# Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

# Introduction

The present document is part 1 of a multi-parts TS:

**3GPP TS 34.121-1: User Equipment (UE) conformance specification; Radio transmission and reception (FDD); Part 1: Conformance specification.**

3GPP TS 34.121-2 [32]: User Equipment (UE) conformance specification; Radio transmission and reception (FDD); Part 2: Implementation Conformance Statement (ICS).

NOTE: TS 34.121 has been converted to multipart TS with version 7.0.0. Previous versions are a single part standard 34.121.

# 1 Scope

The present document specifies the UTRA measurement procedures for the conformance test of the user equipment (UE) that contain transmitting characteristics, receiving characteristics and performance requirements in addition to requirements for support of RRM (Radio Resource Management) in FDD mode. In addition it specifies conformance testing of RRM requirements for support of E-UTRA when the UE operates in UTRA mode.

NOTE: Conformance testing of RRM requirements for support of UTRA when the UE operates in E-UTRA mode are specified in TS 36.521-3 [38].

The requirements are listed in different clauses only if the corresponding parameters deviate. More generally, tests are only applicable to those mobiles that are intended to support the appropriate functionality. To indicate the circumstances in which tests apply, this is noted in the "*definition and applicability*" part of the test.

For example only Release 5 and later UE declared to support HSDPA shall be tested for this functionality. In the event that for some tests different conditions apply for different releases, this is indicated within the text of the test itself.

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

* References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.
* For a specific reference, subsequent revisions do not apply.
* For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document in the same Release as the present document unless the context in which the reference is made suggests a different Release is relevant (information on the applicable release in a particular context can be found in e.g. test case title, description or applicability, message description or content).

- For a Release 1999 UE, references to 3GPP documents are to version 3.x.y.

- For a Release 4 UE, references to 3GPP documents are to version 4.x.y.

- For a Release 5 UE, references to 3GPP documents are to version 5.x.y.

- For a Release 6 UE, references to 3GPP documents are to version 6.x.y.

- For a Release 7 UE, references to 3GPP documents are to version 7.x.y.

- For a Release 8 UE, references to 3GPP documents are to version 8.x.y.

- For a Release 9 UE, references to 3GPP documents are to version 9.x.y.

[1] 3GPP TS 25.101: "UE Radio transmission and reception (FDD)".

[2] 3GPP TS 25.133: "Requirements for Support of Radio Resource Management (FDD)".

[3] 3GPP TS 34.108: "Common Test Environments for User Equipment (UE) Conformance Testing".

[4] 3GPP TS 34.109: "Terminal logical test interface; Special conformance testing functions".

[5] 3GPP TS 25.214: "Physical layer procedures (FDD)".

[6] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[7] 3GPP TR 25.990: "Vocabulary".

[8] 3GPP TS 25.331: "Radio Resource Control (RRC); Protocol Specification".

[9] 3GPP TS 25.433: "UTRAN Iub Interface NBAP Signalling".

[10] ITU-R Recommendation SM.329: "Spurious emissions".

[11] 3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode".

[12] 3GPP TS 25.303: "Interlayer Procedures in Connected Mode".

[13] 3GPP TS 25.321: "Medium Access Control (MAC) protocol specification".

[14] 3GPP TS 25.213: "Spreading and modulation (FDD)".

[15] 3GPP TS 25.223: "Spreading and modulation (TDD)".

[16] ETSI ETR 273-1-2: "Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[17] 3GPP TR 25.926: "UE Radio Access Capabilities".

[18] 3GPP TR 21.904: "UE capability requirements".

[19] 3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".

[20] 3GPP TS 05.08 (R99): "Technical Specification Group GSM/EDGE Radio Access Network; Radio subsystem link control".

[21] 3GPP TS 34.123-1: "User Equipment (UE) Conformance Specification; Part 1: Protocol Conformance Specification".

[22] 3GPP TS 25.215: "Physical Layer - Measurements (FDD)".

[23] Void

[24] 3GPP TR 34.902: "Derivation of test tolerances for multi-cell Radio Resource Management (RRM) conformance tests ".

[25] 3GPP TS 51.010-1: "Mobile Station (MS) conformance specification; Part 1: Conformance specification ".

[26] 3GPP TS 25.307 "Requirements on UEs supporting a release independent frequency band".

[27] ITU-T recommendation O.153: "Basic parameters for the measurement of error performance at bit rates below the primary rate".

[28] 3GPP TS 05.05 (R99): "Technical Specification Group GSM/EDGE Radio Access Network; Radio transmission and reception".

[29] 3GPP TS 45.005 (Rel-4 and later releases): "Technical Specification Group GSM/EDGE Radio Access Network; Radio transmission and reception".

[30] 3GPP TS 45.008 (Rel-4 and later releases): "Technical Specification Group GSM/EDGE Radio Access Network; Radio subsystem link control".

[31] 3GPP TS 25.212: "Multiplexing and channel coding (FDD)".

[32] 3GPP TS 34.121-2: "User Equipment (UE) conformance specification; Radio transmission and reception (FDD); Part 2: Implementation Conformance Statement (ICS)".

[33] 3GPP TS 36.508: "Technical Specification Group Radio Access Network; E-UTRA and EPC; Common test environments for User Equipment (UE)".3 Definitions, symbols, abbreviations and equations

[34] 3GPP TS 36.133: "E-UTRA requirements for support of radio resource management".

[35] 3GPP TS 36.211: "Physical Channels and Modulation".

[36] 3GPP TS 36.331: "E-UTRA Radio Resource Control (RRC): protocol specification".

[37] 3GPP TS 36.101: "E-UTRA UE radio transmission and reception".

[38] 3GPP TS 36.521-3: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 3: Radio Resource Management (RRM) conformance testing".

# 3 Definitions, symbols, abbreviations and equations

## 3.1 Definitions

Definitions, symbols, abbreviations and equations used in the present document are listed in TR 21.905 [5] and TR 25.990 [6].

Terms are listed in alphabetical order in this clause.

For the purpose of the present document, the following terms and definitions apply:

**Maximum Output Power:** This is a measure of the maximum power the UE can transmit (i.e. the actual power as would be measured assuming no measurement error) in a bandwidth of at least (1+  times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot.

For DC-HSUPA the maximum output power is defined by the sum of the broadband transmit power of each carrier in the UE.

**Nominal Maximum Output Power:** This is the nominal power defined by the UE power class.

**Mean power:** When applied to a W-CDMA modulated signal this is the power (transmitted or received) in a bandwidth of at least (1+  times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot unless otherwise stated.

**RRC filtered mean power:** The mean power as measured through a root raised cosine filter with roll-off factor  and a bandwidth equal to the chip rate of the radio access mode.

NOTE 1: The RRC filtered mean power of a perfectly modulated W-CDMA signal is 0.246 dB lower than the mean power of the same signal.

NOTE 2: The roll-off factor  is defined in 3GPP TS 25.101 clause 6.8.1.

**RegDTX:** Regular DTX. These are the times when the HS-DPCCH ACK/NACK is not expected to be transmitted due to an Inter-TTI period greater than 1.

**statDTX:** Statistical DTX. These are the times when the HS-DPCCH is expected to transmit an ACK or NACK but none is transmitted due to the UE not being able to decode consistent control information from the HS\_SCCH.

**Throughput:** Number of information bits per second excluding CRC bits successfully received on HS-DSCH by a HSDPA capable UE.

**Enhanced performance requirements type 1:** This defines performance requirements which are optional for the UE. The requirements are based on UEs which utilise receiver diversity.

**Enhanced performance requirements type 2:** This defines performance requirements which are optional for the UE. The requirements are based on UEs which utilise a chip equaliser receiver structure.

**Enhanced performance requirements type 3:** This defines performance requirements which are optional for the UE. The requirements are based on UEs which utilise a chip equaliser receiver structure with receiver diversity.

**Enhanced performance requirements type 3i:** This defines performance requirements which are optional for the UE, The requirements are based on UEs which utilise an interference-aware chip equaliser receiver structure with receiver diversity.

## 3.2 Symbols

For the purposes of the present document, the following symbols apply:

[…] Values included in square bracket must be considered for further studies, because it means that a decision about that value was not taken

## 3.3 Abbreviations

For the purpose of the present document, the following abbreviations apply:

ACLR Adjacent Channel Leakage power Ratio

ACS Adjacent Channel Selectivity

AFC Automatic Frequency Control

AICH Acquisition Indication Channel

ASD Acceleration Spectral Density

ATT Attenuator

BER Bit Error Ratio

BLER Block Error Ratio

BTFD Blind Transport Format Detection

CQI Channel Quality Indicator

CW Continuous Wave (un-modulated signal)

DB-DC-HSDPA Dual Band Dual Cell HSDPA

DC-HSDPA Dual Cell HSDPA

DCH Dedicated Channel, which is mapped into Dedicated Physical Channel

DIP Dominant Interferer Proportion ratio

DL Down Link (forward link)

DTX Discontinuous Transmission

DPCCH Dedicated Physical Control Channel

DPCH Dedicated Physical Channel

DPDCH Dedicated Physical Data Channel

E-DCH Enhanced Dedicated Channel

E-AGCH E-DCH Absolute Grant Channel

E-HICH E-DCH HARQ ACK Indicator Channel

E-RGCH E-DCH Relative Grant Channel

EIRP Effective Isotropic Radiated Power

EVM Error Vector Magnitude

FACH Forward Access Channel

FDD Frequency Division Duplex

FDR False transmit format Detection Ratio. A false Transport Format detection occurs when the receiver detects a different TF to that which was transmitted, and the decoded transport block(s) for this incorrect TF passes the CRC check(s)

HARQ Hybrid Automatic Repeat Request

HSDPA High Speed Downlink Packet Access

HS-DSCH High Speed Downlink Shared Channel

HS-PDSCH High Speed Physical Downlink Shared Channel

HS-SCCH High Speed Shared Control Channel

HYB Hybrid

Information Data Rate  
Rate of the user information, which must be transmitted over the Air Interface. For example, output rate of the voice codec

IM Intermodulation

ITP Initial Transmission Power control mode

MBSFN MBMS over a Single Frequency Network

MER Message Error Ratio

MIMO Multiple Input Multiple Output

Node B A logical node responsible for radio transmission / reception in one or more cells to/from the User Equipment. Terminates the Iub interface towards the RNC

OBW Occupied Bandwidth

OCNS Orthogonal Channel Noise Simulator, a mechanism used to simulate the users or control signals on the other orthogonal channels of a downlink

PAR Peak to Average Ratio

P-CCPCH Primary Common Control Physical Channel

PCH Paging Channel

P-CPICH Primary Common Pilot ChannelPCDE Peak Code Domain Error

PICH Paging Indicator Channel

PPM Parts Per Million

R Number of information bits per second excluding CRC bits successfully received on HS-DSCH by a HSDPA capable UE.RACH Random Access Channel

RBW Resolution Bandwidth

PRBS Pseudo Random Bit Sequence

regDTX Regular DTX

RRC Root-Raised Cosine

S-CCPCH Secondary Common Control Physical Channel

S-CPICH Secondary Common Pilot Channel

SCH Synchronisation Channel consisting of Primary and Secondary synchronisation channels

SG Serving Grant

SIR Signal to Interference ratio

SML Soft Metric Location (Soft channel bit)

SS System Simulator; see Annex A for description

statDTX Statistical DTX

STTD Space Time Transmit Diversity

TDD Time Division Duplexing

TFC Transport Format Combination

TFCI Transport Format Combination Indicator

TGCFN Transmission Gap Connection Frame Number

TGD Transmission Gap Distance

TGL Transmission Gap Length

TGPL Transmission Gap Pattern Length

TGPRC Transmission Gap Pattern Repetition Count

TGSN Transmission Gap Starting Slot Number

TPC Transmit Power Control

TSTD Time Switched Transmit Diversity

UE User Equipment

UL Up Link (reverse link)

UTRA UMTS Terrestrial Radio Access

## 3.4 Equations

For the purpose of the present document, the following additional equations apply:

The ratio of the received energy per PN chip of the CPICH to the total transmit power spectral density at the Node B (SS) antenna connector.

 Average energy per PN chip for DPCH.

The ratio of the transmit energy per PN chip of the DPCH to the total transmit power spectral density at the Node B (SS) antenna connector.

The ratio of the transmit energy per PN chip of the DPCCH to the total transmit power spectral density at the Node B (SS) antenna connector.

The ratio of the transmit energy per PN chip of the DPDCH to the total transmit power spectral density at the Node B (SS) antenna connector

 Average energy per PN chip.

 The ratio of the average transmit energy per PN chip for different fields or physical channels to the total transmit power spectral density.

Fuw Frequency of unwanted signal. This is specified in bracket in terms of an absolute frequency(s) or a frequency offset from the assigned channel frequency. For DC-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency used and positive offset refers to the assigned channel frequency of the highest carrier frequency used. For DB-DC-HSDPA, offset refers to the assigned channel frequencies of the individual cells.

INode\_B Interference signal power level at Node B in dBm, which is broadcasted on BCH.

 The total received power spectral density, including signal and interference, as measured at the UE antenna connector.

Ioac The power spectral density (integrated in a bandwidth of (1+α) times the chip rate and normalized to the chip rate) of the adjacent frequency channel as measured at the UE antenna connector.

Ioc The power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of a band limited white noise source (simulating interference from cells, which are not defined in a test procedure) as measured at the UE antenna connector. For DC-HSDPA and DB-DC-HSDPA, is defined for each of the cells individually and is assumed to be equal for both cells unless explicitly stated per cell.

Ioc’ The received power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of the summation of the received power spectral densities of the two strongest interfering cells plus Ioc as measured at the UE antenna connector. The respective power spectral density of each interfering cell relative to Ioc’ is defined by its associated DIP value.

Ior The total transmit power spectral density (integrated in a bandwidth of (1+α) times the chip rate and normalized to the chip rate) of the downlink signal at the Node B antenna connect. For DC-HSDPA and DB-DC-HSDPA, is defined for each of the cells individually and is assumed to be equal for both cells unless explicitly stated per cell. Or

Îor The received power spectral density (integrated in a bandwidth of (1+α) times the chip rate and normalized to the chip rate) of the downlink signal as measured at the UE antenna connector For DC-HSDPA and DB-DC-HSDPA,  is defined for each of the cells individually and is assumed to be equal for both cells unless explicitly stated per cell.

Iotx The power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of a band limited white noise source (simulating Node B transmitter impairments) as measured at the Node B transmit antenna connector(s). For DC-HSDPA and DB-DC-HSDPA, is defined for each of the cells individually and is assumed to be equal for both cells unless explicitly stated per cell.).

Iouw Unwanted signal power level.

 Average energy per PN chip for the OCNS.

 The ratio of the average transmit energy per PN chip for the OCNS to the total transmit power spectral density.

*P-CCPCH\_Ec* Average (note) energy per PN chip for P-CCPCH.

The ratio of the received P-CCPCH energy per chip to the total received power spectral density at the UE antenna connector.

The ratio of the average (note) transmit energy per PN chip for the P-CCPCH to the total transmit power spectral density.

*P-CPICH\_Ec* Average (note) energy per PN chip for P-CPICH.

*PICH\_Ec* Average (note) energy per PN chip for PICH.

The ratio of the received energy per PN chip of the PICH to the total transmit power spectral density at the Node B (SS) antenna connector.

R Number of information bits per second excluding CRC bits successfully received on HS-DSCH by a HSDPA capable UE.

<REFSENS> Reference sensitivity

<REF> Reference

 Secondary Common Control Physical Channel.

 Average energy per PN chip for S-CCPCH.

*SCH\_Ec* Average (note) energy per PN chip for SCH.

*S-CPICH\_Ec* Average (note) energy per PN chip for S-CPICH.

NOTE: Averaging period for energy/power of discontinuously transmitted channels should be defined.

NOTE: The units of Power Spectral Density (PSD) are extensively used in this document. PSD is a function of power versus frequency and when integrated across a given bandwidth, the function represents the mean power in such a bandwidth. When the mean power is normalised to (divided by) the chip-rate it represents the mean energy per chip. Some signals are directly defined in terms of energy per chip, (DPCH\_Ec and P-CPICH\_Ec) and others defined in terms of PSD (Ioac, Ioc, and Îor). There also exist quantities that are a ratio of energy per chip to PSD (DPCH\_Ec/Ior, Ec/Ior etc.). This is the common practice of relating energy magnitudes in communication systems.

It can be seen that if both energy magnitudes in the ratio are divided by time, the ratio is converted from an energy ratio to a power ratio, which is more useful from a measurement point of view. It follows that an energy per chip of X dBm/3.84 MHz can be expressed as a mean power per chip of X dBm. Similarly, a signal PSD of Y dBm/3.84 MHz can be expressed as a signal power of Y dBm.

# 4 Frequency bands and channel arrangement

## 4.1 General

The information presented in this clause is based on a chip rate of 3,84 Mcps. The normative reference for the frequency bands and channel arrangement are defined is TS 25.101 [1], clause 5 and TS 25.307 [26].

NOTE: Other chip rates may be considered in future releases.

## 4.2 Frequency bands

a) UTRA/FDD is designed to operate in either of the following paired bands:

|  |  |  |
| --- | --- | --- |
| Operating Band | UL Frequencies  UE transmit, Node B receive | DL frequencies  UE receive, Node B transmit |
| I | 1920 - 1980 MHz | 2110 - 2170 MHz |
| II | 1850 -1910 MHz | 1930 - 1990 MHz |
| III | 1710 -1785 MHz | 1805 - 1880 MHz |
| IV | 1710 -1755MHz | 2110 - 2155MHz |
| V | 824 - 849MHz | 869 - 894MHz |
| VI | 830 - 840 MHz | 875 - 885 MHz |
| VII | 2500 - 2570 MHz | 2620 - 2690 MHz |
| VIII | 880 - 915 MHz | 925 - 960 MHz |
| IX | 1749.9 - 1784.9 MHz | 1844.9 - 1879.9 MHz |
| X | 1710 - 1770 MHz | 2110 - 2170 MHz |
| XI | 1427.9 - 1447.9 MHz | 1475.9 - 1495.9 MHz |
| XII | 699 - 716 MHz | 729 - 746 MHz |
| XIII | 777 - 787 MHz | 746 - 756 MHz |
| XIV | 788 - 798 MHz | 758 - 768 MHz |
| XV | Reserved | Reserved |
| XVI | Reserved | Reserved |
| XVII | Reserved | Reserved |
| XVIII | Reserved | Reserved |
| XIX | 830 - 845 MHz | 875 - 890 MHz |
| XX | 832 - 862 MHz | 791 - 821 MHz |
| XXI | 1447.9 - 1462.9 MHz | 1495.9 - 1510.9 MHz |
| XXII | 3410 - 3490 MHz | 3510 - 3590 MHz |
| XXV | 1850 - 1915 MHz | 1930 - 1995 MHz |
| XXVI | 814 - 849 MHz | 859 - 894 MHz |
| XXXII1 | N/A | 1452 – 1496 MHz |
| NOTE 1: Restricted to UTRA operation when dual band is configured (e.g., DB-DC-HSDPA or dual band 4C-HSDPA). The down link frequenc(ies) of this band are paired with the uplink frequenc(ies) of the other FDD band (external) of the dual band configuration. | | |

b) Deployment in other frequency bands is not precluded.

c) DB-DC-HSDPA is designed to operate in the following configurations:

| DB-DC-HSDPA Configuration | UL Band | DL Bands |
| --- | --- | --- |
| 1 | I or VIII | I and VIII |
| 2 | II or IV | II and IV |
| 3 | I or V | I and V |
| 4 | I or XI | I and XI |
| 5 | II or V | II and V |
| 6 | I | XXXII |

d) Single band 4C-HSDPA is designed to operate in the following configurations:

Table 4.0A: Single band 4C-HSDPA configurations

| Single band 4C-HSDPA Configuration | Operating Band | Number of DL carriers |
| --- | --- | --- |
| I-3 | I | 3 |
| II-3 | II | 3 |
| II-4 | II | 4 |
| NOTE: Single band 4C-HSDPA configuration is numbered as (X-M) where X denotes the operating band and M denotes the number of DL carriers. | | |

e) Dual band 4C-HSDPA is designed to operate in the following configurations:

Table 4.0B: Dual band 4C-HSDPA configurations

| Dual band 4C-HSDPA Configuration | UL Band | DL Band A | Number of DL carriers in Band A | DL Band B | Number of DL carriers in Band B |
| --- | --- | --- | --- | --- | --- |
| I-2-VIII-1 | I or VIII | I | 2 | VIII | 1 |
| I-1-VIII-2 | I or VIII | I | 1 | VIII | 2 |
| I-2-VIII-2 | I or VIII | I | 2 | VIII | 2 |
| I-3-VIII-1 | I or VIII | I | 3 | VIII | 1 |
| II-1-IV-2 | II or IV | II | 1 | IV | 2 |
| II-2-IV-1 | II or IV | II | 2 | IV | 1 |
| II-2-IV-2 | II or IV | II | 2 | IV | 2 |
| I-1-V-2 | I or V | I | 1 | V | 2 |
| I-2-V-1 | I or V | I | 2 | V | 1 |
| I-2-V-2 | I or V | I | 2 | V | 2 |
| II-1-V-2 | II or V | II | 1 | V | 2 |
| I-1-XXXII-2 | I | I | 1 | XXXII | 2 |
| I-2-XXXII-1 | I | I | 2 | XXXII | 1 |
| NOTE: Dual band 4C-HSDPA configuration is numbered as (X-M-Y-N) where X denotes the DL Band A, M denotes the number DL carriers in the DL Band A, Y denotes the DL Band B, and N denotes the number of DL carriers in the DL Band B. | | | | | |

## 4.3 TX-RX frequency separation

a) UTRA/FDD is designed to operate with the following TX-RX frequency separation.

|  |  |
| --- | --- |
| Operating Band | TX-RX frequency separation |
| I | 190 MHz |
| II | 80 MHz |
| III | 95 MHz |
| IV | 400 MHz |
| V | 45 MHz |
| VI | 45 MHz |
| VII | 120 MHz |
| VIII | 45 MHz |
| IX | 95 MHz |
| X | 400 MHz |
| XI | 48 MHz |
| XII | 30 MHz |
| XIII | 31 MHz |
| XIV | 30 MHz |
| XIX | 45 MHz |
| XX | 41 MHz |
| XXI | 48 MHz |
| XXII | 100 MHz |
| XXV | 80 MHz |
| XXVI | 45 MHz |

b) UTRA/FDD can support both fixed and variable transmit to receive frequency separation.

c) The use of other transmit to receive frequency separations in existing or other frequency bands shall not be precluded.

d) When configured to operate on dual cells, the TX-RX frequency separation shall be applied to UL and DL with the serving HS-DSCH cell. For band XII, XIII and XIV, the TX-RX frequency separation shall be the minimum spacing between UL and any of DL carriers.

## 4.4 Channel arrangement

### 4.4.1 Channel spacing

The nominal channel spacing is 5 MHz, but this can be adjusted to optimise performance in a particular deployment scenario. In DC-HSDPA and DB-DC-HSDPA mode, the UE receives two cells simultaneously. In context of DC‑HSDPA and DB-DC-HSDPA, a cell is characterized by a combination of scrambling code and a carrier frequency; see TR 21.905 [5].

### 4.4.2 Channel raster

The channel raster is 200kHz, for all bands which means that the centre frequency must be an integer multiple of 200 kHz. In addition a number of additional centre frequencies are specified according to table 4.1a, which means that the centre frequencies for these channels are shifted 100 kHz relative to the general raster.

### 4.4.3 Channel number

The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number (UARFCN). For each operating Band, the values of the UARFCN are defined as follows.

Uplink: NU =5 \* (FUL - FUL\_Offset), for the carrier frequency range FUL\_low FUL  FUL\_high

Downlink: ND =5 \* (FDL - FDL\_Offset), for the carrier frequency range FDL\_low FDL  FDL\_high

For each operating Band, FUL\_Offset, FUL\_low FUL\_high, FDL\_Offset, FDL\_lowand FDL\_high are defined in Table 4.1 for the general UARFCN. For the additional UARFCN, FUL\_Offset, FDL\_Offset and the specific FUL and FDL are defined in Table 4.1A.

Table 4.1: UARFCN definition (general)

| Band | UPLINK (UL)  UE transmit, Node B receive | | | DOWNLINK (DL)  UE receive, Node B transmit | | |
| --- | --- | --- | --- | --- | --- | --- |
| UARFCN formula offset  FUL\_Offset [MHz] | Carrier frequency (FUL) range [MHz] | | UARFCN formula offset  FDL\_Offset [MHz] | Carrier frequency (FDL) range [MHz] | |
| **FUL\_low** | **FUL\_high** | **FDL\_low** | **FDL\_high** |
| I | 0 | 1922.4 | 1977.6 | 0 | 2112.4 | 2167.6 |
| II | 0 | 1852.4 | 1907.6 | 0 | 1932.4 | 1987.6 |
| III | 1525 | 1712.4 | 1782.6 | 1575 | 1807.4 | 1877.6 |
| IV | 1450 | 1712.4 | 1752.6 | 1805 | 2112.4 | 2152.6 |
| V | 0 | 826.4 | 846.6 | 0 | 871.4 | 891.6 |
| VI | 0 | 832.4 | 837.6 | 0 | 877.4 | 882.6 |
| VII | 2100 | 2502.4 | 2567.6 | 2175 | 2622.4 | 2687.6 |
| VIII | 340 | 882.4 | 912.6 | 340 | 927.4 | 957.6 |
| IX | 0 | 1752.4 | 1782.4 | 0 | 1847.4 | 1877.4 |
| X | 1135 | 1712.4 | 1767.6 | 1490 | 2112.4 | 2167.6 |
| XI | 733 | 1430.4 | 1445.4 | 736 | 1478.4 | 1493.4 |
| XII | -22 | 701.4 | 713.6 | -37 | 731.4 | 743.6 |
| XIII | 21 | 779.4 | 784.6 | -55 | 748.4 | 753.6 |
| XIV | 12 | 790.4 | 795.6 | -63 | 760.4 | 765.6 |
| XIX | 770 | 832.4 | 842.6 | 735 | 877.4 | 887.6 |
| XX | -23 | 834.4 | 859.6 | -109 | 793.4 | 818.6 |
| XXI | 1358 | 1450.4 | 1460.4 | 1326 | 1498.4 | 1508.4 |
| XXII | 2525 | 3412.4 | 3487.6 | 2580 | 3512.4 | 3587.6 |
| XXV | 875 | 1852.4 | 1912.6 | 910 | 1932.4 | 1992.6 |
| XXVI | -291 | 816.4 | 846.6 | -291 | 861.4 | 891.6 |
| XXXII1 | N/A | | | 131 | 1454.4 | 1493.6 |
| NOTE 1: Restricted to UTRA operation when dual band is configured (e.g., DB-DC-HSDPA or dual band 4C-HSDPA) | | | | | | |

Table 4.1a: UARFCN definition (additional channels)

| Band | UPLINK (UL)  UE transmit, Node B receive | | DOWNLINK (DL)  UE receive, Node B transmit | |
| --- | --- | --- | --- | --- |
| UARFCN formula offset  FUL\_Offset [MHz] | Carrier frequency [MHz]  (FUL)) | UARFCN formula offset  FDL\_Offset [MHz] | Carrier frequency [MHz]  (FDL)) |
| I | - | - | - | - |
| II | 1850.1 | 1852.5, 1857.5, 1862.5, 1867.5, 1872.5, 1877.5, 1882.5, 1887.5, 1892.5, 1897.5, 1902.5, 1907.5 | 1850.1 | 1932.5, 1937.5, 1942.5, 1947.5, 1952.5, 1957.5, 1962.5, 1967.5, 1972.5, 1977.5, 1982.5, 1987.5 |
| III | - | - | - | - |
| IV | 1380.1 | 1712.5, 1717.5, 1722.5, 1727.5, 1732.5, 1737.5 1742.5, 1747.5, 1752.5 | 1735.1 | 2112.5, 2117.5, 2122.5, 2127.5, 2132.5, 2137.5, 2142.5, 2147.5, 2152.5 |
| V | 670.1 | 826.5, 827.5, 831.5, 832.5, 837.5, 842.5 | 670.1 | 871.5, 872.5, 876.5,  877.5, 882.5, 887.5 |
| VI | 670.1 | 832.5, 837.5 | 670.1 | 877.5, 882.5 |
| VII | 2030.1 | 2502.5, 2507.5, 2512.5,  2517.5, 2522.5, 2527.5,  2532.5, 2537.5, 2542.5,  2547.5, 2552.5, 2557.5,  2562.5, 2567.5 | 2105.1 | 2622.5, 2627.5, 2632.5,  2637.5, 2642.5, 2647.5,  2652.5, 2657.5, 2662.5,  2667.5, 2672.5, 2677.5,  2682.5, 2687.5 |
| VIII | - | - | - | - |
| IX | - | - | - | - |
| X | 1075.1 | 1712.5, 1717.5, 1722.5,  1727.5, 1732.5, 1737.5,  1742.5, 1747.5, 1752.5,  1757.5, 1762.5, 1767.5 | 1430.1 | 2112.5, 2117.5, 2122.5,  2127.5, 2132.5, 2137.5,  2142.5, 2147.5, 2152.5, 2157.5, 2162.5, 2167.5 |
| XI | - | - | - | - |
| XII | -39.9 | 701.5, 706.5,  707.5, 712.5, 713.5 | -54.9 | 731.5, 736.5,  737.5, 742.5, 743.5 |
| XIII | 11.1 | 779.5, 784.5 | -64.9 | 748.5, 753.5 |
| XIV | 2.1 | 790.5, 795.5 | -72.9 | 760.5, 765.5 |
| XIX | 755.1 | 832.5, 837.5, 842.5 | 720.1 | 877.5, 882.5, 887.5 |
| XX | - | - | - | - |
| XXI | - | - | - | - |
| XXII | - | - | - | - |
| XXV | 639.1 | 1852.5, 1857.5, 1862.5,1867.5, 1872.5, 1877.5, 1882.5, 1887.5, 1892.5, 1897.5, 1902.5, 1907.5, 1912.5 | 674.1 | 1932.5, 1937.5, 1942.5, 1947.5, 1952.5, 1957.5, 1962.5, 1967.5, 1972.5, 1977.5, 1982.5, 1987.5, 1992.5 |
| XXVI | -325.9 | 816.5, 821.5, 826.5, 827.5, 831.5, 832.5, 836.5, 837.5, 841.5, 842.5, 846.5 | -325.9 | 861.5, 866.5, 871.5, 872.5, 876.5, 877.5, 881.5, 882.5, 886,5, 887.5, 891.5 |
| XXXII1 | N/A | | 87.1 | 1454.5, 1459.5, 1464.5, 1469.5, 1474.5, 1479.5, 1484.5, 1489.5 |
| NOTE 1: Restricted to UTRA operation when dual band is configured (e.g., DB-DC-HSDPA or dual band 4C-HSDPA) | | | | |

### 4.4.4 UARFCN

The following UARFCN range shall be supported for each paired band.

Table 4.2: UTRA Absolute Radio Frequency Channel Number

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Band | Uplink (UL)  UE transmit, Node B receive | | Downlink (DL)  UE receive, Node B transmit | |
| General | Additional | General | Additional |
| I | 9612 to 9888 | - | 10562 to 10838 |  |
| II | 9262 to 9538 | 12, 37, 62,  87, 112, 137,  162, 187, 212,  237, 262, 287 | 9662 to 9938 | 412, 437, 462,  487, 512, 537,  562, 587, 612,  637, 662, 687 |
| III | 937 to 1288 | - | 1162 to 1513 | - |
| IV | 1312 to 1513 | 1662, 1687, 1712, 1737, 1762, 1787, 1812, 1837, 1862 | 1537 to 1738 | 1887, 1912, 1937, 1962, 1987, 2012, 2037, 2062, 2087 |
| V | 4132 to 4233 | 782, 787, 807,  812, 837, 862 | 4357 to 4458 | 1007, 1012, 1032,  1037, 1062, 1087 |
| VI | 4162 to 4188 | 812, 837 | 4387 to 4413 | 1037, 1062 |
| VII | 2012 to 2338 | 2362, 2387, 2412, 2437, 2462, 2487, 2512, 2537, 2562, 2587, 2612, 2637, 2662, 2687 | 2237 to 2563 | 2587, 2612, 2637, 2662, 2687, 2712, 2737, 2762, 2787, 2812, 2837, 2862, 2887, 2912 |
| VIII | 2712 to 2863 | - | 2937 to 3088 | - |
| IX | 8762 to 8912 | - | 9237 to 9387 | - |
| X | 2887 to 3163 | 3187, 3212, 3237, 3262, 3287, 3312, 3337, 3362, 3387, 3412, 3437, 3462 | 3112 to 3388 | 3412, 3437, 3462, 3487, 3512, 3537, 3562, 3587, 3612, 3637, 3662, 3687 |
| XI | 3487 to 3562 | - | 3712 to 3787 | - |
| XII | 3617 to 3678 | 3707, 3732, 3737, 3762, 3767 | 3842 to 3903 | 3932, 3957, 3962, 3987, 3992 |
| XIII | 3792 to 3818 | 3842, 3867 | 4017 to 4043 | 4067, 4092 |
| XIV | 3892 to 3918 | 3942, 3967 | 4117 to 4143 | 4167, 4192 |
| XIX | 312 to 363 | 387, 412, 437 | 712 to 763 | 787, 812, 837 |
| XX | 4287 to 4413 | - | 4512 to 4638 | - |
| XXI | 462 to 512 | - | 862 to 912 | - |
| XXII | 4437 to 4813 | - | 4662 to 5038 | - |
| XXV | 4887 to 5188 | 6067, 6092, 6117, 6142, 6167, 6192, 6217, 6242, 6267, 6292, 6317, 6342, 6367 | 5112 to 5413 | 6292, 6317, 6342, 6367, 6392, 6417, 6442, 6467, 6492, 6517, 6542, 6567, 6592 |
| XXVI | 5537 to 5688 | 5712, 5737, 5762, 5767, 5787, 5792, 5812, 5817, 5837, 5842, 5862 | 5762 to 5913 | 5937, 5962, 5987, 5992, 6012, 6017, 6037, 6042, 6062, 6067, 6087 |
| XXXII1 | N/A | | 6617 to 6813 | 6837, 6862, 6887, 6912, 6937, 6962,  6987, 7012 |
| NOTE 1: Restricted to UTRA operation when dual band is configured (e.g., DB-DC-HSDPA or dual band 4C-HSDPA) | | | | |

NOTE: If the UE is on a network with Mobile Country Code set to Japan then it may assume that any DL UARFCN sent by the network from the overlapping region of Band V and Band VI is from Band VI. If the UE is on a network with a Mobile Country Code other than Japan then it may assume that any DL UARFCN sent by the network from the overlapping region of Band V and Band VI is from Band V.

# 4A Reference Conditions

The reference environment used by all test cases in this document is specified in TS 34.108 [3] and TS 36.508 [33]. Where a test requires an environment that is different, this will be specified in the test itself.

## 4A.1 Generic setup procedures

Test procedures for RF test are defined in TS 34.108 [3] clause 7.3. The initial conditions of this clause also refer to the generic setup procedures defined in TS 34.108 [3] clause 7.2.

## 4A.2 System information

The reference system information used for test cases specified in this document is defined in TS 34.108 [3] clauses 6.1.0a (Default Master Information Block and Scheduling Block messages) and 6.1.0b (Default System Information Block Messages). For cells other than cell 1 the difference in information elements is defined in TS 34.108 [3] clause 6.1.4. For the generic setup procedures defined in TS 34.108 [3] clause 7.3 some SIB elements override those specific SIB elements from TS 34.108 [3] clause 6.1.0b. Annex I in the present document overwrites specific elements in the Master Information Block and Scheduling Block messages compared to TS 34.108 [3] clause 6.1.0a and specific SIB elements compared to TS 34.108 [3] clauses 6.1.0b and 7.3. In the test description itself specific SIB elements can be overwritten again. This leads to the following places defining Master Information Block, Scheduling Block messages and System Information Block Messages:

1. TS 34.108 [3] clauses 6.1.0a, 6.1.0b and 6.1.4

2. TS 34.108 [3] clause 7.3

3. TS 34.121 Annex I

4. TS 34.121 test case description

When the same Information Element is defined in several places then the place with the higher number according to the above list will override the other definition(s).

The reference system information for E-UTRAN is specified in TS 36.508 [33]

## 4A.3 Message contents

Default message contents for test cases specified in this document are defined in TS 34.108 [3] clause 9. Most default message contents are specified in TS 34.108 [3] clause 9.2.1, but some default message contents originally defined for signalling test cases are re-used for RF testing and specified in TS 34.108 [3] clause 9.1.1. TS 34.108 [3] clause 7.3 contains additional information regarding the default messages. Annex I in the present document overwrites specific message contents for some test cases. In the test description itself specific information elements can be overwritten again. This leads to the following places defining message contents:

1a. TS 34.108 [3] clause 9.1.1 (only if indicated by TS 34.108 [3] clause 7.3 or the test description in TS 34.121)

1b. TS 34.108 [3] clause 9.2.1 (as indicated by TS 34.108 [3] clause 7.3 or the test description in TS 34.121)

2. TS 34.108 [3] clause 7.3

3. TS 34.121 Annex I

4. TS 34.121 test case description

When the same Information Element is defined in several places then the place with the higher number according to the above list will override the other definition(s). Default message contents from TS 34.108 [3] clause 9 will be used either from clause 9.1.1 (1a in the list above) or from clause 9.2.1 (1b in the list above). Some messages are not defined in all places, but all messages have to be defined at least in the test description.

Default message contents for E-UTRAN is specified in TS 36.508 [33].

## 4A.4 Measurement configurations

Measurement configurations defined by system information are specified in TS 34.108 [3]. System Information Block type 11 (SIB 11) configures measurements for cell 1 according to TS 34.108 [3], clause 6.1.0b. See TS 34.108 [3], clause 6.1.4 for the difference in message contents of SIB 11 (FDD) for other cells used in the test. SIB 12 is specified in TS 34.108 [3] clause 6.1.0b, but is currently not used to configure measurements.

Some modifications to specific information elements in SIB 11 are defined in TS 34.121 Annex I or in the test description itself. In this case the priority defined in clause 4A.2 shall be applied.

Note: Currently SIB 11 in TS 34.108 [3] configures Intra-frequency measurement system information to use "Intra-frequency measurement identity=1" (default value), "Intra-frequency measurement identity =CPICH RSCP" with events 1a, 1b and 1c. The Inter-frequency measurement system information and the Inter-RAT measurement system information do not configure measurement identities. Traffic volume measurement system information is not present.

In many test cases the measurement identity as configured by SIB 11 is reused and the Measurement Control message will "Modify" the Measurement Identity configured in SIB 11.

In some test cases additional measurements are used. Then the Measurement Control message will "Setup" a new Measurement Identity with the default value for that measurement quantity as specified in TS 25.331 [8]. If the Measurement Control message uses "Setup" then the new Measurement Identity shall be different to already configured ones. All Inter-frequency measurements and Inter-RAT measurements are first configured by Measurement Control message using "Setup".

All UE measurements are referenced to the UE antenna connector.

Measurement configurations defined by system information for E-UTRAN is specified in TS 36.508 [33].

# 5 Transmitter Characteristics

## 5.1 General

Transmitting performance test of the UE is implemented during communicating with the SS via air interface. The procedure is using normal call protocol until the UE is communicating on traffic channel basically. On the traffic channel, the UE provides special function for testing that is called Logical Test Interface and the UE is tested using this function. (Refer to TS 34.109 [4]).

Transmitting or receiving bit/symbol rate for test channel is shown in table 5.1.

Table 5.1: Bit / Symbol rate for Test Channel

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type of User Information | User bit rate | DL DPCH  symbol rate | UL DPCH  bit rate | Remarks |
| 12,2 kbps reference measurement channel | 12,2 kbps | 30 ksps | 60 kbps | Standard Test |

Unless detailed the transmitter characteristic are specified at the antenna connector of the UE. For UE with integral antenna only, a reference antenna with a gain of 0 dBi is assumed. Transmitter characteristics for UE(s) with multiple antennas/antenna connectors are FFS.

The UE antenna performance has a significant impact on system performance, and minimum requirements on the antenna efficiency are therefore intended to be included in future versions of the present document. It is recognised that different requirements and test methods are likely to be required for the different types of UE.

All the parameters in clause 5 are defined using the UL reference measurement channel (12,2 kbps) specified in clause C.2.1 and unless stated otherwise, with the UL power control ON.

The common RF test conditions of Tx Characteristics are defined in clause E.3.1, and each test conditions in this clause (clause 5) should refer clause E.3.1. Individual test conditions are defined in the paragraph of each test.

When DCCH has been configured on downlink DCH then DCCH Data shall be continuously transmitted on downlink DCH during the measurement period. When there is no signalling to transmit on downlink DCCH then dummy DCCH transmission as described in Annex C.9 shall be used.

For HSDPA test cases and E-DCH test cases, when DTCH has been configured on downlink DCH then DTCH Data shall be continuously transmitted on downlink DCH during the measurement period.

The MAC header transmission on HS-DSCH for all E-DCH test cases shall use a correct MAC-hs header consistent with the actual HSDPA transmission.

The DL and UL RLC SDU size for all E-DCH tests in clause 5 shall be set according to Annex C.11.3.

For HSDPA test cases without E-DCH, the MAC headers on HS-DSCH shall be according to Annex C.9A.

UEs supporting DC-HSUPA shall support both minimum requirements, as well as additional requirements for DC-HSUPA.

For the additional requirements for DC-HSUPA, all the parameters in clause 6 are defined using the UL E-DCH reference measurement channel, specified in subclause C.2.6. For the additional requirements for DC-HSUPA, the spacing of the carrier frequencies of the two cells shall be 5 MHz.

## 5.2 Maximum Output Power

### 5.2.1 Definition and applicability

The nominal maximum output power and its tolerance are defined according to the Power Class of the UE.

The maximum output power is a measure of the maximum power the UE can transmit (i.e. the actual power as would be measured assuming no measurement error) in a bandwidth of at least (1+  times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot.

The requirements and this test apply to all types of UTRA for the FDD UE.

### 5.2.2 Minimum Requirements

The UE maximum output power shall be within the nominal value and tolerance specified in table 5.2.1 even for the multi-code transmission mode.

Table 5.2.1: Nominal Maximum Output Power

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Operating Band | Power Class 1 | | Power Class 2 | | Power Class 3 | | Power Class 3bis | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| Band I | +33 | +1/-3 | +27 | +1/-3 | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band II | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band III | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band IV | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band V | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band VI | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band VII | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band VIII | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band IX | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band X | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band XI | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band XII | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band XIII | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band XIV | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band XIX | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band XX | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band XXI | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band XXII | - | - | - | - | +24 | +1/-4.5 | +23 | +2/-3.5 | +21 | +2/-3.5 |
| Band XXV |  |  |  |  | +24 | +1/-4 | +23 | +2/-3 | +21 | +2/-3 |
| Band XXVI  (Note 1) | - | - | - | - | +24 | +1/-4 | +23 | +2/-3 | +21 | +2/-3 |
| NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz. | | | | | | | | | | |

NOTE: The tolerance allowed for the nominal maximum output power applies even for the multi-code DPDCH transmission mode.

For the UE which supports DB-DC-HSDPA configuration in Table 6.1aB, the lower side of the tolerance in Table 5.2.1 is allowed to be adjusted by the amount given in Table 5.2.1a for the applicable bands.

Table 5.2.1a Allowed adjustment in lower side of tolerance for UE which supports DB-DC-HSDPA

| DB-DC-HSDPA Configuration | Maximum allowed adjustment  in lower side of tolerance (dB) | Applicable bands | |
| --- | --- | --- | --- |
| 1 | -0.3 | I, VIII |  |
| 2 | -1 | II, IV | |
| 3 | -0.3 | I, V | |
| 4 | -1 | I, XI | |
| 5 | -0.3 | II, V | |
| 6 | -0.3 | I | |
| NOTE: The requirements reflect what can be achieved with the present state of the art technology. They shall be reconsidered when the state of the art technology progresses. | | | |

For the UE which supports dual band 4C-HSDPA configuration in Table 5.2.1b, the lower side of the tolerance in Table 5.2.1 is allowed to be adjusted by the amount given in Table 5.2.1b for the applicable bands.

Table 5.2.1b: Allowed adjustment in lower side of tolerance for UE which supports dual band 4C-HSDPA

| Dual Band  4C-HSDPA Configuration | Maximum allowed adjustment in lower side of tolerance (dB) | Applicable bands |
| --- | --- | --- |
| I-2-VIII-1, I-3-VIII-1, I-2-VIII-2, I-1-VIII-2 | -0.3 | I, VIII |
| II-1-IV-2, II-2-IV-1, II-2-IV-2 | -1 | II, IV |
| I-1-V-2, I-2-V-1, I-2-V-2 | -0.3 | I, V |
| II-1-V-2 | -0.3 | II, V |
| I-1-XXXII-2, I-2-XXXII-1 | -0.3 | I |
| NOTE: The requirements reflect what can be achieved with the present state of the art technology. They shall be reconsidered when the state of the art technology progresses. | | |

For the UE which supports E-UTRA inter-band carrier aggregation, the lower side of the tolerance in Table 5.2.1 is allowed to be decreased by the amount given in Table 6.2.5-2 of TS 36.101[11] for those UTRA operating bands corresponding to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations. The tolerance in Table 6.2.5-2 of TS 36.101[11] does not apply to supported UTRA operating bands with frequency range below 1 GHz that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations when such bands are belonging only to band combination(s) where one band is <1GHz and another band is >1.7GHz and there is no harmonic relationship between the low band UL and high band DL.

In case the UE supports DB-DC-HSDPA or dual band 4C-HSDPA configurations and one or more of the E-UTRA inter-band carrier aggregation configurations listed in Table 6.2.5-2 of TS36.101[11] with a UTRA operating band that belongs to UTRA and E-UTRA carrier aggregation configurations, then

- When the UTRA operating band frequency range is ≤ 1GHz, the applicable additional tolerance shall be the average of the applicable tolerances, truncated to one decimal place for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations, with the DB-DC-HSDPA, dual carrier 4C-HSDPA, and E-UTRA CA configurations counted separately. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied

- When the UTRA operating band frequency range is >1GHz, the applicable additional tolerance shall be the maximum tolerance that applies for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations.

The normative reference for this requirement is TS 25.101 [1], clause 6.2.1.

### 5.2.3 Test purpose

To verify that the error of the UE maximum output power does not exceed the range prescribed by the nominal maximum output power and tolerance in table 5.2.1.

An excess maximum output power has the possibility to interfere to other channels or other systems. A small maximum output power decreases the coverage area.

### 5.2.4 Method of test

#### 5.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3], clause 7.3.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

#### 5.2.4.2 Procedure

1) Set and send continuously Up power control commands to the UE.

2) Measure the mean power of the UE in a bandwidth of at least (1+  times the chip rate of the radio access mode. The mean power shall be averaged over at least one timeslot.

### 5.2.5 Test requirements

The maximum output power, derived in step 2), shall not exceed the range prescribed by the nominal maximum output power and tolerance in table 5.2.2.

Table 5.2.2: Nominal Maximum Output Power

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Operating Band | Power Class 1 | | Power Class 2 | | Power Class 3 | | Power Class 3bis | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| Band I | +33 | +1,7/-3,7 | +27 | +1,7/-3,7 | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band II | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band III | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band IV | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band V | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band VI | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band VII | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band VIII | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band IX | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band X | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XI | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XII | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XIII | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XIV | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XIX | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XX | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XXI | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XXII | - | - | - | - | +24 | +1,7/-5.2 | +23 | +2,7/-4.2 | +21 | +2.7/-4.2 |
| Band XXV | - | - | - | - | +24 | +1,7/-4,7 | +23 | +2,7/-3,7 | +21 | +2,7/-3,7 |
| Band XXVI  (Note 1) | - | - | - | - | +24 | +1.7/-4.7 | +23 | +2.7/-3.7 | +21 | +2.7/-3.7 |
| NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824‑845 MHz. | | | | | | | | | | |

For the UE which supports E-UTRA inter-band carrier aggregation, the lower side of the tolerance in Table 5.2.2 is allowed to be decreased by the amount given in Table 6.2.5-2 of TS 36.101[11] for those UTRA operating bands corresponding to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations. The tolerance in Table 6.2.5-2 of TS 36.101[11] does not apply to supported UTRA operating bands with frequency range below 1 GHz that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations when such bands are belonging only to band combination(s) where one band is <1GHz and another band is >1.7GHz and there is no harmonic relationship between the low band UL and high band DL.

For the UE which supports DB-DC-HSDPA or dual band 4C-HSDPA configurations with uplink assigned to one UTRA band the relaxation in Table 5.2.1a and Table 5.2.1b respectively shall be applied for applicable bands.

In case the UE supports DB-DC-HSDPA or dual band 4C-HSDPA configurations and one or more of the E-UTRA inter-band carrier aggregation configurations listed in Table 6.2.5-2 of TS36.101[11] with a UTRA operating band that belongs to UTRA and E-UTRA carrier aggregation configurations, then

- When the UTRA operating band frequency range is ≤ 1GHz, the applicable additional tolerance shall be the average of the applicable tolerances, truncated to one decimal place for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations, with the DB-DC-HSDPA, dual carrier 4C-HSDPA, and E-UTRA CA configurations counted separately. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied

- When the UTRA operating band frequency range is >1GHz, the applicable additional tolerance shall be the maximum tolerance that applies for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.2A Maximum Output Power with HS-DPCCH (Release 5 only)

### 5.2A.1 Definition and applicability

The maximum output power with HS-DPCCH and its tolerance are defined according to the Power Class of the UE.

The maximum output power with HS-DPCCH is a measure of the maximum power the UE can transmit when HS‑DPCCH is fully or partially transmitted during a DPCCH timeslot. The measurement period shall be at least one timeslot.

The requirements and this test apply to all types of UTRA for the FDD UE that supports HSDPA for Release 5.

### 5.2A.2 Minimum Requirements

The UE maximum output power with HS-DPCCH shall be within the value and tolerance specified in table 5.2A.1 when HS-DPCCH is fully or partially transmitted during a DPCCH timeslot. The maximum output power where HS‑DPCCH is not transmitted shall be within the values and tolerance specified in table 5.2.1.

Table 5.2A.1: Maximum Output Powers with HS-DPCCH

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Ratio of  to for all values of | Power Class 3 | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| 1/15  c/d  12/15 | +24 | +1/-3 | +21 | +2/-2 |
| 13/15  c/d  15/8 | +23 | +2/-3 | +20 | +3/-2 |
| 15/7  c/d  15/0 | +22 | +3/-3 | +19 | +4/-2 |

The normative reference for this requirement is TS 25.101 [1], clause 6.2.2.

### 5.2A.3 Test purpose

To verify that the error of the UE maximum output power with HS-DPCCH does not exceed the range prescribed by the maximum output power and tolerance in table 5.2A.1.

An excess maximum output power may interfere with other channels or other systems. A small maximum output power decreases the coverage area.

### 5.2A.4 Method of test

#### 5.2A.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1 with the beta values set according to table C.10.1.4.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.2A.1A.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.2A.1A: Settings for the serving cell during the measurement  
of Maximum Output Power with HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2A.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.2A.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.1.4 and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.

2) Set and send continuously Up power control commands to the UE.

3) Start transmitting HSDPA Data.

4) Measure the mean power of the UE. The mean power shall be averaged over at least one timeslot.

5) Repeat the measurement for the different combinations of beta values as given in table C.10.1.4.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I.

### 5.2A.5 Test requirements

The maximum output power with HS-DPCCH, derived in step 4), shall not exceed the range prescribed by the maximum output power and tolerance in table 5.2A.2. The maximum output power where HS-DPCCH is not transmitted shall not exceed the range prescribed in table 5.2.2.

The UL reference measurement channel for TX test will be set as defined in C.10.1 with the power ratio between HS-DPCH, DPCCH and DPDCH being set to the values defined in table C.10.1.4.

Table 5.2A.2: Maximum Output Powers with HS-DPCCH for test

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Ratio of  to for all values of | Power Class 3 | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| c /d = 2/15, 12/15 | +24 | +1.7/-3.7 | +21 | +2.7/-2.7 |
| c /d = 15/8 | +23 | +2.7/-3.7 | +20 | +3.7/-2.7 |
| c /d = 15/4 | +22 | +3.7/-3.7 | +19 | +4.7/-2.7 |
| NOTE: For the purpose of the test ∆ACK, ∆NACK and ∆CQI = 30/15 with = 30/15 \* . | | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.2AA Maximum Output Power with HS-DPCCH (Release 6 and later)

### 5.2AA.1 Definition and applicability

The maximum output power with HS-DPCCH and its tolerance are defined according to the UE Maximum Power Reduction (MPR) for the nominal maximum output power.

The maximum output power with HS-DPCCH is a measure of the maximum power the UE can transmit when HS-DPCCH is fully or partially transmitted during a DPCCH timeslot. The measurement period shall be at least one timeslot.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA without E-DCH.

### 5.2AA.2 Minimum Requirements

The UE Maximum Power Reduction (MPR) for the nominal maximum output power shall be within the value and tolerance specified in table 5.2AA.1 for when the values of c, d, hs, ec and ed is fully or partially transmitted during a DPCCH timeslot.

Table 5.2AA.1: Maximum Output Power with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| UE transmit channel configuration | CM (dB) | MPR (dB) |
| For all combinations of; DPDCH, DPCCH, HS‑DPCCH, E-DPDCH and E-DPCCH | 0  CM  3.5 | MAX (CM-1, 0) |
| NOTE 1: CM = 1 for c/d =12/15, hs/c=24/15. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCHthe MPR is based on the relative CM difference. | | |

Where Cubic Metric (CM) is based on the UE transmit channel configuration and is given by:

CM = CEIL { [20 \* log10 ((v\_norm 3) rms) - 20 \* log10 ((v\_norm\_ref 3) rms)] / k, 0.5 }

Where:

- CEIL{ x, 0.5 } means rounding upwards to closest 0.5dB, i.e. CM  [0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5]

- k is 1.85 for signals where all channelisations codes meet the following criteria CSF, N where N< SF/2

- k is 1.56 for signals were any channelisations codes meet the following criteria CSF, N where N ≥ SF/2

- v\_normis the normalized voltage waveform of the input signal

- v\_norm\_ref is the normalized voltage waveform of the reference signal (12.2 kbps AMR Speech) and 20 \* log10 ((v\_norm\_ref3)rms) = 1.52 dB

The normative reference for this requirement is TS 25.101 [1], clause 6.2.2.

### 5.2AA.3 Test purpose

To verify that the error of the UE maximum output power with HS-DPCCH does not exceed the range prescribed by the maximum output power and tolerance in table 5.2AA.2.

An excess maximum output power may interfere with other channels or other systems. A small maximum output power decreases the coverage area.

### 5.2AA.4 Method of test

#### 5.2AA.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1) are specified in clauses C.10.1 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.2AA.1A.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.2AA.1A: Settings for the serving cell during the measurement  
of Maximum Output Power with HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2AA.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.2AA.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.1.4 and the DPCH frame offset according to the HS-DPCCH slot offset required for measurements.

2) Set and send continuously Up power control commands to the UE.

3) Start transmitting HSDPA Data.

4) Measure the mean power of the UE. The mean power shall be averaged over at least one timeslot.

5) Repeat the measurement for the different combinations of beta values as given in table C.10.1.4.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I.

### 5.2AA.5 Test requirements

The maximum output power with HS-DPCCH, derived in step 4), shall not exceed the range prescribed by the maximum output power and tolerance in table 5.2AA.2 or 5.2AA.3 depending on tested band. The maximum output power where HS-DPCCH is not transmitted shall not exceed the range prescribed in table 5.2.2.

The UL reference measurement channel for TX test will be set as defined in C.10.1 with the power ratio between HS-DPCH, DPCCH and DPDCH being set to the values defined in table C.10.1.4.

Table 5.2AA.2: Maximum Output Powers with HS-DPCCH for test

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sub-test in table C.10.1.4 | | Power Class 3 | | | | Power Class 4 | | |
| Power  (dBm) | | Tol  (dB) | | Power  (dBm) | | Tol  (dB) |
| 1 | +24 | | +1.7/-3.7 | | +21 | | +2.7/-2.7 | |
| 2 | +24 | | +1.7/-3.7 | | +21 | | +2.7/-2.7 | |
| 3 | +23.5 | | +2.2/-3.7 | | +20.5 | | +3.2/-2.7 | |
| 4 | +23.5 | | +2.2/-3.7 | | +20.5 | | +3.2/-2.7 | |

For the UE which supports E-UTRA inter-band carrier aggregation, the lower side of the tolerance in Table 5.2AA.2 and 5.2AA.3 is allowed to be decreased by the amount given in Table 6.2.5-2 of TS 36.101[11] for those UTRA operating bands corresponding to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations. The tolerance in Table 6.2.5-2 of TS 36.101[11] does not apply to supported UTRA operating bands with frequency range below 1 GHz that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations when such bands are belonging only to band combination(s) where one band is <1GHz and another band is >1.7GHz and there is no harmonic relationship between the low band UL and high band DL.

For the UE which supports DB-DC-HSDPA or dual band 4C-HSDPA configurations with uplink assigned to one UTRA band the relaxation in Table 5.2.1a and Table 5.2.1b respectively shall be applied for applicable bands.

In case the UE supports DB-DC-HSDPA or dual band 4C-HSDPA configurations and one or more of the E-UTRA inter-band carrier aggregation configurations listed in Table 6.2.5-2 of TS36.101[11] with a UTRA operating band that belongs to UTRA and E-UTRA carrier aggregation configurations, then

- When the UTRA operating band frequency range is ≤ 1GHz, the applicable additional tolerance shall be the average of the applicable tolerances, truncated to one decimal place for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations, with the DB-DC-HSDPA, dual carrier 4C-HSDPA, and E-UTRA CA configurations counted separately. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied

- When the UTRA operating band frequency range is >1GHz, the applicable additional tolerance shall be the maximum tolerance that applies for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations.

Table 5.2AA.3: Maximum Output Powers with HS-DPCCH for test in bands XXV and XXVI

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sub-test in table C.10.1.4 | | Power Class 3 | | | | Power Class 4 | | |
| Power  (dBm) | | Tol  (dB) | | Power  (dBm) | | Tol  (dB) |
| 1 | +24 | | +1.7/-4.7 | | +21 | | +2.7/-3.7 | |
| 2 | +24 | | +1.7/-4.7 | | +21 | | +2.7/-3.7 | |
| 3 | +23.5 | | +2.2/-4.7 | | +20.5 | | +3.2/-3.7 | |
| 4 | +23.5 | | +2.2/-4.7 | | +20.5 | | +3.2/-3.7 | |
| NOTE: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz. | | | | | | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.2AB Maximum Output Power for OLTD

### 5.2AB.1 Definition and applicability

The nominal maximum output power with UL OLTD and its tolerance are defined according to the Power Class of the UE.

The maximum output power is a measure of the maximum power the UE can transmit (i.e. the actual power as would be measured assuming no measurement error) in a bandwidth of at least (1+  times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL OLTD and HSDPA.

### 5.2AB.2 Minimum Requirements

For UE with two active transmit antenna connectors in UL OLTD operation, the maximum output power is specified in Table 5.2.AB.1. The nominal transmit power is defined by the sum of transmit power at each UE antenna connector.

Table 5.2.AB.1: UE Power Classes for UL OLTD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Operating Band | Power Class 3 | | Power Class 3bis | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| Band I | +24 | +1/-4 | 23 | +2/-3 |
| Band II | +24 | +1/-4 | 23 | +2/-3 |
| Band III | +24 | +1/-4 | 23 | +2/-3 |
| Band IV | +24 | +1/-4 | 23 | +2/-3 |
| Band V | +24 | +1/-4 | 23 | +2/-3 |
| Band VI | +24 | +1/-4 | 23 | +2/-3 |
| Band VII | +24 | +1/-4 | 23 | +2/-3 |
| Band VIII | +24 | +1/-4 | 23 | +2/-3 |
| Band IX | +24 | +1/-4 | 23 | +2/-3 |
| Band X | +24 | +1/-4 | 23 | +2/-3 |
| Band XI | +24 | +1/-4 | 23 | +2/-3 |
| Band XII | +24 | +1/-4 | 23 | +2/-3 |
| Band XIII | +24 | +1/-4 | 23 | +2/-3 |
| Band IV | +24 | +1/-4 | 23 | +2/-3 |
| Band XIX | +24 | +1/-4 | 23 | +2/-3 |
| Band XX | +24 | +1/-4 | 23 | +2/-3 |
| Band XXI | +24 | +1/-4 | 23 | +2/-3 |
| Band XXII | +24 | +1/-5.5 | 23 | +2/-4.5 |
| Band XXV | +24 | +1/-5 | 23 | +2/-4 |
| Band XXVI  (Note 1) | +24 | +1/-5 | 23 | +2/-4 |
| Note 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz. | | | | |

The normative reference for this requirement is TS 25.101 [1], clause 6.2.1A.

### 5.2AB.3 Test purpose

To verify that the error of the UE maximum output power for UL OLTD does not exceed the range prescribed by the nominal maximum output power and tolerance in table 5.2.AB.1.

An excess maximum output power has the possibility to interfere to other channels or other systems. A small maximum output power decreases the coverage area.

### 5.2AB.4 Method of test

#### 5.2AB.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1) are specified in clauses C.10.2 and C.8.1.1 with the beta values set according to table C.10.2.4.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.18. RF parameters are set up according to table E.5.1 and table E.5.10.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

#### 5.2AB.4.2 Procedure

1) Set and send continuously Up power control commands to the UE.

2) Start transmitting HSDPA Data.

3) Measure the mean power of the UE in a bandwidth of at least (1+  times the chip rate of the radio access mode. The mean power shall be averaged over at least one timeslot and measured at each transmit antenna connector.

### 5.2AB.5 Test requirements

For UE with two active transmit antenna connectors in UL OLTD, the nominal maximum output power is specified in Table 5.2AB.2. The nominal transmit power is defined by the sum of transmit power at each transmit antenna connector.

The maximum output power, derived in step 3), shall not exceed the range prescribed by the nominal maximum output power and tolerance in table 5.2AB.2.

Table 5.2AB.2: Nominal Maximum Output Power for UL OLTD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Operating Band | Power Class 3 | | Power Class 3bis | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| Band I | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band II | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band III | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band IV | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band V | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band VI | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band VII | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band VIII | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band IX | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band X | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band XI | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band XII | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band XIII | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band IV | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band XIX | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band XX | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band XXI | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band XXII | +24 | +1.7/-6.2 | 23 | +2.7/-5.2 |
| Band XXV | +24 | +1.7/-5.7 | 23 | +2.7/-4.7 |
| Band XXVI  (Note 1) | +24 | +1.7/-5.7 | 23 | +2.7/-4.7 |
| Note 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz. | | | | |

For the UE which supports E-UTRA inter-band carrier aggregation, the lower side of the tolerance in Table 5.2 AB.2 is allowed to be decreased by the amount given in Table 6.2.5-2 of TS 36.101[11] for those UTRA operating bands corresponding to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations. The tolerance in Table 6.2.5-2 of TS 36.101[11] does not apply to supported UTRA operating bands with frequency range below 1 GHz that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations when such bands are belonging only to band combination(s) where one band is <1GHz and another band is >1.7GHz and there is no harmonic relationship between the low band UL and high band DL.

For the UE which supports DB-DC-HSDPA or dual band 4C-HSDPA configurations with uplink assigned to one UTRA band the relaxation in Table 5.2.1a and Table 5.2.1b respectively shall be applied for applicable bands.

In case the UE supports DB-DC-HSDPA or dual band 4C-HSDPA configurations and one or more of the E-UTRA inter-band carrier aggregation configurations listed in Table 6.2.5-2 of TS 36.101[11] with a UTRA operating band that belongs to UTRA and E-UTRA carrier aggregation configurations, then:

- When the UTRA operating band frequency range is ≤ 1GHz, the applicable additional tolerance shall be the average of the applicable tolerances, truncated to one decimal place for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations, with the DB-DC-HSDPA, dual carrier 4C-HSDPA, and E-UTRA CA configurations counted separately. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied

- When the UTRA operating band frequency range is >1GHz, the applicable additional tolerance shall be the maximum tolerance that applies for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4 FFS.

## 5.2AC Maximum Output Power for UL CLTD activation state 1

Editor’s note: This clause is incomplete. The following aspects are either missing or not yet determined:

- CM distribution for CLTD Mode 1 is incomplete.

### 5.2AC.1 Definition and applicability

The nominal maximum output power with UL CLTD and its tolerance are defined according to the Power Class of the UE.

The maximum output power is a measure of the maximum power the UE can transmit (i.e. the actual power as would be measured assuming no measurement error) in a bandwidth of at least (1+  times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and HSDPA.

### 5.2AC.2 Minimum Requirements

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the nominal maximum output power is specified in Table 5.2AC.1. The nominal transmit power is defined by the sum of transmit power at each transmit antenna connector.

Table 5.2AC.1: Nominal Maximum Output Power for UL CLTD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Operating Band | Power Class 3 | | Power Class 3bis | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| Band I | +24 | +1/-4 | 23 | +2/-3 |
| Band II | +24 | +1/-4 | 23 | +2/-3 |
| Band III | +24 | +1/-4 | 23 | +2/-3 |
| Band IV | +24 | +1/-4 | 23 | +2/-3 |
| Band V | +24 | +1/-4 | 23 | +2/-3 |
| Band VI | +24 | +1/-4 | 23 | +2/-3 |
| Band VII | +24 | +1/-4 | 23 | +2/-3 |
| Band VIII | +24 | +1/-4 | 23 | +2/-3 |
| Band IX | +24 | +1/-4 | 23 | +2/-3 |
| Band X | +24 | +1/-4 | 23 | +2/-3 |
| Band XI | +24 | +1/-4 | 23 | +2/-3 |
| Band XII | +24 | +1/-4 | 23 | +2/-3 |
| Band XIII | +24 | +1/-4 | 23 | +2/-3 |
| Band IV | +24 | +1/-4 | 23 | +2/-3 |
| Band XIX | +24 | +1/-4 | 23 | +2/-3 |
| Band XX | +24 | +1/-4 | 23 | +2/-3 |
| Band XXI | +24 | +1/-4 | 23 | +2/-3 |
| Band XXII | +24 | +1/-5.5 | 23 | +2/-4.5 |
| Band XXV | +24 | +1/-5 | 23 | +2/-4 |
| Band XXVI  (Note 1) | +24 | +1/-5 | 23 | +2/-4 |
| Note 1 For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz. | | | | |

The normative reference for this requirement is TS 25.101 [1], clause 6.2.1B.

### 5.2AC.3 Test purpose

To verify that the error of the UE maximum output power for UL CLTD activation state 1 does not exceed the range prescribed by the nominal maximum output power and tolerance in table 5.2.AC.1.

An excess maximum output power has the possibility to interfere to other channels or other systems. A small maximum output power decreases the coverage area.

### 5.2AC.4 Method of test

#### 5.2AC.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1) are specified in clauses C.10.1 and C.8.1.1 with the beta values set according to table C.10.1.4.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.17. RF parameters are set up according to table E.5.1 and table E.5.10.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

#### 5.2AC.4.2 Procedure

1) Set and send continuously Up power control commands to the UE.

2) Start transmitting HSDPA Data.

3) Measure the mean power of the UE in a bandwidth of at least (1+  times the chip rate of the radio access mode. The mean power shall be averaged over at least one timeslot and measured at each transmit antenna connector.

### 5.2AC.5 Test requirements

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the nominal maximum output power is specified in Table 5.2AC.2. The nominal transmit power is defined by the sum of transmit power at each transmit antenna connector.

The maximum output power, derived in step 3), shall not exceed the range prescribed by the nominal maximum output power and tolerance in table 5.2AC.2.

Table 5.2AC.2: Nominal Maximum Output Power for UL CLTD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Operating Band | Power Class 3 | | Power Class 3bis | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| Band I | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band II | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band III | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band IV | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band V | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band VI | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band VII | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band VIII | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band IX | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band X | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band XI | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band XII | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band XIII | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band IV | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band XIX | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band XX | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band XXI | +24 | +1.7/-4.7 | 23 | +2.7/-3.7 |
| Band XXII | +24 | +1.7/-6.2 | 23 | +2.7/-5.2 |
| Band XXV | +24 | +1.7/-5.7 | 23 | +2.7/-4.7 |
| Band XXVI  (Note 1) | +24 | +1.7/-5.7 | 23 | +2.7/-4.7 |
| Note 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz. | | | | |

For the UE which supports E-UTRA inter-band carrier aggregation, the lower side of the tolerance in Table 5.2 AC.2 is allowed to be decreased by the amount given in Table 6.2.5-2 of TS 36.101[11] for those UTRA operating bands corresponding to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations. The tolerance in Table 6.2.5-2 of TS 36.101[11] does not apply to supported UTRA operating bands with frequency range below 1 GHz that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations when such bands are belonging only to band combination(s) where one band is <1GHz and another band is >1.7GHz and there is no harmonic relationship between the low band UL and high band DL.

For the UE which supports DB-DC-HSDPA or dual band 4C-HSDPA configurations with uplink assigned to one UTRA band the relaxation in Table 5.2.1a and Table 5.2.1b respectively shall be applied for applicable bands.

In case the UE supports DB-DC-HSDPA or dual band 4C-HSDPA configurations and one or more of the E-UTRA inter-band carrier aggregation configurations listed in Table 6.2.5-2 of TS36.101[11] with a UTRA operating band that belongs to UTRA and E-UTRA carrier aggregation configurations, then

- When the UTRA operating band frequency range is ≤ 1GHz, the applicable additional tolerance shall be the average of the applicable tolerances, truncated to one decimal place for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations, with the DB-DC-HSDPA, dual carrier 4C-HSDPA, and E-UTRA CA configurations counted separately. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied

- When the UTRA operating band frequency range is >1GHz, the applicable additional tolerance shall be the maximum tolerance that applies for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.2AD Maximum Output Power for UL CLTD activation state 2 and 3

### 5.2AD.1 Definition and applicability

The nominal maximum output power with UL CLTD and its tolerance are defined according to the Power Class of the UE.

The maximum output power is a measure of the maximum power the UE can transmit (i.e. the actual power as would be measured assuming no measurement error) in a bandwidth of at least (1+  times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and HSDPA.

### 5.2AD.2 Minimum Requirements

For UE configured in UL CLTD activation state 2 or activation state 3, the nominal maximum output power specified in table 5.2AD.1 applies at the active transmit antenna connector.

Table 5.2AD.1: Nominal Maximum Output Power

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Operating Band | Power Class 1 | | Power Class 2 | | Power Class 3 | | Power Class 3bis | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| Band I | +33 | +1/-3 | +27 | +1/-3 | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band II | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band III | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band IV | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band V | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band VI | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band VII | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band VIII | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band IX | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band X | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band XI | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band XII | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band XIII | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band XIV | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band XIX | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band XX | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band XXI | - | - | - | - | +24 | +1/-3 | +23 | +2/-2 | +21 | +2/-2 |
| Band XXII | - | - | - | - | +24 | +1/-4.5 | +23 | +2/-3.5 | +21 | +2/-3.5 |
| Band XXV |  |  |  |  | +24 | +1/-4 | +23 | +2/-3 | +21 | +2/-3 |
| Band XXVI  (Note 1) | - | - | - | - | +24 | +1/-4 | +23 | +2/-3 | +21 | +2/-3 |
| NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz. | | | | | | | | | | |

The normative reference for this requirement is TS 25.101 [1], clause 6.2.1B.

### 5.2AD.3 Test purpose

To verify that the error of the UE maximum output power with UL CLTD activation state 2 and 3 does not exceed the range prescribed by the nominal maximum output power and tolerance in table 5.2.AD.1.

An excess maximum output power has the possibility to interfere to other channels or other systems. A small maximum output power decreases the coverage area.

### 5.2AD.4 Method of test

#### 5.2AD.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1) are specified in clauses C.10.1 and C.8.1.1 with the beta values set according to table C.10.1.4.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.17 with the following exception in the RADIO BEARER SETUP messages in table 5.2AD.1.1.This exception allows the call to be setup with initial UL CLTD activation state as state 2. RF parameters are set up according to table E.5.1 and table E.5.10.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

Table 5.2AD.1.1: Contents of Radio bearer setup message

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink CLTD info FDD |  | Rel-11 |
| - CHOICE *Mode* | New |  |
| - Initial CLTD activation state | Second state |  |

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

#### 5.2AD.4.2 Procedure

1) Set and send continuously up power control commands to the UE.

2) Start transmitting HSDPA Data.

3) Measure the mean power of the UE in a bandwidth of at least (1+  times the chip rate of the radio access mode. The mean power shall be averaged over at least one timeslot and is measured at the active transmit antenna connector.

4) SS sends a HS-SCCH order activating UL\_CLTD activation state 3

5) Repeat step 1 to 3 for activation state 3.

### 5.2AD.5 Test requirements

For UE configured in UL CLTD activation state 2 or activation state 3, the nominal maximum output power specified in table 5.2AD.2 applies at the active transmit antenna connector.

The maximum output power, derived in step 3) for activation 2 and 3, shall not exceed the range prescribed by the nominal maximum output power and tolerance in table 5.2AD.2.

Table 5.2AD.2: Nominal Maximum Output Power

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Operating Band | Power Class 1 | | Power Class 2 | | Power Class 3 | | Power Class 3bis | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| Band I | +33 | +/-TT | +27 | +/-TT | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band II | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band III | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band IV | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band V | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band VI | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band VII | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band VIII | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band IX | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band X | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XI | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XII | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XIII | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XIV | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XIX | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XX | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XXI | - | - | - | - | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XXII | - | - | - | - | +24 | +1,7/-5.2 | +23 | +2,7/-4.2 | +21 | +2.7/-4.2 |
| Band XXV | - | - | - | - | +24 | +1,7/-4,7 | +23 | +2,7/-3,7 | +21 | +2,7/-3,7 |
| Band XXVI  (Note 1) | - | - | - | - | +24 | +1,7/-4,7 | +23 | +2,7/-3,7 | +21 | +2,7/-3,7 |
| NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824‑845 MHz. | | | | | | | | | | |

For the UE which supports E-UTRA inter-band carrier aggregation, the lower side of the tolerance in Table 5.2AD.2 is allowed to be decreased by the amount given in Table 6.2.5-2 of TS 36.101[11] for those UTRA operating bands corresponding to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations. The tolerance in Table 6.2.5-2 of TS 36.101[11] does not apply to supported UTRA operating bands with frequency range below 1 GHz that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations when such bands are belonging only to band combination(s) where one band is <1GHz and another band is >1.7GHz and there is no harmonic relationship between the low band UL and high band DL.

For the UE which supports DB-DC-HSDPA or dual band 4C-HSDPA configurations with uplink assigned to one UTRA band the relaxation in Table 5.2.1a and Table 5.2.1b respectively shall be applied for applicable bands.

In case the UE supports DB-DC-HSDPA or dual band 4C-HSDPA configurations and one or more of the E-UTRA inter-band carrier aggregation configurations listed in Table 6.2.5-2 of TS36.101[11] with a UTRA operating band that belongs to UTRA and E-UTRA carrier aggregation configurations, then

- When the UTRA operating band frequency range is ≤ 1GHz, the applicable additional tolerance shall be the average of the applicable tolerances, truncated to one decimal place for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations, with the DB-DC-HSDPA, dual carrier 4C-HSDPA, and E-UTRA CA configurations counted separately. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied

- When the UTRA operating band frequency range is >1GHz, the applicable additional tolerance shall be the maximum tolerance that applies for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.2B Maximum Output Power with HS-DPCCH and E-DCH

### 5.2B.1 Definition and applicability

The maximum output power with HS-DPCCH and E-DCH and its tolerance are defined according to the UE Maximum Power Reduction (MPR) for the nominal maximum output power.

The maximum output power with HS-DPCCH and E-DCH is a measure of the maximum power the UE can transmit when HS-DPCCH and E-DCH is fully or partially transmitted during a DPCCH timeslot. The measurement period shall be at least one timeslot.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA and E-DCH.

### 5.2B.2 Minimum Requirements

The UE Maximum Power Reduction (MPR) for the nominal maximum output power shall be within the value and tolerance specified in table 5.2B.1 for when the values of c, d, hs, ec and ed is fully or partially transmitted during a DPCCH timeslot.

Table 5.2B.1: Maximum Output Power with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| UE transmit channel configuration | CM (dB) | MPR (dB) |
| For all combinations of; DPDCH, DPCCH, HS‑DPCCH, E-DPDCH and E-DPCCH | 0  CM  3.5 | MAX (CM-1, 0) |
| NOTE 1: CM = 1 for c/d =12/15, hs/c=24/15. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCHthe MPR is based on the relative CM difference. | | |

Where Cubic Metric (CM) is based on the UE transmit channel configuration and is given by:

CM = CEIL { [20 \* log10 ((v\_norm 3) rms) - 20 \* log10 ((v\_norm\_ref 3) rms)] / k, 0.5 }

Where

- CEIL{ x, 0.5 } means rounding upwards to closest 0.5dB, i.e. CM  [0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5]

- k is 1.85 for signals where all channelisations codes meet the following criteria CSF, N where N< SF/2

- k is 1.56 for signals were any channelisations codes meet the following criteria CSF, N where N ≥ SF/2

- v\_normis the normalized voltage waveform of the input signal

- v\_norm\_ref is the normalized voltage waveform of the reference signal (12.2 kbps AMR Speech) and 20 \* log10 ((v\_norm\_ref3)rms) = 1.52 dB

The normative reference for this requirement is TS 25.101 [1], clause 6.2.2.

### 5.2B.3 Test purpose

To verify that the error of the UE maximum output power with HS-DPCCH and E-DCH does not exceed the range prescribed by the maximum output power and tolerance in table 5.2B.5.

An excess maximum output power may interfere with other channels or other systems. A small maximum output power decreases the coverage area.

### 5.2B.4 Method of test

#### 5.2B.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex C.11.1 and C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.9 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.3 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.2B.4A.

4) For sub-test 1 to 4, enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH according to procedure 7.3.9.3.1 in TS 34.108 [3] and start the loopback test. For sub-test 5, enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.9.3.2 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2B.1A: Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

| Information Element | Value/Remark |
| --- | --- |
| UL Transport channel information for all transport channels |  |
| - 2bit CTFC | 3 |
| - Power offset Information |  |
| - CHOICE Gain Factors | Signalled Gain Factors |
| - CHOICE mode | FDD |
| - Gain factor ßc | Value used in test: see Table C.11.1.3 |
| - Gain factor ßd | Value used in test: see Table C.11.1.3 |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |
| NOTE: All other 2 bit CTFC values use computed gain factors as in the default message. | |

Table 5.2B.2: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-tests 1,2,4

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 5 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 67 |
| - Reference E-TFCI PO | 18 |
| - Reference E-TFCI | 71 |
| - Reference E-TFCI PO | 23 |
| - Reference E-TFCI | 75 |
| - Reference E-TFCI PO | 26 |
| - Reference E-TFCI | 81 |
| - Reference E-TFCI PO | 27 |

Table 5.2B.3: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-test 3

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 2 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 92 |
| - Reference E-TFCI PO | 18 |

Table 5.2B.3A: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) -condition A3 for Sub-test 5

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - E-DCH minimum set of E-TFCI | 67 |
| - Reference E-TFCIs | 1 E-TFCI |
| - Reference E-TFCI | 67 |
| - Reference E-TFCI PO | 18 |
| - Maximum channelisation codes | Sf4 |

Table 5.2B.4: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | For sub-test 1 to 4: Algorithm2  For sub-test 5: Algorithm 1 |
| - ACK | Value used in test: see Table C.11.1.3 |
| - NACK | Value used in test: see Table C.11.1.3 |
| - Ack-Nack repetition factor | 3 (required for continuous HS-DPCCH signal) |
| E-DCH info |  |
| - E-DPCCH/DPCCH power offset | Value used in test: see Table C.11.1.3 |
| Downlink HS-PDSCH Information |  |
| - Measurement Feedback Info |  |
| - CQI Feedback cycle, k | 4 ms |
| - CQI repetition factor | 2 (required for continuous HS-DPCCH signal) |
| - CQI | Value used in test: see Table C.11.1.3 |

Table 5.2B.4A: Settings for the serving cell during the measurement  
of Maximum Output Power with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2B.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.2B.4.2 Procedure

5.2B.4.2.1 Procedure for sub-test 1 to 4

1) Set the Absolute Grant according to Table C.11.1.3.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Set the UE power to be at least 7.5dB lower than the maximum output power. Wait 150 ms.

4) Send power control bits to give one TPC\_cmd = +1 command to the UE.

5) The SS checks the received E-TFCI for 150 ms. If UE does not send any decreased E-TFCI (DTX on E‑DPDCH is also considered decreased E-TFCI) within the 150ms then go back to step (4) otherwise proceed to step 6).

6) Send power control bits to give one TPC\_cmd = -1 command to the UE and wait 150ms.

7) The SS checks the received E-TFCI for 150 ms. If UE sends any decreased E-TFCI (DTX on E-DPDCH is also considered decreased E-TFCI) within the 150ms, then send new power control bits to give another TPC\_cmd = -1 command to the UE and wait 150ms.

8) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.3. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

9) Measure the mean power of the UE. The mean power shall be averaged over at least one timeslot.

10) Repeat the measurement for the different combinations of beta values for sub-test 1 to 4 as given in table C.11.1.3.

5.2B.4.2.2 Procedure for sub-test 5

1) Set the Absolute Grant according to sub-test 5 in Table C.11.1.3.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Set the UE power to be at least 7.5dB lower than the maximum output power. Wait 150ms.

4) Set and send continuously Up power control commands to the UE. Wait 150ms.

5) Measure the mean power of the UE. The mean power shall be averaged over at least one timeslot.

### 5.2B.5 Test requirements

The maximum output power with HS-DPCCH and E-DCH, derived in step 9), shall not exceed the range prescribed by the maximum output power and tolerance in table 5.2B.5 or 5.2B.6 depending on tested band. Note:

The UL reference measurement channel for TX test will be set as defined in C.11.1 with the power ratio between HS-DPCH, DPCCH, DPDCH, E-DPCCH and E-DPDCH being set to the values defined in table C.11.1.3.

Table 5.2B.5: Maximum Output Powers with HS-DPCCH and E-DCH for test

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-test in table C.11.1.3 | Power Class 3 | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| 1 | +24 | +1.7/-6.7 | +21 | +2.7/-5.7 |
| 2 | +22 | +3.7/-5.2 | +19 | +4.7/-4.2 |
| 3 | +23 | +2.7/-5.2 | +20 | +3.7/-4.2 |
| 4 | +22 | +3.7/-5.2 | +19 | +4.7/-4.2 |
| 5 | +24 | +1.7/-3.7 | +21 | +2.7/-2.7 |

For the UE which supports E-UTRA inter-band carrier aggregation, the lower side of the tolerance in Table 5.2B.5 and 5.2B.6 is allowed to be decreased by the amount given in Table 6.2.5-2 of TS 36.101[11] for those UTRA operating bands corresponding to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations. The tolerance in Table 6.2.5-2 of TS 36.101[11] does not apply to supported UTRA operating bands with frequency range below 1 GHz that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations when such bands are belonging only to band combination(s) where one band is <1GHz and another band is >1.7GHz and there is no harmonic relationship between the low band UL and high band DL.

For the UE which supports DB-DC-HSDPA or dual band 4C-HSDPA configurations with uplink assigned to one UTRA band the relaxation in Table 5.2.1a and Table 5.2.1b respectively shall be applied for applicable bands.

In case the UE supports DB-DC-HSDPA or dual band 4C-HSDPA configurations and one or more of the E-UTRA inter-band carrier aggregation configurations listed in Table 6.2.5-2 of TS36.101[11] with a UTRA operating band that belongs to UTRA and E-UTRA carrier aggregation configurations, then

- When the UTRA operating band frequency range is ≤ 1GHz, the applicable additional tolerance shall be the average of the applicable tolerances, truncated to one decimal place for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations, with the DB-DC-HSDPA, dual carrier 4C-HSDPA, and E-UTRA CA configurations counted separately. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied

- When the UTRA operating band frequency range is >1GHz, the applicable additional tolerance shall be the maximum tolerance that applies for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations.

Table 5.2B.6: Maximum Output Powers with HS-DPCCH and E-DCH for test in bands XXV and XXVI

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-test in table C.11.1.3 | Power Class 3 | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| 1 | +24 | +1.7/-7.7 | +21 | +2.7/-6.7 |
| 2 | +22 | +3.7/-6.2 | +19 | +4.7/-5.2 |
| 3 | +23 | +2.7/-6.2 | +20 | +3.7/-5.2 |
| 4 | +22 | +3.7/-6.2 | +19 | +4.7/-5.2 |
| 5 | +24 | +1.7/-4.7 | +21 | +2.7/-3.7 |
| NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz. | | | | |

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 2: The test procedure for sub-test 1 to 4 will result in a power slightly below the maximum, and therefore the lower limits in Table 5.2B.5 are made lower by 1.5 dB.

NOTE 3: The test procedure allows UE to decrease its maximum transmit power for E-TFC selection in sub-test 1, and therefore the lower limits of sub-test 1 in Table 5.2B.5 are made lower by 1.5 dB.

NOTE 4: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

## 5.2BA UE Maximum Output Power for DC-HSUPA (QPSK)

Editor’s note: This clause is incomplete. The following aspects are either missing or not yet determined:

- The MPR values are need to be updated.

### 5.2BA.1 Definition and applicability

The maximum output power with DC-HSUPA and its tolerance are defined according to the UE Maximum Power Reduction (MPR) for the nominal maximum output power.

The maximum output power with DC-HSUPA is a measure of the maximum power the UE can transmit when HS-DPCCH and E-DCH is fully or partially transmitted during a DPCCH timeslot. For DC-HSUPA, the nominal transmit power is defined by the sum of the broadband transmit power of each carrier in the UE. The measurement period shall be at least one timeslot.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

### 5.2BA.2 Minimum Requirements

The Maximum Power Reduction (MPR) for the nominal maximum output power shall be within the value and tolerance specified for the values of c, d, hs, ec and ed is fully or partially transmitted during a DPCCH timeslot and defined through calculation of the Raw Cubic Metric (Raw CM) which is based on the UE transmit channel configuration and is given by:

Raw CM = 20 \* log10 ((v\_norm 3) rms) - 20 \* log10 ((v\_norm\_ref 3) rms)

Where:

- v\_normis the normalized voltage waveform of the input signal

- v\_norm\_ref is the normalized voltage waveform of the reference signal (12.2 kbps AMR Speech) and

- 20 \* log10 ((v\_norm\_ref 3) rms) = 1.52 dB

For any DC-HSUPA signal not employing 16QAM modulation on any of the carriers, and for any DC-HSUPA signal having Raw CM < [2.5], the MPR is specified in Table 5.2BA.1.

Table 5.2BA.1: UE maximum output power for DC-HSUPA signals not employing  
16QAM modulation, and DC-HSUPA signals having Raw CM < [2.5]

|  |  |  |
| --- | --- | --- |
| UE transmit channel configuration | CM (dB) | MPR (dB) |
| For all combinations of; DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH | 0.22  CM  3.72 | MAX (CM-0.72, 0) |

Where Cubic Metric (CM) is based on the Raw Cubic Metric and is given by

CM = CEIL { Raw CM / k, 0.22 }

Where:

- CEIL { x, 0.22 } means rounding upwards to closest 0.22dB with 0.5 dB granularity, i.e. CM [0.22, 0.72, 1.22, 1.72, 2.22, 2.72, 3.22, 3.72]

- k is 1.66

For any DC-HSUPA signal employing 16QAM modulation on any of the carriers and having Raw CM ≥ [2.5], the MPR is specified in Table 5.2BA.2.

Table 5.2BA.2: UE maximum output power for DC-HSUPA signals employing  
16QAM modulation and having RAW CM ≥ [2.5]

|  |  |  |
| --- | --- | --- |
| UE transmit channel configuration | CM (dB) | MPR (dB) |
| For all combinations of; DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH | [2.24]  CM  [5.24] | MAX (CM-[1.24], 0) |

Where Cubic Metric (CM) is based on the Raw Cubic Metric and is given by:

CM = CEIL { Raw CM / k, [0.24] }

Where:

- CEIL { x, 0.24 } means rounding upwards to closest 0.24dB with 0.5 dB granularity, i.e. CM = [2.24, 2.74, 3.24, 3.74, 4.24, 4.74, 5.24]

- k is [1.23] for DC-HSUPA signals employing 16QAM modulation and having Raw CM ≥ [2.5]

It is necessary to verify this requirement only for the DC-HSUPA configurations specified in clause C.2.8.

The normative reference for this requirement is TS 25.101 [1], clause 6.2.2A.

### 5.2BA.3 Test purpose

To verify that the error of the UE maximum output power with DC-HSUPA does not exceed the range prescribed by the maximum output power and tolerance in table 5.2BA.6.

An excess maximum output power may interfere with other channels or other systems. A small maximum output power decreases the coverage area.

### 5.2BA.4 Method of test

#### 5.2BA.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in clauses C.2.6, C.2.8 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.2BA.5.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2BA.3: Void

Table 5.2BA.4: Void

Table 5.2BA.5: Settings for the serving cell during the measurement  
of Maximum Output Power with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2BA.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.2BA.4.2 Procedure

1) Set the Absolute Grant according to Table C.11A.1.1.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands to each individual carrier from the SS to set the total power in each of the assigned carriers according to one of the configurations in table 5.2BA.5A and the total output power of the UE to be at least 7.5dB lower than the maximum output power. Wait 150ms.

4) Set and send continuously Up power control commands to both carriers to the UE and wait 150ms.

5) Measure the mean power of each carrier of the UE. The mean power shall be averaged over at least one timeslot. The maximum output power is the sum of the broadband transmit power of each carrier in the UE.

6) The SS shall verify that UE is still in a DC-HSUPA call by verifying that UE transmits signal on each carrier. If UE is not transmitting signal on each carrier the SS shall fail the UE in this test.

7) Repeat steps 1-6 for all the different combinations of beta values as given in tables C.11A.1.1.

8) Repeat steps 1-7 for all the different configurations given in table 5.2BA.5A

Table 5.2BA.5A: Settings for E-DPDCH and for uplink power control

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Config # | Primary carrier | Secondary carrier | Power difference of total power primary carrier – total power secondary carrier | Allowed MPR [dB] |
| 1 | BPSK | BPSK | -10 dB 1.7 dB | [0.5] |
| 2 | BPSK | BPSK | 8 dB 1.7 dB | [1.0] |
| 3 | BPSK | BPSK | 0 dB 1.7 dB | [1.5] |
| NOTE 1: This table represents the applicable configurations defined in table C.2.8.1.  NOTE 2: The power differences are used to achieve the power imbalances defined in table C.2.8.1.  NOTE3: A power difference of -10dB in config #1 means that the total power in the primary carrier is 10dB lower than the total power in the secondary carrier. | | | | |

### 5.2BA.5 Test requirements

The maximum output power with DC-HSUPA, derived in step 6), shall not exceed the range prescribed by the maximum output power and tolerance in table 5.2BA.6 or 5.2BA.7 depending on tested band.

The UL reference measurement channel for TX test will be set as defined in C.2.6 and C.2.7 with the power ratio between HS-DPCH, DPCCH, DPDCH, E-DPCCH and E-DPDCH being set to the values defined in tables C.11A.1.1.

Table 5.2BA.6: Maximum Output Power for DC-HSUPA test

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-test in table C.11A.1.1 | Power Class 3 | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| 1 | +22.5 | +3.2/-3.7 | +19.5 | +4.2/-2.7 |

For the UE which supports E-UTRA inter-band carrier aggregation, the lower side of the tolerance in Table 5.2BA.6 and 5.2BA.7 is allowed to be decreased by the amount given in Table 6.2.5-2 of TS 36.101[11] for those UTRA operating bands corresponding to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations. The tolerance in Table 6.2.5-2 of TS 36.101[11] does not apply to supported UTRA operating bands with frequency range below 1 GHz that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations when such bands are belonging only to band combination(s) where one band is <1GHz and another band is >1.7GHz and there is no harmonic relationship between the low band UL and high band DL.

For the UE which supports DB-DC-HSDPA or dual band 4C-HSDPA configurations with uplink assigned to one UTRA band the relaxation in Table 5.2.1a and Table 5.2.1b respectively shall be applied for applicable bands.

In case the UE supports DB-DC-HSDPA or dual band 4C-HSDPA configurations and one or more of the E-UTRA inter-band carrier aggregation configurations listed in Table 6.2.5-2 of TS36.101[11] with a UTRA operating band that belongs to UTRA and E-UTRA carrier aggregation configurations, then

- When the UTRA operating band frequency range is ≤ 1GHz, the applicable additional tolerance shall be the average of the applicable tolerances, truncated to one decimal place for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations, with the DB-DC-HSDPA, dual carrier 4C-HSDPA, and E-UTRA CA configurations counted separately. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied

- When the UTRA operating band frequency range is >1GHz, the applicable additional tolerance shall be the maximum tolerance that applies for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations.

Table 5.2BA.7: Maximum Output Power for DC-HSUPA test in bands XXV and XXVI

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-test in table C.11A.1.1 | Power Class 3 | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| 1 | +22.5 | +3.2/-4.7 | +19.5 | +4.2/-3.7 |
| NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz. | | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.2BB UE Maximum Output Power for DC-HSUPA (16QAM)

Editor’s note: This clause is incomplete. The following aspects are either missing or not yet determined:

- The MPR value is TBD.

### 5.2BB.1 Definition and applicability

The maximum output power with DC-HSUPA and its tolerance are defined according to the UE Maximum Power Reduction (MPR) for the nominal maximum output power.

The maximum output power with DC-HSUPA is a measure of the maximum power the UE can transmit when HS-DPCCH and E-DCH is fully or partially transmitted during a DPCCH timeslot. For DC-HSUPA, the nominal transmit power is defined by the sum of the broadband transmit power of each carrier in the UE. The measurement period shall be at least one timeslot.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH 16QAM UE capability category 9.

### 5.2BB.2 Minimum Requirements

The Maximum Power Reduction (MPR) for the nominal maximum output power shall be within the value and tolerance specified for the values of c, d, hs, ec and ed is fully or partially transmitted during a DPCCH timeslot and defined through calculation of the Raw Cubic Metric (Raw CM) which is based on the UE transmit channel configuration and is given by:

Raw CM = 20 \* log10 ((v\_norm 3) rms) - 20 \* log10 ((v\_norm\_ref 3) rms)

Where:

- v\_normis the normalized voltage waveform of the input signal

- v\_norm\_ref is the normalized voltage waveform of the reference signal (12.2 kbps AMR Speech) and

- 20 \* log10 ((v\_norm\_ref 3) rms) = 1.52 dB

For any DC-HSUPA signal not employing 16QAM modulation on any of the carriers, and for any DC-HSUPA signal having Raw CM < [2.5], the MPR is specified in Table 5.2BB.1.

Table 5.2BB.1: UE maximum output power for DC-HSUPA signals not employing  
16QAM modulation, and DC-HSUPA signals having Raw CM < [2.5]

|  |  |  |
| --- | --- | --- |
| UE transmit channel configuration | CM (dB) | MPR (dB) |
| For all combinations of; DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH | 0.22  CM  3.72 | MAX (CM-0.72, 0) |

Where Cubic Metric (CM) is based on the Raw Cubic Metric and is given by

CM = CEIL { Raw CM / k, 0.22 }

Where:

- CEIL { x, 0.22 } means rounding upwards to closest 0.22dB with 0.5 dB granularity, i.e. CM [0.22, 0.72, 1.22, 1.72, 2.22, 2.72, 3.22, 3.72]

- k is 1.66

For any DC-HSUPA signal employing 16QAM modulation on any of the carriers and having Raw CM ≥ [2.5], the MPR is specified in Table 5.2BB.2.

Table 5.2BB.2: UE maximum output power for DC-HSUPA signals employing  
16QAM modulation and having RAW CM ≥ [2.5]

|  |  |  |
| --- | --- | --- |
| UE transmit channel configuration | CM (dB) | MPR (dB) |
| For all combinations of; DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH | [2.24]  CM  [5.24] | MAX (CM-[1.24], 0) |

Where Cubic Metric (CM) is based on the Raw Cubic Metric and is given by:

CM = CEIL { Raw CM / k, [0.24] }

Where:

- CEIL { x, 0.24 } means rounding upwards to closest 0.24dB with 0.5 dB granularity, i.e. CM = [2.24, 2.74, 3.24, 3.74, 4.24, 4.74, 5.24]

- k is [1.23] for DC-HSUPA signals employing 16QAM modulation and having Raw CM ≥ [2.5]

It is necessary to verify this requirement only for the DC-HSUPA configurations specified in clause C.2.8.

The normative reference for this requirement is TS 25.101 [1], clause 6.2.2A.

### 5.2BB.3 Test purpose

To verify that the error of the UE maximum output power with DC-HSUPA does not exceed the range prescribed by the maximum output power and tolerance in table 5.2BB.6.

An excess maximum output power may interfere with other channels or other systems. A small maximum output power decreases the coverage area.

### 5.2BB.4 Method of test

#### 5.2BB.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in clauses C.2.6, C.2.8 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.2BB.5. E-DPDCH settings according to configuration 4 in Table C.2.8.1.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2BB.3: Void

Table 5.2BB.4: Void

Table 5.2BB.5: Settings for the serving cell during the measurement  
of Maximum Output Power with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2BB.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.2BB.4.2 Procedure

1) Set the Absolute Grant according to Table C.11A.1.1.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands to each individual carrier from the SS to set the total power in each of the assigned carriers according to configuration 4 in table 5.2BB.5A and the total output power of the UE to be at least 7.5dB lower than the maximum output power. Wait 150ms.

4) Set and send continuously Up power control commands to both carriers to the UE and wait 150ms.

5) Measure the mean power of each carrier of the UE. The mean power shall be averaged over at least one timeslot. The maximum output power is the sum of the broadband transmit power of each carrier in the UE.

6) The SS shall verify that UE is still in a DC-HSUPA call by verifying that UE transmits signal on each carrier. If UE is not transmitting signal on each carrier the SS shall fail the UE in this test.

7) Repeat steps 1-6 for all the different combinations of beta values as given in table C.11A.1.2.

8) Repeat steps 1-7 for all the different configurations given in table 5.2B.5.

Table 5.2BB.5: Settings for E-DPDCH and for uplink power control

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Config # | Primary carrier | Secondary carrier | Power difference of total power primary carrier – total power secondary carrier | Allowed MPR [dB] |
| 4 | 16QAM | 16QAM | 0 dB 1.7 dB | [TBD] |
| NOTE 1: This table represents the applicable configurations defined in table C.2.8.1.  NOTE 2: The power differences are used to achieve the power imbalances defined in table C.2.8.1. | | | | |

### 5.2BB.5 Test requirements

The maximum output power with DC-HSUPA, derived in step 6), shall not exceed the range prescribed by the maximum output power and tolerance in table 5.2BB.6 or 5.2BB.7 depending on tested band.

The UL reference measurement channel for TX test will be set as defined in C.2.6 and C.2.7 with the power ratio between HS-DPCH, DPCCH, DPDCH, E-DPCCH and E-DPDCH being set to the values defined in table C.11A.1.2.

Table 5.2BB.6: Maximum Output Power for DC-HSUPA test

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-test in table C.11A.1.1 | Power Class 3 | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| 1 | +22.5 | +3.2/-3.7 | +19.5 | +4.2/-2.7 |

For the UE which supports E-UTRA inter-band carrier aggregation, the lower side of the tolerance in Table 5.2BB.6 and 5.2BB.7 is allowed to be decreased by the amount given in Table 6.2.5-2 of TS 36.101[11] for those UTRA operating bands corresponding to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations. The tolerance in Table 6.2.5-2 of TS 36.101[11] does not apply to supported UTRA operating bands with frequency range below 1 GHz that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations when such bands are belonging only to band combination(s) where one band is <1GHz and another band is >1.7GHz and there is no harmonic relationship between the low band UL and high band DL.

For the UE which supports DB-DC-HSDPA or dual band 4C-HSDPA configurations with uplink assigned to one UTRA band the relaxation in Table 5.2.1a and Table 5.2.1b respectively shall be applied for applicable bands.

In case the UE supports DB-DC-HSDPA or dual band 4C-HSDPA configurations and one or more of the E-UTRA inter-band carrier aggregation configurations listed in Table 6.2.5-2 of TS36.101[11] with a UTRA operating band that belongs to UTRA and E-UTRA carrier aggregation configurations, then

- When the UTRA operating band frequency range is ≤ 1GHz, the applicable additional tolerance shall be the average of the applicable tolerances, truncated to one decimal place for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations, with the DB-DC-HSDPA, dual carrier 4C-HSDPA, and E-UTRA CA configurations counted separately. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied

- When the UTRA operating band frequency range is >1GHz, the applicable additional tolerance shall be the maximum tolerance that applies for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations.

Table 5.2BB.7: Maximum Output Power for DC-HSUPA test in bands XXV and XXVI

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-test in table C.11A.1.1 | Power Class 3 | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| 1 | +22.5 | +3.2/-4.7 | +19.5 | +4.2/-3.7 |
| NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz. | | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.2BC Maximum Output Power with HS-DPCCH and E-DCH for OLTD

5.2BC.1 Definition and applicability

The maximum output power for UL OLTD with HS-DPCCH and E-DCH and its tolerance are defined according to the UE Maximum Power Reduction (MPR) for the nominal maximum output power.

The maximum output power with HS-DPCCH and E-DCH is a measure of the maximum power the UE can transmit when HS-DPCCH and E-DCH is fully or partially transmitted during a DPCCH timeslot. The measurement period shall be at least one timeslot.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL OLTD, HSDPA and E-DCH.

5.2BC.2 Minimum Requirements

For the UE with two active transmit antenna connectors in UL OLTD operation, the allowed Maximum Power Reduction (MPR) for the nominal maximum output power of each antenna is specified in Table 5.2BC.1. The amount of applied power reduction on each antenna shall be the same.

NOTE: CM is measured at each transmit antenna connector.

Table 5.2BC.1: UE maximum output power with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| UE transmit channel configuration | CM (dB) | MPR (dB) |
| For all combinations of; DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH | 0  CM  4 | MAX (CM-1, 0) |
| Note 1: CM = 1 for c/d =12/15, hs/c=24/15. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCHthe MPR is based on the relative CM difference. | | |

The normative reference for this requirement is TS 25.101 [1], clause 6.2.2B.

5.2BC.3 Test purpose

To verify that the error of the UE maximum output power for UL OLTD with HS-DPCCH and E-DCH does not exceed the range prescribed by the maximum output power and tolerance in table 5.2BC.5.

An excess maximum output power may interfere with other channels or other systems. A small maximum output power decreases the coverage area.

5.2BC.4 Method of test

5.2BC.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex C, clauses C.11.1A and C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.1.20 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1A.4 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.2BC.4A.

4) For sub-test 1 to 4, enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH according to procedure 7.3.20.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2BC.1A: Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

| Information Element | Value/Remark |
| --- | --- |
| UL Transport channel information for all transport channels |  |
| - 2bit CTFC | 3 |
| - Power offset Information |  |
| - CHOICE Gain Factors | Signalled Gain Factors |
| - CHOICE mode | FDD |
| - Gain factor ßc | Value used in test: see Table C.11.1A.4 |
| - Gain factor ßd | Value used in test: see Table C.11.1A.4 |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |
| NOTE: All other 2 bit CTFC values use computed gain factors as in the default message. | |

Table 5.2BC.2: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-tests 1,2,4

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 5 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 67 |
| - Reference E-TFCI PO | 18 |
| - Reference E-TFCI | 71 |
| - Reference E-TFCI PO | 23 |
| - Reference E-TFCI | 75 |
| - Reference E-TFCI PO | 26 |
| - Reference E-TFCI | 81 |
| - Reference E-TFCI PO | 27 |

Table 5.2BC.3: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-test 3

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 2 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 92 |
| - Reference E-TFCI PO | 18 |

Table 5.2BC.3A: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) -condition A3 for Sub-test 5

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - E-DCH minimum set of E-TFCI | 67 |
| - Reference E-TFCIs | 1 E-TFCI |
| - Reference E-TFCI | 67 |
| - Reference E-TFCI PO | 18 |
| - Maximum channelisation codes | Sf4 |

Table 5.2BC.4: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | For sub-test 1 to 4: Algorithm2  For sub-test 5: Algorithm 1 |
| - ACK | Value used in test: see Table C.11.1A.4 |
| - NACK | Value used in test: see Table C.11.1A.4 |
| - Ack-Nack repetition factor | 3 (required for continuous HS-DPCCH signal) |
| E-DCH info |  |
| - E-DPCCH/DPCCH power offset | Value used in test: see Table C.11.1A.4 |
| Downlink HS-PDSCH Information |  |
| - Measurement Feedback Info |  |
| - CQI Feedback cycle, k | 4 ms |
| - CQI repetition factor | 2 (required for continuous HS-DPCCH signal) |
| - CQI | Value used in test: see Table C.11.1A.4 |

Table 5.2BC.4A: Settings for the serving cell during the measurement  
of Maximum Output Power with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2B.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

5.2BC.4.2 Procedure

5.2BC.4.2.1 Procedure for sub-test 1 to 4

1) Set the Absolute Grant according to Table C.11.1A.4.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Set the UE power to be at least 7.5dB lower than the maximum output power. Wait 150 ms.

4) Send power control bits to give one TPC\_cmd = +1 command to the UE.

5) The SS checks the received E-TFCI for 150 ms. If UE does not send any decreased E-TFCI (DTX on E‑DPDCH is also considered decreased E-TFCI) within the 150ms then go back to step (4) otherwise proceed to step 6).

6) Send power control bits to give one TPC\_cmd = -1 command to the UE and wait 150ms.

7) The SS checks the received E-TFCI for 150 ms. If UE sends any decreased E-TFCI (DTX on E-DPDCH is also considered decreased E-TFCI) within the 150ms, then send new power control bits to give another TPC\_cmd = -1 command to the UE and wait 150ms.

8) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1A.4. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

9) Measure the mean power of the UE. The mean power shall be averaged over at least one timeslot and measured at each transmit antenna connector.

10) Repeat the measurement for the different combinations of beta values for sub-test 1 to 4 as given in table C.11.1A.4.

5.2BC.5 Test requirements

The maximum output power with HS-DPCCH and E-DCH, derived in step 9), shall not exceed the range prescribed by the maximum output power and tolerance in table 5.2BC.5 or 5.2BC.6 depending on tested band. Note:

For UE with two active transmit antenna connectors in UL CLTD, the nominal transmit power is defined by the sum of transmit power at each transmit antenna connector.

The UL reference measurement channel for TX test will be set as defined in C.11.1 with the power ratio between HS-DPCH, DPCCH, DPDCH, E-DPCCH and E-DPDCH being set to the values defined in table C.11.1A.4.

Table 5.2BC.5: Maximum Output Powers with HS-DPCCH and E-DCH for test

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-test in table C.11.1A.4 | Power Class 3 | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| 1 | +24 | +1.7/-6.7 | +21 | +2.7/-5.7 |
| 2 | +22 | +1.7/-6.7 | +19 | +2.7/-5.7 |
| 3 | +23 | +1.7/-6.7 | +20 | +2.7/-5.7 |
| 4 | +22 | +1.7/-6.7 | +19 | +2.7/-5.7 |

For the UE which supports E-UTRA inter-band carrier aggregation, the lower side of the tolerance in Table 5.2BC.5 and 5.2BC.6 is allowed to be decreased by the amount given in Table 6.2.5-2 of TS 36.101[11] for those UTRA operating bands corresponding to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations. The tolerance in Table 6.2.5-2 of TS 36.101[11] does not apply to supported UTRA operating bands with frequency range below 1 GHz that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations when such bands are belonging only to band combination(s) where one band is <1GHz and another band is >1.7GHz and there is no harmonic relationship between the low band UL and high band DL.

For the UE which supports DB-DC-HSDPA or dual band 4C-HSDPA configurations with uplink assigned to one UTRA band the relaxation in Table 5.2.1a and Table 5.2.1b respectively shall be applied for applicable bands.

In case the UE supports DB-DC-HSDPA or dual band 4C-HSDPA configurations and one or more of the E-UTRA inter-band carrier aggregation configurations listed in Table 6.2.5-2 of TS 36.101[11] with a UTRA operating band that belongs to UTRA and E-UTRA carrier aggregation configurations, then:

- When the UTRA operating band frequency range is ≤ 1GHz, the applicable additional tolerance shall be the average of the applicable tolerances, truncated to one decimal place for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations, with the DB-DC-HSDPA, dual carrier 4C-HSDPA, and E-UTRA CA configurations counted separately. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied

- When the UTRA operating band frequency range is >1GHz, the applicable additional tolerance shall be the maximum tolerance that applies for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations.

Table 5.2BC.6: Maximum Output Powers with HS-DPCCH and E-DCH for test in bands XXV and XXVI

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-test in table C.11.1A.4 | Power Class 3 | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| 1 | +24 | +1.7/-7.7 | +21 | +2.7/-6.7 |
| 2 | +22 | +3.7/-6.2 | +19 | +4.7/-5.2 |
| 3 | +23 | +2.7/-6.2 | +20 | +3.7/-5.2 |
| 4 | +22 | +3.7/-6.2 | +19 | +4.7/-5.2 |
| NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz. | | | | |

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 2: The test procedure for sub-test 1 to 4 will result in a power slightly below the maximum, and therefore the lower limits in Table 5.2BC.5 are made lower by 1.5 dB.

NOTE 3: The test procedure allows UE to decrease its maximum transmit power for E-TFC selection in sub-test 1, and therefore the lower limits of sub-test 1 in Table 5.2BC.5 are made lower by 1.5 dB.

NOTE 4: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

## 5.2BD Maximum Output Power with HS-DPCCH and E-DCH for UL CLTD activation state 1

Editor’s note: This clause is incomplete. The following aspects are either missing or not yet determined:

- CM distribution for CLTD Mode 1 is incomplete.

### 5.2BD.1 Definition and applicability

The maximum output power for UL CLTD with HS-DPCCH and E-DCH and its tolerance are defined according to the UE Maximum Power Reduction (MPR) for the nominal maximum output power.

The maximum output power with HS-DPCCH and E-DCH is a measure of the maximum power the UE can transmit when HS-DPCCH and E-DCH is fully or partially transmitted during a DPCCH timeslot. The measurement period shall be at least one timeslot.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and E-DCH.

### 5.2BD.2 Minimum Requirements

The Maximum Power Reduction (MPR) for the nominal maximum output power is specified in table 5.2BD.1 for the values of c, d, hs, ec, ed and sc defined in [8] fully or partially transmitted during a DPCCH timeslot.

Table 5.2BD.1: Maximum Output Power with HS-DPCCH and E-DCH for UL CLTD

|  |  |  |
| --- | --- | --- |
| UE transmit channel configuration | CM (dB) | MPR (dB) |
| For all combinations of; DPDCH, DPCCH, HS-DPCCH, E-DPDCH, E-DPCCH and S-DPCCH | 0  CM  4 | MAX (CM-1, 0) |

T Where Cubic Metric (CM) is based on the UE transmit channel configuration and is given by

CM = CEIL { [20 \* log10 ((v\_norm 3) rms) - 20 \* log10 ((v\_norm\_ref 3) rms)] / k, 0.5 }

Where:

- CEIL { x, 0.5 } means rounding upwards to closest 0.5dB, i.e. CM = [0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5]

- k is 1.85 for signals where all channelisations codes meet the following criteria CSF, N where N< SF/2

- k is 1.56 for signals were any channelisations codes meet the following criteria CSF, N where N ≥ SF/2

- v\_normis the normalized voltage waveform of the input signal

- v\_norm\_ref is the normalized voltage waveform of the reference signal (12.2 kbps AMR Speech) and

- 20 \* log10 ((v\_norm\_ref 3) rms) = 1.52 dB

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the allowed Maximum Power Reduction (MPR) for the nominal maximum output power of each antenna is specified in Table 5.2BA.1 The amount of applied power reduction on each antenna shall be the same.

NOTE: CM is measured at each transmit antenna connector.

The normative reference for this requirement is TS 25.101 [1], clause 6.2.2C.

### 5.2BD.3 Test purpose

To verify that the error of the UE maximum output power for UL CLTD activation state 1 with HS-DPCCH and E-DCH does not exceed the range prescribed by the maximum output power and tolerance in table 5.2BD.5.

An excess maximum output power may interfere with other channels or other systems. A small maximum output power decreases the coverage area.

### 5.2BD.4 Method of test

#### 5.2BD.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex c, clauses C.11.1A and C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.19 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1A.4 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.2BD.4A.

4) For sub-test 1 to 4, enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH according to procedure 7.3.19.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2BD.1A: Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

| Information Element | Value/Remark |
| --- | --- |
| UL Transport channel information for all transport channels |  |
| - 2bit CTFC | 3 |
| - Power offset Information |  |
| - CHOICE Gain Factors | Signalled Gain Factors |
| - CHOICE mode | FDD |
| - Gain factor ßc | Value used in test: see Table C.11.1A.4 |
| - Gain factor ßd | Value used in test: see Table C.11.1A.4 |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |
| NOTE: All other 2 bit CTFC values use computed gain factors as in the default message. | |

Table 5.2BD.2: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-tests 1,2,4

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 5 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 67 |
| - Reference E-TFCI PO | 18 |
| - Reference E-TFCI | 71 |
| - Reference E-TFCI PO | 23 |
| - Reference E-TFCI | 75 |
| - Reference E-TFCI PO | 26 |
| - Reference E-TFCI | 81 |
| - Reference E-TFCI PO | 27 |

Table 5.2BD.3: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-test 3

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 2 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 92 |
| - Reference E-TFCI PO | 18 |

Table 5.2BD.3A: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) -condition A3 for Sub-test 5

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - E-DCH minimum set of E-TFCI | 67 |
| - Reference E-TFCIs | 1 E-TFCI |
| - Reference E-TFCI | 67 |
| - Reference E-TFCI PO | 18 |
| - Maximum channelisation codes | Sf4 |

Table 5.2BD.4: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | For sub-test 1 to 4: Algorithm2  For sub-test 5: Algorithm 1 |
| - ACK | Value used in test: see Table C.11.1A.4 |
| - NACK | Value used in test: see Table C.11.1A.4 |
| - Ack-Nack repetition factor | 3 (required for continuous HS-DPCCH signal) |
| E-DCH info |  |
| - E-DPCCH/DPCCH power offset | Value used in test: see Table C.11.1A.4 |
| Downlink HS-PDSCH Information |  |
| - Measurement Feedback Info |  |
| - CQI Feedback cycle, k | 4 ms |
| - CQI repetition factor | 2 (required for continuous HS-DPCCH signal) |
| - CQI | Value used in test: see Table C.11.1A.4 |

Table 5.2BDs.4A: Settings for the serving cell during the measurement  
of Maximum Output Power with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2B.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.2BD.4.2 Procedure

##### 5.2BD.4.2.1 Procedure for sub-test 1 to 4

1) Set the Absolute Grant according to Table C.11.1A.4.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Set the UE power to be at least 7.5dB lower than the maximum output power. Wait 150 ms.

4) Send power control bits to give one TPC\_cmd = +1 command to the UE.

5) The SS checks the received E-TFCI for 150 ms. If UE does not send any decreased E-TFCI (DTX on E‑DPDCH is also considered decreased E-TFCI) within the 150ms then go back to step (4) otherwise proceed to step 6).

6) Send power control bits to give one TPC\_cmd = -1 command to the UE and wait 150ms.

7) The SS checks the received E-TFCI for 150 ms. If UE sends any decreased E-TFCI (DTX on E-DPDCH is also considered decreased E-TFCI) within the 150ms, then send new power control bits to give another TPC\_cmd = -1 command to the UE and wait 150ms.

8) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1A.4. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

9) Measure the mean power of the UE. The mean power shall be averaged over at least one timeslot and measured at each transmit antenna connector.

10) Repeat the measurement for the different combinations of beta values for sub-test 1 to 4 as given in table C.11.1A.4.

### 5.2BD.5 Test requirements

The maximum output power with HS-DPCCH and E-DCH, derived in step 9), shall not exceed the range prescribed by the maximum output power and tolerance in table 5.2BD.5 or 5.2BD.6 depending on tested band. Note:

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the nominal transmit power is defined by the sum of transmit power at each transmit antenna connector.

The UL reference measurement channel for TX test will be set as defined in C.11.1 with the power ratio between HS-DPCH, DPCCH, DPDCH, E-DPCCH and E-DPDCH being set to the values defined in table C.11.1A.4.

Table 5.2BD.5: Maximum Output Powers with HS-DPCCH and E-DCH for test

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-test in table C.11.1A.4 | Power Class 3 | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| 1 | +24 | +1.7/-6.7 | +21 | +2.7/-5.7 |
| 2 | +22 | +3.7/-5.2 | +19 | +4.7/-4.2 |
| 3 | +23 | +2.7/-5.2 | +20 | +3.7/-4.2 |
| 4 | +22 | +3.7/-5.2 | +19 | +4.7/-4.2 |

For the UE which supports E-UTRA inter-band carrier aggregation, the lower side of the tolerance in Table 5.2BD.5 and 5.2BD.6 is allowed to be decreased by the amount given in Table 6.2.5-2 of TS 36.101[11] for those UTRA operating bands corresponding to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations. The tolerance in Table 6.2.5-2 of TS 36.101[11] does not apply to supported UTRA operating bands with frequency range below 1 GHz that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations when such bands are belonging only to band combination(s) where one band is <1GHz and another band is >1.7GHz and there is no harmonic relationship between the low band UL and high band DL.

For the UE which supports DB-DC-HSDPA or dual band 4C-HSDPA configurations with uplink assigned to one UTRA band the relaxation in Table 5.2.1a and Table 5.2.1b respectively shall be applied for applicable bands.

In case the UE supports DB-DC-HSDPA or dual band 4C-HSDPA configurations and one or more of the E-UTRA inter-band carrier aggregation configurations listed in Table 6.2.5-2 of TS36.101[11] with a UTRA operating band that belongs to UTRA and E-UTRA carrier aggregation configurations, then

- When the UTRA operating band frequency range is ≤ 1GHz, the applicable additional tolerance shall be the average of the applicable tolerances, truncated to one decimal place for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations, with the DB-DC-HSDPA, dual carrier 4C-HSDPA, and E-UTRA CA configurations counted separately. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied

- When the UTRA operating band frequency range is >1GHz, the applicable additional tolerance shall be the maximum tolerance that applies for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations.

Table 5.2BD.6: Maximum Output Powers with HS-DPCCH and E-DCH for test in bands XXV and XXVI

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-test in table C.11.1A.4 | Power Class 3 | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| 1 | +24 | +1.7/-7.7 | +21 | +2.7/-6.7 |
| 2 | +22 | +3.7/-6.2 | +19 | +4.7/-5.2 |
| 3 | +23 | +2.7/-6.2 | +20 | +3.7/-5.2 |
| 4 | +22 | +3.7/-6.2 | +19 | +4.7/-5.2 |
| NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz. | | | | |

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 2: The test procedure for sub-test 1 to 4 will result in a power slightly below the maximum, and therefore the lower limits in Table 5.2BD.5 are made lower by 1.5 dB.

NOTE 3: The test procedure allows UE to decrease its maximum transmit power for E-TFC selection in sub-test 1, and therefore the lower limits of sub-test 1 in Table 5.2BD.5 are made lower by 1.5 dB.

NOTE 4: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

## 5.2BE Maximum Output Power with HS-DPCCH and E-DCH for UL CLTD activation state 2 and 3.

### 5.2BE.1 Definition and applicability

The maximum output power for UL CLTD with HS-DPCCH and E-DCH and its tolerance are defined according to the UE Maximum Power Reduction (MPR) for the nominal maximum output power.

The maximum output power with HS-DPCCH and E-DCH is a measure of the maximum power the UE can transmit when HS-DPCCH and E-DCH is fully or partially transmitted during a DPCCH timeslot. The measurement period shall be at least one timeslot.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and E-DCH.

### 5.2BE.2 Minimum Requirements

The UE Maximum Power Reduction (MPR) for the nominal maximum output power shall be within the value and tolerance specified in table 5.2BE.1 for when the values of c, d, hs, ec and ed is fully or partially transmitted during a DPCCH timeslot.

Table 5.2BE.1: Maximum Output Power with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| UE transmit channel configuration | CM (dB) | MPR (dB) |
| For all combinations of; DPDCH, DPCCH, HS‑DPCCH, E-DPDCH and E-DPCCH | 0  CM  3.5 | MAX (CM-1, 0) |
| NOTE 1: CM = 1 for c/d =12/15, hs/c=24/15. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCHthe MPR is based on the relative CM difference. | | |

Where Cubic Metric (CM) is based on the UE transmit channel configuration and is given by:

CM = CEIL { [20 \* log10 ((v\_norm 3) rms) - 20 \* log10 ((v\_norm\_ref 3) rms)] / k, 0.5 }

Where:

- CEIL{ x, 0.5 } means rounding upwards to closest 0.5dB, i.e. CM  [0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5]

- k is 1.85 for signals where all channelisations codes meet the following criteria CSF, N where N< SF/2

- k is 1.56 for signals were any channelisations codes meet the following criteria CSF, N where N ≥ SF/2

- v\_normis the normalized voltage waveform of the input signal

- v\_norm\_ref is the normalized voltage waveform of the reference signal (12.2 kbps AMR Speech) and 20 \* log10 ((v\_norm\_ref3)rms) = 1.52 dB

For UE configured in UL CLTD activation state 2 or activation state 3, the allowed Maximum Power Reduction (MPR) for the nominal maximum output power applies at the active transmit antenna connector.

The normative reference for this requirement is TS 25.101 [1], clause 6.2.2C.

### 5.2BE.3 Test purpose

To verify that the error of the UE maximum output power for UL CLTD activation state 2 and 3 with HS-DPCCH and E-DCH does not exceed the range prescribed by the maximum output power and tolerance in table 5.2BD.5.

An excess maximum output power may interfere with other channels or other systems. A small maximum output power decreases the coverage area.

### 5.2BE.4 Method of test

#### 5.2BE.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex C, clauses C.11.1 and C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.19 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1A.4, each UL physical channel to be at constant power during the measurement and allow the call to be setup with initial UL CLTD activation state as state 2. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.2BE.4A.

4) For sub-test 1 to 4, enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH according to procedure 7.3.19.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2BE.1A: Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

| Information Element | Value/Remark |
| --- | --- |
| UL Transport channel information for all transport channels |  |
| - 2bit CTFC | 3 |
| - Power offset Information |  |
| - CHOICE Gain Factors | Signalled Gain Factors |
| - CHOICE mode | FDD |
| - Gain factor ßc | Value used in test: see Table C.11.1A.4 |
| - Gain factor ßd | Value used in test: see Table C.11.1A.4 |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |
| NOTE: All other 2 bit CTFC values use computed gain factors as in the default message. | |

Table 5.2BE.2: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-tests 1,2,4

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 5 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 67 |
| - Reference E-TFCI PO | 18 |
| - Reference E-TFCI | 71 |
| - Reference E-TFCI PO | 23 |
| - Reference E-TFCI | 75 |
| - Reference E-TFCI PO | 26 |
| - Reference E-TFCI | 81 |
| - Reference E-TFCI PO | 27 |

Table 5.2BE.3: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-test 3

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 2 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 92 |
| - Reference E-TFCI PO | 18 |

Table 5.2BE.3A: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) -condition A3 for Sub-test 5

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - E-DCH minimum set of E-TFCI | 67 |
| - Reference E-TFCIs | 1 E-TFCI |
| - Reference E-TFCI | 67 |
| - Reference E-TFCI PO | 18 |
| - Maximum channelisation codes | Sf4 |

Table 5.2BE.4: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | For sub-test 1 to 4: Algorithm2  For sub-test 5: Algorithm 1 |
| - ACK | Value used in test: see Table C.11.1A.4 |
| - NACK | Value used in test: see Table C.11.1A.4 |
| - Ack-Nack repetition factor | 3 (required for continuous HS-DPCCH signal) |
| E-DCH info |  |
| - E-DPCCH/DPCCH power offset | Value used in test: see Table C.11.1A.4 |
| Downlink HS-PDSCH Information |  |
| - Measurement Feedback Info |  |
| - CQI Feedback cycle, k | 4 ms |
| - CQI repetition factor | 2 (required for continuous HS-DPCCH signal) |
| - CQI | Value used in test: see Table C.11.1A.4 |
| Uplink CLTD info FDD |  |
| - CHOICE Mode | New |
| - Initial CLTD activation state | Second state |

Table 5.2BE.4A: Settings for the serving cell during the measurement  
of Maximum Output Power with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2B.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.2BE.4.2 Procedure

##### 5.2BE.4.2.1 Procedure for sub-test 1 to 4

1) Set the Absolute Grant according to Table C.11.1A.4.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Set the UE power to be at least 7.5dB lower than the maximum output power. Wait 150 ms.

4) Send power control bits to give one TPC\_cmd = +1 command to the UE.

5) The SS checks the received E-TFCI for 150 ms. If UE does not send any decreased E-TFCI (DTX on E‑DPDCH is also considered decreased E-TFCI) within the 150ms then go back to step (4) otherwise proceed to step 6).

6) Send power control bits to give one TPC\_cmd = -1 command to the UE and wait 150ms.

7) The SS checks the received E-TFCI for 150 ms. If UE sends any decreased E-TFCI (DTX on E-DPDCH is also considered decreased E-TFCI) within the 150ms, then send new power control bits to give another TPC\_cmd = -1 command to the UE and wait 150ms.

8) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1A.4. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

9) Measure the mean power of the UE. The mean power shall be averaged over at least one timeslot and is measured at the active transmit antenna connector.

10) Repeat the measurement for the different combinations of beta values for sub-test 1 to 4 as given in table C.11.1A.4.

11) SS sends a HS-SCCH order activating UL\_CLTD activation state 3.

12) Repeat step 1 to 10 for activation state 3.

### 5.2BE.5 Test requirements

The maximum output power with HS-DPCCH and E-DCH, derived in step 9) for activation 2 and 3, shall not exceed the range prescribed by the maximum output power and tolerance in table 5.2BE.5 or 5.2BE.6 depending on tested band. Note:

For UE configured in UL CLTD activation state 2 or activation state 3, the nominal maximum output power applies at the active transmit antenna connector.

The UL reference measurement channel for TX test will be set as defined in C.11.1 with the power ratio between HS-DPCH, DPCCH, DPDCH, E-DPCCH and E-DPDCH being set to the values defined in table C.11.1A.4.

Table 5.2BE.5: Maximum Output Powers with HS-DPCCH and E-DCH for test

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-test in table C.11.1A.4 | Power Class 3 | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| 1 | +24 | +1.7/-6.7 | +21 | +2.7/-5.7 |
| 2 | +22 | +3.7/-5.2 | +19 | +4.7/-4.2 |
| 3 | +23 | +2.7/-5.2 | +20 | +3.7/-4.2 |
| 4 | +22 | +3.7/-5.2 | +19 | +4.7/-4.2 |

For the UE which supports E-UTRA inter-band carrier aggregation, the lower side of the tolerance in Table 5.2BE.5 and 5.2BE.6 is allowed to be decreased by the amount given in Table 6.2.5-2 of TS 36.101[11] for those UTRA operating bands corresponding to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations. The tolerance in Table 6.2.5-2 of TS 36.101[11] does not apply to supported UTRA operating bands with frequency range below 1 GHz that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations when such bands are belonging only to band combination(s) where one band is <1GHz and another band is >1.7GHz and there is no harmonic relationship between the low band UL and high band DL.

For the UE which supports DB-DC-HSDPA or dual band 4C-HSDPA configurations with uplink assigned to one UTRA band the relaxation in Table 5.2.1a and Table 5.2.1b respectively shall be applied for applicable bands.

In case the UE supports DB-DC-HSDPA or dual band 4C-HSDPA configurations and one or more of the E-UTRA inter-band carrier aggregation configurations listed in Table 6.2.5-2 of TS36.101[11] with a UTRA operating band that belongs to UTRA and E-UTRA carrier aggregation configurations, then

- When the UTRA operating band frequency range is ≤ 1GHz, the applicable additional tolerance shall be the average of the applicable tolerances, truncated to one decimal place for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations, with the DB-DC-HSDPA, dual carrier 4C-HSDPA, and E-UTRA CA configurations counted separately. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied

- When the UTRA operating band frequency range is >1GHz, the applicable additional tolerance shall be the maximum tolerance that applies for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations.

Table 5.2BE.6: Maximum Output Powers with HS-DPCCH and E-DCH for test in bands XXV and XXVI

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-test in table C.11.1.3 | Power Class 3 | | Power Class 4 | |
| Power  (dBm) | Tol  (dB) | Power  (dBm) | Tol  (dB) |
| 1 | +24 | +1.7/-7.7 | +21 | +2.7/-6.7 |
| 2 | +22 | +3.7/-6.2 | +19 | +4.7/-5.2 |
| 3 | +23 | +2.7/-6.2 | +20 | +3.7/-5.2 |
| 4 | +22 | +3.7/-6.2 | +19 | +4.7/-5.2 |
| NOTE 1: For the UE which supports both Band V and Band XXVI operating frequencies, the UE maximum output power of Band V shall apply for Band XXVI when the carrier frequency of the assigned UTRA channel is within 824-845 MHz. | | | | |

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 2: The test procedure for sub-test 1 to 4 will result in a power slightly below the maximum, and therefore the lower limits in Table 5.2BE.5 are made lower by 1.5 dB.

NOTE 3: The test procedure allows UE to decrease its maximum transmit power for E-TFC selection in sub-test 1, and therefore the lower limits of sub-test 1 in Table 5.2BE.5 are made lower by 1.5 dB.

NOTE 4: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

## 5.2C UE relative code domain power accuracy

### 5.2C.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where:

Measured CDP ratio = 10\*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10\*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA but not E-DCH.

### 5.2C.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2C.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

Table 5.2C.1: UE Relative CDP accuracy

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.5 |
| -10 dB to ≥ -15 dB | ±2.0 |
| -15 dB to ≥ -20 dB | ±2.5 |

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3.

### 5.2C.3 Test purpose

To verify that the UE relative code domain power accuracy meets the requirements given in table 5.2C.4.

### 5.2C.4 Method of test

#### 5.2C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.2C.2.

4) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

Table 5.2C.2: Settings for the serving cell during the measurement of HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2C.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

#### 5.2C.4.2 Procedure

1) Send the TRANSPORT CHANNEL RECONFIGURATION message to set the beta values defined in table C.10.1.4 subtest 1 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS to set the output power of the UE, when the HS-DPCCH is not transmitted, measured at the UE antenna connector, to be in the range 0 dBm ± 2dB. This is a nominal setting and not part of the test requirements.

3) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

4) Start transmitting HSDPA Data.

5) Figure 5.2C.1 shows the 12ms cycle created when using the TRANSPORT CHANNEL RECONFIGURATION message from Annex I with the test specific message content defined below and with TPC\_cmd=0. Measure the relative code domain power of each active code at the measurement points specified in figure 5.2C.1. Each measurement is over a half slot period. Point 1 is the half slot prior to the ACK/NACK. Point 2 is the first half slot of the ACK/NACK, point 3 is the first half slot of the CQI and point 4 is the first half slot after the CQI. The 25us transient periods at the end of each half slot period shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2C.3. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2C.4.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in annex I. The test specific content for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

|  |  |
| --- | --- |
| Information Element | Value/remark |
| - Ack-Nack repetition factor | 1 |
| - CQI repetition factor | 1 |



Figure 5.2C.1: Transmit power profile showing measurement points

### 5.2C.5 Test requirements

For the expected relative code domain power ratios given in table 5.2C.3 the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2C.4.

Table 5.2C.3: UE relative code domain power nominal ratios

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-test in table C.10.1.4 | Measurement point | Expected relative code domain power in dB | | |
| DPCCH | DPDCH | HS-DPCCH |
| 1 | 1 | -17.6 | -0.08 | OFF |
| 2 | -17.9 | -0.4 | -11.8 |
| 3 | -17.8 | -0.3 | -13.7 |
| 4 | -17.6 | -0.08 | OFF |
| 2 | 1 | -4.1 | -2.1 | OFF |
| 2 | -8.2 | -6.2 | -2.1 |
| 3 | -7.1 | -5.2 | -3 |
| 4 | -4.1 | -2.1 | OFF |
| 3 | 1 | -1.1 | -6.5 | OFF |
| 2 | -7.2 | -12.7 | -1.2 |
| 3 | -5.8 | -11.3 | -1.8 |
| 4 | -1.1 | -6.5 | OFF |
| 4 | 1 | -0.3 | -11.8 | OFF |
| 2 | -7.1 | -18.5 | -1 |
| 3 | -5.6 | -17.1 | -1.5 |
| 4 | -0.3 | -11.8 | OFF |

Table 5.2C.4: UE relative code domain power accuracy test requirements

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.7 |
| -10 dB to ≥ -15 dB | ±2.3 |
| -15 dB to ≥ -20 dB | ±2.9 |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.2CA UE relative code domain power accuracy for OLTD

### 5.2CA.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where:

Measured CDP ratio = 10\*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10\*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL OLTD and HSDPA.

### 5.2CA.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2CB.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

For UE with two active transmit antenna connectors in UL OLTD, the relative code domain power accuracy specified in table 5.2CA.1 applies at each transmit antenna connector.

Table 5.2CA.1: UE Relative CDP accuracy

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.5 |
| -10 dB to ≥ -15 dB | ±2.0 |
| -15 dB to ≥ -20 dB | ±2.5 |
| -20 dB to ≥ -30 dB | ±3.0 |

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3B.

### 5.2CA.3 Test purpose

To verify that the UE relative code domain power accuracy for UL OLTD meets the requirements given in table 5.2CA.4.

### 5.2CA.4 Method of test

#### 5.2CA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C, clauses C.10.2 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.18.RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.2CB.2.

4) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

Table 5.2CA.2: Settings for the serving cell during the measurement of HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2C.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

#### 5.2CA.4.2 Procedure

1) Send the TRANSPORT CHANNEL RECONFIGURATION message to set the beta values defined in table C.10.2.4 subtest 1 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS to set the output power of the UE, when the HS-DPCCH is not transmitted, measured at the UE antenna connector, to be in the range 0 dBm ± 2dB. This is a nominal setting and not part of the test requirements.

3) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

4) Start transmitting HSDPA Data.

5) Figure 5.2CA.1 shows the 12ms cycle created when using the TRANSPORT CHANNEL RECONFIGURATION message from Annex I with the test specific message content defined below and with TPC\_cmd=0. Measure the relative code domain power of each active code at the measurement points specified in figure 5.2CA.1 at each transmit antenna connector. Each measurement is over a half slot period. Point 1 is the half slot prior to the ACK/NACK. Point 2 is the first half slot of the ACK/NACK, point 3 is the first half slot of the CQI and point 4 is the first half slot after the CQI. The 25us transient periods at the end of each half slot period shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2CA.3. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2CB.4.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in annex I. The test specific content for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

|  |  |
| --- | --- |
| Information Element | Value/remark |
| - Ack-Nack repetition factor | 1 |
| - CQI repetition factor | 1 |



Figure 5.2CA.1: Transmit power profile showing measurement points

### 5.2CA.5 Test requirements

For the expected relative code domain power ratios given in table 5.2CA.3 the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2CA.4.

For UE with two active transmit antenna connectors in UL OLTD, the relative code domain power accuracy applies at each transmit antenna connector.

Table 5.2CA.3: UE relative code domain power nominal ratios

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-test in table C.10.2.4 | Measurement point | Expected relative code domain power in dB | | |
| DPCCH | DPDCH | HS-DPCCH |
| 1 | 1 | -17.6 | -0.08 | OFF |
| 2 | -17.9 | -0.4 | -11.8 |
| 3 | -17.8 | -0.3 | -13.7 |
| 4 | -17.6 | -0.08 | OFF |
| 2 | 1 | -4.1 | -2.1 | OFF |
| 2 | -8.2 | -6.2 | -2.1 |
| 3 | -7.1 | -5.2 | -3 |
| 4 | -4.1 | -2.1 | OFF |
| 3 | 1 | -1.1 | -6.5 | OFF |
| 2 | -7.2 | -12.7 | -1.2 |
| 3 | -5.8 | -11.3 | -1.8 |
| 4 | -1.1 | -6.5 | OFF |
| 4 | 1 | -0.3 | -11.8 | OFF |
| 2 | -7.1 | -18.5 | -1 |
| 3 | -5.6 | -17.1 | -1.5 |
| 4 | -0.3 | -11.8 | OFF |

Table 5.2CA.4: UE relative code domain power accuracy test requirements

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.7 |
| -10 dB to ≥ -15 dB | ±2.3 |
| -15 dB to ≥ -20 dB | ±2.9 |
| -20 dB to ≥ -30 dB | ±3.5 |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.2CB UE relative code domain power accuracy for UL CLTD activation state 1

Editor’s note: This clause is incomplete. The following aspects are either missing or not yet determined:

- CM distribution for CLTD Mode 1 is incomplete.

### 5.2CB.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where:

Measured CDP ratio = 10\*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10\*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and HSDPA.

### 5.2CB.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2CB.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the relative code domain power accuracy specified in table 5.2CB.1 applies at each transmit antenna connector.

Table 5.2CB.1: UE Relative CDP accuracy

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.5 |
| -10 dB to ≥ -15 dB | ±2.0 |
| -15 dB to ≥ -20 dB | ±2.5 |

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3C.

### 5.2CB.3 Test purpose

To verify that the UE relative code domain power accuracy for UL CLTD activation state 1 meets the requirements given in table 5.2CB.4.

### 5.2CB.4 Method of test

#### 5.2CB.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C, clauses C.10.2 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3. 17.RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.2CB.2.

4) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

Table 5.2CB.2: Settings for the serving cell during the measurement of HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2C.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

#### 5.2CB.4.2 Procedure

1) Send the TRANSPORT CHANNEL RECONFIGURATION message to set the beta values defined in table C.10.2.4 subtest 1 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS to set the output power of the UE, when the HS-DPCCH is not transmitted, measured at the UE antenna connector, to be in the range 0 dBm ± 2dB. This is a nominal setting and not part of the test requirements.

3) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

4) Start transmitting HSDPA Data.

5) Figure 5.2CB.1 shows the 12ms cycle created when using the TRANSPORT CHANNEL RECONFIGURATION message from Annex I with the test specific message content defined below and with TPC\_cmd=0. Measure the relative code domain power of each active code at the measurement points specified in figure 5.2CB.1 at each transmit antenna connector. Each measurement is over a half slot period. Point 1 is the half slot prior to the ACK/NACK. Point 2 is the first half slot of the ACK/NACK, point 3 is the first half slot of the CQI and point 4 is the first half slot after the CQI. The 25us transient periods at the end of each half slot period shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2CB.3. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2CB.4.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in annex I. The test specific content for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

|  |  |
| --- | --- |
| Information Element | Value/remark |
| - Ack-Nack repetition factor | 1 |
| - CQI repetition factor | 1 |



Figure 5.2CB.1: Transmit power profile showing measurement points

### 5.2CB.5 Test requirements

For the expected relative code domain power ratios given in table 5.2CB.3 the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2CB.4.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the relative code domain power accuracy applies at each transmit antenna connector.

Table 5.2CB.3: UE relative code domain power nominal ratios

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sub-test in table C.10.2.4 | Measurement point | Expected relative code domain power in dB | | | |
| DPCCH | S-DPCCH | DPDCH | HS-DPCCH |
| 1 | 1 | --20.6 | -20.6 | -0.08 | OFF |
| 2 | -20.9 | -20.9 | -0.4 | -11.8 |
| 3 | -20.8 | -20.8 | -0.3 | -13.7 |
| 4 | -20.6 | -20.6 | -0.08 | OFF |
| 2 | 1 | -7.1 | -7.1 | -2.1 | OFF |
| 2 | -11.2 | -11.2 | -6.2 | -2.1 |
| 3 | -10.1 | -10.1 | -5.2 | -3 |
| 4 | -7.1 | -7.1 | -2.1 | OFF |
| 3 | 1 | -4.1 | -4.1 | -6.5 | OFF |
| 2 | -10.2 | -10.2 | -12.7 | -1.2 |
| 3 | -8.8 | -8.8 | -11.3 | -1.8 |
| 4 | -4.1 | -4.1 | -6.5 | OFF |
| 4 | 1 | -3.3 | -3.3 | -11.8 | OFF |
| 2 | -10.1 | -10.1 | -18.5 | -1 |
| 3 | -8.6 | -8.6 | -17.1 | -1.5 |
| 4 | -3.3 | -3.3 | -11.8 | OFF |

Table 5.2CB.4: UE relative code domain power accuracy test requirements

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.7 |
| -10 dB to ≥ -15 dB | ±2.3 |
| -15 dB to ≥ -20 dB | ±2.9 |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.2CC UE relative code domain power accuracy for UL CLTD activation state 2 and 3

### 5.2CC.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where:

Measured CDP ratio = 10\*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10\*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and HSDPA.

### 5.2CC.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2CC.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

For UE configured in UL CLTD activation state 2 or activation state 3, the relative code domain power accuracy specified in table 5.2CC.1 applies at the active transmit antenna connector.

Table 5.2CC.1: UE Relative CDP accuracy

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.5 |
| -10 dB to ≥ -15 dB | ±2.0 |
| -15 dB to ≥ -20 dB | ±2.5 |

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3C.

### 5.2CC.3 Test purpose

To verify that the UE relative code domain power accuracy for UL CLTD activation state 2 and 3 meets the requirements given in table 5.2CC.4.

### 5.2CC.4 Method of test

#### 5.2CC.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C, clauses C.10.1 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.17 with the following exception in the RADIO BEARER SETUP messages in table 5.2CC.1.1. This exception allows the call to be setup with initial UL CLTD activation state as state 2. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.2CC.2.

4) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

Table 5.2CC.1.1: Contents of Radio bearer setup message

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink CLTD info FDD |  | Rel-11 |
| - CHOICE *Mode* | New |  |
| - Initial CLTD activation state | Second state |  |

Table 5.2CC.2: Settings for the serving cell during the measurement of HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2C.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

#### 5.2CC.4.2 Procedure

1) Send the TRANSPORT CHANNEL RECONFIGURATION message to set the beta values defined in table C.10.1.4 subtest 1 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS to set the output power of the UE, when the HS-DPCCH is not transmitted, measured at the UE antenna connector, to be in the range 0 dBm ± 2dB. This is a nominal setting and not part of the test requirements.

3) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

4) Start transmitting HSDPA Data.

5) Figure 5.2CC.1 shows the 12ms cycle created when using the TRANSPORT CHANNEL RECONFIGURATION message from Annex I with the test specific message content defined below and with TPC\_cmd=0. Measure the relative code domain power of each active code at the measurement points specified in figure 5.2CC.1 at the active transmit antenna connector. Each measurement is over a half slot period. Point 1 is the half slot prior to the ACK/NACK. Point 2 is the first half slot of the ACK/NACK, point 3 is the first half slot of the CQI and point 4 is the first half slot after the CQI. The 25us transient periods at the end of each half slot period shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2CC.3. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2CC.4.

6) SS sends a HS-SCCH order activating UL\_CLTD activation state 3.

7) Repeat step 1 to 5 for activation state 3.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in annex I. The test specific content for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

|  |  |
| --- | --- |
| Information Element | Value/remark |
| - Ack-Nack repetition factor | 1 |
| - CQI repetition factor | 1 |



Figure 5.2CC.1: Transmit power profile showing measurement points

### 5.2CC.5 Test requirements

For the expected relative code domain power ratios given in table 5.2CC.3 the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2CC.4.

For UE configured in UL CLTD activation state 2 or activation state 3, the relative code domain power accuracy applies at the active transmit antenna connector.

Table 5.2CC.3: UE relative code domain power nominal ratios

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-test in table C.10.1.4 | Measurement point | Expected relative code domain power in dB | | |
| DPCCH | DPDCH | HS-DPCCH |
| 1 | 1 | -17.6 | -0.08 | OFF |
| 2 | -17.9 | -0.4 | -11.8 |
| 3 | -17.8 | -0.3 | -13.7 |
| 4 | -17.6 | -0.08 | OFF |
| 2 | 1 | -4.1 | -2.1 | OFF |
| 2 | -8.2 | -6.2 | -2.1 |
| 3 | -7.1 | -5.2 | -3 |
| 4 | -4.1 | -2.1 | OFF |
| 3 | 1 | -1.1 | -6.5 | OFF |
| 2 | -7.2 | -12.7 | -1.2 |
| 3 | -5.8 | -11.3 | -1.8 |
| 4 | -1.1 | -6.5 | OFF |
| 4 | 1 | -0.3 | -11.8 | OFF |
| 2 | -7.1 | -18.5 | -1 |
| 3 | -5.6 | -17.1 | -1.5 |
| 4 | -0.3 | -11.8 | OFF |

Table 5.2CC.4: UE relative code domain power accuracy test requirements

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.7 |
| -10 dB to ≥ -15 dB | ±2.3 |
| -15 dB to ≥ -20 dB | ±2.9 |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.2D UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH

### 5.2D.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where

Measured CDP ratio = 10\*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10\*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA and E-DCH.

### 5.2D.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2D.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

Table 5.2D.1: UE Relative CDP accuracy

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.5 |
| -10 dB to ≥ -15 dB | ±2.0 |
| -15 dB to ≥ -20 dB | ±2.5 |

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3.

### 5.2D.3 Test purpose

To verify that the UE relative code domain power accuracy meets the requirements given in table 5.2D.8.

### 5.2D.4 Method of test

#### 5.2D.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.11.1 and C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.9 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.3 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.2D.6.

4) Enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2D.2 Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

| Information Element | Value/Remark |
| --- | --- |
| UL Transport channel information for all transport channels |  |
| - 2bit CTFC | 3 |
| - Power offset Information |  |
| - CHOICE Gain Factors | Signalled Gain Factors |
| - CHOICE mode | FDD |
| - Gain factor ßc | Value used in test: see Table C.11.1.3 |
| - Gain factor ßd | Value used in test: see Table C.11.1.3 |
| NOTE: All other 2 bit CTFC values use computed gain factors as in the default message | |

Table 5.2D.3: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-tests 1,2,4

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 5 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 67 |
| - Reference E-TFCI PO | 18 |
| - Reference E-TFCI | 71 |
| - Reference E-TFCI PO | 23 |
| - Reference E-TFCI | 75 |
| - Reference E-TFCI PO | 26 |
| - Reference E-TFCI | 81 |
| - Reference E-TFCI PO | 27 |

Table 5.2D.4: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-test 3

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 2 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 92 |
| - Reference E-TFCI PO | 18 |

Table 5.2D.5 Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |
| - ACK | Value used in test: see Table C.11.1.3 |
| - NACK | Value used in test: see Table C.11.1.3 |
| - Ack-Nack repetition factor | 3 (required for continuous HS-DPCCH signal) |
| E-DCH info |  |
| - E-DPCCH/DPCCH power offset | Value used in test: see Table C.11.1.3 |
| Downlink HS-PDSCH Information |  |
| - Measurement Feedback Info |  |
| - CQI Feedback cycle, k | 4 ms |
| - CQI repetition factor | 2 (required for continuous HS-DPCCH signal) |
| - CQI | Value used in test: see Table C.11.1.3 |

Table 5.2D.6: Settings for the serving cell during the measurement of  
UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2B.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.2D.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1.3.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.3. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

6) Send Absolute Grants in a repeating pattern starting with the value according to Table C.11.1.3 and alternating between this value and an Absolute Grant Index of Zero\_Grant. This will generate a repeating pattern on the E-DPDCH(s) with a level corresponding to the sending of Scheduling Information every other 10ms E-DCH TTI as shown in Figure 5.2D.1.



Figure 5.2D.1: Transmit power profile showing measurement points

7) Measure the relative code domain power of each active code at the measurement points specified in Figure 5.2D.1. Each measurement is made over one timeslot. Measurement point 1 is the last timeslot before TTI1. Measurement point 2 is the first timeslot of TTI1 and measurement point 3 is the first timeslot of TTI2. The 25 us transient periods at the ends of each measured timeslot shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2D.7. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2D.8.

8) Repeat steps 1 through 7 for the other combinations of beta values for sub-tests 1, 2, 3, and 4 as given in Table C.11.1.3.

### 5.2D.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2D.7 ≥ -20 dB the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2D.8.

Table 5.2D.7: UE relative code domain power nominal ratios

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sub-Test in Table C.11.1.3 | Measure-ment Point | Expected Relative Code Domain Power in dB | | | | | |
| DPCCH | DPDCH | HS-DPCCH | E-DPCCH | E-DPDCH1 | E-DPDCH2 |
| 1 | 1 | -9.3 | -6.6 | -3.3 | -7.3 | -18.9 | OFF |
| 2 | -18.5 | -15.8 | -12.5 | -16.5 | -0.5 | OFF |
| 3 | -9.3 | -6.6 | -3.3 | -7.3 | -18.9 | OFF |
| 2 | 1 | -11.9 | -3.9 | -5.8 | -5.8 | -21.4 | OFF |
| 2 | -14.0 | -6.0 | -8.0 | -8.0 | -4.1 | OFF |
| 3 | -11.9 | -3.9 | -5.8 | -5.8 | -21.4 | OFF |
| 3 | 1 | -9.8 | -14.2 | -3.7 | -3.7 | -19.3 | OFF |
| 2 | -14.6 | -19.1 | -8.6 | -8.6 | -4.7 | -4.7 |
| 3 | -9.8 | -14.2 | -3.7 | -3.7 | -19.3 | OFF |
| 4 | 1 | -17.9 | -0.4 | -11.9 | -17.9 | -27.5 | OFF |
| 2 | -19.7 | -2.2 | -13.7 | -19.7 | -4.7 | OFF |
| 3 | -17.9 | -0.4 | -11.9 | -17.9 | -27.5 | OFF |

Table 5.2D.8: UE relative code domain power accuracy test requirements

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.7 |
| -10 dB to ≥ -15 dB | ±2.3 |
| -15 dB to ≥ -20 dB | ±2.9 |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.2DA UE Relative Code Domain Power Accuracy for DC-HSUPA with QPSK

### 5.2DA.1 Definition and applicability

The requirement and corresponding measurements apply to each individual carrier when the total power in each of the assigned carriers is equal to each other. Furthermore, it is necessary to verify this requirement only for β values as specified in Table C.11A.1.1.

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers in a carrier relative to the total power of all active codes in that carrier. The measure of accuracy is the difference between two dB ratios measured per carrier configured on the uplink:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where

Measured CDP ratio = 10\*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10\*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes in each carrier and is derived from beta factors. The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal in each carrier and of noise in the signal that falls on inactive codes.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

### 5.2DA.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2DA.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

Table 5.2DA.1: UE Relative CDP accuracy

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.5 |
| -10 dB to ≥ -15 dB | ±2.0 |
| -15 dB to ≥ -20 dB | ±2.5 |
| -20 dB to ≥ -30 dB | ±3.0 |

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3A.

### 5.2DA.3 Test purpose

To verify that the UE relative code domain power accuracy for DC-HSUPA meets the requirements given in table 5.2DA.7.

### 5.2DA.4 Method of test

#### 5.2DA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.6 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14. RF parameters are set up according to table E. 5A.1A. Settings for the serving cell are defined in table 5.2DA.5.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2DA.2: Void

Table 5.2DA.3: Void

Table 5.2DA.4: Contents of RADIO BEARER SETUP message: AM or UM

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |

Table 5.2DA.5: Settings for the serving cell during the measurement of  
UE Relative Code Domain Power Accuracy for DC-HSUPA with QPSK

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2BA.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

#### 5.2DA.4.2 Procedure

1) Set the Absolute Grant according to Table C.11A.1.3.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands to each individual carrier from the SS to set the total power in each of the assigned carriers to be equal to each other within 1.7 dB and the total output power of the UE to be in the range 15dBm 2dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11A.1.1. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0. This test step is expected to keep the total power in each of the assigned carriers to be equal to each other within 1.7 dB and the total output power of the UE to be in the range 15dBm 2dB during the relative code domain power measurements performed at next step.

6) Measure the relative code domain power of each active code on each uplink frequency. Each measurement is made over one timeslot. The nominal UE relative code domain power for each active code is defined in table 5.2DA.6. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2DA.7.

### 5.2DA.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2DA.6 the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2DA.7.

Table 5.2DA.6: UE relative code domain power nominal ratios

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sub-Test in Table C.11A.1.3 | Expected Relative Code Domain Power in dB | | | | | | |
| Primary Uplink Frequency | | | | Secondary Uplink Frequency | | |
| DPCCH | HS-DPCCH | E-DPCCH | E-DPDCH | DPCCH | E-DPCCH | E-DPDCH |
| 1 | -5.8 | -15.3 | -15.3 | -1.7 | -5.6 | -15.2 | -1.6 |

Table 5.2DA.7: UE relative code domain power accuracy test requirements

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.7 |
| -10 dB to ≥ -15 dB | ±2.3 |
| -15 dB to ≥ -20 dB | ±2.9 |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.2DB UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH for OLTD

### 5.2DB.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where:

Measured CDP ratio = 10\*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10\*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL OLTD, HSDPA and E-DCH.

### 5.2DB.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2DB.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

For UE with two active transmit antenna connectors in UL OLTD, the relative code domain power accuracy specified in table 5.2DB.1 applies at each transmit antenna connector.

Table 5.2DB.1: UE Relative CDP accuracy

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.5 |
| -10 dB to ≥ -15 dB | ±2.0 |
| -15 dB to ≥ -20 dB | ±2.5 |
| -20 dB to ≥ -30 dB | ±3.0 |

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3B.

### 5.2DB.3 Test purpose

To verify that the UE relative code domain power accuracy for UL OLTD meets the requirements given in table 5.2DB.8.

### 5.2DB.4 Method of test

#### 5.2DB.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C, clause C.11.1A.

3) An E-DCH call is set up according to TS 34.108 [3], clause 7.3.20 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1A.4 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.2DB.6.

4) Enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2DB.2: Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

| Information Element | Value/Remark |
| --- | --- |
| UL Transport channel information for all transport channels |  |
| - 2bit CTFC | 3 |
| - Power offset Information |  |
| - CHOICE Gain Factors | Signalled Gain Factors |
| - CHOICE mode | FDD |
| - Gain factor ßc | Value used in test: see Table C.11.1A.4 |
| - Gain factor ßd | Value used in test: see Table C.11.1A.4 |
| NOTE: All other 2 bit CTFC values use computed gain factors as in the default message | |

Table 5.2DB.3: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-tests 1,2,4

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 5 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 67 |
| - Reference E-TFCI PO | 18 |
| - Reference E-TFCI | 71 |
| - Reference E-TFCI PO | 23 |
| - Reference E-TFCI | 75 |
| - Reference E-TFCI PO | 26 |
| - Reference E-TFCI | 81 |
| - Reference E-TFCI PO | 27 |

Table 5.2DB.4: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-test 3

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 2 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 92 |
| - Reference E-TFCI PO | 18 |

Table 5.2DB.5: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |
| - ACK | Value used in test: see Table C.11.1A.4 |
| - NACK | Value used in test: see Table C.11.1A.4 |
| - Ack-Nack repetition factor | 3 (required for continuous HS-DPCCH signal) |
| E-DCH info |  |
| - E-DPCCH/DPCCH power offset | Value used in test: see Table C.11.1A.4 |
| Downlink HS-PDSCH Information |  |
| - Measurement Feedback Info |  |
| - CQI Feedback cycle, k | 4 ms |
| - CQI repetition factor | 2 (required for continuous HS-DPCCH signal) |
| - CQI | Value used in test: see Table C.11.1A.4 |

Table 5.2DB.6: Settings for the serving cell during the measurement of  
UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2B.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.2DB.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1A.4.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1A.4. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

6) Send Absolute Grants in a repeating pattern starting with the value according to Table C.11.1A.4 and alternating between this value and an Absolute Grant Index of Zero\_Grant. This will generate a repeating pattern on the E-DPDCH(s) with a level corresponding to the sending of Scheduling Information every other 10ms E-DCH TTI as shown in Figure 5.2DB.1.



Figure 5.2DB.1: Transmit power profile showing measurement points

7) Measure the relative code domain power of each active code at the measurement points specified in Figure 5.2DB.1 at each transmit antenna connector. Each measurement is made over one timeslot. Measurement point 1 is the last timeslot before TTI1. Measurement point 2 is the first timeslot of TTI1 and measurement point 3 is the first timeslot of TTI2. The 25 us transient periods at the ends of each measured timeslot shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2DB.7. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2DB.8.

8) Repeat steps 1 through 7 for the other combinations of beta values for sub-tests 1, 2, 3, and 4 as given in Table C.11.1A.4.

### 5.2DB.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2DB.7 ≥ -20 dB the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2DB.8.

For UE with two active transmit antenna connectors in UL OLTD, the relative code domain power accuracy applies at each transmit antenna connector.

Table 5.2DB.7: UE relative code domain power nominal ratios

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sub-Test in Table C.11.1A.4 | Measure-ment Point | Expected Relative Code Domain Power in dB | | | | | |
| DPCCH | DPDCH | HS-DPCCH | E-DPCCH | E-DPDCH1 | E-DPDCH2 |
| 1 | 1 | -9.3 | -6.6 | -3.3 | -7.3 | -18.9 | OFF |
| 2 | -18.5 | -15.8 | -12.5 | -16.5 | -0.5 | OFF |
| 3 | -9.3 | -6.6 | -3.3 | -7.3 | -18.9 | OFF |
| 2 | 1 | -11.9 | -3.9 | -5.8 | -5.8 | -21.4 | OFF |
| 2 | -14.0 | -6.0 | -8.0 | -8.0 | -4.1 | OFF |
| 3 | -11.9 | -3.9 | -5.8 | -5.8 | -21.4 | OFF |
| 3 | 1 | -9.8 | -14.2 | -3.7 | -3.7 | -19.3 | OFF |
| 2 | -14.6 | -19.1 | -8.6 | -8.6 | -4.7 | -4.7 |
| 3 | -9.8 | -14.2 | -3.7 | -3.7 | -19.3 | OFF |
| 4 | 1 | -17.9 | -0.4 | -11.9 | -17.9 | -27.5 | OFF |
| 2 | -19.7 | -2.2 | -13.7 | -19.7 | -4.7 | OFF |
| 3 | -17.9 | -0.4 | -11.9 | -17.9 | -27.5 | OFF |

Table 5.2DB.8: UE relative code domain power accuracy test requirements

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.7 |
| -10 dB to ≥ -15 dB | ±2.3 |
| -15 dB to ≥ -20 dB | ±2.9 |
| -20 dB to ≥ -30 dB | ±3.5 |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.2DC UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH for UL CLTD activation state 1

### 5.2DC.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where:

Measured CDP ratio = 10\*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10\*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and E-DCH.

### 5.2DC.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2DC.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the relative code domain power accuracy specified in table 5.2CB.1 applies at each transmit antenna connector.

Table 5.2DC.1: UE Relative CDP accuracy

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.5 |
| -10 dB to ≥ -15 dB | ±2.0 |
| -15 dB to ≥ -20 dB | ±2.5 |

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3C.

### 5.2DC.3 Test purpose

To verify that the UE relative code domain power accuracy for UL CLTD activation state 1 meets the requirements given in table 5.2DC.8.

### 5.2DC.4 Method of test

#### 5.2DC.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C, clause C.11.1A.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.19 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1A.4 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.2DC.6.

4) Enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2DC.2 Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

| Information Element | Value/Remark |
| --- | --- |
| UL Transport channel information for all transport channels |  |
| - 2bit CTFC | 3 |
| - Power offset Information |  |
| - CHOICE Gain Factors | Signalled Gain Factors |
| - CHOICE mode | FDD |
| - Gain factor ßc | Value used in test: see Table C.11.1A.4 |
| - Gain factor ßd | Value used in test: see Table C.11.1A.4 |
| NOTE: All other 2 bit CTFC values use computed gain factors as in the default message | |

Table 5.2DC.3: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-tests 1,2,4

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 5 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 67 |
| - Reference E-TFCI PO | 18 |
| - Reference E-TFCI | 71 |
| - Reference E-TFCI PO | 23 |
| - Reference E-TFCI | 75 |
| - Reference E-TFCI PO | 26 |
| - Reference E-TFCI | 81 |
| - Reference E-TFCI PO | 27 |

Table 5.2DC.4: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-test 3

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 2 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 92 |
| - Reference E-TFCI PO | 18 |

Table 5.2DC.5 Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |
| - ACK | Value used in test: see Table C.11.1A.4 |
| - NACK | Value used in test: see Table C.11.1A.4 |
| - Ack-Nack repetition factor | 3 (required for continuous HS-DPCCH signal) |
| E-DCH info |  |
| - E-DPCCH/DPCCH power offset | Value used in test: see Table C.11.1A.4 |
| Downlink HS-PDSCH Information |  |
| - Measurement Feedback Info |  |
| - CQI Feedback cycle, k | 4 ms |
| - CQI repetition factor | 2 (required for continuous HS-DPCCH signal) |
| - CQI | Value used in test: see Table C.11.1A.4 |

Table 5.2DC.6: Settings for the serving cell during the measurement of  
UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2B.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.2DC.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1A.4.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1A.4. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

6) Send Absolute Grants in a repeating pattern starting with the value according to Table C.11.1A.4 and alternating between this value and an Absolute Grant Index of Zero\_Grant. This will generate a repeating pattern on the E-DPDCH(s) with a level corresponding to the sending of Scheduling Information every other 10ms E-DCH TTI as shown in Figure 5.2DC.1.



Figure 5.2DC.1: Transmit power profile showing measurement points

7) Measure the relative code domain power of each active code at the measurement points specified in Figure 5.2DC.1 at each transmit antenna connector. Each measurement is made over one timeslot. Measurement point 1 is the last timeslot before TTI1. Measurement point 2 is the first timeslot of TTI1 and measurement point 3 is the first timeslot of TTI2. The 25 us transient periods at the ends of each measured timeslot shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2DC.7. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2DC.8.

8) Repeat steps 1 through 7 for the other combinations of beta values for sub-tests 1, 2, 3, and 4 as given in Table C.11.1A.4.

### 5.2DC.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2DC.7 ≥ -20 dB the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2DC.8.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the relative code domain power accuracy applies at each transmit antenna connector.

Table 5.2DC.7: UE relative code domain power nominal ratios

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sub-Test in Table C.11.1A.4 | Measure-ment Point | Expected Relative Code Domain Power in dB | | | | | | |
| DPCCH | S- DPCCH | DPDCH | HS-DPCCH | E-DPCCH | E-DPDCH1 | E-DPDCH2 |
| 1 | 1 | -12.3 | -12.3 | -6.6 | -3.3 | -7.3 | -18.9 | OFF |
| 2 | -21.5 | -21.5 | -15.8 | -12.5 | -16.5 | -0.5 | OFF |
| 3 | -12.3 | -12.3 | -6.6 | -3.3 | -7.3 | -18.9 | OFF |
| 2 | 1 | -14.9 | -14.9 | -3.9 | -5.8 | -5.8 | -21.4 | OFF |
| 2 | -17 | -17 | -6.0 | -8.0 | -8.0 | -4.1 | OFF |
| 3 | -14.9 | -14.9 | -3.9 | -5.8 | -5.8 | -21.4 | OFF |
| 3 | 1 | -12.8 | -12.8 | -14.2 | -3.7 | -3.7 | -19.3 | OFF |
| 2 | -17.6 | -17.6 | -19.1 | -8.6 | -8.6 | -4.7 | -4.7 |
| 3 | -12.8 | -12.8 | -14.2 | -3.7 | -3.7 | -19.3 | OFF |
| 4 | 1 | -20.9 | -20.9 | -0.4 | -11.9 | -17.9 | -27.5 | OFF |
| 2 | -22.7 | -22.7 | -2.2 | -13.7 | -19.7 | -4.7 | OFF |
| 3 | -20.9 | -20.9 | -0.4 | -11.9 | -17.9 | -27.5 | OFF |

Table 5.2DC.8: UE relative code domain power accuracy test requirements

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.7 |
| -10 dB to ≥ -15 dB | ±2.3 |
| -15 dB to ≥ -20 dB | ±2.9 |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.2DD UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH for UL CLTD activation state 2 and 3

### 5.2DD.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where:

Measured CDP ratio = 10\*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10\*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and E-DCH.

### 5.2DD.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2DD.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

For UE configured in UL CLTD activation state 2 or activation state 3, the relative code domain power accuracy specified in table 5.2CC.1 applies at the active transmit antenna connector.

Table 5.2D.1: UE Relative CDP accuracy

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.5 |
| -10 dB to ≥ -15 dB | ±2.0 |
| -15 dB to ≥ -20 dB | ±2.5 |

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3C.

### 5.2DD.3 Test purpose

To verify that the UE relative code domain power accuracy for UL CLTD activation state 2 and 3 meets the requirements given in table 5.2DD.8.

### 5.2DD.4 Method of test

#### 5.2DD.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C, clause C.11.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.19 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1A.4, each UL physical channel to be at constant power at the start of the measurement and allow the call to be setup with initial UL CLTD activation state as state 2. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.2DD.6.

4) Enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2DD.2 Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

| Information Element | Value/Remark |
| --- | --- |
| UL Transport channel information for all transport channels |  |
| - 2bit CTFC | 3 |
| - Power offset Information |  |
| - CHOICE Gain Factors | Signalled Gain Factors |
| - CHOICE mode | FDD |
| - Gain factor ßc | Value used in test: see Table C.11.1A.4 |
| - Gain factor ßd | Value used in test: see Table C.11.1A.4 |
| NOTE: All other 2 bit CTFC values use computed gain factors as in the default message | |

Table 5.2DD.3: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-tests 1,2,4

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 5 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 67 |
| - Reference E-TFCI PO | 18 |
| - Reference E-TFCI | 71 |
| - Reference E-TFCI PO | 23 |
| - Reference E-TFCI | 75 |
| - Reference E-TFCI PO | 26 |
| - Reference E-TFCI | 81 |
| - Reference E-TFCI PO | 27 |

Table 5.2DD.4: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-test 3

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 2 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 92 |
| - Reference E-TFCI PO | 18 |

Table 5.2DD.5 Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |
| - ACK | Value used in test: see Table C.11.1A.4 |
| - NACK | Value used in test: see Table C.11.1A.4 |
| - Ack-Nack repetition factor | 3 (required for continuous HS-DPCCH signal) |
| E-DCH info |  |
| - E-DPCCH/DPCCH power offset | Value used in test: see Table C.11.1A.4 |
| Downlink HS-PDSCH Information |  |
| - Measurement Feedback Info |  |
| - CQI Feedback cycle, k | 4 ms |
| - CQI repetition factor | 2 (required for continuous HS-DPCCH signal) |
| - CQI | Value used in test: see Table C.11.1A.4 |
| Uplink CLTD info FDD |  |
| - CHOICE Mode | New |
| - Initial CLTD activation state | Second state |

Table 5.2DD.6: Settings for the serving cell during the measurement of  
UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2B.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.2DD.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1A.4.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1A.4. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

6) Send Absolute Grants in a repeating pattern starting with the value according to Table C.11.1A.4 and alternating between this value and an Absolute Grant Index of Zero\_Grant. This will generate a repeating pattern on the E-DPDCH(s) with a level corresponding to the sending of Scheduling Information every other 10ms E-DCH TTI as shown in Figure 5.2DD.1.



Figure 5.2DD.1: Transmit power profile showing measurement points

7) Measure the relative code domain power of each active code at the measurement points specified in Figure 5.2DD.1 at the active transmit antenna connector. Each measurement is made over one timeslot. Measurement point 1 is the last timeslot before TTI1. Measurement point 2 is the first timeslot of TTI1 and measurement point 3 is the first timeslot of TTI2. The 25 us transient periods at the ends of each measured timeslot shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2DD.7. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2DD.8.

8) Repeat steps 1 through 7 for the other combinations of beta values for sub-tests 1, 2, 3, and 4 as given in Table C.11.1A.4.

9) SS sends a HS-SCCH order activating UL\_CLTD activation state 3

10) Repeat step 1 to 8 for activation state 3.

### 5.2DD.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2DD.7 ≥ -20 dB the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2DD.8.

For UE configured in UL CLTD activation state 2 or activation state 3, the relative code domain power accuracy applies at the active transmit antenna connector.

Table 5.2DD.7: UE relative code domain power nominal ratios

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sub-Test in Table C.11.1A.4 | Measure-ment Point | Expected Relative Code Domain Power in dB | | | | | |
| DPCCH | DPDCH | HS-DPCCH | E-DPCCH | E-DPDCH1 | E-DPDCH2 |
| 1 | 1 | -9.3 | -6.6 | -3.3 | -7.3 | -18.9 | OFF |
| 2 | -18.5 | -15.8 | -12.5 | -16.5 | -0.5 | OFF |
| 3 | -9.3 | -6.6 | -3.3 | -7.3 | -18.9 | OFF |
| 2 | 1 | -11.9 | -3.9 | -5.8 | -5.8 | -21.4 | OFF |
| 2 | -14.0 | -6.0 | -8.0 | -8.0 | -4.1 | OFF |
| 3 | -11.9 | -3.9 | -5.8 | -5.8 | -21.4 | OFF |
| 3 | 1 | -9.8 | -14.2 | -3.7 | -3.7 | -19.3 | OFF |
| 2 | -14.6 | -19.1 | -8.6 | -8.6 | -4.7 | -4.7 |
| 3 | -9.8 | -14.2 | -3.7 | -3.7 | -19.3 | OFF |
| 4 | 1 | -17.9 | -0.4 | -11.9 | -17.9 | -27.5 | OFF |
| 2 | -19.7 | -2.2 | -13.7 | -19.7 | -4.7 | OFF |
| 3 | -17.9 | -0.4 | -11.9 | -17.9 | -27.5 | OFF |

Table 5.2DD.8: UE relative code domain power accuracy test requirements

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.7 |
| -10 dB to ≥ -15 dB | ±2.3 |
| -15 dB to ≥ -20 dB | ±2.9 |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.2E UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH with 16QAM

### 5.2E.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. When the UE uses 16QAM modulation on any of the uplink code channels the IQ origin offset power shall be removed from the Measured CDP ratio; however, the removed relative IQ origin offset power (relative carrier leakage power) also has to satisfy the applicable requirement. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where

Measured CDP ratio = 10\*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10\*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements apply for Release 7 and later releases for all types of UTRA for the FDD UE that support E-DCH 16QAM UE capability category 7. This test applies only to UE that support HSDPA and E-DCH.

### 5.2E.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2E.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

Table 5.2E.1: UE Relative CDP accuracy, HS-DPCCH and E-DCH with 16QAM

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.5 |
| -10 dB to ≥ -15 dB | ±2.0 |
| -15 dB to ≥ -20 dB | ±2.5 |
| -20 dB to ≥ -30 dB | ±3.0 |

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3.

### 5.2E.3 Test purpose

To verify that the UE relative code domain power accuracy meets the requirements given in table 5.2E.6.

### 5.2E.4 Method of test

#### 5.2E.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the DL Fixed Reference Channels (FRC H-Set 1,16QAM) are specified in Annex C.11.1 and C.8.1.1. The payload of the transport block for the DL Fixed Reference Channels shall be PRBS data.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.9 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.4 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.2E.4. Uplink SRB for DCCH mapped on E-DCH and downlink SRB for DCCH on DCH. E-DCH is configured with 2ms TTI.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2E.2: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-test 1

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPCCH info |  |
| - E-DPDCH power interpolation | FALSE |
| - E-DPDCH info |  |
| - E-TFCI Table Index | 2 |
| - Reference E-TFCIs | 3 E-TFCIs |
| - Reference E-TFCI | 105 |
| - Reference E-TFCI PO | 12 |
| - Reference E-TFCI | 116 |
| - Reference E-TFCI PO | 14 |
| - Reference E-TFCI | 127 |
| - Reference E-TFCI PO | 16 |
| - Max Channelisation Codes | SF4x2 and SF2x2 |

Table 5.2E.3: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |
| - ACK | Value used in test: see Table C.11.1.4 |
| - NACK | Value used in test: see Table C.11.1.4 |
| - Ack-Nack repetition factor | 3 (required for continuous HS-DPCCH signal) |
| E-DCH info |  |
| - E-DPCCH info |  |
| - E-DPCCH/DPCCH power offset | Value used in test: see Table C.11.1.4 |
| - E-TFC Boost Info |  |
| - E-TFCI boost | Value used in test: see Table C.11.1.4 |
| - Delta T2TP | 12 dB |
| - UL 16QAM settings |  |
| - BetaEd gain E-AGCH table selection | 0 |
| Downlink HS-PDSCH Information |  |
| - Measurement Feedback Info |  |
| - CQI Feedback cycle, k | 4 ms |
| - CQI repetition factor | 2 (required for continuous HS-DPCCH signal) |
| - CQI | Value used in test: see Table C.11.1.4 |

Table 5.2E.4: Settings for the serving cell during the measurement of UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2E.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.2E.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1.4.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.4. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

6) Send Absolute Grants in a repeating pattern starting with the value according to Table C.11.1.4 and alternating between this value and an Absolute Grant Index of Zero\_Grant. This will generate a repeating pattern on the E-DPDCH(s) with a level corresponding to the sending of Scheduling Information every other 2ms E-DCH TTI as shown in Figure 5.2E.1.



Figure 5.2E.1: Transmit power profile showing measurement points

7) Measure the relative code domain power of each active code at the measurement points specified in Figure 5.2E.1. Each measurement is made over one timeslot. Measurement point 1 is the last timeslot before TTI1. Measurement point 2 is the first timeslot of TTI1 and measurement point 3 is the first timeslot of TTI2. The 25 us transient periods at the ends of each measured timeslot shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2E.5. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2E.6.

### 5.2E.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2E.5 ≥ -30 dB the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2E.6.

Table 5.2E.5: UE relative code domain power nominal ratios

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sub-Test in Table C.11.1.4 | Meas Point | Expected Relative Code Domain Power in dB | | | | | |
| DPCCH | HS-DPCCH | E-DPCCH | E-DPDCH 1 | E-DPDCH 2 | E-DPDCH  3,4 |
| 1 | 1 | -9.6 | -3.6 | -3.6 | -19.1 | OFF | OFF |
| 2 | -13.4 | -7.4 | -7.4 | -7.4 | -7.4 | -9.4 |
| 3 | -9.6 | -3.6 | -3.6 | -19.1 | OFF | OFF |

Table 5.2E.6: UE relative code domain power accuracy test requirements,  
HSDPA and E-DCH with 16QAM

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.7 |
| -10 dB to ≥ -15 dB | ±2.3 |
| -15 dB to ≥ -20 dB | ±2.9 |
| -20 dB to ≥ -30 dB | [±3.5] |

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 2: For the measurement points in which UE uses 16QAM modulation the correction factor in the measurements shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

## 5.2EA UE Relative Code Domain Power Accuracy for DC-HSUPA with 16QAM

### 5.2EA.1 Definition and applicability

The requirement and corresponding measurements apply to each individual carrier when the total power in each of the assigned carriers is equal to each other.

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers in a carrier relative to the total power of all active codes in that carrier. When the UE uses 16QAM modulation on any of the uplink code channels in a carrier the IQ origin offset power measured in that carrier shall be removed from the Measured CDP ratio in that carrier; however, the removed relative IQ origin offset power (relative carrier leakage power) measured in that carrier also has to satisfy the applicable requirement in that carrier. The measure of accuracy is the difference between two dB ratios measured per carrier configured on the uplink:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where

Measured CDP ratio = 10\*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10\*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes in each carrier and is derived from beta factors. The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal in each carrier and of noise in the signal that falls on inactive codes.

The reference measurement channels for the requirements in this subclause are provided in subclause C.2.7 with additional parameters as specified in Table C.11A.1.2.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support Dual Cell E-DCH 16QAM UE capability category 9.

### 5.2EA.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2EA.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

Table 5.2EA.1: UE Relative CDP accuracy, HS-DPCCH and E-DCH with 16QAM

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.5 |
| -10 dB to ≥ -15 dB | ±2.0 |
| -15 dB to ≥ -20 dB | ±2.5 |
| -20 dB to ≥ -30 dB | ±3.0 |

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3A.

### 5.2EA.3 Test purpose

To verify that the UE relative code domain power accuracy meets the requirements given in table 5.2EA.4.

### 5.2EA.4 Method of test

#### 5.2EA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.7 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14 with the exceptions in the RADIO BEARER SETUP message as specified in Table 5.2EA.2. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.2EA.3.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2EA.2: Contents of RADIO BEARER SETUP message: AM or UM (DC-HSUPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |

Table 5.2EA.3: Settings for the serving cell during the measurement of  
UE Relative Code Domain Power Accuracy for DC-HSUPA with 16QAM

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2BA.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

#### 5.2EA.4.2 Procedure

1) Set the Absolute Grant according to Table C.11A.1.2.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands to each individual carrier from the SS to set the total power in each of the assigned carriers to be equal to each other within 1.7 dB and the total output power of the UE to be in the range 15dBm 2dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11A.1.2. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0. This test step is expected to keep the total power in each of the assigned carriers to be equal to each other within 1.7 dB and the total output power of the UE to be in the range 15dBm 2dB during the relative code domain power measurements performed at next step.

6) Measure the relative code domain power of each active code on each uplink frequency. Each measurement is made over one timeslot.

### 5.2EA.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2EA.4 the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2EA.5.

Table 5.2EA.4: UE relative code domain power nominal ratios

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Expected Relative Code Domain Power in dB | | | | | | | | |
| Primary Uplink Frequency | | | | | Secondary Uplink Frequency | | | |
| DPCCH | HS-DPCCH | E-DPCCH | E-DPDCH codes 1 and 2 (2xSF2) | E-DPDCH codes 3 and 4 (2xSF4) | DPCCH | E-DPCCH | E-DPDCH codes 1 and 2 (2xSF2) | E-DPDCH codes 3 and 4 (2xSF4) |
| -24.0 | -21.9 | -15.9 | -4.9 | -7.9 | -23.9 | -15.9 | -4.9 | -7.9 |

Table 5.2EA.5: UE relative code domain power accuracy test requirements,  
HSDPA and E-DCH with 16QAM

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.7 |
| -10 dB to ≥ -15 dB | ±2.3 |
| -15 dB to ≥ -20 dB | ±2.9 |
| -20 dB to ≥ -30 dB | ±3.5 |

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 2: For the measurement points in which UE uses 16QAM modulation the correction factor in the measurements shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

## 5.2EB UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH with 16QAM for OLTD

### 5.2EB.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. When the UE uses 16QAM modulation on any of the uplink code channels the IQ origin offset power shall be removed from the Measured CDP ratio; however, the removed relative IQ origin offset power (relative carrier leakage power) also has to satisfy the applicable requirement. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where

Measured CDP ratio = 10\*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10\*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements apply for Release 11 and later releases for all types of UTRA for the FDD UE that support E-DCH 16QAM UE capability category 7 and UL OLTD.

### 5.2EB.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2EB.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

For UE with two active transmit antenna connectors in UL OLTD activation state 1, the relative code domain power accuracy specified in table 5.2CB.1 applies at each transmit antenna connector.

Table 5.2EB.1: UE Relative CDP accuracy, HS-DPCCH and E-DCH with 16QAM

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.5 |
| -10 dB to ≥ -15 dB | ±2.0 |
| -15 dB to ≥ -20 dB | ±2.5 |
| -20 dB to ≥ -30 dB | ±3.0 |

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3B.

### 5.2EB.3 Test purpose

To verify that the UE relative code domain power accuracy for UL OLTD activation state 1 meets the requirements given in table 5.2EB.6.

### 5.2EB.4 Method of test

#### 5.2EB.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the DL Fixed Reference Channels (FRC H-Set 1,16QAM) are specified in Annex C, clauses C.11.1A and C.8.1.1. The payload of the transport block for the DL Fixed Reference Channels shall be PRBS data.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.20 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1A.5 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to E.5A.1. Settings for the serving cell are defined in table 5.2E.4. Uplink SRB for DCCH mapped on E-DCH and downlink SRB for DCCH on DCH. E-DCH is configured with 2ms TTI.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2EB.2: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-test 1

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPCCH info |  |
| - E-DPDCH power interpolation | FALSE |
| - E-DPDCH info |  |
| - E-TFCI Table Index | 2 |
| - Reference E-TFCIs | 3 E-TFCIs |
| - Reference E-TFCI | 105 |
| - Reference E-TFCI PO | 12 |
| - Reference E-TFCI | 116 |
| - Reference E-TFCI PO | 14 |
| - Reference E-TFCI | 127 |
| - Reference E-TFCI PO | 16 |
| - Max Channelisation Codes | SF4x2 and SF2x2 |

Table 5.2EB.3: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |
| - ACK | Value used in test: see Table C.11.2.5 |
| - NACK | Value used in test: see Table C.11.2.5 |
| - Ack-Nack repetition factor | 3 (required for continuous HS-DPCCH signal) |
| E-DCH info |  |
| - E-DPCCH info |  |
| - E-DPCCH/DPCCH power offset | Value used in test: see Table C.11.2.5 |
| - E-TFC Boost Info |  |
| - E-TFCI boost | Value used in test: see Table C.11.2.5 |
| - Delta T2TP | 12 dB |
| - UL 16QAM settings |  |
| - BetaEd gain E-AGCH table selection | 0 |
| Downlink HS-PDSCH Information |  |
| - Measurement Feedback Info |  |
| - CQI Feedback cycle, k | 4 ms |
| - CQI repetition factor | 2 (required for continuous HS-DPCCH signal) |
| - CQI | Value used in test: see Table C.11.2.5 |

Table 5.2EB.4: Settings for the serving cell during the measurement of UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2E.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.2EB.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.2.5.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.2.5. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

6) Send Absolute Grants in a repeating pattern starting with the value according to Table C.11.2.5 and alternating between this value and an Absolute Grant Index of Zero\_Grant. This will generate a repeating pattern on the E-DPDCH(s) with a level corresponding to the sending of Scheduling Information every other 2ms E-DCH TTI as shown in Figure 5.2EB.1.



Figure 5.2EB.1: Transmit power profile showing measurement points

7) Measure the relative code domain power of each active code at the measurement points specified in Figure 5.2EB.1 at each transmit antenna connector. Each measurement is made over one timeslot. Measurement point 1 is the last timeslot before TTI1. Measurement point 2 is the first timeslot of TTI1 and measurement point 3 is the first timeslot of TTI2. The 25 us transient periods at the ends of each measured timeslot shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2EB.5. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2EB.6.

### 5.2EB.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2EB.5 ≥ -30 dB the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2EB.6.

For UE with two active transmit antenna connectors in UL OLTD, the relative code domain power accuracy applies at each transmit antenna connector.

Table 5.2EB.5: UE relative code domain power nominal ratios

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sub-Test in Table C.11.1A.5 | Meas Point | Expected Relative Code Domain Power in dB | | | | | |
| DPCCH | HS-DPCCH | E-DPCCH | E-DPDCH 1 | E-DPDCH 2 | E-DPDCH  3,4 |
| 1 | 1 | -9.6 | -3.6 | -3.6 | -19.1 | OFF | OFF |
| 2 | -13.4 | -7.4 | -7.4 | -7.4 | -7.4 | -9.4 |
| 3 | -9.6 | -3.6 | -3.6 | -19.1 | OFF | OFF |

Table 5.2EB.6: UE relative code domain power accuracy test requirements,  
HSDPA and E-DCH with 16QAM

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.7 |
| -10 dB to ≥ -15 dB | ±2.3 |
| -15 dB to ≥ -20 dB | ±2.9 |
| -20 dB to ≥ -30 dB | ±3.5 |

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 2: For the measurement points in which UE uses 16QAM modulation the correction factor in the measurements shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

## 5.2EC UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH with 16QAM for UL CLTD activation state 1

Editor’s note: This clause is incomplete. The following aspects are either missing or not yet determined:

- CM distribution for CLTD Mode 1 is incomplete.

### 5.2EC.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. When the UE uses 16QAM modulation on any of the uplink code channels the IQ origin offset power shall be removed from the Measured CDP ratio; however, the removed relative IQ origin offset power (relative carrier leakage power) also has to satisfy the applicable requirement. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where

Measured CDP ratio = 10\*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10\*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements apply for Release 11 and later releases for all types of UTRA for the FDD UE that support E-DCH 16QAM UE capability category 7 and UL CLTD.

### 5.2EC.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2EC.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the relative code domain power accuracy specified in table 5.2CB.1 applies at each transmit antenna connector.

Table 5.2EC.1: UE Relative CDP accuracy, HS-DPCCH and E-DCH with 16QAM

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.5 |
| -10 dB to ≥ -15 dB | ±2.0 |
| -15 dB to ≥ -20 dB | ±2.5 |
| -20 dB to ≥ -30 dB | ±3.0 |

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3C.

### 5.2EC.3 Test purpose

To verify that the UE relative code domain power accuracy for UL CLTD activation state 1 meets the requirements given in table 5.2EC.6.

### 5.2EC.4 Method of test

#### 5.2EC.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the DL Fixed Reference Channels (FRC H-Set 1,16QAM) are specified in Annex C, clauses C.11.1A and C.8.1.1. The payload of the transport block for the DL Fixed Reference Channels shall be PRBS data.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.19 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1A.5 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to E.5A.1. Settings for the serving cell are defined in table 5.2EC.4. Uplink SRB for DCCH mapped on E-DCH and downlink SRB for DCCH on DCH. E-DCH is configured with 2ms TTI.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2EC.2: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-test 1

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPCCH info |  |
| - E-DPDCH power interpolation | FALSE |
| - E-DPDCH info |  |
| - E-TFCI Table Index | 2 |
| - Reference E-TFCIs | 3 E-TFCIs |
| - Reference E-TFCI | 105 |
| - Reference E-TFCI PO | 12 |
| - Reference E-TFCI | 116 |
| - Reference E-TFCI PO | 14 |
| - Reference E-TFCI | 127 |
| - Reference E-TFCI PO | 16 |
| - Max Channelisation Codes | SF4x2 and SF2x2 |

Table 5.2EC.3: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |
| - ACK | Value used in test: see Table C.11.1A.5 |
| - NACK | Value used in test: see Table C.11.1A.5 |
| - Ack-Nack repetition factor | 3 (required for continuous HS-DPCCH signal) |
| E-DCH info |  |
| - E-DPCCH info |  |
| - E-DPCCH/DPCCH power offset | Value used in test: see Table C.11.1A.5 |
| - E-TFC Boost Info |  |
| - E-TFCI boost | Value used in test: see Table C.11.1A.5 |
| - Delta T2TP | 12 dB |
| - UL 16QAM settings |  |
| - BetaEd gain E-AGCH table selection | 0 |
| Downlink HS-PDSCH Information |  |
| - Measurement Feedback Info |  |
| - CQI Feedback cycle, k | 4 ms |
| - CQI repetition factor | 2 (required for continuous HS-DPCCH signal) |
| - CQI | Value used in test: see Table C.11.1A.5 |

Table 5.2EC.4: Settings for the serving cell during the measurement of UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2E.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.2EC.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1A.5.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1A.5. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

6) Send Absolute Grants in a repeating pattern starting with the value according to Table C.11.1A.5 and alternating between this value and an Absolute Grant Index of Zero\_Grant. This will generate a repeating pattern on the E-DPDCH(s) with a level corresponding to the sending of Scheduling Information every other 2ms E-DCH TTI as shown in Figure 5.2EC.1.



Figure 5.2EC.1: Transmit power profile showing measurement points

7) Measure the relative code domain power of each active code at the measurement points specified in Figure 5.2EC.1 at each transmit antenna connector. Each measurement is made over one timeslot. Measurement point 1 is the last timeslot before TTI1. Measurement point 2 is the first timeslot of TTI1 and measurement point 3 is the first timeslot of TTI2. The 25 us transient periods at the ends of each measured timeslot shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2EC.5. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2EC.6.

### 5.2EC.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2EC.5 ≥ -30 dB the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2EC.6.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the relative code domain power accuracy applies at each transmit antenna connector.

Table 5.2EC.5: UE relative code domain power nominal ratios

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sub-Test in Table C.11.1A.5 | Meas Point | Expected Relative Code Domain Power in dB | | | | | | |
| DPCCH | S- DPCCH | HS-DPCCH | E-DPCCH | E-DPDCH 1 | E-DPDCH 2 | E-DPDCH  3,4 |
| 1 | 1 | -12.6 | -12.6 | -3.6 | -3.6 | -19.1 | OFF | OFF |
| 2 | -16.4 | -16.4 | -7.4 | -7.4 | -7.4 | -7.4 | -9.4 |
| 3 | -12.6 | -12.6 | -3.6 | -3.6 | -19.1 | OFF | OFF |

Table 5.2EC.6: UE relative code domain power accuracy test requirements,  
HSDPA and E-DCH with 16QAM

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.7 |
| -10 dB to ≥ -15 dB | ±2.3 |
| -15 dB to ≥ -20 dB | ±2.9 |
| -20 dB to ≥ -30 dB | ±3.5 |

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 2: For the measurement points in which UE uses 16QAM modulation the correction factor in the measurements shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

## 5.2ED UE Relative Code Domain Power Accuracy for HS-DPCCH and E-DCH with 16QAM for UL CLTD activation state 2 and 3

### 5.2ED.1 Definition and applicability

The UE Relative code domain power accuracy is a measure of the ability of the UE to correctly set the level of individual code powers relative to the total power of all active codes. When the UE uses 16QAM modulation on any of the uplink code channels the IQ origin offset power shall be removed from the Measured CDP ratio; however, the removed relative IQ origin offset power (relative carrier leakage power) also has to satisfy the applicable requirement. The measure of accuracy is the difference between two dB ratios:

UE Relative CDP accuracy = (Measured CDP ratio) - (Nominal CDP ratio)

where

Measured CDP ratio = 10\*log((Measured code power) / (Measured total power of all active codes))

Nominal CDP ratio = 10\*log((Nominal CDP) / (Sum of all nominal CDPs))

The nominal CDP of a code is relative to the total of all codes and is derived from beta factors.

When the UE uses 16QAM modulation a correction factor shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

The sum of all nominal CDPs will equal 1 by definition.

NOTE: The above definition of UE relative CDP accuracy is independent of variations in the actual total power of the signal and of noise in the signal that falls on inactive codes.

The requirements apply for Release 11 and later releases for all types of UTRA for the FDD UE that support E-DCH 16QAM UE capability category 7 and UL CLTD.

### 5.2ED.2 Minimum Requirements

The required accuracy of the UE relative CDP is given in table 5.2ED.1. The UE relative CDP accuracy shall be maintained over the period during which the total of all active code powers remains unchanged or one timeslot, whichever is the longer.

For UE configured in UL CLTD activation state 2 or activation state 3, the relative code domain power accuracy specified in table 5.2ED.1 applies at the active transmit antenna connector.

Table 5.2ED.1: UE Relative CDP accuracy, HS-DPCCH and E-DCH with 16QAM

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.5 |
| -10 dB to ≥ -15 dB | ±2.0 |
| -15 dB to ≥ -20 dB | ±2.5 |
| -20 dB to ≥ -30 dB | ±3.0 |

The normative reference for this requirement is TS 25.101 [1] clause 6.2.3C.

### 5.2ED.3 Test purpose

To verify that the UE relative code domain power accuracy for UL CLTD activation state 2 and 3 meets the requirements given in table 5.2ED.6.

### 5.2ED.4 Method of test

#### 5.2ED.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the DL Fixed Reference Channels (FRC H-Set 1,16QAM) are specified in Annex C.11.1 and C.8.1.1. The payload of the transport block for the DL Fixed Reference Channels shall be PRBS data.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.19 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.4 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.2ED.4. Uplink SRB for DCCH mapped on E-DCH and downlink SRB for DCCH on DCH. E-DCH is configured with 2ms TTI.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH, and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.2ED.2: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-test 1

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPCCH info |  |
| - E-DPDCH power interpolation | FALSE |
| - E-DPDCH info |  |
| - E-TFCI Table Index | 2 |
| - Reference E-TFCIs | 3 E-TFCIs |
| - Reference E-TFCI | 105 |
| - Reference E-TFCI PO | 12 |
| - Reference E-TFCI | 116 |
| - Reference E-TFCI PO | 14 |
| - Reference E-TFCI | 127 |
| - Reference E-TFCI PO | 16 |
| - Max Channelisation Codes | SF4x2 and SF2x2 |

Table 5.2ED.3: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |
| - ACK | Value used in test: see Table C.11.1.4 |
| - NACK | Value used in test: see Table C.11.1.4 |
| - Ack-Nack repetition factor | 3 (required for continuous HS-DPCCH signal) |
| E-DCH info |  |
| - E-DPCCH info |  |
| - E-DPCCH/DPCCH power offset | Value used in test: see Table C.11.1.4 |
| - E-TFC Boost Info |  |
| - E-TFCI boost | Value used in test: see Table C.11.1.4 |
| - Delta T2TP | 12 dB |
| - UL 16QAM settings |  |
| - BetaEd gain E-AGCH table selection | 0 |
| Downlink HS-PDSCH Information |  |
| - Measurement Feedback Info |  |
| - CQI Feedback cycle, k | 4 ms |
| - CQI repetition factor | 2 (required for continuous HS-DPCCH signal) |
| - CQI | Value used in test: see Table C.11.1.4 |

Table 5.2ED.4: Settings for the serving cell during the measurement of UE Relative Code Domain Power Accuracy with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2E.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

Table 5.2ED.4A: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink CLTD info FDD |  | Rel-11 |
| - CHOICE *Mode* | New |  |
| - S-DPCCH Info |  |  |
| - S-DPCCH/DPCCH power offset | 0 |  |
| - Initial CLTD activation state | Second state |  |

#### 5.2ED.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1.4.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.4. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

6) Send Absolute Grants in a repeating pattern starting with the value according to Table C.11.1.4 and alternating between this value and an Absolute Grant Index of Zero\_Grant. This will generate a repeating pattern on the E-DPDCH(s) with a level corresponding to the sending of Scheduling Information every other 2ms E-DCH TTI as shown in Figure 5.2ED.1.



Figure 5.2ED.1: Transmit power profile showing measurement points

7) Measure the relative code domain power of each active code at the measurement points specified in Figure 5.2ED.1 at the active transmit antenna connector. Each measurement is made over one timeslot. Measurement point 1 is the last timeslot before TTI1. Measurement point 2 is the first timeslot of TTI1 and measurement point 3 is the first timeslot of TTI2. The 25 us transient periods at the ends of each measured timeslot shall not be included. The nominal UE relative code domain power for each active code at each point is defined in table 5.2ED.5. The required accuracy which is the difference between the expected and measured code domain power shall meet the test requirements given in table 5.2ED.6.

8) SS sends a HS-SCCH order activating UL\_CLTD activation state 3

9) Repeat step 1 to 7 for activation state 3.

### 5.2ED.5 Test requirements

For all UE relative code domain power nominal ratios given in table 5.2ED.5 ≥ -30 dB the UE shall meet the UE relative code domain power accuracy test requirements given in Table 5.2ED.6.

For UE configured in UL CLTD activation state 2 or activation state 3, the relative code domain power accuracy applies at the active transmit antenna connector.

Table 5.2ED.5: UE relative code domain power nominal ratios

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sub-Test in Table C.11.1.4 | Meas Point | Expected Relative Code Domain Power in dB | | | | | |
| DPCCH | HS-DPCCH | E-DPCCH | E-DPDCH 1 | E-DPDCH 2 | E-DPDCH  3,4 |
| 1 | 1 | -9.6 | -3.6 | -3.6 | -19.1 | OFF | OFF |
| 2 | -13.4 | -7.4 | -7.4 | -7.4 | -7.4 | -9.4 |
| 3 | -9.6 | -3.6 | -3.6 | -19.1 | OFF | OFF |

Table 5.2ED.6: UE relative code domain power accuracy test requirements,  
HSDPA and E-DCH with 16QAM

|  |  |
| --- | --- |
| Nominal CDP ratio | Accuracy (dB) |
| ≥ -10 dB | ±1.7 |
| -10 dB to ≥ -15 dB | ±2.3 |
| -15 dB to ≥ -20 dB | ±2.9 |
| -20 dB to ≥ -30 dB | [±3.5] |

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 2: For the measurement points in which UE uses 16QAM modulation the correction factor in the measurements shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

## 5.3 Frequency Error

### 5.3.1 Definition and applicability

The frequency error is the difference between the RF modulated carrier frequency transmitted from the UE and the assigned frequency. The UE transmitter tracks to the RF carrier frequency received from the Node B. These signals will have an apparent error due to Node B frequency error and Doppler shift. In the later case, signals from the Node B must be averaged over sufficient time that errors due to noise or interference are allowed for within the minimum requirements specified in 5.3.2.

The UE shall use the same frequency source for both RF frequency generation and the chip clock.

The requirements and this test apply to all types of UTRA for the FDD UE.

### 5.3.2 Minimum Requirements

The UE modulated carrier frequency shall be accurate to within ±0,1 ppm observed over a period of one timeslot compared to the carrier frequency received from the Node B.

The normative reference for this requirement is TS 25.101 [1] clause 6.3.

### 5.3.3 Test purpose

To verify that the UE carrier frequency error does not exceed ±0,1 ppm. This requirement is tested with the UE receiver at the reference sensitivity.

An excess error of the carrier frequency increases the transmission errors in the up link own channel.

This test verifies the ability of the receiver to derive correct frequency information for the transmitter, when locked to the DL carrier frequency.

### 5.3.4 Method of test

#### 5.3.4.1 Initial conditions

Test environment for UE without vibration sensitive components: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Test environment for other UE: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.

NOTE: "UE without vibration sensitive components" is declared in table A.12 of [32].

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2, and RF parameters (DPCH\_Ec and Îor) are set up according to table 6.2.2. The relative power level of other downlink physical channels to the DPCH\_Ec are set up according to clause E.3.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

#### 5.3.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE reaches its maximum output power.

2) Measure the frequency error delta f, using the Global In-Channel-Tx-test (annex B).

### 5.3.5 Test Requirements

For all measurements, the frequency error, derived in step 2), shall not exceed ±(0,1 ppm + 10 Hz).

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.3A Frequency Error for DC-HSUPA

### 5.3A.1 Definition and applicability

The frequency error for DC-HSUPA is the difference, for each carrier, between the RF modulated carrier frequency transmitted from the UE and the assigned frequency. The UE transmitter tracks to the RF carrier frequencies received from the Node B. These signals will have an apparent error due to Node B frequency error and Doppler shift. In the later case, signals from the Node B must be averaged over sufficient time that errors due to noise or interference are allowed for within the minimum requirements specified in clause 5.3A.2.

The UE shall use the same frequency source for both RF frequency generation and the chip clock.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

### 5.3A.2 Minimum Requirements

The UE modulated carrier frequency per carrier shall be accurate to within ±0,1 ppm observed over a period of one timeslot compared to the carrier frequencies received from the Node B. If the signal from one Node B cell is out-of-sync, the UE modulated carrier frequency shall be compared to the remaining carrier frequency received from the other Node B cell.

The normative reference for this requirement is TS 25.101 [1] clause 6.3A.

### 5.3A.3 Test purpose

To verify that the UE carrier frequency error, on each carrier, does not exceed ±0,1 ppm. This requirement is tested with the UE receiver at the reference sensitivity.

An excess error of the carrier frequency increases the transmission errors in the up link own channel.

This test verifies the ability of the receiver to derive correct frequency information for the transmitter, when locked to the DL carrier frequencies.

### 5.3A.4 Method of test

#### 5.3A.4.1 Initial conditions

Test environment for UE without vibration sensitive components: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Test environment for other UE: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.

NOTE: "UE without vibration sensitive components" is declared in table A.12 of [32].

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.6 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) A call is set up according to the Generic call setup procedure specified in TS34.108 [3] sub clause 7.3.14, and RF parameters (HS-PDSCH\_Ec and Îor) are set up according to table 6.2A.1. The other RF parameters are set up according to table E.5A.1A.

4) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

#### 5.3A.4.2 Procedure

1) Set the UE to maximum output power according to 5.2BA.4.2 steps 1 to 4 with the exception that only configuration #3 from table 5.2BA.5A is applied..

2) Measure the frequency error delta f on each of the two assigned channel frequencies, using the Global In-Channel-Tx-test (annex B).

### 5.3A.5 Test Requirements

For all measurements, the frequency error, derived in step 2), shall not exceed ±(0,1 ppm + 10 Hz).

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.3B Frequency Error for OLTD

### 5.3B.1 Definition and applicability

The frequency error for OLTD is the difference, between the RF modulated carrier frequency transmitted at each antenna connector from the UE and the assigned frequency. The UE transmitter tracks to the RF carrier frequency received from the Node B. These signals will have an apparent error due to Node B frequency error and Doppler shift. In the later case, signals from the Node B must be averaged over sufficient time that errors due to noise or interference are allowed for within the minimum requirements specified in 5.3B.2.

The UE shall use the same frequency source for both RF frequency generation and the chip clock.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that support OLTD.

### 5.3B.2 Minimum Requirements

The UE modulated carrier frequency at each antenna connector shall be accurate to within ±0,1 ppm observed over a period of one timeslot compared to the carrier frequency received from the Node B.

The normative reference for this requirement is TS 25.101 [1] clause 6.3B.

### 5.3B.3 Test purpose

To verify that the UE carrier frequency error at each antenna connector does not exceed ±0,1 ppm. This requirement is tested with the UE receiver at the reference sensitivity.

An excess error of the carrier frequency increases the transmission errors in the up link own channel.

This test verifies the ability of the receiver to derive correct frequency information for the transmitter, when locked to the DL carrier frequency.

### 5.3B.4 Method of test

#### 5.3B.4.1 Initial conditions

Test environment for UE without vibration sensitive components: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Test environment for other UE: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.

NOTE: "UE without vibration sensitive components" is declared in table A.12 of [32].

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and parameters are specified in Annex C, clause C.10.2. The DL Fixed Reference Channels (FRC H-Set 1, QPSK) is specified in Annex C.8.1.1.

3) An HSDPA call with OLTD is set up according to TS 34.108 [3] 7.3.18. RF parameters are set up according to tables E.5.1 and E.5.10. Settings for the serving cell are defined in table 5.3B.1.

4) SS sends a HS-SCCH order activating OLTD.

5) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

Table 5.3B.1: Settings for the serving cell

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.3B.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

#### 5.3B.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE reaches its maximum output power.

2) Measure the frequency error delta f at each antenna connector, using the Global In-Channel-Tx-test (annex B).

### 5.3B.5 Test Requirements

For all measurements, the frequency error at each antenna connector, derived in step 2), shall not exceed ±(0,1 ppm + 10 Hz).

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.3C Frequency Error for UL CLTD Activation state 1

### 5.3C.1 Definition and applicability

The frequency error for UL CLTD is the difference, between the RF modulated carrier frequency transmitted at each antenna connector from the UE and the assigned frequency. The UE transmitter tracks to the RF carrier frequency received from the Node B. These signals will have an apparent error due to Node B frequency error and Doppler shift. In the later case, signals from the Node B must be averaged over sufficient time that errors due to noise or interference are allowed for within the minimum requirements specified in 5.3C.2.

The UE shall use the same frequency source for both RF frequency generation and the chip clock.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that support UL CLTD.

### 5.3C.2 Minimum Requirements

The UE modulated carrier frequency at each antenna connector shall be accurate to within ±0,1 ppm observed over a period of one timeslot compared to the carrier frequency received from the Node B.

The normative reference for this requirement is TS 25.101 [1] clause 6.3C.

### 5.3C.3 Test purpose

To verify that the UE carrier frequency error at each antenna connector does not exceed ±0,1 ppm. This requirement is tested with the UE receiver at the reference sensitivity.

An excess error of the carrier frequency increases the transmission errors in the up link own channel.

This test verifies the ability of the receiver to derive correct frequency information for the transmitter, when locked to the DL carrier frequency.

### 5.3C.4 Method of test

#### 5.3C.4.1 Initial conditions

Test environment for UE without vibration sensitive components: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Test environment for other UE: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.

NOTE: "UE without vibration sensitive components" is declared in table A.12 of [32].

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and parameters are specified in Annex C, clause C.10.2. The DL Fixed Reference Channels (FRC H-Set 1, QPSK) is specified in Annex C.8.1.1.

3) An HSDPA call with CLTD is set up according to TS 34.108 [3] 7.3.17. RF parameters are set up according to table s E.5.1and E.5.10. Settings for the serving cell are defined in table 5.3C.1.

4) SS sends a HS-SCCH order activating UL\_CLTD activation state 1.

5) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

Table 5.3C.1: Settings for the serving cell

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.3C.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

#### 5.3C.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE reaches its maximum output power.

2) Measure the frequency error delta f at each antenna connector, using the Global In-Channel-Tx-test (annex B).

### 5.3C.5 Test Requirements

For all measurements, the frequency error at each antenna connector, derived in step 2), shall not exceed ±(0,1 ppm + 10 Hz).

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.3D Frequency Error for UL CLTD Activation state 2 and 3

### 5.3D.1 Definition and applicability

The frequency error for UL CLTD is the difference, between the RF modulated carrier frequency transmitted at each antenna connector from the UE and the assigned frequency. The UE transmitter tracks to the RF carrier frequency received from the Node B. These signals will have an apparent error due to Node B frequency error and Doppler shift. In the later case, signals from the Node B must be averaged over sufficient time that errors due to noise or interference are allowed for within the minimum requirements specified in 5.3D.2.

The UE shall use the same frequency source for both RF frequency generation and the chip clock.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that support UL CLTD.

### 5.3D.2 Minimum Requirements

The UE modulated carrier frequency at each antenna connector shall be accurate to within ±0,1 ppm observed over a period of one timeslot compared to the carrier frequency received from the Node B.

The normative reference for this requirement is TS 25.101 [1] clause 6.3C.

### 5.3D.3 Test purpose

To verify that the UE carrier frequency error at each antenna connector does not exceed ±0,1 ppm. This requirement is tested with the UE receiver at the reference sensitivity.

An excess error of the carrier frequency increases the transmission errors in the up link own channel.

This test verifies the ability of the receiver to derive correct frequency information for the transmitter, when locked to the DL carrier frequency.

### 5.3D.4 Method of test

#### 5.3D.4.1 Initial conditions

Test environment for UE without vibration sensitive components: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Test environment for other UE: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.

NOTE: "UE without vibration sensitive components" is declared in table A.12 of [32].

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and parameters are specified in Annex C, clause C.10.2. The DL Fixed Reference Channels (FRC H-Set 1, QPSK) is specified in Annex C.8.1.1.

3) An HSDPA call with CLTD is set up according to TS 34.108 [3] 7.3.17. RF parameters are set up according to tablesE.5.1 and E.5.10. Settings for the serving cell are defined in table 5.3D.1.

4) SS sends a HS-SCCH order activating UL\_CLTD activation state 2.

5) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test for state 2.

Table 5.3D.1: Settings for the serving cell

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.3D.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

#### 5.3D.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE reaches its maximum output power.

2) Measure the frequency error delta f at each antenna connector, using the Global In-Channel-Tx-test (annex B).

3) SS sends a HS-SCCH order activating UL\_CLTD activation state 3.

4) Repeat step 1 to 2 for activation state 3.

### 5.3D.5 Test Requirements

For all measurements, the frequency error at each antenna connector, derived in step 2), shall not exceed ±(0,1 ppm + 10 Hz).

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.4 Output Power Dynamics in the Uplink

Power control is used to limit the interference level.

### 5.4.1 Open Loop Power Control in the Uplink

#### 5.4.1.1 Definition and applicability

Open loop power control in the uplink is the ability of the UE transmitter to set its output power to a specific value. This function is used for PRACH transmission and based on the information from Node B using BCCH and the downlink received signal power level of the CPICH. The information from Node B includes transmission power of CPICH and uplink interference power level.

The requirements and this test apply to all types of UTRA for the FDD UE.

#### 5.4.1.2 Minimum requirements

The UE open loop power is defined as the mean power in a timeslot or ON power duration, whichever is available.

The UE open loop power control tolerance is given in table 5.4.1.1.

Table 5.4.1.1: Open loop power control tolerance

|  |  |
| --- | --- |
| Normal conditions | ±9 dB |
| Extreme conditions | ±12 dB |

The reference for this requirement is TS 25.101 [1] clause 6.4.1.

#### 5.4.1.3 Test purpose

The power measured by the UE of the received signal and the signalled BCCH information are used by the UE to control the power of the UE transmitted signal with the target to transmit at the lowest power acceptable for proper communication.

The test stresses the ability of the receiver to measure the received power correctly over the receiver dynamic range.

The test purpose is to verify that the UE open loop power control tolerance does not exceed the described value shown in table 5.4.1.1.

An excess error of the open loop power control decreases the system capacity.

#### 5.4.1.4 Method of test

5.4.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) Channel conditions are initially set up with received CPICH\_RSCP >-85 dBm. The relative power level of downlink physical channels to Ior are set up according to clause E.2.1. The parameter settings of the cell are set up according to Table 5.4.1.1a.

3) Switch on the phone.

4) After the UE has performed registration and entered idle mode, Îor is set up according to table 5.4.1.2. The relative power level of downlink physical channels to Ior are set up according to clause E.2.1

5) A call is set up according to the Generic call setup procedure in [3] clause 7.3.1 with channel conditions according the test parameters in table 5.4.1.3, The RACH procedure within the call setup is used for the test.

Table 5.4.1.1a: Settings for the serving cell

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | Channel 1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | 21 |
| Preamble Retrans Max |  | 1 |

Table 5.4.1.2: Test parameters for Open Loop Power Control (UE)

|  |  |  |
| --- | --- | --- |
| Parameter | Level / Status | Unit |
| Îor | See table 5.4.1.3 | dBm / 3,84 MHz |

Table 5.4.1.3: Test parameters for Open Loop Power Control (SS)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | RX Upper dynamic end | RX-middle | RX-Sensitivity level |
| Îor (note 3) | | -25,0 dBm / 3,84 MHz | -65,7 dBm / 3,84 MHz | <REFÎor> dBm / 3,84 MHz |
| CPICH\_RSCP (notes 3 and 4) | | -28,9 dBm | -69,6 dBm | <REFÎor> +CPICH\_Ec / Ior |
| Primary CPICH DL TX power | | +19 dBm | +28 dBm | +19 dBm |
| Simulated path loss = Primary CPICH DL TX power - CPICH\_RSCP | | +47.9 dB | +97.6 dB | Band I, IV, VI, X, XIX, XI, XXI: +128.9 dB  Band II, V, VII, XI: +126.9 dB  Band III, VIII, XII, XIII, XIV, XX, XXII: +125.9 dB  Band IX: +127.9 dB  Band XXV, XXVI: +125.4 dB |
| UL interference | Band I, IV, VI, X, XIX, XI, XXI | -75 dBm | -101 dBm | -110 dBm |
| Band II, V, VII | -108 dBm |
| Band III, VIII, XII, XIII, XIV, XX, XXII | -107 dBm |
| Band IX | -109 dBm |
|  | Band XXV, XXVI |  |  | -106.5 dBm |
| Constant Value | | -10 dB | -10 dB | -10 dB |
| Expected nominal UE TX power (note 5) | | -37.1 dBm | -13.4 dBm | +8.9 dBm (note 2) |
| NOTE 1: While the SS transmit power shall cover the receiver input dynamic range, the logical parameters: Primary CPICH DL TX power, UL interference, Constant Value are chosen to achieve a UE TX power, located within the TX output power dynamic range of a class 4 UE.  NOTE 2: Nominal TX output power <9 dBm allows to check the open loop power algorithm within the entire tolerance range (9 dBm ± 12 dB; 9 dBm + 12 dB = 21 dBm = max power class 4).  NOTE 3: <REFÎor> is specified in Table 6.2.2, and CPICH\_Ec / Ior is specified in Table E.2.2. The power level of S-CCPCH should be defined because S-CCPCH is transmitted during Preamble RACH transmission period. The power level of S-CCPCH is set to -5.3 dB relative to Ior.  NOTE 4: The purpose of this parameter is to calculate the Expected nominal UE TX power.  NOTE 5: The Expected nominal UE TX power is calculated by using the equation in the clause 8.5.7 Open Loop Power Control of TS 25.331 [8]. | | | | |

5.4.1.4.2 Procedure

1) Set the TX output level of the SS to obtain Îor at the UE antenna connector. Îor shall be according to table 5.4.1.3 (-25 dBm / 3,84 MHz).

2) Measure the first RACH preamble mean power of the UE.

3) Repeat the above measurement for all SS levels in table 5.4.1.3.

#### 5.4.1.5 Test requirements

The deviation with respect to the Expected nominal UE TX power (table 5.4.1.3), derived in step 2) shall not exceed the prescribed tolerance in table 5.4.1.4.

Table 5.4.1.4: Open loop power control tolerance

|  |  |
| --- | --- |
| Normal conditions | ±10 dB |
| Extreme conditions | ±13 dB |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.4.1A Open Loop Power Control in the Uplink for DC-HSUPA

#### 5.4.1A.1 Definition and applicability

Open loop power control in the uplink for DC-HSUPA is the ability of the UE transmitter to set its output power, for each carrier, to a specific value. This function is used for initial Dual Cell transmission in CELL\_DCH and based on the information from Node B using RADIO BEARER SETUP message and the downlink received signal power level of the CPICH.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

#### 5.4.1A.2 Minimum requirements

The UE open loop power is defined as the mean power in a timeslot or ON power duration, whichever is available.

The UE open loop power control tolerance per carrier is given in table 5.4.1A.1.

Table 5.4.1A.1: Open loop power control tolerance

|  |  |
| --- | --- |
| Normal conditions | ±9 dB |
| Extreme conditions | ±12 dB |

The reference for this requirement is TS 25.101 [1] clause 6.4.1.1A

#### 5.4.1A.3 Test purpose

The power measured by the UE of the received signal and information in RADIO BEARER SETUP message are used by the UE to control the power of the UE transmitted signal with the target to transmit at the lowest power acceptable for proper communication.

The test stresses the ability of the receiver to measure the received power correctly over the receiver dynamic range.

The test purpose is to verify that the UE open loop power control tolerance does not exceed the described value shown in table 5.4.1A.1 during Dual Cell E-DCH.

An excess error of the open loop power control decreases the system capacity.

#### 5.4.1A.4 Method of test

5.4.1A.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range, see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.41.

2) Channel conditions are initially set up with received CPICH\_RSCP >-85 dBm. The relative power level of downlink physical channels to Ior are set up according to clause E.5.0. The parameter settings of the cell are set up according to Table 5.4.1A.1a.

3) Switch on the phone.

4) After the UE has performed registration and entered idle mode, Îor for primary and secondary serving cells are set up according to table 5.4.1A.2.

5) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.14 with channel conditions, for primary and secondary serving cells, according to the test parameters in table 5.4.1A.3 and exception for information elements in RADIO BEARER SETUP message as specified in table 5.4.1A.4. The uplink DPCCH power control preambles related to the call setup is used for the test.

Table 5.4.1A.1a: Settings for the serving cell

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | Channel 1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | 21 |
| Preamble Retrans Max |  | 1 |

Table 5.4.1A.2: Test parameters for Open Loop Power Control (UE)

|  |  |  |
| --- | --- | --- |
| Parameter | Level / Status | Unit |
| Îor | See table 5.4.1A.3 | dBm / 3,84 MHz |

Table 5.4.1A.3: Test parameters for Open Loop Power Control (SS)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | RX Upper dynamic end | RX-middle | RX-Sensitivity level |
| Îor (note 3) | -25,0 dBm / 3,84 MHz | -65,7 dBm / 3,84 MHz | <REFÎor> dBm / 3,84 MHz |
| CPICH\_RSCP (notes 3 and 4) | -28,9 dBm | -69,6 dBm | <REFÎor> +CPICH\_Ec / Ior |
| DPCCH Power offset | -66 dB | -84 dB | Band I, IV, VI, IX, X, XI, XIX, XXI: -108 dB  Band II, III, V, VII, VIII, XII, XIII, XIV, XX, XXII: -106 dB |
| Expected nominal UE TX power (note 5) | -37.1 dBm | -14.4 dBm | Band I, II, IV, V, VI, VII, X, XI, XIX, XXI:+8.7 dBm (note 2)  Band III, VIII, IX, XII, XIII, XIV, XX, XXII: +7.7 dBm |
| NOTE 1: While the SS transmit power shall cover the receiver input dynamic range, the logical parameter DPCCH Power offset is chosen to achieve a UE TX power, located within the TX output power dynamic range of a class 4 UE.  NOTE 2: Nominal TX output power <9 dBm allows to check the open loop power algorithm within the entire tolerance range (9 dBm ± 12 dB; 9 dBm + 12 dB = 21 dBm = max power class 4).  NOTE 3: <REFÎor> is specified in Table 6.2.2, and CPICH\_Ec / Ior is specified in Table E.5.0.  NOTE 4: The purpose of this parameter is to calculate the Expected nominal UE TX power.  NOTE 5: The Expected nominal UE TX power is calculated by using the equation in the clause 8.5.3 Open Loop Power Control of TS 25.331 [8]. | | | |

Table 5.4.1A.4: Contents of RADIO BEARER SETUP message: AM or UM

|  |  |
| --- | --- |
| Uplink radio resources |  |
| - Uplink DPCH info |  |
| - PC Preamble | 1 |
| - SRB Delay | 7 |
| - Uplink secondary Cell info FDD |  |
| - PC Preamble | 1 |

5.4.1A.4.2 Procedure

1) Set the TX output level of the SS to obtain Îor at the UE antenna connector. Îor shall be according to table 5.4.1A.3 (-25 dBm / 3,84 MHz).

2) Measure the Dual Cell transmission mean power from the first slot of uplink DPCCH PC preamble for each carrier.

3) Repeat the above measurement for all SS levels in table 5.4.1A.3.

#### 5.4.1A.5 Test requirements

The deviation at any carrier with respect to the Expected nominal UE TX power (table 5.4.1A.3), derived in step 2) shall not exceed the prescribed tolerance in table 5.4.1A.5.

Table 5.4.1A.5: Open loop power control tolerance per carrier

|  |  |
| --- | --- |
| Normal conditions | ±10 dB |
| Extreme conditions | ±13 dB |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.4.2 Inner Loop Power Control in the Uplink

Editor’s notes: - For a transition period unti RAN5#72, this test case in version 12.3.0 of 34.121-1 shall be used.

#### 5.4.2.1 Definition and applicability

Inner loop power control in the uplink is the ability of the UE transmitter to adjust its output power in accordance with one or more TPC commands received in the downlink.

The power control step is the change in the UE transmitter output power in response to a single TPC command, TPC\_cmd, derived at the UE.

This clause does not cover all the requirements of compressed mode or soft handover.

The requirements and this test apply to all types of UTRA for the FDD UE.

#### 5.4.2.2 Minimum requirements

The UE transmitter shall have the capability of changing the output power with a step size of 1 dB, 2 dB and 3 dB according to the value of TPC or RP-TPC, in the slot immediately after the TPC\_cmd can be derived.

a) The transmitter output power step due to inner loop power control shall be within the range shown in table 5.4.2.1.

b) The transmitter aggregate output power step due to inner loop power control shall be within the range shown in table 5.4.2.2. Here a TPC\_cmd group is a set of TPC\_cmd values derived from a corresponding sequence of TPC commands of the same duration.

The inner loop power step is defined as the relative power difference between the mean power of the original (reference) timeslot and the mean power of the target timeslot, not including the transient duration. The transient duration is from 25 µs before the slot boundary to 25 µs after the slot boundary.

Table 5.4.2.1: Transmitter power control range

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd | Transmitter power control range (all units are in dB) | | | | | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +0,5 | +1,5 | +1 | +3 | +1,5 | +4,5 |
| 0 | -0,5 | +0,5 | -0,5 | +0,5 | -0,5 | +0,5 |
| -1 | -0,5 | -1,5 | -1 | -3 | -1,5 | -4,5 |

Table 5.4.2.1A: Transmitter power control range for exceptions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_ cmd | Transmitter power control range | | | | | |
| 1 dB step size | | 2 dB step size | | 3 dB step size | |
| Lower | Upper | Lower | Upper | Lower | Upper |
| + 1 | -0.5 dB | +2.5 dB | +0.5 dB | +3.5 dB | +1.5 dB | +4.5 dB |
| 0 | -0.5 dB | +0.5 dB | -0.5 dB | +0.5 dB | -0.5 dB | +0.5 dB |
| -1 | 0.5 dB | -2.5 dB | -0.5 dB | -3.5 dB | -1.5 dB | -4.5 dB |

Table 5.4.2.2: Transmitter aggregate power control tolerance

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd group | Transmitter power control range after 10 equal TPC\_cmd group (all units are in dB) | | | | Transmitter power control range after 7 equal TPC\_cmd groups (all units are in dB) | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +8 | +12 | +16 | +24 | +16 | +26 |
| 0 | -1 | +1 | -1 | +1 | -1 | +1 |
| -1 | -8 | -12 | -16 | -24 | -16 | -26 |
| 0,0,0,0,+1 | +6 | +14 | N/A | N/A | N/A | N/A |
| 0,0,0,0,-1 | -6 | -14 | N/A | N/A | N/A | N/A |

The UE shall meet the above requirements with the exceptions defined below for inner loop power control over the power range bounded by the Minimum output power as defined in clause 5.4.3.2, and the Maximum output power supported by the UE (i.e. the actual power as would be measured assuming no measurement error). This power shall be in the range specified for the power class of the UE in clause 5.2.2. For each direction, up to 2 exceptions to the transmitter power control range defined in table 5.4.2.1 shall be allowed. The transmitter power control range for exceptions is defined in table 5.4.2.1A.

NOTE: 3 dB inner loop power control steps are only used in compressed mode.

The reference for this requirement is TS 25.101 [1] clause 6.4.2.1.1.

The requirements for the derivation of TPC\_cmd are detailed in TS 25.214 [5] clauses 5.1.2.2.2 and 5.1.2.2.3.

#### 5.4.2.3 Test purpose

- To verify that the UE inner loop power control size and response is meet to the described value shown in clause 5.4.2.2.

- To verify that TPC\_cmd is correctly derived from received TPC commands.

An excess error of the inner loop power control decreases the system capacity.

The UE shall be tested for the requirements for inner loop power control over the power range bounded by the Min power threshold for test and the Max power threshold for test.

The Min power threshold for test is defined as the Minimum Output Power Test Requirement (clause 5.4.3.5).

The Max power threshold for test is defined as the Measured Maximum output power of the UE in the relevant Step of the test (using the same method as in clause 5.2.4.2 step 2) minus the Test Tolerance specified for test 5.2 Maximum Output Power in table F.2.1.

For the final power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

#### 5.4.2.4 Method of test

5.4.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure specified in TS34.108 [3] sub clause 7.3.2, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Table 5.4.2.4.1: Contents of RADIO BEARER SETUP message: AM or UM

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm 2 |

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.2.4.2 Procedure



Figure 5.4.2.4 Inner Loop Power Control Test Steps

1) Before proceeding with paragraph (2) (Step A) below, set the output power of the UE to be in the range -10 ± 9 dBm. This may be achieved by setting the downlink signal (Îor) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

2) Step A: Transmit a sequence of at least 30 and no more than 60 TPC commands, which shall commence at a frame boundary and last for a whole number of frames, and which shall contain:

- no sets of 5 consecutive "0" or "1" commands which commence in the 1st, 6th or 11th slots of a frame;

- at least one set of 5 consecutive "0" commands which does not commence in the 1st, 6th or 11th slots of a frame;

- at least one set of 5 consecutive "1" commands which does not commence in the 1st, 6th or 11th slots of a frame.

The following is an example of a suitable sequence of TPC commands:

100000101010101111101000001010101011111010000010101010111110

3) Step B: Transmit a sequence of 50 TPC commands with the value 1.

4) Step C: Transmit a sequence of 50 TPC commands with the value 0.

5) Step D: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel in order to set the Power Control Algorithm to algorithm 1, and the TPC step size to 1 dB. Contents of the message is specified in the table 5.4.2.4.2.A. After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold.

6) Step E: Transmit a sequence of 150 (note 1) TPC commands with the value 0.

7) Step F: Transmit a sequence of 150 (note 1) TPC commands with the value 1.

8) Step G: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel in order to set the TPC step size to 2 dB (with the Power Control Algorithm remaining as algorithm 1). Contents of the message is specified in the table 5.4.2.4.2.B. After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold. Transmit a sequence of 75 (note 1) TPC commands with the value 0.

9) Step H: Transmit a sequence of 75 (note 1) TPC commands with the value 1.

10) During steps A to H the mean power of every slot shall be measured, with the following exceptions:

- In steps D and F, measurement of the mean power is not required in slots after the 10th slot after the mean power has exceeded the maximum power threshold;

- In steps E and G, measurement of the mean power is not required in slots after the 10th slot after the mean power has fallen below the minimum power threshold.

The transient periods of 25 µs before each slot boundary and 25 µs after each slot boundary shall not be included in the power measurements.

NOTE 1: These numbers of TPC commands are given as examples. The actual number of TPC commands transmitted in these steps shall be at least 10 more than the number required to ensure that the UE reaches the relevant maximum or minimum power threshold in each step, as shown in figure 5.4.2.4.

NOTE 2: In order to make it more practical to measure the entire power control dynamic range (between min power threshold and max power threshold with suitable margins), it is permissible to segment the power control sequences into smaller subsequence. For example, Step-E can be divided into different stages while still fulfilling the purpose of the test to measure the entire dynamic range.

Table 5.4.2.4.2.A: PHYSICAL CHANNEL RECONFIGURATION message for step D (step 5)

|  |  |  |
| --- | --- | --- |
| Information Element | Value/Remark | Version |
| Message Type |  |  |
| UE Information Elements |  |  |
| -RRC transaction identifier | 0 |  |
| -Integrity check info |  |  |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |  |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |  |
| -Integrity protection mode info | Not Present |  |
| -Ciphering mode info | Not Present |  |
| -Activation time | Not Present |  |
| -New U-RNTI | Not Present |  |
| -New C-RNTI | Not Present |  |
| -RRC State Indicator | CELL\_DCH |  |
| -UTRAN DRX cycle length coefficient | Not Present |  |
| CN Information Elements |  |  |
| -CN Information info | Not Present |  |
| UTRAN mobility information elements |  |  |
| -URA identity | Not Present |  |
| RB information elements |  |  |
| -Downlink counter synchronisation info | Not Present |  |
| PhyCH information elements |  |  |
| -Frequency info | Not Present |  |
| Uplink radio resources |  |  |
| -Maximum allowed UL TX power | Not Present |  |
| -CHOICE channel requirement | Uplink DPCH info |  |
| -Uplink DPCH power control info |  |  |
| -CHOICE mode | FDD |  |
| -DPCCH Power offset | -40 (-80dB) |  |
| -PC Preamble | 1 frame |  |
| -SRB delay | 7 frames |  |
| -Power Control Algorithm | Algorithm 1 |  |
| -TPC step size | 1dB |  |
| -CHOICE mode | FDD |  |
| -Scrambling code type | Long |  |
| -Scrambling code number | 0 |  |
| -Number of DPDCH | 1 |  |
| -spreading factor | 64 |  |
| -TFCI existence | TRUE |  |
| -Number of FBI bits | Not Present(0) |  |
| -Puncturing Limit | 1 |  |
| Downlink radio resources |  |  |
| -CHOICE mode | FDD |  |
| -Downlink PDSCH information | Not Present | R99 and Rel-4 only |
| -Downlink information common for all radio links | Not Present |  |
| -Downlink DPCH info common for all RL | Not Present |  |

Table 5.4.2.4.2.B: PHYSICAL CHANNEL RECONFIGURATION message for step G (step 8)

|  |  |  |
| --- | --- | --- |
| Information Element | Value/Remark | Version |
| Message Type |  |  |
| UE Information Elements |  |  |
| -RRC transaction identifier | 0 |  |
| -Integrity check info |  |  |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |  |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |  |
| -Integrity protection mode info | Not Present |  |
| -Ciphering mode info | Not Present |  |
| -Activation time | Not Present |  |
| -New U-RNTI | Not Present |  |
| -New C-RNTI | Not Present |  |
| -RRC State Indicator | CELL\_DCH |  |
| -UTRAN DRX cycle length coefficient | Not Present |  |
| CN Information Elements |  |  |
| -CN Information info | Not Present |  |
| UTRAN mobility information elements |  |  |
| -URA identity | Not Present |  |
| RB information elements |  |  |
| -Downlink counter synchronisation info | Not Present |  |
| PhyCH information elements |  |  |
| -Frequency info | Not Present |  |
| Uplink radio resources |  |  |
| -Maximum allowed UL TX power | Not Present |  |
| -CHOICE channel requirement | Uplink DPCH info |  |
| -Uplink DPCH power control info |  |  |
| -CHOICE mode | FDD |  |
| -DPCCH Power offset | -40 (-80dB) |  |
| -PC Preamble | 1 frame |  |
| -SRB delay | 7 frames |  |
| -Power Control Algorithm | Algorithm 1 |  |
| -TPC step size | 2dB |  |
| -CHOICE mode | FDD |  |
| -Scrambling code type | Long |  |
| -Scrambling code number | 0 |  |
| -Number of DPDCH | 1 |  |
| -spreading factor | 64 |  |
| -TFCI existence | TRUE |  |
| -Number of FBI bits | Not Present(0) |  |
| -Puncturing Limit | 1 |  |
| Downlink radio resources |  |  |
| -CHOICE mode | FDD |  |
| -Downlink PDSCH information | Not Present | R99 and Rel-4 only |
| -Downlink information common for all radio links | Not Present |  |
| -Downlink DPCH info common for all RL | Not Present |  |

#### 5.4.2.5 Test requirements

Table 5.4.2.5.1: Transmitter power control range

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd | Transmitter power control range (all units are in dB) | | | | | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +0,4 | +1,6 | +0,85 | +3,15 | +1,3 | +4,7 |
| 0 | -0,6 | +0,6 | -0,6 | +0,6 | -0,6 | +0,6 |
| -1 | -0,4 | -1,6 | -0,85 | -3,15 | -1,3 | -4,7 |

Table 5.4.2.5.1A: Transmitter power control range for exceptions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd | Transmitter power control range (all units are in dB) | | | | | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | -0.6 | +2,6 | +0,35 | +3,65 | +1,3 | +4,7 |
| 0 | -0,6 | +0,6 | -0,6 | +0,6 | -0,6 | +0,6 |
| -1 | 0.6 | -2,6 | -0,35 | -3,65 | -1,3 | -4,7 |

Table 5.4.2.5.2: Transmitter aggregate power control tolerance

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd group | Transmitter power control range after 10 equal TPC\_cmd group (all units are in dB) | | | | Transmitter power control range after 7 equal TPC\_cmd groups (all units are in dB) | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +7,7 | +12,3 | +15,7 | +24,3 | +15,7 | +26,3 |
| 0 | -1,1 | +1,1 | -1,1 | +1,1 | -1,1 | +1,1 |
| -1 | -7,7 | -12,3 | -15,7 | -24,3 | -15,7 | -26,3 |
| 0,0,0,0,+1 | +5,7 | +14,3 | N/A | N/A | N/A | N/A |
| 0,0,0,0,-1 | -5,7 | -14,3 | N/A | N/A | N/A | N/A |

a) During Step A, the difference in mean power between adjacent slots shall be within the prescribed range for a TPC\_cmd of 0, as given in table 5.4.2.5.1.

b) During Step A, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of 0, as given in table 5.4.2.5.2.

c) During Step B, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2.5.1, with up to 2 exceptions are allowed as defined in table 5.4.2.5.1A, given that every 5th TPC\_cmd should have the value +1, with a step size of 1 dB, and all other TPC\_cmd should have the value 0.

d) During Step B, the change in mean power over 50 consecutive slots shall be within the prescribed range for a TPC\_cmd group of {0,0,0,0,+1}, as given in table 5.4.2.5.2.

e) During Step C, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2.5.1, with up to 2 exceptions are allowed as defined in table 5.4.2.5.1A, given that every 5th TPC\_cmd should have the value -1, with a step size of 1 dB, and all other TPC\_cmd should have the value 0.

f) During Step C, the change in mean power over 50 consecutive slots shall be within the prescribed range for a TPC\_cmd group of {0,0,0,0,-1}, as given in table 5.4.2.5.2.

g) During Step E, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2.5.1 for a TPC\_cmd of -1 and step size of 1 dB, with up to 2 exceptions are allowed as defined in table 5.4.2.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

h) During Step E, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of -1, and step size of 1 dB as given in table 5.4.2.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

i) During Step F, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2.5.1 for a TPC\_cmd of +1 and step size of 1 dB, with up to 2 exceptions are allowed as defined in table 5.4.2.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

j) During Step F, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of +1, and step size of 1 dB as given in table 5.4.2.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

k) During Step G, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2.5.1 for a TPC\_cmd of -1 and step size of 2 dB, with up to 2 exceptions are allowed as defined in table 5.4.2.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

l) During Step G, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of -1, and step size of 2 dB as given in table 5.4.2.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots.

m) During Step H, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2.5.1 for a TPC\_cmd of +1 and step size of 2 dB, with up to 2 exceptions are allowed as defined in table 5.4.2.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

n) During Step H, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of +1, and step size of 2 dB as given in table 5.4.2.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.4.2A Inner Loop Power Control in the Uplink for DC-HSUPA

- Editor’s notes: - For a transition period unti Ran5#73, this test case in version 12.3.0 of 34.121-1 shall be used.

#### 5.4.2A.1 Definition and applicability

Inner loop power control in the uplink for DC-HSUPA is the ability of the UE transmitter to adjust its output power, on each uplink carrier, in accordance with one or more TPC commands received in the downlink.

The power control step is the change in the UE transmitter output power in response to a single TPC command, TPC\_cmd, derived at the UE.

This clause does not cover all the requirements of compressed mode or soft handover.

The requirements and this test apply for Release 9 and later releases for the FDD UE that supports HSDPA and Dual Cell E-DCH.

#### 5.4.2A.2 Minimum requirements

The UE transmitter shall have the capability of changing the output power in each assigned carrier in the uplink with a step size of 1, 2 and 3 dB according to the value of TPC or RP-TPC, in the slot immediately after the TPC\_cmd for the corresponding carrier as follows

a) The transmitter output power step due to inner loop power control in each assigned carrier in the uplink shall be within the range shown in Table 5.4.2A.1, when the total transmit power in each of the assigned carriers is equal to each other.

b) The transmitter average output power step due to inner loop power control in each assigned carrier in the uplink shall be within the range shown in Table 5.4.2A.2, when the total transmit power in each of the assigned carriers is equal to each other. Here a TPC\_cmd group is a set of TPC\_cmd values derived from a corresponding sequence of TPC commands of the same duration.

c) The requirements can be tested by sending the same TPC commands for each of the assigned carriers, assuming that the signal powers for the carriers (in terms of DPCCH code power and total power) have been aligned prior to the beginning of the test procedure.

The inner loop power step is defined as the relative power difference between the mean power of the original (reference) timeslot and the mean power of the target timeslot in each carrier, not including the transient duration. The transient duration is from 25s before the slot boundary to 25s after the slot boundary.

Table 5.4.2A.1: Transmitter power control range

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd | Transmitter power control range (all units are in dB) | | | | | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +0,5 | +1,5 | +1 | +3 | +1,5 | +4,5 |
| 0 | -0,5 | +0,5 | -0,5 | +0,5 | -0,5 | +0,5 |
| -1 | -0,5 | -1,5 | -1 | -3 | -1,5 | -4,5 |

Table 5.4.2A.1A: Transmitter power control range for exceptions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_ cmd | Transmitter power control range | | | | | |
| 1 dB step size | | 2 dB step size | | 3 dB step size | |
| Lower | Upper | Lower | Upper | Lower | Upper |
| + 1 | -0.5 dB | +2.5 dB | +0.5 dB | +3.5 dB | +1.5 dB | +4.5 dB |
| 0 | -0.5 dB | +0.5 dB | -0.5 dB | +0.5 dB | -0.5 dB | +0.5 dB |
| -1 | 0.5 dB | -2.5 dB | -0.5 dB | -3.5 dB | -1.5 dB | -4.5 dB |

Table 5.4.2A.2: Transmitter aggregate power control tolerance

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd group | Transmitter power control range after 10 equal TPC\_cmd group (all units are in dB) | | | | Transmitter power control range after 7 equal TPC\_cmd groups (all units are in dB) | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +8 | +12 | +16 | +24 | +16 | +26 |
| 0 | -1 | +1 | -1 | +1 | -1 | +1 |
| -1 | -8 | -12 | -16 | -24 | -16 | -26 |
| 0,0,0,0,+1 | +6 | +14 | N/A | N/A | N/A | N/A |
| 0,0,0,0,-1 | -6 | -14 | N/A | N/A | N/A | N/A |

The UE shall meet the above requirements with the exceptions defined below for inner loop power control over the power range bounded by the Minimum output power as defined in clause 5.4.3.2, and the Maximum output power supported by the UE (i.e. the actual power as would be measured assuming no measurement error). This power shall be in the range specified for the power class of the UE in clause 5.2.2. For each direction, up to 2 exceptions to the transmitter power control range defined in table 5.4.2.1 shall be allowed. The transmitter power control range for exceptions is defined in table 5.4.2A.1A.

NOTE: 3 dB inner loop power control steps are only used in compressed mode.

The reference for this requirement is TS 25.101 [1] clause 6.4.2.1.1A.

The requirements for the derivation of TPC\_cmd are detailed in TS 25.214 [5] clauses 5.1.2.2.2 and 5.1.2.2.3.

#### 5.4.2A.3 Test purpose

- To verify that the UE inner loop power control size and response, on each carrier, is met to the described value shown in clause 5.4.2A.2.

- To verify that TPC\_cmd is correctly derived from received TPC commands.

An excess error of the inner loop power control decreases the system capacity.

The UE shall be tested for the requirements for inner loop power control for DC-HSUPA over the power range bounded by the Min power threshold for test and the Max power threshold for test.

The Min power threshold for test is defined as the Minimum Output Power Test Requirement for DC-HSUPA (clause 5.4.3A.5).

The Max power threshold for test is defined as the Measured Maximum output power for DC-HSUPA of the UE in the relevant Step of the test (using the same method as in clause 5.2BA.4.2 with the exception that only configuration #3 from table 5.2BA.5A is applied) minus the Test Tolerance specified for test 5.2BA Maximum Output Power for DC-HSUPA in table F.2.1.

For the final power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

#### 5.4.2A.4 Method of test

5.4.2A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.6 and C.11A.1.1. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) A call is set up according to the Generic call setup procedure specified in TS34.108 [3] sub clause 7.3.14, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for each carrier in the Uplink is set to algorithm 2.

Table 5.4.2A.4.1: Contents of RADIO BEARER SETUP message: AM or UM

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm 2 |

4) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.2A.4.2 Procedure



Figure 5.4.2A.4 Inner Loop Power Control Test Steps

1) Before proceeding with paragraph (2) (Step A) below, set the output power of the assigned carriers equal to each other within ± 1.7 dB and in the range -10 ± 9 dBm. This may be achieved by generating suitable downlink TPC commands from the SS.

2) Step A: Transmit a sequence of at least 30 and no more than 60 TPC commands on both cells, which shall commence at a frame boundary and last for a whole number of frames, and which shall contain:

- no sets of 5 consecutive "0" or "1" commands which commence in the 1st, 6th or 11th slots of a frame;

- at least one set of 5 consecutive "0" commands which does not commence in the 1st, 6th or 11th slots of a frame;

- at least one set of 5 consecutive "1" commands which does not commence in the 1st, 6th or 11th slots of a frame.

The following is an example of a suitable sequence of TPC commands:

100000101010101111101000001010101011111010000010101010111110

3) Step B: Transmit a sequence of 50 TPC commands with the value 1.

4) Step C: Transmit a sequence of 50 TPC commands with the value 0.

5) Step D: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel, in order to set the Power Control Algorithm to algorithm 1, and the TPC step size to 1 dB. Contents of the information elements are as specified in TS34.108 [3] sub clause 7.3.14.4.2 with the exception as specified in the table 5.4.2A.4.2.A. After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold.

6) Step E: Transmit a sequence of 150 (note 1) TPC commands with the value 0.

7) Step F: Transmit a sequence of 150 (note 1) TPC commands with the value 1.

8) Step G: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel, in order to set the TPC step size to 2 dB (with the Power Control Algorithm remaining as algorithm 1). Contents of the information elements are as specified in TS34.108 [3] sub clause 7.3.14.4.2 with the exception as specified in the table 5.4.2A.4.2.B. After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold. Transmit a sequence of 75 (note 1) TPC commands with the value 0.

9) Step H: Transmit a sequence of 75 (note 1) TPC commands with the value 1.

10) During steps A to H the mean power of every slot on each carrier shall be measured, with the following exceptions:

- In steps D and F, measurement of the mean power is not required in slots after the 10th slot after the mean power has exceeded the maximum power threshold;

- In steps E and G, measurement of the mean power is not required in slots after the 10th slot after the mean power has fallen below the minimum power threshold.

The transient periods of 25 µs before each slot boundary and 25 µs after each slot boundary shall not be included in the power measurements.

NOTE 1: These numbers of TPC commands are given as examples. The actual number of TPC commands transmitted in these steps shall be at least 10 more than the number required to ensure that each carrier reaches the relevant maximum or minimum power threshold in each step, as shown in figure 5.4.2A.4.

NOTE 2: In order to make it more practical to measure the entire power control dynamic range (between min power threshold and max power threshold with suitable margins), it is permissible to segment the power control sequences into smaller subsequence. For example, Step-E can be divided into different stages while still fulfilling the purpose of the test to measure the entire dynamic range.

Table 5.4.2A.4.2.A: PHYSICAL CHANNEL RECONFIGURATION message for step D (step 5)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm  - TPC step size | Algorithm 1  1 dB |

Table 5.4.2A.4.2.B: PHYSICAL CHANNEL RECONFIGURATION message for step G (step 8)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - TPC step size | 2 dB |

#### 5.4.2A.5 Test requirements

Table 5.4.2A.5.1: Transmitter power control range

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd | Transmitter power control range (all units are in dB) | | | | | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +0,4 | +1,6 | +0,85 | +3,15 | +1,3 | +4,7 |
| 0 | -0,6 | +0,6 | -0,6 | +0,6 | -0,6 | +0,6 |
| -1 | -0,4 | -1,6 | -0,85 | -3,15 | -1,3 | -4,7 |

Table 5.4.2A.5.1A: Transmitter power control range for exceptions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd | Transmitter power control range (all units are in dB) | | | | | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | -0.6 | +2,6 | +0,35 | +3,65 | +1,3 | +4,7 |
| 0 | -0,6 | +0,6 | -0,6 | +0,6 | -0,6 | +0,6 |
| -1 | 0.6 | -2,6 | -0,35 | -3,65 | -1,3 | -4,7 |

Table 5.4.2A.5.2: Transmitter aggregate power control tolerance

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd group | Transmitter power control range after 10 equal TPC\_cmd group (all units are in dB) | | | | Transmitter power control range after 7 equal TPC\_cmd groups (all units are in dB) | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +7,7 | +12,3 | +15,7 | +24,3 | +15,7 | +26,3 |
| 0 | -1,1 | +1,1 | -1,1 | +1,1 | -1,1 | +1,1 |
| -1 | -7,7 | -12,3 | -15,7 | -24,3 | -15,7 | -26,3 |
| 0,0,0,0,+1 | +5,7 | +14,3 | N/A | N/A | N/A | N/A |
| 0,0,0,0,-1 | -5,7 | -14,3 | N/A | N/A | N/A | N/A |

a) During Step A, the difference in mean power between adjacent slots on each carrier shall be within the prescribed range for a TPC\_cmd of 0, as given in table 5.4.2A.5.1.

b) During Step A, the change in mean power over 10 consecutive slots on each carrier shall be within the prescribed range for a TPC\_cmd group of 0, as given in table 5.4.2A.5.2.

c) During Step B, the difference in mean power between adjacent slots on each carrier shall be within the prescribed range given in table 5.4.2A.5.1, with up to 2 exceptions are allowed as defined in table 5.4.2A.5.1A, given that every 5th TPC\_cmd should have the value +1, with a step size of 1 dB, and all other TPC\_cmd should have the value 0.

d) During Step B, the change in mean power over 50 consecutive slots on each carrier shall be within the prescribed range for a TPC\_cmd group of {0,0,0,0,+1}, as given in table 5.4.2A.5.2.

e) During Step C, the difference in mean power between adjacent slots on each carrier shall be within the prescribed range given in table 5.4.2A.5.1, with up to 2 exceptions are allowed as defined in table 5.4.2A.5.1A, given that every 5th TPC\_cmd should have the value -1, with a step size of 1 dB, and all other TPC\_cmd should have the value 0.

f) During Step C, the change in mean power over 50 consecutive slots on each carrier shall be within the prescribed range for a TPC\_cmd group of {0,0,0,0,-1}, as given in table 5.4.2A.5.2.

g) During Step E, the difference in mean power between adjacent slots on each carrier shall be within the prescribed range given in table 5.4.2A.5.1 for a TPC\_cmd of -1 and step size of 1 dB with up to 2 exceptions are allowed as defined in table 5.4.2A.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

h) During Step E, the change in mean power over 10 consecutive slots on each carrier shall be within the prescribed range for a TPC\_cmd group of -1, and step size of 1 dB as given in table 5.4.2A.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

i) During Step F, the difference in mean power between adjacent slots on each carrier shall be within the prescribed range given in table 5.4.2A.5.1 for a TPC\_cmd of +1 and step size of 1 dB with up to 2 exceptions are allowed as defined in table 5.4.2A.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

j) During Step F, the change in mean power over 10 consecutive slots on each carrier shall be within the prescribed range for a TPC\_cmd group of +1, and step size of 1 dB as given in table 5.4.2A.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

k) During Step G, the difference in mean power between adjacent slots on each carrier shall be within the prescribed range given in table 5.4.2A.5.1 for a TPC\_cmd of -1 and step size of 2 dB with up to 2 exceptions are allowed as defined in table 5.4.2A.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

l) During Step G, the change in mean power over 10 consecutive slots on each carrier shall be within the prescribed range for a TPC\_cmd group of -1, and step size of 2 dB as given in table 5.4.2A.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots.

m) During Step H, the difference in mean power between adjacent slots on each carrier shall be within the prescribed range given in table 5.4.2A.5.1 for a TPC\_cmd of +1 and step size of 2 dB with up to 2 exceptions are allowed as defined in table 5.4.2A.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

n) During Step H, the change in mean power over 10 consecutive slots on each carrier shall be within the prescribed range for a TPC\_cmd group of +1, and step size of 2 dB as given in table 5.4.2A.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.4.2B Inner Loop Power Control in the Uplink for OLTD

Editor’s note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Uplink Reference Measurement Channel is TBD.

- For a transition period unti Ran5#73, this test case in version 12.3.0 of 34.121-1 shall be used.

#### 5.4.2B.1 Definition and applicability

Inner loop power control in the uplink is the ability of the UE transmitter to adjust its output power in accordance with one or more TPC commands received in the downlink.

The power control step is the change in the UE transmitter output power in response to a single TPC command, TPC\_cmd, derived at the UE.

This clause does not cover all the requirements of compressed mode or soft handover.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL OLTD.

#### 5.4.2B.2 Minimum requirements

The UE transmitter shall have the capability of changing the output power with a step size of 1 dB, 2 dB and 3 dB according to the value of TPC or RP-TPC, in the slot immediately after the TPC\_cmd can be derived.

a) The transmitter output power step due to inner loop power control shall be within the range shown in table 5.4.2B.1.

b) The transmitter aggregate output power step due to inner loop power control shall be within the range shown in table 5.4.2B.2. Here a TPC\_cmd group is a set of TPC\_cmd values derived from a corresponding sequence of TPC commands of the same duration.

For UE with two active transmit antenna connectors in UL OLTD, the inner loop power control in the uplink specified in this clause applies at each transmit antenna connector.

The inner loop power step is defined as the relative power difference between the mean power of the original (reference) timeslot and the mean power of the target timeslot, not including the transient duration. The transient duration is from 25 µs before the slot boundary to 25 µs after the slot boundary.

Table 5.4.2B.1: Transmitter power control range

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd | Transmitter power control range (all units are in dB) | | | | | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +0,5 | +1,5 | +1 | +3 | +1,5 | +4,5 |
| 0 | -0,5 | +0,5 | -0,5 | +0,5 | -0,5 | +0,5 |
| -1 | -0,5 | -1,5 | -1 | -3 | -1,5 | -4,5 |

Table 5.4.2B.1A: Transmitter power control range for exceptions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_ cmd | Transmitter power control range | | | | | |
| 1 dB step size | | 2 dB step size | | 3 dB step size | |
| Lower | Upper | Lower | Upper | Lower | Upper |
| + 1 | -0.5 dB | +2.5 dB | +0.5 dB | +3.5 dB | +1.5 dB | +4.5 dB |
| 0 | -0.5 dB | +0.5 dB | -0.5 dB | +0.5 dB | -0.5 dB | +0.5 dB |
| -1 | 0.5 dB | -2.5 dB | -0.5 dB | -3.5 dB | -1.5 dB | -4.5 dB |

Table 5.4.2B.2: Transmitter aggregate power control tolerance

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd group | Transmitter power control range after 10 equal TPC\_cmd group (all units are in dB) | | | | Transmitter power control range after 7 equal TPC\_cmd groups (all units are in dB) | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +8 | +12 | +16 | +24 | +16 | +26 |
| 0 | -1 | +1 | -1 | +1 | -1 | +1 |
| -1 | -8 | -12 | -16 | -24 | -16 | -26 |
| 0,0,0,0,+1 | +6 | +14 | N/A | N/A | N/A | N/A |
| 0,0,0,0,-1 | -6 | -14 | N/A | N/A | N/A | N/A |

The UE shall meet the above requirements, with the exceptions defined below for inner loop power control over the power range bounded by the Minimum output power as defined in clause 5.4.3.2, and the Maximum output power supported by the UE (i.e. the actual power as would be measured assuming no measurement error). This power shall be in the range specified for the power class of the UE in clause 5.2.2. For each direction, up to 2 exceptions to the transmitter power control range defined in table 5.4.2.1 shall be allowed. The transmitter power control range for exceptions is defined in table 5.4.2B.1A.

NOTE: 3 dB inner loop power control steps are only used in compressed mode.

The reference for this requirement is TS 25.101 [1] clause 6.4.2.1.1B.

The requirements for the derivation of TPC\_cmd are detailed in TS 25.214 [5] clauses 5.1.2.2.2 and 5.1.2.2.3.

#### 5.4.2B.3 Test purpose

- To verify that the UE inner loop power control size and response with UL OLTD is meet to the described value shown in clause 5.4.2B.2.

- To verify that TPC\_cmd is correctly derived from received TPC commands.

An excess error of the inner loop power control decreases the system capacity.

The UE shall be tested for the requirements for inner loop power control over the power range bounded by the Min power threshold for test and the Max power threshold for test.

The Min power threshold for test is defined as the Minimum Output Power Test Requirement (clause 5.4.3.5).

The Max power threshold for test is defined as the Measured Maximum output power of the UE in the relevant Step of the test (using the same method as in clause 5.2.4.2 step 2) minus the Test Tolerance specified for test 5.2 Maximum Output Power in table F.2.1.

For the final power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

#### 5.4.2B.4 Method of test

##### 5.4.2B.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) A call is set up according to the Generic call setup procedure specified in TS34.108 [3] sub clause 7.3.18, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Table 5.4.2B.4.1: Contents of RADIO BEARER SETUP message: AM or UM

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm 2 |

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

##### 5.4.2B.4.2 Procedure



Figure 5.4.2B.4: Inner Loop Power Control Test Steps

1) Before proceeding with paragraph (2) (Step A) below, set the output power of the UE to be in the range -10 ± 9 dBm. This may be achieved by setting the downlink signal (Îor) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

2) Step A: Transmit a sequence of at least 30 and no more than 60 TPC commands, which shall commence at a frame boundary and last for a whole number of frames, and which shall contain:

- no sets of 5 consecutive "0" or "1" commands which commence in the 1st, 6th or 11th slots of a frame;

- at least one set of 5 consecutive "0" commands which does not commence in the 1st, 6th or 11th slots of a frame;

- at least one set of 5 consecutive "1" commands which does not commence in the 1st, 6th or 11th slots of a frame.

The following is an example of a suitable sequence of TPC commands:

100000101010101111101000001010101011111010000010101010111110

3) Step B: Transmit a sequence of 50 TPC commands with the value 1.

4) Step C: Transmit a sequence of 50 TPC commands with the value 0.

5) Step D: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel in order to set the Power Control Algorithm to algorithm 1, and the TPC step size to 1 dB. Contents of the message is specified in the table 5.4.2B.4.2.A. After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold.

6) Step E: Transmit a sequence of 150 (note 1) TPC commands with the value 0.

7) Step F: Transmit a sequence of 150 (note 1) TPC commands with the value 1.

8) Step G: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel in order to set the TPC step size to 2 dB (with the Power Control Algorithm remaining as algorithm 1). Contents of the message is specified in the table 5.4.2B.4.2.B. After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold. Transmit a sequence of 75 (note 1) TPC commands with the value 0.

9) Step H: Transmit a sequence of 75 (note 1) TPC commands with the value 1.

10) During steps A to H the mean power of every slot shall be measured, with the following exceptions:

- In steps D and F, measurement of the mean power is not required in slots after the 10th slot after the mean power has exceeded the maximum power threshold;

- In steps E and G, measurement of the mean power is not required in slots after the 10th slot after the mean power has fallen below the minimum power threshold.

The transient periods of 25 µs before each slot boundary and 25 µs after each slot boundary shall not be included in the power measurements.

NOTE 1: These numbers of TPC commands are given as examples. The actual number of TPC commands transmitted in these steps shall be at least 10 more than the number required to ensure that the UE reaches the relevant maximum or minimum power threshold in each step, as shown in figure 5.4.2B.4.

NOTE 2: In order to make it more practical to measure the entire power control dynamic range (between min power threshold and max power threshold with suitable margins), it is permissible to segment the power control sequences into smaller subsequence. For example, Step-E can be divided into different stages while still fulfilling the purpose of the test to measure the entire dynamic range.

Table 5.4.2B.4.2.A: PHYSICAL CHANNEL RECONFIGURATION message for step D (step 5)

|  |  |  |
| --- | --- | --- |
| Information Element | Value/Remark | Version |
| Message Type |  |  |
| UE Information Elements |  |  |
| -RRC transaction identifier | 0 |  |
| -Integrity check info |  |  |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |  |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |  |
| -Integrity protection mode info | Not Present |  |
| -Ciphering mode info | Not Present |  |
| -Activation time | Not Present |  |
| -New U-RNTI | Not Present |  |
| -New C-RNTI | Not Present |  |
| -RRC State Indicator | CELL\_DCH |  |
| -UTRAN DRX cycle length coefficient | Not Present |  |
| CN Information Elements |  |  |
| -CN Information info | Not Present |  |
| UTRAN mobility information elements |  |  |
| -URA identity | Not Present |  |
| RB information elements |  |  |
| -Downlink counter synchronisation info | Not Present |  |
| PhyCH information elements |  |  |
| -Frequency info | Not Present |  |
| Uplink radio resources |  |  |
| -Maximum allowed UL TX power | Not Present |  |
| -CHOICE channel requirement | Uplink DPCH info |  |
| -Uplink DPCH power control info |  |  |
| -CHOICE mode | FDD |  |
| -DPCCH Power offset | -40 (-80dB) |  |
| -PC Preamble | 1 frame |  |
| -SRB delay | 7 frames |  |
| -Power Control Algorithm | Algorithm 1 |  |
| -TPC step size | 1dB |  |
| -CHOICE mode | FDD |  |
| -Scrambling code type | Long |  |
| -Scrambling code number | 0 |  |
| -Number of DPDCH | 1 |  |
| -spreading factor | 64 |  |
| -TFCI existence | TRUE |  |
| -Number of FBI bits | Not Present(0) |  |
| -Puncturing Limit | 1 |  |
| Downlink radio resources |  |  |
| -CHOICE mode | FDD |  |
| -Downlink PDSCH information | Not Present | R99 and Rel-4 only |
| -Downlink information common for all radio links | Not Present |  |
| -Downlink DPCH info common for all RL | Not Present |  |

Table 5.4.2B.4.2.B: PHYSICAL CHANNEL RECONFIGURATION message for step G (step 8)

|  |  |  |
| --- | --- | --- |
| Information Element | Value/Remark | Version |
| Message Type |  |  |
| UE Information Elements |  |  |
| -RRC transaction identifier | 0 |  |
| -Integrity check info |  |  |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |  |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |  |
| -Integrity protection mode info | Not Present |  |
| -Ciphering mode info | Not Present |  |
| -Activation time | Not Present |  |
| -New U-RNTI | Not Present |  |
| -New C-RNTI | Not Present |  |
| -RRC State Indicator | CELL\_DCH |  |
| -UTRAN DRX cycle length coefficient | Not Present |  |
| CN Information Elements |  |  |
| -CN Information info | Not Present |  |
| UTRAN mobility information elements |  |  |
| -URA identity | Not Present |  |
| RB information elements |  |  |
| -Downlink counter synchronisation info | Not Present |  |
| PhyCH information elements |  |  |
| -Frequency info | Not Present |  |
| Uplink radio resources |  |  |
| -Maximum allowed UL TX power | Not Present |  |
| -CHOICE channel requirement | Uplink DPCH info |  |
| -Uplink DPCH power control info |  |  |
| -CHOICE mode | FDD |  |
| -DPCCH Power offset | -40 (-80dB) |  |
| -PC Preamble | 1 frame |  |
| -SRB delay | 7 frames |  |
| -Power Control Algorithm | Algorithm 1 |  |
| -TPC step size | 2BB |  |
| -CHOICE mode | FDD |  |
| -Scrambling code type | Long |  |
| -Scrambling code number | 0 |  |
| -Number of DPDCH | 1 |  |
| -spreading factor | 64 |  |
| -TFCI existence | TRUE |  |
| -Number of FBI bits | Not Present(0) |  |
| -Puncturing Limit | 1 |  |
| Downlink radio resources |  |  |
| -CHOICE mode | FDD |  |
| -Downlink PDSCH information | Not Present | R99 and Rel-4 only |
| -Downlink information common for all radio links | Not Present |  |
| -Downlink DPCH info common for all RL | Not Present |  |

#### 5.4.2B.5 Test requirements

Table 5.4.2B.5.1: Transmitter power control range

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd | Transmitter power control range (all units are in dB) | | | | | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +0,5± TT | +1,5± TT | +1± TT | +3± TT | +1,5± TT | +4,5± TT |
| 0 | -0,5± TT | +0,5± TT | -0,5± TT | +0,5± TT | -0,5± TT | +0,5± TT |
| -1 | -0,5± TT | -1,5± TT | -1± TT | -3± TT | -1,5± TT | -4,5± TT |

Table 5.4.2B.5.1A: Transmitter power control range for exceptions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd | Transmitter power control range (all units are in dB) | | | | | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | -0.6 | +2,6 | +0,35 | +3,65 | +1,3 | +4,7 |
| 0 | -0,6 | +0,6 | -0,6 | +0,6 | -0,6 | +0,6 |
| -1 | 0.6 | -2,6 | -0,35 | -3,65 | -1,3 | -4,7 |

Table 5.4.2B.5.2: Transmitter aggregate power control tolerance

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd group | Transmitter power control range after 10 equal TPC\_cmd group (all units are in dB) | | | | Transmitter power control range after 7 equal TPC\_cmd groups (all units are in dB) | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +8±TT | +12±TT | +16±TT | +24±TT | +16±TT | +26±TT |
| 0 | -1±TT | +1±TT | -1±TT | +1±TT | -1±TT | +1±TT |
| -1 | -8±TT | -12±TT | -16±TT | -24±TT | -16±TT | -26±TT |
| 0,0,0,0,+1 | +6±TT | +14±TT | N/A | N/A | N/A | N/A |
| 0,0,0,0,-1 | -6±TT | -14±TT | N/A | N/A | N/A | N/A |

a) During Step A, the difference in mean power between adjacent slots shall be within the prescribed range for a TPC\_cmd of 0, as given in table 5.4.2B.5.1.

b) During Step A, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of 0, as given in table 5.4.2B.5.2.

c) During Step B, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2B.5.1, with up to 2 exceptions are allowed as defined in table 5.4.2B.5.1A, given that every 5th TPC\_cmd should have the value +1, with a step size of 1 dB, and all other TPC\_cmd should have the value 0.

d) During Step B, the change in mean power over 50 consecutive slots shall be within the prescribed range for a TPC\_cmd group of {0,0,0,0,+1}, as given in table 5.4.2B.5.2.

e) During Step C, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2B.5.1, with up to 2 exceptions are allowed as defined in table 5.4.2B.5.1A, given that every 5th TPC\_cmd should have the value -1, with a step size of 1 dB, and all other TPC\_cmd should have the value 0.

f) During Step C, the change in mean power over 50 consecutive slots shall be within the prescribed range for a TPC\_cmd group of {0,0,0,0,-1}, as given in table 5.4.2B.5.2.

g) During Step E, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2B.5.1 for a TPC\_cmd of -1 and step size of 1 dB with up to 2 exceptions are allowed as defined in table 5.4.2B.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

h) During Step E, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of -1, and step size of 1 dB as given in table 5.4.2B.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

i) During Step F, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2B.5.1 for a TPC\_cmd of +1 and step size of 1 dB with up to 2 exceptions are allowed as defined in table 5.4.2B.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

j) During Step F, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of +1, and step size of 1 dB as given in table 5.4.2B.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

k) During Step G, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2B.5.1 for a TPC\_cmd of -1 and step size of 2 dB with up to 2 exceptions are allowed as defined in table 5.4.2B.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

l) During Step G, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of -1, and step size of 2 dB as given in table 5.4.2B.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots.

m) During Step H, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2B.5.1 for a TPC\_cmd of +1 and step size of 2 dB with up to 2 exceptions are allowed as defined in table 5.4.2B.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

n) During Step H, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of +1, and step size of 2 dB as given in table 5.4.2B.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.4.2C Inner Loop Power Control in the Uplink for UL CLTD activation state 1

Editor’s note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Test procedure, test tolerances may need an update.

- For a transition period unti Ran5#73, this test case in version 12.3.0 of 34.121-1 shall be used.

#### 5.4.2C.1 Definition and applicability

Inner loop power control in the uplink is the ability of the UE transmitter to adjust its output power in accordance with one or more TPC commands received in the downlink.

The power control step is the change in the UE transmitter output power in response to a single TPC command, TPC\_cmd, derived at the UE.

This clause does not cover all the requirements of compressed mode or soft handover.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD.

#### 5.4.2C.2 Minimum requirements

The UE transmitter shall have the capability of changing the output power with a step size of 1 dB, 2 dB and 3 dB according to the value of TPC or RP-TPC, in the slot immediately after the TPC\_cmd can be derived.

a) The transmitter output power step due to inner loop power control shall be within the range shown in table 5.4.2C.1.

b) The transmitter aggregate output power step due to inner loop power control shall be within the range shown in table 5.4.2C.2. Here a TPC\_cmd group is a set of TPC\_cmd values derived from a corresponding sequence of TPC commands of the same duration.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the inner loop power control in the uplink specified in this clause applies at each transmit antenna connector.

The inner loop power step is defined as the relative power difference between the mean power of the original (reference) timeslot and the mean power of the target timeslot, not including the transient duration. The transient duration is from 25 µs before the slot boundary to 25 µs after the slot boundary.

Table 5.4.2C.1: Transmitter power control range

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd | Transmitter power control range (all units are in dB) | | | | | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +0,5 | +1,5 | +1 | +3 | +1,5 | +4,5 |
| 0 | -0,5 | +0,5 | -0,5 | +0,5 | -0,5 | +0,5 |
| -1 | -0,5 | -1,5 | -1 | -3 | -1,5 | -4,5 |

Table 5.4.2C.1A: Transmitter power control range for exceptions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_ cmd | Transmitter power control range | | | | | |
| 1 dB step size | | 2 dB step size | | 3 dB step size | |
| Lower | Upper | Lower | Upper | Lower | Upper |
| + 1 | -0.5 dB | +2.5 dB | +0.5 dB | +3.5 dB | +1.5 dB | +4.5 dB |
| 0 | -0.5 dB | +0.5 dB | -0.5 dB | +0.5 dB | -0.5 dB | +0.5 dB |
| -1 | 0.5 dB | -2.5 dB | -0.5 dB | -3.5 dB | -1.5 dB | -4.5 dB |

Table 5.4.2C.2: Transmitter aggregate power control tolerance

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd group | Transmitter power control range after 10 equal TPC\_cmd group (all units are in dB) | | | | Transmitter power control range after 7 equal TPC\_cmd groups (all units are in dB) | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +8 | +12 | +16 | +24 | +16 | +26 |
| 0 | -1 | +1 | -1 | +1 | -1 | +1 |
| -1 | -8 | -12 | -16 | -24 | -16 | -26 |
| 0,0,0,0,+1 | +6 | +14 | N/A | N/A | N/A | N/A |
| 0,0,0,0,-1 | -6 | -14 | N/A | N/A | N/A | N/A |

The UE shall meet the above requirements, with the exceptions defined below, for inner loop power control over the power range bounded by the Minimum output power as defined in clause 5.4.3.2, and the Maximum output power supported by the UE (i.e. the actual power as would be measured assuming no measurement error). This power shall be in the range specified for the power class of the UE in clause 5.2.2. For each direction, up to 2 exceptions to the transmitter power control range defined in table 5.4.2.1 shall be allowed. The transmitter power control range for exceptions is defined in table 5.4.2C.1A.

NOTE: 3 dB inner loop power control steps are only used in compressed mode.

The reference for this requirement is TS 25.101 [1] clause 6.4.2.1.1C.

The requirements for the derivation of TPC\_cmd are detailed in TS 25.214 [5] clauses 5.1.2.2.2 and 5.1.2.2.3.

#### 5.4.2C.3 Test purpose

- To verify that the UE inner loop power control size and response with UL CLTD activation state 1 is meet to the described value shown in clause 5.4.2C.2.

- To verify that TPC\_cmd is correctly derived from received TPC commands.

An excess error of the inner loop power control decreases the system capacity.

The UE shall be tested for the requirements for inner loop power control over the power range bounded by the Min power threshold for test and the Max power threshold for test.

The Min power threshold for test is defined as the Minimum Output Power Test Requirement (clause 5.4.3.5).

The Max power threshold for test is defined as the Measured Maximum output power of the UE in the relevant Step of the test (using the same method as in clause 5.2.4.2 step 2) minus the Test Tolerance specified for test 5.2 Maximum Output Power in table F.2.1.

For the final power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

#### 5.4.2C.4 Method of test

##### 5.4.2C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) A call is set up according to the Generic call setup procedure specified in TS34.108 [3] sub clause FFS, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Table 5.4.2C.4.1: Contents of RADIO BEARER SETUP message: AM or UM

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm 2 |

3) SS sends a HS-SCCH order activating UL\_CLTD activation state 1.

4) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

##### 5.4.2C.4.2 Procedure



Figure 5.4.2C.4 Inner Loop Power Control Test Steps

1) Before proceeding with paragraph (2) (Step A) below, set the output power of the UE to be in the range -10 ± 9 dBm. This may be achieved by setting the downlink signal (Îor) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

2) Step A: Transmit a sequence of at least 30 and no more than 60 TPC commands, which shall commence at a frame boundary and last for a whole number of frames, and which shall contain:

- no sets of 5 consecutive "0" or "1" commands which commence in the 1st, 6th or 11th slots of a frame;

- at least one set of 5 consecutive "0" commands which does not commence in the 1st, 6th or 11th slots of a frame;

- at least one set of 5 consecutive "1" commands which does not commence in the 1st, 6th or 11th slots of a frame.

The following is an example of a suitable sequence of TPC commands:

100000101010101111101000001010101011111010000010101010111110

3) Step B: Transmit a sequence of 50 TPC commands with the value 1.

4) Step C: Transmit a sequence of 50 TPC commands with the value 0.

5) Step D: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel in order to set the Power Control Algorithm to algorithm 1, and the TPC step size to 1 dB. Contents of the message is specified in the table 5.4.2C.4.2.A. After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold.

6) Step E: Transmit a sequence of 150 (note 1) TPC commands with the value 0.

7) Step F: Transmit a sequence of 150 (note 1) TPC commands with the value 1.

8) Step G: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel in order to set the TPC step size to 2 dB (with the Power Control Algorithm remaining as algorithm 1). Contents of the message is specified in the table 5.4.2C.4.2.B. After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold. Transmit a sequence of 75 (note 1) TPC commands with the value 0.

9) Step H: Transmit a sequence of 75 (note 1) TPC commands with the value 1.

10) During steps A to H the mean power of every slot shall be measured, with the following exceptions:

- In steps D and F, measurement of the mean power is not required in slots after the 10th slot after the mean power has exceeded the maximum power threshold;

- In steps E and G, measurement of the mean power is not required in slots after the 10th slot after the mean power has fallen below the minimum power threshold.

The transient periods of 25 µs before each slot boundary and 25 µs after each slot boundary shall not be included in the power measurements.

NOTE 1: These numbers of TPC commands are given as examples. The actual number of TPC commands transmitted in these steps shall be at least 10 more than the number required to ensure that the UE reaches the relevant maximum or minimum power threshold in each step, as shown in figure 5.4.2C.4.

NOTE 2: In order to make it more practical to measure the entire power control dynamic range (between min power threshold and max power threshold with suitable margins), it is permissible to segment the power control sequences into smaller subsequence. For example, Step-E can be divided into different stages while still fulfilling the purpose of the test to measure the entire dynamic range.

Table 5.4.2C.4.2.A: PHYSICAL CHANNEL RECONFIGURATION message for step D (step 5)

|  |  |  |
| --- | --- | --- |
| Information Element | Value/Remark | Version |
| Message Type |  |  |
| UE Information Elements |  |  |
| -RRC transaction identifier | 0 |  |
| -Integrity check info |  |  |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |  |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |  |
| -Integrity protection mode info | Not Present |  |
| -Ciphering mode info | Not Present |  |
| -Activation time | Not Present |  |
| -New U-RNTI | Not Present |  |
| -New C-RNTI | Not Present |  |
| -RRC State Indicator | CELL\_DCH |  |
| -UTRAN DRX cycle length coefficient | Not Present |  |
| CN Information Elements |  |  |
| -CN Information info | Not Present |  |
| UTRAN mobility information elements |  |  |
| -URA identity | Not Present |  |
| RB information elements |  |  |
| -Downlink counter synchronisation info | Not Present |  |
| PhyCH information elements |  |  |
| -Frequency info | Not Present |  |
| Uplink radio resources |  |  |
| -Maximum allowed UL TX power | Not Present |  |
| -CHOICE channel requirement | Uplink DPCH info |  |
| -Uplink DPCH power control info |  |  |
| -CHOICE mode | FDD |  |
| -DPCCH Power offset | -40 (-80dB) |  |
| -PC Preamble | 1 frame |  |
| -SRB delay | 7 frames |  |
| -Power Control Algorithm | Algorithm 1 |  |
| -TPC step size | 1dB |  |
| -CHOICE mode | FDD |  |
| -Scrambling code type | Long |  |
| -Scrambling code number | 0 |  |
| -Number of DPDCH | 1 |  |
| -spreading factor | 64 |  |
| -TFCI existence | TRUE |  |
| -Number of FBI bits | Not Present(0) |  |
| -Puncturing Limit | 1 |  |
| Downlink radio resources |  |  |
| -CHOICE mode | FDD |  |
| -Downlink PDSCH information | Not Present | R99 and Rel-4 only |
| -Downlink information common for all radio links | Not Present |  |
| -Downlink DPCH info common for all RL | Not Present |  |

Table 5.4.2C.4.2.B: PHYSICAL CHANNEL RECONFIGURATION message for step G (step 8)

|  |  |  |
| --- | --- | --- |
| Information Element | Value/Remark | Version |
| Message Type |  |  |
| UE Information Elements |  |  |
| -RRC transaction identifier | 0 |  |
| -Integrity check info |  |  |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |  |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |  |
| -Integrity protection mode info | Not Present |  |
| -Ciphering mode info | Not Present |  |
| -Activation time | Not Present |  |
| -New U-RNTI | Not Present |  |
| -New C-RNTI | Not Present |  |
| -RRC State Indicator | CELL\_DCH |  |
| -UTRAN DRX cycle length coefficient | Not Present |  |
| CN Information Elements |  |  |
| -CN Information info | Not Present |  |
| UTRAN mobility information elements |  |  |
| -URA identity | Not Present |  |
| RB information elements |  |  |
| -Downlink counter synchronisation info | Not Present |  |
| PhyCH information elements |  |  |
| -Frequency info | Not Present |  |
| Uplink radio resources |  |  |
| -Maximum allowed UL TX power | Not Present |  |
| -CHOICE channel requirement | Uplink DPCH info |  |
| -Uplink DPCH power control info |  |  |
| -CHOICE mode | FDD |  |
| -DPCCH Power offset | -40 (-80dB) |  |
| -PC Preamble | 1 frame |  |
| -SRB delay | 7 frames |  |
| -Power Control Algorithm | Algorithm 1 |  |
| -TPC step size | 2dB |  |
| -CHOICE mode | FDD |  |
| -Scrambling code type | Long |  |
| -Scrambling code number | 0 |  |
| -Number of DPDCH | 1 |  |
| -spreading factor | 64 |  |
| -TFCI existence | TRUE |  |
| -Number of FBI bits | Not Present(0) |  |
| -Puncturing Limit | 1 |  |
| Downlink radio resources |  |  |
| -CHOICE mode | FDD |  |
| -Downlink PDSCH information | Not Present | R99 and Rel-4 only |
| -Downlink information common for all radio links | Not Present |  |
| -Downlink DPCH info common for all RL | Not Present |  |

#### 5.4.2C.5 Test requirements

Table 5.4.2C.5.1: Transmitter power control range

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd | Transmitter power control range (all units are in dB) | | | | | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +0,5± TT | +1,5± TT | +1± TT | +3± TT | +1,5± TT | +4,5± TT |
| 0 | -0,5± TT | +0,5± TT | -0,5± TT | +0,5± TT | -0,5± TT | +0,5± TT |
| -1 | -0,5± TT | -1,5± TT | -1± TT | -3± TT | -1,5± TT | -4,5± TT |

Table 5.4.2C.5.1A: Transmitter power control range for exceptions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd | Transmitter power control range (all units are in dB) | | | | | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | -0.6 | +2,6 | +0,35 | +3,65 | +1,3 | +4,7 |
| 0 | -0,6 | +0,6 | -0,6 | +0,6 | -0,6 | +0,6 |
| -1 | 0.6 | -2,6 | -0,35 | -3,65 | -1,3 | -4,7 |

Table 5.4.2C.5.2: Transmitter aggregate power control tolerance

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd group | Transmitter power control range after 10 equal TPC\_cmd group (all units are in dB) | | | | Transmitter power control range after 7 equal TPC\_cmd groups (all units are in dB) | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +8±TT | +12±TT | +16±TT | +24±TT | +16±TT | +26±TT |
| 0 | -1±TT | +1±TT | -1±TT | +1±TT | -1±TT | +1±TT |
| -1 | -8±TT | -12±TT | -16±TT | -24±TT | -16±TT | -26±TT |
| 0,0,0,0,+1 | +6±TT | +14±TT | N/A | N/A | N/A | N/A |
| 0,0,0,0,-1 | -6±TT | -14±TT | N/A | N/A | N/A | N/A |

a) During Step A, the difference in mean power between adjacent slots shall be within the prescribed range for a TPC\_cmd of 0, as given in table 5.4.2C.5.1.

b) During Step A, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of 0, as given in table 5.4.2C.5.2.

c) During Step B, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2C.5.1, with up to 2 exceptions are allowed as defined in table 5.4.2C.5.1A, given that every 5th TPC\_cmd should have the value +1, with a step size of 1 dB, and all other TPC\_cmd should have the value 0.

d) During Step B, the change in mean power over 50 consecutive slots shall be within the prescribed range for a TPC\_cmd group of {0,0,0,0,+1}, as given in table 5.4.2C.5.2.

e) During Step C, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2C.5.1, with up to 2 exceptions are allowed as defined in table 5.4.2C.5.1A, given that every 5th TPC\_cmd should have the value -1, with a step size of 1 dB, and all other TPC\_cmd should have the value 0.

f) During Step C, the change in mean power over 50 consecutive slots shall be within the prescribed range for a TPC\_cmd group of {0,0,0,0,-1}, as given in table 5.4.2C.5.2.

g) During Step E, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2C.5.1 for a TPC\_cmd of -1 and step size of 1 dB with up to 2 exceptions are allowed as defined in table 5.4.2C.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

h) During Step E, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of -1, and step size of 1 dB as given in table 5.4.2C.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

i) During Step F, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2C.5.1 for a TPC\_cmd of +1 and step size of 1 dB with up to 2 exceptions are allowed as defined in table 5.4.2C.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

j) During Step F, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of +1, and step size of 1 dB as given in table 5.4.2C.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

k) During Step G, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2C.5.1 for a TPC\_cmd of -1 and step size of 2 dB with up to 2 exceptions are allowed as defined in table 5.4.2C.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

l) During Step G, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of -1, and step size of 2 dB as given in table 5.4.2C.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots.

m) During Step H, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2C.5.1 for a TPC\_cmd of +1 and step size of 2 dB with up to 2 exceptions are allowed as defined in table 5.4.2C.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

n) During Step H, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of +1, and step size of 2 dB as given in table 5.4.2C.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.4.2D Inner Loop Power Control in the Uplink for UL CLTD activation state 2 and 3

Editor’s note: This clause is incomplete. The following aspects are either missing or not yet determined:

- Call Setup procedure, test procedure, test tolerances may need an update.

- Update of Annexure is FFS.

- For a transition period unti Ran5#73, this test case in version 12.3.0 of 34.121-1 shall be used.

#### 5.4.2D.1 Definition and applicability

Inner loop power control in the uplink is the ability of the UE transmitter to adjust its output power in accordance with one or more TPC commands received in the downlink.

The power control step is the change in the UE transmitter output power in response to a single TPC command, TPC\_cmd, derived at the UE.

This clause does not cover all the requirements of compressed mode or soft handover.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD.

#### 5.4.2D.2 Minimum requirements

The UE transmitter shall have the capability of changing the output power with a step size of 1 dB, 2 dB and 3 dB according to the value of TPC or RP-TPC, in the slot immediately after the TPC\_cmd can be derived.

a) The transmitter output power step due to inner loop power control shall be within the range shown in table 5.4.2D.1.

b) The transmitter aggregate output power step due to inner loop power control shall be within the range shown in table 5.4.2D.2. Here a TPC\_cmd group is a set of TPC\_cmd values derived from a corresponding sequence of TPC commands of the same duration.

For UE configured in UL CLTD activation state 2 or 3, the inner loop power control in the uplink specified in this clause applies at the active transmit antenna connector.

The inner loop power step is defined as the relative power difference between the mean power of the original (reference) timeslot and the mean power of the target timeslot, not including the transient duration. The transient duration is from 25 µs before the slot boundary to 25 µs after the slot boundary.

Table 5.4.2D.1: Transmitter power control range

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd | Transmitter power control range (all units are in dB) | | | | | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +0,5 | +1,5 | +1 | +3 | +1,5 | +4,5 |
| 0 | -0,5 | +0,5 | -0,5 | +0,5 | -0,5 | +0,5 |
| -1 | -0,5 | -1,5 | -1 | -3 | -1,5 | -4,5 |

Table 5.4.2D.1A: Transmitter power control range for exceptions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_ cmd | Transmitter power control range | | | | | |
| 1 dB step size | | 2 dB step size | | 3 dB step size | |
| Lower | Upper | Lower | Upper | Lower | Upper |
| + 1 | -0.5 dB | +2.5 dB | +0.5 dB | +3.5 dB | +1.5 dB | +4.5 dB |
| 0 | -0.5 dB | +0.5 dB | -0.5 dB | +0.5 dB | -0.5 dB | +0.5 dB |
| -1 | 0.5 dB | -2.5 dB | -0.5 dB | -3.5 dB | -1.5 dB | -4.5 dB |

Table 5.4.2D.2: Transmitter aggregate power control tolerance

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd group | Transmitter power control range after 10 equal TPC\_cmd group (all units are in dB) | | | | Transmitter power control range after 7 equal TPC\_cmd groups (all units are in dB) | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +8 | +12 | +16 | +24 | +16 | +26 |
| 0 | -1 | +1 | -1 | +1 | -1 | +1 |
| -1 | -8 | -12 | -16 | -24 | -16 | -26 |
| 0,0,0,0,+1 | +6 | +14 | N/A | N/A | N/A | N/A |
| 0,0,0,0,-1 | -6 | -14 | N/A | N/A | N/A | N/A |

The UE shall meet the above requirements, with the exceptions defined below, for inner loop power control over the power range bounded by the Minimum output power as defined in clause 5.4.3.2, and the Maximum output power supported by the UE (i.e. the actual power as would be measured assuming no measurement error). This power shall be in the range specified for the power class of the UE in clause 5.2.2. For each direction, up to 2 exceptions to the transmitter power control range defined in table 5.4.2.1 shall be allowed. The transmitter power control range for exceptions is defined in table 5.4.2D.1A.

NOTE: 3 dB inner loop power control steps are only used in compressed mode.

The reference for this requirement is TS 25.101 [1] clause 6.4.2.1.1C.

The requirements for the derivation of TPC\_cmd are detailed in TS 25.214 [5] clauses 5.1.2.2.2 and 5.1.2.2.3.

#### 5.4.2D.3 Test purpose

- To verify that the UE inner loop power control size and response with UL CLTD activation state 2 and 3 is meet to the described value shown in clause 5.4.2D.2.

- To verify that TPC\_cmd is correctly derived from received TPC commands.

An excess error of the inner loop power control decreases the system capacity.

The UE shall be tested for the requirements for inner loop power control over the power range bounded by the Min power threshold for test and the Max power threshold for test.

The Min power threshold for test is defined as the Minimum Output Power Test Requirement (clause 5.4.3.5).

The Max power threshold for test is defined as the Measured Maximum output power of the UE in the relevant Step of the test (using the same method as in clause 5.2.4.2 step 2) minus the Test Tolerance specified for test 5.2 Maximum Output Power in table F.2.1.

For the final power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

#### 5.4.2D.4 Method of test

##### 5.4.2D.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure FFS.

2) A call is set up according to the Generic call setup procedure specified in TS34.108 [3] sub clause 7.3.17, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Table 5.4.2D.4.1: Contents of RADIO BEARER SETUP message: AM or UM

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm 2 |

3) SS sends a HS-SCCH order activating UL\_CLTD activation state 2.

4) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

##### 5.4.2D.4.2 Procedure



Figure 5.4.2D.4 Inner Loop Power Control Test Steps

1) Before proceeding with paragraph (2) (Step A) below, set the output power of the UE to be in the range -10 ± 9 dBm. This may be achieved by setting the downlink signal (Îor) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

2) Step A: Transmit a sequence of at least 30 and no more than 60 TPC commands, which shall commence at a frame boundary and last for a whole number of frames, and which shall contain:

- no sets of 5 consecutive "0" or "1" commands which commence in the 1st, 6th or 11th slots of a frame;

- at least one set of 5 consecutive "0" commands which does not commence in the 1st, 6th or 11th slots of a frame;

- at least one set of 5 consecutive "1" commands which does not commence in the 1st, 6th or 11th slots of a frame.

The following is an example of a suitable sequence of TPC commands:

100000101010101111101000001010101011111010000010101010111110

3) Step B: Transmit a sequence of 50 TPC commands with the value 1.

4) Step C: Transmit a sequence of 50 TPC commands with the value 0.

5) Step D: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel in order to set the Power Control Algorithm to algorithm 1, and the TPC step size to 1 dB. Contents of the message is specified in the table 5.4.2D.4.2.A. After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold.

6) Step E: Transmit a sequence of 150 (note 1) TPC commands with the value 0.

7) Step F: Transmit a sequence of 150 (note 1) TPC commands with the value 1.

8) Step G: Transmit the PHYSICAL CHANNEL RECONFIGURATION message to reconfigure the uplink channel in order to set the TPC step size to 2 dB (with the Power Control Algorithm remaining as algorithm 1). Contents of the message is specified in the table 5.4.2D.4.2.B. After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold. Transmit a sequence of 75 (note 1) TPC commands with the value 0.

9) Step H: Transmit a sequence of 75 (note 1) TPC commands with the value 1.

10) During steps A to H the mean power of every slot shall be measured, with the following exceptions:

- In steps D and F, measurement of the mean power is not required in slots after the 10th slot after the mean power has exceeded the maximum power threshold;

- In steps E and G, measurement of the mean power is not required in slots after the 10th slot after the mean power has fallen below the minimum power threshold.

The transient periods of 25 µs before each slot boundary and 25 µs after each slot boundary shall not be included in the power measurements.

11) SS sends a HS-SCCH order activating UL\_CLTD activation state 3

12) Repeat step 1 to 10 for activation state 3.

NOTE 1: These numbers of TPC commands are given as examples. The actual number of TPC commands transmitted in these steps shall be at least 10 more than the number required to ensure that the UE reaches the relevant maximum or minimum power threshold in each step, as shown in figure 5.4.2D.4.

NOTE 2: In order to make it more practical to measure the entire power control dynamic range (between min power threshold and max power threshold with suitable margins), it is permissible to segment the power control sequences into smaller subsequence. For example, Step-E can be divided into different stages while still fulfilling the purpose of the test to measure the entire dynamic range.

Table 5.4.2D.4.2.A: PHYSICAL CHANNEL RECONFIGURATION message for step D (step 5)

|  |  |  |
| --- | --- | --- |
| Information Element | Value/Remark | Version |
| Message Type |  |  |
| UE Information Elements |  |  |
| -RRC transaction identifier | 0 |  |
| -Integrity check info |  |  |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |  |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |  |
| -Integrity protection mode info | Not Present |  |
| -Ciphering mode info | Not Present |  |
| -Activation time | Not Present |  |
| -New U-RNTI | Not Present |  |
| -New C-RNTI | Not Present |  |
| -RRC State Indicator | CELL\_DCH |  |
| -UTRAN DRX cycle length coefficient | Not Present |  |
| CN Information Elements |  |  |
| -CN Information info | Not Present |  |
| UTRAN mobility information elements |  |  |
| -URA identity | Not Present |  |
| RB information elements |  |  |
| -Downlink counter synchronisation info | Not Present |  |
| PhyCH information elements |  |  |
| -Frequency info | Not Present |  |
| Uplink radio resources |  |  |
| -Maximum allowed UL TX power | Not Present |  |
| -CHOICE channel requirement | Uplink DPCH info |  |
| -Uplink DPCH power control info |  |  |
| -CHOICE mode | FDD |  |
| -DPCCH Power offset | -40 (-80dB) |  |
| -PC Preamble | 1 frame |  |
| -SRB delay | 7 frames |  |
| -Power Control Algorithm | Algorithm 1 |  |
| -TPC step size | 1dB |  |
| -CHOICE mode | FDD |  |
| -Scrambling code type | Long |  |
| -Scrambling code number | 0 |  |
| -Number of DPDCH | 1 |  |
| -spreading factor | 64 |  |
| -TFCI existence | TRUE |  |
| -Number of FBI bits | Not Present(0) |  |
| -Puncturing Limit | 1 |  |
| Downlink radio resources |  |  |
| -CHOICE mode | FDD |  |
| -Downlink PDSCH information | Not Present | R99 and Rel-4 only |
| -Downlink information common for all radio links | Not Present |  |
| -Downlink DPCH info common for all RL | Not Present |  |

Table 5.4.2D.4.2.B: PHYSICAL CHANNEL RECONFIGURATION message for step G (step 8)

|  |  |  |
| --- | --- | --- |
| Information Element | Value/Remark | Version |
| Message Type |  |  |
| UE Information Elements |  |  |
| -RRC transaction identifier | 0 |  |
| -Integrity check info |  |  |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |  |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |  |
| -Integrity protection mode info | Not Present |  |
| -Ciphering mode info | Not Present |  |
| -Activation time | Not Present |  |
| -New U-RNTI | Not Present |  |
| -New C-RNTI | Not Present |  |
| -RRC State Indicator | CELL\_DCH |  |
| -UTRAN DRX cycle length coefficient | Not Present |  |
| CN Information Elements |  |  |
| -CN Information info | Not Present |  |
| UTRAN mobility information elements |  |  |
| -URA identity | Not Present |  |
| RB information elements |  |  |
| -Downlink counter synchronisation info | Not Present |  |
| PhyCH information elements |  |  |
| -Frequency info | Not Present |  |
| Uplink radio resources |  |  |
| -Maximum allowed UL TX power | Not Present |  |
| -CHOICE channel requirement | Uplink DPCH info |  |
| -Uplink DPCH power control info |  |  |
| -CHOICE mode | FDD |  |
| -DPCCH Power offset | -40 (-80dB) |  |
| -PC Preamble | 1 frame |  |
| -SRB delay | 7 frames |  |
| -Power Control Algorithm | Algorithm 1 |  |
| -TPC step size | 2dB |  |
| -CHOICE mode | FDD |  |
| -Scrambling code type | Long |  |
| -Scrambling code number | 0 |  |
| -Number of DPDCH | 1 |  |
| -spreading factor | 64 |  |
| -TFCI existence | TRUE |  |
| -Number of FBI bits | Not Present(0) |  |
| -Puncturing Limit | 1 |  |
| Downlink radio resources |  |  |
| -CHOICE mode | FDD |  |
| -Downlink PDSCH information | Not Present | R99 and Rel-4 only |
| -Downlink information common for all radio links | Not Present |  |
| -Downlink DPCH info common for all RL | Not Present |  |

#### 5.4.2D.5 Test requirements

Table 5.4.2D.5.1: Transmitter power control range

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd | Transmitter power control range (all units are in dB) | | | | | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +0,5± TT | +1,5± TT | +1± TT | +3± TT | +1,5± TT | +4,5± TT |
| 0 | -0,5± TT | +0,5± TT | -0,5± TT | +0,5± TT | -0,5± TT | +0,5± TT |
| -1 | -0,5± TT | -1,5± TT | -1± TT | -3± TT | -1,5± TT | -4,5± TT |

Table 5.4.2D.5.1A: Transmitter power control range for exceptions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd | Transmitter power control range (all units are in dB) | | | | | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | -0.6 | +2,6 | +0,35 | +3,65 | +1,3 | +4,7 |
| 0 | -0,6 | +0,6 | -0,6 | +0,6 | -0,6 | +0,6 |
| -1 | 0.6 | -2,6 | -0,35 | -3,65 | -1,3 | -4,7 |

Table 5.4.2D.5.2: Transmitter aggregate power control tolerance

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TPC\_cmd group | Transmitter power control range after 10 equal TPC\_cmd group (all units are in dB) | | | | Transmitter power control range after 7 equal TPC\_cmd groups (all units are in dB) | |
|  | 1 dB step size | | 2 dB step size | | 3 dB step size | |
|  | Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | +8±TT | +12±TT | +16±TT | +24±TT | +16±TT | +26±TT |
| 0 | -1±TT | +1±TT | -1±TT | +1±TT | -1±TT | +1±TT |
| -1 | -8±TT | -12±TT | -16±TT | -24±TT | -16±TT | -26±TT |
| 0,0,0,0,+1 | +6±TT | +14±TT | N/A | N/A | N/A | N/A |
| 0,0,0,0,-1 | -6±TT | -14±TT | N/A | N/A | N/A | N/A |

a) During Step A, the difference in mean power between adjacent slots shall be within the prescribed range for a TPC\_cmd of 0, as given in table 5.4.2D.5.1.

b) During Step A, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of 0, as given in table 5.4.2D.5.2.

c) During Step B, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2D.5.1, with up to 2 exceptions are allowed as defined in table 5.4.2D.5.1A, given that every 5th TPC\_cmd should have the value +1, with a step size of 1 dB, and all other TPC\_cmd should have the value 0.

d) During Step B, the change in mean power over 50 consecutive slots shall be within the prescribed range for a TPC\_cmd group of {0,0,0,0,+1}, as given in table 5.4.2D.5.2.

e) During Step C, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2D.5.1, with up to 2 exceptions are allowed as defined in table 5.4.2D.5.1A, given that every 5th TPC\_cmd should have the value -1, with a step size of 1 dB, and all other TPC\_cmd should have the value 0.

f) During Step C, the change in mean power over 50 consecutive slots shall be within the prescribed range for a TPC\_cmd group of {0,0,0,0,-1}, as given in table 5.4.2D.5.2.

g) During Step E, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2D.5.1 for a TPC\_cmd of -1 and step size of 1 dB with up to 2 exceptions are allowed as defined in table 5.4.2D.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

h) During Step E, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of -1, and step size of 1 dB as given in table 5.4.2D.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

i) During Step F, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2D.5.1 for a TPC\_cmd of +1 and step size of 1 dB with up to 2 exceptions are allowed as defined in table 5.4.2D.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

j) During Step F, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of +1, and step size of 1 dB as given in table 5.4.2D.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

k) During Step G, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2D.5.1 for a TPC\_cmd of -1 and step size of 2 dB with up to 2 exceptions are allowed as defined in table 5.4.2D.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

l) During Step G, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of -1, and step size of 2 dB as given in table 5.4.2D.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots.

m) During Step H, the difference in mean power between adjacent slots shall be within the prescribed range given in table 5.4.2D.5.1 for a TPC\_cmd of +1 and step size of 2 dB with up to 2 exceptions are allowed as defined in table 5.4.2D.5.1A. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

n) During Step H, the change in mean power over 10 consecutive slots shall be within the prescribed range for a TPC\_cmd group of +1, and step size of 2 dB as given in table 5.4.2D.5.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause FFS and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause FFS.

### 5.4.3 Minimum Output Power

#### 5.4.3.1 Definition and applicability

The minimum controlled output power of the UE is when the power control setting is set to a minimum value. This is when both the inner loop and open loop power control indicate a minimum transmit output power is required.

The requirements and this test apply to all types of UTRA for the FDD UE.

#### 5.4.3.2 Minimum Requirements

The minimum output power is defined as the mean power in one timeslot. The minimum transmit power shall be less than -50 dBm.

The normative reference for this requirement is TS 25.101 [1] clause 6.4.3.1.

#### 5.4.3.3 Test purpose

To verify that the UE minimum transmit power is less than -50 dBm.

An excess minimum output power increases the interference to other channels, and decreases the system capacity.

#### 5.4.3.4 Method of test

5.4.3.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.3.4.2 Procedure

1) Set and send continuously Down power control commands to the UE.

2) Measure the mean power of the UE.

#### 5.4.3.5 Test requirements

The measured power, derived in step 2), shall be less than -49 dBm.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.4.3A Minimum Output Power for DC-HSUPA

#### 5.4.3A.1 Definition and applicability

The minimum controlled output power of the UE is when the power control setting is set to a minimum value. This is when both the inner loop and open loop power control indicate a minimum transmit output power is required.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

#### 5.4.3A.2 Minimum Requirements

The minimum output power is defined as the mean power in one time slot in each carrier. The minimum output power in each carrier shall be less than -50 dBm, when both carriers are set to minimum output power.

The normative reference for this requirement is TS 25.101 [1] clause 6.4.3.1A.

#### 5.4.3A.3 Test purpose

To verify that the UE minimum transmit power in each carrier is less than -50 dBm when both carriers are set to minimum output power.

An excess minimum output power increases the interference to other channels, and decreases the system capacity.

#### 5.4.3A.4 Method of test

##### 5.4.3A.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.6 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14 with the exceptions in the RADIO BEARER SETUP message given in Tables 5.2BA.2, 5.2BA.3 and 5.2BA4. These exceptions allow the beta values to be set according to table C.11A.1. and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.4.3A.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.4.3A: Settings for the serving cell during the measurement of  
Minimum Output Power with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.4.3A.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

##### 5.4.3A.4.2 Procedure

1) Set and send continuously Down power control commands to the UE.

2) Measure the mean power in each carrier of the UE.

#### 5.4.3A.5 Test requirements

The measured power in each carrier, derived in step 2), shall be less than -49 dBm.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.4.3B Minimum Output Power for OLTD

Editor’s Note: This clause is incomplete. The following aspects are either missing or not yet determined

- Uplink Reference Measurement Channel is TBD.

#### 5.4.3B.1 Definition and applicability

The minimum controlled output power of the UE is when the power control setting is set to a minimum value. This is when both the inner loop and open loop power control indicate a minimum transmit output power is required.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that support uplink OLTD.

#### 5.4.3B.2 Minimum Requirements

For UE with two active transmit antenna connectors in UL OLTD, the minimum output power specified in sub-clause 5.4.3.2 applies at each transmit antenna connector, when the UE power is set to a minimum value.

The normative reference for this requirement is TS 25.101 [1] clause 6.4.3.1B.

#### 5.4.3B.3 Test purpose

To verify that the UE minimum transmit power at each carrier is less than -50 dBm when the UE power is set to a minimum value.

An excess minimum output power increases the interference to other channels, and decreases the system capacity.

#### 5.4.3B.4 Method of test

##### 5.4.3B.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and parameters are specified in Annex TBD. The DL Reference Measurement Channel (FRC H-Set 1, QPSK) is specified in Annex C.8.1.1.

3) An HSDPA call with OLTD is set up according to TS 34.108 [3] 7.3.18. RF parameters are set up according to tables E.5.1 and E.5.10. Settings for the serving cell are defined in table 5.4.3B.1.

4) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

Table 5.4.3B.1: Settings for the serving cell

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.4.3B.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

See TS 34.109 [4] for details regarding loopback test mode for HSDPA .

##### 5.4.3B.4.2 Procedure

1) Set and send continuously Down power control commands to the UE.

2) Measure the mean power at each carrier of the UE.

#### 5.4.3B.5 Test requirements

The measured power at each carrier, derived in step 2), shall be less than -49 dBm.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.4.3C Minimum Output Power for UL CLTD Activation state 1

#### 5.4.3C.1 Definition and applicability

The minimum controlled output power of the UE is when the power control setting is set to a minimum value. This is when both the inner loop and open loop power control indicate a minimum transmit output power is required.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that support uplink CLTD.

#### 5.4.3C.2 Minimum Requirements

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the minimum output power specified in sub-clause 5.4.3.2 applies at each transmit antenna connector, when the UE power is set to a minimum value.

The normative reference for this requirement is TS 25.101 [1] clause 6.4.3.1C.

#### 5.4.3C.3 Test purpose

To verify that the UE minimum transmit power at each carrier is less than -50 dBm when the UE power is set to a minimum value.

An excess minimum output power increases the interference to other channels, and decreases the system capacity.

#### 5.4.3C.4 Method of test

##### 5.4.3C.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and parameters are specified in Annex C, clause C.10.2. The DL Reference Measurement Channel (FRC H-Set 1, QPSK) is specified in Annex C.8.1.1.

3) An HSDPA call with CLTD is set up according to TS 34.108 [3] 7.3.17. RF parameters are set up according to tables E.5.1 and E.5.10. Settings for the serving cell are defined in table 5.4.3C.1.

4) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

Table 5.4.3C.1: Settings for the serving cell

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.4.3C.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

See TS 34.109 [4] for details regarding loopback test mode for HSDPA.

##### 5.4.3C.4.2 Procedure

1) Set and send continuously Down power control commands to the UE.

2) Measure the mean power at each carrier of the UE.

#### 5.4.3C.5 Test requirements

The measured power at each carrier, derived in step 2), shall be less than -49 dBm.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.4.3D Minimum Output Power for UL CLTD Activation state 2 and 3

#### 5.4.3D.1 Definition and applicability

The minimum controlled output power of the UE is when the power control setting is set to a minimum value. This is when both the inner loop and open loop power control indicate a minimum transmit output power is required.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that support uplink CLTD.

#### 5.4.3D.2 Minimum Requirements

For UE configured in UL CLTD activation state 2 or activation state 3, the minimum output power specified in sub-clause 5.4.3.2 applies at the active transmit antenna connector, when the UE power is set to a minimum value.

The normative reference for this requirement is TS 25.101 [1] clause 6.4.3.1C.

#### 5.4.3D.3 Test purpose

To verify that the UE minimum transmit power at the active carrier is less than -50 dBm when the UE power is set to a minimum value.

An excess minimum output power increases the interference to other channels, and decreases the system capacity.

#### 5.4.3D.4 Method of test

##### 5.4.3D.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and parameters are specified in Annex C, clause C.10.2. The DL Reference Measurement Channel (F-H-Set 1) is specified in Annex C.8.1.1.

3) An HSDPA call with CLTD is set up according to TS 34.108 [3] 7.3.17 with the following exception in the RADIO BEARER SETUP messages in table 5.4.3D.2. This exception allows the call to be setup with initial UL CLTD activation state as state 2. RF parameters are set up according to tables E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.4.3D.1.

4) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

Table 5.4.3D.1: Settings for the serving cell.

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.4.3D.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

Table 5.4.3D.2: Contents of Radio bearer setup message

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink CLTD info FDD |  | Rel-11 |
| - CHOICE *Mode* | New |  |
| - Initial CLTD activation state | Second state |  |

See TS 34.109 [4] for details regarding loopback test mode for HSDPA.

##### 5.4.3D.4.2 Procedure

1) Set and send continuously Down power control commands to the UE.

2) Start transmitting HSDPA data.

3) Measure the mean power at active carrier of the UE.

4) SS sends a HS-SCCH order activating UL\_CLTD activation state 3.

5) Repeat step 1 to 3 for activation state 3.

#### 5.4.3D.5 Test requirements

The measured power at active carrier in activation state 2 and 3, derived in step 3), shall be less than -49 dBm.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.4.4 Out-of-synchronisation handling of output power

#### 5.4.4.1 Definition and applicability

The receiver characteristics in this section are specified at the antenna connector of the UE. For UEs with more than one receiver antenna connector the AWGN signals applied to each receiver antenna connector shall be uncorrelated. The levels of the test signal applied to each of the antenna connectors shall be as defined in section 5.4.4.2 below.

The UE shall monitor the DPCCH quality in order to detect a loss of the signal on Layer 1, as specified in TS 25.214 [5]. The thresholds Qout and Qin specify at what DPCCH quality levels the UE shall shut its power off and when it shall turn its power on respectively. The thresholds are not defined explicitly, but are defined by the conditions under which the UE shall shut its transmitter off and turn it on, as stated in this clause.

The DPCCH quality shall be monitored in the UE and compared to the thresholds Qout and Qin for the purpose of monitoring synchronization. The threshold Qout should correspond to a level of DPCCH quality where no reliable detection of the TPC commands transmitted on the downlink DPCCH can be made. This can be at a TPC command error ratio level of e.g. 30%. The threshold Qin should correspond to a level of DPCCH quality where detection of the TPC commands transmitted on the downlink DPCCH is significantly more reliable than at Qout. This can be at a TPC command error ratio level of e.g. 20%.

The requirements of this test apply to all types of UTRA for the FDD UE and not supporting type 1 for DCH.

#### 5.4.4.2 Minimum Requirements

When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be worse than a threshold Qout, the UE shall shut its transmitter off within 40 ms. The UE shall not turn its transmitter on again until the DPCCH quality exceeds an acceptable level Qin. When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be better than a threshold Qin, the UE shall again turn its transmitter on within 40 ms.

The UE transmitter shall be considered "off" if the transmitted power is below the level defined in TS 25.101 [1] subclause 6.5.1 (Transmit off power). Otherwise the transmitter shall be considered as "on".

The normative reference for this requirement is TS 25.101 [1] clause 6.4.4.1.

The quality levels at the thresholds Qout and Qin correspond to different signal levels depending on the downlink conditions DCH parameters. For the conditions in table 5.4.4.1, a signal with the quality at the level Qout can be generated by a DPCCH\_Ec/Ior ratio of -25 dB, and a signal with Qin by a DPCCH\_Ec/Ior ratio of -21 dB. The DL reference measurement channel (12.2) kbps specified in subclause C.3.1 and with static propagation conditions. The downlink physical channels, other than those specified in table 5.4.4.1, are as specified in table E.3.3 of Annex E.

Table 5.4.4.1: DCH parameters for test of Out-of-synch handling test case

|  |  |  |
| --- | --- | --- |
| Parameter | Value | Unit |
|  | -1 | dB |
|  | -60 | dBm / 3,84 MHz |
|  | See Figure 5.4.4.1: Before point A -16,6  After point A Not defined  See note in clause 5.4.4.3 | dB |
|  | See table 5.4.4.2 | dB |
| Information Data Rate | 12,2 | kbps |

Table 5.4.4.2: Minimum Requirements for DPCCH\_Ec/Ior levels

|  |  |  |
| --- | --- | --- |
| Clause from figure 5.4.4.1 | DPCCH\_Ec/Ior | Unit |
| Before A | -16,6 | dB |
| A to B | -22,0 | dB |
| B to D | -28,0 | dB |
| D to E | -24,0 | dB |
| After E | -18,0 | dB |

Figure 5.4.4.1 shows an example scenario where the DPCCH\_Ec/Ior ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level below Qout where the UE shall shut its power off and then back up to a level above Qin where the UE shall turn the power back on.



Figure 5.4.4.1: Test case for out-of-synch handling in the UE.

In this test case, the requirements for the UE are that:

1. The UE shall not shut its transmitter off before point B.

2. The UE shall shut its transmitter off before point C, which is Toff = 200 ms after point B.

3. The UE shall not turn its transmitter on between points C and E.

4. The UE shall turn its transmitter on before point F, which is Ton = 200 ms after point E.

The reference for this test case is TS 25.101 [1] clause 6.4.4.2.

#### 5.4.4.3 Test purpose

To verify that the UE monitors the DPCCH quality and turns its transmitter on or off according to DPCCH level diagram specified in figure 5.4.4.1.

NOTE 1: DPDCH\_Ec/Ior after point A is not defined in table 5.4.4.1. However it is assumed that DPDCH and DPCCH power level are same on DL 12,2 kbps reference measurement channel for testing. (PO1, PO2, and PO3 are zero.)

NOTE 2: The test case covers only the continuous uplink DPCCH transmission scenario.

#### 5.4.4.4 Method of test

5.4.4.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.9.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3], clause 7.3.2, with the following exception for information elements in System Information Block type 1 specified in TS 34.108 [3], clause 6.1.0b.

Table 5.4.4.2A: System Information Block type 1 message

| Information Element | Value/Remark |
| --- | --- |
| UE Timers and constants in connected mode |  |
| - T313 | 15 seconds |
| - N313 | 200 |

3) DCH parameters are set up according to table 5.4.4.1 with DPCCH\_Ec/Ior ratio level at -16,6 dB. The other RF parameters are set up according to clause E.3.3.

4) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.4.4.2 Procedure

1) The SS sends continuously Up power control commands to the UE until the UE transmitter power reach maximum level.

2) The SS controls the DPCCH\_Ec/Ior ratio level according to clause 'A to B' as defined in table 5.4.4.3. The SS monitors the UE transmitted power for 5 seconds and verifies that the UE transmitter is not switched off during this time.

3) The SS controls the DPCCH\_Ec/Ior ratio level according to clause 'B to D' as defined in table 5.4.4.3. The SS waits 200 ms and then verifies that the UE transmitter has been switched off.

4) The SS monitors the UE transmitted power for 5 seconds and verifies that the UE transmitter is not switched on during this time.

5) The SS controls the DPCCH\_Ec/Ior ratio level according to clause 'D to E' as defined in table 5.4.4.3. The SS monitors the UE transmitted power for 5 s and verifies that the UE transmitter is not switched on during this time.

6) The SS controls the DPCCH\_Ec/Ior ratio level according to clause 'After E' as defined in table 5.4.4.3. The SS waits 200 ms and then verifies that the UE transmitter has been switched on.

#### 5.4.4.5 Test requirements

Table 5.4.4.3: Test Requirements for DPCCH\_Ec/Ior levels

|  |  |  |
| --- | --- | --- |
| Clause from figure 5.4.4.1 | DPCCH\_Ec/Ior | Unit |
| Before A | -16,6 | dB |
| A to B | -21,6 | dB |
| B to D | -28,4 | dB |
| D to E | -24,4 | dB |
| After E | -17,6 | dB |

To pass the test, steps 1 through 6 of the procedure in clause 5.4.4.4.2 must be fulfilled.

The UE transmitter off criterion and its tolerances is defined in clause 5.5.1 (Transmit off power).

The UE transmitter on criterion and its tolerances is defined in clause 5.4.3 (Minimum Output Power). The UE transmitter is considered to be on if the UE transmitted power is higher than minimum output power.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Test Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.4.4A Out-of-synchronization handling of output power for a UE which supports type1 for DCH

#### 5.4.4A.1 Definition and applicability

The receiver characteristics in this section are specified at the antenna connector of the UE. For UEs with more than one receiver antenna connector the AWGN signals applied to each receiver antenna connector shall be uncorrelated. The levels of the test signal applied to each of the antenna connectors shall be as defined in section 5.4.4A.2 below.

The UE shall monitor the DPCCH quality in order to detect a loss of the signal on Layer 1, as specified in TS 25.214 [5]. The thresholds Qout and Qin specify at what DPCCH quality levels the UE shall shut its power off and when it shall turn its power on respectively. The thresholds are not defined explicitly, but are defined by the conditions under which the UE shall shut its transmitter off and turn it on, as stated in this clause.

The DPCCH quality shall be monitored in the UE and compared to the thresholds Qout and Qin for the purpose of monitoring synchronization. The threshold Qout should correspond to a level of DPCCH quality where no reliable detection of the TPC commands transmitted on the downlink DPCCH can be made. This can be at a TPC command error ratio level of e.g. 30%. The threshold Qin should correspond to a level of DPCCH quality where detection of the TPC commands transmitted on the downlink DPCCH is significantly more reliable than at Qout. This can be at a TPC command error ratio level of e.g. 20%.

The requirements of this test apply to UEs, which support the enhanced receiver performance of type1 for DCH of UTRA for the FDD from Release 7 onwards.

#### 5.4.4A.2 Minimum requirement

When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be worse than a threshold Qout, the UE shall shut its transmitter off within 40 ms. The UE shall not turn its transmitter on again until the DPCCH quality exceeds an acceptable level Qin. When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be better than a threshold Qin, the UE shall again turn its transmitter on within 40 ms.

The UE transmitter shall be considered "off" if the transmitted power is below the level defined in TS 25.101 [1] subclause 6.5.1 (Transmit off power). Otherwise the transmitter shall be considered as "on".

The normative reference for this requirement is TS 25.101 [1] clause 6.4.4.1.

The quality levels at the thresholds Qout and Qin correspond to different signal levels depending on the downlink conditions DCH parameters. For the conditions in Table 5.4.4A.1, a signal with the quality at the level Qout can be generated by a DPCCH\_Ec/Ior ratio of -28 dB, and a signal with Qin by a DPCCH\_Ec/Ior ratio of -24 dB. The DL reference measurement channel (12.2) kbps specified in subclause C.3.1 and with static propagation conditions. The downlink physical channels, other than those specified in Table 5.4.4A.1, are as specified in Table E.3.3 of Annex E.

Table 5.4.4A.1: DCH parameters for the Out-of-synch handling test case

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
|  | dB | -1 |
|  | dBm/3.84 MHz | -60 |
|  | dB | See figure 5.4.4A.1: Before point A  -19.6  After point A Not defined |
|  |  | See table 5.4.4A.2 |
| Information Data Rate | kbps | 12.2 |

Table 5.4.4A.2: Minimum Requirements for DPCCH\_Ec/Ior levels

|  |  |  |
| --- | --- | --- |
| Clause from figure 5.4.4A.1 | DPCCH\_Ec/Ior  (UE, supporting enhanced performance requirements type 1 for DCH) | Unit |
| Before A | -19.6 | dB |
| A to B | -25.0 | dB |
| B to D | -31.0 | dB |
| D to E | -27.0 | dB |
| After E | -21.0 | dB |

Figure 5.4.4A.1 shows an example scenario for a UE which supports the optional enhanced performance requirements type1 for DCH, where the DPCCH\_Ec/Ior ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level below Qout where the UE shall shut its power off and then back up to a level above Qin where the UE shall turn the power back on.



Figure 5.4.4A.1: Test case for out-of-synch handling in the UE supporting  
the enhanced performance requirements type1 for DCH

In this test case, the requirements for the UE are that:

1. The UE shall not shut its transmitter off before point B.

2. The UE shall shut its transmitter off before point C, which is Toff = 200 ms after point B.

3. The UE shall not turn its transmitter on between points C and E.

4. The UE shall turn its transmitter on before point F, which is Ton = 200 ms after point E.

#### 5.4.4A.3 Test purpose

To verify that the UE monitors the DPCCH quality and turns its transmitter on or off according to DPCCH level diagram specified in figure 5.4.4A.1.

NOTE 1: DPDCH\_Ec/Ior after point A is not defined in table 5.4.4A.1. However it is assumed that DPDCH and DPCCH power level are same on DL 12,2 kbps reference measurement channel for testing. (PO1, PO2, and PO3 are zero.)

NOTE 2: The test case covers only the continuous uplink DPCCH transmission scenario.

#### 5.4.4A.4 Method of test

5.4.4A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.9 or figure A.26 in case of a UE, supporting enhanced performance requirements type 1 for DCH, equipped with RX-diversity.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3], clause 7.3.2, with the following exception for information elements in System Information Block type 1 specified in TS 34.108 [3], clause 6.1.0b.

Table 5.4.4A.2A: System Information Block type 1 message

| Information Element | Value/Remark |
| --- | --- |
| UE Timers and constants in connected mode |  |
| - T313 | 15 seconds |
| - N313 | 200 |

3) DCH parameters are set up according to table 5.4.4A.1 with DPCCH\_Ec/Ior ratio level at -19,6 dB. The other RF parameters are set up according to clause E.3.3.

4) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.4A.4.2 Procedure

1) The SS sends continuously Up power control commands to the UE until the UE transmitter power reach maximum level.

2) The SS controls the DPCCH\_Ec/Ior ratio level according to clause 'A to B' as defined in table 5.4.4A.3. The SS monitors the UE transmitted power for 5 seconds and verifies that the UE transmitter is not switched off during this time.

3) The SS controls the DPCCH\_Ec/Ior ratio level according to clause 'B to D' as defined in table 5.4.4A.3. The SS waits 200 ms and then verifies that the UE transmitter has been switched off.

4) The SS monitors the UE transmitted power for 5 seconds and verifies that the UE transmitter is not switched on during this time.

5) The SS controls the DPCCH\_Ec/Ior ratio level according to clause 'D to E' as defined in table 5.4.4A.3. The SS monitors the UE transmitted power for 5 s and verifies that the UE transmitter is not switched on during this time.

6) The SS controls the DPCCH\_Ec/Ior ratio level according to clause 'After E' as defined in table 5.4.4A.3. The SS waits 200 ms and then verifies that the UE transmitter has been switched on.

#### 5.4.4A.5 Test requirements

Table 5.4.4A.3: Test Requirements for DPCCH\_Ec/Ior levels

|  |  |  |
| --- | --- | --- |
| Clause from figure 5.4.4A.1 | DPCCH\_Ec/Ior  (UE, supporting enhanced performance requirements type 1) | Unit |
| Before A | -19.6 | dB |
| A to B | -24.6 | dB |
| B to D | -31.4 | dB |
| D to E | -27.4 | dB |
| After E | -20.6 | dB |

To pass the test, steps 1 through 6 of the procedure in clause 5.4.4A.4.2 must be fulfilled.

The UE transmitter off criterion and its tolerances is defined in clause 5.5.1 (Transmit off power).

The UE transmitter on criterion and its tolerances is defined in clause 5.4.3 (Minimum Output Power). The UE transmitter is considered to be on if the UE transmitted power is higher than minimum output power.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Test Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.4.4B Out-of-synchronisation handling of output power for OLTD

Editor’s note: This clause is incomplete. The following aspects are either missing or not yet determined:

* Test procedure is FFS
* Reference Measurement Channel is FFS

#### 5.4.4B.1 Definition and applicability

The receiver characteristics in this section are specified at the antenna connector of the UE. For UEs with more than one receiver antenna connector the AWGN signals applied to each receiver antenna connector shall be uncorrelated. The levels of the test signal applied to each of the antenna connectors shall be as defined in section 5.4.4B.2 below.

The UE shall monitor the DPCCH quality in order to detect a loss of the signal on Layer 1, as specified in TS 25.214 [5]. The thresholds Qout and Qin specify at what DPCCH quality levels the UE shall shut its power off and when it shall turn its power on respectively. The thresholds are not defined explicitly, but are defined by the conditions under which the UE shall shut its transmitter off and turn it on, as stated in this clause.

The DPCCH quality shall be monitored in the UE and compared to the thresholds Qout and Qin for the purpose of monitoring synchronization. The threshold Qout should correspond to a level of DPCCH quality where no reliable detection of the TPC commands transmitted on the downlink DPCCH can be made. This can be at a TPC command error ratio level of e.g. 30%. The threshold Qin should correspond to a level of DPCCH quality where detection of the TPC commands transmitted on the downlink DPCCH is significantly more reliable than at Qout. This can be at a TPC command error ratio level of e.g. 20%.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL OLTD and not supporting type 1 for DCH.

#### 5.4.4B.2 Minimum Requirements

For UE with two active transmit antenna connectors in UL OLTD, the minimum requirements specified below apply at each transmit antenna connector.

When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be worse than a threshold Qout, the UE shall shut its transmitter off within 40 ms. The UE shall not turn its transmitter on again until the DPCCH quality exceeds an acceptable level Qin. When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be better than a threshold Qin, the UE shall again turn its transmitter on within 40 ms.

The UE transmitter shall be considered "off" if the transmitted power is below the level defined in TS 25.101 [1] subclause 6.5.1 (Transmit off power). Otherwise the transmitter shall be considered as "on".

The quality levels at the thresholds Qout and Qin correspond to different signal levels depending on the downlink conditions DCH parameters. For the conditions in table 5.4.4B.1, a signal with the quality at the level Qout can be generated by a DPCCH\_Ec/Ior ratio of -25 dB, and a signal with Qin by a DPCCH\_Ec/Ior ratio of -21 dB. The DL reference measurement channel (12.2) kbps specified in subclause C.3.1 and with static propagation conditions. The downlink physical channels, other than those specified in table 5.4.4B.1, are as specified in table E.3.3 of Annex E.

Table 5.4.4B.1: DCH parameters for test of Out-of-synch handling test case

|  |  |  |
| --- | --- | --- |
| Parameter | Value | Unit |
|  | -1 | dB |
|  | -60 | dBm / 3,84 MHz |
|  | See Figure 5.4.4B.1: Before point A -16,6  After point A Not defined  See note in clause 5.4.4B.3 | dB |
|  | See table 5.4.4B.2 | dB |
| Information Data Rate | 12,2 | Kbps |

Table 5.4.4B.2: Minimum Requirements for DPCCH\_Ec/Ior levels

|  |  |  |
| --- | --- | --- |
| Clause from figure 5.4.4B.1 | DPCCH\_Ec/Ior | Unit |
| Before A | -16,6 | dB |
| A to B | -22,0 | dB |
| B to D | -28,0 | dB |
| D to E | -24,0 | dB |
| After E | -18,0 | dB |

Figure 5.4.4B.1 shows an example scenario where the DPCCH\_Ec/Ior ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level below Qout where the UE shall shut its power off and then back up to a level above Qin where the UE shall turn the power back on.



Figure 5.4.4B.1: Test case for out-of-synch handling in the UE

In this test case, the requirements for the UE are that:

1. The UE shall not shut its transmitter off before point B.

2. The UE shall shut its transmitter off before point C, which is Toff = 200 ms after point B.

3. The UE shall not turn its transmitter on between points C and E.

4. The UE shall turn its transmitter on before point F, which is Ton = 200 ms after point E.

The normative reference for this requirement is TS 25.101 [1] clause 6.4.4.1A.

#### 5.4.4B.3 Test purpose

To verify that the UE monitors the DPCCH quality and turns its transmitter on or off according to DPCCH level diagram specified in figure 5.4.4B.1.

NOTE 1: DPDCH\_Ec/Ior after point A is not defined in table 5.4.4B.1. However it is assumed that DPDCH and DPCCH power level are same on DL 12,2 kbps reference measurement channel for testing. (PO1, PO2, and PO3 are zero.)

NOTE 2: The test case covers only the continuous uplink DPCCH transmission scenario.

#### 5.4.4B.4 Method of test

##### 5.4.4B.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3], clause7.1.18, with the following exception for information elements in System Information Block type 1 specified in TS 34.108 [3], clause 6.1.0b.

Table 5.4.4B.2A: System Information Block type 1 message

| Information Element | Value/Remark |
| --- | --- |
| UE Timers and constants in connected mode |  |
| - T313 | 15 seconds |
| - N313 | 200 |

3) DCH parameters are set up according to table 5.4.4B.1 with DPCCH\_Ec/Ior ratio level at -16,6 dB. The other RF parameters are set up according to clause E.3.3.

4) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

##### 5.4.4B.4.2 Procedure

FFS

#### 5.4.4B.5 Test requirements

Table 5.4.4B.3: Test Requirements for DPCCH\_Ec/Ior levels

|  |  |  |
| --- | --- | --- |
| Clause from figure 5.4.4B.1 | DPCCH\_Ec/Ior | Unit |
| Before A | -16,6+TT | dB |
| A to B | -21,6+TT | dB |
| B to D | -28,4+TT | dB |
| D to E | -24,4+TT | dB |
| After E | -17,6+TT | dB |

To pass the test, steps 1 through 6 of the procedure in clause 5.4.4B.4.2 must be fulfilled.

The UE transmitter off criterion and its tolerances is defined in clause 5.5.1 (Transmit off power).

The UE transmitter on criterion and its tolerances is defined in clause 5.4.3 (Minimum Output Power). The UE transmitter is considered to be on if the UE transmitted power is higher than minimum output power.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Test Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.4.4C Out-of-synchronisation handling of output power for UL CLTD activation state 1

Editor’s note: This clause is incomplete. The following aspects are either missing or not yet determined:

* Message Contents are FFS.
* Reference Measurement Channel’s to be defined
* Call Setup procedure, test procedure, test tolerances may need an update.
* Update of Annexure is FFS

#### 5.4.4C.1 Definition and applicability

The receiver characteristics in this section are specified at the antenna connector of the UE. For UEs with more than one receiver antenna connector the AWGN signals applied to each receiver antenna connector shall be uncorrelated. The levels of the test signal applied to each of the antenna connectors shall be as defined in section 5.4.4C.2 below.

The UE shall monitor the DPCCH quality in order to detect a loss of the signal on Layer 1, as specified in TS 25.214 [5]. The thresholds Qout and Qin specify at what DPCCH quality levels the UE shall shut its power off and when it shall turn its power on respectively. The thresholds are not defined explicitly, but are defined by the conditions under which the UE shall shut its transmitter off and turn it on, as stated in this clause.

The DPCCH quality shall be monitored in the UE and compared to the thresholds Qout and Qin for the purpose of monitoring synchronization. The threshold Qout should correspond to a level of DPCCH quality where no reliable detection of the TPC commands transmitted on the downlink DPCCH can be made. This can be at a TPC command error ratio level of e.g. 30%. The threshold Qin should correspond to a level of DPCCH quality where detection of the TPC commands transmitted on the downlink DPCCH is significantly more reliable than at Qout. This can be at a TPC command error ratio level of e.g. 20%.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and not supporting type 1 for DCH.

#### 5.4.4C.2 Minimum Requirements

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the minimum requirements specified below apply at each transmit antenna connector.

When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be worse than a threshold Qout, the UE shall shut its transmitter off within 40 ms. The UE shall not turn its transmitter on again until the DPCCH quality exceeds an acceptable level Qin. When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be better than a threshold Qin, the UE shall again turn its transmitter on within 40 ms.

The UE transmitter shall be considered "off" if the transmitted power is below the level defined in TS 25.101 [1] subclause 6.5.1 (Transmit off power). Otherwise the transmitter shall be considered as "on".

The quality levels at the thresholds Qout and Qin correspond to different signal levels depending on the downlink conditions DCH parameters. For the conditions in table 5.4.4C.1, a signal with the quality at the level Qout can be generated by a DPCCH\_Ec/Ior ratio of -25 dB, and a signal with Qin by a DPCCH\_Ec/Ior ratio of -21 dB. The DL reference measurement channel (12.2) kbps specified in subclause C.3.1 and with static propagation conditions. The downlink physical channels, other than those specified in table 5.4.4C.1, are as specified in table E.3.3 of Annex E.

Table 5.4.4C.1: DCH parameters for test of Out-of-synch handling test case

|  |  |  |
| --- | --- | --- |
| Parameter | Value | Unit |
|  | -1 | dB |
|  | -60 | dBm / 3,84 MHz |
|  | See Figure 5.4.4C.1: Before point A -16,6  After point A Not defined  See note in clause 5.4.4C.3 | dB |
|  | See table 5.4.4C.2 | dB |
| Information Data Rate | 12,2 | kbps |

Table 5.4.4C.2: Minimum Requirements for DPCCH\_Ec/Ior levels

|  |  |  |
| --- | --- | --- |
| Clause from figure 5.4.4C.1 | DPCCH\_Ec/Ior | Unit |
| Before A | -16,6 | dB |
| A to B | -22,0 | dB |
| B to D | -28,0 | dB |
| D to E | -24,0 | dB |
| After E | -18,0 | dB |

Figure 5.4.4C.1 shows an example scenario where the DPCCH\_Ec/Ior ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level below Qout where the UE shall shut its power off and then back up to a level above Qin where the UE shall turn the power back on.



Figure 5.4.4C.1: Test case for out-of-synch handling in the UE

In this test case, the requirements for the UE are that:

1. The UE shall not shut its transmitter off before point B.

2. The UE shall shut its transmitter off before point C, which is Toff = 200 ms after point B.

3. The UE shall not turn its transmitter on between points C and E.

4. The UE shall turn its transmitter on before point F, which is Ton = 200 ms after point E.

The normative reference for this requirement is TS 25.101 [1] clause 6.4.4.1B.

#### 5.4.4C.3 Test purpose

To verify that the UE monitors the DPCCH quality and turns its transmitter on or off according to DPCCH level diagram specified in figure 5.4.4C.1.

NOTE 1: DPDCH\_Ec/Ior after point A is not defined in table 5.4.4C.1. However it is assumed that DPDCH and DPCCH power level are same on DL 12,2 kbps reference measurement channel for testing. (PO1, PO2, and PO3 are zero.)

NOTE 2: The test case covers only the continuous uplink DPCCH transmission scenario.

#### 5.4.4C.4 Method of test

5.4.4C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3], clause FFS, with the following exception for information elements in System Information Block type 1 specified in TS 34.108 [3], clause 6.1.0b.

Table 5.4.4C.2A: System Information Block type 1 message

| Information Element | Value/Remark |
| --- | --- |
| UE Timers and constants in connected mode |  |
| - T313 | 15 seconds |
| - N313 | 200 |

4) DCH parameters are set up according to table 5.4.4C.1 with DPCCH\_Ec/Ior ratio level at -16,6 dB. The other RF parameters are set up according to clause E.3.3.

5) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.4C.4.2 Procedure

1) The SS sends continuously up power control commands to the UE until the UE transmitter power reach maximum level.

2) The SS controls the DPCCH\_Ec/Ior ratio level according to clause 'A to B' as defined in table 5.4.4C.3. The SS monitors the UE transmitted power for 5 seconds and verifies that the UE transmitter is not switched off during this time.

3) The SS controls the DPCCH\_Ec/Ior ratio level according to clause 'B to D' as defined in table 5.4.4C.3. The SS waits 200 ms and checks at each transmit antenna connector to verify that the UE transmitter has been switched off .

4) The SS monitors the UE transmitted power for 5 seconds and verifies that the UE transmitter is not switched on during this time.

5) The SS controls the DPCCH\_Ec/Ior ratio level according to clause 'D to E' as defined in table 5.4.4C.3. The SS monitors the UE transmitted power for 5 s and verifies that the UE transmitter is not switched on during this time.

6) The SS controls the DPCCH\_Ec/Ior ratio level according to clause 'After E' as defined in table 5.4.4C.3. The SS waits 200 ms and checks at each transmit antenna connector to verify that the UE transmitter has been switched on.

#### 5.4.4C.5 Test requirements

Table 5.4.4C.3: Test Requirements for DPCCH\_Ec/Ior levels

|  |  |  |
| --- | --- | --- |
| Clause from figure 5.4.4C.1 | DPCCH\_Ec/Ior | Unit |
| Before A | -16,6+TT | dB |
| A to B | -21,6+TT | dB |
| B to D | -28,4+TT | dB |
| D to E | -24,4+TT | dB |
| After E | -17,6+TT | dB |

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the test requirements specified in Table 5.4.4C.3 apply at each transmit antenna connector.

To pass the test, steps 1 through 6 of the procedure in clause 5.4.4C.4.2 must be fulfilled.

The UE transmitter off criterion and its tolerances is defined in clause 5.5.1 (Transmit off power).

The UE transmitter on criterion and its tolerances is defined in clause 5.4.3 (Minimum Output Power). The UE transmitter is considered to be on if the UE transmitted power is higher than minimum output power.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Test Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.4.4D Out-of-synchronisation handling of output power for UL CLTD activation state 2 and 3

Editor’s note: This clause is incomplete. The following aspects are either missing or not yet determined:

* Message Contents are FFS.
* Reference Measurement Channel’s to be defined
* Call Setup procedure, test procedure, test tolerances may need an update.
* Update of Annexure is FFS

#### 5.4.4D.1 Definition and applicability

The receiver characteristics in this section are specified at the antenna connector of the UE. For UEs with more than one receiver antenna connector the AWGN signals applied to each receiver antenna connector shall be uncorrelated. The levels of the test signal applied to each of the antenna connectors shall be as defined in section 5.4.4D.2 below.

The UE shall monitor the DPCCH quality in order to detect a loss of the signal on Layer 1, as specified in TS 25.214 [5]. The thresholds Qout and Qin specify at what DPCCH quality levels the UE shall shut its power off and when it shall turn its power on respectively. The thresholds are not defined explicitly, but are defined by the conditions under which the UE shall shut its transmitter off and turn it on, as stated in this clause.

The DPCCH quality shall be monitored in the UE and compared to the thresholds Qout and Qin for the purpose of monitoring synchronization. The threshold Qout should correspond to a level of DPCCH quality where no reliable detection of the TPC commands transmitted on the downlink DPCCH can be made. This can be at a TPC command error ratio level of e.g. 30%. The threshold Qin should correspond to a level of DPCCH quality where detection of the TPC commands transmitted on the downlink DPCCH is significantly more reliable than at Qout. This can be at a TPC command error ratio level of e.g. 20%.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and not supporting type 1 for DCH.

#### 5.4.4D.2 Minimum Requirements

For UE configured in UL CLTD activation state 2 or activation state 3, the minimum requirements specified below apply at the active transmit antenna connector.

When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be worse than a threshold Qout, the UE shall shut its transmitter off within 40 ms. The UE shall not turn its transmitter on again until the DPCCH quality exceeds an acceptable level Qin. When the UE estimates the DPCCH quality or the quality of the TPC fields of the F-DPCH frame received from the serving HS-DSCH cell over the last 160 ms period or quality of the TPC fields of the F-DPCH from the serving HS-DSCH cell over the previous 240 slots in which the TPC symbols are known to be present when the discontinuous uplink DPCCH transmission operation is enabled to be better than a threshold Qin, the UE shall again turn its transmitter on within 40 ms.

The UE transmitter shall be considered "off" if the transmitted power is below the level defined in TS 25.101 [1] subclause 6.5.1 (Transmit off power). Otherwise the transmitter shall be considered as "on".

The quality levels at the thresholds Qout and Qin correspond to different signal levels depending on the downlink conditions DCH parameters. For the conditions in table 5.4.4D.1, a signal with the quality at the level Qout can be generated by a DPCCH\_Ec/Ior ratio of -25 dB, and a signal with Qin by a DPCCH\_Ec/Ior ratio of -21 dB. The DL reference measurement channel (12.2) kbps specified in subclause C.3.1 and with static propagation conditions. The downlink physical channels, other than those specified in table 5.4.4D.1, are as specified in table FFS of Annex E.

Table 5.4.4D.1: DCH parameters for test of Out-of-synch handling test case

|  |  |  |
| --- | --- | --- |
| Parameter | Value | Unit |
|  | -1 | dB |
|  | -60 | dBm / 3,84 MHz |
|  | See Figure 5.4.4D.1: Before point A -16,6  After point A Not defined  See note in clause 5.4.4D.3 | dB |
|  | See table 5.4.4D.2 | dB |
| Information Data Rate | 12,2 | kbps |

Table 5.4.4D.2: Minimum Requirements for DPCCH\_Ec/Ior levels

|  |  |  |
| --- | --- | --- |
| Clause from figure 5.4.4D.1 | DPCCH\_Ec/Ior | Unit |
| Before A | -16,6 | dB |
| A to B | -22,0 | dB |
| B to D | -28,0 | dB |
| D to E | -24,0 | dB |
| After E | -18,0 | dB |

Figure 5.4.4D.1 shows an example scenario where the DPCCH\_Ec/Ior ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level below Qout where the UE shall shut its power off and then back up to a level above Qin where the UE shall turn the power back on.



Figure 5.4.4D.1: Test case for out-of-synch handling in the UE.

In this test case, the requirements for the UE are that:

1. The UE shall not shut its transmitter off before point B.

2. The UE shall shut its transmitter off before point C, which is Toff = 200 ms after point B.

3. The UE shall not turn its transmitter on between points C and E.

4. The UE shall turn its transmitter on before point F, which is Ton = 200 ms after point E.

The normative reference for this requirement is TS 25.101 [1] clause 6.4.4.1B.

#### 5.4.4D.3 Test purpose

To verify that the UE monitors the DPCCH quality and turns its transmitter on or off according to DPCCH level diagram specified in figure 5.4.4D.1.

NOTE 1: DPDCH\_Ec/Ior after point A is not defined in table 5.4.4D.1. However it is assumed that DPDCH and DPCCH power level are same on DL 12,2 kbps reference measurement channel for testing. (PO1, PO2, and PO3 are zero.)

NOTE 2: The test case covers only the continuous uplink DPCCH transmission scenario.

#### 5.4.4D.4 Method of test

5.4.4D.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3], clause 7.3.17, with the following exception for RADIO BEARER SETUP message and for information elements in System Information Block type 1 specified in TS 34.108 [3], clause 6.1.0b.

Table 5.4.4D.2A: System Information Block type 1 message

| Information Element | Value/Remark |
| --- | --- |
| UE Timers and constants in connected mode |  |
| - T313 | 15 seconds |
| - N313 | 200 |

Table 5.4.4D.2B: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink CLTD info FDD |  | Rel-11 |
| - CHOICE *Mode* | New |  |
| - S-DPCCH Info |  |  |
| - S-DPCCH/DPCCH power offset | 0 |  |
| - Initial CLTD activation state | Second state |  |

3) DCH parameters are set up according to table 5.4.4D.1 with DPCCH\_Ec/Ior ratio level at -16,6 dB. The other RF parameters are set up according to clause FFS.

4) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.4D.4.2 Procedure

FFS

#### 5.4.4D.5 Test requirements

Table 5.4.4D.3: Test Requirements for DPCCH\_Ec/Ior levels

|  |  |  |
| --- | --- | --- |
| Clause from figure 5.4.4D.1 | DPCCH\_Ec/Ior | Unit |
| Before A | -16,6+TT | dB |
| A to B | -21,6+TT | dB |
| B to D | -28,4+TT | dB |
| D to E | -24,4+TT | dB |
| After E | -17,6+TT | dB |

For UE configured in UL CLTD activation state 2 or activation state 3, the test requirements specified in Table 5.4.4D.3 apply at the active transmit antenna connector.

To pass the test, steps 1 through 6 of the procedure in clause 5.4.4D.4.2 must be fulfilled.

The UE transmitter off criterion and its tolerances is defined in clause 5.5.1 (Transmit off power).

The UE transmitter on criterion and its tolerances is defined in clause 5.4.3 (Minimum Output Power). The UE transmitter is considered to be on if the UE transmitted power is higher than minimum output power.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Test Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.4.5 Out of quality handling of TPI for UL CLTD activation state 1

#### 5.4.5.1 Definition and applicability

An F-TPICH carries transmitted precoding indicator generated at layer 1 for UL CLTD operation.

The UE shall measure the reliability of the received TPI bits over the 3 slot period in which the TPI bit pattern corresponding to a precoding weight is received, as specified in TS 25.214 [8]. The received TPI bits are mapped to precoding weights and applied by the UE only if the estimated quality of the TPI bits is determined to be better than a threshold Qtpi. Otherwise, the UE shall apply the precoding weights corresponding to the last reliably received TPI bit pattern. The threshold is not defined explicitly, but is defined by the conditions under which the UE shall apply the precoding weights corresponding to the received TPI bits and apply the precoding weights corresponding to the last reliably received TPI bits, as stated in this subclause.

The threshold Qtpi should correspond to a level of F-TPICH quality below which no reliable detection of the TPI bits transmitted on the downlink DPCCH can be made.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and HSDPA.

#### 5.4.5.2 Minimum Requirements

When the UE estimates the F-TPICH quality received over the 3 slot period to be worse than a threshold Qtpi, the UE shall apply the precoding weights corresponding to the last reliably received TPI bit pattern. The UE shall not apply the precoding weights corresponding to the received TPI bits again until the F-TPICH quality exceeds a threshold Qtpi. When the estimated F-TPICH quality is better than a threshold Qtpi, the UE shall again apply the precoding weights corresponding to the received TPI bits.

The quality level at the threshold Qtpi corresponds to a signal level depending on the downlink conditions F-TPICH parameters. For the conditions in Table 5.4.5.1, a signal with the quality below the level Qtpi can be generated by an F-TPICH\_Ec/Ior ratio of -26 dB, and a signal with the quality above the level Qtpi can be generated by an F-TPICH\_Ec/Ior ratio of -12 dB. The downlink physical channels, other than those specified in Table 5.4.5.1, are as specified in table E.3.3 of Annex E.

Table 5.4.5.1: Parameters for the out-of-quality handling of F-TPICH test case

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Propagation condition |  | Static |
|  | dB | -1 |
|  | dBm/3.84 MHz | -60 |
| *or*  *c*  *I*  *E*  *F-TPICH*  \_ | dB | See figure 5.4.5.1 |

Table 5.4.5.2: Minimum Requirements for F-TPICH\_Ec/Ior levels

|  |  |  |
| --- | --- | --- |
| Clause from Figure 5.4.5.1 | DPCCH\_Ec/Ior | Unit |
| Before A | -7 | dB |
| A to C | -26 | dB |
| After C | -12 | dB |

Figure 5.4.5.1 shows an example scenario where the F-TPICH\_Ec/Ior ratio varies from a level where the F-TPICH is demodulated under normal conditions, down to a level below Qtpi where the UE shall apply the precoding weights corresponding to the last reliably received TPI bit pattern and then back up to a level above Qtpi where the UE shall apply the precoding weights corresponding to the received TPI bit pattern. Point B shall be at least 10 ms after point A, and point D shall be at least 10 ms after point C.



Figure 5.4.5.1: Test case for F-TPICH out-of-quality handling in the UE supporting the minimum requirements for F-TPICH

In these test cases, the requirements for the UE are that:

1. The UE shall keep precoding weights with more than 50% of the time between point B and point C.

2. The UE apply precoding weights w.r.t. TPI bits with more than 99% of the time after point D.

The normative reference for this requirement is TS 25.101 [1] clause 6.4A.1.

#### 5.4.5.3 Test purpose

To verify that the UE monitors the F-TPICH quality and in turns apply the precoding weights as per level diagram specified in figure 5.4.5.1 and as per test requirement.

#### 5.4.5.4 Method of test

5.4.5.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3], clause 7.3.17.

4) RF parameters are set up according to table 5.4.5.1 with F-TPICH\_Ec/Ior ratio level set according to the figure 5.4.5.1. The other RF parameters are set up according to clause E.3.3.

5) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.5.4.2 Procedure

1) The SS controls and maintains the F-TPICH\_Ec/Ior ratio level according to clause 'Before A' as defined in table 5.4.5.3 and sends TPI bits set to the fixed precoder weight corresponding to bit pattern “1100” for about 50 ms.

2) The SS controls and maintains the F-TPICH\_Ec/Ior ratio level according to clause 'A to C' as defined in table 5.4.5.3 and sends TPI bit pattern as “1111” for 100 ms. The SS waits 10 ms after point A and then verifies that UE shall keep precoding weights corresponding to TPI bits pattern “1100” with more than 50% of the time till point C shown in figure 5.4.5.1.

3) The SS controls and maintains the F-TPICH\_Ec/Ior ratio level according to clause 'After C' as defined in table 5.4.5.3 and sends TPI bit pattern as “0011” for 50 ms. The SS waits 10 ms after point C and then verifies that UE apply precoding weights w.r.t. TPI bits pattern “0011” with more than 99% of the time after point C shown in figure 5.4.5.1

#### 5.4.5.5 Test requirements

Table 5.4.5.3: Test Requirements for F-TPICH\_Ec/Ior levels

|  |  |  |
| --- | --- | --- |
| Clause from figure 5.4.5.1 | F-TPICH\_Ec/Ior | Unit |
| Before A | -6.6 | dB |
| A to C | -26.4 | dB |
| After C | -11.6 | dB |

To pass the test, steps 2 and 3 of the procedure in clause 5.4.5.4.2 must be fulfilled.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Test Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.5 Transmit ON/OFF Power

### 5.5.1 Transmit OFF Power

#### 5.5.1.1 Definition and applicability

Transmit OFF power is defined as the RRC filtered mean power when the transmitter is off. The transmit OFF power state is when the UE does not transmit or during periods when the UE is not transmitting DPCCH due to discontinuous uplink DPCCH transmission During transmission gaps in UL compressed mode, the UE is not considered to be in the OFF state.

The requirements and this test apply to all types of UTRA for the FDD UE.

#### 5.5.1.2 Minimum Requirements

The requirement for the transmit OFF power shall be less than -56 dBm.

The normative reference for this requirement is TS 25.101 [1] clause 6.5.1.1.

#### 5.5.1.3 Test purpose

To verify that the UE transmit OFF power is less than -56 dBm.

An excess transmit OFF power increases the interference to other channels, and decreases the system capacity.

#### 5.5.1.4 Method of test

This test is covered by clause 5.5.2 Transmit ON/OFF Time mask.

#### 5.5.1.5 Test requirements

The measured RRC filtered mean power shall be less than -55 dBm.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.5.2 Transmit ON/OFF Time mask

#### 5.5.2.1 Definition and applicability

The time mask for transmit ON/OFF defines the ramping time allowed for the UE between transmit OFF power and transmit ON power. Possible ON/OFF scenarios for release 99 and release 4 only are PRACH, CPCH or uplink compressed mode. For release 5 and later the possible ON/OFF scenarios are PRACH, discontinuous uplink DPCCH transmission or uplink compressed mode.

The requirements and this test apply to all types of UTRA for the FDD UE.

#### 5.5.2.2 Minimum requirements

The mean power of successive slots shall be calculated according to figure 5.5.1 for PRACH preambles, figure 5.5.1A for discontinuous uplink DPCCH transmission and figure 5.5.2 for all other cases. The off signal is defined as the RRC filtered mean power.



Figure 5.5.1: Transmit ON/OFF template for PRACH preambles



Figure 5.5.1A: Transmit ON/OFF template for discontinuous uplink DPCCH transmission



Figure 5.5.2: Transmit ON/OFF template for all other On/Off cases

OFF Power is defined in clause 5.5.1.2.

ON power is defined as the mean power. The specification depends on each possible case.

- First preamble of PRACH: Open loop accuracy (table 5.4.1.1).

- During preamble ramping of the RACH and between final RACH preamble and RACH message part: Accuracy depending on size of the required power difference (table 5.5.2.1).

- After transmission gap due to discontinuous uplink DPCCH transmission: Accuracy as in table 5.5.2.1A.

- After transmission gaps in compressed mode: Accuracy as in table 5.7.1.

- Power step to Maximum Power: Maximum power accuracy (table 5.2.1).

Table 5.5.2.1: Transmitter power difference tolerance for RACH preamble ramping,  
and between final RACH preamble and RACH message part

|  |  |
| --- | --- |
| Power difference size  P [dB] | Transmitter power difference tolerance [dB] |
| 0 | 1 |
| 1 | 1 |
| 2 | 1.5 |
| 3 | 2 |
| 4 £ P £ 10 | 2.5 |
| 11 £ P £ 15 | 3.5 |
| 16 £ P £ 20 | 4.5 |
| 21 £ P | 6.5 |

Table 5.5.2.1A: Transmitter power difference tolerance after a gap of up to 10 sub-frames due to discontinuous uplink DPCCH transmission

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Last TPC\_cmd | Transmitter power step tolerance after discontinuous UL DPCCH transmission gap | | | | | |
| 1 dB step size | | 2 dB step size | | 3 dB step size | |
| Lower | Upper | Lower | Upper | Lower | Upper |
| +1 | -2 dB | +4 dB | -1 dB | +5 dB | 0 dB | +6 dB |
| 0 | -3 dB | +3 dB | -3 dB | +3 dB | -3 dB | +3 dB |
| -1 | -4 dB | +2 dB | -5 dB | +1 dB | -6 dB | 0 dB |

The reference for this requirement is TS 25.101 [1] clause 6.5.2.1.

This is tested using PRACH operation.

#### 5.5.2.3 Test purpose

To verify that the power ON/OFF ratio of the PRACH shown in figure 5.5.1 meets the requirements given in 5.5.2.2.

Transmission of the wrong power increases interference to other channels, or increases transmission errors in the uplink's own channel.

NOTE: The test case covers only the PRACH scenario.

#### 5.5.2.4 Method of test

5.5.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) Channel conditions are initially set up with received CPICH\_RSCP >-85 dBm. The relative power level of downlink physical channels to Ior are set up according to clause E.2.1. The parameter settings of the cell are set up according to table 5.5.2.1A.

3) Switch on the phone.

4) After the UE has performed registration and entered idle mode, Îor is set up according to table 5.5.2.2. The relative power level of downlink physical channels to Ior are set up according to clause E.2.1

5) A call is set up according to the Generic call setup procedure, in [3] clause 7.3.1 with channel conditions according the test parameters in table 5.5.2.3.

The RACH procedure within the call setup is used for the test. The number of the available subchannels should be limited to one. This ensures that the preamble sequence is known to the SS. The preamble retransmission shall be at least 3. The power ramping step size shall be 1 dB. Note that the maximum number of preamble retransmissions is limited to 5 due to the fact that the commanded uplink power exceeds the allowed uplink power of more than 6 dB. The SS shall not send either an ACK or a NACK.

Table 5.5.2.1A: Settings for the serving cell

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Cell 1 | | | |
| Power class 1 | Power class 2 | Power class 3 | Power class 4 |
| Cell type |  | Serving cell | | | |
| UTRA RF Channel Number |  | Channel 1 | | | |
| Qqualmin | dB | -24 | | | |
| Qrxlevmin | dBm | -115 | | | |
| UE\_TXPWR\_MAX\_RACH | dBm | 33 | 27 | 24 | 21 |

Table 5.5.2.2: Test parameters for Transmit ON/OFF Time mask (UE)

|  |  |  |
| --- | --- | --- |
| Parameter | Level / Status | Unit |
| Îor | See table 5.5.2.3 | dBm / 3,84 MHz |

Table 5.5.2.3: Test parameters for Transmit ON/OFF Time mask (SS)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | | Power Class 1 | Power Class 2 | Power Class 3 | Power Class 4 | Unit |
| Îor (note 1) | | <REFÎor> | <REFÎor> | <REFÎor> | <REFÎor> | dBm / 3,84 MHz |
| CPICH\_RSCP (notes 1 and 2) | | <REFÎor> + CPICH\_Ec / Ior | <REFÎor> + CPICH\_Ec / Ior | <REFÎor> + CPICH\_Ec / Ior | <REFÎor> + CPICH\_Ec / Ior | dBm |
| Primary CPICH DL TX power | | +19 | +19 | +19 | +19 | dBm |
| Simulated path loss = Primary CPICH DL TX power - CPICH\_RSCP | Band I, IV, VI, X, XIX, XI, XXI | 128.9 | 128.9 | 128.9 | 128.9 | dB |
| Band II, V, VII | 126.9 | 126.9 | 126.9 | 126.9 |
| Band III, VIII, XII, XIII, XIV, XX, XXII | 125.9 | 125.9 | 125.9 | 125.9 |
| Band IX | 127.9 | 127.9 | 127.9 | 127.9 |
|  | Band XXV, XXVI | 125.4 | 125.4 | 125.4 | 125.4 |  |
| UL interference | Band I, IV, VI, X, XIX, XI, XXI | -86 | -92 | -95 | -98 | dBm |
| Band II, V, VII | -84 | -90 | -93 | -96 |
| Band III, VIII, XII, XIII, XIV, XX, XXII | -83 | -89 | -92 | -95 |
| Band IX | -85 | -91 | -94 | -97 |
|  | Band XXV, XXVI | -83 | -89 | -92 | -95 |  |
| Constant Value | | -10 | -10 | -10 | -10 | dB |
| Expected nominal UE TX power for all bands except bands XXV and XXVI (note 3) | | +32.9 | +26.9 | +23.9 | +20.9 | dBm |
| Expected nominal UE TX power for bands XXV and XXVI (note 3) | | +32.4 | +26.4 | +23.4 | +20.4 |  |
| NOTE 1: <REFÎor> is specified in Table 6.2.2, and CPICH\_Ec / Ior is specified in Table E.2.2. The power level of S-CCPCH should be defined because S-CCPCH is transmitted during Preamble RACH transmission period. The power level of S-CCPCH is set to -5.3 dB relative to Ior.  NOTE 2: The purpose of this parameter is to calculate the Expected nominal UE TX power.  NOTE 3: The Expected nominal UE TX power is calculated by using the equation in the clause 8.5.7 Open Loop Power Control of TS 25.331 [8]. | | | | | | |

5.5.2.4.2 Procedure

1) Set the TX output level of the SS to obtain Îor at the UE antenna connector and select the test parameters of table 5.5.2.3 according to the power class. Îor shall be according to table 5.5.2.3.

2) Measure the mean power (ON power) of the UE on the first PRACH preamble according to the timing in figure 5.5.1.

3) Measure the RRC filtered mean power (OFF power) in a 2368 chip time interval before a transient period of 25 µs (96 chips) prior to a RACH preamble (ON power). Measure the RRC filtered mean power (OFF power) in a 2368 chip time interval after a transient period of 25 µs (96 chips) after a RACH preamble (ON power). Due to the dynamic range between the ON and OFF power measurements, the OFF power measurements can be made on subsequent PRACH preambles rather than adjacent to the first PRACH preamble.

#### 5.5.2.5 Test requirements

The deviation with respect to the Expected nominal UE TX power (table 5.5.2.3), derived in step 2), shall not exceed the prescribed upper tolerance in table 5.2.2 (clause 5.2.5) and lower tolerance in table 5.4.1.4. (clause 5.4.1.5) for the first PRACH preamble.

The measured RRC filtered mean power, derived in step 3), shall be less than -55 dBm. (clause 5.5.1.5).

## 5.6 Change of TFC

### 5.6.1 Definition and applicability

A change of TFC (Transport Format Combination) in uplink means that the power in the uplink varies according to the change in data rate. DTX, where the DPDCH is turned off, is a special case of variable data, which is used to minimise the interference between UE(s) by reducing the UE transmit power when voice, user or control information is not present.

The requirements and this test apply to all types of UTRA for the FDD UE.

### 5.6.2 Minimum requirements

A change of output power is required when the TFC, and thereby the data rate, is changed. The ratio of the amplitude between the DPDCH codes and the DPCCH code will vary. The power step due to a change in TFC shall be calculated in the UE so that the power transmitted on the DPCCH shall follow the inner loop power control. The step in total transmitted power (DPCCH + DPDCH) shall then be rounded to the closest integer dB value. A power step exactly half-way between two integer values shall be rounded to the closest integer of greater magnitude. The accuracy of the power step, given the step size is specified in table 5.6.1. The power change due to a change in TFC is defined as the relative power difference between the mean power of the original (reference) timeslot and the mean power of the target timeslot, not including the transient duration. The transient duration is from 25 ms before the slot boundary to 25 ms after the slot boundary.

Table 5.6.1: Transmitter power step tolerance

|  |  |
| --- | --- |
| Power control step size (Up or down) P [dB] | Transmitter power step tolerance [dB] |
| 0 | 0,5 |
| 1 | 0,5 |
| 2 | 1,0 |
| 3 | 1,5 |
| 4 £ P £ 10 | 2,0 |
| 11 £ P £ 15 | 3,0 |
| 16 £ P £ 20 | 4,0 |
| 21 £ P | 6,0 |

Clause C.2.1 defines the UL reference measurement channels (12,2 kbps) for TX test and the power ratio between DPCCH and DPDCH as -5,46 dB. Therefore, only one power control step size is selected as minimum requirement from table 5.6.1. The accuracy of the power step, given the step size is specified in table 5.6.2.

Table 5.6.2: Transmitter power step tolerance for test

|  |  |  |
| --- | --- | --- |
| Quantized amplitude ratios  bc and bd | Power control step size (Up or down) DP [dB] | Transmitter power step tolerance [dB] |
| bc = 0,5333, bd = 1,0 | 7 | 2 |

The mean power of successive slots shall be calculated according to figure 5.6.1.



Figure 5.6.1: Transmit template during TFC change

The UL reference measurement channel (12,2 kbps) is a fixed rate channel. Therefore, DTX, where the DPDCH is turned off, is tested, as shown in figure 5.6.2.



Figure 5.6.2: Transmit template during DTX

The reference for this requirement is TS 25.101 [1] clause 6.5.3.1.

### 5.6.3 Test purpose

To verify that the tolerance of power control step size does not exceed the described value shown in table 5.6.2.

To verify that the DTX ON/OFF power levels versus time meets the described mask shown in figure 5.6.2.

### 5.6.4 Method of test

5.6.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.6.4.2 Procedure

1) Set the power level of the UE to , 0 dBm  1 dB.

2) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

3) Measure the mean output power of the UE in two cases, both DPDCH and DPCCH are ON and only DPCCH is ON. The measurements shall not include the transient periods.

### 5.6.5 Test requirements

The difference in mean power between DPDCH ON and OFF, derived in step 3), shall not exceed the prescribed range in table 5.6.3.

Table 5.6.3: Transmitter power step tolerance for test

|  |  |  |
| --- | --- | --- |
| Quantized amplitude ratios  bc and bd | Power control step size (Up or down) DP [dB] | Transmitter power step tolerance [dB] |
| bc = 0,5333, bd = 1,0 | 7 | 2.3 |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.6AA Change of TFC for OLTD

### 5.6AA.1 Definition and applicability

A change of TFC (Transport Format Combination) in uplink means that the power in the uplink varies according to the change in data rate. DTX, where the DPDCH is turned off, is a special case of variable data, which is used to minimise the interference between UE(s) by reducing the UE transmit power when voice, user or control information is not present.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that support UL OLTD.

### 5.6AA.2 Minimum requirements

A change of output power is required when the TFC, and thereby the data rate, is changed. The ratio of the amplitude between the DPDCH codes and the DPCCH code will vary. The power step due to a change in TFC shall be calculated in the UE so that the power transmitted on the DPCCH shall follow the inner loop power control. The step in total transmitted power (DPCCH + S-DPCCH + DPDCH for UE configured in UL OLTD) shall then be rounded to the closest integer dB value. A power step exactly half-way between two integer values shall be rounded to the closest integer of greater magnitude. The accuracy of the power step, given the step size, is specified in Table 5.6AA.1 at each transmit antenna connector. The power change at each transmit antenna connector due to a change in TFC is defined as the relative power difference between the mean power of the original (reference) timeslot and the mean power of the target timeslot, not including the transient duration. The transient duration is from 25s before the slot boundary to 25s after the slot boundary.

Table 5.6AA.1: Transmitter power step tolerance

|  |  |
| --- | --- |
| Power control step size (Up or down) P [dB] | Transmitter power step tolerance [dB] |
| 0 | 0,5 |
| 1 | 0,5 |
| 2 | 1,0 |
| 3 | 1,5 |
| 4 £ P £ 10 | 2,0 |
| 11 £ P £ 15 | 3,0 |
| 16 £ P £ 20 | 4,0 |
| 21 £ P | 6,0 |

Clause [FFS] defines the UL reference measurement channels for TX test and the power ratio between DPCCH and DPDCH as [FFS]. Therefore, only one power control step size is selected as minimum requirement from table 5.6AA.1. The accuracy of the power step, given the step size is specified in table 5.6AA.2.

Table 5.6AA.2: Transmitter power step tolerance for test

|  |  |  |
| --- | --- | --- |
| Quantized amplitude ratios  bc and bd | Power control step size (Up or down) DP [dB] | Transmitter power step tolerance [dB] |
| bc = 0,5333, bd = 1,0 | 7 | 2 |

The mean power of successive slots shall be calculated according to figure 5.6AA.1.



Figure 5.6AA.1: Transmit template during TFC change

The UL reference measurement channel (12,2 kbps) is a fixed rate channel. Therefore, DTX, where the DPDCH is turned off, is tested, as shown in figure 5.6AA.2.



Figure 5.6AA.2: Transmit template during DTX

The reference for this requirement is TS 25.101 [1] clause 6.5.3.1A.

### 5.6AA.3 Test purpose

To verify that the tolerance of power control step size does not exceed the described value shown in table 5.6AA.2.

To verify that the DTX ON/OFF power levels versus time meets the described mask shown in figure 5.6AA.2.

### 5.6AA.4 Method of test

#### 5.6AA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.18. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

#### 5.6AA.4.2 Procedure

1) Set the power level of the UE to , 0 dBm  1 dB.

2) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

3) Measure the mean output power of the UE in two cases, when all DPDCH, S-DPCCH and DPCCH are ON and when only DPCCH is ON. The measurements shall not include the transient periods.

### 5.6AA.5 Test requirements

The difference in mean power between DPDCH ON and OFF, derived in step 3), shall not exceed the prescribed range in table 5.6AA.3.

Table 5.6AA.3: Transmitter power step tolerance for test

|  |  |  |
| --- | --- | --- |
| Quantized amplitude ratios  bc and bd | Power control step size (Up or down) DP [dB] | Transmitter power step tolerance [dB] |
| bc = 0,5333, bd = 1,0 | 7 | 2.3 |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.3.

## 5.6AB Void

## 5.6AC Void

## 5.7 Power setting in uplink compressed mode

### 5.7.1 Definition and applicability

Compressed mode in uplink means that the power in uplink is changed.

The requirements and this test apply to all types of UTRA for the FDD UE that support UL or combined UL/DL compressed modes.

### 5.7.2 Minimum requirements

A change of output power is required during uplink compressed frames since the transmission of data is performed in a shorter interval. The ratio of the amplitude between the DPDCH codes and the DPCCH code will also vary. The power step due to compressed mode shall be calculated in the UE so that the energy transmitted on the pilot bits during each transmitted slot shall follow the inner loop power control.

Thereby, the power during compressed mode, and immediately afterwards, shall be such that the mean power of the DPCCH follows the steps due to inner loop power control combined with additional steps of 10Log10(Npilot.prev / Npilot.curr) dB where Npilot.prev is the number of pilot bits in the previously transmitted slot, and Npilot.curr is the current number of pilot bits per slot.

The resulting step in total transmitted power (DPCCH +DPDCH) shall then be rounded to the closest integer dB value. A power step exactly half-way between two integer values shall be rounded to the closest integer of greatest magnitude. The accuracy of the power step, given the step size, is specified in table 5.6.1 in clause 5.6.2. The power step is defined as the relative power difference between the mean power of the original (reference) timeslot and the mean power of the target timeslot, when neither the original timeslot nor the reference timeslot are in a transmission gap. The transient duration is not included, and is from 25 ms before the slot boundary to 2 5ms after the slot boundary.

In addition to any power change due to the ratio Npilot.prev / Npilot.curr, the mean power of the DPCCH in the first slot after a compressed mode transmission gap shall differ from the mean power of the DPCCH in the last slot before the transmission gap by an amount DRESUME, where DRESUME is calculated as described in clause 5.1.2.3 of TS 25.214 [5].

The resulting difference in the total transmitted power (DPCCH + DPDCH) shall then be rounded to the closest integer dB value. A power difference exactly half-way between two integer values shall be rounded to the closest integer of greatest magnitude. The accuracy of the resulting difference in the total transmitted power (DPCCH + DPDCH) after a transmission gap of up to 14 slots shall be as specified in table 5.7.1.

Table 5.7.1: Transmitter power difference tolerance after a transmission gap of up to 14 slots

|  |  |
| --- | --- |
| Power difference (Up or down)  P [dB] | Transmitter power step tolerance after a transmission gap [dB] |
| P  2 | ±3 |
| 3 | ±3 |
| 4 P  10 | ±3.5 |
| 11 P  15 | ±4 |
| 16 P 20 | ±4.5 |
| 21 P | ±6.5 |

The power difference is defined as the difference between the mean power of the original (reference) timeslot before the transmission gap and the mean power of the target timeslot after the transmission gap, not including the transient durations. The transient durations at the start and end of the transmission gaps are each from 25 ms before the slot boundary to 25 ms after the slot boundary.

The mean power of successive slots shall be calculated according to figure 5.7.1.

The reference for this requirement is TS 25.101 [1], clause 6.5.4.1.



Figure 5.7.1: Transmit template during Compressed mode

For RPL (Recovery Period Length) slots after the transmission gap, where RPL is the minimum out of the transmission gap length and 7 slots, the UE shall use the power control algorithm and step size specified by the signalled Recovery Period Power Control Mode (RPP), as detailed in TS 25.214 [5] clause 5.1.2.3.

When nominal 3 dB power control steps are used in the recovery period, the transmitter mean power steps due to inner loop power control shall be within the range shown in table 5.7.2, and the transmitter aggregate mean power step due to inner loop power control shall be within the range shown in table 5.7.3, excluding any other power changes due, for example, to changes in spreading factor or number of pilot bits.

Table 5.7.2: Transmitter power control range for 3dB step size

|  |  |  |
| --- | --- | --- |
| TPC\_cmd | Transmitter power control range for 3dB step size | |
|  | Lower | Upper |
| +1 | +1,5 dB | +4,5 dB |
| 0 | -0,5 dB | +0,5 dB |
| -1 | -1,5 dB | -4,5 dB |

Table 5.7.3: Transmitter aggregate power control range for 3dB step size

|  |  |  |
| --- | --- | --- |
| TPC\_cmd group | Transmitter power control range  after 7 equal TPC\_cmd groups | |
|  | Lower | Upper |
| +1 | +16 dB | +26 dB |
| 0 | -1 dB | +1 dB |
| -1 | -16 dB | -26 dB |

The reference for this requirement is TS 25.101 [1] clause 6.4.2.1.1.

### 5.7.3 Test purpose

To verify that the changes in uplink transmit power in compressed mode are within the prescribed tolerances.

Excess error in transmit power setting in compressed mode increases the interference to other channels, or increases transmission errors in the uplink.

### 5.7.4 Method of test

5.7.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2. The 12,2 kbps UL reference measurement channel is used, with gain factors bc = 0,5333 and bd = 1,0 in non-compressed frames. Slot formats 0 and 0B are used on the uplink DPCCH.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.7.4.2 Procedure

NOTE: CFNs are given in this procedure for reference as examples only. A fixed offset may be applied to the CFNs.

1) Before proceeding with step (3) below, set the output power of the UE to be in the range -36 ± 9 dBm. This may be achieved by setting the downlink signal (Îor) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

2) Transmit the PHYSICAL CHANNEL RECONFIGURATION message to set the uplink power control parameters to use Algorithm 1 and a step size of 2 dB, and to set the compressed mode parameters shown in table 5.7.5. The contents of the message are specified in table 5.7.9. This set of compressed mode parameters defines the compressed mode pattern which is used to test the implementation of:

a) in steps (3) and (4), upward 3 dB output power steps and the implementation of a downward power change when resuming transmission after a compressed mode gap, and

b) in steps (7) and (8), downward 3dB output power steps and the implementation of an upward power change when resuming transmission after a compressed mode gap.

Table 5.7.5: Parameters for pattern A for compressed mode test

|  |  |  |
| --- | --- | --- |
| Parameter | Meaning | Value |
| TGPRC | Number of transmission gap patterns within the Transmission Gap Pattern Sequence | 1 |
| TGCFN | Connection Frame Number of the first frame of the first pattern within the Transmission Gap Pattern Sequence | 0 |
| TGSN | Slot number of the first transmission gap slot within the TGCFN | 2 |
| TGL1 | Length of first transmission gap within the transmission gap pattern | 7 slots |
| TGL2 | Length of second transmission gap within the transmission gap pattern | 7 slots |
| TGD | Duration between the starting slots of two consecutive transmission gaps within a transmission gap pattern | 15 slots |
| TGPL1 | Duration of transmission gap pattern 1 | 3 frames |
| TGPL2 | Duration of transmission gap pattern 2 | R99 and Rel-4: Omit  Rel-5 and later releases:  Not applicable |
| RPP | Recovery Period Power Control Mode | Mode 1 |
| ITP | Initial Transmit Power Mode | Mode 1 |
| UL/DL Mode | Defines whether UL only or combined UL/DL compressed mode is used | UL only or UL/DL |
| Downlink Compressed Mode Method | Method for generating downlink compressed mode gap | SF/2 |
| Uplink Compressed Mode Method | Method for generating uplink compressed mode gap | SF/2 |
| Scrambling code change | Indicates whether the alternative scrambling code is used | No code change |
| Downlink frame type | Downlink compressed frame structure | A |
| DeltaSIR | Delta in DL SIR target value to be set in the UE during compressed frames | 0 |
| DeltaSIRafter | Delta in DL SIR target value to be set in the UE one frame after the compressed frames | 0 |

The resulting compressed mode pattern is shown in figure 5.7.2.



Figure 5.7.2: Pattern A for compressed mode test

3) After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit TPC commands on the downlink as shown in table 5.7.6.

Table 5.7.6: TPC commands transmitted in downlink

|  |  |
| --- | --- |
| CFN | TPC commands in downlink |
| 0 | 0 1 - - - - - - - 1 1 1 1 1 1 |
| 1 | 1 1 - - - - - - - 1 0 1 0 1 0 |
| 2 | 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 |

4) Measure the mean power in the following slots, not including the 25 ms transient periods at the start and end of each slot:  
  
CFN 0: Slots # 9,10,11,12,13,14  
CFN 1: Slots # 0,1,9

5) Re-start the test. Before proceeding with step (7) below, set the output power of the UE to be in the range 2 ± 9 dBm. This may be achieved by setting the downlink signal (Îor) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

6) Repeat step (2) above, with the exception that TGCFN = 3 in table 5.7.5 and table 5.7.9.

7) After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit TPC commands on the downlink as shown in table 5.7.7.

Table 5.7.7: TPC commands transmitted in downlink

|  |  |
| --- | --- |
| CFN | TPC commands in downlink |
| 3 | 0 1 - - - - - - - 0 0 0 0 0 0 |
| 4 | 0 0 - - - - - - - 0 1 0 1 0 1 |
| 5 | 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 |

8) Measure the mean power in the following slots, not including the 25 ms transient periods at the start and end of each slot:  
  
CFN 3: Slots # 9,10,11,12,13,14  
CFN 4: Slots # 0,1,9

9) Re-start the test. Before proceeding with step (11) below, set the output power of the UE to be in the range -10 ± 9 dBm. This may be achieved by setting the downlink signal (Îor) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

10) Transmit the PHYSICAL CHANNEL RECONFIGURATION message to set the uplink power control parameters to use Algorithm 1 and a step size of 1 dB, and to set the compressed mode parameters shown in table 5.7.8. The contents of the message are specified in table 5.7.10. This set of compressed mode parameters defines the compressed mode pattern which is used to test the implementation of power steps at the start and end of compressed frames, and the implementation of a zero power change when resuming transmission after a compressed mode gap.

Table 5.7.8: Parameters for pattern B for compressed mode test

|  |  |  |
| --- | --- | --- |
| Parameter | Meaning | Value |
| TGPRC | Number of transmission gap patterns within the Transmission Gap Pattern Sequence | 1 |
| TGCFN | Connection Frame Number of the first frame of the first pattern within the Transmission Gap Pattern Sequence | 7 |
| TGSN | Slot number of the first transmission gap slot within the TGCFN | 8 |
| TGL1 | Length of first transmission gap within the transmission gap pattern | 14 slots |
| TGL2 | Length of second transmission gap within the transmission gap pattern | omit |
| TGD | Duration between the starting slots of two consecutive transmission gaps within a transmission gap pattern | UNDEFINED |
| TGPL1 | Duration of transmission gap pattern 1 | 4 frames |
| TGPL2 | Duration of transmission gap pattern 2 | R99 and Rel-4: Omit  Rel-5 and later releases:  Not applicable |
| RPP | Recovery Period Power Control Mode | Mode 0 |
| ITP | Initial Transmit Power Mode | Mode 0 |
| UL/DL Mode | Defines whether UL only or combined UL/DL compressed mode is used | UL only or UL/DL |
| Downlink Compressed Mode Method | Method for generating downlink compressed mode gap | SF/2 |
| Uplink Compressed Mode Method | Method for generating uplink compressed mode gap | SF/2 |
| Scrambling code change | Indicates whether the alternative scrambling code is used | No code change |
| Downlink frame type | Downlink compressed frame structure | A |
| DeltaSIR | Delta in DL SIR target value to be set in the UE during compressed frames | 0 |
| DeltaSIRafter | Delta in DL SIR target value to be set in the UE one frame after the compressed frames | 0 |

The resulting compressed mode pattern is shown in figure 5.7.3.



Figure 5.7.3: Pattern B for compressed mode test

11) After the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message from the UE is received, transmit TPC commands on the downlink as shown in table 5.7.8.

Table 5.7.8: TPC commands transmitted in downlink

|  |  |
| --- | --- |
| CFN | TPC commands in downlink |
| 6 | 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 |
| 7 | 1 1 1 1 1 1 1 1 - - - - - - - |
| 8 | - - - - - - - 0 0 0 0 0 0 0 0 |
| 9 | 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 |

12) Measure the mean power in the following slots, not including the 25 ms transient periods at the start and end of each slot:  
  
CFN 6: Slot # 14  
CFN 7: Slots # 0 and 7  
CFN 8: Slots # 7 and 14  
CFN 9: Slot # 0

Table 5.7.9: PHYSICAL CHANNEL RECONFIGURATION message (step 2)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Message Type |  |  |
| UE Information Elements |  |  |
| -RRC transaction identifier | 0 |  |
| -Integrity check info |  |  |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |  |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |  |
| -Integrity protection mode info | Not Present |  |
| -Ciphering mode info | Not Present |  |
| -Activation time | Not Present |  |
| -New U-RNTI | Not Present |  |
| -New C-RNTI | Not Present |  |
| -RRC State Indicator | CELL\_DCH |  |
| -UTRAN DRX cycle length coefficient | Not Present |  |
| CN Information Elements |  |  |
| -CN Information info | Not Present |  |
| UTRAN mobility information elements |  |  |
| -URA identity | Not Present |  |
| RB information elements |  |  |
| -Downlink counter synchronisation info | Not Present |  |
| PhyCH information elements |  |  |
| -Frequency info | Not Present |  |
| Uplink radio resources |  |  |
| -Maximum allowed UL TX power | Not Present |  |
| -CHOICE channel requirement | Uplink DPCH info |  |
| -Uplink DPCH power control info |  |  |
| -CHOICE mode | FDD |  |
| -DPCCH Power offset | -40 (-80dB) |  |
| -PC Preamble | 1 frame |  |
| -SRB delay | 7 frames |  |
| -Power Control Algorithm | Algorithm 1 |  |
| -TPC step size | 2dB |  |
| -CHOICE mode | FDD |  |
| -Scrambling code type | Long |  |
| -Scrambling code number | 0 |  |
| -Number of DPDCH | 1 |  |
| -spreading factor | 64 |  |
| -TFCI existence | TRUE |  |
| -Number of FBI bits | Not Present(0) |  |
| -Puncturing Limit | 1 |  |
| Downlink radio resources |  |  |
| -CHOICE mode | FDD |  |
| -Downlink PDSCH information | Not Present | R99 and Rel-4 only |
| -Downlink information common for all radio links |  |  |
| -Downlink DPCH info common for all RL | Not Present |  |
| -CHOICE mode | FDD |  |
| -DPCH compressed mode info |  |  |
| -Transmission gap pattern sequence |  |  |
| -TGPSI | 1 |  |
| -TGPS Status Flag | Activate |  |
| -TGCFN | 0 |  |
| -Transmission gap pattern sequence configuration parameters |  |  |
| -TGMP | FDD measurement |  |
| -TGPRC | 1 |  |
| -TGSN | 2 |  |
| -TGL1 | 7 |  |
| -TGL2 | 7 |  |
| -TGD | 15 |  |
| -TGPL1 | 3 |  |
| -TGPL2 | Not Present | R99 and Rel-4 only |
| -RPP | Mode 1 |  |
| -ITP | Mode 1 |  |
| -CHOICE UL/DL mode | UL only or UL and DL, depending on UE capability |  |
| -Downlink compressed mode method | SF/2 or Not present depending on UE capability |  |
| -Uplink compressed mode method | SF/2 |  |
| -Downlink frame type | A |  |
| -DeltaSIR1 | 0 |  |
| -DeltaSIRafter1 | 0 |  |
| -DeltaSIR2 | Not Present |  |
| -DeltaSIRafter2 | Not Present |  |
| -N Identify abort | Not Present |  |
| -T Reconfirm abort | Not Present |  |
| -TX Diversity Mode | Not Present |  |
| -SSDT information | Not Present | R99 and Rel-4 only |
| -Default DPCH Offset Value | Not Present |  |
| -Downlink information per radio link list |  |  |
| - Downlink information for each radio link |  |  |
| -Choice mode | FDD |  |
| -Primary CPICH info |  |  |
| -Primary scrambling code | 100 |  |
| -PDSCH with SHO DCH Info | Not Present | R99 and Rel-4 only |
| -PDSCH code mapping | Not Present | R99 and Rel-4 only |
| -Downlink DPCH info for each RL |  |  |
| -CHOICE mode | FDD |  |
| -Primary CPICH usage for channel estimation | Primary CPICH may be used |  |
| -DPCH frame offset | Set to value Default DPCH Offset Value ( as currently stored in SS) mod 38400 |  |
| -Secondary CPICH info | Not Present |  |
| -DL channelisation code |  |  |
| -Secondary scrambling code | Not Present |  |
| -Spreading factor | 128 |  |
| -Code number | 96 |  |
| -Scrambling code change | No code change |  |
| -TPC combination index | 0 |  |
| -SSDT Cell Identity | Not Present | R99 and Rel-4 only |
| -Closed loop timing adjustment mode | Not Present |  |
| -SCCPCH Information for FACH | Not Present |  |

Table 5.7.10: PHYSICAL CHANNEL RECONFIGURATION message (step 10)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Message Type |  |  |
| UE Information Elements |  |  |
| -RRC transaction identifier | 0 |  |
| -Integrity check info |  |  |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |  |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |  |
| -Integrity protection mode info | Not Present |  |
| -Ciphering mode info | Not Present |  |
| -Activation time | Not Present |  |
| -New U-RNTI | Not Present |  |
| -New C-RNTI | Not Present |  |
| -RRC State Indicator | CELL\_DCH |  |
| -UTRAN DRX cycle length coefficient | Not Present |  |
| CN Information Elements |  |  |
| -CN Information info | Not Present |  |
| UTRAN mobility information elements |  |  |
| -URA identity | Not Present |  |
| RB information elements |  |  |
| -Downlink counter synchronisation info | Not Present |  |
| PhyCH information elements |  |  |
| -Frequency info | Not Present |  |
| Uplink radio resources |  |  |
| -Maximum allowed UL TX power | Not Present |  |
| -CHOICE channel requirement | Uplink DPCH info |  |
| -Uplink DPCH power control info |  |  |
| -CHOICE mode | FDD |  |
| -DPCCH Power offset | -40 (-80dB) |  |
| -PC Preamble | 1 frame |  |
| -SRB delay | 7 frames |  |
| -Power Control Algorithm | Algorithm 1 |  |
| -TPC step size | 1dB |  |
| -CHOICE mode | FDD |  |
| -Scrambling code type | Long |  |
| -Scrambling code number | 0 |  |
| -Number of DPDCH | 1 |  |
| -spreading factor | 64 |  |
| -TFCI existence | TRUE |  |
| -Number of FBI bits | Not Present(0) |  |
| -Puncturing Limit | 1 |  |
| Downlink radio resources |  |  |
| -CHOICE mode | FDD |  |
| -Downlink PDSCH information | Not Present | R99 and Rel-4 only |
| -Downlink information common for all radio links |  |  |
| -Downlink DPCH info common for all RL | Not Present |  |
| -CHOICE mode | FDD |  |
| -DPCH compressed mode info |  |  |
| -Transmission gap pattern sequence |  |  |
| -TGPSI | 1 |  |
| -TGPS Status Flag | Activate |  |
| -TGCFN | 7 |  |
| -Transmission gap pattern sequence configuration parameters |  |  |
| -TGMP | FDD measurement |  |
| -TGPRC | 1 |  |
| -TGSN | 8 |  |
| -TGL1 | 14 |  |
| -TGL2 | Not Present |  |
| -TGD | UNDEFINED |  |
| -TGPL1 | 4 |  |
| -TGPL2 | Not Present | R99 and Rel-4 only |
| -RPP | Mode 0 |  |
| -ITP | Mode 0 |  |
| -CHOICE UL/DL mode | UL only or UL and DL, depending on UE capability |  |
| -Downlink compressed mode method | SF/2 or Not present depending on UE capability |  |
| -Uplink compressed mode method | SF/2 |  |
| -Downlink frame type | A |  |
| -DeltaSIR1 | 0 |  |
| -DeltaSIRafter1 | 0 |  |
| -DeltaSIR2 | Not Present |  |
| -DeltaSIRafter2 | Not Present |  |
| -N Identify abort | Not Present |  |
| -T Reconfirm abort | Not Present |  |
| -TX Diversity Mode | Not Present |  |
| -SSDT information | Not Present | R99 and Rel-4 only |
| -Default DPCH Offset Value | Not Present |  |
| -Downlink information per radio link list |  |  |
| - Downlink information for each radio link |  |  |
| -Choice mode | FDD |  |
| -Primary CPICH info |  |  |
| -Primary scrambling code | 100 |  |
| -PDSCH with SHO DCH Info | Not Present | R99 and Rel-4 only |
| -PDSCH code mapping | Not Present | R99 and Rel-4 only |
| -Downlink DPCH info for each RL |  |  |
| -CHOICE mode | FDD |  |
| -Primary CPICH usage for channel estimation | Primary CPICH may be used |  |
| -DPCH frame offset | Set to value Default DPCH Offset Value ( as currently stored in SS) mod 38400 |  |
| -Secondary CPICH info | Not Present |  |
| -DL channelisation code |  |  |
| -Secondary scrambling code | Not Present |  |
| -Spreading factor | 128 |  |
| -Code number | 96 |  |
| -Scrambling code change | No code change |  |
| -TPC combination index | 0 |  |
| -SSDT Cell Identity | Not Present | R99 and Rel-4 only |
| -Closed loop timing adjustment mode | Not Present |  |
| -SCCPCH Information for FACH | Not Present |  |

### 5.7.5 Test requirements

For ease of reference, the following uplink output power measurements are defined in figure 5.7.4. In this figure:

- Pg is the RRC filtered mean power in an uplink transmission gap, excluding the 25 ms transient periods.

- Pa is the mean power in the last slot before a compressed frame (or pair of compressed frames), excluding the 25 ms transient periods.

- Pb is the mean power in the first slot of a compressed frame, excluding the 25 ms transient periods.

- Pc is the mean power in the last slot before a transmission gap, excluding the 25 ms transient periods.

- Pd is the mean power in the first slot after a transmission gap, excluding the 25 ms transient periods.

- Pe is the mean power in the last slot of a compressed frame, excluding the 25 ms transient periods.

- Pf is the mean power in the first slot after a compressed frame (or pair of compressed frames), excluding the  
25 ms transient periods.



Figure 5.7.4: Uplink transmit power in uplink compressed mode

1. At the boundary between CFN 6 and CFN 7, Pb - Pa shall be within the range +4 ± 2.3 dB.

2. In slot #9 of CFN 1, the power difference Pd - Pc from the power in slot #1 of CFN 1 shall be within the range ‑11 ± 4.3 dB.

3. In slot #9 of CFN 4, the power difference Pd - Pc from the power in slot #1 of CFN 4 shall be within the range +11 ± 4.3 dB.

4. In slot #7 of CFN 8, the power difference Pd - Pc from the power in slot #7 of CFN 7 shall be within the range 0 ± 3.2 dB.

5. (void)

6. At the boundary between CFN 8 and CFN 9, Pf - Pe shall be within the range -4 ± 2.3 dB.

7. In the slots between slot #10 of CFN 0 and slot #1 of CFN 1 inclusive, the change in mean power from the previous slot shall be within the range given in table 5.7. 11 for TPC\_cmd = +1.

8. The aggregate change in mean power from slot #9 of CFN 0 to slot #1 of CFN 1 shall be within the range given in table 5.7. 12 for TPC\_cmd = +1.

9. In the slots between slot #10 of CFN 3 and slot #1 of CFN 4 inclusive, the change in mean power from the previous slot shall be within the range given in table 5.7. 11 for TPC\_cmd = -1.

10. The aggregate change in mean power from slot #9 of CFN 3 to slot #1 of CFN 4 shall be within the range given in table 5.7. 12 for TPC\_cmd = -1.

Table 5.7.11: Transmitter power control range for 3dB step size

|  |  |  |
| --- | --- | --- |
| TPC\_cmd | Transmitter power control range for 3dB step size | |
|  | Lower | Upper |
| +1 | +1,3 dB | +4,7 dB |
| 0 | -0,6 dB | +0,6 dB |
| -1 | -1,3 dB | -4,7 dB |

Table 5.7.12: Transmitter aggregate power control range for 3dB step size

|  |  |  |
| --- | --- | --- |
| TPC\_cmd group | Transmitter power control range after 7 equal TPC\_cmd groups | |
|  | Lower | Upper |
| +1 | +15,7dB | +26,3dB |
| 0 | -1,1dB | +1,1dB |
| -1 | -15,7dB | -26,3dB |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.7A HS-DPCCH power control

Editor’s notes:

- For a transition period unti Ran5#72, this test case in version 12.3.0 of 34.121-1 shall be used.

### 5.7A.1 Definition and applicability

The transmission of Ack/Nack or CQI over the HS-DPCCH may cause the transmission power in the uplink to vary. The ratio of the amplitude between the DPCCH and the Ack/Nack and CQI respectively is signalled by higher layers.

The requirements and this test apply for Release 5 and later releases to all types of UTRA for the FDD UE that support HSDPA.

### 5.7A.2 Minimum requirement

The nominal sum power on DPCCH+DPDCH is independent of the transmission of Ack/Nack and CQI unless the UE output power when Ack/Nack or CQI is transmitted would exceed the maximum value specified in Table 5.2A.1 or fall below the value specified in 5.4.3.2, whereupon the UE may then also apply additional scaling to the total transmit power as defined in section 5.1.2.6 of TS.25.214 [5].

The composite transmitted power (DPCCH + DPDCH+HS-DPCCH) may then also be rounded to the closest integer dB value. If rounding is done a power step exactly half-way between two integer values shall be rounded to the closest integer of greater magnitude.

The nominal power step due to transmission of Ack/Nack or CQI is defined as the difference between the nominal mean powers of two power evaluation periods either side of an HS-DPCCH boundary. The first evaluation period starts 25 s after a DPCCH slot boundary and ends 25s before the following HS-DPCCH slot boundary. The second evaluation period starts 25 s after the same HS-DPCCH slot boundary and ends 25 s before the following DPCCH slot boundary. This is described in figure 5.7A.1.



Figure 5.7A.1: Transmit power template during HS-DPCCH transmission

The tolerance of the power step due to transmission of the HS-DPCCH shall meet the requirements in table 5.7A.1. For each direction, up to 2 exceptions to the transmitter power step tolerance defined in table 5.7A.1 shall be allowed. The transmitter power control range for exceptions is defined in table 5.7A.2. Exceptions are applicable only if the change in UL power is measured per 1-dB step size.

Table 5.7A.1: Transmitter power step tolerance

|  |  |
| --- | --- |
| Power step size (Up or down)  P [dB] | Transmitter power step tolerance [dB] |
| 0 | ±0.5 |
| 1 | ±0.5 |
| 2 | ±1.0 |
| 3 | ±1.5 |
| 4  Δ P  7 | ±2.0 |

Table 5.7A.1AA: Transmitter power step tolerance for exceptions

|  |  |
| --- | --- |
| Nominal power step size (Up or down) P [dB] | Transmitter power step tolerance [dB] |
| 0 | +/- 0.5 |
| 1 | +/- 1.5 |
| 2 | +/- 1.5 |
| 3 | +/- 1.5 |
| 4  Δ P  7 | +/- 2.0 |

The normative reference for this requirement is TS 25.101 [1], clause 6.5.5.1.

### 5.7A.3 Test purpose

To verify that the changes in uplink transmit power when transmitting the HS-DPCCH (Ack/Nack and CQI) and the power between HS-DPCCH transmissions are within the allowed power step tolerances as shown in table 5.7A.2 and 5.7A.3. The test is carried out at max power with TPC\_cmd=1 and at a nominal power of 0 dBm at the minimum point of the 12ms transmit pattern (HS-DPCCH off).

### 5.7A.4 Method of test

5.7A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.7A.1A.

4) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.7A.1A: Settings for the serving cell during the measurement of HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.7A.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

5.7A.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values defined in table C.10.1.4 subtest 3 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms. The Uplink DPCH Power Control Info shall initially specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS to set the output power of the UE, measured at the UE antenna connector when the HS-DPCCH is not transmitted, to be in the range 0 dBm ± 2dB. This is a nominal setting and not part of the test requirements.

5) Figure 5.7A.2 shows the 12ms cycle created when using the TRANSPORT CHANNEL RECONFIGURATION message from Annex I with the test specific message content defined below and with TPC\_cmd=0. Measure the mean power during the half slot periods either side of the measurement points specified on figure 5.7A.2. The 25us transient periods at the end of each half slot period shall not be included. Measurement points 4, 8 and 11 are at the DPCCH slot boundaries just after and just before the HS-DPCCH transmission. Evaluate the difference in mean power to determine the power steps around the measurement points shown in Figure 5.7A.2. The power steps shall meet the test requirements in table 5.7A.2.

6) Reconfigure the uplink DPCH power control Info to use Algorithm 1 with 1 dB step size. Set and send continuously Up power control commands to the UE until the UE output power during HS-DPCCH ACK/NACK transmission reaches the maximum as defined in table 5.2A.1.

7) Figure 5.7A.3 shows the 12ms cycle created when using TPC\_cmd=1. Measure the mean power during the half slot periods either side of the measurement points specified on figure 5.7A.3. The 25us transient periods at the end of each half slot period shall not be included. Measurement points 5, 10 and 13 are at the DPCCH slot boundaries in between the HS-DPCCH transmissions. The last downward step prior to the HS-DPCCH transmission is not tested due to the accumulation of tolerances making the test requirement very wide. Evaluate the difference in mean power to determine the power steps around the measurement points shown in Figure 5.7A.3. The transmitter power steps shall meet the test requirements in table 5.7A.3, with upto two exceptions as defined in Table 5.7A.4 allowed for 1-dB step size in each direction.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I. The test specific content for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

|  |  |
| --- | --- |
| Information Element | Value/remark |
| - Ack-Nack repetition factor | 1 |
| - CQI repetition factor | 1 |

### 5.7A.5 Test requirements



Figure 5.7A.2: Transmit power template below max power with TPC\_cmd = 0



Figure 5.7A.3: Transmit power template at max power with TPC\_cmd = 1

The difference in mean power derived in steps 5) and 7), shall not exceed the allowed transmitter power step range in table 5.7A.2 and 5.7A.3 respectively.

The UL reference measurement channel for TX test will be set as defined in C.10.1 with the power ratio between HS-DPCH, DPCCH and DPDCH being set to the values defined in table C.10.1.4 sub-test 3.

Table 5.7A.2: Transmitter power test requirements for TPC\_cmd=0

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sub-test in table C.10.1.4 | Power step | Nominal Power step size, DP [dB] | Rounded Power step size, DP [dB] | Transmitter power step Tolerance [dB] | Allowed Transmitter power step range [dB] |
| 3 | 1 | 6.14 | 6 | +/- 2.3 | 3.7 to 8.44 |
| 2 | -1.38 | -1 | +/- 0.6 | -1.98 to -0.4 |
| 3 | -4.76 | -5 | +/- 2.3 | -7.3 to -2.46 |
| 41 | 0 | 0 | +/- 0.6 | -0.6 to 0.6 |
| 5 | 4.76 | 5 | +/- 2.3 | 2.46 to 7.3 |
| 6 | 1.38 | 1 | +/- 0.6 | 0.4 to 1.98 |
| 7 | -6.14 | -6 | +/- 2.3 | -8.44 to -3.7 |
| 81 | 0 | 0 | +/- 0.6 | -0.6 to 0.6 |
| 9 | 4.76 | 5 | +/- 2.3 | 2.46 to 7.3 |
| 10 | -4.76 | -5 | +/- 2.3 | -7.3 to -2.46 |
| 111 | 0 | 0 | +/- 0.6 | -0.6 to 0.6 |
| NOTE 1: Two test points. | | | | | |

Table 5.7A.3: Transmitter power test requirements for TPC\_cmd=1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sub-test in table C.10.1.4 | Power step | Nominal Power step size, DP [dB] | Rounded Power step size, DP [dB] | Transmitter power step Tolerance [dB] | Allowed Transmitter power step range [dB] |
| 3 | 1 | 6.14 | 6 | +/- 2.3 | 3.7 to 8.44 |
| 2 | -1.38 | -1 | +/- 0.6 | -1.98 to -0.4 |
| 33 | No requirements | No requirements | NA | No requirements |
| 4 | -4.76 | -5 | +/- 2.3 | -7.3 to -2.46 |
| 51 | 1 | 1 | +/- 0.6 | 0.4 to 1.6 |
| 6 | 4.76 | 5 | +/- 2.3 | 2.46 to 7.3 |
| 73 | No Requirements | No requirements | NA | No requirements |
| 8 | 1.38 | 1 | +/- 0.6 | 0.40 to 1.98 |
| 9 | -6.14 | -6 | +/- 2.3 | -8.44 to -3.7 |
| 102 | 1 | 1 | +/- 0.6 | 0.4 to 1.6 |
| 11 | 4.76 | 5 | +/- 2.3 | 2.46 to 7.3 |
| 12 | -4.76 | -5 | +/- 2.3 | -7.3 to -2.46 |
| 132 | 1 | 1 | +/- 0.6 | 0.4 to 1.6 |
| NOTE 1: Three test points.  NOTE 2: Two test points.  NOTE 3: In these test points rel-6 UE performs additional power scaling due to changes in allowed MPR, and therefore there are no requirements specified for transmitter power steps. | | | | | |

Table 5.7A.4: Exceptions for Transmitter power test requirements for TPC\_cmd=1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sub-test in table C.10.1.4 | Power step | Nominal Power step size, DP [dB] | Rounded Power step size, DP [dB] | Transmitter power step Tolerance [dB] | Allowed Transmitter power step range [dB] |
| 3 | 51 | 1 | 1 | +/- 1.6 | -0.6 to 2.6 |
| 102 | 1 | 1 | +/- 1.6 | -0.6 to 2.6 |
| 132 | 1 | 1 | +/- 1.6 | -0.6 to 2.6 |
| NOTE 1: Three test points.  NOTE 2: Two test points. | | | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.7BA HS-DPCCH power control for UL OLTD

Editor’s notes:

- For a transition period unti Ran5#73, this test case in version 12.3.0 of 34.121-1 shall be used.

### 5.7BA.1 Definition and applicability

The transmission of Ack/Nack or CQI over the HS-DPCCH may cause the transmission power in the uplink to vary. The ratio of the amplitude between the DPCCH and the Ack/Nack and CQI respectively is signalled by higher layers.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL OLTD and HSDPA.

### 5.7BA.2 Minimum requirement

The nominal sum power on DPCCH+S-DPCCH+DPDCH is independent of the transmission of Ack/Nack and CQI unless the UE output power when Ack/Nack or CQI is transmitted would exceed the maximum value specified in Table 5.2A.1 or fall below the value specified in 5.4.3.2, whereupon the UE may then also apply additional scaling to the total transmit power as defined in clause 5.1.2.6 of TS.25.214 [5].

The composite transmitted power (DPCCH + S-DPCCH+DPDCH+HS-DPCCH) may then also be rounded to the closest integer dB value. If rounding is done a power step exactly half-way between two integer values shall be rounded to the closest integer of greater magnitude.

The nominal power step due to transmission of Ack/Nack or CQI is defined as the difference between the nominal mean powers of two power evaluation periods either side of an HS-DPCCH boundary. The first evaluation period starts 25 s after a DPCCH slot boundary and ends 25s before the following HS-DPCCH slot boundary. The second evaluation period starts 25 s after the same HS-DPCCH slot boundary and ends 25 s before the following DPCCH slot boundary.

The tolerance of the power step due to transmission of the HS-DPCCH shall meet the requirements in table 5.7BA.1. For each direction, up to 2 exceptions to the transmitter power step tolerance defined in table 5.7BA.1 shall be allowed. The transmitter power control range for exceptions is defined in table 5.7BA.2. Exceptions are applicable only if the change in UL power is measured per 1-dB step size.

For UE with two active transmit antenna connectors in UL OLTD , tolerance of the power step due to transmission of the HS-DPCCH shall meet the requirements at each transmit antenna connector.

Table 5.7BA.1: Transmitter power step tolerance

|  |  |
| --- | --- |
| Power step size (Up or down)  P [dB] | Transmitter power step tolerance [dB] |
| 0 | ±0.5 |
| 1 | ±0.5 |
| 2 | ±1.0 |
| 3 | ±1.5 |
| 4  Δ P  7 | ±2.0 |

Table 5.7BA.1AA: Transmitter power step tolerance for exceptions

|  |  |
| --- | --- |
| Nominal power step size (Up or down) P [dB] | Transmitter power step tolerance [dB] |
| 0 | +/- 0.5 |
| 1 | +/- 1.5 |
| 2 | +/- 1.5 |
| 3 | +/- 1.5 |
| 4  Δ P  7 | +/- 2.0 |

The normative reference for this requirement is TS 25.101 [1], clause 6.5.5.1B.

### 5.7BA.3 Test purpose

To verify that the changes in uplink transmit power for UL OLTD when transmitting the HS-DPCCH (Ack/Nack and CQI) and the power between HS-DPCCH transmissions are within the allowed power step tolerances as shown in table 5.7BA.2 and 5.7BA.3. The test is carried out at max power with TPC\_cmd=1 and at a nominal power of 0 dBm at the minimum point of the 12ms transmit pattern (HS-DPCCH off).

### 5.7BA.4 Method of test

#### 5.7BA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.2 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.18. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.7BA.1A.

4) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.7BA.1A: Settings for the serving cell during the measurement of HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.7BA.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.7BA.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values defined in table C.10.2.4 subtest 3 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms. The Uplink DPCH Power Control Info shall initially specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS to set the output power of the UE, measured at the UE antenna connector when the HS-DPCCH is not transmitted, to be in the range 0 dBm ± 2dB. This is a nominal setting and not part of the test requirements.

5) Figure 5.7BA.1 shows the 12ms cycle created when using the TRANSPORT CHANNEL RECONFIGURATION message from Annex I with the test specific message content defined below and with TPC\_cmd=0. Measure the mean power during the half slot periods either side of the measurement points specified on figure 5.7BA.1. The 25us transient periods at the end of each half slot period shall not be included. Measurement points 4, 8 and 11 are at the DPCCH slot boundaries just after and just before the HS-DPCCH transmission. Evaluate the difference in mean power to determine the power steps around the measurement points shown in Figure 5.7BA.1. The power steps shall meet the test requirements in table 5.7BA.2.

6) Reconfigure the uplink DPCH power control Info to use Algorithm 1 with 1 dB step size. Set and send continuously Up power control commands to the UE until the UE output power during HS-DPCCH ACK/NACK transmission reaches the maximum as defined in table 5.2A.1.

7) Figure 5.7BA.2 shows the 12ms cycle created when using TPC\_cmd=1. Measure the mean power during the half slot periods either side of the measurement points specified on figure 5.7BA.2. The 25us transient periods at the end of each half slot period shall not be included. Measurement points 5, 10 and 13 are at the DPCCH slot boundaries in between the HS-DPCCH transmissions. The last downward step prior to the HS-DPCCH transmission is not tested due to the accumulation of tolerances making the test requirement very wide. Evaluate the difference in mean power to determine the power steps around the measurement points shown in Figure 5.7BA.2. The transmitter power steps shall meet the test requirements in table 5.7BA.3, with upto two exceptions as defined in Table 5.7BA.4 allowed for 1-dB step size in each direction.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I. The test specific content for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

|  |  |
| --- | --- |
| Information Element | Value/remark |
| - Ack-Nack repetition factor | 1 |
| - CQI repetition factor | 1 |

### 5.7BA.5 Test requirements



Figure 5.7BA.1: Transmit power template below max power with TPC\_cmd = 0



Figure 5.7BA.2: Transmit power template at max power with TPC\_cmd = 1

The difference in mean power derived in steps 5) and 7), shall not exceed the allowed transmitter power step range in table 5.7BA.2 and 5.7BA.3 respectively.

For UE with two active transmit antenna connectors in UL OLTD, the difference in mean power requirements applies at each transmit antenna connector.

The UL reference measurement channel for TX test will be set as defined in C.10.2 with the power ratio between HS-DPCH, DPCCH and DPDCH being set to the values defined in table C.10.2.4 sub-test 3.

Table 5.7BA.2: Transmitter power test requirements for TPC\_cmd=0

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sub-test in table C.10.2.4 | Power step | Nominal Power step size, DP [dB] | Rounded Power step size, DP [dB] | Transmitter power step Tolerance [dB] | Allowed Transmitter power step range [dB] |
| 3 | 1 | 6.14 | 6 | +/- 2.3 | 3.7 to 8.44 |
| 2 | -1.38 | -1 | +/- 0.6 | -1.98 to -0.4 |
| 3 | -4.76 | -5 | +/- 2.3 | -7.3 to -2.46 |
| 41 | 0 | 0 | +/- 0.6 | -0.6 to 0.6 |
| 5 | 4.76 | 5 | +/- 2.3 | 2.46 to 7.3 |
| 6 | 1.38 | 1 | +/- 0.6 | 0.4 to 1.98 |
| 7 | -6.14 | -6 | +/- 2.3 | -8.44 to -3.7 |
| 81 | 0 | 0 | +/- 0.6 | -0.6 to 0.6 |
| 9 | 4.76 | 5 | +/- 2.3 | 2.46 to 7.3 |
| 10 | -4.76 | -5 | +/- 2.3 | -7.3 to -2.46 |
| 111 | 0 | 0 | +/- 0.6 | -0.6 to 0.6 |
| NOTE 1: Two test points. | | | | | |

Table 5.7BA.3: Transmitter power test requirements for TPC\_cmd=1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sub-test in table C.10.2.4 | Power step | Nominal Power step size, DP [dB] | Rounded Power step size, DP [dB] | Transmitter power step Tolerance [dB] | Allowed Transmitter power step range [dB] |
| 3 | 1 | 6.14 | 6 | +/- 2.3 | 3.7 to 8.44 |
| 2 | -1.38 | -1 | +/- 0.6 | -1.98 to -0.4 |
| 33 | No requirements | No requirements | NA | No requirements |
| 4 | -4.76 | -5 | +/- 2.3 | -7.3 to -2.46 |
| 51 | 1 | 1 | +/- 0.6 | 0.4 to 1.6 |
| 6 | 4.76 | 5 | +/- 2.3 | 2.46 to 7.3 |
| 73 | No Requirements | No requirements | NA | No requirements |
| 8 | 1.38 | 1 | +/- 0.6 | 0.40 to 1.98 |
| 9 | -6.14 | -6 | +/- 2.3 | -8.44 to -3.7 |
| 102 | 1 | 1 | +/- 0.6 | 0.4 to 1.6 |
| 11 | 4.76 | 5 | +/- 2.3 | 2.46 to 7.3 |
| 12 | -4.76 | -5 | +/- 2.3 | -7.3 to -2.46 |
| 132 | 1 | 1 | +/- 0.6 | 0.4 to 1.6 |
| NOTE 1: Three test points.  NOTE 2: Two test points.  NOTE 3: In these test points rel-6 UE performs additional power scaling due to changes in allowed MPR, and therefore there are no requirements specified for transmitter power steps. | | | | | |

Table 5.7BA.4: Exceptions for Transmitter power test requirements for TPC\_cmd=1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sub-test in table C.10.1.4 | Power step | Nominal Power step size, DP [dB] | Rounded Power step size, DP [dB] | Transmitter power step Tolerance [dB] | Allowed Transmitter power step range [dB] |
| 3 | 51 | 1 | 1 | +/- 1.6 | -0.6 to 2.6 |
| 102 | 1 | 1 | +/- 1.6 | -0.6 to 2.6 |
| 132 | 1 | 1 | +/- 1.6 | -0.6 to 2.6 |
| NOTE 1: Three test points.  NOTE 2: Two test points. | | | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.7BB HS-DPCCH power control for UL CLTD activation state 1

Editor’s notes:

- For a transition period unti Ran5#73, this test case in version 12.3.0 of 34.121-1 shall be used.

### 5.7BB.1 Definition and applicability

The transmission of Ack/Nack or CQI over the HS-DPCCH may cause the transmission power in the uplink to vary. The ratio of the amplitude between the DPCCH and the Ack/Nack and CQI respectively is signalled by higher layers.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and HSDPA.

### 5.7BB.2 Minimum requirement

The nominal sum power on DPCCH+S-DPCCH+DPDCH is independent of the transmission of Ack/Nack and CQI unless the UE output power when Ack/Nack or CQI is transmitted would exceed the maximum value specified in Table 5.2A.1 or fall below the value specified in 5.4.3.2, whereupon the UE may then also apply additional scaling to the total transmit power as defined in section 5.1.2.6 of TS 25.214 [5].

The composite transmitted power (DPCCH + S-DPCCH+DPDCH+HS-DPCCH) may then also be rounded to the closest integer dB value. If rounding is done a power step exactly half-way between two integer values shall be rounded to the closest integer of greater magnitude.

The nominal power step due to transmission of Ack/Nack or CQI is defined as the difference between the nominal mean powers of two power evaluation periods either side of an HS-DPCCH boundary. The first evaluation period starts 25 s after a DPCCH slot boundary and ends 25s before the following HS-DPCCH slot boundary. The second evaluation period starts 25 s after the same HS-DPCCH slot boundary and ends 25 s before the following DPCCH slot boundary.

The tolerance of the power step due to transmission of the HS-DPCCH shall meet the requirements in table 5.7BB.1. For each direction, up to 2 exceptions to the transmitter power step tolerance defined in table 5.7BB.1 shall be allowed. The transmitter power control range for exceptions is defined in table 5.7BB.2. Exceptions are applicable only if the change in UL power is measured per 1-dB step size.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, tolerance of the power step due to transmission of the HS-DPCCH shall meet the requirements at each transmit antenna connector.

Table 5.7BB.1: Transmitter power step tolerance

|  |  |
| --- | --- |
| Power step size (Up or down)  P [dB] | Transmitter power step tolerance [dB] |
| 0 | ±0.5 |
| 1 | ±0.5 |
| 2 | ±1.0 |
| 3 | ±1.5 |
| 4  ΔP  7 | ±2.0 |

Table 5.7BB.1AA: Transmitter power step tolerance for exceptions

|  |  |
| --- | --- |
| Nominal power step size (Up or down) P [dB] | Transmitter power step tolerance [dB] |
| 0 | +/- 0.5 |
| 1 | +/- 1.5 |
| 2 | +/- 1.5 |
| 3 | +/- 1.5 |
| 4  Δ P  7 | +/- 2.0 |

The normative reference for this requirement is TS 25.101 [1], clause 6.5.5.1B.

### 5.7BB.3 Test purpose

To verify that the changes in uplink transmit power for UL CLTD activation state 1 when transmitting the HS-DPCCH (Ack/Nack and CQI) and the power between HS-DPCCH transmissions are within the allowed power step tolerances as shown in table 5.7BB.2 and 5.7BB.3. The test is carried out at max power with TPC\_cmd=1 and at a nominal power of 0 dBm at the minimum point of the 12ms transmit pattern (HS-DPCCH off).

### 5.7BB.4 Method of test

#### 5.7BB.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.2 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.17. RF parameters are set up according to tables E.5.1 and E.5.10. Settings for the serving cell are defined in table 5.7BB.1A.

4) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.7BB.1A: Settings for the serving cell during the measurement of HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.7BB.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.7BB.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values defined in table C.10.2.4 subtest 3 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms. The Uplink DPCH Power Control Info shall initially specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS to set the output power of the UE, measured at the UE antenna connector when the HS-DPCCH is not transmitted, to be in the range 0 dBm ± 2dB. This is a nominal setting and not part of the test requirements.

5) Figure 5.7BB.1 shows the 12ms cycle created when using the TRANSPORT CHANNEL RECONFIGURATION message from Annex I with the test specific message content defined below and with TPC\_cmd=0. Measure the mean power during the half slot periods either side of the measurement points specified on figure 5.7BB.1. The 25us transient periods at the end of each half slot period shall not be included. Measurement points 4, 8 and 11 are at the DPCCH slot boundaries just after and just before the HS-DPCCH transmission. Evaluate the difference in mean power to determine the power steps around the measurement points shown in Figure 5.7BB.1. The power steps shall meet the test requirements in table 5.7BB.2.

6) Reconfigure the uplink DPCH power control Info to use Algorithm 1 with 1 dB step size. Set and send continuously Up power control commands to the UE until the UE output power during HS-DPCCH ACK/NACK transmission reaches the maximum as defined in table 5.2A.1.

7) Figure 5.7BB.2 shows the 12ms cycle created when using TPC\_cmd=1. Measure the mean power during the half slot periods either side of the measurement points specified on figure 5.7BB.2. The 25us transient periods at the end of each half slot period shall not be included. Measurement points 5, 10 and 13 are at the DPCCH slot boundaries in between the HS-DPCCH transmissions. The last downward step prior to the HS-DPCCH transmission is not tested due to the accumulation of tolerances making the test requirement very wide. Evaluate the difference in mean power to determine the power steps around the measurement points shown in Figure 5.7BB.2. The transmitter power steps shall meet the test requirements in table 5.7BB.3, with upto two exceptions as defined in Table 5.7BB.4 allowed for 1-dB step size in each direction.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I. The test specific content for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

|  |  |
| --- | --- |
| Information Element | Value/remark |
| - Ack-Nack repetition factor | 1 |
| - CQI repetition factor | 1 |

### 5.7BB.5 Test requirements



Figure 5.7BB.1: Transmit power template below max power with TPC\_cmd = 0



Figure 5.7BB.2: Transmit power template at max power with TPC\_cmd = 1

The difference in mean power derived in steps 5) and 7), shall not exceed the allowed transmitter power step range in table 5.7BB.2 and 5.7BB.3 respectively.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the difference in mean power requirements applies at each transmit antenna connector.

The UL reference measurement channel for TX test will be set as defined in C.10.2 with the power ratio between HS-DPCH, DPCCH and DPDCH being set to the values defined in table C.10.2.4 sub-test 3.

Table 5.7BB.2: Transmitter power test requirements for TPC\_cmd=0

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sub-test in table C.10.2.4 | Power step | Nominal Power step size, DP [dB] | Rounded Power step size, DP [dB] | Transmitter power step Tolerance [dB] | Allowed Transmitter power step range [dB] |
| 3 | 1 | 6.14 | 6 | +/- 2.3 | 3.7 to 8.44 |
| 2 | -1.38 | -1 | +/- 0.6 | -1.98 to -0.4 |
| 3 | -4.76 | -5 | +/- 2.3 | -7.3 to -2.46 |
| 41 | 0 | 0 | +/- 0.6 | -0.6 to 0.6 |
| 5 | 4.76 | 5 | +/- 2.3 | 2.46 to 7.3 |
| 6 | 1.38 | 1 | +/- 0.6 | 0.4 to 1.98 |
| 7 | -6.14 | -6 | +/- 2.3 | -8.44 to -3.7 |
| 81 | 0 | 0 | +/- 0.6 | -0.6 to 0.6 |
| 9 | 4.76 | 5 | +/- 2.3 | 2.46 to 7.3 |
| 10 | -4.76 | -5 | +/- 2.3 | -7.3 to -2.46 |
| 111 | 0 | 0 | +/- 0.6 | -0.6 to 0.6 |
| NOTE 1: Two test points. | | | | | |

Table 5.7BB.3: Transmitter power test requirements for TPC\_cmd=1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sub-test in table C.10.2.4 | Power step | Nominal Power step size, DP [dB] | Rounded Power step size, DP [dB] | Transmitter power step Tolerance [dB] | Allowed Transmitter power step range [dB] |
| 3 | 1 | 6.14 | 6 | +/- 2.3 | 3.7 to 8.44 |
| 2 | -1.38 | -1 | +/- 0.6 | -1.98 to -0.4 |
| 33 | No requirements | No requirements | NA | No requirements |
| 4 | -4.76 | -5 | +/- 2.3 | -7.3 to -2.46 |
| 51 | 1 | 1 | +/- 0.6 | 0.4 to 1.6 |
| 6 | 4.76 | 5 | +/- 2.3 | 2.46 to 7.3 |
| 73 | No Requirements | No requirements | NA | No requirements |
| 8 | 1.38 | 1 | +/- 0.6 | 0.40 to 1.98 |
| 9 | -6.14 | -6 | +/- 2.3 | -8.44 to -3.7 |
| 102 | 1 | 1 | +/- 0.6 | 0.4 to 1.6 |
| 11 | 4.76 | 5 | +/- 2.3 | 2.46 to 7.3 |
| 12 | -4.76 | -5 | +/- 2.3 | -7.3 to -2.46 |
| 132 | 1 | 1 | +/- 0.6 | 0.4 to 1.6 |
| NOTE 1: Three test points.  NOTE 2: Two test points.  NOTE 3: In these test points rel-6 UE performs additional power scaling due to changes in allowed MPR, and therefore there are no requirements specified for transmitter power steps. | | | | | |

Table 5.7BB.4: Exceptions for Transmitter power test requirements for TPC\_cmd=1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sub-test in table C.10.1.4 | Power step | Nominal Power step size, DP [dB] | Rounded Power step size, DP [dB] | Transmitter power step Tolerance [dB] | Allowed Transmitter power step range [dB] |
| 3 | 51 | 1 | 1 | +/- 1.6 | -0.6 to 2.6 |
| 102 | 1 | 1 | +/- 1.6 | -0.6 to 2.6 |
| 132 | 1 | 1 | +/- 1.6 | -0.6 to 2.6 |
| NOTE 1: Three test points.  NOTE 2: Two test points. | | | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.7BC HS-DPCCH power control for UL CLTD activation state 2 and 3

Editor’s notes:

- For a transition period unti Ran5#73, this test case in version 12.3.0 of 34.121-1 shall be used.

### 5.7BC.1 Definition and applicability

The transmission of Ack/Nack or CQI over the HS-DPCCH may cause the transmission power in the uplink to vary. The ratio of the amplitude between the DPCCH and the Ack/Nack and CQI respectively is signalled by higher layers.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and HSDPA.

### 5.7BC.2 Minimum requirement

The nominal sum power on DPCCH +DPDCH is independent of the transmission of Ack/Nack and CQI unless the UE output power when Ack/Nack or CQI is transmitted would exceed the maximum value specified in Table 5.2A.1 or fall below the value specified in 5.4.3.2, whereupon the UE may then also apply additional scaling to the total transmit power as defined in section 5.1.2.6 of TS.25.214 [5].

The composite transmitted power (DPCCH +DPDCH+HS-DPCCH) may then also be rounded to the closest integer dB value. If rounding is done a power step exactly half-way between two integer values shall be rounded to the closest integer of greater magnitude.

The nominal power step due to transmission of Ack/Nack or CQI is defined as the difference between the nominal mean powers of two power evaluation periods either side of an HS-DPCCH boundary. The first evaluation period starTS 25 s after a DPCCH slot boundary and ends 25s before the following HS-DPCCH slot boundary. The second evaluation period starTS 25 s after the same HS-DPCCH slot boundary and ends 25 s before the following DPCCH slot boundary.

The tolerance of the power step due to transmission of the HS-DPCCH shall meet the requirements in table 5.7BC.1. For each direction, up to 2 exceptions to the transmitter power step tolerance defined in table 5.7BC.1 shall be allowed. The transmitter power control range for exceptions is defined in table 5.7BC.2. Exceptions are applicable only if the change in UL power is measured per 1-dB step size

For UE configured in UL CLTD activation state 2 or activation state 3, tolerance of the power step due to transmission of the HS-DPCCH shall meet the requirements at active transmit antenna connector.

Table 5.7BC.1: Transmitter power step tolerance

|  |  |
| --- | --- |
| Power step size (Up or down)  P [dB] | Transmitter power step tolerance [dB] |
| 0 | ±0.5 |
| 1 | ±0.5 |
| 2 | ±1.0 |
| 3 | ±1.5 |
| 4  ΔP  7 | ±2.0 |

Table 5.7BC.1AA: Transmitter power step tolerance for exceptions

|  |  |
| --- | --- |
| Nominal power step size (Up or down) P [dB] | Transmitter power step tolerance [dB] |
| 0 | +/- 0.5 |
| 1 | +/- 1.5 |
| 2 | +/- 1.5 |
| 3 | +/- 1.5 |
| 4  Δ P  7 | +/- 2.0 |

The normative reference for this requirement is TS 25.101 [1], clause 6.5.5.1B.

### 5.7BC.3 Test purpose

To verify that the changes in uplink transmit power for UL CLTD activation state 2 and 3 when transmitting the HS-DPCCH (Ack/Nack and CQI) and the power between HS-DPCCH transmissions are within the allowed power step tolerances as shown in table 5.7BC.2 and 5.7BC.3. The test is carried out at max power with TPC\_cmd=1 and at a nominal power of 0 dBm at the minimum point of the 12ms transmit pattern (HS-DPCCH off).

### 5.7BC.4 Method of test

#### 5.7BC.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C, clauses C.10.1 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.17 with the following exception in the RADIO BEARER SETUP messages in table 5.7BC.1B. This exception allows the call to be setup with initial UL CLTD activation state as state 2. RF parameters are set up according to tables E.5.1 and E.5.10. Settings for the serving cell are defined in table 5.7BC.1A.

4) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.7BC.1A: Settings for the serving cell during the measurement of HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.7BC.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

Table 5.7BC.1B: Contents of Radio bearer setup message

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink CLTD info FDD |  | Rel-11 |
| - CHOICE *Mode* | New |  |
| - Initial CLTD activation state | Second state |  |

#### 5.7BC.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values defined in table C.10.1.4 subtest 3 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms. The Uplink DPCH Power Control Info shall initially specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS to set the output power of the UE, measured at the UE antenna connector when the HS-DPCCH is not transmitted, to be in the range 0 dBm ± 2dB. This is a nominal setting and not part of the test requirements.

5) Figure 5.7BC.1 shows the 12ms cycle created when using the TRANSPORT CHANNEL RECONFIGURATION message from Annex I with the test specific message content defined below and with TPC\_cmd=0. Measure the mean power during the half slot periods either side of the measurement points specified on figure 5.7BC.1. The 25us transient periods at the end of each half slot period shall not be included. Measurement points 4, 8 and 11 are at the DPCCH slot boundaries just after and just before the HS-DPCCH transmission. Evaluate the difference in mean power to determine the power steps around the measurement points shown in Figure 5.7BC.1. The power steps shall meet the test requirements in table 5.7BC.2.

6) Reconfigure the uplink DPCH power control Info to use Algorithm 1 with 1 dB step size. Set and send continuously Up power control commands to the UE until the UE output power during HS-DPCCH ACK/NACK transmission reaches the maximum as defined in table 5.2A.1.

7) Figure 5.7BC.2 shows the 12ms cycle created when using TPC\_cmd=1. Measure the mean power during the half slot periods either side of the measurement points specified on figure 5.7BC.2. The 25us transient periods at the end of each half slot period shall not be included. Measurement points 5, 10 and 13 are at the DPCCH slot boundaries in between the HS-DPCCH transmissions. The last downward step prior to the HS-DPCCH transmission is not tested due to the accumulation of tolerances making the test requirement very wide. Evaluate the difference in mean power to determine the power steps around the measurement points shown in Figure 5.7BC.2. The transmitter power steps shall meet the test requirements in table 5.7BC.3, with upto two exceptions as defined in Table 5.7BC.4 allowed for 1-dB step size in each direction.

8) SS sends a HS-SCCH order now to move the UE in UL\_CLTD activation state 3.

9) Repeat step 1 to 7 for activation state 3

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I. The test specific content for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

|  |  |
| --- | --- |
| Information Element | Value/remark |
| - Ack-Nack repetition factor | 1 |
| - CQI repetition factor | 1 |

### 5.7BC.5 Test requirements



Figure 5.7BC.1: Transmit power template below max power with TPC\_cmd = 0



Figure 5.7BC.2: Transmit power template at max power with TPC\_cmd = 1

The difference in mean power derived in steps 5) and 7), shall not exceed the allowed transmitter power step range in table 5.7BC.2 and 5.7BC.3 respectively.

For UE configured in UL CLTD activation state 2 or activation state 3, the difference in mean power requirements applies at active transmit antenna connector.

The UL reference measurement channel for TX test will be set as defined in C.10.1 with the power ratio between HS-DPCH, DPCCH and DPDCH being set to the values defined in table C.10.1.4 sub-test 3.

Table 5.7BC.2: Transmitter power test requirements for TPC\_cmd=0

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sub-test in table C.10.1.4 | Power step | Nominal Power step size, DP [dB] | Rounded Power step size, DP [dB] | Transmitter power step Tolerance [dB] | Allowed Transmitter power step range [dB] |
| 3 | 1 | 6.14 | 6 | +/- 2.3 | 3.7 to 8.44 |
| 2 | -1.38 | -1 | +/- 0.6 | -1.98 to -0.4 |
| 3 | -4.76 | -5 | +/- 2.3 | -7.3 to -2.46 |
| 41 | 0 | 0 | +/- 0.6 | -0.6 to 0.6 |
| 5 | 4.76 | 5 | +/- 2.3 | 2.46 to 7.3 |
| 6 | 1.38 | 1 | +/- 0.6 | 0.4 to 1.98 |
| 7 | -6.14 | -6 | +/- 2.3 | -8.44 to -3.7 |
| 81 | 0 | 0 | +/- 0.6 | -0.6 to 0.6 |
| 9 | 4.76 | 5 | +/- 2.3 | 2.46 to 7.3 |
| 10 | -4.76 | -5 | +/- 2.3 | -7.3 to -2.46 |
| 111 | 0 | 0 | +/- 0.6 | -0.6 to 0.6 |
| NOTE 1: Two test points. | | | | | |

Table 5.7BC.3: Transmitter power test requirements for TPC\_cmd=1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sub-test in table C.10.1.4 | Power step | Nominal Power step size, DP [dB] | Rounded Power step size, DP [dB] | Transmitter power step Tolerance [dB] | Allowed Transmitter power step range [dB] |
| 3 | 1 | 6.14 | 6 | +/- 2.3 | 3.7 to 8.44 |
| 2 | -1.38 | -1 | +/- 0.6 | -1.98 to -0.4 |
| 33 | No requirements | No requirements | NA | No requirements |
| 4 | -4.76 | -5 | +/- 2.3 | -7.3 to -2.46 |
| 51 | 1 | 1 | +/- 0.6 | 0.4 to 1.6 |
| 6 | 4.76 | 5 | +/- 2.3 | 2.46 to 7.3 |
| 73 | No Requirements | No requirements | NA | No requirements |
| 8 | 1.38 | 1 | +/- 0.6 | 0.40 to 1.98 |
| 9 | -6.14 | -6 | +/- 2.3 | -8.44 to -3.7 |
| 102 | 1 | 1 | +/- 0.6 | 0.4 to 1.6 |
| 11 | 4.76 | 5 | +/- 2.3 | 2.46 to 7.3 |
| 12 | -4.76 | -5 | +/- 2.3 | -7.3 to -2.46 |
| 132 | 1 | 1 | +/- 0.6 | 0.4 to 1.6 |
| NOTE 1: Three test points.  NOTE 2: Two test points.  NOTE 3: In these test points rel-6 UE performs additional power scaling due to changes in allowed MPR, and therefore there are no requirements specified for transmitter power steps. | | | | | |

Table 5.7BC.4: Exceptions for Transmitter power test requirements for TPC\_cmd=1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sub-test in table C.10.1.4 | Power step | Nominal Power step size, DP [dB] | Rounded Power step size, DP [dB] | Transmitter power step Tolerance [dB] | Allowed Transmitter power step range [dB] |
| 3 | 51 | 1 | 1 | +/- 1.6 | -0.6 to 2.6 |
| 102 | 1 | 1 | +/- 1.6 | -0.6 to 2.6 |
| 132 | 1 | 1 | +/- 1.6 | -0.6 to 2.6 |
| NOTE 1: Three test points.  NOTE 2: Two test points. | | | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.8 Occupied Bandwidth (OBW)

### 5.8.1 Definition and applicability

Occupied bandwidth is a measure of the bandwidth containing 99 % of the total integrated power of the transmitted spectrum, centred on the assigned channel frequency.

The requirements and this test apply to all types of UTRA for the FDD UE.

### 5.8.2 Minimum Requirements

The occupied channel bandwidth shall be less than 5 MHz based on a chip rate of 3,84 Mcps.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.1.

### 5.8.3 Test purpose

To verify that the UE occupied channel bandwidth is less than 5 MHz based on a chip rate of 3,84 Mcps.

Excess occupied channel bandwidth increases the interference to other channels or to other systems.

### 5.8.4 Method of test

5.8.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.8.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the power spectrum distribution within two times or more range over the requirement for Occupied Bandwidth specification centring on the current carrier frequency with 30 kHz or less RBW. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter).

3) Calculate the total power within the range of all frequencies measured in '2)' and save this value as "Total Power".

4) Sum up the power upward from the lower boundary of the measured frequency range in '2)' and seek the limit frequency point by which this sum becomes 0,5 % of "Total Power" and save this point as "Lower Frequency".

5) Sum up the power downward from the upper boundary of the measured frequency range in '2)' and seek the limit frequency point by which this sum becomes 0,5 % of "Total Power" and save this point as "Upper Frequency".

6) Calculate the difference ("Upper Frequency" - "Lower Frequency" = "Occupied Bandwidth") between two limit frequencies obtained in '4)' and '5)'.

### 5.8.5 Test Requirements

The measured Occupied Bandwidth, derived in step 6), shall not exceed 5 MHz.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.8A Occupied Bandwidth (OBW) for DC-HSUPA

### 5.8A.1 Definition and applicability

In the case dual adjacent carriers are assigned in the uplink, occupied bandwidth is a measure of the bandwidth containing 99 % of the total integrated power of the transmitted spectrum, centred at the centre of the assigned channel frequencies.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

### 5.8A.2 Minimum Requirements

The occupied channel bandwidth shall be less than 10 MHz on a chip rate of 3.84 Mcps.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.1A.

### 5.8A.3 Test purpose

To verify that the DC-HSUPA UE occupied channel bandwidth is less than 10 MHz based on a chip rate of 3,84 Mcps.

Excess occupied channel bandwidth increases the interference to other channels or to other systems.

### 5.8A.4 Method of test

#### 5.8A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.6 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14 with the exceptions in the RADIO BEARER SETUP message given in Tables 5.2BA.2, 5.2BA.3, 5.2BA.4. These exceptions allow the beta values to be set according to table C.11A.1. and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.8A.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.8A: Settings for the serving cell during the measurement of  
Occupied Bandwidth for with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.8A.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.8A.4.2 Procedure

1) Set the Absolute Grant according to Table C.11A.1.1.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands to each individual carrier from the SS to set the total power in each of the assigned carriers to be equal to each other within 1.7 dB and the total output power of the UE to be at least 7.5dB lower than the maximum output power. Wait 150ms.

4) Set and send continuously Up power control commands to both carriers to the UE and wait 150ms.

5) Measure the power spectrum distribution within two times or more range over the requirement for Occupied Bandwidth specification centring between the two carrier frequencies with 30 kHz or less RBW. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter).

6) Calculate the total power of the two carriers within the range of all frequencies measured in '2)' and save this value as "Total Power".

7) Sum up the power upward from the lower boundary of the measured frequency range in '2)' and seek the limit frequency point by which this sum becomes 0,5 % of "Total Power" of the two carriers and save this point as "Lower Frequency".

8) Sum up the power downward from the upper boundary of the measured frequency range in '2)' and seek the limit frequency point by which this sum becomes 0,5 % of "Total Power" and save this point as "Upper Frequency".

9) Calculate the difference ("Upper Frequency" - "Lower Frequency" = "Occupied Bandwidth") between two limit frequencies obtained in '4)' and '5)'.

### 5.8A.5 Test Requirements

The measured Occupied Bandwidth, derived in step 6), shall not exceed 10 MHz.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.8B Occupied Bandwidth (OBW) for OLTD

### 5.8B.1 Definition and applicability

Occupied bandwidth is a measure of the bandwidth containing 99 % of the total integrated power of the transmitted spectrum, centred at the centre of the assigned channel frequency. For UE with two active transmit antenna connectors in UL OLTD activation state 1, occupied bandwidth requirement is defined per UE.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL OLTD and HSDPA.

### 5.8B.2 Minimum Requirements

The occupied bandwidth of the UL OLTD UE is determined by the occupied bandwidth (defined in 5.8.1) measured at each active antenna port of the UE. The upper boundary of the UE occupied bandwidth is the highest boundary of the two measured occupied bandwidths. The lower boundary of the UE occupied bandwidth is the lowest boundary of the two measured occupied bandwidths. The occupied channel bandwidth for UE shall be less than 5 MHz based on a chip rate of 3.84 Mcps.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.1B.

### 5.8B.3 Test purpose

To verify that the occupied channel bandwidth is less than 5 MHz based on a chip rate of 3,84 Mcps.

Excess occupied channel bandwidth increases the interference to other channels or to other systems.

### 5.8B.4 Method of test

#### 5.8B.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1) are specified in clauses C.10.2 and C.8.1.1 with the beta values set according to table C.10.2.4.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.18. RF parameters are set up according to table E.5.1 and table E.5.10.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

#### 5.8B.4.2 Procedure

1) Start transmitting HSDPA Data.

2) Set and send continuously Up power control commands to the UE and wait 150ms.

3) Measure the power spectrum distribution within two times or more range over the requirement for Occupied Bandwidth specification centring on the current carrier frequency with 30 kHz or less RBW for first antenna. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter).

4) Calculate the total power within the range of all frequencies measured in step 3 and save this value as "Total Power".

5) Sum up the power upward from the lower boundary of the measured frequency range in step 3 and seek the limit frequency point by which this sum becomes 0,5 % of "Total Power" and save this point as "Lower Frequency".

6) Sum up the power downward from the upper boundary of the measured frequency range in step 3 and seek the limit frequency point by which this sum becomes 0,5 % of "Total Power" and save this point as "Upper Frequency".

7) Repeat steps 3 to 6 for second antenna

8) Calculate “Lower Frequency per UE” as the lowest of the two “Lower Frequency” measurements per antenna

9) Calculate “Upper Frequency per UE” as the highest of the two “Higher Frequency” measurements per antenna

10) Calculate the difference ("Upper Frequency per UE" - "Lower Frequency per UE" = "Occupied Bandwidth") between two limit frequencies obtained in '4)' and '5)'.

### 5.8B.5 Test Requirements

The measured Occupied Bandwidth, derived in step 10, shall not exceed 5 MHz.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.8C Occupied Bandwidth (OBW) for UL CLTD Activation state 1

### 5.8C.1 Definition and applicability

Occupied bandwidth is a measure of the bandwidth containing 99 % of the total integrated power of the transmitted spectrum, centred at the centre of the assigned channel frequency. For UE with two active transmit antenna connectors in UL CLTD activation state 1, occupied bandwidth requirement is defined per UE.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and HSDPA.

### 5.8C.2 Minimum Requirements

The occupied bandwidth of the UL CLTD UE is determined by the occupied bandwidth (defined in 5.8.1) measured at each active antenna port of the UE. The upper boundary of the UE occupied bandwidth is the highest boundary of the two measured occupied bandwidths. The lower boundary of the UE occupied bandwidth is the lowest boundary of the two measured occupied bandwidths. The occupied channel bandwidth for UE shall be less than 5 MHz based on a chip rate of 3.84 Mcps.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.1C.

### 5.8C.3 Test purpose

To verify that the occupied channel bandwidth is less than 5 MHz based on a chip rate of 3,84 Mcps.

Excess occupied channel bandwidth increases the interference to other channels or to other systems.

### 5.8C.4 Method of test

#### 5.8C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1) are specified in clauses C.10.2 and C.8.1.1 with the beta values set according to table C.10.2.4.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.17. RF parameters are set up according to table E.5.1 and table E.5.10.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

#### 5.8C.4.2 Procedure

1) Start transmitting HSDPA Data.

2) Set and send continuously Up power control commands to the UE and wait 150ms.

3) Measure the power spectrum distribution within two times or more range over the requirement for Occupied Bandwidth specification centring on the current carrier frequency with 30 kHz or less RBW for first antenna. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter).

4) Calculate the total power within the range of all frequencies measured in step 3 and save this value as "Total Power".

5) Sum up the power upward from the lower boundary of the measured frequency range in step 3 and seek the limit frequency point by which this sum becomes 0,5 % of "Total Power" and save this point as "Lower Frequency".

6) Sum up the power downward from the upper boundary of the measured frequency range in step 3 and seek the limit frequency point by which this sum becomes 0,5 % of "Total Power" and save this point as "Upper Frequency".

7) Repeat steps 3 to 6 for second antenna

8) Calculate “Lower Frequency per UE” as the lowest of the two “Lower Frequency” measurements per antenna

9) Calculate “Upper Frequency per UE” as the highest of the two “Higher Frequency” measurements per antenna

10) Calculate the difference ("Upper Frequency per UE" - "Lower Frequency per UE" = "Occupied Bandwidth") between two limit frequencies obtained in '4)' and '5)'.

### 5.8C.5 Test Requirements

The measured Occupied Bandwidth, derived in step 10, shall not exceed 5 MHz.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.9 Spectrum emission mask

### 5.9.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

The requirements and this test apply to all types of UTRA for the FDD UE.

### 5.9.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in Table 5.9.1. The absolute requirement is based on a -50 dBm/3.84 MHz minimum power threshold for the UE. This limit is expressed for the narrower measurement bandwidths as -55.8 dBm/1 MHz and -71.1 dBm/30 kHz. The requirements are applicable for all values of c, d as specified in [5].

Table 5.9.1: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Minimum requirement (note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -71.1 dBm | 30 kHz  (note 3) |
| 3.5 - 7.5 |  | -55.8 dBm | 1 MHz  (note 4) |
| 7.5 - 8.5 |  | -55.8 dBm | 1 MHz (note 4) |
| 8.5 - 12.5 MHz | -49 dBc | -55.8 dBm | 1 MHz (note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

For operation in band II, IV, V, X, XII, XIII,XIV, XXV and XXVI the minimum requirement is calculated from the minimum requirement in table 5.9.1 or the applicable additional requirement in Tables  5.9.1A, 5.9.1B or 5.9.1C, whichever is the tighter requirement.

Table 5.9.1A: Additional spectrum emission limits for Bands II, IV, X and XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9.1B: Additional spectrum emission limits for Band V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9.1C: Additional spectrum emission limits for Bands XII, XIII and XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth specified in tables 5.9.1, 5.9.1A, 5.9.1B and 5.9.1C. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

The normative reference for this requirement is TS 25.101 [1], clause 6.6.2.1.1.

### 5.9.3 Test purpose

To verify that the power of UE emission does not exceed the prescribed limits shown in table 5.9.1.

Excess emission increases the interference to other channels or to other systems.

### 5.9.4 Method of test

#### 5.9.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

#### 5.9.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9.2 and 5.9.2A, 5.9.2B, 5.9.2C if applicable. For measurements using 1 MHz or 100KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9.2. The measured power shall be recorded for each step.

3) Measure the RRC filtered mean power centred on the assigned channel frequency.

4) Calculate the ratio of the power 2) with respect to 3) in dBc.

### 5.9.5 Test requirements

The result of clause 5.9.4.2 step 4) shall fulfil the requirements of table 5.9.2.

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI both minimum requirement in table 5.9.2 and the applicable additional requirement in Tables  5.9.2A, 5.9.2B, or 5.9.2C need to be satisfied.

Table 5.9.2: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Minimum requirement (note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -69.6 dBm | 30 kHz  (note 3) |
| 3.5 - 7.5 |  | -54.3 dBm | 1 MHz  (note 4) |
| 7.5 - 8.5 |  | -54.3 dBm | 1 MHz (note 4) |
| 8.5 - 12.5 MHz | -47.5 dBc | -54.3 dBm | 1 MHz (note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

Table 5.9.2A: Additional spectrum emission limits for Bands II, IV, X, XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9.2B: Additional spectrum emission limits for Band V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9.2C: Additional spectrum emission limits for Bands XII, XIII and XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.9A Spectrum Emission Mask with HS-DPCCH

### 5.9A.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

The requirements and this test apply for Release 5 and later releases to all types of UTRA for the FDD UE that support HSDPA.

### 5.9A.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in Table 5.9A.1. The absolute requirement is based on a -50 dBm/3.84 MHz minimum power threshold for the UE. This limit is expressed for the narrower measurement bandwidths as -55.8 dBm/1 MHz and -71.1 dBm/30 kHz. The requirements are applicable for all values of c, d, hs as specified in [5].

Table 5.9A.1: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Minimum requirement (note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -71.1 dBm | 30 kHz  (note 3) |
| 3.5 - 7.5 |  | -55.8 dBm | 1 MHz  (note 4) |
| 7.5 - 8.5 |  | -55.8 dBm | 1 MHz (note 4) |
| 8.5 - 12.5 MHz | -49 dBc | -55.8 dBm | 1 MHz (note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI the minimum requirement is calculated from the minimum requirement in table 5.9A.1 or the applicable additional requirement in Tables  5.9A.1A, 5.9A.1B or 5.9A.1C, whichever is the tighter requirement.

Table 5.9A.1A: Additional spectrum emission limits for Bands II, IV, X and XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9A.1B: Additional spectrum emission limits for Bands V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9A.1C: Additional spectrum emission limits for Bands XII, XIII and XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth specified in tables 5.9A.1, 5.9A.1A, 5.9A.1B and 5.9A.1C. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

The normative reference for this requirement is TS 25.101 [1], clause 6.6.2.1.1.

### 5.9A.3 Test purpose

To verify that the power of UE emission does not exceed the prescribed limits shown in table 5.9A.1. even in the presence of the HS-DPCCH. (see note). This is applicable for all values of,and as specified in [5]. The maximum output power with HS-DPCCH is specified in table 5.2A.1.

Excess emission increases the interference to other channels or to other systems.

NOTE: For a static signal, the measurement with a 1MHz filter can be replaced by a narrower filter and integration over the bandwidth. (Note 6 in table 5.9A.1) For a non static signal the above described replacement gives different results, depending on the type of dynamic in the signal and depending on the bandwidth of the filter. Hence the signal is tested only when static.

### 5.9A.4 Method of test

#### 5.9A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.9A.2.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.9A.2: Settings for the serving cell during the measurement of  
Spectrum Emission Mask with HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.9A.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.9A.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.1.4 and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.

2) Set and send continuously Up power control commands to the UE.

3) Start transmitting HSDPA Data.

4) When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9A.3 and 5.9A.3A, 5.9A.3B, 5.9A.3C if applicable. For measurements using 1 MHz or 100KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter(≥3kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9A.3 and 5.9A.3A, 5.9A.3B, 5.9A.3C if applicable. The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

5) Measure the RRC filtered mean power centred on the assigned channel frequency.

6) Calculate the ratio of the power 4) with respect to 5) in dBc.

7) Repeat steps 1-6 for all the different combinations of beta values as given in table C.10.1.4.

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I.

### 5.9A.5 Test requirements

The result of clause 5.9A.4.2 step 6) shall fulfil the requirements of table 5.9A.3.

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI both minimum requirement in table 5.9A.3 and the applicable additional requirement in Tables  5.9A.3A, 5.9A.3B, or 5.9A.3C need to be satisfied.

Table 5.9A.3: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Minimum requirement (note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -69.6 dBm | 30 kHz  (note 3) |
| 3.5 - 7.5 |  | -54.3 dBm | 1 MHz  (note 4) |
| 7.5 - 8.5 |  | -54.3 dBm | 1 MHz (note 4) |
| 8.5 - 12.5 MHz | -47.5 dBc | -54.3 dBm | 1 MHz (note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

Table 5.9A.3A: Additional spectrum emission limits for Bands II, IV, X and XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9A.3B: Additional spectrum emission limits for Bands V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9A.3C: Additional spectrum emission limits for Bands XII, XIII and XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.9AA Spectrum Emission Mask with HS-DPCCH for UL OLTD

### 5.9AA.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL OLTD and HSDPA.

### 5.9AA.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in Table 5.9AA.1. The absolute requirement is based on a -50 dBm/3.84 MHz minimum power threshold for the UE. This limit is expressed for the narrower measurement bandwidths as -55.8 dBm/1 MHz and -71.1 dBm/30 kHz. The requirements are applicable for all values of c, d, hs as specified in [5].

For UE with two active transmit antenna connectors in UL OLTD , the spectrum emission mask requirements apply at each transmit antenna connector.

Table 5.9AA.1: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Minimum requirement (note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -71.1 dBm | 30 kHz  (note 3) |
| 3.5 - 7.5 |  | -55.8 dBm | 1 MHz  (note 4) |
| 7.5 - 8.5 |  | -55.8 dBm | 1 MHz (note 4) |
| 8.5 - 12.5 MHz | -49 dBc | -55.8 dBm | 1 MHz (note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI the minimum requirement is calculated from the minimum requirement in table 5.9AA.1 or the applicable additional requirement in Tables 5.9AA.1A, 5.9AA.1B or 5.9AA.1C, whichever is the tighter requirement.

Table 5.9AA.1A: Additional spectrum emission limits for Bands II, IV, X and XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9AA.1B: Additional spectrum emission limits for Bands V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9AA.1C: Additional spectrum emission limits for Bands XII, XIII and XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth specified in tables 5.9AA.1, 5.9AA.1A, 5.9AA.1B and 5.9AA.1C. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

The normative reference for this requirement is TS 25.101 [1], clause 6.6.2.1B.

### 5.9AA.3 Test purpose

To verify that the power of UE emission for UL OLTD does not exceed the prescribed limits shown in table 5.9AA.1. even in the presence of the HS-DPCCH. (see note). This is applicable for all values of,and as specified in [5]. The maximum output power with HS-DPCCH is specified in table 5.2A.1.

Excess emission increases the interference to other channels or to other systems.

NOTE: For a static signal, the measurement with a 1MHz filter can be replaced by a narrower filter and integration over the bandwidth. (Note 6 in table 5.9AA.1) For a non static signal the above described replacement gives different results, depending on the type of dynamic in the signal and depending on the bandwidth of the filter. Hence the signal is tested only when static.

### 5.9AA.4 Method of test

#### 5.9AA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.2 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.18. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.9AA.2.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.9AA.2: Settings for the serving cell during the measurement of  
Spectrum Emission Mask with HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.9AA.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.9AA.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.2.4 and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.

2) Set and send continuously Up power control commands to the UE.

3) Start transmitting HSDPA Data.

4) When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9AA.3 and 5.9AA.3A, 5.9AA.3B, 5.9AA.3C if applicable. For measurements using 1 MHz or 100KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter(≥3kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9AA.3 and 5.9AA.3A, 5.9AA.3B, 5.9AA.3C if applicable. The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

5) Measure the RRC filtered mean power centred on the assigned channel frequency.

6) Calculate the ratio of the power 4) with respect to 5) in dBc.

7) Repeat steps 1-6 for all the different combinations of beta values as given in table C.10.2.4.

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I.

### 5.9AA.5 Test requirements

The result of clause 5.9AA.4.2 step 6) shall fulfil the requirements of table 5.9AA.3.

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI both minimum requirement in table 5.9AA.3 and the applicable additional requirement in Tables 5.9AA.3A, 5.9AA.3B, or 5.9AA.3C need to be satisfied.

For UE with two active transmit antenna connectors in UL OLTD , the spectrum emission mask requirements apply at each transmit antenna connector.

Table 5.9AA.3: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Minimum requirement (note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -69.6 dBm | 30 kHz  (note 3) |
| 3.5 - 7.5 |  | -54.3 dBm | 1 MHz  (note 4) |
| 7.5 - 8.5 |  | -54.3 dBm | 1 MHz (note 4) |
| 8.5 - 12.5 MHz | -47.5 dBc | -54.3 dBm | 1 MHz (note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

Table 5.9AA.3A: Additional spectrum emission limits for Bands II, IV, X and XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9AA.3B: Additional spectrum emission limits for Bands V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9AA.3C: Additional spectrum emission limits for Bands XII, XIII and XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.9AB Spectrum Emission Mask with HS-DPCCH for UL CLTD activation state 1

### 5.9AB.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and HSDPA.

### 5.9AB.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in Table 5.9AB.1. The absolute requirement is based on a -50 dBm/3.84 MHz minimum power threshold for the UE. This limit is expressed for the narrower measurement bandwidths as -55.8 dBm/1 MHz and -71.1 dBm/30 kHz. The requirements are applicable for all values of c, d, hs as specified in [5].

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the spectrum emission mask requirements apply at each transmit antenna connector.

Table 5.9AB.1: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Minimum requirement (note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -71.1 dBm | 30 kHz  (note 3) |
| 3.5 - 7.5 |  | -55.8 dBm | 1 MHz  (note 4) |
| 7.5 - 8.5 |  | -55.8 dBm | 1 MHz (note 4) |
| 8.5 - 12.5 MHz | -49 dBc | -55.8 dBm | 1 MHz (note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI the minimum requirement is calculated from the minimum requirement in table 5.9AB.1 or the applicable additional requirement in Tables 5.9AB.1A, 5.9AB.1B or 5.9AB.1C, whichever is the tighter requirement.

Table 5.9AB.1A: Additional spectrum emission limits for Bands II, IV, X and XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9AB.1B: Additional spectrum emission limits for Bands V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9AB.1C: Additional spectrum emission limits for Bands XII, XIII and XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth specified in tables 5.9AB.1, 5.9AB.1A, 5.9AB.1B and 5.9AB.1C. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

The normative reference for this requirement is TS 25.101 [1], clause 6.6.2.1C.

### 5.9AB.3 Test purpose

To verify that the power of UE emission for UL CLTD activation state 1 does not exceed the prescribed limits shown in table 5.9AB.1. even in the presence of the HS-DPCCH. (see note). This is applicable for all values of,and as specified in [5]. The maximum output power with HS-DPCCH is specified in table 5.2A.1.

Excess emission increases the interference to other channels or to other systems.

NOTE: For a static signal, the measurement with a 1MHz filter can be replaced by a narrower filter and integration over the bandwidth (Note 6 in table 5.9AB.1). For a non static signal the above described replacement gives different results, depending on the type of dynamic in the signal and depending on the bandwidth of the filter. Hence the signal is tested only when static.

### 5.9AB.4 Method of test

#### 5.9AB.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C, clauses C.10.2 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.17. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.9AB.2.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.9AB.2: Settings for the serving cell during the measurement of  
Spectrum Emission Mask with HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.9AB.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

#### 5.9AB.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.2.4 and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.

2) Set and send continuously Up power control commands to the UE.

3) Start transmitting HSDPA Data.

4) When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9AB.3 and 5.9AB.3A, 5.9AB.3B, 5.9AB.3C if applicable. For measurements using 1 MHz or 100KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter(≥3kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9AB.3 and 5.9AB.3A, 5.9AB.3B, 5.9AB.3C if applicable. The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

5) Measure the RRC filtered mean power centred on the assigned channel frequency.

6) Calculate the ratio of the power 4) with respect to 5) in dBc.

7) Repeat steps 1-6 for all the different combinations of beta values as given in table C.10.2.4.

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I.

### 5.9AB.5 Test requirements

The result of clause 5.9AB.4.2 step 6) shall fulfil the requirements of table 5.9AB.3.

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI both minimum requirement in table 5.9AB.3 and the applicable additional requirement in Tables 5.9AB.3A, 5.9AB.3B, or 5.9AB.3C need to be satisfied.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the spectrum emission mask requirements apply at each transmit antenna connector.

Table 5.9AB.3: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Minimum requirement (note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -69.6 dBm | 30 kHz  (note 3) |
| 3.5 - 7.5 |  | -54.3 dBm | 1 MHz  (note 4) |
| 7.5 - 8.5 |  | -54.3 dBm | 1 MHz (note 4) |
| 8.5 - 12.5 MHz | -47.5 dBc | -54.3 dBm | 1 MHz (note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

Table 5.9AB.3A: Additional spectrum emission limits for Bands II, IV, X and XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9AB.3B: Additional spectrum emission limits for Bands V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9AB.3C: Additional spectrum emission limits for Bands XII, XIII and XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.9AC Spectrum Emission Mask with HS-DPCCH for UL CLTD activation state 2 and 3

### 5.9AC.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and HSDPA.

### 5.9AC.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in Table 5.9AC.1. The absolute requirement is based on a -50 dBm/3.84 MHz minimum power threshold for the UE. This limit is expressed for the narrower measurement bandwidths as -55.8 dBm/1 MHz and -71.1 dBm/30 kHz. The requirements are applicable for all values of c, d, hs as specified in [5].

For UE configured in UL CLTD activation state 2 or activation state 3, the spectrum emission mask requirements apply at the active transmit antenna connector.

Table 5.9AC.1: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Minimum requirement (note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -71.1 dBm | 30 kHz  (note 3) |
| 3.5 - 7.5 |  | -55.8 dBm | 1 MHz  (note 4) |
| 7.5 - 8.5 |  | -55.8 dBm | 1 MHz (note 4) |
| 8.5 - 12.5 MHz | -49 dBc | -55.8 dBm | 1 MHz (note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI the minimum requirement is calculated from the minimum requirement in table 5.9AC.1 or the applicable additional requirement in Tables 5.9AC.1A, 5.9AC.1B or 5.9AC.1C, whichever is the tighter requirement.

Table 5.9AC.1A: Additional spectrum emission limits for Bands II, IV, X and XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9AC.1B: Additional spectrum emission limits for Bands V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9AC.1C: Additional spectrum emission limits for Bands XII, XIII and XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth specified in tables 5.9AC.1, 5.9AC.1A, 5.9AC.1B and 5.9AC.1C. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

The normative reference for this requirement is TS 25.101 [1], clause 6.6.2.1C.

### 5.9AC.3 Test purpose

To verify that the power of UE emission for UL CLTD activation state 2 and 3 does not exceed the prescribed limits shown in table 5.9AC.1. even in the presence of the HS-DPCCH. (see note). This is applicable for all values of,and as specified in [5]. The maximum output power with HS-DPCCH is specified in table 5.2A.1.

Excess emission increases the interference to other channels or to other systems.

NOTE: For a static signal, the measurement with a 1MHz filter can be replaced by a narrower filter and integration over the bandwidth (Note 6 in table 5.9AC.1). For a non static signal the above described replacement gives different results, depending on the type of dynamic in the signal and depending on the bandwidth of the filter. Hence the signal is tested only when static.

### 5.9AC.4 Method of test

#### 5.9AC.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C, clauses C.10.1 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.17 with the following exception in the RADIO BEARER SETUP messages in table 5.9AC.2A. This exception allows the call to be setup with initial UL CLTD activation state as state 2. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.9AC.2.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.9AC.2: Settings for the serving cell during the measurement of  
Spectrum Emission Mask with HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.9AC.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2. | | |

Table 5.9AC.2A: Contents of Radio bearer setup message

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink CLTD info FDD |  | Rel-11 |
| - CHOICE *Mode* | New |  |
| - Initial CLTD activation state | Second state |  |

#### 5.9AC.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.1.4 and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.

2) Set and send continuously Up power control commands to the UE.

3) Start transmitting HSDPA Data.

4) When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9AC.3 and 5.9AC.3A, 5.9AC.3B, 5.9AC.3C if applicable. For measurements using 1 MHz or 100KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter(≥3kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9AC.3 and 5.9AC.3A, 5.9AC.3B, 5.9AC.3C if applicable. The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

5) Measure the RRC filtered mean power centred on the assigned channel frequency.

6) Calculate the ratio of the power 4) with respect to 5) in dBc.

7) Repeat steps 1-6 for all the different combinations of beta values as given in table C.10.1.4.

8) SS sends a HS-SCCH order now to move the UE in UL\_CLTD activation state 3.

9) Repeat step 1 to 7 for activation state 3

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I.

### 5.9AC.5 Test requirements

The result of clause 5.9AC.4.2 step 6) shall fulfil the requirements of table 5.9AC.3.

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI both minimum requirement in table 5.9AC.3 and the applicable additional requirement in Tables 5.9AC.3A, 5.9AC.3B, or 5.9AC.3C need to be satisfied.

For UE configured in UL CLTD activation state 2 or activation state 3, the spectrum emission mask requirements apply at the active transmit antenna connector.

Table 5.9AC.3: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Minimum requirement (note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -69.6 dBm | 30 kHz  (note 3) |
| 3.5 - 7.5 |  | -54.3 dBm | 1 MHz  (note 4) |
| 7.5 - 8.5 |  | -54.3 dBm | 1 MHz (note 4) |
| 8.5 - 12.5 MHz | -47.5 dBc | -54.3 dBm | 1 MHz (note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

Table 5.9AC.3A: Additional spectrum emission limits for Bands II, IV, X and XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9AC.3B: Additional spectrum emission limits for Bands V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9AC.3C: Additional spectrum emission limits for Bands XII, XIII and XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.9B Spectrum Emission Mask with E-DCH

### 5.9B.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA and E-DCH.

### 5.9B.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in table 5.9B.1. The absolute requirement is based on a -50 dBm/3.84 MHz minimum power threshold for the UE. This limit is expressed for the narrower measurement bandwidths as -55.8 dBm/1 MHz and -71.1 dBm/30 kHz. This is applicable for all values of *c* , *d*,*hs*, *ec* and *ed*  as specified in [5].

Table 5.9B.1: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Minimum requirement (note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -71.1 dBm | 30 kHz  (note 3) |
| 3.5 - 7.5 |  | -55.8 dBm | 1 MHz  (note 4) |
| 7.5 - 8.5 |  | -55.8 dBm | 1 MHz (note 4) |
| 8.5 - 12.5 MHz | -49 dBc | -55.8 dBm | 1 MHz (note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI the minimum requirement is calculated from the minimum requirement in table 5.9B.1 or the applicable additional requirement in Tables 5.9B.1A, 5.9B.1B or 5.9B.1C, whichever is the tighter requirement.

Table 5.9B.1A: Additional spectrum emission limits for Bands II, IV, X and XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9B.1B: Additional spectrum emission limits for Bands V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9B.1C: Additional spectrum emission limits for Bands XII, XIII, XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth specified in tables 5.9B.1, 5.9B.1A, 5.9B.1B and 5.9B.1C. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.1.1.

### 5.9B.3 Test purpose

To verify that the power of UE emission does not exceed the prescribed limits shown in table 5.9B.1. even in the presence of the E-DCH. (see note). This is applicable for all values of *c* , *d*  ,*hs*, *ec* and *ed*  as specified in [5]. The maximum output power with HS-DPCCH and/or E-DCH is specified in table 5.2B.1.

Excess emission increases the interference to other channels or to other systems.

NOTE: For a static signal, the measurement with a 1MHz filter can be replaced by a narrower filter and integration over the bandwidth. (Note 6 in table 5.9B.1) For a non static signal the above described replacement gives different results, depending on the type of dynamic in the signal and depending on the bandwidth of the filter. Hence the signal is tested only when static.

### 5.9B.4 Method of test

#### 5.9B.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex C.11.1 and C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.9 with the exceptions in the RADIO BEARER SETUP messages as given in Tables 5.2B.1A, 5.2B.2, 5.2B3, 5.2B.3A and 5.2B.4. These exceptions allow the beta values to be set according to table C.11.1.3 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.9B.2.

4) For sub-test 1 to 4, enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH according to procedure 7.3.9.3.1 in TS 34.108 [3] and start the loopback test. For sub-test 5, enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.9.3.2 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.9B.2: Settings for the serving cell during the measurement of  
Spectrum Emission Mask with E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.9B.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

#### 5.9B.4.2 Procedure

1) For sub-test 1 to 4, set UE to maximum output power according to 5.2B.4.2.1 steps 1 to 8. For sub-test 5, set UE to maximum output power according to 5.2B.4.2.2 step 1 to 4.

2) When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9B.3 and 5.9B.3A, 5.9B.3B, 5.9B.3C if applicable. For measurements using 1 MHz or 100KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter(≥3kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9B.3 and 5.9B.3A, 5.9B.3B 5.9B.3C if applicable. The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

3) Measure the RRC filtered mean power centred on the assigned channel frequency.

4) Calculate the ratio of the power 2) with respect to 3) in dBc.

5) Repeat steps 1-4 for all the different combinations of beta values as given in table C.11.1.3.

### 5.9B.5 Test requirements

The result of clause 5.9B.4.2 step 4) shall fulfil the requirements of table 5.9B.3.

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI both minimum requirement in table 5.9B.3 and the applicable additional requirement in Tables  5.9B.3A, 5.9B.3B or 5.9B.3C need to be satisfied.

Table 5.9B.3: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Minimum requirement (Note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -69.6 dBm | 30 kHz  (Note 3) |
| 3.5 - 7.5 |  | -54.3 dBm | 1 MHz  (Note 4) |
| 7.5 - 8.5 |  | -54.3 dBm | 1 MHz (Note 4) |
| 8.5 - 12.5 MHz | -47.5 dBc | -54.3 dBm | 1 MHz (Note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

Table 5.9B.3A: Additional spectrum emission limits for Bands II, IV, X and XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9B.3B: Additional spectrum emission limits for Bands V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9B.3C: Additional spectrum emission limits for Bands XII, XIII and XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.9BA Spectrum Emission Mask with E-DCH for UL OLTD

### 5.9BA.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL OLTD and E-DCH.

### 5.9BA.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in table 5.9BA.1. The absolute requirement is based on a -50 dBm/3.84 MHz minimum power threshold for the UE. This limit is expressed for the narrower measurement bandwidths as -55.8 dBm/1 MHz and -71.1 dBm/30 kHz. This is applicable for all values of *c* , *d*,*hs*, *ec* and *ed* as specified in [5].

For UE with two active transmit antenna connectors in UL OLTD, the spectrum emission mask requirements apply at each transmit antenna connector.

Table 5.9BA.1: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Minimum requirement (note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -71.1 dBm | 30 kHz  (note 3) |
| 3.5 - 7.5 |  | -55.8 dBm | 1 MHz  (note 4) |
| 7.5 - 8.5 |  | -55.8 dBm | 1 MHz (note 4) |
| 8.5 - 12.5 MHz | -49 dBc | -55.8 dBm | 1 MHz (note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI the minimum requirement is calculated from the minimum requirement in table 5.9BA.1 or the applicable additional requirement in Tables 5.9BA.1A, 5.9BA.1B or 5.9BA.1C, whichever is the tighter requirement.

Table 5.9BA.1A: Additional spectrum emission limits for Bands II, IV, X and XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9BA.1B: Additional spectrum emission limits for Bands V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9BA.1C: Additional spectrum emission limits for Bands XII, XIII, XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth specified in tables 5.9BA.1, 5.9BA.1A, 5.9BA.1B and 5.9BA.1C. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.1B.

### 5.9BA.3 Test purpose

To verify that the power of UE emission for UL OLTD does not exceed the prescribed limits shown in table 5.9BA.1. even in the presence of the E-DCH. (see note). This is applicable for all values of *c* , *d* ,*hs*, *ec* and *ed* as specified in [5]. The maximum output power with HS-DPCCH and/or E-DCH is specified in table 5.2B.1.

Excess emission increases the interference to other channels or to other systems.

NOTE: For a static signal, the measurement with a 1MHz filter can be replaced by a narrower filter and integration over the bandwidth. (Note 6 in table 5.9BA.1) For a non static signal the above described replacement gives different results, depending on the type of dynamic in the signal and depending on the bandwidth of the filter. Hence the signal is tested only when static.

### 5.9BA.4 Method of test

#### 5.9BA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex C.11.1A and C.8.1.1..

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.20 with the exceptions in the RADIO BEARER SETUP messages as given in Tables 5.2B.1A, 5.2B.2, 5.2B3, 5.2B.3A and 5.2B.4. These exceptions allow the beta values to be set according to table C.11.1A.4 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.9BA.2.

4) For sub-test 1 to 4, enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH according to procedure 7.3.9.3.1 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.9BA.2: Settings for the serving cell during the measurement of  
Spectrum Emission Mask with E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.9BA.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

#### 5.9BA.4.2 Procedure

1) For sub-test 1 to 4, set UE to maximum output power according to 5.2B.4.2.1 steps 1 to 8.

2) When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9BA.3 and 5.9BA.3A, 5.9BA.3B, 5.9BA.3C if applicable. For measurements using 1 MHz or 100 KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter (≥3kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9BA.3 and 5.9BA.3A, 5.9BA.3B 5.9BA.3C if applicable. The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

3) Measure the RRC filtered mean power centred on the assigned channel frequency.

4) Calculate the ratio of the power 2) with respect to 3) in dBc.

5) Repeat steps 1-4 for all the different combinations of beta values as given in table C.11.1A.4.

### 5.9BA.5 Test requirements

The result of clause 5.9BA.4.2 step 4) shall fulfil the requirements of table 5.9BA.3.

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI both minimum requirement in table 5.9BA.3 and the applicable additional requirement in Tables 5.9BA.3A, 5.9BA.3B or 5.9BA.3C need to be satisfied.

For UE with two active transmit antenna connectors in UL OLTD , the spectrum emission mask requirements apply at each transmit antenna connector.

Table 5.9BA.3: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Minimum requirement (Note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -69.6 dBm | 30 kHz  (Note 3) |
| 3.5 - 7.5 |  | -54.3 dBm | 1 MHz  (Note 4) |
| 7.5 - 8.5 |  | -54.3 dBm | 1 MHz (Note 4) |
| 8.5 - 12.5 MHz | -47.5 dBc | -54.3 dBm | 1 MHz (Note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

Table 5.9BA.3A: Additional spectrum emission limits for Bands II, IV, X and XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9BA.3B: Additional spectrum emission limits for Bands V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9BA.3C: Additional spectrum emission limits for Bands XII, XIII and XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.9BB Spectrum Emission Mask with E-DCH for UL CLTD activation state 1

### 5.9BB.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD HSDPA and E-DCH.

### 5.9BB.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in table 5.9BB.1. The absolute requirement is based on a -50 dBm/3.84 MHz minimum power threshold for the UE. This limit is expressed for the narrower measurement bandwidths as -55.8 dBm/1 MHz and -71.1 dBm/30 kHz. This is applicable for all values of *c* , *d*,*hs*, *ec* and *ed* as specified in [5].

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the spectrum emission mask requirements apply at each transmit antenna connector.

Table 5.9BB.1: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Minimum requirement (note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -71.1 dBm | 30 kHz  (note 3) |
| 3.5 - 7.5 |  | -55.8 dBm | 1 MHz  (note 4) |
| 7.5 - 8.5 |  | -55.8 dBm | 1 MHz (note 4) |
| 8.5 - 12.5 MHz | -49 dBc | -55.8 dBm | 1 MHz (note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI the minimum requirement is calculated from the minimum requirement in table 5.9BB.1 or the applicable additional requirement in Tables 5.9BB.1A, 5.9BB.1B or 5.9BB.1C, whichever is the tighter requirement.

Table 5.9BB.1A: Additional spectrum emission limits for Bands II, IV, X and XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9BB.1B: Additional spectrum emission limits for Bands V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9BB.1C: Additional spectrum emission limits for Bands XII, XIII, XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth specified in tables 5.9BB.1, 5.9BB.1A, 5.9BB.1B and 5.9BB.1C. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.1C.

### 5.9BB.3 Test purpose

To verify that the power of UE emission for UL CLTD activation state 1 does not exceed the prescribed limits shown in table 5.9BB.1. even in the presence of the E-DCH. (see note). This is applicable for all values of *c* , *d* ,*hs*, *ec* and *ed* as specified in [5]. The maximum output power with HS-DPCCH and/or E-DCH is specified in table 5.2B.1.

Excess emission increases the interference to other channels or to other systems.

NOTE: For a static signal, the measurement with a 1MHz filter can be replaced by a narrower filter and integration over the bandwidth. (Note 6 in table 5.9BB.1) For a non static signal the above described replacement gives different results, depending on the type of dynamic in the signal and depending on the bandwidth of the filter. Hence the signal is tested only when static.

### 5.9BB.4 Method of test

#### 5.9BB.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex C, clauses C.11.1A and C.8.1.1..

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.19 with the exceptions in the RADIO BEARER SETUP messages as given in Tables 5.2B.1A, 5.2B.2, 5.2B3, 5.2B.3A and 5.2B.4. These exceptions allow the beta values to be set according to table C.11.1A.4 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.9BB.2.

4) For sub-test 1 to 4, enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH according to procedure 7.3.9.3.1 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.9BB.2: Settings for the serving cell during the measurement of  
Spectrum Emission Mask with E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.9BB.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

#### 5.9BB.4.2 Procedure

1) For sub-test 1 to 4, set UE to maximum output power according to 5.2B.4.2.1 steps 1 to 8.

2) When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9BB.3 and 5.9BB.3A, 5.9BB.3B, 5.9BB.3C if applicable. For measurements using 1 MHz or 100 KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter (≥3kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9BB.3 and 5.9BB.3A, 5.9BB.3B 5.9BB.3C if applicable. The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

3) Measure the RRC filtered mean power centred on the assigned channel frequency.

4) Calculate the ratio of the power 2) with respect to 3) in dBc.

5) Repeat steps 1-4 for all the different combinations of beta values as given in table C.11.1A.4.

### 5.9BB.5 Test requirements

The result of clause 5.9BB.4.2 step 4) shall fulfil the requirements of table 5.9BB.3.

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI both minimum requirement in table 5.9BB.3 and the applicable additional requirement in Tables 5.9BB.3A, 5.9BB.3B or 5.9BB.3C need to be satisfied.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the spectrum emission mask requirements apply at each transmit antenna connector.

Table 5.9BB.3: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Minimum requirement (Note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -69.6 dBm | 30 kHz  (Note 3) |
| 3.5 - 7.5 |  | -54.3 dBm | 1 MHz  (Note 4) |
| 7.5 - 8.5 |  | -54.3 dBm | 1 MHz (Note 4) |
| 8.5 - 12.5 MHz | -47.5 dBc | -54.3 dBm | 1 MHz (Note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

Table 5.9BB.3A: Additional spectrum emission limits for Bands II, IV, X and XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9BB.3B: Additional spectrum emission limits for Bands V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9BB.3C: Additional spectrum emission limits for Bands XII, XIII and XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.9BC Spectrum Emission Mask with E-DCH for UL CLTD activation state 2 and 3

### 5.9BC.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD with HSDPA and E-DCH.

### 5.9BC.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in table 5.9BC.1. The absolute requirement is based on a -50 dBm/3.84 MHz minimum power threshold for the UE. This limit is expressed for the narrower measurement bandwidths as -55.8 dBm/1 MHz and -71.1 dBm/30 kHz. This is applicable for all values of *c* , *d*,*hs*, *ec* and *ed* as specified in [5].

For UE configured in UL CLTD activation state 2 or activation state 3, the spectrum emission mask requirements apply at the active transmit antenna connector.

Table 5.9BC.1: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Minimum requirement (note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -71.1 dBm | 30 kHz  (note 3) |
| 3.5 - 7.5 |  | -55.8 dBm | 1 MHz  (note 4) |
| 7.5 - 8.5 |  | -55.8 dBm | 1 MHz (note 4) |
| 8.5 - 12.5 MHz | -49 dBc | -55.8 dBm | 1 MHz (note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI the minimum requirement is calculated from the minimum requirement in table 5.9BC.1 or the applicable additional requirement in Tables 5.9BC.1A, 5.9BC.1B or 5.9BC.1C, whichever is the tighter requirement.

Table 5.9BC.1A: Additional spectrum emission limits for Bands II, IV, X and XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9BC.1B: Additional spectrum emission limits for Bands V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9BC.1C: Additional spectrum emission limits for Bands XII, XIII, XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth specified in tables 5.9BC.1, 5.9BC.1A, 5.9BC.1B and 5.9BC.1C. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.1C.

### 5.9BC.3 Test purpose

To verify that the power of UE emission for UL CLTD activation state 2 and 3 does not exceed the prescribed limits shown in table 5.9BC.1. even in the presence of the E-DCH. (see note). This is applicable for all values of *c* , *d* ,*hs*, *ec* and *ed* as specified in [5]. The maximum output power with HS-DPCCH and/or E-DCH is specified in table 5.2B.1.

Excess emission increases the interference to other channels or to other systems.

NOTE: For a static signal, the measurement with a 1MHz filter can be replaced by a narrower filter and integration over the bandwidth. (Note 6 in table 5.9BC.1) For a non static signal the above described replacement gives different results, depending on the type of dynamic in the signal and depending on the bandwidth of the filter. Hence the signal is tested only when static.

### 5.9BC.4 Method of test

#### 5.9BC.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex C, clauses C.11.1 and C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.19 with the exceptions in the RADIO BEARER SETUP messages as given in Tables 5.2B.1A, 5.2B.2, 5.2B3, 5.2B.3A, 5.2B.4 and 5.9BC.2A. These exceptions allows the beta values to be set according to table C.11.1.3, each UL physical channel to be at constant power during the measurement and allow the call to be setup with initial UL CLTD activation state as state 2. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.9BC.2.

4) For sub-test 1 to 4, enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH according to procedure 7.3.9.3.1 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.9BC.2: Settings for the serving cell during the measurement of  
Spectrum Emission Mask with E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.9BC.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

Table 5.9BC.2A: Contents of Radio bearer setup message

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink CLTD info FDD |  | Rel-11 |
| - CHOICE *Mode* | New |  |
| - Initial CLTD activation state | Second state |  |

#### 5.9BC.4.2 Procedure

1) For sub-test 1 to 4, set UE to maximum output power according to 5.2B.4.2.1 steps 1 to 8.

2) When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9BC.3 and 5.9BC.3A, 5.9BC.3B, 5.9BC.3C if applicable. For measurements using 1 MHz or 100 KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter (≥3kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9BC.3 and 5.9BC.3A, 5.9BC.3B 5.9BC.3C if applicable. The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

3) Measure the RRC filtered mean power centred on the assigned channel frequency.

4) Calculate the ratio of the power 2) with respect to 3) in dBc.

5) Repeat steps 1-4 for all the different combinations of beta values as given in table C.11.1.3.

6) SS sends a HS-SCCH order now to move the UE in UL\_CLTD activation state 3.

7) Repeat step 1 to 5 for activation state 3

### 5.9BC.5 Test requirements

The result of clause 5.9BC4.2 step 4) shall fulfil the requirements of table 5.9BC.3.

For operation in band II, IV, V, X, XII, XIII, XIV, XXV and XXVI both minimum requirement in table 5.9BC.3 and the applicable additional requirement in Tables 5.9BC.3A, 5.9BC.3B or 5.9BC.3C need to be satisfied.

For UE configured in UL CLTD activation state 2 or activation state 3, the spectrum emission mask requirements apply at the active transmit antenna connector.

Table 5.9BC.3: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Minimum requirement (Note 2) | | Measurement bandwidth |
| Relative requirement | Absolute requirement |
| 2.5 - 3.5 |  | -69.6 dBm | 30 kHz  (Note 3) |
| 3.5 - 7.5 |  | -54.3 dBm | 1 MHz  (Note 4) |
| 7.5 - 8.5 |  | -54.3 dBm | 1 MHz (Note 4) |
| 8.5 - 12.5 MHz | -47.5 dBc | -54.3 dBm | 1 MHz (Note 4) |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth.  NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.  NOTE 3: The first and last measurement position with a 30 kHz filter is at f equals to 2.515 MHz and 3.485 MHz.  NOTE 4: The first and last measurement position with a 1 MHz filter is at f equals to 4 MHz and 12 MHz. | | | |

Table 5.9BC.3A: Additional spectrum emission limits for Bands II, IV, X and XXV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band II, IV, X | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 4.0MHz  f\_offset < 12.0 MHz | -13 dBm | 1 MHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9BC.3B: Additional spectrum emission limits for Bands V and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band V | Measurement bandwidth |
| 2.5 MHz  f < 3.5 MHz | 2.515MHz  f\_offset < 3.485MHz | -15 dBm | 30 kHz |
| 3.5 MHz  f  12.5 MHz | 3.55MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

Table 5.9BC.3C: Additional spectrum emission limits for Bands XII, XIII and XIV

|  |  |  |  |
| --- | --- | --- | --- |
| Δf in MHz (Note 1) | Frequency offset of measurement filter centre frequency, f\_offset | Additional requirements Band XII, XIII, XIV | Measurement bandwidth |
| 2.5 MHz  f < 2.6 MHz | 2.515MHz  f\_offset < 2.585MHz | -13 dBm | 30 kHz |
| 2.6 MHz  f  12.45 MHz | 2.65MHz  f\_offset < 12.45 MHz | -13 dBm | 100 kHz |
| NOTE 1: f is the separation between the carrier frequency and the centre of the measurement bandwidth. | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.9C Additional Spectrum Emission Mask for DC-HSUPA (QPSK)

### 5.9C.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 5 MHz and 20 MHz away from the UE centre frequency of the two assigned channel frequencies. The requirements assume that the UE output power shall be maximum level.

It is necessary to verify the requirements only for the DC-HSUPA configurations specified in clause C.2.8.The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

### 5.9C.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in Table 5.9C.1 for the specified channel bandwidth.

Table 5.9C.1: Spectrum emission mask for DC-HSUPA

|  |  |  |  |
| --- | --- | --- | --- |
| Δf  (MHz) | Frequency offset of measurement filter centre frequency, f\_offset | Spectrum emission limit (dBm) | Measurement bandwidth |
|  5-6 | 5.015MHz  f\_offset < 5.985MHz | -18 | 30 kHz |
|  6-10 | 6.5MHz  f\_offset < 10.0MHz | -10 | 1 MHz |
|  10-19 | 10.0MHz  f\_offset < 19.0MHz | -13 | 1 MHz |
|  19-20 | 19.0MHz  f\_offset < 19.5MHz | -25 | 1 MHz |
| Note: f is the separation between the centre of two assigned channel frequencies and the centre of the measurement bandwidth | | | |

The UE shall meet an additional requirement specified in Table 5.9C.1A for band II, IV, V and X.

Table 5.9C.1A: Additional spectrum emission mask for  
DC-HSUPA in band II, IV, V, X, XXV and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf  (MHz) | Frequency offset of measurement filter centre frequency, f\_offset | Spectrum emission limit (dBm) | Measurement bandwidth |
|  5-6 | 5.015MHz  f\_offset < 5.985MHz | -18 | 30 kHz |
|  6-19 | 6.5MHz  f\_offset < 19.0MHz | -13 | 1 MHz |
|  19-20 | 19.0MHz  f\_offset < 19.5MHz | -25 | 1 MHz |
| Note: f is the separation between the centre of two assigned channel frequencies and the centre of the measurement bandwidth | | | |

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.1A

### 5.9C.3 Test purpose

To verify that the power of UE emission, during DC-HSUPA transmission, does not exceed the prescribed limits shown in table 5.9C.1 or 5.9C.1A. This is applicable for all values of *c* , *d*  ,*hs*, *ec* and *ed*  as specified in [5]. The maximum output power with HS-DPCCH and/or E-DCH is specified in table 5.2BA.1.

Excess emission increases the interference to other channels or to other systems.

NOTE: For a static signal, the measurement with a 1MHz filter can be replaced by a narrower filter and integration over the bandwidth. For a non static signal the above described replacement gives different results, depending on the type of dynamic in the signal and depending on the bandwidth of the filter. Hence the signal is tested only when static.

### 5.9C.4 Method of test

#### 5.9C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.8 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) A call is set up according to the Generic call setup procedure specified in TS34.108 [3] sub clause 7.3.14, with exceptions for information elements in RADIO BEARER SETUP message as given in Table 5.2BA.2, 5.2BA.3 and 5.2BA.4. These exceptions allow the beta values to be set according to table C.11A.1.1 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to E.5 A.1A. Settings for the serving cell are defined in table 5.9C.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

Table 5.9C.2: Settings for the serving cell during the measurement of  
Spectrum Emission Mask for DC-HSUPA

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.9C.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

#### 5.9C.4.2 Procedure

1) Set the UE to maximum output power according to 5.2BA.4.2 steps 1 to 4.

2) When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9C.1 and 5.9C.1A. For measurements using 1 MHz or 100KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter (≥3kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9C.1 and 5.9C.1A. The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

3) Repeat steps 1-2 for all the different combinations of UL E-DCH reference measurement channels and of beta values as given in clause C.2.8 and table C.11A.1.1.

4) Repeat steps 1-3 for all the different configurations given in table 5.2BA.5A

### 5.9C.5 Test requirements

The result of clause 5.9C.4.2 step 2) shall fulfil the requirements of table 5.9C.3.

For operation in band II, IV, V and X both minimum requirement in table 5.9C.3 and the applicable additional requirement in Tables  5.9C.3A need to be satisfied.

Table 5.9C.3: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf  (MHz) | Frequency offset of measurement filter centre frequency, f\_offset | Spectrum emission limit (dBm) | Measurement bandwidth |
|  5-6 | 5.015MHz  f\_offset < 5.985MHz | -16.5 | 30 kHz |
|  6-10 | 6.5MHz  f\_offset < 10.0MHz | -8.5 | 1 MHz |
|  10-19 | 10.0MHz  f\_offset < 19.0MHz | -11.5 | 1 MHz |
|  19-20 | 19.0MHz  f\_offset < 19.5MHz | -23.5 | 1 MHz |
| Note: f is the separation between the centre of two assigned channel frequencies and the centre of the measurement bandwidth | | | |

Table 5.9C.3A: Additional spectrum emission limits for Bands II, IV, V, X, XXV and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf  (MHz) | Frequency offset of measurement filter centre frequency, f\_offset | Spectrum emission limit (dBm) | Measurement bandwidth |
|  5-6 | 5.015MHz  f\_offset < 5.985MHz | -18 | 30 kHz |
|  6-19 | 6.5MHz  f\_offset < 19.0MHz | -13 | 1 MHz |
|  19-20 | 19.0MHz  f\_offset < 19.5MHz | -25 | 1 MHz |
| Note: f is the separation between the centre of two assigned channel frequencies and the centre of the measurement bandwidth | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.9D Additional Spectrum Emission Mask for DC-HSUPA (16QAM)

### 5.9D.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 5 MHz and 20 MHz away from the UE centre frequency of the two assigned channel frequencies. The requirements assume that the UE output power shall be maximum level.

It is necessary to verify the requirements only for the DC-HSUPA configurations specified in subclause C.2.8.The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH 16QAM UE capability category 9.

### 5.9D.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in Table 5.9D.1 for the specified channel bandwidth.

Table 5.9D.1: Spectrum emission mask for DC-HSUPA

|  |  |  |  |
| --- | --- | --- | --- |
| Δf  (MHz) | Frequency offset of measurement filter centre frequency, f\_offset | Spectrum emission limit (dBm) | Measurement bandwidth |
|  5-6 | 5.015MHz  f\_offset < 5.985MHz | -18 | 30 kHz |
|  6-10 | 6.5MHz  f\_offset < 10.0MHz | -10 | 1 MHz |
|  10-19 | 10.0MHz  f\_offset < 19.0MHz | -13 | 1 MHz |
|  19-20 | 19.0MHz  f\_offset < 19.5MHz | -25 | 1 MHz |
| Note: f is the separation between the centre of two assigned channel frequencies and the centre of the measurement bandwidth | | | |

The UE shall meet an additional requirement specified in Table 5.9D.1A for band II, IV, V and X.

Table 5.9D.1A: Additional spectrum emission mask for  
DC-HSUPA in band II, IV, V, X, XXV and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf  (MHz) | Frequency offset of measurement filter centre frequency, f\_offset | Spectrum emission limit (dBm) | Measurement bandwidth |
|  5-6 | 5.015MHz  f\_offset < 5.985MHz | -18 | 30 kHz |
|  6-19 | 6.5MHz  f\_offset < 19.0MHz | -13 | 1 MHz |
|  19-20 | 19.0MHz  f\_offset < 19.5MHz | -25 | 1 MHz |
| Note: f is the separation between the centre of two assigned channel frequencies and the centre of the measurement bandwidth | | | |

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.1A

### 5.9D.3 Test purpose

To verify that the power of UE emission, during DC-HSUPA transmission, does not exceed the prescribed limits shown in table 5.9D.1 or 5.9D.1A. This is applicable for all values of *c* , *d*  ,*hs*, *ec* and *ed*  as specified in [5]. The maximum output power with HS-DPCCH and/or E-DCH is specified in table 5.2BA.1.

Excess emission increases the interference to other channels or to other systems.

NOTE: For a static signal, the measurement with a 1MHz filter can be replaced by a narrower filter and integration over the bandwidth. For a non static signal the above described replacement gives different results, depending on the type of dynamic in the signal and depending on the bandwidth of the filter. Hence the signal is tested only when static.

### 5.9D.4 Method of test

#### 5.9D.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.8 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) A call is set up according to the Generic call setup procedure specified in TS34.108 [3] sub clause 7.3.14, with exceptions for information elements in RADIO BEARER SETUP message as given in Table 5.2BA.2, 5.2BA.3 and 5.2BA.4. These exceptions allow the beta values to be set according to table C.11A.1.1 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to E.5 A.1A. Settings for the serving cell are defined in table 5.9D.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

Table 5.9D.2: Settings for the serving cell during the measurement of  
Spectrum Emission Mask for DC-HSUPA

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.9D.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

#### 5.9D.4.2 Procedure

1) Set the UE to maximum output power according to 5.2BA.4.2 steps 1 to 4.

2) When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9D.1 and 5.9D.1A. For measurements using 1 MHz or 100KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter (≥3kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9D.1 and 5.9D.1A. The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

3) Repeat steps 1-2 for all the different combinations of UL E-DCH reference measurement channels and of beta values as given in clause C.2.8 and table C.11A.1.2.

4) Repeat steps 1-3 for all the different configurations given in table 5.2BB.5.

### 5.9D.5 Test requirements

The result of clause 5.9D.4.2 step 2) shall fulfil the requirements of table 5.9D.3.

For operation in band II, IV, V and X both minimum requirement in table 5.9D.3 and the applicable additional requirement in Tables  5.9D.3A need to be satisfied.

Table 5.9D.3: Spectrum Emission Mask Requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Δf  (MHz) | Frequency offset of measurement filter centre frequency, f\_offset | Spectrum emission limit (dBm) | Measurement bandwidth |
|  5-6 | 5.015MHz  f\_offset < 5.985MHz | -16.5 | 30 kHz |
|  6-10 | 6.5MHz  f\_offset < 10.0MHz | -8.5 | 1 MHz |
|  10-19 | 10.0MHz  f\_offset < 19.0MHz | -11.5 | 1 MHz |
|  19-20 | 19.0MHz  f\_offset < 19.5MHz | -23.5 | 1 MHz |
| Note: f is the separation between the centre of two assigned channel frequencies and the centre of the measurement bandwidth | | | |

Table 5.9D.3A: Additional spectrum emission limits for Bands II, IV, V, X, XXV and XXVI

|  |  |  |  |
| --- | --- | --- | --- |
| Δf  (MHz) | Frequency offset of measurement filter centre frequency, f\_offset | Spectrum emission limit (dBm) | Measurement bandwidth |
|  5-6 | 5.015MHz  f\_offset < 5.985MHz | -18 | 30 kHz |
|  6-19 | 6.5MHz  f\_offset < 19.0MHz | -13 | 1 MHz |
|  19-20 | 19.0MHz  f\_offset < 19.5MHz | -25 | 1 MHz |
| Note: f is the separation between the centre of two assigned channel frequencies and the centre of the measurement bandwidth | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.10 Adjacent Channel Leakage Power Ratio (ACLR)

### 5.10.1 Definition and applicability

ACLR is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

The requirements and this test apply to all types of UTRA for the FDD UE.

### 5.10.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than -50dBm then the ACLR shall be higher than the value specified in table 5.10.1.

Table 5.10.1: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 33 dB |
| 3 | +10 MHz or -10 MHz | 43 dB |
| 4 | +5 MHz or -5 MHz | 33 dB |
| 4 | +10 MHz or -10 MHz | 43 dB |

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1.

### 5.10.3 Test purpose

To verify that the UE ACLR does not exceed prescribed limit shown in table 5.10.1.

Excess ACLR increases the interference to other channels or to other systems.

### 5.10.4 Method of test

5.10.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.10.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the RRC filtered mean power.

3) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.

4) Calculate the ratio of the power between the values measured in '2)'and '3)'.

### 5.10.5 Test requirements

If the measured adjacent channel RRC filtered mean power, derived in step 3), is greater than -50,0 dBm then the measured ACLR, derived in step 4), shall be higher than the limit in table 5.10.2.

Table 5.10.2: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 32,2 dB |
| 3 | +10 MHz or -10 MHz | 42,2 dB |
| 4 | +5 MHz or -5 MHz | 32,2 dB |
| 4 | +10 MHz or -10 MHz | 42,2 dB |

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

NOTE 4: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.10A Adjacent Channel Leakage Power Ratio (ACLR) with HS-DPCCH

### 5.10A.1 Definition and applicability

ACLR is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

The requirements and this test apply for Release 5 and later releases to all types of UTRA for the FDD UE that support HSDPA.

### 5.10A.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than -50dBm then the ACLR shall be higher than the value specified in table 5.10A.1. This is applicable for all values of,and as specified in [5].

Table 5.10A.1: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 33 dB |
| 3 | +10 MHz or -10 MHz | 43 dB |
| 4 | +5 MHz or -5 MHz | 33 dB |
| 4 | +10 MHz or -10 MHz | 43 dB |

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1.

### 5.10A.3 Test purpose

To verify that the UE ACLR does not exceed prescribed limit shown in table 5.10A.1. This is applicable for all values of,and as specified in [5]. The maximum output power with HS-DPCCH is specified in table 5.2A.1.

Excess ACLR increases the interference to other channels or to other systems.

### 5.10A.4 Method of test

5.10A.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.10A.2.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.10A.2: Settings for the serving cell during the measurement of  
Adjacent Channel Leakage Power Ratio (ACLR) with HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.10A.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

5.10A.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.1.4 and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.

2) Set and send continuously Up power control commands to the UE.

3) Start transmitting HSDPA Data.

4) When UE has reached the maximum power, measure the RRC filtered mean power on the wanted channel. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.

5) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.

6) Calculate the ratio of the power between the values measured in step 4) and step 5).

7) Repeat steps 1-6 for all the different combinations of beta values as given in table C.10.1.4.

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I.

### 5.10A.5 Test requirements

The measured ACLR, derived in step 6), shall be higher than the limit in table 5.10A.3.

Table 5.10A.3: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 32.2 dB |
| 3 | +10 MHz or -10 MHz | 42.2 dB |
| 4 | +5 MHz or -5 MHz | 32.2 dB |
| 4 | +10 MHz or -10 MHz | 42.2 dB |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.10AA Adjacent Channel Leakage Power Ratio (ACLR) with HS-DPCCH for OLTD

### 5.10AA.1 Definition and applicability

ACLR is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

The requirements and this test apply for Release 5 and later releases to all types of UTRA for the FDD UE that support UL OLTD and HSDPA.

### 5.10AA.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than -50dBm then the ACLR shall be higher than the value specified in table 5.10AA.1. This is applicable for all values of,and as specified in [5].

Table 5.10AA.1: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 33 dB |
| 3 | +10 MHz or -10 MHz | 43 dB |
| 4 | +5 MHz or -5 MHz | 33 dB |
| 4 | +10 MHz or -10 MHz | 43 dB |

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1B.

### 5.10AA.3 Test purpose

To verify that the UE ACLR for UL OLTD does not exceed prescribed limit shown in table 5.10AA.1. This is applicable for all values of,and as specified in [5]. The maximum output power with HS-DPCCH is specified in table 5.2A.1.

Excess ACLR increases the interference to other channels or to other systems.

### 5.10AA.4 Method of test

5.10AA.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.18. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.10AA.2.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.10AA.2: Settings for the serving cell during the measurement of  
Adjacent Channel Leakage Power Ratio (ACLR) with HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.10AA.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

5.10AA.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.2.4 and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.

2) Set and send continuously Up power control commands to the UE.

3) Start transmitting HSDPA Data.

4) When UE has reached the maximum power, measure the RRC filtered mean power on the wanted channel. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.

5) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.

6) Calculate the ratio of the power between the values measured in step 4) and step 5).

7) Repeat steps 1-6 for all the different combinations of beta values as given in table C.10.2.4.

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I.

### 5.10AA.5 Test requirements

The measured ACLR, derived in step 6), shall be higher than the limit in table 5.10AA.3.

Table 5.10AA.3: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 32.2 dB |
| 3 | +10 MHz or -10 MHz | 42.2 dB |
| 4 | +5 MHz or -5 MHz | 32.2 dB |
| 4 | +10 MHz or -10 MHz | 42.2 dB |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.10AB Adjacent Channel Leakage Power Ratio (ACLR) with HS-DPCCH for UL CLTD Activation state 1

### 5.10AB.1 Definition and applicability

ACLR is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and HSDPA.

### 5.10AB.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than -50dBm then the ACLR shall be higher than the value specified in table 5.10AB.1. This is applicable for all values of,, and as specified in [5].

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the ACLR requirements apply at each transmit antenna connector.

Table 5.10AB.1: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 33 dB |
| 3 | +10 MHz or -10 MHz | 43 dB |
| 4 | +5 MHz or -5 MHz | 33 dB |
| 4 | +10 MHz or -10 MHz | 43 dB |

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1C.

### 5.10AB.3 Test purpose

To verify that the UE ACLR for UL CLTD activation state 1 does not exceed prescribed limit shown in table 5.10AB.1. This is applicable for all values of,and as specified in [5]. The maximum output power with HS-DPCCH is specified in table 5.2A.1.

Excess ACLR increases the interference to other channels or to other systems.

### 5.10AB.4 Method of test

#### 5.10AB.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C, clauses C.10.2 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.17. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.10AB.2.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.10AB.2: Settings for the serving cell during the measurement of  
Adjacent Channel Leakage Power Ratio (ACLR) with HS-DPCCH for UL CLTD

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.10AB.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

#### 5.10AB.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.2.4 and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.

2) Set and send continuously Up power control commands to the UE.

3) Start transmitting HSDPA Data.

4) When UE has reached the maximum power measure the RRC filtered mean power on the wanted channel at each transmits antenna connector. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.

5) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels at each transmit antenna connector.

6) Calculate the ratio of the power between the values measured in step 4) and step 5).

7) Repeat steps 1-6 for all the different combinations of beta values as given in table C.10.2.4.

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I.

### 5.10AB.5 Test requirements

The measured ACLR, derived in step 6), shall be higher than the limit in table 5.10AB.3.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the ACLR requirements apply at each transmit antenna connector.

Table 5.10AB.3: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 32.2 dB |
| 3 | +10 MHz or -10 MHz | 42.2 dB |
| 4 | +5 MHz or -5 MHz | 32.2 dB |
| 4 | +10 MHz or -10 MHz | 42.2 dB |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.10AC Adjacent Channel Leakage Power Ratio (ACLR) with HS-DPCCH for UL CLTD Activation state 2 and 3

### 5.10AC.1 Definition and applicability

ACLR is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and HSDPA.

### 5.10AC.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than -50dBm then the ACLR shall be higher than the value specified in table 5.10AC.1. This is applicable for all values of,and as specified in [5].

For UE configured in UL CLTD activation state 2 or activation state 3, the ACLR requirements apply at the active transmit antenna connector.

Table 5.10AC.1: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 33 dB |
| 3 | +10 MHz or -10 MHz | 43 dB |
| 4 | +5 MHz or -5 MHz | 33 dB |
| 4 | +10 MHz or -10 MHz | 43 dB |

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1C.

### 5.10AC.3 Test purpose

To verify that the UE ACLR for UL CLTD activation state 2 and 3 does not exceed prescribed limit shown in table 5.10AC.1. This is applicable for all values of,and as specified in [5]. The maximum output power with HS-DPCCH is specified in table 5.2A.1.

Excess ACLR increases the interference to other channels or to other systems.

### 5.10AC.4 Method of test

#### 5.10AC.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C, clauses C.10.1 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.17 with the following exception in the RADIO BEARER SETUP messages in table 5.10AC.1.1. This exception allows the call to be setup with initial UL CLTD activation state as state 2. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.10AC.2.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.10AC.1.1: Contents of Radio bearer setup message

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink CLTD info FDD |  | Rel-11 |
| - CHOICE *Mode* | New |  |
| - Initial CLTD activation state | Second state |  |

Table 5.10AC.2: Settings for the serving cell during the measurement of  
Adjacent Channel Leakage Power Ratio (ACLR) with HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.10AC.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

#### 5.10AC.4.2 Procedure

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.1.4 and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.

2) Set and send continuously Up power control commands to the UE.

3) Start transmitting HSDPA Data.

4) When UE has reached the maximum power, measure the RRC filtered mean power on the wanted channel at active transmit antenna connector. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.

5) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.

6) Calculate the ratio of the power between the values measured in step 4) and step 5).

7) Repeat steps 1-6 for all the different combinations of beta values as given in table C.10.1.4.

8) SS sends a HS-SCCH order now to move the UE in UL\_CLTD activation state 3.

9) Repeat step 1 to 7 for activation state 3

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I.

### 5.10AC.5 Test requirements

The measured ACLR, derived in step 6), shall be higher than the limit in table 5.10AC.3.

For UE configured in UL CLTD activation state 2 and activation state 3, the ACLR requirements apply at the active transmit antenna connector.

Table 5.10AC.3: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 32.2 dB |
| 3 | +10 MHz or -10 MHz | 42.2 dB |
| 4 | +5 MHz or -5 MHz | 32.2 dB |
| 4 | +10 MHz or -10 MHz | 42.2 dB |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.10B Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH

### 5.10B.1 Definition and applicability

ACLR is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA and E-DCH.

### 5.10B.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than -50dBm then the ACLR shall be higher than the value specified in table 5.10B.1. This is applicable for all values of *c* , *d*  ,*hs*, *ec* and *ed*  as specified in [5].

Table 5.10B.1: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 33 dB |
| 3 | +10 MHz or -10 MHz | 43 dB |
| 4 | +5 MHz or -5 MHz | 33 dB |
| 4 | +10 MHz or -10 MHz | 43 dB |

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1.

### 5.10B.3 Test purpose

To verify that the UE ACLR does not exceed prescribed limit shown in table 5.10B.1. This is applicable for all values of *c* , *d*  ,*hs*, *ec* and *ed*  as specified in [5]. The maximum output power with HS-DPCCH and/or E-DCH is specified in table 5.2B.1.

Excess ACLR increases the interference to other channels or to other systems.

### 5.10B.4 Method of test

5.10B.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex C.11.1 and C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.9, with the exceptions in the RADIO BEARER SETUP messages as given in Tables 5.2B.1A, 5.2B.2, 5.2B3, 5.2B.3A and 5.2B.4. These exceptions allow the beta values to be set according to table C.11.1.3 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.10B.1A.

4) For sub-test 1 to 4, enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH according to procedure 7.3.9.3.1 in TS 34.108 [3] and start the loopback test. For sub-test 5, enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.9.3.2 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.10B.1A: Settings for the serving cell during the measurement  
of Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.10B.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

5.10B.4.2 Procedure

1) For sub-test 1 to 4, set UE to maximum output power according to 5.2B.4.2.1 steps 1 to 8. For sub-test 5, set UE to maximum output power according to 5.2B.4.2.2 step 1 to 4.

2) When UE has reached the maximum power, measure the RRC filtered mean power on the wanted channel. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.

3) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.

4) Calculate the ratio of the power between the values measured in step 2) and step 3).

5) Repeat steps 1-4 for all the different combinations of beta values as given in table C.11.1.3.

### 5.10B.5 Test requirements

The measured ACLR, derived in step 4), shall be higher than the limit in table 5.10B.2.

Table 5.10B.2: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 32.2 dB |
| 3 | +10 MHz or -10 MHz | 42.2 dB |
| 4 | +5 MHz or -5 MHz | 32.2 dB |
| 4 | +10 MHz or -10 MHz | 42.2 dB |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause

## 5.10BA Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH for OLTD

### 5.10BA.1 Definition and applicability

ACLR is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA and E-DCH and UL OLTD.

### 5.10BA.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than -50dBm then the ACLR shall be higher than the value specified in table 5.10BA.1. This is applicable for all values of *c* , *d*  ,*hs*, *ec* and *ed*  as specified in [5].

Table 5.10BA.1: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 33 dB |
| 3 | +10 MHz or -10 MHz | 43 dB |
| 4 | +5 MHz or -5 MHz | 33 dB |
| 4 | +10 MHz or -10 MHz | 43 dB |

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1B.

### 5.10BA.3 Test purpose

To verify that the UE ACLR does not exceed prescribed limit shown in table 5.10BA.1. This is applicable for all values of *c* , *d*  ,*hs*, *ec* and *ed*  as specified in [5]. The maximum output power with HS-DPCCH and/or E-DCH is specified in table 5.2B.1.

Excess ACLR increases the interference to other channels or to other systems.

### 5.10BA.4 Method of test

5.10BA.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex C.11.1A.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.20, with the exceptions in the RADIO BEARER SETUP messages as given in Tables 5.2B.1A, 5.2B.2, 5.2B3, 5.2B.3A and 5.2B.4. These exceptions allow the beta values to be set according to table C.11.1A.4 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.10BA.1A.

4) For sub-test 1 to 4, enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH according to procedure 7.3.20.3.1 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.10BA.1A: Settings for the serving cell during the measurement  
of Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.10BA.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

5.10BA.4.2 Procedure

1) For sub-test 1 to 4, set UE to maximum output power according to 5.2B.4.2.1 steps 1 to 8. For sub-test 5, set UE to maximum output power according to 5.2B.4.2.2 step 1 to 4.

2) When UE has reached the maximum power, measure the RRC filtered mean power on the wanted channel. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.

3) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.

4) Calculate the ratio of the power between the values measured in step 2) and step 3).

5) Repeat steps 1-4 for all the different combinations of beta values as given in table C.11.1A.4.

### 5.10BA.5 Test requirements

The measured ACLR, derived in step 4), shall be higher than the limit in table 5.10BA.2.

Table 5.10BA.2: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 32.2 dB |
| 3 | +10 MHz or -10 MHz | 42.2 dB |
| 4 | +5 MHz or -5 MHz | 32.2 dB |
| 4 | +10 MHz or -10 MHz | 42.2 dB |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause.

## 5.10BB Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH for UL CLTD Activation state 1

### 5.10BB.1 Definition and applicability

ACLR is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that support HSDPA and E-DCH and UL CLTD.

### 5.10BB.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than -50dBm then the ACLR shall be higher than the value specified in table 5.10BB.1. This is applicable for all values of *c* , *d*  ,*hs*, *ec* and *ed*  as specified in [5].

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the ACLR requirements specified in Table 5.10BB.1 apply at each transmit antenna connector.

Table 5.10BB.1: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 33 dB |
| 3 | +10 MHz or -10 MHz | 43 dB |
| 4 | +5 MHz or -5 MHz | 33 dB |
| 4 | +10 MHz or -10 MHz | 43 dB |

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1C.

### 5.10BB.3 Test purpose

To verify that the UE ACLR does not exceed prescribed limit shown in table 5.10BB.1. This is applicable for all values of *c* , *d*  ,*hs*, *ec* and *ed*  as specified in [5]. The maximum output power with HS-DPCCH and/or E-DCH and UL CLTD is specified in table 5.2BD.1.

Excess ACLR increases the interference to other channels or to other systems.

### 5.10BB.4 Method of test

5.10BB.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex C, clause C.11.1A and C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.19, with the exceptions in the RADIO BEARER SETUP messages as given in Tables 5.2BD.1A, 5.2BD.2, 5.2BD3 and 5.2BD.4. These exceptions allow the beta values to be set according to table C.11.1A.4 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.10BB.1A.

4) For sub-test 1 to 4, enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH according to procedure 7.3.19.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.10BB.1A: Settings for the serving cell during the measurement  
of Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.10BB.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

5.10BB.4.2 Procedure

1) For sub-test 1 to 4, set UE to maximum output power according to 5.2BD.4.2.1 steps 1 to 8.

2) When UE has reached the maximum power, measure the RRC filtered mean power on the wanted channel. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.

3) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.

4) Calculate the ratio of the power between the values measured in step 2) and step 3).

5) Repeat steps 1-4 for all the different combinations of beta values as given in table C.11.1A.4.

### 5.10BB.5 Test requirements

The measured ACLR, derived in step 4), shall be higher than the limit in table 5.10BB.2.

Table 5.10BB.2: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 32.2 dB |
| 3 | +10 MHz or -10 MHz | 42.2 dB |
| 4 | +5 MHz or -5 MHz | 32.2 dB |
| 4 | +10 MHz or -10 MHz | 42.2 dB |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4

## 5.10BC Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH for UL CLTD Activation state 2 and 3

### 5.10BC.1 Definition and applicability

ACLR is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that support HSDPA, E-DCH and UL CLTD.

### 5.10BC.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than -50dBm then the ACLR shall be higher than the value specified in table 5.10BC.1. This is applicable for all values of *c* , *d*  ,*hs*, *ec* and *ed*  as specified in [5].

For UE configured in UL CLTD activation state 2 or activation state 3, the ACLR requirements specified in Table 5.10BC.1 apply at the active transmit antenna connector.

Table 5.10BC.1: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 33 dB |
| 3 | +10 MHz or -10 MHz | 43 dB |
| 4 | +5 MHz or -5 MHz | 33 dB |
| 4 | +10 MHz or -10 MHz | 43 dB |

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1C.

### 5.10BC.3 Test purpose

To verify that the UE ACLR does not exceed prescribed limit shown in table 5.10BC.1. This is applicable for all values of *c* , *d*  ,*hs*, *ec* and *ed*  as specified in [5]. The maximum output power with HS-DPCCH and/or E-DCH is specified in table 5.2BE.1.

Excess ACLR increases the interference to other channels or to other systems.

### 5.10BC.4 Method of test

5.10BC.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex C, clause C.11.1 and C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.19, with the exceptions in the RADIO BEARER SETUP messages as given in Tables 5.2BE.1A, 5.2BE.2, 5.2BE3, 5.2BE.3A, 5.2BE.4 and 5.10BC.1B. These exceptions allow the beta values to be set according to table C.11.1.3 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.10BC.1A.

4) For sub-test 1 to 4, enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH according to procedure 7.3.19.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.10BC.1A: Settings for the serving cell during the measurement  
of Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.10BC.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

Table 5.10BC.1B: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink CLTD info FDD |  | Rel-11 |
| - CHOICE *Mode* | New |  |
| - S-DPCCH Info |  |  |
| - S-DPCCH/DPCCH power offset | 0 |  |
| - Initial CLTD activation state | Second state |  |

5.10BC.4.2 Procedure

1) For sub-test 1 to 4, set UE to maximum output power according to 5.2BE.4.2.1 steps 1 to 8.

2) When UE has reached the maximum power, measure the RRC filtered mean power on the wanted channel. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.

3) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.

4) Calculate the ratio of the power between the values measured in step 2) and step 3).

5) Repeat steps 1-4 for all the different combinations of beta values as given in table C.11.1.3.

6) SS sends a HS-SCCH order activating UL\_CLTD activation state 3.

7) Repeat step 1 to 5 for activation state 3.

### 5.10BC.5 Test requirements

The measured ACLR, derived in step 4), shall be higher than the limit in table 5.10BC.2.

Table 5.10BC.2: UE ACLR

|  |  |  |
| --- | --- | --- |
| Power Class | UE channel | ACLR limit |
| 3 | +5 MHz or -5 MHz | 32.2 dB |
| 3 | +10 MHz or -10 MHz | 42.2 dB |
| 4 | +5 MHz or -5 MHz | 32.2 dB |
| 4 | +10 MHz or -10 MHz | 42.2 dB |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4

## 5.10C Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH for DC-HSUPA (QPSK)

### 5.10C.1 Definition and applicability

In the case dual adjacent carriers are assigned on the uplink, ACLR is the ratio of the sum of the RRC filtered mean powers centred on each of the two assigned channel frequencies to the RRC filtered mean power centred on an adjacent channel frequency.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

### 5.10C.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than -50dBm then the ACLR shall be higher than the value specified in table 5.10C.1. This is applicable for all values of *c* , *hs*, *ec* and *ed*  as specified in [5]. However, it is necessary to verify the requirements only for the DC-HSUPA configurations in subclause C.2.8.

Table 5.10C.1: UE ACLR for DC-HSUPA

|  |  |  |
| --- | --- | --- |
| Power Class | Adjacent channel frequency relative to the centre of two assigned channel frequencies | ACLR limit |
| 3 | + 7.5 MHz or - 7.5 MHz | 33 dB |
| 3 | + 12.5 MHz or - 12.5 MHz | 36 dB |
| 4 | + 7.5 MHz or - 7.5 MHz | 33 dB |
| 4 | + 12.5 MHz or -12.5 MHz | 36 dB |

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1A.

### 5.10C.3 Test purpose

To verify that the UE ACLR does not exceed prescribed limit shown in table 5.10C.1. This is applicable for all values of *c* , *d*  ,*hs*, *ec* and *ed*  as specified in [5].

Excess ACLR increases the interference to other channels or to other systems.

### 5.10C.4 Method of test

5.10C.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.8 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14, with the exceptions in the RADIO BEARER SETUP messages as given in Tables 5.2BA.2, 5.2BA.3, 5.2BA4 and 5.2BA.5. These exceptions allow the beta values to be set according to table C.11A.1.1, table C.11A.1.2 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.10C.2.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.10C.2: Settings for the serving cell during the measurement  
of Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.10C.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

5.10C.4.2 Procedure

1) Set UE to maximum output power according to 5.2BA.4.2 step 1 to 4.

2) Measure the sum of the RRC filtered mean powers centred on each of the two assigned channel frequencies. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.

3) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.

4) Calculate the ratio of the power between the values measured in step 2) and step 3).

5) Repeat steps 1-4 for all the different combinations of beta values as given in table C.11A.1.1.

6) Repeat steps 1-5 for all the different configurations given in table 5.2BA.5A

### 5.10C.5 Test requirements

The measured ACLR, derived in step 4), shall be higher than the limit in table 5.10C.3.

Table 5.10C.3: UE ACLR for DC-HSUPA

|  |  |  |
| --- | --- | --- |
| Power Class | Adjacent channel frequency relative to the centre of two assigned channel frequencies | ACLR limit |
| 3 | + 7.5 MHz or - 7.5 MHz | 32.2 dB |
| 3 | + 12.5 MHz or - 12.5 MHz | 35.2 dB |
| 4 | + 7.5 MHz or - 7.5 MHz | 32.2 dB |
| 4 | + 12.5 MHz or -12.5 MHz | 35.2 dB |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause

## 5.10D Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH for DC-HSUPA (16QAM)

### 5.10D.1 Definition and applicability

In the case dual adjacent carriers are assigned on the uplink, ACLR is the ratio of the sum of the RRC filtered mean powers centred on each of the two assigned channel frequencies to the RRC filtered mean power centred on an adjacent channel frequency.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH 16QAM UE capability category 9.

### 5.10D.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than -50dBm then the ACLR shall be higher than the value specified in table 5.10D.1. This is applicable for all values of *c* , *hs*, *ec* and *ed*  as specified in [5]. However, it is necessary to verify the requirements only for the DC-HSUPA configurations in subclause C.2.8.

Table 5.10D.1: UE ACLR for DC-HSUPA

|  |  |  |
| --- | --- | --- |
| Power Class | Adjacent channel frequency relative to the centre of two assigned channel frequencies | ACLR limit |
| 3 | + 7.5 MHz or - 7.5 MHz | 33 dB |
| 3 | + 12.5 MHz or - 12.5 MHz | 36 dB |
| 4 | + 7.5 MHz or - 7.5 MHz | 33 dB |
| 4 | + 12.5 MHz or -12.5 MHz | 36 dB |

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1A.

### 5.10D.3 Test purpose

To verify that the UE ACLR does not exceed prescribed limit shown in table 5.10D.1. This is applicable for all values of *c* , *d*  ,*hs*, *ec* and *ed*  as specified in [5].

Excess ACLR increases the interference to other channels or to other systems.

### 5.10D.4 Method of test

5.10D.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.8 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14, with the exceptions in the RADIO BEARER SETUP messages as given in Tables 5.2BA.2, 5.2BA.3, 5.2BA4 and 5.2BA.5. These exceptions allow the beta values to be set according to table C.11A.1.1, table C.11A.1.2 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.10D.2.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.10D.2: Settings for the serving cell during the measurement  
of Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.10D.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

5.10D.4.2 Procedure

1) Set UE to maximum output power according to 5.2BA.4.2 step 1 to 4.

2) Measure the sum of the RRC filtered mean powers centred on each of the two assigned channel frequencies. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.

3) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.

4) Calculate the ratio of the power between the values measured in step 2) and step 3).

5) Repeat steps 1-4 for all the different combinations of beta values as given in table C.11A.1.2.

6) Repeat steps 1-5 for all the different configurations given in table 5.2BB.5.

### 5.10D.5 Test requirements

The measured ACLR, derived in step 4), shall be higher than the limit in table 5.10D.3.

Table 5.10D.3: UE ACLR for DC-HSUPA

|  |  |  |
| --- | --- | --- |
| Power Class | Adjacent channel frequency relative to the centre of two assigned channel frequencies | ACLR limit |
| 3 | + 7.5 MHz or - 7.5 MHz | 32.2 dB |
| 3 | + 12.5 MHz or - 12.5 MHz | 35.2 dB |
| 4 | + 7.5 MHz or - 7.5 MHz | 32.2 dB |
| 4 | + 12.5 MHz or -12.5 MHz | 35.2 dB |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause.

## 5.11 Spurious Emissions

### 5.11.1 Definition and applicability

Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermediation products and frequency conversion products, but exclude out of band emissions.

The frequency boundary and the detailed transitions of the limits between the requirement for out band emissions and spectrum emissions are based on ITU-R Recommendations SM.329.

The requirements and this test apply to all types of UTRA for the FDD UE.

### 5.11.2 Minimum Requirements

These requirements are only applicable for frequencies, which are greater than 12.5 MHz away from the UE centre carrier frequency.

Table 5.11.1a: General spurious emissions requirements

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency Bandwidth | Measurement Bandwidth | Minimum requirement | Note |
| 9 kHz £ f < 150 kHz | 1 kHz | -36 dBm |  |
| 150 kHz £ f < 30 MHz | 10 kHz | -36 dBm |  |
| 30 MHz £ f < 1 000 MHz | 100 kHz | -36 dBm |  |
| 1 GHz £ f < 12,75 GHz | 1 MHz | -30 dBm |  |
| 12.75 GHz  f < 5th harmonic of the upper frequency edge of the UL operating band in GHz | 1 MHz | -30 dBm | Note 1 |
| NOTE 1: Applies only for Band XXII. | | | |

Table 5.11.1b: Additional spurious emissions requirements

| Operating Band | Frequency Bandwidth | Measurement Bandwidth | Minimum requirement |
| --- | --- | --- | --- |
| I | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz  f  935 MHz | 100 kHz  3.84 MHz | -67 dBm (see note 1)  -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1452 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz < f <1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm |
| II | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  758 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2483.5 MHz  f  2495 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| III | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm (see note 5) |
| 921 MHz £ f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz £ f £ 935 MHz | 100 kHz  3.84 MHz | -67 dBm (see note 1)  -60 dBm |
| 935 MHz < f £ 960 MHz | 100 kHz | -79 dBm (see note 1) |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1447 MHz  f  1467 MHz | 1 MHz | -50 dBm |
| 1452 MHz  f  1496 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm (see note 5) |
| 1805 MHz £ f £ 1880 MHz | 3.84 MHz | -60 dBm |
| 1880 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f  1915.7 MHz | 300 kHz | -41 dBm (see note 5) |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz £ f £ 2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| IV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2483.5 MHz  f  2495 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| V | 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 859 MHz  f  869 MHz | 1 MHz | -27 dBm |
| 869 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1805 MHz  f  1880 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2483.5 MHz  f  2495 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm (see note 2) |
| 2570 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm |
| VI | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f  875 MHz | 1 MHz | -37 dBm |
| 875 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz £ f £ 1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz £ f £ 1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz £ f £ 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| VII | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 756 MHz  f  758 MHz | 1 MHz | -50 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  791 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 1900 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz <f< 2400 MHz | 3.84 MHz | -60 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2595 MHz  f  2620 MHz | 1 MHz | -40 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm |
| VIII | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 860 MHz  f  890 MHz | 1 MHz | -37 dBm (see note 4) |
| 925 MHz f 935 MHz | 100 kHz  3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1) -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452MHz  f  1496 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm (see note 4) |
| 1805 MHz < f  1830 MHz | 100 kHz  3.84 MHz | -71 dBm (see notes 1 and 2) -60 dBm (see note 2) |
| 1830 MHz < f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1) -60 dBm |
| 1880MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm (see note 4) |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz <f< 2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2640 MHz | 3.84 MHz | -60 dBm |
| 2640 MHz < f  2690 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| IX | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 859MHz  f  894 MHz | 3.84 MHz | -60dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz £ f £ 1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60dBm |
| 1884.5 MHzf 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| X | 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f 894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| XI | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.8 MHz £ f £ 1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz £ f £ 1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz £ f £ 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XII | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2483.5 MHz  f  2495 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 3550 MHz  f  3700 MHz | 1 MHz | -50 dBm |
| XIII | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 763 MHz  f  775 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 793 MHz  f  805 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm (see note 2) |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm (see note 2) |
| 2483.5 MHz  f  2495 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 3550 MHz  f  3700 MHz | 1 MHz | -50 dBm |
| XIV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 769 MHz  f  775 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 799 MHz  f  805 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2483.5 MHz  f  2495 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 3550 MHz  f  3700 MHz | 1 MHz | -50 dBm |
| XIX | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f < 875 MHz | 1 MHz | -37 dBm |
| 875 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XX | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 753 MHz  f  788 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz  f  935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| XXI | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 1 MHz | -35 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XXII | 758 MHz  f  791 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 1880 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3525 MHz | 1 MHz | -40 dBm |
| 3525 MHz  f  3590 MHz | 1 MHz | -50 dBm |
| 3600 MHz  f  3800 MHz | 3.84 MHz | -50 dBm |
| XXV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2483.5 MHz  f  2495 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| XXVI | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  799 MHz | 1 MHz | -50 dBm |
| 799 MHz  f  803 MHz | 1 MHz | -40 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1805 MHz  f  1880 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2483.5 MHz  f  2495 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm (see note 2) |
| 3400 MHz  f 3800 MHz | 1 MHz | -50 dBm |
| NOTE 1: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11.1a are permitted for each UARFCN used in the measurement.  NOTE 2: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, measurements with a level up to the applicable requirements defined in Table 5.11.1a are permitted for each UARFCN used in the measurement due to 2nd, 3rd or 4th harmonic spurious emissions.  NOTE 3: This requirement is applicable also for frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency.  NOTE 4: This requirement is applicable only when transmission is made between 900MHz to 915MHz.  NOTE 5: This requirement is applicable only when transmission is made between 1744.9 MHz to 1784.9 MHz | | | |

NOTE: The applicability of each line in Table 5.11.1b for UEs of different releases is defined in TS 25.101 [1].

Table 5.11.1c: Additional spurious emissions requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **Operating Band** | **Frequency Bandwidth** | **Measurement Bandwidth** | **Minimum requirement** |
| XXVI | 806 MHz £ f £ 813.5 MHz | 6.25 kHz | -42 dBm (NOTE 1) |
| 806 MHz £ f £ 816 MHz | 6.25 kHz | -42 dBm (NOTE 2) |
| 852 MHz £ f £ 859 MHz | 1 MHz | -32 dBm (NOTE 3) |
| 851 MHz £ f £ 859 MHz | 6.25 kHz | -53 dBm (NOTE 4) |
| NOTE 1: Applicable for UE center frequencies ≥ 816.4 MHz. For UE center frequencies ≤ 819.6 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +17 dBm.  NOTE 2: Applicable for UE center frequencies ≥ 819.4 MHz. For UE center frequencies ≤ 822 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +17 dBm.  NOTE 3: Applicable for UE center frequencies ≤ 846.6 MHz. For UE center frequencies ≥ 842.4 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +10 dBm.  NOTE 4: Applicable for UE center frequencies ≤ 846.6 MHz. For UE center frequencies ≥ 842.4 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +10 dBm.  NOTE 5: For the 6.25kHz measurement bandwidth, the emissions measurement shall be sufficiently power averaged to ensure standard standard deviation < 0.5 dB. | | | |

As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11.1a are permitted in each of the bands, 925 MHz to 960 MHz and 1805 MHz to 1880 MHz for each UARFCN used in the measurement. The reference is 3GPP TS 45.005 [29].

The normative reference for this requirement is TS 25.101 [1] clause 6.6.3.1.

### 5.11.3 Test purpose

To verify that the UE spurious emissions do not exceed described value shown in table 5.11.1a, table 5.11.1b and table 5.11.1c.

Excess spurious emissions increase the interference to other systems.

### 5.11.4 Method of test

5.11.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.8.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.11.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

### 5.11.5 Test requirements

The measured average power of spurious emission, derived in step 2), shall not exceed the described value in tables 5.11.2a, 5.11.2b and 5.11.2c.

These requirements are only applicable for frequencies, which are greater than 12.5 MHz away from the UE centre carrier frequency.

Table 5.11.2a: General spurious emissions test requirements

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency Bandwidth | Measurement Bandwidth | Minimum requirement | Note |
| 9 kHz £ f < 150 kHz | 1 kHz | -36 dBm |  |
| 150 kHz £ f < 30 MHz | 10 kHz | -36 dBm |  |
| 30 MHz £ f < 1 000 MHz | 100 kHz | -36 dBm |  |
| 1 GHz £ f < 12,75 GHz | 1 MHz | -30 dBm |  |
| 12.75 GHz  f < 5th harmonic of the upper frequency edge of the UL operating band in GHz | 1 MHz | -30 dBm | Note 1 |
| NOTE 1: Applies only for Band XXII. | | | |

Table 5.11.2b: Additional spurious emissions test requirements

| Operating Band | Frequency Bandwidth | Measurement Bandwidth | Minimum requirement |
| --- | --- | --- | --- |
| I | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz  f  935 MHz | 100 kHz  3.84 MHz | -67 dBm (see note 1)  -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz < f <1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm |
| II | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  758 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| III | 461 MHz  f  466 MHz | 1 MHz | -50dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm (see note 5) |
| 921 MHz £ f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz £ f £ 935 MHz | 100 kHz  3.84 MHz | -67 dBm (see note 1)  -60 dBm |
| 935 MHz < f £ 960 MHz | 100 kHz | -79 dBm (see note 1) |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1447 MHz  f  1467 MHz | 1 MHz | -50 dBm |
| 1452 MHz  f  1496 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm (see note 5) |
| 1805 MHz £ f £ 1880 MHz | 3.84 MHz | -60 dBm |
| 1880 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f  1915.7 MHz | 300 kHz | -41 dBm (see note 5) |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz £ f £ 2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| IV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| V | 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 859 MHz  f  869 MHz | 1 MHz | -27 dBm |
| 869 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1805 MHz  f  1880 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm (see note 2) |
| 2570 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm |
| VI | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f  875 MHz | 1 MHz | -37 dBm |
| 875 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz £ f £ 1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz £ f £ 1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz £ f £ 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| VII | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 756 MHz  f  758 MHz | 1 MHz | -50 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  791 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 1900 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz <f< 2400 MHz | 3.84 MHz | -60 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2595 MHz  f  2620 MHz | 1 MHz | -40 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm |
| VIII | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 860 MHz  f  890 MHz | 1 MHz | -37 dBm (see note 4) |
| 925 MHz f 935 MHz | 100 kHz  3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1) -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452MHz  f  1496 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm (see note 4) |
| 1805 MHz < f  1830 MHz | 100 kHz  3.84 MHz | -71 dBm (see notes 1 and 2) -60 dBm (see note 2) |
| 1830 MHz < f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1) -60 dBm |
| 1880MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm (see note 4) |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz <f< 2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2640 MHz | 3.84 MHz | -60 dBm |
| 2640 MHz < f  2690 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| IX | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 859MHz  f  894 MHz | 3.84 MHz | -60dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz £ f £ 1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60dBm |
| 1884.5 MHzf 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| X | 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f 894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| XI | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz £ f £ 1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz £ f £ 1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz £ f £ 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XII | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| XIII | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 763 MHz  f  775 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 793 MHz  f  805 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm (see note 2) |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm (see note 2) |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| XIV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 769 MHz  f  775 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 799 MHz  f  805 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| XIX | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f < 875 MHz | 1 MHz | -37 dBm |
| 875 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XX | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 753 MHz  f  788 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz  f  935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| XXI | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 1 MHz | -35 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XXII | 758 MHz  f  791 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 1880 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3525 MHz | 1 MHz | -40 dBm |
| 3525 MHz  f  3590 MHz | 1 MHz | -50 dBm |
| 3600 MHz  f  3800 MHz | 3.84 MHz | -50 dBm |
| XXV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| XXVI | 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  799 MHz | 1 MHz | -50 dBm |
| 799 MHz  f  803 MHz | 1 MHz | -40 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1805 MHz  f  1880 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm (see note 2) |
| 3400 MHz  f 3800 MHz | 1 MHz | -50 dBm |
| NOTE 1: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11.1a are permitted for each UARFCN used in the measurement.  NOTE 2: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, measurements with a level up to the applicable requirements defined in Table 5.11.1a are permitted for each UARFCN used in the measurement due to 2nd, 3rd , or 4th harmonic spurious emissions.  NOTE 3: This requirement is applicable also for frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency.  NOTE 4: This requirement is applicable only when transmission is made between 900MHz to 915MHz.  NOTE 5: This requirement is applicable only when transmission is made between 1744.9 MHz to 1784.9 MHz | | | |

NOTE: The applicability of each line in Table 5.11.2b for UEs of different releases is defined in TS 25.101 [1].

Table 5.11.2c: Additional spurious emissions requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **Operating Band** | **Frequency Bandwidth** | **Measurement Bandwidth** | **Minimum requirement** |
| XXVI | 806 MHz £ f £ 813.5 MHz | 6.25 kHz | -42 dBm (NOTE 1) |
| 806 MHz £ f £ 816 MHz | 6.25 kHz | -42 dBm (NOTE 2) |
| 852 MHz £ f £ 859 MHz | 1 MHz | -32 dBm (NOTE 3) |
| 851 MHz £ f £ 859 MHz | 6.25 kHz | -53 dBm (NOTE 4) |
| NOTE 1: Applicable for UE center frequencies ≥ 816.4 MHz. For UE center frequencies ≤ 819.6 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +17 dBm.  NOTE 2: Applicable for UE center frequencies ≥ 819.4 MHz. For UE center frequencies ≤ 822 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +17 dBm.  NOTE 3: Applicable for UE center frequencies ≤ 846.6 MHz. For UE center frequencies ≥ 842.4 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +10 dBm.  NOTE 4: Applicable for UE center frequencies ≤ 846.6 MHz. For UE center frequencies ≥ 842.4 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +10 dBm.  NOTE 5: For the 6.25kHz measurement bandwidth, the emissions measurement shall be sufficiently power averaged to ensure standard standard deviation < 0.5 dB. | | | |

As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11.2a are permitted in each of the bands, 925 MHz to 960 MHz and 1805 MHz to 1880 MHz for each UARFCN used in the measurement. The reference is 3GPP TS 45.005 [29].

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.11A Spurious Emissions for DC-HSUPA

### 5.11A.1 Definition and applicability

Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out of band emissions.

The frequency boundary and the detailed transitions of the limits between the requirement for out band emissions and spectrum emissions are based on ITU-R Recommendations SM.329.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

### 5.11A.2 Minimum Requirements

These requirements are only applicable for frequencies, which are greater than 20 MHz away from the centre of the assigned carrier frequencies when dual adjacent carriers are assigned on the uplink.

Table 5.11A.1: General spurious emissions requirements for DC-HSUPA

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency Bandwidth | Measurement Bandwidth | Minimum requirement | Note |
| 9 kHz £ f < 150 kHz | 1 kHz | -36 dBm |  |
| 150 kHz £ f < 30 MHz | 10 kHz | -36 dBm |  |
| 30 MHz £ f < 1 000 MHz | 100 kHz | -36 dBm |  |
| 1 GHz £ f < 12,75 GHz | 1 MHz | -30 dBm |  |
| 12.75 GHz  f < 5th harmonic of the upper frequency edge of the UL operating band in GHz | 1 MHz | -30 dBm | Note 1 |
| NOTE 1: Applies only for Band XXII. | | | |

The requirements in Table 5.11A.2 are only applicable for frequencies, which are greater than 25 MHz away from the centre of the assigned frequencies when dual adjacent carriers are assigned on the uplink.

Table 5.11A.2: Additional spurious emissions requirements for DC-HSUPA

| Operating Band | Frequency Bandwidth | Measurement Bandwidth | Minimum requirement |
| --- | --- | --- | --- |
| I | 460 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  895 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz | -79 dBm (see note 1) |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz | -71 dBm (see note 1) |
| 1844.9 MHz  f  1879.9 MHz | 3.84 MHz | -55 dBm |
| 1884.5 MHz <f <1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz <f< 2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| II | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  758 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1990 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2620 MHz | 1 MHz | -50 dBm |
| III | 460 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  869 MHz | 1 MHz | -50 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) - 60 dBm |
| 935 MHz < f  960 MHz | 100 kHz | -79 dBm (see note 1) |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1805 MHz  f  1880 MHz | 3.84 MHz | -60 dBm |
| 1880 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| IV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1990 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| V | 460 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 3.84 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 859 MHz  f  869 MHz | 1 MHz | -27 dBm |
| 869 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1805 MHz  f  1880 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1990 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 | 3.84 MHz | -60 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2620 MHz | 1 MHz | -50 dBm (see note 1) |
| 2570 MHz  f  2690 MHz | 1 MHz | -50 dBm (see note 1) |
| 2483.5 MHz  f  2495 MHz | 1 MHz | -50 dBm |
| 3550 MHz  f  3700 MHz | 1 MHz | -50 dBm |
| VI | 860 MHz  f < 875 MHz | 1 MHz | -37 dBm |
| 875 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1500.9 MHz | 3.84 MHz | -60 dBm |
| 1844.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| VII | 462.5 MHz  f  467.5 MHz | 1 MHz | -50dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 738 MHz  f  758 MHz | 1 MHz | -50 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  791 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  869 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz | -79 dBm (see note 1) |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz | -71 dBm (see note 1) |
| 1900 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz <f< 2400 MHz | 3.84 MHz | -60 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2595 MHz  f  2620 MHz | 1 MHz | -37 dBm |
| VIII | 460 MHz  f  467.5 MHz | 1 MHz | -50dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -57 dBm (see notes 1 and 3)  -50 dBm |
| 935 MHz < f  960 MHz | 100 kHz 3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz < f  1830 MHz | 100 kHz 3.84 MHz | -71 dBm (see notes 1 and 2)  -60 dBm (see note 2) |
| 1830 MHz < f  1880 MHz | 100 kHz 3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 1880MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 2010MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2300MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2640 MHz | 3.84 MHz | -60 dBm |
| 2640 MHz < f  2690 MHz | 3.84 MHz | -60 dBm (see note 2) |
| IX | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1844.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| X | 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1990 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| XI | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1844.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XIX | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f < 875 MHz | 1 MHz | -30 dBm |
| 875 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1844.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XX | 738 MHz  f  758 MHz | 1 MHz | -50 dBm |
| 758 MHz  f  788 MHz | 1 MHz | -50 dBm |
| 811 MHz  f  821 MHz | 3.84 MHz | -50 dBm (see note 3) |
| 791 MHz  f  811 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz | -79 dBm (see note 1) |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz | -71 dBm (see note 1) |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -60 dBm (see note 2) |
| XXII | 738 MHz  f  758 MHz | 1 MHz | -50 dBm |
| 758 MHz  f  791 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  869 MHz | 1 MHz | -50 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -79 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz | -71 dBm (see note 1) |
| 1880 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -50 dBm |
| 3510 MHz  f  3525 MHz | 1 MHz | -40 dBm |
| 3525 MHz  f  3590 MHz | 1 MHz | -50 dBm |
| 3600 MHz  f  3800 MHz | 3.84 MHz | -50 dBm |
| XXV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm |
| XXVI | 460 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  799 MHz | 1 MHz | -50 dBm |
| 799 MHz  f  803 MHz | 1 MHz | -40 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1805 MHz  f  1880 MHz | 3.84 MHz | -60 dBm |
| 1844.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2010 MHz  f  2025 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm (see note 2) |
| 3400 MHz  f 3800 MHz | 1 MHz | -50 dBm |
| NOTE 1: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table 5.11A.1 are permitted for each UARFCN used in the measurement.  NOTE 2: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, measurements with a level up to the applicable requirements defined in Table 5.11A.1 are permitted for each UARFCN used in the measurement due to 2,nd 3, or 4th rdharmonic spurious emissions.  NOTE 3: This requirement is applicable also for frequencies, which are between 5 MHz and 25 MHz away from the UE centre carrier frequency. | | | |

NOTE: The applicability of each line in Table 5.11A.2 for UEs of different releases is defined in TS 25.101 [1].

As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11A.1 are permitted in each of the bands, 925 MHz to 960 MHz and 1805 MHz to 1880 MHz for each UARFCN used in the measurement. The reference is 3GPP TS 45.005 [29].

The normative reference for this requirement is TS 25.101 [1] clause 6.6.3.1A.

### 5.11A.3 Test purpose

To verify that the UE spurious emissions do not exceed described value shown in table 5.11A.1 and table 5.11A.2.

Excess spurious emissions increase the interference to other systems.

### 5.11A.4 Method of test

5.11A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.6 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14, with the exceptions in the RADIO BEARER SETUP messages as given in Tables 5.2BA.2, 5.2BA.3, 5.2BA4 and 5.2BA.5. These exceptions allow the beta values to be set according to table C.11A.1 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to table E.5A.1A.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.11A.4.2 Procedure

1) Set UE to maximum output power according to 5.2BA.4.2 step 1 to 4 with the exception that only configuration #3 from table 5.2BA.5A is applied.

2) Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

### 5.11A.5 Test requirements

The measured average power of spurious emission, derived in step 2), shall not exceed the described value in tables 5.11A.3 and 5.11A.4.

These requirements are only applicable for frequencies, which are greater than 20 MHz away from the centre of the assigned carrier frequencies when dual adjacent carriers are assigned on the uplink.

Table 5.11A.3: General spurious emissions test requirements for DC-HSUPA

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency Bandwidth | Measurement Bandwidth | Minimum requirement | Note |
| 9 kHz £ f < 150 kHz | 1 kHz | -36 dBm |  |
| 150 kHz £ f < 30 MHz | 10 kHz | -36 dBm |  |
| 30 MHz £ f < 1 000 MHz | 100 kHz | -36 dBm |  |
| 1 GHz £ f < 12,75 GHz | 1 MHz | -30 dBm |  |
| 12.75 GHz  f < 5th harmonic of the upper frequency edge of the UL operating band in GHz | 1 MHz | -30 dBm | Note 1 |
| NOTE 1: Applies only for Band XXII. | | | |

|  |  |  |
| --- | --- | --- |
| Frequency Bandwidth | Measurement Bandwidth | Minimum requirement |
| 9 kHz £ f < 150 kHz | 1 kHz | -36 dBm |
| 150 kHz £ f < 30 MHz | 10 kHz | -36 dBm |
| 30 MHz £ f < 1 000 MHz | 100 kHz | -36 dBm |
| 1 GHz £ f < 12,75 GHz | 1 MHz | -30 dBm |

The requirements in Table 5.11A.4 are only applicable for frequencies, which are greater than 25 MHz away from the centre of the assigned frequencies when dual adjacent carriers are assigned on the uplink.

Table 5.11A.4: Additional spurious emissions test requirements for DC-HSUPA

| **Operating Band** | **Frequency Bandwidth** | **Measurement Bandwidth** | **Minimum requirement** |
| --- | --- | --- | --- |
| I | 460 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  895 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz | -79 dBm (see note 1) |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz | -71 dBm (see note 1) |
| 1844.9 MHz  f  1879.9 MHz | 3.84 MHz | -55 dBm |
| 1884.5 MHz <f <1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz <f< 2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| II | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  758 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1990 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2620 MHz | 1 MHz | -50 dBm |
| III | 460 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  869 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) - 60 dBm |
| 935 MHz < f  960 MHz | 100 kHz | -79 dBm (see note 1) |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1805 MHz  f  1880 MHz | 3.84 MHz | -60 dBm |
| 1880 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| IV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1990 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| V | 460 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 3.84 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 859 MHz  f  869 MHz | 1 MHz | -27 dBm |
| 869 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1805 MHz  f  1880 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1990 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2620 MHz | 1 MHz | -50 dBm (see note 1) |
| 2570 MHz  f  2690 MHz | 1 MHz | -50 dBm (see note 1) |
| 2483.5 MHz  f  2495 MHz | 1 MHz | -50 dBm |
| 3550 MHz  f  3700 MHz | 1 MHz | -50 dBm |
| VI | 860 MHz  f < 875 MHz | 1 MHz | -37 dBm |
| 875 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1500.9 MHz | 3.84 MHz | -60 dBm |
| 1844.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| VII | 462.5 MHz  f  467.5 MHz | 1 MHz | -50dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 738 MHz  f  758 MHz | 1 MHz | -50 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  791 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  869 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz | -79 dBm (see note 1) |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz | -71 dBm (see note 1) |
| 1900 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz <f< 2400 MHz | 3.84 MHz | -60 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2595 MHz  f  2620 MHz | 1 MHz | -37 dBm |
| VIII | 460 MHz  f  467.5 MHz | 1 MHz | -50dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -57 dBm (see notes 1 and 3)  -50 dBm |
| 935 MHz < f  960 MHz | 100 kHz 3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz < f  1830 MHz | 100 kHz 3.84 MHz | -71 dBm (see notes 1 and 2)  -60 dBm (see note 2) |
| 1830 MHz < f  1880 MHz | 100 kHz 3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 1880MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 2010MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2300MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2640 MHz | 3.84 MHz | -60 dBm |
| 2640 MHz < f  2690 MHz | 3.84 MHz | -60 dBm (see note 2) |
| IX | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1844.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| X | 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1990 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| XI | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1844.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XIX | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f < 875 MHz | 1 MHz | -30 dBm |
| 875 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1844.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XX | 738 MHz  f  758 MHz | 1 MHz | -50 dBm |
| 758 MHz  f  788 MHz | 1 MHz | -50 dBm |
| 811 MHz  f  821 MHz | 3.84 MHz | -50 dBm (see note 3) |
| 791 MHz  f  811 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz | -79 dBm (see note 1) |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz | -71 dBm (see note 1) |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -60 dBm (see note 2) |
| XXII | 738 MHz  f  758 MHz | 1 MHz | -50 dBm |
| 758 MHz  f  791 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  869 MHz | 1 MHz | -50 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -79 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz | -71 dBm (see note 1) |
| 1880 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -50 dBm |
| 3510 MHz  f  3525 MHz | 1 MHz | -40 dBm |
| 3525 MHz  f  3590 MHz | 1 MHz | -50 dBm |
| 3600 MHz  f  3800 MHz | 3.84 MHz | -50 dBm |
| XXV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm |
| XXVI | 460 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 728 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  799 MHz | 1 MHz | -50 dBm |
| 799 MHz  f  803 MHz | 1 MHz | -40 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1805 MHz  f  1880 MHz | 3.84 MHz | -60 dBm |
| 1844.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2010 MHz  f  2025 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 1 MHz | -50 dBm |
|  |  |  |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm (see note 2) |
| 3400 MHz  f 3800 MHz | 1 MHz | -50 dBm |
| NOTE 1: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table 5.11A.3 are permitted for each UARFCN used in the measurement.  NOTE 2: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, measurements with a level up to the applicable requirements defined in Table 5.11A.3 are permitted for each UARFCN used in the measurement due to 2,nd 3, or 4th rdharmonic spurious emissions.  NOTE 3: This requirement is applicable also for frequencies, which are between 5 MHz and 25 MHz away from the UE centre carrier frequency.  NOTE 4: The applicability of each line in Table 5.11A.4 for UEs of different releases is defined in TS 25.101 [1]. | | | |

As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11A.3 are permitted in each of the bands, 925 MHz to 960 MHz and 1805 MHz to 1880 MHz for each UARFCN used in the measurement. The reference is 3GPP TS 45.005 [29].

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.11B Spurious Emissions for UL OLTD

Editor’s note: For a transition period of two meeting cycles until RAN#70, the test requirements in version 11.6.0 of this specification is allowed to be used for this test.

This clause is incomplete. The following aspects are either missing or not yet determined:

* Test procedure needs an update.

### 5.11B.1 Definition and applicability

Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermediation products and frequency conversion products, but exclude out of band emissions.

The frequency boundary and the detailed transitions of the limits between the requirement for out band emissions and spectrum emissions are based on ITU-R Recommendations SM.329.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL OLTD.

### 5.11B.2 Minimum Requirements

For UE with two active transmit antenna connectors in UL OLTD, the spectrum emission requirements specified in sub-clause 5.11.2 apply at each transmit antenna connector.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.3.1B .

### 5.11B.3 Test purpose

To verify that the UE spurious emissions do not exceed described value shown in table 5.11B.1a and table 5.11B.1b

Excess spurious emissions increase the interference to other systems.

### 5.11B.4 Method of test

5.11B.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause FFS.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.11B.4.2 Procedure

1) Set and send continuously up power control commands to the UE until the UE output power shall be maximum level.

2) Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

### 5.11B.5 Test requirements

The measured average power of spurious emission, derived in step 2), shall not exceed the described value in tables 5.11B.2a, 5.11B.2b and 5.11B.2c.

These requirements are only applicable for frequencies, which are greater than 12.5 MHz away from the UE centre carrier frequency.

For UE with two active transmit antenna connectors in UL OLTD, the spectrum emission requirements apply at each transmit antenna connector.

Table 5.11B.2a: General spurious emissions test requirements

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency Bandwidth | Measurement Bandwidth | Minimum requirement | Note |
| 9 kHz £ f < 150 kHz | 1 kHz | -36 dBm |  |
| 150 kHz £ f < 30 MHz | 10 kHz | -36 dBm |  |
| 30 MHz £ f < 1 000 MHz | 100 kHz | -36 dBm |  |
| 1 GHz £ f < 12,75 GHz | 1 MHz | -30 dBm |  |
| 12.75 GHz  f < 5th harmonic of the upper frequency edge of the UL operating band in GHz | 1 MHz | -30 dBm | Note 1 |
| NOTE 1: Applies only for Band XXII. | | | |

Table 5.11B.2b: Additional spurious emissions test requirements

| Operating Band | Frequency Bandwidth | Measurement Bandwidth | Minimum requirement |
| --- | --- | --- | --- |
| I | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  895 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz  f  935 MHz | 100 kHz  3.84 MHz | -67 dBm (see note 1)  -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84MHz | -79 dBm (see note 1)  -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84MHz | -71 dBm (see note 1)  -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz < f <1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm |
| II | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  758 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| III | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm (see note 5) |
| 921 MHz £ f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz £ f £ 935 MHz | 100 kHz  3.84 MHz | -67 dBm (see note 1)  -60 dBm |
| 935 MHz < f £ 960 MHz | 100 kHz | -79 dBm (see note 1) |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz  f  1496 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm (see note 5) |
| 1805 MHz £ f £ 1880 MHz | 3.84 MHz | -60 dBm |
| 1880 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f  1915.7 MHz | 300 kHz | -41 dBm (see note 5) |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz £ f £ 2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| IV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| V | 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 859 MHz  f  869 MHz | 1 MHz | -27 dBm |
| 869 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1805 MHz  f  1880 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1990 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm (see note 2) |
| 2570 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm |
| VI | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f  875 MHz | 1 MHz | -37 dBm |
| 875 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz £ f £ 1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz £ f £ 1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz £ f £ 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| VII | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 756 MHz  f  758 MHz | 1 MHz | -50 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  791 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 1900 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz <f< 2400 MHz | 3.84 MHz | -60 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2595 MHz  f  2620 MHz | 3.84 MHz | -50 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm |
| VIII | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 860 MHz  f  890 MHz | 1 MHz | -37 dBm (see note 4) |
| 925 MHz f 935 MHz | 100 kHz  3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1) -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452MHz  f  1496 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm (see note 4) |
| 1805 MHz < f  1830 MHz | 100 kHz  3.84 MHz | -71 dBm (see notes 1 and 2) -60 dBm (see note 2) |
| 1830 MHz < f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1) -60 dBm |
| 1880MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm (see note 4) |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz <f< 2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2640 MHz | 3.84 MHz | -60 dBm |
| 2640 MHz < f  2690 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| IX | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 859MHz  f  894 MHz | 3.84 MHz | -60dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz £ f £ 1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60dBm |
| 1884.5 MHzf 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| X | 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f 894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| XI | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz £ f £ 1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz £ f £ 1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz £ f £ 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XII | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| XIII | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 763 MHz  f  775 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 793 MHz  f  805 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm (see note 2) |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm (see note 2) |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| XIV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 769 MHz  f  775 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 799 MHz  f  805 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| XIX | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f < 875 MHz | 1 MHz | -37 dBm |
| 875 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XX | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 753 MHz  f  788 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz  f  935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -50 dBm (see note 2) |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| XXI | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 1 MHz | -35 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XXII | 758 MHz  f  791 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 1880 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -50 dBm |
| 3510 MHz  f  3525 MHz | 1 MHz | -40 dBm |
| 3525 MHz  f  3590 MHz | 1 MHz | -50 dBm |
| 3600 MHz  f  3800 MHz | 3.84 MHz | -50 dBm |
| XXV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| XXVI | 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  799 MHz | 1 MHz | -50 dBm |
| 799 MHz  f  803 MHz | 1 MHz | -40 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1805 MHz  f  1880 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.6 MHz | 300 kHz | -41 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm (see note 2) |
| 3400 MHz  f 3800 MHz | 1 MHz | -50 dBm |
| NOTE 1: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11.1a are permitted for each UARFCN used in the measurement.  NOTE 2: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, measurements with a level up to the applicable requirements defined in Table 5.11.1a are permitted for each UARFCN used in the measurement due to 2nd, 3rd , or 4th harmonic spurious emissions.  NOTE 3: This requirement is applicable also for frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency.  NOTE 4: This requirement is applicable only when transmission is made between 900MHz to 915MHz.  NOTE 5: This requirement is applicable only when transmission is made between 1744.9 MHz to 1784.9 MHz | | | |

NOTE 1: The applicability of each line in Table 5.11B.2b for UEs of different releases is defined in TS 25.101 [1].

Table 5.11B.2c: Additional spurious emissions requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **Operating Band** | **Frequency Bandwidth** | **Measurement Bandwidth** | **Minimum requirement** |
| XXVI | 806 MHz £ f £ 813.5 MHz | 6.25 kHz | -42 dBm (NOTE 1) |
| 806 MHz £ f £ 816 MHz | 6.25 kHz | -42 dBm (NOTE 2) |
| 852 MHz £ f £ 859 MHz | 1 MHz | -32 dBm (NOTE 3) |
| 851 MHz £ f £ 859 MHz | 6.25 kHz | -53 dBm (NOTE 4) |
| NOTE 1: Applicable for UE center frequencies ≥ 816.4 MHz. For UE center frequencies ≤ 819.6 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +17 dBm.  NOTE 2: Applicable for UE center frequencies ≥ 819.4 MHz. For UE center frequencies ≤ 822 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +17 dBm.  NOTE 3: Applicable for UE center frequencies ≤ 846.6 MHz. For UE center frequencies ≥ 842.4 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +10 dBm.  NOTE 4: Applicable for UE center frequencies ≤ 846.6 MHz. For UE center frequencies ≥ 842.4 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +10 dBm.  NOTE 5: For the 6.25kHz measurement bandwidth, the emissions measurement shall be sufficiently power averaged to ensure standard standard deviation < 0.5 dB. | | | |

As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11B.2a are permitted in each of the bands, 925 MHz to 960 MHz and 1805 MHz to 1880 MHz for each UARFCN used in the measurement. The reference is 3GPP TS 45.005 [29].

NOTE 2: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.11C Spurious Emissions for UL CLTD Activation state 1

Editor’s note: For a transition period of two meeting cycles until RAN#70, the test requirements in version 11.6.0 of this specification is allowed to be used for this test.

This clause is incomplete. The following aspects are either missing or not yet determined:

* Call Setup procedure needs an update.

### 5.11C.1 Definition and applicability

Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermediation products and frequency conversion products, but exclude out of band emissions.

The frequency boundary and the detailed transitions of the limits between the requirement for out band emissions and spectrum emissions are based on ITU-R Recommendations SM.329.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD.

### 5.11C.2 Minimum Requirements

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the spectrum emission requirements specified in sub-clause 5.11.2 apply at each transmit antenna connector.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.3.1C.

### 5.11C.3 Test purpose

To verify that the UE spurious emissions do not exceed described value shown in table 5.11C.1a and table 5.11C.1b.

Excess spurious emissions increase the interference to other systems.

### 5.11C.4 Method of test

5.11C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause FFS.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.11C.4.2 Procedure

1) Set and send continuously up power control commands to the UE until the UE output power shall be maximum level.

2) Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

### 5.11C.5 Test requirements

The measured average power of spurious emission, derived in step 2), shall not exceed the described value in tables 5.11C.2a, 5.11C.2b and 5.11C.2c.

These requirements are only applicable for frequencies, which are greater than 12.5 MHz away from the UE centre carrier frequency.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the spectrum emission requirements apply at each transmit antenna connector.

Table 5.11C.2a: General spurious emissions test requirements

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency Bandwidth | Measurement Bandwidth | Minimum requirement | Note |
| 9 kHz £ f < 150 kHz | 1 kHz | -36 dBm |  |
| 150 kHz £ f < 30 MHz | 10 kHz | -36 dBm |  |
| 30 MHz £ f < 1 000 MHz | 100 kHz | -36 dBm |  |
| 1 GHz £ f < 12,75 GHz | 1 MHz | -30 dBm |  |
| 12.75 GHz  f < 5th harmonic of the upper frequency edge of the UL operating band in GHz | 1 MHz | -30 dBm | Note 1 |
| NOTE 1: Applies only for Band XXII. | | | |

Table 5.11C.2b: Additional spurious emissions test requirements

| Operating Band | Frequency Bandwidth | Measurement Bandwidth | Minimum requirement |
| --- | --- | --- | --- |
| I | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  895 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz  f  935 MHz | 100 kHz  3.84 MHz | -67 dBm (see note 1)  -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz < f <1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm |
| II | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  758 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| III | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm (see note 5) |
| 921 MHz £ f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz £ f £ 935 MHz | 100 kHz  3.84 MHz | -67 dBm (see note 1)  -60 dBm |
| 935 MHz < f £ 960 MHz | 100 kHz | -79 dBm (see note 1) |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz  f  1496 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm (see note 5) |
| 1805 MHz £ f £ 1880 MHz | 3.84 MHz | -60 dBm |
| 1880 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f  1915.7 MHz | 300 kHz | -41 dBm (see note 5) |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz £ f £ 2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| IV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| V | 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 859 MHz  f  869 MHz | 1 MHz | -27 dBm |
| 869 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1805 MHz  f  1880 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm (see note 2) |
| 2570 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm |
| VI | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f  875 MHz | 1 MHz | -37 dBm |
| 875 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz £ f £ 1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz £ f £ 1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz £ f £ 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| VII | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 756 MHz  f  758 MHz | 1 MHz | -50 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  791 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 1900 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz <f< 2400 MHz | 3.84 MHz | -60 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2595 MHz  f  2620 MHz | 1 MHz | -40 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm |
| VIII | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 860 MHz  f  890 MHz | 1 MHz | -37 dBm (see note 4) |
| 925 MHz f 935 MHz | 100 kHz  3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1) -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452MHz  f  1496 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm (see note 4) |
| 1805 MHz < f  1830 MHz | 100 kHz  3.84 MHz | -71 dBm (see notes 1 and 2) -60 dBm (see note 2) |
| 1830 MHz < f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1) -60 dBm |
| 1880MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm (see note 4) |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz <f< 2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2640 MHz | 3.84 MHz | -60 dBm |
| 2640 MHz < f  2690 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| IX | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 859MHz  f  894 MHz | 3.84 MHz | -60dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz £ f £ 1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60dBm |
| 1884.5 MHzf 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| X | 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f 894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| XI | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz £ f £ 1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz £ f £ 1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz £ f £ 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XII | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| XIII | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 763 MHz  f  775 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 793 MHz  f  805 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm (see note 2) |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm (see note 2) |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| XIV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 769 MHz  f  775 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 799 MHz  f  805 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| XIX | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f < 875 MHz | 1 MHz | -37 dBm |
| 875 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XX | 753 MHz  f  788 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz  f  935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| XXI | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 1 MHz | -35 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XXII | 758 MHz  f  791 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 1880 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3525 MHz | 1 MHz | -40 dBm |
| 3525 MHz  f  3590 MHz | 1 MHz | -50 dBm |
| 3600 MHz  f  3800 MHz | 3.84 MHz | -50 dBm |
| XXV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| XXVI | 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  799 MHz | 1 MHz | -50 dBm |
| 799 MHz  f  803 MHz | 1 MHz | -40 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1805 MHz  f  1880 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm (see note 2) |
| 3400 MHz  f 3800 MHz | 1 MHz | -50 dBm |
| NOTE 1: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11.1a are permitted for each UARFCN used in the measurement.  NOTE 2: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, measurements with a level up to the applicable requirements defined in Table 5.11.1a are permitted for each UARFCN used in the measurement due to 2nd, 3rd , or 4th harmonic spurious emissions.  NOTE 3: This requirement is applicable also for frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency.  NOTE 4: This requirement is applicable only when transmission is made between 900MHz to 915MHz.  NOTE 5: This requirement is applicable only when transmission is made between 1744.9 MHz to 1784.9 MHz | | | |

NOTE 1: The applicability of each line in Table 5.11C.2b for UEs of different releases is defined in TS 25.101 [1].

Table 5.11C.2c: Additional spurious emissions requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **Operating Band** | **Frequency Bandwidth** | **Measurement Bandwidth** | **Minimum requirement** |
| XXVI | 806 MHz £ f £ 813.5 MHz | 6.25 kHz | -42 dBm (NOTE 1) |
| 806 MHz £ f £ 816 MHz | 6.25 kHz | -42 dBm (NOTE 2) |
| 852 MHz £ f £ 859 MHz | 1 MHz | -32 dBm (NOTE 3) |
| 851 MHz £ f £ 859 MHz | 6.25 kHz | -53 dBm (NOTE 4) |
| NOTE 1: Applicable for UE center frequencies ≥ 816.4 MHz. For UE center frequencies ≤ 819.6 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +17 dBm.  NOTE 2: Applicable for UE center frequencies ≥ 819.4 MHz. For UE center frequencies ≤ 822 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +17 dBm.  NOTE 3: Applicable for UE center frequencies ≤ 846.6 MHz. For UE center frequencies ≥ 842.4 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +10 dBm.  NOTE 4: Applicable for UE center frequencies ≤ 846.6 MHz. For UE center frequencies ≥ 842.4 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +10 dBm.  NOTE 5: For the 6.25kHz measurement bandwidth, the emissions measurement shall be sufficiently power averaged to ensure standard standard deviation < 0.5 dB. | | | |

As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11C.2a are permitted in each of the bands, 925 MHz to 960 MHz and 1805 MHz to 1880 MHz for each UARFCN used in the measurement. The reference is 3GPP TS 45.005 [29].

NOTE 2: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.11D Spurious Emissions for UL CLTD Activation state 2 and 3

Editor’s note: For a transition period of two meeting cycles until RAN#70, the test requirements in version 11.6.0 of this specification is allowed to be used for this test.

This clause is incomplete. The following aspects are either missing or not yet determined:

* Call Setup procedure needs update.

### 5.11D.1 Definition and applicability

Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermediation products and frequency conversion products, but exclude out of band emissions.

The frequency boundary and the detailed transitions of the limits between the requirement for out band emissions and spectrum emissions are based on ITU-R Recommendations SM.329.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD.

### 5.11D.2 Minimum Requirements

For UE configured in UL CLTD activation state 2 or activation state 3, the spectrum emission requirements in sub-clause 5.11.2 apply at the active transmit antenna connector.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.3.1C.

### 5.11D.3 Test purpose

To verify that the UE spurious emissions do not exceed described value shown in table 5.11D.1a and table 5.11D.1b.

Excess spurious emissions increase the interference to other systems.

### 5.11D.4 Method of test

5.11D.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.52.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause FFS with the following exception in the RADIO BEARER SETUP messages in table 5.11D.1C. This exception allows the call to be setup with initial UL CLTD activation state as state 2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.11D.4.2 Procedure

1) Set and send continuously up power control commands to the UE until the UE output power shall be maximum level.

2) Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

3) SS sends radio bearer reconfiguration to move the UE to UL\_CLTD activation state 3.

4) Repeat step 1 to 2 for activation state 3.

Table 5.11D.1c: Contents of Radio bearer setup message

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink CLTD info FDD |  | Rel-11 |
| - CHOICE *Mode* | New |  |
| - Initial CLTD activation state | Second state |  |

### 5.11D.5 Test requirements

The measured average power of spurious emission, derived in step 2), shall not exceed the described value in tables 5.11D.2a, 5.11D.2b and 5.11D.2c.

These requirements are only applicable for frequencies, which are greater than 12.5 MHz away from the UE centre carrier frequency.

For UE configured in UL CLTD activation state 2 or activation state 3, the spectrum emission requirements apply at the active transmit antenna connector.

Table 5.11D.2a: General spurious emissions test requirements

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency Bandwidth | Measurement Bandwidth | Minimum requirement | Note |
| 9 kHz £ f < 150 kHz | 1 kHz | -36 dBm |  |
| 150 kHz £ f < 30 MHz | 10 kHz | -36 dBm |  |
| 30 MHz £ f < 1 000 MHz | 100 kHz | -36 dBm |  |
| 1 GHz £ f < 12,75 GHz | 1 MHz | -30 dBm |  |
| 12.75 GHz  f < 5th harmonic of the upper frequency edge of the UL operating band in GHz | 1 MHz | -30 dBm | Note 1 |
| NOTE 1: Applies only for Band XXII. | | | |

Table 5.11D.2b: Additional spurious emissions test requirements

| Operating Band | Frequency Bandwidth | Measurement Bandwidth | Minimum requirement |
| --- | --- | --- | --- |
| I | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  895 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz  f  935 MHz | 100 kHz  3.84 MHz | -67 dBm (see note 1)  -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz < f <1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm |
| II | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  758 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| III | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm (see note 5) |
| 921 MHz £ f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz £ f £ 935 MHz | 100 kHz  3.84 MHz | -67 dBm (see note 1)  -60 dBm |
| 935 MHz < f £ 960 MHz | 100 kHz | -79 dBm (see note 1) |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz  f  1496 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm (see note 5) |
| 1805 MHz £ f £ 1880 MHz | 3.84 MHz | -60 dBm |
| 1880 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f  1915.7 MHz | 300 kHz | -41 dBm (see note 5) |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz £ f £ 2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| IV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| V | 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 859 MHz  f  869 MHz | 1 MHz | -27 dBm |
| 869 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1805 MHz  f  1880 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm (see note 2) |
| 2570 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm |
| VI | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f  875 MHz | 1 MHz | -37 dBm |
| 875 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz £ f £ 1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz £ f £ 1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz £ f £ 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| VII | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 756 MHz  f  758 MHz | 1 MHz | -50 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  791 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 1900 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 2010 MHz <f< 2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz <f< 2400 MHz | 3.84 MHz | -60 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2595 MHz  f  2620 MHz | 1 MHz | -40 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm |
| VIII | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 703 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 860 MHz  f  890 MHz | 1 MHz | -37 dBm (see note 4) |
| 925 MHz f 935 MHz | 100 kHz  3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1) -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452MHz  f  1496 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm (see note 4) |
| 1805 MHz < f  1830 MHz | 100 kHz  3.84 MHz | -71 dBm (see notes 1 and 2) -60 dBm (see note 2) |
| 1830 MHz < f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1) -60 dBm |
| 1880MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm (see note 4) |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz <f< 2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 2570 MHz  f  2640 MHz | 3.84 MHz | -60 dBm |
| 2640 MHz < f  2690 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| IX | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 859MHz  f  894 MHz | 3.84 MHz | -60dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz £ f £ 1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60dBm |
| 1884.5 MHzf 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| X | 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f 894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2570 MHz | 1 MHz | -50 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| XI | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz £ f £ 1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz £ f £ 1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz £ f £ 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XII | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| XIII | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 763 MHz  f  775 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 793 MHz  f  805 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm (see note 2) |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm (see note 2) |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| XIV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 769 MHz  f  775 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 799 MHz  f  805 MHz | 6.25 kHz | -35 dBm (see note 3) |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| XIX | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f < 875 MHz | 1 MHz | -37 dBm |
| 875 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XX | 461 MHz  f  466 MHz | 1 MHz | -50 dBm |
| 460 MHz  f  465 MHz | 1 MHz | -50 dBm |
| 753 MHz  f  788 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz  f  935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -60 dBm (see note 2) |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| XXI | 758 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 860 MHz  f  890 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1475.9 MHz  f  1510.9 MHz | 1 MHz | -35 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2545 MHz  f  2575 MHz | 1 MHz | -50 dBm |
| 2595 MHz  f  2645 MHz | 1 MHz | -50 dBm |
| XXII | 758 MHz  f  791 MHz | 1 MHz | -50 dBm |
| 791 MHz  f  821 MHz | 3.84 MHz | -60 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 921 MHz  f < 925 MHz | 100 kHz | -60 dBm (see note 1) |
| 925 MHz f 935 MHz | 100 kHz 3.84 MHz | -67 dBm (see note 1) -60 dBm |
| 935 MHz < f  960 MHz | 100 kHz  3.84 MHz | -79 dBm (see note 1)  -60 dBm |
| 1452 MHz < f  1496 MHz | 3.84 MHz | -60 dBm |
| 1805 MHz  f  1880 MHz | 100 kHz  3.84 MHz | -71 dBm (see note 1)  -60 dBm |
| 1880 MHz  f  1920 MHz | 3.84 MHz | -60 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2620 MHz  f  2690 MHz | 3.84 MHz | -60 dBm |
| 2570 MHz  f  2620 MHz | 3.84 MHz | -60 dBm |
| 3510 MHz  f  3525 MHz | 1 MHz | -40 dBm |
| 3525 MHz  f  3590 MHz | 1 MHz | -50 dBm |
| 3600 MHz  f  3800 MHz | 3.84 MHz | -50 dBm |
| XXV | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  746 MHz | 3.84 MHz | -60 dBm |
| 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm |
| 758 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  803 MHz | 1 MHz | -50 dBm |
| 852 MHz  f  859 MHz | 1 MHz | -50 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 3.84 MHz | -60 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2350 MHz  f  2360 MHz | 1 MHz | -50 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm |
| 3510 MHz  f  3590 MHz | 3.84 MHz | -60 dBm |
| 3400 MHz  f  3800 MHz | 1 MHz | -50 dBm (see note 2) |
| XXVI | 617 MHz  f  652 MHz | 1 MHz | -50 dBm |
| 462.5 MHz  f  467.5 MHz | 1 MHz | -50 dBm |
| 717 MHz  f  728 MHz | 1 MHz | -50 dBm |
| 729 MHz  f  768 MHz | 3.84 MHz | -60 dBm |
| 768 MHz  f  799 MHz | 1 MHz | -50 dBm |
| 799 MHz  f  803 MHz | 1 MHz | -40 dBm |
| 859 MHz  f  894 MHz | 3.84 MHz | -60 dBm |
| 945 MHz  f  960 MHz | 3.84 MHz | -60 dBm |
| 1427 MHz  f  1518 MHz | 1 MHz | -50 dBm |
| 1475.9 MHz  f  1510.9 MHz | 3.84 MHz | -60 dBm |
| 1525 MHz  f  1559 MHz | 1 MHz | -50 dBm |
| 1805 MHz  f  1880 MHz | 3.84 MHz | -60 dBm |
| 1839.9 MHz  f  1879.9 MHz | 3.84 MHz | -60 dBm |
| 1884.5 MHz f 1915.7 MHz | 300 kHz | -41 dBm |
| 1930 MHz  f  1995 MHz | 3.84 MHz | -60 dBm |
| 1995 MHz  f  2020 MHz | 1 MHz | -50 dBm |
| 2010 MHz  f  2025 MHz | 3.84 MHz | -60 dBm |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm |
| 2170 MHz  f  2200 MHz | 1 MHz | -50 dBm |
| 2300 MHz  f  2400 MHz | 3.84 MHz | -60 dBm |
| 2496 MHz  f  2690 MHz | 1 MHz | -50 dBm (see note 2) |
| 3400 MHz  f 3800 MHz | 1 MHz | -50 dBm |
| NOTE 1: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11.1a are permitted for each UARFCN used in the measurement.  NOTE 2: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, measurements with a level up to the applicable requirements defined in Table 5.11.1a are permitted for each UARFCN used in the measurement due to 2nd, 3rd , or 4th harmonic spurious emissions.  NOTE 3: This requirement is applicable also for frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency.  NOTE 4: This requirement is applicable only when transmission is made between 900MHz to 915MHz.  NOTE 5: This requirement is applicable only when transmission is made between 1744.9 MHz to 1784.9 MHz | | | |

NOTE 1: The applicability of each line in Table 5.11.2b for UEs of different releases is defined in TS 25.101 [1].

Table 5.11D.2c: Additional spurious emissions requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **Operating Band** | **Frequency Bandwidth** | **Measurement Bandwidth** | **Minimum requirement** |
| XXVI | 806 MHz £ f £ 813.5 MHz | 6.25 kHz | -42 dBm (NOTE 1) |
| 806 MHz £ f £ 816 MHz | 6.25 kHz | -42 dBm (NOTE 2) |
| 852 MHz £ f £ 859 MHz | 1 MHz | -32 dBm (NOTE 3) |
| 851 MHz £ f £ 859 MHz | 6.25 kHz | -53 dBm (NOTE 4) |
| NOTE 1: Applicable for UE center frequencies ≥ 816.4 MHz. For UE center frequencies ≤ 819.6 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +17 dBm.  NOTE 2: Applicable for UE center frequencies ≥ 819.4 MHz. For UE center frequencies ≤ 822 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +17 dBm.  NOTE 3: Applicable for UE center frequencies ≤ 846.6 MHz. For UE center frequencies ≥ 842.4 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +10 dBm.  NOTE 4: Applicable for UE center frequencies ≤ 846.6 MHz. For UE center frequencies ≥ 842.4 MHz the IE "Maximum allowed UL TX power" shall be indicated and set to +10 dBm.  NOTE 5: For the 6.25kHz measurement bandwidth, the emissions measurement shall be sufficiently power averaged to ensure standard standard deviation < 0.5 dB. | | | |

As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11.2a are permitted in each of the bands, 925 MHz to 960 MHz and 1805 MHz to 1880 MHz for each UARFCN used in the measurement. The reference is 3GPP TS 45.005 [29].

NOTE 2: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.12 Transmit Intermodulation

### 5.12.1 Definition and applicability

The transmit intermodulation performance is a measure of the capability of the transmitter to inhibit the generation of signals in its non linear elements caused by presence of the wanted signal and an interfering signal reaching the transmitter via the antenna.

UE(s) transmitting in close vicinity of each other can produce intermodulation products, which can fall into the UE, or Node B receive band as an unwanted interfering signal. The UE transmit intermodulation attenuation is defined by the ratio of the RRC filtered mean power of the wanted signal to the RRC filtered mean power of the intermodulation product when an interfering CW signal is added at a level below the wanted signal.

The requirements and this test apply to all types of UTRA for the FDD UE.

### 5.12.2 Minimum Requirements

The UE transmit intermodulation shall not exceed the described value in table 5.12.1.

Table 5.12.1: Transmit Intermodulation

|  |  |  |
| --- | --- | --- |
| CW Signal Frequency Offset from Transmitting Carrier | 5MHz | 10MHz |
| Interference CW Signal Level | -40 dBc | |
| Intermodulation Product | -31 dBc | -41 dBc |

The normative reference for this requirement is TS 25.101 [1] clause 6.7.1.

### 5.12.3 Test purpose

To verify that the UE transmit intermodulation does not exceed the described value in table 5.12.1.

An excess transmit intermodulation increases transmission errors in the up link own channel when other transmitter exists nearby.

### 5.12.4 Method of test

5.12.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.2.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.12.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Set the frequency of the CW generator to the offset 1 or offset 2 as shown in table 5.12.2.

3) Measure the RRC filtered mean power of the UE.

4) Search the intermodulation product signal, then measure the RRC filtered mean power of transmitting intermodulation, and calculate the ratio with the power measured in step 3).

5) Repeat the measurement with another tone offset.

### 5.12.5 Test requirements

The ratio derived in step 4), shall not exceed the described value in table 5.12.2.

Table 5.12.2: Transmit Intermodulation

|  |  |  |
| --- | --- | --- |
| CW Signal Frequency Offset from Transmitting Carrier | 5MHz | 10MHz |
| Interference CW Signal Level | -40 dBc | |
| Intermodulation Product | -31 dBc | -41 dBc |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.12A Transmit Intermodulation for DC-HSUPA

### 5.12A.1 Definition and applicability

The transmit intermodulation performance is a measure of the capability of the transmitter to inhibit the generation of signals in its non linear elements caused by presence of the wanted signal and an interfering signal reaching the transmitter via the antenna.

The UE intermodulation attenuation is defined by the ratio of the sum of the RRC filtered mean powers of the wanted signal on the assigned carriers to the sum of the RRC filtered mean powers of the intermodulation product on two adjacent carriers when an interfering CW signal is added at a level below the wanted signal.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that supports HSDPA and Dual Cell E-DCH.

### 5.12A.2 Minimum Requirements for DC-HSUPA

The requirement of transmitting intermodulation for a carrier spacing of 5 MHz is prescribed in Table 5.12A.1.

Table 5.12A.1: Transmit Intermodulation requirement for DC-HSUPA

|  |  |  |  |
| --- | --- | --- | --- |
| Interference Signal Frequency Offset | 10MHz | | 20MHz |
| Interference CW Signal Level | -40dBc | | |
| Intermodulation Product | -31dBc | -41dBc | |

The normative reference for this requirement is TS 25.101 [1] clause 6.7.1A.

### 5.12A.3 Test purpose

To verify that the UE transmit intermodulation does not exceed the described value in table 5.12A.2.

An excess transmit intermodulation increases transmission errors in the up link when other transmitter exists nearby.

### 5.12A.4 Method of test

5.12A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.42.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

5.12A.4.2 Procedure

1) Set the UE to maximum output power according to 5.2BA.4.2 steps 1 to 4 with the exception that only configuration #3 from table 5.2BA.5A is applied.

2) Set the frequency of the CW generator to the first offset as shown in table 5.12A.2.

3) Measure the sum of the RRC filtered mean powers centred on each of the two assigned channels.

4) Search the intermodulation product signal and measure the RRC filtered mean power of transmitting intermodulation.

5) Calculate the ratio of the intermodulation product signal power (step 4) with the wanted power (step 3).

6) Repeat the measurement to both sides of the two assigned channels and using the second tone offset.

### 5.12A.5 Test requirements

The ratio derived in step 4), shall not exceed the described value in table 5.12A.2.

Table 5.12A.2: Transmit Intermodulation

|  |  |  |
| --- | --- | --- |
| Interference Signal Frequency Offset | 10MHz | 20MHz |
| Interference CW Signal Level | -40dBc | |
| Intermodulation Product | -31dBc | -41dBc |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 5.13 Transmit Modulation

Transmit modulation defines the modulation quality for expected in-channel RF transmissions from the UE. The requirements apply to all transmissions including the PRACH/PCPCH pre-amble and message parts and all other expected transmissions for release 99 and release 4 only. For release 5 and later the requirements apply to all transmissions including the PRACH pre-amble and message parts and all other expected transmissions. In cases where the mean power of the RF signal is allowed to change versus time e.g. PRACH, DPCH in compressed mode, change of TFC, inner loop power control and for HSDPA transmissions with non-constant HS-DPCCH code power, the EVM and Peak Code Domain Error requirements do not apply during the 25 us period before and after the nominal time when the mean power is expected to change.

### 5.13.1 Error Vector Magnitude (EVM)

#### 5.13.1.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the reference waveform and the measured waveform. This difference is called the error vector. Both waveforms pass through a matched Root Raised Cosine filter with bandwidth 3,84 MHz and roll-off =0,22. Both waveforms are then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the mean reference power expressed as a %.

For Release 99 and Release 4 the measurement interval is one timeslot.

For Release 5 and later releases where tests may include power changes, the measurement interval is further clarified as being one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 μs at each end of the slot. The requirements and this test apply to all types of UTRA for the FDD UE.

#### 5.13.1.2 Minimum Requirements

The EVM shall not exceed 17,5 % for the parameters specified in table 5.13.1.

Table 5.13.1: Parameters for EVM

|  |  |  |
| --- | --- | --- |
| Parameter | Level / Status | Unit |
| Output power | ³ -20 | dBm |
| Operating conditions | Normal conditions |  |
| Power control step size | 1 | dB |

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3.0.

#### 5.13.1.3 Test purpose

To verify that the EVM does not exceed 17,5 % for the specified parameters in table 5.13.1.

An excess EVM increases transmission errors in the up link own channel.

#### 5.13.1.4 Method of test

5.13.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.13.1.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the EVM using Global In-Channel Tx-Test (annex B).

3) Set the power level of UE to -18dBm or send Down power control commands (1dB step size should be used.) to the UE until UE output power shall be -18dBm with 2dB tolerance.

4) Repeat step 2).

#### 5.13.1.5 Test requirements

The measured EVM, derived in step 2) and 4), shall not exceed 17,5 %. for parameters specified in table 5.13.1 Parameters for EVM.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.13.1A Error Vector Magnitude (EVM) with HS-DPCCH

#### 5.13.1A.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the reference waveform and the measured waveform. This difference is called the error vector. Both waveforms pass through a matched Root Raised Cosine filter with bandwidth 3,84 MHz and roll-off =0,22. Both waveforms are then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the mean reference power expressed as a %.

The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 μs at each end of the slot.

For signals containing more than one spreading code where the slot alignment of the codes is not the same and the code power is varying, the period over which the nominal mean power remains constant can be less than one timeslot. For such time-varying signals it is not possible to define EVM across one timeslot since this interval contains an expected change in mean power, and the exact timing and trajectory of the power change is not defined. For these signals, the EVM minimum requirements apply only for intervals of at least one half timeslot (less any 25μs transient periods) during which the nominal code power of each individual code is constant.

NOTE: The reason for setting a lower limit for the EVM measurement interval is that for any given impaired signal, the EVM would be expected to improve for measurement intervals less than one timeslot while the frequency error would be expected to degrade.

The requirements and this test apply for Release 5 only to all types of UTRA for the FDD UE that support HSDPA.

#### 5.13.1A.2 Minimum Requirements

The EVM shall not exceed 17.5 % for the parameters specified in table 5.13.1A.1. This is applicable for all values of,and as specified in [5].

Table 5.13.1A.1: Parameters for EVM

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | | Level / Status | Unit |
| Output power | | ³ -20 | dBm |
| Operating conditions | | Normal conditions |  |
| Power control step size | | 1 | dB |
| Measurement period1 | PRACH | 3904 | Chips |
| Any DPCH | From 1280 to 25602 |
| NOTE 1: Less any 25μs transient periods  NOTE 2: The longest period over which the nominal power remains constant | | | |

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3.0.

#### 5.13.1A.3 Test purpose

To verify that the EVM does not exceed 17.5 % for the specified parameters in table 5.13.1A.1 using the values of ,and specified in table C.10.1.4 for subtest 3.

#### 5.13.1A.4 Method of test

5.13.1A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.13.1A.2. Set the Default DPCH Offset Value according to the required HS-DPCCH slot offset as specified in TS 25.331 [8] clause 8.6.6.14 and TS 25.211 [19].

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.13.1A.2: Settings for the serving cell during the measurement  
of Error Vector Magnitude (EVM) with HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.13.1A.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

5.13.1A.4.2 Procedure

1) Send the TRANSPORT CHANNEL RECONFIGURATION message defined in Annex I to set the beta values according to table C.10.1.4 subtest 3 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms as shown in Figure 5.13.1A.1. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS such that the half slot period with the highest output power for the defined 12ms sequence as measured at the UE antenna connector is the maximum output as defined in table 5.2A.2. Maintain this power level by sending alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

3) Start transmitting HSDPA Data.

4) With reference to Figure 5.13.1A.1 measure the EVM using Global In-Channel Tx-Test (annex B) during the last half slot period of the ACK/NACK in subframe n+3 when the UE is at its maximum power in the 12ms cycle (measurement point 3) and in the following half slot period when the CQI is off (measurement point 4) and the UE is at its minimum power in the cycle. Measure the EVM in the last half slot before subframe n when the UE is at its minimum power (measurement point 1) and immediately following in the first half slot of subframe n when the ACK/NACK is transmitting and the UE is at its maximum power in the 12ms cycle (measurement point 2). All measurements shall exclude the 25 us transient periods at the beginning and end of each measurement period.

5) Generate suitable TPC commands from the SS such that the half slot period with the lowest output power for the defined 12ms sequence as measured at the UE antenna connector is -18dBm with 2dB tolerance. Maintain this power level by sending alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

6) Repeat step 4).



Figure 5.13.1A.1: HS-DPCCH on/off pattern showing measurement positions

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I. The test specific exception for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

|  |  |
| --- | --- |
| Information Element | Value/remark |
| - Ack-Nack repetition factor | 1 |
| - CQI repetition factor | 1 |

#### 5.13.1A.5 Test requirements

The measured EVM, derived in steps 4) and 6), shall not exceed 17.5 % for parameters specified in table 5.13.1A.1 parameters for EVM.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.13.1AA Error Vector Magnitude (EVM) and phase discontinuity with HS-DPCCH

#### 5.13.1AA.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the reference waveform and the measured waveform. This difference is called the error vector. Both waveforms pass through a matched Root Raised Cosine filter with bandwidth 3,84 MHz and roll-off =0,22. Both waveforms are then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the mean reference power expressed as a %.

The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 μs at each end of the slot.

For signals containing more than one spreading code where the slot alignment of the codes is not the same and the code power is varying, the period over which the nominal mean power remains constant can be less than one timeslot. For such time-varying signals it is not possible to define EVM across one timeslot since this interval contains an expected change in mean power, and the exact timing and trajectory of the power change is not defined. For these signals, the EVM minimum requirements apply only for intervals of at least one half timeslot (less any 25μs transient periods) during which the nominal code power of each individual code is constant.

NOTE: The reason for setting a lower limit for the EVM measurement interval is that for any given impaired signal, the EVM would be expected to improve for measurement intervals less than one timeslot while the frequency error would be expected to degrade.

Phase discontinuity for HS-DPCCH is the change in phase due to the transmission of the HS-DPCCH. In the case where the HS-DPCCH timeslot is offset from the DPCCH timeslot, the period of evaluation of the phase discontinuity shall be the DPCCH timeslot that contains the HS-DPCCH slot boundary. The phase discontinuity for HS-DPCCH result is defined as the difference between the absolute phase used to calculate the EVM for that part of the DPCCH timeslot prior to the HS-DPCCH slot boundary, and the absolute phase used to calculate the EVM for remaining part of the DPCCH timeslot following the HS-DPCCH slot boundary. In all cases the subslot EVM is measured excluding the transient periods of 25 s.

Since subslot EVM is only defined for intervals of at least one half timeslot, the phase discontinuity for HS-DPCCH is only defined for non-aligned timeslots when the offset is 0.5 slots.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA.

#### 5.13.1AA.2 Minimum Requirements

The EVM shall not exceed 17.5 % for the parameters specified in table 5.13.1AA. This is applicable for all values of,and as specified in [5].

Table 5.13.1AA.1: Parameters for EVM

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | | Level / Status | Unit |
| Output power | | ³ -20 | dBm |
| Operating conditions | | Normal conditions |  |
| Power control step size | | 1 | dB |
| Measurement period1 | PRACH | 3904 | Chips |
| Any DPCH | From 1280 to 25602 |
| NOTE 1: Less any 25μs transient periods  NOTE 2: The longest period over which the nominal power remains constant | | | |

The phase discontinuity for HS-DPCCH shall not exceed the value specified in table 5.13.1AA.2 90% of the time. When calculating the phase discontinuity, the requirements for frequency error and EVM in sub clauses 6.3 and 6.8.2, of TS 25.101 [1] respectively shall be met.

Table 5.13.1AA.2: Phase discontinuity minimum requirement  
for HS-DPCCH at HS-DPCCH slot boundary

|  |  |
| --- | --- |
| Phase discontinuity for HS-DPCCH Δθ in degrees | Δθ  30 |

The normative reference for these requirements is TS 25.101 [1] clause 6.8.3.0 and 6.8.5.1.

#### 5.13.1AA.3 Test purpose

To verify that the EVM does not exceed 17.5 % for the specified parameters in table 5.13.1AA using the values of ,and specified in table C.10.1.4 for subtest 3.

To verify that HSDPA phase discontinuity does not exceed the values in table 5.13.1AA.2.

NOTE: The statistical aspect (90% pass rate) of this minimum requirement is not currently tested.

#### 5.13.1AA.4 Method of test

5.13.1AA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.13.1AA.3. Set the Default DPCH Offset Value according to the required HS-DPCCH slot offset as specified in TS 25.331 [8] clause 8.6.6.14 and TS 25.211 [19].

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.13.1AA.3: Settings for the serving cell during the measurement  
of Error Vector Magnitude (EVM) with HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.13.1AA.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

5.13.1AA.4.2 Procedure

1) Send the TRANSPORT CHANNEL RECONFIGURATION message defined in Annex I to set the beta values according to table C.10.1.4 subtest 3 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms as shown in Figure 5.13.1AA.1. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS such that the half slot period with the highest output power for the defined 12ms sequence as measured at the UE antenna connector is the maximum output as defined in table 5.2AA.2. Maintain this power level by sending alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

3) Start transmitting HSDPA Data.

4) With reference to Figure 5.13.1AA.1 measure the EVM using Global In-Channel Tx-Test (annex B) during the last half slot period of the ACK/NACK in subframe n+3 when the UE is at its maximum power in the 12ms cycle (measurement point 3) and in the following half slot period when the CQI is off and the UE is at its minimum power in the cycle (measurement point 4). Compute from these two EVM results the phase discontinuity between the two half slot periods. Measure the EVM in the last half slot before subframe n when the UE is at its minimum power (measurement point 1) and immediately following in the first half slot of subframe n when the ACK/NACK is transmitting and the UE is at its maximum power in the 12ms cycle (measurement point 2). Compute from these two EVM results the phase discontinuity between the two half slot periods. All measurements shall exclude the 25 us transient periods at the beginning and end of each measurement period.

5) Generate suitable TPC commands from the SS such that the half slot period with the lowest output power for the defined 12ms sequence as measured at the UE antenna connector is -18dBm with 2dB tolerance. Maintain this power level by sending alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

6) Repeat step 4).



Figure 5.13.1AA.1: HS-DPCCH on/off pattern showing measurement positions

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I. The test specific exception for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

|  |  |
| --- | --- |
| Information Element | Value/remark |
| - Ack-Nack repetition factor | 1 |
| - CQI repetition factor | 1 |

#### 5.13.1AA.5 Test requirements

Table 5.13.1AA.4: Phase discontinuity test requirement for HS-DPCCH at HS-DPCCH slot boundary

|  |  |
| --- | --- |
| Phase discontinuity for HS-DPCCH Δθ in degrees | Δθ  36 |

The measured EVM, derived in steps 4) and 6), shall not exceed 17.5 % for parameters specified in table 5.13.1AA.1 parameters for EVM.

The measured phase discontinuity, derived in steps 4) and 6), shall not exceed the value specified in table 5.13.1AA.4.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.13.1AB Error Vector Magnitude (EVM) and phase discontinuity with HS-DPCCH for OLTD

#### 5.13.1AB.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the reference waveform and the measured waveform. This difference is called the error vector. Both waveforms pass through a matched Root Raised Cosine filter with bandwidth 3,84 MHz and roll-off =0,22. Both waveforms are then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the mean reference power expressed as a %.

The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 μs at each end of the slot.

For signals containing more than one spreading code where the slot alignment of the codes is not the same and the code power is varying, the period over which the nominal mean power remains constant can be less than one timeslot. For such time-varying signals it is not possible to define EVM across one timeslot since this interval contains an expected change in mean power, and the exact timing and trajectory of the power change is not defined. For these signals, the EVM minimum requirements apply only for intervals of at least one half timeslot (less any 25μs transient periods) during which the nominal code power of each individual code is constant.

NOTE: The reason for setting a lower limit for the EVM measurement interval is that for any given impaired signal, the EVM would be expected to improve for measurement intervals less than one timeslot while the frequency error would be expected to degrade.

Phase discontinuity for HS-DPCCH is the change in phase due to the transmission of the HS-DPCCH. In the case where the HS-DPCCH timeslot is offset from the DPCCH timeslot, the period of evaluation of the phase discontinuity shall be the DPCCH timeslot that contains the HS-DPCCH slot boundary. The phase discontinuity for HS-DPCCH result is defined as the difference between the absolute phase used to calculate the EVM for that part of the DPCCH timeslot prior to the HS-DPCCH slot boundary, and the absolute phase used to calculate the EVM for remaining part of the DPCCH timeslot following the HS-DPCCH slot boundary. In all cases the subslot EVM is measured excluding the transient periods of 25 s.

Since subslot EVM is only defined for intervals of at least one half timeslot, the phase discontinuity for HS-DPCCH is only defined for non-aligned timeslots when the offset is 0.5 slots.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL OLTD and HSDPA.

#### 5.13.1AB.2 Minimum Requirements

The EVM shall not exceed 17.5 % for the parameters specified in table 5.13.1AB.1 at each transmit antenna connector. This is applicable for all values of,and as specified in [5].

Table 5.13.1AB.1: Parameters for Error Vector Magnitude for UL OLTD

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | | Unit | Level |
| UE Output Power, no 16QAM | | dBm |  -20 |
| UE Output Power, 16QAM | | dBm |  -30 |
| Operating conditions | |  | Normal conditions |
| Power control step size | | dB | 1 |
| Measurement period (Note 1) | Any DPCH | Chips | From 1280 to 2560 (Note 2) |
| Note 1: Less any 25μs transient periods  Note 2: The longest period over which the nominal power remains constant | | | |

For UE with two transmit antenna connectors in UL OLTD operation, the phase discontinuity for HS-DPCCH shall not exceed the value specified in table 6.18 90% of the time for each transmit antenna connector. In addition, the relative phase applied to the two transmit paths shall be fixed during the phase discontinuity test. When calculating the phase discontinuity, the requirements for frequency error and EVM in sub clauses 6.3B and 6.8.2, respectively shall be met.

Table 5.13.1AB.2: Phase discontinuity minimum requirement  
for HS-DPCCH at HS-DPCCH slot boundary

|  |  |
| --- | --- |
| Phase discontinuity for HS-DPCCH Δθ in degrees | Δθ  30 |

The normative reference for these requirements is TS 25.101 [1] clause 6.8.2.1B and 6.8.5.1A

#### 5.13.1AB.3 Test purpose

To verify that the EVM does not exceed 17.5 % for the specified parameters in table 5.13.1AB using the values of ,and specified in table C.10.2.4 for subtest 3.

To verify that HSDPA phase discontinuity does not exceed the values in table 5.13.1AB.2.

NOTE: The statistical aspect (90% pass rate) of this minimum requirement is not currently tested.

#### 5.13.1AB.4 Method of test

5.13.1AB.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.2 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.18. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.13.1AB.3. Set the Default DPCH Offset Value according to the required HS-DPCCH slot offset as specified in TS 25.331 [8] clause 8.6.6.14 and TS 25.211 [19].

4) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.13.1AB.3: Settings for the serving cell during the measurement  
of Error Vector Magnitude (EVM) and phase discontinuity with HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.13.1AB.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

5.13.1AB.4.2 Procedure

1) Send the TRANSPORT CHANNEL RECONFIGURATION message defined in Annex I to set the beta values according to table C.10.2.4 subtest 3 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms as shown in Figure 5.13.1AB.1. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS such that the half slot period with the highest output power for the defined 12ms sequence as measured at the UE antenna connector is the maximum output as defined in table 5.2AA.2. Maintain this power level by sending alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

3) Start transmitting HSDPA Data.

4) With reference to Figure 5.13.1AB.1 measure the EVM at each antenna connector using Global In-Channel Tx-Test (annex B) during the last half slot period of the ACK/NACK in subframe n+3 when the UE is at its maximum power in the 12ms cycle (measurement point 3) and in the following half slot period when the CQI is off and the UE is at its minimum power in the cycle (measurement point 4). Compute from these two EVM results the phase discontinuity between the two half slot periods for each antenna connector. Measure the EVM in the last half slot before subframe n when the UE is at its minimum power (measurement point 1) and immediately following in the first half slot of subframe n when the ACK/NACK is transmitting and the UE is at its maximum power in the 12ms cycle (measurement point 2). Compute from these two EVM results the phase discontinuity between the two half slot periods for each antenna connector. All measurements shall exclude the 25 us transient periods at the beginning and end of each measurement period.

5) Generate suitable TPC commands from the SS such that the half slot period with the lowest output power for the defined 12ms sequence as measured at the UE antenna connector is -18dBm with 2dB tolerance. Maintain this power level by sending alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

6) Repeat step 4).



Figure 5.13.1AB.1: HS-DPCCH on/off pattern showing measurement positions

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I. The test specific exception for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

|  |  |
| --- | --- |
| Information Element | Value/remark |
| - Ack-Nack repetition factor | 1 |
| - CQI repetition factor | 1 |

#### 5.13.1AB.5 Test requirements

Table 5.13.1AB.4: Phase discontinuity test requirement for HS-DPCCH at HS-DPCCH slot boundary

|  |  |
| --- | --- |
| Phase discontinuity for HS-DPCCH Δθ in degrees | Δθ  36 |

The measured EVM at each antenna connector, derived in steps 4) and 6), shall not exceed 17.5 % for parameters specified in table 5.13.1AB.1 parameters for EVM.

The measured phase discontinuity for each antenna connector, derived in steps 4) and 6), shall not exceed the value specified in table 5.13.1AB.4.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.13.1AB Error Vector Magnitude (EVM) and phase discontinuity with HS-DPCCH for OLTD

TBD

### 5.13.1AC Error Vector Magnitude (EVM) and phase discontinuity with HS-DPCCH for UL CLTD Activation state 1

#### 5.13.1AC.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the reference waveform and the measured waveform. This difference is called the error vector. Both waveforms pass through a matched Root Raised Cosine filter with bandwidth 3,84 MHz and roll-off =0,22. Both waveforms are then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the mean reference power expressed as a %.

The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 μs at each end of the slot.

For signals containing more than one spreading code where the slot alignment of the codes is not the same and the code power is varying, the period over which the nominal mean power remains constant can be less than one timeslot. For such time-varying signals it is not possible to define EVM across one timeslot since this interval contains an expected change in mean power, and the exact timing and trajectory of the power change is not defined. For these signals, the EVM minimum requirements apply only for intervals of at least one half timeslot (less any 25μs transient periods) during which the nominal code power of each individual code is constant.

NOTE: The reason for setting a lower limit for the EVM measurement interval is that for any given impaired signal, the EVM would be expected to improve for measurement intervals less than one timeslot while the frequency error would be expected to degrade.

Phase discontinuity for HS-DPCCH is the change in phase due to the transmission of the HS-DPCCH. In the case where the HS-DPCCH timeslot is offset from the DPCCH timeslot, the period of evaluation of the phase discontinuity shall be the DPCCH timeslot that contains the HS-DPCCH slot boundary. The phase discontinuity for HS-DPCCH result is defined as the difference between the absolute phase used to calculate the EVM for that part of the DPCCH timeslot prior to the HS-DPCCH slot boundary, and the absolute phase used to calculate the EVM for remaining part of the DPCCH timeslot following the HS-DPCCH slot boundary. In all cases the subslot EVM is measured excluding the transient periods of 25 s.

Since subslot EVM is only defined for intervals of at least one half timeslot, the phase discontinuity for HS-DPCCH is only defined for non-aligned timeslots when the offset is 0.5 slots.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and HSDPA.

#### 5.13.1AC.2 Minimum Requirements

The EVM shall not exceed 17.5 % for the parameters specified in table 5.13.1AC.1 at each transmit antenna connector. This is applicable for all values of,and as specified in [5].

Table 5.13.1AC.1: Parameters for Error Vector Magnitude for UL CLTD

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | | Unit | Level |
| UE Output Power, no 16QAM | | dBm |  -20 |
| UE Output Power, 16QAM | | dBm |  -30 |
| Operating conditions | |  | Normal conditions |
| Power control step size | | dB | 1 |
| Measurement period (Note 1) | Any DPCH | Chips | From 1280 to 2560 (Note 2) |
| Note 1: Less any 25μs transient periods  Note 2: The longest period over which the nominal power remains constant | | | |

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the phase discontinuity for HS-DPCCH shall not exceed the value specified in table 5.13.1AC.2 90% of the time for each transmit antenna connector. In addition, TPI applied to the two transmit paths shall be fixed during the phase discontinuity test. When calculating the phase discontinuity, the requirements for frequency error and EVM in sub clauses 6.3C and 6.8.2 of TS 25.101 [1] respectively shall be met.

Table 5.13.1AC.2: Phase discontinuity minimum requirement  
for HS-DPCCH at HS-DPCCH slot boundary

|  |  |
| --- | --- |
| Phase discontinuity for HS-DPCCH Δθ in degrees | Δθ  30 |

The normative reference for these requirements is TS 25.101 [1] clause 6.8.2.1C and 6.8.5.1B

#### 5.13.1AC.3 Test purpose

To verify that the EVM does not exceed 17.5 % for the specified parameters in table 5.13.1AC using the values of ,and specified in table C.10.2.4 for subtest 3.

To verify that HSDPA phase discontinuity does not exceed the values in table 5.13.1AC.2.

NOTE: The statistical aspect (90% pass rate) of this minimum requirement is not currently tested.

#### 5.13.1AC.4 Method of test

5.13.1AC.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.2 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.17. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.13.1AC.3. Set the Default DPCH Offset Value according to the required HS-DPCCH slot offset as specified in TS 25.331 [8] clause 8.6.6.14 and TS 25.211 [19].

4) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.13.1AC.3: Settings for the serving cell during the measurement  
of Error Vector Magnitude (EVM) and phase discontinuity with HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.13.1AC.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

5.13.1AC.4.2 Procedure

1) Send the TRANSPORT CHANNEL RECONFIGURATION message defined in Annex I to set the beta values according to table C.10.2.4 subtest 3 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms as shown in Figure 5.13.1AC.1. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS such that the half slot period with the highest output power for the defined 12ms sequence as measured at the UE antenna connector is the maximum output as defined in table 5.2AA.2. Maintain this power level by sending alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

3) Start transmitting HSDPA Data.

4) With reference to Figure 5.13.1AC.1 measure the EVM at each antenna connector using Global In-Channel Tx-Test (annex B) during the last half slot period of the ACK/NACK in subframe n+3 when the UE is at its maximum power in the 12ms cycle (measurement point 3) and in the following half slot period when the CQI is off and the UE is at its minimum power in the cycle (measurement point 4). Compute from these two EVM results the phase discontinuity between the two half slot periods for each antenna connector. Measure the EVM in the last half slot before subframe n when the UE is at its minimum power (measurement point 1) and immediately following in the first half slot of subframe n when the ACK/NACK is transmitting and the UE is at its maximum power in the 12ms cycle (measurement point 2). Compute from these two EVM results the phase discontinuity between the two half slot periods for each antenna connector. All measurements shall exclude the 25 us transient periods at the beginning and end of each measurement period.

5) Generate suitable TPC commands from the SS such that the half slot period with the lowest output power for the defined 12ms sequence as measured at the UE antenna connector is -18dBm with 2dB tolerance. Maintain this power level by sending alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

6) Repeat step 4).



Figure 5.13.1AC.1: HS-DPCCH on/off pattern showing measurement positions

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I. The test specific exception for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

|  |  |
| --- | --- |
| Information Element | Value/remark |
| - Ack-Nack repetition factor | 1 |
| - CQI repetition factor | 1 |

#### 5.13.1AC.5 Test requirements

Table 5.13.1AC.4: Phase discontinuity test requirement for HS-DPCCH at HS-DPCCH slot boundary

|  |  |
| --- | --- |
| Phase discontinuity for HS-DPCCH Δθ in degrees | Δθ  36 |

The measured EVM at each antenna connector, derived in steps 4) and 6), shall not exceed 17.5 % for parameters specified in table 5.13.1AC.1 parameters for EVM.

The measured phase discontinuity for each antenna connector, derived in steps 4) and 6), shall not exceed the value specified in table 5.13.1AC.4.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.13.1AD Error Vector Magnitude (EVM) and phase discontinuity with HS-DPCCH for UL CLTD Activation state 2 and 3

#### 5.13.1AD.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the reference waveform and the measured waveform. This difference is called the error vector. Both waveforms pass through a matched Root Raised Cosine filter with bandwidth 3,84 MHz and roll-off =0,22. Both waveforms are then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the mean reference power expressed as a %.

The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 μs at each end of the slot.

For signals containing more than one spreading code where the slot alignment of the codes is not the same and the code power is varying, the period over which the nominal mean power remains constant can be less than one timeslot. For such time-varying signals it is not possible to define EVM across one timeslot since this interval contains an expected change in mean power, and the exact timing and trajectory of the power change is not defined. For these signals, the EVM minimum requirements apply only for intervals of at least one half timeslot (less any 25μs transient periods) during which the nominal code power of each individual code is constant.

NOTE: The reason for setting a lower limit for the EVM measurement interval is that for any given impaired signal, the EVM would be expected to improve for measurement intervals less than one timeslot while the frequency error would be expected to degrade.

Phase discontinuity for HS-DPCCH is the change in phase due to the transmission of the HS-DPCCH. In the case where the HS-DPCCH timeslot is offset from the DPCCH timeslot, the period of evaluation of the phase discontinuity shall be the DPCCH timeslot that contains the HS-DPCCH slot boundary. The phase discontinuity for HS-DPCCH result is defined as the difference between the absolute phase used to calculate the EVM for that part of the DPCCH timeslot prior to the HS-DPCCH slot boundary, and the absolute phase used to calculate the EVM for remaining part of the DPCCH timeslot following the HS-DPCCH slot boundary. In all cases the subslot EVM is measured excluding the transient periods of 25 s.

Since subslot EVM is only defined for intervals of at least one half timeslot, the phase discontinuity for HS-DPCCH is only defined for non-aligned timeslots when the offset is 0.5 slots.

The requirements and this test apply for Release 11 and later releases to all types of UTRA for the FDD UE that supports UL CLTD and HSDPA.

#### 5.13.1AD.2 Minimum Requirements

The EVM shall not exceed 17.5 % for the parameters specified in table 5.13.1AD.1 at each transmit antenna connector. This is applicable for all values of,and as specified in [5].

Table 5.13.1AD.1: Parameters for Error Vector Magnitude for UL CLTD

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | | Unit | Level |
| UE Output Power, no 16QAM | | dBm |  -20 |
| UE Output Power, 16QAM | | dBm |  -30 |
| Operating conditions | |  | Normal conditions |
| Power control step size | | dB | 1 |
| Measurement period (Note 1) | Any DPCH | Chips | From 1280 to 2560 (Note 2) |
| Note 1: Less any 25μs transient periods  Note 2: The longest period over which the nominal power remains constant | | | |

For UE configured in UL CLTD activation state 2 or activation state 3, the phase discontinuity for HS-DPCCH shall not exceed the value specified in table 5.13.1AD.2 90% of the time for at the active transmit antenna connector. When calculating the phase discontinuity, the requirements for frequency error and EVM in sub clauses 6.3C and 6.8.2 of TS 25.101 [1] respectively shall be met.

Table 5.13.1AD.2: Phase discontinuity minimum requirement  
for HS-DPCCH at HS-DPCCH slot boundary

|  |  |
| --- | --- |
| Phase discontinuity for HS-DPCCH Δθ in degrees | Δθ  30 |

The normative reference for these requirements is TS 25.101 [1] clause 6.8.2.1C and 6.8.5.1B

#### 5.13.1AD.3 Test purpose

To verify that the EVM does not exceed 17.5 % for the specified parameters in table 5.13.1AD using the values of ,and specified in table C.10.2.4 for subtest 3.

To verify that HSDPA phase discontinuity does not exceed the values in table 5.13.1AD.2.

NOTE: The statistical aspect (90% pass rate) of this minimum requirement is not currently tested.

#### 5.13.1AD.4 Method of test

5.13.1AD.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.52.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.2 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.17 with the following exception in the RADIO BEARER SETUP messages in table 5.13.1AD.4. This exception allows the call to be setup with initial UL CLTD activation state as state 2. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.13.1AD.3. Set the Default DPCH Offset Value according to the required HS-DPCCH slot offset as specified in TS 25.331 [8] clause 8.6.6.14 and TS 25.211 [19].

4) Enter the UE into loopback test mode 1 in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.13.1AD.3: Settings for the serving cell during the measurement  
of Error Vector Magnitude (EVM) and phase discontinuity with HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.13.1AD.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

Table 5.13.1AD.4: Contents of Radio bearer setup message

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink CLTD info FDD |  | Rel-11 |
| - CHOICE *Mode* | New |  |
| - Initial CLTD activation state | Second state |  |

5.13.1AD.4.2 Procedure

1) Send the TRANSPORT CHANNEL RECONFIGURATION message defined in Annex I to set the beta values according to table C.10.2.4 subtest 3 and the DPCH frame offset according the HS-DPCCH half slot offset required for measurements. This will create a signal with a repeat pattern of 12ms as shown in Figure 5.13.1AD.1. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.

2) Generate suitable TPC commands from the SS such that the half slot period with the highest output power for the defined 12ms sequence as measured at the UE antenna connector is the maximum output as defined in table 5.2AA.2. Maintain this power level by sending alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

3) Start transmitting HSDPA Data.

4) With reference to Figure 5.13.1AD.1 measure the EVM at the active antenna connector using Global In-Channel Tx-Test (annex B) during the last half slot period of the ACK/NACK in subframe n+3 when the UE is at its maximum power in the 12ms cycle (measurement point 3) and in the following half slot period when the CQI is off and the UE is at its minimum power in the cycle (measurement point 4). Compute from these two EVM results the phase discontinuity between the two half slot periods for the active antenna connector. Measure the EVM in the last half slot before subframe n when the UE is at its minimum power (measurement point 1) and immediately following in the first half slot of subframe n when the ACK/NACK is transmitting and the UE is at its maximum power in the 12ms cycle (measurement point 2). Compute from these two EVM results the phase discontinuity between the two half slot periods for the active antenna connector. All measurements shall exclude the 25 us transient periods at the beginning and end of each measurement period.

5) Generate suitable TPC commands from the SS such that the half slot period with the lowest output power for the defined 12ms sequence as measured at the UE antenna connector is -18dBm with 2dB tolerance. Maintain this power level by sending alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

6) Repeat step 4).

7) SS sends a HS-SCCH order now to move the UE in UL\_CLTD activation state 3.

8) Repeat steps 1 to 7 for activation state 3.



Figure 5.13.1AD.1: HS-DPCCH on/off pattern showing measurement positions

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I. The test specific exception for the TRANSPORT CHANNEL RECONFIGURATION message is as follows:

|  |  |
| --- | --- |
| Information Element | Value/remark |
| - Ack-Nack repetition factor | 1 |
| - CQI repetition factor | 1 |

#### 5.13.1AD.5 Test requirements

Table 5.13.1AD.5: Phase discontinuity test requirement for HS-DPCCH at HS-DPCCH slot boundary

|  |  |
| --- | --- |
| Phase discontinuity for HS-DPCCH Δθ in degrees | Δθ  36 |

The measured EVM at the active antenna connector, derived in steps 4) and 6), shall not exceed 17.5 % for parameters specified in table 5.13.1AD.1 parameters for EVM.

The measured phase discontinuity for the active antenna connector, derived in steps 4) and 6), shall not exceed the value specified in table 5.13.1AD.5.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.13.1AAA EVM and IQ origin offset for HS-DPCCH and E-DCH with 16 QAM

#### 5.13.1AAA.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the reference waveform and the measured waveform. This difference is called the error vector. Both waveforms pass through a matched Root Raised Cosine filter with bandwidth 3,84 MHz and roll-off =0,22. Both waveforms are then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the mean reference power expressed as a %. The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 μs at each end of the slot. For the PRACH preamble the measurement interval is 4096 chips less 25 μs at each end of the burst (3904 chips).

When the UE uses 16QAM modulation on any of the uplink code channels, the error minimization step also includes selecting an IQ origin offset besides selecting the frequency, absolute phase, absolute amplitude and chip clock timing to minimise the error vector. The IQ origin offset shall be removed from the evaluated signal before calculating the EVM; however, the removed relative IQ origin offset power (relative carrier leakage power) also has to satisfy the applicable requirement.

For signals containing more than one spreading code where the slot alignment of the codes is not the same and the code power is varying, the period over which the nominal mean power remains constant can be less than one timeslot. For such time-varying signals it is not possible to define EVM across one timeslot since this interval contains an expected change in mean power, and the exact timing and trajectory of the power change is not defined. For these signals, the EVM minimum requirements apply only for intervals of at least one half timeslot (less any 25μs transient periods) during which the nominal code power of each individual code is constant.

NOTE: The reason for setting a lower limit for the EVM measurement interval is that for any given impaired signal, the EVM would be expected to improve for measurement intervals less than one timeslot while the frequency error would be expected to degrade.

The requirements apply for Release 7 and later releases to all types of UTRA for the FDD UE that support E-DCH 16 QAM UE capability category 7. This test applies only to UE that support HSDPA and E-DCH.

#### 5.13.1AAA.2 Minimum requirement

When 16QAM modulation is not used on any of the uplink code channels, the Error Vector Magnitude shall not exceed 17.5 %. This is tested in 5.13.1A.

When 16QAM modulation is used on any of the uplink code channels, the modulation accuracy requirement shall meet one or both of the following requirements:

1. The Error Vector Magnitude does not exceed 14 %. This is not tested

2. The Relative Code Domain Error requirements are met. This is tested in 5.13.2C

When 16QAM modulation is used on any of the uplink code channels, the relative carrier leakage power (IQ origin offset power) shall not exceed the values specified in Table 5.13.1AAA.2

The requirements are applicable for all values of βc, βd, βhs, βec and βed as specified in [8].

Table 5.13.1AAA.1: Parameters for IQ origin offset

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | | Unit | Level |
| UE Output Power, 16QAM | | dBm |  -30 |
| Operating conditions | |  | Normal conditions |
| Power control step size | | dB | 1 |
| Measurement period (Note 1) | PRACH | Chips | 3904 |
| Any DPCH | From 1280 to 2560 (Note 2) |
| NOTE 1: Less any 25μs transient periods  NOTE 2: The longest period over which the nominal power remains constant | | | |

Table 5.13.1AAA.2: Relative Carrier Leakage Power

|  |  |
| --- | --- |
| UE Transmitted Mean Power | Relative Carrier Leakage Power (dB) |
| P  -30 dBm | < -17 |

#### 5.13.1AAA.3 Test purpose

To verify that the IQ offset does not exceed the values in table 5.13.1AAA.6 for the specified parameters in Table 5.13.1AAA.1 and for the beta values defined in table C.11.1.4.

#### 5.13.1AAA.4 Method of test

5.13.1AAA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the DL Fixed Reference Channelsare specified in Annex C.11.1 and C. 11.2

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.9, with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.4 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.13.1AAA.5. Uplink SRB for DCCH mapped on E-DCH and downlink SRB for DCCH on DCH. E-DCH is configured with 2ms TTI.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.13.1AAA.3: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-test 1

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPCCH info |  |
| - E-DPDCH power interpolation | FALSE |
| - E-DPDCH info |  |
| - E-TFCI Table index | 2 |
| - Reference E-TFCIs | 3 E-TFCIs |
| - Reference E-TFCI | 105 |
| - Reference E-TFCI PO | 12 |
| - Reference E-TFCI | 116 |
| - Reference E-TFCI PO | 14 |
| - Reference E-TFCI | 127 |
| - Reference E-TFCI PO | 16 |
| - Max Channelisation Codes | SF4x2 and SF2x2 |

Table 5.13.1AAA.4: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |
| - ACK | Value used in test: see Table C.11.1.4 |
| - NACK | Value used in test: see Table C.11.1.4 |
| - Ack-Nack repetition factor | 3 (required for continuous HS-DPCCH signal) |
| E-DCH info |  |
| - E-DPCCH info |  |
| - E-DPCCH/DPCCH power offset | Value used in test: see Table C.11.1.4 |
| - E-TFC Boost Info |  |
| - E-TFCI boost | Value used in test: see Table C.11.1.4 |
| - Delta T2TP | 12 dB |
| - UL 16QAM settings |  |
| - BetaEd gain E-AGCH table selection | 0 |
| Downlink HS-PDSCH Information |  |
| - Measurement Feedback Info |  |
| - CQI Feedback cycle, k | 4 ms |
| - CQI repetition factor | 2 (required for continuous HS-DPCCH signal) |
| - CQI | Value used in test: see Table C.11.1.4 |

Table 5.13.1AAA.5: Settings for the serving cell during the measurement of IQ origin offset

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.13.1AAA.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

5.13.1AAA.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1.4.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range -28 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.4. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

6) Measure Relative Carrier Leakage Power (IQ origin offset) according Annex B of the composite signal.

#### 5.13.1AAA.5 Test requirements

The Relative Carrier Leakage Power shall not exceed the value given in table 5.13.1AAA.6.

Table 5.13.1AAA.6: Relative Carrier Leakage Power

|  |  |
| --- | --- |
| UE Transmitted Mean Power | Relative Carrier Leakage Power (dB) |
| -28 dBm | <-16.5 |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.13.2 Peak code domain error

#### 5.13.2.1 Definition and applicability

The Peak Code Domain Error is computed by projecting power of the error vector (as defined in clause 5.13.1.1) onto the code domain at a specific spreading factor. The Code Domain Error for every code in the domain is defined as the ratio of the mean power of the projection onto that code, to the mean power of the composite reference waveform expressed in dB. The Peak Code Domain Error is defined as the maximum value for the Code Domain Error for all codes.

For Release 99 and Release 4 the measurement interval is one timeslot.

For Release 5 and later releases where tests may include power changes, the measurement interval is further clarified as being one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 μs at each end of the slot.

The requirements and this test apply only to the UE in which the multi-code DPDCH transmission is provided and therefore does not apply for the PRACH and PCPCH preamble and message parts for R99 and Release 4 only or the PRACH preamble and message parts for Release 5 and later.

#### 5.13.2.2 Minimum Requirements

The peak code domain error shall not exceed -15 dB at spreading factor 4 for the parameters specified in table 5.13.3.The requirements are defined using the UL reference measurement channel (768 kbps) specified in clause C.2.5.

Table 5.13.3: Parameters for Peak code domain error

|  |  |  |
| --- | --- | --- |
| Parameter | Level / Status | Unit |
| Output power | ³ -20 | dBm |
| Operating conditions | Normal conditions |  |
| Power control step size | 1 | dB |

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3.1.

#### 5.13.2.3 Test purpose

To verify that the UE peak code domain error does not exceed -15 dB for the specified parameters in table 5.13.3.

An excess peak code domain error increases transmission errors in the up link own channel.

#### 5.13.2.4 Method of test

5.13.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2, and RF parameters are set up according to table 5.13.4.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

Table 5.13.4: Test parameters for Peak code domain error

|  |  |  |
| --- | --- | --- |
| Parameter | Level / Status | Unit |
| Operating conditions | Normal conditions |  |
| Uplink signal | multi-code |  |
| Information bit rate | 2\*384 | kbps |
| Power control step size | 1 | dB |

5.13.2.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the Peak code Domain error using Global In-Channel Tx-Test (annex B).

3) Set the power level of UE to -18dBm or send Down power control commands (1dB step size should be used.) to the UE until UE output power shall be-18dBm with 2dB tolerance.

4) Repeat step 2).

#### 5.13.2.5 Test requirements

The measured Peak code domain error, derived in step 2) and 4), shall not exceed -14 dB.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4

5.13.2A Relative Code Domain Error with HS-DPCCH

#### 5.13.2A.1 Definition and applicability

The Relative Code Domain Error is computed by projecting the error vector (as defined in TS 25.101 [1] 6.8.2) onto the code domain. Only the code channels with non-zero betas in the composite reference waveform are considered for this requirement. The Relative Code Domain Error for every non-zero beta code in the domain is defined as the ratio of the mean power of the projection onto that non-zero beta code, to the mean power of the non-zero beta code in the composite reference waveform. This ratio is expressed in dB. The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 μs at each end of the slot.

The Relative Code Domain Error is affected by both the spreading factor and beta value of the various code channels in the domain. The Effective Code Domain Power (ECDP) is defined to capture both considerations into one parameter. It uses the Nominal CDP ratio (as defined in TS25101 [1] 6.2.3), and is defined as follows for each used code, k, in the domain:

ECDPk = (Nominal CDP ratio)k + 10\*log10(SFk/256)

The requirements for Relative Code Domain Error are not applicable when either or both the following channel combinations occur:

- when the ECDP of any code channel is < -30dB.

- when the nominal code domain power of any code channel is < -20 dB

The requirement for Relative Code Domain Error also does not apply for the PRACH preamble and message parts.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA but not E-DCH.

#### 5.13.2A.2 Minimum Requirements

The Relative Code Domain Error shall meet the requirements in Table 5.13.2A.1 for the parameters specified in table 5.13.2A.2.

Table 5.13.2A.1: Relative Code Domain Error minimum requirement

|  |  |
| --- | --- |
| ECDP dB | Relative Code Domain Error dB |
| -21 < ECDP | ≤ -16 |
| -30 ≤ ECDP ≤ -21 | ≤ -37 - ECDP |
| ECDP < -30 | No requirement |

Table 5.13.2A.2: Parameters for Error Vector Magnitude/Peak Code Domain Error

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | | Unit | Level |
| UE Output Power | | dBm |  -20 |
| Operating conditions | |  | Normal conditions |
| Power control step size | | dB | 1 |
| Measurement period (Note 1) | PRACH | Chips | 3904 |
| Any DPCH | From 1280 to 2560 (Note 2) |
| NOTE 1: Less any 25μs transient periods  NOTE 2: The longest period over which the nominal power remains constant | | | |

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3a.

#### 5.13.2A.3 Test purpose

To verify that the Relative Code Domain Error does not exceed the values in table 5.13.2A.5 for the beta values defined in table 5.13.2A.4.

#### 5.13.2A.4 Method of test

5.13.2A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1 with the beta values set according to table C.10.1.4.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.13.2A.3.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.13.2A.3: Settings for the serving cell during the measurement  
of Relative Code Domain Error with HS-DPCCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.2A.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

5.13.2A.4.2 Procedure

1) Set and send continuously Up power control commands to the UE and wait until the UE has reached maximum power.

2) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.1.4 sub test 1 and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.

3) Start transmitting HSDPA Data.

4) Measure the Relative Code Domain Error of the DPCCH, DPDCH and HS-DPCCH.

5) Repeat step 4 for the other combinations of beta values as given in table 5.13.2A.4.

6) Set the power level of UE to -18dBm or send Down power control commands (1dB step size should be used.) to the UE until UE output power shall be -18dBm with 2dB tolerance.

7) Repeat step 4 for all the combinations of beta values as given in table 5.13.2A.4.

All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the TRANSPORT CHANNEL RECONFIGURATION message which is defined in Annex I.

5.13.2A.5 Test requirements

For the ECDP of each code measured in step 4 the Relative Code Domain Error shall not exceed the value given in table 5.13.2A.5.

Table 5.13.2A.4: Nominal ECDP ratios

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-test in table C.10.1.4 | Code | Nominal Code Domain Power | Spreading factor | Nominal ECDP |
| 1 | DPCCH | -17.9 | 256 | -17.9 |
| DPDCH | -0.4 | 64 | -6.4 |
| HS-DPCCH | -11.8 | 256 | -11.8 |
| 3 | DPCCH | -7.2 | 256 | -7.2 |
| DPDCH | -12.7 | 64 | -18.7 |
| HS-DPCCH | -1.2 | 256 | -1.2 |
| 4 | DPCCH | -7.1 | 256 | -7.1 |
| DPDCH | -18.5 | 64 | -24.5 |
| HS-DPCCH | -1 | 256 | -1 |

NOTE: The nominal ECDP ratios given above are calculated from the nominal beta factors and are for general information to indicate the test coverage. The actual ECDP to use in the test for each code shall be based on the measured code domain power. The accuracy of the code domain powers is tested separately in 5.2C.

Table 5.13.2A.5: Relative Code Domain Error test requirement

|  |  |
| --- | --- |
| ECDP dB | Relative Code Domain Error dB |
| -21 < ECDP | ≤ -15.5 |
| -30 ≤ ECDP ≤ -21 | ≤ -36.5 - ECDP |
| ECDP < -30 | No requirement |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.13.2B Relative Code Domain Error with HS-DPCCH and E-DCH

#### 5.13.2B.1 Definition and applicability

The Relative Code Domain Error is computed by projecting the error vector (as defined in TS 25.101 [1] 6.8.2) onto the code domain. Only the code channels with non-zero betas in the composite reference waveform are considered for this requirement. The Relative Code Domain Error for every non-zero beta code in the domain is defined as the ratio of the mean power of the projection onto that non-zero beta code, to the mean power of the non-zero beta code in the composite reference waveform. This ratio is expressed in dB. The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 μs at each end of the slot.

The Relative Code Domain Error is affected by both the spreading factor and beta value of the various code channels in the domain. The Effective Code Domain Power (ECDP) is defined to capture both considerations into one parameter. It uses the Nominal CDP ratio (as defined in TS25101 [1] 6.2.3), and is defined as follows for each used code, k, in the domain:

ECDPk = (Nominal CDP ratio)k + 10\*log10(SFk/256)

The requirements for Relative Code Domain Error are not applicable when either or both of the following channel combinations occur:

- when the ECDP of any code channel is < -30dB.

- when the nominal code domain power of any code channel is < -20 dB

The requirement for Relative Code Domain Error also does not apply for the PRACH preamble and message parts.

The requirements and this test apply for Release 6 and later releases to all types of UTRA for the FDD UE that support HSDPA and E-DCH.

#### 5.13.2B.2 Minimum Requirements

The Relative Code Domain Error shall meet the requirements in Table 5.13.2B.1 for the parameters specified in Table 5.13.2B.2.

Table 5.13.2B.1: Relative Code Domain Error minimum requirement

|  |  |
| --- | --- |
| ECDP dB | Relative Code Domain Error dB |
| -21 < ECDP | ≤ -16 |
| -30 ≤ ECDP ≤ -21 | ≤ -37 - ECDP |
| ECDP < -30 | No requirement |

Table 5.13.2B.2: Parameters for Relative Code Domain Error with HS-DPCCH and E-DCH

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | | Unit | Level |
| UE Output Power | | dBm |  -20 |
| Operating conditions | |  | Normal conditions |
| Power control step size | | dB | 1 |
| Measurement period (Note 1) | PRACH | Chips | 3904 |
| Any DPCH | From 1280 to 2560 (Note 2) |
| NOTE 1: Less any 25 μs transient periods  NOTE 2: The longest period over which the nominal power remains constant | | | |

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3a.

#### 5.13.2B.3 Test purpose

To verify that the Relative Code Domain Error does not exceed the values in table 5.13.2B.9 for the beta values defined in table 5.13.2B.8.

#### 5.13.2B.4 Method of test

5.13.2B.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK) are specified in Annex C.11.1 and C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.9, with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.3 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.13.2B.7.

4) Enter the UE into loopback test mode 1 looping back both the 12.2kbps RMC and HSDPA to E-DCH and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.13.2B.3: Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

| Information Element | Value/Remark |
| --- | --- |
| UL Transport channel information for all transport channels |  |
| - 2bit CTFC | 3 |
| - Power offset Information |  |
| - CHOICE Gain Factors | Signalled Gain Factors |
| - CHOICE mode | FDD |
| - Gain factor ßc | Value used in test: see Table C.11.1.3 |
| - Gain factor ßd | Value used in test: see Table C.11.1.3 |
| NOTE: All other 2 bit CTFC values use computed gain factors as in the default message. | |

Table 5.13.2B.4: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-tests 1,2,4

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 5 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 67 |
| - Reference E-TFCI PO | 18 |
| - Reference E-TFCI | 71 |
| - Reference E-TFCI PO | 23 |
| - Reference E-TFCI | 75 |
| - Reference E-TFCI PO | 26 |
| - Reference E-TFCI | 81 |
| - Reference E-TFCI PO | 27 |

Table 5.13.2B.5: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-test 3

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 2 E-TFCIs |
| - Reference E-TFCI | 11 |
| - Reference E-TFCI PO | 4 |
| - Reference E-TFCI | 92 |
| - Reference E-TFCI PO | 18 |

Table 5.13.2B.6: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |
| - ACK | Value used in test: see Table C.11.1.3 |
| - NACK | Value used in test: see Table C.11.1.3 |
| - Ack-Nack repetition factor | 3 (required for continuous HS-DPCCH signal) |
| E-DCH info |  |
| - E-DPCCH/DPCCH power offset | Value used in test: see Table C.11.1.3 |
| Downlink HS-PDSCH Information |  |
| - Measurement Feedback Info |  |
| - CQI Feedback cycle, k | 4 ms |
| - CQI repetition factor | 2 (required for continuous HS-DPCCH signal) |
| - CQI | Value used in test: see Table C.11.1.3 |

Table 5.13.2B.7: Settings for the serving cell during the measurement  
of Relative Code Domain Error with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.13.2B.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

5.13.2B.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1.3.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15dBm 2dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.3. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.5) Measure the Relative Code Domain Error of the DPCCH, DPDCH, HS-DPCCH, E-DPCCH and E-DPDCH(s).

6) Repeat steps 1 through 5 for the other combinations of beta values as given in Table C.11.1.3.

7) Set the power level of UE to -18 dBm or send down power control commands (1 dB step size should be used) to the UE until UE output power shall be -18 dBm with  2 dB tolerance.

8) Measure the Relative Code Domain Error of the DPCCH, DPDCH, HS-DPCCH, E-DPCCH and E-DPDCH(s).

9) Repeat steps 7 and 8 for all the combinations of beta values for sub-tests 1, 2, 3, and 4 as given in Table C.11.1.3.

#### 5.13.2B.5 Test requirements

For the ECDP of each code measured in steps 5 and 8 the Relative Code Domain Error shall not exceed the value given in table 5.13.2B.9.

Table 5.13.2B.8: Nominal ECDP ratios

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-Test in Table C.11.1.3 | Code | Nominal Code Domain Power | Spreading Factor | Nominal ECDP |
| 1 | DPCCH | -18.5 | 256 | -18.5 |
| DPDCH | -15.8 | 64 | -21.8 |
| HS-DPCCH | -12.5 | 256 | -12.5 |
| E-DPCCH | -16.5 | 256 | -16.5 |
| E-DPDCH | -0.5 | 4 | -18.6 |
| 2 | DPCCH | -14.0 | 256 | -14.0 |
| DPDCH | -6.0 | 64 | -12.0 |
| HS-DPCCH | -8.0 | 256 | -8.0 |
| E-DPCCH | -8.0 | 256 | -8.0 |
| E-DPDCH | -4.1 | 4 | -22.2 |
| 3 | DPCCH | -14.6 | 256 | -14.6 |
| DPDCH | -19.1 | 64 | -25.1 |
| HS-DPCCH | -8.6 | 256 | -8.6 |
| E-DPCCH | -8.6 | 256 | -8.6 |
| E-DPDCH1 | -4.7 | 4 | -22.8 |
| E-DPDCH2 | -4.7 | 4 | -22.8 |
| 4 | DPCCH | -19.7 | 256 | -19.7 |
| DPDCH | -2.2 | 64 | -8.2 |
| HS-DPCCH | -13.7 | 256 | -13.7 |
| E-DPCCH | -19.7 | 256 | -19.7 |
| E-DPDCH | -4.7 | 4 | -22.8 |

NOTE: The nominal ECDP ratios given above are calculated from the nominal beta factors and are for general information to indicate the test coverage. The actual ECDP to use in the test for each code shall be based on the measured code domain power. The accuracy of the code domain powers is tested separately in 5.2D.

Table 5.13.2B.9: Relative Code Domain Error test requirement

|  |  |
| --- | --- |
| ECDP dB | Relative Code Domain Error dB |
| -21 < ECDP | ≤ -15.5 |
| -30 ≤ ECDP ≤ -21 | ≤ -36.5 - ECDP |
| ECDP < -30 | No requirement |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.13.2BA Relative Code Domain Error with HS-DPCCH and E-DCH for DC-HSUPA

#### 5.13.2BA.1 Definition and applicability

The Relative Code Domain Error is computed by projecting the error vector (as defined in TS 25.101 [1] 6.8.2) onto the code domain for each of the two assigned channel frequencies. Only the code channels with non-zero betas in the composite reference waveform are considered for this requirement. The Relative Code Domain Error for every non-zero beta code in the domain is defined as the ratio of the mean power of the projection onto that non-zero beta code, to the mean power of the non-zero beta code in the composite reference waveform. This ratio is expressed in dB. The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 μs at each end of the slot.

In the mode of DC-HSUPA, the requirement and corresponding measurements apply to each individual carrier when the total power in each of the assigned carriers is equal to each other. Furthermore, it is necessary to verify the requirements when each carrier is configured according to either of the UL E-DCH reference measurement channel for DC-HSUPA using BPSK or 16QAM modulation, specified in subclause C.2.6, C.2.7 and C.11A.

The Relative Code Domain Error is affected by both the spreading factor and beta value of the various code channels in the domain. The Effective Code Domain Power (ECDP) is defined to capture both considerations into one parameter. It uses the Nominal CDP ratio (as defined in TS25101 [1] 6.2.3), and is defined as follows for each used code, k, in the domain:

ECDPk = (Nominal CDP ratio)k + 10\*log10(SFk/256)

The requirements for Relative Code Domain Error are not applicable when either or both of the following channel combinations occur:

- when the ECDP of any code channel is < -30dB.

- when the nominal code domain power of any code channel is < -20 dB

The requirement for Relative Code Domain Error also does not apply for the PRACH preamble and message parts.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

#### 5.13.2BA.2 Minimum Requirements

The Relative Code Domain Error shall meet the requirements in Table 5.13.2BA.1 for the parameters specified in Table 5.13.2BA.2.

Table 5.13.2BA.1: Relative Code Domain Error minimum requirement

|  |  |
| --- | --- |
| ECDP dB | Relative Code Domain Error dB |
| -21 < ECDP | ≤ -16 |
| -30 ≤ ECDP ≤ -21 | ≤ -37 - ECDP |
| ECDP < -30 | No requirement |

Table 5.13.2BA.2: Parameters for Relative Code Domain Error with HS-DPCCH and E-DCH for DC-HSUPA

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Level |
| UE Output Power, no 16QAM | dBm |  -20 |
| Operating conditions |  | Normal conditions |
| Power control step size | dB | 1 |

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3a.

#### 5.13.2BA.3 Test purpose

To verify that the Relative Code Domain Error does not exceed the values in table 5.13.2BA.9 for the beta values defined in table 5.13.2BA.8.

#### 5.13.2BA.4 Method of test

5.13.2BA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 3A, QPSK) and parameters are specified in Annex C.2.6 and C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14, with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11A.1 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.13.2BA.7.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.13.2BA.3: Void

Table 5.13.2BA.4: Void

Table 5.13.2BA.5: Void

Table 5.13.2BA.6: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |

Table 5.13.2BA.7: Settings for the serving cell during the measurement  
of Relative Code Domain Error with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.13.2BA.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

5.13.2BA.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1.3.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of each of the two carriers to be in the range 15dBm 2dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11A.1.1. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Measure the Relative Code Domain Error of the DPCCH, HS-DPCCH, E-DPCCH and E-DPDCH(s) on each of the two assigned channel frequencies.

6) Set the power level of each of the two carriers to -18 dBm or send down power control commands (1 dB step size should be used) to the UE until the power level of each of the two carriers is -18 dBm with  2 dB tolerance.

7) Measure the Relative Code Domain Error of the DPCCH, HS-DPCCH, E-DPCCH and E-DPDCH(s) on each of the two assigned channel frequencies.

#### 5.13.2BA.5 Test requirements

For the ECDP of each code measured in steps 5 and 8 the Relative Code Domain Error shall not exceed the value given in table 5.13.2BA.9.

Table 5.13.2BA.8: Nominal ECDP ratios

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sub-Test in Table C.11A.1.1 | UL frequency | Code | Nominal Code Domain Power | Spreading Factor | Nominal ECDP |
| 1 | Primary | DPCCH | -5.8 | 256 | -5.8 |
| DPDCH | - | - | - |
| HS-DPCCH | -15.3 | 256 | -15.3 |
| E-DPCCH | -15.3 | 256 | -15.3 |
| E-DPDCH | -1.7 | 16 | -13.7 |
| Secondary | DPCCH | -5.6 | 256 | -5.6 |
| DPDCH | - | - | - |
| HS-DPCCH | - | - | - |
| E-DPCCH | -15.2 | 256 | -15.2 |
| E-DPDCH | -1.6 | 16 | -13.6 |

NOTE: The nominal ECDP ratios given above are calculated from the nominal beta factors and are for general information to indicate the test coverage. The actual ECDP to use in the test for each code shall be based on the measured code domain power. The accuracy of the code domain powers is tested separately in 5.2DA.

Table 5.13.2BA.9: Relative Code Domain Error test requirement

|  |  |
| --- | --- |
| ECDP dB | Relative Code Domain Error dB |
| -21 < ECDP | ≤ -15.5 |
| -30 ≤ ECDP ≤ -21 | ≤ -36.5 - ECDP |
| ECDP < -30 | No requirement |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.13.2C Relative Code Domain Error for HS-DPCCH and E-DCH with 16QAM

#### 5.13.2C.1 Definition and applicability

The Relative Code Domain Error is computed by projecting the error vector (as defined in TS 25.101 [1] 6.8.2) onto the code domain. Only the code channels with non-zero betas in the composite reference waveform are considered for this requirement. The Relative Code Domain Error for every non-zero beta code in the domain is defined as the ratio of the mean power of the projection onto that non-zero beta code, to the mean power of the non-zero beta code in the composite reference waveform. This ratio is expressed in dB. The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 μs at each end of the slot.

The Relative Code Domain Error is affected by both the spreading factor and beta value of the various code channels in the domain. The Effective Code Domain Power (ECDP) is defined to capture both considerations into one parameter. It uses the Nominal CDP ratio (as defined in TS25101 [1] 6.2.3), and is defined as follows for each used code, k, in the domain:

ECDPk = (Nominal CDP ratio)k + 10\*log10(SFk/256)

When 16QAM is used on any of the UL code channels, the requirements for Relative Code Domain Error are not applicable when either or both of the following channel combinations occur:

- when the ECDP of any code channel is < -30dB.

- when the nominal code domain power of any code channel is < -30 dB

The requirement for Relative Code Domain Error also does not apply for the PRACH preamble and message parts.

The requirements apply for Release 7 and later releases for all types of UTRA for the FDD UE that support E-DCH 16QAM UE capability category 7. This test applies only to UE that support HSDPA and E-DCH.

#### 5.13.2C.2 Minimum Requirements

When 16QAM is used on any of the UL code channels, the Relative Code Domain Error of the codes not using 16QAM shall meet the requirements in Table 5.13.2C.1 for the parameters specified in Table 5.13.2C.3.

Table 5.13.2C.1: Relative Code Domain Error minimum requirement, codes not using 16QAM

|  |  |
| --- | --- |
| ECDP dB | Relative Code Domain Error dB |
| -22 < ECDP | ≤ -18 |
| -30 ≤ ECDP ≤ -22 | ≤ -40 - ECDP |
| ECDP < -30 | No requirement |

When 16QAM is used on any of the UL code channels; the Nominal CDP-Ratio-weighted average of the Relative Code Domain Errors measured individually on each of the codes using 16QAM shall meet the requirements in Table 5.13.2C.2 for the parameters specified in Table 5.13.2C.3. The Nominal CDP Ratio-weighted average of the Relative Code Domain Errors means the sum over all code k that uses 16QAM.

For the purposes of evaluating the requirements specified in Table 5.13.2C.2, the ECDP value is determined as the minimum of the individual ECDP values corresponding to the codes using 16QAM.

Table 5.13.2C.2: Relative Code Domain Error minimum requirement, with 16QAM used

|  |  |
| --- | --- |
| ECDP dB | Average Relative Code Domain Error dB |
| -25.5 < ECDP | ≤ -18 |
| -30 ≤ ECDP ≤ -25.5 | ≤ -43.5 - ECDP |
| ECDP < -30 | No requirement |

Table 5.13.2C.3: Parameters for Relative Code Domain Error, with 16QAM used

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | | Unit | Level |
| UE Output Power, 16QAM | | dBm |  -30 |
| Operating conditions | |  | Normal conditions |
| Power control step size | | dB | 1 |
| Measurement period (Note 1) | PRACH | Chips | 3904 |
| Any DPCH | From 1280 to 2560 (Note 2) |
| NOTE 1: Less any 25 μs transient periods  NOTE 2: The longest period over which the nominal power remains constant | | | |

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3a.

#### 5.13.2C.3 Test purpose

To verify that the Relative Code Domain Error does not exceed the values in table 5.13.2C.7for the beta values defined in table 5.13.2C.6.

#### 5.13.2C.4 Method of test

5.13.2C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the DL Fixed Reference Channels (FRC H-Set 1,16QAM) are specified in Annex C.11.1 and C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.9, with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.4 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1. Settings for the serving cell are defined in table 5.13.2C.5. Uplink SRB for DCCH mapped on E-DCH and downlink SRB for DCCH on DCH. E-DCH is configured with 2ms TTI.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.13.2C.4: Contents of RADIO BEARER SETUP message:  
AM or UM (E-DCH and HSDPA) for Sub-test 1

| Information Element | Value/Remark |
| --- | --- |
| E-DCH info | Uplink DPCH info |
| - E-DPCCH info |  |
| - E-TFCI Table Index | 2 |
| - E-DPDCH power interpolation | FALSE |
| - E-DPDCH info |  |
| - Reference E-TFCIs | 3 E-TFCIs |
| - Reference E-TFCI | 105 |
| - Reference E-TFCI PO | 12 |
| - Reference E-TFCI | 116 |
| - Reference E-TFCI PO | 14 |
| - Reference E-TFCI | 127 |
| - Reference E-TFCI PO | 16 |
| - Max Channelisation Codes | SF4x2 and SF2x2 |

Table 5.13.2C.5: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |
| - ACK | Value used in test: see Table C.11.1.4 |
| - NACK | Value used in test: see Table C.11.1.4 |
| - Ack-Nack repetition factor | 3 (required for continuous HS-DPCCH signal) |
| E-DCH info |  |
| - E-DPCCH info |  |
| - E-DPCCH/DPCCH power offset | Value used in test: see Table C.11.1.4 |
| - E-TFC Boost Info |  |
| - E-TFCI boost | Value used in test: see Table C.11.1.4 |
| - Delta T2TP | 12 dB |
| - UL 16QAM settings |  |
| - BetaEd gain E-AGCH table selection | 0 |
| Downlink HS-PDSCH Information |  |
| - Measurement Feedback Info |  |
| - CQI Feedback cycle, k | 4 ms |
| - CQI repetition factor | 2 (required for continuous HS-DPCCH signal) |
| - CQI | Value used in test: see Table C.11.1.4 |

Table 5.13.2C.6: Settings for the serving cell during the measurement  
of Relative Code Domain Error with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.13.2C.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

5.13.2C.4.2 Procedure

1) Set the Absolute Grant according to Table C.11.1.4.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range 15 dBm ± 2 dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11.1.4. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC\_cmd = 0.

6) Measure the Relative Code Domain Error of the DPCCH, HS-DPCCH, E-DPCCH and E-DPDCH(s).

7) Generate suitable TPC commands from the SS to set the output power of the UE to be in the range -18 dBm ± 2 dB and repeat steps 4 to 6.5.13.2C.5 Test requirements

For the ECDP of each code measured in step 6) the Relative Code Domain Error shall not exceed the value given in table 5.13.2C.8 and table 5.13.2C.9.

Table 5.13.2C.7: Nominal ECDP ratios

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-Test in Table C.11.1.4 | Code | Nominal Code Domain Power | Spreading Factor | Nominal ECDP |
| 1 | DPCCH | -13.4 | 256 | -13.4 |
| HS-DPCCH | -7.4 | 256 | -7.4 |
| E-DPCCH | -7.4 | 256 | -7.4 |
| E-DPDCH1 | -7.4 | 2 | -28.5 |
| E-DPDCH2 | -7.4 | 2 | -28.5 |
| E-DPDCH3 | -9.4 | 4 | -27.5 |
| E-DPDCH4 | -9.4 | 4 | -27.5 |

NOTE: The nominal ECDP ratios given above are calculated from the nominal beta factors and are for general information to indicate the test coverage. The actual ECDP to use in the test for each code shall be based on the measured code domain power. The accuracy of the code domain powers is tested separately in 5.2E.

Table 5.13.2C.8: Relative Code Domain Error test requirement, codes not using 16QAM

|  |  |
| --- | --- |
| ECDP dB | Average Relative Code Domain Error dB |
| -22 < ECDP | ≤ -17.5 |
| -30 ≤ ECDP ≤ -22 | ≤ -39.5 - ECDP |
| ECDP < -30 | No requirement |

Table 5.13.2C.9: Relative Code Domain Error test requirement, with 16QAM used

|  |  |
| --- | --- |
| ECDP dB | Average Relative Code Domain Error dB |
| -25.5 < ECDP | ≤ -17.5 |
| -30 ≤ ECDP ≤ -25.5 | ≤ -43.0 - ECDP |
| ECDP < -30 | No requirement |

NOTE 1: For the measurement points in which UE uses 16QAM modulation the correction factor in the measurements shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

NOTE 2: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.13.2CA Relative Code Domain Error for HS-DPCCH and E-DCH with 16QAM for DC-HSUPA

#### 5.13.2CA.1 Definition and applicability

The Relative Code Domain Error is computed by projecting the error vector (as defined in TS 25.101 [1] 6.8.2) onto the code domain for each of the two assigned channel frequences. Only the code channels with non-zero betas in the composite reference waveform are considered for this requirement. The Relative Code Domain Error for every non-zero beta code in the domain is defined as the ratio of the mean power of the projection onto that non-zero beta code, to the mean power of the non-zero beta code in the composite reference waveform. This ratio is expressed in dB. The measurement interval is one timeslot except when the mean power between slots is expected to change whereupon the measurement interval is reduced by 25 μs at each end of the slot.

The Relative Code Domain Error is affected by both the spreading factor and beta value of the various code channels in the domain. The Effective Code Domain Power (ECDP) is defined to capture both considerations into one parameter. It uses the Nominal CDP ratio (as defined in TS25101 [1] 6.2.3), and is defined as follows for each used code, k, in the domain:

ECDPk = (Nominal CDP ratio)k + 10\*log10(SFk/256)

The requirements for Relative Code Domain Error are not applicable when either or both of the following channel combinations occur:

- when the ECDP of any code channel is < -30dB.

- when the nominal code domain power of any code channel is < -30 dB

The requirement for Relative Code Domain Error also does not apply for the PRACH preamble and message parts.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

#### 5.13.2CA.2 Minimum Requirements

When 16QAM is used on any of the UL code channels, the Relative Code Domain Error of the codes not using 16QAM shall meet the requirements in Table 5.13.2CA.1 for the parameters specified in Table 5.13.2CA.3.

Table 5.13.2CA.1: Relative Code Domain Error minimum requirement, codes not using 16QAM

|  |  |
| --- | --- |
| ECDP dB | Relative Code Domain Error dB |
| -22 < ECDP | ≤ -18 |
| -30 ≤ ECDP ≤ -22 | ≤ -40 - ECDP |
| ECDP < -30 | No requirement |

When 16QAM is used on any of the UL code channels; the Nominal CDP-Ratio-weighted average of the Relative Code Domain Errors measured individually on each of the codes using 16QAM in that carrier shall meet the requirements in Table 5.13.2CA.2 for the parameters specified in Table 5.13.2CA.3. The Nominal CDP Ratio-weighted average of the Relative Code Domain Errors means the sum over all code k that uses 16QAM.

For the purposes of evaluating the requirements specified in Table 5.13.2CA.2, the ECDP value is determined as the minimum of the individual ECDP values corresponding to the codes using 16QAM.

Table 5.13.2CA.2: Relative Code Domain Error minimum requirement, with 16QAM used

|  |  |
| --- | --- |
| ECDP dB | Average Relative Code Domain Error dB |
| -25.5 < ECDP | ≤ -18 |
| -30 ≤ ECDP ≤ -25.5 | ≤ -43.5 - ECDP |
| ECDP < -30 | No requirement |

Table 5.13.2CA.3: Parameters for Relative Code Domain Error, with 16QAM used

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | | Unit | Level |
| UE Output Power, 16QAM | | dBm |  -30 |
| Operating conditions | |  | Normal conditions |
| Power control step size | | dB | 1 |
| Measurement period (Note 1) | PRACH | Chips | 3904 |
| Any DPCH | From 1280 to 2560 (Note 2) |
| NOTE 1: Less any 25 μs transient periods  NOTE 2: The longest period over which the nominal power remains constant | | | |

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3a.

#### 5.13.2CA.3 Test purpose

To verify that the Relative Code Domain Error does not exceed the values in table 5.13.2CA.6 for the beta values defined in table 5.13.2CA.5.

#### 5.13.2CA.4 Method of test

5.13.2CA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and the DL Fixed Reference Channels (FRC H-Set 3A,16QAM) are specified in Annex C.2.6 and C.8.1.1.

3) An E-DCH call is set up according to TS 34.108 [3] 7.3.14, with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.A.1 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5A.1A. Settings for the serving cell are defined in table 5.13.2CA.5. Uplink SRB for DCCH mapped on E-DCH and downlink SRB for DCCH on DCH. E-DCH is configured with 2ms TTI.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.13.2CA.4: Contents of RADIO BEARER SETUP message: AM or UM (E-DCH and HSDPA)

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |

Table 5.13.2CA.5: Settings for the serving cell during the measurement  
of Relative Code Domain Error with HS-DPCCH and E-DCH

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.13.2CA.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

5.13.2CA.4.2 Procedure

1) Set the Absolute Grant according to Table C.11A.1.2.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands from the SS to set the output power of each of the two carriers to be in the range 15dBm 2dB.

4) Confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table C.11A.1.2. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE.

5) Measure the Relative Code Domain Error of the DPCCH, HS-DPCCH, E-DPCCH and E-DPDCH(s) on each of the two assigned channel frequencies.

6) Set the power level of each of the two carriers to -18 dBm or send down power control commands (1 dB step size should be used) to the UE until the power level of each of the two carriers is -18 dBm with  2 dB tolerance.

7) Measure the Relative Code Domain Error of the DPCCH, HS-DPCCH, E-DPCCH and E-DPDCH(s) on each of the two assigned channel frequencies.

#### 5.13.2CA.5 Test requirements

For the ECDP of each code measured in steps 5) and 7) the Relative Code Domain Error shall not exceed the value given in table 5.13.2CA.7 and table 5.13.2CA.8.

Table 5.13.2CA.6: Nominal ECDP ratios

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sub-Test in Table C.11A.1.2 | UL frequency | Code | Nominal Code Domain Power | Spreading Factor | Nominal ECDP |
| 1 | Primary | DPCCH | -24,0 | 256 | -24,0 |
| DPDCH | - | - | - |
| HS-DPCCH | -21,9 | 256 | -21,9 |
| E-DPCCH | -15,9 | 256 | -15,9 |
| E-DPDCH (SF/2) | -4,9 | 2 | -26,0 |
| E-DPDCH (SF/4) | -7,9 | 4 | -26,0 |
| Secondary | DPCCH | -23,9 | 256 | -23,9 |
| DPDCH | - | - | - |
| HS-DPCCH | - | - | - |
| E-DPCCH | -15,9 | 256 | -15,9 |
| E-DPDCH (SF/2) | -4,9 | 2 | -26,0 |
| E-DPDCH (SF/4) | -7,9 | 4 | -26,0 |

NOTE: The nominal ECDP ratios given above are calculated from the nominal beta factors and are for general information to indicate the test coverage. The actual ECDP to use in the test for each code shall be based on the measured code domain power. The accuracy of the code domain powers is tested separately in 5.2E.

Table 5.13.2CA.7: Relative Code Domain Error test requirement, codes not using 16QAM

|  |  |
| --- | --- |
| ECDP dB | Average Relative Code Domain Error dB |
| -22 < ECDP | ≤ -17.5 |
| -30 ≤ ECDP ≤ -22 | ≤ -39.5 - ECDP |
| ECDP < -30 | No requirement |

Table 5.13.2CA.8: Relative Code Domain Error test requirement, with 16QAM used

|  |  |
| --- | --- |
| ECDP dB | Average Relative Code Domain Error dB |
| -25.5 < ECDP | ≤ -17.5 |
| -30 ≤ ECDP ≤ -25.5 | ≤ -43.0 - ECDP |
| ECDP < -30 | No requirement |

NOTE 1: For the measurement points in which UE uses 16QAM modulation the correction factor in the measurements shall be applied to the ed value used to compute the Nominal CDP equal to {A1\*(0.4472)^2 + A2\*(1.3416)^2+ A3\*(-0.4472)^2 + A4\*(-1.3416)^2}1/2 where A1, A2, A3 and A4 are the fractions of symbols (00, 01, 10, 11 respectively) transmitted during the test.

NOTE 2: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.13.3 UE phase discontinuity

#### 5.13.3.1 Definition and applicability

Phase discontinuity is the change in phase between any two adjacent timeslots. The EVM for each timeslot (excluding the transient periods of 25 s on either side of the nominal timeslot boundaries) shall be measured according to subclause 5.13.1. The frequency, absolute phase, absolute amplitude and chip clock timing used to minimise the error vector are chosen independently for each timeslot. The phase discontinuity result is defined as the difference between the absolute phase used to calculate EVM for the preceding timeslot, and the absolute phase used to calculate EVM for the succeeding timeslot.



Figure 5.13.3.1 Graphical description of phase discontinuity

The best-fit rate of change of phase for each timeslot is calculated using the same process as used to minimize the EVM. This best-fit rate of change of phase is by definition the frequency error result for the timeslot. Due to the presence of power steps in the test, the data used for the best-fit calculation shall exclude the 25s transition period at the beginning and end of each timeslot. The best-fit rate of change of phase for each timeslot is then extrapolated in both directions onto the timeslot boundaries. The phase discontinuity result at any one slot boundary is the difference between the extrapolated phase at the end of the timeslot preceding the slot boundary and the extrapolated phase at the start of the timeslot following the slot boundary.

The requirements and this test apply to all types of UTRA for the FDD UE for Release 5 and later releases.

#### 5.13.3.2 Minimum requirements

The rate of occurrence of any phase discontinuity on an uplink DPCH for the parameters specified in table 5.13.3.1 shall not exceed the values specified in table 5.13.3.2. Phase shifts that are caused by changes of the UL transport format combination (TFC) and compressed mode are not included. When calculating the phase discontinuity, the requirements for frequency error and EVM in subclauses TS 25.101 [1] 6.3 and TS 25.101 [1] 6.8.2 for each timeslot shall be met.

Table 5.13.3.1: Parameters for Phase discontinuity

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Level |
| Power control step size | dB | 1 |

Table 5.13.3.2: Phase discontinuity minimum requirement

|  |  |
| --- | --- |
| Phase discontinuity Δθ in degrees | Maximum allowed rate of occurrence in Hz |
| Δθ  30 | 1500 |
| 30 < Δθ  60 | 300 |
| Δθ > 60 | 0 |

The normative reference for this requirement is TS 25.101 [1] clause 6.8.4.

#### 5.13.3.3 Test purpose

To verify that the UE phase discontinuity is within the limits shown in clause 5.13.3.2.

To verify that any timeslot used in the calculation of a phase discontinuity result also passes the frequency error and EVM requirements referenced in clause 5.3 2 and 5.13.3.2.

#### 5.13.3.4 Method of test

5.13.3.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure using power control algorithm 1 as specified in TS34.108 [3] sub clause 7.3.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

Procedure



Figure 5.13.3.2: Five down four up hysteresis test pattern



Figure 5.13.3.3: Five up four down hysteresis test pattern

1) Set the power of the UE to max power using continuous up TPC commands.

2) Transmit a sequence of five down four up TPC commands as shown in figure 5.13.3.2 until the UE has reached the minimum power defined in 5.4.3 with 2dB tolerance.

3) During step 2 starting with the slot before the first down power step, measure the EVM of each slot and the phase discontinuity to the next slot.

4) Transmit a sequence of five up four down TPC commands as shown in figure 5.13.3.3 until the UE has reached its maximum power defined in 5.2 with 2dB tolerance.

5) During step 4 starting with the slot before the first up power step, measure the EVM of each slot and the phase discontinuity to the next slot.

NOTE: In order to make it practical to measure the entire power control dynamic range (between min power threshold and max power threshold with suitable margins), it is permissible to segment the power control sequences into smaller subsequences. Except when within 5 dB of the upper or lower thresholds, segmentation will require sufficient overlap such that every power step in one direction is followed by four steps in the other direction.

#### 5.13.3.5 Test requirements

a) During 5.13.3.4.2 step 3, and step 5, the EVM of every measured slot which is greater than or equal to -20 dBm shall not exceed 17.5%

b) During 5.13.3.4.2 step 3, and step 5, the Frequency error of every measured slot shall not exceed ±(0,1 ppm + 10 Hz).

c) During 5.13.3.4.2 step 3, and step 5; the phase discontinuity measurements made between any two adjacent slots shall be less than or equal to 36 degrees. If a phase discontinuity measurement is greater than 36 degrees and less than or equal to 66 degrees then the next four measurements shall be less than or equal to 36 degrees. No measurement shall exceed 66 degrees.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.13.4 PRACH preamble quality

#### 5.13.4.1 Definition and applicability

PRACH preamble quality is a measure of the ability of the UE to transmit the PRACH preamble in accordance with the core requirements so that the Node B can reliably decode the PRACH.

This test applies to all types of UTRA for the FDD UE from Release 5 onwards.

#### 5.13.4.2 Minimum requirements

The EVM of the PRACH preamble observed over the interval of 3904 chips (i.e. excluding the transient periods) shall not exceed 17.5%.

The reference for this requirement is TS 25.101 [1] clause 6.8.2.

The UE modulated carrier frequency used to transmit the PRACH preamble observed over the interval of 3904 chips (i.e. excluding the transient periods) shall be within ± 0.1 PPM compared to the carrier frequency received from the Node B.

The reference for this requirement is TS 25.101 [1] clause 6.3.

The PRACH preamble shall be transmitted in the correct access slot using the correct signature as defined by the parameters signalled to the UE.

The reference for this requirement is TS 25.214 [5] clause 6.1 physical random access procedure.

#### 5.13.4.3 Test purpose

The test purpose is to verify that the transmission quality of the first PRACH preamble meets the minimum requirements for modulation quality, carrier frequency, access slot and signature as defined in 5.13.4.2. The UE is tested at nominal maximum output power and nominally 5.6 dB to 8.6 dB above reference sensitivity, which simulates operation towards the cell boundary. The access slot and signature are chosen randomly from the allowed possibilities for each execution of the RACH procedure. There are 384 possible configurations that could be chosen, but only 10 of these are randomly selected for test in order to minimize the test time.

#### 5.13.4.4 Method of test

5.13.4.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure, using the modified parameters according to table 5.13.4.1 and table 5.13.4.2. The relative power levels of the downlink physical channels to Ior are set up according to clause E.2.1. The physical random access procedure within the call setup is used for the test.

See TS 34.108 [3] for details regarding generic call setup procedure and 25.214 [5] for details of the physical random access procedure.

Table 5.13.4.1: Static test parameters for PRACH quality

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Static Parameters | **Power Class 1** | **Power Class 2** | **Power Class 3** | **Power Class 4** | **Unit** |
| Îor | -98.1 | -98.1 | -98.1 | -98.1 | dBm / 3,84 MHz |
| Nominal CPICH\_RSCP | -102 | -102 | -102 | -102 | dBm |
| Primary CPICH TX power | +24 | +24 | +24 | +24 | dBm |
| Simulated path loss = Primary CPICH TX power - CPICH\_RSCP | +126 | +126 | +126 | +126 | dB |
| UL interference | -83 | -89 | -92 | -95 | dBm |
| Constant Value | -10 | -10 | -10 | -10 | dB |
| Expected nominal UE TX power1 | +33 | +27 | +24 | +21 | dBm |
| Preamble Retrans Max | 1 | | | | |
| NOTE 1: The Expected nominal UE TX power is calculated by using the equation in the clause 8.5.7 Open Loop Power Control of TS 25.331 [8]. | | | | | |

Table 5.13.4.2: Random test parameters for PRACH quality

|  |  |
| --- | --- |
| **Random Parameters1** | **Value** |
| Available RACH Sub Channels | One sub-channel chosen at random from the 12-bit Available sub channel number |
| Available PRACH Signatures | One signature chosen at random from the 16-bit Available signature number |
| ASC Setting | Both Available signature Start Index and Available signature End Index are 0 |
| AICH transmission timing | Chosen at random from the range 0 to1 |
| NOTE 1: In order to avoid a static test configuration, each time the RACH procedure is executed, the parameters in this table are to be chosen at random from the defined range. The random function used shall be such that each of the allowed selections is chosen with equal probability. | |

Table 5.13.4.3: PAGING TYPE 1 Message content

|  |  |
| --- | --- |
| **Information Element** | **Value/remark** |
| BCCH modification info |  |
| MIB Value Tag | Set to the same value as the value tag of the MIB after the BCCH modification |
| BCCH Modification time | Not present |

5.13.4.4.2 Procedure

1) Set the TX output level of the SS to obtain Îor at the UE antenna connector. Îor shall be according to table 5.13.4.1 depending on the power class of the UE.

2) The SS shall initiate a call by sending PAGING TYPE 1 message and measure the first RF transmission from the UE.

3) The SS shall determine the access slot used, the received signature, the EVM and the frequency error.

4) Choose a new set of parameters from table 5.13.4.2

5) Send PAGING TYPE 1 message with BCCH modification info as per table 5.13.4.3.

6) Wait 5seconds to allow the UE to read the new SIB 5.

7) Repeat from step number 2) ten times.

#### 5.13.4.5 Test requirements

For all the transmitted PRACH preambles measured in 5.13.4.4.2 step 3:

1. The EVM shall not exceed 17,5 %.
2. The frequency error shall not exceed ±(0,1 ppm + 10 Hz).
3. The detected access slot and signature shall be correct according to the physical random access procedure defined in [5].

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

### 5.13.5 In-band emission for DC-HSUPA

#### 5.13.5.1 Definition and applicability

The in-band emission is measured as the ratio of the UE output power in one carrier in dual cells to the UE output power in the other carrier, where the power in the former carrier shall be set to the minimum output power and the power in the latter carrier to the maximum output power. It is necessary to verify the requirements when the both carriers are configured according to the UL E-DCH reference measurement channel for DC-HSUPA using BPSK modulation, specified in subclause C.11A. The basic in-band emission measurement interval is defined over one slot in the time domain.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support HSDPA and Dual Cell E-DCH.

#### 5.13.5.2 Minimum Requirements

The in-band emission shall not exceed the value specified in Table 5.13.5.1.

Table 5.13.5.1: In-band emission minimum requirements for DC-HSUPA

|  |  |  |
| --- | --- | --- |
| Parameter Description | Unit | Limit |
| In-band emission | dBc | -24 |
| NOTE: The measurement bandwidth is 3.84 MHz centred on each carrier frequency and the limit is expressed as a ratio of RRC filtered mean power in one carrier, transmitting at minimum output power, to the RRC filtered mean power in the other carrier, transmitting at maximum output power. | | |

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3b.1.

#### 5.13.5.3 Test purpose

To verify that the in-band emission, during DC-HSUPA transmission, does not exceed the prescribed limits shown in table 5.13.5.1. This is applicable for all values of *c* , *d*  ,*hs*, *ec* and *ed*  as specified in [5]. The maximum output power with HS-DPCCH and/or E-DCH is specified in table 5.2BA.1.

Excess in-band emission decreases the uplink stability and throughput in DC-HSUPA operation.

NOTE: For a static signal, the measurement with a 3.84 MHz filter can be replaced by a narrower filter and integration over the bandwidth. For a non static signal the above described replacement gives different results, depending on the type of dynamic in the signal and depending on the bandwidth of the filter. Hence the signal is tested only when static.

#### 5.13.5.4 Method of test

5.13.5.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.41.

2) The UL Reference Measurement Channel and parameters are specified in Annex C.2.6 and C.11A. The DL Reference Measurement Channel (FRC H-SET 3A, QPSK) is specified in C.8.1.1.

3) A call is set up according to the Generic call setup procedure specified in TS34.108 [3] sub clause 7.3.14, with exceptions for information elements in RADIO BEARER SETUP message as given in Table 5.2BA.2, 5.2BA.3 and 5.2BA.4. These exceptions allow the beta values to be set according to table C.11A.1.1 and each UL physical channel to be at constant power during the measurement. RF parameters are set up according to E.5 A.1A. Settings for the serving cell are defined in table 5.13.5.2

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH according to procedure 7.3.14.3 in TS 34.108 [3] and start the loopback test.

See TS 34.109 [4] clauses 5.3.2.3 and 5.3.2.6 for details regarding loopback test mode for HSDPA and E-DCH.

Table 5.13.5.2: Settings for the serving cell during the measurement  
of in-band emission for DC-HSUPA

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 5.145.13.5.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| Îor (see notes 1 and 2) | dBm/3.84 MHz | -86 |
| NOTE 1: The power level is specified in terms of Îor instead of CPICH\_RSCP because RSCP is a receiver measurement, whereas the SS can only set Îor.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

Table 5.13.5.3: Power Settings of Uplink Carriers for the measurement  
of in-band emission for DC-HSUPA

|  |  |  |
| --- | --- | --- |
| Sub-test | Power of First Carrier | Power of Second Carrier |
| 1 | Maximum | Minimum |
| 2 | Minimum | Maximum |

5.13.5.4.2 Procedure

1) Set the Absolute Grant according to Table C.11A.1.1.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Set and send continuously Up power control commands to one carrier and Down power control commands to the other carrier to reach the power levels as given in table 5.13.5.3. Wait for 150ms.

4) Measure the power of each carrier with a measurement filter of bandwidths according to table 5.13.5.1 and record the power difference. The power may be calculated by integrating multiple narrower filter(≥3kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

5) Repeat steps 1-4 for sub-tests as given in table 5.13.5.3.

#### 5.13.5.5 Test requirements

The result of clause 5.13.5.4.2 step 4) shall fulfil the requirements of table 5.13.5.4.

Table 5.13.5.4: In-band Emission Requirement for DC-HSUPA

|  |  |  |
| --- | --- | --- |
| Parameter Description | Unit | Limit |
| In-band emission | dBc | -23.2 |
| NOTE: The measurement bandwidth is 3.84 MHz centred on each carrier frequency and the limit is expressed as a ratio of RRC filtered mean power in one carrier, transmitting at minimum output power, to the RRC filtered mean power in the other carrier, transmitting at maximum output power. | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

# 6 Receiver Characteristics

## 6.1 General

Receiving performance test of the UE is implemented during communicating with the SS via air interface. The procedure is using normal call protocol until the UE is communicating on traffic channel basically. On the traffic channel, the UE provides special function for testing that is called Logical Test Interface and the UE is tested using this function (Refer to TS 34.109 [4]).

Transmitting or receiving bit/symbol rate for test channel is shown in table 6.1.

Table 6.1: Bit / Symbol rate for Test Channel

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type of User Information | User bit rate | DL DPCH  symbol rate | UL DPCH  bit rate | Remarks |
| 12,2 kbps reference measurement channel | 12,2 kbps | 30 ksps | 60 kbps | Standard Test |

Unless otherwise stated the receiver characteristics are specified at the antenna connector of the UE. For UE(s) with an integral antenna only, a reference antenna with a gain of 0 dBi is assumed. UE with an integral antenna may be taken into account by converting these power levels into field strength requirements, assuming a 0 dBi gain antenna. For UEs with more than one receiver antenna connector the AWGN signals applied to each receiver antenna connector shall be uncorrelated. The levels of the test signals applied to each of the antenna connectors shall be as defined in the respective sections below.

The UE antenna performance has a significant impact on system performance, and minimum requirements on the antenna efficiency are therefore intended to be included in future versions of the present document. It is recognised that different requirements and test methods are likely to be required for the different types of UE.

With the exception of clause 6.8, all the parameters in clause 6 are defined using the DL reference measurement channel (12,2 kbps) specified in clause C.3.1 and unless stated otherwise, with DL power control OFF.

The common RF test conditions of Rx Characteristics are defined in clause E.3.2, and each test conditions in this clause (clause 6) should refer clause E.3.2. Individual test conditions are defined in the paragraph of each test.

When DCCH has been configured on downlink DCH then DCCH Data shall be continuously transmitted on downlink DCH during the measurement period. When there is no signalling to transmit on downlink DCCH then dummy DCCH transmission as described in Annex C.9 shall be used.

For HSDPA test cases, when DTCH has been configured on downlink DCH then DTCH Data shall be continuously transmitted on downlink DCH during the measurement period.

All Bit Error ratio (BER) measurements in clause 6 shall be performed according to the general rules for statistical testing in Annex F.6.

For HSDPA test cases without E-DCH, the MAC headers on HS-DSCH shall be according to Annex C.9A.

UEs supporting DC-HSDPA, regardless of MIMO configuration, shall support both minimum requirements, as well as additional requirements for DC-HSDPA.

UEs supporting DB-DC-HSDPA shall support both minimum requirements as well as additional requirements for DB-DC-HSDPA.

UEs supporting DC-HSUPA shall support both minimum requirements, as well as additional requirements for DC-HSUPA.

UEs supporting single band 4C-HSDPA shall support minimum requirements, additional requirements for DC-HSDPA as well as additional requirements for single band 4C-HSDPA.

UEs supporting dual band 4C-HSDPA shall support minimum requirements, additional requirements for DC-HSDPA, additional requirements for DB-DC-HSDPA as well as additional requirements for dual band 4C-HSDPA.

For the additional requirements for DC-HSDPA, DB-DC-HSDPA, DC-HSUPA or single band/dual band 4C-HSDPA, all the parameters in clause 6 are defined using the DL reference measurement channel H-Set 12 unless otherwise stated, specified in subclause C.8.1.12 and the downlink physical channel setup according to table E.5.4B.

For the additional requirements for DC-HSDPA, the spacing of the carrier frequencies of the two cells in downlink shall be 5 MHz, and it is assumed that the UE is configured with a single uplink carrier frequency.

For the additional requirements for DC-HSUPA, the spacing of the carrier frequencies of the two cells in both downlink and uplink shall be 5 MHz.

For the additional requirements for single band/dual band 4C-HSDPA, the spacing of the adjacent carrier frequencies in downlink and uplink shall be 5 MHz.

For each single band/dual band 4C-HSDPA configuration, the UL-DL carrier separation is defined as minimum (maximum) when the UL carrier is placed at minimum (maximum) possible distance in frequency from the closest carrier in the corresponding DL band for which the requirement applies.

The requirements specified in Section 6 in general could be different for each single band/dual band 4C-HSDPA configuration within the same operating band(s).

## 6.1A Reference input power adjustment for a dual band device

For the UE which supports DB-DC-HSDPA configuration in clause 4.2, the reference input powers (HS-PDSCH\_Ec and Îor)of core requirements specified in test cases 6.5C and 6.7C are allowed to be increased by the amount given in Table 6.1A for the applicable bands.

Table 6.1A: Allowed increase of HS-PDSCH Ec and Îor for UE which supports DB-DC-HSDPA.

|  |  |  |
| --- | --- | --- |
| DB-DC-HSDPA Configuration | Allowed increase of HS-PDSCH Ec and Îor (dB) | Applicable bands |
| 1 | 0.5 | I, VIII |
| 2 | 1 | II, IV |
| 3 | 0.5 | I, V |
| 6 | 0.6 | I |

For the UE which supports dual band 4C-HSDPA configuration in Table 4.0B, the reference input powers (HS-PDSCH\_Ec and Îor) of core requirements specified in clause 6.5C, 6.5E and 6.7C are allowed to be increased by the amount given in Table 6.1B for the applicable bands.

Table 6.1B: Allowed increase of HS-PDSCH Ec and Îor for UE which supports dual band 4C-HSDPA

|  |  |  |
| --- | --- | --- |
| Dual Band 4C-HSDPA Configuration | Allowed increase of HS-PDSCH Ec and Îor (dB) | Applicable bands |
| I-2-VIII-1  I-3-VIII-1 | 0.5 | I, VIII |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | 1 | II, IV |
| I-1-V-2  I-2-V-1  I-2-V-2 | 0.5 | I, V |
| I-1-XXXII-2  I-2-XXXII-1 | 0.6 | I |

## 6.2 Reference Sensitivity Level

### 6.2.1 Definition and applicability

The reference sensitivity level <REFSENS> is the minimum mean power received at the UE antenna port at which the Bit Error Ratio (BER) shall not exceed a specific value

The requirements and this test apply to all types of UTRA for the FDD UE.

### 6.2.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.2.1.

Table 6.2.1: Test parameters for Reference Sensitivity Level

|  |  |  |  |
| --- | --- | --- | --- |
| Operating Band | Unit | DPCH\_Ec  <REFSENS> | <REFÎor> |
| I | dBm/3.84 MHz | -117 | -106.7 |
| II | dBm/3.84 MHz | -115 | -104.7 |
| III | dBm/3.84 MHz | -114 | -103.7 |
| IV | dBm/3.84 MHz | -117 | -106.7 |
| V | dBm/3.84 MHz | -115 | -104.7 |
| VI | dBm/3.84 MHz | -117 | -106.7 |
| VII | dBm/3.84 MHz | -115 | -104.7 |
| VIII | dBm/3.84 MHz | -114 | -103.7 |
| IX | dBm/3.84 MHz | -116 | -105.7 |
| X | dBm/3.84 MHz | -117 | -106.7 |
| XI | dBm/3.84 MHz | -117 | -106.7 |
| XII | dBm/3.84 MHz | -114 | -103.7 |
| XIII | dBm/3.84 MHz | -114 | -103.7 |
| XIV | dBm/3.84 MHz | -114 | -103.7 |
| XIX | dBm/3.84 MHz | -117 | -106.7 |
| XX | dBm/3.84 MHz | -114 | -103.7 |
| XXI | dBm/3.84 MHz | -117 | -106.7 |
| XXII | dBm/3.84 MHz | -114 | -103.7 |
| XXV | dBm/3.84 MHz | -113.5 | -103.2 |
| XXVI | dBm/3.84 MHz | -113.5 | -103.2 |
| NOTE 1: For Power class 3 and 3bis this shall be at the maximum output power.  NOTE 2: For Power class 4 this shall be at the maximum output power.  NOTE 3: For the UE which supports both Band III and Band IX operating frequencies, the reference sensitivity level of -114.5 dBm DPCH\_Ec <REFSENS> shall apply for Band IX. The corresponding <REFÎor> is -104.2 dBm.  NOTE 4: For the UE which supports both Band XI and Band XXI operating frequencies, the reference sensitivity level is FFS. | | | |

For the UE which supports DB-DC-HSDPA configuration in Table 6.2.1A, the reference sensitivity level DPCH\_Ec <REFSENS> and corresponding <REFÎor> in Table 6.2.1 are allowed to be increased by the amount given in Table 6.2.1A for the applicable bands.

Table 6.2.1A: Allowed de-sensitization relative to reference sensitivity  
for UE which supports DB-DC-HSDPA.

|  |  |  |
| --- | --- | --- |
| DB-DC-HSDPA Configuration | Allowed de-sensitization (dB) | Applicable bands |
| 2 | 1 | II, IV |

For the UE which supports dual band 4C-HSDPA configuration in Table 6.2.1B, the reference sensitivity level DPCH\_Ec <REFSENS> and corresponding <REFÎor> in Table 6.2.1 are allowed to be increased by the amount given in Table 6.2.1B for the applicable bands.

Table 6.2.1B: Allowed de-sensitization relative to reference sensitivity for UE which supports dual band 4C-HSDPA.

|  |  |  |
| --- | --- | --- |
| **Dual Band 4C-HSDPA Configuration** | **Allowed de-sensitization (dB)** | **Applicable bands** |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | 1 | II, IV |

For the UE which supports E-UTRA inter-band carrier aggregation the reference sensitivity level DPCH\_Ec <REFSENS> and corresponding <REFÎor> in Table 6.2.1 are allowed to be increased by the amount given in Table 7.3.1-1A of TS 36.101[10] for those UTRA operating bands corresponding to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations. The tolerance in Table 7.3.1-1A of TS 36.101[10] does not apply to supported UTRA operating bands with frequency range below 1 GHz that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations when such bands are belonging only to band combination(s) where one band is <1GHz and another band is >1.7GHz and there is no harmonic relationship between the low band UL and high band DL.

In case the UE supports DB-DC-HSDPA or dual band 4C-HSDPA configurations and one or more of the E-UTRA inter-band carrier aggregation configurations listed in Table 7.3.1-1A of TS36.101[10] with a UTRA operating band that belongs to UTRA and E-UTRA carrier aggregation configurations, then

- When the UTRA operating band frequency range is ≤ 1GHz, the applicable additional tolerance shall be the average of the applicable tolerances, truncated to one decimal place for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations, with the DB-DC-HSDPA, dual carrier 4C-HSDPA, and E-UTRA CA configurations counted separately. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied

- When the UTRA operating band frequency range is >1GHz, the applicable additional tolerance shall be the maximum tolerance that applies for that operating band among the supported DB-DC-HSDPA, dual band HSDPA, and E-UTRA CA configurations.

The normative reference for this requirement is TS 25.101 [1] clause 7.3.1.

### 6.2.3 Test purpose

To verify that the UE BER shall not exceed 0,001 for the parameters specified in table 6.2.2.

The lack of the reception sensitivity decreases the coverage area at the far side from Node B.

### 6.2.4 Method of test

6.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) Channel conditions are initially set up with received CPICH\_RSCP >-85 dBm. The relative power level of downlink physical channels to Ior are set up according to clause E.2.1. The parameter settings of the cell are set up according to TS 34.108 [3], clause 6.1.5 for "Default settings for a serving cell in a single cell environment".

3) Switch on the phone.

4) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.2.

5) The RF parameters are set up according to table 6.2.2.

6) Enter the UE into loopback test mode and start the loopback test.

See TS 34.109 [4] for details regarding loopback test.

6.2.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the BER of DCH received from the UE at the SS.

### 6.2.5 Test requirements

The measured BER, derived in step 2), shall not exceed 0,001.

Table 6.2.2: Test parameters for Reference Sensitivity Level

|  |  |  |  |
| --- | --- | --- | --- |
| Operating Band | Unit | DPCH\_Ec  <REFSENS> | <REFÎor> |
| I | dBm/3.84 MHz | -116.3 | -106 |
| II | dBm/3.84 MHz | -114.3 | -104 |
| III | dBm/3.84 MHz | -113.3 | -103 |
| IV | dBm/3.84 MHz | -116.3 | -106 |
| V | dBm/3.84 MHz | -114.3 | -104 |
| VI | dBm/3.84 MHz | -116.3 | -106 |
| VII | dBm/3.84 MHz | -114.3 | -104 |
| VIII | dBm/3.84 MHz | -113.3 | -103 |
| IX | dBm/3.84 MHz | -115.3 | -105 |
| X | dBm/3.84 MHz | -116.3 | -106 |
| XI | dBm/3.84 MHz | -116.3 | -106 |
| XII | dBm/3.84 MHz | -113.3 | -103 |
| XIII | dBm/3.84 MHz | -113.3 | -103 |
| XIV | dBm/3.84 MHz | -113.3 | -103 |
| XIX | dBm/3.84 MHz | -116.3 | -106 |
| XX | dBm/3.84 MHz | -113.3 | -103 |
| XXI | dBm/3.84 MHz | -116.3 | -106 |
| XXII | dBm/3.84 MHz | -113.3 | -103 |
| XXV | dBm/3.84 MHz | -112.8 | -102.5 |
| XXVI | dBm/3.84 MHz | -112.8 | -102.5 |
| NOTE 1: For Power class 3 and 3bis this shall be at the maximum output power.  NOTE 2: For Power class 4 this shall be at the maximum output power.  NOTE 3: For the UE which supports both Band III and Band IX operating frequencies, the reference sensitivity level of -113.8 dBm DPCH\_Ec <REFSENS> shall apply for Band IX. The corresponding <REFÎor> is -103.5 dBm.  NOTE 4: For the UE which supports both Band XI and Band XXI operating frequencies, the reference sensitivity level is FFS. | | | |

For the UE, which supports DB-DC-HSDPA or dual band 4C-HSDPA and/or E-UTRA inter-band carrier aggregation the reference sensitivity level of DPCH\_Ec <REFSENS> and corresponding < REFÎor>in Table 6.2.2 are allowed to be increased by the amount defined in minimum requirement clause.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.2A Reference Sensitivity Level for DC-HSDPA

### 6.2A.1 Definition and applicability

The reference sensitivity level <REFSENS> is the minimum mean power received at the UE antenna port at which the Block Error Ratio (BLER) on each individual cell shall not exceed a specific value.

The requirements and this test apply for Release 8 and later releases to all types of UTRA for the FDD UE that support DC-HSDPA.

### 6.2A.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.2A.1.

Table 6.2A.1: Test parameters for reference sensitivity, additional requirement for DC-HSDPA

|  |  |  |  |
| --- | --- | --- | --- |
| Operating Band | Unit | HS-PDSCH\_Ec <REFSENS> | <REFÎor> |
| I | dBm/3.84 MHz | -113 | -102.7 |
| II | dBm/3.84 MHz | -111 | -100.7 |
| III | dBm/3.84 MHz | -110 | -99.7 |
| IV | dBm/3.84 MHz | -113 | -102.7 |
| V | dBm/3.84 MHz | -111 | -100.7 |
| VI | dBm/3.84 MHz | -113 | -102.7 |
| VII | dBm/3.84 MHz | -111 | -100.7 |
| VIII | dBm/3.84 MHz | -110 | -99.7 |
| IX | dBm/3.84 MHz | -112 | -101.7 |
| X | dBm/3.84 MHz | -113 | -102.7 |
| XI | dBm/3.84 MHz | -113 | -102.7 |
| XII | dBm/3.84 MHz | -110 | -99.7 |
| XIII | dBm/3.84 MHz | -110 | -99.7 |
| XIV | dBm/3.84 MHz | -110 | -99.7 |
| XIX | dBm/3.84 MHz | -113 | -102.7 |
| XX | dBm/3.84 MHz | -110 | -99.7 |
| XXI | dBm/3.84 MHz | -113 | -102.7 |
| XXII | dBm/3.84 MHz | -110 | -99.7 |
| XXV | dBm/3.84 MHz | -109.5 | -99.2 |
| XXVI | dBm/3.84 MHz | -109.5 | -99.2 |
| NOTE 1: For Power class 3 and 3bis this shall be at the maximum output power  NOTE 2: For Power class 4 this shall be at the maximum output power  NOTE 3: For the UE which supports both Band III and Band IX operating frequencies, the reference sensitivity level of -110.5 dBm HS-PDSCH\_Ec <REFSENS> shall apply for Band IX. The corresponding <REFÎor> is -100.2 dBm  NOTE 4: For the UE which supports both Band XI and Band XXI operating frequencies, the reference sensitivity level is FFS.  NOTE 5 For the UE which supports both Band V and Band XXVI operating frequencies, the reference sensitivity level of -111 dBm HS-PDSCH\_Ec <REFSENS> shall apply for Band XXVI when any of the carrier frequencies of the assigned UTRA channel is within 869-894 MHz. The corresponding <REFÎor> is -100.7 dBm. | | | |

For the UE which supports DB-DC-HSDPA configuration in Table 6.2A.1A, the reference sensitivity level HS-PDSCH\_Ec <REFSENS> and corresponding <REFÎor> in Table 6.2A.1 are allowed to be increased by the amount given in Table 6.2A.1A for the applicable bands.

Table 6.2A.1A: Allowed de-sensitization relative to reference sensitivity for UE which supports DB-DC-HSDPA.

|  |  |  |
| --- | --- | --- |
| DB-DC-HSDPA Configuration | Allowed de-sensitization (dB) | Applicable bands |
| 2 | 1 | II, IV |
| 4 | 1 | I, XI |

For the UE which supports dual band 4C-HSDPA configuration in Table 6.2A.1B, the reference sensitivity level HS-PDSCH\_Ec <REFSENS> and corresponding <REFÎor> in Table 6.2A.1 are allowed to be increased by the amount given in Table 6.2A.1B for the applicable bands.

Table 6.2A.1B: Allowed de-sensitization relative to reference sensitivity for UE which supports dual band 4C-HSDPA.

|  |  |  |
| --- | --- | --- |
| Dual Band 4C-HSDPA Configuration | Allowed de-sensitization (dB) | Applicable bands |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | 1 | II, IV |

For the UE which supports E-UTRA inter-band carrier aggregation the reference sensitivity level HS-PDSCH\_Ec <REFSENS> and corresponding <REFÎor> in Table 6.2A.1 are allowed to be increased by the amount given in Table 7.3.1-1A of TS 36.101[11] for those UTRA operating bands corresponding to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations. The tolerance in Table 7.3.1-1A of TS 36.101[11] does not apply to supported UTRA operating bands with frequency range below 1 GHz that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations when such bands are belonging only to band combination(s) where one band is <1GHz and another band is >1.7GHz and there is no harmonic relationship between the low band UL and high band DL.

In case the UE supports DB-DC-HSDPA or dual band 4C-HSDPA configurations and one or more of the E-UTRA inter-band carrier aggregation configurations listed in Table 7.3.1-1A of TS36.101[11] with a UTRA operating band that belongs to UTRA and E-UTRA carrier aggregation configurations, then

- When the UTRA operating band frequency range is ≤ 1GHz, the applicable additional tolerance shall be the average of the applicable tolerances, truncated to one decimal place for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations, with the DB-DC-HSDPA, dual carrier 4C-HSDPA, and E-UTRA CA configurations counted separately. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied

- When the UTRA operating band frequency range is >1GHz, the applicable additional tolerance shall be the maximum tolerance that applies for that operating band among the supported DB-DC-HSDPA, dual band 4C-HSDPA, and E-UTRA CA configurations.

The normative reference for this requirement is TS 25.101 [1] clause 7.3.2.

### 6.2A.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell shall not exceed 0,1 for the parameters specified in table 6.2A.3 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the reception sensitivity decreases the HSDPA coverage area at the far side from Node B.

### 6.2A.4 Method of test

6.2A.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.30.

2) Channel conditions are initially set up with received CPICH\_RSCP >-85 dBm. The relative power level of primary downlink physical channels to Ior are set up according to clause E.5.0.

3) Switch on the phone.

4) A call is set up according to the Generic DC-HSDPA setup procedure in TS34.108 [3] sub clause 7.3.13 with exceptions for information elements listed in table 6.2A.2.

5) The RF parameters are set up according to table 6.2A.3 for both primary and secondary serving cells.

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Table 6.2A.2: Specific Message Contents for reference sensitivity, additional requirement for DC-HSDPA

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Downlink HS-PDSCH Information |  |  |
| - CHOICE mode | FDD |  |
| - Downlink 64QAM configured | Not Present | Rel-7 |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) | Rel-7 |
| Downlink secondary cell info FDD |  | Rel-8 |
| - CHOICE Configuration info | New configuration |  |
| - Downlink 64QAM configured | Not Present |  |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) |  |

See TS 34.109 [4] for details regarding loopback test.

6.2A.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level as in Table 5.2AA.2 or 5.2AA.3 depending on tested band.

2) Measure the BLER of HS-PDSCH on each individual cell received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

### 6.2A.5 Test requirements

The measured BLER, derived in step 2), shall not exceed 0,1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.2A.3: Test parameters for reference sensitivity, additional requirement for DC-HSDPA

|  |  |  |  |
| --- | --- | --- | --- |
| Operating Band | Unit | HS-PDSCH\_Ec <REFSENS> | <REFÎor> |
| I | dBm/3.84 MHz | -112.3 | -102 |
| II | dBm/3.84 MHz | -110.3 | -100 |
| III | dBm/3.84 MHz | -109.3 | -99 |
| IV | dBm/3.84 MHz | -112.3 | -102 |
| V | dBm/3.84 MHz | -110.3 | -100 |
| VI | dBm/3.84 MHz | -112.3 | -102 |
| VII | dBm/3.84 MHz | -110.3 | -100 |
| VIII | dBm/3.84 MHz | -109.3 | -99 |
| IX | dBm/3.84 MHz | -111.3 | -101 |
| X | dBm/3.84 MHz | -112.3 | -102 |
| XI | dBm/3.84 MHz | -112.3 | -102 |
| XII | dBm/3.84 MHz | -109.3 | -99 |
| XIII | dBm/3.84 MHz | -109.3 | -99 |
| XIV | dBm/3.84 MHz | -109.3 | -99 |
| XIX | dBm/3.84 MHz | -112.3 | -102 |
| XX | dBm/3.84 MHz | -109.3 | -99 |
| XXI | dBm/3.84 MHz | -112.3 | -102 |
| XXII | dBm/3.84 MHz | -119.3 | -99 |
| XXV | dBm/3.84 MHz | -108.8 | -98.5 |
| XXVI | dBm/3.84 MHz | -108.8 | -98.5 |
| NOTE 1 For Power class 3 and 3bis this shall be at the maximum output power.  NOTE 2 For Power class 4 this shall be at the maximum output power.  NOTE 3 For the UE which supports both Band III and Band IX operating frequencies, the reference sensitivity level of -109.8 dBm HS-PDSCH\_Ec <REFSENS> shall apply for Band IX. The corresponding <REFÎor> is -99.5 dBm.  NOTE 4: For the UE which supports both Band XI and Band XXI operating frequencies, the reference sensitivity level is FFS.  NOTE 5 For the UE which supports both Band V and Band XXVI operating frequencies, the reference sensitivity level of -110.3 dBm HS-PDSCH\_Ec <REFSENS> shall apply for Band XXVI when any of the carrier frequencies of the assigned UTRA channel is within 869-894 MHz. The corresponding <REFÎor> is -100 dBm. | | | |

For the UE, which supports DB-DC-HSDPA or dual band 4C-HSDPA and/or E-UTRA inter-band carrier aggregation the reference sensitivity level of HS-PDSCH\_Ec <REFSENS> and corresponding < REFÎor>in Table 6.2A.3 are allowed to be increased by the amount defined in minimum requirement clause.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.2B Reference Sensitivity Level for DB-DC-HSDPA

### 6.2B.1 Definition and applicability

The reference sensitivity level <REFSENS> is the minimum mean power received at the UE antenna port at which the Block Error Ratio (BLER) on each individual cell shall not exceed a specific value.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support DB-DC-HSDPA.

DB-DC-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.2B.2 Minimum Requirements

For all requirements listed in Table 6.2B.1, corresponding to the specific DB-DC-HSDPA configuration(s) supported by the UE, (see clause 4.2), the BLER measured on each individual cell shall not exceed 0.1.

Table 6.2B.1: Test parameters for reference sensitivity, additional requirement for DB-DC-HSDPA.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| DB-DC-HSDPA configuration | DL Band | UL Band | Unit | HS-PDSCH\_Ec  <REFSENS> | <REFÎor> |
| 1 | I | I | dBm/3.84 MHz | -113 | -102.7 |
| VIII | dBm/3.84 MHz | -110 | -99.7 |
| I | VIII | dBm/3.84 MHz | -113 | -102.7 |
| VIII | dBm/3.84 MHz | -110 | -99.7 |
| 2 | II | II | dBm/3.84 MHz | -110 | -99.7 |
| IV | dBm/3.84 MHz | -112 | -101.7 |
| II | IV | dBm/3.84 MHz | -110 | -99.7 |
| IV | dBm/3.84 MHz | -112 | -101.7 |
| 3 | I | I | dBm/3.84 MHz | -113 | -102.7 |
| V | dBm/3.84 MHz | -111 | -100.7 |
| I | V | dBm/3.84 MHz | -113 | -102.7 |
| V | dBm/3.84 MHz | -111 | -100.7 |
| 4 | I | I | dBm/3.84 MHz | -112 | -101.7 |
| XI | dBm/3.84 MHz | -112 | -101.7 |
| I | XI | dBm/3.84 MHz | -112 | -101.7 |
| XI | dBm/3.84 MHz | -112 | -101.7 |
| 5 | II | II | dBm/3.84 MHz | -111 | -100.7 |
| V | dBm/3.84 MHz | -111 | -100.7 |
| II | V | dBm/3.84 MHz | -111 | -100.7 |
| V | dBm/3.84 MHz | -111 | -100.7 |
| 6 | I | I | dBm/3.84 MHz | -113 | -102.7 |
| XXXII | dBm/3.84 MHz | -113 | -102.7 |
| NOTE 1: For Power class 3 and 3bis this shall be at the maximum output power.  NOTE 2: For Power class 4 this shall be at the maximum output power. | | | | | |

The normative reference for this requirement is TS 25.101 [1] clause 7.3.3.

### 6.2B.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell shall not exceed 0,1 for the parameters specified in table 6.2B.2 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the reception sensitivity decreases the HSDPA coverage area at the far side from Node B.

### 6.2B.4 Method of test

6.2B.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.30.

2) Channel conditions are initially set up with received CPICH\_RSCP >-85 dBm. The relative power level of primary downlink physical channels to Ior are set up according to clause E.5.0.

3) Switch on the phone.

4) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.13 with exceptions for information elements listed in table 6.2B.2.

5) The RF parameters are set up according to table 6.2B.3 for both primary and secondary serving cells.

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

Table 6.2B.2: Specific Message Contents for reference sensitivity,  
additional requirement for DB-DC-HSDPA

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Downlink HS-PDSCH Information |  |  |
| - CHOICE mode | FDD |  |
| - Downlink 64QAM configured | Not Present | Rel-7 |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) | Rel-7 |
| Downlink secondary cell info FDD |  | Rel-8 |
| - CHOICE Configuration info | New configuration |  |
| - Downlink 64QAM configured | Not Present |  |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) |  |

See TS 34.109 [4] for details regarding loopback test.

6.2B.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the BLER of HS-PDSCH on each individual cell received from the UE at the SS.

### 6.2B.5 Test requirements

The measured BLER, derived in step 2), shall not exceed 0,1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.2B.3: Test parameters for reference sensitivity, additional requirement for DB-DC-HSDPA

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| DB-DC-HSDPA configuration | DL Band | UL Band | Unit | HS-PDSCH\_Ec  <REFSENS> | <REFÎor> |
| 1 | I | I | dBm/3.84 MHz | -112.3 | -102 |
| VIII | dBm/3.84 MHz | -109.3 | -99 |
| I | VIII | dBm/3.84 MHz | -112.3 | -102 |
| VIII | dBm/3.84 MHz | -109.3 | -99 |
| 2 | II | II | dBm/3.84 MHz | -109.3 | -99 |
| IV | dBm/3.84 MHz | -111.3 | -101 |
| II | IV | dBm/3.84 MHz | -109.3 | -99 |
| IV | dBm/3.84 MHz | -111.3 | -101 |
| 3 | I | I | dBm/3.84 MHz | -112.3 | -102 |
| V | dBm/3.84 MHz | -110.3 | -100 |
| I | V | dBm/3.84 MHz | -112.3 | -102 |
| V | dBm/3.84 MHz | -110.3 | -100 |
| 4 | I | I | dBm/3.84 MHz | -111.3 | -101 |
| XI | dBm/3.84 MHz | -111.3 | -101 |
| I | XI | dBm/3.84 MHz | -111.3 | -101 |
| XI | dBm/3.84 MHz | -111.3 | -101 |
| 5 | II | II | dBm/3.84 MHz | -110.3 | -100 |
| V | dBm/3.84 MHz | -110.3 | -100 |
| II | V | dBm/3.84 MHz | -110.3 | -100 |
| V | dBm/3.84 MHz | -110.3 | -100 |
| 6 | I | I | dBm/3.84 MHz | -112.3 | -102 |
| XXXII | dBm/3.84 MHz | -112.3 | -102 |
| NOTE 1: For Power class 3 and 3bis this shall be at the maximum output power.  NOTE 2: For Power class 4 this shall be at the maximum output power. | | | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.2C Reference Sensitivity Level for Single band 4C-HSDPA

### 6.2C.1 Definition and applicability

The reference sensitivity level <REFSENS> is the minimum mean power received at the UE antenna port at which the Block Error Ratio (BLER) on each individual cell shall not exceed a specific value.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support Single band 4C-HSDPA and HS-DSCH categories 29 to 32.

Single band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.2C.2 Minimum Requirements

For all requirements listed in Table 6.2C.1, corresponding to the specific single band 4C-HSDPA configuration(s) supported by the UE, (see Table 4.0A), the BLER measured on each individual cell shall not exceed 0.1.

NOTE: The reference sensitivity level <REFSENS> requirement for single band 4C-HSDPA is not applicable for dual uplink operation. However, there might be a substantial Rx de-sensitization for the UE operating in bands which have less than 80 MHz Tx-Rx frequency separation, transmitting on more than one uplink frequency, at maximum power.

Table 6.2C.1: Test parameters for reference sensitivity, additional requirement for single band 4C-HSDPA

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Single band 4C-HSDPA configuration | DL Band | Unit | HS-PDSCH\_Ec <REFSENS> | <REFÎor> | UL-DL carrier separation |
| I-3 | I | dBm/3.84 MHz | -113 | -102.7 | Minimum |
| II-3, II-4 | II | dBm/3.84 MHz | -111 | -100.7 | Minimum |
| NOTE 1 For Power class 3, 3bis and 4, this shall be at the maximum output power | | | | | |

For the UE which supports DB-DC-HSDPA configuration in Table 6.2C.2, the reference sensitivity level HS-PDSCH\_Ec <REFSENS> and corresponding <REFÎor> in Table 6.2C.1 are allowed to be increased by the amount given in Table 6.2C.2 for the applicable bands.

Table 6.2C.2: Allowed de-sensitization relative to reference sensitivity for UE which supports  
DB-DC-HSDPA

|  |  |  |
| --- | --- | --- |
| DB-DC-HSDPA Configuration | Allowed de-sensitization (dB) | Applicable bands |
| 2 | 1 | II |
| 4 | 1 | I |

For the UE which supports dual band 4C-HSDPA configuration in Table 6.2C.2A, the reference sensitivity level HS-PDSCH\_Ec <REFSENS> and corresponding <REFÎor> in Table 6.2C.1 are allowed to be increased by the amount given in Table 6.2C.2A for the applicable bands.

Table 6.2C.2A: Allowed de-sensitization relative to reference sensitivity for UE which supports dual band 4C-HSDPA.

|  |  |  |
| --- | --- | --- |
| **Dual Band 4C-HSDPA Configuration** | **Allowed de-sensitization (dB)** | **Applicable bands** |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | 1 | II |

For the UE which supports E-UTRA inter-band carrier aggregation the reference sensitivity level HS-PDSCH\_Ec <REFSENS> and corresponding <REFÎor> in Table 6.2C.1 are allowed to be increased by the amount given in Table 7.3.1-1A of TS 36.101[11] for those UTRA operating bands corresponding to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations. The tolerance in Table 7.3.1-1A of TS 36.101[11] does not apply to supported UTRA operating bands with frequency range below 1 GHz that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations when such bands are belonging only to band combination(s) where one band is <1GHz and another band is >1.7GHz and there is no harmonic relationship between the low band UL and high band DL.

In case the UE supports DB-DC-HSDPA configurations and one or more of the E-UTRA inter-band carrier aggregation configurations listed in Table 7.3.1-1A of TS36.101[11] with a UTRA operating band that belongs to UTRA and E-UTRA carrier aggregation configurations, then

- When the UTRA operating band frequency range is ≤ 1GHz, the applicable additional tolerance shall be the average of the applicable tolerances, truncated to one decimal place for that operating band among the supported DB-DC-HSDPA and E-UTRA CA configurations, with the DB-DC-HSDPA and E-UTRA CA configurations counted separately. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied

- When the UTRA operating band frequency range is >1GHz, the applicable additional tolerance shall be the maximum tolerance that applies for that operating band among the supported DB-DC-HSDPA and E-UTRA CA configurations.

The normative reference for this requirement is TS 25.101 [1] clause 7.3.4.

### 6.2C.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell shall not exceed 0,1 for the parameters specified in table 6.2C.4 for the DL reference channel H-Set 1B specified in Annex C.8.1.1.

The lack of the reception sensitivity decreases the HSDPA coverage area at the far side from Node B.

This test case tests only 3 carrier configurations.

### 6.2C.4 Method of test

6.2C.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clauseG.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.48.

2) Channel conditions are initially set up with received CPICH\_RSCP >-85 dBm. The relative power level of primary downlink physical channels to Ior are set up according to clause E.5.0.

3) Switch on the phone.

4) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause 7.3.16.

5) The RF parameters are set up according to table 6.2C.3 for each individual cells.

See TS 34.109 [4] for details regarding loopback test.

#### 6.2C.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the BLER of HS-PDSCH on each individual cell received from the UE at the SS.

### 6.2C.5 Test requirements

The measured BLER, derived in step 2), shall not exceed 0,1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.2C.3: Test parameters for reference sensitivity, additional requirement for single band 4C-HSDPA.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Single band 4C-HSDPA configuration | DL Band | Unit | HS-PDSCH\_Ec <REFSENS> | <REFÎor> | UL-DL carrier separation |
| I-3 | I | dBm/3.84 MHz | -112.3 | -102 | Minimum |
| II-3, II-4 | II | dBm/3.84 MHz | -110.3 | -100 | Minimum |
| NOTE 1 For Power class 3, 3bis and 4, this shall be at the maximum output power | | | | | |

For the UE, which supports DB-DC-HSDPA or dual band 4C-HSDPA and/or E-UTRA inter-band carrier aggregation the reference sensitivity level of HS-PDSCH\_Ec <REFSENS> and corresponding < REFÎor>in Table 6.2C.3 are allowed to be increased by the amount defined in minimum requirement clause.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.2D Reference Sensitivity Level for Dual band 4C-HSDPA

### 6.2D.1 Definition and applicability

The reference sensitivity level <REFSENS> is the minimum mean power received at the UE antenna port at which the Block Error Ratio (BLER) on each individual cell shall not exceed a specific value.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band 4C-HSDPA and HS-DSCH categories 31 or 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.2D.2 Minimum Requirements

For all requirements listed in Table 6.2D.1, corresponding to the specific dual band 4C-HSDPA configuration(s) supported by the UE, (see Table 4.0B), the BLER measured on each individual cell shall not exceed 0.1.

Note: The reference sensitivity level <REFSENS> requirement for dual band 4C-HSDPA is not applicable for dual uplink operation. However, there might be a substantial Rx de-sensitization for the UE operating in bands which have less than 80 MHz Tx-Rx frequency separation, transmitting on more than one uplink frequency, at maximum power.

Table 6.2D.1: Test parameters for reference sensitivity, additional requirement for dual band 4C-HSDPA

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA configuration | DL Band | UL Band | Unit | HS-PDSCH\_Ec <REFSENS> | <REFÎor> | **UL-DL carrier separation** |
| I-2-VIII-1  I-3-VIII-1  I-2-VIII-2  I-1-VIII-2 | I | I | dBm/3.84 MHz | -113 | -102.7 | Minimum |
| VIII | dBm/3.84 MHz | -110 | -99.7 | Minimum |
| I | VIII | dBm/3.84 MHz | -113 | -102.7 | Minimum |
| VIII | dBm/3.84 MHz | -110 | -99.7 | Minimum |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | II | II | dBm/3.84 MHz | -110 | -99.7 | Minimum |
| IV | dBm/3.84 MHz | -112 | -101.7 | Minimum |
| II | IV | dBm/3.84 MHz | -110 | -99.7 | Minimum |
| IV | dBm/3.84 MHz | -112 | -101.7 | Minimum |
| I-1-V-2  I-2-V-1  I-2-V-2 | I | I | dBm/3.84 MHz | -113 | -102.7 | Minimum |
| V | dBm/3.84 MHz | -111 | -100.7 | Minimum |
| I | V | dBm/3.84 MHz | -113 | -102.7 | Minimum |
| V | dBm/3.84 MHz | -111 | -100.7 | Minimum |
| II-1-V-2 | II | II | dBm/3.84 MHz | -111 | -100.7 | Minimum |
| V | dBm/3.84 MHz | -111 | -100.7 | Minimum |
| II | V | dBm/3.84 MHz | -111 | -100.7 | Minimum |
| V | dBm/3.84 MHz | -111 | -100.7 | Minimum |
| I-1-XXXII-2  I-2-XXXII-1 | I | I | dBm/3.84 MHz | -113 | -102.7 | Minimum |
| XXXII | dBm/3.84 MHz | -113 | -102.7 | Minimum |
| NOTE 1 For Power class 3, 3bis and 4, this shall be at the maximum output power | | | | | | |

The normative reference for this requirement is TS 25.101 [1] clause 7.3.5.

### 6.2D.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell shall not exceed 0,1 for the parameters specified in table 6.2D.3 for the DL reference channel H-Set 1C specified in Annex C.8.1.1.

The lack of the reception sensitivity decreases the HSDPA coverage area at the far side from Node B.

This test case tests only 4 carrier configurations.

### 6.2D.4 Method of test

6.2D.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.48.

2) Channel conditions are initially set up with received CPICH\_RSCP >-85 dBm. The relative power level of primary downlink physical channels to Ior are set up according to clause E.5.0.

3) Switch on the phone.

4) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause7.3.16.

5) The RF parameters are set up according to table 6.2D.2 for each individual cells.

See TS 34.109 [4] for details regarding loopback test.

6.2D.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the BLER of HS-PDSCH on each individual cell received from the UE at the SS.

### 6.2D.5 Test requirements

The measured BLER, derived in step 2), shall not exceed 0,1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.2D.2: Test parameters for reference sensitivity, additional requirement for dual band 4C-HSDPA

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA configuration | DL Band | UL Band | Unit | HS-PDSCH\_Ec <REFSENS> | <REFÎor> | **UL-DL carrier separation** |
| I-3-VIII-1  I-2-VIII-2 | I | I | dBm/3.84 MHz | -112.3 | -102 | Minimum |
| VIII | dBm/3.84 MHz | -109.3 | -99 | Minimum |
| I | VIII | dBm/3.84 MHz | -112.3 | -102 | Minimum |
| VIII | dBm/3.84 MHz | -109.3 | -99 | Minimum |
| II-2-IV-2 | II | II | dBm/3.84 MHz | -109.3 | -99 | Minimum |
| IV | dBm/3.84 MHz | -111.3 | -101 | Minimum |
| II | IV | dBm/3.84 MHz | -109.3 | -99 | Minimum |
| IV | dBm/3.84 MHz | -111.3 | -101 | Minimum |
| I-2-V-2 | I | I | dBm/3.84 MHz | -112.3 | -102 | Minimum |
| V | dBm/3.84 MHz | -110.3 | -100 | Minimum |
| I | V | dBm/3.84 MHz | -112.3 | -102 | Minimum |
| V | dBm/3.84 MHz | -110.3 | -100 | Minimum |
| NOTE 1 For Power class 3, 3bis and 4, this shall be at the maximum output power | | | | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.2DA Reference Sensitivity Level for Dual band 4C-HSDPA (3 carrier)

### 6.2DA.1 Definition and applicability

The reference sensitivity level <REFSENS> is the minimum mean power received at the UE antenna port at which the Block Error Ratio (BLER) on each individual cell shall not exceed a specific value.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band 4C-HSDPA and HS-DSCH categories 29 to 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.2DA.2 Minimum Requirements

For all requirements listed in Table 6.2DA.1, corresponding to the specific dual band 4C-HSDPA configuration(s) supported by the UE, (see Table 4.0B), the BLER measured on each individual cell shall not exceed 0.1.

Note: The reference sensitivity level <REFSENS> requirement for dual band 4C-HSDPA is not applicable for dual uplink operation. However, there might be a substantial Rx de-sensitization for the UE operating in bands which have less than 80 MHz Tx-Rx frequency separation, transmitting on more than one uplink frequency, at maximum power.

Table 6.2DA.1: Test parameters for reference sensitivity, additional requirement for dual band 4C-HSDPA

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA configuration | DL Band | UL Band | Unit | HS-PDSCH\_Ec <REFSENS> | <REFÎor> | **UL-DL carrier separation** |
| I-2-VIII-1  I-3-VIII-1  I-2-VIII-2  I-1-VIII-2 | I | I | dBm/3.84 MHz | -113 | -102.7 | Minimum |
| VIII | dBm/3.84 MHz | -110 | -99.7 | Minimum |
| I | VIII | dBm/3.84 MHz | -113 | -102.7 | Minimum |
| VIII | dBm/3.84 MHz | -110 | -99.7 | Minimum |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | II | II | dBm/3.84 MHz | -110 | -99.7 | Minimum |
| IV | dBm/3.84 MHz | -112 | -101.7 | Minimum |
| II | IV | dBm/3.84 MHz | -110 | -99.7 | Minimum |
| IV | dBm/3.84 MHz | -112 | -101.7 | Minimum |
| I-1-V-2  I-2-V-1  I-2-V-2 | I | I | dBm/3.84 MHz | -113 | -102.7 | Minimum |
| V | dBm/3.84 MHz | -111 | -100.7 | Minimum |
| I | V | dBm/3.84 MHz | -113 | -102.7 | Minimum |
| V | dBm/3.84 MHz | -111 | -100.7 | Minimum |
| II-1-V-2 | II | II | dBm/3.84 MHz | -111 | -100.7 | Minimum |
| V | dBm/3.84 MHz | -111 | -100.7 | Minimum |
| II | V | dBm/3.84 MHz | -111 | -100.7 | Minimum |
| V | dBm/3.84 MHz | -111 | -100.7 | Minimum |
| I-1-XXXII-2  I-2-XXXII-1 | I | I | dBm/3.84 MHz | -113 | -102.7 | Minimum |
| XXXII | dBm/3.84 MHz | -113 | -102.7 | Minimum |
| NOTE 1: For Power class 3, 3bis and 4, this shall be at the maximum output power | | | | | | |

The normative reference for this requirement is TS 25.101 [1] clause 7.3.5.

### 6.2DA.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell shall not exceed 0,1 for the parameters specified in table 6.2DA.3 for the DL reference channel H-Set 1C specified in Annex C.8.1.1.

The lack of the reception sensitivity decreases the HSDPA coverage area at the far side from Node B.

This test case tests only 3 carrier configurations.

### 6.2DA.4 Method of test

6.2DA.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.48.

2) Channel conditions are initially set up with received CPICH\_RSCP >-85 dBm. The relative power level of primary downlink physical channels to Ior are set up according to clause E.5.0.

3) Switch on the phone.

4) A call is set up according to the Generic call setup procedure in TS34.108 [3] sub clause7.3.16.

5) The RF parameters are set up according to table 6.2DA.2 for each individual cells.

See TS 34.109 [4] for details regarding loopback test.

6.2DA.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the BLER of HS-PDSCH on each individual cell received from the UE at the SS.

### 6.2DA.5 Test requirements

The measured BLER, derived in step 2), shall not exceed 0,1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.2DA.2: Test parameters for reference sensitivity, additional requirement for dual band 4C-HSDPA

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA configuration | DL Band | UL Band | Unit | HS-PDSCH\_Ec <REFSENS> | <REFÎor> | **UL-DL carrier separation** |
| I-2-VIII-1  I-1-VIII-2 | I | I | dBm/3.84 MHz | -112.3 | -102 | Minimum |
| VIII | dBm/3.84 MHz | -109.3 | -99 | Minimum |
| I | VIII | dBm/3.84 MHz | -112.3 | -102 | Minimum |
| VIII | dBm/3.84 MHz | -109.3 | -99 | Minimum |
| II-1-IV-2  II-2-IV-1 | II | II | dBm/3.84 MHz | -109.3 | -99 | Minimum |
| IV | dBm/3.84 MHz | -111.3 | -101 | Minimum |
| II | IV | dBm/3.84 MHz | -109.3 | -99 | Minimum |
| IV | dBm/3.84 MHz | -111.3 | -101 | Minimum |
| I-1-V-2  I-2-V-1 | I | I | dBm/3.84 MHz | -112.3 | -102 | Minimum |
| V | dBm/3.84 MHz | -110.3 | -100 | Minimum |
| I | V | dBm/3.84 MHz | -112.3 | -102 | Minimum |
| V | dBm/3.84 MHz | -110.3 | -100 | Minimum |
| II-1-V-2 | II | II | dBm/3.84 MHz | -110.3 | -100 | Minimum |
| V | dBm/3.84 MHz | -110.3 | -100 | Minimum |
| II | V | dBm/3.84 MHz | -110.3 | -100 | Minimum |
| V | dBm/3.84 MHz | -110.3 | -100 | Minimum |
| I-1-XXXII-2  I-2-XXXII-1 | I | I | dBm/3.84 MHz | -113 | -102 | Minimum |
| XXXII | dBm/3.84 MHz | -113 | -102 | Minimum |
| NOTE 1 For Power class 3, 3bis and 4, this shall be at the maximum output power | | | | | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.3 Maximum Input Level

### 6.3.1 Definition and applicability

This is defined as the maximum mean power received at the UE antenna port, which shall not degrade the specified BER performance.

The requirements and this test apply to all types of UTRA for the FDD UE.

### 6.3.2 Minimum requirements

The BER shall not exceed 0.001 for the parameters specified in table 6.3.2.

The reference for this requirement is TS 25.101 [1] clause 7.4.1.

NOTE: Since the spreading factor is large (10log(SF)=21dB), the majority of the total input signal consists of the OCNS interference. The structure of OCNS signal is defined in clause E.3.3.

### 6.3.3 Test purpose

To verify that the UE BER shall not exceed 0,001 for the parameters specified in table 6.3.3.

An inadequate maximum input level causes loss of coverage near the Node B

### 6.3.4 Method of test

6.3.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) RF parameters are set up according to table 6.3.3 and table E.3.3.

3) A call is set up according to the Generic call setup procedure specified in TS34.108[3] sub clause 7.3.2, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

4) Enter the UE into loopback test mode and start the loopback test.

Table 6.3.1 Contents of RADIO BEARER SETUP message: AM or UM

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

Table 6.3.2: Test parameters for Maximum Input Level

|  |  |  |
| --- | --- | --- |
| Parameter | Level / Status | Unit |
| Îor | -25 | dBm / 3,84MHz |
|  | -19 | dB |
| UE transmitted mean power | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | dBm |

6.3.4.2 Procedure

1) Set the power level of UE according to the table 6.3.3 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

2) Measure the BER of DCH received from the UE at the SS.

### 6.3.5 Test requirements

The measured BER, derived in step 1), shall not exceed 0,001.

Table 6.3.3: Test requirements for Maximum Input Level

|  |  |  |
| --- | --- | --- |
| Parameter | Level / Status | Unit |
| Îor | -25.7 | dBm / 3,84MHz |
|  | -19 | dB |
| UE transmitted mean power | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | dBm |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.3A Maximum Input Level for HS-PDSCH Reception (16QAM)

### 6.3A.1 Definition and applicability

Maximum input level for HS-PDSCH reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified HSDPA throughput performance. The requirements and this test apply to all types of UTRA FDD UE that support HSDPA (16QAM).

### 6.3A.2 Minimum requirements

The requirements are specified in terms of a minimum information bit throughput R for the DL reference channel H-Set 1 (16QAM version) specified in Annex C.8.1.1 with the addition of the parameters in Table 6.3A.1 and the downlink physical channel setup according to table E.5.1.

Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3A.2.

The reference for this requirement is TS 25.101 [1] clause 7.4.2.

Table 6.3A.1 Minimum requirement parameters for 16QAM Maximum Input Level

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Îor | dBm/3.84 MHz | -25 \* |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| NOTE: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI. | | |

Table 6.3A.2 Minimum throughput requirement

|  |  |
| --- | --- |
| HS-PDSCH (dB) | T-put  (kbps) |
| -3 | 700 |

### 6.3A.3 Test purpose

To verify that the UE HSDPA throughput meets the minimum requirements specified in table 6.3A.2 for the DL reference channel H-Set 1 specified in Annex C.8.1.1 with the addition of the parameters specified in table 6.3A.4.

An inadequate maximum input level causes loss of coverage near the Node B.

### 6.3A.4 Method of test

6.3A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3A.4 and table E.5.1.

Table 6.3A.3 Contents of RADIO BEARER SETUP message: AM or UM

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |

6.3A.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.1.

1) The UE is switched on.

2) An RRC connection is set-up according to the generic HSDPA set-up procedure with looping back 12.2kbps RMC specified in TS 34.108 [3] clause 7.3.6. Additional radio bearer message definition is in table 6.3A.3

3) Set the power level of UE according to the table 6.3A.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

4) Measure the HS-PDSCH throughput *R* received by the UE by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize\*number of blocks acknowledged/time).

5) The UE is switched off.

### 6.3A.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 700Kbit/second. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1.

Table 6.3A.4: Test requirement parameters for 16QAM Maximum Input Level

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Îor | dBm/3.84 MHz | -25.7 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| NOTE: The HS-SCCH and corresponding HS-DSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI. | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.3B Maximum Input Level for HS-PDSCH Reception (64QAM)

### 6.3B.1 Definition and applicability

Maximum input level for HS-PDSCH reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified HSDPA throughput performance. The requirements and this test apply for Release 7 and later releases to all types of UTRA FDD UE that support HSDPA (64QAM).

### 6.3B.2 Minimum requirements

The requirements are specified in terms of a minimum information bit throughput R for the DL reference channel H-Set 8 (64QAM version) specified in Annex C.8.1.8 with the addition of the parameters in Table 6.3B.1 and the downlink physical channel setup according to table E.5.1A.

Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3B.2.

The reference for this requirement is TS 25.101 [1] clause 7.4.2.

Table 6.3B.1 Minimum requirement parameters for 64QAM Maximum Input Level

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Îor | dBm/3.84 MHz | -25 |
| UE transmitted mean power | dBm | 0 |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| NOTE: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI. | | |

Table 6.3B.2 Minimum throughput requirement

|  |  |
| --- | --- |
| HS-PDSCH  (dB) | T-put  (kbps) |
| -2 | 11800 |

### 6.3B.3 Test purpose

To verify that the UE HSDPA throughput meets the minimum requirements specified in table 6.3B.2 for the DL reference channel H-Set 8 specified in Annex C.8.1.8 with the addition of the parameters specified in table 6.3B.4.

An inadequate maximum input level causes loss of coverage near the Node B.

### 6.3B.4 Method of test

6.3B.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3B.4 and table E.5.1A.

Contents of RRC CONNECTION SETUP message: UM (Transition to CELL\_DCH)

Table 6.3B.3 Specific Message Contents for 64QAM Maximum Input Level

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Downlink information for per radio links list |  |  |
| - Downlink information for each radio links |  |  |
| - Downlink DPCH info for each RL |  |  |
| - DL channelisation code |  |  |
| - Code number | 14 |  |

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink information per radio link list |  |  |
| - Downlink information for each radio link |  |  |
| - Downlink DPCH info for each RL |  |  |
| - DL channelisation code |  |  |
| - Code number | 7 |  |

Contents of RADIO BEARER SETUP message: AM or UM (HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| RAB information for setup list |  |  |
| - RAB information for setup |  |  |
| - RB mapping info |  |  |
| - Downlink RLC logical channel info |  |  |
| - Downlink transport channel type | HS-DSCH |  |
| - CHOICE DL MAC header type | MAC-ehs | Rel-7 |
| - DL HS-DSCH MAC-ehs Queue Id | 0 | Rel-7 |
| - Logical channel identity | 1 |  |
| Added or Reconfigured DL TrCH information list | 1 TrCHs added |  |
| - Added or Reconfigured DL TrCH information |  |  |
| - CHOICE DL parameters | HS-DSCH |  |
| - CHOICE DL MAC header type | MAC-ehs | Rel-7 |
| - Added or reconfigured MAC-ehs reordering queue |  | Rel-7 |
| - MAC-ehs queue to add or reconfigure list | (one queue) | Rel-7 |
| - MAC-ehs queue Id | 0 | Rel-7 |
| - T1 | 50 | Rel-7 |
| - Treset | Not Present | Rel-7 |
| - MAC-ehs window size | 16 | Rel-7 |
| Uplink DPCH info |  | Rel-6 |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink HS-PDSCH Information |  |  |
| - HS-SCCH Info |  |  |
| - CHOICE mode | FDD |  |
| - DL Scrambling Code |  |  |
| - HS-SCCH Channelisation Code Information |  |  |
| - HS-SCCH Channelisation Code | 2 |  |
| - HS-SCCH Channelisation Code | 3 |  |
| - CHOICE mode | FDD |  |
| - Downlink 64QAM configured | TRUE | Rel-7 |
| Downlink information per radio link list |  |  |
| - Downlink information for each radio link |  |  |
| - Downlink DPCH info for each RL |  |  |
| - DL channelisation code |  |  |
| - Code number | 7 |  |

6.3B.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.1.

1) The UE is switched on.

2) An RRC connection is set-up according to the generic HSDPA set-up procedure with looping back 12.2kbps RMC specified in TS 34.108 [3] clause 7.3.6, with the exceptions for information elements listed in table 6.3B.3

3) Set the power level of UE according to the table 6.3B.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

4) Measure the HS-PDSCH throughput *R* received by the UE by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize\*number of blocks acknowledged/time).

5) The UE is switched off.

### 6.3B.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 11800Kbit/second. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1A.

Table 6.3B.4: Test requirement parameters for 64QAM Maximum Input Level

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Îor | dBm/3.84 MHz | -25.7 |
| UE transmitted mean power | dBm | 0 |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| NOTE: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.3C Maximum Input Level for DC-HSDPA Reception (16QAM)

### 6.3C.1 Definition and applicability

Maximum input level for DC-HSDPA reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified DC-HSDPA throughput performance.

The requirements and this test apply for Release 8 and later releases to all types of UTRA for the FDD UE that support DC-HSDPA with 16QAM.

### 6.3C.2 Minimum requirements

The additional DC-HSDPA requirements are specified in terms of a minimum information throughput per cell R with the DL reference channel H-Set 1 (16QAM version) specified in Annex C.8.1.1, with the addition of the parameters in Table 6.3C.1, and the downlink physical channel setup according to table E.5.1, applied to both cells simultaneously. Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3C.2.

Table 6.3C.1 Minimum requirement parameters for 16QAM Maximum Input Level (DC-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Îor | dBm/3.84 MHz | -25 \* |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| NOTE: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI. | | |

Table 6.3C.2 Minimum throughput requirement (DC-HSDPA)

|  |  |
| --- | --- |
| HS-PDSCH (dB) | T-put  (kbps) |
| -3 | 700 |

The reference for this requirement is TS 25.101 [1] clause 7.4.3.1

### 6.3C.3 Test purpose

To verify that the UE DC-HSDPA throughput meets the minimum requirements specified in table 6.3C.2 for the DL reference channel H-Set 1 specified in Annex C.8.1.1 with the addition of the parameters specified in table 6.3C.4.

An inadequate maximum input level causes loss of DC-HSDPA coverage near the Node B.

### 6.3C.4 Method of test

6.3C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3C.4 and table E.5.1.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.3C.3: Specific Message Contents for 16QAM Maximum Input Level (DC-HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

6.3C.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.30.

1) The UE is switched on.

2) An RRC connection is set-up according to the generic HSDPA set-up procedure specified in TS 34.108 [3] clause 7.3.13 with exceptions for information elements listed in table 6.3C.3

3) Set the power level of UE according to the table 6.3C.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

4) Measure the HS-PDSCH throughput *R* received by the UE on each individual cell by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize\*number of blocks acknowledged/time).

5) The UE is switched off.

### 6.3C.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 700Kbit/second on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1.

Table 6.3C.4: Test requirement parameters for 16QAM Maximum Input Level (DC-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Îor | dBm/3.84 MHz | -25.7 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| NOTE: The HS-SCCH and corresponding HS-DSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI. | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.3D Maximum Input Level for DC-HSDPA Reception (64QAM)

### 6.3D.1 Definition and applicability

Maximum input level for DC-HSDPA reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified DC-HSDPA throughput performance.

The requirements and this test apply for Release 8 and later releases to all types of UTRA for the FDD UE that support DC-HSDPA with 64QAM.

### 6.3D.2 Minimum requirements

The additional DC-HSDPA requirements are specified in terms of a minimum information throughput per cell R with the DL reference channel H-Set 8A specified in Annex C.8.1.8, with the addition of the parameters in Table 6.3D.1, and the downlink physical channel setup according to table E.5.1, applied to both cells simultaneously. Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3D.2.

Table 6.3D.1: Minimum requirement parameters for 64QAM Maximum Input Level (DC-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Îor | dBm/3.84 MHz | -25 \* |
| UE transmitted mean power | dBm | 0 |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| NOTE: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI. | | |

Table 6.3D.2: Minimum throughput requirement (DC-HSDPA)

|  |  |
| --- | --- |
| HS-PDSCH (dB) | T-put  (kbps) |
| -2 | 11800 |

The reference for this requirement is TS 25.101 [1] clause 7.4.3.2.

### 6.3D.3 Test purpose

To verify that the UE DC-HSDPA throughput meets the minimum requirements specified in table 6.3D.2 for the DL reference channel H-Set 8A specified in Annex C.8.1.8 with the addition of the parameters specified in table 6.3D.4.

An inadequate maximum input level causes loss of DC-HSDPA coverage near the Node B.

### 6.3D.4 Method of test

6.3D.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3D.4 and table E.5.1.

Contents of RRC CONNECTION SETUP message: UM (Transition to CELL\_DCH)

Table 6.3D.3: Specific Message Contents for 64QAM Maximum Input Level (DC-HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Downlink information for per radio links list |  |  |
| -Downlink information for each radio links |  |  |
| - Downlink DPCH info for each RL |  |  |
| - DL channelisation code |  |  |
| - Code number | 14 |  |

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink information per radio link list |  |  |
| - Downlink information for each radio link |  |  |
| - Downlink DPCH info for each RL |  |  |
| - DL channelisation code |  |  |
| - Code number | 7 |  |

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink HS-PDSCH Information |  |  |
| - CHOICE mode | FDD |  |
| - Downlink 64QAM configured | TRUE (for H-Set 8A) | Rel-7 |
| - HS-DSCH TB size table | Not Present | Rel-7 |
| Downlink information per radio link list |  |  |
| - Downlink information for each radio link |  |  |
| - Downlink DPCH info for each RL |  |  |
| - DL channelisation code |  |  |
| - Code number | 7 |  |
| Downlink secondary cell info FDD |  | Rel-8 |
| - CHOICE Configuration info | New configuration |  |
| - Downlink 64QAM configured | TRUE (for H-Set 8A) |  |
| - HS-DSCH TB size table | Not Present |  |

6.3D.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.30.

1) The UE is switched on.

2) An RRC connection is set-up according to the generic HSDPA set-up procedure specified in TS 34.108 [3] clause 7.3.13with exceptions for information elements listed in table 6.3D.3

3) Set the power level of UE according to the table 6.3D.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

4) Measure the HS-PDSCH throughput *R* received by the UE on each individual cell by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize\*number of blocks acknowledged/time).

5) The UE is switched off.

### 6.3D.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 11800 Kbit/second on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1A.

Table 6.3D.4: Test requirement parameters for 64QAM Maximum Input Level (DC-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Îor | dBm/3.84 MHz | -25.7 |
| UE transmitted mean power | dBm | 0 |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| NOTE: The HS-SCCH and corresponding HS-DSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI. | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.3E Maximum Input Level for DB-DC-HSDPA Reception (16QAM)

### 6.3E.1 Definition and applicability

Maximum input level for DB-DC-HSDPA reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified DB-DC-HSDPA throughput performance.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support DB-DC-HSDPA with 16QAM.

DB-DC-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.3E.2 Minimum requirements

The additional DB-DC-HSDPA requirements are specified in terms of a minimum information throughput per cell R with the DL reference channel H-Set 1 (16QAM version) specified in Annex C.8.1.1, with the addition of the parameters in Table 6.3E.1, and the downlink physical channel setup according to table E.5.1, applied to both cells simultaneously. Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3E.2.

Table 6.3E.1: Minimum requirement parameters for 16QAM Maximum Input Level (DB-DC-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Îor | dBm/3.84 MHz | -25 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| NOTE: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI. | | |

Table 6.3E.2: Minimum throughput requirement (DB-DC-HSDPA)

|  |  |
| --- | --- |
| HS-PDSCH (dB) | T-put  (kbps) |
| -3 | 700 |

The reference for this requirement is TS 25.101 [1] clause 7.4.3.1

### 6.3E.3 Test purpose

To verify that the UE DB-DC-HSDPA throughput meets the minimum requirements specified in table 6.3E.2 for the DL reference channel H-Set 1 specified in Annex C.8.1.1 with the addition of the parameters specified in table 6.3E.4.

An inadequate maximum input level causes loss of DB-DC-HSDPA coverage near the Node B.

### 6.3E.4 Method of test

6.3E.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3E.4 and table E.5.1.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.3E.3: Specific Message Contents for 16QAM Maximum Input Level (DC-HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

6.3E.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.30.

1) The UE is switched on.

2) An RRC connection is set-up according to the generic HSDPA set-up procedure specified in TS 34.108 [3] clause 7.3.13 with exceptions for information elements listed in table 6.3E.3

3) Set the power level of UE according to the table 6.3E.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

4) Measure the HS-PDSCH throughput *R* received by the UE on each individual cell by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize\*number of blocks acknowledged/time).

5) The UE is switched off.

### 6.3E.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 700Kbit/second on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1.

Table 6.3E.4: Test requirement parameters for 16QAM Maximum Input Level (DB-DC-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Îor | dBm/3.84 MHz | -25.7 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| NOTE: The HS-SCCH and corresponding HS-DSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI. | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.3F Maximum Input Level for DB-DC-HSDPA Reception (64QAM)

### 6.3F.1 Definition and applicability

Maximum input level for DB-DC-HSDPA reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified DB-DC-HSDPA throughput performance.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support DB-DC-HSDPA with 64QAM.

DB-DC-HSDPA is designed to operate in configurations, specified in clause 4.2

### 6.3F.2 Minimum requirements

The additional DB-DC-HSDPA requirements are specified in terms of a minimum information throughput per cell R with the DL reference channel H-Set 8A specified in Annex C.8.1.8, with the addition of the parameters in Table 6.3F.1, and the downlink physical channel setup according to table E.5.1, applied to both cells simultaneously. Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3F.2.

Table 6.3F.1: Minimum requirement parameters for 64QAM Maximum Input Level (DB-DC-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Îor | dBm/3.84 MHz | -25 |
| UE transmitted mean power | dBm | 0 |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| NOTE: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI. | | |

Table 6.3F.2: Minimum throughput requirement (DB-DC-HSDPA)

|  |  |
| --- | --- |
| HS-PDSCH (dB) | T-put  (kbps) |
| -2 | 11800 |

The reference for this requirement is TS 25.101 [1] clause 7.4.3.2.

### 6.3F.3 Test purpose

To verify that the UE DB-DC-HSDPA throughput meets the minimum requirements specified in table 6.3F.2 for the DL reference channel H-Set 8A specified in Annex C.8.1.8 with the addition of the parameters specified in table 6.3F.4.

An inadequate maximum input level causes loss of DB-DC-HSDPA coverage near the Node B.

### 6.3F.4 Method of test

6.3F.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3F.4 and table E.5.1.

Contents of RRC CONNECTION SETUP message: UM (Transition to CELL\_DCH)

Table 6.3F.3: Specific Message Contents for 64QAM Maximum Input Level (DB-DC-HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Downlink information for per radio links list |  |  |
| -Downlink information for each radio links |  |  |
| - Downlink DPCH info for each RL |  |  |
| - DL channelisation code |  |  |
| - Code number | 14 |  |

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink information per radio link list |  |  |
| - Downlink information for each radio link |  |  |
| - Downlink DPCH info for each RL |  |  |
| - DL channelisation code |  |  |
| - Code number | 7 |  |

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink HS-PDSCH Information |  |  |
| - CHOICE mode | FDD |  |
| - Downlink 64QAM configured | TRUE (for H-Set 8A) | Rel-7 |
| - HS-DSCH TB size table | Not Present | Rel-7 |
| Downlink information per radio link list |  |  |
| - Downlink information for each radio link |  |  |
| - Downlink DPCH info for each RL |  |  |
| - DL channelisation code |  |  |
| - Code number | 7 |  |
| Downlink secondary cell info FDD |  | Rel-8 |
| - CHOICE Configuration info | New configuration |  |
| - Downlink 64QAM configured | TRUE (for H-Set 8A) |  |
| - HS-DSCH TB size table | Not Present |  |

6.3F.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.30.

1) The UE is switched on.

2) An RRC connection is set-up according to the generic HSDPA set-up procedure specified in TS 34.108 [3] clause 7.3.13 with exceptions for information elements listed in table 6.3F.3

3) Set the power level of UE according to the table 6.3F.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

4) Measure the HS-PDSCH throughput *R* received by the UE on each individual cell by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize\*number of blocks acknowledged/time).

5) The UE is switched off.

### 6.3F.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 11800 Kbit/second on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1A.

Table 6.3F.4: Test requirement parameters for 64QAM Maximum Input Level (DB-DC-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Îor | dBm/3.84 MHz | -25.7 |
| UE transmitted mean power | dBm | 0 |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| NOTE: The HS-SCCH and corresponding HS-DSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI. | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.3G Maximum Input Level for 4C-HSDPA Reception (16QAM)

### 6.3G.1 Definition and applicability

Maximum input level for 4C-HSDPA reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified 4C-HSDPA throughput performance.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support Single band/Dual band 4C-HSDPA with 16QAM and HS-DSCH categories 31 or 32.

Single band/Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.3G.2 Minimum requirements

The additional 4C-HSDPA requirements are specified in terms of a minimum information throughput per cell R with the DL reference channel H-Set 1C (16QAM version) specified in Annex C.8.1.1, with the addition of the parameters in Table 6.3G.1, and the downlink physical channel setup according to table E.5.1, applied to all the cells simultaneously. Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3G.2.

Table 6.3G.1: Minimum requirement parameters for 16QAM Maximum Input Level (4C-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Wanted signal mean power per band (dBm) | dBm/band | -22 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| Note 1: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI  Note 2: Wanted signal mean power per band is the sum of measured mean power on each carrier in a band over 3.84 MHz. | | |

Table 6.3G.2: Minimum throughput requirement (4C-HSDPA)

|  |  |
| --- | --- |
| HS-PDSCH (dB) | T-put  (kbps) |
| -3 | 700 |

The reference for this requirement is TS 25.101 [1] clause 7.4.4.1

### 6.3G.3 Test purpose

To verify that the UE DC-HSDPA throughput meets the minimum requirements specified in table 6.3G.2 for the DL reference channel H-Set 1C specified in Annex C.8.1.1 with the addition of the parameters specified in table 6.3G.4.

An inadequate maximum input level causes loss of 4C-HSDPA coverage near the Node B.

This test case tests only 4 carrier configurations.

### 6.3G.4 Method of test

6.3G.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3G.4 and table E.5.1.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.3G.3: Specific Message Contents for 16QAM Maximum Input Level (4C-HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

6.3G.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.48.

1) The UE is switched on.

2) An RRC connection is set-up according to the generic HSDPA set-up procedure specified in TS 34.108 [3] clause 7.3.16 with exceptions for information elements listed in table 6.3G.3

3) Set the power level of UE according to the table 6.3G.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

4) Measure the HS-PDSCH throughput *R* received by the UE on each individual cell by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize\*number of blocks acknowledged/time).

5) The UE is switched off.

### 6.3G.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 700Kbit/second on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1.

Table 6.3G.4: Test requirement parameters for 16QAM Maximum Input Level (4C-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Wanted signal mean power per band (dBm) | dBm/band | -22.7 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| Note 1: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI.  Note 2: Wanted signal mean power per band is the sum of measured mean power on each carrier in a band over 3.84 MHz. | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.3GA Maximum Input Level for 4C-HSDPA Reception (16QAM) (3 carrier)

### 6.3GA.1 Definition and applicability

Maximum input level for 4C-HSDPA reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified 4C-HSDPA throughput performance.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support Single band/Dual band 4C-HSDPA with 16QAM and HS-DSCH UE categories 29 to 32.

Single band/Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.3GA.2 Minimum requirements

The additional 4C-HSDPA requirements are specified in terms of a minimum information throughput per cell R with the DL reference channel H-Set 1B (16QAM version) specified in Annex C.8.1.1, with the addition of the parameters in Table 6.3GA.1, and the downlink physical channel setup according to table E.5.1, applied to all the cells simultaneously. Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3GA.2.

Table 6.3GA.1 Minimum requirement parameters for 16QAM Maximum Input Level (4C-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Wanted signal mean power per band (dBm) | dBm/band | -22 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| Note 1: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI  Note 2: Wanted signal mean power per band is the sum of measured mean power on each carrier in a band over 3.84 MHz. | | |

Table 6.3GA.2: Minimum throughput requirement (4C-HSDPA)

|  |  |
| --- | --- |
| HS-PDSCH (dB) | T-put  (kbps) |
| -3 | 700 |

The reference for this requirement is TS 25.101 [1] clause 7.4.4.1

### 6.3GA.3 Test purpose

To verify that the UE 4C-HSDPA throughput meets the minimum requirements specified in table 6.3GA.2 for the DL reference channel H-Set 1B specified in Annex C.8.1.1 with the addition of the parameters specified in table 6.3GA.4.

An inadequate maximum input level causes loss of 4C-HSDPA coverage near the Node B.

This test case tests only 3 carrier configurations.

### 6.3GA.4 Method of test

6.3GA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3GA.4 and table E.5.1.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.3GA.3: Specific Message Contents for 16QAM Maximum Input Level (4C-HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

6.3GA.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.48.

1) The UE is switched on.

2) An RRC connection is set-up according to the generic HSDPA set-up procedure specified in TS 34.108 [3] clause 7.3.16 with exceptions for information elements listed in table 6.3GA.3

3) Set the power level of UE according to the table 6.3GA.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

4) Measure the HS-PDSCH throughput *R* received by the UE on each individual cell by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize\*number of blocks acknowledged/time).

5) The UE is switched off.

### 6.3GA.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 700Kbit/second on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1.

Table 6.3GA.4: Test requirement parameters for 16QAM Maximum Input Level (4C-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Wanted signal mean power per band (dBm) | dBm/band | -22.7 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| Note 1: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI.  Note 2: Wanted signal mean power per band is the sum of measured mean power on each carrier in a band over 3.84 MHz. | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.3H Maximum Input Level for 4C-HSDPA Reception (64QAM)

### 6.3H.1 Definition and applicability

Maximum input level for DC-HSDPA reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified DC-HSDPA throughput performance.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support Single band/Dual band 4C-HSDPA with 64QAM and HS-DSCH categories 31 or 32.

Single band/Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.3H.2 Minimum requirements

The additional 4C-HSDPA requirements are specified in terms of a minimum information throughput per cell R with the DL reference channel H-Set 8C specified in Annex C.8.1.8, with the addition of the parameters in Table 6.3H.1, and the downlink physical channel setup according to table E.5.1, applied to all the cells simultaneously. Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3H.2.

Table 6.3H.1: Minimum requirement parameters for 64QAM Maximum Input Level (4C-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Wanted signal mean power per band (dBm) | dBm/band | -22 |
| UE transmitted mean power | dBm | 0 |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| Note 1: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI  Note 2: Wanted signal mean power per band is the sum of measured mean power on each carrier in a band over 3.84 MHz. | | |

Table 6.3H.2: Minimum throughput requirement (4C-HSDPA)

|  |  |
| --- | --- |
| HS-PDSCH (dB) | T-put  (kbps) |
| -2 | 11800 |

The reference for this requirement is TS 25.101 [1] clause 7.4.4.2.

### 6.3H.3 Test purpose

To verify that the UE 4C-HSDPA throughput meets the minimum requirements specified in table 6.3H.2 for the DL reference channel H-Set 8C specified in Annex C.8.1.8 with the addition of the parameters specified in table 6.3H.4.

An inadequate maximum input level causes loss of 4C-HSDPA coverage near the Node B.

This test case tests only 4 carrier configurations.

### 6.3H.4 Method of test

6.3H.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3H.4 and table E.5.1.

Contents of RRC CONNECTION SETUP message: UM (Transition to CELL\_DCH)

Table 6.3H.3: Specific Message Contents for 64QAM Maximum Input Level (4C-HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Downlink information for per radio links list |  |  |
| -Downlink information for each radio links |  |  |
| - Downlink DPCH info for each RL |  |  |
| - DL channelisation code |  |  |
| - Code number | 14 |  |

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink information per radio link list |  |  |
| - Downlink information for each radio link |  |  |
| - Downlink DPCH info for each RL |  |  |
| - DL channelisation code |  |  |
| - Code number | 7 |  |

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

| Information Element | Value/remark | Version |  |
| --- | --- | --- | --- |
| Downlink HS-PDSCH Information |  |  |  |
| - CHOICE mode | FDD |  |  |
| - Downlink 64QAM configured | TRUE | Rel-7 |  |
| Downlink information per radio link list |  |  |  |
| - Downlink information for each radio link |  |  |  |
| - Downlink DPCH info for each RL |  |  |  |
| - DL channelisation code |  |  |  |
| - Code number | 7 |  |  |
| Downlink secondary cell info FDD |  | Rel-8 | |
| - CHOICE Configuration info | New configuration |  | |
| - Downlink 64QAM configured | TRUE |  | |

6.3H.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.48.

1) The UE is switched on.

2) An RRC connection is set-up according to the generic HSDPA set-up procedure specified in TS 34.108 [3] clause 7.3.16 exceptions for information elements listed in table 6.3H.3

3) Set the power level of UE according to the table 6.3H.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

4) Measure the HS-PDSCH throughput *R* received by the UE on each individual cell by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize\*number of blocks acknowledged/time).

5) The UE is switched off.

### 6.3H.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 11800 Kbit/second on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1A.

Table 6.3H.4: Test requirement parameters for 64QAM Maximum Input Level (4C-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Wanted signal mean power per band (dBm) | dBm/band | -22.7 |
| UE transmitted mean power | dBm | 0 |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| Note 1: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI  Note 2: Wanted signal mean power per band is the sum of measured mean power on each carrier in a band over 3.84 MHz. | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.3HA Maximum Input Level for 4C-HSDPA Reception (64QAM) (3 carrier)

### 6.3HA.1 Definition and applicability

Maximum input level for 4C-HSDPA reception is defined as the maximum power received at the UE antenna port, which shall not degrade the specified 4C-HSDPA throughput performance.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support Single band/Dual band 4C-HSDPA with 64QAM and HSDPA UE capability categories 29 to 32.

Single band/Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.3HA.2 Minimum requirements

The additional 4C-HSDPA requirements are specified in terms of a minimum information throughput per cell R with the DL reference channel H-Set 8B specified in Annex C.8.1.8, with the addition of the parameters in Table 6.3HA.1, and the downlink physical channel setup according to table E.5.1, applied to all the cells simultaneously. Using this configuration the throughput shall meet or exceed the minimum requirements specified in table 6.3HA.2.

Table 6.3HA.1: Minimum requirement parameters for 64QAM Maximum Input Level (4C-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Wanted signal mean power per band (dBm) | dBm/band | -22 |
| UE transmitted mean power | dBm | 0 |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| Note 1: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI  Note 2: Wanted signal mean power per band is the sum of measured mean power on each carrier in a band over 3.84 MHz. | | |

Table 6.3HA.2: Minimum throughput requirement (4C-HSDPA)

|  |  |
| --- | --- |
| HS-PDSCH (dB) | T-put  (kbps) |
| -2 | 11800 |

The reference for this requirement is TS 25.101 [1] clause 7.4.4.2.

### 6.3HA.3 Test purpose

To verify that the UE 4C-HSDPA throughput meets the minimum requirements specified in table 6.3HA.2 for the DL reference channel H-Set 8B specified in Annex C.8.1.8 with the addition of the parameters specified in table 6.3HA.4.

An inadequate maximum input level causes loss of 4C-HSDPA coverage near the Node B.

This test case tests only 3 carrier configurations.

### 6.3HA.4 Method of test

6.3HA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

RF parameters are given in tables 6.3HA.4 and table E.5.1.

Contents of RRC CONNECTION SETUP message: UM (Transition to CELL\_DCH)

Table 6.3HA.3: Specific Message Contents for 64QAM Maximum Input Level (4C-HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Downlink information for per radio links list |  |  |
| -Downlink information for each radio links |  |  |
| - Downlink DPCH info for each RL |  |  |
| - DL channelisation code |  |  |
| - Code number | 14 |  |

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink information per radio link list |  |  |
| - Downlink information for each radio link |  |  |
| - Downlink DPCH info for each RL |  |  |
| - DL channelisation code |  |  |
| - Code number | 7 |  |

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

| Information Element | Value/remark | Version |  |
| --- | --- | --- | --- |
| Downlink HS-PDSCH Information |  |  |  |
| - CHOICE mode | FDD |  |  |
| - Downlink 64QAM configured | TRUE | Rel-7 |  |
| Downlink information per radio link list |  |  |  |
| - Downlink information for each radio link |  |  |  |
| - Downlink DPCH info for each RL |  |  |  |
| - DL channelisation code |  |  |  |
| - Code number | 7 |  |  |
| Downlink secondary cell info FDD |  | Rel-8 | |
| - CHOICE Configuration info | New configuration |  | |
| - Downlink 64QAM configured | TRUE |  | |

6.3HA.4.2 Procedure

Connect the SS to the UE antenna connector as shown in figure A.48.

1) The UE is switched on.

2) An RRC connection is set-up according to the generic HSDPA set-up procedure specified in TS 34.108 [3] clause 7.3.16 exceptions for information elements listed in table 6.3HA.3

3) Set the power level of UE according to the table 6.3HA.4 and send power control commands to the UE .The UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

4) Measure the HS-PDSCH throughput *R* received by the UE on each individual cell by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (Throughput = blocksize\*number of blocks acknowledged/time).

5) The UE is switched off.

### 6.3HA.5 Test requirements

The measured throughput, as derived in step 4), shall meet or exceed 11800 Kbit/second on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.1A.

Table 6.3HA.4: Test requirement parameters for 64QAM Maximum Input Level (4C-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Phase reference |  | P-CPICH |
| Wanted signal mean power per band (dBm) | dBm/band | -22.7 |
| UE transmitted mean power | dBm | 0 |
| DPCH\_Ec/Ior | dB | -13 |
| HS-SCCH\_1\_Ec/Ior | dB | -13 |
| Redundancy and constellation version |  | 6 |
| Maximum number of HARQ transmissions |  | 1 |
| Note 1: The HS-SCCH and corresponding HS-PDSCH shall be transmitted continuously with constant power but the HS-SCCH shall only use the identity of the UE under test every third TTI  Note 2: Wanted signal mean power per band is the sum of measured mean power on each carrier in a band over 3.84 MHz. | | |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.4 Adjacent Channel Selectivity (ACS) (Rel-99 and Rel-4)

### 6.4.1 Definition and applicability

Adjacent Channel Selectivity (ACS) is a measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the ratio of the receive filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

The requirements and this test apply to all types of UTRA for the FDD UE for Release 99 and Release 4.

### 6.4.2 Minimum Requirements

For the UE of power class 3 and 4, the BER shall not exceed 0,001 for the parameters specified in table 6.4.1. This test condition is equivalent to the ACS value 33 dB.

Table 6.4.1: Test parameters for Adjacent Channel Selectivity for Release 99 and Release 4.

|  |  |  |
| --- | --- | --- |
| Parameter | Level / Status | Unit |
| DPCH\_Ec | -103 | dBm / 3,84 MHz |
| Îor | -92,7 | dBm / 3,84 MHz |
| Ioac mean power (modulated) | -52 | dBm |
| Fuw (offset) | -5 or +5 | MHz |
| UE transmitted mean power | 20 (for Power class 3)  18 (for Power class 4) | dBm |

The normative reference for these requirements is TS 25.101 [1] clause 7.5.1.

NOTE: The Ioac (modulated) signal consists of the common channels needed for tests as specified in table E.4.1 and 16 dedicated data channels as specified in table E.3.6.

### 6.4.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the test parameters specified in table 6.4.2.

The lack of the ACS decreases the coverage area when other transmitter exists in the adjacent channel.

### 6.4.4 Method of test

6.4.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.4.

2) RF parameters are set up according to table 6.4.2.

3) A call is set up according to the Generic call setup procedure specified in TS34.108[3] sub clause 7.3.2, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

4) Enter the UE into loopback test mode and start the loopback test.

Table 6.4.1A Contents of RADIO BEARER SETUP message: AM or UM

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.4.4.2 Procedure

1) Set the parameters of the interference signal generator as shown in table 6.4.2.

2) Set the power level of UE according to the table 6.4.2 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BER of DCH received from the UE at the SS.

### 6.4.5 Test requirements

The measured BER, derived in step 1), shall not exceed 0,001.

Table 6.4.2: Test parameters for Adjacent Channel Selectivity for Release 99 and Release 4.

|  |  |  |
| --- | --- | --- |
| Parameter | Level / Status | Unit |
| DPCH\_Ec | -103 | dBm / 3,84 MHz |
| Îor | -92,7 | dBm / 3,84 MHz |
| Ioac mean power (modulated) | -52 | dBm |
| Fuw (offset) | -5 or +5 | MHz |
| UE transmitted mean power | 20 (for Power class 3)  18 (for Power class 4) | dBm |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.4A Adjacent Channel Selectivity (ACS) (Rel-5 and later releases)

### 6.4A.1 Definition and applicability

Adjacent Channel Selectivity (ACS) is a measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the ratio of the receive filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

The requirements and this test apply to all types of UTRA for the FDD UE for Release 5 and later releases.

### 6.4A.2 Minimum Requirements

For the UE of power class 3, 3bis and 4, the BER shall not exceed 0,001 for the parameters specified in table 6.4A.1. This test condition is equivalent to the ACS value 33 dB.

Table 6.4A.1: Test parameters for Adjacent Channel Selectivity for release 5 and later releases

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Case 1 | Case 2 |
| DPCH\_Ec | dBm/3.84 MHz | <REFSENS> + 14 dB | <REFSENS> + 41 dB |
| Îor | dBm/3.84 MHz | <REFÎor> + 14 dB | <REFÎor> + 41 dB |
| Ioac mean power (modulated) | dBm | -52 | -25 |
| Fuw (offset) | MHz | +5 or -5 | +5 or -5 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |

The normative reference for these requirements is TS 25.101 [1] clause 7.5.1.

NOTE 1: The Ioac (modulated) signal consists of the common channels needed for tests as specified in table E.4.1 and 16 dedicated data channels as specified in table E.3.6.

NOTE 2: <REFSENS> and <REFÎor> refers to the DPCH\_Ec<REFSENS> and the DPCH<REFÎor> as specified in Table 6.2.1.

### 6.4A.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the test parameters specified in table 6.4A.2.

The lack of the ACS decreases the coverage area when other transmitter exists in the adjacent channel.

### 6.4A.4 Method of test

6.4A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.4.

2) RF parameters are set up according to table 6.4A.2.

3) A call is set up according to the Generic call setup procedure specified in TS34.108[3] sub clause 7.3.2, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

4) Enter the UE into loopback test mode and start the loopback test.

Table 6.4A.1A: Contents of RADIO BEARER SETUP message: AM or UM

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.4A.4.2 Procedure

1) Set the parameters of the interference signal generator as shown in table 6.4A.2 case 1.

2) Set the power level of UE according to the table 6.4A.2 case 1 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BER of DCH received from the UE at the SS.

4) Set the parameters of the interference signal generator as shown in table 6.4A.2 case 2.

5) Set the power level of UE according to the table 6.4A.2 case 2 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

6) Measure the BER of DCH received from the UE at the SS.

### 6.4A.5 Test requirements

The measured BER, derived in step 1) and step 6), shall not exceed 0,001.

Table 6.4A.2: Test parameters for Adjacent Channel Selectivity for Release 5 and later releases

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Case 1 | Case 2 |
| DPCH\_Ec | dBm/3.84 MHz | <REFSENS> + 14 dB | <REFSENS> + 41 dB |
| Îor | dBm/3.84 MHz | <REFÎor> + 14 dB | <REFÎor> + 41 dB |
| Ioac mean power (modulated) | dBm | -52 | -25 |
| Fuw (offset) | MHz | +5 or -5 | +5 or -5 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |

NOTE: 1 The Ioac (modulated) signal consists of the common channels needed for tests as specified in table E.4.1 and 16 dedicated data channels as specified in table E.3.6.

NOTE 2: <REFSENS> and <REFÎor> refers to the DPCH\_Ec<REFSENS> and the DPCH<REFÎor> as specified in Table 6.2.1.

NOTE 3: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.4B Adjacent Channel Selectivity (ACS) for DC-HSDPA

### 6.4B.1 Definition and applicability

Adjacent Channel Selectivity (ACS) is a measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the ratio of the receive filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

The requirements and this test apply for Release 8 and later releases to all types of UTRA for the FDD UE that support DC-HSDPA.

### 6.4B.2 Minimum Requirements

The UE shall fulfil the additional requirement specified in Table 6.4B.1 for all values of an adjacent channel interferer up to -25 dBm.

However it is not possible to directly measure the ACS, instead the lower and upper range of test parameters are chosen in Table 6.4.B.2, where the HS-PDSCH BLER shall not exceed 0.1.

Table 6.4B.1: Adjacent Channel Selectivity

|  |  |  |
| --- | --- | --- |
| Power Class | Unit | ACS |
| 3 | dB | 33 |
| 4 | dB | 33 |

Table 6.4B.2: Test parameters for Adjacent Channel Selectivity (DC-HSDPA)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Case 1 | Case 2 |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS> + 14 dB | <REFSENS> + 41 dB |
| Îor | dBm/3.84 MHz | <REFÎor> + 14 dB | <REFÎor> + 41 dB |
| Ioac mean power (modulated) | dBm | -52 | -25 |
| Fuw (offset)  (note 2) | MHz | +5 or -5 | +5 or -5 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |

NOTE 1: The Ioac (modulated) signal consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 3: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2A.1.

The normative reference for these requirements is TS 25.101 [1] clause 7.5.2.

### 6.4B.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the test parameters specified in table 6.4B.4 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the ACS decreases the DC-HSDPA coverage area when other transmitter exists in the adjacent channel.

### 6.4B.4 Method of test

6.4B.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.31.

2) RF parameters are set up according to table 6.4B.2.

3) A call is set up according to the Generic DC-HSDPA setup procedure specified in TS34.108[3] sub clause 7.3.13, with exceptions for information elements listed in Table 6.4B.3. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.4B.3: Specific Message Contents for Adjacent Channel Selectivity (DC-HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink HS-PDSCH Information |  |  |
| - CHOICE mode | FDD |  |
| - Downlink 64QAM configured | Not Present | Rel-7 |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) | Rel-7 |
| Downlink secondary cell info FDD |  | Rel-8 |
| - CHOICE Configuration info | New configuration |  |
| - Downlink 64QAM configured | Not Present |  |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) |  |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.4B.4.2 Procedure

1) Set the parameters of the interference signal generator as shown in table 6.4B.4 case 1.

2) Set the power level of UE according to the table 6.4B.4 case 1 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

4) Set the parameters of the interference signal generator as shown in table 6.4B.4 case 2.

5) Set the power level of UE according to the table 6.4B.4 case 2 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

6) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

### 6.4B.5 Test requirements

The measured BLER, derived in step 1) and step 6), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.4B.4: Test parameters for Adjacent Channel Selectivity (DC-HSDPA)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Case 1 | Case 2 |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS> + 14 dB | <REFSENS> + 41 dB |
| Îor | dBm/3.84 MHz | <REFÎor> + 14 dB | <REFÎor> + 41 dB |
| Ioac mean power (modulated) | dBm | -52 | -25 |
| Fuw (offset) | MHz | +5 or -5 | +5 or -5 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |

NOTE 1: The Ioac (modulated) signal consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 3: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2A.1.

NOTE 4: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.4C Adjacent Channel Selectivity (ACS) for DB-DC-HSDPA

### 6.4C.1 Definition and applicability

Adjacent Channel Selectivity (ACS) is a measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the ratio of the receive filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support DB-DC-HSDPA.

DB-DC-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.4C.2 Minimum Requirements

The UE shall fulfil the additional requirement specified in Table 6.4C.1 for all values of an adjacent channel interferer up to -25 dBm.

However it is not possible to directly measure the ACS, instead the lower and upper range of test parameters are chosen in Table 6.4.B.2, where the HS-PDSCH BLER shall not exceed 0.1.

Table 6.4C.1: Adjacent Channel Selectivity

|  |  |  |
| --- | --- | --- |
| Power Class | Unit | ACS |
| 3 | dB | 33 |
| 4 | dB | 33 |

Table 6.4C.2: Test parameters for Adjacent Channel Selectivity (DB-DC-HSDPA)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Case 1 | Case 2 |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS> + 14 dB | <REFSENS> + 41 dB |
| Îor | dBm/3.84 MHz | <REFÎor> + 14 dB | <REFÎor> + 41 dB |
| Ioac mean power (modulated) | dBm | -52 | -25 |
| Fuw (offset)  (note 2) | MHz | +5 or -5 | +5 or -5 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |

NOTE 1: The Ioac (modulated) signal consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For DC-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency used and positive offset refers to the assigned channel frequency of the highest carrier frequency used. For DB-DC-HSDPA, offset refers to the assigned channel frequencies of the individual cells.

NOTE 3: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2B.1.

The normative reference for these requirements is TS 25.101 [1] clause 7.5.2.

### 6.4C.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the test parameters specified in table 6.4C.4 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the ACS decreases the DB-DC-HSDPA coverage area when other transmitter exists in the adjacent channel.

### 6.4C.4 Method of test

6.4C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.31.

2) RF parameters are set up according to table 6.4C.2.

3) A call is set up according to the Generic call setup procedure specified in TS34.108[3] sub clause 7.3.13, with exceptions for information elements listed in Table 6.4C.3. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.4C.3: Specific Message Contents for Adjacent Channel Selectivity (DB-DC-HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink HS-PDSCH Information |  |  |
| - CHOICE mode | FDD |  |
| - Downlink 64QAM configured | Not Present | Rel-7 |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) | Rel-7 |
| Downlink secondary cell info FDD |  | Rel-8 |
| - CHOICE Configuration info | New configuration |  |
| - Downlink 64QAM configured | Not Present |  |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) |  |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.4C.4.2 Procedure

1) Set the parameters of the interference signal generator as shown in table 6.4C.4 case 1.

2) Set the power level of UE according to the table 6.4C.4 case 1 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

4) Set the parameters of the interference signal generator as shown in table 6.4C.4 case 2.

5) Set the power level of UE according to the table 6.4C.4 case 2 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

6) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

### 6.4C.5 Test requirements

The measured BLER, derived in step 1) and step 6), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.4C.4: Test parameters for Adjacent Channel Selectivity (DB-DC-HSDPA)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Case 1 | Case 2 |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS> + 14 dB | <REFSENS> + 41 dB |
| Îor | dBm/3.84 MHz | <REFÎor> + 14 dB | <REFÎor> + 41 dB |
| Ioac mean power (modulated) | dBm | -52 | -25 |
| Fuw (offset) | MHz | +5 or -5 | +5 or -5 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |

NOTE 1: The Ioac (modulated) signal consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Offset refers to the assigned channel frequencies of the individual cells.

NOTE 3: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2B.1.

NOTE 5: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.5 Blocking Characteristics

### 6.5.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in clause 6.5.2.1 and 6.5.2.2 and this test apply to all types of UTRA for the FDD UE.

The requirements in clause 6.5.2.3 and this test apply to the FDD UE supporting Band II, Band III, Band IV, Band V, Band VIII, Band X, Band XII, Band XIII or Band XIV.

The frequency range 4 requirements do not apply to Release 5 or earlier releases, but only to Release 6 and onwards.

### 6.5.2 Minimum Requirements

#### 6.5.2.1 Minimum Requirements (In-band blocking)

The BER shall not exceed 0,001 for the parameters specified in table 6.5.1. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1.

Table 6.5.1: Test parameters for In-band blocking characteristics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Level | | |
| DPCH\_Ec | dBm/3.84 MHz | <REFSENS>+3 dB | | |
| Îor | dBm/3.84 MHz | <REFÎor> + 3 dB | | |
| Iblocking mean power (modulated) | dBm | -56 | -44 | |
| Fuw offset |  | =10 MHz | -15 MHz  &  15 MHz | |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6  (Note 2) | 2095 f 2185 | |
| Fuw  (Band II operation) | MHz | 1922.4 f 1997.6 (Note 2) | 1915 f 2005 | |
| Fuw  (Band III operation) | MHz | 1797.4 f 1887.6 (Note 2) | 1790 f 1895 | |
| Fuw  (Band IV operation) | MHz | 2102.4 f 2162.6 (Note 2) | 2095 f 2170 | |
| Fuw  (Band V operation) | MHz | 861.4 f 901.6 (Note 2) | 854 f 909 | |
| Fuw  (Band VI operation) | MHz | 867.4 f 892.6 (Note 2 and 3) | 860 f 900  (Note 3) | |
| Fuw  (Band VII operation) | MHz | 2612.4 f 2697.6 (Note 2) | 2605  f  2705 | |
| Fuw  (Band VIII operation) | MHz | 917.4 f 967.6 (Note 2) | 910  f  975 | |
| Fuw  (Band IX operation) | MHz | 1837.4  f  1887.4 (Note 2) | 1829.9 £ f £ 1894.9 | |
| Fuw  (Band X operation) | MHz | 2102.4 ≤ f ≤ 2177.6  (Note 2) | 2095 ≤ f ≤ 2185 | |
| Fuw  (Band XI operation) | MHz | 1468.4 ≤ f ≤ 1503.4  (Note 2) | 1460.9 ≤ f ≤ 1510.9 | |
| Fuw  (Band XII operation) | MHz | 721.4 ≤ f ≤ 753.6  (Note 2) | 714 ≤ f ≤ 761 | |
| Fuw  (Band XIII operation) | MHz | 738.4 ≤ f ≤ 763.6  (Note 2) | 731 ≤ f ≤ 771 | |
| Fuw  (Band XIV operation) | MHz | 750.4 ≤ f ≤ 775.6  (Note 2) | 743 ≤ f ≤ 783 | |
| Fuw  (Band XIX operation) | MHz | 867.4 f 897.6 (Note 2) | 860 f 905  (Note 3) | |
| Fuw  (Band XX operation) | MHz | 783.4 f 828.6 (Note 2) | 776 f 836 | |
| Fuw  (Band XXI operation) | MHz | 1488.4 f 1518.4 (Note 2) | | 1480.9 f 1525.9  (Note 3) |
| Fuw  (Band XXII operation) | MHz | 3502.4 f 3597.6 | | 3495 f 3605 |
| Fuw  (Band XXV operation) | MHz | 1922.4 f 2002.6 | | 1915 f 2010 |
| Fuw  (Band XXVI operation) | MHz | 851.4 f 901.6 | | 844 f 909 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | |

NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For each carrier frequency the requirement is valid for two frequencies, the carrier frequency +/- 10 MHz.

NOTE 3: For Band VI, Band XIX and Band XXI, the unwanted interfering signal does not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.

NOTE 4: <REFSENS> and <REFÎor> refers to the DPCH\_Ec<REFSENS> and the DPCH<REFÎor> as specified in Table 6.2.1.

#### 6.5.2.2 Minimum requirements (Out of-band blocking)

The BER shall not exceed 0.001 for the parameters specified in table 6.5.2. Out-of-band band blocking is defined for an unwanted interfering signal falling more than 15 MHz below or above the UE receive band. For table 6.5.2 in frequency range 1, 2 and 3, up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size.

For Table 6.5.2 in frequency range 4, up to 8 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using 1 MHz step size.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.2.

Table 6.5.2: Test parameters for Out of band blocking characteristics

| Parameter | Unit | Frequency range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 |
| --- | --- | --- | --- | --- | --- |
| DPCH\_Ec | dBm/3.84 MHz | <REFSENS>+3 dB | <REFSENS>+3 dB | <REFSENS>+3 dB | <REFSENS> +3 dB |
| Îor | dBm/3.84 MHz | <REFÎor> + 3 dB | <REFÎor> + 3 dB | <REFÎor> + 3 dB | <REFÎor> + 3 dB |
| Iblocking (CW) | dBm | -44 | -30 | -15 | -15 |
| Fuw  (Band I operation) | MHz | 2050<f <2095  2185<f <2230 | 2025 <f 2050  2230 f <2255 | 1< f 2025  2255f<12750 | - |
| Fuw  (Band II operation) | MHz | 1870<f <1915  2005<f <2050 | 1845 <f 1870  2050 f <2075 | 1< f 1845  2075f<12750 | 1850  f  1910 |
| Fuw  (Band III operation) | MHz | 1745 <f <1790  1895<f <1940 | 1720 <f  1745  1940f < 1965 | 1< f 1720  1965f<12750 | - |
| Fuw  (Band IV operation) | MHz | 2050< f <2095  2170< f <2215 | 2025< f 2050  2215 f < 2240 | 1< f 2025  2240f<12750 | - |
| Fuw  (Band V operation) | MHz | 809< f <854  909< f <954 | 784< f 809  954 f < 979 | 1< f 784  979f<12750 | 824  f  849 |
| Fuw  (Band VI operation) | MHz | 815 < f < 860  900 < f < 945 | 790 < f  815  945  f < 970 | 1 < f  790  970  f < 12750 | - |
| Fuw  (Band VII operation) | MHz | 2570 < f < 2605  2705 < f < 2750 | na  2750  f < 2775 | 1 < f  2570  2775  f < 12750 | - |
| Fuw  (Band VIII operation) | MHz | 865 < f < 910  975 < f < 1020 | 840 < f  865  1020  f < 1045 | 1 < f  840  1045  f < 12750 | - |
| Fuw  (Band IX operation) | MHz | 1784.9 < f < 1829.9  1894.9 < f < 1939.9 | 1759.9 < f £ 1784.9  1939.9 £ f < 1964.9 | 1 < f £ 1759.9  1964.9 £ f < 12750 | - |
| Fuw  (Band X operation) | MHz | 2050 < f < 2095  2185 < f < 2230 | 2025 < f  2050  2230  f < 2255 | 1 < f  2025  2255  f < 12750 | - |
| Fuw  (Band XI operation) | MHz | 1415.9 < f < 1460.9  1510.9 < f < 1555.9 | 1390.9 < f  1415.9  1555.9  f < 1580.9 | 1 < f  1390.9  1580.9  f< 12750 | - |
| Fuw  (Band XII operation) | MHz | 669 < f < 714  761 < f < 806 | 644 < f  669  806 < f < 831 | 1 < f  644  831  f < 12750 | 699  f  716 |
| Fuw  (Band XIII operation) | MHz | 686 < f < 731  771 < f < 816 | 661 < f  686  816  f < 841 | 1 < f  661  841  f < 12750 | 776  f  788 |
| Fuw  (Band XIV operation) | MHz | 698 < f < 743  783 < f < 828 | 673 < f  698  828  f < 853 | 1 < f  673  853  f < 12750 | 788  f  798 |
| Fuw  Band XIX operation) | MHz | 815 < f < 860  905 < f < 950 | 790 < f  815  950  f < 975 | 1 < f  790  975  f < 12750 | - |
| Fuw  (Band XX operation) | MHz | 731< f <776  836< f <881 | 706 < f  731  881  f < 906 | 1 < f  706  906  f < 12750 | - |
| Fuw  (Band XXI operation) | MHz | 1435.9 < f < 1480.9  1525.9 < f < 1570.9 | 1410.9 < f  1435.9  1570.9  f < 1595.9 | 1 < f  1410.9  1595.9  f < 12750 | - |
| Fuw  (Band XXII operation) | MHz | 3450 < f <3495  3605< f <3650 | 3425 < f  3450  3650 f < 3675 | 1< f 3425  3675 f<12750 | - |
| Fuw  (Band XXV operation) | MHz | 1870<f <1915  2010<f <2055 | 1845 <f 1870  2055 f <2080 | 1< f 1845  2080f<12750 | 1850  f  1915 |
| Fuw  (Band XXVI operation) | MHz | 799< f <844  909< f <954 | 774 < f 799  954  f < 979 | 1< f 774  979  f < 12750 | 814  f  849 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |
| Band I operation | For 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied. | | | | |
| Band II operation | For 1915f 2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied | | | | |
| Band III operation | For 1790f 1895 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied. | | | | |
| Band IV operation | For 2095f 2170 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied. | | | | |
| Band V operation | For 854<f 909 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied. | | | | |
| Band VI operation | For 860f 900 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied. | | | | |
| Band VII operation | For 2605  f  2705 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied. | | | | |
| Band VIII operation | For 910  f  975 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied. | | | | |
| Band IX operation | For 1829.9£f£ 1894.9 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied. | | | | |
| Band X operation | For 2095  f  2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied. | | | | |
| Band XI operation | For 1460.9  f  1510.9 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied. | | | | |
| Band XII operation | For 714  f  761 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied. | | | | |
| Band XIII operation | For 731  f  771 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied. | | | | |
| Band XIV operation | For 743  f  783 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied. | | | | |
| Band XIX operation | For 860f905 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied. | | | | |
| Band XX operation | For 776f836 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied. | | | | |
| Band XXI operation | For 1480.9f 1525.9 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied. | | | | |
| Band XXII operation | For 3495 f 3605 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied. | | | | |
| Band XXV operation | For 1915f 2010 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied | | | | |
| Band XXVI operation | For 844<f 909 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied. | | | | |
| NOTE: For the UE which supports both Band XI and Band XXI operating frequencies, the Out of band blocking is FFS. | | | | | |

NOTE: <REFSENS> and <REFÎor> refers to the DPCH\_Ec<REFSENS> and the DPCH<REFÎor> as specified in Table 6.2.1.

#### 6.5.2.3 Minimum requirements (Narrow band blocking)

The BER shall not exceed 0.001 for the parameters specified in table 6.5.3. This requirement is measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing. The requirements and this test apply to UTRA for the FDD UE supporting band II, band III, band IV, band V, band VIII, band X, band XII, band XIII or band XIV.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.3

Table 6.5.3: Test parameters for narrow band blocking

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V, X, XXV, XXVI | Band III, VIII, XII, XIII, XIV |
| DPCH\_Ec | dBm/3.84 MHz | <REFSENS> + 10 dB | <REFSENS> + 10 dB |
| Îor | dBm/3.84 MHz | <REFÎor> + 10 dB | <REFÎor> + 10 dB |
| Iblocking (GMSK) | dBm | -57 | -56 |
| Fuw (offset) | MHz | 2.7 | 2.8 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iblocking (GMSK) is an interfering signal as defined in TS 45.004. It is a continuous GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or any pseudo random data stream.

NOTE 2: <REFSENS> and <REFÎor> refers to the DPCH\_Ec<REFSENS> and the DPCH<REFÎor> as specified in Table 6.2.1.

### 6.5.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the parameters specified in table 6.5.4, table 6.5.5 and table 6.5.6. For Table 6.5.5 in frequency range 1, 2 and 3, up to (24) exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size.

For Table 6.5.5 in frequency range 4, up to 8 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size.

The lack of the blocking ability decreases the coverage area when other transmitter exists (except in the adjacent channels and spurious response).

### 6.5.4 Method of test

6.5.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

For narrow-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.5.

2) RF parameters are set up according to table 6.5.4, table 6.5.5 and table 6.5.6.

3) A call is set up according to the Generic call setup procedure specified in TS34.108[3] sub clause 7.3.2, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

4) Enter the UE into loopback test mode and start the loopback test.

Table 6.5.3A Contents of RADIO BEARER SETUP message: AM or UM

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.5.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5.4, 6.5.5 and table 6.5.6. For table 6.5.5, the frequency step size is 1 MHz.

2) Set the power level of UE according to the table 6.5.4, table 6.5.5, and table 6.5.6, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BER of DCH received from the UE at the SS.

4) For table 6.5.5, record the frequencies for which BER exceed the test requirements.

### 6.5.5 Test requirements

For table 6.5.4, the measured BER, derived in step 2), shall not exceed 0.001. For table 6.5.5, the measured BER, derived in step 2) shall not exceed 0,001 except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24 for frequency range 1, 2 and 3. The number of spurious response frequencies, recorded in step 3) shall not exceed 8 for frequency range 4 . For table 6.5.6, the measured BER, derived in step 2), shall not exceed 0.001.

Table 6.5.4: Test parameters for In-band blocking characteristics

| Parameter | Unit | Level | |
| --- | --- | --- | --- |
| DPCH\_Ec | dBm/3.84 MHz | <REFSENS>+3 dB | |
| Îor | dBm/3.84 MHz | <REFÎor> + 3 dB | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6  (Note 2) | 2095 f 2185 |
| Fuw  (Band II operation) | MHz | 1922.4 f 1997.6 (Note 2) | 1915 f 2005 |
| Fuw  (Band III operation) | MHz | 1797.4 f 1887.6 (Note 2) | 1790 f 1895 |
| Fuw  (Band IV operation) | MHz | 2102.4 f 2162.6 (Note 2) | 2095 f 2170 |
| Fuw  (Band V operation) | MHz | 861.4 f 901.6 (Note 2) | 854 f 909 |
| Fuw  (Band VI operation) | MHz | 867.4 f 892.6 (Note 2 and 3) | 860 f 900  (Note 3) |
| Fuw  (Band VII operation) | MHz | 2612.4 f 2697.6 (Note 2) | 2605  f  2705 |
| Fuw  (Band VIII operation) | MHz | 917.4 f 967.6 (Note 2) | 910  f  975 |
| Fuw  (Band IX operation) | MHz | 1837.4  f  1887.4 (Note 2) | 1829.9 £ f £ 1894.9 |
| Fuw  (Band X operation) | MHz | 2102.4 ≤ f ≤ 2177.6  (Note 2) | 2095 ≤ f ≤ 2185 |
| Fuw  (Band XI operation) | MHz | 1468.4 ≤ f ≤ 1503.4  (Note 2) | 1460.9 ≤ f ≤ 1510.9 |
| Fuw  (Band XII operation) | MHz | 721.4 ≤ f ≤ 753.6  (Note 2) | 714 ≤ f ≤ 761 |
| Fuw  (Band XIII operation) | MHz | 738.4 ≤ f ≤ 763.6  (Note 2) | 731 ≤ f ≤ 771 |
| Fuw  (Band XIV operation) | MHz | 750.4 ≤ f ≤ 775.6  (Note 2) | 743 ≤ f ≤ 783 |
| Fuw  (Band XIX operation) | MHz | 867.4 f 897.6 (Note 2) | 860 f 905  (Note 3) |
| Fuw  (Band XX operation) | MHz | 783.4 f 828.6 (Note 2) | 776 f 836 |
| Fuw  (Band XXI operation) | MHz | 1488.4 f 1518.4 (Note 2) | 1480.9 f 1525.9  (Note 3) |
| Fuw  (Band XXII operation) | MHz | 3502.4 f 3597.6 | 3495 f 3605 |
| Fuw  (Band XXV operation) | MHz | 1922.4 f 2002.6 | 1915 f 2010 |
| Fuw  (Band XXVI operation) | MHz | 851.4 f 901.6 | 844 f 909 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For each carrier frequency the requirement is valid for two frequencies, the carrier frequency +/- 10 MHz.

NOTE 3: For Band VI, Band XIX and Band XXI and Band XIX, the unwanted interfering signal does not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.

NOTE 4: <REFSENS> and <REFÎor> refers to the DPCH\_Ec<REFSENS> and the DPCH<REFÎor> as specified in Table 6.2.1.

Table 6.5.5: Test parameters for Out of band blocking characteristics

| Parameter | Unit | Frequency range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 |
| --- | --- | --- | --- | --- | --- |
| DPCH\_Ec | dBm/3.84 MHz | <REFSENS>+3 dB | <REFSENS>+3 dB | <REFSENS>+3 dB | <REFSENS> +3 dB |
| Îor | dBm/3.84 MHz | <REFÎor> + 3 dB | <REFÎor> + 3 dB | <REFÎor> + 3 dB | <REFÎor> + 3 dB |
| Iblocking (CW) | dBm | -44 | -30 | -15 | -15 |
| Fuw  (Band I operation) | MHz | 2050<f <2095  2185<f <2230 | 2025 <f 2050  2230 f <2255 | 1< f 2025  2255f<12750 | - |
| Fuw  (Band II operation) | MHz | 1870<f <1915  2005<f <2050 | 1845 <f 1870  2050 f <2075 | 1< f 1845  2075f<12750 | 1850  f  1910 |
| Fuw  (Band III operation) | MHz | 1745 <f <1790  1895<f <1940 | 1720 <f  1745  1940f < 1965 | 1< f 1720  1965f<12750 | - |
| Fuw  (Band IV operation) | MHz | 2050< f <2095  2170< f <2215 | 2025< f 2050  2215 f < 2240 | 1< f 2025  2240f<12750 | - |
| Fuw  (Band V operation) | MHz | 809< f <854  909< f <954 | 784< f 809  954 f < 979 | 1< f 784  979f<12750 | 824  f  849 |
| Fuw  (Band VI operation) | MHz | 815 < f < 860  900 < f < 945 | 790 < f  815  945  f < 970 | 1 < f  790  970  f < 12750 | - |
| Fuw  (Band VII operation) | MHz | 2570 < f < 2605  2705 < f < 2750 | na  2750  f < 2775 | 1 < f  2570  2775  f < 12750 | - |
| Fuw  (Band VIII operation) | MHz | 865 < f < 910  975 < f < 1020 | 840 < f  865  1020  f < 1045 | 1 < f  840  1045  f < 12750 | - |
| Fuw  (Band IX operation) | MHz | 1785 < f < 1830  1895 < f < 1940 | 1760 < f  1785  1940  f < 1965 | 1 < f  1760  1965  f < 12750 | - |
| Fuw  (Band X operation) | MHz | 2050 < f < 2095  2185 < f < 2230 | 2025 < f  2050  2230  f < 2255 | 1 < f  2025  2255  f < 12750 | - |
| Fuw  (Band XI operation) | MHz | 1416 < f < 1461  1511 < f < 1556 | 1391 < f  1416  1556  f < 1581 | 1 < f  1391  1581  f< 12750 | - |
| Fuw  (Band XII operation) | MHz | 669 < f < 714  761 < f < 806 | 644 < f < 669  806 < f < 831 | 1 < f  644  831  f < 12750 | 699  f  716 |
| Fuw  (Band XIII operation) | MHz | 686 < f < 731  771 < f < 816 | 661 < f < 686  816 < f < 841 | 1 < f  661  841  f < 12750 | 776  f  788 |
| Fuw  (Band XIV operation) | MHz | 698 < f < 743  783 < f < 828 | 673 < f < 698  828 < f < 853 | 1 < f  673  853  f < 12750 | 788  f  798 |
| Fuw  (Band XIX operation) | MHz | 815 < f < 860  905 < f < 950 | 790 < f  815  950  f < 975 | 1 < f  790  975  f < 12750 | - |
| Fuw  (Band XX operation) | MHz | 731< f <776  836< f <881 | 706 < f  731  881  f < 906 | 1 < f  706  906  f < 12750 | - |
| Fuw  (Band XXI operation) | MHz | 1436 < f < 1481  1526 < f < 1571 | 1411 < f  1436  1571  f < 1596 | 1 < f  1411  1596  f< 12750 | - |
| Fuw  (Band XXII operation) | MHz | 3450 < f <3495  3605< f <3650 | 3425 < f  3450  3650 f < 3675 | 1< f 3425  3675 f<12750 | - |
| Fuw  (Band XXV operation) | MHz | 1870<f <1915  2010<f <2055 | 1845 <f 1870  2055 f <2080 | 1< f 1845  2080f<12750 | 1850  f  1915 |
| Fuw  (Band XXVI operation) | MHz | 799< f <844  909< f <954 | 774 < f 799  954  f < 979 | 1< f 774  979  f < 12750 | 814  f  849 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |
| Band I operation | For 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied. | | | | |
| Band II operation | For 1915f 2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied | | | | |
| Band III operation | For 1790f 1895 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied. | | | | |
| Band IV operation | For 2095f 2170 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied. | | | | |
| Band V operation | For 854<f 909 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied. | | | | |
| Band VI operation | For 860<f<875 MHz and 885<f<900 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied | | | | |
| Band VII operation | For 2605  f  2705 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied. | | | | |
| Band VIII operation | For 910  f  975 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied. | | | | |
| Band IX operation | For 1830f 1895 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied. | | | | |
| Band X operation | For 2095  f  2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied. | | | | |
| Band XI operation | For 1461  f  1511 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied. | | | | |
| Band XII operation | For 714  f  761 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied. | | | | |
| Band XIII operation | For 731  f  771 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied. | | | | |
| Band XIV operation | For 743  f  783 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied. | | | | |
| Band XIX operation | For 860f905 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied. | | | | |
| Band XX operation | For 776f836 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 and clause 6.4.2 shall be applied. | | | | |
| Band XXI operation | For 1480.9f 1525.9 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied. | | | | |
| Band XXII operation | For 3495 f 3605 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied. | | | | |
| Band XXV operation | For 1915f 2010 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied | | | | |
| Band XXVI operation | For 844f 909 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.5.2 and subclause 6.4.2 shall be applied | | | | |
| NOTE: For the UE which supports both Band XI and Band XXI operating frequencies, the Out of band blocking is FFS. | | | | | |

NOTE 1: <REFSENS> and <REFÎor> refers to the DPCH\_Ec<REFSENS> and the DPCH<REFÎor> as specified in Table 6.2.1.

Table 6.5.6: Test parameters for narrow band blocking

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V, X, XXV, XXVI | Band III, VIII, XII, XIII, XIV |
| DPCH\_Ec | dBm/3.84 MHz | <REFSENS> + 10 dB | <REFSENS> + 10 dB |
| Îor | dBm/3.84 MHz | <REFÎor> + 10 dB | <REFÎor> + 10 dB |
| Iblocking (GMSK) | dBm | -57 | -56 |
| Fuw (offset) | MHz | 2.7 | 2.8 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 2: Iblocking (GMSK) is an interfering signal as defined in TS 45.004. It is a continuous GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or any pseudo random data stream.

NOTE 3: <REFSENS> and <REFÎor> refers to the DPCH\_Ec<REFSENS> and the DPCH<REFÎor> as specified in Table 6.2.1.

NOTE 4: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.5A Blocking Characteristics for DC-HSDPA

### 6.5A.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in clause 6.5A.2.1 and 6.5A.2.2 and this test apply for Release 8 and later releases to all types of UTRA for the FDD UE that support DC-HSDPA.

The requirements in clause 6.5A.2.3 and this test apply for Release 8 and later releases to the FDD UE that support DC-HSDPA and are supporting Band II, Band III, Band IV, Band V, Band VIII, Band X, Band XII, Band XIII or Band XIV.

### 6.5A.2 Minimum Requirements

#### 6.5A.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5A.1. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5A.1: In-band blocking for DC-HSDPA

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS>+3 dB | |
| Îor | dBm/3.84 MHz | <REFÎor> + 3 dB | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (note 4) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6  (Note 2) | 2095 f 2185 |
| Fuw  (Band II operation) | MHz | 1922.4 f 1997.6 (Note 2) | 1915 f 2005 |
| Fuw  (Band III operation) | MHz | 1797.4 f 1887.6 (Note 2) | 1790 f 1895 |
| Fuw  (Band IV operation) | MHz | 2102.4 f 2162.6 (Note 2) | 2095 f 2170 |
| Fuw  (Band V operation) | MHz | 861.4 f 901.6 (Note 2) | 854 f 909 |
| Fuw  (Band VI operation) | MHz | 867.4 f 892.6 (Note 2 and 3) | 860 f 900  (Note 3) |
| Fuw  (Band VII operation) | MHz | 2612.4 f 2697.6 (Note 2) | 2605  f  2705 |
| Fuw  (Band VIII operation) | MHz | 917.4 f 967.6 (Note 2) | 910  f  975 |
| Fuw  (Band IX operation) | MHz | 1837.4 £ f £ 1887.4 (Note 2) | 1829.9 £ f £ 1894.9 |
| Fuw  (Band X operation) | MHz | 2102.4  f  2177.6 (Note 2) | 2095  f  2185 |
| Fuw  (Band XI operation) | MHz | 1468.4  f  1503.4 (Note 2) | 1460.9  f  1510.9 |
| Fuw  (Band XII operation) | MHz | 721.4  f  753.6 (Note 2) | 714  f  761 |
| Fuw  (Band XIII operation) | MHz | 738.4  f  763.6 (Note 2) | 731  f  771 |
| Fuw  (Band XIV operation) | MHz | 750.4  f  775.6 (Note 2) | 743  f  783 |
| Fuw  (Band XIX operation) | MHz | 867.4 f 897.6 (Note 2) | 860 f 905  (Note 3) |
| Fuw  (Band XX operation) | MHz | 783.4 f 828.6 (Note 2) | 776 f 836 |
| Fuw  (Band XXI operation) | MHz | 1488.4 f 1518.4 (Note 2) | 1480.9 f 1525.9  (Note 3) |
| Fuw  (Band XXII operation) | MHz | 3502.4 f 3597.6  (Note 2) | 3495 f 3605 |
| Fuw  (Band XXV operation) | MHz | 1922.4 f 2002.6 | 1915 f 2010 |
| Fuw  (Band XXVI operation) | MHz | 851.4 f 901.6 | 844 f 909 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For each carrier frequency the requirement is valid for two frequencies, the carrier frequency +/- 10 MHz.

NOTE 3: For Band VI, Band XIX and Band XXI, the unwanted interfering signal does not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.

NOTE 4: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 5: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2A.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1A.

#### 6.5A.2.2 Minimum requirements (Out of-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5A.2. Out-of-band band blocking is defined for an unwanted interfering signal falling more than 15 MHz below or above the UE receive band.

For Table 6.5A.2 in frequency range 1, 2 and 3, up to 24 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6A spurious response are applicable.

For Table 6.5.A.2 in frequency range 4, up to 8 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6A spurious response are applicable.

Table 6.5A.2: Out of band blocking for DC-HSDPA

| Parameter | Unit | Frequency range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 |
| --- | --- | --- | --- | --- | --- |
| HS-PDSCH\_Ec | dBm / 3.84 MHz | <REFSENS>+3 dB | <REFSENS>+3 dB | <REFSENS>+3 dB | <REFSENS> +3 dB |
| Îor | dBm / 3.84 MHz | <REFÎor> + 3 dB | <REFÎor> + 3 dB | <REFÎor> + 3 dB | <REFÎor> + 3 dB |
| Iblocking (CW) | dBm | -44 | -30 | -15 | -15 |
| Fuw  (Band I operation) | MHz | 2050<f <2095  2185<f <2230 | 2025 <f 2050  2230 f <2255 | 1< f 2025  2255f<12750 | - |
| Fuw  (Band II operation) | MHz | 1870<f <1915  2005<f <2050 | 1845 <f 1870  2050 f <2075 | 1< f 1845  2075f<12750 | 1850  f  1910 |
| Fuw  (Band III operation) | MHz | 1745 <f <1790  1895<f <1940 | 1720 <f  1745  1940f < 1965 | 1< f 1720  1965f<12750 | - |
| Fuw  (Band IV operation) | MHz | 2050< f <2095  2170< f <2215 | 2025< f 2050  2215 f < 2240 | 1< f 2025  2240f<12750 | - |
| Fuw  (Band V operation) | MHz | 809< f <854  909< f <954 | 784< f 809  954 f < 979 | 1< f 784  979f<12750 | 824  f  849 |
| Fuw  (Band VI operation) | MHz | 815 < f < 860  900 < f < 945 | 790 < f  815  945  f < 970 | 1 < f  790  970  f < 12750 | - |
| Fuw  (Band VII operation) | MHz | 2570 < f < 2605  2705 < f < 2750 | na  2750  f < 2775 | 1 < f  2570  2775  f < 12750 | - |
| Fuw  (Band VIII operation) | MHz | 865 < f < 910  975 < f < 1020 | 840 < f £ 865  1020  f < 1045 | 1 < f  840  1045  f < 12750 | - |
| Fuw  (Band IX operation) | MHz | 1784.9 < f < 1829.9  1894.9 < f < 1939.9 | 1759.9 < f £ 1784.9  1939.9 £ f < 1964.9 | 1 < f £ 1759.9  1964.9 £ f < 12750 | - |
| Fuw  (Band X operation) | MHz | 2050 < f < 2095  2185 < f < 2230 | 2025 < f  2050  2230  f < 2255 | 1 < f  2025  2255 f< 12750 | - |
| Fuw  (Band XI operation) | MHz | 1415.9 < f < 1460.9  1510.9 < f < 1555.9 | 1390.9 < f  1415.9  1555.9  f < 1580.9 | 1 < f  1390.9  1580.9  f < 12750 | - |
| Fuw  (Band XII operation) | MHz | 669 < f < 714  761 < f < 806 | 644 < f  669  806  f < 831 | 1 < f  644  831 f< 12750 | 699  f  716 |
| Fuw  (Band XIII operation) | MHz | 686 < f < 731  771 < f < 816 | 661 < f  686  816  f < 841 | 1 < f  661  841 f< 12750 | 776  f  788 |
| Fuw  (Band XIV operation) | MHz | 698 < f < 743  783 < f < 828 | 673 < f  698  828  f < 853 | 1 < f  673  853 f< 12750 | 788  f  798 |
| Fuw  (Band XIX operation) | MHz | 815 < f < 860  905 < f < 950 | 790 < f  815  950  f < 975 | 1 < f  790  975  f < 12750 | - |
| Fuw  (Band XX operation) | MHz | 731< f <776  836< f <881 | 706 < f  731  881  f < 906 | 1 < f  706  906  f < 12750 | - |
| Fuw  (Band XXI operation) | MHz | 1435.9 < f < 1480.9  1525.9 < f < 1570.9 | 1410.9 < f  1435.9  1570.9  f < 1595.9 | 1 < f  1410.9  1595.9  f < 12750 | - |
| Fuw  (Band XXII operation) | MHz | 3450 <f <3495  3605<f <3650 | 3425 <f  3450  3650f < 3675 | 1< f 3425  3675f<12750 | - |
| Fuw  (Band XXV operation) | MHz | 1870<f <1915  2010<f <2055 | 1845 <f 1870  2055 f <2080 | 1< f 1845  2080f<12750 | 1850  f  1915 |
| Fuw  (Band XXVI operation) | MHz | 799< f <844  909< f <954 | 774 < f 799  954  f < 979 | 1< f 774  979  f < 12750 | 814  f  849 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |
| Band I operation | For 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band II operation | For 1915f 2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band III operation | For 1790f 1895 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band IV operation | For 2095f2170 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band V operation | For 854f909 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band VI operation | For 860f900 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band VII operation | For 2605  f  2705 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band VIII operation | For 910  f  975 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band IX operation | For 1829.9£f£ 1894.9 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band X operation | For 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band XI  operation | For 1460.9f 1510.9 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band XII  operation | For 714  f  761 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band XIII  operation | For 731  f  771 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band XIV  operation | For 743  f  783 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band XX operation | For 776f836 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band XIX  operation | For 860f905 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band XXI  operation | For 1480.9f 1525.9 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band XXII operation | For 3495 f 3605 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band XXV operation | For 1915f 2010 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied | | | | |
| Band XXVI operation | For 844f909 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| NOTE: For the UE which supports both Band XI and Band XXI operating frequencies, the Out of band blocking is FFS. | | | | | |

NOTE: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2A.1

The normative reference for this requirement is TS 25.101 [1] clause 7.6.2A.

#### 6.5A.2.3 Minimum requirements (Narrow band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5A.3. This requirement is measure of a receiver’s ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing.

Table 6.5A.3: Narrow band blocking characteristics for DC-HSDPA

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V, X, XXV, XXVI | Band III, VIII, XII, XIII, XIV |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS> + 10 dB | <REFSENS> + 10 dB |
| Îor | dBm/3.84 MHz | <REFÎor> + 10 dB | <REFÎor> + 10 dB |
| Iblocking (GMSK) | dBm | -57 | -56 |
| Fuw (offset)  (NOTE 2) | MHz | 2.7 | 2.8 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iblocking (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 3: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2A.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.3A.

### 6.5A.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5A.5, table 6.5A.6 and table 6.5A.7 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the blocking ability decreases the DC-HSDPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

### 6.5A.4 Method of test

6.5A.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

For narrow-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.32.

2) RF parameters are set up according to table 6.5A.5, table 6.5A.6 and table 6.5A.7.

3) A call is set up according to the Generic DC-HSDPA setup procedure specified in TS34.108[3] sub clause 7.3.13, with exceptions for information elements listed in Table 6.5A.4. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5A.: Specific Message Contents for In-band blocking characteristics for DC-HSDPA

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink HS-PDSCH Information |  |  |
| - CHOICE mode | FDD |  |
| - Downlink 64QAM configured | Not Present | Rel-7 |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) | Rel-7 |
| Downlink secondary cell info FDD |  | Rel-8 |
| - CHOICE Configuration info | New configuration |  |
| - Downlink 64QAM configured | Not Present |  |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) |  |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.5A.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5A.5, table 6.5A.6 and table 6.5A.6. For table 6.5A.6, the frequency step size is 1 MHz.

2) Set the power level of UE according to the table 6.5A.5, table 6.5A.6, and table 6.5A.7, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

4) For table 6.5A.6, record the frequencies for which BLER exceed the test requirements.

### 6.5A.5 Test requirements

For table 6.5A.5, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. For table 6.5A.6, the measured BLER, derived in step 2) shall not exceed 0.1 on each individual cell except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24 for frequency range 1, 2 and 3. The number of spurious response frequencies, recorded in step 3) shall not exceed 8 for frequency range 4 . For table 6.5A.7, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5A.5: Test parameters for In-band blocking characteristics for DC-HSDPA

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS>+3 dB | |
| Îor | dBm/3.84 MHz | <REFÎor> + 3 dB | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (NOTE 4) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6  (Note 2) | 2095 f 2185 |
| Fuw  (Band II operation) | MHz | 1922.4 f 1997.6 (Note 2) | 1915 f 2005 |
| Fuw  (Band III operation) | MHz | 1797.4 f 1887.6 (Note 2) | 1790 f 1895 |
| Fuw  (Band IV operation) | MHz | 2102.4 f 2162.6 (Note 2) | 2095 f 2170 |
| Fuw  (Band V operation) | MHz | 861.4 f 901.6 (Note 2) | 854 f 909 |
| Fuw  (Band VI operation) | MHz | 867.4 f 892.6 (Note 2 and 3) | 860 f 900  (Note 3) |
| Fuw  (Band VII operation) | MHz | 2612.4 f 2697.6 (Note 2) | 2605  f  2705 |
| Fuw  (Band VIII operation) | MHz | 917.4 f 967.6 (Note 2) | 910  f  975 |
| Fuw  (Band IX operation) | MHz | 1837.4 £ f £ 1887.4 (Note 2) | 1829.9 £ f £ 1894.9 |
| Fuw  (Band X operation) | MHz | 2102.4  f  2177.6 (Note 2) | 2095  f  2185 |
| Fuw  (Band XI operation) | MHz | 1468.4  f  1503.4 (Note 2) | 1460.9  f  1510.9 |
| Fuw  (Band XII operation) | MHz | 721.4  f  753.6 (Note 2) | 714  f  761 |
| Fuw  (Band XIII operation) | MHz | 738.4  f  763.6 (Note 2) | 731  f  771 |
| Fuw  (Band XIV operation) | MHz | 750.4  f  775.6 (Note 2) | 743  f  783 |
| Fuw  (Band XIX operation) | MHz | 867.4 f 897.6 (Note 2) | 860 f 905  (Note 3) |
| Fuw  (Band XXI operation) | MHz | 1488.4 f 1518.4 (Note 2) | 1480.9 f 1525.9  (Note 3) |
| Fuw  (Band XXII operation) | MHz | 3502.4 f 3597.6  (Note 2) | 3495 f 3605 |
| Fuw  (Band XXV operation) | MHz | 1922.4 f 2002.6 | 1915 f 2010 |
| Fuw  (Band XXVI operation) | MHz | 851.4 f 901.6 | 844 f 909 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For each carrier frequency the requirement is valid for two frequencies, the carrier frequency +/- 10 MHz.

NOTE 3: For Band VI, Band XIX and Band XXI, the unwanted interfering signal does not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.

NOTE 4: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 5: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2A.1.

Table 6.5A.6: Test parameters for Out of band blocking characteristics for DC-HSDPA

| Parameter | Unit | Frequency range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 |
| --- | --- | --- | --- | --- | --- |
| HS-PDSCH\_Ec | dBm / 3.84 MHz | <REFSENS>+3 dB | <REFSENS>+3 dB | <REFSENS>+3 dB | <REFSENS> +3 dB |
| Îor | dBm / 3.84 MHz | <REFÎor> + 3 dB | <REFÎor> + 3 dB | <REFÎor> + 3 dB | <REFÎor> + 3 dB |
| Iblocking (CW) | dBm | -44 | -30 | -15 | -15 |
| Fuw  (Band I operation) | MHz | 2050<f <2095  2185<f <2230 | 2025 <f 2050  2230 f <2255 | 1< f 2025  2255f<12750 | - |
| Fuw  (Band II operation) | MHz | 1870<f <1915  2005<f <2050 | 1845 <f 1870  2050 f <2075 | 1< f 1845  2075f<12750 | 1850  f  1910 |
| Fuw  (Band III operation) | MHz | 1745 <f <1790  1895<f <1940 | 1720 <f  1745  1940f < 1965 | 1< f 1720  1965f<12750 | - |
| Fuw  (Band IV operation) | MHz | 2050< f <2095  2170< f <2215 | 2025< f 2050  2215 f < 2240 | 1< f 2025  2240f<12750 | - |
| Fuw  (Band V operation) | MHz | 809< f <854  909< f <954 | 784< f 809  954 f < 979 | 1< f 784  979f<12750 | 824  f  849 |
| Fuw  (Band VI operation) | MHz | 815 < f < 860  900 < f < 945 | 790 < f  815  945  f < 970 | 1 < f  790  970  f < 12750 | - |
| Fuw  (Band VII operation) | MHz | 2570 < f < 2605  2705 < f < 2750 | na  2750  f < 2775 | 1 < f  2570  2775  f < 12750 | - |
| Fuw  (Band VIII operation) | MHz | 865 < f < 910  975 < f < 1020 | 840 < f £ 865  1020  f < 1045 | 1 < f  840  1045  f < 12750 | - |
| Fuw  (Band IX operation) | MHz | 1785 < f < 1830  1895 < f < 1940 | 1760 < f £ 1785  1940 £ f < 1965 | 1 < f £ 1760  1965 £ f < 12750 | - |
| Fuw  (Band X operation) | MHz | 2050 < f < 2095  2185 < f < 2230 | 2025 < f  2050  2230  f < 2255 | 1 < f  2025  2255 f< 12750 | - |
| Fuw  (Band XI operation) | MHz | 1416 < f < 1461  1511 < f < 1556 | 1391 < f  1416  1556  f < 1581 | 1 < f  1391  1581  f < 12750 | - |
| Fuw  (Band XII operation) | MHz | 669 < f < 714  761 < f < 806 | 644 < f  669  806  f < 831 | 1 < f  644  831 f< 12750 | 699  f  716 |
| Fuw  (Band XIII operation) | MHz | 686 < f < 731  771 < f < 816 | 661 < f  686  816  f < 841 | 1 < f  661  841 f< 12750 | 776  f  788 |
| Fuw  (Band XIV operation) | MHz | 698 < f < 743  783 < f < 828 | 673 < f  698  828  f < 853 | 1 < f  673  853 f< 12750 | 788  f  798 |
| Fuw  (Band XIX operation) | MHz | 815 < f < 860  905 < f < 950 | 790 < f  815  950  f < 975 | 1 < f  790  975  f < 12750 | - |
| Fuw  (Band XX operation) | MHz | 731< f <776  836< f <881 | 706 < f  731  881  f < 906 | 1 < f  706  906  f < 12750 | - |
| Fuw  (Band XXI operation) | MHz | 1436 < f < 1481  1526 < f < 1571 | 1411 < f  1436  1571  f < 1596 | 1 < f  1411  1596  f < 12750 | - |
| Fuw  (Band XXV operation) | MHz | 1870<f <1915  2010<f <2055 | 1845 <f 1870  2055 f <2080 | 1< f 1845  2080f<12750 | 1850  f  1915 |
| Fuw  (Band XXVI operation) | MHz | 799< f <844  909< f <954 | 774 < f 799  954  f < 979 | 1< f 774  979  f < 12750 | 814  f  849 |
| Fuw  (Band XXII operation) | MHz | 3450 < f <3495  3605< f <3650 | 3425 < f  3450  3650 f < 3675 | 1< f 3425  3675 f <12750 | - |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |
| Band I operation | For 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band II operation | For 1915f 2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band III operation | For 1790f 1895 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band IV operation | For 2095f2170 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band V operation | For 854f909 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band VI operation | For 860f900 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band VII operation | For 2605  f  2705 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band VIII operation | For 910  f  975 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band IX operation | For 1830£f£ 1895 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band X operation | For 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band XI  operation | For 1461f 1516 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band XII  operation | For 714  f  761 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band XIII  operation | For 731  f  771 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band XIV  operation | For 743  f  783 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band XIX  operation | For 860f905 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band XXI  operation | For 1481f 1526 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band XXII operation | For 3495 f 3605 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| Band XXV operation | For 1915f 2010 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied | | | | |
| Band XXVI operation | For 844f909 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4A.2 and subclause 6.5.2.1 shall be applied. | | | | |
| NOTE | For the UE which supports both Band XI and Band XXI operating frequencies, the Out of band blocking is FFS. | | | | |

NOTE 6: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2A.1

Table 6.5A.7: Test parameters for narrow band blocking for DC-HSDPA

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V, X, XXV, XXVI | Band III, VIII, XII, XIII, XIV |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS> + 10 dB | <REFSENS> + 10 dB |
| Îor | dBm/3.84 MHz | <REFÎor> + 10 dB | <REFÎor> + 10 dB |
| Iblocking (GMSK) | dBm | -57 | -56 |
| Fuw (offset)  (NOTE 2) | MHz | 2.7 | 2.8 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 7: Iblocking (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 8: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 9: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2A.1.

NOTE 10: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.5B Blocking Characteristics for DB-DC-HSDPA

### 6.5B.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support DB-DC-HSDPA.

DB-DC-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.5B.2 Minimum Requirements

#### 6.5B.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5B.1. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5B.1: In-band blocking for DB-DC-HSDPA

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS>+3 dB | |
| Îor | dBm/3.84 MHz | <REFÎor> + 3 dB | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (NOTE 4) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6 | 2095 f 2185 |
| Fuw  (Band II operation) | MHz | 1922.4 f 1997.6 | 1915 f 2005 |
| Fuw  (Band III operation) | MHz | 1797.4 f 1887.6 | 1790 f 1895 |
| Fuw  (Band IV operation) | MHz | 2102.4 f 2162.6 | 2095 f 2170 |
| Fuw  (Band V operation) | MHz | 861.4 f 901.6 | 854 f 909 |
| Fuw  (Band VI operation) | MHz | 867.4 f 892.6 (Note3) | 860 f 900  (Note 3) |
| Fuw  (Band VII operation) | MHz | 2612.4 f 2697.6 | 2605  f  2705 |
| Fuw  (Band VIII operation) | MHz | 917.4 f 967.6 | 910  f  975 |
| Fuw  (Band IX operation) | MHz | 1837.4 £ f £ 1887.4 | 1829.9 £ f £ 1894.9 |
| Fuw  (Band X operation) | MHz | 2102.4  f  2177.6 | 2095  f  2185 |
| Fuw  (Band XI operation) | MHz | 1468.4  f  1503.4 | 1460.9  f  1510.9 |
| Fuw  (Band XII operation) | MHz | 721.4  f  753.6 | 714  f  761 |
| Fuw  (Band XIII operation) | MHz | 738.4  f  763.6 | 731  f  771 |
| Fuw  (Band XIV operation) | MHz | 750.4  f  775.6 | 743  f  783 |
| Fuw  (Band XIX operation) | MHz | 867.4 f 897.6 | 860 f 905  (Note 3) |
| Fuw  (Band XX operation) | MHz | 783.4  f  828.6 | 776  f  836 |
| Fuw  (Band XXI operation) | MHz | 1488.4 f 1518.4 | 1480.9 f 1525.9  (Note 3) |
| Fuw  (Band XXII operation) | MHz | 3502.4 f 3597.6 | 3495 f 3605 |
| Fuw  (Band XXV operation) | MHz | 1922.4 f 2002.6 | 1915 f 2010 |
| Fuw  (Band XXVI operation) | MHz | 851.4 f 901.6 | 844 f 909 |
| Fuw  (Band XXXII operation)  (NOTE 6) | MHz | 1444.4 f 1503.6 | 1437 f 1511 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |
| NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.  NOTE 2: For Band VI, Band XIX and Band XXI, the unwanted interfering signal does not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.  NOTE 3: For DC-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency used and positive offset refers to the assigned channel frequency of the highest carrier frequency used. For DB-DC-HSDPA, offset refers to the assigned channel frequencies of the individual cells.  NOTE 4: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2A.1 for DC-HSDPA and Table 6.2B.1 for DB-DC-HSDPA.  NOTE 5: The UE transmitted mean power shall be reduced by 0.5dB for a UE operating in band XXII.  NOTE 6: Restricted to UTRA operation when dual band is configured (e.g., DB-DC-HSDPA or dual band 4C-HSDPA) | | | |

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1A.

#### 6.5B.2.2 Minimum requirements (Out of-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5B.2. Out-of-band blocking is defined for an unwanted interfering signal falling at frequencies outside of frequency regions defined as the UE receive bands extended by 15 MHz at their lower and upper ends. For Table 6.5B.2 in frequency range 1, 2 and 3, up to 24 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6B Spurious response are applicable.

For Table 6.5B.2 in frequency range 4, up to 8 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6B Spurious response for DB-DC-HSDPA are applicable.

Table 6.5B.2: Out of band blocking for DB-DC-HSDPA

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Frequency range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 |
| HS-PDSCH\_Ec | dBm / 3.84 MHz | <REFSENS>+3 dB | <REFSENS>+3 dB | <REFSENS>+3 dB | <REFSENS> +3 dB |
| Îor | dBm / 3.84 MHz | <REFÎor> + 3 dB | <REFÎor> + 3 dB | <REFÎor> + 3 dB | <REFÎor> + 3 dB |
| Iblocking (CW) | dBm | -44 | -30 | -15 | -15 |
| Fuw  (DB-DC-HSDPA Configuration 1) | MHz | 865< f <910  975< f <1020  2050< f <2095  2185< f <2230 | 840< f £865  1020 f <1045  2025< f 2050  2230 f <2255 | 1< f 840  1045 f <2025  2255< f  12750 | - |
| Fuw  (DB-DC-HSDPA Configuration 2) | MHz | 1870< f <1915  2005< f <2095  2170< f <2215 | 1845< f 1870  2215 f <2240 | 1< f 1845  2240 f <12750 | 1850 f 1910 |
| Fuw  (DB-DC-HSDPA Configuration 3) | MHz | 809< f <854  909< f <954  2050< f <2095  2185< f <2230 | 784< f 809  954 f < 979  2025< f 2050  2230 f <2255 | 1< f 784  979 f <2025  2255< f 12750 | 824  f  849 |
| Fuw  (DB-DC-HSDPA Configuration 6) | MHz | 1392< f <1437  1511< f <1556  2050< f <2095  2185< f <2230 | 1367< f £1392  1556 f <1581  2025< f 2050  2230 f <2255 | 1< f 1367  1581 f <2025  2255< f  12750 | - |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |
| DB-DC-HSDPA Configuration 1 | For 910f 975 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4C.2 and subclause 6.5.B2.1 shall be applied. | | | | |
| DB-DC-HSDPA Configuration 2 | For 1915f 2005 MHz and 2095f 2070 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4C.2 and subclause 6.5.B2.1 shall be applied. | | | | |
| DB-DC-HSDPA Configuration 3 | For 854f909 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4C.2 and subclause 6.5.B2.1 shall be applied. | | | | |
| DB-DC-HSDPA Configuration 6 | For 1437f 1511 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 7.5.2 and subclause 7.6.1A shall be applied. | | | | |
| NOTE: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2B.1. | | | | | |

The normative reference for this requirement is TS 25.101 [1] clause 7.6.2B.

#### 6.5B.2.3 Minimum requirements (Narrow band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5B.3. This requirement is measure of a receiver’s ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing.

Table 6.5B.3: Narrow band blocking characteristics for DB-DC-HSDPA

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V, X, XXV, XXVI | Band III, VIII, XII, XIII, XIV |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS> + 10 dB | <REFSENS> + 10 dB |
| Îor | dBm/3.84 MHz | <REFÎor> + 10 dB | <REFÎor> + 10 dB |
| Iblocking (GMSK) | dBm | -57 | -56 |
| Fuw (offset)  (NOTE 2) | MHz | 2.7 | 2.8 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iblocking (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: For DC-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency used and positive offset refers to the assigned channel frequency of the highest carrier frequency used. For DB-DC-HSDPA, offset refers to the assigned channel frequencies of the individual cells.

NOTE 3: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2B.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.3A.

### 6.5B.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5B.5, table 6.5B.6 and table 6.5B.7 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the blocking ability decreases the DB-DC-HSDPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

### 6.5B.4 Method of test

6.5B.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

For narrow-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.32.

2) RF parameters are set up according to table 6.5B.5, table 6.5B.6 and table 6.5B.7.

3) A call is set up according to the Generic call setup procedure specified in TS34.108[3] sub clause 7.3.13, with exceptions for information elements listed in Table 6.5B.4. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5B.4 Specific Message Contents for In-band blocking characteristics for DB-DC-HSDPA

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink HS-PDSCH Information |  |  |
| - CHOICE mode | FDD |  |
| - Downlink 64QAM configured | Not Present | Rel-7 |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) | Rel-7 |
| Downlink secondary cell info FDD |  | Rel-8 |
| - CHOICE Configuration info | New configuration |  |
| - Downlink 64QAM configured | Not Present |  |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) |  |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.5B.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5B.5, table 6.5B.6 and table 6.5B.6. For table 6.5B.6, the frequency step size is 1 MHz.

2) Set the power level of UE according to the table 6.5B.5, table 6.5B.6, and table 6.5B.7, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

4) For table 6.5B.6, record the frequencies for which BLER exceed the test requirements.

### 6.5B.5 Test requirements

For table 6.5B.5, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. For table 6.5B.6, the measured BLER, derived in step 2) shall not exceed 0.1 on each individual cell except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24 for frequency range 1, 2 and 3. The number of spurious response frequencies, recorded in step 3) shall not exceed 8 for frequency range 4 . For table 6.5B.7, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5B.5: Test parameters for In-band blocking characteristics for DB-DC-HSDPA

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS>+3 dB | |
| Îor | dBm/3.84 MHz | <REFÎor> + 3 dB | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (NOTE 3) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6  (Note 2) | 2095 f 2185 |
| Fuw  (Band II operation) | MHz | 1922.4 f 1997.6 (Note 2) | 1915 f 2005 |
| Fuw  (Band IV operation) | MHz | 2102.4 f 2162.6 (Note 2) | 2095 f 2170 |
| Fuw  (Band V operation) | MHz | 861.4 f 901.6 (Note 2) | 854 f 909 |
| Fuw  (Band VIII operation) | MHz | 917.4 f 967.6 (Note 2) | 910  f  975 |
| Fuw  (Band XXXII operation)  (NOTE 6) | MHz | 1444.4 f 1503.6 | 1437 f 1511 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |
| NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.  NOTE 2: For Band VI, Band XIX and Band XXI, the unwanted interfering signal does not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.  NOTE 3: For DC-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency used and positive offset refers to the assigned channel frequency of the highest carrier frequency used. For DB-DC-HSDPA, offset refers to the assigned channel frequencies of the individual cells.  NOTE 4: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2A.1 for DC-HSDPA and Table 6.2B.1 for DB-DC-HSDPA.  NOTE 5: The UE transmitted mean power shall be reduced by 0.5dB for a UE operating in band XXII.  NOTE 6: Restricted to UTRA operation when dual band is configured (e.g., DB-DC-HSDPA or dual band 4C-HSDPA) | | | |

Table 6.5B.6: Test parameters for Out of band blocking characteristics for DB-DC-HSDPA

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Frequency range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 |
| HS-PDSCH\_Ec | dBm / 3.84 MHz | <REFSENS>+3 dB | <REFSENS>+3 dB | <REFSENS>+3 dB | <REFSENS> +3 dB |
| Îor | dBm / 3.84 MHz | <REFÎor> + 3 dB | <REFÎor> + 3 dB | <REFÎor> + 3 dB | <REFÎor> + 3 dB |
| Iblocking (CW) | dBm | -44 | -30 | -15 | -15 |
| Fuw  (DB-DC-HSDPA Configuration 1) | MHz | 865< f <910  975< f <1020  2050< f <2095  2185< f <2230 | 840< f £865  1020 f <1045  2025< f 2050  2230 f <2255 | 1< f 840  1045 f <2025  2255< f  12750 | - |
| Fuw  (DB-DC-HSDPA Configuration 2) | MHz | 1870< f <1915  2005< f <2095  2170< f <2215 | 1845< f 1870  2215 f <2240 | 1< f 1845  2240 f <12750 | 1850 f 1910 |
| Fuw  (DB-DC-HSDPA Configuration 3) | MHz | 809< f <854  909< f <954  2050< f <2095  2185< f <2230 | 784< f 809  954 f < 979  2025< f 2050  2230 f <2255 | 1< f 784  979 f <2025  2255< f 12750 | 824  f  849 |
| Fuw  (DB-DC-HSDPA Configuration 6) | MHz | 1392< f <1437  1511< f <1556  2050< f <2095  2185< f <2230 | 1367< f £1392  1556 f <1581  2025< f 2050  2230 f <2255 | 1< f 1367  1581 f <2025  2255< f  12750 | - |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |
| DB-DC-HSDPA Configuration 1 | For 910f 975 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4C.2 and subclause 6.5B.2.1 shall be applied. | | | | |
| DB-DC-HSDPA Configuration 2 | For 1915f 2005 MHz and 2095f 2070 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause6.4C.2 and subclause 6.5B.2.1 shall be applied. | | | | |
| DB-DC-HSDPA Configuration 3 | For 854f909 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4C.2 and subclause 6.5B.2.1 shall be applied. | | | | |
| DB-DC-HSDPA Configuration 6 | For 1437f 1511 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 7.5.2 and subclause 7.6.1A shall be applied. | | | | |
| NOTE: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2B.1. | | | | | |

Table 6.5B.7: Test parameters for narrow band blocking for DB-DC-HSDPA

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V | Band VIII |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS> + 10 dB | <REFSENS> + 10 dB |
| Îor | dBm/3.84 MHz | <REFÎor> + 10 dB | <REFÎor> + 10 dB |
| Iblocking (GMSK) | dBm | -57 | -56 |
| Fuw (offset)  (NOTE 2) | MHz | 2.7 | 2.8 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 6: Iblocking (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 7: Offset refers to the assigned channel frequencies of the individual cells.

NOTE 8: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2B.1.

NOTE 9: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.5C Blocking Characteristics for DC-HSUPA

### 6.5C.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements and this test apply for Release 9 and later releases for the FDD UE that supports HSDPA and Dual Cell E-DCH.

### 6.5C.2 Minimum Requirements

#### 6.5C.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5C.1 and Table 6.5C.2. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5C.1: In-band blocking for DC-HSUPA

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (NOTE 4) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6  (Note 2) | 2095 f 2185 |
| Fuw  (Band II operation) | MHz | 1922.4 f 1997.6  (Note 2) | 1915 f 2005 |
| Fuw  (Band III operation) | MHz | 1797.4 f 1887.6  (Note 2) | 1790 f 1895 |
| Fuw  (Band IV operation) | MHz | 2102.4 f 2162.6  (Note 2) | 2095 f 2170 |
| Fuw  (Band V operation) | MHz | 861.4 f 901.6  (Note 2) | 854 f 909 |
| Fuw  (Band VI operation) | MHz | 867.4 f 892.6 (Note3) | 860 f 900  (Note 3) |
| Fuw  (Band VII operation) | MHz | 2612.4 f 2697.6  (Note 2) | 2605  f  2705 |
| Fuw  (Band VIII operation) | MHz | 917.4 f 967.6  (Note 2) | 910  f  975 |
| Fuw  (Band IX operation) | MHz | 1837.4 £ f £ 1887.4  (Note 2) | 1829.9 £ f £ 1894.9 |
| Fuw  (Band X operation) | MHz | 2102.4  f  2177.6  (Note 2) | 2095  f  2185 |
| Fuw  (Band XI operation) | MHz | 1468.4  f  1503.4  (Note 2) | 1460.9  f  1510.9 |
| Fuw  (Band XII operation) | MHz | 721.4  f  753.6  (Note 2) | 714  f  761 |
| Fuw  (Band XIII operation) | MHz | 738.4  f  763.6  (Note 2) | 731  f  771 |
| Fuw  (Band XIV operation) | MHz | 750.4  f  775.6  (Note 2) | 743  f  783 |
| Fuw  (Band XIX operation) | MHz | 867.4 f 897.6  (Note 2) | 860 f 905  (Note 3) |
| Fuw  (Band XX operation) | MHz | 783.4 f 828.6  (Note 2) | 776 f 836  (Note 3) |
| Fuw  (Band XXI operation) | MHz | 1488.4 f 1518.4  (Note 2) | 1480.9 f 1525.9  (Note 3) |
| Fuw  (Band XXII operation) | MHz | 3502.4 f 3597.6  (Note 2) | 3495 f 3605  (Note 3) |
| Fuw  (Band XXV operation) | MHz | 1922.4 f 2002.6  (Note 2) | 1915 f 2010  (Note 3) |
| Fuw  (Band XXVI operation) | MHz | 851.4 f 901.6 | 844 f 909 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For each carrier frequency the requirement is valid for two frequencies, the carrier frequency +/- 10 MHz.

NOTE 3: For Band VI, Band XIX and Band XXI, the unwanted interfering signal does not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.

NOTE 4: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.5C.2: Reference input powers for in-band blocking, DC-HSUPA

|  |  |  |  |
| --- | --- | --- | --- |
| Operating Band | Unit | HS-PDSCH\_Ec | Îor |
| I | dBm/3.84 MHz | -110 | -99.7 |
| II | dBm/3.84 MHz | -108 | -97.7 |
| III | dBm/3.84 MHz | -107 | -96.7 |
| IV | dBm/3.84 MHz | -110 | -99.7 |
| V | dBm/3.84 MHz | -104.3 | -94 |
| VI | dBm/3.84 MHz | -104.7 | -94.4 |
| VII | dBm/3.84 MHz | -108 | -97.7 |
| VIII | dBm/3.84 MHz | -101.1 | -90.8 |
| IX | dBm/3.84 MHz | -109 | -98.7 |
| X | dBm/3.84 MHz | -110 | -99.7 |
| XI | dBm/3.84 MHz | -101.4 | -91.1 |
| XII | dBm/3.84 MHz | N/A | N/A |
| XIII | dBm/3.84 MHz | N/A | N/A |
| XIV | dBm/3.84 MHz | N/A | N/A |
| XIX | dBm/3.84 MHz | -104.7 | -94.4 |
| XX | dBm/3.84 MHz | TBD | TBD |
| XXI | dBm/3.84 MHz | -101.4 | -91.1 |
| XXII | dBm/3.84 MHz | TBD | TBD |
| XXV | dBm/3.84 MHz | -106.5 | -96.2 |
| XXVI | dBm/3.84 MHz | -101.1 | -90.8 |
| NOTE 1: For the UE which supports both Band III and Band IX operating frequencies, the reference sensitivity level of TBD dBm <REF\_Ec,in-band> shall apply for Band IX. The corresponding <REFÎor,in-band> is TBD dBm  NOTE 2: For the UE which supports both Band XI and Band XXI operating frequencies, the reference input power level is FFS.  NOTE 3: For the UE which supports DB-DC-HSDPA configuration in clause 4.2 the < HS-PDSCH\_Ec > and < Îor > are allowed to be increased by an amount defined in Table 6.1A | | | |

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1B.

#### 6.5C.2.2 Minimum requirements (Narrow band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5C.3 and Table 6.5C.4. This requirement is measure of a receiver’s ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing.

Table 6.5C.3: Narrow band blocking characteristics for DC-HSUPA

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V, X, XXV, XXVI | Band III, VIII, XII, XIII, XIV |
| Iblocking (GMSK) | dBm | -57 | -56 |
| Fuw (offset)  (NOTE 2) | MHz | 2.7 | 2.8 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iblocking (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.5C.4: Reference input powers for narrow-band blocking, DC-HSUPA

|  |  |  |  |
| --- | --- | --- | --- |
| Operating Band | Unit | HS-PDSCH\_Ec | Îor |
| II | dBm/3.84 MHz | -101 | -90.7 |
| III | dBm/3.84 MHz | -100 | -89.7 |
| IV | dBm/3.84 MHz | -102.8 | -92.5 |
| V | dBm/3.84 MHz | -100.9 | -90.6 |
| VIII | dBm/3.84 MHz | -98.5 | -88.2 |
| X | dBm/3.84 MHz | -102.8 | -92.5 |
| XII | dBm/3.84 MHz | N/A | N/A |
| XIII | dBm/3.84 MHz | N/A | N/A |
| XIV | dBm/3.84 MHz | N/A | N/A |
| XXV | dBm/3.84 MHz | -99.5 | -89.2 |
| XXVI | dBm/3.84 MHz | -98.5 | -88.2 |
| NOTE 1: For the UE which supports DB-DC-HSDPA configuration in clause 4.2 the < HS‑PDSCH\_Ec > and < Îor > are allowed to be increased by an amount defined in Table 6.1A | | | |

The normative reference for this requirement is TS 25.101 [1] clause 7.6.3B.

### 6.5C.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5C.6, table 6.5C.7, table 6.5C.8 and table 6.5C.9 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the blocking ability decreases the DC-HSUPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

### 6.5C.4 Method of test

6.5C.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

For narrow-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.43.

2) RF parameters are set up according to table 6.5C.6, table 6.5C.7, table 6.5C.8 and table 6.5C.9.

3) A call is set up according to the Generic call setup procedure specified in TS34.108[3] sub clause 7.3.14, with exceptions for information elements listed in Table 6.5C.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5C.5 Specific Message Contents for In-band blocking characteristics for DC-HSUPA

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink HS-PDSCH Information |  |  |
| - CHOICE mode | FDD |  |
| - Downlink 64QAM configured | Not Present | Rel-7 |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) | Rel-7 |
| Downlink secondary cell info FDD |  | Rel-8 |
| - CHOICE Configuration info | New configuration |  |
| - Downlink 64QAM configured | Not Present |  |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) |  |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.5C.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5C.6 and table 6.5C.8.

2) Set the power level of UE according to the table 6.5C.6, table 6.5C.7, table 6.5C.8 and table 6.5C.9 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

### 6.5C.5 Test requirements

For table 6.5C.6, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. For table 6.5C.8, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5C.6: Test parameters for In-band blocking characteristics for DC-HSUPA

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (NOTE 4) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6  (Note 2) | 2095 f 2185 |
| Fuw  (Band II operation) | MHz | 1922.4 f 1997.6  (Note 2) | 1915 f 2005 |
| Fuw  (Band III operation) | MHz | 1797.4 f 1887.6  (Note 2) | 1790 f 1895 |
| Fuw  (Band IV operation) | MHz | 2102.4 f 2162.6  (Note 2) | 2095 f 2170 |
| Fuw  (Band V operation) | MHz | 861.4 f 901.6  (Note 2) | 854 f 909 |
| Fuw  (Band VI operation) | MHz | 867.4 f 892.6 (Note 3) | 860 f 900  (Note 3) |
| Fuw  (Band VII operation) | MHz | 2612.4 f 2697.6  (Note 2) | 2605  f  2705 |
| Fuw  (Band VIII operation) | MHz | 917.4 f 967.6  (Note 2) | 910  f  975 |
| Fuw  (Band IX operation) | MHz | 1837.4 £ f £ 1887.4  (Note 2) | 1829.9 £ f £ 1894.9 |
| Fuw  (Band X operation) | MHz | 2102.4  f  2177.6  (Note 2) | 2095  f  2185 |
| Fuw  (Band XI operation) | MHz | 1468.4  f  1503.4  (Note 2) | 1460.9  f  1510.9 |
| Fuw  (Band XII operation) | MHz | 721.4  f  753.6  (Note 2) | 714  f  761 |
| Fuw  (Band XIII operation) | MHz | 738.4  f  763.6  (Note 2) | 731  f  771 |
| Fuw  (Band XIV operation) | MHz | 750.4  f  775.6  (Note 2) | 743  f  783 |
| Fuw  (Band XIX operation) | MHz | 867.4 f 897.6  (Note 2) | 860 f 905  (Note 3) |
| Fuw  (Band XX operation) | MHz | 783.4 f 828.6  (Note 2) | 776 f 836  (Note 3) |
| Fuw  (Band XXI operation) | MHz | 1488.4 f 1518.4  (Note 2) | 1480.9 f 1525.9  (Note 3) |
| Fuw  (Band XXII operation) | MHz | 3502.4 f 3597.6  (Note 2) | 3495 f 3605  (Note 3) |
| Fuw  (Band XXV operation) | MHz | 1922.4 f 2002.6  (Note 2) | 1915 f 2010  (Note 3) |
| Fuw  (Band XXVI operation) | MHz | 851.4 f 901.6 | 844 f 909 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For each carrier frequency the requirement is valid for two frequencies, the carrier frequency +/- 10 MHz.

NOTE 3: For Band VI, Band XIX and Band XXI, the unwanted interfering signal does not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.

NOTE 4: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.5C.7: Test parameters for reference input powers for  
in-band blocking characteristics, DC-HSUPA

|  |  |  |  |
| --- | --- | --- | --- |
| Operating Band | Unit | HS-PDSCH\_Ec | Îor |
| I | dBm/3.84 MHz | -110 | -99.7 |
| II | dBm/3.84 MHz | -108 | -97.7 |
| III | dBm/3.84 MHz | -107 | -96.7 |
| IV | dBm/3.84 MHz | -110 | -99.7 |
| V | dBm/3.84 MHz | -104.3 | -94 |
| VI | dBm/3.84 MHz | -104.7 | -94.4 |
| VII | dBm/3.84 MHz | -108 | -97.7 |
| VIII | dBm/3.84 MHz | -101.1 | -90.8 |
| IX | dBm/3.84 MHz | -109 | -98.7 |
| X | dBm/3.84 MHz | -110 | -99.7 |
| XI | dBm/3.84 MHz | -101.4 | -91.1 |
| XII | dBm/3.84 MHz | N/A | N/A |
| XIII | dBm/3.84 MHz | N/A | N/A |
| XIV | dBm/3.84 MHz | N/A | N/A |
| XIX | dBm/3.84 MHz | -104.7 | -94.4 |
| XX | dBm/3.84 MHz | TBD | TBD |
| XXI | dBm/3.84 MHz | -101.4 | -91.1 |
| XXII | dBm/3.84 MHz | TBD | TBD |
| XXV | dBm/3.84 MHz | -106.5 | -96.2 |
| XXVI | dBm/3.84 MHz | -101.1 | -90.8 |
| NOTE 1: For the UE which supports both Band III and Band IX operating frequencies, the reference sensitivity level of TBD dBm <REF\_Ec,in-band> shall apply for Band IX. The corresponding <REFÎor,in-band> is TBD dBm  NOTE 2: For the UE which supports both Band XI and Band XXI operating frequencies, the reference input power level is FFS.  NOTE 3: For the UE which supports DB-DC-HSDPA configuration in clause 4.2 the < HS‑PDSCH\_Ec > and < Îor > are allowed to be increased by an amount defined in Table 6.1A | | | |

Table 6.5C.8: Test parameters for narrow band blocking for DC-HSUPA

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V, X, XXV, XXVI | Band III, VIII, XII, XIII, XIV |
| Iblocking (GMSK) | dBm | -57 | -56 |
| Fuw (offset)  (NOTE 2) | MHz | 2.7 | 2.8 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 5: Iblocking (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 6: Offset refers to the assigned channel frequencies of the individual cells.

Table 6.5C.9: Test parameters for reference input powers for narrow-band blocking, DC-HSUPA

|  |  |  |  |
| --- | --- | --- | --- |
| Operating Band | Unit | HS-PDSCH\_Ec | Îor |
| II | dBm/3.84 MHz | -101 | -90.7 |
| III | dBm/3.84 MHz | -100 | -89.7 |
| IV | dBm/3.84 MHz | -102.8 | -92.5 |
| V | dBm/3.84 MHz | -100.9 | -90.6 |
| VIII | dBm/3.84 MHz | -98.5 | -88.2 |
| X | dBm/3.84 MHz | -102.8 | -92.5 |
| XII | dBm/3.84 MHz | N/A | N/A |
| XIII | dBm/3.84 MHz | N/A | N/A |
| XIV | dBm/3.84 MHz | N/A | N/A |
| XXV | dBm/3.84 MHz | -99.5 | -89.2 |
| XXVI | dBm/3.84 MHz | -98.5 | -88.2 |
| NOTE: For the UE which supports DB-DC-HSDPA configuration in clause 4.2 the < HS‑PDSCH\_Ec > and < Îor > are allowed to be increased by an amount defined in Table 6.1A | | | |

NOTE 7: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.5D Blocking Characteristics for single Uplink Single band 4C-HSDPA

### 6.5D.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in clause 6.5D.2.1 and 6.5D.2.2 and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support single band single uplink 4C-HSDPA.

Single band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.5D.2 Minimum Requirements

#### 6.5D.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5D.1 and 6.5D.2. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5D.1: Test parameters for in-band blocking, single band 4C-HSDPA, single uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (NOTE 2) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6 | 2095 f 2185 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For single band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequencies, and positive offset refers to the assigned channel frequency of the highest carrier frequencies.

Table 6.5D.2: In-band blocking requirements, single band 4C-HSDPA, single uplink operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Single band 4C-HSDPA Configuration | DL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor  (dBm/3.84MHz) | UL-DL carrier separation |
| I-3 | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |

NOTE 3: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2C.1 for single band 4C-HSDPA.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1C.1.

#### 6.5D.2.2 Minimum requirements (Out of-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5D.3 and 6.5D.4. Out-of-band band blocking is defined for an unwanted interfering signal falling more than 15 MHz below or above the UE receive band.

For Table 6.5D.3 in frequency range 1, 2 and 3, up to 24 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6C spurious response are applicable.

For Table 6.5D.4 in frequency range 4, up to 8 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6C spurious response are applicable.

Table 6.5D.3: Test parameters for out of band blocking, single band 4C-HSDPA

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Frequency range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 |
| Iblocking (CW) | dBm | -44 | -30 | -15 | -15 |
| Fuw  (Single band 4C-HSDPA  Configuration I-3) | MHz | 2050<f <2095  2185<f <2230 | 2025 <f 2050  2230 f <2255 | 1< f 2025  2255f<12750 | - |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |
| Single band 4C-HSDPA  Configuration I-3 | For 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5D.2.1 shall be applied. | | | | |

Table 6.5D.4: Out of band blocking requirements, single band 4C-HSDPA

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Singe band 4C-HSDPA Configuration | Parameter | Frequency range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 | UL-DL carrier separation |
| I-3 | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| Îor (dBm/3.84MHz) | <REFÎor> + 3 dB | <REFÎor> + 3 dB | <REFÎor> + 3 dB | <REFÎor> + 3 dB |

NOTE: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2C.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.2C.

### 6.5D.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5D.6, table 6.5D.7, table 6.5D.8 and table 6.5D.10 for the DL reference channel H-Set 1B specified in Annex C.8.1.1.

The lack of the blocking ability decreases the 4C-HSDPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

### 6.5D.4 Method of test

#### 6.5D.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clauseG.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.49.

2) RF parameters are set up according to table 6.5D.6, table 6.5D.7, table 6.5D.8 and table 6.5D.9.

3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS34.108[3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.5D.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5D.5: Specific Message Contents for In-band blocking characteristics for Single band 4C-HSDPA, Single uplink operation

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

#### 6.5D.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5D.6 and table 6.5D.7, for inblocking measurements and table 6.5D.8 and table 6.5D.9 for out of band measurements. For table 6.5D.8 and 6.5D.9, the frequency step size is 1 MHz.

2) Set the power level of UE according to the table 6.5D.6, table 6.5D.7, table 6.5D.8 and table 6.5D.9, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

4) For table 6.5D.8 and 6.5D.9, record the frequencies for which BLER exceed the test requirements.

### 6.5D.5 Test requirements

For table 6.5D.6 and 6.5D.7, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. For table 6.5D.8 and 6.5D.9, the measured BLER, derived in step 2) shall not exceed 0.1 on each individual cell except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24 for frequency range 1, 2 and 3. The number of spurious response frequencies, recorded in step 3) shall not exceed 8 for frequency range 4. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5D.6: Test parameters for in-band blocking, single band 4C-HSDPA, single uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (NOTE 2) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6 | 2095 f 2185 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For single band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequencies, and positive offset refers to the assigned channel frequency of the highest carrier frequencies.

Table 6.5D.7: In-band blocking requirements, single band 4C-HSDPA, single uplink operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Single band 4C-HSDPA Configuration | DL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor  (dBm/3.84MHz) | UL-DL carrier separation |
| I-3 | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |

NOTE 3: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2C.1 for single band 4C-HSDPA.

Table 6.5D.8: Test parameters for out of band blocking, single band 4C-HSDPA

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Frequency range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 |
| Iblocking (CW) | dBm | -44 | -30 | -15 | -15 |
| Fuw  (Single band 4C-HSDPA  Configuration I-3) | MHz | 2050<f <2095  2185<f <2230 | 2025 <f 2050  2230 f <2255 | 1< f 2025  2255f<12750 | - |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |
| Single band 4C-HSDPA  Configuration I-3 | For 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5D.2.1 shall be applied. | | | | |

Table 6.5D.9: Out of band blocking requirements, single band 4C-HSDPA

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Singe band 4C-HSDPA Configuration | Parameter | Frequency range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 | UL-DL carrier separation |
| I-3 | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| Îor (dBm/3.84MHz) | <REFÎor> + 3 dB | <REFÎor> + 3 dB | <REFÎor> + 3 dB | <REFÎor> + 3 dB |

NOTE 4: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2C.1.

NOTE 5: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.5E Blocking Characteristics for dual uplink single band 4C-HSDPA

### 6.5E.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in clause 6.5E.2.1 and 6.5E.2.2 and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support single band dual uplink 4C-HSDPA.

Single band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.5E.2 Minimum Requirements

#### 6.5E.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5E.1 and 6.5E.2. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5E.1: Test parameters for in-band blocking, single band 4C-HSDPA, dual uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (NOTE 2) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6 | 2095 f 2185 |

NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For single band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequencies, and positive offset refers to the assigned channel frequency of the highest carrier frequencies.

Table 6.5E.2: In-band blocking requirements, single band 4C-HSDPA, dual uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Single band 4C-HSDPA Configuration | DL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor  (dBm/3.84MHz) | UE transmitted mean power (dBm) | UL-DL carrier separation |
| I-3 | I | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| NOTE 1: For the UE which supports DB-DC-HSDPA configuration in section 4.2 the < HS-PDSCH\_Ec > and < Îor > are allowed to be increased by an amount defined in Table 6.1A.  NOTE 2: For the UE which supports dual band 4C-HSDPA configuration in Table 4.0B the < HS-PDSCH\_Ec > and < Îor > are allowed to be increased by an amount defined in Table 6.1B. | | | | | |

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1C.2.

### 6.5E.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5E.4 and table 6.5E.5 for the DL reference channel H-Set 1B specified in Annex C.8.1.1.

The lack of the blocking ability decreases the 4C-HSDPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

### 6.5E.4 Method of test

#### 6.5E.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clauseG.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figureA.49.

2) RF parameters are set up according to table 6.5E.4 and table 6.5E.5.

3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS34.108[3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.5E.3. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5E.3: Specific Message Contents for In-band blocking characteristics for Single band 4C-HSDPA, Single uplink operation

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

#### 6.5E.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5E.4 and table 6.5E.5, for inblocking measurements.

2) Set the power level of UE according to the table 6.5E.4 and table 6.5E.5, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

4) For table 6.5E.5, record the frequencies for which BLER exceed the test requirements.

### 6.5E.5 Test requirements

For table 6.5E.4 and 6.5E.5, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5E.4: Test parameters for in-band blocking, single band 4C-HSDPA, dual uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (NOTE 2) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6 | 2095 f 2185 |

NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For single band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequencies, and positive offset refers to the assigned channel frequency of the highest carrier frequencies.

Table 6.5E.5: In-band blocking requirements, single band 4C-HSDPA, dual uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Single band 4C-HSDPA Configuration | DL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor  (dBm/3.84MHz) | UE transmitted mean power (dBm) | UL-DL carrier separation |
| I-3 | I | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| NOTE 1: For the UE which supports DB-DC-HSDPA configuration in section 4.2 the < HS-PDSCH\_Ec > and < Îor > are allowed to be increased by an amount defined in Table 6.1A.  NOTE 2: For the UE which supports dual band 4C-HSDPA configuration in Table 4.0B the < HS-PDSCH\_Ec > and < Îor > are allowed to be increased by an amount defined in Table 6.1B. | | | | | |

NOTE 3: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.5F Blocking Characteristics for single Uplink dual band 4C-HSDPA

### 6.5F.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in clause 6.5F.2.1 and 6.5F.2.2 and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band single uplink 4C-HSDPA and HS-DSCH categories 31 or 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.5F.2 Minimum Requirements

#### 6.5F.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5F.1 and 6.5F.2. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5F.1: Test parameters for in-band blocking, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (NOTE 2) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6 | 2095 f 2185 |
| Fuw  (Band II operation) | MHz | 1922.4 f 1997.6 | 1915 f 2005 |
| Fuw  (Band IV operation) | MHz | 2102.4 f 2162.6 | 2095 f 2170 |
| Fuw  (Band V operation) | MHz | 861.4 f 901.6 | 854 f 909 |
| Fuw  (Band VIII operation) | MHz | 917.4 f 967.6 | 910  f  975 |
| Fuw  (Band XXXII operation) | MHz | 1444.4 f 1503.6 | 1437 f 1511 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |
| NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.  NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequenc(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequenc(ies) in each band. | | | |

Table 6.5F.2: In-band blocking requirements, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor (dBm/3.84MHz) | UL-DL carrier separation |
| I-2-VIII-1  I-3-VIII-1 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I | VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | II | II | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| II | IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I-1-V-2  I-2-V-1  I-2-V-2 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I | V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I-1-XXXII-2  I-2-XXXII-1 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| XXXII |  | <REFSENS>+ 3 dB | <REFÎor>+ 3dB | Minimum |
| NOTE: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2D.1 for dual band 4C-HSDPA. | | | | | |

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1D.1.

#### 6.5F.2.2 Minimum requirements (Out of-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5F.3 and 6.5F.4. Out-of-band band blocking is defined for an unwanted interfering signal falling more than 15 MHz below or above the UE receive band.

For Table 6.5F.3 in frequency range 1, 2 and 3, up to 24 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6D spurious response are applicable.

For Table 6.5F.4 in frequency range 4, up to 8 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6D spurious response are applicable.

Table 6.5F.3: Test parameters for out of band blocking, dual band 4C-HSDPA

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Frequency  range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 |
| Iblocking (CW) | dBm | -44 | -30 | -15 | -15 |
| Fuw  (Dual band 4C-HSDPA Configuration  I-2-VIII-1, I-3-VIII-1) | MHz | 865< f <910  975< f <1020  2050< f <2095  2185< f <2230 | 840< f £865  1020 f <1045  2025< f 2050  2230 f <2255 | 1< f 840  1045 f <2025  2255< f  12750 | - |
| Fuw  (Dual band 4C-HSDPA Configuration II-1-IV-2,  II-2-IV-1, II-2-IV-2) | MHz | 1870< f <1915  2005< f <2095  2170< f <2215 | 1845< f 1870  2215 f <2240 | 1< f 1845  2240 f <12750 | 1850 f 1910 |
| Fuw  (Dual band 4C-HSDPA Configuration I-1-V-2,  I-2-V-1, I-2-V-2) | MHz | 809< f <854  909< f <954  2050< f <2095  2185< f <2230 | 784< f 809  954 f < 979  2025< f 2050  2230 f <2255 | 1< f 784  979 f <2025  2255< f 12750 | 824  f  849 |
| Fuw  (Dual band 4C-HSDPA Configuration I-1-XXXII-2, I-2-XXXII-1) | MHz | 1392< f <1437  1511< f <1556  2050< f <2095  2185< f <2230 | 1367< f £1392  1556 f <1581  2025< f 2050  2230 f <2255 | 1< f 1367  1581 f <2025  2255< f  12750 | - |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |
| Dual band 4C-HSDPA Configuration  I-2-VIII-1, I-3-VIII-1 | For 910f 975 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5F.2.1 shall be applied. | | | | |
| Dual band 4C-HSDPA Configuration II-1-IV-2,  II-2-IV-1, II-2-IV-2 | For 1915f 2005 MHz and 2095f 2070 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5F.2.1 shall be applied. | | | | |
| Dual band 4C-HSDPA Configuration I-1-V-2,  I-2-V-1, I-2-V-2 | For 854f909 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5F.2.1 shall be applied. | | | | |
| Dual band 4C-HSDPA Configuration I-1-XXXII-2, I-2-XXXII-1 | For 1437f 1511 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5F.2.1 shall be applied. | | | | |

Table 6.5F.4: Out of band blocking requirements, dual band 4C-HSDPA

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | Parameter | Frequency range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 | UL-DL carrier separation |
| I-2-VIII-1  I-3-VIII-1 | I | I | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| VIII | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| I | VIII | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| VIII | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | II | II | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| IV | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| II | IV | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| IV | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| I-1-V-2  I-2-V-1  I-2-V-2 | I | I | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| V | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| I | V | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| V | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| I-1-XXXII-2  I-2-XXXII-1 | I | I | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| XXXII |  | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB |  |
| NOTE: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2D.1. | | | | | | | | |

The normative reference for this requirement is TS 25.101 [1] clause 7.6.2D.

#### 6.5F.2.3 Minimum requirements (Narrow band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5F.5 and 6.5F.6. This requirement is measure of a receiver’s ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing.

Table 6.5F.5: Test parameters for narrow band blocking characteristics, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V | Band VIII |
| Iblocking (GMSK) | dBm | -57 | -56 |
| Fuw (offset)  (NOTE 2) | MHz | 2.7 | 2.8 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iblocking (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.5F.6: Narrow band blocking requirements, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor (dBm/3.84MHz) | UL-DL carrier separation |
| I-2-VIII-1  I-3-VIII-1 | VIII | I | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| VIII | VIII | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | II | II | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| IV | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| II | IV | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| IV | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| I-1-V-2  I-2-V-1  I-2-V-2 | V | I | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| V | V | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |

NOTE 3: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2D.1 for dual band 4C-HSDPA.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.3D.1.

### 6.5F.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5F.8, table 6.5F.9, table 6.5F.10, table 6.5F.11, table 6.5F.12 and table 6.5F.13 for the DL reference channel H-Set 1C specified in Annex C.8.1.1.

The lack of the blocking ability decreases the 4C-HSDPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

This test case tests only 4 carrier configurations.

### 6.5F.4 Method of test

#### 6.5F.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clauseG.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figureA.49.

2) RF parameters are set up according to table 6.5F.8 through table 6.5F.13.

3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS34.108[3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.5F.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5F.7: Specific Message Contents for In-band blocking characteristics for Single band 4C-HSDPA, Single uplink operation

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

#### 6.5F.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5F.8 and table 6.5F.9, for inblocking measurements, Table 6.5F.10 and table 6.5F.11 for out of band measurements and Table 6.5F.12 and table 6.5F.13 for narrow band blocking. For table 6.5F.8 and 6.5F.9, the frequency step size is 1 MHz.

2) Set the power level of UE according to the table 6.5F.8 through table 6.5F.13, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

4) For table 6.5F.9, table 6.5F.11 and table 6.5F.13, record the frequencies for which BLER exceed the test requirements.

### 6.5F.5 Test requirements

For table 6.5F.8 and 6.5F.9, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. For table 6.5F.10 and 6.5F.11, the measured BLER, derived in step 2) shall not exceed 0.1 on each individual cell except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24 for frequency range 1, 2 and 3. The number of spurious response frequencies, recorded in step 3) shall not exceed 8 for frequency range 4. For table 6.5F.12 and 6.5F.13, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5F.8: Test parameters for in-band blocking, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (NOTE 2) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6 | 2095 f 2185 |
| Fuw  (Band II operation) | MHz | 1922.4 f 1997.6 | 1915 f 2005 |
| Fuw  (Band IV operation) | MHz | 2102.4 f 2162.6 | 2095 f 2170 |
| Fuw  (Band V operation) | MHz | 861.4 f 901.6 | 854 f 909 |
| Fuw  (Band VIII operation) | MHz | 917.4 f 967.6 | 910  f  975 |
| Fuw  (Band XXXII operation) | MHz | 1444.4 f 1503.6 | 1437 f 1511 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |
| NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.  NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequenc(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequenc(ies) in each band. | | | |

Table 6.5F.9: In-band blocking requirements, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor (dBm/3.84MHz) | UL-DL carrier separation |
| I-3-VIII-1 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I | VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| II-2-IV-2 | II | II | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| II | IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I-2-V-2 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I | V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| NOTE: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2D.1 for dual band 4C-HSDPA. | | | | | |

Table 6.5F.10: Test parameters for out of band blocking, dual band 4C-HSDPA

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Frequency  range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 |
| Iblocking (CW) | dBm | -44 | -30 | -15 | -15 |
| Fuw  (Dual band 4C-HSDPA Configuration  I-2-VIII-1, I-3-VIII-1) | MHz | 865< f <910  975< f <1020  2050< f <2095  2185< f <2230 | 840< f £865  1020 f <1045  2025< f 2050  2230 f <2255 | 1< f 840  1045 f <2025  2255< f  12750 | - |
| Fuw  (Dual band 4C-HSDPA Configuration II-1-IV-2,  II-2-IV-1, II-2-IV-2) | MHz | 1870< f <1915  2005< f <2095  2170< f <2215 | 1845< f 1870  2215 f <2240 | 1< f 1845  2240 f <12750 | 1850 f 1910 |
| Fuw  (Dual band 4C-HSDPA Configuration I-1-V-2,  I-2-V-1, I-2-V-2) | MHz | 809< f <854  909< f <954  2050< f <2095  2185< f <2230 | 784< f 809  954 f < 979  2025< f 2050  2230 f <2255 | 1< f 784  979 f <2025  2255< f 12750 | 824  f  849 |
| Fuw  (Dual band 4C-HSDPA Configuration I-1-XXXII-2, I-2-XXXII-1) | MHz | 1392< f <1437  1511< f <1556  2050< f <2095  2185< f <2230 | 1367< f £1392  1556 f <1581  2025< f 2050  2230 f <2255 | 1< f 1367  1581 f <2025  2255< f  12750 | - |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |
| Dual band 4C-HSDPA Configuration  I-2-VIII-1, I-3-VIII-1 | For 910f 975 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5F.2.1 shall be applied. | | | | |
| Dual band 4C-HSDPA Configuration II-1-IV-2,  II-2-IV-1, II-2-IV-2 | For 1915f 2005 MHz and 2095f 2070 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5F.2.1 shall be applied. | | | | |
| Dual band 4C-HSDPA Configuration I-1-V-2,  I-2-V-1, I-2-V-2 | For 854f909 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5F.2.1 shall be applied. | | | | |
| Dual band 4C-HSDPA Configuration I-1-XXXII-2, I-2-XXXII-1 | For 1437f 1511 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5F.2.1 shall be applied. | | | | |

Table 6.5F.11: Out of band blocking requirements, dual band 4C-HSDPA

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | Parameter | Frequency range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 | UL-DL carrier separation |
| I-3-VIII-1 | I | I | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| VIII | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| I | VIII | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| VIII | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| II-2-IV-2 | II | II | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| IV | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| II | IV | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| IV | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| I-2-V-2 | I | I | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| V | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| I | V | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| V | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| NOTE: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2D.1. | | | | | | | | |

Table 6.5F.12: Test parameters for narrow band blocking characteristics, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V | Band VIII |
| Iblocking (GMSK) | dBm | -57 | -56 |
| Fuw (offset)  (NOTE 2) | MHz | 2.7 | 2.8 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 5: Iblocking (GMSK) is an interfering signal as defined in TS 45.004

NOTE 6: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.5F.13: Narrow band blocking requirements, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor (dBm/3.84MHz) | UL-DL carrier separation |
| I-2-VIII-1  I-3-VIII-1 | VIII | I | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| VIII | VIII | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | II | II | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| IV | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| II | IV | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| IV | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| I-1-V-2  I-2-V-1  I-2-V-2 | V | I | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| V | V | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |

NOTE 7: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2D.1 for dual band 4C-HSDPA.

NOTE 8: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.5FA Blocking Characteristics for single Uplink dual band 4C-HSDPA (3 carrier)

### 6.5FA.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in clause 6.5FA.2.1 and 6.5FA.2.2 and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band single uplink 4C-HSDPA and HS-DSCH categories 29 to 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.5FA.2 Minimum Requirements

#### 6.5FA.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5FA.1 and 6.5FA.2. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5FA.1: Test parameters for in-band blocking, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (NOTE 2) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6 | 2095 f 2185 |
| Fuw  (Band II operation) | MHz | 1922.4 f 1997.6 | 1915 f 2005 |
| Fuw  (Band IV operation) | MHz | 2102.4 f 2162.6 | 2095 f 2170 |
| Fuw  (Band V operation) | MHz | 861.4 f 901.6 | 854 f 909 |
| Fuw  (Band VIII operation) | MHz | 917.4 f 967.6 | 910  f  975 |
| Fuw  (Band XXXII operation) | MHz | 1444.4 f 1503.6 | 1437 f 1511 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |
| NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.  NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequenc(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequenc(ies) in each band. | | | |

Table 6.5FA.2: In-band blocking requirements, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor (dBm/3.84MHz) | UL-DL carrier separation |
| I-2-VIII-1  I-3-VIII-1 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I | VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | II | II | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| II | IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I-1-V-2  I-2-V-1  I-2-V-2 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I | V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I-1-XXXII-2  I-2-XXXII-1 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| XXXII |  | <REFSENS>+ 3 dB | <REFÎor>+ 3dB | Minimum |
| NOTE: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2D.1 for dual band 4C-HSDPA. | | | | | |

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1D.1.

#### 6.5FA.2.2 Minimum requirements (Out of-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5FA.3 and 6.5FA.4. Out-of-band band blocking is defined for an unwanted interfering signal falling more than 15 MHz below or above the UE receive band.

For Table 6.5FA.3 in frequency range 1, 2 and 3, up to 24 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6DA spurious response are applicable.

For Table 6.5FA.4 in frequency range 4, up to 8 exceptions per received cell are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 6.6DA spurious response are applicable.

Table 6.5FA.3: Test parameters for out of band blocking, dual band 4C-HSDPA

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Frequency  range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 |
| Iblocking (CW) | dBm | -44 | -30 | -15 | -15 |
| Fuw  (Dual band 4C-HSDPA Configuration  I-2-VIII-1, I-3-VIII-1) | MHz | 865< f <910  975< f <1020  2050< f <2095  2185< f <2230 | 840< f £865  1020 f <1045  2025< f 2050  2230 f <2255 | 1< f 840  1045 f <2025  2255< f  12750 | - |
| Fuw  (Dual band 4C-HSDPA Configuration II-1-IV-2,  II-2-IV-1, II-2-IV-2) | MHz | 1870< f <1915  2005< f <2095  2170< f <2215 | 1845< f 1870  2215 f <2240 | 1< f 1845  2240 f <12750 | 1850 f 1910 |
| Fuw  (Dual band 4C-HSDPA Configuration I-1-V-2,  I-2-V-1, I-2-V-2) | MHz | 809< f <854  909< f <954  2050< f <2095  2185< f <2230 | 784< f 809  954 f < 979  2025< f 2050  2230 f <2255 | 1< f 784  979 f <2025  2255< f 12750 | 824  f  849 |
| Fuw  (Dual band 4C-HSDPA Configuration I-1-XXXII-2, I-2-XXXII-1) | MHz | 1392< f <1437  1511< f <1556  2050< f <2095  2185< f <2230 | 1367< f £1392  1556 f <1581  2025< f 2050  2230 f <2255 | 1< f 1367  1581 f <2025  2255< f  12750 | - |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |
| Dual band 4C-HSDPA Configuration  I-2-VIII-1, I-3-VIII-1 | For 910f 975 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5FA.2.1 shall be applied. | | | | |
| Dual band 4C-HSDPA Configuration II-1-IV-2,  II-2-IV-1, II-2-IV-2 | For 1915f 2005 MHz and 2095f 2070 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5FA.2.1 shall be applied. | | | | |
| Dual band 4C-HSDPA Configuration I-1-V-2,  I-2-V-1, I-2-V-2 | For 854f909 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5FA.2.1 shall be applied. | | | | |
| Dual band 4C-HSDPA Configuration I-1-XXXII-2, I-2-XXXII-1 | For 1437f 1511 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5FA.2.1 shall be applied. | | | | |

Table 6.5FA.4: Out of band blocking requirements, dual band 4C-HSDPA

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | Parameter | Frequency range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 | UL-DL carrier separation |
| I-2-VIII-1  I-3-VIII-1 | I | I | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| VIII | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| I | VIII | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| VIII | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | II | II | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| IV | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| II | IV | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| IV | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| I-1-V-2  I-2-V-1  I-2-V-2 | I | I | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| V | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| I | V | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| V | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| I-1-XXXII-2  I-2-XXXII-1 | I | I | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| XXXII |  | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB |  |
| NOTE: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2DA.1. | | | | | | | | |

The normative reference for this requirement is TS 25.101 [1] clause 7.6.2DA.

#### 6.5FA.2.3 Minimum requirements (Narrow band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5FA.5 and 6.5FA.6. This requirement is measure of a receiver’s ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing.

Table 6.5FA.5: Test parameters for narrow band blocking characteristics, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V | Band VIII |
| Iblocking (GMSK) | dBm | -57 | -56 |
| Fuw (offset)  (NOTE 2) | MHz | 2.7 | 2.8 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iblocking (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.5FA.6: Narrow band blocking requirements, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor (dBm/3.84MHz) | UL-DL carrier separation |
| I-2-VIII-1  I-3-VIII-1 | VIII | I | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| VIII | VIII | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | II | II | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| IV | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| II | IV | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| IV | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| I-1-V-2  I-2-V-1  I-2-V-2 | V | I | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| V | V | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |

NOTE 3: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2DA.1 for dual band 4C-HSDPA.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.3D.1.

### 6.5FA.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5FA.8, table 6.5FA.9, table 6.5FA.10, table 6.5FA.11, table 6.5FA.12 and table 6.5FA.13 for the DL reference channel H-Set 1B specified in Annex C.8.1.1.

The lack of the blocking ability decreases the 4C-HSDPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

This test case tests only 3 carrier configurations.

### 6.5FA.4 Method of test

#### 6.5FA.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clauseG.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figureA.49.

2) RF parameters are set up according to table 6.5FA.8 through table 6.5FA.13.

3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS34.108[3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.5FA.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5FA.7: Specific Message Contents for In-band blocking characteristics for Single band 4C-HSDPA, Single uplink operation

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

#### 6.5FA.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5FA.8 and table 6.5FA.9, for inblocking measurements, Table 6.5FA.10 and table 6.5FA.11 for out of band measurements and Table 6.5FA.12 and table 6.5FA.13 for narrow band blocking. For table 6.5FA.8 and 6.5FA.9, the frequency step size is 1 MHz.

2) Set the power level of UE according to the table 6.5FA.8 through table 6.5FA.13, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

4) For table 6.5FA.9, table 6.5FA.11 and table 6.5FA.13, record the frequencies for which BLER exceed the test requirements.

### 6.5FA.5 Test requirements

For table 6.5FA.8 and 6.5FA.9, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. For table 6.5FA.10 and 6.5FA.11, the measured BLER, derived in step 2) shall not exceed 0.1 on each individual cell except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24 for frequency range 1, 2 and 3. The number of spurious response frequencies, recorded in step 3) shall not exceed 8 for frequency range 4. For table 6.5FA.12 and 6.5FA.13, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5FA.8: Test parameters for in-band blocking, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (NOTE 2) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6 | 2095 f 2185 |
| Fuw  (Band II operation) | MHz | 1922.4 f 1997.6 | 1915 f 2005 |
| Fuw  (Band IV operation) | MHz | 2102.4 f 2162.6 | 2095 f 2170 |
| Fuw  (Band V operation) | MHz | 861.4 f 901.6 | 854 f 909 |
| Fuw  (Band VIII operation) | MHz | 917.4 f 967.6 | 910  f  975 |
| Fuw  (Band XXXII operation) | MHz | 1444.4 f 1503.6 | 1437 f 1511 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |
| NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.  NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequenc(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequenc(ies) in each band. | | | |

Table 6.5FA.9: In-band blocking requirements, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor (dBm/3.84MHz) | UL-DL carrier separation |
| I-2-VIII-1 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I | VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| II-1-IV-2  II-2-IV-1 | II | II | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| II | IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I-1-V-2  I-2-V-1 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I | V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I-1-XXXII-2  I-2-XXXII-1 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| XXXII |  | <REFSENS>+ 3 dB | <REFÎor>+ 3dB | Minimum |
| NOTE: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2D.1 for dual band 4C-HSDPA. | | | | | |

Table 6.5FA.10: Test parameters for out of band blocking, dual band 4C-HSDPA

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Frequency  range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 |
| Iblocking (CW) | dBm | -44 | -30 | -15 | -15 |
| Fuw  (Dual band 4C-HSDPA Configuration  I-2-VIII-1, I-3-VIII-1) | MHz | 865< f <910  975< f <1020  2050< f <2095  2185< f <2230 | 840< f £865  1020 f <1045  2025< f 2050  2230 f <2255 | 1< f 840  1045 f <2025  2255< f  12750 | - |
| Fuw  (Dual band 4C-HSDPA Configuration II-1-IV-2,  II-2-IV-1, II-2-IV-2) | MHz | 1870< f <1915  2005< f <2095  2170< f <2215 | 1845< f 1870  2215 f <2240 | 1< f 1845  2240 f <12750 | 1850 f 1910 |
| Fuw  (Dual band 4C-HSDPA Configuration I-1-V-2,  I-2-V-1, I-2-V-2) | MHz | 809< f <854  909< f <954  2050< f <2095  2185< f <2230 | 784< f 809  954 f < 979  2025< f 2050  2230 f <2255 | 1< f 784  979 f <2025  2255< f 12750 | 824  f  849 |
| Fuw  (Dual band 4C-HSDPA Configuration I-1-XXXII-2, I-2-XXXII-1) | MHz | 1392< f <1437  1511< f <1556  2050< f <2095  2185< f <2230 | 1367< f £1392  1556 f <1581  2025< f 2050  2230 f <2255 | 1< f 1367  1581 f <2025  2255< f  12750 | - |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |
| Dual band 4C-HSDPA Configuration  I-2-VIII-1, I-3-VIII-1 | For 910f 975 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5FA.2.1 shall be applied. | | | | |
| Dual band 4C-HSDPA Configuration II-1-IV-2,  II-2-IV-1, II-2-IV-2 | For 1915f 2005 MHz and 2095f 2070 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5FA.2.1 shall be applied. | | | | |
| Dual band 4C-HSDPA Configuration I-1-V-2,  I-2-V-1, I-2-V-2 | For 854f909 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5FA.2.1 shall be applied. | | | | |
| Dual band 4C-HSDPA Configuration I-1-XXXII-2, I-2-XXXII-1 | For 1437f 1511 MHz and 2095f 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause [6.4D.2] and subclause 6.5FA.2.1 shall be applied. | | | | |

Table 6.5FA.11: Out of band blocking requirements, dual band 4C-HSDPA

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | Parameter | Frequency range 1 | Frequency range 2 | Frequency range 3 | Frequency range 4 | UL-DL carrier separation |
| I-2-VIII-1 | I | I | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| VIII | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| I | VIII | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| VIII | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| II-1-IV-2  II-2-IV-1 | II | II | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| IV | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| II | IV | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| IV | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| I-1-V-2  I-2-V-1 | I | I | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| V | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| I | V | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| V | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | Minimum |
| I-1-XXXII-2  I-2-XXXII-1 | I | I | HS-PDSCH\_Ec (dBm/3.84MHz) | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | <REFSENS>  +3 dB | Minimum |
| XXXII | Îor (dBm/3.84MHz) | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB | <REFÎor>  + 3 dB |
| NOTE: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2DA.1. | | | | | | | | |

Table 6.5FA.12: Test parameters for narrow band blocking characteristics, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V | Band VIII |
| Iblocking (GMSK) | dBm | -57 | -56 |
| Fuw (offset)  (NOTE 2) | MHz | 2.7 | 2.8 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 5: Iblocking (GMSK) is an interfering signal as defined in TS 45.004

NOTE 6: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.5FA.13: Narrow band blocking requirements, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor (dBm/3.84MHz) | UL-DL carrier separation |
| I-2-VIII-1  I-3-VIII-1 | VIII | I | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| VIII | VIII | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | II | II | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| IV | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| II | IV | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| IV | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| I-1-V-2  I-2-V-1  I-2-V-2 | V | I | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |
| V | V | <REFSENS>+10 dB | <REFÎor>+10 dB | Minimum |

NOTE 7: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2DA.1 for dual band 4C-HSDPA.

NOTE 8: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.5G Blocking Characteristics for dual uplink dual band 4C-HSDPA

### 6.5G.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in clause 6.5G.2.1 and 6.5G.2.2 and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band dual uplink 4C-HSDPA and HS-DSCH categories 31 or 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.5G.2 Minimum Requirements

#### 6.5G.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5G.1 and 6.5G.2. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5G.1: Test parameters for in-band blocking, dual band 4C-HSDPA, dual uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (NOTE 2) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6 | 2095 f 2185 |
| Fuw  (Band II operation) | MHz | 1922.4 f 1997.6 | 1915 f 2005 |
| Fuw  (Band IV operation) | MHz | 2102.4 f 2162.6 | 2095 f 2170 |
| Fuw  (Band V operation) | MHz | 861.4 f 901.6 | 854 f 909 |
| Fuw  (Band VIII operation) | MHz | 917.4 f 967.6 | 910  f  975 |
| Fuw  (Band XXXII operation) | MHz | 1444.4 f 1503.6 | 1437 f 1511 |
| NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.  NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequenc(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequenc(ies) in each band. | | | |

Table 6.5G.2: In-band blocking requirements, dual band 4C-HSDPA, dual uplink operation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor (dBm/3.84MHz) | UE transmitted mean power (dBm) | UL-DL carrier separation |
| I-2-VIII-1  I-3-VIII-1 | I | I | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| VIII | -107 | -96.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-1-IV-2 | II | IV | -107 | -96.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -109 | -98.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-2-IV-1 | II | II | -107 | -96.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -109 | -98.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-2-IV-2 | II | II | -107 | -96.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -109 | -98.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II | IV | -107 | -96.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -109 | -98.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-1-V-2 | I | V | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| V | -103.2 | -92.9 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-2-V-1 | I | I | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| V | -108 | -97.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-2-V-2 | I | I | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| V | -108 | -97.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I | V | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| V | -103.2 | -92.9 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-2-XXXII-1 | I | I | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| XXXII |  | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |  |

NOTE 3: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2D.1 for single band 4C-HSDPA.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1D.2.

#### 6.5G.2.2 Minimum requirements (Narrow band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5G.3 and Table 6.5G.4. This requirement is measure of a receiver’s ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing.

Table 6.5G.3: Test parameters for narrow band blocking characteristics for dual band 4C-HSDPA, dual uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V | Band VIII |
| Iblocking (GMSK) | dBm | -57 | -56 |
| Fuw (offset)  (NOTE 2) | MHz | 2.7 | 2.8 |

NOTE 1: Iblocking (GMSK) is an interfering signal as defined in TS 45.004

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.5G.4: Narrow band blocking requirements, dual band 4C-HSDPA, dual uplink operation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor (dBm/3.84MHz) | UE transmitted mean power (dBm) | UL-DL carrier separation |
| I-2-VIII-1  I-3-VIII-1 | VIII | I | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-1-IV-2 | II | IV | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-2-IV-1 | II | II | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-2-IV-2 | II | II | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II | IV | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-1-V-2 | V | V | -99.8 | -89.5 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-2-V-1 | V | I | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-2-V-2 | V | I | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| V | V | -99.8 | -89.5 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |

The normative reference for this requirement is TS 25.101 [1] clause 7.6.3D.2.

### 6.5G.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5G.6, table 6.5G.7, table 6.5G.8 and table 6.5G.9 for the DL reference channel H-Set 1C specified in Annex C.8.1.1.

The lack of the blocking ability decreases the 4C-HSDPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

This test case tests only 4 carrier configurations.

### 6.5G.4 Method of test

6.5G.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.49.

2) RF parameters are set up according to table 6.5G.6, table 6.5G.7, table 6.5G.8 and table 6.5G.9.

3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS34.108[3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.5G.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5G.5: Specific Message Contents for In-band blocking characteristics for Single band 4C-HSDPA, Single uplink operation

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

6.5G.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5G.6 and table 6.5G.7, for inblocking measurements and table 6.5G.8 and table 6.5G.9 for narrow band measurements. For table 6.5G.8 and 6.5G.9, the frequency step size is 1 MHz.

2) Set the power level of UE according to the table 6.5G.6, table 6.5G.7, table 6.5G.8 and table 6.5G.9, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

4) For table 6.5G.8 and 6.5G.9, record the frequencies for which BLER exceed the test requirements.

### 6.5G.5 Test requirements

For table 6.5G.6 and 6.5G.7, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. For table 6.5G.8 and 6.5G.9, the measured BLER, derived in step 2) shall not exceed 0.1 on each individual cell except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24 for frequency range 1, 2 and 3. The number of spurious response frequencies, recorded in step 3) shall not exceed 8 for frequency range 4. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5G.6: Test parameters for in-band blocking, dual band 4C-HSDPA, dual uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (NOTE 2) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6 | 2095 f 2185 |
| Fuw  (Band II operation) | MHz | 1922.4 f 1997.6 | 1915 f 2005 |
| Fuw  (Band IV operation) | MHz | 2102.4 f 2162.6 | 2095 f 2170 |
| Fuw  (Band V operation) | MHz | 861.4 f 901.6 | 854 f 909 |
| Fuw  (Band VIII operation) | MHz | 917.4 f 967.6 | 910  f  975 |
| Fuw  (Band XXXII operation) | MHz | 1444.4 f 1503.6 | 1437 f 1511 |
| NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.  NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequenc(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequenc(ies) in each band. | | | |

Table 6.5G.7: In-band blocking requirements, dual band 4C-HSDPA, dual uplink operation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor (dBm/3.84MHz) | UE transmitted mean power (dBm) | UL-DL carrier separation |
| I-3-VIII-1 | I | I | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| VIII | -107 | -96.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-2-IV-2 | II | II | -107 | -96.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -109 | -98.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II | IV | -107 | -96.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -109 | -98.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-2-V-2 | I | I | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| V | -108 | -97.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I | V | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| V | -103.2 | -92.9 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |

NOTE 3: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2D.1 for single band 4C-HSDPA.

Table 6.5G.8: Test parameters for narrow band blocking characteristics for dual band 4C-HSDPA, dual uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V | Band VIII |
| Iblocking (GMSK) | dBm | -57 | -56 |
| Fuw (offset)  (NOTE 2) | MHz | 2.7 | 2.8 |

NOTE 4: Iblocking (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 5: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.5G.9: Narrow band blocking requirements, dual band 4C-HSDPA, dual uplink operation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor (dBm/3.84MHz) | UE transmitted mean power (dBm) | UL-DL carrier separation |
| I-2-VIII-1  I-3-VIII-1 | VIII | I | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-1-IV-2 | II | IV | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-2-IV-1 | II | II | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-2-IV-2 | II | II | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II | IV | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-1-V-2 | V | V | -99.8 | -89.5 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-2-V-1 | V | I | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-2-V-2 | V | I | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| V | V | -99.8 | -89.5 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |

NOTE 6: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.5GA Blocking Characteristics for dual uplink dual band 4C-HSDPA (3 carrier)

### 6.5GA.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in clause 6.5GA.2.1 and 6.5GA.2.2 and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band dual uplink 4C-HSDPA and HS-DSCH categories 29 to 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.5GA.2 Minimum Requirements

#### 6.5GA.2.1 Minimum Requirements (In-band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5GA.1 and 6.5GA.2. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 6.5GA.1: Test parameters for in-band blocking, dual band 4C-HSDPA, dual uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (NOTE 2) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6 | 2095 f 2185 |
| Fuw  (Band II operation) | MHz | 1922.4 f 1997.6 | 1915 f 2005 |
| Fuw  (Band IV operation) | MHz | 2102.4 f 2162.6 | 2095 f 2170 |
| Fuw  (Band V operation) | MHz | 861.4 f 901.6 | 854 f 909 |
| Fuw  (Band VIII operation) | MHz | 917.4 f 967.6 | 910  f  975 |
| Fuw  (Band XXXII operation) | MHz | 1444.4 f 1503.6 | 1437 f 1511 |
| NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.  NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequenc(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequenc(ies) in each band. | | | |

Table 6.5GA.2: In-band blocking requirements, dual band 4C-HSDPA, dual uplink operation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor (dBm/3.84MHz) | UE transmitted mean power (dBm) | UL-DL carrier separation |
| I-2-VIII-1  I-3-VIII-1 | I | I | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| VIII | -107 | -96.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-1-IV-2 | II | IV | -107 | -96.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -109 | -98.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-2-IV-1 | II | II | -107 | -96.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -109 | -98.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-2-IV-2 | II | II | -107 | -96.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -109 | -98.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II | IV | -107 | -96.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -109 | -98.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-1-V-2 | I | V | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| V | -103.2 | -92.9 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-2-V-1 | I | I | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| V | -108 | -97.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-2-V-2 | I | I | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| V | -108 | -97.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I | V | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| V | -103.2 | -92.9 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-2-XXXII-1 | I | I | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| XXXII |  | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |  |

NOTE 3: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2DA.1 for single band 4C-HSDPA.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1D.2.

#### 6.5GA.2.2 Minimum requirements (Narrow band blocking)

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.5GA.3 and Table 6.5GA.4. This requirement is measure of a receiver’s ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing.

Table 6.5GA.3: Test parameters for narrow band blocking characteristics for dual band 4C-HSDPA, dual uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V | Band VIII |
| Iblocking (GMSK) | dBm | -57 | -56 |
| Fuw (offset)  (NOTE 2) | MHz | 2.7 | 2.8 |

NOTE 1: Iblocking (GMSK) is an interfering signal as defined in TS 45.004

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.5GA.4: Narrow band blocking requirements, dual band 4C-HSDPA, dual uplink operation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor (dBm/3.84MHz) | UE transmitted mean power (dBm) | UL-DL carrier separation |
| I-2-VIII-1  I-3-VIII-1 | VIII | I | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-1-IV-2 | II | IV | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-2-IV-1 | II | II | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-2-IV-2 | II | II | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II | IV | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-1-V-2 | V | V | -99.8 | -89.5 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-2-V-1 | V | I | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-2-V-2 | V | I | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| V | V | -99.8 | -89.5 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |

The normative reference for this requirement is TS 25.101 [1] clause 7.6.3D.2.

### 6.5GA.3 Test purpose

To verify that the UE BLER of HS-PDSCH on each individual cell does not exceed 0.1 for the parameters specified in table 6.5GA.6, table 6.5GA.7, table 6.5GA.8 and table 6.5GA.9 for the DL reference channel H-Set 1B specified in Annex C.8.1.1.

The lack of the blocking ability decreases the 4C-HSDPA coverage area when other transmitter exists (except in the adjacent channels and spurious response).

This test case tests only 3 carrier configurations.

### 6.5GA.4 Method of test

6.5GA.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.49.

2) RF parameters are set up according to table 6.5GA.6, table 6.5GA.7, table 6.5GA.8 and table 6.5GA.9.

3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS34.108[3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.5GA.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.5GA.5: Specific Message Contents for In-band blocking characteristics for Single band 4C-HSDPA, Single uplink operation

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

6.5GA.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5GA.6 and table 6.5GA.7, for inblocking measurements and table 6.5GA.8 and table 6.5GA.9 for narrow band measurements. For table 6.5GA.8 and 6.5GA.9, the frequency step size is 1 MHz.

2) Set the power level of UE according to the table 6.5GA.6, table 6.5GA.7, table 6.5GA.8 and table 6.5GA.9, or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

4) For table 6.5GA.8 and 6.5GA.9, record the frequencies for which BLER exceed the test requirements.

### 6.5GA.5 Test requirements

For table 6.5GA.6 and 6.5GA.7, the measured BLER, derived in step 2), shall not exceed 0.1 on each individual cell. For table 6.5GA.8 and 6.5GA.9, the measured BLER, derived in step 2) shall not exceed 0.1 on each individual cell except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24 for frequency range 1, 2 and 3. The number of spurious response frequencies, recorded in step 3) shall not exceed 8 for frequency range 4. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.5GA.6: Test parameters for in-band blocking, dual band 4C-HSDPA, dual uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iblocking mean power (modulated) | dBm | -56 | -44 |
| Fuw offset  (NOTE 2) |  | =10 MHz | -15 MHz  &  15 MHz |
| Fuw  (Band I operation) | MHz | 2102.4 f 2177.6 | 2095 f 2185 |
| Fuw  (Band II operation) | MHz | 1922.4 f 1997.6 | 1915 f 2005 |
| Fuw  (Band IV operation) | MHz | 2102.4 f 2162.6 | 2095 f 2170 |
| Fuw  (Band V operation) | MHz | 861.4 f 901.6 | 854 f 909 |
| Fuw  (Band VIII operation) | MHz | 917.4 f 967.6 | 910  f  975 |
| Fuw  (Band XXXII operation) | MHz | 1444.4 f 1503.6 | 1437 f 1511 |
| NOTE 1: Iblocking (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.  NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequenc(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequenc(ies) in each band. | | | |

Table 6.5GA.7: In-band blocking requirements, dual band 4C-HSDPA, dual uplink operation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor (dBm/3.84MHz) | UE transmitted mean power (dBm) | UL-DL carrier separation |
| I-2-VIII-1 | I | I | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| VIII | -107 | -96.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-1-IV-2 | II | IV | -107 | -96.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -109 | -98.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-2-IV-1 | II | II | -107 | -96.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -109 | -98.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-1-V-2 | I | V | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| V | -103.2 | -92.9 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-2-V-1 | I | I | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| V | -108 | -97.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-2-XXXII-1 | I | I | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| XXXII | -110 | -99.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |

NOTE 3: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2DA.1 for single band 4C-HSDPA.

Table 6.5GA.8: Test parameters for narrow band blocking characteristics for dual band 4C-HSDPA, dual uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V | Band VIII |
| Iblocking (GMSK) | dBm | -57 | -56 |
| Fuw (offset)  (NOTE 2) | MHz | 2.7 | 2.8 |

NOTE 4: Iblocking (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 5: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.5GA.9: Narrow band blocking requirements, dual band 4C-HSDPA, dual uplink operation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dual band 4C-HSDPA Configuration | DL Band | UL Band | HS-PDSCH\_Ec (dBm/3.84MHz) | Îor (dBm/3.84MHz) | UE transmitted mean power (dBm) | UL-DL carrier separation |
| I-2-VIII-1  I-3-VIII-1 | VIII | I | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-1-IV-2 | II | IV | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-2-IV-1 | II | II | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II-2-IV-2 | II | II | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| II | IV | -100 | -89.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| IV | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-1-V-2 | V | V | -99.8 | -89.5 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-2-V-1 | V | I | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| I-2-V-2 | V | I | -101 | -90.7 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |
| V | V | -99.8 | -89.5 | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | Minimum |

NOTE 6: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.6 Spurious Response

### 6.6.1 Definition and applicability

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out of band blocking limit is not met.

The requirements and this test apply to all types of UTRA for the FDD UE.

### 6.6.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.6.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.7.1.

Table 6.6.1: Test parameters for Spurious Response

|  |  |  |
| --- | --- | --- |
| Parameter | Level | Unit |
| DPCH\_Ec | <REFSENS> +3 dB | dBm / 3,84MHz |
| Îor | <REFÎor> +3 dB | dBm / 3,84MHz |
| Iblocking(CW) | -44 | dBm |
| Fuw | Spurious response frequencies | MHz |
| UE transmitted mean power | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | dBm |

### 6.6.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the parameters specified in table 6.6.2.

The lack of the spurious response ability decreases the coverage area when other unwanted interfering signal exists at any other frequency.

### 6.6.4 Method of test

6.6.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: the same frequency as chosen in clause 6.5.4.1 for Blocking characteristics out-of-band case.

1) Connect the SS to the UE antenna connector as shown in figure A.6.

2) RF parameters are set up according to table 6.6.2.

3) A call is set up according to the Generic call setup procedure specified in TS 34.108 [3] sub clause 7.3.2, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

4) Enter the UE into loopback test mode and start the loopback test.

Table 6.6.1A Contents of RADIO BEARER SETUP message: AM or UM

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.6.4.2 Procedure

1) Set the parameter of the CW generator as shown in table 6.6.2. The spurious response frequencies are determined in step 3) of clause 6.5.4.2.

2) Set the power level of UE according to the table 6.6.2 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BER of DCH received from the UE at the SS.

### 6.6.5 Test requirements

The measured BER, derived in step 3), shall not exceed 0,001.

Table 6.6.2: Test parameters for Spurious Response

|  |  |  |
| --- | --- | --- |
| Parameter | Level | Unit |
| DPCH\_Ec | <REFSENS> +3 dB | dBm / 3,84MHz |
| Îor | <REFÎor> +3 dB | dBm / 3,84MHz |
| Iblocking(CW) | -44 | dBm |
| Fuw | Spurious response frequencies | MHz |
| UE transmitted mean power | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | dBm |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.6A Spurious Response for DC-HSDPA

### 6.6A.1 Definition and applicability

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out of band blocking limit as specified in subclause 6.5A.2.2 is not met.

The requirements and this test apply for Release 8 and later releases to all types of UTRA for the FDD UE that support DC-HSDPA.

### 6.6A.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.6A.1.

Table 6.6A.1: Test Parameters for Spurious Response (DC-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Level |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS> +3 dB |
| Îor | dBm/3.84 MHz | <REFÎor> +3 dB |
| Iblocking (CW) | dBm | -44 |
| Fuw | MHz | Spurious response frequencies |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |

NOTE: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 7.2A.

The normative reference for this requirement is TS 25.101 [1] clause 7.7.2.

### 6.6A.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.6A.3 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the spurious response ability decreases the DC-HSDPA coverage area when other unwanted interfering signal exists at any other frequency.

### 6.6A.4 Method of test

6.6A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: the same frequency as chosen in clause 6.5A.4.1 for Blocking characteristics out-of-band case.

1) Connect the SS to the UE antenna connector as shown in figure A.33.

2) RF parameters are set up according to table 6.6A.3.

3) A call is set up according to the Generic DC-HSDPA setup procedure specified in TS 34.108 [3] sub clause 7.3.13, with exceptions for information elements listed in Table 6.6A.2. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.6A.2: Specific Message Contents for Spurious Response (DC-HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink HS-PDSCH Information |  |  |
| - CHOICE mode | FDD |  |
| - Downlink 64QAM configured | Not Present | Rel-7 |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) | Rel-7 |
| Downlink secondary cell info FDD |  | Rel-8 |
| - CHOICE Configuration info | New configuration |  |
| - Downlink 64QAM configured | Not Present |  |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) |  |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.6A.4.2 Procedure

1) Set the parameter of the CW generator as shown in table 6.6A.3. The spurious response frequencies are determined in step 3) of clause 6.5A.4.2.

2) Set the power level of UE according to the table 6.6A.3 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

### 6.6A.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.6A.3: Test parameters for Spurious Response (DC-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Level | Unit |
| HS-PDSCH\_Ec | <REFSENS> +3 dB | dBm / 3,84MHz |
| Îor | <REFÎor> +3 dB | dBm / 3,84MHz |
| Iblocking(CW) | -44 | dBm |
| Fuw | Spurious response frequencies | MHz |
| UE transmitted mean power | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | dBm |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.6B Spurious Response for DB-DC-HSDPA

### 6.6B.1 Definition and applicability

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out of band blocking limit as specified in subclause 6.5B.2.2 is not met.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support DB-DC-HSDPA.

DB-DC-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.6B.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.6B.1.

Table 6.6B.1: Test Parameters for Spurious Response (DB-DC-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Level |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS> +3 dB |
| Îor | dBm/3.84 MHz | <REFÎor> +3 dB |
| Iblocking (CW) | dBm | -44 |
| Fuw | MHz | Spurious response frequencies |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |

NOTE: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2B.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.7.2.

### 6.6B.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.6B.3 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the spurious response ability decreases the DB-DC-HSDPA coverage area when other unwanted interfering signal exists at any other frequency.

### 6.6B.4 Method of test

6.6B.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: the same frequency as chosen in clause 6.5B.4.1 for Blocking characteristics out-of-band case.

1) Connect the SS to the UE antenna connector as shown in figure A.33.

2) RF parameters are set up according to table 6.6B.3.

3) A call is set up according to the Generic call setup procedure specified in TS 34.108 [3] sub clause 7.3.13, with exceptions for information elements listed in Table 6.6B.2. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.6B.2: Specific Message Contents for Spurious Response (DB-DC-HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink HS-PDSCH Information |  |  |
| - CHOICE mode | FDD |  |
| - Downlink 64QAM configured | Not Present | Rel-7 |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) | Rel-7 |
| Downlink secondary cell info FDD |  | Rel-8 |
| - CHOICE Configuration info | New configuration |  |
| - Downlink 64QAM configured | Not Present |  |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) |  |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.6B.4.2 Procedure

1) Set the parameter of the CW generator as shown in table 6.6B.3. The spurious response frequencies are determined in step 3) of clause 6.5B.4.2.

2) Set the power level of UE according to the table 6.6B.3 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

### 6.6B.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.6B.3: Test parameters for Spurious Response (DB-DC-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Level | Unit |
| HS-PDSCH\_Ec | <REFSENS> +3 dB | dBm / 3,84MHz |
| Îor | <REFÎor> +3 dB | dBm / 3,84MHz |
| Iblocking(CW) | -44 | dBm |
| Fuw | Spurious response frequencies | MHz |
| UE transmitted mean power | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | dBm |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.6C Spurious Response for single band 4C-HSDPA

### 6.6C.1 Definition and applicability

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out of band blocking limit as specified in subclause 6.5D.2.2 is not met.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support single band 4C-HSDPA.

Single band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.6C.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.6C.1.

Table 6.6C.1: Test Parameters for Spurious Response single band 4C-HSDPA

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Level |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS> +3 dB |
| Îor | dBm/3.84 MHz | <REFÎor> +3 dB |
| Iblocking (CW) | dBm | -44 |
| Fuw | MHz | Spurious response frequencies |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |

NOTE: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2C.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.7.2.

### 6.6C.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.6C.3 for the DL reference channel H-Set 1B specified in Annex C.8.1.1.

The lack of the spurious response ability decreases the 4C-HSDPA coverage area when other unwanted interfering signal exists at any other frequency.

### 6.6C.4 Method of test

6.6C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: the same frequency as chosen in clause 6.5D.4.1 for Blocking characteristics out-of-band case.

1) Connect the SS to the UE antenna connector as shown in figure A.50.

2) RF parameters are set up according to table 6.6C.3.

3) A call is set up according to the Generic call setup procedure specified in TS 34.108 [3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.6C.2. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.6C.2: Specific Message Contents for Spurious Response (single band 4C-HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.6C.4.2 Procedure

1) Set the parameter of the CW generator as shown in table 6.6C.3. The spurious response frequencies are determined in step 3) of clause 6.5D.4.2.

2) Set the power level of UE according to the table 6.6C.3 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

### 6.6C.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.6C.3: Test parameters for Spurious Response (single band 4C-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Level | Unit |
| HS-PDSCH\_Ec | <REFSENS> +3 dB | dBm / 3,84MHz |
| Îor | <REFÎor> +3 dB | dBm / 3,84MHz |
| Iblocking(CW) | -44 | dBm |
| Fuw | Spurious response frequencies | MHz |
| UE transmitted mean power | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | dBm |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.6D Spurious Response for dual band 4C-HSDPA

### 6.6D.1 Definition and applicability

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out of band blocking limit as specified in subclause 6.5B.2.2 is not met.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band 4C-HSDPA and HS-DSCH categories 31 or 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.6D.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.6D.1.

Table 6.6D.1: Test Parameters for Spurious Response (Dual band 4C-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Level |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS> +3 dB |
| Îor | dBm/3.84 MHz | <REFÎor> +3 dB |
| Iblocking (CW) | dBm | -44 |
| Fuw | MHz | Spurious response frequencies |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |

NOTE: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2D.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.7.2.

### 6.6D.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.6D.3 for the DL reference channel H-Set 1C specified in Annex C.8.1.1.

The lack of the spurious response ability decreases the 4C-HSDPA coverage area when other unwanted interfering signal exists at any other frequency.

This test case tests only 4 carrier configurations.

### 6.6D.4 Method of test

6.6D.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: the same frequency as chosen in clause 6.5F.4.1 for Blocking characteristics out-of-band case.

1) Connect the SS to the UE antenna connector as shown in figure A.50.

2) RF parameters are set up according to table 6.6D.3.

3) A call is set up according to the Generic call setup procedure specified in TS 34.108 [3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.6D.2. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.6D.2: Specific Message Contents for Spurious Response (Dual band 4C-HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.6D.4.2 Procedure

1) Set the parameter of the CW generator as shown in table 6.6D.3. The spurious response frequencies are determined in step 3) of clause 6.5F.4.2.

2) Set the power level of UE according to the table 6.6D.3 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

### 6.6D.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.6D.3: Test parameters for Spurious Response (Dual band 4C-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Level | Unit |
| HS-PDSCH\_Ec | <REFSENS> +3 dB | dBm / 3,84MHz |
| Îor | <REFÎor> +3 dB | dBm / 3,84MHz |
| Iblocking(CW) | -44 | dBm |
| Fuw | Spurious response frequencies | MHz |
| UE transmitted mean power | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | dBm |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.6DA Spurious Response for dual band 4C-HSDPA (3 carrier)

### 6.6DA.1 Definition and applicability

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out of band blocking limit as specified in subclause 6.5B.2.2 is not met.

The requirements and this test apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band 4C-HSDPA and HS-DSCH categories 29 to 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.6DA.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.6DA.1.

Table 6.6DA.1: Test Parameters for Spurious Response (Dual band 4C-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Level |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS> +3 dB |
| Îor | dBm/3.84 MHz | <REFÎor> +3 dB |
| Iblocking (CW) | dBm | -44 |
| Fuw | MHz | Spurious response frequencies |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) |

NOTE: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2DA.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.7.2.

### 6.6DA.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.6DA.3 for the DL reference channel H-Set 1B specified in Annex C.8.1.1.

The lack of the spurious response ability decreases the 4C-HSDPA coverage area when other unwanted interfering signal exists at any other frequency.

This test case tests only 3 carrier configurations.

### 6.6DA.4 Method of test

6.6DA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: the same frequency as chosen in clause 6.5FA.4.1 for Blocking characteristics out-of-band case.

1) Connect the SS to the UE antenna connector as shown in figure A.50.

2) RF parameters are set up according to table 6.6DA.3.

3) A call is set up according to the Generic call setup procedure specified in TS 34.108 [3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.6DA.2. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.6DA.2: Specific Message Contents for Spurious Response (Dual band 4C-HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.6DA.4.2 Procedure

1) Set the parameter of the CW generator as shown in table 6.6DA.3. The spurious response frequencies are determined in step 3) of clause 6.5FA.4.2.

2) Set the power level of UE according to the table 6.6DA.3 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

### 6.6DA.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.6DA.3: Test parameters for Spurious Response (Dual band 4C-HSDPA)

|  |  |  |
| --- | --- | --- |
| Parameter | Level | Unit |
| HS-PDSCH\_Ec | <REFSENS> +3 dB | dBm / 3,84MHz |
| Îor | <REFÎor> +3 dB | dBm / 3,84MHz |
| Iblocking(CW) | -44 | dBm |
| Fuw | Spurious response frequencies | MHz |
| UE transmitted mean power | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | dBm |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.7 Intermodulation Characteristics

### 6.7.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The requirements and this test apply to all types of UTRA for the FDD UE. The test parameters in tables 6.7.2 and 6.7.4 applies to the FDD UE supporting Band II, Band III, Band IV, Band V, Band VIII, Band X, Band XII, Band XIII or Band XIV.

### 6.7.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.7.1 and in table 6.7.2.

The normative reference for this requirement is TS 25.101 [1] clause 7.8.1 and clause 7.8.2.

Table 6.7.1: Test parameters for Intermodulation Characteristics

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Level | | Unit |
| DPCH\_Ec | <REFSENS> +3 dB | | dBm / 3,84 MHz |
| Îor | <REFÎor> +3 dB | | dBm / 3,84 MHz |
| Iouw1 (CW) | -46 | | dBm |
| Iouw2 mean power (modulated) | -46 | | dBm |
| Fuw1 (offset) | 10 | -10 | MHz |
| Fuw2 (offset) | 20 | -20 | MHz |
| UE transmitted mean power | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | dBm |

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in table E.4.1 and 16 dedicated data channels as specified in table E.3.6.

NOTE 2: <REFSENS> and <REFÎor> refers to the DPCH\_Ec<REFSENS> and the DPCH<REFÎor> as specified in Table 6.2A.1.

Table 6.7.2: Test parameters for narrow band intermodulation characteristics

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V, X | | Band III, VIII, XII, XIII, XIV | |
| DPCH\_Ec | dBm/3.84 MHz | <REFSENS>+ 10 dB | | <REFSENS>+ 10 dB | |
| Îor | dBm/3.84 MHz | <REFÎor> + 10 dB | | [<REFÎor> +10 dB | |
| Iouw1 (CW) | dBm | -44 | | -43 | |
| Iouw2 (GMSK) | dBm | -44 | | -43 | |
| Fuw1 (offset) | MHz | 3.5 | -3.5 | 3.6 | -3.6 |
| Fuw2 (offset) | MHz | 5.9 | -5.9 | 6.0 | -6.0 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |

NOTE 3: Iouw2 (GMSK) is an interfering signal as defined in TS 45.004. It is a continuous GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or any pseudo random data stream.

NOTE 4: <REFSENS> and <REFÎor> refers to the DPCH\_Ec<REFSENS> and the DPCH<REFÎor> as specified in Table 6.2.1A.

### 6.7.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the parameters specified in table 6.7.3 and in table 6.7.4.

The lack of the intermodulation response rejection ability decreases the coverage area when two or more interfering signals, which have a specific frequency relationship to the wanted signal, exist.

### 6.7.4 Method of test

6.7.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.7.

2) RF parameters are set up according to table 6.7.3 and table 6.7.4.

3) A call is set up according to the Generic call setup procedure specified in TS 34.108 [3] sub clause 7.3.2, with the following exception for information elements in RADIO BEARER SETUP message. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

4) Enter the UE into loopback test mode and start the loopback test.

Table 6.7.2A Contents of RADIO BEARER SETUP message: AM or UM

| Information Element | Value/Remark |
| --- | --- |
| CHOICE channel requirement | Uplink DPCH info |
| - Power Control Algorithm | Algorithm2 |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.7.4.2 Procedure

1) Set the parameters of the CW generator and interference signal generator as shown in table 6.7.3 and in table 6.7.4.

2) Set the power level of UE according to the tables 6.7.3, and table 6.7.4 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BER of DCH received from the UE at the SS.

### 6.7.5 Test requirements

The measured BER, derived in step 3), shall not exceed 0,001.

Table 6.7.3: Test parameters for Intermodulation Characteristics

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Level | | Unit |
| DPCH\_Ec | <REFSENS> +3 dB | | dBm / 3.84 MHz |
| Îor | <REFÎor> +3 dB | | dBm / 3.84 MHz |
| Iouw1 (CW) | -46 | | dBm |
| Iouw2 mean power (modulated) | -46 | | dBm |
| Fuw1 (offset) | 10 | -10 | MHz |
| Fuw2 (offset) | 20 | -20 | MHz |
| UE transmitted mean power | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | dBm |

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in table E.4.1 and 16 dedicated data channels as specified in table E.3.6.

NOTE 2: <REFSENS> and <REFÎor> refers to the DPCH\_Ec<REFSENS> and the DPCH<REFÎor> as specified in Table 6.2A.1.

Table 6.7.4: Test parameters for narrow band intermodulation characteristics

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V, X | | Band III, VIII, XII, XIII, XIV | |
| DPCH\_Ec | DdBm/3.84 MHz | <REFSENS>+ 10 dB | | <REFSENS>+ 10 dB | |
| Îor | DdBm/3.84 MHz | <REFÎor> + 10 dB | | [<REFÎor> +10 dB | |
| Iouw1 (CW) | dBm | -44 | | -43 | |
| Iouw2 (GMSK) | dBm | -44 | | -43 | |
| Fuw1 (offset) | MHz | 3.5 | -3.5 | 3.6 | -3.6 |
| Fuw2 (offset) | MHz | 5.9 | -5.9 | 6.0 | -6.0 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |

NOTE 3: Iouw2 (GMSK) is an interfering signal as defined in TS 45.004. It is a continuous GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or any pseudo random data stream.

NOTE 4: <REFSENS> and <REFÎor> refers to the DPCH\_Ec<REFSENS> and the DPCH<REFÎor> as specified in Table 6.2.1A.

NOTE 5: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.7A Intermodulation Characteristics for DC-HSDPA

### 6.7A.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The test parameters in Tables 6.7A.1 and 6.7.A.4 apply for Release 8 and later releases to all types of UTRA for the FDD UE that support DC-HSDPA.

The test parameters in Tables 6.7A.2 and 6.7A.5 apply to all types of UTRA for the FDD UE that support DC-HSDPA and are supporting Band II, Band III, Band IV, Band V, Band VIII, Band X, Band XII, Band XIII or Band XIV.

### 6.7A.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7A.1.

Table 6.7A.1: Test Parameters for Receive intermodulation characteristics (DC-HSDPA)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS> +3 dB | |
| Îor | dBm/3.84 MHz | <REFÎor> +3 dB | |
| Iouw1 (CW) | dBm | -46 | |
| Iouw2 mean power (modulated) | dBm | -46 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 10 | -10 |
| Fuw2 (offset)  (NOTE 2) | MHz | 20 | -20 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 3: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2A.1.

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7A.2.

Table 6.7A.2: Test Parameters for narrow band intermodulation characteristics (DC-HSDPA)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V, X, XXV, XXVI | | Band III, VIII, XII, XIII, XIV | |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS>+ 10 dB | | <REFSENS>+ 10 dB | |
| Îor | dBm/3.84 MHz | <REFÎor> + 10 dB | | [<REFÎor> +10 dB | |
| Iouw1 (CW) | dBm | -44 | | -43 | |
| Iouw2 (GMSK) | dBm | -44 | | -43 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 3.5 | -3.5 | 3.6 | -3.6 |
| Fuw2 (offset)  (NOTE 2) | MHz | 5.9 | -5.9 | 6.0 | -6.0 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |

NOTE 4: Iouw2 (GMSK) is an interfering signal as defined in TS 45.004 [6].

NOTE 5: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 6: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2A.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.8.1A and clause 7.8.2A.

### 6.7A.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.7A.4 and in table 6.7A.5 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the intermodulation response rejection ability decreases the DC-HSDPA coverage area when two or more interfering signals, which have a specific frequency relationship to the wanted signal, exist.

### 6.7A.4 Method of test

6.7A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.34.

2) RF parameters are set up according to table 6.7A.4 and table 6.7A.5.

3) A call is set up according to the Generic DC-HSDPA setup procedure specified in TS 34.108 [3] sub clause 7.3.13, with exceptions for information elements listed in Table 6.7A.3. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.7A.3: Specific Message Contents for Intermodulation Characteristics (DC-HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink HS-PDSCH Information |  |  |
| - CHOICE mode | FDD |  |
| - Downlink 64QAM configured | Not Present | Rel-7 |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) | Rel-7 |
| Downlink secondary cell info FDD |  | Rel-8 |
| - CHOICE Configuration info | New configuration |  |
| - Downlink 64QAM configured | Not Present |  |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) |  |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.7A.4.2 Procedure

1) Set the parameters of the CW generator and interference signal generator as shown in table 6.7A.4 and in table 6.7A.5.

2) Set the power level of UE according to the tables 6.7A.4, and table 6.7A.5 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

### 6.7A.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.7A.4: Test parameters for Intermodulation Characteristics (DC-HSDPA)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS> +3 dB | |
| Îor | dBm/3.84 MHz | <REFÎor> +3 dB | |
| Iouw1 (CW) | dBm | -46 | |
| Iouw2 mean power (modulated) | dBm | -46 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 10 | -10 |
| Fuw2 (offset)  (NOTE 2) | MHz | 20 | -20 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 3: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2A.1.

Table 6.7A.5: Test parameters for narrow band intermodulation characteristics (DC-HSDPA)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V, X, XXV, XXVI | | Band III, VIII, XII, XIII, XIV | |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS>+ 10 dB | | <REFSENS>+ 10 dB | |
| Îor | dBm/3.84 MHz | <REFÎor> + 10 dB | | [<REFÎor> +10 dB | |
| Iouw1 (CW) | dBm | -44 | | -43 | |
| Iouw2 (GMSK) | dBm | -44 | | -43 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 3.5 | -3.5 | 3.6 | -3.6 |
| Fuw2 (offset)  (NOTE 2) | MHz | 5.9 | -5.9 | 6.0 | -6.0 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |

NOTE 4: Iouw2 (GMSK) is an interfering signal as defined in TS 45.004 [6].

NOTE 5: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

NOTE 6: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2A.1.

NOTE 7: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.7B Intermodulation Characteristics for DB-DC-HSDPA

### 6.7B.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support DB-DC-HSDPA.

DB-DC-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.7B.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7B.1.

Table 6.7B.1: Test Parameters for Receive intermodulation characteristics (DB-DC-HSDPA)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS> +3 dB | |
| Îor | dBm/3.84 MHz | <REFÎor> +3 dB | |
| Iouw1 (CW) | dBm | -46 | |
| Iouw2 mean power (modulated) | dBm | -46 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 10 | -10 |
| Fuw2 (offset)  (NOTE 2) | MHz | 20 | -20 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: For DC-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency used and positive offset refers to the assigned channel frequency of the highest carrier frequency used. For DB-DC-HSDPA, offset refers to the assigned channel frequencies of the individual cells.

NOTE 3: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2B.1.

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7B.2.

Table 6.7B.2: Test Parameters for narrow band intermodulation characteristics (DB-DC-HSDPA)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V, X | | Band III, VIII, XII, XIII, XIV | |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS>+ 10 dB | | <REFSENS>+ 10 dB | |
| Îor | dBm/3.84 MHz | <REFÎor> + 10 dB | | [<REFÎor> +10 dB | |
| Iouw1 (CW) | dBm | -44 | | -43 | |
| Iouw2 (GMSK) | dBm | -44 | | -43 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 3.5 | -3.5 | 3.6 | -3.6 |
| Fuw2 (offset)  (NOTE 2) | MHz | 5.9 | -5.9 | 6.0 | -6.0 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |

NOTE 4: Iouw2 (GMSK) is an interfering signal as defined in TS 45.004 [6].

NOTE 5: For DC-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency used and positive offset refers to the assigned channel frequency of the highest carrier frequency used. For DB-DC-HSDPA, offset refers to the assigned channel frequencies of the individual cells.

NOTE 6: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2B.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.8.1A and clause 7.8.2A.

### 6.7B.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.7B.4 and in table 6.7B.5 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the intermodulation response rejection ability decreases the DB-DC-HSDPA coverage area when two or more interfering signals, which have a specific frequency relationship to the wanted signal, exist.

### 6.7B.4 Method of test

6.7B.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.34.

2) RF parameters are set up according to table 6.7B.4 and table 6.7B.5.

3) A call is set up according to the Generic call setup procedure specified in TS 34.108 [3] sub clause 7.3.13, with exceptions for information elements listed in Table 6.7B.3. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.7B.3: Specific Message Contents for Intermodulation Characteristics (DB-DC-HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink HS-PDSCH Information |  |  |
| - CHOICE mode | FDD |  |
| - Downlink 64QAM configured | Not Present | Rel-7 |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) | Rel-7 |
| Downlink secondary cell info FDD |  | Rel-8 |
| - CHOICE Configuration info | New configuration |  |
| - Downlink 64QAM configured | Not Present |  |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) |  |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.7B.4.2 Procedure

1) Set the parameters of the CW generator and interference signal generator as shown in table 6.7B.4 and in table 6.7B.5.

2) Set the power level of UE according to the tables 6.7B.4, and table 6.7B.5 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

### 6.7B.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.7B.4: Test parameters for Intermodulation Characteristics (DB-DC-HSDPA)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS> +3 dB | |
| Îor | dBm/3.84 MHz | <REFÎor> +3 dB | |
| Iouw1 (CW) | dBm | -46 | |
| Iouw2 mean power (modulated) | dBm | -46 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 10 | -10 |
| Fuw2 (offset)  (NOTE 2) | MHz | 20 | -20 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Offset refers to the assigned channel frequencies of the individual cells.

NOTE 3: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2B.1.

Table 6.7B.5: Test parameters for narrow band intermodulation characteristics (DB-DC-HSDPA)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V | | Band VIII | |
| HS-PDSCH\_Ec | dBm/3.84 MHz | <REFSENS>+ 10 dB | | <REFSENS>+ 10 dB | |
| Îor | dBm/3.84 MHz | <REFÎor> + 10 dB | | [<REFÎor> +10 dB | |
| Iouw1 (CW) | dBm | -44 | | -43 | |
| Iouw2 (GMSK) | dBm | -44 | | -43 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 3.5 | -3.5 | 3.6 | -3.6 |
| Fuw2 (offset)  (NOTE 2) | MHz | 5.9 | -5.9 | 6.0 | -6.0 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |

NOTE 4: Iouw2 (GMSK) is an interfering signal as defined in TS 45.004 [6].

NOTE 5: Offset refers to the assigned channel frequencies of the individual cells.

NOTE 6: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2B.1.

NOTE 7: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 8: Band II and band IV correspond to DB-DC-HSDPA configuration 2, band V corresponds to DB-DC-HSDPA configuration 3 and band VIII corresponds to DB-DC-HSDPA configuration 1 as given in clause 4.2.

## 6.7C Intermodulation Characteristics for DC-HSUPA

### 6.7C.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The requirements and this test apply for Release 9 and later releases for the FDD UE that supports HSDPA and Dual Cell E-DCH.

### 6.7C.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7C.1 and Table 6.7C.2.

Table 6.7C.1: Receive intermodulation characteristics (DC-HSUPA)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iouw1 (CW) | dBm | -46 | |
| Iouw2 mean power (modulated) | dBm | -46 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 10 | -10 |
| Fuw2 (offset)  (NOTE 2) | MHz | 20 | -20 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.7C.2: Reference input powers for intermodulation (DC-HSUPA)

|  |  |  |  |
| --- | --- | --- | --- |
| Operating Band | Unit | HS-PDSCH\_Ec | Îor |
| I | dBm/3.84 MHz | -104.7 | -94.4 |
| II | dBm/3.84 MHz | -104.4 | -94.1 |
| III | dBm/3.84 MHz | -104.1 | -93.8 |
| IV | dBm/3.84 MHz | -104.7 | -94.4 |
| V | dBm/3.84 MHz | -102 | -91.7 |
| VI | dBm/3.84 MHz | -102.2 | -91.9 |
| VII | dBm/3.84 MHz | -104.4 | -94.1 |
| VIII | dBm/3.84 MHz | -99.8 | -89.5 |
| IX | dBm/3.84 MHz | -104.6 | -94.3 |
| X | dBm/3.84 MHz | -104.7 | -94.4 |
| XI | dBm/3.84 MHz | -100 | -89.7 |
| XII | dBm/3.84 MHz | N/A | N/A |
| XIII | dBm/3.84 MHz | N/A | N/A |
| XIV | dBm/3.84 MHz | N/A | N/A |
| XIX | dBm/3.84 MHz | -102.2 | -91.9 |
| XX | dBm/3.84 MHz | TBD | TBD |
| XXI | dBm/3.84 MHz | -100 | -89.7 |
| XXII | dBm/3.84 MHz | TBD | TBD |
| XXV | dBm/3.84 MHz | -103.5 | -93.2 |
| XXVI | dBm/3.84 MHz | -99.8 | -89.5 |
| NOTE 1: For the UE which supports both Band III and Band IX operating frequencies, the reference sensitivity level of TBD dBm <REF\_Ec,intermod> shall apply for Band IX. The corresponding <REFÎor,intermod> is TBD dBm.  NOTE 2: For the UE which supports both Band XI and Band XXI operating frequencies, the reference input power level is FFS.  NOTE 3: For the UE which supports DB-DC-HSDPA configuration in clause 4.2 the < HS-PDSCH\_Ec > and < Îor > are allowed to be increased by an amount defined in Table 7.12 of TS 25.101[1] clause 7.10. | | | |

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7C.3 and Table 6.7C.4.

Table 6.7C.3: Receive intermodulation for narrow band (DC-HSUPA)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V, X, XXV, XXVI | | Band III, VIII, XII, XIII, XIV | |
| Iouw1 (CW) | dBm | -44 | | -43 | |
| Iouw2 (GMSK) | dBm | -44 | | -43 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 3.5 | -3.5 | 3.6 | -3.6 |
| Fuw2 (offset)  (NOTE 2) | MHz | 5.9 | -5.9 | 6.0 | -6.0 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |

NOTE 1: Iouw2 (GMSK) is an interfering signal as defined in TS 45.004 [6].

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.7C.4: Reference input powers for intermodulation, narrow band, (DC-HSUPA)

|  |  |  |  |
| --- | --- | --- | --- |
| Operating Band | Unit | HS-PDSCH\_Ec | Îor |
| II | dBm/3.84 MHz | -86.7 | -76.4 |
| III | dBm/3.84 MHz | -85.7 | -75.4 |
| IV | dBm/3.84 MHz | -86.7 | -76.4 |
| V | dBm/3.84 MHz | -86.7 | -76.4 |
| VIII | dBm/3.84 MHz | -85.6 | -75.3 |
| X | dBm/3.84 MHz | -86.7 | -76.4 |
| XII | dBm/3.84 MHz | N/A | N/A |
| XIII | dBm/3.84 MHz | N/A | N/A |
| XIV | dBm/3.84 MHz | N/A | N/A |
| XXV | dBm/3.84 MHz | -84.7 | -74.4 |
| XXVI | dBm/3.84 MHz | -85.6 | -75.3 |
| NOTE 1: For the UE which supports DB-DC-HSDPA configuration in clause 4.2 the < HS-PDSCH\_Ec > and < Îor > are allowed to be increased by an amount defined in Table 6.1A. | | | |

The normative reference for this requirement is TS 25.101 [1] clause 7.8.1B and clause 7.8.2B.

### 6.7C.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.7C.6, table 6.7C.7 table 6.7C.8 and in table 6.7C.9 for the DL reference channel H-Set 12 specified in Annex C.8.1.12.

The lack of the intermodulation response rejection ability decreases the DC-HSUPA coverage area when two or more interfering signals, which have a specific frequency relationship to the wanted signal, exist.

### 6.7C.4 Method of test

6.7C.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.44.

2) RF parameters are set up according to table 6.7C.6, table 6.7C.7 table 6.7C.8 and table 6.7C.9.

3) A call is set up according to the Generic call setup procedure specified in TS 34.108 [3] sub clause 7.3.14, with exceptions for information elements listed in Table 6.7C.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.7C.5: Specific Message Contents for Intermodulation Characteristics (DC-HSUPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

Contents of RADIO BEARER SETUP message: AM or UM (DC-HSDPA)

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |
| Downlink HS-PDSCH Information |  |  |
| - CHOICE mode | FDD |  |
| - Downlink 64QAM configured | Not Present | Rel-7 |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) | Rel-7 |
| Downlink secondary cell info FDD |  | Rel-8 |
| - CHOICE Configuration info | New configuration |  |
| - Downlink 64QAM configured | Not Present |  |
| - HS-DSCH TB size table | octet aligned (for H-Set 12) |  |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.7C.4.2 Procedure

1) Set the parameters of the CW generator and interference signal generator as shown in table 6.7C.6 and in table 6.7C.8.

2) Set the power level of UE according to the table 6.7C.6, table 6.7C.7 table 6.7C.8 and table 6.7C.9 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

### 6.7C.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.7C.6: Test parameters for Intermodulation Characteristics (DC-HSUPA)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iouw1 (CW) | dBm | -46 | |
| Iouw2 mean power (modulated) | dBm | -46 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 10 | -10 |
| Fuw2 (offset)  (NOTE 2) | MHz | 20 | -20 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Offset refers to the assigned channel frequencies of individual cells.

Table 6.7C.7: Test Parameters for reference input powers  
for intermodulation characteristics (DC-HSUPA)

|  |  |  |  |
| --- | --- | --- | --- |
| Operating Band | Unit | HS-PDSCH\_Ec | Îor |
| I | dBm/3.84 MHz | -104.7 | -94.4 |
| II | dBm/3.84 MHz | -104.4 | -94.1 |
| III | dBm/3.84 MHz | -104.1 | -93.8 |
| IV | dBm/3.84 MHz | -104.7 | -94.4 |
| V | dBm/3.84 MHz | -102 | -91.7 |
| VI | dBm/3.84 MHz | -102.2 | -91.9 |
| VII | dBm/3.84 MHz | -104.4 | -94.1 |
| VIII | dBm/3.84 MHz | -99.8 | -89.5 |
| IX | dBm/3.84 MHz | -104.6 | -94.3 |
| X | dBm/3.84 MHz | -104.7 | -94.4 |
| XI | dBm/3.84 MHz | -100 | -89.7 |
| XII | dBm/3.84 MHz | N/A | N/A |
| XIII | dBm/3.84 MHz | N/A | N/A |
| XIV | dBm/3.84 MHz | N/A | N/A |
| XIX | dBm/3.84 MHz | -102.2 | -91.9 |
| XX | dBm/3.84 MHz | TBD | TBD |
| XXI | dBm/3.84 MHz | -100 | -89.7 |
| XXII | dBm/3.84 MHz | TBD | TBD |
| XXV | dBm/3.84 MHz | -103.5 | -93.2 |
| NOTE 1: For the UE which supports both Band III and Band IX operating frequencies, the reference sensitivity level of TBD dBm <REF\_Ec,intermod> shall apply for Band IX. The corresponding <REFÎor,intermod> is TBD dBm  NOTE 2: For the UE which supports both Band XI and Band XXI operating frequencies, the reference input power level is FFS.  NOTE 3: For the UE which supports DB-DC-HSDPA configuration in clause4.2 the < HS‑PDSCH\_Ec > and < Îor > are allowed to be increased by an amount defined in Table 6.1A | | | |

Table 6.7C.8: Test Parameters for narrow band intermodulation characteristics (DC-HSUPA)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V, X | | Band III, VIII, XII, XIII, XIV | |
| Iouw1 (CW) | dBm | -44 | | -43 | |
| Iouw2 (GMSK) | dBm | -44 | | -43 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 3.5 | -3.5 | 3.6 | -3.6 |
| Fuw2 (offset)  (NOTE 2) | MHz | 5.9 | -5.9 | 6.0 | -6.0 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |

NOTE 1: Iouw2 (GMSK) is an interfering signal as defined in TS 45.004 [6].

NOTE 2: Offset refers to the assigned channel frequencies of the individual cells.

NOTE 3: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

Table 6.7C.9: Test Parameters for reference input powers  
for narrow band intermodulation characteristics (DC-HSUPA)

|  |  |  |  |
| --- | --- | --- | --- |
| Operating Band | Unit | HS-PDSCH\_Ec | Îor |
| II | dBm/3.84 MHz | -86.7 | -76.4 |
| III | dBm/3.84 MHz | -85.7 | -75.4 |
| IV | dBm/3.84 MHz | -86.7 | -76.4 |
| V | dBm/3.84 MHz | -86.7 | -76.4 |
| VIII | dBm/3.84 MHz | -85.6 | -75.3 |
| X | dBm/3.84 MHz | -86.7 | -76.4 |
| XII | dBm/3.84 MHz | N/A | N/A |
| XIII | dBm/3.84 MHz | N/A | N/A |
| XIV | dBm/3.84 MHz | N/A | N/A |
| XXV | dBm/3.84 MHz | -84.7 | -74.4 |
| NOTE 1: For the UE which supports DB-DC-HSDPA configuration in clause 4.2the < HS-PDSCH\_Ec > and < Îor > are allowed to be increased by an amount defined in Table6.1A. | | | |

## 6.7D Intermodulation Characteristics for single uplink single band 4C-HSDPA

### 6.7D.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The test parameters in Tables 6.7D.1 and 6.7D.4 apply for Release 10 and later releases to all types of UTRA for the FDD UE that support single band 4C-HSDPA, single uplink operation.

Single band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.7D.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7D.1 and 6.7D.2.

Table 6.7D.1: Test parameters for receive intermodulation characteristics, single band 4C-HSDPA, single uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iouw1 (CW) | dBm | -46 | |
| Iouw2 mean power (modulated) | dBm | -46 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 10 | -10 |
| Fuw2 (offset)  (NOTE 2) | MHz | 20 | -20 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.7D.2: Intermodulation requirements, single band 4C-HSDPA, single uplink operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Single band 4C-HSDPA Configuration** | **DL Band** | **HS-PDSCH\_Ec (dBm/3.84MHz)** | **Îor**  **(dBm/3.84MHz)** | **UL-DL carrier separation** |
| I-3 | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |

NOTE 3: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2C.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.8.1C.1.

### 6.7D.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.7D.4 and in table 6.7D.5 for the DL reference channel H-Set 1B/1C specified in Annex C.8.1.1.

The lack of the intermodulation response rejection ability decreases the 4C-HSDPA coverage area when two or more interfering signals, which have a specific frequency relationship to the wanted signal, exist.

### 6.7D.4 Method of test

6.7D.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.51.

2) RF parameters are set up according to table 6.7D.4 and table 6.7D.5.

3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS 34.108 [3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.7D.3. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.7D.3: Specific Message Contents for Intermodulation Characteristics  
(Single Uplink Single band 4C-HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.7D.4.2 Procedure

1) Set the parameters of the CW generator and interference signal generator as shown in table 6.7D.4 and in table 6.7D.5.

2) Set the power level of UE according to the tables 6.7D.4, and table 6.7D.5 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

### 6.7D.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.7D.4: Test parameters for receive intermodulation characteristics, single band 4C-HSDPA, single uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iouw1 (CW) | dBm | -46 | |
| Iouw2 mean power (modulated) | dBm | -46 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 10 | -10 |
| Fuw2 (offset)  (NOTE 2) | MHz | 20 | -20 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.7D.5: Intermodulation requirements, single band 4C-HSDPA, single uplink operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Single band 4C-HSDPA Configuration** | **DL Band** | **HS-PDSCH\_Ec (dBm/3.84MHz)** | **Îor**  **(dBm/3.84MHz)** | **UL-DL carrier separation** |
| I-3 | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |

NOTE 3: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2C.1.

NOTE 4: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.7E Intermodulation Characteristics for single uplink dual band 4C-HSDPA

### 6.7E.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The test parameters in Tables 6.7E.1 and 6.7E.4 apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band 4C-HSDPA, single uplink operation and HSDPA UE capability categories 31 or 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.7E.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7E.1 and 6.7E.2.

Table 6.7E.1: Test parameters for receive intermodulation characteristics, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iouw1 (CW) | dBm | -46 | |
| Iouw2 mean power (modulated) | dBm | -46 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 10 | -10 |
| Fuw2 (offset)  (NOTE 2) | MHz | 20 | -20 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.7E.2: Intermodulation requirements, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Dual band 4C-HSDPA Configuration** | **DL Band** | **UL Band** | **HS-PDSCH\_Ec (dBm/3.84MHz)** | **Îor (dBm/3.84MHz)** | **UL-DL carrier separation** |
| I-2-VIII-1  I-3-VIII-1 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I | VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | II | II | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| II | IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I-1-V-2  I-2-V-1  I-2-V-2 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I | V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I-1-XXXII-2  I-2-XXXII-1 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| XXXII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| NOTE: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2D.1 for dual band 4C-HSDPA. | | | | | |

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7E.3 and Table 6.7E.4.

Table 6.7E.3: Test parameters for receive narrow-band intermodulation characteristics, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V | | Band VIII | |
| Iouw1 (CW) | dBm | -44 | | -43 | |
| Iouw2 (GMSK) | dBm | -44 | | -43 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 3.5 | -3.5 | 3.6 | -3.6 |
| Fuw2 (offset)  (NOTE 2) | MHz | 5.9 | -5.9 | 6.0 | -6.0 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |

NOTE 1: Iouw2 (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.7E.4: Narrow-band intermodulation requirements, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Dual band 4C-HSDPA Configuration** | **DL Band** | **UL Band** | **HS-PDSCH\_Ec (dBm/3.84MHz)** | **Îor (dBm/3.84MHz)** | **UL-DL carrier separation** |
| I-2-VIII-1  I-3-VIII-1 | VIII | I | <REFSENS>+16.6 dB | <REFÎor>+16.6 dB | Minimum |
| VIII | VIII | <REFSENS>+16.6 dB | <REFÎor>+16.6 dB | Minimum |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | II | II | <REFSENS>+17 dB | <REFÎor>+17 dB | Minimum |
| IV | <REFSENS>+18.9 dB | <REFÎor>+18.9 dB | Minimum |
| II | IV | <REFSENS>+17 dB | <REFÎor>+17 dB | Minimum |
| IV | <REFSENS>+18.9 dB | <REFÎor>+18.9 dB | Minimum |
| I-1-V-2  I-2-V-1  I-2-V-2 | V | I | <REFSENS>+17 dB | <REFÎor>+17 dB | Minimum |
| V | V | <REFSENS>+17 dB | <REFÎor>+17 dB | Minimum |

NOTE 3: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2D.1for dual band 4C-HSDPA.

The normative reference for this requirement is TS 25.101 [1] clause 7.8.1D.1and clause 7.8.2D.1.

### 6.7E.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.7E.6 through 6.7E.9 for the DL reference channel H-Set 1C specified in Annex C.8.1.1.

The lack of the intermodulation response rejection ability decreases the 4C-HSDPA coverage area when two or more interfering signals, which have a specific frequency relationship to the wanted signal, exist.

This test case tests only 4 carrier configurations.

### 6.7E.4 Method of test

6.7E.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.51.

2) RF parameters are set up according to table 6.7E.6 and table 6.7E.8.

3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS 34.108 [3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.7E.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.7E.5: Specific Message Contents for Intermodulation Characteristics (Single Uplink Single band 4C--HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.7E.4.2 Procedure

1) Set the parameters of the CW generator and interference signal generator as shown in table 6.7E.4 and in table 6.7E.5.

2) Set the power level of UE according to the tables 6.7E.6, 6.7E.7, 6.7E.8 and table 6.7E.9 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

### 6.7E.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.7E.6: Test parameters for receive intermodulation characteristics, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iouw1 (CW) | dBm | -46 | |
| Iouw2 mean power (modulated) | dBm | -46 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 10 | -10 |
| Fuw2 (offset)  (NOTE 2) | MHz | 20 | -20 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.7E.7: Intermodulation requirements, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Dual band 4C-HSDPA Configuration** | **DL Band** | **UL Band** | **HS-PDSCH\_Ec (dBm/3.84MHz)** | **Îor (dBm/3.84MHz)** | **UL-DL carrier separation** |
| I-3-VIII-1 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I | VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| II-2-IV-2 | II | II | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| II | IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I-2-V-2 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I | V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |

Table 6.7E.8: Test parameters for receive narrow-band intermodulation characteristics, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V | | Band VIII | |
| Iouw1 (CW) | dBm | -44 | | -43 | |
| Iouw2 (GMSK) | dBm | -44 | | -43 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 3.5 | -3.5 | 3.6 | -3.6 |
| Fuw2 (offset)  (NOTE 2) | MHz | 5.9 | -5.9 | 6.0 | -6.0 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |

NOTE 1: Iouw2 (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.7E.8: Narrow-band intermodulation requirements, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Dual band 4C-HSDPA Configuration** | **DL Band** | **UL Band** | **HS-PDSCH\_Ec (dBm/3.84MHz)** | **Îor (dBm/3.84MHz)** | **UL-DL carrier separation** |
| I-3-VIII-1 | VIII | I | <REFSENS>+16.6 dB | <REFÎor>+16.6 dB | Minimum |
| VIII | VIII | <REFSENS>+16.6 dB | <REFÎor>+16.6 dB | Minimum |
| II-2-IV-2 | II | II | <REFSENS>+17 dB | <REFÎor>+17 dB | Minimum |
| IV | <REFSENS>+18.9 dB | <REFÎor>+18.9 dB | Minimum |
| II | IV | <REFSENS>+17 dB | <REFÎor>+17 dB | Minimum |
| IV | <REFSENS>+18.9 dB | <REFÎor>+18.9 dB | Minimum |
| I-2-V-2 | V | I | <REFSENS>+17 dB | <REFÎor>+17 dB | Minimum |
| V | V | <REFSENS>+17 dB | <REFÎor>+17 dB | Minimum |

NOTE 3: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2D.1for dual band 4C-HSDPA.

NOTE 4: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.7EA Intermodulation Characteristics for single uplink dual band 4C-HSDPA (3 carrier)

### 6.7EA.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The test parameters in Tables 6.7EA.1 and 6.7EA.4 apply for Release 10 and later releases to all types of UTRA for the FDD UE that support dual band 4C-HSDPA, single uplink operation and HS-DSCH categories 29 to 32.

Dual band 4C-HSDPA is designed to operate in configurations specified in clause 4.2.

### 6.7EA.2 Minimum Requirements

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7EA.1 and 6.7EA.2.

Table 6.7EA.1: Test parameters for receive intermodulation characteristics, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iouw1 (CW) | dBm | -46 | |
| Iouw2 mean power (modulated) | dBm | -46 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 10 | -10 |
| Fuw2 (offset)  (NOTE 2) | MHz | 20 | -20 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.7EA.2: Intermodulation requirements, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Dual band 4C-HSDPA Configuration** | **DL Band** | **UL Band** | **HS-PDSCH\_Ec (dBm/3.84MHz)** | **Îor (dBm/3.84MHz)** | **UL-DL carrier separation** |
| I-2-VIII-1  I-3-VIII-1 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I | VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | II | II | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| II | IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I-1-V-2  I-2-V-1  I-2-V-2 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I | V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I-1-XXXII-2  I-2-XXXII-1 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| XXXII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| NOTE: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2DA.1 for dual band 4C-HSDPA. | | | | | |

The BLER measured on each individual cell shall not exceed 0.1 for the parameters specified in Table 6.7EA.3 and Table 6.7EA.4.

Table 6.7EA.3: Test parameters for receive narrow-band intermodulation characteristics, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V | | Band VIII | |
| Iouw1 (CW) | dBm | -44 | | -43 | |
| Iouw2 (GMSK) | dBm | -44 | | -43 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 3.5 | -3.5 | 3.6 | -3.6 |
| Fuw2 (offset)  (NOTE 2) | MHz | 5.9 | -5.9 | 6.0 | -6.0 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |

NOTE 1: Iouw2 (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.7EA.4: Narrow-band intermodulation requirements, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Dual band 4C-HSDPA Configuration** | **DL Band** | **UL Band** | **HS-PDSCH\_Ec (dBm/3.84MHz)** | **Îor (dBm/3.84MHz)** | **UL-DL carrier separation** |
| I-2-VIII-1  I-3-VIII-1 | VIII | I | <REFSENS>+16.6 dB | <REFÎor>+16.6 dB | Minimum |
| VIII | VIII | <REFSENS>+16.6 dB | <REFÎor>+16.6 dB | Minimum |
| II-1-IV-2  II-2-IV-1  II-2-IV-2 | II | II | <REFSENS>+17 dB | <REFÎor>+17 dB | Minimum |
| IV | <REFSENS>+18.9 dB | <REFÎor>+18.9 dB | Minimum |
| II | IV | <REFSENS>+17 dB | <REFÎor>+17 dB | Minimum |
| IV | <REFSENS>+18.9 dB | <REFÎor>+18.9 dB | Minimum |
| I-1-V-2  I-2-V-1  I-2-V-2 | V | I | <REFSENS>+17 dB | <REFÎor>+17 dB | Minimum |
| V | V | <REFSENS>+17 dB | <REFÎor>+17 dB | Minimum |

NOTE 3: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2DA.1for dual band 4C-HSDPA.

The normative reference for this requirement is TS 25.101 [1] clause 7.8.1D.1and clause 7.8.2D.1.

### 6.7EA.3 Test purpose

To verify that the UE BLER of HS-PDSCH does not exceed 0.1 for the parameters specified in table 6.7EA.6 through 6.7EA.9 for the DL reference channel H-Set 1B specified in Annex C.8.1.1.

The lack of the intermodulation response rejection ability decreases the 4C-HSDPA coverage area when two or more interfering signals, which have a specific frequency relationship to the wanted signal, exist.

This test case tests only 4 carrier configurations.

### 6.7EA.4 Method of test

6.7EA.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.51.

2) RF parameters are set up according to table 6.7EA.6 and table 6.7EA.8.

3) A call is set up according to the Generic 4C-HSDPA setup procedure specified in TS 34.108 [3] sub clause 7.3.16, with exceptions for information elements listed in Table 6.7EA.5. With this exception, the Power Control Algorithm for the Uplink is set to algorithm 2.

Contents of RADIO BEARER SETUP message: AM or UM (Test Loop Mode1)

Table 6.7EA.5: Specific Message Contents for Intermodulation Characteristics (Single Uplink Single band 4C--HSDPA)

| Information Element | Value/Remark | Version |
| --- | --- | --- |
| Uplink DPCH info |  | Rel-6 |
| - Uplink DPCH power control info |  |  |
| - CHOICE mode | FDD |  |
| - Power Control Algorithm | Algorithm2 |  |

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.7EA.4.2 Procedure

1) Set the parameters of the CW generator and interference signal generator as shown in table 6.7EA.4 and in table 6.7EA.5.

2) Set the power level of UE according to the tables 6.7EA.6, 6.7EA.7, 6.7EA.8 and table 6.7EA.9 or send the power control commands (1dB step size should be used.) to the UE until UE output power measured by Test System shall be kept at the specified power level with 1dB tolerance.

3) Measure the BLER of HS-PDSCH received from the UE at the SS by counting the number of NACK, ACK and statDTX on the UL HS-DPCCH (BLER = (NACK + statDTX)/(NACK + statDTX + ACK)).

### 6.7EA.5 Test requirements

The measured BLER, derived in step 3), shall not exceed 0.1 on each individual cell. The minimum number of measurements required for a statistically significant result to this test is clarified in annex F.6.3, Table F.6.3.5.0.

Table 6.7EA.6: Test parameters for receive intermodulation characteristics, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Level | |
| Iouw1 (CW) | dBm | -46 | |
| Iouw2 mean power (modulated) | dBm | -46 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 10 | -10 |
| Fuw2 (offset)  (NOTE 2) | MHz | 20 | -20 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | |

NOTE 1: Iouw2 (modulated) consists of the common channels needed for tests as specified in Table E.4.1 and 16 dedicated data channels as specified in Table E.3.6.

NOTE 2: Negative offsets refer to the assigned channel frequency of the lowest carrier frequency used and positive offsets refer to the assigned channel frequency of the highest carrier frequency used.

Table 6.7EA.7: Intermodulation requirements, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Dual band 4C-HSDPA Configuration** | **DL Band** | **UL Band** | **HS-PDSCH\_Ec (dBm/3.84MHz)** | **Îor (dBm/3.84MHz)** | **UL-DL carrier separation** |
| I-2-VIII-1 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I | VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| VIII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| II-1-IV-2  II-2-IV-1 | II | II | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| II | IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| IV | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I-1-V-2  I-2-V-1 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I | V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| V | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| I-1-XXXII-2  I-2-XXXII-1 | I | I | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| XXXII | <REFSENS>+3 dB | <REFÎor>+3 dB | Minimum |
| NOTE: <REFSENS> and <REFÎor> refer to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2D.1 for dual band 4C-HSDPA. | | | | | |

Table 6.7EA.8: Test parameters for receive narrow-band intermodulation characteristics, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Band II, IV, V | | Band VIII | |
| Iouw1 (CW) | dBm | -44 | | -43 | |
| Iouw2 (GMSK) | dBm | -44 | | -43 | |
| Fuw1 (offset)  (NOTE 2) | MHz | 3.5 | -3.5 | 3.6 | -3.6 |
| Fuw2 (offset)  (NOTE 2) | MHz | 5.9 | -5.9 | 6.0 | -6.0 |
| UE transmitted mean power | dBm | 20 (for Power class 3 and 3bis)  18 (for Power class 4) | | | |

NOTE 1: Iouw2 (GMSK) is an interfering signal as defined in TS 45.004.

NOTE 2: For dual band 4C-HSDPA, negative offset refers to the assigned channel frequency of the lowest carrier frequency(ies) in each band, and positive offset refers to the assigned channel frequency of the highest carrier frequency(ies) in each band.

Table 6.7EA.8: Narrow-band intermodulation requirements, dual band 4C-HSDPA, single uplink operation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Dual band 4C-HSDPA Configuration** | **DL Band** | **UL Band** | **HS-PDSCH\_Ec (dBm/3.84MHz)** | **Îor (dBm/3.84MHz)** | **UL-DL carrier separation** |
| I-2-VIII-1 | VIII | I | <REFSENS>+16.6 dB | <REFÎor>+16.6 dB | Minimum |
| VIII | VIII | <REFSENS>+16.6 dB | <REFÎor>+16.6 dB | Minimum |
| II-1-IV-2  II-2-IV-1 | II | II | <REFSENS>+17 dB | <REFÎor>+17 dB | Minimum |
| IV | <REFSENS>+18.9 dB | <REFÎor>+18.9 dB | Minimum |
| II | IV | <REFSENS>+17 dB | <REFÎor>+17 dB | Minimum |
| IV | <REFSENS>+18.9 dB | <REFÎor>+18.9 dB | Minimum |
| I-1-V-2  I-2-V-1 | V | I | <REFSENS>+17 dB | <REFÎor>+17 dB | Minimum |
| V | V | <REFSENS>+17 dB | <REFÎor>+17 dB | Minimum |

NOTE 3: <REFSENS> and <REFÎor> refers to the HS-PDSCH\_Ec<REFSENS> and the HS-PDSCH<REFÎor> as specified in Table 6.2DA.1for dual band 4C-HSDPA.

NOTE 4: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

## 6.8 Spurious Emissions

Editor’s note: For a transition period of two meeting cycles until RAN#70, the test requirements in version 11.6.0 of this specification is allowed to be used for this test.

### 6.8.1 Definition and applicability

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the UE antenna connector. The spurious emission is verified per antenna connector with the other(s) terminated.

The requirements and this test apply to all types of UTRA for the FDD UE.

### 6.8.2 Minimum Requirements

The power of any narrow band CW spurious emission shall not exceed the maximum level specified in table 6.8.1, table 6.8.2 and 5.11.1b.

Table 6.8.1: General receiver spurious emission requirements

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency Band | Measurement  Bandwidth | Maximum level | Note |
| 30 MHz  f < 1 GHz | 100 kHz | -57 dBm |  |
| 1 GHz  f  12,75 GHz | 1 MHz | -47 dBm |  |
| 12.75GHz  f  5th harmonic of the upper frequency edge of the DL operating band in GHz | 1 MHz | -47 dBm | Note 1 |
| NOTE 1: Applies only for Band XXII. | | | |

Table 6.8.2: Additional receiver spurious emission requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Band | Frequency Band | MeasurementBandwidth | Maximum level | Note |
| I | 1920 MHz  f  1980 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| II | 1850 MHz  f  1915 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| III | 1710 MHz  f  1785 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| IV | 1710 MHz  f < 1755 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| V | 824 MHz  f  849 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| VI | 815 MHz  f  830 MHz | 3.84 MHz | -60 dBm |  |
| 830 MHz  f  840 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| 840 MHz  f  845 MHz | 3.84 MHz | -60 dBm |  |
| 860 MHz  f  875 MHz | 3.84 MHz | -60 dBm | UE receive band |
| VII | 2500 MHz  f  2570 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| VIII | 880 MHz f 915 MHz | 3.84 MHz | -60 dBm | UE in URA\_PCH, Cell\_PCH and idle state |
| IX | 1749.9 MHz £ f £ 1784.9 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| X | 1710 MHz  f < 1770 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| XI | 1427.9 MHz £ f £ 1447.9 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| XII | 699 MHz £ f 716 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| XIII | 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm | UE receive band |
| 776 MHz  f  788 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| XIV | 788 MHz  f  798 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| XIX | 815 MHz  f  830 MHz | 3.84 MHz | -60 dBm |  |
| 830 MHz  f  845 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| 860 MHz  f  875 MHz | 3.84 MHz | -60 dBm |  |
| XX | 832 MHz  f  862 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| XXI | 1447.9 MHz £ f £ 1462.9 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| XXII | 3410 MHz  f  3490 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| XXV | 1850 MHz  f  1915 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| XXVI | 814 MHz  f  849 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| Note \*: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table 7.10 are permitted for each UARFCN used in the measurement | | | | |

The reference for this requirement is TS 25.101 [1] clause 7.9.1.

### 6.8.3 Test purpose

To verify that the UE spurious emission meets the specifications described in clause 6.8.5.

Excess spurious emissions increase the interference to other systems.

### 6.8.4 Method of test

6.8.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect a spectrum analyzer (or other suitable test equipment) to the UE antenna connector as shown in figure A.8.

2) RF parameters are setup according to table E.3.2.2. Settings for the serving cell are defined in table 6.8.2A.

3) A call is set up according to the setup procedure specified in TS34.108 [3] sub clause 7.3.5, with the following exceptions for information elements in System Information Block type3.

| SIB 3 Information Element | Value/Remark |
| --- | --- |
| - Cell selection and re-selection info |  |
| - CHOICE mode | FDD |
| - Sintrasearch | 0 dB |
| - Sintersearch | 0 dB |
| - RAT List | This parameter is not present |
| - Maximum allowed UL TX power | Power level where Pcompensation=0 |

The exceptions for SIB1 are defined in TS 34.108 [3] clause 7.3.5.2.

NOTE: The setup procedure (3) sets the UE into the CELL\_FACH state. With this state and the SS level (2) it is ensured that UE continuously monitors the S-CCPCH and no cell reselections are performed [see 3GPP TS 25.304, clauses 5.2.3.and 5.2.6]. The UE will not be transmitting, and therefore will not interfere with the measurement.

Table 6.8.2A: Settings for the serving cell during the measurement of Rx Spurious Emissions

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Cell type |  | Serving cell |
| UTRA RF Channel Number |  | As defined in clause 6.8.4.1 |
| Qqualmin | dB | -24 |
| Qrxlevmin | dBm | -115 |
| UE\_TXPWR\_MAX\_RACH | dBm | +21 |
| CPICH Ec (see notes 1 and 2) | dBm/3.84 MHz | As defined in table E.3.2.2 |
| NOTE 1: The power level is specified in terms of CPICH\_Ec instead of CPICH\_RSCP as RSCP is a receiver measurement and only CPICH\_Ec can be directly controlled by the SS.  NOTE 2: The cell fulfils TS 25.304, 5.2.3.1.2. | | |

6.8.4.2 Procedure

1) Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

### 6.8.5 Test requirements

It shall be verified that the RRC connection release at the end of the procedure described in 34.108 [3] clause 7.3.5.3 shall be completed successfully indicating that the UE has stayed in CELL\_FACH state during the measurement of the spurious emissions.

The measured spurious emissions, derived in step 1), shall not exceed the maximum level specified in table 6.8.3 and table 6.8.4.

Table 6.8.3: General receiver spurious emission requirements

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency Band | Measurement  Bandwidth | Maximum level | Note |
| 30 MHz  f < 1 GHz | 100 kHz | -57 dBm |  |
| 1 GHz  f  12,75 GHz | 1 MHz | -47 dBm |  |
| 12.75GHz  f  5th harmonic of the upper frequency edge of the DL operating band in GHz | 1 MHz | -47 dBm | Note 1 |
| NOTE 1: Applies only for Band XXII. | | | |

Table 6.8.4: Additional receiver spurious emission requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Band | Frequency Band | MeasurementBandwidth | Maximum level | Note |
| I | 1920 MHz  f  1980 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| 2110 MHz  f  2170 MHz | 3.84 MHz | -60 dBm | UE receive band |
| II | 1850 MHz  f  1915 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| III | 1710 MHz  f  1785 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| IV | 1710 MHz  f < 1755 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| V | 824 MHz  f  849 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| VI | 815 MHz  f  830 MHz | 3.84 MHz | -60 dBm |  |
| 830 MHz  f  840 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| 840 MHz  f  845 MHz | 3.84 MHz | -60 dBm |  |
| 860 MHz  f  875 MHz | 3.84 MHz | -60 dBm |  |
| 875 MHz  f  885 MHz | 3.84 MHz | -60 dBm | UE receive band |
| 885 MHz  f  890 MHz | 3.84 MHz | -60 dBm |  |
| VII | 2500 MHz  f  2570 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| VIII | 880 MHz f 915 MHz | 3.84 MHz | -60 dBm | UE in URA\_PCH, Cell\_PCH and idle state |
| 935 MHz < f  960 MHz | 3.84 MHz | -60 dBm | UE receive band |
| IX | 1749.9 MHz £ f £ 1784.9 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| X | 1710 MHz  f < 1770 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| XI | 1427.9 MHz £ f £ 1447.9 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| 1475.9 MHz  f  1495.9 MHz | 3.84 MHz | -60 dBm | UE receive band |
| XII | 699 MHz £ f 716 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| XIII | 746 MHz  f  756 MHz | 3.84 MHz | -60 dBm | UE receive band |
| 776 MHz  f  788 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| XIV | 788 MHz  f  798 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| XIX | 815 MHz  f  830 MHz | 3.84 MHz | -60 dBm |  |
| 830 MHz  f  845 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| 860 MHz  f  875 MHz | 3.84 MHz | -60 dBm |  |
| 875 MHz  f  890 MHz | 3.84 MHz | -60 dBm | UE receive band |
| XX | 832 MHz  f  862 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| XXI | 1447.9 MHz £ f £ 1462.9 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| XXII | 3410 MHz  f  3490 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| XXV | 1850 MHz  f  1915 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| XXVI | 814 MHz  f  849 MHz | 3.84 MHz | -60 dBm | UE transmit band in URA\_PCH, Cell\_PCH and idle state |
| Note \*: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table 7.10 are permitted for each UARFCN used in the measurement | | | | |

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 2: The Test Requirements are measured in the CELL\_FACH state instead of in the UE states defined in the Minimum Requirement because the CELL\_FACH state ensures that the UE receiver is continuously on and the UE transmitter is off whilst the spectrum analyser searches for spurious emissions. The UE states defined in the Minimum Requirement allow the UE receiver to be in discontinuous reception, and using those UE states during the measurement would have resulted in a complicated and significantly lengthened test procedure since the UE receiver would be allowed to be switched off part of the time.

## 6.8A Spurious Emissions for DB-DC-HSDPA

Editor’s note: This clause is incomplete. The following aspects are either missing or not yet determined:

* Test procedure is TBD.

### 6.8A.1 Definition and applicability

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the UE antenna connector. The spurious emission is verified per antenna connector with the other(s) terminated.

The requirements and this test apply for Release 9 and later releases to all types of UTRA for the FDD UE that support DB-DC-HSDPA with a DL-only band (DB-DC-HSDPA Configuration 6).

### 6.8A.2 Minimum Requirements

For DB-DC-HSDPA and Dual band 4C-HSDPA configurations including an operating band without UL Band, the power of any narrow band CW spurious emission shall not exceed the maximum level specified in Table 6.8A.1.

Table 6.8A.1: General receiver spurious emission requirements

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency Band | Measurement  Bandwidth | Maximum level | Note |
| 30MHz  f < 1GHz | 100 kHz | -57 dBm |  |
| 1GHz  f  12.75 GHz | 1 MHz | -47 dBm |  |
| NOTE 1: The requirements apply when the UE is configured for DL multicarrier operation but is not transmitting. | | | |

The reference for this requirement is TS 25.101 [1] clause 7.9.1A.

### 6.8A.3 Test purpose

To verify that the UE spurious emission meets the specifications described in clause 6.8A.5.

Excess spurious emissions increase the interference to other systems.

### 6.8A.4 Method of test

6.8A.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

6.8A.4.2 Procedure

TBD

### 6.8A.5 Test requirements

The measured spurious emissions, derived in step TBD, shall not exceed the maximum level specified in table 6.8A.2

Table 6.8A.2: General receiver spurious emission requirements

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency Band | Measurement  Bandwidth | Maximum level | Note |
| 30MHz  f < 1GHz | 100 kHz | -57 dBm |  |
| 1GHz  f  12.75 GHz | 1 MHz | -47 dBm |  |
| NOTE 1: The requirements apply when the UE is configured for DL multicarrier operation but is not transmitting. | | | |

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 2: The Test Requirements are measured in the CELL\_FACH state instead of in the UE states defined in the Minimum Requirement because the CELL\_FACH state ensures that the UE receiver is continuously on and the UE transmitter is off whilst the spectrum analyser searches for spurious emissions. The UE states defined in the Minimum Requirement allow the UE receiver to be in discontinuous reception, and using those UE states during the measurement would have resulted in a complicated and significantly lengthened test procedure since the UE receiver would be allowed to be switched off part of the time.