## ETSI TS 136 307 V12.5.0 (2014-10)



### LTE;

Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements on User Equipments (UEs) supporting a release-independent frequency band (3GPP TS 36.307 version 12.5.0 Release 12)



# Reference RTS/TSGR-0436307vc50 Keywords LTE

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- 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.

### 1 Scope

The present document specifies requirements on UEs supporting a frequency band and inter-band/intra-band CA configurations that are independent of release.

#### 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*.
- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 36.101 (Release 12): "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) Radio Transmission and Reception".
- [3] 3GPP TS 36.133 (Release 12): "Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for Support of Radio Resource Management".

### 3 Definitions and Abbreviations

#### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in [1] apply.

#### 3.2 Abbreviations

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

#### 3A General

TSG-RAN has agreed that the standardisation of new frequency bands may be independent of a release, and that the standardisations of new inter-band/intra-band CA configurations also may be independent of a release for Rel-10 upwards. However, in order to implement a UE that conforms to a particular release but supports a band of operation or carrier aggregation of particular inter-band/intra-band CA configurations that is specified in a later release, it is necessary to specify some extra requirements.

For example, Band 19 is contained in the Release 9 specifications. In order to implement a UE conforming to Release 8 but supporting Band 19, it is necessary for the UE to additionally conform to some parts of the Release 9 specifications, such as the radio frequency and radio resource management requirements for the Band 19.

For another example on carrier aggregations, CA configuration CA\_1A-19A is contained in the Release 11 specifications. In order to implement a UE conforming to Release 10 but supporting the CA configuration CA\_1A-19A, it is necessary for the UE to additionally conform to some parts of the Release 11 specifications, such as the radio frequency and radio resource management requirements for the CA configuration CA\_1A-19A.

All frequency bands are fully specified in this release of the specifications. The present document does not contain any requirements for UEs supporting frequency bands independent of release.

NOTE: See NOTE in clause 4.4 in [2].

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## Annex A (informative): Frequency arrangement for overlapping operating bands

The following information is provided in order to assist a UE derive the DL EARFCN and UL EARFCN in a multi-band environment, in which multiple overlapping operating bands may be indicated in the fields *freqBandIndicator* and *multiBandInfoList* of SIB1.

The overlapping bands, independent of release, which may be indicated in a cell are shown in Table A-1 for applicable E-UTRA bands. The DL EARFCN and UL EARFCN are derived according to [2].

Table A-1: Overlapping bands (multi-band environments) for each E-UTRA band

E-UTRA Operating Band	Overlapping E-UTRA operating bands	Duplex Mode
2	25	FDD
3	9	FDD
4	10	FDD
5	18, 19, 26	FDD
9	3	FDD
10	4	FDD
12	17	FDD
17	12	FDD
18	5, 26, 27	FDD
19	5, 26	FDD
25	2	FDD
26	5, 18, 19, 27	FDD
27	18, 26	FDD
33	39	TDD
38	41	TDD
39	33	TDD
41	38	TDD

## Annex B (normative): Common Requirements

## B.1 Purpose of annex

The purpose of Annex B is to group the requirements that are common for several bands or CA configurations in this specification and use the common tables as references.

### B.2 Common RRM requirements

## B.2.1 Common RRM requirements for a band independent of release

The requirements and test cases listed in Table B.2.1-1 are specified in [3].

Table B.2.1-1: Common RRM requirements for a band independent of release

Section / Clause	Description
4 Note 1	E-UTRAN RRC_IDLE state mobility
5	E-UTRAN RRC_CONNECTED state mobility
6 Note 2	RRC Connection Mobility Control
7 Note 3	Timing and signalling characteristics
8 Note 4	UE Measurements Procedures in RRC_CONNECTED State
9 Note 5	Measurements performance requirements for UE
A.4 Note 1	E-UTRAN RRC_IDLE state
A.5	E-UTRAN RRC CONNECTED Mode Mobility
A.6 Note 2	RRC Connection Control
A.7 Note 3	Timing and Signalling Characteristics
A.8 Note 4	UE Measurements Procedures
A.9 Note 5	Measurement Performance Requirements

- NOTE 1: All requirements and the corresponding test cases shall apply, except:
  - for supporting the corresponding band in Rel-9 and below: clause 4.3 (Minimization of Drive Tests).
- NOTE 2: All requirements and the corresponding test cases shall apply, except:
  - for supporting the corresponding band in Rel-8: clauses 6.3 (RRC Connection Release with Redirection), 6.4 (CSG Proximity Indication for E-UTRAN and UTRAN).
- NOTE 3: All requirements and corresponding test cases shall apply, except those defined in sections 7.4 and 7.5
- NOTE 4: All requirements and corresponding test cases shall apply, except:
  - for supporting the corresponding band in Rel-8: clauses 8.1.2.5 (E-UTRAN OTDOA Intra-Frequency RSTD Measurements), 8.1.2.6 (E-UTRAN Inter-Frequency OTDOA Measurements), 8.1.2.7 (E-UTRAN E-CID Measurements).
- NOTE 5: All requirements and corresponding test cases shall apply, except:
  - for supporting the corresponding band in Rel-8: clauses 9.1.9 (UE Rx–Tx time difference), 9.1.10 (Reference Signal Time Difference).
- NOTE 6: In addition to the exceptions above, all requirements and test cases in this table shall apply, except those defined for:
  - carrier aggregation;
  - for supporting the corresponding band in Rel-9 or below: measurements under time-domain measurement resource restriction without CRS assistance information;
  - for supporting the corresponding band in Rel-10 or below: measurements under time-domain measurement resource restriction with CRS assistance information;
  - for supporting the corresponding band in Rel-11 or below: requirements introduced in Rel-12.

## B.2.2 Common RRM requirements for an intra-band contiguous CA configuration

The requirements and test cases listed in Table B.2.2-1 are specified in [3].

Table B.2.2-1: Common RRM requirements for a single-band CA configuration independent of release

Section / Clause	Description
7.1	UE transmit timing
7.7	SCell Activation and Deactivation Delay for E-UTRA Carrier Aggregation
7.8	Interruptions with Carrier Aggregation
8.2	Capabilities for Support of Event Triggering and Reporting Criteria
8.3	Measurements for E-UTRA carrier aggregation
8.4	OTDOA RSTD Measurements for E-UTRAN carrier aggregation
9.1.11	Carrier aggregation measurement accuracy
9.1.12	Reference Signal Time Difference (RSTD) Measurement Accuracy Requirements for Carrier Aggregation
A.7	Timing and Signalling Characteristics
A.8	UE Measurements Procedures
A.9	Measurement Performance Requirements
NOTE 2: In addition to the	s and test cases defined for intra-band contiguous carrier aggregation shall apply. exceptions above, all requirements and test cases in this table shall apply, except: the corresponding band in Rel-11 or below: requirements introduced in Rel-12.

### B.2.3 Common RRM requirements for an intra-band noncontiguous CA configuration

The requirements and test cases listed in Table B.2.3-1 are specified in [3].

Table B.2.3-1: Common RRM requirements for a single-band CA configuration independent of release

Section / Clause	Description
7.1	UE transmit timing
7.7	SCell Activation and Deactivation Delay for E-UTRA Carrier Aggregation
7.8	Interruptions with Carrier Aggregation
8.2	Capabilities for Support of Event Triggering and Reporting Criteria
8.3	Measurements for E-UTRA carrier aggregation
8.4	OTDOA RSTD Measurements for E-UTRAN carrier aggregation
9.1.11	Carrier aggregation measurement accuracy
9.1.12	Reference Signal Time Difference (RSTD) Measurement Accuracy Requirements for Carrier Aggregation
A.7	Timing and Signalling Characteristics
A.8	UE Measurements Procedures
A.9	Measurement Performance Requirements
NOTE 1: Only requirements apply.	and test cases defined for intra-band non-contiguous carrier aggregation shall
	xceptions above, all requirements and test cases in this table shall apply, except: the corresponding band in Rel-11 or below: requirements introduced in Rel-12.

## B.2.4 Common RRM requirements for an inter-band CA configuration

The requirements and test cases listed in Table B.2.4-1 are specified in [3].

Table B.2.4-1: Common RRM requirements for a band-combination CA configuration

Section / Clause	Description
7.1	UE transmit timing
7.7	SCell Activation and Deactivation Delay for E-UTRA Carrier Aggregation
7.8	Interruptions with Carrier Aggregation
8.2	Capabilities for Support of Event Triggering and Reporting Criteria
8.3	Measurements for E-UTRA carrier aggregation
8.4	OTDOA RSTD Measurements for E-UTRAN carrier aggregation
9.1.11	Carrier aggregation measurement accuracy
9.1.12	Reference Signal Time Difference (RSTD) Measurement Accuracy Requirements for Carrier Aggregation
A.7	Timing and Signalling Characteristics
A.8	UE Measurements Procedures
A.9	Measurement Performance Requirements
NOTE 2: In addition to the e	and test cases defined for inter-band carrier aggregation shall apply.  xceptions above, all requirements and test cases in this table shall apply, except: the corresponding band in Rel-11 or below: requirements introduced in Rel-12.

## B.3 Common UE performance requirements

#### B.3.1 Void

Table B.3.1-1: Void

## B.3.2 Common UE performance requirements and tests for different CA configurations and combination sets

Table B.3.2-1: Common UE performance requirements and tests for different CA configurations and combination sets

Section / Clause	Description
8.2.1.1.1	Single-antenna port performance (FDD)
8.2.2.1.1	Single-antenna port performance (TDD)
8.2.1.3.1	Open-loop spatial multiplexing performance - Minimum Requirement 2 Tx Antenna Port (FDD)
8.2.2.3.1	Open-loop spatial multiplexing performance - Minimum Requirement 2 Tx Antenna Port (TDD)
8.2.1.3.1A	Open-loop spatial multiplexing performance - Soft buffer management test (FDD)
8.2.2.3.1A	Open-loop spatial multiplexing performance - Soft buffer management test (TDD)
8.2.1.4.3	Closed-loop spatial multiplexing performance - Minimum Requirement Multi-Layer Spatial Multiplexing 4 Tx Antenna Port (FDD)
8.2.2.4.3	Closed-loop spatial multiplexing performance - Minimum Requirement Multi-Layer Spatial Multiplexing 4 Tx Antenna Port (TDD)
8.2.1.7	Carrier aggregation with power imbalance (FDD)
8.2.2.7	Carrier aggregation with power imbalance (TDD)
8.7.1	Sustained downlink data rate provided by lower layers (FDD)
8.7.2	Sustained downlink data rate provided by lower layers (TDD)
9.6.1.1	Additional requirements for carrier aggregation - Periodic reporting on multiple cells (Cell Specific Reference symbols) (FDD)
9.6.1.2	Additional requirements for carrier aggregation - Periodic reporting on multiple cells (Cell Specific Reference symbols) (TDD)
Note 1: The applicability of Section 8.1.2.3 and	requirements for different CA configurations and bandwidth combination sets is specified in 9.1.12 in [2].

B.3.3 Void

Table B.3.3-1: Void

B.3.4 Void

## Annex C (informative): Change history

**Table C.1: Change History** 

Date	TSG#	TSG Doc.	CR	Subject	Old	New
11-2009	RP#46	RP-091141		TS36.307 V0.1.0 approved by RAN (Originally in R4-095022)	-	0.1.0
02-2010	R4#54	R4-100419		For release 9 version, replace sections 4 to 6 as "Void" and add a new void section as section 7.	0.1.0	0.2.0
03-2010	RP#47	RP-100162		TS36.307 v1.0.0 for approval	0.2.0	1.0.0
03-2010		RP-100162		Approved by RAN	1.0.0	9.0.0
09-2010	RP-49	RP-100927	2	CR LTE_TDD_2600_US spectrum band definition additions to TS 36.307 V900	9.0.0	9.1.0
				Correction of section numbering	9.1.0	9.1.1
12-2010	RP-50	RP-101356	800	Band 42 and 43 parameters for UMTS/LTE 3500 (TDD) for TS 36.307	9.1.1	9.2.0
12-2010	RP-50		005	Introduction of L-band in TS 36.307	9.1.1	9.2.0
12-2010	RP-50	RP-101344	016	CR creating the rel-10 of the 36.307 specification		9.3.0
12-2010	RP-50	RP-101356	012	Band 42 and 43 parameters for UMTS/LTE 3500 (TDD) for TS 36.307	9.2.0	9.3.0
12-2010	RP-50			Raised to Rel-10 with no technical change	9.3.0	10.0.0
01-2011				Correction to history table	10.0. 0	10.0.1
06-2011	RP-52	RP-110804	015	Add Expanded 1900 MHz Band (Band 25) in 36.307	10.0. 1	10.1.0
06-2011	RP-52	RP-110812	022	Add 2GHz S-Band (Band 23) in 36.307 (Rel 10)	10.0.	10.1.0
09-2011	RP-53	RP-111255	025	Add Band 22 for LTE/UMTS 3500 (FDD) to TS 36.307	10.1. 0	10.2.0
03-2012	RP-55	RP-120305	029	Introduction of Band 26/XXVI to TS 36.307	10.2.	11.0.0
2012-06	RP-56	RP-120789	043	Introduction of CA_1A-19A to TS 36.307	11.0. 0	11.1.0
2012-06	RP-56	RP-120793	049	Introduction of APAC700(FDD) into TS 36.307 Rel-11	11.0. 0	11.1.0
2012-06	RP-56	RP-120793	053	Introduction of APAC700(TDD) into TS 36.307 Rel-11	11.0. 0	11.1.0
2012-06	RP-56	RP-120791		Introduction of e850_LB (Band 27) to TS 36.307	11.0. 0	11.1.0
2012-09	RP-57	RP-121335	059	Introduction of CA_1A-21A to TS 36.307	11.1. 0	11.2.0
2012-09	RP-57	RP-121295	070r1	Relation between EARFCN for overlapping bands with multiple FBI indication	11.1. 0	11.2.0
2012-09	RP-57	RP-121338	072	36.307 CR for LTE_CA_B7	11.1. 0	11.2.0
2012-09	RP-57	RP-121337	073	TS 36.307 CR for CA_38	11.1. 0	11.2.0
2012-09	RP-57	RP-121327	074	Introduction of CA_B7_B20 in 36.307	11.1. 0	11.2.0
2012-09	RP-57	RP-121329	075	Introduction of CA band combination Band3 + Band5 to TS 36.307	11.1. 0	11.2.0
2012-09	RP-57	RP-121331	076	Introduction of CA_3A-20A to TS 36.307	11.1. 0	11.2.0
2012-09	RP-57	RP-121334	077	Add requirements for inter-band CA of B_1-18 in TS36.307	11.1. 0	11.2.0
2012-09	RP-57	RP-121333	078	Introduction of CA_8_20 RF requirements into TS36.307	11.1. 0	11.2.0
2012-09	RP-57	RP-121324	079	Introduction of CA_B3_B7 in 36.307	11.1. 0	11.2.0
2012-12	RP-58	RP-121890	086	Introduction of CA_4A-5A into 36.307	11.2. 0	11.3.0
2012-12	RP-58	RP-121889	088	Introduction of CA band combination Band4 + Band13 to TS 36.307 (Rel-11)	11.2. 0	11.3.0

2012-12 RP- 2013-06 RP- 2013-06 RP-	P-58 RP-121894 P-58 RP-121887 P-58 RP-121882 P-58 RP-121861 P-58 RP-121718 P-58 RP-121718 P-58 RP-121720	092 093 095 097 099 101 0102	Introduction of Band 5 + Band 17 inter-band CA configuration into 36.307 Introduction of CA_3A-8A to TS 36.307 Introduction of CA_B5_B12 in 36.307 Introduction of CA_4-12 into TS 36.307 (Rel-11) [Rel-11] Introduction of inter-band CA_11-18 into TS36.307 Release-independent implementation of carrier aggregation configuration CA_4-7 Introduction of Band 29	11.2. 0 11.2. 0 11.2. 0 11.2. 0 11.2. 0 11.2. 0 11.2.	11.3.0 11.3.0 11.3.0 11.3.0 11.3.0
2012-12 RP- 2013-06 RP- 2013-06 RP-	P-58 RP-121894 P-58 RP-121887 P-58 RP-121882 P-58 RP-121861 P-58 RP-121718 P-58 RP-121718 P-58 RP-121720	093 095 097 099 101 0102	Introduction of CA_3A-8A to TS 36.307  Introduction of CA_B5_B12 in 36.307  Introduction of CA_4-12 into TS 36.307 (Rel-11)  [Rel-11] Introduction of inter-band CA_11-18 into TS36.307  Release-independent implementation of carrier aggregation configuration CA_4-7  Introduction of Band 29	0 11.2. 0 11.2. 0 11.2. 0 11.2. 0	11.3.0 11.3.0 11.3.0 11.3.0
2012-12 RP- 2012-12 RP- 2012-12 RP- 2012-12 RP- 2012-12 RP- 2012-12 RP- 2013-06 RP- 2013-06 RP-	P-58 RP-121887 P-58 RP-121882 P-58 RP-121861 P-58 RP-121901 P-58 RP-121718 P-58 RP-121720	095 097 099 101 0102	Introduction of CA_4-12 into TS 36.307 (Rel-11)  [Rel-11] Introduction of inter-band CA_11-18 into TS36.307  Release-independent implementation of carrier aggregation configuration CA_4-7  Introduction of Band 29	11.2. 0 11.2. 0 11.2. 0 11.2. 0 11.2.	11.3.0 11.3.0 11.3.0
2012-12 RP- 2012-12 RP- 2012-12 RP- 2012-12 RP- 2012-12 RP- 2013-06 RP- 2013-06 RP-	P-58 RP-121882 P-58 RP-121861 P-58 RP-121901 P-58 RP-121718 P-58 RP-121720	097 099 101 0102	[Rel-11] Introduction of inter-band CA_11-18 into TS36.307  Release-independent implementation of carrier aggregation configuration CA_4-7  Introduction of Band 29	11.2. 0 11.2. 0 11.2. 0 11.2.	11.3.0
2012-12 RP- 2012-12 RP- 2012-12 RP- 2012-12 RP- 2013-06 RP- 2013-06 RP-	P-58 RP-121861 P-58 RP-121901 P-58 RP-121718 P-58 RP-121720	099 101 0102	Release-independent implementation of carrier aggregation configuration CA_4-7 Introduction of Band 29	11.2. 0 11.2. 0 11.2.	11.3.0
2012-12 RP- 2012-12 RP- 2012-12 RP- 2013-06 RP- 2013-06 RP-	P-58 RP-121718 P-58 RP-121720	101 0102	configuration CA_4-7 Introduction of Band 29	0 11.2.	
2012-12 RP- 2012-12 RP- 2013-06 RP- 2013-06 RP-	P-58 RP-121718 P-58 RP-121720	0102	Introduction of Band 29	_	1100
2012-12 RP- 2013-06 RP- 2013-06 RP-	P-58 RP-121720		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0	11.3.0
2013-06 RP-		0104	Introduction of CA band combination Band2 + Band17 to TS 36.307 (Rel-11)	11.2. 0	11.3.0
2013-06 RP-	P-60 RP-130771	i	Introduction of CA band combination Band4 + Band17 to TS 36.307 (Rel-11)	11.2. 0	11.3.0
		108	Introduction of CA 1+8 into TS36.307(Rel-12)	11.3. 0	12.0.0
2013-06 RP	P-60 RP-130782	111	Introduction of LTE Advanced inter-band Carrier Aggregation of Band 3 and Band 28 to TS 36.307 Rel-12	11.3. 0	12.0.0
	P-60 RP-130785	114	Introduction of LTE Advanced inter-band Carrier Aggregation of Band 23 and Band 29 to TS 36.307 (Rel-12)	11.3. 0	12.0.0
2013-06 RP	P-60 RP-130779	117	Introduction of LTE Advanced inter-band Carrier Aggregation of Band 3 and Band 26 to TS 36.307 (Rel-12)	11.3. 0	12.0.0
2013-06 RP	P-60 RP-130777	120	Introduction of CA_3A-19A to TS 36.307	11.3. 0	12.0.0
2013-06 RP	P-60 RP-130783	123	Introduction of CA_19A-21A to TS 36.307	11.3. 0	12.0.0
2013-06 RP	P-60 RP-130775	131	Introduction of CA_2A-13A to TS 36.307	11.3. 0	12.0.0
2013-06 RP	P-60 RP-130791	136	Introduction of Band 30	11.3. 0	12.0.0
2013-06 RP	P-60 RP-130790	143	Introduction of LTE 450 into TS 36.307 R12	11.3. 0	12.0.0
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12-2013 RP	P-62 RP-131965	173	Introduction of CA_23A-23A to TS 36.307	12.1. 0	12.2.0
12-2013 RP-	P-62 RP-131946	178	Introduction of CA band combination Band2 + Band12 to TS 36.307	12.1. 0	12.2.0
12-2013 RP	P-62 RP-131954	181	Introduction of CA band combination Band12 + Band25 to TS 36.307	12.1. 0	12.2.0
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12-2013 RP	P-62 RP-131957	192	Introduction of CA_23B to TS 36.307	12.1. 0	12.2.0
		194	Introduction of Intra-band non-contiguous CA in band 3 to TS 36.307	12.1. 0	12.2.0
		200	Introduction of CA band combination Band5 + Band25 to TS 36.307	12.1. 0	12.2.0
12-2013 RP	P-62 RP-131967	201r1	Introducing 'General' clause with note referring to note in clause 4.4 in TS36.101, editorial corrections and modifications to Forward and Scope clauses	12.1. 0	12.2.0
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12-2013	RP-62	RP-131967	211	Correction to release independent specification	12.1.	12.2.0
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03-2014	RP-63	RP-140388	210r1	Introduction of CA_39C to TS 36.307	12.2. 0	12.3.0
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## History

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