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Technical Report

3rd Generation Partnership Project;

Technical Specification Group Radio Access Network;

Dual Connectivity (EN-DC) with 3 bands DL and 3 bands UL

(Release 16)



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# 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:

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where:

x the first digit:

1 presented to TSG for information;

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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 is a technical report for Dual Connectivity (EN-DC) with 3 bands DL and 3 bands UL under Rel-16 time frame. The purpose is to gather the relevant background information and studies in order to address Dual Connectivity (EN-DC) with 3 bands DL and 3 bands UL for the Rel-16 band combinations, where:

- For only 1 NR band included, only NR FR2 band is applied

- For only 2 NR bands included, 1 NR FR1 band and 1 NR FR2 band are included and operated as inter-band CA

Table 1-1: Release 16 Dual Connectivity (EN-DC) with 3 bands DL and 3 bands UL (1 NR band)

|  |  |
| --- | --- |
| DC combination | Uplink EN-DC configuration |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

Table 1-2: Release 16 Dual Connectivity (EN-DC) with 3 bands DL and 3 bands UL(2 NR bands)

|  |  |
| --- | --- |
| DC combination | Uplink EN-DC configuration |
| DC\_3\_n79-n258 | DC\_3A\_n79A-n258A |
| DC\_66\_n5-n260 | DC\_66A-n5A-n260A |
| DC\_66\_n5-n261 | DC\_66A\_n5A-n261A |
| DC\_21\_n77-n257 | DC\_21A\_n77A-n257A  DC\_21A\_n77A-n257G  DC\_21A\_n77A-n257H  DC\_21A\_n77A-n257I |
| DC\_21\_n78-n257 | DC\_21A\_n78A-n257A  DC\_21A\_n78A-n257G  DC\_21A\_n78A-n257H  DC\_21A\_n78A-n257I |
| DC\_21\_n79-n257 | DC\_21A\_n79A-n257A  DC\_21A\_n79A-n257G  DC\_21A\_n79A-n257H  DC\_21A\_n79A-n257I |
| DC\_3A\_n40A-n258A | DC\_3A\_n40A-n258A |

This TR contains a general part and band specific combination part. The actual requirements are added to the corresponding technical specifications.

# 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 38.101-1: "NR; User Equipment (UE) radio transmission and reception; Part 1: Range 1 Standalone".

[3] 3GPP TS 38.101-2: "NR; User Equipment (UE) radio transmission and reception; Part 2: Range 2 Standalone".

[4] 3GPP TS 38.101-3: "NR; User Equipment (UE) radio transmission and reception; Part 3: Range 1 and Range 2 Interworking operation with other radios".

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

## 3.2 Symbols

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

ΔRIB,c Allowed reference sensitivity relaxation due to support for CA or DC operation, for serving cell *c*.

ΔTIB,c Allowed maximum configured output power relaxation due to support for CA or DC operation, for serving cell *c*.

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

# 4 Background

The present document is a technical report for Dual Connectivity (EN-DC) with 3 bands DL and 3 bands UL under Rel-16 time frame. It covers both the UE and BS side. The document is divided in two different parts:

- General part: this part covers BS and UE specific which is band combination independent.

- Specific band combination part: this part covers each band combination and its specific issues independently from each other (i.e. one subclause is defined per band combination)

The specific band combination parts are independent and therefore, the working speed also differs.

## 4.1 TR Maintenance

A single company is responsible for introducing all approved TPs in the current TR, i.e. TR editor. However, it is the responsibility of the contact person of each band combination to ensure that the TPs related to the band combination have been implemented.

# 5 EN-DC with 3 bands DL and 3 bands UL: General Part

## 5.1 General treatment of ∆TIB and ∆RIB values

For the 3 bands DL and 3 bands UL EN-DC band combination, RAN4 should consider to reuse agreed additional insertion losses for all EN-DC band combinations when new RF components are not introduced to support this basket WI. If the new RF components are introduced, then more detail decription will be captured in some specific EN-DC band combinations.

In the 3 bands DL and 3 bands UL EN-DC combination, at least one NR FR2 band is included, which means the other two bands can be LTE 2 bands or LTE 1 band + NR 1 FR1 band. It shall be noted that the inter-band EN-DC combination with all the 3UL FR1 bands is excluded since the corresponding RF requirements have not been finished yet.

Unless otherwise stated, for inter-band 3 bands DL and 3 bands UL EN-DC configurations including FR2,there are no additional requirements of and ∆TIB and ∆RIB values for NR FR2 band, which means ∆TIB and ∆RIB for constituent FR2 NR bands is set to zero.

For Inter-band EN-DC with LTE 2 band+NR 1 band (i.e. NR 1 FR2 band):

- ΔTIB,c and ΔRIB,c for constituent E-UTRA bands is the same as those for the corresponding E-UTRA inter-band CA configuration specified in TS 36.101.

For Inter-band EN-DC with LTE 1 band+NR 2 bands (i.e. NR 1 FR1 band + NR 1 FR2 band):

- ΔTIB,c and ΔRIB,c for E-UTRA and FR1 NR band is the same as those for the corresponding inter-band EN-DC combinations specified in TS 38.101-3.

## 5.2 Maximum Sensitivity Degradation (MSD) analysis

5.2.1 MSD caused by Harmonic product

The harmonic product analysis for the inter-band EN-DC combination within FR1 and including FR2 have been captured in the TRs, such as TR 37.716-11-11 and 37.716-21-11. Considering:

- the frequency between E-UTRA band and NR FR2 band are very large, and the NR FR2 band frequency is larger than 3rd harmonic frequencies (even 7th harmonic frequencies) of all E-UTRA band, which means the NR FR2 band will not be impacted by the harmonic products of the E-UTRA band.

- the NR FR2 band frequency is larger than 3rd harmonic frequencies of all NR FR1 band, which means the NR FR2 band will not be impacted by the 3rd harmonic products of the NR FR1 band.

Therefore, unless otherwise stated, for inter-band 3 bands DL and 3 bands UL EN-DC configurations including FR2, there are no MSD requirements caused by harmonic products for constituent FR2 NR band, and MSD caused by harmonic products for constituent E-UTRA and NR FR1 bands are the same as those for the corresponding E-UTRA inter-band CA in TS36.101 or inter band EN-DC configuration without the FR2 bands in TS38.101-3, respectively.

5.2.2 MSD caused by intermodulation products

There are two types intermodulation frequencies for 3 bands UL configuration, the first one is choosing desirable UL band configurations for each use scenarios (i.e. 2UL intermodulation frequencies), and the second one is all the possible intermodulation frequencies occur while all three UL’s are active concurrently (i.e. 3UL intermodulation frequencies).

For the first type intermodulation frequencies, the study for 2UL intermodulation frequencies have been captured in TR 37.716-21-11 and TR 37.716-21-21, especially for the 2UL band configuration of E-UTRA band and NR FR1 band. It is no need to recalculate the 2UL frequencies intermudulation products forinter-band 3 bands DL and 3 bands EN-DC combinations.

For the second type intermodulation frequencies, on top of 2UL intermodulation frequencies, some additional intermodulation frequencies shall be studied for all three UL frequencies are active concurrently for inter-band 3UL EN-DC conbination, which is shown in Table 5.2.2-1.

Table 5.2.2-1. intermodulation frequencies all three UL frequencies are active concurrently

|  |  |  |  |
| --- | --- | --- | --- |
| Intermodulation # | IMD3 | IMD4 | IMD5 |
| Intermodulation frequencies | |F1+F2+F3|  |F1+F2-F3|  |F1-F2+F3|  |F1-F2-F3| | |2F1+F2+F3|,|2F1+F2-F3|  |2F1-F2+F3|,|2F1-F2-F3|  |F1+2F2+F3|,|F1+2F2-F3|  |F1-2F2+F3|,|F1-2F2-F3|  |F1+F2+2F3|,|F1+F2-2F3|  |F1-F2+2F3|,|F1-F2-2F3| | |3F1+F2+F3| , |3F1+F2-F3|, |3F1-F2+F3|, |3F1-F2-F3|  |F1+3F2+F3|, |F1+3F2-F3|, |F1-3F2+F3|,|F1-3F2-F3|  |F1+F2+3F3|, |F1+F2-3F3|, |F1-F2+3F3|, |F1-F2-3F3|  |2F1+2F2+F3|, |2F1+2F2-F3|,|2F1-2F2+F3|,|2F1-2F2-F3|  |F1+2F2+2F3|, |F1+2F2-2F3|,|F1-2F2+2F3|,|F1-2F2-2F3|  |2F1+F2+2F3|,|2F1+F2-2F3|,|2F1-F2+2F3|,|2F1-F2-2F3| |

Considering the larger frequency difference between FR1 band and FR2 band, it can be foreseen that the IMDs product caused by FR1 band and FR2 band will not fall into its own Rx band. Hence, it is no need to calculate the IMDs product in table 5.2.2-1 for inter-band EN-DC combinations including FR2 band.

Therefore, unless otherwise stated, for inter-band 3 bands DL and 3 bands UL EN-DC configurations including FR2, there are no MSD requirements caused by intermodulation products for constituent FR2 NR band, and MSD caused by intermodulation products caused by harmonic products for constituent E-UTRA and NR FR1 bands are the same as those for the corresponding E-UTRA inter-band CA in TS36.101 or inter band EN-DC configuration without the FR2 bands in TS38.101-3.

5.3 Spurious emission band UE co-existence

Unless otherwise stated, for inter-band 3 bands DL and 3 bands UL EN-DC configurations including FR2, there are no additional requirements of spurious emission band UE co-existence.

For Inter-band EN-DC with LTE 2 band+NR 1 band (i.e. NR 1 FR2 band):

- For spurious emission band UE co-existence, no requirements for FR2 NR bands to protect E-UTRAbands are applied to the constituent FR2 NR bands. Spurious emission band UE co-existence requirements specified in TS 36.101 are applied to the constituent E-UTRA bands..

For Inter-band EN-DC with LTE 1 band+NR 2 bands (i.e. NR 1 FR1 band + NR 1 FR2 band):

- Spurious emission band UE co-existence requirements for constituent E-UTRA and FR1 NR bands for the inter-band EN-DC are the same as those for the corresponding EN-DC configuration without the FR2 bands specified in TS38.101-3.

# 6 EN-DC with 3 bands DL and 3 bands UL:Specific Band Combination Part

## 6.1 Inter-band EN-DC with LTE 1 band+NR 2 bands(including FR2)

## 6.1.1 DC\_66\_n5-n260

### 6.1.1.1 Operating bands for DC\_66\_n5-n260

**Table 6.1.1.1-1: Band combinations for DC\_66\_n5-n260**

|  |  |  |
| --- | --- | --- |
| EN\_DC Band | E-UTRA Band | NR Band |
| DC\_66\_n5-n260 | 66 | n5, n260 |

### 6.1.1.2 Configurations for DC\_66\_n5-n260

Table 6.1.1.2-1: Inter-band EN-DC configurations for DC\_66\_n5-n260

|  |  |
| --- | --- |
| EN\_DC Configuration | Uplink EN\_DC Configuration |
| DC\_66A\_n5A-n260G  DC\_66A\_n5A-n260H  DC\_66A\_n5A-n260I  DC\_66A\_n5A-n260J  DC\_66A\_n5A-n260K  DC\_66A\_n5A-n260L  DC\_66A\_n5A-n260M | DC\_66A-n5A-n260A |
| DC\_66A\_n5A-n260(2A)  DC\_66A\_n5A-n260(3A)  DC\_66A\_n5A-n260(4A)  DC\_66A\_n5A-n260(5A)  DC\_66A\_n5A-n260(6A)  DC\_66A\_n5A-n260(2H)  DC\_66A\_n5A-n260(2G)  DC\_66A\_n5A-n260(A-2G)  DC\_66A\_n5A-n260(A-H)  DC\_66A\_n5A-n260(A-G)  DC\_66A\_n5A-n260(G-H)  DC\_66A\_n5A-n260(2A-G)  DC\_66A\_n5A-n260(2A-2G)  DC\_66A\_n5A-n260(3A-G) | DC\_66A-n5A-n260A |

### 6.1.1.3 ∆TIB and ∆RIB values

For DC\_66A\_n5A-n260A, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 6.1.1.3-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_66\_n5-n260 | 66 | 0.3 |
| n5 | 0.3 |
| n260 | 0 |

Table 6.1.1.3-2: ΔRIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_66\_n5-n260 | 66 | 0 |
| n5 | 0 |
| n260 | 0 |

6.1.1.4 REFSENS requirements

No additional MSD is required for DC\_66\_n5-n260

## 6.1.2 DC\_66\_n5-n261

### 6.1.2.1 Operating bands for DC\_66\_n5-n261

Table 6.1.2.1-1: Band combinations for DC\_66\_n5-n261

|  |  |  |
| --- | --- | --- |
| EN\_DC Band | E-UTRA Band | NR Band |
| DC\_66\_n5-n261 | 66 | n5, n261 |

### 6.1.2.2 Configuration for DC\_66\_n5-n261

Table 6.1.2.2-1: Inter-band DC\_66\_n5-n261 configurations

|  |  |
| --- | --- |
| **EN\_DC Configuration** | **Uplink EN\_DC Configuration** |
| DC\_66A\_n5A-n261A  DC\_66A\_n5A-n261G  DC\_66A\_n5A-n261H  DC\_66A\_n5A-n261I  DC\_66A\_n5A-n261J  DC\_66A\_n5A-n261K  DC\_66A\_n5A-n261L  DC\_66A\_n5A-n261M | DC\_66A\_n5A-n261A |
| DC\_66A\_n5A-n261(2A)  DC\_66A\_n5A-n261(3A)  DC\_66A\_n5A-n261(2G)  DC\_66A\_n5A-n261(2H)  DC\_66A\_n5A-n261(A-G)  DC\_66A\_n5A-n261(A-H)  DC\_66A\_n5A-n261(A-I)  DC\_66A\_n5A-n261(A-J)  DC\_66A\_n5A-n261(A-K)  DC\_66A\_n5A-n261(G-H)  DC\_66A\_n5A-n261(G-I)  DC\_66A\_n5A-n261(G-J)  DC\_66A\_n5A-n261(H-I)  DC\_66A\_n5A-n261(A-2G)  DC\_66A\_n5A-n261(A-G-H)  DC\_66A\_n5A-n261(A-G-I)  DC\_66A\_n5A-n261(2A-G)  DC\_66A\_n5A-n261(2A-H)  DC\_66A\_n5A-n261(2A-I)  DC\_66A\_n5A-n261(3A-G) | DC\_66A\_n5A-n261A |

### 6.1.2.3 ∆TIB and ∆RIB values

For DC\_66A\_n5A-n261A, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 6.1.2.3-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_66\_n5-n261 | 66 | 0.3 |
| n5 | 0.3 |
| n261 | 0 |

Table 6.1.2.3-2: ΔRIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_66\_n5-n261 | 66 | 0 |
| n5 | 0 |
| n261 | 0 |

### 6.1.2.4 REFSENS requirements

No additional MSD is required for DC\_66\_n5-n261

## 6.1.3 DC\_3\_n79-n258

### 6.1.3.1 Operating bands for DC\_3\_n79-n258

Table 6.1.3.1-1: Band combinations EN-DC (three bands)

| EN-DC Band | E-UTRA Band | NR Band |
| --- | --- | --- |
| DC\_3\_n79-n258 | 3 | n79, n258 |

### 6.1.3.2 Configurations for DC\_3\_n79-n258

Table 6.1.3.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration |
| --- | --- |
| DC\_3A\_n79A-n258A  DC\_3A\_n79A-n258D  DC\_3A\_n79A-n258E  DC\_3A\_n79A-n258F  DC\_3A\_n79A-n258G  DC\_3A\_n79A-n258H  DC\_3A\_n79A-n258I  DC\_3A\_n79A-n258J  DC\_3A\_n79A-n258K  DC\_3A\_n79A-n258L | DC\_3A\_n79A-n258A |

### 6.1.3.3 ∆TIB and ∆RIB values

For DC\_3\_n79-n258, the ΔTIB,c and ΔRIB values are given in the tables below.

Table 6.x.4-2: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_3\_n79-n258 | 3 | 0 |
| n79 | 0 |
| n258 | 0 |

Table 6.x.4-2: ΔRIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_3\_n79-n258 | 3 | 0 |
| n79 | 0 |
| n258 | 0 |

### 6.1.3.4 REFSENS requirements

There are no additional MSD issue need to be specified.

## 6.1.4 DC\_21\_n77-n257

### 6.1.4.1 Operating bands for DC\_21\_n77-n257

Table 6.1.4.1-1: Band combinations EN-DC (three bands)

|  |  |  |
| --- | --- | --- |
| EN-DC Band | E-UTRA Band | NR Band |
| DC\_21\_n77-n257 | 21 | n77, n257 |

### 6.1.4.2 Configurations for DC\_21\_n77-n257

Table 6.1.4.2-1: Inter-band EN-DC configurations (three bands)

|  |  |
| --- | --- |
| EN-DC  configuration | Uplink EN-DC  configuration |
| DC\_21A\_n77A-n257A  DC\_21A\_n77A-n257G  DC\_21A\_n77A-n257H  DC\_21A\_n77A-n257I | DC\_21A\_n77A-n257A  DC\_21A\_n77A-n257G  DC\_21A\_n77A-n257H  DC\_21A\_n77A-n257I |

### 6.1.4.3 ∆TIB and ∆RIB values

For DC\_21\_n77-n257, the DTIB,c and DRIB values are given in the tables below.

Table 6.1.4.3-1: ΔTIB,c

|  |  |  |
| --- | --- | --- |
| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| DC\_21\_n77-n257 | 21 | 0.4 |
| n77 | 0.8 |
| n257 | 0 |

Table 6.1.4.3-2: ΔRIB,c

|  |  |  |
| --- | --- | --- |
| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| DC\_21\_n77-n257 | 21 | 0 |
| n77 | 0.5 |
| n257 | 0 |

### 6.1.4.4 REFSENS requirements

Based on co-existence studies of the fallback band combinations EN-DC of LTE + NR FR1 and EN-DC of LTE + NR FR2 there is no additional harmonic and intermodulation impact for the proposed band combinations.

## 6.1.5 DC\_21\_n78-n257

### 6.1.5.1 Operating bands for DC\_21\_n78-n257

Table 6.1.5.1-1: Band combinations EN-DC (three bands)

|  |  |  |
| --- | --- | --- |
| EN-DC Band | E-UTRA Band | NR Band |
| DC\_21\_n78-n257 | 21 | n78, n257 |

### 6.1.5.2 Configurations for DC\_21\_n78-n257

Table 6.1.5.2-1: Inter-band EN-DC configurations (three bands)

|  |  |
| --- | --- |
| EN-DC  configuration | Uplink EN-DC  configuration |
| DC\_21A\_n78A-n257A  DC\_21A\_n78A-n257G  DC\_21A\_n78A-n257H  DC\_21A\_n78A-n257I | DC\_21A\_n78A-n257A  DC\_21A\_n78A-n257G  DC\_21A\_n78A-n257H  DC\_21A\_n78A-n257I |

### 6.1.5.3 ∆TIB and ∆RIB values

For DC\_21\_n78-n257, the DTIB,c and DRIB values are given in the tables below.

Table 6.1.5.3-1: ΔTIB,c

|  |  |  |
| --- | --- | --- |
| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| DC\_21\_n78-n257 | 21 | 0.4 |
| n78 | 0.8 |
| n257 | 0 |

Table 6.1.5.3-2: ΔRIB,c

|  |  |  |
| --- | --- | --- |
| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| DC\_21\_n78-n257 | 21 | 0 |
| n78 | 0.5 |
| n257 | 0 |

### 6.1.5.4 REFSENS requirements

Based on co-existence studies of the fallback band combinations EN-DC of LTE + NR FR1 and EN-DC of LTE + NR FR2 there is no additional harmonic and intermodulation impact for the proposed band combinations.

## 6.1.6 DC\_21\_n79-n257

### 6.1.6.1 Operating bands for DC\_21\_n79-n257

Table 6.1.6.1-1: Band combinations EN-DC (three bands)

|  |  |  |
| --- | --- | --- |
| EN-DC Band | E-UTRA Band | NR Band |
| DC\_21\_n79-n257 | 21 | n79, n257 |

### 6.1.6.2 Configurations for DC\_21\_n79-n257

Table 6.1.6.2-1: Inter-band EN-DC configurations (three bands)

|  |  |
| --- | --- |
| EN-DC  configuration | Uplink EN-DC  configuration |
| DC\_21A\_n79A-n257A  DC\_21A\_n79A-n257G  DC\_21A\_n79A-n257H  DC\_21A\_n79A-n257I | DC\_21A\_n79A-n257A  DC\_21A\_n79A-n257G  DC\_21A\_n79A-n257H  DC\_21A\_n79A-n257I |

### 6.1.6.3 ∆TIB and ∆RIB values

For DC\_21\_n79-n257, the DTIB,c and DRIB values are given in the tables below.

Table 6.1.6.3-1: ΔTIB,c

|  |  |  |
| --- | --- | --- |
| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| DC\_21\_n79-n257 | 21 | 0 |
| n79 | 0 |
| n257 | 0 |

Table 6.1.6.3-2: ΔRIB,c

|  |  |  |
| --- | --- | --- |
| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| DC\_21\_n79-n257 | 21 | 0 |
| n79 | 0 |
| n257 | 0 |

### 6.1.6.4 REFSENS requirements

Based on co-existence studies of the fallback band combinations EN-DC of LTE + NR FR1 and EN-DC of LTE + NR FR2 there is no additional harmonic and intermodulation impact for the proposed band combinations.

6.1.7 DC\_3\_n40-n258

6.1.7.1 Operating bands for DC\_3\_n40-n258

Table 6.1.7.1-1: Band combinations EN-DC (three bands)

| EN-DC Band | E-UTRA Band | NR Band |
| --- | --- | --- |
| DC\_3\_n40-n258 | 3 | n40, n258 |

6.1.7.2 Configurations for DC\_3\_n40-n258

Table 6.1.7.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration |
| --- | --- |
| DC\_3A\_n40A-n258A | DC\_3A\_n40A-n258A |

6.1.7.3 ∆TIB and ∆RIB values

For DC\_3\_n10-n258, the ΔTIB,c and ΔRIB values are given in the tables below.

Table 6.1.7.4-2: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_3\_n40-n258 | 3 | 0.5 |
| n40 | 0.5 |
| n258 | 0 |

Table 6.1.7.4-2: ΔRIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_3\_n40-n258 | 3 | 0 |
| n40 | 0 |
| n258 | 0 |

6.1.7.4 REFSENS requirements

There are no additional MSD issue need to be specified.

## 6.2 Inter-band EN-DC with LTE 2 bands+NR 1 band(including FR2)

### 6.2.x DC\_X-Y-nZ

6.2.x.1 Operating bands for DC\_X-Y\_nZ

Table 6.2.x.1-1: Band combinations EN-DC (three bands)

| EN-DC Band | E-UTRA Band | NR Band |
| --- | --- | --- |
|  |  |  |

6.2.x.2 Configurations for DC\_X-Y\_nZ

Table 6.2.x.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration |
| --- | --- |
|  |  |

6.2.x.3 ∆TIB and ∆RIB values

6.2.x.4 REFSENS requirements

## Annex A: Change history

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2019-08 | RAN4#92 | R4-1908551 |  |  |  | TR skeleton | 0.0.1 |
| 2019-10 | RAN4#93 | R4-1913631 |  |  |  | Implemented TP´s from RAN4 #92bis:  1. TP for TR 37.716-33: DC\_66A\_n5A-n260 and DC\_66A\_n5A-n261, Qualcomm Incorporated  2., R4-1911252 TP for TR 37.716-33\_DC\_3A\_n79A-n258A,ZTE Corporation | 0.1.0 |
| 2020-04 | RAN4-94bis-e | R4-2003803 |  |  |  | Implemented TP´s from RAN4 #94-e:  1. R4-2000477 TP for TR 37.716-33: DC\_3A\_n79A-n258,ZTE Corporation  2. R4-2001124,TP for DC\_21\_n77-n257 for TR 37.716-33,NTT DOCOMO, INC  3. R4-2001125, TP for DC\_21\_n78-n257 for TR 37.716-33, NTT DOCOMO, INC  4. R4-2001126, ,TP for DC\_21\_n79-n257 for TR 37.716-33,NTT DOCOMO, INC | 0.2.0 |
| 2020-05 | RAN4-95-e | R4-2007015 |  |  |  | Implemented TP´s from RAN4 #95-e:  1. R4-2007015, TP for TR37.716-33\_ DC\_3A\_n40A-n258A, ZTE Corporation | 0.3.0 |
| 2020-06 | RAN-88-e | RP-200713 |  |  |  |  | 1.0.0 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2020-06 | RAN#88 |  |  |  |  | Approved by plenary – Rel-16 spec under change control | 16.0.0 |