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Technical Report

3rd Generation Partnership Project;

Technical Specification Group Radio Access Networks;

Dual Connectivity (DC) of x bands (x=1, 2, 3, 4) LTE inter-band CA (x DL/1 UL) and 2 bands NR Inter-band CA (2 DL/1 UL) band combinations

(Release 17)

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# Foreword

This Technical Report 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.

# 1 Scope

The present document is a technical report for Dual connectivity (DC) band combinations of LTE xDL/1UL (x=1,2,3,4) + inter-band NR 2DL/1UL under Rel-17 time frame. The purpose is to gather the relevant background information and studies in order to address DC band combinations of LTE xDL/1UL (x=1,2,3,4) + inter-band NR 2DL/1UL in Rel-17 as shown in the WID for Rel-17.



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 TR 30.007: “Guideline on WI/SI for new Operating Bands”

[3] 3GPP TS 38.101-1: “NR; User Equipment (UE) radio transmission and reception; Part 1: Range 1 Standalone”

[4] 3GPP TS 38.101-2: “NR; User Equipment (UE) radio transmission and reception; Part 2: Range 2 Standalone”

[5] 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 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 TR 21.905 [1].

## 3.2 Symbols

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

<symbol> <Explanation>

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 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 TR 21.905 [1].

# 4 Background

The present document is a technical report for DC band combinations of LTE x bands (x=1,2,3,4) inter-band CA (x DL/1UL) + inter-band NR 2 bands (2DL/1UL) under Rel-17 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 Dual Connectivity band combinations of LTE x bands DL/1UL(x=1,2,3,4) + NR 2 bands DL/1UL: General Part

## 5.1 UE RF architectures

RAN4 consider same example RF architecture which are described in section 5.1 in TR37.863-01-01. One different point is that LTE and NR modemchip can be used one chip solutions from rel-16.

To support multiple component carriers in LTE and NR, RAN4 consider specific RF components such as Diplexer, Triplexer, Quadplexer and Hexaplexer to derive self-interference problems according to the LTE x bands DL/1UL(x=1,2,3,4) + NR 2 band DL/1UL DC band combinations.

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

For the LTE x bands DL/1UL(x=1,2,3,4) + NR 2 band DL/1UL DC band combinations, RAN4 should consider to reuse agreed additional insertion losses for all DC band combinations in rel-16 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 DC band combinations.

## 5.3 Summary of self-interference analysis

Table 5.3-1 summarizes the EN- DC band combinations with self-interference problems for 3DL/2UL DC operation.

**Table 5.3-1: Summary of Self-interference analysis for LTE 1 band & NR 2 bands DL and 2 bands UL DC operation**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Downlink  band configuration** | **Uplink  DC Configuration** | **Harmonic**  **relation issues** | **intermodulation to own rx band** | **interference due to small frequency separation** | **MSD** |
| **DC\_8\_n28-n78** | **DC\_8A-n28** | 4th harmonic into n78  5th harmonic into n78 | 4th & 5th IMDs into n78 | - | - 4th harmonic problem will be solved in DC\_8A-n78A  - 5th harmonic problem will be solved in DC\_28A-n78A  - Same as DC\_8\_n28-n77A with 2UL\_DC\_8A\_n28A |
| **DC\_8A\_n78A** | **-** | 4th IMD into n28 | **-** | - Same as DC\_8\_n28-n77A with 2UL\_DC\_8A\_n77A |
| **DC\_(n)41AA-n78**  **DC\_(n)41CA-n78**  **DC\_(n)41DA-n78** | **DC\_41A\_n78A** | **-** | 4th IMD into n41 | **-** | B41 and n41 will be operated by synchronous operation. So there is no IMD problem |
| **DC\_40A\_n1-n78**  **DC\_40C\_n1-n78** | **DC\_40A\_n1A** |  | 4th IMD & 5th IMD into n78 | - | - Same as DC\_1A\_n40A-n78A with 2UL\_DC\_1A\_n40A |
| **DC\_40A\_n78A** |  | 4th IMD into n1 | **-** | - FFS |
| **DC\_3C\_n1-n78** | **DC\_3A\_n1A** | 2nd harmonic from 3 into n78 | 2nd & 4th IMDs into n78 | Yes | - Harmonic problems was already covered in DC\_3A\_n78A.  - 2nd &4th IMDs problems same as DC\_1A\_n3A-n78A.  - Small freq. gap was covered in Table 7.3.1A-0bA in TS36.101 |
| **DC\_3A\_n78A** | - | 5th IMD into n1 | - | - Same as DC\_3A\_n1A-n78A with 2UL\_DC\_3A\_n78A |
| **DC\_1\_n28-n41** | **DC\_1A\_n28A** | **-** | 2nd & 4th IMDs into n41 |  | - Same as DC\_1A-41A\_n28A with 2UL\_DC\_1A\_n28A |
| **DC\_1A\_n41A** |  | 2nd & 5th IMDs into n28 |  | - 29.3 dB by IMD2  - 4.5dB by IMD5 |
| **DC\_3\_n28-n41** | **DC\_3A\_n28A** |  | 2nd & 3rd IMDs into n41 |  | - Same as DC\_3A-41A\_n28A with 2UL\_DC\_3A\_n28A |
| **DC\_3A\_n41A** |  | 2nd & 3rd IMDs into n28 |  | - Same as DC\_3A-28A\_n41A with 2UL\_DC\_3A\_n41A |
| **DC\_28\_n1-n40** | **DC\_28A\_n1A** | - | 4th IMD into n40 | - | - Same as DC\_1A\_n28A-n40A with 2UL\_DC\_1A\_n28A |
| **DC\_28A\_n40A** | 3rd harmonic from B28 into n1 | **-** | **-** | 3rd harmonic problem was covered in lower DC or CA band combinations |
| **DC\_7\_n40-n78** | **DC\_7A\_n40A** | **-** | **-** | **-** | No issue |
| **DC\_7A\_n78A** |  | 4th IMD into n40 |  | - FFS |
| **DC\_8\_n40-n78** | **DC\_8A\_n40A** | 4th harmonic from B8 into n78 | 2nd & 3rd IMDs into n78 |  | - FFS |
| **DC\_8A\_n78A** |  | 2nd IMD into n40 |  | - FFS |
| **DC\_1\_n3-n77A**  **DC\_1\_n3-n77(2A)** | **DC\_1A\_n3A** | 2nd harmonic from B1 or n3 into n77 | 2nd & 4th IMDs into n77 | Yes | - Harmonic problems already covered in DC\_n3A-n78A.  - Same as IMD issues in DC\_1A\_n3A-n78A  - Small freq. gap was covered in Table 7.3.1A-0bA in TS36.101 |
| **DC\_1A\_n77A** | - | 2nd , 4th & 5th IMDs into n3 | - | - Same as IMD issues in DC\_1A\_n3A-n78A |
| **DC\_8\_n3-n77A**  **DC\_8\_n3-n77(2A)** | **DC\_8A\_n3A** | 2nd harmonic from n3 into n77  4th harmonic from B8 into n77 | 3rd & 5th IMDs into n77 |  | - Harmonic problems already covered in CA\_3A\_n77A and DC\_8A\_n77A  - Same as DC\_3A\_n8A-n78A with 2UL\_DC\_3A\_n8A |
| **DC\_8A\_n77A** | 2nd harmonic from B8 into n3 | 3rd IMD into n3 |  | - Same as DC\_3A-8A-n77A with 2UL\_DC\_8A\_n77A |
| **DC\_11\_n28-n77A**  **DC\_11\_n28-n77(2A)** | **DC\_11A\_n28A** | 5th harmonic from n28 into n77 | 3rd & 4th IMDs into n77 |  | - Harmonic problems already covered in CA\_n28A\_n77A  - FFS |
| **DC\_11A\_n77A** | **-** | 3rd & 4th IMDs into n28 |  | - FFS |
| **DC\_42A\_n3-n28**  **DC\_42C\_n3-n28** | **DC\_42A\_n3A**  **DC\_42C\_n3A** | **-** | - |  | - No issue |
| **DC\_42A\_n28A**  **DC\_42C\_n28A** | **-** | - |  | - No issue |
| **DC\_42A\_n3-n77A**  **DC\_42A\_n3-n77(2A)**  **DC\_42C\_n3-n77A**  **DC\_42C\_n3-n77(2A)** | **DC\_42A\_n3A**  **DC\_42C\_n3A** | 2nd harmonic from n3 into n77 | 4th & 5th IMDs into n77 |  | - Harmonic problems already covered in CA\_n3A\_n77A  - These IMD problem was not impact to n77 due to synchronous TDD operation |
| **DC\_2\_n5-n77 or**  **DC\_2A-2A\_n5A-n77A** | **DC\_2A\_n5A** | 2nd harmonic from B2 into n77  5th harmonic from n5 into n77 | 3rd & 5th IMDs into n77 |  | - Harmonic problems already covered in DC\_2A\_n77A or CA\_n5A-n77A.  - FFS |
| **DC\_2A\_n77A** | - | 5th IMD into n5 |  | - FFS |
| **DC\_13\_n2-n77** | **DC\_13A\_n2A** | 2nd harmonic from n2 into n77  5th harmonic from B13 into n77 | 3rd, 4th & 5th IMDs into n77 |  | - Harmonic problems already covered in CA\_n2A-n77A or DC\_13A\_n77A.  - FFS |
| **DC\_13A\_n77A** | **-** | 3rd IMD into n2 |  | - FFS |
| **DC\_66\_n2-n77** | **DC\_66A\_n2A** | 2nd harmonic from B66 or n2 into n77 | 2nd & 4th IMDs into n77 | **-** | - Same as DC\_2A\_n66A-n78A with 2UL\_DC\_2A\_n66A |
| **DC\_66A\_n77A** | **-** | 2nd , 4th & 5th IMDs into n2 | **-** | - Same as DC\_2A-66A\_n78A with 2UL\_DC\_66A\_n78A |
| **DC\_66\_n5-n77**  **DC\_66-66\_n5-n77** | **DC\_66A\_n5A** | 2nd harmonic from B66 into n77  4th & 5th harmonics from n5 into n77 | 3rd, 4th & 5th IMDs into n77 | **-** | - These harmonic issue already solved in DC\_66A\_n77A or DC\_5A\_n77A  - FFS |
| **DC\_66A\_n77A** | **-** |  | **-** | - No issue |
| **DC\_28\_n1-n78** | **DC\_28A\_n1A** | 5th harmonic from 28 into n78 | 3rd IMD into n78 | - | - Harmonic problems already solved in CA\_28A-n78A  - Same as DC\_1A\_n28A-n78A with 2UL\_DC\_1A\_n28A |
| **DC\_28A\_n78A** | 3rd harmonic from B28 into n1 | 3rd IMD into n1 | - | - 3rd harmonic will be covered in CA\_1A-28A  - Same as DC\_1A-28A\_n78A with 2UL\_DC\_28A\_n78A |
| **DC\_2\_n48-n66** | **DC\_2A\_n48A** | **-** | 4th IMD into n66 | **-** | - Same as DC\_2A-66A\_n48A with 2UL\_DC\_2A\_n48A |
| **DC\_2A\_n66A** | 2nd harmonic from n66 into n48 | 2nd IMD into n48 | - | - Same as DC\_2A-48A\_n66A with 2UL\_DC\_2A\_n66A |
| **DC\_48\_n25-n48** | **DC\_48A\_n25A** | - | 4th IMD into n48 |  | There was no IMD problem due to TDD n48 |
| **DC\_48\_n48-n66** | **DC\_48A\_n66A** | 2nd harmonic from n66 into n48 | 4th IMD into n48 |  | There was no IMD problem due to TDD n48 |
| **DC\_66\_n25-n48** | **DC\_66A\_n25A** | 2nd harmonic from n66 into n48 | 2nd IMD into n48 | - | - Same as DC\_2A-48A\_n66A with 2UL\_DC\_2A\_n66A |
| **DC\_66A\_n48A** | **-** | 2nd IMD into n25 | - | - Same as DC\_2A-48A\_n66A with 2UL\_DC\_48A\_n66A |
| **DC\_3\_n40-n41C** | **DC\_3A\_n40A** | 3rd harmonic from B3 into n41 | - | - | CA\_n40-n41 operation should consider synchronous operation.  So No self desense problem to 3rd NR Band |
| **DC\_3A\_n41A** | - | - | Yes | CA\_n40-n41 operation should consider synchronous operation.  So No self desense problem to 3rd NR Band  - The cross band isolation issue already covered in Table 7.3B.2.3.4-1 |
| **DC\_3\_n40-n79C** | **DC\_3A\_n40A** | 2nd harmonic form n40 into n79 | 5th IMD into n79 | - | - Same as DC\_3A\_n40A-n79A with 2UL\_DC\_3A\_n40A |
| **DC\_3A\_n79A** | **-** | 5th IMD into n40 | - | - Same as DC\_3A\_n40A-n79A with 2UL\_DC\_3A\_n79A |
| **DC\_3\_n41A-n79C**  **DC\_3\_n41C-n79A**  **DC\_3\_n41C-n79C** | **DC\_3A\_n41A** | 2nd harmonic form n41 into n79 | 2nd & 5th IMDs into n79 | Yes | - The 2nd harmonic problem will be studied in CA\_n41-n79.  - Same as DC\_3A\_n41A-n79A with 2UL\_DC\_3A\_n41A  - The cross band isolation issue already covered in Table 7.3B.2.3.4-1 |
| **DC\_3A\_n79A** | **-** | 2nd & 5th IMDs into n41 | - | - Same as DC\_3A\_n41A-n79A with 2UL\_DC\_3A\_n79A |
| **DC\_8\_n40-n41C** | **DC\_8A\_n40A** | 3rd harmonic from B8 into n41 | - | - | * Harmonic problem will be studied in DC\_8A\_n41A. * CA\_n40-n41 operation should consider synchronous operation. So No self desense problem to 3rd NR Band |
| **DC\_8A\_n41A** | - | 5th IMD into n40 | - | - CA\_n40-n41 operation should consider synchronous operation. So No self desense problem to 3rd NR Band |
| **DC\_8\_n40-n79C** | **DC\_8A\_n40A** | 2nd harmonic from n40 into n79  5th harmonic from B8 into n79 | 4th IMD into n79 | - | - These harmonic problem will be treated lower order DC or CA band combos.  - Same as DC\_8A\_n40A-n79A with 2UL\_DC\_8A\_n40A |
| **DC\_8A\_n79A** | - | 4th IMD into n40 | - | - Same as DC\_8A\_n40A-n79A with 2UL\_DC\_8A\_n79A |
| **DC\_8\_n41A-n79C**  **DC\_8\_n41C-n79A**  **DC\_8\_n41C-n79C** | **DC\_8A\_n41A** | 2nd harmonic from n41 into n79  5th harmonic from B8 into n79 | 3rd IMD into n79 | - | - These harmonic problem will be treated lower order DC or CA band combos.  - Same as DC\_8A\_n41A-n79A with 2UL\_DC\_8A\_n41A |
| **DC\_8A\_n79A** | 3rd harmonic from B8 into n41 | 3rd IMD into n41 | - | - These harmonic problem will be treated lower order DC or CA band combos.  - Same as DC\_8A\_n41A-n79A with 2UL\_DC\_8A\_n79A |
| **DC\_39\_n40-n41C** | **DC\_39A\_n40A** | - | 3rd IMD into n41 | - | - CA\_n40-n41 operation should consider synchronous operation. So No self desense problem to 3rd NR Band |
| **DC\_39A\_n41A** | - | - | - | - CA\_n40-n41 operation should consider synchronous operation. So No self desense problem to 3rd NR Band |
| **DC\_39\_n40-n79C** | **DC\_39A\_n40A** | 2nd harmonic from n40 into n79 | 4th IMD into n79 | - | - The harmonic problem will be treated CA\_n40-n79 band combos.  - Same as DC\_39A\_n40A-n79A with 2UL\_DC\_39A\_n40A |
| **DC\_39A\_n79A** | - | - | - | No issue |
| **DC\_39\_n41A-n79C**  **DC\_39\_n41C-n79A**  **DC\_39\_n41C-n79C** | **DC\_39A\_n41A** | 2nd harmonic from n41 into n79 | 2nd & 5th IMDs into n79 | - | - Over 4992MHz frequency in n79 was impacted by 2nd harmonic, but not used  - Same as DC\_39A\_n41A-n79A with 2UL\_DC\_39A\_n41A |
| **DC\_39A\_n79A** | - | 2nd & 5th IMDs into n41 | - | - Same as DC\_39A\_n41A-n79A with 2UL\_DC\_39A\_n79A |
| **DC\_13\_n5-n48** | **DC\_13A\_n48A** | - | - | - | No issue |
| **DC\_13\_n48-n66** | **DC\_13A\_n48A** | - | 3rd IMD into n66 | - | Follow 17.1dB MSD for CA\_13A-48A-66A in TS36.101 |
| **DC\_13A\_n66A** | 2nd harmonic from n66 into n48 | 5th IMD into n48 | - | - 2nd harmonic issue will be solved in CA\_n48-n66  - In rel-16 TR, define as 2.8 dB |
| **DC\_66\_n5-n48** | **DC\_66A\_n5A** | 2nd harmonic from n66 into n48 | 5th IMD into n48 | - | - 2nd harmonic issue will be solved in CA\_n48-n66  - In rel-16 TR, define as 3.3 dB |
| **DC\_66A\_n48A** | - | - | - | No issue |
| **DC\_11\_n3-n28** | **DC\_11A\_n3A** | - | 5th IMD into n28 |  | - In rel-16 TR, define as 2.5 dB |
| **DC\_11A\_n28A** | - | - | - | No issue |
| **DC\_3\_n1-n257**  **DC\_3-3\_n1-n257** | **DC\_3A\_n1A** | - | - | Yes | No issue |
| **DC\_3A\_n257A** | - | - | - | No issue |
| **DC\_7\_n1-n257**  **DC\_7-7\_n1-n257** | **DC\_7A\_n1A** | High order harmonics from B7 or n1 | - | - | No issue |
| **DC\_7A\_n257A** | - | - | - | No issue |
| **DC\_3\_n78-n258** | **DC\_3A\_n78A** | 7th & 8th harmonics from n78 into n258 | - | - | - No harmonic problems by 7th & 8th order between FR1 and FR2 |
| **DC\_3A\_n258A** | 2nd harmonic from B3 into B78 | - | - | - Harmonic problem already covered in DC\_3A\_n78A |
| **DC\_7A\_n78-n258**  **DC\_7C\_n78-n258** | **DC\_7A\_n78A**  **DC\_7C\_n78A** | 7th & 8th harmonics from n78 into n258 | - | - | - No harmonic problems by 7th & 8th order between FR1 and FR2 |
| **DC\_7A\_n258A DC\_7C\_n258A** | - | - | - | - No issue |
| **DC\_28\_n78-n258** | **DC\_28A\_n78A** | 7th & 8th harmonics from n78 into n258 | - | - | - No harmonic problems by 7th & 8th order between FR1 and FR2 |
| **DC\_28A\_n258A** | 5th harmonic from B28 into n78 | - | **-** | - Harmonic problem already covered in DC\_28A\_n78A |
| **DC\_8\_n78-n258** | **DC\_8A\_n78A** | 7th & 8th harmonics from n78 into n258 | - | - | - No harmonic problems by 7th & 8th order between FR1 and FR2 |
| **DC\_8A\_n258A** | 4th harmonic from B8 into n78 | - | **-** | - Harmonic problem already covered in DC\_8A\_n78A |
| **DC\_8\_n40-n258** | **DC\_8A\_n40A** | 11th harmonics from n40 into n258 |  |  | - No harmonic problems higher than 7th order between FR1 and FR2 |
| **DC\_8A\_n258A** | **-** | **-** | **-** | - No issue |
| **DC\_3\_n34-n258** | **DC\_3A\_n34A** | 14th & 15th harmonics from B3 into n258  12th & 13th harmonics from n34 into n258 |  |  | - No harmonic problems higher than 7th order between FR1 and FR2 |
| **DC\_3A\_n258A** | **-** | **-** | **-** | - No issue |
| **DC\_3\_n41-n258** | **DC\_3A\_n41A** | 10th harmonic from n41 into n258 |  |  | - No harmonic problems higher than 7th order between FR1 and FR2 |
| **DC\_3A\_n258A** | **-** | **-** | **-** | - No issue |
| **DC\_8\_n34-n258** | **DC\_8A\_n34A** | 12th & 13th harmonics from n34 into n258 |  |  | - No harmonic problems higher than 7th order between FR1 and FR2 |
| **DC\_8A\_n258A** | **-** | **-** | **-** | - No issue |
| **DC\_8\_n41-n258** | **DC\_8A\_n41A** | 10th harmonic from n41 into n258 |  |  | - No harmonic problems higher than 7th order between FR1 and FR2 |
| **DC\_8A\_n258A** | 3rd harmonic from B8 into n41 | - | - | - Harmonic problem already covered in DC\_8A\_n41A |
| **DC\_39\_n40-n258** | **DC\_39A\_n40A** | 11th harmonics from n40 into n258 |  |  | - No harmonic problems higher than 7th order between FR1 and FR2 |
| **DC\_39A\_n258A** | **-** | **-** | **-** | - No issue |
| **DC\_39\_n41A-n258 DC\_39\_n41C-n258** | **DC\_39A\_n41A** | 10th harmonic from n41 into n258 |  |  | - No harmonic problems higher than 7th order between FR1 and FR2 |
| **DC\_39A\_n258A** | **-** | **-** | **-** | - No issue |
| **DC\_8\_n79-n258** | **DC\_8A\_n79A** | 5th & 6th harmonic from n79 into n258 | **-** |  | - These harmonic problem will be covered in CA\_n79A\_n258A |
| **DC\_8A\_n258A** | 5th harmonic from B8 into n79 | - | - | - Harmonic problem already covered in DC\_8A\_n79A |
| **DC\_39\_n79A-n258 DC\_39\_n79C-n258** | **DC\_39A\_n79A** | 5th & 6th harmonic from n79 into n258 | **-** |  | - These harmonic problem will be covered in CA\_n79A\_n258A |
| **DC\_39A\_n258A** | **-** | **-** | **-** | - No issue |
| **DC\_40\_n41A-n258 DC\_40\_n41C-n258** | **DC\_40A\_n41A** | 10th harmonic from n41 into n258  11th harmonics from B40 into n258 |  |  | - No harmonic problems higher than 7th order between FR1 and FR2 |
| **DC\_40A\_n258A** | **-** | **-** | **-** | - No issue |
| **DC\_40\_n79A-n258 DC\_40\_n79C-n258** | **DC\_40A\_n79A** | 11th harmonics from B40 into n258  5th & 6th harmonic from n79 into n258 |  |  | - No harmonic problems higher than 7th order between FR1 and FR2  - These harmonic problem will be covered in CA\_n79A\_n258A |
| **DC\_40A\_n258A** | 2nd harmonic from B40 into n79 |  |  | - These harmonic problem will be covered in DC\_40A\_n79A |
| **DC\_41\_n79A-n258 DC\_41\_n79C-n258** | **DC\_41A\_n79A** | 10th harmonic from n41 into n258  5th & 6th harmonic from n79 into n258 |  |  | - No harmonic problems higher than 7th order between FR1 and FR2  - These harmonic problem will be covered in CA\_n79A\_n258A |
| **DC\_41A\_n258A** | 2nd harmonic from n41 into n79 |  |  | - Over 4992MHz frequency in n79 was impacted by 2nd harmonic, but not used |
| **DC\_8\_n77(2A)-n257** | **DC\_8A\_n77A** | 7th & 8th Harmonics from n77 into n257 | - | - | - No harmonic problems by 7th & 8th order between FR1 and FR2 |
| **DC\_8A\_n257D**  **DC\_8A\_n257G**  **DC\_8A\_n257H**  **DC\_8A\_n257I** | 4th harmonic from B8 into n77 | - | - | - Harmonic problem already covered in DC\_8A\_n77A |
| **DC\_11\_n77(2A)-n257** | **DC\_11A\_n77A** | 7th & 8th harmonics from n77 into n257 | - | - | No harmonic problem to n257 |
| **DC\_11A\_n257D**  **DC\_11A\_n257G**  **DC\_11A\_n257H**  **DC\_11A\_n257I** | - | - | - | No issue |
| **DC\_28\_n77(2A)-n257D** | **DC\_28A\_n77A** | 7th & 8th harmonics from n77 into n257 | - | - | No harmonic problem to n257 |
| **DC\_28A\_n257D** | 5th harmonic from B28 into n77 | - | - | 5th harmonic problem was solved in DC\_28A\_n77A |
| **DC\_2\_n7A-n66A**  **DC\_2\_n7(2A)-n66A** | **DC\_2A\_n7A** | - | - | - | No issue |
| **DC\_2A\_n66A** | - | - | - | No issue |
| **DC\_12\_n7A-n66A**  **DC\_12\_n7(2A)-n66A** | **DC\_12A\_n7A** | 3rd harmonic into n66 from B12 | - | - | The 3rd harmonic issue already covered in DC\_12A\_n66A |
| **DC\_12A\_n66A** | - | - | - | No issue |
| **DC\_2\_n66A-n78(2A)**  **DC\_2\_n66(2A)-n78A**  **DC\_2\_n66(2A)-n78(2A)** | **DC\_2A\_n66A** | 2nd harmonics into n78 from B2 and n66 | 2nd & 4th IMDs into n78 | - | The 2nd harmonic issue already covered in DC\_66A\_n78A  - Follow same as DC\_2A\_n66A-n78A in Table 7.3B.2.3.5.2-1 in TS38.101-3 |
| **DC\_2A\_n78A** | - | 4th IMD into n66 | - | - For 4th IMD problem, follow same as DC\_2A-66A\_n78A in Table 7.3B.2.3.5.2-1 in TS38.101-3 |
| **DC\_12\_n66A-n78A**  **DC\_12\_n66A-n78(2A)**  **DC\_12\_n66(2A)-n78A**  **DC\_12\_n66(2A)-n78(2A)** | **DC\_12A\_n66A** | 2nd harmonic into n78 from n66  5th harmonic into n78 from B12 | 5th IMD into n78 | - | These harmonic issues are already covered in DC\_66A\_n78A or DC\_12A\_n78A  - 4.1dB by 5th IMD in TR37.716-21-21 |
| **DC\_12A\_n78A** | 3rd harmonic into n66 from B12 | 3rd IMD into n66 | - | 3rd harmonic issue already covered in DC\_12A\_n66A  - 16.5dB by 3rd IMD in TR37.716-21-21 |
| **DC\_13\_n7-n78** | **DC\_13A\_n7A** | - | 2nd & 4th IMDs into n78 | - | - 29.0 dB by 2nd IMD already analyzed in TR37.716-21-21 |
| **DC\_13A\_n78A** |  | 2nd IMD into n7 | - | - 27.9 dB by 2nd IMD already analyzed in TR37.716-21-21 |
| **DC\_2\_n38-n66** | **DC\_2A\_n38A** | - | - | - | No issue |
| **DC\_2A\_n66A** | - | - | - | No issue |
| **DC\_66\_n38-n66** | **DC\_66A\_n38A** | - | - | - | No issue |
| **DC\_66A\_n66A** | - | - | - | DC\_66A\_n66A only allowed single UL switched mode |
| **DC\_1-3\_n3-n77**  **or DC\_1-3\_n3-n78** | **DC\_1A\_n3A** | 2nd harmonic from n3 into n77/n78 | 2nd & 4th IMDs into n77/n78 |  | - Harmonic problems was already covered in DC\_3A\_n77A.  - 2nd &4th IMDs problems same as DC\_1A\_n3A-n78A. |
| **DC\_1A\_n77A or DC\_1A\_n78A** |  | 2nd, 4th & 5th IMDs into B3 | Yes | These MSD issues are same as DC\_1A-3A\_n77A.  - Small freq. gap was covered in Table 7.3.1A-0bA in TS36.101 |
| **DC\_3A\_n3A** | 2nd harmonic from n3 into n77/n78 | 2nd & 4th IMD into n77/n78 | - | - Harmonic problems was already covered in DC\_3A\_n77A.  - Due to apply MPR, no need to define MSD |
| **DC\_3A\_n77A or DC\_3A\_n78A** | - | 2nd & 5th IMD into B1  2nd, 4th &5th IMD into n3 | - | - 31.0 dB by 2nd IMD that follow DC\_1A-3A\_n77A in TR37.863-02-01 in rel-15.  - Follow DC\_3A\_n1A-n78A for 5th IMD problem.  - MSD problems in n3 were already solved in DC\_3A\_n77A |
| **DC\_18\_n28-n77 or DC\_18\_n28-n78** | **DC\_18A\_n28A** | 4th & 5th harmonic from B18 and n28 fall into n77/n78 | 5th IMD into n77/n78 | - | - Harmonic problems was already covered in DC\_18A\_n77A or CA\_n28-n77  - FFS |
| **DC\_18A\_n77A or**  **DC\_18A\_n78A** | - | 5th IMD into n77 | - | - FFS |
| **DC\_1\_n3-n41** | **DC\_1A\_n3A** | - | 5th IMD into n41 | - | - 5.0 dB by 5th IMD that follow DC\_1A-41A\_n3A in TS38.101-3 |
| **DC\_1A\_n41A** | - | - | Yes | Small freq. gap was covered in Table 7.3.1A-0bA in TS36.101 |
| **DC\_3\_n3-n41** | **DC\_3A\_n3A** | - | - | - | No issue |
| **DC\_3A\_n41A** | - | 4th IMD into n3 | - | 4th IMD issue already covered by DC\_3\_n41 in Table 7.3B.2.3.5.1-1 in TS38.101-13 |
| **DC\_18\_n3-n41** | **DC\_18A\_n3A** | - | 2nd & 3rd IMDs into B41 | - | 3rd IMD problem already covered in DC\_18A-41A\_n3A  - FFS for 2nd IMD |
| **DC\_18A\_n41A** | - | 2nd IMD into n3 |  | - FFS |
| **DC\_1-3\_n3-n41** | **DC\_1A\_n3A** | - | 5th IMD into n41 |  | 5th IMD problem already covered in CA\_1A-3A-41A in TS36.101 |
| **DC\_1A\_n41A** | - | - | - | No issue |
| **DC\_3A\_n3A** | - | - | - | No issue |
| **DC\_3A\_n41A** | - | - | - | No issue |
| **DC\_18\_n28-n41** | **DC\_18A\_n28A** |  | 5th IMD into n41 | - | - FFS |
| **DC\_18A\_n41A** |  | 5th IMD into n28 | - | - FFS |
| **DC\_1\_n41-n77** | **DC\_1A\_n41A** | 2nd harmonic from B1 into n77 | 3rd , 4th & 5th IMDs into n77 | - | * The harmonic problem already covered in DC\_1\_n77 in TS38.101-3 * These IMDs problem follow DC\_1\_n41-n78 in TS38.101-3 |
| **DC\_1A\_n77A** | - | 4th & 5th IMDs into n41 | - | * The IMD problem follow DC\_1-41\_n77 in TS38.101-3 |
| **DC\_3\_n41-n77** | **DC\_3A\_n41A** | 2nd harmonic from B3 into n77 | 3rd & 5th IMDs into n77 | - | * The harmonic problem already covered in DC\_3\_n77 in TS38.101-3   - These IMDs problem follow DC\_3\_n41-n78 in TS38.101-3 |
| **DC\_3A\_n77A** |  | 5th IMD into n41 |  | - The IMD problem follow DC\_3-41\_n77 in TS38.101-3 |
| **DC\_18\_n41-n77 or**  **DC\_18\_n41-n78** | **DC\_18A\_n41A** | 4th harmonic from B18 into n78 | 2nd & 4th IMDs into n77/n78 | - | - FFS |
| **DC\_18A\_n77A or DC\_18A\_n78A** |  | 2nd IMD into n4177/n78  3rd IMD into n41 in DC\_18A\_n77A | - | - FFS |
| **DC\_41\_n3-n41** | **DC\_41A\_n3A** | - | 4th IMD into n41 | Yes | For TDD band, the IMD problem is not impact to the 3rd Rx band |
| **DC\_41A\_n41A** | - | - | Yes | No issue |
| **DC\_41\_n28-n41** | **DC\_41A\_n28A** | - | - | - | No issue |
| **DC\_41A\_n41A** | - | - | - | No issue |
| **DC\_41\_n41-n77 or**  **DC\_41\_n41-n78** | **DC\_41A\_n41A** | - | - | - | No issue |
| **DC\_41A\_n77A or DC\_41A\_n78A** | - | 4th IMD into n41 |  | For TDD band, the IMD problem is not impact to the 3rd Rx band |
| **DC\_(n)5AA-n77A** | **DC\_(n)5AA** | 4th & 5th harmonics from n5 into n77 | 4th & 5th IMD into n77 |  | 4th & 5th harmonic issues were covered in DC\_5A\_n77A  The 4th & 5th IMD problem will not be impacted due to only single UL switching operation. |
| **DC\_5A\_n77A** |  | 4th & 5th IMDs |  | The 4th & 5th IMD problem will be covered in DC\_5A\_n77A |
| **DC\_12\_n5-n77** | **DC\_12A\_n5A** | 4th & 5th harmonics from n5 into n77 | 5th IMD |  | The 4th & 5th IMD problem will be covered in DC\_5A\_n77A  - FFS |
| **DC\_12A\_n77A** |  | 5th IMD |  | - FFS |
| **DC\_14\_n5-n77** | **DC\_14A\_n5A** | 4th & 5th harmonics from n5 into n77 | 4th & 5th IMD |  | The 4th & 5th IMD problem will be covered in DC\_5A\_n77A  - FFS |
| **DC\_14A\_n77A** |  | 5th IMD |  | - FFS |
| **DC\_2\_n71-n78** | **DC\_2A\_n71A** | 2nd harmonic from B2 into n78  5th harmonic from n71 into n78 | 3rd IMD into n78 | - | These harmonics issues were already solved in DC\_2\_n78 or CA\_n71\_n78  - FFS |
| **DC\_2A\_n78A** | - | - | - | No issue |
| **DC\_7\_n71-n78** | **DC\_7A\_n71A** | 5th harmonic from n71 into n78 | 4th IMD into n78 | - | - The harmonic issue was already solved in CA\_n71\_n78  - FFS |
| **DC\_7A\_n78A** | - | 5th IMD into n71 | - | - FFS |
| **DC\_66\_n71-n78** | **DC\_66A\_n71A** | -2nd harmonic from B66 into n78  5th harmonic from n71 into n78 | 4th & 5th IMDs into n78 | - | Harmonic issues were already solved in DC\_66\_n78 or CA\_n71\_n78  - MSD of 4th IMD can be reused in DC\_48A-66A\_n71A in TS38.101-3 |
| **DC\_66A\_n78A** | - | - | - | No issue |
| **DC\_2\_n38-n71** | **DC\_2A\_n38A** | - | - | - | No issue |
| **DC\_2A\_n71A** | - | 2nd IMD into n38 | - | 29.2 dB of DC\_2A\_n41A-n71A can be reused in TS38.101-3 |
| **DC\_66\_n38-n71** | **DC\_66A\_n38A** | - | - | - | No issue |
| **DC\_66A\_n71A** | - | - | - | No issue |
| **DC\_2\_n38-n78** | **DC\_2A\_n38A** | 2nd harmonic from B2 | 3rd IMD into n78 |  | Harmonic issue were covered in DC\_2A\_n78A   * 14.8 dB was captured in TR37.716-21-21 in Rel-16 |
| **DC\_2A\_n78A** | - | - | - | No issue |
| **DC\_66\_n38-n78** | **DC\_66A\_n38A** | 2nd harmonic from B66 | 3rd IMD into n78 | - | Harmonic issue were covered in DC\_66A\_n78A   * 15.0 dB was captured in TR37.716-21-21 in Rel-16 |
| **DC\_66A\_n78A** | - | - | - | No issue |
| **DC\_71\_n38-n78** | **DC\_71A\_n38A** | 5th harmonic from B71 into n78 | 2nd & 4th IMDs into n78 |  | Harmonic issue were covered in DC\_71A\_n78A  - FFS |
| **DC\_71A\_n78A** |  | 2nd IMD into n38 |  | - FFS |
| **DC\_5\_n66-n78** | **DC\_5A\_n66A** | -2nd harmonic from B66 into n78  4th harmonic from B5 into n78 | 3rd & 5th IMDs into n78 |  | Harmonic issue were covered in DC\_66A\_n78A or DC\_5A\_n78A  - Same MSD levels can be reused in DC\_66\_n5-n77 in this TR |
| **DC\_5A\_n78A** | - | 3rd IMD into n66 |  | 13.2 dB by DC\_5A-66A\_n78A can be reused in TS38.101-3 |
| **DC\_71\_n66-n78** | **DC\_71A\_n66A** | -2nd harmonic from n66 into n78  5th harmonic from B71 into n78 | 4th & 5th IMDs into n78 | - | Harmonic issues were already solved in DC\_2\_n78 or CA\_n71\_n78  - MSD of 4th IMD can be reused in DC\_48A-66A\_n71A in TS38.101-3 |
| **DC\_71A\_n78A** |  | 3rd IMD into n66 | - | - FFS |
| **DC\_5\_n38-n66** | **DC\_5A\_n38A** | - | - | - | No issue |
| **DC\_5A\_n66A** |  | 2nd & 3rd IMD into n38 |  | - FFS |
| **DC\_71\_n38-n66** | **DC\_71A\_n38A** | - | - | - | No issue |
| **DC\_71A\_n66A** | - | - | - | No issue |
| **DC\_2\_n2-n38 or DC\_2\_n2-n41** | **DC\_2A\_n2A** | - | - | - | DC\_2A\_n2A only allowed single UL switched mode |
| **DC\_2A\_n38A or DC\_2A\_n41A** | - | - | - | No issue |
| **DC\_66\_n2-n38** | **DC\_66A\_n2A** | - | - | - | No issue |
| **DC\_66A\_n38A** | - | - | - | No issue |
| **DC\_12\_n2-n38 or**  **DC\_12\_n2-n41** | **DC\_12A\_n2A** |  | 2nd IMD into n38/n41 | - | - FFS |
| **DC\_12A\_n38A or**  **DC\_12A\_n41A** | - | - | - | No issue |
| **DC\_71\_n2-n41** | **DC\_71A\_n2A** | 4th harmonic from B71 into n41 | 2nd IMD into n41 | - | Harmonic issue already covered in DC\_71\_n41  - 29.2dB MSD by DC\_2A\_n41A-n71A can be reused in TS38.101-3 |
| **DC\_71A\_n41A** | 3rd harmonic from B71 into n2 | 2nd IMD into n2 |  | Harmonic issue already covered in DC\_71\_n2  - 26.0dB MSD by DC\_2A-71A\_n38A can be reused in TS38.101-3 |
| **DC\_2\_n2-n78** | **DC\_2A\_n2A** | 2nd harmonic from B2 into n78 | 2nd & 4th IMDs into n78 |  | DC\_2A\_n2A only allowed single UL switched mode. |
| **DC\_2A\_n78A** |  | 2nd,4th & 5th IMDs into n2 |  | The IMD problem already solved in DC\_2A\_n78A in TS38.101-3 |
| **DC\_7\_n2-n78** | **DC\_7A\_n2A** | 2nd harmonic from n2 into n78 | 5th IMD into n78 |  | Harmonic issue already covered in DC\_2\_n78  4.2dB MSD of DC\_2A\_n7A-n78A can be reused in TS38.101-3 |
| **DC\_7A\_n78A** | - | 4th IMD into n2 |  | 8.6dB MSD of DC\_2A-7A\_n78A can be reused in TS38.101-3 |
| **DC\_71\_n2-n78** | **DC\_71A\_n2A** | 2nd harmonic from n2 into n78  5th harmonic from B71 into n78 | 3rd IMD into n78 |  | Harmonic issue already covered in DC\_2\_n78 or DC\_71\_n78  - 3rd IMD can be reused in DC\_2\_n71-n78 in this TR |
| **DC\_71A\_n78A** | 3rd harmonic from B71 into n2 | 3rd IMD into n2 |  | Harmonic issue already covered in DC\_71\_n2  - 16.5dB MSD of DC\_2A-71A\_n78A can be reused in TS38.101-3 |
| **DC\_2\_n66-n71** | **DC\_2A\_n66A** | - | - | - | No issue |
| **DC\_2A\_n71A** | - | - | - | No issue |
| **DC\_7\_n66-n71** | **DC\_7A\_n66A** | - | - | - | No issue |
| **DC\_7A\_n71A** | - | - | - | No issue |
| **DC\_66\_n66-n71** | **DC\_66A\_n66A** | - | - | - | DC\_66A\_n66A only allowed single UL switched mode |
| **DC\_66A\_n71A** |  | 4th IMD into n66 |  | 5.0dB MSD for DC\_66A\_n71A can be reused in TS38.101-3 |
| **DC\_2\_n2-n71** | **DC\_2A\_n2A** | - | - | - | DC\_2A\_n2A only allowed single UL switched mode |
| **DC\_2A\_n71A** | 3rd harmonic from n71 into B2 | - | - | Harmonic issue already covered in DC\_2\_n71 |
| **DC\_7\_n2-n71** | **DC\_7A\_n2A** |  | 2nd & 5th IMDs into n71 |  | 28.7dB MSD for DC\_2A\_n41A-n71A can be reused in TS38.101-3 |
| **DC\_7A\_n71A** | 3rd harmonic from n71 into n2 | - | - | Harmonic issue already covered in DC\_2\_n71 |
| **DC\_66\_n2-n71** | **DC\_66A\_n2A** | - | - | - | No issue |
| **DC\_66A\_n71A** | 3rd harmonic from n71 into n2 | - | - | Harmonic issue already covered in DC\_2\_n71 |
| **DC\_2\_n2-n66** | **DC\_2A\_n2A** | - | - | - | DC\_2A\_n2A only allowed single UL switched mode |
| **DC\_2A\_n66A** |  | 3rd & 5th IMDs into n2 |  | 20.0dB MSD of DC\_2A\_n66A can be reused in TS38.101-3 |
| **DC\_7\_n2-n66** | **DC\_7A\_n2A** | - | - | - | No issue |
| **DC\_7A\_n66A** | - | - | - | No issue |
| **DC\_66\_n2-n66** | **DC\_66A\_n2A** |  | 5th IMD into n66 |  | 4.0dB MSD of DC\_2A\_n66A can be reused in TS38.101-3 |
| **DC\_66A\_n66A** | - | - | - | DC\_66A\_n66A only allowed single UL switched mode |
| **DC\_71\_n2-n66** | **DC\_71A\_n2A** | - | - | - | No issue |
| **DC\_71A\_n66A** | 3rd harmonic from B71 into n2 | - | - | Harmonic issue already covered in DC\_2\_n71 |
| **DC\_2\_n66-n77 or**  **DC\_2-2\_n66-n77** | **DC\_2A\_n77A** | - | 2nd , 4th & 5th IMDs into n66 | - | - FFS for 2nd IMD  - 10.3 dB MSD by 4th IMD in DC\_2A-66A\_n78A can be reused in Table 7.3B.2.3.5.2-1 in TS38.101-3 |
| **DC\_13\_n66-n77** | **DC\_13A\_n77A** |  | 3rd IMD into n66 |  | - 17.1dB MSD for DC\_13-66A\_n48A can be reused in TS38.101-3 |
| **DC\_13A\_n66A** | 2nd harmonic from n66 into n77  5th harmonic from B13 into n77 | 3rd, 4th & 5th IMDs into n77 | - | -Harmonic issue will be solved in CA\_n66-n77 or DC\_13\_n77  - FFS |
| **DC\_66\_n66-n77** | **DC\_66A\_n77A** | - | 2nd & 5th IMDs into B66 | - | - These IMDs problems already covered in DC\_66A\_n77A |
| **DC\_11\_n3-n77 or**  **DC\_11\_n3-n77(2A)** | **DC\_11A\_n3A** | 2nd harmonic from n3 into n77 | 4th & 5th IMDs into n77 | - | Harmonic issues already solved in DC\_3\_n77  - FFS |
| **DC\_11A\_n77A** |  | 2nd & 5th IMDs into n3 |  | - FFS |

For the high order xDL/2UL (x=4,5,6) DC combinations, the self-interference problems will be covered in 3DL/2UL or lower order DC operation. Hence, RAN4 do not make summary tables for high order xDL/2UL DC band combinations.

Based on these assumptions, we proposed the MSD test configuration and required MSD levels by self-interference as below.

**Table 5.3-2: Proposed MSD levels and MSD test configuration for 3DL/2UL DC UE**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc (MHz) | UL BW (MHz) | UL  RB # | DL Fc (MHz) | DL BW (MHz) | CF (dB) | MSD (dB) | |
| DC\_XA\_nYA-nZA | X | IMD order | |fBX -fnY| |  |  |  |  |  |  | **N/A** |
| nY |  |  |  |  |  |
| nZ |  |  |  |  |  | **x.x dB** |

# 6 Dual Connectivity band combinations of LTE 1 band DL/1UL + NR 2 bands DL/1UL: Specific Band Combination Part

## 6.1 DC\_3\_n1-n257, DC\_3-3\_n1-n257

### 6.1.1 Operating bands for DC

**Table 6.1.1-1: DC band combination of one LTE band + inter-band NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_3\_n1-n257  DC\_3-3\_n1-n257 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz |
| n257 | 26500 MHz | – | 29500 MHz | 26500 MHz | – | 29500 MHz | TDD |

### 6.1.2 Channel bandwidths per operating band for DC

**Table 6.1.2-1: Supported bandwidths per DC one LTE band + inter-band NR 2DL/1UL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **Channel bandwidth set** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A\_n1A-n257D  DC\_3A\_n1A-n257E  DC\_3A\_n1A-n257F  DC\_3A\_n1A-n257G  DC\_3A\_n1A-n257H  DC\_3A\_n1A-n257I  DC\_3A\_n1A-n257J  DC\_3A\_n1A-n257K  DC\_3A\_n1A-n257L  DC\_3A\_n1A-n257M | DC\_3A\_n1A  DC\_3A\_n257A | 3 | -- | 440  640  840  240  340  440  540  640  740  840 |
| n1 | See CA\_n1A-n257D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n257 |
| DC\_3A-3A\_n1A-n257D  DC\_3A-3A\_n1A-n257E  DC\_3A-3A\_n1A-n257F  DC\_3A-3A\_n1A-n257G  DC\_3A-3A\_n1A-n257H  DC\_3A-3A\_n1A-n257I  DC\_3A-3A\_n1A-n257J  DC\_3A-3A\_n1A-n257K  DC\_3A-3A\_n1A-n257L  DC\_3A-3A\_n1A-n257M | DC\_3A\_n1A  DC\_3A\_n257A | 3 | See CA\_3A-3A in TS 36.101 | 460  660  860  260  360  460  560  660  760  860 |
| n1 | See CA\_n1A-n257D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n257 |

### 6.1.3 Co-existence studies

Based on co-existence studies of DC\_3A\_n1A and DC\_3A\_n257A specified in TR 37.716-11-11, TR 37.863-01-01, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 6.1.4 ∆TIB and ∆RIB values

For DC\_3\_n1-n257, DC\_3-3\_n1-n257, ΔTIB,c and ΔRIB,c values are already mentioned in 37.716-21-21 under the same band combinations with n257A.

### 6.1.5 MSD

No additional MSD requirement is needed.

## 6.2 DC\_7\_n1-n257, DC\_7-7\_n1-n257

### 6.2.1 Operating bands for DC

**Table 6.2.1-1: DC band combination of one LTE band + inter-band NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_7\_n1-n257  DC\_7-7\_n1-n257 | 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz |
| n257 | 26500 MHz | – | 29500 MHz | 26500 MHz | – | 29500 MHz | TDD |

### 6.2.2 Channel bandwidths per operating band for DC

**Table 6.2.2-1: Supported bandwidths per DC one LTE band + inter-band NR 2DL/1UL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **Channel bandwidth set** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_7A\_n1A-n257D  DC\_7A\_n1A-n257E  DC\_7A\_n1A-n257F  DC\_7A\_n1A-n257G  DC\_7A\_n1A-n257H  DC\_7A\_n1A-n257I  DC\_7A\_n1A-n257J  DC\_7A\_n1A-n257K  DC\_7A\_n1A-n257L  DC\_7A\_n1A-n257M | DC\_7A\_n1A  DC\_7A\_n257A | 7 | -- | 440  640  840  240  340  440  540  640  740  840 |
| n1 | See CA\_n1A-n257D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n257 |
| DC\_7A-7A\_n1A-n257D  DC\_7A-7A\_n1A-n257E  DC\_7A-7A\_n1A-n257F  DC\_7A-7A\_n1A-n257G  DC\_7A-7A\_n1A-n257H  DC\_7A-7A\_n1A-n257I  DC\_7A-7A\_n1A-n257J  DC\_7A-7A\_n1A-n257K  DC\_7A-7A\_n1A-n257L  DC\_7A-7A\_n1A-n257M | DC\_7A\_n1A  DC\_7A\_n257A | 3 | See CA\_7A-7A in TS 36.101 | 460  660  860  260  360  460  560  660  760  860 |
| n1 | See CA\_n1A-n257D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n257 |

### 6.2.3 Co-existence studies

Based on co-existence studies of DC\_7A\_n1A and DC\_7A\_n257A specified in TR 37.716-11-11, TR 37.863-01-01, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 6.2.4 ∆TIB and ∆RIB values

For DC\_7\_n1-n257, DC\_7-7\_n1-n257, ΔTIB,c and ΔRIB,c values are already mentioned in 37.716-21-21 under the same band combinations with n257A.

### 6.2.5 MSD

No additional MSD requirement is needed.

## 6.3 DC\_11\_n3-n28

### 6.3.1 Operating bands for DC

Table 6.3.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_11\_n3-n28 | 11 | 1427.9 MHz | – | 1447.9 MHz | 1475.9 MHz | – | 1495.9 MHz | FDD |
| n3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |

### 6.3.2 Channel bandwidths per operating band for DC

Table 6.3.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **80** | **90** | **100** | **Maximum aggregated bandwidth For DL**  **[MHz]** |
| DC\_11A\_n3A-n28A | DC\_11A\_n3A  DC\_11A\_n28A | 11 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  | 50 |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |

### 6.3.3 Co-existence studies

Based on the co-existence studies of DC\_11A-n3A and DC\_11A-n28A captured in TR 37.716-11-11, 5th order IMD generated by dual uplink of Band 11 + Band n3 may also fall into own Rx of band n28.

### 6.3.4 ∆TIB and ∆RIB values

For DC\_11\_n3-n28, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 6.3.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_11\_n3-n28 | 11 | 0.8 |
| n3 | 0.9 |
| n28 | 0.6 |

Table 6.3.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_11\_n3-n28 | 11 | 0.3 |
| n3 | 0.5 |
| n28 | 0.2 |

### 6.3.5 MSD

As mentioned in 6.3.3, IMD5 of B11 and n3 to Band n28 Rx need to be addressed for REFSENS relaxation. Based on the relaxation value of CA\_3-21-28, The following value is proposed:

Table 6.3.5-1: Reference sensitivity exceptions due to dual uplink operation for EN-DC in NR FR1 (three bands)

| NR or E-UTRA Band / Channel bandwidth / NRB / MSD | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **EN-DC Configuration** | **EUTRA/NR band** | **UL Fc  (MHz)** | **UL/DL BW  (MHz)** | **UL**  **LCRB** | **DL Fc (MHz)** | **MSD  (dB)** | **Duplex mode** | **IMD order** |
| DC\_11A-n3A\_n28A | 11 | 1435 | 5 | 25 | 1483 | N/A | FDD | N/A |
| n3 | 1753 | 5 | 25 | 1848 | N/A | TDD | N/A |
| n28 | 745 | 5 | 25 | 800 | 3.0 | FDD | IMD5 |

6.4 DC\_1\_n28-n41

6.4.1 Operating bands for DC

**Table 6.4.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_1A\_n28A-n41A | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n41 | 2496 MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |

6.4.2 Channel bandwidths per operating band for DC

**Table 6.4.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_1A\_n28A-n41A | DC\_1A\_n28A  DC\_1A\_n41A | 1 | | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 150 |
| n28 | | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n41 | | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |

6.4.3 Co-existence studies

The 2nd and 3rd order harmonics and 2nd, 3rd, 4th and 5th order intermodulation products for the UE coexistence analysis of DC\_1A\_n28A-n41A with dual uplink on DC\_1A\_n28A and DC\_1A\_n41A were calculated and listed in Table 6.4.3-1 and 6.4.3-2 respectively.

**Table 6.4.3-1: Harmonic and IMD analysis for DC\_1\_n28-n41 with UL on DC\_1\_n28**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **UE UL carriers** | **fx\_low** | **fx\_high** | **fy\_low** | **fy\_high** |
| UL frequency (MHz) | 1920 | 1980 | 703 | 748 |
| 2nd harmonics frequency limits | 2\*fx\_low | 2\*fx\_high | 2\* fy\_low | 2\* fy\_high |
| 2nd harmonics frequency limits (MHz) | 3840 | 3960 | 1406 | 1496 |
| 3rd harmonics frequency limits | 3\*fx\_low | 3\*fx\_high | 3\* fy\_low | 3\* fy\_high |
| 3rd harmonics frequency limits (MHz) | 5760 | 5940 | 2109 | 2244 |
| Two tone 2nd order IMD products | |fy\_low – fx\_high| | |fy\_high – fx\_low| | |fy\_low + fx\_low| | |fy\_high + fx\_high| |
| IMD frequency limits (MHz) | 1172 | 1277 | 2623 | 2728 |
| Two-tone 3rd order IMD products | |2\*fx\_low – fy\_high| | |2\*fx\_high – fy\_low| | |2\*fy\_low – fx\_high| | |2\*fy\_high – fx\_low| |
| IMD frequency limits (MHz) | 3092 | 3257 | 424 | 574 |
| Two-tone 3rd order IMD products | |2\*fx\_low + fy\_low| | |2\*fx\_high + fy\_high| | |2\*fy\_low + fx\_low| | |2\*fy\_high + fx\_high| |
| IMD frequency limits (MHz) | 4543 | 4708 | 3326 | 3476 |
| Two-tone 4th order IMD products | |3\*fx\_low – fy\_high| | |3\*fx\_high – fy\_low| | |3\*fy\_low – fx\_high| | |3\*fy\_high – fx\_low| |
| IMD frequency limits (MHz) | 5012 | 5237 | 129 | 324 |
| Two-tone 4th order IMD products | |3\*fx\_low + fy\_low| | |3\*fx\_high + fy\_high| | |3\*fy\_low + fx\_low| | |3\*fy\_high + fx\_high| |
| IMD frequency limits (MHz) | 6463 | 6688 | 4029 | 4224 |
| Two-tone 4th order IMD products | |2\*fx\_low – 2\*fy\_high| | |2\*fx\_high – 2\*fy\_low| | |2\*fx\_low + 2\*fy\_low| | |2\*fx\_high + 2\*fy\_high| |
| IMD frequency limits (MHz) | 2344 | 2554 | 5246 | 5456 |
| Two-tone 5th order IMD products | |fx\_low – 4\*fy\_high| | |fx\_high – 4\*fy\_low| | |fy\_low – 4\*fx\_high| | |fy\_high – 4\*fx\_low| |
| IMD frequency limits (MHz) | 832 | 1072 | 6932 | 7217 |
| Two-tone 5th order IMD products | |fx\_low + 4\*fy\_low| | |fx\_high + 4\*fy\_high| | |fy\_low + 4\*fx\_low| | |fy\_high + 4\*fx\_high| |
| IMD frequency limits (MHz) | 4732 | 4972 | 8383 | 8668 |
| Two-tone 5th order IMD products | |2\*fx\_low – 3\*fy\_high| | |2\*fx\_high – 3\*fy\_low| | |2\*fy\_low – 3\*fx\_high| | |2\*fy\_high – 3\*fx\_low| |
| IMD frequency limits (MHz) | 1596 | 1851 | 4264 | 4534 |
| Two-tone 5th order IMD products | |2\*fx\_low + 3\*fy\_low| | |2\*fx\_high + 3\*fy\_high| | |2\*fy\_low + 3\*fx\_low| | |2\*fy\_high + 3\*fx\_high| |
| IMD frequency limits (MHz) | 5949 | 6204 | 7166 | 7436 |

**Table 6.4.3-2: Harmonic and IMD analysis for DC\_1\_n28-n41 with UL on DC\_1\_n41**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **UE UL carriers** | **fx\_low** | **fx\_high** | **fy\_low** | **fy\_high** |
| UL frequency (MHz) | 1920 | 1980 | 2496 | 2690 |
| 2nd harmonics frequency limits | 2\*fx\_low | 2\*fx\_high | 2\* fy\_low | 2\* fy\_high |
| 2nd harmonics frequency limits (MHz) | 3840 | 3960 | 4992 | 5380 |
| 3rd harmonics frequency limits | 3\*fx\_low | 3\*fx\_high | 3\* fy\_low | 3\* fy\_high |
| 3rd harmonics frequency limits (MHz) | 5760 | 5940 | 7488 | 8070 |
| Two tone 2nd order IMD products | |fy\_low – fx\_high| | |fy\_high – fx\_low| | |fy\_low + fx\_low| | |fy\_high + fx\_high| |
| IMD frequency limits (MHz) | 516 | 770 | 4416 | 4670 |
| Two-tone 3rd order IMD products | |2\*fx\_low – fy\_high| | |2\*fx\_high – fy\_low| | |2\*fy\_low – fx\_high| | |2\*fy\_high – fx\_low| |
| IMD frequency limits (MHz) | 1150 | 1464 | 3012 | 3460 |
| Two-tone 3rd order IMD products | |2\*fx\_low + fy\_low| | |2\*fx\_high + fy\_high| | |2\*fy\_low + fx\_low| | |2\*fy\_high + fx\_high| |
| IMD frequency limits (MHz) | 6336 | 6650 | 6912 | 7360 |
| Two-tone 4th order IMD products | |3\*fx\_low – fy\_high| | |3\*fx\_high – fy\_low| | |3\*fy\_low – fx\_high| | |3\*fy\_high – fx\_low| |
| IMD frequency limits (MHz) | 3070 | 3444 | 5508 | 6150 |
| Two-tone 4th order IMD products | |3\*fx\_low + fy\_low| | |3\*fx\_high + fy\_high| | |3\*fy\_low + fx\_low| | |3\*fy\_high + fx\_high| |
| IMD frequency limits (MHz) | 8256 | 8630 | 9408 | 10050 |
| Two-tone 4th order IMD products | |2\*fx\_low – 2\*fy\_high| | |2\*fx\_high – 2\*fy\_low| | |2\*fx\_low + 2\*fy\_low| | |2\*fx\_high + 2\*fy\_high| |
| IMD frequency limits (MHz) | 1032 | 1540 | 8832 | 9340 |
| Two-tone 5th order IMD products | |fx\_low – 4\*fy\_high| | |fx\_high – 4\*fy\_low| | |fy\_low – 4\*fx\_high| | |fy\_high – 4\*fx\_low| |
| IMD frequency limits (MHz) | 8004 | 8840 | 4990 | 5424 |
| Two-tone 5th order IMD products | |fx\_low + 4\*fy\_low| | |fx\_high + 4\*fy\_high| | |fy\_low + 4\*fx\_low| | |fy\_high + 4\*fx\_high| |
| IMD frequency limits (MHz) | 11904 | 12740 | 10176 | 10610 |
| Two-tone 5th order IMD products | |2\*fx\_low – 3\*fy\_high| | |2\*fx\_high – 3\*fy\_low| | |2\*fy\_low – 3\*fx\_high| | |2\*fy\_high – 3\*fx\_low| |
| IMD frequency limits (MHz) | 3528 | 4230 | 380 | 948 |
| Two-tone 5th order IMD products | |2\*fx\_low + 3\*fy\_low| | |2\*fx\_high + 3\*fy\_high| | |2\*fy\_low + 3\*fx\_low| | |2\*fy\_high + 3\*fx\_high| |
| IMD frequency limits (MHz) | 11328 | 12030 | 10752 | 11320 |

Based on Table 6.4.3-1 and Table 6.4.3-2:

- 2nd and 4th order IMD generated by dual uplink of Band 1 + Band n28 may also fall into own Rx of band n41, it could reuse the MSD value of DC\_1A-41A\_n28A

- 2nd and 5th order IMD generated by dual uplink of Band 1 + Band n41 may also fall into own Rx of band n28.

6.4.4 ∆TIB and ∆RIB values

For DC\_1A\_n28A-n41A, the ΔTIB,c and ΔRIB,c values can reuse the values of DC\_1A-41A\_n28A as given in the tables below.

**Table 6.4.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1\_n28-n41 | 1 | 0.5 |
| n28 | 0.5 |
| n41 | 0.5 |

**Table 6.4.4-2:** **ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1\_n28-n41 | 1 | 0 |
| n28 | 0.2 |
| n41 | 0 |

6.4.5 MSD

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table 6.4.5-1 shows the required MSD:**Table 6.4.5-1: MSD exception for Scell due to dual uplink operation for EN-DC\_1A\_n28A-n41ADC bands** | **UL DC** | **IMD** | | **UL Fc (MHz)** | **UL BW (MHz)** | **UL**  **RB #** | **DL Fc (MHz)** | **MSD (dB)** |
| DC\_1A\_n28A-n41A | 1 | IMD2 | |fB1+fBn28| | 1935 | 5 | 25 | 2125 | **N/A** |
| n28 | 718 | 5 | 25 | 773 | **N/A** |
| n41 | 2653 | 10 | 50 | 2653 | **30.1** |
| 1 | IMD2 | |fBn41 -fB1| | 1923 | 5 | 25 | 2113 | **N/A** |
| n41 | 2685 | 10 | 50 | 2685 |
| n28 | 707 | 5 | 25 | 762 | **29.3** |
| 1 | IMD5 | |2\*fBn41 -3\*fB1| | 1935 | 5 | 25 | 2125 | **N/A** |
| n41 | 2510 | 10 | 50 | 2510 |
| n28 | 730 | 10 | 50 | 785 | **4.5** |
| **NOTE 1: This band is subject to IMD4 also which MSD is not specified** | | | | | | | | |

6.5 DC\_3\_n28-n41

6.5.1 Operating bands for DC

**Table 6.5.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3A\_n28A-n41A | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n41 | 2496 MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |

6.5.2 Channel bandwidths per operating band for DC

**Table 6.5.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A\_n28A-n41A | DC\_3A\_n28A  DC\_3A\_n41A | 3 | | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 150 |
| n28 | | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n41 | | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |

6.5.3 Co-existence studies

The 2nd and 3rd order harmonics and 2nd, 3rd, 4th and 5th order intermodulation products for the UE coexistence analysis of DC\_3A\_n28A-n41A with dual uplink on DC\_3A\_n28A and DC\_3A\_n41A were calculated and listed in Table 6.5.3-1 and 6.5.3-2 respectively.

**Table 6.5.3-1: Harmonic and IMD analysis for DC\_3\_n28-n41 with UL on DC\_3\_n28**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **UE UL carriers** | **fx\_low** | **fx\_high** | **fy\_low** | **fy\_high** |
| UL frequency (MHz) | 1710 | 1785 | 703 | 748 |
| 2nd harmonics frequency limits | 2\*fx\_low | 2\*fx\_high | 2\* fy\_low | 2\* fy\_high |
| 2nd harmonics frequency limits (MHz) | 3420 | 3570 | 1406 | 1496 |
| 3rd harmonics frequency limits | 3\*fx\_low | 3\*fx\_high | 3\* fy\_low | 3\* fy\_high |
| 3rd harmonics frequency limits (MHz) | 5130 | 5355 | 2109 | 2244 |
| Two tone 2nd order IMD products | |fy\_low – fx\_high| | |fy\_high – fx\_low| | |fy\_low + fx\_low| | |fy\_high + fx\_high| |
| IMD frequency limits (MHz) | 962 | 1082 | 2413 | 2533 |
| Two-tone 3rd order IMD products | |2\*fx\_low – fy\_high| | |2\*fx\_high – fy\_low| | |2\*fy\_low – fx\_high| | |2\*fy\_high – fx\_low| |
| IMD frequency limits (MHz) | 2672 | 2867 | 214 | 379 |
| Two-tone 3rd order IMD products | |2\*fx\_low + fy\_low| | |2\*fx\_high + fy\_high| | |2\*fy\_low + fx\_low| | |2\*fy\_high + fx\_high| |
| IMD frequency limits (MHz) | 4123 | 4318 | 3116 | 3281 |
| Two-tone 4th order IMD products | |3\*fx\_low – fy\_high| | |3\*fx\_high – fy\_low| | |3\*fy\_low – fx\_high| | |3\*fy\_high – fx\_low| |
| IMD frequency limits (MHz) | 4382 | 4652 | 324 | 534 |
| Two-tone 4th order IMD products | |3\*fx\_low + fy\_low| | |3\*fx\_high + fy\_high| | |3\*fy\_low + fx\_low| | |3\*fy\_high + fx\_high| |
| IMD frequency limits (MHz) | 5833 | 6103 | 3819 | 4029 |
| Two-tone 4th order IMD products | |2\*fx\_low – 2\*fy\_high| | |2\*fx\_high – 2\*fy\_low| | |2\*fx\_low + 2\*fy\_low| | |2\*fx\_high + 2\*fy\_high| |
| IMD frequency limits (MHz) | 1924 | 2164 | 4826 | 5066 |
| Two-tone 5th order IMD products | |fx\_low – 4\*fy\_high| | |fx\_high – 4\*fy\_low| | |fy\_low – 4\*fx\_high| | |fy\_high – 4\*fx\_low| |
| IMD frequency limits (MHz) | 1027 | 1282 | 6092 | 6437 |
| Two-tone 5th order IMD products | |fx\_low + 4\*fy\_low| | |fx\_high + 4\*fy\_high| | |fy\_low + 4\*fx\_low| | |fy\_high + 4\*fx\_high| |
| IMD frequency limits (MHz) | 4522 | 4777 | 7543 | 7888 |
| Two-tone 5th order IMD products | |2\*fx\_low – 3\*fy\_high| | |2\*fx\_high – 3\*fy\_low| | |2\*fy\_low – 3\*fx\_high| | |2\*fy\_high – 3\*fx\_low| |
| IMD frequency limits (MHz) | 1176 | 1461 | 3634 | 3949 |
| Two-tone 5th order IMD products | |2\*fx\_low + 3\*fy\_low| | |2\*fx\_high + 3\*fy\_high| | |2\*fy\_low + 3\*fx\_low| | |2\*fy\_high + 3\*fx\_high| |
| IMD frequency limits (MHz) | 5529 | 5814 | 6536 | 6851 |

**Table 6.5.3-2: Harmonic and IMD analysis for DC\_3\_n28-n41 with UL on DC\_3\_n41**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **UE UL carriers** | **fx\_low** | **fx\_high** | **fy\_low** | **fy\_high** |
| UL frequency (MHz) | 1710 | 1785 | 2496 | 2690 |
| 2nd harmonics frequency limits | 2\*fx\_low | 2\*fx\_high | 2\* fy\_low | 2\* fy\_high |
| 2nd harmonics frequency limits (MHz) | 3420 | 3570 | 4992 | 5380 |
| 3rd harmonics frequency limits | 3\*fx\_low | 3\*fx\_high | 3\* fy\_low | 3\* fy\_high |
| 3rd harmonics frequency limits (MHz) | 5130 | 5355 | 7488 | 8070 |
| Two tone 2nd order IMD products | |fy\_low – fx\_high| | |fy\_high – fx\_low| | |fy\_low + fx\_low| | |fy\_high + fx\_high| |
| IMD frequency limits (MHz) | 711 | 980 | 4206 | 4475 |
| Two-tone 3rd order IMD products | |2\*fx\_low – fy\_high| | |2\*fx\_high – fy\_low| | |2\*fy\_low – fx\_high| | |2\*fy\_high – fx\_low| |
| IMD frequency limits (MHz) | 730 | 1074 | 3207 | 3670 |
| Two-tone 3rd order IMD products | |2\*fx\_low + fy\_low| | |2\*fx\_high + fy\_high| | |2\*fy\_low + fx\_low| | |2\*fy\_high + fx\_high| |
| IMD frequency limits (MHz) | 5916 | 6260 | 6702 | 7165 |
| Two-tone 4th order IMD products | |3\*fx\_low – fy\_high| | |3\*fx\_high – fy\_low| | |3\*fy\_low – fx\_high| | |3\*fy\_high – fx\_low| |
| IMD frequency limits (MHz) | 2440 | 2859 | 5703 | 6360 |
| Two-tone 4th order IMD products | |3\*fx\_low + fy\_low| | |3\*fx\_high + fy\_high| | |3\*fy\_low + fx\_low| | |3\*fy\_high + fx\_high| |
| IMD frequency limits (MHz) | 7626 | 8045 | 9198 | 9855 |
| Two-tone 4th order IMD products | |2\*fx\_low – 2\*fy\_high| | |2\*fx\_high – 2\*fy\_low| | |2\*fx\_low + 2\*fy\_low| | |2\*fx\_high + 2\*fy\_high| |
| IMD frequency limits (MHz) | 1422 | 1960 | 8412 | 8950 |
| Two-tone 5th order IMD products | |fx\_low – 4\*fy\_high| | |fx\_high – 4\*fy\_low| | |fy\_low – 4\*fx\_high| | |fy\_high – 4\*fx\_low| |
| IMD frequency limits (MHz) | 8199 | 9050 | 4150 | 4644 |
| Two-tone 5th order IMD products | |fx\_low + 4\*fy\_low| | |fx\_high + 4\*fy\_high| | |fy\_low + 4\*fx\_low| | |fy\_high + 4\*fx\_high| |
| IMD frequency limits (MHz) | 11694 | 12545 | 9336 | 9830 |
| Two-tone 5th order IMD products | |2\*fx\_low – 3\*fy\_high| | |2\*fx\_high – 3\*fy\_low| | |2\*fy\_low – 3\*fx\_high| | |2\*fy\_high – 3\*fx\_low| |
| IMD frequency limits (MHz) | 3918 | 4650 | 250 | 363 |
| Two-tone 5th order IMD products | |2\*fx\_low + 3\*fy\_low| | |2\*fx\_high + 3\*fy\_high| | |2\*fy\_low + 3\*fx\_low| | |2\*fy\_high + 3\*fx\_high| |
| IMD frequency limits (MHz) | 10908 | 11640 | 10122 | 10735 |

Based on Table 6.5.3-1 and Table 6.5.3-2:

- 2nd and 3rd order IMD generated by dual uplink of Band 3 + Band n28 may also fall into own Rx of band n41, it could reuse the MSD value of DC\_3A-41A\_n28A

- 2nd and 3rd order IMD generated by dual uplink of Band 3 + Band n41 may also fall into own Rx of band n28.

6.5.4 ∆TIB and ∆RIB values

For DC\_3A\_n28A-n41A, the ΔTIB,c and ΔRIB,c values can reuse the values of DC\_3A-41A\_n28A as given in the tables below.

**Table 6.5.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3\_n28-n41 | 3 | 0.5 |
| n28 | 0.3 |
| n41 | 0.31/0.82 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

**Table 6.5.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3\_n28-n41 | 3 | 0 |
| n28 | 0 |
| n41 | 01/0.52 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

6.5.5 MSD

Table 6.5.5-1 shows the required MSD:

**Table 6.5.5-1: MSD exception for Scell due to dual uplink operation for EN-DC\_3A\_n28A-n41A**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR Band / Channel bandwidth / NRB / Duplex mode** | | | | | | | | **Source of IMD** |
| **DC**  **Configuration** | **EUTRA and NR band** | **UL Fc  (MHz)** | **UL/DL BW  (MHz)** | **UL  CLRB** | **DL Fc (MHz)** | **MSD  (dB)** | **Duplex mode** |
| DC\_3A\_n28A-n41A | 3 | 1720 | 5 | 25 | 1815 | N/A | TDD | N/A |
| n28 | 735 | 5 | 25 | 790 | 261 | FDD | IMD2  |fn41-fB3| |
| n41 | 2510 | 5 | 25 | 2510 | N/A | FDD | N/A |
| 3 | 1780 | 5 | 25 | 1875 | N/A | FDD | N/A |
| n28 | 738 | 5 | 25 | 793 | N/A | FDD | N/A |
| n41 | 2518 | 5 | 25 | 2518 | 27.4 | TDD | IMD2  |fB3+fn28| |
| 3 | 1715 | 5 | 25 | 1810 | N/A | FDD | N/A |
| n28 | 743 | 5 | 25 | 798 | N/A | FDD | N/A |
| n41 | 2687 | 5 | 25 | 2687 | 15.9 | TDD | IMD3  |2\*fB3-fn28| |
| NOTE 1: This band is subject to IMD3 also which MSD is not specified | | | | | | | | |

## 6.6 DC\_2\_n48-n66

### 6.6.1 Operating bands for DC

**Table 6.6.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_2\_n48-n66 | 2 | 1850 MHz | – | 1910 MHz | 1930 MHz | – | 1990 MHz | FDD |
| n48 | 3550 MHz | – | 3700 MHz | 3550 MHz | – | 3700 MHz | TDD |
| n66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |

### 6.6.2 Configuration for DC

Table 6.6.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_2A\_n48A-n66A | DC\_2A\_n48A  DC\_2A\_n66A | 2A | CA\_n48A-n66A |

### 6.6.3 Co-existence studies

Co-existence analysis for DC\_2\_n48 UL shows no impact to NR Band n66 DL.

Co-existence analysis for DC\_2\_n66 UL shows that 2nd HAM of band 66 may fall into the lowest 10MHz of NR Band n48 DL. This is already covered in Table 7.3B.2.3.1-1 and Table 7.3B.2.3.1-2 in 38.101-3. Further 2nd IMD might also fall in n48 DL.

### 6.6.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values are given in the tables below. Values from DC\_2-48\_n66 already defined in 38.101-3 is reused.

**Table 6.6.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_2\_n48-n66 | 2 | 0.6 |
| n48 | 0.8 |
| n66 | 0.6 |

**Table 6.6.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_2\_n48-n66 | 2 | 0.3 |
| n48 | 0.4 |
| n66 | 0.3 |

### 6.6.5 MSD

Based on co-existence studies additional MSD is needed to be defined due to 2nd IMD. Similar values as for DC\_2A-48A\_n66A already defined in 38101-3 is proposed.

Table 6.6.5-1: MSD test points for Scell due to dual uplink operation for EN-DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| EN-DC  Configuration | EUTRA or NR band | UL Fc  (MHz) | UL/DL BW  (MHz) | UL  LCRB | DL Fc (MHz) | MSD  (dB) | IMD order |
| DC\_2A\_n48A-n66A | 2 | 1880 | 5 | 25 | 1960 | N/A | N/A |
| n48 | 3620 | 10 | 50 | 3620 | 29.4 | IMD2 |
| n66 | 1740 | 5 | 25 | 2140 | N/A | N/A |

## 6.7 DC\_48\_n25-n48

### 6.7.1 Operating bands for DC

**Table 6.7.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_48\_n25-n48 | 48 | 3550 MHz | – | 3700 MHz | 3550 MHz | – | 3700 MHz | TDD |
| n25 | 1850 MHz | – | 1915 MHz | 1930 MHz | – | 1995 MHz | FDD |
| n48 | 3550 MHz | – | 3700 MHz | 3550 MHz | – | 3700 MHz | TDD |

### 6.7.2 Configuration for DC

Table 6.7.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_48A\_n25A-n48A | DC\_48A\_n25A | 48A | CA\_n25A-n48A |

### 6.7.3 Co-existence studies

Co-existence analysis for DC\_48\_n25 UL shows that 4th IMD may fall into NR Band n48 DL. However, since 48 and n48 will be operated as synchronous in same UL/DL configuration there is no IMD problem.

### 6.7.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 6.7.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_48\_n25-n48 | 48 | 0.8 |
| n25 | 0.6 |
| n48 | 0.8 |

**Table 6.7.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_48\_n25-n48 | 48 | 0.4 |
| n25 | 0.3 |
| n48 | 0.4 |

### 6.7.5 MSD

Based on co-existence studies no additional MSD is needed.

## 6.8 DC\_48\_n48-n66

### 6.8.1 Operating bands for DC

**Table 6.8.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_48\_n48-n66 | 48 | 3550 MHz | – | 3700 MHz | 3550 MHz | – | 3700 MHz | TDD |
| n48 | 3550 MHz | – | 3700 MHz | 3550 MHz | – | 3700 MHz | TDD |
| n66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |

### 6.8.2 Configuration for DC

Table 6.8.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_48A\_n48A-n66A | DC\_48A\_n66A | 48A | CA\_n48A-n66A |

### 6.8.3 Co-existence studies

Co-existence analysis for DC\_48\_n66 UL shows that 2nd HAM of band 66 may fall into the lowest 10MHz of NR Band n48 DL. This is already covered in Table 7.3B.2.3.1-1 and Table 7.3B.2.3.1-2 in 38.101-3. Further 4th order IMD might fall in 48 DL However, since 48 and n48 will be operated as synchronous in same UL/DL configuration no IMD issue.

### 6.8.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 6.8.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_48\_n48-n66 | 48 | 0.8 |
| n48 |
| n66 | 0.6 |

**Table 6.8.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_48\_n48-n66 | 48 | 0.4 |
| n48 |
| n66 | 0.3 |

### 6.8.5 MSD

Based on co-existence studies no additional MSD is needed.

## 6.9 DC\_66\_n25-n48

### 6.9.1 Operating bands for DC

**Table 6.9.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_66\_n25-n48 | 66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |
| n25 | 1850 MHz | – | 1915 MHz | 1930 MHz | – | 1995 MHz | FDD |
| n48 | 3550 MHz | – | 3700 MHz | 3550 MHz | – | 3700 MHz | TDD |

### 6.9.2 Configuration for DC

Table 6.9.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_66A\_n25A-n48A | DC\_66A\_n25A  DC\_66A\_n48A | 66A | CA\_n25A-n48A |

### 6.9.3 Co-existence studies

Co-existence analysis for DC\_66\_n48 UL shows that 2nd HAM of band 66 may fall into the lowest 10MHz of NR Band n48 DL. This is already covered in Table 7.3B.2.3.1-1 and Table 7.3B.2.3.1-2 in 38.101-3. Further 2nd IMD might also fall in n25 and 5th order IMD might fall in 66 DL. But the 5th IMD already covered in Table 7.3B.2.3.5.1-1 for DC\_66A\_n48A

Co-existence analysis for DC\_66\_n25 UL shows that 2nd HAM of band 66 may fall into the lowest 10MHz of NR Band n48 DL. This is already covered in Table 7.3B.2.3.1-1 and Table 7.3B.2.3.1-2 in 38.101-3. Further 2nd IMD might also fall in n48 DL.

### 6.9.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 6.9.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_66\_n25-n48 | 66 | 0.6 |
| n25 | 0.6 |
| n48 | 0.8 |

**Table 6.9.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_66\_n25-n48 | 66 | 0.3 |
| n25 | 0.3 |
| n48 | 0.4 |

### 6.9.5 MSD

Based on co-existence studies additional MSD is needed to be defined. Similar values as for DC\_2A-48A\_n66A already defined in 38101-3 is proposed due to similarity in frequency range.

Table 6.9.5-1: MSD test points for Scell due to dual uplink operation for EN-DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| EN-DC  Configuration | EUTRA or NR band | UL Fc  (MHz) | UL/DL BW  (MHz) | UL  LCRB | DL Fc (MHz) | MSD  (dB) | IMD order |
| DC\_66A\_n25-n48 | 66 | 1740 | 5 | 25 | 2140 | N/A | N/A |
| n25 | 1880 | 5 | 25 | 1960 | N/A | N/A |
| n48 | 3620 | 10 | 50 | 3620 | 29.4 | IMD2 |
| 66 | 1735 | 5 | 25 | 2135 | N/A | N/A |
| n25 | 1880 | 5 | 25 | 1960 | 28.3 | IMD2 |
| n48 | 3695 | 5 | 25 | 3695 | N/A | N/A |

## 6.10 DC\_7\_n40-n78

### 6.10.1 Operating bands for DC

**Table 6.10.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_7\_n40-n78 | 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 6.10.2 Configuration for DC

Table 6.10.2-1: Inter-band DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_7A\_n40A-n78A | DC\_7A\_n40A  DC\_7A\_n78A | 7A | CA\_n40A-n78A |

### 6.10.3 Co-existence studies

Co-existence analysis for DC\_7\_n40 UL shows no impact to NR Band n78 DL.

Co-existence analysis for DC\_7\_n78 UL shows 4th IMD might fall into NR Band n40 DL.

### 6.10.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 6.10.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_7\_n40-n78 | 7 | 0.5 |
| n40 | 0.6 |
| n78 | 0.8 |

**Table 6.10.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_7\_n40-n78 | 7 | 0 |
| n40 | 0.5 |
| n78 | 0.5 |

### 6.10.5 MSD

Based on co-existence studies additional MSD is needed to be defined due to 4nd IMD.

Table 6.10.5-1: Proposed MSD levels from interested companies for DC\_7\_n40-n78

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | Nokia | LG | MSD (dB) |
| DC\_7A\_n40A-n78A | 7 | IMD4 | |2\*fB7 -2\*fn78| | 9.3 | 9.1 | 9.2 |
| n78 |
| n40 |

Table 6.10.5-2: MSD test points for Scell due to dual uplink operation for DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| EN-DC  Configuration | EUTRA or NR band | UL Fc  (MHz) | UL/DL BW  (MHz) | UL  LCRB | DL Fc (MHz) | MSD  (dB) | IMD order |
| DC\_7A\_n40A-n78A | 7 | 2520 | 10 | 50 | 2640 | N/A | N/A |
| n40 | 2360 | 5 | 25 | 2360 | 9.2 | IMD4 |
| n78 | 3700 | 10 | 50 | 3700 | N/A | N/A |

## 6.11 DC\_8\_n40-n78

### 6.11.1 Operating bands for DC

**Table 6.11.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_8\_n40-n78 | 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 6.11.2 Configuration for DC

Table 6.11.2-1: Inter-band DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_8A\_n40A-n78A | DC\_8A\_n40A  DC\_8A\_n78A | 8A | CA\_n40A-n78A |

### 6.11.3 Co-existence studies

Co-existence analysis for DC\_8\_n40 UL shows that 4th HAM of band 8 may fall into NR Band n78 DL. This is already covered in Table 7.3B.2.3.1-1 and Table 7.3B.2.3.1-2 in 38.101-3. Further, it shows that 2nd and 3rd IMD may fall in NR Band n78 DL.

Co-existence analysis for DC\_8\_n78 UL shows that 2nd IMD may fall into NR Band n40 DL.

### 6.11.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 6.11.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_8\_n40-n78 | 8 | 0.6 |
| n40 | 0.3 |
| n78 | 0.8 |

**Table 6.11.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_8\_n40-n78 | 8 | 0.2 |
| n40 | 0.4 |
| n78 | 0.5 |

### 6.11.5 MSD

Based on co-existence studies additional MSD is needed.

Table 6.10.5-1: Proposed MSD levels from interested companies for DC\_7\_n40-n78

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | Nokia | LG | MSD (dB) |
| DC\_8A\_n40A-n78A | 8 | IMD2 | |fB8 + fn40| | 28.2 | 29.2 | 28.7 |
| n40 |
| n78 |
| 8 | IMD2 | |fB8 - fn78| | 26.0 | 28.6 | 27.3 |
| n78 |
| n40 |

Table 6.11.5-2: MSD test points for Scell due to dual uplink operation for DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| EN-DC  Configuration | EUTRA or NR band | UL Fc  (MHz) | UL/DL BW  (MHz) | UL  LCRB | DL Fc (MHz) | MSD  (dB) | IMD order |
| DC\_8A\_n40A-n78A | 8 | 910 | 5 | 25 | 955 | N/A | N/A |
| n40 | 2395 | 5 | 25 | 2395 | N/A | N/A |
| n78 | 3305 | 10 | 50 | 3307.5 | 28.7 | IMD21 |
| 8 | 910 | 5 | 25 | 955 | N/A | N/A |
| n40 | 2395 | 5 | 25 | 2395 | 27.3 | IMD2 |
| n78 | 3305 | 10 | 50 | 3305 | N/A | N/A |

## 6.12 DC\_28\_n1-n40

### 6.12.1 Operating bands for DC

**Table 6.12.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_28\_n1-n40 | 28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |

### 6.12.2 Configuration for DC

Table 6.12.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_28A\_n1A-n40A | DC\_28A\_n1A  DC\_28A\_n40A | 28A | CA\_n1A-n40A |

### 6.12.3 Co-existence studies

Co-existence analysis for DC\_28\_n1 UL shows that 4th IMD may fall in NR Band n40 DL.

Co-existence analysis for DC\_28\_n40 UL shows that 3rd HAM of band 28 may fall into NR Band n1 DL. This is already covered in Table 7.3B.2.3.1-1 and Table 7.3B.2.3.1-2 in 38.101-3.

### 6.12.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 6.12.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_28\_n1-n40 | 28 | 0.6 |
| n1 | 0.3 |
| n40 | 0.5 |

**Table 6.12.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_28\_n1-n40 | 28 | 0.2 |
| n1 | 0 |
| n40 | 0 |

### 6.12.5 MSD

Based on co-existence studies additional MSD is needed.

Table 6.12.5-1: MSD test points for Scell due to dual uplink operation for EN-DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| EN-DC  Configuration | EUTRA or NR band | UL Fc  (MHz) | UL/DL BW  (MHz) | UL  LCRB | DL Fc (MHz) | MSD  (dB) | IMD order |
| DC\_28A\_n1A-n40A | 28 | 743 | 5 | 25 | 798 | N/A | N/A |
| n1 | 1930 | 5 | 25 | 2120 | N/A | N/A |
| n40 | 2374 | 5 | 25 | 2374 | 10.1 | IMD4 |

## 6.13 DC\_1\_n3-n77

### 6.13.1 Operating bands for DC

Table 6.13.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_1\_n3-n77 | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 6.13.2 Channel bandwidths per operating band for DC

Table 6.13.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth For DL**  **[MHz]** |
| DC\_1A\_n3A-n77A | DC\_1A\_n3A  DC\_1A\_n77A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 150 |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| DC\_1A\_n3A-n77(2A) | DC\_1A\_n3A  DC\_1A\_n77A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 250 |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n77 | See CA\_n77(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | |

### 6.13.3 Co-existence studies

Based on the co-existence studies of DC\_1A-n3A and DC\_1A-n77A captured in TR 37.716-11-11 and 37.863-01-01, 2nd and 4th order IMD generated by dual uplink of Band 1 + Band n3 may also fall into own Rx of band n77 and 2nd and 4th order IMD generated by dual uplink of Band 1 + Band n77 may also fall into own Rx of band n3.

### 6.13.4 ∆TIB and ∆RIB values

For DC\_1\_n3-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 6.13.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_1\_n3-n77 | 1 | 0.6 |
| n3 | 0.6 |
| n77 | 0.8 |

Table 6.13.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_1\_n3-n77 | 1 | 0.2 |
| n3 | 0.2 |
| n77 | 0.5 |

### 6.13.5 MSD

As mentioned in 6.13.3, IMD2 and IMD4 of B1 and n3 to Band n77 Rx and those of B1 and n77 to Band n3 need to be addressed for REFSENS relaxation. Based on the exceptions of DC\_1-3\_n77 and DC\_1\_n3-n78, the following values are proposed:

Table 6.13.5-1: Reference sensitivity exceptions due to dual uplink operation for EN-DC in NR FR1 (three bands)

| NR or E-UTRA Band / Channel bandwidth / NRB / MSD | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **EN-DC Configuration** | **EUTRA/NR band** | **UL Fc  (MHz)** | **UL/DL BW  (MHz)** | **UL**  **LCRB** | **DL Fc (MHz)** | **MSD  (dB)** | **Duplex mode** | **IMD order** |
| DC\_1A\_n3A-n77A  DC\_1A\_n3A-n77(2A) | 1 | 1950 | 5 | 25 | 2140 | N/A | FDD | N/A |
| n3 | 1750 | 5 | 25 | 1845 | N/A | FDD | N/A |
| n77 | 3700 | 10 | 50 | 3700 | 28.4 | TDD | IMD2 |
| 1 | 1950 | 5 | 25 | 2140 | N/A | FDD | N/A |
| n3 | 1770 | 5 | 25 | 1865 | N/A | FDD | N/A |
| n77 | 3360 | 10 | 50 | 3360 | 11.2 | TDD | IMD4 |
| 1 | 1950 | 5 | 25 | 2140 | N/A | FDD | N/A |
| n77 | 3757.5 | 10 | 50 | 3757.5 | N/A | TDD | N/A |
| n3 | 1712.5 | 5 | 25 | 1807.5 | 31.5 | FDD | IMD2 |
| 1 | 1950 | 5 | 25 | 2140 | N/A | FDD | N/A |
| n77 | 3980 | 10 | 50 | 3980 | N/A | TDD | N/A |
| n3 | 1775 | 5 | 25 | 1870 | 8.5 | FDD | IMD4 |

## 6.14 DC\_8\_n3-n77

### 6.14.1 Operating bands for DC

Table 6.14.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_8\_n3-n77 | 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz | FDD |
| n3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 6.14.2 Channel bandwidths per operating band for DC

Table 6.14.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth For DL**  **[MHz]** |
| DC\_8A\_n3A-n77A | DC\_8A\_n3A  DC\_8A\_n77A | 8 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 140 |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| DC\_8A\_n3A-n77(2A) | DC\_8A\_n3A  DC\_8A\_n77A | 8 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 240 |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n77 | See CA\_n77(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | |

### 6.14.3 Co-existence studies

Based on the co-existence studies of DC\_8A-n3A and DC\_8A-n77A captured in TR 37.716-11-11 and 37.863-01-01, 3rd and 5th order IMD generated by dual uplink of Band 8 + Band n3 may also fall into own Rx of band n77 and 3rd order IMD generated by dual uplink of Band 8 + Band n77 may also fall into own Rx of band n3.

### 6.14.4 ∆TIB and ∆RIB values

For DC\_8\_n3-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 6.14.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_8\_n3-n77 | 8 | 0.6 |
| n3 | 0.6 |
| n77 | 0.8 |

Table 6.14.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_8\_n3-n77 | 8 | 0.2 |
| n3 | 0.2 |
| n77 | 0.5 |

### 6.14.5 MSD

As mentioned in 6.14.3, IMD3 of B8 and n3 to n77 Rx and IMD3 of B8 and n77 to n3 Rx need to be addressed for REFSENS relaxation. Based on REFSENS relaxation of DC\_3-8\_n78 and DC\_3\_n8-n78, the following values are proposed:

Table 6.14.5-1: Reference sensitivity exceptions due to dual uplink operation for EN-DC in NR FR1 (three bands)

| NR or E-UTRA Band / Channel bandwidth / NRB / MSD | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **EN-DC Configuration** | **EUTRA/NR band** | **UL Fc  (MHz)** | **UL/DL BW  (MHz)** | **UL**  **LCRB** | **DL Fc (MHz)** | **MSD  (dB)** | **Duplex mode** | **IMD order** |
| DC\_8A-n3A\_n77A  DC\_8A-n3A\_n77(2A) | 8 | 900 | 5 | 25 | 945 | N/A | FDD | N/A |
| n3 | 1740 | 5 | 25 | 1835 | N/A | TDD | N/A |
| n77 | 3540 | 10 | 50 | 3540 | 16.3 | FDD | IMD3 |
| 8 | 910 | 5 | 25 | 955 | N/A | FDD | N/A |
| n77 | 3640 | 10 | 50 | 3640 | N/A | TDD | N/A |
| n3 | 1725 | 5 | 25 | 1820 | 16.5 | FDD | IMD3 |

6.15 DC\_1\_n3-n41

6.15.1 Operating bands for DC

**Table 6.15.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1\_n3-n41 | 1 | n3, n41 |

6.15.2 Channel bandwidths per operating band for DC

**Table 6.15.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A\_n3A-n41A | DC\_1A\_n3A  DC\_1A\_n41A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n3 | See CA\_n3A-n41A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n41 |

6.15.3 Co-existence studies

Co-existence studies of this 3DL/2UL DC configuration are already covered in the constituent fall-back mode.Table 6.15.3-1 summarizes the EN-DC band combinations with self-interference problems for DC\_1\_n3-n41

**Table 6.15.3-1: Summary of Self-interference analysis for DC\_1\_n3-n41 with 2bands UL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Downlink  band configuration** | **Uplink  DC Configuration** | **Harmonic**  **relation issues** | **intermodulation to own rx band** | **interference due to small frequency separation** | **MSD** |
| DC\_1\_n3-n41 | DC\_1A\_n3A | No | IMD5 | Yes | Yes |
| DC\_1A\_n41A | No | No | Yes | Yes |

The MSD due to small frequency separation has been defined in the constituent fall-back modes DC\_1\_n3 and DC\_1\_n41.

6.15.4 ∆TIB and ∆RIB values

For DC\_1\_n3-n41, the ΔTIB,c and ΔRIB,c values are reuse the values of DC\_1-3\_n41 as given in the tables below.

**Table 6.15.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1\_n3-n41 | 1 | 0.5 |
| n3 | 0.5 |
| n41 | 0.31/0.82 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

**Table 6.15.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1\_n3-n41 | 1 | 0 |
| n3 | 0 |
| n41 | 01/0.52 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

6.15.5 MSD

Table 6.15.5-1 shows the required MSD, its value reused the value of CA\_1A-3A-41:

Table 6.15.5-1: MSD exception for Scell due to dual uplink operation for DC\_1\_n3-n41

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC bands** | **UL DC** | **IMD** | | **UL Fc (MHz)** | **UL BW (MHz)** | **UL**  **RB #** | **DL Fc (MHz)** | **MSD (dB)** |
| DC\_1A\_n3A-n41A | 1 | IMD5 | |3\*fB1-2\*fn3| | 1977.5 | 5 | 25 | 2167.5 | N/A |
| n3 | 1712.5 | 5 | 25 | 1807.5 | N/A |
| n41 | 2507.5 | 5 | 25 | 2507.5 | 5.0 |

6.16 DC\_1\_n41-n77

6.16.1 Operating bands for DC

**Table 6.16.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1\_n41-n77 | 1 | n41, n77 |

6.16.2 Channel bandwidths per operating band for DC

**Table 6.16.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A\_n41A-n77A | DC\_1A\_n41A  DC\_1A\_n77A | 1 |  | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n41 | See CA\_n41A-n77A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n77 |

6.16.3 Co-existence studies

Co-existence studies of this 3DL/2UL DC configuration are already covered in the constituent fall-back mode.Table 6.16.3-1 summarizes the EN-DC band combinations with self-interference problems for DC\_1\_n41-n77

**Table 6.16.3-1: Summary of Self-interference analysis for DC\_1\_n41-n77 with 2bands UL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Downlink  band configuration** | **Uplink  DC Configuration** | **Harmonic**  **relation issues** | **intermodulation to own rx band** | **interference due to small frequency separation** | **MSD** |
| DC\_1\_n41-n77 | DC\_1A\_n41A | H2 of B1 UL impacts to n77 DL | IMD3, IMD4, IMD5 | Yes | Yes |
| DC\_1A\_n77A | H2 of B1 UL impacts to n77 DL | IMD4, IMD5 | Yes | Yes |

The MSD due to harmonic issue has been defined in the constituent fall-back modes DC\_1\_n77.

The MSD due to small frequency separation has been defined in the constituent fall-back modes DC\_1\_n41.

6.16.4 ∆TIB and ∆RIB values

For DC\_1\_n41-n77, the ΔTIB,c and ΔRIB,c values are reuse the values of DC\_1-41\_n77 as given in the tables below.

**Table 6.16.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1\_n41-n77 | 1 | 0.5 |
| n41 | 0.5 |
| n77 | 0.8 |

**Table 6.16.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1\_n41-n77 | 1 | 0 |
| n41 | 0 |
| n77 | 0.5 |

6.16.5 MSD

Table 6.16.5-1 shows the required MSD, its values can reuse the values for DC\_1A\_n41A-n78A:

**Table 6.16.5-1: MSD exception for Scell due to dual uplink operation for DC\_1\_n41-n77**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC bands** | **UL DC** | **IMD** | | **UL Fc (MHz)** | **UL BW (MHz)** | **UL**  **RB #** | **DL Fc (MHz)** | **MSD (dB)** |
| DC\_1A\_n41A-n77A | 1 | IMD3 | |2\*fn41- fB1| | 1970 | 5 | 25 | 2160 | N/A |
| n41 | 2650 | 10 | 25 | 2650 | N/A |
| n77 | 3330 | 10 | 50 | 3330 | 19.6 |
| 1 | IMD4 | |3\*f**B**1 –fn41| | 1970 | 5 | 25 | 2160 | N/A |
| n41 | 2520 | 5 | 25 | 2640 | N/A |
| n77 | 3390 | 10 | 50 | 3390 | 10.11 |
| 1 | IMD4 | |2\*fn77 –2\*fB1| | 1970 | 5 | 25 | 2160 | N/A |
| n41 | 2680 | 5 | 25 | 2680 | 11.51 |
| n77 | 3310 | 10 | 50 | 3310 | N/A |
| NOTE 1: This band is subject to IMD5 also which MSD is not specified | | | | | | | | |

6.17 DC\_3\_n3-n41

6.17.1 Operating bands for DC

**Table 6.17.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_3\_n3-n41 | 3 | n3, n41 |

6.17.2 Channel bandwidths per operating band for DC

**Table 6.17.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_3A\_n3A-n41A | DC\_3A\_n3A1  DC\_3A\_n41A | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n3 | See CA\_n3A-n41A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n41 |
| NOTE1: Only single switched UL is supported. | | | | | | | | | | | | | | | | |

6.17.3 Co-existence studies

Co-existence studies of this 3DL/2UL DC configuration are already covered in the constituent fall-back mode.Table 6.17.3-1 summarizes the EN-DC band combinations with self-interference problems for DC\_3\_n3-n41

**Table 6.17.3-1: Summary of Self-interference analysis for DC\_3\_n3-n41 with 2bands UL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Downlink  band configuration** | **Uplink  DC Configuration** | **Harmonic**  **relation issues** | **intermodulation to own rx band** | **interference due to small frequency separation** | **MSD** |
| DC\_3\_n3-n41 | DC\_3A\_n3A | No | No | No | No |
| DC\_3A\_n41A | No | IMD4 | Yes | Yes |

The MSD due to small frequency separation has been defined in the constituent fall-back modes DC\_3\_n41.

6.17.4 ∆TIB and ∆RIB values

For DC\_3\_n3-n41, the ΔTIB,c and ΔRIB,c values are reuse the values of DC\_3\_n41 as given in the tables below.

**Table 6.17.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3\_n3-n41 | 3 | 0.5 |
| n3 | 0.5 |
| n41 | 0.31/0.82 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

**Table 6.17.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3\_n3-n41 | 3 | 0 |
| n3 | 0 |
| n41 | 01/0.52 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

6.17.5 MSD

Table 6.17.5-1 shows the required MSD, its value can reuse the value for DC\_3A\_n41A:

**Table 6.17.5-1: MSD exception for Scell due to dual uplink operation for DC\_3\_n3-n41**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC bands** | **UL DC** | **IMD** | | **UL Fc (MHz)** | **UL BW (MHz)** | **UL**  **RB #** | **DL Fc (MHz)** | **MSD (dB)** |
| DC\_3A\_n3A-n41A | 3 | IMD4 | |2\*fn41-2\*fB3| | 1725 | 5 | 25 | 1820 | N/A |
| n3 | 1770 | 5 | 25 | 1865 | 8.2 |
| n41 | 2657.5 | 5 | 25 | 2657.5 | N/A |

6.18 DC\_3\_n41-n77

6.18.1 Operating bands for DC

**Table 6.18.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_3\_n41-n77 | 3 | n41, n77 |

6.18.2 Channel bandwidths per operating band for DC

**Table 6.18.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_3A\_n41A-n77A | DC\_3A\_n41A  DC\_3A\_n77A | 3 |  | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n41 | See CA\_n41A-n77A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n77 |

6.18.3 Co-existence studies

Co-existence studies of this 3DL/2UL DC configuration are already covered in the constituent fall-back mode.Table 6.18.3-1 summarizes the EN-DC band combinations with self-interference problems for DC\_3\_n41-n77

**Table 6.18.3-1: Summary of Self-interference analysis for DC\_3\_n41-n77 with 2bands UL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Downlink  band configuration** | **Uplink  DC Configuration** | **Harmonic**  **relation issues** | **intermodulation to own rx band** | **interference due to small frequency separation** | **MSD** |
| DC\_3\_n41-n77 | DC\_3A\_n41A | H2 of B3 UL impacts to n77 DL | IMD3, IMD5 | Yes | Yes |
| DC\_3A\_n77A | H2 of B3 UL impacts to n77 DL | IMD5 | No | Yes |

The MSD due to harmonic issue has been defined in the constituent fall-back modes DC\_3\_n77.

The MSD due to small frequency separation has been defined in the constituent fall-back modes DC\_3\_n41.

6.18.4 ∆TIB and ∆RIB values

For DC\_3\_n41-n77, the ΔTIB,c and ΔRIB,c values are reuse the values of DC\_3-41\_n77 as given in the tables below.

**Table 6.18.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3\_n41-n77 | 3 | 0.6 |
| n41 | 0.31/0.82 |
| n77 | 0.8 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

**Table 6.18.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3\_n41-n77 | 3 | 0.2 |
| n41 | 010.52 |
| n77 | 0.5 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

6.18.5 MSD

Table 6.18.5-1 shows the required MSD, its value can reuse the value for DC\_3A\_n41A-n78A:

**Table 6.18.5-1: MSD exception for Scell due to dual uplink operation for DC\_3\_n41-n77**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC bands** | **UL DC** | **IMD** | | **UL Fc (MHz)** | **UL BW (MHz)** | **UL**  **RB #** | **DL Fc (MHz)** | **MSD (dB)** |
| DC\_3A\_n41A-n77A | 3 | IMD3 | |2\*fn41- fB3| | 1730 | 5 | 25 | 1825 | N/A |
| n41 | 2560 | 10 | 50 | 2560 | N/A |
| n77 | 3390 | 10 | 50 | 3390 | 16.41 |
| 3 | IMD5 | |2\*fn77 –3\*fB3| | 1720 | 5 | 25 | 1815 | N/A |
| n41 | 2640 | 5 | 25 | 2640 | 5.3 |
| n77 | 3900 | 10 | 50 | 3900 | N/A |
| NOTE 1: This band is subject to IMD5 also which MSD is not specified | | | | | | | | |

6.19 DC\_41\_n3-n41

6.19.1 Operating bands for DC

**Table 6.19.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_41\_n3-n41 | 41 | n3, n41 |

6.19.2 Channel bandwidths per operating band for DC

**Table 6.19.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_41A\_n3A-n41A | DC\_41A\_n3A | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n3 | See CA\_n3A-n41A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n41 |

6.19.3 Co-existence studies

Co-existence studies of this 3DL/2UL DC configuration are already covered in the constituent fall-back mode.Table 6.19.3-1 summarizes the EN-DC band combinations with self-interference problems for DC\_41\_n3-n41

**Table 6.19.3-1: Summary of Self-interference analysis for DC\_41\_n3-n41 with 2bands UL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Downlink  band configuration** | **Uplink  DC Configuration** | **Harmonic**  **relation issues** | **intermodulation to own rx band** | **interference due to small frequency separation** | **MSD** |
| DC\_41\_n3-n41 | DC\_41\_n3 | No | No | Yes | Yes |
| DC\_41\_n41 | No | No | No | No |

The MSD due to small frequency separation has been defined in the constituent fall-back modes DC\_41\_n3.

6.19.4 ∆TIB and ∆RIB values

For DC\_41\_n3-n41, the ΔTIB,c and ΔRIB,c values are reuse the values of DC\_41\_n3 as given in the tables below.

**Table 6.19.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_41\_n3-n41 | 41 | 0.31/0.82 |
| n3 | 0.5 |
| n41 | 0.31/0.82 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

**Table 6.19.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_41\_n3-n41 | 41 | 01/0.52 |
| n3 | 0 |
| n41 | 01/0.52 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

6.19.5 MSD

There are no additional MSD requirements for this band combination.

6.20 DC\_41\_n41-n77

6.20.1 Operating bands for DC

**Table 6.20.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_41\_n41-n77 | 41 | n41, n77 |

6.20.2 Channel bandwidths per operating band for DC

**Table 6.20.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_41A\_n41A-n77A | DC\_41A\_n77A | 41 |  | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n41 | See CA\_n41A-n77A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n77 |

6.20.3 Co-existence studies

Co-existence studies of this 3DL/2UL DC configuration are already covered in the constituent fall-back mode.Table 6.20.3-1 summarizes the EN-DC band combinations with self-interference problems for DC\_41\_n41-n77

**Table 6.20.3-1: Summary of Self-interference analysis for DC\_41\_n41-n77 with 2bands UL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Downlink  band configuration** | **Uplink  DC Configuration** | **Harmonic**  **relation issues** | **intermodulation to own rx band** | **interference due to small frequency separation** | **MSD** |
| DC\_41\_n41-n77 | DC\_41A\_n77A | No | IMD4 | Yes | No |

The MSD due to small frequency separation has been defined in the constituent fall-back modes DC\_41\_n77.

Since DC\_41\_n41 only apply for non-simultaneous Tx/Rx between all carriers, there is no IMD4 issue for DC\_41\_n41-n77 with UL DC\_41\_n77.

6.20.4 ∆TIB and ∆RIB values

For DC\_41\_n41-n77, the ΔTIB,c and ΔRIB,c values are reuse the values of DC\_41\_n77 as given in the tables below.

**Table 6.20.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_41\_n41-n77 | 41 | 0.3 |
| n41 | 0.3 |
| n77 | 0.8 |

**Table 6.20.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_41\_n41-n77 | 41 | 0 |
| n41 | 0 |
| n77 | 0.5 |

6.20.5 MSD

There is no additional MSD requirement for this band combination.

6.21 DC\_41\_n41-n78

6.21.1 Operating bands for DC

**Table 6.21.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_41\_n41-n78 | 41 | n41, n78 |

6.21.2 Channel bandwidths per operating band for DC

**Table 6.21.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_41A\_n41A-n78A | DC\_41A\_n78A | 41 |  | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n41 | See CA\_n41A-n78A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n78 |

6.21.3 Co-existence studies

Co-existence studies of this 3DL/2UL DC configuration are already covered in the constituent fall-back mode.Table 6.21.3-1 summarizes the EN-DC band combinations with self-interference problems for DC\_41\_n41-n78

**Table 6.21.3-1: Summary of Self-interference analysis for DC\_41\_n41-n78 with 2 bands UL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Downlink  band configuration** | **Uplink  DC Configuration** | **Harmonic**  **relation issues** | **intermodulation to own rx band** | **interference due to small frequency separation** | **MSD** |
| DC\_41\_n41-n78 | DC\_41\_n78 | No | IMD4 | Yes | No |

The MSD due to small frequency separation has been defined in the constituent fall-back modes DC\_41\_n78.

Since DC\_41\_n41 only apply for non-simultaneous Tx/Rx between all carriers, there is no IMD4 issue for DC\_41\_n41-n78 with UL DC\_41\_n78.

6.21.4 ∆TIB and ∆RIB values

For DC\_41\_n41-n78, the ΔTIB,c and ΔRIB,c values are reuse the values of DC\_41\_n78 as given in the tables below.

**Table 6.21.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_41\_n41-n78 | 41 | 0.3 |
| n41 | 0.3 |
| n78 | 0.8 |

**Table 6.21.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_41\_n41-n78 | 41 | 0 |
| n41 | 0 |
| n78 | 0.5 |

6.21.5 MSD

There is no additional MSD requirement for this band combination.

6.22 DC\_2\_n7-n66

6.22.1 Operating bands for DC

**Table 6.22.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_2\_n7-n66 | 2 | n7, n66 |

6.22.2 Channel bandwidths per operating band for DC

**Table 6.22.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | | **SCS (kHz)** | **5** | **10** | **15** | | **20** | **25** | | **30** | | **40** | | **50** | | **60** | | **70** | | **80** | | **90** | | **100** | | **Maximum aggregated bandwidth**  **[MHz]** | |
| DC\_2A\_n7A-n66A | DC\_2A\_n7A  DC\_2A\_n66A | 2 | | 15 | Yes | Yes | Yes | | Yes |  | |  | |  | |  | |  | |  | |  | |  | |  | | 80 | |
| n7 | | See CA\_n7A-n66A BCS configurations in Table 5.5A.3.1-1 in TS 38.101-1 | | | | | | | | | | | | | | | | | | | | | | | |
| n66 | |
| DC\_2A\_n7(2A)-n66A | DC\_2A\_n7A  DC\_2A\_n66A | 2 | | 15 | Yes | Yes | Yes | Yes | | |  | |  | |  | |  | |  | |  | |  | |  | |  | 100 |
| n7 | | See CA\_n7(2A)-n66A BCS configurations in Table 5.5A.3.1-1 in TS 38.101-1 | | | | | | | | | | | | | | | | | | | | | | | |
| n66 | |

6.22.3 Co-existence studies

Co-existence studies of this 3DL/2UL DC configuration are already covered in the constituent fall-back mode.Table 6.22.3-1 summarizes the EN- DC band combinations with self-interference problems for DC\_2\_n7-n66

**Table 6.22.3-1: Summary of Self-interference analysis for DC\_2\_n7-n66 with 2bands UL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Downlink  band configuration** | **Uplink  DC Configuration** | **Harmonic**  **relation issues** | **intermodulation to own rx band** | **interference due to small frequency separation** | **MSD** |
| DC\_2\_n7-n66 | DC\_2A\_n7A | No | No | No | No |
| DC\_2A\_n66A | No | No | No | No |

6.22.4 ∆TIB and ∆RIB values

For DC\_2\_n77-n66, the ΔTIB,c and ΔRIB,c values can reuse the values of DC\_2A-7A\_n66A as given in the tables below.

**Table 6.22.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_2\_n7-n66 | 2 | 0.5 |
| n7 | 0.5 |
| n66 | 0.5 |

**Table 6.22.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_2\_n7-n66 | 2 | 0.3 |
| n7 | 0.5 |
| n66 | 0.5 |

6.22.5 MSD

There are no additional MSD requirements for this band combination.

6.23 DC\_2\_n38-n66

6.23.1 Operating bands for DC

**Table 6.23.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_2\_n38-n66 | 2 | n38, n66 |

6.23.2 Channel bandwidths per operating band for DC

**Table 6.23.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_2A\_n38A-n66A | DC\_2A\_n38A  DC\_2A\_n66A | 2 | | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 60 |
| n38 | | See CA\_n38A-n66A BCS configurations in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n66 | |

6.23.3 Co-existence studies

Co-existence studies of this 3DL/2UL DC configuration are already covered in the constituent fall-back mode.Table 6.23.3-1 summarizes the EN- DC band combinations with self-interference problems for DC\_2\_n38-n66

**Table 6.23.3-1: Summary of Self-interference analysis for DC\_2\_n38-n66 with 2bands UL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Downlink  band configuration** | **Uplink  DC Configuration** | **Harmonic**  **relation issues** | **intermodulation to own rx band** | **interference due to small frequency separation** | **MSD** |
| DC\_2\_n38-n66 | DC\_2A\_n38A | No | No | No | No |
| DC\_2A\_n66A | No | No | No | No |

6.23.4 ∆TIB and ∆RIB values

For DC\_2\_n38-n66, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 6.23.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_2\_n38-n66 | 2 | 0.5 |
| n38 | 0.9 |
| n66 | 0.5 |

**Table 6.23.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_2\_n38-n66 | 2 | 0.3 |
| n38 | 0.5 |
| n66 | 0.5 |

6.23.5 MSD

There are no additional MSD requirements for this band combination.

6.24 DC\_2\_n66-n78

6.24.1 Operating bands for DC

**Table 6.24.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_2\_n66-n78 | 2 | n66, n78 |

6.24.2 Channel bandwidths per operating band for DC

**Table 6.24.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_2A\_n66A-n78(2A)  DC\_2A\_n66(2A)-n78A  DC\_2A\_n66(2A)-n78(2A) | DC\_2A\_n66A  DC\_2A\_n78A | 2 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n66 | See CA\_n66A-n78(2A) BCS configurations in Table 5.5A.3.1-1 of TS 38.101-1  See CA\_n66(2A)-n78A BCS configurations in Table 5.5A.3.1-1 of TS 38.101-1  See CA\_n66(2A)-n78(2A) BCS configurations in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n78 |

6.24.3 Co-existence studies

Co-existence studies of this 3DL/2UL DC configuration are already covered in the constituent fall-back mode.Table 6.24.3-1 summarizes the EN- DC band combinations with self-interference problems for DC\_2\_n66-n78

**Table 6.24.3-1: Summary of Self-interference analysis for DC\_2\_n66-n78 with 2bands UL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Downlink  band configuration** | **Uplink  DC Configuration** | **Harmonic**  **relation issues** | **intermodulation to own rx band** | **interference due to small frequency separation** | **MSD** |
| DC\_2\_n66-n78 | DC\_2A\_n66A | H2 of B2 UL impacts to n78 DL | IMD2 and IMD4 impacts to n78 | No | Yes |
| DC\_2A\_n78A | H2 of B2 UL impacts to n78 DL | IMD4 impacts to n66 | No | Yes |

The MSD due to harmonic issue has been defined in the constituent fall-back modes DC\_2A\_n78A in TS 38.101-3.

6.24.4 ∆TIB and ∆RIB values

The ΔTIB,c and ΔRIB,c values have been defined in the constituent fall-back modes DC\_2A\_n66A-n78A in TS 38.101-3.

6.24.5 MSD

The MSD due to intermodulation have been defined in the constituent fall-back modes DC\_2A\_n66A-n78A in TS 38.101-3. Table 6.24.5-1 shows the required MSD:

**Table 6.24.5-1: MSD exception for Scell due to dual uplink operation for DC\_2\_n66-n78**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC bands** | **UL DC** | **IMD** | | **UL Fc (MHz)** | **UL BW (MHz)** | **UL**  **RB #** | **DL Fc (MHz)** | **MSD (dB)** |
| DC\_2A\_n66A-n78(2A)  DC\_2A\_n66(2A)-n78A  DC\_2A\_n66(2A)-n78(2A) | 2 | IMD4 | |3\*fB2-fn78| | 1880 | 5 | 25 | 1960 | N/A |
| n66 | 1760 | 5 | 25 | 2160 | 10.3 |
| n78 | 3480 | 10 | 50 | 3480 | N/A |
| 2 | IMD2 | |fB2 +fn66| | 1880 | 5 | 25 | 1960 | N/A |
| n66 | 1740 | 5 | 25 | 2140 | N/A |
| n78 | 3620 | 10 | 50 | 3620 | 29.4 |
| 2 | IMD4 | |3\*fn66 -fB2|  |3\*fB2 –fn66| | 1880 | 5 | 25 | 1960 | N/A |
| n66 | 1740 | 5 | 25 | 2140 | N/A |
| n78 | 3340 | 10 | 50 | 3340 | 8.9 |

6.25 DC\_12\_n7-n66

6.25.1 Operating bands for DC

**Table 6.25.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_12\_n7-n66 | 12 | n7, n66 |

6.25.2 Channel bandwidths per operating band for DC

**Table 6.25.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | | **SCS (kHz)** | **5** | **10** | **15** | | **20** | **25** | | **30** | | **40** | | **50** | | **60** | | **70** | | **80** | | **90** | | **100** | | **Maximum aggregated bandwidth**  **[MHz]** | |
| DC\_12A\_n7A-n66A | DC\_12A\_n7A  DC\_12A\_n66A | 12 | | 15 | Yes | Yes |  | |  |  | |  | |  | |  | |  | |  | |  | |  | |  | | 50 | |
| n7 | | See CA\_n7A-n66A BCS configurations in TS 38.101-1 | | | | | | | | | | | | | | | | | | | | | | | |
| n66 | |
| DC\_12A\_n7(2A)-n66A | DC\_12A\_n7A  DC\_12A\_n66A | 12 | | 15 | Yes | Yes |  |  | | |  | |  | |  | |  | |  | |  | |  | |  | |  | 70 |
| n7 | | See CA\_n7(2A)-n66A BCS configurations in TS 38.101-1 | | | | | | | | | | | | | | | | | | | | | | | |
| n66 | |

6.25.3 Co-existence studies

Co-existence studies of this 3DL/2UL DC configuration are already covered in the constituent fall-back mode.Table 6.25.3-1 summarizes the EN-DC band combinations with self-interference problems for DC\_12\_n7-n66

**Table 6.25.3-1: Summary of Self-interference analysis for DC\_12\_n7-n66 with 2bands UL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Downlink  band configuration** | **Uplink  DC Configuration** | **Harmonic**  **relation issues** | **intermodulation to own rx band** | **interference due to small frequency separation** | **MSD** |
| DC\_12\_n7-n66 | DC\_12A\_n7A | H3 of B12 UL impacts to n66 DL | No | No | Yes |
| DC\_12A\_n66A | H3 of B12 UL impacts to n66 DL | No | No | Yes |

The MSD due to harmonic issue has been defined in the constituent fall-back modes DC\_12\_n66.

6.25.4 ∆TIB and ∆RIB values

For DC\_12\_n7-n66, the ΔTIB,c and ΔRIB,c values can reuse the values of CA\_7A-12A\_66A as given in the tables below.

**Table 6.25.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_12\_n7-n66 | 12 | 0.8 |
| n7 | 0.5 |
| n66 | 0.5 |

**Table 6.25.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_12\_n7-n66 | 12 | 0.5 |
| n7 | 0.5 |
| n66 | 0.5 |

6.25.5 MSD

There are no additional MSD requirements for this band combination.

6.26 DC\_66\_n38-n66

6.26.1 Operating bands for DC

**Table 6.26.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_66\_n38-n66 | 66 | n38, n66 |

6.26.2 Channel bandwidths per operating band for DC

**Table 6.26.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_66A\_n38A-n66A | DC\_66A\_n38A  DC\_66A\_n66A1 | 66 | | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 60 |
| n38 | | See CA\_n38A-n66A BCS configurations in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n66 | |
| NOTE 1: Only single switched UL is supported | | | | | | | | | | | | | | | | | | |

6.26.3 Co-existence studies

Co-existence studies of this 3DL/2UL DC configuration are already covered in the constituent fall-back mode.Table 6.26.3-1 summarizes the EN- DC band combinations with self-interference problems for DC\_66\_n38-n66

**Table 6.26.3-1: Summary of Self-interference analysis for DC\_66\_n38-n66 with 2bands UL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Downlink  band configuration** | **Uplink  DC Configuration** | **Harmonic**  **relation issues** | **intermodulation to own rx band** | **interference due to small frequency separation** | **MSD** |
| DC\_66\_n38-n66 | DC\_66A\_n38A | No | No | No | No |
| DC\_66A\_n66A | No | No | No | No |

6.26.4 ∆TIB and ∆RIB values

For DC\_66\_n38-n66, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 6.26.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_66\_n38-n66 | 66 | 0.5 |
| n38 | 0.5 |
| n66 | 0.5 |

**Table 6.26.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_66\_n38-n66 | 66 | 0.5 |
| n38 | 0.5 |
| n66 | 0.5 |

6.26.5 MSD

There are no additional MSD requirements for this band combination.

## 6.27 DC\_19\_n1-n77

### 6.27.1 Operating bands for DC

Table 6.27.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_19\_n1-n77 | 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 6.27.2 Configuration for DC

Table 6.27.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_19A\_n1A-n77A | DC\_19A\_n1A  DC\_19A\_n77A | 19A | CA\_n1A-n77A |

### 6.27.3 Co-existence studies

Based on the co-existence studies of DC\_19\_n1 and DC\_19\_n77, own Rx impact of the 3rd band is the followings.

- 3rd order IMD products generated by DC\_19\_n1 uplink may fall into own Rx of band n77.

- 5th order IMD products generated by DC\_19\_n1 uplink may fall into own Rx of band n77.

- 3rd order IMD products generated by DC\_19\_n77 uplink may fall into own Rx of band n1.

### 6.27.4 ∆TIB and ∆RIB values

For DC\_19\_n1-n77, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-19\_n77, and are given in the tables below.

Table 6.27.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_19\_n1-n77 | 19 | 0.3 |
| n1 | 0.3 |
| n77 | 0.8 |

Table 6.27.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_19\_n1-n77 | 19 | 0 |
| n1 | 0 |
| n77 | 0.5 |

### 6.27.5 MSD

The MSD values for own Rx impact of the 3rd band stated in 6.27.3 are shown in the following table [1]. (We will provide MSD result with [ ] because other companies wants to further study.)

Table 6.27.5-1: MSD test points for Scell due to dual uplink operation for EN-DC in NR FR1 (three bands)

| NR or E-UTRA Band / Channel bandwidth / NRB / MSD | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| EN-DC Configuration | EUTRA / NR band | UL Fc  (MHz) | UL/DL BW  (MHz) | UL  LCRB | DL Fc (MHz) | MSD  (dB) | IMD order |
| DC\_19A\_n1A-n77A | 19 | 840 | 5 | 25 | 885 | N/A | N/A |
| n1 | 1975 | 5 | 25 | 2165 | N/A | N/A |
| n77 | 3655 | 10 | 50 | 3655 | [21.4] | IMD34 |
| 19 | 832.5 | 5 | 25 | 877.5 | N/A | N/A |
| n1 | 1940 | 5 | 25 | 2130 | 17.8 | IMD3 |
| n77 | 3795 | 10 | 50 | 3795 | N/A | N/A |
| NOTE 4: This band is subject to IMD5 also which MSD is not specified. | | | | | | | |

## 6.28 DC\_19\_n1-n78

### 6.28.1 Operating bands for DC

Table 6.28.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_19\_n1-n78 | 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 6.28.2 Configuration for DC

Table 6.28.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_19A\_n1A-n78A | DC\_19A\_n1A  DC\_19A\_n78A | 19A | CA\_n1A-n78A |

### 6.28.3 Co-existence studies

Based on the co-existence studies of DC\_19\_n1 and DC\_19\_n78, own Rx impact of the 3rd band is the followings.

- 3rd order IMD products generated by DC\_19\_n1 uplink may fall into own Rx of band n78.

- 3rd order IMD products generated by DC\_19\_n78 uplink may fall into own Rx of band n1.

### 6.28.4 ∆TIB and ∆RIB values

For DC\_19\_n1-n78, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-19\_n78, and are given in the tables below.

Table 6.28.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_19\_n1-n78 | 19 | 0.3 |
| n1 | 0.3 |
| n78 | 0.8 |

Table 6.28.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_19\_n1-n78 | 19 | 0 |
| n1 | 0 |
| n78 | 0.5 |

### 6.28.5 MSD

The MSD values for own Rx impact of the 3rd band stated in 6.28.3 are shown in the following table [1]. (We will provide MSD result with [ ] because other companies wants to consider further.)

Table 6.28.5-1: MSD test points for Scell due to dual uplink operation for EN-DC in NR FR1 (three bands)

| NR or E-UTRA Band / Channel bandwidth / NRB / MSD | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| EN-DC Configuration | EUTRA / NR band | UL Fc  (MHz) | UL/DL BW  (MHz) | UL  LCRB | DL Fc (MHz) | MSD  (dB) | IMD order |
| DC\_19A\_n1A-n78A | 19 | 840 | 5 | 25 | 885 | N/A | N/A |
| n1 | 1975 | 5 | 25 | 2165 | N/A | N/A |
| n78 | 3655 | 10 | 50 | 3655 | [21.4] | IMD3 |
| 19 | 832.5 | 5 | 25 | 877.5 | N/A | N/A |
| n1 | 1940 | 5 | 25 | 2130 | 17.8 | IMD3 |
| n78 | 3795 | 10 | 50 | 3795 | N/A | N/A |

## 6.29 DC\_11\_n3-n77

### 6.29.1 Operating bands for DC

Table 6.29.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_11\_n3-n77 | 11 | 1427.9 MHz | – | 1447.9 MHz | 1475.9 MHz | – | 1495.9 MHz | FDD |
| n3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 6.29.2 Channel bandwidths per operating band for DC

Table 6.29.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **Subcarrier Spacing**  **[kHz]** | **5MHz** | **10**  **MHz** | **15**  **MHz** | **20**  **MHz** | **25**  **MHz** | **30**  **MHz** | **40**  **MHz** | **50**  **MHz** | **60**  **MHz** | **70**  **MHz** | **80**  **MHz** | **90**  **MHz** | **100**  **MHz** | **Maximum aggregated bandwidth For DL**  **[MHz]** |
| DC\_11A\_n3A-n77A | DC\_11A\_n3A  DC\_11A\_n77A | 11 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 140 |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| DC\_11A\_n3A-n77(2A) | DC\_11A\_n3A  DC\_11A\_n77A | 11 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 240 |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n77 | See CA\_n77(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | |

### 6.29.3 Co-existence studies

Based on the co-existence studies of DC\_11A-n3A and DC\_11A-n77A captured in TR 37.716-11-11 and 37.863-01-01,

* 4th and 5th order IMD generated by dual uplink of Band 11 + Band n3 may also fall into own Rx of Band n77
* 2nd and 5th order IMD generated by dual uplink of Band 11 + Band n77 may also fall into own Rx of Band n3.

### 6.29.4 ∆TIB and ∆RIB values

For DC\_11\_n3-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 6.29.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_11\_n3-n77 | 11 | 0.8 |
| n3 | 0.9 |
| n77 | 0.8 |

Table 6.29.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_11\_n3-n77 | 11 | 0.3 |
| n3 | 0.5 |
| n77 | 0.5 |

### 6.29.5 MSD

As mentioned in 6.29.3, IMD4 of B11 and n3 to n77 Rx and IMD2 of B11 and n77 to n3 Rx need to be addressed for REFSENS relaxation. The following values are proposed:

Table 6.29.5-1: Reference sensitivity exceptions due to dual uplink operation for EN-DC in NR FR1 (three bands)

| NR or E-UTRA Band / Channel bandwidth / NRB / MSD | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **EN-DC Configuration** | **EUTRA/NR band** | **UL Fc  (MHz)** | **UL/DL BW  (MHz)** | **UL**  **LCRB** | **DL Fc (MHz)** | **MSD  (dB)** | **Duplex mode** | **IMD order** |
| DC\_11A-n3A\_n77A  DC\_11A-n3A\_n77(2A) | 11 | 1440 | 5 | 25 | 1488 | N/A | FDD | N/A |
| n3 | 1740 | 5 | 25 | 1835 | N/A | FDD | N/A |
| n77 | 3780 | 10 | 50 | 3780 | 10.8 | TDD | IMD4 |
| 11 | 1440 | 5 | 25 | 1488 | N/A | FDD | N/A |
| n77 | 3310 | 10 | 50 | 3310 | N/A | TDD | N/A |
| n3 | 1775 | 5 | 25 | 1870 | 29.0 | FDD | IMD2 |

## 6.30 DC\_11\_n28-n77

### 6.30.1 Operating bands for DC

Table 6.30.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_11\_n28-n77 | 11 | 1427.9 MHz | – | 1447.9 MHz | 1475.9 MHz | – | 1495.9 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 6.30.2 Channel bandwidths per operating band for DC

Table 6.30.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **Subcarrier Spacing**  **[kHz]** | **5MHz** | **10**  **MHz** | **15**  **MHz** | **20**  **MHz** | **25**  **MHz** | **30**  **MHz** | **40**  **MHz** | **50**  **MHz** | **60**  **MHz** | **70**  **MHz** | **80**  **MHz** | **90**  **MHz** | **100**  **MHz** | **Maximum aggregated bandwidth For DL**  **[MHz]** |
| DC\_11A\_n28A-n77A | DC\_11A\_n28A  DC\_11A\_n77A | 11 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 130 |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| DC\_11A\_n28A-n77(2A) | DC\_11A\_n28A  DC\_11A\_n77A | 11 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 230 |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | See CA\_n77(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | |

### 6.30.3 Co-existence studies

Based on the co-existence studies of DC\_11A-n28A and DC\_11A-n77A captured in TR 37.716-11-11 and 37.863-01-01,

* 3rd and 4th order IMD generated by dual uplink of Band 11 + Band n28 may also fall into own Rx of Band n77
* 3rd and 4th order IMD generated by dual uplink of Band 11 + Band n77 may also fall into own Rx of Band n28.

### 6.30.4 ∆TIB and ∆RIB values

For DC\_11\_n28-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 6.30.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_11\_n28-n77 | 11 | 0.4 |
| n28 | 0.6 |
| n77 | 0.8 |

Table 6.30.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_11\_n28-n77 | 11 | 0 |
| n28 | 0.2 |
| n77 | 0.5 |

### 6.30.5 MSD

As mentioned in 6.30.3, IMD3 of B11 and n28 to n77 Rx and IMD3 of B11 and n77 to n28 Rx need to be addressed for REFSENS relaxation. The following values are proposed:

Table 5.1.x.5-1: Reference sensitivity exceptions due to dual uplink operation for EN-DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc  (MHz) | UL BW (MHz) | UL  RB # | DL Fc  (MHz) | DL BW  (MHz) | MSD  (dB) |
| DC\_11A\_n28A-n77A  DC\_11A\_n28A-n77(2A) | 11 | IMD3 | |2\*fB11 +fn28| | 1443 | 5 | 25 | 1491 | 5 | **N/A** |
| n28 | 743 | 5 | 25 | 798 | 5 |
| n77 | 3629 | 10 | 50 | 3629 | 10 | **17.5** |
| 11 | IMD4 | |3\*fB11 -fn28| | 1443 | 5 | 25 | 1491 | 5 | **N/A** |
| n28 | 743 | 5 | 25 | 798 | 5 |
| n77 | 3586 | 10 | 50 | 3586 | 10 | **11.2** |
| 11 | IMD3 | |2\*fB11 -fn77| | 1443 | 5 | 25 | 1491 | 5 | **N/A** |
| n77 | 3684 | 10 | 50 | 3684 | 10 |
| n28 | 743 | 5 | 25 | 798 | 5 | **15.8** |
| 11 | IMD4 | |3\*fB11 -fn77| | 1443 | 5 | 25 | 1491 | 5 | **N/A** |
| n77 | 3564 | 10 | 50 | 3564 | 10 |
| n28 | 710 | 5 | 25 | 765 | 5 | **11.0** |

## 6.31 DC\_42\_n3-n28

### 6.31.1 Operating bands for DC

Table 6.31.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_42\_n3-n28 | 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |

### 6.31.2 Channel bandwidths per operating band for DC

Table 6.31.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **Subcarrier Spacing**  **[kHz]** | **5MHz** | **10**  **MHz** | **15**  **MHz** | **20**  **MHz** | **25**  **MHz** | **30**  **MHz** | **40**  **MHz** | **50**  **MHz** | **60**  **MHz** | **70**  **MHz** | **80**  **MHz** | **90**  **MHz** | **100**  **MHz** | **Maximum aggregated bandwidth For DL**  **[MHz]** |
| DC\_42A\_n3A-n28A | DC\_42A\_n3A  DC\_42A\_n28A | 42 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 70 |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DC\_42C\_n3A-n28A | DC\_42A\_n3A  DC\_42A\_n28A  DC\_42C\_n28A | 42 | See CA\_42C Bandwidth Combination Set 0 in Table 5.6A.1 in TS36.101 | | | | | | | | | | | | | | 90 |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |

### 6.31.3 Co-existence studies

Based on the co-existence studies of DC\_42A-n3A and DC\_42A-n28A, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 6.31.4 ∆TIB and ∆RIB values

For DC\_42\_n3-n28, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 6.31.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_42\_n3-n28 | 42 | 0.8 |
| n3 | 0.6 |
| n28 | 0.8 |

Table 6.31.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_42\_n3-n28 | 42 | 0.5 |
| n3 | 0.2 |
| n28 | 0.5 |

### 6.31.5 MSD

As mentioned in 6.31.3, there is no need to specify additional MSD requirement for this UL DC configuration..

## 6.32 DC\_42\_n3-n77

### 6.32.1 Operating bands for DC

Table 6.32.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_42\_n3-n77 | 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 6.32.2 Channel bandwidths per operating band for DC

Table 6.32.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **Subcarrier Spacing**  **[kHz]** | **5MHz** | **10**  **MHz** | **15**  **MHz** | **20**  **MHz** | **25**  **MHz** | **30**  **MHz** | **40**  **MHz** | **50**  **MHz** | **60**  **MHz** | **70**  **MHz** | **80**  **MHz** | **90**  **MHz** | **100**  **MHz** | **Maximum aggregated bandwidth For DL**  **[MHz]** |
| DC\_42A\_n3A-n77A | DC\_42A\_n3A | 42 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 150 |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| DC\_42A\_n3A-n77(2A) | DC\_42A\_n3A | 42 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 250 |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n77 | See CA\_n77(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | |
| DC\_42C\_n3A-n77A | DC\_42A\_n3A  DC\_42C\_n3A | 42 | See CA\_42C Bandwidth Combination Set 0 in Table 5.6A.1 in TS36.101 | | | | | | | | | | | | | | 170 |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| DC\_42C\_n3A-n77(2A) | DC\_42A\_n3A  DC\_42C\_n3A | 42 | See CA\_42C Bandwidth Combination Set 0 in Table 5.6A.1 in TS36.101 | | | | | | | | | | | | | | 270 |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n77 | See CA\_n77(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | |

### 6.32.3 Co-existence studies

Based on the co-existence studies of DC\_42A-n3A and DC\_42A-n77A, 4th and 5th order IMD generated by dual uplink of Band 42 + Band n3 may also fall into own Rx of band n77. But due to the TDD synchronous operation of B42 and n77, it is not impacted.

### 6.32.4 ∆TIB and ∆RIB values

For DC\_42\_n3-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 6.32.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_42\_n3-n77 | 42 | 0.8 |
| n3 | 0.6 |
| n77 | 0.8 |

Table 6.32.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_42\_n3-n77 | 42 | 0.5 |
| n3 | 0.2 |
| n77 | 0.5 |

### 6.32.5 MSD

As mentioned in 6.32.3, there is no need to specify additional MSD requirement for this UL DC configuration.

6.33 DC\_41\_n28-n41

6.33.1 Operating bands for DC

**Table 6.33.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_41A\_n28A-n41A | 41 | 2496 MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n41 | 2496 MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |

6.33.2 Channel bandwidths per operating band for DC

**Table 6.33.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_41A\_n28A-n41A | DC\_41A\_n28A | 41 | | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 150 |
| n28 | | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n41 | | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |

6.33.3 Co-existence studies

The 2nd and 3rd order harmonics and 2nd, 3rd, 4th and 5th order intermodulation products for the UE coexistence analysis of DC\_41A\_n28A-n41A with uplink on DC\_41A\_n28A was calculated and listed in Table 6.33.3-1.

**Table 6.33.3-1: Harmonic and IMD analysis for DC\_41\_n28-n41 with UL on DC\_41\_n28**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **UE UL carriers** | **Fx\_low** | **Fx\_high** | **Fy\_low** | **Fy\_high** |
| **UL frequency (MHz)** | **1710** | **1785** | **703** | **748** |
| **2nd harmonics frequency limits** | **2\*fx\_low** | **2\*fx\_high** | **2\* fy\_low** | **2\* fy\_high** |
| **2nd harmonics frequency limits (MHz)** | **3420** | **3570** | **1406** | **1496** |
| **3rd harmonics frequency limits** | **3\*fx\_low** | **3\*fx\_high** | **3\* fy\_low** | **3\* fy\_high** |
| **3rd harmonics frequency limits (MHz)** | **5130** | **5355** | **2109** | **2244** |
| **2nd order IMD products** | **|fy\_low – fx\_high|** | **|fy\_high – fx\_low|** | **|fy\_low + fx\_low|** | **|fy\_high + fx\_high|** |
| **IMD frequency limits (MHz)** | **1082** | **962** | **2413** | **2533** |
| **Two-tone 3rd order IMD products** | **|2\*fx\_low – fy\_high|** | **|2\*fx\_high – fy\_low|** | **|2\*fy\_low – fx\_high|** | **|2\*fy\_high – fx\_low|** |
| **IMD frequency limits (MHz)** | **2672** | **2867** | **379** | **214** |
| **Two-tone 3rd order IMD products** | **|2\*fx\_low + fy\_low|** | **|2\*fx\_high + fy\_high|** | **|2\*fy\_low + fx\_low|** | **|2\*fy\_high + fx\_high|** |
| **IMD frequency limits (MHz)** | **4123** | **4318** | **3116** | **3281** |
| **Two-tone 4th order IMD products** | **|3\*fx\_low –1\* fy\_high|** | **|3\*fx\_high – 1\*fy\_low|** | **|3\*fy\_low – 1\*fx\_high|** | **|3\*fy\_high – 1\*fx\_low|** |
| **IMD frequency limits (MHz)** | **4382** | **4652** | **324** | **534** |
| **Two-tone 4th order IMD products** | **|2\*fx\_low –2\* fy\_high|** | **|2\*fx\_high –2\* fy\_low|** |  |  |
| **IMD frequency limits (MHz)** | **1924** | **2164** |  |  |
| **Two-tone 4th order IMD products** | **|3\*fx\_low +1\* fy\_low|** | **|3\*fx\_high + 1\*fy\_high|** | **|3\*fy\_low + 1\*fx\_low|** | **|3\*fy\_high + 1\*fx\_high|** |
| **IMD frequency limits (MHz)** | **5833** | **6103** | **3819** | **4029** |
| **Two-tone 4th order IMD products** | **|2\*fx\_low +2\* fy\_low|** | **|2\*fx\_high +2\* fy\_high|** |  |  |
| **IMD frequency limits (MHz)** | **4826** | **5066** |  |  |
| **Two-tone 5th order IMD products** | **|fx\_low – 4\*fy\_high|** | **|fx\_high – 4\*fy\_low|** | **|fy\_low – 4\*fx\_high|** | **|fy\_high – 4\*fx\_low|** |
| **IMD frequency limits (MHz)** | **1282** | **1027** | **6437** | **6092** |
| **Two-tone 5th order IMD products** | **|2\*fx\_low - 3\*fy\_high|** | **|2\*fx\_high - 3\*fy\_low|** | **|2\*fy\_low - 3\*fx\_high|** | **|2\*fy\_high -3\*fx\_low|** |
| **IMD frequency limits (MHz)** | **1176** | **1461** | **3949** | **3634** |
| **Two-tone 5th order IMD products** | **|fx\_low + 4\*fy\_low|** | **|fx\_high + 4\*fy\_high|** | **|fy\_low + 4\*fx\_low|** | **|fy\_high + 4\*fx\_high|** |
| **IMD frequency limits (MHz)** | **4522** | **4777** | **7543** | **7888** |
| **Two-tone 5th order IMD products** | **|2\*fx\_low + 3\*fy\_low|** | **|2\*fx\_high + 3\*fy\_high|** | **|2\*fy\_low + 3\*fx\_low|** | **|2\*fy\_high + 3\*fx\_high|** |
| **IMD frequency limits (MHz)** | **5529** | **5814** | **6536** | **6851** |

No IMD issue for this combination.

6.33.4 ∆TIB and ∆RIB values

For DC\_41A\_n28A-n41A, the ΔTIB,c and ΔRIB,c values can reuse the values of DC\_3A-41A\_n28A as given in the tables below.

**Table 6.33.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_41\_n28-n41 | 41 | 0.31/0.82 |
| n28 | 0.3 |
| n41 | 0.31/0.82 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz | | |

**Table 6.33.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_41\_n28-n41 | 41 | 01/0.52 |
| n28 | 0 |
| n41 | 01/0.52 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz | | |

6.33.5 MSD

There is no additional MSD requirement for this configuration.

6.34 DC\_18\_n28-n41

6.34.1 Operating bands for DC

**Table 6.34.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_18A\_n28A-n41A | 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n41 | 2496 MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |

6.34.2 Channel bandwidths per operating band for DC

**Table 6.34.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_18A\_n28A-n41A | DC\_18A\_n28A  DC\_18A\_n41A | 18 | | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  | 145 |
| n28 | | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n41 | | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |

6.34.3 Co-existence studies

Based on the co-existence studies of DC\_18A-n28A and DC\_18A-n41, impact on own Rx of 3rd band is as follows.

- 5th order IMD generated by dual uplink of Band 18 + Band n28 may also fall into own Rx of band n41.

- 5th order IMD generated by dual uplink of Band 18 + Band n41 may also fall into own Rx of band n28. Since band 18 is only used in Japan, there will be no IMD issue for this dual uplink configuration considering Japanese spectrum allocation.

6.34.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values for DC\_18A\_n28A-n41A are shown in the following tables.

**Table 6.34.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_18\_n28-n41 | 18 | 0.5 |
| n28 | 0.5 |
| n41 | 0.3 |

**Table 6.34.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_18\_n28-n41 | 18 | 0 |
| n28 | 0 |
| n41 | 0 |

6.34.5 MSD

Table 6.34.5-1 shows the required MSD:

**Table 6.34.5-1: MSD exception for Scell due to dual uplink operation for EN-DC\_18A\_n28A-n41A**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR Band / Channel bandwidth / NRB / Duplex mode** | | | | | | | | **Source of IMD** |
| **DC**  **Configuration** | **EUTRA and NR band** | **UL Fc  (MHz)** | **UL/DL BW  (MHz)** | **UL  CLRB** | **DL Fc (MHz)** | **MSD  (dB)** | **Duplex mode** |
| DC\_18A\_n28A-n41A | 18 | 1720 | 5 | 25 | 1815 | N/A | FDD | N/A |
| n28 | 735 | 5 | 25 | 790 | N/A | FDD | N/A |
| n41 | 2510 | 5 | 25 | 2510 | 5.1 | TDD | IMD5  |4\*fB18 -fn28| |
| 18 | 820 | 5 | 25 | 865 | N/A | FDD | N/A |
| n41 | 2515 | 5 | 25 | 2515 | N/A | TDD | N/A |
| n28 | 710 | 5 | 25 | 765 | 4.7 | FDD | IMD5  |4\*fB18 -fn41| |

6.35 DC\_18\_n28-n77

6.35.1 Operating bands for DC

**Table 6.35.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_18A\_n28A-n77A | 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

6.35.2 Channel bandwidths per operating band for DC

**Table 6.35.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_18A\_n28A-n77A | DC\_18A\_n28A  DC\_18A\_n77A | 18 | | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  | 145 |
| n28 | | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

6.35.3 Co-existence studies

Based on the co-existence studies of DC\_18A-n28A and DC\_18A-n77, impact on own Rx of 3rd band is as follows.

- 5th order IMD generated by dual uplink of Band 18 + Band n28 may also fall into own Rx of band n77.

- 5th order IMD generated by dual uplink of Band 18 + Band n77 may also fall into own Rx of band n28.

6.35.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values for DC\_18A\_n28A-n77A are shown in the following tables.

**Table 6.35.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_18\_n28-n77 | 18 | 0.5 |
| n28 | 0.5 |
| n77 | 0.8 |

**Table 6.35.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_18\_n28-n77 | 18 | 0 |
| n28 | 0 |
| n77 | 0.5 |

6.35.5 MSD

Table 6.35.5-1 shows the required MSD:

**Table 6.35.5-1: MSD exception for Scell due to dual uplink operation for EN-DC\_18A\_n28A-n77A**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc  (MHz) | UL BW (MHz) | UL  RB # | DL Fc  (MHz) | DL BW  (MHz) | MSD  (dB) |
| DC\_18A\_n28A-n77A | 18 | IMD5 | |2\*fB18 +3\*fn28| | 820 | 5 | 25 | 865 | 5 | **N/A** |
| n28 | 710 | 5 | 25 | 765 | 5 |
| n77 | 3770 | 10 | 50 | 3770 | 10 | **4.0** |
| 18 | IMD5 | |4\*fB18 -fn77| | 820 | 5 | 25 | 865 | 5 | **N/A** |
| n77 | 4045 | 10 | 50 | 4045 | 10 |
| n28 | 710 | 5 | 25 | 765 | 5 | **5.7** |

6.36 DC\_18\_n28-n78

6.36.1 Operating bands for DC

**Table 6.36.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_18A\_n28A-n78A | 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

6.36.2 Channel bandwidths per operating band for DC

**Table 6.36.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_18A\_n28A-n78A | DC\_18A\_n28A  DC\_18A\_n78A | 18 | | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  | 145 |
| n28 | | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n78 | | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

6.36.3 Co-existence studies

Based on the co-existence studies of DC\_18A-n28A and DC\_18A-n78, impact on own Rx of 3rd band is as follows.

- 5th order IMD generated by dual uplink of Band 18 + Band n28 may also fall into own Rx of band n78.

6.36.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values for DC\_18A\_n28A-n78A are shown in the following tables.

**Table 6.36.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_18\_n28-n78 | 18 | 0.5 |
| n28 | 0.5 |
| n78 | 0.8 |

**Table 6.36.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_18\_n28-n78 | 18 | 0 |
| n28 | 0 |
| n78 | 0.5 |

6.36.5 MSD

Table 6.36.5-1 shows the required MSD:

**Table 6.36.5-1: MSD exception for Scell due to dual uplink operation for EN-DC\_18A\_n28A-n78A**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc  (MHz) | UL BW (MHz) | UL  RB # | DL Fc  (MHz) | DL BW  (MHz) | MSD  (dB) |
| DC\_18A\_n28A-n78A | 18 | IMD5 | |2\*fB18 +3\*fn28| | 820 | 5 | 25 | 865 | 5 | **N/A** |
| n28 | 710 | 5 | 25 | 765 | 5 |
| n78 | 3770 | 10 | 50 | 3770 | 10 | **4.0** |

6.37 DC\_18\_n3-n41

6.37.1 Operating bands for DC

**Table 6.37.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_18A\_n3A-n41A | 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n41 | 2496 MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |

6.37.2 Channel bandwidths per operating band for DC

**Table 6.37.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_18A\_n3A-n41A | DC\_18A\_n3A  DC\_18A\_n41A | 18 | | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  | 155 |
| n3 | | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| n41 | | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |

6.37.3 Co-existence studies

Based on the co-existence studies of DC\_18A-n3A and DC\_18A-n41, impact on own Rx of 3rd band is as follows.

- 2nd and 3rd order IMD generated by dual uplink of Band 18 + Band n3 may also fall into own Rx of band n41.

- 2nd order IMD generated by dual uplink of Band 18 + Band n41 may also fall into own Rx of band n3.

6.37.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values for DC\_18A\_n3A-n41A are shown in the following tables.

**Table 6.37.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_18\_n3-n41 | 18 | 0.3 |
| n3 | 0.5 |
| n41 | 0.3 |

**Table 6.37.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_18\_n3-n41 | 18 | 0 |
| n3 | 0 |
| n41 | 0 |

6.37.5 MSD

Table 6.37.5-1 shows the required MSD:

**Table 6.37.5-1: MSD exception for Scell due to dual uplink operation for EN-DC\_18A\_n3A-n41A**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc  (MHz) | UL BW (MHz) | UL  RB # | DL Fc  (MHz) | DL BW  (MHz) | MSD  (dB) |
| DC\_18A\_n3A-n41A | 18 | IMD2 | |fB18 +fn3| | 820 | 5 | 25 | 865 | 5 | **N/A** |
| n3 | 1720 | 5 | 25 | 1815 | 5 |
| n41 | 2540 | 5 | 25 | 2540 | 5 | **29.41** |
| 18 | IMD2 | |fB18 -fn41| | 820 | 5 | 25 | 865 | 5 | **N/A** |
| n41 | 2655 | 5 | 25 | 2655 | 5 |
| n3 | 1740 | 5 | 25 | 1835 | 5 | **28.2** |
| Note1: This band is subject to IMD3 also which MSD is not specified | | | | | | | | | |

6.38 DC\_18\_n41-n77

6.38.1 Operating bands for DC

**Table 6.38.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_18A\_n41A-n77A | 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n41 | 2496 MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

6.38.2 Channel bandwidths per operating band for DC

**Table 6.38.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_18A\_n41A-n77A | DC\_18A\_n41A  DC\_18A\_n77A | 18 | | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  | 215 |
| n41 | | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| n77 | | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

6.38.3 Co-existence studies

Based on the co-existence studies of DC\_18A-n41A and DC\_18A-n77, impact on own Rx of 3rd band is as follows.

- 2nd, 3rd and 4th order IMD generated by dual uplink of Band 18 + Band n41 may also fall into own Rx of band n77.

- 2nd and 3rd order IMD generated by dual uplink of Band 18 + Band n77 may also fall into own Rx of band n41.

6.38.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values for DC\_18A\_n41A-n77A are shown in the following tables.

**Table 6.38.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_18\_n41-n77 | 18 | 0.3 |
| n41 | 0.3 |
| n77 | 0.8 |

**Table 6.38.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_18\_n41-n77 | 18 | 0 |
| n41 | 0 |
| n77 | 0.5 |

6.38.5 MSD

Table 6.38.5-1 shows the required MSD:

**Table 6.38.5-1: MSD exception for Scell due to dual uplink operation for EN-DC\_18A\_n41A-n77A**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc  (MHz) | UL BW (MHz) | UL  RB # | DL Fc  (MHz) | DL BW  (MHz) | MSD  (dB) |
| DC\_18A\_n41A-n77A | 18 | IMD2 | |fB18 +fn41| | 820 | 5 | 25 | 865 | 5 | **N/A** |
| n41 | 2570 | 5 | 25 | 2570 | 5 |
| n77 | 3390 | 10 | 50 | 3390 | 10 | **30.1** |
| 18 | IMD3 | |2\*fB18 +fn41| | 820 | 5 | 25 | 865 | 5 | **N/A** |
| n41 | 2515 | 5 | 25 | 2515 | 5 |
| n77 | 4155 | 10 | 50 | 4155 | 10 | **16.4** |
| 18 | IMD4 | |2\*fB18 -2\*fn41| | 820 | 5 | 25 | 865 | 5 | **N/A** |
| n41 | 2515 | 5 | 25 | 2515 | 5 |
| n77 | 3390 | 10 | 50 | 3390 | 10 | **9.1** |
| 18 | IMD2 | |fB18 -fn77| | 820 | 5 | 25 | 865 | 5 | **N/A** |
| n77 | 3450 | 10 | 50 | 3450 | 10 |
| n41 | 2630 | 5 | 25 | 2630 | 5 | **28.5** |

6.39 DC\_18\_n41-n78

6.39.1 Operating bands for DC

**Table 6.39.1-1: DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_18A\_n41A-n78A | 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n41 | 2496 MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

6.39.2 Channel bandwidths per operating band for DC

**Table 6.39.2-1: Supported bandwidths per DC band combination of LTE 1DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_18A\_n41A-n78A | DC\_18A\_n41A  DC\_18A\_n78A | 18 | | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  | 215 |
| n41 | | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| n78 | | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

6.39.3 Co-existence studies

Based on the co-existence studies of DC\_18A-n41A and DC\_18A-n78, impact on own Rx of 3rd band is as follows.

- 2nd and 4th order IMD generated by dual uplink of Band 18 + Band n41 may also fall into own Rx of band n78.

- 2nd order IMD generated by dual uplink of Band 18 + Band n78 may also fall into own Rx of band n41.

6.39.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values for DC\_18A\_n41A-n78A are shown in the following tables.

**Table 6.39.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_18\_n41-n78 | 18 | 0.3 |
| n41 | 0.3 |
| n78 | 0.8 |

**Table 6.39.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_18\_n41-n78 | 18 | 0 |
| n41 | 0 |
| n78 | 0.5 |

6.39.5 MSD

Table 6.39.5-1 shows the required MSD:

**Table 6.39.5-1: MSD exception for Scell due to dual uplink operation for EN-DC\_18A\_n41A-n78A**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc  (MHz) | UL BW (MHz) | UL  RB # | DL Fc  (MHz) | DL BW  (MHz) | MSD  (dB) |
| DC\_18A\_n41A-n78A | 18 | IMD2 | |fB18 +fn41| | 820 | 5 | 25 | 865 | 5 | **N/A** |
| n41 | 2570 | 5 | 25 | 2570 | 5 |
| n78 | 3390 | 10 | 50 | 3390 | 10 | **30.1** |
| 18 | IMD4 | |2\*fB18 -2\*fn41| | 820 | 5 | 25 | 865 | 5 | **N/A** |
| n41 | 2515 | 5 | 25 | 2515 | 5 |
| n78 | 3390 | 10 | 50 | 3390 | 10 | **9.1** |
| 18 | IMD2 | |fB18 -fn78| | 820 | 5 | 25 | 865 | 5 | **N/A** |
| n78 | 3450 | 10 | 50 | 3450 | 10 |
| n41 | 2630 | 5 | 25 | 2630 | 5 | **28.5** |

## 6.40 DC\_19\_n1-n79

### 6.40.1 Operating bands for DC

Table 6.40.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_19\_n1-n79 | 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n79 | 4400 MHz | – | 5000 MHz | 4400 MHz | – | 5000 MHz | TDD |

### 6.40.2 Configuration for DC

Table 6.40.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_19A\_n1A-n79 AX1,X2 | DC\_19A\_n1A  DC\_19A\_n79A | 19A | CA\_n1A-n79A |
| NOTE X1: The frequency range in band n1 is restricted for this band combination to 1940 - 1960 MHz for the UL and 2130-2150 MHz for the DL.  NOTE X2: The frequency range in band n79 is restricted for this band combination to 4500 - 4600 MHz. | | | |

### 6.40.3 Co-existence studies

Based on the co-existence studies of DC\_19\_n1 and DC\_19\_n79, own Rx impact of the 3rd band is the followings.

- 3rd order IMD products generated by DC\_19\_n1 uplink may fall into own Rx of band n79.

- 4th order IMD products generated by DC\_19\_n1 uplink may fall into own Rx of band n79.

- 4th order IMD products generated by DC\_19\_n79 uplink may fall into own Rx of band n1.

### 6.40.4 ∆TIB and ∆RIB values

For DC\_19\_n1-n79, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-19\_n79, and are given in the tables below.

Table 6.40.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_19\_n1-n79 | 19 | 0.3 |
| n1 | 0.3 |
| n79 | 0 |

Table 6.40.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_19\_n1-n79 | 19 | 0.3 |
| n1 | 0.3 |
| n79 | 0 |

### 6.40.5 MSD

When IMD was calculated based on the frequency range that the operator actually owned, IMD3 and IMD4 don’t fall into own Rx of band n79 and IMD4 doesn’t fall into own Rx of band n1. Therefore, there is no need to have MSD added. NOTE X1 and NOTE X2 in Table 6.40.2-1 indicate these frequency ranges.

## 6.41 DC\_21\_n1-n77

### 6.41.1 Operating bands for DC

Table 6.41.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_21\_n1-n77 | 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 6.41.2 Configuration for DC

Table 6.41.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_21A\_n1A-n77AX1,X2 | DC\_21A\_n1A  DC\_21A\_n77A | 21A | CA\_n1A-n77A |
| NOTE X1: The frequency range in band n1 is restricted for this band combination to 1940 - 1960 MHz for the UL and 2130-2150 MHz for the DL.  NOTE X2: The frequency range in band n77 is restricted for this band combination to 3440 – 3520 MHz and 3600 - 3700 MHz. | | | |

### 6.41.3 Co-existence studies

Based on the co-existence studies of DC\_21\_n1 and DC\_21\_n77, own Rx impact of the 3rd band is the followings.

- 2nd order IMD products generated by DC\_21\_n1 uplink may fall into own Rx of band n77.

- 5th order IMD products generated by DC\_21\_n1 uplink may fall into own Rx of band n77.

- 2nd order IMD products generated by DC\_21\_n77 uplink may fall into own Rx of band n1.

- 5th order IMD products generated by DC\_21\_n77 uplink may fall into own Rx of band n1.

### 6.41.4 ∆TIB and ∆RIB values

For DC\_21\_n1-n77, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-21\_n77, and are given in the tables below.

Table 6.41.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_21\_n1-n77 | 21 | 0.3 |
| n1 | 0.3 |
| n77 | 0.8 |

Table 6.41.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_21\_n1-n77 | 21 | 0 |
| n1 | 0 |
| n77 | 0.5 |

### 6.41.5 MSD

IMD2 of band 21 and band n77 to band n1 Rx need to be addressed for REFSENS relaxation. For DC\_21\_n1-n77, REFSENS exceptions are reused from DC\_1-21\_n77, already defined in TS 38.101-3. On the other hand, IMD2 and IMD5 don’t fall into own Rx of band n77 when IMD was calculated based on the frequency range that the operator actually owned. Therefore, there is no need to have MSD added about these. NOTE X1 and NOTE X2 in Table 6.41.2-1 indicate these frequency ranges.

Table 6.41.5-1: MSD test points for Scell due to dual uplink operation for EN-DC in NR FR1 (three bands)

| NR or E-UTRA Band / Channel bandwidth / NRB / MSD | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| EN-DC Configuration | EUTRA / NR band | UL Fc  (MHz) | UL/DL BW  (MHz) | UL  LCRB | DL Fc (MHz) | MSD  (dB) | IMD order |
| DC\_21A\_n1A-n77A | 21 | 1450.4 | 5 | 25 | 1498.4 | N/A | N/A |
| n1 | 1964.6 | 5 | 25 | 2154.6 | 30.6 | IMD24 |
| n77 | 3605 | 10 | 50 | 3605 | N/A | N/A |
| NOTE 4: This band is subject to IMD5 also which MSD is not specified. | | | | | | | |

## 6.42 DC\_21\_n1-n78

### 6.42.1 Operating bands for DC

Table 6.42.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_21\_n1-n78 | 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 6.42.2 Configuration for DC

Table 6.42.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_21A\_n1A-n78AX1,X2 | DC\_21A\_n1A  DC\_21A\_n78A | 21A | CA\_n1A-n78A |
| NOTE X1: The frequency range in band n1 is restricted for this band combination to 1940 - 1960 MHz for the UL and 2130-2150 MHz for the DL.  NOTE X2: The frequency range in band n78 is restricted for this band combination to 3440 – 3520 MHz and 3600 - 3700 MHz. | | | |

### 6.42.3 Co-existence studies

Based on the co-existence studies of DC\_21\_n1 and DC\_21\_n78, own Rx impact of the 3rd band is the followings.

- 2nd order IMD products generated by DC\_21\_n1 uplink may fall into own Rx of band n78.

- 2nd order IMD products generated by DC\_21\_n78 uplink may fall into own Rx of band n1.

- 5th order IMD products generated by DC\_21\_n78 uplink may fall into own Rx of band n1.

### 6.42.4 ∆TIB and ∆RIB values

For DC\_21\_n1-n78, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-21\_n78, and are given in the tables below.

Table 6.42.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_21\_n1-n78 | 21 | 0.4 |
| n1 | 0.6 |
| n78 | 0.8 |

Table 6.42.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_21\_n1-n78 | 21 | 0 |
| n1 | 0.2 |
| n78 | 0.5 |

### 6.42.5 MSD

IMD2 of band 21 and band n78 to band n1 Rx need to be addressed for REFSENS relaxation. For DC\_21\_n1-n78, REFSENS exceptions are reused from DC\_1-21\_n78, already defined in TS 38.101-3. On the other hand, IMD2 doesn’t fall into own Rx of band n78 when IMD was calculated based on the frequency range that the operator actually owned. Therefore, there is no need to have MSD added about this. NOTE X1 and NOTE X2 in Table 6.42.2-1 indicate these frequency ranges.

Table 6.42.5-1: MSD test points for Scell due to dual uplink operation for EN-DC in NR FR1 (three bands)

| NR or E-UTRA Band / Channel bandwidth / NRB / MSD | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| EN-DC Configuration | EUTRA / NR band | UL Fc  (MHz) | UL/DL BW  (MHz) | UL  LCRB | DL Fc (MHz) | MSD  (dB) | IMD order |
| DC\_21A\_n1A-n78A | 21 | 1450.4 | 5 | 25 | 1498.4 | N/A | N/A |
| n1 | 1964.6 | 5 | 25 | 2154.6 | 30.6 | IMD24 |
| n78 | 3605 | 10 | 50 | 3605 | N/A | N/A |
| NOTE 4: This band is subject to IMD5 also which MSD is not specified. | | | | | | | |

## 6.43 DC\_21\_n1-n79

### 6.43.1 Operating bands for DC

Table 6.43.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_21\_n1-n79 | 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n79 | 4400 MHz | – | 5000 MHz | 4400 MHz | – | 5000 MHz | TDD |

### 6.43.2 Configuration for DC

Table 6.43.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_21A\_n1A-n79A | DC\_21A\_n1A  DC\_21A\_n79A | 21A | CA\_n1A-n79A |
| NOTE X1: The frequency range in band n1 is restricted for this band combination to 1940 - 1960 MHz for the UL and 2130-2150 MHz for the DL.  NOTE X2: The frequency range in band n79 is restricted for this band combination to 4500 - 4600 MHz. | | | |

### 6.43.3 Co-existence studies

Based on the co-existence studies of DC\_21\_n1 and DC\_21\_n79, own Rx impact of the 3rd band is the followings.

- 3rd order IMD products generated by DC\_21\_n1 uplink may fall into own Rx of band n79.

- 4th order IMD products generated by DC\_21\_n1 uplink may fall into own Rx of band n79.

### 6.43.4 ∆TIB and ∆RIB values

For DC\_21\_n1-n79, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-21\_n79, and are given in the tables below.

Table 6.43.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_21\_n1-n79 | 21 | 0.3 |
| n1 | 0.3 |
| n79 | 0 |

Table 6.43.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_21\_n1-n79 | 21 | 0 |
| n1 | 0 |
| n79 | 0 |

### 6.43.5 MSD

When IMD was calculated based on the frequency range that the operator actually owned, IMD3 and IMD4 don’t fall into own Rx of band n79. Therefore, there is no need to have MSD added. NOTE X1 and NOTE X2 in Table 6.43.2-1 indicate these frequency ranges.

## 6.44 DC\_42\_n1-n77

### 6.44.1 Operating bands for DC

Table 6.44.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_42\_n1-n77 | 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 6.44.2 Configuration for DC

Table 6.44.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_42A\_n1A-n77AX1 | N/A | 42A | CA\_n1A-n77A |
| DC\_42C\_n1A-n77AX1 | N/A | CA\_42C | CA\_n1A-n77A |
| NOTE X1: The combination is not used alone as fall back mode of other band combinations in which UL in Band 42 is not used. | | | |

### 6.44.3 Co-existence studies

Co-existence studies are not needed because Uplink EN-DC configuration is N/A for DC\_42\_n1-n77.

### 6.44.4 ∆TIB and ∆RIB values

For DC\_42\_n1-n77, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-42\_n77, and are given in the tables below.

Table 6.44.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_42\_n1-n77 | 42 | 0.8 |
| n1 | 0.6 |
| n77 | 0.8 |

Table 6.44.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_42\_n1-n77 | 42 | 0.5 |
| n1 | 0.2 |
| n77 | 0.5 |

### 6.44.5 MSD

MSD are not needed because Uplink EN-DC configuration is N/A for DC\_42\_n1-n77.

## 6.45 DC\_42\_n1-n78

### 6.45.1 Operating bands for DC

Table 6.45.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_42\_n1-n78 | 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 6.45.2 Configuration for DC

Table 6.45.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_42A\_n1A-n78AX1 | N/A | 42A | CA\_n1A-n78A |
| DC\_42C\_n1A-n78AX1 | N/A | CA\_42C | CA\_n1A-n78A |
| NOTE X1: The combination is not used alone as fall back mode of other band combinations in which UL in Band 42 is not used. | | | |

### 6.45.3 Co-existence studies

Co-existence studies are not needed because Uplink EN-DC configuration is N/A for DC\_42\_n1-n78.

### 6.45.4 ∆TIB and ∆RIB values

For DC\_42\_n1-n78, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-42\_n78, and are given in the tables below.

Table 6.45.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_42\_n1-n78 | 42 | 0.8 |
| n1 | 0.3 |
| n78 | 0.8 |

Table 6.45.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_42\_n1-n78 | 42 | 0.5 |
| n1 | 0.2 |
| n78 | 0.5 |

### 6.45.5 MSD

MSD are not needed because Uplink EN-DC configuration is N/A for DC\_42\_n1-n78.

## 6.46 DC\_42\_n1-n79

### 6.46.1 Operating bands for DC

Table 6.46.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_42\_n1-n79 | 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n79 | 4400 MHz | – | 5000 MHz | 4400 MHz | – | 5000 MHz | TDD |

### 6.46.2 Configuration for DC

Table 6.46.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_42A\_n1A-n79AX1 | N/A | 42A | CA\_n1A-n79A |
| DC\_42C\_n1A-n79 AX1 | N/A | CA\_42C | CA\_n1A-n79A |
| NOTE X1: The combination is not used alone as fall back mode of other band combinations in which UL in Band 42 is not used. | | | |

### 6.46.3 Co-existence studies

Co-existence studies are not needed because Uplink EN-DC configuration is N/A for DC\_42\_n1-n79.

### 6.46.4 ∆TIB and ∆RIB values

For DC\_42\_n1-n79, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-42\_n79, and are given in the tables below.

Table 6.46.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_42\_n1-n79 | 42 | 0.8 |
| n1 | 0.3 |
| n79 | 0 |

Table 6.46.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_42\_n1-n79 | 42 | 0.5 |
| n1 | 0 |
| n79 | 0 |

### 6.46.5 MSD

MSD are not needed because Uplink EN-DC configuration is N/A for DC\_42\_n1-n79.

## 6.47 DC\_28\_n1-n78

### 6.47.1 Operating bands for DC

Table 6.47.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_28\_n1-n78 | 28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 6.47.2 Channel bandwidths per operating band for DC

Table 6.47.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |
| DC\_28A\_n1A-n78A | DC\_28A\_ n1A DC\_28A\_ n78A | 28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 170 |
| n1 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 6.47.3 Co-existence studies

Based on co-existence studies, 3rd order IMD generated by dual uplink of 28\_n1 may fall into own Rx of band n78.

Based on co-existence studies, 3rd order IMD generated by dual uplink of 28\_n78 may fall into own Rx of band n1.

### 6.47.4 ∆TIB and ∆RIB values

For DC\_28\_n1-n78, the ΔTIB,c and ΔRIB,c values are derived from DC\_1-28\_n78 and are given in the tables below.

Table 6.47.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_28\_n1-n78 | 28 | 0.6 |
| n1 | 0.3 |
| n78 | 0.8 |

Table 6.47.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_28\_n1-n78 | 28 | 0.2 |
| n1 | 0 |
| n78 | 0.5 |

### 6.47.5 MSD

As mentioned in 6.47.3, 3rd order IMD generated by dual uplink of 28\_n1 may fall into own Rx of band n78. Relaxation is derived from DC\_1A\_n28A-n78A and proposed in table below.

As mentioned in 6.47.3, 3rd order IMD generated by dual uplink of 28\_n78 may fall into own Rx of band n1. Relaxation is derived from DC\_1A-28A\_n78A and proposed in table below.

Table 6.47.5-1: Reference sensitivity exceptions due to dual uplink operation for EN-DC in NR FR1 (three bands)

| **NR or E-UTRA Band / Channel bandwidth / NRB / MSD** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **EN-DC Configuration** | **EUTRA / NR band** | **UL Fc  (MHz)** | **UL/DL BW  (MHz)** | **UL**  **LCRB** | **DL Fc (MHz)** | **MSD  (dB)** | **IMD order** |
| DC\_28A\_n1A-n78A | 28 | 733 | 5 | 25 | 788 | N/A | N/A |
| n1 | 1950 | 5 | 25 | 2140 | N/A | N/A |
| n78 | 3416 | 10 | 50 | 3416 | 15.7 | IMD3 |
| 28 | 740 | 5 | 25 | 795 | N/A | N/A |
| n1 | 1960 | 5 | 25 | 2150 | 15.7 | IMD3 |
| n78 | 3630 | 10 | 50 | 3630 | N/A | N/A |

## 6.48 DC\_2\_n5-n77

### 6.48.1 Operating bands for DC

Table 6.48.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_2\_n5-n77 | 2 | 1850 MHz | – | 1910 MHz | 1930 MHz | – | 1990 MHz | FDD |
| n5 | 824 MHz | – | 849 MHz | 869 MHz | – | 894 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 6.48.2 Channel bandwidths per operating band for DC

Table 6.48.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |
| DC\_2A\_n5A-n77A | DC\_2A\_n5A  DC\_2A\_ n77A | 2 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 140 |
| n5 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 6.48.3 Co-existence studies

Based on co-existence studies, 3rd and 5th order IMD generated by dual uplink of 2\_n5 may fall into own Rx of band n77.

Based on co-existence studies, 5th order IMD generated by dual uplink of 2\_n77 may fall into own Rx of band n5.

### 6.48.4 ∆TIB and ∆RIB values

For DC\_2\_n5-n77, the ΔTIB,c and ΔRIB,c values are derived from CA\_2-13-48 and are given in the tables below.

Table 6.48.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_2\_n5-n77 | 2 | 0.6 |
| n5 | 0.3 |
| n77 | 0.8 |

Table 6.48.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_2\_n5-n77 | 2 | 0.2 |
| n5 | 0 |
| n77 | 0.5 |

### 6.48.5 MSD

As mentioned in 6.48.3, 3rd and 5th order IMD generated by dual uplink of 2\_n5 may fall into own Rx of band n77.

As mentioned in 6.48.3, 5th order IMD generated by dual uplink of 2\_n77 may fall into own Rx of band n5.

Table 6.48.5-1: Reference sensitivity exceptions due to dual uplink operation for EN-DC in NR FR1 (three bands)

| **NR or E-UTRA Band / Channel bandwidth / NRB / MSD** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **EN-DC Configuration** | **EUTRA / NR band** | **UL Fc  (MHz)** | **UL/DL BW  (MHz)** | **UL**  **LCRB** | **DL Fc (MHz)** | **MSD  (dB)** | **IMD order** |
| DC\_2A\_n5A-n77A | 2 | 1880 | 5 | 25 | 1960 | N/A | N/A |
| n5 | 830 | 5 | 25 | 875 | N/A | N/A |
| n77 | 3540 | 10 | 50 | 3540 | 16.0 | IMD3 |
| 2 | 1880 | 5 | 25 | 1960 | N/A | N/A |
| n5 | 830 | 5 | 25 | 875 | N/A | N/A |
| n77 | 3980 | 10 | 50 | 3980 | 4.1 | IMD5 |
| 2 | 1907 | 5 | 25 | 1987 | N/A | N/A |
| n5 | 844 | 5 | 25 | 889 | 3.8 | IMD5 |
| n77 | 3305 | 10 | 50 | 3305 | N/A | N/A |

## 6.49 DC\_2\_n66-n77

### 6.49.1 Operating bands for DC

Table 6.49.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_2\_n66-n77 | 2 | 1850 MHz | – | 1910 MHz | 1930 MHz | – | 1990 MHz | FDD |
| n66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 6.49.2 Channel bandwidths per operating band for DC

Table 6.49.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |
| DC\_2A\_n66A-n77A | DC\_2A\_ n77A | 2 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 160 |
| n66 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| DC\_2A-2A\_n66A-n77A | DC\_2A\_ n77A | 2 | See CA\_2A-2A Bandwidth Combination Set 0 in TS 36.101 Table 5.6A.1-3 | | | | | | | | | | | | | | 180 |
| n66 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 6.49.3 Co-existence studies

Based on co-existence studies, 2nd, 4th and 5th order IMD generated by dual uplink of 2\_n77 may fall into own Rx of band n66.

### 6.49.4 ∆TIB and ∆RIB values

For DC\_2\_n66-n77, the ΔTIB,c and ΔRIB,c values are derived from CA\_n25-n66-n78 and are given in the tables below.

Table 6.49.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_2\_n66-n77 | 2 | 0.6 |
| n66 | 0.6 |
| n77 | 0.8 |

Table 6.49.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_2\_n66-n77 | 2 | 0.3 |
| n66 | 0.3 |
| n77 | 0.5 |

### 6.49.5 MSD

As mentioned in 6.49.3, 2nd 4th and 5th order IMD generated by dual uplink of 2\_n77 may fall into own Rx of band n66.

Table 6.49.5-1: Reference sensitivity exceptions due to dual uplink operation for EN-DC in NR FR1 (three bands)

| **NR or E-UTRA Band / Channel bandwidth / NRB / MSD** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **EN-DC Configuration** | **EUTRA / NR band** | **UL Fc  (MHz)** | **UL/DL BW  (MHz)** | **UL**  **LCRB** | **DL Fc (MHz)** | **MSD  (dB)** | **IMD order** |
| DC\_2A\_n66A-n77A DC\_2A-2A\_n66A-n77A | 2 | 1900 | 5 | 25 | 1980 | N/A | N/A |
| n66 | 1760 | 5 | 25 | 2160 | 29.2 | IMD2 |
| n77 | 4060 | 10 | 50 | 4060 | N/A | N/A |
| DC\_2A\_n66A-n77A DC\_2A-2A\_n66A-n77A | 2 | 1900 | 5 | 25 | 1980 | N/A | N/A |
| n66 | 1760 | 5 | 25 | 2160 | 10.3 | IMD4 |
| n77 | 3540 | 10 | 50 | 3540 | N/A | N/A |
| DC\_2A\_n66A-n77A DC\_2A-2A\_n66A-n77A | 2 | 1900 | 5 | 25 | 1980 | N/A | N/A |
| n66 | 1760 | 5 | 25 | 2160 | 4.0 | IMD5 |
| n77 | 3930 | 10 | 50 | 3930 | N/A | N/A |

## 6.50 DC\_13\_n2-n77

### 6.50.1 Operating bands for DC

Table 6.50.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_13\_n2-n77 | 13 | 777 MHz | – | 787 MHz | 746 MHz | – | 756 MHz | FDD |
| n2 | 1850 MHz | – | 1910 MHz | 1930 MHz | – | 1990 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 6.50.2 Channel bandwidths per operating band for DC

Table 6.50.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |
| DC\_13A\_n2A-n77A | DC\_13A\_n2A  DC\_13A\_ n77A | 13 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 130 |
| n2 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 6.50.3 Co-existence studies

Based on co-existence studies, 3rd order IMD generated by dual uplink of 13\_n77 may fall into own Rx of band n2.

Based on co-existence studies, 3rd 4th and 5th order IMD generated by dual uplink of 13\_n2 may fall into own Rx of band n77.

### 6.50.4 ∆TIB and ∆RIB values

For DC\_13\_n2-n77, the ΔTIB,c and ΔRIB,c values are derived from DC\_13-48\_n2 and are given in the tables below.

Table 6.50.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_13\_n2-n77 | 13 | 0.3 |
| n2 | 0.6 |
| n77 | 0.8 |

Table 6.50.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_13\_n2-n77 | 13 | 0 |
| n2 | 0.2 |
| n77 | 0.5 |

### 6.50.5 MSD

As mentioned in 6.50.3, 3rd order IMD generated by dual uplink of 13\_n77 may fall into own Rx of band n2.

As mentioned in 6.50.3, 3rd 4th and 5th order IMD generated by dual uplink of 13\_n2 may fall into own Rx of band n77.

Table 6.50.5-1: Reference sensitivity exceptions due to dual uplink operation for EN-DC in NR FR1 (three bands)

| **NR or E-UTRA Band / Channel bandwidth / NRB / MSD** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **EN-DC Configuration** | **EUTRA / NR band** | **UL Fc  (MHz)** | **UL/DL BW  (MHz)** | **UL**  **LCRB** | **DL Fc (MHz)** | **MSD  (dB)** | **IMD order** |
| DC\_13A\_n2A-n77A | 13 | 782 | 5 | 25 | 751 | N/A | N/A |
| n2 | 1880 | 5 | 25 | 1960 | N/A | N/A |
| n77 | 3444 | 10 | 50 | 3444 | 17.3 | IMD3 |
| 13 | 780 | 5 | 25 | 749 | N/A | N/A |
| n2 | 1855 | 5 | 25 | 1935 | N/A | N/A |
| n77 | 4195 | 10 | 50 | 4195 | 12.4 | IMD4 |
| 13 | 782 | 5 | 25 | 751 | N/A | N/A |
| n2 | 1880 | 5 | 25 | 1960 | N/A | N/A |
| n77 | 4076 | 10 | 50 | 4076 | 4.5 | IMD5 |
| 13 | 782 | 5 | 25 | 751 | N/A | N/A |
| n2 | 1880 | 5 | 25 | 1960 | 16.0 | IMD3 |
| n77 | 3524 | 10 | 50 | 3524 | N/A | N/A |

## 6.51 DC\_13\_n5-n48

### 6.51.1 Operating bands for DC

Table 6.51.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_13\_n5-n48 | 13 | 777 MHz | – | 787 MHz | 746 MHz | – | 756 MHz | FDD |
| n5 | 824 MHz | – | 849 MHz | 869 MHz | – | 894 MHz | FDD |
| n48 | 3550 MHz | – | 3800 MHz | 3550 MHz | – | 3800 MHz | TDD |

### 6.51.2 Channel bandwidths per operating band for DC

Table 6.51.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |
| DC\_13A\_n5A-n48A | DC\_13A\_ n48A | 13 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 130 |
| n5 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n48 | 15 | Yes5 | Yes | Yes | Yes |  |  | Yes | Yes6 |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes6 | Yes6 |  | Yes6 | Yes6,4 | Yes6 |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes6 | Yes6 |  | Yes6 | Yes6,4 | Yes6 |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification.  NOTE 5: For this bandwidth, the minimum requirements are restricted to operation when carrier is configured as an SCell part of DC or CA configuration.  NOTE 6: For this bandwidth, the minimum requirements are restricted to operation when carrier is configured as an downlink SCell part of CA configuration. | | | | | | | | | | | | | | | | | |

### 6.51.3 Co-existence studies

Based on co-existence studies, there are no IMD generated by dual uplink of 13\_n48 that fall into own Rx of band n5.

### 6.51.4 ∆TIB and ∆RIB values

For DC\_13\_n5-n48, the ΔTIB,c and ΔRIB,c values are derived from CA\_5-12-48 and are given in the tables below.

Table 6.51.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_13\_n5-n48 | 13 | 0.4 |
| n5 | 0.8 |
| n48 | 0.3 |

Table 6.51.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_13\_n5-n48 | 13 | 0.3 |
| n5 | 0.5 |
| n48 | 0 |

### 6.51.5 MSD

There is no need for MSD to be defined.

## 6.52 DC\_13\_n48-n66

### 6.52.1 Operating bands for DC

Table 6.52.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_13\_n48-n66 | 13 | 777 MHz | – | 787 MHz | 746 MHz | – | 756 MHz | FDD |
| n48 | 3550 MHz | – | 3800 MHz | 3550 MHz | – | 3800 MHz | TDD |
| n66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |

### 6.52.2 Channel bandwidths per operating band for DC

Table 6.52.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |
| DC\_13A\_n48A-n66A | DC\_13A\_n48A  DC\_13A\_ n66A | 13 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 150 |
| n48 | 15 | Yes5 | Yes | Yes | Yes |  |  | Yes | Yes6 |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes6 | Yes6 |  | Yes6 | Yes6,4 | Yes6 |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes6 | Yes6 |  | Yes6 | Yes6,4 | Yes6 |
| n66 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification.  NOTE 5: For this bandwidth, the minimum requirements are restricted to operation when carrier is configured as an SCell part of DC or CA configuration.  NOTE 6: For this bandwidth, the minimum requirements are restricted to operation when carrier is configured as an downlink SCell part of CA configuration. | | | | | | | | | | | | | | | | | |

### 6.52.3 Co-existence studies

Based on co-existence studies, 5th order IMD generated by dual uplink of 13\_n66 may fall into own Rx of band n48.

Based on co-existence studies, 3rd order IMD generated by dual uplink of 13\_n48 may fall into own Rx of band n66.

### 6.52.4 ∆TIB and ∆RIB values

For DC\_13\_n48-n66, the ΔTIB,c and ΔRIB,c values are derived from DC\_13-48\_n66 and are given in the tables below.

Table 6.52.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_13\_n48-n66 | 13 | 0.3 |
| n48 | 0.8 |
| n66 | 0.6 |

Table 6.52.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_13\_n48-n66 | 13 | 0 |
| n48 | 0.5 |
| n66 | 0.2 |

### 6.52.5 MSD

As mentioned in 6.52.3, 5th order IMD generated by dual uplink of 13\_n66 may fall into own Rx of band n48. Relaxation is given in the TR [2] and proposed in table below.

As mentioned in 6.52.3, 3rd order IMD generated by dual uplink of 13\_n48 may fall into own Rx of band n66. Relaxation is derived from CA\_13A-48A-66A and DC\_13A-66A\_n48A and proposed in table below.

Table 6.52.5-1: Reference sensitivity exceptions due to dual uplink operation for EN-DC in NR FR1 (three bands)

| **NR or E-UTRA Band / Channel bandwidth / NRB / MSD** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **EN-DC Configuration** | **EUTRA / NR band** | **UL Fc  (MHz)** | **UL/DL BW  (MHz)** | **UL**  **LCRB** | **DL Fc (MHz)** | **MSD  (dB)** | **IMD order** |
| DC\_13A\_n48A-n66A | 13 | 782 | 5 | 25 | 751 | N/A | N/A |
| n48 | 3584 | 5 | 25 | 3584 | 2.8 | IMD5 |
| n66 | 1716 | 5 | 25 | 2116 | N/A | N/A |
| 13 | 782 | 5 | 25 | 751 | N/A | N/A |
| n48 | 3695 | 5 | 25 | 3695 | N/A | N/A |
| n66 | 1731 | 5 | 25 | 2131 | 17.1 | IMD3 |

## 6.53 DC\_13\_n66-n77

### 6.53.1 Operating bands for DC

Table 6.53.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_13\_n66-n77 | 13 | 777 MHz | – | 787 MHz | 746 MHz | – | 756 MHz | FDD |
| n66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 6.53.2 Channel bandwidths per operating band for DC

Table 6.53.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |
| DC\_13A\_n66A-n77A | DC\_13A\_n66A  DC\_13A\_ n77A | 13 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 150 |
| n66 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 6.53.3 Co-existence studies

Based on co-existence studies, 3rd order IMD generated by dual uplink of 13\_n77 may fall into own Rx of band n66.

Based on co-existence studies, 3rd 4th and 5th order IMD generated by dual uplink of 13\_n66 may fall into own Rx of band n77.

### 6.53.4 ∆TIB and ∆RIB values

For DC\_13\_n66-n77, the ΔTIB,c and ΔRIB,c values are derived from DC\_13-48\_n66 and are given in the tables below.

Table 6.53.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_13\_n66-n77 | 13 | 0.3 |
| n66 | 0.6 |
| n77 | 0.8 |

Table 6.53.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_13\_n66-n77 | 13 | 0 |
| n66 | 0.2 |
| n77 | 0.5 |

### 6.53.5 MSD

As mentioned in 6.53.3, 3rd order IMD generated by dual uplink of 13\_n77 may fall into own Rx of band n66.

As mentioned in 6.53.3, 3rd 4th and 5th order IMD generated by dual uplink of 13\_n66 may fall into own Rx of band n77.

Table 6.53.5-1: Reference sensitivity exceptions due to dual uplink operation for EN-DC in NR FR1 (three bands)

| **NR or E-UTRA Band / Channel bandwidth / NRB / MSD** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **EN-DC Configuration** | **EUTRA / NR band** | **UL Fc  (MHz)** | **UL/DL BW  (MHz)** | **UL**  **LCRB** | **DL Fc (MHz)** | **MSD  (dB)** | **IMD order** |
| DC\_13A\_n66A-n77A | 13 | 782 | 5 | 25 | 751 | N/A | N/A |
| n66 | 1760 | 5 | 25 | 2160 | N/A | N/A |
| n77 | 3324 | 10 | 50 | 3324 | 16.4 | IMD3 |
| 13 | 782 | 5 | 25 | 751 | N/A | N/A |
| n66 | 1760 | 5 | 25 | 2160 | N/A | N/A |
| n77 | 4106 | 10 | 50 | 4106 | 11.7 | IMD4 |
| 13 | 782 | 5 | 25 | 751 | N/A | N/A |
| n66 | 1760 | 5 | 25 | 2160 | N/A | N/A |
| n77 | 3716 | 10 | 50 | 3716 | 4.4 | IMD5 |
| 13 | 782 | 5 | 25 | 751 | N/A | N/A |
| n66 | 1731 | 5 | 25 | 2131 | 17.1 | IMD3 |
| n77 | 3695 | 10 | 50 | 3695 | N/A | N/A |

## 6.54 DC\_66\_n2-n77

### 6.54.1 Operating bands for DC

Table 6.54.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_66\_n2-n77 | 66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |
| n2 | 1850 MHz | – | 1910 MHz | 1930 MHz | – | 1990 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 6.54.2 Channel bandwidths per operating band for DC

Table 6.54.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |
| DC\_66A\_n2A-n77A | DC\_66A\_n2A  DC\_66A\_ n77A | 66 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 140 |
| n2 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 6.54.3 Co-existence studies

Based on co-existence studies, 2nd, 4th and 5th order IMD generated by dual uplink of 66\_n77 may fall into own Rx of band n2.

Based on co-existence studies, 2nd and 4th order IMD generated by dual uplink of 66\_n2 may fall into own Rx of band n77.

### 6.54.4 ∆TIB and ∆RIB values

For DC\_66\_n2-n77, the ΔTIB,c and ΔRIB,c values are derived from CA\_n25-n66-n78 and are given in the tables below.

Table 6.54.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_66\_n2-n77 | 66 | 0.6 |
| n2 | 0.6 |
| n77 | 0.8 |

Table 6.54.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_66\_n2-n77 | 66 | 0.3 |
| n2 | 0.3 |
| n77 | 0.5 |

### 6.54.5 MSD

As mentioned in 6.54.3, 2nd 4th and 5th order IMD generated by dual uplink of 66\_n77 may fall into own Rx of band n2. Relaxation are derived from DC\_2A-66A\_n78A and proposed in table below.

As mentioned in 6.54.3, 2nd and 4th order IMD generated by dual uplink of 66\_n2 may fall into own Rx of band n77. Relaxation are derived from DC\_2A\_n66A-n78A and proposed in table below.

Table 6.54.5-1: Reference sensitivity exceptions due to dual uplink operation for EN-DC in NR FR1 (three bands)

| **NR or E-UTRA Band / Channel bandwidth / NRB / MSD** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **EN-DC Configuration** | **EUTRA / NR band** | **UL Fc  (MHz)** | **UL/DL BW  (MHz)** | **UL**  **LCRB** | **DL Fc (MHz)** | **MSD  (dB)** | **IMD order** |
| DC\_66A\_n2A-n77A | 66 | 1740 | 5 | 25 | 2140 | N/A | N/A |
| n2 | 1880 | 5 | 25 | 1960 | N/A | N/A |
| n77 | 3620 | 10 | 50 | 3620 | 29.4 | IMD2 |
| 66 | 1740 | 5 | 25 | 2140 | N/A | N/A |
| n2 | 1880 | 5 | 25 | 1960 | N/A | N/A |
| n77 | 3340 | 10 | 50 | 3340 | 8.9 | IMD4 |
| 2 | 1880 | 5 | 25 | 1960 | 32.1 | IMD2 |
| 66 | 1740 | 5 | 25 | 2140 | N/A | N/A |
| n77 | 3700 | 10 | 50 | 3700 | N/A | N/A |
| 2 | 1880 | 5 | 25 | 1960 | 9.1 | IMD4 |
| 66 | 1770 | 5 | 25 | 2170 | N/A | N/A |
| n77 | 3350 | 10 | 50 | 3350 | N/A | N/A |
| 2 | 1880 | 5 | 25 | 1960 | 2.1 | IMD5 |
| 66 | 1760 | 5 | 25 | 2160 | N/A | N/A |
| n77 | 3620 | 10 | 50 | 3620 | N/A | N/A |

## 6.55 DC\_66\_n5-n48

### 6.55.1 Operating bands for DC

Table 6.55.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_66\_n5-n48 | 66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |
| n5 | 824 MHz | – | 849 MHz | 869 MHz | – | 894 MHz | FDD |
| n48 | 3350 MHz | – | 3700 MHz | 3350 MHz | – | 3700 MHz | TDD |

### 6.55.2 Channel bandwidths per operating band for DC

Table 6.55.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |
| DC\_66A\_n5A-n48A | DC\_66A\_n5A  DC\_66A\_ n48A | 66 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 140 |
| n5 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n48 | 15 | Yes5 | Yes | Yes | Yes |  |  | Yes | Yes6 |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes6 | Yes6 |  | Yes6 | Yes6,4 | Yes6 |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes6 | Yes6 |  | Yes6 | Yes6,4 | Yes6 |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification.  NOTE 5: For this bandwidth, the minimum requirements are restricted to operation when carrier is configured as an SCell part of DC or CA configuration.  NOTE 6: For this bandwidth, the minimum requirements are restricted to operation when carrier is configured as an downlink SCell part of CA configuration. | | | | | | | | | | | | | | | | | |

### 6.55.3 Co-existence studies

Based on co-existence studies, 5th order IMD generated by dual uplink of 66\_n5 may fall into own Rx of band n48.

### 6.55.4 ∆TIB and ∆RIB values

For DC\_66\_n5-n48, the ΔTIB,c and ΔRIB,c values are derived from DC\_48-66\_n5 and are given in the tables below.

Table 6.55.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_66\_n5-n48 | 66 | 0.6 |
| n5 | 0.3 |
| n48 | 0.8 |

Table 6.55.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_66\_n5-n48 | 66 | 0.2 |
| n5 | 0 |
| n48 | 0.5 |

### 6.55.5 MSD

As mentioned in 6.55.3, 5th order IMD generated by dual uplink of 66\_n5 may fall into own Rx of band n48. Relaxation are defined in Rel-16 TR [2] and proposed in table below.

Table 6.55.5-1: Reference sensitivity exceptions due to dual uplink operation for EN-DC in NR FR1 (three bands)

| **NR or E-UTRA Band / Channel bandwidth / NRB / MSD** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **EN-DC Configuration** | **EUTRA / NR band** | **UL Fc  (MHz)** | **UL/DL BW  (MHz)** | **UL**  **LCRB** | **DL Fc (MHz)** | **MSD  (dB)** | **IMD order** |
| DC\_66A\_n5A-n48A | 66 | 1750 | 5 | 25 | 2150 | N/A | N/A |
| n5 | 834 | 5 | 25 | 879 | N/A | N/A |
| n48 | 3582 | 5 | 25 | 3582 | 3.3 | IMD5 |

## 6.56 DC\_66\_n5-n77

### 6.56.1 Operating bands for DC

Table 6.56.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_66\_n5-n77 | 66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |
| n5 | 824 MHz | – | 849 MHz | 869 MHz | – | 894 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 6.56.2 Channel bandwidths per operating band for DC

Table 6.56.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |
| DC\_66A\_n5A-n77A | DC\_66A\_n5A  DC\_66A\_ n77A | 66 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 140 |
| n5 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| DC\_66A-66A\_n5A-n77A | DC\_66A\_n5A  DC\_66A\_ n77A | 66 | See CA\_66A-66A Bandwidth Combination Set 0 in TS 36.101 Table 5.6A.1-3 | | | | | | | | | | | | | | 160 |
| n5 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 6.56.3 Co-existence studies

Based on co-existence studies, 3rd 4th and 5th order IMD generated by dual uplink of 66\_n5 may fall into own Rx of band n77.

### 6.56.4 ∆TIB and ∆RIB values

For DC\_66\_n5-n77, the ΔTIB,c and ΔRIB,c values are derived from DC\_48-66\_n5 and are given in the tables below.

Table 6.56.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_66\_n5-n77 | 66 | 0.6 |
| n5 | 0.3 |
| n77 | 0.8 |

Table 6.56.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_66\_n5-n77 | 66 | 0.2 |
| n5 | 0 |
| n77 | 0.5 |

### 6.56.5 MSD

As mentioned in 6.56.3, 3rd 4th and 5th order IMD generated by dual uplink of 66\_n5 may fall into own Rx of band n77.

Table 6.56.5-1: Reference sensitivity exceptions due to dual uplink operation for EN-DC in NR FR1 (three bands)

| **NR or E-UTRA Band / Channel bandwidth / NRB / MSD** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **EN-DC Configuration** | **EUTRA / NR band** | **UL Fc  (MHz)** | **UL/DL BW  (MHz)** | **UL**  **LCRB** | **DL Fc (MHz)** | **MSD  (dB)** | **IMD order** |
| DC\_66A\_n5A-n77A DC\_66A-66A\_n5A-n77A | 66 | 1760 | 5 | 25 | 2160 | N/A | N/A |
| n5 | 830 | 5 | 25 | 875 | N/A | N/A |
| n77 | 3420 | 10 | 50 | 3420 | 16.6 | IMD3 |
| 66 | 1714 | 5 | 25 | 2114 | N/A | N/A |
| n5 | 827 | 5 | 25 | 872 | N/A | N/A |
| n77 | 4195 | 10 | 50 | 4195 | 12.1 | IMD4 |
| 66 | 1760 | 5 | 25 | 2160 | N/A | N/A |
| n5 | 830 | 5 | 25 | 875 | N/A | N/A |
| n77 | 3620 | 10 | 50 | 3620 | 3.6 | IMD5 |

## 6.57 DC\_66\_n66-n77

### 6.57.1 Operating bands for DC

Table 6.57.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_66\_n66-n77 | 66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |
| n66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 6.57.2 Channel bandwidths per operating band for DC

Table 6.57.2-1: Supported bandwidths per DC LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |
| DC\_66A\_n66A-n77A | DC\_66A\_ n77A | 66 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 160 |
| n66 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 6.57.3 Co-existence studies

Based on co-existence studies, 2nd and 5th order IMD generated by dual uplink of 66\_n77 may fall into own Rx of band n66.

### 6.57.4 ∆TIB and ∆RIB values

For DC\_66\_n66-n77, the ΔTIB,c and ΔRIB,c values are derived from CA\_n66-n77 and are given in the tables below.

Table 6.57.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_66\_n66-n77 | 66 | 0.6 |
| n66 | 0.6 |
| n77 | 0.8 |

Table 6.57.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_66\_n66-n77 | 66 | 0.2 |
| n66 | 0.2 |
| n77 | 0.5 |

### 6.57.5 MSD

As mentioned in 6.57.3, 2nd and 5th order IMD generated by dual uplink of 66\_n77 may fall into own Rx of band n66. Relaxation are derived from CA\_n66A-n77A and proposed in table below.

Table 6.57.5-1: Reference sensitivity exceptions due to dual uplink operation for EN-DC in NR FR1 (three bands)

| **NR or E-UTRA Band / Channel bandwidth / NRB / MSD** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **EN-DC Configuration** | **EUTRA / NR band** | **UL Fc  (MHz)** | **UL/DL BW  (MHz)** | **UL**  **LCRB** | **DL Fc (MHz)** | **MSD  (dB)** | **IMD order** |
| DC\_66A\_n66A-n77A | 66 | 1730 | 5 | 25 | 2140 | N/A | N/A |
| n66 | 1760 | 5 | 25 | 2170 | 31 | IMD2 |
| n77 | 3900 | 10 | 50 | 3900 | N/A | N/A |
| 66 | 1730 | 5 | 25 | 2140 | N/A | N/A |
| n66 | 1760 | 5 | 25 | 2170 | 5.0 | IMD5 |
| n77 | 3680 | 10 | 50 | 3680 | N/A | N/A |

## 6.58 DC\_40\_n41-n258

### 6.58.1 Operating bands for DC

Table 6.58.1-1: DC band combination of one LTE band + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_40\_n41-n258 | 40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n41 | 2496 MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |
| n257 | 24250 MHz | – | 27500 MHz | 24250 MHz | – | 27500 MHz | TDD |

### 6.58.2 Configuration for DC

Table 6.58.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) |
| --- | --- |
| DC\_40A\_n41A-n258A  DC\_40A\_n41C-n258A | DC\_40A\_n41A DC\_40A\_n258A |

### 6.58.3 Co-existence studies

- For combination of DC\_40\_n41, the co-existence studies have been covered in TR37.716-11-11, where band 40 and band n41 are synchronized operaiton.

- For combination of DC\_40\_n258, it is no need to consider the harmonic and intermodulation co-existence studies due to the large frequency seperation.

### 6.58.4 ∆TIB and ∆RIB values

For the DC conbination of DC\_40\_n41-n258, the ΔTIB,c and ΔRIB,c for band n258 equals to 0, and the ΔTIB,c and ΔRIB,c for band 40 and n79 are the same with the DC\_40\_n41.

### 6.58.5 MSD

No additional MSD requirement is needed.

## 6.59 DC\_40\_n79-n258

### 6.59.1 Operating bands for DC

Table 6.59.1-1: DC band combination of one LTE band + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_40\_n79-n258 | 40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n79 | 4400 MHz | – | 5000 MHz | 4400 MHz | – | 5000 MHz | TDD |
| n257 | 24250 MHz | – | 27500 MHz | 24250 MHz | – | 27500 MHz | TDD |

### 6.59.2 Configuration for DC

Table 6.59.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) |
| --- | --- |
| DC\_40A\_n79A-n258A  DC\_40A\_n79C-n258A | DC\_40A\_n79A DC\_40A\_n258A |

### 6.59.3 Co-existence studies

- For combination of DC\_40\_n79, the co-existence studies have been covered in TR37.716-11-11, where 2nd harmonic from B40 into n79

- For combination of DC\_40\_n258, it is no need to consider the harmonic and intermodulation co-existence studies due to the large frequency seperation.

### 6.59.4 ∆TIB and ∆RIB values

For the DC conbination of DC\_40\_n79-n258, the ΔTIB,c and ΔRIB,c for band n258 equals to 0, and the ΔTIB,c and ΔRIB,c for band 40 and n79 are the same with the DC\_40\_n79.

### 6.59.5 MSD

No additional MSD requirement is needed.

## 6.60 DC\_41\_n79-n258

### 6.60.1 Operating bands for DC

Table 6.60.1-1: DC band combination of one LTE band + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_41\_n79-n258 | 41 | 2496 MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |
| n79 | 4400 MHz | – | 5000 MHz | 4400 MHz | – | 5000 MHz | TDD |
| n257 | 24250 MHz | – | 27500 MHz | 24250 MHz | – | 27500 MHz | TDD |

### 6.60.2 Configuration for DC

Table 6.60.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) |
| --- | --- |
| DC\_41A\_n79A-n258A  DC\_41A\_n79C-n258A | DC\_41A\_n79A DC\_41A\_n258A |

### 6.60.3 Co-existence studies

- For combination of DC\_41\_n79, the co-existence studies have been covered in TR37.716-11-11, where over 4992MHz frequency in n79 was impacted by 2nd harmonic, but not used.

- For combination of DC\_41\_n258, it is no need to consider the harmonic and intermodulation co-existence studies due to the large frequency seperation.

### 6.60.4 ∆TIB and ∆RIB values

For the DC conbination of DC\_41\_n79-n258, the ΔTIB,c and ΔRIB,c for band n258 equals to 0, and the ΔTIB,c and ΔRIB,c for band 41 and n79 are the same with the DC\_41\_n79.

### 6.60.5 MSD

No additional MSD requirement is needed.

## 6.61 DC\_8\_n78-n258

### 6.61.1 Operating bands for DC

**Table 6.61.1-1: DC band combination of one LTE band + inter-band NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_8\_n78-n258 | 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |
| n258 | 24250 MHz | – | 27500 MHz | 24250 MHz | – | 27500 MHz |

### 6.61.2 Channel bandwidths per operating band for DC

**Table 6.61.2-1: Supported bandwidths per DC one LTE band + inter-band NR 2DL/1UL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **Channel bandwidth set** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_8A\_n78A-n258A  DC\_8A\_n78A-n258D  DC\_8A\_n78A-n258E  DC\_8A\_n78A-n258F  DC\_8A\_n78A-n258G  DC\_8A\_n78A-n258H  DC\_8A\_n78A-n258I  DC\_8A\_n78A-n258J  DC\_8A\_n78A-n258K  DC\_8A\_n78A-n258L  DC\_8A\_n78A-n258M | DC\_8A\_n78A  DC\_8A\_n258A | 8 | - | 310  410  510  610  710  810  910 |
| n78 | CA\_n78A-n258A/D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n258 |

### 6.61.3 Co-existence studies

The co-existence summary in section 5.3 of 37.717-11-21 already captures this combination. There is no additional harmonic and/or intermodulation impact for this combination.

### 6.61.4 ∆TIB and ∆RIB values

No further ΔTIB,c and ΔRIB,c values are needed defined for this combination including FR2 as the FR1 combinations is already completed.

### 6.61.5 MSD

No additional MSD requirement is needed.

## 6.62 DC\_8\_n40-n258

### 6.62.1 Operating bands for DC

**Table 6.62.1-1: DC band combination of one LTE band + inter-band NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_8\_n40-n258 | 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n258 | 24250 MHz | – | 27500 MHz | 24250 MHz | – | 27500 MHz |

### 6.62.2 Channel bandwidths per operating band for DC

**Table 6.62.2-1: Supported bandwidths per DC one LTE band + inter-band NR 2DL/1UL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **Channel bandwidth set** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_8A\_n40A-n258A  DC\_8A\_n40A-n258D  DC\_8A\_n40A-n258E  DC\_8A\_n40A-n258F  DC\_8A\_n40A-n258G  DC\_8A\_n40A-n258H  DC\_8A\_n40A-n258I  DC\_8A\_n40A-n258J  DC\_8A\_n40A-n258K  DC\_8A\_n40A-n258L  DC\_8A\_n40A-n258M | DC\_8A\_n40A  DC\_8A\_n258A | 8 | - | 290  390  490  590  690  790  890 |
| n40 | CA\_n40A-n258A/D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n258 |

### 6.62.3 Co-existence studies

The co-existence summary in section 5.3 of 37.717-11-21 already captures this combination. There is no additional harmonic and/or intermodulation impact for this combination.

### 6.62.4 ∆TIB and ∆RIB values

No further ΔTIB,c and ΔRIB,c values are needed defined for this combination including FR2 as the FR1 combinations is already completed.

### 6.62.5 MSD

No additional MSD requirement is needed.

## 6.63 DC\_7\_n78-n258

### 6.63.1 Operating bands for DC

**Table 6.63.1-1: DC band combination of one LTE band + inter-band NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_7\_n78-n258 | 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |
| n258 | 24250 MHz | – | 27500 MHz | 24250 MHz | – | 27500 MHz | TDD |

### 6.63.2 Channel bandwidths per operating band for DC

**Table 6.63.2-1: Supported bandwidths per DC one LTE band + inter-band NR 2DL/1UL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **Channel bandwidth set** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_7A\_n78A-n258A DC\_7A\_n78A-n258G  DC\_7A\_n78A-n258H  DC\_7A\_n78A-n258I  DC\_7A\_n78A-n258J  DC\_7A\_n78A-n258K  DC\_7A\_n78A-n258L  DC\_7A\_n78A-n258M DC\_7C\_n78A-n258A DC\_7C\_n78A-n258G  DC\_7C\_n78A-n258H  DC\_7C\_n78A-n258I  DC\_7C\_n78A-n258J  DC\_7C\_n78A-n258K  DC\_7C\_n78A-n258L  DC\_7C\_n78A-n258M | DC\_7A\_n78A  DC\_7A\_n258A  DC\_7C\_n78A  DC\_7C\_n258A | 7 | - | 920 |
| n78 | - |
| n258 | - |

### 6.63.3 Co-existence studies

Based on co-existence studies of DC\_7\_n78 and DC\_7\_n258 specified in TR 37.717-11-21, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 6.63.4 ∆TIB and ∆RIB values

For DC\_7\_n78-n258, the ΔTIB,c and ΔRIB values are given in the tables below.

Table 6.63.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_7\_n78-n258 | 7 | 0.5 |
| n78 | 0.8 |
| n258 | 0 |

Table 6.63.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_7\_n78-n258 | 7 | 0 |
| n78 | 0.5 |
| n258 | 0 |

### 6.63.5 MSD

There is no additional MSD issue for DC\_7\_n78-n258.

## 6.64 DC\_3\_n78-n258

### 6.64.1 Operating bands for DC

**Table 6.64.1-1: DC band combination of one LTE band + inter-band NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_3\_n78-n258 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |
| n258 | 24250 MHz | – | 27500 MHz | 24250 MHz | – | 27500 MHz | TDD |

### 6.64.2 Channel bandwidths per operating band for DC

**Table 6.64.2-1: Supported bandwidths per DC one LTE band + inter-band NR 2DL/1UL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **Channel bandwidth set** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A\_n78A-n258A DC\_3A\_n78A-n258G  DC\_3A\_n78A-n258H  DC\_3A\_n78A-n258I  DC\_3A\_n78A-n258J  DC\_3A\_n78A-n258K  DC\_3A\_n78A-n258L  DC\_3A\_n78A-n258M | DC\_3A\_n78A  DC\_3A\_n258A | 3 | - | 920 |
| n78 | - |
| n258 | - |

### 6.64.3 Co-existence studies

Based on co-existence studies of DC\_3\_n78 and DC\_3\_n258 specified in TR 37.717-11-21, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 6.64.4 ∆TIB and ∆RIB values

For DC\_3\_n78-n258, the ΔTIB,c and ΔRIB values are given in the tables below.

Table 6.64.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_3\_n78-n258 | 3 | 0.6 |
| n78 | 0.8 |
| n258 | 0 |

Table 6.64.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_3\_n78-n258 | 3 | 0.2 |
| n78 | 0.5 |
| n258 | 0 |

### 6.64.5 MSD

There is no additional MSD issue for DC\_3\_n78-n258.

## 6.65 DC\_28\_n78-n258

### 6.65.1 Operating bands for DC

**Table 6.65.1-1: DC band combination of one LTE band + inter-band NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_28\_n78-n258 | 28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |
| n258 | 24250 MHz | – | 27500 MHz | 24250 MHz | – | 27500 MHz | TDD |

### 6.65.2 Channel bandwidths per operating band for DC

**Table 6.65.2-1: Supported bandwidths per DC one LTE band + inter-band NR 2DL/1UL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **Channel bandwidth set** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_28A\_n78A-n258A DC\_28A\_n78A-n258G  DC\_28A\_n78A-n258H  DC\_28A\_n78A-n258I  DC\_28A\_n78A-n258J  DC\_28A\_n78A-n258K  DC\_28A\_n78A-n258L  DC\_28A\_n78A-n258M | DC\_28A\_n78A  DC\_28A\_n258A | 28 | - | 920 |
| n78 | - |
| n258 | - |

### 6.65.3 Co-existence studies

Based on co-existence studies of DC\_28\_n78 and DC\_28\_n258 specified in TR 37.717-11-21, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 6.65.4 ∆TIB and ∆RIB values

For DC\_28\_n78-n258, the ΔTIB,c and ΔRIB values are given in the tables below.

Table 6.65.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_28\_n78-n258 | 28 | 0.5 |
| n78 | 0.8 |
| n258 | 0 |

Table 6.65.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_28\_n78-n258 | 28 | 0.2 |
| n78 | 0.5 |
| n258 | 0 |

### 6.65.5 MSD

There is no additional MSD issue for DC\_28\_n78-n258.

## 6.66 DC\_40\_n1-n78

### 6.66.5 MSD

Based on Table 5.3-1 in TR 37.717-11-21, there are IMD4 and IMD5 produced by Band 40 and NR band n1 that impact the reference sensitivity of NR band n78. However, these IMD problems already solved in DC\_1A\_n40A-n78A with 2UL\_DC\_1A\_n40A. So, RAN4 can follow the MSD levels in TS38.101-3.

Also there are IMD4 produced by Band 40 and NR band n78 that impact the reference sensitivity of NR band n1.

The required MSD is shown in the following Table.

Table 6.66.5-1: Reference sensitivity exceptions for Scell due to dual uplink operation for DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC bands** | **UL DC** | **IMD** | | **UL Fc**  **(MHz)** | **UL BW (MHz)** | **UL**  **RB #** | **DL Fc**  **(MHz)** | **DL BW**  **(MHz)** | **MSD**  **(dB)** |
| DC\_40A\_n1A-n78A  DC\_40C\_n1A-n78A | 40 | IMD4 | |2\*fB40 -2\*fn78| | 2320 | 5 | 25 | 2320 | 5 | **N/A** |
| n78 | 3380 | 10 | 50 | 3380 | 5 |
| n1 | 1930 | 5 | 25 | 2120 | 5 | **7.6** |

## 6.67 DC\_12\_n5-n77

### 6.67.5 MSD

Based on Table 5.3-1 in TR 37.717-11-21, there is IMD5 produced by Band 12 and NR band n5 that impact the reference sensitivity of NR band n77. Also, there is IMD5 produced by Band 12 and NR band n77 that impact the reference sensitivity of NR band n5.

The required MSD levels and test configuration are shown in the following Table.

Table 6.67.5-1: Reference sensitivity exceptions for Scell due to dual uplink operation for DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc  (MHz) | UL BW (MHz) | UL  RB # | DL Fc  (MHz) | DL BW  (MHz) | MSD  (dB) |
| DC\_12A\_n5A-n77A | 12 | IMD5 | |4\*fB12 +fn5| | 708 | 5 | 25 | 738 | 5 | **N/A** |
| n5 | 830 | 5 | 25 | 875 | 5 |
| n77 | 3662 | 10 | 50 | 3662 | 10 | **5.4** |
| 12 | IMD5 | |4\*fB12 -fn77| | 708 | 5 | 25 | 738 | 5 | **N/A** |
| n77 | 3707 | 10 | 50 | 3707 | 10 |
| n5 | 830 | 5 | 25 | 875 | 5 | **4.8** |

## 6.68 DC\_14\_n5-n77

### 6.68.5 MSD

Based on Table 5.3-1 in TR 37.717-11-21, there are IMD4 and IMD5 produced by Band 14 and NR band n5 that impact the reference sensitivity of NR band n77. Also, there is IMD5 produced by Band 14 and NR band n77 that impact the reference sensitivity of NR band n5.

The required MSD levels and test configuration are shown in the following Table.

Table 6.68.5-1: Reference sensitivity exceptions for Scell due to dual uplink operation for DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc  (MHz) | UL BW (MHz) | UL  RB # | DL Fc  (MHz) | DL BW  (MHz) | MSD  (dB) |
| DC\_14A\_n5A-n77A | 14 | IMD4 | |fB14 +3\*fn5| | 793 | 5 | 25 | 763 | 5 | **N/A** |
| n5 | 845 | 5 | 25 | 890 | 5 |
| n77 | 3328 | 10 | 50 | 3328 | 10 | **10.6** |
| 14 | IMD5 | |fB14 +4\*fn5| | 793 | 5 | 25 | 763 | 5 | **N/A** |
| n5 | 830 | 5 | 25 | 875 | 5 |
| n77 | 4113 | 10 | 50 | 4113 | 10 | **5.1** |
| 14 | IMD5 | |4\*fB14 -fn77| | 793 | 5 | 25 | 763 | 5 | **N/A** |
| n77 | 4047 | 10 | 50 | 4047 | 10 |
| n5 | 830 | 5 | 25 | 875 | 5 | **4.4** |

## 6.69 DC\_2\_n71-n78

### 6.69.5 MSD

Based on Table 5.3-1 in TR 37.717-11-21, there is IMD3 produced by Band 2 and NR band n71 that impact the reference sensitivity of NR band n78.

The required MSD levels and test configuration are shown in the following Table.

Table 6.69.5-1: Reference sensitivity exceptions for Scell due to dual uplink operation for DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc  (MHz) | UL BW (MHz) | UL  RB # | DL Fc  (MHz) | DL BW  (MHz) | MSD  (dB) |
| DC\_2A\_n71A-n78A | 2 | IMD3 | |fB2 +2\*fn71| | 1907.5 | 5 | 25 | 1987.5 | 5 | **N/A** |
| n71 | 695.5 | 5 | 25 | 649.5 | 5 |
| n78 | 3305 | 10 | 50 | 3305 | 10 | **8.0** |

## 6.70 DC\_7\_n71-n78

### 6.70.5 MSD

Based on Table 5.3-1 in TR 37.717-11-21, there is IMD4 produced by Band 7 and NR band n71 that impact the reference sensitivity of NR band n78. Also there is IMD5 produced by Band 7 and NR band n78 that impact the reference sensitivity of NR band n71.

The required MSD levels and test configuration are shown in the following Table.

Table 6.70.5-1: Reference sensitivity exceptions for Scell due to dual uplink operation for DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc  (MHz) | UL BW (MHz) | UL  RB # | DL Fc  (MHz) | DL BW  (MHz) | MSD  (dB) |
| DC\_7A\_n71A-n78A | 7 | IMD4 | |2\*fB7 -2\*fn71| | 2550 | 5 | 25 | 2670 | 5 | **N/A** |
| n71 | 693 | 5 | 25 | 647 | 5 |
| n78 | 3714 | 10 | 50 | 3714 | 10 | **9.7** |
| 7 | IMD5 | |3\*fB7 -2\*fn78| | 2555 | 5 | 25 | 2675 | 5 | **N/A** |
| n78 | 3520 | 10 | 50 | 3520 | 10 |
| n71 | 671 | 5 | 25 | 625 | 5 | **3.9** |

## 6.71 DC\_71\_n38-n78

### 6.71.5 MSD

Based on Table 5.3-1 in TR 37.717-11-21, there are IMD2 and IMD4 produced by Band 71 and NR band n38 that impact the reference sensitivity of NR band n78. Also there is IMD2 produced by Band 71 and NR band n78 that impact the reference sensitivity of NR band n38.

The required MSD levels and test configuration are shown in the following Table.

Table 6.71.5-1: Reference sensitivity exceptions for Scell due to dual uplink operation for DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc  (MHz) | UL BW (MHz) | UL  RB # | DL Fc  (MHz) | DL BW  (MHz) | MSD  (dB) |
| DC\_71A\_n38A-n78A | 71 | IMD2 | |fB71 +fn38| | 693 | 5 | 25 | 647 | 5 | **N/A** |
| n38 | 2615 | 5 | 25 | 2615 | 5 |
| n78 | 3308 | 10 | 50 | 3308 | 10 | **29.1** |
| 71 | IMD4 | |2\*fB71 -2\*fn38| | 693 | 5 | 25 | 647 | 5 | **N/A** |
| n38 | 2580 | 5 | 25 | 2580 | 5 |
| n78 | 3774 | 10 | 50 | 3774 | 10 | **10.3** |
| 71 | IMD2 | |fB71 -fn78| | 693 | 5 | 25 | 647 | 5 | **N/A** |
| n78 | 3308 | 10 | 50 | 3308 | 10 |
| n38 | 2615 | 5 | 25 | 2615 | 5 | **28.7** |

## 6.72 DC\_5\_n66-n78

### 6.72.5 MSD

Based on Table 5.3-1 in TR 37.717-11-21, there are IMD3 and IMD5 produced by Band 5 and NR band n66 that impact the reference sensitivity of NR band n78.

The required MSD levels and test configuration are shown in the following Table.

Table 6.72.5-1: Reference sensitivity exceptions for Scell due to dual uplink operation for DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc  (MHz) | UL BW (MHz) | UL  RB # | DL Fc  (MHz) | DL BW  (MHz) | MSD  (dB) |
| DC\_5A\_n66A-n78A | 5 | IMD3 | |fn66 +2\*fB5| | 830 | 5 | 25 | 875 | 5 | **N/A** |
| n66 | 1760 | 5 | 25 | 2160 | 5 |
| n78 | 3420 | 10 | 50 | 3420 | 10 | **16.6** |
| 5 | IMD5 | |3\*fn66 -2\*fB5| | 830 | 5 | 25 | 875 | 5 | **N/A** |
| n66 | 1760 | 5 | 25 | 2160 | 5 |
| n78 | 3620 | 10 | 50 | 3620 | 10 | **3.6** |

## 6.73 DC\_71\_n66-n78

### 6.73.5 MSD

Based on Table 5.3-1 in TR 37.717-11-21, there is IMD3 produced by Band 71 and NR band n78 that impact the reference sensitivity of NR band n66.

The required MSD levels and test configuration are shown in the following Table.

Table 6.73.5-1: Reference sensitivity exceptions for Scell due to dual uplink operation for DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc  (MHz) | UL BW (MHz) | UL  RB # | DL Fc  (MHz) | DL BW  (MHz) | MSD  (dB) |
| DC\_71A\_n66A-n78A | 71 | IMD3 | |2\*fB71 -fn78| | 693 | 5 | 25 | 647 | 5 | **N/A** |
| n78 | 3546 | 10 | 50 | 3546 | 10 |
| n66 | 1760 | 5 | 25 | 2160 | 5 | **15.5** |

## 6.74 DC\_5\_n38-n66

### 6.74.5 MSD

Based on Table 5.3-1 in TR 37.717-11-21, there are IMD2 and IMD3 produced by Band 5 and NR band n66 that impact the reference sensitivity of NR band n38.

The required MSD levels and test configuration are shown in the following Table.

Table 6.74.5-1: Reference sensitivity exceptions for Scell due to dual uplink operation for DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc  (MHz) | UL BW (MHz) | UL  RB # | DL Fc  (MHz) | DL BW  (MHz) | MSD  (dB) |
| DC\_5A\_n38A-n66A | 5 | IMD2 | |fB5 +fn66| | 830 | 5 | 25 | 875 | 5 | **N/A** |
| n66 | 1760 | 5 | 25 | 2160 | 5 |
| n38 | 2590 | 5 | 25 | 2590 | 5 | **28.9** |
| 5 | IMD3 | |fB5 -2\*fn66| | 830 | 5 | 25 | 875 | 5 | **N/A** |
| n66 | 1720 | 5 | 25 | 2120 | 5 |
| n38 | 2610 | 5 | 25 | 2610 | 5 | **16.4** |

## 6.75 DC\_12\_n2-n38

### 6.75.5 MSD

Based on Table 5.3-1 in TR 37.717-11-21, there is IMD2 produced by Band 12 and NR band n2 that impact the reference sensitivity of NR band n38.

The required MSD levels and test configuration are shown in the following Table.

Table 6.75.5-1: Reference sensitivity exceptions for Scell due to dual uplink operation for DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc  (MHz) | UL BW (MHz) | UL  RB # | DL Fc  (MHz) | DL BW  (MHz) | MSD  (dB) |
| DC\_12A\_n2A-n38A | 12 | IMD2 | |fn2 +fB12| | 708 | 5 | 25 | 738 | 5 | **N/A** |
| n2 | 1900 | 5 | 25 | 1980 | 5 |
| n38 | 2608 | 5 | 25 | 2608 | 5 | **28.7** |

## 6.76 DC\_12\_n2-n41

### 6.76.5 MSD

Based on Table 5.3-1 in TR 37.717-11-21, there is IMD2 produced by Band 12 and NR band n2 that impact the reference sensitivity of NR band n41.

The required MSD levels and test configuration are shown in the following Table.

Table 6.76.5-1: Reference sensitivity exceptions for Scell due to dual uplink operation for DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc  (MHz) | UL BW (MHz) | UL  RB # | DL Fc  (MHz) | DL BW  (MHz) | MSD  (dB) |
| DC\_12A\_n2A-n41A | 12 | IMD2 | |fn2 +fB12| | 708 | 5 | 25 | 738 | 5 | **N/A** |
| n2 | 1900 | 5 | 25 | 1980 | 5 |
| n41 | 2608 | 5 | 25 | 2608 | 5 | **28.7** |

## 6.77 DC\_71\_n2-n78

### 6.77.5 MSD

Based on Table 5.3-1 in TR 37.717-11-21, there is IMD3 produced by Band 71 and NR band n2 that impact the reference sensitivity of NR band n78.

The required MSD levels and test configuration are shown in the following Table.

Table 6.77.5-1: Reference sensitivity exceptions for Scell due to dual uplink operation for DC in NR FR1 (three bands)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC bands | UL DC | IMD | | UL Fc  (MHz) | UL BW (MHz) | UL  RB # | DL Fc  (MHz) | DL BW  (MHz) | MSD  (dB) |
| DC\_71A\_n2A-n78A | n2 | IMD3 | |fn2 +2\*fB71| | 1907.5 | 5 | 25 | 1987.5 | 5 | **N/A** |
| B71 | 695.5 | 5 | 25 | 649.5 | 5 |
| n78 | 3305 | 10 | 50 | 3305 | 10 | **8.0** |

# 7 Dual Connectivity band combinations of LTE 2 bands DL/1UL + NR 2 bands DL/1UL: Specific Band Combination Part

## 7.1 DC\_3-7\_n1-n257, DC\_3-3-7\_n1-n257, DC\_3-7-7\_n1-n257, DC\_3-3-7-7\_n1-n257

### 7.1.1 Operating bands for DC

**Table 7.1.1-1: DC band combination of one LTE band + inter-band NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_3-7\_n1-n257  DC\_3-3-7\_n1-n257  DC\_3-7-7\_n1-n257  DC\_3-3-7-7\_n1-n257 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz |
| n257 | 26500 MHz | – | 29500 MHz | 26500 MHz | – | 29500 MHz | TDD |

### 7.1.2 Channel bandwidths per operating band for DC

**Table 7.1.2-1: Supported bandwidths per DC one LTE band + inter-band NR 2DL/1UL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **Channel bandwidth set** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A-7A\_n1A-n257D  DC\_3A-7A\_n1A-n257E  DC\_3A-7A\_n1A-n257F  DC\_3A-7A\_n1A-n257G  DC\_3A-7A\_n1A-n257H  DC\_3A-7A\_n1A-n257I  DC\_3A-7A\_n1A-n257J  DC\_3A-7A\_n1A-n257K  DC\_3A-7A\_n1A-n257L  DC\_3A-7A\_n1A-n257M | DC\_3A\_n1A  DC\_3A\_n257A  DC\_7A\_n1A  DC\_7A\_n257A | 3 | See CA\_3A-7A in TS 36.101 | 460  660  860  260  360  460  560  660  760  860 |
| 7 |
| n1 | See CA\_n1A-n257D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n257 |
| DC\_3A-3A-7A\_n1A-n257D  DC\_3A-3A-7A\_n1A-n257E  DC\_3A-3A-7A\_n1A-n257F  DC\_3A-3A-7A\_n1A-n257G  DC\_3A-3A-7A\_n1A-n257H  DC\_3A-3A-7A\_n1A-n257I  DC\_3A-3A-7A\_n1A-n257J  DC\_3A-3A-7A\_n1A-n257K  DC\_3A-3A-7A\_n1A-n257L  DC\_3A-3A-7A\_n1A-n257M | DC\_3A\_n1A  DC\_3A\_n257A  DC\_7A\_n1A  DC\_7A\_n257A | 3 | See CA\_3A-3A-7A in TS 36.101 | 480  680  880  280  380  480  580  680  780  880 |
| 7 |
| n1 | See CA\_n1A-n257D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n257 |
| DC\_3A-7A-7A\_n1A-n257D  DC\_3A-7A-7A\_n1A-n257E  DC\_3A-7A-7A\_n1A-n257F  DC\_3A-7A-7A\_n1A-n257G  DC\_3A-7A-7A\_n1A-n257H  DC\_3A-7A-7A\_n1A-n257I  DC\_3A-7A-7A\_n1A-n257J  DC\_3A-7A-7A\_n1A-n257K  DC\_3A-7A-7A\_n1A-n257L  DC\_3A-7A-7A\_n1A-n257M | DC\_3A\_n1A  DC\_3A\_n257A  DC\_7A\_n1A  DC\_7A\_n257A | 3 | See CA\_3A-7A-7A in TS 36.101 | 480  680  880  280  380  480  580  680  780  880 |
| 7 |
| n1 | See CA\_n1A-n257D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n257 |
| DC\_3A-3A-7A-7A\_n1A-n257D  DC\_3A-3A-7A-7A\_n1A-n257E  DC\_3A-3A-7A-7A\_n1A-n257F  DC\_3A-3A-7A-7A\_n1A-n257G  DC\_3A-3A-7A-7A\_n1A-n257H  DC\_3A-3A-7A-7A\_n1A-n257I  DC\_3A-3A-7A-7A\_n1A-n257J  DC\_3A-3A-7A-7A\_n1A-n257K  DC\_3A-3A-7A-7A\_n1A-n257L  DC\_3A-3A-7A-7A\_n1A-n257M | DC\_3A\_n1A  DC\_3A\_n257A  DC\_7A\_n1A  DC\_7A\_n257A | 3 | See CA\_3A-3A-7A-7A in TS 36.101 | 500  700  900  300  400  500  600  700  800  900 |
| 7 |
| n1 | See CA\_n1A-n257D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n257 |

### 7.1.3 Co-existence studies

Based on co-existence studies of DC\_3A\_n1A and DC\_3A\_n257A specified in TR 37.716-11-11, TR 37.863-01-01, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.1.4 ∆TIB and ∆RIB values

For DC\_3-7\_n1-n257, DC\_3-3-7\_n1-n257, DC\_3-7-7\_n1-n257, DC\_3-3-7-7\_n1-n257, ΔTIB,c and ΔRIB,c values are already mentioned in 37.716-21-21 under the same band combinations with n257A.

### 7.1.5 MSD

No additional MSD requirement is needed.

## 7.2 DC\_1-42\_n28-n77

### 7.2.1 Operating bands for DC

Table 7.2.1-1: DC band combination of LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_1-42\_n28-n77 | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 7.2.2 Channel bandwidths per operating band for DC

Table 7.2.2-1: Supported bandwidths per DC LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth For DL**  **[MHz]** |
| DC\_1A-42A\_n28A-n77A | DC\_1A\_n28A  DC\_1A\_n77A  DC\_42A\_n28A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 160 |
| 42 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| DC\_1A-42A\_n28A-n77(2A) | DC\_1A\_n28A  DC\_1A\_n77A  DC\_42A\_n28A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 260 |
| 42 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | See CA\_n77(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | |  |
| DC\_1A-42C\_n28A-n77A | DC\_1A\_n28A  DC\_1A\_n77A  DC\_42A\_n28A  DC\_42C\_n28A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 180 |
| 42 | See CA\_42C Bandwidth Combination Set 0 in Table 5.6A.1 in TS36.101 | | | | | | | | | | | | | |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| DC\_1A-42C\_n28A-n77(2A) | DC\_1A\_n28A  DC\_1A\_n77A  DC\_42A\_n28A  DC\_42C\_n28A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 280 |
| 42 | See CA\_42C Bandwidth Combination Set 0 in Table 5.6A.1 in TS36.101 | | | | | | | | | | | | | |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | See CA\_n77(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | |  |

### 7.2.3 Co-existence studies

Co-existence studies of this DC LTE inter-band 2DL/1UL + inter-band NR 2DL/1UL are already covered by the fallback configurations, DC\_1-42\_n28, DC\_1-42\_n77, DC\_1\_n28-n77 and DC\_42\_n28-n77. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.2.4 ∆TIB and ∆RIB values

For DC\_1-42\_n28-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 7.2.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_1-42\_n28-n77 | 1 | 0.6 |
| 42 | 0.8 |
| n28 | 0.8 |
| n77 | 0.8 |

Table 7.2.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_1-42\_n28-n77 | 1 | 0.2 |
| 42 | 0.5 |
| n28 | 0.5 |
| n77 | 0.5 |

### 7.2.5 MSD

As mentioned in 7.2.3, there is no need to specify additional MSD requirement for this UL DC configuration.

## 7.3 DC\_3-42\_n28-n77

### 7.3.1 Operating bands for DC

Table 7.3.1-1: DC band combination of LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_3-42\_n28-n77 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 7.3.2 Channel bandwidths per operating band for DC

Table 7.3.2-1: Supported bandwidths per DC LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth For DL**  **[MHz]** |
| DC\_3A-42A\_n28A-n77A | DC\_3A\_n28A  DC\_3A\_n77A  DC\_42A\_n28A | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 160 |
| 42 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| DC\_3A-42A\_n28A-n77(2A) | DC\_3A\_n28A  DC\_3A\_n77A  DC\_42A\_n28A | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 260 |
| 42 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | See CA\_n77(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | |
| DC\_3A-42C\_n28A-n77A | DC\_3A\_n28A  DC\_3A\_n77A  DC\_42A\_n28A  DC\_42C\_n28A | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 180 |
| 42 | See CA\_42C Bandwidth Combination Set 0 in Table 5.6A.1 in TS36.101 | | | | | | | | | | | | | |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| DC\_3A-42C\_n28A-n77(2A) | DC\_3A\_n28A  DC\_3A\_n77A  DC\_42A\_n28A  DC\_42C\_n28A | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 280 |
| 42 | See CA\_42C Bandwidth Combination Set 0 in Table 5.6A.1 in TS36.101 | | | | | | | | | | | | | |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | See CA\_n77(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | |

### 7.3.3 Co-existence studies

Co-existence studies of this DC LTE inter-band 2DL/1UL + inter-band NR 2DL/1UL are already covered by the fallback configurations, DC\_3-42\_n28, DC\_3-42\_n77, DC\_3\_n28-n77 and DC\_42\_n28-n77. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.3.4 ∆TIB and ∆RIB values

For DC\_3-42\_n28-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 7.3.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_3-42\_n28-n77 | 3 | 0.6 |
| 42 | 0.8 |
| n28 | 0.8 |
| n77 | 0.8 |

Table 7.3.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_3-42\_n28-n77 | 3 | 0.2 |
| 42 | 0.5 |
| n28 | 0.5 |
| n77 | 0.5 |

### 7.3.5 MSD

As mentioned in 7.3.3, there is no need to specify additional MSD requirement for this UL DC configuration.

## 7.4 DC\_8-42\_n28-n77

### 7.4.1 Operating bands for DC

Table 7.4.1-1: DC band combination of LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_8-42\_n28-n77 | 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 7.4.2 Channel bandwidths per operating band for DC

Table 7.4.2-1: Supported bandwidths per DC LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth For DL**  **[MHz]** |
| DC\_8A-42A\_n28A-n77A | DC\_8A\_n28A  DC\_8A\_n77A  DC\_42A\_n28A | 8 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 150 |
| 42 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| DC\_8A-42A\_n28A-n77(2A) | DC\_8A\_n28A  DC\_8A\_n77A  DC\_42A\_n28A | 8 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 250 |
| 42 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | See CA\_n77(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | |
| DC\_8A-42C\_n28A-n77A | DC\_8A\_n28A  DC\_8A\_n77A  DC\_42A\_n28A  DC\_42C\_n28A | 8 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 170 |
| 42 | See CA\_42C Bandwidth Combination Set 0 in Table 5.6A.1 in TS36.101 | | | | | | | | | | | | | |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| DC\_8A-42C\_n28A-n77(2A) | DC\_8A\_n28A  DC\_8A\_n77A  DC\_42A\_n28A  DC\_42C\_n28A | 8 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 270 |
| 42 | See CA\_42C Bandwidth Combination Set 0 in Table 5.6A.1 in TS36.101 | | | | | | | | | | | | | |
| n28 | 15 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | See CA\_n77(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | |

### 7.4.3 Co-existence studies

Co-existence studies of this DC LTE inter-band 2DL/1UL + inter-band NR 2DL/1UL are already covered by the fallback configurations, DC\_8-42\_n28, DC\_8-42\_n77, DC\_8\_n28-n77 and DC\_42\_n28-n77. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.4.4 ∆TIB and ∆RIB values

For DC\_8-42\_n28-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 7.4.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_8-42\_n28-n77 | 8 | 0.6 |
| 42 | 0.8 |
| n28 | 0.8 |
| n77 | 0.8 |

Table 7.4.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_8-42\_n28-n77 | 8 | 0.2 |
| 42 | 0.5 |
| n28 | 0.5 |
| n77 | 0.5 |

### 7.4.5 MSD

As mentioned in 7.4.3, there is no need to specify additional MSD requirement for this UL DC configuration.

7.5 DC\_1-3\_n28-n41

7.5.1 Operating bands for DC

**Table 7.5.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_1A-3A\_n28A-n41A | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n41 | 2496MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |

7.5.2 Channel bandwidths per operating band for DC

**Table 7.5.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_1A-3A\_n28A-n41A | DC\_1A\_n28A  DC\_1A\_n41A  DC\_3A\_n28A  DC\_3A\_n41A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 170 |
| 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n41 | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |

7.5.3 Co-existence studies

Co-existence studies of DC\_1A-3A\_n28A-n41A and protected bands are already covered in the constituent fall-back modes.

7.5.4 ∆TIB and ∆RIB values

The ΔTIB,c and ΔRIB,c values of DC\_1-3\_n28-n41 are given in the tables below reusing the values for DC\_ DC\_1-3-41\_n28.

**Table 7.5.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3\_n28-n41 | 1 | 0.6 |
| 3 | 0.6 |
| n28 | 0.5 |
| n41 | 0.31/0.82 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

**Table 7.5.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3\_n28-n41 | 1 | 0 |
| 3 | 0 |
| n28 | 0.2 |
| n41 | 01/0.52 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

7.5.5 MSD

All MSD requirements forDC\_1-3\_n28-n41 are already covered by constituent fallback modes. No additional MSD requirement is needed.

## 7.6 DC\_2-48\_n48-n66

### 7.6.1 Operating bands for DC

**Table 7.6.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_2-48\_n48-n66 | 2 | 1850 MHz | – | 1910 MHz | 1930 MHz | – | 1990 MHz | FDD |
| 48 | 3550 MHz | – | 3700 MHz | 3550 MHz | – | 3700 MHz | TDD |
| n48 | 3550 MHz | – | 3700 MHz | 3550 MHz | – | 3700 MHz | TDD |
| n66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |

### 7.6.2 Configuration for DC

Table 7.6.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_2A-48A\_n48A-n66A | DC\_2A\_n48A  DC\_2A\_n66A  DC\_48A\_n66A | CA\_2A-48A | CA\_n48A-n66A |

### 7.6.3 Co-existence studies

Co-existence studies are captured in TR 37.716-11-11 as well as for lower order combinations in TR 37.716-21-21.

### 7.6.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.6.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_2-48\_n48-n66 | 2 | 0.6 |
| 48 | 0.8 |
| n48 | 0.8 |
| n66 | 0.6 |

**Table 7.6.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_2-48\_n48-n66 | 2 | 0.3 |
| 48 | 0.4 |
| n48 | 0.4 |
| n66 | 0.3 |

### 7.6.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.7 DC\_48-66\_n25-n48

### 7.7.1 Operating bands for DC

**Table 7.7.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_48-66\_n25-n48 | 48 | 3550 MHz | – | 3700 MHz | 3550 MHz | – | 3700 MHz | TDD |
| 66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |
| n25 | 1850 MHz | – | 1915 MHz | 1930 MHz | – | 1995 MHz | FDD |
| n48 | 3550 MHz | – | 3700 MHz | 3550 MHz | – | 3700 MHz | TDD |

### 7.7.2 Configuration for DC

Table 7.7.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_48A-66A\_n25A-n48A | DC\_48A\_n25A  DC\_66A\_n25A  DC\_66A\_n48A | CA\_48A-66A | CA\_n25A-n48A |

### 7.7.3 Co-existence studies

Co-existence studies are captured in TR 37.716-11-11 as well as for lower order combinations in TR 37.716-21-21.

### 7.7.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.7.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_48-66\_n25-n48 | 48 | 0.8 |
| 66 | 0.6 |
| n25 | 0.6 |
| n48 | 0.8 |

**Table 7.7.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_48-66\_n25-n48 | 48 | 0.4 |
| 66 | 0.3 |
| n25 | 0.3 |
| n48 | 0.4 |

### 7.7.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.8 DC\_1-8\_n40-n78

### 7.8.1 Operating bands for DC

**Table 7.8.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_1-8\_n40-n78 | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 7.8.2 Configuration for DC

Table 7.8.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_1A-8A\_n40A-n78A | DC\_1A\_n40A  DC\_1A\_n78A  DC\_8A\_n40A  DC\_8A\_n78A | CA\_1A-8A | CA\_n40A-n78A |

### 7.8.3 Co-existence studies

Co-existence studies are captured in TR 37.716-11-11 as well as for lower order combinations in TR 37.716-21-21.

### 7.8.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.8.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-8\_n40-n78 | 1 | 0.5 |
| 8 | 0.3 |
| n40 | 0.5 |
| n78 | 0.8 |

**Table 7.8.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_1-8\_n40-n78 | 1 | 0 |
| 8 | 0.2 |
| n40 | 0.4 |
| n78 | 0.5 |

### 7.8.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.9 DC\_3-7\_n1-n40

### 7.9.1 Operating bands for DC

**Table 7.9.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-7\_n1-n40 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |

### 7.9.2 Configuration for DC

Table 7.9.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-7A\_n1A-n40A | DC\_3A\_n1A  DC\_3A\_n40A  DC\_7A\_n1A  DC\_7A\_n40A | CA\_3A-7A | CA\_n1A-n40A |

### 7.9.3 Co-existence studies

Co-existence studies are captured in TR 37.716-11-11 as well as for lower order combinations in TR 37.716-21-21.

### 7.9.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.9.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-7\_n1-n40 | 3 | 0.6 |
| 7 | 0.8 |
| n1 | 0.6 |
| n40 | 0.9 |

**Table 7.9.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-7\_n1-n40 | 3 | 0 |
| 7 | 0.3 |
| n1 | 0 |
| n40 | 0.8 |

### 7.9.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.10 DC\_3-8\_n40-n78

### 7.10.1 Operating bands for DC

**Table 7.10.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-8\_n40-n78 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 7.10.2 Configuration for DC

Table 7.10.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  Configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-8A\_n40A-n78A | DC\_3A\_n40A  DC\_3A\_n78A  DC\_8A\_n40A  DC\_8A\_n78A | CA\_3A-8A | CA\_n40A-n78A |

### 7.10.3 Co-existence studies

Co-existence studies are captured in TR 37.716-11-11 as well as for lower order combinations in TR 37.716-21-21.

### 7.10.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.10.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-8\_n40-n78 | 3 | 0.6 |
| 8 | 0.3 |
| n40 | 0.5 |
| n78 | 0.8 |

**Table 7.10.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-8\_n40-n78 | 3 | 0.2 |
| 8 | 0.2 |
| n40 | 0.4 |
| n78 | 0.5 |

### 7.10.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.11 DC\_3-28\_n1-n40

### 7.11.1 Operating bands for DC

**Table 7.11.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-28\_n1-n40 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |

### 7.11.2 Configuration for DC

Table 7.11.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-28A\_n1A-n40A | DC\_3A\_n1A  DC\_3A\_n40A  DC\_28A\_n1A  DC\_28A\_n40A | CA\_3A-28A | CA\_n1A-n40A |

### 7.11.3 Co-existence studies

Co-existence studies are captured in TR 37.716-11-11 as well as for lower order combinations in TR 37.716-21-21.

### 7.11.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.11.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-28\_n1-n40 | 3 | 0.5 |
| 28 | 0.6 |
| n1 | 0.5 |
| n40 | 0.5 |

**Table 7.11.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-28\_n1-n40 | 3 | 0 |
| 28 | 0.2 |
| n1 | 0 |
| n40 | 0 |

### 7.11.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.12 DC\_7-8\_n40-n78

### 7.12.1 Operating bands for DC

**Table 7.12.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_7-8\_n40-n78 | 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 7.12.2 Configuration for DC

Table 7.12.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  Configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_7A-8A\_n40A-n78A | DC\_7A\_n40A  DC\_7A\_n78A  DC\_8A\_n40A  DC\_8A\_n78A | CA\_7A-8A | CA\_n40A-n78A |

### 7.12.3 Co-existence studies

Co-existence studies are captured in TR 37.716-11-11 as well as for lower order combinations in TR 37.716-21-21.

### 7.12.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.12.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_7-8\_n40-n78 | 7 | 0.5 |
| 8 | 0.3 |
| n40 | 0.5 |
| n78 | 0.8 |

**Table 7.12.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_7-8\_n40-n78 | 7 | 0 |
| 8 | 0.2 |
| n40 | 0.4 |
| n78 | 0.5 |

### 7.12.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.13 DC\_7-28\_n1-n40

### 7.13.1 Operating bands for DC

**Table 7.13.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_7-28\_n1-n40 | 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| 28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |

### 7.13.2 Configuration for DC

Table 7.13.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_7A-28A\_n1A-n40A | DC\_7A\_n1A  DC\_7A\_n40A  DC\_28A\_n1A  DC\_28A\_n40A | CA\_7A-28A | CA\_n1A-n40A |

### 7.13.3 Co-existence studies

Co-existence studies are captured in TR 37.716-11-11 as well as for lower order combinations in TR 37.716-21-21.

### 7.13.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.13.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_7-28\_n1-n40 | 7 | 0.8 |
| 28 | 0.6 |
| n1 | 0.6 |
| n40 | 0.9 |

**Table 7.13.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_7-28\_n1-n40 | 7 | 0.3 |
| 28 | 0.2 |
| n1 | 0 |
| n40 | 0.8 |

### 7.13.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

7.14 DC\_1-3\_n41-n77

7.14.1 Operating bands for DC

**Table 7.14.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1-3\_n41-n77 | 1, 3 | n41, n77 |

7.14.2 Channel bandwidths per operating band for DC

**Table 7.14.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A-3A\_n41A-n77A | DC\_1A\_n41A  DC\_1A\_n77A  DC\_3A\_n41A  DC\_3A\_n77A | 1 | See CA\_1A-3A BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 3 |
| n41 | See CA\_n41A-n77A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n77 |

7.14.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.14.4 ∆TIB and ∆RIB values

For DC\_1-3\_n41-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.14.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3\_n41-n77 | 1 | 0.6 |
| 3 | 0.6 |
| n41 | 0.5 |
| n77 | 0.8 |

**Table 7.14.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3\_n41-n77 | 1 | 0.2 |
| 3 | 0.2 |
| n41 | 0 |
| n77 | 0.5 |

7.14.5 MSD

There are no additional MSD requirements for this band combination.

7.15 DC\_1-3\_n3-n41

7.15.1 Operating bands for DC

**Table 7.15.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1-3\_n3-n41 | 1, 3 | n3, n41 |

7.15.2 Channel bandwidths per operating band for DC

**Table 7.15.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A-3A\_n3A-n41A | DC\_1A\_n3A  DC\_1A\_n41A  DC\_3A\_n3A1  DC\_3A\_n41A | 1 | See CA\_1A-3A BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 3 |
| n3 | See CA\_n3A-n41A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n41 |
| NOTE1: Only single switched UL is supported. | | | | | | | | | | | | | | | | |

7.15.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.15.4 ∆TIB and ∆RIB values

For DC\_1-3\_n3-n41, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.15.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3\_n3-n41 | 1 | 0.5 |
| 3 | 0.5 |
| n3 | 0.5 |
| n41 | 0.31/0.82 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

**Table 7.15.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3\_n3-n41 | 1 | 0 |
| 3 | 0 |
| n3 | 0 |
| n41 | 01/0.52 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

7.15.5 MSD

There are no additional MSD requirements for this band combination.

7.16 DC\_1-3\_n3-n77

7.16.1 Operating bands for DC

**Table 7.16.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1-3\_n3-n77 | 1, 3 | n3, n77 |

7.16.2 Channel bandwidths per operating band for DC

**Table 7.16.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A-3A\_n3A-n77A | DC\_1A\_n3A  DC\_1A\_n77A  DC\_3A\_n3A1  DC\_3A\_n77A | 1 | See CA\_1A-3A BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 3 |
| n3 | See CA\_n3A-n77A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n77 |
| NOTE1: Only single switched UL is supported. | | | | | | | | | | | | | | | | |

7.16.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.16.4 ∆TIB and ∆RIB values

For DC\_1-3\_n3-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.16.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3\_n3-n77 | 1 | 0.6 |
| 3 | 0.6 |
| n3 | 0.6 |
| n77 | 0.8 |

**Table 7.16.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3\_n3-n77 | 1 | 0.2 |
| 3 | 0.2 |
| n3 | 0.2 |
| n77 | 0.5 |

7.16.5 MSD

There are no additional MSD requirements for this band combination.

7.17 DC\_1-3\_n3-n78

7.17.1 Operating bands for DC

**Table 7.17.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1-3\_n3-n78 | 1, 3 | n3, n78 |

7.17.2 Channel bandwidths per operating band for DC

**Table 7.17.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A-3A\_n3A-n78A | DC\_1A\_n3A  DC\_1A\_n78A  DC\_3A\_n3A1  DC\_3A\_n78A | 1 | See CA\_1A-3A BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 3 |
| n3 | See CA\_n3A-n78A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n78 |
| NOTE1: Only single switched UL is supported. | | | | | | | | | | | | | | | | |

7.17.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.17.4 ∆TIB and ∆RIB values

For DC\_1-3\_n3-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.17.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3\_n3-n78 | 1 | 0.6 |
| 3 | 0.6 |
| n3 | 0.6 |
| n78 | 0.8 |

**Table 7.17.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3\_n3-n78 | 1 | 0.2 |
| 3 | 0.2 |
| n3 | 0.2 |
| n78 | 0.5 |

7.17.5 MSD

There are no additional MSD requirements for this band combination.

7.18 DC\_1-18\_n3-n77

7.18.1 Operating bands for DC

**Table 7.18.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1-18\_n3-n77 | 1, 18 | n3, n77 |

7.18.2 Channel bandwidths per operating band for DC

**Table 7.18.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A-18A\_n3A-n77A | DC\_1A\_n3A  DC\_1A\_n77A | 1 | See CA\_1A-18A BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 18 |
| n3 | See CA\_n3A-n77A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n77 |

7.18.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.18.4 ∆TIB and ∆RIB values

For DC\_1-18\_n3-n77, the ΔTIB,c and ΔRIB,c values have existed in TS 38.101-3.

7.18.5 MSD

There are no additional MSD requirements for this band combination.

7.19 DC\_1-41\_n3-n41

7.19.1 Operating bands for DC

**Table 7.19.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1-41\_n3-n41 | 1, 41 | n3, n41 |

7.19.2 Channel bandwidths per operating band for DC

**Table 7.19.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A-41A\_n3A-n41A | DC\_1A\_n3A  DC\_1A\_n41A  DC\_41A\_n3A | 1 | See CA\_1A-41A BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 41 |
| n3 | See CA\_n3A-n41A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n41 |

7.19.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.19.4 ∆TIB and ∆RIB values

For DC\_1-41\_n3-n41, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.19.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-41\_n3-n41 | 1 | 0.5 |
| 41 | 0.31/0.82 |
| n3 | 0.5 |
| n41 | 0.31/0.82 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

**Table 7.19.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-41\_n3-n41 | 1 | 0 |
| 41 | 01/0.52 |
| n3 | 0 |
| n41 | 01/0.52 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

7.19.5 MSD

There are no additional MSD requirements for this band combination.

7.20 DC\_1-41\_n3-n77

7.20.1 Operating bands for DC

**Table 7.20.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1-41\_n3-n77 | 1, 41 | n3, n77 |

7.20.2 Channel bandwidths per operating band for DC

**Table 7.20.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A-41A\_n3A-n77A | DC\_1A\_n3A  DC\_1A\_n77A | 1 | See CA\_1A-41A BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 41 |
| n3 | See CA\_n3A-n77A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n77 |

7.20.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.20.4 ∆TIB and ∆RIB values

For DC\_1-41\_n3-n77, the ΔTIB,c and ΔRIB,c values are already defined in TS 38.101-3.

7.20.5 MSD

There are no additional MSD requirements for this band combination.

7.21 DC\_1-41\_n3-n78

7.21.1 Operating bands for DC

**Table 7.21.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1-41\_n3-n78 | 1, 41 | n3, n78 |

7.21.2 Channel bandwidths per operating band for DC

**Table 7.21.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A-41A\_n3A-n78A | DC\_1A\_n3A  DC\_1A\_n78A | 1 | See CA\_1A-41A BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 41 |
| n3 | See CA\_n3A-n78A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n78 |

7.21.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.21.4 ∆TIB and ∆RIB values

For DC\_1-41\_n3-n78, the ΔTIB,c and ΔRIB,c values are already defined in TS 38.101-3.

7.21.5 MSD

There are no additional MSD requirements for this band combination.

7.22 DC\_1-41\_n41-n77

7.22.1 Operating bands for DC

**Table 7.22.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1-41\_n41-n77 | 1, 41 | n41, n77 |

7.22.2 Channel bandwidths per operating band for DC

**Table 7.22.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A-41A\_n41A-n77A | DC\_1A\_n41A  DC\_1A\_n77A  DC\_41A\_n77A | 1 | See CA\_1A-41A BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 41 |
| n41 | See CA\_n41A-n77A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n77 |

7.22.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.22.4 ∆TIB and ∆RIB values

For DC\_1-41\_n41-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.22.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-41\_n41-n77 | 1 | 0.5 |
| 41 | 0.5 |
| n41 | 0.5 |
| n77 | 0.8 |

**Table 7.22.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-41\_n41-n77 | 1 | 0 |
| 41 | 0 |
| n41 | 0 |
| n77 | 0.5 |

7.22.5 MSD

There are no additional MSD requirements for this band combination.

7.23 DC\_1-41\_n41-n78

7.23.1 Operating bands for DC

**Table 7.23.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1-41\_n41-n78 | 1, 41 | n41, n78 |

7.23.2 Channel bandwidths per operating band for DC

**Table 7.23.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A-41A\_n41A-n78A | DC\_1A\_n41A  DC\_1A\_n78A  DC\_41A\_n78A | 1 | See CA\_1A-41A BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 41 |
| n41 | See CA\_n41A-n78A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n78 |

7.23.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.23.4 ∆TIB and ∆RIB values

For DC\_1-41\_n41-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.23.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-41\_n41-n78 | 1 | 0.5 |
| 41 | 0.5 |
| n41 | 0.5 |
| n78 | 0.8 |

**Table 7.23.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-41\_n41-n78 | 1 | 0 |
| 41 | 0 |
| n41 | 0 |
| n78 | 0.5 |

7.23.5 MSD

There are no additional MSD requirements for this band combination.

7.24 DC\_3-18\_n3-n77

7.24.1 Operating bands for DC

**Table 7.24.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_3-18\_n3-n77 | 3, 18 | n3, n77 |

7.24.2 Channel bandwidths per operating band for DC

**Table 7.24.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_3A-18A\_n3A-n77A | DC\_3A\_n3A1  DC\_3A\_n77A  DC\_18A\_n3A  DC\_18A\_n77A | 3 | See CA\_3A-18A BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 18 |
| n3 | See CA\_n3A-n77A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n77 |
| n77 |
| NOTE1: Only single switched UL is supported. | | | | | | | | | | | | | | | | |

7.24.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.24.4 ∆TIB and ∆RIB values

For DC\_3-18\_n3-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.24.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-18\_n3-n77 | 3 | 0.6 |
| 18 | 0.3 |
| n3 | 0.6 |
| n77 | 0.8 |

**Table 7.24.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3-18\_n3-n77 | 3 | 0.2 |
| 18 | 0 |
| n3 | 0.2 |
| n77 | 0.5 |

7.24.5 MSD

There are no additional MSD requirements for this band combination.

7.25 DC\_3-18\_n3-n78

7.25.1 Operating bands for DC

**Table 7.25.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_3-18\_n3-n78 | 3, 18 | n3, n78 |

7.25.2 Channel bandwidths per operating band for DC

**Table 7.25.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_3A-18A\_n3A-n78A | DC\_3A\_n3A  DC\_3A\_n78A  DC\_18A\_n3A  DC\_18A\_n78A | 3 | See CA\_3A-18A BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 18 |
| n3 | See CA\_n3A-n78A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n78 |

7.25.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.25.4 ∆TIB and ∆RIB values

For DC\_3-18\_n3-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.25.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-18\_n3-n78 | 3 | 0.6 |
| 18 | 0.3 |
| n3 | 0.6 |
| n78 | 0.8 |

**Table 7.25.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3-18\_n3-n78 | 3 | 0.2 |
| 18 | 0 |
| n3 | 0.2 |
| n78 | 0.5 |

7.25.5 MSD

There are no additional MSD requirements for this band combination.

7.26 DC\_3-41\_n3-n41

7.26.1 Operating bands for DC

**Table 7.26.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_3-41\_n3-n41 | 3, 41 | n3, n41 |

7.26.2 Channel bandwidths per operating band for DC

**Table 7.26.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_3A-41A\_n3A-n41A | DC\_3A\_n3A1  DC\_3A\_n41A  DC\_41A\_n3A | 3 | See CA\_3A-41A BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 41 |
| n3 | See CA\_n3A-n41A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n41 |
| NOTE1: Only single switched UL is supported. | | | | | | | | | | | | | | | | |

7.26.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.26.4 ∆TIB and ∆RIB values

For DC\_3-41\_n3-n41, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.26.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-41\_n3-n41 | 3 | 0.5 |
| 41 | 0.31/0.82 |
| n3 | 0.5 |
| n41 | 0.31/0.82 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

**Table 7.26.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3-41\_n3-n41 | 3 | 0 |
| 41 | 01/0.52 |
| n3 | 0 |
| n41 | 01/0.52 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

7.26.5 MSD

There are no additional MSD requirements for this band combination.

7.27 DC\_3-41\_n3-n77

7.27.1 Operating bands for DC

**Table 7.27.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_3-41\_n3-n77 | 3, 41 | n3, n77 |

7.27.2 Channel bandwidths per operating band for DC

**Table 7.27.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_3A-41A\_n3A-n77A | DC\_3A\_n3A1  DC\_3A\_n77A  DC\_41A\_n3A  DC\_41A\_n77A | 3 | See CA\_3A-41A BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 41 |
| n3 | See CA\_n3A-n77A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n77 |
| DC\_3A-41C\_n3A-n77A | DC\_3A\_n3A1  DC\_3A\_n77A  DC\_41A\_n3A  DC\_41A\_n77A  DC\_41C\_n3A  DC\_41C\_n77A | 3 | See CA\_3A-41C BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 41 |
| n3 | See CA\_n3A-n77A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n77 |
| NOTE1: Only single switched UL is supported. | | | | | | | | | | | | | | | | |

7.27.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.27.4 ∆TIB and ∆RIB values

For DC\_3-41\_n3-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.27.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-41\_n3-n77 | 3 | 0.6 |
| 41 | 0.31/0.82 |
| n3 | 0.6 |
| n77 | 0.8 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

**Table 7.27.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3-41\_n3-n77 | 3 | 0.2 |
| 41 | 01/0.52 |
| n3 | 0.2 |
| n77 | 0.5 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

7.27.5 MSD

There are no additional MSD requirements for this band combination.

7.28 DC\_3-41\_n3-n78

7.28.1 Operating bands for DC

**Table 7.28.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_3-41\_n3-n78 | 3, 41 | n3, n78 |

7.28.2 Channel bandwidths per operating band for DC

**Table 7.28.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_3A-41A\_n3A-n78A | DC\_3A\_n3A1  DC\_3A\_n78A  DC\_41A\_n3A  DC\_41A\_n78A | 3 | See CA\_3A-41A BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 41 |
| n3 | See CA\_n3A-n78A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n78 |
| DC\_3A-41C\_n3A-n78A | DC\_3A\_n3A1  DC\_3A\_n78A  DC\_41A\_n3A  DC\_41A\_n78A  DC\_41C\_n3A  DC\_41C\_n78A | 3 | See CA\_3A-41C BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 41 |
| n3 | See CA\_n3A-n78A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n78 |
| NOTE1: Only single switched UL is supported. | | | | | | | | | | | | | | | | |

7.28.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.28.4 ∆TIB and ∆RIB values

For DC\_3-41\_n3-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.28.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-41\_n3-n78 | 3 | 0.6 |
| 41 | 0.31/0.82 |
| n3 | 0.6 |
| n78 | 0.8 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

**Table 7.28.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3-41\_n3-n78 | 3 | 0.2 |
| 41 | 01/0.52 |
| n3 | 0.2 |
| n78 | 0.5 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

7.28.5 MSD

There are no additional MSD requirements for this band combination.

7.29 DC\_3-41\_n41-n77

7.29.1 Operating bands for DC

**Table 7.29.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_3-41\_n41-n77 | 3, 41 | n41, n77 |

7.29.2 Channel bandwidths per operating band for DC

**Table 7.29.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_3A-41A\_n41A-n77A | DC\_3A\_n41A  DC\_3A\_n77A  DC\_41A\_n77A | 3 | See CA\_3A-41A BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 41 |
| n41 | See CA\_n41A-n77A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n77 |

7.29.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.29.4 ∆TIB and ∆RIB values

For DC\_3-41\_n41-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.29.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-41\_n41-n77 | 3 | 0.6 |
| 41 | 0.31/0.82 |
| n41 | 0.31/0.82 |
| n77 | 0.8 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

**Table 7.29.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3-41\_n41-n77 | 3 | 0.2 |
| 41 | 01/0.52 |
| n41 | 01/0.52 |
| n77 | 0.5 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

7.29.5 MSD

There are no additional MSD requirements for this band combination.

7.30 DC\_3-41\_n41-n78

7.30.1 Operating bands for DC

**Table 7.30.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_3-41\_n41-n78 | 3, 41 | n41, n78 |

7.30.2 Channel bandwidths per operating band for DC

**Table 7.30.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_3A-41A\_n41A-n78A | DC\_3A\_n41A  DC\_3A\_n78A  DC\_41A\_n78A | 3 | See CA\_3A-41A BCS0 in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 41 |
| n41 | See CA\_n41A-n78A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n78 |

7.30.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.30.4 ∆TIB and ∆RIB values

For DC\_3-41\_n41-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.30.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-41\_n41-n78 | 3 | 0.6 |
| 41 | 0.31/0.82 |
| n41 | 0.31/0.82 |
| n78 | 0.8 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

**Table 7.30.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3-41\_n41-n78 | 3 | 0.2 |
| 41 | 01/0.52 |
| n41 | 01/0.52 |
| n78 | 0.5 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

7.30.5 MSD

There are no additional MSD requirements for this band combination.

7.31 DC\_2-7\_n38-n66

7.31.1 Operating bands for DC

**Table 7.31.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_2-7\_n38-n66  DC\_2-7-7\_n38-n66 | 2, 7 | n38, n66 |

7.31.2 Channel bandwidths per operating band for DC

**Table 7.31.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_2A-7A\_n38A-n66A | DC\_2A\_n38A  DC\_2A\_n66A  DC\_7A\_n66A | 2 | See CA\_2A-7A BCS configurations in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 7 |
| n38 | See CA\_n38A-n66A BCS configurations in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n66 |
| DC\_2A-7C\_n38A-n66A | DC\_2A\_n38A  DC\_2A\_n66A  DC\_7A\_n66A | 2 | See CA\_2A-7C BCS configurations in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 7 |
| n38 | See CA\_n38A-n66A BCS configurations in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n66 |
| DC\_2A-7A-7A\_n38A-n66A | DC\_2A\_n38A  DC\_2A\_n66A  DC\_7A\_n66A | 2 | See CA\_2A-7A-7A BCS configurations in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 7 |
| n38 | See CA\_n38A-n66A BCS configurations in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n66 |

7.31.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.31.4 ∆TIB and ∆RIB values

For DC\_2-7\_n38-n66, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.31.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_2-7\_n38-n66  DC\_2-7-7\_n38-n66 | 2 | 0.5 |
| n66 | 0.5 |

**Table 7.31.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_2-7\_n38-n66  DC\_2-7-7\_n38-n66 | 2 | 0.3 |
| n66 | 0.5 |

7.31.5 MSD

There are no additional MSD requirements for this band combination.

7.32 DC\_7-66\_n38-n78 and DC\_7-7-66\_n38-n78

7.32.1 Operating bands for DC

**Table 7.32.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_7-66\_n38-n78  DC\_7-7-66\_n38-n78 | 7, 66 | n38, n78 |

7.32.2 Channel bandwidths per operating band for DC

**Table 7.32.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_7A-66A\_n38A-n78A | DC\_66A\_n38A  DC\_66A\_n78A | 7 | See CA\_7A-66A BCS configurations in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 66 |
| n38 | See CA\_n38A-n78A BCS configurations in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n78 |
| DC\_7A-7A-66A\_n38A-n78A | DC\_66A\_n38A  DC\_66A\_n78A | 7 | See CA\_7A-7A-66A BCS configurations in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 66 |
| n38 | See CA\_n38A-n78A BCS configurations in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n78 |
| DC\_7C-66A\_n38A-n78A | DC\_66A\_n38A  DC\_66A\_n78A | 7 | See CA\_7C-66A BCS configurations in Table 5.6A.1-2 of TS 36.101 | | | | | | | | | | | | | |
| 66 |
| n38 | See CA\_n38A-n78A BCS configurations in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n78 |

7.32.3 Co-existence studies

Co-existence studies of this 4DL/2UL DC configuration are already covered in the constituent fall-back mode.

7.32.4 ∆TIB and ∆RIB values

For DC\_7-66\_n38-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.32.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_7-66\_n38-n78  DC\_7-7-66\_n38-n78 | 66 | 0.6 |
| n78 | 0.8 |

**Table 7.32.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_7-66\_n38-n78  DC\_7-7-66\_n38-n78 | 66 | 0.2 |
| n78 | 0.5 |

7.32.5 MSD

There are no additional MSD requirements for this band combination.

## 7.33 DC\_1-8\_n3-n77

### 7.33.1 Operating bands for DC

Table 7.33.1-1: DC band combination of LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_1-8\_n3-n77 | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz | FDD |
| n3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 7.33.2 Channel bandwidths per operating band for DC

Table 7.33.2-1: Supported bandwidths per DC LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **Subcarrier Spacing**  **[kHz]** | **5**  **MHz** | **10**  **MHz** | **15**  **MHz** | **20**  **MHz** | **25**  **MHz** | **30**  **MHz** | **40**  **MHz** | **50**  **MHz** | **60**  **MHz** | **70**  **MHz** | **80**  **MHz** | **90**  **MHz** | **100**  **MHz** | **Maximum aggregated bandwidth For DL**  **[MHz]** |
| DC\_1A-8A\_n3A-n77A | DC\_1A\_n3A  DC\_1A\_n77A  DC\_8A\_n3A  DC\_8A\_n77A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 160 |
| 8 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| DC\_1A-8A\_n3A-n77(2A) | DC\_1A\_n3A  DC\_1A\_n77A  DC\_8A\_n3A  DC\_8A\_n77A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 260 |
| 8 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n77 | See CA\_n77(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | |

### 7.33.3 Co-existence studies

Co-existence studies of this DC LTE inter-band 2DL/1UL + inter-band NR 2DL/1UL are already covered by the fallback configurations, DC\_1-8\_n3, DC\_1-8\_n77, DC\_1\_n3-n77 and DC\_8\_n3-n77. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.33.4 ∆TIB and ∆RIB values

For DC\_1-8\_n3-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 7.33.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_1-8\_n3-n77 | 1 | 0.6 |
| 8 | 0.6 |
| n3 | 0.8 |
| n77 | 0.8 |

Table 7.33.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_1-8\_n3-n77 | 1 | 0.2 |
| 8 | 0.2 |
| n3 | 0.2 |
| n77 | 0.5 |

### 7.33.5 MSD

As mentioned in 7.33.3, there is no need to specify additional MSD requirement for this UL DC configuration.

## 7.34 DC\_1-11\_n3-n28

### 7.34.1 Operating bands for DC

Table 7.34.1-1: DC band combination of LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_1-11\_n3-n28 | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 11 | 1427.9 MHz | – | 1447.9 MHz | 1475.9 MHz | – | 1495.9 MHz | FDD |
| n3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |

### 7.34.2 Channel bandwidths per operating band for DC

Table 7.34.2-1: Supported bandwidths per DC LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **Subcarrier Spacing**  **[kHz]** | **5**  **MHz** | **10**  **MHz** | **15**  **MHz** | **20**  **MHz** | **25**  **MHz** | **30**  **MHz** | **40**  **MHz** | **50**  **MHz** | **60**  **MHz** | **70**  **MHz** | **80**  **MHz** | **90**  **MHz** | **100**  **MHz** | **Maximum aggregated bandwidth For DL**  **[MHz]** |
| DC\_1A-11A\_n3A-n28A | DC\_1A\_n3A  DC\_1A\_n28A  DC\_11A\_n3A  DC\_11A\_n28A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 80 |
| 11 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |

### 7.34.3 Co-existence studies

Co-existence studies of this DC LTE inter-band 2DL/1UL + inter-band NR 2DL/1UL are already covered by the fallback configurations, DC\_1-11\_n3, DC\_1-11\_n28, DC\_1\_n3-n28 and DC\_11\_n3-n28. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.34.4 ∆TIB and ∆RIB values

For DC\_1-11\_n3-n28, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 7.34.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_1-11\_n3-n28 | 1 | 0.3 |
| 11 | 0.8 |
| n3 | 0.9 |
| n28 | 0.6 |

Table 7.34.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_1-11\_n3-n28 | 1 | 0 |
| 11 | 0.3 |
| n3 | 0.5 |
| n28 | 0.2 |

### 7.34.5 MSD

As mentioned in 7.34.3, there is no need to specify additional MSD requirement for this UL DC configuration.

## 7.35 DC\_8-11\_n3-n28

### 7.35.1 Operating bands for DC

Table 7.35.1-1: DC band combination of LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_8-11\_n3-n28 | 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz | FDD |
| 11 | 1427.9 MHz | – | 1447.9 MHz | 1475.9 MHz | – | 1495.9 MHz | FDD |
| n3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |

### 7.35.2 Channel bandwidths per operating band for DC

Table 7.35.2-1: Supported bandwidths per DC LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **Subcarrier Spacing**  **[kHz]** | **5**  **MHz** | **10**  **MHz** | **15**  **MHz** | **20**  **MHz** | **25**  **MHz** | **30**  **MHz** | **40**  **MHz** | **50**  **MHz** | **60**  **MHz** | **70**  **MHz** | **80**  **MHz** | **90**  **MHz** | **100**  **MHz** | **Maximum aggregated bandwidth For DL**  **[MHz]** |
| DC\_8A-11A\_n3A-n28A | DC\_8A\_n3A  DC\_8A\_n28A  DC\_11A\_n3A  DC\_11A\_n28A | 8 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 70 |
| 11 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |

### 7.35.3 Co-existence studies

Co-existence studies of this DC LTE inter-band 2DL/1UL + inter-band NR 2DL/1UL are already covered by the fallback configurations, DC\_8-11\_n3, DC\_8-11\_n28, DC\_8\_n3-n28 and DC\_11\_n3-n28. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.35.4 ∆TIB and ∆RIB values

For DC\_8-11\_n3-n28, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 7.35.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_8-11\_n3-n28 | 8 | 0.6 |
| 11 | 0.8 |
| n3 | 0.9 |
| n28 | 0.6 |

Table 7.35.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_8-11\_n3-n28 | 8 | 0.2 |
| 11 | 0.3 |
| n3 | 0.5 |
| n28 | 0.2 |

### 7.35.5 MSD

As mentioned in 7.35.3, there is no need to specify additional MSD requirement for this UL DC configuration.

7.36 DC\_1-18\_n28-n41

7.36.1 Operating bands for DC

**Table 7.36.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_1A-18A\_n28A-n41A | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n41 | 2496MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |

7.36.2 Channel bandwidths per operating band for DC

**Table 7.36.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_1A-18A\_n28A-n41A | DC\_1A\_n28A  DC\_1A\_n41A  DC\_18A\_n28A  DC\_18A\_n41A | | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 165 |
| 18 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n41 | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |

7.36.3 Co-existence studies

Co-existence studies of DC\_1A-18A\_n28A-n41A and protected bands are already covered in the constituent fall-back modes.

7.36.4 ∆TIB and ∆RIB values

For DC\_1-18\_n28-n41, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.36.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-18\_n28-n41 | 1 | 0.3 |
| 18 | 0.3 |
| n28 | 0.5 |
| n41 | 0.31 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz. | | |

**Table 7.36.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-18\_n28-n41 | 1 | 0 |
| 18 | 0 |
| n28 | 0.2 |
| n41 | 01 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz. | | |

7.36.5 MSD

All MSD requirements forDC\_1-18\_n28-n41 are already covered by constituent fallback modes. No additional MSD requirement is needed.

7.37 DC\_1-18\_n28-n77

7.37.1 Operating bands for DC

**Table 7.37.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_1A-18A\_n28A-n77A | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n77 | 3300MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

7.37.2 Channel bandwidths per operating band for DC

**Table 7.37.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_1A-18A\_n28A-n77A | DC\_1A\_n28A  DC\_1A\_n77A  DC\_18A\_n28A  DC\_18A\_n77A | | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 165 |
| 18 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |

7.37.3 Co-existence studies

Co-existence studies of DC\_1A-18A\_n28A-n77A and protected bands are already covered in the constituent fall-back modes.

7.37.4 ∆TIB and ∆RIB values

For DC\_1-18\_n28-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.37.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-18\_n28-n77 | 1 | 0.3 |
| 18 | 0.5 |
| n28 | 0.5 |
| n77 | 0.8 |

**Table 7.37.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-18\_n28-n77 | 1 | 0 |
| 18 | 0 |
| n28 | 0 |
| n77 | 0.5 |

7.37.5 MSD

All MSD requirements forDC\_1-18\_n28-n77 are already covered by constituent fallback modes. No additional MSD requirement is needed.

7.38 DC\_1-18\_n28-n78

7.38.1 Operating bands for DC

**Table 7.38.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_1A-18A\_n28A-n78A | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n78 | 3300MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

7.38.2 Channel bandwidths per operating band for DC

**Table 7.38.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_1A-18A\_n28A-n78A | DC\_1A\_n28A  DC\_1A\_n78A  DC\_18A\_n28A  DC\_18A\_n78A | | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 165 |
| 18 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n78 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |

7.38.3 Co-existence studies

Co-existence studies of DC\_1A-18A\_n28A-n78A and protected bands are already covered in the constituent fall-back modes.

7.38.4 ∆TIB and ∆RIB values

For DC\_1-18\_n28-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.38.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-18\_n28-n78 | 1 | 0.3 |
| 18 | 0.5 |
| n28 | 0.5 |
| n78 | 0.8 |

**Table 7.38.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-18\_n28-n78 | 1 | 0 |
| 18 | 0 |
| n28 | 0 |
| n78 | 0.5 |

7.38.5 MSD

All MSD requirements forDC\_1-18\_n28-n78 are already covered by constituent fallback modes. No additional MSD requirement is needed.

7.39 DC\_1-18\_n3-n41

7.39.1 Operating bands for DC

**Table 7.39.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_1A-18A\_n3A-n41A | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n41 | 2496MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |

7.39.2 Channel bandwidths per operating band for DC

**Table 7.39.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_1A-18A\_n3A-n41A | DC\_1A\_n3A  DC\_1A\_n41A  DC\_18A\_n3A  DC\_18A\_n41A | | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 175 |
| 18 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| n41 | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |

7.39.3 Co-existence studies

Co-existence studies of DC\_1A-18A\_n3A-n41A and protected bands are already covered in the constituent fall-back modes.

7.39.4 ∆TIB and ∆RIB values

For DC\_1-18\_n3-n41, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.39.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-18\_n3-n41 | 1 | 0.3 |
| 18 | 0.3 |
| n3 | 0.3 |
| n41 | 0.31 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz. | | |

**Table 7.39.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-18\_n3-n41 | 1 | 0 |
| 18 | 0 |
| n3 | 0 |
| n41 | 01 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz. | | |

7.39.5 MSD

All MSD requirements forDC\_1-18\_n3-n41 are already covered by constituent fallback modes. No additional MSD requirement is needed.

7.40 DC\_1-18\_n41-n77

7.40.1 Operating bands for DC

**Table 7.40.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_1A-18A\_n41A-n77A | 1 | 1920MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n41 | 2496MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |
| n77 | 3300MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

7.40.2 Channel bandwidths per operating band for DC

**Table 7.40.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_1A-18A\_n41A-n77A | DC\_1A\_n41A  DC\_1A\_n77A  DC\_18A\_n41A  DC\_18A\_n77A | | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 235 |
| 18 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| n41 | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |

7.40.3 Co-existence studies

Co-existence studies of DC\_1A-18A\_n41A-n77A and protected bands are already covered in the constituent fall-back modes.

7.40.4 ∆TIB and ∆RIB values

For DC\_1-18\_n41-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.40.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-18\_n41-n77 | 1 | 0.6 |
| 18 | 0.3 |
| n41 | 0.5 |
| n77 | 0.8 |
|  | | |

**Table 7.40.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-18\_n41-n77 | 1 | 0.2 |
| 18 | 0 |
| n41 | 0 |
| n77 | 0.5 |
|  | | |

7.40.5 MSD

All MSD requirements forDC\_1-18\_n41-n77 are already covered by constituent fallback modes. No additional MSD requirement is needed.

7.41 DC\_1-18\_n41-n78

7.41.1 Operating bands for DC

**Table 7.41.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_1A-18A\_n41A-n78A | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n41 | 2496MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |
| n78 | 3300MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

7.41.2 Channel bandwidths per operating band for DC

**Table 7.41.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_1A-18A\_n41A-n78A | DC\_1A\_n41A  DC\_1A\_n78A  DC\_18A\_n41A  DC\_18A\_n78A | | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 235 |
| 18 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| n41 | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| n78 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |

7.41.3 Co-existence studies

Co-existence studies of DC\_1A-18A\_n41A-n78A and protected bands are already covered in the constituent fall-back modes.

7.41.4 ∆TIB and ∆RIB values

For DC\_1-18\_n41-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.41.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-18\_n41-n78 | 1 | 0.5 |
| 18 | 0.3 |
| n41 | 0.5 |
| n78 | 0.8 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz. | | |

**Table 7.41.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-18\_n41-n78 | 1 | 0 |
| 18 | 0 |
| n41 | 0 |
| n78 | 0.5 |
|  | | |

7.41.5 MSD

All MSD requirements forDC\_1-18\_n41-n78 are already covered by constituent fallback modes. No additional MSD requirement is needed.

7.42 DC\_1-41\_n28-n41

7.42.1 Operating bands for DC

**Table 7.42.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_1A-41A\_n28A-n41A | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 41 | 2496MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n41 | 2496MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |

7.42.2 Channel bandwidths per operating band for DC

**Table 7.42.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_1A-41A\_n28A-n41A | DC\_1A\_n28A  DC\_1A\_n41A  DC\_41A\_n28A | | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 170 |
| 41 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n41 | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |

7.42.3 Co-existence studies

Co-existence studies of DC\_1A-41A\_n28A-n41A and protected bands are already covered in the constituent fall-back modes.

7.42.4 ∆TIB and ∆RIB values

For DC\_1-41\_n28-n41, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.42.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-41\_n28-n41 | 1 | 0.5 |
| 41 | 0.31/0.82 |
| n28 | 0.5 |
| n41 | 0.31/0.82 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz | | |

**Table 7.42.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-41\_n28-n41 | 1 | 0 |
| 41 | 01/0.52 |
| n28 | 0.2 |
| n41 | 01/0.52 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz | | |

7.42.5 MSD

All MSD requirements forDC\_1-41\_n28-n41 are already covered by constituent fallback modes. No additional MSD requirement is needed.

7.43 DC\_3-18\_n28-n41

7.43.1 Operating bands for DC

**Table 7.43.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3A-18A\_n28A-n41A | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n41 | 2496MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |

7.43.2 Channel bandwidths per operating band for DC

**Table 7.43.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A-18A\_n28A-n41A | DC\_3A\_n28A  DC\_3A\_n41A  DC\_18A\_n28A  DC\_18A\_n41A | | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 165 |
| 18 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n41 | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |

7.43.3 Co-existence studies

Co-existence studies of DC\_**3**A-18A\_n28A-n41A and protected bands are already covered in the constituent fall-back modes.

7.43.4 ∆TIB and ∆RIB values

For DC\_3-18\_n28-n41, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.43.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-18\_n28-n41 | 3 | 0.6 |
| 18 | 0.3 |
| n28 | 0.5 |
| n41 | 0.31 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz. | | |

**Table 7.43.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3-18\_n28-n41 | 3 | 0.2 |
| 18 | 0 |
| n28 | 0.2 |
| n41 | 01 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz. | | |

7.43.5 MSD

All MSD requirements forDC\_3-18\_n28-n41 are already covered by constituent fallback modes. No additional MSD requirement is needed.

7.44 DC\_3-18\_n28-n77

7.44.1 Operating bands for DC

**Table 7.44.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3A-18A\_n28A-n77A | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n77 | 3300MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

7.44.2 Channel bandwidths per operating band for DC

**Table 7.44.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A-18A\_n28A-n77A | DC\_3A\_n28A  DC\_3A\_n77A  DC\_18A\_n28A  DC\_18A\_n77A | | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 165 |
| 18 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |

7.44.3 Co-existence studies

Co-existence studies of DC\_3A-18A\_n28A-n77A and protected bands are already covered in the constituent fall-back modes.

7.44.4 ∆TIB and ∆RIB values

For DC\_3-18\_n28-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.44.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-18\_n28-n77 | 3 | 0.6 |
| 18 | 0.3 |
| n28 | 0.5 |
| n77 | 0.8 |

**Table 7.44.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3-18\_n28-n77 | **3** | 0.2 |
| 18 | 0 |
| n28 | 0.2 |
| n77 | 0.5 |

7.44.5 MSD

All MSD requirements forDC\_3-18\_n28-n77 are already covered by constituent fallback modes. No additional MSD requirement is needed.

7.45 DC\_3-18\_n28-n78

7.45.1 Operating bands for DC

**Table 7.45.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3A-18A\_n28A-n78A | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n78 | 3300MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

7.45.2 Channel bandwidths per operating band for DC

**Table 7.45.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A-18A\_n28A-n78A | DC\_3A\_n28A  DC\_3A\_n78A  DC\_18A\_n28A  DC\_18A\_n78A | | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 165 |
| 18 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n78 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |

7.45.3 Co-existence studies

Co-existence studies of DC\_3A-18A\_n28A-n78A and protected bands are already covered in the constituent fall-back modes.

7.45.4 ∆TIB and ∆RIB values

For DC\_3-18\_n28-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.45.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-18\_n28-n78 | 3 | 0.6 |
| 18 | 0.3 |
| n28 | 0.5 |
| n78 | 0.8 |

**Table 7.45.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3-18\_n28-n78 | 3 | 0.2 |
| 18 | 0 |
| n28 | 0.2 |
| n78 | 0.5 |

7.45.5 MSD

All MSD requirements forDC\_3-18\_n28-n78 are already covered by constituent fallback modes. No additional MSD requirement is needed.

7.46 DC\_3-18\_n3-n41

7.46.1 Operating bands for DC

**Table 7.46.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3A-18A\_n3A-n41A | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| n41 | 2496MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |

7.46.2 Channel bandwidths per operating band for DC

**Table 7.46.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A-18A\_n3A-n41A | DC\_3A\_n3A1  DC\_3A\_n41A  DC\_18A\_n3A  DC\_18A\_n41A | | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 175 |
| 18 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| n41 | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| NOTE1: Only single switched UL is supported. | | | | | | | | | | | | | | | | | | |

7.46.3 Co-existence studies

Co-existence studies of DC\_3A-18A\_n3A-n41A and protected bands are already covered in the constituent fall-back modes.

7.46.4 ∆TIB and ∆RIB values

For DC\_3-18\_n3-n41, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.46.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-18\_n3-n41 | 3 | 0.6 |
| 18 | 0.3 |
| n3 | 0.6 |
| n41 | 0.31 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz. | | |

**Table 7.46.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3-18\_n3-n41 | 3 | 0.2 |
| 18 | 0 |
| n3 | 0.2 |
| n41 | 01 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz. | | |

7.46.5 MSD

All MSD requirements forDC\_3-18\_n3-n41 are already covered by constituent fallback modes. No additional MSD requirement is needed.

7.47 DC\_3-18\_n41-n77

7.47.1 Operating bands for DC

**Table 7.47.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3A-18A\_n41A-n77A | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n41 | 2496MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |
| n77 | 3300MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

7.47.2 Channel bandwidths per operating band for DC

**Table 7.47.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A-18A\_n41A-n77A | DC\_3A\_n41A  DC\_3A\_n77A  DC\_18A\_n41A  DC\_18A\_n77A | | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 235 |
| 18 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| n41 | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |

7.47.3 Co-existence studies

Co-existence studies of DC\_3A-18A\_n41A-n77A and protected bands are already covered in the constituent fall-back modes.

7.47.4 ∆TIB and ∆RIB values

For DC\_3-18\_n41-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.47.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-18\_n41-n77 | 3 | 0.6 |
| 18 | 0.3 |
| n41 | 0.5 |
| n77 | 0.8 |
|  | | |

**Table 7.47.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3-18\_n41-n77 | 3 | 0.2 |
| 18 | 0 |
| n41 | 0 |
| n77 | 0.5 |
|  | | |

7.47.5 MSD

All MSD requirements forDC\_3-18\_n41-n77 are already covered by constituent fallback modes. No additional MSD requirement is needed.

7.48 DC\_3-18\_n41-n78

7.48.1 Operating bands for DC

**Table 7.48.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3A-18A\_n41A-n78A | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n41 | 2496MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |
| n78 | 3300MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

7.48.2 Channel bandwidths per operating band for DC

**Table 7.48.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A-18A\_n41A-n78A | DC\_3A\_n41A  DC\_3A\_n78A  DC\_18A\_n41A  DC\_18A\_n78A | | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 235 |
| 18 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| n41 | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| n78 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |

7.48.3 Co-existence studies

Co-existence studies of DC\_3A-18A\_n41A-n78**A** and protected bands are already covered in the constituent fall-back modes.

7.48.4 ∆TIB and ∆RIB values

For DC\_3-18\_n41-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.48.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-18\_n41-n78 | 3 | 0.6 |
| 18 | 0.3 |
| n41 | 0.6 |
| n78 | 0.8 |
|  | | |

**Table 7.48.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3-18\_n41-n78 | 3 | 0.2 |
| 18 | 0 |
| n41 | 01 |
| n78 | 0.5 |
|  | | |

7.48.5 MSD

All MSD requirements forDC\_3-18\_n41-n78 are already covered by constituent fallback modes. No additional MSD requirement is needed.

7.49 DC\_3-41\_n28-n41

7.49.1 Operating bands for DC

**Table 7.49.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3A-41A\_n28A-n41A | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 41 | 2496MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n41 | 2496MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |

7.49.2 Channel bandwidths per operating band for DC

**Table 7.49.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A-41A\_n28A-n41A | DC\_3A\_n28A  DC\_3A\_n41A  DC\_41A\_n28A | | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 170 |
| 41 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n41 | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |

7.49.3 Co-existence studies

Co-existence studies of DC\_3A-41A\_n28A-n41A and protected bands are already covered in the constituent fall-back modes.

7.49.4 ∆TIB and ∆RIB values

For DC\_3-41\_n28-n41, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 7.49.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-41\_n28-n41 | 3 | 0.6 |
| 41 | 0.31/0.82 |
| n28 | 0.5 |
| n41 | 0.31/0.82 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz | | |

**Table 7.49.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3-41\_n28-n41 | 3 | 0.2 |
| 41 | 01/0.52 |
| n28 | 0.2 |
| n41 | 01/0.52 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz | | |

7.49.5 MSD

All MSD requirements forDC\_3-41\_n28-n41 are already covered by constituent fallback modes. No additional MSD requirement is needed.

## 7.50 DC\_3-19\_n1-n77

### 7.50.1 Operating bands for DC

**Table 7.50.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-19\_n1-n77 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 7.50.2 Configuration for DC

Table 7.50.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-19A\_n1A-n77A | DC\_3A\_n1A  DC\_3A\_n77A  DC\_19A\_n1A  DC\_19A\_n77A | CA\_3A-19A | CA\_n1A-n77A |

### 7.50.3 Co-existence studies

Co-existence studies of DC\_3-19\_n1-n77 are already covered by the fallback configurations, DC\_3-19\_n1, DC\_3-19\_n77, DC\_3\_n1-n77 and DC\_19\_n1-n77. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.50.4 ∆TIB and ∆RIB values

For DC\_3-19\_n1-n77, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-3-19\_n77, and are given in the tables below.

**Table 7.50.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-19\_n1-n77 | 3 | 0.6 |
| 19 | 0.3 |
| n1 | 0.6 |
| n77 | 0.8 |

**Table 7.50.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-19\_n1-n77 | 3 | 0.2 |
| 19 | 0 |
| n1 | 0.2 |
| n77 | 0.5 |

### 7.50.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.51 DC\_3-19\_n1-n78

### 7.51.1 Operating bands for DC

**Table 7.51.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-19\_n1-n78 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 7.51.2 Configuration for DC

Table 7.51.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-19A\_n1A-n78A | DC\_3A\_n1A  DC\_3A\_n78A  DC\_19A\_n1A  DC\_19A\_n78A | CA\_3A-19A | CA\_n1A-n78A |

### 7.51.3 Co-existence studies

Co-existence studies of DC\_3-19\_n1-n78 are already covered by the fallback configurations, DC\_3-19\_n1, DC\_3-19\_n78, DC\_3\_n1-n78 and DC\_19\_n1-n78. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.51.4 ∆TIB and ∆RIB values

For DC\_3-19\_n1-n78, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-3-19\_n78, and are given in the tables below.

**Table 7.51.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-19\_n1-n78 | 3 | 0.6 |
| 19 | 0.3 |
| n1 | 0.6 |
| n78 | 0.8 |

**Table 7.51.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-19\_n1-n78 | 3 | 0.2 |
| 19 | 0 |
| n1 | 0.2 |
| n78 | 0.5 |

### 7.51.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.52 DC\_3-19\_n1-n79

### 7.52.1 Operating bands for DC

**Table 7.52.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-19\_n1-n79 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n79 | 4400 MHz | – | 5000 MHz | 4400 MHz | – | 5000 MHz | TDD |

### 7.52.2 Configuration for DC

Table 7.52.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-19A\_n1A-n79A | DC\_3A\_n1A  DC\_3A\_n79A  DC\_19A\_n1A  DC\_19A\_n79A | CA\_3A-19A | CA\_n1A-n79A |

### 7.52.3 Co-existence studies

Co-existence studies of DC\_3-19\_n1-n79 are already covered by the fallback configurations, DC\_3-19\_n1, DC\_3-19\_n79, DC\_3\_n1-n79 and DC\_19\_n1-n79. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.52.4 ∆TIB and ∆RIB values

For DC\_3-19\_n1-n79, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-3-19\_n79, and are given in the tables below.

**Table 7.52.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-19\_n1-n79 | 3 | 0.3 |
| 19 | 0.3 |
| n1 | 0.3 |
| n79 | 0 |

**Table 7.52.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-19\_n1-n79 | 3 | 0 |
| 19 | 0 |
| n1 | 0 |
| n79 | 0 |

### 7.52.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.53 DC\_3-21\_n1-n77

### 7.53.1 Operating bands for DC

**Table 7.53.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-21\_n1-n77 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 7.53.2 Configuration for DC

Table 7.53.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-21A\_n1A-n77A | DC\_3A\_n1A  DC\_3A\_n77A  DC\_21A\_n1A  DC\_21A\_n77A | CA\_3A-21A | CA\_n1A-n77A |

### 7.53.3 Co-existence studies

Co-existence studies of DC\_3-21\_n1-n77 are already covered by the fallback configurations, DC\_3-21\_n1, DC\_3-21\_n77, DC\_3\_n1-n77 and DC\_21\_n1-n77. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.53.4 ∆TIB and ∆RIB values

For DC\_3-21\_n1-n77, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-3-21\_n77, and are given in the tables below.

**Table 7.53.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-21\_n1-n77 | 3 | 0.8 |
| 21 | 0.9 |
| n1 | 0.6 |
| n77 | 0.8 |

**Table 7.53.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-21\_n1-n77 | 3 | 0.3 |
| 21 | 0.5 |
| n1 | 0.2 |
| n77 | 0.5 |

### 7.53.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.54 DC\_3-21\_n1-n78

### 7.54.1 Operating bands for DC

**Table 7.54.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-21\_n1-n78 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 7.54.2 Configuration for DC

Table 7.54.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-21A\_n1A-n78A | DC\_3A\_n1A  DC\_3A\_n78A  DC\_21A\_n1A  DC\_21A\_n78A | CA\_3A-21A | CA\_n1A-n78A |

### 7.54.3 Co-existence studies

Co-existence studies of DC\_3-21\_n1-n78 are already covered by the fallback configurations, DC\_3-21\_n1, DC\_3-21\_n78, DC\_3\_n1-n78 and DC\_21\_n1-n78. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.54.4 ∆TIB and ∆RIB values

For DC\_3-21\_n1-n78, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-3-21\_n78, and are given in the tables below.

**Table 7.54.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-21\_n1-n78 | 3 | 0.8 |
| 21 | 0.9 |
| n1 | 0.6 |
| n78 | 0.8 |

**Table 7.54.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-21\_n1-n78 | 3 | 0.3 |
| 21 | 0.5 |
| n1 | 0.2 |
| n78 | 0.5 |

### 7.54.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.55 DC\_3-21\_n1-n79

### 7.55.1 Operating bands for DC

**Table 7.55.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-21\_n1-n79 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n79 | 4400 MHz | – | 5000 MHz | 4400 MHz | – | 5000 MHz | TDD |

### 7.55.2 Configuration for DC

Table 7.55.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-21A\_n1A-n79A | DC\_3A\_n1A  DC\_3A\_n79A  DC\_21A\_n1A  DC\_21A\_n79A | CA\_3A-21A | CA\_n1A-n79A |

### 7.55.3 Co-existence studies

Co-existence studies of DC\_3-21\_n1-n79 are already covered by the fallback configurations, DC\_3-21\_n1, DC\_3-21\_n79, DC\_3\_n1-n79 and DC\_21\_n1-n79. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.55.4 ∆TIB and ∆RIB values

For DC\_3-21\_n1-n79, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-3-21\_n79, and are given in the tables below.

**Table 7.55.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-21\_n1-n79 | 3 | 0.8 |
| 21 | 0.9 |
| n1 | 0.3 |
| n79 | 0 |

**Table 7.55.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-21\_n1-n79 | 3 | 0.3 |
| 21 | 0.5 |
| n1 | 0 |
| n79 | 0 |

### 7.55.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.56 DC\_3-42\_n1-n77

### 7.56.1 Operating bands for DC

**Table 7.56.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-42\_n1-n77 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 7.56.2 Configuration for DC

Table 7.56.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-42A\_n1A-n77A | DC\_3A\_n1A  DC\_3A\_n77A | CA\_3A-42A | CA\_n1A-n77A |
| DC\_3A-42C\_n1A-n77A | DC\_3A\_n1A  DC\_3A\_n77A | CA\_3A-42C | CA\_n1A-n77A |

### 7.56.3 Co-existence studies

Co-existence studies of DC\_3-42\_n1-n77 are already covered by the fallback configurations, DC\_3-42\_n1, DC\_3-42\_n77 and DC\_3\_n1-n77. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.56.4 ∆TIB and ∆RIB values

For DC\_3-42\_n1-n77, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-3-42\_n77, and are given in the tables below.

**Table 7.56.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-42\_n1-n77 | 3 | 0.6 |
| 42 | 0.8 |
| n1 | 0.6 |
| n77 | 0.8 |

**Table 7.56.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-42\_n1-n77 | 3 | 0.2 |
| 42 | 0.5 |
| n1 | 0.2 |
| n77 | 0.5 |

### 7.56.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.57 DC\_3-42\_n1-n78

### 7.57.1 Operating bands for DC

**Table 7.57.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-42\_n1-n78 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 7.57.2 Configuration for DC

Table 7.57.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-42A\_n1A-n78A | DC\_3A\_n1A  DC\_3A\_n78A | CA\_3A-42A | CA\_n1A-n78A |
| DC\_3A-42C\_n1A-n78A | DC\_3A\_n1A  DC\_3A\_n78A | CA\_3A-42C | CA\_n1A-n78A |

### 7.57.3 Co-existence studies

Co-existence studies of DC\_3-42\_n1-n78 are already covered by the fallback configurations, DC\_3-42\_n1, DC\_3-42\_n78 and DC\_3\_n1-n78. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.57.4 ∆TIB and ∆RIB values

For DC\_3-42\_n1-n78, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-3-42\_n78, and are given in the tables below.

**Table 7.57.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-42\_n1-n78 | 3 | 0.6 |
| 42 | 0.8 |
| n1 | 0.6 |
| n78 | 0.8 |

**Table 7.57.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-42\_n1-n78 | 3 | 0.2 |
| 42 | 0.5 |
| n1 | 0.2 |
| n78 | 0.5 |

### 7.57.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.58 DC\_3-42\_n1-n79

### 7.58.1 Operating bands for DC

**Table 7.58.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-42\_n1-n79 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n79 | 4400 MHz | – | 5000 MHz | 4400 MHz | – | 5000 MHz | TDD |

### 7.58.2 Configuration for DC

Table 7.58.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-42A\_n1A-n79A | DC\_3A\_n1A  DC\_3A\_n79A | CA\_3A-42A | CA\_n1A-n79A |
| DC\_3A-42C\_n1A-n79A | DC\_3A\_n1A  DC\_3A\_n79A | CA\_3A-42C | CA\_n1A-n79A |

### 7.58.3 Co-existence studies

Co-existence studies of DC\_3-42\_n1-n79 are already covered by the fallback configurations, DC\_3-42\_n1, DC\_3-42\_n79 and DC\_3\_n1-n79. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.58.4 ∆TIB and ∆RIB values

For DC\_3-42\_n1-n79, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-3-42\_n79, and are given in the tables below.

**Table 7.58.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-42\_n1-n79 | 3 | 0.6 |
| 42 | 0.8 |
| n1 | 0.6 |
| n79 | 0 |

**Table 7.58.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-42\_n1-n79 | 3 | 0.2 |
| 42 | 0.5 |
| n1 | 0.2 |
| n79 | 0 |

### 7.58.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.59 DC\_19-21\_n1-n77

### 7.59.1 Operating bands for DC

**Table 7.59.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_19-21\_n1-n77 | 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 7.59.2 Configuration for DC

Table 7.59.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_19A-21A\_n1A-n77A | DC\_19A\_n1A  DC\_19A\_n77A  DC\_21A\_n1A  DC\_21A\_n77A | CA\_19A-21A | CA\_n1A-n77A |

### 7.59.3 Co-existence studies

Co-existence studies of DC\_19-21\_n1-n77 are already covered by the fallback configurations, DC\_19-21\_n1, DC\_19-21\_n77, DC\_19\_n1-n77 and DC\_21\_n1-n77. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.59.4 ∆TIB and ∆RIB values

For DC\_19-21\_n1-n77, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-19-21\_n77, and are given in the tables below.

**Table 7.59.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_19-21\_n1-n77 | 19 | 0.3 |
| 21 | 0.4 |
| n1 | 0.3 |
| n77 | 0.8 |

**Table 7.59.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_19-21\_n1-n77 | 19 | 0 |
| 21 | 0 |
| n1 | 0 |
| n77 | 0.5 |

### 7.59.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.60 DC\_19-21\_n1-n78

### 7.60.1 Operating bands for DC

**Table 7.60.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_19-21\_n1-n78 | 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 7.60.2 Configuration for DC

Table 7.60.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_19A-21A\_n1A-n78A | DC\_19A\_n1A  DC\_19A\_n78A  DC\_21A\_n1A  DC\_21A\_n78A | CA\_19A-21A | CA\_n1A-n78A |

### 7.60.3 Co-existence studies

Co-existence studies of DC\_19-21\_n1-n78 are already covered by the fallback configurations, DC\_19-21\_n1, DC\_19-21\_n78, DC\_19\_n1-n78 and DC\_21\_n1-n78. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.60.4 ∆TIB and ∆RIB values

For DC\_19-21\_n1-n78, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-19-21\_n78, and are given in the tables below.

**Table 7.60.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_19-21\_n1-n78 | 19 | 0.3 |
| 21 | 0.4 |
| n1 | 0.6 |
| n78 | 0.8 |

**Table 7.60.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_19-21\_n1-n78 | 19 | 0 |
| 21 | 0 |
| n1 | 0.2 |
| n78 | 0.5 |

### 7.60.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.61 DC\_19-21\_n1-n79

### 7.61.1 Operating bands for DC

**Table 7.61.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_19-21\_n1-n79 | 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n79 | 4400 MHz | – | 5000 MHz | 4400 MHz | – | 5000 MHz | TDD |

### 7.61.2 Configuration for DC

Table 7.61.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_19A-21A\_n1A-n79A | DC\_19A\_n1A  DC\_19A\_n79A  DC\_21A\_n1A  DC\_21A\_n79A | CA\_19A-21A | CA\_n1A-n79A |

### 7.61.3 Co-existence studies

Co-existence studies of DC\_19-21\_n1-n79 are already covered by the fallback configurations, DC\_19-21\_n1, DC\_19-21\_n79, DC\_19\_n1-n79 and DC\_21\_n1-n79. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.61.4 ∆TIB and ∆RIB values

For DC\_19-21\_n1-n79, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-19-21\_n79, and are given in the tables below.

**Table 7.61.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_19-21\_n1-n79 | 19 | 0.3 |
| 21 | 0.4 |
| n1 | 0.3 |
| n79 | 0 |

**Table 7.61.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_19-21\_n1-n79 | 19 | 0 |
| 21 | 0 |
| n1 | 0 |
| n79 | 0 |

### 7.61.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.62 DC\_19-42\_n1-n77

### 7.62.1 Operating bands for DC

**Table 7.62.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_19-42\_n1-n77 | 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 7.62.2 Configuration for DC

Table 7.62.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_19A-42A\_n1A-n77A | DC\_19A\_n1A  DC\_19A\_n77A | CA\_19A-42A | CA\_n1A-n77A |
| DC\_19A-42C\_n1A-n77A | DC\_19A\_n1A  DC\_19A\_n77A | CA\_19A-42C | CA\_n1A-n77A |

### 7.62.3 Co-existence studies

Co-existence studies of DC\_19-42\_n1-n77 are already covered by the fallback configurations, DC\_19-42\_n1, DC\_19-42\_n77 and DC\_19\_n1-n77. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.62.4 ∆TIB and ∆RIB values

For DC\_19-42\_n1-n77, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-19-42\_n77, and are given in the tables below.

**Table 7.62.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_19-42\_n1-n77 | 19 | 0.3 |
| 42 | 0.8 |
| n1 | 0.6 |
| n77 | 0.8 |

**Table 7.62.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_19-42\_n1-n77 | 19 | 0 |
| 42 | 0.5 |
| n1 | 0.2 |
| n77 | 0.5 |

### 7.62.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.63 DC\_19-42\_n1-n78

### 7.63.1 Operating bands for DC

**Table 7.63.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_19-42\_n1-n78 | 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 7.63.2 Configuration for DC

Table 7.63.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_19A-42A\_n1A-n78A | DC\_19A\_n1A  DC\_19A\_n78A | CA\_19A-42A | CA\_n1A-n78A |
| DC\_19A-42C\_n1A-n78A | DC\_19A\_n1A  DC\_19A\_n78A | CA\_19A-42C | CA\_n1A-n78A |

### 7.63.3 Co-existence studies

Co-existence studies of DC\_19-42\_n1-n78 are already covered by the fallback configurations, DC\_19-42\_n1, DC\_19-42\_n78 and DC\_19\_n1-n78. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.63.4 ∆TIB and ∆RIB values

For DC\_19-42\_n1-n78, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-19-42\_n78, and are given in the tables below.

**Table 7.63.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_19-42\_n1-n78 | 19 | 0.3 |
| 42 | 0.8 |
| n1 | 0.3 |
| n78 | 0.8 |

**Table 7.63.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_19-42\_n1-n78 | 19 | 0 |
| 42 | 0.5 |
| n1 | 0 |
| n78 | 0.5 |

### 7.63.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.64 DC\_19-42\_n1-n79

### 7.64.1 Operating bands for DC

**Table 7.64.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_19-42\_n1-n79 | 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n79 | 4400 MHz | – | 5000 MHz | 4400 MHz | – | 5000 MHz | TDD |

### 7.64.2 Configuration for DC

Table 7.64.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_19A-42A\_n1A-n79A | DC\_19A\_n1A  DC\_19A\_n79A | CA\_19A-42A | CA\_n1A-n79A |
| DC\_19A-42C\_n1A-n79A | DC\_19A\_n1A  DC\_19A\_n79A | CA\_19A-42C | CA\_n1A-n79A |

### 7.64.3 Co-existence studies

Co-existence studies of DC\_19-42\_n1-n79 are already covered by the fallback configurations, DC\_19-42\_n1, DC\_19-42\_n79 and DC\_19\_n1-n79. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.64.4 ∆TIB and ∆RIB values

For DC\_19-42\_n1-n79, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-19-42\_n79, and are given in the tables below.

**Table 7.64.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_19-42\_n1-n79 | 19 | 0.3 |
| 42 | 0.8 |
| n1 | 0.3 |
| n79 | 0 |

**Table 7.64.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_19-42\_n1-n79 | 19 | 0 |
| 42 | 0.5 |
| n1 | 0 |
| n79 | 0 |

### 7.64.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.65 DC\_21-42\_n1-n77

### 7.65.1 Operating bands for DC

**Table 7.65.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_21-42\_n1-n77 | 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 7.65.2 Configuration for DC

Table 7.65.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_21A-42A\_n1A-n77A | DC\_21A\_n1A  DC\_21A\_n77A | CA\_21A-42A | CA\_n1A-n77A |
| DC\_21A-42C\_n1A-n77A | DC\_21A\_n1A  DC\_21A\_n77A | CA\_21A-42C | CA\_n1A-n77A |

### 7.65.3 Co-existence studies

Co-existence studies of DC\_21-42\_n1-n77 are already covered by the fallback configurations, DC\_21-42\_n1, DC\_21-42\_n77 and DC\_21\_n1-n77. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.65.4 ∆TIB and ∆RIB values

For DC\_21-42\_n1-n77, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-21-42\_n77, and are given in the tables below.

**Table 7.65.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_21-42\_n1-n77 | 21 | 0.4 |
| 42 | 0.8 |
| n1 | 0.6 |
| n77 | 0.8 |

**Table 7.65.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_21-42\_n1-n77 | 21 | 0 |
| 42 | 0.5 |
| n1 | 0.2 |
| n77 | 0.5 |

### 7.65.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.66 DC\_21-42\_n1-n78

### 7.66.1 Operating bands for DC

**Table 7.66.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_21-42\_n1-n78 | 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 7.66.2 Configuration for DC

Table 7.66.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_21A-42A\_n1A-n78A | DC\_21A\_n1A  DC\_21A\_n78A | CA\_21A-42A | CA\_n1A-n78A |
| DC\_21A-42C\_n1A-n78A | DC\_21A\_n1A  DC\_21A\_n78A | CA\_21A-42C | CA\_n1A-n78A |

### 7.66.3 Co-existence studies

Co-existence studies of DC\_21-42\_n1-n78 are already covered by the fallback configurations, DC\_21-42\_n1, DC\_21-42\_n78 and DC\_21\_n1-n78. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.66.4 ∆TIB and ∆RIB values

For DC\_21-42\_n1-n78, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-21-42\_n78, and are given in the tables below.

**Table 7.66.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_21-42\_n1-n78 | 21 | 0.4 |
| 42 | 0.8 |
| n1 | 0.3 |
| n78 | 0.8 |

**Table 7.66.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_21-42\_n1-n78 | 21 | 0 |
| 42 | 0.5 |
| n1 | 0 |
| n78 | 0.5 |

### 7.66.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.67 DC\_21-42\_n1-n79

### 7.67.1 Operating bands for DC

**Table 7.67.1-1: LTE 2 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_21-42\_n1-n79 | 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n79 | 4400 MHz | – | 5000 MHz | 4400 MHz | – | 5000 MHz | TDD |

### 7.67.2 Configuration for DC

Table 7.67.2-1: Inter-band EN-DC configurations (four bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_21A-42A\_n1A-n79A | DC\_21A\_n1A  DC\_21A\_n79A | CA\_21A-42A | CA\_n1A-n79A |
| DC\_21A-42C\_n1A-n79A | DC\_21A\_n1A  DC\_21A\_n79A | CA\_21A-42C | CA\_n1A-n79A |

### 7.67.3 Co-existence studies

Co-existence studies of DC\_21-42\_n1-n79 are already covered by the fallback configurations, DC\_21-42\_n1, DC\_21-42\_n79 and DC\_21\_n1-n79. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 7.67.4 ∆TIB and ∆RIB values

For DC\_21-42\_n1-n79, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-21-42\_n79, and are given in the tables below.

**Table 7.67.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_21-42\_n1-n79 | 21 | 0.4 |
| 42 | 0.8 |
| n1 | 0.3 |
| n79 | 0 |

**Table 7.67.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_21-42\_n1-n79 | 21 | 0 |
| 42 | 0.5 |
| n1 | 0 |
| n79 | 0 |

### 7.67.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

7.68 DC\_3-20\_n1-n78

7.68.1 Operating bands for DC

**Table 7.68.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3A-20A\_n1A-n78A  DC\_3C-20A\_n1A-n78A | n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 20 | 832 MHz | – | 862 MHz | 791 MHz | – | 821 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

7.68.2 Channel bandwidths per operating band for DC

**Table 7.68.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A-20A\_n1A-n78A | DC\_3A\_n1A  DC\_3A\_n78A  DC\_20A\_n1A  DC\_20A\_n78A | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 190 |
| 20 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n1 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| n78 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| DC\_3C-20A\_n1A-n78A | DC\_3A\_n1A  DC\_3A\_n78A  DC\_20A\_n1A  DC\_20A\_n78A | 3 | See CA\_3C Bandwidth Combination Set 0 in Table 5.6A.1-1 | | | | | | | | | | | | | | 210 |
| 20 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n1 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| n78 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

7.68.3 Co-existence studies

Co-existence studies of DC\_3-20\_n1-n78 and protected bands are already covered in the constituent fall-back modes.

7.68.4 ∆TIB and ∆RIB values

The ΔTIB,c and ΔRIB,c values of DC\_3-20\_n1-n78 are given in the tables below reusing the values for DC\_1-3-20\_n78.

**Table 7.68.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-20\_n1-n78 | n1 | 0.6 |
| 3 | 0.6 |
| 20 | 0.3 |
| n78 | 0.8 |
|  | | |

**Table 7.68.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3-20\_n1-n78 | n1 | 0.2 |
| 3 | 0.2 |
| 20 | 0 |
| n78 | 0.5 |
|  | | |

7.68.5 MSD

All MSD requirements for DC\_3-20\_n1-n78 are already covered by constituent fallback modes. No additional MSD requirement is needed.

7.69 DC\_7-20\_n1-n78

7.69.1 Operating bands for DC

**Table 7.69.1-1: DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_7A-20A\_n1A-n78A | n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| 20 | 832 MHz | – | 862 MHz | 791 MHz | – | 821 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

7.69.2 Channel bandwidths per operating band for DC

**Table 7.69.2-1: Supported bandwidths per DC band combination of LTE 2DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_7A-20A\_n1A-n78A | DC\_7A\_n1A  DC\_7A\_n78A  DC\_20A\_n1A  DC\_20A\_n78A | 7 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 190 |
| 20 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n1 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| n78 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

7.69.3 Co-existence studies

Co-existence studies of DC\_7-20\_n1-n78 and protected bands are already covered in the constituent fall-back modes.

7.69.4 ∆TIB and ∆RIB values

The ΔTIB,c and ΔRIB,c values of DC\_7-20\_n1-n78 are given in the tables below reusing the values for DC\_1-7-20\_n78.

**Table 7.69.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_7-20\_n1-n78 | n1 | 0.6 |
| 7 | 0.7 |
| 20 | 0.4 |
| n78 | 0.8 |
|  | | |

**Table 7.69.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_7-20\_n1-n78 | n1 | 0.2 |
| 7 | 0.2 |
| 20 | 0.2 |
| n78 | 0.5 |
|  | | |

7.69.5 MSD

All MSD requirements for DC\_7-20\_n1-n78 are already covered by constituent fallback modes. No additional MSD requirement is needed.

## 7.70 DC\_3-7\_n40-n78

### 7.70.1 Operating bands for DC

Table 7.70.1-1: DC band combination of LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_3-7\_n40-n78 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 7.70.2 Channel bandwidths per operating band for DC

Table 7.70.2-1: Supported bandwidths per DC LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC\_3A-7A\_n40A-n78A | DC\_3A\_n40A DC\_3A\_n78A DC\_7A\_n40A DC\_7A\_n78A | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 220 |
| 7 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n40 | 15 | Yes9 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
| n78 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 7.70.3 Co-existence studies

Co-existence studies are captured for lower order combinations.

### 7.70.4 ∆TIB and ∆RIB values

For DC\_3-7\_n40-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 7.70.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_3-7\_n40-n78 | 3 | 0.6 |
| 7 | 0.5 |
| n40 | 0.5 |
| n78 | 0.8 |

Table 7.70.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_3-7\_n40-n78 | 3 | 0.2 |
| 7 | 0 |
| n40 | 0.4 |
| n78 | 0.5 |

### 7.70.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.71 DC\_1-7\_n40-n78

### 7.71.1 Operating bands for DC

Table 7.71.1-1: DC band combination of LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_1-7\_n40-n78 | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 7.71.2 Channel bandwidths per operating band for DC

Table 7.71.2-1: Supported bandwidths per DC LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC\_1A-7A\_n40A-n78A | DC\_1A\_n40A DC\_1A\_n78A DC\_7A\_n40A DC\_7A\_n78A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 220 |
| 7 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n40 | 15 | Yes9 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
| n78 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 7.71.3 Co-existence studies

Co-existence studies are captured for lower order combinations.

### 7.71.4 ∆TIB and ∆RIB values

For DC\_1-7\_n40-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 7.71.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_1-7\_n40-n78 | 1 | 0.6 |
| 7 | 0.5 |
| n40 | 0.5 |
| n78 | 0.8 |

Table 7.71.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_1-7\_n40-n78 | 1 | 0.2 |
| 7 | 0 |
| n40 | 0.4 |
| n78 | 0.5 |

### 7.71.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.72 DC\_7-28\_n40-n78

### 7.72.1 Operating bands for DC

Table 7.72.1-1: DC band combination of LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_7-28\_n40-n78 | 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| 28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 7.72.2 Channel bandwidths per operating band for DC

Table 7.72.2-1: Supported bandwidths per DC LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC\_7A-28A\_n40A-n78A | DC\_7A\_n40A DC\_7A\_n78A DC\_28A\_n40A DC\_28A\_n78A | 7 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 220 |
| 28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n40 | 15 | Yes9 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
| n78 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 7.72.3 Co-existence studies

Co-existence studies are captured for lower order combinations.

### 7.72.4 ∆TIB and ∆RIB values

For DC\_7-28\_n40-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 7.72.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_7-28\_n40-n78 | 7 | 0.5 |
| 28 | 0.3 |
| n40 | 0.5 |
| n78 | 0.8 |

Table 7.72.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_7-28\_n40-n78 | 7 | 0 |
| 28 | 0.2 |
| n40 | 0.4 |
| n78 | 0.5 |

### 7.72.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.73 DC\_2-13\_n66-n77

### 7.73.1 Operating bands for DC

Table 7.73.1-1: DC band combination of LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_2-13\_n66-n77 | 2 | 1850 MHz | – | 1910 MHz | 1930 MHz | – | 1990 MHz | FDD |
| 13 | 777 MHz | – | 787 MHz | 746 MHz | – | 756 MHz | FDD |
| n66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 7.73.2 Channel bandwidths per operating band for DC

Table 7.73.2-1: Supported bandwidths per DC LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |
| DC\_2A-13A\_n66A-n77A | DC\_2A\_n77A DC\_13A\_n66A DC\_13A\_n77A | 2 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 170 |
| 13 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| n66 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| NOTE 1: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 7.73.3 Co-existence studies

Co-existence studies are captured for lower order combinations.

### 7.73.4 ∆TIB and ∆RIB values

For DC\_2-13\_n66-n77, the ΔTIB,c and ΔRIB,c values are derived from DC\_2-13-66\_n48 and are given in the tables below.

Table 7.73.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_2-13\_n66-n77 | 2 | 0.6 |
| 13 | 0.3 |
| n66 | 0.6 |
| n77 | 0.8 |

Table 7.73.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_2-13\_n66-n77 | 2 | 0.3 |
| 13 | 0 |
| n66 | 0.3 |
| n77 | 0.5 |

### 7.73.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.74 DC\_2-66\_n66-n77

### 7.74.1 Operating bands for DC

Table 7.74.1-1: DC band combination of LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_2-66\_n66-n77 | 2 | 1850 MHz | – | 1910 MHz | 1930 MHz | – | 1990 MHz | FDD |
| 66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |
| n66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 7.74.2 Channel bandwidths per operating band for DC

Table 7.74.2-1: Supported bandwidths per DC LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |
| DC\_2A-66A\_n66A-n77A | DC\_2A\_n77A DC\_66A\_n77A | 2 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 180 |
| 66 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n66 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 7.74.3 Co-existence studies

Co-existence studies are captured for lower order combinations.

### 7.74.4 ∆TIB and ∆RIB values

For DC\_2-66\_n66-n77, the ΔTIB,c and ΔRIB,c values are derived from DC\_2\_n66-n78 and are given in the tables below.

Table 7.74.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_2-66\_n66-n77 | 2 | 0.6 |
| 66 | 0.6 |
| n66 | 0.6 |
| n77 | 0.8 |

Table 7.74.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_2-66\_n66-n77 | 2 | 0.3 |
| 66 | 0.3 |
| n66 | 0.3 |
| n77 | 0.5 |

### 7.74.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.75 DC\_2-66\_n5-n77

### 7.75.1 Operating bands for DC

Table 7.75.1-1: DC band combination of LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_2-66\_n5-n77 | 2 | 1850 MHz | – | 1910 MHz | 1930 MHz | – | 1990 MHz | FDD |
| 66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |
| n5 | 824 MHz | – | 849 MHz | 869 MHz | – | 894 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 7.75.2 Channel bandwidths per operating band for DC

Table 7.75.2-1: Supported bandwidths per DC LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |
| DC\_2A-66A\_n5A-n77A | DC\_66A\_n5A DC\_66A\_n77A DC\_2A\_n5A DC\_2A\_n77A | 2 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 160 |
| 66 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n5 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 7.75.3 Co-existence studies

Co-existence studies are captured for lower order combinations.

### 7.75.4 ∆TIB and ∆RIB values

For DC\_2-66\_n5-n77, the ΔTIB,c and ΔRIB,c values are derived from DC\_2-13-66\_n48 and are given in the tables below.

Table 7.75.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_2-66\_n5-n77 | 2 | 0.6 |
| 66 | 0.6 |
| n5 | 0.3 |
| n77 | 0.8 |

Table 7.75.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_2-66\_n5-n77 | 2 | 0.3 |
| 66 | 0.3 |
| n5 | 0 |
| n77 | 0.5 |

### 7.75.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.76 DC\_13-66\_n66-n77

### 7.76.1 Operating bands for DC

Table 7.76.1-1: DC band combination of LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_13-66\_n66-n77 | 13 | 777 MHz | – | 787 MHz | 746 MHz | – | 756 MHz | FDD |
| 66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |
| n66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 7.76.2 Channel bandwidths per operating band for DC

Table 7.76.2-1: Supported bandwidths per DC LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |
| DC\_13A-66A\_n66A-n77A | DC\_13A\_n66A DC\_13A\_n77A DC\_66A\_n77A | 13 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 170 |
| 66 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n66 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 7.76.3 Co-existence studies

Co-existence studies are captured for lower order combinations.

### 7.76.4 ∆TIB and ∆RIB values

For DC\_13-66\_n66-n77, the ΔTIB,c and ΔRIB,c values are derived from DC\_13-66\_n48 and are given in the tables below.

Table 7.76.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_13-66\_n66-n77 | 13 | 0.3 |
| 66 | 0.6 |
| n66 | 0.6 |
| n77 | 0.8 |

Table 7.76.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_13-66\_n66-n77 | 13 | 0 |
| 66 | 0.2 |
| n66 | 0.2 |
| n77 | 0.5 |

### 7.76.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.77 DC\_13-66\_n2-n77

### 7.77.1 Operating bands for DC

Table 7.77.1-1: DC band combination of LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_13-66\_n2-n77 | 13 | 777 MHz | – | 787 MHz | 746 MHz | – | 756 MHz | FDD |
| 66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |
| n2 | 1850 MHz | – | 1910 MHz | 1930 MHz | – | 1990 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 7.77.2 Channel bandwidths per operating band for DC

Table 7.77.2-1: Supported bandwidths per DC LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |
| DC\_13A-66A\_n2A-n77A | DC\_13A\_n2A DC\_13A\_n77A DC\_66A\_n2A DC\_66A\_n77A | 13 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 150 |
| 66 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n2 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 7.77.3 Co-existence studies

Co-existence studies are captured for lower order combinations.

### 7.77.4 ∆TIB and ∆RIB values

For DC\_13-66\_n2-n77, the ΔTIB,c and ΔRIB,c values are derived from DC\_2-13-66\_n48 and are given in the tables below.

Table 7.77.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_13-66\_n2-n77 | 13 | 0.3 |
| 66 | 0.6 |
| n2 | 0.6 |
| n77 | 0.8 |

Table 7.77.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_13-66\_n2-n77 | 13 | 0 |
| 66 | 0.2 |
| n2 | 0.2 |
| n77 | 0.5 |

### 7.77.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.78 DC\_13-66\_n5-n48

### 7.78.1 Operating bands for DC

Table 7.78.1-1: DC band combination of LTE 1DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_13-66\_n5-n48 | 13 | 777 MHz | – | 787 MHz | 746 MHz | – | 756 MHz | FDD |
| 66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD |
| n5 | 824 MHz | – | 849 MHz | 869 MHz | – | 894 MHz | FDD |
| n48 | 3550 MHz | – | 3800 MHz | 3550 MHz | – | 3800 MHz | TDD |

### 7.78.2 Channel bandwidths per operating band for DC

Table 7.78.2-1: Supported bandwidths per DC LTE 2DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |
| DC\_13A-66A\_n5A-n48A | DC\_13A\_n48A DC\_66A\_n5A DC\_66A\_n48A | 13 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 150 |
| 66 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n5 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n48 | 15 | Yes5 | Yes | Yes | Yes |  |  | Yes | Yes6 |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes6 | Yes6 |  | Yes6 | Yes6,4 | Yes6 |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes6 | Yes6 |  | Yes6 | Yes6,4 | Yes6 |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification.  NOTE 5: For this bandwidth, the minimum requirements are restricted to operation when carrier is configured as an SCell part of DC or CA configuration.  NOTE 6: For this bandwidth, the minimum requirements are restricted to operation when carrier is configured as an downlink SCell part of CA configuration. | | | | | | | | | | | | | | | | | |

### 7.78.3 Co-existence studies

Co-existence studies are captured for lower order combinations.

### 7.78.4 ∆TIB and ∆RIB values

For DC\_13-66\_n5-n48, the ΔTIB,c and ΔRIB,c values are derived from DC\_5-48-66\_n12 and are given in the tables below.

Table 7.78.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_13-66\_n5-n48 | 13 | 0.4 |
| 66 | 0.6 |
| n5 | 0.8 |
| n48 | 0.8 |

Table 7.78.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_13-66\_n5-n48 | 13 | 0.3 |
| 66 | 0.2 |
| n5 | 0.5 |
| n48 | 0.5 |

### 7.78.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 7.79 DC\_1-8\_n78-n258

### 7.79.1 Operating bands for DC

**Table 7.79.1-1: DC band combination LTE 2bands + inter-band NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_1-8\_n78-n258 | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |
| n258 | 24250 MHz | – | 27500 MHz | 24250 MHz | – | 27500 MHz |

### 7.79.2 Channel bandwidths per operating band for DC

**Table 7.79.2-1: Supported bandwidths per DC LTE 2bands + inter-band NR 2DL/1UL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **Channel bandwidth set** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_1A-8A\_n78A-n258A  DC\_1A-8A\_n78A-n258D  DC\_1A-8A\_n78A-n258E  DC\_1A-8A\_n78A-n258F  DC\_1A-8A\_n78A-n258G  DC\_1A-8A\_n78A-n258H  DC\_1A-8A\_n78A-n258I  DC\_1A-8A\_n78A-n258J  DC\_1A-8A\_n78A-n258K  DC\_1A-8A\_n78A-n258L  DC\_1A-8A\_n78A-n258M | DC\_1A\_n78A  DC\_1A\_n258A DC\_8A\_n78A  DC\_8A\_n258A | 1 | See CA\_1A-8A in TS 36.101 | 330  430  530  630  730  830  930 |
| 8 |
| n78 | CA\_n78A-n258A/D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n258 |

### 7.79.3 Co-existence studies

The co-existence summary in section 5.3 of 37.717-11-21 already captures the needed studies. There is no additional harmonic and/or intermodulation impact for this combination.

### 7.79.4 ∆TIB and ∆RIB values

No further ΔTIB,c and ΔRIB,c values are needed defined for this combination including FR2 as the FR1 combinations is already completed.

### 7.79.5 MSD

No additional MSD requirement is needed.

## 7.80 DC\_3-8\_n78-n258

### 7.80.1 Operating bands for DC

**Table 7.80.1-1: DC band combination of LTE 2bands + inter-band NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_3-8\_n78-n258 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |
| n258 | 24250 MHz | – | 27500 MHz | 24250 MHz | – | 27500 MHz |

### 7.80.2 Channel bandwidths per operating band for DC

**Table 7.80.2-1: Supported bandwidths per DC LTE 2bands + inter-band NR 2DL/1UL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **Channel bandwidth set** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A-8A\_n78A-n258A  DC\_3A-8A\_n78A-n258D  DC\_3A-8A\_n78A-n258E  DC\_3A-8A\_n78A-n258F  DC\_3A-8A\_n78A-n258G  DC\_3A-8A\_n78A-n258H  DC\_3A-8A\_n78A-n258I  DC\_3A-8A\_n78A-n258J  DC\_3A-8A\_n78A-n258K  DC\_3A-8A\_n78A-n258L  DC\_3A-8A\_n78A-n258M | DC\_3A\_n78A  DC\_3A\_n258A DC\_8A\_n78A  DC\_8A\_n258A | 3 | See CA\_3A-8A in TS 36.101 | 330  430  530  630  730  830  930 |
| 8 |
| n78 | CA\_n78A-n258A/D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n258 |

### 7.80.3 Co-existence studies

The co-existence summary in section 5.3 of 37.717-11-21 already captures the needed studies. There is no additional harmonic and/or intermodulation impact for this combination.

### 7.80.4 ∆TIB and ∆RIB values

No further ΔTIB,c and ΔRIB,c values are needed defined for this combination including FR2 as the FR1 combinations is already completed.

### 7.80.5 MSD

No additional MSD requirement is needed.

## 7.81 DC\_7-8\_n78-n258

### 7.81.1 Operating bands for DC

**Table 7.81.1-1: DC band combination of LTE 2bands + inter-band NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_7-8\_n78-n258 | 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |
| n258 | 24250 MHz | – | 27500 MHz | 24250 MHz | – | 27500 MHz |

### 7.81.2 Channel bandwidths per operating band for DC

**Table 7.81.2-1: Supported bandwidths per DC LTE 2bands + inter-band NR 2DL/1UL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **Channel bandwidth set** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_7A-8A\_n78A-n258A  DC\_7A-8A\_n78A-n258D  DC\_7A-8A\_n78A-n258E  DC\_7A-8A\_n78A-n258F  DC\_7A-8A\_n78A-n258G  DC\_7A-8A\_n78A-n258H  DC\_7A-8A\_n78A-n258I  DC\_7A-8A\_n78A-n258J  DC\_7A-8A\_n78A-n258K  DC\_7A-8A\_n78A-n258L  DC\_7A-8A\_n78A-n258M | DC\_7A\_n78A  DC\_7A\_n258A DC\_8A\_n78A  DC\_8A\_n258A | 7 | See CA\_7A-8A in TS 36.101 | 330  430  530  630  730  830  930 |
| 8 |
| n78 | CA\_n78A-n258A/D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n258 |

### 7.81.3 Co-existence studies

The co-existence summary in section 5.3 of 37.717-11-21 already captures the needed studies. There is no additional harmonic and/or intermodulation impact for this combination.

### 7.81.4 ∆TIB and ∆RIB values

No further ΔTIB,c and ΔRIB,c values are needed defined for this combination including FR2 as the FR1 combinations is already completed.

### 7.81.5 MSD

No additional MSD requirement is needed.

## 7.82 DC\_1-8\_n40-n258

### 7.82.1 Operating bands for DC

**Table 7.82.1-1: DC band combination of LTE 2bands + inter-band NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_1-8\_n40-n258 | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n258 | 24250 MHz | – | 27500 MHz | 24250 MHz | – | 27500 MHz |

### 7.82.2 Channel bandwidths per operating band for DC

**Table 7.82.2-1: Supported bandwidths per DC LTE 2bands + inter-band NR 2DL/1UL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **Channel bandwidth set** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_1A-8A\_n40A-n258A  DC\_1A-8A\_n40A-n258D  DC\_1A-8A\_n40A-n258E  DC\_1A-8A\_n40A-n258F  DC\_1A-8A\_n40A-n258G  DC\_1A-8A\_n40A-n258H  DC\_1A-8A\_n40A-n258I  DC\_1A-8A\_n40A-n258J  DC\_1A-8A\_n40A-n258K  DC\_1A-8A\_n40A-n258L  DC\_1A-8A\_n40A-n258M | DC\_1A\_n40A  DC\_1A\_n258A DC\_8A\_n40A  DC\_8A\_n258A | 1 | See CA\_1A-8A in TS 36.101 | 310  410  510  610  710  810  910 |
| 8 |
| n40 | CA\_n40A-n258A/D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n258 |

### 7.82.3 Co-existence studies

The co-existence summary in section 5.3 of 37.717-11-21 already captures the needed studies. There is no additional harmonic and/or intermodulation impact for this combination.

### 7.82.4 ∆TIB and ∆RIB values

No further ΔTIB,c and ΔRIB,c values are needed defined for this combination including FR2 as the FR1 combinations is already completed.

### 7.82.5 MSD

No additional MSD requirement is needed.

## 7.83 DC\_3-8\_n40-n258

### 7.83.1 Operating bands for DC

**Table 7.83.1-1: DC band combination of LTE 2 bands + inter-band NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_3-8\_n40-n258 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n258 | 24250 MHz | – | 27500 MHz | 24250 MHz | – | 27500 MHz |

### 7.83.2 Channel bandwidths per operating band for DC

**Table 7.83.2-1: Supported bandwidths per DC LTE 2 bands + inter-band NR 2DL/1UL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **Channel bandwidth set** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A-8A\_n40A-n258A  DC\_3A-8A\_n40A-n258D  DC\_3A-8A\_n40A-n258E  DC\_3A-8A\_n40A-n258F  DC\_3A-8A\_n40A-n258G  DC\_3A-8A\_n40A-n258H  DC\_3A-8A\_n40A-n258I  DC\_3A-8A\_n40A-n258J  DC\_3A-8A\_n40A-n258K  DC\_3A-8A\_n40A-n258L  DC\_3A-8A\_n40A-n258M | DC\_3A\_n40A  DC\_3A\_n258A DC\_8A\_n40A  DC\_8A\_n258A | 3 | See CA\_3A-8A in TS 36.101 | 310  410  510  610  710  810  910 |
| 8 |
| n40 | CA\_n40A-n258A/D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n258 |

### 7.83.3 Co-existence studies

The co-existence summary in section 5.3 of 37.717-11-21 already captures the needed studies. There is no additional harmonic and/or intermodulation impact for this combination.

### 7.83.4 ∆TIB and ∆RIB values

No further ΔTIB,c and ΔRIB,c values are needed defined for this combination including FR2 as the FR1 combinations is already completed.

### 7.83.5 MSD

No additional MSD requirement is needed.

## 7.84 DC\_7-8\_n40-n258

### 7.84.1 Operating bands for DC

**Table 7.84.1-1: DC band combination of LTE 2 bands + inter-band NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_7-8\_n40-n258 | 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n258 | 24250 MHz | – | 27500 MHz | 24250 MHz | – | 27500 MHz |

### 7.84.2 Channel bandwidths per operating band for DC

**Table 7.84.2-1: Supported bandwidths per DC LTE 2 bands + inter-band NR 2DL/1UL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **Channel bandwidth set** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_7A-8A\_n40A-n258A  DC\_7A-8A\_n40A-n258D  DC\_7A-8A\_n40A-n258E  DC\_7A-8A\_n40A-n258F  DC\_7A-8A\_n40A-n258G  DC\_7A-8A\_n40A-n258H  DC\_7A-8A\_n40A-n258I  DC\_7A-8A\_n40A-n258J  DC\_7A-8A\_n40A-n258K  DC\_7A-8A\_n40A-n258L  DC\_7A-8A\_n40A-n258M | DC\_7A\_n40A  DC\_7A\_n258A DC\_8A\_n40A  DC\_8A\_n258A | 7 | See CA\_7A-8A in TS 36.101 | 310  410  510  610  710  810  910 |
| 8 |
| n40 | CA\_n40A-n258A/D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n258 |

### 7.84.3 Co-existence studies

The co-existence summary in section 5.3 of 37.717-11-21 already captures the needed studies. There is no additional harmonic and/or intermodulation impact for this combination.

### 7.84.4 ∆TIB and ∆RIB values

No further ΔTIB,c and ΔRIB,c values are needed defined for this combination including FR2 as the FR1 combinations is already completed.

### 7.84.5 MSD

No additional MSD requirement is needed.

# 8 Dual Connectivity band combinations of LTE 3 bands DL/1UL + NR 2 bands DL/1UL: Specific Band Combination Part

## 8.1 DC\_1-3-8\_n28-n77

### 8.1.1 Operating bands for DC

Table 8.1.1-1: DC band combination of LTE 3DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_1-3-8\_n28-n77 | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 8.1.2 Channel bandwidths per operating band for DC

Table 8.1.2-1: Supported bandwidths per DC LTE 3DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5**  **MHz** | **10**  **MHz** | **15**  **MHz** | **20**  **MHz** | **25**  **MHz** | | **30**  **MHz** | | **40**  **MHz** | | **50**  **MHz** | | **60**  **MHz** | | **70**  **MHz** | | **80**  **MHz** | | **90**  **MHz** | | **100**  **MHz** | **Maximum aggregated bandwidth For DL**  **[MHz]** | |
| DC\_1A-3A-8A\_n28A-n77A | DC\_1A\_n28A  DC\_1A\_n77A  DC\_3A\_n28A  DC\_3A\_n77A  DC\_8A\_n28A  DC\_8A\_n77A | 1 | 15 | Yes | Yes | Yes | Yes |  |  | |  | |  | |  | |  | |  | |  | |  | | | 170 |
| 3 | 15 | Yes | Yes | Yes | Yes |  |  | |  | |  | |  | |  | |  | |  | |  | | |
| 8 | 15 | Yes | Yes |  |  |  |  | |  | |  | |  | |  | |  | |  | |  | | |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  | |  | |  | |  | |  | |  | |  | |  | | |
| 30 |  | Yes | Yes | Yes |  |  | |  | |  | |  | |  | |  | |  | |  | | |
| 60 |  |  |  |  |  |  | |  | |  | |  | |  | |  | |  | |  | | |
| n77 | 15 |  | Yes | Yes | Yes |  |  | | Yes | | Yes | |  | |  | |  | |  | |  | | |
| 30 |  | Yes | Yes | Yes |  |  | | Yes | | Yes | | Yes | |  | | Yes | | Yes | | Yes | | |
| 60 |  | Yes | Yes | Yes |  |  | | Yes | | Yes | | Yes | |  | | Yes | | Yes | | Yes | | |
| DC\_1A-3A-8A\_n28A-n77(2A) | DC\_1A\_n28A  DC\_1A\_n77A  DC\_3A\_n28A  DC\_3A\_n77A  DC\_8A\_n28A  DC\_8A\_n77A | 1 | 15 | Yes | Yes | Yes | Yes |  |  | |  | |  | |  | |  | |  | |  | |  | | | 270 |
| 3 | 15 | Yes | Yes | Yes | Yes |  |  | |  | |  | |  | |  | |  | |  | |  | | |
| 8 | 15 | Yes | Yes |  |  |  |  | |  | |  | |  | |  | |  | |  | |  | | |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  | |  | |  | |  | |  | |  | |  | |  | | |
| 30 |  | Yes | Yes | Yes |  |  | |  | |  | |  | |  | |  | |  | |  | | |
| 60 |  |  |  |  |  |  | |  | |  | |  | |  | |  | |  | |  | | |
| n77 | See CA\_n77(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | | | | | | | | | | |

### 8.1.3 Co-existence studies

Co-existence studies of this DC LTE inter-band 3DL/1UL + inter-band NR 2DL/1UL are already covered by the fallback configurations, DC\_1-3-8\_n28, DC\_1-3-8\_n77, DC\_1-3\_n28-n77, DC\_1-8\_n28-n77 and DC\_3-8\_n28-n77. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 8.1.4 ∆TIB and ∆RIB values

For DC\_1-3-8\_n28-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 8.1.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_1-3-8\_n28-n77 | 1 | 0.6 |
| 3 | 0.6 |
| 8 | 0.6 |
| n28 | 0.6 |
| n77 | 0.8 |

Table 8.1.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_1-3-8\_n28-n77 | 1 | 0.2 |
| 3 | 0.2 |
| 8 | 0.2 |
| n28 | 0.2 |
| n77 | 0.5 |

### 8.1.5 MSD

As mentioned in 8.1.3, there is no need to specify additional MSD requirement for this UL DC configuration.

## 8.2 DC\_3-7-8\_n40-n78

### 8.2.1 Operating bands for DC

**Table 8.2.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-7-8\_n40-n78 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 8.2.2 Configuration for DC

Table 8.2.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  Configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-7A-8A\_n40A-n78A | DC\_3A\_n40A  DC\_3A\_n78A  DC\_7A\_n40A  DC\_7A\_n78A  DC\_8A\_n40A  DC\_8A\_n78A | CA\_3A-7A-8A | CA\_n40A-n78A |

### 8.2.3 Co-existence studies

Co-existence studies are captured in TR 37.716-11-11 as well as for lower order combinations in TR 37.716-21-21.

### 8.2.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 8.2.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_7-8\_n40-n78 | 3 | 0.6 |
| 7 | 0.5 |
| 8 | 0.3 |
| n40 | 0.5 |
| n78 | 0.8 |

**Table 8.2.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_7-8\_n40-n78 | 3 | 0.2 |
| 7 | 0 |
| 8 | 0.2 |
| n40 | 0.4 |
| n78 | 0.5 |

### 8.2.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 8.3 DC\_3-7-28\_n1-n40

### 8.3.1 Operating bands for DC

**Table 8.3.1-1: LTE 1 band DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-7-28\_n1-n40 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| 28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |

### 8.3.2 Configuration for DC

Table 8.3.2-1: Inter-band EN-DC configurations (three bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-7A-28A\_n1A-n40A | DC\_3A\_n1A  DC\_3A\_n40A  DC\_7A\_n1A  DC\_7A\_n40A  DC\_28A\_n1A  DC\_28A\_n40A | CA\_3A-7A-28A | CA\_n1A-n40A |

### 8.3.3 Co-existence studies

Co-existence studies are captured in TR 37.716-11-11 as well as for lower order combinations in TR 37.716-21-21.

### 8.3.4 ∆TIB and ∆RIB values

ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 8.3.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-7-28\_n1-n40 | 3 | 0.6 |
| 7 | 0.8 |
| 28 | 0.6 |
| n1 | 0.6 |
| n40 | 0.9 |

**Table 8.3.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-7-28\_n1-n40 | 3 | 0 |
| 7 | 0.3 |
| 28 | 0.2 |
| n1 | 0 |
| n40 | 0.8 |

### 8.3.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

8.4 DC\_1-3-18\_n3-n77

8.4.1 Operating bands for DC

**Table 8.4.1-1: DC band combination of LTE 3DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1-3-18\_n3-n77 | 1, 3, 18 | n3, n77 |

8.4.2 Channel bandwidths per operating band for DC

**Table 8.4.2-1: Supported bandwidths per DC band combination of LTE 3DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A-3A-18A\_n3A-n77A | DC\_1A\_n3A  DC\_1A\_n77A  DC\_3A\_n3A1  DC\_3A\_n77A  DC\_18A\_n3A  DC\_18A\_n77A | 1 | See CA\_1A-3A-18A BCS0 in Table 5.6A.1-2a of TS 36.101 | | | | | | | | | | | | | |
| 3 |
| 18 |
| n3 | See CA\_n3A-n77A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n77 |
| NOTE1: Only single switched UL is supported. | | | | | | | | | | | | | | | | |

8.4.3 Co-existence studies

Co-existence studies of this 5DL/2UL DC configuration are already covered in the constituent fall-back mode.

8.4.4 ∆TIB and ∆RIB values

For DC\_1-3-18\_n3-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 8.4.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3-18\_n3-n77 | 1 | 0.6 |
| 3 | 0.6 |
| 18 | 0.3 |
| n3 | 0.6 |
| n77 | 0.8 |

**Table 8.4.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3-18\_n3-n77 | 1 | 0.2 |
| 3 | 0.2 |
| 18 | 0 |
| n3 | 0.2 |
| n77 | 0.5 |

8.4.5 MSD

There are no additional MSD requirements for this band combination.

8.5 DC\_1-3-18\_n3-n78

8.5.1 Operating bands for DC

**Table 8.5.1-1: DC band combination of LTE 3DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1-3-18\_n3-n78 | 1, 3, 18 | n3, n78 |

8.5.2 Channel bandwidths per operating band for DC

**Table 8.5.2-1: Supported bandwidths per DC band combination of LTE 3DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A-3A-18A\_n3A-n78A | DC\_1A\_n3A  DC\_1A\_n78A  DC\_3A\_n3A  DC\_3A\_n78A  DC\_18A\_n3A  DC\_18A\_n78A | 1 | See CA\_1A-3A-18A BCS0 in Table 5.6A.1-2a of TS 36.101 | | | | | | | | | | | | | |
| 3 |
| 18 |
| n3 | See CA\_n3A-n78A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n78 |

8.5.3 Co-existence studies

Co-existence studies of this 5DL/2UL DC configuration are already covered in the constituent fall-back mode.

8.5.4 ∆TIB and ∆RIB values

For DC\_1-3-18\_n3-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 8.5.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3-18\_n3-n78 | 1 | 0.6 |
| 3 | 0.6 |
| 18 | 0.3 |
| n3 | 0.6 |
| n78 | 0.8 |

**Table 8.5.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3-18\_n3-n78 | 1 | 0.2 |
| 3 | 0.2 |
| 18 | 0 |
| n3 | 0.2 |
| n78 | 0.5 |

8.5.5 MSD

There are no additional MSD requirements for this band combination.

8.6 DC\_1-3-41\_n3-n41

8.6.1 Operating bands for DC

**Table 8.6.1-1: DC band combination of LTE 3DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1-3-41\_n3-n41 | 1, 3, 41 | n3, n41 |

8.6.2 Channel bandwidths per operating band for DC

**Table 8.6.2-1: Supported bandwidths per DC band combination of LTE 3DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A-3A-41A\_n3A-n41A | DC\_1A\_n3A  DC\_1A\_n41A  DC\_3A\_n3A1  DC\_3A\_n41A  DC\_41A\_n3A | 1 | See CA\_1A-3A-41A BCS0 in Table 5.6A.1-2a of TS 36.101 | | | | | | | | | | | | | |
| 3 |
| 41 |
| n3 | See CA\_n3A-n41A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n41 |
| n41 |
| NOTE1: Only single switched UL is supported. | | | | | | | | | | | | | | | | |

8.6.3 Co-existence studies

Co-existence studies of this 5DL/2UL DC configuration are already covered in the constituent fall-back mode.

8.6.4 ∆TIB and ∆RIB values

For DC\_1-3-41\_n3-n41, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 8.6.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3-41\_n3-n41 | 1 | 0.5 |
| 3 | 0.5 |
| 41 | 0.31/0.82 |
| n3 | 0.5 |
| n41 | 0.31/0.82 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

**Table 8.6.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3-41\_n3-n41 | 1 | 0 |
| 3 | 0 |
| 41 | 01/0.52 |
| n3 | 0 |
| n41 | 01/0.52 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz. | | |

8.6.5 MSD

There are no additional MSD requirements for this band combination.

8.7 DC\_1-3-41\_n3-n77

8.7.1 Operating bands for DC

**Table 8.7.1-1: DC band combination of LTE 3DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1-3-41\_n3-n77 | 1, 3, 41 | n3, n77 |

8.7.2 Channel bandwidths per operating band for DC

**Table 8.7.2-1: Supported bandwidths per DC band combination of LTE 3DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A-3A-41A\_n3A-n77A | DC\_1A\_n3A  DC\_1A\_n77A  DC\_3A\_n3A1  DC\_3A\_n77A  DC\_41A\_n3A  DC\_41A\_n77A | 1 | See CA\_1A-3A-41A BCS0 in Table 5.6A.1-2a of TS 36.101 | | | | | | | | | | | | | |
| 3 |
| 41 |
| n3 | See CA\_n3A-n77A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n77 |
| DC\_1A-3A-41C\_n3A-n77A | DC\_1A\_n3A  DC\_1A\_n77A  DC\_3A\_n3A1  DC\_3A\_n77A  DC\_41A\_n3A  DC\_41A\_n77A  DC\_41C\_n3A  DC\_41C\_n77A | 1 | See CA\_1A-3A-41C BCS0 in Table 5.6A.1-2a of TS 36.101 | | | | | | | | | | | | | |
| 3 |
| 41 |
| n3 | See CA\_n3A-n77A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n77 |
| NOTE1: Only single switched UL is supported. | | | | | | | | | | | | | | | | |

8.7.3 Co-existence studies

Co-existence studies of this 5DL/2UL DC configuration are already covered in the constituent fall-back mode.

8.7.4 ∆TIB and ∆RIB values

For DC\_1-3-41\_n3-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 8.7.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3-41\_n3-n77 | 1 | 0.6 |
| 3 | 0.6 |
| 41 | 0.5 |
| n3 | 0.6 |
| n77 | 0.8 |

**Table 8.7.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3-41\_n3-n77 | 1 | 0.2 |
| 3 | 0.2 |
| 41 | 0 |
| n3 | 0.2 |
| n77 | 0.5 |

8.7.5 MSD

There are no additional MSD requirements for this band combination.

8.8 DC\_1-3-41\_n3-n78

8.8.1 Operating bands for DC

**Table 8.8.1-1: DC band combination of LTE 3DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1-3-41\_n3-n78 | 1, 3, 41 | n3, n78 |

8.8.2 Channel bandwidths per operating band for DC

**Table 8.8.2-1: Supported bandwidths per DC band combination of LTE 3DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A-3A-41A\_n3A-n78A | DC\_1A\_n3A  DC\_1A\_n78A  DC\_3A\_n3A1  DC\_3A\_n78A  DC\_41A\_n3A  DC\_41A\_n78A | 1 | See CA\_1A-3A-41A BCS0 in Table 5.6A.1-2a of TS 36.101 | | | | | | | | | | | | | | |
| 3 |
| 41 |
| n3 | See CA\_n3A-n78A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | | |
| n78 |
| DC\_1A-3A-41C\_n3A-n78A | DC\_1A\_n3A  DC\_1A\_n78A  DC\_3A\_n3A1  DC\_3A\_n78A  DC\_41A\_n3A  DC\_41A\_n78A  DC\_41C\_n3A  DC\_41C\_n78A | 1 | See CA\_1A-3A-41C BCS0 in Table 5.6A.1-2a of TS 36.101 | | | | | | | | | | | | | | |
| 3 |
| 41 |
| n3 | See CA\_n3A-n78A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | | |
| n78 |
| NOTE1: Only single switched UL is supported. | | | | | | | | | | | | | | | | | |

8.8.3 Co-existence studies

Co-existence studies of this 5DL/2UL DC configuration are already covered in the constituent fall-back mode.

8.8.4 ∆TIB and ∆RIB values

For DC\_1-3-41\_n3-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 8.8.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3-41\_n3-n78 | 1 | 0.6 |
| 3 | 0.6 |
| 41 | 0.5 |
| n3 | 0.6 |
| n78 | 0.8 |

**Table 8.8.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3-41\_n3-n78 | 1 | 0.2 |
| 3 | 0.2 |
| 41 | 0 |
| n3 | 0.2 |
| n78 | 0.5 |

8.8.5 MSD

There are no additional MSD requirements for this band combination.

8.9 DC\_1-3-41\_n41-n77

8.9.1 Operating bands for DC

**Table 8.9.1-1: DC band combination of LTE 3DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1-3-41\_n41-n77 | 1, 3, 41 | n41, n77 |

8.9.2 Channel bandwidths per operating band for DC

**Table 8.9.2-1: Supported bandwidths per DC band combination of LTE 3DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A-3A-41A\_n41A-n77A | DC\_1A\_n41A  DC\_1A\_n77A  DC\_3A\_n41A  DC\_3A\_n77A  DC\_41A\_n77A | 1 | See CA\_1A-3A-41A BCS0 in Table 5.6A.1-2a of TS 36.101 | | | | | | | | | | | | | |
| 3 |
| 41 |
| n41 | See CA\_n41A-n77A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n77 |

8.9.3 Co-existence studies

Co-existence studies of this 5DL/2UL DC configuration are already covered in the constituent fall-back mode.

8.9.4 ∆TIB and ∆RIB values

For DC\_1-3-41\_n41-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 8.9.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3-41\_n41-n77 | 1 | 0.6 |
| 3 | 0.6 |
| 41 | 0.5 |
| n41 | 0.5 |
| n77 | 0.8 |

**Table 8.9.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3-41\_n41-n77 | 1 | 0.2 |
| 3 | 0.2 |
| 41 | 0 |
| n41 | 0 |
| n77 | 0.5 |

8.9.5 MSD

There are no additional MSD requirements for this band combination.

8.10 DC\_1-3-41\_n41-n78

8.10.1 Operating bands for DC

**Table 8.10.1-1: DC band combination of LTE 3DL/1UL + NR 2DL/1UL**

|  |  |  |
| --- | --- | --- |
| DC Band | LTE Band  (Table 5.5-1 in TS36.101[4]) | NR Band  (Table 5.2-1 in TS38.101-1[2] and TS38.101-2[3]) |
| DC\_1-3-41\_n41-n78 | 1, 3, 41 | n41, n78 |

8.10.2 Channel bandwidths per operating band for DC

**Table 8.10.2-1: Supported bandwidths per DC band combination of LTE 3DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** |
| DC\_1A-3A-41A\_n41A-n78A | DC\_1A\_n41A  DC\_1A\_n78A  DC\_3A\_n41A  DC\_3A\_n78A  DC\_41A\_n78A | 1 | See CA\_1A-3A-41A BCS0 in Table 5.6A.1-2a of TS 36.101 | | | | | | | | | | | | | |
| 3 |
| 41 |
| n41 | See CA\_n41A-n78A BCS0 in Table 5.5A.3.1-1 of TS 38.101-1 | | | | | | | | | | | | | |
| n78 |

8.10.3 Co-existence studies

Co-existence studies of this 5DL/2UL DC configuration are already covered in the constituent fall-back mode.

8.10.4 ∆TIB and ∆RIB values

For DC\_1-3-41\_n41-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

**Table 8.10.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3-41\_n41-n78 | 1 | 0.6 |
| 3 | 0.6 |
| 41 | 0.5 |
| n41 | 0.5 |
| n78 | 0.8 |

**Table 8.10.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_1-3-41\_n41-n78 | 1 | 0.2 |
| 3 | 0.2 |
| 41 | 0 |
| n41 | 0 |
| n78 | 0.5 |

8.10.5 MSD

There are no additional MSD requirements for this band combination.

## 8.11 DC\_1-8-42\_n28-n77

### 8.11.1 Operating bands for DC

Table 8.11.1-1: DC band combination of LTE 3DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_1-8-42\_n28-n77 | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 8.11.2 Channel bandwidths per operating band for DC

Table 8.11.2-1: Supported bandwidths per DC LTE 3DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **Subcarrier Spacing**  **[kHz]** | **5**  **MHz** | **10**  **MHz** | **15**  **MHz** | **20**  **MHz** | **25**  **MHz** | **30**  **MHz** | **40**  **MHz** | **50**  **MHz** | **60**  **MHz** | **70**  **MHz** | **80**  **MHz** | **90**  **MHz** | **100**  **MHz** | **Maximum aggregated bandwidth For DL**  **[MHz]** |
| DC\_1A-8A-42A\_n28A-n77A | DC\_1A\_n28A  DC\_1A\_n77A  DC\_8A\_n28A  DC\_8A\_n77A  DC\_42A\_n28A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 170 |
| 8 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 42 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| DC\_1A-8A-42A\_n28A-n77(2A) | DC\_1A\_n28A  DC\_1A\_n77A  DC\_8A\_n28A  DC\_8A\_n77A  DC\_42A\_n28A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 270 |
| 8 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 42 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | See CA\_n77(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | |
| DC\_1A-8A-42C\_n28A-n77A | DC\_1A\_n28A  DC\_1A\_n77A  DC\_8A\_n28A  DC\_8A\_n77A  DC\_42A\_n28A  DC\_42C\_n28A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 190 |
| 8 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 42 | See CA\_42C Bandwidth Combination Set 0 in Table 5.6A.1 in TS36.101 | | | | | | | | | | | | | |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |
| DC\_1A-8A-42C\_n28A-n77(2A) | DC\_1A\_n28A  DC\_1A\_n77A  DC\_8A\_n28A  DC\_8A\_n77A  DC\_42A\_n28A  DC\_42C\_n28A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 290 |
| 8 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 42 | See CA\_42C Bandwidth Combination Set 0 in Table 5.6A.1 in TS36.101 | | | | | | | | | | | | | |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | See CA\_n77(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | |

### 8.11.3 Co-existence studies

Co-existence studies of this DC LTE inter-band 3DL/1UL + inter-band NR 2DL/1UL are already covered by the fallback configurations, DC\_1-8-42\_n28, DC\_1-8-42\_n77, DC\_1-8\_n28-n77, DC\_1-42\_n28-n77 and DC\_8-42\_n28-n77. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 8.11.4 ∆TIB and ∆RIB values

For DC\_1-8-42\_n28-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 8.11.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_1-8-42\_n28-n77 | 1 | 0.6 |
| 8 | 0.6 |
| 42 | 0.8 |
| n28 | 0.8 |
| n77 | 0.8 |

Table 8.11.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_1-8-42\_n28-n77 | 1 | 0.2 |
| 8 | 0.2 |
| 42 | 0.5 |
| n28 | 0.5 |
| n77 | 0.5 |

### 8.11.5 MSD

As mentioned in 8.11.3, there is no need to specify additional MSD requirement for this UL DC configuration.

## 8.12 DC\_1-3-18\_n28-n77

### 8.12.1 Operating bands for DC

Table 8.12.1-1: DC band combination of LTE 3DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_1-3-18\_n28-n77 | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 8.12.2 Channel bandwidths per operating band for DC

Table 8.12.2-1: Supported bandwidths per DC LTE 3DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth** | | | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **Subcarrier Spacing**  **[kHz]** | **5**  **MHz** | **10**  **MHz** | **15**  **MHz** | **20**  **MHz** | **25**  **MHz** | **30**  **MHz** | **40**  **MHz** | **50**  **MHz** | **60**  **MHz** | **70**  **MHz** | **80**  **MHz** | **90**  **MHz** | **100**  **MHz** | **200**  **MHz** | **400**  **MHz** | **Maximum aggregated bandwidth For DL**  **[MHz]** |
| DC\_1A-3A-18A\_n28A-n77A | DC\_1A\_n28A  DC\_1A\_n77A  DC\_3A\_n28A  DC\_3A\_n77A  DC\_18A\_n28A  DC\_18A\_n77A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 185 |
| 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 18 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |
| DC\_1A-3A-18A\_n28A-n77(2A) | DC\_1A\_n28A  DC\_1A\_n77A  DC\_3A\_n28A  DC\_3A\_n77A  DC\_18A\_n28A  DC\_18A\_n77A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 285 |
| 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 18 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | See CA\_n77(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | | | |

### 8.12.3 Co-existence studies

Co-existence studies of DC\_1A-3A-18A\_n28A-n**77A** and protected bands are already covered in the constituent fall-back modes.

### 8.12.4 ∆TIB and ∆RIB values

For DC\_1-3-18\_n28-n77, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 8.12.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_1-3-18\_n28-n77 | 1 | 0.3 |
| 3 | 0.3 |
| 18 | 0.3 |
| n28 | 0.6 |
| n77 | 0.8 |

Table 8.12.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_1-3-18\_n28-n77 | 1 | 0 |
| 3 | 0 |
| 18 | 0 |
| n28 | 0.2 |
| n77 | 0.5 |

### 8.12.5 MSD

As mentioned in 8.12.3, there is no need to specify additional MSD requirement for this UL DC configuration.

## 8.13 DC\_1-3-18\_n28-n78

### 8.13.1 Operating bands for DC

Table 8.13.1-1: DC band combination of LTE 3DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_1-3-18\_n28-n77 | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 8.13.2 Channel bandwidths per operating band for DC

Table 8.13.2-1: Supported bandwidths per DC LTE 3DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth** | | | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **Subcarrier Spacing**  **[kHz]** | **5**  **MHz** | **10**  **MHz** | **15**  **MHz** | **20**  **MHz** | **25**  **MHz** | **30**  **MHz** | **40**  **MHz** | **50**  **MHz** | **60**  **MHz** | **70**  **MHz** | **80**  **MHz** | **90**  **MHz** | **100**  **MHz** | **200**  **MHz** | **400**  **MHz** | **Maximum aggregated bandwidth For DL**  **[MHz]** |
| DC\_1A-3A-18A\_n28A-n78A | DC\_1A\_n28A  DC\_1A\_n78A  DC\_3A\_n28A  DC\_3A\_n77A  DC\_18A\_n28A  DC\_18A\_n78A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 185 |
| 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 18 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n78 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |
| DC\_1A-3A-18A\_n28A-n78(2A) | DC\_1A\_n28A  DC\_1A\_n78A  DC\_3A\_n28A  DC\_3A\_n78A  DC\_18A\_n28A  DC\_18A\_n78A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 285 |
| 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 18 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n78 | See CA\_n78(2A) Bandwidth Combination Set 0 in Table 5.5A.2-1 in TS38.101-1 | | | | | | | | | | | | | | | |

### 8.13.3 Co-existence studies

Co-existence studies of DC\_1A-3A-18A\_n28A-n**78A** and protected bands are already covered in the constituent fall-back modes.

### 8.13.4 ∆TIB and ∆RIB values

For DC\_1-3-18\_n28-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 8.13.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_1-3-18\_n28-n78 | 1 | 0.3 |
| 3 | 0.3 |
| 18 | 0.3 |
| n28 | 0.6 |
| n78 | 0.8 |

Table 8.13.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_1-3-18\_n28-n78 | 1 | 0 |
| 3 | 0 |
| 18 | 0 |
| n28 | 0.2 |
| n78 | 0.5 |

### 8.13.5 MSD

As mentioned in 8.13.3, there is no need to specify additional MSD requirement for this UL DC configuration.

## 8.14 DC\_1-3-41\_n28-n41

### 8.14.1 Operating bands for DC

Table 8.14.1-1: DC band combination of LTE 3DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_1-3-41\_n28-n41 | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 41 | 2496 MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |
| n28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n41 | 2496 MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | TDD |

### 8.14.2 Channel bandwidths per operating band for DC

Table 8.14.2-1: Supported bandwidths per DC LTE 3DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth** | | | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **Subcarrier Spacing**  **[kHz]** | **5**  **MHz** | **10**  **MHz** | **15**  **MHz** | **20**  **MHz** | **25**  **MHz** | **30**  **MHz** | **40**  **MHz** | **50**  **MHz** | **60**  **MHz** | **70**  **MHz** | **80**  **MHz** | **90**  **MHz** | **100**  **MHz** | **200**  **MHz** | **400**  **MHz** | **Maximum aggregated bandwidth For DL**  **[MHz]** |
| DC\_1A-3A-41A\_n28A-n41A | DC\_1A\_n28A  DC\_1A\_n41A  DC\_3A\_n28A  DC\_3A\_n41A  DC\_41A\_n28A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  | 190 |
| 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| 41 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  | Yes |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n41 | 15 |  | Yes | Yes | Yes |  |  | Yes | Yes |  |  |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |
| 60 |  | Yes | Yes | Yes |  |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |

### 8.14.3 Co-existence studies

Co-existence studies of DC\_1A-3A-41A\_n28A-n**41A** and protected bands are already covered in the constituent fall-back modes.

### 8.14.4 ∆TIB and ∆RIB values

For DC\_1-3-41\_n28-n41, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 8.14.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_1-3-41\_n28-n41 | 1 | 0.3 |
| 3 | 0.3 |
| 41 | 0.31/0.82 |
| n28 | 0.6 |
| n41 | 0.31/0.82 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz | | |

Table 8.14.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_1-3-41\_n28-n41 | 1 | 0 |
| 3 | 0 |
| 41 | 01/0.52 |
| n28 | 0.2 |
| n41 | 01/0.52 |
| NOTE 1: Applicable for the frequency range of 2515-2690 MHz.  NOTE 2: Applicable for the frequency range of 2496-2515 MHz | | |

### 8.14.5 MSD

As mentioned in 8.14.3, there is no need to specify additional MSD requirement for this UL DC configuration.

## 8.15 DC\_3-19-42\_n1-n77

### 8.15.1 Operating bands for DC

**Table 8.15.1-1: LTE 3 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-19-42\_n1-n77 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 8.15.2 Configuration for DC

Table 8.15.2-1: Inter-band EN-DC configurations (five bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-19A-42A\_n1A-n77A | DC\_3A\_n1A  DC\_3A\_n77A  DC\_19A\_n1A  DC\_19A\_n77A | CA\_3A-19A-42A | CA\_n1A-n77A |
| DC\_3A-19A-42C\_n1A-n77A | DC\_3A\_n1A  DC\_3A\_n77A  DC\_19A\_n1A  DC\_19A\_n77A | CA\_3A-19A-42C | CA\_n1A-n77A |

### 8.15.3 Co-existence studies

Co-existence studies of DC\_3-19-42\_n1-n77 are already covered by the fallback configurations, DC\_3-19-42\_n1, DC\_3-19-42\_n77, DC\_3-19\_n1-n77, DC\_3-42\_n1-n77 and DC\_19-42\_n1-n77. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 8.15.4 ∆TIB and ∆RIB values

For DC\_3-19-42\_n1-n77, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-3-19-42\_n77, and are given in the tables below.

**Table 8.15.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-19-42\_n1-n77 | 3 | 0.6 |
| 19 | 0.3 |
| 42 | 0.8 |
| n1 | 0.6 |
| n77 | 0.8 |

**Table 8.15.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-19-42\_n1-n77 | 3 | 0.2 |
| 19 | 0 |
| 42 | 0.5 |
| n1 | 0.2 |
| n77 | 0.5 |

### 8.15.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 8.16 DC\_3-19-42\_n1-n78

### 8.16.1 Operating bands for DC

**Table 8.16.1-1: LTE 3 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-19-42\_n1-n78 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 8.16.2 Configuration for DC

Table 8.16.2-1: Inter-band EN-DC configurations (five bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-19A-42A\_n1A-n78A | DC\_3A\_n1A  DC\_3A\_n78A  DC\_19A\_n1A  DC\_19A\_n78A | CA\_3A-19A-42A | CA\_n1A-n78A |
| DC\_3A-19A-42C\_n1A-n78A | DC\_3A\_n1A  DC\_3A\_n78A  DC\_19A\_n1A  DC\_19A\_n78A | CA\_3A-19A-42C | CA\_n1A-n78A |

### 8.16.3 Co-existence studies

Co-existence studies of DC\_3-19-42\_n1-n78 are already covered by the fallback configurations, DC\_3-19-42\_n1, DC\_3-19-42\_n78, DC\_3-19\_n1-n78, DC\_3-42\_n1-n78 and DC\_19-42\_n1-n78. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 8.16.4 ∆TIB and ∆RIB values

For DC\_3-19-42\_n1-n78, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-3-19-42\_n78, and are given in the tables below.

**Table 8.16.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-19-42\_n1-n78 | 3 | 0.6 |
| 19 | 0.3 |
| 42 | 0.8 |
| n1 | 0.6 |
| n78 | 0.8 |

**Table 8.16.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-19-42\_n1-n78 | 3 | 0.2 |
| 19 | 0 |
| 42 | 0.5 |
| n1 | 0.2 |
| n78 | 0.5 |

### 8.16.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 8.17 DC\_3-19-42\_n1-n79

### 8.17.1 Operating bands for DC

**Table 8.17.1-1: LTE 3 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-19-42\_n1-n79 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n79 | 4400 MHz | – | 5000 MHz | 4400 MHz | – | 5000 MHz | TDD |

### 8.17.2 Configuration for DC

Table 8.17.2-1: Inter-band EN-DC configurations (five bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-19A-42A\_n1A-n79A | DC\_3A\_n1A  DC\_3A\_n79A  DC\_19A\_n1A  DC\_19A\_n79A | CA\_3A-19A-42A | CA\_n1A-n79A |
| DC\_3A-19A-42C\_n1A-n79A | DC\_3A\_n1A  DC\_3A\_n79A  DC\_19A\_n1A  DC\_19A\_n79A | CA\_3A-19A-42C | CA\_n1A-n79A |

### 8.17.3 Co-existence studies

Co-existence studies of DC\_3-19-42\_n1-n79 are already covered by the fallback configurations, DC\_3-19-42\_n1, DC\_3-19-42\_n79, DC\_3-19\_n1-n79, DC\_3-42\_n1-n79 and DC\_19-42\_n1-n79. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 8.17.4 ∆TIB and ∆RIB values

For DC\_3-19-42\_n1-n79, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-3-19-42\_n79, and are given in the tables below.

**Table 8.17.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-19-42\_n1-n79 | 3 | 0.6 |
| 19 | 0.3 |
| 42 | 0.8 |
| n1 | 0.6 |
| n79 | 0 |

**Table 8.17.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-19-42\_n1-n79 | 3 | 0.2 |
| 19 | 0 |
| 42 | 0.5 |
| n1 | 0.2 |
| n79 | 0 |

### 8.17.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 8.18 DC\_3-21-42\_n1-n77

### 8.18.1 Operating bands for DC

**Table 8.18.1-1: LTE 3 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-21-42\_n1-n77 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 8.18.2 Configuration for DC

Table 8.18.2-1: Inter-band EN-DC configurations (five bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-21A-42A\_n1A-n77A | DC\_3A\_n1A  DC\_3A\_n77A  DC\_21A\_n1A  DC\_21A\_n77A | CA\_3A-21A-42A | CA\_n1A-n77A |
| DC\_3A-21A-42C\_n1A-n77A | DC\_3A\_n1A  DC\_3A\_n77A  DC\_21A\_n1A  DC\_21A\_n77A | CA\_3A-21A-42C | CA\_n1A-n77A |

### 8.18.3 Co-existence studies

Co-existence studies of DC\_3-21-42\_n1-n77 are already covered by the fallback configurations, DC\_3-21-42\_n1, DC\_3-21-42\_n77, DC\_3-21\_n1-n77, DC\_3-42\_n1-n77 and DC\_21-42\_n1-n77. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 8.18.4 ∆TIB and ∆RIB values

For DC\_3-21-42\_n1-n77, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-3-21-42\_n77, and are given in the tables below.

**Table 8.18.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-21-42\_n1-n77 | 3 | 0.8 |
| 21 | 0.9 |
| 42 | 0.8 |
| n1 | 0.6 |
| n77 | 0.6 |

**Table 8.18.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-21-42\_n1-n77 | 3 | 0.3 |
| 21 | 0.5 |
| 42 | 0.5 |
| n1 | 0.2 |
| n77 | 0.2 |

### 8.18.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 8.19 DC\_3-21-42\_n1-n78

### 8.19.1 Operating bands for DC

**Table 8.19.1-1: LTE 3 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-21-42\_n1-n78 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 8.19.2 Configuration for DC

Table 8.19.2-1: Inter-band EN-DC configurations (five bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-21A-42A\_n1A-n78A | DC\_3A\_n1A  DC\_3A\_n78A  DC\_21A\_n1A  DC\_21A\_n78A | CA\_3A-21A-42A | CA\_n1A-n78A |
| DC\_3A-21A-42C\_n1A-n78A | DC\_3A\_n1A  DC\_3A\_n78A  DC\_21A\_n1A  DC\_21A\_n78A | CA\_3A-21A-42C | CA\_n1A-n78A |

### 8.19.3 Co-existence studies

Co-existence studies of DC\_3-21-42\_n1-n78 are already covered by the fallback configurations, DC\_3-21-42\_n1, DC\_3-21-42\_n78, DC\_3-21\_n1-n78, DC\_3-42\_n1-n78 and DC\_21-42\_n1-n78. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 8.19.4 ∆TIB and ∆RIB values

For DC\_3-21-42\_n1-n78, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-3-21-42\_n78, and are given in the tables below.

**Table 8.19.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-21-42\_n1-n78 | 3 | 0.8 |
| 21 | 0.9 |
| 42 | 0.8 |
| n1 | 0.6 |
| n78 | 0.6 |

**Table 8.19.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-21-42\_n1-n78 | 3 | 0.3 |
| 21 | 0.5 |
| 42 | 0.5 |
| n1 | 0.2 |
| n78 | 0.2 |

### 8.19.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 8.20 DC\_3-21-42\_n1-n79

### 8.20.1 Operating bands for DC

**Table 8.20.1-1: LTE 3 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3-21-42\_n1-n79 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n79 | 4400 MHz | – | 5000 MHz | 4400 MHz | – | 5000 MHz | TDD |

### 8.20.2 Configuration for DC

Table 8.20.2-1: Inter-band EN-DC configurations (five bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_3A-21A-42A\_n1A-n79A | DC\_3A\_n1A  DC\_3A\_n79A  DC\_21A\_n1A  DC\_21A\_n79A | CA\_3A-21A-42A | CA\_n1A-n79A |
| DC\_3A-21A-42C\_n1A-n79A | DC\_3A\_n1A  DC\_3A\_n79A  DC\_21A\_n1A  DC\_21A\_n79A | CA\_3A-21A-42C | CA\_n1A-n79A |

### 8.20.3 Co-existence studies

Co-existence studies of DC\_3-21-42\_n1-n79 are already covered by the fallback configurations, DC\_3-21-42\_n1, DC\_3-21-42\_n79, DC\_3-21\_n1-n79, DC\_3-42\_n1-n79 and DC\_21-42\_n1-n79. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 8.20.4 ∆TIB and ∆RIB values

For DC\_3-21-42\_n1-n79, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-3-21-42\_n79, and are given in the tables below.

**Table 8.20.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_3-21-42\_n1-n79 | 3 | 0.8 |
| 21 | 0.9 |
| 42 | 0.8 |
| n1 | 0.6 |
| n79 | 0 |

**Table 8.20.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_3-21-42\_n1-n79 | 3 | 0.3 |
| 21 | 0.5 |
| 42 | 0.5 |
| n1 | 0.2 |
| n79 | 0 |

### 8.20.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 8.21 DC\_19-21-42\_n1-n77

### 8.21.1 Operating bands for DC

**Table 8.21.1-1: LTE 3 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_19-21-42\_n1-n77 | 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n77 | 3300 MHz | – | 4200 MHz | 3300 MHz | – | 4200 MHz | TDD |

### 8.21.2 Configuration for DC

Table 8.21.2-1: Inter-band EN-DC configurations (five bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_19A-21A-42A\_n1A-n77A | DC\_19A\_n1A  DC\_19A\_n77A  DC\_21A\_n1A  DC\_21A\_n77A | CA\_19A-21A-42A | CA\_n1A-n77A |
| DC\_19A-21A-42C\_n1A-n77A | DC\_19A\_n1A  DC\_19A\_n77A  DC\_21A\_n1A  DC\_21A\_n77A | CA\_19A-21A-42C | CA\_n1A-n77A |

### 8.21.3 Co-existence studies

Co-existence studies of DC\_19-21-42\_n1-n77 are already covered by the fallback configurations, DC\_19-21-42\_n1, DC\_19-21-42\_n77, DC\_19-21\_n1-n77, DC\_19-42\_n1-n77 and DC\_21-42\_n1-n77. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 8.21.4 ∆TIB and ∆RIB values

For DC\_19-21-42\_n1-n77, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-19-21-42\_n77, and are given in the tables below.

**Table 8.21.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_19-21-42\_n1-n77 | 19 | 0.3 |
| 21 | 0.4 |
| 42 | 0.8 |
| n1 | 0.3 |
| n77 | 0.8 |

**Table 8.21.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_19-21-42\_n1-n77 | 19 | 0 |
| 21 | 0 |
| 42 | 0.5 |
| n1 | 0.2 |
| n77 | 0.5 |

### 8.21.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 8.22 DC\_19-21-42\_n1-n78

### 8.22.1 Operating bands for DC

**Table 8.22.1-1: LTE 3 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_19-21-42\_n1-n78 | 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 8.22.2 Configuration for DC

Table 8.22.2-1: Inter-band EN-DC configurations (five bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_19A-21A-42A\_n1A-n78A | DC\_19A\_n1A  DC\_19A\_n78A  DC\_21A\_n1A  DC\_21A\_n78A | CA\_19A-21A-42A | CA\_n1A-n78A |
| DC\_19A-21A-42C\_n1A-n78A | DC\_19A\_n1A  DC\_19A\_n78A  DC\_21A\_n1A  DC\_21A\_n78A | CA\_19A-21A-42C | CA\_n1A-n78A |

### 8.22.3 Co-existence studies

Co-existence studies of DC\_19-21-42\_n1-n78 are already covered by the fallback configurations, DC\_19-21-42\_n1, DC\_19-21-42\_n78, DC\_19-21\_n1-n78, DC\_19-42\_n1-n78 and DC\_21-42\_n1-n78. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 8.22.4 ∆TIB and ∆RIB values

For DC\_19-21-42\_n1-n78, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-19-21-42\_n78, and are given in the tables below.

**Table 8.22.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_19-21-42\_n1-n78 | 19 | 0.3 |
| 21 | 0.4 |
| 42 | 0.8 |
| n1 | 0.3 |
| n78 | 0.8 |

**Table 8.22.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_19-21-42\_n1-n78 | 19 | 0 |
| 21 | 0 |
| 42 | 0.5 |
| n1 | 0 |
| n78 | 0.5 |

### 8.22.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 8.23 DC\_19-21-42\_n1-n79

### 8.23.1 Operating bands for DC

**Table 8.23.1-1: LTE 3 bands DL/1UL + NR 2 bands DL/1UL DC operating bands**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) operating band** | | | **Downlink (DL) operating band** | | | **Duplex Mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_19-21-42\_n1-n79 | 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| n79 | 4400 MHz | – | 5000 MHz | 4400 MHz | – | 5000 MHz | TDD |

### 8.23.2 Configuration for DC

Table 8.23.2-1: Inter-band EN-DC configurations (five bands)

| EN-DC  configuration | Uplink EN-DC  configuration  (NOTE 1) | E-UTRA CA configuration | NR band |
| --- | --- | --- | --- |
| DC\_19A-21A-42A\_n1A-n79A | DC\_19A\_n1A  DC\_19A\_n79A  DC\_21A\_n1A  DC\_21A\_n79A | CA\_19A-21A-42A | CA\_n1A-n79A |
| DC\_19A-21A-42C\_n1A-n79A | DC\_19A\_n1A  DC\_19A\_n79A  DC\_21A\_n1A  DC\_21A\_n79A | CA\_19A-21A-42C | CA\_n1A-n79A |

### 8.23.3 Co-existence studies

Co-existence studies of DC\_19-21-42\_n1-n79 are already covered by the fallback configurations, DC\_19-21-42\_n1, DC\_19-21-42\_n79, DC\_19-21\_n1-n79, DC\_19-42\_n1-n79 and DC\_21-42\_n1-n79. Therefore, there is no additional harmonic and intermodulation impact for the additional band receiver.

### 8.23.4 ∆TIB and ∆RIB values

For DC\_19-21-42\_n1-n79, the ΔTIB,c and ΔRIB,c values are reused from DC\_1-19-21-42\_n79, and are given in the tables below.

**Table 8.23.4-1: ΔTIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| --- | --- | --- |
| DC\_19-21-42\_n1-n79 | 19 | 0.3 |
| 21 | 0.4 |
| 42 | 0.8 |
| n1 | 0.3 |
| n79 | 0 |

**Table 8.23.4-2: ΔRIB**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB [dB]** |
| --- | --- | --- |
| DC\_19-21-42\_n1-n79 | 19 | 0 |
| 21 | 0 |
| 42 | 0.5 |
| n1 | 0 |
| n79 | 0 |

### 8.23.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

8.24 DC\_3-7-20\_n1-n78

8.24.1 Operating bands for DC

**Table 8.24.1-1: DC band combination of LTE 3DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Band** | **E-UTRA and NR Band** | **Uplink (UL) band** | | | **Downlink (DL) band** | | | **Duplex**  **mode** |
| **BS receive / UE transmit** | | | **BS transmit / UE receive** | | |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| DC\_3A-7A-20A\_n1A-n78A  DC\_3C-7A-20A\_n1A-n78A | n1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| 20 | 832 MHz | – | 862 MHz | 791 MHz | – | 821 MHz | FDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

8.24.2 Channel bandwidths per operating band for DC

**Table 8.24.2-1: Supported bandwidths per DC band combination of LTE 3DL/1UL + NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **SCS (kHz)** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A-7A-20A\_n1A-n78A | DC\_3A\_n1A  DC\_3A\_n78A  DC\_7A\_n1A  DC\_7A\_n78A  DC\_20A\_n1A  DC\_20A\_n78A | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 210 |
| 7 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 20 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n1 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| n78 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| DC\_3C-7A-20A\_n1A-n78A | DC\_3A\_n1A  DC\_3A\_n78A  DC\_7A\_n1A  DC\_7A\_n78A  DC\_20A\_n1A  DC\_20A\_n78A | 3 | See CA\_3C Bandwidth Combination Set 0 in Table 5.6A.1-1 | | | | | | | | | | | | | | 230 |
| 7 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 20 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n1 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| n78 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

8.24.3 Co-existence studies

Co-existence studies of DC\_3-7-20\_n1-n78 and protected bands are already covered in the constituent fall-back modes.

8.24.4 ∆TIB and ∆RIB values

The ΔTIB,c and ΔRIB,c values of DC\_3-7-20\_n1-n78 are given in the tables below reusing the values for DC\_1-3-7-20\_n78.

**Table 8.24.4-1: ΔTIB,c**

|  |  |  |
| --- | --- | --- |
| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔTIB,c [dB]** |
| DC\_3-7-20\_n1-n78 | n1 | 0.6 |
| 3 | 0.6 |
| 7 | 0.7 |
| 20 | 0.6 |
| n78 | 0.8 |
|  | | |

**Table 8.24.4-2: ΔRIB,c**

| **Inter-band DC Configuration** | **E-UTRA and NR Band** | **ΔRIB,c [dB]** |
| --- | --- | --- |
| DC\_3-7-20\_n1-n78 | n1 | 0.2 |
| 3 | 0.2 |
| 7 | 0.2 |
| 20 | 0.2 |
| n78 | 0.5 |
|  | | |

8.24.5 MSD

All MSD requirements for DC\_3-7-20\_n1-n78 are already covered by constituent fallback modes. No additional MSD requirement is needed.

## 8.25 DC\_3-7-28\_n40-n78

### 8.25.1 Operating bands for DC

Table 8.25.1-1: DC band combination of LTE 3DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_3-7-28\_n40-n78 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| 28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 8.25.2 Channel bandwidths per operating band for DC

Table 8.25.2-1: Supported bandwidths per DC LTE 3DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC\_3A-7A-28A\_n40A-n78A | DC\_3A\_n40A DC\_3A\_n78A DC\_7A\_n40A DC\_7A\_n78A DC\_28A\_n40A DC\_28A\_n78A | 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 240 |
| 7 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n40 | 15 | Yes9 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
| n78 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 8.25.3 Co-existence studies

Co-existence studies are captured for lower order combinations.

### 8.25.4 ∆TIB and ∆RIB values

For DC\_3-7-28\_n40-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 8.25.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_3-7-28\_n40-n78 | 3 | 0.6 |
| 7 | 0.5 |
| 28 | 0.3 |
| n40 | 0.5 |
| n78 | 0.8 |

Table 8.25.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_3-7-28\_n40-n78 | 3 | 0.2 |
| 7 | 0 |
| 28 | 0.2 |
| n40 | 0.4 |
| n78 | 0.5 |

### 8.25.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 8.26 DC\_1-3-7\_n40-n78

### 8.26.1 Operating bands for DC

Table 8.26.1-1: DC band combination of LTE 3DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_1-3-7\_n40-n78 | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 8.26.2 Channel bandwidths per operating band for DC

Table 8.26.2-1: Supported bandwidths per DC LTE 3DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC\_1A-3A-7\_n40A-n78A | DC\_1A\_n40A DC\_1A\_n78A DC\_3A\_n40A DC\_3A\_n78A DC\_7A\_n40A DC\_7A\_n78A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 240 |
| 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 7 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n40 | 15 | Yes9 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
| n78 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 8.26.3 Co-existence studies

Co-existence studies are captured for lower order combinations.

### 8.26.4 ∆TIB and ∆RIB values

For DC\_1-3-7\_n40-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 8.26.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_1-3-7\_n40-n78 | 1 | 0.6 |
| 3 | 0.6 |
| 7 | 0.8 |
| n40 | 0.9 |
| n78 | 0.8 |

Table 8.26.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_1-3-7\_n40-n78 | 1 | 0 |
| 3 | 0 |
| 7 | 0.3 |
| n40 | 0.8 |
| n78 | 0.5 |

### 8.26.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 8.27 DC\_1-7-28\_n40-n78

### 8.27.1 Operating bands for DC

Table 8.27.1-1: DC band combination of LTE 3DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_1-7-28\_n40-n78 | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| 28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 8.27.2 Channel bandwidths per operating band for DC

Table 8.27.2-1: Supported bandwidths per DC LTE 3DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC\_1A-7A-28A\_n40A-n78A | DC\_1A\_n40A DC\_1A\_n78A DC\_7A\_n40A DC\_7A\_n78A DC\_28A\_n40A DC\_28A\_n78A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 240 |
| 7 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n40 | 15 | Yes9 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
| n78 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 8.27.3 Co-existence studies

Co-existence studies are captured for lower order combinations.

### 8.27.4 ∆TIB and ∆RIB values

For DC\_1-7-28\_n40-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 8.27.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_1-7-28\_n40-n78 | 1 | 0.6 |
| 7 | 0.5 |
| 28 | 0.3 |
| n40 | 0.5 |
| n78 | 0.8 |

Table 8.27.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_1-7-28\_n40-n78 | 1 | 0.2 |
| 7 | 0 |
| 28 | 0.2 |
| n40 | 0.4 |
| n78 | 0.5 |

### 8.27.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

## 8.28 DC\_3-7-8\_n78-n258

### 8.28.1 Operating bands for DC

**Table 8.28.1-1: DC band combination of LTE 3 bands + inter-band NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_3-7-8\_n78-n258 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz |
| 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |
| n258 | 24250 MHz | – | 27500 MHz | 24250 MHz | – | 27500 MHz |

### 8.28.2 Channel bandwidths per operating band for DC

**Table 8.28.2-1: Supported bandwidths per DC LTE 3 bands + inter-band NR 2DL/1UL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **Channel bandwidth set** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A-7A-8A\_n78A-n258A  DC\_3A-7A-8A\_n78A-n258D  DC\_3A-7A-8A\_n78A-n258E  DC\_3A-7A-8A\_n78A-n258F  DC\_3A-7A-8A\_n78A-n258G  DC\_3A-7A-8A\_n78A-n258H  DC\_3A-7A-8A\_n78A-n258I  DC\_3A-7A-8A\_n78A-n258J  DC\_3A-7A-8A\_n78A-n258K  DC\_3A-7A-8A\_n78A-n258L  DC\_3A-7A-8A\_n78A-n258M | DC\_3A\_n78A  DC\_3A\_n258A DC\_7A\_n78A  DC\_7A\_n258A DC\_8A\_n78A  DC\_8A\_n258A | 3 | See CA\_3A-7A-8A in TS 36.101 | 350  450  550  650  750  850  950 |
| 7 |
| 8 |
| n78 | CA\_n78A-n258A/D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n258 |

### 8.28.3 Co-existence studies

The co-existence summary in section 5.3 of 37.717-11-21 already captures the needed studies. There is no additional harmonic and/or intermodulation impact for this combination.

### 8.28.4 ∆TIB and ∆RIB values

No further ΔTIB,c and ΔRIB,c values are needed defined for this combination including FR2 as the FR1 combinations is already completed.

### 8.28.5 MSD

No additional MSD requirement is needed.

## 8.29 DC\_3-7-8\_n40A-n258

### 8.29.1 Operating bands for DC

**Table 8.29.1-1: DC band combination of LTE 3 bands + inter-band NR 2DL/1UL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | Duplex  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_3A-3-7-8\_n40-n258 | 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz |
| 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n258 | 24250 MHz | – | 27500 MHz | 24250 MHz | – | 27500 MHz |

### 8.29.2 Channel bandwidths per operating band for DC

**Table 8.29.2-1: Supported bandwidths per DC LTE 3 bands + inter-band NR 2DL/1UL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E-UTRA and NR DC Configuration** | **UL Configuration** | **E-UTRA and NR Band** | **Channel bandwidth set** | **Maximum aggregated bandwidth**  **[MHz]** |
| DC\_3A-7A-8A\_n40A-n258A  DC\_3A-7A-8A\_n40A-n258D  DC\_3A-7A-8A\_n40A-n258E  DC\_3A-7A-8A\_n40A-n258F  DC\_3A-7A-8A\_n40A-n258G  DC\_3A-7A-8A\_n40A-n258H  DC\_3A-7A-8A\_n40A-n258I  DC\_3A-7A-8A\_n40A-n258J  DC\_3A-7A-8A\_n40A-n258K  DC\_3A-7A-8A\_n40A-n258L  DC\_3A-7A-8A\_n40A-n258M | DC\_3A\_n40A  DC\_3A\_n258A DC\_7A\_n40A  DC\_7A\_n258A DC\_8A\_n40A  DC\_8A\_n258A | 3 | See CA\_3A-7A-8A in TS 36.101 | 330  430  530  630  730  830  930 |
| 7 |
| 8 |
| n40 | CA\_n40A-n258A/D/E/F/G/H/I/J/K/L/M in TS 38.101-3 |
| n258 |

### 8.29.3 Co-existence studies

The co-existence summary in section 5.3 of 37.717-11-21 already captures the needed studies. There is no additional harmonic and/or intermodulation impact for this combination.

### 8.29.4 ∆TIB and ∆RIB values

No further ΔTIB,c and ΔRIB,c values are needed defined for this combination including FR2 as the FR1 combinations is already completed.

### 8.29.5 MSD

No additional MSD requirement is needed.

# 9 Dual Connectivity band combinations of LTE 4 band DL/1UL + NR 2 bands DL/1UL: Specific Band Combination Part

## 9.1 DC\_1-3-7-28\_n40-n78

### 9.1.1 Operating bands for DC

Table 9.1.1-1: DC band combination of LTE 4DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA and NR DC Band combination | E-UTRA and NR DC Band | Uplink (UL) band | | | Downlink (DL) band | | | **Duplex**  mode |
| BS receive / UE transmit | | | BS transmit / UE receive | | |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| DC\_1-3-7-28\_n40-n78 | 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| 28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| n40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| n78 | 3300 MHz | – | 3800 MHz | 3300 MHz | – | 3800 MHz | TDD |

### 9.1.2 Channel bandwidths per operating band for DC

Table 9.1.2-1: Supported bandwidths per DC LTE 4DL/1UL + inter-band NR 2DL/1UL

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DC operating / channel bandwidth [MHz]** | | | | | | | | | | | | | | | | | |
| **E-UTRA and NR DC Configuration** | **UL Configurations** | **E-UTRA and NR Band** | **SCS**  **[kHz]** | **5** | **10** | **15** | **20** | **25** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **Max aggreg. BW DL [MHz]** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC\_1A-3A-7A-28A\_n40A-n78A | DC\_1A\_n40A DC\_1A\_n78A DC\_3A\_n40A DC\_3A\_n78A DC\_7A\_n40A DC\_7A\_n78A DC\_28A\_n40A DC\_28A\_n78A | 1 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  | 260 |
| 3 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 7 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| 28 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n40 | 15 | Yes9 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
| n78 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| NOTE 4: This UE channel bandwidth is optional in this release of the specification. | | | | | | | | | | | | | | | | | |

### 9.1.3 Co-existence studies

Co-existence studies are captured for lower order combinations.

### 9.1.4 ∆TIB and ∆RIB values

For DC\_1-3-7-28\_n40-n78, the ΔTIB,c and ΔRIB,c values are given in the tables below.

Table 9.1.4-1: ΔTIB,c

| Inter-band DC Configuration | E-UTRA and NR Band | ΔTIB,c [dB] |
| --- | --- | --- |
| DC\_1-3-7-28\_n40-n78 | 1 | 0.6 |
| 3 | 0.6 |
| 7 | 0.8 |
| 28 | 0.3 |
| n40 | 0.9 |
| n78 | 0.8 |

Table 9.1.4-2: ΔRIB

| Inter-band DC Configuration | E-UTRA and NR Band | ΔRIB [dB] |
| --- | --- | --- |
| DC\_1-3-7-28\_n40-n78 | 1 | 0 |
| 3 | 0 |
| 7 | 0.3 |
| 28 | 0.2 |
| n40 | 0.8 |
| n78 | 0.5 |

### 9.1.5 MSD

MSD was studied in lower order band combinations. No need for additional MSD analysis.

# Annex A: Change history

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Subject/Comment** | **Old** | **New** |
| 2020-08 | RAN4 #96-e | R4-2010130 |  |  | TR37.717-11-21 Skeleton for DC band combinations of LTE xDL/1UL (x=1,2,3,4) + inter-band NR 2DL/1UL | N/A | 0.0.1 |
| 2020-09 | RAN4 #96-e | R4-2011885 |  |  | TR 37.717-11-21 v0.1.0 for LTE(xDL/1UL)+ NR(2DL/1UL) DC in Rel-17 | 0.0.1 | 0.1.0 |
| 2020-11 | RAN4 #97-e | R4-2014304 |  |  | TR 37.717-11-21 v0.2.0 for LTE(xDL/1UL)+ NR(2DL/1UL) DC in Rel-17  - Included all approved TPs in section 10.7 | 0.1.0 | 0.2.0 |