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**5G;  
NR;  
User Equipment (UE) radio transmission and reception;  
Part 3: Range 1 and Range 2 Interworking operation with other  
radios  
(3GPP TS 38.101-3 version 15.5.0 Release 15)**



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# Foreword

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

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

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.

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# 1 Scope

The present document establishes the minimum RF requirements for NR User Equipment (UE) Interworking operation with other radios. This includes but is not limited to additional requirements for carrier aggregation or NR dual connectivity between Range 1 and Range 2 and additional requirements due to NR non-standalone (NSA) operation mode with E-UTRA.

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# 2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 38.101-1: "NR; User Equipment (UE) radio transmission and reception; Part 1: Range 1 Standalone"
- [3] 3GPP TS 38.101-2: "NR; User Equipment (UE) radio transmission and reception; Part 1: Range 1 Standalone"
- [4] 3GPP TS 36.101: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception"
- [5] 3GPP TS 38.521-3: "NR; User Equipment (UE) conformance specification; Radio transmission and reception; Part 3: Range 1 and Range 2 Interworking operation with other radios"
- [6] Recommendation ITU-R M.1545: "Measurement uncertainty as it applies to test limits for the terrestrial component of International Mobile Telecommunications-2000"
- [7] 3GPP TS 36.211: "E-UTRA; Physical channels and modulation"

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# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

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

<defined term>: <definition>.

## 3.2 Symbols

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

$\Delta R_{IB,c}$  Allowed reference sensitivity relaxation due to support for CA or DC operation, for serving cell  $c$ .

|                         |   |
|-------------------------|---|
| $\Delta T_{IB,c}$       | Allowed maximum configured output power relaxation due to support for CA or DC operation, for serving cell $c$  |
| $BW_{LTE\_Channel}$     | Channel bandwidth of E-UTRA carrier   |
| $BW_{LTE\_Channel\_CA}$ | Channel bandwidth of E-UTRA sub-block which is composed of intra-band contiguous CA E-UTRA carriers   |
| $BW_{NR\_Channel}$      | Channel bandwidth of NR carrier   |
| $BW_{NR\_Channel\_CA}$  | Channel bandwidth of NR sub-block which is composed of intra-band contiguous CA NR carriers   |
| $Ceil(x)$               | Rounding upwards; $ceil(x)$ is the smallest integer such that $ceil(x) \geq x$  |
| $EN-DC_{ACLR}$          | The ratio of the filtered mean power centred on the aggregated sub-block bandwidth ENBW to the filtered mean power centred on an adjacent bandwidth of the same size ENBW |
| $E-UTRA_{ACLR}$         | E-UTRA ACLR   |
| $F_c$                   | <i>RF reference frequency</i> for the carrier center on the channel raster  |
| $F_{DL\_low}$           | The lowest frequency of the downlink <i>operating band</i>  |
| $F_{DL\_high}$          | The highest frequency of the downlink <i>operating band</i>   |
| $F_{UL\_low}$           | The lowest frequency of the uplink <i>operating band</i>  |
| $F_{UL\_high}$          | The highest frequency of the uplink <i>operating band</i>   |
| $F_{OOB}$               | The boundary between the NR out of band emission and spurious emission domains  |
| $L_{CRB}$               | Transmission bandwidth which represents the length of a contiguous resource block allocation expressed in units of resources blocks                                       |
| $Max()$                 | The largest of given numbers  |
| $Min()$                 | The smallest of given numbers   |
| $NR_{ACLR}$             | NR ACLR   |
| $N_{RB}$                | Transmission bandwidth configuration, expressed in units of resource blocks   |
| $P_{CMAX}$              | The configured maximum UE output power  |
| $RB_{start}$            | Indicates the lowest RB index of transmitted resource blocks  |
| $W_{gap}$               | The sub-block gap between the two sub-blocks  |

### 3.3 Abbreviations

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

|         |   |
|---------|---|
| ACLR    | Adjacent Channel Leakage Ratio  |
| ACS     | Adjacent Channel Selectivity  |
| A-MPR   | Additional Maximum Power Reduction  |
| BCS     | Bandwidth Combination Set   |
| CA      | Carrier Aggregation   |
| CC      | Component carrier   |
| DC      | Dual Connectivity   |
| EN-DC   | E-UTRA/NR DC  |
| EVM     | Error Vector Magnitude  |
| FDM     | Frequency Division Multiplexing   |
| FR      | Frequency Range   |
| ENBW    | The aggregated bandwidth of an E-UTRA sub-block and an adjacent NR sub-block                          |
| ITU R   | Radiocommunication Sector of the International Telecommunication Union                                |
| MBW     | Measurement bandwidth defined for the protected band  |
| MPR     | Allowed maximum power reduction   |
| MSD     | Maximum Sensitivity Degradation   |
| MCG     | Master Cell Group   |
| NR      | New Radio   |
| NS      | Network Signalling  |
| NSA     | Non-Standalone, a mode of operation where operation of an other radio is assisted with an other radio |
| OOB     | Out-of-band   |
| OOBE    | Out-of-band emission  |
| OTA     | Over The Air  |
| PRB     | Physical Resource Block   |
| RE      | Resource Element  |
| REFSENS | Reference Sensitivity   |
| RF      | Radio Frequency   |
| Rx      | Receiver  |

|         |                                       |
|---------|---------------------------------------|
| SCG     | Secondary Cell Group                  |
| SCS     | Subcarrier spacing                    |
| SEM     | Spectrum Emission Mask                |
| SUL     | Supplementary uplink                  |
| TDM     | Time Division Multiplex               |
| Tx      | Transmitter                           |
| UE      | User Equipment                        |
| UL-MIMO | Up Link Multiple Antenna transmission |
| ULSUP   | Uplink sharing from UE perspective    |

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## 4 General

### 4.1 Relationship between minimum requirements and test requirements

The present document is interwork specification for NR UE, covering RF characteristics and minimum performance requirements. Conformance to the present specification is demonstrated by fulfilling the test requirements specified in the conformance specification 3GPP TS 38.521-3 [5].

The Minimum Requirements given in this specification make no allowance for measurement uncertainty. The test specification TS 38.521-3 [5] defines test tolerances. These test tolerances are individually calculated for each test. The test tolerances are used to relax the minimum requirements in this specification to create test requirements. For some requirements, including regulatory requirements, the test tolerance is set to zero.

The measurement results returned by the test system are compared - without any modification - against the test requirements as defined by the shared risk principle.

The shared risk principle is defined in Recommendation ITU-R M.1545 [6].

### 4.2 Applicability of minimum requirements

- a) In this specification the Minimum Requirements are specified as general requirements and additional requirements. Where the Requirement is specified as a general requirement, the requirement is mandated to be met in all scenarios
- b) For specific scenarios for which an additional requirement is specified, in addition to meeting the general requirement, the UE is mandated to meet the additional requirements.
- c) The spurious emissions power requirements are for the long-term average of the power. For the purpose of reducing measurement uncertainty it is acceptable to average the measured power over a period of time sufficient to reduce the uncertainty due to the statistical nature of the signal
- d) Terminal that supports EN-DC configuration shall meet E-UTRA requirements as specified in TS 36.101 [4] and NR requirements as in TS 38.101-1 [2] and TS 38.101-2 [3] unless otherwise specified in this specification
- e) All the requirements for intra-band contiguous and non-contiguous CA apply under the assumption of the same uplink-downlink and special subframe configurations in the PCell and SCells for SA.

A terminal which supports an inter-band EN-DC configuration shall support all specified E-UTRA bandwidth combination set that belong to the E-UTRA CA configuration part of E-UTRA – NR DC and shall support all specified NR bandwidth combination set that belong to the NR CA configuration part of E-UTRA – NR DC.

A terminal which supports an inter-band EN-DC configuration with a certain UL configuration shall support the all lower order DL configurations of the lower order EN-DC combinations, which have this certain UL configuration and the fallbacks of this UL configuration.

Terminal that supports inter-band NR-DC between FR1 and FR2 configuration shall meet the requirements for corresponding CA configuration (suffix A), unless otherwise specified.

## 4.3 Specification suffix information

Unless stated otherwise the following suffixes are used for indicating at 2<sup>nd</sup> level subclause, shown in Table 4.3-1.

**Table 4.3-1: Definition of suffixes**

| Clause suffix | Variant  |
|---------------|--|
| None          | Single Carrier   |
| A             | Carrier Aggregation (CA) between FR1 and FR2   |
| B             | Dual-Connectivity (DC) with and without SUL including UL sharing from UE perspective, inter-band NR DC between FR1 and FR2 |
| D             | UL MIMO  |

---

# 5 Operating bands and channel arrangement

## 5.1 General

The channel arrangements presented in this clause are based on the operating bands and channel bandwidths defined in the present release of specifications.

NOTE: Other operating bands and channel bandwidths may be considered in future releases.

Requirements throughout the RF specifications are in many cases defined separately for different frequency ranges (FR). The frequency ranges in which NR can operate according to this version of the specifications are identified as described in Table 5.1-1.

**Table 5.1-1: Definition of frequency ranges**

| Frequency range designation | Corresponding frequency range |
|-----------------------------|-------------------------------|
| FR1                         | 410 MHz – 7125 MHz            |
| FR2                         | 24250 MHz – 52600 MHz         |

The present specification covers band combinations including

- at least one FR1 operating band and one FR2 operating band for carrier aggregation and dual connectivity operations;
- at least one E-UTRA operating band for dual connectivity operations.

## 5.2 Operating bands

NR is designed to operate in FR1 operating bands defined in TS 38.101-1 [2] and FR2 operating bands defined in TS 38.101-2 [3]. E-UTRA is designed to operate in operating bands defined in TS 36.101 [4].

Editor's note: The lists of specific NR operating bands and band combinations is maintained in TR 38.817-01 and will be merged into TS 38.101-3 in a future version.

## 5.2A Operating bands for CA

### 5.2A.1 Inter-band CA between FR1 and FR2

NR carrier aggregation are designed to operate in the operating bands defined in Table 5.2A.1-1. The band combinations include at least one FR1 operating band and one FR2 operating band.

**Table 5.2A.1-1: Band combinations for inter-band NR CA between FR1 and FR2**

| NR CA Band  | NR Band   |
|---|-----------|
| CA_n8-n258  | n8, n258  |
| CA_n71-n257 <sup>1</sup>  | n71, n257 |
| CA_n77-n257 <sup>1</sup>  | n77, n257 |
| CA_n78-n257 <sup>1</sup>  | n78, n257 |
| CA_n79-n257 <sup>1</sup>  | n79, n257 |
| NOTE 1: Applicable for UE supporting inter-band carrier aggregation with mandatory simultaneous Rx/Tx capability. |           |

## 5.2B Operating bands for DC

### 5.2B.1 General

The operating bands are specified for operation with EN-DC or NGEN-DC, NR-DC configured. The EN-DC or NGEN-DC band combinations include at least one E-UTRA operating band.

For EN-DC configurations indicated by column “Single Uplink allowed” (e.g., problematic band combinations as defined in TS38.306) in tables in this section the UE may indicate capability of not supporting simultaneous dual and triple uplink operation due to possible intermodulation interference to its own primary downlink channel bandwidth if the intermodulation order is 2 or if the intermodulation order is 3 for the combinations when both operating bands are between 450 MHz – 960 MHz or between 1427 MHz – 2690 MHz. In case for the EN-DC configurations listed in tables in this section for which the intermodulation products caused by the dual and triple uplink operation fall into the receive band but do not interfere with the own primary downlink channel bandwidth as defined in Annex-I the UE is mandated to operate in dual and triple uplink mode. Single Uplink is also allowed for certain band combinations where intermodulation or reverse intermodulation products could create difficulty for meeting emission requirements.

For EN-DC combinations of order 3 or higher, “Single Uplink allowed” UL configurations captured in Table 5.2B.2.1-1, Table 5.2B.3.1-1, Table 5.2B.4.1-1 apply.

### 5.2B.2 Intra-band contiguous EN-DC

#### 5.2B.2.1 EN-DC

**Table 5.2B.2.1-1: Band combinations for intra-band contiguous EN-DC**

| EN-DC band  | E-UTRA Band | NR Band | Single UL allowed |
|---|-------------|---------|-------------------|
| DC_(n)71  | 71          | n71     | No <sup>3</sup>   |
| DC_(n)41 <sup>4</sup>   | 41          | n41     | Yes <sup>1</sup>  |
| NOTE 1: Single UL allowed due to potential emission issues, not self-interference.  |             |         |                   |
| NOTE 2: The minimum requirements apply for 15 kHz subcarrier spacing on the SCG.  |             |         |                   |
| NOTE 3: For UE(s) supporting dynamic power sharing it is mandatory to do dual simultaneous UL. For UE(s) not supporting dynamic power sharing single UL is allowed. |             |         |                   |
| NOTE 4: The minimum requirements only apply for non-simultaneous Tx/Rx between all carriers.  |             |         |                   |

## 5.2B.3 Intra-band non-contiguous EN-DC

### 5.2B.3.1 EN-DC

**Table 5.2B.3.1-1: Band combinations for intra-band non-contiguous EN-DC**

| EN-DC Band Uplink Combination | E-UTRA Band | NR Band | Single UL allowed |
|-------------------------------|-------------|---------|-------------------|
| DC_3_n3                       | 3           | n3      | Yes <sup>1</sup>  |
| DC_41_n41 <sup>2</sup>        | 41          | n41     | Yes               |

NOTE 1: Only single switched UL is supported in Rel.15  
NOTE 2: The minimum requirements only apply for non-simultaneous Tx/Rx between all carriers.

### 5.2B.3.2 Void



## 5.2B.4 Inter-band EN-DC within FR1

### 5.2B.4.1 EN-DC (two bands)

**Table 5.2B.4.1-1: Band combinations for inter-band EN-DC within FR1 (two bands)**

| EN-DC band              | E-UTRA Band | NR Band | Single UL allowed |
|-------------------------|-------------|---------|-------------------|
| DC_1_n28                | 1           | n28     | No                |
| DC_1_n40                | 1           | n40     | No                |
| DC_1_n51                | 1           | n51     | No                |
| DC_1_n77 <sup>3</sup>   | 1           | n77     | DC_1_n77          |
| DC_1_n78 <sup>3</sup>   | 1           | n78     | No                |
| DC_1_n79 <sup>3</sup>   | 1           | n79     | No                |
| DC_2_n5                 | 2           | n5      | No                |
| DC_2_n66                | 2           | n66     | DC_2_n66          |
| DC_2_n71                | 2           | n71     | No                |
| DC_2_n78                | 2           | n78     | DC_2_n78          |
| DC_3_n7                 | 3           | n7      | No                |
| DC_3_n28                | 3           | n28     | No                |
| DC_3_n40                | 3           | n40     | No                |
| DC_3_n51                | 3           | n51     | No                |
| DC_3_n77 <sup>3</sup>   | 3           | n77     | DC_3_n77          |
| DC_3_n78 <sup>3</sup>   | 3           | n78     | DC_3_n78          |
| DC_3_n79 <sup>3</sup>   | 3           | n79     | No                |
| DC_5_n40                | 5           | n40     | No                |
| DC_5_n66                | 5           | n66     | DC_5_n66          |
| DC_5_n78 <sup>3</sup>   | 5           | n78     | No                |
| DC_7_n28                | 7           | n28     | No                |
| DC_7_n51                | 7           | n51     | No                |
| DC_7_n78 <sup>3</sup>   | 7           | n78     | No                |
| DC_7-7_n78 <sup>3</sup> | CA_7-7      | n78     | No                |
| DC_8_n40                | 8           | n40     | No                |
| DC_8_n77 <sup>3</sup>   | 8           | n77     | No                |
| DC_8_n78 <sup>3</sup>   | 8           | n78     | No                |
| DC_8_n79 <sup>3</sup>   | 8           | n79     | No                |
| DC_11_n77 <sup>3</sup>  | 11          | n77     | No                |
| DC_11_n78 <sup>3</sup>  | 11          | n78     | No                |
| DC_11_n79 <sup>3</sup>  | 11          | n79     | No                |
| DC_12_n5                | 12          | n5      | No                |
| DC_12_n66               | 12          | n66     | No                |
| DC_18_n77 <sup>3</sup>  | 18          | n77     | No                |
| DC_18_n78 <sup>3</sup>  | 18          | n78     | No                |
| DC_18_n79 <sup>3</sup>  | 18          | n79     | No                |
| DC_19_n77 <sup>3</sup>  | 19          | n77     | No                |
| DC_19_n78 <sup>3</sup>  | 19          | n78     | No                |
| DC_19_n79 <sup>3</sup>  | 19          | n79     | No                |
| DC_20_n8                | 20          | n8      | DC_20_n8          |
| DC_20_n28 <sup>4</sup>  | 20          | n28     | No                |
| DC_20_n51               | 20          | n51     | No                |
| DC_20_n77               | 20          | n77     | No                |
| DC_20_n78 <sup>3</sup>  | 20          | n78     | No                |
| DC_21_n77 <sup>3</sup>  | 21          | n77     | No                |
| DC_21_n78 <sup>3</sup>  | 21          | n78     | No                |

| EN-DC band   | E-UTRA Band | NR Band | Single UL allowed |
|--|-------------|---------|-------------------|
| DC_21_n79 <sup>3</sup>   | 21          | n79     | No                |
| DC_25_n41  | 25          | n41     | No                |
| DC_26_n41 <sup>3</sup>   | 26          | n41     | No                |
| DC_26_n77 <sup>3</sup>   | 26          | n77     | No                |
| DC_26_n78 <sup>3</sup>   | 26          | n78     | No                |
| DC_26_n79 <sup>3</sup>   | 26          | n79     | No                |
| DC_28_n51  | 28          | n51     | No                |
| DC_28_n77 <sup>3</sup>   | 28          | n77     | No                |
| DC_28_n78 <sup>3</sup>   | 28          | n78     | No                |
| DC_28_n79 <sup>3</sup>   | 28          | n79     | No                |
| DC_30_n5   | 30          | n5      | No                |
| DC_30_n66  | 30          | n66     | No                |
| DC_38_n78  | 38          | n78     | No                |
| DC_39_n78 <sup>1,3</sup>   | 39          | n78     | No                |
| DC_39_n79 <sup>3</sup>   | 39          | n79     | No                |
| DC_40_n77  | 40          | n77     | No                |
| DC_41_n77  | 41          | n77     | No                |
| DC_41_n78  | 41          | n78     | No                |
| DC_41_n79 <sup>2,3</sup>   | 41          | n79     | No                |
| DC_42_n51  | 42          | n51     | No                |
| DC_42_n77 <sup>5</sup>   | 42          | n77     | N/A               |
| DC_42_n78 <sup>5</sup>   | 42          | n78     | N/A               |
| DC_42_n79 <sup>5</sup>   | 42          | n79     | N/A               |
| DC_66_n71  | 66          | n71     | No                |
| DC_66_n5   | 66          | n5      | DC_66_n5          |
| DC_66_n78  | 66          | n78     | No                |
| <p>NOTE 1: The frequency range above 3600 MHz for Band n78 is not used in this combination.</p> <p>NOTE 2: The frequency range below 2506 MHz for Band 41 is not used in this combination.</p> <p>NOTE 3: Applicable for UE supporting inter-band EN-DC with mandatory simultaneous Rx/Tx capability.</p> <p>NOTE 4: The frequency range in band n28 is restricted for this band combination to 703-733 MHz for the UL and 758-788 MHz for the DL.</p> <p>NOTE 5: The combination is not used alone as fall back mode of other band combinations in which UL in Band 42 is not used.</p> |             |         |                   |

## 5.2B.4.2 EN-DC (three bands)

**Table 5.2B.4.2-1: Band combinations for inter-band EN-DC within FR1 (three bands)**

| EN-DC Band                    | E-UTRA Band | NR Band     |  |
|-------------------------------|-------------|-------------|--|
| DC_1-3_n28                    | CA_1-3      | n28         |  |
| DC_1-3_n77 <sup>2</sup>       | CA_1-3      | n77         |  |
| DC_1-3_n78 <sup>2</sup>       | CA_1-3      | n78         |  |
| DC_1-3_n79 <sup>2</sup>       | CA_1-3      | n79         |  |
| DC_1-5_n78 <sup>2</sup>       | CA_1-5      | n78         |  |
| DC_1-7_n28 <sup>2</sup>       | CA_1-7      | n28         |  |
| DC_1-7_n78 <sup>2</sup>       | CA_1-7      | n78         |  |
| DC_1-7-7_n78 <sup>2</sup>     | CA_1-7-7    | n78         |  |
| DC_1-8_n78 <sup>2</sup>       | CA_1-8      | n78         |  |
| DC_1-18_n77 <sup>2</sup>      | CA_1-18     | n77         |  |
| DC_1-18_n78 <sup>2</sup>      | CA_1-18     | n78         |  |
| DC_1-18_n79                   | CA_1-18     | n79         |  |
| DC_1-19_n77 <sup>2</sup>      | CA_1-19     | n77         |  |
| DC_1-19_n78 <sup>2</sup>      | CA_1-19     | n78         |  |
| DC_1-19_n79 <sup>2</sup>      | CA_1-19     | n79         |  |
| DC_1-20_n28 <sup>3</sup>      | CA_1-20     | n28         |  |
| DC_1-20_n78 <sup>2</sup>      | CA_1-20     | n78         |  |
| DC_1-21_n77 <sup>2</sup>      | CA_1-21     | n77         |  |
| DC_1-21_n78 <sup>2</sup>      | CA_1-21     | n78         |  |
| DC_1-21_n79 <sup>2</sup>      | CA_1-21     | n79         |  |
| DC_1-28_n77 <sup>2</sup>      | CA_1-28     | n77         |  |
| DC_1-28_n78 <sup>2</sup>      | CA_1-28     | n78         |  |
| DC_1-28_n79                   | CA_1-28     | n79         |  |
| DC_1_n28-n78 <sup>2</sup>     | 1           | CA_n28-n78  |  |
| DC_1_n77-n79                  | 1           | CA_n77-n79  |  |
| DC_1_n78-n79                  | 1           | CA_n78-n79  |  |
| DC_1-41_n77                   | CA_1-41     | n77         |  |
| DC_1-41_n78                   | CA_1-41     | n78         |  |
| DC_1-41_n79                   | CA_1-41     | n79         |  |
| DC_1-42_n77                   | CA_1-42     | n77         |  |
| DC_1-42_n78                   | CA_1-42     | n78         |  |
| DC_1-42_n79                   | CA_1-42     | n79         |  |
| DC_1_SUL_n78-n84 <sup>2</sup> | 1           | SUL_n78-n84 |  |
| DC_2-5_n66                    | CA_2-5      | n66         |  |
| DC_2-12_n66                   | CA_2-12     | n66         |  |
| DC_2-30_n66                   | CA_2-30     | n66         |  |
| DC_2-(n)71                    | CA_2-71     | n71         |  |
| DC_2-66_n71                   | CA_2-66     | n71         |  |
| DC_3_n3-n77                   | 3           | CA_n3-n77   |  |
| DC_3_n3-n78                   | 3           | CA_n3-n78   |  |
| DC_3-5_n78 <sup>2</sup>       | CA_3-5      | n78         |  |
| DC_3-7_n28                    | CA_3-7      | n28         |  |
| DC_3-7_n78 <sup>2</sup>       | CA_3-7      | n78         |  |
| DC_3-7-7_n78 <sup>2</sup>     | CA_3-7-7    | n78         |  |
| DC_3-8_n78                    | CA_3-8      | n78         |  |
| DC_3-19_n77 <sup>2</sup>      | CA_3-19     | n77         |  |

| EN-DC Band                    | E-UTRA Band | NR Band                  |  |
|-------------------------------|-------------|--------------------------|--|
| DC_3-19_n78 <sup>2</sup>      | CA_3-19     | n78                      |  |
| DC_3-19_n79 <sup>2</sup>      | CA_3-19     | n79                      |  |
| DC_3-20_n28 <sup>2,3</sup>    | CA_3-20     | n28                      |  |
| DC_3-20_n78 <sup>2</sup>      | CA_3-20     | n78                      |  |
| DC_3-21_n77 <sup>2</sup>      | CA_3-21     | n77                      |  |
| DC_3-21_n78 <sup>2</sup>      | CA_3-21     | n78                      |  |
| DC_3-21_n79 <sup>2</sup>      | CA_3-21     | n79                      |  |
| DC_3-28_n78 <sup>2</sup>      | CA_3-28     | n78                      |  |
| DC_3_n28-n78 <sup>2</sup>     | 3           | CA_n28-n78               |  |
| DC_3-28_n79                   | 3           | CA_n28-n79               |  |
| DC_3-38_n78                   | CA_3-38     | n78                      |  |
| DC_3-41_n78                   | CA_3-41     | n78                      |  |
| DC_3-42_n77                   | CA_3-42     | n77                      |  |
| DC_3-42_n78                   | CA_3-42     | n78                      |  |
| DC_3-42_n79                   | CA_3-42     | n79                      |  |
| DC_3_n77-n79                  | 3           | CA_n77-n79               |  |
| DC_3_n78-n79                  | 3           | CA_n78-n79               |  |
| DC_3_SUL_n78-n80 <sup>2</sup> | 3           | SUL_n78-n80              |  |
| DC_3_SUL_n78-n82 <sup>2</sup> | 3           | SUL_n78-n82 <sup>1</sup> |  |
| DC_3_SUL_n79-n80 <sup>2</sup> | 3           | SUL_n79-n80              |  |
| DC_5-7-7_n78                  | CA_5-7-7    | n78                      |  |
| DC_5-7_n78                    | CA_5-7      | n78                      |  |
| DC_5-30_n66                   | CA_5-30     | n66                      |  |
|                               |             |                          |  |
| DC_7-20_n28 <sup>3</sup>      | CA_7-20     | n28                      |  |
| DC_7-20_n78 <sup>2</sup>      | CA_7-20     | n78                      |  |
| DC_7-28_n78 <sup>2</sup>      | CA_7-28     | n78                      |  |
| DC_7_n28-n78 <sup>2</sup>     | 7           | CA_n28-n78               |  |
| DC_7-46_n78                   | CA_7-46     | n78                      |  |
| DC_8_SUL_n78-n81 <sup>2</sup> | 8           | SUL_n78-n81              |  |
| DC_8_SUL_n79-n81 <sup>2</sup> | 8           | SUL_n79-n81              |  |
| DC_12-30_n66                  | CA_12-30    | n66                      |  |
| DC_18-28_n77 <sup>2</sup>     | CA_18-28    | n77                      |  |
| DC_18-28_n78 <sup>2</sup>     | CA_18-28    | n78                      |  |
| DC_18-28_n79 <sup>2</sup>     | CA_18-28    | n79                      |  |
| DC_19-21_n77 <sup>2</sup>     | CA_19-21    | n77                      |  |
| DC_19-21_n78 <sup>2</sup>     | CA_19-21    | n78                      |  |
| DC_19-21_n79 <sup>2</sup>     | CA_19-21    | n79                      |  |
| DC_19-42_n77                  | CA_19-42    | n77                      |  |
| DC_19-42_n78                  | CA_19-42    | n78                      |  |
| DC_19-42_n79                  | CA_19-42    | n79                      |  |
| DC_19_n77-n79                 | 19          | CA_n77-n79               |  |
| DC_19_n78-n79                 | 19          | CA_n78-n79               |  |
| DC_20_n8-n75                  | 20          | CA_n8-n75                |  |
| DC_20_n28-n75 <sup>3</sup>    | 20          | CA_n28-n75               |  |
| DC_20_n28-n78 <sup>2,3</sup>  | 20          | CA_n28-n78               |  |

| EN-DC Band   | E-UTRA Band | NR Band                  |  |
|--|-------------|--------------------------|--|
| DC_20_n75-n78 <sup>2</sup>   | 20          | CA_n75-n78               |  |
| DC_20_n76-n78 <sup>2</sup>   | 20          | CA_n76-n78               |  |
| DC_20_SUL_n78-n82 <sup>2</sup>   | 20          | SUL_n78-n82              |  |
| DC_20_SUL_n78-n83 <sup>2</sup>   | 20          | SUL_n78-n83 <sup>1</sup> |  |
| DC_21-42_n77   | CA_21-42    | n77                      |  |
| DC_21-42_n78   | CA_21-42    | n78                      |  |
| DC_21-42_n79   | CA_21-42    | n79                      |  |
| DC_21_n77-n79  | 21          | CA_n77-n79               |  |
| DC_21_n78-n79  | 21          | CA_n78-n79               |  |
| DC_28-42_n77   | CA_28-42    | n77                      |  |
| DC_28-42_n78   | CA_28-42    | n78                      |  |
| DC_28-42_n79   | CA_28-42    | n79                      |  |
| DC_41-42_n77   | CA_41-42    | n77                      |  |
| DC_41-42_n78   | CA_41-42    | n78                      |  |
| DC_41-42_n79   | CA_41-42    | n79                      |  |
| DC_28_SUL_n78-n83 <sup>2</sup>   | 28          | SUL_n78-n83              |  |
| DC_66_(n)71  | CA_66-71    | n71                      |  |
| DC_66_SUL_n78-n86 <sup>2</sup>   | 66          | SUL_n78-n86              |  |
| <p>NOTE 1: If a UE is configured with both NR UL and NR SUL carriers in a cell, the switching time between NR UL carrier and NR SUL carrier can be up to 140us and placed in SUL resources.</p> <p>NOTE 2: Applicable for UE supporting inter-band EN-DC with mandatory simultaneous Rx/Tx capability</p> <p>NOTE 3: The frequency range in band n28 is restricted for this band combination to 703-733 MHz for the UL and 758-788 MHz for the DL.</p> |             |                          |  |

5.2B.4.3 EN-DC (four bands)

**Table 5.2B.4.3-1: Band combinations for inter-band EN-DC within FR1 (four bands)**



| EN-DC Band                     | E-UTRA Band | NR Band    |  |
|--------------------------------|-------------|------------|--|
| DC_1-3-5_n78 <sup>1</sup>      | CA_1-3-5    | n78        |  |
| DC_1-3-7_n28                   | CA_1-3-7    | n28        |  |
| DC_1-3-7-7_n78 <sup>1</sup>    | CA_1-3-7-7  | n78        |  |
| DC_1-3-7_n78 <sup>1</sup>      | CA_1-3-7    | n78        |  |
| DC_1-3-8_n78 <sup>1</sup>      | CA_1-3-8    | n78        |  |
| DC_1-3-28_n77 <sup>1</sup>     | CA_1-3-28   | n77        |  |
| DC_1-3-28_n78 <sup>1</sup>     | CA_1-3-28   | n78        |  |
| DC_1-3_n28-n78 <sup>1</sup>    | CA_1-3      | CA_n28-n78 |  |
| DC_1-3-28_n79 <sup>1</sup>     | CA_1-3-28   | n79        |  |
| DC_1-3-19_n77 <sup>1</sup>     | CA_1-3-19   | n77        |  |
| DC_1-3-19_n78 <sup>1</sup>     | CA_1-3-19   | n78        |  |
| DC_1-3-19_n79 <sup>1</sup>     | CA_1-3-19   | n79        |  |
| DC_1-3-20_n28 <sup>2</sup>     | CA_1-3-20   | n28        |  |
| DC_1-3-20_n78 <sup>1</sup>     | CA_1-3-20   | n78        |  |
| DC_1-3-21_n77 <sup>1</sup>     | CA_1-3-21   | n77        |  |
| DC_1-3-21_n78 <sup>1</sup>     | CA_1-3-21   | n78        |  |
| DC_1-3-21_n79 <sup>1</sup>     | CA_1-3-21   | n79        |  |
| DC_1-3-42_n77                  | CA_1-3-42   | n77        |  |
| DC_1-3-42_n78                  | CA_1-3-42   | n78        |  |
| DC_1-3-42_n79                  | CA_1-3-42   | n79        |  |
| DC_1-5-7_n78                   | CA_1-5-7    | n78        |  |
| DC_1-5-7-7_n78                 | CA_1-5-7-7  | n78        |  |
| DC_1-7-20_n28 <sup>2</sup>     | CA_1-7-20   | n28        |  |
| DC_1-7-20_n78 <sup>1</sup>     | CA_1-7-20   | n78        |  |
| DC_1-7_n28-n78 <sup>1</sup>    | CA_1-7      | CA_n28-n78 |  |
| DC_1-18-28_n77                 | CA_1-18-28  | n77        |  |
| DC_1-18-28_n78                 | CA_1-18-28  | n78        |  |
| DC_1-18-28_n79 <sup>1</sup>    | CA_1-18-28  | n79        |  |
| DC_1-19-21_n77                 | CA_1-19-21  | n77        |  |
| DC_1-19-21_n78                 | CA_1-19-21  | n78        |  |
| DC_1-19-21_n79                 | CA_1-19-21  | n79        |  |
| DC_1-19-42_n77                 | CA_1-19-42  | n77        |  |
| DC_1-19-42_n78                 | CA_1-19-42  | n78        |  |
| DC_1-19-42_n79                 | CA_1-19-42  | n79        |  |
| DC_1-20_n28-n78 <sup>1,2</sup> | CA_1-20     | CA_n28-n78 |  |
| DC_1-21-28_n77 <sup>1</sup>    | CA_1-21-28  | n77        |  |
| DC_1-21-28_n78 <sup>1</sup>    | CA_1-21-28  | n78        |  |
| DC_1-21-28_n79 <sup>1</sup>    | CA_1-21-28  | n79        |  |
| DC_1-21-42_n77                 | CA_1-21-42  | n77        |  |
| DC_1-21-42_n78                 | CA_1-21-42  | n78        |  |
| DC_1-21-42_n79                 | CA_1-21-42  | n79        |  |
| DC_1-28-42_n77                 | CA_1-28-42  | n77        |  |
| DC_1-28-42_n78                 | CA_1-28-42  | n78        |  |
| DC_1-28-42_n79                 | CA_1-28-42  | n79        |  |
| DC_1-41-42_n77                 | CA_1-41-42  | n77        |  |
| DC_1-41-42_n78                 | CA_1-41-42  | n78        |  |

| EN-DC Band  | E-UTRA Band | NR Band    |  |
|---|-------------|------------|--|
| DC_1-41-42-n79  | CA_1-41-42  | n79        |  |
| DC_2-66-(n)71   | CA_2-66-71  | n71        |  |
| DC_3-5-7_n78  | CA_3-5-7    | n78        |  |
| DC_3-5-7-7_n78  | CA_3-5-7-7  | n78        |  |
| DC_3-7-20_n28 <sup>2</sup>  | CA_3-7-20   | n28        |  |
| DC_3-7-20_n78 <sup>1</sup>  | CA_3-7-20   | n78        |  |
| DC_3-7-28_n78 <sup>1</sup>  | CA_3-7-28   | n78        |  |
| DC_3-7-n28-n78 <sup>1</sup>   | CA_3-7      | CA_n28-n78 |  |
| DC_3-19-21_n77 <sup>1</sup>   | CA_3-19-21  | n77        |  |
| DC_3-19-21_n78 <sup>1</sup>   | CA_3-19-21  | n78        |  |
| DC_3-19-21_n79 <sup>1</sup>   | CA_3-19-21  | n79        |  |
| DC_3-19-42_n77  | CA_3-19-42  | n77        |  |
| DC_3-19-42_n78  | CA_3-19-42  | n78        |  |
| DC_3-19-42_n79 <sup>1</sup>   | CA_3-19-42  | n79        |  |
| DC_3-20_n28-n78 <sup>1,2</sup>  | CA_3-20     | CA_n28-n78 |  |
| DC_3-21-42_n77  | CA_3-21-42  | n77        |  |
| DC_3-21-42_n78  | CA_3-21-42  | n78        |  |
| DC_3-21-42_n79  | CA_3-21-42  | n79        |  |
| DC_3-28-42_n77  | CA_3-28-42  | n77        |  |
| DC_3-28-42_n78  | CA_3-28-42  | n78        |  |
| DC_3-28-42_n79  | CA_3-28-42  | n79        |  |
| DC_7-20_n28-n78 <sup>1,2</sup>  | CA_7-20     | CA_n28-n78 |  |
| DC_19-21-42_n77   | CA_19-21-42 | n77        |  |
| DC_19-21-42_n78   | CA_19-21-42 | n78        |  |
| DC_19-21-42_n79   | CA_19-21-42 | n79        |  |
| DC_21-28-42_n77   | CA_21-28-42 | n77        |  |
| DC_21-28-42_n78   | CA_21-28-42 | n78        |  |
| DC_21-28-42_n79   | CA_21-28-42 | n79        |  |
| NOTE 1: Applicable for UE supporting inter-band EN-DC with mandatory simultaneous Rx/Tx capability                                    |             |            |  |
| NOTE 2: The frequency range in band n28 is restricted for this band combination to 703-733 MHz for the UL and 758-788 MHz for the DL. |             |            |  |

## 5.2B.4.4 EN-DC (five bands)

Table 5.2B.4.4-1: Band combinations inter-band EN-DC within FR1 (five bands)

| EN-DC Band                       | E-UTRA Band   | NR Band    |  |
|----------------------------------|---------------|------------|--|
| DC_1-3-5-7_n78                   | CA_1-3-5-7    | n78        |  |
| DC_1-3-5-7-7_n78                 | CA_1-3-5-7-7  | n78        |  |
| DC_1-3-7-20_n28 <sup>2</sup>     | CA_1-3-7-20   | n28        |  |
| DC_1-3-7-20_n78 <sup>1</sup>     | CA_1-3-7-20   | n78        |  |
| DC_1-3-7_n28-n78 <sup>1</sup>    | CA_1-3-7      | CA_n28-n78 |  |
| DC_1-3-19-21_n77 <sup>1</sup>    | CA_1-3-19-21  | n77        |  |
| DC_1-3-19-21_n78 <sup>1</sup>    | CA_1-3-19-21  | n78        |  |
| DC_1-3-19-21_n79 <sup>1</sup>    | CA_1-3-19-21  | n79        |  |
| DC_1-3-19-42_n77                 | CA_1-3-19-42  | n77        |  |
| DC_1-3-19-42_n78                 | CA_1-3-19-42  | n78        |  |
| DC_1-3-19-42_n79                 | CA_1-3-19-42  | n79        |  |
| DC_1-3-20_n28-n78 <sup>1,2</sup> | CA_1-3-20     | CA_n28-n78 |  |
| DC_1-3-21-42_n77                 | CA_1-3-21-42  | n77        |  |
| DC_1-3-21-42_n78                 | CA_1-3-21-42  | n78        |  |
| DC_1-3-21-42_n79                 | CA_1-3-21-42  | n79        |  |
| DC_1-7-20_n28-n78 <sup>1,2</sup> | CA_1-7-20     | CA_n28-n78 |  |
| DC_1-19-21-42_n77                | DC_1-19-21-42 | n77        |  |
| DC_1-19-21-42_n78                | DC_1-19-21-42 | n78        |  |
| DC_1-19-21-42_n79                | DC_1-19-21-42 | n79        |  |
| DC_1-3-5-7_n78                   | CA_1-3-5-7    | n78        |  |
| DC_1-3-28-42_n77                 | CA_1-3-28-42  | n77        |  |
| DC_1-3-28-42_n78                 | CA_1-3-28-42  | n78        |  |
| DC_1-3-28-42_n79                 | CA_1-3-28-42  | n79        |  |
| DC_1-21-28-42_n77                | CA_1-21-28-42 | n77        |  |
| DC_1-21-28-42_n78                | CA_1-21-28-42 | n78        |  |
| DC_1-21-28-42_n79                | CA_1-21-28-42 | n79        |  |
| DC_3-7-20_n28-n78 <sup>1,2</sup> | CA_3-7-20     | CA_n28-n78 |  |

NOTE 1: Applicable for UE supporting inter-band EN-DC with mandatory simultaneous Rx/Tx capability  
NOTE 2: The frequency range in band n28 is restricted for this band combination to 703-733 MHz for the UL and 758-788 MHz for the DL

## 5.2B.4.5 EN-DC (six bands)

Table 5.2B.4.5-1: Band combinations for inter-band EN-DC within FR1 (six bands)

| EN-DC Band                         | E-UTRA Band | NR Band    |  |
|------------------------------------|-------------|------------|--|
| DC_1-3-7-20_n28-n78 <sup>1,2</sup> | CA_1-3-7-20 | CA_n28-n78 |  |

NOTE 1: Applicable for UE supporting inter-band EN-DC with mandatory simultaneous Rx/Tx capability  
NOTE 2: The frequency range in band n28 is restricted for this band combination to 703-733 MHz for the UL and 758-788 MHz for the DL

## 5.2B.5 Inter-band EN-DC including FR2

### 5.2B.5.1 EN-DC (two bands)

**Table 5.2B.5.1-1: Band combinations for inter-band EN-DC including FR2 (two bands)**

| EN-DC Band    | E-UTRA Band | NR Band |  |
|---------------|-------------|---------|--|
| DC_1_n257     | 1           | n257    |  |
| DC_2-2_n257   | CA_2-2      | n257    |  |
| DC_2_n257     | CA_2        | n257    |  |
| DC_2_n260     | 2           | n260    |  |
| DC_2_n260     | CA_2        | n260    |  |
| DC_2-2_n260   | CA_2-2      | n260    |  |
| DC_3_n257     | 3           | n257    |  |
| DC_3_n258     | 3           | n258    |  |
| DC_5_n257     | 5           | n257    |  |
| DC_5-5_n257   | CA_5-5      | n257    |  |
| DC_5-5_n260   | CA_5-5      | n260    |  |
| DC_5_n260     | 5           | n260    |  |
| DC_5_n261     | 5           | n261    |  |
| DC_7-7_n257   | CA_7-7      | n257    |  |
| DC_7_n257     | 7           | n257    |  |
| DC_7_n258     | 7           | n258    |  |
| DC_8_n257     | 8           | n257    |  |
| DC_8_n258     | 8           | n258    |  |
| DC_11_n257    | 11          | n257    |  |
| DC_12_n260    | 12          | n260    |  |
| DC_13_n257    | 13          | n257    |  |
| DC_13_n260    | 13          | n260    |  |
| DC_18_n257    | 18          | n257    |  |
| DC_19_n257    | 19          | n257    |  |
| DC_20_n258    | 20          | n258    |  |
| DC_21_n257    | 21          | n257    |  |
| DC_26_n257    | 26          | n257    |  |
| DC_28_n257    | 28          | n257    |  |
| DC_28_n258    | 28          | n258    |  |
| DC_30_n260    | 30          | n260    |  |
| DC_39_n258    | 39          | n258    |  |
| DC_41_n257    | 41          | n257    |  |
| DC_41_n258    | 41          | n258    |  |
| DC_42_n257    | 42          | n257    |  |
| DC_48-48_n257 | CA_48-48    | n257    |  |
| DC_48_n257    | CA_48       | n257    |  |
| DC_48-48_n260 | CA_48-48    | n260    |  |
| DC_48_n260    | CA_48       | n260    |  |
| DC_66-66_n257 | CA_66-66    | n257    |  |
| DC_66_n257    | 66          | n257    |  |
| DC_66-66_n260 | CA_66-66    | n260    |  |
| DC_66_n260    | 66          | n260    |  |
| DC_66_n261    | 66          | n261    |  |

NOTE 1: Applicable for UE supporting inter-band EN-DC with mandatory simultaneous Rx/Tx capability for all of the above combinations

5.2B.5.2 EN-DC (three bands)

**Table 5.2B.5.2-1: Band combinations inter-band EN-DC including FR2 (three bands)**

| EN-DC Band   | E-UTRA Band | NR Band |  |
|--|-------------|---------|--|
| DC_1-3_n257 <sup>1</sup>   | CA_1-3      | n257    |  |
| DC_1-5_n257 <sup>1</sup>   | CA_1-5      | n257    |  |
| DC_1-7_n257 <sup>1</sup>   | CA_1-7      | n257    |  |
| DC_1-7-7_n257 <sup>1</sup>   | CA_1-7-7    | n257    |  |
| DC_1-8_n257  | CA_1-8      | n257    |  |
| DC_1-18_n257 <sup>1</sup>  | CA_1-18     | n257    |  |
| DC_1-19_n257 <sup>1</sup>  | CA_1-19     | n257    |  |
| DC_1-21_n257 <sup>1</sup>  | CA_1-21     | n257    |  |
| DC_1-28_n257 <sup>1</sup>  | CA_1-28     | n257    |  |
| DC_1-41_n257   | CA_1-41     | n257    |  |
| DC_1-42_n257   | CA_1-42     | n257    |  |
| DC_2-5_n257 <sup>1</sup>   | CA_2-5      | n257    |  |
| DC_2-5_n260  | CA_2-5      | n260    |  |
| DC_2-12_n260   | CA_2-12     | n260    |  |
| DC_2-13_n257 <sup>1</sup>  | CA_2-13     | n257    |  |
| DC_2-13_n260 <sup>1</sup>  | CA_2-13     | n260    |  |
| DC_2-30_n260   | CA_2-30     | n260    |  |
| DC_2-66_n257 <sup>1</sup>  | CA_2-66     | n257    |  |
| DC_2-66_n260   | CA_2-66     | n260    |  |
| DC_3-5_n257 <sup>1</sup>   | CA_3-5      | n257    |  |
| DC_3-7_n257 <sup>1</sup>   | CA_3-7      | n257    |  |
| DC_3-7-7_n257 <sup>1</sup>   | CA_3-7-7    | n257    |  |
| DC_3-19_n257 <sup>1</sup>  | CA_3-19     | n257    |  |
| DC_3-21_n257 <sup>1</sup>  | CA_3-21     | n257    |  |
| DC_3-28_n257 <sup>1</sup>  | CA_3-28     | n257    |  |
| DC_3-41_n257   | CA_3-41     | n257    |  |
| DC_3-42_n257 <sup>1</sup>  | CA_3-42     | n257    |  |
| DC_5-7-7_n257 <sup>1</sup>   | CA_5-7-7    | n257    |  |
| DC_5-7_n257 <sup>1</sup>   | CA_5-7      | n257    |  |
| DC_5-30_n260   | CA_5-30     | n260    |  |
| DC_5-66_n260   | CA_5-66     | n260    |  |
| DC_12-30_n260  | CA_12-30    | n260    |  |
| DC_12-66_n260  | CA_12-66    | n260    |  |
| DC_13-66_n257 <sup>1</sup>   | CA_13-66    | n257    |  |
| DC_13-66_n260 <sup>1</sup>   | CA_13-66    | n260    |  |
| DC_18-28_n257 <sup>1</sup>   | CA_18-28    | n257    |  |
| DC_19-21_n257 <sup>1</sup>   | CA_19-21    | n257    |  |
| DC_19-42_n257 <sup>1</sup>   | CA_19-42    | n257    |  |
| DC_21-42_n257 <sup>1</sup>   | CA_21-42    | n257    |  |
| DC_21-28_n257 <sup>1</sup>   | CA_21-28    | n257    |  |
| DC_28-42_n257 <sup>1</sup>   | CA_28-42    | n257    |  |
| DC_30-66_n260  | CA_30-66    | n260    |  |
| DC_41-42_n257  | CA_41-42    | n257    |  |
| NOTE 1: Applicable for UE supporting inter-band EN-DC with mandatory simultaneous Rx/Tx capability |             |         |  |

## 5.2B.5.3 EN-DC (four bands)

**Table 5.2B.5.3-1: Band combinations inter-band EN-DC including FR2 (four bands)**

| EN-DC Band   | E-UTRA Band | NR Band |  |
|--|-------------|---------|--|
| DC_1-3-5_n257 <sup>1</sup>   | CA_1-3-5    | n257    |  |
| DC_1-3-7_n257 <sup>1</sup>   | CA_1-3-7    | n257    |  |
| DC_1-3-7-7_n257  | CA_1-3-7-7  | n257    |  |
| DC_1-3-19_n257 <sup>1</sup>  | CA_1-3-19   | n257    |  |
| DC_1-3-21_n257 <sup>1</sup>  | CA_1-3-21   | n257    |  |
| DC_1-3-28_n257 <sup>1</sup>  | CA_1-3-28   | n257    |  |
| DC_1-3-42_n257   | CA_1-3-42   | n257    |  |
| DC_1-5-7_n257 <sup>1</sup>   | CA_1-5-7    | n257    |  |
| DC_1-5-7-7_n257  | CA_1-5-7-7  | n257    |  |
| DC_1-18-28_n257 <sup>1</sup>   | CA_1-18-28  | n257    |  |
| DC_1-19-21_n257  | CA_1-19-21  | n257    |  |
| DC_1-19-42_n257  | CA_1-19-42  | n257    |  |
| DC_1-21-28_n257 <sup>1</sup>   | CA_1-21-28  | n257    |  |
| DC_1-21-42_n257  | CA_1-21-42  | n257    |  |
| DC_1-28-42_n257  | CA_1-28-42  | n257    |  |
| DC_1-41-42_n257  | CA_1-41-42  | n257    |  |
| DC_3-5-7-7_n257  | CA_3-5-7-7  | n257    |  |
| DC_3-5-7_n257 <sup>1</sup>   | CA_3-5-7    | n257    |  |
| DC_3-19-21_n257 <sup>1</sup>   | CA_3-19-21  | n257    |  |
| DC_3-19-42_n257  | CA_3-19-42  | n257    |  |
| DC_3-21-42_n257  | CA_3-21-42  | n257    |  |
| DC_3-28-42_n257  | CA_3-28-42  | n257    |  |
| DC_19-21-42_n257 <sup>1</sup>  | CA_19-21-42 | n257    |  |
| DC_21-28-42_n257 <sup>1</sup>  | CA_21-28-42 | n257    |  |
| NOTE 1: Applicable for UE supporting inter-band EN-DC with mandatory simultaneous Rx/Tx capability |             |         |  |

## 5.2B.5.4 EN-DC (five bands)

**Table 5.2B.5.4-1: Band combinations inter-band EN-DC including FR2 (five bands)**

| EN-DC Band   | E-UTRA Band   | NR Band |  |
|--|---------------|---------|--|
| DC_1-3-5-7_n257 <sup>1</sup>   | CA_1-3-5-7    | n257    |  |
| DC_1-3-5-7-7_n257 <sup>1</sup>   | CA_1-3-5-7-7  | n257    |  |
| DC_1-3-19-21_n257 <sup>1</sup>   | CA_1-3-19-21  | n257    |  |
| DC_1-3-19-42_n257  | CA_1-3-19-42  | n257    |  |
| DC_1-3-21-42_n257  | CA_1-3-21-42  | n257    |  |
| DC_1-3-28-42_n257  | CA_1-3-28-42  | n257    |  |
| DC_1-19-21-42_n257   | DC_1-19-21-42 | n257    |  |
| DC_1-21-28-42_n257   | DC_1-21-28-42 | n257    |  |
| NOTE 1: Applicable for UE supporting inter-band EN-DC with mandatory simultaneous Rx/Tx capability |               |         |  |



## 5.2B.6 Inter-band EN-DC including both FR1 and FR2

### 5.2B.6.1 Void

### 5.2B.6.2 EN-DC (three bands)

**Table 5.2B.6.2-1: Band combinations inter-band EN-DC including both FR1 and FR2 (three bands)**

| EN-DC Band   | E-UTRA Band | NR Band     |  |
|--|-------------|-------------|--|
| DC_1_n77-n257  | 1           | CA_n77-n257 |  |
| DC_1_n78-n257  | 1           | CA_n78-n257 |  |
| DC_1_n79-n257  | 1           | CA_n79-n257 |  |
| DC_3_n77-n257  | 3           | CA_n77-n257 |  |
| DC_3_n78-n257  | 3           | CA_n78-n257 |  |
| DC_3_n79-n257  | 3           | CA_n79-n257 |  |
| DC_5_n78-n257 <sup>1</sup>   | 5           | CA_n78-n257 |  |
| DC_7-7_n78-n257  | CA_7-7      | CA_n78-n257 |  |
| DC_7_n78-n257  | 7           | CA_n78-n257 |  |
| DC_19_n77-n257   | 19          | CA_n77-n257 |  |
| DC_19_n78-n257   | 19          | CA_n78-n257 |  |
| DC_19_n79-n257   | 19          | CA_n79-n257 |  |
| DC_21_n77-n257   | 21          | CA_n77-n257 |  |
| DC_21_n78-n257   | 21          | CA_n78-n257 |  |
| DC_21_n79-n257   | 21          | CA_n79-n257 |  |
| NOTE 1: Applicable for UE supporting inter-band EN-DC with mandatory simultaneous Rx/Tx capability |             |             |  |

### 5.2B.6.3 EN-DC (four bands)

**Table 5.2B.6.3-1: Band combinations inter-band EN-DC including both FR1 and FR2 (four bands)**

| EN-DC Band        | E-UTRA Band | NR Band     |  |
|-------------------|-------------|-------------|--|
| DC_1-3_n78-n257   | CA_1-3      | CA_n78-n257 |  |
| DC_1-5_n78-n257   | CA_1-5      | CA_n78-n257 |  |
| DC_1-7-7_n78-n257 | CA_1-7-7    | CA_n78-n257 |  |
| DC_1-7_n78-n257   | CA_1-7      | CA_n78-n257 |  |
| DC_3-5_n78-n257   | CA_3-5      | CA_n78-n257 |  |
| DC_3-7-7_n78-n257 | CA_3-7-7    | CA_n78-n257 |  |
| DC_3-7_n78-n257   | CA_3-7      | CA_n78-n257 |  |
| DC_5-7-7_n78-n257 | CA_5-7-7    | CA_n78-n257 |  |
| DC_5-7_n78-n257   | CA_5-7      | CA_n78-n257 |  |

### 5.2B.6.4 EN-DC (five bands)

**Table 5.2B.6.4-1: Band combinations inter-band EN-DC including both FR1 and FR2 (five bands)**

| EN-DC Band          | E-UTRA Band | NR Band     |
|---------------------|-------------|-------------|
| DC_1-3-5_n78-n257   | CA_1-3-5    | CA_n78-n257 |
| DC_1-3-7-7_n78-n257 | CA_1-3-7-7  | CA_n78-n257 |
| DC_1-3-7_n78-n257   | CA_1-3-7    | CA_n78-n257 |
| DC_1-5-7-7_n78-n257 | CA_1-5-7-7  | CA_n78-n257 |
| DC_1-5-7_n78-n257   | CA_1-5-7    | CA_n78-n257 |
| DC_3-5-7-7_n78-n257 | CA_3-5-7-7  | CA_n78-n257 |
| DC_3-5-7_n78-n257   | CA_3-5-7    | CA_n78-n257 |

### 5.2B.6.5 EN-DC (six bands)

**Table 5.2B.6.5-1: Band combinations inter-band EN-DC including both FR1 and FR2 (six bands)**

| EN-DC Band   | E-UTRA Band | NR Band     |
|--|-------------|-------------|
| DC_1-3-5-7_n78-n257  | CA_1-3-5-7  | CA_n78-n257 |
| NOTE 1: Applicable for UE supporting inter-band EN-DC with mandatory simultaneous Rx/Tx capability |             |             |

## 5.2B.7 Inter-band NR-DC between FR1 and FR2

### 5.2B.7.1 NR-DC (two bands)

**Table 5.2B.7.1-1: Band combinations inter-band NR-DC between FR1 and FR2 (two bands)**

| NR-DC Band  | NR Band   |
|-------------|-----------|
| DC_n77-n257 | n77, n257 |
| DC_n78-n257 | n78, n257 |
| DC_n79-n257 | n79, n257 |

## 5.3 UE Channel bandwidth

### 5.3A UE Channel bandwidth for CA

#### 5.3A.1 Inter-band CA between FR1 and FR2

For inter-band NR CA between FR1 and FR2, a carrier aggregation configuration is a combination of operating bands, each supporting a carrier aggregation bandwidth class as specified in clause 5.3A.5 of TS 38.101-1 [2] and clause 5.3A.4 of TS 38.101-2 [3] independently.

### 5.3B UE Channel bandwidth for EN-DC

For intra-band contiguous EN-DC, the aggregated channel bandwidth is sum of the individual NR and E-UTRA channel bandwidths assuming nominal EN-DC channel with 0 kHz offset spacing as specified in sub-clause 5.4.

$$\text{ENBW} = \text{BW}_{\text{NR\_Channel}} + \text{BW}_{\text{E-UTRA Channel}}$$

In the case where the NR sub-block and/or the E-UTRA sub-block itself is composed of intra-band contiguous CA carriers, the EN-DC aggregated channel bandwidth is the sum of the aggregated channel bandwidths of the NR and E-UTRA sub-blocks assuming nominal EN-DC channel spacing between the NR sub-block and E-UTRA sub-block.

$$ENBW = BW_{NR\_Channel\_CA} + BW_{E-UTRA\_Channel\_CA}$$

For NR inter-band dual connectivity specified in 5.2B.7, the corresponding NR CA configurations in 5.5A.1, i.e., dual uplink inter-band carrier aggregation between FR1 and FR2 with uplink assigned to two NR bands, are applicable to Dual Connectivity.

NOTE 1: Requirements for the dual connectivity configurations are defined in the section corresponding NR uplink CA between FR1 and FR2 configurations, unless otherwise specified.

Intra-band contiguous EN-DC configurations are defined using intra-band contiguous EN-DC bandwidth class notation where the first EN-DC bandwidth class letter indicates the number of contiguous E-UTRA carriers and the second EN-DC bandwidth class letter indicates the number of contiguous NR carriers. Applicable contiguous intraband EN-DC bandwidth classes are listed in Table 5.3.B-1.

**Table 5.3.B-1: Intra-band contiguous EN-DC bandwidth classes**

| Intra-band contiguous EN-DC bandwidth class | Number of contiguous CC |    |
|---|-------------------------|----|
|   | E-UTRA                  | NR |
| AA  | 1                       | 1  |
| CA  | 2                       | 1  |
| DA  | 3                       | 1  |

## 5.3B.1 Intra-band EN-DC in FR1

### 5.3B.1.1 General

The requirements for intra-band EN-DC in this specification are defined for EN-DC configurations with associated bandwidth combination sets.

For each EN-DC configuration, requirements are specified for all bandwidth combinations contained in a *bandwidth combination set*, which is indicated per supported band combination in the UE radio access capability. A UE can indicate support of several bandwidth combination sets per band combination.

### 5.3B.1.2 BCS for Intra-band contiguous EN-DC

For intra-band contiguous EN-DC, an EN-DC configuration is a single operating band supporting an intra-band contiguous EN-DC bandwidth class.

Bandwidth combination sets for intra-band contiguous EN-DC are specified in Table 5.3B.1.2-1.

**Table 5.3B.1.2-1: EN-DC configurations and bandwidth combination sets defined for intra-band contiguous EN-DC**

| Downlink EN-DC configuration | Uplink EN-DC configurations | E-UTRA – NR configuration / Bandwidth combination set       |   |  |                                    |                           |
|------------------------------|-----------------------------|---|---|--|------------------------------------|---------------------------|
|                              |                             | Component carriers in order of increasing carrier frequency |   |  | Maximum aggregated bandwidth (MHz) | Bandwidth combination set |
|                              |                             | Channel bandwidths for LTE carrier (MHz)                    | Channel bandwidths NR for carrier (MHz) | Channel bandwidths for LTE carrier (MHz) |                                    |                           |
|                              |                             |   |   |  |                                    |                           |

|            |   |          |                       |          |     |   |
|------------|---|----------|-----------------------|----------|-----|---|
| DC_(n)41AA | DC_(n)41AA  | 20       | 40, 60, 80,100        |          | 120 | 0 |
|            |   |          | 40, 60, 80,100        | 20       |     |   |
| DC_(n)41CA | DC_(n)41AA <sup>1</sup> ,<br>DC_41A_n41A <sup>2</sup> | 20       | 40, 50, 60,<br>80,100 |          | 120 | 1 |
|            |   |          | 40, 50, 60,<br>80,100 | 20       |     |   |
| DC_(n)41DA | DC_(n)41AA <sup>1</sup> ,<br>DC_41A_n41A <sup>2</sup> | 20+20    | 40, 60, 80,100        |          | 140 | 0 |
|            |   |          | 40, 60, 80,100        | 20+20    |     |   |
| DC_(n)41CA | DC_(n)41AA <sup>1</sup> ,<br>DC_41A_n41A <sup>2</sup> | 20+20    | 40, 50, 60,<br>80,100 |          | 140 | 1 |
|            |   |          | 40, 50, 60,<br>80,100 | 20+20    |     |   |
| DC_(n)41DA | DC_(n)41AA <sup>1</sup> ,<br>DC_41A_n41A <sup>2</sup> | 20+20+20 | 40, 60, 80,100        |          | 160 | 0 |
|            |   |          | 40, 60, 80,100        | 20+20+20 |     |   |
| DC_(n)41DA | DC_(n)41AA <sup>1</sup> ,<br>DC_41A_n41A <sup>2</sup> | 20+20+20 | 40, 50, 60,<br>80,100 |          | 160 | 1 |
|            |   |          | 40, 50, 60,<br>80,100 | 20+20+20 |     |   |
| DC_(n)71AA | DC_(n)71AA  | 15       | 5                     |          | 20  | 0 |
|            |   | 10       | 5, 10                 |          |     |   |
|            |   | 5        | 5, 10, 15             |          |     |   |
|            |   |          | 5                     | 15       |     |   |
|            |   |          | 5, 10                 | 10       |     |   |
|            |   |          | 5, 10, 15             | 5        |     |   |

NOTE 1: Contiguous intra-band EN-DC uplink requirements shall apply.  
NOTE 2: LTE and NR ACLR requirements and non-contiguous intra-band EN-DC uplink requirements shall apply.

### 5.3B.1.3 BCS for Intra-band non-contiguous EN-DC

For intra-band non-contiguous EN-DC, an EN-DC configuration is a single operating band supporting E-UTRA and NR carriers, where E-UTRA configuration is indicated by using E-UTRA CA bandwidth class as defined in TS 36.101 [4] and NR configuration is indicated by using NR CA bandwidth class as defined in TS 38.101-1 [2].

Requirements for intra-band non-contiguous EN-DC are defined for the EN-DC configurations and bandwidth combination sets specified in Table 5.3B.1.3-1.

**Table 5.3B.1.3-1: EN-DC configurations and bandwidth combination sets defined for intra-band non-contiguous EN-DC**

| Downlink EN-DC configuration | Uplink EN-DC configurations | E-UTRA – NR configuration / Bandwidth combination set       |   |  |                                    |                           |
|------------------------------|-----------------------------|---|---|--|------------------------------------|---------------------------|
|                              |                             | Component carriers in order of increasing carrier frequency |   |  | Maximum aggregated bandwidth (MHz) | Bandwidth combination set |
|                              |                             | Channel bandwidths for LTE carrier (MHz)                    | Channel bandwidths NR for carrier (MHz) | Channel bandwidths for LTE carrier (MHz) |                                    |                           |

|             |                          |          |                       |               |     |   |
|-------------|--------------------------|----------|-----------------------|---------------|-----|---|
| DC_3A_n3A   | DC_3A_n3A <sup>(1)</sup> |          | 5, 10, 15, 20, 25, 30 | 5, 10, 15, 20 | 50  | 0 |
| DC_41A_n41A | DC_41A_n41A              | 20       | 40, 60, 80,100        |               | 120 | 0 |
|             |                          |          | 40, 60, 80,100        | 20            |     |   |
|             |                          | 20       | 40, 50, 60, 80,100    |               | 120 | 1 |
|             |                          |          | 40, 50, 60, 80,100    | 20            |     |   |
| DC_41C_n41A | DC_41A_n41A              | 20+20    | 40, 60, 80,100        |               | 140 | 0 |
|             |                          |          | 40, 60, 80,100        | 20+20         |     |   |
|             |                          | 20+20    | 40, 50, 60, 80,100    |               | 140 | 1 |
|             |                          |          | 40, 50, 60, 80,100    | 20+20         |     |   |
| DC_41D_n41A | DC_41A_n41A              | 20+20+20 | 40, 60, 80,100        |               | 160 | 0 |
|             |                          |          | 40, 60, 80,100        | 20+20+20      |     |   |
|             |                          | 20+20+20 | 40, 50, 60, 80,100    |               | 160 | 1 |
|             |                          |          | 40, 50, 60, 80,100    | 20+20+20      |     |   |

NOTE 1: Only single switched UL is supported in Rel.15

## 5.4 Channel arrangement

### 5.4A Channel arrangement for CA

The channel arrangement for CA operations in FR1 and FR2 as specified in TS 38.101-1 [2] and TS 38.101-2 [3], respectively.

### 5.4B Channel arrangement for DC

The channel arrangement for intra-band EN-DC operations in FR1 is specified in sub-clause 5.4B.1 of TS 38.101-1 [2].

#### 5.4B.1 Channel spacing for intra-band EN-DC carriers

The spacing between carriers will depend on the deployment scenario, the size of the frequency block available and the channel bandwidths. The nominal channel spacing between and E-UTRA carrier and an adjacent NR carrier for intra-band contiguous EN-DC is defined as following:

- For NR operating bands with 100 kHz channel raster,

$$\text{Nominal Channel spacing} = (BW_{\text{LTE\_Channel}} + BW_{\text{NR\_Channel}})/2$$

- For NR operating bands with 15 kHz channel raster,

$$\text{Nominal Channel spacing} = (BW_{\text{LTE\_Channel}} + BW_{\text{NR\_Channel}})/2 + \{-5\text{kHz}, 0\text{kHz}, 5\text{kHz}\}$$

- For NR operating bands with 30 kHz channel raster,

$$\text{Nominal Channel spacing} = (BW_{\text{LTE\_Channel}} + BW_{\text{NR\_Channel}})/2 + \{-10\text{kHz}, 0\text{kHz}, 10\text{kHz}\}$$

where  $BW_{\text{LTE\_Channel}}$  and  $BW_{\text{NR\_Channel}}$  are the channel bandwidths of the E-UTRA and NR carriers. The channel spacing can be adjusted depending on the channel raster to optimize performance in a particular deployment scenario.

For intra-band non-contiguous EN-DC the channel spacing between E-UTRA and NR carriers shall be larger than the nominal channel spacing defined in this subclause.

## 5.5 Configuration

### 5.5A Configuration for CA

#### 5.5A.1 Inter-band CA configurations between FR1 and FR2

**Table 5.5A.1-1: Inter-band CA configurations and bandwidth combinations sets between FR1 and FR2 (two bands)**

| NR CA configuration | Uplink CA configuration | NR Band | SCS (kHz)                                     | 5 MHz   | 10 MHz | 15 MHz | 20 MHz | 40 MHz | 50 MHz | 60 MHz | 80 MHz | 100 MHz | 200 MHz | 400 MHz | Band width combination set |
|---------------------|-------------------------|---------|---|---|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|----------------------------|
| CA_n8A-n258A        | CA_n8A-n258A            | n8      | 15  | Yes   | Yes    | Yes    | Yes    |        |        |        |        |         |         |         | 0                          |
|                     |                         |         | 30  |   | Yes    | Yes    | Yes    |        |        |        |        |         |         |         |                            |
|                     |                         |         | 60  |   |        |        |        |        |        |        |        |         |         |         |                            |
|                     |                         | n258    | 60  |   |        |        |        |        | Yes    |        |        | Yes     | Yes     |         |                            |
|                     |                         |         | 120   |   |        |        |        |        | Yes    |        |        | Yes     | Yes     | Yes     |                            |
| CA_n71A-n257A       | -                       | n71     | 15  | Yes   | Yes    | Yes    | Yes    |        |        |        |        |         |         |         | 0                          |
|                     |                         |         | 30  |   | Yes    | Yes    | Yes    |        |        |        |        |         |         |         |                            |
|                     |                         |         | 60  |   |        |        |        |        |        |        |        |         |         |         |                            |
|                     |                         | n257    | 60  |   |        |        |        |        | Yes    |        |        | Yes     | Yes     |         |                            |
|                     |                         |         | 120   |   |        |        |        |        | Yes    |        |        | Yes     | Yes     | Yes     |                            |
| CA_n77A-n257A       | CA_n77A-n257A           | n77     | 15  |   | Yes    | Yes    | Yes    | Yes    | Yes    |        |        |         |         |         | 0                          |
|                     |                         |         | 30  |   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes     |         |         |                            |
|                     |                         |         | 60  |   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes     |         |         |                            |
|                     |                         | n257    | 60  |   |        |        |        |        | Yes    |        |        | Yes     | Yes     |         |                            |
|                     |                         |         | 120   |   |        |        |        |        | Yes    |        |        | Yes     | Yes     | Yes     |                            |
| CA_n77A-n257D       | CA_n77A-n257A           | n77     | 15  |   | Yes    | Yes    | Yes    | Yes    | Yes    |        |        |         |         |         | 0                          |
|                     |                         |         | 30  |   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes     |         |         |                            |
|                     |                         |         | 60  |   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes     |         |         |                            |
|                     |                         | n257    | See CA_n257D in Table 5.5A.1-2 in TS 38.101-2 |   |        |        |        |        |        |        |        |         |         |         |                            |
| CA_n77A-n257E       | CA_n77A-n257A           | n77     | 15  |   | Yes    | Yes    | Yes    | Yes    | Yes    |        |        |         |         |         | 0                          |
|                     |                         |         | 30  |   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes     |         |         |                            |
|                     |                         |         | 60  |   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes     |         |         |                            |
|                     |                         | n257    | See CA_n257E in Table 5.5A.1-2 in TS 38.101-2 |   |        |        |        |        |        |        |        |         |         |         |                            |
| CA_n77A-n257F       | CA_n77A-n257A           | n77     | 15  |   | Yes    | Yes    | Yes    | Yes    | Yes    |        |        |         |         |         | 0                          |
|                     |                         |         | 30  |   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes     |         |         |                            |
|                     |                         |         | 60  |   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes     |         |         |                            |
|                     |                         | n257    | See CA_n257F in Table 5.5A.1-2 in TS 38.101-2 |   |        |        |        |        |        |        |        |         |         |         |                            |
| CA_n77C-n257A       | CA_n77A-n257A           | n77     | See CA_n77C in Table 5.5A.1-1 in TS 38.101-1  |   |        |        |        |        |        |        |        |         |         |         |                            |
|                     |                         |         | n257  | 60  |        |        |        |        |        |        | Yes    |         |         | Yes     | Yes                        |
|                     |                         |         | 120   |   |        |        |        |        | Yes    |        |        | Yes     | Yes     | Yes     |                            |
| CA_n77C-n257D       | CA_n77A-n257A           | n77     | See CA_n77C in Table 5.5A.1-1 in TS 38.101-1  |   |        |        |        |        |        |        |        |         |         |         |                            |
|                     |                         |         | n257  | See CA_n257D in Table 5.5A.1-2 in TS 38.101-2 |        |        |        |        |        |        |        |         |         |         |                            |
| CA_n77C-n257E       | CA_n77A-n257A           | n77     | See CA_n77C in Table 5.5A.1-1 in TS 38.101-1  |   |        |        |        |        |        |        |        |         |         |         |                            |
|                     |                         |         | n257  | See CA_n257E in Table 5.5A.1-2 in TS 38.101-2 |        |        |        |        |        |        |        |         |         |         |                            |
| CA_n77C-n257F       | CA_n77A-n257A           | n77     | See CA_n77C in Table 5.5A.1-1 in TS 38.101-1  |   |        |        |        |        |        |        |        |         |         |         |                            |
|                     |                         |         | n257  | See CA_n257F in Table 5.5A.1-2 in TS 38.101-2 |        |        |        |        |        |        |        |         |         |         |                            |
| CA_n78A-n257A       | CA_n78A-n257A           | n78     | 15  |   | Yes    | Yes    | Yes    | Yes    | Yes    |        |        |         |         |         | 0                          |
|                     |                         |         | 30  |   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes     |         |         |                            |
|                     |                         |         | 60  |   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes     |         |         |                            |
|                     |                         | n257    | 60  |   |        |        |        |        | Yes    |        |        | Yes     | Yes     |         |                            |
|                     |                         |         | 120   |   |        |        |        |        | Yes    |        |        | Yes     | Yes     | Yes     |                            |
| CA_n78A-n257D       | CA_n78A-n257A           | n78     | 15  |   | Yes    | Yes    | Yes    | Yes    | Yes    |        |        |         |         |         | 0                          |
|                     |                         |         | 30  |   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes     |         |         |                            |
|                     |                         |         | 60  |   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes     |         |         |                            |
|                     |                         | n257    | See CA_n257D in Table 5.5A.1-2 in TS 38.101-2 |   |        |        |        |        |        |        |        |         |         |         |                            |
| CA_n78A-n257E       | CA_n78A-n257A           | n78     | 15  |   | Yes    | Yes    | Yes    | Yes    | Yes    |        |        |         |         |         | 0                          |
|                     |                         |         | 30  |   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes     |         |         |                            |
|                     |                         |         | 60  |   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes     |         |         |                            |
|                     |                         | n257    | See CA_n257E in Table 5.5A.1-2 in TS 38.101-2 |   |        |        |        |        |        |        |        |         |         |         |                            |
| CA_n78A-n257F       | CA_n78A-n257A           | n78     | 15  |   | Yes    | Yes    | Yes    | Yes    | Yes    |        |        |         |         |         | 0                          |
|                     |                         |         | 30  |   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes     |         |         |                            |
|                     |                         |         | 60  |   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes     |         |         |                            |
|                     |                         | n257    | See CA_n257F in Table 5.5A.1-2 in TS 38.101-2 |   |        |        |        |        |        |        |        |         |         |         |                            |
| CA_n78C-n257A       | CA_n78A-n257A           | n78     | See CA_n78C in Table 5.5A.1-1 in TS 38.101-1  |   |        |        |        |        |        |        |        |         |         |         |                            |
|                     |                         |         | n257  | 60  |        |        |        |        |        |        | Yes    |         |         | Yes     | Yes                        |
|                     |                         |         | 120   |   |        |        |        |        | Yes    |        |        | Yes     | Yes     | Yes     |                            |
| CA_n78C-n257D       | CA_n78A-n257A           | n78     | See CA_n78C in Table 5.5A.1-1 in TS 38.101-1  |   |        |        |        |        |        |        |        |         |         |         |                            |
|                     |                         |         | n257  | See CA_n257D in Table 5.5A.1-2 in TS 38.101-2 |        |        |        |        |        |        |        |         |         |         |                            |
| CA_n78C-n257E       | CA_n78A-n257A           | n78     | See CA_n78C in Table 5.5A.1-1 in TS 38.101-1  |   |        |        |        |        |        |        |        |         |         |         |                            |
|                     |                         |         | n257  | See CA_n257E in Table 5.5A.1-2 in TS 38.101-2 |        |        |        |        |        |        |        |         |         |         |                            |

|                   |                   |      |   |  |  |  |  |     |     |     |     |     |     |     |     |
|-------------------|-------------------|------|---|--|--|--|--|-----|-----|-----|-----|-----|-----|-----|-----|
| CA_n78C<br>-n257F | CA_n78A<br>-n257A | n78  | See CA_n78C in Table 5.5A.1-1 in TS 38.101-1  |  |  |  |  |     |     |     |     |     | 0   |     |     |
|                   |                   | n257 | See CA_n257F in Table 5.5A.1-2 in TS 38.101-2 |  |  |  |  |     |     |     |     |     |     |     |     |
| CA_n79A<br>-n257A | CA_n79A<br>-n257A | n79  | 15  |  |  |  |  | Yes | Yes |     |     |     |     | 0   |     |
|                   |                   |      | 30  |  |  |  |  | Yes | Yes | Yes | Yes | Yes |     |     |     |
|                   |                   |      | 60  |  |  |  |  | Yes | Yes | Yes | Yes | Yes |     |     |     |
|                   |                   | n257 | 60  |  |  |  |  |     | Yes |     |     | Yes | Yes |     |     |
|                   |                   |      | 120   |  |  |  |  |     | Yes |     |     | Yes | Yes |     | Yes |
| CA_n79A<br>-n257D | CA_n79A<br>-n257A | n79  | 15  |  |  |  |  | Yes | Yes |     |     |     |     | 0   |     |
|                   |                   |      | 30  |  |  |  |  | Yes | Yes | Yes | Yes | Yes |     |     |     |
|                   |                   |      | 60  |  |  |  |  | Yes | Yes | Yes | Yes | Yes |     |     |     |
|                   |                   | n257 | See CA_n257D in Table 5.5A.1-2 in TS 38.101-2 |  |  |  |  |     |     |     |     |     |     |     |     |
|                   |                   |      |   |  |  |  |  |     |     |     |     |     |     |     |     |
| CA_n79A<br>-n257E | CA_n79A<br>-n257A | n79  | 15  |  |  |  |  | Yes | Yes |     |     |     |     | 0   |     |
|                   |                   |      | 30  |  |  |  |  | Yes | Yes | Yes | Yes | Yes |     |     |     |
|                   |                   |      | 60  |  |  |  |  | Yes | Yes | Yes | Yes | Yes |     |     |     |
|                   |                   | n257 | See CA_n257E in Table 5.5A.1-2 in TS 38.101-2 |  |  |  |  |     |     |     |     |     |     |     |     |
|                   |                   |      |   |  |  |  |  |     |     |     |     |     |     |     |     |
| CA_n79A<br>-n257F | CA_n79A<br>-n257A | n79  | 15  |  |  |  |  | Yes | Yes |     |     |     |     | 0   |     |
|                   |                   |      | 30  |  |  |  |  | Yes | Yes | Yes | Yes | Yes |     |     |     |
|                   |                   |      | 60  |  |  |  |  | Yes | Yes | Yes | Yes | Yes |     |     |     |
|                   |                   | n257 | See CA_n257F in Table 5.5A.1-2 in TS 38.101-2 |  |  |  |  |     |     |     |     |     |     |     |     |
|                   |                   |      |   |  |  |  |  |     |     |     |     |     |     |     |     |
| CA_n79C<br>-n257A | CA_n79A<br>-n257A | n79  | See CA_n79C in Table 5.5A.1-1 in TS 38.101-1  |  |  |  |  |     |     |     |     |     | 0   |     |     |
|                   |                   | n257 | 60  |  |  |  |  |     | Yes |     |     | Yes |     | Yes |     |
|                   |                   |      | 120   |  |  |  |  |     | Yes |     |     | Yes |     | Yes | Yes |
|                   |                   |      |   |  |  |  |  |     |     |     |     |     |     |     |     |
| CA_n79C<br>-n257D | CA_n79A<br>-n257A | n79  | See CA_n79C in Table 5.5A.1-1 in TS 38.101-1  |  |  |  |  |     |     |     |     |     | 0   |     |     |
|                   |                   | n257 | See CA_n257D in Table 5.5A.1-2 in TS 38.101-2 |  |  |  |  |     |     |     |     |     |     |     |     |
| CA_n79C<br>-n257E | CA_n79A<br>-n257A | n79  | See CA_n79C in Table 5.5A.1-1 in TS 38.101-1  |  |  |  |  |     |     |     |     |     | 0   |     |     |
|                   |                   | n257 | See CA_n257E in Table 5.5A.1-2 in TS 38.101-2 |  |  |  |  |     |     |     |     |     |     |     |     |
| CA_n79C<br>-n257F | CA_n79A<br>-n257A | n79  | See CA_n79C in Table 5.5A.1-1 in TS 38.101-1  |  |  |  |  |     |     |     |     |     | 0   |     |     |
|                   |                   | n257 | See CA_n257F in Table 5.5A.1-2 in TS 38.101-2 |  |  |  |  |     |     |     |     |     |     |     |     |

## 5.5B Configuration for DC

### 5.5B.1 General

The channel bandwidth and bandwidth classes are specified for operation with EN-DC, NGEN-DC or NR-DC configured.

### 5.5B.2 Intra-band contiguous EN-DC

Supported channel bandwidths for E-UTRA operating bands are defined in [4] and for NR operating bands in TS 38.101-1 [2].

**Table 5.5B.2-1: Intra-band contiguous EN-DC configurations**

| EN-DC configuration  | Uplink EN-DC configuration (NOTE 1) | E-UTRA configuration | NR configuration  |
|--|-------------------------------------|----------------------|-------------------|
| DC_(n)41AA   | DC_(n)41AA                          | 41A                  | n41A              |
| DC_(n)41CA   | DC_(n)41AA, DC_41A_n41A             | CA_41C               | n41A              |
| DC_(n)41DA   | DC_(n)41AA, DC_41A_n41A             | CA_41D               | n41A              |
| DC_(n)71AA   | DC_(n)71AA                          | 71A                  | n71A <sup>2</sup> |
| NOTE 1: Uplink EN-DC configurations are the configurations supported by the present release of specifications. |                                     |                      |                   |
| NOTE 2: Requirements in this specification apply for NR SCS of 15 kHz only.                                    |                                     |                      |                   |

### 5.5B.3 Intra-band non-contiguous EN-DC

Supported channel bandwidths for E-UTRA operating bands are defined in TS 36.101 [4] and for NR operating bands in TS 38.101-1 [2].



**Table 5.5B.3-1: Intra-band non-contiguous EN-DC configurations**

| <b>EN-DC configuration</b> | <b>Uplink EN-DC configuration (NOTE 1)</b> | <b>E-UTRA configuration</b> | <b>NR configuration</b> |
|----------------------------|--|-----------------------------|-------------------------|
| DC_3A_n3A                  | DC_3A_n3A <sup>2</sup>                     | 3A                          | n3A                     |
| DC_41A_n41A                | DC_41A_n41A                                | 41A                         | n41A                    |
| DC_41C_n41A                | DC_41A_n41A                                | CA_41C                      | n41A                    |
| DC_41D_n41A                | DC_41A_n41A                                | CA_41D                      | n41A                    |

NOTE 1: Uplink EN-DC configurations are the configurations supported by the present release of specifications.  
NOTE 2: Only single switched UL is supported in Rel.15

## 5.5B.4 Inter-band EN-DC within FR1

### 5.5B.4.1 Inter-band EN-DC configurations within FR1 (two bands)

**Table 5.5B.4.1-1: Inter-band EN-DC configurations within FR1 (two bands)**

| EN-DC configuration        | Uplink EN-DC configuration (NOTE 1) | E-UTRA configuration | NR configuration |
|----------------------------|-------------------------------------|----------------------|------------------|
| DC_1A_n28A                 | DC_1A_n28A                          | 1A                   | n28A             |
| DC_1A_n40A                 | DC_1A_n40A                          | 1A                   | n40A             |
| DC_1A_n51A                 | DC_1A_n51A                          | 1A                   | n51A             |
| DC_1A_n77A<br>DC_1A_n77C   | DC_1A_n77A                          | 1A                   | n77A<br>CA_n77C  |
| DC_1A_n78A<br>DC_1A_n78C   | DC_1A_n78A                          | 1A                   | n78A<br>CA_n78C  |
| DC_1A_n79A<br>DC_1A_n79C   | DC_1A_n79A                          | 1A                   | n79A<br>CA_n79C  |
| DC_2A_n5A                  | DC_2A_n5A                           | 2A                   | n5A              |
| DC_2A_n66A                 | DC_2A_n66A                          | 2A                   | n66A             |
| DC_2A_n71A                 | DC_2A_n71A                          | 2A                   | n71A             |
| DC_2A_n78A                 | DC_2A_n78A                          | 2A                   | n78A             |
| DC_3A_n7A                  | DC_3A_n7A                           | 3A                   | n7A              |
| DC_3A_n28A                 | DC_3A_n28A                          | 3A                   | n28A             |
| DC_3A_n40A                 | DC_3A_n40A                          | 3A                   | n40A             |
| DC_3A_n51A                 | DC_3A_n51A                          | 3A                   | n51A             |
| DC_3A_n77A<br>DC_3A_n77C   | DC_3A_n77A                          | 3A                   | n77A<br>CA_n77C  |
| DC_3A_n78A<br>DC_3A_n78C   | DC_3A_n78A                          | 3A                   | n78A<br>CA_n78C  |
| DC_3A_n79A<br>DC_3A_n79C   | DC_3A_n79A                          | 3A                   | n79A<br>CA_n79C  |
| DC_3C_n78A                 | DC_3A_n78A                          | CA_3C                | n78A             |
| DC_5A_n40A                 | DC_5A_n40A                          | 5A                   | n40A             |
| DC_5A_n66A                 | DC_5A_n66A                          | 5A                   | n66A             |
| DC_5A_n78A                 | DC_5A_n78A                          | 5A                   | n78A             |
| DC_7A-7A_n78A              | DC_7A_n78A                          | CA_7A-7A             | n78A             |
| DC_7A_n28A                 | DC_7A_n28A                          | 7A                   | n28A             |
| DC_7A_n51A                 | DC_7A_n51A                          | 7A                   | n51A             |
| DC_7A_n78A                 | DC_7A_n78A                          | 7A                   | n78A             |
| DC_7C_n78A                 | DC_7C_n78A                          | CA_7C                | n78A             |
| DC_8A_n40A                 | DC_8A_n40A                          | 8A                   | n40A             |
| DC_8A_n77A                 | DC_8A_n77A                          | 8A                   | n77A             |
| DC_8A_n78A                 | DC_8A_n78A                          | 8A                   | n78A             |
| DC_8A_n79A                 | DC_8A_n79A                          | 8A                   | n79A             |
| DC_11A_n77A                | DC_11A_n77A                         | 11A                  | n77A             |
| DC_11A_n78A                | DC_11A_n78A                         | 11A                  | n78A             |
| DC_11A_n79A                | DC_11A_n79A                         | 11A                  | n79A             |
| DC_12A_n5A                 | DC_12A_n5A                          | 12A                  | n5A              |
| DC_12A_n66A                | DC_12A_n66A                         | 12A                  | n66A             |
| DC_18A_n77A                | DC_18A_n77A                         | 18A                  | n77A             |
| DC_18A_n78A                | DC_18A_n78A                         | 18A                  | n78A             |
| DC_18A_n79A                | DC_18A_n79A                         | 18A                  | n79A             |
| DC_19A_n77A<br>DC_19A_n77C | DC_19A_n77A                         | 19A                  | n77A<br>CA_n77C  |
| DC_19A_n78A<br>DC_19A_n78C | DC_19A_n78A                         | 19A                  | n78A<br>CA_n78C  |
| DC_19A_n79A<br>DC_19A_n79C | DC_19A_n79A                         | 19A                  | n79A<br>CA_n79C  |
| DC_20A_n8A                 | DC_20A_n8A                          | 20A                  | n8A              |

| EN-DC configuration                                      | Uplink EN-DC configuration (NOTE 1) | E-UTRA configuration | NR configuration |
|--|-------------------------------------|----------------------|------------------|
| DC_20A_n28A <sup>4</sup>                                 | DC_20A_n28A                         | 20A                  | n28A             |
| DC_20A_n51A  | DC_20A_n51A                         | 20A                  | n51A             |
| DC_20A_n77A  | DC_20A_n77A                         | 20A                  | n77A             |
| DC_20A_n78A  | DC_20A_n78A                         | 20A                  | n78A             |
| DC_21A_n77A<br>DC_21A_n77C                               | DC_21A_n77A                         | 21A                  | n77A<br>CA_n77C  |
| DC_21A_n78A<br>DC_21A_n78C                               | DC_21A_n78A                         | 21A                  | n78A<br>CA_n78C  |
| DC_21A_n79A<br>DC_21A_n79C                               | DC_21A_n79A                         | 21A                  | n79A<br>CA_n79C  |
| DC_25A_n41A  | DC_25A_n41A                         | 25A                  | n41A             |
| DC_26A_n41A  | DC_26A_n41A                         | 26A                  | n41A             |
| DC_26A_n77A  | DC_26A_n77A                         | 26A                  | n77A             |
| DC_26A_n78A  | DC_26A_n78A                         | 26A                  | n78A             |
| DC_26A_n79A  | DC_26A_n79A                         | 26A                  | n79A             |
| DC_28A_n51A  | DC_28A_n51A                         | 28A                  | n51A             |
| DC_28A_n77A<br>DC_28A_n77C                               | DC_28A_n77A                         | 28A                  | n77A<br>CA_n77C  |
| DC_28A_n78A<br>DC_28A_n78C                               | DC_28A_n78A                         | 28A                  | n78A<br>CA_n78C  |
| DC_28A_n79A<br>DC_28A_n79C                               | DC_28A_n79A                         | 28A                  | n79A<br>CA_n79C  |
| DC_30A_n5A   | DC_30A_n5A                          | 30A                  | n5A              |
| DC_30A_n66A  | DC_30A_n66A                         | 30A                  | n66A             |
| DC_38A_n78A  | N/A                                 | 38A                  | n78A             |
| DC_39A_n78A  | DC_39A_n78A                         | 39A                  | n78A             |
| DC_39A_n79A  | DC_39A_n79A                         | 39A                  | n79A             |
| DC_40A_n77A  | N/A                                 | 40A                  | n77A             |
| DC_41A_n77A  | DC_41A_n77A                         | 41A                  | n77A             |
| DC_41A_n78A  | DC_41A_n78A                         | 41A                  | n78A             |
| DC_41A_n79A  | DC_41A_n79A                         | 41A                  | n79A             |
| DC_41C_n77A  | DC_41C_n77A                         | CA_41C               | n77A             |
| DC_41C_n78A  | DC_41C_n78A                         | CA_41C               | n78A             |
| DC_41C_n79A  | DC_41C_n79A                         | CA_41C               | n79A             |
| DC_42A_n51A  | DC_42A_n51A                         | 42A                  | n51A             |
| DC_42A_n77A <sup>3,4</sup><br>DC_42A_n77C <sup>3,4</sup> | N/A                                 | 42A                  | n77A<br>CA_n77C  |
| DC_42A_n78A <sup>3,4</sup><br>DC_42A_n78C <sup>3,4</sup> | N/A                                 | 42A                  | n78A<br>CA_n78C  |
| DC_42A_n79A<br>DC_42A_n79C                               | N/A                                 | 42A                  | n79A<br>CA_n79C  |
| DC_42C_n77A <sup>3,4</sup>                               | N/A                                 | CA_42C               | n77A             |
| DC_42C_n78A <sup>3,4</sup>                               | N/A                                 | CA_42C               | n78A             |
| DC_42C_n79A  | N/A                                 | CA_42C               | n79A             |
| DC_42C_n77C <sup>3,4</sup>                               | N/A                                 | CA_42C               | CA n77C          |
| DC_42C_n78C <sup>3,4</sup>                               | N/A                                 | CA_42C               | CA n78C          |
| DC_42C_n79C  | N/A                                 | CA_42C               | CA n79C          |
| DC_42D_n77A <sup>3,4</sup>                               | N/A                                 | CA_42D               | n77A             |
| DC_42D_n78A <sup>3,4</sup>                               | N/A                                 | CA_42D               | n78A             |
| DC_42D_n79A  | N/A                                 | CA_42D               | n79A             |

| EN-DC configuration        | Uplink EN-DC configuration (NOTE 1) | E-UTRA configuration | NR configuration |
|----------------------------|-------------------------------------|----------------------|------------------|
| DC_42E_n77A <sup>3,4</sup> | N/A                                 | CA_42E               | n77A             |
| DC_42E_n78A <sup>3,4</sup> | N/A                                 | CA_42E               | n78A             |
| DC_42E_n79A                | N/A                                 | CA_42E               | n79A             |
| DC_46A_n78A <sup>2</sup>   | N/A                                 | 46A                  | n78A             |
| DC_46C_n78A <sup>2</sup>   | N/A                                 | CA_46C               | n78A             |
| DC_46D_n78A <sup>2</sup>   | N/A                                 | CA_46D               | n78A             |
| DC_46E_n78A <sup>2</sup>   | N/A                                 | CA_46E               | n78A             |
| DC_66A_n5A                 | DC_66A_n5A                          | 66A                  | n5A              |
| DC_66A_n71A                | DC_66A_n71A                         | 66A                  | n71A             |
| DC_66A_n78A                | DC_66A_n78A                         | 66A                  | n78A             |

NOTE 1: Uplink CA configurations are the configurations supported by the present release of specifications.

NOTE 2: Restricted to E-UTRA operation when inter-band carrier aggregation is configured. The downlink operating band for Band 46 is paired with the uplink operating band (external E-UTRA band) of the carrier aggregation configuration that is supporting the configured Pcell.

NOTE 3: The minimum requirements apply only when there is non-simultaneous Tx/Rx operation between E-UTRA and NR carriers. This restriction applies also for these carriers when applicable EN-DC configuration is part of a higher order EN-DC configuration.

NOTE 4: The minimum requirements for inter-band EN-DC apply when the maximum power spectral density imbalance between downlink carriers is within [6] dB. The power spectral density imbalance condition also applies for these carriers when applicable EN-DC configuration is a subset of a higher order EN-DC configuration.

5.5B.4.2 Inter-band EN-DC configurations within FR1 (three bands)

**Table 5.5B.4.2-1: Inter-band EN-DC configurations within FR1 (three bands)**

| EN-DC configuration              | Uplink EN-DC configuration (NOTE 1) | E-UTRA configuration | NR configuration |
|----------------------------------|-------------------------------------|----------------------|------------------|
| DC_1A-3A_n28A                    | DC_1A_n28A<br>DC_3A_n28A            | CA_1A-3A             | n28A             |
| DC_1A-3A_n77A<br>DC_1A-3A_n77C   | DC_1A_n77A<br>DC_3A_n77A            | CA_1A-3A             | n77A<br>CA_n77C  |
| DC_1A-3A_n78A<br>DC_1A-3A_n78C   | DC_1A_n78A<br>DC_3A_n78A            | CA_1A-3A             | n78A<br>CA_n78C  |
| DC_1A-3A_n79A<br>DC_1A-3A_n79C   | DC_1A_n79A<br>DC_3A_n79A            | CA_1A-3A             | n79A<br>CA_n79C  |
| DC_1A-3C_n78A                    | DC_1A_n78A<br>DC_3A_n78A            | CA_1A-3C             | n78A             |
| DC_1A-5A_n78A                    | DC_1A_n78A<br>DC_5A_n78A            | CA_1A-5A             | n78A             |
| DC_1A-7A_n28A                    | DC_1A_n28A<br>DC_7A_n28A            | CA_1A-7A             | n28A             |
| DC_1A-7A_n78A                    | DC_1A_n78A<br>DC_7A_n78A            | CA_1A-7A             | n78A             |
| DC_1A-7A-7A_n78A                 | DC_1A_n78A<br>DC_7A_n78A            | CA_1A-7A-7A          | n78A             |
| DC_1A-8A_n78A                    | DC_1A_n78A<br>DC_8A_n78A            | CA_1A-8A             | n78A             |
| DC_1A-18A_n77A                   | DC_1A_n77A<br>DC_18A_n77A           | CA_1A-18A            | n77A             |
| DC_1A-18A_n78A                   | DC_1A_n78A<br>DC_18A_n78A           | CA_1A-18A            | n78A             |
| DC_1A-18A_n79A                   | DC_1A_n79A<br>DC_18A_n79A           | CA_1A-18A            | n79A             |
| DC_1A-19A_n77A<br>DC_1A-19A_n77C | DC_1A_n77A<br>DC_19A_n77A           | CA_1A-19A            | n77A<br>CA_n77C  |
| DC_1A-19A_n78A<br>DC_1A-19A_n78C | DC_1A_n78A<br>DC_19A_n78A           | CA_1A-19A            | n78A<br>CA_n78C  |
| DC_1A-19A_n79A<br>DC_1A-19A_n79C | DC_1A_n79A<br>DC_19A_n79A           | CA_1A-19A            | n79A<br>CA_n79C  |
| DC_1A-19A_n77A                   | DC_1A_n77A<br>DC_19A_n77A           | CA_1A-19A            | n77A             |
| DC_1A-19A_n78A                   | DC_1A_n78A<br>DC_19A_n78A           | CA_1A-19A            | n78A             |
| DC_1A-19A_n79A                   | DC_1A_n79A<br>DC_19A_n79A           | CA_1A-19A            | n79A             |
| DC_1A-20A_n28A                   | DC_1A_n28A<br>DC_20A_n28A           | CA_1A-20A            | n28A             |
| DC_1A-20A_n78A                   | DC_1A_n78A<br>DC_20A_n78A           | CA_1A-20A            | n78A             |
| DC_1A-21A_n77A<br>DC_1A-21A_n77C | DC_1A_n77A<br>DC_21A_n77A           | CA_1A-21A            | n77A<br>CA_n77C  |
| DC_1A-21A_n78A<br>DC_1A-21A_n78C | DC_1A_n78A<br>DC_21A_n78A           | CA_1A-21A            | n78A<br>CA_n78C  |
| DC_1A-21A_n79A<br>DC_1A-21A_n79C | DC_1A_n79A<br>DC_21A_n79A           | CA_1A-21A            | n79A<br>CA_n79C  |
| DC_1A-21A_n77A                   | DC_1A_n77A<br>DC_21A_n77A           | CA_1A-21A            | n77A             |
| DC_1A-21A_n78A                   | DC_1A_n78A<br>DC_21A_n78A           | CA_1A-21A            | n78A             |
| DC_1A-21A_n79A                   | DC_1A_n79A<br>DC_21A_n79A           | CA_1A-21A            | n79A             |
| DC_1A-28A_n77A<br>DC_1A-28A_n77C | DC_1A_n77A<br>DC_28A_n77A           | CA_1A-28A            | n77A<br>CA_n77C  |
| DC_1A-28A_n78A<br>DC_1A-28A_n78C | DC_1A_n78A<br>DC_28A_n78A           | CA_1A-28A            | n78A<br>CA_n78C  |
| DC_1A-28A_n79A<br>DC_1A-28A_n79C | DC_1A_n79A<br>DC_28A_n79A           | CA_1A-28A            | n79A<br>CA_n79C  |
| DC_1A_n28A-n78A                  | DC_1A_n28A,<br>DC_1A_n78A           | 1A                   | CA_n28A-n78A     |

| EN-DC configuration              | Uplink EN-DC configuration (NOTE 1)                                    | E-UTRA configuration   | NR configuration |
|----------------------------------|--|------------------------|------------------|
| DC_1A-41A_n77A<br>DC_1A-41C_n77A | DC_1A_n77A<br>DC_41A_n77A<br>DC_41C_n77A                               | CA_1A-41A<br>CA_1A-41C | n77A             |
| DC_1A-41A_n78A<br>DC_1A-41C_n78A | DC_1A_n78A<br>DC_41A_n78A<br>DC_41C_n78A                               | CA_1A-41A<br>CA_1A-41C | n78A             |
| DC_1A-41C_n79A                   | DC_1A_n79A<br>DC_41C_n79A  | CA_1A-41C              | n79A             |
| DC_1A-42A_n77A<br>DC_1A-42A_n77C | DC_1A_n77A   | CA_1A-42A              | n77A<br>CA_n77C  |
| DC_1A-42A_n78A<br>DC_1A-42A_n78C | DC_1A_n78A   | CA_1A-42A              | n78A<br>CA_n78C  |
| DC_1A-42A_n79A<br>DC_1A-42A_n79C | DC_1A_n79A   | CA_1A-42A              | n79A<br>CA_n79C  |
| DC_1A-42C_n77A<br>DC_1A-42C_n77C | DC_1A_n77A   | CA_1A-42C              | n77A<br>CA_n77C  |
| DC_1A-42C_n78A<br>DC_1A-42C_n78C | DC_1A_n78A   | CA_1A-42C              | n78A<br>CA_n78C  |
| DC_1A-42C_n79A<br>DC_1A-42C_n79C | DC_1A_n79A   | CA_1A-42C              | n79A<br>CA_n79C  |
| DC_1A-42D_n77A                   | DC_1A_n77A   | CA_1A-42D              | n77A             |
| DC_1A-42D_n78A                   | DC_1A_n78A   | CA_1A-42D              | n78A             |
| DC_1A-42D_n79A                   | DC_1A_n79A   | CA_1A-42D              | n79A             |
| DC_1A-42E_n77A                   | DC_1A_n77A   | CA_1A-42E              | n77A             |
| DC_1A-42E_n78A                   | DC_1A_n78A   | CA_1A-42E              | n78A             |
| DC_1A-42E_n79A                   | DC_1A_n79A   | CA_1A-42E              | n79A             |
| DC_1A_n77A-n79A                  | DC_1A_n77A<br>DC_1A_n79A   | 1A                     | CA_n77A-n79A     |
| DC_1A_n78A-n79A                  | DC_1A_n78A<br>DC_1A_n79A   | 1A                     | CA_n78A-n79A     |
| DC_1A_SUL_n78A-n84A              | DC_1A_n78A,<br>DC_1A_n84A_ULSUP-TDM_n78A,<br>DC_1A_n84A_ULSUP-FDM_n78A | 1A                     | SUL_n78A-n84A    |
| DC_2A-5A_n66A                    | DC_2A_n66A<br>DC_5A_n66A   | CA_2A-5A               | n66A             |
| DC_2A-12A_n66A                   | DC_2A_n66A<br>DC_12A_n66A  | CA_2A-12A              | n66A             |
| DC_2A-30A_n66A                   | DC_2A_n66A<br>DC_30A_n66A  | CA_2A-30A              | n66A             |
| DC_2A-66A_n71A                   | DC_2A_n71A<br>DC_66A_n71A  | CA_2A-66A              | n71A             |
| DC_2A-(n)71AA                    | DC_2A_n71A<br>DC_(n)71AA   | CA_2A-71A              | n71A             |
| DC_3A_n3A-n77A                   | DC_3A_n77A<br>DC_3A_n3A <sup>2</sup>                                   | 3A                     | CA_n3A-n77A      |
| DC_3A_n3A-n78A                   | DC_3A_n78A<br>DC_3A_n3A <sup>2</sup>                                   | 3A                     | CA_n3A-n78A      |
| DC_3A-5A_n78A                    | DC_3A_n78A<br>DC_5A_n78A   | CA_3A-5A               | n78A             |
| DC_3A-7A-7A_n78A                 | DC_3A_n78A<br>DC_7A_n78A   | CA_3A-7A-7A            | n78A             |
| DC_3A-7A_n28A                    | DC_3A_n28A<br>DC_7A_n28A   | CA_3A-7A               | n28A             |
| DC_3A-7A_n78A                    | DC_3A_n78A<br>DC_7A_n78A   | CA_3A-7A               | n78A             |
| DC_3A-7C_n78A                    | DC_3A_n78A<br>DC_7C_n78A   | CA_3A-7C               | n78A             |
| DC_3C-7C_n78A                    | DC_3A_n78A<br>DC_7C_n78A   | CA_3C-7C               | n78A             |
| DC_3C-7A_n78A                    | DC_3A_n78A<br>DC_7A_n78A   | CA_3C-7A               | n78A             |



| EN-DC configuration              | Uplink EN-DC configuration (NOTE 1)                                    | E-UTRA configuration | NR configuration |
|----------------------------------|--|----------------------|------------------|
| DC_3A-8A_n78A                    | DC_3A_n78A<br>DC_8A_n78A   | CA_3A-8A             | n78A             |
| DC_3A-19A_n77A<br>DC_3A-19A_n77C | DC_3A_n77A<br>DC_19A_n77A  | CA_3A-19A            | n77A<br>CA_n77C  |
| DC_3A-19A_n78A<br>DC_3A-19A_n78C | DC_3A_n78A<br>DC_19A_n78A  | CA_3A-19A            | n78A<br>CA_n78C  |
| DC_3A-19A_n79A<br>DC_3A-19A_n79C | DC_3A_n79A<br>DC_19A_n79A  | CA_3A-19A            | n79A<br>CA_n79C  |
| DC_3A-20A_n28A                   | DC_3A_n28A<br>DC_20A_n28A  | CA_3A-20A            | n28A             |
| DC_3A-20A_n78A                   | DC_3A_n78A<br>DC_20A_n78A  | CA_3A-20A            | n78A             |
| DC_3C-20A_n78A                   | DC_3A_n78A<br>DC_20A_n78A  | CA_3C-20A            | n78A             |
| DC_3A-21A_n77A<br>DC_3A-21A_n77C | DC_3A_n77A<br>DC_21A_n77A  | CA_3A-21A            | n77A<br>CA_n77C  |
| DC_3A-21A_n78A<br>DC_3A-21A_n78C | DC_3A_n78A<br>DC_21A_n78A  | CA_3A-21A            | n78A<br>CA_n78C  |
| DC_3A-21A_n79A<br>DC_3A-21A_n79C | DC_3A_n79A<br>DC_21A_n79A  | CA_3A-21A            | n79A<br>CA_n79C  |
| DC_3A-28A_n77A<br>DC_3A-28A_n77C | DC_3A_n77A<br>DC_28A_n77A  | CA_3A-28A            | n77A<br>CA_n77C  |
| DC_3A-28A_n78A<br>DC_3A-28A_n78C | DC_3A_n78A<br>DC_28A_n78A  | CA_3A-28A            | n78A<br>CA_n78C  |
| DC_3A-28A_n79A<br>DC_3A-28A_n79C | DC_3A_n79A<br>DC_28A_n79A  | CA_3A-28A            | n79A<br>CA_n79C  |
| DC_3A_n28A-n78A                  | DC_3A_n28A,<br>DC_3A_n78A  | 3A                   | CA_n28A-n78A     |
| DC_3A-38A_n78A                   | DC_3A_n78A   | CA_3A-38A            | n78A             |
| DC_3A-41A_n78A                   | DC_3A_n78A<br>DC_41A_n78A  | CA_3A-41A            | n78A             |
| DC_3A-42A_n77A<br>DC_3A-42A_n77C | DC_3A_n77A   | CA_3A-42A            | n77A<br>CA_n77C  |
| DC_3A-42A_n78A<br>DC_3A-42A_n78C | DC_3A_n78A   | CA_3A-42A            | n78A<br>CA_n78C  |
| DC_3A-42A_n79A<br>DC_3A-42A_n79C | DC_3A_n79A   | CA_3A-42A            | n79A<br>CA_n79C  |
| DC_3A-42C_n77A<br>DC_3A-42C_n77C | DC_3A_n77A   | CA_3A-42C            | n77A<br>CA_n77C  |
| DC_3A-42C_n78A<br>DC_3A-42C_n78C | DC_3A_n78A   | CA_3A-42C            | n78A<br>CA_n78C  |
| DC_3A-42C_n79A<br>DC_3A-42C_n79C | DC_3A_n79A   | CA_3A-42C            | n79A<br>CA_n79C  |
| DC_3A-42D_n77A                   | DC_3A_n77A   | CA_3A-42D            | n77A             |
| DC_3A-42D_n78A                   | DC_3A_n78A   | CA_3A-42D            | n78A             |
| DC_3A-42D_n79A                   | DC_3A_n79A   | CA_3A-42D            | n79A             |
| DC_3A-42E_n77A                   | DC_3A_n77A   | CA_3A-42E            | n77A             |
| DC_3A-42E_n78A                   | DC_3A_n78A   | CA_3A-42E            | n78A             |
| DC_3A-42E_n79A                   | DC_3A_n79A   | CA_3A-42E            | n79A             |
| DC_3A_n77A-n79A                  | DC_3A_n77A<br>DC_3A_n79A   | 3A                   | CA_n77A-n79A     |
| DC_3A_n78A-n79A                  | DC_3A_n78A<br>DC_3A_n79A   | 3A                   | CA_n78A-n79A     |
| DC_3A_SUL_n78A-n80A              | DC_3A_n78A<br>DC_3A_n80A_ULSUP-TDM_n78A<br>DC_3A_n80A_ULSUP-FDM_n78A   | 3A                   | SUL_n78A-n80A    |
| DC_3A_SUL_n78A-n82A              | DC_3A_n78A<br>DC_3A_n82A   | 3A                   | SUL_n78A-n82A    |
| DC_3A_SUL_n79A-n80A              | DC_3A_n79A,<br>DC_3A_n80A_ULSUP-TDM_n79A,<br>DC_3A_n80A_ULSUP-FDM_n79A | 3A                   | SUL_n79A-n80A    |

| EN-DC configuration                | Uplink EN-DC configuration (NOTE 1)                                    | E-UTRA configuration | NR configuration |
|------------------------------------|--|----------------------|------------------|
| DC_5A-7A-7A_n78A                   | DC_5A_n78A<br>DC_7A_n78A   | CA_5A-7A-7A          | n78A             |
| DC_5A-7A_n78A                      | DC_5A_n78A<br>DC_7A_n78A   | CA_5A-7A             | n78A             |
| DC_5A-30A_n66A                     | DC_5A_n66A<br>DC_30A_n66A  | CA_5A-30A            | n66A             |
| DC_7A-20A_n28A                     | DC_7A_n28A<br>DC_20A_n28A  | CA_7A-20A            | n28A             |
| DC_7A-20A_n78A                     | DC_7A_n78A<br>DC_20A_n78A  | CA_7A-20A            | n78A             |
| DC_7A-28A_n78A                     | DC_7A_n78A<br>DC_28A_n78A  | CA_7A-28A            | n78A             |
| DC_7A_n28A-n78A                    | DC_7A_n28A,<br>DC_7A_n78A  | 7A                   | CA_n28A-n78A     |
| DC_7C-28A_n78A                     | DC_7C_n78A<br>DC_28A_n78A  | CA_7C-28A            | n78A             |
| DC_7A-46A_n78A <sup>3</sup>        | DC_7A_n78A   | CA_7A-46A            | n78A             |
| DC_7A-46C_n78A <sup>3</sup>        | DC_7A_n78A   | CA_7A-46C            | n78A             |
| DC_7A-46D_n78A <sup>3</sup>        | DC_7A_n78A   | CA_7A-46D            | n78A             |
| DC_7A-46E_n78A <sup>3</sup>        | DC_7A_n78A   | CA_7A-46E            | n78A             |
| DC_8A_SUL_n78A-n81A                | DC_8A_n78A,<br>DC_8A_n81A_ULSUP-TDM_n78A,<br>DC_8A_n81A_ULSUP-FDM_n78A | 8A                   | SUL_n78A-n81A    |
| DC_8A_SUL_n79A-n81A                | DC_8A_n79A,<br>DC_8A_n81A_ULSUP-TDM_n79A,<br>DC_8A_n81A_ULSUP-FDM_n79A | 8A                   | SUL_n79A-n81A    |
| DC_12A-30A_n66A                    | DC_12A_n66A<br>DC_30A_n66A   | CA_12A-30A           | n66A             |
| DC_18A-28A_n77A                    | DC_18A_n77A<br>DC_28A_n77A   | CA_18A-28A           | n77A             |
| DC_18A-28A_n78A                    | DC_18A_n78A<br>DC_28A_n78A   | CA_18A-28A           | n78A             |
| DC_18A-28A_n79A                    | DC_18A_n79A<br>DC_28A_n79A   | CA_18A-28A           | n79A             |
| DC_19A-21A_n78A<br>DC_19A-21A_n78C | DC_19A_n78A<br>DC_21A_n78A   | CA_19A-21A           | n78A<br>CA_n78C  |
| DC_19A-21A_n79A<br>DC_19A-21A_n79C | DC_19A_n79A<br>DC_21A_n79A   | CA_19A-21A           | n79A<br>CA_n79C  |
| DC_19A-21A_n77A<br>DC_19A-21A_n77C | DC_19A_n77A<br>DC_21A_n77A   | CA_19A-21A           | n77A<br>CA_n77C  |
| DC_19A-42A_n77A<br>DC_19A-42A_n77C | DC_19A_n77A  | CA_19A-42A           | n77A<br>CA_n77C  |
| DC_19A-42A_n78A<br>DC_19A-42A_n78C | DC_19A_n78A  | CA_19A-42A           | n78A<br>CA_n78C  |
| DC_19A-42A_n79A<br>DC_19A-42A_n79C | DC_19A_n79A  | CA_19A-42A           | n79A<br>CA_n79C  |
| DC_19A-42C_n77A<br>DC_19A-42C_n77C | DC_19A_n77A  | CA_19A-42C           | n77A<br>CA_n77C  |
| DC_19A-42C_n78A<br>DC_19A-42C_n78C | DC_19A_n78A  | CA_19A-42C           | n78A<br>CA_n78C  |
| DC_19A-42C_n79A<br>DC_19A-42C_n79C | DC_19A_n79A  | CA_19A-42C           | n79A<br>CA_n79C  |
| DC_19A_n77A-n79A                   | DC_19A_n77A<br>DC_19A_n79A   | 19A                  | CA_n77A-n79A     |
| DC_19A_n78A-n79A                   | DC_19A_n78A<br>DC_19A_n79A   | 19A                  | CA_n78A-n79A     |
| DC_20A_n8A-n75A                    | DC_20A_n8A   | 20A                  | CA_n8A-n75A      |
| DC_20A_n28A-n75A                   | DC_20A_n28A  | 20A                  | CA_n28A-n75A     |
| DC_20A_n28A-n78A                   | DC_20A_n28A<br>DC_20A_n78A   | 20A                  | CA_n28A-n78A     |
| DC_20A_n75A-n78A                   | DC_20A_n78A  | 20A                  | CA_n75A-n78A     |

| EN-DC configuration                | Uplink EN-DC configuration (NOTE 1)                                       | E-UTRA configuration     | NR configuration |
|------------------------------------|---|--------------------------|------------------|
| DC_20A_n76A-n78A                   | DC_20A_n78A   | 20A                      | CA_n76A-n78A     |
| DC_20A_SUL_n78A-n82A               | DC_20A_n78A,<br>DC_20A_n82A_ULSUP-TDM_n78A,<br>DC_20A_n82A_ULSUP-FDM_n78A | 20A                      | SUL_n78A-n82A    |
| DC_20A_SUL_n78A-n83A               | DC_20A_n78A<br>DC_20A_n83A  | 20A                      | SUL_n78A-n83A    |
| DC_21A-28A_n77A<br>DC_21A-28A_n77C | DC_21A_n77A<br>DC_28A_n77A  | CA_21A-28A               | n77A<br>CA_n77C  |
| DC_21A-28A_n78A<br>DC_21A-28A_n78C | DC_21A_n78A<br>DC_28A_n78A  | CA_21A-28A               | n78A<br>CA_n78C  |
| DC_21A-28A_n79A<br>DC_21A-28A_n79C | DC_21A_n79A<br>DC_28A_n79A  | CA_21A-28A               | n79A<br>CA_n79C  |
| DC_21A-42A_n77A<br>DC_21A-42A_n77C | DC_21A_n77A   | CA_21A-42A               | n77A<br>CA_n77C  |
| DC_21A-42A_n78A<br>DC_21A-42A_n78C | DC_21A_n78A   | CA_21A-42A               | n78A<br>CA_n78C  |
| DC_21A-42A_n79A<br>DC_21A-42A_n79C | DC_21A_n79A   | CA_21A-42A               | n79A<br>CA_n79C  |
| DC_21A-42C_n77A<br>DC_21A-42C_n77C | DC_21A_n77A   | CA_21A-42C               | n77A<br>CA_n77C  |
| DC_21A-42C_n78A<br>DC_21A-42C_n78C | DC_21A_n78A   | CA_21A-42C               | n78A<br>CA_n78C  |
| DC_21A-42C_n79A<br>DC_21A-42C_n79C | DC_21A_n79A   | CA_21A-42C               | n79A<br>CA_n79C  |
| DC_21A_n77A-n79A                   | DC_21A_n77A<br>DC_21A_n79A  | 21A                      | CA_n77A-n79A     |
| DC_21A_n78A-n79A                   | DC_21A_n78A<br>DC_21A_n79A  | 21A                      | CA_n78A-n79A     |
| DC_28A_SUL_n78A-n83A               | DC_28A_n78A,<br>DC_28A_n83A_ULSUP-TDM_n78A,<br>DC_28A_n83A_ULSUP-FDM_n78A | 28A                      | SUL_n78A-n83A    |
| DC_28A-42A_n77A<br>DC_28A-42A_n77C | DC_28A_n77A   | CA_28A-42A               | n77A<br>CA_n77C  |
| DC_28A-42A_n78A<br>DC_28A-42A_n78C | DC_28A_n78A   | CA_28A-42A               | n78A<br>CA_n78C  |
| DC_28A-42A_n79A<br>DC_28A-42A_n79C | DC_28A_n79A   | CA_28A-42A               | n79A<br>CA_n79C  |
| DC_28A-42C_n77A                    | DC_28A_n77A   | CA_28A-42C               | n77A             |
| DC_28A-42C_n78A                    | DC_28A_n78A   | CA_28A-42C               | n78A             |
| DC_28A-42C_n79A                    | DC_28A_n79A   | CA_28A-42C               | n79A             |
| DC_41A-42A_n77A                    | DC_41A_n77A   | CA_41A-42A               | n77A             |
| DC_41C-42C_n77A                    | DC_41A_n77A   | CA_41C-42C               | n77A             |
| DC_41A-42C_n77A                    | DC_41A_n77A   | CA_41A-42C               | n77A             |
| DC_41C-42A_n77A                    | DC_41C_n77A   | CA_41C-42A               | n77A             |
| DC_41A-42A_n78A                    | DC_41A_n78A   | CA_41A-42A               | n78A             |
| DC_41C-42A_n78A                    | DC_41C_n78A   | CA_41C-42A               | n78A             |
| DC_41C-42C_n78A                    | DC_41A_n78A   | CA_41C-42C               | n78A             |
| DC_41A-42C_n78A                    | DC_41A_n78A   | CA_41A-42C               | n78A             |
| DC_41A-42A_n79A<br>DC_41A-42C_n79A | DC_41A_n79A   | CA_41A-42A<br>CA_41A-42C | n79A             |
| DC_41C-42C_n79A                    | DC_41A_n79A   | CA_41C-42C               | n79A             |
| DC_41C-42A_n79A                    | DC_41C_n79A   | CA_41C-42A               | n79A             |
| DC_66A_(n)71AA                     | DC_66A_n71A<br>DC_(n)71AA   | CA_66A_71A               | n71A             |
| DC_66A_SUL_n78A-n86A               | DC_66A_n78A,<br>DC_66A_n86A_ULSUP-TDM_n78A,<br>DC_66A_n86A_ULSUP-FDM_n78A | 66A                      | SUL_n78A-n86A    |

| <b>EN-DC configuration</b>  | <b>Uplink EN-DC configuration (NOTE 1)</b> | <b>E-UTRA configuration</b> | <b>NR configuration</b> |
|---|--|-----------------------------|-------------------------|
| <p>NOTE 1: Uplink CA configurations are the configurations supported by the present release of specifications.</p> <p>NOTE 2: Only single switched UL is supported in Rel.15</p> <p>NOTE 3: Restricted to E-UTRA operation when inter-band carrier aggregation is configured. The downlink operating band for Band 46 is paired with the uplink operating band (external E-UTRA band) of the carrier aggregation configuration that is supporting the configured Pcell.</p> |  |                             |                         |

5.5B.4.3 Inter-band EN-DC configurations within FR1 (four bands)

**Table 5.5B.4.3-1: Inter-band EN-DC configurations within FR1 (four bands)**

| EN-DC configuration                    | Uplink EN-DC configuration (NOTE 1)                  | E-UTRA configuration | NR configuration |
|--|--|----------------------|------------------|
| DC_1A-3A-5A_n78A                       | DC_1A_n78A<br>DC_3A_n78A<br>DC_5A_n78A               | CA_1A-3A-5A          | n78A             |
| DC_1A-3A-7A_n28A                       | DC_1A_n28A<br>DC_3A_n28A<br>DC_7A_n28A               | CA_1A-3A-7A          | n28A             |
| DC_1A-3A-7A_n78A                       | DC_1A_n78A<br>DC_3A_n78A<br>DC_7A_n78A               | CA_1A-3A-7A          | n78A             |
| DC_1A-3C-7A_n78A                       | DC_1A_n78A<br>DC_3A_n78A<br>DC_7A_n78A               | CA_1A-3C-7A          | n78A             |
| DC_1A-3A-7A-7A_n78A                    | DC_1A_n78A<br>DC_3A_n78A<br>DC_7A_n78A               | CA_1A-3A-7A-7A       | n78A             |
| DC_1A-3A-8A_n78A                       | DC_1A_n78A<br>DC_3A_n78A<br>DC_8A_n78A               | CA_1A-3A-8A          | n78A             |
| DC_1A-3A-19A_n77A<br>DC_1A-3A-19A_n77C | DC_1A_n77A<br>DC_3A_n77A<br>DC_19A_n77A              | CA_1A-3A-19A         | n77A<br>CA_n77C  |
| DC_1A-3A-19A_n78A<br>DC_1A-3A-19A_n78C | DC_1A_n78A<br>DC_3A_n78A<br>DC_19A_n78A              | CA_1A-3A-19A         | n78A<br>CA_n78C  |
| DC_1A-3A-19A_n79A<br>DC_1A-3A-19A_n79C | DC_1A_n79A<br>DC_3A_n79A<br>DC_19A_n79A              | CA_1A-3A-19A         | n79A<br>CA_n79C  |
| DC_1A-3A-20A_n28A                      | DC_1A_n28A<br>DC_3A_n28A<br>DC_20A_n28A              | CA_1A-3A-20A         | n28A             |
| DC_1A-3A-20A_n78A                      | DC_1A_n78A<br>DC_3A_n78A<br>DC_20A_n78A              | CA_1A-3A-20A         | n78A             |
| DC_1A-3A-21A_n77A<br>DC_1A-3A-21A_n77C | DC_1A_n77A<br>DC_3A_n77A<br>DC_21A_n77A              | CA_1A-3A-21A         | n77A<br>CA_n77C  |
| DC_1A-3A-21A_n78A<br>DC_1A-3A-21A_n78C | DC_1A_n78A<br>DC_3A_n78A<br>DC_21A_n78A              | CA_1A-3A-21A         | n78A<br>CA_n78C  |
| DC_1A-3A-21A_n79A<br>DC_1A-3A-21A_n79C | DC_1A_n79A<br>DC_3A_n79A<br>DC_21A_n79A              | CA_1A-3A-21A         | n79A<br>CA_n79C  |
| DC_1A-3A-28A_n77A                      | DC_1A_n77A<br>DC_3A_n77A<br>DC_28A_n77A              | CA_1A-3A-28A         | n77A             |
| DC_1A-3A-28A_n78A                      | DC_1A_n78A<br>DC_3A_n78A<br>DC_28A_n78A              | CA_1A-3A-28A         | n78A             |
| DC_1A-3A-28A_n79A                      | DC_1A_n79A<br>DC_3A_n79A<br>DC_28A_n79A              | CA_1A-3A-28A         | n79A             |
| DC_1A-3A_n28A-n78A                     | DC_1A_n28A<br>DC_1A_n78A<br>DC_3A_n28A<br>DC_3A_n78A | CA_1A-3A             | CA_n28A-n78A     |
| DC_1A-3A-42A_n77A<br>DC_1A-3A-42A_n77C | DC_1A_n77A<br>DC_3A_n77A                             | CA_1A-3A-42A         | n77A<br>CA_n77C  |
| DC_1A-3A-42A_n78A<br>DC_1A-3A-42A_n78C | DC_1A_n78A<br>DC_3A_n78A                             | CA_1A-3A-42A         | n78A<br>CA_n78C  |
| DC_1A-3A-42A_n79A<br>DC_1A-3A-42A_n79C | DC_1A_n79A<br>DC_3A_n79A                             | CA_1A-3A-42A         | n79A<br>CA_n79C  |
| DC_1A-3A-42C_n77A                      | DC_1A_n77A<br>DC_3A_n77A                             | CA_1A-3A-42C         | n77A             |

| EN-DC configuration                      | Uplink EN-DC configuration (NOTE 1)                  | E-UTRA configuration | NR configuration   |
|--|--|----------------------|--------------------|
| DC_1A-3A-42C_n78A                        | DC_1A_n78A<br>DC_3A_n78A                             | CA_1A-3A-42C         | n78A               |
| DC_1A-3A-42C_n79A                        | DC_1A_n79A<br>DC_3A_n79A                             | CA_1A-3A-42C         | n79A               |
| DC_1A-3A-42C_n77C                        | DC_1A_n77A<br>DC_3A_n77A                             | CA_1A-3A-42C         | CA_n77C            |
| DC_1A-3A-42C_n78C                        | DC_1A_n78A<br>DC_3A_n78A                             | CA_1A-3A-42C         | CA_n78C            |
| DC_1A-3A-42C_n79C                        | DC_1A_n79A<br>DC_3A_n79A                             | CA_1A-3A-42C         | CA_n79C            |
| DC_1A-5A-7A_n78A                         | DC_1A_n78A<br>DC_5A_n78A<br>DC_7A_n78A               | CA_1A-5A-7A          | n78A               |
| DC_1A-5A-7A-7A_n78A                      | DC_1A_n78A<br>DC_5A_n78A<br>DC_7A_n78A               | CA_1A-5A-7A-7A       | n78A               |
| DC_1A-7A-20A_n28A                        | DC_1A_n28A<br>DC_7A_n28A<br>DC_20A_n28A              | CA_1A-7A-20A         | n28A               |
| DC_1A-7A-20A_n78A                        | DC_1A_n78A<br>DC_7A_n78A<br>DC_20A_n78A              | CA_1A-7A-20A         | n78A               |
| DC_1A-7A_n28A-n78A                       | DC_1A_n28A<br>DC_1A_n78A<br>DC_7A_n28A<br>DC_7A_n78A | CA_1A-7A             | CA_n28A-n78A       |
| DC_1A-18A-28A_n77A                       | DC_1A_n77A<br>DC_18A_n77A<br>DC_28A_n77A             | CA_1A-18A-28A        | n77A               |
| DC_1A-18A-28A_n78A                       | DC_1A_n78A<br>DC_18A_n78A<br>DC_28A_n78A             | CA_1A-18A-28A        | n78A               |
| DC_1A-18A-28A_n79A                       | DC_1A_n79A<br>DC_18A_n79A<br>DC_28A_n79A             | CA_1A-18A-28A        | n79A               |
| DC_1A-19A-21A_n77A<br>DC_1A-19A-21A_n77C | DC_1A_n77A<br>DC_19A_n77A<br>DC_21A_n77A             | CA_1A-19A-21A        | CA_n77A<br>CA_n77C |
| DC_1A-19A-21A_n78A<br>DC_1A-19A-21A_n78C | DC_1A_n78A<br>DC_19A_n78A<br>DC_21A_n78A             | CA_1A-19A-21A        | CA_n78A<br>CA_n78C |
| DC_1A-19A-21A_n79A<br>DC_1A-19A-21A_n79C | DC_1A_n79A<br>DC_19A_n79A<br>DC_21A_n79A             | CA_1A-19A-21A        | CA_n79A<br>CA_n79C |
| DC_1A-19A-42A_n77A<br>DC_1A-19A-42A_n77C | DC_1A_n77A<br>DC_19A_n77A                            | CA_1A-19A-42A        | n77A<br>CA_n77C    |
| DC_1A-19A-42A_n78A<br>DC_1A-19A-42A_n78C | DC_1A_n78A<br>DC_19A_n78A                            | CA_1A-19A-42A        | n78A<br>CA_n78C    |
| DC_1A-19A-42A_n79A<br>DC_1A-19A-42A_n79C | DC_1A_n79A<br>DC_19A_n79A                            | CA_1A-19A-42A        | n79A<br>CA_n79C    |
| DC_1A-19A-42C_n77A                       | DC_1A_n77A<br>DC_19A_n77A                            | CA_1A-19A-42C        | n77A               |
| DC_1A-19A-42C_n78A                       | DC_1A_n78A<br>DC_19A_n78A                            | CA_1A-19A-42C        | n78A               |
| DC_1A-19A-42C_n79A                       | DC_1A_n79A<br>DC_19A_n79A                            | CA_1A-19A-42C        | n79A               |
| DC_1A-19A-42C_n77C                       | DC_1A_n77A<br>DC_19A_n77A                            | CA_1A-19A-42C        | CA_n77C            |
| DC_1A-19A-42C_n78C                       | DC_1A_n78A<br>DC_19A_n78A                            | CA_1A-19A-42C        | CA_n78C            |
| DC_1A-19A-42C_n79C                       | DC_1A_n79A<br>DC_19A_n79A                            | CA_1A-19A-42C        | CA_n79C            |

| EN-DC configuration                      | Uplink EN-DC configuration (NOTE 1)                    | E-UTRA configuration | NR configuration |
|--|--|----------------------|------------------|
| DC_1A-20A_n28A-n78A                      | DC_1A_n28A<br>DC_1A_n78A<br>DC_20A_n28A<br>DC_20A_n78A | CA_1A-20A            | CA_n28A-n78A     |
| DC_1A-21A-28A_n77A                       | DC_1A_n77A<br>DC_21A_n77A<br>DC_28A_n77A               | CA_1A-21A-28A        | n77A             |
| DC_1A-21A-28A_n78A                       | DC_1A_n78A<br>DC_21A_n78A<br>DC_28A_n78A               | CA_1A-21A-28A        | n78A             |
| DC_1A-21A-28A_n79A                       | DC_1A_n79A<br>DC_21A_n79A<br>DC_28A_n79A               | CA_1A-21A-28A        | n79A             |
| DC_1A-21A-42A_n77A<br>DC_1A-21A-42A_n77C | DC_1A_n77A<br>DC_21A_n77A                              | CA_1A-21A-42A        | n77A<br>CA_n77C  |
| DC_1A-21A-42A_n78A<br>DC_1A-21A-42A_n78C | DC_1A_n78A<br>DC_21A_n78A                              | CA_1A-21A-42A        | n78A<br>CA_n78C  |
| DC_1A-21A-42A_n79A<br>DC_1A-21A-42A_n79C | DC_1A_n79A<br>DC_21A_n79A                              | CA_1A-21A-42A        | n79A<br>CA_n79C  |
| DC_1A-21A-42C_n77A                       | DC_1A_n77A<br>DC_21A_n77A                              | CA_1A-21A-42C        | n77A             |
| DC_1A-21A-42C_n78A                       | DC_1A_n78A<br>DC_21A_n78A                              | CA_1A-21A-42C        | n78A             |
| DC_1A-21A-42C_n79A                       | DC_1A_n79A<br>DC_21A_n79A                              | CA_1A-21A-42C        | n79A             |
| DC_1A-21A-42C_n77C                       | DC_1A_n77A<br>DC_21A_n77A                              | CA_1A-21A-42C        | CA_n77C          |
| DC_1A-21A-42C_n78C                       | DC_1A_n78A<br>DC_21A_n78A                              | CA_1A-21A-42C        | CA_n78C          |
| DC_1A-21A-42C_n79C                       | DC_1A_n79A<br>DC_21A_n79A                              | CA_1A-21A-42C        | CA_n79C          |
| DC_1A-28A-42A_n77A                       | DC_1A_n77A<br>DC_28A_n77A                              | CA_1A-28A-42A        | n77A             |
| DC_1A-28A-42A_n78A                       | DC_1A_n78A<br>DC_28A_n78A                              | CA_1A-28A-42A        | n78A             |
| DC_1A-28A-42A_n79A                       | DC_1A_n79A<br>DC_28A_n79A                              | CA_1A-28A-42A        | n79A             |
| DC_1A-28A-42C_n77A                       | DC_1A_n77A<br>DC_28A_n77A                              | CA_1A-28A-42C        | n77A             |
| DC_1A-28A-42C_n78A                       | DC_1A_n78A<br>DC_28A_n78A                              | CA_1A-28A-42C        | n78A             |
| DC_1A-28A-42C_n79A                       | DC_1A_n79A<br>DC_28A_n79A                              | CA_1A-28A-42C        | n79A             |
| DC_1A-41A-42A_n77A                       | DC_1A_n77A<br>DC_41A_n77A                              | CA_1A-41A-42A        | n77A             |
| DC_1A-41A-42C_n77A                       | DC_1A_n77A<br>DC_41A_n77A                              | CA_1A-41A-42C        | n77A             |
| DC_1A-41C-42A_n77A                       | DC_1A_n77A<br>DC_41A_n77A                              | CA_1A-41C-42A        | n77A             |
| DC_1A-41A-42A_n78A                       | DC_1A_n78A<br>DC_41A_n78A                              | CA_1A-41A-42A        | n78A             |
| DC_1A-41A-42C_n78A                       | DC_1A_n78A<br>DC_41A_n78A                              | CA_1A-41A-42C        | n78A             |
| DC_1A-41C-42A_n78A                       | DC_1A_n78A<br>DC_41A_n78A                              | CA_1A-41C-42A        | n78A             |
| DC_1A-41A-42A_n79A                       | DC_1A_n79A<br>DC_41A_n79A                              | CA_1A-41A-42A        | n79A             |
| DC_1A-41A-42C_n79A                       | DC_1A_n79A<br>DC_41A_n79A                              | CA_1A-41A-42C        | n79A             |
| DC_1A-41C-42A_n79A                       | DC_1A_n79A<br>DC_41A_n79A                              | CA_1A-41C-42A        | n79A             |
| DC_1A-41C-42C_n77A                       | DC_1A_n77A<br>DC_41A_n77A                              | CA_1A-41C-42C        | n77A             |



| EN-DC configuration                      | Uplink EN-DC configuration (NOTE 1)                    | E-UTRA configuration | NR configuration |
|--|--|----------------------|------------------|
| DC_1A-41C-42C_n78A                       | DC_1A_n78A<br>DC_41A_n78A                              | CA_1A-41C-42C        | n78A             |
| DC_1A-41C-42C_n79A                       | DC_1A_n79A<br>DC_41A_n79A                              | CA_1A-41C-42C        | n79A             |
| DC_2A-66A-(n)71AA                        | DC_2A_n71A<br>DC_66A_n71A<br>DC_(n)71AA                | CA_2A-66A-71A        | n71A             |
| DC_3A-5A-7A-7A_n78A                      | DC_3A_n78A<br>DC_5A_n78A<br>DC_7A_n78A                 | CA_3A-5A-7A-7A       | n78A             |
| DC_3A-5A-7A_n78A                         | DC_3A_n78A<br>DC_5A_n78A<br>DC_7A_n78A                 | CA_3A-5A-7A          | n78A             |
| DC_3A-7A-20A_n28A                        | DC_3A_n28A<br>DC_7A_n28A<br>DC_20A_n28A                | CA_3A-7A-20A         | n28A             |
| DC_3A-7A-20A_n78A                        | DC_3A_n78A<br>DC_20A_n78A<br>DC_7A_n78A                | CA_3A-7A-20A         | n78A             |
| DC_3A-7A-28A_n78A                        | DC_3A_n78A<br>DC_7A_n78A<br>DC_28A_n78A                | CA_3A-7A-28A         | n78A             |
| DC_3A-7C-28A_n78A                        | DC_3A_n78A<br>DC_7A_n78A<br>DC_28A_n78A                | CA_3A-7C-28A         | n78A             |
| DC_3A-7A_n28A-n78A                       | DC_3A_n28A<br>DC_3A_n78A<br>DC_7A_n28A<br>DC_7A_n78A   | CA_3A-7A             | CA_n28A-n78A     |
| DC_3A-19A-21A_n77A<br>DC_3A-19A-21A_n77C | DC_3A_n77A<br>DC_19A_n77A<br>DC_21A_n77A               | CA_3A-19A-21A        | n77A<br>CA_n77C  |
| DC_3A-19A-21A_n78A<br>DC_3A-19A-21A_n78C | DC_3A_n78A<br>DC_19A_n78A<br>DC_21A_n78A               | CA_3A-19A-21A        | n78A<br>CA_n78C  |
| DC_3A-19A-21A_n79A<br>DC_3A-19A-21A_n79C | DC_3A_n79A<br>DC_19A_n79A<br>DC_21A_n79A               | CA_3A-19A-21A        | n79A<br>CA_n79C  |
| DC_3A-19A-42A_n77A<br>DC_3A-19A-42A_n77C | DC_3A_n77A<br>DC_19A_n77A                              | CA_3A-19A-42A        | n77A<br>CA_n77C  |
| DC_3A-19A-42C_n77A<br>DC_3A-19A-42C_n77C | DC_3A_n77A<br>DC_19A_n77A                              | CA_3A-19A-42C        | n77A<br>CA_n77C  |
| DC_3A-19A-42A_n78A<br>DC_3A-19A-42A_n78C | DC_3A_n78A<br>DC_19A_n78A                              | CA_3A-19A-42A        | n78A<br>CA_n78C  |
| DC_3A-19A-42C_n78A<br>DC_3A-19A-42C_n78C | DC_3A_n78A<br>DC_19A_n78A                              | CA_3A-19A-42C        | n78A<br>CA_n78C  |
| DC_3A-19A-42A_n79A<br>DC_3A-19A-42A_n79C | DC_3A_n79A<br>DC_19A_n79A                              | CA_3A-19A-42A        | n79A<br>CA_n79C  |
| DC_3A-19A-42C_n79A<br>DC_3A-19A-42C_n79C | DC_3A_n79A<br>DC_19A_n79A                              | CA_3A-19A-42C        | n79A<br>CA_n79C  |
| DC_3A-20A_n28A-n78A                      | DC_3A_n28A<br>DC_3A_n78A<br>DC_20A_n28A<br>DC_20A_n78A | CA_3A-20A            | CA_n28A-n78A     |
| DC_3A-21A-42A_n77A<br>DC_3A-21A-42A_n77C | DC_3A_n77A<br>DC_21A_n77A                              | CA_3A-21A-42A        | n77A<br>CA_n77C  |
| DC_3A-21A-42A_n78A<br>DC_3A-21A-42A_n78C | DC_3A_n78A<br>DC_21A_n78A                              | CA_3A-21A-42A        | n78A<br>CA_n78C  |
| DC_3A-21A-42A_n79A<br>DC_3A-21A-42A_n79C | DC_3A_n79A<br>DC_21A_n79A                              | CA_3A-21A-42A        | n79A<br>CA_n79C  |
| DC_3A-21A-42C_n77A                       | DC_3A_n77A<br>DC_21A_n77A                              | CA_3A-21A-42C        | n77A             |
| DC_3A-21A-42C_n78A                       | DC_3A_n78A<br>DC_21A_n78A                              | CA_3A-21A-42C        | n78A             |

| EN-DC configuration                        | Uplink EN-DC configuration (NOTE 1)                    | E-UTRA configuration | NR configuration |
|--|--|----------------------|------------------|
| DC_3A-21A-42C_n79A                         | DC_3A_n79A<br>DC_21A_n79A                              | CA_3A-21A-42C        | n79A             |
| DC_3A-21A-42C_n77C                         | DC_3A_n77A<br>DC_21A_n77A                              | CA_3A-21A-42C        | CA_n77C          |
| DC_3A-21A-42C_n78C                         | DC_3A_n78A<br>DC_21A_n78A                              | CA_3A-21A-42C        | CA_n78C          |
| DC_3A-21A-42C_n79C                         | DC_3A_n79A<br>DC_21A_n79A                              | CA_3A-21A-42C        | CA_n79C          |
| DC_3A-28A-42A_n77A                         | DC_3A_n77A<br>DC_28A_n77A                              | CA_3A-28A-42A        | n77A             |
| DC_3A-28A-42A_n78A                         | DC_3A_n78A<br>DC_28A_n78A                              | CA_3A-28A-42A        | n78A             |
| DC_3A-28A-42A_n79A                         | DC_3A_n79A<br>DC_28A_n79A                              | CA_3A-28A-42A        | n79A             |
| DC_3A-28A-42C_n77A                         | DC_3A_n77A<br>DC_28A_n77A                              | CA_3A-28A-42C        | n77A             |
| DC_3A-28A-42C_n78A                         | DC_3A_n78A<br>DC_28A_n78A                              | CA_3A-28A-42C        | n78A             |
| DC_3A-28A-42C_n79A                         | DC_3A_n79A<br>DC_28A_n79A                              | CA_3A-28A-42C        | n79A             |
| DC_7A-20A_n28A-n78A                        | DC_7A_n28A<br>DC_7A_n78A<br>DC_20A_n28A<br>DC_20A_n78A | CA_7A-20A            | CA_n28A-n78A     |
| DC_19A-21A-42A_n77A<br>DC_19A-21A-42A_n77C | DC_19A_n77A<br>DC_21A_n77A                             | CA_19A-21A-42A       | n77A<br>CA_n77C  |
| DC_19A-21A-42A_n78A<br>DC_19A-21A-42A_n78C | DC_19A_n78A<br>DC_21A_n78A                             | CA_19A-21A-42A       | n78A<br>CA_n78C  |
| DC_19A-21A-42A_n79A<br>DC_19A-21A-42A_n79C | DC_19A_n79A<br>DC_21A_n79A                             | CA_19A-21A-42A       | n79A<br>CA_n79C  |
| DC_19A-21A-42C_n77A                        | DC_19A_n77A<br>DC_21A_n77A                             | CA_19A-21A-42C       | n77A             |
| DC_19A-21A-42C_n78A                        | DC_19A_n78A<br>DC_21A_n78A                             | CA_19A-21A-42C       | n78A             |
| DC_19A-21A-42C_n79A                        | DC_19A_n79A<br>DC_21A_n79A                             | CA_19A-21A-42C       | n79A             |
| DC_19A-21A-42C_n77C                        | DC_19A_n77A<br>DC_21A_n77A                             | CA_19A-21A-42C       | CA_n77C          |
| DC_19A-21A-42C_n78C                        | DC_19A_n78A<br>DC_21A_n78A                             | CA_19A-21A-42C       | CA_n78C          |
| DC_19A-21A-42C_n79C                        | DC_19A_n79A<br>DC_21A_n79A                             | CA_19A-21A-42C       | CA_n79C          |
| DC_21A-28A-42A_n77A                        | DC_21A_n77A<br>DC_28A_n77A                             | CA_21A-28A-42A       | n77A             |
| DC_21A-28A-42A_n78A                        | DC_21A_n78A<br>DC_28A_n78A                             | CA_21A-28A-42A       | n78A             |
| DC_21A-28A-42A_n79A                        | DC_21A_n79A<br>DC_28A_n79A                             | CA_21A-28A-42A       | n79A             |
| DC_21A-28A-42C_n77A                        | DC_21A_n77A<br>DC_28A_n77A                             | CA_21A-28A-42C       | n77A             |
| DC_21A-28A-42C_n78A                        | DC_21A_n78A<br>DC_28A_n78A                             | CA_21A-28A-42C       | n78A             |
| DC_21A-28A-42C_n79A                        | DC_21A_n79A<br>DC_28A_n79A                             | CA_21A-28A-42C       | n79A             |

NOTE 1: Uplink CA configurations are the configurations supported by the present release of specifications.

5.5B.4.4 Inter-band EN-DC configurations within FR1 (five bands)

**Table 5.5B.4.4-1: Inter-band EN-DC configurations within FR1 (five bands)**

| EN-DC configuration    | Uplink EN-DC configuration (NOTE 1)  | E-UTRA configuration | NR configuration |
|------------------------|--|----------------------|------------------|
| DC_1A-3A-5A-7A_n78A    | DC_1A_n78A<br>DC_3A_n78A<br>DC_5A_n78A<br>DC_7A_n78A                             | CA_1A-3A-5A-7A       | n78A             |
| DC_1A-3A-7A-20A_n28A   | DC_1A_n28A<br>DC_3A_n28A<br>DC_7A_n28A<br>DC_20A_n28A                            | CA_1A-3A-7A-20A      | n28A             |
| DC_1A-3A-5A-7A-7A_n78A | DC_1A_n78A<br>DC_3A_n78A<br>DC_5A_n78A<br>DC_7A_n78A                             | CA_1A-3A-5A-7A-7A    | n78A             |
| DC_1A-3A-7A-20A_n78A   | DC_1A_n78A<br>DC_3A_n78A<br>DC_7A_n78A<br>DC_20A_n78A                            | CA_1A-3A-7A-20A      | n78A             |
| DC_1A-3A-7A_n28A-n78A  | DC_1A_n28A<br>DC_1A_n78A<br>DC_3A_n28A<br>DC_3A_n78A<br>DC_7A_n28A<br>DC_7A_n78A | CA_1A-3A-7A          | CA_n28A-n78A     |
| DC_1A-3A-19A-21A_n77A  | DC_1A_n77A<br>DC_3A_n77A<br>DC_19A_n77A<br>DC_21A_n77A                           | CA_1A-3A-19A-21A     | n77A             |
| DC_1A-3A-19A-21A_n77C  | DC_1A_n77A<br>DC_3A_n77A<br>DC_19A_n77A<br>DC_21A_n77A                           | CA_1A-3A-19A-21A     | CA_n77C          |
| DC_1A-3A-19A-21A_n78A  | DC_1A_n78A<br>DC_3A_n78A<br>DC_19A_n78A<br>DC_21A_n78A                           | CA_1A-3A-19A-21A     | n78A             |
| DC_1A-3A-19A-21A_n78C  | DC_1A_n78A<br>DC_3A_n78A<br>DC_19A_n78A<br>DC_21A_n78A                           | CA_1A-3A-19A-21A     | CA_n78C          |
| DC_1A-3A-19A-21A_n79A  | DC_1A_n79A<br>DC_3A_n79A<br>DC_19A_n79A<br>DC_21A_n79A                           | CA_1A-3A-19A-21A     | n79A             |
| DC_1A-3A-19A-21A_n79C  | DC_1A_n79A<br>DC_3A_n79A<br>DC_19A_n79A<br>DC_21A_n79A                           | CA_1A-3A-19A-21A     | CA_n79C          |
| DC_1A-3A-19A-42A_n77A  | DC_1A_n77A<br>DC_3A_n77A<br>DC_19A_n77A  | CA_1A-3A-19A-42A     | n77A             |
| DC_1A-3A-19A-42A_n77C  | DC_1A_n77A<br>DC_3A_n77A<br>DC_19A_n77A  | CA_1A-3A-19A-42A     | CA_n77C          |
| DC_1A-3A-19A-42C_n77A  | DC_1A_n77A<br>DC_3A_n77A<br>DC_19A_n77A  | CA_1A-3A-19A-42C     | n77A             |
| DC_1A-3A-19A-42C_n77C  | DC_1A_n77A<br>DC_3A_n77A<br>DC_19A_n77A  | CA_1A-3A-19A-42C     | CA_n77C          |
| DC_1A-3A-19A-42A_n78A  | DC_1A_n78A<br>DC_3A_n78A<br>DC_19A_n78A  | CA_1A-3A-19A-42A     | n78A             |
| DC_1A-3A-19A-42A_n78C  | DC_1A_n78A<br>DC_3A_n78A<br>DC_19A_n78A  | CA_1A-3A-19A-42A     | CA_n78C          |

| EN-DC configuration                            | Uplink EN-DC configuration (NOTE 1)  | E-UTRA configuration | NR configuration |
|--|--|----------------------|------------------|
| DC_1A-3A-19A-42C_n78A                          | DC_1A_n78A<br>DC_3A_n78A<br>DC_19A_n78A  | CA_1A-3A-19A-42C     | n78A             |
| DC_1A-3A-19A-42C_n78C                          | DC_1A_n78A<br>DC_3A_n78A<br>DC_19A_n78A  | CA_1A-3A-19A-42C     | CA_n78C          |
| DC_1A-3A-19A-42A_n79A                          | DC_1A_n79A<br>DC_3A_n79A<br>DC_19A_n79A  | CA_1A-3A-19A-42A     | n79A             |
| DC_1A-3A-19A-42A_n79C                          | DC_1A_n79A<br>DC_3A_n79A<br>DC_19A_n79A  | CA_1A-3A-19A-42A     | CA_n79C          |
| DC_1A-3A-19A-42C_n79A                          | DC_1A_n79A<br>DC_3A_n79A<br>DC_19A_n79A  | CA_1A-3A-19A-42C     | n79A             |
| DC_1A-3A-19A-42C_n79C                          | DC_1A_n79A<br>DC_3A_n79A<br>DC_19A_n79A  | CA_1A-3A-19A-42C     | CA_n79C          |
| DC_1A-3A-20A_n28A-n78A                         | DC_1A_n28A<br>DC_1A_n78A<br>DC_3A_n28A<br>DC_3A_n78A<br>DC_20A_n28A<br>DC_20A_n78A | CA_1A-3A-20A         | CA_n28A-n78A     |
| DC_1A-3A-21A-42A_n77A<br>DC_1A-3A-21A-42A_n77C | DC_1A_n77A<br>DC_3A_n77A<br>DC_21A_n77A  | CA_1A-3A-21A-42A     | n77A<br>CA_n77C  |
| DC_1A-3A-21A-42A_n78A<br>DC_1A-3A-21A-42A_n78C | DC_1A_n78A<br>DC_3A_n78A<br>DC_21A_n78A  | CA_1A-3A-21A-42A     | n78A<br>CA_n78C  |
| DC_1A-3A-21A-42A_n79A<br>DC_1A-3A-21A-42A_n79C | DC_1A_n79A<br>DC_3A_n79A<br>DC_19A_n79A  | CA_1A-3A-21A-42A     | n79A<br>CA_n79C  |
| DC_1A-3A-21A-42C_n77A                          | DC_1A_n77A<br>DC_3A_n77A<br>DC_21A_n77A  | CA_1A-3A-21A-42C     | n77A             |
| DC_1A-3A-21A-42C_n77C                          | DC_1A_n77A<br>DC_3A_n77A<br>DC_21A_n77A  | CA_1A-3A-21A-42C     | CA_n77C          |
| DC_1A-3A-21A-42C_n78A                          | DC_1A_n78A<br>DC_3A_n78A<br>DC_21A_n78A  | CA_1A-3A-21A-42C     | n78A             |
| DC_1A-3A-21A-42C_n78C                          | DC_1A_n78A<br>DC_3A_n78A<br>DC_21A_n78A  | CA_1A-3A-21A-42C     | CA_n78C          |
| DC_1A-3A-21A-42C_n79A                          | DC_1A_n79A<br>DC_3A_n79A<br>DC_21A_n79A  | CA_1A-3A-21A-42C     | n79A             |
| DC_1A-3A-21A-42C_n79C                          | DC_1A_n79A<br>DC_3A_n79A<br>DC_21A_n79A  | CA_1A-3A-21A-42C     | CA_n79C          |
| DC_1A-3A-28A-42A_n77A                          | DC_1A_n77A<br>DC_3A_n77A<br>DC_28A_n77A  | CA_1A-3A-28A-42A     | n77A             |
| DC_1A-3A-28A-42A_n78A                          | DC_1A_n78A<br>DC_3A_n78A<br>DC_28A_n78A  | CA_1A-3A-28A-42A     | n78A             |
| DC_1A-3A-28A-42A_n79A                          | DC_1A_n79A<br>DC_3A_n79A<br>DC_28A_n79A  | CA_1A-3A-28A-42A     | n79A             |
| DC_1A-3A-28A-42C_n77A                          | DC_1A_n77A<br>DC_3A_n77A<br>DC_28A_n77A  | CA_1A-3A-28A-42C     | n77A             |

| EN-DC configuration    | Uplink EN-DC configuration (NOTE 1)  | E-UTRA configuration | NR configuration |
|------------------------|--|----------------------|------------------|
| DC_1A-3A-28A-42C_n78A  | DC_1A_n78A<br>DC_3A_n78A<br>DC_28A_n78A  | CA_1A-3A-28A-42C     | n78A             |
| DC_1A-3A-28A-42C_n79A  | DC_1A_n79A<br>DC_3A_n79A<br>DC_28A_n79A  | CA_1A-3A-28A-42C     | n79A             |
| DC_1A-7A-20A_n28A-n78A | DC_1A_n28A<br>DC_1A_n78A<br>DC_7A_n28A<br>DC_7A_n78A<br>DC_20A_n28A<br>DC_20A_n78A | CA_1A-7A-20A         | CA_n28A-n78A     |
| DC_1A-19A-21A-42A_n77A | DC_1A_n77A<br>DC_19A_n77A<br>DC_21A_n77A   | CA_1A-19A-21A-42A    | n77A             |
| DC_1A-19A-21A-42A_n78A | DC_1A_n78A<br>DC_19A_n78A<br>DC_21A_n78A   | CA_1A-19A-21A-42A    | n78A             |
| DC_1A-19A-21A-42A_n79A | DC_1A_n79A<br>DC_19A_n79A<br>DC_21A_n79A   | CA_1A-19A-21A-42A    | n79A             |
| DC_1A-19A-21A-42A_n77C | DC_1A_n77A<br>DC_19A_n77A<br>DC_21A_n77A   | CA_1A-19A-21A-42A    | CA_n77C          |
| DC_1A-19A-21A-42A_n78C | DC_1A_n78A<br>DC_19A_n78A<br>DC_21A_n78A   | CA_1A-19A-21A-42A    | CA_n78C          |
| DC_1A-19A-21A-42A_n79C | DC_1A_n79A<br>DC_19A_n79A<br>DC_21A_n79A   | CA_1A-19A-21A-42A    | CA_n79C          |
| DC_1A-19A-21A-42C_n77A | DC_1A_n77A<br>DC_19A_n77A<br>DC_21A_n77A   | CA_1A-19A-21A-42C    | n77A             |
| DC_1A-19A-21A-42C_n77C | DC_1A_n77A<br>DC_19A_n77A<br>DC_21A_n77A   | CA_1A-19A-21A-42C    | CA_n77C          |
| DC_1A-19A-21A-42C_n78A | DC_1A_n78A<br>DC_19A_n78A<br>DC_21A_n78A   | CA_1A-19A-21A-42C    | n78A             |
| DC_1A-19A-21A-42C_n78C | DC_1A_n78A<br>DC_19A_n78A<br>DC_21A_n78A   | CA_1A-19A-21A-42C    | CA_n78C          |
| DC_1A-19A-21A-42C_n79A | DC_1A_n79A<br>DC_19A_n79A<br>DC_21A_n79A   | CA_1A-19A-21A-42C    | n79A             |
| DC_1A-19A-21A-42C_n79C | DC_1A_n79A<br>DC_19A_n79A<br>DC_21A_n79A   | CA_1A-19A-21A-42C    | CA_n79C          |
| DC_1A-21A-28A-42A_n77A | DC_1A_n77A<br>DC_21A_n77A<br>DC_28A_n77A   | CA_1A-21A-28A-42A    | n77A             |
| DC_1A-21A-28A-42A_n78A | DC_1A_n78A<br>DC_21A_n78A<br>DC_28A_n78A   | CA_1A-21A-28A-42A    | n78A             |
| DC_1A-21A-28A-42A_n79A | DC_1A_n79A<br>DC_21A_n79A<br>DC_28A_n79A   | CA_1A-21A-28A-42A    | n79A             |
| DC_1A-21A-28A-42C_n77A | DC_1A_n77A<br>DC_21A_n77A<br>DC_28A_n77A   | CA_1A-21A-28A-42C    | n77A             |
| DC_1A-21A-28A-42C_n78A | DC_1A_n78A<br>DC_21A_n78A<br>DC_28A_n78A   | CA_1A-21A-28A-42C    | n78A             |

| EN-DC configuration    | Uplink EN-DC configuration (NOTE 1)  | E-UTRA configuration | NR configuration |
|------------------------|--|----------------------|------------------|
| DC_1A-21A-28A-42C_n79A | DC_1A_n79A<br>DC_21A_n79A<br>DC_28A_n79A   | CA_1A-21A-28A-42C    | n79A             |
| DC_3A-7A-20A_n28A-n78A | DC_3A_n28A<br>DC_3A_n78A<br>DC_7A_n28A<br>DC_7A_n78A<br>DC_20A_n28A<br>DC_20A_n78A | CA_3A-7A-20A         | CA_n28A-n78A     |

NOTE 1: Uplink CA configurations are the configurations supported by the present release of specifications.

#### 5.5B.4.5 Inter-band EN-DC configurations within FR1 (six bands)

**Table 5.5B.4.5-1: Inter-band EN-DC configurations within FR1 (six bands)**

| EN-DC configuration       | Uplink EN-DC configuration (NOTE 1)  | E-UTRA configuration | NR configuration |
|---------------------------|--|----------------------|------------------|
| DC_1A-3A-7A-20A_n28A-n78A | DC_1A_n28A<br>DC_1A_n78A<br>DC_3A_n28A<br>DC_3A_n78A<br>DC_7A_n28A<br>DC_7A_n78A<br>DC_20A_n28A<br>DC_20A_n78A | CA_1A-3A-7A-20A      | CA_n28A-n78A     |

NOTE 1: Uplink CA configurations are the configurations supported by the present release of specifications.

#### 5.5B.5 Inter-band EN-DC including FR2

Supported channel bandwidths for E-UTRA operating bands and CA configurations are defined in TS 36.101 [4] and for NR operating bands and CA configurations in TS 38.101-1 [2], TS 38.101-2 [3] and TS 38.101-3.

5.5B.5.1 Inter-band EN-DC configurations including FR2 (two bands)

**Table 5.5B.5.1-1: Inter-band EN-DC configurations including FR2 (two bands)**



| EN-DC configuration  | Uplink EN-DC configuration (NOTE 1) | E-UTRA configuration | NR configuration   |
|--|-------------------------------------|----------------------|--|
| DC_1A_n257A<br>DC_1A_n257D<br>DC_1A_n257E<br>DC_1A_n257F   | DC_1A_n257A                         | 1A                   | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F  |
| DC_2A_n257A<br>DC_2A_n257(2A)  | DC_2A_n257A                         | 2A                   | n257A<br>CA_n257(2A)   |
| DC_2A-2A_n257A   | DC_2A_n257A                         | CA_2A-2A             | n257A  |
| DC_2A_n257A  | DC_2A_n257A                         | 2A                   | n257A  |
| DC_2C_n257A  | DC_2A_n257A                         | CA_2C                | n257A  |
| DC_2A_n260A<br>DC_2A_n260G<br>DC_2A_n260H<br>DC_2A_n260I<br>DC_2A_n260J<br>DC_2A_n260K<br>DC_2A_n260L<br>DC_2A_n260M<br>DC_2A_n260(2A)       | DC_2A_n260A                         | 2A                   | n260A<br>CA_n260G<br>CA_n260H<br>CA_n260I<br>CA_n260J<br>CA_n260K<br>CA_n260L<br>CA_n260M<br>CA_n260(2A) |
| DC_2A-2A_n260A<br>DC_2A-2A_n260G<br>DC_2A-2A_n260H<br>DC_2A-2A_n260I<br>DC_2A-2A_n260J<br>DC_2A-2A_n260K<br>DC_2A-2A_n260L<br>DC_2A-2A_n260M | DC_2A_n260A                         | CA_2A-2A             | n260A<br>CA_n260G<br>CA_n260H<br>CA_n260I<br>CA_n260J<br>CA_n260K<br>CA_n260L<br>CA_n260M                |
| DC_2C_n260A  | DC_2A_n260A                         | CA_2C                | n260A  |
| DC_3A_n257A<br>DC_3A_n257D<br>DC_3A_n257E<br>DC_3A_n257F   | DC_3A_n257A                         | 3A                   | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F  |
| DC_3A_n258A  | DC_3A_n258A                         | 3A                   | n258A  |
| DC_5A-5A_n257A   | DC_5A_n257A                         | CA_5A-5A             | n257A  |
| DC_5A-5A_n260A   | DC_5A_n260A                         | CA_5A-5A             | n260A  |
| DC_5A_n257A  | DC_5A_n257A                         | 5A                   | n257A  |

| EN-DC configuration   | Uplink EN-DC configuration (NOTE 1) | E-UTRA configuration | NR configuration   |
|---|-------------------------------------|----------------------|--|
| DC_5A_n260A<br>DC_5A_n260B<br>DC_5A_n260C<br>DC_5A_n260D<br>DC_5A_n260E<br>DC_5A_n260F<br>DC_5A_n260G<br>DC_5A_n260H<br>DC_5A_n260I<br>DC_5A_n260J<br>DC_5A_n260K<br>DC_5A_n260L<br>DC_5A_n260M<br>DC_5A_n260O<br>DC_5A_n260P<br>DC_5A_n260Q<br>DC_5A_n260(2A)<br>DC_5A_n260(3A)<br>DC_5A_n260(4A)<br>DC_5A_n260(A-I)<br>DC_5A_n260(D-G)<br>DC_5A_n260(D-H)<br>DC_5A_n260(D-I)<br>DC_5A_n260(D-O)<br>DC_5A_n260(D-P)<br>DC_5A_n260(D-Q)<br>DC_5A_n260(E-O)<br>DC_5A_n260(E-P)<br>DC_5A_n260(E-Q)<br>DC_5A_n260(G-I) | DC_5A_n260A                         | 5A                   | n260A<br>CA_n260B<br>CA_n260C<br>CA_n260D<br>CA_n260E<br>CA_n260F<br>CA_n260G<br>CA_n260H<br>CA_n260I<br>CA_n260J<br>CA_n260K<br>CA_n260L<br>CA_n260M<br>CA_n260O<br>CA_n260P<br>CA_n260Q<br>CA_n260(2A)<br>CA_n260(3A)<br>CA_n260(4A)<br>CA_n260(A-I)<br>CA_n260(D-G)<br>CA_n260(D-H)<br>CA_n260(D-I)<br>CA_n260(D-O)<br>CA_n260(D-P)<br>CA_n260(D-Q)<br>CA_n260(E-O)<br>CA_n260(E-P)<br>CA_n260(E-Q)<br>CA_n260(G-I) |
| DC_5A_n261A<br>DC_5A_n261B<br>DC_5A_n261C<br>DC_5A_n261D<br>DC_5A_n261E<br>DC_5A_n261F<br>DC_5A_n261G<br>DC_5A_n261H<br>DC_5A_n261I<br>DC_5A_n261J<br>DC_5A_n261K<br>DC_5A_n261L<br>DC_5A_n261M<br>DC_5A_n261O<br>DC_5A_n261P<br>DC_5A_n261Q<br>DC_5A_n261(2A)<br>DC_5A_n261(3A)<br>DC_5A_n261(4A)<br>DC_5A_n261(D-G)<br>DC_5A_n261(D-H)<br>DC_5A_n261(D-I)<br>DC_5A_n261(D-O)<br>DC_5A_n261(D-P)<br>DC_5A_n261(D-Q)<br>DC_5A_n261(E-O)<br>DC_5A_n261(E-P)<br>DC_5A_n261(E-Q)                                       | DC_5A_n261A                         | 5A                   | n261A<br>CA_n261B<br>CA_n261C<br>CA_n261D<br>CA_n261E<br>CA_n261F<br>CA_n261G<br>CA_n261H<br>CA_n261I<br>CA_n261J<br>CA_n261K<br>CA_n261L<br>CA_n261M<br>CA_n261O<br>CA_n261P<br>CA_n261Q<br>CA_n261(2A)<br>CA_n261(3A)<br>CA_n261(4A)<br>CA_n261(D-G)<br>CA_n261(D-H)<br>CA_n261(D-I)<br>CA_n261(D-O)<br>CA_n261(D-P)<br>CA_n261(D-Q)<br>CA_n261(E-O)<br>CA_n261(E-P)<br>CA_n261(E-Q)                                 |
| DC_5B_n257A   | DC_5B_n257A                         | CA_5B                | n257A  |
| DC_5B_n260A   | DC_5B_n260A                         | CA_5B                | n260A  |
| DC_7A-7A_n257A  | DC_7A_n257A                         | CA_7A-7A             | n257A  |
| DC_7A_n257A   | DC_7A_n257A                         | 7A                   | n257A  |
| DC_7A_n258A   | DC_7A_n258A                         | 7A                   | n258A  |

| EN-DC configuration  | Uplink EN-DC configuration (NOTE 1) | E-UTRA configuration               | NR configuration  |
|--|-------------------------------------|------------------------------------|---|
| DC_8A_n257A  | DC_8A_n257A                         | 8A                                 | n257A   |
| DC_8A_n258A  | DC_8A_n258A                         | 8A                                 | n258A   |
| DC_11A_n257A   | DC_11A_n257A                        | 11A                                | n257A   |
| DC_12A_n260A<br>DC_12A_n260G<br>DC_12A_n260H<br>DC_12A_n260I<br>DC_12A_n260J<br>DC_12A_n260K<br>DC_12A_n260L<br>DC_12A_n260M<br>DC_12A_n260(A-I)<br>DC_12A_n260(G-I) | DC_12A_n260A                        | 12A                                | n260A<br>CA_n260G<br>CA_n260H<br>CA_n260I<br>CA_n260J<br>CA_n260K<br>CA_n260L<br>CA_n260M<br>CA_n260(A-I)<br>CA_n260(G-I) |
| DC_13A_n257A   | DC_13A_n257A                        | 13A                                | n257A   |
| DC_13A_n260A   | DC_13A_n260A                        | 13A                                | n260A   |
| DC_18A_n257A   | DC_18A_n257A                        | 18A                                | n257A   |
| DC_19A_n257A<br>DC_19A_n257D<br>DC_19A_n257E<br>DC_19A_n257F   | DC_19A_n257A                        | 19A                                | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F   |
| DC_20A_n258A   | DC_20A_n258A                        | 20A                                | n258A   |
| DC_21A_n257A<br>DC_21A_n257D<br>DC_21A_n257E<br>DC_21A_n257F   | DC_21A_n257A                        | 21A                                | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F   |
| DC_26A_n257A   | DC_26A_n257A                        | 26A                                | n257A   |
| DC_28A_n257A<br>DC_28A_n257D<br>DC_28A_n257E<br>DC_28A_n257F   | DC_28A_n257A                        | 28A                                | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F   |
| DC_28A_n258A   | DC_28A_n258A                        | 28A                                | n258A   |
| DC_30A_n260A<br>DC_30A_n260G<br>DC_30A_n260H<br>DC_30A_n260I<br>DC_30A_n260J<br>DC_30A_n260K<br>DC_30A_n260L<br>DC_30A_n260M<br>DC_30A_n260(A-I)<br>DC_30A_n260(G-I) | DC_30A_n260A                        | 30A                                | n260A<br>CA_n260G<br>CA_n260H<br>CA_n260I<br>CA_n260J<br>CA_n260K<br>CA_n260L<br>CA_n260M<br>CA_n260(A-I)<br>CA_n260(G-I) |
| DC_39A_n258A   | DC_39A_n258A                        | 39A                                | n258A   |
| DC_41A_n257A<br>DC_41C_n257A   | DC_41A_n257A                        | 41A<br>CA_41C                      | n257A   |
| DC_41A_n258A   | DC_41A_n258A                        | 41A                                | n258A   |
| DC_41C_n257A   | DC_41C_n257A                        | CA_41C                             | n257A   |
| DC_42A_n257A<br>DC_42C_n257A<br>DC_42A_n257D<br>DC_42A_n257E<br>DC_42A_n257F   | DC_42A_n257A                        | 42A<br>CA_42C<br>42A<br>42A<br>42A | n257A<br>n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F  |
| DC_42C_n257A<br>DC_42C_n257D<br>DC_42C_n257E<br>DC_42C_n257F   | DC_42C_n257A                        | CA_42C                             | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F   |
| DC_42D_n257A   | DC_42C_n257A                        | CA_42D                             | n257A   |
| DC_42E_n257A   | DC_42A_n257A                        | CA_42E                             | n257A   |
| DC_48A-48A_n257A   | DC_48A_n257A                        | CA_48A-48A                         | n257A   |

| EN-DC configuration   | Uplink EN-DC configuration (NOTE 1) | E-UTRA configuration | NR configuration   |
|---|-------------------------------------|----------------------|--|
| DC_48A-48A_n260A  | DC_48A_n260A                        | CA_48A-48A           | n260A  |
| DC_48A_n257A  | DC_48A_n257A                        | 48A                  | n257A  |
| DC_48C_n257A  | DC_48C_n257A                        | CA_48C               | n257A  |
| DC_48C_n260A  | DC_48C_n260A                        | CA_48C               | n260A  |
| DC_48A_n260A  | DC_48A_n260A                        | 48A                  | n260A  |
| DC_66A-66A_n257A  | DC_66A_n257A                        | CA_66A-66A           | n257A  |
| DC_66A-66A_n260A<br>DC_66A-66A_n260G<br>DC_66A-66A_n260H<br>DC_66A-66A_n260I<br>DC_66A-66A_n260J<br>DC_66A-66A_n260K<br>DC_66A-66A_n260L<br>DC_66A-66A_n260M  | DC_66A_n260A                        | CA_66A-66A           | n260A<br>CA_n260G<br>CA_n260H<br>CA_n260I<br>CA_n260J<br>CA_n260K<br>CA_n260L<br>CA_n260M  |
| DC_66A_n257A<br>DC_66A_n257(2A)<br>DC_66A_n257G<br>DC_66A_n257H<br>DC_66A_n257I<br>DC_66A_n257J<br>DC_66A_n257K<br>DC_66A_n257L<br>DC_66A_n257M   | DC_66A_n257A                        | 66A                  | n257A<br>CA_n257(2A)<br>CA_n257G<br>CA_n257H<br>CA_n257I<br>CA_n257J<br>CA_n257K<br>CA_n257L<br>CA_n257M   |
| DC_66A_n260A<br>DC_66A_n260D<br>DC_66A_n260E<br>DC_66A_n260F<br>DC_66A_n260G<br>DC_66A_n260H<br>DC_66A_n260I<br>DC_66A_n260J<br>DC_66A_n260K<br>DC_66A_n260L<br>DC_66A_n260M<br>DC_66A_n260O<br>DC_66A_n260P<br>DC_66A_n260Q<br>DC_66A_n260(2A)<br>DC_66A_n260(3A)<br>DC_66A_n260(4A)<br>DC_66A_n260(A-I)<br>DC_66A_n260(D-G)<br>DC_66A_n260(D-H)<br>DC_66A_n260(D-I)<br>DC_66A_n260(D-O)<br>DC_66A_n260(D-P)<br>DC_66A_n260(D-Q)<br>DC_66A_n260(E-O)<br>DC_66A_n260(E-P)<br>DC_66A_n260(E-Q)<br>DC_66A_n260(G-I) | DC_66A_n260A                        | 66A                  | n260A<br>CA_n260D<br>CA_n260E<br>CA_n260F<br>CA_n260G<br>CA_n260H<br>CA_n260I<br>CA_n260J<br>CA_n260K<br>CA_n260L<br>CA_n260M<br>CA_n260O<br>CA_n260P<br>CA_n260Q<br>CA_n260(2A)<br>CA_n260(3A)<br>CA_n260(4A)<br>CA_n260(A-I)<br>CA_n260(D-G)<br>CA_n260(D-H)<br>CA_n260(D-I)<br>CA_n260(D-O)<br>CA_n260(D-P)<br>CA_n260(D-Q)<br>CA_n260(E-O)<br>CA_n260(E-P)<br>CA_n260(E-Q)<br>CA_n260(G-I) |
| DC_66C_n257A  | DC_66C_n257A                        | CA_66C               | n257A  |

| EN-DC configuration   | Uplink EN-DC configuration (NOTE 1) | E-UTRA configuration | NR configuration   |
|---|-------------------------------------|----------------------|--|
| DC_66A_n261A<br>DC_66A_n261D<br>DC_66A_n261E<br>DC_66A_n261F<br>DC_66A_n261G<br>DC_66A_n261H<br>DC_66A_n261I<br>DC_66A_n261J<br>DC_66A_n261K<br>DC_66A_n261L<br>DC_66A_n261M<br>DC_66A_n261O<br>DC_66A_n261P<br>DC_66A_n261Q<br>DC_66A_n261(2A)<br>DC_66A_n261(3A)<br>DC_66A_n261(4A)<br>DC_66A_n261(D-G)<br>DC_66A_n261(D-H)<br>DC_66A_n261(D-I)<br>DC_66A_n261(D-O)<br>DC_66A_n261(D-P)<br>DC_66A_n261(D-Q)<br>DC_66A_n261(E-O)<br>DC_66A_n261(E-P)<br>DC_66A_n261(E-Q) | DC_66A_n261A                        | 66A                  | n261A<br>CA_n261D<br>CA_n261E<br>CA_n261F<br>CA_n261G<br>CA_n261H<br>CA_n261I<br>CA_n261J<br>CA_n261K<br>CA_n261L<br>CA_n261M<br>CA_n261O<br>CA_n261P<br>CA_n261Q<br>CA_n261(2A)<br>CA_n261(3A)<br>CA_n261(4A)<br>CA_n261(D-G)<br>CA_n261(D-H)<br>CA_n261(D-I)<br>CA_n261(D-O)<br>CA_n261(D-P)<br>CA_n261(D-Q)<br>CA_n261(E-O)<br>CA_n261(E-P)<br>CA_n261(E-Q) |
| NOTE 1: Uplink CA configurations are the configurations supported by the present release of specifications.   |                                     |                      |  |

5.5B.5.2 Inter-band EN-DC configurations including FR2 (three bands)

**Table 5.5B.5.2-1: Inter-band EN-DC configurations including FR2 (three bands)**

| EN-DC configuration  | Uplink EN-DC configuration (NOTE 1) | E-UTRA configuration | NR configuration  |
|--|-------------------------------------|----------------------|---|
| DC_1A-3A_n257A<br>DC_1A-3A_n257D<br>DC_1A-3A_n257E<br>DC_1A-3A_n257F   | DC_1A_n257A<br>DC_3A_n257A          | CA_1A-3A             | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F   |
| DC_1A-5A_n257A   | DC_1A_n257A<br>DC_5A_n257A          | CA_1A-5A             | n257A   |
| DC_1A-7A_n257A   | DC_1A_n257A<br>DC_7A_n257A          | CA_1A-7A             | n257A   |
| DC_1A-7A-7A_n257A  | DC_1A_n257A<br>DC_7A_n257A          | CA_1A-7A-7A          | n257A   |
| DC_1A-8A_n257A   | DC_1A_n257A<br>DC_8A_n257A          | CA_1A-8A             | n257A   |
| DC_1A-18A_n257A  | DC_1A_n257A<br>DC_18A_n257A         | CA_1A-18A            | n257A   |
| DC_1A-19A_n257A<br>DC_1A-19A_n257D<br>DC_1A-19A_n257E<br>DC_1A-19A_n257F   | DC_1A_n257A<br>DC_19A_n257A         | CA_1A-19A            | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F   |
| DC_1A-21A_n257A<br>DC_1A-21A_n257D<br>DC_1A-21A_n257E<br>DC_1A-21A_n257F   | DC_1A_n257A<br>DC_21A_n257A         | CA_1A-21A            | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F   |
| DC_1A-28A_n257A<br>DC_1A-28A_n257D<br>DC_1A-28A_n257E<br>DC_1A-28A_n257F   | DC_1A_n257A<br>DC_28A_n257A         | CA_1A-28A            | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F   |
| DC_1A-41A_n257A  | DC_1A_n257A<br>DC_41A_n257A         | CA_1A-41A            | n257A   |
| DC_1A-41C_n257A  | DC_1A_n257A<br>DC_41C_n257A         | CA_1A-41C            | n257A   |
| DC_1A-42A_n257A<br>DC_1A-42A_n257D<br>DC_1A-42A_n257E<br>DC_1A-42A_n257F   | DC_1A_n257A<br>DC_42A_n257A         | CA_1A-42A            | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F   |
| DC_1A-42C_n257A  | DC_1A_n257A<br>DC_42A_n257A         | CA_1A-42C            | n257A   |
| DC_1A-42D_n257A  | DC_1A_n257A<br>DC_42A_n257A         | CA_1A-42D            | n257A   |
| DC_1A-42E_n257A  | DC_1A_n257A<br>DC_42A_n257A         | CA_1A-42E            | n257A   |
| DC_2A-13A_n260A  | DC_2A_n260A<br>DC_13A_n260A         | CA_2A-13A            | n260A   |
| DC_2A-5A_n257A   | DC_2A_n257A<br>DC_5A_n257A          | CA_2A-5A             | n257A   |
| DC_2A-5A_n260A<br>DC_2A-5A_n260G<br>DC_2A-5A_n260H<br>DC_2A-5A_n260I<br>DC_2A-5A_n260J<br>DC_2A-5A_n260K<br>DC_2A-5A_n260L<br>DC_2A-5A_n260M         | DC_2A_n260A<br>DC_5A_n260A          | CA_2A-5A             | n260A<br>CA_n260G<br>CA_n260H<br>CA_n260I<br>CA_n260J<br>CA_n260K<br>CA_n260L<br>CA_n260M |
| DC_2A-12A_n260A<br>DC_2A-12A_n260G<br>DC_2A-12A_n260H<br>DC_2A-12A_n260I<br>DC_2A-12A_n260J<br>DC_2A-12A_n260K<br>DC_2A-12A_n260L<br>DC_2A-12A_n260M | DC_2A_n260A<br>DC_12A_n260A         | CA_2A-12A            | n260A<br>CA_n260G<br>CA_n260H<br>CA_n260I<br>CA_n260J<br>CA_n260K<br>CA_n260L<br>CA_n260M |
| DC_2A-13A_n257A  | DC_2A_n257A<br>DC_13A_n257A         | CA_2A-13A            | n257A   |

| EN-DC configuration  | Uplink EN-DC configuration (NOTE 1) | E-UTRA configuration | NR configuration  |
|--|-------------------------------------|----------------------|---|
| DC_2A-30A_n260A<br>DC_2A-30A_n260G<br>DC_2A-30A_n260H<br>DC_2A-30A_n260I<br>DC_2A-30A_n260J<br>DC_2A-30A_n260K<br>DC_2A-30A_n260L<br>DC_2A-30A_n260M | DC_2A_n260A<br>DC_30A_n260A         | CA_2A-30A            | n260A<br>CA_n260G<br>CA_n260H<br>CA_n260I<br>CA_n260J<br>CA_n260K<br>CA_n260L<br>CA_n260M |
| DC_2A-66A_n257A  | DC_2A_n257A<br>DC_66A_n257A         | CA_2A-66A            | n257A   |
| DC_2A-66A_n260A<br>DC_2A-66A_n260G<br>DC_2A-66A_n260H<br>DC_2A-66A_n260I<br>DC_2A-66A_n260J<br>DC_2A-66A_n260K<br>DC_2A-66A_n260L<br>DC_2A-66A_n260M | DC_2A_n260A<br>DC_66A_n260A         | CA_2A-66A            | n260A<br>CA_n260G<br>CA_n260H<br>CA_n260I<br>CA_n260J<br>CA_n260K<br>CA_n260L<br>CA_n260M |
| DC_3A-5A_n257A   | DC_3A_n257A<br>DC_5A_n257A          | CA_3A-5A             | n257A   |
| DC_3A-7A-7A_n257A  | DC_3A_n257A<br>DC_7A_n257A          | CA_3A-7A-7A          | n257A   |
| DC_3A-7A_n257A   | DC_3A_n257A<br>DC_7A_n257A          | CA_3A-7A             | n257A   |
| DC_3A-19A_n257A<br>DC_3A-19A_n257D<br>DC_3A-19A_n257E<br>DC_3A-19A_n257F   | DC_3A_n257A<br>DC_19A_n257A         | CA_3A-19A            | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F   |
| DC_3A-21A_n257A<br>DC_3A-21A_n257D<br>DC_3A-21A_n257E<br>DC_3A-21A_n257F   | DC_3A_n257A<br>DC_21A_n257A         | CA_3A-21A            | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F   |
| DC_3A-28A_n257A<br>DC_3A-28A_n257D<br>DC_3A-28A_n257E<br>DC_3A-28A_n257F   | DC_3A_n257A<br>DC_28A_n257A         | CA_3A-28A            | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F   |
| DC_3A-41A_n257A  | DC_3A_n257A<br>DC_41A_n257A         | CA_3A-41A            | n257A   |
| DC_3A-42A_n257A<br>DC_3A-42A_n257D<br>DC_3A-42A_n257E<br>DC_3A-42A_n257F   | DC_3A_n257A<br>DC_42A_n257A         | CA_3A-42A            | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F   |
| DC_3A-42C_n257A  | DC_3A_n257A<br>DC_42A_n257A         | CA_3A-42C            | n257A   |
| DC_3A-42D_n257A  | DC_3A_n257A<br>DC_42A_n257A         | CA_3A-42D            | n257A   |
| DC_3A-42E_n257A  | DC_3A_n257A<br>DC_42A_n257A         | CA_3A-42E            | n257A   |
| DC_5A-30A_n260A<br>DC_5A-30A_n260G<br>DC_5A-30A_n260H<br>DC_5A-30A_n260I<br>DC_5A-30A_n260J<br>DC_5A-30A_n260K<br>DC_5A-30A_n260L<br>DC_5A-30A_n260M | DC_5A_n260A<br>DC_30A_n260A         | CA_5A-30A            | n260A<br>CA_n260G<br>CA_n260H<br>CA_n260I<br>CA_n260J<br>CA_n260K<br>CA_n260L<br>CA_n260M |
| DC_5A-66A_n257A  | DC_5A_n257A<br>DC_66A_n257A         | CA_5A-66A            | n257A   |



| EN-DC configuration  | Uplink EN-DC configuration (NOTE 1) | E-UTRA configuration | NR configuration  |
|--|-------------------------------------|----------------------|---|
| DC_5A-66A_n260A<br>DC_5A-66A_n260G<br>DC_5A-66A_n260H<br>DC_5A-66A_n260I<br>DC_5A-66A_n260J<br>DC_5A-66A_n260K<br>DC_5A-66A_n260L<br>DC_5A-66A_n260M         | DC_5A_n260A<br>DC_66A_n260A         | CA_5A-66A            | n260A<br>CA_n260G<br>CA_n260H<br>CA_n260I<br>CA_n260J<br>CA_n260K<br>CA_n260L<br>CA_n260M |
| DC_5A-7A-7A_n257A  | DC_5A_n257A<br>DC_7A_n257A          | CA_5A-7A-7A          | n257A   |
| DC_5A-7A_n257A   | DC_5A_n257A<br>DC_7A_n257A          | CA_5A-7A             | n257A   |
| DC_12A-30A_n260A<br>DC_12A-30A_n260G<br>DC_12A-30A_n260H<br>DC_12A-30A_n260I<br>DC_12A-30A_n260J<br>DC_12A-30A_n260K<br>DC_12A-30A_n260L<br>DC_12A-30A_n260M | DC_12A_n260A<br>DC_30A_n260A        | CA_12A-30A           | n260A<br>CA_n260G<br>CA_n260H<br>CA_n260I<br>CA_n260J<br>CA_n260K<br>CA_n260L<br>CA_n260M |
| DC_12A-66A_n260A<br>DC_12A-66A_n260G<br>DC_12A-66A_n260H<br>DC_12A-66A_n260I<br>DC_12A-66A_n260J<br>DC_12A-66A_n260K<br>DC_12A-66A_n260L<br>DC_12A-66A_n260M | DC_12A_n260A<br>DC_66A_n260A        | CA_12A-66A           | n260A<br>CA_n260G<br>CA_n260H<br>CA_n260I<br>CA_n260J<br>CA_n260K<br>CA_n260L<br>CA_n260M |
| DC_13A-66A_n257A   | DC_13A_n257A<br>DC_66A_n257A        | CA_13A-66A           | n257A   |
| DC_13A-66A_n260A   | DC_13A_n260A<br>DC_66A_n260A        | CA_13A-66A           | n260A   |
| DC_18A-28A_n257A   | DC_18A_n257A<br>DC_28A_n257A        | CA_18A-28A           | n257A   |
| DC_19A-42A_n257A<br>DC_19A-42A_n257D<br>DC_19A-42A_n257E<br>DC_19A-42A_n257F   | DC_19A_n257A<br>DC_42A_n257A        | CA_19A-42A           | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F   |
| DC_19A-21A_n257A<br>DC_19A-21A_n257D<br>DC_19A-21A_n257E<br>DC_19A-21A_n257F   | DC_19A_n257A<br>DC_21A_n257A        | CA_19A-21A           | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F   |
| DC_19A-42C_n257A   | DC_19A_n257A<br>DC_42A_n257A        | CA_19A-42C           | n257A   |
| DC_21A-28A_n257A<br>DC_21A-28A_n257D<br>DC_21A-28A_n257E<br>DC_21A-28A_n257F   | DC_21A_n257A<br>DC_28A_n257A        | CA_21A-28A           | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F   |
| DC_21A-42A_n257A<br>DC_21A-42A_n257D<br>DC_21A-42A_n257E<br>DC_21A-42A_n257F   | DC_21A_n257A<br>DC_42A_n257A        | CA_21A-42A           | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F   |
| DC_21A-42C_n257A   | DC_21A_n257A<br>DC_42A_n257A        | CA_21A-42C           | n257A   |
| DC_28A-42C_n257A   | DC_28A_n257A<br>DC_42A_n257A        | CA_28A-42C           | n257A   |
| DC_28A-42A_n257A   | DC_28A_n257A<br>DC_42A_n257A        | CA_28A-42A           | n257A   |

| EN-DC configuration  | Uplink EN-DC configuration (NOTE 1) | E-UTRA configuration | NR configuration  |
|--|-------------------------------------|----------------------|---|
| DC_30A-66A_n260A<br>DC_30A-66A_n260G<br>DC_30A-66A_n260H<br>DC_30A-66A_n260I<br>DC_30A-66A_n260J<br>DC_30A-66A_n260K<br>DC_30A-66A_n260L<br>DC_30A-66A_n260M | DC_30A_n260A<br>DC_66A_n260A        | CA_30A-66A           | n260A<br>CA_n260G<br>CA_n260H<br>CA_n260I<br>CA_n260J<br>CA_n260K<br>CA_n260L<br>CA_n260M |
| DC_41A-42A_n257A   | DC_41A_n257A<br>DC_42A_n257A        | CA_41A-42A           | n257A   |
| DC_41A-42C_n257A   | DC_41A_n257A<br>DC_42C_n257A        | CA_41A-42C           | n257A   |
| DC_41C-42A_n257A   | DC_41C_n257A<br>DC_42A_n257A        | CA_41C-42A           | n257A   |
| DC_41C-42C_n257A   | DC_41A_n257A<br>DC_42A_n257A        | CA_41C-42C           | n257A   |

NOTE 1: Uplink CA configurations are the configurations supported by the present release of specifications.

5.5B.5.3 Inter-band EN-DC configurations including FR2 (four bands)

**Table 5.5B.5.3-1: Inter-band EN-DC configurations including FR2 (four bands)**

| EN-DC configuration  | Uplink EN-DC configuration (NOTE 1)         | E-UTRA configuration | NR configuration                          |
|--|---|----------------------|---|
| DC_1A-3A-5A_n257A  | DC_1A_n257A<br>DC_3A_n257A<br>DC_5A_n257A   | CA_1A-3A-5A          | n257A                                     |
| DC_1A-3A-7A-7A_n257A   | DC_1A_n257A<br>DC_3A_n257A<br>DC_7A_n257A   | CA_1A-3A-7A-7A       | n257A                                     |
| DC_1A-3A-7A_n257A  | DC_1A_n257A<br>DC_3A_n257A<br>DC_7A_n257A   | CA_1A-3A-7A          | n257A                                     |
| DC_1A-3A-19A_n257A   | DC_1A_n257A<br>DC_3A_n257A<br>DC_19A_n257A  | CA_1A-3A-19A         | n257A                                     |
| DC_1A-3A-21A_n257A   | DC_1A_n257A<br>DC_3A_n257A<br>DC_21A_n257A  | CA_1A-3A-21A         | n257A                                     |
| DC_1A-3A-28A_n257A   | DC_1A_n257A<br>DC_3A_n257A<br>DC_28A_n257A  | CA_1A-3A-28A         | n257A                                     |
| DC_1A-3A-42A_n257A   | DC_1A_n257A<br>DC_3A_n257A<br>DC_42A_n257A  | CA_1A-3A-42A         | n257A                                     |
| DC_1A-3A-42C_n257A   | DC_1A_n257A<br>DC_3A_n257A<br>DC_42A_n257A  | CA_1A-3A-42C         | n257A                                     |
| DC_1A-3A-42C_n257D   | DC_1A_n257A<br>DC_3A_n257A<br>DC_42A_n257A  | CA_1A-3A-42C         | CA_n257D                                  |
| DC_1A-3A-42C_n257E   | DC_1A_n257A<br>DC_3A_n257A<br>DC_42A_n257A  | CA_1A-3A-42C         | CA_n257E                                  |
| DC_1A-3A-42C_n257F   | DC_1A_n257A<br>DC_3A_n257A<br>DC_42A_n257A  | CA_1A-3A-42C         | CA_n257F                                  |
| DC_1A-5A-7A-7A_n257A   | DC_1A_n257A<br>DC_5A_n257A<br>DC_7A_n257A   | CA_1A-5A-7A-7A       | n257A                                     |
| DC_1A-5A-7A_n257A  | DC_1A_n257A<br>DC_5A_n257A<br>DC_7A_n257A   | CA_1A-5A-7A          | n257A                                     |
| DC_1A-18A-28A_n257A  | DC_1A_n257A<br>DC_18A_n257A<br>DC_28A_n257A | CA_1A-18A-28A        | n257A                                     |
| DC_1A-19A-21A_n257A<br>DC_1A-19A-21A_n257D<br>DC_1A-19A-21A_n257E<br>DC_1A-19A-21A_n257F | DC_1A_n257A<br>DC_19A_n257A<br>DC_21A_n257A | CA_1A-19A-21A        | n257A<br>CA_n257D<br>CA_n257E<br>CA_n257F |
| DC_1A-19A-42A_n257A  | DC_1A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_1A-19A-42A        | n257A                                     |
| DC_1A-19A-42C_n257A  | DC_1A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_1A-19A-42C        | n257A                                     |
| DC_1A-19A-42C_n257D  | DC_1A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_1A-19A-42C        | CA_n257D                                  |
| DC_1A-19A-42C_n257E  | DC_1A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_1A-19A-42C        | CA_n257E                                  |
| DC_1A-19A-42C_n257F  | DC_1A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_1A-19A-42C        | CA_n257F                                  |
| DC_1A-21A-28A_n257A  | DC_1A_n257A<br>DC_21A_n257A<br>DC_28A_n257A | CA_1A-21A-28A        | n257A                                     |

|                      |   |                |          |
|----------------------|---|----------------|----------|
| DC_1A-21A-42A_n257A  | DC_1A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_1A-21A-42A  | n257A    |
| DC_1A-21A-42C_n257A  | DC_1A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_1A-21A-42C  | n257A    |
| DC_1A-21A-42C_n257D  | DC_1A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_1A-21A-42C  | CA_n257D |
| DC_1A-21A-42C_n257E  | DC_1A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_1A-21A-42C  | CA_n257E |
| DC_1A-21A-42C_n257F  | DC_1A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_1A-21A-42C  | CA_n257F |
| DC_1A-28A-42A_n257A  | DC_1A_n257A<br>DC_28A_n257A<br>DC_42A_n257A | CA_1A-28A-42A  | n257A    |
| DC_1A-28A-42C_n257A  | DC_1A_n257A<br>DC_28A_n257A<br>DC_42A_n257A | CA_1A-28A-42C  | n257A    |
| DC_1A-41A-42A_n257A  | DC_1A_n257A<br>DC_41A_n257A<br>DC_42A_n257A | CA_1A-41A-42A  | n257A    |
| DC_1A-41A-42C_n257A  | DC_1A_n257A<br>DC_41A_n257A<br>DC_42A_n257A | CA_1A-41A-42C  | n257A    |
| DC_1A-41C-42A_n257A  | DC_1A_n257A<br>DC_41A_n257A<br>DC_42A_n257A | CA_1A-41C-42A  | n257A    |
| DC_1A-41C-42C_n257A  | DC_1A_n257A<br>DC_41A_n257A<br>DC_42A_n257A | CA_1A-41C-42C  | n257A    |
| DC_3A-5A-7A-7A_n257A | DC_3A_n257A<br>DC_5A_n257A<br>DC_7A_n257A   | CA_3A-5A-7A-7A | n257A    |
| DC_3A-5A-7A_n257A    | DC_3A_n257A<br>DC_5A_n257A<br>DC_7A_n257A   | CA_3A-5A-7A    | n257A    |
| DC_3A-19A-21A_n257A  | DC_3A_n257A<br>DC_19A_n257A<br>DC_21A_n257A | CA_3A-19A-21A  | n257A    |
| DC_3A-19A-42A_n257A  | DC_3A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_3A-19A-42A  | n257A    |
| DC_3A-19A-42C_n257A  | DC_3A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_3A-19A-42C  | n257A    |
| DC_3A-19A-42C_n257D  | DC_3A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_3A-19A-42C  | CA_n257D |
| DC_3A-19A-42C_n257E  | DC_3A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_3A-19A-42C  | CA_n257E |
| DC_3A-19A-42C_n257F  | DC_3A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_3A-19A-42C  | CA_n257F |
| DC_3A-21A-42A_n257A  | DC_3A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_3A-21A-42A  | n257A    |
| DC_3A-21A-42C_n257A  | DC_3A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_3A-21A-42C  | n257A    |
| DC_3A-21A-42C_n257D  | DC_3A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_3A-21A-42C  | CA_n257D |
| DC_3A-21A-42C_n257E  | DC_3A_n257A                                 | CA_3A-21A-42C  | CA_n257E |

|   |  |                |          |
|---|--|----------------|----------|
|   | DC_21A_n257A<br>DC_42A_n257A                 |                |          |
| DC_3A-21A-42C_n257F   | DC_3A_n257A<br>DC_21A_n257A<br>DC_42A_n257A  | CA_3A-21A-42C  | CA_n257F |
| DC_3A-28A-42A_n257A   | DC_3A_n257A<br>DC_28A_n257A<br>DC_42A_n257A  | CA_3A-28A-42A  | n257A    |
| DC_3A-28A-42C_n257A   | DC_3A_n257A<br>DC_28A_n257A<br>DC_42A_n257A  | CA_3A-28A-42C  | n257A    |
| DC_19A-21A-42A_n257A  | DC_19A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_19A-21A-42A | n257A    |
| DC_19A-21A-42C_n257D  | DC_19A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_19A-21A-42C | CA_n257D |
| DC_19A-21A-42C_n257E  | DC_19A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_19A-21A-42C | CA_n257E |
| DC_19A-21A-42C_n257F  | DC_19A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_19A-21A-42C | CA_n257F |
| DC_19A-21A-42C_n257A  | DC_19A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_19A-21A-42C | n257A    |
| DC_21A-28A-42A_n257A  | DC_21A_n257A<br>DC_28A_n257A<br>DC_42A_n257A | CA_21A-28A-42A | n257A    |
| DC_21A-28A-42C_n257A  | DC_21A_n257A<br>DC_28A_n257A<br>DC_42A_n257A | CA_21A-28A-42C | n257A    |
| NOTE 1: Uplink CA configurations are the configurations supported by the present release of specifications. |  |                |          |

5.5B.5.4 Inter-band EN-DC configurations including FR2 (five bands)

**Table 5.5B.5.4-1: Inter-band EN-DC configurations including FR2 (five bands)**

| EN-DC configuration     | Uplink EN-DC configuration (NOTE 1)                        | E-UTRA configuration | NR configuration |
|-------------------------|--|----------------------|------------------|
| DC_1A-3A-5A-7A_n257A    | DC_1A_n257A<br>DC_3A_n257A<br>DC_5A_n257A<br>DC_7A_n257A   | CA_1A-3A-5A-7A       | n257A            |
| DC_1A-3A-5A-7A-7A_n257A | DC_1A_n257A<br>DC_3A_n257A<br>DC_5A_n257A<br>DC_7A_n257A   | CA_1A-3A-5A-7A-7A    | n257A            |
| DC_1A-3A-19A-21A_n257A  | DC_1A_n257A<br>DC_3A_n257A<br>DC_19A_n257A<br>DC_21A_n257A | CA_1A-3A-19A-21A     | n257A            |
| DC_1A-3A-19A-21A_n257D  | DC_1A_n257A<br>DC_3A_n257A<br>DC_19A_n257A<br>DC_21A_n257A | CA_1A-3A-19A-21A     | CA_n257D         |
| DC_1A-3A-19A-21A_n257E  | DC_1A_n257A<br>DC_3A_n257A<br>DC_19A_n257A<br>DC_21A_n257A | CA_1A-3A-19A-21A     | CA_n257E         |
| DC_1A-3A-19A-21A_n257F  | DC_1A_n257A<br>DC_3A_n257A<br>DC_19A_n257A<br>DC_21A_n257A | CA_1A-3A-19A-21A     | CA_n257F         |
| DC_1A-3A-19A-42A_n257A  | DC_1A_n257A<br>DC_3A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_1A-3A-19A-42A     | n257A            |
| DC_1A-3A-19A-42A_n257D  | DC_1A_n257A<br>DC_3A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_1A-3A-19A-42A     | CA_n257D         |
| DC_1A-3A-19A-42A_n257E  | DC_1A_n257A<br>DC_3A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_1A-3A-19A-42A     | CA_n257E         |
| DC_1A-3A-19A-42A_n257F  | DC_1A_n257A<br>DC_3A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_1A-3A-19A-42A     | CA_n257F         |
| DC_1A-3A-19A-42C_n257A  | DC_1A_n257A<br>DC_3A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_1A-3A-19A-42C     | n257A            |
| DC_1A-3A-19A-42C_n257D  | DC_1A_n257A<br>DC_3A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_1A-3A-19A-42C     | CA_n257D         |
| DC_1A-3A-19A-42C_n257E  | DC_1A_n257A<br>DC_3A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_1A-3A-19A-42C     | CA_n257E         |
| DC_1A-3A-19A-42C_n257F  | DC_1A_n257A<br>DC_3A_n257A<br>DC_19A_n257A<br>DC_42A_n257A | CA_1A-3A-19A-42C     | CA_n257F         |
| DC_1A-3A-21A-42A_n257A  | DC_1A_n257A<br>DC_3A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_1A-3A-21A-42A     | n257A            |
| DC_1A-3A-21A-42C_n257A  | DC_1A_n257A<br>DC_3A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_1A-3A-21A-42C     | n257A            |



| EN-DC configuration     | Uplink EN-DC configuration (NOTE 1)                         | E-UTRA configuration | NR configuration |
|-------------------------|---|----------------------|------------------|
| DC_1A-3A-21A-42C_n257D  | DC_1A_n257A<br>DC_3A_n257A<br>DC_21A_n257A<br>DC_42A_n257A  | CA_1A-3A-21A-42C     | CA_n257D         |
| DC_1A-3A-21A-42C_n257E  | DC_1A_n257A<br>DC_3A_n257A<br>DC_21A_n257A<br>DC_42A_n257A  | CA_1A-3A-21A-42C     | CA_n257E         |
| DC_1A-3A-21A-42C_n257F  | DC_1A_n257A<br>DC_3A_n257A<br>DC_21A_n257A<br>DC_42A_n257A  | CA_1A-3A-21A-42C     | CA_n257F         |
| DC_1A-3A-28A-42A_n257A  | DC_1A_n257A<br>DC_3A_n257A<br>DC_28A_n257A<br>DC_42A_n257A  | CA_1A-3A-28A-42A     | n257A            |
| DC_1A-3A-28A-42C_n257A  | DC_1A_n257A<br>DC_3A_n257A<br>DC_28A_n257A<br>DC_42A_n257A  | CA_1A-3A-28A-42C     | n257A            |
| DC_1A-19A-21A-42A_n257A | DC_1A_n257A<br>DC_19A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_1A-19A-21A-42A    | n257A            |
| DC_1A-19A-21A-42A_n257D | DC_1A_n257A<br>DC_19A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_1A-19A-21A-42A    | CA_n257D         |
| DC_1A-19A-21A-42A_n257E | DC_1A_n257A<br>DC_19A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_1A-19A-21A-42A    | CA_n257E         |
| DC_1A-19A-21A-42A_n257F | DC_1A_n257A<br>DC_19A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_1A-19A-21A-42A    | CA_n257F         |
| DC_1A-19A-21A-42C_n257A | DC_1A_n257A<br>DC_19A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_1A-19A-21A-42C    | n257A            |
| DC_1A-19A-21A-42C_n257D | DC_1A_n257A<br>DC_19A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_1A-19A-21A-42C    | CA_n257D         |
| DC_1A-19A-21A-42C_n257E | DC_1A_n257A<br>DC_19A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_1A-19A-21A-42C    | CA_n257E         |
| DC_1A-19A-21A-42C_n257F | DC_1A_n257A<br>DC_19A_n257A<br>DC_21A_n257A<br>DC_42A_n257A | CA_1A-19A-21A-42C    | CA_n257F         |
| DC_1A-19A-28A-42C_n257A | DC_1A_n257A<br>DC_19A_n257A<br>DC_28A_n257A<br>DC_42A_n257A | CA_1A-19A-28A-42C    | n257A            |
| DC_1A-21A-28A-42A_n257A | DC_1A_n257A<br>DC_21A_n257A<br>DC_28A_n257A<br>DC_42A_n257A | CA_1A-21A-28A-42A    | n257A            |

NOTE 1: Uplink CA configurations are the configurations supported by the present release of specifications.

### 5.5B.5.5 Inter-band EN-DC configurations including FR2 (six bands)

**Table 5.5B.5.5-1: Inter-band EN-DC configurations including FR2 (six bands)**

| <b>EN-DC configuration</b> | <b>Uplink EN-DC configuration (NOTE 1)</b> | <b>E-UTRA configuration</b> | <b>NR configuration</b> |
|----------------------------|--|-----------------------------|-------------------------|
|                            |  |                             |                         |

NOTE 1: Uplink CA configurations are the configurations supported by the present release of specifications.

### 5.5B.6 Inter-band EN-DC including FR1 and FR2

Supported channel bandwidths for E-UTRA operating bands and CA configurations are defined in TS 36.101 [4] and for NR operating bands and CA configurations in TS 38.101-1 [2], TS 38.101-2 [3] and TS 38.101-3.

5.5B.6.1 Void

5.5B.6.2 Inter-band EN-DC configurations including FR1 and FR2 (three bands)

**Table 5.5B.6.2-1: Inter-band EN-DC configurations including FR1 and FR2 (three bands)**

| EN-DC configuration | Uplink EN-DC configuration (NOTE 1)           | E-UTRA configuration | NR configuration |
|---------------------|---|----------------------|------------------|
| DC_1A_n77A-n257A    | DC_1A_n77A<br>DC_1A_n257A<br>DC_1A_n77A-n257A | 1A                   | CA_n77A-n257A    |
| DC_1A_n77A-n257D    | DC_1A_n77A<br>DC_1A-n257A<br>DC_1A_n77A-n257A | 1A                   | CA_n77A-n257D    |
| DC_1A_n77A-n257E    | DC_1A_n77A<br>DC_1A_n257A<br>DC_1A_n77A-n257A | 1A                   | CA_n77A-n257E    |
| DC_1A_n77A-n257F    | DC_1A_n77A<br>DC_1A_n257A<br>DC_1A_n77A-n257A | 1A                   | CA_n77A-n257F    |
| DC_1A_n77C-n257A    | DC_1A_n77A<br>DC_1A_n257A<br>DC_1A_n77A-n257A | 1A                   | CA_n77C-n257A    |
| DC_1A_n77C-n257D    | DC_1A_n77A<br>DC_1A_n257A<br>DC_1A_n77A-n257A | 1A                   | CA_n77C-n257D    |
| DC_1A_n77C-n257E    | DC_1A_n77A<br>DC_1A_n257A<br>DC_1A_n77A-n257A | 1A                   | CA_n77C-n257E    |
| DC_1A_n77C-n257F    | DC_1A_n77A<br>DC_1A_n257A<br>DC_1A_n77A-n257A | 1A                   | CA_n77C-n257F    |
| DC_1A_n78A-n257A    | DC_1A_n78A<br>DC_1A_n257A<br>DC_1A_n78A-n257A | 1A                   | CA_n78A-n257A    |
| DC_1A_n78A-n257D    | DC_1A_n78A<br>DC_1A-n257A<br>DC_1A_n78A-n257A | 1A                   | CA_n78A-n257D    |
| DC_1A_n78A-n257E    | DC_1A_n78A<br>DC_1A_n257A<br>DC_1A_n78A-n257A | 1A                   | CA_n78A-n257E    |
| DC_1A_n78A-n257F    | DC_1A_n78A<br>DC_1A_n257A<br>DC_1A_n78A-n257A | 1A                   | CA_n78A-n257F    |
| DC_1A_n78C-n257A    | DC_1A_n78A<br>DC_1A_n257A<br>DC_1A_n78A-n257A | 1A                   | CA_n78C-n257A    |
| DC_1A_n78C-n257D    | DC_1A_n78A<br>DC_1A_n257A<br>DC_1A_n78A-n257A | 1A                   | CA_n78C-n257D    |
| DC_1A_n78C-n257E    | DC_1A_n78A<br>DC_1A_n257A<br>DC_1A_n78A-n257A | 1A                   | CA_n78C-n257E    |
| DC_1A_n78C-n257F    | DC_1A_n78A<br>DC_1A_n257A<br>DC_1A_n78A-n257A | 1A                   | CA_n78C-n257F    |
| DC_1A_n79A-n257A    | DC_1A_n79A<br>DC_1A_n257A<br>DC_1A_n79A-n257A | 1A                   | CA_n79A-n257A    |
| DC_1A_n79A-n257D    | DC_1A_n79A<br>DC_1A-n257A<br>DC_1A_n79A-n257A | 1A                   | CA_n79A-n257D    |
| DC_1A_n79A-n257E    | DC_1A_n79A<br>DC_1A_n257A<br>DC_1A_n79A-n257A | 1A                   | CA_n79A-n257E    |
| DC_1A_n79A-n257F    | DC_1A_n79A<br>DC_1A_n257A<br>DC_1A_n79A-n257A | 1A                   | CA_n79A-n257F    |
| DC_1A_n79C-n257A    | DC_1A_n79A<br>DC_1A_n257A<br>DC_1A_n79A-n257A | 1A                   | CA_n79C-n257A    |

| EN-DC configuration | Uplink EN-DC configuration (NOTE 1)           | E-UTRA configuration | NR configuration |
|---------------------|---|----------------------|------------------|
| DC_1A_n79C-n257D    | DC_1A_n79A<br>DC_1A_n257A<br>DC_1A_n79A-n257A | 1A                   | CA_n79C-n257D    |
| DC_1A_n79C-n257E    | DC_1A_n79A<br>DC_1A_n257A<br>DC_1A_n79A-n257A | 1A                   | CA_n79C-n257E    |
| DC_1A_n79C-n257F    | DC_1A_n79A<br>DC_1A_n257A<br>DC_1A_n79A-n257A | 1A                   | CA_n79C-n257F    |
| DC_3A_n77A-n257A    | DC_3A_n77A<br>DC_3A_n257A<br>DC_3A_n77A-n257A | 3A                   | CA_n77A-n257A    |
| DC_3A_n77A-n257D    | DC_3A_n77A<br>DC_3A_n257A<br>DC_3A_n77A-n257A | 3A                   | CA_n77A-n257D    |
| DC_3A_n77A-n257E    | DC_3A_n77A<br>DC_3A_n257A<br>DC_3A_n77A-n257A | 3A                   | CA_n77A-n257E    |
| DC_3A_n77A-n257F    | DC_3A_n77A<br>DC_3A_n257A<br>DC_3A_n77A-n257A | 3A                   | CA_n77A-n257F    |
| DC_3A_n77C-n257A    | DC_3A_n77A<br>DC_3A_n257A<br>DC_3A_n77A-n257A | 3A                   | CA_n77C-n257A    |
| DC_3A_n77C-n257D    | DC_3A_n77A<br>DC_3A_n257A<br>DC_3A_n77A-n257A | 3A                   | CA_n77C-n257D    |
| DC_3A_n77C-n257E    | DC_3A_n77A<br>DC_3A_n257A<br>DC_3A_n77A-n257A | 3A                   | CA_n77C-n257E    |
| DC_3A_n77C-n257F    | DC_3A_n77A<br>DC_3A_n257A<br>DC_3A_n77A-n257A | 3A                   | CA_n77C-n257F    |
| DC_3A_n78A-n257A    | DC_3A_n78A<br>DC_3A_n257A<br>DC_3A_n78A-n257A | 3A                   | CA_n78A-n257A    |
| DC_3A_n78A-n257D    | DC_3A_n78A<br>DC_3A_n257A<br>DC_3A_n78A-n257A | 3A                   | CA_n78A-n257D    |
| DC_3A_n78A-n257E    | DC_3A_n78A<br>DC_3A_n257A<br>DC_3A_n78A-n257A | 3A                   | CA_n78A-n257E    |
| DC_3A_n78A-n257F    | DC_3A_n78A<br>DC_3A_n257A<br>DC_3A_n78A-n257A | 3A                   | CA_n78A-n257F    |
| DC_3A_n78C-n257A    | DC_3A_n78A<br>DC_3A_n257A<br>DC_3A_n78A-n257A | 3A                   | CA_n78C-n257A    |
| DC_3A_n78C-n257D    | DC_3A_n78A<br>DC_3A_n257A<br>DC_3A_n78A-n257A | 3A                   | CA_n78C-n257D    |
| DC_3A_n78C-n257E    | DC_3A_n78A<br>DC_3A_n257A<br>DC_3A_n78A-n257A | 3A                   | CA_n78C-n257E    |
| DC_3A_n78C-n257F    | DC_3A_n78A<br>DC_3A_n257A<br>DC_3A_n78A-n257A | 3A                   | CA_n78C-n257F    |
| DC_3A_n79A-n257A    | DC_3A_n79A<br>DC_3A_n257A<br>DC_3A_n79A-n257A | 3A                   | CA_n79A-n257A    |
| DC_3A_n79A-n257D    | DC_3A_n79A<br>DC_3A_n257A<br>DC_3A_n79A-n257A | 3A                   | CA_n79A-n257D    |

| EN-DC configuration | Uplink EN-DC configuration (NOTE 1)              | E-UTRA configuration | NR configuration |
|---------------------|--|----------------------|------------------|
| DC_3A_n79A-n257E    | DC_3A_n79A<br>DC_3A_n257A<br>DC_3A_n79A-n257A    | 3A                   | CA_n79A-n257E    |
| DC_3A_n79A-n257F    | DC_3A_n79A<br>DC_3A_n257A<br>DC_3A_n79A-n257A    | 3A                   | CA_n79A-n257F    |
| DC_3A_n79C-n257A    | DC_3A_n79A<br>DC_3A_n257A<br>DC_3A_n79A-n257A    | 3A                   | CA_n79C-n257A    |
| DC_3A_n79C-n257D    | DC_3A_n79A<br>DC_3A_n257A<br>DC_3A_n79A-n257A    | 3A                   | CA_n79C-n257D    |
| DC_3A_n79C-n257E    | DC_3A_n79A<br>DC_3A_n257A<br>DC_3A_n79A-n257A    | 3A                   | CA_n79C-n257E    |
| DC_3A_n79C-n257F    | DC_3A_n79A<br>DC_3A_n257A<br>DC_3A_n79A-n257A    | 3A                   | CA_n79C-n257F    |
| DC_5A_n78A-n257A    | DC_5A_n78A<br>DC_5A_n257A                        | 5A                   | CA_n78A-n257A    |
| DC_7A_n78A-n257A    | DC_7A_n78A<br>DC_7A_n257A                        | 7A                   | CA_n78A-n257A    |
| DC_7A-7A_n78-n257A  | DC_7A_n78A<br>DC_7A_n257A<br>DC_7A_n78A-n257A    | CA_7A-7A             | CA_n78A-n257A    |
| DC_19A_n77A-n257A   | DC_19A_n77A<br>DC_19A_n257A<br>DC_19A_n77A-n257A | 19A                  | CA_n77A-n257A    |
| DC_19A_n77A-n257D   | DC_19A_n77A<br>DC_19A_n257A<br>DC_19A_n77A-n257A | 19A                  | CA_n77A-n257D    |
| DC_19A_n77A-n257E   | DC_19A_n77A<br>DC_19A_n257A<br>DC_19A_n77A-n257A | 19A                  | CA_n77A-n257E    |
| DC_19A_n77A-n257F   | DC_19A_n77A<br>DC_19A_n257A<br>DC_19A_n77A-n257A | 19A                  | CA_n77A-n257F    |
| DC_19A_n77C-n257A   | DC_19A_n77A<br>DC_19A_n257A<br>DC_19A_n77A-n257A | 19A                  | CA_n77C-n257A    |
| DC_19A_n77C-n257D   | DC_19A_n77A<br>DC_19A_n257A<br>DC_19A_n77A-n257A | 19A                  | CA_n77C-n257D    |
| DC_19A_n77C-n257E   | DC_19A_n77A<br>DC_19A_n257A<br>DC_19A_n77A-n257A | 19A                  | CA_n77C-n257E    |
| DC_19A_n77C-n257F   | DC_19A_n77A<br>DC_19A_n257A<br>DC_19A_n77A-n257A | 19A                  | CA_n77C-n257F    |
| DC_19A_n78A-n257A   | DC_19A_n78A<br>DC_19A_n257A<br>DC_19A_n78A-n257A | 19A                  | CA_n78A-n257A    |
| DC_19A_n78A-n257D   | DC_19A_n78A<br>DC_19A_n257A<br>DC_19A_n78A-n257A | 19A                  | CA_n78A-n257D    |
| DC_19A_n78A-n257E   | DC_19A_n78A<br>DC_19A_n257A<br>DC_19A_n78A-n257A | 19A                  | CA_n78A-n257E    |
| DC_19A_n78A-n257F   | DC_19A_n78A<br>DC_19A_n257A<br>DC_19A_n78A-n257A | 19A                  | CA_n78A-n257F    |
| DC_19A_n78C-n257A   | DC_19A_n78A<br>DC_19A_n257A<br>DC_19A_n78A-n257A | 19A                  | CA_n78C-n257A    |

| EN-DC configuration | Uplink EN-DC configuration (NOTE 1)              | E-UTRA configuration | NR configuration |
|---------------------|--|----------------------|------------------|
| DC_19A_n78C-n257D   | DC_19A_n78A<br>DC_19A_n257A<br>DC_19A_n78A-n257A | 19A                  | CA_n78C-n257D    |
| DC_19A_n78C-n257E   | DC_19A_n78A<br>DC_19A_n257A<br>DC_19A_n78A-n257A | 19A                  | CA_n78C-n257E    |
| DC_19A_n78C-n257F   | DC_19A_n78A<br>DC_19A_n257A<br>DC_19A_n78A-n257A | 19A                  | CA_n78C-n257F    |
| DC_19A_n79A-n257A   | DC_19A_n79A<br>DC_19A_n257A<br>DC_19A_n79A-n257A | 19A                  | CA_n79A-n257A    |
| DC_19A_n79A-n257D   | DC_19A_n79A<br>DC_19A_n257A<br>DC_19A_n79A-n257A | 19A                  | CA_n79A-n257D    |
| DC_19A_n79A-n257E   | DC_19A_n79A<br>DC_19A_n257A<br>DC_19A_n79A-n257A | 19A                  | CA_n79A-n257E    |
| DC_19A_n79A-n257F   | DC_19A_n79A<br>DC_19A_n257A<br>DC_19A_n79A-n257A | 19A                  | CA_n79A-n257F    |
| DC_19A_n79C-n257A   | DC_19A_n79A<br>DC_19A_n257A<br>DC_19A_n79A-n257A | 19A                  | CA_n79C-n257A    |
| DC_19A_n79C-n257D   | DC_19A_n79A<br>DC_19A_n257A<br>DC_19A_n79A-n257A | 19A                  | CA_n79C-n257D    |
| DC_19A_n79C-n257E   | DC_19A_n79A<br>DC_19A_n257A<br>DC_19A_n79A-n257A | 19A                  | CA_n79C-n257E    |
| DC_19A_n79C-n257F   | DC_19A_n79A<br>DC_19A_n257A<br>DC_19A_n79A-n257A | 19A                  | CA_n79C-n257F    |
| DC_21A_n77A-n257A   | DC_21A_n77A<br>DC_21A_n257A                      | 21A                  | CA_n77A-n257A    |
| DC_21A_n78A-n257A   | DC_21A_n78A<br>DC_21A_n257A                      | 21A                  | CA_n78A-n257A    |
| DC_21A_n79A-n257A   | DC_21A_n79A<br>DC_21A_n257A                      | 21A                  | CA_n79A-n257A    |

NOTE 1: Uplink CA configurations are the configurations supported by the present release of specifications.

## 5.5B.6.3 Inter-band EN-DC configurations including FR1 and FR2 (four bands)

Table 5.5B.6.3-1: Inter-band EN-DC configurations including FR1 and FR2 (four bands)

| EN-DC configuration    | Uplink EN-DC configuration (NOTE 1)                    | E-UTRA configuration | NR configuration |
|------------------------|--|----------------------|------------------|
| DC_1A-3A_n78A-n257A    | DC_1A_n78A<br>DC_1A_n257A<br>DC_3A_n78A<br>DC_3A_n257A | CA_1A-3A             | CA_n78A-n257A    |
| DC_1A-5A_n78A-n257A    | DC_1A_n78A<br>DC_1A_n257A<br>DC_5A_n78A<br>DC_5A_n257A | CA_1A-5A             | CA_n78A-n257A    |
| DC_1A-7A-7A_n78A-n257A | DC_1A_n78A<br>DC_1A_n257A<br>DC_7A_n78A<br>DC_7A_n257A | CA_1A-7A-7A          | CA_n78A-n257A    |
| DC_1A-7A_n78A-n257A    | DC_1A_n78A<br>DC_1A_n257A<br>DC_7A_n78A<br>DC_7A_n257A | CA_1A-7A             | CA_n78A-n257A    |
| DC_3A-5A_n78A-n257A    | DC_3A_n78A<br>DC_3A_n257A<br>DC_5A_n78A<br>DC_5A_n257A | CA_3A-5A             | CA_n78A-n257A    |
| DC_3A-7A-7A_n78A-n257A | DC_3A_n78A<br>DC_3A_n257A<br>DC_7A_n78A<br>DC_7A_n257A | CA_3A-7A-7A          | CA_n78A-n257A    |
| DC_3A-7A_n78A-n257A    | DC_3A_n78A<br>DC_3A_n257A<br>DC_7A_n78A<br>DC_7A_n257A | CA_3A-7A             | CA_n78A-n257A    |
| DC_5A-7A-7A_n78A-n257A | DC_5A_n78A<br>DC_5A_n257A<br>DC_7A_n78A<br>DC_7A_n257A | CA_5A-7A-7A          | CA_n78A-n257A    |
| DC_5A-7A_n78A-n257A    | DC_5A_n78A<br>DC_5A_n257A<br>DC_7A_n78A<br>DC_7A_n257A | CA_5A-7A             | CA_n78A-n257A    |

NOTE 1: Uplink CA configurations are the configurations supported by the present release of specifications.



5.5B.6.4 Inter-band EN-DC configurations including FR1 and FR2 (five bands)

**Table 5.5B.6.4-1: Inter-band EN-DC configurations including FR1 and FR2 (five bands)**

| EN-DC configuration       | Uplink EN-DC configuration (NOTE 1)   | E-UTRA configuration | NR configuration |
|---------------------------|---|----------------------|------------------|
| DC_1A-3A-5A_n78A-n257A    | DC_1A_n78A<br>DC_1A_n257A<br>DC_3A_n78A<br>DC_3A_n257A<br>DC_5A_n78A<br>DC_5A_n257A | CA_1A-3A-5A          | CA_n78A-n257A    |
| DC_1A-3A-7A-7A_n78A-n257A | DC_1A_n78A<br>DC_1A_n257A<br>DC_3A_n78A<br>DC_3A_n257A<br>DC_7A_n78A<br>DC_7A_n257A | CA_1A-3A-7A-7A       | CA_n78A-n257A    |
| DC_1A-3A-7A_n78A-n257A    | DC_1A_n78A<br>DC_1A_n257A<br>DC_3A_n78A<br>DC_3A_n257A<br>DC_7A_n78A<br>DC_7A_n257A | CA_1A-3A-7A          | CA_n78A-n257A    |
| DC_1A-5A-7A-7A_n78A-n257A | DC_1A_n78A<br>DC_1A_n257A<br>DC_5A_n78A<br>DC_5A_n257A<br>DC_7A_n78A<br>DC_7A_n257A | CA_1A-5A-7A-7A       | CA_n78A-n257A    |
| DC_1A-5A-7A_n78A-n257A    | DC_1A_n78A<br>DC_1A_n257A<br>DC_5A_n78A<br>DC_5A_n257A<br>DC_7A_n78A<br>DC_7A_n257A | CA_1A-5A-7A          | CA_n78A-n257A    |
| DC_3A-5A-7A-7A_n78A-n257A | DC_3A_n78A<br>DC_3A_n257A<br>DC_5A_n78A<br>DC_5A_n257A<br>DC_7A_n78A<br>DC_7A_n257A | CA_3A-5A-7A-7A       | CA_n78A-n257A    |
| DC_3A-5A-7A_n78A-n257A    | DC_3A_n78A<br>DC_3A_n257A<br>DC_5A_n78A<br>DC_5A_n257A<br>DC_7A_n78A<br>DC_7A_n257A | CA_3A-5A-7A          | CA_n78A-n257A    |

## 5.5B.6.5 Inter-band EN-DC configurations including FR1 and FR2 (six bands)

Table 5.5B.6.5-1: Inter-band EN-DC configurations including FR1 and FR2 (six bands)

| EN-DC configuration   | Uplink EN-DC configuration (NOTE 1)  | E-UTRA configuration | NR configuration |
|---|--|----------------------|------------------|
| DC_1A-3A-5A-7A_n78A-n257A   | DC_1A_n78A<br>DC_1A_n257A<br>DC_3A_n78A<br>DC_3A_n257A<br>DC_5A_n78A<br>DC_5A_n257A<br>DC_7A_n78A<br>DC_7A_n257A | CA_1A-3A-5A-7A       | CA_n78A-n257A    |
| NOTE 1: Uplink CA configurations are the configurations supported by the present release of specifications. |  |                      |                  |

## 5.5B.7 Inter-band NR-DC between FR1 and FR2

### 5.5B.7.1 Inter-band NR-DC configurations between FR1 and FR2 (two bands)

**Table 5.5B.7-1: Inter-band NR-DC configurations between FR1 and FR2 (two bands)**

| Downlink NR DC configuration | Uplink NR DC configuration | NR configuration for FR1 | NR configuration for FR2 |
|------------------------------|----------------------------|--------------------------|--------------------------|
| DC_n77A-n257A                | DC_n77A-n257A              | n77A                     | n257A                    |
| DC_n77A-n257D                |                            | CA_n257D                 |                          |
| DC_n77A-n257E                |                            | CA_n257E                 |                          |
| DC_n77A-n257F                |                            | CA_n257F                 |                          |
| DC_n77A-n257G                |                            | CA_n257G                 |                          |
| DC_n77A-n257H                |                            | CA_n257H                 |                          |
| DC_n77A-n257I                |                            | CA_n257I                 |                          |
| DC_n77A-n257J                |                            | CA_n257J                 |                          |
| DC_n77A-n257K                |                            | CA_n257K                 |                          |
| DC_n77A-n257L                |                            | CA_n257L                 |                          |
| DC_n77A-n257M                |                            | CA_n257M                 |                          |
| DC_n77C-n257A                |                            | CA_n77C                  | n257A                    |
| DC_n77C-n257D                |                            | CA_n77C                  | CA_n257D                 |
| DC_n77C-n257E                |                            | CA_n77C                  | CA_n257E                 |
| DC_n77C-n257F                |                            | CA_n77C                  | CA_n257F                 |
| DC_n78A-n257A                |                            | DC_n78A-n257A            | n78A                     |
| DC_n78A-n257D                | CA_n257D                   |                          |                          |
| DC_n78A-n257E                | CA_n257E                   |                          |                          |
| DC_n78A-n257F                | CA_n257F                   |                          |                          |
| DC_n78A-n257G                | CA_n257G                   |                          |                          |
| DC_n78A-n257H                | CA_n257H                   |                          |                          |
| DC_n78A-n257I                | CA_n257I                   |                          |                          |
| DC_n78A-n257J                | CA_n257J                   |                          |                          |
| DC_n78A-n257K                | CA_n257K                   |                          |                          |
| DC_n78A-n257L                | CA_n257L                   |                          |                          |
| DC_n78A-n257M                | CA_n257M                   |                          |                          |
| DC_n78C-n257A                | CA_n78C                    |                          | n257A                    |
| DC_n78C-n257D                | CA_n78C                    |                          | CA_n257D                 |
| DC_n78C-n257E                | CA_n78C                    |                          | CA_n257E                 |
| DC_n78C-n257F                | CA_n78C                    |                          | CA_n257F                 |
| DC_n79A-n257A                | DC_n79A-n257A              |                          | n79A                     |
| DC_n79A-n257D                |                            | CA_n257D                 |                          |
| DC_n79A-n257E                |                            | CA_n257E                 |                          |
| DC_n79A-n257F                |                            | CA_n257F                 |                          |
| DC_n79A-n257G                |                            | CA_n257G                 |                          |
| DC_n79A-n257H                |                            | CA_n257H                 |                          |
| DC_n79A-n257I                |                            | CA_n257I                 |                          |
| DC_n79A-n257J                |                            | CA_n257J                 |                          |
| DC_n79A-n257K                |                            | CA_n257K                 |                          |
| DC_n79A-n257L                |                            | CA_n257L                 |                          |
| DC_n79A-n257M                |                            | CA_n257M                 |                          |
| DC_n79C-n257A                |                            | CA_n79C                  | n257A                    |
| DC_n79C-n257D                |                            | CA_n79C                  | CA_n257D                 |
| DC_n79C-n257E                |                            | CA_n79C                  | CA_n257E                 |
| DC_n79C-n257F                |                            | CA_n79C                  | CA_n257F                 |

NOTE 1: NR configuration for FR1 and FR2 are defined in TS 38.101-1 [2] and TS 38.101-2 [3] respectively.

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## 6 Transmitter characteristics

### 6.1 General

Unless otherwise stated the transmitter characteristics are specified at the antenna connector(s) of the UE for the bands operating on frequency range 1 and over the air of the UE for the bands operating on frequency range 2. The requirements for frequency range 1 and frequency range 2 can be verified separately. For the carrier in frequency range 1, requirements can be verified with NR FR2 link disabled. For the carrier in frequency range 2, requirements can be verified in OTA mode with LTE connecting to the network by OTA without calibration.

Unless otherwise stated, requirements for NR transmitter written in TS 38.101-1 [2] and TS 38.101-2 [3] apply and are assumed anchor agnostic. Requirements are verified under conditions where anchor resources do not interfere NR operation.

### 6.2 Transmitter power

#### 6.2A Transmitter power for CA

##### 6.2A.1 UE maximum output power for CA

###### 6.2A.1.1 Inter-band CA between FR1 and FR2

**Table 6.2A.1.1-1: Void**

For inter-band NR CA in FR1 and FR2 combined, the UE shall meet each transmitter power requirement specified in clause 6.2.1 of TS 38.101-1 [2] and clause 6.2.1 TS 38.101-2 [3] independently.

##### 6.2A.2 UE maximum output power reduction for CA

###### 6.2A.2.1 Inter-band CA between FR1 and FR2

For inter-band NR CA between FR1 and FR2, UE maximum output power reduction specified in TS 38.101-1 [2] and TS 38.101-2 [3] apply for each frequency range respectively.

##### 6.2A.3 UE additional maximum output power reduction for CA

For inter-band NR CA between FR1 and FR2, UE additional maximum output power reduction specified in TS 38.101-1 [2] and TS 38.101-2 [3] apply for each frequency range respectively.

##### 6.2A.4 Configured output power for CA

###### 6.2A.4.1 Configured output power level

For inter-band NR CA between FR1 and FR2, UE configured output power specified in TS 38.101-1 [2] and TS 38.101-2 [3] apply for each frequency range respectively.

## 6.2A.4.2 $\Delta T_{IB,c}$ for CA

### 6.2A.4.2.1 $\Delta T_{IB,c}$ for Inter-band CA between FR1 and FR2

$\Delta T_{IB,c}$  for NR CA For the UE which supports inter-band NR CA configuration,  $\Delta T_{IB,c}$  in Tables below applies. Unless otherwise stated,  $\Delta T_{IB,c}$  is set to zero.

**Table 6.2A.4.2.1-1: Void**

## 6.2B Transmitter power for DC

### 6.2B.1 UE maximum output power for EN-DC

#### 6.2B.1.1 Intra-band contiguous EN-DC

The following UE Power Classes define the total maximum output power for any transmission bandwidth(s) of the CG(s) configured.

The maximum output power is measured as the total maximum output power across the UE antenna connector(s). The period of measurement shall be at least one sub frame.

**Table 6.2B.1.1-1: Maximum output power for EN-DC (continuous sub-blocks)**

| DC configuration  | Power class 2 (dBm) | Tolerance (dB)     | Power class 3 (dBm) | Tolerance (dB)     |
|---|---------------------|--------------------|---------------------|--------------------|
| DC_(n)71AA  |                     |                    | 23                  | +2/-3              |
| DC_(n)41AA  | 26                  | +2/-2 <sup>1</sup> | 23                  | +2/-2 <sup>1</sup> |
| NOTE 1: If all transmitted resource blocks over all component carriers are confined within $F_{UL\_low}$ and $F_{UL\_low} + 4$ MHz or/and $F_{UL\_high} - 4$ MHz and $F_{UL\_high}$ , the maximum output power requirement is relaxed by reducing the lower tolerance limit by 1.5 dB |                     |                    |                     |                    |
| NOTE 2: Power Class 3 is the default power class unless otherwise stated.   |                     |                    |                     |                    |

If UE supports a different power class than the default UE power class for EN-DC band combination, and the supported power class enables higher maximum output power than that of the default power class:

- if the LTE UL/DL configuration is 0 or 6; or
- if the LTE UL/DL configuration is 1 and special subframe configuration is 0 or 5; or
- if the IE *p-maxUE-FR1* as defined in TS 38.331 [7] is provided and set to the maximum output power of the default power class or lower;
  - apply all requirements for the default power class, and set the configured transmitted power as specified in sub-clause 6.2B.4;
- else
  - apply all requirements for the supported power class, and set the configured transmitted power class as specified in sub-clause 6.2B.4;

## 6.2B.1.2 Intra-band non-contiguous EN-DC

Table 6.2B.1.2-1: Maximum output power for EN-DC (non-continuous sub-blocks)

| DC configuration  | Power class 2 (dBm) | Tolerance (dB)     | Power class 3 (dBm) | Tolerance (dB)     |
|---|---------------------|--------------------|---------------------|--------------------|
| DC_3A_n3A <sup>2</sup>  |                     |                    | 23                  | +2/-3              |
| DC_41A_n41A   | 26                  | +2/-2 <sup>1</sup> | 23                  | +2/-2 <sup>1</sup> |
| NOTE 1: If all transmitted resource blocks over all component carriers are confined within $F_{UL\_low}$ and $F_{UL\_low} + 4$ MHz or/and $F_{UL\_high} - 4$ MHz and $F_{UL\_high}$ , the maximum output power requirement is relaxed by reducing the lower tolerance limit by 1.5 dB |                     |                    |                     |                    |
| NOTE 2: Only single switched UL is supported in Rel.15  |                     |                    |                     |                    |
| NOTE 3: Power Class 3 is the default power class unless otherwise stated.   |                     |                    |                     |                    |

If UE supports a different power class than the default UE power class for EN-DC band combination, and the supported power class enables higher maximum output power than that of the default power class:

- if the LTE UL/DL configuration is 0 or 6; or
- if the LTE UL/DL configuration is 1 and special subframe configuration is 0 or 5; or
- if the IE  $p\text{-maxUE-FR1}$  as defined in TS 38.331 [7] is provided and set to the maximum output power of the default power class or lower;
  - apply all requirements for the default power class, and set the configured transmitted power as specified in sub-clause 6.2B.4;
- else
- apply all requirements for the supported power class, and set the configured transmitted power class as specified in sub-clause 6.2B.4;

## 6.2B.1.3 Inter-band EN-DC within FR1

For inter-band EN-DC of LTE and NR in FR1, the following UE Power Classes define the maximum output power for any transmission bandwidth within the aggregated channel bandwidth. The maximum output power is measured as the sum of the maximum output power at each UE antenna connector. The period of measurement shall be at least one sub frame (1ms). UE maximum output power shall be measured over all component carriers from different bands. If each band has separate antenna connectors, maximum output power is measured as the sum of maximum output power at each UE antenna connector.

**Table 6.2B.1.3-1: Maximum output power for inter-band EN-DC (two bands)**



| EN-DC configuration   | Power class 3 (dBm) | Tolerance (dB)     |
|---|---------------------|--------------------|
| DC_1A_n28A  | 23                  | +2/-3              |
| DC_1A_n40A  | 23                  | +2/-3              |
| DC_1A_n51A  | 23                  | +2/-3              |
| DC_1A_n77A  | 23                  | +2/-3              |
| DC_1A_n78A<br>DC_1A_n84A_ULSUP-TDM_n78A<br>DC_1A_n84A_ULSUP-FDM_n78A  | 23                  | +2/-3              |
| DC_1A_n79A  | 23                  | +2/-3              |
| DC_2A_n5A   | 23                  | +2/-3 <sup>1</sup> |
| DC_2A_n66A  | 23                  | +2/-3 <sup>1</sup> |
| DC_2A_n71A  | 23                  | +2/-3              |
| DC_2A_n78A  | 23                  | +2/-3              |
| DC_3A_n7A   | 23                  | +2/-3 <sup>1</sup> |
| DC_3A_n28A  | 23                  | +2/-3 <sup>1</sup> |
| DC_3A_n40A  | 23                  | +2/-3 <sup>1</sup> |
| DC_3A_n51A  | 23                  | +2/-3 <sup>1</sup> |
| DC_3A_n77A  | 23                  | +2/-3 <sup>1</sup> |
| DC_3A_n78A<br>DC_3A_n80A_ULSUP-TDM_n78A,<br>DC_3A_n80A_ULSUP-FDM_n78A | 23                  | +2/-3 <sup>1</sup> |
| DC_3A_n79A<br>DC_3A_n80A_ULSUP-TDM_n79A,<br>DC_3A_n80A_ULSUP-FDM_n79A | 23                  | +2/-3 <sup>1</sup> |
| DC_3A_n82A  | 23                  | +2/-3 <sup>1</sup> |
| DC_5A_n40A  | 23                  | +2/-3 <sup>1</sup> |
| DC_5A_n66A  | 23                  | +2/-3 <sup>1</sup> |
| DC_5A_n78A  | 23                  | +2/-3              |
| DC_7A_n28A  | 23                  | +2/-3 <sup>1</sup> |
| DC_7A_n51A  | 23                  | +2/-3 <sup>1</sup> |
| DC_7A_n78A<br>DC_7C_n78A  | 23                  | +2/-3              |
| DC_8A_n40A  | 23                  | +2/-3 <sup>1</sup> |
| DC_8A_n77A  | 23                  | +2/-3              |
| DC_8A_n78A<br>DC_8A_n81A_ULSUP-TDM_n78A,<br>DC_8A_n81A_ULSUP-FDM_n78A | 23                  | +2/-3              |
| DC_8A_n79A<br>DC_8A_n81A_ULSUP-TDM_n79A,<br>DC_8A_n81A_ULSUP-FDM_n79A | 23                  | +2/-3              |
| DC_11A_n77A   | 23                  | +2/-3              |
| DC_11A_n78A   | 23                  | +2/-3              |
| DC_11A_n79A   | 23                  | +2/-3              |
| DC_12A_n5A  | 23                  | +2/-3              |
| DC_12A_n66A   | 23                  | +2/-3              |
| DC_18A_n77A   | 23                  | +2/-3              |
| DC_18A_n78A   | 23                  | +2/-3              |
| DC_18A_n79A   | 23                  | +2/-3              |
| DC_19A_n77A   | 23                  | +2/-3              |
| DC_19A_n78A   | 23                  | +2/-3              |
| DC_19A_n79A   | 23                  | +2/-3              |
| DC_20A_n8A  | 23                  | +2/-3              |

| EN-DC configuration  | Power class 3 (dBm) | Tolerance (dB)     |
|--|---------------------|--------------------|
| DC_20A_n28A<br>DC_20A_n83A   | 23                  | +2/-3              |
| DC_20A_n51A  | 23                  | +2/-3              |
| DC_20A_n77A  | 23                  | +2/-3              |
| DC_20A_n78A<br>DC_20A_n82A_ULSUP-TDM_n78A,<br>DC_20A_n82A_ULSUP-FDM_n78A   | 23                  | +2/-3              |
| DC_21A_n77A  | 23                  | +2/-3              |
| DC_21A_n78A  | 23                  | +2/-3              |
| DC_21A_n79A  | 23                  | +2/-3              |
| DC_25A_n41A  | 23                  | +2/-3              |
| DC_26A_n41A  | 23                  | +2/-3              |
| DC_26A_n77A  | 23                  | +2/-3              |
| DC_26A_n78A  | 23                  | +2/-3              |
| DC_26A_n79A  | 23                  | +2/-3              |
| DC_28A_n51A  | 23                  | +2/-3              |
| DC_28A_n77A  | 23                  | +2/-3              |
| DC_28A_n78A<br>DC_28A_n83A_ULSUP-TDM_n78A,<br>DC_28A_n83A_ULSUP-FDM_n78A   | 23                  | +2/-3              |
| DC_28A_n79A  | 23                  | +2/-3              |
| DC_30A_n5A   | 23                  | +2/-3              |
| DC_30A_n66A  | 23                  | +2/-3              |
| DC_38A_n78A  | N/A                 | N/A                |
| DC_39A_n78A  | 23                  | +2/-3 <sup>1</sup> |
| DC_39A_n79A  | 23                  | +2/-3 <sup>1</sup> |
| DC_40A_n77A  | N/A                 | N/A                |
| DC_41A_n77A<br>DC_41C_n77A   | 23                  | +2/-3 <sup>1</sup> |
| DC_41A_n78A<br>DC_41C_n77A   | 23                  | +2/-3 <sup>1</sup> |
| DC_41A_n79A<br>DC_41C_n77A   | 23                  | +2/-3 <sup>1</sup> |
| DC_42A_n51A  | 23                  | +2/-3              |
| DC_42A_n77A  | N/A                 | N/A                |
| DC_42A_n78A  | N/A                 | N/A                |
| DC_42A_n79A  | N/A                 | N/A                |
| DC_66A_n5A   | 23                  | +2/-3 <sup>1</sup> |
| DC_66A_n71A  | 23                  | +2/-3              |
| DC_66A_n78A, DC_66A_n86A_ULSUP-TDM_n78A,<br>DC_66A_n86A_ULSUP-FDM_n78A   | 23                  | +2/-3              |
| NOTE 1: For the transmission bandwidths confined within $F_{UL\_low}$ and $F_{UL\_low} + 4$ MHz or $F_{UL\_high} - 4$ MHz and $F_{UL\_high}$ , the maximum output power requirement is relaxed by reducing the lower tolerance limit by 1.5 dB |                     |                    |
| NOTE 2: $P_{PowerClass\_EN-DC}$ is the maximum UE power specified without taking into account the tolerance  |                     |                    |
| NOTE 3: For inter-band EN-DC the maximum power requirement should apply to the total transmitted power over all component carriers (per UE).   |                     |                    |
| NOTE 4: Power Class 3 is the default power class unless otherwise stated.  |                     |                    |

### 6.2B.1.4 Inter-band EN-DC including FR2

For inter-band EN-DC of LTE and NR in FR2, the UE shall meet each transmitter power requirement specified in clause 6.2.1 of TS 36.101 [4] and clause 6.2.1 TS 38.101-2 [3] independently.

### 6.2B.1.5 Inter-band EN-DC including both FR1 and FR2

For inter-band EN-DC of LTE and NR in both FR1 and FR2, the UE shall meet each transmitter power requirement for inter-band EN-DC of LTE and NR in FR1 specified in clause 6.2B.1.3 of TS 38.101-3 and for NR in FR2 clause 6.2.1 of TS 38.101-2 [3] independently.

## 6.2B.2 UE maximum output power reduction for EN-DC

### 6.2B.2.0 General

The UE maximum output power reduction (MPR) specified in this subclause is applicable for UEs configured with EN-DC when NS\_01 is indicated in the MCG and the SCG. The MPR applies subject to indication in the field *modifiedMPRbehavior* for the SCG [2].

### 6.2B.2.1 Intra-band contiguous EN-DC

#### 6.2B.2.1.1 General

When the UE is configured for intra-band contiguous EN-DC, the UE determines the total allowed maximum output power reduction as specified in this subclause.

For UE supporting dynamic power sharing the following:

- for the MCG,  $MPR_c$  in accordance with [4]
- for the SCG,

$$MPR'_c = MPR_{NR} = \text{MAX}(MPR_{\text{single,NR}}, MPR_{\text{ENDC}})$$

- for the total configured transmission power,

$$MPR_{\text{tot}} = P_{\text{PowerClass,EN-DC}} - \min(P_{\text{PowerClass,EN-DC}}, 10 \cdot \log_{10}(10^{(P_{\text{PowerClass,E-UTRA}} - MPR_{\text{E-UTRA}})/10} + 10^{(P_{\text{PowerClass,NR}} - MPR_{\text{NR}})/10}))$$

where

$$MPR_{\text{E-UTRA}} = \text{MAX}(MPR_{\text{single,E-UTRA}}, MPR_{\text{ENDC}})$$

with

- $MPR_{\text{single,E-UTRA}}$  is the MPR defined for the E-UTRA transmission in [4]
- $MPR_{\text{single,NR}}$  is the MPR defined for the NR transmission in [2]

For UEs not supporting dynamic power sharing the following

- for the MCG,

$$MPR_c = \text{MAX}(MPR_{\text{single,E-UTRA}}, MPR_{\text{ENDC}})$$

- for the SCG,

$$MPR'_c = \text{MAX}(MPR_{\text{single,NR}}, MPR_{\text{ENDC}})$$

where

- $MPR_{\text{single,NR}}$  is the MPR defined for the NR transmission in [2]
- $MPR_{\text{single,E-UTRA}}$  is the MPR defined for the E-UTRA transmission in [4]

$MPR_{ENDC}$  is defined in Subclause 6.2B.2.1.2

### 6.2B.2.1.2 MPR for power class 3 and power class 2

MPR in this sub-clause is applicable for power class 3 and power class 2. The allowed maximum output power reduction applied to transmission on the MCG and the SCG is defined as follows:

$$MPR_{ENDC} = M_A$$

Where  $M_A$  is defined as follows

$$M_A = \begin{cases} [15] & ; \quad 0 \leq B < 0.5 \\ [10] & ; \quad 0.5 \leq B < 1.0 \\ [8] & ; \quad 1.0 \leq B < 2.0 \\ [6] & ; \quad 2.0 < B \end{cases}$$

Where:

For UEs supporting dynamic power sharing,

$$B = (L_{CRB\_alloc, E-UTRA} * 12 * SCS_{E-UTRA} + L_{CRB\_alloc, NR} * 12 * SCS_{NR}) / 1,000,000$$

For UEs not supporting dynamic power sharing,

For E-UTRA

$$B = (L_{CRB\_alloc, E-UTRA} * 12 * SCS_{E-UTRA} + 12 * SCS_{NR}) / 1,000,000$$

For NR

$$B = (12 * SCS_{E-UTRA} + L_{CRB\_alloc, NR} * 12 * SCS_{NR}) / 1,000,000$$

and  $M_A$  is reduced by 1 dB for  $B < 2$ .

## 6.2B.2.2 Intra-band non-contiguous EN-DC

### 6.2B.2.2.1 General

When the UE is configured for intra-band non-contiguous EN-DC, the UE determines the total allowed maximum output power reduction as specified in this subclause.

For UE supporting dynamic power sharing the following:

- for the MCG,  $MPR_c$  in accordance with [4]
- for the SCG,

$$MPR'_c = MPR_{NR} = \text{MAX}(MPR_{\text{single, NR}}, MPR_{ENDC})$$

- for the total configured transmission power,

$$MPR_{\text{tot}} = P_{\text{PowerClass, EN-DC}} - \min(P_{\text{PowerClass, EN-DC}}, 10 * \log_{10}(10^{(P_{\text{PowerClass, E-UTRA}} - MPR_{E-UTRA})/10} + 10^{(P_{\text{PowerClass, NR}} - MPR_{NR})/10}))$$

where

$$MPR_{E-UTRA} = \text{MAX}(MPR_{\text{single, E-UTRA}}, MPR_{ENDC})$$

with

- $MPR_{\text{single, E-UTRA}}$  is the MPR defined for the E-UTRA transmission in [4]

- $MPR_{single,NR}$  is the MPR defined for the NR transmission in [2]

For UEs not supporting dynamic power sharing the following

- for the MCG,

$$MPR_c = \text{MAX}(MPR_{single,E-UTRA}, MPR_{ENDC})$$

- for the SCG,

$$MPR'_c = \text{MAX}(MPR_{single,NR}, MPR_{ENDC})$$

where

- $MPR_{single,NR}$  is the MPR defined for the NR transmission in [2]
- $MPR_{single,E-UTRA}$  is the MPR defined for the E-UTRA transmission in [4]

$MPR_{ENDC}$  is defined in Subclause 6.2B.2.2.2

### 6.2B.2.2.2 MPR for power class 3 and power class 2

MPR in this sub-clause is applicable for power class 3 and power class 2. The allowed maximum output power reduction for IM3 related emissions applied to transmission on the MCG and the SCG is defined as follows:

$$MPR_{ENDC} = M_A$$

Where  $M_A$  is defined as follows

$$\begin{aligned} M_A &= [18] \quad ; \quad 0 \leq B < 1.0 \\ &[17] \quad ; \quad 1.0 \leq B < 2.0 \\ &[16] \quad ; \quad 2.0 \leq B < 5.0 \\ &[15] \quad ; \quad 5.0 < B \end{aligned}$$

Where:

For UEs supporting dynamic power sharing,

$$B = (L_{CRB\_alloc, E-UTRA} * 12 * SCS_{E-UTRA} + L_{CRB\_alloc, NR} * 12 * SCS_{NR}) / 1,000,000$$

For UEs not supporting dynamic power sharing,

For E-UTRA

$$B = (L_{CRB\_alloc, E-UTRA} * 12 * SCS_{E-UTRA} + 12 * SCS_{NR}) / 1,000,000$$

For NR

$$B = (12 * SCS_{E-UTRA} + L_{CRB\_alloc, NR} * 12 * SCS_{NR}) / 1,000,000$$

and  $M_A$  is reduced by 1 dB for  $B < 2$ .

### 6.2B.2.3 Inter-band EN-DC within FR1

For inter-band EN-DC between E-UTRA and FR1 NR, UE maximum output power reduction specified in TS 36.101 [4] and TS 38.101-1 [2] apply for E-UTRA and NR respectively.

### 6.2B.2.4 Inter-band EN-DC including FR2

For inter-band EN-DC between E-UTRA and FR1 NR, UE maximum output power reduction specified in TS 36.101 [4] and TS 38.101-2 [3] apply for E-UTRA and NR respectively.

## 6.2B.2.5 Inter-band EN-DC including both FR1 and FR2

For inter-band EN-DC between E-UTRA and FR1 NR and FR2 NR, UE maximum output power reduction specified in TS 36.101 [4], TS 38.101-1 [2], TS 38.101-2 [3] apply for E-UTRA and FR1 NR and FR2 NR respectively.

## 6.2B.3 UE additional maximum output power reduction for EN-DC

### 6.2B.3.1 Intra-band contiguous EN-DC

#### 6.2B.3.1.0 General

For EN-DC band combinations with additional requirements the allowed A-MPR is specified in Table 6.2B.3.1.0-1 for combinations of network signalling values indicated in E-UTRA and NR cell group(s). Unless otherwise stated the A-MPR specified in sub-clause 6.2B.3.1 for intra-band contiguous EN-DC configurations includes MPR.

**Table 6.2B.3.1.0-1: Additional maximum power reduction for Intra-band contiguous EN-DC**

| DC configuration  | Requirement (sub-clause) | E-UTRA network signalling value | NR network signalling value | A-MPR (subclause)       |
|---|--------------------------|---------------------------------|-----------------------------|-------------------------|
| DC_(n)71AA  | 6.5B.2.1.2.1             | NS_35                           | NS_35                       | 6.2B.3.1.1 <sup>3</sup> |
| DC_(n)41AA <sup>1</sup>   | 6.5B.2.1.2.2             | NS_01 or NS_04                  | NS_04                       | 6.2B.3.1.2 <sup>4</sup> |
| NOTE 1: Only applies to UEs that support dual UL transmission for this EN-DC combination.   |                          |                                 |                             |                         |
| NOTE 2: The network signalling value for NR is mapped to configured FBI and <i>AdditionalSpectrumEmission</i> values as specified in [4]. |                          |                                 |                             |                         |
| NOTE 3: The A-MPR is applied as MPR if NS_35 is not signalled.  |                          |                                 |                             |                         |
| NOTE 4: The A-MPR is applied as MPR if NS_04 is not signalled.  |                          |                                 |                             |                         |

#### 6.2B.3.1.1 A-MPR for DC\_(n)71AA

For UE supporting dynamic power sharing the following:

- for the MCG,  $A\text{-MPR}_c$  in accordance with [4]
- for the SCG,  $A\text{-MPR}'_c = [A\text{-MPR}_{DC}]$
- for the total configured transmission power,  $A\text{-MPR}_{tot} = A\text{-MPR}_{DC}$

with  $A\text{-MPR}_{DC}$  as defined in this sub-clause.

For UEs not supporting dynamic power sharing the following

- for the MCG,

$$A\text{-MPR}_c = A\text{-MPR}_{LTE}$$

- for the SCG,

$$A\text{-MPR}'_c = A\text{-MPR}_{NR}$$

with  $A\text{-MPR}_{LTE}$  and  $A\text{-MPR}_{NR}$  as defined in this sub-clause.

For DC\_(n)71AA with configured with network signaling values as per Table 6.2B.3.1.1-1 the allowed A-MPR is defined by

- for UE indicating support of dynamicPowerSharing in the *UE-MRDC-Capability* IE

$$A\text{-MPR}_{DC} = \text{CEIL}\{ M_{A,DC}(A), 0.5 \}$$

where  $A\text{-MPR}_{DC}$  is the total power reduction allowed (dB),

- for OFDM:

$$M_{A,DC} = 11.00 - 11.67 * A; \quad 0.00 < A \leq 0.30$$

$$\begin{aligned} & 8.10 - 2.00 \cdot A; & 0.30 < A \leq 0.80 \\ & 6.50; & 0.80 < A \leq 1.00 \end{aligned}$$

- for DFT-S-OFDM:

$$\begin{aligned} M_{A,DC} &= 11.00 - 13.33 \cdot A; & 0.00 < A \leq 0.30 \\ & 8.00 - 3.33 \cdot A; & 0.30 < A \leq 0.60 \\ & 6.00; & 0.60 < A \leq 1.00 \end{aligned}$$

where

$$A = \frac{L_{CRB,LTE} + L_{CRB,NR}}{N_{RB,LTE} + N_{RB,NR}}$$

with  $L_{CRB}$  and  $N_{RB}$  the number of allocated PRB and transmission bandwidth for the respective CG,

- for UE not indicating support of dynamicPowerSharing

$$A\text{-MPR}_{LTE} = \text{CEIL}\{ M_{A,LTE}, 0.5 \}$$

$$A\text{-MPR}_{NR} = \text{CEIL}\{ M_{A,NR}, 0.5 \}$$

where A-MPR is the total power reduction allowed per CG with

$$M_{A,LTE} = M_{A,DC}(A_{LTE,wc}) - 1 - \Delta_{LTE}$$

$$M_{A,NR} = M_{A,DC}(A_{NR,wc}) - 1 - \Delta_{NR}$$

$$A_{LTE,wc} = \frac{L_{CRB,LTE} + 1}{N_{RB,LTE} + N_{RB,NR}}$$

$$A_{NR,wc} = \frac{1 + L_{CRB,NR}}{N_{RB,LTE} + N_{RB,NR}}$$

$$\Delta_{LTE} = 10 \log_{10} \frac{N_{RB,LTE}}{N_{RB,LTE} + N_{RB,NR}}$$

$$\Delta_{NR} = 10 \log_{10} \frac{N_{RB,NR}}{N_{RB,LTE} + N_{RB,NR}}$$

### 6.2B.3.1.2 A-MPR for NS\_04

#### 6.2B.3.1.2.0 General

When the UE is configured for B41/n41 intra-band contiguous EN-DC and it receives IE NS\_04, the UE determines the total allowed maximum output power reduction as specified in this subclause. The A-MPR for EN-DC defined in this section is used instead of MPR defined in 6.2B.2.2, not additively, so EN-DC MPR=0 when NS\_04 is signaled.

For UE supporting dynamic power sharing the following:

- for the MCG, A-MPR<sub>c</sub> in accordance with [4]
- for the SCG,

$$A\text{-MPR}'_c = A\text{-MPR}_{NR} = \text{MAX}(A\text{-MPR}_{\text{single,NR}}, A\text{-MPR}_{\text{IM3}})$$

- for the total configured transmission power,

$$A\text{-MPR}_{\text{tot}} = P_{\text{PowerClass,EN-DC}} - \min(P_{\text{PowerClass,EN-DC}}, 10^{\log_{10}(10^{\log_{10}(P_{\text{PowerClass,E-UTRA}} - A\text{-MPR}_{\text{E-UTRA}}/10)} + 10^{\log_{10}(P_{\text{PowerClass,NR}} - A\text{-MPR}_{\text{NR}}/10)})})$$

where

$$A\text{-MPR}_{E\text{-UTRA}} = \text{MAX}( A\text{-MPR}_{\text{single},E\text{-UTRA}} + \text{MPR}_{\text{single},E\text{-UTRA}}, A\text{-MPR}_{\text{IM3}} )$$

with

- $A\text{-MPR}_{\text{single}, E\text{-UTRA}}$  is the A-MPR defined for the E-UTRA transmission in [4]
- $A\text{-MPR}_{\text{single},\text{NR}}$  is the A-MPR defined for the NR transmission in [2]
- $\text{MPR}_{\text{single},E\text{-UTRA}}$  is the MPR defined for the E-UTRA transmission in [4]

For UEs not supporting dynamic power sharing the following

- for the MCG,

$$A\text{-MPR}_c = \text{MAX}( A\text{-MPR}_{\text{single}, E\text{-UTRA}} + \text{MPR}_{\text{single},E\text{-UTRA}}, A\text{-MPR}_{\text{IM3}} )$$

- for the SCG,

$$A\text{-MPR}'_c = \text{MAX}( A\text{-MPR}_{\text{single},\text{NR}}, A\text{-MPR}_{\text{IM3}} )$$

where

- $A\text{-MPR}_{\text{single}, E\text{-UTRA}}$  is the A-MPR defined for the E-UTRA transmission in [4]
- $A\text{-MPR}_{\text{single},\text{NR}}$  is the A-MPR defined for the NR transmission in [2]
- $\text{MPR}_{\text{single},E\text{-UTRA}}$  is the MPR defined for the E-UTRA transmission in [4]

The UE determines the Channel Configuration Case and the value of  $A\text{-MPR}_{\text{IM3}}$  as follows:

If  $F_{\text{IM3},\text{low\_block},\text{low}} < 2490.5$  MHz

Channel Configuration Case B.  $A\text{-MPR}_{\text{IM3}}$  defined in Subclause 6.2B.3.1.2.2

Else

Channel Configuration Case A.  $A\text{-MPR}_{\text{IM3}}$  defined in Subclause 6.2B.3.1.2.1

where

- $F_{\text{IM3},\text{low\_block},\text{low}} = (2 * F_{\text{low\_channel},\text{low\_edge}}) - F_{\text{high\_channel},\text{high\_edge}}$
- $F_{\text{low\_channel},\text{low\_edge}}$  is the lowermost frequency of lower transmission bandwidth configuration.
- $F_{\text{high\_channel},\text{high\_edge}}$  is the uppermost frequency of upper transmission bandwidth configuration.

#### 6.2B.3.1.2.1 $A\text{-MPR}_{\text{IM3}}$ for NS\_04 to meet -13 dBm / 1MHz for 26dBm UE power

$A\text{-MPR}$  in this sub-clause is relative to 26 dBm for power class 2. The same  $A\text{-MPR}$  is used relative to 23 dBm for power class 3. For the UE is configured with channel configurations Case A or Case C (defined in Subclause 6.2B.3.2.1), the allowed maximum output power reduction for IM3s applied to transmission on the MCG and the SCG with non-contiguous resource allocation is defined as follows:

$$A\text{-MPR}_{\text{IM3}} = M_A$$

Where  $M_A$  is defined as follows

$$M_A = \begin{array}{ll} 15 & ; \quad 0 \leq B < 0.5 \\ 10 & ; \quad 0.5 \leq B < 1.0 \\ 8 & ; \quad 1.0 \leq B < 2.0 \\ 6 & ; \quad 2.0 < B \end{array}$$



Where:

For UEs supporting dynamic power sharing,

$$B = (L_{CRB\_alloc, E-UTRA} * 12 * SCS_{E-UTRA} + L_{CRB\_alloc, NR} * 12 * SCS_{NR}) / 1,000,000$$

For UEs not supporting dynamic power sharing,

For E-UTRA

$$B = (L_{CRB\_alloc, E-UTRA} * 12 * SCS_{E-UTRA} + 12 * SCS_{NR}) / 1,000,000$$

For NR

$$B = (12 * SCS_{E-UTRA} + L_{CRB\_alloc, NR} * 12 * SCS_{NR}) / 1,000,000$$

and  $M_A$  is reduced by 1 dB for  $B < 2.0$ .

#### 6.2B.3.1.2.2 A-MPR for NS\_04 to meet -25 dBm / 1MHz for 26 dBm UE power

A-MPR in this sub-clause is relative to 26 dBm. The same A-MPR is used relative to 23 dBm for power class 3. For the UE is configured with channel configurations Case B or Case D (defined in Subclause 6.2B.3.2.1), the allowed maximum output power reduction for IM3s applied to transmission on the MCG and the SCG with non-contiguous resource allocation is defined as follows:

$$A-MPR_{IM3} = M_A$$

Where  $M_A$  is defined as follows

$$M_A = \begin{array}{ll} 15 ; & 0 \leq B < 1.0 \\ 14 ; & 1.0 \leq B < 2.0 \\ 13 ; & 2.0 \leq B < 5.0 \\ 12 ; & 5.0 < B \end{array}$$

Where:

For UEs supporting dynamic power sharing,

$$B = (L_{CRB\_alloc, E-UTRA} * 12 * SCS_{E-UTRA} + L_{CRB\_alloc, NR} * 12 * SCS_{NR}) / 1,000,000$$

For UEs not supporting dynamic power sharing,

For E-UTRA

$$B = (L_{CRB\_alloc, E-UTRA} * 12 * SCS_{E-UTRA} + 12 * SCS_{NR}) / 1,000,000$$

For NR

$$B = (L_{CRB\_alloc, E-UTRA} * 12 * SCS_{E-UTRA} + 12 * SCS_{NR}) / 1,000,000$$

and  $M_A$  is reduced by 1 dB.

### 6.2B.3.2 Intra-band non-contiguous EN-DC

#### 6.2B.3.2.0 General

For intra-band EN-DC band combinations with additional requirements the A-MPR allowed are specified in Table 6.2B.3.2.0-1 for combinations of network signalling values indicated in E-UTRA and NR cell group(s). Unless otherwise stated the A-MPR specified in sub-clause 6.2B.3.2 for intra-band non-contiguous EN-DC configurations includes MPR.

Table 6.2B.3.2.0-1: Allowed power reduction for EN-DC

| DC configuration  | Requirement (sub-clause)   | E-UTRA network signalling value | NR network signalling value | A-MPR (subclause) |
|---|--|---------------------------------|-----------------------------|-------------------|
| DC_41A_n41 <sup>1</sup>   | 6.6.3.3.19 and 6.6.2.2.2 of [4] and 6.5.2.3.2 and 6.5.3.3.1 of [2] | NS_01 or NS_04                  | NS_04                       | 6.2B.3.2.2        |
| NOTE 1: Only applies to UEs that support dual UL transmission for this EN-DC combination.<br>NOTE 2: The A-MPR is applied as MPR if NS_04 is not signalled. |  |                                 |                             |                   |

### 6.2B.3.2.1 A-MPR for NS\_04

When the UE is configured for B41/n41 intra-band non-contiguous EN-DC and it receives IE NS\_04, the UE determines the total allowed maximum output power reduction as specified in this subclause. The A-MPR for EN-DC defined in this section is used instead of MPR defined in 6.2B.2.2, not additively, so EN-DC MPR=0 when NS\_04 is signaled.

For UE supporting dynamic power sharing the following:

- for the MCG, A-MPR<sub>c</sub> in accordance with [4]
- for the SCG,

$$A-MPR'_c = A-MPR_{NR} = \text{MAX}(A-MPR_{\text{single,NR}}, A-MPR_{\text{EN-DC}})$$

- for the total configured transmission power,

$$A-MPR_{\text{tot}} = P_{\text{PowerClass,EN-DC}} - \min(P_{\text{PowerClass,EN-DC}}, 10 * \log_{10}(10^{(P_{\text{PowerClass,E-UTRA}} - A-MPR_{\text{E-UTRA}})/10}) + 10^{(P_{\text{PowerClass,NR}} - A-MPR_{\text{NR}})/10}))$$

where

$$A-MPR_{\text{E-UTRA}} = \text{MAX}(A-MPR_{\text{single,E-UTRA}} + MPR_{\text{single,E-UTRA}}, A-MPR_{\text{EN-DC}})$$

$$A-MPR_{\text{EN-DC}} = \text{MAX}(A-MPR_{\text{IM3}}, A-MPR_{\text{ACLRoverlap}})$$

with

- A-MPR<sub>single, E-UTRA</sub> is the A-MPR defined for the E-UTRA transmission in [4]
- A-MPR<sub>single,NR</sub> is the A-MPR defined for the NR transmission in [2]
- MPR<sub>single,E-UTRA</sub> is the MPR defined for the E-UTRA transmission in [4]

For UEs not supporting dynamic power sharing the following

- for the MCG,

$$A-MPR_c = \text{MAX}(A-MPR_{\text{single, E-UTRA}} + MPR_{\text{single,E-UTRA}}, A-MPR_{\text{IM3}}, A-MPR_{\text{ACLRoverlap}})$$

- for the SCG,

$$A-MPR'_c = \text{MAX}(A-MPR_{\text{single,NR}}, A-MPR_{\text{IM3}}, A-MPR_{\text{ACLRoverlap}})$$

where

- A-MPR<sub>single, E-UTRA</sub> is the A-MPR defined for the E-UTRA transmission in [4]
- A-MPR<sub>single,NR</sub> is the A-MPR defined for the NR transmission in [2]
- MPR<sub>single,E-UTRA</sub> is the MPR defined for the E-UTRA transmission in [4]

The UE determines the Channel Configuration Case and the value of A-MPR<sub>IM3</sub> as follows:

$$\text{If AND}(F_{\text{IM3,low\_block,high}} < F_{\text{filter,low}}, \text{MAX}(SEM_{-13,high}, F_{\text{IM3,high\_block,low}}) > F_{\text{filter,high}})$$

Channel Configuration Case C. A-MPR<sub>IM3</sub> defined in Subclause 6.2B.3.1.2.1

Else

Channel Configuration Case D. A-MPR<sub>IM3</sub> defined in Subclause 6.2B.3.1.2.2

where

- $F_{IM3,low\_block,high} = (2 * F_{low\_channel,high\_edge}) - F_{high\_channel,low\_edge}$
- $F_{IM3,high\_block,low} = (2 * F_{high\_channel,low\_edge}) - F_{low\_channel,high\_edge}$
- $F_{low\_channel,low\_edge}$  is the lowermost frequency of lower transmission bandwidth configuration.
- $F_{low\_channel,high\_edge}$  is the uppermost frequency of lower transmission bandwidth configuration.
- $F_{high\_channel,low\_edge}$  is the lowermost frequency of upper transmission bandwidth configuration.
- $F_{high\_channel,high\_edge}$  is the uppermost frequency of upper transmission bandwidth configuration.
- $F_{filter,low} = 2480$  MHz
- $F_{filter,high} = 2745$  MHz
- SEM<sub>-13,high</sub> = Threshold frequency where upper spectral emission mask for upper channel drops from -13 dBm / 1MHz to -25 dBm / 1MHz, as specified in Subclause 6.5B.2.1.2.2.

The UE determines the value of A-MPR<sub>ACLROverlap</sub> as specified in Table 6.2B.3.2.1-1:

**Table 6.2B.3.2.1-1: A-MPR<sub>ACLROverlap</sub>**

| $W_{gap}$   | A-MPR <sub>ACLROverlap</sub> |
|---|------------------------------|
| $< BW_{channel,E-UTRA} + BW_{channel,NR}$                                     | 4 dB                         |
| $\geq BW_{channel,E-UTRA} + BW_{channel,NR}$                                  | 0 dB                         |
| NOTE 1: $W_{gap} = F_{high\_channel,low\_edge} - F_{low\_channel,high\_edge}$ |                              |

### 6.2B.3.3 Inter-band EN-DC within FR1

For inter-band EN-DC between E-UTRA and FR1 NR, UE additional maximum output power reduction specified in TS 36.101 [4] and TS 38.101-1 [2] apply for E-UTRA and NR respectively.

### 6.2B.3.4 Inter-band EN-DC including FR2

For inter-band EN-DC between E-UTRA and FR1 NR, UE additional maximum output power reduction specified in TS 36.101 [4] and TS 38.101-2 [3] apply for E-UTRA and NR respectively.

### 6.2B.3.5 Inter-band EN-DC including both FR1 and FR2

For inter-band EN-DC between E-UTRA and FR1 NR and FR2 NR, UE additional maximum output power reduction specified in TS 36.101 [4], TS 38.101-1 [2], TS 38.101-2 [3] apply for E-UTRA and FR1 NR and FR2 NR respectively.

## 6.2B.4 Configured output power for EN-DC

### 6.2B.4.1 Configured output power level

#### 6.2B.4.1.1 Intra-band contiguous EN-DC

The following requirements apply for one component carrier per CG configured for synchronous DC.

For intra-band dual connectivity with one uplink serving cell per CG on E-UTRA and NR respectively, the UE is allowed to set its configured maximum output power  $P_{\text{CMAX},c(i)}$  for serving cell  $c(i)$  of CG  $i$ ,  $i = 1, 2$ , and its total configured maximum transmission power for EN-DC operation  $\hat{P}_{\text{Total}}^{\text{EN-DC}}$ .

The configured maximum output power  $P_{\text{CMAX\_E-UTRA},c}(p)$  in sub-frame  $p$  for the configured E-UTRA uplink carrier shall be set within the bounds:

$$P_{\text{CMAX\_L\_E-UTRA},c}(p) \leq P_{\text{CMAX\_E-UTRA},c}(p) \leq P_{\text{CMAX\_H\_E-UTRA},c}(p)$$

where  $P_{\text{CMAX\_L\_E-UTRA},c}$  and  $P_{\text{CMAX\_H\_E-UTRA},c}$  are the limits for a serving cell  $c$  as specified in TS 36.101 [4] sub-clause 6.2.5 modified by  $P_{\text{LTE}}$  as follows:

$$P_{\text{CMAX\_L\_E-UTRA},c} = \text{MIN} \{ \text{MIN}(P_{\text{EMAX},c}, P_{\text{EMAX, EN-DC}}, P_{\text{LTE}}) - \Delta T_{\text{c\_E-UTRA},c}, (P_{\text{PowerClass}} - \Delta P_{\text{PowerClass}}) - \text{MAX}(M\text{PR}_c + \text{A-MPR}_c + \Delta T_{\text{IB},c} + \Delta T_{\text{c\_E-UTRA},c} + \Delta T_{\text{ProSe}}, P\text{-MPR}_c) \}$$

$$P_{\text{CMAX\_H\_E-UTRA},c} = \text{MIN} \{ P_{\text{EMAX},c}, P_{\text{EMAX, EN-DC}}, P_{\text{LTE}}, P_{\text{PowerClass}} - \Delta P_{\text{PowerClass}} \}$$

and whenever NS\_01 is not indicated within CG 1:

- for a UE indicating support of dynamicPowerSharing, the A-MPR<sub>c</sub> is determined in accordance with the DCI of serving cell  $c$  of the CG 1 and the specification in sub-clause 6.2.4 of [4];
- for a UE not indicating support of dynamicPowerSharing, the A-MPR<sub>c</sub> is determined in accordance with sub-clause 6.2B.3.1 with parameters applicable for UEs not indicating support of dynamicPowerSharing and MPR<sub>c</sub> = 0 dB;

and whenever NS\_01 is indicated in CG 1:

- for a UE indicating support of dynamicPowerSharing, the MPR<sub>c</sub> is determined in accordance with the DCI of serving cell  $c$  of the CG 1 and the specification in sub-clause 6.2.4 of [4];
- for a UE not indicating support of dynamicPowerSharing, the MPR<sub>c</sub> is determined in accordance with sub-clause 6.2B.2.1 with parameters applicable for UEs not indicating support of dynamicPowerSharing and A-MPR<sub>c</sub> = 0 dB;

The configured maximum output power  $P_{\text{CMAX\_NR},c}(q)$  in physical channel  $q$  for the configured NR carrier shall be set within the bounds:

$$P_{\text{CMAX\_L,f,c, NR}}(q) \leq P_{\text{CMAX,f,c, NR}}(q) \leq P_{\text{CMAX\_H,f,c, NR}}(q)$$

where  $P_{\text{CMAX\_L\_NR},c}$  and  $P_{\text{CMAX\_H\_NR},c}$  are the limits for a serving cell  $c$  as specified in sub-clause 6.2.4 of TS 38.101-1 [2] modified by  $P_{\text{NR}}$  as follows:

$$P_{\text{CMAX\_L,f,c, NR}} = \text{MIN} \{ \text{MIN}(P_{\text{EMAX},c}, P_{\text{EMAX, EN-DC}}, P_{\text{NR}}) - \Delta T_{\text{c\_NR},c}, (P_{\text{PowerClass}} - \Delta P_{\text{PowerClass}}) - \text{MAX}(M\text{PR}_c + \text{A-MPR}_c + \Delta T_{\text{IB},c} + \Delta T_{\text{c\_NR},c} + \Delta T_{\text{RxsRS}}, P\text{-MPR}_c) \}$$

$$P_{\text{CMAX\_H,f,c, NR}} = \text{MIN} \{ P_{\text{EMAX},c}, P_{\text{EMAX, EN-DC}}, P_{\text{NR}}, P_{\text{PowerClass}} - \Delta P_{\text{PowerClass}} \}$$

- $P_{\text{LTE}}$  and  $P_{\text{NR}}$  are the linear values for the  $P_{\text{LTE}}$  and  $P_{\text{NR}}$  respectively signaled by RRC defined in [7]
- $\Delta T_{\text{c\_E-UTRA},c} = 1.5\text{dB}$  when NOTE 2 in Table 6.2.2-1 in TS 36.101 [4] applies for a serving cell  $c$ , otherwise  $\Delta T_{\text{c\_E-UTRA},c} = 0\text{dB}$ ;
- $\Delta T_{\text{c\_NR},c} = 1.5\text{dB}$  when NOTE 3 in Table 6.2.1-1 in TS 38.101-1 [2] applies for a serving cell  $c$ , otherwise  $\Delta T_{\text{c\_NR},c} = 0\text{dB}$ ;
- $\Delta T_{\text{IB},c}$  specified in sub-clause 6.2.7 for EN-DC, the individual Power Class defined in table 6.2B.1-3 and any other additional power reductions parameters specified in sub-clauses 6.2.3 and 6.2.4 for EN-DC are applicable to  $P_{\text{CMAX\_E-UTRA},c}$  and  $P_{\text{CMAX\_NR},c}$  evaluations.

and whenever NS\_01 is not indicated within CG 2:

- for a UE indicating support of dynamicPowerSharing, A-MPR<sub>c</sub> = A-MPR'<sub>c</sub> with A-MPR'<sub>c</sub> determined in accordance with sub-clause 6.2B.3.1 and MPR<sub>c</sub> = 0 dB if transmission(s) in subframe  $p$  on CG 1 overlap in time with physical channel  $q$  on CG 2;

- for a UE indicating support of dynamicPowerSharing, A-MPR<sub>c</sub> is determined in accordance with [2] if transmission(s) in subframe  $p$  on CG 1 does not overlap in time with physical channel  $q$  on CG 2;
- for a UE not indicating support of dynamicPowerSharing, the A-MPR<sub>c</sub> is determined in accordance with sub-clause 6.2B.3.1 with parameters applicable for UEs not indicating support of dynamicPowerSharing and MPR<sub>c</sub> = 0 dB;

and whenever NS\_01 is indicated in CG 2.

- for a UE indicating support of dynamicPowerSharing, MPR<sub>c</sub> = MPR'<sub>c</sub> with MPR'<sub>c</sub> determined in accordance with sub-clause 6.2B.2.1 and A-MPR<sub>c</sub> = 0 dB if transmission(s) in subframe  $p$  on CG 1 overlap in time with physical channel  $q$  on CG 2;
- for a UE indicating support of dynamicPowerSharing, MPR<sub>c</sub> is determined in accordance with [2] if transmission(s) in subframe  $p$  on CG 1 does not overlap in time with physical channel  $q$  on CG 2;
- for a UE not indicating support of dynamicPowerSharing, the MPR<sub>c</sub> is determined in accordance with sub-clause 6.2B.2.1 with parameters applicable for UEs not indicating support of dynamicPowerSharing and MPR<sub>c</sub> = 0 dB;

If the transmissions from NR and E-UTRA do not overlap, then the complete sub-clauses for configured transmitted power for E-UTRA and NR respectively from their own specifications apply with the modifications specified above. The lower value between P<sub>PowerClass, EN-DC</sub> or P<sub>EMAX, EN-DC</sub> shall not be exceeded at any time by UE.

If the EN-DC UE is not supporting dynamic power sharing, then the complete sub-clauses for configured transmitted power for E-UTRA and NR respectively from their own specifications TS 36.101 [4] and TS 38.101-1 [2] respectively apply with the modifications specified above.

P<sub>EN-DC\_Total</sub> is the dB value of  $\hat{P}_{Total}^{EN-DC}$ , which is used in [38.213] and P<sub>EMAX, EN-DC</sub> is p-maxUE-FR1-r15 value signaled by RRC and defined in [36.331];

If the UE does not support dynamic power sharing,

$$P_{EN-DC,tot} = \text{MIN} \{ P_{EMAX, EN-DC}, P_{PowerClass, EN-DC} \} + 0.3 \text{ dB}$$

For UEs indicating support of dynamicPowerSharing in the *UE-MRDC-Capability* IE the UE can configure the total maximum transmission power within the range

$$P_{EN-DC,tot,L} \leq P_{EN-DC,tot} \leq P_{EN-DC,tot,H}$$

where

$$P_{EN-DC,tot,L}(p,q) = \text{MIN} \{ P_{PowerClass,EN-DC} - \text{MAX} \{ \text{MPR}_{tot}, \text{A-MPR}_{tot} \}, P_{EMAX,EN-DC} \}$$

$$P_{EN-DC,tot,H}(p,q) = \text{MIN} \{ P_{PowerClass,EN-DC}, P_{EMAX,EN-DC} \}$$

for sub-frame  $p$  on CG 1 overlapping with physical channel  $q$  on CG 2 and with MPR<sub>tot</sub> and A-MPR<sub>tot</sub> in accordance with 6.2B.2.1 and sub-clause 6.2B.3.1, respectively.

The measured total maximum output power P<sub>UMAX</sub> over both CGs/RATs, measured over the transmission reference time duration is

$$P_{UMAX} = 10 \log_{10} [p_{UMAX,c,E-UTRA} + p_{UMAX,f,c,NR}],$$

where p<sub>UMAX,c,E-UTRA</sub> and p<sub>UMAX,c,NR</sub> denotes the measured output power of serving cell  $c$  for E-UTRA and NR respectively, expressed in linear scale.

For UEs indicating support of dynamicPowerSharing, the measured total configured maximum output power P<sub>UMAX</sub> shall be within the following bounds:

$$P_{CMAX,L} - T_{LOW}(P_{CMAX,L}) \leq P_{UMAX} \leq P_{CMAX,H} + T_{HIGH}(P_{CMAX,H})$$

with the tolerances T<sub>LOW</sub>(P<sub>CMAX,L</sub>) and T<sub>HIGH</sub>(P<sub>CMAX,H</sub>) for applicable values of P<sub>CMAX,L</sub> and P<sub>CMAX,H</sub> specified in Table 6.2B.4.1.1-2.

When an UL subframe transmission  $p$  from E-UTRA overlap with a physical channel  $q$  from the NR, then for  $P_{UMAX}$  evaluation, the E-UTRA subframe  $p$  is taken as reference period  $T_{REF}$  and always considered as the reference measurement duration and the following rules are applicable.

$T_{REF}$  and  $T_{eval}$  are specified in Table 6.2B.4.1.1-1 when same or different subframes and physical channel durations are used in aggregated carriers.  $P_{PowerClass\_EN-DC}$  shall not be exceeded by the UE during any evaluation period of time.

**Table 6.2B.4.1.1-1:  $P_{CMAX}$  evaluation window**

| transmission duration                                     | $T_{REF}$    | $T_{eval}$  |
|---|--------------|---|
| Different transmission duration in different RAT carriers | LTE Subframe | $\text{Min}(T_{no\_hopping}, \text{Physical Channel Length})$ |

For each  $T_{REF}$ , the  $P_{CMAX\_H}$  is evaluated per  $T_{eval}$  and given by the maximum value over the transmission(s) within the  $T_{eval}$  as follows:

$$P_{CMAX\_H} = \text{MAX} \{ P_{CMAX\_EN-DC\_H}(p,q), P_{CMAX\_EN-DC\_H}(p,q+I), \dots, P_{CMAX\_EN-DC\_H}(p,q+n) \}$$

where  $P_{CMAX\_EN-DC\_H}$  are the applicable upper limits for each overlapping scheduling unit pairs  $(p,q)$ ,  $(p,q+I)$ , up to  $(p,q+n)$  for each applicable  $T_{eval}$  duration, where  $q+n$  is the last NR UL physical channel overlapping with LTE subframe  $p$ .

While  $P_{CMAX\_L}$  is computed as follows:

$$P_{CMAX\_L} = \text{MIN} \{ P_{CMAX\_EN-DC\_L}(p,q), P_{CMAX\_EN-DC\_L}(p,q+I), \dots, P_{CMAX\_EN-DC\_L}(p,q+n) \}$$

where  $P_{CMAX\_EN-DC\_L}$  are the applicable lower limits for each overlapping scheduling unit pairs  $(p,q)$ ,  $(p,q+I)$ , up to  $(p,q+n)$  for each applicable  $T_{eval}$  duration, where  $q+n$  is the last NR UL physical channel overlapping with LTE subframe  $p$ .

With

$$P_{CMAX\_EN-DC\_H}(p,q) = \text{MIN} \{ 10 \log_{10} [p_{CMAX\_H\_E-UTRA,c}(p) + p_{CMAX\_H,f,c,NR,c}(q)], P_{EMAX,EN-DC}, P_{PowerClass,EN-DC} \}$$

And:

$$a = 10 \log_{10} [p_{CMAX\_E-UTRA,c}(p) + p_{CMAX,f,c,NR}(q)] > P_{EN-DC,tot\_L}$$

$$b = 10 \log_{10} [p_{CMAX\_E-UTRA,c}(p) + p_{CMAX,f,c,NR}(q) / X\_scale] > P_{EN-DC,tot\_L}$$

If  $a = \text{FALSE}$  and the configured transmission power spectral density between the MCG and SCG differs by less than [6] dB

$$P_{CMAX\_EN-DC\_L}(p,q) = \text{MIN} \{ 10 \log_{10} [p_{CMAX\_L\_E-UTRA,c}(p) + p_{CMAX\_L,f,c,NR,c}(q)], P_{EMAX,EN-DC}, P_{PowerClass,EN-DC} \}$$

ELSE If  $(a=\text{TRUE})$  AND  $(b=\text{FALSE})$  and the configured transmission power spectral density between the MCG and SCG differs by less than [6] dB

$$P_{CMAX\_EN-DC\_L}(p,q) = \text{MIN} \{ 10 \log_{10} [p_{CMAX\_L\_E-UTRA,c}(p) + p_{CMAX\_L,f,c,NR,c}(q) / X\_scale], P_{EMAX,EN-DC}, P_{PowerClass,EN-DC} \}$$

ELSE If  $b = \text{TRUE}$  or the configured transmission power spectral density between the MCG and SCG differs by more than [6] dB

$$P_{CMAX\_EN-DC\_L}(p,q) = \text{MIN} \{ 10 \log_{10} [p_{CMAX\_L\_E-UTRA,c}(p)], P_{EMAX,EN-DC}, P_{PowerClass,EN-DC} \}$$

where

- $p_{CMAX\_H\_E-UTRA,c}(p)$  is the E-UTRA higher limit of the maximum configured power expressed in linear scale;
- $p_{CMAX\_H\_NR,c}(q)$  is the NR higher limit of the maximum configured power expressed in linear scale;
- $p_{CMAX\_L\_E-UTRA,c}(p)$  is the E-UTRA lower limit of the maximum configured power expressed in linear scale;
- $p_{CMAX\_L\_NR,c}(q)$  is the NR lower limit of the maximum configured power expressed in linear scale;
- $P_{PowerClass,EN-DC}$  is defined in sub-clause 6.2B.1.1-1 for intra-band EN-DC;

- $X_{\text{scale}}$  is the linear value of  $X$  dB which is configured by RRC and can only take values  $[0, 6]$  dB
- $P_{\text{CMAX\_E-UTRA},c}(p)$  is the linear value of  $P_{\text{CMAX\_E-UTRA},c}(p)$ , the real configured max power for LTE
- $P_{\text{CMAX},f,c, NR}(q)$  is the linear value of  $P_{\text{CMAX},f,c, NR}(q)$ , the real configured max power of NR

**Table 6.2B.4.1.1-2:  $P_{\text{CMAX}}$  tolerance for Dual Connectivity LTE-NR**

| $P_{\text{CMAX}}(\text{dBm})$     | Tolerance<br>$T_{\text{LOW}}(P_{\text{CMAX\_L}})$ (dB) | Tolerance<br>$T_{\text{HIGH}}(P_{\text{CMAX\_H}})$ (dB) |
|-----------------------------------|--|---|
| $23 \leq P_{\text{CMAX}} \leq 33$ | [3.0]  | [2.0]   |
| $22 \leq P_{\text{CMAX}} < 23$    | [5.0]  | [2.0]   |
| $21 \leq P_{\text{CMAX}} < 22$    | [5.0]  | [3.0]   |
| $20 \leq P_{\text{CMAX}} < 21$    | [6.0]  | [4.0]   |
| $16 \leq P_{\text{CMAX}} < 20$    |  | [5.0]   |
| $11 \leq P_{\text{CMAX}} < 16$    |  | [6.0]   |
| $-40 \leq P_{\text{CMAX}} < 11$   |  | [7.0]   |

If the UE supports dynamic power sharing, and when LTE and NR transmissions overlap and the condition (If (a=TRUE) AND (b=FALSE)) is met, SCG shall be transmitted and the following supplementary minimum requirement apply for the measured SCG power,  $P_{\text{UMAX},f,c, NR}(q)$ , under nominal conditions and unless otherwise stated

$$10\log(p_{\text{CMAX\_L},f,c, NR}(q)/X_{\text{scale}}) - T_{\text{LOW}}(10\log(p_{\text{CMAX\_L},f,c, NR}(q)/X_{\text{scale}})) \leq P_{\text{UMAX},f,c, NR}(q) \leq 10\log(p_{\text{CMAX\_H},f,c, NR}(q)) + T_{\text{HIGH}}(10\log(p_{\text{CMAX\_H},f,c, NR}(q)))$$

with the tolerances  $T_{\text{LOW}}$  and  $T_{\text{HIGH}}$  for applicable values of  $P_{\text{CMAX}}$  specified in Table 6.2B.4.1.1-2.

If the UE supports dynamic power sharing, the measured maximum output power in subframe  $p$  on CG 1,  $p_{\text{UMAX},c,E-UTRA}$ , shall meet the requirements in subclause 6.2.5 in [4] with the limits  $P_{\text{CMAX\_L},c}$  and  $P_{\text{CMAX\_H},c}$  replaced by  $P_{\text{CMAX\_L},E-UTRA,c}$  and  $P_{\text{CMAX\_H},E-UTRA,c}$  as specified above, respectively.

If the configured transmission power spectral density between the MCG and SCG differs by more than [6] dB, then

$$P_{\text{UMAX},f,c, NR}(q) \leq 10\log(p_{\text{CMAX\_H},f,c, NR}(q)) + T_{\text{HIGH}}(10\log(p_{\text{CMAX\_H},f,c, NR}(q)))$$

### 6.2B.4.1.2 Intra-band non-contiguous EN-DC

The following requirements apply for one component carrier per CG configured for synchronous DC. The CG(s) are indexed by  $j = 1$  for MCG and  $j = 2$  for SCG.

The configured maximum output power  $P_{\text{CMAX\_E-UTRA},c}(p)$  in sub-frame  $p$  for the configured E-UTRA uplink carrier shall be set in accordance with sub-clause 6.2B.4.1.1 but where

- for a UE not indicating support of dynamicPowerSharing, the  $A\text{-MPR}_c$  determined in accordance with sub-clause 6.2B.3.2 with parameters applicable for UEs not indicating support of dynamicPowerSharing and  $\text{MPR}_c = 0$  dB;

whenever NS\_01 is not indicated within CG 1 while

- for a UE not indicating support of dynamicPowerSharing, the  $\text{MPR}_c$  determined in accordance with sub-clause 6.2B.2.2 with parameters applicable for UEs not indicating support of dynamicPowerSharing and  $A\text{-MPR}_c = 0$  dB;

whenever NS\_01 is indicated in CG 1.

The configured maximum output power  $P_{\text{CMAX\_NR},c}(q)$  in physical channel  $q$  for the configured NR carrier shall be set in accordance with sub-clause 6.2B.4.1.1 but where

- for a UE indicating support of dynamicPowerSharing,  $A\text{-MPR}_c = A\text{-MPR}'_c$  with  $A\text{-MPR}'_c$  determined in accordance with sub-clause 6.2B.3.2 and  $\text{MPR}_c = 0$  dB if transmission(s) in subframe  $p$  on CG 1 overlap in time with physical channel  $q$  on CG 2;
- for a UE indicating support of dynamicPowerSharing,  $A\text{-MPR}_c$  is determined in accordance with [2] if transmission(s) in subframe  $p$  on CG 1 does not overlap in time with physical channel  $q$  on CG 2;

- for a UE not indicating support of dynamicPowerSharing, the A-MPR<sub>c</sub> is determined in accordance with sub-clause 6.2B.3.2 with parameters applicable for UEs not indicating support of dynamicPowerSharing and MPR<sub>c</sub> = 0 dB;

whenever NS\_01 is not indicated in CG 2 while

- for a UE indicating support of dynamicPowerSharing, MPR<sub>c</sub> = MPR'<sub>c</sub> with MPR'<sub>c</sub> determined in accordance with sub-clause 6.2B.2.2 and A-MPR<sub>c</sub> = 0 dB if transmission(s) in subframe  $p$  on CG 1 overlap in time with physical channel  $q$  on CG 2;
- for a UE indicating support of dynamicPowerSharing, MPR<sub>c</sub> is determined in accordance with [2] if transmission(s) in subframe  $p$  on CG 1 does not overlap in time with physical channel  $q$  on CG 2;
- for a UE not indicating support of dynamicPowerSharing, the MPR<sub>c</sub> is determined in accordance with sub-clause 6.2B.2.2 with parameters applicable for UEs not indicating support of dynamicPowerSharing and A-MPR<sub>c</sub> = 0 dB;

whenever NS\_01 is indicated in CG 2.

For UEs indicating support of dynamicPowerSharing in the *UE-MRDC-Capability IE*, the UE can configure the total transmission power in accordance with sub-clause 6.2B.4.1.1 but with P<sub>powerclass,EN-DC</sub> the EN-DC power class of the intra-band non-contiguous band combination configured and A-MPR determined in accordance with sub-clause 6.2B.3.2.

The total maximum output power P<sub>UMAX</sub> over both CGs is measured in accordance with sub-clause 6.2B.4.1.1 and shall be within the limits specified in sub-clause 6.2B.4.1.1 but with parameters applicable for the non-contiguous band combination configured.

*The maximum output power levels p<sub>UMAX,c,E-UTRA</sub> and p<sub>UMAX,f,c,NR</sub> for the CGs are measured in accordance with sub-clause 6.2B.4.1.1 and shall be within the limits specified in sub-clause 6.2B.4.1.1 but with parameters applicable for the non-contiguous band combination configured.*

### 6.2B.4.1.3 Inter-band EN-DC within FR1

For inter-band dual connectivity with one uplink serving cell per CG on E-UTRA and NR respectively, the UE is allowed to set its configured maximum output power P<sub>CMAX,c(i),i</sub> for serving cell  $c(i)$  of CG  $i$ ,  $i = 1,2$ , and its total configured maximum transmission power for EN-DC operation,  $\hat{P}_{Total}^{EN-DC}$ .

The configured maximum output power P<sub>CMAX\_E-UTRA,c</sub>( $p$ ) in sub-frame  $p$  for the configured E-UTRA uplink carrier shall be set within the bounds:

$$P_{CMAX\_L\_E-UTRA,c}(p) \leq P_{CMAX\_E-UTRA,c}(p) \leq P_{CMAX\_H\_E-UTRA,c}(p)$$

where P<sub>CMAX\_L\_E-UTRA,c</sub> and P<sub>CMAX\_H\_E-UTRA,c</sub> are the limits for a serving cell  $c$  as specified in TS 36.101 [4] sub-clause 6.2.5 modified by P<sub>LTE</sub> as follows:

$$P_{CMAX\_L\_E-UTRA,c} = \text{MIN} \{ P_{EMAX, EN-DC}, (P_{PowerClass, EN-DC} - \Delta P_{PowerClass, EN-DC}), \text{MIN}(P_{EMAX,c}, P_{LTE}) - \Delta T_{C\_E-UTRA, c}, (P_{PowerClass} - \Delta P_{PowerClass}) - \text{MAX}(MPR_c + A-MPR_c + \Delta T_{IB,c} + \Delta T_{C\_E-UTRA, c} + \Delta T_{ProSe}, P-MPR_c) \}$$

$$P_{CMAX\_H\_E-UTRA,c} = \text{MIN} \{ P_{EMAX,c}, P_{EMAX, EN-DC}, (P_{PowerClass, EN-DC} - \Delta P_{PowerClass, EN-DC}), P_{LTE}, P_{PowerClass} - \Delta P_{PowerClass} \}$$

The configured maximum output power P<sub>CMAX\_NR,c</sub>( $q$ ) in physical-channel  $q$  for the configured NR carrier shall be set within the bounds:

$$P_{CMAX\_L\_f,c,NR}(q) \leq P_{CMAX\_f,c,NR}(q) \leq P_{CMAX\_H\_f,c,NR}(q)$$

where P<sub>CMAX\_L\_f,c,NR</sub> and P<sub>CMAX\_H\_f,c,NR</sub> are the limits for a serving cell  $c$  as specified in sub-clause 6.2.4 of TS 38.101-1 [2] modified by P<sub>NR</sub> as follows:

$$P_{CMAX\_L\_f,c,NR} = \text{MIN} \{ P_{EMAX, EN-DC}, (P_{PowerClass, EN-DC} - \Delta P_{PowerClass, EN-DC}), \text{MIN}(P_{EMAX,c}, P_{NR}) - \Delta T_{C\_NR, c}, (P_{PowerClass} - \Delta P_{PowerClass}) - \text{MAX}(MPR_c + A-MPR_c + \Delta T_{IB,c} + \Delta T_{C\_NR, c} + \Delta T_{RxSRS}, P-MPR_c) \}$$

$$P_{CMAX\_H\_f,c,NR} = \text{MIN} \{ P_{EMAX,c}, P_{EMAX, EN-DC}, (P_{PowerClass, EN-DC} - \Delta P_{PowerClass, EN-DC}), P_{NR}, P_{PowerClass} - \Delta P_{PowerClass} \}$$

- P<sub>LTE</sub> signalled by RRC as p-MaxEUTRA in [36.331]



- $P_{NR}$  signalled by RRC as p-NR-FR1 defined in [38.331]
- $\Delta T_{c,E-UTRA,c} = 1.5\text{dB}$  when NOTE 2 in Table 6.2.2-1 in TS 36.101 [4] applies for a serving cell  $c$ , otherwise  $\Delta T_{c,E-UTRA,c} = 0\text{dB}$ ;
- $\Delta T_{c,NR,c} = 1.5\text{dB}$  when NOTE 3 in Table 6.2.1-1 in TS 38.101-1 [2] applies for a serving cell  $c$ , otherwise  $\Delta T_{c,NR,c} = 0\text{dB}$ ;
- $\Delta T_{IB,c}$  specified in sub-clause 6.2.7 for EN-DC, the individual Power Class defined in table 6.2B.1-3 and any other additional power reductions parameters specified in sub-clauses 6.2.3 and 6.2.4 for EN-DC are applicable to  $P_{CMAX,E-UTRA,c}$  and  $P_{CMAX,NR,c}$  evaluations.
- $\Delta P_{PowerClass,EN-DC} = 3\text{ dB}$  for a power class 2 capable EN-DC UE when LTE UL/DL configuration is 0 or 6; or LTE UL/DL configuration is 1 and special subframe configuration is 0 or 5; or the IE *p-maxUE-FR1* as defined in TS 38.331 [7] is provided and set to the maximum output power of the default power class or lower; otherwise  $\Delta P_{PowerClass,EN-DC} = 0\text{ dB}$ ;

If the transmissions from NR and E-UTRA do not overlap, then the complete sub-clauses for configured transmitted power for E-UTRA and NR respectively from their own specifications apply with the modifications specified above. The lower value between  $P_{PowerClass, EN-DC}$  or  $P_{EMAX, EN-DC}$  shall not be exceeded at any time by UE.

The total configured maximum transmission power for both synchronous and non-synchronous operation is

$$P_{EN-DC\_Total} = \text{MIN} \{ P_{EMAX, EN-DC}, P_{PowerClass, EN-DC} - \Delta P_{PowerClass, EN-DC} \}$$

$P_{EN-DC\_Total}$  is the dB value of  $\hat{P}_{Total}^{EN-DC}$ , which is used in [38.213] and  $P_{EMAX, EN-DC}$  is p-maxUE-FR1-r15 value signaled by RRC and defined in [36.331];

If the UE does not support dynamic power sharing,

$$P_{EN-DC\_Total} = \text{MIN} \{ P_{EMAX, EN-DC}, P_{PowerClass, EN-DC} - \Delta P_{PowerClass, EN-DC} \} + 0.3\text{ dB}$$

If the EN-DC UE does not support dynamic power sharing, then the complete sub-clauses for configured transmitted power for E-UTRA and NR respectively from their own specifications TS 36.101 [4] and TS 38.101-1 [2] respectively apply with the modifications specified above and  $P_{EN-DC\_Total}$  applies.

When a UE supporting dynamic sharing is configured for overlapping E-UTRA uplink and NR uplink transmissions, the UE can set its configured maximum output power  $P_{CMAX,E-UTRA,c}$  and  $P_{CMAX,NR,c}$  for the configured E-UTRA and NR uplink carriers, respectively, and its configured maximum transmission power for EN-DC operation,  $\hat{P}_{Total}^{EN-DC}$ , as specified above.

The measured total maximum output power  $P_{UMAX}$  over both CGs/RATs, measured over the transmission reference time duration is

$$P_{UMAX} = 10 \log_{10} [p_{UMAX,c,E-UTRA} + p_{UMAX,c,NR}],$$

where  $p_{UMAX,c,E-UTRA}$  and  $p_{UMAX,c,NR}$  denotes the measured output power of serving cell  $c$  for E-UTRA and NR respectively, expressed in linear scale.

The measured total configured maximum output power  $P_{UMAX}$  shall be within the following bounds:

$$P_{CMAX,L} - T_{LOW}(P_{CMAX,L}) \leq P_{UMAX} \leq P_{CMAX,H} + T_{HIGH}(P_{CMAX,H})$$

with the tolerances  $T_{LOW}(P_{CMAX,H})$  and  $T_{HIGH}(P_{CMAX,H})$  for applicable values of  $P_{CMAX}$  specified in Table 6.2B.4.1.3-2.

When an UL subframe transmission  $p$  from E-UTRA overlap with a physical-channel  $q$  from the NR, then for  $P_{UMAX}$  evaluation, the E-UTRA subframe  $p$  is taken as reference period  $T_{REF}$  and always considered as the reference measurement duration and the following rules are applicable.

$T_{REF}$  and  $T_{eval}$  are specified in Table 6.2B.4.1.3-1 when same or different subframe and physical-channel durations are used in aggregated carriers.  $P_{PowerClass, EN-DC}$  shall not be exceeded by the UE during any evaluation period of time.

**Table 6.2B.4.1.3-1: P<sub>CMAX</sub> evaluation window**

| transmission duration                                     | T <sub>REF</sub> | T <sub>eval</sub>                                      |
|---|------------------|--|
| Different transmission duration in different RAT carriers | LTE Subframe     | Min(T <sub>no_hopping</sub> , Physical Channel Length) |

For each T<sub>REF</sub>, the P<sub>CMAX\_H</sub> is evaluated per T<sub>eval</sub> and given by the maximum value over the transmission(s) within the T<sub>eval</sub> as follows:

$$P_{CMAX\_H} = \text{MAX} \{ P_{CMAX\_EN-DC\_H}(p,q), P_{CMAX\_EN-DC\_H}(p,q+I), \dots, P_{CMAX\_EN-DC\_H}(p,q+n) \}$$

where P<sub>CMAX\_EN-DC\_H</sub> are the applicable upper limits for each overlapping scheduling unit pairs (p,q), (p, q+I), up to (p, q+n) for each applicable T<sub>eval</sub> duration, where q+n is the last NR UL physical-channel overlapping with LTE subframe p.

While P<sub>CMAX\_L</sub> is computed as follows:

$$P_{CMAX\_L} = \text{MIN} \{ P_{CMAX\_EN-DC\_L}(p,q), P_{CMAX\_EN-DC\_L}(p,q+I), \dots, P_{CMAX\_EN-DC\_L}(p,q+n) \}$$

where P<sub>CMAX\_EN-DC\_L</sub> are the applicable lower limits for each overlapping scheduling unit pairs (p,q), (p, q+I), up to (p, q+n) for each applicable T<sub>eval</sub> duration, where q+n is the last NR UL physical-channel overlapping with LTE subframe p,

With

$$P_{CMAX\_EN-DC\_H}(p,q) = \text{MIN} \{ 10 \log_{10} [p_{CMAX\_H\_E-UTRA,c}(p) + p_{CMAX\_H,f,c,NR,c}(q)], P_{EMAX, EN-DC}, P_{PowerClass, EN-DC} \}$$

And:

$$a = 10 \log_{10} [p_{CMAX\_E-UTRA,c}(p) + p_{CMAX,f,c,NR}(q)] > P_{EN-DC\_Total}$$

$$b = 10 \log_{10} [p_{CMAX\_E-UTRA,c}(p) + p_{CMAX,f,c,NR}(q) / X\_scale] > P_{EN-DC\_Total}$$

If a= FALSE

$$P_{CMAX\_EN-DC\_L}(p,q) = \text{MIN} \{ 10 \log_{10} [p_{CMAX\_L\_E-UTRA,c}(p) + p_{CMAX\_L,f,c,NR,c}(q)], P_{EMAX, EN-DC}, P_{PowerClass, EN-DC} \}$$

ELSE If (a=TRUE) AND (b=FALSE)

$$P_{CMAX\_EN-DC\_L}(p,q) = \text{MIN} \{ 10 \log_{10} [p_{CMAX\_L\_E-UTRA,c}(p) + p_{CMAX\_L,f,c,NR,c}(q) / X\_scale ], P_{EMAX, EN-DC}, P_{PowerClass, EN-DC} \}$$

ELSE If b= TRUE

$$P_{CMAX\_EN-DC\_L}(p,q) = \text{MIN} \{ 10 \log_{10} [p_{CMAX\_L\_E-UTRA,c}(p) ], P_{EMAX, EN-DC}, P_{PowerClass, EN-DC} \}$$

where

- p<sub>CMAX\_H\_E-UTRA,c</sub>(p) is the E-UTRA higher limit of the maximum configured power expressed in linear scale;
- p<sub>CMAX\_H\_NR,c</sub>(q) is the NR higher limit of the maximum configured power expressed in linear scale;
- p<sub>CMAX\_L\_E-UTRA,c</sub>(p) is the E-UTRA lower limit of the maximum configured power expressed in linear scale;
- p<sub>CMAX\_L\_NR,c</sub>(q) is the NR lower limit of the maximum configured power expressed in linear scale;
- P<sub>PowerClass, EN-DC</sub> is defined in sub-clause 6.2B.1.3-1 for inter-band EN-DC;
- X<sub>scale</sub> is the linear value of X dB which is configured by RRC and can only take values [0, 6]
- p<sub>CMAX\_E-UTRA,c</sub>(p) is the linear value of P<sub>CMAX\_E-UTRA,c</sub>(p), the real configured max power for LTE
- p<sub>CMAX,f,c,NR</sub>(q) is the linear value of P<sub>CMAX,f,c,NR</sub>(q), the real configured max power of NR

**Table 6.2B.4.1.3-2: P<sub>CMAX</sub> tolerance for Dual Connectivity LTE-NR**

| P <sub>CMAX</sub> (dBm)   | Tolerance<br>T <sub>LOW</sub> (P <sub>CMAX_L</sub> ) (dB) | Tolerance<br>T <sub>HIGH</sub> (P <sub>CMAX_H</sub> ) (dB) |
|---|---|--|
| 23 ≤ P <sub>CMAX</sub> ≤ 33   | [3.0]   | [2.0]  |
| 22 ≤ P <sub>CMAX</sub> < 23   | [5.0]   | [2.0]  |
| 21 ≤ P <sub>CMAX</sub> < 22   | [5.0]   | [3.0]  |
| 20 ≤ P <sub>CMAX</sub> < 21   | [6.0]   | [4.0]  |
| 16 ≤ P <sub>CMAX</sub> < 20   | [5.0]   |  |
| 11 ≤ P <sub>CMAX</sub> < 16   | [6.0]   |  |
| -40 ≤ P <sub>CMAX</sub> < 11  | [7.0]   |  |
| NOTE 1: For UEs not indicating support of dynamic power sharing, the upper tolerance T <sub>high</sub> shall be reduced by 0.3 dB for P ≥ 20 dBm. |   |  |

When LTE and NR transmissions overlap and the condition (If (a=TRUE) AND (b=FALSE)) is met, SCG shall be transmitted and the following supplementary minimum requirement apply for the measured SCG power, P<sub>UMAX,f,c,NR</sub>(q), under nominal conditions.

$$10\log(p_{\text{CMAX}_{L,f,c,NR}}(q)/X_{\text{scale}}) - T_{\text{LOW}}(10\log(p_{\text{CMAX}_{L,f,c,NR}}(q)/X_{\text{scale}})) \leq P_{\text{UMAX},f,c,NR}(q) \leq 10\log(p_{\text{CMAX}_{H,f,c,NR}}(q)) + T_{\text{HIGH}}(10\log(p_{\text{CMAX}_{H,f,c,NR}}(q))).$$

with the tolerances T<sub>LOW</sub> and T<sub>HIGH</sub> for applicable values of P<sub>CMAX</sub> specified in Table 6.2B.4.1.3-2.

#### 6.2B.4.1.4 Inter-band EN-DC including FR2

For inter-band dual connectivity with one uplink serving cell per CG on E-UTRA and NR respectively, with NR configured in FR2, the UE is allowed to set its configured maximum output power P<sub>CMAX,c(i),i</sub> for serving cell c(i) of CG i, i = 1,2.

The UE maximum configured power P<sub>CMAX,c(i)</sub>, on E-UTRA for the subframe i shall be set according to subclause 6.2.5 from TS 36.101 [4]. Applicable inter-band ΔT<sub>IB,c</sub> parameters shall be used according to the subclauses 6.2B.4.2.4 or 6.2B.4.2.5.

The UE maximum configured power P<sub>CMAX,c(j)</sub>, on NR for the slot j shall be set according to subclause 6.2.4 from TS 38.101-2 [3].

For the configured power measurements TS 36.101 [4] subclause 6.2.5 and TS 38.101-2 [3] subclause 6.2.4 are applicable.

#### 6.2B.4.1.5 Inter-band EN-DC including both FR1 and FR2

#### 6.2B.4.2 ΔT<sub>IB,c</sub> for EN-DC

For the UE which supports inter-band EN-DC configuration, ΔT<sub>IB,c</sub> in Tables below applies where unless otherwise stated, the same ΔT<sub>IB,c</sub> is applicable to NR band(s) part for DC configurations which have the same NR operating band combination. Unless otherwise stated, ΔT<sub>IB,c</sub> is set to zero.

##### 6.2B.4.2.1 Intra-band contiguous EN-DC

ΔT<sub>IB,c</sub> is not applicable for intra-band contiguous EN-DC.

##### 6.2B.4.2.2 Intra-band non-contiguous EN-DC

ΔT<sub>IB,c</sub> is not applicable for intra-band non-contiguous EN-DC.

6.2B.4.2.3 Inter-band EN-DC within FR1

6.2B.4.2.3.1  $\Delta T_{IB,c}$  for EN-DC two bands

**Table 6.2B.4.2.3.1-1:  $\Delta T_{IB,c}$  due to EN-DC(two bands)**

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta T_{B,c}$ (dB) |
|--------------------------------|-------------------|-----------------------|
| DC_1_n28                       | 1                 | 0.3                   |
|                                | n28               | 0.6                   |
| DC_1_n40                       | 1                 | 0.5                   |
|                                | n40               | 0.5                   |
| DC_1_n51                       | 1                 | 0.6                   |
|                                | n51               | 0.6                   |
| DC_1_n77                       | 1                 | 0.6                   |
|                                | n77               | 0.8                   |
| DC_1_n78                       | 1                 | 0.3                   |
|                                | n78               | 0.8                   |
| DC_2_n5                        | 2                 | 0.3                   |
|                                | n5                | 0.3                   |
| DC_2_n66                       | 2                 | 0.5                   |
|                                | n66               | 0.5                   |
| DC_2_n71                       | 2                 | 0.3                   |
|                                | n71               | 0.3                   |
| DC_2_n78                       | 2                 | 0.6                   |
|                                | n78               | 0.8                   |
| DC_3_n7                        | 3                 | 0.5                   |
|                                | n7                | 0.5                   |
| DC_3_n28                       | 3                 | 0.3                   |
|                                | n28               | 0.3                   |
| DC_3_n40                       | 3                 | 0.5                   |
|                                | n40               | 0.5                   |
| DC_3_n51                       | 3                 | 0.3                   |
|                                | n51               | 0.3                   |
| DC_3_n77                       | 3                 | 0.6                   |
|                                | n77               | 0.8                   |
| DC_3_n78                       | 3                 | 0.6                   |
|                                | n78               | 0.8                   |
| DC_5_n40                       | 5                 | 0.3                   |
|                                | n40               | 0.3                   |
| DC_5_n66                       | 5                 | 0.3                   |
|                                | n66               | 0.3                   |
| DC_5_n78                       | 5                 | 0.6                   |
|                                | n78               | 0.8                   |
| DC_7_n28                       | 7                 | 0.3                   |
|                                | n28               | 0.3                   |
| DC_7_n51                       | 7                 | 0.3                   |
|                                | n51               | 0.3                   |
| DC_7_n78                       | 7                 | 0.5                   |
|                                | n78               | 0.8                   |
| DC_8_n40                       | 8                 | 0.3                   |
|                                | n40               | 0.3                   |
| DC_8_n77                       | 8                 | 0.6                   |
|                                | n77               | 0.8                   |
| DC_8_n78                       | 8                 | 0.6                   |
|                                | n77               | 0.8                   |
| DC_11_n77                      | 11                | 0.4                   |
|                                | n77               | 0.8                   |
| DC_11_n78                      | 11                | 0.4                   |
|                                | n78               | 0.8                   |
| DC_12_n5                       | 12                | 0.4                   |
|                                | n5                | 0.8                   |
| DC_12_n66                      | 12                | 0.8                   |
|                                | n66               | 0.3                   |
| DC_18_n77                      | 18                | 0.3                   |
|                                | n77               | 0.8                   |
| DC_18_n78                      | 18                | 0.3                   |
|                                | n78               | 0.8                   |
| DC_19_n77                      | 19                | 0.3                   |
|                                | n77               | 0.8                   |
| DC_19_n78                      | 19                | 0.3                   |

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta T_{B,c}$ (dB) |
|--------------------------------|-------------------|-----------------------|
|                                | n78               | 0.8                   |
| DC_20_n8                       | 20                | 0.4                   |
|                                | n8                | 0.4                   |
| DC_20_n28                      | 20                | 0.5                   |
|                                | n28               | 0.5                   |
| DC_20_n51                      | 20                | 0.5                   |
|                                | n51               | 0.5                   |
| DC_20_n77                      | 20                | 0.6                   |
|                                | n77               | 0.8                   |
| DC_20_n78                      | 20                | 0.6                   |
|                                | n78               | 0.8                   |
| DC_21_n77                      | 21                | 0.4                   |
|                                | n77               | 0.8                   |
| DC_21_n78                      | 21                | 0.4                   |
|                                | n78               | 0.8                   |
|                                | n77               | 0.8                   |
| DC_25_n41                      | 25                | 0.5                   |
|                                | n41               | 0.4 <sup>1</sup>      |
|                                |                   | 0.9 <sup>2</sup>      |
| DC_26_n41                      | 26                | 0.3                   |
|                                | n41               | 0.3                   |
| DC_26_n77                      | 26                | 0.3                   |
|                                | n77               | 0.8                   |
| DC_26_n78                      | 26                | 0.3                   |
|                                | n78               | 0.8                   |
| DC_28_n51                      | 28                | 0.5                   |
|                                | n51               | 0.5                   |
| DC_28_n77                      | 28                | 0.5                   |
|                                | n77               | 0.8                   |
| DC_28_n78                      | 28                | 0.5                   |
|                                | n78               | 0.8                   |
| DC_30_n5                       | 30                | 0.3                   |
|                                | n5                | 0.3                   |
| DC_30_n66                      | 30                | 0.5                   |
|                                | n66               | 0.8                   |
| DC_38_n78                      | n78               | 0.5                   |
| DC_39_n78                      | 39                | 0.3                   |
|                                | n78               | 0.8                   |
| DC_39_n79                      | 39                | 0.3                   |
|                                | n79               | 0.8                   |
| DC_40_n77                      | n77               | 0.5                   |
| DC_41_n77                      | 41                | 0.3                   |
|                                | n77               | 0.8                   |
| DC_41_n78                      | 41                | 0.3                   |
|                                | n78               | 0.8                   |
| DC_41_n79                      | 41                | 0.3                   |
|                                | n79               | 0.8                   |
| DC_42_n51                      | 42                | 0.6                   |
|                                | n51               | 0.8                   |
| DC_66_n5                       | 66                | 0.3                   |
|                                | n5                | 0.3                   |
| DC_66_n71                      | 66                | 0.3                   |
|                                | n71               | 0.3                   |
| DC_66_n78                      | 66                | 0.6                   |
|                                | n78               | 0.8                   |

NOTE 1: The requirement is applied for UE transmitting on the frequency range of 2545-2690 MHz.  
NOTE 2: The requirement is applied for UE transmitting on the frequency range of 2496-2545 MHz.

6.2B.4.2.3.2  $\Delta T_{IB,c}$  for EN-DC three bands

**Table 6.2B.4.2.3.2-1:  $\Delta T_{IB,c}$  due to EN-DC (three bands)**

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta T_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
| DC_1-3_n28                     | 1                 | 0.3                    |
|                                | 3                 | 0.3                    |
|                                | n28               | 0.6                    |
| DC_1-3_n77                     | 1                 | 0.6                    |
|                                | 3                 | 0.6                    |
|                                | n77               | 0.8                    |
| DC_1-3_n78                     | 1                 | 0.6                    |
|                                | 3                 | 0.6                    |
|                                | n78               | 0.8                    |
| DC_1-3_n79                     | 1                 | 0.3                    |
|                                | 3                 | 0.3                    |
| DC_1-5_n78                     | 1                 | 0.3                    |
|                                | 5                 | 0.6                    |
|                                | n78               | 0.8                    |
| DC_1-7_n28                     | 1                 | 0.5                    |
|                                | 7                 | 0.6                    |
|                                | n28               | 0.6                    |
| DC_1-7_n78                     | 1                 | 0.6                    |
|                                | 7                 | 0.6                    |
|                                | n78               | 0.8                    |
| DC_1-7-7_n78                   | 1                 | 0.6                    |
|                                | 7                 | 0.6                    |
|                                | n78               | 0.8                    |
| DC_1-8_n78                     | 1                 | 0.3                    |
|                                | 8                 | 0.6                    |
|                                | n78               | 0.8                    |
| DC_1-18_n77                    | 1                 | 0.3                    |
|                                | 18                | 0.3                    |
|                                | n77               | 0.8                    |
| DC_1-18_n78                    | 1                 | 0.3                    |
|                                | 18                | 0.3                    |
|                                | n78               | 0.8                    |
| DC_1-19_n77                    | 1                 | 0.3                    |
|                                | 19                | 0.3                    |
|                                | n77               | 0.8                    |
| DC_1-19_n78                    | 1                 | 0.3                    |
|                                | 19                | 0.3                    |
|                                | n78               | 0.8                    |
| DC_1-19_n79                    | 1                 | 0.3                    |
|                                | 19                | 0.3                    |
| DC_1-20_n28                    | 1                 | 0.3                    |
|                                | 20                | 0.6                    |
|                                | n28               | 0.6                    |
| DC_1-20_n78                    | 1                 | 0.3                    |
|                                | 20                | 0.3                    |
|                                | n78               | 0.8                    |
| DC_1-21_n77                    | 1                 | 0.3                    |
|                                | 21                | 0.3                    |
|                                | n77               | 0.8                    |
| DC_1-21_n78                    | 1                 | 0.6                    |
|                                | 21                | 0.4                    |
|                                | n78               | 0.8                    |
| DC_1-21_n79                    | 1                 | 0.3                    |
|                                | 21                | 0.3                    |
| DC_1-41_n77                    | 1                 | 0.5                    |
|                                | 41                | 0.5                    |
|                                | n77               | 0.8                    |
| DC_1-41_n78                    | 1                 | 0.5                    |
|                                | 41                | 0.5                    |
|                                | n78               | 0.8                    |
| DC_1-41_n79                    | 1                 | 0.5                    |
|                                | 41                | 0.5                    |
| DC_1-28_n77                    | 1                 | 0.3                    |



| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta T_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
|                                | 28                | 0.6                    |
|                                | n77               | 0.8                    |
| DC_1-28_n78                    | 1                 | 0.3                    |
|                                | 28                | 0.6                    |
|                                | n78               | 0.8                    |
| DC_1_n28-n78                   | 1                 | 0.3                    |
|                                | n28               | 0.6                    |
|                                | n78               | 0.8                    |
| DC_1_n28-n79                   | 1                 | 0.3                    |
|                                | n28               | 0.3                    |
| DC_1-42_n77                    | 1                 | 0.6                    |
|                                | 42                | 0.8                    |
|                                | n77               | 0.8                    |
| DC_1-42_n78                    | 1                 | 0.3                    |
|                                | 42                | 0.8                    |
|                                | n78               | 0.8                    |
| DC_1-42_n79                    | 1                 | 0.3                    |
|                                | 42                | 0.8                    |
| DC_1_SUL_n78-n84               | 1                 | 0.3                    |
|                                | n78               | 0.8                    |
|                                | n84               | 0.3                    |
| DC_1_n77-n79                   | 1                 | 0.6                    |
|                                | n77               | 0.8                    |
|                                | n79               | 0                      |
| DC_1_n78-n79                   | 1                 | 0.3                    |
|                                | n78               | 0.8                    |
|                                | n79               | 0.5                    |
| DC_2-(n)71                     | 2                 | 0.3                    |
|                                | 71                | 0.3                    |
|                                | n71               |                        |
| DC_2-5_n66                     | 2                 | 0.5                    |
|                                | 5                 | 0.3                    |
|                                | n66               | 0.5                    |
| DC_2-30_n66                    | 2                 | 0.5                    |
|                                | 30                | 0.3                    |
|                                | n66               | 0.5                    |
| DC_2-66_n71                    | 2                 | 0.5                    |
|                                | 66                | 0.5                    |
|                                | n71               | 0.3                    |
| DC_3_n3-n77                    | 3                 | 0.6                    |
|                                | n3                | 0.6                    |
|                                | n77               | 0.8                    |
| DC_3_n3-n78                    | 3                 | 0.6                    |
|                                | n3                | 0.6                    |
|                                | n78               | 0.8                    |
| DC_3-5_n78                     | 3                 | 0.6                    |
|                                | 5                 | 0.6                    |
|                                | n78               | 0.8                    |
| DC_3-7_n28                     | 3                 | 0.5                    |
|                                | 7                 | 0.5                    |
|                                | n28               | 0.3                    |
| DC_3-7_n78, DC_3-7-7_n78       | 3                 | 0.6                    |
|                                | 7                 | 0.6                    |
|                                | n78               | 0.8                    |
| DC_3-8_n78                     | 3                 | 0.6                    |
|                                | 8                 | 0.6                    |
|                                | n78               | 0.8                    |
| DC_3-19_n77                    | 3                 | 0.6                    |
|                                | 19                | 0.3                    |
|                                | n77               | 0.8                    |
| DC_3-19_n78                    | 3                 | 0.6                    |
|                                | 19                | 0.3                    |
|                                | n78               | 0.8                    |

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta T_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
| DC_3-19_n79                    | 3                 | 0.3                    |
|                                | 19                | 0.3                    |
| DC_3-20_n28                    | 3                 | 0.3                    |
|                                | 20                | 0.5                    |
|                                | n28               | 0.5                    |
| DC_3-20_n78                    | 3                 | 0.5                    |
|                                | 20                | 0.3                    |
|                                | n78               | 0.8                    |
| DC_3-21_n77                    | 3                 | 0.8                    |
|                                | 21                | 0.9                    |
|                                | n77               | 0.8                    |
| DC_3-21_n78                    | 3                 | 0.8                    |
|                                | 21                | 0.9                    |
|                                | n78               | 0.8                    |
| DC_3-21_n79                    | 3                 | 0.8                    |
|                                | 21                | 0.9                    |
| DC_3-28_n78                    | 3                 | 0.5                    |
|                                | 28                | 0.3                    |
|                                | n78               | 0.8                    |
| DC_3_n28-n78                   | 3                 | 0.5                    |
|                                | n28               | 0.3                    |
|                                | n78               | 0.8                    |
| DC_3-38_n78                    | 3                 | 0.6                    |
|                                | n78               | 0.8                    |
| DC_3-41_n78                    | 3                 | 0.6                    |
|                                | 41                | 0.3 <sup>1</sup>       |
|                                | n78               | 0.8 <sup>2</sup>       |
| DC_3-42_n77                    | 3                 | 0.6                    |
|                                | 42                | 0.8                    |
|                                | n77               | 0.8                    |
| DC_3-42_n78                    | 3                 | 0.6                    |
|                                | 42                | 0.8                    |
|                                | n78               | 0.8                    |
| DC_3-42_n79                    | 3                 | 0.6                    |
|                                | 42                | 0.8                    |
| DC_3_n77-n79                   | 3                 | 0.6                    |
|                                | n77               | 0.8                    |
|                                | n79               | 0                      |
| DC_3_n78-n79                   | 3                 | 0.6                    |
|                                | n78               | 0.8                    |
|                                | n79               | 0.5                    |
| DC_3_SUL_n78-n80               | 3                 | 0.6                    |
|                                | n78               | 0.8                    |
|                                | n80               | 0.6                    |
| DC_3_SUL_n78-n82               | 3                 | 0.5                    |
|                                | n78               | 0.8                    |
|                                | n82               | 0.3                    |
| DC_5-7_n78, DC_5-7-7_n78       | 5                 | 0.6                    |
|                                | 7                 | 0.6                    |
|                                | n78               | 0.8                    |
| DC_5-30_n66                    | 5                 | 0.3                    |
|                                | 30                | 0.3                    |
|                                | n66               | 0.5                    |
| DC_7-7_n78                     | 7                 | 0.5                    |
|                                | n78               | 0.8                    |
| DC_7-20_n28                    | 7                 | 0.3                    |
|                                | 20                | 0.6                    |
|                                | n28               | 0.6                    |
| DC_7-20_n78                    | 7                 | 0.3                    |
|                                | 20                | 0.3                    |
|                                | n78               | 0.8                    |
| DC_7-28_n78                    | 7                 | 0.3                    |

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta T_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
|                                | 28                | 0.3                    |
|                                | n78               | 0.8                    |
| DC_7_n28-n78                   | 7                 | 0.3                    |
|                                | n28               | 0.3                    |
| DC_7-46_n78                    | n78               | 0.8                    |
|                                | 7                 | 0.5                    |
| DC_8_SUL_n78- n81              | n78               | 0.8                    |
|                                | 8                 | 0.6                    |
| DC_18-28_n77                   | n77               | 0.8                    |
|                                | 18                | 0.5                    |
| DC_18-28_n78                   | 28                | 0.5                    |
|                                | n78               | 0.8                    |
| DC_18-28_n79                   | 18                | 0.5                    |
|                                | 28                | 0.5                    |
| DC_19-21_n77                   | 19                | 0.3                    |
|                                | 21                | 0.4                    |
| DC_19-21_n78                   | n77               | 0.8                    |
|                                | 19                | 0.3                    |
| DC_19-21_n79                   | 21                | 0.4                    |
|                                | 19                | 0.3                    |
| DC_19-42_n77                   | 19                | 0.3                    |
|                                | 42                | 0.8                    |
| DC_19-42_n78                   | n77               | 0.8                    |
|                                | 19                | 0.3                    |
| DC_19-42_n79                   | 42                | 0.8                    |
|                                | 19                | 0.3                    |
| DC_19_n77-n79                  | n77               | 0.8                    |
|                                | n79               | 0                      |
| DC_19_n78-n79                  | 19                | 0.3                    |
|                                | n78               | 0.8                    |
| DC_20_n8-n75                   | n79               | 0.5                    |
|                                | 20                | 0.4                    |
| DC_20_n28-n75                  | n8                | 0.4                    |
|                                | 20                | 0.5                    |
| DC_20_n28-n78                  | n28               | 0.7                    |
|                                | 20                | 0.6                    |
| DC_20_n75-n78                  | n28               | 0.6                    |
|                                | n78               | 0.8                    |
| DC_20_n76-n78                  | 20                | 0.5                    |
|                                | n78               | 0.8                    |
| DC_20_SUL_n78-n82              | 20                | 0.6                    |
|                                | n78               | 0.8                    |
| DC_20_SUL_n78-n83              | n82               | 0.6                    |
|                                | 20                | 0.8                    |
| DC_21-42_n77                   | n78               | 0.8                    |
|                                | n83               | 0.8                    |
| DC_21-42_n78                   | 21                | 0.4                    |
|                                | 42                | 0.8                    |
|                                | n77               | 0.8                    |
|                                | 21                | 0.4                    |
|                                | 42                | 0.8                    |
|                                | n78               | 0.8                    |

| Inter-band EN-DC configuration  | E-UTRA or NR Band | $\Delta T_{IB,c}$ (dB) |
|---|-------------------|------------------------|
| DC_21-42_n79  | 21                | 0.4                    |
|   | 42                | 0.8                    |
| DC_21_n77-n79   | 21                | 0.4                    |
|   | n77               | 0.8                    |
|   | n79               | 0                      |
| DC_21_n78-n79   | 21                | 0.4                    |
|   | n78               | 0.8                    |
|   | n79               | 0.5                    |
| DC_28-42_n77  | 28                | 0.5                    |
|   | 42                | 0.8                    |
|   | n77               | 0.8                    |
| DC_28-42_n78  | 28                | 0.5                    |
|   | 42                | 0.8                    |
|   | n78               | 0.8                    |
| DC_28-42_n79  | 28                | 0.5                    |
|   | 42                | 0.8                    |
| DC_28_SUL_n78-n83   | 28                | 0.5                    |
|   | n78               | 0.8                    |
|   | n83               | 0.5                    |
| DC_41-42_n77  | 41                | 0.5                    |
|   | 42                | 0.8                    |
|   | n77               | 0.8                    |
| DC_41-42_n78  | 41                | 0.5                    |
|   | 42                | 0.8                    |
|   | n78               | 0.8                    |
| DC_41-42_n79  | 41                | 0.                     |
|   | 42                | 0.8                    |
| DC_41_n77   | 41                | 0.3                    |
|   | n77               | 0.8                    |
| DC_41_n78   | 41                | 0.3                    |
|   | n78               | 0.8                    |
| DC_41_n79   | 41                | 0.3                    |
|   | n79               | 0.8                    |
| DC_66_(n)71   | 66                | 0.3                    |
|   | 71                | 0.3                    |
|   | n71               | 0.3                    |
| DC_66_SUL_n78-n86   | 66                | 0.6                    |
|   | n78               | 0.8                    |
|   | n86               | 0.6                    |
| NOTE 1: The requirement is applied for UE transmitting on the frequency range of 2545-2690 MHz. |                   |                        |
| NOTE 2: The requirement is applied for UE transmitting on the frequency range of 2496-2545 MHz. |                   |                        |

6.2B.4.2.3.3  $\Delta T_{IB,c}$  for EN-DC four bands

**Table 6.2B.4.2.3.3-1:  $\Delta T_{IB,c}$  due to EN-DC(four bands)**

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta T_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
| DC_1-3-5_n78                   | 1                 | 0.6                    |
|                                | 3                 | 0.6                    |
|                                | 5                 | 0.3                    |
|                                | n78               | 0.8                    |
| DC_1-3-7_n28                   | 1                 | 0.6                    |
|                                | 3                 | 0.6                    |
|                                | 7                 | 0.6                    |
|                                | n28               | 0.6                    |
| DC_1-3-7_n78<br>DC_1-3-7-7_n78 | 1                 | 0.7                    |
|                                | 3                 | 0.7                    |
|                                | 7                 | 0.7                    |
|                                | n78               | 0.8                    |
| DC_1-3-8_n78                   | 1                 | 0.6                    |
|                                | 3                 | 0.6                    |
|                                | 8                 | 0.6                    |
|                                | n78               | 0.8                    |
| DC_1-3-28_n77                  | 1                 | 0.6                    |
|                                | 3                 | 0.6                    |
|                                | 28                | 0.6                    |
|                                | n77               | 0.8                    |
| DC_1-3-28_n78                  | 1                 | 0.6                    |
|                                | 3                 | 0.6                    |
|                                | 28                | 0.6                    |
|                                | n78               | 0.8                    |
| DC_1-3_n28-n78                 | 1                 | 0.6                    |
|                                | 3                 | 0.6                    |
|                                | n28               | 0.6                    |
|                                | n78               | 0.8                    |
| DC_1-3-28_n79                  | 1                 | 0.6                    |
|                                | 3                 | 0.6                    |
|                                | 28                | 0.6                    |
| DC_1-3-19_n78                  | 1                 | 0.6                    |
|                                | 3                 | 0.6                    |
|                                | 19                | 0.3                    |
|                                | n78               | 0.8                    |
| DC_1-3-19_n79                  | 1                 | 0.3                    |
|                                | 3                 | 0.3                    |
|                                | 19                | 0.3                    |
| DC_1-3-20_n28                  | 1                 | 0.3                    |
|                                | 3                 | 0.3                    |
|                                | 20                | 0.6                    |
|                                | n28               | 0.6                    |
| DC_1-3-20_n78                  | 1                 | 0.6                    |
|                                | 3                 | 0.6                    |
|                                | 20                | 0.3                    |
|                                | n78               | 0.8                    |
| DC_1-3-21_n77                  | 1                 | 0.6                    |
|                                | 3                 | 0.8                    |
|                                | 21                | 0.9                    |
|                                | n77               | 0.8                    |
| DC_1-3-21_n78                  | 1                 | 0.6                    |
|                                | 3                 | 0.8                    |
|                                | 21                | 0.9                    |
|                                | n78               | 0.8                    |
| DC_1-3-21_n79                  | 1                 | 0.3                    |
|                                | 3                 | 0.8                    |
|                                | 21                | 0.9                    |
| DC_1-3-42_n77                  | 1                 | 0.6                    |
|                                | 3                 | 0.6                    |
|                                | 42                | 0.8                    |
|                                | n77               | 0.8                    |
| DC_1-3-42_n78                  | 1                 | 0.6                    |
|                                | 3                 | 0.6                    |

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta T_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
|                                | 42                | 0.8                    |
|                                | n78               | 0.8                    |
| DC_1-3-42_n79                  | 1                 | 0.6                    |
|                                | 3                 | 0.6                    |
|                                | 42                | 0.8                    |
| DC_1-5-7_n78<br>DC_1-5-7-7_n78 | 1                 | 0.6                    |
|                                | 5                 | 0.6                    |
|                                | 7                 | 0.6                    |
|                                | n78               | 0.8                    |
| DC_1-7-20_n28                  | 1                 | 0.5                    |
|                                | 7                 | 0.6                    |
|                                | 20                | 0.6                    |
|                                | n28               | 0.6                    |
| DC_1-7-20_n78                  | 1                 | 0.6                    |
|                                | 7                 | 0.7                    |
|                                | 20                | 0.4                    |
|                                | n78               | 0.8                    |
| DC_1-7_n28-n78                 | 1                 | 0.6                    |
|                                | 7                 | 0.6                    |
|                                | n28               | 0.6                    |
|                                | n78               | 0.8                    |
| DC_1-18-28_n77                 | 1                 | 0.3                    |
|                                | 18                | 0.5                    |
|                                | 28                | 0.5                    |
|                                | n77               | 0.8                    |
| DC_1-18-28_n78                 | 1                 | 0.3                    |
|                                | 18                | 0.5                    |
|                                | 28                | 0.5                    |
|                                | n78               | 0.8                    |
| DC_1-18-28_n79                 | 1                 | 0.3                    |
|                                | 18                | 0.5                    |
|                                | 28                | 0.5                    |
| DC_1-19-42_n77                 | 1                 | 0.6                    |
|                                | 19                | 0.3                    |
|                                | 42                | 0.8                    |
|                                | n77               | 0.8                    |
| DC_1-19-42_n78                 | 1                 | 0.3                    |
|                                | 19                | 0.3                    |
|                                | 42                | 0.8                    |
|                                | n78               | 0.8                    |
| DC_1-19-42_n79                 | 1                 | 0.3                    |
|                                | 19                | 0.3                    |
|                                | 42                | 0.8                    |
| DC_1-20_n28-n78                | 1                 | 0.3                    |
|                                | 20                | 0.6                    |
|                                | n28               | 0.6                    |
|                                | n78               | 0.8                    |
| DC_1-21-28_n77                 | 1                 | 0.6                    |
|                                | 21                | 0.4                    |
|                                | 28                | 0.6                    |
|                                | n77               | 0.8                    |
| DC_1-21-28_n78                 | 1                 | 0.3                    |
|                                | 21                | 0.4                    |
|                                | 28                | 0.6                    |
|                                | n78               | 0.8                    |
| DC_1-21-28_n79                 | 1                 | 0.3                    |
|                                | 21                | 0.4                    |
|                                | 28                | 0.6                    |
| DC_1-21-42_n77                 | 1                 | 0.6                    |
|                                | 21                | 0.4                    |
|                                | 42                | 0.8                    |
|                                | n77               | 0.8                    |
| DC_1-21-42_n78                 | 1                 | 0.3                    |

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta T_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
|                                | 21                | 0.4                    |
|                                | 42                | 0.8                    |
|                                | n78               | 0.8                    |
| DC_1-21-42_n79                 | 1                 | 0.3                    |
|                                | 21                | 0.4                    |
|                                | 42                | 0.8                    |
| DC_1-28-42_n77                 | 1                 | 0.6                    |
|                                | 28                | 0.6                    |
|                                | 42                | 0.8                    |
|                                | n77               | 0.8                    |
| DC_1-28-42_n78                 | 1                 | 0.3                    |
|                                | 28                | 0.6                    |
|                                | 42                | 0.8                    |
|                                | n78               | 0.8                    |
| DC_1-28-42_n79                 | 1                 | 0.3                    |
|                                | 28                | 0.6                    |
|                                | 42                | 0.8                    |
| DC_1-41-42_n77                 | 1                 | 0.5                    |
|                                | 41                | 0.5                    |
|                                | 42                | 0.8                    |
|                                | n77               | 0.8                    |
| DC_1-41-42_n78                 | 1                 | 0.5                    |
|                                | 41                | 0.5                    |
|                                | 42                | 0.8                    |
|                                | n78               | 0.8                    |
| DC_1-41-42_n79                 | 1                 | 0.5                    |
|                                | 41                | 0.5                    |
|                                | 42                | 0.8                    |
| DC_2-66-(n)71                  | 2                 | 0.5                    |
|                                | 66                | 0.5                    |
|                                | 71                | 0.3                    |
|                                | n71               |                        |
| DC_3-5-7_n78, DC_3-5-7-7_n78   | 3                 | 0.6                    |
|                                | 5                 | 0.6                    |
|                                | 7                 | 0.6                    |
|                                | n78               | 0.8                    |
| DC_3-7-20_n28                  | 3                 | 0.5                    |
|                                | 7                 | 0.5                    |
|                                | 20                | 0.6                    |
|                                | n28               | 0.5                    |
| DC_3-7-20_n78                  | 3                 | 0.6                    |
|                                | 7                 | 0.6                    |
|                                | 20                | 0.3                    |
|                                | n78               | 0.8                    |
| DC_3-7-28_n78                  | 3                 | 0.6                    |
|                                | 7                 | 0.6                    |
|                                | 28                | 0.6                    |
|                                | n78               | 0.8                    |
| DC_3-7_n28-n78                 | 3                 | 0.6                    |
|                                | 7                 | 0.6                    |
|                                | n28               | 0.6                    |
|                                | n78               | 0.8                    |
| DC_3-19-21_n77                 | 3                 | 0.8                    |
|                                | 19                | 0.3                    |
|                                | 21                | 0.9                    |
|                                | n77               | 0.8                    |
| DC_3-19-21_n78                 | 3                 | 0.8                    |
|                                | 19                | 0.3                    |
|                                | 21                | 0.9                    |
|                                | n78               | 0.8                    |
| DC_3-19-21_n79                 | 3                 | 0.8                    |
|                                | 19                | 0.3                    |
|                                | 21                | 0.9                    |



| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta T_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
| DC_3-19-42_n77                 | 3                 | 0.6                    |
|                                | 19                | 0.3                    |
|                                | 42                | 0.8                    |
|                                | n77               | 0.8                    |
| DC_3-19-42_n78                 | 3                 | 0.6                    |
|                                | 19                | 0.3                    |
|                                | 42                | 0.8                    |
|                                | n78               | 0.8                    |
| DC_3-19-42_n79                 | 3                 | 0.6                    |
|                                | 19                | 0.3                    |
|                                | 42                | 0.8                    |
| DC_3-20_n28-n78                | 3                 | 0.6                    |
|                                | 20                | 0.6                    |
|                                | n28               | 0.6                    |
|                                | n78               | 0.8                    |
| DC_3-28-42_n77                 | 3                 | 0.6                    |
|                                | 28                | 0.5                    |
|                                | 42                | 0.8                    |
|                                | n77               | 0.8                    |
| DC_3-28-42_n78                 | 3                 | 0.6                    |
|                                | 28                | 0.5                    |
|                                | 42                | 0.8                    |
|                                | n78               | 0.8                    |
| DC_3-28-42_n79                 | 3                 | 0.6                    |
|                                | 28                | 0.5                    |
|                                | 42                | 0.8                    |
| DC_3-21-42_n77                 | 3                 | 0.8                    |
|                                | 21                | 0.9                    |
|                                | 42                | 0.8                    |
|                                | n77               | 0.8                    |
| DC_3-21-42_n78                 | 3                 | 0.8                    |
|                                | 21                | 0.9                    |
|                                | 42                | 0.8                    |
|                                | n78               | 0.8                    |
| DC_3-21-42_n79                 | 3                 | 0.8                    |
|                                | 21                | 0.9                    |
|                                | 42                | 0.8                    |
| DC_7-20_n28-n78                | 7                 | 0.3                    |
|                                | 20                | 0.6                    |
|                                | n28               | 0.6                    |
|                                | n78               | 0.8                    |
| DC_19-21-42_n77                | 19                | 0.3                    |
|                                | 21                | 0.4                    |
|                                | 42                | 0.8                    |
|                                | n77               | 0.8                    |
| DC_19-21-42_n78                | 19                | 0.3                    |
|                                | 21                | 0.4                    |
|                                | 42                | 0.8                    |
|                                | n78               | 0.8                    |
| DC_19-21-42_n79                | 19                | 0.3                    |
|                                | 21                | 0.4                    |
|                                | 42                | 0.8                    |
| DC_21-28-42_n77                | 21                | 0.4                    |
|                                | 28                | 0.5                    |
|                                | 42                | 0.8                    |
|                                | n77               | 0.8                    |
| DC_21-28-42_n78                | 21                | 0.4                    |
|                                | 28                | 0.5                    |
|                                | 42                | 0.8                    |
|                                | n78               | 0.8                    |
| DC_21-28-42_n79                | 21                | 0.4                    |
|                                | 28                | 0.5                    |
|                                | 42                | 0.8                    |



6.2B.4.2.3.4  $\Delta T_{IB,c}$  for EN-DC five bands

**Table 6.2B.4.2.3.4-1:  $\Delta T_{IB,c}$  due to EN-DC (five bands)**

| Inter-band EN-DC configuration      | E-UTRA or NR Band | $\Delta T_{IB,c}$ (dB) |
|-------------------------------------|-------------------|------------------------|
| DC_1-3-5-7_n78,<br>DC_1-3-5-7-7_n78 | 1                 | 0.6                    |
|                                     | 3                 | 0.6                    |
|                                     | 5                 | 0.6                    |
|                                     | 7                 | 0.6                    |
|                                     | n78               | 0.8                    |
| DC_1-3-7-20_n28                     | 1                 | 0.6                    |
|                                     | 3                 | 0.6                    |
|                                     | 7                 | 0.6                    |
|                                     | 20                | 0.6                    |
|                                     | n28               | 0.6                    |
| DC_1-3-7-20_n78                     | 1                 | 0.6                    |
|                                     | 3                 | 0.6                    |
|                                     | 7                 | 0.6                    |
|                                     | 20                | 0.6                    |
|                                     | n78               | 0.6                    |
| DC_1-3-7_n28-n78                    | 1                 | 0.7                    |
|                                     | 3                 | 0.7                    |
|                                     | 7                 | 0.7                    |
|                                     | n28               | 0.6                    |
|                                     | n78               | 0.8                    |
| DC_1-3-19-21_n77                    | 1                 | 0.6                    |
|                                     | 3                 | 0.8                    |
|                                     | 19                | 0.3                    |
|                                     | 21                | 0.9                    |
|                                     | n77               | 0.8                    |
| DC_1-3-19-21_n78                    | 1                 | 0.6                    |
|                                     | 3                 | 0.8                    |
|                                     | 19                | 0.3                    |
|                                     | 21                | 0.9                    |
|                                     | n78               | 0.8                    |
| DC_1-3-19-21_n79                    | 1                 | 0.3                    |
|                                     | 3                 | 0.8                    |
|                                     | 19                | 0.3                    |
|                                     | 21                | 0.9                    |
| DC_1-3-19-42_n77                    | 1                 | 0.6                    |
|                                     | 3                 | 0.6                    |
|                                     | 19                | 0.3                    |
|                                     | 42                | 0.8                    |
|                                     | n77               | 0.8                    |
| DC_1-3-19-42_n78                    | 1                 | 0.6                    |
|                                     | 3                 | 0.6                    |
|                                     | 19                | 0.3                    |
|                                     | 42                | 0.8                    |
|                                     | n78               | 0.8                    |
| DC_1-3-19-42_n79                    | 1                 | 0.6                    |
|                                     | 3                 | 0.6                    |
|                                     | 19                | 0.3                    |
|                                     | 42                | 0.8                    |
| DC_1-3-20_n28-n78                   | 1                 | 0.6                    |
|                                     | 3                 | 0.6                    |
|                                     | 20                | 0.6                    |
|                                     | n28               | 0.6                    |
|                                     | n78               | 0.8                    |
| DC_1-3-21-42_n77                    | 1                 | 0.6                    |
|                                     | 3                 | 0.8                    |
|                                     | 21                | 0.9                    |
|                                     | 42                | 0.8                    |
|                                     | n77               | 0.6                    |

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta T_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
| DC_1-3-21-42_n78               | 1                 | 0.6                    |
|                                | 3                 | 0.8                    |
|                                | 21                | 0.9                    |
|                                | 42                | 0.8                    |
|                                | n78               | 0.6                    |
| DC_1-3-21-42_n79               | 1                 | 0.6                    |
|                                | 3                 | 0.8                    |
|                                | 21                | 0.9                    |
|                                | 42                | 0.8                    |
|                                | n79               | 0                      |
| DC_1-3-28-42_n77               | 1                 | 0.6                    |
|                                | 3                 | 0.6                    |
|                                | 28                | 0.6                    |
|                                | 42                | 0.8                    |
|                                | n77               | 0.8                    |
| DC_1-3-28-42_n78               | 1                 | 0.6                    |
|                                | 3                 | 0.6                    |
|                                | 28                | 0.6                    |
|                                | 42                | 0.8                    |
|                                | n78               | 0.8                    |
| DC_1-3-28-42_n79               | 1                 | 0.6                    |
|                                | 3                 | 0.6                    |
|                                | 28                | 0.6                    |
|                                | 42                | 0.8                    |
|                                |                   |                        |
| DC_1-7-20_n28-n78              | 1                 | 0.6                    |
|                                | 7                 | 0.7                    |
|                                | 20                | 0.6                    |
|                                | n28               | 0.6                    |
|                                | n78               | 0.8                    |
| DC_1-19-21-42_n77              | 1                 | 0.3                    |
|                                | 19                | 0.3                    |
|                                | 21                | 0.4                    |
|                                | 42                | 0.8                    |
|                                | n77               | 0.8                    |
| DC_1-19-21-42_n78              | 1                 | 0.3                    |
|                                | 19                | 0.3                    |
|                                | 21                | 0.4                    |
|                                | 42                | 0.8                    |
|                                | n78               | 0.8                    |
| DC_1-19-21-42_n79              | 1                 | 0.3                    |
|                                | 19                | 0.3                    |
|                                | 21                | 0.4                    |
|                                | 42                | 0.8                    |
|                                |                   |                        |
| DC_1-21-28-42_n77              | 1                 | 0.6                    |
|                                | 21                | 0.4                    |
|                                | 28                | 0.6                    |
|                                | 42                | 0.8                    |
|                                | n77               | 0.8                    |
| DC_1-21-28-42_n78              | 1                 | 0.3                    |
|                                | 21                | 0.4                    |
|                                | 28                | 0.6                    |
|                                | 42                | 0.8                    |
|                                | n78               | 0.8                    |
| DC_1-21-28-42_n79              | 1                 | 0.3                    |
|                                | 21                | 0.4                    |
|                                | 28                | 0.6                    |
|                                | 42                | 0.8                    |
|                                |                   |                        |
| DC_3-7-20_n28-n78              | 3                 | 0.6                    |

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta T_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
|                                | 7                 | 0.6                    |
|                                | 20                | 0.6                    |
|                                | n28               | 0.6                    |
|                                | n78               | 0.8                    |

6.2B.4.2.3.5  $\Delta T_{IB,c}$  for EN-DC six bands**Table 6.2B.4.2.3.5-1:  $\Delta T_{IB,c}$  due to EN-DC (six bands)**

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta T_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
| DC_1-3-7-20_n28-n78            | 1                 | 0.7                    |
|                                | 3                 | 0.7                    |
|                                | 7                 | 0.7                    |
|                                | 20                | 0.6                    |
|                                | n28               | 0.6                    |
|                                | n78               | 0.8                    |

## 6.2B.4.2.4 Inter-band EN-DC including FR2

6.2B.4.2.4.1  $\Delta T_{IB,c}$  for EN-DC two bands

Unless otherwise stated,  $\Delta T_{IB,c}$  for E-UTRA and FR2 NR bands of inter-band EN-DC combinations defined in table 5.2B.5.1-1 is set to zero.

**Table 6.2B.4.2.4.1-1:  $\Delta T_{IB,c}$  due to EN-DC(two bands)****(Void)**6.2B.4.2.4.2  $\Delta T_{IB,c}$  for EN-DC three bands

Unless otherwise stated,  $\Delta T_{IB,c}$  for FR2 NR bands is set to zero, and  $\Delta T_{IB,c}$  for constituent E-UTRA bands for inter-band EN-DC defined in table 5.2B.5.2-1 is the same as those for the corresponding E-UTRA CA configuration specified in TS 36.101 [4], without the FR2 NR bands.

**Table 6.2B.4.2.4.2-1:  $\Delta T_{IB,c}$  due to EN-DC (three bands)****(Void)**6.2B.4.2.4.3  $\Delta T_{IB,c}$  for EN-DC four bands

Unless otherwise stated,  $\Delta T_{IB,c}$  for FR2 NR bands is set to zero, and  $\Delta T_{IB,c}$  for constituent E-UTRA bands for inter-band EN-DC defined in table 5.2B.5.3-1 is the same as those for the corresponding E-UTRA CA configuration specified in TS 36.101 [4], without the FR2 NR bands.

**Table 6.2B.4.2.4.3-1:  $\Delta T_{IB,c}$  due to EN-DC(four bands)****(Void)**6.2B.4.2.4.4  $\Delta T_{IB,c}$  for EN-DC five bands

Unless otherwise stated,  $\Delta T_{IB,c}$  for FR2 NR bands is set to zero, and  $\Delta T_{IB,c}$  for constituent E-UTRA bands for inter-band EN-DC defined in table 5.2B.5.4-1 is the same as those for the corresponding E-UTRA CA configuration specified in TS 36.101 [4], without the FR2 NR bands.

**Table 6.2B.4.2.4.4-1:  $\Delta T_{IB,c}$  due to EN-DC (five bands)****(Void)**6.2B.4.2.4.5  $\Delta T_{IB,c}$  for EN-DC six bands

(Void)

6.2B.4.2.5 Inter-band EN-DC including both FR1 and FR2

6.2B.4.2.5.1  $\Delta T_{IB,c}$  for EN-DC three bands

Unless otherwise stated, for inter-band EN-DC configurations defined in table 5.2B.6.2-1,  $\Delta T_{IB,c}$  for constituent FR2 NR bands is set to zero, and  $\Delta T_{IB,c}$  for constituent E-UTRA and FR1 NR bands is the same as those for the corresponding inter band EN-DC configuration without the FR2 bands specified in 6.2B.4.2.3.

**Table 6.2B.4.2.5.1-1:  $\Delta T_{IB,c}$  due to EN-DC (three bands)****(Void)**6.2B.4.2.5.2  $\Delta T_{IB,c}$  for EN-DC four bands

Unless otherwise stated, for inter-band EN-DC configurations defined in table 5.2B.6.3-1,  $\Delta T_{IB,c}$  for constituent FR2 NR bands is set to zero, and  $\Delta T_{IB,c}$  for constituent E-UTRA and FR1 NR bands is the same as those for the corresponding inter band EN-DC configuration without the FR2 bands specified in 6.2B.4.2.3.

6.2B.4.2.5.3  $\Delta T_{IB,c}$  for EN-DC five bands

Unless otherwise stated, for inter-band EN-DC configurations defined in table 5.2B.6.4-1,  $\Delta T_{IB,c}$  for constituent FR2 NR bands is set to zero, and  $\Delta T_{IB,c}$  for constituent E-UTRA and FR1 NR bands is the same as those for the corresponding inter band EN-DC configuration without the FR2 bands specified in 6.2B.4.2.3.

6.2B.4.2.5.4  $\Delta T_{IB,c}$  for EN-DC six bands

Unless otherwise stated, for inter-band EN-DC configurations defined in table 5.2B.6.5-1,  $\Delta T_{IB,c}$  for constituent FR2 NR bands is set to zero, and  $\Delta T_{IB,c}$  for constituent E-UTRA and FR1 NR bands is the same as those for the corresponding inter band EN-DC configuration without the FR2 bands specified in 6.2B.4.2.3.

## 6.2B.5 Configured output power for NR-DC

6.2B.5.1 Configured output power level

6.2B.5.1.1 Inter-band NR-DC between FR1 and FR2

For inter-band NR-DC between FR1 and FR2 combined with one uplink serving cell per CG, the UE is allowed to set its configured maximum output power  $P_{CMAX,c(i),i}$  for serving cell  $c(i)$  of CG  $i$ ,  $i = 1,2$  as specified in clause 6.2.4 of TS 38.101-1 [2] and clause 6.2.4 TS 38.101-2 [3] independently.

## 6.3 Output power dynamics

Output power dynamics for EN-DC operations in FR1 and FR2 as specified in TS 38.101-1 [2] and TS 38.101-2 [3], respectively. E-UTRA as specified in TS 36.101 [4]. For intra-band contiguous EN-DC operation in FR1, minimum output power requirements specified in sub-clause 6.3.1 of TS 38.101-1 [2] and sub-clause 6.3.2 of TS 36.101 [4] shall only apply when the power of all NR and E-UTRA carriers are set to minimum value. Similarly, OFF power requirements specified in sub-clause 6.3.2 of TS 38.101-1 [2] and sub-clause 6.3.3 of TS 36.101 [4] shall only apply when the power of all NR and E-UTRA carriers are OFF. The OFF power condition in transmit ON/OFF time mask requirements specified in sub-clause 6.3.3 of TS 38.101-1 [2] and sub-clause 6.3.4 of TS 36.101 [4] is applicable only when all NR and E-UTRA carriers are OFF. If both E-UTRA and NR transition between ON and OFF states

simultaneously, the longer transient time shall apply to both. If either E-UTRA or NR is OFF and the other carrier transitions from OFF to ON, then the transient time associated with that carrier applies.

## 6.3A Output power dynamics for CA

For inter-band NR CA between FR1 and FR2, output power dynamics as specified in [2] and [3] apply for FR1 and FR2 respectively.

## 6.3B Output power dynamics for DC

### 6.3B.0 General

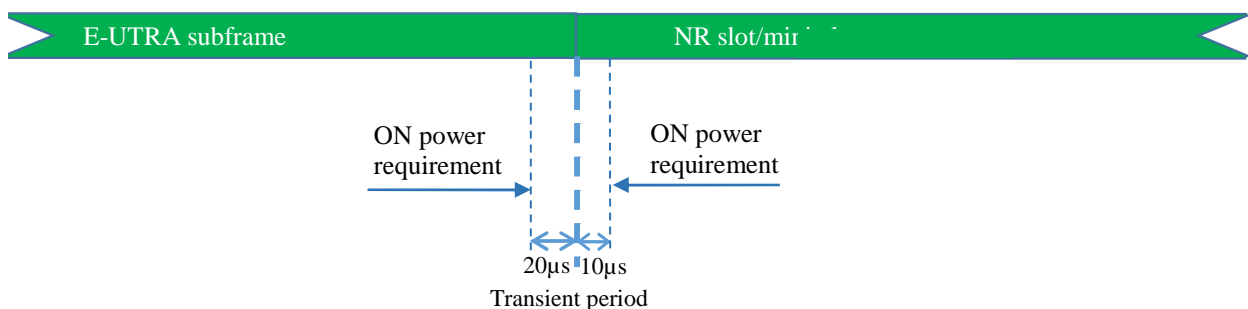
The E-UTRA and NR switching time mask defines the observation period between E-UTRA subframe and NR slot/mini-slot boundary. Both E-UTRA subframe and NR slot/mini-slot have ON power transmissions. The ON power is defined as the mean power over the symbol duration excluding any transient period. For E-UTRA subframe or NR slot/mini-slot having OFF power transmission, the general time mask for E-UTRA or NR shall apply.

### 6.3B.1 Output power dynamics for EN-DC with UL sharing from UE perspective

#### 6.3B.1.1 E-UTRA and NR switching time mask for TDM based UL sharing from UE perspective

The E-UTRA and NR switching time mask is applicable for non-simultaneous transmissions between E-UTRA and NR in TDM based UL sharing from the UE perspective in the same channel, which is shared by E-UTRA and NR.

For UEs reporting E-UTRA and NR switching time capability of type 1 with switching time  $< 0.5$  us for TDM based UL sharing from UE perspective within FR1 time masks in Figure 6.3B.1.1-1 and Figure 6.3B.1.1-2 shall apply. For UEs reporting E-UTRA and NR switching time capability of type 2 with switching time  $< 20$  us for TDM based UL sharing from UE perspective within FR1, time masks in Figure 6.3B.1.1-3 and Figure 6.3B.1.1-4 shall apply.



**Figure 6.3B.1.1-1: E-UTRA to NR switching time mask for type 1 for TDM based UL sharing from UE perspective within FR1**



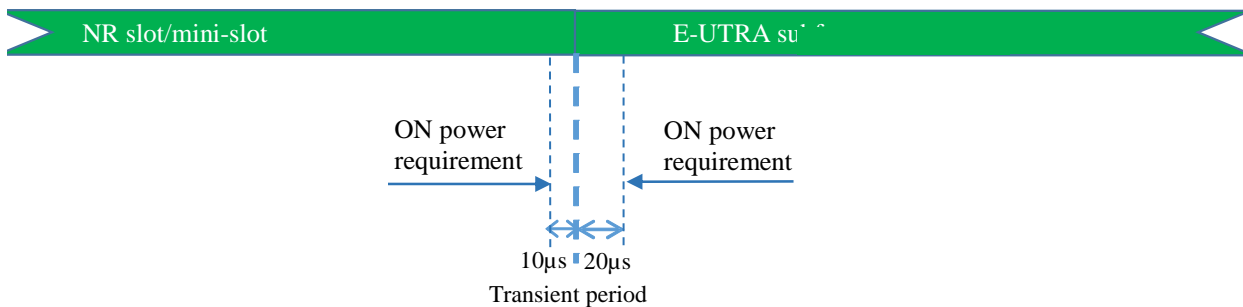


Figure 6.3B.1.1-2: NR to E-UTRA switching time mask for type 1 for TDM based UL sharing from UE perspective within FR1

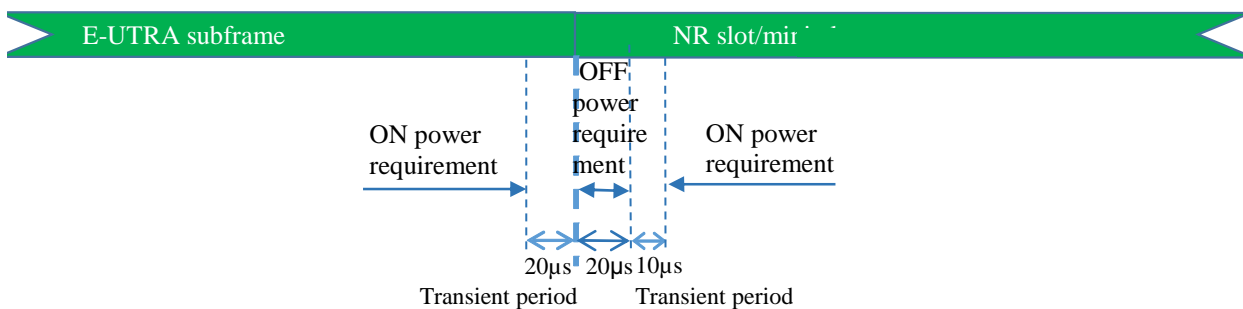


Figure 6.3B.1.1-3: E-UTRA to NR switching time mask for type 2 for TDM based UL sharing from UE perspective within FR1

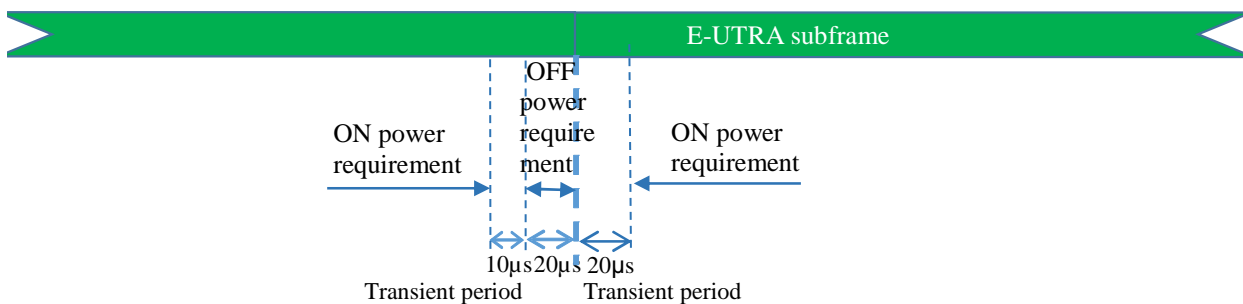


Figure 6.3B.1.1-4: NR to E-UTRA switching time mask for type 2 for TDM based UL sharing from UE perspective within FR1

### 6.3B.2 Output power dynamics for intra-band EN-DC without dual PA capability

For both non-contiguous intra-band EN-DC and contiguous EN-DC for DC\_(n)41 and DC\_(n)71 without dual PA capability, maximum UL switching time is defined as 120 µs and DL reception interruption is allowed during UL switching. Time masks in Figure 6.3B.2-1 and Figure 6.3B.2-2 shall apply. Unless otherwise stated, for intra-band contiguous EN-DC of other band combinations the switching time in 6.3B.1.1 applies.

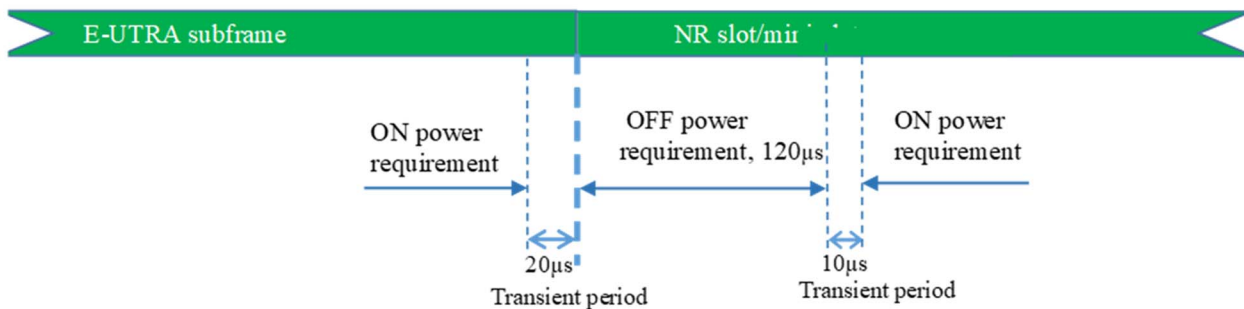


Figure 6.3B.2-1: E-UTRA to NR switching time mask for intra-band EN-DC without dual PA capability when single UL is allowed

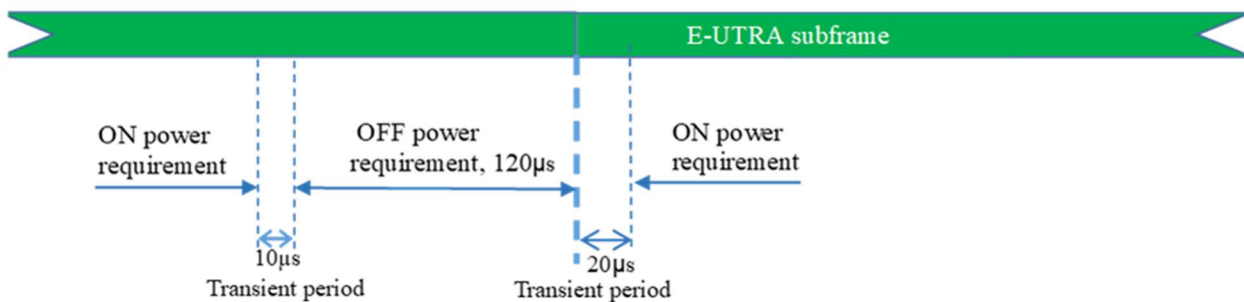


Figure 6.3B.2-2: NR to E-UTRA switching time mask for intra-band EN-DC without dual PA capability when single UL is allowed

### 6.3B.3 Output power dynamics for intra-band EN-DC with dual PA capability

For both contiguous and non-contiguous intra-band EN-DC with dual PA capability, time masks in Figure 6.3B.3-1 and Figure 6.3B.3-2 shall apply.

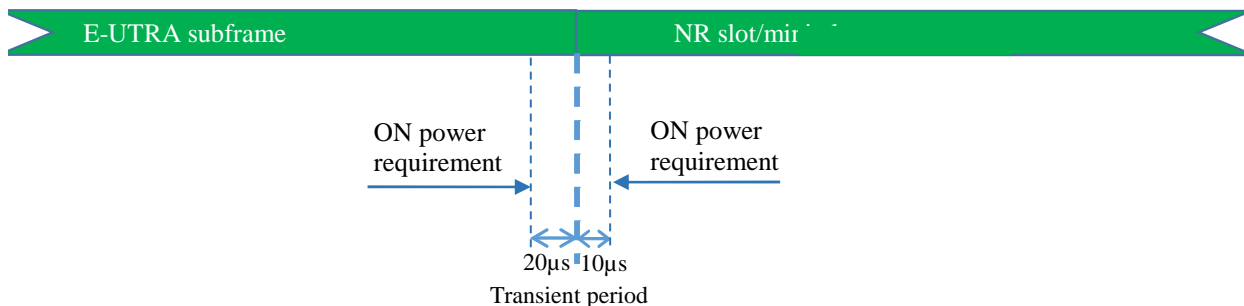


Figure 6.3B.3-1: E-UTRA to NR switching time mask for intra-band EN-DC with dual PA capability

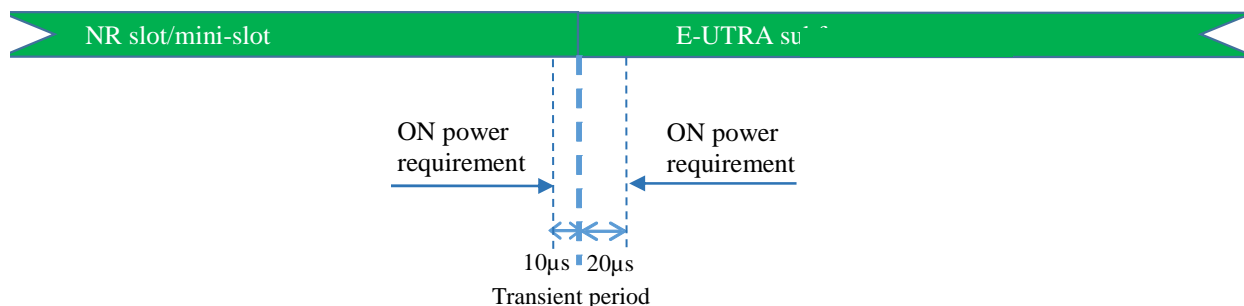


Figure 6.3B.3-2: NR to E-UTRA switching time mask for intra-band EN-DC with dual PA capability

## 6.4 Transmit signal quality

### 6.4A Transmit signal quality for CA

#### 6.4A.1 Frequency error for CA

For inter-band NR CA between FR1 and FR2, frequency error as specified in [2] and [3] apply for FR1 and FR2 respectively.

#### 6.4A.2 Transmit modulation quality for CA

For inter-band NR CA between FR1 and FR2, transmit modulation quality as specified in [2] and [3] apply for FR1 and FR2 respectively.

### 6.4B Transmit signal quality for DC

#### 6.4B.1 Frequency error for EN-DC

##### 6.4B.1.1 Frequency error for Intra-band contiguous EN-DC

##### 6.4B.1.2 Frequency error for Intra-band non-contiguous EN-DC

##### 6.4B.1.3 Frequency error for inter-band EN-DC

For inter-band EN-DC with uplink assigned to one E-UTRA band and one NR band, the requirements shall apply on each component carrier as defined in clause 6.5.1 in [4] and in clause 6.4.1 in [2], respectively, with all component carriers active. If multiple component carriers are assigned to one E-UTRA band, the requirements in subclauses 6.5.1A in [4] apply for those component carriers, and if multiple component carriers are assigned to one NR band, the requirements in subclauses 6.4A.1 in [2] apply for those component carriers.

##### 6.4B.1.4 Frequency error for inter-band EN-DC involving FR2

For inter-band EN-DC including FR2 or both FR1 and FR2, frequency error for EN-DC operations in FR1 and FR2 as specified in TS 36.101 [4], 38.101-1 [2] and 38.101-2 [3] apply for E-UTRA, NR FR1 and NR FR2 respectively.

## 6.4B.2 Transmit modulation quality for EN-DC

### 6.4B.2.1 Transmit modulation quality for Intra-band contiguous EN-DC

#### 6.4B.2.1.1 Error Vector Magnitude

For the intra-band contiguous EN-DC with one component carrier per CG the EVM requirement applies with PRB allocation in one of the CG and the other CG unallocated.

The EVM requirements for each CG are according to clause 6.5.2 of [4] for the MCG and 6.4.2 of [2] for the SCG with EN-DC configured.

#### 6.4B.2.1.2 Carrier leakage

The carrier leakage requirements for each CG are according to clause 6.5.2 of [4] for the MCG and 6.4.2 of [2] for the SCG with EN-DC configured.

#### 6.4B.2.1.3 In-band emissions

For the MCG the in-band emission requirements in Table 6.5.2A.3.1-1 and 6.5.2A.3.1-2 in [4] apply within the aggregated transmission bandwidth configuration of the EN-DC bandwidth with the carriers of both CGs active and one single contiguous PRB allocation of bandwidth  $L_{CRB}$  within the MCG at the edge of the said aggregated transmission bandwidth configuration.

For the SCG the in-band emission requirements in Table 6.5.2A.3.1-1 and 6.5.2A.3.1-2 in [4] apply within the aggregated transmission bandwidth configuration of the EN-DC bandwidth with the carriers of both CGs active and one single contiguous PRB allocation of bandwidth  $L_{CRB}$  within the SCG at the edge of the aggregated transmission bandwidth configuration.

### 6.4B.2.2 Transmit modulation quality for Intra-band non-contiguous EN-DC

#### 6.4B.2.2.1 Error Vector Magnitude

For the intra-band non-contiguous EN-DC with one component carrier per CG the EVM requirement applies with PRB allocation in one of the CG and the other CG unallocated.

The EVM requirements for each CG are according to clause 6.5.2 of [4] for the MCG and 6.4.2 of [2] for the SCG with EN-DC configured.

#### 6.4B.2.2.2 Carrier leakage

The carrier leakage requirements for each CG are according to clause 6.5.2 of [4] for the MCG and 6.4.2 of [2] for the SCG with EN-DC configured and PRB allocation only in the CG being measured.

#### 6.4B.2.2.3 In-band emissions

For the MCG the in-band emission requirements in Table 6.5.2A.3.1-1 and 6.5.2A.3.1-2 in [4] apply within the transmission bandwidth configuration of the MCG with the carriers of both CGs active and one single contiguous PRB allocation of bandwidth  $L_{CRB}$  within the MCG at the edge of the transmission bandwidth configuration.

For the SCG the in-band emission requirements in Table 6.5.2A.3.1-1 and 6.5.2A.3.1-2 in [4] apply within the transmission bandwidth configuration of the SCG with the carriers of both CGs active and one single contiguous PRB allocation of bandwidth  $L_{CRB}$  within the SCG at the edge of the transmission bandwidth configuration.

### 6.4B.2.3 Transmit modulation quality for Inter-band EN-DC

For inter-band EN-DC with uplink assigned to one E-UTRA band and one NR band, the requirements shall apply on each component carrier as defined in clause 6.5.2 in [4] and in clause 6.4.2 in [2], respectively, with all component carriers active. If multiple component carriers are assigned to one E-UTRA band, the requirements in subclauses 6.5.2A

in [4] apply for those component carriers, and if multiple component carriers are assigned to one NR band, the requirements in subclauses 6.4A.2 in [2] apply for those component carriers.

#### 6.4B.2.4 Transmit modulation quality for Inter-band EN-DC involving FR2

For inter-band EN-DC including FR2 or both FR1 and FR2, transmit modulation quality for EN-DC operations in FR1 and FR2 as specified in TS 36.101 [4], 38.101-1 [2] and 38.101-2 [3] apply for E-UTRA, NR FR1 and NR FR2 respectively.

## 6.5 Output RF spectrum emissions

### 6.5A Output RF spectrum emissions for CA

#### 6.5A.1 Occupied bandwidth for CA

For inter-band NR CA between FR1 and FR2, occupied bandwidth specified in TS 38.101-1 [2] and TS 38.101-2 [3] apply for each frequency range respectively.

#### 6.5A.2 Out-of-band emissions for CA

For inter-band NR CA between FR1 and FR2, out-of-band emissions specified in TS 38.101-1 [2] and TS 38.101-2 [3] apply for each frequency range respectively.

## 6.5A.3 Spurious emissions for CA

### 6.5A.3.1 Inter-band CA between FR1 and FR2

**Table 6.5A.3.1-1: Requirements for uplink inter-band CA (two bands)**

| NR CA Configuration   | Spurious emission  |                       |   |                      |                     |           |      |
|---|--|-----------------------|---|----------------------|---------------------|-----------|------|
|   | Protected band   | Frequency range (MHz) |   |                      | Maximum Level (dBm) | MBW (MHz) | NOTE |
| CA_n8-n258  | E-UTRA Band 1, 8, 20, 28, 34, 39, 40, 65                               | F <sub>DL_low</sub>   | - | F <sub>DL_high</sub> | -50                 | 1         |      |
|   | E-UTRA Band 3, 7, 41, 42, n78, n79                                     | F <sub>DL_low</sub>   | - | F <sub>DL_high</sub> | -50                 | 1         | 2    |
|   | E-UTRA Band 11, 21   | F <sub>DL_low</sub>   | - | F <sub>DL_high</sub> | -50                 | 1         | 6    |
|   | Frequency range  | 860                   | - | 890                  | -40                 | 1         | 5, 6 |
|   | Frequency range  | 1884.5                | - | 1915.7               | -41                 | 0.3       | 4    |
| CA_n77-n257   | E-UTRA Band 1, 3, 5, 7, 8, 11, 18, 19, 21, 26, 28, 34, 39, 40, 41, 65  | F <sub>DL_low</sub>   | - | F <sub>DL_high</sub> | -50                 | 1         |      |
|   | Frequency range  | 1884.5                | - | 1915.7               | -41                 | 0.3       | 4    |
| CA_n78-n257   | E-UTRA Band 1, 3, 5, 7, 8, 11, 18, 19, 21, 26, 28, 34, 39, 40, 41, 65  | F <sub>DL_low</sub>   | - | F <sub>DL_high</sub> | -50                 | 1         |      |
|   | Frequency range  | 1884.5                | - | 1915.7               | -41                 | 0.3       | 4    |
| CA_n79-n257   | E-UTRA Band 1, 3, 5, 8, 11, 18, 19, 26, 21, 28, 34, 39, 40, 41, 42, 65 | F <sub>DL_low</sub>   | - | F <sub>DL_high</sub> | -50                 | 1         |      |
|   | Frequency range  | 1884.5                | - | 1915.7               | -41                 | 0.3       | 4    |
| <p>NOTE 1: F<sub>DL_low</sub> and F<sub>DL_high</sub> refer to each frequency band specified in Table 5.2-1 in TS 38.101-1/2 or Table 5.5 in TS 36.101 [4]</p> <p>NOTE 2: As exceptions, measurements with a level up to the applicable requirements defined in Table 6.5.3.1-2 in TS 38.101-1 [2] are permitted for each assigned NR carrier used in the measurement due to 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> or 5<sup>th</sup> harmonic spurious emissions. Due to spreading of the harmonic emission the exception is also allowed for the first 1 MHz frequency range immediately outside the harmonic emission on both sides of the harmonic emission. This results in an overall exception interval centred at the harmonic emission of (2MHz + N x L<sub>CRB</sub> x 180kHz), where N is 2, 3, 4, 5 for the 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> or 5<sup>th</sup> harmonic respectively. The exception is allowed if the measurement bandwidth (MBW) totally or partially overlaps the overall exception interval.</p> <p>NOTE 3: 15 kHz SCS is assumed when RB is mentioned in the note.</p> <p>NOTE 4: Applicable when co-existence with PHS system operating in 1884.5 -1915.7MHz</p> <p>NOTE 5: These requirements also apply for the frequency ranges that are less than F<sub>OOB</sub> (MHz) in Table 6.5.3.1-1 and Table 6.5A.3.1-1 in TS 38.101-1 [2] from the edge of the channel bandwidth.</p> <p>NOTE 6: This requirement is applicable only for the following cases: - for carriers of 5 MHz channel bandwidth when carrier centre frequency (Fc) is within the range 902.5 MHz ≤ Fc &lt; 907.5 MHz with an uplink transmission bandwidth less than or equal to 20 RB - for carriers of 5 MHz channel bandwidth when carrier centre frequency (Fc) is within the range 907.5 MHz ≤ Fc ≤ 912.5 MHz without any restriction on uplink transmission bandwidth. - for carriers of 10 MHz channel bandwidth when carrier centre frequency (Fc) is Fc = 910 MHz with an uplink transmission bandwidth less than or equal to 32 RB with RBstart &gt; 3.</p> |  |                       |   |                      |                     |           |      |

NOTE: To simplify above Table, E-UTRA band numbers are listed for bands which are specified only for E-UTRA operation or both E-UTRA and NR operation. NR band numbers are listed for bands which are specified only for NR operation.

## 6.5B Output RF spectrum emissions for DC

### 6.5B.1 Occupied bandwidth for EN-DC

For intra-band contiguous EN-DC the occupied bandwidth is a measure of the bandwidth containing 99% of the total integrated power of the transmitted spectrum. The OBW shall be less than the aggregated channel bandwidth for EN-DC, denoted as ENBW in sub-clause 5.3B.

## 6.5B.2 Out-of-band emissions for EN-DC

### 6.5B.2.1 Intra-band contiguous EN-DC

The out of band emissions are unwanted emissions immediately outside the EN-DC aggregated channel bandwidth resulting from the modulation process and non-linearity in the transmitter but excluding spurious emissions. This out of band emission limit is specified in terms of a spectrum emission mask and an adjacent channel leakage power ratio.

Unless otherwise stated, the OOB limits specified for the DC combination in this sub-clause supercede any OOB requirements specified for each sub-block in the respective TS [4] and [2].

The requirements apply to the sum of transmissions across all antenna connectors.

#### 6.5B.2.1.1 Spectrum emissions mask

The spectrum emission mask of the UE applies to frequencies ( $\Delta f_{\text{OOB}}$ ) starting from the  $\pm$  edge of the EN-DC aggregated channel bandwidth. For frequencies offset greater than  $\Delta f_{\text{OOB}}$  as specified in Table 6.5B.2.1.1-1 the spurious requirements in subclause 6.5B.3 are applicable.

The general spectrum emission for intra-band contiguous EN-DC is specified in Table 6.5B.2.1.1-1.

The power of any UE emission shall not exceed the levels specified in Table 6.5B.2.1.1-1 for the specified EN-DC aggregated channel bandwidth.

**Table 6.5B.2.1.1-1. General spectrum emission mask for intra-band contiguous EN-DC**

| $\Delta f_{\text{OOB}}$<br>(MHz)  | Spectrum emission limit (dBm)                                    | Measurement bandwidth |
|---|--|-----------------------|
| $\pm 0 - 1$   | $\text{Max}(\text{Round}(10 \cdot \log(0.15/\text{ENBW})), -24)$ | 30 kHz                |
| $\pm 1 - 5$   | -10  | 1 MHz                 |
| $\pm 5 - \text{ENBW}$   | -13  | 1 MHz                 |
| $\pm \text{ENBW} - (\text{ENBW} + 5)$   | -25  | 1 MHz                 |
| NOTE: ENBW refers to the aggregated channel bandwidth in MHz as defined in sub-clause 5.3B. |  |                       |

#### 6.5B.2.1.2 Additional spectrum emissions mask

##### 6.5B.2.1.2.1 Requirements for network signalled value "NS\_35"

When NS\_35 is indicated in the MCG and NS\_35 is indicated in the SCG, the requirements in Table 6.5B.2.1.2.1-1 apply in the frequency ranges immediately adjacent and outside the aggregated sub-blocks of the EN-DC configuration for DC\_(n)71AA.

**Table 6.5B.2.1.2.1-1: Additional requirements**

| $\Delta f_{\text{OOB}}$<br>(MHz)   | Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$           | Minimum requirement (dBm) | Measurement bandwidth |
|--|--|---------------------------|-----------------------|
| $0 \text{ MHz} \leq \Delta f < 0.1 \text{ MHz}$  | $0.015 \text{ MHz} \leq f_{\text{offset}} < 0.085 \text{ MHz}$                         | -13                       | 30 kHz                |
| $0.1 \text{ MHz} \leq \Delta f < \text{ENBW}$  | $0.15 \text{ MHz} \leq f_{\text{offset}} < \text{ENBW} - 0.05 \text{ MHz}$             | -13                       | 100 kHz               |
| $\text{ENBW} \leq \Delta f < \text{ENBW} + 5 \text{ MHz}$  | $\text{ENBW} + 0.5 \text{ MHz} \leq f_{\text{offset}} < \text{ENBW} + 4.5 \text{ MHz}$ | -25                       | 1 MHz                 |
| NOTE 1: ENBW is the aggregated bandwidth of an E-UTRA sub-block and an adjacent NR sub-block; there is no frequency separation between the said sub-blocks. The sub-block bandwidths include any internal guard bands. |  |                           |                       |

## 6.5B.2.1.2.2 Requirements for network signalled value "NS\_04"

Additional spectrum emission requirements are signalled by the network to indicate that the UE shall meet an additional requirement for a specific deployment scenario as part of the cell handover/broadcast message.

The Band 41/n41 SEM transition point from -13 dBm/MHz to -25 dBm/MHz is based on the emission bandwidth. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. Since the 26 dB emission bandwidth is implementation dependent, the transmission bandwidths occupied by RBs is used for the SEM. The emission bandwidth for LTE carriers is document in TS 36.101 [4], and the emission bandwidth for NR carriers is documented in 38.101-1 [2]. The total emission bandwidth for contiguous intra-band EN-DC is the sum of the emission bandwidth for each CC plus the guard band between contiguous CCs.

When "NS\_04" is indicated in the cell, the power of any UE emission shall not exceed the levels specified in Table 6.5B.2.1.2.2-1.

Table 6.5B.2.1.2.2-1: DC\_(n)41 SEM with NS\_04

| $\Delta f_{OOB}$<br>MHz          | Spectrum emission limit (dBm) / measurement bandwidth<br>for each ENBW |           |           |           |             |                          |
|----------------------------------|--|-----------|-----------|-----------|-------------|--------------------------|
|                                  | 15<br>MHz  | 20<br>MHz | 40<br>MHz | 50<br>MHz | > 50<br>MHz | Measurement<br>bandwidth |
| $\pm 0 - 1$                      | -10  | -10       | -10       |           |             | 2 % ENBW                 |
|                                  |  |           |           |           | -10         | 1 MHz                    |
| $\pm 1 - 5$                      |  |           | -10       |           |             | 1 MHz                    |
| $\pm 5 - X$                      |  |           | -13       |           |             |                          |
| $\pm X - (ENBW + 5 \text{ MHz})$ |  |           | -25       |           |             |                          |

NOTE: X is defined as the sum of the emission bandwidth of the component carriers plus the guard band between contiguous CCs.

## 6.5B.2.1.3 Adjacent channel leakage ratio

For EN-DC operation with an E-UTRA sub-block immediately adjacent to an NR sub-block, the ACLR is defined as the ratio of the filtered mean power centred on the aggregated sub-block bandwidth ENBW to the filtered mean power centred on an adjacent bandwidth of the same size ENBW at nominal channel spacing. The UE shall meet the ACLR minimum requirement EN-DC<sub>ACLR</sub> specified in Table 6.5B.2.1.3-1 with ENBW the sum of the sub-block bandwidths.

The assigned channel power and adjacent channel power are measured with rectangular filters with measurement bandwidths specified in 6.5B.2.1.3-1.

Table 6.5B.2.1.3-1: ACLR for intra-band EN-DC (contiguous sub-blocks)

| Parameter   | Unit | Value              |
|---|------|--------------------|
| EN-DC <sub>ACLR</sub> for PC3   | dBc  | 30                 |
| EN-DC <sub>ACLR</sub> for PC2   | dBc  | 31                 |
| Measurement bandwidth of EN-DC channel  |      | 1.00*ENBW          |
| Measurement bandwidth of adjacent channel   |      | 0.95*ENBW          |
| Frequency offset of adjacent channel  |      | ENBW<br>/<br>-ENBW |
| NOTE 1: ENBW is the aggregated bandwidth in MHz as defined in sub-clause 5.3B.                    |      |                    |
| NOTE 2: The frequency offset is that in between the centre frequencies of the measurement filters |      |                    |



## 6.5B.2.2 Intra-band non-contiguous EN-DC

### 6.5B.2.2.1 Spectrum emissions mask

The spectral emission mask for intra-band non-contiguous EN-DC is a composite of the emission mask for each CC with the level set to the maximum value from each mask for each frequency outside of the transmission bandwidth of either carrier. A composite spectrum emission mask is a combination of individual CC spectrum emissions masks. Where two masks overlap the most relaxed limit is used. Composite spectrum emission mask applies to frequencies up to  $\pm \Delta f_{\text{OoB}}$  starting from the edges of the sub-blocks. If for some frequency an individual CC spectrum emission mask overlaps with the bandwidth of another CC then the emission mask does not apply for that frequency.

### 6.5B.2.2.2 Additional spectrum emissions mask

When additional spectrum emission mask or masks apply, the additional SEM(s) shall be used to calculate the composite SEM described in 6.5B.2.2.1.

### 6.5B.2.2.3 Adjacent channel leakage ratio

For intra-band non-contiguous EN-DC, the EN-DC Adjacent Channel Leakage power Ratio ( $\text{EN-DC}_{\text{ACLR}}$ ) is the ratio of the sum of the filtered mean powers centred on the assigned E-UTRA and NR sub-block frequencies to the filtered mean power centred on an adjacent channel frequency at nominal channel spacing. In case the sub-block gap bandwidth  $W_{\text{gap}}$  is smaller than a E-UTRA or NR sub-block bandwidth, no  $\text{EN-DC}_{\text{ACLR}}$  requirement is set for the corresponding sub-block for the gap. The assigned EN-DC sub-block power and adjacent channel power are measured with rectangular filters with measurement bandwidths specified in [4] for the E-UTRA sub-block, and [2],[3] for the NR sub-block. If the measured adjacent channel power is greater than  $-50\text{dBm}$  then the  $\text{EN-DC}_{\text{ACLR}}$  shall be higher than the value specified in for  $\text{E-UTRA}_{\text{ACLR}}$  and  $\text{NR}_{\text{ACLR}}$ .

## 6.5B.2.3 Inter-band EN-DC within FR1

Unless otherwise stated, the OOB requirements specified in sub-clause 6.6.2.1 of [4], sub-clause 6.6.2 of [4] and sub-clause 6.5.2 of [2] apply for each component carrier.

The requirements apply to each antenna connector.

## 6.5B.2.4 Inter-band EN-DC including FR2

Unless otherwise stated, the OOB requirements specified in sub-clause 6.6.2 of [4] and sub-clause 6.5.2 of [3] apply for each component carrier.

## 6.5B.2.5 Inter-band EN-DC including both FR1 and FR2

Unless otherwise stated, the OOB requirements specified in sub-clause 6.6.2 of [4], sub-clause 6.5.2 of [2] and 6.5.2 of [3] apply for each component carrier.

## 6.5B.3 Spurious emissions for EN-DC

### 6.5B.3.1 Intra-band contiguous EN-DC

#### 6.5B.3.1.1 General spurious emissions

The general spurious emissions requirements specified in sub-clause 6.6.3.1 of [4] and sub-clause 6.5.3.1 of [2] apply beyond any frequencies for which the out-of-band emissions requirements in sub-clause 6.5B.2.1 apply.

#### 6.5B.3.1.2 Spurious emission band UE co-existence

The requirements in Table 6.5B.3.1.2-1 apply on each component carrier with all component carriers are active.

Table 6.5B.3.1.2-1: Requirements for intra-band contiguous EN-DC

| EN-DC Configuration | Spurious emission   |                       |   |                      |                     |           |      |
|---------------------|---|-----------------------|---|----------------------|---------------------|-----------|------|
|                     | Protected band  | Frequency range (MHz) |   |                      | Maximum Level (dBm) | MBW (MHz) | NOTE |
| DC_(n)71            | E-UTRA Band 4, 5, 12, 13, 14, 17, 24, 26, 30, 48, 66  | F <sub>DL_low</sub>   | - | F <sub>DL_high</sub> | -50                 | 1         |      |
|                     | E-UTRA Band 2, 25, 41, 70   | F <sub>DL_low</sub>   | - | F <sub>DL_high</sub> | -50                 | 1         | 2    |
|                     | E-UTRA Band 29  | F <sub>DL_low</sub>   | - | F <sub>DL_high</sub> | -38                 | 1         | 3    |
|                     | E-UTRA Band 71  | F <sub>DL_low</sub>   | - | F <sub>DL_high</sub> | -50                 | 1         | 3    |
| DC_(n)41            | E-UTRA Band 1, 2, 3, 4, 5, 8, 10, 12, 13, 14, 17, 24, 25, 26, 27, 28, 29, 30, 34, 39, 42, 44, 45, 48, 50, 51, 66, 70, 71, 73, 74<br>NR Band n77, n78 and n79  | F <sub>DL_low</sub>   | - | F <sub>DL_high</sub> | -50                 | 1         |      |
|                     | E-UTRA Band 40  | F <sub>DL_low</sub>   | - | F <sub>DL_high</sub> | [-40]               | 1         |      |
|                     | NOTE 1: F <sub>DL_low</sub> and F <sub>DL_high</sub> refer to each E-UTRA frequency band specified in Table 5.5-1<br>NOTE 2: As exceptions, measurements with a level up to the applicable requirements defined in Table 6.6.3.1-2 are permitted for each assigned E-UTRA carrier used in the measurement due to 2 <sup>nd</sup> , 3 <sup>rd</sup> , 4 <sup>th</sup> or 5 <sup>th</sup> harmonic spurious emissions. Due to spreading of the harmonic emission the exception is also allowed for the first 1 MHz frequency range immediately outside the harmonic emission on both sides of the harmonic emission. This results in an overall exception interval centred at the harmonic emission of (2MHz + N x L <sub>CRB</sub> x 180kHz), where N is 2, 3, 4, 5 for the 2 <sup>nd</sup> , 3 <sup>rd</sup> , 4 <sup>th</sup> or 5 <sup>th</sup> harmonic respectively. The exception is allowed if the measurement bandwidth (MBW) totally or partially overlaps the overall exception interval<br>NOTE 3: These requirements also apply for the frequency ranges that are less than F <sub>OOB</sub> (MHz) in Table 6.6.3.1-1 and Table 6.6.3.1A-1 [4] from the edge of the channel bandwidth. |                       |   |                      |                     |           |      |

## 6.5B.3.2 Intra-band non-contiguous EN-DC

### 6.5B.3.2.1 General spurious emissions

The general spurious emissions requirements specified in sub-clause 6.6.3.1 of [4] and sub-clause 6.5.3.1 of [2] apply beyond any frequencies for which the out-of-band emissions requirements in sub-clause 6.5B.2.2 apply.

### 6.5B.3.2.2 Spurious emission band UE co-existence

The requirements in Table 6.5B.3.2.2-1 apply with all component carriers are active.

**Table 6.5B.3.2.2-1: Requirements for intra-band non-contiguous EN-DC**

| EN-DC Configuration  | Spurious emission  |                       |   |                      |                     |           |      |
|--|--|-----------------------|---|----------------------|---------------------|-----------|------|
|  | Protected band   | Frequency range (MHz) |   |                      | Maximum Level (dBm) | MBW (MHz) | NOTE |
| DC_41_n41  | E-UTRA Band 1, 2, 3, 4, 5, 8, 10, 12, 13, 14, 17, 24, 25, 26, 27, 28, 29, 34, 39, 42, 44, 45, 48, 50, 51, 66, 70, 71, 73, 74<br>NR Band n77, n78 and n79 | F <sub>DL_low</sub>   | - | F <sub>DL_high</sub> | -50                 | 1         |      |
|  | E-UTRA Band 30   | F <sub>DL_low</sub>   | - | F <sub>DL_high</sub> | [-40]               | 1         |      |
| NOTE 1: F <sub>DL_low</sub> and F <sub>DL_high</sub> refer to each E-UTRA frequency band specified in Table 5.5-1  |  |                       |   |                      |                     |           |      |
| NOTE 2: As exceptions, measurements with a level up to the applicable requirements defined in Table 6.6.3.1-2 are permitted for each assigned E-UTRA carrier used in the measurement due to 2 <sup>nd</sup> , 3 <sup>rd</sup> , 4 <sup>th</sup> or 5 <sup>th</sup> harmonic spurious emissions. Due to spreading of the harmonic emission the exception is also allowed for the first 1 MHz frequency range immediately outside the harmonic emission on both sides of the harmonic emission. This results in an overall exception interval centred at the harmonic emission of (2MHz + N x L <sub>CRB</sub> x 180kHz), where N is 2, 3, 4, 5 for the 2 <sup>nd</sup> , 3 <sup>rd</sup> , 4 <sup>th</sup> or 5 <sup>th</sup> harmonic respectively. The exception is allowed if the measurement bandwidth (MBW) totally or partially overlaps the overall exception interval |  |                       |   |                      |                     |           |      |

**6.5B.3.3 Inter-band EN-DC within FR1**

**6.5B.3.3.1 General spurious emissions**

The general spurious emissions requirements specified in sub-clause 6.6.3.1 of [4], sub-clause 6.5.3.1 of [2] and [3] apply for each component carrier.

**Table 6.5B.3.3.1-1: (Void)**

**6.5B.3.3.2 Spurious emission band UE co-existence**

This clause specifies the requirements for the specified EN-DC, for coexistence with protected bands. The requirements in Table 6.5B.3.3.2-1 apply on each component carrier with all component carriers are active.

**Table 6.5B.3.3.2-1: Requirements**

| EN-DC Configuration  | Spurious emission  |                       |        |                      |           |       |          |
|--|--|-----------------------|--------|----------------------|-----------|-------|----------|
|  | Protected band   | Frequency range (MHz) |        | Maximum Level (dBm)  | MBW (MHz) | NOTE  |          |
| DC_1_n28   | E-UTRA Band 18, 19, 27, 31, 32, 72<br>NR band n5, n7, n8, n20, n26, n38,<br>n40, n41, n50, n51, n74  | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     |          |
|  | E-UTRA Band 42, 43<br>NR band n78, n75, n76  | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     | 2        |
|  | NR band n3, n34  | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     | 5        |
|  | E-UTRA Band 11, 21   | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     | 9, 11    |
|  | E-UTRA Band 65<br>NR band n1   | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     | 9, 10    |
|  | Frequency range  | 470                   | -      | 694                  | -42       | 8     | 5, 17    |
|  | Frequency range  | 470                   | -      | 710                  | -26.2     | 6     | 14       |
|  | Frequency range  | 758                   | -      | 773                  | -32       | 1     | 5        |
|  | Frequency range  | 773                   | -      | 803                  | -50       | 1     |          |
|  | Frequency range  | 662                   | -      | 694                  | -26.2     | 6     | 5        |
|  | Frequency range  | 1880                  | -      | 1895                 | -40       | 1     | 5, 16    |
|  | Frequency range  | 1895                  | -      | 1915                 | -15.5     | 5     | 5, 7, 16 |
|  | Frequency range  | 1915                  | -      | 1920                 | +1.6      | 5     | 5, 7, 16 |
|  | Frequency range  | 1839.9                | -      | 1879.9               | -50       | 1     | 5        |
| Frequency range  | 1884.5   | -                     | 1915.7 | -41                  | 0.3       | 9, 15 |          |
| DC_1_n40   | Band 1, 5, 7, 8, 11, 18, 19, 20, 21,<br>22, 26, 27, 28, 31, 32, 38, 40, 41, 42,<br>43, 44, 45, 50, 51, 52, 65, 67, 68, 69,<br>72, 73, 74, 75, 76 | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     |          |
|  | Band 3, 34   | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     | 5        |
|  | Frequency range  | 1880                  | -      | 1895                 | -40       | 1     | 5, 17    |
|  | Frequency range  | 1895                  | -      | 1915                 | -15.5     | 5     | 5, 7, 17 |
| DC_1_n51   | Frequency range  | 1915                  | -      | 1920                 | +1.6      | 5     | 5, 7, 17 |
|  | E-UTRA Band 7, 12, 13, 17, 20, 22,<br>27, 28, 29, 31, 38, 44, 48, 67, 68, 69,<br>72, 73  | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     |          |
|  | E-UTRA Band 3, 34  | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     | 5, 2     |
|  | Frequency range  | 1880                  | -      | 1895                 | -40       | 1     | 5, 16    |
|  | Frequency range  | 1895                  | -      | 1915                 | -15.5     | 5     | 5, 7, 16 |
| DC_1_n77   | Frequency range  | 1915                  | -      | 1920                 | +1.6      | 5     | 5, 7, 16 |
|  | E-UTRA Band 5, 6, 8, 26, 30, 40, 41,<br>42, 43, 46<br>NR Band n77, n78, n79,   | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     | 2        |
|  | E-UTRA Band 1, 3, 5, 7, 8, 11, 18,<br>19, 20, 21, 26, 28, 34, 39, 40, 41, 65   | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     |          |
|  | Frequency range  | 1880                  | -      | 1895                 | -40       | 1     | 5, 8     |
|  | Frequency range  | 1895                  | -      | 1915                 | -15.5     | 5     | 5, 7, 8  |
| DC_1_n78<br>DC_1_n84_ULS<br>UP-TDM_n78<br>DC_1_n84_ULS<br>UP-FDM_n78 | Frequency range  | 1915                  | -      | 1920                 | +1.6      | 5     | 5, 7, 8  |
|  | E-UTRA Band 1, 3, 5, 7, 8, 11, 18,<br>19, 20, 21, 26, 28, 34, 40, 41, 65   | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     |          |
|  | Frequency range  | 1880                  | -      | 1895                 | -40       | 1     | 5, 8     |
|  | Frequency range  | 1895                  | -      | 1915                 | -15.5     | 5     | 5, 7, 8  |
| DC_1_n79   | Frequency range  | 1915                  | -      | 1920                 | +1.6      | 5     | 5, 7, 8  |
|  | E-UTRA Band 1, 3, 5, 7, 8, 11, 18,<br>19, 21, 26, 28, 34, 40, 41, 42, 65   | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     |          |
|  | Frequency range  | 1880                  | -      | 1895                 | -40       | 1     | 5, 8     |
|  | Frequency range  | 1895                  | -      | 1915                 | -15.5     | 5     | 5, 7, 8  |
| DC_2_n5  | Frequency range  | 1915                  | -      | 1920                 | +1.6      | 5     | 5, 7, 8  |
|  | Bands 4, 5, 10, 12, 13, 14, 17, 24,<br>28, 29, 30, 42, 48, 50, 51, 66, 70, 71,<br>n71, 74, 85  | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     |          |
|  | Bands 2, 25, 48  | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     | 2        |
|  | E-UTRA Band 26   | 859                   | -      | 869                  | -27       | 1     |          |
| DC_2_n66   | E-UTRA Band 41, 43   | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     |          |
|  | Bands 4, 5, 10, 12, 13, 14, 17, 24,<br>26, 27, 28, 29, 30, 41, 50, 51, 66, 70,<br>71, n71, 74, 85  | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     |          |
|  | Bands 2, 25  | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     | 5        |
| DC_2_n71   | Bands 42, 48   | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     | 2        |
|  | E-UTRA Band 4, 5, 12, 13, 14, 17,<br>24, 26, 29, 30, 48, 66  | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     |          |
|  | E-UTRA Band 2, 25, 41, 70<br>NR Band n71   | F <sub>DL_low</sub>   | -      | F <sub>DL_high</sub> | -50       | 1     | 2<br>5   |

|   |   |                     |   |                      |       |     |         |
|---|---|---------------------|---|----------------------|-------|-----|---------|
| DC_2_n78  | E-UTRA Band 4, 5, 10, 12, 13, 14, 17, 24, 26, 27, 28, 29, 30, 41, 42, 48, 50, 51, 66, 70, 71, 74, 85  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |         |
|   | E-UTRA Band 2, 25   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2       |
| DC_3_n7   | E-UTRA Band 1, 5, 7, 8, 20, 26, 27, 28, 31, 32, 33, 34, 40, 43, 44, 50, 51, 65, 67, 72, 74, 75, 76<br>NR Band n1, n5, n7, n8, n20, n28, n50, n51, n74, n75, n76 | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |         |
|   | E-UTRA band 3   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 5       |
|   | E-UTRA band 22, 42  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2       |
|   | Frequency range   | 2570                | - | 2575                 | +1.6  | 5   | 5, 6, 7 |
|   | Frequency range   | 2575                | - | 2595                 | -15.5 | 5   | 5, 6, 7 |
|   | Frequency range   | 2595                | - | 2620                 | -40   | 1   | 5, 6    |
| DC_3_n28  | E-UTRA Band 42, 43, 65<br>NR band n1, n50, n51, n74, n75, n76, n78  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2       |
|   | NR band n1  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 9, 10   |
|   | NR band n3  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 5       |
|   | E-UTRA Band 27, 31, 72<br>NR band n5, n7, n8, n20, n26, n34, n38, n40, n41  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |         |
|   | E-UTRA Band 11, 18, 19, 21  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 13      |
|   | Frequency range   | 1884.5              | - | 1915.7               | -41   | 0.3 | 13      |
|   | Frequency range   | 470                 | - | 710                  | -26.2 | 6   | 14      |
|   | Frequency range   | 758                 | - | 773                  | -32   | 1   | 5       |
|   | Frequency range   | 773                 | - | 803                  | -50   | 1   |         |
|   | Frequency range   | 1884.5              | - | 1915.7               | -41   | 0.3 | 3, 9    |
| DC_3_n40  | Band 1, 5, 7, 8, 20, 26, 27, 28, 31, 32, 33, 34, 38, 39, 41, 43, 44, 45, 50, 51, 65, 67, 68, 69, 72, 73, 75, 76   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |         |
|   | Band 3  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 5       |
|   | Band 22, 42, 52   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2       |
|   | Frequency range   | 1884.5              | - | 1915.7               | -41   | 0.3 | 3       |
| DC_3_n51  | E-UTRA Band 7, 8, 12, 13, 17, 20, 27, 28, 31, 33, 38, 48, 67, 68, 69, 72, 73  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |         |
|   | E-UTRA Band 3   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 5       |
|   | E-UTRA Band 1, 5, 6, 22, 26, 30, 34, 36, 40, 41, 42, 43, 44, 46, 65, 71   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2       |
| DC_3_n77  | E-UTRA Band 1, 3, 5, 7, 8, 11, 18, 19, 20, 21, 26, 28, 34, 39, 40, 41, 65   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |         |
|   | Frequency range   | 1884.5              | - | 1915.7               | -41   | 0.3 | 3       |
| DC_3_n78<br>DC_3_n80_ULS<br>UP-TDM_n78,<br>DC_3_n80_ULS<br>UP-FDM_n78 | E-UTRA Band 1, 3, 5, 7, 8, 11, 18, 19, 20, 21, 26, 28, 34, 39, 40, 41, 65   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |         |
|   | Frequency range   | 1884.5              | - | 1915.7               | -41   | 0.3 | 3       |
| DC_3_n79<br>DC_3_n80_ULS<br>UP-TDM_n79,<br>DC_3_n80_ULS<br>UP-FDM_n79 | E-UTRA Band 1, 3, 5, 8, 11, 18, 19, 21, 28, 34, 39, 40, 41, 65  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |         |
|   | E-UTRA Band 42  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2       |
|   | Frequency range   | 1884.5              | - | 1915.7               | -41   | 0.3 | 3       |
| DC_3_n82  | E-UTRA Band 1, 3, 7, 8, 20, 22, 31, 32, 33, 34, 38, 40, 43, 50, 51, 65, 67, 68, 69, 72, 74, 75, 76  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |         |
|   | E-UTRA Band 42  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2       |
| DC_5_n40  | Band 1, 3, 5, 7, 8, 28, 31, 34, 38, 42, 43, 45, 65, 73  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |         |
|   | Band 26   | 859                 | - | 869                  | -27   | 1   |         |
|   | Band 41, 52   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |         |
|   | Frequency range   | 1884.5              | - | 1915.7               | -41   | 0.3 | 3       |
| DC_5_n66  | Bands 1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 13, 14, 17, 24, 25, 28, 29, 30, 34, 38, 40, 43, 45, 50, 51, 65, 66, 70, 71, n71, 85                                       | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |         |
|   | E-UTRA Band 26  | 859                 | - | 869                  | -27   | 1   |         |
|   | Bands 41, 42, 48, 52  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2       |
|   | E-UTRA Band 18, 19  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -40   | 1   |         |
|   | E-UTRA Band 11, 21  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |         |
|   | Frequency range   | 1884.5              | - | 1915.7               | -41   | 0.3 | 3       |

|   |   |                     |   |                      |       |     |          |
|---|---|---------------------|---|----------------------|-------|-----|----------|
| DC_5_n78  | E-UTRA Band 1, 2, 3, 4, 5, 7, 8, 10, 12, 13, 14, 17, 24, 25, 28, 29, 30, 31, 34, 38, 40, 42, 43, 45, 48, 65, 66, 70             | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | E-UTRA Band 26  | 859                 | - | 869                  | -27   | 1   |          |
|   | Frequency range   | 945                 | - | 960                  | -50   | 1   |          |
|   | Frequency range   | 1884.5              | - | 1915.7               | -41   | 0.3 | 3, 4     |
|   | Frequency range   | 2545                | - | 2575                 | -50   | 1   |          |
|   | Frequency range   | 2595                | - | 2645                 | -50   | 1   |          |
|   | E-UTRA Band 41  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 7        |
|   | E-UTRA Band 18, 19  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -40   | 1   | 4        |
| DC_7_n28  | E-UTRA Band 27, 31, 72<br>NR band n2, n3, n5, n7, n8, n20, n26, n34, n40  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | E-UTRA Band 4, 10, 42, 43, 65<br>NR band n1, n50, n51, n66, n74, n75, n76, n78  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2        |
|   | NR band n1  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 9, 10    |
|   | Frequency range   | 758                 | - | 773                  | -32   | 1   | 5        |
|   | Frequency range   | 773                 | - | 803                  | -50   | 1   |          |
|   | Frequency range   | 2570                | - | 2575                 | +1.6  | 5   | 5, 6, 7  |
|   | Frequency range   | 2575                | - | 2595                 | -15.5 | 5   | 5, 6, 7  |
|   | Frequency range   | 2595                | - | 2620                 | -40   | 1   | 5, 6     |
| DC_7_n51  | E-UTRA Band 2, 3, 5, 8, 26, 30, 31, 32, 33, 34, 40, 48, 72  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | Frequency range   | 2570                | - | 2575                 | +1.6  | 5   | 5, 7, 16 |
|   | Frequency range   | 2575                | - | 2595                 | -15.5 | 5   | 5, 7, 16 |
|   | Frequency range   | 2595                | - | 2620                 | -40   | 1   | 5        |
|   | E-UTRA Band 1, 4, 10, 12, 13, 14, 17, 20, 22, 23, 27, 28, 29, 42, 43, 44, 46, 65, 66, 67, 68<br>NR Band n77, n78, n79,          | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2        |
| DC_7_n78  | E-UTRA Band 1, 2, 3, 4, 5, 7, 8, 10, 11, 18, 19, 20, 21, 26, 27, 28, 31, 32, 33, 34, 40, 50, 51, 65, 66, 67, 68, 72, 74, 75, 76 | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | Frequency range   | 2570                | - | 2575                 | +1.6  | 5   | 5, 6, 7  |
|   | Frequency range   | 2575                | - | 2595                 | -15.5 | 5   | 5, 6, 7  |
|   | Frequency range   | 2595                | - | 2620                 | -40   | 1   | 5, 6     |
| DC_8_n40  | Band 1, 20, 28, 31, 32, 33, 34, 38, 39, 40, 45, 50, 51, 65, 67, 68, 69, 72, 73, 74, 75, 76                                      | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | Band 3, 7, 22, 41, 42, 43, 52   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2        |
|   | Band 8  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 5        |
|   | Band 11, 21   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 12       |
|   | Frequency range   | 860                 | - | 890                  | -40   | 1   | 5, 12    |
|   | Frequency range   | 1884.5              | - | 1915.7               | -41   | 0.3 | 3, 12    |
| DC_8_n77  | E-UTRA Band 1, 20, 28, 31, 32, 33, 34, 38, 39, 40, 44, 45, 50, 51, 65, 67, 68, 69, 72, 73, 74, 75, 76                           | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | E-UTRA band 3, 7, 22, 41  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2        |
|   | E-UTRA Band 8   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 5        |
|   | E-UTRA Band 11, 21  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 12       |
|   | Frequency range   | 860                 | - | 890                  | -40   | 1   | 5, 12    |
|   | Frequency range   | 1884.5              | - | 1915.7               | -41   | 0.3 | 3, 12    |
| DC_8_n78<br>DC_8_n81_ULS<br>UP-TDM_n78,<br>DC_8_n81_ULS<br>UP-FDM_n78 | E-UTRA Band 1,8, 20, 28, 34, 39, 40,65  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | E-UTRA Band 3, 7,41   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2        |
|   | E-UTRA Band 11, 21  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 12       |
|   | Frequency range   | 860                 | - | 890                  | -40   | 1   | 5, 12    |
|   | Frequency range   | 1884.5              | - | 1915.7               | -41   | 0.3 | 3, 12    |
| DC_8_n79<br>DC_8_n81_ULS<br>UP-TDM_n79,<br>DC_8_n81_ULS<br>UP-FDM_n79 | E-UTRA Band 1,8,28,34,39,40,65  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | E-UTRA Band 3,41,42   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2        |
|   | E-UTRA Band 11, 21  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 12       |
|   | Frequency range   | 860                 | - | 890                  | -40   | 1   | 5, 12    |
|   | Frequency range   | 1884.5              | - | 1915.7               | -41   | 0.3 | 3        |
| DC_11_n77   | E-UTRA Band 1, 3, 18, 19, 28, 34, 65  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | Frequency range   | 945                 | - | 960                  | -50   | 1   |          |
|   | Frequency range   | 1884.5              | - | 1915.7               | -41   | 0.3 | 3        |
|   | Frequency range   | 2545                | - | 2575                 | -50   | 1   |          |
|   | Frequency range   | 2595                | - | 2645                 | -50   | 1   |          |

|                        |   |               |   |                |     |     |   |
|------------------------|---|---------------|---|----------------|-----|-----|---|
| DC_11_n78              | E-UTRA Band 1, 3, 18, 19, 28, 34, 65  | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
|                        | Frequency range   | 945           | - | 960            | -50 | 1   |   |
|                        | Frequency range   | 1884.5        | - | 1915.7         | -41 | 0.3 | 3 |
|                        | Frequency range   | 2545          | - | 2575           | -50 | 1   |   |
|                        | Frequency range   | 2595          | - | 2645           | -50 | 1   |   |
| DC_11_n79              | E-UTRA Band 1, 3, 18, 19, 28, 34, 42, 65  | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
|                        | Frequency range   | 945           | - | 960            | -50 | 1   |   |
|                        | Frequency range   | 1884.5        | - | 1915.7         | -41 | 0.3 | 3 |
|                        | Frequency range   | 2545          | - | 2575           | -50 | 1   |   |
|                        | Frequency range   | 2595          | - | 2645           | -50 | 1   |   |
| DC_12_n5               | Bands 2, 5, 12, 13, 14, 17, 24, 25, 30, 42, 43 50, 51, 71, n71, 74                              | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
|                        | Bands 4, 10, 41, 48, 66, 70   | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   | 2 |
|                        | Band 26   | 859           | - | 869            | -27 | 1   |   |
|                        | Band 12, 85   | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
| DC_12_n66<br>DC_12_n5  | Bands 2, 4, 5, 13, 14, 17, 24, 25, 26, 27, 29, 30, 41, 50, 51, 70, 71, n71, 74                  | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
|                        | Bands 4, 10, 48   | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   | 2 |
|                        | Bands 12, 85  | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   | 5 |
|                        | Bands 2, 5, 12, 13, 14, 17, 24, 25, 30, 42, 43 50, 51, 71, n71, 74                              | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
| DC_18_n77              | E-UTRA Band 1, 3, 11, 21, 28, 34, 65  | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
|                        | Frequency range   | 945           | - | 960            | -50 | 1   |   |
|                        | Frequency range   | 1884.5        | - | 1915.7         | -41 | 0.3 | 3 |
|                        | Frequency range   | 2545          | - | 2575           | -50 | 1   |   |
|                        | Frequency range   | 2595          | - | 2645           | -50 | 1   |   |
| DC_18_n78              | E-UTRA Band 1, 3, 11, 21, 28, 34, 65  | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
|                        | Frequency range   | 945           | - | 960            | -50 | 1   |   |
|                        | Frequency range   | 1884.5        | - | 1915.7         | -41 | 0.3 | 3 |
|                        | Frequency range   | 2545          | - | 2575           | -50 | 1   |   |
|                        | Frequency range   | 2595          | - | 2645           | -50 | 1   |   |
| DC_18_n79              | E-UTRA Band 1, 3, 11, 21, 28, 34, 42, 65  | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
|                        | Frequency range   | 945           | - | 960            | -50 | 1   |   |
|                        | Frequency range   | 1884.5        | - | 1915.7         | -41 | 0.3 | 3 |
|                        | Frequency range   | 2545          | - | 2575           | -50 | 1   |   |
|                        | Frequency range   | 2595          | - | 2645           | -50 | 1   |   |
| DC_19_n77              | E-UTRA Band 1, 3, 11, 21, 28, 34, 65  | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
|                        | Frequency range   | 945           | - | 960            | -50 | 1   |   |
|                        | Frequency range   | 1884.5        | - | 1915.7         | -41 | 0.3 | 3 |
|                        | Frequency range   | 2545          | - | 2575           | -50 | 1   |   |
|                        | Frequency range   | 2595          | - | 2645           | -50 | 1   |   |
| DC_19_n78              | E-UTRA Band 1, 3, 11, 21, 28, 34, 65  | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
|                        | Frequency range   | 945           | - | 960            | -50 | 1   |   |
|                        | Frequency range   | 1884.5        | - | 1915.7         | -41 | 0.3 | 3 |
|                        | Frequency range   | 2545          | - | 2575           | -50 | 1   |   |
|                        | Frequency range   | 2595          | - | 2645           | -50 | 1   |   |
| DC_19_n79              | E-UTRA Band 1, 3, 11, 21, 28, 34, 42, 65  | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
|                        | Frequency range   | 945           | - | 960            | -50 | 1   |   |
|                        | Frequency range   | 1884.5        | - | 1915.7         | -41 | 0.3 | 3 |
|                        | Frequency range   | 2545          | - | 2575           | -50 | 1   |   |
|                        | Frequency range   | 2595          | - | 2645           | -50 | 1   |   |
| DC_20_n8               | E-UTRA Band 1, 3, 7, 22, 28, 31, 32, 34, 38, 42, 43, 65, 75, 76, n78                            | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
| DC_20_n28<br>DC_20_n83 | E-UTRA Band 1, 3, 7, 8, 22, 31, 32, 34, 38, 42, 43, 65, 75, 76                                  | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
| DC_20_n51              | E-UTRA Band 1, 3, 4, 8, 17, 22, 28, 29, 31, 40, 43, 48, 65, 66, 68, 72                          | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
|                        | E-UTRA Band 20  | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   | 5 |
|                        | Frequency range   | 758           | - | 788            | -50 | 1   |   |
|                        | E-UTRA Band 2, 7, 25, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 46, 69, 70 NR Band n77, n78, n79, | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   | 2 |



|   |  |                     |   |                      |       |     |          |
|---|--|---------------------|---|----------------------|-------|-----|----------|
| DC_20_n77   | E-UTRA Band 1, 3, 7, 8, 31, 32, 33, 34, 40, 50, 51, 65, 67, 68, 72, 74, 75, 76   |                     |   |                      |       |     |          |
|   | E-UTRA Band 20   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 5        |
|   | E-UTRA Band 38, 69   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2        |
| DC_20_n78,<br>DC_20_n82_ULS<br>UP-TDM_n78,<br>DC_20_n82_ULS<br>UP-FDM_n78 | E-UTRA Band 1, 3, 7, 8, 22, 31, 32, 33, 34, 40, 42, 43, 50, 51, 65, 67, 68, 72, 74, 75, 76                                       |                     |   |                      |       |     |          |
|   | E-UTRA Band 20   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 5        |
|   | E-UTRA Band 38, 69   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2        |
| DC_21_n77   | E-UTRA Band 1, 3, 18, 19, 21, 28, 34, 65   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | Frequency range  | 945                 | - | 960                  | -50   | 1   |          |
|   | Frequency range  | 1884.5              | - | 1915.7               | -41   | 0.3 | 3        |
|   | Frequency range  | 2545                | - | 2575                 | -50   | 1   |          |
|   | Frequency range  | 2595                | - | 2645                 | -50   | 1   |          |
| DC_21_n78   | E-UTRA Band 1, 3, 18, 19, 21, 28, 34, 65   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | Frequency range  | 945                 | - | 960                  | -50   | 1   |          |
|   | Frequency range  | 1884.5              | - | 1915.7               | -41   | 0.3 | 3        |
|   | Frequency range  | 2545                | - | 2575                 | -50   | 1   |          |
|   | Frequency range  | 2595                | - | 2645                 | -50   | 1   |          |
| DC_21_n79   | E-UTRA Band 1, 3, 18, 19, 21, 28, 34, 42, 65   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | Frequency range  | 945                 | - | 960                  | -50   | 1   |          |
|   | Frequency range  | 1884.5              | - | 1915.7               | -41   | 0.3 | 3        |
|   | Frequency range  | 2545                | - | 2575                 | -50   | 1   |          |
|   | Frequency range  | 2595                | - | 2645                 | -50   | 1   |          |
| DC_25_n41   | NR band n5, n28, n66, n71<br>E-UTRA/NR Band 4, 10, 12, 13, 14, 17, 24, 26, 27, 29, 30, 42, 45, 48, 70                            | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | NR band n2<br>E-UTRA/NR Band 25  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 5        |
|   | EUTRA/NR Band 43   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2        |
| DC_26_n41   | E-UTRA/NR Band 1, 2, 3, 4, 5, 10, 12, 13, 14, 17, 24, 25, 26, 28, 29, 30, 31, 34, 39, 40, 42, 43, 48, 50, 51, 65, 66, 70, 71, 74 | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | E-UTRA Band 9, 11, 18, 19, 21  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 19       |
|   | Frequency range  | 1884.5              | - | 1915.7               | -41   | 0.3 | 3, 19    |
|   | Frequency range  | 703                 | - | 799                  | -50   | 1   |          |
|   | Frequency range  | 799                 | - | 803                  | -40   | 1   | 5        |
|   | Frequency range  | 945                 | - | 960                  | -50   | 1   |          |
| DC_26_n77   | E-UTRA Band 1, 3, 11, 21, 28, 34, 65   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | Frequency range  | 945                 | - | 960                  | -50   | 1   |          |
|   | Frequency range  | 1884.5              | - | 1915.7               | -41   | 0.3 | 3        |
|   | Frequency range  | 2545                | - | 2575                 | -50   | 1   |          |
|   | Frequency range  | 2595                | - | 2645                 | -50   | 1   |          |
| DC_26_n78   | E-UTRA Band 1, 3, 11, 21, 28, 34, 65   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | Frequency range  | 945                 | - | 960                  | -50   | 1   |          |
|   | Frequency range  | 1884.5              | - | 1915.7               | -41   | 0.3 | 3        |
|   | Frequency range  | 2545                | - | 2575                 | -50   | 1   |          |
|   | Frequency range  | 2595                | - | 2645                 | -50   | 1   |          |
| DC_26_n79   | E-UTRA Band 1, 3, 11, 21, 28, 34, 42, 65   | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | Frequency range  | 945                 | - | 960                  | -50   | 1   |          |
|   | Frequency range  | 1884.5              | - | 1915.7               | -41   | 0.3 | 3        |
|   | Frequency range  | 2545                | - | 2575                 | -50   | 1   |          |
|   | Frequency range  | 2595                | - | 2645                 | -50   | 1   |          |
| DC_28_n51   | E-UTRA Band 2, 3, 5, 7, 8, 25, 26, 31, 34, 38, 40, 41, 66, 72  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   |          |
|   | E-UTRA Band 4, 10, 20, 22, 24, 32, 42, 43, 45, 46, 65, 66, 71, 73<br>NR band n78, n79  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2        |
|   | E-UTRA Band 1  | F <sub>DL_low</sub> | - | F <sub>DL_high</sub> | -50   | 1   | 2, 9, 10 |
|   | Frequency range  | 470                 | - | 694                  | -42   | 8   | 5, 17    |
|   | Frequency range  | 470                 | - | 710                  | -26.2 | 6   | 14       |
|   | Frequency range  | 662                 | - | 694                  | -26.2 | 6   | 5        |
|   | Frequency range  | 758                 | - | 773                  | -32   | 1   | 5        |
|   | Frequency range  | 773                 | - | 803                  | -50   | 1   |          |



|   |   |               |   |                |     |     |   |
|---|---|---------------|---|----------------|-----|-----|---|
|   | E-UTRA Band 11, 21  | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
|   | Frequency range   | 1884.5        | - | 1915.7         | -41 | 0.3 | 3 |
| DC_66_n71   | E-UTRA Band 4, 5, 7, 10, 13, 14, 17, 22, 24, 26, 27, 29, 30, 43, 50, 51, 66, 74 | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
|   | E-UTRA Band 2, 25, 41, 42, 48, 70   | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   | 2 |
|   | E-UTRA Band 71  | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   | 5 |
| DC_66_n78,<br>DC_66_n86_ULS<br>UP-TDM_n78,<br>DC_66_n86_ULS<br>UP-FDM_n78                             | E-UTRA Band 1, 3, 5, 7, 8, 20, 26, 28, 34, 39, 40, 41, 65                       | $F_{DL\_low}$ | - | $F_{DL\_high}$ | -50 | 1   |   |
| NOTE 1: $F_{DL\_low}$ and $F_{DL\_high}$ refer to each E-UTRA frequency band specified in Table 5.5-1 |   |               |   |                |     |     |   |

- NOTE 2: As exceptions, measurements with a level up to the applicable requirements defined in Table 6.6.3.1-2 are permitted for each assigned E-UTRA carrier used in the measurement due to 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> or 5<sup>th</sup> harmonic spurious emissions. Due to spreading of the harmonic emission the exception is also allowed for the first 1 MHz frequency range immediately outside the harmonic emission on both sides of the harmonic emission. This results in an overall exception interval centred at the harmonic emission of  $(2\text{MHz} + N \times L_{\text{CRB}} \times 180\text{kHz})$ , where N is 2, 3, 4, 5 for the 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> or 5<sup>th</sup> harmonic respectively. The exception is allowed if the measurement bandwidth (MBW) totally or partially overlaps the overall exception interval.
- NOTE 3: Applicable when co-existence with PHS system operating in 1884.5 -1915.7MHz
- NOTE 4: Applicable only when the assigned E-UTRA carrier is confined within 824 MHz and 849 MHz for UE category M1, M2 and UE category NB1 and NB2.
- NOTE 5: These requirements also apply for the frequency ranges that are less than  $F_{\text{OoB}}$  (MHz) in Table 6.6.3.1-1 and Table 6.6.3.1A-1 from the edge of the channel bandwidth.
- NOTE 6: This requirement is applicable for any channel bandwidths within the range 2500 - 2570 MHz with the following restriction: for carriers of 15 MHz bandwidth when carrier centre frequency is within the range 2560.5 - 2562.5 MHz and for carriers of 20 MHz bandwidth when carrier centre frequency is within the range 2552 - 2560 MHz the requirement is applicable only for an uplink transmission bandwidth less than or equal to 54 RB.
- NOTE 7: For these adjacent bands, the emission limit could imply risk of harmful interference to UE(s) operating in the protected operating band.
- NOTE 8: This requirement is applicable for any channel bandwidths within the range 1920 - 1980 MHz with the following restriction: for carriers of 15 MHz bandwidth when carrier centre frequency is within the range 1927.5 - 1929.5 MHz and for carriers of 20 MHz bandwidth when carrier centre frequency is within the range 1930 - 1938 MHz the requirement is applicable only for an uplink
- NOTE 9: Applicable when the assigned E-UTRA carrier is confined within 718 MHz and 748 MHz and when the channel bandwidth used is 5 or 10 MHz.
- NOTE 10: As exceptions, measurements with a level up to the applicable requirement of -36 dBm/MHz is permitted for each assigned E-UTRA carrier used in the measurement due to 2<sup>nd</sup> harmonic spurious emissions. An exception is allowed if there is at least one individual RB within the transmission bandwidth (see Figure 5.6-1) for which the 2<sup>nd</sup> harmonic totally or partially overlaps the measurement bandwidth (MBW).
- NOTE 11: As exceptions, measurements with a level up to the applicable requirement of -38 dBm/MHz is permitted for each assigned E-UTRA carrier used in the measurement due to 3<sup>rd</sup> harmonic spurious emissions. An exception is allowed if there is at least one individual RB within the transmission bandwidth (see Figure 5.6-1) for which the 3<sup>rd</sup> harmonic totally or partially overlaps the measurement bandwidth (MBW).
- NOTE 12: This requirement is applicable only for the following cases: - for carriers of 5 MHz channel bandwidth when carrier centre frequency ( $F_c$ ) is within the range  $902.5 \text{ MHz} \leq F_c < 907.5 \text{ MHz}$  with an uplink transmission bandwidth less than or equal to 20 RB - for carriers of 5 MHz channel bandwidth when carrier centre frequency ( $F_c$ ) is within the range  $907.5 \text{ MHz} \leq F_c \leq 912.5 \text{ MHz}$  without any restriction on uplink transmission bandwidth. - for carriers of 10 MHz channel bandwidth when carrier centre frequency ( $F_c$ ) is  $F_c = 910 \text{ MHz}$  with an uplink transmission bandwidth less than or equal to 32 RB with  $\text{RB}_{\text{start}} > 3$ .
- NOTE13: This requirement applies for 5, 10, 15 and 20 MHz E-UTRA channel bandwidth allocated within 1744.9MHz and 1784.9MHz.
- NOTE 14: This requirement is applicable for 5 and 10 MHz E-UTRA channel bandwidth allocated within 718-728MHz. For carriers of 10 MHz bandwidth, this requirement applies for an uplink transmission bandwidth less than or equal to 30 RB with  $\text{RB}_{\text{start}} > 1$  and  $\text{RB}_{\text{start}} < 48$ .
- NOTE 15: Applicable when  $\text{NS}_{05}$  in section 6.6.3.3.1 is signalled by the network.
- NOTE 16: This requirement is applicable for any channel bandwidths within the range 1920 - 1980 MHz with the following restriction: for carriers of 15 MHz bandwidth when carrier centre frequency is within the range 1927.5 - 1929.5 MHz and for carriers of 20 MHz bandwidth when carrier centre frequency is within the range 1930 - 1938 MHz the requirement is applicable only for an uplink transmission bandwidth less than or equal to 54 RB.
- NOTE 17: This requirement is applicable in the case of a 10 MHz E-UTRA carrier confined within 703 MHz and 733 MHz, otherwise the requirement of -25 dBm with a measurement bandwidth of 8 MHz applies.
- NOTE 18: This requirement is only applicable for E-UTRA carriers with bandwidth confined within 1885-1920 MHz (requirement for carriers with at least 1RB confined within 1880 - 1885 MHz is not specified). This requirement applies for an uplink transmission bandwidth less than or equal to 54 RB for E-UTRA carriers of 15 MHz bandwidth when carrier center frequency is within the range 1892.5 - 1894.5 MHz and for E-UTRA carriers of 20 MHz bandwidth when carrier center frequency is within the range 1895 - 1903 MHz.
- NOTE 19: This requirement applies when the E-UTRA and NR carriers are confined within 2545-2575MHz or 2595-2645MHz and the channel bandwidth is 10 or 20 MHz

#### 6.5B.3.4 Inter-band EN-DC including FR2

The general spurious emissions requirements specified in sub-clause 6.6.3.1 of [4], sub-clause 6.5.3.1 of [2] and [3] apply for each component carrier.

#### 6.5B.3.4.1 Spurious emission band UE co-existence

This clause specifies the requirements for the specified EN-DC, for coexistence with protected bands. Unless otherwise stated, for inter-band EN-DC configurations defined in table 5.2B.5.1-1, no requirements for FR2 NR bands to protect E-UTRA and FR1 NR bands are applied to the constituent FR2 NR bands. Spurious emission band UE co-existence requirements specified in TS 36.101 [4] are applied to the constituent E-UTRA bands for the EN-DC configuration.

**Table 6.5B.3.4.1-1: Requirements**

(Void)

#### 6.5B.3.5 Inter-band EN-DC including both FR1 and FR2

The general spurious emissions requirements specified in sub-clause 6.6.3.1 of [4], sub-clause 6.5.3.1 of [2] and [3] apply for each component carrier.

#### 6.5B.3.5.1 Spurious emission band UE co-existence

This clause specifies the requirements for the specified EN-DC, for coexistence with protected bands. Unless otherwise stated, for inter-band EN-DC configurations defined in section 5.2B.6, no requirements for FR2 NR bands to protect E-UTRA and FR1 NR bands are applied to the constituent FR2 NR bands. Spurious emission band UE co-existence requirements for constituent E-UTRA and FR1 NR bands for the inter-band EN-DC are the same as those for the corresponding EN-DC configuration without the FR2 bands specified in 6.5B.3.2.2.

**Table 6.5B.3.5.1-1: Requirements**

(Void)

### 6.5B.4 Additional spurious emissions

#### 6.5B.4.1 General

These requirements are specified in terms of an additional spectrum emission requirement. Additional spurious emission requirements are signalled by the network to indicate that the UE shall meet an additional requirement for a specific deployment scenario as part of the cell handover/broadcast message.

NOTE: For measurement conditions at the edge of each frequency range, the lowest frequency of the measurement position in each frequency range should be set at the lowest boundary of the frequency range plus MBW/2. The highest frequency of the measurement position in each frequency range should be set at the highest boundary of the frequency range minus MBW/2. MBW denotes the measurement bandwidth defined for the protected band.

#### 6.5B.4.1.1 Minimum requirement (network signalled value "NS\_04")

When "NS 04" is indicated in the cell, the power of any UE emission shall not exceed the levels specified in Table 6.5B.4.1.1-1. This requirement also applies for the frequency ranges that are less than  $F_{\text{OOB}}$  (MHz) in Table 6.6.3.1-1 from the edge of the channel bandwidth.

**Table 6.5B.4.1.1-1: Additional requirements**

| Frequency band (MHz)   | Channel bandwidth / Spectrum emission limit (dBm) | Measurement bandwidth   |
|------------------------|---|---|
| $2495 \leq f < 2496$   | -13   | 1 % of Channel BW for contiguous BW up to 100 MHz,<br>1 MHz for contiguous BW > 100 MHz |
| $2490.5 \leq f < 2495$ | -13   | 1 MHz   |
| $0 < f < 2490.5$       | -25   | 1 MHz   |

## 6.5B.5 Transmit intermodulation

### 6.5B.5.1 Intra-band contiguous EN-DC

### 6.5B.5.2 Intra-band non-contiguous EN-DC

### 6.5B.5.3 Inter-band EN-DC within FR1

The transmit intermodulation requirement specified in sub-clauses 6.7.1 and 6.7.1A of [4] and sub-clauses 6.5.4 and 6.5A.4 of [2] apply for each component carrier in E-UTRA bands and NR bands, respectively.

### 6.5B.5.4 Inter-band EN-DC including FR2

The transmit intermodulation requirements specified in sub-clause 6.7.1 and 6.7.1A of [4] apply for each component carrier in E-UTRA bands.

### 6.5B.5.5 Inter-band EN-DC including both FR1 and FR2

The transmit intermodulation requirement specified in sub-clauses 6.7.1 and 6.7.1A of [4] and sub-clauses 6.5.4 and 6.5A.4 of [2] apply for each component carrier in E-UTRA bands and NR bands, respectively.

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# 7 Receiver characteristics

## 7.1 General

Unless otherwise stated the receiver characteristics are specified at the antenna connector(s) of the UE for the bands operating on frequency range 1 and over the air of the UE for the bands operating on frequency range 2. The requirements for frequency range 1 and frequency range 2 can be verified separately. For the carrier in frequency range 1, requirements can be verified with NR FR2 link disabled. For the carrier in frequency range 2, requirements can be verified in OTA mode with LTE connecting to the network by OTA without calibration.

The requirements defined in this clause are the extra requirements compared with the single carrier requirements defined in [2] and [3].

Unless otherwise stated, the UL and DL reference measurement channels are the same with the configurations specified in [2] and [3].

Unless otherwise stated, requirements for NR receiver written in TS 38.101-1 [2] and TS 38.101-2 [3] apply and are assumed anchor agnostic. Requirements are verified under conditions where anchor resources do not interfere NR operation.

RX requirements for intra-band contiguous and non-contiguous EN-DC only apply for bands < 2.7GHz.

For intra-band non-contiguous EN-DC, the output power is configured as follows:

- One E-UTRA uplink carrier with the output power set to 4dB Below  $P_{\text{CMAX\_L}}$  and the NR band whose downlink is being tested has its uplink carrier output power set to minimum output power as defined in sub-clause 6.3.1 of [2].
- One NR uplink carrier with the output power set to 4dB Below  $P_{\text{CMAX\_L}}$  and the E-UTRA band whose downlink is being tested has its uplink carrier output power set to minimum output power as defined in sub-clause 6.3.2.1 of [4].

For the additional requirements for intra-band non-contiguous EN-DC of two sub-blocks, an in-gap test refers to the case when the interfering signal is located at a negative offset with respect to the assigned lowest channel frequency of the highest sub-block and located at a positive offset with respect to the assigned highest channel frequency of the lowest sub-block.

For the additional requirements for intra-band non-contiguous EN-DC of two sub-blocks, an out-of-gap test refers to the case when the interfering signal(s) is (are) located at a positive offset with respect to the assigned channel frequency of the highest carrier frequency or located at a negative offset with respect to the assigned channel frequency of the lowest carrier frequency.

For the additional requirements for intra-band non-contiguous EN-DC of two sub-blocks with channel bandwidth larger than or equal to 5 MHz, the existing adjacent channel selectivity requirements, in-band blocking requirements (for each case), and narrow band blocking requirements apply for in-gap tests only if the corresponding interferer frequency offsets with respect to the two measured carriers satisfy the following condition in relation to the sub-block gap size  $W_{\text{gap}}$  for at least one of the E-UTRA or NR sub-blocks, so that the interferer frequency position does not change the nature of the core requirement tested:

$$W_{\text{gap}} \geq 2 \cdot |F_{\text{Interferer (offset)}}| - BW_{\text{Channel}}$$

For the E-UTRA sub-block, the  $F_{\text{Interferer (offset)}}$ , for a sub-block with a single component carrier is the interferer frequency offset with respect to carrier as specified in subclause 7.5.1, subclause 7.6.1 and subclause 7.6.3 for the respective requirement in [4] and  $BW_{\text{Channel}}$ .  $F_{\text{Interferer (offset)}}$  for the E-UTRA sub-block with two or more contiguous component carriers is the interference frequency offset with respect to the carrier adjacent to the gap is specified in subclause 7.5.1A, 7.6.1A and 7.6.3A in [4].

For the NR sub-block, the  $F_{\text{Interferer (offset)}}$ , for a sub-block with a single component carrier is the interferer frequency offset with respect to carrier as specified in subclause 7.5.1, subclause 7.6.1 and subclause 7.6.3 for the respective requirement in [2] and  $BW_{\text{Channel}}$ .

The interferer frequency offsets for adjacent channel selectivity, each in-band blocking case and narrow-band blocking shall be tested separately with a single in-gap interferer at a time.

## 7.2 Diversity characteristics

## 7.3 Reference sensitivity

### 7.3A Reference sensitivity for CA

#### 7.3A.1 General

For NR CA operation NR single carrier REFSENS requirements defined in [2] and [3] apply to all downlink bands part of NR CA configurations listed in Table 5.2A.1-1 unless sensitivity degradation is allowed as defined in clause 7.3A.

#### 7.3A.2 Reference sensitivity power level for CA

#### 7.3A.3 $\Delta R_{\text{IB,c}}$ for CA

For the UE which supports inter-band NR CA configuration, the minimum requirement for reference sensitivity in subclause 7.3.2 in TS 38.101-1 [2] and subclause 7.3.2, 7.3A.2 in TS 38.101-2 [3] shall be increased by the amount given in  $\Delta R_{\text{IB,c}}$  in Tables below. Unless otherwise stated,  $\Delta R_{\text{IB,c}}$  is set to zero.

In case the UE supports more than one of band combinations for CA, SUL or DC, and an operating band belongs to more than one band combinations then

- When the operating band frequency range is  $\leq 1\text{GHz}$ , the applicable additional  $\Delta R_{\text{IB,c}}$  shall be the average value for all band combinations defined in subclause 7.3A, 7.3B, 7.3C in this specification and 7.3A, 7.3B in TS 38.101-3 [3], truncated to one decimal place that apply for that operating band among the supported band combinations. In case there is a harmonic relation between low band UL and high band DL, then the maximum  $\Delta R_{\text{IB,c}}$  among the different supported band combinations involving such band shall be applied

- When the operating band frequency range is > 1 GHz, the applicable additional  $\Delta R_{IB,c}$  shall be the maximum value for all band combinations defined in subclause 7.3A, 7.3B, 7.3C in this specification and 7.3A, 7.3B in TS 38.101-3 [3] for the applicable operating bands.

### 7.3A.3.1 $\Delta R_{IB,c}$ for Inter-band CA between FR1 and FR2

**Table 7.3A.3.1-1:  $\Delta R_{IB,c}$  due to NR CA (two bands)**

(Void)

### 7.3A.4 Reference sensitivity exceptions due to UL harmonic interference for CA

Sensitivity degradation is allowed for a band in frequency range 2 if it is impacted by UL harmonic interference from the band in frequency range 1 of the same CA configuration. Reference sensitivity exceptions are specified in Table 7.3A.4-1 with uplink configuration specified in Table 7.3A.4-2.

**Table 7.3A.4-1: Reference sensitivity exceptions due to UL harmonic for NR CA of FR1+FR2**

| UL Band | DL Band | 50 MHz (dBm) | 100 MHz (dBm) | 200 MHz (dBm) | 400 MHz (dBm) |
|---------|---------|--------------|---------------|---------------|---------------|
| X       | Y       |              |               |               |               |

**Table 7.3A.2-2: Uplink configuration for reference sensitivity exceptions due to UL harmonic interference for NR CA of FR1+FR2**

| UL band | DL band | 5 MHz (dBm) | 10 MHz (dBm) | 15 MHz (dBm) | 20 MHz (dBm) | 25 MHz (dBm) | 40 MHz (dBm) | 50 MHz (dBm) | 60 MHz (dBm) | 80 MHz (dBm) | 90 MHz (dBm) | 100 MHz (dBm) |
|---------|---------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|
| X       | Y       |             |              |              |              |              |              |              |              |              |              |               |

## 7.3B Reference sensitivity level for DC

### 7.3B.1 General

For EN-DC, E-UTRA and NR single carrier REFSENS requirements defined in [2], [3] and [4] apply to all downlink bands of EN-DC configurations listed in clause 5.5B, unless sensitivity degradation is allowed in this clause of this specification, section 7.3 in TS 38.101-1 [2] or section 7.3 in TS 36.101 [4]. These exceptions also apply to any higher order combination containing one of the exception combinations listed in the sections above as subset. EN-DC REFSENS requirements shall be met for NR uplink transmissions using QPSK DFT-s-OFDM waveforms as defined in clause 7.3.2 [2].

In case of interband EN-DC the receiver REFSENS requirements in this clause do not apply for 1.4 and 3 MHz E-UTRA carriers.

### 7.3B.2 Reference sensitivity for EN-DC

#### 7.3B.2.1 Intra-band contiguous EN-DC

For intra-band contiguous EN-DC configurations, the reference sensitivity power level REFSENS is the minimum mean power applied to each one of the UE antenna ports at which the throughput for the carrier(s) of the E-UTRA and NR CGs shall meet or exceed the requirements for the specified E-UTRA and NR reference measurement channels.

For each CG, the reference sensitivity is specified as a maximum allowed degradation MSD of the reference sensitivity level as specified for the applicable carrier bandwidths in accordance with [4] for the E-UTRA CG and [2] for the NR CG.



For DC configurations of DC bandwidth class B, the throughput on each of the CGs shall be  $\geq 95\%$  of the maximum throughput of the respective reference measurement channels as specified in TBD with parameters specified in Table 7.3B.2.1-1.

**Table 7.3B.2.1-1: Reference sensitivity (MSD) for intra-band DC bandwidth class**

| MSD / DC bandwidth class B |                |                           |                         |                              |                           |          |             |
|----------------------------|----------------|---------------------------|-------------------------|------------------------------|---------------------------|----------|-------------|
| DC configuration           | E-UTRA/NR band | F <sub>c</sub> (UL) (MHz) | Channel bandwidth (MHz) | UL allocation (LCRB)         | F <sub>c</sub> (DL) (MHz) | MSD (dB) | Duplex mode |
| DC_(n)71AA                 | 71             | 665.5                     | 5                       | 5 (RB <sub>end</sub> =24)    | 619.5                     | 0        | FDD         |
|                            | n71            | 675.5                     | 15                      | 15 (RB <sub>start</sub> = 0) | 629.5                     | 1.8      |             |
| DC_(n)71AA                 | 71             | 670.5                     | 15                      | 15 (RB <sub>end</sub> = 74)  | 624.5                     | 0        |             |
|                            | n71            | 680.5                     | 5                       | 5 (RB <sub>start</sub> = 0)  | 634.5                     | 1.6      |             |
| DC_(n)71AA                 | 71             | 668                       | 10                      | 10 (RB <sub>end</sub> = 49)  | 622                       | 0        |             |
|                            | n71            | 678                       | 10                      | 10 (RB <sub>start</sub> = 0) | 632                       | 1.7      |             |
| DC_(n)71AA                 | 71             | 668                       | 10                      | 10 (RB <sub>start</sub> = 0) | 622                       | 17.2     |             |
|                            | n71            | 678                       | 10                      | 10 (RB <sub>end</sub> = 51)  | 632                       | 29.4     |             |

### 7.3B.2.2 Intra-band non-contiguous EN-DC

For DC\_3A\_n3A intra-band non-contiguous EN-DC combination, only single switched UL is supported in rel.15, no MSD is required.

### 7.3B.2.3 Inter-band EN-DC within FR1

Reference sensitivity exceptions are specified for the condition when there is uplink transmission only in the aggressor band.

<Editor's note: FFS how to clarify the issues of ITx may also exist for 2Tx mode, for example harmonic, etc.>

#### 7.3B.2.3.1 Reference sensitivity exceptions due to UL harmonic interference for EN-DC in NR FR1

Sensitivity degradation is allowed for a band if it is impacted by UL harmonic interference from another band part of the same DC configuration. Reference sensitivity exceptions are specified in Table 7.3B.2.3.1-1 with uplink configuration specified in Table 7.3B.2.3.1-2.

**Table 7.3B.2.3.1-1: MSD due to UL harmonic for EN-DC in NR FR1**

| UL band | DL band                                  | 5 MHz (dB) | 10 MHz (dB) | 15 MHz (dB) | 20 MHz (dB) | 25 MHz (dB) | 30 MHz (dB) | 40 MHz (dB) | 50 MHz (dB) | 60 MHz (dB) | 80 MHz (dB) | 90 MHz (dB) | 100 MHz (dB) |
|---------|--|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| 1, 3    | n77 <sup>1,2,13</sup>                    |            | 23.9        | 22.1        | 20.9        |             |             | 17.9        | 16.8        | 16.0        | 14.8        | 14.3        | 13.8         |
|         | n77 <sup>3</sup>                         |            | 1.1         | 0.8         | 0.3         |             |             | 0           | 0           | 0           | 0           | 0           | 0            |
| 2       | n78 <sup>1,2</sup>                       |            | 23.9        | 22.1        | 20.9        |             |             | 17.9        | 16.8        | 16.0        | 14.8        | 14.3        | 13.8         |
|         | n78 <sup>3</sup>                         |            | 1.1         | 0.8         | 0.3         |             |             | 0           | 0           | 0           | 0           | 0           | 0            |
| 3       | n78 <sup>1,2,13</sup>                    |            | 23.9        | 22.1        | 20.9        |             |             | 17.9        | 16.8        | 16.0        | 14.8        | 14.3        | 13.8         |
|         | n78 <sup>3</sup>                         |            | 1.1         | 0.8         | 0.3         |             |             | 0           | 0           | 0           | 0           | 0           | 0            |
| 8       | n77 <sup>6,7</sup><br>n78 <sup>6,7</sup> |            | 10.8        | 9.1         | 8           |             |             | 5.1         | 4.2         | 3.5         | 2.3         | 2.1         | 1.4          |
| 8       | n79 <sup>4,5</sup>                       |            |             |             |             |             |             | 6.8         | 6.2         | 5.6         | 4.9         |             | 4.4          |
| 18, 19  | n77 <sup>4,5</sup>                       |            | 10.4        | 8.9         | 7.8         |             |             | 4.7         | 3.7         | 3           | 1.7         | 1.2         | 0.7          |
| 28      | n77 <sup>4,5</sup><br>n78 <sup>4,5</sup> |            | 10.4        | 8.9         | 7.8         |             |             | 4.7         | 3.7         | 3           | 1.7         | 1.2         | 0.7          |
| 20      | n77 <sup>6,7</sup><br>n78 <sup>6,7</sup> |            | 10.8        | 9.1         | 8           |             |             | 6           | 4.0         | 3.2         | 2.0         | 1.5         | 1.0          |
| 26      | n41 <sup>8,9</sup>                       |            | 10.3        | 8.4         | 7.4         |             |             | 5           | 4.3         | 3.9         | 3.1         | 2.7         |              |
| 26      | n77 <sup>6,7</sup><br>n78 <sup>6,7</sup> |            | 10.8        | 9.1         | 8           |             |             | 6           | 4.0         | 3.2         | 2.0         | 1.5         | 1.0          |
|         |  |            |             |             |             |             |             |             |             |             |             |             |              |
| n28     | 1 <sup>8,9,10</sup>                      | 10.2       | 7.6         | 6.2         | 5.3         |             |             |             |             |             |             |             |              |
|         |  |            |             |             |             |             |             |             |             |             |             |             |              |
| n71     | 2 <sup>11</sup>                          | 4.6        | 1.0         | 0.7         | 0.6         |             |             |             |             |             |             |             |              |
|         | 2 <sup>12</sup>                          | 1.7        | 1.0         | 0.7         | 0.6         |             |             |             |             |             |             |             |              |
| 66      | n78 <sup>1,2</sup>                       |            | 23.9        | 22.1        | 20.9        |             |             | 17.9        | 16.8        | 16.0        | 14.8        | 14.3        | 13.8         |
|         | n78 <sup>3</sup>                         |            | 1.1         | 0.8         | 0.3         |             |             | 0           | 0           | 0           | 0           | 0           | 0            |

- NOTE 1: These requirements apply when there is at least one individual RE within the uplink transmission bandwidth of the aggressor (lower) band for which the 2nd transmitter harmonic is within the downlink transmission bandwidth of a victim (higher) band.
- NOTE 2: The requirements should be verified for UL EARFCN or NR ARFCN of the aggressor (lower) band (superscript LB) such that  $f_{UL}^{LB} = \lfloor f_{DL}^{HB} / 0.2 \rfloor \cdot 0.1$  in MHz and  $F_{UL\_low}^{LB} + BW_{Channel}^{LB} / 2 \leq f_{UL}^{LB} \leq F_{UL\_high}^{LB} - BW_{Channel}^{LB} / 2$  with carrier frequency in the victim (higher) band in MHz and the channel bandwidth configured in the lower band.
- NOTE 3: The requirements are only applicable to channel bandwidths with a carrier frequency at  $\pm (20 + BW_{Channel}^{HB} / 2)$  MHz offset from  $2f_{UL}^{LB}$  in the victim (higher band) with  $F_{UL\_low}^{LB} + BW_{Channel}^{LB} / 2 \leq f_{UL}^{LB} \leq F_{UL\_high}^{LB} - BW_{Channel}^{LB} / 2$ , whereand  $BW_{Channel}^{HB}$  are the channel bandwidths configured in the aggressor (lower) and victim (higher) bands in MHz, respectively.
- NOTE 4: These requirements apply when there is at least one individual RE within the uplink transmission bandwidth of the aggressor (lower) band for which the 5<sup>th</sup> transmitter harmonic is within the downlink transmission bandwidth of a victim (higher) band.
- NOTE 5: The requirements should be verified for UL EARFCN of the aggressor (lower) band (superscript LB) such that  $f_{UL}^{LB} = \lfloor f_{DL}^{HB} / 0.5 \rfloor \cdot 0.1$  in MHz and  $F_{UL\_low}^{LB} + BW_{Channel}^{LB} / 2 \leq f_{UL}^{LB} \leq F_{UL\_high}^{LB} - BW_{Channel}^{LB} / 2$  with carrier frequency in the victim (higher) band in MHz and the channel bandwidth configured in the lower band.
- NOTE 6: These requirements apply when there is at least one individual RE within the uplink transmission bandwidth of the aggressor (lower) band for which the 4<sup>th</sup> transmitter harmonic is within the downlink transmission bandwidth of a victim (higher) band.
- NOTE 7: The requirements should be verified for UL EARFCN of the aggressor (lower) band (superscript LB) such that  $f_{UL}^{LB} = \lfloor f_{DL}^{HB} / 0.4 \rfloor \cdot 0.1$  in MHz and  $F_{UL\_low}^{LB} + BW_{Channel}^{LB} / 2 \leq f_{UL}^{LB} \leq F_{UL\_high}^{LB} - BW_{Channel}^{LB} / 2$  with carrier frequency in the victim (higher) band in MHz and the channel bandwidth configured in the lower band.
- NOTE 8: These requirements apply when there is at least one individual RE within the uplink transmission bandwidth of the aggressor (lower) for which the 3rd transmitter harmonic is within the downlink transmission bandwidth of a victim (higher) band.
- NOTE 9 The requirements should be verified for UL EARFCN of the aggressor (lower) band (superscript LB) such that  $f_{UL}^{LB} = \lfloor f_{DL}^{HB} / 0.3 \rfloor \cdot 0.1$  in MHz and  $F_{UL\_low}^{LB} + BW_{Channel}^{LB} / 2 \leq f_{UL}^{LB} \leq F_{UL\_high}^{LB} - BW_{Channel}^{LB} / 2$  with the carrier frequency in the victim (higher) band in MHz and the channel bandwidth configured in the low band.
- NOTE 10: Applicable for the operations with 2 or 4 antenna ports supported in the band with carrier aggregation configured.
- NOTE 11: These requirements apply when the lower edge frequency of the 5 MHz uplink channel in Band 71 is located at or below 668 MHz and the downlink channel in Band 2 is located with its upper edge at 1990 MHz.
- NOTE 12: These requirements apply when the lower edge frequency of the 10 MHz, 15 MHz, or 20 MHz uplink channel in Band 71 is located at or below 668 MHz and the downlink channel in Band 2 is located with its upper edge at 1990 MHz.
- NOTE 13: These requirements apply when there is at least one individual RE within the uplink transmission bandwidth of the aggressor (lower) band for which the 2nd transmitter harmonic is within the downlink transmission bandwidth of a victim (higher) band and a range  $\Delta F_{HD}$  above and below the edge of this downlink transmission bandwidth. The value  $\Delta F_{HD}$  depends on the EN-DC band combination:  $\Delta F_{HD} = 10$  MHz for DC\_3\_n77 and DC\_3\_n78;  $\Delta F_{HD} = 20$  MHz for DC\_1\_n77.

**Table 7.3B.2.3.1-2: Uplink configuration for reference sensitivity exceptions due to UL harmonic interference for EN-DC in NR FR1**

| UL band | E-UTRA or NR Band / Channel bandwidth of the high band |                 |                 |                 |                 |        |        |        |        |        |        |        |         |
|---------|--|-----------------|-----------------|-----------------|-----------------|--------|--------|--------|--------|--------|--------|--------|---------|
|         | DL band  | 5 MHz           | 10 MHz          | 15 MHz          | 20 MHz          | 25 MHz | 30 MHz | 40 MHz | 50 MHz | 60 MHz | 80 MHz | 90 MHz | 100 MHz |
| 1       | n77  |                 | 25              | 36              | 50              |        |        | 100    | 100    | 100    | 100    | 100    | 100     |
| 2       | n78  |                 | 25              | 36              | 50              |        |        | 100    | 100    | 100    | 100    | 100    | 100     |
| 3       | n77,<br>n78  |                 | 25              | 36              | 50              |        |        | 50     | 50     | 50     | 50     | 50     | 50      |
|         |  |                 |                 |                 |                 |        |        |        |        |        |        |        |         |
| 8       | n77<br>n78   |                 | 16              | 25              | 25              |        |        | 25     | 25     | 25     | 25     | 25     | 25      |
| 8       | n79  |                 |                 |                 |                 |        |        | 25     | 25     | 25     | 25     |        | 25      |
| 18      | n77  |                 | 16              | 25              | 25              |        |        | 25     | 25     | 25     | 25     | 25     | 25      |
| 19      | n77  |                 | 16              | 25              | 25              |        |        | 25     | 25     | 25     | 25     | 25     | 25      |
| 20      | n77,<br>n78  |                 | 16              | 25              | 25              |        |        | 25     | 25     | 25     | 25     | 25     | 25      |
|         |  |                 |                 |                 |                 |        |        |        |        |        |        |        |         |
| 26      | n41  |                 | 16              | 25              | 25              |        |        | 25     | 25     |        |        |        |         |
| 26      | n77,<br>n78  |                 | 16              | 25              | 25              |        |        | 25     | 25     | 25     | 25     | 25     | 25      |
| n28     | 1  | 8               | 16              | 25              | 25              |        |        |        |        |        |        |        |         |
|         |  |                 |                 |                 |                 |        |        |        |        |        |        |        |         |
| 28      | n77,<br>n78  |                 | 10              | -15             | 20              |        |        | 25     | 25     | 25     | 25     | 25     | 25      |
| 66      | n78  |                 | 25              | 36              | 50              |        |        | 100    | 100    | 100    | 100    | 100    | 100     |
| n71     | 2  | $25^4$<br>$8^5$ | $25^4$<br>$8^5$ | $20^4$<br>$8^5$ | $20^4$<br>$8^5$ |        |        |        |        |        |        |        |         |

NOTE 1: The UL configuration applies regardless of the channel bandwidth of the UL band. UL resource blocks allocation in the table shall be further limited to that specified in Table 7.3.1-2 in TS 36.101 [4] or Table 7.3.2-3 in TS 38.101-1 [2]

NOTE 2: Void

NOTE 3: The RB allocation is at the lower edge of the lowest channel of UL band.

NOTE 4: These requirements apply when the lower edge frequency of the 5 MHz uplink channel in Band 71 is located at or below 668 MHz and the downlink channel in Band 2 is located with its upper edge at 1990 MHz.

NOTE 5: These requirements apply when the lower edge frequency of the 10 MHz, 15 MHz, or 20 MHz uplink channel in Band 71 is located at or below 668 MHz and the downlink channel in Band 2 is located with its upper edge at 1990 MHz.

**7.3B.2.3.2 MSD due to receiver harmonic mixing for EN-DC in NR FR1**

Sensitivity degradation is allowed for a band if it is impacted by receiver harmonic mixing due to another band part of the same DC configuration. Reference sensitivity exceptions are specified in Table 7.3B.2.3.2-1 with uplink configuration specified in Table 7.3B.2.3.2-2.

**Table 7.3B.2.3.2-1: Reference sensitivity exceptions due to receiver harmonic mixing for EN-DC in NR FR1**

| E-UTRA or NR Band / Channel bandwidth of the affected DL band |                  |            |             |             |             |             |             |             |             |             |             |              |
|---|------------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| UL band   | DL band          | 5 MHz (dB) | 10 MHz (dB) | 15 MHz (dB) | 20 MHz (dB) | 25 MHz (dB) | 40 MHz (dB) | 50 MHz (dB) | 60 MHz (dB) | 80 MHz (dB) | 90 MHz (dB) | 100 MHz (dB) |
| 2   | n71 <sup>4</sup> | 26.8       | 23.6        | 21.2        | 15.6        |             |             |             |             |             |             |              |
| n41   | 26 <sup>4</sup>  | 24.3       | 24.3        | 22.5        | N/A         |             |             |             |             |             |             |              |
| 41  | n77 <sup>7</sup> |            | 8.3         | 8.0         | 6.9         |             | 3.9         | 3           | 2.3         | 1.2         |             | 0.4          |
| 41  | n78 <sup>7</sup> |            | 8.3         | 8.0         | 6.9         |             | 3.9         | 3           | 2.3         | 1.2         |             | 0.4          |
| n71   | 2 <sup>5</sup>   | 4.6        | 1           | 0.7         | 0.6         |             |             |             |             |             |             |              |
|   | 2 <sup>6</sup>   | 1.7        | 1           | 0.7         | 0.6         |             |             |             |             |             |             |              |
| n77   | 41 <sup>8</sup>  | 10.4       | 10.4        | 10.4        | 10.4        |             |             |             |             |             |             | N/A          |
| n77   | 28 <sup>2</sup>  | 28         | 25          | 23.2        | 22          |             |             |             |             |             |             |              |
| n78   | 41 <sup>8</sup>  | 10.4       | 10.4        | 10.4        | 10.4        |             |             |             |             |             |             | N/A          |
| n79   | 19 <sup>2</sup>  | 29.5       | 26.5        | 24.7        |             |             |             |             |             |             |             |              |
| n79   | 21 <sup>3</sup>  | 39.3       | 36.3        | 34.5        |             |             |             |             |             |             |             |              |
| n79   | 26 <sup>2</sup>  | 27         | 24          | 22.2        |             |             |             |             |             |             |             |              |

NOTE 1: These requirements apply when there is at least one individual RE within the uplink transmission bandwidth of the aggressor (higher) band for which the mixing product due to harmonic of victim (lower) band LO with leakage of aggressor (higher) band is within the downlink transmission bandwidth of a victim (lower) band.

NOTE 2: The requirements should be verified for DL EARFCN of the victim (lower) band (superscript LB) such that  $f_{DL}^{LB} = \lfloor f_{UL}^{HB} / 0.5 \rfloor 0.1$  in MHz and  $F_{DL\_low}^{LB} + BW_{Channel}^{LB} / 2 \leq f_{DL}^{LB} \leq F_{DL\_high}^{LB} - BW_{Channel}^{LB} / 2$  with  $f_{DL}^{LB}$  carrier frequency in the victim (lower) band in MHz and the channel bandwidth configured in the lower band.

NOTE 3: The requirements should be verified for DL EARFCN of the victim (lower) band (superscript LB) such that  $f_{DL}^{LB} = \lfloor f_{UL}^{HB} / 0.4 \rfloor 0.1$  in MHz and  $F_{DL\_low}^{LB} + BW_{Channel}^{LB} / 2 \leq f_{DL}^{LB} \leq F_{DL\_high}^{LB} - BW_{Channel}^{LB} / 2$  with  $f_{DL}^{LB}$  carrier frequency in the victim (lower) band in MHz and the channel bandwidth configured in the lower band.

NOTE 4: The requirements should be verified for UL EARFCN of the aggressor (higher) band (superscript HB) such that  $f_{DL}^{LB} = \lfloor f_{UL}^{HB} / 0.3 \rfloor 0.1$  in MHz and  $F_{UL\_low}^{LB} + BW_{Channel}^{LB} / 2 \leq f_{DL}^{LB} \leq F_{UL\_high}^{LB} - BW_{Channel}^{LB} / 2$  with the carrier frequency in the victim (lower) band and the channel bandwidth configured in the higher band.

NOTE 5: These requirements apply when the lower edge frequency of the 5 MHz uplink channel in Band n71 is located at or below 668 MHz and the downlink channel in Band 2 is located with its upper edge at 1990 MHz.

NOTE 6: These requirements apply when the lower edge frequency of the 10 MHz, 15 MHz, or 20 MHz uplink channel in Band n71 is located at or below 668 MHz and the downlink channel in Band 2 is located with its upper edge at 1990 MHz.

NOTE 7: The requirements should be verified for UL EARFCN of the aggressor (lower) band (superscript LB) such that  $f_{DL}^{LB} = \lfloor f_{UL}^{HB} / 0.15 \rfloor 0.1$  in MHz and  $F_{UL\_low}^{LB} + BW_{Channel}^{LB} / 2 \leq f_{DL}^{LB} \leq F_{UL\_high}^{LB} - BW_{Channel}^{LB} / 2$  with carrier frequency in the victim (higher) band in MHz and the channel bandwidth configured in the lower band.

NOTE 8: The requirements should be verified for UL EARFCN of the aggressor (higher) band (superscript HB) such that  $f_{UL}^{LB} = \lfloor 15 * f_{DL}^{HB} \rfloor 0.1$  in MHz and  $F_{UL\_low}^{HB} + BW_{Channel}^{HB} / 2 \leq f_{UL}^{LB} \leq F_{UL\_high}^{HB} - BW_{Channel}^{HB} / 2$  with  $f_{DL}^{LB}$  carrier frequency in the victim (lower) band in MHz and  $BW_{Channel}^{LB}$  the channel bandwidth configured in the higher band.

**Table 7.3B.2.3.2-2: Uplink configuration for reference sensitivity exceptions due to receiver harmonic mixing for EN-DC in NR FR1**

| E-UTRA or NR Band / SCS / Channel bandwidth of the affected DL band |         |                      |       |        |        |        |        |        |        |        |        |        |         |
|---|---------|----------------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| UL band   | DL band | SCS of UL band (kHz) | 5 MHz | 10 MHz | 15 MHz | 20 MHz | 25 MHz | 40 MHz | 50 MHz | 60 MHz | 80 MHz | 90 MHz | 100 MHz |
| 2   | n71     | 15                   | 25    | 50     | 50     | 50     |        |        |        |        |        |        |         |
| n41   | 26      | 15                   | 25    | 50     | 75     |        |        |        |        |        |        |        |         |
| 41  | n77     | 15                   |       | 25     | 25     | 25     |        |        |        |        |        |        |         |
| 41  | n78     | 15                   |       | 25     | 25     | 25     |        |        |        |        |        |        |         |
| n77   | 28      | 15                   | 25    | 50     | 75     | 100    |        |        |        |        |        |        |         |
| n77   | 41      | 30                   | N/A   | 50     | 50     | 50     |        |        |        |        |        |        |         |
| n78   | 41      | 30                   | N/A   | 50     | 50     | 50     |        |        |        |        |        |        |         |
| n79   | 19      | 15                   | 25    | 50     | 75     |        |        |        |        |        |        |        |         |
| n79   | 21      | 15                   | 25    | 50     | 75     |        |        |        |        |        |        |        |         |
| n79   | 26      | 15                   | 25    | 50     | 75     |        |        |        |        |        |        |        |         |

NOTE 1: These requirements apply when there is at least one individual RE within the downlink transmission bandwidth of the victim (lower) band for which the 3rd harmonic is within the uplink transmission bandwidth or the uplink adjacent channel's transmission bandwidth of an aggressor (higher) band.

NOTE 2: The requirements should be verified for UL EARFCN of the aggressor (higher) band (superscript HB) such that  $f_{DL}^{LB} = \lfloor f_{UL}^{HB} / 0.3 \rfloor 0.1$  in MHz and  $F_{UL\_low}^{LB} + BW_{Channel}^{LB} / 2 \leq f_{UL}^{LB} \leq F_{UL\_high}^{LB} - BW_{Channel}^{LB} / 2$  with the carrier frequency in the victim (lower) band and the channel bandwidth configured in the higher band.

NOTE 3: The UL configuration applies regardless of the channel bandwidth of the UL band. UL resource blocks allocation in the table shall be further limited to that specified in Table 7.3.1-2 in TS 36.101 [4] or Table 7.3.2-3 in TS 38.101-1 [2].

**7.3B.2.3.3 Reference sensitivity exceptions due to close proximity of bands for EN-DC in NR FR1**

Sensitivity degradation is allowed for a band if it is impacted by close proximity of an UL of another band part of the same DC configuration. Reference sensitivity exceptions are specified in Table 7.3B.2.3.3-1 with uplink configuration specified in Table 7.3B.2.3.3-2.

**Table 7.3B.2.3.3-1: Reference sensitivity exceptions due to close proximity of bands for EN-DC in NR FR1**

| E-UTRA or NR Band / Channel bandwidth of the affected DL band |         |            |             |             |             |             |             |             |             |             |             |              |  |
|---|---------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--|
| UL band   | DL band | 5 MHz (dB) | 10 MHz (dB) | 15 MHz (dB) | 20 MHz (dB) | 25 MHz (dB) | 40 MHz (dB) | 50 MHz (dB) | 60 MHz (dB) | 80 MHz (dB) | 90 MHz (dB) | 100 MHz (dB) |  |
| X   | Y       |            |             |             |             |             |             |             |             |             |             |              |  |

**Table 7.3B.2.3-2: Uplink configuration for reference sensitivity exceptions due to close proximity of bands for EN-DC in NR FR1**

| E-UTRA or NR Band / SCS / Channel bandwidth of the affected DL band |         |                      |       |        |        |        |        |        |        |        |        |        |         |
|---|---------|----------------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| UL band   | DL band | SCS of UL band (kHz) | 5 MHz | 10 MHz | 15 MHz | 20 MHz | 25 MHz | 40 MHz | 50 MHz | 60 MHz | 80 MHz | 90 MHz | 100 MHz |
| X   | Y       |                      |       |        |        |        |        |        |        |        |        |        |         |

NOTE 1: The UL configuration applies regardless of the channel bandwidth of the UL band. UL resource blocks allocation in the table shall be further limited to that specified in Table 7.3.1-2 in TS 36.101 [4] or Table 7.3.2-3 in TS 38.101-1 [2].

### 7.3B.2.3.4 Reference sensitivity exceptions due to cross band isolation for EN-DC in NR FR1

Sensitivity degradation is allowed for a band if it is impacted by UL of another band part of the same DC configuration due to cross band isolation issues. Reference sensitivity exceptions are specified in Table 7.3B.2.3.4-1 with uplink configuration specified in Table 7.3B.2.3.4-2.

**Table 7.3B.2.3.4-1: Reference sensitivity exceptions due to cross band isolation for EN-DC in NR FR1**

| E-UTRA or NR Band / Channel bandwidth of the affected DL band |                 |            |             |             |             |             |             |             |             |             |             |              |
|---|-----------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| UL band   | DL band         | 5 MHz (dB) | 10 MHz (dB) | 15 MHz (dB) | 20 MHz (dB) | 25 MHz (dB) | 40 MHz (dB) | 50 MHz (dB) | 60 MHz (dB) | 80 MHz (dB) | 90 MHz (dB) | 100 MHz (dB) |
| n41   | 25              | 0.6        | 0.6         | 0.6         | 0.6         |             |             |             |             |             |             |              |
| n77   | 41 <sup>1</sup> | 4.5        | 4.5         | 4.5         | 4.5         |             |             |             |             |             |             |              |
| n78   | 41 <sup>1</sup> | 4.5        | 4.5         | 4.5         | 4.5         |             |             |             |             |             |             |              |

NOTE 1: Applicable only when harmonic mixing MSD for this combination is not applied.

**Table 7.3B.2.3.4-2: Uplink configuration for reference sensitivity exceptions due to cross band isolation for EN-DC in NR FR1**

| E-UTRA or NR Band / SCS / Channel bandwidth of the affected DL band |         |                      |       |        |        |        |        |        |        |        |        |        |         |
|---|---------|----------------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| UL band   | DL band | SCS of UL band (kHz) | 5 MHz | 10 MHz | 15 MHz | 20 MHz | 25 MHz | 40 MHz | 50 MHz | 60 MHz | 80 MHz | 90 MHz | 100 MHz |
| n41   | 25      | 30                   | 160   | 160    | 160    | 160    |        |        |        |        |        |        |         |
| n77   | 41      | 30                   | 270   | 270    | 270    | 270    |        |        |        |        |        |        |         |
| n78   | 41      | 30                   | 270   | 270    | 270    | 270    |        |        |        |        |        |        |         |

NOTE 1: The UL configuration applies regardless of the channel bandwidth of the UL band. UL resource blocks allocation in the table shall be further limited to that specified in Table 7.3.1-2 in TS 36.101 [4] or Table 7.3.2-3 in TS 38.101-1 [2].

### 7.3B.2.3.5 Reference sensitivity exceptions for intermodulation interference due to dual uplink operation for EN-DC in NR FR1

For EN-DC configurations in NR FR1 the UE may indicate capability of not supporting simultaneous dual uplink operation due to possible intermodulation interference overlapping in frequency to its own primary downlink channel bandwidth if

- the intermodulation order is 2;
- the intermodulation order is 3 when both operating bands are between 450 MHz – 960 MHz or between 1427 MHz – 2690 MHz

In case for the EN-DC in NR FR1 configurations the intermodulation products caused by dual uplink operation do not interfere with the own primary downlink channel bandwidth as defined in Annex-I the UE is mandated to operate in dual and triple uplink mode.

For EN-DC in NR FR1 with uplink and downlink assigned to E-UTRA and NR FR1 bands given in Table 7.3B.2.3.5.1-1, Table 7.3B.2.3.5.2-1 and Table 7.3B.2.3.5.3-1 the reference sensitivity is defined only for the specific uplink and downlink test points specified in Table 7.3B.2.3.5.1-1, Table 7.3B.2.3.5.2-1 and Table 7.3B.2.3.5.3-1. For these test points the reference sensitivity levels specified in clause 7.3.1 in [4] and 7.3.2.1 of [2] for the corresponding channel bandwidths or in clause 7.3.1 of [4] are relaxed by the amount of the parameter MSD given in Table 7.3B.2.3.5.1-1, Table 7.3B.2.3.5.2-1 and Table 7.3B.2.3.5.3-1.

The throughput on each of the CGs shall be  $\geq 95\%$  of the maximum throughput of the respective reference measurement channels as specified in ... with parameters specified in Table 7.3B.2.3.5-1 with dual UL transmissions overlapping in time unless otherwise stated.



7.3B.2.3.5.1 Reference sensitivity exceptions for intermodulation interference due to dual uplink operation for EN-DC in NR FR1 involving two bands

**Table 7.3B.2.3.5.1-1: Reference sensitivity exceptions for PCell due to dual uplink operation for EN-DC in NR FR1 (two bands)**

| NR or E-UTRA Band / Channel bandwidth / N <sub>RB</sub> / MSD        |                  |                         |                |                     |                         |                   |             |                   |
|--|------------------|-------------------------|----------------|---------------------|-------------------------|-------------------|-------------|-------------------|
| EN-DC Configuration  | EUTRA or NR band | UL F <sub>c</sub> (MHz) | UL/DL BW (MHz) | UL L <sub>CRB</sub> | DL F <sub>c</sub> (MHz) | MSD (dB)          | Duplex mode | IMD order         |
| DC_1A_n77A   | 1                | 1950                    | 5              | 25                  | 2140                    | 29.8              | FDD         | IMD2 <sup>3</sup> |
|  |                  |                         |                |                     |                         | 32.5 <sup>4</sup> |             |                   |
| DC_1A_n77A,<br>DC_1A_n78A,<br>DC_1A_SUL_n78A-<br>n84A                | 1                | 1950                    | 5              | 25                  | 2140                    | 8.0               | FDD         | IMD4 <sup>3</sup> |
|  |                  |                         |                |                     |                         | 10.7 <sup>4</sup> |             |                   |
| DC_2A_n66A   | n77              | 4090                    | 10             | 50                  | 4090                    | N/A               | TDD         | N/A               |
|  |                  |                         |                |                     |                         | 2                 |             |                   |
| DC_2A_n66A   | n66              | 1775                    | 5              | 25                  | 2175                    | N/A               | FDD         | N/A               |
|  |                  |                         |                |                     |                         | 2                 |             |                   |
| DC_2A_n66A   | n66              | 1750                    | 5              | 25                  | 2150                    | 4                 | FDD         | IMD5              |
|  |                  |                         |                |                     |                         | 2                 |             |                   |
| DC_2A_n78A   | n78              | 3795                    | 10             | 50                  | 3795                    | 28.7 <sup>4</sup> | TDD         | N/A               |
|  |                  |                         |                |                     |                         | 2                 |             |                   |
| DC_2A_n78A   | n78              | 3700                    | 10             | 50                  | 3700                    | 10.7 <sup>4</sup> | TDD         | N/A               |
|  |                  |                         |                |                     |                         | 3                 |             |                   |
| DC_3A_n7A  | n7               | 2535                    | 10             | 50                  | 2655                    | 10.2              | FDD         | IMD4              |
|  |                  |                         |                |                     |                         | 3                 |             |                   |
| DC_3A_n77A,<br>DC_3A_n78A,<br>DC_3A-SUL_n78A-<br>n80A,<br>DC_3C_n78A | n77,<br>n78      | 3575                    | 10             | 50                  | 3575                    | 28.7 <sup>4</sup> | TDD         | N/A               |
|  |                  |                         |                |                     |                         | 3                 |             |                   |
| DC_3A_n77A,<br>DC_3A_n78A,<br>DC_3A-SUL_n78A-<br>n80A,<br>DC_3C_n78A | n77,<br>n78      | 3435                    | 10             | 50                  | 3435                    | 10.7 <sup>4</sup> | TDD         | N/A               |
|  |                  |                         |                |                     |                         | 5                 |             |                   |
| DC_5A_n66A   | n66              | 1721                    | 5              | 25                  | 2121                    | N/A               | FDD         | N/A               |
|  |                  |                         |                |                     |                         | 5                 |             |                   |
| DC_5A_n78A   | n78              | 3421                    | 10             | 50                  | 3421                    | N/A               | TDD         | N/A               |
|  |                  |                         |                |                     |                         | 8                 |             |                   |
| DC_8A_n77A,<br>DC_8A_n78A,<br>DC_8A-SUL_n78A-<br>n81A                | n77,<br>n78      | 3635                    | 10             | 50                  | 3635                    | N/A               | TDD         | N/A               |
|  |                  |                         |                |                     |                         | 8                 |             |                   |
| DC_8A_n79A,<br>DC_8A-SUL_n79A-<br>n81A                               | n79              | 4532.5                  | 40             | 216                 | 4532.5                  | N/A               | TDD         | N/A               |
|  |                  |                         |                |                     |                         | 20                |             |                   |
| DC_20A_n8A   | n8               | 892.5                   | 5              | 25                  | 937.5                   | 21                | FDD         | IMD3              |
|  |                  |                         |                |                     |                         | 20                |             |                   |
| DC_20A_n77A,<br>DC_20A_n78A,<br>DC_20A-<br>SUL_n78A-n82A             | n77              | 3359                    | 10             | 50                  | 3359                    | N/A               | TDD         | N/A               |
|  |                  |                         |                |                     |                         | 20                |             |                   |
| DC_20A_n77A  | n77              | 4159                    | 10             | 50                  | 4159                    | N/A               | TDD         | N/A               |
|  |                  |                         |                |                     |                         | 21                |             |                   |
| DC_21A_n79A  | n79              | 4420.5                  | 40             | 216                 | 4420.5                  | N/A               | TDD         | N/A               |
|  |                  |                         |                |                     |                         | 26                |             |                   |
| DC_26A_n41A  | n41              | 2562                    | 10             | 50                  | 2562                    | N/A               | TDD         | N/A               |
|  |                  |                         |                |                     |                         | 28                |             |                   |
| DC_28A_n51A  | n51              | 1429.5                  | 5              | 25                  | 1429.5                  | N/A               | TDD         | N/A               |
|  |                  |                         |                |                     |                         | 26                |             |                   |
| DC_26A_n77A,<br>DC_26A_n78A  | n77,<br>n78      | 3391                    | 10             | 50                  | 3391                    | N/A               | TDD         | N/A               |
|  |                  |                         |                |                     |                         | 28                |             |                   |

|  |             |        |    |    |        |     |     |                   |
|--|-------------|--------|----|----|--------|-----|-----|-------------------|
| CA_28A_n77A,<br>CA_28A_n78A,<br>DC_28A-<br>SUL_n78A-n83A   | n77,<br>n78 | 3582.5 | 10 | 50 | 3582.5 | N/A | TDD | N/A               |
| DC_66A_n5A   | n5          | 838    | 5  | 25 | 883    | 30  | FDD | IMD2 <sup>3</sup> |
|  | 66          | 1721   | 5  | 25 | 2121   | N/A | FDD | N/A               |
| DC_66A_n71A  | 66          | 1750   | 5  | 25 | 2150   | 5   | FDD | IMD4              |
|  | n71         | 675    | 5  | 25 | 629    | N/A | FDD | N/A               |
| NOTE 1: Both of the transmitters shall be set min(+20 dBm, P <sub>C<sub>MAX</sub>L,c</sub> ) as defined in subclause 6.2.5A. |             |        |    |    |        |     |     |                   |
| NOTE 2: RB <sub>START</sub> = 0  |             |        |    |    |        |     |     |                   |
| NOTE 3: This band is subject to IMD5 also which MSD is not specified.  |             |        |    |    |        |     |     |                   |
| NOTE 4: Applicable only if operation with 4 antenna ports is supported in the band with carrier aggregation configured.      |             |        |    |    |        |     |     |                   |
| NOTE 5: Void   |             |        |    |    |        |     |     |                   |

7.3B.2.3.5.2 Reference sensitivity exceptions for intermodulation interference due to dual uplink operation for EN-DC in NR FR1 involving three bands

**Table 7.3B.2.3.5.2-0: Reference sensitivity exceptions for Pcell due to dual uplink operation for EN-DC in NR FR1 (three bands)**

| EN-DC Configuration | EUTRA/NR band | UL F <sub>c</sub> (MHz) | UL/DL BW (MHz) | UL L <sub>CRB</sub>            | DL F <sub>c</sub> (MHz) | MSD (dB) | Duplex mode | IMD order |
|---------------------|---------------|-------------------------|----------------|--------------------------------|-------------------------|----------|-------------|-----------|
| DC_66A_(n)71AA      | 66            | 1750                    | 5              | 25                             | 2150                    | 5        | FDD         | IMD4      |
|                     | n71           | 678                     | 10             | 10<br>(RB <sub>start</sub> =0) | 632                     | N/A      |             | N/A       |

**Table 7.3B.2.3.5.2-1: Reference sensitivity exceptions for Scell due to dual uplink operation for EN-DC in NR FR1 (three bands)**

| EN-DC Configuration            | EUTRA/NR band | UL F <sub>c</sub> (MHz) | UL/DL BW (MHz) | UL L <sub>CRB</sub> | DL F <sub>c</sub> (MHz) | MSD (dB) | Duplex mode | IMD order                                      |
|--------------------------------|---------------|-------------------------|----------------|---------------------|-------------------------|----------|-------------|--|
| DC_1A-3A_n28A                  | 1             | 1975                    | 5              | 25                  | 2165                    | N/A      | FDD         | N/A  |
|                                | n28           | 710.5                   | 5              | 25                  | 765.5                   | N/A      | FDD         | N/A  |
|                                | 3             | 1723.5                  | 5              | 25                  | 1818.5                  | 4.0      | FDD         | IMD5   |
| DC_1A-3A_n28A                  | 3             | 1780                    | 5              | 25                  | 1875                    | N/A      | FDD         | N/A  |
|                                | n28           | 710.5                   | 5              | 25                  | 765.5                   | N/A      | FDD         | N/A  |
|                                | 1             | 1949                    | 5              | 25                  | 2139                    | 11.0     | FDD         | IMD4   |
| DC_1A-7A_n28A                  | 1             | 1935                    | 5              | 25                  | 2125                    | N/A      | FDD         | N/A  |
|                                | n28           | 718                     | 5              | 25                  | 773                     | N/A      | FDD         | N/A  |
|                                | 7             | 2533                    | 10             | 50                  | 2653                    | 30.0     | FDD         | IMD2   |
| DC_1A-3A_n77A                  | 1             | 1950                    | 5              | 25                  | 2140                    | N/A      | FDD         | N/A  |
|                                | 3             | 1712.5                  | 5              | 25                  | 1807.5                  | 31.5     |             | IMD2   |
|                                | n77           | 3757.5                  | 10             | 50                  | 3757.5                  | N/A      | TDD         | N/A  |
|                                | 1             | 1950                    | 5              | 25                  | 2140                    | N/A      | FDD         | N/A  |
|                                | 3             | 1775                    | 5              | 25                  | 1870                    | 8.5      |             | IMD4   |
|                                | n77           | 3980                    | 10             | 50                  | 3980                    | N/A      | TDD         | N/A  |
|                                | 1             | 1950                    | 5              | 25                  | 2140                    | 31.0     | FDD         | IMD2   |
|                                | 3             | 1775                    | 5              | 25                  | 1870                    | N/A      |             | N/A  |
|                                | n77           | 3915                    | 10             | 50                  | 3915                    | N/A      | TDD         | N/A  |
| DC_1A-3A_n78A<br>DC_1A-3C_n78A | 1             | 1950                    | 5              | 25                  | 2140                    | N/A      | FDD         | N/A  |
|                                | 3             | 1712.5                  | 5              | 25                  | 1807.5                  | 31.2     |             | IMD2<br> f <sub>B78</sub> -f <sub>B1</sub>     |
|                                | n78           | 3757.5                  | 10             | 50                  | 3757.5                  | N/A      | TDD         | N/A  |
|                                | 1             | 1935                    | 5              | 25                  | 2125                    | 2.8      | FDD         | IMD5<br> 2*f <sub>B78</sub> -3*f <sub>B3</sub> |
|                                | 3             | 1775                    | 5              | 25                  | 1870                    | N/A      |             | N/A  |
|                                | n78           | 3725                    | 10             | 50                  | 3725                    | N/A      | TDD         | N/A  |
| DC_1A-5A_n78A                  | 1             | 1932                    | 5              | 25                  | 2122                    | 18.1     | FDD         | IMD3<br> f <sub>B78</sub> -2*f <sub>B5</sub>   |
|                                | 5             | 829                     | 5              | 25                  | 874                     | N/A      | FDD         | N/A  |
|                                | n78           | 3780                    | 10             | 50                  | 3780                    | N/A      | TDD         | N/A  |
|                                | 1             | 1975                    | 5              | 25                  | 2165                    | N/A      | FDD         | N/A  |
|                                | 5             | 840                     | 5              | 25                  | 885                     | 3.1      | FDD         | IMD5<br> 2*f <sub>B78</sub> -3*f <sub>B1</sub> |
|                                | n78           | 3405                    | 10             | 50                  | 3405                    | N/A      | TDD         | N/A  |
| DC_1A-7A_n78A                  | 1             | 1977.5                  | 5              | 25                  | 2167.5                  | N/A      | FDD         | N/A  |
|                                | 7             | 2507.5                  | 5              | 25                  | 2627.5                  | 9.1      | FDD         | IMD4<br> f <sub>B78</sub> -3*f <sub>B1</sub>   |
|                                | n78           | 3305                    | 10             | 50                  | 3305                    | N/A      | TDD         | N/A  |
|                                | 1             | 1950                    | 5              | 25                  | 2140                    | 8.7      | FDD         | IMD4<br> 2*f <sub>B78</sub> -2*f <sub>B7</sub> |
|                                | 7             | 2510                    | 10             | 50                  | 2630                    | N/A      | FDD         | N/A  |
|                                | n78           | 3310                    | 10             | 50                  | 3310                    | N/A      | TDD         | N/A  |
| DC_1A-3A_n79A                  | 1             | 1950                    | 5              | 25                  | 2140                    | 3.6      | FDD         | IMD5   |
|                                | 3             | 1750                    | 5              | 25                  | 1845                    | N/A      |             | N/A  |
|                                | n79           | 4860                    | 40             | 216                 | 4860                    | N/A      | TDD         | N/A  |
| DC_1A-18A_n77A                 | 1             | 1930                    | 5              | 25                  | 2120                    | 16.4     | FDD         | IMD3   |
|                                | 18            | 825                     | 5              | 25                  | 870                     | N/A      |             | N/A  |
|                                | n77           | 3770                    | 10             | 50                  | 3770                    | N/A      | TDD         | N/A  |
| DC_1A-18A_n78A                 | 1             | 1930                    | 5              | 25                  | 2120                    | 16.4     | FDD         | IMD3   |
|                                | 18            | 819                     | 5              | 25                  | 864                     | N/A      |             | N/A  |
|                                | n78           | 3758                    | 10             | 50                  | 3758                    | N/A      | TDD         | N/A  |
| DC_1A-18A_n79A                 | 1             | 1935                    | 5              | 25                  | 2125                    | N/A      | FDD         | N/A  |
|                                | 18            | 822.5                   | 5              | 25                  | 867.5                   | 18.3     | FDD         | IMD3   |
|                                | n79           | 4782.5                  | 40             | 216                 | 4782.5                  | N/A      | TDD         | N/A  |
|                                | 1             | 1930                    | 5              | 25                  | 2120                    | N/A      | FDD         | N/A  |
|                                | 18            | 820                     | 5              | 25                  | 865                     | 8.9      | FDD         | IMD4   |
|                                | n79           | 4925                    | 40             | 216                 | 4925                    | N/A      | TDD         | N/A  |

| EN-DC Configuration              | EUTRA/NR band | UL F <sub>c</sub> (MHz) | UL/DL BW (MHz) | UL L <sub>CRB</sub> | DL F <sub>c</sub> (MHz) | MSD (dB) | Duplex mode | IMD order |
|----------------------------------|---------------|-------------------------|----------------|---------------------|-------------------------|----------|-------------|-----------|
|                                  | 1             | 1935                    | 5              | 25                  | 2125                    | 8.1      | FDD         | IMD4      |
|                                  | 18            | 822.5                   | 5              | 25                  | 867.5                   | N/A      | FDD         | N/A       |
|                                  | n79           | 4782.5                  | 40             | 216                 | 4782.5                  | N/A      | TDD         | N/A       |
| DC_1A-19A_n77A<br>DC_1A-19A_n78A | 1             | 1940                    | 5              | 25                  | 2130                    | 17.8     | FDD         | IMD3      |
|                                  | 19            | 832.5                   | 5              | 25                  | 877.5                   | N/A      |             | N/A       |
|                                  | n77, n78      | 3795                    | 10             | 50                  | 3795                    | N/A      | TDD         | N/A       |
| DC_1A-19A_n79A                   | 1             | 1950                    | 5              | 25                  | 2140                    | N/A      | FDD         | N/A       |
|                                  | 19            | 837.5                   | 5              | 25                  | 882.5                   | 18.3     |             | IMD3      |
|                                  | n79           | 4782.5                  | 40             | 216                 | 4782.5                  | N/A      | TDD         | N/A       |
|                                  | 1             | 1950                    | 5              | 25                  | 2140                    | 8.1      | FDD         | IMD4      |
|                                  | 19            | 837.5                   | 5              | 25                  | 882.5                   | N/A      |             | N/A       |
|                                  | n79           | 4652.5                  | 40             | 216                 | 4652.5                  | N/A      | TDD         | N/A       |
| DC_1A-20A_n78A                   | 1             | 1930                    | 5              | 25                  | 2120                    | 20.3     | FDD         | IMD3      |
|                                  | 20            | 835                     | 5              | 25                  | 794                     | N/A      | FDD         | N/A       |
|                                  | n78           | 3790                    | 10             | 50                  | 3790                    | N/A      | TDD         | N/A       |
| DC_1A-20A_n78A                   | 1             | 1950                    | 5              | 25                  | 2140                    | N/A      | FDD         | N/A       |
|                                  | 20            | 851                     | 5              | 25                  | 810                     | 3.0      | FDD         | IMD5      |
|                                  | n78           | 3330                    | 10             | 50                  | 3330                    | N/A      | TDD         | N/A       |
| DC_1A-21A_n77A<br>DC_1A-21A_n78A | 1             | 1964.6                  | 5              | 25                  | 2154.6                  | 30.6     | FDD         | IMD2      |
|                                  | 21            | 1450.4                  | 5              | 25                  | 1498.4                  | N/A      |             | N/A       |
|                                  | n77, n78      | 3605                    | 10             | 50                  | 3605                    | N/A      | TDD         | N/A       |
|                                  | 1             | 1950                    | 5              | 25                  | 2140                    | N/A      | FDD         | N/A       |
|                                  | 21            | 1452                    | 5              | 25                  | 1500                    | 2.9      |             | IMD5      |
| n77, n78                         | 3675          | 10                      | 50             | 3675                | N/A                     | TDD      | N/A         |           |
| DC_1A-28A_n77A                   | 1             | 1960                    | 5              | 25                  | 2150                    | 15.8     | FDD         | IMD3      |
|                                  | 28            | 740                     | 5              | 25                  | 795                     | N/A      |             | N/A       |
|                                  | n77           | 3630                    | 10             | 50                  | 3630                    | N/A      | TDD         | N/A       |
| DC_1A-28A_n77A                   | 1             | 1960                    | 5              | 25                  | 2150                    | N/A      | FDD         | N/A       |
|                                  | 28            | 725                     | 5              | 25                  | 780                     | 4.3      |             | IMD5      |
|                                  | n77           | 3330                    | 10             | 50                  | 3330                    | N/A      | TDD         | N/A       |
| DC_1A-28A_n78A                   | 1             | 1960                    | 5              | 25                  | 2150                    | 15.7     | FDD         | IMD3      |
|                                  | 28            | 740                     | 5              | 25                  | 795                     | N/A      |             | N/A       |
|                                  | n78           | 3630                    | 10             | 50                  | 3630                    | N/A      | TDD         | N/A       |
| DC_1A-28A_n78A                   | 1             | 1970                    | 5              | 25                  | 2160                    | N/A      | FDD         | N/A       |
|                                  | 28            | 739                     | 5              | 25                  | 794                     | 4.2      |             | IMD5      |
|                                  | n78           | 3352                    | 10             | 50                  | 3352                    | N/A      | TDD         | N/A       |
| DC_1A_n28A-n78A                  | 1             | 1950                    | 5              | 25                  | 2140                    | N/A      | FDD         | N/A       |
|                                  | n28           | 733                     | 5              | 25                  | 788                     | N/A      |             | N/A       |
|                                  | n78           | 3416                    | 10             | 50                  | 3416                    | 15.7     | TDD         | IMD3      |
|                                  | 1             | 1950                    | 5              | 25                  | 2140                    | N/A      | FDD         | N/A       |
|                                  | n78           | 3320                    | 10             | 50                  | 3320                    | N/A      | TDD         | N/A       |
|                                  | n28           | 735                     | 5              | 25                  | 790                     | 3.3      | FDD         | IMD5      |
| DC_1A-28A_n79A                   | 1             | 1930                    | 5              | 25                  | 2120                    | N/A      | FDD         | N/A       |
|                                  | 28            | 733                     | 5              | 25                  | 788                     | 15.2     | FDD         | IMD3      |
|                                  | n79           | 4648                    | 40             | 216                 | 4648                    | N/A      | TDD         | N/A       |
|                                  | 1             | 1925                    | 5              | 25                  | 2115                    | N/A      | FDD         | N/A       |
|                                  | 28            | 740                     | 5              | 25                  | 795                     | 10.0     | FDD         | IMD4      |
|                                  | n79           | 4980                    | 40             | 216                 | 4980                    | N/A      | TDD         | N/A       |
|                                  | 1             | 1977.5                  | 5              | 25                  | 2167.5                  | 1.2      | FDD         | IMD4      |
|                                  | 28            | 745.5                   | 5              | 25                  | 800.5                   | N/A      | FDD         | N/A       |
|                                  | n79           | 4420                    | 40             | 216                 | 4420                    | N/A      | TDD         | N/A       |
|                                  | 1             | 1935                    | 5              | 25                  | 2125                    | 4.5      | FDD         | IMD5      |
|                                  | 28            | 718                     | 5              | 25                  | 773                     | N/A      | FDD         | N/A       |
|                                  | n79           | 4807                    | 40             | 216                 | 4807                    | N/A      | TDD         | N/A       |
| DC_1A-41A_n77A                   | 1             | 1970                    | 5              | 25                  | 2160                    | N/A      | FDD         | N/A       |
|                                  | n77           | 3400                    | 10             | 50                  | 3400                    |          | TDD         |           |
|                                  | 41            | 2510                    | 5              | 25                  | 2510                    | 11.0     | TDD         | IMD4      |
|                                  | 1             | 1930                    | 5              | 25                  | 2120                    | N/A      | FDD         | N/A       |
|                                  | n77           | 4150                    | 10             | 50                  | 4150                    |          | TDD         |           |
|                                  | 41            | 2510                    | 5              | 25                  | 2510                    | 3.6      | TDD         | IMD5      |
| DC_1A-41A_n78A                   | 1             | 1975                    | 5              | 25                  | 2165                    | N/A      | FDD         | N/A       |
|                                  | 41            |                         | 5              | 25                  | 2515                    | 12       | TDD         | IMD4      |

| EN-DC Configuration | EUTRA/NR band | UL F <sub>c</sub> (MHz) | UL/DL BW (MHz) | UL L <sub>CRB</sub> | DL F <sub>c</sub> (MHz) | MSD (dB) | Duplex mode | IMD order  |
|---------------------|---------------|-------------------------|----------------|---------------------|-------------------------|----------|-------------|--|
|                     | n78           | 3410                    | 10             | 50                  | 3410                    | N/A      | TDD         | N/A  |
| DC_1A-41A_n79A      | 1             | 1970                    | 5              | 25                  | 2160                    | N/A      | FDD         | N/A  |
|                     | n79           | 4500                    | 40             | 216                 | 4500                    |          | TDD         |  |
|                     | 41            | 2530                    | 5              | 25                  | 2530                    | 29.4     | TDD         | IMD2   |
|                     | 1             | 1922.5                  | 5              | 25                  | 2112.5                  | N/A      | FDD         | N/A  |
|                     | n79           | 4980                    | 40             | 216                 | 4980                    |          | TDD         |  |
|                     | 41            | 2687.5                  | 5              | 25                  | 2687.5                  | 0.0      | TDD         | IMD5   |
| DC_1A-42A_n79A      | 1             | 1977.5                  | 5              | 25                  | 2167.5                  | N/A      | FDD         | N/A  |
|                     | n79           | 4420                    | 40             | 216                 | 4420                    |          | TDD         |  |
|                     | 42            | 3490                    | 5              | 25                  | 3490                    | 4.8      | TDD         | IMD5   |
|                     | 42            | 3402.5                  | 5              | 25                  | 3402.5                  | N/A      | TDD         | N/A  |
|                     | n79           | 4640                    | 40             | 216                 | 4640                    |          | TDD         |  |
|                     | 1             | 1975                    | 5              | 25                  | 2165                    | 15.5     | FDD         | IMD3   |
|                     | 42            | 3450                    | 5              | 25                  | 3450                    | N/A      | TDD         | N/A  |
|                     | n79           | 4520                    | 40             | 216                 | 4520                    |          | TDD         |  |
| DC_1A_n78A-n79A     | 1             | 1950                    | 5              | 25                  | 2140                    | 9.3      | FDD         | IMD4   |
|                     | 1             | 1950                    | 5              | 25                  | 2140                    | N/A      | FDD         | N/A  |
|                     | n78           | 3410                    | 10             | 50                  | 3410                    | N/A      | TDD         | N/A  |
|                     | n79           | 4870                    | 40             | 216                 | 4870                    | 15.9     | TDD         | IMD3   |
|                     | 1             | 1950                    | 5              | 25                  | 2140                    | N/A      | FDD         | N/A  |
|                     | n79           | 4670                    | 40             | 216                 | 4670                    | N/A      | TDD         | N/A  |
| DC_3A-7A_n28A       | n78           | 3490                    | 10             | 50                  | 3490                    | 4.6      | TDD         | IMD5   |
|                     | 3             | 1712.5                  | 5              | 25                  | 1807.5                  | N/A      | FDD         | N/A  |
|                     | n28           | 743                     | 5              | 25                  | 798                     | N/A      | FDD         | N/A  |
|                     | 7             | 2562                    | 10             | 50                  | 2682                    | 16.9     | FDD         | IMD3   |
|                     | 7             | 2543                    | 10             | 50                  | 2663                    | N/A      | FDD         | N/A  |
|                     | n28           | 710.5                   | 5              | 25                  | 765.5                   | N/A      | FDD         | N/A  |
| DC_3C-7C_n78A       | 3             | 1737.5                  | 5              | 25                  | 1832.5                  | 26.0     | FDD         | IMD2   |
|                     | 3             | 1725                    | 5              | 25                  | 1820                    | 17.6     | FDD         | IMD3<br> f <sub>B78</sub> -<br>2*f <sub>B7</sub>   |
|                     | 7             | 2565                    | 5              | 25                  | 2685                    | N/A      | FDD         | N/A  |
|                     | n78           | 3310                    | 10             | 50                  | 3310                    | N/A      | TDD         | N/A  |
|                     | 3             | 1725                    | 5              | 25                  | 1820                    | 8.6      | FDD         | IMD4<br> 2*f <sub>B78</sub> -<br>2*f <sub>B7</sub> |
|                     | 7             | 2565                    | 5              | 25                  | 2685                    | N/A      | FDD         | N/A  |
|                     | n78           | 3475                    | 10             | 50                  | 3475                    | N/A      | TDD         | N/A  |
| DC_3A-20A_n28A      | 20            | 852                     | 5              | 25                  | 811                     | N/A      | FDD         | N/A  |
|                     | n28           | 738                     | 5              | 25                  | 793                     | N/A      | FDD         | N/A  |
| DC_3A-28A_n77A      | 3             | 1723                    | 5              | 25                  | 1818                    | 9.4      | FDD         | IMD4   |
|                     | 3             | 1712.5                  | 5              | 25                  | 1807.5                  | N/A      | FDD         | N/A  |
|                     | 28            | 715                     | 5              | 25                  | 770                     | 15.3     | FDD         | IMD3   |
|                     | n77           | 4195                    | 10             | 50                  | 4195                    | N/A      | TDD         | N/A  |
|                     | 3             | 1755                    | 5              | 25                  | 1850                    | 17.0     | FDD         | IMD3   |
|                     | 28            | 735                     | 5              | 25                  | 790                     | N/A      | FDD         | N/A  |
| DC_3A-28A_n78A      | n77           | 3320                    | 10             | 50                  | 3320                    | N/A      | TDD         | N/A  |
|                     | 3             | 1775                    | 5              | 25                  | 1870                    | 17.3     | FDD         | IMD3   |
|                     | 28            | 740                     | 5              | 25                  | 760                     | N/A      |             | N/A  |
| DC_3A-28A_n79A      | n78           | 3350                    | 10             | 25                  | 3350                    | N/A      | TDD         | N/A  |
|                     | 3             | 1770                    | 5              | 25                  | 1865                    | N/A      | FDD         | N/A  |
|                     | 28            | 725                     | 5              | 25                  | 780                     | 10.3     | FDD         | IMD4   |
|                     | n79           | 4530                    | 40             | 216                 | 4530                    | N/A      | TDD         | N/A  |
|                     | 3             | 1775                    | 5              | 25                  | 1870                    | 5.7      | FDD         | IMD5   |
|                     | 28            | 725                     | 5              | 25                  | 780                     | N/A      | FDD         | N/A  |
| DC_3A_n28A-n78A     | n79           | 4770                    | 40             | 216                 | 4770                    | N/A      | TDD         | N/A  |
|                     | 3             | 1750                    | 5              | 25                  | 1845                    | N/A      | FDD         | N/A  |
|                     | n28           | 743                     | 5              | 25                  | 798                     | N/A      |             | N/A  |
| DC_3A_n78A-n79A     | n78           | 3764                    | 10             | 50                  | 3764                    | 4.5      | TDD         | IMD5   |
|                     | 3             | 1770                    | 5              | 25                  | 1865                    | N/A      | FDD         | N/A  |
|                     | n78           | 3340                    | 10             | 50                  | 3340                    | N/A      | TDD         | N/A  |
|                     | n79           | 4910                    | 40             | 216                 | 4910                    | 16.3     | TDD         | IMD3   |
|                     | 3             | 1770                    | 5              | 25                  | 1865                    | N/A      | FDD         | N/A  |

| EN-DC Configuration              | EUTRA/NR band | UL F <sub>c</sub> (MHz) | UL/DL BW (MHz) | UL L <sub>CRB</sub> | DL F <sub>c</sub> (MHz) | MSD (dB) | Duplex mode | IMD order                                      |
|----------------------------------|---------------|-------------------------|----------------|---------------------|-------------------------|----------|-------------|--|
|                                  | n79           | 4510                    | 40             | 216                 | 4510                    | N/A      | TDD         | N/A  |
|                                  | n78           | 3710                    | 10             | 50                  | 3710                    | 4.2      | TDD         | IMD5   |
| DC_3A-SUL_n78A-n82A              | 3             | 1775                    | 5              | 25                  | 1870                    | 4        | FDD         | IMD4   |
|                                  | n82           | 840                     | 5              | 25                  |                         | N/A      | SUL         | N/A  |
| DC_3A-7A_n78A<br>DC_3C-7A_n78A   | 3             | 1725                    | 5              | 25                  | 1820                    | 17.6     | FDD         | IMD3<br> f <sub>B78</sub> -2*f <sub>B7</sub>   |
|                                  | 7             | 2565                    | 5              | 25                  | 2685                    | N/A      | FDD         | N/A  |
|                                  | n78           | 3310                    | 10             | 50                  | 3310                    | N/A      | TDD         | N/A  |
| DC_3A-7A_n78A<br>DC_3C-7A_n78A   | 3             | 1725                    | 5              | 25                  | 1820                    | 8.6      | FDD         | IMD4<br> 2*f <sub>B78</sub> -2*f <sub>B7</sub> |
|                                  | 7             | 2565                    | 5              | 25                  | 2685                    | N/A      | FDD         | N/A  |
|                                  | n78           | 3475                    | 10             | 50                  | 3475                    | N/A      | TDD         | N/A  |
| DC_3A-19A_n79A                   | 3             | 1782.5                  | 5              | 25                  | 1877.5                  | 0.2      | FDD         | IMD4   |
|                                  | 19            | 842.5                   | 5              | 25                  | 887.5                   | N/A      |             | N/A  |
|                                  | n79           | 4420                    | 40             | 216                 | 4420                    | N/A      | TDD         | N/A  |
| DC_3A-20A_n78A<br>DC_3C-20A_n78A | 3             | 1725                    | 5              | 25                  | 1820                    | 17.3     | FDD         | IMD3<br> f <sub>B78</sub> -2*f <sub>B20</sub>  |
|                                  | 20            | 845                     | 5              | 25                  | 804                     | N/A      | FDD         | N/A  |
|                                  | n78           | 3510                    | 10             | 50                  | 3510                    | N/A      | TDD         | N/A  |
| DC_3A-21A_n77A<br>DC_3A-21A_n78A | 3             | 1767.5                  | 5              | 25                  | 1862.5                  | N/A      | FDD         | N/A  |
|                                  | 21            | 1459.5                  | 5              | 25                  | 1507.5                  | 8.8      |             | IMD4   |
|                                  | n77, n78      | 3795                    | 10             | 50                  | 3795                    | N/A      | TDD         | N/A  |
| DC_3A-21A_n77A                   | 3             | 1771.6                  | 5              | 25                  | 1866.6                  | 3.4      | FDD         | IMD5   |
|                                  | 21            | 1450.4                  | 5              | 25                  | 1498.4                  | N/A      |             | N/A  |
|                                  | n77           | 3935                    | 10             | 50                  | 3935                    | N/A      | TDD         | N/A  |
| DC_3A-21A_n79A                   | 3             | 1774.2                  | 5              | 25                  | 1869.2                  | 17.8     | FDD         | IMD3   |
|                                  | 21            | 1450.4                  | 5              | 25                  | 1498.4                  | N/A      |             | N/A  |
|                                  | n79           | 4770                    | 40             | 216                 | 4770                    | N/A      | TDD         | N/A  |
| DC_5A-7A_n78A                    | 5             | 844                     | 5              | 25                  | 889                     | N/A      | FDD         | N/A  |
|                                  | 7             | 2525                    | 5              | 25                  | 2645                    | 30.1     | FDD         | IMD2<br> f <sub>B78</sub> -f <sub>B5</sub>     |
|                                  | n78           | 3489                    | 10             | 50                  | 3489                    | N/A      | TDD         | N/A  |
|                                  | 5             | 834                     | 5              | 25                  | 879                     | 30.2     | FDD         | IMD2<br> f <sub>B78</sub> -f <sub>B7</sub>     |
|                                  | 7             | 2550                    | 5              | 25                  | 2670                    | N/A      | FDD         | N/A  |
|                                  | n78           | 3429                    | 10             | 50                  | 3429                    | N/A      | TDD         | N/A  |
|                                  | 5             | 830                     | 5              | 25                  | 875                     | 3.3      | FDD         | IMD5<br> 2*f <sub>B78</sub> -3f <sub>B7</sub>  |
|                                  | n78           | 3350                    | 10             | 50                  | 3350                    | N/A      | TDD         | N/A  |
| DC_5A_41A_n78A                   | 5             | 860                     | 5              | 25                  | 885                     | 30.2     | FDD         | IMD2   |
|                                  | 41            | 2615                    | 5              | 25                  | 2615                    | N/A      | TDD         | N/A  |
|                                  | n78           | 3500                    | 10             | 50                  | 3500                    | N/A      | TDD         | N/A  |
|                                  | 5             | 856.5                   | 5              | 25                  | 881.5                   | 3.1      | FDD         | IMD5   |
|                                  | 41            | 2620.5                  | 5              | 25                  | 2620.5                  | N/A      | TDD         | N/A  |
|                                  | n78           | 3490                    | 10             | 50                  | 3490                    | N/A      | TDD         | N/A  |
| DC_7A-20A_n28A                   | 20            | 852                     | 5              | 25                  | 811                     | N/A      | FDD         | N/A  |
|                                  | n28           | 738                     | 5              | 25                  | 793                     | N/A      | FDD         | N/A  |
|                                  | 7             | 2550                    | 10             | 50                  | 2670                    | 5.9      | FDD         | IMD5   |
| DC_7A-20A_n78A                   | 7             | 2560                    | 5              | 25                  | 2680                    | N/A      | FDD         | N/A  |
|                                  | 20            | 851                     | 5              | 25                  | 810                     | 30.5     | FDD         | IMD2<br> f <sub>B78</sub> -f <sub>B7</sub>     |
|                                  | n78           | 3370                    | 10             | 50                  | 3370                    | N/A      | TDD         | N/A  |
| DC_7A-20A_n78A                   | 7             | 2560                    | 5              | 25                  | 2680                    | N/A      | FDD         | N/A  |



| EN-DC Configuration                | EUTRA/NR band   | UL F <sub>c</sub> (MHz) | UL/DL BW (MHz) | UL L <sub>CRB</sub> | DL F <sub>c</sub> (MHz) | MSD (dB) | Duplex mode | IMD order                                      |
|------------------------------------|-----------------|-------------------------|----------------|---------------------|-------------------------|----------|-------------|--|
|                                    | 20              | 851                     | 5              | 25                  | 810                     | 3.0      | FDD         | IMD5<br> 2*f <sub>B78</sub> -3*f <sub>B7</sub> |
|                                    | n78             | 3435                    | 10             | 50                  | 3435                    | N/A      | TDD         | N/A  |
| DC_7A-20A_n78A                     | 7               | 2555                    | 5              | 25                  | 2675                    | 30.8     | FDD         | IMD2<br> f <sub>B78</sub> -f <sub>B20</sub>    |
|                                    | 20              | 845                     | 5              | 25                  | 804                     | N/A      | FDD         | N/A  |
|                                    | n78             | 3520                    | 10             | 50                  | 3520                    | N/A      | TDD         | N/A  |
| DC_7A-28A_n78A                     | 7               | 2570                    | 5              | 25                  | 2670                    | N/A      | FDD         | N/A  |
|                                    | 28              | 720                     | 5              | 25                  | 780                     | 8.3      |             | IMD2   |
|                                    | n78             | 3350                    | 10             | 50                  | 3421                    | N/A      | TDD         | N/A  |
|                                    | 7               | 2570                    | 5              | 25                  | 2670                    | N/A      | FDD         | N/A  |
|                                    | 28              | 720                     | 5              | 25                  | 790                     | 3.0      |             | IMD5   |
|                                    | n78             | 3460                    | 10             | 50                  | 3421                    | N/A      | TDD         | N/A  |
|                                    | 7               | 2570                    | 5              | 25                  | 2650                    | 30.5     | FDD         | IMD2   |
|                                    | 28              | 740                     | 5              | 25                  | 768                     | N/A      |             | N/A  |
|                                    | n78             | 3390                    | 10             | 50                  | 3421                    | N/A      | TDD         | N/A  |
|                                    | DC_7A_n28A-n78A | 7                       | 2565           | 5                   | 25                      | 2685     | N/A         | FDD  |
| n28                                |                 | 745                     | 5              | 25                  | 800                     | N/A      |             | N/A  |
| n78                                |                 | 3310                    | 10             | 50                  | 3310                    | 29.7     | TDD         | IMD2   |
| 7                                  |                 | 2565                    | 5              | 25                  | 2685                    | N/A      | FDD         | N/A  |
| n78                                |                 | 3365                    | 10             | 50                  | 3365                    | N/A      | TDD         | N/A  |
| DC_7A-46A_n78A <sup>6</sup>        | n28             | 745                     | 5              | 25                  | 800                     | 28.8     | FDD         | IMD2   |
|                                    | 7               | N/A                     | N/A            | N/A                 | N/A                     | N/A      | FDD         | N/A  |
|                                    | 46              | N/A                     | N/A            | N/A                 | N/A                     | N/A      | TDD         | IMD2,<br>IMD5                                  |
| DC_18A-28A_n77A                    | n78             | N/A                     | N/A            | N/A                 | N/A                     | N/A      | TDD         | N/A  |
|                                    | 18              | 820                     | 5              | 25                  | 865                     | N/A      | FDD         | N/A  |
| DC_18A-28A_n77A                    | 28              | 723                     | 5              | 25                  | 778                     | 4.4      |             | IMD5   |
|                                    | n77             | 4058                    | 10             | 50                  | 4058                    | N/A      | TDD         | N/A  |
|                                    | 18              | 820                     | 5              | 25                  | 865                     | 3.9      | FDD         | IMD5   |
| DC_18A-28A_n78A                    | 28              | 723                     | 5              | 25                  | 778                     | N/A      |             | N/A  |
|                                    | n77             | 3757                    | 10             | 50                  | 3757                    | N/A      | TDD         | N/A  |
|                                    | 18              | 819                     | 5              | 25                  | 864                     | 3.8      | FDD         | IMD5   |
| DC_19A-21A_n77A<br>DC_19A-21A_n78A | 28              | 723                     | 5              | 25                  | 778                     | N/A      |             | N/A  |
|                                    | n78             | 3756                    | 10             | 50                  | 3756                    | N/A      | TDD         | N/A  |
|                                    | 19              | 837.5                   | 5              | 25                  | 882.5                   | 18.7     | FDD         | IMD3   |
| DC_19A-21A_n77A                    | 21              | 1450.4                  | 5              | 25                  | 1498.4                  | N/A      |             | N/A  |
|                                    | n77, n78        | 3783.3                  | 10             | 50                  | 3783.3                  | N/A      | TDD         | N/A  |
|                                    | 19              | 837.5                   | 5              | 25                  | 882.5                   | N/A      | FDD         | N/A  |
| DC_19A-21A_n79A                    | 21              | 1454.5                  | 5              | 25                  | 1502.5                  | 9.0      | FDD         | IMD4   |
|                                    | n77             | 4015                    | 10             | 50                  | 4015                    | N/A      | TDD         | N/A  |
|                                    | 19              | 837.5                   | 5              | 25                  | 882.2                   | N/A      | FDD         | N/A  |
| DC_21A-28A_n77A                    | 21              | 1452                    | 5              | 25                  | 1500                    | 3.8      | FDD         | IMD5   |
|                                    | n79             | 4850                    | 40             | 216                 | 4850                    | N/A      | TDD         | N/A  |
|                                    | 21              | 1452                    | 5              | 25                  | 1500                    | N/A      | FDD         | N/A  |
| DC_21A-28A_n79A                    | 28              | 730.5                   | 5              | 25                  | 785.5                   | 16.9     | FDD         | IMD3   |
|                                    | n77             | 3689.5                  | 10             | 50                  | 3689.5                  | N/A      | TDD         | N/A  |
|                                    | 21              | 1450.5                  | 5              | 25                  | 1498.5                  | 9.9      | FDD         | IMD4   |
|                                    | 28              | 730.5                   | 5              | 25                  | 785.5                   | N/A      | FDD         | N/A  |
|                                    | n77             | 3690                    | 10             | 50                  | 3690                    | N/A      | TDD         | N/A  |
| DC_28A-42A_79A                     | 21              | 1450                    | 5              | 25                  | 1498                    | 5.2      | FDD         | IMD5   |
|                                    | 28              | 730.5                   | 5              | 25                  | 785.5                   | N/A      | TDD         | N/A  |
|                                    | n79             | 4420                    | 40             | 216                 | 4420                    | N/A      | TDD         | N/A  |
| DC_19A_n78A-n79A                   | 28              | 730                     | 5              | 25                  | 785                     | N/A      | FDD         | N/A  |
|                                    | 42              | 3420                    | 5              | 25                  | 3420                    | 15.3     | TDD         | IMD3   |
|                                    | n79             | 4880                    | 40             | 216                 | 4880                    | N/A      | TDD         | N/A  |
|                                    | 28              | 745                     | 5              | 25                  | 800                     | 16.2     | FDD         | IMD2   |
|                                    | 42              | 3597.5                  | 5              | 25                  | 3597.5                  | N/A      | TDD         | N/A  |
|                                    | n79             | 4420                    | 40             | 216                 | 4420                    | N/A      | TDD         | N/A  |
| DC_19A_n78A-n79A                   | 19              | 835                     | 5              | 25                  | 880                     | N/A      | FDD         | N/A  |
|                                    | n78             | 3680                    | 10             | 50                  | 3680                    | N/A      | TDD         | N/A  |

| EN-DC Configuration                    | EUTRA/NR band | UL F <sub>c</sub> (MHz) | UL/DL BW (MHz) | UL L <sub>CRB</sub> | DL F <sub>c</sub> (MHz) | MSD (dB) | Duplex mode | IMD order |
|--|---------------|-------------------------|----------------|---------------------|-------------------------|----------|-------------|-----------|
|  | n79           | 4515                    | 40             | 216                 | 4515                    | 29.3     | TDD         | IMD2      |
|  | 19            | 835                     | 5              | 25                  | 880                     | N/A      | FDD         | N/A       |
|  | n79           | 4550                    | 40             | 216                 | 4550                    | N/A      | TDD         | N/A       |
|  | n78           | 3715                    | 10             | 50                  | 3715                    | 28.8     | TDD         | IMD2      |
| DC_20A_n28A-n78A, DC_20A_SUL_n78A-n83A | 20            | 857                     | 5              | 25                  | 816                     | N/A      | FDD         | N/A       |
|  | n28, n83      | 743                     | 5              | 25                  | 798                     | N/A      | FDD, SUL    | N/A       |
|  | n78           | 3314                    | 10             | 50                  | 3314                    | 8.7      | TDD         | IMD4      |
|  | 20            | 837                     | 5              | 25                  | 796                     | N/A      | FDD         | N/A       |
|  | n78           | 3310                    | 10             | 50                  | 3310                    | N/A      | TDD         | N/A       |
|  | n28           | 744                     | 5              | 25                  | 799                     | 9.4      | FDD         | IMD4      |
| DC_21A_n78A-n79A                       | 21            | 1453                    | 5              | 25                  | 1501                    | N/A      | FDD         | N/A       |
|  | n78           | 3420                    | 10             | 50                  | 3420                    | N/A      | TDD         | N/A       |
|  | n79           | 4873                    | 40             | 216                 | 4873                    | 30.1     | TDD         | IMD2      |
|  | 21            | 1453                    | 5              | 25                  | 1501                    | N/A      | FDD         | N/A       |
|  | n79           | 4940                    | 40             | 216                 | 4940                    | N/A      | TDD         | N/A       |
|  | n78           | 3487                    | 10             | 50                  | 3487                    | 29.8     | TDD         | IMD2      |

7.3B.2.3.5.3 MSD exceptions due to Tx leakage issue

Table 7.3B.2.3.5.3-1: Void

7.3B.2.4 Inter-band EN-DC including FR2

7.3B.2.4.1 Reference sensitivity exceptions due to UL harmonic interference for EN-DC in NR FR2

Reference sensitivity exceptions are specified for the condition when there is uplink transmission only in the aggressor band.

Sensitivity degradation is allowed for a band in frequency range 2 if it is impacted by UL harmonic interference from the band in frequency range 1 of the same DC configuration. Reference sensitivity exceptions are specified in Table 7.3B.2.4.1-1 with uplink configuration specified in Table 7.3B.2.4.1-2.

Table 7.3B.2.4.1-1: Reference sensitivity exceptions due to UL harmonic for EN-DC in NR FR2

| UL Band | DL Band | 50 MHz (dBm) | 100 MHz (dBm) | 200 MHz (dBm) | 400 MHz (dBm) |
|---------|---------|--------------|---------------|---------------|---------------|
| X       | Y       |              |               |               |               |

Table 7.3B.2.4.1-2: Uplink configuration for reference sensitivity exceptions due to UL harmonic interference

| UL band | DL band | 5 MHz (dBm) | 10 MHz (dBm) | 15 MHz (dBm) | 20 MHz (dBm) | 25 MHz (dBm) | 40 MHz (dBm) | 50 MHz (dBm) | 60 MHz (dBm) | 80 MHz (dBm) | 90 MHz (dBm) | 100 MHz (dBm) |
|---------|---------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|
| X       | Y       |             |              |              |              |              |              |              |              |              |              |               |

## 7.3B.2.5 Inter-band EN-DC including both FR1 and FR2

### 7.3B.2.5.1 Reference sensitivity exceptions due to UL harmonic interference for EN-DC including both FR1 and FR2

For inter-band EN-DC of LTE and NR in both FR1 and FR2, the UE is allowed to apply each sensitivity degradation for EN-DC in FR1 specified in clause 7.3B.2.3 TS 38.101-3 and for EN-DC including FR2 specified in clause 7.3B.2.3 of TS 38.101-3 independently.

## 7.3B.3 $\Delta R_{IB,c}$ , $\Delta R_{IBNC}$ for EN-DC

<Editor's note: Table number to be updated>

For the UE which supports inter-band EN-DC configuration, the minimum requirement for reference sensitivity in Table 7.3.1-1 and Table 7.3.1-1a in [4], subclause 7.3.2, 7.3A.2, 7.3C.2 in [2] and subclause 7.3.2, 7.3A.2 in [3] shall be increased by the amount given in  $\Delta R_{IB,c}$ ,  $\Delta R_{IBNC}$  in Tables below where unless otherwise stated, the same  $\Delta R_{IB,c}$ ,  $\Delta R_{IBNC}$  are applicable to NR band(s) part for DC configurations which have the same NR operating band combination. Unless otherwise stated,  $\Delta R_{IB,c}$  or  $\Delta R_{IBNC}$  is set to zero.

In case the UE supports more than one of band combinations for CA, SUL or DC, and an operating band belongs to more than one band combinations then

- When the operating band frequency range is  $\leq 1$  GHz, the applicable additional  $\Delta R_{IB,c}$  shall be the average value for all band combinations defined in subclause 7.3A, 7.3B, 7.3C in this specification and 7.3A, 7.3B in TS 38.101-3 [3], truncated to one decimal place that apply for that operating band among the supported band combinations. In case there is a harmonic relation between low band UL and high band DL, then the maximum  $\Delta R_{IB,c}$  among the different supported band combinations involving such band shall be applied
- When the operating band frequency range is  $> 1$  GHz, the applicable additional  $\Delta R_{IB,c}$  shall be the maximum value for all band combinations defined in subclause 7.3A, 7.3B, 7.3C in this specification and 7.3A, 7.3B in TS 38.101-3 [3] for the applicable operating bands.

7.3B.3.1 Intra-band contiguous EN-DC

7.3B.3.2 Intra-band non-contiguous EN-DC

**Table 7.3B.3.2-1: Intra-band non-contiguous EN-DC with one uplink configuration for reference sensitivity**

| DC configuration | Aggregated channel bandwidth (LTE+NR) | $W_{gap}$ / (MHz)          | UL LTE allocation | $\Delta R_{IBNC}$ (dB) | Duplex mode |
|------------------|---------------------------------------|----------------------------|-------------------|------------------------|-------------|
| DC_3A_n3A        | 5MHz+5MHz                             | $45.0 < W_{gap} \leq 65.0$ | 12 <sup>1</sup>   | 4.7                    | FDD         |
|                  |                                       | $0.0 < W_{gap} \leq 45.0$  | 25 <sup>1</sup>   | 0                      |             |
|                  | 5MHz+10MHz                            | $40.0 < W_{gap} \leq 60.0$ | 12 <sup>1</sup>   | 3.8                    |             |
|                  |                                       | $0.0 < W_{gap} \leq 40.0$  | 25 <sup>1</sup>   | 0                      |             |
|                  | 5MHz+15MHz                            | $35.0 < W_{gap} \leq 55.0$ | 12 <sup>1</sup>   | 3.6                    |             |
|                  |                                       | $0.0 < W_{gap} \leq 35.0$  | 25 <sup>1</sup>   | 0                      |             |
|                  | 5MHz+20MHz                            | $30.0 < W_{gap} \leq 50.0$ | 12 <sup>1</sup>   | 3.4                    |             |
|                  |                                       | $0.0 < W_{gap} \leq 30.0$  | 25 <sup>1</sup>   | 0                      |             |
|                  | 5MHz+25MHz                            | $25.0 < W_{gap} \leq 45.0$ | 12 <sup>1</sup>   | 3.2                    |             |
|                  |                                       | $0.0 < W_{gap} \leq 25.0$  | 25 <sup>1</sup>   | 0                      |             |
|                  | 5MHz+30MHz                            | $20.0 < W_{gap} \leq 40.0$ | 12 <sup>1</sup>   | 3.0                    |             |
|                  |                                       | $0.0 < W_{gap} \leq 20.0$  | 25 <sup>1</sup>   | 0                      |             |
|                  | 10MHz+5MHz                            | $30.0 < W_{gap} \leq 60.0$ | 12 <sup>5</sup>   | 5.1                    |             |
|                  |                                       | $0.0 < W_{gap} \leq 30.0$  | 32 <sup>1</sup>   | 0                      |             |
|                  | 10MHz+10MHz                           | $25.0 < W_{gap} \leq 55.0$ | 12 <sup>5</sup>   | 4.3                    |             |
|                  |                                       | $0.0 < W_{gap} \leq 25.0$  | 32 <sup>1</sup>   | 0                      |             |
|                  | 10MHz+15MHz                           | $20.0 < W_{gap} \leq 50.0$ | 12 <sup>5</sup>   | 3.8                    |             |
|                  |                                       | $0.0 < W_{gap} \leq 20.0$  | 32 <sup>1</sup>   | 0                      |             |
|                  | 10MHz+20MHz                           | $15.0 < W_{gap} \leq 45.0$ | 12 <sup>5</sup>   | 3.5                    |             |
|                  |                                       | $0.0 < W_{gap} \leq 15.0$  | 32 <sup>1</sup>   | 0                      |             |
|                  | 10MHz+25MHz                           | $10.0 < W_{gap} \leq 40.0$ | 12 <sup>5</sup>   | 3.2                    |             |
|                  |                                       | $0.0 < W_{gap} \leq 10.0$  | 32 <sup>1</sup>   | 0                      |             |
|                  | 10MHz+30MHz                           | $5.0 < W_{gap} \leq 35.0$  | 12 <sup>5</sup>   | 2.8                    |             |
|                  |                                       | $0.0 < W_{gap} \leq 5.0$   | 32 <sup>1</sup>   | 0                      |             |
|                  | 15MHz+5MHz                            | $25.0 < W_{gap} \leq 55.0$ | 12 <sup>6</sup>   | 6.0                    |             |
|                  |                                       | $0.0 < W_{gap} \leq 25.0$  | 32 <sup>1</sup>   | 0                      |             |
|                  | 15MHz+10MHz                           | $20.0 < W_{gap} \leq 50.0$ | 12 <sup>6</sup>   | 4.7                    |             |
|                  |                                       | $0.0 < W_{gap} \leq 20.0$  | 32 <sup>1</sup>   | 0                      |             |
|                  | 15MHz+15MHz                           | $15.0 < W_{gap} \leq 45.0$ | 12 <sup>6</sup>   | 4.2                    |             |
|                  |                                       | $0.0 < W_{gap} \leq 15.0$  | 32 <sup>1</sup>   | 0                      |             |
|                  | 15MHz+20MHz                           | $10.0 < W_{gap} \leq 40.0$ | 12 <sup>6</sup>   | 3.8                    |             |
|                  |                                       | $0.0 < W_{gap} \leq 10.0$  | 32 <sup>1</sup>   | 0                      |             |
| 15MHz+25MHz      | $5.0 < W_{gap} \leq 35.0$             | 12 <sup>6</sup>            | 3.5               |                        |             |
|                  | $0.0 < W_{gap} \leq 5.0$              | 32 <sup>1</sup>            | 0                 |                        |             |
| 15MHz+30MHz      | $0.0 < W_{gap} \leq 30.0$             | 12 <sup>6</sup>            | 3.3               |                        |             |
|                  | $15.0 < W_{gap} \leq 50.0$            | 16 <sup>7</sup>            | 6.5               |                        |             |
| 20MHz+5MHz       | $0.0 < W_{gap} \leq 15.0$             | 32 <sup>1</sup>            | 0                 |                        |             |
|                  | $10.0 < W_{gap} \leq 45.0$            | 16 <sup>7</sup>            | 5.1               |                        |             |
| 20MHz+10MHz      | $0.0 < W_{gap} \leq 10.0$             | 32 <sup>1</sup>            | 0                 |                        |             |
|                  | $5.0 < W_{gap} \leq 40.0$             | 16 <sup>7</sup>            | 4.5               |                        |             |
| 20MHz+15MHz      | $0.0 < W_{gap} \leq 5.0$              | 32 <sup>1</sup>            | 0                 |                        |             |
|                  | $0.0 < W_{gap} \leq 35.0$             | 16 <sup>7</sup>            | 4.1               |                        |             |
| 20MHz+20MHz      | $0.0 < W_{gap} \leq 30.0$             | 16 <sup>7</sup>            | 3.8               |                        |             |
|                  | $0.0 < W_{gap} \leq 25.0$             | 16 <sup>7</sup>            | 3.6               |                        |             |

NOTE 1: <sup>1</sup> refers to the UL resource blocks shall be located as close as possible to the downlink operating band but confined within the transmission.  
 NOTE 2:  $W_{gap}$  is the sub-block gap between the two sub-blocks.  
 NOTE 3: The carrier center frequency of PCC in the UL operating band is configured closer to the DL operating band.  
 NOTE 4: All combinations of channel bandwidths defined in Table 5.3B.1.3-1.  
 NOTE 5: <sup>5</sup> refers to the UL resource blocks shall be located at  $RB_{start}=25$ .  
 NOTE 6: <sup>6</sup> refers to the UL resource blocks shall be located at  $RB_{start}=35$ .  
 NOTE 7: <sup>7</sup> refers to the UL resource blocks shall be located at  $RB_{start}=50$ .

### 7.3B.3.3 Inter-band EN-DC within FR1

#### 7.3B.3.3.1 $\Delta R_{IB,c}$ for EN-DC in two bands

**Table 7.3B.3.3.1-1:  $\Delta R_{IB,c}$  due to EN-DC(two bands)**

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta R_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
| DC_1_n28                       | n28               | 0.2                    |
| DC_1_n51                       | n51               | 0.1                    |
| DC_1_n77                       | 1                 | 0.2                    |
|                                | n77               | 0.5                    |
| DC_1_n78                       | n78               | 0.5                    |
| DC_2_n66                       | 2                 | 0.3                    |
|                                | n66               | 0.3                    |
| DC_2_n78                       | 2                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_3_n51                       | 3                 | 0.2                    |
|                                | n51               | 0.2                    |
| DC_3_n77                       | 3                 | 0.2                    |
|                                | n77               | 0.5                    |
| DC_3_n78                       | 3                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_5_n78                       | 5                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_7_n51                       | n51               | 0.2                    |
| DC_7_n77                       | n77               | 0.5                    |
| DC_7_n78                       | n78               | 0.5                    |
| DC_8_n77                       | 8                 | 0.2                    |
|                                | n77               | 0.5                    |
| DC_8_n78                       | 8                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_11_n77                      | n77               | 0.5                    |
| DC_11_n78                      | n78               | 0.5                    |
| DC_12A_n5A                     | 12                | 0.3                    |
|                                | n5                | 0.5                    |
| DC_12A_n66A                    | 12                | 0.5                    |
| DC_18_n77                      | n77               | 0.5                    |
| DC_19_n77                      | n77               | 0.5                    |
| DC_19_n78                      | n78               | 0.5                    |
| DC_20_n51                      | n51               | 0.2                    |
| DC_20_n77                      | n77               | 0.5                    |
| DC_20_n78                      | n78               | 0.5                    |
| DC_21_n77                      | n77               | 0.5                    |
| DC_21_n78                      | n78               | 0.5                    |
| DC_25_n41                      | n41               | 0 <sup>1</sup>         |
|                                |                   | 0.5 <sup>2</sup>       |
| DC_26A_n77A                    | n77               | 0.5                    |
| DC_26_n78                      | n78               | 0.5                    |
| DC_28A_n51                     | n51               | 0.2                    |
| DC_28_n77                      | 28                | 0.2                    |
|                                | n77               | 0.5                    |
| DC_28_n78                      | 28                | 0.2                    |
|                                | n78               | 0.5                    |
| DC_30_n66                      | 30                | 0.5                    |
|                                | n66               | 0.4                    |
| DC_38_n78                      | 38                | 0.4                    |
|                                | n78               | 0.5                    |
| DC_39_n78                      | n78               | 0.5                    |
| DC_39_n79                      | n79               | 0.5                    |
| DC_40_n77                      | 40                | 0.4                    |
|                                | n77               | 0.5                    |
| DC_41_n77                      | n77               | 0.5                    |
| DC_41_n78                      | n78               | 0.5                    |
| DC_41_n79                      | n79               | 0.5                    |
| DC_42_n51                      | n51               | 0.2                    |
| DC_66A_n78A                    | 66                | 0.2                    |
|                                | n78               | 0.5                    |

NOTE 1: The requirement is applied for UE transmitting on the frequency range of 2545-2690MHz.  
NOTE 2: The requirement is applied for UE transmitting on the frequency range of 2496-2545MHz.

7.3B.3.3.2  $\Delta R_{IB,c}$  for EN-DC three bands**Table 7.3B.3.3.2-1:  $\Delta R_{IB,c}$  due to EN-DC (three bands)**

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta R_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
| DC_1-3_n28                     | n28               | 0.2                    |
| DC_1-3_n77                     | 1                 | 0.2                    |
|                                | 3                 | 0.2                    |
|                                | n77               | 0.5                    |
| DC_1-3_n78                     | 1                 | 0.2                    |
|                                | 3                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_1-5_n78                     | 1                 | 0.2                    |
|                                | 5                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_1-7_n28                     | n28               | 0.2                    |
| DC_1-7_n78<br>DC_1-7-7_n78     | 1                 | 0.2                    |
|                                | 7                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_1-8_n78                     | 8                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_1-18_n77                    | n77               | 0.5                    |
| DC_1-18_n78                    | n78               | 0.5                    |
| DC_1-19_n77                    | n77               | 0.5                    |
| DC_1-19_n78                    | n78               | 0.5                    |
| DC_1-19_n79                    | 1                 | 0.3                    |
|                                | 19                | 0.3                    |
| DC_1-20_n28                    | 1                 | 0.0                    |
|                                | 20                | 0.2                    |
|                                | n28               | 0.2                    |
| DC_1-20_n78                    | n78               | 0.5                    |
| DC_1-21_n77                    | n77               | 0.5                    |
| DC_1-21_n78                    | 1                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_1-28_n77                    | 28                | 0.2                    |
|                                | n77               | 0.5                    |
| DC_1-28_n78                    | 28                | 0.2                    |
|                                | n78               | 0.5                    |
| DC_1_n28-n78                   | 1                 | 0                      |
|                                | n28               | 0.2                    |
|                                | n78               | 0.5                    |
| DC_1_n28-n79                   | 1                 | 0.3                    |
|                                | 28                | 0.3                    |
| DC_1-42_n77                    | 1                 | 0.2                    |
|                                | 42                | 0.5                    |
|                                | n77               | 0.5                    |
| DC_1-41_n77                    | n77               | 0.5                    |
| DC_1-41_n78                    | n78               | 0.5                    |
| DC_1-42_n78                    | 1                 | 0.2                    |
|                                | 42                | 0.5                    |
|                                | n78               | 0.5                    |
| DC_1-42_n79                    | 42                | 0.5                    |
| DC_1_n77-n79                   | 1                 | 0.2                    |
|                                | n77               | 0.5                    |
|                                | n79               | 0.0                    |
| DC_1_n78-n79                   | 1                 | 0.0                    |
|                                | n78               | 0.5                    |
|                                | n79               | 0.0                    |
| DC_1-SUL_n78-n84               | n78               | 0.5                    |
| DC_2_5_n66                     | 2                 | 0.3                    |
|                                | n66               | 0.3                    |
| DC_2_30_n66                    | 2                 | 0.4                    |
|                                | 30                | 0.5                    |
|                                | n66               | 0.4                    |
| DC_2-66_n71B                   | 2                 | 0.3                    |
|                                | 66                | 0.3                    |
| DC_3_n3-n77                    | 3                 | 0.2                    |
|                                | n3                | 0.2                    |



| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta R_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
|                                | n77               | 0.5                    |
| DC_3_n3-n78                    | 3                 | 0.2                    |
|                                | n3                | 0.2                    |
|                                | n78               | 0.5                    |
| DC_3-5_n78                     | 3                 | 0.2                    |
|                                | 5                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_3-7_n78, DC_3-7-7_n78       | 3                 | 0.2                    |
|                                | 7                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_3-8_n78                     | 3                 | 0.2                    |
|                                | 8                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_3-19_n77                    | 3                 | 0.2                    |
|                                | n77               | 0.5                    |
| DC_3-19_n78                    | 3                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_3-20_n28                    | 20                | 0.1                    |
|                                | n28               | 0.1                    |
| DC_3-19_n79                    |                   |                        |
| DC_3-20_n78                    | 3                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_3-21_n77                    | 3                 | 0.3                    |
|                                | 21                | 0.5                    |
|                                | n77               | 0.5                    |
| DC_3-21_n78                    | 3                 | 0.3                    |
|                                | 21                | 0.5                    |
|                                | n78               | 0.5                    |
| DC_3-21_n79                    | 3                 | 0.3                    |
|                                | 21                | 0.5                    |
| DC_3-28_n78                    | 3                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_3_n28-n78                   | 3                 | 0.2                    |
|                                | n28               | 0                      |
|                                | n78               | 0.5                    |
| DC_3-38_n78                    | 3                 | 0.2                    |
|                                | 38                | 0.4                    |
|                                | n78               | 0.5                    |
| DC_3-41_n78                    | 3                 | 0.2                    |
|                                | 41                | 0 <sup>1</sup>         |
|                                | n78               | 0.5 <sup>2</sup>       |
| DC_3-42_n77                    | 3                 | 0.2                    |
|                                | 42                | 0.5                    |
|                                | n77               | 0.5                    |
| DC_3-42_n78                    | 3                 | 0.2                    |
|                                | 42                | 0.5                    |
|                                | n78               | 0.5                    |
| DC_3-42_n79                    | 3                 | 0.2                    |
|                                | 42                | 0.5                    |
| DC_3_n77-n79                   | 3                 | 0.2                    |
|                                | n77               | 0.5                    |
|                                | n79               | 0.0                    |
| DC_3_n78-n79                   | 3                 | 0.2                    |
|                                | n78               | 0.5                    |
|                                | n79               | 0.0                    |
| DC_3-SUL_n78-n80               | 3                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_3-SUL_n78-n82               | 3                 | 0.2                    |
|                                | n78               | 0.5                    |

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta R_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
| DC_5-7_n78                     | 5                 | 0.2                    |
|                                | 7                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_5_30_n66                    | 30                | 0.5                    |
|                                | n66               | 0.4                    |
| DC_7-7_n78                     | 7                 | 0.0                    |
|                                | n78               | 0.5                    |
| DC_7-20_n28                    | 20                | 0.2                    |
|                                | n28               | 0.2                    |
| DC_7-20_n78                    | n78               | 0.5                    |
| DC_7-28_n78                    | n78               | 0.5                    |
| DC_7_n28-n78                   | n78               | 0.5                    |
| DC_7-46_n78                    | n78               | 0.5                    |
| DC_8A-SUL_n78-n81              | 8                 | 0.2                    |
|                                | n78               | 0.2                    |
|                                |                   |                        |
| DC_18-28_n77                   | n77               | 0.5                    |
| DC_18-28_n78                   | n78               | 0.5                    |
| DC_19-21_n77                   | n77               | 0.5                    |
| DC_19-21_n78                   | n78               | 0.5                    |
| DC_19-42_n77                   | 42                | 0.5                    |
|                                | n77               | 0.5                    |
| DC_19-42_n78                   | 42                | 0.5                    |
|                                | n78               | 0.5                    |
| DC_19-42_n79                   | 42                | 0.5                    |
| DC_19_n77-n79                  | 19                | 0.0                    |
|                                | n77               | 0.5                    |
|                                | n79               | 0.0                    |
| DC_19_n78-n79                  | 19                | 0.0                    |
|                                | n78               | 0.5                    |
|                                | n79               | 0.0                    |
| DC_20_n8-n75                   | 20                | 0.0                    |
|                                | n8                | 0.0                    |
|                                | n75               | 0.0                    |
| DC_20_n28-n75                  | 20                | 0.0                    |
|                                | n28               | 0.2                    |
|                                | n75               | 0.0                    |
| DC_20_n28-n78                  | 20                | 0.2                    |
|                                | n28               | 0.2                    |
|                                | n78               | 0.5                    |
| DC_20_n75-n78                  | 20                | 0.0                    |
|                                | n75               | 0.0                    |
|                                | n78               | 0.5                    |
| DC_20_n76-n78                  | 20                | 0.0                    |
|                                | n76               | 0.0                    |
|                                | n78               | 0.5                    |
| DC_20-SUL_n78-n82              | n78               | 0.5                    |
| DC_20-SUL_n78-n83              | 20                | 0.2                    |
|                                | n78               | 0.5                    |
| DC_21-42_n77                   | 42                | 0.5                    |
|                                | n77               | 0.5                    |
| DC_21-42_n78                   | 42                | 0.5                    |
|                                | n78               | 0.5                    |
| DC_21-42_n79                   | 42                | 0.5                    |
| DC_21_n77-n79                  | 21                | 0.0                    |
|                                | n77               | 0.5                    |
|                                | n79               | 0.0                    |
| DC_21_n78-n79                  | 21                | 0.0                    |
|                                | n78               | 0.5                    |
|                                | n79               | 0.0                    |
| DC_28-SUL_n78-n83              | 28                | 0.2                    |
|                                | n78               | 0.5                    |

| Inter-band EN-DC configuration   | E-UTRA or NR Band | $\Delta R_{IB,c}$ (dB) |
|--|-------------------|------------------------|
|  |                   |                        |
| DC_28-42_n77   | 28                | 0.2                    |
|  | 42                | 0.5                    |
|  | n77               | 0.5                    |
| DC_28-42_n78   | 28                | 0.2                    |
|  | 42                | 0.5                    |
|  | n78               | 0.5                    |
| DC_28-42_n79   | 28                | 0.2                    |
|  | 42                | 0.5                    |
| DC_41-42_n77   | 42                | 0.5                    |
|  | n77               | 0.5                    |
| DC_41-42_n78   | 42                | 0.5                    |
|  | n78               | 0.5                    |
| DC_41-42_n79   | 42                | 0.5                    |
| DC_41_n77  | n77               | 0.5                    |
| DC_41_n78  | n78               | 0.5                    |
| DC_41_n79  | n79               | 0.5                    |
| DC_66-SUL_n78-n86  | 66                | 0.2                    |
|  | n78               | 0.5                    |
| NOTE 1: The requirement is applied for UE transmitting on the frequency range of 2545-2690MHz. |                   |                        |
| NOTE 2: The requirement is applied for UE transmitting on the frequency range of 2496-2545MHz. |                   |                        |

7.3B.3.3.3  $\Delta R_{IB,c}$  for EN-DC four bands**Table 7.3B.3.3.3-1:  $\Delta R_{IB,c}$  due to EN-DC (four bands)**

| Inter-band EN-DC configuration  | E-UTRA or NR Band | $\Delta R_{IB,c}$ (dB) |
|---------------------------------|-------------------|------------------------|
| DC_1-3-5_n78                    | 1                 | 0.2                    |
|                                 | 3                 | 0.2                    |
|                                 | n78               | 0.5                    |
| DC_1-3-7_n28                    | n28               | 0.2                    |
| DC_1-3-7_n78<br>DC_1-3-7-7_n78  | 1                 | 0.3                    |
|                                 | 3                 | 0.3                    |
|                                 | 7                 | 0.3                    |
|                                 | n78               | 0.5                    |
| DC_1-3-8_n78                    | 1                 | 0.2                    |
|                                 | 3                 | 0.2                    |
|                                 | 8                 | 0.2                    |
|                                 | n78               | 0.5                    |
| DC_1-3-28_n77                   | 1                 | 0.2                    |
|                                 | 3                 | 0.2                    |
|                                 | 28                | 0.2                    |
|                                 | n77               | 0.5                    |
| DC_1-3-28_n78<br>DC_1-3_n28-n78 | 1                 | 0.2                    |
|                                 | 3                 | 0.2                    |
|                                 | 28 or n28         | 0.2                    |
|                                 | n78               | 0.5                    |
| DC_1-3-28_n79                   | 1                 | 0.2                    |
|                                 | 3                 | 0.2                    |
|                                 | 28                | 0.2                    |
| DC_1-3-19_n78                   | 1                 | 0.2                    |
|                                 | 3                 | 0.2                    |
|                                 | n78               | 0.5                    |
| DC_1-3-20_n28                   | 20                | 0.2                    |
|                                 | n28               | 0.2                    |
| DC_1-3-20_n78                   | 1                 | 0.2                    |
|                                 | 3                 | 0.2                    |
|                                 | n78               | 0.5                    |
| DC_1-3-21_n77                   | 1                 | 0.2                    |
|                                 | 3                 | 0.3                    |
|                                 | 21                | 0.5                    |
|                                 | n77               | 0.5                    |
| DC_1-3-21_n78                   | 1                 | 0.2                    |
|                                 | 3                 | 0.3                    |
|                                 | 21                | 0.5                    |
|                                 | n78               | 0.5                    |
| DC_1-3-21_n79                   | 3                 | 0.3                    |
|                                 | 21                | 0.5                    |
| DC_1-3-42_n77                   | 1                 | 0.2                    |
|                                 | 3                 | 0.2                    |
|                                 | 42                | 0.5                    |
|                                 | n77               | 0.5                    |
| DC_1-3-42_n78                   | 1                 | 0.2                    |
|                                 | 3                 | 0.2                    |
|                                 | 42                | 0.5                    |
|                                 | n78               | 0.5                    |
| DC_1-3-42_n79                   | 1                 | 0.2                    |
|                                 | 3                 | 0.2                    |
|                                 | 42                | 0.5                    |
| DC_1-5-7_n78<br>DC_1-5-7-7_n78  | 1                 | 0.2                    |
|                                 | 5                 | 0.2                    |
|                                 | 7                 | 0.2                    |
|                                 | n78               | 0.5                    |
| DC_1-7-20_n28                   | 20                | 0.2                    |
|                                 | n28               | 0.2                    |
| DC_1-7-20_n78                   | 1                 | 0.2                    |
|                                 | 7                 | 0.2                    |
|                                 | 20                | 0.2                    |
|                                 | n78               | 0.5                    |
| DC_1-7_n28-n78                  | 1                 | 0.2                    |

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta R_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
|                                | 7                 | 0.2                    |
|                                | n28               | 0.2                    |
|                                | n78               | 0.5                    |
| DC_1-18-28_n77                 | n77               | 0.5                    |
| DC_1-18-28_n78                 | n78               | 0.5                    |
|                                | 1                 | 0.2                    |
| DC_1-19-42_n77                 | 42                | 0.5                    |
|                                | n77               | 0.5                    |
| DC_1-19-42_n78                 | 42                | 0.5                    |
|                                | n78               | 0.5                    |
| DC_1-19-42_n79                 | 42                | 0.5                    |
|                                | 1                 | 0.0                    |
| DC_1-20_n28-n78                | 20                | 0.2                    |
|                                | n28               | 0.2                    |
|                                | n78               | 0.5                    |
|                                | 1                 | 0.2                    |
| DC_1-21-42_n77                 | 42                | 0.5                    |
|                                | n77               | 0.5                    |
| DC_1-21-42_n78                 | 42                | 0.5                    |
|                                | n78               | 0.5                    |
| DC_1-21-42_n79                 | 42                | 0.5                    |
|                                | 1                 | 0.2                    |
| DC_1-28-42_n77                 | 28                | 0.2                    |
|                                | 42                | 0.5                    |
|                                | n77               | 0.5                    |
|                                | n78               | 0.5                    |
| DC_1-28-42_n78                 | 28                | 0.2                    |
|                                | 42                | 0.5                    |
|                                | n78               | 0.5                    |
| DC_1-28-42_n79                 | 28                | 0.2                    |
|                                | 42                | 0.5                    |
| DC_1-41-42_n77                 | 42                | 0.5                    |
|                                | n77               | 0.5                    |
| DC_1-41-42_n78                 | 42                | 0.5                    |
|                                | n78               | 0.5                    |
| DC_1-41-42_n79                 | 42                | 0.5                    |
| DC_1-41-42_n79                 | 42                | 0.5                    |
|                                | 2                 | 0.3                    |
| DC_2-66-(n)71                  | 66                | 0.3                    |
|                                | 3                 | 0.2                    |
| DC_3-5-7_n78, DC_3-5-7-7_n78   | 5                 | 0.2                    |
|                                | 7                 | 0.2                    |
|                                | n78               | 0.5                    |
|                                | 3                 | 0.2                    |
| DC_3-7-7_n78                   | 7                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_3-7-20_n28                  | 20                | 0.2                    |
|                                | n28               | 0.1                    |
|                                | 3                 | 0.2                    |
| DC_3-7-20_n78                  | 7                 | 0.2                    |
|                                | n78               | 0.5                    |
|                                | 3                 | 0.2                    |
| DC_3-7-28_n78                  | 7                 | 0.2                    |
| DC_3-7_n28-n78                 | 28 or n28         | 0.2                    |
|                                | n78               | 0.5                    |
|                                | 3                 | 0.3                    |
| DC_3-19-21_n77                 | 21                | 0.5                    |
|                                | n77               | 0.5                    |
|                                | 3                 | 0.3                    |
| DC_3-19-21_n78                 | 21                | 0.5                    |
|                                | n78               | 0.5                    |
| DC_3-19-21_n79                 | 3                 | 0.3                    |
|                                | 21                | 0.5                    |
| DC_3-19-42_n77                 | 3                 | 0.2                    |

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta R_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
|                                | 42                | 0.5                    |
|                                | n77               | 0.5                    |
| DC_3-19-42_n78                 | 0.2               | 0.2                    |
|                                | 0.5               | 0.5                    |
|                                | 0.5               | 0.5                    |
| DC_3-19-42_n79                 | 3                 | 0.2                    |
|                                | 42                | 0.5                    |
| DC_3-20_n28-n78                | 3                 | 0.2                    |
|                                | 20                | 0.2                    |
|                                | n28               | 0.2                    |
|                                | n78               | 0.5                    |
| DC_3-21-42_n77                 | 3                 | 0.3                    |
|                                | 21                | 0.5                    |
|                                | 42                | 0.5                    |
|                                | n77               | 0.5                    |
| DC_3-21-42_n78                 | 3                 | 0.3                    |
|                                | 21                | 0.5                    |
|                                | 42                | 0.5                    |
|                                | n78               | 0.5                    |
| DC_3-21-42_n79                 | 3                 | 0.3                    |
|                                | 21                | 0.5                    |
|                                | 42                | 0.5                    |
| DC_3-28-42_n77                 | 3                 | 0.2                    |
|                                | 28                | 0.2                    |
|                                | 42                | 0.5                    |
|                                | n77               | 0.5                    |
| DC_3-28-42_n78                 | 3                 | 0.2                    |
|                                | 28                | 0.2                    |
|                                | 42                | 0.5                    |
|                                | n78               | 0.5                    |
| DC_3-28-42_n79                 | 3                 | 0.2                    |
|                                | 28                | 0.2                    |
|                                | 42                | 0.5                    |
| DC_5-7-7_n78                   | 5                 | 0.2                    |
|                                | 7                 | 0.2                    |
|                                | n78               | 0.5                    |
| DC_7-20_n28-n78                | 7                 | 0.0                    |
|                                | 20                | 0.2                    |
|                                | n28               | 0.2                    |
|                                | n78               | 0.5                    |
| DC_19-21-42_n77                | 42                | 0.5                    |
|                                | n77               | 0.5                    |
| DC_19-21-42_n78                | 42                | 0.5                    |
|                                | n78               | 0.5                    |
| DC_19-21-42_n79                | 42                | 0.5                    |
| DC_21-28-42_n77                | 28                | 0.2                    |
|                                | 42                | 0.5                    |
|                                | n77               | 0.5                    |
| DC_21-28-42_n78                | 28                | 0.2                    |
|                                | 42                | 0.5                    |
|                                | n78               | 0.5                    |
| DC_21-28-42_n79                | 28                | 0.2                    |
|                                | 42                | 0.5                    |

7.3B.3.3.4  $\Delta R_{IB,c}$  for EN-DC five bands**Table 7.3B.3.3.4-1:  $\Delta R_{IB,c}$  due to EN-DC (five bands)**



| Inter-band EN-DC configuration      | E-UTRA or NR Band | $\Delta R_{B,c}$ (dB) |
|-------------------------------------|-------------------|-----------------------|
| DC_1-3-5-7_n78,<br>DC_1-3-5-7-7_n78 | 1                 | 0.2                   |
|                                     | 3                 | 0.2                   |
|                                     | 5                 | 0.2                   |
|                                     | 7                 | 0.2                   |
|                                     | n78               | 0.5                   |
| DC_1-3-7-20_n28                     | 20                | 0.2                   |
|                                     | n28               | 0.2                   |
| DC_1-3-7-20_n78                     | 1                 | 0.2                   |
|                                     | 3                 | 0.2                   |
|                                     | 7                 | 0.2                   |
|                                     | n78               | 0.5                   |
| DC_1-3-7_n28-n78                    | 1                 | 0.2                   |
|                                     | 3                 | 0.2                   |
|                                     | 7                 | 0.2                   |
|                                     | n28               | 0.2                   |
| DC_1-3-7_n78                        | n78               | 0.5                   |
|                                     | 1                 | 0.2                   |
|                                     | 3                 | 0.3                   |
|                                     | 21                | 0.5                   |
| DC_1-3-19-21_n77                    | n77               | 0.5                   |
|                                     | 1                 | 0.2                   |
|                                     | 3                 | 0.3                   |
|                                     | 21                | 0.5                   |
| DC_1-3-19-21_n78                    | n78               | 0.5                   |
|                                     | 1                 | 0.2                   |
|                                     | 3                 | 0.3                   |
|                                     | 21                | 0.5                   |
| DC_1-3-19-21_n79                    | n79               | 0.5                   |
|                                     | 1                 | 0.2                   |
| DC_1-3-19-42_n77                    | 3                 | 0.3                   |
|                                     | 21                | 0.5                   |
|                                     | n77               | 0.5                   |
|                                     | 1                 | 0.2                   |
| DC_1-3-19-42_n78                    | 3                 | 0.3                   |
|                                     | 21                | 0.5                   |
|                                     | n78               | 0.5                   |
|                                     | 1                 | 0.2                   |
| DC_1-3-19-42_n79                    | 3                 | 0.3                   |
|                                     | 21                | 0.5                   |
|                                     | 42                | 0.5                   |
| DC_1-3-28-42_n77                    | 1                 | 0.2                   |
|                                     | 3                 | 0.2                   |
|                                     | 42                | 0.5                   |
|                                     | n77               | 0.5                   |
| DC_1-3-28-42_n78                    | 1                 | 0.2                   |
|                                     | 3                 | 0.2                   |
|                                     | 28                | 0.2                   |
|                                     | 42                | 0.5                   |
| DC_1-3-28-42_n79                    | n78               | 0.5                   |
|                                     | 1                 | 0.2                   |
|                                     | 3                 | 0.2                   |
|                                     | 28                | 0.2                   |
| DC_1-3-21-42_n77                    | 42                | 0.5                   |
|                                     | n77               | 0.2                   |
|                                     | 1                 | 0.2                   |
|                                     | 3                 | 0.3                   |
| DC_1-3-21-42_n78                    | 21                | 0.5                   |
|                                     | 42                | 0.5                   |
|                                     | n78               | 0.5                   |
|                                     | 1                 | 0.2                   |
|                                     | 3                 | 0.3                   |
| DC_1-3-21-42_n79                    | 21                | 0.5                   |
|                                     | 3                 | 0.3                   |
|                                     | 42                | 0.5                   |

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta R_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
|                                | 42                | 0.5                    |
|                                | n78               | 0.2                    |
| DC_1-3-21-42_n79               | 1                 | 0.2                    |
|                                | 3                 | 0.3                    |
|                                | 21                | 0.5                    |
|                                | 42                | 0.5                    |
| DC_1-7-20_n28-n78              | 1                 | 0.2                    |
|                                | 7                 | 0.2                    |
|                                | 20                | 0.2                    |
|                                | n28               | 0.2                    |
|                                | n78               | 0.5                    |
| DC_1-19-21-42_n77              | 1                 | 0.2                    |
|                                | 42                | 0.5                    |
|                                | n77               | 0.5                    |
| DC_1-19-21-42_n78              | 42                | 0.5                    |
|                                | n78               | 0.5                    |
| DC_1-19-21-42_n79              | 42                | 0.5                    |
| DC_1-21-28-42_n77              | 1                 | 0.2                    |
|                                | 28                | 0.2                    |
|                                | 42                | 0.5                    |
|                                | n77               | 0.5                    |
| DC_1-21-28-42_n78              | 28                | 0.2                    |
|                                | 42                | 0.5                    |
|                                | n78               | 0.5                    |
| DC_1-21-28-42_n79              | 28                | 0.2                    |
|                                | 42                | 0.5                    |
| DC_3-7-20_n28-n78              | 3                 | 0.2                    |
|                                | 7                 | 0.2                    |
|                                | 20                | 0.2                    |
|                                | n28               | 0.2                    |

### 7.3B.3.3.5 $\Delta R_{IB,c}$ for EN-DC six bands

**Table 7.3B.3.3.5-1:  $\Delta R_{IB,c}$  due to EN-DC (six bands)**

| Inter-band EN-DC configuration | E-UTRA or NR Band | $\Delta R_{IB,c}$ (dB) |
|--------------------------------|-------------------|------------------------|
| DC_1-3-7-20_n28-n78            | 1                 | 0.2                    |
|                                | 3                 | 0.2                    |
|                                | 7                 | 0.2                    |
|                                | 20                | 0.2                    |
|                                | n28               | 0.2                    |
|                                | n78               | 0.5                    |

### 7.3B.3.4 Inter-band EN-DC including FR2

#### 7.3B.3.4.1 $\Delta R_{IB,c}$ for EN-DC in two bands

Unless otherwise stated,  $\Delta R_{IB,c}$  for E-UTRA and FR2 NR bands of inter-band EN-DC combinations defined in table 5.2B.5.1-1 is set to zero.

**Table 7.3B.3.4.1-1:  $\Delta R_{IB,c}$  due to EN-DC(two bands)**

(Void)

#### 7.3B.3.4.2 $\Delta R_{IB,c}$ for EN-DC three bands

Unless otherwise stated,  $\Delta R_{IB,c}$  for FR2 NR bands is set to zero, and  $\Delta R_{IB,c}$  for constituent E-UTRA bands for inter-band EN-DC defined in table 5.2B.5.2-1 is the same as those for the corresponding E-UTRA CA configuration specified in TS 36.101 [4], without the FR2 NR bands.

**Table 7.3B.3.4.2-1:  $\Delta R_{IB,c}$  due to EN-DC (three bands)**

(Void)

#### 7.3B.3.4.3 $\Delta R_{IB,c}$ for EN-DC four bands

Unless otherwise stated,  $\Delta R_{IB,c}$  for FR2 NR bands is set to zero, and  $\Delta R_{IB,c}$  for constituent E-UTRA bands for inter-band EN-DC defined in table 5.2B.5.3-1 is the same as those for the corresponding E-UTRA CA configuration specified in TS 36.101 [4], without the FR2 NR bands.

**Table 7.3B.3.4.3-1:  $\Delta R_{IB,c}$  due to EN-DC (four bands)**

(Void)

#### 7.3B.3.4.4 $\Delta R_{IB,c}$ for EN-DC five bands

Unless otherwise stated,  $\Delta R_{IB,c}$  for FR2 NR bands is set to zero, and  $\Delta R_{IB,c}$  for constituent E-UTRA bands for inter-band EN-DC defined in table 5.2B.5.4-1 is the same as those for the corresponding E-UTRA CA configuration specified in TS 36.101 [4], without the FR2 NR bands.

**Table 7.3B.3.4.4-1:  $\Delta R_{IB,c}$  due to EN-DC (five bands)**

(Void)

#### 7.3B.3.4.5 $\Delta R_{IB,c}$ for EN-DC six bands

(Void)

**Table 7.3B.3.4.5-1:  $\Delta R_{IB,c}$  due to EN-DC (six bands)**

(Void)

### 7.3B.3.5 Inter-band EN-DC including both FR1 and FR2

#### 7.3B.3.5.2 $\Delta R_{IB,c}$ for EN-DC three bands

Unless otherwise stated, for inter-band EN-DC configurations defined in table 5.2B.6.2-1,  $\Delta R_{IB,c}$  for constituent FR2 NR bands is set to zero, and  $\Delta R_{IB,c}$  for constituent E-UTRA and FR1 NR bands is the same as those for the corresponding inter band EN-DC configuration without the FR2 bands specified in 7.3B.3.3.

**Table 7.3B.3.5.2-1:  $\Delta R_{IB,c}$  due to EN-DC (three bands)**

(Void)

#### 7.3B.3.5.3 $\Delta R_{IB,c}$ for EN-DC four bands

Unless otherwise stated, for inter-band EN-DC configurations defined in table 5.2B.6.3-1,  $\Delta R_{IB,c}$  for constituent FR2 NR bands is set to zero, and  $\Delta R_{IB,c}$  for constituent E-UTRA and FR1 NR bands is the same as those for the corresponding inter band EN-DC configuration without the FR2 bands specified in 7.3B.3.3.

#### 7.3B.3.5.4 $\Delta R_{IB,c}$ for EN-DC five bands

Unless otherwise stated, for a certain inter-band EN-DC configurations defined in table 5.2B.6.4-1,  $\Delta R_{IB,c}$  for constituent FR2 NR bands is set to zero, and  $\Delta R_{IB,c}$  for constituent E-UTRA and FR1 NR bands is the same as those for the corresponding inter band EN-DC configuration without the FR2 bands specified in 7.3B.3.3.

#### 7.3B.3.5.5 $\Delta R_{IB,c}$ for EN-DC six bands

Unless otherwise stated, for inter-band EN-DC configurations defined in table 5.2B.6.5-1,  $\Delta R_{IB,c}$  for constituent FR2 NR bands is set to zero, and  $\Delta R_{IB,c}$  for constituent E-UTRA and FR1 NR bands is the same as those for the corresponding inter band EN-DC configuration without the FR2 bands specified in 7.3B.3.3.

## 7.4 Maximum input level

### 7.4A Maximum input level for CA

For inter-band NR CA between FR1 and FR2, the maximum input level specified in [2] and [3] apply for FR1 and FR2 respectively.

### 7.4B Maximum input level for EN-DC in FR1

#### 7.4B.1 Intra-band contiguous EN-DC in FR1

Intra-band contiguous EN-DC maximum input level requirement and parameters are defined in Table 7.4B.1-1.

**Table 7.4B.1-1: Maximum Input**

| Power in Largest CC, E-UTRA or NR, dBm   | $X^1$   |
|--|---|
| Power in each other CC, dBm  | $X^1 - 10 \cdot \log_{10}(N_x \text{SCS}_x / N_y \text{SCS}_y)$ |
| NOTE 1: Power in Largest E-UTRA or NR bandwidth CC, listed in Table 7.4-1 [2]  |   |
| NOTE 2: $N_x, \text{SCS}_x$ is the number of RB's and Sub carrier spacing in the largest carrier bandwidth and could be LTE or NR carrier  |   |
| NOTE 3: $N_y, \text{SCS}_y$ is the number of RB's in any other carrier.  |   |
| NOTE 4: For NR carrier, the transmitter shall be set to 4dB below $P_{\text{CMAX}_L}$ at the minimum uplink configuration specified in Table 7.3-3 with $P_{\text{CMAX}_L}$ as defined in subclause 6.2B.4.                          |   |
| NOTE 5: For E-UTRA carrier, the transmitter shall be set to 4dB below $P_{\text{CMAX}_L}$ at the minimum uplink configuration specified in Table 7.3-1-2 with $P_{\text{CMAX}_L}$ as defined in subclause 6.2B.4 for single carrier. |   |

#### 7.4B.2 Intra-band non-contiguous EN-DC in FR1

For the E-UTRA sub-block containing one or multiple CC's, the requirement is defined in sub-clause 7.4.1 for single carrier operation and in sub-clause 7.4.1A for CA in [4].

For the NR sub-block, the requirement is defined in sub-clause 7.4 in [2].

#### 7.4B.3 Inter-band EN-DC within FR1

Maximum input level requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.4.1 and 7.4.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.4 and 7.4A of [2] apply.

#### 7.4B.4 Inter-band EN-DC including FR2

Maximum input level requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.4.1 and 7.4.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.4 and 7.4A of [3] apply.

## 7.4B.5 Inter-band EN-DC including both FR1 and FR2

Maximum input level requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.4.1 and 7.4.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.4 and 7.4A of [2] and [3] apply.

## 7.5 Adjacent channel selectivity

### 7.5A Adjacent channel selectivity for CA

For inter-band NR CA between FR1 and FR2, the adjacent channel selectivity specified in [2] and [3] apply for FR1 and FR2 respectively.

### 7.5B Adjacent channel selectivity for EN-DC in FR1

#### 7.5B.1 Intra-band contiguous EN-DC in FR1

Intra-band contiguous EN-DC ACS requirement and parameters are defined for test case 1 in Table 7.5B.1-1 and for test case 2 in Table 7.5B.1-2.

**Table 7.5B.1-1: ACS test case 1**

| EN-DC Aggregated Bandwidth, MHz  | <=100         | >100, <=120                | >120, <=140              | >140, <=160                |
|--|---------------|----------------------------|--------------------------|----------------------------|
| ACS, dB  | $X^1$         | 19.2                       | 18.5                     | 17.9                       |
| $P_{\text{interferer}}$ , dBm  | $P_1^2$       | Aggregated power + 17.7 dB | Aggregated power + 17 dB | Aggregated power + 16.4 dB |
| $P_w$ in Transmission BW configuration, per CC, dBm  | REFSENS +14dB |                            |                          |                            |
| NOTE 1: X is ACS level at the specified EN-DC aggregated Bandwidth from Table 7.5.1A-1 in [4]  |               |                            |                          |                            |
| NOTE 2: $P_1$ is from Table 7.5.1A-2 in [4]  |               |                            |                          |                            |
| NOTE 3: Jammer BW and offset is from Table 7.5.1A-2 and is applied from the lowest edge of the lowest carrier and the highest edge of the highest carrier  |               |                            |                          |                            |
| NOTE 4: For NR carrier, the transmitter shall be set to 4dB below $P_{\text{CMAX\_L,f,c}}$ at the minimum uplink configuration specified in Table 7.3-3 with $P_{\text{CMAX\_L,f,c}}$ as defined in subclause 6.2B.4.                      |               |                            |                          |                            |
| NOTE 5: For E-UTRA carrier, the transmitter shall be set to 4dB below $P_{\text{CMAX\_L,c}}$ at the minimum uplink configuration specified in Table 7.3-1-2 with $P_{\text{CMAX\_L,c}}$ as defined in subclause 6.2B.4 for single carrier. |               |                            |                          |                            |

Table 7.5B.1-2: ACS test case 2

| EN-DC Aggregated Bandwidth, $BW_{agg}$ , MHz  | $\leq 100$         | $> 100, \leq 120$                                 | $> 120, \leq 140$                               | $> 140, \leq 160$                                 |
|---|--------------------|---|---|---|
| P <sub>w</sub> in Transmission Bandwidth Configuration, perCC, dBm  | $P_w$ <sup>1</sup> | $-42.7 + 10 \log_{10}(N_{RB,c} SCS_c / BW_{agg})$ | $-42 + 10 \log_{10}(N_{RB,c} SCS_c / BW_{agg})$ | $-41.4 + 10 \log_{10}(N_{RB,c} SCS_c / BW_{agg})$ |
| P <sub>interferer</sub> , dBm   | -25                |   |   |   |
| NOTE 1: P <sub>w</sub> is wanted signal power level at the specified EN-DC aggregated Bandwidth from Table 7.5.1A-3 in [4]  |                    |   |   |   |
| NOTE 2: Jammer BW and offset is from Table 7.5.1A-3 and is applied from the lowest edge of the lowest carrier and the highest edge of the highest carrier   |                    |   |   |   |
| NOTE 3: For NR carrier, the transmitter shall be set to 4dB below P <sub>C<sub>MAX</sub>L<sub>f,c</sub></sub> at the minimum uplink configuration specified in Table 7.3-3 with P <sub>C<sub>MAX</sub>L<sub>f,c</sub></sub> as defined in subclause 6.2B.4.                       |                    |   |   |   |
| NOTE 4: For E-UTRA carrier, the transmitter shall be set to 4 dB below P <sub>C<sub>MAX</sub>L<sub>c</sub></sub> at the minimum uplink configuration specified in Table 7.3-1-2 with P <sub>C<sub>MAX</sub>L<sub>c</sub></sub> as defined in subclause 6.2B.4 for single carrier. |                    |   |   |   |

## 7.5B.2 Intra-band non-contiguous EN-DC in FR1

For the E-UTRA sub-block containing one or multiple CC's, the requirement is defined in sub-clause 7.5.1 for single carrier operation and in sub-clause 7.5.1A for CA in [4].

For the NR sub-block, the requirement is defined in sub-clause 7.5 in [2].

The blocker configuration is defined in the general sub-clause 7.1.

## 7.5B.3 Inter-band EN-DC within FR1

Adjacent channel selectivity requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.5.1 and 7.5.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.5 and 7.5A of [2] apply.

## 7.5B.4 Inter-band EN-DC including FR2

Adjacent channel selectivity requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.5.1 and 7.5.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.5 and 7.5A of [3] apply.

## 7.5B.5 Inter-band EN-DC including both FR1 and FR2

Adjacent channel selectivity requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.5.1 and 7.5.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.5 and 7.5A of [2] and [3] apply.

## 7.6 Blocking characteristics

### 7.6A Blocking characteristics for CA

For inter-band NR CA between FR1 and FR2, the in-band blocking characteristics specified in [2] and [3] apply for FR1 and FR2 respectively. The narrow band blocking and out-of-band blocking specified in [2] apply for FR1.

### 7.6B Blocking characteristics for EN-DC in FR1

#### 7.6B.1 General

#### 7.6B.2 Inband blocking for EN-DC in FR1

##### 7.6B.2.1 Intra-band contiguous EN-DC in FR1

Intra-band contiguous EN-DC in-band blocking requirement and parameters are defined in Table 7.6B.2.1-1.

**Table 7.6B.2.1-1: In-band blocking**

| EN-DC Aggregated Bandwidth, MHz   | $\leq 100$                                   | $>100,$<br>$\leq 120$ | $>120,$<br>$\leq 140$ | $>140,$<br>$\leq 160$ |
|---|--|-----------------------|-----------------------|-----------------------|
| Pw in Transmission Bandwidth Configuration, perCC, dBm  | REFSENS + Aggregated BW specific value below |                       |                       |                       |
|   | $P_w^1$                                      | 16.8                  | 17.5                  | 18                    |
| NOTE 1: $P_w$ is wanted signal power level at the specified EN-DC aggregated Bandwidth from Table 7.6.1.1A-1 in [4]<br>NOTE 2: Interferer values are specified from Table 7.6.1.1A-2 in [4]<br>NOTE 3: Jammer BW and offset is from Table 7.6.1.1A-1 and is applied from the lowest edge of the lowest carrier and the highest edge of the highest carrier<br>NOTE 4: For NR carrier, the transmitter shall be set to 4dB below $P_{CMAX\_L,f,c}$ at the minimum uplink configuration specified in Table 7.3-3 with $P_{CMAX\_L,f,c}$ as defined in subclause 6.2B.4.<br>NOTE 5: For E-UTRA carrier, the transmitter shall be set to 4dB below $P_{CMAX\_L,c}$ at the minimum uplink configuration specified in Table 7.3-1-2 with $P_{CMAX\_L,c}$ as defined in subclause 6.2B.4 for single carrier. |  |                       |                       |                       |

##### 7.6B.2.2 Intra-band non-contiguous EN-DC in FR1

For the E-TRA sub-block containing one or multiple CC's, the requirement is defined in sub-clause 7.6.1.1 for single carrier operation and in sub-clause 7.6.1.1A for CA in [4].

For the NR sub-block, the requirement is defined in sub-clause 7.6.2 in [2].

The blocker configuration is defined in the general sub-clause 7.1.

##### 7.6B.2.3 Inter-band EN-DC within FR1

Inband blocking requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.6.1.1 and 7.6.1.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.6.2 and 7.6A.2 of [2] apply.

##### 7.6B.2.4 Inter-band EN-DC including FR2

Inband blocking requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.6.1.1 and 7.6.1.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.6.2 and 7.6A.2 of [3] apply.

### 7.6B.2.5 Inter-band EN-DC including both FR1 and FR2

Inband blocking requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.6.1.1 and 7.6.1.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.6.2 and 7.6A.2 of [2] and [3] apply.

### 7.6B.3 Out-of-band blocking for EN-DC in FR1

#### 7.6B.3.1 Intra-band contiguous EN-DC in FR1

Intra-band contiguous EN-DC out-of-band requirement and parameters are defined in Table 7.6B.3.1-1.

**Table 7.6B.3.1-1: Out-of-band blocking**

| EN-DC Aggregated Bandwidth, MHz  | $\leq 100$                                   | $>100,$<br>$\leq 120$ | $>120,$<br>$\leq 140$ | $>140,$<br>$\leq 160$ |
|--|--|-----------------------|-----------------------|-----------------------|
| Pw in Transmission Bandwidth Configuration, perCC, dBm   | REFSENS + Aggregated BW specific value below |                       |                       |                       |
|  | 9  |                       |                       |                       |
| NOTE 1: Interferer values and offsets are specified from Table 7.6.2.1A-2 in [4]   |  |                       |                       |                       |
| NOTE 2: For NR carrier, the transmitter shall be set to 4dB below $P_{\text{CMAX\_L,f,c}}$ at the minimum uplink configuration specified in Table 7.3-3 with $P_{\text{CMAX\_L,f,c}}$ as defined in subclause 6.2B.4.                      |  |                       |                       |                       |
| NOTE 3: For E-UTRA carrier, the transmitter shall be set to 4dB below $P_{\text{CMAX\_L,c}}$ at the minimum uplink configuration specified in Table 7.3-1-2 with $P_{\text{CMAX\_L,c}}$ as defined in subclause 6.2B.4 for single carrier. |  |                       |                       |                       |

#### 7.6B.3.2 Intra-band non-contiguous EN-DC in FR1

For the E-UTRA sub-block containing one or multiple CC's, the requirement is defined in sub-clause 7.6.2.1 for single carrier operation and in sub-clause 7.6.2.1A for CA in [4].

For the NR sub-block, the requirement is defined in sub-clause 7.6.3 is [2].

#### 7.6B.3.3 Inter-band EN-DC within FR1

Out-of band blocking requirements for E-UTRA single carrier and CA operation specified in sub-clauses 7.6.2.1 and 7.6.2.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.6.3 and 7.6A.3 of [2] apply for lowest level EN-DC fallbacks (two bands) in section 5.2.B.4.1 with following conditions

- one E-UTRA uplink carrier with the output power set to 4dB Below  $P_{\text{CMAX\_L}}$  and the NR band whose downlink is being tested has its uplink carrier output power set to minimum output power as defined in sub-clause 6.3.1 of [2]
- one NR uplink carrier with the output power set to 4dB Below  $P_{\text{CMAX\_L}}$  on the NR band with both E-UTRA and NR downlinks being tested with E-UTRA output power set to minimum output power as defined in sub-clause 6.3.2.1 of [4].

#### 7.6B.3.4 Inter-band EN-DC including FR2

Out-of band blocking requirements specified for E-UTRA single carrier and CA operation specified in sub-clauses 7.6.2.1 and 7.6.2.1A of [4] apply for lowest level EN-DC fallbacks (two bands) in section 5.2B.5.1 with only E-UTRA UL with output power as in TS 36.101 [4] (4dB Below  $P_{\text{Cmax\_1}}$ ).

#### 7.6B.3.5 Inter-band EN-DC including both FR1 and FR2

Out-of band blocking requirements specified for E-UTRA single carrier and CA operation specified in sub-clauses 7.6.2.1 and 7.6.2.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.6.3 and 7.6A.3 of [2] apply for lowest level EN-DC fallbacks (three bands) in section 5.2B.6.2 with only E-UTRA UL with output power as in TS 36.101 [4] (4dB Below  $P_{\text{Cmax\_1}}$ ).



## 7.6B.4 Narrow band blocking for EN-DC in FR1

### 7.6B.4.1 Intra-band contiguous EN-DC in FR1

Intra-band contiguous EN-DC narrow band blocking requirement and parameters are defined in Table 7.6B.4.1-1.

**Table 7.6B.4.1-1: Narrow band blocking parameters**

| EN-DC Aggregated Bandwidth, MHz  | $\leq 100$                                   | $>100,$<br>$\leq 120$ | $>120,$<br>$\leq 140$ | $>140,$<br>$\leq 160$ |
|--|--|-----------------------|-----------------------|-----------------------|
| Pw in Transmission Bandwidth Configuration, perCC, dBm   | REFSENS + Aggregated BW specific value below |                       |                       |                       |
| P <sub>Uw</sub> , dBm (CW)   | -55  |                       |                       |                       |
| NOTE 1: Jammer offset is from Table 7.6.3.1A-1 and is applied from the lowest edge of the lowest carrier and the highest edge of the highest carrier   |  |                       |                       |                       |
| NOTE 2: For NR carrier, the transmitter shall be set to 4dB below P <sub>C<sub>MAX</sub>_L,f,c</sub> at the minimum uplink configuration specified in Table 7.3-3 with P <sub>C<sub>MAX</sub>_L,f,c</sub> as defined in subclause 6.2.4 from TS 38.101-1 [2].  |  |                       |                       |                       |
| NOTE 3: For E-UTRA carrier, the transmitter shall be set to 4dB below P <sub>C<sub>MAX</sub>_L,c</sub> at the minimum uplink configuration specified in Table 7.3-1-2 with P <sub>C<sub>MAX</sub>_L,c</sub> as defined in subclause 6.2B.4 for single carrier. |  |                       |                       |                       |
| NOTE 4: If NR carrier BW > 40M, no narrow band blocking requirements apply when blocker is applied at the edge of the NR carrier.  |  |                       |                       |                       |

### 7.6B.4.2 Intra-band non-contiguous EN-DC in FR1

For the E-TRA sub-block containing one or multiple CC's, the requirement is defined in sub-clause 7.6.3.1 for single carrier operation and in sub-clause 7.6.3.1A for CA in [4].

For the NR sub-block, the requirement is defined in sub-clause 7.6.4 in [2].

The blocker configuration is defined in the general sub-clause 7.1.

### 7.6B.4.3 Inter-band EN-DC within FR1

Narrow band blocking requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.6.3.1 and 7.6.3.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.6.4 and 7.6A.4 of [2] apply.

### 7.6B.4.4 Inter-band EN-DC including FR2

Narrow band blocking requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.6.3.1 and 7.6.3.1A of [4] apply.

### 7.6B.4.5 Inter-band EN-DC including both FR1 and FR2

Narrow band blocking requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.6.3.1 and 7.6.3.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.6.4 and 7.6A.4 of [2] apply.

## 7.7 Spurious response

### 7.7A Spurious response for CA

For inter-band NR CA between FR1 and FR2, the spurious response specified in [2] apply for FR1.

## 7.7B Spurious response for EN-DC in FR1

### 7.7B.1 Intra-band contiguous EN-DC in FR1

Intra-band contiguous EN-DC spurious response requirement and parameters are defined in Table 7.7B.1-1.

**Table 7.7B.1-1: Spurious Response Parameters**

| EN-DC Aggregated Bandwidth, MHz   | <=100  | >100,<br><=120 | >120,<br><=140 | >140,<br><=160 |
|---|--|----------------|----------------|----------------|
| P <sub>w</sub> in Transmission Bandwidth Configuration, perCC, dBm  | REFSENS + Aggregated BW specific value below |                |                |                |
| P <sub>interferer</sub> , dBm (CW)  | -44  |                |                |                |
| NOTE 1: For NR carrier, the transmitter shall be set to 4dB below P <sub>C<sub>MAX</sub>L,f,c</sub> at the minimum uplink configuration specified in Table 7.3-3 with P <sub>C<sub>MAX</sub>L,f,c</sub> as defined in subclause 6.2.4 from TS 38.101-1 [2]. |  |                |                |                |
| NOTE 2: For E-UTRA carrier, the transmitter shall be set to 4dB below P <sub>C<sub>MAX</sub>L,c</sub> at the minimum uplink configuration specified in Table 7.3-1-2 with P <sub>C<sub>MAX</sub>L,c</sub> as defined in subclause 6.2B.4 for single .       |  |                |                |                |

### 7.7B.2 Intra-band non-contiguous EN-DC in FR1

For the E-UTRA sub-block containing one or multiple CC's, the requirement is defined in sub-clause 7.7.1 for single carrier operation and in sub-clause 7.7.1A for CA in [4].

For the NR sub-block, the requirement is defined in sub-clause 7.7 is [2].

### 7.7B.3 Inter-band EN-DC within FR1

Spurious response requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.7.1 and 7.7.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.7 and 7.7A of [2] apply.

### 7.7B.4 Inter-band EN-DC including FR2

Spurious response requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.7.1 and 7.7.1A of [4] apply.

### 7.7B.5 Inter-band EN-DC including both FR1 and FR2

Spurious response requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.7.1 and 7.7.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.7 and 7.7A of [2] apply.

## 7.8 Intermodulation characteristics

### 7.8A Intermodulation characteristics for CA

For inter-band NR CA between FR1 and FR2, the intermodulation characteristics specified in [2] apply for FR1.

## 7.8B Intermodulation characteristics for EN-DC in FR1

### 7.8B.1 General

### 7.8B.2 Wide band Intermodulation

#### 7.8B.2.1 Intra-band contiguous EN-DC in FR1

Intra-band contiguous EN-DC wide band intermodulation requirement and parameters are defined in Table 7.8B.2.1-1.

**Table 7.8B.2.1-1: Wide band intermodulation**

| EN-DC Aggregated Bandwidth, MHz  | <=100                       | >100, <=120 | >120, <=140 | >140, <=160 |
|--|-----------------------------|-------------|-------------|-------------|
| P <sub>w</sub> in Transmission Bandwidth Configuration, perCC, dBm   | P <sub>w</sub> <sup>1</sup> | 16.8        | 17.5        | 18.0        |
| P <sub>interferer 1</sub> , dBm (CW) <sup>2</sup>  | -46                         |             |             |             |
| P <sub>interferer 2</sub> , dBm (Modulated) <sup>2</sup>   | -46                         |             |             |             |
| NOTE 1: P <sub>w</sub> is wanted signal power level from Table 7.8.1A-1 in [4]   |                             |             |             |             |
| NOTE 2: Jammer BW and offsets is from Table 7.8.1A-1 [4] and is applied from the lowest edge of the lowest carrier and the highest edge of the highest carrier   |                             |             |             |             |
| NOTE 3: For NR carrier, the transmitter shall be set to 4dB below P <sub>CMAX_L,f,c</sub> at the minimum uplink configuration specified in Table 7.3-3 with P <sub>CMAX_L,f,c</sub> as defined in subclause 6.2B..                       |                             |             |             |             |
| NOTE 4: For E-UTRA carrier, the transmitter shall be set to 4dB below P <sub>CMAX_L,c</sub> at the minimum uplink configuration specified in Table 7.3-1-2 with P <sub>CMAX_L,c</sub> as defined in subclause 6.2B.4 for single carrier. |                             |             |             |             |

#### 7.8B.2.2 Intra-band non-contiguous EN-DC in FR1

For the E-UTRA sub-block containing one or multiple CC's, the requirement is defined in sub-clause 7.8.1 for single carrier operation and in sub-clause 7.8.1A for CA in [4].

For the NR sub-block, the requirement is defined in sub-clause 7.8.2 in [2].

The blocker configuration is defined in the general sub-clause 7.1 and the requirement only apply for out of gap interferers.

#### 7.8B.2.3 Inter-band EN-DC within FR1

Wide band Intermodulation requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.8.1 and 7.8.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.8.2 and 7.8A.2 of [2] apply.

#### 7.8B.2.4 Inter-band EN-DC including FR2

Wide band Intermodulation requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.8.1 and 7.8.1A of [4] apply.

#### 7.8B.2.5 Inter-band EN-DC including both FR1 and FR2

Wide band Intermodulation requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.8.1 and 7.8.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.8.2 and 7.8A.2 of [2] apply.

## 7.9 Spurious emissions

### 7.9A Spurious emissions for CA

For inter-band NR CA between FR1 and FR2, the spurious emission specified in [2] and [3] apply for FR1 and FR2 respectively.

### 7.9B Spurious emissions for EN-DC in FR1

#### 7.9B.1 Intra-band contiguous EN-DC in FR1

The requirement is defined in sub-clause 7.9A.1 in [2].

#### 7.9B.2 Intra-band non-contiguous EN-DC in FR1

Spurious emissions requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.9.1 and 7.9.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.9 and 7.9A of [2] apply.

#### 7.9B.4 Inter-band EN-DC including FR2

Spurious emissions requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.9.1 and 7.9.1A of [4] and for NR single carrier and CA operation specified in sub-clause 7.9 of [3] apply.

#### 7.9B.5 Inter-band EN-DC including both FR1 and FR2

Spurious emissions requirement for E-UTRA single carrier and CA operation specified in sub-clauses 7.9.1 and 7.9.1A of [4] and for NR single carrier and CA operation specified in sub-clauses 7.9 and 7.9A of [2] and [3] apply.

#### 7.9B.3 Inter-band EN-DC within FR1

E-UTRA requirements from TS 36.101 [4] and NR requirements from TS 38.101-1 [2] apply.

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## Annex A (normative): Measurement channels

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### A.1 General

The throughput values defined in the measurement channels specified in Annex A, are calculated and are valid per datastream (codeword). For multi-stream (more than one codeword) transmissions, the throughput referenced in the minimum requirements is the sum of throughputs of all datastreams (codewords).

The UE category entry in the definition of the reference measurement channel in Annex A is only informative and reveals the UE categories, which can support the corresponding measurement channel. Whether the measurement channel is used for testing a certain UE category or not is specified in the individual minimum requirements.

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### A.2 UL reference measurement channels for E-UTRA TDD Config 2

#### A.2.1 General

The measurement channels in the following subclauses are defined to derive the requirements in clause 6 (Transmitter Characteristics) and clause 7 (Receiver Characteristics). The measurement channels represent example configurations of physical channels for different data rates.

## A.2.2 Reference measurement channels for E-UTRA

### A.2.2.1 Full RB allocation

#### A.2.2.1.1 QPSK

**Table A.2.2.1.1-1: Reference Channels for QPSK with full RB allocation**

| Parameter  | Unit | Value |      |      |       |       |       |
|--|------|-------|------|------|-------|-------|-------|
|  |      | 1.4   | 3    | 5    | 10    | 15    | 20    |
| Channel bandwidth  | MHz  | 1.4   | 3    | 5    | 10    | 15    | 20    |
| Allocated resource blocks  |      | 6     | 15   | 25   | 50    | 75    | 100   |
| Uplink-Downlink Configuration (Note 2)   |      | 2     | 2    | 2    | 2     | 2     | 2     |
| Special subframe configuration (Note 3)  |      | 7     | 7    | 7    | 7     | 7     | 7     |
| DFT-OFDM Symbols per Sub-Frame   |      | 12    | 12   | 12   | 12    | 12    | 12    |
| Modulation   |      | QPSK  | QPSK | QPSK | QPSK  | QPSK  | QPSK  |
| Target Coding rate   |      | 1/3   | 1/3  | 1/3  | 1/3   | 1/5   | 1/6   |
| Payload size   |      |       |      |      |       |       |       |
| For Sub-Frame 2,7  | Bits | 600   | 1544 | 2216 | 5160  | 4392  | 4584  |
| Transport block CRC  | Bits | 24    | 24   | 24   | 24    | 24    | 24    |
| Number of code blocks per Sub-Frame (Note 1)   |      |       |      |      |       |       |       |
| For Sub-Frame 2,7  |      | 1     | 1    | 1    | 1     | 1     | 1     |
| Total number of bits per Sub-Frame   |      |       |      |      |       |       |       |
| For Sub-Frame 2,7  | Bits | 1728  | 4320 | 7200 | 14400 | 21600 | 28800 |
| Total symbols per Sub-Frame  |      |       |      |      |       |       |       |
| For Sub-Frame 2,7  |      | 864   | 2160 | 3600 | 7200  | 10800 | 14400 |
| UE Category  |      | ≥ 1   | ≥ 1  | ≥ 1  | ≥ 1   | ≥ 1   | ≥ 1   |
| Note 1: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit) |      |       |      |      |       |       |       |
| Note 2: As per Table 4.2-2 in TS 36.211 [7]  |      |       |      |      |       |       |       |
| Note 3: As per Table 4.2-1 in TS 36.211 [7]  |      |       |      |      |       |       |       |

#### A.2.2.1.2 16-QAM

**Table A.2.2.1.2-1: Reference Channels for 16-QAM with full RB allocation**

| Parameter  | Unit | Value |       |       |       |       |       |
|--|------|-------|-------|-------|-------|-------|-------|
|  |      | 1.4   | 3     | 5     | 10    | 15    | 20    |
| Channel bandwidth  | MHz  | 1.4   | 3     | 5     | 10    | 15    | 20    |
| Allocated resource blocks  |      | 6     | 15    | 25    | 50    | 75    | 100   |
| Uplink-Downlink Configuration (Note 2)   |      | 2     | 2     | 2     | 2     | 2     | 2     |
| Special subframe configuration (Note 3)  |      | 7     | 7     | 7     | 7     | 7     | 7     |
| DFT-OFDM Symbols per Sub-Frame   |      | 12    | 12    | 12    | 12    | 12    | 12    |
| Modulation   |      | 16QAM | 16QAM | 16QAM | 16QAM | 16QAM | 16QAM |
| Target Coding rate   |      | 3/4   | 1/2   | 1/3   | 3/4   | 1/2   | 1/3   |
| Payload size   |      |       |       |       |       |       |       |
| For Sub-Frame 2,7  | Bits | 2600  | 4264  | 4968  | 21384 | 21384 | 19848 |
| Transport block CRC  | Bits | 24    | 24    | 24    | 24    | 24    | 24    |
| Number of code blocks per Sub-Frame (Note 1)   |      |       |       |       |       |       |       |
| For Sub-Frame 2,7  |      | 1     | 1     | 1     | 4     | 4     | 4     |
| Total number of bits per Sub-Frame   |      |       |       |       |       |       |       |
| For Sub-Frame 2,7  | Bits | 3456  | 8640  | 14400 | 28800 | 43200 | 57600 |
| Total symbols per Sub-Frame  |      |       |       |       |       |       |       |
| For Sub-Frame 2,7  |      | 864   | 2160  | 3600  | 7200  | 10800 | 14400 |
| UE Category  |      | ≥ 1   | ≥ 1   | ≥ 1   | ≥ 2   | ≥ 2   | ≥ 2   |
| Note 1: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit) |      |       |       |       |       |       |       |
| Note 2: As per Table 4.2-2 in TS 36.211 [7]  |      |       |       |       |       |       |       |
| Note 3: As per Table 4.2-1 in TS 36.211 [7]  |      |       |       |       |       |       |       |

## A.2.2.1.3 64-QAM

Table A.2.2.1.3-1: Reference Channels for 64-QAM with full RB allocation

| Parameter   | Unit | Value           |                 |                 |                 |                 |                 |
|---|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Channel bandwidth   | MHz  | 1.4             | 3               | 5               | 10              | 15              | 20              |
| Allocated resource blocks   |      | 6               | 15              | 25              | 50              | 75              | 100             |
| Uplink-Downlink Configuration (Note 2)  |      | 2               | 2               | 2               | 2               | 2               | 2               |
| Special subframe configuration (Note 3)   |      | 7               | 7               | 7               | 7               | 7               | 7               |
| DFT-OFDM Symbols per Sub-Frame  |      | 12              | 12              | 12              | 12              | 12              | 12              |
| Modulation  |      | 64QAM           | 64QAM           | 64QAM           | 64QAM           | 64QAM           | 64QAM           |
| Target Coding rate  |      | 3/4             | 3/4             | 3/4             | 3/4             | 3/4             | 3/4             |
| Payload size  |      |                 |                 |                 |                 |                 |                 |
| For Sub-Frame 2,7   | Bits | 3752            | 9528            | 15840           | 31704           | 46888           | 63776           |
| Transport block CRC   | Bits | 24              | 24              | 24              | 24              | 24              | 24              |
| Number of code blocks per Sub-Frame (Note 1)  |      |                 |                 |                 |                 |                 |                 |
| For Sub-Frame 2,7   |      | 1               | 2               | 3               | 6               | 8               | 11              |
| Total number of bits per Sub-Frame  |      |                 |                 |                 |                 |                 |                 |
| For Sub-Frame 2,7   | Bits | 5184            | 12960           | 21600           | 43200           | 64800           | 86400           |
| Total symbols per Sub-Frame   |      |                 |                 |                 |                 |                 |                 |
| For Sub-Frame 2,7   |      | 864             | 2160            | 3600            | 7200            | 10800           | 14400           |
| UE Category (Note 4)  |      | 5, 8            | 5, 8            | 5, 8            | 5, 8            | 5, 8            | 5, 8            |
| UE UL Category (Note 4)   |      | 5, 8,<br>13, 14 | 5, 8,<br>13, 14 | 5, 8,<br>13, 14 | 5, 8,<br>13, 14 | 5, 8,<br>13, 14 | 5, 8,<br>13, 14 |
| <p>Note 1: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit)</p> <p>Note 2: As per Table 4.2-2 in TS 36.211 [7]</p> <p>Note 3: As per Table 4.2-1 in TS 36.211 [7]</p> <p>Note 4: If UE does not report UE UL category, then the applicability of reference channel is determined by UE category. If UE reports UE UL category, then the applicability of reference channel is determined by UE UL category.</p> |      |                 |                 |                 |                 |                 |                 |

## A.2.2.1.4 256 QAM

Table A.2.2.1.4-1: Reference Channels for 256 QAM with full RB allocation

| Parameter  | Unit | Value  |        |        |        |        |        |
|--|------|--------|--------|--------|--------|--------|--------|
| Channel bandwidth  | MHz  | 1.4    | 3      | 5      | 10     | 15     | 20     |
| Allocated resource blocks  |      | 6      | 15     | 25     | 50     | 75     | 100    |
| Uplink-Downlink Configuration (Note 2)   |      | 2      | 2      | 2      | 2      | 2      | 2      |
| Special subframe configuration (Note 3)  |      | 7      | 7      | 7      | 7      | 7      | 7      |
| DFT-OFDM Symbols per Sub-Frame   |      | 12     | 12     | 12     | 12     | 12     | 12     |
| Modulation   |      | 256QAM | 256QAM | 256QAM | 256QAM | 256QAM | 256QAM |
| Target Coding rate   |      | 3/4    | 3/4    | 3/4    | 3/4    | 3/4    | 3/4    |
| Payload size   |      |        |        |        |        |        |        |
| For Sub-Frame 2,7  | Bits | 5160   | 12960  | 21384  | 42368  | 63776  | 84760  |
| Transport block CRC  | Bits | 24     | 24     | 24     | 24     | 24     | 24     |
| Number of code blocks per Sub-Frame (Note 1)   |      |        |        |        |        |        |        |
| For Sub-Frame 2,7  |      | 1      | 3      | 4      | 8      | 11     | 15     |
| Total number of bits per Sub-Frame   |      |        |        |        |        |        |        |
| For Sub-Frame 2,7  | Bits | 6912   | 17280  | 28800  | 57600  | 86400  | 115200 |
| Total symbols per Sub-Frame  |      |        |        |        |        |        |        |
| For Sub-Frame 2,7  |      | 864    | 2160   | 3600   | 7200   | 10800  | 14400  |
| UE UL Category   |      | ≥ 15   | ≥ 15   | ≥ 15   | ≥ 15   | ≥ 15   | ≥ 15   |
| Note 1: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit) |      |        |        |        |        |        |        |
| Note 2: As per Table 4.2-2 in TS 36.211 [7]  |      |        |        |        |        |        |        |
| Note 3: As per Table 4.2-1 in TS 36.211 [7]  |      |        |        |        |        |        |        |



## A.2.2.2 Partial RB allocation

## A.2.2.2.1 QPSK

Table A.2.2.2.1-1: Reference Channels for QPSK with partial RB allocation

| Parameter | Ch BW  | Allocated RBs | UL-DL Configuration (Note 2) | Special subframe configuration (Note 3) | DFT-OFDM Symbols per Sub-Frame | Mod'n | Target Coding rate | Payload size for Sub-Frame 2, 7 | Transport block CRC | Number of code blocks per Sub-Frame (Note 1) | Total number of bits per Sub-Frame for Sub-Frame 2, 7 | Total symbols per Sub-Frame for Sub-Frame 2, 7 | UE Category |
|-----------|--|---------------|------------------------------|---|--------------------------------|-------|--------------------|---------------------------------|---------------------|--|---|--|-------------|
| Unit      | MHz  |               |                              |   |                                |       |                    | Bits                            | Bits                |  | Bits  |  |             |
|           | 1.4 - 20   | 1             | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 72                              | 24                  | 1  | 288   | 144  | ≥ 1         |
|           | 1.4 - 20   | 2             | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 176                             | 24                  | 1  | 576   | 288  | ≥ 1         |
|           | 1.4 - 20   | 3             | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 256                             | 24                  | 1  | 864   | 432  | ≥ 1         |
|           | 1.4 - 20   | 4             | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 392                             | 24                  | 1  | 1152  | 576  | ≥ 1         |
|           | 1.4 - 20   | 5             | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 424                             | 24                  | 1  | 1440  | 720  | ≥ 1         |
|           | 3-20   | 6             | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 600                             | 24                  | 1  | 1728  | 864  | ≥ 1         |
|           | 3-20   | 8             | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 808                             | 24                  | 1  | 2304  | 1152   | ≥ 1         |
|           | 3-20   | 9             | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 776                             | 24                  | 1  | 2592  | 1296   | ≥ 1         |
|           | 3-20   | 10            | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 872                             | 24                  | 1  | 2880  | 1440   | ≥ 1         |
|           | 3-20   | 12            | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 1224                            | 24                  | 1  | 3456  | 1728   | ≥ 1         |
|           | 5-20   | 15            | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 1320                            | 24                  | 1  | 4320  | 2160   | ≥ 1         |
|           | 5-20   | 16            | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 1384                            | 24                  | 1  | 4608  | 2304   | ≥ 1         |
|           | 5-20   | 18            | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 1864                            | 24                  | 1  | 5184  | 2592   | ≥ 1         |
|           | 5-20   | 20            | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 1736                            | 24                  | 1  | 5760  | 2880   | ≥ 1         |
|           | 5-20   | 24            | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 2472                            | 24                  | 1  | 6912  | 3456   | ≥ 1         |
|           | 10-20  | 25            | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 2216                            | 24                  | 1  | 7200  | 3600   | ≥ 1         |
|           | 10-20  | 27            | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 2792                            | 24                  | 1  | 7776  | 3888   | ≥ 1         |
|           | 10-20  | 30            | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 2664                            | 24                  | 1  | 8640  | 4320   | ≥ 1         |
|           | 10-20  | 32            | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 2792                            | 24                  | 1  | 9216  | 4608   | ≥ 1         |
|           | 10-20  | 36            | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 3752                            | 24                  | 1  | 10368   | 5184   | ≥ 1         |
|           | 10-20  | 40            | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 4136                            | 24                  | 1  | 11520   | 5760   | ≥ 1         |
|           | 10-20  | 45            | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 4008                            | 24                  | 1  | 12960   | 6480   | ≥ 1         |
|           | 10-20  | 48            | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 4264                            | 24                  | 1  | 13824   | 6912   | ≥ 1         |
|           | 15 - 20  | 50            | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 5160                            | 24                  | 1  | 14400   | 7200   | ≥ 1         |
|           | 15 - 20  | 54            | 2                            | 7                                       | 12                             | QPSK  | 1/3                | 4776                            | 24                  | 1  | 15552   | 7776   | ≥ 1         |
|           | 15 - 20  | 60            | 2                            | 7                                       | 12                             | QPSK  | 1/4                | 4264                            | 24                  | 1  | 17280   | 8640   | ≥ 1         |
|           | 15 - 20  | 64            | 2                            | 7                                       | 12                             | QPSK  | 1/4                | 4584                            | 24                  | 1  | 18432   | 9216   | ≥ 1         |
|           | 15 - 20  | 72            | 2                            | 7                                       | 12                             | QPSK  | 1/4                | 5160                            | 24                  | 1  | 20736   | 10368  | ≥ 1         |
|           | 20   | 75            | 2                            | 7                                       | 12                             | QPSK  | 1/5                | 4392                            | 24                  | 1  | 21600   | 10800  | ≥ 1         |
|           | 20   | 80            | 2                            | 7                                       | 12                             | QPSK  | 1/5                | 4776                            | 24                  | 1  | 23040   | 11520  | ≥ 1         |
|           | 20   | 81            | 2                            | 7                                       | 12                             | QPSK  | 1/5                | 4776                            | 24                  | 1  | 23328   | 11664  | ≥ 1         |
|           | 20   | 90            | 2                            | 7                                       | 12                             | QPSK  | 1/6                | 4008                            | 24                  | 1  | 25920   | 12960  | ≥ 1         |
|           | 20   | 96            | 2                            | 7                                       | 12                             | QPSK  | 1/6                | 4264                            | 24                  | 1  | 27648   | 13824  | ≥ 1         |
| Note 1:   | If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit) |               |                              |   |                                |       |                    |                                 |                     |  |   |  |             |
| Note 2:   | As per Table 4.2-2 in TS 36.211 [7]  |               |                              |   |                                |       |                    |                                 |                     |  |   |  |             |
| Note 3:   | As per Table 4.2-1 in TS 36.211 [7]  |               |                              |   |                                |       |                    |                                 |                     |  |   |  |             |

## A.2.2.2.2 16-QAM

Table A.2.2.2-1: Reference Channels for 16QAM with partial RB allocation

| Parameter | Ch BW    | Allocated RBs | UL-DL Configuration (Note 2) | Special subframe configuration (Note 3) | DFT-OFDM Symbols per Sub-Frame | Mod'n | Target Coding rate | Payload size for Sub-Frame 2, 7 | Transport block CRC | Number of code blocks per Sub-Frame (Note 1) | Total number of bits per Sub-Frame for Sub-Frame 2, 7 | Total symbols per Sub-Frame for Sub-Frame 2, 7 | UE Category |
|-----------|----------|---------------|------------------------------|---|--------------------------------|-------|--------------------|---------------------------------|---------------------|--|---|--|-------------|
| Unit      | MHz      |               |                              |   |                                |       |                    | Bits                            | Bits                |  | Bits  |  |             |
|           | 1.4 - 20 | 1             | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 408                             | 24                  | 1  | 576   | 144  | ≥ 1         |
|           | 1.4 - 20 | 2             | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 840                             | 24                  | 1  | 1152  | 288  | ≥ 1         |
|           | 1.4 - 20 | 3             | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 1288                            | 24                  | 1  | 1728  | 432  | ≥ 1         |
|           | 1.4 - 20 | 4             | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 1736                            | 24                  | 1  | 2304  | 576  | ≥ 1         |
|           | 1.4 - 20 | 5             | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 2152                            | 24                  | 1  | 2880  | 720  | ≥ 1         |
|           | 3-20     | 6             | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 2600                            | 24                  | 1  | 3456  | 864  | ≥ 1         |
|           | 3-20     | 8             | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 3496                            | 24                  | 1  | 4608  | 1152   | ≥ 1         |
|           | 3-20     | 9             | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 3880                            | 24                  | 1  | 5184  | 1296   | ≥ 1         |
|           | 3-20     | 10            | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 4264                            | 24                  | 1  | 5760  | 1440   | ≥ 1         |
|           | 3-20     | 12            | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 5160                            | 24                  | 1  | 6912  | 1728   | ≥ 1         |
|           | 5-20     | 15            | 2                            | 7                                       | 12                             | 16QAM | 1/2                | 4264                            | 24                  | 1  | 8640  | 2160   | ≥ 1         |
|           | 5-20     | 16            | 2                            | 7                                       | 12                             | 16QAM | 1/2                | 4584                            | 24                  | 1  | 9216  | 2304   | ≥ 1         |
|           | 5-20     | 18            | 2                            | 7                                       | 12                             | 16QAM | 1/2                | 5160                            | 24                  | 1  | 10368   | 2592   | ≥ 1         |
|           | 5-20     | 20            | 2                            | 7                                       | 12                             | 16QAM | 1/3                | 4008                            | 24                  | 1  | 11520   | 2880   | ≥ 1         |
|           | 5-20     | 24            | 2                            | 7                                       | 12                             | 16QAM | 1/3                | 4776                            | 24                  | 1  | 13824   | 3456   | ≥ 1         |
|           | 10-20    | 25            | 2                            | 7                                       | 12                             | 16QAM | 1/3                | 4968                            | 24                  | 1  | 14400   | 3600   | ≥ 1         |
|           | 10-20    | 27            | 2                            | 7                                       | 12                             | 16QAM | 1/3                | 4776                            | 24                  | 1  | 15552   | 3888   | ≥ 1         |
|           | 10-20    | 30            | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 12960                           | 24                  | 3  | 17280   | 4320   | ≥ 2         |
|           | 10-20    | 32            | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 13536                           | 24                  | 3  | 18432   | 4608   | ≥ 2         |
|           | 10-20    | 36            | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 15264                           | 24                  | 3  | 20736   | 5184   | ≥ 2         |
|           | 10-20    | 40            | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 16992                           | 24                  | 3  | 23040   | 5760   | ≥ 2         |
|           | 10-20    | 45            | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 19080                           | 24                  | 4  | 25920   | 6480   | ≥ 2         |
|           | 10-20    | 48            | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 20616                           | 24                  | 4  | 27648   | 6912   | ≥ 2         |
|           | 15 - 20  | 50            | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 21384                           | 24                  | 4  | 28800   | 7200   | ≥ 2         |
|           | 15 - 20  | 54            | 2                            | 7                                       | 12                             | 16QAM | 3/4                | 22920                           | 24                  | 4  | 31104   | 7776   | ≥ 2         |
|           | 15 - 20  | 60            | 2                            | 7                                       | 12                             | 16QAM | 2/3                | 23688                           | 24                  | 4  | 34560   | 8640   | ≥ 2         |
|           | 15 - 20  | 64            | 2                            | 7                                       | 12                             | 16QAM | 2/3                | 25456                           | 24                  | 4  | 36864   | 9216   | ≥ 2         |
|           | 15 - 20  | 72            | 2                            | 7                                       | 12                             | 16QAM | 1/2                | 20616                           | 24                  | 4  | 41472   | 10368  | ≥ 2         |
|           | 20       | 75            | 2                            | 7                                       | 12                             | 16QAM | 1/2                | 21384                           | 24                  | 4  | 43200   | 10800  | ≥ 2         |
|           | 20       | 80            | 2                            | 7                                       | 12                             | 16QAM | 1/2                | 22920                           | 24                  | 4  | 46080   | 11520  | ≥ 2         |
|           | 20       | 81            | 2                            | 7                                       | 12                             | 16QAM | 1/2                | 22920                           | 24                  | 4  | 46656   | 11664  | ≥ 2         |
|           | 20       | 90            | 2                            | 7                                       | 12                             | 16QAM | 2/5                | 20616                           | 24                  | 4  | 51840   | 12960  | ≥ 2         |
|           | 20       | 96            | 2                            | 7                                       | 12                             | 16QAM | 2/5                | 22152                           | 24                  | 4  | 55296   | 13824  | ≥ 2         |

Note 1: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit)

Note 2: As per Table 4.2-2 in TS 36.211 [7]

Note 3: As per Table 4.2-1 in TS 36.211 [7]

A.2.2.2.3 64-QAM

Table A.2.2.2.3-1: Reference Channels for 64-QAM with partial RB allocation

| Parameter | Ch BW    | Allocated RBs | UL-DL Configuration (Note 2) | Special subframe configuration (Note 3) | DFT-OFDM Symbols per Sub-Frame | Mod'n | Target Coding rate | Payload size for Sub-Frame 2, 7 | Transport block CRC | Number of code blocks per Sub-Frame (Note 1) | Total number of bits per Sub-Frame for Sub-Frame 2, 7 | Total symbols per Sub-Frame for Sub-Frame 2, 7 | UE Category (Note 4) |
|-----------|----------|---------------|------------------------------|---|--------------------------------|-------|--------------------|---------------------------------|---------------------|--|---|--|----------------------|
| Unit      | MHz      |               |                              |   |                                |       |                    | Bits                            | Bits                |  | Bits  |  |                      |
|           | 1.4 - 20 | 1             | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 616                             | 24                  | 1  | 864   | 144  | 5,8                  |
|           | 1.4 - 20 | 2             | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 1256                            | 24                  | 1  | 1728  | 288  | 5,8                  |
|           | 1.4 - 20 | 3             | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 1864                            | 24                  | 1  | 2592  | 432  | 5,8                  |
|           | 1.4 - 20 | 4             | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 2536                            | 24                  | 1  | 3456  | 576  | 5,8                  |
|           | 1.4 - 20 | 5             | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 3112                            | 24                  | 1  | 4320  | 720  | 5,8                  |
|           | 3-20     | 6             | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 3752                            | 24                  | 1  | 5184  | 864  | 5,8                  |
|           | 3-20     | 8             | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 5160                            | 24                  | 1  | 6912  | 1152   | 5,8                  |
|           | 3-20     | 9             | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 5736                            | 24                  | 1  | 7776  | 1296   | 5,8                  |
|           | 3-20     | 10            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 6200                            | 24                  | 2  | 8640  | 1440   | 5,8                  |
|           | 3-20     | 12            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 7480                            | 24                  | 2  | 10368   | 1728   | 5,8                  |
|           | 5-20     | 15            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 9528                            | 24                  | 2  | 12960   | 2160   | 5,8                  |
|           | 5-20     | 16            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 10296                           | 24                  | 2  | 13824   | 2304   | 5,8                  |
|           | 5-20     | 18            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 11448                           | 24                  | 2  | 15552   | 2592   | 5,8                  |
|           | 5-20     | 20            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 12576                           | 24                  | 3  | 17280   | 2880   | 5,8                  |
|           | 5-20     | 24            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 15264                           | 24                  | 3  | 20736   | 3456   | 5,8                  |
|           | 10-20    | 25            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 15840                           | 24                  | 3  | 21600   | 3600   | 5,8                  |
|           | 10-20    | 27            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 16992                           | 24                  | 3  | 23328   | 3888   | 5,8                  |
|           | 10-20    | 30            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 19080                           | 24                  | 4  | 25920   | 4320   | 5,8                  |
|           | 10-20    | 32            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 20616                           | 24                  | 4  | 27648   | 4608   | 5,8                  |
|           | 10-20    | 36            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 22920                           | 24                  | 4  | 31104   | 5184   | 5,8                  |
|           | 10-20    | 40            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 25456                           | 24                  | 5  | 34560   | 5760   | 5,8                  |
|           | 10-20    | 45            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 28336                           | 24                  | 5  | 38880   | 6480   | 5,8                  |
|           | 10-20    | 48            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 30576                           | 24                  | 5  | 41472   | 6912   | 5,8                  |
|           | 15 - 20  | 50            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 31704                           | 24                  | 6  | 43200   | 7200   | 5,8                  |
|           | 15 - 20  | 54            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 34008                           | 24                  | 6  | 46656   | 7776   | 5,8                  |
|           | 15 - 20  | 60            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 37888                           | 24                  | 7  | 51840   | 8640   | 5,8                  |
|           | 15 - 20  | 64            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 40576                           | 24                  | 7  | 55296   | 9216   | 5,8                  |
|           | 1.4 - 20 | 1             | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 616                             | 24                  | 1  | 864   | 144  | 5,8                  |
|           | 1.4 - 20 | 2             | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 1256                            | 24                  | 1  | 1728  | 288  | 5,8                  |
|           | 1.4 - 20 | 3             | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 1864                            | 24                  | 1  | 2592  | 432  | 5,8                  |
|           | 1.4 - 20 | 4             | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 2536                            | 24                  | 1  | 3456  | 576  | 5,8                  |
|           | 1.4 - 20 | 5             | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 3112                            | 24                  | 1  | 4320  | 720  | 5,8                  |
|           | 3-20     | 6             | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 3752                            | 24                  | 1  | 5184  | 864  | 5,8                  |
|           | 3-20     | 8             | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 5160                            | 24                  | 1  | 6912  | 1152   | 5,8                  |
|           | 3-20     | 9             | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 5736                            | 24                  | 1  | 7776  | 1296   | 5,8                  |
|           | 3-20     | 10            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 6200                            | 24                  | 2  | 8640  | 1440   | 5,8                  |
|           | 3-20     | 12            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 7480                            | 24                  | 2  | 10368   | 1728   | 5,8                  |
|           | 5-20     | 15            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 9528                            | 24                  | 2  | 12960   | 2160   | 5,8                  |
|           | 5-20     | 16            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 10296                           | 24                  | 2  | 13824   | 2304   | 5,8                  |
|           | 5-20     | 18            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 11448                           | 24                  | 2  | 15552   | 2592   | 5,8                  |
|           | 5-20     | 20            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 12576                           | 24                  | 3  | 17280   | 2880   | 5,8                  |
|           | 5-20     | 24            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 15264                           | 24                  | 3  | 20736   | 3456   | 5,8                  |
|           | 10-20    | 25            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 15840                           | 24                  | 3  | 21600   | 3600   | 5,8                  |
|           | 10-20    | 27            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 16992                           | 24                  | 3  | 23328   | 3888   | 5,8                  |
|           | 10-20    | 30            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 19080                           | 24                  | 4  | 25920   | 4320   | 5,8                  |
|           | 15 - 20  | 50            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 31704                           | 24                  | 6  | 43200   | 7200   | 5,8                  |
|           | 15 - 20  | 54            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 34008                           | 24                  | 6  | 46656   | 7776   | 5,8                  |
|           | 15 - 20  | 60            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 37888                           | 24                  | 7  | 51840   | 8640   | 5,8                  |
|           | 15 - 20  | 64            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 40576                           | 24                  | 7  | 55296   | 9216   | 5,8                  |
|           | 15 - 20  | 72            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 45352                           | 24                  | 8  | 62208   | 10368  | 5,8                  |
|           | 20       | 75            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 46888                           | 24                  | 8  | 64800   | 10800  | 5,8                  |
|           | 20       | 80            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 51024                           | 24                  | 9  | 69120   | 11520  | 5,8                  |
|           | 20       | 81            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 51024                           | 24                  | 9  | 69984   | 11664  | 5,8                  |
|           | 20       | 90            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 51024                           | 24                  | 9  | 77760   | 12960  | 5,8                  |
|           | 20       | 96            | 2                            | 7                                       | 12                             | 64QAM | 3/4                | 61664                           | 24                  | 11   | 82944   | 13824  | 5,8                  |

Note 1: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit)

Note 2: As per Table 4.2-2 in TS 36.211 [7].

Note 3: As per Table 4.2-1 in TS 36.211 [7].

Note 4: If UE does not report UE UL category, then the applicability of reference channel is determined by UE category. If UE reports UE UL category, then the applicability of reference channel is determined by UE UL category

## A.2.2.2.4 256 QAM

Table A.2.2.2.4-1: Reference Channels for 256 QAM with partial RB allocation

| Parameter | Ch BW  | Allocated RBs | UL-DL Configuration (Note 2) | Special Slot Configuration (Note 3) | DFT-OFDM Symbols per Sub-Frame | Mod'n  | Target Coding rate | Payload size for Sub-Frame 2, 7 | Transport block CRC | Number of code blocks per Sub-Frame (Note 1) | Total number of bits per Sub-Frame for Sub-Frame 2, 7 | Total symbols per Sub-Frame for Sub-Frame 2, 7 | UE UL Category |
|-----------|--|---------------|------------------------------|-------------------------------------|--------------------------------|--------|--------------------|---------------------------------|---------------------|--|---|--|----------------|
| Unit      | MHz  |               |                              |                                     |                                |        |                    | Bits                            | Bits                |  | Bits  |  |                |
|           | 1.4 - 20   | 1             | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 840                             | 24                  | 1  | 1152  | 144  | ≥ 15           |
|           | 1.4 - 20   | 2             | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 1672                            | 24                  | 1  | 2304  | 288  | ≥ 15           |
|           | 1.4 - 20   | 3             | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 2536                            | 24                  | 1  | 3456  | 432  | ≥ 15           |
|           | 1.4 - 20   | 4             | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 3368                            | 24                  | 1  | 4608  | 576  | ≥ 15           |
|           | 1.4 - 20   | 5             | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 4264                            | 24                  | 1  | 5760  | 720  | ≥ 15           |
|           | 3-20   | 6             | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 5160                            | 24                  | 1  | 6912  | 864  | ≥ 15           |
|           | 3-20   | 8             | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 6712                            | 24                  | 2  | 9216  | 1152   | ≥ 15           |
|           | 3-20   | 9             | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 7736                            | 24                  | 2  | 10368   | 1296   | ≥ 15           |
|           | 3-20   | 10            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 8504                            | 24                  | 2  | 11520   | 1440   | ≥ 15           |
|           | 3-20   | 12            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 10296                           | 24                  | 2  | 13824   | 1728   | ≥ 15           |
|           | 5-20   | 15            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 12960                           | 24                  | 3  | 17280   | 2160   | ≥ 15           |
|           | 5-20   | 16            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 13536                           | 24                  | 3  | 18432   | 2304   | ≥ 15           |
|           | 5-20   | 18            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 15264                           | 24                  | 3  | 20736   | 2592   | ≥ 15           |
|           | 5-20   | 20            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 16992                           | 24                  | 3  | 23040   | 2880   | ≥ 15           |
|           | 5-20   | 24            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 20616                           | 24                  | 4  | 27648   | 3456   | ≥ 15           |
|           | 10-20  | 25            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 21384                           | 24                  | 4  | 28800   | 3600   | ≥ 15           |
|           | 10-20  | 27            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 22920                           | 24                  | 4  | 31104   | 3888   | ≥ 15           |
|           | 10-20  | 30            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 25456                           | 24                  | 5  | 34560   | 4320   | ≥ 15           |
|           | 10-20  | 32            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 27376                           | 24                  | 5  | 36864   | 4608   | ≥ 15           |
|           | 10-20  | 36            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 30576                           | 24                  | 6  | 41472   | 5184   | ≥ 15           |
|           | 10-20  | 40            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 34008                           | 24                  | 6  | 46080   | 5760   | ≥ 15           |
|           | 10-20  | 45            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 37888                           | 24                  | 7  | 51840   | 6480   | ≥ 15           |
|           | 10-20  | 48            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 40576                           | 24                  | 8  | 55296   | 6912   | ≥ 15           |
|           | 15 - 20  | 50            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 42368                           | 24                  | 8  | 57600   | 7200   | ≥ 15           |
|           | 15 - 20  | 54            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 46888                           | 24                  | 8  | 62208   | 7776   | ≥ 15           |
|           | 15 - 20  | 60            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 51024                           | 24                  | 9  | 69120   | 8640   | ≥ 15           |
|           | 15 - 20  | 64            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 55056                           | 24                  | 9  | 73728   | 9216   | ≥ 15           |
|           | 15 - 20  | 72            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 61664                           | 24                  | 11   | 82944   | 10368  | ≥ 15           |
|           | 20   | 75            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 63776                           | 24                  | 11   | 86400   | 10800  | ≥ 15           |
|           | 20   | 80            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 68808                           | 24                  | 12   | 92160   | 11520  | ≥ 15           |
|           | 20   | 81            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 68808                           | 24                  | 12   | 93312   | 11664  | ≥ 15           |
|           | 20   | 90            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 76208                           | 24                  | 13   | 103680  | 12960  | ≥ 15           |
|           | 20   | 96            | 2                            | 7                                   | 12                             | 256QAM | 3/4                | 81176                           | 24                  | 14   | 110592  | 13824  | ≥ 15           |
| Note 1:   | If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit) |               |                              |                                     |                                |        |                    |                                 |                     |  |   |  |                |
| Note 2:   | As per Table 4.2-2 in TS 36.211 [7]  |               |                              |                                     |                                |        |                    |                                 |                     |  |   |  |                |
| Note 3:   | As per Table 4.2-1 in TS 36.211 [7]  |               |                              |                                     |                                |        |                    |                                 |                     |  |   |  |                |

## A.3 DL reference measurement channels for E-UTRA

### A.3.1 General

The number of available channel bits varies across the sub-frames due to PBCH and PSS/SSS overhead. The payload size per sub-frame is varied in order to keep the code rate constant throughout a frame.

Unless otherwise stated, no user data is scheduled on subframes #5 in order to facilitate the transmission of system information blocks (SIB).

The algorithm for determining the payload size  $A$  is as follows; given a desired coding rate  $R$  and radio block allocation  $N_{RB}$

1. Calculate the number of channel bits  $N_{ch}$  that can be transmitted during the first transmission of a given sub-frame.
2. Find  $A$  such that the resulting coding rate is as close to  $R$  as possible, that is,

$$\min \left| R - (A + 24 * (N_{CB} + 1)) / N_{ch} \right|, \text{ where } N_{CB} = \begin{cases} 0, & \text{if } C = 1 \\ C, & \text{if } C > 1 \end{cases}$$

subject to

- a) A is a valid TB size according to section 7.1.7 of TS 36.213 [6] assuming an allocation of  $N_{RB}$  resource blocks.
  - b) C is the number of Code Blocks calculated according to section 5.1.2 of TS 36.212 [5].
3. If there is more than one A that minimizes the equation above, then the larger value is chosen per default and the chosen code rate should not exceed 0.93.
  4. For TDD, the measurement channel is based on DL/UL configuration ratio of 3DL+DwPTS (10 OFDM symbol SSF7): 1UL

### A.3.1.1 QPSK

**Table A.3.1.1-1: Fixed Reference Channel for Receiver Requirements (TDD)**

| Parameter                                    | Unit  | Value |      |      |        |        |        |
|--|---|-------|------|------|--------|--------|--------|
|  |   | 1.4   | 3    | 5    | 10     | 15     | 20     |
| Channel Bandwidth                            | MHz   | 1.4   | 3    | 5    | 10     | 15     | 20     |
| Allocated resource blocks                    |   | 6     | 15   | 25   | 50     | 75     | 100    |
| Uplink-Downlink Configuration (Note 5)       |   | 2     | 2    | 2    | 2      | 2      | 2      |
| Special subframe configuration (Note 6)      |   | 7     | 7    | 7    | 7      | 7      | 7      |
| Allocated subframes per Radio Frame (D+S)    |   | 3     | 3+2  | 3+2  | 3+2    | 3+2    | 3+2    |
| Number of HARQ Processes                     | Processes   | 7     | 7    | 7    | 7      | 7      | 7      |
| Maximum number of HARQ transmission          |   | 1     | 1    | 1    | 1      | 1      | 1      |
| Modulation                                   |   | QPSK  | QPSK | QPSK | QPSK   | QPSK   | QPSK   |
| Target coding rate                           |   | 1/3   | 1/3  | 1/3  | 1/3    | 1/3    | 1/3    |
| Information Bit Payload per Sub-Frame        | Bits  |       |      |      |        |        |        |
| For Sub-Frame 3, 4, 8, 9                     |   | 408   | 1320 | 2216 | 4392   | 6712   | 8760   |
| For Sub-Frame 1, 6                           |   | N/A   | 776  | 1288 | 2664   | 4008   | 5352   |
| For Sub-Frame 5                              |   | N/A   | N/A  | N/A  | N/A    | N/A    | N/A    |
| For Sub-Frame 0                              |   | 208   | 1064 | 1800 | 4392   | 6712   | 8760   |
| Transport block CRC                          | Bits  | 24    | 24   | 24   | 24     | 24     | 24     |
| Number of Code Blocks per Sub-Frame (Note 4) |   |       |      |      |        |        |        |
| For Sub-Frame 3, 4, 8, 9                     |   | 1     | 1    | 1    | 1      | 2      | 2      |
| For Sub-Frame 1, 6                           |   | N/A   | 1    | 1    | 1      | 1      | 1      |
| For Sub-Frame 5                              |   | N/A   | N/A  | N/A  | N/A    | N/A    | N/A    |
| For Sub-Frame 0                              |   | 1     | 1    | 1    | 1      | 2      | 2      |
| Binary Channel Bits Per Sub-Frame            | Bits  |       |      |      |        |        |        |
| For Sub-Frame 3, 4, 8, 9                     |   | 1368  | 3780 | 6300 | 13800  | 20700  | 27600  |
| For Sub-Frame 1, 6                           |   | N/A   | 2616 | 4456 | 9056   | 13656  | 18256  |
| For Sub-Frame 5                              |   | N/A   | N/A  | N/A  | N/A    | N/A    | N/A    |
| For Sub-Frame 0                              |   | 672   | 3084 | 5604 | 13104  | 20004  | 26904  |
| Max. Throughput averaged over 1 frame        | kbps  | 102.4 | 564  | 932  | 1965.6 | 3007.2 | 3970.4 |
| UE Category                                  |   | ≥ 1   | ≥ 1  | ≥ 1  | ≥ 1    | ≥ 1    | ≥ 1    |
| Note 1:                                      | For normal subframes(0,3,4,5,8,9), 2 symbols allocated to PDCCH for 20 MHz, 15 MHz and 10 MHz channel BW; 3 symbols allocated to PDCCH for 5 MHz and 3 MHz; 4 symbols allocated to PDCCH for 1.4 MHz. For special subframe (1&6), only 2 OFDM symbols are allocated to PDCCH for all BWs. |       |      |      |        |        |        |
| Note 2:                                      | For 1.4MHz, no data shall be scheduled on special subframes(1&6) to avoid problems with insufficient PDCCH performance  |       |      |      |        |        |        |
| Note 3:                                      | Reference signal, Synchronization signals and PBCH allocated as per TS 36.211 [7]   |       |      |      |        |        |        |
| Note 4:                                      | If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit).   |       |      |      |        |        |        |
| Note 5:                                      | As per Table 4.2-2 in TS 36.211 [7]   |       |      |      |        |        |        |
| Note 6:                                      | As per Table 4.2-1 in TS 36.211 [7]   |       |      |      |        |        |        |

## A.3.1.2 64-QAM

Table A.3.1.2-1: Fixed Reference Channel for Maximum input level for UE Categories  $\geq 3$  (TDD)

| Parameter                                    | Unit  | Value         |               |               |               |               |               |
|--|---|---------------|---------------|---------------|---------------|---------------|---------------|
|  |   | 1.4           | 3             | 5             | 10            | 15            | 20            |
| Channel bandwidth                            | MHz   | 1.4           | 3             | 5             | 10            | 15            | 20            |
| Allocated resource blocks                    |   | 6             | 15            | 25            | 50            | 75            | 100           |
| Subcarriers per resource block               |   | 12            | 12            | 12            | 12            | 12            | 12            |
| Uplink-Downlink Configuration (Note 5)       |   | 2             | 2             | 2             | 2             | 2             | 2             |
| Special subframe configuration (Note 6)      |   | 7             | 7             | 7             | 7             | 7             | 7             |
| Allocated subframes per Radio Frame          |   | 2             | 3+2           | 3+2           | 3+2           | 3+2           | 3+2           |
| Modulation                                   |   | 64QAM         | 64QAM         | 64QAM         | 64QAM         | 64QAM         | 64QAM         |
| Target Coding Rate                           |   | $\frac{3}{4}$ | $\frac{3}{4}$ | $\frac{3}{4}$ | $\frac{3}{4}$ | $\frac{3}{4}$ | $\frac{3}{4}$ |
| Number of HARQ Processes                     | Processes   | 7             | 7             | 7             | 7             | 7             | 7             |
| Maximum number of HARQ transmissions         |   | 1             | 1             | 1             | 1             | 1             | 1             |
| Information Bit Payload per Sub-Frame        |   |               |               |               |               |               |               |
| For Sub-Frames 3, 4, 8, 9                    | Bits  | 2984          | 8504          | 14112         | 30576         | 46888         | 61664         |
| For Sub-Frames 1,6                           | Bits  | N/A           | 5544          | 9528          | 19848         | 30576         | 40576         |
| For Sub-Frame 5                              | Bits  | N/A           | N/A           | N/A           | N/A           | N/A           | N/A           |
| For Sub-Frame 0                              | Bits  | N/A           | 6968          | 12576         | 30576         | 45352         | 61664         |
| Transport block CRC                          | Bits  | 24            | 24            | 24            | 24            | 24            | 24            |
| Number of Code Blocks per Sub-Frame (Note 4) |   |               |               |               |               |               |               |
| For Sub-Frames 3, 4, 8, 9                    |   | 1             | 2             | 3             | 5             | 8             | 11            |
| For Sub-Frames 1,6                           |   | N/A           | 2             | 2             | 4             | 6             | 8             |
| For Sub-Frame 5                              |   | N/A           | N/A           | N/A           | N/A           | N/A           | N/A           |
| For Sub-Frame 0                              |   | N/A           | 2             | 3             | 5             | 8             | 11            |
| Binary Channel Bits per Sub-Frame            |   |               |               |               |               |               |               |
| For Sub-Frames 3, 4, 8, 9                    | Bits  | 4104          | 11340         | 18900         | 41400         | 62100         | 82800         |
| For Sub-Frames 1,6                           |   | N/A           | 7848          | 13368         | 27168         | 40968         | 54768         |
| For Sub-Frame 5                              | Bits  | N/A           | N/A           | N/A           | N/A           | N/A           | N/A           |
| For Sub-Frame 0                              | Bits  | N/A           | 9252          | 16812         | 39312         | 60012         | 80712         |
| Max. Throughput averaged over 1 frame        | kbps  | 596.8         | 3791.2        | 6369.6        | 13910         | 20945         | 27877         |
| Note 1:                                      | For normal subframes(0,3,4,5,8,9), 2 symbols allocated to PDCCH for 20 MHz, 15 MHz and 10 MHz channel BW; 3 symbols allocated to PDCCH for 5 MHz and 3 MHz; 4 symbols allocated to PDCCH for 1.4 MHz. For special subframe (1&6), only 2 OFDM symbols are allocated to PDCCH for all BWs. |               |               |               |               |               |               |
| Note 2:                                      | For 1.4MHz, no data shall be scheduled on special subframes(1&6) to avoid problems with insufficient PDCCH performance.   |               |               |               |               |               |               |
| Note 3:                                      | Reference signal, Synchronization signals and PBCH allocated as per TS 36.211 [7].  |               |               |               |               |               |               |
| Note 4:                                      | If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit).   |               |               |               |               |               |               |
| Note 5:                                      | As per Table 4.2-2 in TS 36.211 [7].  |               |               |               |               |               |               |
| Note 6:                                      | As per Table 4.2-1 in TS 36.211 [7]   |               |               |               |               |               |               |

## A.3.1.3 256-QAM

Table A.3.1.3-1: Fixed Reference Channel for Maximum input level for UE Categories 11/12 and UE DL categories  $\geq 11$  (TDD)

| Parameter                                    | Unit  | Value  |        |        |         |        |         |
|--|---|--------|--------|--------|---------|--------|---------|
|  |   | 1.4    | 3      | 5      | 10      | 15     | 20      |
| Channel bandwidth                            | MHz   | 1.4    | 3      | 5      | 10      | 15     | 20      |
| Allocated resource blocks                    |   | 6      | 15     | 25     | 50      | 75     | 100     |
| Subcarriers per resource block               |   | 12     | 12     | 12     | 12      | 12     | 12      |
| Uplink-Downlink Configuration (Note 5)       |   | 2      | 2      | 2      | 2       | 2      | 2       |
| Special subframe configuration (Note 6)      |   | 7      | 7      | 7      | 7       | 7      | 7       |
| Allocated subframes per Radio Frame          |   | 2      | 3+2    | 3+2    | 3+2     | 3+2    | 3+2     |
| Modulation                                   |   | 256QAM | 256QAM | 256QAM | 256QAM  | 256QAM | 256QAM  |
| Target Coding Rate                           |   | 4/5    | 4/5    | 4/5    | 4/5     | 4/5    | 4/5     |
| Number of HARQ Processes                     | Processes   | 7      | 7      | 7      | 7       | 7      | 7       |
| Maximum number of HARQ transmissions         |   | 1      | 1      | 1      | 1       | 1      | 1       |
| Information Bit Payload per Sub-Frame        |   |        |        |        |         |        |         |
| For Sub-Frames 3,4,8,9                       | Bits  | 4392   | 12216  | 19848  | 42368   | 63776  | 84760   |
| For Sub-Frames 1,6                           | Bits  | N/A    | 10464  | 17824  | 36224   | 54624  | 73024   |
| For Sub-Frame 5                              | Bits  | N/A    | N/A    | N/A    | N/A     | N/A    | N/A     |
| For Sub-Frame 0                              | Bits  | N/A    | 9912   | 17568  | 42368   | 63776  | 84760   |
| Transport block CRC                          | Bits  | 24     | 24     | 24     | 24      | 24     | 24      |
| Number of Code Blocks per Sub-Frame (Note 4) |   |        |        |        |         |        |         |
| For Sub-Frames 3,4,8,9                       |   | 1      | 2      | 4      | 7       | 11     | 14      |
| For Sub-Frames 1,6                           |   | N/A    | 2      | 3      | 6       | 9      | 13      |
| For Sub-Frame 5                              |   | N/A    | N/A    | N/A    | N/A     | N/A    | N/A     |
| For Sub-Frame 0                              |   | N/A    | 2      | 3      | 7       | 11     | 14      |
| Binary Channel Bits per Sub-Frame            |   |        |        |        |         |        |         |
| For Sub-Frames 3,4,8,9                       | Bits  | 5472   | 15120  | 25200  | 55200   | 82800  | 110400  |
| For Sub-Frames 1,6                           |   | N/A    | 8248   | 13536  | 27376   | 40576  | 55056   |
| For Sub-Frame 5                              | Bits  | N/A    | N/A    | N/A    | N/A     | N/A    | N/A     |
| For Sub-Frame 0                              | Bits  | N/A    | 12336  | 22416  | 52416   | 80016  | 107616  |
| Max. Throughput averaged over 1 frame        | kbps  | 878.4  | 5570.4 | 9240   | 20049.6 | 30144  | 40503.2 |
| Note 1:                                      | For normal subframes(0,3,4,5,8,9), 2 symbols allocated to PDCCH for 20 MHz, 15 MHz and 10 MHz channel BW; 3 symbols allocated to PDCCH for 5 MHz and 3 MHz; 4 symbols allocated to PDCCH for 1.4 MHz. For special subframe (1&6), only 2 OFDM symbols are allocated to PDCCH for all BWs. |        |        |        |         |        |         |
| Note 2:                                      | For 1.4MHz, no data shall be scheduled on special subframes(1&6) to avoid problems with insufficient PDCCH performance.   |        |        |        |         |        |         |
| Note 3:                                      | Reference signal, Synchronization signals and PBCH allocated as per TS 36.211 [7].  |        |        |        |         |        |         |
| Note 4:                                      | If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit).   |        |        |        |         |        |         |
| Note 5:                                      | As per Table 4.2-2 in TS 36.211 [7].  |        |        |        |         |        |         |
| Note 6:                                      | As per Table 4.2-1 in TS 36.211 [7]   |        |        |        |         |        |         |

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Annex B: Void

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Annex C: Void

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Annex D: Void

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Annex E: Void

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Annex F: Void

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Annex G: Void



# Annex H (normative): Modified MPR behavior

## H.1 Indication of modified MPR behavior

This annex contains the definitions of the bits in the field *modifiedMPRbehavior* indicated in the IE RF-Parameters [7] by a UE supporting an MPR or A-MPR modified in a later release of this specification. *modifiedMPRbehavior* is indicated in [7] by an 8-bit bitmap per NR band.

**Table H.1-1: Definitions of the bits in the field *modifiedMPRbehavior***

| NR Band | Index of field<br>(bit number) | Definition<br>(description of the supported functionality if indicator<br>set to one)  | Notes   |
|---------|--------------------------------|--|---|
| n41     | 0 (leftmost bit)               | - EN-DC contiguous intraband MPR as defined in clause 6.2B.2.1 of 38.101-3 v15.5.0     | - This bit may be set to 1 by a UE supporting DC_(n)41AA UE EN-DC |
|         | 1                              | - EN-DC non-contiguous intraband MPR as defined in clause 6.2B.2.2 of 38.101-3 v15.5.0 | - This bit may be set to 1 by a UE supporting DC_41A_n41A EN-DC   |
| n71     | 0 (leftmost bit)               | - EN-DC contiguous intraband MPR as defined in clause 6.2B.2.1 of 38.101-3 v15.5.0     | - This bit may be set to 1 by a UE supporting DC_(n)71AA UE EN-DC |

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## Annex I (normative): Dual uplink interferer

UE is mandated to support operation in dual uplink mode also in EN-DC configuration for FR1 listed in Table 7.3.2.1.5-1 and indicated by column single uplink allowed if the intermodulation products caused by the dual uplink operation do not interfere own primary downlink transmission channel bandwidth. For intermodulation products falling into LTE secondary downlink channel bandwidth, UE single UL capability is not considered.

Formula for determining if the EN-DC in NR FR1 configuration with dual uplink operation interferes own downlink reception.

Interference bandwidth:  $IBW = |a| * CBW1 + |b| * CBW2$

- $|a| + |b| = 2$  (or 3)
- CBW1 and CBW2 are the transmission bandwidth configurations of the UL channels

Center frequency of IBW:  $f_{IBW} = |a * f1 + b * f2|$

- f1 and f2 are center frequency of the transmission bandwidth configurations of each UL channel

The range of IMD 2 (or 3):  $[f_{IBW} - IBW/2, f_{IBW} + IBW/2]$

NOTE 1: UE shall be able to apply operations which are configured by RRC reconfiguration and corresponding HARQ timing on the transmission bandwidth.

NOTE 2: For identified difficult band combination, during two adjacent RRC reconfiguration, the changing of transmission bandwidth should not introduce IM2 and IM3, which will result in UE changing from 2Tx to 1Tx. Otherwise, UE behavior is not specified.

For DC\_3A\_n3A intra-band non-contiguous EN-DC combination, only single switched UL is supported in rel.15.

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## Annex J: Void

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## Annex K: Void

## Annex L (informative): Change history

| Change history |                |            |      |     |     |  |             |
|----------------|----------------|------------|------|-----|-----|--|-------------|
| Date           | Meeting        | TDoc       | CR   | Rev | Cat | Subject/Comment  | New version |
| 2017-08        | RAN4#84        |            |      |     |     | Initial Skeleton   | 0.0.1       |
| 2017-11        | RAN4#84<br>Bis | R4-1711980 |      |     |     | Number TPs from editors  | 0.1.0       |
| 2017-12        | RAN4#85        | R4-1713807 |      |     |     | Approved TPs in RAN4#85<br>R4-1714444, CA BW classes, TP, Ericsson<br>R4-1714170, How to list DC configurations into TS 38.101-3, Nokia<br>R4-1714530, TP on introducing operating bands for NR-LTE DC including SUL band combinations in 38.101-3, Qualcomm<br>R4-1714098, TP to TS 38.101-3: UE RF requirements for non-standalone SUL, Huawei<br>R4-1713206, TP on general parts for 38.101-3 NR interwork, Ericsson<br>R4-1714443, TP to TS 38.101-3: On dual uplink operation for EN-DC in NR FR1 and single uplink, Nokia<br>R4-1714450, TP to 38.101-3: maximum output power and unwanted emissions for EN-DC, Ericsson<br>R4-1714346, TP to 38.101-3: REFSENS for intra-band EN-DC, Ericsson<br>R4-1714345, TP for TS 36.101-3: clause 7 receiver requirements, Huawei<br><br>Band list according to R4-1714542, List of bands and band combinations to be introduced into RAN4 NR core requirements by December 2017, RAN4 Chairmen                                       | 0.2.0       |
| 2017-12        | RAN4#85        | R4-1714571 |      |     |     | Further corrections after email review   | 0.3.0       |
| 2017-12        | RAN#78         | RP-172477  |      |     |     | v1.0.0 submitted for plenary approval. Contents same as 0.3.0  | 1.0.0       |
| 2017-12        | RAN#78         |            |      |     |     | Approved by plenary – Rel-15 spec under change control   | 15.0.0      |
| 2018-03        | RAN#79         | RP-180264  | 0005 |     | F   | Implementation of endorsed CRs to 38.101-3<br>Endorsed draft CR<br>F: R4-1801267, Draft CR on UE RF requirements for SUL in TS 38.101-3, Huawei<br>B: R4-1801111, Draft CR for completed LTE 1CC + NR 1band for TS 38.101-3, NTT DOCOMO, INC.<br>B: R4-1800716, Draft CR for introduction of completed band combinations from 37.863-03-01 into 38.101-3, Ericsson<br>B: R4-1800063, Draft CR for completed EN-DC of LTE 4CC + NR 1band for TS 38.101-3, Nokia<br>B: R4-1800717, Draft CR for introduction of completed band combinations from 37.865-01-01 into 38.101-3, Ericsson<br>F: R4-1800049, Modification for TS38.101-3, CATT<br>F: R4-1800287, 38.101-3 DC_(n)71B draft CR for section 6.2.4.1 - A-MPR for intra-band EN-DC - NS value, T-Mobile USA Inc.<br>F: R4-1800288, 38.101-3 DC_(n)71B draft CR for section 7.3.3 Reference sensitivity for DC_(n)71B - MSD values, T-Mobile USA Inc.<br>F: R4-1801139 Draft CR to 38.101-3: MSD for inter-band EN-DC, Ericsson | 15.1.0      |
| 2018-06        | RAN#80         | RP-181374  | 0013 | 1   | F   | CR to TS 38.101-3: Implementation of endorsed draft CRs from RAN4 #87<br><b>Missing figures (Figure 6.3B.1.1-1, Figure 6.3B.1.1-2, Figure 6.3B.1.1-3 and Figure 6.3B.1.1-4) from the endorsed draft CR (R4-1807235) were added during the CR implementation.</b>   | 15.2.0      |

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| 2018-09 | RAN#81 | RP-182129 | 0020 | 2 | F | <p>Big CR for 38.101-3</p> <p>Draft CRs from RAN4#88:</p> <p>R4-1809960 Draft CR to TS 38.101-3: to introduce new NR inter-band DC band combinations Samsung,KDDI,SKT,KT,LGU+</p> <p>R4-1809991 CR to 38.101-3:Corrections on UE coexistence table for Table 6.5B.3.3.1-1 MediaTek Inc.</p> <p>R4-1810054 Pcmx for Rel-15 inter-band EN-DC for FR1 and NR in FR2 InterDigital, Inc.</p> <p>R4-1810111 Single UL allowed corrections for DC_28A-n51A EN-DC in 38.101-3 Skyworks Solutions Inc.</p> <p>R4-1810125 Draft CR to 38.101-3 Single UL allowed corrections for DC_28A_51A EN-DC Skyworks Solutions Inc.</p> <p>R4-1810128 Draft CR to 38.101-3 Single UL allowed corrections for EN-DC operation in NR FR1 (two bands) Skyworks Solutions Inc.</p> <p>R4-1810167 TP for TR 37.863-01-01: MSD for DC_5A_n78A due to the 4th harmonic MediaTek Inc.</p> <p>R4-1810410 Draft CR to 38.101-3: Corrections on symbols and abbreviations in section 3 ZTE Corporation</p> <p>R4-1810417 Correction to DC_(n)71B MSD definition Nokia</p> <p>R4-1810433 Correction on EN-DC 8A_n79A SoftBank Corp.,ZTE</p> <p>R4-1810476 Draft CR to TS 38.101-3 correction for DC_3_n3-n77, DC_3_n3-n78 CHITL</p> <p>R4-1810976 Annex lettering change for 38.101-3Qualcomm Incorporated</p> <p>R4-1811461 Clarification and corrections of EN-DC REFSSENS exceptions requirement Nokia, Nokia Shanghai Bell</p> <p>R4-1811462 Correction to DC_(n)71B scs restriction for NR Nokia</p> <p>R4-1811466 EN DC_41-79 CATT</p> <p>R4-1811467 Draft CR TS 38.101-3 Corrections to Single UL Allowed Criteria for Mid-Band EN-DC in FR1 Skyworks Solutions Inc.</p> <p>R4-1811484 Pcmx for inter-band EN-DC FR1 draft CR InterDigital, Inc.</p> <p>R4-1811525 Draft CR TS 38.101-3 on missing requirements for FR1 EN-DC Skyworks Solutions, Inc.</p> <p>R4-1811542 Draft CR to 38.101-3 on correction on some errors Huawei, HiSilicon</p> <p>R4-1811796 Draft CR to 38.101-3 Corrections to Single UL allowed criteria for EN-DC Skyworks Solutions Inc.</p> <p>R4-1811800 DRAFT CR for PCmax FR2 correction Qualcomm Incorporated</p> <p>R4-1811810 Draft CR TS 38.101-3: Corrections for B41/n41 SPRINT Corporation</p> | 15.3.0 |
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| 2018-12 | RAN#82 | RP-182359 | 0030 |  | F | <p>Endorsed draft CRs from RAN4#88Bis :</p> <p>R4-1812057, Introduction of Intra-band contiguous EN-DC bandwidth classes, Nokia<br/> R4-1812290 Draft CR on MSD for EN-DC including Band 66 and n78 Huawei, HiSilicon<br/> R4-1812293 Draft CR on switching time mask for EN-DC Huawei, HiSilicon<br/> R4-1812298 Draft CR to TS 38.101-3: to add missing requirements for inter-band CA between FR1 and FR2. Samsung<br/> R4-1812360 Draft CR to 38.101-3: Correction to UL configuration for EN-DC reference sensitivity exceptions Skyworks Solutions Inc.<br/> R4-1812361 Draft CR to 38.101-3: NR uplink DFT-S-OFDM waveforms for EN-DC reference sensitivity Skyworks Solutions Inc.<br/> R4-1812362 Draft CR to 38.101-3: Editorial and RB allocation corrections to table 7.3B.2.3.4-2 Skyworks Solutions Inc.<br/> R4-1812363 Draft CR to 38.101-3: Single UL allowed operation corrections in clause 7.3B.2.3.5 Skyworks Solutions Inc.<br/> R4-1812404 Non-contiguous intra-band EN-DC emission requirements Qualcomm Incorporated<br/> R4-1812410 Correction on REFSENS exception for EN-DC 41A-n77A/n78A SoftBank Corp.<br/> R4-1812670 Correction on REFSENS exceptions of DC_5A-7A_n78A to TS 38.101-3 LG Uplus<br/> R4-1813471 draft CR on applicability of TDD configuration for CA in TS 38.101-3 Huawei<br/> R4-1813796 Draft CR for 38.101-3: Intra-band P<sub>max</sub> for Type 2 UEs Sprint Corporation<br/> R4-1813816 Renaming of DC_(n)71B into DC_(n)71AA Nokia<br/> R4-1813817 Correction to EN-DC operating bands and configurations Nokia<br/> R4-1813818 Draft CR on correction REFSENS exceptions due to dual uplink operation for inter-band EN-DC to TS 38.101-3 Samsung<br/> R4-1813822 Draft CR for 38.101-3: Single UL allowed criteria in Annex I Vodafone España SA<br/> R4-1814157 Draft CR for UE-to-UE coexistence requirements for intra-band EN-DC in TS38.101-3 LG Electronics France<br/> R4-1814167 Draft CR on Single UL for some EN-DC combinations Huawei</p> <p>Endorsed draft CRs from Ran4#89:</p> <p>R4-1815952 dCR on TS38.101-3 merging draft CRs from RAN4#(88Bis) Qualcomm Incorporated R4-1814803 Draft CR on editorial error for EN-DC band combinations to TS 38.101-3 Huawei, HiSilicon<br/> R4-1815802 draft CR editorial correction in 38.101-3 Ericsson<br/> R4-1814425 Simplification of requirements for EN-DC configuration including FR2 NTT DOCOMO, INC.<br/> R4-1814512 Draft CR to TS38.101-3_Corrections on MSD requirements for EN-DC combinations of band 8 and n77 n78(Section 7.3B.2.3.1) ZTE Corporation<br/> R4-1814938 Draft CR to 38.101-3 on operating bands for CA and DC ZTE Corporation Zhifeng Ma<br/> R4-1814976 Correction for Maximum output power for inter-band EN-DC (two bands) Nokia, Nokia Shanghai Bell<br/> R4-1814977 Correction for ?TIB,c for EN-DC Nokia, Nokia Shanghai Bell<br/> R4-1814978 MPR and A-MPR for interband EN-DC Nokia, Nokia Shanghai Bell<br/> R4-1814980 Correction for intra-band EN-DC bandwidth class Nokia, Nokia Shanghai Bell<br/> R4-1815065 draft CR for adding missing transmit signal quality for inter band EN-DC for TS 38.101-3 NTT DOCOMO, INC.<br/> R4-1815811 draft Rel-15 CR to 38.101-3 to correct n260 BW class Ericsson, AT&amp;T<br/> R4-1815865 Draft CR for 38.101-3 Intra-band EN-DC nominal carrier spacing for 30 kHz raster SPRINT Corporation<br/> R4-1815973 Draft CR to 38.101-3 rel. 15 to fix MSD issues for higher order EN-DC combinations<br/> R4-1816227 Draft CR on Power Class for inter band EN-DC within FR1 OPPO<br/> R4-1816233 Receiver requirements for intra-band EN-DC Qualcomm Incorporated</p> | 15.4.0 |
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|         |        |           |      |   |   | <p>R4-1816621 Introduction of maxUplinkDutyCycle to ENDC HPUE in FR1 OPPO</p> <p>R4-1816638 Pcmx computation and evaluation for inter band ENDC Qualcomm</p> <p>R4-1816178 Draft CR for correction for missing agreed DC combinations in Rel-15 for TS 38.101-3 NTT DOCOMO, INC.</p> <p>R4-1816197 Draft CR to TS38.101-3_Clarifications on MSD and UL configuration tables for EN-DC ZTE Corporation</p> <p>R4-1816198 Simplification of EN-DC and CA between FR1 and FR2 UE to UE co-ex table by adopting CA band approach Nokia, Nokia Shanghai Bell</p> <p>R4-1816202 Correction to interband EN-DC OOB emission requirements Nokia, Nokia Shanghai Bell</p> <p>R4-1816203 Receiver requirements for interband EN-DC Nokia, Nokia Shanghai Bell</p> <p>R4-1816207 Draft CR to 38.101-3 rel. 15 to fix MPR issue Apple GmbH</p> <p>R4-1816224 Draft CR for 38.101-3 NS_04 applicability for intra-band EN-DC SPRINT Corporation</p> <p>R4-1816231 Draft CR on output power dynamic for DC OPPO</p> <p>R4-1816237 Correction for Intra-band contiguous EN-DC A-MPR definition Nokia, Nokia Shanghai Bell</p> <p>R4-1816246 Draft CR to TS38.101-3: Corrections on TS for MSD calculations based on ENDC bands combination including of bands 1,3,8, n77, and n78 MediaTek Inc.</p> <p>R4-1816247 Draft CR 38-101-3 Corrections for EN-DC Single Uplink allowed Operation Skyworks Solutions Inc.</p> <p>R4-1816250 draft CR for adding note about the fallback of EN-DC in Applicability of minimum requirements for TS 38.101-3 NTT DOCOMO, INC.</p> <p>R4-1816608 Draft CR on LTE RMC for TDD EN-DC UE RF Tests Qualcomm Incorporated</p> <p>R4-1816613 Draft CR for reducing AMPR for DC_(n)71AA without Dynamic Power Sharing" Motorola Mobility, T-Mobile"</p> |        |
| 2018-12 | RAN#82 | RP-182773 | 0033 | 1 | F | Completion of configured maximum output power for intra-band contiguous EN-DC   | 15.4.0 |
| 2018-12 | RAN#82 | RP-182774 | 0034 | 1 | F | Configured maximum output power for intra-band non-contiguous EN-DC   | 15.4.0 |



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| 2019-03 | RAN#83 | RP-190403 | 0035 | F | <p>CR to TS 38.101-3: Implementation of endorsed draft CRs from RAN4#90</p> <p>Endorced draft CRs from RAN4#90<br/> R4-1900034, Editorial corrections for 38.101-3, Qualcomm Incorporated<br/> R4-1900460, Draft CR to TS38.101-3_corrections on MSD, ZTE Corporation<br/> R4-1900461, Draft CR to TS38.101-3_inter-band NR DC between FR1 and FR2, ZTE Corporation<br/> R4-1900524, Draft CR to TS 38.101-3 on inter-band CA &amp; inter-band EN-DC configurations, ZTE Corporation<br/> R4-1900529, Draft CR to TS 38.101-3 on Single Uplink Allowed for EN-DC combinations of order 3 or higher, ZTE Corporation<br/> R4-1900726, Editorial corrections to delta Tib for EN-DC, Rohde &amp; Schwarz<br/> R4-1901359, draft CR for correction for missing operating band for EN-DC, NTT DOCOMO INC.<br/> R4-1901428, draft CR to make editorial corrections in 38-101-3 Rel-15, Ericsson<br/> R4-1901848, Draft CR for 38.101-3: Addition of default power class, Sprint Corporation<br/> R4-1901850, Draft CR for 38.101-3: Intra-band P<sub>cmx</sub> P<sub>EN-DC</sub>_Total for non-DPS UEs, Sprint Corporation<br/> R4-1901851, Draft CR for 38.101-3: Intra-band P<sub>cmx</sub> Editorial corrections, Sprint Corporation<br/> R4-1901874, Guardband for harmonic exception to reference sensitivity, Qualcomm Incorporated<br/> R4-1901878, Non-simultaneous Tx/Rx for TDD intra-band EN-DC, Qualcomm Incorporated<br/> R4-1901890, A-MPR for DC<sub>(n)</sub>71AA without Dynamic Power Sharing, Motorola Mobility France S.A.S<br/> R4-1901926, Draft CR to 38.101-3 to clarify ACS2 wanted level, Qualcomm Incorporated<br/> R4-1901997, draft_CR TS 38.101-3 type 2 UE DC<sub>(n)</sub>41 and DC_41_n41 NS04 AMPR correction, Skyworks Solutions Inc.<br/> R4-1902002, Draft CR to 38.101-3 on DC<sub>n</sub>41-41 – B40 coexistence, Qualcomm Incorporated<br/> R4-1902154, Draft CR to TS38.101-3_clean up on inter-band CA between FR1 and FR2, ZTE Corporation<br/> R4-1902155, Draft CR for TS 38.101-3: Corrections to Table 7.3B.2.3.5.1-1 for reference sensitivity exceptions (two bands), MediaTek Inc.<br/> R4-1902156, draftCR corrections for TS 38.101-3, Huawei<br/> R4-1902157, CR on intraband ENDC channel configurations, Intel Corporation<br/> R4-1902160, Draft CR on some errors to TS 38.101-3, Huawei<br/> R4-1902161, CR to 38.101-3 to clarify non-simultaneous RXTX capability for co-bands, Qualcomm Incorporated<br/> R4-1902163, Draft CR to 38.101-3 to clarify DL carrier levels for bands in close frequency proximity, Qualcomm Incorporated<br/> R4-1902164, Draft CR to reflect agreed MSD analysis of DC_25A-n41A for TS 38.101-3, MediaTek Inc.<br/> R4-1902169, draft CR for inter-band EN-DC P<sub>cmx</sub>, Huawei<br/> R4-1902172, Draft CR ACLR for NC intra-band EN-DC, Skyworks Solutions Inc.<br/> R4-1902176, Draft CR for 38.101-3 modification of requirements for intra-band non-contiguous EN-DC SEM, Huawei<br/> R4-1902179, draft CR for introduction of Tx IM for Inter-band EN-DC in TS38.101-3, NTT DOCOMO, INC.<br/> R4-1902182, Clarification for OOB boundary for intra-band contiguous and non-contiguous EN-DC, vivo<br/> R4-1902195, draft_CR TS 38.101-3 Footnote correction in Table 7.3B.2.3.1-2, Skyworks Solutions Inc.<br/> R4-1902232, Draft CR on SUL band combinations to TS 38.101-3, Huawei<br/> R4-1902478, Addition of power class 2 EN-DC ACLR requirement, Nokia<br/> R4-1902481, draftCR on inter-band EN-DC Rx requirement for TS 38.101-3, Huawei<br/> R4-1902486, Draft CR for 38.101-3 modification of requirements for network signalled value NS_04, Huawei<br/> R4-1902496, Draft CR for TS 38.101-3: Switching time for intra-band EN-DC upon dual PA UE capability, Huawei<br/> R4-1902500, Draft CR for 38.101-3: adding MPR for intra-band ENDC, Skyworks Solutions Inc<br/> R4-1902660, Introduction of modified MPR for 38.101-3, Nokia</p> | 15.5.0 |
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|  |  |  |  |  |  | Editorial changes after RAN#83<br>To align the annex numbering with other specifications (TS 38.101-x series), 'Modified MPR behavior' was moved to annex H. |  |
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## History

| <b>Document history</b> |              |             |
|-------------------------|--------------|-------------|
| V15.2.0                 | July 2018    | Publication |
| V15.3.0                 | October 2018 | Publication |
| V15.4.0                 | April 2019   | Publication |
| V15.5.0                 | May 2019     | Publication |
|                         |              |             |