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Technical Specification

3rd Generation Partnership Project;
Technical Specification Group Radio Access Network;
NR;
User Equipment (UE) radio transmission and reception;
Part 3: Range 1 and Range 2 Interworking operation with other radios
(Release 15)

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Contents

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:

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

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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.

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"

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) ≥ 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	*RF reference frequency* for the carrier center on the channel raster
F_{DL_low}	The lowest frequency of the downlink *operating band*
F_{DL_high}	The highest frequency of the downlink *operating band*
F_{UL_low}	The lowest frequency of the uplink *operating band*
F_{UL_high}	The highest frequency of the uplink *operating band*
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

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 apecified E-UTRA bandwidth combination set that belong to the E-UTRA CA configuration part of E-UTRA – NR DC and shall support all apecified 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 2nd 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[1]	n71, n257
CA_n77-n257[1]	n77, n257
CA_n78-n257[1]	n78, n257
CA_n79-n257[1]	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[3]
DC_(n)41[4]	41	n41	Yes[1]
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[1]
DC_41_n41[2]	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[3]	1	n77	DC_1_n77
DC_1_n78[3]	1	n78	No
DC_1_n79[3]	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[3]	3	n77	DC_3_n77
DC_3_n78[3]	3	n78	DC_3_n78
DC_3_n79[3]	3	n79	No
DC_5_n40	5	n40	No
DC_5_n66	5	n66	DC_5_n66
DC_5_n78[3]	5	n78	No
DC_7_n28	7	n28	No
DC_7_n51	7	n51	No
DC_7_n78[3]	7	n78	No
DC_7-7_n78[3]	CA_7-7	n78	No
DC_8_n40	8	n40	No
DC_8_n77[3]	8	n77	No
DC_8_n78[3]	8	n78	No
DC_8_n79[3]	8	n79	No
DC_11_n77[3]	11	n77	No
DC_11_n78[3]	11	n78	No
DC_11_n79[3]	11	n79	No
DC_12_n5	12	n5	No
DC_12_n66	12	n66	No
DC_18_n77[3]	18	n77	No
DC_18_n78[3]	18	n78	No
DC_18_n79[3]	18	n79	No
DC_19_n77[3]	19	n77	No
DC_19_n78[3]	19	n78	No
DC_19_n79[3]	19	n79	No
DC_20_n8	20	n8	DC_20_n8
DC_20_n28[4]	20	n28	No
DC_20_n51	20	n51	No
DC_20_n77	20	n77	No
DC_20_n78[3]	20	n78	No
DC_21_n77[3]	21	n77	No
DC_21_n78[3]	21	n78	No
DC_21_n79[3]	21	n79	No

EN-DC band	E-UTRA Band	NR Band	Single UL allowed
DC_25_n41	25	n41	No
DC_26_n41[3]	26	n41	No
DC_26_n77[3]	26	n77	No
DC_26_n78[3]	26	n78	No
DC_26_n79[3]	26	n79	No
DC_28_n51	28	n51	No
DC_28_n77[3]	28	n77	No
DC_28_n78[3]	28	n78	No
DC_28_n79[3]	28	n79	No
DC_30_n5	30	n5	No
DC_30_n66	30	n66	No
DC_38_n78	38	n78	No
DC_39_n78[1,3]	39	n78	No
DC_39_n79[3]	39	n79	No
DC_40_n77	40	n77	No
DC_41_n77	41	n77	No
DC_41_n78	41	n78	No
DC_41_n79[2,3]	41	n79	No
DC_42_n51	42	n51	No
DC_42_n77[5]	42	n77	N/A
DC_42_n78[5]	42	n78	N/A
DC_42_n79[5]	42	n79	N/A
DC_66_n71	66	n71	No
DC_66_n5	66	n5	DC_66_n5
DC_66_n78	66	n78	No

NOTE 1: The frequency range above 3600 MHz for Band n78 is not used in this combination.
NOTE 2: The frequency range below 2506 MHz for Band 41 is not used in this combination.
NOTE 3: Applicable for UE supporting inter-band EN-DC with mandatory simultaneous Rx/Tx capability.
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.
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.

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[2]	CA_1-3	n77	
DC_1-3_n78[2]	CA_1-3	n78	
DC_1-3_n79[2]	CA_1-3	n79	
DC_1-5_n78[2]	CA_1-5	n78	
DC_1-7_n28[2]	CA_1-7	n28	
DC_1-7_n78 [2]	CA_1-7	n78	
DC_1-7-7_n78[2]	CA_1-7-7	n78	
DC_1-8_n78[2]	CA_1-8	n78	
DC_1-18_n77[2]	CA_1-18	n77	
DC_1-18_n78[2]	CA_1-18	n78	
DC_1-18_n79	CA_1-18	n79	
DC_1-19_n77[2]	CA_1-19	n77	
DC_1-19_n78[2]	CA_1-19	n78	
DC_1-19_n79[2]	CA_1-19	n79	
DC_1-20_n28[3]	CA_1-20	n28	
DC_1-20_n78[2]	CA_1-20	n78	
DC_1-21_n77[2]	CA_1-21	n77	
DC_1-21_n78[2]	CA_1-21	n78	
DC_1-21_n79[2]	CA_1-21	n79	
DC_1-28_n77[2]	CA_1-28	n77	
DC_1-28_n78[2]	CA_1-28	n78	
DC_1-28_n79	CA_1-28	n79	
DC_1_n28-n78[2]	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[2]	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[2]	CA_3-5	n78	
DC_3-7_n28	CA_3-7	n28	
DC_3-7_n78[2]	CA_3-7	n78	
DC_3-7-7_n78[2]	CA_3-7-7	n78	
DC_3-8_n78	CA_3-8	n78	
DC_3-19_n77[2]	CA_3-19	n77	
DC_3-19_n78[2]	CA_3-19	n78	

EN-DC Band	E-UTRA Band	NR Band	
DC_3-19_n79[2]	CA_3-19	n79	
DC_3-20_n28[2,3]	CA_3-20	n28	
DC_3-20_n78[2]	CA_3-20	n78	
DC_3-21_n77[2]	CA_3-21	n77	
DC_3-21_n78[2]	CA_3-21	n78	
DC_3-21_n79[2]	CA_3-21	n79	
DC_3-28_n78[2]	CA_3-28	n78	
DC_3_n28-n78[2]	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[2]	3	SUL_n78-n80	
DC_3_SUL_n78-n82[2]	3	SUL_n78-n82[1]	
DC_3_SUL_n79-n80[2]	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[3]	CA_7-20	n28	
DC_7-20_n78[2]	CA_7-20	n78	
DC_7-28_n78[2]	CA_7-28	n78	
DC_7_n28-n78[2]	7	CA_n28-n78	
DC_7-46_n78	CA_7-46	n78	
DC_8_SUL_n78-n81[2]	8	SUL_n78-n81	
DC_8_SUL_n79-n81[2]	8	SUL_n79-n81	
DC_12-30_n66	CA_12-30	n66	
DC_18-28_n77[2]	CA_18-28	n77	
DC_18-28_n78[2]	CA_18-28	n78	
DC_18-28_n79[2]	CA_18-28	n79	
DC_19-21_n77[2]	CA_19-21	n77	
DC_19-21_n78[2]	CA_19-21	n78	
DC_19-21_n79[2]	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[3]	20	CA_n28-n75	
DC_20_n28-n78[2,3]	20	CA_n28-n78	
DC_20_n75-n78[2]	20	CA_n75-n78	
DC_20_n76-n78[2]	20	CA_n76-n78	
DC_20_SUL_n78-n82[2]	20	SUL_n78-n82	

EN-DC Band	E-UTRA Band	NR Band	
DC_20_SUL_n78-n83[2]	20	SUL_n78-n83[1]	
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[2]	28	SUL_n78-n83	
DC_66_(n)71	CA_66-71	n71	
DC_66_SUL_n78-n86[2]	66	SUL_n78-n86	
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. NOTE 2: Applicable for UE supporting inter-band EN-DC with mandatory simultaneous Rx/Tx capability 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.			

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[1]	CA_1-3-5	n78	
DC_1-3-7_n28	CA_1-3-7	n28	
DC_1-3-7-7_n78[1]	CA_1-3-7-7	n78	
DC_1-3-7_n78[1]	CA_1-3-7	n78	
DC_1-3-8_n78[1]	CA_1-3-8	n78	
DC_1-3-28_n77[1]	CA_1-3-28	n77	
DC_1-3-28_n78[1]	CA_1-3-28	n78	
DC_1-3_n28-n78[1]	CA_1-3	CA_n28-n78	
DC_1-3-28_n79[1]	CA_1-3-28	n79	
DC_1-3-19_n77[1]	CA_1-3-19	n77	
DC_1-3-19_n78[1]	CA_1-3-19	n78	
DC_1-3-19_n79[1]	CA_1-3-19	n79	
DC_1-3-20_n28[2]	CA_1-3-20	n28	
DC_1-3-20_n78[1]	CA_1-3-20	n78	
DC_1-3-21_n77[1]	CA_1-3-21	n77	
DC_1-3-21_n78[1]	CA_1-3-21	n78	
DC_1-3-21_n79[1]	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[2]	CA_1-7-20	n28	
DC_1-7-20_n78[1]	CA_1-7-20	n78	
DC_1-7_n28-n78[1]	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[1]	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[1,2]	CA_1-20	CA_n28-n78	
DC_1-21-28_n77[1]	CA_1-21-28	n77	
DC_1-21-28_n78[1]	CA_1-21-28	n78	
DC_1-21-28_n79[1]	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	
DC_1-41-42-n79	CA_1-41-42	n79	

EN-DC Band	E-UTRA Band	NR Band	
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[2]	CA_3-7-20	n28	
DC_3-7-20_n78[1]	CA_3-7-20	n78	
DC_3-7-28_n78[1]	CA_3-7-28	n78	
DC_3-7_n28-n78[1]	CA_3-7	CA_n28-n78	
DC_3-19-21_n77[1]	CA_3-19-21	n77	
DC_3-19-21_n78[1]	CA_3-19-21	n78	
DC_3-19-21_n79[1]	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[1]	CA_3-19-42	n79	
DC_3-20_n28-n78[1,2]	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[1,2]	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[2]	CA_1-3-7-20	n28	
DC_1-3-7-20_n78[1]	CA_1-3-7-20	n78	
DC_1-3-7_n28-n78[1]	CA_1-3-7	CA_n28-n78	
DC_1-3-19-21_n77[1]	CA_1-3-19-21	n77	
DC_1-3-19-21_n78[1]	CA_1-3-19-21	n78	
DC_1-3-19-21_n79[1]	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[1,2]	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[1,2]	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[1,2]	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[1,2]	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[1]	CA_1-3	n257	
DC_1-5_n257[1]	CA_1-5	n257	
DC_1-7_n257[1]	CA_1-7	n257	
DC_1-7-7_n257[1]	CA_1-7-7	n257	
DC_1-8_n257	CA_1-8	n257	
DC_1-18_n257[1]	CA_1-18	n257	
DC_1-19_n257[1]	CA_1-19	n257	
DC_1-21_n257[1]	CA_1-21	n257	
DC_1-28_n257[1]	CA_1-28	n257	
DC_1-41_n257	CA_1-41	n257	
DC_1-42_n257	CA_1-42	n257	
DC_2-5_n257[1]	CA_2-5	n257	
DC_2-5_n260	CA_2-5	n260	
DC_2-12_n260	CA_2-12	n260	
DC_2-13_n257[1]	CA_2-13	n257	
DC_2-13_n260[1]	CA_2-13	n260	
DC_2-30_n260	CA_2-30	n260	
DC_2-66_n257[1]	CA_2-66	n257	
DC_2-66_n260	CA_2-66	n260	
DC_3-5_n257[1]	CA_3-5	n257	
DC_3-7_n257[1]	CA_3-7	n257	
DC_3-7-7_n257[1]	CA_3-7-7	n257	
DC_3-19_n257[1]	CA_3-19	n257	
DC_3-21_n257[1]	CA_3-21	n257	
DC_3-28_n257[1]	CA_3-28	n257	
DC_3-41_n257	CA_3-41	n257	
DC_3-42_n257[1]	CA_3-42	n257	
DC_5-7-7_n257[1]	CA_5-7-7	n257	
DC_5-7_n257[1]	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[1]	CA_13-66	n257	
DC_13-66_n260[1]	CA_13-66	n260	
DC_18-28_n257[1]	CA_18-28	n257	
DC_19-21_n257[1]	CA_19-21	n257	
DC_19-42_n257[1]	CA_19-42	n257	
DC_21-42_n257[1]	CA_21-42	n257	
DC_21-28_n257[1]	CA_21-28	n257	
DC_28-42_n257[1]	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[1]	CA_1-3-5	n257	
DC_1-3-7_n257[1]	CA_1-3-7	n257	
DC_1-3-7-7_n257	CA_1-3-7-7	n257	
DC_1-3-19_n257[1]	CA_1-3-19	n257	
DC_1-3-21_n257[1]	CA_1-3-21	n257	
DC_1-3-28_n257[1]	CA_1-3-28	n257	
DC_1-3-42_n257	CA_1-3-42	n257	
DC_1-5-7_n257[1]	CA_1-5-7	n257	
DC_1-5-7-7_n257	CA_1-5-7-7	n257	
DC_1-18-28_n257[1]	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[1]	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[1]	CA_3-5-7	n257	
DC_3-19-21_n257[1]	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[1]	CA_19-21-42	n257	
DC_21-28-42_n257[1]	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[1]	CA_1-3-5-7	n257	
DC_1-3-5-7-7_n257[1]	CA_1-3-5-7-7	n257	
DC_1-3-19-21_n257[1]	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[1]	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.

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

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.

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

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

		E-UTRA – NR configuration / Bandwidth combination set				
Downlink EN-DC configuration	Uplink EN-DC configurations	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		
		20	40, 50, 60, 80,100		120	1
			40, 50, 60, 80,100	20		
DC_(n)41CA	DC_(n)41AA[1], DC_41A_n41A[2]	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_(n)41DA	DC_(n)41AA[1], DC_41A_n41A[2]	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		
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

		E-UTRA – NR configuration / Bandwidth combination set				
Downlink EN-DC configuration	Uplink EN-DC configurations	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(1)		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,

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

- For NR operating bands with 15 kHz channel raster,

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

- For NR operating bands with 30 kHz channel raster,

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

where $BW_{LTE\_Channel}$ and $BW_{NR\_Channel}$ 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 bandwith 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	Bandwidth 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												0
		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												0
		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												0
		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												0
		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												0
		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												0
		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												0
		n257	See CA_n257E in Table 5.5A.1-2 in TS 38.101-2												
CA_n78C-n257F	CA_n78A-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-n257A	CA_n79A-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-n257D	CA_n79A-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-n257E	CA_n79A-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-n257F	CA_n79A-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-n257A	CA_n79A-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-n257D	CA_n79A-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-n257E	CA_n79A-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-n257F	CA_n79A-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[2]
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

EN-DC configuration	Uplink EN-DC configuration (NOTE 1)	E-UTRA configuration	NR configuration
DC_3A_n3A	DC_3A_n3A[2]	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 DC_1A_n77C	DC_1A_n77A	1A	n77A CA_n77C
DC_1A_n78A DC_1A_n78C	DC_1A_n78A	1A	n78A CA_n78C
DC_1A_n79A DC_1A_n79C	DC_1A_n79A	1A	n79A 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 DC_3A_n77C	DC_3A_n77A	3A	n77A CA_n77C
DC_3A_n78A DC_3A_n78C	DC_3A_n78A	3A	n78A CA_n78C
DC_3A_n79A DC_3A_n79C	DC_3A_n79A	3A	n79A 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 DC_19A_n77C	DC_19A_n77A	19A	n77A CA_n77C
DC_19A_n78A DC_19A_n78C	DC_19A_n78A	19A	n78A CA_n78C
DC_19A_n79A DC_19A_n79C	DC_19A_n79A	19A	n79A CA_n79C

EN-DC configuration	Uplink EN-DC configuration (NOTE 1)	E-UTRA configuration	NR configuration
DC_20A_n8A	DC_20A_n8A	20A	n8A
DC_20A_n28A[4]	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 DC_21A_n77C	DC_21A_n77A	21A	n77A CA_n77C
DC_21A_n78A DC_21A_n78C	DC_21A_n78A	21A	n78A CA_n78C
DC_21A_n79A DC_21A_n79C	DC_21A_n79A	21A	n79A 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 DC_28A_n77C	DC_28A_n77A	28A	n77A CA_n77C
DC_28A_n78A DC_28A_n78C	DC_28A_n78A	28A	n78A CA_n78C
DC_28A_n79A DC_28A_n79C	DC_28A_n79A	28A	n79A 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[3,4] DC_42A_n77C[3,4]	N/A	42A	n77A CA_n77C
DC_42A_n78A[3,4] DC_42A_n78C[3,4]	N/A	42A	n78A CA_n78C
DC_42A_n79A DC_42A_n79C	N/A	42A	n79A CA_n79C
DC_42C_n77A[3,4]	N/A	CA_42C	n77A
DC_42C_n78A[3,4]	N/A	CA_42C	n78A
DC_42C_n79A	N/A	CA_42C	n79A
DC_42C_n77C[3,4]	N/A	CA_42C	CA n77C
DC_42C_n78C[3,4]	N/A	CA_42C	CA n78C
DC_42C_n79C	N/A	CA_42C	CA n79C
DC_42D_n77A[3,4]	N/A	CA_42D	n77A
DC_42D_n78A[3,4]	N/A	CA_42D	n78A
DC_42D_n79A	N/A	CA_42D	n79A
DC_42E_n77A[3,4]	N/A	CA_42E	n77A

EN-DC configuration	Uplink EN-DC configuration (NOTE 1)	E-UTRA configuration	NR configuration
DC_42E_n78A[3,4]	N/A	CA_42E	n78A
DC_42E_n79A	N/A	CA_42E	n79A
DC_46A_n78A[2]	N/A	46A	n78A
DC_46C_n78A[2]	N/A	CA_46C	n78A
DC_46D_n78A[2]	N/A	CA_46D	n78A
DC_46E_n78A[2]	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 cong\figuration 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 DC_3A_n28A	CA_1A-3A	n28A
DC_1A-3A_n77A DC_1A-3A_n77C	DC_1A_n77A DC_3A_n77A	CA_1A-3A	n77A CA_n77C
DC_1A-3A_n78A DC_1A-3A_n78C	DC_1A_n78A DC_3A_n78A	CA_1A-3A	n78A CA_n78C
DC_1A-3A_n79A DC_1A-3A_n79C	DC_1A_n79A DC_3A_n79A	CA_1A-3A	n79A CA_n79C
DC_1A-3C_n78A	DC_1A_n78A DC_3A_n78A	CA_1A-3C	n78A
DC_1A-5A_n78A	DC_1A_n78A DC_5A_n78A	CA_1A-5A	n78A
DC_1A-7A_n28A	DC_1A_n28A DC_7A_n28A	CA_1A-7A	n28A
DC_1A-7A_n78A	DC_1A_n78A DC_7A_n78A	CA_1A-7A	n78A
DC_1A-7A-7A_n78A	DC_1A_n78A DC_7A_n78A	CA_1A-7A-7A	n78A
DC_1A-8A_n78A	DC_1A_n78A DC_8A_n78A	CA_1A-8A	n78A
DC_1A-18A_n77A	DC_1A_n77A DC_18A_n77A	CA_1A-18A	n77A
DC_1A-18A_n78A	DC_1A_n78A DC_18A_n78A	CA_1A-18A	n78A
DC_1A-18A_n79A	DC_1A_n79A DC_18A_n79A	CA_1A-18A	n79A
DC_1A-19A_n77A DC_1A-19A_n77C	DC_1A_n77A DC 19A_n77A	CA_1A-19A	n77A CA_n77C
DC_1A-19A_n78A DC_1A-19A_n78C	DC_1A_n78A DC_19A_n78A	CA_1A-19A	n78A CA_n78C
DC_1A-19A_n79A DC_1A-19A_n79C	DC_1A_n79A DC_19A_n79A	CA_1A-19A	n79A CA_n79C
DC_1A-19A_n77A	DC_1A_n77A DC 19A_n77A	CA_1A-19A	n77A
DC_1A-19A_n78A	DC_1A_n78A DC_19A_n78A	CA_1A-19A	n78A
DC_1A-19A_n79A	DC_1A_n79A DC_19A_n79A	CA_1A-19A	n79A
DC_1A-20A_n28A	DC_1A_n28A DC_20A_n28A	CA_1A-20A	n28A
DC_1A-20A_n78A	DC_1A_n78A DC_20A_n78A	CA_1A-20A	n78A
DC_1A-21A_n77A DC_1A-21A_n77C	DC_1A_n77A DC_21A_n77A	CA_1A-21A	n77A CA_n77C
DC_1A-21A_n78A DC_1A-21A_n78C	DC_1A_n78A DC_21A_n78A	CA_1A-21A	n78A CA_n78C
DC_1A-21A_n79A DC_1A-21A_n79C	DC_1A_n79A DC_21A_n79A	CA_1A-21A	n79A CA_n79C
DC_1A-21A_n77A	DC_1A_n77A DC_21A_n77A	CA_1A-21A	n77A
DC_1A-21A_n78A	DC_1A_n78A DC_21A_n78A	CA_1A-21A	n78A
DC_1A-21A_n79A	DC_1A_n79A DC_21A_n79A	CA_1A-21A	n79A
DC_1A-28A_n77A DC_1A-28A_n77C	DC_1A_n77A DC_28A_n77A	CA_1A-28A	n77A CA_n77C
DC_1A-28A_n78A DC_1A-28A_n78C	DC_1A_n78A DC_28A_n78A	CA_1A-28A	n78A CA_n78C
DC_1A-28A_n79A DC_1A-28A_n79C	DC_1A_n79A DC_28A_n79A	CA_1A-28A	n79A CA_n79C
DC_1A_n28A-n78A	DC_1A_n28A, 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 DC_1A-41C_n77A	DC_1A_n77A DC_41A_n77A DC_41C_n77A	CA_1A-41A CA_1A-41C	n77A
DC_1A-41A_n78A DC_1A-41C_n78A	DC_1A_n78A DC_41A_n78A DC_41C_n78A	CA_1A-41A CA_1A-41C	n78A
DC_1A-41C_n79A	DC_1A_n79A DC_41C_n79A	CA_1A-41C	n79A
DC_1A-42A_n77A DC_1A-42A_n77C	DC_1A_n77A	CA_1A-42A	n77A CA_n77C
DC_1A-42A_n78A DC_1A-42A_n78C	DC_1A_n78A	CA_1A-42A	n78A CA_n78C
DC_1A-42A_n79A DC_1A-42A_n79C	DC_1A_n79A	CA_1A-42A	n79A CA_n79C
DC_1A-42C_n77A DC_1A-42C_n77C	DC_1A_n77A	CA_1A-42C	n77A CA_n77C
DC_1A-42C_n78A DC_1A-42C_n78C	DC_1A_n78A	CA_1A-42C	n78A CA_n78C
DC_1A-42C_n79A DC_1A-42C_n79C	DC_1A_n79A	CA_1A-42C	n79A 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 DC_1A_n79A	1A	CA_n77A-n79A
DC_1A_n78A-n79A	DC_1A_n78A DC_1A_n79A	1A	CA_n78A-n79A
DC_1A_SUL_n78A-n84A	DC_1A_n78A, DC_1A_n84A_ULSUP-TDM_n78A, DC_1A_n84A_ULSUP-FDM_n78A	1A	SUL_n78A-n84A
DC_2A-5A_n66A	DC_2A_n66A DC_5A_n66A	CA_2A-5A	n66A
DC_2A-12A_n66A	DC_2A_n66A DC_12A_n66A	CA_2A-12A	n66A
DC_2A-30A_n66A	DC_2A_n66A DC_30A_n66A	CA_2A-30A	n66A
DC_2A-66A_n71A	DC_2A_n71A DC_66A_n71A	CA_2A-66A	n71A
DC_2A-(n)71AA	DC_2A_n71A DC_(n)71AA	CA_2A-71A	n71A
DC_3A_n3A-n77A	DC_3A_n77A DC_3A_n3A[2]	3A	CA_n3A-n77A
DC_3A_n3A-n78A	DC_3A_n78A DC_3A_n3A[2]	3A	CA_n3A-n78A
DC_3A-5A_n78A	DC_3A_n78A DC_5A_n78A	CA_3A-5A	n78A
DC_3A-7A-7A_n78A	DC_3A_n78A DC_7A_n78A	CA_3A-7A-7A	n78A
DC_3A-7A_n28A	DC_3A_n28A DC_7A_n28A	CA_3A-7A	n28A
DC_3A-7A_n78A	DC_3A_n78A DC_7A_n78A	CA_3A-7A	n78A
DC_3A-7C_n78A	DC_3A_n78A DC_7C_n78A	CA_3A-7C	n78A
DC_3C-7C_n78A	DC_3A_n78A DC_7C_n78A	CA_3C-7C	n78A
DC_3C-7A_n78A	DC_3A_n78A 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 DC_8A_n78A	CA_3A-8A	n78A
DC_3A-19A_n77A DC_3A-19A_n77C	DC_3A_n77A DC_19A_n77A	CA_3A-19A	n77A CA_n77C
DC_3A-19A_n78A DC_3A-19A_n78C	DC_3A_n78A DC_19A_n78A	CA_3A-19A	n78A CA_n78C
DC_3A-19A_n79A DC_3A-19A_n79C	DC_3A_n79A DC_19A_n79A	CA_3A-19A	n79A CA_n79C
DC_3A-20A_n28A	DC_3A_n28A DC_20A_n28A	CA_3A-20A	n28A
DC_3A-20A_n78A	DC_3A_n78A DC_20A_n78A	CA_3A-20A	n78A
DC_3C-20A_n78A	DC_3A_n78A DC_20A_n78A	CA_3C-20A	n78A
DC_3A-21A_n77A DC_3A-21A_n77C	DC_3A_n77A DC_21A_n77A	CA_3A-21A	n77A CA_n77C
DC_3A-21A_n78A DC_3A-21A_n78C	DC_3A_n78A DC_21A_n78A	CA_3A-21A	n78A CA_n78C
DC_3A-21A_n79A DC_3A-21A_n79C	DC_3A_n79A DC_21A_n79A	CA_3A-21A	n79A CA_n79C
DC_3A-28A_n77A DC_3A-28A_n77C	DC_3A_n77A DC_28A_n77A	CA_3A-28A	n77A CA_n77C
DC_3A-28A_n78A DC_3A-28A_n78C	DC_3A_n78A DC_28A_n78A	CA_3A-28A	n78A CA_n78C
DC_3A-28A_n79A DC_3A-28A_n79C	DC_3A_n79A DC_28A_n79A	CA_3A-28A	n79A CA_n79C
DC_3A_n28A-n78A	DC_3A_n28A, 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 DC_41A_n78A	CA_3A-41A	n78A
DC_3A-42A_n77A DC_3A-42A_n77C	DC_3A_n77A	CA_3A-42A	n77A CA_n77C
DC_3A-42A_n78A DC_3A-42A_n78C	DC_3A_n78A	CA_3A-42A	n78A CA_n78C
DC_3A-42A_n79A DC_3A-42A_n79C	DC_3A_n79A	CA_3A-42A	n79A CA_n79C
DC_3A-42C_n77A DC_3A-42C_n77C	DC_3A_n77A	CA_3A-42C	n77A CA_n77C
DC_3A-42C_n78A DC_3A-42C_n78C	DC_3A_n78A	CA_3A-42C	n78A CA_n78C
DC_3A-42C_n79A DC_3A-42C_n79C	DC_3A_n79A	CA_3A-42C	n79A 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 DC_3A_n79A	3A	CA_n77A-n79A
DC_3A_n78A-n79A	DC_3A_n78A DC_3A_n79A	3A	CA_n78A-n79A
DC_3A_SUL_n78A-n80A	DC_3A_n78A DC_3A_n80A_ULSUP-TDM_n78A DC_3A_n80A_ULSUP-FDM_n78A	3A	SUL_n78A-n80A
DC_3A_SUL_n78A-n82A	DC_3A_n78A DC_3A_n82A	3A	SUL_n78A-n82A
DC_3A_SUL_n79A-n80A	DC_3A_n79A, DC_3A_n80A_ULSUP-TDM_n79A, 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 DC_7A_n78A	CA_5A-7A-7A	n78A
DC_5A-7A_n78A	DC_5A_n78A DC_7A_n78A	CA_5A-7A	n78A
DC_5A-30A_n66A	DC_5A_n66A DC_30A_n66A	CA_5A-30A	n66A
DC_7A-20A_n28A	DC_7A_n28A DC_20A_n28A	CA_7A-20A	n28A
DC_7A-20A_n78A	DC_7A_n78A DC_20A_n78A	CA_7A-20A	n78A
DC_7A-28A_n78A	DC_7A_n78A DC_28A_n78A	CA_7A-28A	n78A
DC_7A_n28A-n78A	DC_7A_n28A, DC_7A_n78A	7A	CA_n28A-n78A
DC_7C-28A_n78A	DC_7C_n78A DC_28A_n78A	CA_7C-28A	n78A
DC_7A-46A_n78A[3]	DC_7A_n78A	CA_7A-46A	n78A
DC_7A-46C_n78A[3]	DC_7A_n78A	CA_7A-46C	n78A
DC_7A-46D_n78A[3]	DC_7A_n78A	CA_7A-46D	n78A
DC_7A-46E_n78A[3]	DC_7A_n78A	CA_7A-46E	n78A
DC_8A_SUL_n78A-n81A	DC_8A_n78A, DC_8A_n81A_ULSUP-TDM_n78A, DC_8A_n81A_ULSUP-FDM_n78A	8A	SUL_n78A-n81A
DC_8A_SUL_n79A-n81A	DC_8A_n79A, DC_8A_n81A_ULSUP-TDM_n79A, DC_8A_n81A_ULSUP-FDM_n79A	8A	SUL_n79A-n81A
DC_12A-30A_n66A	DC_12A_n66A DC_30A_n66A	CA_12A-30A	n66A
DC_18A-28A_n77A	DC_18A_n77A DC_28A_n77A	CA_18A-28A	n77A
DC_18A-28A_n78A	DC_18A_n78A DC_28A_n78A	CA_18A-28A	n78A
DC_18A-28A_n79A	DC_18A_n79A DC_28A_n79A	CA_18A-28A	n79A
DC_19A-21A_n78A DC_19A-21A_n78C	DC_19A_n78A DC_21A_n78A	CA_19A-21A	n78A CA_n78C
DC_19A-21A_n79A DC_19A-21A_n79C	DC_19A_n79A DC_21A_n79A	CA_19A-21A	n79A CA_n79C
DC_19A-21A_n77A DC_19A-21A_n77C	DC_19A_n77A DC_21A_n77A	CA_19A-21A	n77A CA_n77C
DC_19A-42A_n77A DC_19A-42A_n77C	DC_19A_n77A	CA_19A-42A	n77A CA_n77C
DC_19A-42A_n78A DC_19A-42A_n78C	DC_19A_n78A	CA_19A-42A	n78A CA_n78C
DC_19A-42A_n79A DC_19A-42A_n79C	DC_19A_n79A	CA_19A-42A	n79A CA_n79C
DC_19A-42C_n77A DC_19A-42C_n77C	DC_19A_n77A	CA_19A-42C	n77A CA_n77C
DC_19A-42C_n78A DC_19A-42C_n78C	DC_19A_n78A	CA_19A-42C	n78A CA_n78C
DC_19A-42C_n79A DC_19A-42C_n79C	DC_19A_n79A	CA_19A-42C	n79A CA_n79C
DC_19A_n77A-n79A	DC_19A_n77A DC_19A_n79A	19A	CA_n77A-n79A
DC_19A_n78A-n79A	DC_19A_n78A 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 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, DC_20A_n82A_ULSUP-TDM_n78A, DC_20A_n82A_ULSUP-FDM_n78A	20A	SUL_n78A-n82A
DC_20A_SUL_n78A-n83A	DC_20A_n78A DC_20A_n83A	20A	SUL_n78A-n83A
DC_21A-28A_n77A DC_21A-28A_n77C	DC_21A_n77A DC_28A_n77A	CA_21A-28A	n77A CA_n77C
DC_21A-28A_n78A DC_21A-28A_n78C	DC_21A_n78A DC_28A_n78A	CA_21A-28A	n78A CA_n78C
DC_21A-28A_n79A DC_21A-28A_n79C	DC_21A_n79A DC_28A_n79A	CA_21A-28A	n79A CA_n79C
DC_21A-42A_n77A DC_21A-42A_n77C	DC_21A_n77A	CA_21A-42A	n77A CA_n77C
DC_21A-42A_n78A DC_21A-42A_n78C	DC_21A_n78A	CA_21A-42A	n78A CA_n78C
DC_21A-42A_n79A DC_21A-42A_n79C	DC_21A_n79A	CA_21A-42A	n79A CA_n79C
DC_21A-42C_n77A DC_21A-42C_n77C	DC_21A_n77A	CA_21A-42C	n77A CA_n77C
DC_21A-42C_n78A DC_21A-42C_n77C	DC_21A_n78A	CA_21A-42C	n78A CA_n78C
DC_21A-42C_n79A DC_21A-42C_n77C	DC_21A_n79A	CA_21A-42C	n79A CA_n79C
DC_21A_n77A-n79A	DC_21A_n77A DC_21A_n79A	21A	CA_n77A-n79A
DC_21A_n78A-n79A	DC_21A_n78A DC_21A_n79A	21A	CA_n78A-n79A
DC_28A_SUL_n78A-n83A	DC_28A_n78A, DC_28A_n83A_ULSUP-TDM_n78A, DC_28A_n83A_ULSUP-FDM_n78A	28A	SUL_n78A-n83A
DC_28A-42A_n77A DC_28A-42A_n77C	DC_28A_n77A	CA_28A-42A	n77A CA_n77C
DC_28A-42A_n78A DC_28A-42A_n78C	DC_28A_n78A	CA_28A-42A	n78A CA_n78C
DC_28A-42A_n79A DC_28A-42A_n79C	DC_28A_n79A	CA_28A-42A	n79A 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 DC_41A-42C_n79A	DC_41A_n79A	CA_41A-42A 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 DC_(n)71AA	CA_66A_71A	n71A
DC_66A_SUL_n78A-n86A	DC_66A_n78A, DC_66A_n86A_ULSUP-TDM_n78A, DC_66A_n86A_ULSUP-FDM_n78A	66A	SUL_n78A-n86A

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

EN-DC configuration	Uplink EN-DC configuration (NOTE 1)	E-UTRA configuration	NR configuration
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.			

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 DC_3A_n78A DC_5A_n78A	CA_1A-3A-5A	n78A
DC_1A-3A-7A_n28A	DC_1A_n28A DC_3A_n28A DC_7A_n28A	CA_1A-3A-7A	n28A
DC_1A-3A-7A_n78A	DC_1A_n78A DC_3A_n78A DC_7A_n78A	CA_1A-3A-7A	n78A
DC_1A-3C-7A_n78A	DC_1A_n78A DC_3A_n78A DC_7A_n78A	CA_1A-3C-7A	n78A
DC_1A-3A-7A-7A_n78A	DC_1A_n78A DC_3A_n78A DC_7A_n78A	CA_1A-3A-7A-7A	n78A
DC_1A-3A-8A_n78A	DC_1A_n78A DC_3A_n78A DC_8A_n78A	CA_1A-3A-8A	n78A
DC_1A-3A-19A_n77A DC_1A-3A-19A_n77C	DC_1A_n77A DC_3A_n77A DC_19A_n77A	CA_1A-3A-19A	n77A CA_n77C
DC_1A-3A-19A_n78A DC_1A-3A-19A_n78C	DC_1A_n78A DC_3A_n78A DC_19A_n78A	CA_1A-3A-19A	n78A CA_n78C
DC_1A-3A-19A_n79A DC_1A-3A-19A_n79C	DC_1A_n79A DC_3A_n79A DC_19A_n79A	CA_1A-3A-19A	n79A CA_n79C
DC_1A-3A-20A_n28A	DC_1A_n28A DC_3A_n28A DC_20A_n28A	CA_1A-3A-20A	n28A
DC_1A-3A-20A_n78A	DC_1A_n78A DC_3A_n78A DC_20A_n78A	CA_1A-3A-20A	n78A
DC_1A-3A-21A_n77A DC_1A-3A-21A_n77C	DC_1A_n77A DC_3A_n77A DC_21A_n77A	CA_1A-3A-21A	n77A CA_n77C
DC_1A-3A-21A_n78A DC_1A-3A-21A_n78C	DC_1A_n78A DC_3A_n78A DC_21A_n78A	CA_1A-3A-21A	n78A CA_n78C
DC_1A-3A-21A_n79A DC_1A-3A-21A_n79C	DC_1A_n79A DC_3A_n79A DC_21A_n79A	CA_1A-3A-21A	n79A CA_n79C
DC_1A-3A-28A_n77A	DC_1A_n77A DC_3A_n77A DC_28A_n77A	CA_1A-3A-28A	n77A
DC_1A-3A-28A_n78A	DC_1A_n78A DC_3A_n78A DC_28A_n78A	CA_1A-3A-28A	n78A
DC_1A-3A-28A_n79A	DC_1A_n79A DC_3A_n79A DC_28A_n79A	CA_1A-3A-28A	n79A
DC_1A-3A_n28A-n78A	DC_1A_n28A DC_1A_n78A DC_3A_n28A DC_3A_n78A	CA_1A-3A	CA_n28A-n78A
DC_1A-3A-42A_n77A DC_1A-3A-42A_n77C	DC_1A_n77A DC_3A_n77A	CA_1A-3A-42A	n77A CA_n77C
DC_1A-3A-42A_n78A DC_1A-3A-42A_n78C	DC_1A_n78A DC_3A_n78A	CA_1A-3A-42A	n78A CA_n78C
DC_1A-3A-42A_n79A DC_1A-3A-42A_n79C	DC_1A_n79A DC_3A_n79A	CA_1A-3A-42A	n79A CA_n79C

EN-DC configuration	Uplink EN-DC configuration (NOTE 1)	E-UTRA configuration	NR configuration
DC_1A-3A-42C_n77A	DC_1A_n77A DC_3A_n77A	CA_1A-3A-42C	n77A
DC_1A-3A-42C_n78A	DC_1A_n78A DC_3A_n78A	CA_1A-3A-42C	n78A
DC_1A-3A-42C_n79A	DC_1A_n79A DC_3A_n79A	CA_1A-3A-42C	n79A
DC_1A-3A-42C_n77C	DC_1A_n77A DC_3A_n77A	CA_1A-3A-42C	CA_n77C
DC_1A-3A-42C_n78C	DC_1A_n78A DC_3A_n78A	CA_1A-3A-42C	CA_n78C
DC_1A-3A-42C_n79C	DC_1A_n79A DC_3A_n79A	CA_1A-3A-42C	CA_n79C
DC_1A-5A-7A_n78A	DC_1A_n78A DC_5A_n78A DC_7A_n78A	CA_1A-5A-7A	n78A
DC_1A-5A-7A-7A_n78A	DC_1A_n78A DC_5A_n78A DC_7A_n78A	CA_1A-5A-7A-7A	n78A
DC_1A-7A-20A_n28A	DC_1A_n28A DC_7A_n28A DC_20A_n28A	CA_1A-7A-20A	n28A
DC_1A-7A-20A_n78A	DC_1A_n78A DC_7A_n78A DC_20A_n78A	CA_1A-7A-20A	n78A
DC_1A-7A_n28A-n78A	DC_1A_n28A DC_1A_n78A DC_7A_n28A DC_7A_n78A	CA_1A-7A	CA_n28A-n78A
DC_1A-18A-28A_n77A	DC_1A_n77A DC_18A_n77A DC_28A_n77A	CA_1A-18A-28A	n77A
DC_1A-18A-28A_n78A	DC_1A_n78A DC_18A_n78A DC_28A_n78A	CA_1A-18A-28A	n78A
DC_1A-18A-28A_n79A	DC_1A_n79A DC_18A_n79A DC_28A_n79A	CA_1A-18A-28A	n79A
DC_1A-19A-21A_n77A DC_1A-19A-21A_n77C	DC_1A_n77A DC_19A_n77A DC_21A_n77A	CA_1A-19A-21A	CA_n77A CA_n77C
DC_1A-19A-21A_n78A DC_1A-19A-21A_n78C	DC_1A_n78A DC_19A_n78A DC_21A_n78A	CA_1A-19A-21A	CA_n78A CA_n78C
DC_1A-19A-21A_n79A DC_1A-19A-21A_n79C	DC_1A_n79A DC_19A_n79A DC_21A_n79A	CA_1A-19A-21A	CA_n79A CA_n79C
DC_1A-19A-42A_n77A DC_1A-19A-42A_n77C	DC_1A_n77A DC_19A_n77A	CA_1A-19A-42A	n77A CA_n77C
DC_1A-19A-42A_n78A DC_1A-19A-42A_n78C	DC_1A_n78A DC_19A_n78A	CA_1A-19A-42A	n78A CA_n78C
DC_1A-19A-42A_n79A DC_1A-19A-42A_n79C	DC_1A_n79A DC_19A_n79A	CA_1A-19A-42A	n79A CA_n79C
DC_1A-19A-42C_n77A	DC_1A_n77A DC_19A_n77A	CA_1A-19A-42C	n77A
DC_1A-19A-42C_n78A	DC_1A_n78A DC_19A_n78A	CA_1A-19A-42C	n78A
DC_1A-19A-42C_n79A	DC_1A_n79A DC_19A_n79A	CA_1A-19A-42C	n79A
DC_1A-19A-42C_n77C	DC_1A_n77A DC_19A_n77A	CA_1A-19A-42C	CA_n77C
DC_1A-19A-42C_n78C	DC_1A_n78A DC_19A_n78A	CA_1A-19A-42C	CA_n78C
DC_1A-19A-42C_n79C	DC_1A_n79A 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 DC_1A_n78A DC_20A_n28A DC_20A_n78A	CA_1A-20A	CA_n28A-n78A
DC_1A-21A-28A_n77A	DC_1A_n77A DC_21A_n77A DC_28A_n77A	CA_1A-21A-28A	n77A
DC_1A-21A-28A_n78A	DC_1A_n78A DC_21A_n78A DC_28A_n78A	CA_1A-21A-28A	n78A
DC_1A-21A-28A_n79A	DC_1A_n79A DC_21A_n79A DC_28A_n79A	CA_1A-21A-28A	n79A
DC_1A-21A-42A_n77A DC_1A-21A-42A_n77C	DC_1A_n77A DC_21A_n77A	CA_1A-21A-42A	n77A CA_n77C
DC_1A-21A-42A_n78A DC_1A-21A-42A_n78C	DC_1A_n78A DC_21A_n78A	CA_1A-21A-42A	n78A CA_n78C
DC_1A-21A-42A_n79A DC_1A-21A-42A_n79C	DC_1A_n79A DC_21A_n79A	CA_1A-21A-42A	n79A CA_n79C
DC_1A-21A-42C_n77A	DC_1A_n77A DC_21A_n77A	CA_1A-21A-42C	n77A
DC_1A-21A-42C_n78A	DC_1A_n78A DC_21A_n78A	CA_1A-21A-42C	n78A
DC_1A-21A-42C_n79A	DC_1A_n79A DC_21A_n79A	CA_1A-21A-42C	n79A
DC_1A-21A-42C_n77C	DC_1A_n77A DC_21A_n77A	CA_1A-21A-42C	CA_n77C
DC_1A-21A-42C_n78C	DC_1A_n78A DC_21A_n78A	CA_1A-21A-42C	CA_n78C
DC_1A-21A-42C_n79C	DC_1A_n79A DC_21A_n79A	CA_1A-21A-42C	CA_n79C
DC_1A-28A-42A_n77A	DC_1A_n77A DC_28A_n77A	CA_1A-28A-42A	n77A
DC_1A-28A-42A_n78A	DC_1A_n78A DC_28A_n78A	CA_1A-28A-42A	n78A
DC_1A-28A-42A_n79A	DC_1A_n79A DC_28A_n79A	CA_1A-28A-42A	n79A
DC_1A-28A-42C_n77A	DC_1A_n77A DC_28A_n77A	CA_1A-28A-42C	n77A
DC_1A-28A-42C_n78A	DC_1A_n78A DC_28A_n78A	CA_1A-28A-42C	n78A
DC_1A-28A-42C_n79A	DC_1A_n79A DC_28A_n79A	CA_1A-28A-42C	n79A
DC_1A-41A-42A_n77A	DC_1A_n77A DC_41A_n77A	CA_1A-41A-42A	n77A
DC_1A-41A-42C_n77A	DC_1A_n77A DC_41A_n77A	CA_1A-41A-42C	n77A
DC_1A-41C-42A_n77A	DC_1A_n77A DC_41A_n77A	CA_1A-41C-42A	n77A
DC_1A-41A-42A_n78A	DC_1A_n78A DC_41A_n78A	CA_1A-41A-42A	n78A
DC_1A-41A-42C_n78A	DC_1A_n78A DC_41A_n78A	CA_1A-41A-42C	n78A
DC_1A-41C-42A_n78A	DC_1A_n78A DC_41A_n78A	CA_1A-41C-42A	n78A
DC_1A-41A-42A_n79A	DC_1A_n79A DC_41A_n79A	CA_1A-41A-42A	n79A
DC_1A-41A-42C_n79A	DC_1A_n79A DC_41A_n79A	CA_1A-41A-42C	n79A
DC_1A-41C-42A_n79A	DC_1A_n79A DC_41A_n79A	CA_1A-41C-42A	n79A
DC_1A-41C-42C_n77A	DC_1A_n77A DC_41A_n77A	CA_1A-41C-42C	n77A
DC_1A-41C-42C_n78A	DC_1A_n78A	CA_1A-41C-42C	n78A

EN-DC configuration	Uplink EN-DC configuration (NOTE 1)	E-UTRA configuration	NR configuration
	DC_41A_n78A		

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

EN-DC configuration	Uplink EN-DC configuration (NOTE 1)	E-UTRA configuration	NR configuration
DC_3A-21A-42C_n77C	DC_3A_n77A DC_21A_n77A	CA_3A-21A-42C	CA_n77C
DC_3A-21A-42C_n78C	DC_3A_n78A DC_21A_n78A	CA_3A-21A-42C	CA_n78C
DC_3A-21A-42C_n79C	DC_3A_n79A DC_21A_n79A	CA_3A-21A-42C	CA_n79C
DC_3A-28A-42A_n77A	DC_3A_n77A DC_28A_n77A	CA_3A-28A-42A	n77A
DC_3A-28A-42A_n78A	DC_3A_n78A DC_28A_n78A	CA_3A-28A-42A	n78A
DC_3A-28A-42A_n79A	DC_3A_n79A DC_28A_n79A	CA_3A-28A-42A	n79A
DC_3A-28A-42C_n77A	DC_3A_n77A DC_28A_n77A	CA_3A-28A-42C	n77A
DC_3A-28A-42C_n78A	DC_3A_n78A DC_28A_n78A	CA_3A-28A-42C	n78A
DC_3A-28A-42C_n79A	DC_3A_n79A DC_28A_n79A	CA_3A-28A-42C	n79A
DC_7A-20A_n28A-n78A	DC_7A_n28A DC_7A_n78A DC_20A_n28A DC_20A_n78A	CA_7A-20A	CA_n28A-n78A
DC_19A-21A-42A_n77A DC_19A-21A-42A_n77C	DC_19A_n77A DC_21A_n77A	CA_19A-21A-42A	n77A CA_n77C
DC_19A-21A-42A_n78A DC_19A-21A-42A_n78C	DC_19A_n78A DC_21A_n78A	CA_19A-21A-42A	n78A CA_n78C
DC_19A-21A-42A_n79A DC_19A-21A-42A_n79C	DC_19A_n79A DC_21A_n79A	CA_19A-21A-42A	n79A CA_n79C
DC_19A-21A-42C_n77A	DC_19A_n77A DC_21A_n77A	CA_19A-21A-42C	n77A
DC_19A-21A-42C_n78A	DC_19A_n78A DC_21A_n78A	CA_19A-21A-42C	n78A
DC_19A-21A-42C_n79A	DC_19A_n79A DC_21A_n79A	CA_19A-21A-42C	n79A
DC_19A-21A-42C_n77C	DC_19A_n77A DC_21A_n77A	CA_19A-21A-42C	CA_n77C
DC_19A-21A-42C_n78C	DC_19A_n78A DC_21A_n78A	CA_19A-21A-42C	CA_n78C
DC_19A-21A-42C_n79C	DC_19A_n79A DC_21A_n79A	CA_19A-21A-42C	CA_n79C
DC_21A-28A-42A_n77A	DC_21A_n77A DC_28A_n77A	CA_21A-28A-42A	n77A
DC_21A-28A-42A_n78A	DC_21A_n78A DC_28A_n78A	CA_21A-28A-42A	n78A
DC_21A-28A-42A_n79A	DC_21A_n79A DC_28A_n79A	CA_21A-28A-42A	n79A
DC_21A-28A-42C_n77A	DC_21A_n77A DC_28A_n77A	CA_21A-28A-42C	n77A
DC_21A-28A-42C_n78A	DC_21A_n78A DC_28A_n78A	CA_21A-28A-42C	n78A
DC_21A-28A-42C_n79A	DC_21A_n79A 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 DC_3A_n78A DC_5A_n78A DC_7A_n78A	CA_1A-3A-5A-7A	n78A
DC_1A-3A-7A-20A_n28A	DC_1A_n28A DC_3A_n28A DC_7A_n28A DC_20A_n28A	CA_1A-3A-7A-20A	n28A
DC_1A-3A-5A-7A-7A_n78A	DC_1A_n78A DC_3A_n78A DC_5A_n78A DC_7A_n78A	CA_1A-3A-5A-7A-7A	n78A
DC_1A-3A-7A-20A_n78A	DC_1A_n78A DC_3A_n78A DC_7A_n78A DC_20A_n78A	CA_1A-3A-7A-20A	n78A
DC_1A-3A-7A_n28A-n78A	DC_1A_n28A DC_1A_n78A DC_3A_n28A DC_3A_n78A DC_7A_n28A DC_7A_n78A	CA_1A-3A-7A	CA_n28A-n78A
DC_1A-3A-19A-21A_n77A	DC_1A_n77A DC_3A_n77A DC_19A_n77A DC_21A_n77A	CA_1A-3A-19A-21A	n77A
DC_1A-3A-19A-21A_n77C	DC_1A_n77A DC_3A_n77A DC_19A_n77A DC_21A_n77A	CA_1A-3A-19A-21A	CA_n77C
DC_1A-3A-19A-21A_n78A	DC_1A_n78A DC_3A_n78A DC_19A_n78A DC_21A_n78A	CA_1A-3A-19A-21A	n78A
DC_1A-3A-19A-21A_n78C	DC_1A_n78A DC_3A_n78A DC_19A_n78A DC_21A_n78A	CA_1A-3A-19A-21A	CA_n78C
DC_1A-3A-19A-21A_n79A	DC_1A_n79A DC_3A_n79A DC_19A_n79A DC_21A_n79A	CA_1A-3A-19A-21A	n79A
DC_1A-3A-19A-21A_n79C	DC_1A_n79A DC_3A_n79A DC_19A_n79A DC_21A_n79A	CA_1A-3A-19A-21A	CA_n79C
DC_1A-3A-19A-42A_n77A	DC_1A_n77A DC_3A_n77A DC_19A_n77A	CA_1A-3A-19A-42A	n77A
DC_1A-3A-19A-42A_n77C	DC_1A_n77A DC_3A_n77A DC_19A_n77A	CA_1A-3A-19A-42A	CA_n77C
DC_1A-3A-19A-42C_n77A	DC_1A_n77A DC_3A_n77A DC_19A_n77A	CA_1A-3A-19A-42C	n77A
DC_1A-3A-19A-42C_n77C	DC_1A_n77A DC_3A_n77A DC_19A_n77A	CA_1A-3A-19A-42C	CA_n77C
DC_1A-3A-19A-42A_n78A	DC_1A_n78A DC_3A_n78A DC_19A_n78A	CA_1A-3A-19A-42A	n78A

EN-DC configuration	Uplink EN-DC configuration (NOTE 1)	E-UTRA configuration	NR configuration
DC_1A-3A-19A-42A_n78C	DC_1A_n78A DC_3A_n78A DC_19A_n78	CA_1A-3A-19A-42A	CA_n78C
DC_1A-3A-19A-42C_n78A	DC_1A_n78A DC_3A_n78A DC_19A_n78A	CA_1A-3A-19A-42C	n78A
DC_1A-3A-19A-42C_n78C	DC_1A_n78A DC_3A_n78A DC_19A_n78A	CA_1A-3A-19A-42C	CA_n78C
DC_1A-3A-19A-42A_n79A	DC_1A_n79A DC_3A_n79A DC_19A_n79A	CA_1A-3A-19A-42A	n79A
DC_1A-3A-19A-42A_n79C	DC_1A_n79A DC_3A_n79A DC_19A_n79A	CA_1A-3A-19A-42A	CA_n79C
DC_1A-3A-19A-42C_n79A	DC_1A_n79A DC_3A_n79A DC_19A_n79A	CA_1A-3A-19A-42C	n79A
DC_1A-3A-19A-42C_n79C	DC_1A_n79A DC_3A_n79A DC_19A_n79A	CA_1A-3A-19A-42C	CA_n79C
DC_1A-3A-20A_n28A-n78A	DC_1A_n28A DC_1A_n78A DC_3A_n28A DC_3A_n78A DC_20A_n28A DC_20A_n78A	CA_1A-3A-20A	CA_n28A-n78A
DC_1A-3A-21A-42A_n77A DC_1A-3A-21A-42A_n77C	DC_1A_n77A DC_3A_n77A DC_21A_n77A	CA_1A-3A-21A-42A	n77A CA_n77C
DC_1A-3A-21A-42A_n78A DC_1A-3A-21A-42A_n78C	DC_1A_n78A DC_3A_n78A DC_21A_n78A	CA_1A-3A-21A-42A	n78A CA_n78C
DC_1A-3A-21A-42A_n79A DC_1A-3A-21A-42A_n79C	DC_1A_n79A DC_3A_n79A DC_19A_n79A	CA_1A-3A-21A-42A	n79A CA_n79C
DC_1A-3A-21A-42C_n77A	DC_1A_n77A DC_3A_n77A DC_21A_n77A	CA_1A-3A-21A-42C	n77A
DC_1A-3A-21A-42C_n77C	DC_1A_n77A DC_3A_n77A DC_21A_n77A	CA_1A-3A-21A-42C	CA_n77C
DC_1A-3A-21A-42C_n78A	DC_1A_n78A DC_3A_n78A DC_21A_n78A	CA_1A-3A-21A-42C	n78A
DC_1A-3A-21A-42C_n78C	DC_1A_n78A DC_3A_n78A DC_21A_n78A	CA_1A-3A-21A-42C	CA_n78C
DC_1A-3A-21A-42C_n79A	DC_1A_n79A DC_3A_n79A DC_21A_n79A	CA_1A-3A-21A-42C	n79A
DC_1A-3A-21A-42C_n79C	DC_1A_n79A DC_3A_n79A DC_21A_n79A	CA_1A-3A-21A-42C	CA_n79C
DC_1A-3A-28A-42A_n77A	DC_1A_n77A DC_3A_n77A DC_28A_n77A	CA_1A-3A-28A-42A	n77A
DC_1A-3A-28A-42A_n78A	DC_1A_n78A DC_3A_n78A DC_28A_n78A	CA_1A-3A-28A-42A	n78A
DC_1A-3A-28A-42A_n79A	DC_1A_n79A DC_3A_n79A DC_28A_n79A	CA_1A-3A-28A-42A	n79A
DC_1A-3A-28A-42C_n77A	DC_1A_n77A	CA_1A-3A-28A-42C	n77A

EN-DC configuration	Uplink EN-DC configuration (NOTE 1)	E-UTRA configuration	NR configuration
	DC_3A_n77A DC_28A_n77A		

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

EN-DC configuration	Uplink EN-DC configuration (NOTE 1)	E-UTRA configuration	NR configuration
	DC_21A_n79A DC_28A_n79A		
DC_3A-7A-20A_n28A-n78A	DC_3A_n28A DC_3A_n78A DC_7A_n28A DC_7A_n78A DC_20A_n28A 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 DC_1A_n78A DC_3A_n28A DC_3A_n78A DC_7A_n28A DC_7A_n78A DC_20A_n28A 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 DC_1A_n257D DC_1A_n257E DC_1A_n257F	DC_1A_n257A	1A	n257A CA_n257D CA_n257E CA_n257F
DC_2A_n257A DC_2A_n257(2A)	DC_2A_n257A	2A	n257A 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 DC_2A_n260G DC_2A_n260H DC_2A_n260I DC_2A_n260J DC_2A_n260K DC_2A_n260L DC_2A_n260M DC_2A_n260(2A)	DC_2A_n260A	2A	n260A CA_n260G CA_n260H CA_n260I CA_n260J CA_n260K CA_n260L CA_n260M CA_n260(2A)
DC_2A-2A_n260A DC_2A-2A_n260G DC_2A-2A_n260H DC_2A-2A_n260I DC_2A-2A_n260J DC_2A-2A_n260K DC_2A-2A_n260L DC_2A-2A_n260M	DC_2A_n260A	CA_2A-2A	n260A CA_n260G CA_n260H CA_n260I CA_n260J CA_n260K CA_n260L CA_n260M
DC_2C_n260A	DC_2A_n260A	CA_2C	n260A
DC_3A_n257A DC_3A_n257D DC_3A_n257E DC_3A_n257F	DC_3A_n257A	3A	n257A CA_n257D CA_n257E 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 DC_5A_n260B DC_5A_n260C DC_5A_n260D DC_5A_n260E DC_5A_n260F DC_5A_n260G DC_5A_n260H DC_5A_n260I DC_5A_n260J DC_5A_n260K DC_5A_n260L DC_5A_n260M DC_5A_n260O DC_5A_n260P DC_5A_n260Q DC_5A_n260(2A) DC_5A_n260(3A) DC_5A_n260(4A) DC_5A_n260(A-I) DC_5A_n260(D-G) DC_5A_n260(D-H) DC_5A_n260(D-I) DC_5A_n260(D-O) DC_5A_n260(D-P) DC_5A_n260(D-Q) DC_5A_n260(E-O) DC_5A_n260(E-P) DC_5A_n260(E-Q) DC_5A_n260(G-I)	DC_5A_n260A	5A	n260A CA_n260B CA_n260C CA_n260D CA_n260E CA_n260F CA_n260G CA_n260H CA_n260I CA_n260J CA_n260K CA_n260L CA_n260M CA_n260O CA_n260P CA_n260Q CA_n260(2A) CA_n260(3A) CA_n260(4A) CA_n260(A-I) CA_n260(D-G) CA_n260(D-H) CA_n260(D-I) CA_n260(D-O) CA_n260(D-P) CA_n260(D-Q) CA_n260(E-O) CA_n260(E-P) CA_n260(E-Q) CA_n260(G-I)
DC_5A_n261A DC_5A_n261B DC_5A_n261C DC_5A_n261D DC_5A_n261E DC_5A_n261F DC_5A_n261G DC_5A_n261H DC_5A_n261I DC_5A_n261J DC_5A_n261K DC_5A_n261L DC_5A_n261M DC_5A_n261O DC_5A_n261P DC_5A_n261Q DC_5A_n261(2A) DC_5A_n261(3A) DC_5A_n261(4A) DC_5A_n261(D-G) DC_5A_n261(D-H) DC_5A_n261(D-I) DC_5A_n261(D-O) DC_5A_n261(D-P) DC_5A_n261(D-Q) DC_5A_n261(E-O) DC_5A_n261(E-P) DC_5A_n261(E-Q)	DC_5A_n261A	5A	n261A CA_n261B CA_n261C CA_n261D CA_n261E CA_n261F CA_n261G CA_n261H CA_n261I CA_n261J CA_n261K CA_n261L CA_n261M CA_n261O CA_n261P CA_n261Q CA_n261(2A) CA_n261(3A) CA_n261(4A) CA_n261(D-G) CA_n261(D-H) CA_n261(D-I) CA_n261(D-O) CA_n261(D-P) CA_n261(D-Q) CA_n261(E-O) CA_n261(E-P) 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 DC_12A_n260G DC_12A_n260H DC_12A_n260I DC_12A_n260J DC_12A_n260K DC_12A_n260L DC_12A_n260M DC_12A_n260(A-I) DC_12A_n260(G-I)	DC_12A_n260A	12A	n260A CA_n260G CA_n260H CA_n260I CA_n260J CA_n260K CA_n260L CA_n260M CA_n260(A-I) 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 DC_19A_n257D DC_19A_n257E DC_19A_n257F	DC_19A_n257A	19A	n257A CA_n257D CA_n257E CA_n257F
DC_20A_n258A	DC_20A_n258A	20A	n258A
DC_21A_n257A DC_21A_n257D DC_21A_n257E DC_21A_n257F	DC_21A_n257A	21A	n257A CA_n257D CA_n257E CA_n257F
DC_26A_n257A	DC_26A_n257A	26A	n257A
DC_28A_n257A DC_28A_n257D DC_28A_n257E DC_28A_n257F	DC_28A_n257A	28A	n257A CA_n257D CA_n257E CA_n257F
DC_28A_n258A	DC_28A_n258A	28A	n258A
DC_30A_n260A DC_30A_n260G DC_30A_n260H DC_30A_n260I DC_30A_n260J DC_30A_n260K DC_30A_n260L DC_30A_n260M DC_30A_n260(A-I) DC_30A_n260(G-I)	DC_30A_n260A	30A	n260A CA_n260G CA_n260H CA_n260I CA_n260J CA_n260K CA_n260L CA_n260M CA_n260(A-I) CA_n260(G-I)
DC_39A_n258A	DC_39A_n258A	39A	n258A
DC_41A_n257A DC_41C_n257A	DC_41A_n257A	41A CA_41C	n257A
DC_41A_n258A	DC_41A_n258A	41A	n258A
DC_41C_n257A	DC_41C_n257A	CA_41C	n257A
DC_42A_n257A DC_42C_n257A DC_42A_n257D DC_42A_n257E DC_42A_n257F	DC_42A_n257A	42A CA_42C 42A 42A 42A	n257A n257A CA_n257D CA_n257E CA_n257F
DC_42C_n257A DC_42C_n257D DC_42C_n257E DC_42C_n257F	DC_42C_n257A	CA_42C	n257A CA_n257D CA_n257E 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
DC_48A-48A_n260A	DC_48A_n260A	CA_48A-48A	n260A

EN-DC configuration	Uplink EN-DC configuration (NOTE 1)	E-UTRA configuration	NR configuration
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 DC_66A-66A_n260G DC_66A-66A_n260H DC_66A-66A_n260I DC_66A-66A_n260J DC_66A-66A_n260K DC_66A-66A_n260L DC_66A-66A_n260M	DC_66A_n260A	CA_66A-66A	n260A CA_n260G CA_n260H CA_n260I CA_n260J CA_n260K CA_n260L CA_n260M
DC_66A_n257A DC_66A_n257(2A) DC_66A_n257G DC_66A_n257H DC_66A_n257I DC_66A_n257J DC_66A_n257K DC_66A_n257L DC_66A_n257M	DC_66A_n257A	66A	n257A CA_n257(2A) CA_n257G CA_n257H CA_n257I CA_n257J CA_n257K CA_n257L CA_n257M
DC_66A_n260A DC_66A_n260D DC_66A_n260E DC_66A_n260F DC_66A_n260G DC_66A_n260H DC_66A_n260I DC_66A_n260J DC_66A_n260K DC_66A_n260L DC_66A_n260M DC_66A_n260O DC_66A_n260P DC_66A_n260Q DC_66A_n260(2A) DC_66A_n260(3A) DC_66A_n260(4A) DC_66A_n260(A-I) DC_66A_n260(D-G) DC_66A_n260(D-H) DC_66A_n260(D-I) DC_66A_n260(D-O) DC_66A_n260(D-P) DC_66A_n260(D-Q) DC_66A_n260(E-O) DC_66A_n260(E-P) DC_66A_n260(E-Q) DC_66A_n260(G-I)	DC_66A_n260A	66A	n260A CA_n260D CA_n260E CA_n260F CA_n260G CA_n260H CA_n260I CA_n260J CA_n260K CA_n260L CA_n260M CA_n260O CA_n260P CA_n260Q CA_n260(2A) CA_n260(3A) CA_n260(4A) CA_n260(A-I) CA_n260(D-G) CA_n260(D-H) CA_n260(D-I) CA_n260(D-O) CA_n260(D-P) CA_n260(D-Q) CA_n260(E-O) CA_n260(E-P) CA_n260(E-Q) CA_n260(G-I)
DC_66C_n257A	DC_66C_n257A	CA_66C	n257A
DC_66A_n261A DC_66A_n261D DC_66A_n261E DC_66A_n261F DC_66A_n261G DC_66A_n261H DC_66A_n261I DC_66A_n261J DC_66A_n261K DC_66A_n261L DC_66A_n261M DC_66A_n261O	DC_66A_n261A	66A	n261A CA_n261D CA_n261E CA_n261F CA_n261G CA_n261H CA_n261I CA_n261J CA_n261K CA_n261L CA_n261M CA_n261O

EN-DC configuration	Uplink EN-DC configuration (NOTE 1)	E-UTRA configuration	NR configuration
DC_66A_n261P DC_66A_n261Q DC_66A_n261(2A) DC_66A_n261(3A) DC_66A_n261(4A) DC_66A_n261(D-G) DC_66A_n261(D-H) DC_66A_n261(D-I) DC_66A_n261(D-O) DC_66A_n261(D-P) DC_66A_n261(D-Q) DC_66A_n261(E-O) DC_66A_n261(E-P) DC_66A_n261(E-Q)			CA_n261P CA_n261Q CA_n261(2A) CA_n261(3A) CA_n261(4A) CA_n261(D-G) CA_n261(D-H) CA_n261(D-I) CA_n261(D-O) CA_n261(D-P) CA_n261(D-Q) CA_n261(E-O) CA_n261(E-P) 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 DC_1A-3A_n257D DC_1A-3A_n257E DC_1A-3A_n257F	DC_1A_n257A DC_3A_n257A	CA_1A-3A	n257A CA_n257D CA_n257E CA_n257F
DC_1A-5A_n257A	DC_1A_n257A DC_5A_n257A	CA_1A-5A	n257A
DC_1A-7A_n257A	DC_1A_n257A DC_7A_n257A	CA_1A-7A	n257A
DC_1A-7A-7A_n257A	DC_1A_n257A DC_7A_n257A	CA_1A-7A-7A	n257A
DC_1A-8A_n257A	DC_1A_n257A DC_8A_n257A	CA_1A-8A	n257A
DC_1A-18A_n257A	DC_1A_n257A DC_18A_n257A	CA_1A-18A	n257A
DC_1A-19A_n257A DC_1A-19A_n257D DC_1A-19A_n257E DC_1A-19A_n257F	DC_1A_n257A DC_19A_n257A	CA_1A-19A	n257A CA_n257D CA_n257E CA_n257F
DC_1A-21A_n257A DC_1A-21A_n257D DC_1A-21A_n257E DC_1A-21A_n257F	DC_1A_n257A DC_21A_n257A	CA_1A-21A	n257A CA_n257D CA_n257E CA_n257F
DC_1A-28A_n257A DC_1A-28A_n257D DC_1A-28A_n257E DC_1A-28A_n257F	DC_1A_n257A DC_28A_n257A	CA_1A-28A	n257A CA_n257D CA_n257E CA_n257F
DC_1A-41A_n257A	DC_1A_n257A DC_41A_n257A	CA_1A-41A	n257A
DC_1A-41C_n257A	DC_1A_n257A DC_41C_n257A	CA_1A-41C	n257A
DC_1A-42A_n257A DC_1A-42A_n257D DC_1A-42A_n257E DC_1A-42A_n257F	DC_1A_n257A DC_42A_n257A	CA_1A-42A	n257A CA_n257D CA_n257E CA_n257F
DC_1A-42C_n257A	DC_1A_n257A DC_42A_n257A	CA_1A-42C	n257A
DC_1A-42D_n257A	DC_1A_n257A DC_42A_n257A	CA_1A-42D	n257A
DC_1A-42E_n257A	DC_1A_n257A DC_42A_n257A	CA_1A-42E	n257A
DC_2A-13A_n260A	DC_2A_n260A DC_13A_n260A	CA_2A-13A	n260A
DC_2A-5A_n257A	DC_2A_n257A DC_5A_n257A	CA_2A-5A	n257A
DC_2A-5A_n260A DC_2A-5A_n260G DC_2A-5A_n260H DC_2A-5A_n260I DC_2A-5A_n260J DC_2A-5A_n260K DC_2A-5A_n260L DC_2A-5A_n260M	DC_2A_n260A DC_5A_n260A	CA_2A-5A	n260A CA_n260G CA_n260H CA_n260I CA_n260J CA_n260K CA_n260L CA_n260M
DC_2A-12A_n260A DC_2A-12A_n260G DC_2A-12A_n260H DC_2A-12A_n260I DC_2A-12A_n260J DC_2A-12A_n260K DC_2A-12A_n260L DC_2A-12A_n260M	DC_2A_n260A DC_12A_n260A	CA_2A-12A	n260A CA_n260G CA_n260H CA_n260I CA_n260J CA_n260K CA_n260L CA_n260M
DC_2A-13A_n257A	DC_2A_n257A 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 DC_2A-30A_n260G DC_2A-30A_n260H DC_2A-30A_n260I DC_2A-30A_n260J DC_2A-30A_n260K DC_2A-30A_n260L DC_2A-30A_n260M	DC_2A_n260A DC_30A_n260A	CA_2A-30A	n260A CA_n260G CA_n260H CA_n260I CA_n260J CA_n260K CA_n260L CA_n260M
DC_2A-66A_n257A	DC_2A_n257A DC_66A_n257A	CA_2A-66A	n257A
DC_2A-66A_n260A DC_2A-66A_n260G DC_2A-66A_n260H DC_2A-66A_n260I DC_2A-66A_n260J DC_2A-66A_n260K DC_2A-66A_n260L DC_2A-66A_n260M	DC_2A_n260A DC_66A_n260A	CA_2A-66A	n260A CA_n260G CA_n260H CA_n260I CA_n260J CA_n260K CA_n260L CA_n260M
DC_3A-5A_n257A	DC_3A_n257A DC_5A_n257A	CA_3A-5A	n257A
DC_3A-7A-7A_n257A	DC_3A_n257A DC_7A_n257A	CA_3A-7A-7A	n257A
DC_3A-7A_n257A	DC_3A_n257A DC_7A_n257A	CA_3A-7A	n257A
DC_3A-19A_n257A DC_3A-19A_n257D DC_3A-19A_n257E DC_3A-19A_n257F	DC_3A_n257A DC_19A_n257A	CA_3A-19A	n257A CA_n257D CA_n257E CA_n257F
DC_3A-21A_n257A DC_3A-21A_n257D DC_3A-21A_n257E DC_3A-21A_n257F	DC_3A_n257A DC_21A_n257A	CA_3A-21A	n257A CA_n257D CA_n257E CA_n257F
DC_3A-28A_n257A DC_3A-28A_n257D DC_3A-28A_n257E DC_3A-28A_n257F	DC_3A_n257A DC_28A_n257A	CA_3A-28A	n257A CA_n257D CA_n257E CA_n257F
DC_3A-41A_n257A	DC_3A_n257A DC_41A_n257A	CA_3A-41A	n257A
DC_3A-42A_n257A DC_3A-42A_n257D DC_3A-42A_n257E DC_3A-42A_n257F	DC_3A_n257A DC_42A_n257A	CA_3A-42A	n257A CA_n257D CA_n257E CA_n257F
DC_3A-42C_n257A	DC_3A_n257A DC_42A_n257A	CA_3A-42C	n257A
DC_3A-42D_n257A	DC_3A_n257A DC_42A_n257A	CA_3A-42D	n257A
DC_3A-42E_n257A	DC_3A_n257A DC_42A_n257A	CA_3A-42E	n257A
DC_5A-30A_n260A DC_5A-30A_n260G DC_5A-30A_n260H DC_5A-30A_n260I DC_5A-30A_n260J DC_5A-30A_n260K DC_5A-30A_n260L DC_5A-30A_n260M	DC_5A_n260A DC_30A_n260A	CA_5A-30A	n260A CA_n260G CA_n260H CA_n260I CA_n260J CA_n260K CA_n260L CA_n260M
DC_5A-66A_n257A	DC_5A_n257A DC_66A_n257A	CA_5A-66A	n257A
DC_5A-66A_n260A DC_5A-66A_n260G DC_5A-66A_n260H DC_5A-66A_n260I DC_5A-66A_n260J DC_5A-66A_n260K	DC_5A_n260A DC_66A_n260A	CA_5A-66A	n260A CA_n260G CA_n260H CA_n260I CA_n260J CA_n260K

EN-DC configuration	Uplink EN-DC configuration (NOTE 1)	E-UTRA configuration	NR configuration
DC_5A-66A_n260L DC_5A-66A_n260M			CA_n260L CA_n260M
DC_5A-7A-7A_n257A	DC_5A_n257A DC_7A_n257A	CA_5A-7A-7A	n257A
DC_5A-7A_n257A	DC_5A_n257A DC_7A_n257A	CA_5A-7A	n257A
DC_12A-30A_n260A DC_12A-30A_n260G DC_12A-30A_n260H DC_12A-30A_n260I DC_12A-30A_n260J DC_12A-30A_n260K DC_12A-30A_n260L DC_12A-30A_n260M	DC_12A_n260A DC_30A_n260A	CA_12A-30A	n260A CA_n260G CA_n260H CA_n260I CA_n260J CA_n260K CA_n260L CA_n260M
DC_12A-66A_n260A DC_12A-66A_n260G DC_12A-66A_n260H DC_12A-66A_n260I DC_12A-66A_n260J DC_12A-66A_n260K DC_12A-66A_n260L DC_12A-66A_n260M	DC_12A_n260A DC_66A_n260A	CA_12A-66A	n260A CA_n260G CA_n260H CA_n260I CA_n260J CA_n260K CA_n260L CA_n260M
DC_13A-66A_n257A	DC_13A_n257A DC_66A_n257A	CA_13A-66A	n257A
DC_13A-66A_n260A	DC_13A_n260A DC_66A_n260A	CA_13A-66A	n260A
DC_18A-28A_n257A	DC_18A_n257A DC_28A_n257A	CA_18A-28A	n257A
DC_19A-42A_n257A DC_19A-42A_n257D DC_19A-42A_n257E DC_19A-42A_n257F	DC_19A_n257A DC_42A_n257A	CA_19A-42A	n257A CA_n257D CA_n257E CA_n257F
DC_19A-21A_n257A DC_19A-21A_n257D DC_19A-21A_n257E DC_19A-21A_n257F	DC_19A_n257A DC_21A_n257A	CA_19A-21A	n257A CA_n257D CA_n257E CA_n257F
DC_19A-42C_n257A	DC_19A_n257A DC_42A_n257A	CA_19A-42C	n257A
DC_21A-28A_n257A DC_21A-28A_n257D DC_21A-28A_n257E DC_21A-28A_n257F	DC_21A_n257A DC_28A_n257A	CA_21A-28A	n257A CA_n257D CA_n257E CA_n257F
DC_21A-42A_n257A DC_21A-42A_n257D DC_21A-42A_n257E DC_21A-42A_n257F	DC_21A_n257A DC_42A_n257A	CA_21A-42A	n257A CA_n257D CA_n257E CA_n257F
DC_21A-42C_n257A	DC_21A_n257A DC_42A_n257A	CA_21A-42C	n257A
DC_28A-42C_n257A	DC_28A_n257A DC_42A_n257A	CA_28A-42C	n257A
DC_28A-42A_n257A	DC_28A_n257A DC_42A_n257A	CA_28A-42A	n257A
DC_30A-66A_n260A DC_30A-66A_n260G DC_30A-66A_n260H DC_30A-66A_n260I DC_30A-66A_n260J DC_30A-66A_n260K DC_30A-66A_n260L DC_30A-66A_n260M	DC_30A_n260A DC_66A_n260A	CA_30A-66A	n260A CA_n260G CA_n260H CA_n260I CA_n260J CA_n260K CA_n260L CA_n260M
DC_41A-42A_n257A	DC_41A_n257A DC_42A_n257A	CA_41A-42A	n257A

EN-DC configuration	Uplink EN-DC configuration (NOTE 1)	E-UTRA configuration	NR configuration
DC_41A-42C_n257A	DC_41A_n257A DC_42C_n257A	CA_41A-42C	n257A
DC_41C-42A_n257A	DC_41C_n257A DC_42A_n257A	CA_41C-42A	n257A
DC_41C-42C_n257A	DC_41A_n257A 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 DC_3A_n257A DC_5A_n257A	CA_1A-3A-5A	n257A
DC_1A-3A-7A-7A_n257A	DC_1A_n257A DC_3A_n257A DC_7A_n257A	CA_1A-3A-7A-7A	n257A
DC_1A-3A-7A_n257A	DC_1A_n257A DC_3A_n257A DC_7A_n257A	CA_1A-3A-7A	n257A
DC_1A-3A-19A_n257A	DC_1A_n257A DC_3A_n257A DC_19A_n257A	CA_1A-3A-19A	n257A
DC_1A-3A-21A_n257A	DC_1A_n257A DC_3A_n257A DC_21A_n257A	CA_1A-3A-21A	n257A
DC_1A-3A-28A_n257A	DC_1A_n257A DC_3A_n257A DC_28A_n257A	CA_1A-3A-28A	n257A
DC_1A-3A-42A_n257A	DC_1A_n257A DC_3A_n257A DC_42A_n257A	CA_1A-3A-42A	n257A
DC_1A-3A-42C_n257A	DC_1A_n257A DC_3A_n257A DC_42A_n257A	CA_1A-3A-42C	n257A
DC_1A-3A-42C_n257D	DC_1A_n257A DC_3A_n257A DC_42A_n257A	CA_1A-3A-42C	CA_n257D
DC_1A-3A-42C_n257E	DC_1A_n257A DC_3A_n257A DC_42A_n257A	CA_1A-3A-42C	CA_n257E
DC_1A-3A-42C_n257F	DC_1A_n257A DC_3A_n257A DC_42A_n257A	CA_1A-3A-42C	CA_n257F
DC_1A-5A-7A-7A_n257A	DC_1A_n257A DC_5A_n257A DC_7A_n257A	CA_1A-5A-7A-7A	n257A
DC_1A-5A-7A_n257A	DC_1A_n257A DC_5A_n257A DC_7A_n257A	CA_1A-5A-7A	n257A
DC_1A-18A-28A_n257A	DC_1A_n257A DC_18A_n257A DC_28A_n257A	CA_1A-18A-28A	n257A
DC_1A-19A-21A_n257A DC_1A-19A-21A_n257D DC_1A-19A-21A_n257E DC_1A-19A-21A_n257F	DC_1A_n257A DC_19A_n257A DC_21A_n257A	CA_1A-19A-21A	n257A CA_n257D CA_n257E CA_n257F
DC_1A-19A-42A_n257A	DC_1A_n257A DC_19A_n257A DC_42A_n257A	CA_1A-19A-42A	n257A
DC_1A-19A-42C_n257A	DC_1A_n257A DC_19A_n257A DC_42A_n257A	CA_1A-19A-42C	n257A
DC_1A-19A-42C_n257D	DC_1A_n257A DC_19A_n257A DC_42A_n257A	CA_1A-19A-42C	CA_n257D
DC_1A-19A-42C_n257E	DC_1A_n257A DC_19A_n257A DC_42A_n257A	CA_1A-19A-42C	CA_n257E
DC_1A-19A-42C_n257F	DC_1A_n257A DC_19A_n257A DC_42A_n257A	CA_1A-19A-42C	CA_n257F
DC_1A-21A-28A_n257A	DC_1A_n257A DC_21A_n257A DC_28A_n257A	CA_1A-21A-28A	n257A
DC_1A-21A-42A_n257A	DC_1A_n257A DC_21A_n257A DC_42A_n257A	CA_1A-21A-42A	n257A
DC_1A-21A-42C_n257A	DC_1A_n257A DC_21A_n257A DC_42A_n257A	CA_1A-21A-42C	n257A
DC_1A-21A-42C_n257D	DC_1A_n257A DC_21A_n257A DC_42A_n257A	CA_1A-21A-42C	CA_n257D
DC_1A-21A-42C_n257E	DC_1A_n257A DC_21A_n257A DC_42A_n257A	CA_1A-21A-42C	CA_n257E
	DC_1A_n257A		

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 DC_3A_n257A DC_5A_n257A DC_7A_n257A	CA_1A-3A-5A-7A	n257A
DC_1A-3A-5A-7A-7A_n257A	DC_1A_n257A DC_3A_n257A DC_5A_n257A DC_7A_n257A	CA_1A-3A-5A-7A-7A	n257A
DC_1A-3A-19A-21A_n257A	DC_1A_n257A DC_3A_n257A DC_19A_n257A DC_21A_n257A	CA_1A-3A-19A-21A	n257A
DC_1A-3A-19A-21A_n257D	DC_1A_n257A DC_3A_n257A DC_19A_n257A DC_21A_n257A	CA_1A-3A-19A-21A	CA_n257D
DC_1A-3A-19A-21A_n257E	DC_1A_n257A DC_3A_n257A DC_19A_n257A DC_21A_n257A	CA_1A-3A-19A-21A	CA_n257E
DC_1A-3A-19A-21A_n257F	DC_1A_n257A DC_3A_n257A DC_19A_n257A DC_21A_n257A	CA_1A-3A-19A-21A	CA_n257F
DC_1A-3A-19A-42A_n257A	DC_1A_n257A DC_3A_n257A DC_19A_n257A DC_42A_n257A	CA_1A-3A-19A-42A	n257A
DC_1A-3A-19A-42A_n257D	DC_1A_n257A DC_3A_n257A DC_19A_n257A DC_42A_n257A	CA_1A-3A-19A-42A	CA_n257D
DC_1A-3A-19A-42A_n257E	DC_1A_n257A DC_3A_n257A DC_19A_n257A DC_42A_n257A	CA_1A-3A-19A-42A	CA_n257E
DC_1A-3A-19A-42A_n257F	DC_1A_n257A DC_3A_n257A DC_19A_n257A DC_42A_n257A	CA_1A-3A-19A-42A	CA_n257F
DC_1A-3A-19A-42C_n257A	DC_1A_n257A DC_3A_n257A DC_19A_n257A DC_42A_n257A	CA_1A-3A-19A-42C	n257A
DC_1A-3A-19A-42C_n257D	DC_1A_n257A DC_3A_n257A DC_19A_n257A DC_42A_n257A	CA_1A-3A-19A-42C	CA_n257D
DC_1A-3A-19A-42C_n257E	DC_1A_n257A DC_3A_n257A DC_19A_n257A DC_42A_n257A	CA_1A-3A-19A-42C	CA_n257E
DC_1A-3A-19A-42C_n257F	DC_1A_n257A DC_3A_n257A DC_19A_n257A DC_42A_n257A	CA_1A-3A-19A-42C	CA_n257F
DC_1A-3A-21A-42A_n257A	DC_1A_n257A DC_3A_n257A DC_21A_n257A DC_42A_n257A	CA_1A-3A-21A-42A	n257A

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

EN-DC configuration	Uplink EN-DC configuration (NOTE 1)	E-UTRA configuration	NR configuration
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)

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

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

EN-DC configuration	Uplink EN-DC configuration (NOTE 1)	E-UTRA configuration	NR configuration
	DC_3A_n257A DC_3A_n79A-n257A		

EN-DC configuration	Uplink EN-DC configuration (NOTE 1)	E-UTRA configuration	NR configuration
DC_3A_n79A-n257E	DC_3A_n79A DC_3A_n257A DC_3A_n79A-n257A	3A	CA_n79A-n257E
DC_3A_n79A-n257F	DC_3A_n79A DC_3A_n257A DC_3A_n79A-n257A	3A	CA_n79A-n257F
DC_3A_n79C-n257A	DC_3A_n79A DC_3A_n257A DC_3A_n79A-n257A	3A	CA_n79C-n257A
DC_3A_n79C-n257D	DC_3A_n79A DC_3A_n257A DC_3A_n79A-n257A	3A	CA_n79C-n257D
DC_3A_n79C-n257E	DC_3A_n79A DC_3A_n257A DC_3A_n79A-n257A	3A	CA_n79C-n257E
DC_3A_n79C-n257F	DC_3A_n79A DC_3A_n257A DC_3A_n79A-n257A	3A	CA_n79C-n257F
DC_5A_n78A-n257A	DC_5A_n78A DC_5A_n257A	5A	CA_n78A-n257A
DC_7A_n78A-n257A	DC_7A_n78A DC_7A_n257A	7A	CA_n78A-n257A
DC_7A-7A_n78-n257A	DC_7A_n78A DC_7A_n257A DC_7A_n78A-n257A	CA_7A-7A	CA_n78A-n257A
DC_19A_n77A-n257A	DC_19A_n77A DC_19A_n257A DC_19A_n77A-n257A	19A	CA_n77A-n257A
DC_19A_n77A-n257D	DC_19A_n77A DC_19A_n257A DC_19A_n77A-n257A	19A	CA_n77A-n257D
DC_19A_n77A-n257E	DC_19A_n77A DC_19A_n257A DC_19A_n77A-n257A	19A	CA_n77A-n257E
DC_19A_n77A-n257F	DC_19A_n77A DC_19A_n257A DC_19A_n77A-n257A	19A	CA_n77A-n257F
DC_19A_n77C-n257A	DC_19A_n77A DC_19A_n257A DC_19A_n77A-n257A	19A	CA_n77C-n257A
DC_19A_n77C-n257D	DC_19A_n77A DC_19A_n257A DC_19A_n77A-n257A	19A	CA_n77C-n257D
DC_19A_n77C-n257E	DC_19A_n77A DC_19A_n257A DC_19A_n77A-n257A	19A	CA_n77C-n257E
DC_19A_n77C-n257F	DC_19A_n77A DC_19A_n257A DC_19A_n77A-n257A	19A	CA_n77C-n257F
DC_19A_n78A-n257A	DC_19A_n78A DC_19A_n257A DC_19A_n78A-n257A	19A	CA_n78A-n257A
DC_19A_n78A-n257D	DC_19A_n78A DC_19A_n257A DC_19A_n78A-n257A	19A	CA_n78A-n257D
DC_19A_n78A-n257E	DC_19A_n78A DC_19A_n257A DC_19A_n78A-n257A	19A	CA_n78A-n257E
DC_19A_n78A-n257F	DC_19A_n78A DC_19A_n257A DC_19A_n78A-n257A	19A	CA_n78A-n257F
DC_19A_n78C-n257A	DC_19A_n78A DC_19A_n257A 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 DC_19A_n257A DC_19A_n78A-n257A	19A	CA_n78C-n257D
DC_19A_n78C-n257E	DC_19A_n78A DC_19A_n257A DC_19A_n78A-n257A	19A	CA_n78C-n257E
DC_19A_n78C-n257F	DC_19A_n78A DC_19A_n257A DC_19A_n78A-n257A	19A	CA_n78C-n257F
DC_19A_n79A-n257A	DC_19A_n79A DC_19A_n257A DC_19A_n79A-n257A	19A	CA_n79A-n257A
DC_19A_n79A-n257D	DC_19A_n79A DC_19A_n257A DC_19A_n79A-n257A	19A	CA_n79A-n257D
DC_19A_n79A-n257E	DC_19A_n79A DC_19A_n257A DC_19A_n79A-n257A	19A	CA_n79A-n257E
DC_19A_n79A-n257F	DC_19A_n79A DC_19A_n257A DC_19A_n79A-n257A	19A	CA_n79A-n257F
DC_19A_n79C-n257A	DC_19A_n79A DC_19A_n257A DC_19A_n79A-n257A	19A	CA_n79C-n257A
DC_19A_n79C-n257D	DC_19A_n79A DC_19A_n257A DC_19A_n79A-n257A	19A	CA_n79C-n257D
DC_19A_n79C-n257E	DC_19A_n79A DC_19A_n257A DC_19A_n79A-n257A	19A	CA_n79C-n257E
DC_19A_n79C-n257F	DC_19A_n79A DC_19A_n257A DC_19A_n79A-n257A	19A	CA_n79C-n257F
DC_21A_n77A-n257A	DC_21A_n77A DC_21A_n257A	21A	CA_n77A-n257A
DC_21A_n78A-n257A	DC_21A_n78A DC_21A_n257A	21A	CA_n78A-n257A
DC_21A_n79A-n257A	DC_21A_n79A 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 DC_1A_n257A DC_3A_n78A DC_3A_n257A	CA_1A-3A	CA_n78A-n257A
DC_1A-5A_n78A-n257A	DC_1A_n78A DC_1A_n257A DC_5A_n78A DC_5A_n257A	CA_1A-5A	CA_n78A-n257A
DC_1A-7A-7A_n78A-n257A	DC_1A_n78A DC_1A_n257A DC_7A_n78A DC_7A_n257A	CA_1A-7A-7A	CA_n78A-n257A
DC_1A-7A_n78A-n257A	DC_1A_n78A DC_1A_n257A DC_7A_n78A DC_7A_n257A	CA_1A-7A	CA_n78A-n257A
DC_3A-5A_n78A-n257A	DC_3A_n78A DC_3A_n257A DC_5A_n78A DC_5A_n257A	CA_3A-5A	CA_n78A-n257A
DC_3A-7A-7A_n78A-n257A	DC_3A_n78A DC_3A_n257A DC_7A_n78A DC_7A_n257A	CA_3A-7A-7A	CA_n78A-n257A
DC_3A-7A_n78A-n257A	DC_3A_n78A DC_3A_n257A DC_7A_n78A DC_7A_n257A	CA_3A-7A	CA_n78A-n257A
DC_5A-7A-7A_n78A-n257A	DC_5A_n78A DC_5A_n257A DC_7A_n78A DC_7A_n257A	CA_5A-7A-7A	CA_n78A-n257A
DC_5A-7A_n78A-n257A	DC_5A_n78A DC_5A_n257A DC_7A_n78A 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 DC_1A_n257A DC_3A_n78A DC_3A_n257A DC_5A_n78A DC_5A_n257A	CA_1A-3A-5A	CA_n78A-n257A
DC_1A-3A-7A-7A_n78A-n257A	DC_1A_n78A DC_1A_n257A DC_3A_n78A DC_3A_n257A DC_7A_n78A DC_7A_n257A	CA_1A-3A-7A-7A	CA_n78A-n257A
DC_1A-3A-7A_n78A-n257A	DC_1A_n78A DC_1A_n257A DC_3A_n78A DC_3A_n257A DC_7A_n78A DC_7A_n257A	CA_1A-3A-7A	CA_n78A-n257A
DC_1A-5A-7A-7A_n78A-n257A	DC_1A_n78A DC_1A_n257A DC_5A_n78A DC_5A_n257A DC_7A_n78A DC_7A_n257A	CA_1A-5A-7A-7A	CA_n78A-n257A
DC_1A-5A-7A_n78A-n257A	DC_1A_n78A DC_1A_n257A DC_5A_n78A DC_5A_n257A DC_7A_n78A DC_7A_n257A	CA_1A-5A-7A	CA_n78A-n257A
DC_3A-5A-7A-7A_n78A-n257A	DC_3A_n78A DC_3A_n257A DC_5A_n78A DC_5A_n257A DC_7A_n78A DC_7A_n257A	CA_3A-5A-7A-7A	CA_n78A-n257A
DC_3A-5A-7A_n78A-n257A	DC_3A_n78A DC_3A_n257A DC_5A_n78A DC_5A_n257A DC_7A_n78A 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 DC_1A_n257A DC_3A_n78A DC_3A_n257A DC_5A_n78A DC_5A_n257A DC_7A_n78A 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		n77A	CA_n257D
DC_n77A-n257E		n77A	CA_n257E
DC_n77A-n257F		n77A	CA_n257F
DC_n77A-n257G		n77A	CA_n257G
DC_n77A-n257H		n77A	CA_n257H
DC_n77A-n257I		n77A	CA_n257I
DC_n77A-n257J		n77A	CA_n257J
DC_n77A-n257K		n77A	CA_n257K
DC_n77A-n257L		n77A	CA_n257L
DC_n77A-n257M		n77A	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	n257A
DC_n78A-n257D		n78A	CA_n257D
DC_n78A-n257E		n78A	CA_n257E
DC_n78A-n257F		n78A	CA_n257F
DC_n78A-n257G		n78A	CA_n257G
DC_n78A-n257H		n78A	CA_n257H
DC_n78A-n257I		n78A	CA_n257I
DC_n78A-n257J		n78A	CA_n257J
DC_n78A-n257K		n78A	CA_n257K
DC_n78A-n257L		n78A	CA_n257L
DC_n78A-n257M		n78A	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	n257A
DC_n79A-n257D		n79A	CA_n257D
DC_n79A-n257E		n79A	CA_n257E
DC_n79A-n257F		n79A	CA_n257F
DC_n79A-n257G		n79A	CA_n257G
DC_n79A-n257H		n79A	CA_n257H
DC_n79A-n257I		n79A	CA_n257I
DC_n79A-n257J		n79A	CA_n257J
DC_n79A-n257K		n79A	CA_n257K
DC_n79A-n257L		n79A	CA_n257L
DC_n79A-n257M		n79A	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.			

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[1]	23	+2/-2[1]
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[2]			23	+2/-3
DC_41A_n41A	26	+2/-2[1]	23	+2/-2[1]
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-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 DC_1A_n84A_ULSUP-TDM_n78A DC_1A_n84A_ULSUP-FDM_n78A	23	+2/-3
DC_1A_n79A	23	+2/-3
DC_2A_n5A	23	+2/-3[1]
DC_2A_n66A	23	+2/-3[1]
DC_2A_n71A	23	+2/-3
DC_2A_n78A	23	+2/-3
DC_3A_n7A	23	+2/-3[1]
DC_3A_n28A	23	+2/-3[1]
DC_3A_n40A	23	+2/-3[1]
DC_3A_n51A	23	+2/-3[1]
DC_3A_n77A	23	+2/-3[1]
DC_3A_n78A DC_3A_n80A_ULSUP-TDM_n78A, DC_3A_n80A_ULSUP-FDM_n78A	23	+2/-3[1]
DC_3A_n79A DC_3A_n80A_ULSUP-TDM_n79A, DC_3A_n80A_ULSUP-FDM_n79A	23	+2/-3[1]
DC_3A_n82A	23	+2/-3[1]
DC_5A_n40A	23	+2/-3[1]
DC_5A_n66A	23	+2/-3[1]
DC_5A_n78A	23	+2/-3
DC_7A_n28A	23	+2/-3[1]
DC_7A_n51A	23	+2/-3[1]
DC_7A_n78A DC_7C_n78A	23	+2/-3
DC_8A_n40A	23	+2/-3[1]
DC_8A_n77A	23	+2/-3
DC_8A_n78A DC_8A_n81A_ULSUP-TDM_n78A, DC_8A_n81A_ULSUP-FDM_n78A	23	+2/-3
DC_8A_n79A DC_8A_n81A_ULSUP-TDM_n79A, 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 DC_20A_n83A	23	+2/-3
DC_20A_n51A	23	+2/-3
DC_20A_n77A	23	+2/-3
DC_20A_n78A DC_20A_n82A_ULSUP-TDM_n78A, 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 DC_28A_n83A_ULSUP-TDM_n78A, 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[1]
DC_39A_n79A	23	+2/-3[1]
DC_40A_n77A	N/A	N/A
DC_41A_n77A DC_41C_n77A	23	+2/-3[1]
DC_41A_n78A DC_41C_n77A	23	+2/-3[1]
DC_41A_n79A DC_41C_n77A	23	+2/-3[1]
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[1]
DC_66A_n71A	23	+2/-3
DC_66A_n78A, DC_66A_n86A_ULSUP-TDM_n78A, DC_66A_n86A_ULSUP-FDM_n78A	23	+2/-3
NOTE 1: For thetransmission 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 FR1specified 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,

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

- for the total configured transmission power,

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

where

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

with

- $MPR_{single, E-UTRA}$ 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,

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

- for the SCG,

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

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.2.1.2

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

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

Where:

For UEs supporting dynamic power sharing,

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

For UEs not supporting dynamic power sharing,

For E-UTRA

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

For NR

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

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,

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

- for the total configured transmission power,

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

where

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

with

- $MPR_{single,\ E\text{-}UTRA}$ 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,

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

- for the SCG,

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

where

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

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

Where:

For UEs supporting dynamic power sharing,

$$B = (L_{CRB\_alloc,\ E\text{-}UTRA} * 12 * SCS_{E\text{-}UTRA} + L_{CRB\_alloc,NR} * 12 * SCS_{NR})/1{,}000.000$$

For UEs not supporting dynamic power sharing,

For E-UTRA

$$B = (L_{CRB\_alloc,\ E\text{-}UTRA} * 12 * SCS_{E\text{-}UTRA} + 12 * SCS_{NR})/1{,}000.000$$

For NR

$$B = (12 * SCS_{E\text{-}UTRA} + L_{CRB\_alloc,NR} * 12 * SCS_{NR})/1{,}000.000$$

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[3]
DC_(n)41AA[1]	6.5B.2.1.2.2	NS_01 or NS_04	NS_04	6.2B.3.1.2[4]
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 *AdditionalSpecrumEmission* 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-MPR$_c$ in accordance with [4]
- for the SCG, A-MPR'$_c$ = [A-MPR$_{DC}$]
- for the total configured transmission power, A-MPR$_{tot}$ = A-MPR$_{DC}$

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

For UEs not supporting dynamic power sharing the following

- for the MCG,

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

- for the SCG,

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

with A-MPR$_{LTE}$ and A-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

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

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

- for OFDM:

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

8.10 - 2.00*A;	0.30 < A ≤ 0.80
6.50;	0.80 < A ≤ 1.00

- for DFT-S-OFDM:

$M_{A,DC}$ = 11.00 - 13.33*A;	0.00 < A ≤ 0.30
8.00 - 3.33*A;	0.30 < A ≤ 0.60
6.00;	0.60 < A ≤ 1.00

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

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

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

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

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

- for the total configured transmission power,

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

where

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

with

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

For UEs not supporting dynamic power sharing the following

- for the MCG,

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

- for the SCG,

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

where

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

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

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

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

Else

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

where

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

6.2B.3.1.2.1 $A\text{-}MPR_{IM3}$ for NS_04 to meet -13 dBm / 1MHz for 26dBm UE power

A-MPR in this sub-clause is relative to 26 dBm for power class 2. The same A-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:

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

Where M_A is defined as follows

$$M_A = \begin{cases} 15 ; & 0 \le B < 0.5 \\ 10 ; & 0.5 \le B < 1.0 \end{cases}$$

8 ; $1.0 \leq B < 2.0$

6 ; $2.0 < B$

Where:

For UEs supporting dynamic power sharing,

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

For UEs not supporting dynamic power sharing,

For E-UTRA

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

For NR

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

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:

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

Where M_A is defined as follows

$M_A =$ 15 ; $0 \leq B < 1.0$

14 ; $1.0 \leq B < 2.0$

13 ; $2.0 \leq B < 5.0$

12 ; $5.0 < B$

Where:

For UEs supporting dynamic power sharing,

$$B = (L_{CRB\_alloc,\ E\text{-}UTRA} * 12 * SCS_{E\text{-}UTRA} + L_{CRB\_alloc,NR} * 12 * SCS_{NR})/1{,}000.000$$

For UEs not supporting dynamic power sharing,

For E-UTRA

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

For NR

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

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[1]	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. 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, $A\text{-}MPR_c$ in accordance with [4]
- for the SCG,

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

- for the total configured transmission power,

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

where

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

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

with

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

For UEs not supporting dynamic power sharing the following

- for the MCG,

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

- for the SCG,

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

where

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

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

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

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

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

Else

Channel Configuration Case D. $A\text{-}MPR_{IM3}$ 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
- $SEM_{-13,high}$ = 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 $A\text{-}MPR_{ACLRoverlap}$ as specified in Table 6.2B.3.2.1-1:

Table 6.2B.3.2.1-1: $A\text{-}MPR_{ACLRoverlap}$

W_{gap}	$A\text{-}MPR_{ACLRoverlap}$
< $BW_{channel,E\text{-}UTRA} + BW_{channel,NR}$	4 dB
≥ $BW_{channel,E\text{-}UTRA} + BW_{channel,NR}$	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 $P_{CMAX,c(i),i}$ for serving cell *c(i)* of CG *i*, *i = 1,2*, and its total configured maximum transmission power for EN-DC operation $\widehat{P}^{EN-DC}_{Total}$.

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

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

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

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

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

and whenever NS_01 is not indicated within CG 1:

- for a UE indicating support of dynamicPowerSharing, the $A\text{-}MPR_c$ 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 $A\text{-}MPR_c$ is determined in accordance with sub-clause 6.2B.3.1 with parameters applicable for UEs not indicating support of dynamicPowerSharing and MPR_c = 0 dB;

and whenever NS_01 is indicated in CG 1:

- for a UE indicating support of dynamicPowerSharing, the MPR_c 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_c is determined in accordance with sub-clause 6.2B.2.1 with parameters applicable for UEs not indicating support of dynamicPowerSharing and $A\text{-}MPR_c$ = 0 dB;

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

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

where $P_{CMAX\_L\_NR,c}$ and $P_{CMAX\_H\_NR,c}$ 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_{NR} as follows:

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

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

- P_{LTE} and P_{NR} are the linear values for the P_{LTE} and P_{NR} respectively signaled by RRC defined in [7]

- $\Delta T_{c\_E\text{-}UTRA,c}$ = 1.5dB when NOTE 2 in Table 6.2.2-1 in TS 36.101 [4] applies for a serving cell *c*, otherwise $\Delta T_{C\_E\text{-}UTRA,c}$ = 0dB;

- $\Delta T_{C\_NR,c}$ = 1.5dB when NOTE 3 in Table 6.2.1-1 in TS 38.101-1 [2] applies for a serving cell *c*, otherwise $\Delta T_{C\_NR,c}$ = 0dB;

- $\Delta T_{IB,c}$ 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 $P_{CMAX\_E\text{-}UTRA,c}$ and $P_{CMAX\_NR,c}$ evaluations.

and whenever NS_01 is not indicated within CG 2:

- for a UE indicating support of dynamicPowerSharing, A-MPR$_c$ = A-MPR'$_c$ with A-MPR'$_c$ determined in accordance with sub-clause 6.2B.3.1 and 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-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$_c$ is determined in accordance with sub-clause 6.2B.3.1 with parameters applicable for UEs not indicating support of dynamicPowerSharing and MPR$_c$ = 0 dB;

and whenever NS_01 is indicated in CG 2.

- for a UE indicating support of dynamicPowerSharing, MPRc = MPR'c with MPR'c determined in accordance with sub-clause 6.2B.2.1 and A-MPRc = 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, MPRc 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 MPRc is determined in accordance with sub-clause 6.2B.2.1 with parameters applicable for UEs not indicating support of dynamicPowerSharing and MPRc = 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 $P_{PowerClass,\ EN\text{-}DC}$ or $P_{EMAX,\ EN\text{-}DC}$ 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_EN-DC_Total is the dB value of $\hat{P}^{EN-DC}_{Total}$, which is used in [38.213] and $P_{EMAX,\ EN\text{-}DC}$ is p-maxUE-FR1-r15 value signaled by RRC and defined in [36.331];

If the UE does not support dynamic power sharing,

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

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

$$P_{EN\text{-}DC,tot\_L} \le P_{EN\text{-}DC,tot} \le P_{EN\text{-}DC,tot\_H}$$

where

$$P_{EN\text{-}DC,tot\_L}(p,q) = \mathrm{MIN}\{\ P_{PowerClass,EN\text{-}DC} - \mathrm{MAX}\{MPR_{tot},\ A\text{-}MPR_{tot}\},\ P_{EMAX,EN\text{-}DC}\}$$

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

for sub-frame *p* on CG 1 overlapping with physical channel *q* on CG 2 and with MPR_{tot} and A-MPR_{tot} in accordance with 6.2B.2.1 and sub-clause 6.2B.3.1, respectively.

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

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

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

For UEs indicating support of dynamicPowerSharing, 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 $T_{LOW}(P_{CMAX\_L})$ and $T_{HIGH}(P_{CMAX\_H})$ for applicable values of P_{CMAX_L} and P_{CMAX_L} 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	Min($T_{no\_hopping}$, 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:

$$P_{CMAX\_H} = \text{MAX} \{ P_{CMAX\_EN-DC\_H}(p,q), P_{CMAX\_EN-DC\_H}(p,q+1), \dots, P_{CMAX\_EN-DC\_H}(p,q+n) \}$$

where $P_{CMAX\_EN-DC\_H}$ are the applicable upper limits for each overlapping scheduling unit pairs *(p,q)* , (*p, q+1*) , 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:

$$P_{CMAX\_L} = \text{MIN} \{ P_{CMAX\_EN-DC\_L}(p,q), P_{CMAX\_EN-DC\_L}(p,q+1), \dots, P_{CMAX\_EN-DC\_L}(p,q+n) \}$$

where $P_{CMAX\_EN-DC\_L}$ are the applicable lower limits for each overlapping scheduling unit pairs *(p,q)* , (*p, q+1*) , 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= 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=TRUE) AND (b=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= 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;

- $p_{CMAX\ L\_E\text{-}UTRA,c}(p)$ 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;
- $P_{PowerClass,\ EN\text{-}DC}$ is defined in sub-clause 6.2B.1.1-1 for intra-band EN-DC;
- X_scale is the linear value of X dB which is configured by RRC and can only take values [0 , 6] dB
- $p_{CMAX\ E\text{-}UTRA,c}(p)$ is the linear value of $P_{CMAX\ E\text{-}UTRA,c}(p)$, the real configured max power for LTE
- $p_{CMAX,f,c\ NR}(q)$ is the linear value of $P_{CMAX,f,c\ NR}(q)$, the real configured max power of NR

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

P_{CMAX}(dBm)	Tolerance T_{LOW} (P_{CMAX_L}) (dB)	Tolerance T_{HIGH} (P_{CMAX_H}) (dB)
$23 \le P_{CMAX} \le 33$	[3.0]	[2.0]
$22 \le P_{CMAX} < 23$	[5.0]	[2.0]
$21 \le P_{CMAX} < 22$	[5.0]	[3.0]
$20 \le P_{CMAX} < 21$	[6.0]	[4.0]
$16 \le P_{CMAX} < 20$	[5.0]	
$11 \le P_{CMAX} < 16$	[6.0]	
$-40 \le P_{CMAX} < 11$	[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, $P_{UMAX,f,c,NR}(q)$, under nominal conditions and unless otherwise stated

$10\log(p_{CMAX\ L,f,c,,NR}(q)/X\_scale) - T_{LOW}(10\log(p_{CMAX\ L,f,c,,NR}(q)/X\_scale))\} \le P_{UMAX,f,c,NR}(q) \le 10\log(p_{CMAX\ H,f,c,,NR}(q)) + T_{HIGH}(10\log(p_{CMAX\ H,f,c,,NR}(q)))$.

with the tolerances T_{LOW} and T_{HIGH} for applicable values of P_{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, $p_{UMAX,c,E\text{-}UTRA}$, shall meet the requirements in subclause 6.2.5 in [4] with the limits $P_{CMAX\_L,c}$ and $P_{CMAX\_H,c}$ replaced by $P_{CMAX\_L\_E\text{-}UTRA,c}$ and $P_{CMAX\_H\_E\text{-}UTRA,c}$ as specified above, respectively.

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

$$P_{UMAX,f,c,NR}(q) \le 10\log(p_{CMAX\ H,f,c,,NR}(q)) + T_{HIGH}(10\log(p_{CMAX\ H,f,c,NR}(q))).$$

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 $P_{CMAX\_E\text{-}UTRA,c}(p)$ 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-MPR_c determined in accordance with sub-clause 6.2B.3.2 with parameters applicable for UEs not indicating support of dynamicPowerSharing and MPR_c = 0 dB;

whenever NS_01 is not indicated within CG 1 while

- for a UE not indicating support of dynamicPowerSharing, the MPR_c determined in accordance with sub-clause 6.2B.2.2 with parameters applicable for UEs not indicating support of dynamicPowerSharing and A-MPR_c = 0 dB;

whenever NS_01 is indicated in CG 1.

The configured maximum output power $P_{CMAX\_NR,c}(q)$ 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-MPR$_c$ = A-MPR'$_c$ with A-MPR'$_c$ determined in accordance with sub-clause 6.2B.3.2 and 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-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$_c$ is determined in accordance with sub-clause 6.2B.3.2 with parameters applicable for UEs not indicating support of dynamicPowerSharing and MPR$_c$ = 0 dB;

whenever NS_01 is not indicated in CG 2 while

- for a UE indicating support of dynamicPowerSharing, MPR$_c$ = MPR'$_c$ with MPR'$_c$ determined in accordance with sub-clause 6.2B.2.2 and A-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, 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 MPR$_c$ is determined in accordance with sub-clause 6.2B.2.2 with parameters applicable for UEs not indicating support of dynamicPowerSharing and A-MPR$_c$ = 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 $P_{\text{powerclass,EN-DC}}$ 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_{UMAX} 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 $p_{UMAX,\text{c,E-UTRA}}$ *and* $p_{UMAX,\text{f,c,NR}}$ *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 $P_{\text{CMAX},c(i),i}$ for serving cell *c(i)* of CG *i*, *i = 1,2*, and its total configured maximum transmission power for EN-DC operation, $\hat{P}_{Total}^{EN-DC}$.

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_{LTE} as follows:

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

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

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_{NR} as follows:

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

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

- P_{LTE} signalled by RRC as p-MaxEUTRA in [36.331]
- P_{NR} signalled by RRC as p-NR-FR1 defined in [38.331]
- $\Delta T_{c\_E\text{-}UTRA,\,c}$ = 1.5dB when NOTE 2 in Table 6.2.2-1 in TS 36.101 [4] applies for a serving cell *c*, otherwise $\Delta T_{C\_E\text{-}UTRA,c}$ = 0dB;
- $\Delta T_{C\_NR,c}$ = 1.5dB when NOTE 3 in Table 6.2.1-1 in TS 38.101-1 [2] applies for a serving cell *c*, otherwise $\Delta T_{C\_NR,c}$ = 0dB;
- $\Delta T_{IB,c}$ 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 $P_{CMAX\_\,E\text{-}UTRA,c}$ and $P_{CMAX\_\,NR,c}$ evaluations.
- $\Delta P_{PowerClass,EN\text{-}DC}$ = 3 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 $\Delta P_{PowerClass,EN\text{-}DC}$ = 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 $P_{PowerClass,\,EN\text{-}DC}$ or $P_{EMAX,\,EN\text{-}DC}$ shall not be exceeded at any time by UE.

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

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

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

If the UE does not support dynamic power sharing,

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

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 $P_{CMAX\_\,E\text{-}UTRA,c}$ 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, $\hat{P}^{EN-DC}_{Total}$, as specified above.

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

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

where $p_{UMAX,c,E\text{-}UTRA}$ 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:

$$P_{CMAX\_L} - T_{LOW}(P_{CMAX\_L}) \le P_{UMAX} \le P_{CMAX\_H} + T_{HIGH}(P_{CMAX\_H})$$

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_{CMAX} evaluation window

transmission duration	T_{REF}	T_{eval}
Different transmission duration in different RAT carriers	LTE Subframe	Min($T_{no\_hopping}$, 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:

$$P_{CMAX\_H} = \text{MAX}\ \{ P_{CMAX\_EN-DC\_H}(p,q),\ P_{CMAX\_EN-DC\_H}(p,q+1),\ \ldots,\ P_{CMAX\_EN-DC\_H}(p,q+n) \}$$

where $P_{CMAX\_EN-DC\_H}$ are the applicable upper limits for each overlapping scheduling unit pairs (p,q), $(p, q+1)$, 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:

$$P_{CMAX\_L} = \text{MIN}\ \{ P_{CMAX\_EN-DC\_L}(p,q),\ P_{CMAX\_EN-DC\_L}(p,q+1),\ \ldots,\ P_{CMAX\_EN-DC\_L}(p,q+n) \}$$

where $P_{CMAX\_EN-DC\_L}$ are the applicable lower limits for each overlapping scheduling unit pairs (p,q), $(p, q+1)$, 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:

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

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

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

- $p_{CMAX\ H\_E-UTRA,c}(p)$ 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.1.3-1 for inter-band EN-DC;
- X_scale is the linear value of X dB which is configured by RRC and can only take values [0 , 6]
- $p_{CMAX\_E-UTRA,c}$ (p) is the linear value of $P_{CMAX\_E-UTRA,c}$ (p), the real configured max power for LTE
- $p_{CMAX,f,c,NR}$ (q) is the linear value of $P_{CMAX,f,c,NR}$ (q), the real configured max power of NR

Table 6.2B.4.1.3-2: P_{CMAX} tolerance for Dual Connectivity LTE-NR

P_{CMAX}(dBm)	Tolerance T_{LOW} (P_{CMAX_L}) (dB)	Tolerance T_{HIGH} (P_{CMAX_H}) (dB)
$23 \le P_{CMAX} \le 33$	[3.0]	[2.0]
$22 \le P_{CMAX} < 23$	[5.0]	[2.0]
$21 \le P_{CMAX} < 22$	[5.0]	[3.0]
$20 \le P_{CMAX} < 21$	[6.0]	[4.0]
$16 \le P_{CMAX} < 20$	[5.0]	
$11 \le P_{CMAX} < 16$	[6.0]	
$-40 \le P_{CMAX} < 11$	[7.0]	
NOTE 1: For UEs not indicating support of dynamic power sharing, the upper tolerance T_{high} shall be reduced by 0.3 dB for $P \ge 20$ 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, $P_{UMAX,f,c,NR}(q)$, under nominal conditions.

$10\log(p_{CMAX\ L,f,c,,NR\ c}(q)/X\_scale) - T_{LOW}\ (10\log(p_{CMAX\ L,f,c,,NR\ c}(q)/X\_scale)\ )\} \le P_{UMAX,f,c,NR}(q) \le 10\log(p_{CMAX\ H,\ f,c,,NR\ c}(q)) + T_{HIGH}\ (10\log(p_{CMAX\ H,\ f,c,,NR\ c}(q)))$.

with the tolerances T_{LOW} and T_{HIGH} for applicable values of P_{CMAX} 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 PCMAX,c(i),i for serving cell c(i) of CG i, i = 1,2.

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

The UE maximum configured power PCMAX,c(j), on NR for the slot j shall be set according to subclase 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 $\Delta T_{IB,c}$ for EN-DC

For the UE which supports inter-band EN-DC configuration, $\Delta T_{IB,c}$ in Tables below applies where unless otherwise stated, the same $\Delta T_{IB,c}$ is applicable to NR band(s) part for DC configurations which have the same NR operating band combination. Unless otherwise stated, $\Delta T_{IB,c}$ is set to zero.

6.2B.4.2.1 Intra-band contiguous EN-DC

$\Delta T_{IB,c}$ is not applicable for intra-band contiguous EN-DC.

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

$\Delta T_{IB,c}$ 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	$\Delta T_{IB,c}$ (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

Inter-band EN-DC configuration	E-UTRA or NR Band	$\Delta T_{IB,c}$ (dB)
	n77	0.8
DC_19_n78	19	0.3
	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[1]
		0.9[2]
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

Inter-band EN-DC configuration	E-UTRA or NR Band	$\Delta T_{IB,c}$ (dB)
	41	0.5
DC_1-28_n77	1	0.3
	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

Inter-band EN-DC configuration	E-UTRA or NR Band	$\Delta T_{IB,c}$ (dB)
	19	0.3
	n78	0.8
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[1]
		0.8[2]
	n78	0.8
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

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

Inter-band EN-DC configuration	E-UTRA or NR Band	$\Delta T_{IB,c}$ (dB)
	42	0.8
	n78	0.8
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 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

Inter-band EN-DC configuration	E-UTRA or NR Band	$\Delta T_{IB,c}$ (dB)
DC_1-3-42_n78	1	0.6
	3	0.6
	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 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

Inter-band EN-DC configuration	E-UTRA or NR Band	$\Delta T_{IB,c}$ (dB)
	n77	0.8
DC_1-21-42_n78	1	0.3
	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

Inter-band EN-DC configuration	E-UTRA or NR Band	$\Delta T_{IB,c}$ (dB)
	19	0.3
	21	0.9
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

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

Inter-band EN-DC configuration	E-UTRA or NR Band	$\Delta T_{IB,c}$ (dB)
	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 transiet 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.

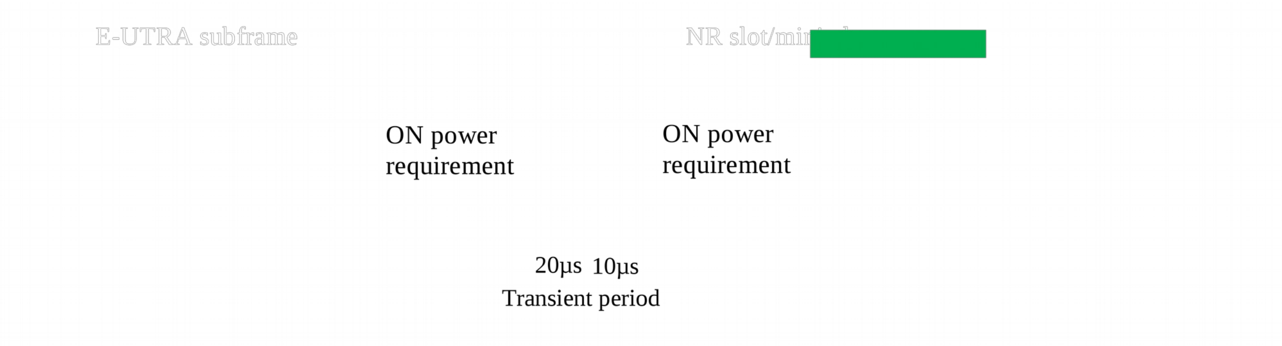

Figure 6.3B.1.1-1: E-UTRA to NR switching time mask for type 1 for TDM based UL sharing from UE perspective within FR1

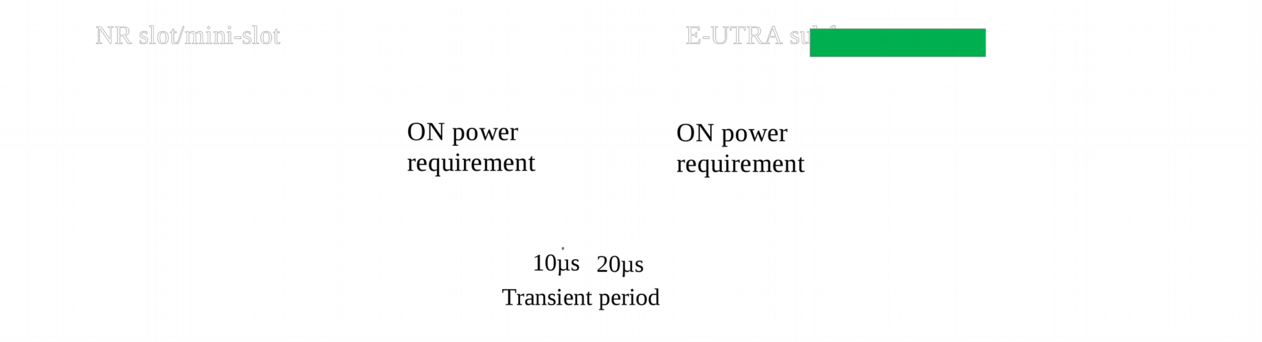

Figure 6.3B.1.1-2: NR to E-UTRA switching time mask for type 1 for TDM based UL sharing from UE perspective within FR1

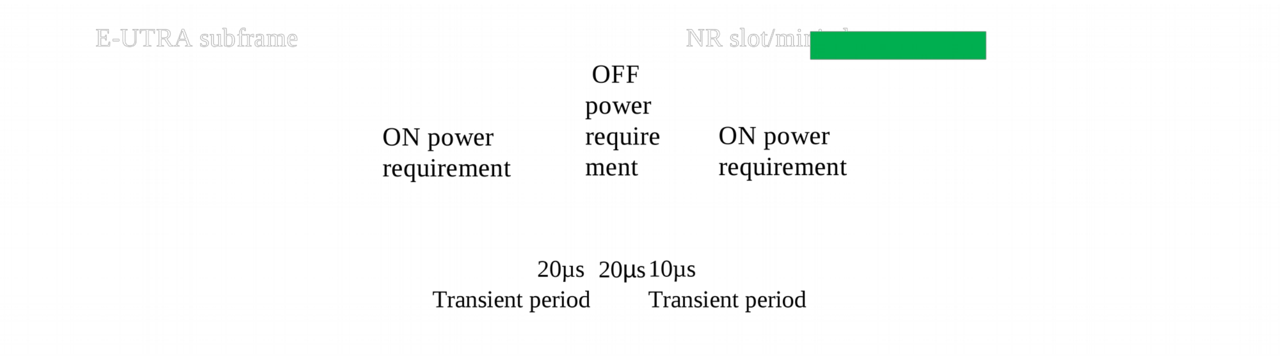

Figure 6.3B.1.1-3: E-UTRA to NR switching time mask for type 2 for TDM based UL sharing from UE perspective within FR1

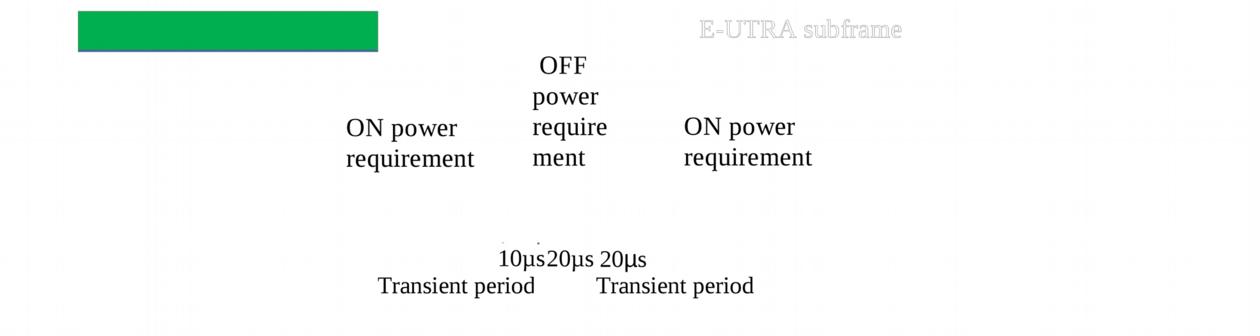

Figure 6.3B.1.1-4: NR to E-UTRA switching time mask for type 2 for TDM based UL sharing from UE perspective within FR1

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 us 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.

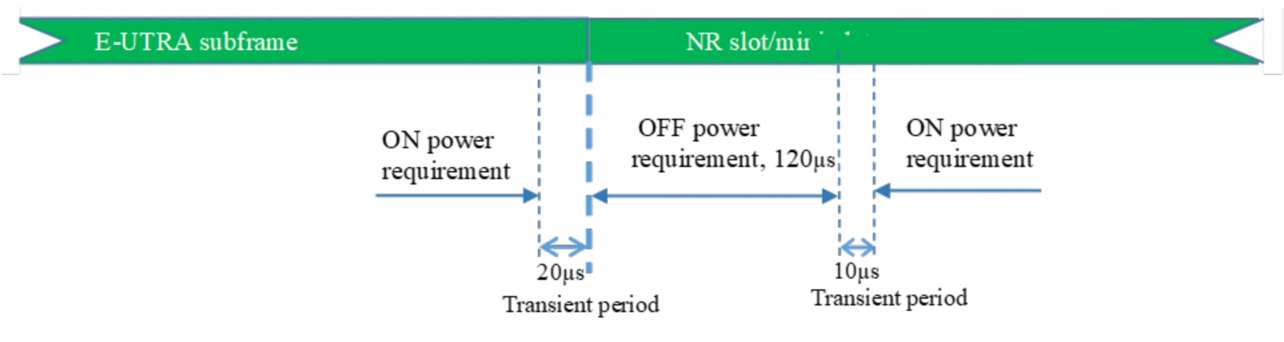

Figure 6.3B.2-1: E-UTRA to NR switching time mask for intra-band EN-DC without dual PA capabilitywhen single UL is allowed

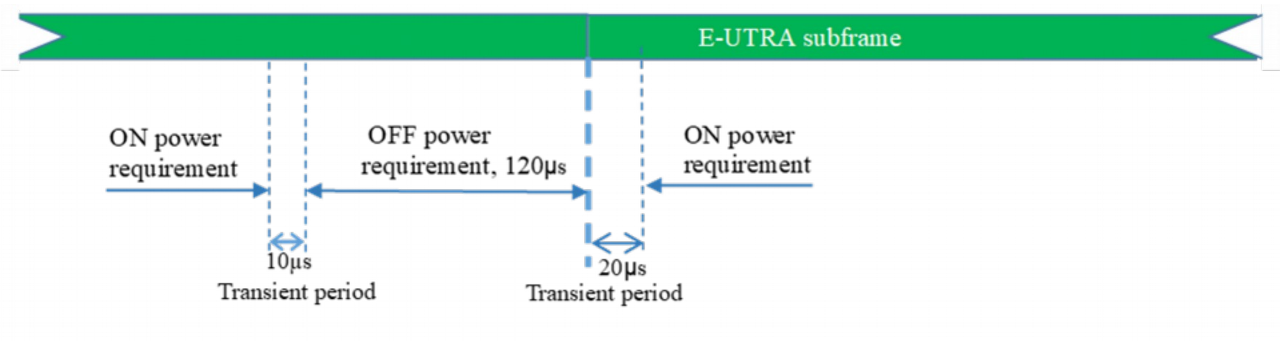

Figure 6.3B.2-2: NR to E-UTRA switching time mask for intra-band EN-DC without dual PA capabilitywhen single UL is allowed

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.

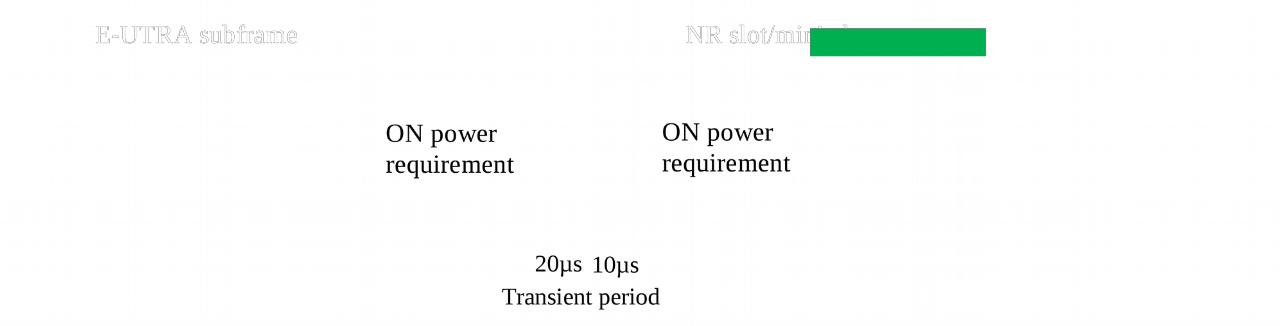

Figure 6.3B.3-1: E-UTRA to NR switching time mask for intra-band EN-DC with dual PA capability

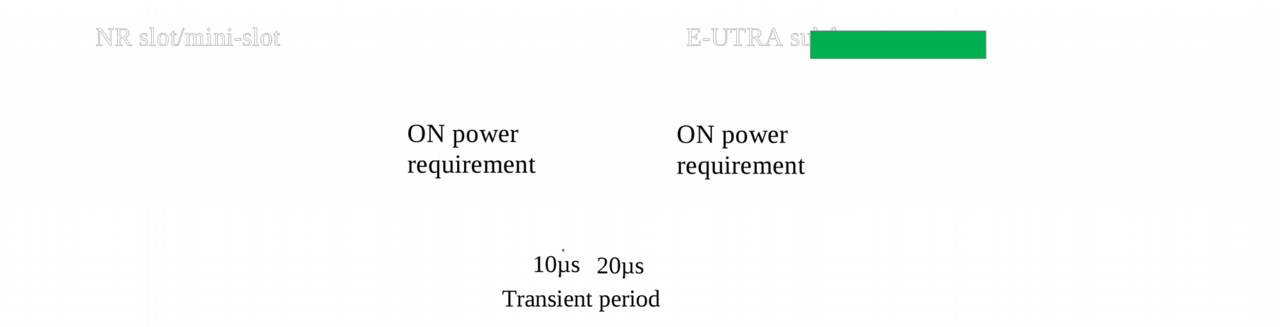

Figure 6.3B.3-2: NR to E-UTRA switching time mask for intra-band EN-DC with dual PA capability

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 requirments 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_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 3, 7,41,42,n78,n79	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 11, 21	F_{DL_low}	-	F_{DL_high}	-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_{DL_low}	-	F_{DL_high}	-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_{DL_low}	-	F_{DL_high}	-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_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	1884.5	-	1915.7	-41	0.3	4

NOTE 1: F_{DL_low} and F_{DL_high} 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]

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 2nd, 3rd, 4th or 5th 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_{CRB} x 180kHz), where N is 2, 3, 4, 5 for the 2nd, 3rd, 4th or 5th harmonic respectively. The exception is allowed if the measurement bandwidth (MBW) totally or partially overlaps the overall exception interval.

NOTE 3: 15 kHz SCS is assumed when RB is mentioned in the note.

NOTE 4: Applicable when co-existence with PHS system operating in 1884.5 -1915.7MHz

NOTE 5: These requirements also apply for the frequency ranges that are less than F_{OOB} (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.

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 < 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 > 3.

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 OOBE limits specified for the DC combination in this sub-clause supercede any OOBE 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 (Δf_{OOB}) starting from the ± edge of the EN-DC aggregated channel bandwidth. For frequencies offset greater than Δf_{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

Δf_{OOB} (MHz)	Spectrum emission limit (dBm)	Measurement bandwidth
± 0 - 1	Max(Round(10*log(0.15/ENBW)),-24)	30 kHz
± 1 - 5	-10	1 MHz
± 5 - ENBW	-13	1 MHz
± ENBW – (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

Δf_{OOB} (MHz)	Frequency offset of measurement filter centre frequency, f_offset	Minimum requirement (dBm)	Measurement bandwidth
0 MHz ≤ Δf < 0.1 MHz	0.015 MHz ≤ f_offset < 0.085 MHz	-13	30 kHz
0.1 MHz ≤ Δf < ENBW	0.15 MHz ≤ f_offset < ENBW – 0.05 MHz	-13	100 kHz
ENBW ≤ Δf < ENBW + 5 MHz	ENBW+0.5 MHz ≤ f_offset < ENBW + 4.5 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

	Spectrum emission limit (dBm) / measurement bandwidth for each ENBW						
ΔfOOB MHz		**15 MHz**	**20 MHz**	**40 MHz**	**50 MHz**	**> 50 MHz**	**Measurement bandwidth**
± 0 - 1		-10	-10	-10			2 % ENBW
					-10		1 MHz
± 1 - 5	-10						1 MHz
± 5 - X	-13						
± X - (ENBW+ 5 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$_{ACLR}$ 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$_{ACLR}$ for PC3	dBc	30
EN-DC$_{ACLR}$ 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 / -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 ± Δf_{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 ($EN\text{-}DC_{ACLR}$) 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 Wgap is smaller than a E-UTRA or NR sub-block bandwidth, no $EN\text{-}DC_{ACLR}$ 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 –50dBm then the $EN\text{-}DC_{ACLR}$ shall be higher than the value specified in for $E\text{-}UTRA_{ACLR}$ and NR_{ACLR}.

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

Unless otherewise stated, the OOBE 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 otherewise stated, the OOBE 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 otherewise stated, the OOBE 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.2.1apply.

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_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 2, 25, 41, 70	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 29	F_{DL_low}	- -	F_{DL_high}	-38	1	3
	E-UTRA Band 71	F_{DL_low}	-	F_{DL_high}	-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 NR Band n77, n78 and n79	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 40	F_{DL_low}	-	F_{DL_high}	[-40]	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 2nd, 3rd, 4th or 5th 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_{CRB} x 180kHz), where N is 2, 3, 4, 5 for the 2nd, 3rd, 4th or 5th harmonic respectively. The exception is allowed if the measurement bandwidth (MBW) totally or partially overlaps the overall exception interval

NOTE 3: These requirements also apply for the frequency ranges that are less than F_{OOB} (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 NR Band n77, n78 and n79	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 30	F_{DL_low}	-	F_{DL_high}	[-40]	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 2nd, 3rd, 4th or 5th 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_{CRB} x 180kHz), where N is 2, 3, 4, 5 for the 2nd, 3rd, 4th or 5th 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 NR band n5, n7, n8, n20, n26, n38, n40, n41, n50, n51, n74	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band42, 43 NR band n78, n75, n76	F_{DL_low}	-	F_{DL_high}	-50	1	2
	NR band n3, n34	F_{DL_low}	-	F_{DL_high}	-50	1	5
	E-UTRA Band 11, 21	F_{DL_low}	-	F_{DL_high}	-50	1	9, 11
	E-UTRA Band 65 NR band n1	F_{DL_low}	-	F_{DL_high}	-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, 22, 26, 27, 28, 31, 32, 38, 40, 41, 42, 43, 44, 45, 50, 51, 52, 65, 67, 68, 69, 72, 73, 74, 75, 76	F_{DL_low}	-	F_{DL_high}	-50	1	
	Band 3, 34	F_{DL_low}	-	F_{DL_high}	-50	1	5
	Frequency range	1880		1895	-40	1	5, 17
	Frequency range	1895		1915	-15.5	5	5, 7, 17
	Frequency range	1915		1920	+1.6	5	5, 7, 17
DC_1_n51	E-UTRA Band 7, 12, 13, 17, 20, 22, 27, 28, 29, 31, 38, 44, 48, 67, 68, 69, 72, 73	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 3, 34	F_{DL_low}	-	F_{DL_high}	-50	1	5, 2
	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
	E-UTRA Band 5, 6, 8, 26, 30, 40, 41, 42, 43, 46 NR Band n77, n78, n79,	F_{DL_low}	-	F_{DL_high}	-50	1	2
DC_1_n77	E-UTRA Band 1, 3, 5, 7, 8, 11, 18, 19, 20, 21, 26, 28, 34, 39, 40, 41, 65	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	1880	-	1895	-40	1	5, 8
	Frequency range	1895	-	1915	-15.5	5	5, 7, 8
	Frequency range	1915	-	1920	+1.6	5	5, 7, 8
DC_1_n78 DC_1_n84_ULSUP-TDM_n78 DC_1_n84_ULSUP-FDM_n78	E-UTRA Band 1, 3, 5, 7, 8, 11, 18, 19, 20, 21, 26, 28, 34, 40, 41, 65	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	1880	-	1895	-40	1	5, 8
	Frequency range	1895	-	1915	-15.5	5	5, 7, 8
	Frequency range	1915	-	1920	+1.6	5	5, 7, 8
DC_1_n79	E-UTRA Band 1, 3, 5, 7, 8, 11, 18, 19, 21, 26, 28, 34, 40, 41, 42, 65	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	1880	-	1895	-40	1	5, 8
	Frequency range	1895	-	1915	-15.5	5	5, 7, 8
	Frequency range	1915	-	1920	+1.6	5	5, 7, 8
DC_2_n5	Bands 4, 5, 10, 12, 13, 14, 17, 24, 28, 29, 30, 42, 48, 50, 51, 66, 70, 71, n71, 74, 85	F_{DL_low}	-	F_{DL_high}	-50	1	
	Bands 2, 25, 48	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 26	859	-	869	-27	1	
	E-UTRA Band 41, 43	F_{DL_low}	-	F_{DL_high}	-50	1	
DC_2_n66	Bands 4, 5, 10, 12, 13, 14, 17, 24, 26, 27, 28, 29, 30, 41, 50, 51, 66, 70, 71, n71, 74, 85	F_{DL_low}	-	F_{DL_high}	-50	1	
	Bands 2, 25	F_{DL_low}	-	F_{DL_high}	-50	1	5
	Bands 42, 48	F_{DL_low}	-	F_{DL_high}	-50	1	2
DC_2_n71	E-UTRA Band 4, 5, 12, 13, 14, 17, 24, 26, 29, 30, 48, 66	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 2, 25, 41, 70	F_{DL_low}	-	F_{DL_high}	-50	1	2
	NR Band n71	F_{DL_low}	-	F_{DL_high}	-50	1	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_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 2, 25	F_{DL_low}	-	F_{DL_high}	-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 NR Band n1, n5, n7, n8, n20, n28, n50, n51, n74, n75, n76	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA band 3	F_{DL_low}	-	F_{DL_high}	-50	1	5
	E-UTRA band 22, 42	F_{DL_low}	-	F_{DL_high}	-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 NR band n1, n50, n51, n74, n75, n76, n78	F_{DL_low}	-	F_{DL_high}	-50	1	2
	NR band n1	F_{DL_low}	-	F_{DL_high}	-50	1	9, 10
	NR band n3	F_{DL_low}	-	F_{DL_high}	-50	1	5
	E-UTRA Band 27, 31, 72 NR band n5, n7, n8, n20, n26, n34, n38, n40, n41	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 11, 18, 19, 21	F_{DL_low}	-	F_{DL_high}	-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_{DL_low}	-	F_{DL_high}	-50	1	
	Band 3	F_{DL_low}	-	F_{DL_high}	-50	1	5
	Band 22, 42, 52	F_{DL_low}	-	F_{DL_high}	-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_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 3	F_{DL_low}	-	F_{DL_high}	-50	1	5
	E-UTRA Band 1, 5, 6, 22, 26, 30, 34, 36, 40, 41, 42, 43, 44, 46, 65, 71	F_{DL_low}	-	F_{DL_high}	-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_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	1884.5	-	1915.7	-41	0.3	3
DC_3_n78 DC_3_n80_ULSUP-TDM_n78, DC_3_n80_ULSUP-FDM_n78	E-UTRA Band 1, 3, 5, 7, 8, 11, 18, 19, 20, 21, 26, 28, 34, 39, 40, 41, 65	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	1884.5	-	1915.7	-41	0.3	3
DC_3_n79 DC_3_n80_ULSUP-TDM_n79, DC_3_n80_ULSUP-FDM_n79	E-UTRA Band 1, 3, 5, 8, 11, 18, 19, 21, 28, 34, 39, 40, 41, 65	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 42	F_{DL_low}	-	F_{DL_high}	-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_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 42	F_{DL_low}	-	F_{DL_high}	-50	1	2
DC_5_n40	Band 1, 3, 5, 7, 8, 28, 31, 34, 38, 42, 43, 45, 65, 73	F_{DL_low}	-	F_{DL_high}	-50	1	
	Band 26	859	-	869	-27	1	
	Band 41, 52	F_{DL_low}	-	F_{DL_high}	-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_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 26	859	-	869	-27	1	
	Bands 41, 42, 48, 52	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 18, 19	F_{DL_low}	-	F_{DL_high}	-40	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_5_n78	E-UTRA Band 1, 2, 3, 4, 5, 7, 8, 10, 12, 13, 14, 17, 24, 25, 28, 29, 30, 31,	F_{DL_low}	-	F_{DL_high}	-50	1	

	34, 38, 40, 42, 43, 45, 48, 65, 66, 70						

	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_{DL_low}	-	F_{DL_high}	-50	1	7
	E-UTRA Band 18, 19	F_{DL_low}	-	F_{DL_high}	-40	1	4
	E-UTRA Band 11, 21	F_{DL_low}	-	F_{DL_high}	-50	1	4
DC_7_n28	E-UTRA Band 27, 31, 72 NR band n2, n3, n5, n7, n8, n20, n26, n34, n40	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 4, 10, 42, 43, 65 NR band n1, n50, n51, n66, n74, n75, n76, n78	F_{DL_low}	-	F_{DL_high}	-50	1	2
	NR band n1	F_{DL_low}	-	F_{DL_high}	-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_{DL_low}	-	F_{DL_high}	-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 NR Band n77, n78, n79,	F_{DL_low}	-	F_{DL_high}	-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_{DL_low}	-	F_{DL_high}	-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_{DL_low}	-	F_{DL_high}	-50	1	
	Band 3, 7, 22, 41, 42, 43, 52	F_{DL_low}	-	F_{DL_high}	-50	1	2
	Band 8	F_{DL_low}	-	F_{DL_high}	-50	1	5
	Band 11, 21	F_{DL_low}	-	F_{DL_high}	-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_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA band 3, 7, 22, 41	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 8	F_{DL_low}	-	F_{DL_high}	-50	1	5
	E-UTRA Band 11, 21	F_{DL_low}	-	F_{DL_high}	-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 DC_8_n81_ULSUP-TDM_n78, DC_8_n81_ULSUP-FDM_n78	E-UTRA Band 1,8, 20, 28, 34, 39, 40,65	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 3, 7,41	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 11, 21	F_{DL_low}	-	F_{DL_high}	-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 DC_8_n81_ULSUP-TDM_n79, DC_8_n81_ULSUP-FDM_n79	E-UTRA Band 1,8,28,34,39,40,65	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 3,41,42	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 11, 21	F_{DL_low}	-	F_{DL_high}	-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_{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_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 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 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_{DL_low}	-	F_{DL_high}	-50	1	5
	E-UTRA Band 38, 69	F_{DL_low}	-	F_{DL_high}	-50	1	2
DC_20_n78, DC_20_n82_ULS	E-UTRA Band 1, 3, 7, 8, 22, 31, 32, 33, 34, 40, 42, 43, 50, 51, 65, 67, 68, 72, 74, 75, 76						

UP-TDM_n78, DC_20_n82_ULS UP-FDM_n78	E-UTRA Band 20	F_{DL_low}	-	F_{DL_high}	-50	1	5
	E-UTRA Band 38, 69	F_{DL_low}	-	F_{DL_high}	-50	1	2
DC_21_n77	E-UTRA Band 1, 3, 18, 19, 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_21_n78	E-UTRA Band 1, 3, 18, 19, 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_21_n79	E-UTRA Band 1, 3, 18, 19, 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_25_n41	NR band n5, n28, n66, n71 E-UTRA/NR Band 4, 10, 12, 13 , 14, 17, 24, 26, 27, 29, 30, 42, 45, 48, 70	F_{DL_low}	-	F_{DL_high}	-50	1	
	NR band n2 E-UTRA/NR Band 25	F_{DL_low}	-	F_{DL_high}	-50	1	5
	EUTRA/NR Band 43	F_{DL_low}	-	F_{DL_high}	-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_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 9, 11, 18, 19, 21	F_{DL_low}	-	F_{DL_high}	-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_{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_26_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_26_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_28_n51	E-UTRA Band 2, 3, 5, 7, 8, 25, 26, 31, 34, 38, 40, 41, 66, 72	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 4, 10, 20, 22, 24, 32, 42, 43, 45, 46, 65, 66, 71, 73 NR band n78, n79	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 1	F_{DL_low}	-	F_{DL_high}	-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	
DC_28_n77	E-UTRA Band 3, 5, 7, 8, 18, 19, 20, 26, 34, 39, 40, 41	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 1, 65	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 1	F_{DL_low}	-	F_{DL_high}	-50	1	9, 10
	E-UTRA Band 11, 21	F_{DL_low}	-	F_{DL_high}	-50	1	9, 11
	Frequency range	758	-	773	-32	1	
	Frequency range	773	-	803	-50	1	
	Frequency range	1884.5	-	1915.7	-41	0.3	3

DC_28_n78 DC_28_n83_ULSUP-TDM_n78, DC_28_n83_ULSUP-FDM_n78	E-UTRA Band 3, 5, 7, 8, 18, 19, 20, 26, 34, 39, 40, 41	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 1, 65	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 1	F_{DL_low}	-	F_{DL_high}	-50	1	9, 10
	E-UTRA Band 11, 21	F_{DL_low}	-	F_{DL_high}	-50	1	9, 11
	Frequency range	758	-	773	-32	1	
	Frequency range	773	-	803	-50	1	
	Frequency range	1884.5	-	1915.7	-41	0.3	3
DC_28_n79	E-UTRA Band 3, 5, 8, 18, 19, 34, 39, 40, 41, 42	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 1, 65	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 1	F_{DL_low}	-	F_{DL_high}	-50	1	9, 10
	E-UTRA Band 11, 21	F_{DL_low}	-	F_{DL_high}	-50	1	9, 11
	Frequency range	758	-	773	-32	1	
	Frequency range	773	-	803	-50	1	
	Frequency range	1884.5	-	1915.7	-41	0.3	3
DC_30_n5	Bands 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, 50, 51, 65, 66, 70, 71, 73, 74, 85	F_{DL_low}	-	F_{DL_high}	-50	1	
	Band 26	859	-	869	-27	1	
	Bands 41, 48, 52	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 18, 19	F_{DL_low}	-	F_{DL_high}	-40	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_30_n66	Bands 2, 4, 5, 10, 12, 13, 14, 17, 24, 25, 26, 27, 29, 30, 38, 41, 66, 70, 71, n71	F_{DL_low}	-	F_{DL_high}	-50	1	
	Bands 48	F_{DL_low}	-	F_{DL_high}	-50	1	2
DC_38_n78	N/A						
DC_39_n78	E-UTRA Band 1, 8, 34, 40, 41, 44, 45 or NR Band n1, n8, n34, n40, n41	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	1805	-	1855	-40	1	18
	Frequency range	1855	-	1880	-15.5	5	18
DC_39_n79	E-UTRA Band 1, 8, 34, 40, 41, 44, 45 or NR Band n1, n8, n34, n40, n41	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	1805	-	1855	-40	1	18
	Frequency range	1855	-	1880	-15.5	5	18
DC_40_n77	N/A						
DC_41_n77	E-UTRA Band 1, 3, 5, 8, 26, 28, 33, 34, 39, 40, 44, 45, 73, 74	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 9, 11, 18, 19, 21	F_{DL_low}	-	F_{DL_high}	-50	1	19
	Frequency range	1884.5		1915.7	-41	0.3	3, 19
DC_41_n78	E-UTRA Band 1, 3, 8, 34, 39, 40, 44, 45 or NR Band n1, n8, n34, n40	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	F_{DL_low}	-	F_{DL_high}	-5	100	
DC_41_n79	E-UTRA Band 1, 3, 5, 8, 9, 11, 18, 19, 21, 28, 34, 40, 42, 44, 45, 65 or NR Band n1, n3, n8, n28, n34, n40	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	1884.5	-	1915.7	-41	0.3	3
DC_42_n51	E-UTRA Band 3, 8, 20, 25, 30, 31, 34, 39, 41, 73	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 1, 2, 4, 5, 6, 7, 10, 12, 13, 14, 17, 23, 24, 26, 27, 28, 29, 32, 38, 40, 44, 46, 65, 66, 67, 68, 70, 71	F_{DL_low}	-	F_{DL_high}	-50	1	2
DC_42_n77	N/A						
DC_42_n78	N/A						
DC_42_n79	N/A						
DC_66_n5	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_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 26	859	-	869	-27	1	
	Bands 41, 42, 48, 52	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 18, 19	F_{DL_low}	-	F_{DL_high}	-40	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, DC_66_n86_ULSUP-TDM_n78, DC_66_n86_ULSUP-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 2nd, 3rd, 4th or 5th 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_{CRB} x 180kHz), where N is 2, 3, 4, 5 for the 2nd, 3rd, 4th or 5th 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_{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 2nd 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 2nd 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 3rd 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 3rd 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 (Fc) is within the range 902.5 MHz ≤ Fc < 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 > 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 RBstart > 1 and RBstart<48.

NOTE 15: Applicable when 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_{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 ≤ f < 2496	-13	1 % of Channel BW for contiguous BW up to 100 MHz, 1 MHz for contiguous BW > 100 MHz
2490.5 ≤ 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.

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_{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_{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_{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:

$$Wgap \geq 2\cdot|FInterferer\ (offset)| - BWChannel$$

For the E-UTRA sub-block, the $F_{Interferer\ (offset),}$ 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 $BW_{Channel.}$ $F_{Interferer\ (offset)}$ 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 $F_{Interferer\ (offset),}$ 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 $BW_{Channel.}$

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.1-1unless sensitivity degradation is allowed as defined in clause 7.3A.

7.3A.2 Reference sensitivity power level for CA

7.3A.3 $\Delta R_{IB,c}$ 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.2in TS 38.101-2 [3] shall be increased by the amount given in $\Delta R_{IB,c}$ in Tables below. Unless otherwise stated, $\Delta R_{IB,c}$ 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 ≤ 1GHz, 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.

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

Table 7.3A.3.1-1: ΔRIB,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 ≥ 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_C (UL) (MHz)	Channel bandwidth (MHz)	UL allocation (LCRB)	F_C (DL) (MHz)	MSD (dB)	Duplex mode
DC_(n)71AA	71	665.5	5	5 (RB_{end}=24)	619.5	0	FDD
	n71	675.5	15	15 (RB_{start} = 0)	629.5	1.8	
DC_(n)71AA	71	670.5	15	15 (RB_{end} = 74)	624.5	0	
	n71	680.5	5	5 (RB_{start} = 0)	634.5	1.6	
DC_(n)71AA	71	668	10	10 (RB_{end} = 49)	622	0	
	n71	678	10	10 (RB_{start} = 0)	632	1.7	
DC_(n)71AA	71	668	10	10 (RB_{start} = 0)	622	17.2	
	n71	678	10	10 (RB_{end} = 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 1Tx 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[1,2,13]		23.9	22.1	20.9			17.9	16.8	16.0	14.8	14.3	13.8
	n77[3]		1.1	0.8	0.3			0	0	0	0	0	0
2	n78[1,2]		23.9	22.1	20.9			17.9	16.8	16.0	14.8	14.3	13.8
	n78[3]		1.1	0.8	0.3			0	0	0	0	0	0
3	n78[1,2,13]		23.9	22.1	20.9			17.9	16.8	16.0	14.8	14.3	13.8
	n78[3]		1.1	0.8	0.3			0	0	0	0	0	0
8	n77[6,7] n78[6,7]		10.8	9.1	8			5.1	4.2	3.5	2.3	2.1	1.4
8	n79[4,5]							6.8	6.2	5.6	4.9		4.4
18，19	n77[4,5]		10.4	8.9	7.8			4.7	3.7	3	1.7	1.2	0.7
28	n77[4,5] n78[4,5]		10.4	8.9	7.8			4.7	3.7	3	1.7	1.2	0.7
20	n77[6,7] n78[6,7]		10.8	9.1	8			6	4.0	3.2	2.0	1.5	1.0
26	n41[8,9]		10.3	8.4	7.4			5	4.3	3.9	3.1	2.7	
26	n77[6,7] n78[6,7]		10.8	9.1	8			6	4.0	3.2	2.0	1.5	1.0
n28	1[8,9,10]	10.2	7.6	6.2	5.3								
n71	2[11]	4.6	1.0	0.7	0.6								
	2[12]	1.7	1.0	0.7	0.6								
66	n78[1,2]		23.9	22.1	20.9			17.9	16.8	16.0	14.8	14.3	13.8
	n78[3]		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 $f_{UL}^{LB} = \lfloor f_{DL}^{HB}/0.2 \rfloor 0.1$ 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 5th 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 $f_{UL}^{LB} = \lfloor f_{DL}^{HB}/0.5 \rfloor 0.1$ 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 4th 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 $f_{UL}^{LB} = \lfloor f_{DL}^{HB}/0.4 \rfloor 0.1$ 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 LBsuch that $f_{UL}^{LB} = \lfloor f_{DL}^{HB}/0.3 \rfloor 0.1$ 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 (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 ΔF_{HD} above and below the edge of this downlink transmission bandwidth. The value ΔF_{HD} depends on the EN-DC band combination: ΔF_{HD} = 10 MHz for DC_3_n77 and DC_3_n78; ΔF_{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

	E-UTRA or NR Band / Channel bandwidth of the high band											
UL 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, n78		25	36	50			50	50	50	50	50	50
8	n77 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, n78		16	25	25			25	25	25	25	25	25
26	n41		16	25	25			25	25				
26	n77, n78		16	25	25			25	25	25	25	25	25
n28	1	8	16	25	25								
28	n77, 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] 8[5]	25[4] 8[5]	20[4] 8[5]	20[4] 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[4]	26.8	23.6	21.2	15.6							
n41	26[4]	24.3	24.3	22.5	N/A							
41	n77[7]		8.3	8.0	6.9		3.9	3	2.3	1.2		0.4
41	n78[7]		8.3	8.0	6.9		3.9	3	2.3	1.2		0.4
n71	2[5]	4.6	1	0.7	0.6							
	2[6]	1.7	1	0.7	0.6							
n77	41[8]	10.4	10.4	10.4	10.4							N/A
n77	28[2]	28	25	23.2	22							
n78	41[8]	10.4	10.4	10.4	10.4							N/A
n79	19[2]	29.5	26.5	24.7								
n79	21[3]	39.3	36.3	34.5								
n79	26[2]	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 $F_{DL_{low}}^{LB} + BW_{Channel}^{LB}/2 \le f_{DL}^{LB} \le F_{DL_{high}}^{LB} - BW_{Channel}^{LB}/2$ 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 $F_{DL_{low}}^{LB} + BW_{Channel}^{LB}/2 \le f_{DL}^{LB} \le F_{DL_{high}}^{LB} - BW_{Channel}^{LB}/2$ 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 $F_{UL\_low}^{LB} + BW_{Channel}^{LB}/2 \le f_{UL}^{LB} \le F_{UL\_high}^{LB} - BW_{Channel}^{LB}/2$ 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 $f_{UL}^{LB} = \lfloor f_{DL}^{HB}/0.15 \rfloor 0.1$ in MHz and $F_{UL\_low}^{LB} + BW_{Channel}^{LB}/2 \le f_{UL}^{LB} \le F_{UL\_high}^{LB} - BW_{Channel}^{LB}/2$ 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 $F_{UL_{low}}^{HB} + BW_{Channel}^{HB}/2 \le f_{UL}^{HB} \le f_{UL_{high}}^{HB} - BW_{Channel}^{HB}/2$ 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 $f_{DL}^{LB} = \lceil f_{UL}^{HB} / 0.3 \rceil \cdot 0.1$ in MHz and $F_{UL\_low}^{LB} + BW_{Channel}^{LB} / 2 \le f_{UL}^{LB} \le F_{UL\_high}^{LB} - BW_{Channel}^{LB} / 2$ 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[1]	4.5	4.5	4.5	4.5							
n78	41[1]	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 ≥ 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_{RB} / MSD								
EN-DC Configuration	**EUTRA or NR band**	**UL F_c (MHz)**	**UL/DL BW (MHz)**	**UL L_{CRB}**	**DL F_c (MHz)**	**MSD (dB)**	**Duplex mode**	**IMD order**
DC_1A_n77A	1	1950	5	25	2140	29.8 32.5[4]	FDD	IMD2[3]
	n77	4090	10	50	4090	N/A	TDD	N/A
DC_1A_n77A, DC_1A_n78A, DC_1A_SUL_n78A-n84A	1	1950	5	25	2140	8.0 10.7[4]	FDD	IMD4[3]
	n77	3710	10	50	3710	N/A	TDD	N/A
DC_2A_n66A	2	1855	5	25	1935	20	FDD	IMD3
	n66	1775	5	25	2175	N/A	FDD	N/A
DC_2A_n66A	2	1883.3	5	25	1963.3	N/A	FDD	N/A
	n66	1750	5	25	2150	4	FDD	IMD5
DC_2A_n78A	2	1855	5	25	1940	26 28.7[4]	FDD	IMD2[3]
	n78	3795	10	50	3795	N/A	TDD	N/A
DC_2A_n78A	2	1885	5	25	1955	8.0 10.7[4]	FDD	IMD4[3]
	n78	3700	10	50	3700	N/A	TDD	N/A
DC_3A_n7A	3	1730	5	25	1825	N/A	FDD	N/A
	n7	2535	10	50	2655	10.2	FDD	IMD4
DC_3A_n77A, DC_3A_n78A, DC_3A-SUL_n78A-n80A, DC_3C_n78A	3	1740	5	25	1835	26 28.7[4]	FDD	IMD2[3]
	n77, n78	3575	10	50	3575	N/A	TDD	N/A
DC_3A_n77A, DC_3A_n78A, DC_3A-SUL_n78A-n80A, DC_3C_n78A	3	1765	5	25	1860	8.0 10.7[4]	FDD	IMD4[3]
	n77, n78	3435	10	50	3435	N/A	TDD	N/A
DC_5A_n66A	5	838	5	25	883	30	FDD	IMD2[3]
	n66	1721	5	25	2121	N/A		N/A
DC_5A_n78A	5	844	5	25	889	8.3	FDD	IMD4
	n78	3421	10	50	3421	N/A	TDD	N/A
DC_8A_n77A, DC_8A_n78A, DC_8A-SUL_n78A-n81A	8	897.5	5	25	942.5	8.3	FDD	IMD4
	n77, n78	3635	10	50	3635	N/A	TDD	N/A
DC_8A_n79A, DC_8A-SUL_n79A-n81A	8	897.5	5	25	942.5	4.8	FDD	IMD5
	n79	4532.5	40	216	4532.5	N/A	TDD	N/A
DC_20A_n8A	20	849.5	5	25	808.5	21	FDD	IMD3
	n8	892.5	5	25	937.5	21	FDD	IMD3
DC_20A_n77A, DC_20A_n78A, DC_20A-SUL_n78A-n82A	20	850	5	25	809	11	FDD	IMD4
	n77	3359	10	50	3359	N/A	TDD	N/A
DC_20A_n77A	20	840	5	25	799	6.5	FDD	IMD5
	n77	4159	10	50	4159	N/A	TDD	N/A
DC_21A_n79A	21	1457.5	5	25	1505.5	18.4	FDD	IMD3
	n79	4420.5	40	216	4420.5	N/A	TDD	N/A
DC_26A_n41A	26	839	5	25	884	15.6	FDD	IMD3[3]
	n41	2562	10	50	2562	N/A	TDD	N/A
DC_28A_n51A	28	742.3	5	25	797.3	5	FDD	IMD4
	n51	1429.5	5	25	1429.5	N/A	TDD	N/A
DC_26A_n77A,	26	836.5	5	25	881.5	11.1	FDD	IMD4

DC_26A_n78A	n77, n78	3391	10	50	3391	N/A	TDD	N/A
CA_28A_n77A, CA_28A_n78A, DC_28A-SUL_n78A-n83A	28	705.5	5	25	760.5	5.5	FDD	IMD5
	n77, n78	3582.5	10	50	3582.5	N/A	TDD	N/A
DC_66A_n5A	n5	838	5	25	883	30	FDD	IMD2[3]
	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, $P_{CMAX\_L,c}$) as defined in subclause 6.2.5A.
NOTE 2: RB_{START} = 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_c (MHz)	UL/DL BW (MHz)	UL L_{CRB}	DL F_c (MHz)	MSD (dB)	Duplex mode	IMD order
DC_66A_(n)71AA	66	1750	5	25	2150	5	FDD	IMD4
	n71	678	10	10 (RB_{start} =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_c (MHz)	UL/DL BW (MHz)	UL L_{CRB}	DL F_c (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 DC_1A-3C_n78A	1	1950	5	25	2140	N/A	FDD	N/A
	3	1712.5	5	25	1807.5	31.2		IMD2 $\|f_{B78}-f_{B1}\|$
	n78	3757.5	10	50	3757.5	N/A	TDD	N/A
	1	1935	5	25	2125	2.8	FDD	IMD5 $\|2*f_{B78}-3*f_{B3}\|$
	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 $\|f_{B78}-2*f_{B5}\|$
	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 $\|2*f_{B78}-3*f_{B1}\|$
	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 $\|f_{B78}-3*f_{B1}\|$
	n78	3305	10	50	3305	N/A	TDD	N/A
	1	1950	5	25	2140	8.7	FDD	IMD4 $\|2*f_{B78}-2*f_{B7}\|$
	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

EN-DC Configuration	EUTRA/NR band	UL F_c (MHz)	UL/DL BW (MHz)	UL L_{CRB}	DL F_c (MHz)	MSD (dB)	Duplex mode	IMD order
	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
	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 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 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	

EN-DC Configuration	EUTRA/NR band	UL F_c (MHz)	UL/DL BW (MHz)	UL L_{CRB}	DL F_c (MHz)	MSD (dB)	Duplex mode	IMD order
	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
	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	
	1	1950	5	25	2140	9.3	FDD	IMD4
DC_1A_n78A-n79A	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
	n78	3490	10	50	3490	4.6	TDD	IMD5
DC_3A-7A_n28A	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
	3	1737.5	5	25	1832.5	26.0	FDD	IMD2
DC_3C-7C_n78A	3	1725	5	25	1820	17.6	FDD	IMD3 $\lvert f_{B78}-2{*}f_{B7}\rvert$
	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 $\lvert 2{*}f_{B78}-2{*}f_{B7}\rvert$
	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
	3	1723	5	25	1818	9.4	FDD	IMD4
DC_3A-28A_n77A	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
	n77	3320	10	50	3320	N/A	TDD	N/A
DC_3A-28A_n78A	3	1775	5	25	1870	17.3	FDD	IMD3
	28	740	5	25	760	N/A		N/A
	n78	3350	10	25	3350	N/A	TDD	N/A
DC_3A-28A_n79A	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
	n79	4770	40	216	4770	N/A	TDD	N/A
DC_3A_n28A-n78A	3	1750	5	25	1845	N/A	FDD	N/A
	n28	743	5	25	798	N/A		N/A
	n78	3764	10	50	3764	4.5	TDD	IMD5
DC_3A_n78A-n79A	3	1770	5	25	1865	N/A	FDD	N/A

EN-DC Configuration	EUTRA/NR band	UL F_c (MHz)	UL/DL BW (MHz)	UL L_{CRB}	DL F_c (MHz)	MSD (dB)	Duplex mode	IMD order
	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
	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 DC_3C-7A_n78A	3	1725	5	25	1820	17.6	FDD	IMD3 $\|f_{B78}-2*f_{B7}\|$
	7	2565	5	25	2685	N/A	FDD	N/A
	n78	3310	10	50	3310	N/A	TDD	N/A
DC_3A-7A_n78A DC_3C-7A_n78A	3	1725	5	25	1820	8.6	FDD	IMD4 $\|2*f_{B78}-2*f_{B7}\|$
	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 DC_3C-20A_n78A	3	1725	5	25	1820	17.3	FDD	IMD3 $\|f_{B78}-2*f_{B20}\|$
	20	845	5	25	804	N/A	FDD	N/A
	n78	3510	10	50	3510	N/A	TDD	N/A
DC_3A-21A_n77A 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 $\|f_{B78}-f_{b5}\|$
	n78	3489	10	50	3489	N/A	TDD	N/A
	5	834	5	25	879	30.2	FDD	IMD2 $\|f_{B78}-f_{B7}\|$
	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 $\|2*f_{B78}-3f_{B7}\|$
	7	2525	5	25	2645	N/A	FDD	N/A
	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 $\|f_{B78}-f_{B7}\|$
	n78	3370	10	50	3370	N/A	TDD	N/A

EN-DC Configuration	EUTRA/NR band	UL F_c (MHz)	UL/DL BW (MHz)	UL L_{CRB}	DL F_c (MHz)	MSD (dB)	Duplex mode	IMD order
DC_7A-20A_n78A	7	2560	5	25	2680	N/A	FDD	N/A
	20	851	5	25	810	3.0	FDD	IMD5 $\|2*f_{B78}-3*f_{B7}\|$
	n78	3435	10	50	3435	N/A	TDD	N/A
DC_7A-20A_n78A	7	2555	5	25	2675	30.8	FDD	IMD2 $\|f_{B78}-f_{B20}\|$
	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	N/A
	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
	n28	745	5	25	800	28.8	FDD	IMD2
DC_7A-46A_n78A[6]	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, IMD5
	n78	N/A	N/A	N/A	N/A	N/A	TDD	N/A
DC_18A-28A_n77A	18	820	5	25	865	N/A	FDD	N/A
	28	723	5	25	778	4.4		IMD5
	n77	4058	10	50	4058	N/A	TDD	N/A
DC_18A-28A_n77A	18	820	5	25	865	3.9	FDD	IMD5
	28	723	5	25	778	N/A		N/A
	n77	3757	10	50	3757	N/A	TDD	N/A
DC_18A-28A_n78A	18	819	5	25	864	3.8	FDD	IMD5
	28	723	5	25	778	N/A		N/A
	n78	3756	10	50	3756	N/A	TDD	N/A
DC_19A-21A_n77A DC_19A-21A_n78A	19	837.5	5	25	882.5	18.7	FDD	IMD3
	21	1450.4	5	25	1498.4	N/A		N/A
	n77, n78	3783.3	10	50	3783.3	N/A	TDD	N/A
DC_19A-21A_n77A	19	837.5	5	25	882.5	N/A	FDD	N/A
	21	1454.5	5	25	1502.5	9.0		IMD4
	n77	4015	10	50	4015	N/A	TDD	N/A
DC_19A-21A_n79A	19	837.5	5	25	882.2	N/A	FDD	N/A
	21	1452	5	25	1500	3.8		IMD5
	n79	4850	40	216	4850	N/A	TDD	N/A
DC_21A-28A_n77A	21	1452	5	25	1500	N/A	FDD	N/A
	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_21A-28A_n79A	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_28A-42A_79A	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

EN-DC Configuration	EUTRA/NR band	UL F_c (MHz)	UL/DL BW (MHz)	UL L_{CRB}	DL F_c (MHz)	MSD (dB)	Duplex mode	IMD order
	n78	3680	10	50	3680	N/A	TDD	N/A
	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 $\Delta R_{IB,c}$, ΔR_{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.2in [3] shall be increased by the amount given in $\Delta R_{IB,c}$,ΔR_{IBNC} in Tables below where unless otherwise stated, the same $\Delta R_{IB,c}$, ΔR_{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 ΔR_{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 ≤ 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	ΔR_{IBNC} (dB)	Duplex mode
DC_3A_n3A	5MHz+5MHz	45.0 < W_{gap} ≤ 65.0	12[1]	4.7	FDD
		0.0 < W_{gap} ≤ 45.0	25[1]	0	
	5MHz+10MHz	40.0 < W_{gap} ≤ 60.0	12[1]	3.8	
		0.0 < W_{gap} ≤ 40.0	25[1]	0	
	5MHz+15MHz	35.0 < W_{gap} ≤ 55.0	12[1]	3.6	
		0.0 < W_{gap} ≤ 35.0	25[1]	0	
	5MHz+20MHz	30.0 < W_{gap} ≤ 50.0	12[1]	3.4	
		0.0 < W_{gap} ≤ 30.0	25[1]	0	
	5MHz+25MHz	25.0 < W_{gap} ≤ 45.0	12[1]	3.2	
		0.0 < W_{gap} ≤ 25.0	25[1]	0	
	5MHz+30MHz	20.0 < W_{gap} ≤ 40.0	12[1]	3.0	
		0.0 < W_{gap} ≤ 20.0	25[1]	0	
	10MHz+5MHz	30.0 < W_{gap} ≤ 60.0	12[5]	5.1	
		0.0 < W_{gap} ≤ 30.0	32[1]	0	
	10MHz+10MHz	25.0 < W_{gap} ≤ 55.0	12[5]	4.3	
		0.0 < W_{gap} ≤ 25.0	32[1]	0	
	10MHz+15MHz	20.0 < W_{gap} ≤ 50.0	12[5]	3.8	
		0.0 < W_{gap} ≤ 20.0	32[1]	0	
	10MHz+20MHz	15.0 < W_{gap} ≤ 45.0	12[5]	3.5	
		0.0 < W_{gap} ≤ 15.0	32[1]	0	
	10MHz+25MHz	10.0 < W_{gap} ≤ 40.0	12[5]	3.2	
		0.0 < W_{gap} ≤ 10.0	32[1]	0	
	10MHz+30MHz	5.0 < W_{gap} ≤ 35.0	12[5]	2.8	
		0.0 < W_{gap} ≤ 5.0	32[1]	0	
	15MHz+5MHz	25.0 < W_{gap} ≤ 55.0	12[6]	6.0	
		0.0 < W_{gap} ≤ 25.0	32[1]	0	
	15MHz+10MHz	20.0 < W_{gap} ≤ 50.0	12[6]	4.7	
		0.0 < W_{gap} ≤ 20.0	32[1]	0	
	15MHz+15MHz	15.0 < W_{gap} ≤ 45.0	12[6]	4.2	
		0.0 < W_{gap} ≤ 15.0	32[1]	0	
	15MHz+20MHz	10.0 < W_{gap} ≤ 40.0	12[6]	3.8	
		0.0 < W_{gap} ≤ 10.0	32[1]	0	
	15MHz+25MHz	5.0 < W_{gap} ≤ 35.0	12[6]	3.5	
		0.0 < W_{gap} ≤ 5.0	32[1]	0	
	15MHz+30MHz	0.0 < W_{gap} ≤ 30.0	12[6]	3.3	
	20MHz+5MHz	15.0 < W_{gap} ≤ 50.0	16[7]	6.5	
		0.0 < W_{gap} ≤ 15.0	32[1]	0	
	20MHz+10MHz	10.0 < W_{gap} ≤ 45.0	16[7]	5.1	
		0.0 < W_{gap} ≤ 10.0	32[1]	0	
	20MHz+15MHz	5.0 < W_{gap} ≤ 40.0	16[7]	4.5	
		0.0 < W_{gap} ≤ 5.0	32[1]	0	
	20MHz+20MHz	0.0 < W_{gap} ≤ 35.0	16[7]	4.1	
	20MHz+25MHz	0.0 < W_{gap} ≤ 30.0	16[7]	3.8	
	20MHz+30MHz	0.0 < W_{gap} ≤ 25.0	16[7]	3.6	

NOTE 1: [1] 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: [5] refers to the UL resource blocks shall be located at RB_{start}=25.
NOTE 6: [6] refers to the UL resource blocks shall be located at RB_{start}=35.
NOTE 7: [7] 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[1]
		0.5[2]
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 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

Inter-band EN-DC configuration	E-UTRA or NR Band	$\Delta R_{IB,c}$ (dB)
DC_3_n3-n77	3	0.2
	n3	0.2
	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[1]
		0.5[2]
	n78	0.5
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

Inter-band EN-DC configuration	E-UTRA or NR Band	$\Delta R_{IB,c}$ (dB)
DC_3-SUL_n78-n82	3	0.2
	n78	0.5
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

Inter-band EN-DC configuration	E-UTRA or NR Band	$\Delta R_{IB,c}$ (dB)
DC_28-SUL_n78-n83	28	0.2
	n78	0.5
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 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 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 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

Inter-band EN-DC configuration	E-UTRA or NR Band	$\Delta R_{IB,c}$ (dB)
	n78	0.5
DC_1-7_n28-n78	1	0.2
	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
DC_1-19-42_n77	1	0.2
	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
DC_1-20_n28-n78	1	0.0
	20	0.2
	n28	0.2
	n78	0.5
DC_1-21-42_n77	1	0.2
	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
DC_1-28-42_n77	1	0.2
	28	0.2
	42	0.5
	n77	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
DC_2-66-(n)71	2	0.3
	66	0.3
DC_3-5-7_n78, DC_3-5-7-7_n78	3	0.2
	5	0.2
	7	0.2
	n78	0.5
DC_3-7-7_n78	3	0.2
	7	0.2
	n78	0.5
DC_3-7-20_n28	20	0.2
	n28	0.1
DC_3-7-20_n78	3	0.2
	7	0.2
	n78	0.5
DC_3-7-28_n78 DC_3-7_n28-n78	3	0.2
	7	0.2
	28 or n28	0.2
	n78	0.5
DC_3-19-21_n77	3	0.3
	21	0.5
	n77	0.5
DC_3-19-21_n78	3	0.3
	21	0.5
	n78	0.5
DC_3-19-21_n79	3	0.3

Inter-band EN-DC configuration	E-UTRA or NR Band	$\Delta R_{IB,c}$ (dB)
	21	0.5
DC_3-19-42_n77	3	0.2
	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	$\Delta R_{IB,c}$ (dB)
DC_1-3-5-7_n78, 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
	n78	0.5
DC_1-3-19-21_n77	1	0.2
	3	0.3
	21	0.5
	n77	0.5
DC_1-3-19-21_n78	1	0.2
	3	0.3
	21	0.5
	n78	0.5
DC_1-3-19-21_n79	3	0.3
	21	0.5
DC_1-3-19-42_n77	1	0.2
	3	0.2
	42	0.5
	n77	0.5
DC_1-3-19-42_n78	1	0.2
	3	0.2
	42	0.5
	n78	0.5
DC_1-3-19-42_n79	1	0.2
	3	0.2
	42	0.5
DC_1-3-28-42_n77	1	0.2
	3	0.2
	28	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
	n78	0.5
DC_1-3-28-42_n79	1	0.2
	3	0.2
	28	0.2
	42	0.5
DC_1-3-20_n28-n78	1	0.2
	3	0.2
	20	0.2
	n28	0.2
	n78	0.5
DC_1-3-21-42_n77	1	0.2
	3	0.3
	21	0.5
	42	0.5

Inter-band EN-DC configuration	E-UTRA or NR Band	$\Delta R_{IB,c}$ (dB)
	n77	0.2
DC_1-3-21-42_n78	1	0.2
	3	0.3
	21	0.5
	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: ΔRIB,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*log10($N_x SCS_x / N_y SCS_y$)
NOTE 1: Power in Largest E-UTRA or NR bandwidth CC, listed in Table 7.4-1 [2] NOTE 2: N_x, 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, 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_{CMAX_L} at the minimum uplink configuration specified in Table 7.3-3 with P_{CMAX_L} as defined in subclause 6.2B.4. NOTE 5: For E-UTRA carrier, the transmitter shall be set to 4dB below P_{CMAX_L} at the minimum uplink configuration specified in Table 7.3-1-2 with P_{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
$P_{interferer}$, dBm	P_I [2]	Aggregated power + 17.7 dB	Aggregated power + 17 dB	Aggregated power + 16.4dB
Pw 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_I 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 $P_{CMAX\_L,f,c}$ at the minimum uplink configuration specified in Table 7.3-3 with $P_{CMAX\_L,f,c}$ as defined in subclause 6.2B.4.
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.

Table 7.5B.1-2: ACS test case 2

EN-DC Aggregated Bandwidth, BW_{agg}, MHz	<=100	>100, <=120	>120, <=140	>140, <=160
Pw in Transmission Bandwidth Configuration, perCC, dBm	P_W [1]	-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 $+10\log_{10}(N_{RB,c}SCS_c/BW_{agg})$
$P_{interferer}$, dBm	-25			

NOTE 1: P_W 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 $P_{CMAX\_L,f,c}$ at the minimum uplink configuration specified in Table 7.3-3 with $P_{CMAX\_L,f,c}$ as defined in subclause 6.2B.4.
NOTE 4: For E-UTRA carrier, the transmitter shall be set to 4 dB 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.

7.5B.2 Intra-band non-contiguous EN-DC in FR1

For the E-UTRA sub-block containing one or multiple CC’s, the requirement is defned 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	<=100	>100, <=120	>120, <=140	>140, <=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] NOTE 2: Interferer values are specified from Table 7.6.1.1A-2 in [4] 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 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. 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 deined 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	<=100	>100, <=120	>120, <=140	>140, <=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 $P_{CMAX\_L,f,c}$ at the minimum uplink configuration specified in Table 7.3-3 with $P_{CMAX\_L,f,c}$ as defined in subclause 6.2B.4. NOTE 3: 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.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 dfined 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_{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_{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 PCmax_l).

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 PCmax_l).

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	<=100	>100, <=120	>120, <=140	>140, <=160
Pw in Transmission Bandwidth Configuration, perCC, dBm	REFSENS + Aggregated BW specific value below			
	16			
$P_{UW,}$ 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 $P_{CMAX\_L,f,c}$ at the minimum uplink configuration specified in Table 7.3-3 with $P_{CMAX\_L,f,c}$ as defined in subclause 6.2.4 from TS 38.101-1 [2]. NOTE 3: 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. 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 deined 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, <=120	>120, <=140	>140, <=160
Pw in Transmission Bandwidth Configuration, perCC, dBm	REFSENS + Aggregated BW specific value below			
	9			
$P_{interferer}$, dBm (CW)	-44			
NOTE 1: 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 6.2.4 from TS 38.101-1 [2]. NOTE 2: 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 .				

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
Pw in Transmission Bandwidth Configuration, perCC, dBm	P_W [1]	16.8	17.5	18.0
$P_{interferer\ 1}$, dBm (CW)[2]	-46			
$P_{interferer\ 2}$, dBm (Modulated)[2]	-46			
NOTE 1: P_W 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 $P_{CMAX\_L,f,c}$ at the minimum uplink configuration specified in Table 7.3-3 with $P_{CMAX\_L,f,c}$ as defined in subclause 6.2B.. NOTE 4: 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.				

7.8B.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.

Annex A (normative): Measurement channels

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.

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					
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					
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 Cateogry (Note 4)		5, 8, 13, 14	5, 8, 13, 14	5, 8, 13, 14	5, 8, 13, 14	5, 8, 13, 14	5, 8, 13, 14
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.2.2.1.4 256 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 Cateogry		≥ 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.2.2.2.2-1: 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	Trans-port 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 Cateogry
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,

$$\min\left|R-\left(A+24*\left(N_{CB}+1\right)\right)/N_{ch}\right|,\ where\ N_{CB}=\begin{cases}0,\ if\ C=1\\ C,\ if\ C>1\end{cases},$$

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					
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 ≥ 3 (TDD)

Parameter	Unit	Value					
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		¾	¾	¾	¾	¾	¾
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 ≥ 11 (TDD)

Parameter	Unit	Value					
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]

Annex B: Void

Annex C: Void

Annex D: Void

Annex E: Void

Annex F: Void

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** (bit number)	**Definition** (description of the supported functionality if indicator 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

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: fIBW = |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): [fIBW – IBW/2, fIBW + 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.

Annex J: Void

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 Bis	R4-1711980				Number TPs from editors	0.1.0
2017-12	RAN4#85	R4-1713807				Approved TPs in RAN4#85 R4-1714444, CA BW classes, TP, Ericsson R4-1714170, How to list DC configurations into TS 38.101-3, Nokia R4-1714530, TP on introducing operating bands for NR-LTE DC including SUL band combinations in 38.101-3 , Qualcomm R4-1714098, TP to TS 38.101-3: UE RF requirements for non-standalone SUL, Huawei R4-1713206, TP on general parts for 38.101-3 NR interwork, Ericsson R4-1714443, TP to TS 38.101-3: On dual uplink operation for EN-DC in NR FR1 and single uplink, Nokia R4-1714450, TP to 38.101-3: maximum output power and unwanted emissions for EN-DC, Ericsson R4-1714346, TP to 38.101-3: REFSENS for intra-band EN-DC, Ericsson R4-1714345, TP for TS 36.101-3: clause 7 receiver requirements, Huawei 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 Endorsed draft CR F: R4-1801267, Draft CR on UE RF requirements for SUL in TS 38.101-3, Huawei B: R4-1801111, Draft CR for completed LTE 1CC + NR 1band for TS 38.101-3, NTT DOCOMO, INC. B: R4-1800716, Draft CR for introduction of completed band combinations from 37.863-03-01 into 38.101-3, Ericsson B: R4-1800063, Draft CR for completed EN-DC of LTE 4CC + NR 1band for TS 38.101-3, Nokia B: R4-1800717, Draft CR for introduction of completed band combinations from 37.865-01-01 into 38.101-3, Ericsson F: R4-1800049, Modification for TS38.101-3, CATT 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. 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. 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 **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 draftCR (R4-1807235) were added during the CR implementation.**	15.2.0

2018-09	RAN#81	RP-182129	0020	2	F	Big CR for 38.101-3 Draft CRs from RAN4#88: R4-1809960 Draft CR to TS 38.101-3: to introduce new NR inter-band DC band combinations Samsung,KDDI,SKT,KT,LGU+ R4-1809991 CR to 38.101-3:Corrections on UE coexistence table for Table 6.5B.3.3.1-1 MediaTek Inc. R4-1810054 Pcmax for Rel-15 inter-band EN-DC for FR1 and NR in FR2 InterDigital, Inc. R4-1810111 Single UL allowed corrections for DC_28A-n51A EN-DC in 38.101-3 Skyworks Solutions Inc. R4-1810125 Draft CR to 38.101-3 Single UL allowed corrections for DC_28A_51A EN-DC Skyworks Solutions Inc. R4-1810128 Draft CR to 38.101-3 Single UL allowed corrections for EN-DC operation in NR FR1 (two bands) Skyworks Solutions Inc. R4-1810167 TP for TR 37.863-01-01: MSD for DC_5A_n78A due to the 4th harmonic MediaTek Inc. R4-1810410 Draft CR to 38.101-3: Corrections on symbols and abbreviations in section 3 ZTE Corporation R4-1810417 Correction to DC_(n)71B MSD definition Nokia R4-1810433 Correction on EN-DC 8A_n79A SoftBank Corp.,ZTE R4-1810476 Draft CR to TS 38.101-3 correction for DC_3_n3-n77, DC_3_n3-n78 CHTTL R4-1810976 Annex lettering change for 38.101-3 Qualcomm Incorporated R4-1811461 Clarification and corrections of EN-DC REFSENS exceptions requirement Nokia, Nokia Shanghai Bell R4-1811462 Correction to DC_(n)71B scs restriction for NR Nokia R4-1811466 EN DC_41-79 CATT R4-1811467 Draft CR TS 38.101-3 Corrections to Single UL Allowed Criteria for Mid-Band EN-DC in FR1 Skyworks Solutions Inc. R4-1811484 Pcmax for inter-band EN-DC FR1 draft CR InterDigital, Inc. R4-1811525 Draft CR TS 38.101-3 on missing requirements for FR1 EN-DC Skyworks Solutions, Inc. R4-1811542 Draft CR to 38.101-3 on correction on some errors Huawei, HiSilicon R4-1811796 Draft CR to 38.101-3 Corrections to Single UL allowed criteria for EN-DC Skyworks Solutions Inc. R4-1811800 DRAFT CR for PCmax FR2 correction Qualcomm Incorporated R4-1811810 Draft CR TS 38.101-3: Corrections for B41/n41 SPRINT Corporation	15.3.0
2018-12	RAN#82	RP-182359	0030		F	Endorced draft CRs from RAN4#88Bis : R4-1812057, Introduction of Intra-band contiguous EN-DC bandwidth classes, Nokia R4-1812290 Draft CR on MSD for EN-DC including Band 66 and n78 Huawei, HiSilicon R4-1812293 Draft CR on switching time mask for EN-DC Huawei, HiSilicon R4-1812298 Draft CR to TS 38.101-3: to add missing requirements for inter-band CA between FR1 and FR2. Samsung R4-1812360 Draft CR to 38.101-3: Corrrection to UL configuration for EN-DC reference sensitivity exceptions Skyworks Solutions Inc. R4-1812361 Draft CR to 38.101-3: NR uplink DFT-S-OFDM waveforms for EN-DC reference sensitivity Skyworks Solutions Inc. R4-1812362 Draft CR to 38.101-3: Editorial and RB allocation corrections to table 7.3B.2.3.4-2Skyworks Solutions Inc. R4-1812363 Draft CR to 38.101-3: Single UL allowed operation corrections in clause 7.3B.2.3.5 Skyworks Solutions Inc. R4-1812404 Non-contiguous intra-band EN-DC emission requirements Qualcomm Incorporated R4-1812410 Correction on REFSENS exception for EN-DC 41A-n77A/n78A SoftBank Corp. R4-1812670 Correction on REFSENS exceptions of DC_5A-7A_n78A to TS 38.101-3 LG Uplus R4-1813471 draftCR on applicability of TDD configuratiin for CA in TS 38.101-3 Huawei R4-1813796 Draft CR for 38.101-3: Intra-band Pcmax for Type 2 UEs Sprint Corporation	15.4.0

						R4-1813816 Renaming of DC_(n)71B into DC_(n)71AA Nokia R4-1813817 Correction to EN-DC operating bands and configurations Nokia R4-1813818 Draft CR on correction REFSENs exceptions due to dual uplink operation for inter-band EN-DC to TS 38.101-3 Samsung R4-1813822 Draft CR for 38.101-3: Single UL allowed criteria in Annex I Vodafone España SA R4-1814157 Draft CR for UE-to-UE coexistence requirements for intra-band EN-DC in TS38.101-3 LG Electronics France R4-1814167 Draft CR on Single UL for some EN-DC combinations Huawei Endorsed draft CRs from Ran4#89: R4-1815952 dCR on TS38.101-3 merging draft CRs from RAN4#(88Bis) Qualcomm IncorporatedR4-1814803 Draft CR on editorial error for EN-DC band combinations to TS 38.101-3 Huawei, HiSilicon R4-1815802 draft CR editorial correction in 38.101-3 Ericsson R4-1814425 Simplification of requirements for EN-DC configuration including FR2 NTT DOCOMO, INC. R4-1814512 Draft CR to TS38.101-3_Corrections on MSD requirments for EN-DC combinations of band 8 and n77 n78(Section 7.3B.2.3.1) ZTE Corporation R4-1814938 Draft CR to 38.101-3 on operating bands for CA and DC ZTE Corporation Zhifeng Ma R4-1814976 Correction for Maximum output power for inter-band EN-DC (two bands) Nokia, Nokia Shanghai Bell R4-1814977 Correction for ?TIB,c for EN-DC Nokia, Nokia Shanghai Bell R4-1814978 MPR and A-MPR for interband EN-DC Nokia, Nokia Shanghai Bell R4-1814980 Correction for intra-band EN-DC bandwidth class Nokia, Nokia Shanghai Bell R4-1815065 draft CR for adding missing transmit singnal quality for inter band EN-DC for TS 38.101-3 NTT DOCOMO, INC. R4-1815811 draft Rel-15 CR to 38.101-3 to correct n260 BW class Ericsson, AT&T R4-1815865 Draft CR for 38.101-3 Intra-band EN-DC nominal carrier spacing for 30 kHz raster SPRINT Corporation R4-1815973 Draft CR to 38.101-3 rel. 15 to fix MSD issues for higher order EN-DC combinations R4-1816227 Draft CR on Power Class for inter band EN-DC within FR1 OPPO R4-1816233 Receiver requirements for intra-band EN-DC Qualcomm Incorporated R4-1816621 Introduction of maxUplinkDutyCycle to ENDC HPUE in FR1 OPPO R4-1816638 Pcmax computation and evaluation for inter band ENDC Qualcomm R4-1816178 Draft CR for correction for missing agreed DC combinations in Rel-15 for TS 38.101-3 NTT DOCOMO, INC. R4-1816197 Draft CR to TS38.101-3_Clarifications on MSD and UL configuration tables for EN-DC ZTE Corporation 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 R4-1816202 Correction to interband EN-DC OOBE emission requirements Nokia, Nokia Shanghai Bell R4-1816203 Receiver requirements for interband EN-DC Nokia, Nokia Shanghai Bell R4-1816207 Draft CR to 38.101-3 rel. 15 to fix MPR issue Apple GmbH R4-1816224 Draft CR for 38.101-3 NS_04 applicability for intra-band EN-DC SPRINT Corporation R4-1816231 Draft CR on output power dynamic for DC OPPO R4-1816237 Correction for Intra-band contiguous EN-DC A-MPR definition Nokia, Nokia Shanghai Bell 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. R4-1816247 Draft CR 38-101-3 Corrections for EN-DC Single Uplink allowed Operation Skyworks Solutions Inc. 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.	

						R4-1816608 Draft CR on LTE RMC for TDD EN-DC UE RF Tests Qualcomm Incorporated R4-1816613 Draft CR for reducing AMPR for DC_(n)71AA without Dynamic Power Sharing" Motorola Mobility, T-Mobile"	

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
2019-03	RAN#83	RP-190403	0035		F	CR to TS 38.101-3: Implementation of endorsed draft CRs from RAN4#90 Endorced draft CRs from RAN4#90 R4-1900034, Editorial corrections for 38.101-3, Qualcomm Incorporated R4-1900460, Draft CR to TS38.101-3_corrections on MSD, ZTE Corporation R4-1900461, Draft CR to TS38.101-3_inter-band NR DC between FR1 and FR2, ZTE Corporation R4-1900524, Draft CR to TS 38.101-3 on inter-band CA & inter-band EN-DC configurations, ZTE Corporation R4-1900529, Draft CR to TS 38.101-3 on Single Uplink Allowed for EN-DC combinations of order 3 or higher, ZTE Corporation R4-1900726, Editorial corrections to delta Tib for EN-DC, Rohde & Schwarz R4-1901359, draft CR for correction for missing operating band for EN-DC, NTT DOCOMO INC. R4-1901428, draft CR to make editorial corrections in 38-101-3 Rel-15, Ericsson R4-1901848, Draft CR for 38.101-3: Addition of default power class, Sprint Corporation R4-1901850, Draft CR for 38.101-3: Intra-band Pcmax P_EN-DC_Total for non-DPS UEs, Sprint Corporation R4-1901851, Draft CR for 38.101-3: Intra-band Pcmax Editorial corrections, Sprint Corporation R4-1901874, Guardband for harmonic exception to reference sensitivity, Qualcomm Incorporated R4-1901878, Non-simultaneous Tx/Rx for TDD intra-band EN-DC, Qualcomm Incorporated R4-1901890, A-MPR for DC_(n)71AA without Dynamic Power Sharing, Motorola Mobility France S.A.S R4-1901926, Draft CR to 38.101-3 to clarify ACS2 wanted level, Qualcomm Incorporated R4-1901997, draft_CR TS 38.101-3 type 2 UE DC_(n)41 and DC_41_n41 NS04 AMPR correction, Skyworks Solutions Inc. R4-1902002, Draft CR to 38.101-3 on DC_n41-41 – B40 coexistence, Qualcomm Incorporated R4-1902154, Draft CR to TS38.101-3_clean up on inter-band CA between FR1 and FR2, ZTE Corporation 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. R4-1902156, draftCR corrections for TS 38.101-3, Huawei R4-1902157, CR on intraband ENDC channel configurations, Intel Corporation R4-1902160, Draft CR on some errors to TS 38.101-3, Huawei R4-1902161, CR to 38.101-3 to clarify non-simultaneous RXTX capability for co-bands, Qualcomm Incorporated R4-1902163, Draft CR to 38.101-3 to clarify DL carrier levels for bands in close frequency proximity, Qualcomm Incorporated R4-1902164, Draft CR to reflect agreed MSD analysis of DC_25A-n41A for TS 38.101-3, MediaTek Inc. R4-1902169, draft CR for inter-band EN-DC Pcmax, Huawei R4-1902172, Draft CR ACLR for NC intra-band EN-DC, Skyworks Solutions Inc. R4-1902176, Draft CR for 38.101-3 modification of requirements for intra-band non-contiguous EN-DC SEM, Huawei R4-1902179, draft CR for introduction of Tx IM for Inter-band EN-DC in TS38.101-3, NTT DOCOMO, INC. R4-1902182, Clarification for OOBE boundary for intra-band contiguous and non-contiguous EN-DC, vivo R4-1902195, draft_CR TS 38.101-3 Footnote correction in Table 7.3B.2.3.1-2, Skyworks Solutions Inc. R4-1902232, Draft CR on SUL band combinations to TS 38.101-3, Huawei R4-1902478, Addition of power class 2 EN-DC ACLR requirement, Nokia R4-1902481, draftCR on inter-band EN-DC Rx requirement for TS 38.101-3, Huawei R4-1902486, Draft CR for 38.101-3 modification of requirements for network signalled value NS_04, Huawei R4-1902496, Draft CR for TS 38.101-3: Switching time for intra-	15.5.0

						band EN-DC upon dual PA UE capability, Huawei R4-1902500, Draft CR for 38.101-3: adding MPR for intra-band ENDC,Skyworks Solutions Inc R4-1902660, Introduction of modified MPR for 38.101-3, Nokia Editorial changes after RAN#83 To align the annex numbering with other specifications (TS 38.101-x series), ‘Modified MPR behavior’ was moved to annex H.	