**3GPP TSG-RAN WG4 Meeting #116 R4-2511753**

**Bengaluru, India, August 25th – 29th, 2025**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | 38.101-1 | **CR** | Draft CR | **rev** | - | **Current version:** | 19.2.0 |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Draft CR to R19 38101-1 to introduce power class definitions for inter band CA wo-w MIMO | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Skyworks Solutions Inc, Murata, T-Mobile USA | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | [NR\_ENDC\_RF\_Ph4\_Core](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_114/Inbox/Drafts/%5b114%5d%5b117%5d%20NR_ENDC_RF_Ph4_part2) | | | | |  | ***Date:*** | | | 2025-04-08 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-19 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Introduction of HPUE inter-band power class configuration per band valid in release 19 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The followings are the summary of changes.   1. Removed restriction to FWA in clause 4 2. Modified Notes in section 5 to reflect R19 applicable HPUE UL configuration (Notes may be simplified/merged/removed for some cases in the future) 3. Added the per band power class for MSD applicability in Table 6.2A.1.3-2 for 2Tx inter-band HPUE CA in 6.2A.1.3 and modified Notes in Table 6.2A.1.3-1 accordingly. Reordered combinations consistently. 4. Added the per band power class for MSD applicability in Table 6.2H.3.1-2 for 3Tx inter-band HPUE CA in 6.2H.3.1 and modified Notes in Table 6.2H.3.1-1 accordingly. 5. Integrated the overlapping part from draftCR R4-2502867 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Requested HPUE inter-band UL CA configurations are not introduced in R-19 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.3, 5.5A.3.1, 6.2A.1.3 and 6.2H.3.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **x** |  | Test specifications | | | | TS 38.521-1 | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

<First changed section>

## 4.3 Specification suffix information

Unless stated otherwise, the suffixes shown in Table 4.3-1 are used for indicating at 2nd level clause. For shared spectrum channel access, suffixes A, B, and D are used for indicating at 3rd level clause. For V2X, suffixes A and F are used for indicating at 3rd level clause.

Table 4.3-1: Definition of suffixes

|  |  |
| --- | --- |
| Clause suffix | Variant |
| None | Single Carrier |
| A | Carrier Aggregation (CA) |
| B | Dual-Connectivity (DC) |
| C | Supplementary Uplink (SUL) |
| D | UL MIMO |
| E | V2X |
| F | Shared spectrum channel access |
| G | Tx Diversity (TxD) |
| H | Carrier Aggregation (CA) with UL MIMO |
| I | (e)RedCap |
| J | ATG |
| K | Aerial UE (UAV) |
| L | Carrier Aggregation (CA) with Tx Diversity |

A terminal which supports the above features needs to meet both the general requirements and the additional requirement applicable to the additional clause (suffixes A to L) in clauses 5, 6 and 7. Where there is a difference in requirement between the general requirements and the additional clause requirements (suffixes A to L) in clauses 5, 6 and 7, the tighter requirements are applicable unless stated otherwise in the additional clause.

A terminal which supports advanced V2X services, public safety services and other commercial use cases related to NR sidelink operation shall meet all of the separate corresponding requirements in suffix E.

For a terminal that supports SUL for the band combination specified in Table 5.2C-1, the current version of the specification assumes the terminal is configured with active transmission either on UL carrier or SUL carrier at any time in one serving cell and the UE requirements for single carrier shall apply for the active UL or SUL carrier accordingly.

For a terminal that supports public safety service using sidelink, the minimum requirements are applicable when

- The UE is associated with a serving cell on PS carrier, or

- The UE is not associated with a serving cell on the PS carrier and is provisioned with the preconfigured radio parameters for PS that are associated with known Geographical Area, or

- The UE is associated with a serving cell on a carrier different than the PS carrier, and the radio parameters for PS that are provided by the serving cell, or

- The UE is associated with a serving cell on a carrier different than the PS carrier, and has a non-serving cell selected on the PS carrier with the preconfigured radio parameters.

When the advanced-V2X or PS UE is not associated with a serving cell on the V2X or PS carrier, and the UE does not have knowledge of its geographical area, or is provisioned with preconfigured radio parameters that are not associated with any Geographical Area, V2X or PS UE’ transmissions are not allowed, and the requirements in Section 6.3E.2 apply.

For a terminal that supports operation in shared spectrum, the current version of this specification assumes in the uplink sub-bands within a wideband channel shall be contiguously allocated to the UE. The uplink requirements for one or more non-transmitted sub-bands between two transmitted sub-bands does not form a part of the current version of this specification.

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

A terminal which supports intra-band contiguous UL CA with UL MIMO shall meet the corresponding requirements in suffix H with all UL CCs with UL MIMO.

A terminal which supports inter-band UL CA with UL MIMO shall meet the corresponding requirements in suffix H with all UL CCs with UL MIMO for the frequency band(s) said to be with UL MIMO.

<Next change>

#### 5.5A.3.1 Configurations for inter-band CA (two bands)

<Unchanged Table 5.5A.3.1-1a to 5.5A.3.1-1a omitted>

The following notes are applied to the above tables:

NOTE 1: This UE channel bandwidth is applicable only to downlink.

NOTE 2: The minimum requirements for intra-band contiguous or non-contiguous CA apply.

NOTE 3: For each channel bandwidth of each component carrier, refer to Table 5.3.5-1 for the applicable SCSs. For a given band, not all UE channel bandwidths support the same SCSs.

NOTE 4: This UE channel bandwidth is optional in this release of the specification.

NOTE 5: For this bandwidth, the minimum requirements are restricted to operation when carrier is configured as an SCell part of DC or CA configuration.

NOTE 6: For this bandwidth, the minimum requirements are restricted to operation when carrier is configured as an downlink SCell part of CA configuration

NOTE 7: Limited to operation at 3450-3550 MHz and 3700–3980 MHz.

NOTE 8: Minimum requirements for Power Class 2 are applicable for this uplink CA configuration according to clause 6.2A.1.1 or 6.2A.1.2 or 6.2A.1.3 or single uplink carrier configuration according to clauses 6.2.1 or 6.2D.1 or 6.2G.1 in this downlink/uplink combination

NOTE 9: Minimum requirements for Power Class 1.5 are applicable for this uplink CA configuration according to clause 6.2A.1.3 or single uplink carrier according to clauses 6.2.1 or 6.2D.1 or 6.2G.1 in this downlink/uplink combination.

NOTE 10: Only single uplink carriers with power class other than PC3 are listed.

NOTE 11: The CA configurations are given in Table 5.5A.1-1 or Table 5.5A.2-1 in this specification

NOTE 12: Void.

NOTE 13: Minimum requirements for Power Class 2 are applicable for this uplink CA configuration according to clause 6.2H.3.1 or 6.2L.3.1.

NOTE 14 Minimum requirements for Power Class 1.5 are applicable for this uplink CA configuration according to clause 6.2H.3.1 or 6.2L.3.1.

NOTE 15: Uplink is only in n5 for CA\_n5-n8.

NOTE 16: For UEs only supporting DL CA\_n26-n28, uplink support in band n26 is optional, if the UE supports CA\_n26-n28 UL configuration, it should also support UL in band n26 and n28.

<Next change>

#### 6.2A.1.3 UE maximum output power for Inter-band CA

For inter-band downlink carrier aggregation with one uplink carrier assigned to one NR band, the transmitter power requirements in Table 6.2.1-1 apply for power class 3 and other power classes if indicated in clause 5.5A.3.

For inter-band carrier aggregation with two uplink contiguous carrier assigned to one NR band, the transmitter power requirements specified in subclause 6.2A.1.1 apply.

For inter-band carrier aggregation with two uplink non-contiguous carrier assigned to one NR band, the transmitter power requirements specified in subclause 6.2A.1.2 apply. For inter-band uplink carrier aggregation with uplink assigned to two NR bands, 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 defined as the sum of maximum output power from each UE antenna connector. The period of measurement shall be at least one sub frame (1 ms). The two band UL CA maximum output power with one Tx per band is specified in Table 6.2A.1.3-1. These configurations are subject to the applicable power class of each NR band as specified in Table 6.2.1-1.

If *higherPowerLimit-r17* is indicated for an UL inter-band CA configuration as specified in Table 6.2A.1.3-1 and with uplink bands of different power class capabilities, the UE maximum output power specified in Table 6.2A.1.3-1 for this UL CA configuration is modified in accordance with sub-clause 6.2A.4.1.3.

Table 6.2A.1.3-1: UE Power Class for uplink inter-band CA (two bands)

| Uplink CA Configuration | Class 1.5 (dBm) | Tolerance (dB) | Class 2 (dBm) | Tolerance  (dB) | Class 3 (dBm) | Tolerance (dB) | Class 5 (dBm) | Tolerance (dB) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CA\_n1A-n3A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n1A-n5A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n1A-n7A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n1A-n8A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n1A-n18A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n1A-n20A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n1A-n26A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n1A-n28A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n1A-n40A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n1A-n41A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n1A-n46A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n1A-n71A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n1A-n74A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n1A-n77A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n1A-n78A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n1A-n78C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n1A-n79A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n1A-n102A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n1A-n102B |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n1A-n102C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n1A-n105A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n2A-n5A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n2A-n5B |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n2A-n7A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n2A-n12A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n2A-n14A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n2A-n30A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n2A-n41A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n2A-n48A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n2A-n48B |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n2A-n66A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n2A-n71A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n2A-n77A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n2A-n77C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n2A-n78A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n5A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n7A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n8A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n18A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n20A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n26A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n28A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n34A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n38A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n40A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n3A-n41A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n3A-n41C |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n3A-n71A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n74A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n77A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n3A-n78A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n3A-n78C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n79A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n3A-n79C |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n3A-n102A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n102B |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n102C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n104A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n104C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n3A-n105A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n5A-n7A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n5A-n12A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n5A-n13A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n5A-n14A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n5A-n25A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n5A-n28A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n5A-n30A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n5A-n40A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n5A-n41A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n5A-n48A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n5A-n48B |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n5A-n66A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n5A-n77A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n5A-n78A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n5A-n78C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n5A-n79A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n5A-n105A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n7A-n8A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n7A-n20A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n7A-n25A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n7A-n26A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n7A-n28A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n7A-n40A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n7A-n46A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n7A-n66A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n7A-n71A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n7A-n77A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n7A-n78A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n7A-n102A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n7A-n102B |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n7A-n102C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n7A-n105A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n8A-n20A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n8A-n28A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n8A-n34A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n8A-n39A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n8A-n40A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n8A-n41A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n8A-n41C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n8A-n77A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n8A-n78A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n8A-n78C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n8A-n79A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n8A-n79C |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n8A-n104A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n8A-n104C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n12A-n25A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n12A-n30A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n12A-n66A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n12A-n77A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n12A-n78A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n13A-n25A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n13A-n66A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n13A-n77A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n14A-n30A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n14A-n66A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n14A-n77A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n18A-n28A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n18A-n40A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n18A-n41A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n18A-n74A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n18A-n77A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n18A-n78A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n20A-n28A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n20A-n41A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n20A-n71A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n20A-n77A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n20A-n78A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n24A-n41A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n24A-n48A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n24A-n77A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n25A-n38A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n25A-n41A |  |  | 26 | +2/-32 | 23 | +2/-3 |  |  |
| CA\_n25A-n41C |  |  | 26 | +2/-32 | 23 | +2/-3 |  |  |
| CA\_n25A-n48A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n25A-n66A |  |  | 26 | +2/-32 | 23 | +2/-3 |  |  |
| CA\_n25A-n71A |  |  | 26 | +2/-32 | 23 | +2/-3 |  |  |
| CA\_n25A-n77A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n25A-n78A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n25A-n85A |  |  | 26 | +2/-32 | 23 | +2/-3 |  |  |
| CA\_n26A-n28A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n26A-n48A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n26A-n66A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n26A-n70A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n26A-n77A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n26A-n78A |  |  | 26 | +2/-32 | 23 | +2/-3 |  |  |
| CA\_n28A-n34A |  |  | 26 | +2/-32 | 23 | +2/-3 |  |  |
| CA\_n28A-n39A |  |  | 26 | +2/-32 | 23 | +2/-3 |  |  |
| CA\_n28A-n40A |  |  | 26 | +2/-32 | 23 | +2/-3 |  |  |
| CA\_n28A-n41A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n28A-n41C |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n28A-n46A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n28A-n50A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n28A-n74A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n28A-n77A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n28A-n78A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n28A-n79A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n28A-n79C |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n28A-n102A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n28A-n102B |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n28A-n102C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n34A-n79A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n30A-n66A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n30A-n77A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n34A-n39A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n34A-n40A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n34A-n41A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n34A-n41C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n34A-n79A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n34A-n79C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n38A-n66A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n38A-n78A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n39A-n40A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n39A-n41A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n39A-n41C |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n39A-n79A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n39A-n79C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n40A-n41A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n40A-n41C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n40A-n71A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n40A-n77A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n40A-n78A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n40A-n79A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n40A-n79C |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n40A-n105A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n41A-n48A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n41A-n50A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n41A-n66A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n41C-n66A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n41A-n70A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n41A-n71A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n41C-n71A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n41A-n74A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n41A-n77A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n41C-n77A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n41A-n78A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n41A-n79A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n41A-n79C |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n41C-n79A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| CA\_n41A-n85A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n41A-n104A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n41A-n104C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n41C-n104A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n46A-n48A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n46A-n48B |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n46A-n77A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n46A-n78A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n48A-n66A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n48B-n66A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n48A-n70A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n48A-n71A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n48A-n96A |  |  |  |  | 23 | +2/-3 |  |  |
|  |  |  |  |  |  |  |  |  |
| CA\_n48B-n96A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n48A-n96B |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n50A-n78A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n66A-n71A |  |  | 26 | +2/-32 | 23 | +2/-3 |  |  |
| CA\_n66A-n77A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n66A-n77C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n66A-n78A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n66A-n85A |  |  | 26 | +2/-32 | 23 | +2/-3 |  |  |
| CA\_n70A-n71A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n70A-n77A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n70A-n78A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n71A-n77A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n71A-n78A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n74A-n77A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n74A-n78A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n77A-n79A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n77A-n85A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n77A-n102A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n77A-n102B |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n77A-n102C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n78A-n79A |  |  | 26 | +2/-3 | 23 | +2/-3 |  |  |
| CA\_n78A-n92A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n78A-n102A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n78A-n102B |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n78A-n102C |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n78A-n104A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n78A-n105A |  |  |  |  | 23 | +2/-3 |  |  |
| CA\_n100A-n101A |  |  |  |  | 23 | +2/-3 |  |  |
| NOTE 1: Void  NOTE 2: An uplink CA configuration in which at least one of the bands has NOTE 3 in Table 6.2.1-1 is allowed to reduce the lower tolerance limit by 1.5 dB when the transmission bandwidths of at least one of the bands is confined within FUL\_low and FUL\_low + 4 MHz or FUL\_high - 4 MHz and FUL\_high.  NOTE 3: PPowerClass is the maximum UE power specified without taking into account the tolerance  NOTE 4: For inter-band carrier aggregation the maximum power requirement should apply to the total transmitted power over all component carriers (per UE).  NOTE 5: Power class 3 is the default power class unless otherwise stated.  NOTE 6: Void.  NOTE 7: Void.  NOTE 8: Void.  NOTE 9: Void..  NOTE 10: Void. | | | | | | | | |

Table 6.2A.1.3-2: Per-band transmit power as applicable to REFSENS exceptions (two band ULCA)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inter-band UL CA  power class  (NOTE 1) | Uplink bands of same power class in inter-band UL CA | | Uplink bands of different power class in inter-band UL CA | |
| One band | Other band | One band | Other band |
| Class 3 | Class 3 | Class 3 | Class 3 | Class 5 |
| Class 2 | Class 3 | Class 3 | Class 2 | Class 5 |
|  | Class 2 | Class 2 | Class 2 | Class 3 |
| Class 1.5 | Class 2 | Class 2 |  |  |
| NOTE 1: Indicated by *powerClass/powerClass-v1610*. | | | | |

<Next change>

#### 6.2H.3.1 UE maximum output power for inter-band UL CA with UL MIMO

For inter-band UL CA with 2Tx UL MIMO in one of the two frequency bands and 1Tx in the other band, the maximum output power is defined as the sum of the maximum output power from all UE antenna connectors and all UL CCs, as specified in Table 6.2H.3.1-1. These configurations are subject to the applicable power class of Table 6.2.1-1 for the 1Tx band and of Table 6.2D.1-1 for the 2Tx band. The period of measurement shall be at least one sub frame (1 ms). The requirements shall be met with the UL MIMO configurations specified in Table 6.2D.1-2 and 6.2D.1-3 for 2-layer configuration and ULFPTx configuration respectively for the component carrier configured with UL MIMO. If *higherPowerLimit-r17* is indicated for an UL inter-band CA configuration with UL-MIMO as specified in Table 6.2H.3.1-1 and with uplink bands of different power class capabilities, the UE maximum output power specified in Table 6.2H.3.1-1 for this UL CA configuration is modified in accordance with sub-clause 6.2H.3.4.

Table 6.2H.3.1-1: UE Power Class for inter-band UL CA with 2Tx UL MIMO and/or TxD in one frequency band and 1Tx in the other band.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| NR UL CA Configuration | Class 1.5 (dBm) | Tolerance (dB) | Class 2 (dBm) | Tolerance (dB) | Class 3 (dBm) | Tolerance (dB) |
| CA\_n1A-n78A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n2A-n77A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n3A-n78A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n5A-n77A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n7A-n77A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n7A-n78A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n8A-n78A |  |  | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n25A-n41A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n25A-n41C | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n25A-n77A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n26A-n78A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n28A-n41A |  |  | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n28A-n78A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n41A-n66A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n41C-n66A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n41A-n71A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n41C-n71A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n41A-n77A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n41A-n85A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n66A-n77A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n70A-n77A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n71A-n77A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| CA\_n77A-n85A | 29 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |
| NOTE 1: An uplink CA configuration in which at least one of the bands has NOTE 3 in Table 6.2.1-1 is allowed to reduce the lower tolerance limit by 1.5 dB when the transmission bandwidths of at least one of the bands is confined within FUL\_low and FUL\_low + 4 MHz or FUL\_high - 4 MHz and FUL\_high.  NOTE 2: Void.  NOTE 3: Void.  NOTE 4: Void.  NOTE 5: Power class 3 is default power class unless otherwise stated.  NOTE 6: Void.  NOTE 7: Void. | | | | | | |

Table 6.2H.3.1-2: Per-band transmit power as applicable to REFSENS exceptions (two band ULCA)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inter-band UL CA  Power class  (NOTE 1) | Uplink bands of same power class in inter-band UL CA | | Uplink band of different power class in inter-band UL CA | |
| 2Tx band | 1Tx band | 2Tx band | 1Tx band |
| Class 3 | Class 3 | Class 3 | Class 3 | Class 5 |
| Class 2 | Class 3 | Class 3 | Class 2 | Class 5 |
|  | Class 2 | Class 2 | Class 3 | Class 2 |
|  |  |  | Class 2 | Class 3 |
| Class 1.5 | Class 2 | Class 2 | Class 1.5 | Class 5 |
|  |  |  | Class 1.5 | Class 3 |
|  |  |  | Class 1.5 | Class 2 |
| NOTE 1: Indicated by *powerClass/powerClass-v1610*. | | | | |

<End of changes>