**3GPP TSG-RAN4 Meeting #99-e *R4-2110093***

**Online, , 19th May 2021 - 27th May 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **38.101-1** | **CR** | **0807** | **rev** | **-** | **Current version:** | **17.1.0** |  |
|  |
| *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)*.* |
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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

|  |
| --- |
|  |
| ***Title:***  | Big CR to TS 38.101-1: Adding channel BW support in existing NR bands |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_bands\_R17\_BWs |  | ***Date:*** | 2021-05-11 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-17 |
|  | *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 canbe 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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | Add following channel BWs support:* 90 MHz and 100 MHz in band n40.
* 50 MHz in band n3.
 |
|  |  |
| ***Summary of change:*** | 90 and 100MHz CBW are added for n40 in table 5.3.5-150MHz CBW is added for n3 in table 5.3.5-11dB deltaMPR is specified for 100MHz for n40.UE co-exisence requirements is updated for n40 REFSENS are specified. |
|  |  |
| ***Consequences if not approved:*** | The new CBWs won’t be supported in those bands |
|  |  |
| ***Clauses affected:*** |  |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | This version is consolidating all endorsed draft CRs in RAN4#99-e meeting:R4-2107818 and R4-2110656 |
|  |  |
| ***This CR's revision history:*** |  |

*<Start of the change>*

### 5.3.5 UE channel bandwidth per operating band

The requirements in this specification apply to the combination of channel bandwidths, SCS and operating bands shown in Table 5.3.5-1. The transmission bandwidth configuration in Table 5.3.2-1 shall be supported for each of the specified channel bandwidths. The channel bandwidths are specified for both the TX and RX path.

Table 5.3.5-1 Channel bandwidths for each NR band

| NR band / SCS / UE Channel bandwidth |
| --- |
| NR Band | SCSkHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz | 25 MHz | 30 MHz | 40 MHz | 50 MHz | 60 MHz | 70 MHz | 80 MHz | 90 MHz | 100 MHz |
| n1 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
|  | 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| n2 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 60 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n3 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
|  | 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| n5 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n7 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
|  | 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| n8 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n12 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n13 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n14 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n18 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n20 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n24 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  | Yes |  |  |  |  |  |  |  |  |  |  |  |
| n25 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
|  | 60 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| n26 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n28 | 15 | Yes | Yes | Yes | Yes7 |  | Yes7 |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes7 |  | Yes7 |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n29 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n30 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n34 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| n38 | 15 | Yes | Yes10 | Yes | Yes10 | Yes | Yes10 | Yes10 |  |  |  |  |  |  |
|  | 30 |  | Yes10 | Yes | Yes10 | Yes | Yes10 | Yes10 |  |  |  |  |  |  |
|  | 60 |  | Yes10 | Yes | Yes10 | Yes | Yes10 | Yes10 |  |  |  |  |  |  |
| n39 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
|  | 60 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| n40 | 15 | Yes9 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
|  | 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| n41 | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
|  | 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| n46 | 15 |  | Yes5 |  | Yes |  |  | Yes |  |  |  |  |  |  |
|  | 30 |  | Yes5 |  | Yes |  |  | Yes |  | Yes |  | Yes |  |  |
|  | 60 |  | Yes5 |  | Yes |  |  | Yes |  | Yes |  | Yes |  |  |
| n48 | 15 | Yes5 | Yes | Yes | Yes |  | Yes | Yes | Yes6 |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes6 | Yes6 | Yes6 | Yes6 | Yes6,4 | Yes6 |
|  | 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes6 | Yes6 | Yes6 | Yes6 | Yes6,4 | Yes6 |
| n47 | 15 |  | Yes10 |  | Yes10 |  | Yes10 | Yes10 |  |  |  |  |  |  |
|  | 30 |  | Yes10 |  | Yes10 |  | Yes10 | Yes10 |  |  |  |  |  |  |
|  | 60 |  | Yes10 |  | Yes10 |  | Yes10 | Yes10 |  |  |  |  |  |  |
| n50 | 15 | Yes9 | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes3 |  |  |
|  | 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes3 |  |  |
| n51 | 15 | Yes |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n53 | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  | Yes |  |  |  |  |  |  |  |  |  |  |  |
| n65 | 15 | Yes | Yes | Yes | Yes |  |  |  | Yes |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  |  |  | Yes |  |  |  |  |  |
|  | 60 |  | Yes | Yes | Yes |  |  |  | Yes |  |  |  |  |  |
| n66 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
|  | 60 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| n70 | 15 | Yes | Yes | Yes | Yes3 | Yes3 |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes3 | Yes3 |  |  |  |  |  |  |  |  |
|  | 60 |  | Yes | Yes | Yes3 | Yes3 |  |  |  |  |  |  |  |  |
| n71 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n74 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 60 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
| n75 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
|  | 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| n76 | 15 | Yes |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
|  | 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes4 | Yes |
| n78 | 15 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
|  | 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes4 | Yes | Yes | Yes |
| n79 | 15 |  |  |  |  |  |  | Yes | Yes |  |  |  |  |  |
|  | 30 |  |  |  |  |  |  | Yes | Yes | Yes |  | Yes |  | Yes |
|  | 60 |  |  |  |  |  |  | Yes | Yes | Yes |  | Yes |  | Yes |
| n80 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
|  | 60 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| n81 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n82 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n83 | 15 | Yes | Yes | Yes | Yes |  | Yes7 |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  | Yes7 |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n84 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
|  | 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| n86 | 15 | Yes | Yes | Yes | Yes |  |  | Yes |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  |  | Yes |  |  |  |  |  |  |
|  | 60 |  | Yes | Yes | Yes |  |  | Yes |  |  |  |  |  |  |
| n89 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n90 | 15 |  | Yes | Yes | Yes |  | Yes | Yes | Yes |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
|  | 60 |  | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes |
| n91 | 15 | Yes | Yes8 |  |  |  |  |  |  |  |  |  |  |  |
|  | 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n92 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n93 | 15 | Yes | Yes8 |  |  |  |  |  |  |  |  |  |  |  |
|  | 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n94 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n95 | 15 | Yes | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| n96 | 15 |  |  |  | Yes |  |  | Yes |  |  |  |  |  |  |
|  | 30 |  |  |  | Yes |  |  | Yes |  | Yes |  | Yes |  |  |
|  | 60 |  |  |  | Yes |  |  | Yes |  | Yes |  | Yes |  |  |
| n97 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
|  | 60 |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |
| n98 | 15 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
|  | 30 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
|  | 60 |  | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
|  | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| n99 | 30 |  | Yes |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  | Yes |  |  |  |  |  |  |  |  |  |  |  |
| NOTE 1: Void.NOTE 2: Void.NOTE 3: This UE channel bandwidth is applicable only to downlink.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 a downlink SCell part of CA configuration.NOTE 7: For the 20 MHz bandwidth, the minimum requirements are specified for NR UL carrier frequencies confined to either 713-723 MHz or 728-738 MHz. For the 30MHz bandwidth, the minimum requirements are specified for NR UL transmission bandwidth configuration confined to either 703-733 or 718-748 MHz.NOTE 8: This UE channel bandwidth is applicable only to uplink.NOTE 9: For this bandwidth, the minimum requirements are restricted to operation when carrier is configured as an SCell part of DC or CA configuration.NOTE 10: These UE channel bandwidths are applicable to sidelink operation. |

*<End of the change>*

*<Start of the change>*

### 6.2.2 UE maximum output power reduction

UE is allowed to reduce the maximum output power due to higher order modulations and transmit bandwidth configurations. For UE power class 1.5, 2 and 3 and UE power class 1 in Band n14, the allowed maximum power reduction (MPR) is defined in Table 6.2.2-4, Table 6.2.2-2, Table 6.2.2-1 and Table 6.2.2-5, respectively for channel bandwidths ≤ 100 MHz.

If the relative channel bandwidth ≤ 4% for TDD bands or ≤ 3% for FDD band, the ∆MPR is set to zero.

If the relative channel bandwidth > 4% for TDD bands or > 3% for FDD bands, the ∆MPR is defined in Table 6.2.2-3.

Where relative channel bandwidth = 2\*BWChannel / (FUL\_low + FUL\_high)

The allowed MPR for SRS, PUCCH formats 0, 1, 3 and 4, and PRACH shall be as specified for QPSK modulated DFT-s-OFDM of equivalent RB allocation. The allowed MPR for PUCCH format 2 shall be as specified for QPSK modulated CP-OFDM of equivalent RB allocation.

Table 6.2.2-1 Maximum power reduction (MPR) for power class 3

|  |  |
| --- | --- |
| Modulation | MPR (dB) |
|  | Edge RB allocations | Outer RB allocations | Inner RB allocations |
| DFT-s-OFDM | Pi/2 BPSK | ≤ 3.51 | ≤ 1.21 | ≤ 0.21 |
|  |  | ≤ 0.52 | ≤ 0.52 | 02 |
|  | Pi/2 BPSK w Pi/2 BPSK DMRS | ≤ 0.52 | ≤ 02 | 02 |
|  | QPSK | ≤ 1 | 0 |
|  | 16 QAM | ≤ 2 | ≤ 1 |
|  | 64 QAM | ≤ 2.5 |
|  | 256 QAM | ≤ 4.5 |
| CP-OFDM | QPSK | ≤ 3 | ≤ 1.5 |
|  | 16 QAM | ≤ 3 | ≤ 2 |
|  | 64 QAM | ≤ 3.5 |
|  | 256 QAM | ≤ 6.5 |
| NOTE 1: Applicable for UE operating in TDD mode with Pi/2 BPSK modulation and UE indicates support for UE capability *powerBoosting-pi2BPSK* and if the IE *powerBoostPi2BPSK* is set to 1 and 40 % or less slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79. The reference power of 0 dB MPR is 26 dBm.NOTE 2: Applicable for UE operating in FDD mode, or in TDD mode in bands other than n40, n41, n77, n78 and n79 with Pi/2 BPSK modulation and if the IE *powerBoostPi2BPSK* is set to 0 and if more than 40 % of slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79.  |

Table 6.2.2-2 Maximum power reduction (MPR) for power class 2

|  |  |
| --- | --- |
| Modulation | MPR (dB) |
|  | Edge RB allocations | Outer RB allocations | Inner RB allocations |
| DFT-s-OFDM | Pi/2 BPSK | ≤ 3.5 | ≤ 0.5 | 0 |
|  | QPSK | ≤ 3.5 | ≤ 1 | 0 |
|  | 16 QAM | ≤ 3.5 | ≤ 2 | ≤ 1 |
|  | 64 QAM | ≤ 3.5 | ≤ 2.5 |
|  | 256 QAM | ≤ 4.5 |
| CP-OFDM | QPSK | ≤ 3.5 | ≤ 3 | ≤ 1.5 |
|  | 16 QAM | ≤ 3.5 | ≤ 3 | ≤ 2 |
|  | 64 QAM | ≤ 3.5 |
|  | 256 QAM | ≤ 6.5 |

Table 6.2.2-3: ∆MPR

|  |  |  |  |
| --- | --- | --- | --- |
| NR Band | Power class | Channel bandwidth | ∆MPR (dB) |
| n28 and n83 | Power class 3 | 30 MHz | 0.5 |
| n40 | Power class 3 and power class 2 | 100 MHz | 1 |

Table 6.2.2-4 Maximum power reduction (MPR) for power class 1.5 with dual Tx

|  |  |
| --- | --- |
| Modulation | MPR (dB) |
|  | Edge RB allocations | Outer RB allocations | Inner RB allocations |
| DFT-s-OFDM | Pi/2 BPSK | ≤ 6.5 | ≤ 3.5 | ≤ 1.5 |
|  | QPSK | ≤ 6.5 | ≤ 4 | ≤ 1.5 |
|  | 16 QAM | ≤ 6.5 | ≤ 5 | ≤ 2.5 |
|  | 64 QAM | ≤ 6.5 | ≤ 5.5 | ≤ 4 |
|  | 256 QAM | ≤ 7.5 | ≤ 7.5 | ≤ 7.5 |
| CP-OFDM | QPSK | ≤ 6.5 | ≤ 6 | ≤ 3 |
|  | 16 QAM | ≤ 6.5 | ≤ 6 | ≤ 3.5 |
|  | 64 QAM | ≤ 6.5 | ≤ 6.5 | ≤ 5 |
|  | 256 QAM | ≤ 9.5 | ≤ 9.5 | ≤ 9.5 |

Table 6.2.2-5 Maximum power reduction (MPR) for power class 1 for Band n14

|  |  |
| --- | --- |
| Modulation | MPR (dB) |
|  | Edge RB allocations | Outer RB allocations | Inner RB allocations |
| DFT-s-OFDM | Pi/2 BPSK | ≤ 0.5 | ≤ 0.5 | 0 |
|  | Pi/2 BPSK w Pi/2 BPSK DMRS | ≤ 0.5 | ≤ 0 | 0 |
|  | QPSK | ≤ 1 | 0 |
|  | 16 QAM | ≤ 2 | ≤ 1 |
|  | 64 QAM | ≤ 2.5 |
|  | 256 QAM | ≤ 4.5 |
| CP-OFDM | QPSK | ≤ 3 | ≤ 1.5 |
|  | 16 QAM | ≤ 3 | ≤ 2 |
|  | 64 QAM | ≤ 3.5 |
|  | 256 QAM | ≤ 6.5 |

Where the following parameters are defined to specify valid RB allocation ranges for Outer and Inner RB allocations:

NRB is the maximum number of RBs for a given Channel bandwidth and sub-carrier spacing defined in Table 5.3.2-1. RBStart,Low = max(1, floor(LCRB/2))

where max() indicates the largest value of all arguments and floor(x) is the greatest integer less than or equal to x.

RBStart,High = NRB – RBStart,Low – LCRB

The RB allocation is an Inner RB allocation if the following conditions are met

RBStart,Low ≤ RBStart ≤ RBStart,High,and

LCRB ≤ ceil(NRB/2)

where ceil(x) is the smallest integer greater than or equal to x.

An Edge RB allocation is the one for which the RB(s) is (are) allocated at the lowermost or uppermost edge of the channel with LCRB ≤ 2 RBs.

The RB allocation is an Outer RB allocation for all other allocations which are not an Inner RB allocation or Edge RB allocation.

If CP-OFDM allocation satisfies following conditions, it is considered as almost contiguous allocation

NRB\_gap / (NRB\_alloc + NRB\_gap ) ≤ 0.25

and NRB\_alloc + NRB\_gap is larger than 106, 51 or 24 RBs for 15 kHz, 30 kHz or 60 kHz respectively where NRB\_gap is the total number of unallocated RBs between allocated RBs and NRB\_alloc is the total number of allocated RBs. The size and location of allocated and unallocated RBs are restricted by RBG parameters specified in clause 6.1.2.2 of TS 38.214 [10]. For these almost contiguous signals in power class 2 and 3, the allowed maximum power reduction defined in Table 6.2.2-1 is increased by

CEIL{ 10 log10(1 + NRB\_gap / NRB\_alloc), 0.5 } dB,

where CEIL{x,0.5} means x rounding upwards to closest 0.5dB. The parameters of RBStart,Low and RBStart,High to specify valid RB allocation ranges for Outer and Inner RB allocations are defined as following:

RBStart,Low = max(1, floor((NRB\_alloc + NRB\_gap)/2))

RBStart,High = NRB – RBStart,Low – NRB\_alloc –NRB\_gap

For the UE maximum output power modified by MPR, the power limits specified in clause 6.2.4 apply.

*<End of the change>*

*<Start of the change>*

#### 6.5.3.2 Spurious emissions for UE co-existence

This clause specifies the requirements for NR bands for coexistence with protected bands.

Table 6.5.3.2-1: Requirements for spurious emissions for UE co-existence

| NR Band | Spurious emission for UE co-existence |
| --- | --- |
|  | Protected band | Frequency range (MHz) | Maximum Level (dBm) | MBW (MHz) | NOTE |
| n1, n84 | E-UTRA 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,NR Band n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | E-UTRA Band 3, 34 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
|  | Frequency range | 1880 | - | 1895 | -40 | 1 | 15, 27 |
|  | Frequency range | 1895 | - | 1915 | -15.5 | 5 | 15, 26, 27 |
|  | Frequency range | 1915 | - | 1920 | +1.6 | 5 | 15, 26, 27 |
| n2 | E-UTRA Band 4, 5, 12, 13, 14, 17, 24, 26, 27, 28, 29, 30, 41, 42, 48, 50, 51, 53, 66, 70, 71, 74, 85 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | E-UTRA Band 2, 25 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
|  | E-UTRA Band 43, NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| n3, n80 | E-UTRA Band 1, 5, 7, 8, 20, 26, 27, 28, 31, 32, 33, 34, 38, 39, 40, 41, 43, 44, 45, 50, 51, 65, 67, 68, 69, 72, 73,74, 75, 76.NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | E-UTRA Band 3 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
|  | E-UTRA Band 11, 18, 19, 21 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | E-UTRA Band 22, 42, 52, NR Band n77, n78 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 8 |
| n5, n89 | E-UTRA Band 1, 2, 3, 4, 5, 7, 8, 12, 13, 14, 17, 18, 19, 24, 25, 26, 28, 29, 30, 31, 34, 38, 40, 42, 43, 45, 48, 50, 51, 65, 66, 70, 71, 73, 74, 85NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | E-UTRA Band 41, 52, 53NR Band n77, n78 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | E-UTRA Band 11, 21 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 8 |
| n7 | E-UTRA Band 1, 2, 3, 4, 5, 7, 8, 12, 13, 14, 17, 20, 22, 26, 27, 28, 29, 30, 31, 32, 33, 34, 40, 42, 43, 50, 51, 52, 65, 66, 67, 68, 72, 74, 75, 76, 85,NR Band n77, n78 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | Frequency range | 2570 | - | 2575 | +1.6 | 5 | 15, 21, 26 |
|  | Frequency range | 2575 | - | 2595 | -15.5 | 5 | 15, 21, 26 |
|  | Frequency range | 2595 | - | 2620 | -40 | 1 | 15, 21 |
| n8, n81 | E-UTRA Band 1, 20, 28, 31, 32, 33, 34, 38, 39, 40, 45, 50, 51, 65, 67, 68, 69, 72, 73, 74, 75, 76 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | E-UTRA band 3, 7, 22, 41, 42, 43, 52,NR Band n77, n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | E-UTRA 8 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
|  | E-UTRA Band 11, 21 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 8 |
| n12 | E-UTRA Band 2, 5, 13, 14, 17, 24, 25, 26, 27, 30, 41, 48, 50, 53, 71, 74 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | E-UTRA Band 4, 51, 66, 70, NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | E-UTRA Band 12, 85 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
| n13 | E-UTRA Band 2, 4, 5,12, 13, 17, 25, 26, 27, 29, 41, 48, 50, 51, 53, 66, 70, 71, 74, 85 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | E-UTRA Band 14 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
|  | E-UTRA Band 24, 30NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | Frequency range | 769 | - | 775 | -35 | 0.00625 | 15 |
|  | Frequency range | 799 | - | 805 | -35 | 0.00625 | 11, 15 |
| n14 | E-UTRA Band 2, 4, 5, 12, 13, 14, 17, 23, 24, 25, 26, 27, 29, 30, 41, 48, 53, 66, 70, 71, 85 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | Frequency range | 769 | - | 775 | -35 | 0.00625 | 12, 15 |
|  | Frequency range | 799 | - | 805 | -35 | 0.00625 | 11, 12, 15 |
| n18 | E-UTRA Band 1, 3, 11, 21, 34, 42, 65NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n77, n78 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | Frequency range | 758 | - | 799 | -50 | 1 |  |
|  | Frequency range | 799 | - | 803 | -40 | 1 |  |
|  | Frequency range | 860 | - | 890 | -40 | 1 |  |
|  | Frequency range | 945 | - | 960 | -50 | 1 |  |
|  | Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 8 |
|  | Frequency range | 2545 | - | 2575 | -50 | 1 |  |
|  | Frequency range | 2595 | - | 2645 | -50 | 1 |  |
| n20, n82 | E-UTRA Band 1, 3, 7, 8, 22, 31, 32, 33, 34, 40, 43, 50, 51, 65, 67, 68, 72, 74, 75, 76 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | E-UTRA Band 20 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
|  | E-UTRA Band 38, 42, 52, 69,NR Band n77, n78 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | Frequency range | 758 | - | 788 | -50 | 1 |  |
| n24, n99 | E-UTRA Band 2, 4, 5, 10, 12, 13, 14, 17, 24, 25, 26, 29, 30, 41, 48, 66, 70, 71, 85 | FDL\_low  | - | FDL\_high | -50 | 1 |  |
|  | NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| n25 | E-UTRA Band 4, 5, 12, 13, 14, 17, 24, 26, 27, 28, 29, 30, 41, 42, 48, 53, 66, 70, 71, 85 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | E-UTRA Band 2 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
|  | E-UTRA Band 25 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
|  | E-UTRA Band 43, NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| n26 | E-UTRA Band 1, 2, 3, 4, 5, 11, 12, 13, 14, 17, 18,19, 21, 24, 25, 26, 29, 30, 31, 34, 39, 40, 42, 43, 48, 50, 51, 53, 65, 66, 70, 71, 73,74, 85 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | E-UTRA Band 41, NR Band n77, n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | Frequency range | 703 | - | 799 | -50 | 1 |  |
|  | Frequency range | 799 | - | 803 | -40 | 1 | 15 |
|  | Frequency range | 945 | - | 960 | -50 | 1 |  |
|  | Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 8 |
| n28, n83 | E-UTRA Band 1, 4, 22, 32, 42, 43, 50, 51, 65, 66, 73, 74, 75, 76,NR Band n77, n78 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | E-UTRA Band 1 | FDL\_low | - | FDL\_high | -50 | 1 | 19, 25 |
|  | E-UTRA Band 2, 3, 5, 7, 8, 18, 19, 20, 25, 26, 27, 31, 34, 38, 39, 40, 41, 52, 72,NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | E-UTRA Band 11, 21 | FDL\_low | - | FDL\_high | -50 | 1 | 19, 24 |
|  | Frequency range | 470 | - | 694 | -42 | 8 | 15, 35 |
|  | Frequency range | 470 | - | 710 | -26.2 | 6 | 34 |
|  | Frequency range | 662 | - | 694 | -26.2 | 6 | 15 |
|  | Frequency range | 758 | - | 773 | -32 | 1 | 15 |
|  | Frequency range | 773 | - | 803 | -50 | 1 |  |
|  | Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 8, 19 |
| n30 | E-UTRA Band 2, 4, 5, 7, 12, 13, 14, 17, 24, 25, 26, 27, 29, 30, 38, 41, 48, 53, 66, 70, 71, 85,NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| n34 | E-UTRA Band 1, 3, 7, 8, 11, 18, 19, 20, 21, 22, 26, 28, 31, 32, 33, 38,39, 40, 41, 42, 43, 44, 45, 50, 51, 52, 65, 67, 69, 72, 74, 75, 76,NR Band n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 | 5 |
|  | NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 8 |
| n38 | E-UTRA Band 1, 2, 3, 4, 5, 8, 12, 13, 14, 17, 20, 22, 27, 28, 29, 30, 31, 32, 33, 34, 40, 42, 43, 50, 51, 52, 65, 66, 67, 68, 72, 74, 75, 76, 85 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n77, n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | Frequency range | 2620 | - | 2645 | -15.5 | 5 | 15, 22, 26 |
|  | Frequency range | 2645 | - | 2690 | -40 | 1 | 15, 22 |
| n39, n98 | E-UTRA Band 1, 8, 22, 26, 28, 34, 40, 41, 42, 44, 45, 50, 51, 52, 74,NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n77, n78 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | Frequency range | 1805 | - | 1855 | -40 | 1 | 33 |
|  | Frequency range | 1855 | - | 1880 | -15.5 | 5 | 15, 26, 33 |
| n40, n97 | E-UTRA Band 1, 3, 5, 7, 8, 20, 22, 26, 27, 28, 31, 32, 33, 34, 38, 39, 41, 42, 43, 44, 45, 50, 51, 52, 65, 67, 68, 69, 72, 74, 75, 76,NR Band n77, n78 | FDL\_low | - | FDL\_high | -50 | 1 | 44 |
|  | NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| n41 | E-UTRA Band 1, 2, 3, 4, 5, 8, 12, 13, 14, 17, 24, 25, 26, 27, 28, 29, 30, 34, 39, 42, 44, 45, 48, 50, 51, 52, 65, 66, 70, 71, 73, 74, 85, NR Band n77, n78 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | E-UTRA Band 11, 18, 19, 21 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | Frequency range | 1884.5 |  | 1915.7 | -41 | 0.3 | 8 |
| n47 | E-UTRA Band 1, 3, 5, 7, 8, 22, 26, 28, 34, 39, 40, 41, 42, 44, 45, 65, 68, 72, 73 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n71, n77, n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| n48 | E-UTRA Band 2, 4, 5, 12, 13, 14, 17, 24, 25, 26, 29, 30, 41, 50, 51, 66, 70, 71, 74, 85  | FDL\_low | - | FDL\_high | -50 | 1 |  |
| n50 | E-UTRA Band 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 20, 26, 28, 29, 31, 34, 38, 39, 40, 41, 42, 43, 48, 65, 66, 67, 68 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| n51 | E-UTRA Band 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 20, 26, 28, 29, 31, 34, 38, 39, 40, 41, 42, 43, 48, 52, 65, 66, 67, 68, 85 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| n53 | E-UTRA Band 2, 4, 5, 12, 13, 14, 17, 24, 25, 26, 29, 30, 48, 66, 70, 71, 85, NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| n65 | E-UTRA Band 1, 3, 5, 7, 8, 11, 18, 19, 20, 21, 22, 26, 27, 28, 31, 32, 38, 40, 41, 42, 43, 50, 51, 65, 68, 69, 72, 74, 75, 76,NR Band n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | E-UTRA Band 34 | FDL\_low | - | FDL\_high | -50 | 1 | 43 |
|  | Frequency range | 1900 | - | 1915 | -15.5 | 5 | 15, 26, 27 |
|  | Frequency range | 1915 | - | 1920 | +1.6 | 5 | 15, 26, 27 |
| n66, n86 | E-UTRA Band 2, 4, 5, 7, 12, 13, 14, 17, 25, 26, 27, 28, 29, 30, 38, 41, 43, 50, 51, 53, 66, 70, 71, 74, 85 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | E-UTRA Band 42, 48, NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| n70 | E-UTRA Band 2, 4, 5, 12, 13, 14, 17, 24, 25, 26, 29, 30, 41, 48, 66, 70, 71, 85 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n47, n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| n71 | E-UTRA Band 4, 5, 12, 13, 14, 17, 24, 26, 30, 48, 53, 66, 85 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | E-UTRA Band 2, 25, 41, 70,NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | E-UTRA Band 29 | FDL\_low | - | FDL\_high | -38 | 1 | 15 |
|  | E-UTRA Band 71 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
| n74 | E-UTRA Band 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 26, 28, 29, 31, 34, 38, 39, 40, 41, 42, 43, 48, 52, 65, 66, 67, 68, 85NR Band n77, n78 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 8 |
|  | Frequency range | 1400 | - | 1427 | -32 | 27 | 15, 41 |
|  | Frequency range | 1475 | - | 1488 | -50 | 1 | 42 |
|  | Frequency range | 1488 | - | 1518 | -50 | 1 | 15 |
| n77 | E-UTRA Band 1, 2, 3, 4, 5, 7, 8, 11, 12, 13, 14, 17, 18, 19, 20, 21, 24, 25, 26, 27, 28, 29, 30, 34, 39, 40, 41, 53, 65, 66, 70, 71, 74, 85 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 8 |
| n78 | E-UTRA Band 1, 3, 5, 7, 8, 11, 18, 19, 20, 21, 26, 28, 34, 39, 40, 41, 65 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 8 |
| n79 | E-UTRA Band 1, 3, 5, 8, 11, 18, 19, 21, 28, 34, 39, 40, 41, 42, 65, 74 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 8 |
| n95 | E-UTRA Band 1, 3 , 5, 8, 28, 39, 40, 41,NR Band n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 | 5 |
|  | NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 8 |
| NOTE 1: FDL\_low and FDL\_high refer to each frequency band specified in Table 5.2-1 in TS 38.101-1 or Table 5.5-1 in TS 36.101NOTE 2: As exceptions, measurements with a level up to the applicable requirements defined in Table 6.5.3.1-2 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 (2 MHz + N x LCRB x RBsize kHz), 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 when channel bandwidth is less than or equal to 50 MHz, lowest SCS is assumed when channel bandwidth is larger than 50 MHz. The transmission bandwidth in terms of RB position and range is not limited to 15 kHz SCS and shall scale with SCS accordingly.NOTE 4: VoidNOTE 5: For non-synchronised TDD operation to meet these requirements some restriction will be needed for either the operating band or protected bandNOTE 6: N/ANOTE 7: VoidNOTE 8: Applicable when co-existence with PHS system operating in 1884.5 - 1915.7 MHz.NOTE 9: VoidNOTE 10: VoidNOTE 11: VoidNOTE 12: The emissions measurement shall be sufficiently power averaged to ensure a standard deviation < 0.5 dBNOTE 13: VoidNOTE 14: VoidNOTE 15: These requirements also apply for the frequency ranges that are less than FOOB (MHz) in Table 6.5.3.1-1 from the edge of the channel bandwidth.NOTE 16: VoidNOTE 17: VoidNOTE 18: VoidNOTE 19: Applicable when the assigned NR carrier is confined within 718 MHz and 748 MHz and when the channel bandwidth used is 5 or 10 MHz.NOTE 20: VoidNOTE 21: This requirement is applicable for any channel bandwidths up to 20MHz 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 22: This requirement is applicable for power class 3 UE for any channel bandwidths up to 20 MHz. For channel bandwidth within the range 2570 - 2615 MHz with the following restriction: for carriers of 15 MHz bandwidth when the carrier centre frequency is within the range 2605.5 - 2607.5 MHz and for carriers of 20 MHz bandwidth when the carrier centre frequency is within the range 2597 - 2605 MHz the requirement is applicable only for an uplink transmission bandwidth less than or equal to 54 RB. . For carriers overlapping the frequency range 2615 - 2620 MHz the requirement applies with the maximum output power configured to +19 dBm in the IE P-Max.NOTE 23: VoidNOTE 24: As exceptions, measurements with a level up to the applicable requirement of -38 dBm/MHz is permitted for each assigned NR 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 5.3.1-1) for which the 2nd harmonic totally or partially overlaps the measurement bandwidth (MBW).NOTE 25: As exceptions, measurements with a level up to the applicable requirement of -36 dBm/MHz is permitted for each assigned NR 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 5.3.1-1) for which the 3rd harmonic totally or partially overlaps the measurement bandwidth (MBW).NOTE 26: For these adjacent bands, the emission limit could imply risk of harmful interference to UE(s) operating in the protected operating band.NOTE 27: This requirement is applicable for channel bandwidths up to 20 MHz within the range 1920 - 1980 MHz with the following restriction: for carriers of 15 MHz bandwidth when the carrier centre frequency is within the range 1927.5 - 1929.5 MHz and for carriers of 20 MHz bandwidth when the 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 28: VoidNOTE 29: VoidNOTE 30: VoidNOTE 31: VoidNOTE 32: VoidNOTE 33: This requirement is only applicable for carriers with bandwidth up to 20MHz and 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 carriers of 15 MHz bandwidth when carrier center frequency is within the range 1892.5 - 1894.5 MHz and for carriers of 20 MHz bandwidth when carrier center frequency is within the range 1895 - 1903 MHz. NOTE 34: This requirement is applicable for 5 and 10 MHz NR channel bandwidth allocated within 718-728 MHz. 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 35: This requirement is applicable in the case of a 10 MHz NR carrier confined within 703 MHz and 733 MHz, otherwise the requirement of -25 dBm with a measurement bandwidth of 8 MHz applies.NOTE 36: VoidNOTE 37: VoidNOTE 38: VoidNOTE 39: VoidNOTE 40: VoidNOTE 41: Applicable for cases and when the lower edge of the assigned NR UL channel bandwidth frequency is greater than or equal to 1427 MHz + the channel BW assigned for 5 and 10 MHz bandwidth, and when the lower edge of the assigned NR UL channel bandwidth frequency is greater than or equal to 1440 MHz for 15 and 20 MHz bandwidth.NOTE 42: Applicable for 5 MHz bandwidth, and when the upper edge of the assigned NR UL channel bandwidth frequency is less than or equal to 1467 MHz assigned for 10 MHz bandwidth, and when the upper edge of the assigned NR UL channel bandwidth frequency is less than or equal to 1463.8 MHz for 15 MHz bandwidth, and when the upper edge of the assigned NR UL channel bandwidth frequency is less than or equal to 1460.8 MHz for 20 MHz bandwidth.NOTE 43: This requirement is applicable for NR channel bandwidth allocated within 1920-1980 MHz.NOTE 44: As exceptions, for 90 and 100 MHz channel bandwidth, -40 dBm/MHz is applicable in the frequency range of 2496 – 2505 MHz. |

NOTE: To simplify Table 6.5.3.2-1, 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.

*<End of the change>*

*<Start of the change>*

### 7.3.2 Reference sensitivity power level

The throughput shall be ≥ 95 % of the maximum throughput of the reference measurement channels as specified in Annexes A.2.2.2, A.2.3.2, A3.2 and A.3.3 (with one sided dynamic OCNG Pattern OP.1 FDD/TDD for the DL-signal as described in Annex A.5.1.1/A.5.2.1) with parameters specified in Table 7.3.2-1 and Table 7.3.2-2.

Table 7.3.2-1: Two antenna port reference sensitivity QPSK PREFSENS

| Operating band / SCS / Channel bandwidth / Duplex-mode |
| --- |
| Operating Band | SCS kHz | 5MHz(dBm) | 10MHz(dBm) | 15MHz(dBm) | 20MHz(dBm) | 25MHz(dBm) | 30 MHz (dBm) | 40MHz(dBm) | 50MHz(dBm) | 60MHz(dBm) | 70MHz(dBm) | 80MHz(dBm) | 90MHz(dBm) | 100 MHz(dBm) | Duplex Mode |
| n1 | 15 | -100.0 | -96.8 | -95.0 | -93.8 | -92.7 | -91.9 | -90.6 | -89.6 |  |  |  |  |  | FDD |
|  | 30 |  | -97.1 | -95.1 | -94.0 | -92.8 | -92.0 | -90.7 | -89.7 |  |  |  |  |  |  |
|  | 60 |  | -97.5 | -95.4 | -94.2 | -93.0 | -92.1 | -90.9 | -89.7 |  |  |  |  |  |  |
| n2 | 15 | -98.0 | -94.8 | -93.0 | -91.8 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | -95.1 | -93.1 | -92.0 |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  | -95.5 | -93.4 | -92.2 |  |  |  |  |  |  |  |  |  |  |
| n3 | 15 | -97.0 | -93.8 | -92.0 | -90.8 | -89.7 | -88.9 | -82.3 | -79.7 |  |  |  |  |  | FDD |
|  | 30 |  | -94.1 | -92.1 | -91.0 | -89.8 | -89.0 | -82.4 | -79.8 |  |  |  |  |  |  |
|  | 60 |  | -94.5 | -92.4 | -91.2 | -90.0 | -89.1 | -82.6 | -79.9 |  |  |  |  |  |  |
| n5 | 15 | -98.0 | -94.8 | -93.0 | -86.8 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | -95.1 | -93.1 | -88.6 |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n71 | 15 | -98.0 | -94.8 | -93.0 | -91.8 | -90.7 | -89.9 | -88.6 | -81.5 |  |  |  |  |  | FDD |
|  | 30 |  | -95.1 | -93.1 | -92.0 | -90.8 | -90.0 | -88.7 | -81.5 |  |  |  |  |  |  |
|  | 60 |  | -95.5 | -93.4 | -92.2 | -91.0 | -90.1 | -88.9 | -81.5 |  |  |  |  |  |  |
| n8 | 15 | -97.0 | -93.8 | -91.4 | -85.8 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | -94.1 | -91.7 | -87.2 |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n12 | 15 | -97.0 | -93.8 | -84.0 |  |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | -94.1 | -84.1 |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n13 | 15 | -97.0 | -93.8 |  |  |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | -94.1 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n14 | 15 | -97.0 | -93.8 |  |  |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | -94.1 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n18 | 15 | -100.0 | -96.8 | -95.0 |  |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | -97.1 | -95.1 |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n20 | 15 | -97.0 | -93.8 | -91.0 | -89.8 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | -94.1 | -91.1 | -90.0 |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n24 | 15 | -100.0 | -96.8 |  |  |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | -97.1 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  | -97.5 |  |  |  |  |  |  |  |  |  |  |  |  |
| n25 | 15 | -96.5 | -93.3 | -91.5 | -90.3 | -89.3 | -82.2 | -79.5 |  |  |  |  |  |  | FDD |
|  | 30 |  | -93.6 | -91.6 | -90.5 | -89.4 | -82.3 | -79.6 |  |  |  |  |  |  |  |
|  | 60 |  | -94.0 | -91.9 | -90.7 | -89.6 | -82.4 | -79.7 |  |  |  |  |  |  |  |
| n26 | 15 | -97.56 | -94.56 | -92.76 | -87.6 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | -94.86 | -92.76 | -87.7 |  |  |  |  |  |  |  |  |  |  |
| n28 | 15 | -98.5 | -95.5 | -93.5 | -90.8 |  | -78.5 |  |  |  |  |  |  |  | FDD |
|  | 30 |  | -95.6 | -93.6 | -91.0 |  | -78.6 |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n29x | 15 | -97.0 | -93.8 |  |  |  |  |  |  |  |  |  |  |  | SDL |
|  | 30 |  | -94.1 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n30 | 15 | -99.0 | -95.8 |  |  |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | -96.1 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n34 | 15 | -100.0 | -96.8 | -95.0 |  |  |  |  |  |  |  |  |  |  | TDD |
|  | 30 |  | -97.1 | -95.1 |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  | -97.5 | -95.4 |  |  |  |  |  |  |  |  |  |  |  |
| n381 | 15 | -100.0 | -96.8 | -95.0 | -93.8 | -92.7 | -91.9 | -90.6 |  |  |  |  |  |  | TDD |
|  | 30 |  | -97.1 | -95.1 | -94.0 | -92.8 | -92.0 | -90.7 |  |  |  |  |  |  |  |
|  | 60 |  | -97.5 | -95.4 | -94.2 | -93.0 | -92.1 | -90.9 |  |  |  |  |  |  |  |
| n39 | 15 | -100.0 | -96.8 | -95.0 | -93.8 | -92.7 | -91.9 | -90.6 |  |  |  |  |  |  | TDD |
|  | 30 |  | -97.1 | -95.1 | -94.0 | -92.8 | -92.0 | -90.7 |  |  |  |  |  |  |  |
|  | 60 |  | -97.5 | -95.4 | -94.2 | -93.0 | -92.1 | -90.9 |  |  |  |  |  |  |  |
| n40 | 15 | -100.0 | -96.8 | -95.0 | -93.8 | -92.7 | -91.9 | -90.6 | -89.6 |  |  |  |  |  | TDD |
|  | 30 |  | -97.1 | -95.1 | -94.0 | -92.8 | -92.0 | -90.7 | -89.7 | -88.9 |  | -87.6 | -87.1 | -86.7 |  |
|  | 60 |  | -97.5 | -95.4 | -94.2 | -93.0 | -92.1 | -90.9 | -89.8 | -89.1 |  | -87.6 | -87.1 | -86.7 |  |
| n411 | 15 |  | -94.8 | -93.0 | -91.8 |  | -89.9 | -88.6 | -87.6 |  |  |  |  |  | TDD |
|  | 30 |  | -95.1 | -93.1 | -92.0 |  | -90.0 | -88.7 | -87.7 | -86.9 | -86.2 | -85.6 | -85.1 | -84.7 |  |
|  | 60 |  | -95.5 | -93.4 | -92.2 |  | -90.1 | -88.9 | -87.8 | -87.1 | -86.3 | -85.6 | -85.1 | -84.7 |  |
| n481 | 15 | -99 | -95.8 | -94.0 | -92.7 |  | -90.9 | -89.6 | -88.65 |  |  |  |  |  | TDD |
|  | 30 |  | -96.1 | -94.1 | -92.9 |  | -91.0 | -89.7 | -88.75 | -87.95 | -87.25 | -86.65 | -86.15 | -85.65 |  |
|  | 60 |  | -96.5 | -94.4 | -93.1 |  | -91.1 | -89.9 | -88.85 | -88.05 | -87.35 | -86.75 | -86.25 | -85.75 |  |
| n50 | 15 | -100.0 | -96.8 | -95.0 | -93.8 |  | -91.9 | -90.6 | -89.6 |  |  |  |  |  | TDD |
|  | 30 |  | -97.1 | -95.1 | -94.0 |  | -92.0 | -90.7 | -89.7 | -88.9 |  | -87.6 |  |  |  |
|  | 60 |  | -97.5 | -95.4 | -94.2 |  | -92.1 | -90.9 | -89.8 | -89.1 |  | -87.6 |  |  |  |
| n51 | 15 | -100.0 |  |  |  |  |  |  |  |  |  |  |  |  | TDD |
|  | 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n53 | 15 | -100.0 | -96.8 |  |  |  |  |  |  |  |  |  |  |  | TDD |
|  | 30 |  | -97.1 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  | -97.5 |  |  |  |  |  |  |  |  |  |  |  |  |
| n65 | 15 | -99.5 | -96.3 | -94.5 | -93.3 |  |  |  | -89.2 |  |  |  |  |  | FDD |
|  | 30 |  | -96.6 | -94.6 | -93.5 |  |  |  | -89.3 |  |  |  |  |  |  |
|  | 60 |  | -97.0 | -94.9 | -93.7 |  |  |  | -89.4 |  |  |  |  |  |  |
| n66 | 15 | -99.5 | -96.3 | -94.5 | -93.3 | -92.2 | -91.4 | -90.1 |  |  |  |  |  |  | FDD |
|  | 30 |  | -96.6 | -94.6 | -93.5 | -92.3 | -91.5 | -90.2 |  |  |  |  |  |  |  |
|  | 60 |  | -97.0 | -94.9 | -93.7 | -92.5 | -91.6 | -90.4 |  |  |  |  |  |  |  |
| n70 | 15 | -100.0 | -96.8 | -95.0 | -93.8 | -92.7 |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | -97.1 | -95.1 | -94.0 | -92.8 |  |  |  |  |  |  |  |  |  |
|  | 60 |  | -97.5 | -95.4 | -94.2 | -93.0 |  |  |  |  |  |  |  |  |  |
| n71 | 15 | -97.2 | -94.0 | -91.6 | -86.0 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | -94.3 | -91.9 | -87.4 |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n74 | 15 | -99.53 | -96.33 | -94.53 | -89.33 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | -96.63 | -94.63 | -89.53 |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  | -97.03 | -94.93 | -89.63 |  |  |  |  |  |  |  |  |  |  |
| n757 | 15 | -100 | -96.8 | -95.0 | -93.8 | -92.7 | -91.9 | -90.6 | -89.6 |  |  |  |  |  | SDL |
|  | 30 |  | -97.1 | -95.1 | -94.0 | -92.8 | -92.0 | -90.7 | -89.7 |  |  |  |  |  |  |
|  | 60 |  | -97.5 | -95.4 | -94.2 | -93.0 | -92.1 | -90.9 | -89.8 |  |  |  |  |  |  |
| n767 | 15 | -100 |  |  |  |  |  |  |  |  |  |  |  |  | SDL |
|  | 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n771,4 | 15 |  | -95.3 | -93.5 | -92.2 | -91.2 | -90.4 | -89.1 | -88.1 |  |  |  |  |  | TDD |
|  | 30 |  | -95.6 | -93.6 | -92.4 | -91.3 | -90.5 | -89.2 | -88.2 | -87.4 | -86.7 | -86.1 | -85.6 | -85.1 |  |
|  | 60 |  | -96.0 | -93.9 | -92.6 | -91.5 | -90.6 | -89.4 | -88.3 | -87.5 | -86.8 | -86.2 | -85.7 | -85.2 |  |
| n781 | 15 |  | -95.8 | -94.0 | -92.7 | -91.7 | -90.9 | -89.6 | -88.6 |  |  |  |  |  | TDD |
|  | 30 |  | -96.1 | -94.1 | -92.9 | -91.8 | -91 | -89.7 | -88.7 | -87.9 | -87.2 | -86.6 | -86.1 | -85.6 |  |
|  | 60 |  | -96.5 | -94.4 | -93.1 | -92 | -91.1 | -89.9 | -88.8 | -88.0 | -87.3 | -86.7 | -86.2 | -85.7 |  |
| n791 | 15 |  |  |  |  |  |  | -89.6 | -88.6 |  |  |  |  |  | TDD |
|  | 30 |  |  |  |  |  |  | -89.7 | -88.7 | -87.9 |  | -86.6 |  | -85.6 |  |
|  | 60 |  |  |  |  |  |  | -89.9 | -88.8 | -88.0 |  | -86.7 |  | -85.7 |  |
| n91 | 15 | -100 |  |  |  |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n92 | 15 | -100 | -96.8 | -95.0 | -93.8 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | -97.1 | -95.1 | -94.0 |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n93 | 15 | -100 |  |  |  |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n94 | 15 | -100 | -96.8 | -95.0 | -93.8 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | -97.1 | -95.1 | -94.0 |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| NOTE 1: Four Rx antenna ports shall be the baseline for this operating band except for two Rx vehicular UE.NOTE 2: The transmitter shall be set to PUMAX as defined in clause 6.2.4NOTE 3: The requirement is modified by -0.5 dB when the assigned NR channel bandwidth is confined within 1475.9 - 1510.9 MHz.NOTE 4: The requirement is modified by -0.5 dB when the assigned UE channel bandwidth is confined within 3300 - 3800 MHz.NOTE 5: For these bandwidths, the minimum requirements are restricted to operation when carrier is configured as a downlink carrier part of CA configuration.NOTE 6: Values are modified by -0.5dB when carrier channel BW is between 865MHz and 894MHz.NOTE 7: For SDL bands, the reference sensitivity requirements shall be verified by inter-band CA combinations with SDL band, which are supported by UE. |

For UE(s) equipped with 4 Rx antenna ports, reference sensitivity for 2Rx antenna ports in Table 7.3.2-1 shall be modified by the amount given in ΔRIB,4R in Table 7.3.2-2 for the applicable operating bands.

Table 7.3.2-2: Four antenna port reference sensitivity allowance ΔRIB,4R

|  |  |
| --- | --- |
| Operating band | ΔRIB,4R (dB) |
| n28, n71 | -2.71 |
| n1, n2, n3, n30, n40, n7, n34, n38, n39, n41, n66, n70 | -2.7 |
| n48, n77, n78, n79 | -2.2 |
| NOTE 1: 4 Rx operation is targeted for FWA form factor |

The reference receive sensitivity (REFSENS) requirement specified in Table 7.3.2-1 and Table 7.3.2-2 shall be met with uplink transmission bandwidth less than or equal to that specified in Table 7.3.2-3.

Table 7.3.2-3: Uplink configuration for reference sensitivity

| Operating band / SCS / Channel bandwidth / Duplex mode |
| --- |
| Operating Band | SCS kHz | 5MHz | 10MHz | 15MHz | 20MHz | 25 MHz | 30 MHz | 40MHz | 50MHz | 60MHz | 70MHz | 80MHz | 90MHz | 100 MHz | Duplex Mode |
| n1 | 15 | 25 | 501 | 751 | 1001 | 1281 | 1281 | 1281 | 1281 |  |  |  |  |  | FDD |
|  | 30 |  | 24 | 361 | 501 | 641 | 641 | 641 | 641 |  |  |  |  |  |  |
|  | 60 |  | 101 | 18 | 24 | 301 | 301 | 301 | 301 |  |  |  |  |  |  |
| n2 | 15 | 25 | 501 | 501 | 501 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 | 101 | 24 | 241 | 241 |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  | 101 | 101 | 101 |  |  |  |  |  |  |  |  |  |  |
| n3 | 15 | 25 | 501 | 501 | 501 | 501 | 501 | 501 | 501 |  |  |  |  |  | FDD |
|  | 30 |  | 24 | 241 | 241 | 241 | 241 | 241 | 241 |  |  |  |  |  |  |
|  | 60 |  | 101 | 101 | 101 | 101 | 101 | 101 | 101 |  |  |  |  |  |  |
| n5 | 15 | 25 | 251 | 201 | 201 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | 121 | 101 | 101 |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n7 | 15 | 25 | 501 | 751 | 751 | 721 | 641 | 451 | 451 |  |  |  |  |  | FDD |
|  | 30 |  | 24 | 361 | 361 | 361 | 321 | 201 | 201 |  |  |  |  |  |  |
|  | 60 |  | 101 | 18 | 181 | 181 | 161 | 101 | 101 |  |  |  |  |  |  |
| n8 | 15 | 25 | 251 | 201 | 201 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | 121 | 101 | 101 |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n12 | 15 | 201 | 201 | 201 |  |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | 101 | 101 |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n13 | 15 | 201 | 201 |  |  |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | 101 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n14 | 15 | 201 | 201 |  |  |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | 101 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n18 | 15 | 25 | 251 | 251 |  |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | 101 | 101 |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n20 | 15 | 25 | 201 | 202 | 202 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | 101 | 102 | 102 |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n24 | 15 | 25 | 50 |  |  |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | 24 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  | 10 |  |  |  |  |  |  |  |  |  |  |  |  |
| n25 | 15 | 25 | 501 | 501 | 501 | 501 | 481 | 401 |  |  |  |  |  |  | FDD |
|  | 30 |  | 24 | 241 | 241 | 241 | 241 | 201 |  |  |  |  |  |  |  |
|  | 60 |  | 101 | 101 | 101 | 101 | 101 | 101 |  |  |  |  |  |  |  |
| n26 | 15 | 25 | 251 | 251 | 251 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | 121 | 121 | 121 |  |  |  |  |  |  |  |  |  |  |
| n28 | 15 | 25 | 251 | 251 | 251 |  | 251 |  |  |  |  |  |  |  | FDD |
|  | 30 |  | 101 | 101 | 101 |  | 101 |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n30 | 15 | 201 | 201 |  |  |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | 101 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n34 | 15 | 25 | 50 | 75 |  |  |  |  |  |  |  |  |  |  | TDD |
|  | 30 |  | 24 | 36 |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  | 10 | 18 |  |  |  |  |  |  |  |  |  |  |  |
| n38 | 15 | 25 | 50 | 75 | 100 | 128 | 160 | 216 |  |  |  |  |  |  | TDD |
|  | 30 |  | 24 | 36 | 50 | 64 | 75 | 100 |  |  |  |  |  |  |  |
|  | 60 |  | 10 | 18 | 24 | 30 | 36 | 50 |  |  |  |  |  |  |  |
| n39 | 15 | 25 | 50 | 75 | 100 | 128 | 160 | 216 |  |  |  |  |  |  | TDD |
|  | 30 |  | 24 | 36 | 50 | 64 | 75 | 100 |  |  |  |  |  |  |  |
|  | 60 |  | 10 | 18 | 24 | 30 | 36 | 50 |  |  |  |  |  |  |  |
| n40 | 15 | 25 | 50 | 75 | 100 | 128 | 160 | 216 | 270 |  |  |  |  |  | TDD |
|  | 30 |  | 24 | 36 | 50 | 64 | 75 | 100 | 128 | 162 |  | 216 | 243 | 270 |  |
|  | 60 |  | 10 | 18 | 24 | 30 | 36 | 50 | 64 | 75 |  | 100 | 120 | 135 |  |
| n41 | 15 |  | 50 | 75 | 100 |  | 160 | 216 | 270 |  |  |  |  |  | TDD |
|  | 30 |  | 24 | 36 | 50 |  | 75 | 100 | 128 | 162 | 180 | 216 | 243 | 270 |  |
|  | 60 |  | 10 | 18 | 24 |  | 36 | 50 | 64 | 75 | 90 | 100 | 120 | 135 |  |
| n48 | 15 | 25 | 50 | 75 | 100 |  | 160 | 216 |  |  |  |  |  |  | TDD |
|  | 30 |  | 24 | 36 | 50 |  | 75 | 100 |  |  |  |  |  |  |  |
|  | 60 |  | 10 | 18 | 24 |  | 36 | 50 |  |  |  |  |  |  |  |
| n50 | 15 | 25 | 50 | 75 | 100 |  | 160 | 216 | 270 |  |  |  |  |  | TDD |
|  | 30 |  | 24 | 36 | 50 |  | 75 | 100 | 128 | 162 |  | NOTE 3 |  |  |  |
|  | 60 |  | 10 | 18 | 24 |  | 36 | 50 | 64 | 75 |  | NOTE 3 |  |  |  |
| n51 | 15 | 25 |  |  |  |  |  |  |  |  |  |  |  |  | TDD |
|  | 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n53 | 15 | 25 | 50 |  |  |  |  |  |  |  |  |  |  |  | TDD |
|  | 30 |  | 24 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  | 10 |  |  |  |  |  |  |  |  |  |  |  |  |
| n65 | 15 | 25 | 501 | 751 | 1001 |  |  |  | 1281 |  |  |  |  |  | FDD |
|  | 30 |  | 24 | 361 | 501 |  |  |  | 641 |  |  |  |  |  |  |
|  | 60 |  | 101 | 18 | 24 |  |  |  | 301 |  |  |  |  |  |  |
| n66 | 15 | 25 | 501 | 751 | 1001 | 1281 | 160 | 216 |  |  |  |  |  |  | FDD |
|  | 30 |  | 24 | 361 | 501 | 641 | 751 | 1001 |  |  |  |  |  |  |  |
|  | 60 |  | 101 | 18 | 24 | 301 | 361 | 501 |  |  |  |  |  |  |  |
| n70 | 15 | 25 | 501 | 751 | NOTE 3 | NOTE 3 |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | 24 | 361 | NOTE 3 | NOTE 3 |  |  |  |  |  |  |  |  |  |
|  | 60 |  | 101 | 18 | NOTE 3 | NOTE 3 |  |  |  |  |  |  |  |  |  |
| n71 | 15 | 25 | 251 | 201 | 201 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | 121 | 101 | 101 |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n74 | 15 | 25 | 251 | 251 | 251 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | 101 | 101 | 101 |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  | 51 | 51 | 51 |  |  |  |  |  |  |  |  |  |  |
| n77 | 15 |  | 50 | 75 | 100 | 128 | 160 | 216 | 270 |  |  |  |  |  | TDD |
|  | 30 |  | 24 | 36 | 50 | 64 | 75 | 100 | 128 | 162 | 180 | 216 | 243 | 270 |  |
|  | 60 |  | 10 | 18 | 24 | 30 | 36 | 50 | 64 | 75 | 90 | 100 | 120 | 135 |  |
| n78 | 15 |  | 50 | 75 | 100 | 128 | 160 | 216 | 270 |  |  |  |  |  | TDD |
|  | 30 |  | 24 | 36 | 50 | 64 | 75 | 100 | 128 | 162 | 180 | 216 | 243 | 270 |  |
|  | 60 |  | 10 | 18 | 24 | 30 | 36 | 50 | 64 | 75 | 90 | 100 | 120 | 135 |  |
| n79 | 15 |  |  |  |  |  |  | 216 | 270 |  |  |  |  |  | TDD |
|  | 30 |  |  |  |  |  |  | 100 | 128 | 162 |  | 216 |  | 270 |  |
|  | 60 |  |  |  |  |  |  | 50 | 64 | 75 |  | 100 |  | 135 |  |
| n91 | 15 | 254 | 201,4 |  |  |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n92 | 15 | 25 | 201 | 201 | 201 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | 101 | 101 | 101 |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n93 | 15 | 254 | 251,4 |  |  |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| n94 | 15 | 25 | 251 | 201 | 201 |  |  |  |  |  |  |  |  |  | FDD |
|  | 30 |  | 121 | 101 | 101 |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| NOTE 1: UL resource blocks shall be located as close as possible to the downlink operating band but confined within the transmission bandwidth configuration for the channel bandwidth (Table 5.3.2-1).NOTE 2: For Band 20; for 15 kHz SCS, in the case of 15 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 11 and in the case of 20 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 16; for 30 kHz SCS, in the case of 15 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 6 and in the case of 20 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 8; for 60 kHz SCS, in the case of 15 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 3 and in the case of 20 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 4;NOTE 3: For DL channel bandwidths that do not have symmetric UL channel bandwidth, highest valid UL configuration with lowest TX-RX separation (Table 5.4.4-1) shall be used.NOTE 4: For band n91 and n93, largest supported UL bandwidth configuration shall be used. |

Unless given by Table 7.3.2-4, the minimum requirements specified in Tables 7.3.2-1 and 7.3.2-2 shall be verified with the network signalling value NS\_01 (Table 6.2.3-1) configured.

Table 7.3.2-4: Network signaling value for reference sensitivity

|  |  |
| --- | --- |
| Operating band | Network Signalling value |
| n2 | NS\_03 |
| n12 | NS\_06 |
| n13 | NS\_06 |
| n14 | NS\_06 |
| n24 | NS\_52 |
| n25 | NS\_03 |
| n30 | NS\_21 |
| n48 | NS\_27 |
| n53 | NS\_45 |
| n66 | NS\_03 |
| n70 | NS\_03 |
| n71 | NS\_35 |

*<End of the change>*