**3GPP TSG-RAN WG4 Meeting #97-e R4-20xxxxx**

Electronic Meeting, Nov 2nd – 13th, 2020

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| *CR-Form-v11.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.101-1** | **CR** | **0492** | **rev** | **-** | **Current version:** | **16.5.0** |  |
|  | | | | | | | | |
| *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 |  |

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|  | | | | | | | | | | |
| ***Title:*** | CR CatF n7 NS\_46 AMPR and coexistence | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Qualcomm Incorporated | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** |  | | | | |  | | ***Date:*** | |  |
|  |  | | | |  | | |  | |  |
| ***Category:*** | **F** |  | | | | | | ***Release:*** | | Rel-16 |
|  | *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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | 1. Missing the additional spurious requirement for NS\_46 large channel BWs > 20MHz. Need to refer to the additonal requirement since larger channel BWs > 20MHz do not have a requriement. 2. Duplicate requirement in coexsitence table and AMPR for BW ≤ 20MHz. The coexistence table already restricts the transmission BW for channel BW ≤ 20MHz, and the AMPR is defined for channel BW ≤ 20MHz for greater than the restricted transmission BW in the given channel bandwidth. Therefore, if the LCRB is already restricted, then the AMPR defined for the restricted LCRB is meaningless and should be removed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Add reference to the missing additional requirement sub-clause for channel BWs > 20MHz. 2. Remove AMPR for 15MHz and 20MHz channel BWs for NS\_46. 3. Modify note 21 in coexistence table to refer to coexistence requirements only apply for channel BWs up to 20MHz with RB restriction for 15MHz and 20MHz channel BWs. 4. Add the missing additional requirement sub-clause for all channel BWs for NS\_46. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | UE will not be able to meet coexistence requirement for large channel BWs. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.2.3.1, 6.2.3.17, 6.5.3.2, 6.5.3.3.25 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | |  | | | |
| ***Other specs*** | |  | **X** | Other core specifications | | |  | | | |
| ***affected:*** | | **x** |  | Test specifications | | | 38.521-1 | | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | |  | | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |

< start of changes >

#### 6.2.3.1 General

Additional emission requirements can be signalled by the network. Each additional emission requirement is associated with a unique network signalling (NS) value indicated in RRC signalling by an NR frequency band number of the applicable operating band and an associated value in the field *additionalSpectrumEmission.* Throughout this specification, the notion of indication or signalling of an NS value refers to the corresponding indication of an NR frequency band number of the applicable operating band, the IE field *freqBandIndicatorNR* and an associated value of *additionalSpectrumEmission* in the relevant RRC information elements [7]*.*

To meet the additional requirements, additional maximum power reduction (A-MPR) is allowed for the maximum output power as specified in Table 6.2.1-1. Unless stated otherwise, the total reduction to UE maximum output power is max(MPR, A-MPR) where MPR is defined in clause 6.2.2. Outer and inner allocation notation used in clause 6.2.3 is defined in clause 6.2.2 In absense of modulation and waveform types the A-MPR applies to all modulation and waveform types.

Table 6.2.3.1-1 specifies the additional requirements with their associated network signalling values and the allowed A-MPR and applicable operating band(s) for each NS value. In case of a power class 3 UE, when IE *powerBoostPi2BPSK* is set to 1, power class 2 A-MPR values apply. The mapping of NR frequency band numbers and values of the *additionalSpectrumEmission* to network signalling labels is specified in Table 6.2.3.1-1A.

For almost contiguous allocations in CP-OFDM waveforms in power class 3, the allowed A-MPR defined in clause 6.2.3 is increased by CEIL{ 10 log10(1 + NRB\_gap / NRB\_alloc), 0.5 } dB, where NRB\_gap is the total number of unallocated RBs between allocated RBs and NRB\_alloc is the total number of allocated RBs, and the parameter LCRB is replaced by NRB\_alloc + NRB\_gap in specifying the RB allocation regions.

Unless otherwise specified, pi/2 BPSK in following A-MPR tables refers to both variants of pi/2 BPSK referenced in 6.2.2 tables 6.2.2-1.

Table 6.2.3.1-1: Additional maximum power reduction (A-MPR)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Network signalling label | Requirements (clause) | NR Band | Channel bandwidth (MHz) | Resources blocks (*N*RB) | A-MPR (dB) |
| NS\_01 |  | Table 5.2-1 | 5, 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 | Table 5.3.2-1 | N/A |
| NS\_03 | 6.5.2.3.3 | n2, n25, n66,  n70, n86 |  |  | Clause 6.2.3.7 |
| NS\_03U | 6.5.2.3.3, 6.5.2.4.2 | n2, n25, n66, n86 |  |  | Clause 6.2.3.7 |
| NS\_04 | 6.5.2.3.2, 6.5.3.3.1 | n41 | 10, 15, 20, 30, 40, 50, 60 80, 90, 100 |  | Clause 6.2.3.2 |
| NS\_05 | 6.5.3.3.4 | n1, n65, n84 | 5, 10, 15, 20(NOTE 2) |  | Clause 6.2.3.4 |
| NS\_05U | 6.5.3.3.4, 6.5.2.4.2 | n1, n65, n84 | 5, 10, 15, 20 |  | Clause 6.2.3.4 |
| NS\_06 | 6.5.2.3.4 | n12 | 5, 10, 15 |  | N/A |
| n14 | 5,10 |
| NS\_10 |  | n20 | 15, 20 | Table 6.2.3.3-1 | Table  6.2.3.3-1 |
| NS\_12 | 6.5.3.3.17 | n26 |  |  |  |
| NS\_13 | 6.5.3.3.18 | n26 |  |  |  |
| NS\_14 | 6.5.3.3.19 | n26 |  |  |  |
| NS\_15 | 6.5.3.3.20 | n26 |  |  |  |
| NS\_17 | 6.5.3.3.2 | n28, n83 | 5,10 | Table 5.3.2-1 | N/A |
| NS\_18 | 6.5.3.3.3 | n28, n83 | 5 |  | Table 6.2.3.13-1, A1 |
| 10, 15, 20 |  | Table 6.2.3.13-1, A2 |
| 30 |  | Table 6.2.3.13-1, A3, A4, A5 |
| NS\_21 | 6.5.3.3.12 | n30 | 5, 10 |  | Clause 6.2.3.14 |
| NS\_24 | 6.5.3.3.13 | n65 (NOTE 4) | 5, 10, 15, 20 | Table 6.2.3.15-1 | Clause 6.2.3.15 |
| NS\_27 | 6.5.2.3.8  6.5.3.3.14 | n48 | 5, 10, 15, 20, 40 | Table 6.2.3.16-1 | Table 6.2.3.16-2 |
| NS\_35 | 6.5.2.3.1 | n71 | 5, 10, 15, 20 | Table 5.3.2-1 | N/A |
| NS\_37 | 6.5.3.3.6 | n74  (NOTE 3) | 10, 15 | Table 6.2.3.8-1 | Table  6.2.3.8-1 |
| NS\_38 | 6.5.3.3.7 | n74 | 5, 10, 15, 20 | Table 6.2.3.9-1 | Table  6.2.3.9-1 |
| NS\_39 | 6.5.3.3.8 | n74 | 10, 15, 20 | Table 6.2.3.10-1 | Table 6.2.3.10-1 |
| NS\_40 | 6.5.3.3.9 | n51 | 5 |  | Table  6.2.3.5-1 |
| NS\_41 | 6.5.3.3.10 | n50 | 5, 10, 15, 20, 30, 40, 50, 60 |  | Table 6.2.3.11-1 |
| NS\_42 | 6.5.3.3.11 | n50 | 5, 10, 15, 20, 30, 40, 50, 60 |  | Table 6.2.3.12-1 |
| NS\_43 | 6.5.3.3.5 | n8, n81 | 5, 10, 15 |  | Clause 6.2.3.6 |
| NS\_43U | 6.5.3.3.5, 6.5.2.4.2 | n8, n81 | 5, 10, 15 |  | Clause 6.2.3.6 |
| NS\_44 | 6.5.3.3.24 | n38 | 25, 30, 40 | Table 6.2.3.20-1 | Table 6.2.3.20-1 |
| NS\_45 | 6.5.3.3.21 | n53 | 5, 10 |  | Clause 6.2.3.25 |
| NS\_46 | 6.5.3.3.25 | n7 | 25, 30, 40, 50 | Table 6.2.3.17-1 | Table 6.2.3.17-2 |
| NS\_47 | 6.5.3.3.15 | n41 (Note 5) | 30 | Table 6.2.3.18-1 | Table 6.2.3.18-2 |
| NS\_48 | 6.5.3.3.22 | n1 | 25, 30, 40, 50 | Table 6.2.3.26-1 | Table 6.2.3.26-1 |
| NS\_49 | 6.5.3.3.23 | n1 | 25, 30, 40, 50 | Table 6.2.3.27-1 | Table 6.2.3.27-1 |
| NS\_50 | 6.5.3.3.16 | n39 | 25, 30, 40 |  | Clause 6.2.3.19 |
| NS\_51 | 6.5.3.3.22 | n65 | 50 | Table 6.2.3.28-1 | Table 6.2.3.28-2 |
| NS\_100 | 6.5.2.4.2 | n1, n2, n3, n5, n8, n18, n25, n26, n65, n66, n80, n81, n84, n86, n89  (NOTE 1) |  |  | Table  6.2.3.1-2 |
| NOTE 1: This NS can be signalled for NR bands that have UTRA services deployed  NOTE 2: No A-MPR is applied for 5 MHz BWChannel where the lower channel edge is ≥ 1930 MHz,10 MHz BWChannel where the lower channel edge is ≥ 1950 MHz and 15 MHz BWChannel where the lower channel edge is ≥ 1955 MHz.NOTE 3: Applicable when the NR carrier is within 1447.9 – 1462.9 MHz  NOTE 4: Applicable when the upper edge of the channel bandwidth frequency is greater than 1980 MHz.  NOTE 5: Applicable when the NR carrier is within 2545 – 2575 MHz | | | | | |

[The NS\_01 label with the field *additionalPmax* [7] absent is default for all NR bands.]

Table 6.2.3.1-1A: Mapping of network signaling label

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NR band | Value of additionalSpectrumEmission | | | | | | | |
| **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| n1 | NS\_01 | NS\_100 | NS\_05 | NS\_05U | NS\_48 | NS\_49 |  |  |
| n2 | NS\_01 | NS\_100 | NS\_03 | NS\_03U |  |  |  |  |
| n3 | NS\_01 | NS\_100 |  |  |  |  |  |  |
| n5 | NS\_01 | NS\_100 |  |  |  |  |  |  |
| n7 | NS\_01 | NS\_46 |  |  |  |  |  |  |
| n8 | NS\_01 | NS\_100 | NS\_43 | NS\_43U |  |  |  |  |
| n12 | NS\_01 | NS\_06 |  |  |  |  |  |  |
| n14 | NS\_01 | NS\_06 |  |  |  |  |  |  |
| n18 | NS\_01 | NS\_100 |  |  |  |  |  |  |
| n20 | NS\_01 | Void | NS\_10 |  |  |  |  |  |
| n25 | NS\_01 | NS\_100 | NS\_03 | NS\_03U |  |  |  |  |
| n26 | NS\_01 | NS\_100 | NS\_12 | NS\_13 | NS\_14 | NS\_15 |  |  |
| n28 | NS\_01 | NS\_17 | NS\_18 |  |  |  |  |  |
| n30 | NS\_01 | NS\_21 |  |  |  |  |  |  |
| n34 | NS\_01 |  |  |  |  |  |  |  |
| n38 | NS\_01 | NS\_44 |  |  |  |  |  |  |
| n39 | NS\_01 | NS\_50 |  |  |  |  |  |  |
| n40 | NS\_01 |  |  |  |  |  |  |  |
| n41 | NS\_01 | NS\_04 | NS\_47 |  |  |  |  |  |
| n48 | NS\_01 | NS\_27 |  |  |  |  |  |  |
| n50 | NS\_01 | NS\_41 | NS\_42 |  |  |  |  |  |
| n51 | NS\_01 | NS\_40 |  |  |  |  |  |  |
| n53 | NS\_01 | NS\_45 |  |  |  |  |  |  |
| n65 | NS\_01 | NS\_24 | NS\_100 | NS\_05 | NS\_05U | NS\_51 |  |  |
| n66 | NS\_01 | NS\_100 | NS\_03 | NS\_03U |  |  |  |  |
| n70 | NS\_01 | NS\_03 |  |  |  |  |  |  |
| n71 | NS\_01 | NS\_35 |  |  |  |  |  |  |
| n74 | NS\_01 | NS\_37 | NS\_38 | NS\_39 |  |  |  |  |
| n77 | NS\_01 |  |  |  |  |  |  |  |
| n78 | NS\_01 |  |  |  |  |  |  |  |
| n79 | NS\_01 |  |  |  |  |  |  |  |
| n80 | NS\_01 | NS\_100 |  |  |  |  |  |  |
| n81 | NS\_01 | NS\_100 | NS\_43 | NS\_43U |  |  |  |  |
| n82 | NS\_01 | Void |  |  |  |  |  |  |
| n83 | NS\_01 | NS\_17 | NS\_18 |  |  |  |  |  |
| n84 | NS\_01 | NS\_100 | NS\_05 | NS\_05U |  |  |  |  |
| n86 | NS\_01 | NS\_100 | NS\_03 | NS\_03U |  |  |  |  |
| n89 | NS\_01 | NS\_100 |  |  |  |  |  |  |
| n91 | NS\_01 |  |  |  |  |  |  |  |
| n92 | NS\_01 |  |  |  |  |  |  |  |
| n93 | NS\_01 |  |  |  |  |  |  |  |
| n94 | NS\_01 |  |  |  |  |  |  |  |
| n95 | NS\_01 |  |  |  |  |  |  |  |
| NOTE: *additionalSpectrumEmission* corresponds to an information element of the same name defined in clause 6.3.2 of TS 38.331 [7]. | | | | | | | | |

Table 6.2.3.1-2: A-MPR for NS\_100 (UTRA protection)

|  |  |  |
| --- | --- | --- |
| Modulation/Waveform | | Outer (dB) |
| DFT-s-OFDM | Pi/2 BPSK | ≤ 2 |
| QPSK | ≤ 2 |
| 16 QAM | ≤ 2.5 |
| 64 QAM | ≤ 3 |
| 256 QAM | ≤ 4.5 |
| CP-OFDM | QPSK | ≤ 4 |
| 16 QAM | ≤ 4 |
| 64 QAM | ≤ 4 |
| 256 QAM | ≤ 6.5 |
| NOTE 1: Void  NOTE 2: Void | | |

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#### 6.2.3.17 A-MPR for NS\_46

Table 6.2.3.17-1: A-MPR regions for NS\_46

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Channel Bandwidth, MHz | Carrier Center Frequency, Fc, MHz | Regions | | A-MPR |
| RBend\*12\*SCS  MHz | LCRB\*12\*SCS  MHz |
| 25 MHz | 2534.5 ≤ FC < 2557.5 |  | Note 1 | A3 |
| 30 MHz | 2515 ≤ FC ≤ 2555 | ≥0, <1.44 | >0 | A4 |
| ≥1.44, <13.5 | >max (0, 12\*SCS\*RBend -1.8) | A5 |
| ≥13.5, <19.8 | >11.52 | A6 |
| ≥19.8, <25.92 | >6.3 | A7 |
| ≥25.92 | >0 | A8 |
| 40 MHz | 2520 ≤ FC ≤ 2550 | ≥0, <4.14 | >0 | A4 |
| ≥4.14, <18 | >max (0, 12\*SCS\*RBend - 4.5) | A5 |
| ≥18, <25.74 | >13.5 | A6 |
| ≥25.74, <32.4 | >12.6 | A7 |
| ≥32.4 | >0 | A8 |
| 50 MHz | 2525 ≤ FC ≤ 2545 | ≥0, <9 | >0 | A4 |
| ≥9, <21.6 | >max (0, 12\*SCS\*RBend - 7.2) | A5 |
| ≥21.6, <31.5 | >18 | A6 |
| ≥31.5, <39.6 | >16.2 | A7 |
| ≥39.6 | >0 | A8 |
| NOTE 1: > 9.72 MHz for DFT-s-OFDM, > 16.02 MHz for CP-OFDM. | | | | |

Table 6.2.3.17-2: A-MPR for NS\_46

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Modulation/Waveform | |  |  | A3 | A4 | A5 | A6 | A7 | A8 |
|  |  | Outer | Outer/Inner | Outer/Inner | Outer/Inner | Outer/Inner | Outer/Inner |
| DFT-s-OFDM | PI/2 BPSK |  |  | 4.5 | 5 | 2 | 3.5 | 6 | 10 |
| QPSK |  |  | 4.5 | 5 | 2 | 3.5 | 6 | 10 |
| 16 QAM |  |  | 4.5 | 5 | 2 | 3.5 | 6 | 10 |
| 64 QAM |  |  | 4.5 | 5 |  | 3.5 | 6 | 10 |
| 256 QAM |  |  |  |  |  |  | 6 | 10 |
| CP-OFDM | QPSK |  |  | 6 | 5 | 3.5 | 5.5 | 7 | 11 |
| 16 QAM |  |  | 6 | 5 | 3.5 | 5.5 | 7 | 11 |
| 64 QAM |  |  | 6 | 5 | 3.5 | 5.5 | 7 | 11 |
| 256 QAM |  |  | 6 |  |  |  | 7 | 11 |

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#### 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, 10, 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, 10, 12, 13, 14, 17, 18, 19, 24, 25, 26, 28, 29, 30, 31, 34, 38, 40, 42, 43, 45, 48, 50, 51, 53, 65, 66, 70, 71, 73, 74, 85  NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 41, 52,  NR 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, 10, 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, 51, 53, 71, 74 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 4, 10, 66, 70,  NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| E-UTRA Band 12, 85 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
| n14 | E-UTRA Band 2, 4, 5, 10, 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, 65  NR 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 |  |
| n25 | E-UTRA Band 4, 5, 10,12, 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, 10, 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, 10, 22, 32, 42, 43, 50, 51, 52, 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, 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, 10, 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, 10, 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 |  |
| Frequency range | 2620 | - | 2645 | -15.5 | 5 | 15, 22, 26 |
| Frequency range | 2645 | - | 2690 | -40 | 1 | 15, 22 |
| n39 | 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 | E-UTRA Band 1, 3, 5, 7, 8, 20, 22, 26, 27, 28, 31, 32, 33, 34, 38, 39, 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 |  |
| NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| n41 | 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, 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 n47, 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, 10, 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, 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 |
| 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, 85  NR 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, 10, 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 36.101  NOTE 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: Void  NOTE 5: For non-synchronised TDD operation to meet these requirements some restriction will be needed for either the operating band or protected band  NOTE 6: N/A  NOTE 7: Void  NOTE 8: Applicable when co-existence with PHS system operating in 1884.5 - 1915.7 MHz.  NOTE 9: Void  NOTE 10: Void  NOTE 11: Void  NOTE 12: The emissions measurement shall be sufficiently power averaged to ensure a standard deviation < 0.5 dB  NOTE 13: Void  NOTE 14: Void  NOTE 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: Void  NOTE 17: Void  NOTE 18: Void  NOTE 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: Void  NOTE 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: Void  NOTE 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: Void  NOTE 29: Void  NOTE 30: Void  NOTE 31: Void  NOTE 32: Void  NOTE 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: Void  NOTE 37: Void  NOTE 38: Void  NOTE 39: Void  NOTE 40: Void  NOTE 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: 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.

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##### 6.5.3.3.25 Requirement for network signalled value "NS\_46"

When "NS\_46" is indicated in the cell, the power of any UE emission shall not exceed the levels specified in Table 6.5.3.3.25-1. This requirement also applies for the frequency ranges that are less than FOOB (MHz) in Table 6.5.3.1-1 from the edge of the channel bandwidth.

Table 6.5.3.3.25-1: Additional requirements for “NS\_46”

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Protected band | Frequency range (MHz) | | | Maximum Level (dBm) | MBW (MHz) | NOTE |
| Frequency range | 2570 | - | 2575 | +1.6 | 5 | 1, 2 |
| Frequency range | 2575 | - | 2595 | -15.5 | 5 | 1, 2 |
| Frequency range | 2595 | - | 2620 | -40 | 1 | 1 |
| NOTE 1: This requirement is applicable for carriers confined in 2500-2570 MHz.  NOTE 2: For these adjacent bands, the emission limit could imply risk of harmful interference to UE(s) operating in the protected operating band. | | | | | | |

< end of changes >