**3GPP TSG-RAN WG4 Meeting #112-bisR4-2417069**

**Hefei, China, 14th – 18th October 2024**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **36.101** | **CR** | **-** | **rev** | **-** | **Current version:** | **18.6.0** |  |
|  | | | | | | | | |
| *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:*** | draft CR to 36.101 on introduction of Band 111 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Novamint | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LTE\_FDD\_1800\_1830MHz\_CAN-Core | | | | |  | ***Date:*** | | | 2024-10-07 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Introduction of Band 111. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Relevant sections for Band 111 are updated. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Band 111 requirements are not defined. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.5, 5.5E, 5.5F, 5.6.1, 5.7.3, 5.7.4, 6.2.2, 6.2.2E, 6.2.2F, 6.6.3.2, 7.3.1, 7.3.1E, 7.6.1.1, 7.6.2.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **x** |  | Test specifications | | | | TS 38.521-1CR zzzz, CR zzzz | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **< START OF CHANGE >** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

## 5.5 Operating bands

E-UTRA is designed to operate in the operating bands defined in Table 5.5-1.

Table 5.5-1 E-UTRA operating bands

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| E‑UTRA Operating Band | Uplink (UL) operating band BS receive UE transmit | | | Downlink (DL) operating band BS transmit  UE receive | | | Duplex Mode |
| FUL\_low – FUL\_high | | | FDL\_low – FDL\_high | | |
| 1 | 1920 MHz | – | 1980 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 2 | 1850 MHz | – | 1910 MHz | 1930 MHz | – | 1990 MHz | FDD |
| 3 | 1710 MHz | – | 1785 MHz | 1805 MHz | – | 1880 MHz | FDD |
| 4 | 1710 MHz | – | 1755 MHz | 2110 MHz | – | 2155 MHz | FDD |
| 5 | 824 MHz | – | 849 MHz | 869 MHz | – | 894MHz | FDD |
| 61 | 830 MHz | – | 840 MHz | 875 MHz | – | 885 MHz | FDD |
| 7 | 2500 MHz | – | 2570 MHz | 2620 MHz | – | 2690 MHz | FDD |
| 8 | 880 MHz | – | 915 MHz | 925 MHz | – | 960 MHz | FDD |
| 9 | 1749.9 MHz | – | 1784.9 MHz | 1844.9 MHz | – | 1879.9 MHz | FDD |
| 10 | 1710 MHz | – | 1770 MHz | 2110 MHz | – | 2170 MHz | FDD |
| 11 | 1427.9 MHz | – | 1447.9 MHz | 1475.9 MHz | – | 1495.9 MHz | FDD |
| 12 | 699 MHz | – | 716 MHz | 729 MHz | – | 746 MHz | FDD |
| 13 | 777 MHz | – | 787 MHz | 746 MHz | – | 756 MHz | FDD |
| 14 | 788 MHz | – | 798 MHz | 758 MHz | – | 768 MHz | FDD |
| 15 | Reserved | | | Reserved | | | FDD |
| 16 | Reserved | | | Reserved | | | FDD |
| 17 | 704 MHz | – | 716 MHz | 734 MHz | – | 746 MHz | FDD |
| 18 | 815 MHz | – | 830 MHz | 860 MHz | – | 875 MHz | FDD |
| 19 | 830 MHz | – | 845 MHz | 875 MHz | – | 890 MHz | FDD |
| 20 | 832 MHz | – | 862 MHz | 791 MHz | – | 821 MHz | FDD |
| 21 | 1447.9 MHz | – | 1462.9 MHz | 1495.9 MHz | – | 1510.9 MHz | FDD |
| 22 | 3410 MHz | – | 3490 MHz | 3510 MHz | – | 3590 MHz | FDD |
| 231 | 2000 MHz | – | 2020 MHz | 2180 MHz | – | 2200 MHz | FDD |
| 2417 | 1626.5 MHz | – | 1660.5 MHz | 1525 MHz | – | 1559 MHz | FDD |
| 25 | 1850 MHz | – | 1915 MHz | 1930 MHz | – | 1995 MHz | FDD |
| 26 | 814 MHz | – | 849 MHz | 859 MHz | – | 894 MHz | FDD |
| 27 | 807 MHz | – | 824 MHz | 852 MHz | – | 869 MHz | FDD |
| 28 | 703 MHz | – | 748 MHz | 758 MHz | – | 803 MHz | FDD |
| 29 | N/A | | | 717 MHz | – | 728 MHz | FDD2 |
| 3015 | 2305 MHz | – | 2315 MHz | 2350 MHz | – | 2360 MHz | FDD |
| 31 | 452.5 MHz | – | 457.5 MHz | 462.5 MHz | – | 467.5 MHz | FDD |
| 32 |  | N/A |  | 1452 MHz | – | 1496 MHz | FDD2 |
| 33 | 1900 MHz | – | 1920 MHz | 1900 MHz | – | 1920 MHz | TDD |
| 34 | 2010 MHz | – | 2025 MHz | 2010 MHz | – | 2025 MHz | TDD |
| 35 | 1850 MHz | – | 1910 MHz | 1850 MHz | – | 1910 MHz | TDD |
| 36 | 1930 MHz | – | 1990 MHz | 1930 MHz | – | 1990 MHz | TDD |
| 37 | 1910 MHz | – | 1930 MHz | 1910 MHz | – | 1930 MHz | TDD |
| 38 | 2570 MHz | – | 2620 MHz | 2570 MHz | – | 2620 MHz | TDD |
| 39 | 1880 MHz | – | 1920 MHz | 1880 MHz | – | 1920 MHz | TDD |
| 40 | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | TDD |
| 41 | 2496 MHz |  | 2690 MHz | 2496 MHz |  | 2690 MHz | TDD |
| 42 | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | TDD |
| 43 | 3600 MHz | – | 3800 MHz | 3600 MHz | – | 3800 MHz | TDD |
| 44 | 703 MHz | – | 803 MHz | 703 MHz | – | 803 MHz | TDD |
| 45 | 1447 MHz | – | 1467 MHz | 1447 MHz | – | 1467 MHz | TDD |
| 46 | 5150 MHz | – | 5925 MHz | 5150 MHz | – | 5925 MHz | TDD8 |
| 47 | 5855 MHz | – | 5925 MHz | 5855 MHz | – | 5925 MHz | TDD11 |
| 48 | 3550 MHz | – | 3700 MHz | 3550 MHz | – | 3700 MHz | TDD |
| 49 | 3550 MHz | – | 3700 MHz | 3550 MHz | – | 3700 MHz | TDD16 |
| 50 | 1432 MHz | - | 1517 MHz | 1432 MHz | - | 1517 MHz | TDD13 |
| 51 | 1427 MHz | - | 1432 MHz | 1427 MHz | - | 1432 MHz | TDD13 |
| 52 | 3300 MHz | - | 3400 MHz | 3300 MHz | - | 3400 MHz | TDD |
| 53 | 2483.5 MHz | - | 2495 MHz | 2483.5 MHz | - | 2495 MHz | TDD |
| 54 | 1670 MHz | - | 1675 MHz | 1670 MHz | - | 1675 MHz | TDD |
| … |  |  |  |  |  |  |  |
| 64 | Reserved | | | | | |  |
| 65 | 1920 MHz | – | 2010 MHz | 2110 MHz | – | 2200 MHz | FDD |
| 66 | 1710 MHz | – | 1780 MHz | 2110 MHz | – | 2200 MHz | FDD4 |
| 67 |  | N/A |  | 738 MHz | – | 758 MHz | FDD2 |
| 68 | 698 MHz | – | 728 MHz | 753 MHz | – | 783 MHz | FDD |
| 69 | N/A | | | 2570 MHz | – | 2620 MHz | FDD2 |
| 70 | 1695 MHz | – | 1710 MHz | 1995 MHz | – | 2020 MHz | FDD10 |
| 71 | 663 MHz | – | 698 MHz | 617 MHz | – | 652 MHz | FDD |
| 72 | 451 MHz | – | 456 MHz | 461 MHz | – | 466 MHz | FDD |
| 73 | 450 MHz | – | 455 MHz | 460 MHz | – | 465 MHz | FDD |
| 74 | 1427 MHz | – | 1470 MHz | 1475 MHz | – | 1518 MHz | FDD |
| 75 |  | N/A |  | 1432 MHz | – | 1517 MHz | FDD2 |
| 76 |  | N/A |  | 1427 MHz | – | 1432 MHz | FDD2 |
| 85 | 698 MHz | – | 716 MHz | 728 MHz | – | 746 MHz | FDD |
| 87 | 410 MHz | – | 415 MHz | 420 MHz | – | 425 MHz | FDD |
| 88 | 412 MHz | – | 417 MHz | 422 MHz | – | 427 MHz | FDD |
| 10318 | 787 MHz | – | 788 MHz | 757 MHz | – | 758 MHz | FDD |
| 106 | 896 MHz | – | 901 MHz | 935 MHz | – | 940 MHz | FDD |
| 11119 | 1800 MHz | – | 1810 MHz | 1820 MHz | – | 1830 MHz | FDD |
| NOTE 1: Band 6, 23 is not applicable  NOTE 2: Restricted to E-UTRA operation when carrier aggregation is configured. The downlink operating band is paired with the uplink operating band (external) of the carrier aggregation configuration that is supporting the configured Pcell.  NOTE 3: A UE that complies with the E-UTRA Band 65 minimum requirements in this specification shall also comply with the E-UTRA Band 1 minimum requirements.  NOTE 4: The range 2180-2200 MHz of the DL operating band is restricted to E-UTRA operation when carrier aggregation is configured.  NOTE 5: A UE that supports E-UTRA Band 66 shall receive in the entire DL operating band  NOTE 6: A UE that supports E-UTRA Band 66 and CA operation in any CA band shall also comply with the minimum requirements specified for the DL CA configurations CA\_66B, CA\_66C and CA\_66A-66A.  NOTE 7: A UE that complies with the E-UTRA Band 66 minimum requirements in this specification shall also comply with the E-UTRA Band 4 minimum requirements.  NOTE 8: This band is an unlicensed band restricted to licensed-assisted operation using Frame Structure Type 3  NOTE 9: In this version of the specification, restricted to E-UTRA DL operation when carrier aggregation is configured.  NOTE 10: The range 2010-2020 MHz of the DL operating band is restricted to E-UTRA operation when carrier aggregation is configured and TX-RX separation is 300 MHz The range 2005-2020 MHz of the DL operating band is restricted to E-UTRA operation when carrier aggregation is configured and TX-RX separation is 295 MHz.  NOTE 11: This band is unlicensed band used for V2X communication. There is no expected network deployment in this band so Frame Structure Type 1 is used.  NOTE 12: A UE that complies with the E-UTRA Band 74 minimum requirements in this specification shall also comply with the E-UTRA Band 11 and Band 21 minimum requirements.  NOTE 13: UE that complies with the E-UTRA Band 50 minimum requirements in this specification shall also comply with the E-UTRA Band 51 minimum requirements.  NOTE 14: A UE that complies with the E-UTRA Band 75 minimum requirements in this specification shall also comply with the E-UTRA Band 76 minimum requirements.  NOTE 15: Uplink transmission is not allowed at this band for UE with external vehicle-mounted antennas.  NOTE 16: This band is restricted to licensed-assisted operation using Frame Structure Type 3  NOTE 17: DL operation in this band is restricted to 1526 – 1536 MHz and UL operation is restricted to 1627.5 – 1637.5 MHz and 1646.5 – 1656.5 MHz.  NOTE 18: This band is restricted to NB-IoT operation only  NOTE 19: This band is targeted for HD-FDD operation except in large form factor UEs which may not be implementable with miniature acoustic RF filters | | | | | | | |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **Unchanged Section Omitted** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

## 5.5E Operating bands for UE category 0, UE category M1 and M2 and UE category 1bis

UE category 0 is designed to operate in the E-UTRA operating bands 2, 3, 4, 5, 8, 13, 20, 25, 26, 28 and 1111 in both half duplex FDD mode and full-duplex FDD mode and in bands 39, 40 and 41 in TDD mode. The E-UTRA bands are defined in Table 5.5-1.

UE category M1 and M2 is designed to operate in the E-UTRA operating bands 1, 2, 3, 4, 5, 7, 8, 11, 12, 13, 14, 18, 19, 20, 21, 24, 25, 26, 27, 28, 31, 54, 66, 71, 72, 73, 74, 85, 87, 88, 106 and 1111 in both half duplex FDD mode and full-duplex FDD mode, and in bands 39, 40, 41, 42, 43 and 48 in TDD mode. The E-UTRA bands are defined in Table 5.5-1.

UE category 1bis is designed to operate in the E-UTRA operating bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 18, 20, 26, 28, 31, 66, 72 and 111 in full duplex FDD mode and in bands 34, 39, 40 and 41 in TDD mode. The E-UTRA bands are defined in Table 5.5-1

## 5.5F Operating bands for category NB1 and NB2

Category NB1 and NB2 are designed to operate in the E-UTRA operating bands 1, 2, 3, 4, 5, 7, 8, 11, 12, 13, 14, 17, 18, 19, 20, 21, 24, 25, 26, 28, 31, 41, 42, 43, 48, 54, 65, 66, 70, 71, 72, 73, 74, 85, 87, 88, 103, 106 and 111 which are defined in Table 5.5-1. Category NB1 and NB2 are designed to operate in the NR operating bands n1, n2, n3, n5, n7, n8, n12, n14, n18, n20, n24, n25, n26, n28, n31, n41, n54, n65, n66, n70, n71, n72, n74, n90.

Category NB1 and NB2 systems operate in HD-FDD duplex mode or in TDD mode.

In case UE receives network signaling value NS\_04 or NS\_06 on any of the operating bands listed in Table 5.5F-1 then the lower and upper limit of those bands are shown in Table 5.5F-1 to account for the USA emission requirements.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **Unchanged Section Omitted** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 5.6.1 Channel bandwidths per operating band

a) The requirements in this specification apply to the combination of channel bandwidths and operating bands shown in Table 5.6.1-1. The transmission bandwidth configuration in Table 5.6.1-1 shall be supported for each of the specified channel bandwidths. The same (symmetrical) channel bandwidth is specified for both the TX and RX path.

Table 5.6.1-1: E-UTRA channel bandwidth

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| E-UTRA band / Channel bandwidth | | | | | | |
| E-UTRA Band | 1.4 MHz | 3 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz |
| 1 |  |  | Yes | Yes | Yes | Yes |
| 2 | Yes | Yes | Yes | Yes | Yes1 | Yes1 |
| 3 | Yes | Yes | Yes | Yes | Yes1 | Yes1 |
| 4 | Yes | Yes | Yes | Yes | Yes | Yes |
| 5 | Yes | Yes | Yes | Yes1 |  |  |
| 6 |  |  | Yes | Yes1 |  |  |
| 7 |  |  | Yes | Yes | Yes3 | Yes1, 3 |
| 8 | Yes | Yes | Yes | Yes1 |  |  |
| 9 |  |  | Yes | Yes | Yes1 | Yes1 |
| 10 |  |  | Yes | Yes | Yes | Yes |
| 11 |  |  | Yes | Yes1 |  |  |
| 12 | Yes | Yes | Yes1 | Yes1 |  |  |
| 13 |  |  | Yes1 | Yes1 |  |  |
| 14 |  |  | Yes1 | Yes1 |  |  |
| ... |  |  |  |  |  |  |
| 17 |  |  | Yes1 | Yes1 |  |  |
| 18 |  |  | Yes | Yes1 | Yes1 |  |
| 19 |  |  | Yes | Yes1 | Yes1 |  |
| 20 |  |  | Yes | Yes1 | Yes1 | Yes1 |
| 21 |  |  | Yes | Yes1 | Yes1 |  |
| 22 |  |  | Yes | Yes | Yes1 | Yes1 |
| 23 | Yes | Yes | Yes | Yes | Yes1 | Yes1 |
| 24 |  |  | Yes | Yes |  |  |
| 25 | Yes | Yes | Yes | Yes | Yes1 | Yes1 |
| 26 | Yes | Yes | Yes | Yes1 | Yes1 |  |
| 27 | Yes | Yes | Yes | Yes1 |  |  |
| 28 |  | Yes | Yes | Yes1 | Yes1 | Yes1, 2 |
| 30 |  |  | Yes | Yes1 |  |  |
| 31 | Yes | Yes1 | Yes1 |  |  |  |
| ... |  |  |  |  |  |  |
| 33 |  |  | Yes | Yes | Yes | Yes |
| 34 |  |  | Yes | Yes | Yes |  |
| 35 | Yes | Yes | Yes | Yes | Yes | Yes |
| 36 | Yes | Yes | Yes | Yes | Yes | Yes |
| 37 |  |  | Yes | Yes | Yes | Yes |
| 38 |  |  | Yes | Yes | Yes3 | Yes3 |
| 39 |  |  | Yes | Yes | Yes3 | Yes3 |
| 40 |  |  | Yes | Yes | Yes | Yes |
| 41 |  |  | Yes | Yes | Yes | Yes |
| 42 |  |  | Yes | Yes | Yes | Yes |
| 43 |  |  | Yes | Yes | Yes | Yes |
| 44 |  | Yes | Yes | Yes | Yes | Yes |
| 45 |  |  | Yes | Yes | Yes | Yes |
| 46 |  |  |  | Yes |  | Yes |
| 47 |  |  |  | Yes |  | Yes |
| 48 |  |  | Yes | Yes | Yes | Yes |
| 49 |  |  |  | Yes |  | Yes |
| 50 |  | Yes | Yes | Yes | Yes | Yes |
| 51 |  | Yes | Yes |  |  |  |
| 52 |  |  | Yes | Yes | Yes | Yes |
| 53 | Yes | Yes | Yes | Yes |  |  |
| 54 | Yes | Yes | Yes |  |  |  |
| … |  |  |  |  |  |  |
| 64 | Reserved | | | | | |
| 65 | Yes | Yes | Yes | Yes | Yes | Yes |
| 66 | Yes | Yes | Yes | Yes | Yes | Yes |
| 68 |  |  | Yes | Yes | Yes5 |  |
|  |  |  |  |  |  |  |
| 70 |  |  | Yes | Yes | Yes | Yes4 |
| 71 |  |  | Yes | Yes1 | Yes1 | Yes1,6 |
| 72 | Yes | Yes1 | Yes1 |  |  |  |
| 73 | Yes | Yes | Yes |  |  |  |
| 74 | Yes | Yes | Yes | Yes1 | Yes1 | Yes1 |
| 85 |  |  | Yes1 | Yes1 |  |  |
| 87 | Yes | Yes1 | Yes1 |  |  |  |
| 88 | Yes | Yes1 | Yes1 |  |  |  |
| 103 7 |  |  |  |  |  |  |
| 106 | Yes | Yes |  |  |  |  |
| 111 | Yes | Yes | Yes | Yes |  |  |
| NOTE 1: 1 refers to the bandwidth for which a relaxation of the specified UE receiver sensitivity requirement (subclause 7.3) is allowed.  NOTE 2: 2 For the 20 MHz bandwidth, the minimum requirements are specified for E-UTRA UL carrier frequencies confined to either 713-723 MHz or 728-738 MHz  NOTE 3: 3 refersto the bandwidth for which the uplink transmission bandwidth can be restricted by the network for some channel assignments in FDD/TDD co-existence scenarios in order to meet unwanted emissions requirements (Clause 6.6.3.2).  NOTE 4: 4 For the 20 MHz bandwidth, the minimum requirements are restricted to E‑UTRA operation when carrier aggregation is configured.  NOTE 5: 5 For the 15 MHz bandwidth, the minimum requirements are specified for E-UTRA UL carrier frequencies confined to either 705.5 MHz or 710.5-720.5 MHz  NOTE 6: 6 For the 20MHz bandwidth, the minimum requirements are specified for E-UTRA UL carrier frequencies confined to either 673-678 MHz or 683-688MHz.  NOTE 7: 7 This band is for standalone NB-IoT operation only. None of E-UTRA standard channel bandwidths is applicable. | | | | | | |

b) The use of different (asymmetrical) channel bandwidth for the TX and RX is not precluded and is intended to form part of a later release.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **Unchanged Section Omitted** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 5.7.3 Carrier frequency and EARFCN

The carrier frequency in the uplink and downlink is designated by the E-UTRA Absolute Radio Frequency Channel Number (EARFCN) in the range 0 – 262143. The relation between EARFCN and the carrier frequency in MHz for the downlink is given by the following equation, where FDL\_low and NOffs-DL are given in Table 5.7.3-1 and NDL is the downlink EARFCN.

FDL = FDL\_low + 0.1(NDL – NOffs-DL)

The relation between EARFCN and the carrier frequency in MHz for the uplink is given by the following equation where FUL\_low and NOffs-UL are given in Table 5.7.3-1 and NUL is the uplink EARFCN.

FUL = FUL\_low + 0.1(NUL – NOffs-UL)

Table 5.7.3-1: E-UTRA channel numbers

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| E-UTRA Operating  Band | Downlink | | | Uplink | | |
| FDL\_low (MHz) | NOffs-DL | Range of NDL | FUL\_low (MHz) | NOffs-UL | Range of NUL |
| 1 | 2110 | 0 | 0 – 599 | 1920 | 18000 | 18000 – 18599 |
| 2 | 1930 | 600 | 6001199 | 1850 | 18600 | 18600 – 19199 |
| 3 | 1805 | 1200 | 1200 – 1949 | 1710 | 19200 | 19200 – 19949 |
| 4 | 2110 | 1950 | 1950 – 2399 | 1710 | 19950 | 19950 – 20399 |
| 5 | 869 | 2400 | 2400 – 2649 | 824 | 20400 | 20400 – 20649 |
| 6 | 875 | 2650 | 2650 – 2749 | 830 | 20650 | 20650 – 20749 |
| 7 | 2620 | 2750 | 2750 – 3449 | 2500 | 20750 | 20750 – 21449 |
| 8 | 925 | 3450 | 3450 – 3799 | 880 | 21450 | 21450 – 21799 |
| 9 | 1844.9 | 3800 | 3800 – 4149 | 1749.9 | 21800 | 21800 – 22149 |
| 10 | 2110 | 4150 | 4150 – 4749 | 1710 | 22150 | 22150 – 22749 |
| 11 | 1475.9 | 4750 | 4750 – 4949 | 1427.9 | 22750 | 22750 – 22949 |
| 12 | 729 | 5010 | 5010 – 5179 | 699 | 23010 | 23010 – 23179 |
| 13 | 746 | 5180 | 5180 – 5279 | 777 | 23180 | 23180 – 23279 |
| 14 | 758 | 5280 | 5280 – 5379 | 788 | 23280 | 23280 – 23379 |
| … |  |  |  |  |  |  |
| 17 | 734 | 5730 | 5730 – 5849 | 704 | 23730 | 23730 – 23849 |
| 18 | 860 | 5850 | 5850 – 5999 | 815 | 23850 | 23850 – 23999 |
| 19 | 875 | 6000 | 6000 – 6149 | 830 | 24000 | 24000 – 24149 |
| 20 | 791 | 6150 | 6150 – 6449 | 832 | 24150 | 24150 – 24449 |
| 21 | 1495.9 | 6450 | 6450 – 6599 | 1447.9 | 24450 | 24450 – 24599 |
| 22 | 3510 | 6600 | 6600 – 7399 | 3410 | 24600 | 24600 – 25399 |
| 23 | 2180 | 7500 | 7500 – 7699 | 2000 | 25500 | 25500 – 25699 |
| 24 | 1525 | 7700 | 7700 – 8039 | 1626.5 | 25700 | 25700 – 26039 |
| 25 | 1930 | 8040 | 8040 – 8689 | 1850 | 26040 | 26040 – 26689 |
| 26 | 859 | 8690 | 8690 – 9039 | 814 | 26690 | 26690 – 27039 |
| 27 | 852 | 9040 | 9040 – 9209 | 807 | 27040 | 27040 – 27209 |
| 28 | 758 | 9210 | 9210 – 9659 | 703 | 27210 | 27210 – 27659 |
| 292 | 717 | 9660 | 9660 – 9769 | N/A | | |
| 30 | 2350 | 9770 | 9770 – 9869 | 2305 | 27660 | 27660 – 27759 |
| 31 | 462.5 | 9870 | 9870 – 9919 | 452.5 | 27760 | 27760 – 27809 |
| 322 | 1452 | 9920 | 9920 – 10359 | N/A | | |
| 33 | 1900 | 36000 | 36000 – 36199 | 1900 | 36000 | 36000 – 36199 |
| 34 | 2010 | 36200 | 36200 – 36349 | 2010 | 36200 | 36200 – 36349 |
| 35 | 1850 | 36350 | 36350 – 36949 | 1850 | 36350 | 36350 – 36949 |
| 36 | 1930 | 36950 | 36950 – 37549 | 1930 | 36950 | 36950 – 37549 |
| 37 | 1910 | 37550 | 37550 – 37749 | 1910 | 37550 | 37550 – 37749 |
| 38 | 2570 | 37750 | 37750 – 38249 | 2570 | 37750 | 37750 – 38249 |
| 39 | 1880 | 38250 | 38250 – 38649 | 1880 | 38250 | 38250 – 38649 |
| 40 | 2300 | 38650 | 38650 – 39649 | 2300 | 38650 | 38650 – 39649 |
| 41 | 2496 | 39650 | 39650 –41589 | 2496 | 39650 | 39650 –41589 |
| 42 | 3400 | 41590 | 41590 – 43589 | 3400 | 41590 | 41590 – 43589 |
| 43 | 3600 | 43590 | 43590 – 45589 | 3600 | 43590 | 43590 – 45589 |
| 44 | 703 | 45590 | 45590 – 46589 | 703 | 45590 | 45590 – 46589 |
| 45 | 1447 | 46590 | 46590 – 46789 | 1447 | 46590 | 46590 – 46789 |
| 46 | 5150 | 46790 | 46790 – 54539 | 5150 | 46790 | 46790 – 54539 |
| 47 | 5855 | 54540 | 54540 - 55239 | 5855 | 54540 | 54540 – 55239 |
| 48 | 3550 | 55240 | 55240 – 56739 | 3550 | 55240 | 55240 – 56739 |
| 49 | 3550 | 56740 | 56740 – 58239 | 3550 | 56740 | 56740 – 58239 |
| 50 | 1432 | 58240 | 58240 - 59089 | 1432 | 58240 | 58240 - 59089 |
| 51 | 1427 | 59090 | 59090 - 59139 | 1427 | 59090 | 59090 - 59139 |
| 52 | 3300 | 59140 | 59140 - 60139 | 3300 | 59140 | 59140 - 60139 |
| 53 | 2483.5 | 60140 | 60140 - 60254 | 2483.5 | 60140 | 60140 - 60254 |
| 54 | 1670 | 60255 | 60255 - 60304 | 1670 | 60255 | 60255 - 60304 |
| … |  |  |  |  |  |  |
| 64 | Reserved | | | | | |
| 65 | 2110 | 65536 | 65536 – 66435 | 1920 | 131072 | 131072 – 131971 |
| 665 | 2110 | 66436 | 66436 – 67335 | 1710 | 131972 | 131972 – 132671 |
| 672 | 738 | 67336 | 67336 – 67535 | N/A | | |
| 68 | 753 | 67536 | 67536 - 67835 | 698 | 132672 | 132672 - 132971 |
| 692 | 2570 | 67836 | 67836 - 68335 | N/A | | |
| 706 | 1995 | 68336 | 68336 - 68585 | 1695 | 132972 | 132972 - 133121 |
| 71 | 617 | 68586 | 68586 - 68935 | 663 | 133122 | 133122 - 133471 |
| 72 | 461 | 68936 | 68936 - 68985 | 451 | 133472 | 133472 - 133521 |
| 73 | 460 | 68986 | 68986 - 69035 | 450 | 133522 | 133522 - 133571 |
| 74 | 1475 | 69036 | 69036 - 69465 | 1427 | 133572 | 133572 - 134001 |
| 752 | 1432 | 69466 | 69466 - 70315 | N/A | | |
| 762 | 1427 | 70316 | 70316 - 70365 | N/A | | |
| 85 | 728 | 70366 | 70366 - 70545 | 698 | 134002 | 134002 - 134181 |
| 87 | 420 | 70546 | 70546 - 70595 | 410 | 134182 | 134182 - 134231 |
| 88 | 422 | 70596 | 70596 - 70645 | 412 | 134232 | 134232 - 134281 |
| 103 | 757 | 70646 | 70646 – 70655 | 787 | 134282 | 134282 – 134291 |
| 1067 | 935 | 70656 | 70656 – 70705 | 896 | 134292 | 134292 – 134341 |
| 111 | 1820 | 73386 | 73386 – 73485 | 1800 | 134342 | 134342 – 134441 |
| NOTE 1: The channel numbers that designate carrier frequencies so close to the operating band edges that the carrier extends beyond the operating band edge shall not be used. This implies that the first 7, 15, 25, 50, 75 and 100 channel numbers at the lower operating band edge and the last 6, 14, 24, 49, 74 and 99 channel numbers at the upper operating band edge shall not be used for channel bandwidths of 1.4, 3, 5, 10, 15 and 20 MHz respectively.  NOTE 2: Restricted to E-UTRA operation when carrier aggregation is configured.  NOTE 3: For ProSe and V2X the corresponding UL channel number are also specified for the DL for the associated ProSe/V2X operating bands i.e. ProSe\_FUL = FUL and ProSe\_FDL = FUL; V2X\_FUL = FDL and V2X\_FDL = FUL.  NOTE 4: Requirements for uplink operations are not specified in this version of the specification.  NOTE 5: The range 2180-2200 MHz of the DL operating band is restricted to E-UTRA operation when carrier aggregation is configured.  NOTE 6: The range 2010-2020 MHz of the DL operating band is restricted to E-UTRA operation when carrier aggregation is configured and TX-RX separation is 300 MHz The range 2005-2020 MHz of the DL operating band is restricted to E-UTRA operation when carrier aggregation is configured and TX-RX separation is 295 MHz.  NOTE 7: In the present version of the specification, only EARFCN 70686 and 134322 is applicable for 3 MHz channel bandwidth. | | | | | | |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **Unchanged Section Omitted** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 5.7.4 TX–RX frequency separation

a) The default E-UTRA TX channel (carrier centre frequency) to RX channel (carrier centre frequency) separation is specified in Table 5.7.4-1 for the TX and RX channel bandwidths defined in Table 5.6.1-1

Table 5.7.4-1: Default UE TX-RX frequency separation

| E-UTRA Operating Band | TX – RX  carrier centre frequency separation |
| --- | --- |
| 1 | 190 MHz |
| 2 | 80 MHz. |
| 3 | 95 MHz. |
| 4 | 400 MHz |
| 5 | 45 MHz |
| 6 | 45 MHz |
| 7 | 120 MHz |
| 8 | 45 MHz |
| 9 | 95 MHz |
| 10 | 400 MHz |
| 11 | 48 MHz |
| 12 | 30 MHz |
| 13 | -31 MHz |
| 14 | -30 MHz |
| 17 | 30 MHz |
| 18 | 45 MHz |
| 19 | 45 MHz |
| 20 | -41 MHz |
| 21 | 48 MHz |
| 22 | 100 MHz |
| 23 | 180 MHz |
| 24 | -101.51, -120.5 MHz |
| 25 | 80 MHz |
| 26 | 45 MHz |
| 27 | 45 MHz |
| 28 | 55 MHz |
| 30 | 45 MHz |
| 31 | 10 MHz |
| 65 | 190 MHz |
| 66 | 400 MHz |
| 68 | 55 MHz |
| … |  |
| 70 | 295, 300MHz1 |
| 71 | -46 MHz |
| 72 | 10 MHz |
| 73 | 10 MHz |
| 74 | 48 MHz |
| 85 | 30 MHz |
| 87 | 10 MHz |
| 88 | 10 MHz |
| 103 | -30 MHz |
| 106 | 39 MHz |
| 111 | 20 MHz |
| NOTE 1: Default TX-RX carrier centre frequency separation. | |

b) The use of other TX channel to RX channel carrier centre frequency separation is not precluded and is intended to form part of a later release.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **Unchanged Section Omitted** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 6.2.2 UE maximum output power

The following UE Power Classes define the maximum output power for any transmission bandwidth within the channel bandwidth for non CA configuration unless otherwise stated. The period of measurement shall be at least as defined in Table 6.2.2-0.

Table 6.2.2-0: Measurement period for UE maximum output power

|  |  |
| --- | --- |
| TTI pattern | Minimum measurement period |
| Subframe | 1ms |
| Slot | 7OS |
| Subslot | 2OS, 3OS |

Table 6.2.2-1: UE Power Class

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| EUTRA band | Class 1 (dBm) | Tolerance (dB) | Class 2 (dBm) | Tolerance (dB) | Class 3 (dBm) | Tolerance (dB) | Class 4 (dBm) | Tolerance (dB) |
| 1 |  |  |  |  | 23 | ±2 |  |  |
| 2 |  |  |  |  | 23 | ±22 |  |  |
| 3 | 31 | +2/-3 |  |  | 23 | ±22 |  |  |
| 4 |  |  |  |  | 23 | ±2 |  |  |
| 5 |  |  |  |  | 23 | ±2 |  |  |
| 6 |  |  |  |  | 23 | ±2 |  |  |
| 7 |  |  |  |  | 23 | ±22 |  |  |
| 8 |  |  |  |  | 23 | ±22 |  |  |
| 9 |  |  |  |  | 23 | ±2 |  |  |
| 10 |  |  |  |  | 23 | ±2 |  |  |
| 11 |  |  |  |  | 23 | ±2 |  |  |
| 12 | 31 | +2/-3 |  |  | 23 | ±22 |  |  |
| 13 |  |  |  |  | 23 | ±2 |  |  |
| 14 | 31 | +2/-3 | 26 | ±2 | 23 | ±2 |  |  |
| … |  |  |  |  |  |  |  |  |
| 17 |  |  |  |  | 23 | ±2 |  |  |
| 18 |  |  |  |  | 23 | ±25 |  |  |
| 19 |  |  |  |  | 23 | ±2 |  |  |
| 20 | 31 | +2/-3 |  |  | 23 | ±22 |  |  |
| 21 |  |  |  |  | 23 | ±2 |  |  |
| 22 |  |  |  |  | 23 | +2/-3.52 |  |  |
| 23 |  |  |  |  | 236 | ±26 |  |  |
| 24 |  |  |  |  | 23 | +2/-32 |  |  |
| 25 |  |  |  |  | 23 | ±22 |  |  |
| 26 |  |  |  |  | 23 | ±22 |  |  |
| 27 |  |  |  |  | 23 | ±2 |  |  |
| 28 | 31 | +2/-3 |  |  | 23 | +2/-2.5 |  |  |
| 30 |  |  |  |  | 23 | ±2 |  |  |
| 31 | 31 | +2/-3 |  |  | 23 | ±2 |  |  |
| … |  |  |  |  |  |  |  |  |
| 33 |  |  |  |  | 23 | ±2 |  |  |
| 34 |  |  |  |  | 23 | ±2 |  |  |
| 35 |  |  |  |  | 23 | ±2 |  |  |
| 36 |  |  |  |  | 23 | ±2 |  |  |
| 37 |  |  |  |  | 23 | ±2 |  |  |
| 38 |  |  | 26 | ±2 | 23 | ±2 |  |  |
| 39 |  |  |  |  | 23 | ±2 |  |  |
| 40 | 31 | +2/-3 | 26 | ±2 | 23 | ±2 |  |  |
| 41 |  |  | 26 | ±22 | 23 | ±22 |  |  |
| 42 | 31 | +2/-3 | 26 | +2/-3 | 23 | +2/-3 |  |  |
| 43 |  |  |  |  | 23 | +2/-3 |  |  |
| 44 |  |  |  |  | 23 | +2/[-3] |  |  |
| 45 |  |  |  |  | 23 | ±2 |  |  |
| … |  |  |  |  |  |  |  |  |
| 47 |  |  | 26 | ±2 | 23 | ±2 |  |  |
| 48 |  |  |  |  | 23 | +2/-3 |  |  |
| 50 |  |  |  |  | 23 | ±2 |  |  |
| 51 |  |  |  |  | 23 | ±2 |  |  |
| 52 |  |  |  |  | 23 | +2/-3 |  |  |
| 53 |  |  |  |  | 23 | ±2 |  |  |
| 54 |  |  |  |  | 23 | ±2 |  |  |
| 65 |  |  |  |  | 23 | ±2 |  |  |
| 66 |  |  |  |  | 23 | ±2 |  |  |
| 68 |  |  |  |  | 23 | ±2 |  |  |
| … |  |  |  |  |  |  |  |  |
| 70 |  |  |  |  | 23 | ±2 |  |  |
| 71 |  |  |  |  | 23 | +2/-2.5 |  |  |
| 72 | 31 | +2/-3 |  |  | 23 | ±2 |  |  |
| 73 |  |  |  |  | 23 | ±2 |  |  |
| 74 |  |  |  |  | 23 | ±2 |  |  |
| 85 |  |  |  |  | 23 | ±22 |  |  |
| 87 | 31 | +2/-3 |  |  | 23 | ±2 |  |  |
| 88 | 31 | +2/-3 |  |  | 23 | ±2 |  |  |
| 106 | 31 | +2/-3 |  |  | 23 | ±2 |  |  |
| 111 |  |  |  |  | 23 | ±2 |  |  |
| NOTE 1: Void  NOTE 2: 2 refers to the transmission bandwidths (Figure 5.6-1) confined within FUL\_low and FUL\_low + 4 MHz or FUL\_high – 4 MHz and FUL\_high, the maximum output power requirement is relaxed by reducing the lower tolerance limit by 1.5 dB  NOTE 3: For the UE which supports both Band 11 and Band 21 operating frequencies, the tolerance is FFS.  NOTE 4: PPowerClass is the maximum UE power specified without taking into account the tolerance  NOTE 5: For a UE that supports both Band 18 and Band 26, the maximum output power requirement is relaxed by reducing the lower tolerance limit by 1.5 dB for transmission bandwidths confined within 815 MHz and 818 MHz.  NOTE 6: When NS\_20 is signalled, the total output power within 2000-2005 MHz shall be limited to 7 dBm.  NOTE 7: Void.  NOTE 8: Generally, PC1 UE is not targeted for smartphone form factor.  NOTE 9: Void. | | | | | | | | |

The default power class PPowerClass\_Default for an operating band is Power Class 3 unless otherwise stated.

For a power class 2 capable UE operating on Band 41, when an IE *P-max* as defined in TS 36.331 [7] of 23 dBm or lower is indicated in the cell or if the uplink/downlink configuration is 0 or 6, the requirements for power class 2 are not applicable, and the corresponding requirements for a power class 3 UE shall apply.

For each supported frequency band other than Band 14 and Band 41, the UE shall:

- if the UE supports a different power class than the default UE power class for the band and the supported power class enables the higher maximum output power than that of the default power class:

- if the band is a TDD band whose frame configuration is 0 or 6; or

- if the IE *P-Max* as defined in TS 36.331 [7] is not provided; or

- if the IE *P-Ma*x as defined in TS 36.331 [7] is provided and set to the maximum output power of the default power class or lower;

- meet all requirements for the default power class of the operating band in which the UE is operating and set its configured transmitted power as specified in sub-clause 6.2.5;

- else (i.e the IE *P-Max* as defined in TS 36.331 [7] is provided and set to the higher value than the maximum output power of the default power class):

- meet all requirements for the supported power class and set its configured transmitted power class as specified in sub-clause 6.2.5;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **Unchanged Section Omitted** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 6.2.2E UE maximum output power for Category M1 and M2 UE

The following UE Power Classes define the maximum output power for any transmission bandwidth within the channel bandwidth for non CA configuration and UL-MIMO unless otherwise stated. The period of measurement shall be at least one sub frame (1ms).

Table 6.2.2E-1: UE Power Class

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| EUTRA band | Class 2  (dBm) | Tolerance  (dB) | Class 3 (dBm) | Tolerance (dB) | Class 5 (dBm) | Tolerance (dB) | Class 6 (dBm) | Tolerance (dB) |
| 1 |  |  | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 2 |  |  | 23 | ±22 | 20 | ±22 | 14 | ±2.5 |
| 3 |  |  | 23 | ±22 | 20 | ±22 | 14 | ±2.5 |
| 4 |  |  | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 5 |  |  | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 7 |  |  | 23 | ±22 | 20 | ±22 | 14 | ±2.5 |
| 8 |  |  | 23 | ±22 | 20 | ±22 | 14 | ±2.5 |
| 11 |  |  | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 12 |  |  | 23 | ±22 | 20 | ±22 | 14 | ±2.5 |
| 13 |  |  | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 14 |  |  | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 18 |  |  | 23 | ±25 | 20 | ±25 | 14 | ±2.5 |
| 19 |  |  | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 20 |  |  | 23 | ±22 | 20 | ±22 | 14 | ±2.5 |
| 21 |  |  | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 24 |  |  | 23 | +2/-32 | 20 | +2/-32 | 14 | ±2.5 |
| 25 |  |  | 23 | ±22 | 20 | ±2 | 14 | ±2.5 |
| 26 |  |  | 23 | ±22 | 20 | ±22 | 14 | ±2.5 |
| 27 |  |  | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 28 |  |  | 23 | +2/-2.5 | 20 | +2/-2.5 | 14 | ±2.5 |
| 31 | 267 | ±2 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| … |  |  |  |  |  |  |  |  |
| 39 |  |  | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 40 |  |  | 23 | ±22 | 20 | ±2 | 14 | ±2.5 |
| 41 |  |  | 23 | ±22 | 20 | ±22 | 14 | ±2.5 |
| 42 |  |  | 23 | +2/-3 | 20 | +2/-3 | 14 | ±2.5 |
| 43 |  |  | 23 | +2/-3 | 20 | +2/-3 | 14 | ±2.5 |
| 48 |  |  | 23 | +2/-3 | 20 | +2/-3 | 14 | ±2.5 |
| … |  |  |  |  |  |  |  |  |
| 54 |  |  | 23 | +2/-3 | 20 | +2/-3 | 14 | ±2.5 |
| … |  |  |  |  |  |  |  |  |
| 71 |  |  | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 72 | 267 | ±2 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 73 |  |  | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 74 |  |  | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 85 |  |  | 23 | ±22 | 20 | ±22 | 14 | ±2.5 |
| 87 |  |  | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 88 |  |  | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 106 |  |  | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 111 |  |  | 23 | ±2 |  |  |  |  |
| NOTE 1: Void  NOTE 2: 2 refers to the transmission bandwidths (Figure 5.6-1) confined within FUL\_low and FUL\_low + 4 MHz or FUL\_high – 4 MHz and FUL\_high, the maximum output power requirement is relaxed by reducing the lower tolerance limit by 1.5 dB  NOTE 3: For the UE which supports both Band 11 and Band 21 operating frequencies, the tolerance is FFS.  NOTE 4: PPowerClass is the maximum UE power specified without taking into account the tolerance  NOTE 5: For a UE that supports both Band 18 and Band 26, the maximum output power requirement is relaxed by reducing the lower tolerance limit by 1.5 dB for transmission bandwidths confined within 815 MHz and 818 MHz.  NOTE 6: Void  NOTE 7: Applicable for category M1 and M2 HD-FDD UE | | | | | | | | |

### 6.2.2F UE maximum output power for category NB1 and NB2

Category NB1 and NB2 UE Power Classes are specified in Table 6.2.2F-1 and define the maximum output power for any transmission bandwidth within the category NB1 and NB2 channel bandwidth. For 3.75 kHz sub-carrier spacing the maximum output power is defined as mean power of measurement which period is atleast one slot (2ms) excluding the 2304Ts gap when UE is not transmitting. For 15kHz sub-carrier spacing the maximum output power is defined as mean power of measurement which period is atleast one sub-frame (1ms).

Table 6.2.2F-1: UE Power Class

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| EUTRA band | Class 3 (dBm) | Tolerance (dB) | Class 5 (dBm) | Tolerance (dB) | Class 6 (dBm) | Tolerance (dB) |
| 1 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 2 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 3 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 4 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 5 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 7 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 8 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 11 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 12 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 13 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 14 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 17 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 18 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 19 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 20 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 21 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 24 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 25 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 26 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 28 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 31 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 41 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 42 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 43 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 48 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 54 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 65 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 66 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 70 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 71 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 72 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 73 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 74 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 85 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 87 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 103 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 106 | 23 | ±2 | 20 | ±2 | 14 | ±2.5 |
| 111 | 23 | ±2 |  |  |  |  |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **Unchanged Section Omitted** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#### 6.6.3.2 Spurious emission band UE co-existence

This clause specifies the requirements for the specified E-UTRA band, for coexistence with protected bands.

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

Table 6.6.3.2-1: Requirements

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA Band | Spurious emission | | | | | | |
| Protected band | Frequency range (MHz) | | | Maximum Level (dBm) | MBW (MHz) | NOTE |
| 1 | E-UTRA Band 1, 3, 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, 87, 88  NR Band n78, n79, n100, n105 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 34 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
| NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| 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, 44 |
| 2 | E-UTRA Band 4, 5, 12, 13, 14, 17, 24, 26, 27, 28, 29, 30, 41, 42, 50, 51, 53, 54, 66, 70, 71, 74, 85, 103, 106  NR Band n105 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 2, 25 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
| E-UTRA Band 43, 48  NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| 3 | E-UTRA Band 1, 5, 7, 8, 11, 18, 19, 20, 21, 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, 87, 88  NR Band n79, n100, n101, n105 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 3 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
| 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 |  |
| 4 | E-UTRA Band 2, 4, 5, 7, 12, 13, 14, 17, 24, 25, 26, 27, 28, 29, 30, 41, 43, 48, 50, 51, 53, 66, 70, 71, 74, 85, 103, 106 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 42,  NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| 5 | E-UTRA Band 1, 2, 3, 4, 5, 7, 8, 12, 13, 14, 17, 24, 25, 28, 29, 30, 31, 34, 38, 40, 42, 43, 45, 48, 50, 51, 65, 66, 70, 71, 73, 74, 85, 103, 106  NR Band n105 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 26 | 859 | - | 869 | -27 | 1 |  |
| E-UTRA Band 41, 52, 53, 54  NR Band n77, n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| E-UTRA Band 18, 19 | FDL\_low | - | FDL\_high | -40 | 1 | 39 |
| E-UTRA Band 11, 21 | FDL\_low | - | FDL\_high | -50 | 1 | 39 |
| Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 8, 39 |
| 6 | E-UTRA Band 1, 9, 11, 34 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| Frequency range | 860 | - | 875 | -37 | 1 |  |
| Frequency range | 875 | - | 895 | -50 | 1 |  |
| Frequency range | 1884.5 | - | 1919.6 | -41 | 0.3 | 7 |
| 1884.5 | - | 1915.7 | 8 |
| 7 | 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, 87, 88, 103  NR Band n77, n78, n100, n101, n105 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| 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 |
| 8 | E-UTRA Band 1, 20, 28, 31, 32, 33, 34, 38, 39, 40, 45, 50, 51, 54, 65, 67, 68, 69, 72, 73, 74, 75, 76, 87, 88  NR Band n101, n105 | 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 Band 8 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
| E-UTRA Band 11, 21 | FDL\_low | - | FDL\_high | -50 | 1 | 23 |
| Frequency range | 860 | - | 890 | -40 | 1 | 15, 23 |
| Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 8, 23 |
| 9 | E-UTRA Band 1, 3, 11, 18, 19, 21, 26, 28, 34 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 42 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| 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 |  |
| 10 | E-UTRA Band 2, 4, 5, 10, 12, 13, 14, 17, 24, 25, 26, 27, 28, 29, 30, 41, 43, 54, 66, 70, 85, 103 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 22, 42,  NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| 11 | E-UTRA Band 1, 3, 11, 18, 19, 21, 28, 34, 40, 42, 65  NR Band n77, n78, n79 | FDL\_low | - | FDL\_high | -50 | 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 |  |
| 12 | E-UTRA Band 2, 5, 13, 14, 17, 24, 25, 26, 27, 30, 41, 53, 54, 70, 71, 74, 103, 106 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 4, 48, 50, 51, 66  NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| E-UTRA Band 12, 85 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
| 13 | E-UTRA Band 2, 4, 5, 12, 13, 17, 25, 26, 27, 29, 41, 48, 50, 51, 53, 54, 66, 70, 71, 74, 85, 103, 106 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 14 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
| E-UTRA Band 24, 30,  NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| Frequency range | 769 | - | 775 | -35 | 0.00625 | 15 |
| Frequency range | 799 | - | 805 | -35 | 0.00625 | 15 |
| 14 | E-UTRA Band 2, 4, 5, 12, 13, 14, 17, 23, 24, 25, 26, 27, 29, 30, 41, 48, 53, 54, 66, 70, 71, 85, 103 ,106 | 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 | 12, 15 |
| 17 | E-UTRA Band 2, 5, 13, 14, 17, 24, 25, 26, 27, 30, 41, 71, 74, 103 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 4, 48, 50, 51, 53, 54, 66, 70,  NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| E-UTRA Band 12, 48, 85 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
| 18 | E-UTRA Band 1, 3, 11, 21, 34, 40, 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 | 15 |
| 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 |  |
| 19 | E-UTRA Band 1, 3, 11, 21, 28, 34, 40, 42, 65  NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| NR Band n77, n78 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| 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 |  |
| 20 | E-UTRA Band 1, 3, 7, 8, 22, 31, 32, 33, 34, 40, 43, 50, 51, 65, 67, 68, 72, 74, 75, 76, 87, 88  NR Band n100, n101 | 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 |  |
| 21 | E-UTRA Band 1, 3, 18, 19, 28, 34, 40, 42, 65  NR Band n77, n78, n79 | FDL\_low | - | FDL\_high | -50 | 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 |  |
| 22 | E-UTRA Band 1, 3, 7, 8, 20, 26, 27, 28, 31, 32, 33, 34, 38, 39, 40, 43, 65, 67, 68, 69, 72, 75, 76, 87, 88  NR Band n100, n101 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| Frequency range | 3510 | - | 3525 | -40 | 1 | 15 |
| Frequency range | 3525 | - | 3590 | -50 | 1 |  |
| 23 | E-UTRA Band 4, 5, 12, 13, 14, 17, 23, 24, 26, 27, 29, 30, 41, 54, 66, 103, 106 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| 24 | E-UTRA Band 2, 4, 5, 12, 13, 14, 17, 24, 25, 26, 29, 30, 41, 48, 66, 70, 71, 85, 103, 106 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| 25 | E-UTRA Band 4, 5, 12, 13, 14, 17, 24, 26, 27, 28, 29, 30, 41, 42, 53, 54, 66, 70, 71, 85, 103, 106  NR Band n105 | 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, 48  NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| 26 | 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, 65, 66, 70, 71, 73,74, 85, 103, 106 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 41, 53, 54  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 |
| 27 | E-UTRA Band 1, 2, 3, 4, 5, 7, 12, 13, 14, 17, 25, 26, 27, 29, 30, 31, 38, 40, 41, 42, 43, 65, 66, 73, 85, 103 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 28 | FDL\_low | - | 790 | -50 | 1 |  |
| NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| Frequency range | 799 | - | 805 | -35 | 0.00625 |  |
| 28 | E-UTRA Band 1, 4, 22, 32, 42, 43, 50, 51, 65, 66, 73, 74, 75, 76  NR Band n77, n78, n100, n101 | 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, 40, 41, 52, 72, 87, 88  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 |
| 30 | E-UTRA Band 2, 4, 5, 7, 12, 13, 14, 17, 24, 25, 26, 27, 29, 30, 38, 41, 48, 53, 54, 66, 70, 71, 85, 103, 106 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| 31 | E-UTRA Band 1, 5, 7, 8, 20, 22, 26, 27, 28, 31, 32, 33, 34, 38, 40, 42, 43, 50, 51, 52, 65, 67, 68, 69, 74, 75, 76, 87, 88  NR Band n100, n101 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 3 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| Frequency range | 470 | - | 694 | -42 | 8 |  |
| … |  |  |  |  |  |  |  |
| 33 | E-UTRA Band 1, 7, 8, 20, 22, 28, 31, 32, 34, 38, 40, 42, 52, 65, 67, 69, 72, 73, 75, 76, 87, 88  NR Band n100 | FDL\_low | - | FDL\_high | -50 | 1 | 5 |
| E-UTRA Band 43 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| E-UTRA Band 3 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
| 34 | 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, 73, 74, 75, 76, 87, 88  NR Band n78, n79, n100, n101, n105 | FDL\_low | - | FDL\_high | -50 | 1 | 5 |
| NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2, 5 |
| Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 8 |
| 35 |  |  |  |  |  |  |  |
| 36 |  |  |  |  |  |  |  |
| 37 |  |  | - |  |  |  |  |
| 38 | 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, 87, 88, 103  NR Band n77, n78, n79, n100, n101 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| Frequency range | 2620 | - | 2645 | -15.5 | 5 | 15, 22, 26 |
| Frequency range | 2645 | - | 2690 | -40 | 1 | 15, 22 |
| 39 | E-UTRA Band 1, 8, 22, 26, 28, 34, 40, 41, 42, 44, 45, 50, 51, 52, 73, 74  NR Band n79, n105 | 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 |
| 40 | E-UTRA Band 1, 3, 5, 7, 8, 11, 18, 19, 20, 21, 22, 26, 27, 28, 31, 32, 33, 34, 38, 39, 41, 42, 43, 44, 45, 50, 51, 52, 65, 67, 68, 69, 72, 73, 74, 75, 76, 87, 88  NR Band n77, n78, n100, n101, n105 | 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 |
| 41 | E-UTRA Band 1, 2, 3, 4, 5, 8, 12, 13 , 14, 17, 24, 25, 26, 27, 28, 29, 30, 34, 39, 40, 42, 44, 45, 48, 50, 51, 52, 54, 65, 66, 70, 71, 73, 74, 85, 103, 106  NR Band n77, n78, n105 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 9, 11, 18, 19, 21 | FDL\_low | - | FDL\_high | -50 | 1 | 30 |
| NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| Frequency range | 1884.5 |  | 1915.7 | -41 | 0.3 | 8, 30 |
| 42 | E-UTRA Band 1, 2, 3, 4, 5, 7, 8, 11, 18, 19, 20, 21, 25, 26, 27, 28, 31, 32, 33, 34, 38, 40, 41, 44, 45, 50, 51, 65, 66, 67, 68, 69, 72, 73, 74, 75, 76, 87, 88  NR Band n79, n100, n101 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 8 |
| 43 | E-UTRA Band 1, 2, 3, 4, 5, 7, 8, 20, 25, 26, 27, 28, 31,32, 33, 34, 38, 40, 50, 51, 65, 66, 67, 68, 69, 72, 73, 74, 75, 76, 85, 87, 88  NR Band n100, n101 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| 44 | E-UTRA Band 1, 40, 42, 45 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| E-UTRA Band 3, 5, 8, 34, 39, 41, 73 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| 45 | E-UTRA Band 1, 3, 5, 8, 34, 39, 40, 41, 42, 44, 52, 73 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| … |  |  |  |  |  |  |  |
| 47 | E-UTRA Band 1, 3, 5, 7, 8, 22, 26, 28, 34, 39, 40, 41, 42, 44, 45, 65, 68, 72, 73  NR band n77, n78 , n79, n105 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| Frequency range | 5925 | - | 5950 | -30 EIRP | 1 | 38, 40, 43 |
| Frequency range | 5815 | - | 5855 | -30 EIRP | 1 | 38, 43, 45 |
| 48 | E-UTRA Band 2, 4, 5, 12, 13, 14, 17, 24, 25, 26, 29, 30, 41, 50, 51, 54, 66, 70, 71, 74, 85, 103, 106 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| 50 | 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, 103  NR Band n100, n101, n105 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| 51 | 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, 103  NR Band n100, n101, | FDL\_low | - | FDL\_high | -50 | 1 |  |
| 52 | E-UTRA Band 1, 3, 5, 7, 8, 20, 28, 31, 33, 34, 38, 39, 40, 41, 45, 47, 50, 51, 68, 72, 73, 74, 87, 88  NR Band n100, n101, n105 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| 53 | E-UTRA Band 2, 4, 5, 12, 13, 14, 17, 24, 25, 26, 29, 30, 48, 54, 66, 70, 71, 85, 103, 106  NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| 54 | E-UTRA Band 2, 4, 5, 8, 12, 13, 14, 17, 23, 24, 25, 26, 29, 30, 48, 50, 51, 53, 66, 70, 71, 85, 103, 106  NR NTN Band n255, n256 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| 65 | E-UTRA Band 1, 3, 7, 8, 20, 22, 28, 31, 32, 38, 40, 42, 43, 50, 51, 65, 68, 69, 72, 74, 75, 76, 87, 88  NR Band n78, n79, n100, n105 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| E-UTRA Band 5, 11, 18, 19, 21, 26, 27, 41 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 34 | FDL\_low | - | FDL\_high | -50 | 1 | 36 |
| Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 | 37 |
| Frequency range | 1900 | - | 1915 | -15.5 | 5 | 15, 26, 27 |
| Frequency range | 1915 | - | 1920 | +1.6 | 5 | 15, 26, 27,44 |
| 66 | E-UTRA Band 2, 4, 5, 7, 12, 13, 14, 17, 24, 25, 26, 27, 28, 29, 30, 38, 41, 43, 50, 51, 53, 66, 70, 71, 74, 85, 103, 106  NR Band n105 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 42, 48,  NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| 68 | E-UTRA Band 3, 7, 8, 20, 28, 31, 38, 40, 47, 72, 74, 87, 88  NR Band n100, n101 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 1, 22, 42, 43, 50, 51, 52, 65 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| … |  |  |  |  |  |  |  |
| 70 | E-UTRA Band 2, 4, 5, 12, 13, 14, 17, 24, 25, 26, 29, 30, 41, 48, 53, 66, 70, 71, 85, 103, 106 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| 71 | E-UTRA Band 4, 5, 12, 13, 14, 17, 24, 26, 30, 48, 53, 54, 66, 85, 103, 106 | 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 |
| 72 | E-UTRA Band 1, 7, 20, 22, 28, 31, 32, 33, 34, 38, 42, 43, 47, 52, 65, 68, 72, 87, 88  NR Band n100, n101 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 3, 8, 40 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| Frequency range | 470 | - | 694 | -42 | 8 |  |
| 73 | E-UTRA Band 1, 26, 28, 33, 34, 39, 41, 42, 43, 44, 45, 47, 52  NR Band n100, n101 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 3, 5, 8, 27, 40 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| 74 | 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, 103  NR Band n77, n78, n100, n101, n105 | 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 |
| 85 | E-UTRA Band 2, 5, 13, 14, 17, 24, 25, 26, 27, 30, 41, 53, 54, 70, 71, 74, 103, 106 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 4, 48, 51, 66  NR Band n77, n78 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| E-UTRA Band 12, 85 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
| 87 | E-UTRA Band 1, 3, 7, 8, 22, 28, 31, 32, 33, 34, 38, 40, 42, 43, 47, 52, 65, 68, 72  NR Band n100, n101 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band, 20 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| E-UTRA Band 87, 88 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
| Frequency range | 470 | - | 694 | -42 | 8 |  |
| 88 | E-UTRA Band 1, 3, 7, 8, 20, 22, 28, 31, 32, 33, 34, 38, 40, 42, 43, 47, 52, 65, 68, 72  NR Band n100, n101 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 87 | FDL\_low | - | FDL\_high | -20 | 1 | 15 |
| E-UTRA Band 88 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
| Frequency range | 470 | - | 694 | -42 | 8 |  |
| 103 | E-UTRA Band 2, 4, 5, 12, 13, 14, 17, 25, 26, 27, 29, 41, 48, 50, 51, 53, 54, 66, 70, 71, 74, 85, 103, 106 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 24, 30,  NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| Frequency range | 769 | - | 775 | -35 | 0.00625 |  |
| Frequency range | 799 | - | 805 | -35 | 0.00625 |  |
| 106 | E-UTRA Band 2, 4, 12, 13, 14, 23, 24, 25, 30, 53, 54, 66, 70, 71, 85, 103, 106 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| E-UTRA Band 41, 48,  NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| E-UTRA Band 5, 26 | FDL\_low | - | FDL\_high | -30 | 1 |  |
| 111 | E-UTRA Band 4, 5, 7, 12, 13, 14, 17, 24, 26, 27, 29, 30, 38, 41, 53, 54, 66, 70, 71, 85, 103, 106 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | E-UTRA Band 2, 25 | FDL\_low | - | FDL\_high | -50 | 1 | 15 |
|  | E-UTRA Band 48  NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| NOTE 1: FDL\_low and FDL\_high refer to each E-UTRA frequency band specified in Table 5.5-1  NOTE 2: As exceptions, measurements with a level up to the applicable requirements defined in Table 6.6.3.1-2 are permitted for each assigned E-UTRA carrier used in the measurement due to 2nd, 3rd, 4th [or 5th] harmonic spurious emissions. Due to spreading of the harmonic emission the exception is also allowed for the first 1 MHz frequency range immediately outside the harmonic emission on both sides of the harmonic emission. This results in an overall exception interval centred at the harmonic emission of (2MHz + N x LCRB x 180kHz), where N is 2, 3, 4, [5] for the 2nd, 3rd, 4th [or 5th] harmonic respectively. The exception is allowed if the measurement bandwidth (MBW) totally or partially overlaps the overall exception interval.  NOTE 3: N/A  NOTE 4: N/A  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:Applicable when co-existence with PHS system operating in 1884.5 -1919.6MHz.  NOTE 8:Applicable when co-existence with PHS system operating in 1884.5 -1915.7MHz.  NOTE 9:N/A  NOTE 10:N/A  NOTE 11:Whether the applicable frequency range should be 793-805MHz instead of 799-805MHz is TBD  NOTE 12:The emissions measurement shall be sufficiently power averaged to ensure a standard deviation < 0.5 dB  NOTE 13:N/A  NOTE 14: N/A  NOTE 15:These requirements also apply for the frequency ranges that are less than FOOB (MHz) in Table 6.6.3.1-1 and Table 6.6.3.1A-1 from the edge of the channel bandwidth.  NOTE 16: N/A  NOTE 17: N/A  NOTE 18: N/A  NOTE 19:Applicable when the assigned E-UTRA carrier is confined within 718 MHz and 748 MHz and when the channel bandwidth used is 5 or 10 MHz. Applicable when the assigned E-UTRA carrier is confined within 715 MHz and 718 MHz and when the channel bandwidth used is 3 MHz.  NOTE 20:N/A  NOTE21:This requirement is applicable for any channel bandwidths within the range 2500 - 2570 MHz with the following restriction: for carriers of 15 MHz bandwidth when carrier centre frequency is within the range 2560.5 - 2562.5 MHz and for carriers of 20 MHz bandwidth when carrier centre frequency is within the range 2552 - 2560 MHz the requirement is applicable only for an uplink transmission bandwidth less than or equal to 54 RB.  NOTE22:This requirement is applicable for power class 3 UE for any channel bandwidths within the range 2570 - 2615 MHz with the following restriction: for carriers of 15 MHz bandwidth when carrier centre frequency is within the range 2605.5 - 2607.5 MHz and for carriers of 20 MHz bandwidth when 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 power class 2 UE for any channel bandwidths within the range 2570 - 2615 MHz, NS\_44 shall apply. For power class 2 or 3 UE for carriers with channel bandwidth 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: This requirement is applicable only for the following cases: - for carriers of 5 MHz channel bandwidth when carrier centre frequency (Fc) is within the range 902.5 MHz ≤ Fc < 907.5 MHz with an uplink transmission bandwidth less than or equal to 20 RB - for carriers of 5 MHz channel bandwidth when carrier centre frequency (Fc) is within the range 907.5 MHz ≤ Fc ≤ 912.5 MHz without any restriction on uplink transmission bandwidth. - for carriers of 10 MHz channel bandwidth when carrier centre frequency (Fc) is Fc = 910 MHz with an uplink transmission bandwidth less than or equal to 32 RB with RBstart > 3.  NOTE 24: As exceptions, measurements with a level up to the applicable requirement of -38 dBm/MHz is permitted for each assigned E-UTRA carrier used in the measurement due to 2nd harmonic spurious emissions. An exception is allowed if there is at least one individual RB within the transmission bandwidth (see Figure 5.6-1) for which the 2nd harmonic totally or partially overlaps the measurement bandwidth (MBW).  NOTE 25: As exceptions, measurements with a level up to the applicable requirement of -36 dBm/MHz is permitted for each assigned E-UTRA carrier used in the measurement due to 3rd harmonic spurious emissions. An exception is allowed if there is at least one individual RB within the transmission bandwidth (see Figure 5.6-1) for which the 3rd harmonic totally or partially overlaps the measurement bandwidth (MBW).  NOTE 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 any channel bandwidths within the range 1920 - 1980 MHz with the following restriction: for carriers of 15 MHz bandwidth when carrier centre frequency is within the range 1927.5 - 1929.5 MHz and for carriers of 20 MHz bandwidth when carrier centre frequency is within the range 1930 - 1938 MHz the requirement is applicable only for an uplink transmission bandwidth less than or equal to 54 RB.  NOTE 28: N/A  NOTE 29: N/A  NOTE 30: This requirement applies when the E-UTRA carrier is confined within 2545-2575MHz or 2595-2645MHz and the channel bandwidth is 10 or 20 MHz  NOTE 31: N/A  NOTE 32: Void  NOTE 33: This requirement is only applicable for carriers with bandwidth confined within 1885-1920 MHz (requirement for carriers with at least 1RB confined within 1880 - 1885 MHz is not specified). This requirement applies for an uplink transmission bandwidth less than or equal to 54 RB for 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 E-UTRA channel bandwidth allocated within 718-728MHz. For carriers of 10 MHz bandwidth, this requirement applies for an uplink transmission bandwidth less than or equal to 30 RB with RBstart > 1 and RBstart<48. Applicable when the assigned E-UTRA carrier is confined within 715 MHz and 718 MHz and when the channel bandwidth used is 3 MHz.  NOTE 35: This requirement is applicable in the case of a 10 MHz E-UTRA carrier confined within 703 MHz and 733 MHz, otherwise the requirement of -25 dBm with a measurement bandwidth of 8 MHz applies.  NOTE 36: This requirement is applicable for E-UTRA channel bandwidth allocated within 1920-1980 MHz.  NOTE 37: Applicable when the upper edge of the channel bandwidth frequency is greater than 1980MHz.  NOTE 38: Applicable when NS\_33 or NS\_34 is configured by the pre-configured radio parameters.  NOTE 39: Applicable only when the assigned E-UTRA carrier is confined within 824 MHz and 849 MHz for UE category M1, M2 and UE category NB1 and NB2.  NOTE 40: In the frequency range x-5950MHz, SE requirement of -30dBm/MHz should be applied; where x = max (5925, fc + 15), where fc is the channel centre frequency.  NOTE 41: Applicable for all bandwidths, and when the lower edge of the assigned E-UTRA UL channel bandwidth frequency is greater than or equal to 1427 MHz + the channel BW assigned for 1.4, 3, 5 and 10 MHz bandwidth, and when the lower edge of the assigned E-UTRA UL channel bandwidth frequency is greater than or equal to 1440 MHz for 15 and 20 MHz bandwidth. This requirement shall be verified with UE transmission power configured as high as possible but no higher than 15 dBm.  NOTE 42: Applicable for 1.4 , 3 and 5 MHz bandwidth, and when the upper edge of the assigned E-UTRA UL channel bandwidth frequency is less than or equal to 1467 MHz assigned for10 MHz bandwidth, and when the upper edge of the assigned E-UTRA 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 E-UTRA UL channel bandwidth frequency is less than or equal to 1460.8 MHz for 20 MHz bandwidth.  NOTE 43: The EIRP requirement is converted to conducted requirement depend on the supported post antenna connector gain Gpost connector declared by the UE following the principle described in annex I.  NOTE 44: For category NB1 and NB2 UE when carrier centre frequency is 1920.1 MHz, in case of single-tone uplink transmission the requirement is applicable only for sub-carrier index > 2.  NOTE 45: Resolution BW is 10% of the measurement BW and the result should be integrated to achieve the measurement bandwidth. The sweep time shall be set at least as (sweep points)\*(symbol length) to improve the measurement accuracy. | | | | | | | |

NOTE: The restriction on the maximum uplink transmission to 54 RB in Notes 21, 22, and 27 of Table 6.6.3.2-1 and the restriction on the single-tone uplink transmission to sub-carrier index > 2 in Note 44 of Table 6.6.3.2-1 are intended for conformance testing and may be applied to network operation to facilitate coexistence when the aggressor and victim bands are deployed in the same geographical area. The applicable spurious emission requirement of -15.5 dBm/5MHz is a least restrictive technical condition for FDD/TDD coexistence and may have to be revised in the future.

When "NS\_33" or “NS 34” is configured from pre-configured radio parameters or the cell and the indication from upper layers has indicated that the UE is within the protection zone of CEN DSRC devices or HDR DSRC devices, the power of any V2X UE emission shall fulfil either one of the two set of conditions.

|  |  |  |
| --- | --- | --- |
|  | Maximum Transmission Power (dBm EIRP) | Emission Limit in Frequency Range 5795-5815 (dBm/MHz EIRP) |
| Condition 1 | 10 | -65 |
| Condition 2 | 10 | -45 |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **Unchanged Section Omitted** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 7.3.1 Minimum requirements (QPSK)

The throughput shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annexes A.2.2, A.2.3 and A.3.2 (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 7.3.1-1 and Table 7.3.1-2

Table 7.3.1-1: Reference sensitivity QPSK PREFSENS

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Channel bandwidth | | | | | | | |
| E-UTRA Band | 1.4 MHz (dBm) | 3 MHz (dBm) | 5 MHz (dBm) | 10 MHz (dBm) | 15 MHz (dBm) | 20 MHz (dBm) | Duplex Mode |
| 1 |  |  | -100 | -97 | -95.2 | -94 | FDD |
| 2 | -102.7 | -99.7 | -98 | -95 | -93.2 | -92 | FDD |
| 3 | -101.7 | -98.7 | -97 | -94 | -92.2 | -91 | FDD |
| 4 | -104.7 | -101.7 | -100 | -97 | -95.2 | -94 | FDD |
| 5 | -103.2 | -100.2 | -98 | -95 |  |  | FDD |
| 6 |  |  | -100 | -97 |  |  | FDD |
| 7 |  |  | -98 | -95 | -93.2 | -92 | FDD |
| 8 | -102.2 | -99.2 | -97 | -94 |  |  | FDD |
| 9 |  |  | -99 | -96 | -94.2 | -93 | FDD |
| 10 |  |  | -100 | -97 | -95.2 | -94 | FDD |
| 11 |  |  | -100 | -97 |  |  | FDD |
| 12 | -101.7 | -98.7 | -97 | -94 |  |  | FDD |
| 13 |  |  | -97 | -94 |  |  | FDD |
| 14 |  |  | -97 | -94 |  |  | FDD |
|  |  | -96.49 | -93.29 |  |  |  |
| … |  |  |  |  |  |  |  |
| 17 |  |  | -97 | -94 |  |  | FDD |
| 18 |  |  | -1007 | -977 | -95.27 |  | FDD |
| 19 |  |  | -100 | -97 | -95.2 |  | FDD |
| 20 |  |  | -97 | -94 | -91.2 | -90 | FDD |
| 21 |  |  | -100 | -97 | -95.2 |  | FDD |
| 22 |  |  | -97 | -94 | -92.2 | -91 | FDD |
| 23 | -104.7 | -101.7 | -100 | -97 | -95.2 | -94 | FDD |
| 24 |  |  | -100 | -97 |  |  | FDD |
| 25 | -101.2 | -98.2 | -96.5 | -93.5 | -91.7 | -90.5 | FDD |
| 26 | -102.7 | -99.7 | -97.56 | -94.56 | -92.76 |  | FDD |
| 27 | -103.2 | -100.2 | -98 | -95 |  |  | FDD |
| 28 |  | -100.2 | -98.5 | -95.5 | -93.7 | -91 | FDD |
| 30 |  |  | -99 | -96 |  |  | FDD |
| 31 | -99.0 | -95.7 | -93.5 |  |  |  | FDD |
| … |  |  |  |  |  |  |  |
| 33 |  |  | -100 | -97 | -95.2 | -94 | TDD |
| 34 |  |  | -100 | -97 | -95.2 |  | TDD |
| 35 | -106.2 | -102.2 | -100 | -97 | -95.2 | -94 | TDD |
| 36 | -106.2 | -102.2 | -100 | -97 | -95.2 | -94 | TDD |
| 37 |  |  | -100 | -97 | -95.2 | -94 | TDD |
| 38 |  |  | -100 | -97 | -95.2 | -94 | TDD |
| 39 |  |  | -100 | -97 | -95.2 | -94 | TDD |
| 40 |  |  | -100 | -97 | -95.2 | -94 | TDD |
| 41 |  |  | -98 | -95 | -93.2 | -92 | TDD |
| 42 |  |  | -99 | -96 | -94.2 | -93 | TDD |
| 43 |  |  | -99 | -96 | -94.2 | -93 | TDD |
| 44 |  | [-100.2] | [-98] | [-95] | [-93.2] | [-92] | TDD |
| 45 |  |  | -100 | -97 | -95.2 | -94 | TDD |
| 48 |  |  | -99 | -96 | -94.2 | -93 | TDD |
| 50 |  | -102.2 | -100 | -97 | -95.2 | -94 | TDD |
| 51 |  | -102.2 | -100 |  |  |  | TDD |
| 52 |  |  | -99 | -96 | -94.2 | -93 | TDD |
| 53 | -106.2 | -102.2 | -100 | -97 |  |  | TDD |
| 54 | -106.2 | -102.2 | -100 |  |  |  | TDD |
| ... |  |  |  |  |  |  |  |
| 65 | -104.2 | -101.2 | -99.5 | -96.5 | -94.7 | -93.5 | FDD |
| 66 | -104.2 | -101.2 | -99.5 | -96.5 | -94.7 | -93.5 | FDD |
| 68 |  |  | -98.5 | -95.5 | -93.7 |  | FDD |
| … |  |  |  |  |  |  |  |
| 70 |  |  | -100 | -97 | -95.2 | -94 | FDD |
| 71 |  |  | -97.2 | -94.2 | -92.0 | -87.5 | FDD |
| 72 | -99.0 | -95.7 | -93.5 |  |  |  | FDD |
| 73 | -99.0 | -95.7 | -93.5 |  |  |  | FDD |
| 74 | -104.78 | -101.78 | -99.58 | -96.58 | -94.78 | -89.88 | FDD |
| 85 |  |  | -97 | -94 |  |  | FDD |
| 87 | -99.0 | -95.7 | -93.5 |  |  |  | FDD |
| 88 | -99.0 | -95.7 | -93.5 |  |  |  | FDD |
| 106 | -102.2 | -99.2 |  |  |  |  | FDD |
| 111 | -99 | -96.2 | -94.3 | -80.6 |  |  | FDD |
| NOTE 1: The transmitter shall be set to PUMAX as defined in subclause 6.2.5  NOTE 2: Reference measurement channel is A.3.2 with one sided dynamic OCNG Pattern OP.1 FDD/TDD as described in Annex A.5.1.1/A.5.2.1  NOTE 3: The signal power is specified per port  NOTE 4: For the UE which supports both Band 3 and Band 9 the reference sensitivity level is FFS.  NOTE 5: For the UE which supports both Band 11 and Band 21 the reference sensitivity level is FFS.  NOTE 6: 6 indicates that the requirement is modified by -0.5 dB when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.  NOTE 7: For a UE that support both Band 18 and Band 26, the reference sensitivity level for Band 26 applies for the applicable channel bandwidths.  NOTE 8: 8 indicates that the requirement is modified by -0.5 dB when the assigned E-UTRA channel bandwidth is confined within 1475.9-1510.9 MHz.  NOTE 9: The requirement is applicable for power class 2 UE. | | | | | | | |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **Unchanged Section Omitted** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Table 7.3.1-2: Uplink configuration for reference sensitivity

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA Band / Channel bandwidth / NRB / Duplex mode | | | | | | | |
| E-UTRA Band | 1.4 MHz | 3 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz | Duplex Mode |
| 1 |  |  | 25 | 50 | 75 | 100 | FDD |
| 2 | 6 | 15 | 25 | 50 | 501 | 501 | FDD |
| 3 | 6 | 15 | 25 | 50 | 501 | 501 | FDD |
| 4 | 6 | 15 | 25 | 50 | 75 | 100 | FDD |
| 5 | 6 | 15 | 25 | 251 |  |  | FDD |
| 6 |  |  | 25 | 251 |  |  | FDD |
| 7 |  |  | 25 | 50 | 75 | 751 | FDD |
| 8 | 6 | 15 | 25 | 251 |  |  | FDD |
| 9 |  |  | 25 | 50 | 501 | 501 | FDD |
| 10 |  |  | 25 | 50 | 75 | 100 | FDD |
| 11 |  |  | 25 | 251 |  |  | FDD |
| 12 | 6 | 15 | 201 | 201 |  |  | FDD |
| 13 |  |  | 201 | 201 |  |  | FDD |
| 14 |  |  | 151 | 151 |  |  | FDD |
| ... |  |  |  |  |  |  |  |
| 17 |  |  | 201 | 201 |  |  | FDD |
| 18 |  |  | 25 | 251 | 251 |  | FDD |
| 19 |  |  | 25 | 251 | 251 |  | FDD |
| 20 |  |  | 25 | 201 | 203 | 203 | FDD |
| 21 |  |  | 25 | 251 | 251 |  | FDD |
| 22 |  |  | 25 | 50 | 501 | 501 | FDD |
| 23 | 6 | 15 | 25 | 50 | 75 | 100 | FDD |
| 24 |  |  | 25 | 50 |  |  | FDD |
| 25 | 6 | 15 | 25 | 50 | 501 | 501 | FDD |
| 26 | 6 | 15 | 25 | 251 | 251 |  | FDD |
| 27 | 6 | 15 | 25 | 251 |  |  | FDD |
| 28 |  | 15 | 25 | 251 | 251 | 251 | FDD |
| 30 |  |  | 25 | 251 |  |  | FDD |
| 31 | 6 | 54 | 54 |  |  |  | FDD |
| … |  |  |  |  |  |  |  |
| 33 |  |  | 25 | 50 | 75 | 100 | TDD |
| 34 |  |  | 25 | 50 | 75 |  | TDD |
| 35 | 6 | 15 | 25 | 50 | 75 | 100 | TDD |
| 36 | 6 | 15 | 25 | 50 | 75 | 100 | TDD |
| 37 |  |  | 25 | 50 | 75 | 100 | TDD |
| 38 |  |  | 25 | 50 | 75 | 100 | TDD |
| 39 |  |  | 25 | 50 | 75 | 100 | TDD |
| 40 |  |  | 25 | 50 | 75 | 100 | TDD |
| 41 |  |  | 25 | 50 | 75 | 100 | TDD |
| 42 |  |  | 25 | 50 | 75 | 100 | TDD |
| 43 |  |  | 25 | 50 | 75 | 100 | TDD |
| 44 |  | 15 | 25 | 50 | 75 | 100 | TDD |
| 45 |  |  | 25 | 50 | 75 | 100 | TDD |
| 48 |  |  | 25 | 50 | 75 | 100 | TDD |
| 50 |  | 15 | 25 | 50 | 75 | 100 | TDD |
| 51 |  | 15 | 25 |  |  |  | TDD |
| 52 |  |  | 25 | 50 | 75 | 100 | TDD |
| 53 | 6 | 15 | 25 | 50 |  |  |  |
| 54 | 6 | 15 | 25 |  |  |  | TDD |
| … |  |  |  |  |  |  |  |
| 65 | 6 | 15 | 25 | 50 | 75 | 100 | FDD |
| 66 | 6 | 15 | 25 | 50 | 75 | 100 | FDD |
| 68 |  |  | 25 | 251 | 251 |  | FDD |
| … |  |  |  |  |  |  |  |
| 70 |  |  | 25 | 50 | 75 |  | FDD |
| 71 |  |  | 25 | 251 | 201 | 201 | FDD |
| 72 | 6 | 54 | 54 |  |  |  | FDD |
| 73 | 6 | 54 | 54 |  |  |  | FDD |
| 74 | 6 | 15 | 25 | 251 | 251 | 251 | FDD |
| 85 |  |  | 201 | 201 |  |  | FDD |
| 87 | 6 | 54 | 54 |  |  |  | FDD |
| 111 | 6 | 101 | 101 | 101 |  |  | FDD |
| NOTE 1: 1 refers to the UL resource blocks shall be located as close as possible to the downlink operating band but confined within the transmission bandwidth configuration for the channel bandwidth (Table 5.6-1).  NOTE 2: For the UE which supports both Band 11 and Band 21 the uplink configuration for reference sensitivity is FFS.  NOTE 3: 3 refers to Band 20; in the case of 15MHz channel bandwidth, the UL resource blocks shall be located at RBstart 11 and in the case of 20MHz channel bandwidth, the UL resource blocks shall be located at RBstart 16  NOTE 4: 4 refers to Bands 31, 72, 73, 87 and 88; in the case of 3 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 9 and in the case of 5 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 10. | | | | | | | |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **Unchanged Section Omitted** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 7.3.1E Minimum requirements (QPSK) for UE category 0, M1, M2 and 1bis

The throughput shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annexes A.2.2, A.2.3 and A.3.2 (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 7.3.1E-1A/Table 7.3.1E-1B and Table 7.3.1E-2 for category 0, Table 7.3.1E-3/Table 7.3.1E-4 for category M1, and Table 7.3.1E-6/Table 7.3.1E-7 for category 1bis, and Table 7.3.1E-8/Table 7.3.1E-9 for category M2.

Table 7.3.1E-1A: Reference sensitivity for FDD and TDD UE category 0 QPSK PREFSENS

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Channel bandwidth | | | | | | | |
| E-UTRA Band | 1.4 MHz (dBm) | 3 MHz (dBm) | 5 MHz (dBm) | 10 MHz (dBm) | 15 MHz (dBm) | 20 MHz (dBm) | Duplex Mode |
| 2 | -100.2 | -97.2 | -95.5 | -92.5 | -90.7 | -89.5 | FDD |
| 3 | -99.2 | -96.2 | -94.5 | -91.5 | -89.7 | -88.5 | FDD |
| 4 | -102.2 | -99.2 | -97.5 | -94.5 | -92.7 | -91.5 | FDD |
| 5 | -100.7 | -97.7 | -95.5 | -92.5 |  |  | FDD |
| 8 | -99.7 | -96.7 | -94.5 | -91.5 |  |  | FDD |
| 13 |  |  | -94 | -91 |  |  | FDD |
| 20 |  |  | -94.5 | -91.5 | -88.2 | -87 | FDD |
| 25 | -98.7 | -95.7 | -94 | -91 | -89.2 | -88 | FDD |
| 26 | -100.2 | -97.2 | -953 | -923 | -90.23 |  | FDD |
| 28 |  | -97.7 | -96 | -93 | -91.2 | -88.5 | FDD |
| 39 |  |  | -97.5 | -94.5 | -92.7 | -91.5 | TDD |
| 40 |  |  | -97.5 | -94.5 | -92.7 | -91.5 | TDD |
| 41 |  |  | -95.5 | -92.5 | -90.7 | -89.5 | TDD |
| 111 | -96.5 | -93.7 | -91.8 | -78.1 |  |  | FDD |
| NOTE 1: The transmitter shall be set to PUMAX as defined in subclause 6.2.5  NOTE 2: Reference measurement channel is A.3.2 with one sided dynamic OCNG Pattern OP.1 FDD/TDD as described in Annex A.5.1.1/A.5.2.1  NOTE 3: The requirement is modified by -0.5 dB when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz | | | | | | | |

Table 7.3.1E-1B: Reference sensitivity for HD-FDD UE category 0 QPSK PREFSENS

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Channel bandwidth | | | | | | | |
| E-UTRA Band | 1.4 MHz (dBm) | 3 MHz (dBm) | 5 MHz (dBm) | 10 MHz (dBm) | 15 MHz (dBm) | 20 MHz (dBm) | Duplex Mode |
| 2 | -101 | -98 | -96.3 | -93.3 | -91.5 | -90.3 | HD-FDD |
| 3 | -100 | -97 | -95.3 | -92.3 | -90.5 | -89.3 | HD-FDD |
| 4 | -103 | -100 | -98.3 | -95.3 | -93.5 | -92.3 | HD-FDD |
| 5 | -101.5 | -98.5 | -96.3 | -93.3 |  |  | HD-FDD |
| 8 | -100.5 | -97.5 | -95.3 | -92.3 |  |  | HD-FDD |
| 13 |  |  | -95.3 | -92.3 |  |  | HD-FDD |
| 20 |  |  | -95.3 | -92.3 | -89.5 | -88.3 | HD-FDD |
| 25 | -99.5 | -96.5 | -94.8 | -91.8 | -90 | -88.8 | HD-FDD |
| 26 | -101 | -98 | -95.8 | -92.8 |  |  | HD-FDD |
| 28 |  | -98.5 | -96.8 | -93.8 | -92 | -89.3 | HD-FDD |
| 111 | -97.3 | -94.5 | -92.6 | -78.9 |  |  | HD-FDD |
| NOTE 1: The transmitter shall be set to PUMAX as defined in subclause 6.2.5  NOTE 2: Reference measurement channel is A.3.2 with one sided dynamic OCNG Pattern OP.1 FDD/TDD as described in Annex A.5.1.1/A.5.2.1 | | | | | | | |

The reference receive sensitivity (REFSENS) requirement specified in Table 7.3.1E-1A/Table 7.3.1E-1B shall be met for an uplink transmission bandwidth less than or equal to that specified in Table 7.3.1E-2.

Unless given by Table 7.3.1-3, the minimum requirements specified in Table 7.3.1E-1A/Table 7.3.1E-1B shall be verified with the network signalling value NS\_01 (Table 6.2.4E-1) configured.

NOTE: Table 7.3.1E-2 is intended for conformance tests and does not necessarily reflect the operational conditions of the network, where the number of uplink and downlink allocated resource blocks will be practically constrained by other factors. Typical receiver sensitivity performance with HARQ retransmission enabled and using a residual BLER metric relevant for e.g. Speech Services is given in the Annex G (informative).

Table 7.3.1E-2: FDD and TDD UE category 0 Uplink configuration for reference sensitivity

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA Band / Channel bandwidth / NRB / Duplex mode | | | | | | | |
| E-UTRA Band | 1.4 MHz | 3 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz | Duplex Mode |
| 2 | 6 | 15 | 25 | 361 | 361 | 361 | FDD and HD-FDD |
| 3 | 6 | 15 | 25 | 361 | 361 | 361 | FDD and HD-FDD |
| 4 | 6 | 15 | 25 | 361 | 361 | 361 | FDD and HD-FDD |
| 5 | 6 | 15 | 25 | 251 |  |  | FDD and HD-FDD |
| 8 | 6 | 15 | 25 | 251 |  |  | FDD and HD-FDD |
| 13 |  |  | 201 | 201 |  |  | FDD and HD-FDD |
| 20 |  |  | 25 | 201 | 202 | 202 | FDD and HD-FDD |
| 25 | 6 | 15 | 25 | 361 | 361 | 361 | FDD and HD-FDD |
| 26 | 6 | 15 | 25 | 251 | 251 |  | FDD and HD-FDD |
| 28 |  | 15 | 25 | 251 | 251 | 251 | FDD and HD-FDD |
| 39 |  |  | 25 | 361 | 361 | 361 | TDD |
| 40 |  |  | 25 | 361 | 361 | 361 | TDD |
| 41 |  |  | 25 | 361 | 361 | 361 | TDD |
| 111 | 6 | 101 | 101 | 101 |  |  | FDD and HD-FDD |
| NOTE 1: 1 refers to the UL resource blocks shall be located as close as possible to the downlink operating band but confined within the transmission bandwidth configuration for the channel bandwidth (Table 5.6-1).  NOTE 2: 2 refers to Band 20; in the case of 15MHz channel bandwidth, the UL resource blocks shall be located at RBstart 11 and in the case of 20MHz channel bandwidth, the UL resource blocks shall be located at RBstart 16. | | | | | | | |

Table 7.3.1E-3: Reference sensitivity for FDD and TDD UE category M1 QPSK PREFSENS

|  |  |  |
| --- | --- | --- |
| E-UTRA Band | REFSENS (dBm) | Duplex Mode |
| 1 | -102.2 | FDD |
| 2 | -100.2 | FDD |
| 3 | -99.2 | FDD |
| 4 | -102.2 | FDD |
| 5 | -100.7 | FDD |
| 7 | -100.2 | FDD |
| 8 | -99.7 | FDD |
| 11 | -102.23 | FDD |
| 12 | -99.2 | FDD |
| 13 | -98.7 | FDD |
| 14 | -98.7 | FDD |
| 18 | -102.24 | FDD |
| 19 | -102.2 | FDD |
| 20 | -99.7 | FDD |
| 21 | -102.23 | FDD |
| 24 | -102.7 | FDD |
| 25 | -98.7 | FDD |
| 26 | -100.2 | FDD |
| 27 | -100.7 | FDD |
| 28 | -100.7 | FDD |
| 31 | -96.5 | FDD |
| … |  |  |
| 39 | -103.7 | TDD |
| 40 | -103.7 | TDD |
| 41 | -101.7 | TDD |
| 42 | -102.7 | TDD |
| 43 | -102.7 | TDD |
| 48 | -102.7 | TDD |
| … |  |  |
| 54 | -103.7 | TDD |
| … |  |  |
| 71 | 99.4 | FDD |
| 72 | -96.5 | FDD |
| 73 | -96.5 | FDD |
| 74 | -101.78 | FDD |
| 85 | -99.2 | FDD |
| 87 | -96.5 | FDD |
| 88 | -96.5 | FDD |
| 106 | -99.7 | FDD |
| 111 | -96.5 | FDD |
| NOTE 1: The transmitter shall be set to PUMAX as defined in subclause 6.2.5  NOTE 2: Reference measurement channel is A.3.2 with one sided dynamic OCNG Pattern OP.1 FDD/TDD as described in Annex A.5.1.1/A.5.2.1  NOTE 3: For the UE which supports both Band 11 and Band 21 the reference sensitivity level is FFS.  NOTE 4: For a UE that support both Band 18 and Band 26, the reference sensitivity level for Band 26 applies for the applicable channel bandwidths.  NOTE 5: For cat M1 the same reference sensitivity requirement applies for all applicable channel bandwidths (Table 5.6.1-1)  NOTE 6: The reference receive sensitivity shall be met for an uplink transmission bandwidth less than or equal to 6 RB except for band 31 and 72. For band 31 and 72; in the case of 3 MHz channel bandwidth 5 RB applies and the UL resource blocks shall be located at RBstart 9. In case of 5 MHz channel bandwidth 5 RB applies and the UL resource blocks shall be located at RBstart 10.  NOTE 7: The 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.  NOTE 8: 8 indicates that the requirement is modified by -0.5 dB when the assigned E-UTRA channel bandwidth is confined within 1475.9-1510.9 MHz. | | |

Table 7.3.1E-4: Reference sensitivity for HD-FDD UE category M1 QPSK PREFSENS

|  |  |  |
| --- | --- | --- |
| E-UTRA Band | REFSENS (dBm) | Duplex Mode |
| 1 | -103 | HD-FDD |
| 2 | -101 | HD-FDD |
| 3 | -100 | HD-FDD |
| 4 | -103 | HD-FDD |
| 5 | -101.5 | HD-FDD |
| 7 | -101 | HD-FDD |
| 8 | -100.5 | HD-FDD |
| 11 | -1033 | HD-FDD |
| 12 | -100 | HD-FDD |
| 13 | -100 | HD-FDD |
| 14 | -100 | HD-FDD |
| 18 | -1034 | HD-FDD |
| 19 | -103 | HD-FDD |
| 20 | -100.5 | HD-FDD |
| 21 | -1033 | HD-FDD |
| 24 | -103.5 | HD-FDD |
| 25 | -99.5 | HD-FDD |
| 26 | -101 | HD-FDD |
| 27 | -101.5 | HD-FDD |
| 28 | -101.5 | HD-FDD |
| 31 | -97.3 | HD-FDD |
| … |  |  |
| 71 | -100.2 | HD-FDD |
| 72 | -97.3 | HD-FDD |
| 73 | -97.3 | HD-FDD |
| 74 | -103 | HD-FDD |
| 85 | -100 | HD-FDD |
| 87 | -97.3 | HD-FDD |
| 88 | -97.3 | HD-FDD |
| 106 | -100.5 | HD-FDD |
| 111 | -97.3 | HD-FDD |
| NOTE 1: The transmitter shall be set to PUMAX as defined in subclause 6.2.5  NOTE 2: Reference measurement channel is A.3.2 with one sided dynamic OCNG Pattern OP.1 FDD/TDD as described in Annex A.5.1.1/A.5.2.1  NOTE 3: For the UE which supports both Band 11 and Band 21 the reference sensitivity level is FFS.  NOTE 4: For a UE that support both Band 18 and Band 26, the reference sensitivity level for Band 26 applies for the applicable channel bandwidths.  NOTE 5: For cat M1 the same reference sensitivity requirement applies for all applicable channel bandwidths (Table 5.6.1-1) | | |

The reference receive sensitivity (REFSENS) requirement specified in Table 7.3.1E-3/Table 7.3.1E-4 shall be met for an uplink transmission bandwidth less than or equal to that specified in Table 7.3.1E-5.

NOTE: Table 7.3.1E-5 is intended for conformance tests and does not necessarily reflect the operational conditions of the network, where the number of uplink and downlink allocated resource blocks will be practically constrained by other factors. Typical receiver sensitivity performance with HARQ retransmission enabled and using a residual BLER metric relevant for e.g. Speech Services is given in the Annex G (informative).

Table 7.3.1E-5: FDD and TDD UE category M1 Uplink configuration for reference sensitivity

|  |  |  |
| --- | --- | --- |
| E-UTRA Band | NRB | Duplex Mode |
| 1 | 61 | FDD and HD-FDD |
| 2 | 61 | FDD and HD-FDD |
| 3 | 61 | FDD and HD-FDD |
| 4 | 61 | FDD and HD-FDD |
| 5 | 61 | FDD and HD-FDD |
| 7 | 61 | FDD and HD-FDD |
| 8 | 61 | FDD and HD-FDD |
| 11 | 61 | FDD and HD-FDD |
| 12 | 61 | FDD and HD-FDD |
| 13 | 61 | FDD and HD-FDD |
| 14 | 61 | FDD and HD-FDD |
| 18 | 61 | FDD and HD-FDD |
| 19 | 61 | FDD and HD-FDD |
| 20 | 61 | FDD and HD-FDD |
| 21 | 61 | FDD and HD-FDD |
| 24 | 61 | FDD and HD-FDD |
| 25 | 61 | FDD and HD-FDD |
| 26 | 61 | FDD and HD-FDD |
| 27 | 61 | FDD and HD-FDD |
| 28 | 61 | FDD and HD-FDD |
| 31 | 61 | FDD and HD-FDD |
| … |  |  |
| 39 | 61 | TDD |
| 40 | 61 | TDD |
| 41 | 61 | TDD |
| 42 | 61 | TDD |
| 43 | 61 | TDD |
| 48 | 61 | TDD |
| … |  |  |
| 54 | 61 | TDD |
| … |  |  |
| 71 | 61 | FDD and HD-FDD |
| 72 | 61 | FDD and HD-FDD |
| 73 | 61 | FDD and HD-FDD |
| 74 | 61 | FDD and HD-FDD |
| 85 | 61 | FDD and HD-FDD |
| 87 | 61 | FDD and HD-FDD |
| 88 | 61 | FDD and HD-FDD |
| 106 | 61 | FDD and HD-FDD |
| 111 | 61 | FDD and HD-FDD |
| NOTE 1: 1 refers to the UL resource blocks shall be located as close as possible to the downlink operating band but confined within the transmission bandwidth configuration for the channel bandwidth (Table 5.6-1). | | |

Table 7.3.1E-6: Reference sensitivity for FDD and TDD UE category 1bis QPSK PREFSENS

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Channel bandwidth | | | | | | | |
| E-UTRA Band | 1.4 MHz (dBm) | 3 MHz (dBm) | 5 MHz (dBm) | 10 MHz (dBm) | 15 MHz (dBm) | 20 MHz (dBm) | Duplex Mode |
| 1 |  |  | -97.5 | -94 | -92.2 | -91 | FDD |
| 2 | -100.2 | -97.2 | -95.5 | -92 | -90.2 | -89 | FDD |
| 3 | -99.2 | -96.2 | -94.5 | -91 | -89.2 | -88 | FDD |
| 4 | -102.2 | -99.2 | -97.5 | -94 | -92.2 | -91 | FDD |
| 5 | -100.7 | -97.7 | -95.5 | -92.5 |  |  | FDD |
| 7 |  |  | -95.5 | -92 | -90.2 | -89 | FDD |
| 8 | -99.7 | -96.7 | -94.5 | -91.5 |  |  | FDD |
| 12 | -98.7 | -95.7 | -94 | -91 |  |  | FDD |
| 13 |  |  | -94 | -91 |  |  | FDD |
| 18 |  |  | -97.5 | -94.5 | -92.7 |  | FDD |
| 20 |  |  | -94.5 | -91.5 | -88.2 | -87 | FDD |
| 26 | -100.2 | -97.2 | -95.03 | -92.03 | -90.23 |  | FDD |
| 28 |  | -97.7 | -96.0 | -93.0 | -91.2 | -88.5 | FDD |
| 31 | -96.5 | -92.5 | -90.5 |  |  |  | FDD |
| 34 |  |  | -97.5 | -94.5 | -92.7 |  |  |
| 39 |  |  | -97.5 | -94.5 | -92.7 | -91.5 | TDD |
| 40 |  |  | -97.5 | -94.5 | -92.7 | -91.5 | TDD |
| 41 |  |  | -95.5 | -92.5 | -90.7 | -89.5 | TDD |
| 66 | -101.7 | -98.7 | -97 | -93.5 | -91.7 | -90.5 | FDD |
| 72 | -96.5 | -92.5 | -90.5 |  |  |  | FDD |
| 111 | -96.5 | -93.7 | -91.8 | -77.6 |  |  | FDD |
| NOTE 1: The transmitter shall be set to PUMAX as defined in subclause 6.2.5  NOTE 2: Reference measurement channel is A.3.2 with one sided dynamic OCNG Pattern OP.1 FDD/TDD as described in Annex A.5.1.1/A.5.2.1  NOTE 3: 3 indicates that the requirement is modified by -0.5 dB when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz. | | | | | | | |

Table 7.3.1E-7: FDD and TDD UE category 1bis Uplink configuration for reference sensitivity

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA Band / Channel bandwidth / NRB / Duplex mode | | | | | | | |
| E-UTRA Band | 1.4 MHz | 3 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz | Duplex Mode |
| 1 |  |  | 25 | 50 | 75 | 100 | FDD |
| 2 | 6 | 15 | 25 | 50 | 501 | 501 | FDD |
| 3 | 6 | 15 | 25 | 50 | 501 | 501 | FDD |
| 4 | 6 | 15 | 25 | 50 | 75 | 100 | FDD |
| 5 | 6 | 15 | 25 | 251 |  |  | FDD |
| 7 |  |  | 25 | 50 | 75 | 751 | FDD |
| 8 | 6 | 15 | 25 | 251 |  |  | FDD |
| 12 | 6 | 15 | 201 | 201 |  |  | FDD |
| 13 |  |  | 201 | 201 |  |  | FDD |
| 18 |  |  | 25 | 25 | 25 |  | FDD |
| 20 |  |  | 25 | 201 | 202 | 202 | FDD |
| 26 | 6 | 15 | 25 | 251 | 251 |  | FDD |
| 28 |  | 15 | 25 | 251 | 251 | 251 | FDD |
| 31 | 6 | 53 | 53 |  |  |  | FDD |
| 34 |  |  | 25 | 50 | 75 |  |  |
| 39 |  |  | 25 | 50 | 75 | 100 | TDD |
| 40 |  |  | 25 | 50 | 75 | 100 | TDD |
| 41 |  |  | 25 | 50 | 75 | 100 | TDD |
| 66 | 6 | 15 | 25 | 50 | 75 | 100 | FDD |
| 72 | 6 | 53 | 53 |  |  |  | FDD |
| 111 | 6 | 101 | 101 | 101 |  |  | FDD |
| NOTE 1: 1 refers to the UL resource blocks shall be located as close as possible to the downlink operating band but confined within the transmission bandwidth configuration for the channel bandwidth (Table 5.6-1).  NOTE 2: 2 refers to Band 20; in the case of 15MHz channel bandwidth, the UL resource blocks shall be located at RBstart 11 and in the case of 20MHz channel bandwidth, the UL resource blocks shall be located at RBstart 16.  NOTE 3: 3 refers to Bands 31 and 72; in the case of 3 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 9 and in the case of 5 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 10. | | | | | | | |

Table 7.3.1E-8: Reference sensitivity for FDD /TDD UE category M2 QPSK PREFSENS

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Channel bandwidth | | | | | | | |
| E-UTRA Band | 1.4 MHz (dBm) | 3 MHz (dBm) | 5 MHz (dBm) | 10 MHz (dBm) | 15 MHz (dBm) | 20 MHz (dBm) | Duplex Mode |
| 1 |  |  | -97.7 | -97.7 | -97.7 | -97.7 | FDD |
| 2 | -100.2 | -97.2 | -95.7 | -95.7 | -95.7 | -95.7 | FDD |
| 3 | -99.2 | -96.2 | -94.7 | -94.7 | -94.7 | -94.7 | FDD |
| 4 | -102.2 | -99.2 | -97.7 | -97.7 | -97.7 | -97.7 | FDD |
| 5 | -100.7 | -97.7 | -95.7 | -95.7 |  |  | FDD |
| 7 |  |  | -95.7 | -95.7 | -95.7 | -95.7 | FDD |
| 8 | -99.7 | -96.7 | -94.7 | -94.7 |  |  | FDD |
| 11 |  |  | -97.7 | -97.7 |  |  |  |
| 12 | -99.2 | -96.2 | -94.7 | -94.7 |  |  | FDD |
| 13 |  |  | -94.2 | -94.2 |  |  | FDD |
| … |  |  |  |  |  |  |  |
| 18 |  |  | -97.7 | -97.7 | -97.7 |  | FDD |
| 19 |  |  | -97.7 | -97.7 | -97.7 |  | FDD |
| 20 |  |  | -94.7 | -94.7 | -94.7 | -94.7 | FDD |
| 21 |  |  | -97.7 | -97.7 | -97.7 |  | FDD |
| 24 |  |  | -96.7 | -96.7 |  |  | FDD |
| 25 | -98.7 | -95.7 | -94.2 | -94.2 | -94.2 | -94.2 | FDD |
| 26 | -100.2 | -97.2 | -95.2 | -95.2 | -95.2 |  | FDD |
| 27 | -100.7 | -97.7 | -95.7 | -95.7 |  |  | FDD |
| 28 |  | -97.7 | -96.2 | -96.2 | -96.2 | -96.2 | FDD |
| 31 | -96.5 | -93.2 | -91.2 |  |  |  | FDD |
| … |  |  |  |  |  |  |  |
| 39 |  |  | -97.7 | -97.7 | -97.7 | -97.7 | TDD |
| 40 |  |  | -97.7 | -97.7 | -97.7 | -97.7 | TDD |
| 41 |  |  | -95.7 | -95.7 | -95.7 | -95.7 | TDD |
| 42 |  |  | -96.7 | -96.7 | -96.7 | -96.7 | TDD |
| 43 |  |  | -96.7 | -96.7 | -96.7 | -96.7 | TDD |
| 48 |  |  | -96.5 | -96.5 | -96.5 | -96.5 | TDD |
| 54 | -103.7 | -99.7 | -97.7 |  |  |  | TDD |
| 66 | -101.7 | -98.7 | -97.2 | -97.2 | -97.2 | -97.2 | FDD |
| … |  |  |  |  |  |  |  |
| 71 |  |  | [-93.4] | [-93.4] | [-93.4] | [-93.4] | FDD |
| 72 | [-96.5] | [-92.5] | [-90.5] |  |  |  | FDD |
| 73 | [-96.5] | [-92.5] | [-90.5] |  |  |  | FDD |
| 85 |  |  | -94.7 | -94.7 |  |  | FDD |
| 87 | -96.5 | -92.5 | -90.5 |  |  |  | FDD |
| 88 | -96.5 | -92.5 | -90.5 |  |  |  | FDD |
| 106 | -99.7 | -96.7 |  |  |  |  | FDD |
| 111 | -96.5 | -93.7 | -92 | -92 |  |  | FDD |
| NOTE 1: The transmitter shall be set to PUMAX as defined in subclause 6.2.5  NOTE 2: Reference measurement channel is A.3.2 with one sided dynamic OCNG Pattern OP.1 FDD/TDD as described in Annex A.5.1.1/A.5.2.1  NOTE 3: For the UE which supports both Band 11 and Band 21 the reference sensitivity level is FFS.  NOTE 4: For a UE that supports both Band 18 and Band 26, the reference sensitivity level for Band 26 applies for the applicable channel bandwidths.  NOTE 5: The 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 7.3.1E-9: Reference sensitivity for HD-FDD category M2 QPSK PREFSENS

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Channel bandwidth | | | | | | | |
| E-UTRA Band | 1.4 MHz (dBm) | 3 MHz (dBm) | 5 MHz (dBm) | 10 MHz (dBm) | 15 MHz (dBm) | 20 MHz (dBm) | Duplex Mode |
| 1 |  |  | -97 | -97 | -97 | -97 | HD-FDD |
| 2 | -101 | -97 | -95 | -95 | -95 | -95 | HD-FDD |
| 3 | -100 | -96 | -94 | -94 | -94 | -94 | HD-FDD |
| 4 | -103 | -99 | -97 | -97 | -97 | -97 | HD-FDD |
| 5 | -101.5 | -97.5 | -95.5 | -95.5 |  |  | HD-FDD |
| 7 |  |  | -95 | -95 | -95 | -95 | HD-FDD |
| 8 | -100.5 | -96.5 | -94.5 | -94.5 |  |  | HD-FDD |
| 11 |  |  | -97 | -97 |  |  | HD-FDD |
| 12 | -100 | -96 | -94 | -94 |  |  | HD-FDD |
| 13 |  |  | -94 | -94 |  |  | HD-FDD |
| 14 |  |  | -94 | -94 |  |  | HD-FDD |
| 18 |  |  | -97 | -97 | -97 |  | HD-FDD |
| 19 |  |  | -97 | -97 | -97 |  | HD-FDD |
| 20 |  |  | -94.5 | -94.5 | -94.5 | -94.5 | HD-FDD |
| 21 |  |  | -97 | -97 | -97 |  | HD-FDD |
| 24 |  |  | -97.5 | -97.5 |  |  | HD-FDD |
| 25 | -99.5 | -95.5 | -93.5 | -93.5 | -93.5 | -93.5 | HD-FDD |
| 26 | -101 | -97 | -95 | -95 | -95 |  | HD-FDD |
| 27 | -101.5 | -97.5 | -95.5 | -95.5 |  |  | HD-FDD |
| 28 |  | -97.5 | -95.5 | -95.5 | -95.5 | -95.5 | HD-FDD |
| 31 | -97.3 | -93.3 | -91.3 |  |  |  | HD-FDD |
| 71 |  |  | -94.2 | -94.2 | -94.2 | -94.2 | HD-FDD |
| 72 | -97.3 | -93.3 | -91.3 |  |  |  | HD-FDD |
| 73 | -97.3 | -93.3 | -91.3 |  |  |  | HD-FDD |
| 85 |  |  | -94 | -94 |  |  | HD-FDD |
| 87 | -97.3 | -93.3 | -91.3 |  |  |  | HD-FDD |
| 88 | -97.3 | -93.3 | -91.3 |  |  |  | HD-FDD |
| 106 | -100.5 | -96.5 |  |  |  |  | HD-FDD |
| 111 | -97.3 | -93.3 | -91.3 | -91.3 |  |  | HD-FDD |
| NOTE 1: The transmitter shall be set to PUMAX as defined in subclause 6.2.5  NOTE 2: Reference measurement channel is A.3.2 with one sided dynamic OCNG Pattern OP.1 FDD/TDD as described in Annex A.5.1.1/A.5.2.1  NOTE 3: For the UE which supports both Band 11 and Band 21 the reference sensitivity level is FFS.  NOTE 4: For a UE that support both Band 18 and Band 26, the reference sensitivity level for Band 26 applies for the applicable channel bandwidths. | | | | | | | |

Table 7.3.1E-10: FDD/HD-FDD and TDD UE category M2 Uplink configuration for reference sensitivity

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA Band / Channel bandwidth / NRB / Duplex mode | | | | | | | |
| E-UTRA Band | 1.4 MHz | 3 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz | Duplex Mode |
| 1 |  |  | 24 | 24 | 24 | 24 | FDD/HD-FDD |
| 2 | 6 | 15 | 24 | 24 | 24 | 24 | FDD/HD-FDD |
| 3 | 6 | 15 | 24 | 24 | 24 | 24 | FDD/HD-FDD |
| 4 | 6 | 15 | 24 | 24 | 24 | 24 | FDD/HD-FDD |
| 5 | 6 | 15 | 24 | 24 |  |  | FDD/HD-FDD |
| 7 |  |  | 24 | 24 | 24 | 24 | FDD/HD-FDD |
| 8 | 6 | 15 | 24 | 24 |  |  | FDD/HD-FDD |
| 11 |  |  | 24 | 24 |  |  | FDD/HD-FDD |
| 12 | 6 | 15 | 201 | 201 |  |  | FDD/HD-FDD |
| 13 |  |  | 201 | 201 |  |  | FDD/HD-FDD |
| 14 |  |  | 151 | 151 |  |  | FDD/HD-FDD |
| 18 |  |  | 24 | 24 | 24 |  | FDD/HD-FDD |
| 19 |  |  | 24 | 24 | 24 |  | FDD/HD-FDD |
| 20 |  |  | 24 | 201 | 203 | 203 | FDD/HD-FDD |
| 21 |  |  | 24 | 241 | 241 |  | FDD/HD-FDD |
| 24 |  |  | 24 | 241 |  |  | FDD/HD-FDD |
| 25 | 6 | 15 | 24 | 24 | 24 | 24 | FDD/HD-FDD |
| 26 | 6 | 15 | 24 | 24 | 24 |  | FDD/HD-FDD |
| 27 | 6 | 15 | 24 | 24 |  |  | FDD/HD-FDD |
| 28 |  | 15 | 24 | 24 | 24 | 24 | FDD/HD-FDD |
| 31 | 6 | 54 | 54 |  |  |  | FDD/HD-FDD |
| … |  |  |  |  |  |  |  |
| 39 |  |  |  | 24 | 24 | 24 | TDD |
| 40 |  |  |  | 24 | 24 | 24 | TDD |
| 41 |  |  |  | 24 | 24 | 24 | TDD |
| 42 |  |  |  | 24 | 24 | 24 | TDD |
| 43 |  |  |  | 24 | 24 | 24 | TDD |
| 48 |  |  |  | 24 | 24 | 24 | TDD |
| … |  |  |  |  |  |  |  |
| 54 | 6 | 15 | 24 |  |  |  | TDD |
| … |  |  |  |  |  |  |  |
| 71 |  |  | 24 | 24 | 24 | 24 | FDD/HD-FDD |
| 72 | 6 | 54 | 54 |  |  |  | FDD/HD-FDD |
| 73 | 6 | 54 | 54 |  |  |  | FDD/HD-FDD |
| 85 |  |  | 201 | 201 |  |  | FDD/HD-FDD |
| 87 | 6 | 54 | 54 |  |  |  | FDD/HD-FDD |
| 88 | 6 | 54 | 54 |  |  |  | FDD/HD-FDD |
| 106 | 6 | 15 |  |  |  |  |  |
| 111 | 6 | 101 | 101 | 101 |  |  | FDD/HD-FDD |
| NOTE 1: 1 refers to the UL resource blocks shall be located as close as possible to the downlink operating band but confined within the transmission bandwidth configuration for the channel bandwidth (Table 5.6-1).  NOTE 2: For the UE which supports both Band 11 and Band 21 the uplink configuration for reference sensitivity is FFS.  NOTE 3: 3 refers to Band 20; in the case of 15MHz channel bandwidth, the UL resource blocks shall be located at RBstart 11 and in the case of 20MHz channel bandwidth, the UL resource blocks shall be located at RBstart 16  NOTE 4: 4 refers to Bands 31, 72 and 73; in the case of 3 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 9 and in the case of 5 MHz channel bandwidth, the UL resource blocks shall be located at RBstart 10. | | | | | | | |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **Unchanged Section Omitted** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 7.6.1 In-band blocking

In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band at which the relative throughput shall meet or exceed the minimum requirement for the specified measurement channels.

For CA configurations including Band 46, in-band blocking in Band 46 is defined for a 20 MHz unwanted interfering signal falling into the UE receive band or into the first 60 MHz below or above the UE receive band (Table 7.6.1.1A-0a and Table 7.6.1.1A-0b).

For CA configurations including Band 49, in-band blocking in Band 49 is defined for an unwanted interfering signal falling into the UE receive band or into the first 60 MHz below or above the UE receive band (Table 7.6.1.1A-0a and Table 7.6.1.1A-0b).

#### 7.6.1.1 Minimum requirements

The throughput shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annexes A.2.2, A.2.3 and A.3.2 (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 Tables 7.6.1.1-1 and 7.6.1.1-2. For operating bands with an unpaired DL part (as noted in Table 5.5-1), the requirements only apply for carriers assigned in the paired part.

Table 7.6.1.1-1: In band blocking parameters

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Rx parameter | Units | Channel bandwidth | | | | | |
| 1.4 MHz | 3 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz |
| Power in Transmission Bandwidth Configuration | dBm | REFSENS + channel bandwidth specific value below | | | | | |
| 6 | 6 | 6 | 6 | 7 | 9 |
| BWInterferer | MHz | 1.4 | 3 | 5 | 5 | 5 | 5 |
| FIoffset, case 1 | MHz | 2.1+0.0125 | 4.5+0.0075 | 7.5+0.0125 | 7.5+0.0025 | 7.5+0.0075 | 7.5+0.0125 |
| FIoffset, case 2 | MHz | 3.5+0.0075 | 7.5+0.0075 | 12.5+0.0075 | 12.5+0.0125 | 12.5+0.0025 | 12.5+0.0075 |
| NOTE 1: The transmitter shall be set to 4dB below PCMAX\_L at the minimum uplink configuration specified in Table 7.3.1-2 with PCMAX\_L as defined in subclause 6.2.5.  NOTE 2: The interferer consists of the Reference measurement channel specified in Annex A.3.2 with one sided dynamic OCNG Pattern OP.1 FDD/TDD as described in Annex A.5.1.1/A.5.2.1 and set-up according to Annex C.3.1.  NOTE 3: The REFSENS power level is specified in Table 7.3.1-1 and Table 7.3.1-1a for two and four antenna ports, respectively.  NOTE 4: For DL category M1 and M2 UE, the reference sensitivity for category M1 in table 7.3.1E-3 and category M2 in Table 7.3.1E-8 should be used as REFSENS for the power in Transmission Bandwidth Configuration.  NOTE5: For DL category M1 and M2 UE, the parameters for the applicable channel bandwidth apply. | | | | | | | |

Table 7.6.1.1-2: In-band blocking

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA band | Parameter | Unit | Case 1 | Case 2 | Case 3 | Case 4 | Case 5 | Case 6 |
| PInterferer | dBm | -56 | -44 | Void | Void | -38 | -15 |
| FInterferer (offset) | MHz | =-BW/2 – FIoffset,case 1  &  =+BW/2 + FIoffset,case 1 | ≤-BW/2 – FIoffset,case 2  &  ≥+BW/2 + FIoffset,case 2 | -BW/2 - 11 |  |
| 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 22, 23,  25, 26, 27, 28, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 48, 50, 51, 52, 53, 54, 65, 66, 68, 70, 72, 73, 74, 85, 87, 88, 106, 111 | FInterferer | MHz | (NOTE 2) | FDL\_low – 15  to  FDL\_high + 15 |  |  |
| 30 | FInterferer | MHz | (NOTE 2) | FDL\_low – 15  to  FDL\_high + 15 | FDL\_low – 11 |  |
| 71 | FInterferer | MHz | (NOTE 2) | FDL\_low – 12 to FDL\_high + 15 |  |  |  | FDL-low - 12 |
| NOTE 1: For certain bands, the unwanted modulated interfering signal may not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band  NOTE 2: For each carrier frequency the requirement is valid for two frequencies:  a. the carrier frequency -BW/2 - FIoffset, case 1 and  b. the carrier frequency +BW/2 + FIoffset, case 1  NOTE 3: FInterferer range values for unwanted modulated interfering signal are interferer center frequencies | | | | | | | |  |

For the UE which supports inter band CA configuration in Table 7.3.1-1A, PInterferer power defined in Table 7.6.1.1-2 is increased by the amount given by ΔRIB,c in Table 7.3.1-1A.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **Unchanged Section Omitted** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 7.6.2 Out-of-band blocking

Out-of-band band blocking is defined for an unwanted CW interfering signal falling more than 15 MHz below or above the UE receive band. For the first 15 MHz below or above the UE receive band the appropriate in-band blocking or adjacent channel selectivity in subclause 7.5.1 and subclause 7.6.1 shall be applied.

For CA configurations including Band 46 or Band 49, out-of-band band blocking is defined for an unwanted CW interfering signal falling more than 60 MHz below or above the UE receive band (see Table 7.6.2.1A-0a). For the first 60 MHz below or above the UE receive band the appropriate in-band blocking or adjacent channel selectivity in subclause 7.5.1A and subclause 7.6.1A shall be applied.

#### 7.6.2.1 Minimum requirements

The throughput shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annexes A.2.2, A.2.3 and A.3.2 (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 Tables 7.6.2.1-1 and 7.6.2.1-2. For operating bands with an unpaired DL part (as noted in Table 5.5-1), the requirements only apply for carriers assigned in the paired part.

For Table 7.6.2.1-2 in frequency range 1, 2 and 3, up to exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1MHz step size, where  is the number of resource blocks in the downlink transmission bandwidth configuration (see Figure 5.6-1). For these exceptions the requirements of subclause 7.7 Spurious response are applicable.

For Table 7.6.2.1-2 in frequency range 4, up to exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1MHz step size, where  is the number of resource blocks in the downlink transmission bandwidth configurations (see Figure 5.6-1) and  is the number of resource blocks allocated in the uplink. For these exceptions the requirements of clause 7.7 spurious response are applicable.

Table 7.6.2.1-1: Out-of-band blocking parameters

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Rx Parameter | Units | Channel bandwidth | | | | | |
| 1.4 MHz | 3 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz |
| Power in Transmission Bandwidth Configuration | dBm | REFSENS + channel bandwidth specific value below | | | | | |
| 6 | 6 | 6 | 6 | 7 | 9 |
| NOTE 1: The transmitter shall be set to 4dB below PCMAX\_L at the minimum uplink configuration specified in Table 7.3.1-2 with PCMAX\_L as defined in subclause 6.2.5.  NOTE 2: Reference measurement channel is specified in Annex A.3.2 with one sided dynamic OCNG Pattern OP.1 FDD/TDD as described in Annex A.5.1.1/A.5.2.  NOTE 3: The REFSENS power level is specified in Table 7.3.1-1 and Table 7.3.1-1a for two and four antenna ports, respectively.  NOTE 4: For DL category M1 and M2 UE, the reference sensitivity for category M1 in table 7.3.1E-3 and category M2 in Table 7.3.1E-8 should be used as REFSENS for the power in Transmission Bandwidth Configuration.  NOTE5: For DL category M1 and M2 UE, the parameters for the applicable channel bandwidth apply. | | | | | | | |

Table 7.6.2.1-2: Out of band blocking

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| E-UTRA band | Parameter | Units | Frequency | | | |
| Range 1 | Range 2 | Range 3 | Range 4 |
| PInterferer | dBm | -44 | -30 | -15 | -15 |
| 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42 (NOTE 2), 43 (NOTE 2), 44, 45, 48 (NOTE 2), 50, 51, 52 (NOTE 6), 539, 54, 65, 66, 68, 70, 71, 72, 73, 74, 85, 87, 88, 106, 111 | FInterferer (CW) | MHz | FDL\_low -15 to  FDL\_low -60 | FDL\_low -60 to  FDL\_low -85 | FDL\_low -85 to  1 MHz | - |
| FDL\_high +15 to  FDL\_high + 60 | FDL\_high +60 to  FDL\_high +85 | FDL\_high +85 to  +12750 MHz | - |
| 2, 5, 12, 17, 85 | FInterferer | MHz | - | - | - | FUL\_low**-** FUL\_high  (NOTE 5) |
| NOTE 1: For the UE which supports both Band 11 and Band 21 the out of blocking is FFS.  NOTE 2: The power level of the interferer (PInterferer) for Range 3 shall be modified to -20 dBm for FInterferer > 2800 MHz and FInterferer < 4400 MHz. The power level of the interferer (PInterferer) for Range 3 shall be modified to -20 dBm for FInterferer > 2800 MHz and FInterferer < 4800 MHz when UE supports both E-UTRA band B42 and NR bands n77, n78.  NOTE 3: For the UE that supports both Band 4 and Band 66, the out-of-blocking frequency range for Band 4 is defined relative to FDL\_low and FDL\_high of Band 66.  NOTE 4: For a UE supporting CA\_20A-28A, CA\_1A-3A-7A-20A-28A, CA\_1A-3A-20A-28A, CA\_1A-3A-3A-20A-28A, CA\_1A-7A-20A-28A, CA\_1A-20A-28A, CA\_3A-7A-20A-28A, CA\_3A-20A-28A or CA\_7A-20A-28A the requirements for Band 20 and Band 28 apply with FDL\_low given by the lower limit of the restricted operating frequency range in Band 28 and FDL\_high by Band 20 (Table 5.5A-2).  NOTE 5: Range 4 requirement does not apply to category M1 and M2.  NOTE 6: The power level of the interferer (PInterferer) for Range 3 shall be modified to -20 dBm for FInterferer > 2700 MHz and FInterferer < 4000 MHz.  NOTE 7: For band 51 the FDL\_high of band 50 is applied as FDL\_high for band 51.  NOTE 8: For UEs supporting both bands 38 and 41, the FDL\_high and FDL\_low of band 41 is applied as FDL\_high and FDL\_low for band 38.  NOTE 9: The power level of the interferer (PInterferer) for Range 3 shall be modified to [-20 dBm] for FInterferer > [2580 MHz] and FInterferer < [2775 MHz]. | | | | | | |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* **< END OF CHANGE >** \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*