**3GPP TSG-RAN WG4 Meeting #99-e *R4-2111144***

**Electronic Meeting, 19 – 27 May, 2021**

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

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

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | CR to 37.141: Correction of NR bands for MSR BS | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Perf | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | When NR support was introduced in the MSR specs (CR 0831 in RP‑182362), the Notes 2, 3 and 4 to table 4.5-1 were updated to include NR support. The notes are however also used for a number of bands where NR is not supported, which means that the NR support is incorrectly described. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Three new notes are introduced (Notes 11, 12 and 13) that can be used as replacements for Notes 2, 3 and 4, in case of bands where NR is not supported. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | It would remain ambiguous regarding what bands that can support NR for MSR BS. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 37.104 | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

## 4.4 Operating bands and band categories

MSR requirements are applicable for band definitions and band numbering as defined in the specifications TS 45.005 [6], TS25.104 [3], TS 25.105 [4], TS 36.104 [5] and TS 38.104 [27]. For the purpose of defining the BS requirements, the operating bands are divided into three band categories as follows:

- Band Category 1 (BC1): Bands for NR FDD, E-UTRA FDD and/or UTRA FDD operation. Bands in this category are also used for NB-IoT operation (all modes).

- Band Category 2 (BC2): Bands for NR FDD, E-UTRA FDD, UTRA FDD and/or GSM/EDGE operation. Bands in this category are also used for NB-IoT operation (all modes).

- Band Category 3 (BC3): Bands for NR TDD, E-UTRA TDD and/or UTRA TDD operation. Bands in this category are also used for NB-IoT operation (all modes).

NOTE: For UTRA TDD, requirements in the present document cover the 1.28 Mcps UTRA TDD option.

The paired and unpaired bands for the three Band Categories are shown in Table 4.4-1 and 4.4-2, together with the corresponding NR, E-UTRA, UTRA and GSM/EDGE band designations. In the present specification, the operating band of an MSR Base Stations is designated using the E-UTRA band number according to the tables.

Table 4.4-1: Paired bands in NR, E-UTRA, UTRA and GSM/EDGE

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MSR and E‑UTRA Band number | NR Band number | UTRA Band number | GSM/EDGE  Band designation | Uplink (UL) BS receive UE transmit | | | | | Downlink (DL) BS transmit  UE receive | | | | | | Band category |
| 1 | n1 | I | - | 1920 MHz | | – | 1980 MHz | | 2110 MHz | | – | | 2170 MHz | | 1 |
| 2 | n2 | II | PCS 1900 | 1850 MHz | | – | 1910 MHz | | 1930 MHz | | – | | 1990 MHz | | 2 |
| 3 | n3 | III | DCS 1800 | 1710 MHz | | – | 1785 MHz | | 1805 MHz | | – | | 1880 MHz | | 2 |
| 4 |  | IV | - | 1710 MHz | | – | 1755 MHz | | 2110 MHz | | – | | 2155 MHz | | 1 |
| 5 | n5 | V | GSM 850 | 824 MHz | | – | 849 MHz | | 869 MHz | | – | | 894 MHz | | 2 |
| 6 |  | VI | - | 830 MHz | | – | 840 MHz | | 875 MHz | | – | | 885 MHz | | 1  (NOTE 1) |
| 7 | n7 | VII | - | 2500 MHz | | – | 2570 MHz | | 2620 MHz | | – | | 2690 MHz | | 1 |
| 8 | n8 | VIII | E-GSM | 880 MHz | | – | 915 MHz | | 925 MHz | | – | | 960 MHz | | 2 |
| 9 |  | IX | - | 1749.9 MHz | | – | 1784.9 MHz | | 1844.9 MHz | | – | | 1879.9 MHz | | 1  (NOTE 12) |
| 10 |  | X | - | 1710 MHz | | – | 1770 MHz | | 2110 MHz | | – | | 2170 MHz | | 1  (NOTE 12) |
| 11 |  | XI | - | 1427.9 MHz | | – | 1447.9 MHz | | 1475.9 MHz | | – | | 1495.9 MHz | | 1 |
| 12 | n12 | XII | - | 699 MHz | | – | 716 MHz | | 729 MHz | | – | | 746 MHz | | 1 |
| 13 |  | XIII | - | 777 MHz | | – | 787 MHz | | 746 MHz | | – | | 756 MHz | | 1 |
| 14 | n14 | XIV | - | 788 MHz | | – | 798 MHz | | 758 MHz | | – | | 768 MHz | | 1 |
| 15 |  | XV | - | Reserved | |  |  | | Reserved | |  | |  | |  |
| 16 |  | XVI | - | Reserved | |  |  | | Reserved | |  | |  | |  |
| 17 |  | - | - | 704 MHz | | – | 716 MHz | | 734 MHz | | – | | 746 MHz | | 1  (NOTE 13) |
| 18 | n18 | - | - | 815 MHz | | – | 830 MHz | | 860 MHz | | – | | 875 MHz | | 1  (NOTE 4) |
| 19 |  | XIX | - | 830 MHz | | – | 845 MHz | | 875 MHz | | – | | 890 MHz | | 1 |
| 20 | n20 | XX | - | 832 MHz | | – | 862 MHz | | 791 MHz | | – | | 821 MHz | | 1 |
| 21 |  | XXI | - | 1447.9 MHz | | – | 1462.9 MHz | | 1495.9 MHz | | – | | 1510.9 MHz | | 1 |
| 22 |  | XXII | - | 3410 MHz | | – | 3490 MHz | | 3510 MHz | | – | | 3590 MHz | | 1  (NOTE 12) |
| 238 |  | - | - | 2000 MHz | | – | 2020 MHz | | 2180 MHz | | – | | 2200 MHz | | 1  (NOTE 11) |
| 2410 |  | - | - | 1626.5 MHz | | – | 1660.5 MHz | | 1525 MHz | | – | | 1559 MHz | | 1  (NOTE 11) |
| 25 | n25 | XXV | - | 1850 MHz | | – | 1915 MHz | | 1930 MHz | | – | | 1995 MHz | | 1 |
| 26 | n26 | XXVI | - | 814 MHz | | – | 849 MHz | | 859 MHz | | – | | 894 MHz | | 1 |
| 27 |  | - | - | 807 MHz | | – | 824 MHz | | 852 MHz | | – | | 869 MHz | | 1  (NOTE 11) |
| 28 | n28 | - | - | 703 MHz | | – | 748 MHz | | 758 MHz | | – | | 803 MHz | | 1  (NOTE 4) |
| 29 | n29 | - | - | N/A | | | | | 717 MHz | | – | | 728 MHz | | 1  (NOTE 2,  NOTE 5) |
| 30 | n30 | - | - | 2305 MHz | | – | 2315 MHz | | 2350 MHz | | – | | 2360 MHz | | 1  (NOTE 2) |
| 31 |  | - | - | 452.5 MHz | | – | 457.5 MHz | | 462.5 MHz | | – | | 467.5 MHz | | 1  (NOTE 13) |
| 32 |  | XXXII (NOTE 6) | - |  | N/A | | |  | | 1452 MHz | | – | | 1496 MHz | 1  (NOTE 12, NOTE 5) |
| 64 |  | - | - |  |  | | |  | | Reserved | | | | |  |
| 65 | n65 | - | - | 1920 MHz | – | | | 2010 MHz | | 2110 MHz | | – | | 2200 MHz | 1  (NOTE 4) |
| 66 | n66 | - | - | 1710 MHz | - | | | 1780 MHz | | 2110 MHz | | - | | 2200 MHz | 1  (NOTE 4, NOTE 7) |
| 67 |  | - | - |  | N/A | | |  | | 738 MHz | | – | | 758 MHz | 1  (NOTE 11, NOTE 5) |
| 68 |  | - | - | 698 MHz | - | | | 728 MHz | | 753 MHz | | - | | 783 MHz | 1  (NOTE 11) |
| 69 |  | - | - | N/A | | | | | | 2570 MHz | | – | | 2620 MHz | 1  (NOTE 11, NOTE 5) |
| 70 | n70 | - | - | 1695 MHz | – | | | 1710 MHz | | 1995 MHz | | – | | 2020 MHz | 1  (NOTE 4, NOTE 9) |
| 71 | n71 | - | - | 663 MHz | – | | | 698 MHz | | 617 MHz | | – | | 652 MHz | 1  (NOTE 4) |
| 72 |  | - | - | 451 MHz | – | | | 456 MHz | | 461 MHz | | – | | 466 MHz | 1  (NOTE 13) |
| 73 |  | - | - | 450 MHz | – | | | 455 MHz | | 460 MHz | | – | | 465 MHz | 1  (NOTE 13) |
| 74 | n74 | - | - | 1427 MHz | – | | | 1470 MHz | | 1475 MHz | | – | | 1518 MHz | 1  (NOTE 4) |
| 75 | n75 | - | - | N/A | | | | | | 1432 MHz | | – | | 1517 MHz | 1  (NOTE 2, NOTE 5) |
| 76 | n76 | - | - | N/A | | | | | | 1427 MHz | | – | | 1432 MHz | 1  (NOTE 2, NOTE 5) |
| 85 |  | - | - | 698 MHz | – | | | 716 MHz | | 728 MHz | | – | | 746 MHz | 1  (NOTE 13) |
| 87 |  | - | - | 410 MHz | – | | | 415 MHz | | 420 MHz | | – | | 425 MHz | 1  (NOTE 13) |
| 88 |  | - | - | 412 MHz | – | | | 417 MHz | | 422 MHz | | – | | 427 MHz | 1  (NOTE 13) |
| NOTE 1: The band is for UTRA only.  NOTE 2: The band is for E-UTRA and/or NR only.  NOTE 3: The band is for NR, E-UTRA and/or UTRA only.  NOTE 4: The band is for NR, E-UTRA and/or NB-IoT only.  NOTE 5: Restricted to NR and/or 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 6: Restricted to UTRA operation when dual band is configured (e.g., DB-DC-HSDPA or dual band 4C-HSDPA). The down link frequency(ies) of this band are paired with the uplink frequenc(ies) of the other FDD band (external) of the dual band configuration.  NOTE 7: In E-UTRA operation, the range 2180 – 2200 MHz of the DL operating band is restricted to operation when carrier aggregation is configured.  NOTE 8: Band 23 is not applicable.  NOTE 9: In E-UTRA operation, the range 2010-2020 MHz of the DL operating band is restricted to operation when carrier aggregation is configured and TX-RX separation is 300 MHz. In E-UTRA operation, the range 2005 – 2020 MHz of the DL operating band is restricted to operation when carrier aggregation is configured and TX-RX separation is 295 MHz.  NOTE 10: DL operation is restricted to 1526-1536 MHz frequency range. UL operation is restricted to 1627.5 – 1637.5 MHz and 1646.5 – 1656.5 MHz per FCC Order DA 20-48.  NOTE 11: The band is for E-UTRA only.  NOTE 12: The band is for E-UTRA and/or UTRA only.  NOTE 13: The band is for E-UTRA and/or NB-IoT only. | | | | | | | | | | | | | | | |

NOTE: For BS capable of multi-band operation, the supported operating bands may belong to different Band Categories.

Table 4.4-2: Unpaired bands in NR, E-UTRA and UTRA

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **MSR and E‑UTRA Band number** | **NR Band number** | **UTRA Band number** | **Uplink (UL) BS receive UE transmit** | | | **Downlink (DL) BS transmit  UE receive** | | | **Band category** |
| 33 |  | a) | 1900 MHz | – | 1920 MHz | 1900 MHz | – | 1920 MHz | 3 |
| 34 | n34 | a) | 2010 MHz | – | 2025 MHz | 2010 MHz | – | 2025 MHz | 3 |
| 35 |  | b) | 1850 MHz | – | 1910 MHz | 1850 MHz | – | 1910 MHz | 3 |
| 36 |  | b) | 1930 MHz | – | 1990 MHz | 1930 MHz | – | 1990 MHz | 3 |
| 37 |  | c) | 1910 MHz | – | 1930 MHz | 1910 MHz | – | 1930 MHz | 3 |
| 38 | n38 | d) | 2570 MHz | – | 2620 MHz | 2570 MHz | – | 2620 MHz | 3 |
| 39 | n39 | f) | 1880 MHz | – | 1920 MHz | 1880 MHz | – | 1920 MHz | 3 |
| 40 | n40 | e) | 2300 MHz | – | 2400 MHz | 2300 MHz | – | 2400 MHz | 3 |
| 41 | n41 | - | 2496 MHz | – | 2690 MHz | 2496 MHz | – | 2690 MHz | 3  (NOTE 1) |
| 42 |  | - | 3400 MHz | – | 3600 MHz | 3400 MHz | – | 3600 MHz | 3  (NOTE 1) |
| 43 |  | - | 3600 MHz | – | 3800 MHz | 3600 MHz | – | 3800 MHz | 3  (NOTE 1) |
| 44 |  | - | 703 MHz | – | 803 MHz | 703 MHz | – | 803 MHz | 3 |
| 45 |  | - | 1447 MHz | – | 1467 MHz | 1447 MHz | – | 1467 MHz | 3 |
| 48 | n48 | - | 3550 MHz | – | 3700 MHz | 3550 MHz | – | 3700 MHz | 3 |
| 50 | n50 | - | 1432 MHz | – | 1517 MHz | 1432 MHz | – | 1517 MHz | 3 |
| 51 | n51 | - | 1427 MHz | – | 1432 MHz | 1427 MHz | – | 1432 MHz | 3 |
| 52 |  | - | 3300 MHz | – | 3400 MHz | 3300 MHz | – | 3400 MHz | 3 |
| 53 | n53 | - | 2483.5 MHz | – | 2495 MHz | 2483.5 MHz | – | 2495 MHz | 3 |
| 77 | n77 | - | 3300 MHz | - | 4200 MHz | 3300 MHz | - | 4200 MHz | 3  (NOTE 2) |
| 78 | n78 | - | 3300 MHz | - | 3800 MHz | 3300 MHz | - | 3800 MHz | 3  (NOTE 2) |
| NOTE 1: The band 41 supports NB-IoT (in certain regions). The band 42 and 43 support NB-IoT.  NOTE 2: The band is for NR only. | | | | | | | | | |

Table 4.4-3. Void

Table 4.4-4. Void

E-UTRA is designed to operate for the carrier aggregation bands defined in TS 36.101 [28]. The E-UTRA channel bandwidth BWChannel for a single carrier and the Aggregated Channel Bandwidth BWChannel\_CA for E-UTRA carrier aggregation are specified in clause 5.6 of TS 36.104 [5].

The NB-IoT channel bandwidth BWChannel is specified in clause 5.6 of TS 36.104 [5].

The NR BS channel bandwidth and PRB utilization is specified in clause 5.3 of TS 38.104 [27].