**3GPP TSG-RAN WG4 Meeting # 108bis R4-2315674**

**Xiamen, China, October 09 – October 13, 2023**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **36.102** | **CR** |  | **rev** |  | **Current version:** | **18.3.0** |  |
|  | | | | | | | | |
| *For* ***[HE](http://www.3gpp.org/3G_Specs/CRs.htm" \l "_blank)******[LP](http://www.3gpp.org/3G_Specs/CRs.htm" \l "_blank)*** *on using this form: comprehensive instructions can be found at  <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 TS36.102 Introduction of the Extended L-band | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | ZTE Corporation | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | IoT\_NTN\_extLband-Core | | | | |  | ***Date:*** | | | 2023-09-25 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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:*** | | The Extended L-band is agreed to be introduced in Rel-18, currently the UE RF requirements for this band is still missing. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | To introduce the UE RF requirements for the Extended L-band into the spec. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | UE RF requirements for the Extended L-band is missing. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.2, 5.4A.2, 5.4A.3, 6.2A.1, 6.2B.1, 6.5A.4.3, 7.3A, 7.6A.2, 7.6B.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

## << Start of change >>

# 5 Operating bands and channel arrangement

## 5.2 Operating bands

E-UTRA satellite access is designed to operate in the operating bands defined in Table 5.2-1.

Table 5.2-1 E-UTRA operating bands for satellite access

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 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 | | |
| 256 | 1980 MHz | – | 2010 MHz | 2170 MHz | – | 2200 MHz | FDD |
| 255 | 1626.5 MHz | – | 1660.5 MHz | 1525 MHz | – | 1559 MHz | FDD |
| 2532 | 1668 MHz | - | 1675 MHz | 1518 MHz | - | 1525 MHz | FDD |
| NOTE 1: Satellite bands are numbered in descending order from 256  NOTE 2: UE assigned to channels and allocated frequency resources in the lower portion of Band 253 may experience blocking or harmful interference from terrestrial networks in adjacent or nearby frequencies when operating in the proximity with terrestrial base station. | | | | | | | |

## 5.4A Channel arrangement for category M1

### 5.4A.2 Channel raster, carrier frequency and EARFCN

The global frequency raster is defined for all frequencies. The granularity of the global frequency raster is 100 kHz, which means that the carrier centre frequency must be an integer multiple of 100 kHz. For each operating band, a subset of frequencies from the global frequency raster are applicable and forms a channel raster with a granularity ΔFRaster.

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 5.4A.2-1 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 5.4.2-1 and NUL is the uplink EARFCN.

FUL = FUL\_low + 0.1(NUL – NOffs-UL)

The applicable channel raster and EARFCNs for each operating band are specified in Table 5.4A.2-1.

For operating bands with a channel raster of 100 kHz, every EARFCN within the operating band shall be applicable for the channel raster, and the step size for the channel raster in Table 5.4A.2‑1 is given as <1>. The broadcast parameter *earfcn-LSB* defined in TS36.331 [6] may be used to assist the UE in synchronizing to the cell.

Table 5.4A.2-1: E-UTRA channel numbers

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA Operating  Band | ΔFRaster (kHz) | Downlink | | | Uplink | | |
| FDL\_low (MHz) | NOffs-DL | Range of NDL  (First – <Step size> – Last) | FUL\_low (MHz) | NOffs-UL | Range of NUL  (First – <Step size> – Last) |
| 256 | 100 | 2170 | 229076 | 229076 –<1>- 229375 | 1980 | 261844 | 261844 –<1>- 262143 |
| 255 | 100 | 1525 | 228736 | 228736 –<1>- 229075 | 1626.5 | 261504 | 261504 –<1>- 261843 |
| 253 | 100 | 1518 | 228501 | 228501-<1>-228570 | 1668 | 261269 | 261269-<1>-261338 |
| 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 channel numbers at the lower operating band edge and the last 6 channel numbers at the upper operating band edge shall not be used for channel bandwidth of 1.4 MHz. | | | | | | | |

### 5.4A.3 TX–RX frequency separation

The default E-UTRA TX channel (carrier centre frequency) to RX channel (carrier centre frequency) separation is specified in Table 5.4A.3-1 for the TX and RX channel bandwidth defined in Table 5.3A-1.

Table 5.4A.3-1: Default UE TX-RX frequency separation

| E-UTRA Operating Band | TX – RX  carrier centre frequency separation |
| --- | --- |
| 256 | 190 MHz |
| 255 | -101.5 MHz |
| 253 | -150 MHz |

# 6 Transmitter characteristics

## 6.2A Transmit power for category M1

### 6.2A.1 UE maximum output power for category M1

The following UE Power Classes define the maximum output power for any transmission bandwidth within the channel bandwidth. The period of measurement shall be at least one sub frame (1ms).

Table 6.2A.1-1: UE Power Class

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| EUTRA band | Class 2  (dBm) | Tolerance  (dB) | Class 3 (dBm) | Tolerance (dB) | Class 5 (dBm) | Tolerance (dB) |
| 256 |  |  | 23 | +/-2 | 20 | +/-2 |
| 255 |  |  | 23 | +/-2 | 20 | +/-2 |
| 253 |  |  | 23 | +/-2 | 20 | +/-2 |
| NOTE 1: PPowerClass is the maximum UE power specified without taking into account the tolerance. | | | | | | |

## 6.2B Transmit power for category NB1 and NB2

### 6.2B.1 UE maximum output power for category NB1 and NB2

Category NB1 and NB2 UE Power Classes are specified in Table 6.2B.1-1 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 at least 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 at least one sub-frame (1ms).

Table 6.2B.1-1: UE Power Class

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| EUTRA band | Class 3 (dBm) | Tolerance (dB) | Class 5 (dBm) | Tolerance (dB) |
| 256 | 23 | +/-2 | 20 | +/-2 |
| 255 | 23 | +/-2 | 20 | +/-2 |
| 253 | 23 | +/-2 | 20 | +/-2 |

## 6.5A Output RF spectrum emissions for category M1

### 6.5A.4 Spurious emission for category M1

#### 6.5A.4.3 Spurious emission band UE co-existence

This clause specifies the requirements for E-UTRA satellite bands for UE coexistence with protected bands.

Table 6.5A.4.3-1: Requirements for spurious emissions for UE co-existence

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| E-UTRA Band | Spurious emission | | | | | | |
| Protected band | Frequency range (MHz) | | | Maximum Level (dBm) | MBW (MHz) | NOTE |
| 253 | E-UTRA Band 2, 4, 5, 12, 13, 14, 17, 24, 25, 26, 29, 30, 41, 48, 66, 70, 71, 85, 103  NR Band n1, n3, n7, n8, n18, n20, n28, n34, n38, n39, n40, n50, n51, n53, n65, n67, n74, n75, n76, n90, n91, n92, n93, n94 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| NR Band n77, n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| 255 | E-UTRA Band 2, 4, 5, 12, 13, 14, 17, 24, 25, 26, 29, 30, 41, 48, 66, 70, 71, 85, 103  NR Band n1, n3, n7, n8, n18, n20, n28, n34, n38, n39, n40, n50, n51, n53, n65, n67, n74, n75, n76, n90, n91, n92, n93, n94 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| NR Band n77, n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| 256 | E-UTRA Band 1, 3, 5,7, 8, 11, 18, 19, 20, 21, 22, 26, 27, 28, 31, 33, 32, 35, 38, 40, 41, 42, 43, 50, 51, 65, 68, 69, 72, 74, 75, 76, 87, 88  NR Band n12, n13, n14, n24, n29, n30, n39, n48, n53, n66, n67, n71, n78, n79, n85, n90, n91, n92, n93, n94, n101 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| NR Band n77 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
| NR Band n2, n25, n70 | FDL\_low | - | FDL\_high | NA | NA | 3 |
| NOTE 1: FDL\_low and FDL\_high refer to each E-UTRA frequency band specified in Table 5.4A.2-1  NOTE 2: As exceptions, measurements with a level up to the applicable requirements defined in Table 6.5A.4.2-2 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: The co-existence between 256 and band 2, 25 and 70 is subject to regional/national regulation. | | | | | | | |

## << End change >>