**3GPP TSG-RAN4 Meeting #104-e R4-221XXXX**

Electronic meeting, 15 – 26 Aug, 2022

**Source:** Ligado Networks

**Title:** WF on Introduction of LTE TDD band in 1670-1675 MHz

**Document for:**  Approval

Round 1 Agreements

**Agreement #1: The following system parameters were agreed to be specified for the new LTE TDD Band in 1670 – 1675 MHz [5]:**

|  |  |  |  |
| --- | --- | --- | --- |
| E‑UTRA Operating Band | Uplink (UL) operating bandBS receiveUE transmit | Downlink (DL) operating bandBS transmit UE receive | Duplex Mode |
| FUL\_low – FUL\_high | FDL\_low – FDL\_high |
| 54  | 1670 MHz – 1675 MHz | 1670 MHz – 1675 MHz | TDD |

|  |
| --- |
| E-UTRA band / Channel bandwidth |
| E-UTRA Band | 1.4 MHz | 3 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz |
| 54 | Yes | Yes | Yes |  |  |  |

|  |  |  |
| --- | --- | --- |
| E-UTRA OperatingBand | Downlink | Uplink |
| FDL\_low (MHz) | NOffs-DL | Range of NDL | FUL\_low (MHz) | NOffs-UL | Range of NUL |
| 54 | 1670 | 60255 | 60255 – 60304 | 1670 | 60255 | 60255 – 60304 |

**Agreement #2: The following key band specific agreements related to UE Tx RF requirements were reached in the meeting [5]:**

**A-MPR:**

1. No A-MPR needs to be specified for the new LTE TDD band in 1670 – 1675 MHz to meet the additional spurious emissions associated with the new band.

**Tx MOP:**

1. Maximum output power to be specified as 23 dBm +/- 2 dB for the new LTE TDD Band in 1670 – 1675 MHz.

**Spurious emission limits for band UE co-existence:**

1. -50dBm/MHz protection to be granted for all US bands.
2. Collect duplexer rejection data as well as measurements for different channel bandwidths for legacy bands B24/n24/n99, B66/n66, B70/n70 and n255 and finalize exception/relaxation for the UE coexistence spurious emission limits for these legacy bands for protection of the new band at the next meeting. The duplexer data to be evaluated should be for legacy devices.
3. -50dBm/MHz protection level to be specified for other legacy US bands (B2/n2, B5/n5/n89, B12/n12, B13/n13, B14/n14, B17, B25/n25, B26/n26, B29/n29, B30/n30, B41/n41, B48/n48, B53/n53, B71/n71, B77/n77, B85/n85, n86) to protect the new LTE TDD band in 1670 – 1675 MHz.

**Agreement #3: The following key band specific agreements related to UE Rx RF requirements were reached in the meeting [5]:**

**UE Rx Reference Senstivity Requirements:**

1. Reference sensitivity requirements for the new band to be specified as below:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA Band** | **1.4 MHz** | **3 MHz** | **5 MHz** | **10 MHz** | **15 MHz** | **20 MHz** | **Duplex** **Mode** |
| **(dBm)** | **(dBm)** | **(dBm)** | **(dBm)** | **(dBm)** | **(dBm)** |
| 54 | -106.2 | -102.2 | -100 |  |  |  | TDD |

**UE Blocking Requirements:**

1. In band and out of band blocking requirements for the new band to be specified as follows:

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 | FInterferer | MHz | (NOTE 2) | FDL\_low – 15toFDL\_high + 15 |  |  |
| 30 | FInterferer | MHz | (NOTE 2) | FDL\_low – 15toFDL\_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 bandNOTE 2: For each carrier frequency the requirement is valid for two frequencies:a. the carrier frequency -BW/2 - FIoffset, case 1 andb. the carrier frequency +BW/2 + FIoffset, case 1NOTE 3: FInterferer range values for unwanted modulated interfering signal are interferer center frequencies  |  |

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,  | FInterferer (CW) | MHz | FDL\_low -15 toFDL\_low -60  | FDL\_low -60 toFDL\_low -85  | FDL\_low -85 to1 MHz | - |
| FDL\_high +15 toFDL\_high + 60  | FDL\_high +60 toFDL\_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]. |

**References**

[1] RP-220971, New WID proposal for Introduction of LTE TDD band in 1670-1675 MHz

[2] R4-2207965, Work Plan for Introduction of LTE TDD band in 1670 – 1675 MHz, Ligado Networks

[3] R4-2210572, WF on Introduction of LTE TDD band in 1670-1675 MHz

[4] R4-2213581, On band number for LTE TDD band in 1670-1675 MHz, Nokia, et. al.

[5] R4-2214105, Email discussion summary for [104-e][127] R18\_LTE\_TDD\_1.6GHz