3GPP TSG-RAN WG4 Meeting # 101-bis-e R4-2203016

Electronic Meeting, 17 – 25 January 2022

**Agenda Item:** **6.16.4**

**Source: Nokia**

**Title:** **WF on BS RF Tx requirements**

**Document for:** **Approval**

**1. Background**

Contributions on BS RF TX requirements for 52.6 – 71 GHz in RAN4#101-e have a variety of proposals:

[1] R4-2200136 Discussion on BS TX RF requirements for 52 6-71GHz CATT

[2] R4-2200411 Proposals on BS transmitter requirements for extending current NR operation to 71 GHz Nokia, Nokia Shanghai Bell

[3] R4-2200843 On BS RF transmitter requirements for the frequency range 52 to 71 GHz Ericsson

[4] R4-2201456 Further discussion on BS Tx requirements for 52.6-71GHz ZTE Corporation

[5] R4-2201821 Discussion on the remaining BS RF requirements for FR2-2: Tx requirements Huawei

The way forward from the discussion of the contributions are summarized as follows.

**2. Way forward**

**2.1 TAE**

- Inter-band CA: 3us.

- Contiguous intra-band CA (baseline assumption): 65 ns for 480 kHz SCS, 32.5 ns for 960 kHz SCS. RAN4 will make final decision on February RAN4#102-e meeting.

- Non-contiguous intra-band CA: [260 ns]. (Note: Whether the requirement need to be specified in Rel-17 specification pending on further confirmation whether NC CA is within Rel-17 scope).

- MIMO: Option 1 baseline assumption; RAN4 will make final decision on February RAN4#102-e meeting.

- Option 1: 65 ns for 480 kHz SCS, 32.5 ns for 960 kHz SCS.

- Option 2: 32.5 ns for 480 kHz, 16.25 ns for 960kHz SCS.

**2.2 EVM**

- Re-use 50% of the normal CP EVM window length for FR-2-2 for 120 kHz SCS.

- FFS for 480kHz and 960kHz SCSs; RAN4 will make conclusion on February RAN4#102-e meeting.

**2.3 Emissions: OBUE**

- ΔfOBUE = 3500 MHz for FDL,high – FDL,low > 4000 MHz for 52.6-71GHz.

 - FFS for the upper bound of FDL,high – FDL,low.

- OBUE limits as shown in Table 1 and Table 2 below:

**Table 1: OBUE limits (Category A) applicable in the frequency range 52.6 – 71 GHz**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter -3B point, Δf**  | **Frequency offset of measurement filter centre frequency, f\_offset** | **Limit** | ***Measurement bandwidth*** |
| 0 MHz ≤ Δf < 0.1\*BWcontiguous | 0.5 MHz ≤ f\_offset < 0.1\* BWcontiguous +0.5 MHz | Min(-5 dBm, Max(Prated,t,TRP – 31 dB, -12 dBm)) | 1 MHz |
| 0.1\*BWcontiguous ≤ Δf < Δfmax | 0.1\* BWcontiguous +0.5 MHz ≤ f\_offset < f\_ offsetmax | Min(-13 dBm, Max(Prated,t,TRP – 39 dB, -20 dBm)) | 1 MHz |
| NOTE 1: For *non-contiguous spectrum* operation within any *operating band* the limitwithin *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent *sub-blocks* on each side of the *sub-block gap*.  |

**Table 2: OBUE limits (Category B) applicable in the frequency range 52.6 – 71 GHz**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter -3 dB point, Δf**  | **Frequency offset of measurement filter centre frequency, f\_offset** | **Limit** | ***Measurement bandwidth*** |
| 0 MHz ≤ Δf < 0.1\*BWcontiguous | 0.5 MHz ≤ f\_offset < 0.1\* BWcontiguous +0.5 MHz | Min(-5 dBm, Max(Prated,t,TRP – 31 dB, -12 dBm)) | 1 MHz |
| 0.1\*BWcontiguous ≤ Δf < ΔfB | 0.1\* BWcontiguous +0.5 MHz ≤ f\_offset < ΔfB +0.5 MHz | Min(-13 dBm, Max(Prated,t,TRP – 39 dB, -20 dBm)) | 1 MHz |
| ΔfB ≤ Δf < Δfmax | ΔfB +5 MHz ≤ f\_offset < f\_ offsetmax | Min(-5 dBm, Max(Prated,t,TRP – 29 dB, -10 dBm)) | 10 MHz |
| NOTE 1: For non-contiguous spectrum operation within any *operating band* the limitwithin sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks on each side of the sub-block gap, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. NOTE 2: ΔfB = 2\*BWcontiguous when BWcontiguous ≤ 500 MHz, otherwise ΔfB = BWcontiguous + 500 MHz. |

**2.4 Emissions: Spurious emissions**

- Re-use Cat A and Cat B emission limits, with new step frequencies defined for Cat B.

- Step frequencies are set as in Table 3 below.

**Table 3: Step frequencies for defining the BS radiated Tx spurious emission limits in FR2 (Category B)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Operating band** | **Fstep,1(GHz)** | **Fstep,2(GHz)** | **Fstep,3(GHz) (Note 2)** | **Fstep,4(GHz) (Note 2)** | **Fstep,5(GHz)** | **Fstep,6(GHz)** |
| n257 | 18 | 23.5 | 25 | 31 | 32.5 | 41.5 |
| n258 | 18 | 21 | 22.75 | 29 | 30.75 | 40.5 |
| n259 | 23.5 | 35.5 | 38 | 45 | 47.5 | 59.5 |
| [Licensed band] | [46] | [61] | [62.5] | [74.5] | [76] | [91] |
| n263 | 18 | 43 | 53.5 | 74.5 | 85 | 127 |
| NOTE 1: Fstep,X are based on ERC Recommendation 74-01 [19], Annex 2.NOTE 2: Fstep,3 and Fstep,4 are aligned with the values for ΔfOBUE in Table 9.7.1-1. |