**Agenda item:** 4.3.1, 4.3.2.1, 4.3.2.2

**Source:** Moderator (Qualcomm Inc)

# New CA bandwidth classes for FR2-2

* Proposal [**R4-2216684**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216684.zip)(Intel)
* **Proposal 1:** Further discuss new CA bandwidth classes for FR2-2 in this meeting and consider the proposed classes captured below [3,4]:

|  |  |  |  |
| --- | --- | --- | --- |
| **NR CA BW class** | **Aggregated channel bandwidth** | **# cont. CC** | **Fallback group** |
| A | BWChannel ≤ 400 MHz | 1 | 1,2,3,4,5 |
| B | 400 MHz < BWChannel\_CA ≤ 800 MHz | 2 | 1 |
| C | 800 MHz < BWChannel\_CA ≤ 1200 MHz | 3 |
| V (Note 4) | 1200 MHz < BWChannel\_CA ≤ 1600 MHz | 4 |
| W (Note 4) | 1600 MHz < BWChannel\_CA ≤ 2000 MHz | 5 |
| NOTE 3: In this release of the specification, the minimum requirements for intra-band contiguous CA configurations apply for aggregated channel bandwidths up to 1600 MHz for FR2-1 (this note is not relevant for UE capability parsing by the network).  NOTE 4: In this release of the specification, this bandwidth class is applicable only for operating bands within FR2-2. | | | |

**Recommended WF:**

Discuss the proposal in round 1

|  |  |
| --- | --- |
| **Company** | **Comments** |
| QCOM | There seems to be a lot of additional work in analyzing and defining requirements for these wider CA BW classes. This may be something better evaluated for rel-18 rather than as a rel-17 maintenance feature. |
|  |  |

# Beam correspondence side conditions

*Side conditions for SSB and CSI-RS based L1-RSRP are missing for n263. Value are proposed using calculation method in 38.133 scaled for 100 MHz bandwidth and assuming fine beam (rahter than wide beam in 38.133).*

***Proposal: Apple (*[R](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2215659.zip)****[4-2215659](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2215659.zip)*)***

Table 1: Conditions for SSB based L1-RSRP measurements for beam correspondence

|  |  |
| --- | --- |
| **Band** | **Minimum SSB (dBm/SCSSBB)** |
| n257 | -96.2 |
| n258 | -96.2 |
| n259 | -90.7 |
| n260 | -91.9 |
| n261 | -96.2 |
| n262 | -88.5 |
| n263 | -88.2 |

Table 2: Conditions for CSI-RS based L1-RSRP measurements for beam correspondence

|  |  |
| --- | --- |
| **Band** | **Minimum CSI-RS (dBm/SCSSBB)** |
| n257 | -96.2 |
| n258 | -96.2 |
| n259 | -90.7 |
| n260 | -91.9 |
| n261 | -96.2 |
| n262 | -88.5 |
| n263 | -88.2 |

Recommended WF:

1. Agree the side conditions
2. Discuss the values in round 1

|  |  |
| --- | --- |
| **Company** | **Comments** |
| QCOM | We would like to understand why the referenced TR B.2.1.3.2 used a coarse beam assumption (and Z=7.0) for PC3 while Apple is saying the fine beam (Z=0) is the correct assumption. |
|  |  |
|  |  |

# Max TRP for PC3

*Max TRP is undefined to PC3*

*Proposal:* Update the max TRP for band n263 in Table 6.2.1.3-2 to 25 dBm.

Intel [**R4-2216683**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216683.zip)

*Recommended WF:*

Agree on the proposal

|  |  |
| --- | --- |
| **Company** | **Comments** |
| QCOM | We are ok with proposed WF |
| Nokia | We are okay to align to ETSI so the proposed WF is OK. |
|  |  |

# Max power limits for PC1

* Proposals (Intel [**R4-2216683**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216683.zip)**)**
  + **Proposal 2: Introduce band n263 to the maximum output power limits table of PC1 (Table 6.2.1.1-2) and capture the max TRP as 25 dBm.**
  + **Proposal 3: For fixed devices in FR2-2, capture the regulatory parameter maximum average EIRP = 40 dBm and add a note stating it is an average EIRP instead of a peak EIRP. Whether a separate note detailing the antenna gain/outdoor conditions is necessary can be further discussed.**

**Recommended WF:**

**Discuss both proposals**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| QCOM | Proposal 2 is probably ok.  For proposal 3 our understanding is the FCC specifies average but the duration of averaging is not clear. Is there an averaging duration we should specify? If we can arrive at a duration for averaging, then it seems reasonable to define requirements to for bother average and peak EIRP. |
| Nokia | Since the allowed TRP is the same as for PC3 we wonder if having separate PC1, even for fixed devices, is really needed. |

# PRACH ON Power measurement period

Proposal adds 480 and 960 SCS to the table.

Qualcomm [**R4-2216795**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216795.zip)

Table 6.3.3.4-1: PRACH ON power measurement period

|  |  |  |  |
| --- | --- | --- | --- |
| Format | SCS | Measurement period | Note |
| A1 | 60 kHz | 0.035677 ms |  |
|  | 120 kHz | 0.017839 ms |  |
|  | 480 kHz | 0.004460 ms |  |
|  | 960 kHz | 0.002230 ms |  |
| A2 | 60 kHz | 0.071354 ms |  |
|  | 120 kHz | 0.035677 ms |  |
|  | 480 kHz | 0.008919 ms |  |
|  | 960 kHz | 0.004460 ms |  |
| A3 | 60 kHz | 0.107031 ms |  |
|  | 120 kHz | 0.053516 ms |  |
|  | 480 kHz | 0.013379 ms |  |
|  | 960 kHz | 0.006690 ms |  |
| B1 | 60 kHz | 0.035091 ms |  |
|  | 120 kHz | 0.0175455 ms |  |
|  | 480 kHz | 0.004386 ms |  |
|  | 960 kHz | 0.002193 ms |  |
| B4 | 60 kHz | 0.207617 ms |  |
|  | 120 kHz | 0.103809 ms |  |
|  | 480 kHz | 0.025952 ms |  |
|  | 960 kHz | 0.012976 ms |  |
| A1/B1 | 60 kHz | 0.035677 ms for front X1 occasion 0.035091 ms for last occasion | X1 = [2,5] |
|  | 120 kHz | 0.017839 ms for front X1occasion 0.017546 ms for last occasion |
|  | 480 kHz | 0.004460 ms for front X1 occasion  0.004387 ms for last occasion |
|  | 960 kHz | 0.017839 ms for front X1occasion 0.017546 ms for last occasion |
| A2/B2 | 60 kHz | 0.071354 ms for front X2 occasion 0.069596 ms for last occasion | X2 = [1,2] |
|  | 120 kHz | 0.035677 ms for front X2 occasion 0.034798 ms for last occasion |
|  | 480 kHz | 0.008919 ms for front X2 occasion 0.008700 ms for last occasion |
|  | 960 kHz | 0.004460 ms for front X2 occasion 0.004350 ms for last occasion |
| A3/B3 | 60 kHz | 0.107031 ms for first occasion 0.104101 ms for second occasion |  |
|  | 120 kHz | 0.053515 ms for first occasion 0.052050 ms for second occasion |  |
|  | 480 kHz | 0.013379 ms for first occasion 0.013013 ms for second occasion |  |
|  | 960 kHz | 0.006689 ms for first occasion 0.006506 ms for second occasion |  |
| C0 | 60 kHz | 0.026758 ms |  |
|  | 120 kHz | 0.013379 ms |  |
|  | 480 kHz | 0.003345 ms |  |
|  | 960 kHz | 0.001672 ms |  |
| C2 | 60 kHz | 0.083333 ms |  |
|  | 120 kHz | 0.0416667 ms |  |
|  | 480 kHz | 0.010417 ms |  |
|  | 960 kHz | 0.005208 ms |  |
| NOTE: For PRACH on PRACH occasion start from begin of 0ms or 0.5 ms boundary, the measurement period will plus 0.032552 μs | | | |

Recommended WF:

Discuss the proposal in round 1

|  |  |
| --- | --- |
| **Company** | **Comments** |
| QCOM | We agree with the proposed table as RAN1 has defined PRACH for 480 and 960 SCS as described in out paper R4-2216795 |
| Nokia | We are okay with the proposed addition of 480 and 960 kHz SCS. |
|  |  |
|  |  |

# PTRS configuration note in EVM table

There is an existing IE where the UE can communicate it’s preferred PTES configuration. Proposal is to use this IE for EVM spec in 38.101-2/

**Proposal: Void NOTE 1 in FR2-2 EVM tables and add NOTE 2: PTRS is configured according to the UE preference in *ptrs-DensityRecommendationSetUL’***

Qualcomm [**R4-2216795**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216795.zip)

Proposed WF: Discuss in round 1

|  |  |
| --- | --- |
| **Company** | **Comments** |
| QCOM | We agree with the recommended WF |
| Nokia | We would like to better understand the implication of this change of notes. We can be fine with the EVM test should follow the IE indication (i.e UE PTRS preferences) but this shall not mandate the gNB operation to follow this IE in operation. |
|  |  |
|  |  |

# CRs to remove some of the []

One CR for TX and the other for RX

Proposed WF:

Agree the content of both CRs. Possibly create a revision of 6797 if we get some more agreements this meeting.

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| [**R4-2216797**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216797.zip) | QCOM: We agree the with content, however we may want to wait to see if we have more agreements, and then merge them into an updated CR. |
| Nokia: We are OK with the CR |
|  |
| [**R4-2216796**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216796.zip) | QCOM: We agree with this CR |
| Nokia: We are OK with the CR |
|  |

Charter

|  |  |  |
| --- | --- | --- |
| [**R4-2216430**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216430.zip) | Adding missing combinations with n48 and n263 | Charter Communications, Inc |

*Should we handle this in thread 102?*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| NR CA configuration | Uplink CA configuration | NR Band | Channel bandwidth (MHz) (NOTE 3) | Bandwidth combination set |
| CA\_n48(A-B)-n263K | CA\_n48A-n263A | n48 | CA\_n48(A-B) | 0 |
| n263 | CA\_n263K |
| CA\_n48(A-B)-n263L | CA\_n48A-n263A | n48 | CA\_n48(A-B) | 0 |
| n263 | CA\_n263L |
| CA\_n48(A-B)-n263M | CA\_n48A-n263A | n48 | CA\_n48(A-B) | 0 |

Proposed WF:

*Chair guidance whether this thread handles the CR*

*Further discuss CR*