**3GPP TSG-RAN WG4 Meeting # 104-e R4-2216940**

**Electronic Meeting, 10 – 19 October 2022**

**Agenda item:** 4.3.8

**Source:** Moderator (Qualcomm Inc)

**Title:** Email discussion summary for [104-bis-e][102]

**Document for:** Information

# Introduction

*This discussion pertains to agenda items highlighted:*

*4.3 Extending current NR operation to 71GHz [NR\_ext\_to\_71GHz]*

***4.3.1 Operation bands and system parameter maintenance [NR\_ext\_to\_71GHz-Core]***

***4.3.2 UE RF requirement maintenance [NR\_ext\_to\_71GHz-Core]***

***4.3.2.1 TX requirements [NR\_ext\_to\_71GHz-Core]***

***4.3.2.2 RX requirements [NR\_ext\_to\_71GHz-Core]***

It is appreciated that the delegates for this topic put their contact information in the table below.

Contact information

|  |  |  |
| --- | --- | --- |
| **Company** | **Name** | **Email address** |
| Qualcomm Inc | Phil Coan | pcoan@qti.qualcomm.com |
| Nokia | Johannes Hejselbaek | Johannes.hejselbaek@nokia.com |
| Huawei | Chunying Gu | guchunying@huawei.com |
| OPPO | Jinqiang Xing | xingjinqiang@oppo.com |
| Ericsson | Christian Bergljung | Christian.Bergljung@ericsson.com |
| LGE | Markus Pettersson | Markus.Pettersson@lge.com |
| Charter Communications Inc | Frank Azcuy | Frank.Azcuy@charter.com |
| Apple | Camila Priale | Cpriale@apple.com |
| Intel | Aida Vera Lopez | aida.l.vera.lopez@intel.com |
| DOCOMO | Ryu Kitagawa | ryuu.kitagawa.pn@nttdocomo.com |

Note:

1. Please add your contact information in above table once you make comments on this email thread.
2. If multiple delegates from the same company make comments on single email thread, please add you name as suffix after company name when make comments i.e. Company A (XX, XX)

# Topic: Maintenance topics for 60 GHz UE

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Title** | **Company** | **Proposal** |
| [**R4-2216684**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216684.zip) | System parameters maintenance for NR ext. to 71GHz | Intel Corporation | **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. |

 |
| [**R4-2215659**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2215659.zip) | Beam Correspondence for band n263 | Apple | Observation 1: The definition of side condition is required also when the beam correspondence without uplink beam sweeping is supported.Proposal 1: RAN4 shall apply the minimum SSB and minimum CSI-RS as provided in Table 1 and Table 2 for band n263.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 |

 |
| **[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 | Adding combinations CA\_n48(A-B)-n263K/L/M |
| [**R4-2216683**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216683.zip) | FR2-2 maintenance aspects for UE Tx | Intel Corporation | *Maximum TRP for PC3***Proposal 1:** Update the max TRP for band n263 in Table 6.2.1.3-2 to 25 dBm.*Maximum power limits for PC1***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.**Observation 1:** The FCC limits for fixed devices are 43 dBm for max peak EIRP and 40 dBm for max average EIRP. For 13 dBi ≤ GAnt < 30 dBi, the max average EIRP limit for ETSI is also 40 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.*RAN #97e discussion***Observation 2:** The following content was added to the work item’s status report [RP-222655] during RAN #97e:* Beam-direction switching time
	+ For Rel-17, no agreement was made on the FR2-2 specific beam-direction switching time value.
* Improved ON/ON transient period
	+ For Rel-17, no agreement was made to have an enhanced FR2-2 specific ON/ON transient period capability. Consequently, the current FR2 ON/ON transient period (5µs) also applies to FR2-2.
 |
| [**R4-2216795**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216795.zip) | 60 GHz UE PRACH and PTRS capabilities | Qualcomm France | **Proposal : PRACH ON power measurement period table should be updated for 480 and 960 SCS as shown. (R4-2216795)****Proposal: Void NOTE 1 in FR2-2 EVM tables and add NOTE 2: PTRS is configured according to the UE preference in *ptrs-DensityRecommendationSetUL’***  |
| [**R4-2216797**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216797.zip) | CR to 38.101-2 on band n263 UE Tx aspects | Qualcomm France | **CR to 38.101-2 removes [] for****6.2.2.1 UE maximum output power reduction for power class 1****6.2.2.3 UE maximum output power reduction for power class 3****Remove square brackets from MPR numbers****6.2A.2.2.1 Maximum output power reduction for power class 1 intra-band contiguous UL CA****6.2A.2.4.1 Maximum output power reduction for power class 3 intra-band contiguous CA****6.4.2.1 Error vector magnitude : parameters** |
| [**R4-2216796**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216796.zip) | CR to 38.101-2 on band n263 UE Rx aspects | Qualcomm France | **CR removes [] for****7.3.2.1 Reference sensitivity power level for power class 1 : Uplink configuration****7.3A.2.1 Intra-band contiguous CA : EIS relaxation**  |

## Open issues summary

*Before e-Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### New CA bandwidth classes for FR2-2

*Sub-topic description*

*Open issues and candidate options before e-meeting:*

**Issue**

* Proposals

**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 proposal 1 in round 1

### Beam correspondence side conditions

*Sub-topic description*

*Open issues and candidate options before e-meeting:*

**Issue**

* Proposals
* Proposal 1: RAN4 shall apply the minimum SSB and minimum CSI-RS as provided in Table 1 and Table 2 for band n263.

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
	+ discuss the proposal for Table 1 and Table 2 SSB and CSI-RS L1-RSRP measurement conditions

### Max TRP for PC3

*Sub-topic description*

*Open issues and candidate options before e-meeting:*

* Proposals
	+ **Proposal 1: Update the max TRP for band n263 in Table 6.2.1.3-2 to 25 dBm.**
* Recommended WF
	+ Discuss proposal 1

### Max power limits for PC1

*Sub-topic description*

*Open issues and candidate options before e-meeting:*

* Proposals
	+ **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 proposal 2 and proposal 3

### PRACH ON power measurement period for 480 and 960 SCS

*Sub-topic description*

*Open issues and candidate options before e-meeting:*

* Proposals

**Proposal : PRACH ON power measurement period table should be updated for 480 and 960 SCS as shown. (R4-2216795)**

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 occasion0.035091 ms for last occasion | X1 = [2,5] |
|  | 120 kHz | 0.017839 ms for front X1occasion0.017546 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 X1occasion0.017546 ms for last occasion |
| A2/B2 | 60 kHz | 0.071354 ms for front X2 occasion0.069596 ms for last occasion | X2 = [1,2] |
|  | 120 kHz | 0.035677 ms for front X2 occasion0.034798 ms for last occasion |
|  | 480 kHz | 0.008919 ms for front X2 occasion0.008700 ms for last occasion |
|  | 960 kHz | 0.004460 ms for front X2 occasion0.004350 ms for last occasion |
| A3/B3 | 60 kHz | 0.107031 ms for first occasion0.104101 ms for second occasion |  |
|  | 120 kHz | 0.053515 ms for first occasion0.052050 ms for second occasion |  |
|  | 480 kHz | 0.013379 ms for first occasion0.013013 ms for second occasion |  |
|  | 960 kHz | 0.006689 ms for first occasion0.006506 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

### PTRS configured per ‘***ptrs-DensityRecommendationSetUL’***

*Sub-topic description*

*Open issues and candidate options before e-meeting:*

**Issue**

* Proposals

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

* Recommended WF
	+ Agree with the proposal for NOTE1 and NOTE2. Capture this in a CR for this meeting.

## Companies views’ collection for 1st round

### Open issues

**New CA bandwidth classes V and W for FR2-2 to extend max CA BW from 1200 to 2000 MHz**

|  |  |
| --- | --- |
| **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. |
| HW | Agree with Qualcomm’s comment. |
| GTW Oct 11 | Qualcomm: we are not sure to include this bandwidth classes now. It should be Rel-18 work. |
| Ericsson: we agree with Qualcomm this needs further discussion. Release independency applies. |
| Intel: we had agreement in the previous meeting to further discuss them. |
| Ericsson | Limiting the new classes to FR2-2 only in this release not straightforward should new bands combinations in FR2-1 be specified with these BW classes in a later release. We could accept removing ‘in this release’ from the proposed NOTE 4 and restrict V and W to band combinations in FR2-2. FBG1 would then effectively be tailored for FR2-2 and band combinations with n\*400 MHz aggregated bandwidth (B and C also for FR2-1 and already in existing band combinations ). |
| Apple | We agree with Qualcomm’s suggestion to discuss the new CA BW Classes in Rel-18. |
| Intel | As we noted in GTW session, in RAN4 #104e we agreed that discussions for new CA bandwidth classes for FR2-2 are allowed during maintenance of the WI (R4-2214422).We are ok with Ericsson’s edit to remove “in this release” from NOTE 4. |

Moderator: Continue discussion in round 2

**Beam correspondence side conditions**

|  |  |
| --- | --- |
| **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. |
| HW | For RF requirement, the side condition of BC was calculated based on fine beam spherical requirements.One question is, based on the equation provided in the document, the BC condition should be proportional to the spherical coverage requirement. Given the spherical coverage requirement of n263 is 0.5dB higher than n262 (-66.2 vs -66.7), maybe it’s better to set the BC side condition to -88.0dBm. |
| GTW Oct 11 | Qualcomm: why the assumption |
| Apple: in RRM the measurement requierment is defined under the coarse beam. In FR we use the fine beam, and there is no 7 dB assumption. |
| Huawei: SSB and CSI-RS side conditions should be proportional to spherical coverage requirement. Can we use -88.0 for side condition? |
| Apple: This is true and we have to consider the calculation. We are open. |
| Apple | FR2-1 bands side conditions were defined using 50 MHz CBW and FR2-2 was calculated with 100 MHz, since band n263 started from CBW 100 MHz.We agree with Huawei’s comment that we need an alignment between bands. Since band n263 has no 50 MHz CBW, we propose to consider the 0.2 delta to our proposal. Thus, our updated proposal is: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 | **-88.0** |

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 | **-88.0** |

If these values can be agreed by all companies, we would like to ask that the Tables to be included in the CR (**[R4-2216797](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216797.zip))** |

Tentative agreement:

* Agree the modified Table with -88.0 as compromise worked out between Apple and Huawei
* Incorporate the change in a revised version of 6797
* Topic is settled

**Max TRP for PC3**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| QCOM | We are ok with proposed WF |
| Nokia | We are okay to align to ETSI so the proposed WF is OK. |
| HW | OK with the proposal |
| Ericsson | We support the WF. What is the maximum EIRP for PC3 with NS\_200? |

Agreement GTW Oct 11:

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

**Max power limits for PC1**

|  |  |
| --- | --- |
| **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.  |
| HW | For Proposal 3, the definition of average EIRP needs to be further clarified in the specification. |
| OPPO | For average EIRP, does it same as the EIRP CDF 50% requirement? If it is, then seems we will have two EIRP CDF requirements. |
| GTW Oct 11 | Qualcomm: averaging. In RAN4 do we need to provide the averaging? FCC do the average, should RAN4 do the same. |
| Nokia: is there really need to do for PC1? Aligned with Qualcomm comment. |
| Intel: averaging or peak was discussed previously. We propose to follow the approach for PC3. We capture the parameters for all the power classes. We would like to keep the requirements complete. |
| Ericsson | Proposal 2: may be acceptable, would be consistent with requirements for fixed equipment used in mobile applications as specified in EN 303 753 and ‘almost’ with the requirement for fixed SRD systems in the EU.Proposal 3: why not use an NS value indicating the average EIRP requirement like for FR2-2 PC3 and NS\_204? The power class would be verified the requisite averaging as indicated by the said NS value. |
| Intel | As proponents, we support both proposals.Regarding Proposal 3, we suggested capturing the regulatory max average EIRP for two reasons:* This is how it was captured for PC3 in Table 6.2.1.3-2, along with NOTE 1
	+ We can further discuss if additional notes are needed
* ETSI does not specify a max peak EIRP; they have a max mean EIRP, and its value is the same as the FCC max average EIRP (40 dBm)
 |
| DOCOMO | I would like to know the definition of average EIRP. |

Proposed WF:

* Tentative Agreement proposal 2: **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.**
* Further discuss proposal 3 in round 2

**PRACH ON power measurement period**

|  |  |
| --- | --- |
| **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. |
| GTW Oct 11 | Apple: need some time to check. |
| LGE | We are OK with the proposal |
| Apple | (2nd round) - Since this issue is not mentioned in the below part of the document for the second round, we are commenting here:We are ok with the numbers shared in this proposal. Thanks to the companies for providing the additional time to check. |

Proposed WF:

* Tentative agreement: Agree the table in 6795

**PTRS configuration**

|  |  |
| --- | --- |
| **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.  |
| HW | If the test configuration depends on UE’s signaling, the test result might be misaligned among different UEs. |
| OPPO | As commented in last meeting, PTRS based on UE claim will lead to different configurations in the conformance testing which is different from traditional conformance testing and certification principle that a unified test configuration for all UEs. Has the proponent checked with RAN5 view on this whether it is acceptable to them? Though we understand the reason of this proposal. |
| GTW Oct 11 | Ericsson: we would like to consider it further. We would like to consider the value in demodualtion test to make the test more feasible rather than going with wider range. |
| Ericsson | A specific configuration must be defined for the tests. We propose use of the K = 2 L = 1 configuration that has been used for demod requirements since Rel-15. We also propose to deprioritize EVM requirements for 960 kHz in view of agreements in the BS and UE demod sessions only to consider 120 kHz and 480 kHz SCS. |
| LGE | We agree with the proposed WF. We would not like to deprioritize 960kHz from RF core requirements. This would lead to 2000MHz CBW to become open. |
| Apple | We agree with the proposed WF. |
|  |  |

Proposed WF: Further discuss in round 2

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **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 |
| HW: OK with the CR |
| LGE: We are OK with the CR |
| Apple: We would like to ask to include the BC side conditions. We have updated the proposal in 1.3.1 based on Huawei’s comment in the GTW. |
|  | Intel: As QCOM noted, new agreements should be included in a revised 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 |
| HW: OK with the CR |
| LGE: We are OK with the CR |
| **[R4-2216430](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216430.zip)****revised to****R4-2217028** | **Chair email:**R4-2216430 is a Rel-17 Cat B CR. The WI code is NR\_CADC\_R17\_2BDL\_xBUL-Core which was also the closed Rel-17 WI. The Cat B CR for the closed WI is not allowed according to 3GPP rule.I can move it to [102] to have discussions and review  since it is related to 71GHz. But in the end no Rel-17 Cat B CR for closed Rel-17 WI will be allowed. It should be Rel-18 Cat B CR with Rel-18 proper WI code.To Frank, in my view, Rel-18 Cat B CR would be OK since the introduction of band combination is release independent. |
| Charter Comm: Thank you moderator for adding this tdoc to the discussion. A bit of a background. As you know we got approval to add a combinations with fr1+ fr2-2 and we used n48 and n263. This was approved in the last revision of 38.101-1 17.7 under the NR\_ext\_71 GHz WID code. Three combinations were missing from this release. This cr intends to add these missing combinations. Now the problem is that there is no Rel 18 38.101-1 specification to do a cr against. The latest spec is version 17.7. So a cr against this spec is a Rel -17 CR. If done under the ext 71 GHz WID then is a maintenance cr, but chair says this cannot be done but if done as a Rel -18 cr under the basket wid code, there is no spec for Rel 18 38.101-3. The groups guidance is much appreciated.Charter Comm (2): After discussing this offline with rapporteur for NR\_CADC\_R18\_2BDL\_xBUL-Core, he suggested to do a draft CR to 38.101-3 to add the missing combinations as a CAT B change to Rel -18. I will upload a draft copy for reviewCharter Comm(3): revision 1 fixes a typo. This is a draft for 38.101-3 not 38.101-1 |
| CHTTL: as commented on the reflector, basically these combos are under the basket WI, R18 NR CA and DC basket WID RP-222079. So the procedure of the basket needs to be followed, draft CR should be used, and the WI code should be NR\_CADC\_R18\_2BDL\_xBUL, also the release on the cover page is Rel-18.So the v2 is ok. (Maybe next time it is preferred not to say “missing combo” when adding new configuration to avoid confusing) |
|  |

## Summary for 1st round

## Discussion on 2nd round

### New CA bandwidth classes V and W for FR2-2 to extend max CA BW from 1200 to 2000 MHz

* Discussion: Can companies please comment on the pros and cons of introducing classes V and W

***Proposed WF: TBA***

|  |  |  |
| --- | --- | --- |
| **Company** | **Reasons for/against proposal for rel17 maint** | **Reasons for/against discussing in rel18** |
| QCOM | Against: We have then additional work for band combo sets to settle in rel17, and our view there is time to do this in rel18. Ours is not however a strong objection and we are open to other companies’ views | For: Gives us time in rel18 to sort of band combo sets |
| Intel | For: We have an agreement to discuss CA bandwidth classes during maintenance (R4-2214422). Given the approved channel bandwidths for FR2-2, the two new classes need to be discussed. As we commented earlier, we are ok with Ericsson’s edit to remove “in this release” from NOTE 4. | Against: Following previous agreement, we should address in maintenance. Considering the approved bandwidths for FR2-2, we should discuss classes from 1200 and 2000 MHz |
|  |  |  |
|  |  |  |
|  |  |  |

***Moderator: Companies are still split 3 for rel 18 (Qualcomm, Apple,Huawe) 2 for rel 17 (Ericsson and Intel). We don’t have an agreement.***

### Max power limits for PC1

#### Max power limits for PC1

*Option 1: 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. (Intel)*

***Proposed WF: Option 1***

|  |  |
| --- | --- |
| **Company** | **Comments** |
| QCOM | We are OK with the proposed WF Option 1 |
| LGE | We are OK with the proposed Option 1 |
| Intel | We support the proposed WF |
| DOCOMO | We are OK with the proposed Option 1. (We are Our question we commented in the 1st round was cleared up.) |

***Tentative agreement: Option 1 agreed and will be implemented in TX CR.***

#### Definition of average:

*Option 1: Define the average in some way in RAN4.*

*Option 2: Leave ‘average’ undefined in RAN4*

***Proposed WF: Option 2***

|  |  |
| --- | --- |
| **Company** | **Comments** |
| QCOM | Our view RAN4 does not need to define. RAN5 can consider what ‘average’ means and will construct the conformance appropriately. |
| LGE | Agree with Qualcomm opinion above |
| HW | It’s preferred to clearly specify the meaning of ‘average peak EIRP’. The terminology just pops up from nowhere. I’m not sure if every reader of the specification understands how to derive it.If companies are reluctant to introduce a specific measurement period, at least it needs to be clarified the ‘average’ is in time domain. Maybe the definition could be added in section 3. |
| Intel | This limit is a regulatory requirement (not a performance one); we do not need to discuss this.If clarity is needed, the average power is time averaged during the transmit “on time”. |
| DOCOMO | We don't have a strong opinion. If it will be defined, we prefer to clarify that the ‘average’ is in time domain. |

***Moderator: Companies are split. We don’t have an agreement on this one.***

### PTRS configured per ‘ptrs-DensityRecommendationSetUL’

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

*Option 2: agree option 1 along with use of the K = 2 L = 1 configuration that has been used for demod requirements since Rel-15.*

***Proposed WF: TBA***

|  |  |
| --- | --- |
| **Company** | **Comments** |
| QCOM | Option 1: Definitely not Option 2. It doesn’t allow the UE to determine the configuration which is the entire point of the IE. From our previous tdocs it can be seen that some phase noise profiles we studied benefit from PTRS and others can be degraded by PTRS for some modulation orders. One UE would communicate different configuration than other UEs to the TE. Generally PTRS will help, however this IE provides some flexibility for different UE phase noise performance.To Nokia our understanding is the BS is not obligated to follow the IE request. Our discussion here is solely related to the conformance test. Our view is that the BS should honor the UE request to enable the best EVM performance but that has nothing to do with what we are discussing here.The same topic is being discussed in 131 issue 2-2-1 and at this point 7 companies are for Option 1 while 2 are against. |
| LGE | Option 1. We can see the rationale for both views (as above), but think that it’s important that there is no need to optimize the UE performance against several targets (Conformance test being different than normal use case), as this means that none of them gives the best performance (many local sub-optimum vs. one global optimum from UE perspective). |
| Apple | Option 1. |
| Ericsson | Option 2. A specific configuration needs to be specified for the conformance test. |

***Moderator: Companies are split 3 to 1. We don’t have an agreement on this one.***

### CR R4-2217028 Adding missing combinations with n48 and n263

*Option 1: Approve this CR*

*Option 2: Comments or issues with the CR*

***Proposed WF: Option 1***

|  |  |
| --- | --- |
| **Company** | **Comments** |
| QCOM | Ok with the WF Option 1 |
| LGE | We are OK with option 1 |
| Intel | We are ok with the proposed WF |

***Tentative agreement: Companies support this CR..***

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **New Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2217056 | CR to 38.101-2 on band n263 UE Tx aspects | Qualcomm | Revision of R4-2216797 |
| R4-2217090 | WF on 60 GHz Operation bands and system parameter and UE RF requirement maintenance  | Qualcomm | Capture agreements that do not flow into endorsed CR |

**Existing tdocs**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tdoc number** | **Revised to** | **Title** | **Source** | **Recommendation**  | **Comments** |
| [**R4-2216684**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216684.zip) |  | System parameters maintenance for NR ext. to 71GHz | Intel Corporation | Noted |  |
| [**R4-2215659**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2215659.zip) |  | Beam Correspondence for band n263 | Apple | Noted |  |
| [**R4-2216683**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216683.zip) |  | FR2-2 maintenance aspects for UE Tx | Intel Corporation | Noted |  |
| [**R4-2216795**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216795.zip) |  | 60 GHz UE PRACH and PTRS capabilities | Qualcomm France | Noted |  |
| [**R4-2216797**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216797.zip) | R4-2217056 | CR to 38.101-2 on band n263 UE Tx aspects | Qualcomm France |  | Agree the content of this CR but a revison is needed to add * the PTRS side condition proposal from Apple
* The PRACH ON power measurement proposal from Qualcomm
* any other TX agreements
 |
| [**R4-2216796**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216796.zip) |  | CR to 38.101-2 on band n263 UE Rx aspects | Qualcomm France | Endorsed |  |
| [**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 | Not Pursued |  |
| **R4-2217028** |  | draft CR 38.101-3 to add missing combinations with n48 and n263 | Charter Communications, Inc |  |  |
|  |  |  |  | Agreeable, Revised, Merged, Postponed, Not Pursued |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
	1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
	2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents

## 2nd round

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tdoc number** | **Revised to** | **Title** | **Source** | **Recommendation**  | **Comments** |
| R4-22xxxxx |  | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-22xxxxx |  | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-22xxxxx |  | LS on … | ZZZ | Agreeable, Revised, Noted |  |
| **R4-2217028** |  | draft CR 38.101-3 to add missing combinations with n48 and n263 | Charter Communications, Inc | Endorsed |  |
| **[R4-2216797](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216797.zip)** | R4-2217056 | CR to 38.101-2 on band n263 UE Tx aspects | Qualcomm France | Endorsed | Agree the content of this CR but a revison is needed to add * the PTRS side condition proposal from Apple
* The PRACH ON power measurement proposal from Qualcomm

any other TX agreements |
| R4-2217090 |  | WF on 60 GHz Operation bands and system parameter and UE RF requirement maintenance  | Qualcomm | TBD | Capture agreements that do not flow into endorsed CR |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics.
2. For the Recommendation column please include one of the following:
	1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
	2. Other documents: Agreeable, Revised, Noted
3. Do not include hyper-links in the documents