**3GPP TSG-RAN4 Meeting #102-e *R4-220xxxx***

**Electronic Meeting, 21 February – 3 March, 2022**

**Agenda item:** 4.1.6, 4.1.7

**Source:** Moderator (Huawei)

**Title:** Email discussion summary for [102-e][201] Maintenance\_R15\_NR\_RRM

**Document for:** Information

# Introduction

The scope of this email discussion includes the following agenda items:

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| 4.1.6 RRM core requirements (38.133/36.133) [NR\_newRAT-Core]  4.1.7 RRM performance requirements (38.133/36.133) [NR\_newRAT-Perf] |

In providing comments, companies are encouraged to:

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# Topic #1: Rel-15 NR RRM core requirements

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc** | **Company** | **Proposals / Observations** |
| [**R4-2203593**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203593.zip) | ZTE Corporation | CR:  Specify that the cell phase sync requirements are measured at either antenna connectors or RIBs. |
| [**R4-2203799**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203799.zip) | Apple | CR (36133):  Correct the note 1 in tables of section 8.1.2.4.21.1.1 for correct reference to TS36.133 section 5: DRX status definition. |
| [**R4-2203837**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203837.zip) | Qualcomm Incorporated | CR:  Removed the description related to UE reporting CQI before completing SCell activation and reporting L1-RSRP before completing first L1-RSRP measurement. |
| [**R4-2204178**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204178.zip) | MediaTek inc. | Proposal 1: RAN4 to specify the applicable DRX cycle for the infer-frequency measurement requirement in NR-DC and NE-DC mode  Proposal 2: In NR-DC mode, the applicable DRX cycle for the infer-frequency measurement requirement follows the maximum of configured MCG DRX cycle and SCG DRX cycle  Proposal 3: In NE-DC mode, the applicable DRX cycle for the infer-frequency measurement requirement follows the maximum of configured MCG DRX cycle and SCG DRX cycle |
| [**R4-2204179**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204179.zip) | MediaTek inc. | CR:  Changes as proposed in R4-2204178 |
| [**R4-2204308**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204308.zip) | OPPO | CR:  Remove the cell-ranking criteria for inter-RAT measurements. |
| [**R4-2204544**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204544.zip) | Nokia, Nokia Shanghai Bell | Proposal 1: For the case where the MCG and the SCG configure an inter-frequency or an inter-RAT measurement on a common ssbFrequency, no clarifications are needed.  Proposal 2: For the case in which an inter-frequency or an inter-RAT measurement is configured on a serving carrier, no clarifications are needed. |
| [**R4-2204552**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204552.zip) | OPPO | CR (36133):  Remove the cell-ranking criteria for inter-RAT measurements subject to CCA. |
| [**R4-2204802**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204802.zip) | vivo | CR:  Add corresponding text for measurement accuracy for inter-RAT LTE cell identification requirements |
| [**R4-2204838**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204838.zip) | Huawei, Hisilicon | CR:  Interruption requirements for SCell addition/ activation are updated for the case when SMTC or SSB configuration is not provided for the SCell. |
| [**R4-2204841**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204841.zip) | Huawei, Hisilicon | CR (36133):  Interruption requirements for SCell addition/ activation are updated for the case when SMTC or SSB configuration is not provided for the SCell. |
| [**R4-2205341**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205341.zip) | Huawei, HiSilicon, Apple | CR:  Update SCell activation delay requirements  1. Remove [] around 2400ms  2. Add UE capability scellWithoutSSB to FR1 SSB-less requirements  3. Correct the description for FR1 unknown case |
| [**R4-2205342**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205342.zip) | Huawei, HiSilicon, Apple | CR for Rel-16 due to spec difference:  Update SCell activation delay requirements  1. Remove [] around 2400ms  2. Add UE capability scellWithoutSSB to FR1 SSB-less requirements |
| [**R4-2205344**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205344.zip) | Huawei, HiSilicon | CR:  1. Correct the clause number for the applicable requirements for inter-frequency RSTD measurement in EN-DC.  2. Remove [] in requirements for inter-frequency RSTD requirements for LTE SA. |
| [**R4-2205406**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205406.zip) | ZTE Corporation | CR:  Specify in general symbols and abbreviations that the measurement is done at either antenna connectors or RIBs. |
| [**R4-2205518**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205518.zip) | Ericsson | Proposal 1: RAN4 to introduce the max function for timer T = max(10s, [K1]\*N1\*M1\*DRX cycles), where N1 is defined in Table 4.2.2.2-1, and K1 is 16 if DRX cycle is 0.32s, 8 if DRX cycle is 0.64s, otherwise, K1 = 4.  Proposal 2: DRX cycle for NR-DC inter-frequency case shall follow the principles agreed for intra-frequency measurements.  Proposal 3: DRX cycle for NE-DC shall be follow the principles mentioned in below table.   |  |  |  | | --- | --- | --- | | **NE-DC** |  | **Applicable DRX** | | Measurement objects configured by MN | Inter-frequency NR | Follow MCG DRX configuration and state | | Inter-RAT LTE  (36.133 8.17.4) | Follow SCG DRX configuration and state | | Follow MCG DRX configuration and state | | Measurement objects configured by SN | Inter-frequency NR (38.133 9.3) | |
| [**R4-2205519**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205519.zip) | Ericsson | CR:  Changes as proposed in R4-2205518 |

## Open issues summary

Note: Only issues proposed in discussion papers are listed in this section. For other issues proposed via CR, comments can be provided in section 1.3.2 to the CRs directly. If some issues are found controversial based on 1st round discussion, new open issues can be added in the 2nd round if needed.

### Sub-topic 1-1: Measurement requirements

#### Issue 1-1-1: Applicable DRX cycle for measurmenet in NE-DC and NR-DC

* Proposals
  + Option 1 (MTK R4-2204178)
    - RAN4 to specify the applicable DRX cycle for the inter-frequency measurement requirement in NR-DC and NE-DC mode
    - In NR-DC mode, the applicable DRX cycle for the inter-frequency measurement requirement follows the maximum of configured MCG DRX cycle and SCG DRX cycle
    - In NE-DC mode, the applicable DRX cycle for the inter-frequency measurement requirement follows the maximum of configured MCG DRX cycle and SCG DRX cycle
  + Option 2 (Nokia R4-2204544)
    - For the case where the MCG and the SCG configure an inter-frequency or an inter-RAT measurement on a common ssbFrequency, no clarifications are needed.
    - For the case in which an inter-frequency or an inter-RAT measurement is configured on a serving carrier, no clarifications are needed.
    - *Moderator’s Note: proposals in Option 2 are based on the following observations.*
      * If the UE has received two independent measurement configurations containing measurement objects with different *ssbFrequency*, one for MCG and another for SCG, the UE applies the DRX cycle of the CG that is associated with the measurement.
      * When the UE receives two independent measurement configurations, one from MCG and one for the SCG, with measurement objects with the same *ssbFrequency*, the UE shall fulfil the requirements in both MCG and SCG. To fulfil the current minimum requirements, the UE must use the shortest DRX cycle of MCG and SCG, for the UE to ensure that the UE can fulfil the measurement requirements with a single physical measurement.
      * In order to fulfil current measurement requirements, if the UE has received two independent measurement configurations containing measurement objects with the same *ssbFrequency*, one for MCG and another for SCG, and the *ssbFrequency* is the same as a serving cell carrier, in either MCG or SCG, the UE applies the DRX cycle of the CG that contains this serving cell.
  + Option 3 (Ericsson R4-2205518)
    - DRX cycle for NR-DC inter-frequency case shall follow the principles agreed for intra-frequency measurements.
    - DRX cycle for NE-DC shall be follow the principles mentioned in below table.
    - *Moderator’s Note: the table is updated based on offline clarification with Ericsson.*

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| --- | --- | --- |
| **NE-DC** |  | **Applicable DRX** |
| Measurement objects configured by MN | Inter-frequency NR | Follow MCG DRX configuration and state |
| Inter-RAT LTE  (36.133 8.17.4) | Follow SCG DRX configuration and state |

* Recommended WF
  + Further discuss the options

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| --- | --- |
| **Company** | **Comments** |
| MTK | Support Option 1.  Option 2 and Option 3 would have backward compatibility issues to the UEs on the market.  Besides, there would be some cases in Option 3 /2 are not covered, e.g.  · NR-DC (FR1-FR2) inter-RAT LTE  · NE-DC Inter-RAT UTRA/ GSM |
| Apple | Support option 1 which can make all the UE implementation meet the requirement if such clarification is added |

### Sub-topic 1-2: Idle mode mobility

#### Issue 1-2-1: FR2 cell reselection in Idle mode

* Proposals
  + Option 1 (Ericsson R4-2205518)
    - RAN4 to introduce the max function for timer T = max(10s, [K1]\*N1\*M1\*DRX cycles), where N1 is defined in Table 4.2.2.2-1, and K1 is 16 if DRX cycle is 0.32s, 8 if DRX cycle is 0.64s, otherwise, K1 = 4.

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| If the UE in RRC\_IDLE has not found any new suitable cell based on searches and measurements using the intra-frequency, inter-frequency and inter-RAT information indicated in the system information for 10 s, the UE shall initiate cell selection procedures for the selected PLMN as defined in TS 38.304 [1]. |

* Recommended WF
  + Further discuss is option 1 is agreeable

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| --- | --- |
| **Company** | **Comments** |
| MTK | We can support Option 1, because there is no backward capability issue observed. |
| Apple | Since R15 UE is on the market, we are wondering: if companies want to have this revision, could it be introduced in late release, e.g., R17. |

## Companies views’ collection for 1st round

### Open issues

### CRs/TPs comments collection

1. Cat-A draftCRs are not listed for comments.
2. R4-2204552 from OPPO is to be treated in email 203 and hence not listed.
3. R4-2119443 from Ericsson, Intel, Huawei, HiSilicon, Qualcomm is not listed, and it will be treated in email 233.

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| **CR/TP number** | **Comments collection** |
| R4-2203593 (ZTE) | Maintenance for cell phase synchronization accuracy |
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| R4-2203799 (Apple) | Draft CR on core part maintenance for TS36.133 R15 |
| MTK: OK. Follow serving cell RAT makes sense. |
|  |
| R4-2203837 (QC) | draft Cat-F CR (R15) to SCell Activation Core |
| MTK: We observe there are many CRs addressing the same issues (including core and perf) have been submitted into many WIs. And we suggest to have Technical discussion in Rel-15. Other WIs just follow the conclusion, in order to have a consistent solution.  We disagree with this CR to remove the UE behavior related to "out of range".  We see no contradiction between RAN1 and RAN4 spec. RAN4 spec can be modified to capture RAN1 behavior.  Even with RAN1 spec, we do not need to delete the paragraph entirely. With this sentence removed, it seems like UE has to report accurate CQI values as long as the CSI-RS is received by UE. This sounds risky. It is still possible that UE receives the CSI-RS but UE has not completed the SCell activation. |
| Apple: We think the revision is not necessary, because this issue has been discussed in RAN1 (the email discussion summary in RAN1 is R1-2112685) and no any spec change is concluded. The common understanding is RAN1 would follow RAN4 and no change is needed, but some companies didn’t think it’s necessary to capture any conclusion without spec change, as duplicated below,  All companies agree with the following UE behavior,  In terms of UE CSI report during SCell activation, from the slot specified in clause 4.3 of TS 38.213 to the time when UE completes the SCell activation (i.e., reports a valid CQI), UE shall report Out of Range (OOR) for CQI and lowest valid SS-RSRP range for L1-RSRP, as specified in 38.133  However, there are companies objecting to capture any conclusion without specification change.  From Chair, “Since there is no conclusion or specification change from this email thread (and I expect no further discussions in future meetings), we close this email thread and reject R1-2111846”. |
| R4-2204179 (MTK) | CR on TS38.133 for applicable DRX cycle in NR-DC and NE-DC inter-frequency measurement  Moderator: related to 1-1-1 |
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| R4-2204308 (OPPO) | Draft CR to maintain inter-RAT measurements in TS 36.133 |
| MTK: OK. |
|  |
| R4-2204802 (vivo) | Draft CR on R15 inter-RAT LTE measurement |
| MTK: OK. |
|  |
| R4-2204838 (HW) | Correction to SCell Interruptions requirements\_EUTRA\_R15 |
| MTK: OK. But would be a typo in the cover page, the following reason should be for case a – SSB-less, isn’t it? “*For case b), assume SMTC duration is 0ms since UE doesn't need to perform AGC on SCell being added in this case*.” |
|  |
| R4-2204841 (HW) | Correction to SCell Interruptions requirements\_NR\_R15 |
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| R4-2205341 (HW, Apple) | CR on SCell activation delay requirements 38133 R15 |
| MTK: One clarification on this change:  If the is known and belongs to FR1, provided that the side condition Ês/Iot ≥ -2dB is fulfilled, then Tactivation\_time is:  - TFirstSSB\_MAX + TSMTC\_MAX + 2\*Trs + 5ms  Should it be known or unknown? And should is requirement to be aligned with R16’s version as the following?  *If the SCell is unknown and belongs to FR1, and if one of the following conditions is met*  *- ‘ssb-PositionInBurst’ indicates only one SSB is being actually transmitted, or*  *- ‘ssb-PositionInBurst’ indicates multiple SSBs and TCI indication is provided in same MAC PDU with SCell activation,*  *provided that the side condition Ês/Iot ≥ -2dB is fulfilled, Tactivation\_time is:*  *- TFirstSSB\_MAX + TSMTC\_MAX + Trs + 5ms, if the following conditions are met,*  *- the SCell is contiguous to an active serving cell in the same band, and*  *- its ssb-PositionInBurst is same as the one of contiguous FR1 active serving cell, and*  *- its SMTC offset is same as the one of contiguous FR1 active serving cell, and*  *- its RTD with contiguous FR1 active serving cell is smaller than or equal to 260ns with respect to the to-be-activated SCell’s SSB numerology, and its reception power difference with contiguous FR1 active serving cell is smaller than or equal to 6dB;*  *- TFirstSSB\_MAX + TSMTC\_MAX + 2\*Trs + 5ms, otherwise.* |
|  |
| R4-2205342 (HW, Apple) | CR on SCell activation delay requirements 38133 R16 |
| MTK: OK. |
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| R4-2205344 (HW) | CR on RSTD measurement requirements 36133 R15 |
| MTK: OK. |
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| R4-2205406 (ZTE) | [draft CR] R15 Maintenance for 38133 |
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| R4-2205519 (Ericsson) | draftCR on RRM remaining issues - r15  Moderator: change #1 related to 1-2-1, change #2 and #3 are for other issues. |
| MTK: OK with change #1, #2 and #3. |
| Apple:  Change 2: the revision of “up to 1 UL SCell in each CG” is also confusing. Based on the 38.101-3, could it only focus on PCell UL and PSCell UL and no other UL on SCell?  Change 3: for the carrier number capability, we would like to check with other companies if RRM capability should be same as RF capability? If the answer is Yes, then not only the UL carrier number but also the DL carrier number shall be updated based on TS38.101.  For instance, in R15 TS38.133, DL NR carrier number of EN-DC is defined as:  - up to 7 NR DL CCs in total, with 1 UL (or 2 UL if SUL is configured) in PSCell and up to 1 UL (or 2 UL if SUL is configured) in SCell in different FR with PSCell.  However, in TS38.101-3, the DL NR carrier number for EN-DC BC of “DC\_2A\_n260M” is 8. |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

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|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

*Recommendations on WF/LS assignment*

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| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

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| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #1: Rel-15 NR RRM performance requirements

## Companies’ contributions summary

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| **T-doc** | **Company** | **Proposals / Observations** |
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| [**R4-2203563**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203563.zip) | Anritsu Corporation | CR:  a) Defined new BWP configurations DLBWP.1.4 and ULBWP.1.4 to confine the allocated resource blocks to 24 RBs in general test parameter. Then changed associated parameters in the test parameter tables.  b) Added test parameter “BWchannel” and “Data RBs allocated” in general test parameter tables. |
| [**R4-2203564**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203564.zip) | Anritsu Corporation | CR for Rel-16 due to spec difference:  a) Defined new BWP configurations DLBWP.1.4 and ULBWP.1.4 to confine the allocated resource blocks to 24 RBs in general test parameter. Then changed associated parameters in the test parameter tables.  b) Added test parameter “BWchannel” and “Data RBs allocated” in general test parameter tables.  c) Corrected parameter names in Table A.5.5.1.6.1-3. |
| [**R4-2203565**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203565.zip) | Anritsu Corporation | CR for Rel-17 due to spec difference:  a) Defined new BWP configurations DLBWP.1.4 and ULBWP.1.4 to confine the allocated resource blocks to 24 RBs in general test parameter. Then changed associated parameters in the test parameter tables.  b) Added test parameter “BWchannel” and “Data RBs allocated” in general test parameter tables.  c) Corrected parameter names in cell specific test parameter tables. |
| [**R4-2203566**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203566.zip) | Anritsu Corporation | Proposal 1: Ginter is defined in the TS 38.133 independently from other relaxation factors.  Proposal 2: Ginter is applied to both the lower bound and upper bound of the test requirement for the relative SS-RSRP accuracy test.  Proposal 3: Gain reduction (D) is applied to the lower bound of the test requirement for the relative SS-RSRP accuracy test.  Observation 1: The idea to add the full volume of Y (i.e. 7 dB for PC3 UE) to the upper bound is not aligned with the current UE design which has fine beam and rough beam.  Observation 2: Actual gain differences between fine beam and rough beam for both beam peak direction (Y’) and spherical coverage direction (Z’) should be similar.  Observation 3: It is questionable that the new relaxation Y should be added to the upper bound of the test requirement.  Observation 4: Since the relaxation factor (1) and (2) has no correlation, it is natural that we define them independently and apply to the test requirement. |
| [**R4-2203567**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203567.zip) | Anritsu Corporation, MediaTek Inc. | CR:  • For the FR2 SS-RSRP Inter frequency relative accuracy in Table 10.1.5.1.2-1, refer to accuracy relaxation Ginter when the pair of cells are in different operating bands.  • For the FR2 SS-RSRP relative accuracy test requirement in Tables A.5.7.1.2.3-2 and A.7.7.1.2.3-2, add new parameters Ginter and D.  • Specify parameter Ginter in new clause B.2.1.5.2  • Specify parameter D in new clause B.2.1.5.3 |
| [**R4-2203570**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203570.zip) | Anritsu Corporation | CR:  (1) Test specification clean up :  - Removed erroneous clause concerning PSCell (Cell 2) transmission/ reception gap during Scell (Cell 3) BWP switching.  - Added UL BWP Configurations.  - Other editorial corrections.  (2) Change the name in Table A.4.7.5.1.2-3 and Table A.8.5.1.1.2-4 from “Configuration” to “Condition”.  (3) Added TRS configuration in Table A.6.3.2.1.3.1-3.  (4) Update cl. A.6.3.2.3.1.2 Test Parameters to include description that Cell 1 and Cell 2 belong to different tracking areas.  (5) Added specific THARQ settings in the general test parameters in Table A.6.5.3.1.1-2, and modified the comment column.  (6) Added separate CSI Report offset settings for the CSI reports for the PCell and SCell in Table A.6.5.3.1.1-3.  (7) Added a note updating the CSI-RS offset settings cell-specific test parameters table in Table A.6.5.3.1.1-3.  (8) Updated Active BWP ID in Table A.6.5.6.1.1.1-3:  ・Cell 1: 1, 2 🡪 0  ・Cell 2: 3 🡪 1, 2  Added missing TRS config |
| [**R4-2203596**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203596.zip) | Rohde & Schwarz | CR:  In TCs A.5.5.8.1, A.5.5.8.2, A.7.5.8.1, A.7.5.8.2 time multiplexing figures added for T1 and T2. The format followed in the one from RLM 2AoA TCs, with the difference, that OCNG is also switched from AoA1 to AoA2, since OP5 pattern assumes OCNG only in serving beam, which is in fact switched. |
| [**R4-2203599**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203599.zip) | Rohde & Schwarz | CR:  Dedicated CORSET reference channels CCR.1.1 FDD, CCR.1.1 TDD, CCR.2.1 TDD added, according to the similar non-inter-RAT TCs A.6.7.1.1, A.6.7.2.1, A.6.7.3.1. |
| [**R4-2203602**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203602.zip) | Rohde & Schwarz | CR:  In all intra-frequency event triggered measurement test cases, set the connection-related transmission parameters (RMC, TRS etc) for the neighbour cell to N/A. |
| [**R4-2203802**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203802.zip) | Apple | CR:  Add Es level to Table A.5.7.1.1.2-3: SS-RSRP Intra frequency OTA related test parameters |
| [**R4-2203831**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203831.zip) | Qualcomm Incorporated | CR:  Add note “When DRX is configured, PDSCH is scheduled only while drx-onDurationTimer is running, unless otherwise specified in the test case” to PDSCH RMCs |
| [**R4-2203834**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203834.zip) | Qualcomm Incorporated | CR:  For TC on E-UTRAN – NR FR2 interruptions at transitions between active and non-active during DRX in synchronous EN-DC  - Updated T1 value to 6.25 seconds.  - Removed the rate of correct events from test requirements. |
| [**R4-2203840**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203840.zip) | Qualcomm Incorporated | CR:  Remove the description related to UE reporting CQI before completing SCell activation and reporting L1-RSRP before completing first L1-RSRP measurement. |
| [**R4-2203892**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203892.zip) | CATT | CR:  Correct D1 and T2/T3 in TC for Radio Link Monitoring Out-of-sync Test for FR1 PCell configured with CSI-RS-based RLM in non-DRX mode |
| [**R4-2204371**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204371.zip) | MediaTek Inc. | CR:  For TCs on RRC-based Active BWP Switch, clarify the start of T1 by separating the original wording into two cases:   * NR RRC message RRCReconfiguration is embedded in E-UTRA RRC message * NR RRC message RRCReconfiguration is not embedded in E-UTRA RRC message. |
| [**R4-2204374**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204374.zip) | MediaTek Inc. | Proposal 1: For the relative inter-frequency accuracy requirement, the following two additional margins should be considered:  (1) Mis-alignment between fine beam and rough beam  (2) Different antenna gain on different bands  Proposal 2: For the test case of FR2 inter-frequency relative RSRP accuracy, to add 5.5 (D) dB and 8.5 (D+ Ginter) dB margin in the lower bound for intra-band and inter-band, respectively, where  (1) D (Mis-alignment between fine beam and rough beam) = 5.5  (2) Ginter (Different antenna gain on different bands) = 3  Proposal 3: For the test case of FR2 inter-frequency relative RSRP accuracy, to add 3 (Ginter) dB margin in the upper bound for inter-band, where  (1) Different antenna gain on different bands (Ginter) = 3 dB |
| [**R4-2204844**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204844.zip) | Huawei, Hisilicon | CR:  measCycleSCell in TC A.4.5.3.2 and 6.5.3.2 (SCell activation TCs) are changed to 640ms. |
| [**R4-2204847**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204847.zip) | Huawei, Hisilicon | CR:  1. OffsetMO is changed to cellIndividualOffset in FR2 intra-frequency measurement without DRX TCs.  2. Io in FR2 intra-frequency measurement without DRX TCs are updated.  3. Value of rsrp-ThresholdSSB in FR2 BFD TCs are corrected.  4. Unit for Noc in CSI-RS based BFD TCs are corrected.  5. reportQuantity in FR2 TCs involving CSI reporting is changed to "cri-RI-PMI-CQI".  6. CSI reporting configuration is added in several FR2 TCs.  7. Antenna configuration 2X2 is added in FR2 RLM/BFD TCs.  8. Typos are corrected. |
| [**R4-2204856**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204856.zip) | Huawei, Hisilicon | Proposal 1:  Define additional margin in lower bound in FR2 inter-frequency relative RSRP accuracy TC:  • Margin due to misalignment between fine beam and rough beam (D), and  • Margin due to different antenna gain on different bands (Ginter)  Define additional margin in upper bound in FR2 inter-frequency relative RSRP accuracy TC:  • Y defined for each UE power class in Table B.2.1.3.1-1, TS 38.133 |
| [**R4-2205073**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205073.zip) | Ericsson | CR:  - A.7.3.2.1.1: Add parameters ‘BWchannel’ and ‘Data RBs allocated’ to align with A.7.3.2.1.2.  - A.7.3.2.1.2: Set Io value of T2/T3 in Cell 1 and T1/T2 in Cell 2 to align with A.7.3.2.1.1.  - \* Io = -83.1 + 10log10(24\*12) = -58.506. |
| [**R4-2205074**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205074.zip) | Ericsson | CR for Rel-16 due to spec difference:  - 6.2.1: It refers the wrong sub clauses B.2.x and they are not aligned with TS38.133 V15.16.0.  - A.7.3.2.1.1: Add parameters ‘BWchannel’ and ‘Data RBs allocated’ to align with A.7.3.2.1.2.  - A.7.3.2.1.2: Set Io value of T2/T3 in Cell 1 and T1/T2 in Cell 2 to align with A.7.3.2.1.1.  - \* Io = -83.1 + 10log10(24\*12) = -58.506. |

## Open issues summary

Note: Only issues proposed in discussion papers are listed in this section. For other issues proposed via CR, comments can be provided in section 1.3.2 to the CRs directly. If some issues are found controversial based on 1st round discussion, new open issues can be added in the 2nd round if needed.

### Sub-topic 2-1: FR2 inter-frequency relative RSRP accuracy

Moderator’s Note: the following table shows the AoA setup in FR2 inter-frequency relative RSRP accuracy TCs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Config** | **Unit** | **Test 1** | | **Test 2** | |
|  |  |  | **Cell 1** | **Cell 2** | **Cell 1** | **Cell 2** |
| Angle of arrival configuration | 1~2 |  | Setup 4b according to clause A.3.15.4.2 | | Setup 4b according to clause A.3.15.4.2 | |
|  |  |  | AoA1  Spherical coverage | AoA2  Rx Beam Peak | AoA1  Spherical coverage | AoA2  Rx Beam Peak |
| Assumption for UE beamsNote 7 | 1~2 |  | Rough | | Rough | |

Moderator’s Note: the following table shows the current test requirements in FR2 inter-frequency relative RSRP accuracy TCs

|  |  |
| --- | --- |
|  | **Test requirement Notes1,2,3,4** |
| Cell 2 – Cell 1 | SSB\_RP2 - SSB\_RP1 -δ ≤ Reported RSRP(dB) ≤ SSB\_RP2 - SSB\_RP1 +δ–(X) |
| Note 1: SSB\_RPn is the equivalent power received by an antenna with 0dBi gain at the centre of the quiet zone configured in the test for the cell n under consideration  Note 2: δ is the RSRP relative accuracy requirement from Table 10.1.5.1.2-1  Note 3: Void  Note 4: X is the Spherical coverage gain difference in dB, derived as (UE Refsens - UE Spherical coverage) from TS 38.101-2 [19] clauses 7.3.2 and 7.3.4, selected according to the UE power class and operating band. X is always a negative value. | |

Moderator’s Note: the following additional margins have been discussed in companies’ contributions

* D: margin due to mis-alignment between fine beam and rough beam
* Ginter: margin due to different antenna gain on different bands
* E: margin due to difference between Y’ and Z’
  + Y’: actual gain difference between fine and rough beam at peak direction
  + Z’: actual gain difference between fine and rough beam at spherical coverage direction

#### Issue 2-1-1: additional margins to the lower bound

* Proposals
  + Option 1 (Anritsu, MTK, HW)
    - Add the following margin to the lower bound when two cells are in different bands
      * D + Ginter
    - Add the following margin to the lower bound when two cells are in same band
      * D
* Recommended WF
  + Further discuss if option 1 is agreeable

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Apple | In general, analysis from companies on D and Ginter makes sense to us. One comment on Ginter: since this comes from RF transceiver gain difference, separation in frequency between two carriers plays a role here. Note that it doesn’t mean Ginter needs to be considered only for inter-band case. Frequency separation between the two carriers can be small between two band, e.g. between two low bands or two high bands. Furthermore, frequency separation could also be quite large for two carriers within the same band, e.g. up to 4GHz according to table 5.2-1 in TS38.101:   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 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 | | |  | | n257 | 26500 MHz | – | 29500 MHz | 26500 MHz | – | 29500 MHz | TDD | | n258 | 24250 MHz | – | 27500 MHz | 24250 MHz | – | 27500 MHz | TDD | | n259 | 39500 MHz | – | 43500 MHz | 39500 MHz | – | 43500 MHz | TDD | | n260 | 37000 MHz | – | 40000 MHz | 37000 MHz | – | 40000 MHz | TDD | | n261 | 27500 MHz | – | 28350 MHz | 27500 MHz | – | 28350 MHz | TDD |   We were wondering if Ginter shall also be considered even for intra-band inter-frequency case.  On the other hand, considering forward compatibility, in higher frequency bands such FR2-2 the frequency separation between two carriers in the same band could be even much larger than existing FR2-1, this issue would become non-negligible. |
|  |  |

#### Issue 2-1-2: additional margins to the upper bound

* Proposals
  + Option 1 (Anritsu, MTK)
    - Add the following margin to the upper bound when two cells are in different bands
      * Ginter
    - No margin is added to the lower bound when two cells are in same band
  + Option 2 (HW)
    - Add the following margin to the upper bound when two cells are in different bands
      * Ginter + E
    - Add the following margin to the lower bound when two cells are in same band
      * E
* Recommended WF
  + Further discuss the options

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Anritsu | On the margin E for option 2. It is appreciated if proponent provides a little more detail with regards to the mechanism on how the antenna gain of rough beam can be increased close to the one for fine beam at the beam peak direction, while a gain deference between the fine and rough beam at spherical coverage direction still exists. Does it mean a number of activated antenna elements differ between the peak direction and spherical coverage direction?  It is also appreciated if other chip vendors and UE vendors can confirm whether that kind of UE behavior can be observed.  For reference, I'd like to excerpt corresponding texts from R4-2204856.  “For instance, if the gain at AoA1 rough beam coverage is exact Z dB (defined in Table B.2.1.3.1-1) lower than AoA1 fine beam coverage, and the gain at AoA2 rough beam peak is close to the gain of fine beam peak. Then the actual difference could be larger than –X.” |
| Apple | Similar comment on Ginter as 2-1-1. Regarding E, we support to consider this on top of Ginter. Analysis from [R4-2204856](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204856.zip) makes sense to us. -X may not represent the actual maximum gain difference, especially for UE which has better performance than the minimum requirement of reference sensitivity. |

#### Issue 2-1-3: exact values for different margins

* Proposals for D
  + Option 1 (Anritsu, MTK)
    - 5.5dB
* Proposals for Ginter
  + Option 1 (Anritsu, MTK)
    - 3dB
* Proposals for E
  + Option 1 (HW)
    - Same value as Y

Table B.2.1.3.1-1: Gain difference Y between fine and rough beams, Rx beam peak direction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Value “Y” in dB, for each UE power class | | | | |
| 1 | 2 | 3 | 4 | 5 |
| FFS | 9.0 | 7.0 | FFS | FFS |

* Recommended WF
  + Further discuss the options for each possible margin D, Ginter and E.

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Anritsu | We assume adding whole volume of Y is not aligned with the assumption that a UE equips both fine beam and rough beam settings. Anyway, we’d like to suggest deferring the discussion on the margin E until the outcome of issue 2-1-2. |
| Apple | We are fine with all proposals above on D, Ginter and E. |

## Companies views’ collection for 1st round

### Open issues

### CRs/TPs comments collection

1. Cat-A draftCRs are not listed for comments.

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2203563 (Anritsu) | Reduction of allocated RBs for CSI-RS based RLM TC in FR2 R15 |
|  |
|  |
| R4-2203564 (Anritsu) | Reduction of allocated RBs for CSI-RS based RLM TC in FR2 R16 |
|  |
|  |
| R4-2203565 (Anritsu) | Reduction of allocated RBs for CSI-RS based RLM TC in FR2 R17 |
|  |
|  |
| R4-2203567 (Anritsu) | Correction on the FR2 inter-frequency relative RSRP accuracy  Moderator: related to 2-1-1 and 2-1-2 |
|  |
|  |
| R4-2203570 (Anritsu) | Draft CR to maintain performance requirement |
| Anritsu: Though this draft CR was submitted from us, we’d like to make 2 comments, one is the suggestion to revert changes at A.4.5.6.1.2.2, and the other is a question to the group also for TC A.4.5.6.1.2. It is appreciated if we can hear a view from companies on 2) below.   1. We realized that the changes made to A.4.5.6.1.2.2, i.e. removing the term “DL” from texts, are not appropriate since it’s explicitly mentioned that DL slot boundary shall be used as the start point of BWP switching delay. Thus, we’d like to revert those changes. 2. Related to the reason for change (1), we’d like to clarify if the test case A.4.5.6.1.2 needs a UL CA setting. In this draft CR, we proposed to add UL BWP configurations at Table A.4.5.6.1.2.1-3. The original motivation with the change is to align the configuration with the Table A.6.5.6.1.1.1-3, which is the standalone test case A.6.5.6.1.1 (A.4.5.6.1.2 is NSA TC), and it was previously corrected by R4-2113960 in Aug. 2021. However, considering the test purpose of both A.4.5.6.1.2 and A.6.5.6.1.1, we now assume that the UL BWP configurations are necessary only for PScell (A.4.5.6.1.2) or PCell (A.6.5.6.1.1) and the UL BWP configurations for SCell are not necessary as also proposed on the cover sheet of R4-2113960.   Our new proposed corrections for Table A.4.5.6.1.2.1-3 are as follows.  Also though it is not included in this original draft CR (R4-2203570), the active UL BWP configuration in Table A.6.5.6.1.1.1-3 should also be as follows. |
|  |
| R4-2203596 (R&S) | Draft CR to TS 38.133: Corrections to active TCI state switch test cases (Rel 15) |
| Anritsu: Numbering of figures are duplicated such as Figure A.5.5.8.1.1.1-1, A.5.5.8.2.1.1-1, A.7.5.8.1.1.1-1, etc. |
|  |
| R4-2203599 (R&S) | Draft CR to TS 38.133: Corrections to inter-RAT measurement test cases (Rel 15) |
|  |
|  |
| R4-2203602 (R&S) | Draft CR to TS 38.133: Corrections to intra-frequency event triggered test cases (Rel 15) |
| Anritsu: Changes at CORESET are fine to us. However as for BWP configurations, the initial BWP configuration shall remain as is for the sake of implementation clarity. |
|  |
| R4-2203802 (Apple) | Draft CR on performance part maintenance for TS38.133 R15 |
| Anritsu: We assume the addition of Es values are not necessary based on the previous discussion for the associated CR (R4-2111865), which are captured in topic summary R4-2115377.  Corresponding texts are excerpted as follows.  **To Huawei** comments from the 1st round. In the RAN5 test specs and TT analysis we have to make a clear distinction between:  - Key parameters, which have an uncertainty value. These must be independent and minimum set  - Derived parameters, which are usually Es/Iot, SSB\_RP and Io.  The Key parameters with an uncertainty value must be independent and minimum set, otherwise the TT analysis process to calculate the overall uncertainty does not work (mathematically invalid).  The derived parameters can all be calculated from the Key parameters. This is what Note 1 is saying “Es/Iot, SSB\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves”.  In Test 1, Noc and Es/Noc are the key parameters (parameters settable by the test system). If we specify Noc, Es/Noc and Es in Test 1, they are not a minimum set and it becomes confusing for RAN5 which uncertainties to specify.  In Test 2, Es is the key parameter. When there is no noise, it’s the only one set by the test system.  All the derived parameters are listed in Note 1. |
|  |
| R4-2203831 (QC) | draft Cat-F CR (R15) to PDSCH RMC |
| Anritsu: We have a concern with the change.  RRM RMC already have a restriction of PDSCH scheduling during SMTC duration as stated in Note1.  In many RRM TC like A.6.6.1.2, OnDuration of DRx config for many RRM TCs is scheduled on SMTC duration. Thus in the test cases, the network cannot send any PDSCH under RRM RMC due to confliction of note 1 and note 7. |
|  |
| R4-2203834 (QC) | draft Cat-F CR (R15) to E-UTRAN - NR FR2 interruptions at transitions between active and non-active during DRX in Xsynchronous EN-DC A.5.5.2.x |
|  |
|  |
| R4-2203840 (QC) | draft Cat-F CR (R15) to SCell Activation Test Cases |
| Anritsu: We would like QC to check our CR (R4-2203570) whether the associated proposal can work. We assume the description in the current specification is correct and there are already descriptions to send CSI Report at the timing after m+k from Scell activation. We have a similar comment to Rel-16 CR R4-2203847. (in topic group #202) |
|  |
| R4-2203892 (CATT) | Draft CR on radio link monitoring test cases |
| Anritsu: Could CATT give a little more explanation with the issue? We have a precedent of PASS data with the original time duration. |
|  |
| R4-2204371 (MTK) | CR for the RRC based BWP switch test case in EN-DC for R15 |
|  |
|  |
| R4-2204844 (HW) | Correction of R15 FR1 test cases and RMCs\_R15 |
|  |
|  |
| R4-2204847 (HW) | Correction of R15 FR2 test cases and RMCs\_R15 |
|  |
|  |
| R4-2205073 (Ericsson) | draft CR: Correction of SA RRC re-establishment tests in FR2 Rel-15 |
|  |
|  |
| R4-2205074 (Ericsson) | draft CR: Correction of SA RRC re-establishment tests in FR2 Rel-16 |
|  |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on … | YYY |  |
| LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
|  |  |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | 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** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-210xxxx | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-210xxxx | LS on … | ZZZ | Agreeable, Revised, Noted |  |
|  |  |  |  |  |

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

Annex

Contact information

|  |  |  |
| --- | --- | --- |
| **Company** | **Name** | **Email address** |
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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)