**3GPP TSG-RAN WG4 Meeting #103-e R4-221xxxx**

**Online Meeting, May 09– May 20 2022**

**Source: RAN4 vice chair (Samsung)**

**Title:** **RAN4#103-e BS\_Demod\_Testing Session meeting minutes**

**Agenda Item:** **2**

**Document for:** **Information**

## 4 Up to Rel-16 maintenance for LTE and NR

### 4.1 NR WIs

#### 4.1.2 BS RF requirements

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**Email discussion for [103-e][301] BSRF\_Maintenance, AI 4.1.2,5.3.1,9.6.1, 9.6.3– Johan Sköld**

**R4-2210307 Email discussion summary for [103-e][301] BSRF\_Maintenance**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210504 (from R4-2210307).**

**R4-2210504 Email discussion summary for [103-e][301] BSRF\_Maintenance**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

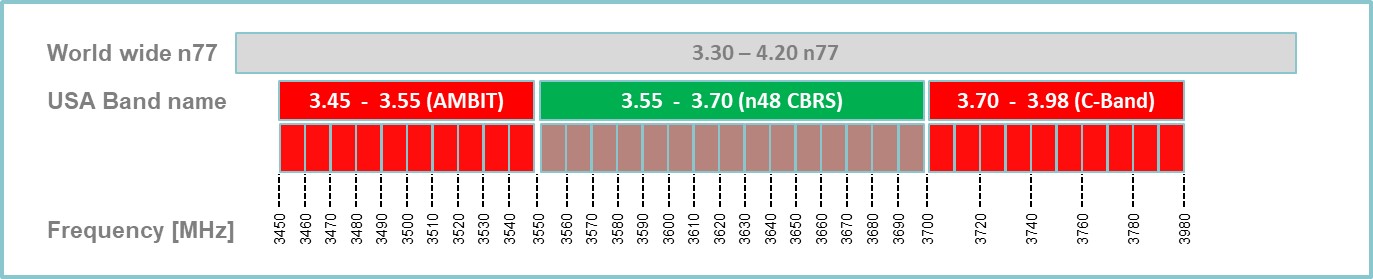
**Discussion:**

**Decision: Noted.**

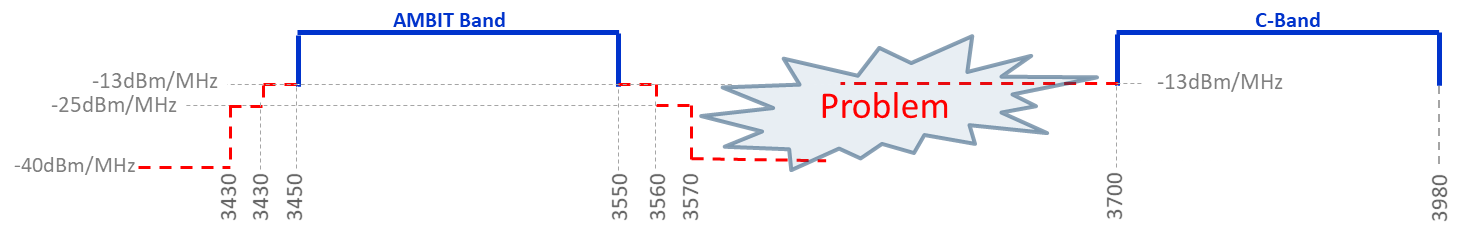
**GTW discussion on May 18th**

**[301] Issue 1-2: Additional BS Spurious emissions for Band n77**

* There are three options in the [301] Subtopic 1-2 discussions
  + Option 0: No change.
  + Option 1: Add a note to Table 6.6.5.2.3-11 Additional BS Spurious emission limits for Band 77 and add the same note to Table 6.6.4.2.1-2 Wide band BS Operating band unwanted emission limits.  
    Proposed note text: “For a BS transmitting non-contiguous CA of 3.45-3.55 GHz and 3.70-3.98 GHz in the USA, the BS out of band emission in the CBRS band must meet all the USA FCC requirements for 3.45-3.55 GHz out of band emission per “47 CFR 27.53(n) 3.45 GHz Service”, and Table 6.6.5.2.3-1”
  + Option 2: Add a note to Table 6.6.5.2.3-11 Additional BS Spurious emission limits for Band 77   
    Propose note text: Same as above.
* Recommended WF
  + To be discussed at GTW.

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**Figure 1: n77 and n48 Spectrum [GHz] (from R4-2209608)**

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**Figure 2: Out of band emissions from 3.45-3.55 GHz and 3.70-3.89 GHz (from R4-2209608)**

**Discussion:**

* Ericsson: We don’t think the note is needed for CA case since we already FCC requirements in band n48.
* Nokia: We already shared the comment in 1st round discussion. We think such note not needed since we already have generic requirements and specific requirements for FCC in the specifications.
* AT&T: We support the view as Ericsson and Nokia. There is no need for additional note into specification.
* Charter: We think such note needed to avoid ambiguity. For the suggestion from Huawei on the wording, we are fine.
* Cablelabs: We support the view from Charter.
* Nokia: We have different view as Charter. 3GPP requirements already clarify regional requirements applicability for specific frequency ranges.
* Ericsson: FCC limits only apply for specific frequency ranges which independence of CA or non-CA.
* Charter: We think CA is new feature and would like to avoid ambiguity for such scenario. The signal from C-band generates interference may cause the block to signal from AMBIT band.
* AT&T: As operator, we can ensure the deployment which not bring issues to other NW deployment.

Agreement: Further discuss this issue in future RAN4 meeting whether RAN4 specification needs to be clarified.

**Conclusion after 2nd round**

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| **Tdoc number** | **Title** | **Source** | **Comments** |

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| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210691 | Draft CR for TS 38.104 R16: correction of some mistakes in the co-existence table (Rel-16) | CATT | Endorsed |  |
| R4-2210692 | draft CR 38.104 to address compliance for spurious emissions in C-band in the US for non-contiguous aggregation between 3.45-3.55 MHz and 3.7-3.98 MHz | Charter Communications, Inc | R4-2207704  Not pursued  R4-2210692 withdrawn |  |
| R4-2210693 | Draft CR to TS 37.145-2 on clarifications of interfering signal for the OTA transmitter intermodulation requirement (REL15) | Huawei, Nokia, Ericsson | Endorsed |  |
| R4-2210694 | CR to 37.141: Corrections to notes in OBUE requirements | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2210695 | Draft CR for TS 38.174 R17: correction of the co-existence and co-location tables | CATT | Endorsed |  |
| R4-2210696 | Draft CR for TS 38.176-2 R16: correction of the co-existence test requirements | CATT | Endorsed |  |
| R4-2210697 | Draft CR for TS 38.176-2 R17: correction of the co-existence and co-location test requirements | CATT | Endorsed |  |
| R4-2210698 | Draft CR for TS 38.141-2 R17: correction of BS type 1-O co-existence table | CATT | Endorsed |  |
| R4-2210699 | Keysight Technologies UK Ltd | CR to 38.141-2: BS FR2 OBUE Cat B requirement table note clarification (6.7.4.5.2) (Rel-17) | Endorsed |  |
| R4-2210700 | CR to TS 38.141-2: Introduction of 1024 QAM in FR1 | Ericsson | Not pursued |  |
| R4-2208536 | CR to TR 38.921: Addition of additional BS antenna parameters in subclause 8.1 (Rel-17) | Ericsson | Not pursued |  |
| R4-2209646 | Draft CR to TS 38.104: NR frequency band table notes corrections, Rel-16 | Huawei, HiSilicon | Endorsed |  |
| R4-2209647 | Draft CR to TS 38.104: NR frequency band table notes corrections, Rel-17 | Huawei, HiSilicon | Endorsed |  |
| R4-2207911 | Draft CR to TS 38.104 on clarifications of interfering signal for the OTA transmitter intermodulation requirement | Nokia, Nokia Shanghai Bell, Ericsson, Huawei | Endorsed |  |
| R4-2207912 | Draft CR to TS 38.104 on clarifications of interfering signal for the OTA transmitter intermodulation requirement | Nokia, Nokia Shanghai Bell, Ericsson, Huawei | Endorsed |  |
| R4-2207913 | Draft CR to TS 38.104 on clarifications of interfering signal for the OTA transmitter intermodulation requirement | Nokia, Nokia Shanghai Bell, Ericsson, Huawei | Endorsed |  |
| R4-2210031 | Draft CR to TS 38.141-2 on clarifications of interfering signal for the OTA transmitter intermodulation requirement | Ericsson, Huawei, Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2210032 | Draft CR to TS 38.141-2 on clarifications of interfering signal for the OTA transmitter intermodulation requirement | Ericsson, Huawei, Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2210033 | Draft CR to TS 38.141-2 on clarifications of interfering signal for the OTA transmitter intermodulation requirement | Ericsson, Huawei, Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2210023 | Draft CR to TS 37.105 on clarifications of interfering signal for the OTA transmitter intermodulation requirement (REL15) | Huawei, Nokia, Ericsson | Endorsed |  |
| R4-2210024 | Draft CR to TS 37.105 on clarifications of interfering signal for the OTA transmitter intermodulation requirement (REL16) | Huawei, Nokia, Ericsson | Endorsed |  |
| R4-2210025 | Draft CR to TS 37.105 on clarifications of interfering signal for the OTA transmitter intermodulation requirement (REL17) | Huawei, Nokia, Ericsson | Endorsed |  |
| R4-2208120 | Draft CR for TS 38.176-1 R17: correction of the co-existence and co-location tables | CATT | Endorsed |  |
| R4-2209648 | Draft CR to TS 38.104: Additional Tx spurious emissions terminology corrections (basic limit, maximum level, minimum requirement), Rel-16 | Huawei, HiSilicon | Endorsed |  |
| R4-2209649 | Draft CR to TS 38.104: Additional Tx spurious emissions terminology corrections (basic limit, maximum level, minimum requirement), Rel-17 | Huawei, HiSilicon | Endorsed |  |
| R4-2209810 | Draft CR to TS 38.104 with clarifications of BS type for band n96 | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2209811 | Draft CR to TS 38.104 with clarifications of BS type for band n96 and n102 | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2209812 | Draft CR to TS 38.141-1 with clarifications of BS type for band n96 | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2209813 | Draft CR to TS 38.141-1 with clarifications of BS type for band n96 and n102 | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2207914 | Draft CR to TS 37.141 on corrections of test configurations | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2207915 | Draft CR to TS 37.141 on corrections of test configurations | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2207916 | Draft CR to TS 37.145-1 on corrections of test configurations | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2207917 | Draft CR to TS 37.145-1 on corrections of test configurations | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2207918 | Draft CR to TS 37.145-2 on corrections of test configurations | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2207919 | Draft CR to TS 37.145-2 on corrections of test configurations | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2209729 | CR to 37.104: Corrections to notes in OBUE requirements | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2209730 | CR to 37.104: Corrections to notes in OBUE requirements | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2209731 | CR to 37.104: Corrections to notes in OBUE requirements | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2208791 | CR to 38.141-1: BS RF conformance requirements for 1024QAM in FR1 | NEC | Agreed |  |
| R4-2208793 | CR to 37.141: BS RF conformance requirements for 1024QAM in FR1 | NEC | Agreed |  |
| R4-2208794 | CR to 37.145-1: BS RF conformance requirements for 1024QAM in FR1 | NEC | Agreed |  |
| R4-2208795 | CR to 37.145-2: BS RF conformance requirements for 1024QAM in FR1 | NEC | Agreed |  |
| R4-2209063 | CR: Introduction of RMC for 1024QAM maximum input level | Ericsson | Agreed |  |
| R4-2208792 | CR to 38.141-2: BS RF conformance requirements for 1024QAM in FR1 | NEC | Not pursued |  |

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**R4-2208130 Draft CR for TS 38.104 R16: correction of some mistakes in the co-existence table**

*Type: draftCR For: Endorsement  
 38.104 v16.11.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Revised to R4-2210691 (from R4-2208130).**

**R4-2210691 Draft CR for TS 38.104 R16: correction of some mistakes in the co-existence table**

*Type: draftCR For: Endorsement  
 38.104 v16.11.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208131 Draft CR for TS 38.104 R17: correction of some mistakes in the co-existence table**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

##### 4.1.2.1 General

**R4-2207704 draft CR 38.104 to address compliance for spurious emissions in C-band in the US for non-contiguous aggregation between 3.45-3.55 MHz and 3.7-3.98 MHz**

*Type: draftCR For: Approval  
 38.104 v16.11.0 CR- rev Cat: F (Rel-16)  
  
 Source: Charter Communications, Inc*

**Decision: Not pursued.**

**R4-2210692 draft CR 38.104 to address compliance for spurious emissions in C-band in the US for non-contiguous aggregation between 3.45-3.55 MHz and 3.7-3.98 MHz**

*Type: draftCR For: Approval  
 38.104 v16.11.0 CR- rev Cat: F (Rel-16)  
  
 Source: Charter Communications, Inc*

**Decision: Withdrawn.**

**R4-2207705 Additional BS Spurious emissions for Band n77**

*Type: discussion For: Approval  
 38.104 v CR- rev Cat: (Rel-16)  
  
 Source: Charter Communications, Inc*

**Decision: Noted.**

**R4-2208535 Technical background related to sub-array parameters relevant for 6 to 10 GHz**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this contribution we have collected the antenna model extension and relevant parameter sets for base stations using sub-arrays operating around 6 GHz and 10 GHz. The parameter sets are presented as addition to previously presented parameters for single

**Decision: Noted.**

**R4-2208536 CR to TR 38.921: Addition of additional BS antenna parameters in subclause 8.1**

*Type: CR For: Approval  
 38.921 v17.1.0 CR-0003 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

At previous ITU-R WP 5D meeting parameters to model base station array antennas with vertical sub-arrays was presented. Vertical sub-arrays are used for base stations operating between 1710 to 4990 MHz. The details are captured in TR 38.803, subclause 5.2

**Decision: Not pursued.**

**R4-2209608 Additional BS Spurious emissions for Band n77**

*Type: discussion For: Approval  
 38.104 v CR- rev Cat: (Rel-16)  
  
 Source: Charter Communications, Inc*

**Decision: Noted.**

**R4-2209646 Draft CR to TS 38.104: NR frequency band table notes corrections, Rel-16**

*Type: draftCR For: Endorsement  
 38.104 v16.11.0 CR- rev Cat: D (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

Correction of references and application of the drafting rules.

**Decision: Endorsed.**

**R4-2209647 Draft CR to TS 38.104: NR frequency band table notes corrections, Rel-17**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

Correction of references and application of the drafting rules.

**Decision: Endorsed.**

##### 4.1.2.2 TX/RX requirements (38.104)

**R4-2209648 Draft CR to TS 38.104: Additional Tx spurious emissions terminology corrections (basic limit, maximum level, minimum requirement), Rel-16**

*Type: draftCR For: Endorsement  
 38.104 v16.11.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

It was observed that for the additional Tx spurious emissions requirements, various terms are used to define the same requirement, i.e. basic limit, maximum level, minimum requirement. This CR is fixing this issues to follow aligned terminology, i.e. basi

**Decision: Endorsed.**

**R4-2209649 Draft CR to TS 38.104: Additional Tx spurious emissions terminology corrections (basic limit, maximum level, minimum requirement), Rel-17**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

It was observed that for the additional Tx spurious emissions requirements, various terms are used to define the same requirement, i.e. basic limit, maximum level, minimum requirement. This CR is fixing this issues to follow aligned terminology, i.e. basi

**Decision: Endorsed.**

**R4-2209810 Draft CR to TS 38.104 with clarifications of BS type for band n96**

*Type: draftCR For: Approval  
 38.104 v16.11.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2209811 Draft CR to TS 38.104 with clarifications of BS type for band n96 and n102**

*Type: draftCR For: Approval  
 38.104 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2207911 Draft CR to TS 38.104 on clarifications of interfering signal for the OTA transmitter intermodulation requirement**

*Type: draftCR For: Endorsement  
 38.104 v15.16.0 CR- rev Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell, Ericsson, Huawei*

**Abstract:**

Clarify the power shall be equally divided between the supported polarizations when the power is either 46 dBm or Prated,t,TRP.

Session Chair: Move to this AI from AI 4.1.1

**Decision: Endorsed.**

**R4-2207912 Draft CR to TS 38.104 on clarifications of interfering signal for the OTA transmitter intermodulation requirement**

*Type: draftCR For: Endorsement  
 38.104 v16.11.0 CR- rev Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell, Ericsson, Huawei*

**Abstract:**

Clarify the power shall be equally divided between the supported polarizations when the power is either 46 dBm or Prated,t,TRP.

Session Chair: Move to this AI from AI 4.1.1

**Decision: Endorsed.**

**R4-2207913 Draft CR to TS 38.104 on clarifications of interfering signal for the OTA transmitter intermodulation requirement**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell, Ericsson, Huawei*

**Abstract:**

Clarify the power shall be equally divided between the supported polarizations when the power is either 46 dBm or Prated,t,TRP.

Session Chair: Move to this AI from AI 4.1.1

**Decision: Endorsed.**

**R4-2210031 Draft CR to TS 38.141-2 on clarifications of interfering signal for the OTA transmitter intermodulation requirement**

*Type: draftCR For: Endorsement  
 38.141-2 v15.13.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson, Huawei, Nokia, Nokia Shanghai Bell*

**Abstract:**

Corrections of notes and test procedure to correctly describe the interfering signal.

**Decision: Endorsed.**

**R4-2210032 Draft CR to TS 38.141-2 on clarifications of interfering signal for the OTA transmitter intermodulation requirement**

*Type: draftCR For: Endorsement  
 38.141-2 v16.11.0 CR- rev Cat: A (Rel-16)  
  
 Source: Ericsson, Huawei, Nokia, Nokia Shanghai Bell*

**Abstract:**

Corrections of notes and test procedure to correctly describe the interfering signal.

**Decision: Endorsed.**

**R4-2210033 Draft CR to TS 38.141-2 on clarifications of interfering signal for the OTA transmitter intermodulation requirement**

*Type: draftCR For: Endorsement  
 38.141-2 v17.5.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson, Huawei, Nokia, Nokia Shanghai Bell*

**Abstract:**

Corrections of notes and test procedure to correctly describe the interfering signal.

**Decision: Endorsed.**

##### 4.1.2.3 MSR and eAAS specifications

**R4-2207914 Draft CR to TS 37.141 on corrections of test configurations**

*Type: draftCR For: Endorsement  
 37.141 v16.13.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

1) Update NTC21 to allow wider channel bandwidth and/or more carriers to be placed to reach the rated total output power.

2) Remove the “a” suffix from NTC3.

**Decision: Endorsed.**

**R4-2207915 Draft CR to TS 37.141 on corrections of test configurations**

*Type: draftCR For: Endorsement  
 37.141 v17.5.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

1) Update NTC21 to allow wider channel bandwidth and/or more carriers to be placed to reach the rated total output power.

2) Remove the “a” suffix from NTC3.

**Decision: Endorsed.**

**R4-2207916 Draft CR to TS 37.145-1 on corrections of test configurations**

*Type: draftCR For: Endorsement  
 37.145-1 v16.10.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Remove the “a” suffix from ANTC3a in places where it is referred to.

**Decision: Endorsed.**

**R4-2207917 Draft CR to TS 37.145-1 on corrections of test configurations**

*Type: draftCR For: Endorsement  
 37.145-1 v17.5.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Remove the “a” suffix from ANTC3a in places where it is referred to.

**Decision: Endorsed.**

**R4-2207918 Draft CR to TS 37.145-2 on corrections of test configurations**

*Type: draftCR For: Endorsement  
 37.145-2 v16.11.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Remove the “a” suffix from ANTCR3a in places where it is referred to. Correct the table heading errors in clause 7.9.5.1.

**Decision: Endorsed.**

**R4-2207919 Draft CR to TS 37.145-2 on corrections of test configurations**

*Type: draftCR For: Endorsement  
 37.145-2 v17.5.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Remove the “a” suffix from ANTCR3a in places where it is referred to. Correct the table heading errors in clause 7.9.5.1.

**Decision: Endorsed.**

**R4-2209729 CR to 37.104: Corrections to notes in OBUE requirements**

*Type: CR For: Agreement  
 37.104 v15.16.0 CR-0965 rev Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2209730 CR to 37.104: Corrections to notes in OBUE requirements**

*Type: CR For: Agreement  
 37.104 v16.13.0 CR-0966 rev Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2209731 CR to 37.104: Corrections to notes in OBUE requirements**

*Type: CR For: Agreement  
 37.104 v17.5.0 CR-0967 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2209732 CR to 37.141: Corrections to notes in OBUE requirements**

*Type: CR For: Agreement  
 37.141 v15.17.0 CR-1011 rev Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2210694 (from R4-2209732).**

**R4-2210694 CR to 37.141: Corrections to notes in OBUE requirements**

*Type: CR For: Agreement  
 37.141 v15.17.0 CR-1011 rev Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2209733 CR to 37.141: Corrections to notes in OBUE requirements**

*Type: CR For: Agreement  
 37.141 v16.13.0 CR-1012 rev Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2209734 CR to 37.141: Corrections to notes in OBUE requirements**

*Type: CR For: Agreement  
 37.141 v17.5.0 CR-1013 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2210023 Draft CR to TS 37.105 on clarifications of interfering signal for the OTA transmitter intermodulation requirement (REL15)**

*Type: draftCR For: Agreement  
 37.105 v15.16.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, Nokia, Ericsson*

**Abstract:**

Correcting the intermodulation interfering signal polarization text so it is consistent with bot signal and dual polarization and the new power level

**Decision: Endorsed.**

**R4-2210024 Draft CR to TS 37.105 on clarifications of interfering signal for the OTA transmitter intermodulation requirement (REL16)**

*Type: draftCR For: Agreement  
 37.105 v16.11.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, Nokia, Ericsson*

**Abstract:**

Correcting the intermodulation interfering signal polarization text so it is consistent with bot signal and dual polarization and the new power level

**Decision: Endorsed.**

**R4-2210025 Draft CR to TS 37.105 on clarifications of interfering signal for the OTA transmitter intermodulation requirement (REL17)**

*Type: draftCR For: Agreement  
 37.105 v17.5.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Nokia, Ericsson*

**Abstract:**

Correcting the intermodulation interfering signal polarization text so it is consistent with bot signal and dual polarization and the new power level

**Decision: Endorsed.**

**R4-2210026 Draft CR to TS 37.145-2 on clarifications of interfering signal for the OTA transmitter intermodulation requirement (REL15)**

*Type: draftCR For: Agreement  
 37.145-2 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, Nokia, Ericsson*

**Abstract:**

Correcting the intermodulation interfering signal polarization text so it is consistent with bot signal and dual polarization and the new power level

**Decision: Revised to R4-2210693 (from R4-2210026).**

**R4-2210693 Draft CR to TS 37.145-2 on clarifications of interfering signal for the OTA transmitter intermodulation requirement (REL15)**

*Type: draftCR For: Agreement  
 37.145-2 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, Nokia, Ericsson*

**Abstract:**

Correcting the intermodulation interfering signal polarization text so it is consistent with bot signal and dual polarization and the new power level

**Decision: Endorsed.**

**R4-2210027 Draft CR to TS 37.145-2 on clarifications of interfering signal for the OTA transmitter intermodulation requirement (REL16)**

*Type: draftCR For: Agreement  
 37.145-2 v16.11.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, Nokia, Ericsson*

**Abstract:**

Correcting the intermodulation interfering signal polarization text so it is consistent with bot signal and dual polarization and the new power level

**Decision: Endorsed.**

**R4-2210028 Draft CR to TS 37.145-2 on clarifications of interfering signal for the OTA transmitter intermodulation requirement (REL17)**

*Type: draftCR For: Agreement  
 37.145-2 v17.5.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Nokia, Ericsson*

**Abstract:**

Correcting the intermodulation interfering signal polarization text so it is consistent with bot signal and dual polarization and the new power level

**Decision: Endorsed.**

#### 4.1.3 BS conformance testing

##### 4.1.3.1 General

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**Email discussion for [103-e][302] NR\_Conformance\_Maintenance, AI 4.1.3– Liehai Liu**

**R4-2210308 Email discussion summary for [103-e][302] NR\_Conformance\_Maintenance**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210505(from R4-2210308).**

**R4-2210505 Email discussion summary for [103-e][302] NR\_Conformance\_Maintenance**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**Conclusion after 2nd round**

|  |  |  |  |  |  |
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| **Tdoc number** | **Revised to** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210817 | R4-2210817 | CR for TS 36.141 On sweep time for unwanted emission testing (Rel-15) | CATT | Endorsed |  |
| R4-2210818 | R4-2210818 | Draft CR to 37.145-1: Clarification for unwanted emission testing | Huawei, HiSilicon | Endorsed |  |
| R4-2210819 | R4-2210819 | Draft CR to 37.145-2: Clarification for unwanted emission testing | Huawei, HiSilicon | Endorsed |  |
| R4-2210820 | R4-2210820 | CR for TS 37.141 On sweep time for unwanted emission testing (Rel-15) | CATT | Endorsed |  |
| R4-2210821 | R4-2210821 | CR for TS 38.141-2 On sweep time for unwanted emission testing (Rel-15) | CATT | Endorsed |  |
| R4-2210822 | R4-2210822 | Draft CR for TS 38.141-2 R16: correction of BS type 1-O co-existence table | CATT | Endorsed |  |
| R4-2208127 |  | Draft CR for TS 38.141-2 R15: correction of declaration descriptions | CATT | Endorsed |  |
| R4-2209652 |  | Draft CR to TS 38.141-2: removal of Editor's notes, Rel-17 | Huawei, HiSilicon | Endorsed |  |
| R4-2209650 |  | Draft CR to TS 38.141-2: removal of Editor's notes, Rel-15 | Huawei, HiSilicon | Not Pursued |  |
| R4-2209651 |  | Draft CR to TS 38.141-2: removal of Editor's notes, Rel-16 | Huawei, HiSilicon | Not Pursued |  |
| R4-2208123 |  | Draft CR for TS 38.176-1 R16: add the missing contents of A.1.1 | CATT | Endorsed |  |
| R4-2208125 |  | Draft CR for TS 38.176-2 R16: add the missing contents of A.1.1 | CATT | Endorsed |  |

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**R4-2208123 Draft CR for TS 38.176-1 R16: add the missing contents of A.1.1**

*Type: draftCR For: Endorsement  
 38.176-1 v16.3.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Noted.**

**R4-2208124 Draft CR for TS 38.176-1 R17: add the missing contents of A.1.1**

*Type: draftCR For: Endorsement  
 38.176-1 v17.0.0 CR- rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208125 Draft CR for TS 38.176-2 R16: add the missing contents of A.1.1**

*Type: draftCR For: Endorsement  
 38.176-2 v16.3.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208126 Draft CR for TS 38.176-2 R17: add the missing contents of A.1.1**

*Type: draftCR For: Endorsement  
 38.176-2 v17.0.0 CR- rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

##### 4.1.3.2 Conducted conformance testing (38.141-1)

**R4-2209812 Draft CR to TS 38.141-1 with clarifications of BS type for band n96**

*Type: draftCR For: Approval  
 38.141-1 v16.11.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2209813 Draft CR to TS 38.141-1 with clarifications of BS type for band n96 and n102**

*Type: draftCR For: Approval  
 38.141-1 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

##### 4.1.3.3 Radiated conformance testing (38.141-2)

**R4-2208127 Draft CR for TS 38.141-2 R15: correction of declaration descriptions**

*Type: draftCR For: Endorsement  
 38.141-2 v15.13.0 CR- rev Cat: F (Rel-15)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208128 Draft CR for TS 38.141-2 R16: correction of BS type 1-O co-existence table**

*Type: draftCR For: Endorsement  
 38.141-2 v16.11.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Revised to R4-2210822 (from R4-2208128).**

**R4-2210822 Draft CR for TS 38.141-2 R16: correction of BS type 1-O co-existence table**

*Type: draftCR For: Endorsement  
 38.141-2 v16.11.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208231 CR for TS 38.141-2 On sweep time for unwanted emission testing (Rel-15)**

*Type: CR For: Agreement  
 38.141-2 v15.13.0 CR-0394 rev Cat: F (Rel-15)  
  
 Source: CATT*

**Decision: Revised to R4-2210821(from R4-2208231).**

**R4-2210821 CR for TS 38.141-2 On sweep time for unwanted emission testing (Rel-15)**

*Type: CR For: Agreement  
 38.141-2 v15.13.0 CR-0394 rev Cat: F (Rel-15)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208232 CR for TS 38.141-2 On sweep time for unwanted emission testing (Rel-16)**

*Type: CR For: Agreement  
 38.141-2 v16.11.0 CR-0395 rev Cat: A (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208233 CR for TS 38.141-2 On sweep time for unwanted emission testing (Rel-17)**

*Type: CR For: Agreement  
 38.141-2 v17.5.0 CR-0396 rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208234 CR for TS 36.141 On sweep time for unwanted emission testing (Rel-15)**

*Type: CR For: Agreement  
 36.141 v15.16.0 CR-1332 rev Cat: F (Rel-15)  
  
 Source: CATT*

**Decision: Revised to R4-2210817 (from R4-2208234).**

**R4-2210817 CR for TS 36.141 On sweep time for unwanted emission testing (Rel-15)**

*Type: CR For: Agreement  
 36.141 v15.16.0 CR-1332 rev Cat: F (Rel-15)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208235 CR for TS 36.141 On sweep time for unwanted emission testing (Rel-16)**

*Type: CR For: Agreement  
 36.141 v16.13.0 CR-1333 rev Cat: A (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208236 CR for TS 36.141 On sweep time for unwanted emission testing (Rel-17)**

*Type: CR For: Agreement  
 36.141 v17.5.0 CR-1334 rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2209080 CR for TS 37.141 On sweep time for unwanted emission testing (Rel-15)**

*Type: CR For: Agreement  
 37.141 v15.17.0 CR-1006 rev Cat: F (Rel-15)  
  
 Source: CATT*

**Decision: Revised to R4-2210820 (from R4-2209080).**

**R4-2210820 CR for TS 37.141 On sweep time for unwanted emission testing (Rel-15)**

*Type: CR For: Agreement  
 37.141 v15.17.0 CR-1006 rev Cat: F (Rel-15)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2209081 CR for TS 37.141 On sweep time for unwanted emission testing (Rel-16)**

*Type: CR For: Agreement  
 37.141 v16.13.0 CR-1007 rev Cat: A (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2209082 CR for TS 37.141 On sweep time for unwanted emission testing (Rel-17)**

*Type: CR For: Agreement  
 37.141 v17.5.0 CR-1008 rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2209650 Draft CR to TS 38.141-2: removal of Editor's notes, Rel-15**

*Type: draftCR For: Endorsement  
 38.141-2 v15.13.0 CR- rev Cat: D (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

As a rapporteur of the specification, we provide editorial correction to remove outstanding Editor's notes.

**Decision: Not pursued.**

**R4-2209651 Draft CR to TS 38.141-2: removal of Editor's notes, Rel-16**

*Type: draftCR For: Endorsement  
 38.141-2 v16.11.0 CR- rev Cat: D (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

As a rapporteur of the specification, we provide editorial correction to remove outstanding Editor's notes.

**Decision: Not pursued.**

**R4-2209652 Draft CR to TS 38.141-2: removal of Editor's notes, Rel-17**

*Type: draftCR For: Endorsement  
 38.141-2 v17.5.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

As a rapporteur of the specification, we provide editorial correction to remove outstanding Editor's notes.

**Decision: Endorsed.**

##### 4.1.3.4 OAT BS testing

**R4-2208564 Draft CR to 37.145-1: Clarification for unwanted emission testing**

*Type: draftCR For: Endorsement  
 37.145-1 v15.13.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2210818 (from R4-2208564).**

**R4-2210818 Draft CR to 37.145-1: Clarification for unwanted emission testing**

*Type: draftCR For: Endorsement  
 37.145-1 v15.13.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2208565 Draft CR to 37.145-1: Clarification for unwanted emission testing**

*Type: draftCR For: Endorsement  
 37.145-1 v16.10.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2208566 Draft CR to 37.145-1: Clarification for unwanted emission testing**

*Type: draftCR For: Endorsement  
 37.145-1 v17.5.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2208567 Draft CR to 37.145-2: Clarification for unwanted emission testing**

*Type: draftCR For: Endorsement  
 37.145-2 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2210819 (from R4-2208567).**

**R4-2210819 Draft CR to 37.145-2: Clarification for unwanted emission testing**

*Type: draftCR For: Endorsement  
 37.145-2 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2208568 Draft CR to 37.145-2: Clarification for unwanted emission testing**

*Type: draftCR For: Endorsement  
 37.145-2 v16.11.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2208569 Draft CR to 37.145-2: Clarification for unwanted emission testing**

*Type: draftCR For: Endorsement  
 37.145-2 v17.5.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

#### 4.1.4 UE/BS EMC requirements

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**Email discussion for [103-e][303] NR\_EMC, AI 4.1.4, 9.5.4– Wubin Zhou**

**R4-2210309 Email discussion summary for [103-e][303] NR\_EMC**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210506 (from R4-2210309).**

**R4-2210506 Email discussion summary for [103-e][303] NR\_EMC**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210627 WF on 6 GHz limit for the Radiated Immunity testing**

*Type: other For: Approval  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Not treated**

**R4-2210628 WF on the criteria for performance assessment for NR Repeater EMC testing**

*Type: other For: Approval  
 Source: ZTE*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tdoc number** | **Revised to** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210627 |  | WF on 6 GHz limit for the Radiated Immunity testing | Huawei | **Not treated** |  |
| R4-2210628 |  | WF on the criteria for performance assessment for NR Repeater EMC testing | ZTE | Approved |  |
| [R4-2207894](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2207894.zip) | R4-2210823 | TS 38.175: Corrections in clause 1 Scope and clause 9 Immunity | Ericsson | Postponed |  |
| [R4-2207895](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2207895.zip) | R4-2210824 | TS 36.113: Corrections in clause 9 Immunity | Ericsson | Postponed |  |
| [R4-2207897](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2207897.zip) | R4-2210825 | TS 37.113: Corrections in clause 9 Immunity | Ericsson | Postponed |  |
| [R4-2207899](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2207899.zip) | R4-2210826 | TS 37.114: Corrections in clause 1 Scope and clause 9 Immunity | Ericsson | Postponed |  |
| [R4-2207901](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2207901.zip) | R4-2211141 | TS 38.113: Corrections in clause 1 Scope and clause 9 Immunity | Ericsson | Postponed |  |
| R4-2211181 | R4-2211181 | Draft CR to TS 38.113 Radiated emission measurement uncertainty (R15) | ZTE Corporation | Endorsed |  |
| [R4-2209653](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2209653.zip) |  | CR to TS 34.124: corrections of the UTRA UE EMC specification, Rel-17 | Huawei, HiSilicon | Agreeable |  |
| [R4-2209654](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2209654.zip) |  | Draft CR to TS 38.124: addition of the missing Rx spurious emissions limits for idle mode testing, Rel-15 | Huawei, HiSilicon, Samsung | Endorsed |  |
| [R4-2209657](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2209657.zip) |  | Draft CR to TS 36.124: correction of the Rx spurious exclusion band (band-agnostic), Rel-8 | Huawei, HiSilicon | Endorsed | Moderator note:  To MCC (ask for guidance) :  Whether or not it is allowed to submit CRs for the earlier releases (such as R8) which frozen for many years? |
| [R4-2209666](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2209666.zip) |  | CR to TS 38.175: updates reflecting modifications in IEC 61000-4-3:2020 for the upper frequency range of the RI test | Huawei, HiSilicon | Postponed |  |
| [R4-2209669](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2209669.zip) |  | CR to TS 38.113: updates reflecting modifications in IEC 61000-4-3:2020 for the upper frequency range of the RI test | Huawei, HiSilicon | Postponed |  |
| [R4-2209670](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2209670.zip) |  | CR to TS 38.124: updates reflecting modifications in IEC 61000-4-3:2020 for the upper frequency range of the RI test, Rel-17 | Huawei, HiSilicon | Postponed |  |
| [R4-2209671](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2209671.zip) |  | CR to TS 38.114: updates reflecting modifications in IEC 61000-4-3:2020 for the upper frequency range of the RI test, Rel-17 | Huawei, HiSilicon | Postponed |  |

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**R4-2207894 TS 38.175: Corrections in clause 1 Scope and clause 9 Immunity**

*Type: draftCR For: Agreement  
 38.175 v16.3.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Postponed.**

**R4-2210823 TS 38.175: Corrections in clause 1 Scope and clause 9 Immunity**

*Type: draftCR For: Agreement  
 38.175 v16.3.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Withdrawn.**

**R4-2207895 TS 36.113: Corrections in clause 9 Immunity**

*Type: draftCR For: Agreement  
 36.113 v15.4.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Postponed.**

**R4-2210824 TS 36.113: Corrections in clause 9 Immunity**

*Type: draftCR For: Agreement  
 36.113 v15.4.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Withdrawn.**

**R4-2207896 TS 36.113: Corrections in clause 9 Immunity**

*Type: draftCR For: Agreement  
 36.113 v16.2.0 CR- rev Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Withdrawn.**

**R4-2207897 TS 37.113: Corrections in clause 9 Immunity**

*Type: draftCR For: Agreement  
 37.113 v15.11.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Postponed.**

**R4-2210825 TS 37.113: Corrections in clause 9 Immunity**

*Type: draftCR For: Agreement  
 37.113 v15.11.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Withdrawn.**

**R4-2207898 TS 37.113: Corrections in clause 9 Immunity**

*Type: draftCR For: Agreement  
 37.113 v16.2.0 CR- rev Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Withdrawn.**

**R4-2207899 TS 37.114: Corrections in clause 1 Scope and clause 9 Immunity**

*Type: draftCR For: Agreement  
 37.114 v15.9.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Postponed.**

**R4-2210826 TS 37.114: Corrections in clause 1 Scope and clause 9 Immunity**

*Type: draftCR For: Agreement  
 37.114 v15.9.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Withdrawn.**

**R4-2207900 TS 37.114: Corrections in clause 1 Scope and clause 9 Immunity**

*Type: draftCR For: Agreement  
 37.114 v16.0.0 CR- rev Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Withdrawn.**

**R4-2207901 TS 38.113: Corrections in clause 1 Scope and clause 9 Immunity**

*Type: draftCR For: Agreement  
 38.113 v15.15.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Postponed.**

**R4-2211141 TS 38.113: Corrections in clause 1 Scope and clause 9 Immunity**

*Type: draftCR For: Agreement  
 38.113 v15.15.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Withdrawn.**

**R4-2207902 TS 38.113: Corrections in clause 1 Scope and clause 9 Immunity**

*Type: draftCR For: Agreement  
 38.113 v16.5.0 CR- rev Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Withdrawn.**

**R4-2208380 Discussion on highest frequency and measurement uncertainty for NR BS radiated emission test with big size EUT**

*Type: discussion For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2208382 Draft CR to TS 38.113 Radiated emission measurement uncertainty (R15)**

*Type: draftCR For: Endorsement  
 38.113 v15.15.0 CR- rev Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2211181 (from R4-2208382).**

**RR4-2211181 Draft CR to TS 38.113 Radiated emission measurement uncertainty (R15)**

*Type: draftCR For: Endorsement  
 38.113 v15.15.0 CR- rev Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Decision: Endorsed.**

**R4-2208384 Draft CR to TS 38.113 Radiated emission measurement uncertainty (R16)**

*Type: draftCR For: Endorsement  
 38.113 v16.5.0 CR- rev Cat: A (Rel-16)  
  
 Source: ZTE Corporation*

**Decision: Endorsed.**

**R4-2208386 Draft CR to TS 38.113 Radiated emission measurement uncertainty (R17)**

*Type: draftCR For: Endorsement  
 38.113 v17.0.0 CR- rev Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Decision: Endorsed.**

**R4-2209653 CR to TS 34.124: corrections of the UTRA UE EMC specification, Rel-17**

*Type: CR For: Agreement  
 34.124 v17.0.0 CR-0047 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

This CR is related to the discussion on 25-, and 34-series specifications maintenance. As those technical specifications were agreed in SA to be further updated to Rel-17 version, there is need to fix some obvious error and technical inconsistencies obser

**Decision: Agreed.**

**R4-2209654 Draft CR to TS 38.124: addition of the missing Rx spurious emissions limits for idle mode testing, Rel-15**

*Type: draftCR For: Endorsement  
 38.124 v15.7.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon, Samsung*

**Abstract:**

Rx spurious emissions limits (enclosure port) for the idle mode testing were unintentionally removed from the NR UE EMC specification. In this CR, those are brought back, including their correction and alignment with the NR UE RF specification.

**Decision: Endorsed.**

**R4-2209655 Draft CR to TS 38.124: addition of the missing Rx spurious emissions limits for idle mode testing, Rel-16**

*Type: draftCR For: Endorsement  
 38.124 v16.4.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon, Samsung*

**Abstract:**

Rx spurious emissions limits (enclosure port) for the idle mode testing were unintentionally removed from the NR UE EMC specification. In this CR, those are brought back, including their correction and alignment with the NR UE RF specification.

**Decision: Endorsed.**

**R4-2209656 Draft CR to TS 38.124: addition of the missing Rx spurious emissions limits for idle mode testing, Rel-17**

*Type: draftCR For: Endorsement  
 38.124 v17.0.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon, Samsung*

**Abstract:**

Rx spurious emissions limits (enclosure port) for the idle mode testing were unintentionally removed from the NR UE EMC specification. In this CR, those are brought back, including their correction and alignment with the NR UE RF specification.

**Decision: Endorsed.**

**R4-2209657 Draft CR to TS 36.124: correction of the Rx spurious exclusion band (band-agnostic), Rel-8**

*Type: draftCR For: Endorsement  
 36.124 v8.2.0 CR- rev Cat: F (Rel-8)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In order to reduce the workload related to the new bands introduction, this CR is introducing a band-agnostic way to define the Rx exclusion band. Similar correction was already introduced in other EMC specifications to reduce the workload when new bands

**Decision: Endorsed.**

**R4-2209658 Draft CR to TS 36.124: correction of the Rx spurious exclusion band (band-agnostic), Rel-9**

*Type: draftCR For: Endorsement  
 36.124 v9.2.0 CR- rev Cat: A (Rel-9)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In order to reduce the workload related to the new bands introduction, this CR is introducing a band-agnostic way to define the Rx exclusion band. Similar correction was already introduced in other EMC specifications to reduce the workload when new bands

**Decision: Endorsed.**

**R4-2209659 Draft CR to TS 36.124: correction of the Rx spurious exclusion band (band-agnostic), Rel-10**

*Type: draftCR For: Endorsement  
 36.124 v10.3.0 CR- rev Cat: A (Rel-10)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In order to reduce the workload related to the new bands introduction, this CR is introducing a band-agnostic way to define the Rx exclusion band. Similar correction was already introduced in other EMC specifications to reduce the workload when new bands

**Decision: Endorsed.**

**R4-2209660 Draft CR to TS 36.124: correction of the Rx spurious exclusion band (band-agnostic), Rel-11**

*Type: draftCR For: Endorsement  
 36.124 v11.2.0 CR- rev Cat: A (Rel-11)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In order to reduce the workload related to the new bands introduction, this CR is introducing a band-agnostic way to define the Rx exclusion band. Similar correction was already introduced in other EMC specifications to reduce the workload when new bands

**Decision: Endorsed.**

**R4-2209661 Draft CR to TS 36.124: correction of the Rx spurious exclusion band (band-agnostic), Rel-12**

*Type: draftCR For: Endorsement  
 36.124 v12.1.0 CR- rev Cat: A (Rel-12)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In order to reduce the workload related to the new bands introduction, this CR is introducing a band-agnostic way to define the Rx exclusion band. Similar correction was already introduced in other EMC specifications to reduce the workload when new bands

**Decision: Endorsed.**

**R4-2209662 Draft CR to TS 36.124: correction of the Rx spurious exclusion band (band-agnostic), Rel-13**

*Type: draftCR For: Endorsement  
 36.124 v13.1.0 CR- rev Cat: A (Rel-13)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In order to reduce the workload related to the new bands introduction, this CR is introducing a band-agnostic way to define the Rx exclusion band. Similar correction was already introduced in other EMC specifications to reduce the workload when new bands

**Decision: Endorsed.**

**R4-2209663 Draft CR to TS 36.124: correction of the Rx spurious exclusion band (band-agnostic), Rel-14**

*Type: draftCR For: Endorsement  
 36.124 v14.1.0 CR- rev Cat: A (Rel-14)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In order to reduce the workload related to the new bands introduction, this CR is introducing a band-agnostic way to define the Rx exclusion band. Similar correction was already introduced in other EMC specifications to reduce the workload when new bands

**Decision: Endorsed.**

**R4-2209664 Draft CR to TS 36.124: correction of the Rx spurious exclusion band (band-agnostic), Rel-15**

*Type: draftCR For: Endorsement  
 36.124 v15.3.0 CR- rev Cat: A (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In order to reduce the workload related to the new bands introduction, this CR is introducing a band-agnostic way to define the Rx exclusion band. Similar correction was already introduced in other EMC specifications to reduce the workload when new bands

**Decision: Endorsed.**

**R4-2209665 Draft CR to TS 36.124: correction of the Rx spurious exclusion band (band-agnostic), Rel-16**

*Type: draftCR For: Endorsement  
 36.124 v16.2.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In order to reduce the workload related to the new bands introduction, this CR is introducing a band-agnostic way to define the Rx exclusion band. Similar correction was already introduced in other EMC specifications to reduce the workload when new bands

**Decision: Endorsed.**

**R4-2209666 CR to TS 38.175: updates reflecting modifications in IEC 61000-4-3:2020 for the upper frequency range of the RI test**

*Type: CR For: Agreement  
 38.175 v17.0.0 CR-0020 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

Based on the updated content of the IEC 61000-4-3:2020 specification, the related 6GHz upper frequency limit for the Radiated Immunity testing is removed.

**Decision: Endorsed.**

**R4-2209667 Draft CR to TS 36.124: correction of the Rx spurious exclusion band (band-agnostic), Rel-17**

*Type: draftCR For: Endorsement  
 36.124 v17.0.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In order to reduce the workload related to the new bands introduction, this CR is introducing a band-agnostic way to define the Rx exclusion band. Similar correction was already introduced in other EMC specifications to reduce the workload when new bands

**Decision: Endorsed.**

**R4-2209668 Further analysis of the updated IEC 61000-4-3:2020 specification: upper frequency range for radiated immunity requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Abstract:**

During RAN4#101-e an analysis of the updated IEC 61000-4-3 specification was presented in R4-2119132, looking into updates on the upper frequency range for radiated immunity requirements. In this contribution we provide further analysis with more details

**Decision: Noted.**

**R4-2209669 CR to TS 38.113: updates reflecting modifications in IEC 61000-4-3:2020 for the upper frequency range of the RI test**

*Type: CR For: Agreement  
 38.113 v17.0.0 CR-0047 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

Based on the updated content of the IEC 61000-4-3:2020 specification, the related 6GHz upper frequency limit for the Radiated Immunity testing is removed.

**Decision: Postponed.**

**R4-2209670 CR to TS 38.124: updates reflecting modifications in IEC 61000-4-3:2020 for the upper frequency range of the RI test, Rel-17**

*Type: CR For: Agreement  
 38.124 v17.0.0 CR-0039 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

Based on the updated content of the IEC 61000-4-3:2020 specification, the related 6GHz upper frequency limit for the Radiated Immunity testing is removed.

**Decision: Postponed.**

**R4-2209671 CR to TS 38.114: updates reflecting modifications in IEC 61000-4-3:2020 for the upper frequency range of the RI test, Rel-17**

*Type: CR For: Agreement  
 38.114 v17.0.1 CR-0001 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

Based on the updated content of the IEC 61000-4-3:2020 specification, the related 6GHz upper frequency limit for the Radiated Immunity testing is removed.

**Decision: Postponed.**

**R4-2210044 TS 38.175: Corrections in clause 1 Scope and clause 9 Immunity**

*Type: draftCR For: Endorsement  
 38.175 v17.0.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Withdrawn.**

**R4-2210045 TS 36.113: Corrections in clause 9 Immunity**

*Type: draftCR For: Endorsement  
 36.113 v17.0.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Withdrawn.**

**R4-2210046 TS 37.113: Corrections in clause 9 Immunity**

*Type: draftCR For: Endorsement  
 37.113 v17.0.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Withdrawn.**

**R4-2210047 TS 37.114: Corrections in clause 1 Scope and clause 9 Immunity**

*Type: draftCR For: Endorsement  
 37.114 v17.0.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Withdrawn.**

**R4-2210048 TS 38.113: Corrections in clause 1 Scope and clause 9 Immunity**

*Type: draftCR For: Endorsement  
 38.113 v17.0.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Corrections to EMC specifications already approved for the NR Repeater specifications

**Decision: Withdrawn.**

##### 4.1.5.2 RRM performance requirements (38.133/36.133)

**Refer to email discussion for [103-e][226] NR\_SL\_enh\_RRM**

**R4-2210084 CR: Corrections on NR V2X Resource Selection Test**

*Type: draftCR For: Endorsement  
 38.133 v16.11.0 CR- rev Cat: F (Rel-16)  
  
 Source: Qualcomm, Inc.*

Session chair note: Cover page error: Other specs affected: -> “N”

**Decision: Endorsed.**

**R4-2210085 (mirror R17)CR: Corrections on NR V2X Resource Selection Test**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Qualcomm, Inc.*

**Decision: Endorsed.**

**R4-2210086 CR: Corrections on LTE V2X Resource Selection Test**

*Type: draftCR For: Endorsement  
 36.133 v14.21.0 CR- rev Cat: F (Rel-14)  
  
 Source: Qualcomm, Inc.*

Session chair note: Cover page error: Other specs affected: -> “N”

**Decision: Endorsed.**

**R4-2210087 (mirror R15)Corrections on LTE V2X Resource Selection Test**

*Type: draftCR For: Endorsement  
 36.133 v15.16.0 CR- rev Cat: F (Rel-15)  
  
 Source: Qualcomm, Inc.*

**Decision: Endorsed.**

**R4-2210088 (mirror R16)Corrections on LTE V2X Resource Selection Test**

*Type: draftCR For: Endorsement  
 36.133 v16.13.0 CR- rev Cat: F (Rel-16)  
  
 Source: Qualcomm, Inc.*

**Decision: Endorsed.**

**R4-2210089 (mirror R17)Corrections on LTE V2X Resource Selection Test**

*Type: draftCR For: Endorsement  
 36.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Qualcomm, Inc.*

**Decision: Endorsed.**

#### 4.1.6 Demodulation and CSI requirements (38.101-4/38.104)

##### 4.1.6.1 UE demodulation requirements

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**Email discussion for [103-e][316] Demod\_Maintenance\_UE, AI 4.1.6.1, 4.1.6.2, 5.3.5.1-Manasa Raghavan**

**R4-2210322 Email discussion summary for [103-e][316] Demod\_Maintenance\_UE**

*Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210519 (from R4-2210322).**

**R4-2210519 Email discussion summary for [103-e][316] Demod\_Maintenance\_UE**

*Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 12th**

List of key open issues:

* Topic #2: Rel-17 TEI: Incorrect PMI reporting

**Sub-topic 2-1-Incorrect PMI reporting**

The existence and impact of incorrect PMI reporting and usefulness of introducing requirements will be discussed in the first round. Based on the discussion in 1st round, we can discuss the evaluation methodology, simulation assumptions, if relevant in the 2nd round.

Conclusion RAN#95-e:

|  |
| --- |
| RAN4 is tasked to discuss and conclude on the following topics in Q2 to enable RAN#96 to make necessary decisions.   * Existence and impact of the incorrect PMI reporting * Usefulness of a demod requirement with no impact to other WGs.   ·           Discuss if it is needed to define a new UE capability, e.g., in relation to a UE reference receiver.  The following point can be discussed in RAN4 if the workload allows. Otherwise, it can be discussed in RAN#96.   * Work scope and the number of RAN4 meetings needed to develop a requirement |

**Issue 2-1: Existence of the issue of incorrect PMI reporting**

* Proposals
  + Option 1: Issue exists in certain theoretical implementations (Nokia)
  + Option 2: Issue doesn’t exist in real NW deployment (Apple, Qualcomm, Huawei, Nokia, ZTE)
  + Option 3: Need to further discuss a proper model to reveal the issue (Ericsson)
  + Option 4: Need more field data to understand existence of issue (Qualcomm, Apple )
* Recommended WF
  + Discuss in GTW
* Discussion:
* Huawei: We didn’t observe the issue from our products (both NW and UE sides).
* Nokia: With NW improper configuration and some early implementation, this issue maybe exist meanwhile from our NW deployment we didn’t observe the issue exist. We think no need performance requirements and if existing in NW, this can be handled by NW configuration.
* Ericsson: We observed the issue with some UE implementation. We don’t think this can be simply resolved by NW configuration. This issue probably can be only existed in early UE implementation.
* Huawei: We need to clarify the issue here. What’s the condition for this issue?
* QC: We don’t have evidence the issue exist. We believe the issue not exist with newly UE implementation.
* MTK: According the feedback from Ericsson, we can’t preclude the possibility of improper UE implementation and we prefer to specify the requirement to verify UE performance.
* Apple: We didn’t observe the performance difference based on our simulation results.
* T-Mobile USA: We observed the issue in our NW since 2019.
* Nokia: It’s better to collect the information what’s the NW configuration that we observe the issue. We are not sure how to have a agreement on the NW configuration as it’s up to NW/Infra-vendors implementation.
* Huawei: Based on the discussion, only Ericsson and MTK observed the issue. We would like to show the evidence that the issue still exists for newly UE.
* Ericsson: For the configuration, with non-overlapping NZP CSI-RS can resolve the issue but this will bring the loss with increased the overhead. We agree with MTK to have a new test case to ensure no problem in the future.
* ZTE: From our NW deployment, we didn’t observe any issue.
* Apple: Could Ericsson and T-Mobile USA share more information what’s the configuration e.g. SINR range the issue observed ?
* MTK: We don’t observe the issue from our chipset implementation. According to the E// paper in R1- 2105813, this issue happened with certain implementation.
* Without further input, we are not sure how to proceed the work in RAN4 given next RAN-P is June.
* Nokia: Refer to E/// paper which discussed in 2 years ago in RAN1, for UE without FD smoothing CE with CSI-RS, or the sequence correlation strong then the problem probably happened in theory. If UE implement proper CE over FD, then this issue shall not exist.
* ZTE: We tend to agree with Nokia. If UE implement proper CE over FD, then no issue exists and we also aware that similar issue discussed in RAN1 in previous release now the issue brought to RAN4 again, now sure whether we need to resolve the issue in RAN4 given the discussion history in RAN1.
* Huawei: All the chipset vendors including MTK think this issue not exist in their newly implementation. And we can’t change the early UEs which already in the market.
* Ericsson: I agree the comments and analysis from Nokia that the issue only existed with overlapped CSI-RSs and improper UE implementation. It’s worth to specify UE performance requirements.
* QC: We believe probably RAN1 can be involved to resolve this issue in root.
* Nokia/Huawei/Apple/Ericsson: We shouldn’t have back and forth discussion between RAN1 and RAN4.
* QC: No strong view from us, but we just want to point out the possibility we can have.
* Agreement:
* RAN4 observed that: The issue only exists under below conditions:
  + Deployment scenario: Colliding NZP-CSI-RS configured with interference cells at cell-edge
  + Improper UE implementation for channel estimation over FD (frequency domain) with CSI-RS
  + Note 1: Companies also observed such improper UE implementation not exist in newly UE implementation.

**LS/WF**

**R4-2210650 LS on incorrect PMI reporting**

*Type: LSout For: Approval*

*To: RAN; Cc:RAN1, RAN2  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2211204 (from R4-2210650).**

**R4-2211204 LS on incorrect PMI reporting**

*Type: LSout For: Approval*

*To: RAN; Cc:RAN1, RAN2  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2211204 | LS on incorrect PMI reporting | Apple | Return to |  |
| R4-2210893 | CR for mTRP demod requirements applicability (Rel-16) | Apple | Endorsed |  |
| R4-2210894 | Draft CR on Correction in TDD LTE-NR Coexistence Tests | Qualcomm Incorporated | Endorsed |  |
| R4-2210895 | Draft CR to Reporting of Channel Quality Indicator (CQI) for CA | Anritsu Corporation | Endorsed |  |
| R4-2210896 | draftCR: Updates to test parameters for NR Rel-16 UE requirements (38.101-4, Rel-16) | Huawei, HiSilicon | Endorsed |  |
| R4-2208532 | CR on PDSCH requirements for HST-972 and TDLC300-600 | CMCC | Endorsed |  |
| R4-2208575 | Correction CA configuration for PDSCH demodulation | Rohde & Schwarz | Endorsed |  |
| R4-2209853 | draftCR: Modification on test parameters for FR2 SDR test (38.101-4 Rel-15) | Huawei, HiSilicon | Endorsed |  |
| R4-2209856 | draftCR: Modification on test parameters for eMTC test (36.101 Rel-14) | Huawei, HiSilicon | Endorsed |  |

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**R4-2207791 CR for mTRP demod requirements applicability (Rel-16)**

*Type: draftCR For: Endorsement  
 38.101-4 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Revised to R4-2210893 (from R4-2207791).**

**R4-2210893 CR for mTRP demod requirements applicability (Rel-16)**

*Type: draftCR For: Endorsement  
 38.101-4 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Endorsed.**

**R4-2207792 CR for mTRP demod requirements applicability (Rel-17)**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Endorsed.**

**R4-2208532 CR on PDSCH requirements for HST-972 and TDLC300-600**

*Type: CR For: Approval  
 38.101-4 v16.8.0 CR-0284 rev Cat: F (Rel-16)  
  
 Source: CMCC*

**Decision: Endorsed.**

**R4-2208533 CR on PDSCH requirements for HST-972 and TDLC300-600**

*Type: CR For: Approval  
 38.101-4 v17.4.0 CR-0285 rev Cat: A (Rel-17)  
  
 Source: CMCC*

**Decision: Endorsed.**

**R4-2208575 Correction CA configuration for PDSCH demodulation**

*Type: draftCR For: Agreement  
 38.101-4 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2208576 Correction CA configuration for PDSCH demodulation**

*Type: draftCR For: Agreement  
 38.101-4 v17.4.0 CR- rev Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2208578 Discussion on scheduling conflicts in UE performance RMCs**

*Type: discussion For: Approval  
 Source: Rohde & Schwarz*

**Decision: Noted.**

**R4-2209851 draftCR: Updates to test parameters for NR Rel-16 UE requirements (38.101-4, Rel-16)**

*Type: draftCR For: Endorsement  
 38.101-4 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2210896 (from R4-2209851).**

**R4-2210896 draftCR: Updates to test parameters for NR Rel-16 UE requirements (38.101-4, Rel-16)**

*Type: draftCR For: Endorsement  
 38.101-4 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2209852 draftCR: Updates to test parameters for NR Rel-16 UE requirements (38.101-4, Rel-17)**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2209853 draftCR: Modification on test parameters for FR2 SDR test (38.101-4 Rel-15)**

*Type: draftCR For: Endorsement  
 38.101-4 v15.13.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2209854 draftCR: Modification on test parameters for FR2 SDR test (38.101-4 Rel-16)**

*Type: draftCR For: Endorsement  
 38.101-4 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2209855 draftCR: Modification on test parameters for FR2 SDR test (38.101-4 Rel-17)**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2209856 draftCR: Modification on test parameters for eMTC test (36.101 Rel-14)**

*Type: draftCR For: Endorsement  
 36.101 v14.22.0 CR- rev Cat: F (Rel-14)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2209857 draftCR: Modification on test parameters for eMTC test (36.101 Rel-15)**

*Type: draftCR For: Endorsement  
 36.101 v15.18.0 CR- rev Cat: A (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2209858 draftCR: Modification on test parameters for eMTC test (36.101 Rel-16)**

*Type: draftCR For: Endorsement  
 36.101 v16.13.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2209859 draftCR: Modification on test parameters for eMTC test (36.101 Rel-17)**

*Type: draftCR For: Endorsement  
 36.101 v17.5.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2209996 Draft CR on Correction in TDD LTE-NR Coexistence Tests**

*Type: draftCR For: Endorsement  
 38.101-4 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2210894 (from R4-2209996).**

**R4-2210894 Draft CR on Correction in TDD LTE-NR Coexistence Tests**

*Type: draftCR For: Endorsement  
 38.101-4 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Decision: Endorsed.**

**R4-2209998 Draft CR on Correction in TDD LTE-NR Coexistence Tests**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Endorsed.**

##### 4.1.6.2 CSI requirements

**R4-2207651 Draft CR to Reporting of Channel Quality Indicator (CQI) for CA**

*Type: draftCR For: Endorsement  
 38.101-4 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

6.2A.3.1.1

Separated CSI Report offset settings of the CSI reports for the PCell and SCell.

**Decision: Endorsed.**

**R4-2210895 Draft CR to Reporting of Channel Quality Indicator (CQI) for CA**

*Type: draftCR For: Endorsement  
 38.101-4 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

6.2A.3.1.1

Separated CSI Report offset settings of the CSI reports for the PCell and SCell.

**Decision: Endorsed.**

**R4-2207652 Draft CR to Reporting of Channel Quality Indicator (CQI) for CA**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: A (Rel-17)  
  
 Source: Anritsu Corporation*

**Abstract:**

6.2A.3.1.1

Separated CSI Report offset settings of the CSI reports for the PCell and SCell.

**Decision: Endorsed.**

##### 4.1.6.3 BS demodulation requirements

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**Email discussion for [103-e][315] Demod\_Maintenance\_BS, AI 4.1.6.3-Aijun Cao**

**R4-2210321Email discussion summary for [103-e][315] Demod\_Maintenance\_BS**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210518 (from R4-2210321).**

**R4-2210518 Email discussion summary for [103-e][315] Demod\_Maintenance\_BS**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210649 | Draft CR to TS 38.141-2: 64QAM BS demodulation FRC description correction, Rel-16 | Huawei, HiSilicon | Endorsed |  |
| R4-2210890 | Maintenance for IAB-MT performance requirement R16 | ZTE | Endorsed |  |
| R4-2210891 | Maintenance for IAB-MT performance requirement R16 | ZTE | Endorsed |  |
| R4-2210892 | *Draft CR to TS 38.104: 64QAM BS demodulation FRC description correction, Rel-16* | *Huawei, HiSilicon* | Endorsed |  |

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**R4-2210649 Draft CR to TS 38.141-2: 64QAM BS demodulation FRC description correction, Rel-16**

*Type: draftCR For: Endorsement  
 38.141-2 v16.11.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

With the introduction of additional FR1 FRCs for the interlaced PUSCH (Table A.5-5), the annex A.5 description text was not updated.

**Decision: Endorsed.**

**R4-2209672 Draft CR to TS 38.104: 64QAM BS demodulation FRC description correction, Rel-16**

*Type: draftCR For: Endorsement  
 38.104 v16.11.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

With the introduction of additional FR1 FRCs for the interlaced PUSCH (Table A.5-5), the annex A.5 description text was not updated.

**Decision: Revised to R4-2210892 (from R4-2209672).**

**RR4-2210892 Draft CR to TS 38.104: 64QAM BS demodulation FRC description correction, Rel-16**

*Type: draftCR For: Endorsement  
 38.104 v16.11.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

With the introduction of additional FR1 FRCs for the interlaced PUSCH (Table A.5-5), the annex A.5 description text was not updated.

**Decision: Endorsed.**

**R4-2209673 Draft CR to TS 38.104: 64QAM BS demodulation FRC description correction, Rel-17**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

With the introduction of additional FR1 FRCs for the interlaced PUSCH (Table A.5-5), the annex A.5 description text was not updated.

**Decision: Endorsed.**

**R4-2209038 [dCR] Maintenance for IAB-MT performance requirement R16**

*Type: draftCR For: Endorsement  
 38.174 v16.6.0 CR- rev Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

This is a R16 Cat F draft CR.

Session chair Note: This t-doc moved to this AI from AI 9.16.6

**Decision: Revised to R4-2210890 (from R4-2209038).**

**R4-2210890 [dCR] Maintenance for IAB-MT performance requirement R16**

*Type: draftCR For: Endorsement  
 38.174 v16.6.0 CR- rev Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

This is a R16 Cat F draft CR.

Session chair Note: This t-doc moved to this AI from AI 9.16.6

**Decision: Endorsed.**

**R4-2209039 [dCR] Maintenance for IAB-MT performance requirement R17 Cat A**

*Type: draftCR For: Endorsement  
 38.174 v17.0.0 CR- rev Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Abstract:**

This is a R17 Cat A draft CR.

Session chair Note: This t-doc moved to this AI from AI 9.16.6

**Decision: Revised to R4-2210891 (from R4-2209039).**

**R4-2210891 [dCR] Maintenance for IAB-MT performance requirement R17 Cat A**

*Type: draftCR For: Endorsement  
 38.174 v17.0.0 CR- rev Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Abstract:**

This is a R17 Cat A draft CR.

Session chair Note: This t-doc moved to this AI from AI 9.16.6

**Decision: Endorsed.**

#### 4.1.7 NR MIMO OTA test methods (38.827)

**Refer to email discussion [103-e][332] NR\_MIMO\_OTA**

**R4-2208625 draft CR to TR38.827 on UE mechanical mode**

*Type: draftCR For: Approval  
 38.827 v16.6.0 CR- rev Cat: F (Rel-16)  
  
 Source: vivo*

**Decision: Revised to R4-2210936 (from R4-2208625).**

**R4-2210936 draft CR to TR38.827 on UE mechanical mode**

*Type: draftCR For: Approval  
 38.827 v16.6.0 CR- rev Cat: F (Rel-16)  
  
 Source: vivo*

**Decision: Endorsed.**

## 5 Rel-17 maintenance for LTE and NR

### 5.1 Rel-17 spectrum related WIs

#### 5.1.3 Introduction of 1900 MHz spectrum to 5G NR applicable for Rail Mobile Radio

**Refer to email discussion [103-e][313] RAIL\_900MHz\_RF**

**R4-2208642 Revised TR 38.852 version 0.3.0**

*Type: draft TR For: Agreement  
 38.852 v0.2.0 CR- rev Cat: (Rel-17)  
  
 Source: Union Inter. Chemins de Fer*

**Decision: Revised to R4-2210883 (from R4-2208642).**

**R4-2210883 Revised TR 38.852 version 0.3.0**

*Type: draft TR For: Agreement  
 38.852 v0.2.0 CR- rev Cat: (Rel-17)  
  
 Source: Union Inter. Chemins de Fer*

**Decision: Email approval**

**R4-2208902 TP to TR 38.852 - Clarification BS output power**

*Type: pCR For: Approval  
 38.852 v0.2.0 CR- rev Cat: (Rel-17)  
  
 Source: Ericsson, UIC*

**Abstract:**

This contribution is a TP to TR 38.852 clarifying BS output power level for 5MHz channel BW

**Decision: Revised to R4-2210882 (from R4-2208902).**

**R4-2210882 TP to TR 38.852 - Clarification BS output power**

*Type: pCR For: Approval  
 38.852 v0.2.0 CR- rev Cat: (Rel-17)  
  
 Source: Ericsson, UIC*

**Abstract:**

This contribution is a TP to TR 38.852 clarifying BS output power level for 5MHz channel BW

**Decision: Approved.**

### 5.2 Rel-17 non-spectrum related WIs

### 5.3 Other WIs and Rel-17 TEI

#### 5.3.1 BS RF requirements

**Refer to email discussion for [103-e][301] BSRF\_Maintenance**

**R4-2208121 Draft CR for TS 38.176-2 R16: correction of the co-existence test requirements**

*Type: draftCR For: Endorsement  
 38.176-2 v16.3.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Revised to R4-2210696 (from R4-2208121).**

**R4-2210696 Draft CR for TS 38.176-2 R16: correction of the co-existence test requirements**

*Type: draftCR For: Endorsement  
 38.176-2 v16.3.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208119 Draft CR for TS 38.174 R17: correction of the co-existence and co-location tables**

*Type: draftCR For: Endorsement  
 38.174 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Revised to R4-2210695 (from R4-2208119).**

**R4-2210695 Draft CR for TS 38.174 R17: correction of the co-existence and co-location tables**

*Type: draftCR For: Endorsement  
 38.174 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208120 Draft CR for TS 38.176-1 R17: correction of the co-existence and co-location tables**

*Type: draftCR For: Endorsement  
 38.176-1 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208122 Draft CR for TS 38.176-2 R17: correction of the co-existence and co-location test requirements**

*Type: draftCR For: Endorsement  
 38.176-2 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Revised to R4-2210697 (from R4-2208122).**

**R4-2210697 Draft CR for TS 38.176-2 R17: correction of the co-existence and co-location test requirements**

*Type: draftCR For: Endorsement  
 38.176-2 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208129 Draft CR for TS 38.141-2 R17: correction of BS type 1-O co-existence table**

*Type: draftCR For: Endorsement  
 38.141-2 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Revised to R4-2210698 (from R4-2208129).**

**R4-2210698 Draft CR for TS 38.141-2 R17: correction of BS type 1-O co-existence table**

*Type: draftCR For: Endorsement  
 38.141-2 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208839 CR to 38.141-2: BS FR2 OBUE Cat B requirement table note clarification (6.7.4.5.2)**

*Type: CR For: Agreement  
 38.141-2 v17.5.0 CR-0398 rev Cat: F (Rel-17)  
  
 Source: Keysight Technologies UK Ltd*

**Decision: Revised to R4-2210699 (from R4-2208839).**

**R4-2210699 CR to 38.141-2: BS FR2 OBUE Cat B requirement table note clarification (6.7.4.5.2)**

*Type: CR For: Agreement  
 38.141-2 v17.5.0 CR-0398 rev Cat: F (Rel-17)  
  
 Source: Keysight Technologies UK Ltd*

**Decision: Endorsed.**

#### 5.3.4 Demodulation and CSI requirements

#### 5.3.5 Rel-17 TEI

##### 5.3.5.1 Incorrect PMI reporting

**Refer to email discussion [103-e][316] Demod\_Maintenance\_UE**

**R4-2207793 Discussion on incorrect PMI reporting**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2209690 Discussion on the incorrect PMI reporting**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discuss the detail of incorrect PMI reporting and answer those questions raised by RAN plenary

**Decision: Noted.**

**R4-2209796 Discussion on PMI requirements for inter-cell interference scenario**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2209893 Discussion on incorrect PMI reporting with inter-cell interference**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2208265 On General for FeMIMO**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution we have provided our views to the discussion on the issue of “Incorrect PMI Reporting in MIMO Operation”.

Session chair note: Moved to this AI from AI 9.18.4.1

**Decision: Noted.**

## R4-6 LS response to ITU

### 6.1 Generic unwanted emission (IMT-2020)

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**Email discussion for [103-e][314] LS\_Response\_ITU-R, AI 6-Johan Sköld**

**R4-2210320 Email discussion summary for [103-e][314] LS\_Response\_ITU-R**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210517 (from R4-2210320).**

**R4-2210517 Email discussion summary for [103-e][314] LS\_Response\_ITU-R**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210648 WF on LS response to WP5D on Generic unwanted emission (IMT-2020)**

*Type: other For: Approval  
 Source:* Ericsson, Nokia, Qualcomm, ZTE, Huawei

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210648 | WF on LS response to WP5D on Generic unwanted emission (IMT-2020) | Ericsson, Nokia, Qualcomm, ZTE, Huawei | Approved |  |
| *R4-2210889* | LS on Test methods for over-the-air TRP field measurements of unwanted emissions from IMT radio equipment utilizing active antennas | Ericsson, Qualcomm, Huawei, Nokia | Approved |  |

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**R4-2207889 LS on unwanted emissions for IMT-2020**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution unwanted emission requirements are collected

**Decision: Noted.**

**R4-2207920 Input on LS response to ITU-R on Generic unwanted emission (IMT-2020)**

*Type: other For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This contribution has provided our input according to the work split determined offline among the interested companies.

**Decision: Noted.**

**R4-2208086 Work plan on LS response to ITU-R on Generic unwanted emission (IMT-2020)**

*Type: other For: Discussion  
 Source: Qualcomm CDMA Technologies*

**Decision: Noted.**

**R4-2209591 Input on LS response to ITU-R on Generic unwanted emission (IMT-2020)**

*Type: other For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209645 Inputs to the ITU-R LS response on generic unwanted emission for (IMT-2020): Receiver spurious emissions**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Abstract:**

In this contribution we provide inputs to the IMT-2020 generic unwanted emissions for the receiver spurious emissions, as per the agreed work-split.

**Decision: Noted.**

### 6.2 Test methods for OTA total radiated power

**R4-2207888 LS on Test methods for over-the-air TRP field measurements of unwanted emissions from IMT radio equipment utilizing active antennas**

*Type: LS out For: Approval  
 to TSG RAN  
 Source: Ericsson, Qualcomm, Huawei, Nokia*

**Abstract:**

The LS response gives furthre responses to the questions from IRU-R WP1C.

**Decision: Revised to R4-2210889 (from R4-2207888).**

**R4-2210889 LS on Test methods for over-the-air TRP field measurements of unwanted emissions from IMT radio equipment utilizing active antennas**

*Type: LS out For: Approval  
 to TSG RAN  
 Source: Ericsson, Qualcomm, Huawei, Nokia*

**Abstract:**

The LS response gives furthre responses to the questions from IRU-R WP1C.

**Decision: Approved.**

## 8 Rel-17 spectrum related WIs for NR

### 8.2 Introduction of 900 MHz spectrum to 5G NR applicable for Rail Mobile Radio

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**Email discussion for [103-e][313] RAIL\_900MHz\_RF, AI 5.1.3,8.2,8.2.1,8.2.2-Michal Szydelko**

**R4-2210319 Email discussion summary for [103-e][313] RAIL\_900MHz\_RF**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210516 (from R4-2210319).**

**R4-2210516 Email discussion summary for [103-e][313] RAIL\_900MHz\_RF**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**R4-2210644 CR to TS 38.104: RMR900 Rx requirements for band n100, Rel-17**

*Type: CR For: Agreement  
 38.104 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei*

**Abstract:**

**Decision: Agreed.**

**R4-2210645 CR to TS 37.105: introduction of n100 co-existence requirements, Rel-17**

*Type: CR For: Agreement  
 37.105 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei*

**Abstract:**

**Decision: Agreed.**

**R4-2210646 CR to TS 37.145-1: introduction of n100 co-existence requirements, Rel-17**

*Type: CR For: Agreement  
 37.145-1 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei*

**Abstract:**

**Decision: Agreed.**

**R4-2210647 CR to TS 37.145-2: introduction of n100 co-existence requirements, Rel-17**

*Type: CR For: Agreement  
 37.145-2 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei*

**Abstract:**

**Decision: Agreed.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210644 | CR to TS 38.104: RMR900 Rx requirements for band n100, Rel-17 | Huawei, HiSilicon | Agreed |  |
| R4-2210645 | CR to TS 37.05: introduction of n100 co-existence requirements, Rel-17 | Huawei, HiSilicon | Agreed |  |
| R4-2210646 | CR to TS 37.145-1: introduction of n100 co-existence requirements, Rel-17 | Huawei, HiSilicon | Agreed |  |
| R4-2210647 | CR to TS 37.145-2: introduction of n100 co-existence requirements, Rel-17 | Huawei, HiSilicon | Agreed |  |
| R4-2210882 | TP to TR 38.852 - Clarification BS output power | Ericsson, UIC | Approved |  |
| R4-2210883 | Revised TR 38.852 version 0.3.0 | Union Inter. Chemins de Fer | Email approval |  |
| R4-2210884 | TP 900MHz RMR band – conclusion- TR 38.853 | Union Inter. Chemins de Fer | Approved |  |
| R4-2210885 | CR to TS 38.104 - Tx requirements: RMR 900MHz band introduction | Ericsson | Agreed |  |
| R4-2210886 | CR to 37.141 on introduction of n100 co-existence requirements | Nokia, Nokia Shanghai Bell | Agreed | *MCC: WI code correction* |
| R4-2210887 | CR to 38.104 on introduction of n100 (system parameters) | Nokia, Nokia Shanghai Bell | Agreed | MCC: WI code correction |
| R4-2210888 | CR to 38.141-1 on introduction of n100 requirements | Nokia, Nokia Shanghai Bell | Agreed |  |
| R4-2209674 | Draft CR to TS 38.104: RMR900 Rx requirements for band n100, Rel-17 | Huawei, HiSilicon | Not Pursued |  |
| R4-2209107 | 38.101-1: Introduction of 900 MHz to 5G NR for RMR | Nokia, UIC | Agreed |  |
| R4-2208898 | CR to TS 38.141-2: RMR 900MHz band introduction | Ericsson | Agreed |  |
| R4-2208899 | CR to TS 36.104: RMR 900MHz band introduction | Ericsson | Agreed |  |
| R4-2208900 | CR to TS 36.141: RMR 900MHz band introduction | Ericsson | Agreed |  |
| R4-2209530 | CR to 37.104 on introduction of n100 co-existence requirements | Nokia, Nokia Shanghai Bell | Agreed |  |
| R4-2208654 | Revised TR 38.853 version 0.4.0 | Union Inter. Chemins de Fer | Endorsed |  |

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**R4-2208654 Revised TR 38.853 version 0.4.0**

*Type: draft TR For: Agreement  
 38.853 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: Union Inter. Chemins de Fer*

**Decision: Endorsed.**

**R4-2209270 TP 900MHz RMR band – conclusion- TR 38.853**

*Type: pCR For: Approval  
 38.853 v0.2.0 CR- rev Cat: (Rel-17)  
  
 Source: Union Inter. Chemins de Fer*

(Replaces R4-2205141)

**Decision: Revised to R4-2210884 (from R4-2209270).**

**R4-2210884 TP 900MHz RMR band – conclusion- TR 38.853**

*Type: pCR For: Approval  
 38.853 v0.2.0 CR- rev Cat: (Rel-17)  
  
 Source: Union Inter. Chemins de Fer*

(Replaces R4-2205141)

**Decision: Approved.**

**R4-2209585 Discussion on sync raster design for railway 900MHz**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

#### 8.2.1 UE RF requirements

**R4-2208281 Synchronisation raster for bandwidth less than 5MHz**

*Type: other For: (not specified)  
 Source: Huawei Tech.(UK) Co.. Ltd*

**Decision: Noted.**

**R4-2209721 Synchronization raster design for n100**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

#### 8.2.2 BS RF requirements

**R4-2208896 RMR 900MHz: Remaining BS RF open issues**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This contribution discusses the remaining BS RF open issues for RMR 900MHz band

**Decision: Noted.**

**R4-2208897 CR to TS 38.104 - Tx requirements: RMR 900MHz band introduction**

*Type: CR For: Agreement  
 38.104 v17.5.0 CR-0380 rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This contribution is a CR to TS 38.104 - Tx requirements: RMR n100 band introduction

**Decision: Revised to R4-2210885 (from R4-2208897).**

**R4-2210885 CR to TS 38.104 - Tx requirements: RMR 900MHz band introduction**

*Type: CR For: Agreement  
 38.104 v17.5.0 CR-0380 rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This contribution is a CR to TS 38.104 - Tx requirements: RMR n100 band introduction

**Decision: Agreed.**

**R4-2208898 CR to TS 38.141-2: RMR 900MHz band introduction**

*Type: CR For: Agreement  
 38.141-2 v17.5.0 CR-0400 rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This contribution is a CR to TS 38.141-2: RMR n100 band introduction

**Decision: Agreed.**

**R4-2208899 CR to TS 36.104: RMR 900MHz band introduction**

*Type: CR For: Agreement  
 36.104 v17.5.0 CR-4957 rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This contribution is a CR to TS 36.104: RMR n100band introduction

**Decision: Agreed.**

**R4-2208900 CR to TS 36.141: RMR 900MHz band introduction**

*Type: CR For: Agreement  
 36.141 v17.5.0 CR-1335 rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This contribution is a CR to TS 36.141: RMR n100band introduction

**Decision: Agreed.**

**R4-2209530 CR to 37.104 on introduction of n100 co-existence requirements**

*Type: CR For: Approval  
 37.104 v17.5.0 CR-0963 rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Agreed.**

**R4-2209531 CR to 37.141 on introduction of n100 co-existence requirements**

*Type: CR For: Approval  
 37.141 v17.5.0 CR-1009 rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2210886(from R4-2209531).**

**RR4-2210886 CR to 37.141 on introduction of n100 co-existence requirements**

*Type: CR For: Approval  
 37.141 v17.5.0 CR-1009 rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Agreed.**

**R4-2209532 CR to 38.104 on introduction of n100 (system parameters)**

*Type: CR For: Approval  
 38.104 v17.5.0 CR-0382 rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2210887(from R4-2209532).**

**R4-2210887 CR to 38.104 on introduction of n100 (system parameters)**

*Type: CR For: Approval  
 38.104 v17.5.0 CR-0382 rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Agreed.**

**R4-2209533 CR to 38.141-1 on introduction of n100 requirements**

*Type: CR For: Approval  
 38.141-1 v17.5.0 CR-0272 rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2210888 (from R4-2209533).**

**R4-2210888 CR to 38.141-1 on introduction of n100 requirements**

*Type: CR For: Approval  
 38.141-1 v17.5.0 CR-0272 rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Agreed.**

**R4-2209674 Draft CR to TS 38.104: RMR900 Rx requirements for band n100, Rel-17**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

As per worksplit agreed among interested companies, this CR to TS 38.104 is to capture the additional out-of-band blocking requirement for RMR900 band n100, including the placeholder for the interfering signal to be decided by the ETSI TC RT.

**Decision: Not pursued.**

## 9 Rel-17 non-spectrum related work items for NR

### 9.1 Multiple Input Multiple Output (MIMO) Over-the-Air (OTA) requirements for NR UEs

#### 9.1.1 General

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**Email discussion for [103-e][332] NR\_MIMO\_OTA, AI 4.1.7, 9.1– Xuan Yi**

**R4-2210338 Email discussion summary for [103-e][332] NR\_MIMO\_OTA**

*Type: other For: Information  
 Source: Moderator (CAICT)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210535 (from R4-2210338).**

**R4-2210535 Email discussion summary for [103-e][332] NR\_MIMO\_OTA**

*Type: other For: Information  
 Source: Moderator (CAICT)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210675 WF on NR MIMO OTA**

*Type: other For: Approval  
 Source: vivo, CAICT*

**Abstract:**

**Discussion:**

**Decision: Approved.**

|  |
| --- |
| Session chair note:   * With the agreement reached for FR2 pass/fail limit, it’s RAN4 understanding this WI core part can be considered as completed. * RAN4 still can revisit the FR2 channel model validation pass/fail limit values during performance phase with more data input from companies. |

**R4-2210676 Reference curves for FR2 channel model validation**

*Type: other For: Information  
 Source: CMCC, CAICT*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-221132 Draft CR to TS38.151 on FR2 channel model validation pass fail limits**

*Type: draftCR For: Endorsement  
 38.151 v17.0.0 CR- rev Cat: B (Rel-17)  
  
 Source: vivo,CAICT*

**Decision: Endorsed.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210675 | WF on NR MIMO OTA | vivo, CAICT | **Approved** |  |
| R4-2210676 | Reference curves for FR2 channel model validation | CMCC, CAICT | Noted |  |
| R4-2211132 | Draft CR to TS38.151 on FR2 channel model validation pass fail limits | vivo, CAICT | **Endorsed** |  |
| R4-2210932 | FR2 Channel validation targets and pass/fail limits | Spirent Communications | Noted | other |
| R4-2210933 | 3GPP NR FR1 MIMO OTA Performance Test Campaign Template | CAICT | **Approved** | discussion |
| R4-2210934 | Commercial terminal testing results of CMCC & BUPT joint lab | CMCC | Noted | discussion |
| R4-2210935 | draft CR to TS38.151 on UE mechanical mode | vivo | **Endorsed** | draftCR |
| R4-2210936 | draft CR to TR38.827 on UE mechanical mode | vivo | **Endorsed** | draftCR |
| R4-2210937 | Draft CR on TS 38.151 for MU of FR2 MIMO OTA | Qualcomm Incorporated | **Endorsed** | draftCR |
| R4-2210938 | FR2 Channel Model Validation Reference and Pass/Fail Limits | Keysight Technologies UK Ltd | Noted | discussion |

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**R4-2207653 Our Status (SGS TW) Update for the 3GPP RAN4 5G FR1 SA MIMO OTA Lab Alignment Activity**

*Type: discussion For: (not specified)  
 Source: SGS Wireless*

**Decision: Noted.**

**R4-2208322 3GPP NR FR1 MIMO OTA Performance Test Campaign Template**

*Type: discussion For: Approval  
 Source: CAICT*

**Decision: Revised to R4-2210933 (from R4-2208322).**

**R4-2210933 3GPP NR FR1 MIMO OTA Performance Test Campaign Template**

*Type: discussion For: Approval  
 Source: CAICT*

**Decision: Approved.**

**R4-2208670 Handling of FR2 MIMO OTA**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2209331 Proposal on concluding the Rel-17 NR MIMO OTA WI**

*Type: discussion For: Approval  
 Source: CAICT, OPPO, Huawei, HiSilicon, MediaTek Inc.*

**Decision: Noted.**

#### 9.1.2 Performance requirements

##### 9.1.2.1 Lab alignment for FR1

**R4-2207654 MIMO OTA lab alignment results**

*Type: discussion For: (not specified)  
 Source: Huawei Tech.(UK) Co.. Ltd*

**Decision: Noted.**

**R4-2207690 Discussion on FR1 MIMO Lab Alignment Timeline**

*Type: discussion For: Decision  
 Source: Apple*

**Decision: Noted.**

**R4-2208319 PAD test results for NR FR1 MIMO OTA lab alignment**

*Type: discussion For: Approval  
 Source: MediaTek Beijing Inc.*

**Decision: Noted.**

**R4-2208320 CAICT FR1 MIMO OTA lab alignment results**

*Type: discussion For: Discussion  
 Source: CAICT*

**Decision: Noted.**

**R4-2208321 Summary of FR1 MIMO OTA lab alignment results**

*Type: discussion For: Discussion  
 Source: CAICT*

**Decision: Noted.**

**R4-2208412 PAD testing results of CMCC & BUPT joint lab**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2208480 Discussion on reference value for FR1 MIMO OTA lab alignment**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2208621 Discussion on FR1 MIMO OTA lab alignment activity**

*Type: other For: Approval  
 Source: vivo*

**Decision: Noted.**

**R4-2209329 Views on FR1 MIMO OTA lab alignment**

*Type: discussion For: Approval  
 Source: CAICT, SAICT*

**Decision: Noted.**

**R4-2209433 Reference value for FR1 MIMO OTA Lab alignment**

*Type: discussion For: Approval  
 Source: OPPO*

**Decision: Noted.**

**R4-2209512 on remaining issue for FR1 Lab alignment**

*Type: discussion For: (not specified)  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2209514 3GPP NR FR1 MIMO OTA Lab Alignment result from Xiaomi Lab**

*Type: discussion For: (not specified)  
 Source: Xiaomi*

**Decision: Noted.**

##### 9.1.2.2 Performance Requirements for FR1

**R4-2208118 on data processing for FR1 MIMO OTA lab alignment**

*Type: discussion For: (not specified)  
 Source: Huawei Tech.(UK) Co.. Ltd*

**Decision: Noted.**

**R4-2208315 Review on FR2 MIMO OTA progress and proposal on simulation formula**

*Type: discussion For: Approval  
 Source: MediaTek Beijing Inc.*

**Decision: Noted.**

**R4-2208413 Commercial terminal testing results of CMCC & BUPT joint lab**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Revised to R4-2210934 (from R4-2208413).**

**R4-2210934 Commercial terminal testing results of CMCC & BUPT joint lab**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2209330 TRMS measurement results for bands n41, n78**

*Type: discussion For: Discussion  
 Source: CAICT*

**Decision: Noted.**

**R4-2209513 initial test result for FR1 performance requirement**

*Type: discussion For: (not specified)  
 Source: Xiaomi*

**Decision: Noted.**

##### 9.1.2.3 Performance Requirements for FR2

**R4-2208317 Review on FR2 MIMO OTA progress and proposal on simulation formula**

*Type: discussion For: Approval  
 Source: MediaTek Beijing Inc.*

**Decision: Noted.**

**R4-2208622 Views on FR2 MIMO OTA requirements**

*Type: other For: Approval  
 Source: vivo*

**Decision: Noted.**

**R4-2208671 FR2 MIMO OTA requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2208672 Summary results for FR2 MIMO OTA**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2209144 Discussion FR2 MIMO OTA performance requirements**

*Type: discussion For: Approval  
 Source: Huawei,HiSilicon*

**Decision: Noted.**

**R4-2209435 Views on performance requirement of FR2 MIMO OTA**

*Type: discussion For: Approval  
 Source: OPPO*

**Decision: Noted.**

##### 9.1.2.4 MU assessment for FR1 and FR2

**R4-2208673 Draft CR on TS 38.151 for MU of FR2 MIMO OTA**

*Type: draftCR For: Endorsement  
 38.151 v17.0.0 CR- rev Cat: B (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2210937 (from R4-2208673).**

**R4-2210937 Draft CR on TS 38.151 for MU of FR2 MIMO OTA**

*Type: draftCR For: Endorsement  
 38.151 v17.0.0 CR- rev Cat: B (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Endorsed.**

#### 9.1.3 Testing methodologies

##### 9.1.3.1 Testing parameters for Performance

**R4-2208624 draft CR to TS38.151 on UE mechanical mode**

*Type: draftCR For: Approval  
 38.151 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: vivo*

**Decision: Revised to R4-2210935 (from R4-2208624).**

**R4-2210935 draft CR to TS38.151 on UE mechanical mode**

*Type: draftCR For: Approval  
 38.151 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: vivo*

**Decision: Endorsed.**

##### 9.1.3.2 Optimization of test methodologies

**R4-2208623 Discussion on UE mechanical mode for foldable smartphones**

*Type: discussion For: Approval  
 Source: vivo*

**Decision: Noted.**

##### 9.1.3.3 Channel model validation

**R4-2207689 FR1 MIMO Channel Model Validation**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2208285 FR2 Channel validation targets and pass/fail limits**

*Type: other For: Approval  
 Source: Spirent Communications*

**Abstract:**

FR2 MIMO OTA Spatial Channel validation involves measuring PDP, Autocorrelation, V/H. This contribution presents theoretical targets and pass/fail limits.

**Decision: Revised to R4-2210932 (from R4-2208285).**

**R4-2210932 FR2 Channel validation targets and pass/fail limits**

*Type: other For: Approval  
 Source: Spirent Communications*

**Abstract:**

FR2 MIMO OTA Spatial Channel validation involves measuring PDP, Autocorrelation, V/H. This contribution presents theoretical targets and pass/fail limits.

**Decision: Noted.**

**R4-2209578 FR2 Channel Model Validation Reference and Pass/Fail Limits**

*Type: discussion For: Approval  
 Source: Keysight Technologies UK Ltd*

**Abstract:**

This contribution presents validation results of FR2 MIMO OTA test setup. Statistical characteristics to be validated are Power Delay Profile (PDP), Temporal Correlation Function (TCF), and PAS Similarity Percentage (PSP). Both theoretical reference value

**Decision: Revised to R4-2210938 (from R4-2209578).**

**R4-2210938 FR2 Channel Model Validation Reference and Pass/Fail Limits**

*Type: discussion For: Approval  
 Source: Keysight Technologies UK Ltd*

**Abstract:**

This contribution presents validation results of FR2 MIMO OTA test setup. Statistical characteristics to be validated are Power Delay Profile (PDP), Temporal Correlation Function (TCF), and PAS Similarity Percentage (PSP). Both theoretical reference value

**Decision: Noted.**

### 9.2 Introduction of UE TRP (Total Radiated Power) and TRS (Total Radiated Sensitivity) requirements and test methodologies for FR1 (NR SA and EN-DC)

#### 9.2.1 General and work plan

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**Email discussion for [103-e][333] FR1\_TRP\_TRS\_Part1, AI 9.2 (except AI 9.2.2.3, 9.2.2.4) – Ruixin Wang**

**R4-2210339 Email discussion summary for [103-e][333] FR1\_TRP\_TRS\_Part1**

*Type: other For: Information  
 Source: Moderator (vivo)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210536 (from R4-2210339).**

**R4-2210536 Email discussion summary for [103-e][333] FR1\_TRP\_TRS\_Part1**

*Type: other For: Information  
 Source: Moderator (vivo)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210677 WF on FR1 TRP TRS**

*Type: other For: Approval  
 Source: vivo*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2210678 Sporton FR1 TRP/TRS lab alignment measurement results**

*Type: other For: Discussion  
 Source: Sporton*

**Abstract:**

**Discussion:**

**Decision: Withdrawn.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210677 | WF on FR1 TRP TRS | vivo | Approved |  |
| R4-2210939 | TP to 38.161 on EN-DC and PC2 test case applicability rules | Apple | Approved |  |
| R4-2210940 | TP to 38.161 on TRP aspects | Apple | Approved |  |
| R4-2210941 | Further updated Working procedure for TRP TRS requirement development | vivo | Approved |  |
| R4-2210942 | TP to TS 38.161 on test method | vivo | Approved |  |
| R4-2210943 | 3GPP TRP/TRS Performance Test Campaign Template | vivo | Approved |  |
| R4-2210944 | TP to TS 38.161 on Phantoms | vivo | Approved |  |
| R4-2211142 | CR to TR38.834 on TAS OFF verification procedure |  | Agreed |  |
| R4-2208481 | TP to TS 38.161 on primary mechanical mode | Samsung, vivo | Endorsed |  |
| R4-2208482 | Draft CR to TR 38.834 on UE mechanical mode and ENDC example band | Samsung, OPPO | Merged | *Merged into formal CR rev of R4-2208638* |
| R4-2208626 | 3GPP TS 38.161 v0.3.0 | vivo | For email approval |  |

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**R4-2207685 TRP-TRS work plan update due to lab alignment delays**

*Type: discussion For: Decision  
 Source: Apple*

**Decision: Noted.**

**R4-2208481 TP to TS 38.161 on primary mechanical mode**

*Type: pCR For: Approval  
 38.161 v0.2.0 CR- rev Cat: (Rel-17)  
  
 Source: Samsung, vivo*

**Decision: Endorsed.**

**R4-2208626 3GPP TS 38.161 v0.3.0**

*Type: draft TS For: Agreement  
 38.161 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: vivo*

**Decision:** Email approavl

**R4-2208631 3GPP TRP/TRS Performance Test Campaign Template**

*Type: other For: Approval  
 Source: vivo*

**Decision: Revised to R4-2210943 (from R4-2208631).**

**R4-2210943 3GPP TRP/TRS Performance Test Campaign Template**

*Type: other For: Approval  
 Source: vivo*

**Decision: Approved.**

**R 4-2208639 Discussion on OTA Testing for devices with a Time-Averaging Algorithm**

*Type: discussion For: Approval  
 Source: vivo*

**Decision: Noted.**

**R4-2210230 NR FR1 TRP TRS updates to test procedure for performance test activity**

*Type: discussion For: Approval  
 38.834 v CR- rev Cat: (Rel-17)  
  
 Source: Sporton International Inc*

**Decision: Noted.**

#### 9.2.2 Test methodology maintenance

**R4-2207688 Discussion on Working scope for Alternative test method**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2208659 Discussion on the addition of RC in test methodology**

*Type: discussion For: Approval  
 38.834 v CR- rev Cat: (Rel-17)  
  
 Source: SRTC, Bluetest*

**Decision: Noted.**

**R4-2208661 TP to TR 38.834: addition of RC in test methodology**

*Type: draftCR For: Approval  
 38.834 v17.0.0 CR- rev Cat: (Rel-17)  
  
 Source: SRTC, Bluetest*

**Decision: Not pursued.**

##### 9.2.2.1 SA test methodology

**R4-2207683 TP to 38.161 on EN-DC and PC2 test case applicability rules**

*Type: pCR For: Approval  
 38.161 v0.2.0 CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Revised to R4-2210939 (from R4-2207683).**

**R4-2210939 TP to 38.161 on EN-DC and PC2 test case applicability rules**

*Type: pCR For: Approval  
 38.161 v0.2.0 CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Approved.**

**R4-2207684 TP to 38.161 on TRP aspects**

*Type: pCR For: Approval  
 38.161 v0.2.0 CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Revised to R4-2210940 (from R4-2207684).**

**R4-2210940 TP to 38.161 on TRP aspects**

*Type: pCR For: Approval  
 38.161 v0.2.0 CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Approved.**

**R4-2208630 TP to TS 38.161 on test method**

*Type: pCR For: Approval  
 38.161 v0.2.0 CR- rev Cat: (Rel-17)  
  
 Source: vivo*

**Decision: Revised to R4-2210942 (from R4-2208630).**

**R4-2210942 TP to TS 38.161 on test method**

*Type: pCR For: Approval  
 38.161 v0.2.0 CR- rev Cat: (Rel-17)  
  
 Source: vivo*

**Decision: Approved.**

##### 9.2.2.2 EN-DC test methodology

**R4-2207682 Remaining issues with EN-DC configuration for TRP-TRS**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2208482 Draft CR to TR 38.834 on UE mechanical mode and ENDC example band**

*Type: draftCR For: Endorsement  
 38.834 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: Samsung, OPPO*

**Decision: Merged**

**R4-2208638 CR to TR38.834 on TAS OFF verification procedure**

*Type: CR For: Agreement  
 38.834 v17.0.0 CR-0001 rev Cat: F (Rel-17)  
  
 Source: vivo*

**Decision: Revised to R4-2211142 (from R4-2208638).**

**R4-2211142 CR to TR38.834 on TAS OFF verification procedure**

*Type: CR For: Agreement  
 38.834 v17.0.0 CR-0001 rev Cat: F (Rel-17)  
  
 Source: vivo*

**Decision: Agreed.**

##### 9.2.2.3 UE with multiple antennas test methodology

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**Email discussion for [103-e][334] FR1\_TRP\_TRS\_Part2, AI AI 9.2.2.3, 9.2.2.4 – Qifei Liu**

**R4-2210340 Email discussion summary for [103-e][334] FR1\_TRP\_TRS\_Part2**

*Type: other For: Information  
 Source: Moderator (OPPO)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210537 (from R4-2210340).**

**R4-2210537 Email discussion summary for [103-e][334] FR1\_TRP\_TRS\_Part2**

*Type: other For: Information  
 Source: Moderator (OPPO)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210679 WF on FR1 TRP TRS for UE with multi-antenna**

*Type: other For: Approval  
 Source: OPPO*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |
| --- | --- | --- | --- |
| **New Tdoc number** | **Title** | **Source** | **Status** |
| R4-2210679 | WF on FR1 TRP TRS for UE with multi-antenna | OPPO | Approved |

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**R4-2207686 Discussion on Tx Diversity Active Cancellation**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2207687 draft CR to 38.834 on TRP for TxD UEs**

*Type: draftCR For: Endorsement  
 38.834 v17.0.0 CR- rev Cat: B (Rel-17)  
  
 Source: Apple*

**Decision: Postponed.**

**R4-2208282 on TRP measurement under TxD**

*Type: discussion For: (not specified)  
 Source: Huawei Tech.(UK) Co.. Ltd*

**Decision: Noted.**

**R4-2208629 Views on test methods for TxD**

*Type: discussion For: Approval  
 Source: vivo*

**Decision: Noted.**

**R4-2208675 TRP test method for UEs with Tx diversity**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2209434 The influenced factors for Tx antenna switch ON**

*Type: discussion For: Approval  
 Source: OPPO*

**Decision: Noted.**

##### 9.2.2.4 Test time reduction

#### 9.2.3 Performance requirements

**R4-2208411 LADs testing results of CMCC lab**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

##### 9.2.3.1 Framework for lab alignment and requirements

**R4-2207655 TRP TRS lab alignment measurement from Huawei**

*Type: discussion For: (not specified)  
 Source: Huawei Tech.(UK) Co.. Ltd*

**Decision: Noted.**

**R4-2208280 on data processing for FR1 TRP and TRS OTA measurement**

*Type: discussion For: (not specified)  
 Source: Huawei Tech.(UK) Co.. Ltd*

**Decision: Noted.**

**R4-2208323 CAICT FR1 TRP/TRS lab alignment measurement results**

*Type: discussion For: Discussion  
 Source: CAICT*

**Decision: Noted.**

**R4-2208483 On percentile value of FR1 TRP TRS performance campaign**

*Type: discussion For: Approval  
 Source: Samsung*

**Decision: Noted.**

**R4-2208627 Further updated Working procedure for TRP TRS requirement development**

*Type: other For: Approval  
 Source: vivo*

**Decision: Revised to R4-2210941(from R4-2208627).**

**R4-2210941 Further updated Working procedure for TRP TRS requirement development**

*Type: other For: Approval  
 Source: vivo*

**Decision: Approved.**

**R4-2208633 Analysis of 3GPP TRP TRS lab alignment measurement results**

*Type: other For: Approval  
 Source: vivo*

**Decision: Revised to R4-2210945 (from R4-2208633).**

**R4-2210945 Analysis of 3GPP TRP TRS lab alignment measurement results**

*Type: other For: Approval  
 Source: vivo*

**Decision: Noted.**

**R4-2209382 3GPP FR1 TRP/TRS Lab Alignment Measurement Results From SRTC**

*Type: discussion For: Approval  
 38.834 v CR- rev Cat: (Rel-17)  
  
 Source: SRTC*

**Decision: Noted.**

**R4-2209432 Lab alignment criteria for FR1 TRP TRS campaign**

*Type: discussion For: Approval  
 Source: OPPO*

**Decision: Noted.**

**R4-2210145 Element FR1 TRP/TRS Lab Alignment Campaign Measurement Results**

*Type: discussion For: Discussion  
 Source: Element Materials Technology*

**Abstract:**

LAD measurement results for the FR1 TRP/TRS lab alignment campaign.

**Decision: Noted.**

**R4-2210352** **OPPO LAD test results for FR1 TRP/TRS Lab Alignment Campaign**

*Type: discusion For: discussion  
 Source: OPPO*

**Abstract:**

**Discussion:**

**Decision: Noted.**

##### 9.2.3.2 SA requirements

**R4-2208628 Measurement results for TRP TRS lab alignment activity**

*Type: other For: Approval  
 Source: vivo*

**Decision: Noted.**

**R4-2209431 Discussion on deriving performance requirement**

*Type: discussion For: Approval  
 Source: OPPO*

**Decision: Noted.**

##### 9.2.3.3 EN-DC requirements

**R4-2208283 on FR1 TRP and TRS OTA requirement for ENDC**

*Type: other For: (not specified)  
 Source: Huawei Tech.(UK) Co.. Ltd*

**Decision: Noted.**

**R4-2208632 TP to TS 38.161 on Phantoms**

*Type: other For: Approval  
 38.161 v CR- rev Cat: (Rel-17)  
  
 Source: vivo*

**Decision: Revised to R4-2210944 (from R4-2208632).**

**R4-2210944 TP to TS 38.161 on Phantoms**

*Type: other For: Approval  
 38.161 v CR- rev Cat: (Rel-17)  
  
 Source: vivo*

**Decision: Approved.**

### 9.4 NR RF requirement enhancements for frequency range 2 (FR2)

#### 9.4.6 RRM core requirements

##### 9.4.6.1 General

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**Email discussion for [103-e][219] NR\_RF\_FR2\_req\_enh2\_RRM, AI 9.4.6**

**9.4.6.1,9.4.6.2, 9.4.7.1-Lei Du**

**R4-2210291 Email discussion summary for [103-e][219] NR\_RF\_FR2\_req\_enh2\_RRM**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210488 (from R4-2210291).**

**R4-2210488 Email discussion summary for [103-e][219] NR\_RF\_FR2\_req\_enh2\_RRM**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 10th**

**List of key open issues:**

* Issue 2-1 requirements on number of serving cells
* Issue 3-1 Test cases for FR2 inter-band UL CA for IBM

**Issue 2-1 requirements on number of serving cells**

* Proposals:
  + Option 1: For the requirements on number of serving carriers, we suggest not to specify the exact number of NR serving carriers in TS38.133. The number of NR serving carriers for NR SA can refer to the configurations for CA as defined in TS38.101-1/2/3. (Huawei)
  + The requirements on number of serving carriers for NR SA can be updated as follows:

|  |
| --- |
| 3.6.2.1 Number of serving carriers for SA  Requirements for standalone NR with NR PCell are applicable for the UE configured with the following number of serving NR CCs:  - with the number of NR DL CCs in total as specified in clause 5.5A of TS 38.101-1 [18], TS 38.101-2 [19] and TS 38.101-3 [18] for NR CA configuration.  - with 1 UL (or 2 UL if SUL is configured) in PCell and up to 1 UL (or 2 UL if SUL is configured) in SCell.  - SUL may be configured together with one of the UL |

* Recommended WF
  + TBA
* Discussion:

Ericsson: We bring similar CR in previous meeting and companies’ comments this is not relevant to this WI.

We should not refer to RF specification here. We prefer same approach as legacy release for RRM specs to update the value otherwise we need to change legacy release RRM specification as well.

Huawei: If we follow legacy RRM approach with exact value in specification then we need to check the detailed band combinations in RF specification which increase our work. In RF session, there are new CA band combinations are considered which may impact the value.

Nokia: We prefer to introduce exact value in RRM specification to make it easily understand; with refer to RF specification, this bring confusion and hard to understand.

Apple: We think the approach proposed from Huawei not straightforward. When RF specification introducing new band combinations, they didn’t consider the impact to RRM. With increased number of CCs, measurement delay will be increased with unreasonable value. This is generic issue for RRM not specific to FR2 RF enhancement WI.

Ericsson: We can discuss in maintenance AI and discuss together with RF and RRM.

* Agreement:

Further discuss the issue with below options

1. Option 1 as Huawei proposed
2. Keep current approach and further discuss whether the value in existing RRM specification need to be updated

The discussion on the issue has no impact on the competition of Rel-17 FR2 RF enhancement WI

**Issue 3-1 Test cases for FR2 inter-band UL CA for IBM**

* Proposals: RAN4 shall define the following test cases for inter-band UL CA for IBM
  + TC#1: Test case for UL carrier RRC reconfiguration delay (Nokia)
  + TC#2: Test case for FR2 inter-band UL CA with IBM (Nokia)
  + Option 1: Use TC5 in PUCCH SCell activation in FeRRM WI as baseline (Nokia)
  + TC#3: Test case for interruptions at UL carrier RRC reconfiguration (Ericsson)
  + TC#4: Test case for interruptions due to Active BWP switching Requirement (Ericsson)
* Recommended WF
  + Please companies provide your comments to respective TCs.
* Discussion:

Huawei: TC#2 and TC#4 not needed. We already have generic BWP switching requirements which not differentiate for intra-band or inter-band CA.

Ericsson: For TC#4, we have test case for DL active BWP but no UL BWP switching test cases.

QC: For TC#2, this is depending on different UE features. For TC#4, previous we can focus on DL BWP switching, now we discuss FR2 with TDD which DL BWP and UL BWP always associated.

Nokia: For TC#2, existing requirements only DL; for UL it’s under discussion in FeRRM WI. We can discuss whether separate test cases needed or not. For TC#4, introducing the interruption on DL during uplink BWP switching; we can update the current test cases and open if new test cases needed.

Ericsson: We can include UL BWP switching in existing test case instead of introducing new test cases.

QC: We can check the test procedure; I think it’s already covered by legacy test case.

* Agreement:

RAN4 will define the following test cases for inter-band UL CA for IBM

* TC#1: Test case for UL carrier RRC reconfiguration delay
* TC#3: Test case for interruptions at UL carrier RRC reconfiguration
* TC #1 and TC #3 merged to a single test case

Further discuss below test cases

* TC#2: Test case for FR2 inter-band UL CA SCell activation delay with IBM
* TC#4: Test case for interruptions due to UL Active BWP switching Requirement

**WF/LS**

**R4-2210606 WF on RRM requirements for FR2 Inter-band DL CA and UL CA**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210606 | WF on RRM requirements for FR2 Inter-band DL CA and UL CA | Nokia | Approved |  |
| R4-2211078 | DraftCR on correction to interruption requirements for IBM R17 | Huawei | Withdrawn | Comments need to be solved. |
| R4-2211079 | Correction for Big CR on RRM requirements for FR2 Inter-band CA | Nokia | Endorsed | Merging the changes in R4-2210124. |
| R4-2211080 | Draft CR on RRM requirements for FR2 inter-band UL CA for IBM UE | Ericsson | Endorsed | Comments need to be solved. |
| R4-2211081 | dratCR on UE UL carrier RRC reconfiguration delay for FR2 | Nokia | Endorsed | Comments on GTW need to be considered. |
| [R4-2210124](file:///C:\\DuLei2019\\RAN4\\RAN4%23103\\Docs\\R4-2210124.zip) | Update of Big CR for RRM requirements of FR2 Inter-band CA | Ericsson | Merged | Merged into R4-2209788 |
| [R4-2208499](file:///C:\DuLei2019\RAN4\RAN4%23103\Docs\R4-2208499.zip) | CR on RRM requirements for IBM inter-band FR2 UL CA | Nokia | Agreed | No comments received in 1st round |

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**R4-2208498 Correction for Big CR on RRM requirements for FR2 Inter-band CA**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2321 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correct the Big CR on RRM requirements for FR2 Inter-band CA according to the agreement of RAN#95e meeting.

**Decision:** The document was **withdrawn**.

**R4-2208992 DraftCR on correction to interruption requirements for IBM R17**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Not pursued.**

**R4-2211078 DraftCR on correction to interruption requirements for IBM R17**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Withdrawn.**

**R4-2209788 Correction for Big CR on RRM requirements for FR2 Inter-band CA**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correct the Big CR on RRM requirements for FR2 Inter-band CA according to the agreement of RAN#95e meeting.

**Decision: Revised to R4-2211079 (from R4-2209788).**

**R4-2211079 Correction for Big CR on RRM requirements for FR2 Inter-band CA**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correct the Big CR on RRM requirements for FR2 Inter-band CA according to the agreement of RAN#95e meeting.

**Decision: Endorsed.**

**R4-2210124 Update of Big CR for RRM requirements of FR2 Inter-band CA**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2392 rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

As per the updated WID, CBM requirements are removed from BIG CR

**Decision: Merged (with R4-2209788).**

##### 9.4.6.2 Inter-band UL CA for IBM

**R4-2208499 CR on RRM requirements for IBM inter-band FR2 UL CA**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2322 rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

CR on RRM requirements for IBM inter-band FR2 UL CA

**Decision: Agreed.**

**R4-2208993 Discussion on carrier numbers for FR2 inter-band UL CA**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2208994 DraftCR on number of serving carriers for FR2 inter-band CA R17**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Return to.**

**R4-2210125 Draft CR on RRM requirements for FR2 inter-band UL CA for IBM UE**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Interruption requirements are provided for FR2 inter-band UL CA

**Decision: Revised to R4-221080 (from R4-2210125).**

**R4-2211080 Draft CR on RRM requirements for FR2 inter-band UL CA for IBM UE**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Interruption requirements are provided for FR2 inter-band UL CA

**Decision: Endorsed.**

#### 9.4.7 RRM performance requirements

##### 9.4.7.1 Inter-band UL CA for IBM

**R4-2209789 Discussion on RRM performance requirements for IBM inter-band FR2 UL CA**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Discussion on RRM test cases for IBM inter-band FR2 UL CA

**Decision: Noted.**

**R4-2209790 dratCR on UE UL carrier RRC reconfiguration delay for FR2**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

dratCR on UE UL carrier RRC reconfiguration delay for FR2

**Decision: Revised to R4-221081 (from R4-2209790).**

**R4-2211081 dratCR on UE UL carrier RRC reconfiguration delay for FR2**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

dratCR on UE UL carrier RRC reconfiguration delay for FR2

**Decision: Endorsed.**

**R4-2210128 Scope of RRM tests for UL inter-band CA for IBM**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discssion on the scope of test cases needed for this feature

**Decision: Noted.**

### 9.5 NR repeater

#### 9.5.1 General requirement maintenance

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**Email discussion for [103-e][304] NR\_Repeater\_RFMaintenance, AI 9.5.1,9.5.2, 9.5.3 – Chunxia Guo**

**R4-2210310 Email discussion summary for [103-e][304] NR\_Repeater\_RFMaintenance**

*Type: other For: Information  
 Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210507 (from R4-2210310).**

**R4-2210507 Email discussion summary for [103-e][304] NR\_Repeater\_RFMaintenance**

*Type: other For: Information  
 Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210629 WF on remaining issues for RF repeater**

*Type: other For: Approval  
 Source: CMCC*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210827 | Draft CR to 38.106: Conducted requirements corrections | Ericsson | Endorsed |  |
| R4-2210828 | CR to 38.106: TDD off power radiated requirement correction | Ericsson | Endorsed |  |
| R4-2210829 | CR to 38.106: Corections to definitons, symbols and abbreviations | Ericsson | Endorsed |  |
| R4-2210830 | CR for TS 38.106 R17: clean up of clause 4 | CATT | Endorsed |  |
| R4-2210831 | CR for TS 38.106 R17: clean up of clause 6 | CATT | Endorsed |  |
| R4-2210832 | CR for TS 38.106 R17: clean up of clause 7 | CATT | Endorsed |  |
| R4-2210833 | Draft CR for 38.106: add co-existence requirements for input intermodulation | CMCC | Endorsed |  |
| R4-2210834 | Draft CR for corrections on unwanted emission requirements for FR1 NR repeater | NTT DOCOMO, INC. | Endorsed |  |
| R4-2210835 | CR to 38.106: Output power definitions for NR repeaters | NEC | Endorsed |  |
| R4-2210836 | CR to TS38.106: clarification on the supported operating bands for NR repeater | ZTE Corporation | Endorsed |  |
| R4-2209804 | CR to TS 38.106 with OTA intermodulation requirement updates | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2210838 | CR to TS 38.106 with corrections to repeater core specification | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2210839 | Draft CR OBUE | Huawei | Endorsed |  |
| R4-2210840 | Draft CR Correction to OTA unwanted emissions | Huawei | Endorsed |  |
| R4-2210841 | Draft CR out of band gain | Huawei | Endorsed |  |
| R4-2210842 | Draft CR Terms, symbols and abbreviations | Huawei | Endorsed |  |
| [R4-2210021](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2210021.zip) | Draft CR conducted output power | Huawei | Merged  R4-2210843  withdrawn |  |
| [R4-2210022](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2210022.zip) | Draft CR radiated output power | Huawei | Merged  R4-2210844  withdrawn |  |
| [R4-2208797](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2208797.zip) | CR to 38.106: Regional requirements for NR repeaters | NEC | Not Pursued |  |
| [R4-2210016](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2210016.zip) | Draft CR Correction to reference point diagram | Huawei | Not Pursued |  |

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**R4-2207983 CR to 38.106: Corections to definitons, symbols and abbreviations**

*Type: CR For: Agreement  
 38.106 v17.0.0 CR-0003 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Correction of definitions etc.

**Decision: Revised to R4-2210829 (from R4-2207983).**

**R4-2210829 CR to 38.106: Corrections to definitions, symbols and abbreviations**

*Type: CR For: Agreement  
 38.106 v17.0.0 CR-0003 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Correction of definitions etc.

**Decision: Endorsed.**

**R4-2208132 CR for TS 38.106 R17: clean up of clause 4**

*Type: CR For: Agreement  
 38.106 v17.0.0 CR-0006 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Revised to R4-2210830 (from R4-2208132).**

**R4-2210830 CR for TS 38.106 R17: clean up of clause 4**

*Type: CR For: Agreement  
 38.106 v17.0.0 CR-0006 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2209600 Discussion on the supported bands for NR repeater**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209601 CR to TS38.106: clarification on the supported operating bands for NR repeater**

*Type: CR For: Approval  
 38.106 v17.0.0 CR-0009 rev Cat: F (Rel-17)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2210836 (from R4-2209601).**

**R4-2210836 CR to TS38.106: clarification on the supported operating bands for NR repeater**

*Type: CR For: Approval  
 38.106 v17.0.0 CR-0009 rev Cat: F (Rel-17)  
  
 Source: ZTE Corporation*

**Decision: Endorsed.**

**R4-2209805 CR to TS 38.106 with corrections to repeater core specification**

*Type: CR For: Approval  
 38.106 v17.0.0 CR-0011 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2210838 (from R4-2209805).**

**R4-2210838 CR to TS 38.106 with corrections to repeater core specification**

*Type: CR For: Approval  
 38.106 v17.0.0 CR-0011 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2210016 Draft CR Correction to reference point diagram**

*Type: draftCR For: Agreement  
 38.106 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei*

**Abstract:**

Correction to the reference point diagram

**Decision: Endorsed.**

**R4-2210020 Draft CR Terms, symbols and abbreviations**

*Type: draftCR For: Agreement  
 38.106 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei*

**Abstract:**

Include all terms, symbols and abbreviations in the current specification. And editorially align some of the above in relevant clauses

**Decision: Revised to R4-2210842 (from R4-2210020).**

**R4-2210842 Draft CR Terms, symbols and abbreviations**

*Type: draftCR For: Agreement  
 38.106 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei*

**Abstract:**

Include all terms, symbols and abbreviations in the current specification. And editorially align some of the above in relevant clauses

**Decision: Endorsed.**

#### 9.5.2 Conductive RF core requirement maintenance

**R4-2207979 Repeater TX IM power level**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Explanation of need to correct TX IM

**Decision: Noted.**

**R4-2207980 Draft CR to 38.106: Conducted requirements corrections**

*Type: CR For: Agreement  
 38.106 v17.0.0 CR-0001 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Correction of TX IM and TDD off

**Decision: Revised to R4-2210827 (from R4-2207980).**

**R4-2210827 Draft CR to 38.106: Conducted requirements corrections**

*Type: CR For: Agreement  
 38.106 v17.0.0 CR-0001 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Correction of TX IM and TDD off

**Decision: Endorsed.**

**R4-2208133 CR for TS 38.106 R17: clean up of clause 6**

*Type: CR For: Agreement  
 38.106 v17.0.0 CR-0007 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Revised to R4-2210831 (from R4-2208133).**

**R4-2210831 CR for TS 38.106 R17: clean up of clause 6**

*Type: CR For: Agreement  
 38.106 v17.0.0 CR-0007 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208406 Draft CR for 38.106: add co-existence requirements for input intermodulation**

*Type: draftCR For: Endorsement  
 38.106 v17.0.0 CR- rev Cat: B (Rel-17)  
  
 Source: CMCC*

**Decision: Revised to R4-2210833 (from R4-2208406).**

**R4-2210833 Draft CR for 38.106: add co-existence requirements for input intermodulation**

*Type: draftCR For: Endorsement  
 38.106 v17.0.0 CR- rev Cat: B (Rel-17)  
  
 Source: CMCC*

**Decision: Endorsed.**

**R4-2208788 Discussion on the corrections of unwanted emission for FR1 repeater**

*Type: other For: Approval  
 Source: NTT DOCOMO, INC.*

**Decision: Noted.**

**R4-2208789 Draft CR for corrections on unwanted emission requirements for FR1 NR repeater**

*Type: draftCR For: Agreement  
 38.106 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Decision: Revised to R4-2210834(from R4-2208789).**

**R4-2210834 Draft CR for corrections on unwanted emission requirements for FR1 NR repeater**

*Type: draftCR For: Agreement  
 38.106 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Decision: Endorsed.**

**R4-2208796 CR to 38.106: Output power definitions for NR repeaters**

*Type: CR For: Agreement  
 38.106 v17.0.0 CR-0004 rev Cat: F (Rel-17)  
  
 Source: NEC*

**Decision: Revised to R4-2210835 (from R4-2208796).**

**R4-2210835 CR to 38.106: Output power definitions for NR repeaters**

*Type: CR For: Agreement  
 38.106 v17.0.0 CR-0004 rev Cat: F (Rel-17)  
  
 Source: NEC*

**Decision: Endorsed.**

**R4-2208797 CR to 38.106: Regional requirements for NR repeaters**

*Type: CR For: Agreement  
 38.106 v17.0.0 CR-0005 rev Cat: F (Rel-17)  
  
 Source: NEC*

**Decision: Not pursued.**

**R4-2210017 Draft CR OBUE**

*Type: draftCR For: Agreement  
 38.106 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei*

**Abstract:**

Correct the references to carrier power in the OBUE requirement]

**Decision: Revised to R4-2210839 (from R4-2210017).**

**R4-2210839 Draft CR OBUE**

*Type: draftCR For: Agreement  
 38.106 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei*

**Abstract:**

Correct the references to carrier power in the OBUE requirement]

**Decision: Endorsed.**

**R4-2210019 Draft CR out of band gain**

*Type: draftCR For: Agreement  
 38.106 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei*

**Abstract:**

Move the general text form the minimum requirement section to the general section for better readability. For both conducted and ITA out of band gain requirements.

**Decision: Revised to R4-2210841 (from R4-2210019).**

**R4-2210841 Draft CR out of band gain**

*Type: draftCR For: Agreement  
 38.106 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei*

**Abstract:**

Move the general text form the minimum requirement section to the general section for better readability. For both conducted and ITA out of band gain requirements.

**Decision: Endorsed.**

**R4-2210021 Draft CR conducted output power**

*Type: draftCR For: Agreement  
 38.106 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei*

**Abstract:**

Remove the square brackets form eth conducted output power requirements.

**Decision: Merged10844**

**R4-2210843 Draft CR conducted output power**

*Type: draftCR For: Agreement  
 38.106 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei*

**Abstract:**

Remove the square brackets form eth conducted output power requirements.

**Decision: Withdrawn.**

#### 9.5.3 Radiated RF core requirement maintenance

**R4-2207981 On uplink power limit for FR2**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

How to finalize power limit for FR2 UL

**Decision: Noted.**

**R4-2207982 CR to 38.106: TDD off power radiated requirement correction**

*Type: CR For: Agreement  
 38.106 v17.0.0 CR-0002 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Correction to TDD OFF

**Decision: Revised to R4-2210828 (from R4-2207982).**

**R4-2210828 CR to 38.106: TDD off power radiated requirement correction**

*Type: CR For: Agreement  
 38.106 v17.0.0 CR-0002 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Correction to TDD OFF

**Decision: Endorsed.**

**R4-2208134 CR for TS 38.106 R17: clean up of clause 7**

*Type: CR For: Agreement  
 38.106 v17.0.0 CR-0008 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Revised to R4-2210832 (from R4-2208134).**

**R4-2210832 CR for TS 38.106 R17: clean up of clause 7**

*Type: CR For: Agreement  
 38.106 v17.0.0 CR-0008 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2209804 CR to TS 38.106 with OTA intermodulation requirement updates**

*Type: CR For: Approval  
 38.106 v17.0.0 CR-0010 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2210837 CR to TS 38.106 with OTA intermodulation requirement updates**

*Type: CR For: Approval  
 38.106 v17.0.0 CR-0010 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Withdrawn.**

**R4-2210018 Draft CR Correction to OTA unwanted emissions**

*Type: draftCR For: Agreement  
 38.106 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei*

**Abstract:**

Correct the TX power symbols in the unwanted emissions tables

**Decision: Revised to R4-2210840 (from R4-2210018).**

**R4-2210840 Draft CR Correction to OTA unwanted emissions**

*Type: draftCR For: Agreement  
 38.106 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei*

**Abstract:**

Correct the TX power symbols in the unwanted emissions tables

**Decision: Endorsed.**

**R4-2210022 Draft CR radiated output power**

*Type: draftCR For: Agreement  
 38.106 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei*

**Abstract:**

Remove the square brackets form eth radiated output power requirements. Make some corrections to references

**Decision: Merged**

**R4-2210844 Draft CR radiated output power**

*Type: draftCR For: Agreement  
 38.106 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei*

**Abstract:**

Remove the square brackets form eth radiated output power requirements. Make some corrections to references

**Decision: Withdrawn.**

#### 9.5.4 EMC core requirement maintenance and performance requirement

**Refer to email discussion for [103-e][303] NR\_EMC**

**R4-2208379 Discussion on performance assessment and work split of NR Repeater EMC**

*Type: discussion For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209140 On TDD NR repeater EMC testing**

*Type: other For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

#### 9.5.5 RF Conformance testing

##### 9.5.5.1 General

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**Email discussion for [103-e][305] NR\_Repeater\_RFConformance\_Part1**

**, AI 9.5.5.1 – Richard Kybett**

**R4-2210311 Email discussion summary for [103-e][305] NR\_Repeater\_RFConformance\_Part1**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210508 (from R4-2210311).**

**R4-2210508 Email discussion summary for [103-e][305] NR\_Repeater\_RFConformance\_Part1**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210630 WF on Repeater conformance general issues**

*Type: other For: Approval  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** |
| R4-2210630 | WF on Repeater conformance general issues | Huawei | Approved |

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###### 9.5.5.1.1 Stimulus signal /Test models

**R4-2207971 Repeaters test models**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Considers the need and specification of test models

**Decision: Noted.**

**R4-2208137 Discussion of stimulus signals for conducted and radiated**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted.**

**R4-2209602 Discussion on NR repeater Stimulus signals**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209808 Repeater stimulus signals and test models for conformance testing**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

###### 9.5.5.1.2 Test configurations

**R4-2207970 Repeaters test configurations**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Considers what is needed in the repeater specification for test configurations

**Decision: Noted.**

**R4-2208136 Discussion of test configuration for conducted and radiated**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted.**

**R4-2208410 Discussion on conducted test configurations for repeater**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2209603 Discussion on NR repeater test configuration**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209809 Repeaters test configurations**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

###### 9.5.5.1.3 Others

**R4-2207972 Repeaters other aspects of conformance**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Considers some other conformance aspects

**Decision: Noted.**

**R4-2209604 Discussions on NR repeater test cases**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209722 Repeater TDD switching conformance testing**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

##### 9.5.5.2 Conductive conformance Testing

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**Email discussion for [103-e][306] NR\_Repeater\_RFConformance\_Part2**

**, AI 9.5.5.2, 9.5.5.3 – CATT**

**R4-2210312 Email discussion summary for [103-e][306] NR\_Repeater\_RFConformance\_Part2**

*Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210509(from R4-2210312).**

**R4-2210509 Email discussion summary for [103-e][306] NR\_Repeater\_RFConformance\_Part2**

*Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210631 WF on NR FR1/FR2 repeater measurement system set-up**

*Type: other For: Approval  
 Source: ZTE*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2211150 WF on NR FR1/FR2 repeater MU and TT**

*Type: other For: Approval  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2211151 WF on NR FR1/FR2 repeater declarations**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2211152 WF on NR FR1/FR2 repeater test procedures and test issues**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2211153 WF on NR FR1/FR2 repeater test specs draft rules and TP splits**

*Type: other For: Approval  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** |
| R4-2210631 | WF on NR FR1/FR2 repeater measurement system set-up | ZTE | Approved |
| R4-2211150 | WF on NR FR1/FR2 repeater MU and TT | Huawei | Approved |
| R4-2211151 | WF on NR FR1/FR2 repeater declarations | Nokia | Approved |
| R4-2211152 | WF on NR FR1/FR2 repeater test procedures and test issues | Ericsson | Approved |
| R4-2211153 | WF on NR FR1/FR2 repeater test specs draft rules and TP splits | CATT | Approved |
| R4-2210845 | Spec skeleton for TS 38.115-1 | CATT | Approved |
| R4-2210846 | Spec skeleton for TS 38.115-2 v.0.0.1 | ZTE Corporation | Approved |

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**R4-2208135 Discussion of drafting specification related issues**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted.**

**R4-2208478 Spec skeleton for TS 38.115-1**

*Type: draft TS For: Agreement  
 38.115-1 v0.0.1 CR- rev Cat: (Rel-17)  
  
 Source: CATT*

**Decision: Revised to R4-2210845 (from R4-2208478).**

**R4-2210845 Spec skeleton for TS 38.115-1**

*Type: draft TS For: Agreement  
 38.115-1 v0.0.1 CR- rev Cat: (Rel-17)  
  
 Source: CATT*

**Decision: Approved.**

**R 4-2209605 Discussion on FR1 NR repeater test conformance testing**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2210014 Repeater conducted testing MU**

*Type: discussion For: Discussion  
 Source: Huawei*

**Abstract:**

Discuss the repeater conducted testing MU

**Decision: Noted.**

###### 9.5.5.2.1 Transmitted power related requirements

**R4-2207973 Conformance testing for conducted power**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on power testing considerations

**Decision: Noted.**

**R4-2208138 Discussion of test setup, MU and TT for FR1 NR repeater**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted.**

**R4-2209723 Repeater conducted measurement considerations**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

###### 9.5.5.2.2 Emission requirements

**R4-2207974 Conformance testing for conducted emissions**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Considerations for unwanted emissions conformance

**Decision: Noted.**

**R4-2208139 Discussion of FR1 repeater declaration**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted.**

**R4-2209724 Applicability of conducted conformance testing**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

###### 9.5.5.2.3 Others

**R4-2207975 Conformance testing for conducted requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Considerations for other requirements conformance

**Decision: Noted.**

**R4-2208140 Discussion of other issues for FR1 conformance test**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted.**

**R4-2209725 Manufacturer declarations for NR repeater type 1-C**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

##### 9.5.5.3 Radiated conformance Testing

**R4-2209598 Spec skeleton for TS 38.115-2 v.0.0.1**

*Type: draft TS For: Agreement  
 38.115-2 v0.0.1 CR- rev Cat: (Rel-17)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2210846 (from R4-2209598).**

**R4-2210846 Spec skeleton for TS 38.115-2 v.0.0.1**

*Type: draft TS For: Agreement  
 38.115-2 v0.0.1 CR- rev Cat: (Rel-17)  
  
 Source: ZTE Corporation*

**Decision: Approved.**

**R4-2209599 Discussion on the skeleton of FR2 NR repeater spec and work split**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209606 Discussion on FR2 NR repeater test conformance testing**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2210015 Repeater radiated testing MU**

*Type: discussion For: Discussion  
 Source: Huawei*

**Abstract:**

Discuss the repeater radiated testing MU

**Decision: Noted.**

###### 9.5.5.3.1 Transmitted power related requirements

**R4-2207976 Conformance testing for radiated power**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on power testing considerations

**Decision: Noted.**

**R4-2208141 Discussion of radiated test setup, MU and TT for NR repeater**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted.**

**R4-2209726 Repeater OTA measurement considerations**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

###### 9.5.5.3.2 Emission requirements

**R4-2207977 Conformance testing for radiated emissions**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Considerations for unwanted emissions conformance

**Decision: Noted.**

**R4-2209727 Applicability of radiated conformance testing**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

###### 9.5.5.3.3 Others

**R4-2207978 Conformance testing for radiated requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Considerations for other requirements conformance

**Decision: Noted.**

**R4-2208142 Discussion of FR2 repeater declaration**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted.**

**R4-2209257 Repeaters OTA Testing**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2209728 Manufacturer declarations for NR repeater type 2-O**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

### 9.6 Introduction of DL 1024QAM for NR FR1

#### 9.6.1 UE RF requirements maintenance

**Refer to email discussion [103-e][301] BSRF\_Maintenance**

**R4-2209063 CR: Introduction of RMC for 1024QAM maximum input level**

*Type: CR For: Agreement  
 38.101-1 v17.5.0 CR-1082 rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR introduces the RMC for 1024QAM maximum input level test.

**Decision: Agreed.**

#### 9.6.2 BS TX RF requirements maintenance

#### 9.6.3 BS RF conformance testing

**Refer to email discussion [103-e][301] BSRF\_Maintenance**

**R4-2208790 Discussion on BS RF conformance requirements for 1024QAM in FR1**

*Type: discussion For: Discussion  
 Source: NEC*

**Decision: Noted.**

**R4-2208791 CR to 38.141-1: BS RF conformance requirements for 1024QAM in FR1**

*Type: CR For: Agreement  
 38.141-1 v17.5.0 CR-0271 rev Cat: F (Rel-17)  
  
 Source: NEC*

**Decision: Agreed.**

**R4-2208792 CR to 38.141-2: BS RF conformance requirements for 1024QAM in FR1**

*Type: CR For: Agreement  
 38.141-2 v17.5.0 CR-0397 rev Cat: F (Rel-17)  
  
 Source: NEC*

**Decision: Not pursued.**

**R4-2208793 CR to 37.141: BS RF conformance requirements for 1024QAM in FR1**

*Type: CR For: Agreement  
 37.141 v17.5.0 CR-1005 rev Cat: F (Rel-17)  
  
 Source: NEC*

**Decision: Agreed.**

**R4-2208794 CR to 37.145-1: BS RF conformance requirements for 1024QAM in FR1**

*Type: CR For: Agreement  
 37.145-1 v17.5.0 CR-0287 rev Cat: F (Rel-17)  
  
 Source: NEC*

**Decision: Agreed.**

**R4-2208795 CR to 37.145-2: BS RF conformance requirements for 1024QAM in FR1**

*Type: CR For: Agreement  
 37.145-2 v17.5.0 CR-0329 rev Cat: F (Rel-17)  
  
 Source: NEC*

**Decision: Agreed.**

**R4-2209138 CR to TS 38.141-2: Introduction of 1024 QAM in FR1**

*Type: CR For: Agreement  
 38.141-2 v17.5.0 CR-0401 rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

resubmission after RAN4#102-e due to incorrect tdoc number

**Decision: Not pursued.**

**R4-2210700 CR to TS 38.141-2: Introduction of 1024 QAM in FR1**

*Type: CR For: Agreement  
 38.141-2 v17.5.0 CR-0401 rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

resubmission after RAN4#102-e due to incorrect tdoc number

**Decision: Withdrawn.**

#### 9.6.4 Demodulation and CSI requirements

##### 9.6.4.1 PDSCH requirements

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**Email discussion for [103-e][317] NR\_DL1024QAM\_Demod, AI 9.6.4– Jiakai Shi**

**R4-2210323 Email discussion summary for [103-e][317] NR\_DL1024QAM\_Demod**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210520 (from R4-2210323).**

**R4-2210520 Email discussion summary for [103-e][317] NR\_DL1024QAM\_Demod**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210651 WF on DL1024QAM UE demodulation requirement**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2210652 Big CR to 38.101-4: Introduction of FR1 1024QAM UE demodulation and CQI reporting requirements**

*Type: CR For: Agreement  
 38.101-4 v17.4.0 CR-? rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Decision: Email approval**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210897 | Draft CR for PDSCH demodulation requirements for 1KQAM in TDD | Apple | Endorsed |  |
| R4-2210898 | Draft CR on Applicability Rules and TDLD30-5 delay profile for FR1 DL 1024QAM PDSCH Requirements | Qualcomm Incorporated | Endorsed |  |
| R4-2210899 | Draft CR to TS38.101-4, PDSCH requirements for 1024QAM in FR1 FDD | MediaTek inc. | Endorsed |  |
| R4-2210900 | draft CR: Introduction of SDR requirements for DL 1024QAM | Ericsson | Endorsed |  |
| R4-2210901 | draft CR: Introduction of TDD CQI reporting requirements for DL 1024QAM | Ericsson | Endorsed |  |
| R4-2210902 | Draft CR on Applicability Rules for FR1 DL 1024QAM CQI Requirements | Qualcomm Incorporated | Endorsed |  |
| R4-2210903 | Draft CR on FDD CQI reporting cases for 1024QAM and CSI RMC (TS38.101-4, Rel-17) | Huawei, HiSilicon | Endorsed |  |
| R4-2210651 | WF on DL1024QAM UE demodulation requirement | Ericsson | Approved |  |

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**R4-2207794 Simulation results for PDSCH demod requirements with 1KQAM**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2207795 Draft CR for PDSCH demodulation requirements for 1KQAM in TDD**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Apple*

**Decision: Revised to R4-2210897 (from R4-2207795).**

**R4-2210897 Draft CR for PDSCH demodulation requirements for 1KQAM in TDD**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Apple*

**Decision: Endorsed.**

**R4-2209064 Summary of PDSCH simulation results for DL 1024QAM in FR1**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This spread sheet summarizes the simulation results of PDSCH demodulation with DL 1024QAM.

**Decision: Noted.**

**R4-2209065 UE demodulation requirements for DL 1024QAM**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution provides the PDSCH simulation results for DL 1024QAM.

**Decision: Noted.**

**R4-2209175 PDSCH Simulation results for 1024QAM FR1 UE Demod Tests**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2209376 Draft CR on Applicability Rules and TDLD30-5 delay profile for FR1 DL 1024QAM PDSCH Requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2210898 (from R4-2209376).**

**R4-2210898 Draft CR on Applicability Rules and TDLD30-5 delay profile for FR1 DL 1024QAM PDSCH Requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Endorsed.**

**R4-2209801 Simulation results and discussion on the PDSCH requirements for 1024QAM**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2209803 Draft CR to TS38.101-4, PDSCH requirements for 1024QAM in FR1 FDD**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2210899(from R4-2209803).**

**R4-2210899 Draft CR to TS38.101-4, PDSCH requirements for 1024QAM in FR1 FDD**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Endorsed.**

**R4-2209871 Simulation results on 1024QAM PDSCH**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 9.6.4.2 SDR requirements

**R4-2207796 Discussion on SDR requirements with 1KQAM**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2209067 draft CR: Introduction of SDR requirements for DL 1024QAM**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the SDR requirements for DL 1024QAM in FR1

**Decision: Revised to R4-2210900(from R4-2209067).**

**R4-2210900 draft CR: Introduction of SDR requirements for DL 1024QAM**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the SDR requirements for DL 1024QAM in FR1

**Decision: Endorsed.**

##### 9.6.4.3 CQI requirements

**R4-2209066 CQI reporting requirements for DL 1024QAM**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the open issues of CQI reporting requirements for DL 1024QAM.

**Decision: Noted.**

**R4-2209068 draft CR: Introduction of TDD CQI reporting requirements for DL 1024QAM**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the TDD CQI reporting requirements for DL 1024QAM in FR1

**Decision: Revised to R4-2210901 (from R4-2209068).**

**R4-2210901 draft CR: Introduction of TDD CQI reporting requirements for DL 1024QAM**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the TDD CQI reporting requirements for DL 1024QAM in FR1

**Decision: Endorsed.**

**R4-2209176 CQI requirements for 1024QAM FR1 UE Demod Tests**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2209430 Draft CR on Applicability Rules for FR1 DL 1024QAM CQI Requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2210902 (from R4-2209430).**

**R4-2210902 Draft CR on Applicability Rules for FR1 DL 1024QAM CQI Requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Endorsed.**

**R4-2209802 Simulation results and discussion on the CQI requirements for 1024QAM**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2209872 Discussion and simulation results on 1024QAM CQI**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209873 Draft CR on FDD CQI reporting cases for 1024QAM and CSI RMC (TS38.101-4, Rel-17)**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2210903 (from R4-2209873).**

**R4-2210903 Draft CR on FDD CQI reporting cases for 1024QAM and CSI RMC (TS38.101-4, Rel-17)**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

### 9.7 Enhancement for NR high speed train scenario in FR1

#### 9.7.1 RRM core requirement maintenance

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**Email discussion for [103-e][220] NR\_HST\_FR1\_enh\_RRM, AI 9.7.1,9.7.2-Jingjing Chen**

**R4-2210292 Email discussion summary for [103-e][220] NR\_HST\_FR1\_enh\_RRM**

*Type: other For: Information  
 Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210489 (from R4-2210292).**

**R4-2210489 Email discussion summary for [103-e][220] NR\_HST\_FR1\_enh\_RRM**

*Type: other For: Information  
 Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 18th**

**Issue 2-1-1: test cases for enhancement on Scell activation/deactivation for FR1 HST**

* Option 1: in R17 FR1 HST, no need to introduce test case for RRM measurement enhancement on active/deactivated Scell
* Option 2a: define test cases for both active Scell and deactivated Scell
* Option 2b: define test cases for deactivated Scell
* Discussion:
* QC: We can compromise with option 2b. For inter-frequency measurement without gap, we prefer option 2 to save overall test effort on the WI.
* Huawei: We support option 2b. Option 2b define requirements for both EN-DC and SA.
* Apple: We are fine with option 2b.
* CMCC: We are fine with option 2b including both EN-DC and SA for compromise.
* CATT/Ericsson: We prefer option 2a and can accept option 2b.
* MTK: We can compromise 2b with same view as QC.
* Agreement:
* Define test cases for deactivated Scell including EN-DC and SA cases

**Issue 2-1-2: test cases for L1-RSRP**

* Option 1: define test cases for L1-RSRP for FR1 HST CA
* Option 2: no need to define test
* Discussion:
* QC: Option 2 aligned with legacy approach.
* Huawei: We also prefer option 2, there are already existing cases for L1-RSRP since no strong needs with additional test cases.
* Apple: We support option 2. The measurement delay/accuracy requirements same as existing requirements.
* MTK: We share similar view as other companies and prefer option 2.
* CMCC: We prefer option 1, and can compromise to option 2.
* Nokia: We prefer option 1. This is for both measurement delay and accuracy?
* QC: We think both cases no need.
* Agreement: Option 2 agreed.

**Issue 2-1-3: test cases for L1-SINR**

* Option 1: not define test cases for L1-SINR for FR1 HST CA
* Option 2: define test cases for L1-SINR for FR1 HST CA
* Discussion:
* vivo: Does this related issue 2-3-1, as we still no performance requirements yet.
* QC: We didn’t see any enhancement on the requirement itself.
* Ericsson: We prefer option 1.
* Huawei: We support option 1. This not relevant to another issue.
* Nokia: We think this is to related to measurement delay and this enhancement not discussed yet.
* CATT: We support option 1, according core requirements, we didn’t see enhancement in this WI.
* Apple: We also support option 1. There is no enhancement on measurement delay, and the only changes potential still discussion on upper bound and this no impact on test.
* MTK: We support option 1.
* CMCC: In previous meeting, we already confirmed existing requirements will be used for measurement delay.
* Nokia: For L1-SINR, there is no enhancement for all of requirements?
* QC/CMCC: We think no enhancement.
* Agreement: Option 1 agreed.

**Issue 2-3-1: upper bound for L1-SINR**

* Option 1: for L1-SINR measurement accuracy requirements, the upper bound of the side condition is 5dB
* Option 2: Current L1-SINR measurement requirement can be reused in HST, no upper bound of side condition
* Option 3:
  + For DPS 1a scenario, if max doppler shift does not beyond TRS tracking ability,
    - No impact to L1-SINR measurement accuracy requirements if the measured RS is associated with active TCI of the UE in DPS 1a scenario, i.e. legacy performance requirements still apply to DPS 1a scenario.
    - No accuracy requirements for L1-SINR measurements on RSs that are not associated with active TCI of the UE in DPS 1a scenario when side condition is above 5dB.
  + For DPS 1b or HST-SFN scenario, no accuracy requirements for L1-SINR measurements when side condition is above 5dB.
* Discussion:
* vivo: We have provided technical analysis in this meeting. Shall we focus on the typical deployment for introducing requirements? UE will monitor the RSs associated within active TCI for time/frequency tracking?
* MTK: We support option 1. If UE can only measure 1 beam per time, then how UE can know the quality of another beam.
* QC: You can acquire the frequency offset with multiple active TCI states; meanwhile UE can’t switch to apply L1-RSRP measurement. This is new UE behavior.
* vivo: We use L1-RSRP to control beams measurement. It’s ok to configure upper bound for neighbour beam.
* MTK: We think all the beams can use L1-RSRP.
* QC: For non-serving beam from other RRH, the measurement may have ICI issue which upper bound still required.
* Nokia: We are ok with option 2 and option 3.
* Agreement: Further discuss above options and RAN4 aims to draw conclusion in RAN4#104-e meeting.

**Issue 2-4-2: measurement accuracy for inter-frequency measurement when highSpeedMeasInterFreq-r17 is configured is configured**

Agreement:

* for SS-RSRP and SS-RSRQ, existing inter-frequency measurement accuracy is applicable
* for SS-SINR,
* existing inter-frequency measurement accuracy is applicable
* the upper bound for side condition is X dB
  + Option 1: 5dB
  + Other options not precluded

**Issue 2-2-1: test cases for inter-frequency measurement enhancement**

Agreements in 1st round:

* Define test for inter-frequency measurement enhancement as following:

|  |  |  |
| --- | --- | --- |
|  | **Test cases** | * **Test parameters** |
| #1 | A.6.1.1.X Cell reselection to FR1 inter-frequency NR case for UE configured with highSpeedMeasInterFreq-r17 | * DRX cycle: 320ms * SMTC period: 20ms |
| #2 | A.6.6.2.X1 Inter-frequency with MG: SA event triggered reporting tests for FR1 without SSB time index detection when DRX is used for UE configured with highSpeedMeasInterFreq-r17 | * DRX cycle: 160ms * SMTC period: 20ms * MGRP: 40ms * MGL: 6ms |
| #3 | A.4.6.2.X Inter-frequency with MG: EN-DC event triggered reporting tests for FR1 without SSB time index detection when DRX is used for UE configured with highSpeedMeasInterFreq-r17 | * DRX cycle: 160ms * SMTC period: 20ms * MGRP: 40ms * MGL: 6ms |

* FFS whether to define test for enhancement on inter-frequency measurement without MG

**Agreement:**

* No test case for enhancement on inter-frequency measurement without MG

**WF/LS**

**R4-2210607 WF on RRM for FR1 HST**

*Type: other For: Approval  
 Source: CMCC*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tdoc number** | **Revised to** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210607 |  | WF on RRM for FR1 HST | CMCC | **Approved** |  |
| R4-2211082  (revision of R4-2208516) |  | Draft CR on test case for cell reselection to NR inter-frequency for FR1 HST | CMCC | **Endorsed** |  |
| R4-2211083  (revision of R4-2208531) |  | CR on enhanced requirements for SCell measurement for Rel-17 FR1 HST requirements | CMCC | Agreed |  |
| R4-2207763 |  | CR on L1-SINR measurement in FR1 HST | Apple | Postponed |  |
| R4-2208152 |  | CR on FR1 HST core requirements | CATT | Merged | Merged to R4-228960 |
| R4-2208960 |  | Correction on singaling name for FR1 HST | Huawei, Hisilicon | Agreed |  |
| R4-2208512 |  | Draft CR on release independent for FR1 HST RRM | CMCC | Endorsed |  |
| R4-2208513 |  | Draft CR on release independent for FR1 HST RRM | CMCC | Endorsed |  |
| R4-2208962 |  | Draft CR on measurement accuracy for FR1 HST | Huawei, Hisilicon | Endorsed |  |

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**R4-2207762 On FR1 HST remaining issue**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2207763 CR on L1-SINR measurement in FR1 HST**

*Type: draftCR For: (not specified)  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision: Postponed.**

**R4-2208150 Discussion on L1-SINR measurements for FR1 HST**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2208152 CR on FR1 HST core requirements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2372 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Merged (with R4-2208960).**

**R4-2208531 CR on enhanced requirements for SCell measurement for Rel-17 FR1 HST requirements**

*Type: CR For: Approval  
 38.133 v17.5.0 CR-2327 rev Cat: F (Rel-17)  
  
 Source: CMCC*

**Decision: Revised to R4-2211083 (from R4-2208531).**

**R4-2211083 CR on enhanced requirements for SCell measurement for Rel-17 FR1 HST requirements**

*Type: CR For: Approval  
 38.133 v17.5.0 CR-2327 rev Cat: F (Rel-17)  
  
 Source: CMCC*

**Decision: Agreed.**

**R4-2208959 Discussion on L1-SINR in FR1 HST**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2208960 Correction on singaling name for FR1 HST**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2345 rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

#### 9.7.2 RRM performance requirements

**R4-2207732 FR1 HST Performance**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2207764 On FR1 HST test scope**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2207871 Discussion on Rel-17 HST in FR1**

*Type: discussion For: (not specified)  
 Source: MediaTek (Shenzhen) Inc.*

**Decision: Noted.**

**R4-2208151 Discussion on RRM test cases for FR1 HST**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2208511 Initial discussion on performance part for FR1 HST RRM enhancement**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2208512 Draft CR on release independent for FR1 HST RRM**

*Type: draftCR For: Approval  
 38.307 v16.10.0 CR- rev Cat: B (Rel-16)  
  
 Source: CMCC*

**Decision: Endorsed.**

**R4-2208513 Draft CR on release independent for FR1 HST RRM**

*Type: draftCR For: Approval  
 38.307 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: CMCC*

**Decision: Endorsed.**

**R4-2208516 Draft CR on test case for cell reselection to NR inter-frequency for FR1 HST**

*Type: draftCR For: Approval  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: CMCC*

**Decision: Revised to R4-2211082 (from R4-2208516).**

**R4-2211082 Draft CR on test case for cell reselection to NR inter-frequency for FR1 HST**

*Type: draftCR For: Approval  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: CMCC*

**Decision: Endorsed.**

**R4-2208961 Discussion on performance accuracy and test case for FR1 HST**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2208962 Draft CR on measurement accuracy for FR1 HST**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2209085 Further discussion on L1-SINR measurements for Rel-17 FR1 HST CA**

*Type: other For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

L1-SINR accuracy requirement for FR1 HST

**Decision: Noted.**

**R4-2209086 On RRM Tests for Rel-17 FR1 HST scenarios**

*Type: other For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

RRM tests for Rel-17 FR2 HST.

**Decision: Noted.**

**R4-2209097 Testing on CA enhancement RRM requirements for NR HST FR1**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Testing on CA enhancement RRM requirements for NR HST FR1

**Decision: Noted.**

**R4-2209491 Discussion on L1-SINR measurements in R17 FR1 HST**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

#### 9.7.3 UE demodulation requirements (38.101-4)

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**Email discussion for [103-e][318] NR\_HST\_FR1\_Demod, AI 9.7.3-Shiyuan Wang**

**R4-2210324 Email discussion summary for [103-e][318] NR\_HST\_FR1\_Demod**

*Type: other For: Information  
 Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210521 (from R4-2210324).**

**R4-2210521 Email discussion summary for [103-e][318] NR\_HST\_FR1\_Demod**

*Type: other For: Information  
 Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210904 | Draft CR on HST DPS CA requirements for 4Rx | Apple | Endorsed | Requirements should to be revised based on latest simulation results |
| R4-2210905 | CR on FR1 HST-SFN CA for 4RX | CMCC | Endorsed | Requirements should to be revised based on latest simulation results |
| R4-2210906 | Draft CR on release independent for FR1 HST demodulation | CMCC | Endorsed | Revised based on Apple’s comments  have Clause number in 1st column and combine two tables |
| R4-2210907 | Draft CR on release independent for FR1 HST demodulation | CMCC | Endorsed | Revised based on Apple’s comments for R4-2208514, have Clause number in 1st column and combine two tables |
| R4-2210908 | Draft CR on HST FR1 DPS CA requirements for 2Rx (38.101-4) | Huawei, HiSilicon | Endorsed | Requirements should to be revised based on latest simulation results |
| R4-2210909 | Draft CR on Applicability Rules for FR1 HST CA Requirements | Qualcomm Incorporated | Endorsed | Revise the Work item code |

--------------------------------------------------------------End--------------------------------------------------------------------------

**R4-2207797 Simulation results for PDSCH CA Requirements in HST**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2207798 Draft CR on HST DPS CA requirements for 4Rx**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision: Revised to R4-2210904 (from R4-2207798).**

**R4-2210904 Draft CR on HST DPS CA requirements for 4Rx**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision: Endorsed.**

**R4-2208508 CR on PDSCH requirements for HST-SFN CA requirements for 4Rx**

*Type: CR For: Approval  
 38.101-4 v17.4.0 CR-0283 rev Cat: F (Rel-17)  
  
 Source: CMCC*

**Decision: Revised to R4-2210905 (from R4-2208508).**

**R4-2210905 CR on PDSCH requirements for HST-SFN CA requirements for 4Rx**

*Type: CR For: Approval  
 38.101-4 v17.4.0 CR-0283 rev Cat: F (Rel-17)  
  
 Source: CMCC*

**Decision: Endorsed.**

**R4-2208514 Draft CR on release independent for FR1 HST demodulation**

*Type: draftCR For: Approval  
 38.307 v16.10.0 CR- rev Cat: B (Rel-16)  
  
 Source: CMCC*

**Decision: Endorsed.**

**R4-2210906 Draft CR on release independent for FR1 HST demodulation**

*Type: draftCR For: Approval  
 38.307 v16.10.0 CR- rev Cat: B (Rel-16)  
  
 Source: CMCC*

**Decision: Endorsed.**

**R4-2208515 Draft CR on release independent for FR1 HST demodulation**

*Type: draftCR For: Approval  
 38.307 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: CMCC*

**Decision: Revised to R4-2210907 (from R4-2208515).**

**R4-2210907 Draft CR on release independent for FR1 HST demodulation**

*Type: draftCR For: Approval  
 38.307 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: CMCC*

**Decision: Endorsed.**

**R4-2208517 Simulation results for FR1 HST CA**

*Type: discussion For: Information  
 Source: CMCC*

**Decision: Noted.**

**R4-2209069 Summary for FR1 HST demodulation results**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This spread sheet summarizes the simulation results of FR1 HST demodulation requirements.

**Decision: Noted.**

**R4-2209070 Simulation results of PDSCH demodulation requirements for CA with HST-SFN scenario**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution provides the simulation results of PDSCH demodulation requirements for CA with HST-SFN scenario.

**Decision: Noted.**

**R4-2209860 Simulation results on PDSCH CA scenarios for NR UE HST FR1 performance requirements**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209861 Draft CR on HST FR1 DPS CA requirements for 2Rx (38.101-4)**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2210908 (from R4-2209861).**

**R4-2210908 Draft CR on HST FR1 DPS CA requirements for 2Rx (38.101-4)**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2209918 Draft CR on Applicability Rules for FR1 HST CA Requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: F (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2210909 (from R4-2209918).**

**R4-2210909 Draft CR on Applicability Rules for FR1 HST CA Requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: F (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Endorsed.**

**R4-2210160 Simulation results for FR1 HST PDSCH CA Tests**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

### 9.8 NR support for high speed train scenario in FR2

#### 9.8.2 RRM core requirement maintenance

**R4-2207734 FR2 HST neighboring cell measurement requirement correction**

*Type: CR For: Approval  
 38.133 v17.5.0 CR-2286 rev Cat: F (Rel-17)  
  
 Source: Qualcomm, Inc.*

**Decision: Revised to R4-2211085 (from R4-2207734).**

**R4-2211085 FR2 HST neighboring cell measurement requirement correction**

*Type: CR For: Approval  
 38.133 v17.5.0 CR-2286 rev Cat: F (Rel-17)  
  
 Source: Qualcomm, Inc.*

**Decision: Return to.**

**R4-2208156 CR on FR2 HST core requirements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2373 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Agreed.**

##### 9.8.2.1 General

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**Email discussion for [103-e][221] NR\_HST\_FR2\_RRM\_1, AI 9.8.2-Dmitry Petrov**

**R4-2210293 Email discussion summary for [103-e][221] NR\_HST\_FR2\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210490 (from R4-2210293).**

**R4-2210490 Email discussion summary for [103-e][221] NR\_HST\_FR2\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 17th**

**Issue 1-1-1: A need for DL timing difference threshold**

* Candidate options:
* Option 1 [OPPO, Samsung, Nokia, Apple]: UE shall apply one shot large timing adjustment on TCI switching occasion if UE measurement on DL timing difference is larger than a timing difference threshold
* Option 2 [QC]: DL timing jump detection is not needed
* GTW discussion:
  + QC: UL timing difference same as DL timing difference. DL threshold is equal or smaller than Tq. We are open to discuss why UE such detection.
  + Samsung: QC prefer to have relaxed UL timing accuracy after one-shot timing adjustment. We think from requirements perspective, we should have aligned requirements/approach for accuracy and threshold.
  + QC: We can accept option 1 for issue 1-1 with option 1-2-2 option 2.
  + Nokia: We slightly prefer option 1 as Samsung explained. In practice, UE didn’t aware intra-node or inter-node even with intra-node TCI state switch with 0 timing difference. We would like to separate discuss issue 1-1 and issue 1-2-2.
  + QC: Tq always be satisfied.
  + Samsung: We would like to specify the condition UE need to enable the one shot Timing adjustment.

**Issue 1-2-2: UL transmit timing accuracy**

* Candidate options:
* Option 1 [Nokia, Samsung, ZTE]: Adopt ±Te as the accuracy of UE UL transmit timing immediately after TCI state switch
* Option 1a [Nokia, Ericsson, ZTE]: Adopt ±Te (3.5 Ts) accuracy with a delay after TCI state switch
* Option 1b: If new TCI state within active TCI state list: Adopt ±Te immediately after TCI state switch as the accuracy otherwise ±9Ts adopted
* Option 2 [Qualcomm, Apple, OPPO]: Remove square bracket on UL timing error of ±9Ts
* GTW discussion:
* Samsung: We are also with option 1a. In TCI switch delay part, we already have the requirement.
* Nokia: If the requirements not followed and relaxed legacy requirement applied and then NW may suffer UL performance degradation. We proposed option 1a and another option can be pending on whether new TCI with in active TCI state list.
* QC: What’s the proposed from Nokia we can support. For UL performance degradation, channel model is different compared traditional channel model for delay spread with LOS for FR2 HST. For LOS channel, time error within CP length, then we can expect no performance degradation.
* OPPO: Our preferred option is option 2 with flexibility for UE. Ok with option 1b.
* Nokia: For channel model, in practice we may observe difference compared the agreed HST channel model and pending on NW implementation.
* Samsung: We still have concern on the relaxing on requirements. We can’t purely rely on the channel model for demodulation introduction which only considered from demodulation performance perspective. We need to consider realistic scenario. I think for most of UE only support 1 active TCI state which means such UE will follow the relaxed requirements.
* Apple: We would like to clarify for option 1b.
* Ericsson: Same question as Apple.
* ZTE: We prefer option 1 and option 1a. We can discuss the value for the accuracy.
* Agreement:
* If new TCI state within active TCI state list: Adopt ±Te immediately after TCI state switch as the accuracy otherwise ±[7Ts] adopted
* Option 1 agreed for issue 1-1-1

**Issue 1-4-1: One shot large UL timing adjustment feature group**

* Candidate options:
* Option 1 [Samsung, ZTE, Ericsson]: Define feature as mandatory with capability signaling.
* Option 2 [Apple, CATT, OPPO, Qualcomm, Huawei, Nokia]: Define feature as optional with capability signaling.
* GTW discussion:
* Ericsson: If the capability is optional, we don’t see the possibility to use this feature. For comprise we can accept with option 2 but from technical aspect, we still prefer option 1.
* ZTE: We have concern for option 2 as Nokia pointed in issue 1-3-1. RA based on solution, performance loss will be observed. In issue 1-3-3, UE complexity between RA based on solution and one shot UL timing adjustment solution is similar.
* Samsung: This feature only applicable for PC6. We share same view as ZTE.
* Nokia: To Ericsson, we didn’t see the issue to use this feature based on UE reporting capability. To ZTE, we agree RA based on solution belongs to existing mechanism which is baseline and this feature can be considered as optimized solution.
* QC: We share similar view as Nokia. For mandatory means without this feature the system not works or unacceptable performance loss showed.
* Agreement: Option 2

ZTE: We think we need more discussion on RA procedure.

Issue 2-1-3: SMTC limit in HST FR2 enhanced requirements

* Candidate Options:
* Option 1 [QC, ZTE, Huawei, Apple, OPPO, CATT]: Apply the FR2 HST enhanced requirement only when SMTC <=40ms cases. When SMTC period > 40ms, requirements in Table 9.2.5.2-2 apply.
* Option 2 [Nokia]: Delete NOTE 3, keep table titles without changes and set M2 = 1.5
* GTW discussion:
* Nokia: with option 1, the performance will be broken for SMTC period >40ms. Option 2 is compromised solution from Nokia.
* QC: For SMTC period >40ms it’s not expected to be configured for high-speed train. It just allows flexibility for NW configuration for low-speed train. The concern from Nokia already reflected in the spec.
* Ericsson: We already agreements previously, we prefer to keep the title unchanged. We can further work on the text.
* Nokia: We share the concern on the proposed changes on the CR.
* Agreement:
* Option 1 agreed as starting point and further work on the drafting CR revision including table heading and note 3.

**WF/LS**

**R4-2210608 WF on HST FR2 RRM Core Requirement Maintenance**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**Conclusion after 1st round**

|  |  |  |  |
| --- | --- | --- | --- |
| **New Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2210608 | WF on HST FR2 RRM Core Requirement Maintenance | Nokia, Nokia Shanghai Bell |  |

**New tdocs**

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210608 | WF on HST FR2 RRM Core Requirement Maintenance | Nokia, Nokia Shanghai Bell | Return to |  |
| R4-2211084 | CR to TS 38.133 on UL Timing Adjustment | Nokia, Nokia Shanghai Bell | Return to |  |
| R4-2211085 | FR2 HST neighboring cell measurement requirement correction | Qualcomm, Inc. | Return to |  |
| R4-2211086 | Draft CR for SSB scheduling restriction | Apple | Postponed |  |
| R4-2211087 | CR to TR 38.854 on HST FR2 RA-Based Timing Adjustment | Nokia, Nokia Shanghai Bell | Agreed |  |
| R4-2211088 | CR to TS38.133 for the applicability of requirement for FR2 HST | Samsung | Agreed |  |
| R4-2211089 | CR to TS 38.133: SSB-based L1-SINR measurements for FR2 NR HST | Nokia, Nokia Shanghai Bell | Postponed |  |
| R4-2209332 | CR for TR 38.854 to remove the squar brackets for identified requirements | ZTE Corporation | Endorsed |  |
| R4-2209521 | CR to TS 38.133: intra-frequency measurements with gaps for for FR2 NR HST | Nokia, Nokia Shanghai Bell | Agreed |  |
| *R4-2208156* | CR on FR2 HST core requirements | CATT | Agreed |  |
| R4-2207880 | CR to TR 38.854 on Bi-directional Scenario-A Mobility Performance | Nokia, Nokia Shanghai Bell | Agreed |  |
| *R4-2207881* | CR to TR 38.854 on Throughput Performance in HST FR2 Scenarios | Nokia, Nokia Shanghai Bell | Agreed |  |
| R4-2210180 | Introduction of FR2 HST bands for power class 6 in TS 38.133 | Ericsson | Merged |  |
| R4-2208846 | CR to TS38.133 for the corrections on one shot large UL timing adjustment for FR2 Power Class 6 UE | Samsung | Merged |  |
| R4-2208963 | Correction on singaling name for FR2 HST | Huawei, Hisilicon | Merged |  |

--------------------------------------------------------------End--------------------------------------------------------------------------

**R4-2207818 Discussion on general aspect of FR2 HST**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2208153 Discussion on remaining issues for FR2 HST**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2208843 Further Discussion on capability and feature list for FR2 HST UE**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2208844 CR to TS38.133 for the applicability of requirement for FR2 HST**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2339 rev Cat: F (Rel-17)  
  
 Source: Samsung*

**Decision: Revised to R4-2211088 (from R4-2208844).**

**R4-2211088 CR to TS38.133 for the applicability of requirement for FR2 HST**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2339 rev Cat: F (Rel-17)  
  
 Source: Samsung*

**Decision: Agreed.**

**R4-2208963 Correction on singaling name for FR2 HST**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2346 rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Merged**

**R4-2208964 Discussion on capability for HST in FR2**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209332 CR for TR 38.854 to remove the squar brackets for identified requirements**

*Type: draftCR For: Approval  
 38.854 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: ZTE Corporation*

**Decision: Endorsed.**

**R4-2209520 Discussions on remaining issues in RRM enhancements for FR2 HST**

*Type: other For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Addressing remaining issues in FR2 HST RRM.

**Decision: Noted.**

**R4-2210180 Introduction of FR2 HST bands for power class 6 in TS 38.133**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2402 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The CR introduces bands for FR2 in HST for PC2 in the FR2 band group

**Decision: Merged**

##### 9.8.2.2 RRC Idle/Inactive and connected state mobility requirements

**R4-2207879 On Throughput and Bi-directional Scenario-A Mobility Performance**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This paper provides motivation for the accompanying CRs to the TR TR 38.854.

**Decision: Noted.**

**R4-2207880 CR to TR 38.854 on Bi-directional Scenario-A Mobility Performance**

*Type: CR For: Agreement  
 38.854 v17.0.0 CR-0001 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Agreed.**

**R4-2207881 CR to TR 38.854 on Throughput Performance in HST FR2 Scenarios**

*Type: CR For: Agreement  
 38.854 v17.0.0 CR-0002 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Agreed.**

**R4-2209521 CR to TS 38.133: intra-frequency measurements with gaps for for FR2 NR HST**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2383 rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Enhancements for Intra-frequency measurements with gaps in connected mode including PSS/SSS detection, and measurement period

**Decision: Agreed.**

##### 9.8.2.3 Timing requirements

**R4-2207882 CR to TR 38.854 on HST FR2 RA-Based Timing Adjustment**

*Type: CR For: Agreement  
 38.854 v17.0.0 CR-0003 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2211087 (from R4-2207882).**

**R4-2211087 CR to TR 38.854 on HST FR2 RA-Based Timing Adjustment**

*Type: CR For: Agreement  
 38.854 v17.0.0 CR-0003 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Agreed.**

**R4-2207890 CR to TS 38.133 on UL Timing Adjustment**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2295 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2211084(from R4-2207890).**

**R4-2211084 CR to TS 38.133 on UL Timing Adjustment**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2295 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**[Moderator]: Need to confirm whether the part when Large one-shot timing adjustment is disabled can be added in [] or not.**

**Decision: Revised**

Session chair Note: R4-2211084 revised to remove last part with [ ] .

**R4-2207891 On HST FR2 UL Timing Adjustment**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

A discussion paper that addresses open issues in the HST FR2 UL timing adjustment requirement left for maintenance.

**Decision: Noted.**

**R4-2208346 Discussion on timing requirements for HST FR2**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2208770 Discussion on remaining issues of Timing for HST FR2**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2208845 Discussion on Remaining Issues on Timing Requirements for FR2 HST**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2208846 CR to TS38.133 for the corrections on one shot large UL timing adjustment for FR2 Power Class 6 UE**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2340 rev Cat: F (Rel-17)  
  
 Source: Samsung*

**Decision: Merged**

##### 9.8.2.4 Signalling characteristics requirements

**R4-2207819 Discussion on signalling characteristics requirements**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2207821 Draft CR for SSB scheduling restriction**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Revised to R4-2211086 (from R4-2207821).**

**R4-2211086 Draft CR for SSB scheduling restriction**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Postponed.**

**R4-2208154 Discussion on scheduling restriction on SSB for FR2 HST**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2208347 Scheduling restriction on SSB**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2208769 Discussion on remaining issue of Signaling characteristics for HST FR2**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

##### 9.8.2.5 Measurement procedure requirements

**R4-2207820 Discussion on measurement procedure requirement for FR2 HST**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2208771 Discussion on Measurement Procedure Requirements for HST FR2**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209524 CR to TS 38.133: SSB-based L1-SINR measurements for FR2 NR HST**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2384 rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

The enhancement for L1-SINR reporting with SSB-based CMR and dedicated IMR configured for FR2 NR HST is defined.

**Decision: Revised to R4-2211089 (from R4-2209524).**

**R4-2211089 CR to TS 38.133: SSB-based L1-SINR measurements for FR2 NR HST**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2384 rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

**Decision: Postponed.**

#### 9.8.3 RRM performance requirements

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**Email discussion for [103-e][222] NR\_HST\_FR2\_RRM\_2, AI 9.8.3-He (Jackson) Wang**

**R4-2210294 Email discussion summary for [103-e][222] NR\_HST\_FR2\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210491 (from R4-2210294).**

**R4-2210491 Email discussion summary for [103-e][222] NR\_HST\_FR2\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210609 WF on RRM performance requirement for FR2 HST**

*Type: other For: Approval  
 Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** |
| R4-2210609 | WF on RRM performance requirement for FR2 HST | Samsung | Approved |
| R4-2209525 | Link simulation assumptions for L1 and L3 measurement accuracy for FR2 HST scenarios | Nokia and NSB | Approved  **Simulation assumption further alignment for L3 measurement**   * Confirm the simulation assumptions provided in R4-2209525, except:   + AWGN with 19444 Hz offset between desired and interfering cells, for bi-directional case   + use SINR = -6dB only, and no need to consider “FFS: -8dB, -7dB”.   **Simulation assumption further alignment for L1 measurement**   * Confirm the simulation assumptions provided in R4-2209525, except:   AWGN with 19444 Hz offset for bi-directional case |

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**R4-2207733 FR2 HST RRM**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2208155 Discussion on RRM test cases for FR2 HST**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2208348 Discussion on performance requirements for FR2 HST**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2208847 Discussion on RRM Performance Requirements for FR2 HST**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2208965 Discussion on measurement accuracy and test case for FR2 HST**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2208966 Simulation results of measurement accuracy for FR2 HST**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209098 NR FR2 HST RRM performance requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

NR FR2 HST RRM performance requirements

**Decision: Noted.**

**R4-2209525 Link simulation assumptions for L1 and L3 measurement accuracy for FR2 HST scenarios**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Link simulation assumptions.

**Decision: Approved.**

**Simulation assumption further alignment for L3 measurement**

*Way Forward:*

* Confirm the simulation assumptions provided in R4-2209525, except:
  + AWGN with 19444 Hz offset between desired and interfering cells, for bi-directional case
  + use SINR = -6dB only, and no need to consider “FFS: -8dB, -7dB”.

**Simulation assumption further alignment for L1 measurement**

*Way Forward:*

* Confirm the simulation assumptions provided in R4-2209525, except:

AWGN with 19444 Hz offset for bi-directional case

**R4-2211154 Link simulation assumptions for L1 and L3 measurement accuracy for FR2 HST scenarios**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Link simulation assumptions.

**Decision: Withdrawn.**

**R4-2209526 On RRM Tests for Rel-17 FR2 HST scenarios**

*Type: other For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

RRM tests for FR2 HST

**Decision: Noted.**

**R4-2210214 Simulation results for measurement accuracy for FR2 HST**

*Type: other For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

L1 and L3 measurement simulation results.

**Decision: Noted.**

#### 9.8.4 Demodulation requirements

##### 9.8.4.1 UE demodulation requirements

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**Email discussion for [103-e][319] NR\_HST\_FR2\_Demod\_Part1, AI 9.8.4.1-Yunchuan Yang**

**R4-2210325 Email discussion summary for [103-e][319] NR\_HST\_FR2\_Demod\_Part1**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210522 (from R4-2210325).**

**R4-2210522 Email discussion summary for [103-e][319] NR\_HST\_FR2\_Demod\_Part1**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210653 WF on UE demodulation requirement for FR2 HST**

*Type: other For: Approval  
 Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2210654 DraftCR to TS 38.101-4: Applicability rules for HST FR2 PDSCH requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Intel*

**Abstract:**

**Decision: Endorsed.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210653 | WF on UE demodulation requirement for FR2 HST | Samsung | Approved |  |
| R4-2210654 | draftCR to TS 38.101-4: Applicability rules for HST FR2 PDSCH requirements | Intel | Endorsed |  |
| R4-2210910 | Draft CR on minimum requirements for FR2 PDSCH HST-DPS requirements (38.101-4, Rel-17) | Huawei | Endorsed |  |
| R4-2210911 | CR: FR2 HST channel model | Qualcomm | Endorsed |  |
| R4-2209072 | (draft CR: FRC for PDSCH demodulation requirement for FR2 HST, Ericsson) | Ericsson | Endorsed |  |

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**R4-2208074 Simulation results summary for Rel-17 FR2 HST UE demod**

*Type: other For: Information  
 Source: Samsung*

**Decision: Noted.**

**R4-2208079 Big CR on FR2 HST UE demodulation requirement for TS 38.101-4**

*Type: CR For: Agreement  
 38.101-4 v17.4.0 CR-0282 rev Cat: B (Rel-17)  
  
 Source: Samsung*

**Decision:** For Email approval

**R4-2209071 PDSCH demodulation requirements for HST FR2**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the remaining open issues on UE demodulation requirements for HST FR2.

**Decision: Noted.**

**R4-2209072 draft CR: FRC for PDSCH demodulation requirement for FR2 HST**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draft CR provides FRC used for PDSCH demodulation requirements for FR2 HST

**Decision: Endorsed.**

**R4-2209862 Draft CR on minimum requirements for FR2 PDSCH HST-DPS requirements (38.101-4, Rel-17)**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2210910 (from R4-2209862).**

**R4-2210910 Draft CR on minimum requirements for FR2 PDSCH HST-DPS requirements (38.101-4, Rel-17)**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2210083 CR: FR2 HST channel model**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Qualcomm, Inc.*

**Decision: Revised to R4-2210911 (from R4-2210083).**

**R4-2210911 CR: FR2 HST channel model**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Qualcomm, Inc.*

**Decision: Endorsed.**

###### 9.8.4.1.1 PDSCH requirements under Uni-directional scenario

**R4-2208076 Simulation results of PDSCH requirement for Rel-17 FR2 HST**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2209863 Discussion on UE demodulation requirements for FR2 HST Uni-directional**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

###### 9.8.4.1.2 PDSCH requirements under Bi-directional scenario

**R4-2209864 Discussion on UE demodulation requirements for FR2 HST Bi-directional**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 9.8.4.2 BS demodulation requirements

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**Email discussion for [103-e][320] NR\_HST\_FR2\_Demod\_Part2, AI 9.8.4.2-Mueller Axel**

**R4-2210326 Email discussion summary for [103-e][320] NR\_HST\_FR2\_Demod\_Part2**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210523 (from R4-2210326).**

**R4-2210523 Email discussion summary for [103-e][320] NR\_HST\_FR2\_Demod\_Part2**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210655 WF on BS demodulation requirement for FR2 HST**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2210656 DraftCR to TS 38.104: HST FR2 PUSCH performance requirements**

*Type: draftCR For: Agreement  
 38.104 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Intel*

**Decision: Endorsed.**

**R4-2210657 DraftCR to TS 38.104: FRC for HST FR2 PUSCH performance requirements**

*Type: draftCR For: Agreement  
 38.104 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Intel*

**Decision: Endorsed.**

**R4-2211127 DraftCR to TS 38.141-2: FRC for HST FR2 PUSCH performance requirements**

*Type: draftCR For: Agreement  
 38.141-2 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Intel*

**Decision: Endorsed.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210655 | WF on BS demodulation requirement for FR2 HST | Nokia, Nokia Shanghai Bell | Approved | WF |
| R4-2210912 | Draft CR on HST FR2 BS applicability rule (38.141-2, Rel-17) | Huawei | Endorsed |  |
| R4-2210913 | draftCR to TS 38.104 on HST FR2 Channel Conditions | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2210914 | draftCR to TS 38.141-2 on HST FR2 Channel Conditions | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2210915 | Draft CR to 38.141-2: Inttroduction of HST PUSCH requirements | Ericsson, Samsung | Endorsed |  |
| R4-2210916 | Draft CR on BS Manufacturer declaration for FR2 HST for TS 38.141-2 | Samsung, Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2210656 | DraftCR to TS 38.104: HST FR2 PUSCH performance requirements | Intel Corporation | Endorsed |  |
| R4-2210657 | DraftCR to TS 38.104: FRC for HST FR2 PUSCH performance requirements | Intel Corporation | Endorsed |  |
| R4-2211127 | DraftCR to TS 38.141-2: FRC for HST FR2 PUSCH performance requirements | Intel Corporation | Endorsed |  |
| R4-2210917 | Draft CR for TS 38.104, Introduce performance requirements for UL TA | CATT | Endorsed |  |
| R4-2210918 | Draft CR for TS 38.141-2, Introduce performance requirements for UL TA | CATT | Endorsed |  |
| R4-2209868 | Draft CR on PRACH minimum requirements for high speed train (38.104, Rel-17) | Huawei, HiSilicon | Endorsed |  |
| R4-2209869 | Draft CR on PRACH test requirement for high speed train (38.141-2, Rel-17) | Huawei, HiSilicon | Endorsed |  |

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**R4-2208075 Simulation results summary for Rel-17 FR2 HST BS demod**

*Type: other For: Information  
 Source: Samsung*

**Decision: Noted.**

**R4-2208078 Big CR on FR2 HST BS demodulation requirement for TS 38.104**

*Type: CR For: Agreement  
 38.104 v17.5.0 CR-0379 rev Cat: B (Rel-17)  
  
 Source: Samsung*

**Decision:** For Email approval

**R4-2209870 Draft CR on HST FR2 BS applicability rule (38.141-2, Rel-17)**

*Type: draftCR For: Endorsement  
 38.141-2 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2210912 (from R4-2209870).**

**R4-2210912 Draft CR on HST FR2 BS applicability rule (38.141-2, Rel-17)**

*Type: draftCR For: Endorsement  
 38.141-2 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2210148 Big CR to TS 38.141-2 on HST FR2 BS Demodulation Performance Requirements**

*Type: CR For: Agreement  
 38.141-2 v17.5.0 CR-0403 rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** For email approval

###### 9.8.4.2.1 PUSCH requirements

**R4-2207907 draftCR to TS 38.104 on HST FR2 Channel Conditions**

*Type: draftCR For: Agreement  
 38.104 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2210913 (from R4-2207907).**

**R4-2210913 draftCR to TS 38.104 on HST FR2 Channel Conditions**

*Type: draftCR For: Agreement  
 38.104 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2207908 draftCR to TS 38.141-2 on HST FR2 Channel Conditions**

*Type: draftCR For: Agreement  
 38.141-2 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2210914 (from R4-2207908).**

**R4-2210914 draftCR to TS 38.141-2 on HST FR2 Channel Conditions**

*Type: draftCR For: Agreement  
 38.141-2 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2207984 PUSCH simulation results**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Final results for PUSCH

**Decision: Noted.**

**R4-2207985 Draft CR to 38.141-2: Inttroduction of HST PUSCH requirements**

*Type: draftCR For: Endorsement  
 38.141-2 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Ericsson, Samsung*

**Abstract:**

Draft CR to introduce PUSCH

**Decision: Revised to R4-2210915 (from R4-2207985).**

**R4-2210915 Draft CR to 38.141-2: Inttroduction of HST PUSCH requirements**

*Type: draftCR For: Endorsement  
 38.141-2 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Ericsson, Samsung*

**Abstract:**

Draft CR to introduce PUSCH

**Decision: Endorsed.**

**R4-2208077 Discussion and simulation results of PUSCH requirement for Rel-17 FR2 HST**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2208080 Draft CR on BS Manufacturer declaration for FR2 HST for TS 38.141-2**

*Type: draftCR For: Endorsement  
 38.141-2 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Samsung*

**Decision: Revised to R4-2210916 (from R4-2208080).**

**R4-2210916 Draft CR on BS Manufacturer declaration for FR2 HST for TS 38.141-2**

*Type: draftCR For: Endorsement  
 38.141-2 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Samsung, Nokia*

**Decision: Endorsed.**

**R4-2208223 Simulation results for PUSCH demodulation requirements for FR2 HST**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted.**

**R4-2209865 Simulation results on PUSCH demodulation requirements for FR2 HST**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2210120 On HST FR2 PUSCH Requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Paper discusses the PUSCH simulation results alignment and manufacturer declaration for HST FR2.

**Decision: Noted.**

###### 9.8.4.2.2 PUSCH with UL timing adjustment requirements

**R4-2208195 Draft CR for TS 38.104, Introduce performance requirements for UL TA**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: CATT*

**Decision: Revised to R4-2210917(from R4-2208195).**

**R4-2210917 Draft CR for TS 38.104, Introduce performance requirements for UL TA**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208224 Discussion on UL TA demodulation requirements for FR2 HST**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted.**

**R4-2208225 Draft CR for TS 38.141-2, Introduce performance requirements for UL TA**

*Type: draftCR For: Endorsement  
 38.141-2 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: CATT*

**Decision: Revised to R4-2210918(from R4-2208225).**

**R4-2210918 Draft CR for TS 38.141-2, Introduce performance requirements for UL TA**

*Type: draftCR For: Endorsement  
 38.141-2 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2209866 Simulation results on PUSCH with UL timing adjustment requirements for FR2 HST**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

###### 9.8.4.2.3 PRACH requirements

**R4-2209867 Simulation results on PRACH demodulation requirements for FR2 HST**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209868 Draft CR on PRACH minimum requirements for high speed train (38.104, Rel-17)**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2209869 Draft CR on PRACH test requirement for high speed train (38.141-2, Rel-17)**

*Type: draftCR For: Endorsement  
 38.141-2 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

### 9.11 Further enhancement on NR demodulation performance

#### 9.11.1 General

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**Email discussion for [103-e][321] NR\_perf\_enh2\_Demod\_Part1, AI 9.11.1, 9.11.2.3-Shan Yang**

**R4-2210327 Email discussion summary for [103-e][321] NR\_perf\_enh2\_Demod\_Part1**

*Type: other For: Information  
 Source: Moderator (China Telecom)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210524 (from R4-2210327).**

**R4-2210524 Email discussion summary for [103-e][321] NR\_perf\_enh2\_Demod\_Part1**

*Type: other For: Information  
 Source: Moderator (China Telecom)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**Discussion on May 12th**

List of key open issues:

* Issue 3-1: Whether to define CRS-IM requirements for 30 kHz SCS scenario
* Issue 3-3: UE feature for 30 kHz CRS-IM
* Issue 2-1-1: Whether to introduce the test with only inter-RAT MO configured
* Issue 2-1-2: Whether the same CRS-IM test requirements can be applied in the two sets of test setup in scenario 2 (if introduced)
* Issue 2-1-3: Extra time for CHBW information detection in the test with only inter-RAT MO configured (if introduced)
* Issue 2-1-4: Whether the inter-RAT MO is only configured during the beginning of the test or throughout the test

Topic #3: CRS-IM for 30 kHz SCS scenario

**Issue 3-1: Whether to define CRS-IM requirements for 30 kHz SCS scenario**

* *Agreements in RAN4 #102e in the WF R4-2207240*
  + *Only define CRS-IM requirements for scenario with 30 kHz SCS assuming [10%] interference loading, 4 CRS ports and 1+1 DMRS configuration under the condition with enough performance discrimination between CRS-IM on and CRS-IM off i.e. at least 1dB performance difference observed*
    - *Channel BW: 20MHz*
    - *FFS on special slot configuration*
    - *Interested companies can bring results with Rel-15 rate matching (symbol level)*
* **Summary of simulation results** 
  + 4T**2**R, 10% LTE Cell Loading, MCS 13

|  |  |  |  |
| --- | --- | --- | --- |
|  | Baseline receiver (dB) | LLR weighting (dB) | Gain with CRS-IM (dB) |
| Apple | 9.8 | 9.0 | 0.6 |
| Intel |  |  | ~1.4 |
| CMCC | 8.7 | 7.1 | 1.6 |
| E/// |  |  | 1.19 |
| Huawei | 9.4 | 7.8 | 1.6 |
| ZTE | 9.8 | 8.7 | 1.11 |
| QC |  |  | ~0.6 |
| **Average** |  |  | 1.16 |
| **SPAN** | 1.1 | 1.9 |  |

* + 4T**4**R, 10% LTE Cell Loading, MCS 13

|  |  |  |  |
| --- | --- | --- | --- |
|  | Baseline receiver (dB) | LLR weighting (dB) | Gain with CRS-IM (dB) |
| Apple | 6 | 5.0 | 0.8 |
| Intel |  |  | ~1.5 |
| CMCC | 6.0 | 3.5 | 2.5 |
| Huawei | 6.4 | 5.3 | 1.1 |
| ZTE | 6.2 | 5.5 | 0.7 |
| QC |  |  | ~0.6 |
| **Average** |  |  | 1.2 |
| **SPAN** | 0.4 | 2.0 |  |

* **Proposals on whether to define CRS-IM requirements for 30kHz SCS**
  + Yes (Intel, CMCC, E///, HW, China Telecom, ZTE)
  + No (Apple, QC, MTK)
* **Moderator’s Recommendation**
  + Considering the simulation results, is it agreeable to define CRS-IM requirements for 30 kHz SCS?
  + Meanwhile, companies are encouraged to discuss whether the performance gain difference is caused by different assumptions (e.g., whether PDSCH is scheduled in the special slot) or implementation (e.g., whether CRS-IM is enabled if PDSCH is scheduled in the special slot) in the special slot.
* **Discussion:**
* QC: We observed the results from operators show more gain compared to the results from chipset vendors. We would like to understand the reason.
* CMCC: The performance gain difference may come from the detailed implementation assumption; we also provide the details in our paper including estimation granularity.
* Apple: We share similar observation as QC. We think the results not well aligned. We have concern for the benefits of introducing the test.
* China Telecom: Based on the summary from collected results, 2dB span is reasonable taking traditional approach and experience from RAN4 introducing performance requirements in the past. Regarding the detailed implementation, we already agreed it’s up to UE implementation as well as the performance span within a reasonable range. We think the difference major from two factors:
  + Estimation granularity
  + Special slot scheduling (with only single symbol for DMRS)
* **Agreement:**

Define CRS-IM requirements for 30kHz SCS scenario

* Separate UE capability introducing for 30kHz SCS scenario (Capability #4, Capability #5)
* RAN4 will continue the effort on the alignment of simulation results from companies.

**Issue 3-2: Special slot configuration for target cell with 30kHz SCS**

* *Agreements in RAN4 #102e in the WF R4-2207240*
  + *Use 7DS2U for the target cell with TDD 30kHz SCS*
  + *FFS the configuration in the special slot*
    - *Option 1: S=6D+4G+4U*
    - *Other Options are not precluded*
* Proposals
  + Option 1: Use option 1 for the special slot configuration, i.e. S=6D+4G+4U (HW, CMCC, Apple, China Telecom, QC, ZTE, E///)
    - Option 1A: it is up to UE implementation whether perform CRS-IM in S slot. If simulation is not aligned, we can unify the UE behavior in S slot. (HW, CMCC, E///)
    - Option 1B: assume no PDSCH scheduling in the specials slot (Apple, China Telecom, QC, ZTE)
      * Based on the FRC for Rel-16 TDD LTE-NR coexistence test, as well as the CRS-IM FRC submitted in this meeting, NR PDSCH is not scheduled in the special slot.
* **Moderator’s Recommendation**
  + Is Option 1B agreeable?
* **Discussion:**
* CMCC: We are fine with option 1B to save effort on the results alignment.
* Intel: This is the assumption for introducing performance requirements only ?
* MTK: For interference loading, we only consider the scheduled PDSCH slots?
* Ericsson: We are ok to not schedule PDSCH on special slot for test.
* Huawei: We are fine with option 1B.
* China Telecom: This is only for test with introducing performance requirements in RAN4 under FRC.
* For MTK question, we agree the interference loading percentage shall only consider the scheduled PDSCH slot.
* **Agreement: Option 1B agreed.**

**Issue 3-3: UE feature for 30 kHz CRS-IM**

* **Proposals**
  + Option 1: Approve the features of CRS-IM in non-DSS and 30 kHz NR SCS scenario. For the features of CRS-IM in non-DSS and 30 kHz NR SCS scenario, reuse the configuration proposed in last meeting WF in R4-2207239. (CMCC, China Telecom, ZTE, QC & Nokia - if agreed to define requirements for 30kHz SCS)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NR\_perf\_enh2\_Demod | X-4 | CRS-IM in non-DSS and 30 kHz NR SCS scenario, without the assistance of network signaling on LTE channel bandwidth | Support of neighboring LTE cell CRS-IM in non-DSS and 30 kHz NR SCS scenario, without the assistance of network signaling on LTE channel bandwidth |  | Yes | N/A | NR UE does not support neighboring LTE cell CRS-IM in non-DSS and 30 kHz NR SCS scenario, without the assistance of network signaling on LTE channel bandwidth | Per FSPC | No | Applicable only to FR1 | Support mixture of FDD/TDD |  | Optional with capability signaling |
| NR\_perf\_enh2\_Demod | X-5 | CRS-IM in non-DSS and 30 kHz NR SCS scenario, with the assistance of network signaling on LTE channel bandwidth | Support of neighboring LTE cell CRS-IM in non-DSS and 30 kHz NR SCS scenario, with the assistance of network signaling on LTE channel bandwidth |  | Yes | N/A | NR UE does not support neighboring LTE cell CRS-IM in non-DSS and 30 kHz NR SCS scenario, with the assistance of network signaling on LTE channel bandwidth | Per FSPC | No | Applicable only to FR1 | Support mixture of FDD/TDD |  | Optional with capability signaling |

* **Moderator’s Recommendation**
  + Is option 1 agreeable?
* **Ageement: Option 1 agreed.**

**LS to RAN2 on 30 kHz UE capability and NWA signalling**

**Session Chair Note: The LS (R4-221XXXX) will be checked and for early approval by email in first week i.e. by 17:00 UTC May 13th.**

**Topic #2: CRS-IM for 15kHz SCS scenario**

**S****ub-topic 2-1: Test with only inter-RAT MO configured for scenario 2**

**Issue 2-1-1: Whether to introduce the test with only inter-RAT MO configured**

* *Status in RAN#102-e in the WF R4-2207239*
  + *Define one set of test setup with the new NWA signalling on LTE CBW configured.*
  + *FFS whether to define the other set of test setup with only inter-RAT MO configured:*
    - *……*
* Proposals on whether to define the test with only inter-RAT MO configured:
  + Option 1: Yes (China Telecom, Nokia, CMCC, ZTE, E///, Huawei)
    - There will be two periods for the test:
      * Period #1: for UE to obtain LTE CBW, and without PDSCH scheduling
      * Period #2: with PDSCH scheduling and measure the relative throughput
    - HW: The capability #2 UE (CRS-IM in scenario 2 with 15 kHz SCS **without** Rel-17 new network assistant signaling on LTE channel bandwidth) cannot be verified if no test is introduced, i.e., there would be UE only support capability #2 but not support capability #3.
    - E///: It gets RRM requirements involved, but it is clearer after the clarification on which RRM requirement will be referred and for what reason. RAN4 has already defined other UE demodulation requirements considering RRM requirements, e.g., HTS-DPS requirements.
  + Option 2: No (Apple, QC, MTK)
    - QC, Apple: It mixes demod and RRM aspects significantly and requirements are expected to be similar to the test defined with NWA signalling.
* **Moderator’s Recommendation**
  + Discuss in GTW
* **Discussion:**
  + - Huawei: We support option 1 as we have separate UE capability to support w/o NWA based on inter-RAT MO configured. We should define dedicated test case to verify UE performance which declare to support this capability.For the concern of mixing demodulation and RRM aspects, we think this test only focused on to verify UE demodulation performance with proper test set-up to be aligned with RRM specification.
    - Apple: Our concern of mixing demodulation and RRM aspects, this will increase test complexity. The purpose of inter-RAT MO is majorly for measurement not for CHBW detection. We prefer to have single test case applicable for both UE capabilities.
    - QC: We have similar concern as Apple. For option 1, we will have two periods, period 1 for RRM measurement and period 2 for PDSCH demodulation; not sure inter-RAT MO shall be configured across all the period since UE need to monitor PBCH to blind detect CHBW and interference. What’s the measurement period we can assume here?Also, as E/// proposed measurement timer which we think it belongs to RRM scope. All above factors bring the complexity on test set-up.
    - CMCC: We share similar view as Huawei. We have separate UE capability which require different UE processing, without test cases, how we can UE performance. Inter-RAT MO is RRC reconfigured message with preconfigured; we think this apply across all the periods. Measurement gap can be configured to ensure test procedure.
    - Nokia: We agree with Huawei/CMCC to have separate test cases covering different UE capability with single set requirements. The configuration of inter-RAT MO can be further discussed and we understand the challenge.
    - China Telecom: If some UE only support capability #2 not capability #3, then no applicable test case for capability #2. For QC questions (inter-RAT MO configuration), we have dedicated issues list below for further discussion. For measure period, we can choose conservative value to ensure the set-up majorly focused on demodulation. For timer issue as E/// proposed, it’s a separate issue.
    - Intel: Can we clarify UE which declare supporting capability #2 can also support capability #3.
    - Apple: We have same proposal as Intel. All the NWA signalling is optional.
    - MTK: We prefer option 2.
    - CMCC: It’s still the choice of NW to configure NWA signalling or not,
    - Huawei: We have different view as Apple/Intel.
    - Ericsson: We have similar view as Huawei and CMCC.
* **Agreement:**

The baseline assumption: RAN4 will introduce the test case with only inter-RAT MO configured if the test feasibility with proper test set-up can be confirmed.

**Issue 2-1-2: Whether the same CRS-IM test requirements can be applied in the two sets of test setup in scenario 2 (if introduced)**

* Proposals
  + Option 1: Yes (China Telecom, Nokia, CMCC, ZTE, E///, HW, QC - *if the CBW is obtained by PBCH decoding and enough time is given*, MTK - *if agreed to define two sets of test setup and there will be no PBCH detection error*)
  + Option 2: The same requirements can be applied to capability #2 and #3 UEs, **but** with the same test setup (with NWA for CBW) instead of defining two test setups (Apple)
* **Moderator’s Recommendation**
  + The same CRS-IM test requirements can be applied in the two sets of test setup in scenario 2, if it is agreed to define two test setups in Issue 2-1-1.
* **Agreement: RAN4 target to specify single set of requirements if two sets of test set-up introduced which is pending on further checking on the test set-up and the performance with power detection method.**

**Issue 2-1-3: Extra time for CHBW information detection in the test with only inter-RAT MO configured (if introduced)**

* Issue A): In the test with only inter-RAT MO configured for scenario 2 (if introduced), is it agreeable to schedule NR PDSCH and measure the throughput after a certain time period?
  + Yes (CMCC, HW, China Telecom, QC, ZTE, E///, Apple)
* Issue B): The length of the time period
  + Option 1 & 3: 2s (E///, Nokia, CMCC& ZTE - for undetected neighbouring cells)
    - Follow the RRM definition and consider the whole timing for UE to acquire neighboring LTE cells CBW to be the TMeasure, E-UTRAN FDD = 2s
  + Option 2: 4.34 s (Huawei, China Telecom, E///, CMCC & ZTE - for undetected neighbouring cells)
    - PDSCH is scheduled after TIdentify, E-UTRAN FDD+500ms for FDD and TIdentify, E-UTRAN TDD+ 500ms for FDD, where 500ms is the time for UE to decode cell 2 PBCH within 5 coherent times (100ms for TDLA30-10) to reach 99.99% (1 - 0.145) PBCH accuracy
    - According to the RRM requirements, TIdentify, E-UTRAN FDD is 3840ms for gap pattern 0 for FDD and TDD.
    - With the above, PDSCH is scheduled after 3840 +500ms = 4340ms for FDD and TDD.
  + Option 4: decided based on feedback from RRM experts (QC)
* Issue C): Is it necessary to send LS to RAN2 and to define a timer based on the time period needed?
  + Yes (E///)
    - E///: We need to clarify the time in the specification, so that the network can have the same understanding as UE to schedule the PDSCH data after a certain period in the real case.
  + No (China Telecom, QC, ZTE, Apple, Intel)
* **Moderator’s Recommendation**
  + Issue A: Yes
  + Issue B: option 2 for the testing, considering the exist of undetected neighbouring cells?
  + Issue C: further discuss
* **Discussion:**
  + - QC: For issue A: Whether inter-RAT MO will be configured on the all period over the test?
    - Apple: For issue C: We don’t understand why timer needed for this? This belongs to RRM scope.
    - China Telecom: To QC, that’s a separate issue. For period 1, no PDSCH scheduling and in period 2 if MG configured, no PDSCH scheduled during MG.
    - Huawei: We share similar view as China Telcom. Inter-RAT MO can be pre-configured and with MG configured during the test.For Issue C, we think it belongs to RRM scope.
    - Intel: For issue C, we have concern on that which is out of WID scope.
    - Ericsson: We would like to let NW aware the timer for NW deployment.
* **Agreement:**
* Issue A: In the test with only inter-RAT MO configured for scenario 2 (if introduced), it’s agreeable to schedule NR PDSCH and measure the throughput after a certain time period
* Issue B: Further discuss the candidate options
* Further discuss in 1st round for Issue C.

**Sub-topic 2-2: Test parameters**

**Issue 2-2-1: Tx antenna and LTE CRS port number for scenario 1**

* *Status in RAN#102-e in the WF R4-2207239*
  + *For scenario 1, companies to bring simulation results for both 2 CRS and 4 CRS ports, and further decide whether to define requirements for 2 CRS or 4 CRS ports in the next meeting based on the performance gain.*
  + *For scenario 2, only cover 4 CRS ports*
* Companies’ observations based on CRS-IM performance for 2Tx in scenario 1
  + CTC, Huawei: CRS-IM under 2Tx CRS interference can achieve **similar performance gain** compared with 4Tx CRS interference for FDD, and can achieve **larger performance gain** for TDD.
  + E///: There is reasonable gain (>1dB) for 2Tx, 2Rx and 2Tx, 4Rx
  + MTK: The performance gap between LLR weighting and Rel-15 CRS serving cell rate matching is quite small for both 2T2R and 2T4R cases
* Proposals on LTE CRS port number for scenario 1
  + Option 1: 2 CRS ports (CTC, [Nokia], Huawei, Apple, ZTE, MTK, E///)
  + Option 2: 4 CRS ports (MTK, QC)
    - QC: interference is more severe for UE since it needs to estimate interference on more symbols and apply mitigation on more symbols
  + Option 3: 2 Ports for FDD and 4 Ports for TDD (CMCC, CTC)
* **Moderator’s Recommendation**
  + Is Option 3 a possible compromise?
* **Agreement: Option 3 agreed**

**WF/LS**

**R4-2210658 Simulation assumptions for CRS-IM (30 kHz SCS TDD)**

*Type: other For: Approval  
 Source: CMCC*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2210659 WF on the test with only inter-RAT MO configured for scenario 2**

*Type: other For: Approval  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2210660 Draft Big CR for CRS-IM**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Decision: Email approval**

**Conclusion after 1st round**

|  |  |  |  |
| --- | --- | --- | --- |
| **New Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2210658 | Simulation assumptions for CRS-IM (30 kHz SCS TDD) | CMCC |  |
| R4-2210659 | WF on the test with only inter-RAT MO configured for scenario 2 | Huawei, HiSilicon | Cover the issues in Sub-topic 2-1, for both 15kHz and 30kHz SCS |
| R4-2210660 | Draft Big CR for CRS-IM | Ericsson | Draft CR, *38.101-4 17.4.0, CAT B*  NR\_demod\_enh2-Perf |

**New tdocs**

**Existing tdocs**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tdoc number** | **Revised to** | **Title** | **Source** | **Status** | **Comments** |
| R4-2208261 | R4-2210919 | draftCR to 38\_101-4: NR CRS-IM 15KHz SCS Scenario - General and applicability sections | Nokia, Nokia Shanghai Bell | Revised |  |
| R4-2208419 | R4-2210920 | Draft CR for introduction of general applicability section of CRS-IM with serving cell 30kHz SCS in TS38.101-4 | CMCC | Revised |  |
| R4-2208420 | R4-2210921 | Draft CR on TDD PDSCH CRS-IM demod requirements for Scenario2 with overlapping spectrum for LTE and NR 15kHz SCS | CMCC | Revised |  |
| R4-2209148 | R4-2210922 | Draft CR for TS38.101-4 PDSCH Reference Channel for CRS-IM receiver in scenarios with overlapping spectrum for LTE and NR | ZTE Corporation | Revised |  |
| R4-2209404 | R4-2210923 | Simulation assumptions for CRS-IM (for 15kHz FDD and TDD) | China Telecom | Revised |  |
| R4-2209410 | R4-2210924 | Draft CR on adding FRC for CRS-IM 15kHz SCS test requirements | China Telecom | Revised |  |
| R4-2209411 | R4-2210925 | Draft CR on FDD PDSCH CRS-IM demod requirements for DSS Scenario | China Telecom | Revised |  |
| R4-2209417 | R4-2210926 | Updated work plan for Further enhancement on NR demodulation performance WI | China Telecom | Revised |  |
| R4-2209695 | R4-2210927 | draft CR to TS 38.101-4: TDD PDSCH CRS-IM demod requirements for DSS Scenario | Ericsson | Revised |  |
| R4-2209795 | R4-2210928 | Draft CR to TS38.101-4, interference model for CRS-IM receiver | MediaTek inc. | Revised |  |
| R4-2209817 | R4-2210929 | draftCR: Introduction of PDSCH requirements for FDD CRS-IM scenario 2 with 15kHz | Huawei, HiSilicon | Revised |  |
| R4-2209819 | R4-2210930 | draftCR: Introduction of PDSCH requirements for CRS-IM scenario 2 with 30kHz | Huawei, HiSilicon | Revised |  |
| R4-2209738 | R4-2210920 | Draft CR to 38\_101-4: Abbreviations section | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2208418 | R4-2210435 | LS on UE capability and network assistant signalling for CRS interference mitigation in the scenario with overlapping spectrum for LTE and NR with 30kHz SCS | CMCC | R4-2210435 is Approved |  |

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**R4-2209417 Updated work plan for Further enhancement on NR demodulation performance WI**

*Type: Work Plan For: Approval  
 Source: China Telecom*

**Decision: Revised to R4-2210926 (from R4-2209417).**

**R4-2210926 Updated work plan for Further enhancement on NR demodulation performance WI**

*Type: Work Plan For: Approval  
 Source: China Telecom*

**Decision: Approved.**

**R4-2209738 Draft CR to 38\_101-4: Abbreviations section**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

#### 9.11.2 UE demodulation and CSI requirements

**R4-2209829 Draft CR: Introduction of release independence for MMSE-IRC receiver requirements (TS 38.307 Rel-17)**

*Type: draftCR For: Endorsement  
 38.307 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2210951 (from R4-2209829).**

**R4-2210951 Draft CR: Introduction of release independence for MMSE-IRC receiver requirements (TS 38.307 Rel-17)**

*Type: draftCR For: Endorsement  
 38.307 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

##### 9.11.2.1 MMSE-IRC receiver for inter-cell interference

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**Email discussion for [103-e][336] NR\_perf\_enh2\_Demod\_Part2, AI 9.11.2.1,9.11.2.2-Zhixun Tang**

**R4-2210342 Email discussion summary for [103-e][336] NR\_perf\_enh2\_Demod\_Part2**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210539 (from R4-2210342).**

**R4-2210539 Email discussion summary for [103-e][336] NR\_perf\_enh2\_Demod\_Part2**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 12th**

**List of open issues:**

* Issue 1-1-1: Interference modelling in PDCCH region
* Issue 2-1-1: Test setup methodology for signal power
* Issue 2-1-2: SINR for 2 Rx
* Issue 2-1-4: SINR for 4 Rx
* Issue 2-1-3: T-put gain for 2 Rx

**Issue 1-1-1: Interference modelling in PDCCH region**

* Background
  + Option 1: ~~Reuse the LTE PDSCH IRC testing approach.~~ NR interference model to have ~~unallocated RE’s~~ all the REs in control region filled with QPSK randomly modulated symbols with random precoding for the number of antenna ports in the requirement scenario.
  + Option 2: Assume PDCCH transmission from interference cells
  + Option 3: Assume PDCCH transmission from interference cells and use non-overlapping PDCCH configurations. Use parameters in Table 2-4 from R4-2209820 as PDCCH configurations
  + Option 4: Assume Option 3 when SSB is non-colliding and Option 2 when SSB is colliding.
* Proposals
  + Option 1 (Nokia, China Telecom, Ericsson)
  + Option 2 (Apple, Ericsson, MediaTek)
    - Option 2a (Qualcomm) when SSB is colliding
  + Option 3 (Huawei)
    - Option 3a (Qualcomm) When SSB is not colliding
* Recommended WF
  + Collect views on options above
* Agreement:

**Further discuss between option 1 and option 2 as following:**

* Option 1: NR interference model to have all the REs in control region filled with QPSK randomly modulated symbols with random precoding for the number of antenna ports in the requirement scenario.
* Option 2: Assume PDCCH transmission from interference cells
  + Detailed PDCCH configuration on interference cells need to be further clarified

**Issue 2-1-1: Test setup methodology for signal power**

* Background
  + Option 1: Define test based on SINR
  + Option 2: Define test based on SNR
* Proposals
  + Option 1 (Apple, Nokia, China Telecom, Ericsson, Huawei)
  + Option 2 (MediaTek)
* Recommended WF
  + Check whether Option 1 can be considered based on majority companies views
* Agreement: Option 1 agreed

**Issue 2-1-2: SINR for 2 Rx**

* Background
  + Option 1: -2 dB
  + Option 2: 0dB or -1 dB
* Proposals
  + Option 1 (Nokia, China Telecom, Ericsson, Huawei)
    - Option 1a (MediaTek): Option 1; or Option 2 if SINR for 4Rx should be lower than that for 2Rx
  + Option 2 (Apple): 0 dB
* Recommended WF
  + Check whether Option 1 (SINR = -2dB) can be considered based on majority companies views
* Discussion:
  + Option 1: 2Rx : 0dB, 4Rx: -3dB (Apple)
  + Option 2: 2Rx: -2 dB, 4Rx: -2dB (QC, Apple, Huawei, MTK(slightly preferred), Nokia (slightly preferred), Ericsson)
  + Option 3: 2Rx: -2dB, 4Rx: -4dB (China Telecom, Ericsson, MTK, Nokia)

**WF/LS**

**R4-2210681 WF on PDSCH demodulation and CSI requirements for inter-cell interference MMSE-IRC**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tdoc number** | **Revised to** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210681 |  | WF on PDSCH demodulation and CSI requirements for inter-cell interference MMSE-IRC | Ericsson | Approved |  |
| R4-2210947 |  | Draft CR on PDSCH demod requirements in ICI-FDD | Apple | Endorsed |  |
| R4-2210948 |  | Draft CR for 38.101-4 Interference model for enhanced performance requirements | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2210949 |  | Draft CR for TS38.101-4 PDSCH TDD demodulation requirements for inter-cell interference MMSE-IRC | CMCC | Endorsed |  |
| R4-2210950 |  | Draft CR for introduction of general applicability section of inter-cell MMSE-IRC receiver in TS 38.101-4 | Huawei, HiSilicon | Endorsed |  |
| R4-2210951 |  | Draft CR for introduction release independence for MMSE-IRC receiver requirements | Huawei, HiSilicon | Endorsed |  |
| R4-2210952 |  | draftCR on CSI reporting test case (TDD) | Ericsson | Endorsed |  |
| R4-2210953 |  | draftCR on CSI reporting test case (FDD) | Qualcomm Incorporated | Endorsed |  |
| R4-2210954 |  | Draft CR on PDSCH 4Rx Demod requirements for intra cell inter user interference MMSE-IRC receiver | China Telecom | Endorsed |  |
| R4-2210955 |  | Draft CR for MU-MIMO FRC | Ericsson | Endorsed |  |
| R4-2210956 |  | Draft CR for introduction of MU-MIMO Beamforming model in TS 38.101-4 | Huawei, HiSilicon | Endorsed |  |
| R4-2210957 |  | Draft CR on PDSCH 2Rx Demod requirements for intra cell inter user interference MMSE-IRC receiver | Huawei, HiSilicon | Endorsed |  |

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**R4-2209824 Draft CR: Introduction of general and applicability section of inter-cell MMSE-IRC receiver (TS 38.101-4 Rel-17)**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2210950 (from R4-2209824).**

**R4-2210950 Draft CR: Introduction of general and applicability section of inter-cell MMSE-IRC receiver (TS 38.101-4 Rel-17)**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2209831 Summary of PDSCH requirements simulation results for inter-cell MMSE-IRC receiver**

*Type: discussion For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

###### 9.11.2.1.1 PDSCH requirements

**R4-2207799 Simulation results for PDSCH requirements in intercell interference scenarios**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2207800 Draft CR on PDSCH demod requirements in ICI-FDD**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Apple*

**Decision: Revised to R4-2210947(from R4-2207800).**

**R4-2210947 Draft CR on PDSCH demod requirements in ICI-FDD**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Apple*

**Decision: Endorsed.**

**R4-2208254 On general and PDSCH demodulation requirements for inter-cell interference MMSE-IRC**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution we have provided our views on the open topic of Interference modelling in PDCCH region.

**Decision: Noted.**

**R4-2208256 Simulation Results on PDSCH demodulation requirements for inter-cell interference MMSE-IRC**

*Type: discussion For: Information  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2208258 draftCR to 38\_101-4: NR Interference model for enhanced performance requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2210948 (from R4-2208258).**

**R4-2210948 draftCR to 38\_101-4: NR Interference model for enhanced performance requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2208414 Simulation results for inter-cell interference suppressing**

*Type: discussion For: Information  
 Source: CMCC*

**Decision: Noted.**

**R4-2208415 Draft CR for TS38.101-4 PDSCH TDD demodulation requirements for inter-cell interference MMSE-IRC**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: CMCC*

**Decision: Revised to R4-2210949 (from R4-2208415).**

**R4-2210949 Draft CR for TS38.101-4 PDSCH TDD demodulation requirements for inter-cell interference MMSE-IRC**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: CMCC*

**Decision: Endorsed.**

**R4-2209414 On PDSCH requirements for UE MMSE-IRC receiver for inter-cell interference suppression**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted.**

**R4-2209415 Simulation results on PDSCH demodulation requirements for inter-cell interference MMSE-IRC**

*Type: discussion For: Information  
 Source: China Telecom*

**Decision: Noted.**

**R4-2209436 Remaining issues on PDSCH requirement for inter-cell interference**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses PDSCH requirements for inter-cell IRC

**Decision: Noted.**

**R4-2209437 Simulation results on PDSCH performance for inter-cell interference**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This contribution submits our simulation results for PDSCH demodulation for inter-cell IRC

**Decision: Noted.**

**R4-2209791 Simulation results and discussion on PDSCH requirements with inter-cell inter-user interference**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2209820 Discussion on PDSCH requirements with IRC receiver for inter-cell interference**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209821 Simulation results for PDSCH IRC performance requirements for inter-cell interference**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2210156 Views and Simulation Results on Inter-cell Interference PDSCH Tests**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

###### 9.11.2.1.2 CQI requirements

**R4-2207801 Simulation results for CSI reporting requirements in intercell interference scenarios**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2208255 On CQI requirements for intercell interference MMSE-IRC**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution we have provided our views on various open issues related CQI requirements setup.

**Decision: Noted.**

**R4-2208257 Simulation Results on CQI requirements for intercell interference MMSE-IRC**

*Type: discussion For: Information  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2209413 On CSI requirements for UE MMSE-IRC receiver for inter-cell interference suppression**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted.**

**R4-2209438 Remaining issues on CSI reporting requirements for inter-cell interference**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses CSI reporting requirements for inter-cell IRC

**Decision: Noted.**

**R4-2209439 Simulation results on CSI reporting for inter-cell interference**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This contribution submits our simulation results for CSI reporting for inter-cell IRC

**Decision: Noted.**

**R4-2209441 draftCR on CSI reporting test case(TDD)**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draftCR introduce the new CSI reporting test case.

**Decision: Revised to R4-2210952(from R4-2209441).**

**R4-2210952 draftCR on CSI reporting test case(TDD)**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draftCR introduce the new CSI reporting test case.

**Decision: Endorsed.**

**R4-2209443 Summary of simulation results for Inter-cell MMSE-IRC CQI reporting**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This contribution summarizes the CSI reporting simulation results for companies

**Decision: Noted.**

**R4-2209529 Draft CR on Intercell Interfrence FDD CQI Requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2210953 (from R4-2209529).**

**R4-2210953 Draft CR on Intercell Interfrence FDD CQI Requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Endorsed.**

**R4-2209792 Simulation results and discussion on CQI requirements with inter-cell inter-user interference**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2209822 Discussion on CQI requirements with IRC receiver for inter-cell interference**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209823 Simulation results for CQI IRC requirements for inter-cell interference**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2210158 Views and Simulation Results for Inter-cell Interference CQI Reporting Tests**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

##### 9.11.2.2 MMSE-IRC receiver for intra-cell inter-user interference

**R4-2207802 Simulation results for PDSCH requirements in MU-MIMO scenarios**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2209412 Draft CR on PDSCH 4Rx demod requirements for MU-MIMO IRC**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: (Rel-17)  
  
 Source: China Telecom*

**Decision: Revised to R4-2210954 (from R4-2209412).**

**R4-2210954 Draft CR on PDSCH 4Rx demod requirements for MU-MIMO IRC**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: (Rel-17)  
  
 Source: China Telecom*

**Decision: Endorsed.**

**R4-2209416 Simulation results on UE MMSE-IRC receiver for intra-cell inter-user interference suppression**

*Type: discussion For: Information  
 Source: China Telecom*

**Decision: Noted.**

**R4-2209440 Simulation results on PDSCH performance for intra-cell inter-user interference**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This contribution submits our simulation results for PDSCH demodulation for intra-cell inter-user IRC

**Decision: Noted.**

**R4-2209442 draftCR on MU-MIMO FRC**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draftCR introduce the FRC for MU-MIMO test case.

**Decision: Revised to R4-2210955 (from R4-2209442).**

**R4-2210955 draftCR on MU-MIMO FRC**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draftCR introduce the FRC for MU-MIMO test case.

**Decision: Endorsed.**

**R4-2209793 Simulation results for MMSE-IRC receiver with intra-cell interference**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2209825 Simulation results for IRC receiver for intra-cell inter-user interference**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209826 Draft CR: Introduction of MU-MIMO Beamforming model (TS 38.101-4 Rel-17)**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2210956 (from R4-2209826).**

**R4-2210956 Draft CR: Introduction of MU-MIMO Beamforming model (TS 38.101-4 Rel-17)**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2209827 Draft CR: Introduction of 2Rx PDSCH demodulation requirements for MU-MIMO MMSE-IRC (TS 38.104 Rel-17)**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2210957 (from R4-2209827).**

**R4-2210957 Draft CR: Introduction of 2Rx PDSCH demodulation requirements for MU-MIMO MMSE-IRC (TS 38.104 Rel-17)**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2209828 BigCR for IRC for intra cell inter user MMSE receiver requirements**

*Type: CR For: Agreement  
 38.101-4 v17.4.0 CR-0286 rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision:** For email approval

**R4-2209830 Summary of PDSCH requirements simulation results for MU-MIMO MMSE-IRC receiver**

*Type: discussion For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2210121 Simulation Results for Intra-cell Inter-user Interference Tests**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

##### 9.11.2.3 CRS-IM receiver in scenarios with overlapping spectrum for LTE and NR

###### 9.11.2.3.1 General

**R4-2207803 Simulation results for CRS-IM requirements**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2208050 Discussion on CRS-IM requirements for 30 kHz SCS case**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2208259 On General for CRS-IM**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution we have provided our views on various open issues with relation to Nokia’s CR for the General and applicability sections.

**Decision: Noted.**

**R4-2208261 draftCR to 38\_101-4: NR CRS-IM 15KHz SCS Scenario - General and applicability sections**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2210919(from R4-2208261).**

**R4-2210919 draftCR to 38\_101-4: NR CRS-IM 15KHz SCS Scenario - General and applicability sections**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2208416 Discussion on the CRS-IM for NR 30kHz SCS**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2208417 Simulation results collection for 30kHz SCS CRS-IM**

*Type: other For: Information  
 Source: CMCC*

**Decision: Noted.**

**R4-2208418 LS on UE capability and network assistant signalling for CRS interference mitigation in the scenario with overlapping spectrum for LTE and NR with 30kHz SCS**

*Type: LS out For: Approval  
 to RAN2  
 Source: CMCC*

**Decision: Revised to R4-2210435 (from R4-2208652).**

**R4-2210435 LS on UE capability and network assistant signalling for CRS interference mitigation in the scenario with overlapping spectrum for LTE and NR with 30kHz SCS**

*Type: LS out For: Approval  
 to RAN2  
 Source: CMCC*

**Decision: Approved.**

**R4-2208419 Draft CR for introduction of general applicability section of CRS-IM with serving cell 30kHz SCS in TS38.101-4**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: CMCC*

**Decision: Revised to R4-2210920(from R4-2208419).**

**R4-2210920 Draft CR for introduction of general applicability section of CRS-IM with serving cell 30kHz SCS in TS38.101-4**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: CMCC*

**Decision: Endorsed.**

**R4-2208420 Draft CR on TDD PDSCH CRS-IM demod requirements for Scenario2 with overlapping spectrum for LTE and NR 15kHz SCS**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: CMCC*

**Decision: Revised to R4-2210921 (from R4-2208420).**

**R4-2210921 Draft CR on TDD PDSCH CRS-IM demod requirements for Scenario2 with overlapping spectrum for LTE and NR 15kHz SCS**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: CMCC*

**Decision: Endorsed.**

**R4-2209148 Draft CR for TS38.101-4 PDSCH Reference Channel for CRS-IM receiver in scenarios with overlapping spectrum for LTE and NR**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: ZTE Corporation*

**Abstract:**

This is a R17 Cat B draft CR

**Decision: Revised to R4-2210922 (from R4-2209148).**

**R4-2210922 Draft CR for TS38.101-4 PDSCH Reference Channel for CRS-IM receiver in scenarios with overlapping spectrum for LTE and NR**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: ZTE Corporation*

**Abstract:**

This is a R17 Cat B draft CR

**Decision: Endorsed.**

**R4-2209405 Summary of CRS-IM simulation results (15 kHz SCS FDD and TDD)**

*Type: discussion For: Information  
 Source: China Telecom*

**Decision: Noted.**

**R4-2209408 Simulation results for CRS-IM for 15kHz SCS scenario**

*Type: discussion For: Information  
 Source: China Telecom*

**Decision: Noted.**

**R4-2209410 Draft CR on adding FRC for CRS-IM 15kHz SCS test requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: (Rel-17)  
  
 Source: China Telecom*

**Decision: Revised to R4-2210924 (from R4-2209410).**

**R4-2210924 Draft CR on adding FRC for CRS-IM 15kHz SCS test requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: (Rel-17)  
  
 Source: China Telecom*

**Decision: Endorsed.**

**R4-2209411 Draft CR on FDD PDSCH CRS-IM demod requirements for DSS Scenario**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: (Rel-17)  
  
 Source: China Telecom*

**Decision: Revised to R4-2210925 (from R4-2209411).**

**R4-2210925 Draft CR on FDD PDSCH CRS-IM demod requirements for DSS Scenario**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: (Rel-17)  
  
 Source: China Telecom*

**Decision: Endorsed.**

**R4-2209693 Discussion on the 30kHz SCS scenario for CRS-IM**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discuss open issues for 30kHz SCS scenrario

**Decision: Noted.**

**R4-2209694 Simulation results for CRS-IM**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Submit simulation results

**Decision: Noted.**

**R4-2209695 draft CR to TS 38.101-4: TDD PDSCH CRS-IM demod requirements for DSS Scenario**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

To capture the requirement in the spec.

**Decision: Revised to R4-2210927 (from R4-2209695).**

**R4-2210927 draft CR to TS 38.101-4: TDD PDSCH CRS-IM demod requirements for DSS Scenario**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

To capture the requirement in the spec.

**Decision: Endorsed.**

**R4-2209794 Simulation results and discussion on PDSCH requirements for CRS-IM receiver**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2209795 Draft CR to TS38.101-4, interference model for CRS-IM receiver**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2210928 (from R4-2209795).**

**R4-2210928 Draft CR to TS38.101-4, interference model for CRS-IM receiver**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Endorsed.**

**R4-2209818 Discussion on CRS-IM with 30kHz SCS**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209819 draftCR: Introduction of PDSCH requirements for CRS-IM scenario 2 with 30kHz**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2210930 (from R4-2209819).**

**R4-2210930 draftCR: Introduction of PDSCH requirements for CRS-IM scenario 2 with 30kHz**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2210003 Simulation results collection for 30kHz SCS CRS-IM**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

###### 9.11.2.3.2 Test set-up

**R4-2208260 On Test Setup for CRS-IM**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution we have provided our views on various open issues with relation to test setup for 15kHz and 30kHz SCS.

**Decision: Noted.**

**R4-2208421 Discussion on the test setup for CRS-IM 15kHz**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2209147 CRS-IM receiver in scenarios with overlapping spectrum for LTE and NR**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209404 Simulation assumptions for CRS-IM (for 15kHz FDD and TDD)**

*Type: discussion For: Approval  
 Source: China Telecom*

**Decision: Noted.**

**R4-2209409 Discussion on the test setup for CRS-IM requirement definition**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted.**

**R4-2209527 Summary of CRS-IM simulation results (15 kHz SCS FDD and TDD)**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209692 Discussion on the test setup for CRS-IM**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discuss the test setup and 2 CRS ports for scenario 2

**Decision: Noted.**

**R4-2209815 Discussion on test setup for CSI-IM with 15kHz SCS**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209816 Simulation results for CRS-IM with 15kHz SCS**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209817 draftCR: Introduction of PDSCH requirements for FDD CRS-IM scenario 2 with 15kHz**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2210929 (from R4-2209817).**

**R4-2210929 draftCR: Introduction of PDSCH requirements for FDD CRS-IM scenario 2 with 15kHz**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2210191 Views on Test Setup for CRS Interference Mitigation in NR**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

#### 9.11.3 BS demodulation requirements maintenance

##### 9.11.3.1 PUSCH demodulation requirements for FR1 256QAM

### 9.12 Solutions for NR to support non-terrestrial networks (NTN)

#### 9.12.1 General

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**Email discussion for [103-e][307] NTN\_Solutions\_General , AI 9.12.1,9.12.2-Dorin Panaitopol**

**R4-2210313 Email discussion summary for 103-e][307] NTN\_Solutions\_General**

*Type: other For: Information  
 Source: Moderator (Thales)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210510 (from R4-2210313).**

**R4-2210510 Email discussion summary for 103-e][307] NTN\_Solutions\_General**

*Type: other For: Information  
 Source: Moderator (Thales)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210632 Way Forward on NTN\_Solutions\_General**

*Type: other For: Approval  
 Source: Thales*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210632 | Way Forward on NTN\_Solutions\_General | THALES | Approved |  |
| R4-2210847 | TP to TR 38.863 - Updates | Ericsson | Approved |  |
| R4-2210848 | Draft text proposal for Clause 6.1 Coexistence Figures - TR 38.863 | THALES | Approved |  |
| R4-2210849 | pCR for Clause 4.3 Requirement reference points - TS 38.108 | THALES | Approved |  |
| R4-2210850 | pCR for Annex D - TS 38.108 | THALES | Approved |  |
| R4-2210851 | Draft text proposal for Clause 3 - TS 38.101-5 | THALES | Approved | (Merged abbreviations from R4-2208886 into [R4-2209992](https://protect2.fireeye.com/v1/url?k=5489d4da-35f27e53-54885f95-74fe48600034-968b00839f2c4371&q=1&e=6d1ebb9e-6e0c-463c-beed-e35edbb9531f&u=https%3A%2F%2Fwww.3gpp.org%2Fftp%2FTSG_RAN%2FWG4_Radio%2FTSGR4_103-e%2FDocs%2FR4-2209992.zip)) |
| R4-2210852 | NR\_NTN\_solutions work plan | THALES | Approved |  |
| R4-2211133 | Draft Text Proposal to Update TR 38.863 Chapter 3,6 and 8 | Samsung | Approved |  |
| [R4-2211134](https://protect2.fireeye.com/v1/url?k=089ece19-69e56490-089f4556-74fe48600034-7ef774287374205d&q=1&e=6d1ebb9e-6e0c-463c-beed-e35edbb9531f&u=https%3A%2F%2Fwww.3gpp.org%2Fftp%2FTSG_RAN%2FWG4_Radio%2FTSGR4_103-e%2FDocs%2FR4-2209997.zip) | Draft Text Proposal to Update TR 38.863 structure | Samsung | Approved |  |
| [R4-2210228](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2210228.zip) | Draft text proposal for Clauses 6.4 and 6.5 Corrections Typos - TR 38.863 | THALES | Approved |  |
| [R4-2209994](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2209994.zip) | pCR for Clause 3.3 Abbreviations - TS 38.108 | THALES | Merge with R4-2208888 |  |

--------------------------------------------------------------End--------------------------------------------------------------------------

**R4-2208246 Remaining issue for General aspects for SAN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2208333 Draft Text Proposal to Update TR 38.863 Chapter 3,6 and 8**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: Samsung*

**Abstract:**

Draft text proposals to update contents of Chapter 3, 6 and 8 in draft TR 38.863.

**Decision: Revised to R4-2211133 (from R4-2208333).**

**R4-2211133 Draft Text Proposal to Update TR 38.863 Chapter 3,6 and 8**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: Samsung*

**Abstract:**

Draft text proposals to update contents of Chapter 3, 6 and 8 in draft TR 38.863.

**Decision: Approved.**

**R4-2208334 Draft Text Proposal to Update TR 38.863 structure**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: Samsung*

**Abstract:**

Draft text proposal to update the structure of draft TR 38.863

**Decision: Revised to R4-2211134 (from R4-2208334).**

**R4-2211134 Draft Text Proposal to Update TR 38.863 structure**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: Samsung*

**Abstract:**

Draft text proposal to update the structure of draft TR 38.863

**Decision: Approved.**

**R4-2208640 Draft TR 38.863 v0.4.0**

*Type: draft TR For: Agreement  
 38.863 v0.4.0 CR- rev Cat: (Rel-17)  
  
 Source: Samsung*

**Abstract:**

Tdoc reserved to capture all agreed TPs towards draft TR 38.863

**Decision:** For Email approval

**R4-2208641 Draft TS 38.101-5 v0.2.0**

*Type: draft TS For: Agreement  
 38.101-5 v0.2.0 CR- rev Cat: (Rel-17)  
  
 Source: Samsung*

**Abstract:**

Tdoc reserved to capture all agreed TPs towards draft TS 38.101-5

**Decision:** For Email approval

**R4-2208889 TP to TR 38.863 - Updates**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This contribution is a TP to TR 38.863 - Updates

**Decision: Revised to R4-2210847 (from R4-2208889).**

**R4-2210847 TP to TR 38.863 - Updates**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This contribution is a TP to TR 38.863 - Updates

**Decision: Approved.**

**R4-2209676 TP to TS 38.108: TS corrections; general parts**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

This TP to TS 38.108 provides multiple corrections to general parts of the TS.

**Decision: Withdrawn.**

**R4-2209917 NR\_NTN\_solutions work plan**

*Type: Work Plan For: Endorsement  
 Source: THALES*

**Abstract:**

At the RAN#95-e meeting, the work item “Solutions for NR to support non-terrestrial networks (NTN)” was revised, with the RAN4 core part completion by June 2022 (RAN#96-e), and the RAN4 performance part by December 2022 (RAN#98) [RP-213691]. In this contr

**Decision: Revised to R4-2210852 (from R4-2209917).**

**R4-2210852 NR\_NTN\_solutions work plan**

*Type: Work Plan For: Endorsement  
 Source: THALES*

**Abstract:**

At the RAN#95-e meeting, the work item “Solutions for NR to support non-terrestrial networks (NTN)” was revised, with the RAN4 core part completion by June 2022 (RAN#96-e), and the RAN4 performance part by December 2022 (RAN#98) [RP-213691]. In this contr

**Decision: Approved.**

**R4-2209990 pCR for Annex D - TS 38.108**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a pCR to update TS 38.108:

- Annex D (normative): Characteristics of the interfering signals

**Decision: Revised to R4-2210850 (from R4-2209990).**

**R4-2210850 pCR for Annex D - TS 38.108**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a pCR to update TS 38.108:

- Annex D (normative): Characteristics of the interfering signals

**Decision: Approved.**

**R4-2209992 Draft text proposal for Clause 3 - TS 38.101-5**

*Type: pCR For: Approval  
 38.101-5 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a TP to update TS 38.101-5:

- Section 3: Definitions of terms, symbols and abbreviations

**Decision: Revised to R4-2210851 (from R4-2209992).**

**R4-2210851 Draft text proposal for Clause 3 - TS 38.101-5**

*Type: pCR For: Approval  
 38.101-5 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a TP to update TS 38.101-5:

- Section 3: Definitions of terms, symbols and abbreviations

**Decision: Approved.**

**R4-2209994 pCR for Clause 3.3 Abbreviations - TS 38.108**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a pCR to update TS 38.108:

- Section 3.3: Abbreviations

**Decision: Merged (with R4-2208888).**

**R4-2209995 pCR for Clause 4.3 Requirement reference points - TS 38.108**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a pCR to update TS 38.108:

- Section 4.3: Requirement reference points

**Decision: Revised to R4-2210849 (from R4-2209995).**

**R4-2210849 pCR for Clause 4.3 Requirement reference points - TS 38.108**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a pCR to update TS 38.108:

- Section 4.3: Requirement reference points

**Decision: Approved.**

**R4-2210189 Draft TS 38.108 v0.2.0**

*Type: draft TS For: Agreement  
 38.108 v0.2.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

Document reserved to capture in TS 38.108 v0.2.0 the approved TPs/pCRs at RAN4#103-e

**Decision: Email approval**

#### 9.12.2 Coexistence aspects

**R4-2209997 Draft text proposal for Clause 6.1 Coexistence Figures - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 6.1 Co-existence simulation scenario of TR 38.863 by including some visual explanations already included in the Annex of previous NTN simulation document gathering all NTN simulat

**Decision: Revised to R4-2210848 (from R4-2209997).**

**R4-2210848 Draft text proposal for Clause 6.1 Coexistence Figures - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 6.1 Co-existence simulation scenario of TR 38.863 by including some visual explanations already included in the Annex of previous NTN simulation document gathering all NTN simulat

**Decision: Approved.**

**R4-2210228 Draft text proposal for Clauses 6.4 and 6.5 Corrections Typos - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to correct a few typos in Section 6.4 and 6.5 from TR 38.863.

**Decision: Approved.**

#### 9.12.3 Satellite Access Node RF requirements

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**Email discussion for [103-e][308] NTN\_Solutions\_SANRF, AI 9.12.3-Yuexia Song**

**R4-2210314 Email discussion summary for [103-e][308] NTN\_Solutions\_SANRF**

*Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210511 (from R4-2210314).**

**R4-2210511 Email discussion summary for [103-e][308] NTN\_Solutions\_SANRF**

*Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 11th**

**Issue 1-1: Δ**fOBUE

* Proposals
  + Option 1: use **Δ**fOBUE=10MHz as baseline for n256 and n255
  + Option 2: The boundary between the out-of-band mask and spurious domain for SAN should be specified as 2\*BWChannel from the channel edge based on ITU regulation.
* Recommended WF
  + TBA
* Discussion:
  + ZTE: Is that possible to meet in-band spurious emission and out of band spurious emission by filtering attenuation.
  + Huawei: For NTN, spurious emission is same with in/out of band spurious which means filtering not helpful for spurious emission requirements. We don’t need the boundary.
  + Ericsson: We have same understanding as Huawei.
  + Thales: We have same understanding Huawei and Ericsson.
* Agreement: Option 2

**Issue 1-2: Δ**fOOB

* Proposals
  + Option 1: use **Δ**fOOB=20MHz as baseline for n256 and n255
  + Option 2: other, please specify
* Recommended WF
  + TBA
* Agreement: Option 1 agreed

**Issue 1-3: Spurious emission**

* Proposals
  + Option 1: spurious emission should be specified as in the following table (Ericsson)

|  |  |  |  |
| --- | --- | --- | --- |
| Spurious frequency range | Prated,c,TRP(W) | Basic limit (dBm) | Measurement bandwidth |
| 30 MHz – 12.75 GHz | ≤ 50 W | -13 | 4 kHz |
|  | > 50 W | 10 Log(Prated,c,sys(W)) – 30 |  |

* + Option 2: specify the spurious emissions as in the following table (Huawei, Thales)

|  |  |  |
| --- | --- | --- |
| Spurious frequency range | Basic limit GEO/LEO class (dBm) | Measurement bandwidth |
| 30 MHz –5th harmonic of the upper frequency edge of the DL operating band (NOTE 3, 4, 5, 6) | When Prated,c,sys ≤ 47dBm :  -13  When Prated,c,sys > 47dBm :  Prated,c,sys-60  (NOTE 1) | 4 kHz  (NOTE 2) |

* + Option 3: specify the spurious emissions as in the following table (ZTE)

|  |  |  |  |
| --- | --- | --- | --- |
| Spurious frequency range | *Basic limit (Note 5)* | *Measurement bandwidth* | Notes |
| 9 kHz – 150 kHz | When Prated,c,sys ≤ 50W :  -13  When Prated,c,sys > 50W :  10\*log(Prated,c,sys)-30 | 4 kHz | Note 1, Note 4 |
| 150 kHz – 30 MHz | 4 kHz | Note 1, Note 4 |
| 30 MHz – 1 GHz | 4 kHz | Note 1 |
| 1 GHz– 12.75 GHz | 4 kHz | Note 1, Note 2 |
| NOTE 1: Prated,c,sys (dBm) is declared by the manufacturer.  NOTE 2: Measurement bandwidths as in ITU-R SM.329 [x], s4.1.  NOTE 3: Lower and Upper frequency as in ITU-R SM.329 [x], s2.5, Table 1. Values as in ITU-R SM.329 [x], Table 10.  NOTE 4: Lower frequency limit is replaced by 800 MHz, according to ITU-R SM.329-12, when using waveguide section, spurious domain emission measurements below 0.7 times the waveguide cut-off frequency are not required.  [NOTE 5: This spurious frequency range applies only to SAN type 1-H.]  [NOTE 6: Applies only for band n255 and n256.] | | | |

* Recommended WF
  + TBA
* Discussion:
  + Thales: Frequency range from ITU-R recommendation starting with 30MHz .
  + Ligado: We share same view as Thales.
  + Huawei: Measurement bandwidth in NTN using 4kHz and in TN 1MHz used.
  + ZTE: TN specification, we also refer to same ITU-R recommendation. Any difficulty for below 30MHz considering there are system operated below 30MHz?
  + We also need to discuss the notes.
  + Ligado: We didn’t observe any issue and satellites now deployed completely follow ITU-R recommendation.
  + CATT: We can agree with option 2 and can further revisit in future if necessary.
* Agreement: Option 2 agreed

|  |  |  |
| --- | --- | --- |
| Spurious frequency range | Basic limit GEO/LEO class (dBm) | Measurement bandwidth |
| 30 MHz –5th harmonic of the upper frequency edge of the DL operating band (NOTE 3, 4, 5, 6) | When Prated,c,sys ≤ 47dBm :  -13  When Prated,c,sys > 47dBm :  Prated,c,sys-60  (NOTE 1) | 4 kHz  (NOTE 2) |

* RAN4 can further revisit the low frequency boundary (30MHz) in maintenance phase if technical justification identified.
* Further discuss the “Notes” in the table over email

**Issue 1-4-1: Principles to define OBUE requirements for SAN**

* Proposals
  + Option 1: Specify satellite access node OBUE based on TN BS OBUE/TN MSR BC1 OBUE and scaling according to ACLR
  + Option 2: Follow Annex 5 of ITU recommendation SM.1541-6 to define SAN OBUE requirements.
* Recommended WF
  + TBA
* Discussion:
  + Huawei: In previous GTW, we already have agreements that need to follow ITU recommendation (option 2).
  + Thales: We agree with option 2 as Huawei explained. During offline discussion, we already explained the detailed considerations from Satellite industry.
  + ZTE: In principle we shall respect the ITU recommendation, but in TN we also take ACLR into account.
  + Ericsson: We just agree to follow ITU recommendation for breaking point. We would like to know how to fit with ACLR requirement with option2.
  + Thales: We shall specify OBUE requirements related to EVM, not ACLR. ACLR and OBUE are sperate requirements, meanwhile more stringent requirements can be verified under conformance test cases/
  + Huawei: Seems companies fine with option 2, for the concern of the linkage between ACLR and OBUE, we believe SAN need to meet these two requirements.
  + Ligado: We share similar view as Huawei.
  + ZTE: OBUE requirement: 1st range related to EVM; 2nd range related to ACLR. For TN, OBUE always related to ACLR.
  + CATT: We slightly agree with Huawei, ACLR and OBUE requirements are different.
  + Ericsson: We think these requirements shall be consistent. We can follow ITU recommendation and further the details.
  + Samsung: We share the same view as CATT and Thales.
* Agreement: Option 2 and further discuss the OBUE requirements.

**Issue 1-4-2: OBUE requirements**

* Proposals
  + Option 1: OBUE according to TN BS OBUE/TN MSR BC1 OBUE.
* **Option 1a:**

SAN GEO Class - OBUE basic limits

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic limits* | *Measurement bandwidth* |
| 0 MHz ≤ Δf < 5 MHz | 0.002 MHz ≤ f\_offset < 5.002 MHz |  | 4kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.002 MHz ≤ f\_offset <  min(10.002 MHz, f\_offsetmax) | 0 dBm | 4kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.002 MHz ≤ f\_offset < f\_offsetmax | Aligned with SAN spurious limit | 4kHz |

SAN LEO Class - OBUE basic limits

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic limits* | *Measurement bandwidth* |
| 0 MHz ≤ Δf < 5 MHz | 0.002 MHz ≤ f\_offset < 5.002 MHz |  | 4kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.002 MHz ≤ f\_offset <  min(10.002 MHz, f\_offsetmax) | -14 dBm | 4kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.002 MHz ≤ f\_offset < f\_offsetmax | Aligned with SAN spurious limit | 4kHz |
| NOTE: *ΔLEOType* = 0dBm for LEO 600 km satellite and 6dBm for LEO 1200 km satellite | | | | |

**Option 1b:**

Table 1-1. SAN GEO Class OBUE limit values

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic limits* (Note 1, 2)  dBm | *Measurement bandwidth* |
| 0 MHz ≤ Δf < 5 MHz | 0.002 MHz ≤ f\_offset < 5.002 MHz |  | 4kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.002 MHz ≤ f\_offset <  min(10.002 MHz, f\_offsetmax) | *-3 dBm* | 4kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.002 MHz ≤ f\_offset < f\_offsetmax | -9dBm | 4kHz |
| NOTE: Assuming with lowest achievable EVM for GEO without power backoff is similar as QPSK EVM requirements to derive the starting point of first slope of UEM with 2dB implementation margin. | | | |

Table 1-2. SAN LEO Class OBUE basic limits

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic limits* (Note 1, 2)  dBm | *Measurement bandwidth* |
| 0 MHz ≤ Δf < 5 MHz | 0.002 MHz ≤ f\_offset < 5.002 MHz | +X | 4kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.002 MHz ≤ f\_offset <  min(10.002 MHz, f\_offsetmax) | *-13+X* | 4kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.002 MHz ≤ f\_offset < f\_offsetmax | -13+X | 4kHz |
| NOTE 1: For LEO600, X is equal to 0dB and LEO1200, X is equal to min(10\*log10( Prated,c,sys)+30-41 ,6);  NOTE 2: Assuming with lowest achievable EVM for LEO without power backoff is similar as 16QAM EVM requirements to derive the starting point of first slope of UEM with 2dB implementation margin. | | | |

* + Option 2: OBUE according to Annex 5 of ITU recommendation SM.1541-6

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic limits*  dBm | *Measurement bandwidth* |

|  |  |  |  |
| --- | --- | --- | --- |
| 0 MHz ≤ Δf < 2\* BWChannel | 0.002 MHz ≤ f\_offset < 2\* BWChannel + 0.002 MHz |  | 4kHz |

|  |
| --- |
| NOTE 1: PSDchannel = Prated,c – 10log10(BWChannel) – 24, unit dBm/4kHz.  NOTE 2: SE limit is spurious emission limit specified in spurious emission clause.  NOTE 3: PSD attenuation as in ITU-R SM.1541-6 [3], Annex 5 OoB domain emission limits for space services. |

* Discussion:
  + Ligado: We think option 2 clear enough.
  + Thales: We already prepare TP following option 2 for TS/TR to complete the work.
  + ZTE: How to derive ACLR from this OBUE requirements?
  + Huawei: For option 2, 19 dB PSD attenuation at first adjacent channel. For the concern on how to reflect ACLR, We can adjust the value to move down the curve 2dB.
  + CATT: We agree the approach from Huawei.
  + Ericsson: What Huawei proposed is the possible way we can follow.
  + Thales: We can accept the value currently to make progress considering the margin.
  + Ligado: For GEO, 2dB not needed we believe since OBUE requirement is already stringent than ACLR.
* Agreement: Option 2

|  |  |  |  |
| --- | --- | --- | --- |
| 0 MHz ≤ Δf < 2\* BWChannel | 0.002 MHz ≤ f\_offset < 2\* BWChannel + 0.002 MHz |  | 4kHz |

* X = 3dB for LEO
* X= 0dB for GEO
* RAN4 can further revisit the requirements including the value(X) during maintenance phase with technical input from companies.

ZTE: We have concern on the approach to specify OBUE requirement which total different compared to TN.

**Issue 1-5: Absolute ACLR**

* Proposals
  + Option 1: Specify absolute ACLR requirement as -13dBm/4kHz
  + Option 2: Do not specify absolute ACLR requirement
* Agreement: Option 2

**WF/LS**

**R4-2210633 WF on remaining issue for SAN RF requirements**

*Type: other For: Approval  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210633 | WF on remaining issue for SAN RF requirements | CATT | **Approved** |  |
| R4-2210853 | TP for 38.863: clause 7.3.2 Conducted transmission characteristics | CATT | Approved |  |
| R4-2210854 | TP for 38.108: clause 6 on unwanted emissions | CATT | Approved |  |
| R4-2210855 | pCR to TS 38.108 - Transmitter spurious requirement | Ericsson | Approved |  |
| R4-2210856 | pCR to TS 38.108 - Alignement | Ericsson | Approved |  |
| R4-2210857 | TP to TS 38.108 on 6.0 Conducted transmitter characteristics | HUGHES Network Systems Ltd; Hughes/EchoStar | Approved |  |
| R4-2210858 | TP to TR 38.863: Conducted reference sensitivity | Huawei, HiSilicon | Approved |  |
| R4-2210859 | TP to TR 38.863: Conducted Rx dynamic range | Huawei, HiSilicon | Approved |  |
| R4-2210860 | Draft text proposal for Clause 7.3.2.2.5 Transmitter spurious emissions - TR38.863 | THALES | Approved |  |
| R4-2210861 | pCR for Clause 7.4 In-band selectivity and blocking - TS 38.108 | THALES | Approved |  |
| R4-2210862 | pCR for Clause 7.5 Out-of-band blocking - TS 38.108 | THALES | Approved |  |
| R4-2210863 | pCR for Clause 7.6 Receiver spurious emissions - TS 38.108 | THALES | Return to |  |
| R4-2210864 | pCR for Clause 10.6.2 Minimum requirement for SAN type 1-O - TS 38.108 | THALES | Approved |  |
| R4-2210865 | Tentative draft pCR for Clause 7.3.2.2.4.2 Operating band unwanted emissions - TR 38.863 | THALES | Approved |  |
| R4-2210866 | Draft text proposal for Clause 7.3.2.2.1 SAN output power - TR 38.863 | THALES | Approved |  |
| R4-2210867 | Draft text proposal for Clause 7.3.3.3.1 OTA sensitivity - TR 38.863 | THALES | Approved |  |
| R4-2210868 | Draft text proposal for Clause 7.3.3.3.2 OTA reference sensitivity - TR 38.863 | THALES | Approved |  |
| R4-2210869 | Draft text proposal for Clause 7.3.3.3.3 OTA dynamic range - TR 38.863 | THALES | Approved |  |
| R4-2210870 | Draft text proposal for Clause 7.3.3.3.7 OTA receiver intermodulation - TR 38.863 | THALES | Approved |  |
| R4-2210871 | Draft text proposal for Clause 7.3.3.3.8 OTA in-channel selectivity - TR 38.863 | THALES | Approved |  |
| R4-2210872 | Draft text proposal for Clause 7.3.3.3.4 OTA in-band selectivity and blocking - TR 38.863 | THALES | Approved |  |
| R4-2210873 | Draft TP for TS 38.108 Section 6.6.4 Operating band unwanted emissions | Inmarsat | Approved |  |
| R4-2211145 | Draft text proposal for Clause 7.3.3.3.2 OTA reference sensitivity - TR 38.863 | Thales | Approved |  |
| [R4-2209999](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2209999.zip) | pCR for Clause 6.6.3 Adjacent Channel Leakage Power Ratio - TS 38.108 | THALES | Merged |  |
| [R4-2210000](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2210000.zip) | Tentative pCR for Clause 6.6 Unwanted emissions and Clause 6.6.4 OBUE - TS 38.108 | THALES | Merged |  |
| [R4-2210001](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2210001.zip) | pCR for Clause 6.6.5 Transmitter spurious emissions - TS 38.108 | THALES | Merged |  |
| *R4-2211135* | TP to TS 38.108: TS corrections; RF requirements | Huawei, HiSilicon | Approved |  |
| [R4-2208663](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2208663.zip) | TP to TS 38.108 on Conducted receiver characteristics | ZTE Corporation | Approved |  |

--------------------------------------------------------------End--------------------------------------------------------------------------

**R4-2208888 pCR to TS 38.108 - Alignement**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This contribution is a pCR to TS 38.108 - Alignment

**Decision: Revised to R4-2210856 (from R4-2208888).**

**R4-2210856 pCR to TS 38.108 - Alignement**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This contribution is a pCR to TS 38.108 - Alignment

**Decision: Approved.**

##### 9.12.3.1 TX requirements for radiated characteristics

**R4-2208883 NTN - SAN TX radiated requirements: remaining issues**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This contribution discusses the remaining open issue of Satellite node access - Tx radiated requirements

**Decision: Noted.**

**R4-2208887 pCR to TS 38.108 - Transmitter spurious requirement**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This contribution is a pCR to TS 38.108 - Transmitter spurious emissions subclause

**Decision: Revised to R4-2210855 (from R4-2208887).**

**R4-2210855 pCR to TS 38.108 - Transmitter spurious requirement**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This contribution is a pCR to TS 38.108 - Transmitter spurious emissions subclause

**Decision: Approved.**

**R4-2209923 On SAN Spurious Emission requirements for Radiated Characteristics**

*Type: discussion For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

##### 9.12.3.2 RX requirements for radiated characteristics

**R4-2210059 pCR for Clause 10.6.2 Minimum requirement for SAN type 1-O - TS 38.108**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a pCR to update TS 38.108:

- Section 10.6.2: Minimum requirement for SAN type 1-O

**Decision: Revised to R4-2210864 (from R4-2210059).**

**R4-2210864 pCR for Clause 10.6.2 Minimum requirement for SAN type 1-O - TS 38.108**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a pCR to update TS 38.108:

- Section 10.6.2: Minimum requirement for SAN type 1-O

**Decision: Approved.**

**R4-2210159 Draft text proposal for Clause 7.3.3.3.1 OTA sensitivity - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.3.3.1 OTA Sensitivity of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Revised to R4-2210867 (from R4-2210159).**

**R4-2210867 Draft text proposal for Clause 7.3.3.3.1 OTA sensitivity - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.3.3.1 OTA Sensitivity of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Approved.**

**R4-2210161 Draft text proposal for Clause 7.3.3.3.2 OTA reference sensitivity - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.3.3.2 OTA reference Sensitivity of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Revised to R4-2210868 (from R4-2210161).**

**R4-2210868 Draft text proposal for Clause 7.3.3.3.2 OTA reference sensitivity - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.3.3.2 OTA reference Sensitivity of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Approved.**

**R4-2210162 Draft text proposal for Clause 7.3.3.3.3 OTA dynamic range - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.3.3.3 OTA dynamic range of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Revised to R4-2210869 (from R4-2210162).**

**R4-2210869 Draft text proposal for Clause 7.3.3.3.3 OTA dynamic range - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.3.3.3 OTA dynamic range of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Approved.**

**R4-2210163 Draft text proposal for Clause 7.3.3.3.2 OTA reference sensitivity - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.3.3.2 OTA reference Sensitivity of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Revised to R4-2211145 (from R4-2210163).**

**R4-2211145 Draft text proposal for Clause 7.3.3.3.2 OTA reference sensitivity - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.3.3.2 OTA reference Sensitivity of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Approved.**

**R4-2210164 Draft text proposal for Clause 7.3.3.3.7 OTA receiver intermodulation - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.3.3.7 OTA receiver intermodulation of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Revised to R4-2210870(from R4-2210164).**

**R4-2210870 Draft text proposal for Clause 7.3.3.3.7 OTA receiver intermodulation - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.3.3.7 OTA receiver intermodulation of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Approved.**

**R4-2210165 Draft text proposal for Clause 7.3.3.3.8 OTA in-channel selectivity - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.3.3.8 OTA in-channel selectivity of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Revised to R4-2210871 (from R4-2210165).**

**R4-2210871 Draft text proposal for Clause 7.3.3.3.8 OTA in-channel selectivity - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.3.3.8 OTA in-channel selectivity of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Approved.**

**R4-2210213 Draft text proposal for Clause 7.3.3.3.4 OTA in-band selectivity and blocking - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.3.3.4 OTA in-band selectivity and blocking of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Revised to R4-2210872 (from R4-2210213).**

**R4-2210872 Draft text proposal for Clause 7.3.3.3.4 OTA in-band selectivity and blocking - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.3.3.4 OTA in-band selectivity and blocking of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Approved.**

##### 9.12.3.3 Tx requirements for conducted characteristics

**R4-2208247 Open issue on conducted requirement for SAN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2208248 Open issue on radiated requirement for SAN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Withdrawn.**

**R4-2208249 TP for 38.863: clause 7.3.2 Conducted transmission characteristics**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: CATT*

**Decision: Revised to R4-2210853 (from R4-2208249).**

**R4-2210853 TP for 38.863: clause 7.3.2 Conducted transmission characteristics**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: CATT*

**Decision: Approved.**

**R4-2208250 TP for 38.108: clause 6 on unwanted emissions**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: CATT*

**Decision: Revised to R4-2210854(from R4-2208250).**

**R4-2210854 TP for 38.108: clause 6 on unwanted emissions**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: CATT*

**Decision: Approved.**

**R4-2208882 NTN - SAN TX conducted requirements: remaining issues**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This contribution discusses the remaining open issue of Satellite node access - Tx conducted requirements

**Decision: Noted.**

**R4-2209361 Discussion on SAN OoB mask and spurious emission requirements**

*Type: other For: Approval  
 Source: Huawei, HiSilicon, Thales*

**Decision: Noted.**

**R4-2209528 TP to TS 38.108 on 6.0 Conducted transmitter characteristics**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: HUGHES Network Systems Ltd; Hughes/EchoStar*

**Decision: Revised to R4-2210857 (from R4-2209528).**

**R4-2210857 TP to TS 38.108 on 6.0 Conducted transmitter characteristics**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: HUGHES Network Systems Ltd; Hughes/EchoStar*

**Decision: Approved.**

**R4-2209592 Further discussion on conducted Tx requirements of satellite access node**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209677 TP to TS 38.108: TS corrections; RF requirements**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

This TP to TS 38.108 provides multiple corrections to RF requirements.

**Decision: Revised to R4-2211135 (from R4-2209677).**

**R4-2211135 TP to TS 38.108: TS corrections; RF requirements**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

This TP to TS 38.108 provides multiple corrections to RF requirements.

**Decision: Approved.**

**R4-2209924 On SAN Spurious Emission requirements for Conducted Characteristics**

*Type: discussion For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2209999 pCR for Clause 6.6.3 Adjacent Channel Leakage Power Ratio - TS 38.108**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a pCR to update TS 38.108:

- Section 6.6.3: Adjacent Channel Leakage Power Ratio

**Decision: Merged**

**R4-2210000 Tentative pCR for Clause 6.6 Unwanted emissions and Clause 6.6.4 OBUE - TS 38.108**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a pCR to update TS 38.108:

- TP1 for Section 6.6: Unwanted emissions

- TP2 (Alternative 1) or TP2 (Alternative 2) for Section 6.6.4: Operating band unwanted emissions

**Decision: Merged**

**R4-2210001 pCR for Clause 6.6.5 Transmitter spurious emissions - TS 38.108**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a pCR to update TS 38.108:

- Section 6.6.5: Transmitter spurious emissions

**Decision: Merged**

**R4-2210004 Draft text proposal for Clause 7.3.2.2.5 Transmitter spurious emissions - TR38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.2.2.5 Transmitter spurious emissions for TR 38.863 taking into account latest agreements to be considered for TS 38.108.

**Decision: Revised to R4-2210860(from R4-2210004).**

**R4-2210860 Draft text proposal for Clause 7.3.2.2.5 Transmitter spurious emissions - TR38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.2.2.5 Transmitter spurious emissions for TR 38.863 taking into account latest agreements to be considered for TS 38.108.

**Decision: Approved.**

**R4-2210082 Discussion on SAN OBUE**

*Type: discussion For: Discussion  
 Source: THALES*

**Abstract:**

Updated SAN OBUE (Option 2) from the approved Way Forward on SAN SEM and spurious emission (R4-2207456).

**Decision: Noted.**

**R4-2210090 Discussion on SAN Spurious Emissions**

*Type: discussion For: Discussion  
 Source: THALES*

**Abstract:**

Updated SAN Spurious Emissions (Option 2) from approved Way Forward on SAN SEM and spurious emission (R4-2207456).

**Decision: Noted.**

**R4-2210110 On SAN OBUE definition using ITU-R recommendation**

*Type: discussion For: Agreement  
 Source: THALES*

**Abstract:**

Simulation results with ITU-R recommendation SM.1541-6 (Unwanted emissions in the out-of-band domain), with frequency offset range within first two break points, and the measurement bandwidth of 4kHz.

**Decision: Noted.**

**R4-2210116 Tentative draft pCR for Clause 7.3.2.2.4.2 Operating band unwanted emissions - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.2.2.4.2 Operating band unwanted emissions of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Revised to R4-2210865 (from R4-2210116).**

**R4-2210865 Tentative draft pCR for Clause 7.3.2.2.4.2 Operating band unwanted emissions - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.2.2.4.2 Operating band unwanted emissions of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Approved.**

**R4-2210154 Draft text proposal for Clause 7.3.2.2.1 SAN output power - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.2.2.1 SAN output power of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Revised to R4-2210865 (from R4-2210154).**

**R4-2210865 Draft text proposal for Clause 7.3.2.2.1 SAN output power - TR 38.863**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this contribution is proposed to add information with respect to Section 7.3.2.2.1 SAN output power of TR 38.863 by including some information related to agreements for TS 38.108.

**Decision: Approved.**

**R4-2210216 Draft TP for TS 38.108 Section 6.6.4 Operating band unwanted emissions**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Inmarsat*

**Decision: Revised to R4-2210873 (from R4-2210216).**

**R4-2210873 Draft TP for TS 38.108 Section 6.6.4 Operating band unwanted emissions**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Inmarsat*

**Decision: Approved.**

##### 9.12.3.4 Rx requirements for conducted characteristics

**R4-2208663 TP to TS 38.108 on Conducted receiver characteristics**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: ZTE Corporation*

**Decision: Endorsed.**

**R4-2209678 TP to TR 38.863: Conducted reference sensitivity**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In this contribution we provide TP to TR 38.863 on the reference sensitivity requirement derivation.

**Decision: Revised to R4-2210858 (from R4-2209678).**

**R4-2210858 TP to TR 38.863: Conducted reference sensitivity**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In this contribution we provide TP to TR 38.863 on the reference sensitivity requirement derivation.

**Decision: Approved.**

**R4-2209679 TP to TR 38.863: Conducted Rx dynamic range**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In this contribution we provide TP to TR 38.863 on the Rx dynamic range requirement derivation.

**Decision: Revised to R4-2210859 (from R4-2209679).**

**R4-2210859 TP to TR 38.863: Conducted Rx dynamic range**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In this contribution we provide TP to TR 38.863 on the Rx dynamic range requirement derivation.

**Decision: Approved.**

**R4-2210030 pCR for Clause 7.4 In-band selectivity and blocking - TS 38.108**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a pCR to update TS 38.108:

- Section 7.4: In-band selectivity and blocking

**Decision: Revised to R4-2210861 (from R4-2210030).**

**R4-2210861 pCR for Clause 7.4 In-band selectivity and blocking - TS 38.108**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a pCR to update TS 38.108:

- Section 7.4: In-band selectivity and blocking

**Decision: Approved.**

**R4-2210042 pCR for Clause 7.5 Out-of-band blocking - TS 38.108**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a pCR to update TS 38.108:

- Section 7.5: Out-of-band blocking

**Decision: Revised to R4-2210862 (from R4-2210042).**

**R4-2210862 pCR for Clause 7.5 Out-of-band blocking - TS 38.108**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a pCR to update TS 38.108:

- Section 7.5: Out-of-band blocking

**Decision: Approved.**

**R4-2210049 pCR for Clause 7.6 Receiver spurious emissions - TS 38.108**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a pCR to update TS 38.108:

- Section 7.6: Receiver spurious emissions

**Decision: Revised to R4-2210863 (from R4-2210049).**

**R4-2210863 pCR for Clause 7.6 Receiver spurious emissions - TS 38.108**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: THALES*

**Abstract:**

In this document, following changes have been proposed as a pCR to update TS 38.108:

- Section 7.6: Receiver spurious emissions

**Decision: Return to.**

#### 9.12.4 Satellite Access Node RF conformance testing

##### 9.12.4.1 General and work plan

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**Email discussion for [103-e][309] NTN\_Solutions\_RFConformance**

**, AI 9.12.4-Dominique Everaere**

**R4-2210315 Email discussion summary for [103-e][309] NTN\_Solutions\_RFConformance**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210512 (from R4-2210315).**

**R4-2210512 Email discussion summary for [103-e][309] NTN\_Solutions\_RFConformance**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210634 WF on NTN Solutions RF conformance**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** |
| R4-2211202 | TP to TS 38.108: removal of extreme conditions requirements | Huawei, HiSilicon | Return to |
| R4-2208251 | Skeleton for TS 38.181 | CATT | Approved |
| R4-2210634 | WF on NTN Solutions RF conformance | Ericsson | Approved |

--------------------------------------------------------------End--------------------------------------------------------------------------

**R4-2208251 Skeleton for TS 38.181**

*Type: draft TS For: Agreement  
 38.181 v0.0.1 CR- rev Cat: (Rel-17)  
  
 Source: CATT*

**Decision: Approved.**

**R4-2209593 Initial discussion on SAN conformance testing: general part**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209680 Structure of the NTN SAN conformance testing specification**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Abstract:**

In this contribution we provide recommendation for the NTN SAN conformance testing specification handling, to follow the approach of AAS BS and NR BS, and to split the specification into the conducted and radiated testing specifications.

**Decision: Noted.**

**R4-2210034 Initial considerations on SAN conformance testing - general requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Several initial observations and proposals for SAN conformance testing

**Decision: Noted.**

**R4-2210039 Further discussion on the Normal and Extreme conditions testing**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Abstract:**

In this contribution, we provide further analysis of the Normal and Extreme conditions testing for NTN SAN.

**Decision: Noted.**

**R4-2210040 TP to TS 38.108: removal of extreme conditions requirements**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

This TP to TS 38.108 removes the extreme condition requirement from the NTN SAN specification.

**Decision: Revised to R4-22111202 (from R4-2210040).**

**R4-22111202 TP to TS 38.108: removal of extreme conditions requirements**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

This TP to TS 38.108 removes the extreme condition requirement from the NTN SAN specification.

**Decision: Return to.**

##### 9.12.4.2 Conductive conformance Testing

**R4-2208252 General consideration on conductive conformance testing for SAN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2209594 Initial discussion on SAN conformance testing: conducted part**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2210035 Initial considerations on SAN conformance testing - conducted requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Several initial observations and proposals for SAN conformance testing

**Decision: Noted.**

##### 9.12.4.3 Radiated conformance Testing

**R4-2208253 General consideration on radiated conformance testing for SAN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2209595 Initial discussion on SAN conformance testing: radiated part**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2210036 Initial considerations on SAN conformance testing - OTA requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Several initial observations and proposals for SAN conformance testing

**Decision: Noted.**

#### 9.12.5 UE RF requirements

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**Email discussion for [103-e][310] NTN\_Solutions\_UERF**

**, AI 9.12.5-Fei Xue**

**R4-2210316 Email discussion summary for [103-e][310] NTN\_Solutions\_UERF**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210513 (from R4-2210316).**

**R4-2210513 Email discussion summary for [103-e][310] NTN\_Solutions\_UERF**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 11th**

**Issue 1-1-1: A-MPR requirement defined for NS\_57**

* Proposals
  + Option 1: no requirements [Ligado, Qualcomm]
  + Option 2: no A-MPR requirement is needed fro NS\_57 if filter could provide 10dB attenuation on the protected frequency range 1559-1605MHz.[ZTE]
* Recommended WF
  + Option 1: no A-MPR requirements for NS\_57
* Agreement: Option 1: no A-MPR requirements for NS\_57

**Issue 1-1-2: Naming for satellite NS value**

* Proposals
  + Option 1: Any new NS message for UE satellite should have prefixed “N”, e.g. the new “NS\_57” should be named “NS\_57N” instead (or “NS\_56N”). [Ericsson]
* Potential agreement after the pre-meeting discussions:
  + For naming for NS\_57N, it have no impacts on RAN2 signalling and it should be okay to have differentiation between TN NS naming and NTN NS naming:
* Recommended WF:
  + Option 1: to define NS\_xxN for NTN NS naming
* Agreement: Option 1: to define NS\_xxN for NTN NS naming for all the NTN bands

**Issue 1-2-1: Duplexer assumption for n256**

* Proposals
  + Option 1: to define dedicated 30MHz duplexer (Ericsson, Hughes/Echostar)
  + Option 2: to reuse the duplexer of band n65 (MTK, ZTE, Skyworks)
  + Option 3: to specify two bands for different duplexer implementation with different RF requirements (Huawei)
* Potential agreement after the pre-meeting discussions:
  + Both 30MHz and 90MHz duplexer could be accommodated. Requirement itself would be still applicable for n256 instead of n65.
* Recommended WF
  + Both 30MHz and 90MHz duplexer could be accommodated. ~~Requirement itself would be still applicable for n256 instead of n65.~~
* Note: Requirement itself would be applicable for n256 instead of referring to band n65 in the TS 38.101-5 spec
* Agreement:
* Both 30MHz and 90MHz duplexer could be accommodated.
* Note: Requirement itself would be applicable for n256 instead of referring to band n65 in the TS 38.101-5 spec
* Note: Above assumption agreed under the condition there is no impact on the competition of NTN UE RF core requirements.

**Issue 1-2-2: Coexistence protection for band n34 DL**

* Proposals
  + Option 1: except for NS\_24, some other solutions/requirements are required to resolve the co-existence issue between n256 and n34 when NTN UE is configured at 2005-2010MHz. [CMCC]
  + Option 2: RAN4 NOT to specify the UE co-existence requirements for NTN bands to protect TN bands such as n34, n39, B33, B35 and B37. Capture a note in section [6.5.3.2] of TS 38.101-5 to indicate that for the area with TN coverage, NTN UE shall not transmit to guarantee the UE co-existence between NTN and TN on the adjacent bands [Qualcomm]
  + Option 3: Apply NS\_24 A-MPR values to n256 as agreed in RAN4#102-e meeting. [Ericsson]
  + Option 4: not to define coexistence requirements and to define the isolation regions between NTN and TN coverage and leave its signalling design to RAN2. [ZTE]
  + Option 5: to define the DBT behavior : Determining whether the IMT services exist in the protected TN bands(NOTE) Before Transmitting UL signal in NTN satellite bands) and send LS to RAN1/RAN2 to check its impacts. [Huawei]
* Recommended WF
  + Option 1: RAN4 to specify the coexistence requirement and apply NS\_24 and FFS for A-MPR requirement for frequency range 2005-2010MHz [CMCC,Ericsson]
  + Option 2: not to define coexistence requirements and to define the isolation regions between NTN and TN coverage and leave its signalling design to RAN2. [ZTE]
  + Option 3: to define the DBT behavior : Determining whether the IMT services exist in the protected TN bands(NOTE) Before Transmitting UL signal in NTN satellite bands) and send LS to RAN1/RAN2 to check its impacts. [Huawei]
  + Option 4: RAN4 NOT to specify the UE co-existence requirements for NTN bands to protect TN bands such as n34, n39, B33, B35 and B37. Capture a note in section [6.5.3.2] of TS 38.101-5 to indicate that for the area with TN coverage, NTN UE shall not transmit to guarantee the UE co-existence between NTN and TN on the adjacent bands [Qualcomm]
* Recommended WF after the pre-meeting discussions:
  + For n34,  to reuse the NS\_24 including A-MPR value ~~with 5MHz guard band at the upper of n256 UL frequency range.~~
  + If not, please further clarify which options are preferred.
* Discussion:
  + Skyworks: Reuse NS\_24 shall combine with A-MPR value.
  + Huawei: We can accept the recommended WF to complete Rel-17 NTN core part meanwhile we would like to emphasize this shall not preclude the further optimized solution in future for certain region i.e. region 3.
  + Hughes: We are ok for NS\_24 but not sure A-MPR value itself since we already 5M guard band already reserved.
  + ZTE: We are fine to remove the 5MHz guard band.
  + Ericsson: Better to clarify the 5MHz guard band case.
* Agreement:
* For n34,  to reuse the NS\_24 including associated A-MPR value as specified in TS 38.101-1
  + Note: there is 5MHz guard band at the upper of n256 UL frequency range

**Issue 1-2-3: Coexistence protection for band n39 DL**

* Proposals
  + Option 1: additional NS is required to protect band n39 for n256 NTN UE when it uses n65 filter and it’s suggested to define -50dBm/MHz additional spurious emissions for NTN UE with n65 filter at frequency range of 1880-1915MHz to protect n39.[CMCC]
  + Option 2: no A-MPR requirement for coexisting with n39 if duplexer is 30MHz. [HUGHES Network Systems Ltd; Hughes/EchoStar]
  + Option 3: FFS for studied if -50dBm/MHz is reachable for a 20 MHz CBW. [Skyworks]
  + Option 4: RAN4 NOT to specify the UE co-existence requirements for NTN bands to protect TN bands such as n34, n39, B33, B35 and B37. Capture a note in section [6.5.3.2] of TS 38.101-5 to indicate that for the area with TN coverage, NTN UE shall not transmit to guarantee the UE co-existence between NTN and TN on the adjacent bands. [Qualcomm]
  + Option 5: not to define coexistence requirements and to define the isolation regions between NTN and TN coverage and leave its signalling design to RAN2. [ZTE]
  + Option 6: if reusing n65 duplexer for n256, to define the DBT behavior : Determining whether the IMT services exist in the protected TN bands(NOTE) Before Transmitting UL signal in NTN satellite bands) and send LS to RAN1/RAN2 to check its impacts. [Huawei]
* Recommended WF after the pre-meeting discussions:
  + For n39/[n101]/B33/B35, no A-MPR requirement is needed
  + If not, please further clarify which options are preferred.
* Discussion:
  + CMCC: We have concern on no A-MPR if using n65 duplex to meet the co-existence requirements with band n39.
  + Skyworks: We believe no A-MPR needed and the duplex usage pending on UE implementation.
  + QC: We have one contribution with analysis which show the feasibility without A-MPR to meet the co-existence requirements.
* Agreement:
  + For n39/n101/B33/B35,  no A-MPR requirement is needed to meet -50dBm/MHz co-existence requirement

**Issue 1-2-4: Coexistence protection for band B33, B35, B37**

* Proposals
  + Option 1: RAN4 NOT to specify the UE co-existence requirements for NTN bands to protect TN bands such as n34, n39, B33, B35 and B37. Capture a note in section [6.5.3.2] of TS 38.101-5 to indicate that for the area with TN coverage, NTN UE shall not transmit to guarantee the UE co-existence between NTN and TN on the adjacent bands. [Qualcomm]
  + Option 2:be clarified if co-existence with band 37 is still a relevant scenario [Skyworks]
* Recommended WF after the pre-meeting discussions:
  + To exclude these bands in the coexistence requirements;
* Note : For B37, ~~B35 and B33~~, based on the companies' feedback, there are no any protection requirements in the existing 38.101-1 specification for these bands, it should be fair enough to exclude it;
  + If not, please further clarify which options are preferred.
* Agreement: Exclude band 37 in the co-existence requirements

**Issue 1-2-5: coexistence protection for band n2, n25 and n70, [FFS for n23] with its DL overlapping with n256 UL**

* Proposals
  + Option 1: RAN4 NOT to specify the UE co-existence requirements for the TN bands overlapping with n256. The deployment of n256 for the countries where n2, n25 and n70 are deployed should follow the regional regulatory requirements. [Qualcomm]
  + Option 2: n256 should not operate in geographical area where n2, n25 and n70 are operating.[Ericsson]
  + Option 3: Only physical separation on the ground can guarantee co-existence between n256 and US bands n2, n25 and n70 (and 23 if relevant) [Skyworks]
  + Option 4: If there is no consensus reached for coexistence between these bands (e.g. n2, n25, n70, 33, 35 and 37 etc), we propose to leave it to future release and declare the coexistence between n256 and those TN bands is not specified in Rel-17. [ZTE]
  + Option 5:

Solution 4 is proposed to address this controversial issue and a LS can be sent to RAN1/RAN2 for checking RAN1/RAN2 spec’s impact. [Huawei]

Solution 4: Since it’s assumed that satellite UE has both TN and NTN functionality and IMT service has a higher priority than NTN service, a candidate solution (DBT: Determining whether the IMT services exist in the protected TN bands(NOTE) Before Transmitting UL signal in NTN satellite bands) was proposed.

For example, before transmitting UL band n256 signals, satellite UE should determine/be informed whether the IMT services exist for the protected TN bands(NOTE) in the vicinity. If not, it means that there is no TN coverage/service for these bands in the vicinity and satellite UE don’t need to protect these frequency bands. If yes, the UE can access the corresponding terrestrial network cell directly and no need to transmit UL signal in band n256.

* Recommended WF: (further discuss in 1st round)
  + Option 1: RAN4 NOT to specify the UE co-existence requirements for the TN bands ( e.g. n2, n25 and n70) overlapping with n256 in Rel-17. [Qualcomm]
  + Option 2: not to define coexistence requirements and to define the isolation regions between NTN and TN coverage and leave its signalling design to RAN2. [ZTE]
  + Option 3: to define the DBT behavior : Determining whether the IMT services exist in the protected TN bands(NOTE) Before Transmitting UL signal in NTN satellite bands) and send LS to RAN1/RAN2 to check its impacts. [Huawei]
  + Option 4: n256 should not operate in geographical area where n2, n25 and n70 are operating.[Ericsson]
* Discussion:
  + QC: From 3GPP technical aspect, we couldn’t handle the overlapping issue by specifying the co-existence requirement which can leave to regulation.
  + Skyworks: We share the view as QC. This rely on regional regulation. We should draw the conclusion and stop the discussion in RAN4.
  + Huawei: In 3GPP, we can try to find the solution to resolve this meanwhile we agree no solution from RAN4 perspective.
  + Ericsson: We are not against to study the possible solutions in option 3 and option 2 in future release but we need to complete the work which seems not practical with op3 and op2. We are proposing option 4 to clarify these bands can’t co-exist from 3GPP perspective.
  + ZTE: We can have a note in the co-existence table that “3GPP has not solution to resolve the co-existence with band n2, n25 and n70.
  + T-Mobile USA: We support the proposal from ZTE.
  + Hughes: We agree there is no solution in 3GPP. We can refer to TR 38.863 for the note.
  + Thales: We agree with option 1 and further improve the note.
* Agreement:
  + There is no UE co-existence requirements (-50dB/MHz) for the TN bands (i.e. n2, n25 and n70) which overlapping with n256 in Rel-17 for RAN4 specification.
    - It’s RAN4 understanding that how to handle the co-existence issue shall rely on regional regulation.
  + Add a note into TS 38.101-5 co-existence requirement table: “The co-existence between n256 and band n2, n25 and n70 subject to regional/national regulation”
  + A TP to TR can be used to capture the observations from Rel-17 RAN4 study.

Session chair note: Some RAN4 companies think it’s worth to study optimized solution for NTN- NT bands

co-existence including the overlapping bands and adjacent bands.

**Issue 1-3-1: NTN UE reference point for frequency error**

* Proposals
  + Option 1:

The NTN satellite UE basic measurement interval of modulated carrier frequency is 1 UL slot. **The NTN satellite UE modulated carrier frequency should be measured at its reception by the NR SAN~~Node B~~**. The mean value of basic measurements of NTN UE modulated carrier frequency shall be accurate to within ± 0.1 PPM observed over a period of 1 ms of cumulated measurement intervals compared to reference the carrier frequency assigned by the NR SAN~~Node B~~.

* + Option 2: others
* Discussion:
  + Huawei: For 101-1, we didn’t consider UL doppler-shift pre-compensation for Frequency error requirements.
  + We can clarify that during RAN4 requirements and test, the error on SAN side assumed as 0.
  + Ligado: There is no issue for GEO. Clarification required for the proposed text.
  + Thales: NTN UE can derive frequency based GNSS.
  + QC: The requirement is to verify UE capability. We can define the reference point for the testing.
  + Nokia: The intention was to clarify the reference point that frequency shall be corrected.

**Issue 2-1-1: REFSENS for n256**

* Proposals
  + Option 1: reusing n65 [MTK,ZTE]

| Operating band / SCS / Channel bandwidth | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Operating Band | SCS kHz | 5  MHz (dBm) | 10  MHz (dBm) | 15  MHz (dBm) | 20  MHz (dBm) | 25  MHz (dBm) | 30 MHz (dBm) | 35 MHz (dBm) | 40  MHz (dBm) | 45 MHz (dBm) | 50  MHz (dBm) |
| n256 | 15 | -99.5 | -96.3 | -94.5 | -93.3 |  |  |  |  |  |  |
| 30 |  | -96.6 | -94.6 | -93.5 |  |  |  |  |  |  |
| 60 |  | -97.0 | -94.9 | -93.7 |  |  |  |  |  |  |

* + Option 2: 30MHz dedicated filter [Ericsson,HUGHES Network Systems Ltd; Hughes/EchoStar ]

| Operating band / SCS / Channel bandwidth / Duplex-mode | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Operating Band | SCS kHz | 5  MHz (dBm) | 10  MHz (dBm) | 15  MHz (dBm) | 20  MHz (dBm) | Duplex Mode |
| n256 | 15 | -100.0 | -96.8 | -95.0 | -93.8 | FDD |
|  | 30 |  | -97.1 | -95.1 | -94.0 |  |
|  | 60 |  | -97.5 | -95.4 | -94.2 |  |

* Agreement: Option 2

| Operating band / SCS / Channel bandwidth / Duplex-mode | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Operating Band | SCS kHz | 5  MHz (dBm) | 10  MHz (dBm) | 15  MHz (dBm) | 20  MHz (dBm) | Duplex Mode |
| n256 | 15 | -100.0 | -96.8 | -95.0 | -93.8 | FDD |
|  | 30 |  | -97.1 | -95.1 | -94.0 |  |
|  | 60 |  | -97.5 | -95.4 | -94.2 |  |

**Issue 2-1-1: OOBB requirements for n256**

* Proposals
  + Option 1: dedicated 30MHz duplexer [Ericsson, HUGHES Network Systems Ltd; Hughes/EchoSta]

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Parameter | Unit | Range 1 | Range 2 | Range 3 |
|  | Pinterferer | dBm | -44 | -30 | -15 |
| n255,  n256 | Finterferer (CW) | MHz | -60 < f – FDL\_low < -15  or  15 < f – FDL\_high < 60 | -85 < f – FDL\_low ≤ -60  or  60 ≤ f – FDL\_high < 85 | 1 ≤ f ≤ FDL\_low – 85  or  FDL\_high + 85 ≤ f  ≤ 12750 |
|  | | | | | |

* + Option 2a: reusing n65 duplexer [MTK, ZTE, Skyworks]

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Parameter | Unit | Range 1 | Range 2 | Range 3 |
|  | Pinterferer | dBm | -44 | [-30] | -15 |
| n255,  n256 | Finterferer (CW) | MHz | -60 < f – FDL\_low < -15  or  15 < f – FDL\_high < 60 | -85 < f – FDL\_low ≤ -60  or  60 ≤ f – FDL\_high < 85 | 1 ≤ f ≤ FDL\_low – 85  or  FDL\_high + 85 ≤ f  ≤ 12750 |
| NOTE 1: For band n256 in Range 2 requirement, the applicable lower frequency range should be modified as -145 < f – FDL\_low ≤ -60  NOTE 2: For band n256 in Range 3 requirement, the applicable lower frequency range should be modified as 1 ≤ f ≤ FDL\_low – 145  ~~NOTE 3: For band n256 in Range 2 requirement, the P~~~~interferer~~ ~~should be the same as -30~~  ~~NOTE 4: For band n256 in Range 3 requirement, the P~~~~interferer~~ ~~should be the same as -15~~ | | | | | |

* + Option 2b: reusing n65 duplexer [Xiaomi]
* For range 3, the Pinterferer for range 3 is no need to be modified.

For range 2, with following relaxations

* Such as the Pinterferer shall be modified as -35 dBm, Or the applicable lower frequency range f – FDL\_low for n256 shall start from -90 MHz instead of -60 MHz if Pinterferer =-30dBm is kept.
* Recommended WF
* Further discuss the OOBB requirement in the intermediate round if we have the agreement on duplexer.
* Agreement:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Parameter | Unit | Range 1 | Range 2 | Range 3 |
|  | Pinterferer | dBm | -44 | [-35] | -15 |
| n256 | Finterferer (CW) | MHz | -60 < f – FDL\_low < -15  or  15 < f – FDL\_high < 60 | -85 < f – FDL\_low ≤ -60  or  60 ≤ f – FDL\_high < 85 | 1 ≤ f ≤ FDL\_low – 85  or  FDL\_high + 85 ≤ f  ≤ 12750 |
| NOTE 1: For band n256 in Range 2 requirement, the applicable lower frequency range should be modified as -145 < f – FDL\_low ≤ -60  NOTE 2: For band n256 in Range 3 requirement, the applicable lower frequency range should be modified as 1 ≤ f ≤ FDL\_low – [145] | | | | | |

**WF/LS**

**R4-2210635 WF on remaining issue of NTN UE RF**

*Type: other For: Approval  
 Source: ZTE*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2210636 TP to TR 38.863: coexistence issues between NTN and TN from Rel-17 RAN4 study**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: Huawei*

**Decision: Approved.**

**R4-2211176 TP for 38.101-5 on frequency error**

*Type: pCR For: Approval*

*38.101-5 0.1.0 CR- rev Cat: (Rel-17)  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210635 | WF on remaining issue of NTN UE RF | ZTE | **Return to** |  |
| R4-2210636 | TP to TR 38.863: coexistence issues between NTN and TN from Rel-17 RAN4 study. | Huawei | Approved |  |
| R4-2211176 | TP for 38.101-5 on frequency error | Qualcomm | **Return to** |  |
| R4-2210874 | TP to TS 38.101-5 on 7.3 Reference Sensitivity | HUGHES Network Systems Ltd, Hughes/EchoStar | Approved | *Note wording to be improved* |
| R4-2210875 | TP for TR 38.863: Updates to n255 A-MPR Clause | Ligado | Approved |  |
| R4-2210876 | Updates to TS 38.101-5 related to n255 A-MPR clause | Ligado | Approved | Please update NS\_57 naming |
| R4-2210877 | TP for 38.101-5 on Spurious emissions for UE coexistence | Huawei, HiSilicon | Approved |  |
| R4-2210878 | TP to update TS 38.101-5 clause 7.6.3 on OOBB | Mediatek India Technology Pvt. | Approved |  |
| [R4-2208886](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2208886.zip) | pCR to TS 38.101-5 - Alignment | Ericsson | Merged |  |
| [R4-2208662](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2208662.zip) | TP to TS 38.101-5 on Conducted transmitter characteristics | ZTE Corporation | Approved |  |
| [R4-2209366](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2209366.zip) | TP for 38.101-5 on Output RF spectrum emissions for satellite UE except for UE coexistence | Huawei, HiSilicon | Approved |  |
| [R4-2209365](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2209365.zip) | TP for 38.863 on UE antenna characteristics for satellite access | Huawei, HiSilicon | Approved |  |
| R4-2209089 | TP for 38.863 on general part for NTN UE conducted receiver characteristics | Xiaomi | Approved |  |
| [R4-2209364](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2209364.zip) | TP for 38.863 on UE Rx spurious emission requirements for satellite access | Huawei, HiSilicon | Approved |  |

--------------------------------------------------------------End--------------------------------------------------------------------------

**R4-2208886 pCR to TS 38.101-5 - Alignement**

*Type: pCR For: Approval  
 38.101-5 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This contribution is a pCR to TS 38.101-5 - Alignment

**Decision: Merged**

##### 9.12.5.1 TX requirements

**R4-2207967 Measurements for n255 A-MPR evaluation**

*Type: discussion For: Approval  
 38.101-5 v CR- rev Cat: (Rel-17)  
  
 Source: Ligado Networks*

**Decision: Noted.**

**R4-2207968 Updates to TS 38.101-5 related to n255 A-MPR clause**

*Type: pCR For: Approval  
 38.101-5 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Ligado Networks*

**Decision: Revised to R4-2210876 (from R4-2207968).**

**R4-2210876 Updates to TS 38.101-5 related to n255 A-MPR clause**

*Type: pCR For: Approval  
 38.101-5 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Ligado Networks*

**Decision: Approved.**

**R4-2207969 TP for TR 38.863: Updates to n255 A-MPR Clause**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: Ligado Networks*

**Decision: Revised to R4-2210875 (from R4-2207969).**

**R4-2210875 TP for TR 38.863: Updates to n255 A-MPR Clause**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: Ligado Networks*

**Decision: Approved.**

**R4-2208400 Discussion on NS signaling for n256 NTN UE**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Approved.**

**R4-2208662 TP to TS 38.101-5 on Conducted transmitter characteristics**

*Type: pCR For: Approval  
 38.101-5 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: ZTE Corporation*

**Decision: Endorsed.**

**R4-2208674 Discussion on NTN UE Tx RF requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2208884 NTN - UE RF TX: remaining issues**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This contribution discusses the remaining open issue of UE - Tx requirements

**Decision: Noted.**

**R4-2209143 n256 co-existence and filter implementation aspects**

*Type: discussion For: Approval  
 38.101-5 v CR- rev Cat: (Rel-17)  
  
 Source: Skyworks Solutions Inc.*

**Abstract:**

In this contribution we provide further precision on the filter implementation aspects in relation to co-existence performance with neighbor TN bands to NTN band n256.

**Decision: Noted.**

**R4-2209362 Discussion on Spurious emissions for protected bands UE co-existence with draft LS**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209365 TP for 38.863 on UE antenna characteristics for satellite access**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2209366 TP for 38.101-5 on Output RF spectrum emissions for satellite UE except for UE coexistence**

*Type: pCR For: Approval  
 38.101-5 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2209367 TP for 38.101-5 on Spurious emissions for UE coexistence**

*Type: pCR For: Approval  
 38.101-5 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2210877 (from R4-2209367).**

**R4-2210877 TP for 38.101-5 on Spurious emissions for UE coexistence**

*Type: pCR For: Approval  
 38.101-5 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Approved.**

**R4-2209596 Further discussion on NTN UE Tx RF requirements**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209715 Requirements for spurious emissions for UE co-existence n256**

*Type: discussion For: Decision  
 38.101-5 v CR- rev Cat: (Rel-17)  
  
 Source: HUGHES Network Systems Ltd; Hughes/EchoStar*

**Decision: Noted.**

**R4-2209922 On NTN UE frequency error reference point**

*Type: discussion For: Approval  
 38.101-5 v CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

##### 9.12.5.2 RX requirements

**R4-2208378 Discussion on UE RX REFSENS and OOBB for band n256**

*Type: discussion For: Approval  
 Source: Mediatek India Technology Pvt.*

**Decision: Noted.**

**R4-2208476 TP to update TS 38.101-5 clause 7.6.3 on OOBB**

*Type: pCR For: Approval  
 38.101-5 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Mediatek India Technology Pvt.*

**Decision: Revised to R4-2210878 (from R4-2208476).**

**R4-2210878 TP to update TS 38.101-5 clause 7.6.3 on OOBB**

*Type: pCR For: Approval  
 38.101-5 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Mediatek India Technology Pvt.*

**Decision: Approved.**

**R4-2208885 NTN - UE RF RX: remaining issues**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This contribution discusses the remaining open issue of UE - Rx requirements

**Decision: Noted.**

**R4-2209087 Updates for TS38.101-5 on out of band blocking requirement for NTN UE**

*Type: pCR For: Approval  
 38.101-5 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2209088 Discussion on out of band blocking requirements for NTN UE**

*Type: other For: Approval  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2209089 TP for 38.863 on general part for NTN UE conducted receiver characteristics**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: Xiaomi*

**Decision: Endorsed.**

**R4-2209363 Discussion on UE requirements for different duplexer implementation**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209364 TP for 38.863 on UE Rx spurious emission requirements for satellite access**

*Type: pCR For: Approval  
 38.863 v0.3.0 CR- rev Cat: (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2209401 Selection of UE duplexer and REFSENS for band n256 in TS 38.101-5**

*Type: discussion For: Decision  
 Source: HUGHES Network Systems Ltd; Hughes/EchoStar*

**Decision: Noted.**

**R4-2209490 TP to TS 38.101-5 on 7.3 Reference Sensitivity**

*Type: pCR For: Approval  
 38.101-5 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: HUGHES Network Systems Ltd, Hughes/EchoStar*

**Decision: Revised to R4-2210874 (from R4-2209490).**

**R4-2210874 TP to TS 38.101-5 on 7.3 Reference Sensitivity**

*Type: pCR For: Approval  
 38.101-5 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: HUGHES Network Systems Ltd, Hughes/EchoStar*

**Decision: Approved.**

**R4-2209597 Further discussion on NTN UE Rx RF requirements**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

#### 9.12.6 RRM core requirements

**R4-2208497 Draft CR for idle mode UE meausrement capability in NTN**

*Type: draftCR For: Agreement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: LG Electronics UK*

**Decision: Revised to R4-2211098 (from R4-2208497).**

**R4-2211098 Draft CR for idle mode UE meausrement capability in NTN**

*Type: draftCR For: Agreement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: LG Electronics UK*

**Decision: Endorsed.**

##### 9.12.6.1 General

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**Email discussion for [103-e][223] NR\_NTN\_solutions\_RRM\_1, AI 9.12.6, 9.12.6.1,9.12.6.2,9.12.6.4 -CH Park**

**R4-2210295 Email discussion summary for [103-e][223] NR\_NTN\_solutions\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210492 (from R4-2210295).**

**R4-2210492 Email discussion summary for [103-e][223] NR\_NTN\_solutions\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 10th**

**List of key open issues:**

* Issue 3-1-6: Measurement Gap
* Issue 3-1-3: Capability on the number of Measurement Carriers/Cells/SSBs
* Issue 3-1-4B: Measurement with multiple SMTCs (Item-2: Scaling factor)
* Issue 4-1-1: UE capability type
* Issue 4-1-2: Feature group “Parallel measurements on multiple SMTC-s for a single frequency carrier”
* Issue 4-1-3: UE capability on the number of satellites UE can simultaneously measure

**Issue 3-1-6: Measurement Gap**

* Proposal 1: MG Colliding/Proximity condition
  + Option 1-1: CMCC, Qualcomm, Xiaomi, LG, OPPO, Huawei
    - Two gap occasions are defined as colliding (overlapping) if the two gap occasions are partially overlapping in time domain or the minimum distance is less than 4 ms.
  + Option 1-2: Apple
    - For NTN measurement, two MG occasions in parallel are defined as colliding (overlapping) if the 2 MGs are partially overlapping in time domain or the minimum distance is less than 5ms (min distance between SMTC + RF tuning/retuning margin).
* Discussion:
  + QC: With option 1-1, we can also update the previous agreement on the min distance between 2 SMTCs for a collision condition. See below: (it was [4] in the agreement)
  + A condition of SMTC collision
    - Two SMTC occasions in parallel are defined as colliding (overlapping) if the 2 SMTCs are partially overlapping in time domain or the minimum distance is less than [3]ms.
  + RF tuning/retuning assumed for MG is 1ms to derive above requirements
  + Apple: For SMTC, the value shall be updated as 3ms, then considering RF retuning for MG 1ms and 4ms applied for MG case.
  + Ericsson: For option 1-1, we can define the absolute boundary on MR/SMTC. For SMTC case/MG case one option with same value as 4ms another option as Apple proposed for SMTC 3ms and MG with 4ms.
  + QC: Could you explain the ration with 3ms for SMTC ?
  + Apple: We don’t need to consider RF retuning for SMTCs without MG.
  + QC: 3ms only applied without MG.
* Agreement:

Option 1-1 agreed with additional agreement as below:

* + A condition of SMTC collision
    - Two SMTC occasions in parallel are defined as colliding (overlapping) if the 2 SMTCs are partially overlapping in time domain or the minimum distance is less than [3]ms.
  + RF tuning/retuning assumed for MG is 1ms to derive above requirements in option 1-1
* Proposal 2: Association between MG and frequency layer (Needs a reply LS to RAN2)
  + Option 2-1: CMCC, Apple, Qualcomm, Xiaomi, CATT, LG, OPPO, Ericsson, Huawei
    - One frequency layer can be associated to both concurrent measurement gaps with the same gap type
    - No need to define additional NTN UE capability for this association.
* Agreement: Option 2-1 agreed
* Proposal 3: Priority rule vs. Scaling factor for concurrent MGs when meeting colliding/proximity condition
  + Option 3-1: MediaTek, Qualcomm, CATT, LG, Huawei, Nokia
    - Priority rule
    - UE does not expect to be configured with fully overlapping concurrent MGs, i.e. it is an invalid concurrent MG configuration if a MG with a lower priority always overlaps with the other MG.
  + Option 3-2: Apple, Xiaomi, Ericsson, CMCC
    - Scaling factor
  + Option 3-3: CMCC
    - When both MGs and SMTCs are colliding, RAN4 define requirements assuming UE measures in only one MG which contains SMTC to be measured.
    - When MGs are colliding and SMTCs are not colliding, RAN4 define requirements assuming UE measures in both MGs.
* Discussion:
* Apple: If gap fully overlapped, then we will have no chance to apply measurement. Can we confirm this case can be considered as a corner case?
* CMCC: Our proposal is similar with 3-2, and we can comprise to 3-2. And we address a special case which MGs are colliding and SMTCs are not colliding. For this special case, do we need to consider and what’s the scaling factor ?
* QC: We believe fully overlapped is a corner case. This configuration seems invalid. NW always configure overlapped MGs with different priority. We think UE support NTN also supporting TN, then with option 3-2 UE need to implement two ways for NTN and TN separately which increase the implementation effort. We have strong concern for option 3-2 unless we see strong needs.
* Xiaomi: We prefer option 3-2.
* LGE: We prefer option 3-1, same issue for MG enhancement WI for cocurrent MG, we should follow same rule.
* Huawei: We prefer option 3-1. We believe fully overlapped case is a corner case and can be avoided by NW. We didn’t see the benefits on option 3-2 meanwhile it bring uncertain for specification work and also extra effort on UE side.
* Ericsson: We think fully overlapped case is corner case meanwhile proximity case is very common case. We can focus on NTN part for this issue.
* CATT: We prefer reusing same rule as option 3-1.
* QC: We believe the case overlapped MG with same priority can always be avoided by NW scheduling. If we go with option 3-2, the new signalling needed and which also impact the conclusion from MG enhancement WI.
* THALES: NTN UE shall always support TN.
* Nokia: We prefer option 3-1 to minimize the effort on NW.
* Ericsson: The co-current MG was introduced for different purpose. For NTN, how to prioritize over the overlapped MG? The RRC signalling already exists in RAN2 specification can be referred.
* Xiaomi: How about the partial overlapped case? Under some scenario, the priority rule maybe not worked.
* Apple: For NTN scenario, we have moving satellite which is different for TN with fixed gNB.
* QC: NW still have choice to resolve this issue by scheduling, and this issue already discussed in another WI.
* Huawei: We don’t think RAN2 has signalling for sharing factor between MGs. We believe NW has full control to avoid the fully overlapping case.
* Agreement: Further discuss below options and make agreement by this meeting
* Option 3-1
* Option 3-2
* Any option which can’t conclude related RAN4 core part work by this meeting and/or have additional effort for other WGs i.e. RAN2 will be deprioritized.

**Issue 3-1-3: Capability on the number of Measurement Carriers/Cells/SSBs**

* Proposal 1: UE capability for the number of target satellites the UE can monitor per carrier including serving LEO satellite
  + Option 1-1: Qualcomm, Huawei, MTK
    - shall not be larger than 4
  + Option 1-2: Ericsson
    - 4 for UE supporting 2 SMTC
    - 6 for UE supporting 4 SMTC
* Discussion:
  + Ericsson: We are open to discuss the values; how about 4 SMTC cases? There are 4 SMTCs served 3 neighbour satellites, is that reasonable?
  + QC: In serving satellite, we may have multiple cells.
  + MTK: We support option 1-1.
* Agreement:

Proposal 1 with option 1-1 agreed

* Proposal 2: Ericsson
  + Agreements on number of NTN and TN carriers UE needs to monitor doesn’t introduce TN-NTN RRM requirements. NTN UE mobility within FR1 between NTN and TN shall be precluded
* Agreement: Proposal 2 agreed

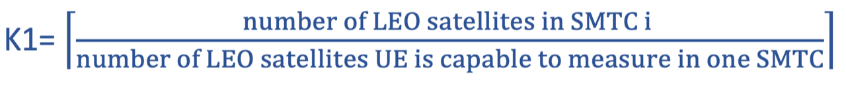
**Issue 3-1-4B: Measurement with multiple SMTCs (Item-2: Scaling factor)**

* Proposal 1: When each SMTC associated with same type of satellites
  + Option 1-1: MediaTek, LG, Ericsson, Apple
    - Option 1c of the previous agreement
  + Option 1c:
* If each SMTC associated with same type of satellites:

§ If SMTCs do not overlap with each other, a scaling factor of measurement period is

·  If LEO satellite(s) is/are required to be measured within SMTC

* + - * Scaling factor of measurement period on SMTC i is K1:



§ If SMTCs partially overlap with each other, a scaling factor of measurement period is

·  If LEO and/or GEO satellite(s) is/are required to be measured within overlapped SMTCs

* + - * Scaling factor of measurement period for overlapped SMTCs is K2



* + Option 1-2:
    - If SMTCs do not overlap with each other, and if LEO satellite(s) is/are required to be measured within SMTC
      * Option 1-2-1A: CATT
        + Scaling factor is not needed
      * Option 1-2-1B: Qualcomm, Huawei
        + , if GEO satellites are measured on the carrier
        + , if LEO satellites are measured on the carrier
    - If SMTCs partially overlap with each other, and if LEO and/or GEO satellite(s) is/are required to be measured within overlapped SMTCs, scaling factor of measurement period for overlapped SMTCs is K2
      * Option 1-2-2A: Xiaomi
      * Option 1-2-2B: CATT
        + K2=Number of overlapping SMTCs
      * Option 1-2-2C: Qualcomm, Huawei, Ericsson
        + , if only GEO satellites are measured on the carrier
        + , if only LEO satellites are measured on the carrier
* Discussion:
* Apple: We need to further discuss whether need to consider the case : mixed type of satellites on the same frequency layer.
* Thales: Mixed types of satellites case is quite complicated for Rel-17. We would like to focus on only single type of satellite on the same frequency layer.
* Agreement:
  + Rel-17 NTN RRM requirements not consider below cases:
    - An SMTC associated with mixed type of satellites
    - Mixed type of satellites on the same frequency layer
  + If SMTCs do not overlap with each other, and if LEO satellite(s) is/are required to be measured within SMTC:
    - Option 1-2-1B agreed
      * , if GEO satellites are measured on the carrier
      * , if LEO satellites are measured on the carrier
  + If SMTCs partially overlap with each other, and if LEO and/or GEO satellite(s) is/are required to be measured within overlapped SMTCs, scaling factor of measurement period for overlapped SMTCs is K2
    - Option 1-2-2C:
      * , if only GEO satellites are measured on the carrier
      * , if only LEO satellites are measured on the carrier
* Proposal 4: Scheduling restriction cap
  + Option 4-1: Huawei
    - Introduce the following scheduling restriction cap as applicability condition for the requirements
      * ~~Measurement requirements~~ Rel-17 NTN RRM requirements is not applicable when overall overhead ratio due to scheduling restriction caused by all configured SMTCs (e.g. scheduling restriction overhead of all SMTCs in one periodicity / SMTC periodicity) is larger than 75%
* Agreement:
  + Introduce the following scheduling restriction cap as applicability condition for the requirements
    - Rel-17 NTN RRM requirements is not applicable when overall overhead ratio due to scheduling restriction caused by all configured SMTCs (e.g. scheduling restriction overhead of all SMTCs in one periodicity / SMTC periodicity) is larger than 75%

**Issue 4-1-1: UE capability type**

* Proposal 1: Qualcomm
  + UE NTN capability type is ‘per band’ for all RAN4 features
* Moderator’s suggestion
  + Share your views.
* Discussion:
  + Apple: How about MG capability? We have separate capability per band ? We can add some note in the interpretation column.
  + QC: For this case, we can further discuss.
  + Ericsson: We have similar view as Apple. We prefer per UE basis.
* Agreement:

Further discuss: the capability types for NTN UE feature list case by case

* Option 1: per band
* Option 2: per UE (only applicable for FR1)

**Issue 4-1-2: Feature group “Parallel measurements on multiple SMTC-s for a single frequency carrier”**

* Proposal 1: Components of Feature group “Parallel measurements on multiple SMTC-s for a single frequency carrier” is updated as below:
  + Option 1-1: Qualcomm
    - Support of measurements on target cells belonging to maximum of 2 or 4 different satellites. GEO satellites are counted as 1
  + Option 1-2: MediaTek
    - Support of measurements on target cells belonging to maximum of 2 or 4 ~~different [NGSO satellites]~~ SMTC-s
* Moderator’s suggestion
  + Share your views.
* Agreement: Option 1-2 agreed.

**Issue 4-1-3: UE capability on the number of satellites UE can simultaneously measure**

* Proposal 1: Qualcomm
  + Feature group “Parallel measurements on cells belonging to different [NGSO satellite] as the serving cell without scheduling restrictions” is updated as below:
    - Feature group: Parallel measurements on cells belonging to different satellite(s) than the serving cell without scheduling restrictions
    - Components: Support of measurements on cells belonging to different satellite(s) as the serving cell in parallel with normal operation (i.e. data/control transmission and/or reception, and L1 measurements) of serving cell without scheduling restrictions. If supported, UE further indicates the number of satellites for the following cases:
      * The number of neighbor satellites for measurements when the serving cell belongs to LEO, if UE supports LEO
      * The number of neighbor satellites for measurements when the serving cell belongs to GEO, if UE supports GEO
      * Note that UE capable of GEO shall be able to measure neighbor cells from different GEO satellites, hence, no additional report is necessary
      * Note that the number of neighbor satellites is the number of LEO satellites plus X. Where X = 0 if UE is incapable of GEO, otherwise X=1
* Proposal 2: MediaTek, [Xiaomi]
  + Introduce a separate UE capability for the number of LEO/NGSO satellites that UE can simultaneously measure. The draft UE capability is provided below.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Index | Feature group | Components | Prerequisite feature groups | Need for the gNB to know if the feature is supported | Applicable to the capability signalling exchange between UEs (V2X WI only)”. | **Consequence if the feature is not supported by the UE** | **Type** | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Capability interpretation for mixture of FDD/TDD and/or FR1/FR2 | Note | Mandatory/Optional |
| X-Y-1 | Parallel measurements on multiple [NGSO] satellites within a SMTC | Support of simultaneously measurements on target cells belonging to different [NGSO satellites] within a SMTC |  | yes | no | UE does not support simultaneously measurements with multiple [NGSO satellites] within a SMTC | [Per UE] | FDD only | FR1 only | NA |  | Optional with capability signalling |

* Agreement: Proposal 2 agreed
* Candidate values for the number satellites UE supporting as {1,2,3,4}

Issue 3-1-4A: Measurement with multiple SMTCs (Item-1: Scheduling restriction)

**Proposals for RAN4#103**

* Proposal 1: OPPO
  + For UE not supporting parallel measurements capability, reuse the scaling factors in legacy FR2 scenarios:
    - For L1 measurements, use scaling factor P to account overlapping between L1 resources and SMTC\_n associated with non-serving satellite
    - For L3 measurements from non-serving satellite, adding factor Klayer1\_measurement to account overlapping between the associated SMTC\_n and L1 resources
    - Restrictions on the association between SMTC and satellite are required, i.e. serving satellite should be exclusively associated with one SMTC\_s, and neighbouring cells from non-serving satellites should be associated with SMTC\_n.
* Discussion:
  + Apple : In FR1, both L1 and L3 measurement can be performed in the same SMTC. If this is valid, then no need restriction.
  + OPPO: If both serving cell (GEO with L1 measurement) and neighbour cell is LEO with L3 measurement; or both cells from different LEO satellite; we think UE cannot simultaneously measure both serving and neighbour cell.
  + QC: The restriction pending on UE capability.
  + MTK: We already agreed focus on single satellite type.
* Agreement:
  + For UE not supporting parallel measurements capability, reuse the scaling factors in legacy FR2 scenarios:
    - For L1 measurements, use scaling factor P to account overlapping between L1 resources and SMTC\_n associated with non-serving satellite
    - For L3 measurements from non-serving satellite, adding factor Klayer1\_measurement to account overlapping between the associated SMTC\_n and L1 resources

**WF/LS**

**R4-2210610 WF on NR NTN RRM requirements**

*Type: other For: Approval  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**GTW Discussion on May 19th**

**Issue 3-1-4A: Measurement with multiple SMTCs (Item-1: Scheduling restriction)**

Agreement: Option 2 agreed; further refinement on CR revision

**Issue 3-1-6: Measurement Gap**

* Proposal 3: Priority rule vs. Scaling factor for concurrent MGs when meeting colliding/proximity condition
  + Option 3-1: MediaTek, Qualcomm, CATT, LGE, Huawei, OPPO, Thales
    - Priority rule
    - UE does not expect to be configured with fully overlapping concurrent MGs, i.e. it is an invalid concurrent MG configuration if a MG with a lower priority always overlaps with the other MG.
  + Option 3-3: Apple, Ericsson, Xiaomi, OPPO, Huawei, CMCC
    - If concurrent MGs fully overlapped, use scaling factor = MG number = 2.
    - otherwise, use Priority rule
    - See figure below (for discussion purposes):

Agreement:

* For non-fully overlapped case: Priority rule applied
* FFS how to address concurrent MGs fully overlapped cases in maintenance phase

Apple: We already compromised to bring option 3-3, we think current agreement not fair enough and we would like to reserve our concern on such agreement.

QC: We are not denied that option 3-3 may bring benefits but we would like to further optimize with enhanced solution in next release e.g. in Rel-18 NTN WI or Gap enhancement WI.

**Issue 4-1: Type of the feature group 25-1**

* Type of the feature group 25-1 is
  + Option 1: per-UE (Ericsson, Apple, Xiaomi, Thales)
  + Option 2: per-band (Qualcomm, Huawei, OPPO)
* Discussion:
  + QC: We would like to have some flexibility from UE implementation.
  + Apple: We didn’t see strong motivation with such flexibility.
  + OPPO: We would like to have some flexibility.
  + Thales: We only have S bands and L bands.

Agreement: Per UE (only applicable for FR1)

**Issue 4-3: Feature group 25-6**

**Agreement: Feature group 25-6 confirmed as agreed**

**Issue 1-5-1-B1**

* Option 1: Huawei, LGE
  + Update the applicability for requirement based on Cell Service Time such that Ttrigger is always max(Tdetect,NR\_Intra, Kcarrier\* Tdetect,NR\_Inter) regardless of the search threshold.
* Option 2: Ericsson
  + Update the applicability for requirement based on Cell Service Time such that Ttrigger is always min(max(Tdetect,NR\_Intra, Kcarrier\* Tdetect,NR\_Inter), max(Tdetect,NR\_Intra, Nlayer\*[60s])) regardless of the search threshold.
* Option 4: Apple, Ericsson, Xiaomi
  + No update on the previous agreement.

Agreement: Option 4 agreed

**Decision: Approved.**

**R4-2210611 Reply LS on measurement gaps enhancements for NTN (R4-2207618\_ R2-2204114)**

*Type: LS out For: Approval*

*To: RAN2   
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210610 | WF on NR NTN RRM requirements | Qualcomm | Approved | Way Forward |
| R4-2210611 | Reply LS on measurement gaps enhancements for NTN (R4-2207618\_ R2-2204114) | Intel Corporation | Approved | Reply LS |
| R4-2211157 | draft Cat-B CR (R17) MDT in NTN | Qualcomm Korea | Endorsed | Revision of R4-2207994 |
| R4-2211090 | DraftCR for serving cell evaluation and intra-frequency measurements of NTN UE cell reselections | Intel Corporation | Endorsed | Revision of R4-2208054, R4-2209099, R4-2209104 |
| R4-2211091 | DraftCR on maximum interruption in paging reception for NR NTN | Xiaomi | Endorsed | Revision of R4-2208100 |
| R4-2211092 | DraftCR on inter-frequency measurement requirements for NR NTN | Xiaomi | Endorsed | Revision of R4-2208102 |
| R4-2211093 | Requirements for RRC connected state mobility for NTN | CATT | Endorsed | Revision of R4-2208181 |
| R4-2211094 | Draft CR to general measurement requirement for NTN | OPPO | Endorsed | Revision of R4-2208363 |
| R4-2211098 | Draft CR for idle mode UE meausrement capability in NTN | LG Electronics UK | Endorsed | Revision of R4-2208497 |
| R4-2211183 | On signalling characteristics for NTN | Ericsson | Endorsed | Revision of R4-2209100 |
| R4-2211095 | DraftCR on reselection for NTN | Ericsson | Not pursued  (Merged to R4-2211090) | Revision of R4-2209104 |
| R4-2211099 | CR on general applicability of NTN RRM requirements | Huawei, Hisilicon | Endorsed | Revision of R4-2209213 |
| R4-2211184 | CR on IDLE mode mobility requirements for NTN | Huawei, Hisilicon | Endorsed | Revision of R4-2209215 |
| R4-2211158 | CR on intra-frequency measurement requirements for NTN | Huawei, Hisilicon | Endorsed | Revision of R4-2209217 |
| R4-2211096 | Draft CR on L1-RSRP measurements for Reporting in NTN | Apple | Endorsed | Revision of R4-2209762 |
| R4-2211097 | Correction to terminologies and scope in NTN RRM | Ericsson | Endorsed | Revision of R4-2210178 |

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**Email discussion for [103-e][224] NR\_NTN\_solutions\_RRM\_2, AI 9.12.6.2,9.12.6.4,9.12.7 -Xuhua Tao**

**R4-2210296 Email discussion summary for [103-e][224] NR\_NTN\_solutions\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (Xiaomi)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210493 (from R4-2210296).**

**R4-2210493 Email discussion summary for [103-e][224] NR\_NTN\_solutions\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (Xiaomi)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210612 WF on UE timing requirements and NTN RRM performance requirements**

*Type: other For: Approval  
 Source: Xiaomi*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2211100 | Introduction of Timing advance requirement for NTN | MediaTek | Endorsed |  |
| R4-2211101 | DraftCR on UE transmit timing requirements for NTN R17 | Huawei | Endorsed |  |
| R4-2210612 | WF on UE timing requirements and NTN RRM performance requirements | Xiaomi | Approved |  |
| R4-2208101 | DraftCR on UE timer accuracy for NR\_NTN | Xiaomi | Endorsed |  |
| R4-2208361 | Draft CR to the timing requirements for NR NTN | OPPO | Merged | To be merged in R4-2208471 |

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**R4-2207958 General and RRM requirements impacts**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2207994 draft Cat-B CR (R17) MDT in NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Qualcomm Korea*

**Decision: Revised to R4-2211157 (from R4-2207994).**

**R4-2211157 draft Cat-B CR (R17) MDT in NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Qualcomm Korea*

**Decision: Endorsed.**

**R4-2208422 Discussion and draft LS on measurement gaps enhancements for NTN.**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2208470 Discussion on general RRM requirements in NTN**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2209099 On measurement and evaluation of serving cell for NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

DraftCR On measurement and evaluation of serving cell for NTN

**Decision: Endorsed.**

**R4-2209100 On signalling characteristics for NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

DraftCR On signalling characteristics for NTN

**Decision: Revised to R4-2211183 (from R4-2209100).**

**R4-2211183 On signalling characteristics for NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

DraftCR On signalling characteristics for NTN

**Decision: Endorsed.**

**R4-2209101 General requirements for NTN**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

General requirements for NTN

**Decision: Noted.**

**R4-2209104 DraftCR on reselection for NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

DraftCR on reselection for NTN

**Decision: Merged**

**R4-2211095 DraftCR on reselection for NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

DraftCR on reselection for NTN

**Decision: Withdrawn.**

**R4-2209212 Discussion on general issues for NTN RRM**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209213 CR on general applicability of NTN RRM requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2211099 (from R4-2209213).**

**R4-2211099 CR on general applicability of NTN RRM requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2210177 On terminologies and scope in NTN RRM**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This paper discusses the use of terminologies and scope of NTN in RAN4 RRM specs

**Decision: Noted.**

**R4-2210178 Correction to terminologies and scope in NTN RRM**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The draft CR updates the terminologies and scope of NTN in RAN4 RRM

**Decision: Revised to R4-2211097 (from R4-2210178).**

**R4-2211097 Correction to terminologies and scope in NTN RRM**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The draft CR updates the terminologies and scope of NTN in RAN4 RRM

**Decision: Endorsed.**

##### 9.12.6.2 GNSS-related requirements

**R4-2209639 On GNSS-Related requirements for UE operation**

*Type: other For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

##### 9.12.6.3 Mobility requirements

**R4-2208054 DraftCR for serving cell evaluation and intra-frequency measurements of NTN UE cell reselections**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Intel Corporation*

**Decision: Revised to R4-2211090 (from R4-2208054).**

**R4-2211090 DraftCR for serving cell evaluation and intra-frequency measurements of NTN UE cell reselections**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Intel Corporation*

**Decision: Endorsed.**

**R4-2208100 DraftCR on maximum interruption in paging reception for NR NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Xiaomi*

**Decision: Revised to R4-2211091 (from R4-2208100).**

**R4-2211091 DraftCR on maximum interruption in paging reception for NR NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Xiaomi*

**Decision: Endorsed.**

**R4-2208180 Discussion on Mobility requirements for NTN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2208181 Requirements for RRC connected state mobility for NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: CATT*

**Decision: Revised to R4-2211093 (from R4-2208181).**

**R4-2211093 Requirements for RRC connected state mobility for NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2208359 Discussion on mobility requirements for NTN**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2208496 Discussion on NTN mobility requirements**

*Type: discussion For: Discussion  
 Source: LG Electronics UK*

**Abstract:**

Discussion on NTN mobility requirements

**Decision: Noted.**

**R4-2209102 Mobility requirements for NTN**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Mobility requirements for NTN

**Decision: Noted.**

**R4-2209214 Discussion on mobility requirements for NTN RRM**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209215 CR on IDLE mode mobility requirements for NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2211184 (from R4-2209215).**

**R4-2211184 CR on IDLE mode mobility requirements for NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

##### 9.12.6.4 Timing requirements

**R4-2208101 DraftCR on UE timer accuracy for NR\_NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Xiaomi*

**Decision: Endorsed.**

**R4-2208360 Discussion on timing requirements for NR NTN**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2208361 Draft CR to the timing requirements for NR NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: OPPO*

**Decision: Merged (with R4-2208471).**

**R4-2208471 Introduction of Timing advance requirement for NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2211100 (from R4-2208471).**

**R4-2211100 Introduction of Timing advance requirement for NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Endorsed.**

**R4-2208653 Timing requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Discussion regarding clarification of N\_TA\_UE\_spcific and N\_TA\_Common and DL timing reference.

**Decision: Noted.**

**R4-2208995 Discussion on remaining issues NTN timing related requirements**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2208996 DraftCR on UE transmit timing requirements for NTN R17**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2211101 (from R4-2208996).**

**R4-2211101 DraftCR on UE transmit timing requirements for NTN R17**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2209640 On NTN timing requirements**

*Type: other For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

##### 9.12.6.5 Measurement procedure requirements

**R4-2207777 Discussion on measurement procedure requirements for NTN**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2207959 Measurement procedure requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2208099 Discussion on the remaining issues for for NTN RRM**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2208102 DraftCR on inter-frequency measurement requirements for NR NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Xiaomi*

**Decision: Revised to R4-2211092 (from R4-2208102).**

**R4-2211092 DraftCR on inter-frequency measurement requirements for NR NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Xiaomi*

**Decision: Endorsed.**

**R4-2208182 Discussion on Measurement procedure requirements for NTN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2208310 Discussion on multiple SMTC measurement and MG in NTN**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2208362 Discussion on measurement procedure requirements for NTN**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2208363 Draft CR to general measurement requirement for NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: OPPO*

**Decision: Revised to R4-2211094 (from R4-2208363).**

**R4-2211094 Draft CR to general measurement requirement for NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: OPPO*

**Decision: Endorsed.**

**R4-2209103 Measurement requirements for NTN**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Measurement requirements for NTN

**Decision: Noted.**

**R4-2209216 Discussion on measurement requirements for NTN**

*Type: LS out For: Approval  
 to RAN2  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209217 CR on intra-frequency measurement requirements for NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2211158 (from R4-2209217).**

**R4-2211158 CR on intra-frequency measurement requirements for NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2209643 NTN multiple SMTC**

*Type: other For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2209762 Draft CR on L1-RSRP measurements for Reporting in NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Apple*

**Decision: Revised to R4-2211096 (from R4-2209762).**

**R4-2211096 Draft CR on L1-RSRP measurements for Reporting in NTN**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Apple*

**Decision: Endorsed.**

#### 9.12.7 RRM performance requirements

**R4-2207960 Performance requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2208103 Discussion on the performance requirements for NTN UE timing**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2208423 Discussion on NTN timing test cases**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2209218 Discussion on measurement accuracy and TCs for NTN**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

#### 9.12.8 Demodulation requirements

##### 9.12.8.1 General

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**Email discussion for** [**103-e][322] NR\_NTN\_Demod\_Part1, AI 9.12.8.1, 9.12.8.3-Bin Han**

**R4-2210328 Email discussion summary for [103-e][322] NR\_NTN\_Demod\_Part1**

*Type: other For: Information  
 Source: Moderator (Quaclom)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210525 (from R4-2210328).**

**R4-2210525 Email discussion summary for [103-e][322] NR\_NTN\_Demod\_Part1**

*Type: other For: Information  
 Source: Moderator (Quaclom)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210661 WF on NTN demodulation - general and PDSCH**

*Type: other For: Approval  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |
| --- | --- | --- | --- |
| **New Tdoc number** | **Title** | **Source** | **Status** |
| R4-2210661 | WF on NTN demodulation - general and PDSCH | Qualcomm Incorporated | Approved |

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**R4-2208014 Discussion on general issue for SAN and UE demodulation**

*Type: discussion For: Discussion  
 Source: Ericssion*

**Abstract:**

Discussion on general issue for SAN and UE demodulation

**Decision: Noted.**

**R4-2208874 Discussion on general issues for NTN demodulation requirements**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution we present discussion of some open issues related to NTN demodulation requirements

**Decision: Noted.**

##### 9.12.8.2 Satellite Access Node demodulation requirements

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**Email discussion for** [**103-e][323] NR\_NTN\_Demod\_Part2, AI 9.12.8.2-Tricia Li**

**R4-2210329 Email discussion summary for [103-e][323] NR\_NTN\_Demod\_Part2**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210526 (from R4-2210329).**

**R4-2210526 Email discussion summary for [103-e][323] NR\_NTN\_Demod\_Part2**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210662 WF on NTN SAN demodulation performance requirements**

*Type: other For: Approval  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |
| --- | --- | --- | --- |
| **New Tdoc number** | **Title** | **Source** | **Status** |
| R4-2210662 | WF on NTN SAN demodulation performance requirements | Huawei, HiSilicon | Approved |

**New tdocs**

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**R4-2208085 View on NTN SAN demodulation requirement**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2209681 TP to TS 38.108: remaining annexes for FRC (SAN demodulation requirements)**

*Type: pCR For: Approval  
 38.108 v0.1.0 CR- rev Cat: (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

This TP to TS 38.108 provides remaining FRC annexes for SAN demodulation requirements.

**Decision: Postponed.**

###### 9.12.8.2.1 PUSCH requirements

**R4-2208015 Discussion on PUSCH requirement for SAN demodulation**

*Type: discussion For: Discussion  
 Source: Ericssion*

**Abstract:**

Discussion on PUSCH requirement for SAN demodulation

**Decision: Noted.**

**R4-2208878 Discussion on PUSCH demodulation requirements for NTN**

*Type: discussion For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Simulation results of PUSCH demodulation.

**Decision: Noted.**

**R4-2209877 Discussion on satellite NTN demod PUSCH**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209878 Simulation results on satellite NTN demod PUSCH**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

###### 9.12.8.2.2 PUCCH requirements

**R4-2208016 Discussion on PUCCH requirement for SAN demodulation**

*Type: discussion For: Discussion  
 Source: Ericssion*

**Abstract:**

Discussion on PUCCH requirement for SAN demodulation

**Decision: Noted.**

**R4-2209879 Discussion on satellite NTN demod PUCCH**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209880 Simulation results on satellite NTN demod PUCCH**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

###### 9.12.8.2.3 PRACH requirements

**R4-2208017 Discussion on PRACH requirement for SAN demodulation**

*Type: discussion For: Discussion  
 Source: Ericssion*

**Abstract:**

Discussion on PRACH requirement for SAN demodulation

**Decision: Noted.**

**R4-2209881 Discussion on satellite NTN demod PRACH**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209882 Simulation results on satellite NTN demod PRACH**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 9.12.8.3 UE demodulation requirements

###### 9.12.8.3.1 PDSCH requirements

**R4-2209874 Discussion on UE NTN demod general**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2207804 Discussion on PDSCH demod requirements for NTN**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2208880 Discussion on PDSCH demodulation requirements for NTN**

*Type: discussion For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Simulation results of PDSCH demod.

**Decision: Noted.**

**R4-2209691 Discussion on PDSCH requirement for NTN**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discuss simulation assumptions for PDSCH requirement

**Decision: Noted.**

**R4-2209875 Discussion on UE NTN demod PDSCH**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209876 Simulation results on UE NTN demod PDSCH**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2210119 Views on NTN UE PDSCH Requirements**

*Type: discussion For: (not specified)  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

### 9.13 UE Power Saving Enhancements for NR

#### 9.13.1 RRM core requirement maintenance

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**Email discussion for [103-e][225] NR\_UE\_pow\_sav\_enh, AI 9.13.1,9.13.2 -Hsuanli Lin**

**R4-2210297 Email discussion summary for [103-e][225] NR\_UE\_pow\_sav\_enh**

*Type: other For: Information  
 Source: Moderator (MTK)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 17th**

Issue 1-1: Clarification on multiple RLM-RS/BFD-RS

* Proposals:
* For entering condition,
  + Option 1: good serving cell quality criterion is fulfilled when the radio link quality is better than the threshold (Qin + X dB) for at least one resource in the set of resources for RLM/BFD.
  + Option 2: The UE is allowed to operate RLM/BFD in relaxed mode for a certain cell (SpCell or SCell) when the radio link quality is better than the threshold (e.g. Qout + X1) for all RLM-RS resource.
* For exiting condition,
  + Option 1: good serving cell quality criterion is not fulfilled when the radio link quality is worse than the threshold (Qin + X dB) for all resource in the set of resources for RLM/BFD.
  + Option 2: The UE shall exit the relaxed mode when the radio link quality is worse than the threshold (e.g. Qout + X2) for any the RLM-RS resources.
* GTW discussion:
* Nokia: We are discussing on multi-RSs measurement; if with option 1 then other RSs also loss measurement samples.
* CATT: We initially prefer option 2 as option 1 may degrade system performance; after further thinking we can accept option 1 since NW has control with possible solutions.
* vivo: We support option 1. It’s up to UE implementation whether UE relax requirements for single RS or multi-RSs. And we can ensure the quality with current RS.
* ZTE: We support option 2. As compromise, we can discuss X value.
* MTK: X value is configurable by NW. As well as one candidate RS with reliable quality, there is no performance impact. We would like to ensure power saving gain as UW may will never enter power saving mode with option2.
* Ericsson: Option 2 initially from Ericsson, with several discussion we can understand the concern from UE vendors. We think the proposal from ZTE seems good way.
* Apple: We favor of option 1which aligned with RLM procedure. The X value already agreed previously, which should already address the concern from NW.
* Huawei: We suggest to follow the in-sync procedure and option 1 preferred.
* QC: We would like to clarify what the performance degradation with option 1. We didn’t see the impact with option 1.
* CMCC: Our preference is option 2 with same reason as Nokia. We can discuss the proposal from ZTE. We can discuss X1 and X2. We propose option 1 for entering condition and option 2 for exiting condition.
* ZTE: I think reasonable compromised solution will be option 1 with the additional agreement X values can be configured by NW.
* MTK: RAN4 already agreed X value configurable with candidate values.
* QC: If both conditions meet for option 3, then how to deal with UE behavior?
* CMCC: We think the exiting condition shall have high priority. If both conditions meet, then UE can’t enter into power saving mode.
* ZTE: X value as {2,4,6,8} agreed before.
* Agreement: Option 1
* X with candidate values {2,4,6, 8} dB can be configured by NW with default value as 0 dB .

Issue 1-1A: Clarification on intra-band CA configured with SSB RLM and CSI-RS BFD (new)

* Proposals: For intra-band CA configured with SSB based RLM and CSI-RS based BFD, to apply the relaxed RLM/BFD requirement,
* Option 1: the UE is required to fulfil the good serving cell quality on both SSB based RLM on SpCell and CSI-RS based BFD on SCell in intra-band CA.
* GTW discussion:
* Ericsson: This is for entering or exiting or both ?
* MTK: This is general criterion for both conditions.
* Agreement: The agreement for the case of CSI-RS based RLM and CSI-RS based BFD will be applied for the case SSB based RLM and CSI-RS based BFD under intra-band CA configuration.

Issue 2-2-5: Principle for test case reduction

* Summary of the status:
* Option 2: all OOS/BFD tests, i.e. 16 TCs. (CMCC, Ericsson)
* Option 3a (compromised from Proposal 3): 3 TCs (QC, vivo, Apple, Xiaomi)
  + RLM SSB in FR1 EN-DC (TC1)
  + RLM CSI-RS in FR2 NR-SA (TC8)
  + BFD CSI-RS in FR2 NR-SA (TC16)
* Option 5 (new): 6 TCs (MTK, CATT)
  + On top of Option 3a, further include the following TCs in addition
    - RLM CSI-RS in FR1 NR-SA (TC4)
    - RLM SSB in FR2 EN-DC (TC5)
* GTW discussion:
* CMCC: We support to specify all test case to ensure test coverage meanwhile considering test effort we are open to discuss test applicable rules.
* QC: We can have minimized list which can be agreed and then further discuss other candidate TCs. The proposal from CMCC seems complexity. Option 3a already covered both EN-DC and SA cases.
* CATT: We proposed full list as CMCC but we are ok to take option 5.
* Nokia: Why BFD with SSB not included?
* CMCC: NR SA deployment will become more typical case. We need to ensure the coverage of test cases.
* MTK: TC13 already included in option 5.
* Vivo: FR1 SSB based BFD is optional feature.
* QC: We can modify option 3a with SA case. The functionality for SSB based and CSI-RS BFD is same.
* Agreement: RAN4 agreed to introduce below test cases:
  + RLM SSB in FR1 EN-DC (TC1)
  + BFD CSI-RS in FR2 NR-SA (TC16)
  + BFD SSB in FR2 EN-DC (TC13)
  + RLM SSB in FR2 EN-DC (TC5)
  + RLM CSI-RS in FR1 NR-SA (TC4)

**WF/LS**

**R4-2210613 WF on RLM/BFD relaxation for UE Power Saving enhancements**

*Type: other For: Approval  
 Source: MTK*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2211139 LS to RAN2 on RLM/BFD relaxation for ePowSav**

*Type: LS out For: Approval*

*To: RAN2  
 Source: vivo*

**Abstract:**

**Discussion:**

**Decision: Withdrawn.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210613 | WF on RLM/BFD relaxation for UE Power Saving enhancements | MediaTek Inc | Approved |  |
| R4-2211139 | LS to RAN2 on RLM/BFD relaxation for ePowSav | vivo | Withdrawn |  |
| R4-2211102 | Power saving criterion clarification | Qualcomm, Inc. | Withdrawn |  |
| R4-2211103 | CR on TS38.133 for applicability of RLM measurement relaxation | MediaTek inc. | Agreed |  |
| R4-2211104 | CR on core requirements for UE power saving enhancement | CATT | Agreed |  |
| R4-2211105 | draftCR on minimum requirements at transition for RLM/BFD relaxation | Nokia, Nokia Shanghai Bell | Postponed |  |
| [R4-2208096](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2208096.zip) | draftCR on introduction of relaxed RLM/BFD measurements | Nokia, Nokia Shanghai Bell | Merged | Merged to R4-2209685 |
| [R4-2208110](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2208110.zip) | Draft CR on RLMBFD relaxation | Xiaomi | Merged | Merged to R4-2209685 |
| [R4-2208998](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2208998.zip) | DraftCR on maintaining RLM/BFD relaxation requirements | Huawei, Hisilicon | Merged | Merged to R4-2209685 |
| [R4-2209498](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2209498.zip) | CR on R17 RLM and BFD relaxation for UE power saving | vivo | Merged | Merged to R4-2209685 |
| R4-2209897 | Corrections to relaxed RLM/BFD requirements | Ericsson | Merged | Merged to R4-2209685 |

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**R4-2207735 Power saving core maintenance**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2207737 Power saving criterion clarification**

*Type: CR For: Approval  
 38.133 v17.5.0 CR-2287 rev Cat: F (Rel-17)  
  
 Source: Qualcomm, Inc.*

**Decision: Not pursued.**

**R4-2211102 Power saving criterion clarification**

*Type: CR For: Approval  
 38.133 v17.5.0 CR-2287 rev Cat: F (Rel-17)  
  
 Source: Qualcomm, Inc.*

**Decision: Withdrawn.**

**R4-2207822 UE measurements relaxation for RLM and/or BFD**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2208061 Discussions on remaining issue about UE power saving for RLM and BM**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2208095 Discussion about RLM/BFD measurement relaxation**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2208096 draftCR on introduction of relaxed RLM/BFD measurements**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Merged (with R4-2209685).**

**R4-2208097 draftCR on minimum requirements at transition for RLM/BFD relaxation**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2211105 (from R4-2208097).**

**R4-2211105 draftCR on minimum requirements at transition for RLM/BFD relaxation**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Postponed.**

**R4-2208110 Draft CR on RLMBFD relaxation**

*Type: CR For: Approval  
 38.133 v17.5.0 CR-2300 rev Cat: F (Rel-17)  
  
 Source: Xiaomi*

**Decision: Merged (with R4-2209685).**

**R4-2208111 Discussion on remaining issues for RLM andor BFD relaxation**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2208157 Discussion on remaining issues for UE Power Saving Enhancements**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2208159 CR on core requirements for UE power saving enhancement**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2374 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Revised to R4-2211104 (from R4-2208159).**

**R4-2211104 CR on core requirements for UE power saving enhancement**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2374 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Agreed.**

**R4-2208364 Discussion on RRM requirements for R17 RLMBFD relaxation**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2208424 Discussion on RLM/BFD relaxation for NR power saving enhancement**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2208730 RLM and RLF relaxation for UE power saving**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Abstract:**

This paper discusses some open issues for the Core part of power saving enhancement in R17.

**Decision: Noted.**

**R4-2208997 Discussion on RRM core remaning issues for RLM/BFD relaxation**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2208998 DraftCR on maintaining RLM/BFD relaxation requirements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2352 rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Merged (with R4-2209685).**

**R4-2209497 Discussion on remaining issues in R17 RLM and BFD relaxation for UE power saving**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2209498 CR on R17 RLM and BFD relaxation for UE power saving**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2380 rev Cat: F (Rel-17)  
  
 Source: vivo*

**Decision: Merged (with R4-2209685).**

**R4-2209684 Discussion on Rel-17 RLM/BFD measurement relaxation**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2209685 CR on TS38.133 for applicability of RLM measurement relaxation**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2386 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2211103 (from R4-2209685).**

**R4-2211103 CR on TS38.133 for applicability of RLM measurement relaxation**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2386 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Agreed.**

**R4-2209896 Discussions on UE power saving for RLM and BFD**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss the remaining issues of Rel-17 UE power saving.

**Decision: Noted.**

**R4-2209897 Corrections to relaxed RLM/BFD requirements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2388 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

CR to correct the references in the requirements agreed at last meeting.

**Decision: Merged (with R4-2209685).**

#### 9.13.2 RRM performance requirements

**R4-2207736 Power saving performance**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2207823 UE power saving enhancement: RRM performance requirements**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2208062 Discussion on UE power saving test case for RLM and BM**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2208098 draftCR TCs of CSI-RS based BFD and LR in FR2 PSCell**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Postponed.**

**R4-2208158 Discussion on RRM test cases for UE Power Saving Enhancements**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2208160 Draft CR on RRM test case for RLM relaxation based on SSB in FR2**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Postponed.**

**R4-2208425 Discussion on test cases for RLM/BFD measurement relaxation**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2208729 Discussions on test cases for power saving R17**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Abstract:**

This paper discusses some open issues for the Perf part of power saving enhancement in R17.

**Decision: Noted.**

**R4-2208999 Discussion on RRM test cases for RLM/BFD relaxation**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209000 DraftCR on RLM out-of-sync tests for FR2 with CSI-RS based RLM relaxation in DRX**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Postponed.**

**R4-2209499 Discussion on test cases for R17 RLM and BFD relaxation for UE power saving**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2209686 Discussion on Rel-17 RLM/BFD measurement relaxation test cases**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2209687 CR on TS38.133 for relaxed RLM test for FR1 PSCell configured with SSB-based RLM RS in EN-DC mode (A.4.5.1.X)**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Postponed.**

**R4-2209688 CR on TS38.133 for relaxed BFD test for FR1 PSCell configured with SSB-based BFD RS in EN-DC and SA mode (A.4.5.5.X and A.6.5.5.X)**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Postponed.**

**R4-2209689 CR on TS38.133 for relaxed BFD test for FR1 PSCell configured with CSI-RS-based BFD RS in EN-DC and SA mode (A.4.5.5.X and A.6.5.5.X)**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Postponed.**

**R4-2209898 Discussions on RRM performance requirements for UE power saving**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss the performance requirements for relaxed RLM/BFD requirements.

**Decision: Noted.**

**R4-2209914 DraftCR – Relaxed SSB-based RLM out-of-sync for FR1 PCell with DRX in SA**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Draft test case for relaxed SSB based RLM out-of-sync in FR1 with DRX in SA.

**Decision: Postponed.**

#### 9.13.3 Demodulation performance requirements

### 9.14 NR Sidelink enhancement

#### 9.14.4 RRM core requirement maintenance

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**Email discussion for [103-e][226] NR\_SL\_enh\_RRM, AI 9.14.4,9.14.5,4.1.5.2 (R4-2210084~ 10089)-Yoonoh Yang**

**R4-2210298 Email discussion summary for [103-e][226] NR\_SL\_enh\_RRM**

*Type: other For: Information  
 Source: Moderator (LGE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210495 (from R4-2210298).**

**R4-221495 Email discussion summary for [103-e][226] NR\_SL\_enh\_RRM**

*Type: other For: Information  
 Source: Moderator (LGE)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 17th**

**1.2 Condition to Relax SyncRef UE detection requirements for Asynchronized SLSS measurement & search**

* Decide which option(s) is acceptable
  + Option 2a: QC, LGE, CATT, Xiaomi
    - SLSS RSRP variation, (instantaneous RSRP – current filtered RSRP)^2 , is lower than a threshold
  + Option 2c: Huawei, MTK, Oppo
    - The current SyncRef UE source is not of Priority 6.
  + Option 4 : vivo, QC
    - Keep existing requirements
* GTW discussion:
  + LGE: We propose t consider both option 2a and 2c.
  + Huawei: We prefer 2c and can compromise to option 4.
  + MTK/QC/LGE/vivo/CATT: We are ok with option 4 for compromise.
* Agreement: option 4 agreed

**2.1 Test for SyncRef UE as synchronization reference source when SL-DRX is used**

* 1. T1/T2/T3
  + Option 1 : T1=3s, T2=5.24s, T3=5.24s
  + Option 2 : T1=6s, T2=10.48s, T3=10.48s
* 2. SL-DRX cycle
  + Option 1 : 320ms
  + Option 2 : 640ms
* GTW discussion:
* LGE: We prefer option 2 for both parameters. We can accept both options for progress.
* Vivo: For option 2, the requirements similar as larger than 130ms. With option 1 we can save test time and we would like to see the benefits with option2.
* Huawei: We are ok for either option.
* CATT: For SL-DRX cycle we are fine with option 2; for T1/T2/T3 we think no extension needed with option 1 as 5s is enough.
* QC: Similar view as vivo for option 1.
* Agreement:
* Option 1 for T1/T2/T3
* Option 1 for SL-DRX cycle

**2.5 SL-DRX configuration : SL.DRX.x1**

* Option 1 : SL.DRX.1 = 40ms, SL.DRX.2 = 320ms
* Option 2 : SL.DRX.1 = 40ms, SL.DRX.2 = 320ms, SL.DRX.3 = 640ms
* This configuration is introduced to LGE’ draft CR(revision of R4-2208582)
* GTW discussion:
  + LGE : We think option 2 is better.
* Agreement: Option 2 agreed

**R4-2210614 WF on NR SL enhancements RRM requirements**

*Type: other For: Approval  
 Source: LGE*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210614 | WF on NR SL enhancements RRM requirements | LG Electronics | Approved |  |
| R4-2211106 | SL enhancement core requirement correction | Qualcomm, Inc. | Agreed |  |
| R4-2211107 | Maintenance CR for RRM requirements for NR Uu and SL intra-band con-current operation | MediaTek (Shenzhen) Inc. | Agreed |  |
| R4-2211108 | CR to TS 38.133 Correction to sidelink core requirements | vivo | Agreed |  |
| R4-2211109 | DraftCR on maintaining RRM core requirements for R17 NR SL | Huawei, Hisilicon | Agreed | Need to change title from ‘draftCR~’ to ‘CR~’ in cover page |
| R4-2211110 | draft CR on Test for Interruption to WAN at transitions during SL-DRX for Asynchronized case | LG Electronics | Endorsed | Draft CR |
| R4-2211111 | Draft CR to TS 38.133: Introduction of test cases for Selection/Reselection of V2X SyncRef Source under SL-DRX | vivo | Endorsed | Draft CR |
| *R4-211112* | DraftCR on initiation/cease SLSS transmisions in SL-DRX mode | Huawei, Hisilicon | Endorsed | Draft CR |
| R4-2210086 | CR: Corrections on LTE V2X Resource Selection Test | Qualcomm | Endorsed | Cover page error:  Other specs affected: -> “N” |
| R4-2210084 | CR: Corrections on NR V2X Resource Selection Test | Qualcomm | Endorsed | Cover page error:  Other specs affected: -> “N” |
| [R4-2207738](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2207738.zip) | SL enhancement resource selection test | Qualcomm, Inc. | Endorsed | Cover page error:  Other specs affected: -> “N” |

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**R4-2207739 SL enhancement core requirement correction**

*Type: CR For: Approval  
 38.133 v17.5.0 CR-2288 rev Cat: F (Rel-17)  
  
 Source: Qualcomm, Inc.*

**Decision: Revised to R4-2211106 (from R4-2207739).**

**R4-2211106 SL enhancement core requirement correction**

*Type: CR For: Approval  
 38.133 v17.5.0 CR-2288 rev Cat: F (Rel-17)  
  
 Source: Qualcomm, Inc.*

**Decision: Agreed.**

**R4-2207874 Maintenance CR for RRM requirements for NR Uu and SL intra-band con-current operation**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2294 rev Cat: F (Rel-17)  
  
 Source: MediaTek (Shenzhen) Inc.*

**Decision: Revised to R4-2211107 (from R4-2207874).**

**R4-2211107 Maintenance CR for RRM requirements for NR Uu and SL intra-band con-current operation**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2294 rev Cat: F (Rel-17)  
  
 Source: MediaTek (Shenzhen) Inc.*

**Decision: Agreed.**

**R4-2208161 Discussion on remaining issues for core requirements for NR SL enhancement**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2208728 Discussions on DRX in NR SL enhancement**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Abstract:**

This paper discusses one remaining issue related to SL DRX.

**Decision: Noted.**

**R4-2208817 CR to TS 38.133 Correction to sidelink core requirements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2337 rev Cat: F (Rel-17)  
  
 Source: vivo*

**Decision: Revised to R4-2211108 (from R4-2208817).**

**R4-2211108 CR to TS 38.133 Correction to sidelink core requirements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2337 rev Cat: F (Rel-17)  
  
 Source: vivo*

**Decision: Agreed.**

**R4-2209001 Discussion on RRM core remaining issues for NR sidelink enhancement**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209002 DraftCR on maintaining RRM core requirements for R17 NR SL**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2353 rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2211109 (from R4-2209002).**

**R4-2211109 CR on maintaining RRM core requirements for R17 NR SL**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2353 rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

#### 9.14.5 RRM performance requirements

**R4-2207738 SL enhancement resource selection test**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Qualcomm, Inc.*

*Session chair Note:* Cover page error: Other specs affected: -> “N”

**Decision: Endorsed.**

**R4-2207740 SL enhancement resource selection test configuration and RRM requirement correction**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2208582 draft CR on Test for Interruption to WAN at transitions during SL-DRX for Asynchronized case**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: LG Electronics*

**Abstract:**

It is draft CR to introduce Test for Interruption to WAN at transitions during SL-DRX for Asynchronized case.

**Decision: Revised to R4-2211110 (from R4-2208582).**

**R4-2211110 draft CR on Test for Interruption to WAN at transitions during SL-DRX for Asynchronized case**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: LG Electronics*

**Abstract:**

It is draft CR to introduce Test for Interruption to WAN at transitions during SL-DRX for Asynchronized case.

**Decision: Endorsed.**

**R4-2208818 Draft CR to TS 38.133: Introduction of test cases for Selection/Reselection of V2X SyncRef Source under SL-DRX**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: vivo*

**Decision: Revised to R4-2211111 (from R4-2208818).**

**R4-2211111 Draft CR to TS 38.133: Introduction of test cases for Selection/Reselection of V2X SyncRef Source under SL-DRX**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: vivo*

**Decision: Endorsed.**

**R4-2208819 Discussion on performance requirements for sidelink enhancement**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2209003 Discussion on test setup for initiation/cease SLSS transmisions in SL-DRX mode**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209004 DraftCR on initiation/cease SLSS transmisions in SL-DRX mode**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2211112 (from R4-2209004).**

**R4-2211112 DraftCR on initiation/cease SLSS transmisions in SL-DRX mode**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

#### 9.14.6 Demodulation performance requirements

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**Email discussion for [103-e][324] NR\_SL\_enh\_Demod, AI 9.14.6-Jin-yup Hwang**

**R4-2210330 Email discussion summary for [103-e][324] NR\_SL\_enh\_Demod**

*Type: other For: Information  
 Source: Moderator (LGE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210527 (from R4-2210330).**

**R4-2210527 Email discussion summary for [103-e][324] NR\_SL\_enh\_Demod**

*Type: other For: Information  
 Source: Moderator (LGE)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210663 WF on SL enhancement demodulation**

*Type: other For: Approval  
 Source: LGE*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |
| --- | --- | --- | --- |
| **New Tdoc number** | **Title** | **Source** | **Status** |
| *R4-2210663* | WF on SL enhancement demodulation | LG Electronics | Approved |

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**R4-2208318 Discussion on test cases for SL enhancement demodulation requirements**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2209849 Discussion on demodulation requirements for NR sidelink enhancements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

### 9.15 Extending current NR operation to 71GHz

#### 9.15.4 BS RF requirements

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**Email discussion for [103-e][311] NR\_exto71GHz\_BSRF, AI 9.15.4,9.15.5-Toni lahteensuo**

**R4-2210317 Email discussion summary for [103-e][311] NR\_exto71GHz\_BSRF**  *Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210514 (from R4-2210317).**

**R4-2210514 Email discussion summary for [103-e][311] NR\_exto71GHz\_BSRF**  *Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 13th**

**Sub-topic #1-1 EVM**

* Candidate options:
  + Remove brackets from EVM window length.
  + Agree [2048] FFT size for 960 kHz/2000 MHz case.
* Discussion:
  + Ericsson: For EVM window length, we didn’t see a urgency for removing [ ].
  + Anyway, we think 4k FFT need to be supported for test receiver. We didn’t see to push 2K FFT here.
  + ZTE: For EVM window length, we can remove [ ]. Otherwise, further evaluation needed to update the value.
  + For 960kHz/2000MHz, we prefer using 3072 FFT size instead of 2K FFT.
  + Nokia: Following the logic from E///, all the values can be updated as 4K. For ZTE proposal with 3072 FFT size, it’s a valid FFT size meanwhile not necessary and increase implementation complexity.
  + CATT: There is Tc parameter in specification. We are ok with 2K FFT size otherwise RAN1/RAN4 (RRM specification) maybe need to be updated. We didn’t see problem with 2k FFT size.
  + Huawei: The value for 960kHz/2000MHz probably not relevant to SU decision, but we would like to double check after we have SU decision.
  + Ericsson: For TE implementation complexity, 4K FFT already need to be implemented and we didn’t see the additional impact on that.
  + CATT: Tc is specified based on the assumption with 4K FFT with 480kHz SCS.
* Agreement:
  + Keep brackets from EVM window length which can be further addressed in conformance phase.
  + Agree [2048] FFT size for 960 kHz/2000 MHz case.

**Sub-topic#2-1 FRC**

* Candidate options:
  + Keep current FRC parameters unless there is change in SU for 100 or 400 MHz ChBWs.
* Discuss:
  + ZTE: The updated FRC from CATT, we can further check offline.
  + Ericsson: We have SU discussion in main session. We need to update FRC if SU decision updated.
  + Nokia: The payload sizes need to be confirmed after SU decision made.
* Agreement:
  + There is no need to define a new dedicated FRC for 960 kHz SCS and 800 MHz ChBW.
  + Keep [ ] on payload sizes in FRCs which can be further confirmed after SU fixed.

**Sub-topic#2-1 Blocking signal definitions**

* Discuss:
  + CATT: For FR1, the interference level is same with different channel bandwidths. In UE specification, we observed no clear rule. We are ok to adopt the scaling approach if all the companies accept this.
  + Ericsson: Regarding interference level, we are fine with the update. We also support to removing [] on 100MHz signal.
  + ZTE: In FR1, we don’t have scaling factor with channel bandwidth in the specified requirements. But we think it’s reasonable to have such scaling factor for FR2.
* Agreement:
* 3dB power scaling agreed for interfering signal (update the value in the CR)
* No need 400 MHz DFT-s-OFDM NR signal interferer

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Requirement* | *BS channel bandwidth* of the *lowest/highest carrier* received (MHz) | Wanted signal mean power (dBm) | Interfering signal mean power (dBm) | Type of modulated interfering signal |
| ACS | 100, 400, 800, 1600, 2000 | EISREFSENS + 6 dB (Note 3) | EISREFSENS\_50M + 3+25.7 + ΔFR2\_REFSENS = EISREFSENS\_50M + 28.7 + ΔFR2\_REFSENS | 100 MHz DFT-s-OFDM NR  signal,120 kHz SCS, 64 RBs |
| In-band blocking | 100, 400, 800, 1600, 2000 | EISREFSENS + 6 dB | EISREFSENS\_50M + 3+ 33 + ΔFR2\_REFSENS= EISREFSENS\_50M + 36 + ΔFR2\_REFSENS | 100 MHz DFT-s-OFDM NR  signal,120 kHz SCS, 64 RBs |
| RX IMD | 100, 400, 800, 1600, 2000 | EISREFSENS + 6 | EISREFSENS\_50M + 3+ 25 + ΔFR2\_REFSENS = EISREFSENS\_50M + 28 + ΔFR2\_REFSENS | 100MHz DFT-s-OFDM NR signal  (Note 2) |

**Sub-topic#3-1 Specification impact**

* Discuss:
* Huawei: The baseline from TS 38.141-2 seems fine. MU analysis probably can be captured into TR 37.941, and if this agreed then update WID to include this TR required.
* Ericsson: We provide overall analysis which seems lots of work need to be done. We agree TR 37.941 can be taken into account and include the TR into WID.
* ZTE: We share similar view as Huawei and Ericsson to include TR 37.941 for technical analysis.
* Agreement:
* Use measurement setup framework in TS 38.141-2 Annex D and E as baseline, update as necessary
* RAN4 recommend to include TR37.941 into WID to capture MU analysis

**Sub-topic#3-2 Where to discuss test methodology for demod OTA testing**

Agreement: BS OTA demod test methodology will be included in AI for BS conformance testing and handled together with general BS RF conformance test issues which follow the same approach as FR2-1.

**Sub-topic#3-3 Test environment**

* Discuss:
  + Ericsson: We support the approach.
  + Keysight: We would like to have further discuss/information for the additional measurement procedure.
  + Ericsson: In FR1 and FR2-1, test procedure didn’t consider how to improve measurement accuracy with some additional procedures i.e. in FR2-2 we can consider power meter for power measurement to improve MU. We think it’s worth to study methods to improve MU for FR2-2.
  + Keysight: Power meter also have some limitation on performance for FR2-2.
  + Ericsson: We support to consider multi options on array sizes considering we may have product types in FR2-2.
  + Keysight: PL is limited factor for test feasibility. Currently we have 4 examples in the list.
* Agreement:
  + Further study for path loss related issues and assumptions are needed.
  + Further study measurement uncertainty considering at least
    - Measurement capabilities with and without mixer including supported frequency range and MU
    - Need for additional components e.g. LNA, mixer in the signal chain
    - Need for additional measurement procedure
  + Both small and larger array sizes need to be considered in path loss evaluations to account for different implementations

**Sub-topic#3-4 Measurement system frequency capabilities and OOB blocking related / spurious emissions related frequency parameters**

* Discuss:
* Ericsson: For lower limit, we may need to reconsider for FR2-2 and it’s difficult to test.
* Agreement:
  + Companies are encouraged to do further study for at least
    - Upper frequency limit, with and without mixer solutions
    - Capability to generate OOB blocking interferer signal power
    - Increasing lower limit of measurement above 30 MHz

**Issue 3-6-2: Test model data length**

* Candidate options:

|  |
| --- |
| * + Option 1: Consider to have the same length on EVM measurement and Test model to reduce measured result variation to reduce MU increase. (R4-2209142) |
| * + Option 2: Signal characteristic study on shorter length test model to be conducted towards future meeting (R4-2209142) |
| * + Option 3: option 2a (5ms) or 5ms (480kHz) and 2.5ms (960kHz) for test model data length. (R4-2208229) |

* Discuss:
* Keysight: Our proposal is to align the EVM measurement length with data length. We prefer to shorten the measurement time length and data length.
* ZTE: TDD pattern and data length are related, usually we fix TDD pattern first.
* Nokia: We think it’s possible to decouple the discussion on TDD pattern and test model data length.
* Nokia: We can agree with option 1 in principle.
* Agreement:
* Have the same length on EVM measurement time length and Test model data length

**WF/LS**

**R4-2210637 WF on BS RF requirements for FR2-2**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2210638 WF on BS RF conformance testing for FR2-2**

*Type: other For: Approval  
Source: ZTE*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2210639 Draft CR to 38.104 on BS RF Rx requirements in clauses 10-10.5**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Endorsed.**

**R4-2210640 Draft CR to 38.104 on FRC Annexes**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Endorsed.**

**R4-2210641 Big CR to 38.104 for Rel-17 NR extension up to 71 GHz introduction**

*Type: CR For: Agreement  
 38.104 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

**Discussion:**

**Decision: Email approval**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Revised to** | **Title** | **Source** | **Status** |
| R4-2210637 |  | WF on BS RF requirements for FR2-2 | Nokia, Nokia Shanghai Bell | Approved |
| R4-2210638 |  | WF on BS RF conformance testing for FR2-2 | ZTE | Approved |
| R4-2210639 |  | Draft CR to 38.104 on BS RF Rx requirements in clauses 10-10.5 | CATT | Endorsed |
| R4-2210640 |  | Draft CR to 38.104 on FRC Annexes | Huawei | Endorsed |
| R4-2210879 |  | Draft CR to TS 38.104: Addition of EVM window length for 480 kHz and 960 kHz SCS in Annex C.5 | Ericsson | Endorsed |
| R4-2210880 |  | Draft CR to TS 38.104: intra-band non-contiguous CA TAE and ACLR for FR2-2 | ZTE | Endorsed |
| R4-2210881 |  | Draft CR for TS 38.104 on introduction of BS RF Rx requirements for 57-71GHz in section 10.6 – 10.9 | ZTE | Endorsed |

--------------------------------------------------------------End--------------------------------------------------------------------------

##### 9.15.4.1 TX requirements

**R4-2207923 Proposals on BS transmitter requirements for extending current NR operation to 71 GHz**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This contribution has provided further proposals on BS transmitter requirements for extending current NR operation to 71 GHz based on the agreed WF.

**Decision: Noted.**

**R4-2208227 Discussion on BS TX RF requirements for 52 6-71GHz**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted.**

**R4-2208537 On BS RF transmitter requirements for the frequency range 52.6 to 71.0 GHz**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this contribution we present an overview of BS transmitter requirements, additional information and some proposals necessary to progress the work related to defining RF core requirements for the NR extension up to 71 GHz.

**Decision: Noted.**

**R4-2208539 Draft CR to TS 38.104: Addition of EVM window length for 480 kHz and 960 kHz SCS in Annex C.5**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

For operation within the frequency range 52.6 to 71.0 GHz new Sub-Carrier Spacing (SCS) and Carrier Bandwidth (CBW) configurations is required. In TS 38.104, annex C.5 information related to EVM window length as function of SCS and CBW is captured for FR2

**Decision: Revised to R4-2210879 (from R4-2208539).**

**R4-2210879 Draft CR to TS 38.104: Addition of EVM window length for 480 kHz and 960 kHz SCS in Annex C.5**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

For operation within the frequency range 52.6 to 71.0 GHz new Sub-Carrier Spacing (SCS) and Carrier Bandwidth (CBW) configurations is required. In TS 38.104, annex C.5 information related to EVM window length as function of SCS and CBW is captured for FR2

**Decision: Endorsed.**

**R4-2209586 Further discussion on BS Tx requirements for 52.6-71GHz**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209587 Draft CR to TS 38.104: intra-band non-contiguous CA TAE requirement and EVM measurement window length**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2210880 (from R4-2209587).**

**R4-2210880 Draft CR to TS 38.104: intra-band non-contiguous CA TAE requirement and ACLR for FR2-2**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: ZTE Corporation*

**Decision: Endorsed.**

##### 9.15.4.2 RX requirements

**R4-2207924 Proposals on BS receiver requirements for extending current NR operation to 71 GHz**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This contribution has provided further proposals on BS receiver requirements for extending current NR operation to 71 GHz based on the agreed WF.

**Decision: Noted.**

**R4-2208228 Discussion on BS RX RF requirements for 52 6-71GHz**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted.**

**R4-2208538 On BS RF receiver requirements for the frequency range 52.6 to 71.0 GHz**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this contribution we present an overview of BS receiver requirements, additional information and some proposals necessary to progress the work related to defining RF core requirements for the NR extension up to 71 GHz.

**Decision: Noted.**

**R4-2208570 View on remaining issues for 71GHz BS RX requirements**

*Type: other For: Approval  
 Source: Samsung*

**Decision: Noted.**

**R4-2209588 Further discussion on BS Rx requirements for 52.6-71GHz**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209589 Draft CR for TS 38.104 on introduction of BS RF Rx requirements for 57-71GHz in section 10.6 – 10.9**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2210881 (from R4-2209589).**

**R4-220881 Draft CR for TS 38.104 on introduction of BS RF Rx requirements for 57-71GHz in section 10.6 – 10.9**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: ZTE Corporation*

**Decision: Endorsed.**

#### 9.15.5 BS RF conformance testing

##### 9.15.5.1 General

**R4-2208542 On general aspects related to FR2-2 base station OTA conformance testing**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

At last meeting we provided some initial thoughts related to OTA testing to further consider [2] when the NR frequency range is extended to 71 GHz. As guidance for this meeting a way-forward [3] was agreed last meeting. In this contribution we go a bit de

**Decision: Noted.**

**R4-2209141 about FR2-2 BS conformance test system**

*Type: discussion For: Discussion  
 Source: Keysight Technologies UK Ltd*

**Decision: Noted.**

**R4-2209590 Discussion on BS conformance testing for 52.6-71GHz**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209719 Measurement uncertainty considerations for NR in 52.6GHz – 71GHz**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

##### 9.15.5.2 Transmitter characteristics

**R4-2207925 Proposals on BS transmitter conformance testing for extending current NR operation to 71 GHz**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This contribution has provided proposals on BS transmitter conformance testing requirements for extending current NR operation to 71 GHz based on the agreed WF.

**Decision: Noted.**

**R4-2208229 Discussion on BS RFtransmitter characteristics conformance testing**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted.**

**R4-2208543 BS transmitter conformance test specification impact overview**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this contribution we summarize the essential updates with respect to the introduction of new carrier bandwidths and sub-carrier spacings to support up to 71 GHz as well as identifying test requirements where new requirement limits are required.

**Decision: Noted.**

**R4-2209142 about FR2-2 BS conformance test, EVM measurement and TM length**

*Type: discussion For: Discussion  
 Source: Keysight Technologies UK Ltd*

**Decision: Noted.**

##### 9.15.5.3 Receiver characteristics

**R4-2207926 Proposals on BS receiver conformance testing for extending current NR operation to 71 GHz**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This contribution has provided proposals on BS receiver conformance testing requirements for extending current NR operation to 71 GHz based on the agreed WF.

**Decision: Noted.**

**R4-2208230 Discussion on BS RFreceiver characteristics conformance testing**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted.**

**R4-2208544 BS receiver conformance test specification impact overview**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this contribution we summarize the essential updates with respect to the introduction of new carrier bandwidths and sub-carrier spacings to support up to 71 GHz as well as identifying test requirements where new requirement limits are required.

**Decision: Noted.**

#### 9.15.10 Demodulation and CSI requirements

##### 9.15.10.1 General

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**Email discussion for [103-e][325] NR\_exto71GHz\_Demod\_Part1, AI 9.15.10.1,9.15.10.3-Meng Zhang**

**R4-2210331 Email discussion summary for [103-e][325] NR\_exto71GHz\_Demod\_Part1**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210528 (from R4-2210331).**

**R4-2210528 Email discussion summary for [103-e][325] NR\_exto71GHz\_Demod\_Part1**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 16th**

**Issue 1-1-1: Whether to define FR2-2 demodulation requirement without LBT model for both DL and UL?**

* **Options**
  + Option 1: Yes, for both DL and UL
  + Option 2: No
  + Option 3: Depends on whether to define requirements for unlicensed band. LBT model will be defined if unlicensed band is considered.
* Tentative agreements:
* Define FR2-2 demodulation requirement without LBT model for UL.
* **Discussion:**
  + Intel: We already agreed no LBT model for UL performance requirements. Now some companies prefer to discuss both DL and UL together.
  + Nokia: For UL/DL, we didn’t see the need for LBT model.
  + Samsung: For UL, we already confirm no LBT needed as no impact on performance same as FR2-1. And for UE, we think no performance impact as well but modeled in test set-up.
  + Huawei: We should consider LBT due to the regional regulation with mandatory. We agree with LBT model has no performance impact but still required for UE considering the request in certain region.
  + Ericsson: For both DL and UL, we think no need to model LBT. LBT is optional for FR2-2.
  + Apple: We don’t think LBT need to be modeled for DL as no impact on performance requirements. The same logic shall be applied for both DL and UL.
  + Qualcomm: We have similar comment as Apple.
  + Nokia: We didn’t observe the issue for regional regulation.
* **Agreement:**
* Rel-17 RAN4 focused on defining FR2-2 demodulation requirement without LBT model for UL/DL.
* It’s not precluded to discuss and specify specific requirements with LBT model in future releases.

**Issue 1-2-1: How to consider phase noise model for the FR2-2 demodulation simulation?**

* **Options**
  + Option 1: PN model + CPE+ICI compensation
  + Option 2: Companies can choose preferred PN model sets and choose the best simulation values among no compensation, CPE compensation and CPE+ICI compensation for the requirement.
* *Tentative agreements:*
* Assume PN model of CPE compensation for UL requirements as the baseline and FFS when and how to consider ICI.
* **Discussion:**
  + Huawei: We prefer not considering PN model in Tx side as it’s controlled by TE and only consider Rx side with only minimum number of BW for each SCSs. And we prefer to only consider CPE compensation.
  + Ericsson: For UL, we agree with the tentative agreement. We prefer to consider PN model and CPE compensation with limited modulation orders for UL. For DL if high MCSs considered, then ICI probably need to consider for the performance improvement.
  + Keysight: We need to more time for checking.
  + Nokia: For TE PN issue discussed 1-2-2. We are fine with the tentative agreements for UL/DL.
  + Samsung: What’s meaning “assume PN model” ? Including PN model for defining performance requirements or just considering the impact? In FR2-1, we consider PN model impact into impairment results for defining requirements but not simulation with PN models. We prefer to focus on CPE and ICI belongs BS implementation.
  + Apple: For DL part, we should only consider CPE compensation as this is baseline requirements for specifying requirements.
  + QC: Testable SNR still on discussion, for 100 CHBW under FR2-2 (70 GHz) the achievable SNR is 7.7 dB and -0.6dB for 400MHz. We don’t think we can consider high MCS with larger CHBW. We think we should consider CPE compensation only for the receiver assumption.
  + Intel: There is a separate issue for TE (issue 1-2-2). I think for UL, the tentative agreements agreeable. How about for DL, same agreement applicable?
  + Ericsson: For DL, SNR range also depending on large RB allocations. The MCS still FFS.
  + Nokia: We believe ICI compensation will bring obvious gain under certain scenarios.
* Agreement:
  + Assume PN model in Receiver side with CPE compensation for initial simulation purpose for both DL and UL
    - FFS when and how to consider ICI including performance gain, implementation complexity and test feasibility
* Further discuss the PN model and ICI compensation assumption during this meeting

**Issue 2-1-1: Whether to define demodulation requirements for 960kHz SCS?**

* **Options**
  + Option 1: Yes
  + Option 2: No
  + Option 3: It is different among PUSCH, PUCCH or PRACH
* **Discussion:**
  + Intel: We prefer to introduce test case for 960kHz in FR2-2 as dedicated feature.
  + Nokia: We prefer to introduce test case for 960kHz since it’s a new feature. Additional effort required to support 960kHz which means verification required.
  + Samsung: We prefer not to specify 960kHz SCS. This is optional UE feature. For Rel-15, 240kHz SCS is optional feature and we didn’t specify requirements for 240kHz in FR2-1. For initial access, 960kHz is not supported.
  + Huawei: We share similar view as Samsung. The required SNR maybe not achievable for 960kHz considering test feasibility. We didn’t strong market demand on that.
  + Ericsson: We share same view as Huawei and Samsung. There are many limitations on the deployment and we have similar approach for FR1 60kHz and 240kHz for FR2 in previous release.
  + Apple: We share similar view as Huawei/Ericsson/Samsung.
  + QC: We share similar view as Apple and not prefer to introduce test case for 960kHz SCS.
  + Nokia: For optional feature, the test will be relied on BS/UE declaration. For initial access, 960kHz not supported and this is very limited cases. We didn’t see limitation to introduce demod requirements on this.
  + Nokia: We are worrying about the repeated comments on the feature 960kHz is useful or not since 960kHz feature is introduced by RAN1 within WID. We already have requirements on RF and RRM session, we have see the impact on demod as well.
* Agreement:
  + FFS whether dedicated UL performance requirements will be introduced for 960kHz SCS
  + FFS whether dedicated DL performance requirements will be introduced for 960kHz SCS
  + Companies are encouraged to discuss simulation assumption for 960kHz SCS

**GTW discussion on May 18th**

**Updated Issue 2-3-1: How many PRBs and symbols are considered for each of the PUCCH format?**

**GTW discussion:**

* Nokia: we have proposed to merge the options with 1RB and, multiple RB allocations.
* Ericsson: We would like to ensure test coverage. We prefer smaller values for RB allocation.
* Huawei: We prefer to only multiple RB configured since it’s enhanced feature FR2-2 and for single RB already verified in FR2-1.
* Samsung: We share similar view as Huawei, we prefer to only specify single set requirement per Format. Multiple PRB feature only applicable for Format 0, 1 and format 4 with maximum 16 RB. We can choose different RB allocation across different formats to ensure test coverage.
* Intel: We share similar comments as Samsung, we should not verify all the formats with both single and multiple RB allocations. We can choose format one.
* Ericsson: Multiple RB allocation is optional feature; we need to consider test applicable rules.
* Huawei: We prefer to verify multi-RB configurations. If BS not support multi-RB configurations, the no need to be verified since base-band performance is frequency agonistic.

Agreement: Introduce below test cases

* For Format 0:
  + 1RB /1 symbol
  + FFS for [10/16] RB/1 symbol
* For format 1:
  + 1 RB/14 symbols
  + [10/16] RB/14 symbols
* For format 2: Reusing FR2-1
* For format 3: Reusing FR2-1
* For format 4:
  + 1 RB/14 symbols
  + [10/16] RB/14 symbols

**WF/LS**

**R4-2210664 WF on general and BS aspects for FR2-2 demodulation requirements**

*Type: other For: Approval  
 Source: Intel*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** |
| R4-2210664 | WF on general and BS aspects for FR2-2 demodulation requirements | Intel Corporation | Approved |

--------------------------------------------------------------End--------------------------------------------------------------------------

**R4-2208018 Discussion on general issue for NR extended to 71GHz demodulation requirements**

*Type: discussion For: Discussion  
 Source: Ericssion*

**Abstract:**

general issue for NR extended to 71GHz demodulation requirements

**Decision: Noted.**

**R4-2209387 Draft CR - definition of FR2-2**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Postponed.**

**R4-2209388 Discussion on general aspects of demodulation requirements for the extension to 71 GHz**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

##### 9.15.10.2 UE Demodulation and CSI requirements

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**Email discussion for [103-e][326] NR\_exto71GHz\_Demod\_Part2, AI 9.15.10.2-Gaurav Nigam**

**R4-2210332 Email discussion summary for [103-e][326] NR\_exto71GHz\_Demod\_Part2**

*Type: other For: Information  
 Source: Moderator (Qualcom)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210665 WF on UE demodulation performance requirements definition for 52.6 - 71 GHz**

*Type: other For: Approval  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**GTW discussion on May 16th**

**Issue 1-2-1/1-2-2: TDL Channel Model and RMS Delay Spread**

* **Options:**
* Option 1: TDL-A10
* Option 2: TDL-A20
* Option 3: TDL-D5
* Option 4: TDL-A10 for some requirements and TDL-D5 for other requirements
* **Agreement:**
* RAN4 will specify demodulation requirements covering TDL-A10 (baseline) and TDL-D5 (for specific test cases)
  + FFS whether TDL-A20 needed or not
  + FFS for tap resolution feasibility for TDL-D5 pending on further feedback from TE vendors

**Issue 1-2-3: Max Doppler Frequency**

* **Options:**
* Option 1: 10 km/h (650 Hz) (Ericsson, R&S, Nokia)
* Option 2: 30 km/h (2000 Hz) (Ericsson)
* Option 3: Do not consider higher Dopplers. Only define requirements with 3 km/h UE speed with 200Hz Max Doppler. (Apple, Huawei, R&S, Qualcomm)
* **Agreement:**
* TDL\_D with 200Hz Max doppler
* TDL\_A channel:
* Option 1: 200Hz
* Option 2: 650Hz
* Option 3: both 200Hz, and 650Hz

**Conclusion after 2nd round**

|  |  |  |  |
| --- | --- | --- | --- |
| **New Tdoc number** | **Title** | **Source** | **Status** |
| R4-2210665 | WF on UE demodulation performance requirements definition for 52.6 - 71 GHz | Qualcomm Incorporated | Approved |

--------------------------------------------------------------End--------------------------------------------------------------------------

**R4-2207805 Discussion on UE demod and CSI reporting requirements for FR2-2**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2209778 Initial Simulation results for UE demod requirements for FR2-2**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2210351 Initial Simulation results for UE demod requirements for FR2-2**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

###### 9.15.10.2.1 PDSCH requirements

**R4-2208262 On PDSCH requirements for the extention to 71GHz**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution we have provided our views on various open issues with relation to PDSCH requirements for the extension to 71GHz.

**Decision: Noted.**

**R4-2208324 The remaining issues of the PDSCH requirements in 52.6 – 71 GHz band**

*Type: discussion For: Discussion  
 38.101-4 v CR- rev Cat: (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

We present our view on PDSCH demodulation requirements for FR2-2.

**Decision: Noted.**

**R4-2208325 Simulation results for PDSCH demodulation in 52.6 GHz – 71 GHz band**

*Type: other For: Information  
 38.101-4 v CR- rev Cat: (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

We present the initial results on the PDSCH performance in the frequency range 52.6 GHz to 71 GHz.

**Decision: Noted.**

**R4-2208331 draft CR on PDSCH requirements for 52.6 - 71 GHz band**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

First skeleton for DraftCR

**Decision: Postponed.**

**R4-2209737 PDSCH simulation results for the extension to 71 GHz**

*Type: discussion For: Information  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2209842 Discussion on PDSCH requirements for FR2-2**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

###### 9.15.10.2.2 PDCCH/PBCH requirements

**R4-2208263 On PDCCH and PBCH requirements for the extention to 71GHz**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution we have provided our views on various open issues with relation to PDCCH and PBCH requirements for the extension to 71GHz.

**Decision: Noted.**

**R4-2208264 draftCR to 38101-4: NR PDCCH requirements for the extention to 71GHz**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Postponed.**

**R4-2208326 On the PDCCH and PBCH requirements in 52.6 GHz – 71 GHz band**

*Type: discussion For: Discussion  
 38.101-4 v CR- rev Cat: (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

We present our view on PDCCH and PBCH demodulation requirements for FR2-2.

**Decision: Noted.**

**R4-2208327 Simulation results for PDCCH and PBCH demodulation in FR2-2**

*Type: other For: Information  
 38.101-4 v CR- rev Cat: (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

We present the initial results on the PDSCH performance in the frequency range 52.6 GHz to 71 GHz.

**Decision: Noted.**

**R4-2209843 Discussion on PDCCH/PBCH requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

###### 9.15.10.2.3 SDR requirements

**R4-2208328 SDR requirements in 52.6 – 71 GHz band**

*Type: discussion For: Discussion  
 38.101-4 v CR- rev Cat: (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

We present our view on the SDR requirements for FR2-2

**Decision: Noted.**

**R4-2208329 Simulation results for SDR requirements in 52.6 – 71 GHz band**

*Type: other For: Information  
 38.101-4 v CR- rev Cat: (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

We present some initial simulation results to support our view on the CSI reporting requirements for 52.6 – 71 GHz band.

**Decision: Noted.**

**R4-2208332 draft CR on SDR requirements for 52.6 - 71 GHz band**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

First skeleton for DraftCR

**Decision: Postponed.**

**R4-2209844 Discussion on SDR requirements for FR2-2**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

###### 9.15.10.2.4 CSI reporting requirements

**R4-2208330 CSI reporting requirements in 52.6 GHz – 71 GHz band**

*Type: discussion For: Discussion  
 38.101-4 v CR- rev Cat: (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

We present our view on the CSI reporting requirements in 52.5 GHz – 71 GHz band

**Decision: Noted.**

**R4-2209845 Discussion on CSI reporting requirements for FR2\_2**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 9.15.10.3 BS demodulation requirements

**R4-2208084 View on BS demodulation requirement for NR extended to 71GHz**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

###### 9.15.10.3.1 PUSCH requirements

**R4-2208019 Discussion on PUSCH demodulation requirements for NR extended to 71GHz**

*Type: discussion For: Discussion  
 Source: Ericssion*

**Abstract:**

PUSCH demodulation requirements for NR extended to 71GHz

**Decision: Noted.**

**R4-2208022 Simulation results on PUSCH demodulation requirements for NR extended to 71GHz**

*Type: other For: Information  
 Source: Ericssion*

**Abstract:**

simulation results on PUSCH demodulation requirements for NR extended to 71GHz

**Decision: Noted.**

**R4-2209389 Discussion on PUSCH demodulation requirements for the extension to 71 GHz**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2209390 PUSCH simulation results for the extension to 71 GHz**

*Type: other For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2209397 Big CR Introduction fo FR2-2 BS Radiated demodulation requirements for TS 38.141-2**

*Type: CR For: Agreement  
 38.141-2 v17.5.0 CR-0402 rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Withdrawn.**

**R4-2209846 Discussion on PUSCH requirements for FR2-2**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

###### 9.15.10.3.2 PUCCH requirements

**R4-2208020 Discussion on PUCCH demodulation requirements for NR extended to 71GHz**

*Type: discussion For: Discussion  
 Source: Ericssion*

**Abstract:**

PUCCH demodulation requirements for NR extended to 71GHz

**Decision: Noted.**

**R4-2208023 Simulation results on PUCCH demodulation requirements for NR extended to 71GHz**

*Type: other For: Information  
 Source: Ericssion*

**Abstract:**

simulation results on PUCCH demodulation requirements for NR extended to 71GHz

**Decision: Noted.**

**R4-2209391 Discussion on PUCCH demodulation requirements for the extension to 71 GHz**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2209392 PUCCH simulation results for the extension to 71 GHz**

*Type: other For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2209847 Discussion on PUCCH requirements for FR2-2**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

###### 9.15.10.3.3 PRACH requirements

**R4-2208021 Discussion on PRACH demodulation requirements for NR extended to 71GHz**

*Type: discussion For: Discussion  
 Source: Ericssion*

**Abstract:**

PRACH demodulation requirements for NR extended to 71GHz

**Decision: Noted.**

**R4-2209393 Discussion on PRACH demodulation requirements for the extension to 71 GHz**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2209394 PRACH simulation results for the extension to 71 GHz**

*Type: other For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2209395 Draft CR 38.104: PRACH requirements for FR2-2**

*Type: draftCR For: Endorsement  
 38.104 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Postponed.**

**R4-2209396 Draft CR 38.141-2: PRACH requirements for FR2-2**

*Type: draftCR For: Endorsement  
 38.141-2 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Postponed.**

**R4-2209848 Discussion on PRACH requirements for FR2-2**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

### 9.16 Enhancements to Integrated Access and Backhaul (IAB) for NR

#### 9.16.1 General

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**Email discussion for [103-e][312] NR\_eIAB\_RF, AI 9.16.1, 9.16.2,9.16.3-Yankun Li**

**R4-2210318 Email discussion summary for [103-e][312] NR\_eIAB\_RF**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210515 (from R4-2210318).**

**R4-2210515 Email discussion summary for [103-e][312] NR\_eIAB\_RF**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion May 13th**

**Issue 1-1-1: timing error requirement for timing case 6**

* Candidate options:
  + Option 1: confirm existing requirement with removal of square brackets in TS38.174(Nokia, Samsung, ZTE)
  + Option 2: update timing error requirement as 3us in TS38.174(Ericsson, Huawei)
* *Discussion:*
  + Ericsson: Current core requirements related to SCSs, this requirement related to the uncertainty of IAB-DU, IAB-MT RF returning and delay uncertainty. And such uncertainty not scaled with SCS value. With above consideration, we suggest to remove the part related to SCS.
  + ZTE: For timing case #6, we need to ensure the receiver timing for simultaneous option. The errors consist of two parts, the time between parent IAB-DU and child IAB; and the IAB-DU and IAB-MT on the same node. We would like to verify case 6 timing performance with RF core requirements; with 3us time error for FR2, the performance will be degraded.
  + Samsung: we support option 1 to remove [] considering intra-node system performance.
  + Ericsson: T\_delta belongs to baseband not related to RF. We don’t have clear agreement on number of hops can be considered.
  + ZTE: We found number of hops supported in FR2 captured in the TR 38.874.
  + Nokia: We agree with Samsung for option 1.
  + Huawei: We think this related to RF hardware performance for this requirement.
* GTW agreement: Further discuss in 2nd round for above two options

**Issue 1-2-1: reply to question on impact of IAB-MT/DU if the DL TX power of parent IAB-DU causes basic PSD difference at the IAB node to be exceeded**

* Candidate options:
* Option 1: the system performance can’t be guarantee since no verification on conditions beyond the minimum requirement. (R4-2208573, R4-2209463)
* Option 2: the high PSD signal may increase the noise level of low PSD signal and thus degrade the low PSD signal SNR.(R4-2208506, R4-2209463)
* Option 3: this results in power control and/or scheduling actions for the impacted IAB Node and adjusting the Tx power of the parent-Node is not necessary.(R4-2209720)
* Option 3a: This may result in power control to downstream UE/IAB-MT and/or scheduling actions for the impacted IAB Node and adjusting the Tx power of the parent-Node may be not necessary to ensure the basic PSD difference condition.
* Discussion:
* Samsung: Option 3a can be captured into LS.
* Nokia: We are fine with option 3a.
* Ericsson: We are not ready to accept option 3a. We think this not relevant to the question from RAN1.
* ZTE: Option 1 and option 2 already response the question from RAN1. For option 3a, this is related to scheduling behaviour, not need to include in the LS. Not sure for timing case #6, downstream UE will be scheduled on the same time.
* Agreement: Option 1 and option 2 will be included into the reply LS.
* Further discuss whether additional information can be included in the response LS in 2nd round with consensus basis.

**Issue 1-2-2: reply to question on consideration for range of DL TX adjustment (at the parent-node)**

* Candidate options:
* Option 1: no additional consideration beside what has already replied in RAN4 LS R4-2203020.
* Agreement: Option 1 agreed.

**Issue 1-2-3: reply to question on necessity of guard symbols to support a DL TX power adjustment**

* Candidate options:
* Option 1: Guard symbols is needed (Samsung, ZTE)
* Option 2: no guard symbols is needed since the RE power control dynamic range applies per transmitted symbol in FR1. (Ericsson)
* Option 3: DL TX power adjustment may not be needed(Nokia)
* Discussion:
* Ericsson: For DL Tx power adjustment, in previous RAN4 reply, the same behaviour as BS and no guard symbol needed from RF core requirements aspect.
* ZTE: RAN1 ask if DL Tx power adjustment from slot to slot, whether guard symbol required. We believe guard symbol required for PA RF returning. This is different information compared to previous reply.
* Samsung: We share same view as ZTE. This is not relevant to previous RAN4 reply with RE power dynamic range requirements. We can combine option 1 and option 2.
* Nokia: We believe this related to implementation. We think RAN1 question not relevant to RE power control dynamic range requirements.
* Ericsson: Same behaviour as BS assume for previous reply, we didn’t discuss the power adjustment per slot.
* Agreement:
* Starting point for further discussion:
  + For DL Tx power adjustment per slot, guard symbols maybe needed pending on implementation. From RAN4 RF requirements perspective, there are no requirements related to DL Tx power adjustment.

**Issue 2-1-1: Testability on OTA timing error for case 6**

* Candidate options:
  + Option 5: Measure the time error of IAB-DU and IAB-MT separately and deduce the timing error by two measurement results
* Discussion:
  + Ericsson: We would like to have better understanding on measurement methods since it related to MU.
  + Keysight: Using two polarization or option 5, both options feasible. Both them have pros and cons, from test set-up aspect, option 5 more simple.
  + Huawei: For MU, we think no big impact. For two polarization method, this is not mandated with simplified implementation. We prefer option 5 since it’s not precluded any implementation. But we can also clarify other possible methods if feasible.
  + Samsung: Considering we have feedback regarding test feasibility. We proposed to use option 5 as starting point.
* Agreement:
  + Option 5 as starting point to further discuss the relevant test procedure, test set-up and MU
    - A Note can be added into the conformance specification to clarify other test methods not precluded if feasible.

**Issue 2-1-2: Test methodology for other RF requirement for IAB simultaneous operation**

* Candidate options:
* Proposal 1: for conducted conformance testing, existing specification set-up in Annex D of TS38.176-1 can be enable the verification on IAB simultaneous operation
* Proposal 2: for OTA testing on directional requirement such as EVM, the requirement of IAB-DU ([and/or IAB-MT]) is verified as the beam under test oriented to test antenna with transmission on IAB-MT ([and/or IAB-DU]) simultaneously by existing specification set-up in Annex E TS38.176-2
* Proposal 3: for OTA testing on TRP requirement, the TRP radiated power level from both IAB-MT and IAB-DU for simultaneous operation could be verified simultaneously by existing specification set-up in Annex E TS38.176-2
* Discuss:
* Ericsson: For conformance test: if we have shared connector, then we can test with simultaneous operation. If no shared connector, then how to cope with this case?
* Samsung: In existing conformance 38.141-1, we already have test set-up with multi-antenna connectors with simultaneous operation.
* Huawei: We should study the feasibility and pending on the study we can conclude whether can be verified.
* Nokia: We think simultaneous operation can be verified no matter shared or separate antenna connector.
* Ericsson: We would like to complete proposal 1.
* Agreement:
* Proposal 1: For conducted conformance testing, existing specification set-up in Annex D of TS38.176-1 can be used as starting point to further discuss the test procedure of supporting the verification on IAB simultaneous operation.
* Proposal 2: for OTA testing on directional requirement such as EVM, the requirement of IAB-DU ([and/or IAB-MT]) is verified as the beam under test oriented to test antenna with transmission on IAB-MT ([and/or IAB-DU]) simultaneously by existing specification set-up in Annex E TS38.176-2
* Proposal 3: for OTA testing on TRP requirement, the TRP radiated power level from both IAB-MT and IAB-DU for simultaneous operation could be verified simultaneously by existing specification set-up in Annex E TS38.176-2

**Issue 2-1-3: Test coverage for IAB simultaneous operation**

* Candidate options:
* Option 2: Both transmission and reception requirement for simultaneous operation should be verified.
* Option 3: IAB simultaneous operation is only verified for IAB with shared radio unit/box between IAB-DU and IAB-MT. And there is no need to test for IAB simultaneous operation if the IAB-MT and IAB-DU implemented with dedicated separated box.
  + Clarification is needed on whether this excludes the case of IAB-MT and IAB-DU in-band operating simultaneously
* Discuss:
* Nokia: We are open to discuss the requirements list applied for conformance testing.
* Ericsson: In core requirements, we have specified Tx/Rx requirements for simultaneous operation. This simultaneous operation is similar multi-carrier transmission/reception, we can consider to reuse test results with similar declaration.
* Huawei: We think we should respect the core requirements specified.
* ZTE: IAB supporting in-band and out-band multi operation. RAN1 specify mechanisms with TDM, FDM resources for the operation. We should not exclude the in-band operation.
* Samsung: Multi-carrier test results didn’t resolve specification work load issue with all the test cases needed to be specified. Do we need to exclude in-band case with option 3?
* Agreement:

Both transmission and reception requirement for simultaneous operation should be verified.

* FFS corresponding requirements list which need to specify test cases for simultaneous operation

**WF/LS**

**R4-2210642 Reply LS for range of power control parameters**

*Type: LS out For: Approval*

*To: RAN1, CC:RAN2  
 Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2210643 WF on conformance testing for eIAB**

*Type: others For: Approval   
 Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210642 | Reply LS for range of power control parameters | Samsung | Approved |  |
| R4-2210643 | WF on conformance testing for eIAB | Samsung | Approved |  |
| R4-2208572 | Draft CR for eIAB clean up | Samsung | Not pursued |  |
| R4-2211200 | CR on Test configuration for eIAB conformance testing 38.176-1 | Ericsson | Endorsed |  |
| R4-2211201 | CR on Test configuration for eIAB conformance testing 38.176-2 | Ericsson | Endorsed |  |
| R4-2209806 | CR to TS 38.174 with bracket removal for timing error between IAB-DU and IAB-MT | Nokia, Nokia Shanghai Bell | Not pursued |  |
| R4-2209464 | CR on case-6 timing for eIAB\_RF | Ericsson | Not Pursued |  |
| R4-2208571 | Updated work plan for eIAB performance part | Samsung | Approved |  |

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**R4-2208571 Updated work plan for eIAB performance part**

*Type: Work Plan For: Approval  
 Source: Samsung*

**Decision: Approved.**

**R4-2209806 CR to TS 38.174 with bracket removal for timing error between IAB-DU and IAB-MT**

*Type: CR For: Approval  
 38.174 v17.0.0 CR-0029 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Not pursued.**

#### 9.16.2 RF requirements maintenance

**R4-2208505 Discussion on timing issues for simultaneous operation of IAB**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2208506 Reply LS to Reply LS on power control parameters for eIAB**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2208572 Draft CR for eIAB clean up**

*Type: draftCR For: Endorsement  
 38.174 v17.0.0 CR- rev Cat: F (Rel-17)  
  
 Source: Samsung*

**Decision: Not pursued.**

**R4-2208573 Discussion on reply LS for range of power control parameters**

*Type: other For: Approval  
 Source: Samsung*

**Decision: Not pursued.**

**R4-2209462 IAB MT /DU Case-6 timing**

*Type: discussion For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our view on the TAE number of the requirement.

**Decision: Noted.**

**R4-2209463 LS response on range of power control parameters for eIAB**

*Type: LS out For: Approval  
 to RAN1  
 Source: Ericsson*

**Abstract:**

In this paper, we present our view on RAN LS questions.

**Decision: Noted.**

**R4-2209464 CR on case-6 timing for eIAB\_RF**

*Type: CR For: Agreement  
 38.174 v17.0.0 CR-0028 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

this CR provide update on the case6 timing requrimeents

**Decision: Not pursued.**

**R4-2209720 Discussion on range of power control parameters**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

#### 9.16.3 RF conformance testing

**R4-2208507 Discussion on conformance test of IAB**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2208574 Discussion on RF conformance testing for eIAB**

*Type: other For: Approval  
 Source: Samsung*

**Decision: Noted.**

**R4-2209465 eIAB conformance test**

*Type: discussion For: Approval  
 Source: Ericsson*

**Abstract:**

We provide our view on eIAB conformance testing aspects

**Decision: Noted.**

**R4-2209466 CR on Test configuration for eIAB conformance testing 38.176-1**

*Type: draftCR For: Endorsement  
 38.176-1 v17.0.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

In CR, the update of the eIAB conformance testing aspect is proposed

**Decision: Revised to R4-2211200 (from R4-2209466).**

**R4-2211200 CR on Test configuration for eIAB conformance testing 38.176-1**

*Type: draftCR For: Endorsement  
 38.176-1 v17.0.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

In CR, the update of the eIAB conformance testing aspect is proposed

**Decision: Return to.**

**R4-2209467 CR on Test configuration for eIAB conformance testing 38.176-2**

*Type: draftCR For: Endorsement  
 38.176-2 v17.0.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

In CR, the update of the eIAB conformance testing aspect is proposed

**Decision: Revised to R4-2211201 (from R4-2209467).**

**R4-2211201 CR on Test configuration for eIAB conformance testing 38.176-2**

*Type: draftCR For: Endorsement  
 38.176-2 v17.0.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

In CR, the update of the eIAB conformance testing aspect is proposed

**Decision: Return to.**

**R4-2209807 On eIAB simultaneous operation testing**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2210029 eIAB testing case#6 intra node TAE**

*Type: discussion For: Discussion  
 Source: Huawei*

**Abstract:**

Discuss the testing of the case#6 intra node TAE

Session chair Note: Move to this AI from AI 9.17.1.2

**Decision: Noted.**

#### 9.16.4 RRM core requirements maintenance

#### 9.16.5 RRM performance requirements

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**Email discussion for [103-e][227] NR\_IAB\_enh\_RRM, AI 9.16.5 -Richie Leo**

**R4-2210299 Email discussion summary for [103-e][227] NR\_IAB\_enh\_RRM**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210496 (from R4-2210299).**

**R4-2210496 Email discussion summary for [103-e][227] NR\_IAB\_enh\_RRM**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210615 WF on IAB enhancement RRM (Perf Part)**

*Type: other For: Approval  
 Source:ZTE*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210615 | WF on IAB enhancement RRM (Perf Part) | ZTE Corporation | Approved |  |

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**R4-2207905 On eIAB RRM Performance Requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2208951 Discussion on performance requirements for eIAB**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2210174 Impact on RRM performance requirements for enhanced IAB**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

The paper further analyzes the need for performance requirements related to IAB enhancement

**Decision: Noted.**

#### 9.16.6 Demodulation requirements

### 9.17 NR coverage enhancements

#### 9.17.2 BS demodulation requirements

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**Email discussion for [103-e][327] NR\_cov\_enh\_Demod, AI 9.17.2-Jingzhou Wu**

**R4-2210333 Email discussion summary for [103-e][327] NR\_cov\_enh\_Demod**

*Type: other For: Information  
 Source: Moderator (China Telecom)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210530 (from R4-2210333).**

**R4-2210530 Email discussion summary for [103-e][327] NR\_cov\_enh\_Demod**

*Type: other For: Information  
 Source: Moderator (China Telecom)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 10th**

**List of key open issues:**

* Issue 1-3-1: Actual TDW length for JCE in BS PUSCH demod requirements
* Issue 1-3-2: PUSCH repetition number for BS PUSCH demod requirements with JCE
* Issue 1-3-3: Configured TDW number for JCE in BS PUSCH demod requirement
* Issue 1-3-9: Antenna configuration for BS PUSCH demod requirements with JCE
* Issue 1-3-5: TDD UL-DL pattern for BS PUSCH demod requirements with JCE
* Issue 1-2-1: Physical/available slots for BS requirements for PUSCH TBoMS
* Issue 1-2-3: TDD UL-DL pattern and test applicability for BS requirements for PUSCH TBoMS
* Issue 1-2-8: Antenna configuration for TBoMS PUSCH demod test
* Issue 2-1-1: Configured TDW length for JCE in BS PUCCH demod requirements
* Issue 2-1-2: Number of repetitions for BS PUCCH demodulation requirements with JCE

**Issue 1-3-1: Actual TDW length for JCE in BS PUSCH demod requirements**

* Proposals:
  + For TDD
    - 2 consecutive slots (Nokia, Samsung, Huawei)
  + For FDD
    - Option 1: 2 consecutive slots (Samsung)
    - Option 2: 4 consecutive slots (Samsung)
    - Option 3: 8 consecutive slots (E///, Huawei, Nokia)
    - Option 4: 16 consecutive slots (CTC)
* Moderator’s recommendation
  + For TDD:
    - Confirm 2 consecutive slots for TDD.
  + For FDD:
    - From the simulation result from HW and Nokia, moderator observes that JCE with aTDW of 8 slots can achieve larger performance gain compared to 2 or 4 slots.
    - Considering the above, can we follow majority view and agree 8 consecutive slots for FDD?
* Discussion:
  + - Samsung: We need to ensure phase continuity across slots when defining requirements.
    - China Telecom: We proposed 16 for FDD, we can comprise to 8.
    - China Telecom: In RF session, we already define RF core requirements for phase continuity across 16 slots.
    - Samsung: RF core requirements with 16 slot is subject to UE capability
    - Ericsson: For FDD, we support option 3. For TDD 30kHz SCS, 2 slots is OK. For other SCS, we suggest to discuss TDD pattern first.
    - Nokia: We already comprise to 8 for FDD.
    - Huawei: We think option 3 can observe more gain over 2,4 cases.
* Agreement:
  + For TDD:
    - Confirm 2 consecutive slots for TDD 30kHz SCS.
  + For FDD:
    - Option 3: 8 (baseline)
    - Option 2: 4

**Issue 1-3-2: PUSCH repetition number for BS PUSCH demod requirements with JCE**

* Proposals:
  + Option 1: the same as aTDW length for JCE (Samsung, Huawei)
  + Option 2: 8 for TDD and 8 for FDD (E///)
  + Option 3: 4 for TDD and 8 for FDD (Nokia)
* Moderator’s recommendation
  + For FDD:
    - E/// and Nokia propose to use repetitionnumber of 8 slots which is same with the proposed aTDW length.
    - Therefore, can we agree to use ‘PUSCH repetition number same as aTDW length’?
  + For TDD:
    - Can we follow majority view and agree option 1 (PUSCH repetition number same as aTDW length)?
* Discussion:
  + - Nokia: aTDW still not agreed for FDD case.
    - Ericsson: We think 8 for TDD can bring more gain.
    - China Telecom: we support option 1 for TDD.
    - Huawei: We prefer to actual TDW length. Repetition performance already be verified in existing Rel-15 test cases, now we are focused on to verify JCE performance.
    - Samsung: We think same value as aTDW length can serve test purpose. With large repetition number it may bring difficulty that how the performance gain from.
    - Nokia: We are fine both proposals.
* Agreement:
  + For TDD: same as aTDW length 2 for 30kHz
* Further discuss test parameters to ensure performance gain can be observed by test cases
  + For FDD: 8 if aTDW length confirmed as 8 for PUSCH

**Issue 1-3-3: Configured TDW number for JCE in BS PUSCH demod requirements**

* Proposals:
  + For TDD
    - Option 1: cTDW length is configured same as the aTDW length (E///, Samsung, CTC, Huawei)
    - Option 2: Use the cTDW length to be 16 slots (Nokia)
    - Nokia: By setting a cTDW same as aTDW, we ignore all segmentation framework and BS behavior will not be tested.
  + For FDD
    - Option 1: cTDW length is configured same as the aTDW length (Agreed parameter in the last meeting, E///, Samsung, CTC, Huawei, Nokia same with the proposed aTDW length)
* Moderator’s recommendation
  + For TDD:
    - From demodulation performance perspective, it looks no difference between the two options. Can we follow majority view and use option 1?
  + For FDD:
    - cTDW length is configured same as the aTDW length.
* Agreement:
  + For FDD:
    - cTDW length is configured same as the aTDW length.
  + For TDD:
    - Option 1: cTDW length is configured same as the aTDW length (baseline)
    - Option 2: Use the cTDW length to be 16 slots

**Issue 1-3-9: Antenna configuration for BS PUSCH demod requirements with JCE**

* Proposals:
  + Option 1: 1T2R for FR1 and FR2 (E///, Samsung, Huawei)
  + Option 2: Cover 2Rx 4Rx and 8Rx for FR1 (CTC, Nokia)
    - CTC: 1) 4Rx and 8Rx are both typical BS deployments for NR. Especially for coverage limited scenario, 4Rx and 8Rx is very likely to be used in addition to TBoMS and/or JCE. 2) PUSCH JCE provide larger performance with the increasing of Rx number.
    - Nokia: The largest JCE gain is achieved using 8Rx
* Moderator’s recommendation
  + For FR1, further discuss on the GTW session
  + For FR2, use 1T2R
* Discussion:
  + - Nokia: We support option 2, the coverage scenario is more typical with more Rx to achieve larger performance gain with JCE.
    - Huawei: We think 1T2Rx already ensure test coverage.
    - Ericsson: We prefer option 1, the performance gain already enough under 2Rx case.

**Issue 1-3-5: TDD UL-DL pattern for BS PUSCH demod requirements with JCE**

* Proposals:
  + For FR1 15KHz SCS
    - Option 1: Define new TDD pattern with multiple contiguous UL slots (E///, Samsung, CTC, Nokia)

Option 1A: DSUUU (Samsung, CTC)

Option 1B: 7D1S2U, S=6D:4G:4U (E///)

Option 1C: DDSUU (Nokia)

* + - Option 2: No PUSCH requirement for 15kHz SCS (Samsung, Huawei)
  + For FR2 60/120 kHz SCS:
    - Option 1: Define new TDD pattern with multiple contiguous UL slots (E///, Samsung, CTC, Nokia)

Option 1A: DSUUU (Samsung, CTC)

Option 1B: 5D1S4U (E///)

Option 1C: DDSUU (Nokia)

* + - Option 2: No PUSCH requirement for FR2 60/120 kHz SCS (Samsung, Huawei)
  + HW: If 15/60/120kHz SCS is considered finally, we propose to define manufacture declaration for support of JCE with corresponding SCS{15kHz, 30kHz, 60kHz 120kHz}
* Moderator’s recommendation
  + For FR1 15KHz SCS, define new TDD pattern with multiple contiguous UL slots and further discuss the exact TDD pattern
  + For FR2 60/120 kHz SCS, define new TDD pattern with multiple contiguous UL slots and further discuss the exact TDD pattern
* Agreement:
  + For FR1 15KHz SCS, define new TDD pattern with multiple contiguous UL slots and further discuss the exact TDD pattern
  + For FR2 60/120 kHz SCS, define new TDD pattern with multiple contiguous UL slots and further discuss the exact TDD pattern
  + Manufacture declaration can be introduced for supporting JCE with corresponding SCS

**Issue 2-1-1: Configured TDW length for JCE in BS PUCCH demod requirements**

* Proposals:
  + For TDD
    - Option 1: 8 slots (Nokia)
    - Option 2: cTDW length is configured same as the aTDW length (E///, Samsung, CTC, HW)
  + For FDD
    - Option 1: 8 slots (Nokia)
    - Option 2: cTDW length is configured same as the aTDW length (E///, Samsung, CTC, HW)
* Moderator’s recommendation
  + Companies have similar proposals for PUSCH JCE test, can we agree to use the same value as PUSCH JCE to avoid duplicate discussion? (Agreed by HW and Nokia)
* Agreement: Follow PUSCH conclusion.

**Issue 2-1-2: Number of repetitions for BS PUCCH demodulation requirements with JCE**

* Proposals:
  + Option 1: 8 for FDD and TDD (E///)
  + Option 2: 2 (Samsung)
  + Option 3: Same with aTDW length (HW)
  + Option 3: larger than 4 (Nokia)
    - Nokia: To be able to test the segmentation framework of cTDW in at least of 2 aTDWs of more than 1 slot, for TDD pattern DDSUU.
* Moderator’s recommendation
  + Companies have similar proposals for PUSCH JCE test, can we agree to use the same value as PUSCH JCE to avoid duplicate discussion? (Agreed by HW and Nokia)
* Agreement: Follow PUSCH conclusion.

**WF/LS**

**R4-2210666 WF on PUSCH demodulation performance of Rel-17 NR coverage enhancement**

*Type: other For: Approval  
 Source: China Telecom*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2210667 WF on PUCCH demodulation performance of Rel-17 NR coverage enhancement**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2210668 Simulation results collection for coverage enhancement for PUSCH**

*Type: other For: Approval  
 Source: China Telecom*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**Conclusion after 2nd round**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** |
| R4-2210666 | WF on PUSCH demodulation performance of Rel-17 NR coverage enhancement | China Telecom | Approved |
| R4-2210667 | WF on PUCCH demodulation performance of Rel-17 NR coverage enhancement | Nokia | Approved |

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##### 9.17.2.1 PUSCH requirements

**R4-2207742 PUSCH demodulation performance of Rel-17 NR coverage enhancements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution, we have provided parameters to test PUSCH enhancements performance.

**Decision: Noted.**

**R4-2208009 PUSCH demodulation performance of Rel-17 NR coverage enhancements: simulation results**

*Type: discussion For: Information  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution, we have provided simulation results parameters for PUSCH enhancements performance.

**Decision: Noted.**

**R4-2208010 Discussion on PUSCH demodulation for NR coverage enhancement**

*Type: discussion For: Discussion  
 Source: Ericssion*

**Abstract:**

PUSCH demodulation requirements for NR coverage enhancement

**Decision: Noted.**

**R4-2208011 Simulation results for PUSCH demodulation for NR coverage enhancement**

*Type: other For: Information  
 Source: Ericssion*

**Abstract:**

simulation results for PUSCH demodulation requirements for NR coverage enhancement

**Decision: Noted.**

**R4-2208082 View on PUSCH demodulation requirement for Rel-17 coverage enhancement**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2209407 On BS PUSCH demodulation requirements for NR coverage enhancements**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted.**

**R4-2209883 Discussion on BS coverage enhancement demod PUSCH**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209884 Simulation results on BS coverage enhancement demod PUSCH**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 9.17.2.2 PUCCH requirements

**R4-2207743 PUCCH demodulation performance of Rel-17 NR coverage enhancements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution, we have provided parameters to test PUSCH enhancements performance.

**Decision: Noted.**

**R4-2208012 Discussion on PUCCH demodulation for NR coverage enhancement**

*Type: discussion For: Discussion  
 Source: Ericssion*

**Abstract:**

PUCCH demodulation requirements for NR coverage enhancement

**Decision: Noted.**

**R4-2208013 Simulation results for PUCCH demodulation for NR coverage enhancement**

*Type: other For: Information  
 Source: Ericssion*

**Abstract:**

simulation results for PUCCH demodulation requirements for NR coverage enhancement

**Decision: Noted.**

**R4-2208083 View on PUCCH demodulation requirement for Rel-17 coverage enhancement**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2209406 On BS PUCCH demodulation requirements for NR coverage enhancements**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted.**

**R4-2209885 Discussion on BS coverage enhancement demod PUCCH**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209886 Simulation results on BS coverage enhancement demod PUCCH**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

### 9.18 Further enhancements on MIMO for NR

#### 9.18.2 RRM core requirement maintenance

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**Email discussion for [103-e][228] NR\_feMIMO\_RRM\_1, AI 9.18.2-Hua Li**

**R4-2210300 Email discussion summary for [103-e][228] NR\_feMIMO\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210497 (from R4-2210300).**

**R4-2210497 Email discussion summary for [103-e][228] NR\_feMIMO\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 18th**

**Issue 1-4-3 MAC CE based UL TCI state list update delay**

* + Option 1 (Apple):
    - The active TCI state list update delay specifies the time for UE to be able to receive DCI for TCI indication.
  + Option 2 (vivo):
    - RAN4 further check whether the common understanding is that, ‘TCI state list’ is the list of TCIs that activated in the same MAC CE, but not the list of activated TCI codepoints in the same MAC CE (Apple)
    - RAN4 confirms that the UL TCI list update delay requirement specifies the delay that UL TCI becomes applicable after a MAC CE activating more than one TCIs is received, and the end point of this delay is defined as the time when UE is able to transmit PUSCH, PUCCH or SRS based on the new TCI list. (MTK)

**Recommend discussion:**

Further clarify the understanding of TCI state list and the ending point of UL TCI state list update.

* + Optoin 1: Receive PDCCH to schedule PUSCH and prepare UL TCI state switch related processing, e.g. PL-RS
  + Option 2: Transmit PUCCH, PUSCH or SRS
  + Option 2a: Time ready/able for PUSCH, PUCCH or SRS transmission with new TCI state in the updated TCI list ~~after receiving scheduling information via PDCCH~~

**Discussion:**

* + Apple: The ending point is when received DCI indicated Beam indication for one of TCI states in the list. (option 1)
  + vivo: Codepoint and update TCI state list is different; TCI list to active multiple TCI states meanwhile codepoints indicate the used TCI for transmission. (Option 2)
  + MTK: We prefer option 2. Ending point shall the time for UE ready to transmit uplink. How to ensure NW scheduling if we go with option 1.
  + Nokia: We have similar view as vivo and MTK and option 2 need to be further refined as UE complete the preparation on uplink timing including time/frequency sync and we would like to further clarify the details with option 2.
  + Huawei: Our understanding is the time for ready to uplink. Support option 2a.
  + Ericsson: I think the views not mutually contradicted with each other. If multiple states in the list then option 1 fine and if only single TCI state in TCI state then option 2a.
  + ZTE: We share similar view as MTK and vivo as with option 2a.
  + Intel: Time for ready or time to transmit with new TCI l state from CR, better to clarify.
  + Samsung: we share different views as vivo, DCI codepoint is same as active TCI list update. And we prefer to option 2a.
  + vivo: our view is option 2a.
  + Apple: Wit multiple TCI states in the active TCI list update, then still need addtional indication through DL channel to inform UE which TCI state follow for uplink transmission.

**Agreement:**

Option 2a: Time ready/able for PUSCH, PUCCH or SRS transmission with new TCI state in the updated TCI list

* Note: If multiple TCI states/codepoints in the TCI list, then indication through DL channel required to indicate the TCI state for uplink transmission (no need to be captured into specification)

**Issue 1-1-4 MAC-CE based UL TCI state switching delay when SSB is indicated as PL-RS in UL TCI state for FR2**

* + Option 1 (Huawei, Apple, Samsung):
    - Extra delay is needed.
  + Option 2 (MTK, vivo, ZTE):
    - No extra delay is needed
  + Option 2b (Intel, MTK, ZTE, Samsung):
    - If CSI-RS is configured for source RS in UL TCI state and SSB is configured for PL-RS, no extra delay is needed

**Discussion:**

* Huawei: We support option 1 as Rx beam sweeping required. UE can’t derive beam information from other resources instead of SSB resources. (option 1)
* Ericsson: We have different understanding as Huawei, in the delay requirements we already consider Rx beam sweeping for L1-RSRP measurement. And no need additional delay for Rx beam sweeping as Rx beam already acquired. (option 2)
* Nokia: As UL TCI is known then RX beam sweeping is not required. 5 samples for PL measurement assumed, UE already measure L1-RSRP, and such information can be used which means 5 samples not always required depending on UE measurement status. (close to option 2)
* ZTE: We prefer option 2. Beam alignment shall be guaranteed for PL measurement. 5 samples is enough. (option 2).
* Apple: If PL-RS is not maintained, the Rx beam sweeping required. (option 1)
* MTK: We share similar view as ZTE/Ericsson as option 2. It’s too long for measurement if Rx sweeping assumed. (option 2)
* vivo: We support option 2.
* Huawei: There is no TCI configurations for SSB resources. With SSB based on L1 RRM measurement, Rx beam sweeping always assumed.
* Apple: Even TCI state known, PL-RS is not maintained, the Rx beam sweeping still required under SSB based.
* QC: We need to split known and unknown cases and focused on known case.
* Nokia: We can focus on uplink TCI known case. We already agreed to focus on beam alignment case with QCL D.
* Ericsson: With beam measurement assumed, we believe no extra delay required.

Agreement: Further discuss

**Issue 2-4-3 Whether to define scheduling restriction for non-serving cell**

* Option 1(MTK):
  + To define non-serving cell scheduling availability for the case that data from non-serving cell and the SSB from serving cell for L1-RSRP measurement are transmitted in the same OFDM symbol.
  + To introduce a new UE capability *simultaneousRxDataSSB-DiffNumerology\_r17* to additionally consider non-serving cell, if UE supports of L1 RSRP measurement/reporting for R17 inter-cell beam management.
* Option 2(Huawei, Apple, Qualcomm, vivo, ZTE, Samsung):
  + The current scheduling restriction requirements are also applied to the data from a TRP with different PCI.

Agreement: option 2.

* Further discuss whether any needs on the update of existing capability signalling

**WF/LS**

**R4-2210616 WF on FeMIMO RRM impact for unified TCI**

*Type: other For: Approval  
 Source: Intel*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-22111203 (from R4-2210616).**

**R4-2211203 WF on FeMIMO RRM impact for unified TCI**

*Type: other For: Approval  
 Source: Intel*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2211148 WF on FeMIMO RRM requirements for inter-cell beam management and TRP-specific link recovery**

*Type: other For: Approval  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2211149 LS on active TCI state list for UL TCI**

*Type: LS out For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Postponed.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Status | **Comments** |
| R4-2211203 | WF on FeMIMO RRM impact for unified TCI | Intel | Approved |  |
| R4-2211148 | WF on FeMIMO RRM requirements for inter-cell beam management and TRP-specific link recovery | Huawei | Approved |  |
| R4-2211149 | LS on active TCI state list for UL TCI | Nokia | Postponed |  |
| R4-2208278 | Draft CR to TS38.133 Corrections on R17 L1-RSRP requirement on NSC | Samsung | Merged  R4-2211113 withdrawn | *Merged to*  *R4-2211114* |
| R4-2211114 | CR on L1-RSRP measurement requirements for inter-cell BM in R17 | vivo | Agreed |  |
| R4-2211115 | DraftCR on maintaining R17 TRP specific BFR requirements | Huawei, Hisilicon | Agreed |  |
| R4-2211116 | CR on TRP specific CBD and BFR requirements | Ericsson | Agreed |  |
| R4-2211188 | CR on measurement restriction and scheduling availability for inter cell L1-RSRP measurement | MediaTek Inc | Agreed |  |
| R4-2211160 | DraftCR on maintaining L1-RSRP measurement requirements for R17 inter-cell beam managements | Huawei, Hisilicon | Agreed |  |
| R4-221144 | CR on unified TCI in R17 feMIMO | vivo | Agreed |  |
| [R4-2210053](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2210053.zip) | DraftCR on DCI based DL and UL TCI switching delay requirements | Nokia, Nokia Shanghai Bell | Postponed |  |
| [R4-2210139](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2210139.zip) | CR on unified TCI state switching requirements | Ericsson | Postponed |  |
| [R4-2209786](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2209786.zip) | DraftCR on maintenance of Inter-cell L1-RSRP measurement requirements | Apple | Postponed |  |
| [R4-2210141](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2210141.zip) | CR on L1-RSRP measurements for a cell with different PCI from serving cell | Ericsson | Postponed |  |
| [R4-2210050](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2210050.zip) | DraftCR on maintenance of TRP specific BFD requirements | Apple | Postponed |  |
| [R4-2208279](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2208279.zip) | Draft CR to TS38.133 Corrections on R17 unified TCI requirement | Samsung | Postponed |  |
| [R4-2209006](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2209006.zip) | DraftCR on maintaining TCI state switching requirements for R17 unified TCI | Huawei, Hisilion | Postponed |  |
| [R4-2208466](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2208466.zip) | CR on known condition of unified TCI for UL | MediaTek Inc. | Agreeable |  |

--------------------------------------------------------------End--------------------------------------------------------------------------

##### 9.18.2.1 Unified TCI for DL and UL

**R4-2207806 Discussion on RRM requirements for Unified TCI**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2208058 Discussion on remaining issue about Unified TCI state in FeMIMO**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2208279 Draft CR to TS38.133 Corrections on R17 unified TCI requirement**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Samsung*

**Decision: Postponed.**

**R4-2208465 Discussion on unified TCI for DL and UL**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2208466 CR on known condition of unified TCI for UL**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2319 rev Cat: F (Rel-17)  
  
 Source: MediaTek Inc.*

**Decision: Agreed.**

**R4-2208776 Discussion on Unified TCI for DL and UL**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209005 Discussion on RRM remaining issues for R17 unified TCI framework**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209006 DraftCR on maintaining TCI state switching requirements for R17 unified TCI**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2354 rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Postponed.**

**R4-2209500 Discussion on remaining issues in RRM requirements for unified TCI in R17 feMIMO**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2209501 CR on unified TCI in R17 feMIMO**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2381 rev Cat: F (Rel-17)  
  
 Source: vivo*

**Decision: Revised to R4-2211144 (from R4-2209501).**

**R4-2211144 CR on unified TCI in R17 feMIMO**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2381 rev Cat: F (Rel-17)  
  
 Source: vivo*

**Decision: Agreed.**

**R 4-2210052 Remaining issues on unified TCI switching delay requirement**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2210053 DraftCR on DCI based DL and UL TCI switching delay requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Postponed.**

**R4-2210138 RRM requirements of unified TCI state for FeMIMO**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss the remaining issues on Unified TCI for DL and UL

**Decision: Noted.**

**R4-2210139 CR on unified TCI state switching requirements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2395 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Based on the discussion we provide the CR for unified TCI state switching requirements

**Decision: Postponed.**

##### 9.18.2.2 Inter-cell beam management

**R4-2207807 Discussion on RRM requirements for inter-cell beam management**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2207808 CR on maintenance of Inter-cell L1-RSRP measurement requirements**

*Type: CR For: Approval  
 38.133 v17.5.0 CR-2292 rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision: Withdrawn.**

**R4-2208059 Discussion on remaining issue about inter-cell beam management in FeMIMO**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2208278 Draft CR to TS38.133 Corrections on R17 L1-RSRP requirement on NSC**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Samsung*

**Decision: Merged**

**R4-2211113 Draft CR to TS38.133 Corrections on R17 L1-RSRP requirement on NSC**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Samsung*

**Decision: Withdrawn.**

**R4-2208467 Discussion on inter cell beam management**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2208468 CR on measurement restriction and scheduling availability for inter cell L1-RSRP measurement**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2320 rev Cat: F (Rel-17)  
  
 Source: MediaTek Inc.*

**Decision: Revised to R4-2211188 (from R4-2208468).**

**R4-2211188 CR on measurement restriction and scheduling availability for inter cell L1-RSRP measurement**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2320 rev Cat: F (Rel-17)  
  
 Source: MediaTek Inc.*

**Decision: Agreed.**

**R4-2209007 Discussion on RRM remaining issues for R17 inter-cell beam managements**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209008 DraftCR on maintaining L1-RSRP measurement requirements for R17 inter-cell beam managements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision:** The document was **withdrawn**.

**R4-2209134 DraftCR on maintaining L1-RSRP measurement requirements for R17 inter-cell beam managements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2356 rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2211160 (from R4-2209134).**

**R4-2211160 DraftCR on maintaining L1-RSRP measurement requirements for R17 inter-cell beam managements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2356 rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2209502 Discussion on remaining issues in RRM requirements for inter-cell L1 beam measurements in R17 feMIMO**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2209503 CR on L1-RSRP measurement requirements for inter-cell BM in R17**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2382 rev Cat: F (Rel-17)  
  
 Source: vivo*

**Decision: Revised to R4-2211114 (from R4-2209503).**

**R4-2211114 CR on L1-RSRP measurement requirements for inter-cell BM in R17**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2382 rev Cat: F (Rel-17)  
  
 Source: vivo*

**Decision: Agreed.**

**R4-2209786 DraftCR on maintenance of Inter-cell L1-RSRP measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision: Postponed.**

**R4-2210054 Remaining issues on inter-cell beam management**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2210140 RRM requirements for inter-cell BM in FeMIMO**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

We discuss the remaining issues on Inter-cell beam management

**Decision: Noted.**

**R4-2210141 CR on L1-RSRP measurements for a cell with different PCI from serving cell**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2396 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Based on the discussion we provide the CR on L1-RSRP measurements for a cell with different PCI from serving cell

**Decision: Postponed.**

##### 9.18.2.3 Others

**R4-2207809 Discussion on other RRM requirements for FeMIMO**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2209009 Discussion on remaining issues for R17 TRP specific BFR**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209010 DraftCR on maintaining R17 TRP specific BFR requirements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision:** The document was **withdrawn**.

**R4-2209135 DraftCR on maintaining R17 TRP specific BFR requirements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2357 rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2211115 (from R4-2209135).**

**R4-2211115 DraftCR on maintaining R17 TRP specific BFR requirements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2357 rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2209504 Discussion on remaining issues in other RRM impacts in R17 feMIMO**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2210050 DraftCR on maintenance of TRP specific BFD requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision: Postponed.**

**R4-2210055 Remaining issues on other items of Rel-17 feMIMO RRM**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2210142 Discussion on TRP specific link recovery procedures**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

We discuss CBD requirements and BFRQ requirements as part of TRP specific link receovery procedures.

**Decision: Noted.**

**R4-2210143 CR on TRP specific CBD and BFR requirements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2397 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

We provide CR on TRP specific CBD and BFR requirements

**Decision: Revised to R4-2211116 (from R4-2210143).**

**R4-2211116 CR on TRP specific CBD and BFR requirements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2397 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

We provide CR on TRP specific CBD and BFR requirements

**Decision: Agreed.**

#### 9.18.3 RRM performance requirements

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**Email discussion for [103-e][229] NR\_feMIMO\_RRM\_2, AI 9.18.3-Yiyan Zhang**

**R4-2210301 Email discussion summary for [103-e][229] NR\_feMIMO\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210498 (from R4-2210301).**

**R4-2210498 Email discussion summary for [103-e][229] NR\_feMIMO\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 18th**

**Issue 1-2-2 Test cases to be defined for serving cell and cell with different PCI in Rel-17 unified TCI state switch framework**

* Proposal: Define the MAC-CE based TCI state switching test cases:
* For serving cells, define the test cases for Joint TCI and UL TCI state
* For cells with different PCI, define the test case for DL TCI state
* Options:
  + Option 1: Support the proposal
  + Option 2: More test cases are needed

**Discussion:**

* Ericsson: We support option 1.

**Agreement:**

Define the MAC-CE based TCI state switching test cases:

* For serving cells, define the test cases for Joint TCI and UL TCI state
* For cells with different PCI, define the test case for DL TCI state

**Issue 1-2-4 Configurations for known/unknown TCI state switching in test cases**

* Options:
  + Option 1: Specify test cases for known TCI state
    - Option 1a: for the known DL or Joint TCI, it is not in the active list
    - Option 1b: for the known UL TCI, the PL-RS is not maintained
  + Option 2: Specify test cases for known TCI state and unknown TCI

**Discussion:**

* Nokia: The PL shall be maintained is the condition for test. We are wondering test set-up to ensure PL maintenance.
* Ericsson: Question for option 1a. We are fine with option 1b.
* MTK: Our preference is option 1 to save test effort.
* Apple: Our preference is option 1 (both option 1a and option 1b fine). I think option 1a is correct with MAC CE based test case.
* Intel: Our preference is option 1. We don’t know how to maintain PL.
* Huawei: We also prefer option 1 to focused on known TCI state.
* vivo: We support option 1 as same reason with Apple.
* Nokia: Our preference is to specify both option 1 and option 1b.

**Agreement:**

Specify test cases for known TCI state only

* Option 1a: for the known DL or Joint TCI, it is not in the active list
* Option 1b: for the known UL TCI, the PL-RS is not maintained
* FFS whether both test cases for option 1a and option 1b need to be introduced.

**Issue 2-2-1 Define the L1-RSRP measurement procedure test cases in which operation mode**

* Options:
  + Option 1: Define the test cases of L1-RSRP measurement procedure for NR SA operation only.
  + Option 2: Define the test cases for both EN-DC and NR-SA
  + Option 3: Define the test cases for FR1 EN-DC and FR2 NR-SA
  + Option 3a: Define test cases for FR1 NR SA and FR1-FR2 ~~EN-DC/~~CA

**Discussion:**

* CMCC: We would like to use FR1 NR SA and FR2 EN-DC.
* Apple: We understand the motivation behind of option 3 and CMCC proposed.
* QC: FR2 NR-SA is not typical case.
* MTK: If we specify FR2 EN-DC test case, do we have test applicability issue.

Agreement:

* Define test cases for FR1 NR SA and FR1-FR2 CA.

**Issue 3-1-2 Defining TRP specific BFD and LR test case for which reference signals**

* Options:
  + Option 1: Go through all possible RSs for each scenario
  + Option 2: Reduce the total number of TCs, such as the table below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1 | EN-DC | FR1 | PSCell | SSB based | Non-DRX |
| 2 | EN-DC | FR2 | PSCell | CSI-RS based | DRX |
| 3 | EN-DC | FR1 | SCell | CSI-RS-based BFD and SSB-based LR | Non-DRX |
| 4 | NR SA | FR1 | PCell | CSI-RS based | DRX |
| 5 | NR SA | FR2 | PCell | SSB based | Non-DRX |
| 6 | NR SA | FR2 | SCell | CSI-RS based | DRX |

**Discussion:**

* Apple: We are supporting to reduce test effort but we would like to check the detailed test case list.

**Agreement:**

RAN4 aims to agree a reasonable test case list to minimize test effort

* Option 2 can be taking starting point for further discussion.
* Other options not precluded

**WF/LS**

**R4-2210617 WF on FeMIMO RRM performance requirements**

*Type: other For: Approval  
 Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |
| --- | --- | --- | --- |
| **New Tdoc number** | **Title** | **Source** | **Status** |
| R4-2210617 | WF on FeMIMO RRM performance requirements | Samsung | Approved |
| R4-2208277 | Draft CR to TS38.133 Accuracy Requirement for R17 L1-SINR Measurement on NSC | Samsung | Endorsed |

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**R4-2208060 Discussion on FeMIMO test case**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2208276 Discussion on RRM Performance part for Rel-17 NR FeMIMO**

*Type: discussion For: Discussion  
 Source: Samsung*

**Abstract:**

Work plan for FeMIMO RRM Perf. Part

**Decision: Noted.**

**R4-2208277 Draft CR to TS38.133 Accuracy Requirement for R17 L1-SINR Measurement on NSC**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Samsung*

**Decision: Endorsed.**

**R4-2208510 Discussion on test cases for further enhancement on MIMO for NR**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2209011 Discussion on RRM test cases for R17 NR FeMIMO**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209505 Discussion on perf requirements and test cases in R17 feMIMO**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2209779 Discussion on RRM performance requirements for FeMIMO**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2210144 Scope of RRM test cases for FeMIMO**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discssion on the scope of test cases needed for this feature

**Decision: Noted.**

#### 29.18.4 UE Demodulation and CSI requirements

##### 29.18.4.1 General

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**Email discussion for [103-e][328] NR\_FeMIMO\_Demod, AI 9.18.4-Yunchuan Yang**

**R4-2210334 Email discussion summary for [103-e][328] NR\_FeMIMO\_Demod**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210531 (from R4-2210334).**

**R4-2210531 Email discussion summary for [103-e][328] NR\_FeMIMO\_Demod**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 10th**

List of key open issues:

* Issue 1-1-1: Whether to define PDCCH requirement for multi-TRP repetition transmission schemes
* Issue 1-1-2: Whether to define PDSCH requirement for Multi-TRP inter-cell operation
* Issue 2-1-1: Whether to define PDSCH requireemnt with HST-SFN scheme B
* Issue 3-1-1: Test cases for CSI reporting enhancement for m-TRP transmission
* Issue 4-1-1: Whether to define PMI requirement for Rel-17 FeTye II PS codebook

**Issue 1-1-1: Whether to define PDCCH requirement for multi-TRP repetition transmission schemes**

* Observations
  + Observation 1(Huawei): There is a great gain by performing soft-combining for non-SFN PDCCH enhancement.
  + Observation 2 (MTK):
    - When SNR of 2 TRPs is balanced we can see little gain on average.
    - When SNR of 2 TRPs is balanced we can see loss in some cases
    - When SNR of 2 TRPs is imbalanced the performance of PDCCH repetition decreases as expected.
* Proposals
  + Option 1(Ericsson, Samsung, Huawei): Yes
  + Option 2 (MTK, Qualcomm, Apple): No
* Recommended WF
  + Define PDCCH requirement for multi-TRP repetition transmission scheme?
* Discussion:
  + Apple: We prefer not to introduce test case, as no much performance gain compared to legacy transmission schemes.
  + QC: We share similar view as Apple.
  + MTK: With imbalanced SNR, we will observe less gain. We prefer not to introduce test cases.
  + Huawei: This feature is important to improve PDCCH robust performance. In our evaluation, we observe the gain. We prefer to introduce test case as the deployment scenario can be cell-edge case.
  + Samsung: We think from UE receiver processing, it’s different compared to legacy transmission schemes; and we observe performance gain from companies’ results.
  + Ericsson: We support option 1.

**Issue 1-1-2: Whether to define PDSCH requirement for Multi-TRP inter-cell operation**

* Proposals
  + Option 1(Samsung, Huawei): Yes
    - Option 1a(Samsung): Introduce test applicable rule between existing multi-DCI intra-cell M-TRP test case and new test case for inter-cell multi-DCI PDSCH
  + Option 2 (Ericsson, Qualcomm, MTK): No
* Recommended WF
  + Encourage comments if any.
* Agreement:

Starting point for further checking:

* Introduce requirements for PDCCH multi-TRP transmission (only single test case) and no new PDSCH requirements PDSCH m-TRP inter-cell operation.

**Issue 2-1-1: Whether to define PDSCH requireemnt with HST-SFN scheme B**

* Observations
  + Observation 1 (Ericsson):
    - The performance of HST-SFN scheme B is around 1.2~1.4dB worse than that of HST single tap
* Proposals
  + Option 1 (Samsung, Huawei, CMCC, Ericsson): Yes
    - Option1a (Samsung, CMCC): If UE pass HST-SFN scheme A test cases, UE can skip HST-SFN scheme B test cases
    - Option1b (CMCC): If UE supporting both HST SFN scheme A and B and supporting both 15kHz SCS and 30kHz SCS, then UE shall only pass scheme A 15kHz and scheme B 30kHz requirements.
    - Option 1c (CMCC): If UE passes the existing test cases (demodulation requirement for HST-SFN with high Doppler shift), UE can skip HST-SFN scheme B test cases
  + Option 2 (Qualcomm, Apple, MTK): No
* Recommended WF
  + Introduce PDSCH requirement with HST-SFN scheme B, FFS on test applicability rule
    - Option1a (Samsung, CMCC): If UE pass HST-SFN scheme A test cases, UE can skip HST-SFN scheme B test cases
    - Option1b (CMCC): If UE supporting both HST SFN scheme A and B and supporting both 15kHz SCS and 30kHz SCS, then UE shall only pass scheme A 15kHz and scheme B 30kHz requirements.
    - Option 1c (CMCC): If UE passes the existing test cases (demodulation requirement for HST-SFN with high Doppler shift), UE can skip HST-SFN scheme B test cases
* Discussion:
  + CMCC: We support to define requirements for HST scheme B and open to further discuss test applicable rule.
  + Apple: We support option 2. For HST scheme B will be similar as single Tap channel from UE processing aspect. We would like to focus on other test cases.
  + QC: We share similar view as Apple. UE can handle residual doppler shift and we didn’t discuss how to model doppler-pre-compensation in BS side.
  + MTK: We share similar view as QC and Apple.
  + Huawei: we prefer option 1.
  + Ericsson: According RAN1 conclusion, the pre-compensation only applied for doppler shift and no pre-compensation for delay from 2nd RRH. We think this is separate UE feature with different UE processing. We don’t support to have test applicable rule.
  + Apple: From UE processing aspect, SFN scheme A has big impact; but for scheme B, we don’t have different doppler shift.
  + Huawei: We are fine to have test case with test applicable rule with option 1b.
* Agreement:
  + Further discuss test case design for HST scheme B and FFS whether dedicated test cases need to be introduced for HST scheme B.

**Issue 3-1-1: Test cases for CSI reporting enhancement for m-TRP transmission**

* Observations
  + Observation 1(Nokia):
    - For single-DCI cases with overlapping PDSCH resources, the optimal PMI/RI/CQI calculations differ significantly from legacy.
    - Practically used algorithms for CQI and RI derivation will likely remain the same from non-mTRP implementations, however with high impact on performance.
    - For multi-DCI cases with non-overlapping PDSCH resources, the PMI/RI calculations for each TRP are not different from legacy. CQI on the other hand is shared among TRPs, so the legacy algorithm does no longer apply
    - For multi-DCI cases with fully overlapping PDSCH resources, the PMI, CQI and RI calculations for each TRP are impacted and differ all from the legacy algorithm.
* Proposals
  + Option 1(Nokia):
    - For single-DCI M-TRP with overlapping PDSCH resources, define new CSI reporting requirement for RI and CQI
    - For Multi-DCI with overlapping PDSCH resources, define new CSI reporting requirements for PMI, CQI, RI reporting for Multi-DCI based Multi-TRP scheme, if time allows.
  + Option 2 (Huawei, Qualcomm, Apple): Only define PMI reporting cases for single-DCI based on multi-TRP
* Recommended WF
  + Encourage comments if any
* Discussion:
  + Nokia: We still prefer to have CQI test case since the calculation behaviour different compared to legacy single TRP test case. Introduce CQI reporting test case in additional PMI test case.
  + Intel: We agree with Nokia. UE need to report a single CQI for m-TRP transmission; but we prefer to cover both single-DIC and multi-DCI schemes.
  + QC: We don’t see benefits to have CQI test case. We believe multi-DCI is not in the scope of WID for CSI reporting.
  + Ericsson: We share similar view as Qualcomm for multi-DCI part.
  + Huawei: For multi-DCI case, we share similar view as QC.
  + Apple: We share similar view as QC and Huawei, this applied only single-DCI SDM case.
  + Nokia: With multi-TRP transmission, single CQI will be reporting with CSI enhancement under multi-TRP transmission hypothesis. CQI key reporting content for NW scheduling.
  + QC: We think PMI reporting already serve test purpose from UE processing aspect.
* Agreement:
  + FFS for introducing CQI reporting test case with multi-TRP transmission
  + Further check whether multi-DCI scheme supported for CSI enhancement with multi-TRP transmission

**Issue 4-1-1: Whether to define PMI requirement for Rel-17 FeTye II PS codebook**

* Observations
  + Observation1(Nokia):
    - The main advantage of feTypeII port selection codebook is not only to outperform the eTypeII port selection codebook, but to reduce the computation complexity at the UE.
    - Defining PMI reporting requirements for Rel-17 feTypeII port selection codebook based on evaluation on the performance gain over eTypeII codebook does not indicate whether to define PMI requirements for Rel-17 feTypeII port selection.
    - The complexity reduction at the UE introduced by feTypeII port selection, requires a completely new implementation of the PMI calculation and selection routines in the UE.
* Proposals
  + Option 1 (Samsung, Nokia, Huawei): Yes
    - Option 1a (Huawei): Define PMI reporting requirement for Rel-17 FeTypeII port selection codebook based on evaluation on the performance gain over eTypeII codebook.
  + Option 2 (Qualcomm, Apple): No
  + Option 3 (Ericsson): Discuss the work scope together with the test setup and test metric
* Recommended WF
  + Encourage comments if any
* Discussion:
  + Apple: This feature only workable with BS using BF CSI-RS. And we didn’t define requirements even for Rel-15 PS codebook.
  + QC: We think BF implementation in BS side is not standardized which not feasible to have test case. We don’t have performance requirements for legacy PS codebook.
  + Nokia: We didn’t define the requirement for Rel-16 PS codebook. For Rel-17 PS codebook applicable for single user and multi-user, we believe it’s useful to specify requirements. Regarding BS implementation for BF, we can simplify test case design to verify UE by W2 part only.
* Agreement:
  + Further discuss test case design especially for BF modelling in BS side, RAN4 will not introduce requirements for Rel-17 FeType II PS codebook if RAN4 can’t identify proper test case set-up by end of Aug RAN4 meeting.

**WF/LS**

**R4-2210669 WF on CSI requirement for Rel-17 FeMIMO**

*Type: other For: Approval  
 Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2210670 WF on demodulation requirement for Enhancement on HST-SFN deployment**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2210671 WF on demodulation requirement for Enhancement on Multi-TRP**

*Type: other For: Approval  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |
| --- | --- | --- | --- |
| **New Tdoc number** | **Title** | **Source** | **Status** |
| R4-2210669 | WF on CSI requirement for Rel-17 FeMIMO | Samsung | Approved |
| R4-2210670 | WF on demodulation requirement for Enhancement on HST-SFN deployment | Ericsson | Approved |
| R4-2210671 | WF on demodulation requirement for Enhancement on Multi-TRP | Huawei | Approved |

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##### 9.18.4.2 Demodulation requirements

**R4-2208494 Views on FeMIMO Demodulation requirements**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

###### 9.18.4.2.1 Enhancement on HST-SFN scenario

**R4-2208477 Views on Rel-17 HST-SFN scheme**

*Type: discussion For: Discussion  
 Source: NTT DOCOMO, INC.*

**Decision: Noted.**

**R4-2208509 Discussion on demodulation requirements for enhancement to support HST-SFN**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2209696 Discussion on the PDSCH requirement for HST-SFN scenario**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discuss the open issues for scheme A and scheme B

**Decision: Noted.**

**R4-2209887 Discussion on UE FeMIMO demod HST-SFN**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209888 Simulation results on UE FeMIMO demod HST-SFN**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2210151 Views on FeMIMO HST Performance Requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

###### 9.18.4.2.2 Enhancement on Multi-TRP

**R4-2208840 Discussion on demodulation performance requirements definition for Rel17 multi-TRP**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2209697 Discussion on the enhancement on Multi-TRP**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discuss whether to introduce PDCCH/PDSCH requirement for Multi-TRP

**Decision: Noted.**

**R4-2209889 Discussion on UE FeMIMO demod mTRP**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209890 Simulation results on UE FeMIMO demod mTRP**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2210152 Views on Performance Requirements for Enhanced Multi-TRP**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

##### 9.18.4.3 CSI requirements

**R4-2208495 Discussion and simulation results for Rel-17 CSI reporting under FeMIMO WI**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

###### 9.18.4.3.1 CSI reporting for Multi-TRP transmission

**R4-2209698 Discussion on the CSI reporting for Multi-TRP transmission**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discuss the simulation assumptions for CSI reporting for Multi-TRP transmission

**Decision: Noted.**

**R4-2209735 On CSI reporting for Multi-TRP transmission for FeMIMO**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution we have provided our views on various open issues with relation to CSI reporting for Multi-TRP transmission for FeMIMO.

**Decision: Noted.**

**R4-2209891 Discussion on UE FeMIMO CSI mTRP**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2210149 Views on m-TRP CSI Performance Requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

###### 9.18.4.3.2 Rel-17 eType II port selection codebook

**R4-2209699 Discussion on the Rel-17 eType II port selection codebook**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discuss whether to introduce requirement for Rel-17 eType II port selection codebook

**Decision: Noted.**

**R4-2209736 On Rel-17 eType II port selection codebook for FeMIMO**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution we have provided our views on various open issues with relation to Rel-17 eType II port selection codebook for FeMIMO.

**Decision: Noted.**

**R4-2209892 Discussion on UE FeMIMO CSI FeTypeII PS codebook**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2210150 Views on Performance Requirements for Further Enhanced TypeII Port Selection Codebook**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

### 9.19 Support of reduced capability NR devices

#### 9.19.5 UE demodulation and CSI requirements

##### 9.19.5.1 General

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**Email discussion for [103-e][329] NR\_RedCap\_Demod, AI 9.19.5-Kazuyoshi Uesaka**

**R4-2210335 Email discussion summary for [103-e][329] NR\_RedCap\_Demod**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210532 (from R4-2210335).**

**R4-2210532 Email discussion summary for [103-e][329] NR\_RedCap\_Demod**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 10th**

**List of key open issues:**

* Issue 1-1-1: Spec structure of UE demodulation and CSI reporting requirements for RedCap
* Issue 1-2-1: UL/DL scheduling for FR1 FDD for 1Rx UE
* Issue 2-1-1: Define 256QAM demodulation requirements (for FR1 only) or not
* Issue 2-1-3: Additional PDSCH demodulation requirements
* Issue 3-4-1: Whether to define RI reporting requirements for RedCap 2Rx UEs
* Issue 2-1-3: Additional PDSCH demodulation requirements

**Issue 1-1-1: Spec structure of UE demodulation and CSI reporting requirements for RedCap**

Background (R4-2209058): RF main session agreed to use suffix ‘I’ to define UE RF requirements for RedCap in TS38.101-1/2

* Proposal (Ericsson)
  + Define RedCap demodulation and CSI reporting requirements in TS38.101-4 with the suffix ‘I’, as same as TS38.101-1/2. The proposed spec structured in provided in R4-2209057.
* Recommended WF
  + Discuss the proposal is acceptable or not from demodulation requirements point of view.
  + If agreeable, 2nd round discusses the CR work split.
* Discussion:

Option 1: New Suffix “I”

Option 2: No new suffix with existing structure.

* + QC: We prefer to keep in existing section without new suffix “I” to avoid confusing since we have 2Rx,1Rx requirements for Redcap UE.
  + Apple: We prefer option 2.
  + Nokia: We support option 1 to be aligned with RF specification for the consistency.
  + Huawei: We are fine with suffix “I”. With option 2, more deeper sub-clauses required.
  + Apple: Instead of “I”, continued with “D” ?
  + Ericsson: Our intention was to be aligned with core specification. We also realize NR-U, v2X didn’t align with 101-1/-2 for 101-4.
* Agreement:
* Further discuss below two options considering specification drafting effort, spec structure and test applicable rule drafting:
  + Option 1: New Suffix “I”
  + Option 2: No new suffix with existing structure.

**Issue 1-2-1: UL/DL scheduling for FR1 FDD for 1Rx UE**

Background: According to RAN1 feature list and RAN#95-e decision, supporting half-duplex FDD is per-band capability, i.e., UE is not mandated to support full-duplex FDD if UE support half-duplex FDD.

* Proposals
  + Option 1 (Ericsson, Nokia): Define the single test case set of UE demodulation and CSI reporting requirements for RedCap 1Rx UE in FDD, which is applicable for both half-duplex FDD UE and full-duplex FDD UE. The applied FRC is based on half-duplex FDD operation, that is, DDDSU.
    - If RedCap UE support only HD-FDD in a FDD band, this UE is tested with HD-FDD mode.
    - If RedCap UE support only FD-FDD in a FDD band, this UE is tested with FD-FDD mode.
    - If RedCap UE support both FD-FDD and HD-FDD in a FDD band, this UE is tested with FD-FDD mode.
  + Option 2 (~~Nokia,~~ Huawei): Consider Full-duplex FDD only for FDD tests for 1 Rx UE.
* Recommended WF
  + Collect inputs.
* Discussion:
  + Huawei: We think no need to define requirements for HD-FDD since HD-FDD will decrease TP and bring complexity for NW.
  + Nokia: After RAN-P decision, we think requirements shall cover HD-FDD case, the open question is can we define single set requirements for FD-FDD and HD-FDD with common FRC or separate requirements with different FRC.
  + Apple: We are fine with option 1. We assume single set requirements will be applicable for both HD-FDD and FD-FDD with changes on FRC.
  + QC: The difference between FD-FDD and HD-FDD is FRC, not sure how to test UE if UE only support HD-FDD.
  + CMCC: We generally fine with option 1. If UE supporting HD-FDD on one band and FD-FDD in another band, then how to apply test case.
  + Ericsson: We can have single set requirements for FD-FDD and HD-FDD with different FRC. We are ok to remove third bullet if it’s not a valid case. For CMCC question, it subject to UE declaration as design in RAN5.
  + QC: DDDSU also applicable for FD-FDD with same FRC.
  + Ericsson: For FD-FDD, we can reuse existing FDD pattern (all DL slots) . We will have separate FRC for FD-FDD and HD-FDD with same requirements.
* Agreement:

Introduce demodulation/CSI requirements covering both FD-FDD and HD-FDD.

* DDDSU applied for HD-FDD
* Existing pattern applied for FD-FDD
* Same demodulation requirement applied for FD-FDD and HD-FDD with different FRCs
* For CSI requirements: Further discuss the CSI feedback scheduling pattern applicable for both FD-FDD and HD-FDD

Test applicable rule:

* If RedCap UE support only HD-FDD in a FDD band, this UE is tested with HD-FDD mode otherwise UE is tested with FD-FDD mode

**Issue 2-1-1: Define 256QAM demodulation requirements (for FR1 only) or not**

Background: 256QAM is optional feature for RedCap UE (both 1Rx and 2Rx)

* Proposals
  + Option 1 (MediaTek, Huawei, Qualcomm): Specify 256QAM demodulation requirements for FR1 only
  + Option 2 (Apple, Nokia): Not to Specify 256QAM demodulation requirements
* Recommended WF
  + Collect inputs
* Discussion:
  + Ericsson: Option 3: Only introduce 256QAM requirement for 2Rx.
  + CMCC: We support option 1 to introduce requirements for both 1Rx and 2 Rx cases.
  + MTK: We think it’s important to verify high TP with 256QAM to achieve high SE.
  + Huawei: Share same view as MTK. We can choose lowest 256QM MCS i.e. MCS 20.
  + Apple: We have another issue 2-1-3. We are wondering the use case with 256QAM for Redcap.
  + QC: We are open to choose low MCS to have a reasonable SNR point to enable 256QAM test cases.
  + Nokia: We have similar view as Apple, 256QAM will increase complexity.
* Agreement:

Introduce 256QAM requirement for 2Rx

FFS whether introduce requirement for 1Rx

**Issue 2-1-3: Additional PDSCH demodulation requirements**

Background (WF: R4-2207206 agreed in RAN4#102-e):

Option 1: Focus on definition of minimum set of requirements, discussed in Topic #2, to verify the mandatory features. RAN4 discuss other requirements once it is stable, and the performance part TU is allowed.

Option 2: Not define the additional PDSCH demodulation requirements other than the candidates discussed in 2.1, in Rel-17 RedCap

* Proposals
  + Option 1 (Nokia): Focus on definition of minimum set of requirements, discussed in Topic #2, to verify the mandatory features. RAN4 to potentially discuss other requirements once mandatory requirements are stable and pending remaining performance part TUs.
  + Option 2 (Huawei): Not define any additional PDSCH demodulation requirements other than those agreed in last RAN4 meeting (moderator: RAN4#102-e) in Rel-17 for RedCap
* Recommended WF
  + Collect inputs considering the updated work plain in R4-2209056.
* Agreement: Option 2 agreed.

**Issue 3-4-1: Whether to define RI reporting requirements for RedCap 2Rx UEs**

* Proposals
  + Option 1 (Nokia, CMCC): Define RI reporting requirements
  + Option 2 (Apple, Ericsson, Huawei, Qualcomm, MTK): Not define RI reporting requirements
* Recommended WF
  + Moderator would like to ask whether option 2.
* Discussion:
  + Nokia: We think it’s a key feature which need to be verified.
  + CMCC: We also support to have RI test for 2Rx. We need to ensure the performance for RI reporting.
  + Ericsson: CSI reporting from UE is the recommended value, but still up to NW to decide the schedule value. We already have demod and SDR requirements covering Rank2 case.
  + Apple: We share same view as Ericsson.
  + Huawei: We have same view as Apple and Ericsson.
  + QC: We support option 2.
  + MTK: We support option 2.
  + Nokia: For legacy UE, we have RI requirements for 2Rx UE.
  + CMCC: RI reporting can’t be verified by SDR and demod requirements with fixed rank 2 during the test for throughput performance. We think this test case is essential and we didn’t see any critical issue to have dedicated test case for RI.
  + Huawei: For existing RI test case, the requirement (TP ratio gain with follow RI reporting /fixed RI) is limited.

**WF/LS**

**R4-2210672 WF on RedCap UE demodulation and CQI reporting requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** |
| R4-2210672 | WF on RedCap UE demodulation and CQI reporting requirements | Ericsson | Approved |
| *R4-2210931* | Update of work plan for RedCap demodulation performance part | Ericsson | Approved |

--------------------------------------------------------------End--------------------------------------------------------------------------

**R4-2209055 Summary of simulation results for RedCap**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This spread sheet summarizes the simulation results for RedCap UE demodulation requirements.

**Decision: Noted.**

**R4-2209056 Update of work plan for RedCap demodulation performance part**

*Type: Work Plan For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution updates the work plan of the RedCap demodulation performance part. This work plan also discusses the CR work split.

**Decision: Revised to R4-2210931 (from R4-2209056).**

**R4-2210931 Update of work plan for RedCap demodulation performance part**

*Type: Work Plan For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution updates the work plan of the RedCap demodulation performance part. This work plan also discusses the CR work split.

**Decision: Approved.**

**R4-2209057 draft big CR: Introduction of UE demodulation and CSI reporting requirements for RedCap**

*Type: draftCR For: Endorsement  
 38.101-4 v17.4.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draft big CR provides the skeleton of CR for UE demodulation and CSI reporting requirements for RedCap.

**Decision: Postponed.**

**R4-2209058 Open issues on UE demodulation and CSI requirements for RedCap**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the open issues for both UE demodulation requirements and CSI reporting requirements for RedCap.

**Decision: Noted.**

**R4-2209705 On RedCap general UE demodulation and CSI reporting requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Discussion on open issues for general UE demodulation requirements

**Decision: Noted.**

##### 9.19.5.2 Demodulation requirements

###### 9.19.5.2.1 PDSCH/SDR requirements

**R4-2207810 On PDSCH Demod Requirements for Reduced Capability Devices in NR**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2209059 PDSCH demodulation requirements for RedCap**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution provides our simulation results and discuss the open issues on PDSCH demodulation requirements fo RedCap UE

**Decision: Noted.**

**R4-2209706 Discussion on PDSCH requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Discussion on open issues for PDSCH demod requirements

**Decision: Noted.**

**R4-2209707 Simulation results for Redcap PDSCH**

*Type: other For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

provides our simulation results for PDSCH for RedCap

**Decision: Noted.**

**R4-2209797 Simulation results and discussion on PDSCH requirements for RedCap**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2209832 Discussion on open issues for RedCap PDSCH and SDR requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209833 Simulation results for RedCap PDSCH and SDR performance requirements**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2210146 Views on RedCap PDSCH/SDR Requirements**

*Type: discussion For: (not specified)  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

###### 9.19.5.2.2 PDCCH/PBCH requirements

**R4-2207811 On PDCCH PBCH Demod Requirements for Reduced Capability Devices in NR**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2209060 PDCCH/PBCH demodulation requirements for RedCap**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution provides our simulation results and discusses the open issues on PDCCH/PBCH demodulation requirements fo RedCap UE

**Decision: Noted.**

**R4-2209708 Discussion on PDCCH/PBCH requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Discussion on open issues for PDCCH / PBCH demod requirements

**Decision: Noted.**

**R4-2209709 Simulation results for Redcap PDCCH and PBCH**

*Type: other For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

provides our simulation results for PDCCH / PBCH for RedCap

**Decision: Noted.**

**R4-2209798 Simulation results and discussion on PDCCH requirements for RedCap**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2209834 Discussion and simulation results for RedCap PDCCH and PBCH performance requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2210147 Views on RedCap PDCCH/PBCH requirements**

*Type: discussion For: (not specified)  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

##### 9.19.5.3 CSI requirements

###### 9.19.5.3.1 CQI requirements

**R4-2207812 On CQI Reporting Requirements for Reduced Capability Devices in NR**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2209061 CQI reporting requirements for RedCap**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution provides our simulation results and discusses the open issues on CQI reporting requirements fo RedCap UE

**Decision: Noted.**

**R4-2209799 Simulation results and discussion on the CQI requirements for RedCap**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2209835 Discussion and simulation results for RedCap CQI reporting requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

###### 9.19.5.3.2 PMI/RI requirements

**R4-2207813 On PMI Reporting Requirements for Reduced Capability Devices in NR**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2209062 PMI/RI reporting requirements for RedCap**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution provides our simulation results and discusses the open issues on PMI/RI reporting requirements fo RedCap UE

**Decision: Noted.**

**R4-2209710 Discussion on RI requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Discussion on open issues for RI reporting requirements

**Decision: Noted.**

**R4-2209800 Simulation results and discussion for the PMI requirements for RedCap**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2209836 Discussion and simulation results for RedCap PMI and RI**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

### 9.22 Enhanced IIoT and URLLC support

#### 9.22.1 RRM core requirement maintenance

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**Email discussion for [103-e][230] NR\_IIOT\_URLLC\_enh, AI 9.22.1,9.22.2-Lars Dalsgaard**

**R4-2210302 Email discussion summary for [103-e][230] NR\_IIOT\_URLLC\_enh**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210499 (from R4-2210302).**

**R4-2210499 Email discussion summary for [103-e][230] NR\_IIOT\_URLLC\_enh**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW discussion on May 18th**

**Issue 1-5: Is there a need for Rx beam sweeping factor if no QCL information is provided for the RS?**

Agreement:

* If no QCL information is provided for the PDC RS it is assumed that UE Rx beam sweeping is needed for PDC measurements.
  + RAN4 only define requirement conditioned:
    - QCL information is provided
    - UE Rx sweeping is not needed

**Issue 1-6: Is there a need for scheduling restriction if PDC RS is not QCL-ed with PDCCH or PDSCH?**

Way forward/Agreement: further discuss

* Option 1: Yes, there is there a need for scheduling restriction if PDC RS is not QCL-ed with PDCCH or PDSCH.
* Option 2: Other

**Discussion:**

* vivo: How the TCI information configured for PDCRS and PDCCH or PDSCH ? If assumed configured separate, option 1 is fine.
* Huawei: It’s included in CSI-RS configuration which can be configured separately. \

**Agreement: Option 1 agreed**

**Issue 1-7: Is there a need for defining measurement restriction if PDC RS is not QCL-ed with L1 RS?**

Way forward/Agreement: further discuss

* Option 1: Yes, there is a need for defining measurement restriction if PDC RS is not QCL-ed with L1 RS.
* Option 2: Other

**Agreement: Option 1 agreed**

**Issue 1-8: Is there a need to define DRX requirements for PDC measurement?**

Way forward/Agreement: further discuss

* Option 1: Yes, define DRX requirements for PDC such that UE is assumed to take one sample per DRX cycle.
* Option 2: Other

**Discussion:**

* Ericsson: We are wondering long DRX cycle compatible with this.
* QC: Considering with long DRX cycle, the measurement delay will be long. We suggest to keep it open for further discuss how to consider DRX cycle with measurement delay impact.
* vivo: For high mobility, measurement delay shall be minimized and it’s better to further study this scenario.

Agreement: FFS whether define DRX requirements for PDC measurement

**Issue 1-4: Is there a need to introduce scaling factor Kgap when the PDC resources occasions collide with MG?**

Way forward/Agreement: further discuss

* Option 1: Introduce scaling factor Kgap when the PDC resources occasions collide with legacy MG only
* Option 2: Introduce scaling factor for all scenarios when the PDC resources occasions collide with legacy gaps, concurrent gaps and PPW
* Option 3: No requirements defined for when PDC resources collide with gaps

**Discussion:**

* QC: Original proposal to consider legacy MG. We can consider scaling factor with legacy MG and concurrent MG introduced in another Rel-17 WI. For PWW, we can further discuss.
* vivo: Our preference is to avoid the overlapped by NW configuration. From RAN4 RRM requirements, no need to consider this case.
* Huawei: We are fine with option 1 for legacy gap. Another alternative with option 3, then do we need to clear indicate the requirement applicable condition.
* Nokia: We prefer to limit the work load since this WI core part already closed.

Agreement: further discuss below options:

* Option 1: Introduce scaling factor Kgap when the PDC resources occasions collide with legacy MG only
* Option 3: No requirements defined for when PDC resources collide with gaps
  + Clarification on the requirements applicable conditions need to included into specification for this option

**Issue 3-1: Define UE Rx-Tx time difference measurement requirement for PRS under fading channel conditions?**

Way forward/Agreement: further discuss

* At least define UE Rx-Tx time difference measurement requirement for PRS under AWGN channel conditions
* Continue to discuss whether RAN4 additionally should define UE Rx-Tx time difference measurement requirement for PRS under fading channel conditions

Discussion:

* Ericsson: We prefer to introduce test cases for both AWGN and fading channel conditions need to be considered considering the deployment scenarios.
* QC: We have PRS (UE side) and SRS (BS side) for the measurement. Do we apply same approach for both UE and gNB side? We also need to consider the work load.
* vivo: We share similar view as QC. We need to cover AWGN condition. We prefer to discuss sub-topic 3-1 and 3-2 jointly.
* Huawei: We have similar view as vivo and QC. We prefer to only focus on AWGN condition.
* Nokia: We can accept to first focus on AWGN condition.
* Ericsson: We prefer to further check for fading conditions.

Agreement:

RAN4 shall focus on specify performance requirements for AWGN condition as first priority:

* UE Rx-Tx time difference measurement requirement for PRS
* gNB Rx-Tx time difference measurement requirement for SRS
* UE Rx-Tx time difference measurement requirements for TRS

FFS whether additional requirements for fading condition shall be specified or not

**Sub-topic 3-7**

Way forward/Agreement: further discuss

* On the CSI-RS RMC, we agree that we need a new RMC for TRS based PDC. TRS RMC is defined in A.3.17 instead of A.3.30?
* Remove 60kHz SCS for both FR1 and FR2 because 60kHz SCS is not tested in any existing test case?
* Include sub-tests for two different PRS/TRS BWs because of different accuracies?
* Detailed list of test cases:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **TC No.** | **TC** | **Purpose** | **Clause** | **Note** |
| **1** | UE Rx-Tx time difference measurement with PRS for RTT-based PDC in FR1 SA | To [verify measurement period requirements and accuracy requirements] for UE Rx-Tx time difference measurement with PRS for RTT-based PDC | A.6.6.x1.1 | A.6.6.x1 UE Rx-Tx time difference measurement for RTT-based PDC |
| **2** | UE Rx-Tx time difference measurement with TRS for RTT-based PDC in FR1 SA | To [verify measurement period requirements and accuracy requirements] for UE Rx-Tx time difference measurement with TRS for RTT-based PDC | A.6.6.x1.2 |
| **3** | UE Rx-Tx time difference measurement with PRS for RTT-based PDC in FR2 SA | To [verify measurement period requirements and accuracy requirements] for UE Rx-Tx time difference measurement with PRS for RTT-based PDC | A.7.6.x1.1 | A.7.6.x1 UE Rx-Tx time difference measurement for RTT-based PDC |
| **4** | UE Rx-Tx time difference measurement with TRS for RTT-based PDC in FR2 SA | To [verify measurement period requirements and accuracy requirements] for UE Rx-Tx time difference measurement with TRS for RTT-based PDC | A.7.6.x1.2 |

Discussion:

* Ericsson: We need to have requirements for FR1/FR2, TRS/PRS and measurement delay/accuracy which means 8 test cases required.
* Nokia: We try to combine test cases to verify measurement delay and measurement accuracy in the same test case save test effort.
* QC: We agree with Nokia. We can update the purpose in the table.
* vivo: We are also fine if we can combine test cases together.

Agreement: RAN4 agreed at least introducing below list of test cases:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **TC No.** | **TC** | **Purpose** | **Clause** | **Note** |
| **1** | UE Rx-Tx time difference measurement with PRS for RTT-based PDC in FR1 SA | To [verify measurement period requirements and accuracy requirements] for UE Rx-Tx time difference measurement with PRS for RTT-based PDC | A.6.6.x1.1 | A.6.6.x1 UE Rx-Tx time difference measurement for RTT-based PDC |
| **2** | UE Rx-Tx time difference measurement with TRS for RTT-based PDC in FR1 SA | To [verify measurement period requirements and accuracy requirements] for UE Rx-Tx time difference measurement with TRS for RTT-based PDC | A.6.6.x1.2 |
| **3** | UE Rx-Tx time difference measurement with PRS for RTT-based PDC in FR2 SA | To [verify measurement period requirements and accuracy requirements] for UE Rx-Tx time difference measurement with PRS for RTT-based PDC | A.7.6.x1.1 | A.7.6.x1 UE Rx-Tx time difference measurement for RTT-based PDC |
| **4** | UE Rx-Tx time difference measurement with TRS for RTT-based PDC in FR2 SA | To [verify measurement period requirements and accuracy requirements] for UE Rx-Tx time difference measurement with TRS for RTT-based PDC | A.7.6.x1.2 |

* FFS whether measurement period requirements and accuracy requirements can be verified in the same test cases

**WF/LS**

**R4-2210618 WF on NR\_IIOT\_URLLC\_enh**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2210619 Simulation Results for NR\_IIOT\_URLLC\_enh**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2211159 | draftCR to clarify timing reference point for UE UL timing test cases | Intel | Endorsed |  |
| R4-2211117 | CR to TS 38.133: Correction to measurement requirements for PDC | vivo | Approved | Revised and account changes from R4-2209236 and R4-2209615 |
| R4-2211118 | draftCR on UE Rx-Tx time difference measurement accuracy requirements for RTT-based PDC | Nokia, Nokia Shanghai Bell | Endorsed | Revised and account changes from R4-2208824 |
| R4-2210618 | WF on NR\_IIOT\_URLLC\_enh | Nokia, Nokia shanghai Bell | Approved |  |
| R4-2209236 | CR on requirements for UE Rx-Tx measurement for PDC | Huawei, HiSilicon | Merged | Merged to R4-2208822 |
| R4-2209615 | CR on correction for RTT-based PDC measurement requirements in 38.133 | Nokia, Nokia Shanghai Bell | Merged | Merged to R4-2208822 |
| R4-2208824 | Draft CR to TS 38.133: Introuduction of accuracy requirements for PDC | vivo | Merged | Merged toR4-2209641 |
|  |  |  |  |  |
| R4-2209642 | draftCR on test cases for RTT-based PDC UE Rx-Tx time difference measurement requirements | Nokia, Nokia Shanghai Bell | Postponed | Come back in next meeting |

--------------------------------------------------------------End--------------------------------------------------------------------------

##### 9.22.1.1 Propagation delay compensation enhancements

**R4-2208820 Remaining issues for PDC enhancement**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2208821 Updated simulation results for TRS based PDC**

*Type: discussion For: Information  
 Source: vivo*

**Decision: Noted.**

**R4-2208822 CR to TS 38.133 Correction to measurements requirements for PDC**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2338 rev Cat: F (Rel-17)  
  
 Source: vivo*

**Decision: Revised to R4-2211117 (from R4-2208822).**

**R4-2211117 CR to TS 38.133 Correction to measurements requirements for PDC**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2338 rev Cat: F (Rel-17)  
  
 Source: vivo*

**Decision: Agreed.**

**R4-2209235 On RRM requirements for PDC enhancements**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209236 CR on requirements for UE Rx-Tx measurement for PDC**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2368 rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Merged (with R4-2208822).**

**R4-2209506 Discussion of RRM Requirements for Propagation Delay Compensation Enhancements**

*Type: discussion For: (not specified)  
 Source: Nokia*

**Decision: Noted.**

**R4-2209615 CR on correction for RTT-based PDC measurement requirements in 38.133**

*Type: CR For: (not specified)  
 38.133 v17.5.0 CR-2385 rev Cat: F (Rel-17)  
  
 Source: Nokia*

**Decision: Merged (with R4-2208822).**

##### 9.22.1.2 Reference point for Te requirements

**R4-2208055 draftCR to clarify timing reference point for UE UL timing test cases**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Intel Corporation*

**Decision: Revised to R4-2211159 (from R4-2208055).**

**R4-2211159 draftCR to clarify timing reference point for UE UL timing test cases**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Intel Corporation*

**Decision: Endorsed.**

**R4-2208823 Discussion on performance requirements for PDC enhancement**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2208824 Draft CR to TS 38.133 Introduction of accuracy requirements for PDC**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: vivo*

**Decision: Merged (with R4-2209641).**

##### 9.22.1.3 Others

#### 9.22.2 RRM performance requirements

**R4-2208651 Simulation results for perfromance part of WI**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Simulation results related to UE Rx-Tx time difference using TRS for PDC.

**Decision: Revised to R4-2210434 (from R4-2208651).**

**R4-2210434 Simulation results for perfromance part of WI**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Simulation results related to UE Rx-Tx time difference using TRS for PDC.

**Decision: Noted.**

**R4-2208652 Scope of RRM tests and RMC for TRS**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Specification sections and contents for UE Rx-Tx time difference using TRS for PDC.

**Decision: Noted.**

**R4-2209237 Simulation results for TRS based PDC**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209238 Discussion on accuracy and TCs for PDC**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209519 Simulation Results for TRS measurement Accuracy**

*Type: discussion For: (not specified)  
 Source: Nokia*

**Decision: Noted.**

**R4-2209641 draftCR on UE Rx-Tx time difference measurement accuracy requirements for RTT-based PDC**

*Type: draftCR For: (not specified)  
 38.133 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Nokia*

**Decision: Revised to R4-2211118 (from R4-2209641).**

**R4-2211118 draftCR on UE Rx-Tx time difference measurement accuracy requirements for RTT-based PDC**

*Type: draftCR For: (not specified)  
 38.133 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Nokia*

**Decision: Endorsed.**

**R4-2209642 draftCR on test cases for RTT-based PDC UE Rx-Tx time difference measurement requirements**

*Type: draftCR For: Discussion  
 38.133 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Nokia*

**Decision: Postponed.**

**R4-2210226 On performance requirements for RTT-based propagation delay compensation**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

#### 9.22.3 Demodulation performance and CSI requirements

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**Email discussion for [103-e][330] NR\_IIOT\_URLLC\_enh\_Demod, AI 9.22.3-Mueller Axel**

**R4-2210336 Email discussion summary for [103-e][330] NR\_IIOT\_URLLC\_enh\_Demod**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210533 (from R4-2210336).**

**R4-2210533 Email discussion summary for [103-e][330] NR\_IIOT\_URLLC\_enh\_Demod**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210673 WF on enhanced IIoT and URLLC support demodulation and CSI requirements**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |
| --- | --- | --- | --- |
| **New Tdoc number** | **Title** | **Source** | **Status** |
| R4-2210673 | WF on enhanced IIoT and URLLC support demodulation and CSI requirements | Nokia, Nokia Shanghai Bell | Approved |

--------------------------------------------------------------End--------------------------------------------------------------------------

**R4-2209523 Sub-slot based PUCCH repetition performance requirements**

*Type: discussion For: (not specified)  
 Source: Nokia*

**Decision: Noted.**

**R4-2209850 Discussion on demodulation and CSI requirements for Rel-17 enhanced IIOT and URLLC support**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

### 9.23 NR Sidelink Relay

#### 9.23.1 RRM core requirement maintenance

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**Email discussion for [103-e][231] NR\_SL\_relay, AI 9.23-Roy Hu**

**R4-2210303 Email discussion summary for [103-e][231] NR\_SL\_relay**

*Type: other For: Information  
 Source: Moderator (OPPO)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210500(from R4-2210303).**

**R4-2210500 Email discussion summary for [103-e][231] NR\_SL\_relay**

*Type: other For: Information  
 Source: Moderator (OPPO)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210620 WF on SL relay test cases**

*Type: other For: Approval  
 Source: OPPO*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210620 | WF on SL relay test cases | OPPO | **Approved** |  |
| R4-2211119 | DraftCR on test cases of interruption requirements for NR sidelink relay | Huawei, Hisilicon | Endorsed |  |
| R4-2211120 | draft CR on test case for Selection/Reselection of relay UE | OPPO | Endorsed |  |
| R4-2208375 | CR to maintain Selection Reselection of relay UE in TS 38.133 | OPPO | Agreed |  |

--------------------------------------------------------------End--------------------------------------------------------------------------

**R4-2208375 CR to maintain Selection Reselection of relay UE in TS 38.133**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2317 rev Cat: F (Rel-17)  
  
 Source: OPPO*

**Decision: Agreed.**

#### 9.23.2 RRM performance requirements

**R4-2207741 SL relay test scope**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2208376 draft CR on test case for Selection/Reselection of relay UE**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: OPPO*

**Decision: Revised to R4-2211120 (from R4-2208376).**

**R4-2211120 draft CR on test case for Selection/Reselection of relay UE**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: OPPO*

**Decision: Endorsed.**

**R4-2209012 Discussion on RRM test cases for NR SL relay**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209013 DraftCR on test cases of interruption requirements for NR sidelink relay**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2211119 (from R4-2209013).**

**R4-2211119 DraftCR on test cases of interruption requirements for NR sidelink relay**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

### 9.24 NR small data transmissions in INACTIVE state

#### 9.24.1 RRM core requirement maintenance

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**Email discussion for [103-e][232] NR\_SmallData\_INACTIVE, AI 9.24-Aijun Cao**

**R4-2210304 Email discussion summary for [103-e][232] NR\_SmallData\_INACTIVE**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210501 (from R4-2210304).**

**R4-2210501 Email discussion summary for [103-e][232] NR\_SmallData\_INACTIVE**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**LS/WF**

**R4-2210621 LS on the feasibility of testing UE initiated SDT data transmission in RRC\_INACTIVE**

*Type: LS Out For: Approval*

*To: RAN5  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2210622 WF on RRM requirements for NR SDT in RRC\_INACTIVE mode**

*Type: other For: Approval  
 Source: ZTE*

**Abstract:**

**Discussion:**

**GTW discussion on May 19th**

**Issue 1-1: X1 value for FR2**

Agreement: Option 1 b agreed (Option 1b: max{480ms, 8\*SMTC periodicity})

**Issue 1-2-3: The time duration between T2 and the actual CG-SDT transmission is clarified with the following options:**

* Option 1: The maximum duration between T2 and the actual CG-SDT transmission is 640ms
* Option 2: UE shall perform a TA validation within X ms from T3, where X is CG-SDT periodicity
* Option 3: the UE shall not transmit in an CG-SDT occasion that occurs more than 640ms after T2
* Option 4: Update T2 definition as “T2 is referred to the time to the next CG-SDT occasion that follows in time based on the configured CG-SDT periodicity”
* Option 5: Use existing text updating 640 for Z at:
  + If at least one of RSRP1 and RSRP2 is considered to be invalid based on the above conditions, then the UE shall not validate the CG-SDT using RSRP1 and RSRP2 and shall not transmit using CG-SDT. Additionally, the UE shall not transmit in an CG-SDT occasion that occurs more than 640 ms after T2.

Agreements: Option 5

**Issue 1-4-6: In RAN4 understanding, for UE performing Rx beam sweeping, the UE should select the largest RSRP value from multiple measured samples from Rx beam sweeping for the same SSB to perform TA validation. Should this be captured into specs?**

* + Option 1: Yes
  + Option 2: No

Agreement: Further discuss in next meeting

**Issue 3-1-3: Since RAN2 refers to RAN4 specs, update the T1 definition in order to resolve inconsistency on the T1 definition between RAN2 and RAN4**

Agreement:

* When changing from RRC Connected to RRC Innactive, T1 whould be the time when RRCRelease with CG-SDT configuration ~~suspendConfig~~ is received
* If TAC command is received while in RRC Innactive, T1 is the time when the latest MAC CE TA command is received
* Further discuss below:
  + [If TAC command is not received while in RRC Innactive, T1 is the time when the latest RRCRelease is received]

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210621 | LS on the feasibility of testing UE initiated SDT data transmission in RRC\_INACTIVE | Ericsson | Approved |  |
| R4-2210622 | WF on RRM requirements for NR SDT in RRC\_INACTIVE mode | ZTE | Approved |  |
| R4-2211121 | CR on TA validation for Rel-17 NR SDT in INACTIVE sate | LG Electronics Inc. | Agreed |  |
| R4-2211122 | Draft reply LS to RAN2 on TA validation for CG-SDT | ZTE Wistron Telecom AB | Approved |  |
| R4-2211123 | Changes to SDT requirements | Ericsson | Agreed |  |
| R4-2211147 | CR on SDT RRM requirements | Huawei, Hisilicon | Agreed |  |
| [R4-2210115](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2210115.zip) | CR on RRM requirements NR SDT in INACTIVE state for NR-U | Qualcomm Incorporated | Not pursued |  |
| [R4-2209399](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2209399.zip) | CR update SDT RRM core requirements | Nokia, Nokia Shanghai Bell | Agreed |  |

--------------------------------------------------------------End--------------------------------------------------------------------------

**R4-2207776 On remaining issues for SDT requirement**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2208305 RSRP measurement reference for TA validation in NR small data transmissions**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2208307 CR on TA validation for Rel-17 NR SDT in INACTIVE sate**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2309 rev Cat: F (Rel-17)  
  
 Source: LG Electronics Inc.*

**Decision: Revised to R4-2211121 (from R4-2208307).**

**R4-2211121 CR on TA validation for Rel-17 NR SDT in INACTIVE sate**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2309 rev Cat: F (Rel-17)  
  
 Source: LG Electronics Inc.*

**Decision: Agreed.**

**R4-2208455 Further discussion on RRM requirements for CG-SDT**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Withdrawn.**

**R4-2209028 Remaining open issue for NR SDT**

*Type: discussion For: Agreement  
 Source: ZTE Wistron Telecom AB*

**Decision: Noted.**

**R4-2209029 Draft reply LS to RAN2 on TA validation for CG-SDT**

*Type: discussion For: Agreement  
 Source: ZTE Wistron Telecom AB*

**Decision: Revised to R4-2211122 (from R4-2209029).**

**R R4-2211122 Draft reply LS to RAN2 on TA validation for CG-SDT**

*Type: discussion For: Agreement  
 Source: ZTE Wistron Telecom AB*

**Decision: Approved.**

**R 4-2209239 Discussion on remaining issues for SDT RRM**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209240 CR on SDT RRM requirements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2369 rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2211147 (from R4-2209240).**

**R4-2211147 CR on SDT RRM requirements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2369 rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2209398 TA validation window requirements for CG-SDT**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2209399 CR update SDT RRM core requirements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2371 rev Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Agreed.**

**R4-2209899 Discussions on RRM requirements for Small Data Transmissions**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we provide an overview of the RRM requirements for CG-SDT that RAN4 needs to introduce.

**Decision: Noted.**

**R4-2209900 Changes to SDT requirements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2389 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR captures the RS-SDT requirements as well as applicability conditions of SDT requirements.raft CR to show our view on how to capture the TA validation requirements.

**Decision: Revised to R4-2211123 (from R4-2209900).**

**R4-2211123 Changes to SDT requirements**

*Type: CR For: Agreement  
 38.133 v17.5.0 CR-2389 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR captures the RS-SDT requirements as well as applicability conditions of SDT requirements.raft CR to show our view on how to capture the TA validation requirements.

**Decision: Agreed.**

**R4-2210111 Further discussion on RRM requirements for CG-SDT**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2210115 CR on RRM requirements NR SDT in INACTIVE state for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v17.5.0 CR- rev Cat: (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Not pursued.**

**R4-2210157 Discussion on the remaining issues for CG-SDT**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: MediaTek Inc.*

**Decision: Noted.**

#### 9.24.2 RRM performance requirements

**R4-2208456 RRM performance requirements for CG-SDT**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Withdrawn.**

**R4-2209030 RRM test cases for NR SDT**

*Type: discussion For: Agreement  
 Source: ZTE Wistron Telecom AB*

**Decision: Noted.**

**R4-2209241 Discussion on TCs for SDT**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209400 RRM performance requirements for SDT**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2209901 Discussions on RRM performance requirements for SDT**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss the performance requirements for SDT.

**Decision: Noted.**

**R4-2210112 RRM performance requirements for CG-SDT**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

## 10 Rel-17 Work Items for LTE

### R4-10.8 Additional enhancements for NB-IoT and LTE-MTC

#### 10.8.4 RRM core requirements maintenance

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**Email discussion for [103-e][233] NB\_IOTenh4\_LTE\_eMTC6\_RRM, AI 10.8.4,10.8.5-Zhongyi Shen**

**R4-2210305 Email discussion summary for [103-e][233] NB\_IOTenh4\_LTE\_eMTC6\_RRM**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210502 (from R4-2210305).**

**R4-2210502 Email discussion summary for [103-e][233] NB\_IOTenh4\_LTE\_eMTC6\_RRM**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210623 WF on RRM requirements for Rel-17 NB-IoT and LTE-MTC**

*Type: other For: Approval  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Issue 1-5-1-1: TBS for performance requirements definition for NPDSCH with 16QAM**

* Proposals
* Option 1 (Ericsson, Nokia): Use (ITBS, ISF) = (16, 5) which corresponds to TBS = 1928bits and effective code rate 0.51
* Option 2 (Huawei, Ericsson): Use (ITBS, ISF) = (21, 7) which corresponds to TBS = 4968bits and effective code rate 0.78

**Issue 1-5-2-2: Ideal SNR test point for CQI reporting test of NB-IOT**

* Proposals
* Option 1 (Ericsson, Nokia): 10/11dB
* Option 2 (Qualcomm, Nokia): 10.5/11.5dB

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210623 | WF on RRM requirements for Rel-17 NB-IoT and LTE-MTC | Huawei, HiSilicon | Approved |  |
| *R4-2211124* | CR on maintenance for NB-IoT R17 | Huawei, HiSilicon | Agreed |  |
| R4-2208955 | Draft CR on conditions for NB-IoT connected mode neighbour cell measurement R17 | Huawei, HiSilicon | Endorsed |  |

--------------------------------------------------------------End--------------------------------------------------------------------------

**R4-2208035 Open issues in core requirements for NB-IoT neighbor cell measurements in RRC\_CONNECTED**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2208952 Discussion on Maintenance for Rel-17 NB-IoT**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2208953 CR on maintenance for NB-IoT R17**

*Type: CR For: Agreement  
 36.133 v17.5.0 CR-7156 rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2211124 (from R4-2208953).**

**R4-2211124 CR on maintenance for NB-IoT R17**

*Type: CR For: Agreement  
 36.133 v17.5.0 CR-7156 rev Cat: F (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2209894 Discussions on remaining issues of RRM requirements for NB-IoT**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contriution we discuss the open issues of Rel-17 NB-IoT.

**Decision: Noted.**

#### 10.8.5 RRM performance requirements

**R4-2208954 Discussion on performance requirements for Rel-17 NB-IoT**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2208955 Draft CR on conditions for NB-IoT connected mode neighbour cell measurement R17**

*Type: draftCR For: Endorsement  
 36.133 v17.5.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2209895 Discussions on performance requirements for NB-IoT**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussions on performance requirements for NB-IoT.

**Decision: Noted.**

#### 10.8.6 Demodulation requirements

##### 10.8.6.1 General

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**Email discussion for [103-e][331] NB-IOT\_MTC\_Demod, AI 10.8.6-Tricia Li**

**R4-2210337 Email discussion summary for [103-e][331] NB-IOT\_MTC\_Demod**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210534 (from R4-2210337).**

**R4-2210534 Email discussion summary for [103-e][331] NB-IOT\_MTC\_Demod**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210674 WF on Rel-17 NB-IOT and eMTC performance requirements**

*Type: other For: Approval  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |
| --- | --- | --- | --- |
| **New Tdoc number** | **Title** | **Source** | **Status** |
| R4-2210674 | WF on Rel-17 NB-IOT and eMTC performance requirements | Huawei, HiSilicon | Approved |

--------------------------------------------------------------End--------------------------------------------------------------------------

**R4-2209841 Summary of simulation results for Rel-17 NB-IOT and eMTC performance requirements**

*Type: discussion For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 10.8.6.2 Demodulation requirements for NB-IoT

###### 10.8.6.2.1 UE demodulation requirements

**R4-2208034 On UE performance requirements for 16-QAM NB-IoT**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2209073 UE demodulation requirements for Rel-17 NB-IoT**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the open issues on Rel-17 NB-IoT UE demodulation and CQI reporting requirements.

**Decision: Noted.**

**R4-2209837 Discussion on NPDSCH performance requirements for Rel-17 NB-IOT**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2209838 Discussion on CQI reporting requirements for Rel-17 NB-IOT**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

###### 10.8.6.2.2 BS demodulation requirements

**R4-2208081 Discussion and simulation results for Rel-17 NB-IoT**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2209074 BS demodulation requirements for Rel-17 NB-IoT**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusees the open issues on Rel-17 NB-IoT BS demodulation requirements.

**Decision: Noted.**

**R4-2209713 Discussion on BS demodulation requirements for Additional enhancements for NB-IoT**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Discussion on BS demodulation requirements for NB-IoT 16QAM

**Decision: Noted.**

**R4-2209839 Discussion on NPUSCH format 1 requirements for Rel-17 NB-IOT**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 10.8.6.3 Demodulation requirements for MTC

**R4-2209075 UE demodulation requirements for Rel-17 LTE-MTC**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the open issues on Rel-17 eMTC UE demodulation requirements.

**Decision: Noted.**

**R4-2209840 Discussion on PDSCH requirements for Rel-17 eMTC**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

## 11 Rel-18 Study Items for NR

### 11.1 Study on enhanced test methods for FR2 in NR

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**Email discussion for [103-e][335] FR2\_enhTestMethods, AI 11.1-Aida Vera Lopez**

**R4-2210341 Email discussion summary for [103-e][335] FR2\_enhTestMethods**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210538 (from R4-2210341).**

**R4-2210538 Email discussion summary for [103-e][335] FR2\_enhTestMethods**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210680 WF on OTA test methods for 52.6~71GHz**

*Type: other For: Approval  
 Source:Intel*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**Conclusion after 2nd round**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Status** | **Comments** |
| R4-2210946 | Draft CR to 38.884 on finalizing the study outcomes | Apple | Endorsed |  |
| R4-2210680 | WF on OTA test methods for 52.6~71GHz | Intel Corporation | Approved |  |

--------------------------------------------------------------End--------------------------------------------------------------------------

**R4-2207691 Proposal to conclude the study on enhanced test methods for FR2 in NR**

*Type: discussion For: Decision  
 Source: Apple*

**Decision: Withdrawn.**

**R4-2207692 Draft CR to 38.884 on finalizing the study outcomes**

*Type: draftCR For: Endorsement  
 38.884 v18.0.0 CR- rev Cat: F (Rel-18)  
  
 Source: Apple*

**Decision: Revised to R4-2210946 (from R4-2207692).**

**R4-2210946 Draft CR to 38.884 on finalizing the study outcomes**

*Type: draftCR For: Endorsement  
 38.884 v18.0.0 CR- rev Cat: F (Rel-18)  
  
 Source: Apple*

**Decision: Endorsed.**

#### 11.1.1 Maintenance on objectives 1~6

#### 11.1.2 OTA test methods for UE RF, RRM and demodulation for 52.6~71GHz

##### 11.1.2.1 General

**R4-2210194 General aspects of test methods for 52.6~71GHz**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision:** The document was **withdrawn**.

**R4-2210212 General aspects of test methods for 52.6~71GHz**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

###### 11.1.2.1.1 Test system assumption

###### 11.1.2.1.2 UE types

###### 11.1.2.1.3 MU assessment

**R4-2207927 On FR2-2 Measurement Grids**

*Type: discussion For: Approval  
 Source: Keysight Technologies UK Ltd*

**Decision: Noted.**

###### 11.1.2.1.4 Others

##### 11.1.2.2 Test methodology for UE RF

##### 11.1.2.3 Test methodology for RRM

##### 11.1.2.4 Test methodology for UE demodulation and CSI

## 12 Rel-18 Work Items for LTE

## 13 Liaison and output to other groups

### 13.1 R17 related

#### 13.1.1 Coordination of R17 gap features (R2-2203879)

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**Email discussion for [103-e][234] LS\_reply, AI 13.1.1, 13.2.1-Jerry Cui**

**R4-2210306 Email discussion summary for [103-e][234] LS\_reply**

*Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2210503 (from R4-2210306).**

**R4-2210503 Email discussion summary for [103-e][234] LS\_reply**

*Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**WF/LS**

**R4-2210624 Reply LS on coordination of R17 gap features**

*Type: LS out For: Approval*

*To: RAN2 CC: RAN1  
 Source: MTK*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2210625 Reply LS on BWP operation without bandwidth restriction**

*Type: LS out For: Approval*

*To: RAN2 CC: RAN1  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Postponed.**

**R4-2210626 WF on R17 gap coordination and BWP operation without BW restriction**

*Type: Others For: Approval  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Revised**

**Conclusion after 2nd round**

|  |  |  |  |
| --- | --- | --- | --- |
| **New Tdoc number** | **Title** | **Source** | **Status** |
| R4-2210624 | Reply LS on coordination of R17 gap features | MediaTek | Approved |
| R4-2210625 | Reply LS on BWP operation without bandwidth restriction | Qualcomm | Postponed |
| R4-2210626 | WF on R17 gap coordination and BWP operation without BW restriction | Apple | Revised. |

**New tdocs**

--------------------------------------------------------------End--------------------------------------------------------------------------

**R4-2207761 On coordination of R17 gap features**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2208105 Discussion on the coordination of R17 gap features**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2208274 Discussion on coordination of R17 gap features**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2208303 Discussion on LS on coordination of R17 gap features**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2208377 Discussion on coordination of R17 gap features**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2209244 reply LS on coordination of R17 gap features**

*Type: LS out For: Approval  
 to RAN2, cc RAN1  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209452 Reply LS on gap coordination**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the reply LS for gap coordination

**Decision: Noted.**

### 13.2 R15, R16 related

#### 13.2.1 BWP operation without bandwidth restriction (R2-2204009)

**Refer to email discussion [103-e][234] LS\_reply**

**R4-2207760 On BWP operation without bandwidth restriction**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2208399 Reply LS On BWP operation without bandwidth restriction**

*Type: discussion For: Decision  
 Source: CMCC*

**Decision: Noted.**

**R4-2208736 Reply LS on BWP operation without bandwidth restriction**

*Type: LS out For: Approval  
 to RAN2, cc RAN1  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2209245 reply LS on BWP operation without bandwidth restriction**

*Type: LS out For: Approval  
 to RAN2, RAN1  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2209253 BWP operation without bandwidth restriction**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2209769 Discussion on incoming LS from other WGs**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2209916 Discussion of BWP operation without bandwidth restriction**

*Type: LS out For: Approval  
 to RAN2  
 Source: Ericsson*

**Abstract:**

Discussions and draft LS realted to RAN2 incoming LS related to BWP operation without bandwidth restriction.

**Decision: Noted.**

**R4-2208828 Reply LS on BWP operation without bandwidth restriction**

*Type: discussion For: Discussion  
 Source: vivo*

**Session Chair Note: Move to this AI from AI 4.1.5**

**Decision: Noted.**

## BACKUP

**R4-22AAAAA Email discussion summary for**

*Type: other For: Approval  
 Source: Xx*

**Abstract:**

**Discussion:**

**Decision: Return to.**