**Third Generation Partnership Project (3GPP™)**

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for  
TSG RAN WG4  
meeting: 98-e**

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## 1 Opening of the E-meeting

The Chairman Steven Chen (Apple) opened the meeting on RAN4 reflector on 25/01/2021.

**Intellectual Property Rights Policy**

The attention of the delegates to the meeting of this Technical Specification Group was drawn to the fact that 3GPP Individual Members have the obligation under the IPR Policies of their respective Organizational Partners to inform their respective Organizational Partners of Essential IPRs they become aware of.

The delegates were asked to take note that they were thereby invited:

- to investigate whether their organization or any other organization owns IPRs which were, or were likely to become Essential in respect of the work of 3GPP.

- to notify their respective Organizational Partners of all potential IPRs, e.g., for ETSI, by means of the IPR Information Statement and the Licensing declaration forms.

**Statement regarding competition law**

The attention of the delegates to the meeting was drawn to the fact that 3GPP activities were subject to all applicable antitrust and competition laws and that compliance with said laws was therefore required by any participant of the meeting, including the Chairman and ice-Chairmen and were invited to seek any clarification needed with their legal counsel. The leadership would conduct the present meeting with impartiality and in the interests of 3GPP. Delegates were reminded that timely submission of work items in advance of TSG/WG meetings was important to allow for full and fair consideration of such matters.

**Meeting Arrangements**

The meeting was conducted on three parallel sessions; Main session, RRM session and BS RF Test Demod session. The Main session was chaired by RAN4 Chairman Steven Chen (Apple), RRM session was chaired by RAN4 Vice Chairman Andrey Chervyakov (Intel) and BS RF Test Demod session was chaired by RAN4 Vice Chairman Haijie Qiu (Samsung). The sessions were further broken down into separate email threads to address specific technical topics lead by assigned discussion moderators. Webinar sessions were used to summarize progress, resolve controversial issues and decide way forward.

## 2 Approval of the agenda

## 3 Letters / reports from other groups / meetings

## 4 Rel-15 New radio access technology

### 4.7 RRM core requirements maintenance (38.133/36.133) [NR\_newRAT-Core]

================================================================================

**Email discussion: [98e][201] NR\_NewRAT\_RRM\_Core**

**R4-2103440 Email discussion summary: [98e][201] NR\_NewRAT\_RRM\_Core***Type: other For: Information  
Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103683 (from R4-2103440).**

**R4-2103683 Email discussion summary: [98e][201] NR\_NewRAT\_RRM\_Core***Type: other For: Information  
Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (January 29, 2021)

**Issue 1-1-2: Whether/how to count CSSF outside MG and CSSF within MG**

Discussion

Nokia: For Alt1/Alt2 we prefer Alt2. Not sure if merging in Alt1 works.

Apple: Support Alt1. Alt2 wording is unclear (capability part). To Nokia – MO configuration for the case of serving or non-serving cell cases.

Huawei: Alt1 and Alt2 are quite similar. Capability part in Alt2 is unclear. The merging conditions need to be discussed.

Nokia: we are quite aligned.

Agreements

* Option 2a: Remove the inter-RAT MOs counted in CSSF outside MG from CSSF within MG, and further discuss allowing existing implementations not to meet the updated requirements.
* CSSF calculation
  + CSSF outside MG
    - to consider merging of intra-frequency MO configured by NR SN and inter-RAT MO configured by LTE MN on the same serving frequency that are measured without MG, based on [MO merging conditions in clause 9.1.3.2 of 38.133].
  + CSSF within MG
    - to consider merging of two MOs configured by LTE MN and NR SN on the same frequency that are measured within MG, based on [MO merging conditions in clause 9.1.3.2 of 38.133].
  + Note: companies can further check the exact MO merging conditions
* Allow requirements relaxation for Rel-15 UEs to avoid compatibility issue
  + Option 1: “longer delays for cell identification and measurement periods derived based on CSSFwithin\_gap,i can be expected, if the UE is configured with inter-RAT MO on NR serving CC by E-UTRAN PCell in EN-DC mode”.

**Issue 1-2: MO merging related to SSB-ToMeasurement indications**

Discussion

MTK: This issue was already agreed in the last meeting. We just want to align the spec and copy it to another section. Union is a mathematical term here. To E///, this is applicable to DC and CA.

Nokia: suggest to clarify the union term (e.g. add a note)

E///: can we use the Component carrier or Serving cell terms in the CR rather than MO?

Session chair: Technical principle is agreeable. Work to address editorial comments.

**Issue 1-4: deactivated SCell measurement for intra-frequency measurement with MG**

Discussion

Huawei: For the scenario is without MG. Kp needs to be introduced. The idea is that the measurement on deactivated Scell will be longer than for the activated Scell.

QC: Agree with Huawei.

Apple: Agree with QC and Huawei

Nokia: Agree with principle. Not sure if Kp is the correct scaling factor.

Agreements

* Not to introduce the intra-frequency de-activated SCell measurement requirement with MG
* Introduce a scaling factor for intra-frequency deactivated SCell measurement requirements without gap when SMTC is partially overlapping with MG
  + Option 1: Scaling factor = Kp
  + Other options not precluded

**Issue 2-1-1: SSB outside the first active BWP**

Discussion

Huawei: To QC and NEC the intention is to clarify that the requirements will not apply for the case SSB is outside the first active BWP.

QC: SSB outside BWP is optional feature. UEs with such support should be able to satisfy the requirements

NEC: Is UE RF BW should be larger than the first active BWP?

QC: This capability does not explicitly imply this? UE can tune RF if needed. The main is that there should be no interruptions.

Huawei: UE may not necessarily use larger BW

Huawei: to QC – can UE with such feature do the measurements without MG? If we follow this logic then UE shall be able to support gapless measurements.

QC: this is not our intention.

E///: support QC.

Huawei: this is optional feature

HW/MTK/Apple: For UEs supporting “SSB outside BWP” some interruption may be needed

E///: UE can keep wider RF BW and interruptions are not needed

HW: this is relevant to the specific UE implementation. This is more like an optimization.

QC: need to double check if tentative agreement is acceptable

Tentative agreements

* Rel-15 SCell activation requirements, except those for SSB-less SCell, apply provided that the SSB of the to-be-activated SCell is within the first active DL BWP of the SCell.
* Further discussion can take place for Rel-16+ whether any differentiation of requirements for UEs supporting “SSB outside BWP” is needed.

**Issue 2-2-1: Condition and requirements for SSB-less SCell activation for FR1**

Discussion

Power imbalance

CMCC: why do we need power restriction? We don’t have it for FR2

Nokia: we think 6dB is ok. We encourage other companies to check with RF colleagues.

MTK: in FR2 we have same TX beam but in FR1 we don’t have such wording and we changed it to power and time difference

E///: 6dB is ok

CMCC: why 6dB is selected

MTK: 6dB is typical value for AGC control

Agreements

* Reception power difference with the contiguous active serving cell is smaller than or equal to 6dB
* RTD is smaller than or equal to 260ns

1st round email discussion conclusions

Issue 2-1-3: Determination of SSB offset

Agreement

* Add the following condition for SCell activation requirements for FR2
  + SSB is in the same half-frame on the SCell and the contiguous FR2 active serving cell

Issue 2-2-2: Condition and requirements for SSB-less SCell activation for FR2

Agreement

* If the SCell being activated belongs to FR2 and if there is at least one active serving cell on that FR2 band, if the UE supporting *scellWithoutSSB* is not provided with any SMTC for the target SCell, Tactivation\_time is 3 ms, provided

Issue 4-1: Applicability of RRC based BWP switch delay requirement in Rel-15

Agreement

* Wait for RAN2 reply LS before making further decisions on applicability of RRC based BWP switch delay requirement in Rel-15

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2100173 | Return to |
| R4-2102827 | Return to |
| R4-2102537 | Return to |
| R4-2102538 | Return to |
| R4-2101051 | Revised |
| R4-2101052 | Return to (Cat A CR for R4-2101051) |
| R4-2101053 | Return to (Cat A CR for R4-2101051) |
| R4-2100852 | Merged into the revised R4-2102738 |
| R4-2100853 | Withdrawn |
| R4-2102738 | Revised |
| R4-2102739 | Return to |
| R4-2102740 | Return to |
| R4-2101006 | Merged into potential revised R4-2102738. |
| R4-2101007 | Withdrawn |
| R4-2101008 | Withdrawn |
| R4-2101071 | Merged into potential revised R4-2102872. |
| R4-2101072 | Merged into potential revised R4-2102873 |
| R4-2102872 | Revised |
| R4-2102873 | Return to (Cat A to R4-2102872) |
| R4-2102874 | Return to (Cat A to R4-2102872) |
| R4-2101464 | Revised |
| R4-2101465 | Return to (Cat A to R4-2101464) |
| R4-2101466 | Return to (Cat A to R4-2101464) |
| R4-2101407 | Postponed |
| R4-2102731 | Return to |
| R4-2102732 | Return to (Cat A CR to R4-2102731) |
| R4-2102733 | Return to (Cat A CR to R4-2102731) |
| R4-2102734 | Agreed |
| R4-2102735 | Agreed |
| R4-2102736 | Agreed |

2nd round email discussion conclusions

Tdoc decisions

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| **Tdoc** | **Decision** |
| R4-2103729 | Endorsed. |
| R4-2102827 | Merged in to R4-2103729 |
| R4-2102537 | Withdrawn (Cat A CR for R4-2102827) |
| R4-2102538 | Withdrawn (Cat A CR for R4-2102827) |
| R4-2103481 | Agreed |
| R4-2101052 | Agreed (Cat A CR for R4-2103481) |
| R4-2101053 | Agreed (Cat A CR for R4-2103481) |
| R4-2100852 | Merged into the revised R4-2102738 |
| R4-2100853 | Withdrawn |
| R4-2103482 | Agreed |
| R4-2102739 | Agreed (Cat A CR for R4-2103482) |
| R4-2102740 | Agreed (Cat A CR for R4-2103482) |
| R4-2104043 | Revised |
| R4-2101007 | Return to (Cat A CR for R4-2104043) |
| R4-2101008 | Return to (Cat A CR for R4-2104043) |
| R4-2103483 | Withdrawn (revised from R4-2102872) |
| R4-2102872 | Postponed |
| R4-2102873 | Withdrawn (Cat A to R4-2102872) |
| R4-2102874 | Withdrawn (Cat A to R4-2102872) |
| R4-2103484 | Agreed. |
| R4-2101465 | Agreed (Cat A to R4-2101464) |
| R4-2101466 | Agreed (Cat A to R4-2101464) |
| R4-2104044 | Agreed |
| R4-2102732 | Agreed (Cat A CR to R4-2104044) |
| R4-2102733 | Agreed (Cat A CR to R4-2104044) |
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**R4-2100172 Further discussion on CSSF for R15 EN-DC**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100173 CR on CSSF for EN-DC R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1438 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103729 (from R4-2100173).**

**R4-2103729 CR on CSSF for EN-DC R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1438 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

Nokia: need to continue discussion

E///: support Nokia view

**Decision: Postponed.**

**R4-2100174 On SSB-less SCell activation**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100175 CR on FR2 SCell activation requirement R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1439 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2100176 CR on FR2 SCell activation requirement R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1440 Cat: A (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100177 CR on FR2 SCell activation requirement R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1441 Cat: A (Rel-17)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100178 CR on smtc1 and smtc2 differentiation in intra-frequency measurement with MG R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1442 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2100179 CR on smtc1 and smtc2 differentiation in intra-frequency measurement with MG R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1443 Cat: A (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100180 CR on smtc1 and smtc2 differentiation in intra-frequency measurement with MG R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1444 Cat: A (Rel-17)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100233 Interruption requirements due to measurement on SCC in NR-DC (R15)**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1463 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2100851 Discussion on deactivated SCell measurement for intra-frequency measurement with measurement gap**

*Type: discussion For: Approval  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100852 CR on deactivated SCell measurement for intra-frequency measurement with measurement gap**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1528 Cat: F (Rel-15)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2100853 CR on deactivated SCell measurement for intra-frequency measurement with measurement gap**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1529 Cat: A (Rel-16)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101006 CR on Scell activation delay maintenance (R15)**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1537 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104043 (from R4-2101006).**

**R4-2104043 CR on Scell activation delay maintenance (R15)**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1537 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104084 (from R4-2104043).**

**R4-2104084 CR on Scell activation delay maintenance (R15)**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1537 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101007 CR on Scell activation delay maintenance (R16)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1538 Cat: A (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101008 CR on Scell activation delay maintenance (R17)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1539 Cat: A (Rel-17)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101050 Remaining issues on RRM in R15**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101051 CR on R15 remaining issues**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1548 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103481 (from R4-2101051).**

**R4-2103481 CR on R15 remaining issues**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1548 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101052 CR on R15 remaining issues**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1549 Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101053 CR on R15 remaining issues**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1550 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101071 CR on SSB less SCell activation for FR1 for Rel-15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1553 Cat: F (Rel-15)  
  
 Source: NEC*

**Abstract:**

SSB less SCell activation for FR1 is supported in Rel-15 from RAN1/RAN2 perspective. However the requirements for the same are missing in TS 38.133.

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2101072 CR on SSB less SCell activation for FR1 for Rel-16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1554 Cat: F (Rel-16)  
  
 Source: NEC*

**Abstract:**

SSB less SCell activation for FR1 is supported in Rel-16 from RAN1/RAN2 perspective. However the requirements for the same are missing in TS 38.133.

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2101407 Discussion on RRC based BWP switching**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2101464 CR on the filter for beam failure indications in 38.133**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1605 Cat: F (Rel-15)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103484 (from R4-2101464).**

**R4-2103484 CR on the filter for beam failure indications in 38.133**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1605 Cat: F (Rel-15)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101465 CR on the filter for beam failure indications in 38.133**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1606 Cat: A (Rel-16)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101466 CR on the filter for beam failure indications in 38.133**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1607 Cat: A (Rel-17)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102536 On correction to inter-RAT CSSF**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On correction to inter-RAT CSSF

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102731 CR to remove intra-frequency ECID requirements for NE-DC 36133 R15**

*Type: CR For: Agreement  
 36.133 v15.12.0 CR-7058 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104044 (from R4-2102731).**

**R4-2104044 CR to remove intra-frequency ECID requirements for NE-DC 36133 R15**

*Type: CR For: Agreement  
 36.133 v15.12.0 CR-7058 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102732 CR to remove intra-frequency ECID requirements for NE-DC 36133 R16**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7059 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102733 CR to remove intra-frequency ECID requirements for NE-DC 36133 R17**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7060 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102734 CR to idle more requirements in 36133 R15**

*Type: CR For: Agreement  
 36.133 v15.12.0 CR-7061 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102735 CR to idle more requirements in 36133 R16**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7062 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102736 CR to idle more requirements in 36133 R17**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7063 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102737 Discussion on CSSF for inter-RAT measurement, SCell activation delay and cell identification requirements on deactivated SCell in Rel-15**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102738 CR on SCell activation delay, cell idenfication requirements on deactivated SCell and inter-RAT ECID requirements for NE-DC R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1752 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103482 (from R4-2102738).**

**R4-2103482 CR on SCell activation delay, cell idenfication requirements on deactivated SCell and inter-RAT ECID requirements for NE-DC R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1752 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104090 (from R4-2103482).**

**R4-2104090 CR on SCell activation delay, cell idenfication requirements on deactivated SCell and inter-RAT ECID requirements for NE-DC R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1752 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102739 CR on SCell activation delay, cell idenfication requirements on deactivated SCell and inter-RAT ECID requirements for NE-DC R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1753 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102740 CR on SCell activation delay, cell idenfication requirements on deactivated SCell and inter-RAT ECID requirements for NE-DC R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1754 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102827 Correction to inter-RAT CSSF**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1775 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Correction to inter-RAT CSSF

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2102537 Correction to inter-RAT CSSF**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1728 Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Correction to inter-RAT CSSF

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102538 Correction to inter-RAT CSSF**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1729 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Correction to inter-RAT CSSF

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102872 Cat-F CR to SSB-less SCell activation delay requirement for deactivated FR1 SCell in Rel-15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1776 Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2103483 Cat-F CR to SSB-less SCell activation delay requirement for deactivated FR1 SCell in Rel-15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1776 Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102873 Cat-A CR to SSB-less SCell activation delay requirement for deactivated FR1 SCell in Rel-16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1777 Cat: A (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102874 Cat-A CR to SSB-less SCell activation delay requirement for deactivated FR1 SCell in Rel-17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1778 Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

### 4.8 RRM perf. requirements maintenance (38.133/36.133) [NR\_newRAT-Perf]

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**Email discussion: [98e][202] NR\_NewRAT\_RRM\_Perf**

**R4-2103441 Email discussion summary: [98e][202] NR\_NewRAT\_RRM\_Perf***Type: other For: Information  
Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103684 (from R4-2103441).**

**R4-2103684 Email discussion summary: [98e][202] NR\_NewRAT\_RRM\_Perf***Type: other For: Information  
Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2100058 | Revised |
| R4-2100068 | Revised |
| R4-2100072 | Agreed |
| R4-2100073 | Agreed |
| R4-2100075 | Agreed |
| R4-2100078 | Agreed |
| R4-2100479 | Agreed |
| R4-2100601 | Agreed |
| R4-2100602 | Agreed |
| R4-2100603 | Agreed |
| R4-2100760 | Agreed |
| R4-2100763 | Return to |
| R4-2102878 | Not pursued |
| R4-2100766 | Agreed |
| R4-2101047 | Agreed |
| R4-2101161 | Revised |
| R4-2101164 | Revised |
| R4-2101167 | Revised |
| R4-2101170 | Revised |
| R4-2101612 | Agreed |
| R4-2101615 | Agreed |
| R4-2101618 | Revised |
| R4-2101621 | Revised |
| R4-2101661 | Revised |
| R4-2101664 | Revised |
| R4-2101701 | Revised |
| R4-2101704 | Return to |
| R4-2102306 | Return to |
| R4-2102309 | Revised |
| R4-2102726 | Agreed |
| R4-2102741 | Revised |
| R4-2102869 | Return to |
| R4-2102875 | Revised |
| R4-2100067 | Return to (background paper) |
| R4-2100071 | Return to (background paper) |
| R4-2101660 | Noted (background paper) |

2nd round email discussion conclusions

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103485 | Agreed |
| R4-2103486 | Agreed |
| R4-2104049 | Agreed |
| R4-2103487 | Agreed |
| R4-2103488 | Revised |
| R4-2103489 | Agreed |
| R4-2103490 | Withdrawn |
| R4-2104065 | Agreed |
| R4-2103492 | Agreed |
| R4-2103493 | Agreed |
| R4-2103494 | Agreed |
| R4-2103495 | Agreed |
| R4-2101704 | Noted |
| R4-2102306 | Revised |
| R4-2103496 | Agreed |
| R4-2103497 | Agreed |
| R4-2102869 | Agreed |
| R4-2103498 | Return to |
| R4-2100067 | Noted |
| R4-2100071 | Noted |

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**R4-2100058 [CR] RRM test case maintenance R15 Cat F**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1416 Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Abstract:**

R15 Cat F CR to fix some errors existing in the test cases.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103485 (from R4-2100058).**

**R4-2103485 [CR] RRM test case maintenance R15 Cat F**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1416 Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Abstract:**

R15 Cat F CR to fix some errors existing in the test cases.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100059 [CR] RRM test case maintenance R16 Cat A**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1417 Cat: A (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

Cat A CR for R16

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100060 [CR] RRM test case maintenance R17 Cat A**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1418 Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Abstract:**

Cat A CR for R17

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100067 FR2 PDSCH Reference channel and OCNG for RRM Test cases**

*Type: discussion For: Endorsement  
 Source: ANRITSU LTD*

**Abstract:**

The downlink dB range for RRM Test cases is very restricted where signals arrive from the UE Spherical coverage direction, and there is not enough range to implement FR2 RRM Spherical Coverage test cases as currently written. The range can be increased by

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100068 Update FR2 Reference channels and OCNG for FR2 RRM Test cases**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1422 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

Define new PDSCH Reference Measurement Channels occupying the same PRBs as the CORESET, 24RB and 48RB. Define new RMSI CORESET Reference Channel and Control Channel RMC with 48RBs allowing use with 240kHz SSB SCS Test cases.

Update OCNG pattern OP.3 to co

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103486 (from R4-2100068).**

**R4-2103486 Update FR2 Reference channels and OCNG for FR2 RRM Test cases**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1422 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

Define new PDSCH Reference Measurement Channels occupying the same PRBs as the CORESET, 24RB and 48RB. Define new RMSI CORESET Reference Channel and Control Channel RMC with 48RBs allowing use with 240kHz SSB SCS Test cases.

Update OCNG pattern OP.3 to co

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100069 Update FR2 Reference channels and OCNG for FR2 RRM Test cases**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1423 Cat: A (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

Define new PDSCH Reference Measurement Channels occupying the same PRBs as the CORESET, 24RB and 48RB. Define new RMSI CORESET Reference Channel and Control Channel RMC with 48RBs allowing use with 240kHz SSB SCS Test cases.

Update OCNG pattern OP.3 to co

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100070 Update FR2 Reference channels and OCNG for FR2 RRM Test cases**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1424 Cat: A (Rel-17)  
  
 Source: ANRITSU LTD*

**Abstract:**

Define new PDSCH Reference Measurement Channels occupying the same PRBs as the CORESET, 24RB and 48RB. Define new RMSI CORESET Reference Channel and Control Channel RMC with 48RBs allowing use with 240kHz SSB SCS Test cases.

Update OCNG pattern OP.3 to co

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100071 FR2 Reference channels for RRM Test cases with 240kHz SSB SCS**

*Type: discussion For: Endorsement  
 Source: ANRITSU LTD*

**Abstract:**

Some FR2 RRM Test cases in Annex A of TS 38.133 specify a configuration with 240kHz SSB SCS.

RRM test case configurations using 240kHz SSB SCS need different Reference channels which are not currently specified in TS 38.133. This Tdoc identifies new Refer

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100072 CR to FR1 SA SS-SINR measurement TCs**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1425 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

Update Test Parameters table format to show that TRS config is only for Cell 1

Update Table A.6.7.3.2.2-2 to include gap configuration, Gap pattern ID = 0

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100073 CR to FR1 SA SS-SINR measurement TCs**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1426 Cat: F (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

Update Test Parameters table format to show that TRS config is only for Cell 1

Align SMTC configuration in Table A.6.7.3.1.2-2 with Rel-15 spec.

Update Table A.6.7.3.1.2-2 to include Time offset with Cell 1.

Update Table A.6.7.3.2.2-2 to include gap confi

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100074 CR to FR1 SA SS-SINR measurement TCs**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1427 Cat: A (Rel-17)  
  
 Source: ANRITSU LTD*

**Abstract:**

Update Test Parameters table format to show that TRS config is only for Cell 1

Align SMTC configuration in Table A.6.7.3.1.2-2 with Rel-15 spec.

Update Table A.6.7.3.1.2-2 to include Time offset with Cell 1.

Update Table A.6.7.3.2.2-2 to include gap confi

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100075 CR on E-UTRA carrier for EN-DC event triggered reporting tests**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1428 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

Remove “TDD” comment to allow LTE FDD configurations to be tested.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100076 CR on E-UTRA carrier for EN-DC event triggered reporting tests**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1429 Cat: A (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

Remove “TDD” comment to allow LTE FDD configurations to be tested.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100077 CR on E-UTRA carrier for EN-DC event triggered reporting tests**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1430 Cat: A (Rel-17)  
  
 Source: ANRITSU LTD*

**Abstract:**

Remove “TDD” comment to allow LTE FDD configurations to be tested.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100078 Add missing FR2 Test case setups and Beam assumptions**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1431 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

Specify setup 1 for FR2 Handover and RRC Connection Release/Redirection and add missing Control Channel RMC.

Reduce allocated RBs to 24 for Inter-RAT event triggered reporting test case A.8.4.2.5 and apply Es only.

Specify setup 1 for Inter-RAT event trig

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100079 Add missing FR2 Test case setups and Beam assumptions**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1432 Cat: A (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

Specify setup 1 for FR2 Handover and RRC Connection Release/Redirection and add missing Control Channel RMC.

Reduce allocated RBs to 24 for Inter-RAT event triggered reporting test case A.8.4.2.5 and apply Es only.

Specify setup 1 for Inter-RAT event trig

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100080 Add missing FR2 Test case setups and Beam assumptions**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1433 Cat: A (Rel-17)  
  
 Source: ANRITSU LTD*

**Abstract:**

Specify setup 1 for FR2 Handover and RRC Connection Release/Redirection and add missing Control Channel RMC.

Reduce allocated RBs to 24 for Inter-RAT event triggered reporting test case A.8.4.2.5 and apply Es only.

Specify setup 1 for Inter-RAT event trig

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100479 Correction to cell reselection test case**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1494 Cat: F (Rel-15)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100480 Correction to cell reselection test case**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1495 Cat: A (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100481 Correction to cell reselection test case**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1496 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100601 Update of DRX configuration in FR1 Event-triggered Test cases**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1503 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

Update DRX configuration to avoid problem with time alignment timer expiry.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100602 Update of DRX configuration in FR1 Event-triggered Test cases**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1504 Cat: F (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

Update DRX configuration to avoid problem with time alignment timer expiry.

This CR is Cat F because Rel-16 includes test cases A.4.6.1.7 and A.6.6.1.7 in addition to those in Rel-15.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100603 Update of DRX configuration in FR1 Event-triggered Test cases**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1505 Cat: F (Rel-17)  
  
 Source: ANRITSU LTD*

**Abstract:**

Update DRX configuration to avoid problem with time alignment timer expiry.

This CR is Cat F because Rel-17 includes test cases A.4.6.1.7 and A.6.6.1.7 in addition to those in Rel-15, and the whole test case A.6.6.1.7 was missing.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100760 Correction on PRACH configuration for FR2 Non-Contention based Random Access in R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1512 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100761 Correction on PRACH configuration for FR2 Non-Contention based Random Access in R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1513 Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100762 Correction on PRACH configuration for FR2 Non-Contention based Random Access in R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1514 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100763 Correction on PRACH configuration for Beam Failure Detection and Link Recovery Test in R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1515 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104049 (from R4-2100763).**

**R4-2104049 Correction on PRACH configuration for Beam Failure Detection and Link Recovery Test in R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1515 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100764 Correction on PRACH configuration for Beam Failure Detection and Link Recovery Test in R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1516 Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100765 Correction on PRACH configuration for Beam Failure Detection and Link Recovery Test in R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1517 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100766 Correction on PRACH RMC for FR1 CSI-RS based Non-Contention based Random Access for BFR in R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1518 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100767 Correction on PRACH RMC for FR1 CSI-RS based Non-Contention based Random Access for BFR in R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1519 Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100768 Correction on PRACH RMC for FR1 CSI-RS based Non-Contention based Random Access for BFR in R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1520 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101047 CR for test requirements correction of SA event triggered reporting tests for FR1 inter-frequency measurements with SSB time index detection when DRX is used**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1545 Cat: F (Rel-15)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101048 CR for test requirements correction of SA event triggered reporting tests for FR1 inter-frequency measurements with SSB time index detection when DRX is used**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1546 Cat: A (Rel-16)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101049 CR for test requirements correction of SA event triggered reporting tests for FR1 inter-frequency measurements with SSB time index detection when DRX is used**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1547 Cat: A (Rel-17)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101161 Correction on the power of the first preamble for random access in EN-DC and SA in R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1563 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103487 (from R4-2101161).**

**R4-2103487 Correction on the power of the first preamble for random access in EN-DC and SA in R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1563 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101162 Correction on the power of the first preamble for random access in EN-DC and SA in R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1564 Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101163 Correction on the power of the first preamble for random access in EN-DC and SA in R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1565 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101164 Correction on the time for Scell activation and CSI-report in R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1566 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103488 (from R4-2101164).**

**R4-2103488 Correction on the time for Scell activation and CSI-report in R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1566 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104082 (from R4-2103488).**

**R4-2104082 Correction on the time for Scell activation and CSI-report in R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1566 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101165 Correction on the time for Scell activation and CSI-report in R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1567 Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101166 Correction on the time for Scell activation and CSI-report in R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1568 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101167 Correction on the Noc level in TS38.133 in R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1569 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103489 (from R4-2101167).**

**R4-2103489 Correction on the Noc level in TS38.133 in R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1569 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101168 Correction on the Noc level in TS38.133 in R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1570 Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101169 Correction on the Noc level in TS38.133 in R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1571 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101170 Correction on the SS-RSRP difference value for SS-RSRP measurement TC in R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1572 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2103490 Correction on the SS-RSRP difference value for SS-RSRP measurement TC in R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1572 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101171 Correction on the SS-RSRP difference value for SS-RSRP measurement TC in R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1573 Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101172 Correction on the SS-RSRP difference value for SS-RSRP measurement TC in R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1574 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101612 Correction to Aperiodic CSI-RS configurations R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1614 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101613 Correction to Aperiodic CSI-RS configurations R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1615 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101614 Correction to Aperiodic CSI-RS configurations R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1616 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101615 Correction to radio link monitoring test cases R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1617 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101616 Correction to radio link monitoring test cases R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1618 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101617 Correction to radio link monitoring test cases R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1619 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101618 Correction to beam failure recovery test cases R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1620 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103491 (from R4-2101618).**

**R4-2103491 Correction to beam failure recovery test cases R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1620 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104065 (from R4-2103491).**

**R4-2104065 Correction to beam failure recovery test cases R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1620 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101619 Correction to beam failure recovery test cases R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1621 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101620 Correction to beam failure recovery test cases R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1622 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101621 Correction to L1-RSRP reporting delay test cases R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1623 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103492 (from R4-2101621).**

**R4-2103492 Correction to L1-RSRP reporting delay test cases R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1623 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101622 Correction to L1-RSRP reporting delay test cases R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1624 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101623 Correction to L1-RSRP reporting delay test cases R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1625 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101660 Discussion on antenna configurations for 4Rx capable UE**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101661 CR on maintaining Antenna configurations in TS38.133 R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1634 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

Session chair: Cover sheet issue (What is the work item? It reads NR\_newRAT-Perf on the cover page but the Tdoc is reserved for NR\_RRM\_enh-Perf.) Please inform MCC on correct WI code. The correct WI code shall be NR\_newRAT-Perf.

**Decision: Revised to R4-2103493 (from R4-2101661).**

**R4-2103493 CR on maintaining Antenna configurations in TS38.133 R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1634 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104056 (from R4-2103493).**

**R4-2104056 CR on maintaining Antenna configurations in TS38.133 R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1634 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101662 CR on maintaining Antenna configurations in TS38.133 R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1635 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101663 CR on maintaining Antenna configurations in TS38.133 R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1636 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101664 CR on test requirements for measurement performance tests R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1637 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

Session chair: Cover sheet issue (What is the work item? It reads NR\_newRAT-Perf on the cover page but the Tdoc is reserved for NR\_RRM\_enh-Perf.) Please inform MCC on correct WI code. The correct WI code shall be NR\_newRAT-Perf.

**Decision: Revised to R4-2103494 (from R4-2101664).**

**R4-2103494 CR on test requirements for measurement performance tests R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1637 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101665 CR on test requirements for measurement performance tests R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1638 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101666 CR on test requirements for measurement performance tests R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1639 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101701 Correction on test cases of inter-frequency Measurements R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1653 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103495 (from R4-2101701).**

**R4-2103495 Correction on test cases of inter-frequency Measurements R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1653 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101702 Correction on test cases of inter-frequency Measurements R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1654 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101703 Correction on test cases of inter-frequency Measurements R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1655 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101704 Correction on NR Pcell FR2 active TCI state switching R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1656 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2101705 Correction on NR Pcell FR2 active TCI state switching R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1657 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101706 Correction on NR Pcell FR2 active TCI state switching R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1658 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102306 CR to TS 38.133: Redundant and incorrect TCI state in tests with TRS (Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1712 Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104054 (from R4-2102306).**

**R4-2104054 CR to TS 38.133: Redundant and incorrect TCI state in tests with TRS (Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1712 Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102307 CR to TS 38.133: Redundant and incorrect TCI state in tests with TRS (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1713 Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102308 CR to TS 38.133: Redundant and incorrect TCI state in tests with TRS (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1714 Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102309 CR to TS 38.133: Corrections to TC A.4.5.7.1 (Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1715 Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103496 (from R4-2102309).**

**R4-2103496 CR to TS 38.133: Corrections to TC A.4.5.7.1 (Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1715 Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102310 CR to TS 38.133: Corrections to TC A.4.5.7.1 (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1716 Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102311 CR to TS 38.133: Corrections to TC A.4.5.7.1 (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1717 Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102726 CR on test cases for inter-RAT measurement r15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1749 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102727 CR on test cases for inter-RAT measurement r16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1750 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102728 CR on test cases for inter-RAT measurement r17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1751 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102741 CR on SCell activation TCs R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1755 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103497 (from R4-2102741).**

**R4-2103497 CR on SCell activation TCs R15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1755 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102742 CR on SCell activation TCs R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1756 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102743 CR on SCell activation TCs R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1757 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102869 CR on correcting SSB and RACH configuration in CSI-RS based beam failure detection and link recovery tests**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1404 rev 1 Cat: F (Rel-15)  
  
 Source: Qualcomm CDMA Technologies*

(Replaces R4-2017048)

**Abstract:**

R4-2017048 was endorsed but returned due to a formatting issue. Resubmission to 98e.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102905 CR on correcting SSB and RACH configuration in CSI-RS based beam failure detection and link recovery tests**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1789 Cat: A (Rel-16)  
  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Mirror CR for CR 1404 in R4-2102869

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102908 CR on correcting SSB and RACH configuration in CSI-RS based beam failure detection and link recovery tests**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1790 Cat: A (Rel-17)  
  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Mirror CR of CR 1404 in R4-2102869

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102875 Cat-F CR to addition of TRS Configurations in Rel-15 Test Cases**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1779 Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103498 (from R4-2102875).**

**R4-2103498 Cat-F CR to addition of TRS Configurations in Rel-15 Test Cases**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1779 Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104086 (from R4-2103498).**

**R4-2104086 Cat-F CR to addition of TRS Configurations in Rel-15 Test Cases**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1779 Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102876 Cat-A CR to addition of TRS Configurations in Rel-16 Test Cases**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1780 Cat: A (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102877 Cat-A CR to addition of TRS Configurations in Rel-17 Test Cases**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1781 Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102878 Cat-F CR to DRX Configurations in Rel-15**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1782 Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

**R4-2102879 Cat-A CR to DRX Configurations in Rel-16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1783 Cat: A (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102880 Cat-A CR to DRX Configurations in Rel-17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1784 Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

## 5 LTE maintenance (up to Rel15) [WI code or TEI]

### 5.3 RRM requirements [WI code or TEI]

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**Email discussion: [98e][203] LTE\_RRM\_maintenance**

**R4-2103442 Email discussion summary: [98e][203] LTE\_RRM\_maintenance***Type: other For: Information  
Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103685 (from R4-2103442).**

**R4-2103685 Email discussion summary: [98e][203] LTE\_RRM\_maintenance***Type: other For: Information  
Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2100457 | Noted (merged with other CR on related topic based on comments) |
| R4-2100458 (cat-A) | Withdrawn |
| R4-2100459 (cat-A) | Withdrawn |
| R4-2101453 | Revised |
| R4-2101454 | Revised |
| R4-2101455 (cat-A) | Return to |
| R4-2101456 (cat-A) | Return to |
| R4-2102348 | Agreed |
| R4-2102349 (cat-A) | Agreed |
| R4-2102350 (cat-A) | Agreed |
| R4-2102693 | Revised |
| R4-2102694 (cat-A) | Return to |
| R4-2102695 (cat-A) | Return to |
| R4-2102696 | Revised |
| R4-2102697 (cat-A) | Return to |
| R4-2102698 (cat-A) | Return to |
| R4-2102699 | Return to |
| R4-2102804 | Revised |
| R4-2102805 | Return to |
| R4-2102806 | Return to |
| R4-2102807 | Revised |
| R4-2102808 (cat-A) | Return to |
| R4-2102809 (cat-A) | Return to |
| R4-2102248 | Agreed |
| R4-2102249 | Agreed |

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103499 | Agreed |
| R4-2103500 | Agreed |
| R4-2101455 (cat-A) | Agreed |
| R4-2101456 (cat-A) | Agreed |
| R4-2103501 | Agreed |
| R4-2102694 (cat-A) | Agreed |
| R4-2102695 (cat-A) | Agreed |
| R4-2103502 | Agreed |
| R4-2102697 (cat-A) | Agreed |
| R4-2102698 (cat-A) | Agreed |
| R4-2102699 (cat-A) | Agreed |
| R4-2104072 | Agreed |
| R4-2102805 (cat-A) | Agreed |
| R4-2102806 (cat-A) | Agreed |
| R4-2103504 | Agreed |
| R4-2102808 (cat-A) | Agreed |
| R4-2102809 (cat-A) | Agreed |

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**R4-2100457 CR on NCSG in 36.133**

*Type: CR For: Agreement  
 36.133 v15.12.0 CR-7013 Cat: F (Rel-15)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2100458 CR on NCSG in 36.133**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7014 Cat: A (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100459 CR on NCSG in 36.133**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7015 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100813 CR for test requirements correction of SA event triggered reporting tests for FR1 inter-frequency measurements with SSB time index detection when DRX is used**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1523 Cat: F (Rel-15)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100814 CR for test requirements correction of SA event triggered reporting tests for FR1 inter-frequency measurements with SSB time index detection when DRX is used**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1524 Cat: F (Rel-16)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100815 CR for test requirements correction of SA event triggered reporting tests for FR1 inter-frequency measurements with SSB time index detection when DRX is used**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1525 Cat: F (Rel-17)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100873 CR for test requirements correction of SA event triggered reporting tests for FR1 inter-frequency measurements with SSB time index detection when DRX is used**

*Type: CR For: Agreement  
 38.133 v15.12.0 CR-1530 Cat: F (Rel-15)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100874 CR for test requirements correction of SA event triggered reporting tests for FR1 inter-frequency measurements with SSB time index detection when DRX is used**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1531 Cat: A (Rel-16)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100875 CR for test requirements correction of SA event triggered reporting tests for FR1 inter-frequency measurements with SSB time index detection when DRX is used**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1532 Cat: A (Rel-17)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101453 CR: Correction of eMTC RLM test cases (Rel-14)**

*Type: CR For: Agreement  
 36.133 v14.17.0 CR-7019 Cat: F (Rel-14)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects TBD and removes [] from Rel-14 eMTC early-OOS/early-IS tests.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103499 (from R4-2101453).**

**R4-2103499 CR: Correction of eMTC RLM test cases (Rel-14)**

*Type: CR For: Agreement  
 36.133 v14.17.0 CR-7019 Cat: F (Rel-14)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects TBD and removes [] from Rel-14 eMTC early-OOS/early-IS tests.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101454 CR: Correction of eMTC RLM test cases**

*Type: CR For: Agreement  
 36.133 v15.12.0 CR-7020 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects TBD and removes [] from Rel-14 eMTC early-OOS/early-IS tests.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103500 (from R4-2101454).**

**R4-2103500 CR: Correction of eMTC RLM test cases**

*Type: CR For: Agreement  
 36.133 v15.12.0 CR-7020 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects TBD and removes [] from Rel-14 eMTC early-OOS/early-IS tests.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101455 CR: Correction of eMTC RLM test cases**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7021 Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects TBD and removes [] from Rel-14 eMTC early-OOS/early-IS tests.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101456 CR: Correction of eMTC RLM test cases**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7022 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects TBD and removes [] from Rel-14 eMTC early-OOS/early-IS tests.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102348 CR 36.133 (A.8.16.106) Correction of test case for direct SCell activation at addition**

*Type: CR For: Agreement  
 36.133 v15.12.0 CR-7038 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Addressing a missing MG configuration

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102349 CR 36.133 (A.8.16.106) Correction of test case for direct SCell activation at addition**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7039 Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Addressing a missing MG configuration

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102350 CR 36.133 (A.8.16.106) Correction of test case for direct SCell activation at addition**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7040 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Addressing a missing MG configuration

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102693 Correction to applicability of E-UTRAN E-CID measurements requirements for NE-DC**

*Type: CR For: Agreement  
 36.133 v15.12.0 CR-7051 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of referencing errors in applicability for NE-DC

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103501 (from R4-2102693).**

**R4-2103501 Correction to applicability of E-UTRAN E-CID measurements requirements for NE-DC**

*Type: CR For: Agreement  
 36.133 v15.12.0 CR-7051 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of referencing errors in applicability for NE-DC

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102694 Correction to applicability of E-UTRAN E-CID measurements requirements for NE-DC**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7052 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of referencing errors in applicability for NE-DC

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102695 Correction to applicability of E-UTRAN E-CID measurements requirements for NE-DC**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7053 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of referencing errors in applicability for NE-DC

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102696 Correction to requirements for NCSG patterns**

*Type: CR For: Agreement  
 36.133 v14.17.0 CR-7054 Cat: F (Rel-14)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of referencing errors for NCSG patterns

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103502 (from R4-2102696).**

**R4-2103502 Correction to requirements for NCSG patterns**

*Type: CR For: Agreement  
 36.133 v14.17.0 CR-7054 Cat: F (Rel-14)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of referencing errors for NCSG patterns

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102697 Correction to requirements for NCSG patterns**

*Type: CR For: Agreement  
 36.133 v15.12.0 CR-7055 Cat: A (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of referencing errors for NCSG patterns

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102698 Correction to requirements for NCSG patterns**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7056 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of referencing errors for NCSG patterns

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102699 Correction to requirements for NCSG patterns**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7057 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of referencing errors for NCSG patterns

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102804 CR on TC for eMTC RSTD measurement R15**

*Type: CR For: Agreement  
 36.133 v15.12.0 CR-7074 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103503 (from R4-2102804).**

**R4-2103503 CR on TC for eMTC RSTD measurement R15**

*Type: CR For: Agreement  
 36.133 v15.12.0 CR-7074 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104072 (from R4-2103503).**

**R4-2104072 CR on TC for eMTC RSTD measurement R15**

*Type: CR For: Agreement  
 36.133 v15.12.0 CR-7074 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102805 CR on TC for eMTC RSTD measurement R16**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7075 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102806 CR on TC for eMTC RSTD measurement R17**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7076 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102807 CR on CRS muting for eMTC R15**

*Type: CR For: Agreement  
 36.133 v15.12.0 CR-7077 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103504 (from R4-2102807).**

**R4-2103504 CR on CRS muting for eMTC R15**

*Type: CR For: Agreement  
 36.133 v15.12.0 CR-7077 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102808 CR on CRS muting for eMTC R16**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7078 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102809 CR on CRS muting for eMTC R17**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7079 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

## 6 Rel-16 Work Items for LTE

### 6.1 Additional MTC enhancements for LTE [LTE\_eMTC5]

#### 6.1.2 RRM requirements maintenance [LTE\_eMTC5-Core/Perf]

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**Email discussion: [98e][225] LTE\_eMTC5\_RRM**

**R4-2103464 Email discussion summary: [98e][225] LTE\_eMTC5\_RRM***Type: other For: Information  
Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103706 (from R4-2103464).**

**R4-2103706 Email discussion summary: [98e][225] LTE\_eMTC5\_RRM***Type: other For: Information  
Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103657 | LS on timing of RSS in neighbor cell for Rel-16 eMTC | Qualcomm Incorporated |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2101457 | Revised |
| R4-2101458 | Return to |
| R4-2102796 | Noted (please use the allocated tdoc). New tdoc allocated |
| R4-2102797 | Revised |
| R4-2102798 | Return to |
|  |  |

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103658 | Agreed |
| R4-2101458 | Agreed |
| R4-2102796 | Noted |
| R4-2103659 | Agreed |
| R4-2102798 | Agreed |
| R4-2103657 | Approved |
| R4-2103728 | Approved |

================================================================================

**R4-2103657 LS on timing of RSS in neighbor cell for Rel-16 eMTC**

*Type: LS Out For: Approval  
 To: RAN1, RAN2  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2101457 Correction Rel-16 eMTC RRM performance requirements**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7023 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects RRM performance requirements defined in Rel-16 eMTC WI.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103658 (from R4-2101457).**

**R4-2103658 Correction Rel-16 eMTC RRM performance requirements**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7023 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects RRM performance requirements defined in Rel-16 eMTC WI.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101458 Correction Rel-16 eMTC RRM performance requirements**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7024 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects RRM performance requirements defined in Rel-16 eMTC WI.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102247 Discussions on RRM maintenance issues for Rel-16 eMTC UE**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss the open issues that were identified at last meeting with regard to INACTIVE state operation and RSS based measurement for release 16 eMTC.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102296 On RSS measurement requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102796 Discussion on remaining issues in RSS measurement and RRC\_Inactive state**

*Type: LS out For: Approval  
 to RAN1, cc RAN2  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2103728 LS on RSS based RSRQ for LTE-MTC**

*Type: LS out For: Approval  
 to RAN2, cc RAN1  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2102797 CR on eMTC RRM requirements**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7072 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103659 (from R4-2102797).**

**R4-2103659 CR on eMTC RRM requirements**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7072 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102798 CR on eMTC RRM requirements R17**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7073 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

### 6.2 Additional enhancements for NB-IoT [NB\_IOTenh3]

#### 6.2.2 RRM requirements maintenance [NB\_IOTenh3-Core/Perf]

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**Email discussion: [98e][226] NB\_IOTenh3\_RRM**

**R4-2103465 Email discussion summary: [98e][226] NB\_IOTenh3\_RRM***Type: other For: Information  
Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103707 (from R4-2103465).**

**R4-2103707 Email discussion summary: [98e][226] NB\_IOTenh3\_RRM***Type: other For: Information  
Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2101654 | Revised |
| R4-2102235 | Not pursued |
|  |  |

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103660 | Agreed |

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**R4-2101654 CR on maintenance for measurement on non-anchor carrier for NB-IoT**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7027 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103660 (from R4-2101654).**

**R4-2103660 CR on maintenance for measurement on non-anchor carrier for NB-IoT**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7027 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101655 CR on maintenance for measurement on non-anchor carrier for NB-IoT**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7028 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102234 Correction to PUR requirements for NB1 UE**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7033 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

PUR requirements have been aligned between category M1 and NB1 UEs. Regarding the use of relaxation factor N in the measurement validation expression, the description of N is not aligned.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102235 Correction to PUR requirements for NB1 UE**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7034 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

PUR requirements have been aligned between category M1 and NB1 UEs. Regarding the use of relaxation factor N in the measurement validation expression, the description of N is not aligned.

**Discussion:**

[report of discussion]

Session chair: Cover sheet errors (What is the work item? It reads NB\_IOTen3-Perf on the cover page but the Tdoc is reserved for NB\_IOTenh3-Core.)

**Decision: Not pursued.**

### 6.3 Even further Mobility enhancement in E-UTRAN [LTE\_feMob]

#### 6.3.1 RRM core requirements maintenance [LTE\_feMob-Core]

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**Email discussion: [98e][227] LTE\_feMob\_RRM**

**R4-2103466 Email discussion summary: [98e][227] LTE\_feMob\_RRM***Type: other For: Information  
Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103708 (from R4-2103466).**

**R4-2103708 Email discussion summary: [98e][227] LTE\_feMob\_RRM***Type: other For: Information  
Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2101208 | Return to |
| R4-2101697 | Revised |
| R4-2101699 | Revised |
| R4-2101700 | Return to |
| R4-2102485 | Agreed |
| R4-2102486 | Agreed |
| R4-2102632 | Revised |
| R4-2102633 | Return to |

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2101208 | Postponed |
| R4-2101209 | Withdrawn |
| R4-2103661 | Agreed |
| R4-2101698 | Agreed |
| R4-2103662 | Agreed |
| R4-2101790 | Agreed |
| R4-2103663 | Agreed |
| R4-2102633 | Agreed |

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**R4-2101207 TDD UL-DL and DL-UL switching in LTE DAPS handover**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Further clarification on DL-to-UL and UL-to-DL switching time

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101208 Correction on the synchronous condition for DAPS handover**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7017 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Add conditions for not expected to transmit / not expected to receive covering both source and target cell. Add autonomous interruption allowance if these conditions are unspecified.

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2101209 Correction on the synchronous condition for DAPS handover**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7018 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Add conditions for not expected to transmit / not expected to receive covering both source and target cell. Add autonomous interruption allowance if these conditions are unspecified.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101697 Clarification on asynchronous DAPS handover**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7029 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103661 (from R4-2101697).**

**R4-2103661 Clarification on asynchronous DAPS handover**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7029 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101698 Clarification on asynchronous DAPS handover**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7030 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

#### 6.3.2 RRM perf. requirements [LTE\_feMob-Perf]

##### 6.3.2.1 General [LTE\_feMob-Perf]

##### 6.3.2.2 Test cases [LTE\_feMob-Perf]

**R4-2101699 Test cases for inter-frequency DAPS handover**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7031 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103662 (from R4-2101699).**

**R4-2103662 Test cases for inter-frequency DAPS handover**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7031 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101700 Test cases for inter-frequency DAPS handover**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7032 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102485 CR on 36133 LTE FDD-TDD inter-F sync DAPS HO TCs**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7043 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Test cases for LTE FDD-TDD inter-band inter-F sync DAPS HO.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102486 CR on 36133 LTE FDD-TDD inter-F sync DAPS HO TCs - Cat-A**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7044 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Mirror CR for Rel17 on test cases for LTE FDD-TDD inter-band inter-F sync DAPS HO.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102632 Addition of missing async FDD-TDD and TDD-FDD LTE interband interfrquency DAPS handover tests**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7047 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The side conditions are related to one shot timing adjustment, which was removed. The annex is no more applicable and is removed.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103663 (from R4-2102632).**

**R4-2103663 Addition of missing async FDD-TDD and TDD-FDD LTE interband interfrquency DAPS handover tests**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7047 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The side conditions are related to one shot timing adjustment, which was removed. The annex is no more applicable and is removed.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102633 Addition of missing async FDD-TDD and TDD-FDD LTE interband interfrquency DAPS handover tests**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7048 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The side conditions are related to one shot timing adjustment, which was removed. The annex is no more applicable and is removed.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

### 6.4 R16 LTE maintenance [WI code]

#### 6.4.3 RRM requirements [WI code]

**R4-2102248 Clarification for performance requirements tests for euCA**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7036 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102249 Clarification for performance requirements tests for euCA**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7037 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

## 7 Rel-16 non-spectrum related work items for NR

### 7.1 NR-based access to unlicensed spectrum [NR\_unlic]

#### 7.1.5 RRM core requirements maintenance (38.133) [NR\_unlic-Core]

================================================================================

**Email discussion: [98e][205] NR\_unlic\_RRM\_1**

**R4-2103444 Email discussion summary: [98e][205] NR\_unlic\_RRM\_1***Type: other For: Information  
Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103687 (from R4-2103444).**

**R4-2103687 Email discussion summary: [98e][205] NR\_unlic\_RRM\_1***Type: other For: Information  
Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (January 26, 2021)

**Topic #2: RRC connection mobility control (AI 7.1.5.2)**

* Sub-topic 2-1: Random Access requirements - general
  + Issue 2-1-2: Supplementary UL in NR-U requirements
    - Proposal 1 (Nokia): It is not necessary to work on requirements for random access in supplementary uplink in Rel-16 NR-U: this scenario is not in the scope of this work item.

Discussion

* + - E///: support Proposal
    - Huawei: we should not preclude SUL. Based on current spec the requirements apply to SUL as well
    - E///: the discuss is about 2step RACH for NR-U. 2step RACH applies for SUL. There is no SUL for NR-U and it should not be discussed.
    - Huawei: support of SUL depends on the BC. It is supported in RAN1.
    - E///: Need to check if there is RF support. We can further check what is going on in RAN1.
    - Nokia: Agree with E/// that we don’t have to work in case in there are no RF requirements. What is Huawei intention (not preclude or include)?
    - Huawei: It is ok for us not have requirement now. In case the RF BCs are defined then we can define it in RRM.

Agreements:

Do not define RRM requirements for random access in supplementary uplink.

Note: The respective requirements can be discussed in the future when the corresponding RF band combinations including NR-U and SUL are introduced and also subject to the outcome of RAN1 discussion.

* Sub-topic 2-2: Random Access requirements – 2-step RA
  + Issue 2-2-1: Whether to define NR-U RA requirements for 2-step RA
    - Proposals
      * Proposal 1 (ZTE, Ericsson, Qualcomm, Nokia): RAN4 to define requirements for 2-step RA in Rel-16 NR-U.
      * Proposal 2 (Huawei/HiSilicon, MTK): Whether to define the requirements for Rel-16 features for NR-U should be taken cautiously. Whether to define 2-step RACH requirements for NR-U shall be discussed also for other Rel-16 features/requirements.
    - Recommended WF
      * RAN4 to define NR-U requirements for 2-step RA.

Discussion

* + - MTK: Prefer Proposal 2
    - ZTE: Proposals 1
    - E///: Agree with ZTE that it is already defined in RAN2; 2step RACH requirements were defined in a generic way
    - Nokia, QC: Same view as E/// and ZTE
    - MTK: there are other Rel-16 features (e.g., multiple SCell, multiple BWP switching). Should we define NR-U requirements for these features as well?
      * E///: it is up to RAN4 discussion and decision. Prefer to keep it as a separate discussion.
    - Huawei: no strong view but have same concerns as MTK on how to treat other R16 requirements.
    - Apple: we prefer to define additional features as well

Agreements: Define requirements for 2-step RA in Rel-16 NR-U.

**Topic #3: SCell activation/deactivation (AI 7.1.5.3)**

* Sub-topic 3-1: Interruptions
  + Issue 3-1-1: General
    - Proposals
      * Proposal 1 (Qualcomm): Interruption requirements (i.e. number of interruptions and starting point of an interruption) on any active cell in the same band as the SCell being activated (intra-band) and any active cell outside this band (inter-band) should be treated separately.
    - Recommended WF
      * Agree to discuss separately:
        + Interruptions on any active cell in the same band with the SCell being activated
        + Interruptions on any active cell outside the band with the SCell being activated

Discussion

* + - * QC: interruptions should be discussed from the victim cell perspective
      * MTK: agree with QC
      * Apple: do we consider only 2 CCs or can consider more CCs?
        + QC: no restriction. Different requirements may apply for different cells.

Agreement

* + - * Further discuss the following 2 types of interruptions
        + Interruptions on any active cell in the same band with the SCell being activated
        + Interruptions on any active cell outside the band with the SCell being activated
  + Issue 3-1-2: For inter-band CA, interruptions (the number of, and the starting point) on active cells in the same band with the SCell being activated
    - Proposals
      * Proposal 1 (Qualcomm): During inter-band CA, interruption requirements (i.e. number of interruptions and starting point of an interruption) for intra-band CA applies to any active cell, if present, in the same band as the SCell being activated.
      * Proposal 2 (Ericsson): A single interruption applies.
      * Proposal 3: For any active cell in the same band with the SCell being activated, the interruption requirements (i.e. number of interruptions and starting point of an interruption) for intra-band CA applies.
    - Recommended WF
      * Discuss the proposals

Discussion

* + - * Huawei: The issue is for inter-band CA. Does P3 mean intra-band CA only?
        + E///: Same question for P3.
      * E///: In case Scell is known then for inter-band CA there will be a single interruption. We follow the legacy requirements.
      * MTK: For Proposal 3 we just add a condition that SCell is in the same band. We need multiple interruption windows.

Agreements: For inter-band CA

* For any active cell in the same band with the SCell being activated, the interruption requirements (i.e. number of interruptions and starting point of an interruption) for intra-band CA apply.
* For any active cell outside the band with the SCell being activated, the interruption requirements are FFS.
  + Issue 3-1-3: For intra-band CA, additional RF re-retuning for the case when there is already activated SCell
    - Proposals
      * Proposal 1 (Qualcomm): There is no need to specify additional RF re-tuning time or extend the interruption time because of DL LBT failure during intra-band SCell activation.
      * Proposal 2 (Huawei/HiSilicon): For the case when there is already activated SCell within the same band, additional interruption for additional RF tuning is allowed when the SMTC occasion is not available until the first available SMTC occasion.
      * Proposal 3 (ZTE): Additional RF re-tuning time is needed.
    - Recommended WF
      * Discuss the proposals

Discussion

* + - * MTK: For intra-band CA the interruption duration is already long. We can extend the interruption time a little bit.
      * QC: Interruption is already long. Even in the worst case UE should be able to retune back.
      * Huawei: We are not talking about multiple interruptions.
      * Chair: continue the discussion
* Sub-topic 3-2: SCell activation/deactivation when *sCellDeactivationTimer* is NOT configured
  + Issue 3-2-1: Applicability of SCell activation requirements when sCellDeactivationTimer is NOT configured
    - Proposals
      * Proposal 1 (Ericsson, Huawei/HiSilicon, Apple): The SCell activation requirements do not apply, when the sCellDeactivationTimer is not configured
        + Issue addressed by the proposal: the current SCell activation delay requirement in 38.133 has no limit, i.e., it is infinite.
      * Proposal 1a (Ericsson, QC):
        + If Proposal 1 (the requirement is not applicable) is not agreeable, an alternative proposal:
        + The SCell activation requirements for NR-U do not apply when the sCellDeactivationTimer is not configured, when the SCell activation delay exceeds some time (e.g., equivalent or comparable to the longest possible value of sCellDeactivationTimer).
      * Proposal 2 (Nokia, ZTE):
        + Proposal 2a (MTK): SCell activation delay requirements are applicable in Scenario A (CA with NR PCell and NR SCell) with any LBT type and in Scenario B and C (E-UTRAN-NR-U DC/SA NR-U) with LBT type 2C. Requirements are also applicable in all scenarios, if the UE does not experience any UL LBT failures during SCell activation/deactivation.
        + Proposal 2b: SCell activation delay requirements are applicable when sCellDeactivationTimer is not configured also in Scenarios B and C (EN-DC and SA) LBT types other than 2C.
      * Proposal 3 (ZTE): Relative requirements apply, regardless of whether or not the timer is configured.

Discussion

* + - * E///: If the timer is not configured, then there is not way to stop the Scell activation procedure from the network or UE perspectives.
      * MTK: Share the concern of no limit. Think that this applies to the case of UL LBT only. Prefer proposal 2a.
        + Nokia/Apple: UL LBT is the problem.
      * Nokia: Not clear what would happen if we say that the requirements do not apply
      * Apple: Agree with Proposal 1.
      * ZTE: Proposal 2 is a reasonable compromise for us
      * QC: Proposal 1a is a better compromise
      * Nokia: For Proposal 1a what is the UE behavior when the SCell activation delay exceeds some time (e.g., equivalent or comparable to the longest possible value of sCellDeactivationTimer)?
      * E///: suggest Proposal 1 + UE behavior is changed and it is FFS ; Proposal 1 + UE behavior is unchanged

Agreements

Applicability of SCell activation requirements when sCellDeactivationTimer is NOT configured

* + - * + Option 1 (E///, QC, Apple, Huawei/HiSilicon):

The SCell activation requirements for NR-U do not apply when the sCellDeactivationTimer is not configured, when the SCell activation delay exceeds some pre-defined time (e.g., equivalent or comparable to the longest possible value of sCellDeactivationTimer).

* + - * + Option 2 (Nokia, ZTE, MTK):

SCell activation delay requirements are applicable in Scenario A (CA with NR PCell and NR SCell) with any LBT type and in Scenario B and C (E-UTRAN-NR-U DC/SA NR-U) with LBT type 2C. Requirements are also applicable in all scenarios, if the UE does not experience any UL LBT failures during SCell activation/deactivation.

SCell activation delay requirements are applicable when sCellDeactivationTimer is not configured also in Scenarios B and C (EN-DC and SA) LBT types other than 2C.

* + - * + Option 3 (possible compromise solution):

SCell activation delay requirements are applicable in Scenario A (CA with NR PCell and NR SCell) with any LBT type and in Scenario B and C (E-UTRAN-NR-U DC/SA NR-U) with LBT type 2C. Requirements are also applicable in all scenarios, if the UE does not experience any UL LBT failures during SCell activation/deactivation.

For all other scenarios the SCell activation requirements for NR-U do not apply when the sCellDeactivationTimer is not configured, when the SCell activation delay exceeds some pre-defined time (e.g., equivalent or comparable to the longest possible value of sCellDeactivationTimer).

1st round email discussion conclusions

**Decisions**

Issue 2-1-1: General specification structure.

Agreement: The specification structure for clause 6.2.2A shall follow the structure of clause 6.2.2, but unnecessary sections can be omitted (do not use void for this purpose).

Issue 6-1-1: Semi-persistent L1-RSRP measurement reporting

Agreement: Capture the following sentence in TS38.133 9.5A.3.2:

When CCA is used on target frequency, the UE shall stop semi-persistent L1-RSRP measurement reports on PUCCH, when the UE cannot transmit a PUCCH with HARQ-ACK information in slot n corresponding to the PDSCH carrying the deactivation command.

Issue 7-2-1: CSSF outside measurement gaps for carrier frequency with CCA

Agreement: CSSF outside gaps (CSSFoutside\_gap,i ) should increase by one if one MO configured both RMTC (for RSSI measurement) and SMTC (for SSB-based measurement)

Issue 7-2-2: CSSF within measurement gaps for carrier frequency with CCA

Agreement

* + CSSF within measurement gaps (CSSFwithin\_gap,i ) needs also to be adapted to account for inter-frequency RSSI/CO measurements and intra-frequency RSSI/CO measurements with gaps
  + Regarding the CSSF within measurement gaps (CSSFwithin\_gap,i ), a MO should be counted twice, if the MO is configured with both RMTC and SMTC which are candidates to be measured in gap j where the measurement object i is also a candidate.

Issue 10-1-1: RRM requirements for PL-RS switch in R16 NR-U

Agreement: Do not include RRM requirements for PL-RS switching in Rel-16 NR-U

Issue 10-2-1: RRM requirements for CGI reading in R16 NR-U

Agreement: Do not include RRM requirements for the Rel-16 CGI reading feature in Rel-16 NR-U.

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103512 | WF on NR-U RRM core | Ericsson |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2102724 | Postponed (2 or more CR cover sheet issues) |
| R4-2102725 | Withdrawn |
| R4-2102238 | Agreed |
| R4-2102237 | Agreed |
| R4-2100189 | Return to |
| R4-2100190 | Return to |
| R4-2101644 | Return to |
| R4-2101645 | Return to |
| R4-2101641 | Agreed |
| R4-2101642 | Agreed |
| R4-2102526 | Endorsed (no comments received) |
| R4-2100064 | Withdrawn (Cat A; not submitted) |
| R4-2100066 | Merged into R4-2101428 |
| R4-2101428 | Revised |
| R4-2101429 | Return to (Cat A; not submitted) |
| R4-2102513 | Return to |
| R4-2102514 | Return to |
| R4-2102720 | Agreed |
| R4-2102721 | Agreed |
| R4-2102519 | Revised |
| R4-2102520 | Return to (Cat A, not submitted) |
| R4-2102521 | Revised |
| R4-2102522 | Return to (Cat A, not submitted) |
| R4-2100051 | Merged into R4-2101132 |
| R4-2101100 | Withdrawn (Cat A, not submitted) |
| R4-2101425 | Merged into R4-2101132 |
| R4-2101426 | Withdrawn (Cat A, not submitted) |
| R4-2102642 | Return to |
| R4-2102643 | Return to |
| R4-2102644 | Return to |
| R4-2102645 | Return to |
| R4-2101132 | Postponed (2 or more CR cover sheet issues) |
| R4-2102823 | Withdrawn |
| R4-2101638 | Merged into R4-2102922 |
| R4-2101639 | Withdrawn (Cat A, not submitted) |
| R4-2102516 | Merged into R4-2102922 |
| R4-2102517 | Withdrawn (Cat A, not submitted) |
| R4-2102922 | Revise |
| R4-2102923 | Return to |

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc #** | **Status** |
| R4-2103512 | Approved |
| R4-2100189 | Return to |
| R4-2100190 | Return to |
| R4-2101644 | Return to |
| R4-2101645 | Return to |
| R4-2103513 | Agreed |
| R4-2101429 | Agreed (Cat A; R4-2103513 is agreeable) |
| R4-2104047 | Agreed |
| R4-2102514 | Agreed (Cat A; R4-2104047 is agreeable) |
| R4-2103514 | Agreed |
| R4-2102520 | Agreed (Cat A; R4-2103514 is agreeable) |
| R4-2103515 | Agreed |
| R4-2102522 | Agreed (Cat A; R4-2103515 is agreeable) |
| R4-2102642 | Agreed |
| R4-2102643 | Agreed (Cat A; R4-2102642 is agreeable) |
| R4-2102644 | Agreed |
| R4-2102645 | Agreed (Cat A; R4-2102644 is agreeable) |
| R4-2103516 | Return to |
| R4-2102923 | Return to |
| R4-2103721 | Agreed |
| R4-2101426 | Agreed (Cat A; R4-2103721 is agreeable) |

================================================================================

**R4-2103512 WF on NR-U RRM core**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

##### 7.1.5.1 General [NR\_unlic-Core]

**R4-2100769 Discussion on terminology for NR-U RRM requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101636 Discussion on terminology updates for NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102518 On SSB availability to meet NR-U requirements in DRX**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On SSB availability to meet NR-U requirements in DRX

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102519 Terminology updates for NR-U in 38.133**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1726 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Terminology updates for NR-U in 38.133

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103514 (from R4-2102519).**

**R4-2103514 Terminology updates for NR-U in 38.133**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1726 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Terminology updates for NR-U in 38.133

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102520 Terminology updates for NR-U in 38.133**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1727 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Terminology updates for NR-U in 38.133

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102521 Terminology updates for NR-U in 36.133**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7045 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Terminology updates for NR-U in 36.133

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103515 (from R4-2102521).**

**R4-2103515 Terminology updates for NR-U in 36.133**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7045 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Terminology updates for NR-U in 36.133

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102522 Terminology updates for NR-U in 36.133**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7046 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Terminology updates for NR-U in 36.133

**Discussion:**

[report of discussion]

**Decision: Agreed.**

##### 7.1.5.2 RRC connection mobility control [NR\_unlic-Core]

**R4-2100050 Random access in NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100051 [CR] Add Random Access requirements under NR-U**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1415 Cat: B (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2101100 [CR] Add Random Access requirements under NR-U (Cat A)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1557 Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Abstract:**

Cat A CR corresponding to R4-2100051.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101424 Remaining open issues on connection mobility control in NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the remaining open issues on the connection mobility control in NR-U, that is, random access procedure and maximum SI acquisition time.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101425 CR: Introduction of random access requirements with CCA**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1601 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR provides random access procedure with CCA.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103721 (from R4-2101425).**

**R4-2103721 CR: Introduction of random access requirements with CCA**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1601 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR provides random access procedure with CCA.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101426 CR: Introduction of random access requirements with CCA**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1602 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR provides random access procedure with CCA.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101637 Discussion on remaining issues for random access for NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102920 Random Access requirements in NR-U**

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

**Abstract:**

In this paper, we discuss Random Access requirements in NR-U

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.1.5.3 SCell activation/deactivation (delay and interruption) [NR\_unlic-Core]

**R4-2100065 Remaining issues in SCell activation under NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101130 SCell (de)activation requirement applicability when sCellDeactivationTimer is not configured**

*Type: discussion For: Discussion  
 Source: Nokia*

**Abstract:**

Discussion and LS text proposal about requirement applicability when sCellDeactivationTimer is not configured.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101638 CR on requirement maintenance for SCell activation and deactivation for NR-U**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1628 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2101639 CR on requirement maintenance for SCell activation and deactivation for NR-U**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1629 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101640 Discussion on remaining issues for SCell activation and deactivation for NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102515 On remaining issues for SCell activation in NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On remaining issues for SCell activation in NR-U

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102516 Updates in SCell activation in NR-U**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1724 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Updates in SCell activation in NR-U

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2102517 Updates in SCell activation in NR-U**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1725 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Updates in SCell activation in NR-U

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102919 Interruptions during SCell activation in NR-U**

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

**Abstract:**

In this paper, we discuss remaining open issues interruptions during Scell activation in NR-U

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102922 CR on Interruptions during Scell activation in NR-U**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1791 Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

The CR updates clause 8.3A based on agreements related to interruptions during Scell activation requirements.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103516 (from R4-2102922).**

**R4-2103516 CR on Interruptions during Scell activation in NR-U**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1791 Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

The CR updates clause 8.3A based on agreements related to interruptions during Scell activation requirements.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102923 CR on Interruptions during Scell activation in NR-U**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1792 Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

The CR updates clause 8.3A based on agreements related to interruptions during Scell activation requirements.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

##### 7.1.5.4 Active TCI state switching [NR\_unlic-Core]

**R4-2102720 CR on Active TCI state switching for NR-U**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1743 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102721 CR on Active TCI state switching for NR-U (cat A)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1744 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

##### 7.1.5.5 RLM [NR\_unlic-Core]

**R4-2102512 On remaining issues for RLM in NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On remaining issues for RLM in NR-U

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102513 Updates in RLM requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1722 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Updates in RLM requirements for NR-U

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104047 (from R4-2102513).**

**R4-2104047 Updates in RLM requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1722 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Updates in RLM requirements for NR-U

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102514 Updates in RLM requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1723 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Updates in RLM requirements for NR-U

**Discussion:**

[report of discussion]

**Decision: Agreed.**

##### 7.1.5.6 Beam management [NR\_unlic-Core]

**R4-2100063 [CR] UE behavior when cannot transmit ACK due to LBT failure for MAC-CE deactivation**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1419 Cat: B (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100064 [CR] UE behavior when cannot transmit ACK due to LBT failure for MAC-CE deactivation (Cat A)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1420 Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100066 [CR] UE behavior when cannot transmit ACK due to LBT failure for MAC-CE deactivation**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1421 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2101427 Remaining open issues on beam management in NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the remaining open issues on beam management in NR-U.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101428 CR: Beam management requirements with CCA**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1603 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR updates the specification of BFD/CBD and L1-RSRP reporting with CCA

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103513 (from R4-2101428).**

**R4-2103513 CR: Beam management requirements with CCA**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1603 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR updates the specification of BFD/CBD and L1-RSRP reporting with CCA

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101429 CR: Beam management requirements with CCA**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1604 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR updates the specification of BFD/CBD and L1-RSRP reporting with CCA

**Discussion:**

[report of discussion]

**Decision: Agreed.**

##### 7.1.5.7 Measurement requirements [NR\_unlic-Core]

**R4-2100191 On RSSI measurement in NR-U**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100510 Remaining issues on intra and inter frequency measurements under NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100770 Discussion on measurement requirements for NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101641 CR on measurement requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1630 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101642 CR on measurement requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1631 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101643 Discussion on measurement requirements for NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102526 RSSI measurement bandwidth**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

RSSI measurement bandwidth

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

##### 7.1.5.8 Measurement capability and reporting criteria [NR\_unlic-Core]

**R4-2102238 Maintenance CR for NR-U core requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1692 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Maintenance CR including changes to the core NR-U requirements.

**Discussion:**

Session chair: moved from AI 7.1.5.1

[report of discussion]

**Decision: Agreed.**

**R4-2102237 Maintenance CR for NR-U core requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1691 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Maintenance CR including changes to the core NR-U requirements.

**Discussion:**

Session chair: moved from AI 7.1.5.1

[report of discussion]

**Decision: Agreed.**

##### 7.1.5.9 Timing [NR\_unlic-Core]

**R4-2100062 Discussions on UE transmit timing and reference cell under NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100188 On reference cell availability for NR-U**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100189 CR on reference cell availability for NR-U R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1451 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

E///: no need for change. Current spec is correct.

Apple: UE may not have a chance to do the measurements within the last 160ms

E///: it is UE responsibility to do the measurement. The situation is same as for legacy NR UE.

**Decision: Postponed.**

**R4-2100190 CR on reference cell availability for NR-U R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1452 Cat: A (Rel-17)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100771 Discussion on timing requirements for NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101644 CR on timing requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1632 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2101645 CR on timing requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1633 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101646 Discussion on timing requirements for NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102646 On UE transmit timing under DL LBT failure in reference cell**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper discusses open issues on timing

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.1.5.10 Other requirements [NR\_unlic-Core]

**R4-2101014 On PL-RS switch and CGI reading for NR-U**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101131 Random access requirements in NR-U**

*Type: discussion For: Discussion  
 Source: Nokia*

**Abstract:**

Discussion about random access requirements for 2-step and 4-step RACH for NR-U.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101132 CR to 38.133 - Introducing NR-U random access requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1558 Cat: B (Rel-16)  
  
 Source: Nokia*

**Abstract:**

CR to introduce RA requirements for 2-step and 4-step RACH.

**Discussion:**

[report of discussion]

Session chair: Cover sheet errors (Is the reserved Tdoc number R4-2101132 correctly spelled on the cover page header? What is the current version? It reads 17.0.0 on the cover page but the Tdoc is reserved for version 16.6.0. What is the CR number? It reads xxxx on the cover page but the Tdoc is reserved for CR number 1558.)

Session chair: tdoc will be postponed due to CR cover sheet issues

**Decision: Postponed.**

**R4-2102724 CR on PSCell Addition requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1747 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

Session chair: Cover sheet errors (What is the impacted specification? It reads 36.133 on the cover page but the Tdoc is reserved for 38.133. What is the current version? It reads 16.8.0 on the cover page but the Tdoc is reserved for version 16.6.0.)

Session chair: tdoc will be postponed due to CR cover sheet issues

**Decision: Postponed.**

**R4-2102725 CR on PSCell Addition requirements for NR-U (cat A)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1748 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102823 CR to 38.133 - Introducing NR-U random access requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1774 Cat: A (Rel-17)  
  
 Source: Nokia*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102641 Analysis of impact of RA with CCA on RRM requirements in NR-U**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper discusses impact on NR-U requirements when 2-step and 4-step RA subject to CCA are used

**Discussion:**

Session chair: moved from AI 7.1.5.2

[report of discussion]

**Decision: Noted.**

**R4-2102642 Applicability of RA with CCA on RRM requirements in NR-U in 38.133**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1738 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR on applicability of 2-step and 4-step RA subject to CCA to NR-U RRM requirements in 38.133

**Discussion:**

Session chair: moved from AI 7.1.5.2

[report of discussion]

**Decision: Agreed.**

**R4-2102643 Applicability of RA with CCA on RRM requirements in NR-U in 38.133**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1739 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The CR on applicability of 2-step and 4-step RA subject to CCA to NR-U RRM requirements in 38.133

**Discussion:**

Session chair: moved from AI 7.1.5.2

[report of discussion]

**Decision: Agreed.**

**R4-2102644 Applicability of RA with CCA on RRM requirements in NR-U in 36.133**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7049 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR on applicability of 2-step and 4-step RA subject to CCA to NR-U RRM requirements in 36.133

**Discussion:**

Session chair: moved from AI 7.1.5.2

[report of discussion]

**Decision: Agreed.**

**R4-2102645 Applicability of RA with CCA on RRM requirements in NR-U in 36.133**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7050 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The CR on applicability of 2-step and 4-step RA subject to CCA to NR-U RRM requirements in 36.133

**Discussion:**

Session chair: moved from AI 7.1.5.2

[report of discussion]

**Decision: Agreed.**

#### 7.1.6 RRM perf. requirements (38.133) [NR\_unlic-Perf]

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**Email discussion: [98e][206] NR\_unlic\_RRM\_2**

**R4-2103445 Email discussion summary: [98e][206] NR\_unlic\_RRM\_2***Type: other For: Information  
Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103688 (from R4-2103445).**

**R4-2103688 Email discussion summary: [98e][206] NR\_unlic\_RRM\_2***Type: other For: Information  
Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (January 26, 2021)

Issue 1-1-3: SCS for data and SSB

* Option 1: Configure the same SCS for data and SSB.
* Option 2: Allow configuration of different SCS for SSB and data.

Discussion:

MTK: Option 1 is more simple and typical case

E///: Option 1

Agreement: Configure the same SCS for data and SSB.

Issue 1-1-4: Cell configuration SCS and channel bandwidth on carrier frequency with CCA

* Option 1 (Huawei?):
  + 15 kHz SSB SCS with 20 MHz bandwidth
* Option 2 (Nokia):
  + NR with CCA 15 kHz SSB SCS, 20 MHz bandwidth, TDD duplex mode
  + NR with CCA 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode
* Option 3 (Ericsson, Mediatek, QC)
  + RAN4 define NR-U RRM test cases with SCS=30kHz for both SSB and data transmission.
  + FFS bandwidths

Discussion

MTK: Option 3. 40MHz BW.

QC, E///: Option 3 is ok.

Agreement

* + RAN4 define NR-U RRM test cases with SCS=30kHz for both SSB and data transmission and 40 MHz bandwidth.

Issue 1-2-1: Differentiation between FBE and LBE

* Option 1 (Ericsson): If needed, test parameter values for FBE and LBE (e.g., signaling-related) are specified in the same test case (a note to clarify their applicability can be added, if needed).
  + For PCCA, it is the actual value that matters, there is no need to call it “FBE” or “LBE”; if needed, multiple PCCA values can be specified in the same test.
* Option 2 (Qualcomm): Define separate test cases for LBE and FBE whenever an LBT failure dependent requirement is tested.

Discussion

QC: Ok with E/// proposal without sub-bullet

Agreement: If needed, test parameter values for FBE and LBE (e.g., signaling-related) are specified in the same test case (a note to clarify their applicability can be added, if needed).

Issue 1-2-2: General approach for DL LBT/CCA models

How should the DL LBT models be defined?

* Option 1: Describe LBT models as a random process defined
* Option 2 (Huawei): Consider the LBT model as a repetitive pattern of n available SSBs for every m SSB occasions.
* Option 3 (Ericsson): For NR-U, define a parameter for CCA success probability, PCCA, to model the probability of successful attempt for acquiring the channel and transmitting the necessary signals.

Discussion

Ericsson: There are two approaches – deterministic and probabilistic. For NR we suggest to adjust the existing LTE approach.

Huawei: For LAA we use probability model. In case of using probabilistic model, then we cannot guarantee a specific UE behavior for each individual test. Test equipment vendors feedback may be required.

E///: Probability-based model was already used in LTE. To guarantee failure we can set the failure probability to 100%.

MTK: we can have a special approach for special test cases.

Agreement:

DL LBT modelling procedures

Option 1: Probabilistic model. Define a parameter for CCA success probability, PCCA, to model the probability of successful attempt for acquiring the channel and transmitting the necessary signals.

Option 2: Deterministic LBT pattern with a repetitive pattern of n available SSBs for every m SSB occasions

Option 1 approach is used as a baseline approach. Option 2 can be used for selected test cases to guarantee proper UE behavior.

Issue 1-2-3: General approach for defining parameters of LBT models

How should the parameters of DL LBT models be defined?

* Option 1 (Ericsson): The probability parameter PCCA is not a single fixed value in the model but a variable; the value(s) are configured to a relevant setting in each test. The specific PCCA values should be defined among cell-specific test parameters in each test case (the access probability can be different at different BS locations). The CCA model only specifies possible values for PCCA. The possible values for PCCA may be defined as
  + 1): The CCA model specifies a continuous range of possible values (one or more specific values from the range are configured in each test), e.g., PCCA Î[0%, 100%], or
  + 2): The CCA model specifies a discrete set of possible values (one or more specific values from the set are chosen in each test).
* Option 2: Common parameters should be defined for all test cases.

Discussion

Apple: what does “the access probability can be different at different BS locations” mean?

E///: there may be some differentiation for PCell and SCell

MTK, QC, Nokia: we prefer to still have a limited subset of values

E///: agree

Agreement: Probabilistic DL LBT model

* The probability parameter PCCA is not a single fixed value in the model but a variable; the value(s) are configured to a relevant setting in each test.
* The specific PCCA values should be defined among cell-specific test parameters in each test case.
* The CCA model specifies a discrete set of possible values
  + One or more specific values from the set are chosen in each test
  + One value can be chosen as a default one and will apply to most of test cases
* The set of values
  + Option 1: {0%, 25%, 50%, 75%, 100%}
  + Other options are not precluded

Issue 1-3-1a: DL LBT model for LBE operation

* Option 1 (Qualcomm, Nokia): DL-LBE-Model 1:
  + For LBE test cases in non DRX: RAN4 to adopt the following DL LBT model: 1) Define a probability equal to P1 for the transmission of the DRS in the first candidate position. 2) In case of LBT failure for transmission in the first candidate position, define a probability equal to P2 for the transmission in the second candidate position for a given SSB index.
* Option 2 (Ericsson): DL-LBE-Model 2:
  + At least at a low Es/Iot (e.g., Es/Iot<-6 dB), the probability of CCA success is higher for the semi-static channel occupancy compared to that for dynamic channel occupancy:
    - PCCA,semi-static,i > PCCA,dynamic,I, when Es/Iot<X,
    - PCCA,semi-static,i = PCCA,dynamic,I, when Es/Iot≥X,
    - where X=TBD (e.g., X=-6 dB).

Discussion

Nokia: what are the benefits of Option 2?

QC: we agree with E/// proposal that “the probability of CCA success is higher for the semi-static channel occupancy compared to that for dynamic channel occupancy”

E///: Option 2 is simpler since Option 1 has conditional probability

QC: for LBE we agreed to monitor 2 positions and we don’t need a single probability

HW: for Option 2, does it mean that we’ll transmit SSB only in the 1st candidate position with certain probability?

E///: For Option 1 the probability of the 2nd SSB transmission is conditional and it is more difficult to control it. In our model we have separate probabilities for the first and second conditions

Agreement:

DL LBT model for LBE and FBE operation:

1) Define a probability equal to P1 for the transmission of the DRS in the first candidate position.

2) In case of LBT failure for transmission in the first candidate position, define a probability equal to P2 for the transmission in the second candidate position for a given SSB index.

Different probabilities can be used for LBE and FBE operation

Note: in case significant issues with this model are identified then the model with independent probabilities for LBT failure can be considered

1st round email discussion conclusions

**Decisions**

Issue 1-1-2: Applicability of NR FDD test configurations.

Agreement: NR FDD test configurations do not apply to the configuration of NR-U cells, but may apply to the configuration of NR cells in NR-U test cases.

Issue 1-1-5: E-UTRA, NR and NR-U configurations

Agreements

Configuration for cells without CCA in NR-U test cases:

* NR cells without CCA:
  + NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode
  + NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode
  + NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode
* LTE cells without CCA:
  + LTE FDD
  + LTE TDD

Issue 1-1-6: PRACH test configuration

Agreements

* For handover and RRC re-establishment cases, RAN4 to assume PRACH configuration 1 and 2 as baseline for NR-U tests, as specified in Annex A.3.8.2 in TS 38.133.
* For the random access test case: RAN4 to discuss the PRACH configuration after the core requirements are defined.
* RAN4 to discuss defining a new test configuration with the new PRACH sequences introduced in NR Rel-16.

Issue 1-1-9: RMCs for PDSCH

Agreements

Define new RMC for PDSCH for slots with RMSI under CCA

* SCS=30kHz
* Reuse the same configuration as RMC for PDSCH for slots with RMSI (i.e., Type A, 24PRB, MCS4, dmrs-TypeA-Position=2, dmrs-Type=1, dmrs-AdditonalPositions=2, maxLength=1, Antenna port index: 1000, and Number of PDSCH DMRS CDM group(s) without data: 1, etc.).

Issue 1-1-11: RMC transmission burst

Agreements

For NR-U RRM tests, RMC is transmitted during the RMC transmission burst:

* The length of the RMC transmission burst in slots is defined as N. The RMC burst transmission format is determined according to the steps below:
  + - 1. Select N randomly from a given set of the number of slots S1 = {[1,3,5,8]} with equal probability as the total length of RMC burst transmission format.
    - 2. A uniform random variable from 0 to 1 is generated. If the random variable is less than PCCA\_DL, a burst of N fully occupied slots is transmitted. Otherwise, the RMC transmission burst is muted and the muting duration is the same as the number N of slots for determined burst format.
* RMC transmission burst is scheduled outside DBT window.
* RAN4 discuss further the number of slots in S1.

Issue 1-1-12: TDD UL/DL configuration

Agreement: NR-U RRM tests does not configure tdd-UL-DL-ConfigurationCommon using RRC configuration. DL scheduling is configured by DCI 1\_1 slot by slot

Issue 1-1-14: Antenna configurations

Agreement: Define new subclause for antenna configurations with unlicensed bands. For 4Rx UE, apply the same applicability rule as Rel-15 RRM test.

Issue 1-3-10: General approach in exceeding Lmax values during RRM tests

Agreement: For the test cases where no particular behaviour to be verified, exceeding Lmax shall be avoided

Issue 1-3-11: List of test cases in which exceeding Lmax values may be considered

Agreement:

* Consider having particular test cases to verify the correct UE behaviour for the following cases:
  + - Initiating the measurements on neighbour upon exceeding Mp and Mq in Cell reselection
    - Initiate cell selection procedures for the selected PLMN upon L1 exceeding L1,max in RRC release with redirection
    - Report RSRP\_0 upon L1 exceeding L1,max for L1-RSRP measurement
* For SCell activation in NR-U, exceeding Lmax should be avoided.
* For SFTD measurement NR-U, exceeding Lmax should be avoided.
* For intra-frequency and inter- frequency measurement for NR-U, exceeding LPSS/SSS,gaps,max should be avoided..

Issue 1-4-1: Need for an UL LBT model

Agreement:

* UL CCA model is needed for NR
* UL CCA model is not necessary in every test case, but where the requirement depends on UL CCA failures.

Issue 1-4-7: Consistent UL CCA failures

Agreement:

* Consistent UL CCA failures are modelled by means of a low PCCA\_UL (e.g., 0%).
* FFS: List of test cases that need to model consistent UL CCA failures

Issue 2-1-4: Test cases on Random access

Agreement:

* Add the following test cases on the test case list for NR-U:
  + - Random access to NR-U PCell
    - Random access to NR-U PSCell
* Define random access test cases for 4-step and 2-step RA in Rel-16.

Issue 2-1-6: Test cases on timing

Agreement:

* Add the following test cases on the test case list for NR-U:
  + - Timing (timing advance) – NR-U PCell
    - Timing (timing advance) – NR-U PSCell

Issue 2-1-8: Test cases on PSCell addition/release delay

Agreement:

* Do not define the following test case for NR-U:
  + - PSCell addition/release delay
      * NR-U PSCell with E-UTRA PCC, unknown

Issue 2-1-13b: Test cases for inter-RAT measurement procedure: RSSI and CO

Agreement:

* Add the following test cases on the test case list for NR-U:
  + - Inter-RAT measurement procedure
      * E-UTRA-NR-U RSSI measurements requirements:
        + On NR-U neighbor, with E-UTRA (FDD,TDD) PCC
      * E-UTRA-NR-U CO measurements requirements:
        + On NR-U neighbor, with E-UTRA (FDD,TDD) PCC

Issue 2-1-16b: Test cases for accuracy for NR-U inter-RAT measurements: RSSI and CO

Agreement:

* Add the following test cases on the test case list for NR-U:
  + - 1b. E-UTRA-NR-U RSSI measurement accuracy requirements:
      * On NR-U neighbor, with E-UTRA (FDD,TDD) PCC
    - 1c. E-UTRA-NR-U CO measurement accuracy requirements:
      * On NR-U neighbor, with E-UTRA (FDD,TDD) PCC

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103517 | WF on LBT models for NR-U RRM performance requirements | ~~Nokia~~Qualcomm |
| R4-2103518 | WF on general test configurations for NR-U RRM performance requirements | Nokia, Nokia Shanghai Bell |
| R4-2103519 | WF on NR-U RRM performance test case list | Ericsson |
| R4-2103520 | WF on test configurations for NR-U RRM performance requirements |  |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2101431 | Revised |
| R4-2102528 | Revised |
| R4-2102524 | Revised |
| R4-2100774 | Return to |
| R4-2100775 | Return to |
| R4-2100776 | Return to |
| R4-2101015 | Return to |
| R4-2101135 | Return to |
| R4-2101136 | Return to |
| R4-2101137 | Return to |
| R4-2101433 | Revised |
| R4-2101649 | Return to |
| R4-2101650 | Return to |
| R4-2101651 | Return to |
| R4-2101652 | Return to |
| R4-2101653 | Return to |
| R4-2102369 | Revised |
| R4-2102372 | Revised |
| R4-2102530 | Revised |
| R4-2102532 | Revised |
| R4-2102650 | Revised |
| R4-2102652 | Revised |
| R4-2102243 | Revised |
| R4-2102523 | Revised |
| R4-2102525 | Revised |

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103518 | Approved |
| R4-2103517 | Approved |
| R4-2103521 | Endorsed |
| R4-2103522 | Endorsed |
| R4-2103520 | Approved |
| R4-2103523 | Approved |
| R4-2103531 | Revised |
| R4-2101135 | Postponed |
| R4-2101649 | Endorsed |
| R4-2101136 | Postponed |
| R4-2101650 | Endorsed |
| R4-2100774 | Postponed |
| R4-2102650 | Revised |
| R4-2102652 | Revised |
| R4-2101651 | Endorsed |
| R4-2102369 | Endorsed |
| R4-2102530 | Endorsed |
| R4-2101433 | Revised |
| R4-2101137 | postponed |
| R4-2101652 | Endorsed |
| R4-2102532 | Endorsed |
| R4-2101015 | postponed |
| R4-2101653 | Revised |
| R4-2102372 | Endorsed |
| R4-2100775 | postponed |
| [R4-2100776](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100776.zip) | postponed |
| R4-2102525 | Endorsed |
|  |  |
|  |  |

GTW session (February 05, 2021)

**[98e][206] NR\_unlic\_RRM\_2**

Issue 1-2-5: DL LBT models parameter variation

* Proposals
  + Option 1: One probability value (per transmitter) applies at any time point during a test; one or more probability values can be configured in the entire test, one value PCCA,i per time interval Ti where i≥1 and the multiple time intervals (when i>1) do not overlap (e.g., PCCA=1.0 in T1 and PCCA=0.75 in T2).
  + Option 2: DL LBT model parameters are kept constant during a test.
  + Option 3 (new): As a baseline approach, DL LBT model parameters are kept constant during a test. In selected test cases parameters may be changed if necessity is identified as:
    - One probability value (per transmitter) applies at any time point during a test; one or more probability values can be configured in the entire test, one value PCCA,i per time interval Ti where i≥1 and the multiple time intervals (when i>1) do not overlap (e.g., PCCA=1.0 in T1 and PCCA=0.75 in T2).
* Discussion
  + E///: model has to be generic. Insist on Option 1.
  + QC: agree with Option 3.
  + MTK: Option 3 as a compromise. Need to see specific test case which requires Option 1.
  + Nokia: Option 3 is ok.
  + Apple: Option 3 is fine.
* Agreements
  + DL CCA model: One probability value (per TRP) applies at any time point during a test; one or more probability values can be configured in the entire test, one value PCCA,i per time interval Ti where i≥1 and the multiple time intervals (when i>1) do not overlap (e.g., PCCA=1.0 in T1 and PCCA=0.75 in T2).
  + As a baseline approach, DL CCA probability (PCCA\_DL) is kept constant during a test.
  + In selected test cases DL CCA probability (PCCA\_DL) parameters may be changed for different time intervals.

Issue 1-2-6: UL LBT models parameter variation

* Proposals
  + Option 1 (Ericsson): For UL CCA, the modelling approach is based on a probability PCCA\_UL,i of successful access during the corresponding time Ti of the time interval i.
  + Option 2: UL LBT model should be kept constant during a test.
  + Option 3 (new): As a baseline approach, UL LBT model parameters are kept constant during a test. In selected test cases parameters may be changed if necessity is identified as:
    - For UL CCA, the modelling approach is based on a probability PCCA\_UL,i of successful access during the corresponding time Ti of the time interval i.
* Discussion
  + R&S: is it for test case or for simulations?
    - E///: for test cases
  + R&S: it will take some efforts to implement such model.
* Agreements
  + UL CCA model: One probability value applies at any time point during a test; one or more probability values can be configured in the entire test, one value PCCA,i per time interval Ti where i≥1 and the multiple time intervals (when i>1) do not overlap (e.g., PCCA=1.0 in T1 and PCCA=0.75 in T2).
  + As a baseline approach, UL CCA probability (PCCA\_UL) is kept constant during a test.
  + In selected test cases UL CCA probability (PCCA\_UL) parameters may be changed for different time intervals.

Issue 1-4-3: UL LBT model

* Proposals
  + Option 1 (new part in bold text): baseline UL LBT model as:
    - Use DL FBE model to transmit a full band/LBT BW OCNG noise pattern in one or more of the scheduled/configured UL resource with probability P.
      * P is FFS
    - The test equipment keeps a count of the number of UL LBT failures it may cause.
    - When the OCNG signal is transmitted, the test equipment does not monitor the UL resource in which the OCNG is transmitted.
    - When the OCNG signal is not transmitted, the test equipment monitors the UL resource for the desired UL signal.
    - Based on whether it receives the signal or not, the test equipment declares the test case pass/fail
    - Consistent UL CCA failures are modelled by means of a low LBT success probability.
  + Option 2: basic principles:
    - For UL CCA, the modelling approach is based on a probability PCCA\_UL,i of successful access during the corresponding time Ti of the time interval i.
    - Prior to each UL transmission burst within a time interval i of the test:
      * Generate a uniform random variable p from the range [0, 1].
      * If p<PCCA\_UL,i, then the energy generated by the test system in the corresponding portion of UL slot is equal to or below the energy detection threshold [TBD]; otherwise the energy generated by the test system in the portion of UL slot is above the energy detection threshold [TBD].
    - Consistent UL CCA failures are modelled by means of a low PCCA\_UL,i (e.g., 0%) during the relevant time interval Ti within the test.
    - In the same time interval i, PCCA\_UL,I and PCCA\_DL,i can have different values.
* Discussion
  + E///: detailed steps of the model may need further check
  + QC: DL and UL models may be different

================================================================================

**R4-2103517 WF on LBT models for NR-U RRM performance requirements**

*Type: other For: Approval  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2104088 (from R4-2103517).**

**R4-2104088 WF on LBT models for NR-U RRM performance requirements**

*Type: other For: Approval  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2103518 WF on general test configurations for NR-U RRM performance requirements**

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

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2103519 WF on NR-U RRM performance test case list**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Withdrawn.**

**R4-2103520 WF on test configurations for NR-U RRM performance requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

##### 7.1.6.1 General [NR\_unlic-Perf]

**R4-2101647 Discussion on RRM performance requirements for NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101648 Discussion on RRM test configurations for NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102523 Draft Big CR: Introduction of Rel-16 NR-U RRM performance requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

Draft Big CR: Introduction of Rel-16 NR-U RRM performance requirements

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103532 (from R4-2102523).**

**R4-2103532 Draft Big CR: Introduction of Rel-16 NR-U RRM performance requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

Draft Big CR: Introduction of Rel-16 NR-U RRM performance requirements

**Discussion:**

[report of discussion]

**Decision: For email approval.**

**R4-2102524 Updated test case list for NR-U**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Updated test case list for NR-U

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103523 (from R4-2102524).**

**R4-2103523 Updated test case list for NR-U**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Updated test case list for NR-U

**Discussion:**

[report of discussion]

**Decision: Approved.**

**R4-2102525 NR-U test cases structure**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

NR-U test cases structure

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103533 (from R4-2102525).**

**R4-2103533 NR-U test cases structure**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

NR-U test cases structure

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102921 Performance requirements in NR-U**

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

**Abstract:**

In this paper, we discuss the various topics on performance requirements in NR-U

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.1.6.2 Common RRM test configuration [NR\_unlic-Perf]

**R4-2100772 Discussion on general test setting for NR-U test cases**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100834 Configurations for NR-U RRM test cases**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101133 Discussion on NR-U RRM test configurations**

*Type: discussion For: Discussion  
 Source: Nokia*

**Abstract:**

Discussion about LBT model and other details of test configurations for NR-U.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101430 Common test parameters for NR-U RRM tests**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the RMC used for NR-U RRM test cases.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101431 Draft CR: RMC for NR-U test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

This draft CR define RMCs used for NR-U RRM test cases.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103521 (from R4-2101431).**

**R4-2103521 Draft CR: RMC for NR-U test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

This draft CR define RMCs used for NR-U RRM test cases.

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

##### 7.1.6.3 Test cases [NR\_unlic-Perf]

###### 7.1.6.3.1 General [NR\_unlic-Perf]

**R4-2100773 Discussion on RRM test cases in NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100833 Scope of test cases for NR-U**

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

**Abstract:**

This paper discusses the planned scope of NR-U test cases with respect to the potential updates in core requirements.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101134 NR-U RRM test case list updates**

*Type: discussion For: Discussion  
 Source: Nokia*

**Abstract:**

Proposal for updates in the NR-U test case list.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102527 On CCA model in NR-U test cases**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On CCA model in NR-U test cases

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102528 CCA model in NR-U test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

CCA model in NR-U test cases

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103522 (from R4-2102528).**

**R4-2103522 CCA model in NR-U test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

CCA model in NR-U test cases

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.1.6.3.2 RRC IDLE, cell re-selection [NR\_unlic-Perf]

**R4-2100839 On test cases for cell reselection under NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102243 Introduction of NR-U cell reselection tests**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1693 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR introduces cell reselection test cases for NR-U.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103531 (from R4-2102243).**

**R4-2103531 Introduction of NR-U cell reselection tests**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1693 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR introduces cell reselection test cases for NR-U.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104078 (from R4-2103531).**

**R4-2104078 Introduction of NR-U cell reselection tests**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1693 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR introduces cell reselection test cases for NR-U.

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102244 Discussions on cell reselection test cases for NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we provide views on testing of the reselection requirements for the agreed test cases.

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.1.6.3.3 HO delay and interruptions [NR\_unlic-Perf]

**R4-2100840 On test cases for handover under NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101135 Draft TC E-UTRAN - NR-U Handover**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia*

**Abstract:**

First draft pf test case for E-UTRAN - NR-U handover.

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2101649 Draft CR of test cases for HO delay and interruption for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104060 (from R4-2101649).**

**R4-2104060 Draft CR of test cases for HO delay and interruption for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102242 Discussions on handover test cases for NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss testing of handover requirements for NR-U.

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.1.6.3.4 RRC Re-establishment [NR\_unlic-Perf]

**R4-2101136 Draft TC RRC re-establishment with CCA**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia*

**Abstract:**

First draft of test cases for RRC re-establishment in NR-U.

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2102647 RRC re-establishment tests for NR-U**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper describes test case on RRC re-establishment in NR-U

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.1.6.3.5 RRC Connection Release with Redirection [NR\_unlic-Perf]

**R4-2100842 Test cases for RRC Connection Release with Redirection in NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101650 Draft CR of test cases for RRC release with redirection for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104061 (from R4-2101650).**

**R4-2104061 Draft CR of test cases for RRC release with redirection for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102648 RRC connetion release with re-direction tests for NR-U**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper describes test case on RRC re-direction in NR-U

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.1.6.3.6 Timing (transmit timing and TA) [NR\_unlic-Perf]

**R4-2100774 Introduction of test cases for UE transmit timing requirements with CCA**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2100843 Test cases for timing in NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102649 Analysis of UE timing tests for NR-U**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper describes test cases on UE transmit timing and UE timing advance in NR-U

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102650 UE timing tests for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

The CR on test cases on UE transmit timing and UE timing advance in NR-U

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103529 (from R4-2102650).**

**R4-2103529 UE timing tests for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

The CR on test cases on UE transmit timing and UE timing advance in NR-U

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104079 (from R4-2103529).**

**R4-2104079 UE timing tests for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

The CR on test cases on UE transmit timing and UE timing advance in NR-U

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.1.6.3.7 BWP switching delay and interruptions [NR\_unlic-Perf]

**R4-2100841 On test cases for BWP switching delay and interruptions under NR-U**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102651 Analysis of test cases on BWP switching with consistent UL LBT failures**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper describes test cases on BWP swiching with consistent UL LBT failures in NR-U

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102652 Test cases on BWP switching with consistent UL LBT failures**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

The CR on test cases on BWP swiching with consistent UL LBT failures in NR-U

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103530 (from R4-2102652).**

**R4-2103530 Test cases on BWP switching with consistent UL LBT failures**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

The CR on test cases on BWP swiching with consistent UL LBT failures in NR-U

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104080 (from R4-2103530).**

**R4-2104080 Test cases on BWP switching with consistent UL LBT failures**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

The CR on test cases on BWP swiching with consistent UL LBT failures in NR-U

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.1.6.3.8 PSCell addition/release (delay and interruption) [NR\_unlic-Perf]

**R4-2100838 Test cases for PSCell addition and release**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101651 Draft CR of test cases for PSCell addition and release for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104062 (from R4-2101651).**

**R4-2104062 Draft CR of test cases for PSCell addition and release for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102370 On PSCell addition release and TCI state activation TCs**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on TCs for PSCell addition/release and for TCI state activation.

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.1.6.3.9 Interruptions [NR\_unlic-Perf]

**R4-2102368 On SCell interruptions and SCell (de)activation test cases**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on interruption and SCell (de)activation test cases for NR-U

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102369 DraftCR Introduction of NR-U SCell interruption and SCell (de)activation tests**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

Interruptions and (de)activation test cases for SCells in NR-U

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103525 (from R4-2102369).**

**R4-2103525 DraftCR Introduction of NR-U SCell interruption and SCell (de)activation tests**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

Interruptions and (de)activation test cases for SCells in NR-U

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.1.6.3.10 RLM [NR\_unlic-Perf]

**R4-2102529 On RLM test cases**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On RLM test cases

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102530 RLM test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

RLM test cases

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103527 (from R4-2102530).**

**R4-2103527 RLM test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

RLM test cases

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.1.6.3.11 Beam management [NR\_unlic-Perf]

**R4-2101432 Test cases on link recovery and L1-RSRP reporting in NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the test cases for beam failure recovery and L1-RSRP reporting in NR-U.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101433 Draft CR: test cases for beam management in NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the test cases for bean failure recovery and L1-RSRP reporting in NR-U.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103524 (from R4-2101433).**

**R4-2103524 Draft CR: test cases for beam management in NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the test cases for bean failure recovery and L1-RSRP reporting in NR-U.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104081 (from R4-2103524).**

**R4-2104081 Draft CR: test cases for beam management in NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the test cases for bean failure recovery and L1-RSRP reporting in NR-U.

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.1.6.3.12 Intra-frequency, inter-frequency and inter-RAT measurement requirements [NR\_unlic-Perf]

**R4-2100775 Introduction of test cases for Accuracy for NR-U inter-frequency SS-RSRP measurements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2100776 Introduction of test cases for L1-RSRP measurement accuracy with CCA serving cell**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2100836 Test cases for intra and inter frequency and inter-RAT measurement requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101137 Draft TC NR-U inter-frequency measurements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia*

**Abstract:**

First draft of test cases for NR-U inter-frequency measurements.

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2101652 Draft CR of test cases for inter-RAT measurement for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104063 (from R4-2101652).**

**R4-2104063 Draft CR of test cases for inter-RAT measurement for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102531 On NR-U measurements test cases**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On NR-U measurements test cases

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102532 NR-U RRM, SFTD, RSSI, and CO measurements test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

NR-U measurements test cases

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103528 (from R4-2102532).**

**R4-2103528 NR-U RRM, SFTD, RSSI, and CO measurements test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

NR-U measurements test cases

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.1.6.3.13 Accuracy requirements for NR-U intra-frequency, inter-frequency and inter-RAT measurements [NR\_unlic-Perf]

**R4-2100837 Test cases for intra and inter frequency and inter-RAT measurement accuracy**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101015 TCs for RSSI and CO measurement accuracy in NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2101653 Draft CR of test cases for intra-frequency measurement accuracy for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104064 (from R4-2101653).**

**R4-2104064 Draft CR of test cases for intra-frequency measurement accuracy for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104077 (from R4-2104064).**

**R4-2104077 Draft CR of test cases for intra-frequency measurement accuracy for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102371 On TC for NR-U Inter-RAT SFTD accuracy**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on test case for E-UTRAN - NR inter-RAT SFTD accuracy.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102372 DraftCR 38.133 NR-U Inter-RAT SFTD accuracy TC**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

Test case for E-UTRAN - NR inter-RAT SFTD accuracy.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103526 (from R4-2102372).**

**R4-2103526 DraftCR 38.133 NR-U Inter-RAT SFTD accuracy TC**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

Test case for E-UTRAN - NR inter-RAT SFTD accuracy.

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

### 7.2 NR mobility enhancement [NR\_Mob\_enh]

#### 7.2.1 RRM requirements maintenance (38.133) [NR\_Mob\_enh-Core/Perf]

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**Email discussion: [98e][207] NR\_Mob\_enh\_RRM**

**R4-2103446 Email discussion summary: [98e][207] NR\_Mob\_enh\_RRM***Type: other For: Information  
Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103689 (from R4-2103446).**

**R4-2103689 Email discussion summary: [98e][207] NR\_Mob\_enh\_RRM***Type: other For: Information  
Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103534 | WF on NR mobility enhancement maintenance | Apple |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2101009 | Merged |
| R4-2101205 | Merged |
| R4-2101210 | Return to |
| R4-2101668 | Revised |

2nd round email discussion conclusions

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2104050 | Agreed |
| R4-2103535 | Return to |
| R4-2103534 | Return to |

================================================================================

**R4-2103534 WF on NR mobility enhancement maintenance**

*Type: other For: Approval  
 Source: Apple*

**Abstract:**

**Discussion:**

Apple: Issue 1-1: Further clarification on DL-to-UL and UL-to-DL switching time needs discussion

* Option 1: same as option 1 in R4-2017093: clarify that 13us switching time is allowed between source cell and target cell: (Apple, Huawei, QC, MTK)
* Option 2: Add conditions for not expected to transmit / not expected to receive covering both source and target cell. Autonomous interruption is allowed if these conditions are not met: (Ericsson, Nokia)

Huawei: Option 1

Nokia: Option 2

QC: Option 1 is spec compliant. Option 2 has impact on UE complexity.

MTK: Option 1. Option 2 may result in interruptions which shall be studied

E///: Option 2.

Session chair: Continue discussion. Agreement shall be made in RAN4 #98-bis-e. In case no consensus is reached, no requirements may be specified.

**Decision: Approved.**

**R4-2101009 CR on maintenance for DAPS handover (R16)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1540 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2101010 CR on maintenance for DAPS handover (R17)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1541 Cat: A (Rel-17)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101204 TDD UL-DL and DL-UL switching in DAPS handover**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Further clarification on DL-to-UL and UL-to-DL switching time

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101205 CR on TS38.133 for dual active protocol stack handover**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1575 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Add conditions for not expected to transmit / not expected to receive covering both source and target cell. Add autonomous interruption allowance if these conditions are unspecified.Correct Ntx-rx and Nrx-tx to 25600 Tc

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2101206 CR on TS38.133 for dual active protocol stack handover**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1576 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Add conditions for not expected to transmit / not expected to receive covering both source and target cell. Add autonomous interruption allowance if these conditions are unspecified.Correct Ntx-rx and Nrx-tx to 25600 Tc

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101210 CR on TS38.133 for Pcell change**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1577 Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104050 (from R4-2101210).**

**R4-2104050 CR on TS38.133 for Pcell change**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1577 Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101211 CR on TS38.133 for Pcell change**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1578 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101667 Discussion on sync conditions for intra-band DAPS handover**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101668 CR on sync conditions for intra-band DAPS handover R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1640 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103535 (from R4-2101668).**

**R4-2103535 CR on sync conditions for intra-band DAPS handover R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1640 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2101669 CR on sync conditions for intra-band DAPS handover R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1641 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

### 7.3 5G V2X with NR sidelink [5G\_V2X\_NRSL]

================================================================================

**Email discussion: [98e][208] 5G\_V2X\_NRSL\_RRM**

**R4-2103447 Email discussion summary: [98e][208] 5G\_V2X\_NRSL\_RRM***Type: other For: Information  
Source: Moderator (LG Electronics)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103690 (from R4-2103447).**

**R4-2103690 Email discussion summary: [98e][208] 5G\_V2X\_NRSL\_RRM***Type: other For: Information  
Source: Moderator (LG Electronics)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103537 | WF on NR V2X RRM requirements | LG Electronics |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2101054 | Revised |
| R4-2101055 | Return to |
| R4-2101788 | Agreed |
| R4-2101787 | Agreed |
| R4-2101057 | Return to |
| R4-2100638 | Revised |

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103536 | Agreed |
| R4-2101055 | Agreed |
| R4-2104045 | Endorsed |
| R4-2103537 | Approved |
|  |  |
|  |  |

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#### 7.3.4 RRM core requirements maintenance (38.133) [5G\_V2X\_NRSL-Core]

**R4-2101054 CR on V2X interruption**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1551 Cat: B (Rel-16)  
  
 Source: Mediatek Inc., LG Electronics, Qualcomm Inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103536 (from R4-2101054).**

**R4-2103536 CR on V2X interruption**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1551 Cat: B (Rel-16)  
  
 Source: Mediatek Inc., LG Electronics, Qualcomm Inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101055 CR on V2X interruption**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1552 Cat: A (Rel-17)  
  
 Source: Mediatek Inc., LG Electronics, Qualcomm Inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101788 CR to 38.133 correction on reselection of V2X synchronization reference source requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1671 Cat: F (Rel-16)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101789 CR to 38.133 correction on reselection of V2X synchronization reference source requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1672 Cat: A (Rel-17)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

#### 7.3.5 RRM perf. requirements (38.133) [5G\_V2X\_NRSL-Perf]

**R4-2103537 WF on NR V2X RRM requirements**

*Type: other For: Approval  
 Source: LG Electronics*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2100638 Big CR-Introduction of NR V2X RRM performance requirements (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1506 Cat: B (Rel-16)  
  
 Source: LG Electronics*

**Abstract:**

It is a big CR to introduce NR V2X RRM performance requirements based on endorsed Draft big CR R4-2017105 in RAN4#97e meeting and additional changes .

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103538 (from R4-2100638).**

**R4-2103538 Big CR-Introduction of NR V2X RRM performance requirements (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1506 Cat: B (Rel-16)  
  
 Source: LG Electronics*

**Abstract:**

It is a big CR to introduce NR V2X RRM performance requirements based on endorsed Draft big CR R4-2017105 in RAN4#97e meeting and additional changes .

**Discussion:**

[report of discussion]

**Decision: For email approval**

**R4-2100639 Big CR-Introduction of NR V2X RRM performance requirements (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1507 Cat: A (Rel-17)  
  
 Source: LG Electronics*

**Abstract:**

It is a Cat.A big CR to introduce NR V2X RRM performance requirements based on endorsed Draft big CR R4-2017105 in RAN4#97e meeting and additional changes for Rel-17.

**Discussion:**

[report of discussion]

**Decision: For email approval**

##### 7.3.5.1 General [5G\_V2X\_NRSL-Perf]

##### 7.3.5.2 L1 SL-RSRP measurement accuracy [5G\_V2X\_NRSL-Perf]

##### 7.3.5.3 Test cases [5G\_V2X\_NRSL-Perf]

###### 7.3.5.3.1 UE transmit timing [5G\_V2X\_NRSL-Perf]

###### 7.3.5.3.2 Initiation/Cease of SLSS Transmission [5G\_V2X\_NRSL-Perf]

###### 7.3.5.3.3 Selection / Reselection of V2X Synchronization Reference Source [5G\_V2X\_NRSL-Perf]

###### 7.3.5.3.4 L1 SL-RSRP measurements [5G\_V2X\_NRSL-Perf]

###### 7.3.5.3.5 Congestion control measurements [5G\_V2X\_NRSL-Perf]

**R4-2101056 Remaining issues on congestion control test case**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101057 draftCR on congestion control test case**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104045 (from R4-2101057).**

**R4-2104045 draftCR on congestion control test case**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.3.5.3.6 Interruptions [5G\_V2X\_NRSL-Perf]

###### 7.3.5.3.7 Resource Pre-emption [5G\_V2X\_NRSL-Perf]

###### 7.3.5.3.8 Resource Re-evaluation [5G\_V2X\_NRSL-Perf]

###### 7.3.5.3.9 Others [5G\_V2X\_NRSL-Perf]

### 7.4 Integrated Access and Backhaul for NR [NR\_IAB]

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**Email discussion: [98e][209] NR\_IAB\_RRM**

**R4-2103448 Email discussion summary: [98e][209] NR\_IAB\_RRM***Type: other For: Information  
Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103691 (from R4-2103448).**

**R4-2103691 Email discussion summary: [98e][209] NR\_IAB\_RRM***Type: other For: Information  
Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103540 | WF on test cases for IAB-MTs | ZTE Corporation |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2100042 | Revised |
| R4-2101627 | Merged |
| R4-2102488 | Merged |
| R4-2102636 | Not pursued |
| R4-2101629 | Revised |
| R4-2100046 | Revised |
| R4-2101630 | Revised |
| R4-2102490 | Revised |
| R4-2102637 | Revised |
| R4-2102639 | Revised |

GTW session (February 04, 2021)

**[98e][209] NR\_IAB\_RRM**

Issue 2-1-2: TDD configuration

* Proposals
  + Option 1 (Huawei, Ericsson, ZTE, Nokia): Tests can be done for any TDD configuration. TDD pattern and related configurations shall be configurable and left for implementation including
    - DL/UL scheduling related configuration
    - PRACH and SRS configuration
    - SSB/CSI-RS configuration
  + Option 2 (Qualcomm): Don’t leave test configurations to declaration and implementation. Update 38.133 to include that requirements are applicable to multi-TRxP deployments. (R4-2100203)
* Discussion
  + QC: Option 1 means that no tests will be introduced in the specification.
  + ZTE: IAB-MT shall be tested as a NW node. The TDD configuration is mainly driven by operators. Option 1 is aligned with RF sessions.
  + E///: for NW nodes (BS) it is typical to test TDD configuration up to declaration. Exact implemented configuration will depend on operator demand.
  + Huawei: the same requirements would apply (no tightening or relaxation of requirements).
  + QC: is it a common accepted practice in the BS testing that TDD parameters are up to declaration?
    - Huawei: yes (but need to check)
    - E///: At least for IAB Demod the requirements are planned to be defined for any possible configurations
  + QC: still disagree with Option 1.
  + E///: in RF session there are approved principles for IAB testing. The WF says that tests can apply for any TDD configuration.
  + ZTE: for BS RF part – BS can choose any TDD configuration based on declaration; for BS Demod – there is a reference configuration, but same requirements apply to all possible configurations.
  + Session chair: Continue discussion.

Issue 2-2-4: Applicability of test cases

* Proposals
  + Option 1 (Huawei, Ericsson, Nokia, ZTE): Only define performance test cases for LA IAB-MT.
  + Option 2 (Qualcomm): Specify test cases also for WA IAB-MT.
* Discussion
  + QC: We already discussed this in Core part. We already agreed that some requirements would apply to both LA and WA. No additional test cases needed.
  + Huawei: for test cases we may follow a different approach. WA is not typical.
  + E///: WA is not an interesting case for test case definition
  + ZTE: Same view as Huawei and E///. Even if we define Core requirements, it is still possible not to define the Performance requirements.
  + Session chair: Continue discussion

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2104057 | Agreed |
| R4-2103541 | Return to |
| R4-2104069 | Return to |
| R4-2103542 | Return to |
| R4-2103543 | Return to |
| R4-2103544 | Return to |
| R4-2103546 | Return to |
|  |  |
|  |  |

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#### 7.4.4 RRM core requirements maintenance [NR\_IAB-Core]

**R4-2100041 On requirements involving gap patterns for IAB-MTs**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100042 [CR] IAB Core Maintenance**

*Type: CR For: Agreement  
 38.174 v16.1.0 CR-0007 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103539 (from R4-2100042).**

**R4-2103539 [CR] IAB Core Maintenance**

*Type: CR For: Agreement  
 38.174 v16.1.0 CR-0007 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104057 (from R4-2103539).**

**R4-2104057 [CR] IAB Core Maintenance**

*Type: CR For: Agreement  
 38.174 v16.1.0 CR-0007 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101626 Discussion on RRM core requirements maintenance for IAB**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101627 CR on RRM core requirements maintenance for MG for IAB**

*Type: CR For: Agreement  
 38.174 v16.1.0 CR-0008 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2102487 discussion on measurement gaps for IAB RRM requirements**

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

**Abstract:**

discussion on measurement gaps for IAB RRM requirements

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102488 CR on removing gap aspects from IAB-MT RRM requirements**

*Type: CR For: Agreement  
 38.174 v16.1.0 CR-0009 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

CR on removing gap aspects from IAB-MT RRM requirements

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2102635 Analysis of measurement gaps for LA IAB-MT**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper analyze gaps for IAB

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102636 Measurement gaps for Local Area IAB-MT**

*Type: CR For: Agreement  
 38.174 v16.1.0 CR-0010 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR defines one gap for BM and RLM requirements for LA IAB-MT

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

#### 7.4.5 RRM perf. requirements [NR\_IAB-Perf]

**R4-2103540 WF on test cases for IAB-MTs**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2104069 (from R4-2103540).**

**R4-2104069 WF on test cases for IAB-MTs**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2104091 (from R4-2104069).**

**R4-2104091 WF on test cases for IAB-MTs**

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

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2102936 IAB-RRM Conformance Testing**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.4.5.1 General [NR\_IAB-Perf]

**R4-2100047 Scope and work split of test cases for IAB-MTs**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100253 On general aspects of IAB-MT test cases**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101628 Discussion on RRM test cases for IAB**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101629 draftCR to introduce test configurations for IAB-MT RRM performance test**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103541 (from R4-2101629).**

**R4-2103541 draftCR to introduce test configurations for IAB-MT RRM performance test**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102489 discussion on IAB RRM test cases**

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

**Abstract:**

Discussion the RRM test cases for IAB.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102640 General principles for IAB RRM test cases**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper discusses some general aspects of RRM tests for IAB

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.4.5.2 Test cases [NR\_IAB-Perf]

**R4-2100046 [draft CR] Test cases for timing for IAB-MT**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103542 (from R4-2100046).**

**R4-2103542 [draft CR] Test cases for timing for IAB-MT**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2101630 draftCR to introduce test cases for RRC release with redirection for IAB-MT**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103543 (from R4-2101630).**

**R4-2103543 draftCR to introduce test cases for RRC release with redirection for IAB-MT**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102490 draftCR on IAB RLM test cases**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Introduce the RLM test cases for IAB-MTs.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103544 (from R4-2102490).**

**R4-2103544 draftCR on IAB RLM test cases**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Introduce the RLM test cases for IAB-MTs.

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102637 Big CR: IAB-MT RRM test cases in 38.174**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Ericsson*

**Abstract:**

The big darft CR on spec structure for IAB-MT RRM test cases in annex of TS 38.174. It was endorsed at RAN#97e

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103545 (from R4-2102637).**

**R4-2103545 Big CR: IAB-MT RRM test cases in 38.174**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Ericsson*

**Abstract:**

The big darft CR on spec structure for IAB-MT RRM test cases in annex of TS 38.174. It was endorsed at RAN#97e

**Discussion:**

[report of discussion]

**Decision: For email approval.**

**R4-2102638 Analysis of RRC re-establishment tests for LA IAB-MT**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The document describes test cases to verify RRC re-establishment requirements for IAB-MT local areas classe

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102639 RRC re-establishment tests for LA IAB-MT**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Ericsson*

**Abstract:**

The darft CR on IAB-MT RRM test cases on RRC re-establishment for IAB-MT LA class

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103546 (from R4-2102639).**

**R4-2103546 RRC re-establishment tests for LA IAB-MT**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Ericsson*

**Abstract:**

The darft CR on IAB-MT RRM test cases on RRC re-establishment for IAB-MT LA class

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

### 7.5 Multi-RAT Dual-Connectivity and Carrier Aggregation enhancements [LTE\_NR\_DC\_CA\_enh]

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**Email discussion: [98e][210] LTE\_NR\_DC\_CA\_RRM\_1**

**R4-2103449 Email discussion summary: [98e][210] LTE\_NR\_DC\_CA\_RRM\_1***Type: other For: Information  
Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103692 (from R4-2103449).**

**R4-2103692 Email discussion summary: [98e][210] LTE\_NR\_DC\_CA\_RRM\_1***Type: other For: Information  
Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (January 27, 2021)

**Topic #1: RRM core requirements maintenance**

Issue 1-3-1: Clarification regarding NEUTRA\_carrier, while T331 is running

* Proposals
  + Option 1: Clarify that NEUTRA\_carrier, while T331 is running, excludes configured E-UTRA carriers indicated to meet high speed requirements.
  + Option 2: other.

Discussion:

Huawei: the intention is not to exclude carriers completely. They were already accounted in a different place. The carriers will still be used for EMR.

Agreement: Clarify that NEUTRA\_carrier, while T331 is running, excludes configured E-UTRA carriers indicated to meet high speed requirements.

Issue 1-1-1: SSB index reading time for FR2 EMR

* Proposals
  + Option 1: SSB index reading time for FR2 EMR = 3 (Nokia)
  + Option 2: SSB index reading time for FR2 EMR = 5 (QC, HW, Apple, MTK)
* Discussion
  + Apple/MTK: Option 2
  + Nokia: Option 2 is acceptable

Agreement: SSB index reading time for FR2 EMR = 5

Issue 1-2-1: Conditions for detected cell

* Proposals
  + Option 1: Clarification/change to the cell detected conditions when transitioning from connected to idle mode is needed. (Nokia)
  + Option 2: Clarification/change to the cell detected conditions when transitioning from connected to idle mode is not needed. (QC, HW, MTK)
* Discussion
  + Apple: Option 2. Based on current spec the procedure is clear.

Agreement: Clarification/change to the cell detected conditions when transitioning from connected to idle mode is not needed

**Topic #2: RRM performance requirements**

Issue 2-1-1: Measurement performance test cases for SS-RSRP and SS-RSRQ measurement accuracies for LTE-NR\_DC\_CA

* Proposals
  + Option 1: Define measurement performance test cases for SS-RSRP and SS-RSRQ measurement accuracies for LTE-NR\_DC\_CA
  + Option 2: other.
* Discussion
  + Apple: Accuracy was already verified in many other places incl. IDLE mode. From UE baseband perspective we don’t expect difference. If test is introduced then we prefer to verify delay and accuracy in the same test.
  + Nokia: we had a similar discussion in Rel-15 and existing test cases do not test absolute accuracy. Support Option 1.
  + Apple: need to check LTE spec
  + QC: what is the delay in EMR context?
    - Apple: we mean measurement period

Agreement:

* Define measurement performance test cases for SS-RSRP and SS-RSRQ measurement accuracies for LTE-NR\_DC\_CA
  + Measurement period and accuracy shall be verified in the same test.

Issue 2-1-2: Define intra-frequency measurement performance test cases for SS-RSRP and SS-RSRQ

* Proposals
  + Option 1: Define intra-frequency measurement performance test cases for SS-RSRP and SS-RSRQ
  + Option 2: Other
* Discussion
  + Huawei: EMR is not applicable for intra-frequency. Is it applicable for the serving cell only?
    - Nokia: Yes.
  + Apple: we think intra-frequency measurements are not in the scope
  + Huawei: serving cell accuracy can be verified in the same test as discussed in 2-1-1
  + Nokia: we are ok. Need to further discuss the details of the test.
  + QC: share same view with Apple/Huawei
  + Session chair: further discuss the serving cell accuracy testing as a part of 2-1-1 test cases

Issue 2-2-1: PCell on NR FR1 and EMR target cell on LTE

* Proposals
  + Option 1: RAN4 do not introduce test case for PCell on NR FR1 and EMR target cell on LTE
  + Option 2: Other
* Discussion
  + Nokia: this is not an uncommon case.
  + QC: ok to define the test case
  + Conclusion: previous agreements can be kept

Issue 2-2-2: PCell on NR FR2 and EMR target cell on NR FR1

* Proposals
  + Option 1: RAN4 do not introduce test case for PCell on NR FR2 and EMR target cell on NR FR1
  + Option 2: Other
* Agreement: do not introduce test case for PCell on NR FR2 and EMR target cell on NR FR1

Issue 2-2-3: PCell on NR RF2 and EMR target cell on NR FR2

* Option 1: RAN4 do not introduce test case for PCell on NR RF2 and EMR target cell on NR FR2
* Agreement: do not introduce test case for PCell on NR FR2 and EMR target cell on NR FR2

Issue 2-2-4: PCell on NR RF2 and EMR target cell on LTE

* Option 1: RAN4 do not introduce test case for PCell on NR RF2 and EMR target cell on LTE
* Agreement: do not introduce test case for PCell on NR FR2 and EMR target cell on LTE

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103547 | WF on Test cases for MR-DC Idle mode CA measurements | Nokia, Nokia Shanghai Bell |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2102252 | Agreed |
| R4-2102745 | Return to |
| R4-2102747 | Return to |
| R4-2102262 | Revised |
| R4-2102263 | Revised |
| R4-2102751 | Return to |
| R4-2102752 | Endorsed |
| R4-2100232 | Revised |
| R4-2102261 | Endorsed |
| R4-2102754 | Revised |

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2102745 | Agreed |
| R4-2103727 | Agreed |
| R4-2103549 | Endorsed |
| R4-2102751 | Endorsed |
| R4-2103550 | Endorsed |
| R4-2103551 | Endorsed |
| R4-2103547 | Approved |
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**Email discussion: [98e][211] LTE\_NR\_DC\_CA\_RRM\_2**

**R4-2103450 Email discussion summary: [98e][211] LTE\_NR\_DC\_CA\_RRM\_2***Type: other For: Information  
Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103693 (from R4-2103450).**

**R4-2103693 Email discussion summary: [98e][211] LTE\_NR\_DC\_CA\_RRM\_2***Type: other For: Information  
Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session discussion conclusions (January 27, 2021)

Issue 1-2-1: Incremental delay D’ for SCell dormancy switching on multiple CCs

* Background
  + In previous meeting it was agreed that the UE capability for incremental delay per CC can be different for active BWP switching (of non-dormant BWPs) and SCell dormancy switching, respectively. The agreement was captured in R4-2017213: “Introduce a capability D’ for dormant BWP switching of multiple SCells that is separate from corresponding capability D for active BWP switching.”
  + In earlier discussions it has been mentioned that D’ shall be taken from the same set of values as applies for D, but it has not been discussed whether the set of values for D’ and D shall be the same, or whether the values for D’ shall represent a subset of the values for D.
* Proposals
  + Option 1 (Nokia): Introduce the following incremental delay values:
    - D’ is {100µs, 200µs} for UE indicating type1 in bwp-SwitchingDelay
    - D’ is {200µs} for UE indicating type2 in bwp-SwitchingDelay
  + Option 2 (MediaTek): Introduce the following incremental delay values:
    - D’ is {100µs, 200µs} for UE indicating type1 in bwp-SwitchingDelay
    - D’ is {200µs, 400µs} for UE indicating type2 in bwp-SwitchingDelay
  + Option 3 (vivo): Introduce the following incremental delay values:
    - D’ is {100µs, 200µs} for UE indicating type1 in bwp-SwitchingDelay
    - D’ is {200µs, 400µs, 800µs} for UE indicating type2 in bwp-SwitchingDelay
  + Option 4 (Ericsson, Qualcomm [R4-2102891], Apple, NEC): Introduce the following incremental delay values:
    - D’ is {100µs, 200µs} for UE indicating type1 in bwp-SwitchingDelay
    - D’ is {200µs, 400µs, 800µs, 1000µs} for UE indicating type2 in bwp-SwitchingDelay
* Discussion
  + E///: 4 companies are supporting Option 4 based on email discussion
  + MTK: Not clear why we need a new capability if we want to keep the same values. Some clarifications are encouraged. We can compromise to Option 3. Option 4 harms the feasibility of dormancy SCell switching
  + Nokia: Option 4 is acceptable. Suggest to discuss how we capture applicability (e.g. max number of CCs UE can activate simultaneously)
  + Vivo: Option 4 is same as multiple BWP switching. But the scenario is different since for this capability we have a single DCI and there is some room for optimization.
  + Apple: Prefer Option 4. New UE capability allows more flexibility. There is no ambiguity on how many CCs UE can handle.
  + QC: Option 4. Can compromise to Option 3.
  + E///: Prefer Option 4. Option is ok as well.
* Agreements
  + Introduce the following incremental delay values:
    - D’ is {100µs, 200µs} for UE indicating type1 in bwp-SwitchingDelay
    - D’ is {200µs, 400µs, 800µs, 1000µs} for UE indicating type2 in bwp-SwitchingDelay

Issue 1-2-2: Incremental delay D’ and number of CCs for SCell dormancy switching

* Background
  + For some choices of D’, the time for switching on multiple CCs may exceed the maximum time that can be supported by other functions (e.g. HARQ feedback). See for instance discussions in LS out (R4-2012269) and LS reply (R1-2009575) on the matter.
  + In R4-2102256 it is proposed that, if needed (pending on outcome of Issue 1-2-1), it shall be specified for how many CCs switching can be supported.
  + Please note that the discussion here is solely whether to capture, somewhere, that there may be a limited applicability w.r.t. number of SCCs. Further discussions on whether such limitation shall be captured e.g. in the capability description are to be carried out in email thread [98e][114] R16\_UE\_ feature, Issue 1-1: New feature simultaneous dormant BWP switching.
* Proposals
  + Option 1 (Nokia): If it is agreed that a UE indicating type2in bwp-SwitchingDelay can report a D’ larger than 200µs, then it shall be specified that for SCS 120kHz, the maximum number of supported CCs will depend on the reported value D’:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| D’ | 200µs | 400µs | 800µs | 1000µs | 200µs | 400µs | 800µs | 1000µs |
|  | DCI received within the first 3 symbols | | | | DCI received after the first 3 symbols | | | |
| #CC | 8 | 5 | 3 | 2 | 8 | 4 | 2 | 2 |

* Recommended WF
  + [Moderator] May need to be coordinated with discussions in thread [98e][218] NR\_RRM\_Enh\_RRM\_1 on BWP switching on multiple CCs. Where to capture, if agreed, is to be discussed in thread [98e][114] R16\_UE\_ feature.
* Discussion
  + E///: recommend a high-level description and discuss jointly with 1-1-2 in [218]
  + QC: there are many parameters. Even high-level description may cause ambiguity.
  + E///: we are also fine with not capturing it at all. Can we agree that this is similar issur of multiple BWP switching
  + Apple: agree to align with [218]. Our preference is not to add a description to RAN4 specs.
  + Nokia: Fine to continue discussion in [218]. We can also add a note that there may be certain restrictions on the number of CCs that can be switched simultaneously.
  + vivo: we are ok to put the description at least high-level but we do not need to put the exact number of CCs.
  + Chair: Continue discussion on a potential high-level note on possible constraints on number of CCs for dormant BWP switching in the thread [218] as a part of issue 1-1-2. Do not capture the exact maximum number of supported CCs. Do not further discuss in [211].

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103552 | WF on replacement of measCycleSCell in core requirements for Direct SCell activation | Apple |
| R4-2103556 | Draft Big CR: Introduction of Rel-16 MR-DC Direct SCell activation and SCell dormancy RRM performance requirements (TS 38.133) | Ericsson |
| R4-2103563 | WF on test cases for SCell dormancy | Ericsson |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2100228 | Revised |
| R4-2101213 | Return to |
| R4-2101388 | Not pursued |
| R4-2102254 | Return to |
| R4-2102257 | Return to |
| R4-2102352 | Merged |
| R4-2102366 | Agreed |
| R4-2102749 | Revised |
| R4-2102881 | Merged |
| R4-2102883 | Merged |
| R4-2100230 | Revised |
| R4-2101215 | Revised |
| R4-2102358 | Revised |
| R4-2102755 | Revised |
| R4-2102260 | Revised |
| R4-2101073 | Revised |
| R4-2100231 | Revised |
| R4-2101217 | Revised |
| R4-2102757 | Revised |
| R4-2102886 | Revised |
| R4-2101074 | Revised |
| R4-2102360 | Revised |
| R4-2102259 | Revised |

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103553 | Revised |
| R4-2101213 | Postponed |
| R4-2102254 | Agreed |
| R4-2102257 | Agreed |
| R4-2103554 | Agreed |
| R4-2103552 | Return to |
| R4-2103557 | Endorsed |
| R4-2103558 | Endorsed |
| R4-2103559 | Endorsed |
| R4-2103560 | Endorsed |
| R4-2103561 | Endorsed |
| R4-2103562 | Endorsed |
| R4-2103564 | Endorsed |
| R4-2103565 | Endorsed |
| R4-2103566 | Endorsed |
| R4-2103567 | Endorsed |
| R4-2103568 | Endorsed |
| R4-2103569 | Endorsed |
| R4-2103570 | Endorsed |
| R4-2103563 | Approved |
|  |  |

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#### 7.5.2 RRM core requirements maintenance (38.133/36.133) [LTE\_NR\_DC\_CA\_enh-Core]

##### 7.5.2.1 Early Measurement reporting [LTE\_NR\_DC\_CA\_enh-Core]

**R4-2102252 Correction to Idle Mode CA/DC Measurements for Inactive mode**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1698 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102253 Correction to Idle Mode CA/DC Measurements for Inactive mode**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1699 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102744 Discussion on remaining issues in EMR requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102745 CR on EMR requirement maintenance in 38.133**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1758 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102746 CR on EMR requirement maintenance in 38.133 R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1759 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102747 CR on EMR requirements in 36.133**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7064 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103727 (from R4-2102747).**

**R4-2103727 CR on EMR requirements in 36.133**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7064 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102748 CR on EMR requirements in 36.133 R17**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7065 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

##### 7.5.2.2 Efficient and low latency serving cell configuration, activation and setup [LTE\_NR\_DC\_CA\_enh-Core]

**R4-2103552 WF on replacement of measCycleSCell in core requirements for Direct SCell activation**

*Type: other For: Approval  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2100227 Activation time in direct SCell activation**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100228 CR on activation time in direct SCell activation**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1461 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103553 (from R4-2100228).**

**R4-2103553 CR on activation time in direct SCell activation**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1461 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104071 (from R4-2103553).**

**R4-2104071 CR on activation time in direct SCell activation**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1461 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2100229 CR on activation time in direct SCell activation (R17)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1462 Cat: A (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101012 CR on activation time in direct SCell activation (R17)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1543 Cat: A (Rel-17)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101212 Discussion on direct Scell activation and dormancy Scell**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101213 CR on TS38.133 for direct Scell activation**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1579 Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2101214 CR on TS38.133 for direct Scell activation**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1580 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101377 Remaining issues for Scell dormancy RRM requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101388 CR for adding capability D’ for SCell dormancy BWP switch requirement**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1593 Cat: F (Rel-16)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

**R4-2101389 CR for adding capability D’ for SCell dormancy BWP switch requirement**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1594 Cat: A (Rel-17)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

Session chair: Cover sheet errors (What is the release? It reads Rel-16 on the cover page but the Tdoc is reserved for Rel-17.)

**Decision: Not pursued.**

**R4-2102254 CR clarifying the UE measurement requirements for an SCell with dormant BWP**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1700 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102255 CR clarifying the UE measurement requirements for an SCell with dormant BWP**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1701 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102256 Discussion related to multiple SCell dormancy BWP switch**

*Type: discussion For: Approval  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102257 Correction to simultaneous DCI based BWP switch delay on multiple CCs**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1702 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102258 Correction to simultaneous DCI based BWP switch delay on multiple CCs**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1703 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102351 On incremental delay for dormancy switching on multiple CCs**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Discussion on separate capability on incremental delay for SCell dormancy switching on multiple CCs.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102352 CR 38.133 (8.2 8.6) Corrections related to SCell dormancy switching**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1718 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Adding separate capability for incremental delay for SCell dormancy switching on multiple CCs. Removal of brackets for interruption due to RRM measurements on dormant SCell.

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2102353 CR 38.133 (8.2 8.6) Corrections related to SCell dormancy switching**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1719 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Adding separate capability for incremental delay for SCell dormancy switching on multiple CCs.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102366 CR 36.133 Removal of brackets for SCell dormancy**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7041 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Removal of brackets for interruption due to RRM measurements on dormant SCell.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102367 CR 36.133 Removal of brackets for SCell dormancy**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7042 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Removal of brackets for interruption due to RRM measurements on dormant SCell.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102749 CR on SCell dormancy switching**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1760 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103554 (from R4-2102749).**

**R4-2103554 CR on SCell dormancy switching**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1760 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102750 CR on SCell dormancy switching R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1761 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102881 Cat-F CR to Removal of brackets for SCell Dormancy and Simultaneous DCI based BWP switch delay on multiple CCs in Rel-16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1785 Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2102882 Cat-A CR to Removal of brackets for SCell Dormancy and Simultaneous DCI based BWP switch delay on multiple CCs in Rel-17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1786 Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102883 Cat-F CR to Removal of brackets for SCell Dormancy and Simultaneous DCI based BWP switch delay on multiple CCs in Rel-16 LTE**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7080 Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2102884 Cat-A CR to Removal of brackets for SCell Dormancy and Simultaneous DCI based BWP switch delay on multiple CCs in Rel-17 LTE**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7081 Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

#### 7.5.3 RRM perf. requirements (38.133) [LTE\_NR\_DC\_CA\_enh-Perf]

**R4-2103547 WF on Test cases for MR-DC Idle mode CA measurements**

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

**Abstract:**

**Discussion:**

**Decision: Approved.**

##### 7.5.3.1 Early Measurement reporting [LTE\_NR\_DC\_CA\_enh- Perf]

###### 7.5.3.1.1 Accuracy requirements [LTE\_NR\_DC\_CA\_enh-Perf]

**R4-2102262 Draft Big CR: Introduction of Rel-16 MR-DC EMR RRM performance requirements (TS 38.133)**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103548 (from R4-2102262).**

**R4-2103548 Draft Big CR: Introduction of Rel-16 MR-DC EMR RRM performance requirements (TS 38.133)**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: For email approval**

**R4-2103555 Draft Big CR: Introduction of Rel-16 MR-DC EMR RRM performance requirements (TS 36.133)**

*Type: draftCR For: Endorsement  
 36.133 v16.8.0  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Withdrawn.**

**R4-2102263 Draft CR for Removal of brackets for idle mode CA measurement accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103549 (from R4-2102263).**

**R4-2103549 Draft CR for Removal of brackets for idle mode CA measurement accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102751 draftCR on accuracy requirements for EMR 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102752 Big CR: Introduction of Rel-16 MR-DC EMR RRM performance requirements (TS 36.133)**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7066 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

Session chair: same CR as last meeting. No new LTE spec Draft CRs are endorsed. Postpone till next meeting.

**Decision: Postponed.**

**R4-2102753 Big CR: Introduction of Rel-16 MR-DC EMR RRM performance requirements (TS 36.133)**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7067 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

###### 7.5.3.1.2 Test cases [LTE\_NR\_DC\_CA\_enh-Perf]

**R4-2100232 Test case for EMR with both PCell and target cell in FR1**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103550 (from R4-2100232).**

**R4-2103550 Test case for EMR with both PCell and target cell in FR1**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102261 Draft CR for Idle Mode measurements of inter-frequency CA candidate cells for early reporting**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102264 Measurement Performance Requirements test for MR-DC**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102754 draftCR to introduce TC4 for EMR**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103551 (from R4-2102754).**

**R4-2103551 draftCR to introduce TC4 for EMR**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102885 Discussion on Cell Configuration for EMR Test Case**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.5.3.2 Efficient and low latency serving cell configuration, activation and setup [LTE\_NR\_DC\_CA\_enh-Perf]

**R4-2103563 WF on test cases for SCell dormancy**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2103556 Draft Big CR: Introduction of Rel-16 MR-DC Direct SCell activation and SCell dormancy RRM performance requirements (TS 38.133)**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Discussion:**

[report of discussion]

**Decision: For email approval**

###### 7.5.3.2.1 Test cases for direct SCell activation [LTE\_NR\_DC\_CA\_enh-Perf]

**R4-2100230 Test case for Direct SCell Activation: EN-DC, NR spCell in FR1, SCell in FR1, SCell addition**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103557 (from R4-2100230).**

**R4-2103557 Test case for Direct SCell Activation: EN-DC, NR spCell in FR1, SCell in FR1, SCell addition**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2101073 Draft CR on TC for direct SCell activation during handover in NR SA for FR2**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: NEC*

**Abstract:**

TC for direct SCell activation during handover in NR SA for FR2 is added/specified

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103562 (from R4-2101073).**

**R4-2103562 Draft CR on TC for direct SCell activation during handover in NR SA for FR2**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: NEC*

**Abstract:**

TC for direct SCell activation during handover in NR SA for FR2 is added/specified

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2101215 CR on TS38.133 for direct SCell activation of SCell in FR2 intra-band in ENDC mode (A.5.5.X)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1581 Cat: B (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103558 (from R4-2101215).**

**R4-2103558 CR on TS38.133 for direct SCell activation of SCell in FR2 intra-band in ENDC mode (A.5.5.X)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1581 Cat: B (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2101216 CR on TS38.133 for direct SCell activation of SCell in FR2 intra-band in ENDC mode (A.5.5.X)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1582 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102260 Draft CR for NR FR1 Intra frequency handover with direct SCell activation**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103561 (from R4-2102260).**

**R4-2103561 Draft CR for NR FR1 Intra frequency handover with direct SCell activation**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102357 On TC3 for Direct SCell Activation**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on test cases for direct SCell activation

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102358 DraftCR 38.133 TC3 Direct SCell activation**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

TC3 for direct SCell activation

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103559 (from R4-2102358).**

**R4-2103559 DraftCR 38.133 TC3 Direct SCell activation**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

TC3 for direct SCell activation

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102755 draftCR to introduce TC4 for direct SCell activation**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103560 (from R4-2102755).**

**R4-2103560 draftCR to introduce TC4 for direct SCell activation**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.5.3.2.2 Test case for SCell Dormancy [LTE\_NR\_DC\_CA\_enh-Perf]

**R4-2100231 Test case for SCell Dormancy: EN-DC, NR spCell in FR1, SCell FR1, DCI 2\_6 within/after 3 OFDM symbols**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103564 (from R4-2100231).**

**R4-2103564 Test case for SCell Dormancy: EN-DC, NR spCell in FR1, SCell FR1, DCI 2\_6 within/after 3 OFDM symbols**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2101074 Draft CR on TC for SCell dormancy in NR SA for FR1**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: NEC*

**Abstract:**

TC for SCell dormancy in NR SA for FR1 is specified

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103568 (from R4-2101074).**

**R4-2103568 Draft CR on TC for SCell dormancy in NR SA for FR1**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: NEC*

**Abstract:**

TC for SCell dormancy in NR SA for FR1 is specified

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2101217 CR on TS38.133 for E-UTRAN – NR SCell FR1 dormant BWP switch with FR1 PSCell in non-DRX in synchronous EN-DC (A.4.5.X)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1583 Cat: B (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103565 (from R4-2101217).**

**R4-2103565 CR on TS38.133 for E-UTRAN – NR SCell FR1 dormant BWP switch with FR1 PSCell in non-DRX in synchronous EN-DC (A.4.5.X)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1583 Cat: B (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2101218 CR on TS38.133 for E-UTRAN – NR SCell FR1 dormant BWP switch with FR1 PSCell in non-DRX in synchronous EN-DC (A.4.5.X)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1584 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102259 Draft CR for test case 7 for Dormant SCell BWP switch delay**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103570 (from R4-2102259).**

**R4-2103570 Draft CR for test case 7 for Dormant SCell BWP switch delay**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102359 On TCs 6 and 8 for SCell dormancy switching**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on test cases for SCell dormancy

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102360 DraftCR 38.133 TCs 6 and 8 SCell dormancy switching**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

TCs 6 and 8 for SCell dormancy

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103569 (from R4-2102360).**

**R4-2103569 DraftCR 38.133 TCs 6 and 8 SCell dormancy switching**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

TCs 6 and 8 for SCell dormancy

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102756 Further discussion on test for SCell dormancy**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102757 draftCR to introduce TC3 for SCell dormancy**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103566 (from R4-2102757).**

**R4-2103566 draftCR to introduce TC3 for SCell dormancy**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102886 DraftCR on EN-DC NR SpCell in FR1 and 2 NR SCells in FR2 for Dormant SCell switch via DCI 2\_6 within and after 3 OFDM symbols**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103567 (from R4-2102886).**

**R4-2103567 DraftCR on EN-DC NR SpCell in FR1 and 2 NR SCells in FR2 for Dormant SCell switch via DCI 2\_6 within and after 3 OFDM symbols**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102887 Test framework for SCell dormancy performance requirements**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Noted.**

### 7.6 UE power saving in NR [NR\_UE\_pow\_sav]

#### 7.6.1 RRM requirements maintenance (38.133) [NR\_UE\_pow\_sav-Core/Perf]

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**Email discussion: [98e][212] NR\_UE\_pow\_sav\_RRM**

**R4-2103451 Email discussion summary: [98e][212] NR\_UE\_pow\_sav\_RRM***Type: other For: Information  
Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103694 (from R4-2103451).**

**R4-2103694 Email discussion summary: [98e][212] NR\_UE\_pow\_sav\_RRM***Type: other For: Information  
Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103571 | LS on RRM relaxation in power saving | CATT |
| R4-2103573 | WF on remaining issue for power saving RRM | CATT |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2101383 | Return to |
| R4-2101624 | Merged |
| R4-2101834 | Revised |
| R4-2100482 | Revised |
| R4-2100727 | Merged |
| R4-2101385 | Status is unclear |
| R4-2101835 | Revised |
| R4-2102246 | Revised |
|  |  |

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2101383 | Return to |
| R4-2101384 | Return to |
| R4-2103572 | Agreeable |
| R4-2101881 | Cat-A. Agreeable |
| R4-2103571 | Return to |
| R4-2103573 | Return to |
| R4-2103574 | Agreeable |
| R4-2100483 | Cat-A CR Agreeable |
| R4-2103575 | Agreeable |
| R4-2101836 | Cat-A CR Agreeable |
| R4-2103576 | To be noted |
| R4-2102245 | Withdrawn |
|  |  |
|  |  |
|  |  |

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**R4-2103571 LS on RRM relaxation in power saving**

*Type: LS out For: Approval  
 to RAN2  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Withdrawn.**

**R4-2103573 WF on remaining issue for power saving RRM**

*Type: other For: Approval  
 Source: CATT*

**Abstract:**

**Discussion:**

vivo: Misalignment between RAN2/RAN4 specifications. If we don’t update RAN4 specs, then we’ll need to update RAN2 specs.

E///: Keep current RAN4 specification and inform RAN2 to update their spec.

Session chair: For issue “Whether to change “K2\* Thigher\_priority\_search” to “1 hour” in Slide 2, continue discussion in RAN4 #98-bis-e. If no consensus is reached to modify RAN4 specification, then LS to RAN2 shall be sent to inform on mismatch in RAN4 and RAN2 specs.

**Decision: Approved.**

**R4-2100473 Discussion on remaining issues for UE power saving test case**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100482 Correction to cell reselection test case for UE Power saving**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1497 Cat: F (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103574 (from R4-2100482).**

**R4-2103574 Correction to cell reselection test case for UE Power saving**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1497 Cat: F (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100483 Correction to cell reselection test case for UE Power saving**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1498 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100727 CR on RRM test cases for NR UE power saving**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2101383 CR for removing K2 for R16 UE power saving**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1589 Cat: F (Rel-16)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2101384 CR for removing K2 for R16 UE power saving**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1590 Cat: A (Rel-17)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2101385 CR for modifications on FR1 intra-frequency UE power saving test cases**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1591 Cat: F (Rel-16)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2101386 CR for modifications on FR1 intra-frequency UE power saving test cases**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1592 Cat: A (Rel-17)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

Session chair: Cover sheet errors (What is the release? It reads Rel-16 on the cover page but the Tdoc is reserved for Rel-17. What is the CR category? It reads F on the cover page but the Tdoc is reserved for category A.)

Session chair: tdoc will be postponed due to CR cover sheet issues

**Decision: Postponed.**

**R4-2101624 Correction to relexed cell reselection requirements R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1626 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2101625 Correction to relexed cell reselection requirements R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1627 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101834 Correction on inter-RAT E-UTRAN cells for UE configured with relaxed measurement criterion**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1673 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103572 (from R4-2101834).**

**R4-2103572 Correction on inter-RAT E-UTRAN cells for UE configured with relaxed measurement criterion**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1673 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101881 Correction on inter-RAT E-UTRAN cells for UE configured with relaxed measurement criterion**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1690 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101835 Test case for cell reselection to FR2 intra-frequency NR case for UE configured with relaxed measurement**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1674 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103575 (from R4-2101835).**

**R4-2103575 Test case for cell reselection to FR2 intra-frequency NR case for UE configured with relaxed measurement**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1674 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101836 Test case for cell reselection to FR2 intra-frequency NR case for UE configured with relaxed measurement**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1675 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102246 Changes to cell reselection tests under power saving**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1695 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The cell reselection test cases contain square brackets which for the signal levels which are removed. Signal levels are checked and no need to further modify them.

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2103576 Changes to cell reselection tests under power saving**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1695 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The cell reselection test cases contain square brackets which for the signal levels which are removed. Signal levels are checked and no need to further modify them.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102245 Changes to cell reselection tests under power saving**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1694 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The cell reselection test cases contain square brackets which for the signal levels which are removed. Signal levels are checked and no need to further modify them.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

### 7.7 NR Positioning Support [NR\_pos]

#### 7.7.1 RRM core requirements maintenance (38.133) [NR\_pos-Core]

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**Email discussion: [98e][213] NR\_pos\_RRM\_1**

**R4-2103452 Email discussion summary: [98e][213] NR\_pos\_RRM\_1***Type: other For: Information  
Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103695 (from R4-2103452).**

**R4-2103695 Email discussion summary: [98e][213] NR\_pos\_RRM\_1***Type: other For: Information  
Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (January 28, 2021)

Issue 1-1-1: Consideration on PRS resource muting

* Option 1a (HW, OPPO, vivo)
  + If muting option 1 is applied, the periodicity of a PRS resource is scaled by
    - where is X \* *dl-prs-MutingBitRepetitionFactor*, and X is the size of NR-*MutingPattern-r16* for *mutingOption1-r16*
* Option 1b (QC, Intel)
  + If muting option 1 is applied, the periodicity of a PRS resource is scaled by
* where is X \* *dl-prs-MutingBitRepetitionFactor*, and X is the number of consecutive zeros in *NR-MutingPattern-r16* for *mutingOption1-r16*
* Option 1c (Intel)
  + X is the maximum number of consecutive zeros in *NR-MutingPattern-r16* for *mutingOption1-r16*
* Option 2 (E///, CATT): LTE approach
* Option 3 (Intel): Do not define requirements for the case of PRS resource muting in Rel-16

Discussion

* Intel: can we focus on the no muting case in Rel-16 and deprioritize the work on muting
* E///: need to discuss no muting first. Concerns on way of working. Option 1 provides unnecessary scaling. Consider capability and MG issue.
* Huawei: we are open to Intel’s suggestion to focus on no muting case in Rel-16. On Option 2 – it may not be applicable. Disagree that NR requirements are much worse than LTE.
* vivo: Muting case requirements need to be defined. The PRS configuration is cell-specific and MG is UE specific. The PRS periodicity originally did not account MG periodicity. Therefore, it is important to have repetitions. Measurement delay depends on configuration.
* QC: Limiting the scope of Rel-16 can be discussed. Type 1 muting needs to be accounted since it affects the amount of resources and Type 2 muting may not need to be taken into account.
* Intel: In case PRS muting is applied, then typically the positioning performance will be better. So, we think that no muting case is the worst case.
* Session chair: continue the discussion

Issue 1-1-2: Consideration on different resource periodicities

* Option 1a (CATT, vivo, QC, Intel)
  + Use the least common multiple of PRS periodicities among all PRS resources in the PFL
* Option 1b (OPPO, QC?)
  + Use the least common multiple of PRS periodicities among all PRS resources in the PFL, where only the PRS resources or resource sets within the MGs should be considered
* Option 1c (Huawei)
  + Use the least common multiple of PRS periodicities after muting among all PRS resources in the PFL, where only the PRS resources or resource sets within the MGs should be considered
  + The measurement requirements apply provided that, the resource periodicities after muting are either <= 160ms for all PRS resources on the PFL, or > 160ms for all PRS resources on the PFL.
* Option 2a (Intel)
  + Use the maximum PRS resource periodicity among all PRS resource in a same positioning frequency layer.
* Option 2b (Ericsson)
  + Clarify in RSTD measurement period requirements that the measured PRS resources shall be contained in at least some MGs
  + No need to restrict PRS periodicity to be a multiple of 5 ms.
  + TPRS,i is the longest PRS periodicity (of PRS resources contained within at least some measurement gaps) on that carrier.
* Option 3 (QC)
  + Measurement requirements would not apply to PRS periodicities equal to 4, 8, 16, 32 and 64 ms in Rel-16
  + Adopt option 1a or option 1b (which are equivalent with above bullet)
* Option 4 (HW)
  + RSTD measurement requirements apply provided that all PRS resources on a PRS frequency layer have same periodicity after muting

Discussion

* + Huawei: For Option 1b there were suggestions to clarify “count only PRS resources that have at least some instances fully contained within the configured MG pattern”
  + QC: Option1a is a basic approach. Option1b is a kind of optimization
  + Intel: Option1a is fine for us.
  + E///: It is not sufficient to say PRS within MG. MGRP needs to be considered. Max(PRS periodicity, MGRP) needs to be considered.
  + QC: it is given that MG is configured. Option 1b is an optimization.
  + Vivo: for the case of LCM (option 1) – all resources can be measured, but for the case Max(PRS periodicity, MGRP) some resources may not be measured. Both can work.
  + E///: Network knows only on the configured PRS. Assumptions between gNB and UE need to be aligned.
  + Huawei/QC/Intel: Option 2 is redundant and MGRP is already considered in the existing requirements.
  + OPPO: our intention is to always exclude PRS resources outside the gap. We are ok with Option 1a as well.
  + E///: for PRS periodicities – are these configured or these are PRS resources in gaps
    - QC: these are configured PRS periodicities

Agreements

* + Use the least common multiple of PRS periodicities among all PRS resources in the PFL
    - FFS: whether only the PRS resources or resource sets configured within the MGs should be considered

Issue 1-3-1: Definition of parameter L\_(PRS,i)

* Option 1 (vivo)
  + Lprs is the time duration of available number of PRS symbols or number of slots during Teffect depending on the type that UE used to report {N, T}
* Option 2 (HW, CATT, Intel)
  + Refer to clause 5.1.6.5 of 38.214 for definition of calculation of Lprs.
* Option 3 (Ericsson)
  + is the size of the downlink PRS resource in the time domain defined in TS 38.211 [6] and indicated by the higher-layer parameter dl-PRS-NumSymbols specified in TS 37.355.

Discussion

* + vivo: 38.214 does not include clear definition of Lprs
  + HW: we can clarify 38.133 to provide more clear references to RAN1 specs. Can combine Option 1 and Option 2.
  + E///: there are several issues 1) references 2) notations. For Option 2 we may need to change the notation.
  + QC: we are talking about requirements.
  + HW: we are fine to change the notation if it is confusing. Suggest to focus on Option 2 and further discuss the clarifications.

Agreements

* + Refer to clause 5.1.6.5 of 38.214 for calculation of Lprs.
  + Further clarify the description and notations of Lprs in 38.133 (e.g. account PRS resources within MGs; clarify period of time over which Lprs is counted)

Issue 1-4-1: Basic principle (sum approach v.s. max approach)

* Option 1 (Intel, vivo, QC, HW, Nokia)
  + Measurement period of multiple PRS layers is defined as summation of the measurement period in each frequency layer
  + CSSF is only for the MG sharing between PRS and RRM layers. Count only a single PRS layer for a gap occasion in CSSF calculation for both PRS and RRM layers.
* Option 2a (OPPO)
  + Measurement period of multiple PRS layers is defined as maximum of the measurement period in each frequency layer
  + CSSF is based on Rel-15 CSSF concept and all PRS layers should be counted
  + For long PRS processing time cases, the following scaling factor k should be added
    - The scaling factor k should be applied to all PRS layer involved in the collision,
      * PRS layer i whose processing time covers other PRS instances and
      * PRS layer j whose PRS instance is covered by the processing time of PRS layer i
    - k is the number of colliding MGs due to long processing time
  + If more than one long-periodicity PRS layers are configured, the same MG competition rules as short-periodicity PRS layers could be reused.
* Option 2b (Ericsson)
  + CSSF is the NR concept which is used for all types of measurements including RRM, scaling based on the number of frequency layers is the LTE concept.
  + Hence, for the overlapping case, CSSF shall be used in the requirements, but Σ over frequency layers shall be replaced with the max operator:

TRSTD, Total = *maxi* (TRSTD,i).

Discussion

* + Moderator: no changes of views in the 1st round.
  + Session chair: what happens if we don’t make agreement
    - Huawei: by default Option 1 is assumed in the spec but there may be ambiguity or FFS in some parts of the spec
  + E///: in the last meeting we brought some issues which were not resolved. TRSTD,i becomes the measurement period. What we can be ok with the following equation
    - TRSTD, Total =
  + HW: it is more like terminology issue. Our preference is to keep using TRSTD,i but to clarify the definition
  + QC: do not see much difference between the current equation and new equation

Agreements

* + Measurement period of multiple PRS layers is defined as summation of the measurement period in each frequency layer
  + CSSF is only for the MG sharing between PRS and RRM layers. Count only a single PRS layer for a gap occasion in CSSF calculation for both PRS and RRM layers.
  + FFS how to capture the equations in the specifications
    - Option 1A:
      * Note: is already defined in the specification
    - Option 1B
      * TRSTD, Total =
      * Note: needs to be removed from the specification

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103577 | WF on UE PRS measurement requirements | Huawei, HiSilicon |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2100438 | Revised |
| R4-2101779 | Merged |
| R4-2102298 | Merged |
| R4-2102540 | Merged |
| R4-2102759 | Merged |
| R4-2101781 | Merged |
| R4-2102300 | Merged |
| R4-2102543 | Revised |
| R4-2102761 | Merged |
| R4-2100439 | Merged |
| R4-2101527 | Revised  Need to request Cat-A CR |
| R4-2101783 | Merged |
| R4-2102302 | Merged |
| R4-2102546 | Merged |
| R4-2102764 | Merged |
| R4-2101785 | Revised |
| R4-2102767 | Revised  Focus on changes related to UE capability and MG |
| R4-2102769 | Revised |
| R4-2102548 | Merged |

2nd round email discussion conclusions

|  |  |
| --- | --- |
| R4-2103578 | Return to |
| R4-2103579 | Revised |
| R4-2103580 | Agreed |
| R4-2103582 | Revised |
| R4-2103583 | Postpone |
| R4-2103584 | Agreed |
| R4-2103577 | Revised |

================================================================================

**R4-2103577 WF on UE PRS measurement requirements**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2104076 (from R4-2103577).**

**R4-2104076 WF on UE PRS measurement requirements**

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

**Abstract:**

**Discussion:**

Session chair: further discuss the terminology in slide 20 in the next meeting. The RAN4 specs can be updated once the conclusion is reached.

**Decision: Approved.**

##### 7.7.1.1 PRS-RSTD measurement requirements [NR\_pos-Core]

**R4-2100436 Discussion on PRS RSTD measurement requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100438 CR on PRS RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1477 Cat: F (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

Session chair: Cover sheet errors (What is the work item? It reads NR\_pos-Perf but the Tdoc is reserved for NR\_pos-Core.)

**Decision: Revised to R4-2103578 (from R4-2100438).**

**R4-2103578 CR on PRS RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1477 Cat: F (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100468 CR on PRS RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1489 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101272 Discussion on NR PRS RSTD measurement report requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101526 Further discussion on maintenance for RSTD measurement requirement**

*Type: discussion For: Discussion  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101776 Discussion on PRS RSTD measurement requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101779 CR to 38.133 correction to PRS RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1663 Cat: F (Rel-16)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2101780 CR to 38.133 correction to PRS RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1664 Cat: A (Rel-17)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102290 On PRS-RSTD measurement requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102298 Revision of PRS-RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1706 Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2102299 Revision of PRS-RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1707 Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102539 On RSTD measurement requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On RSTD measurement requirements

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102540 RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1730 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

RSTD measurement requirements

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2102541 RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1731 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

RSTD measurement requirements

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102548 Correction to CSSF for PRS measurements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1736 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Correction to CSSF for PRS measurements

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2102758 Discussion on remaining issues for RSTD measurement requirements**

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

**Abstract:**

Rel-16

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102759 CR to update RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1762 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2102760 CR to update RSTD measurement requirements R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1763 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102926 Correction to CSSF for PRS measurements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1793 Cat: A (Rel-17)  
  
 Source: Ericsson-LG Co., LTD*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102934 On PRS-RSTD measurement period definition**

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

**Abstract:**

Discussion on aspects related to PRS-RSTD measurement period definition

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.7.1.2 PRS-RSRP measurement requirements [NR\_pos-Core]

**R4-2101781 CR to 38.133 correction on PRS-RSRP measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1665 Cat: F (Rel-16)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2101782 CR to 38.133 correction on PRS-RSRP measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1666 Cat: A (Rel-17)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102300 Revision of PRS-RSRP measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1708 Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2102301 Revision of PRS-RSRP measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1709 Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102542 On PRS-RSRP measurement requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On PRS-RSRP measurement requirements

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102543 PRS-RSRP measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1732 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

PRS-RSRP measurement requirements

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103579 (from R4-2102543).**

**R4-2103579 PRS-RSRP measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1732 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

PRS-RSRP measurement requirements

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104074 (from R4-2103579).**

**R4-2104074 PRS-RSRP measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1732 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

PRS-RSRP measurement requirements

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102544 PRS-RSRP measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1733 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

PRS-RSRP measurement requirements

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102761 CR to update PRS-RSRP measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1764 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2102762 CR to update PRS-RSRP measurement requirements R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1765 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

##### 7.7.1.3 UE Rx-Tx time difference measurement requirements [NR\_pos-Core]

**R4-2100049 UE Rx-Tx measurements**

*Type: LS out For: Approval  
 to RAN1  
 Source: ZTE Corporation*

**Abstract:**

This discussion paper discusses issues related to UE Rx - Tx measurements and provides a draft LS to be sent to RAN1 for clarification on a definition in RAN1 specification.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100437 Discussion on UE Rx-Tx time difference measurement requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100439 CR on UE Rx-Tx time difference measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1478 Cat: F (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

Session chair: Cover sheet errors (What is the work item? It reads NR\_pos-Perf but the Tdoc is reserved for NR\_pos-Core.)

**Decision: Merged.**

**R4-2100469 CR on UE Rx-Tx time difference measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1490 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101273 Discussion on NR UE RX-TX time difference measurement requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101527 CR to TS 38.133 on UE Rx-Tx time difference measurements (section 9.9.4)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1608 Cat: F (Rel-16)  
  
 Source: OPPO*

**Discussion:**

[report of discussion]

Session chair: Cover sheet errors (What is the revision number? It reads revision number 1 on the cover page but the Tdoc is not reserved for a revision.)

**Decision: Revised to R4-2103580 (from R4-2101527).**

**R4-2103580 CR to TS 38.133 on UE Rx-Tx time difference measurements (section 9.9.4)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1608 Cat: F (Rel-16)  
  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2103581 CR to TS 38.133 on UE Rx-Tx time difference measurements (section 9.9.4)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-TBA Cat: A (Rel-17)  
  
 Source: OPPO*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2101528 Discussion on maintenance for UE Rx-Tx time difference measurements**

*Type: discussion For: Discussion  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101777 Discussion on UE RX-TX timing difference measurement requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101783 CR to 38.133 correction on UE Rx-Tx time difference measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1667 Cat: F (Rel-16)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2101784 CR to 38.133 correction on UE Rx-Tx time difference measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1668 Cat: A (Rel-17)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102291 On UE Rx-Tx measurement requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102302 Revision of UE Rx-Tx measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1710 Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2102303 Revision of UE Rx-Tx measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1711 Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102545 On UE Rx-Tx measurement requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On UE Rx-Tx measurement requirements

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102546 UE Rx-Tx measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1734 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

UE Rx-Tx measurement requirements

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2102547 UE Rx-Tx measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1735 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

UE Rx-Tx measurement requirements

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102763 Discussion on remaining issues for UE Rx-Rx time difference measurement requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102764 CR to update UE Rx-Tx time differnece measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1766 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2102765 CR to update UE Rx-Tx time differnece measurement requirements R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1767 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

##### 7.7.1.4 Other requirements [NR\_pos-Core]

**R4-2101529 Discussion on remaining issues for general PRS measurements**

*Type: discussion For: Discussion  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101778 Discussion on CCSF for NR positioning measurements**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101785 CR to 38.133 correction on CCSF for NR measurements for positioning**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1669 Cat: F (Rel-16)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103582 (from R4-2101785).**

**R4-2103582 CR to 38.133 correction on CCSF for NR measurements for positioning**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1669 Cat: F (Rel-16)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104075 (from R4-2103582).**

**R4-2104075 CR to 38.133 correction on CCSF for NR measurements for positioning**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1669 Cat: F (Rel-16)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101786 CR to 38.133 correction on CCSF for NR measurements for positioning**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1670 Cat: A (Rel-17)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102292 On general PRS measurement requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102766 Discussion on measurement capability and MG for PRS measurement**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102767 CR on CSSF and MG for PRS measurement 38.133**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1768 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103583 (from R4-2102767).**

**R4-2103583 CR on CSSF and MG for PRS measurement 38.133**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1768 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2102768 CR on CSSF and MG for PRS measurement 38.133 R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1769 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102769 CR to introduce new measurement gap patterns for positioning in 36.133**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7068 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103584 (from R4-2102769).**

**R4-2103584 CR to introduce new measurement gap patterns for positioning in 36.133**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7068 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102770 CR to introduce new measurement gap patterns for positioning in 36.133 R17**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7069 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

#### 7.7.2 RRM perf. requirements (38.133) [NR\_pos-Perf]

##### 7.7.2.1 General [NR\_pos-Perf]

**R4-2102549 Draft Big CR: Introduction of Rel-16 NR Positioning RRM performance requirements and test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson, Intel*

**Abstract:**

Draft Big CR: Introduction of Rel-16 NR Positioning RRM performance requirements and test cases

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103585 (from R4-2102549).**

**R4-2103585 Draft Big CR: Introduction of Rel-16 NR Positioning RRM performance requirements and test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson, Intel*

**Abstract:**

Draft Big CR: Introduction of Rel-16 NR Positioning RRM performance requirements and test cases

**Discussion:**

[report of discussion]

**Decision: For email approval.**

##### 7.7.2.2 UE requirements and test cases [NR\_pos-Perf]

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**Email discussion: [98e][214] NR\_pos\_RRM\_2**

**R4-2103453 Email discussion summary: [98e][214] NR\_pos\_RRM\_2***Type: other For: Information  
Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103696 (from R4-2103453).**

**R4-2103696 Email discussion summary: [98e][214] NR\_pos\_RRM\_2***Type: other For: Information  
Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (January 28, 2021)

Sub-topic 2-4 How to define the accuracy requirements with the combinations of PRS BW and other parameters (e.g. comb size, repetition)

* Option 1a (Intel). RSTD accuracy requirements are defined based on PRS configuration parameters of
  + PRS BW defined in number of PRBs
  + PRS repetition factor dl-PRS-ResourceRepetitionFactor \* dl-PRS-NumSymbols / dl-PRS-CombSizeN
* Option 1b (Huawei). RSTD accuracy requirements are defined based on PRS configuration parameters of
  + PRS BW defined in number of PRBs
  + PRS SCS
  + PRS repetition factor dl-PRS-ResourceRepetitionFactor \* dl-PRS-NumSymbols / dl-PRS-CombSizeN
* Option 2 (vivo): Define RSTD accuracy requirements for
  + multiple PRS BWPs.
  + Combination of {12, 12} for {Comb size, number of PRS symbols} is used as baseline to define accuracy requirements for the case without repetition.
  + Accuracy requirements for number of repetitions for PRS resource can be further specified if significant accuracy gap is identified.
* Option 3(Qualcomm)
  + PRS BW defined in number of PRBs
  + PRS SCS
  + number of PRS symbols per slot equal to PRS comb size.
* Option 4 (Ericsson): The RSTD accuracy requirements
  + Depend on PRS BW defined in number of PRBs
  + apply for:
    - any DL-PRS-ResourceRepetitionFactor≥1 and
    - any LPRS≥2 which is given by the higher-layer parameter dl-PRS-NumSymbols and
    - any comb pattern
* Option 5 (CATT): Define the RSTD accuracy requirements based on PRS configuration parameters of
  + PRS BW defined in number of PRBs
  + PRS repetition factor dl-PRS-ResourceRepetitionFactor

Agreements

* + RSTD accuracy requirements are defined to cover all BW configurations
  + Different RSTD accuracy requirements depend on the following parameters
    - PRS BW defined in number of PRBs
  + Companies are encouraged to bring PRS accuracy simulation results in RAN4 #99e for the identified set of parameters
    - PRS BW defined in number of PRBs
    - PRS SCS
    - dl-PRS-ResourceRepetitionFactor
    - dl-PRS-NumSymbols
    - dl-PRS-CombSizeN
    - Other parameters are FFS
    - Note: the full set of parameters and values to be finalized in RAN4 #98e. Prepare unified format for results collection.

Sub-topic 3-1 PRS-RSRP SINR side condition of #1

* Option 1a (Ericsson): PRS-RSRP SINR side condition #1 is -3 dB.
* Option 1b (Ericsson): both -3 dB and -6 dB could also be acceptable
* Option 2 (CATT, Intel, Huawei, vivo): -6dB

Agreement: PRS-RSRP SINR side condition #1 is [-3] dB. Companies are encouraged to bring simulation results for -3dB and -6dB SINR conditions.

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103586 | WF on NR Positioning UE performance requirements | Intel Corporation |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2102549 | Revised |
| R4-2102772 | Return to |
| R4-2102553 | Return to |
| R4-2100061 | Return to |
| R4-2100447 | Return to |
| R4-2100448 | Return to |
| R4-2101278 | Return to |
| R4-2101279 | Return to |
| R4-2102555 | Return to |
| R4-2102556 | Return to |
| R4-2102777 | Return to |
| R4-2102778 | Return to |
| R4-2100446 | Return to |

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103730 | Endorsed |
| R4-2103732 | Endorsed |
| R4-2103731 | Endorsed |
| R4-2103733 | Postponed |
| R4-2103734 | Postponed |
| R4-2103735 | Postponed |
| R4-2103736 | Postponed |
| R4-2103737 | Postponed |
| R4-2103738 | Postponed |
| R4-2103739 | Postponed |
| R4-2104042 | Postponed |
| R4-2103586 | Approved |
| R4-2104046 | Revised |

================================================================================

**R4-2103586 WF on NR Positioning UE performance requirements**

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

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2104046 Summary of link level simulation result of RSTD, PRS RSRP and UE DToA**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2104073 (from R4-2104046).**

**R4-2104073 Summary of link level simulation result of RSTD, PRS RSRP and UE DToA**

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

**Abstract:**

**Discussion:**

QC: need to update the results. There was change in units from ns to Tc

Intel: added a not on units in the file

E///: we propose to capture in the chairman notes

Chair: need to change TDOA to UE Rx-Tx

CATT: propose to replace parameters

|  |  |  |
| --- | --- | --- |
| **DL-PRS-NumSymbols** | **DL-PRS-CombSizeN** | **DL-PRS\_ResourceRepetitionFactor** |
|
| 12 | 4 | 1 |

with parameters

|  |  |  |
| --- | --- | --- |
| **DL-PRS-NumSymbols** | **DL-PRS-CombSizeN** | **DL-PRS\_ResourceRepetitionFactor** |
|
| 6 | 2 | 2 |

Intel/vivo: prefer not to change

vivo: companies can still bring additional results.

**Decision: Revised to R4-2104087 (from R4-2104073).**

**R4-2104087 Summary of link level simulation result of RSTD, PRS RSRP and UE DToA**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2104092 (from R4-2104087).**

**R4-2104092 Summary of link level simulation result of RSTD, PRS RSRP and UE DToA**

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

**Abstract:**

**Discussion:**

Agreement: the data format in R4-2104092 will be used for simulation results collection in RAN4 98-bis-e

Agreement: RSTD and UE Rx-Tx measurement accuracy data will be collected in the units of Tc

Session chair: encourage rapporteurs to share clean template with companies before the next meeting.

Session chair: companies can bring additional results for 1 sample case

**Decision: Noted.**

###### 7.7.2.2.1 Measurement accuracy requirements [NR\_pos-Perf]

7.7.2.2.1.1 PRS RSTD [NR\_pos-Perf]

**R4-2100440 Discussion on PRS RSTD accuracy requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100443 Link-level simulation results of PRS RSTD measurement**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101274 Discussion on NR PRS RSTD measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101787 Discussion on PRS RSTD accuracy requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102293 On PRS-RSTD measurement accuracy requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102312 Test structure and complexity for NR RSTD test cases**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102550 On RSTD measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On RSTD measurement accuracy requirements

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102771 Discussion on accuracy requirements for RSTD measurement**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102772 draftCR to introduce accuracy requirements for RSTD measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103730 (from R4-2102772).**

**R4-2103730 draftCR to introduce accuracy requirements for RSTD measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

7.7.2.2.1.2 PRS RSRP [NR\_pos-Perf]

**R4-2100061 [draft CR] Test cases for PRS-RSRP measurement accuracy**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103733 (from R4-2100061).**

**R4-2103733 [draft CR] Test cases for PRS-RSRP measurement accuracy**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2100441 Discussion on PRS RSRP accuracy requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100444 Link-level simulation results of PRS RSRP measurement**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100446 CR on PRS-RSRP accuracy requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1479 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103732 (from R4-2100446).**

**R4-2103732 CR on PRS-RSRP accuracy requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1479 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2100470 CR on PRS-RSRP accuracy requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1491 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101275 Discussion on NR PRS RSRP measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102551 On PRS-RSRP measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On PRS-RSRP measurement accuracy requirements

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102773 Discussion on accuracy requirements for PRS-RSRP measurement**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102774 Further simulation results for PRS-RSRP**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

7.7.2.2.1.3 UE Rx-Tx time difference [NR\_pos-Perf]

**R4-2100442 Discussion on UE Rx-Tx time difference accuracy requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100445 Link-level simulation results for UE Rx-Tx time difference measurement**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101276 Discussion on NR UE RX-TX time difference measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102294 On UE Rx-Tx measurement accuracy requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102552 On UE Rx-Tx measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On UE Rx-Tx measurement accuracy requirements

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102553 UE Rx-Tx measurement accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

UE Rx-Tx measurement accuracy requirements

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103731 (from R4-2102553).**

**R4-2103731 UE Rx-Tx measurement accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

UE Rx-Tx measurement accuracy requirements

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102775 Discussion on accuracy requirements for UE Rx-Tx time difference measurement**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.7.2.2.2 Test cases [NR\_pos-Perf]

**R4-2100447 CR on PRS configuration for test cases**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1480 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2100449 Discussion on test cases for PRS based measurement**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100471 CR on PRS configuration for test cases**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1492 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101277 Discussion on NR Positioning test cases configuration**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101278 [draftCR] CR for PRS configurations for NR Pos RRM tests**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103735 (from R4-2101278).**

**R4-2103735 [draftCR] CR for PRS configurations for NR Pos RRM tests**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2102295 On design of test cases for NR positioning**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102554 On positioning test cases**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On positioning test cases

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102776 Discussion on RRM test case for UE positioning requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.7.2.2.3 Measurement requirements [NR\_pos-Perf]

**R4-2100448 CR on test case for PRS-RSRP measurement requirements for FR2 in SA**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1481 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103734 (from R4-2100448).**

**R4-2103734 CR on test case for PRS-RSRP measurement requirements for FR2 in SA**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1481 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2100472 CR on test case for PRS-RSRP measurement requirements for FR2 in SA**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1493 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101279 [draftCR] CR for the test case of RSTD measurement requirements reporting in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103736 (from R4-2101279).**

**R4-2103736 [draftCR] CR for the test case of RSTD measurement requirements reporting in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2102555 TC5 and TC6: UE Rx-Tx time difference measurement requirements for FR1 and FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

TC5 and TC6: UE Rx-Tx time difference measurement requirements for FR1 and FR2 in SA

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103737 (from R4-2102555).**

**R4-2103737 TC5 and TC6: UE Rx-Tx time difference measurement requirements for FR1 and FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

TC5 and TC6: UE Rx-Tx time difference measurement requirements for FR1 and FR2 in SA

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2102777 draftCR to introduce TC for PRS-RSRP measurement requirements for FR1 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103739 (from R4-2102777).**

**R4-2103739 draftCR to introduce TC for PRS-RSRP measurement requirements for FR1 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

###### 7.7.2.2.4 Accuracy requirements [NR\_pos-Perf]

**R4-2102556 TC11 and TC12: UE Rx-Tx time difference measurement accuracy for FR1 and FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

TC11 and TC12: UE Rx-Tx time difference measurement accuracy for FR1 and FR2 in SA

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103738 (from R4-2102556).**

**R4-2103738 TC11 and TC12: UE Rx-Tx time difference measurement accuracy for FR1 and FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

TC11 and TC12: UE Rx-Tx time difference measurement accuracy for FR1 and FR2 in SA

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2102778 draftCR to introduce TC for RSTD measurement accuracy for FR1 and FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104042 (from R4-2102778).**

**R4-2104042 draftCR to introduce TC for RSTD measurement accuracy for FR1 and FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

###### 7.7.2.2.5 Other [NR\_pos-Perf]

##### 7.7.2.3 gNB requirements [NR\_pos-Perf]

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**Email discussion: [98e][215] NR\_pos\_RRM\_3**

**R4-2103454 Email discussion summary: [98e][215] NR\_pos\_RRM\_3***Type: other For: Information  
Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103697 (from R4-2103454).**

**R4-2103697 Email discussion summary: [98e][215] NR\_pos\_RRM\_3***Type: other For: Information  
Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (January 28, 2021)

**Issue 1-2-1: Antenna configuration in accuracy requirement**

* Option 1: E///, Nokia
  + Fixed antenna beams are assumed in gNB for deriving accuracy
* Option 2:
  + Proposal 1: ZTE, HW
    - Accuracy does not depend on antenna beam configuration in gNB, i.e. do not assume fixed gNB antenna beams.
  + Proposal 2: HW
    - Positioning measurement requirements apply for the same RoAoA as OTA reference sensitivity requirements for 1-O and 2-O BS

Discussion

* Nokia: Support Option 1
* Huawei: Option 1 is not clear to us. RX beam is up to gNB implementation. The impact on requirement is unclear.
* QC: the main issue is to understand what options mean
* E///: beam is not supposed to change over measurement. BS does not need to do TX beam sweeping.
* QC: Is it TX or RX beam?
  + Nokia: this is RX beam at gNB side.
* E///: update “Accuracy requirements apply under assumption that gNB does not need to perform RX beam sweeping over the measurement period (i.e. RX beam sweeping to improve accuracy is not precluded)”
* Huawei: do we have any gNB behavior defined in spec? Also, we do not have any gNB measurement period
* Nokia: measurement time can be further clarified.
* ZTE: not sure on intention of Option 1. gNB behavior can be left up to implementation.
* HW: how does gNB make the measurement without RX beam sweeping?

Tentative agreements

* gNB accuracy requirements do not mandate gNB RX beam sweeping

**Issue 1-6-1: Optional accuracy for low side condition**

* Option 1: Nokia
  + gNB accuracy defined only for high Ês/Iot side condition (i.e. corresponding to serving cell) is mandatory for gNB supporting that measurement.
  + gNB accuracy defined for low Ês/Iot side condition (i.e. corresponding to neighbor cell) is optional even for gNB supporting that measurement.
* Other options not precluded

Discussion

* Huawei: If gNB declares the support of the measurement then it needs to support at least one of high or low side conditions
* Nokia: accuracy levels for low/high side conditions are different. Low side condition is more related to the neighbor cell and not very typical case.
* QC: Nokia’s concerns can be addressed when the requirements are defined.
* E///: agree with Huawei proposal
* QC: there is no requirement to meet the side condition. The question it to meet the positioning requirement when for the particular conditions.

Agreement

* The gNB, which declares the support of positioning measurements, needs to declare the support of measurements for at least either high or low Ês/Iot side conditions

**Issue 4-1-1: Reuse of gNB-Rx-Tx time difference accuracy for UL RTOA accuracy**

* Can gNB-Rx-Tx time difference accuracy be reused for defining UL RTOA accuracy?
  + Option 1: HW, Nokia
    - Yes
  + Option 2: E///
    - No

Agreement

* Further identify how to derive reference time in the ideal UL-RTOA (e.g. whether it is determined by gNB’s own timing based on LMF configuration).
  + If no consensus reached in the 2nd round, then further send LS to RAN1 and RAN3 to clarify the procedure.

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103587 | WF on gNB positioning measurement requirements | Ericsson |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| [R4-2101760](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101760.zip) | Return to |
| R4-2102785 | Return to |
| R4-2101790 | Return to |
| R4-2102782 | Return to |
| R4-2102787 | Postponed |
|  |  |

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103587 | Approved |
| R4-2104052 | Return to |
| R4-2102785 | Noted |
| R4-2101790 | Noted |
| R4-2104053 | Return to |
|  |  |

================================================================================

**R4-2103587 WF on gNB positioning measurement requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

###### 7.7.2.3.1 General [NR\_pos-Perf]

**R4-2100048 Beam configuration for gNB measurement accuracy**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100353 gNB positioning requirements**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

gNB positioning general topics and WF statement overview

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101729 gNB Positioning UL SRS System simulation results for side conditions**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

gNB positioning system level results for side conditions

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102690 On SRS configurations for gNB measurement accuracy requirements**

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

**Abstract:**

Discussion on set of SRS configurations for gNB measurement accuracy requirements

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102779 Discussion on general issues for gNB positioning measurement requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.7.2.3.2 SRS-RSRP requirements [NR\_pos-Perf]

**R4-2100450 Discussion on SRS-RSRP measurement requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101737 gNB SRS-RSRP measurement analysis**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion document for related CR

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101760 gNB SRS-RSRP measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

Adding SRS-RSRP measurement accuracy requirements table structure

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104052 (from R4-2101760).**

**R4-2104052 gNB SRS-RSRP measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

Adding SRS-RSRP measurement accuracy requirements table structure

**Discussion:**

[report of discussion]

Session chair: include in the existing Big CR. No separate Big CR for BS requirements.

**Decision: Endorsed.**

**R4-2102783 Discussion on SRS-RSRP requirements**

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

**Discussion:**

Session chair: moved from AI 7.7.2.3.3

[report of discussion]

**Decision: Noted.**

**R4-2102784 Link level simulation results for SRS-RSRP**

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

**Discussion:**

Session chair: moved from AI 7.7.2.3.3

[report of discussion]

**Decision: Noted.**

**R4-2102785 draftCR to introduce SRS-RSRP requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

Session chair: moved from AI 7.7.2.3.3

[report of discussion]

**Decision: Postponed.**

###### 7.7.2.3.3 gNB Rx-Tx time difference requirements [NR\_pos-Perf]

**R4-2100451 Discussion on gNB Rx-Tx time difference measurement requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101761 gNB Rx-Tx measurement analysis**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion document for related CR

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101790 gNB Rx-Tx measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

Adding Rx-Tx measurement accuracy requirements table structure

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2102691 Link simulation results for gNB Rx-Tx time difference accuracy**

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

**Abstract:**

Link simulation results for gNB Rx-Tx time difference accuracy for some agreed SRS configurations

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102780 Discussion on gNB Rx-Tx time difference requirements**

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

**Discussion:**

Session chair: moved from AI 7.7.2.3.2

[report of discussion]

**Decision: Noted.**

**R4-2102781 Link level simulation results for UL-RTOA and gNB Rx-Tx time difference**

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

**Discussion:**

Session chair: moved from AI 7.7.2.3.2

[report of discussion]

**Decision: Noted.**

**R4-2102782 draftCR to introduce gNB Rx-Tx time difference requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

Session chair: moved from AI 7.7.2.3.2

[report of discussion]

**Decision: Revised to R4-2104053 (from R4-2102782).**

**R4-2104053 draftCR to introduce gNB Rx-Tx time difference requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

Session chair: moved from AI 7.7.2.3.2

[report of discussion]

**Decision: Endorsed.**

###### 7.7.2.3.4 UL RTOA requirements [NR\_pos-Perf]

**R4-2100452 Discussion on UL RTOA measurement requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100453 Link-level simulation results for UL timing measurement**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101801 gNB UL RTOA measurement analysis**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on WF analysis if RxTx requirements defined should be reused for UL RTOA

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102692 On UL RTOA requirements for NR positioning**

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

**Abstract:**

Discussion on introduction of RTOA requirements for NR positioning

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102786 Discussion on UL-RTOA requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102787 draftCR to introduce UL-RTOA requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

### 7.8 Physical layer enhancements for NR URLLC [NR\_L1enh\_URLLC-Core]

### 7.9 Enhancements on MIMO for NR [NR\_eMIMO]

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**Email discussion: [98e][216] NR\_eMIMO\_RRM**

**R4-2103455 Email discussion summary: [98e][216] NR\_eMIMO\_RRM***Type: other For: Information  
Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103698 (from R4-2103455).**

**R4-2103698 Email discussion summary: [98e][216] NR\_eMIMO\_RRM***Type: other For: Information  
Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103588 | WF on NR eMIMO RRM Performance requirements | Samsung |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2100203 | Return to |
| R4-2100205 | Return to |
| R4-2100207 | Revised |
| R4-2100756 | Return to |
| R4-2100758 | Agreed |
| R4-2100933 | Revised |
| R4-2101671 | Revised |
| R4-2102867 | Revised |
| R4-2102868 | Return to |
| R4-2101675 | Endorsed |
| R4-2100936 | Revised |
| R4-2101676 | Endorsed |
| R4-2100937 | Merged |
| R4-2101677 | Revised |
| R4-2100754 | Revised |
| R4-2101447 | Revised |
| R4-2100054 | Revised |
| R4-2102912 | Revised |

GTW session (February 04, 2021)

**[98e][216] NR\_eMIMO\_RRM**

Issue 2-2-1: Additional FR2 margin for CMR+IMR L1-SINR measurement Scenario

* Proposals
  + Option 1: No difference between FR1 and FR2 requirement. (Huawei, MediaTek, Ericsson, Nokia, Samsung)
  + Option 2: Introduce 1dB extra RF margin for CMR+IMR case in FR2. (Apple, Qualcomm)
* Moderator view
  + Technically no reason identified for option 2. The only reason for extra FR2 margin is test error due to implementation.
* Discussion
  + QC: we prefer Option 2. If CMR and IMR come from different directions, then they would experience different antenna gains. Should we account this in the requirements?
  + Apple: CMR and IMR measurements are not done at the same time. Need to account for possible mismatch.
    - Samsung: time difference is very short. It should not cause 1 dB loss.
  + MTK: Option 1. There are already big margins in Annex B to account for different antenna gains.
  + Samsung: CMR/IMR in the test come from the same directions.
  + Nokia: to Apple, what would change over time?
  + Nokia: to QC, for different directions, can we average over long time?
    - QC: UE does not need to make such averaging.
  + Samsung: Signal will come from beam peak direction. Both CMR and IMR come from the beam peak direction.
  + E///: CMR/IMR can be scheduled in the same slot.
* Agreements
  + No additional margin for CMR+IMR L1-SINR measurement is introduced for FR2
  + The requirements are defined under the following assumption
    - CMR/IMR in the test come from the same directions
    - CMR/IMR are scheduled in the same slot
    - Note: capture the respective assumptions in the specification

Issue 2-2-2: Other implementation margins for L1-SINR measurement accuracy

* Proposals
  + For L1-SINR measurement accuracy in FR1/FR2, add a margin of 1dB considering the fading condition.
    - Option 1: Support (MediaTek, Ericsson, Qualcomm)
    - Option 2: Do not support (Samsung)
* Moderator view
  + Some companies think fading channel should be considered in the test. But in our understanding for test case the pathloss will be precisely controlled, then only a very little measurement error will exist. 1dB channel fading in the test is unreasonable.
* Discussion
  + MTK: 1 dB was discussed in Rel-15 for RSRP as well and included.
  + E///: Same view as MTK. Measurement requirement is generic for different propagation conditions.
  + QC: Same view as MTK and E///
  + Nokia: how was 1dB derived? Is it similar between FR1 and FR2?
    - MTK: based on simulation results
  + Samsung: can compromise to 1dB. Does it mean that we should derive the requirements based on the fading channel? The test is still AWGN.
    - E///: It is same methodology as RSRP – accuracy derived based on AWGN and margin added to account for fading conditions.
* Agreements
  + Add 1 dB margin for L1-SINR measurement accuracy in FR1/FR2 to take into account the fading conditions.

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2100203 | Postponed |
| R4-2104055 | Postponed |
| R4-2103589 | Agreed |
| R4-2100756 | Merged |
| R4-2103590 | Agreed |
| R4-2103591 | Agreed |
| R4-2103592 | Endorsed |
| R4-2102868 | Postponed |
| R4-2103593 | Endorsed |
| R4-2103598 | Endorsed |
| R4-2103594 | Endorsed |
| R4-2103595 | Endorsed |
| R4-2103596 | Endorsed |
| R4-2103597 | Postponed |
|  |  |
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#### 7.9.2 RRM core requirements maintenance (38.133) [NR\_eMIMO-Core]

**R4-2100202 RRM Core requirements maintenance for eMIMO**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100203 CR to 38.133 on RRM requirements for multi-TRP (R16)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1453 Cat: B (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2100204 CR to 38.133 on RRM requirements for multi-TRP (R17)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1454 Cat: A (Rel-17)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100205 CR to 38.133 on Link Recovery requirements (R16)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1455 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104055 (from R4-2100205).**

**R4-2104055 CR to 38.133 on Link Recovery requirements (R16)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1455 Cat: F (Rel-16)  
  
 Source: Apple, MediaTek*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100206 CR to 38.133 on Link Recovery requirements (R17)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1456 Cat: A (Rel-17)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100207 CR to 38.133 on Pathloss activation delay requirements (R16)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1457 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103589 (from R4-2100207).**

**R4-2103589 CR to 38.133 on Pathloss activation delay requirements (R16)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1457 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100208 CR to 38.133 on Pathloss activation delay requirements (R17)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1458 Cat: A (Rel-17)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100755 Discussion on the scaling factor for SCell beam failure recovery**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100756 CR on the scaling factor for SCell beam failure recovery in R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1508 Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2100757 CR on the scaling factor for SCell beam failure recovery in R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1509 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100758 Correction on the measurement restriction for CSI-IM resource in R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1510 Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100759 Correction on the measurement restriction for CSI-IM resource in R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1511 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100933 CR to TS38.133 on L1-SINR measurement requirement**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1533 Cat: F (Rel-16)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103590 (from R4-2100933).**

**R4-2103590 CR to TS38.133 on L1-SINR measurement requirement**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1533 Cat: F (Rel-16)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100934 CR to TS38.133 on L1-SINR measurement requirement**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1534 Cat: A (Rel-17)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101670 Discussion on maintaining issues for L1-SINR measurent requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101671 CR on maintaining L1-SINR measurent requirements Rel-16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1642 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103591 (from R4-2101671).**

**R4-2103591 CR on maintaining L1-SINR measurent requirements Rel-16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1642 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101672 CR on maintaining L1-SINR measurent requirements Rel-17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1643 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102864 On Rel-16 NR eMIMO multi-TRxP transmissions**

*Type: other For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Proposal 1: Option 2: no need to revise the spec.

**Discussion:**

[report of discussion]

**Decision: Noted.**

#### 7.9.3 RRM perf. requirements (38.133) [NR\_eMIMO-Perf]

**R4-2103588 WF on NR eMIMO RRM Performance requirements**

*Type: other For: Approval  
 Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2104068 (from R4-2103588).**

**R4-2104068 WF on NR eMIMO RRM Performance requirements**

*Type: other For: Approval  
 Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2100938 Big CR: Introduction of Rel-16 NR eMIMO RRM performance requirements and test cases**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1535 Cat: B (Rel-16)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: For email approval.**

**R4-2100939 Big CR: Introduction of Rel-16 NR eMIMO RRM performance requirements and test cases**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1536 Cat: A (Rel-17)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: For email approval.**

**R4-2103726 L1-SINR simulation results summary**

*Type: other For: Information  
 Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Noted.**

##### 7.9.3.1 General [NR\_eMIMO-Perf]

**R4-2101674 Discussion on IMR configuration for L1-SINR measurement tests**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101675 DraftCR on IMR configuration for L1-SINR measurement tests**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

##### 7.9.3.2 L1-SINR measurement accuracy [NR\_eMIMO-Perf]

**R4-2100209 RRM Performance requirements for L1-SINR Measurement Accuracy**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100868 Simulation results for the measurement of L1-SINR**

*Type: discussion For: Information  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100869 Discussion on L1-SINR measurement accuracy**

*Type: discussion For: Approval  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100935 Remaining issues on L1-SINR measurement accuracy requirement**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101445 L1-SINR measurement accuracy**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution shows our simulation results on L1-SINR and discusses the accuracy requirements.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101673 Discussion on L1-SINR measurement accuracy requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102865 Discussions on Rel-16 NR eMIMO L1-SINR measurement Accuracy**

*Type: other For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

The document has discussed the remaining open issues on L1-SINR measurements.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102867 CR to TS 38.133: Adding L1-SINR accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

The CR provides the text proposal for L1-SINR absolute accuracy requirements for FR1 and FR2, which is in accordance with the agreed WF (R4-2017375) and simulation results.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103592 (from R4-2102867).**

**R4-2103592 CR to TS 38.133: Adding L1-SINR accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

The CR provides the text proposal for L1-SINR absolute accuracy requirements for FR1 and FR2, which is in accordance with the agreed WF (R4-2017375) and simulation results.

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102868 CR to TS 38.133: Adding conditions for L1-SINR reporting (Annex B.2)**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

The CR provides the text proposal for the conditions for NR L1-SINR reporting, which are required by the L1-SINR accuracy requirements.

**Discussion:**

[report of discussion]

**Decision: Postponed.**

##### 7.9.3.3 Test cases [NR\_eMIMO-Perf]

###### 7.9.3.3.1 L1-SINR measurements [NR\_eMIMO-Perf]

**R4-2100936 Draft CR on L1-SINR measurement accuracy tests with CSI-RS based CMR and dedicated IMR**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103593 (from R4-2100936).**

**R4-2103593 Draft CR on L1-SINR measurement accuracy tests with CSI-RS based CMR and dedicated IMR**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2101676 DraftCR on L1-SINR measurement procedure tests with SSB CMR and dedicated IMR**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102912 Draft test case CR on measurement performance of L1-SINR for CSI-RS-based CMR and no dedicated IMR**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Qualcomm CDMA Technologies*

(Replaces R4-2014292)

**Abstract:**

Resubmission of R4-2014292

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103598 (from R4-2102912).**

**R4-2103598 Draft test case CR on measurement performance of L1-SINR for CSI-RS-based CMR and no dedicated IMR**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Qualcomm CDMA Technologies*

(Replaces R4-2014292)

**Abstract:**

Resubmission of R4-2014292

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.9.3.3.2 BFR for SCell [NR\_eMIMO-Perf]

**R4-2100754 Introduction of test cases for BFD and link recovery procedure for Scell**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103595 (from R4-2100754).**

**R4-2103595 Introduction of test cases for BFD and link recovery procedure for Scell**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2101446 Test case for SCell beam failure recovery**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the test case for SCell beam failure recovery.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101447 Draft CR: Introduction of test case of link recovery with link recovery requests**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the test case for link recovery with LRR.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103596 (from R4-2101447).**

**R4-2103596 Draft CR: Introduction of test case of link recovery with link recovery requests**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the test case for link recovery with LRR.

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.9.3.3.3 DL/UL beam indication with reduced latency and overhead [NR\_eMIMO-Perf]

**R4-2100044 Test cases for applicable timing for PL RS activated by MAC-CE**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100045 [CR] Test cases for applicable timing for PL RS activated by MAC-CE**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1414 Cat: B (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100054 [draft CR] Test cases for applicable timing for PL RS activated by MAC-CE**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: ZTE Corporation*

**Abstract:**

This CR adds test cases to 38.133 in correspondance to the core requirements for PL RS activation delay.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103597 (from R4-2100054).**

**R4-2103597 [draft CR] Test cases for applicable timing for PL RS activated by MAC-CE**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: ZTE Corporation*

**Abstract:**

This CR adds test cases to 38.133 in correspondance to the core requirements for PL RS activation delay.

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2101678 Discussion on testability of pathloss-RS activation delay**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.9.3.3.4 Others [NR\_eMIMO-Perf]

**R4-2100937 Draft CR on CSI-RS configurations**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2101677 DraftCR on L1-SINR measurement accuracy tests with SSB CMR and dedicated IMR**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103594 (from R4-2101677).**

**R4-2103594 DraftCR on L1-SINR measurement accuracy tests with SSB CMR and dedicated IMR**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

### 7.10 Add support of NR DL 256QAM for FR2 [NR\_DL256QAM\_FR2]

### 7.11 RF requirements for NR frequency range 1 (FR1) [NR\_RF\_FR1]

#### 7.11.2 RRM requirements maintenance (38.133) [NR\_RF\_FR1-Core/Perf]

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**Email discussion: [98e][217] NR\_RF\_FR1\_RRM**

**R4-2103456 Email discussion summary: [98e][217] NR\_RF\_FR1\_RRM***Type: other For: Information  
Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103699 (from R4-2103456).**

**R4-2103699 Email discussion summary: [98e][217] NR\_RF\_FR1\_RRM***Type: other For: Information  
Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103599 | WF on test case for DL interruption due to Tx switching between two uplink carriers | Huawei, HiSilicon |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2101148 | Revised |
| R4-2101710 | Revised |
|  |  |

2nd round email discussion conclusions

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103599 | Return to |
| R4-2103600 | Agreed |
| R4-2103601 | Agreed |
|  |  |

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**R4-2103599 WF on test case for DL interruption due to Tx switching between two uplink carriers**

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

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2101147 Discussion on interruption test cases for Tx switching**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101148 Update on interruption test cases for Tx switching R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1559 Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103600 (from R4-2101148).**

**R4-2103600 Update on interruption test cases for Tx switching R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1559 Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101149 Update on interruption test cases for Tx switching R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1560 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101710 Correction on test cases of DL interruptions at switching between two uplink carriers**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1659 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103601 (from R4-2101710).**

**R4-2103601 Correction on test cases of DL interruptions at switching between two uplink carriers**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1659 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101711 Correction on test cases of DL interruptions at switching between two uplink carriers**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1660 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

### 7.12 NR RF requirement enhancements for frequency range 2 (FR2) [NR\_RF\_FR2\_req\_enh]

#### 7.12.2 RRM requirements maintenance (38.133) [NR\_RF\_FR2\_req\_enh-Core]

### 7.13 NR RRM requirement enhancement [NR\_RRM\_Enh-Core]

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**Email discussion: [98e][218] NR\_RRM\_Enh\_RRM\_1**

**R4-2103457 Email discussion summary: [98e][218] NR\_RRM\_Enh\_RRM\_1***Type: other For: Information  
Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103700 (from R4-2103457).**

**R4-2103700 Email discussion summary: [98e][218] NR\_RRM\_Enh\_RRM\_1***Type: other For: Information  
Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (January 29, 2021)

**Issue 3-1-1: Whether to define DCI/Timer based FR1+FR2 simultaneous BWP switch test case**

* Proposals
  + Option 1 (Intel, Huawei): Yes
  + Option 1a (Ericsson, Nokia): Yes, with Pcell in FR1 and Scell in FR2
  + Option 2 (MTK):
    - Option 1: Define FR1+FR2 simultaneous BWP switch test case in RAN4.
    - Option 2: If TE vendors confirm FR1 demodulation performance can’t be guaranteed in OTA mode, RAN4 deletes multiple BWP switch, and multiple Scell activation test cases which UE needs to correctly demodulate the downlink channels for FR1 in OTA mode.
  + Option 3 (vivo, QC, Apple): No.
* Moderator note: Suggest companies to consider the comment from TE vendor in the 2nd round discussion, which are as follows:
  + If an FR1+FR2 BWP switch test case can be considered as a “functional” test, and if we are OK to specify the test case with FR1 as a link only, same as in A.7.3.1.1 (FR1 to FR2 handover) or in A.7.5.3.2 (FR1+FR2 SCell Act/Deact), then we could define a test case.
  + FR1 is configured with noise-free condition. For FR2 Test cases using FR1 link, the FR1 cells should refer to clause A.3.7A, which states “. The Test System shall provide a stable **and noise-free** NR FR1 signal”.
* Discussion
  + QC: we have link and measurement antenna in the chamber. Spec does not assume performance verification on FR1. There may be some performance failure on FR1.
  + Apple: Functional test is possible. This test is not fully functional.
  + Vivo: Option 3
  + QC: UE will be able to receive PDCCH. Not sure on reliability of FR2 test environment. May not pass FR2 certification.
  + E///: We prefer to have a test. TE vendors confirmed no issues with the test cases and can provide a stable link.
  + QC: FR1 is not tested as of now.
  + MTK: we can define the test case. If TE vendors identify further issues then it can be handled as a RAN5 issue.
  + Apple: do we have precedence of hybrid of FR1-FR2 test?
  + MTK: for current test cases the FR1 link is functional. Decision depends on TE vendors.
  + QC: FR1 + FR2 testing is not possible
  + QC: 38.810 - no performance verification is supported for FR1
  + Session chair: encourage TE vendors to provide more inputs in the 2nd round regarding the feasibility of the test. Come back in the 2nd round.

**Issue 3-1-3: Whether to define RRC based BWP switch on multiple CCs test case**

* Proposals
  + Option 1 (vivo, Intel):
* No for both simultaneous and non-simultaneous case
  + Option 2 (Huawei):
* Wait for the conclusion on feasibility of RRC based switch on multiple CCs
  + Option 3 (Ericsson, QC, Apple, MTK, vivo, Huawei, Nokia, Intel):
* To be discussed after receiving RAN2 response followed by the conclusion on their requirements

Agreement: Test cases for RRC based BWP switch on multiple CCs will be discussed after receiving RAN2 response followed by the conclusion on the respective Core requirements

**Issue 2-1-1: Whether to consider the pathloss RS for PUCCH spatial relation info switch requirements**

* Proposals
  + Option 1 (Apple, QC, Ericsson, Nokia): Yes.
  + Option 2 (MTK, Huawei): No
  + Option 3 (NTT DOCOMO, Intel): Needs further clarification.

Discussion

Apple: Pathloss RS may change during PUCCH spatial relation info switch. We suggest to include PL RS into the requirements.

MTK: not sure if we need to combine 2 independent requirements. For example, during BWP switching we may have UL spatial relation switch. No discussion on combination of multiple requirements is needed.

NTT DOCOMO: Not clear if UL spatial relation switch is related to PL RS change

QC: After further check of MTK comments – PL RS requirements are already specified in other sections. We can simply refer to the PL RS requirements in the UL spatial relation requirements

Huawei: PL RS switching is for UL power control and UL spatial relation switch – it is for spatial direction change. If IE includes both, then the existing PL RS requirements already cover this case. Prefer not to consider complicated cases.

Intel: PL RS is aligned with the DL RS for which PUCCH is associated. They should be in the same TCI chain. If they are in different TCI chain then no requirements. Also prefer not to consider known+unknown combinations.

E///: We are fine to keep these issues separate.

Apple: UL spatial relation requirements do not refer to PL RS at all. We need to specify that additional requirements would apply.

Nokia: If it is already covered by different parts then we can keep it. Meantime we can add clarifications.

Session chair: Continue discussion in the second round. PL RS case needs to be referred in the specification for UL spatial relation switch. It is not expected that detailed requirements will be defined. A reference to the PL RS section can be provided or the requirements can be extended.

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103619 | WF on R16 RRM enhancement part 1 – BWP switching, UL spatial relation switch | Intel Corporation |

**Tdoc decisions**

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| --- | --- |
| **Tdoc** | **Decision** |
| R4-2101409 | Return to |
| R4-2101631 | Agreed |
| R4-2102355 | Revised |
| R4-2102722 | Return to |
| R4-2100214 | Return to |
| R4-2101694 | Revised |
| R4-2101390 | Revised |
| R4-2101412 | Agreed |
| R4-2101635 | Revised |
| R4-2102363 | Revised |
| R4-2101696 | Agreed |
| R4-2102265 | Revised |
|  |  |

GTW session (February 02, 2021)

**Issue 3-1-1: Whether to define DCI/Timer based FR1+FR2 simultaneous BWP switch test case**

* Proposals
  + Option 1 (Intel, Huawei): Yes
  + Option 1a (Ericsson, Nokia): Yes, with Pcell in FR1 and Scell in FR2
  + Option 2 (MTK):
    - Option 1: Define FR1+FR2 simultaneous BWP switch test case in RAN4.
    - Option 2: If TE vendors confirm FR1 demodulation performance can’t be guaranteed in OTA mode, RAN4 deletes multiple BWP switch, and multiple Scell activation test cases which UE needs to correctly demodulate the downlink channels for FR1 in OTA mode.
  + Option 3 (vivo, QC, Apple): No.
  + Moderator note: Suggest companies to consider the comment from TE vendor in the 2nd round discussion, which are as follows:
    - If an FR1+FR2 BWP switch test case can be considered as a “functional” test, and if we are OK to specify the test case with FR1 as a link only, same as in A.7.3.1.1 (FR1 to FR2 handover) or in A.7.5.3.2 (FR1+FR2 SCell Act/Deact), then we could define a test case.
    - FR1 is configured with noise-free condition. For FR2 Test cases using FR1 link, the FR1 cells should refer to clause A.3.7A, which states “. The Test System shall provide a stable **and noise-free** NR FR1 signal”.
* 1st round GTW summary
  + Session chair: encourage TE vendors to provide more inputs in the 2nd round regarding the feasibility
* Discussion
  + Anritsu: the existing FR1+FR2 tests require functional link. It means that we cannot test demodulation performance in FR1. It will be more challenging if we want to control SNR or noise level in FR1. Functional link is ok.
  + R&S: agree with Anritsu. In case FR1 has functional link without precise SNR, then it is ok. If we need to include FR1 performance (i.e. control SNR) then we need to have additional test methods studies.
  + MTK: would like to further check. We would like to check if it is possible to set the signal level larger than certain level (e.g. -4dB) to ensure that control channels can be decoded?
  + QC: For noise environment approach TE just transmits useful signal without artificial noise. If we cannot control the DL signal level then we cannot guarantee that UE can decode PDCCH.
  + E///: same understanding as MTK. UE needs to be able to receive PDCCH (e.g. anything > 0dB SNR) and we can check ACK/NACK.
  + Apple: can the performance be verified for the FR1 link? Can we check switching delay requirements or interruption requirements.
  + Anritsu: the TE cannot guarantee UE baseband SNR since it depends on UE antenna. Control requires conducted connection. If we want to guarantee a number then we need to have extension of testability studies. Is there anything new in this test?
  + R&S: the current test guarantee reliable link but current specs do not guarantee the specific signal level. Prefer to refrain from the numbers.
  + Chair: are there any specific values we can guarantee
    - Anritsu, R&S: no specific level
  + Apple: how to guarantee that the link is reliable? What is the definition? Can we guarantee that UE can decode RRC configuration?
  + QC: for certification test we need to have full confidence it can work.
  + Huawei: In Rel-15 we already have FR1 + FR2 tests which are quite similar to the current test setup. Are there any issues with these tests?
    - R&S: So far we have not seen any issues. In all EN-DC test case we have LTE OTA link. Same will happen with FR1. Do not see difference and it is working.
    - Anritsu: When the test gets validated we check that UE can decode the link. It is not in our interest to provide the link which cannot be decoded.
    - QC: we can bring CRs to remove such tests in the future
    - vivo: same view as QC. No performance verification on FR1.
  + E///: Can we check that TE can reliably receive on FR1?
    - Anritsu: need to check
  + Intel: there should be ways to validate that the FR1 link is reliable. We can say in RAN4 spec that the FR1 link is reliable.
  + QC: checked with RAN5 colleagues. The test is not feasible. The proper place would be to discuss it in RAN plenary in the scope of FR1 TRP/TRS item. We object to introduce FR1+FR2 test. Prefer not to include RAN5.
  + Apple: we should address the testability issue first in RAN5.
  + Samsung: Is there any boundary for the testability topic? Should we continue this discussion?
  + E///: agree with Samsung. BWP switching does not require UE to do measurements. We can check ACK/NACK on FR2 only.
  + R&S: we have an issue in configuring the level for FR1.
* Session chair: Tentative agreement
  + Define DCI/Timer based FR1+FR2 simultaneous BWP switch test case in RAN4.
    - Add a note that the test is not expected to be verified in RAN5
    - Companies can further check the FR1 + FR2 testability issues as a part of Rel-16 maintenance
  + QC: object
  + Apple: object. Prefer to have studies first.
* Agreement:
  + Do not define DCI/Timer based FR1+FR2 simultaneous BWP switch test case
* Session chair:
  + Companies are encouraged to further discuss FR1 + FR2 testability issues for existing test cases (e.g. as a part of Rel-16 maintenance)

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103602 | Agreed |
| R4-2102722 | Agreed |
| R4-2101409 | Not pursued |
| R4-2103603 | Agreed |
| R4-2100214 | Not pursued |
| R4-2103605 | Endorsed |
| R4-2103606 | Endorsed |
| R4-2101390 | Endorsed |
| R4-2103607 | Endorsed |
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**Email discussion: [98e][219] NR\_RRM\_Enh\_RRM\_2**

**R4-2103458 Email discussion summary: [98e][219] NR\_RRM\_Enh\_RRM\_2***Type: other For: Information  
Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103701 (from R4-2103458).**

**R4-2103701 Email discussion summary: [98e][219] NR\_RRM\_Enh\_RRM\_2***Type: other For: Information  
Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (January 29, 2021)

**Issue 2-1-1: FR1 + FR2 test cases**

* Proposals
  + Option 1: Do not introduce FR1+FR2 SRS carrier switching tests. (Qualcomm, Huawei, vivo, Apple)
  + Option 2: Introduce at least one TC for FR1+FR2 SRS carrier switching. (Ericsson, Nokia)
* Discussion:
  + QC: One concern is testability problem. If the SNR is not provided then we cannot guarantee that UE can decode PDCCH. Also we already have FR1 + FR1 interruption test.
  + Huawei: FR1 and FR2 have different RF components and it may not be possible to borrow the RF chains.
  + vivo: Same view as Huawei. FR1 and FR2 switching is not practical. No necessity to have such test case
  + Nokia: Does this case include 1) switching between FR1 and FR2 or 2) the switching within FR1 and impact on FR2
  + Huawei: for this case we discuss Case 1 – switching between FR1 and FR2. Case 2 is discussed in another issue.

Agreements

Further check the feasibility of SRS carrier-based switching between different frequency ranges

Do not define test cases for SRS carrier-based switching between FR1 and FR2 in Rel-16

**Issue 2-1-3: How to configure the test parameter *usage***

* Proposals
  + Option 1: Set the parameter usage to ‘antennaSwitching’ in SRS configuration. (Apple, Huawei, Qualcomm, vivo)
  + Option 2: Set the parameter usage to ‘antennaSwitching’ in SRS configuration for aperiodic SRS. (Nokia)
* Discussion:
  + Nokia: Based on RAN1 spec ‘antennaSwitching’ applies to aperiodic SRS case only. No restriction for periodic SRS.
  + QC: It should be aperiodic one in accordance to the test description.

Agreement

Set the parameter usage to ‘antennaSwitching’ in SRS configuration

* The parameter applies to aperiodic SRS case only

**Issue 2-1-5: TCs for SA interruptions**

* Proposals
  + Option 1 (Huawei, Ericsson, vivo, Nokia): The below tests can be added into SA interruptions at NR SRS carrier based switching. The added test cases are only specified for UE capable of/configured with per-FR gap.
    - TC1: PCell in FR1, SCell in FR1, adding an SCell in FR2
    - TC2: PCell in FR2, SCell in FR2, adding an SCell in FR1
  + Option 2 (Qualcomm): Agree on Option 1 if Option 1 in Issue 2-1-1 is agreed
* Discussion:
  + QC: disagree with Option 1
  + Huawei: this is relevant to switching within one FR. We can wait for the conclusion of FR1 + FR2 testing.
  + Session chair: come back in the 2nd round and involve TE vendors on testability questions.

**Issue 4-1: Whether the UE is allowed to skip R15 tests**

* Proposals
  + Option 1: For the scenario which is without SSB time index detection and when DRX is not used, the Rel-15 MG related test cases can be skipped if UE passes the Rel-16 new introduced MG related test cases for the same scenario. For other scenarios, no Rel-15 test cases can be skipped. (Qualcomm, CMCC, Huawei, ZTE, MediaTek)
  + Option 2: No. R15 test cases on mandatory gap patterns shall be inherited completely to R16 specifications, and R16 UEs shall pass all test cases. (ZTE, CMCC, Ericsson, Nokia)
  + Option 3: (Apple)
    - allow UE to skip some existing test case configured with GP#0 if it has to be verified in the new test case configured with GP#2.
    - allow UE to skip some existing test case configured with GP#13 if it has to be verified in the new test case configured with GP#17.
    - The new test cases configured with GP#2 or GP#17 can be introduced by replacing existing test cases configured with GP#0 or GP#13.
* Discussion:
  + Apple: ok with Option 1
  + E///: we would like to further check and come back on Mon

Tentative agreement: For the scenario which is without SSB time index detection and when DRX is not used, the Rel-15 MG related test cases can be skipped if UE passes the Rel-16 new introduced MG related test cases for the same scenario. For other scenarios, no Rel-15 test cases can be skipped.

Session chair: come back in the 2nd round

**Issue 3-1-1: Value for T321 in CGI reading with autonomous gap**

Discussion

Apple: ok with Option 1

QC: ok with Option 1. Network needs to be aware that more time is needed in case side condition is not satisfied.

Agreement: Value for T321 in CGI reading with autonomous gap is 200ms.

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103609 | WF on R16 RRM enhancement part 2 – SRS Carrier switching, CGI reading, Mandatory MG patterns | ZTE Corporation |
| R4-2103610 | LS on CGI reading with autonomous gaps | ZTE Corporation |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2101689 | Agreed |
| R4-2101690 | Agreed |
| R4-2101762 | Revised |
| R4-2101763 | Return to |
| R4-2102686 | Revised |
| R4-2102687 | Return to |
| R4-2102791 | Revised |
| R4-2102792 | Return to |
| R4-2102793 | Agreed |
| R4-2102794 | Agreed |
| R4-2100226 | Revised |
| R4-2101765 | Revised |
| R4-2102533 | Revised |
| R4-2102795 | Revised |
| R4-2100626 | Revised |
|  |  |

GTW session (February 04, 2021)

**[98e][219] NR\_RRM\_Enh\_RRM\_2**

Issue 2-1-5: TCs for SA interruptions

* Proposals
  + Option 1 (Huawei, Ericsson, vivo, Nokia): The below tests can be added into SA interruptions at NR SRS carrier based switching. The added test cases are only specified for UE capable of/configured with per-FR gap.
    - TC1: PCell in FR1, SCell in FR1, adding an SCell in FR2
    - ~~TC2: PCell in FR2, SCell in FR2, adding an SCell in FR1~~
  + Option 2 (Qualcomm): keep previous TC1 and TC2
* Agreements
  + Keep existing TC1 and TC2 definition

Issue: Whether the UE is allowed to skip R15 tests

* Proposals
  + Option 1: For the scenario which is without SSB time index detection and when DRX is not used, the Rel-15 MG related test cases can be skipped if UE passes the Rel-16 new introduced MG related test cases for the same scenario. For other scenarios, no Rel-15 test cases can be skipped. (Qualcomm, CMCC, Huawei, ZTE, MediaTek, Apple)
  + Option 2: No. R15 test cases on mandatory gap patterns shall be inherited completely to R16 specifications, and R16 UEs shall pass all test cases. (ZTE, CMCC, Ericsson, Nokia)
  + Option 3: (Apple)
    - allow UE to skip some existing test case configured with GP#0 if it has to be verified in the new test case configured with GP#2.
    - allow UE to skip some existing test case configured with GP#13 if it has to be verified in the new test case configured with GP#17.
    - The new test cases configured with GP#2 or GP#17 can be introduced by replacing existing test cases configured with GP#0 or GP#13.
* 1st round GTW tentative agreement: For the scenario which is without SSB time index detection and when DRX is not used, the Rel-15 MG related test cases can be skipped if UE passes the Rel-16 new introduced MG related test cases for the same scenario. For other scenarios, no Rel-15 test cases can be skipped.
* Discussion
  + Apple: agree with Option 1
  + Nokia: can consider to reduce the test cases for the new mandatory gap patterns
  + Apple: R16 – 2 new test cases. R15 – more than 9 test cases with GP0.
  + Apple/ZTE: Option 2 is the default assumption.
  + E///: we can discuss separately if R15 test cases can be skipped.
* Session chair: no consensus to consider Rel-15 test case skipping.

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103611 | Return to |
| R4-2101763 | Return to |
| R4-2103612 | Postponed |
| R4-2102687 | Withdrawn |
| R4-2103613 | Agreed |
| R4-2102792 | Agreed |
| R4-2103614 | Endorsed |
| R4-2103615 | Endorsed |
| R4-2103616 | Revised |
| R4-2104070 | Return to |
| R4-2103617 | endorsed |
| R4-2103610 | Approved |
| R4-2103618 | Postponed |
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**Email discussion: [98e][220] NR\_RRM\_Enh\_RRM\_3**

**R4-2103459 Email discussion summary: [98e][220] NR\_RRM\_Enh\_RRM\_3***Type: other For: Information  
Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103702 (from R4-2103459).**

**R4-2103702 Email discussion summary: [98e][220] NR\_RRM\_Enh\_RRM\_3***Type: other For: Information  
Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (January 29, 2021)

**Issue 4-1: Power imbalance condition for inter-frequency measurement requirement without MG (perf)**

* Proposals
  + Option 1 (Qualcomm, MTK, Huawei): Measurement accuracy requirement doesn’t apply when power imbalance between serving frequency layer and inter-frequency layer on which UE performs measurement without gap is larger than [6] dB.
  + Option 2: Do not define conditions
* Discussion
  + Nokia: this needs to be coordinated with RF session
  + CMCC: Issue raise late. No performance analysis to show the actual impacts. Cannot agree.
  + QC: have an analytical justification for 6dB value. Current tests do not have issues and we do not ask to revise the test.
  + E///: support CMCC view.
  + Huawei: support QC. In Rel-15 UE used gap to perform measurement. UE switched to different CC and adjusted AGC based on SSB. For Rel-16 UE we have a different implementation and UE can use serving cell power for AGC settings.
* Session chair: No consensus to adopt proposal 1. Proponents can bring more simulation results to justify the proposal. For the TC – companies will check the actual power imbalance in the test setup and come back in the 2nd round.

**Issue 6-1: AoA setup in TCs of inter-band CA requirement for FR2 UE measurement capability of independent Rx beam (perf)**

* Proposals
  + Option 1 (Qualcomm, Huawei): AoA configuration for both Cell 1 and Cell 2 = Setup 3 (with rough beams)
  + Option 2 (Qualcomm): AoA configuration for both Cell 1 and Cell 2 = Setup 4b, and for Cell 1 a fixed Rx Beam Peak of Cell 1 (with rough beams)
  + Option 1a (to address Anritsu comment): AoA configuration for both Cell 1 and Cell 2 = Setup 3 (with rough beams) and FFS on the other parameter adjustment (e.g. Noc, Es, Es/Iot and etc) in the test cases.
* Agreement: AoA configuration for both Cell 1 and Cell 2 = Setup 3 (with rough beams) and FFS on the other parameter adjustment (e.g. Noc, Es, Es/Iot and etc) in the test cases.

**Issue 1-1-1: The RTD (reception timing difference) with contiguous FR1 known cell or active serving cell to the to-be-activated SCell (core)**

* Proposals
  + Option 1 (MTK, Apple, Ericsson, QC, HW, NEC): shall be no larger than 260ns.
  + Option 2 (Huawei): shall be no larger than CP/2 with respect to the to-be-activated SCell’s SSB numerology.
* Agreement: The RTD (reception timing difference) with contiguous FR1 known cell or active serving cell to the to-be-activated SCell shall be no larger than 260ns

**Issue 1-2-2: Requirement applicability on the other being-activated SCells during the FR1 multiple Scells activation (core)**

* Proposals
  + Option 1 (Huawei, Apple, Ericsson, QC, MTK): No requirement apply for other SCells being activated, if no requirements apply for any of the FR1 unknown SCell activated with the same MAC CE.
  + Option 2 (Nokia, NEC): Activation requirement still apply for other SCells being activated, even though no requirements apply for one of the FR1 unknown SCell activated with the same MAC CE.
* Discussion
  + Nokia: see no problem for Option 2.
  + Huawei: UE is not aware whether the side conditions will be met. Also, this is only about unknown SCells where UE will need to apply detection. It should address the question for NEC.
  + NEC: we can still compute the N1 value.
    - Huawei: it can be computed. But it is based on the condition that side condition is met for all SCells. If the side conditions are not met then the requirements will not apply. We try to address other SCells which share the searcher with this special SCell.
  + Nokia: disagree with Huawei that UE does not know the side condition. Also, the condition is per SCell. If UE does not know the condition, then it simply makes the detection.
  + Apple: there may be AGC issue which will affect all CCs.
  + NEC: if there are 4 SCells and side conditions are unknown for 2 SCells the how do we apply requirements (N1 = 2)?
    - Huawei: requirements for all SCells counted in N1 will not apply.
    - NEC: Option 1 is ok under such clarification
  + Huawei: RTD conditions are unknown for UE. UE reuses the values from intra-band.
* Tentative agreement: No requirement apply for other SCells being activated, if no requirements apply for any of the FR1 unknown SCell activated with the same MAC CE.
* Session chair: continue discussion in the 2nd round. Nokia will check if Option 1 is acceptable.

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103620 | WF on Rel-16 RRM enhancement part 3 | Apple |
|  |  |  |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| [R4-2102789](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102789.zip) | Revised |
| R4-2100181 | Agreed |
| R4-2100183 | Revised |
| R4-2100778 | Revised |
| R4-2101219 | Revised |
| R4-2101691 | Revised |
| R4-2101059 | Revised |
| R4-2101693 | Endorsed |
| R4-2101070 | Revised |
| R4-2101679 | Revised |

GTW session (February 04, 2021)

**[98e][220] NR\_RRM\_Enh\_RRM\_3**

Issue 7-1: Removal of TCs for multiple SCell activation due to the testability of simultaneous FR1+FR2 links

* Test cases
  + TC1: EN-DC (LTE +FR1) UE to activate 2 FR1 SCCs
  + TC2: EN-DC (LTE +FR1) UE to activate 2 FR2 SCCs
    - Interruption on LTE PCell and FR1 PSCell is tested associated with the activation delay
  + TC3: NR-DC (FR1 +FR2) UE to activate 1 FR1 SCC and 1 FR2 SCC
    - Interruption on FR1 and FR2 serving CCs are tested associated with the activation delay
* Proposals
  + Option 1 (Apple, QC, MTK): Remove the TC2 and TC3 at this stage until the testability of simultaneous FR1+FR2 is clarified.
  + Option 2a (QC): Keep TC2 but remove the interruption test part for FR1 PSCell in TC2 and remove TC3 at this stage until the testability of simultaneous FR1+FR2 is clarified
  + Option 2b (Huawei, Apple, Ericsson, MTK): Keep TC2 but remove the interruption test part for LTE and FR1 PSCell in TC2 and remove TC3 at this stage until the testability of simultaneous FR1+FR2 is clarified.
  + Option 3: FFS whether or which TC shall be removed. But TC1 shall be kept.
  + Option 4: Keep TC1 and TC2 in scope. Further discuss TC3 from testability point of view.
* Discussion
  + Apple: we already made an agreement on Option 2b.
  + Session chair: how can we address “simultaneous FR1+FR2” issue
  + QC: RAN4 or RAN5 should resolve it. It should be a separate SI. Not our area of expertise.
  + Apple: share same view as QC that it should be further discussed. Can have a separate item or send LS to RAN5.
  + E///: share same view QC. Need to look into this separately.
  + R&S: at least we should avoid providing the exact power levels for FR1
  + Apple: we checked RAN5 specs, they still list that applicability of FR1+FR2 tests is marked is FFS. Are there any RAN5 issues?
  + Session chair: Encourage companies to further look into “simultaneous FR1+FR2” issue to define a systematic approach to handle this in the future.

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103621 | Agreed |
| R4-2103620 | Approved |
| R4-2103622 | Agreed |
| R4-2103623 | Agreed |
| R4-2103624 | Agreed |
| R4-2103625 | Withdrawn |
| R4-2101691 | Postponed |
| R4-2103626 | Endorsed |
| R4-2103627 | Endorsed |
| R4-2103628 | Endorsed |
|  |  |
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**R4-2103619 WF on R16 RRM enhancement part 1 – BWP switching, UL spatial relation switch**

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

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2103609 WF on R16 RRM enhancement part 2 – SRS Carrier switching, CGI reading, Mandatory MG patterns**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2104070 (from R4-2103609).**

**R4-2104070 WF on R16 RRM enhancement part 2 – SRS Carrier switching, CGI reading, Mandatory MG patterns**

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

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2103610 LS on CGI reading with autonomous gaps**

*Type: LS Out For: Approval  
To: RAN2  
Source: ZTE Corporation*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2103620 WF on Rel-16 RRM enhancement part 3**

*Type: other For: Approval  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Approved.**

#### 7.13.1 RRM core requirements maintenance (38.133) [NR\_RRM\_Enh-Core]

##### 7.13.1.1 Multiple Scell activation/deactivation [NR\_RRM\_Enh-Core]

**R4-2101058 Remaining Issues on multiple SCell Activation**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102788 Discussion on remaining issues in multiple SCell activation**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102789 CR on multiple SCell activation requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1770 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103621 (from R4-2102789).**

**R4-2103621 CR on multiple SCell activation requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1770 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102790 CR on multiple SCell activation requirements R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1771 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

##### 7.13.1.2 BWP switching on multiple CCs [NR\_RRM\_Enh-Core]

**R4-2101408 Discussion on RRC based BWP switching on multiple CC**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101409 CR on RRC based BWP switching on multiple CCs (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1597 Cat: F (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

Session chair: Cover sheet errors (What is the CR category? It reads F on the cover page but the Tdoc is reserved for category B.)

**Decision: Not pursued.**

**R4-2101410 CR on RRC based BWP switching on multiple CCs (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1598 Cat: A (Rel-17)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101631 CR on interruption requirements of BWP switch on multiple CCs for EN-DC**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7025 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101632 CR on interruption requirements of BWP switch on multiple CCs for EN-DC**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7026 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101633 Discussion on requirements maintenance for BWP switch on multiple CCs**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102354 On DCI-based simultaneous BWP switch on multiple CCs**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on clarification of DCI-based BWP switching requirement for switching on multiple CCs, in response to LS reply from RAN1.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102355 CR 38.133 (8.6.2A) Clarification on DCI-triggered BWP switch on multiple CCs**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1720 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Adding clarification for DCI-based BWP switching on multiple CCs w.r.t. k0, k1, k2.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103602 (from R4-2102355).**

**R4-2103602 CR 38.133 (8.6.2A) Clarification on DCI-triggered BWP switch on multiple CCs**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1720 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Adding clarification for DCI-based BWP switching on multiple CCs w.r.t. k0, k1, k2.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102356 CR 38.133 (8.6.2A) Clarification on DCI-triggered BWP switch on multiple CCs**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1721 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Adding clarification for DCI-based BWP switching on multiple CCs w.r.t. k0, k1, k2.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102722 CR on maintenance on BWP switch requirements on multiple CCs**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1745 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102723 CR on maintenance on BWP switch requirements on multiple CCs (cat A)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1746 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

##### 7.13.1.3 Other requirements maintenance [NR\_RRM\_Enh-Core]

**R4-2100052 CGI reading with autonomous gaps**

*Type: LS out For: Approval  
 to RAN2  
 Source: ZTE Corporation*

**Abstract:**

According to RAN2 discussion summary during RAN2 112-e, they are waiting for RAN4 input on the value of T321. This discussion paper along with a draft LS discusses this issue and provides a draft LS to be sent to RAN2.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100181 CR on maintenance for inter-band FR2 CA RRM R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1445 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100182 CR on maintenance for inter-band FR2 CA RRM R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1446 Cat: A (Rel-17)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100183 CR on UE behavior for UE specific CBW change R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1447 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103622 (from R4-2100183).**

**R4-2103622 CR on UE behavior for UE specific CBW change R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1447 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100184 CR on UE behavior for UE specific CBW change R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1448 Cat: A (Rel-17)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100213 Remaining issues for UL spatial relation switching requirements**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100214 CR to 38.133 on UL spatial relation switch requirements (R16)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1459 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

**R4-2100215 CR to 38.133 on UL spatial relation switch requirements (R17)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1460 Cat: A (Rel-17)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100777 Discussion on Inter-band CA requirement for FR2**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100778 Correction on scheduling availability and measurement restriction on FR2 inter-band CA in R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1521 Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103623 (from R4-2100778).**

**R4-2103623 Correction on scheduling availability and measurement restriction on FR2 inter-band CA in R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1521 Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100779 Correction on scheduling availability and measurement restriction on FR2 inter-band CA in R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1522 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101219 CR on TS38.133 for inter-frequency measurement requirement without gap**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1585 Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103624 (from R4-2101219).**

**R4-2103624 CR on TS38.133 for inter-frequency measurement requirement without gap**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1585 Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101220 CR on TS38.133 for inter-frequency measurement requirement without gap**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1586 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101689 Correction on interruptions of SRS carrier switching**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1647 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101690 Correction on interruptions of SRS carrier switching**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1648 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101691 Clarification on inter-frequency measurement without gap requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1649 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2103625 Clarification on inter-frequency measurement without gap requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1649 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101692 Clarification on inter-frequency measurement without gap requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1650 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101694 UL spatial relation switching to an unknown DL RS**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1651 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103603 (from R4-2101694).**

**R4-2103603 UL spatial relation switching to an unknown DL RS**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1651 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101695 UL spatial relation switching to an unknown DL RS**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1652 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101762 CR to 38.133 correction on SRS carrier based switching core requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1661 Cat: F (Rel-16)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103611 (from R4-2101762).**

**R4-2103611 CR to 38.133 correction on SRS carrier based switching core requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1661 Cat: F (Rel-16)  
  
 Source: vivo, Qualcomm, Huawei, HiSilicon, MediaTek Inc., Apple, Nokia*

**Discussion:**

E///: Object the CR.

Session chair: Continue in the next meeting. Further discuss the if there are any UEs capable of FR1-FR2 SRS carrier based switching.

**Decision: Postponed.**

**R4-2101763 CR to 38.133 correction on SRS carrier based switching core requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1662 Cat: A (Rel-17)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102686 SRS carrier switching interruption CR**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1741 Cat: F (Rel-16)  
  
 Source: Qualcomm, Inc.*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2103612 SRS carrier switching interruption CR**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1741 Cat: F (Rel-16)  
  
 Source: Qualcomm, Inc.*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102687 SRS carrier switching interruption CR**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1742 Cat: A (Rel-17)  
  
 Source: Qualcomm, Inc.*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102791 CR on CGI reading requirements 38.133**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1772 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon, MediaTek*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103613 (from R4-2102791).**

**R4-2103613 CR on CGI reading requirements 38.133**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1772 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon, MediaTek*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102792 CR on CGI reading requirements 38.133 R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1773 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon, MediaTek*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102793 CR on CGI reading report delay 36.133**

*Type: CR For: Agreement  
 36.133 v16.8.0 CR-7070 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102794 CR on CGI reading report delay 36.133 R17**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7071 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

#### 7.13.2 RRM perf. requirements (38.133) [NR\_RRM\_Enh-Perf]

##### 7.13.2.1 General [NR\_RRM\_Enh-Perf]

**R4-2100225 Test applicability for mandatory gap patterns**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101416 Big CR: Introduction of Rel-16 NR RRM enhancements WI performance requirements and test cases (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1599 Cat: B (Rel-16)  
  
 Source: Intel Corporation, ZTE Corporation, Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103608 (from R4-2101416).**

**R4-2103608 Big CR: Introduction of Rel-16 NR RRM enhancements WI performance requirements and test cases (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1599 Cat: B (Rel-16)  
  
 Source: Intel Corporation, ZTE Corporation, Apple*

**Discussion:**

[report of discussion]

**Decision: For email approval**

**R4-2101417 Big CR: Introduction of Rel-16 NR RRM enhancements WI performance requirements and test cases (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1600 Cat: A (Rel-17)  
  
 Source: Intel Corporation, ZTE Corporation, Apple*

**Discussion:**

[report of discussion]

**Decision: For email approval**

##### 7.13.2.2 Test cases [NR\_RRM\_Enh-Perf]

###### 7.13.2.2.1 SRS carrier switching requirements [NR\_RRM\_Enh-Perf]

**R4-2100226 TC4: E-UTRAN – NR interruptions at NR SRS carrier based switching (PSCell in FR2, SCell in FR2)**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103614 (from R4-2100226).**

**R4-2103614 TC4: E-UTRAN – NR interruptions at NR SRS carrier based switching (PSCell in FR2, SCell in FR2)**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2100624 SRS carrier switching discussion**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101688 Discussion on SRS carrier switching test case**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101764 Remaining issues for SRS carrier switching test cases**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101765 CR to 38.133 on SRS configuration**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103615 (from R4-2101765).**

**R4-2103615 CR to 38.133 on SRS configuration**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102533 TC2 - SA interruptions at NR SRS carrier based switching**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

TC2 - SA interruptions at NR SRS carrier based switching

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103616 (from R4-2102533).**

**R4-2103616 TC2 - SA interruptions at NR SRS carrier based switching**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

TC2 - SA interruptions at NR SRS carrier based switching

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104085 (from R4-2103616).**

**R4-2104085 TC2 - SA interruptions at NR SRS carrier based switching**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

TC2 - SA interruptions at NR SRS carrier based switching

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102634 Test cases for BWP switching on multiple CCs for FR1+FR2**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper discusses scenarios for RRM tests for multiple BWP switching on CCs with FR1 and FR2

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.13.2.2.2 Multiple Scell activation/deactivation [NR\_RRM\_Enh-Perf]

**R4-2101059 draftCR on multiple SCell activation test case**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103626 (from R4-2101059).**

**R4-2103626 draftCR on multiple SCell activation test case**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.13.2.2.3 CGI reading requirements with autonomous gap [NR\_RRM\_Enh-Perf]

**R4-2100623 CGI reading discussion T321 LS**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101766 On CGI reading test cases**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102795 draftCR to CGI reading TC4**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103617 (from R4-2102795).**

**R4-2103617 draftCR to CGI reading TC4**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.13.2.2.4 BWP switching on multiple CCs [NR\_RRM\_Enh-Perf]

**R4-2101060 Discussion on multiple BWP switch test case**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101378 Further considerations on test cases for BWP switch over multiple CCs**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101390 CR for test cases for simultaneously DCI/timer based bwp switch over mulitple CCs on FR1 in SA**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1595 Cat: B (Rel-16)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2103604 CR for test cases for simultaneously DCI/timer based bwp switch over mulitple CCs on FR1 in SA**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1595 Cat: B (Rel-16)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101411 Discussion on test case design for BWP switching on multiple CCs**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101412 Draft CR on DCI-based and Timer-based simultaneous Active BWP Switch on multiple CCs on FR1 in EN-DC (section 4.5.6.x)**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2101634 Discussion on performance requirements for BWP switch on multiple CCs**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101635 draftCR to introduce Active BWP Switch on multiple CCs TC2**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103605 (from R4-2101635).**

**R4-2103605 draftCR to introduce Active BWP Switch on multiple CCs TC2**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102362 On TC4 for simultaneous BWP switch on multiple CCs**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on test case for simultaneous BWP switching on multiple CCs.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102363 DraftCR 38.133 (A.7.5.X) TC4 BWP switching**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

TC4 for simultaneous BWP switching on multiple CCs

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103606 (from R4-2102363).**

**R4-2103606 DraftCR 38.133 (A.7.5.X) TC4 BWP switching**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Ericsson*

**Abstract:**

TC4 for simultaneous BWP switching on multiple CCs

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.13.2.2.5 Inter-frequency measurement requirement without MG [NR\_RRM\_Enh-Perf]

**R4-2100627 Inter frequency w/o gap power imbalance discussion**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101693 Correction on inter-frequency measurement without gap test case**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.13.2.2.6 Mandatory MG patterns [NR\_RRM\_Enh-Perf]

**R4-2100625 Mandatory MG applicability rule discussion**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100626 Mandatory MG applicability rule CR**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Qualcomm, Inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103618 (from R4-2100626).**

**R4-2103618 Mandatory MG applicability rule CR**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Qualcomm, Inc.*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2100860 Discussion on test cases for mandatory MG patterns**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101922 On test cases for mandatory gap patterns**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102361 Test case applicability for mandatory measurement gaps in R15/R16**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on test case applicability for measurement gaps.

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.13.2.2.7 UE-specific CBW change [NR\_RRM\_Enh-Perf]

**R4-2101070 draftCR on the CBW change test case for adding the UL CBW configuration**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103627 (from R4-2101070).**

**R4-2103627 draftCR on the CBW change test case for adding the UL CBW configuration**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.13.2.2.8 Spatial relation switch for uplink [NR\_RRM\_Enh-Perf]

**R4-2101696 Correction on uplink spatial relation switching test case**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102265 Test case for RRC based UL spatial relation switch associated with a known DL-RS in SA for periodic SRS**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103607 (from R4-2102265).**

**R4-2103607 Test case for RRC based UL spatial relation switch associated with a known DL-RS in SA for periodic SRS**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.13.2.2.9 Inter-band CA requirement for FR2 UE measurement capability of independent Rx beam [NR\_RRM\_Enh-Perf]

**R4-2101679 DraftCR on SCell activation and deactication delay test for FR2 inter-band CA**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103628 (from R4-2101679).**

**R4-2103628 DraftCR on SCell activation and deactication delay test for FR2 inter-band CA**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102888 Updates on Test Configuration for FR2 Inter-band CA IBM UEs**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Noted.**

### 7.14 NR RRM requirements for CSI-RS based L3 measurement [NR\_CSIRS\_L3meas]

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**Email discussion: [98e][221] NR\_CSIRS\_L3meas\_RRM\_1**

**R4-2103460 Email discussion summary: [98e][221] NR\_CSIRS\_L3meas\_RRM\_1***Type: other For: Information  
Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103703 (from R4-2103460).**

**R4-2103703 Email discussion summary: [98e][221] NR\_CSIRS\_L3meas\_RRM\_1***Type: other For: Information  
Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (January 27, 2021)

Issue 2-1-1: The upper bound of timing offset for case 1?

* Proposals
  + Option 1: (CATT, Xiaomi, CMCC, Nokia, OPPO, vivo, Apple, Huawei, Intel, QC)
    - CP.
  + Option 2: (MTK)
    - 0.9\*CP.
  + Option 4: (Huawei)
    - CP/2.
* Discussion
  + MTK: need to clarify that this is for RSRP/RSRQ. For the TO = CP we observe some performance degradation.
  + Apple/Huawei/Intel/QC: ok with Option 1.
  + MTK: did companies consider positive/negative TO?
    - vivo: for simulation assumption we considered positive only. However from performance perspective positive/negative should be quite identical.
    - Apple: It depends on how to set the timing reference. UE can adjust its implementation to address different scenarios.
  + MTK: suggest to compromise that timing offset is < CP
  + Nokia: we would like to clarify with MTK on the conditions when the performance degradation is observed. What is the channel model?
    - MTK: it is AWGN
  + Chair: MTK will check. Come back on Fri.
* Tentative agreement
  + For CSI-RSRP and CSI-RSRQ the upper bound of timing offset for case 1 is CP

Issue 2-1-2: The CSI-RSRP measurement accuracy requirements for case 1?

* Proposals
  + Option 1: (CATT, Xiaomi, CMCC, MTK, Qualcomm, OPPO, vivo, Huawei, Intel, Apple)
    - Reuse the accuracy requirements of SS-RSRP measurement.
  + Option 3: (Nokia)
    - A better accuracy than SS-RSRP measurement if using 5 samples.
    - Reuse the accuracy of SS-RSRP measurement if using 3 samples.
* Discussion
  + Nokia: from NW perspective CSI-RSRP consumes more resources, so some benefits in terms of accuracy or measurement delay are desirable
  + CATT: the CSI-RS configuration can be more flexible comparing to SSB. Our original intention is to improve accuracy but based on companies results it seems that SS-RSRP accuracy is acceptable
  + Apple: Option 1
  + vivo: for 48MHz BW the amount of resources for CSI-RS and SSB is comparable. We see limited room for improvement of CSI-RSRP accuracy.
  + CMCC: we also have same views as Nokia that CSI-RSRP should provide some benefits. However, we agreed 48MHz BW and the performance gain is quite limited. So, we are ok with Option 1.
  + Nokia: most companies have shown the better performance in case of using 5 samples.
  + QC: on the motivation - on the cell-edge the SSB SNR can be low and CSI-RS can have better SNR due to beamforming gain.
  + MTK: accuracy includes BB accuracy and RF calibration error. RF error depends on the handled BW. Eventually CSI-RS may not necessarily give better accuracy.
  + Chair: Nokia will check. Come back on Fri.
* Tentative agreement
  + Reuse the accuracy requirements of SS-RSRP and SS-RSRQ measurement

Issue 2-1-3: Whether to define CSI-RS measurement accuracy requirements for case 2?

* Proposals
  + Option 1: (CATT, MTK, Qualcomm, CMCC, Apple, Huawei, OPPO, vivo, Xiaomi, Nokia, NTT DoCoMo)
    - No.
  + Option 2: (Xiaomi, CMCC, Huawei, OPPO)
    - Yes.
* Discussion
  + Apple: Option 1. For Option 2 it depends on a specific timing offset value.
  + Huawei/OPPO/Xiaomi: Can compromise to Option 1
* Agreement
  + Do not define CSI-RS measurement accuracy requirements for case 2

Issue 2-3-1: The upper limit of Es/Iot for CSI-SINR measurement with timing offset(T△)?

* Proposals
  + Option 1: (CATT, QC, OPPO, Huawei, Apple)
    - Es/Iot ≤ 10dB for the case that timing offset is within CP.
  + Option 2: (CMCC, vivo)
    - Es/Iot ≤ 25dB for the case that timing offset is within CP.
  + Option 3: (MTK, vivo)
    - Es/Iot ≤ 25dB for the case 0 ≤T△ ≤CP/2.
  + Option 4: (MTK)
    - Es/Iot ≤ X dB for the case |T△| ≤CP/2, where X is within the range of 0 to 10dB.
  + Option 5: (Huawei)
    - Two set of Es/Iot based on timing difference:
      * Case 1: Es/Iot ≤ 25dB for the casetiming error is <= CP/2;
      * Case 2: Es/Iot ≤ 12dB for the casetiming error is <= 1.5\*CP;
* Discussion
  + vivo: Option 3
  + MTK: need to discuss jointly with the accuracy. We need to relax the accuracy if we go with Option 1.
  + CMCC: We prefer compromise Es/Iot ≤ 18dB
  + QC: we can put the value into brackets.
  + vivo: the serving cell measurements is important and ok with 18dB
  + Huawei: is 18dB based on CP or CP/2?
    - CMCC: CP
  + Huawei: we can accept 10dB with CP. No confident to use 18dB as baseline.
  + MTK: suggest to collect some table
* Agreement
  + Option 1: Es/Iot ≤ [10] dB for the case that timing offset is within CP.
  + Option 2: Es/Iot ≤ [18] dB for the case that timing offset is within CP/2.

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103629 | WF on core part maintenance of CSI-RS based L3 measurement requirements | Apple |
| R4-2103630 | WF on accuracy requirements and test cases of CSI-RS based L3 measurement | CATT, OPPO |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2100422 | Revised |
| R4-2100718 | Revised |
| R4-2101150 | Revised |
| R4-2101394 | Revised |
| R4-2101838 | Noted |
| R4-2101840 | Agreed |
| R4-2101842 | Revised |
| R4-2100429 | Noted |
| R4-2100430 | Revised |
| R4-2100431 | Noted |
| R4-2100719 | Noted |
| R4-2100720 | Noted |
| R4-2100721 | Noted |
| R4-2101396 | Revised |
| R4-2102801 | Revised |
|  |  |

GTW session (February 01, 2021)

Issue 2-1-1: The upper bound of timing offset for case 1?

* Proposals
  + Option 1: (CATT, Xiaomi, CMCC, Nokia, OPPO, vivo, Apple, Huawei, Intel, QC)
    - CP.
  + Option 2: (MTK)
    - 0.9\*CP.
  + Option 4: (Huawei)
    - CP/2.
* Discussion
  + MTK: need more time to converge on this issue. Recommend companies to check both positive and negative timing offsets.
  + Chair: are there plans to bring more simulation results?
  + CATT: open to have another simulation round
  + vivo: Is WI planned to be closed in the next meeting? What would be the completion level?
  + OPPO: we can endorse CRs and keep values in []
  + Chair: in case the WI cannot finish, the TUs for Q2 were reserved.
  + CATT: it is better to have a conclusion in this meeting. Are companies open to bring more results?
  + QC: We agree with MTK that it is better to bring more simulation results. In the previous meeting there was some ambiguity on the timing offset model.
  + Apple: even 1 CP can be unrealistic. We are open to check more results.
* Agreement
  + For CSI-RSRP and CSI-RSRQ the upper bound of timing offset for case 1 is TBD
    - Option 1: 1 CP
    - Option 2: 0.9 CP
  + Companies are encouraged to bring additional simulation results for different values of timing offset and evaluate both positive and negative timing offsets.
  + Note: the timing offset value in the test cases can be specified in []

Issue 2-1-2: The CSI-RSRP measurement accuracy requirements for case 1?

* Proposals
  + Option 1: (CATT, Xiaomi, CMCC, MTK, Qualcomm, OPPO, vivo, Huawei, Intel, Apple)
    - Reuse the accuracy requirements of SS-RSRP measurement.
  + Option 3: (Nokia)
    - A better accuracy than SS-RSRP measurement if using 5 samples.
    - Reuse the accuracy of SS-RSRP measurement if using 3 samples.
* Discussion
  + Nokia: this is relevant to 2-1-1. Need to have more simulations
  + CATT: We need to fix either 2-1-1 or 2-1-2. Otherwise the discussion will be endless
  + MTK: Same view as CATT. We need to agree on the accuracy at least.
  + vivo: Accuracy can be decided in this meeting. No much difference between 0.9 and 1 CP
  + Xiaomi: agree with CATT/MTK/vivo
  + Nokia: can compromise
* Agreement
  + Reuse the accuracy requirements of SS-RSRP and SS-RSRQ measurement

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103629 | Approved |
| R4-2103631 | Agreed |
| R4-2103632 | Withdrawn |
| R4-2103633 | Agreed |
| R4-2103634 | Agreed |
| R4-2103635 | Return to |
| R4-2100461 | Agreed |
| R4-2101151 | Agreed |
| R4-2102612 | Return to |
| R4-2101843 | Return to |
| R4-2104058 | Return to |
| R4-2104059 | Return to |
| R4-2103630 | Approved |
| R4-2103725 | Agreed |
| R4-2103636 | Endorsed |
| R4-2103637 | Endorsed |
| R4-2103638 | Endorsed |
|  |  |
|  |  |
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**Email discussion: [98e][222] NR\_CSIRS\_L3meas\_RRM\_2**

**R4-2103461 Email discussion summary: [98e][222] NR\_CSIRS\_L3meas\_RRM\_2***Type: other For: Information  
Source: Moderator (OPPO)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103704 (from R4-2103461).**

**R4-2103704 Email discussion summary: [98e][222] NR\_CSIRS\_L3meas\_RRM\_2***Type: other For: Information  
Source: Moderator (OPPO)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (January 27, 2021)

Sub-topic 1-1: Whether to introduce test case for FDD mode

* Proposals
  + Option 1: No (Qualcomm, OPPO, vivo, MTK, Xiaomi, CATT)
  + Option 2: Yes (Huawei, CATT, Nokia, Apple)
    - If option 2 was agreed, FFS time offset for FDD mode (e.g., 3us, 3ms or others)
* Discussion
  + Nokia: Option 2.
  + Huawei: the main concern shared by companies is that there will be large timing error. For the test we can control and set appropriate value.
  + vivo: we can set any arbitrary value in the test. Not sure what is the likelihood of having synchronous FDD networks
  + Huawei: the current NR design already requires some level of synchronous operation for FDD (e.g. SMTC configuration)
  + Apple: do not see much reasons to limit to FDD
  + OPPO: even if we define requirements, we cannot guarantee in the field that there will be synch FDD
  + MTK: there are no tight requirements for FDD
  + Chair: continue the discussion

Sub-topic 1-2: DRX configuration for Test Cases with DRX

* Proposals
  + FR2:
    - Option 1: DRX.5 = 320ms
    - Option 2: DRX.1 = 40ms
  + FR1:
    - Option 1: DRX.6 = 640ms
    - Option 2: DRX.5 = 320ms
* Recommended WF
  + Following the agreements of DRX configuration for test cases with DRX in last meeting:
    - For test cases with DRX: FR1 with long DRX, FR2 with short DRX
  + Recommended DRX configuration:
    - 320ms (DRX.5 in A.3.3) for FR1
    - 40ms (DRX.1 in A.3.3) for FR2
* Discussion
  + OPPO: 320ms (DRX.5 in A.3.3) for FR1 is the majority view
* Agreement
  + DRX configuration:
    - 320ms (DRX.5 in A.3.3) for FR1
    - 40ms (DRX.1 in A.3.3) for FR2

1st round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2100433 | Revised |
| R4-2100722 | Revised |
| R4-2102820 | Revised |
| R4-2100434 | Revised |
| R4-2100723 | Revised |
| R4-2101534 | Revised |
| R4-2100435 | Revised |
| R4-2100724 | Revised |
| R4-2101154 | Revised |
| R4-2101535 | Revised |
| R4-2101775 | Revised |
| R4-2102803 | Revised |
| R4-2102825 | Revised |
| R4-2101533 | Return to (Note a new big CR of Cat A for Rel-17 would be also suggested to be reserved if allowed.) |
| R4-2100465 | Withdrawn |
| R4-2100466 | Withdrawn |
| R4-2100467 | Withdrawn |
| R4-2101292 | Return to |
|  |  |

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103639 | Endorsed |
| R4-2103640 | Endorsed |
| R4-2103641 | Endorsed |
| R4-2103642 | Endorsed |
| R4-2103643 | Endorsed |
| R4-2103644 | Endorsed |
| R4-2103645 | Endorsed |
| R4-2103646 | Endorsed |
| R4-2101154 | postponed |
| R4-2103647 | withdrawn |
| R4-2103648 | Endorsed |
| R4-2103649 | Endorsed |
| R4-2103650 | Endorsed |
| R4-2103651 | Endorsed |
|  |  |
|  |  |

GTW session (February 05, 2021)

Subtopic 1-1: Whether to introduce test case for FDD mode

* Proposals
  + Option 1: No (Qualcomm, OPPO, vivo, MTK, Xiaomi, CATT)
  + Option 2: Yes (Huawei, Nokia, Apple, CMCC, CATT)
* Discussion
  + QC: ok to have FDD. In the test the time offset is within the CP.
  + vivo: ok to have FDD
* Agreements
  + Introduce test case for FDD mode
    - Use same timing offset model as for TDD

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#### 7.14.1 RRM core requirements maintenance (38.133) [NR\_CSIRS\_L3meas-Core]

**R4-2103629 WF on core part maintenance of CSI-RS based L3 measurement requirements**

*Type: other For: Approval  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2100242 CR on CSSF with CSI-RS for L3 measurement**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1468 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100243 On remaining core issues of CSI-RS for L3 measurements**

*Type: discussion For: Agreement  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100421 Discussion on core part maintenance open issues**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100422 CR on CSI-RS based L3 measurement**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1470 Cat: F (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103631 (from R4-2100422).**

**R4-2103631 CR on CSI-RS based L3 measurement**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1470 Cat: F (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100461 CR on CSI-RS based L3 measurement**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1482 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100716 Discussion on the remaining issues of core requirement for CSI-RS L3 measurement**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100718 CR on core requirement for CSI-RS L3 measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2103632 CR on core requirement for CSI-RS L3 measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2104058 CR on core requirement for CSI-RS L3 measurement**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-TBA Cat: F (Rel-16)  
 Source: Xiaomi*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2104059 CR on core requirement for CSI-RS L3 measurement**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-TBA Cat: A (Rel-17)  
 Source: Xiaomi*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2101150 Maintenance CR for CSI-RS based L3 measurement requirements R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1561 Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103633 (from R4-2101150).**

**R4-2103633 Maintenance CR for CSI-RS based L3 measurement requirements R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1561 Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101151 Maintenance CR for CSI-RS based L3 measurement requirements R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1562 Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101185 Comments on remaining issues of CSI-RS based L3 measurement core requirements**

*Type: discussion For: (not specified)  
 38.133 v..  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

The remaining issues in the core requirements of CSI-RS based L3 measurements from 97e are discussed.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101393 Open issues on the CSI-RS based measurement requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101394 38.133 CR on the CSI-RS based measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1596 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103634 (from R4-2101394).**

**R4-2103634 38.133 CR on the CSI-RS based measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1596 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104093 (from R4-2103634).**

**R4-2104093 38.133 CR on the CSI-RS based measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1596 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102612 38.133 CR on the CSI-RS based measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1737 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101767 Remaining issues on CSI-RS L3 measurement core requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101837 Discussion on remaining issues for CSI-RS based L3 measurement**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101838 CR on CSI-RS based intra-frequency scheduling restriction**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1676 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2101839 CR on CSI-RS based intra-frequency scheduling restriction**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1677 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101840 Correction on CSSFoutsidegap**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1678 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101841 Correction on CSSFoutsidegap**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1679 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101842 CR on CSI-RS measurement window and intra-frequency measurements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1680 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103635 (from R4-2101842).**

**R4-2103635 CR on CSI-RS measurement window and intra-frequency measurements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1680 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2101843 CR on CSI-RS measurement window and intra-frequency measurements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1681 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

#### 7.14.2 RRM perf. requirements (38.133) [NR\_CSIRS\_L3meas-Perf]

**R4-2103630 WF on accuracy requirements and test cases of CSI-RS based L3 measurement**

*Type: other For: Approval  
 Source: CATT, OPPO*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2104089 (from R4-2103630).**

**R4-2104089 WF on accuracy requirements and test cases of CSI-RS based L3 measurement**

*Type: other For: Approval  
 Source: CATT, OPPO*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2101291 Big CR: Introduction of Rel-16 CSI-RS based L3 measurement RRM performance requirements**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1587 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

Session chair: planned to be endorsed

**Decision: For email approval.**

**R4-2103653 Big CR: Introduction of Rel-16 CSI-RS based L3 measurement RRM performance requirements**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-TBA Cat: A (Rel-17)  
  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Withdrawn.**

**R4-2103725 Simulation assumptions for CSI-RS based L3 measurement**

*Type: other For: Approval  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2100717 Discussion on the remaining issues of performance requirement for CSI-RS L3 measurement**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.14.2.1 General [NR\_CSIRS\_L3meas-Perf]

**R4-2101203 On the performance requirements of CSI-RS based L3 measurement**

*Type: discussion For: (not specified)  
 38.133 v..  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Sim results on CSI-RSRP and CSI-SINR

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101395 Discussion on the performance of CSI-RS based measurements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101413 Discussion on CSI-RS L3 measurement**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.14.2.1.1 CSI-RSRP requirements [NR\_CSIRS\_L3meas-Perf]

**R4-2100423 Updated simulation results for CSI-RSRP measurement**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100426 Discussion on performance requirement for CSI-RSRP**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100429 CR on performance requirement for CSI-RSRP**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1471 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2100462 CR on performance requirement for CSI-RSRP**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1483 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100719 CR on CSI-RSRP performance requirement for CSI-RS L3 measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2100861 Discussion on performance requirements for CSI-RS based L3 measurement**

*Type: discussion For: Approval  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100862 Simulation results for CSI-RSRP**

*Type: discussion For: Information  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101152 CSI-RSRP measurement accuracy requirement**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101396 38.133 draftCR on the CSI-RSRP accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103637 (from R4-2101396).**

**R4-2103637 38.133 draftCR on the CSI-RSRP accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2101397 Simulation results for CSI-RS based measurements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101532 Discussion on remaining issues for CSI-RS measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101768 Simulation results for CSI-RSRP measurement accuracy**

*Type: other For: Information  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101769 Discussion on CSI-RSRP measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102799 Discussion on CSI-RSRP accuracy requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.14.2.1.2 CSI-RSRQ requirements [NR\_CSIRS\_L3meas-Perf]

**R4-2100424 Updated simulation results for CSI-RSRQ measurement**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100427 Discussion on performance requirement for CSI-RSRQ**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100430 CR on performance requirement for CSI-RSRQ**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1472 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103636 (from R4-2100430).**

**R4-2103636 CR on performance requirement for CSI-RSRQ**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1472 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2100463 CR on performance requirement for CSI-RSRQ**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1484 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100720 CR on CSI-RSRQ performance requirement for CSI-RS L3 measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2100863 Simulation results for CSI-RSRQ**

*Type: discussion For: Information  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101770 Simulation results for CSI-RSRQ measurement accuracy**

*Type: other For: Information  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101771 Discussion on CSI-RSRQ measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.14.2.1.3 CSI-SINR requirements [NR\_CSIRS\_L3meas-Perf]

**R4-2100425 Simulation results for CSI-SINR measurement**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100428 Discussion on performance requirement for CSI-SINR**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100431 CR on performance requirement for CSI-SINR**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1473 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2100464 CR on performance requirement for CSI-SINR**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1485 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100721 CR on CSI-SINR performance requirement for CSI-RS L3 measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2100864 Simulation results for CSI-SINR**

*Type: discussion For: Information  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100865 Discussion on side condition for CSI-SINR measurement**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101153 CSI-SINR measurement accuracy requirement**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101772 Simulation results for CSI-SINR measurement accuracy**

*Type: other For: Information  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101773 Discussion on CSI-SINR measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102800 Discussion on CSI-SINR accuracy requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102801 draftCR on CSI-SINR accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103638 (from R4-2102801).**

**R4-2103638 draftCR on CSI-SINR accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

##### 7.14.2.2 Test cases [NR\_CSIRS\_L3meas-Perf]

**R4-2101292 Big CR: Introduction of Rel-16 CSI-RS based L3 measurement RRM test cases**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1588 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2103652 Big CR: Introduction of Rel-16 CSI-RS based L3 measurement RRM test cases**

*Type: CR For: Agreement  
 38.133 v 17.0.0 CR-TBA Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

###### 7.14.2.2.1 General [NR\_CSIRS\_L3meas-Perf]

**R4-2100432 Discussion on test case for CSI-RS based measurement**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101533 Big CR: Introduction of Rel-16 CSI-RS based L3 measurement RRM test cases**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1611 Cat: F (Rel-16)  
  
 Source:* *OPPO, CATT*

**Discussion:**

[report of discussion]

Session chair: plan to endorse the big CR

**Decision: For email approval.**

**R4-2101774 Remaining issues on CSI-RS L3 measurement test cases**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102802 Discussion on remaining issues in CSI-RS RRM test cases**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.14.2.2.2 Intra-frequency measurement [NR\_CSIRS\_L3meas-Perf]

**R4-2100433 CR on test case for CSI-RS based intra-frequency measurement for FR1 in SA**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1474 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103639 (from R4-2100433).**

**R4-2103639 CR on test case for CSI-RS based intra-frequency measurement for FR1 in SA**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1474 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2100465 CR on test case for CSI-RS based intra-frequency measurement for FR1 in SA**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1486 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100722 RRM test cases for CSI-RS L3 intra-frequency measurements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103640 (from R4-2100722).**

**R4-2103640 RRM test cases for CSI-RS L3 intra-frequency measurements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102820 Draft test case of CSI-RS based intra-frequency test for EN-DC event triggered reporting tests without gap for NR neighbor cell in FR2**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Update the cell time offset for the intra-frequency CSI-RS L3 test to be within a CP.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103641 (from R4-2102820).**

**R4-2103641 Draft test case of CSI-RS based intra-frequency test for EN-DC event triggered reporting tests without gap for NR neighbor cell in FR2**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Update the cell time offset for the intra-frequency CSI-RS L3 test to be within a CP.

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.14.2.2.3 Inter-frequency measurement [NR\_CSIRS\_L3meas-Perf]

**R4-2100434 CR on test case for CSI-RS based inter-frequency measurement for FR1 in SA**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1475 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103642 (from R4-2100434).**

**R4-2103642 CR on test case for CSI-RS based inter-frequency measurement for FR1 in SA**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1475 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2100466 CR on test case for CSI-RS based inter-frequency measurement for FR1 in SA**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1487 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100723 RRM test cases for CSI-RS L3 inter-frequency measurements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103643 (from R4-2100723).**

**R4-2103643 RRM test cases for CSI-RS L3 inter-frequency measurements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2101534 CR on EN-DC tests for NR inter-frequency neighbor cell in FR2(PScell in FR2)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1612 Cat: F (Rel-16)  
  
 Source: OPPO*

**Discussion:**

[report of discussion]

Session chair: Cover sheet errors (What is the revision number? It reads revision number 1 on the cover page but the Tdoc is not reserved for a revision.)

**Decision: Revised to R4-2103644 (from R4-2101534).**

**R4-2103644 CR on EN-DC tests for NR inter-frequency neighbor cell in FR2(PScell in FR2)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1612 Cat: F (Rel-16)  
  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.14.2.2.4 Measurement performance [NR\_CSIRS\_L3meas-Perf]

**R4-2100435 CR on test case for CSI-RSRP measurement accuracy requirements in SA**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1476 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103645 (from R4-2100435).**

**R4-2103645 CR on test case for CSI-RSRP measurement accuracy requirements in SA**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1476 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2100467 CR on test case for CSI-RSRP measurement accuracy requirements in SA**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1488 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100724 RRM test cases for CSI-RS L3 measurement performance requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103646 (from R4-2100724).**

**R4-2103646 RRM test cases for CSI-RS L3 measurement performance requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2101154 CR to Update timing offset in test case for CSI-SINR in SA FR2**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2103647 CR to Update timing offset in test case for CSI-SINR in SA FR2**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101535 CR on EN-DC tests for CSI-RSRQ accuracy**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1613 Cat: F (Rel-16)  
  
 Source: OPPO*

**Discussion:**

[report of discussion]

Session chair: Cover sheet errors (What is the revision number? It reads revision number 1 on the cover page but the Tdoc is not reserved for a revision.)

**Decision: Revised to R4-2103648 (from R4-2101535).**

**R4-2103648 CR on EN-DC tests for CSI-RSRQ accuracy**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1613 Cat: F (Rel-16)  
  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2101775 CR to 38.133 correction to test cases for EN-DC CSI-SINR measurement accuracy**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103649 (from R4-2101775).**

**R4-2103649 CR to 38.133 correction to test cases for EN-DC CSI-SINR measurement accuracy**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102803 draft CR to update TC3 and TC12 for CSI-RS accuracy test**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103650 (from R4-2102803).**

**R4-2103650 draft CR to update TC3 and TC12 for CSI-RS accuracy test**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102825 Draft test case of measurement performance for EN-DC CSI-RSRP measurement accuracy for NR neighbor cell in FR2**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Update the cell time offset for the test cases of measurement performance in the scenario of EN-DC FR2

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103651 (from R4-2102825).**

**R4-2103651 Draft test case of measurement performance for EN-DC CSI-RSRP measurement accuracy for NR neighbor cell in FR2**

*Type: draftCR For: Endorsement  
 38.133 v16.6.0  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Update the cell time offset for the test cases of measurement performance in the scenario of EN-DC FR2

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

### 7.15 NR support for high speed train scenario [NR\_HST]

#### 7.15.1 RRM requirements maintenance (38.133) [NR\_HST-Core/Perf]

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**Email discussion: [98e][223] NR\_HST\_RRM**

**R4-2103462 Email discussion summary: [98e][223] NR\_HST\_RRM***Type: other For: Information  
Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103705 (from R4-2103462).**

**R4-2103705 Email discussion summary: [98e][223] NR\_HST\_RRM***Type: other For: Information  
Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2100849 | Revised |
| R4-2100850 | Return to |
| R4-2101844 | Agreed |
| R4-2101845 | Agreed |
| R4-2100238 | Revised |
| R4-2100239 | Withdrawn |
| R4-2101013 | Return to |
| R4-2100484 | Agreed |
| R4-2100485 | Agreed |
| R4-2101846 | Revised |
| R4-2101847 | Return to |
|  |  |

2nd round email discussion conclusions

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| --- | --- |
| **Tdoc** | **Decision** |
| [R4-2103654](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100849.zip) | Agreed |
| R4-2100850 | Agreed |
| [R4-2103655](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100238.zip) | Agreed |
| R4-2101013 | Agreed |
| R4-2103656 | Agreed |
| R4-2101847 | Return to |
| R4-2101847 | Return to |

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**R4-2100237 R16 HST maintenance: measurement requirements for active SCell in HST**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100238 CR on HST core part maintenance**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1466 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103655 (from R4-2100238).**

**R4-2103655 CR on HST core part maintenance**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1466 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100239 CR on HST core part maintenance (R17)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1467 Cat: A (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101013 CR on HST core part maintenance (R17)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1544 Cat: A (Rel-17)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2104094 CR on introduction of missing HST test cases**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-TBA Cat: F (Rel-17)  
  
 Source: CMCC*

**Discussion:**

**Decision: Email approval.**

**R4-2100484 Correction to cell reselection test case for HST**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1499 Cat: F (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

Session chair: resubmit in the next meeting

**Decision: Endorsed.**

**R4-2100485 Correction to cell reselection test case for HST**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1500 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100849 CR on HST RRM requirements in connected mode**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1526 Cat: F (Rel-16)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103654 (from R4-2100849).**

**R4-2103654 CR on HST RRM requirements in connected mode**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1526 Cat: F (Rel-16)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100850 CR on HST RRM requirements in connected mode**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1527 Cat: A (Rel-17)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101844 Correction on inter-RAT measurement in high speed scenario**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1682 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101845 Correction on inter-RAT measurement in high speed scenario**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1683 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101846 Correction on test cases for inter-RAT cell identification in connected mode for HST**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1684 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

Session chair: Cover sheet errors (What is the work item? It reads NR\_RRM\_Enh-Perf on the cover page but the Tdoc is reserved for NR\_HST-Perf.)

**Decision: Revised to R4-2103656 (from R4-2101846).**

**R4-2103656 Correction on test cases for inter-RAT cell identification in connected mode for HST**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1684 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

Session chair: resubmit in the next meeting

Session chair: Rel-17 spec issue

**Decision: Endorsed.**

**R4-2101847 Correction on test cases for inter-RAT cell identification in connected mode for HST**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1685 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

### 7.16 NR performance requirement enhancement [NR\_perf\_enh-Perf]

### 7.17 Over the air (OTA) base station (BS) testing TR Maintenance [OTA\_BS\_testing-Perf]

### 7.18 2-step RACH for NR [NR\_2step\_RACH-Perf]

#### 7.18.1 RRM requirements maintenance (38.133) [NR\_2step\_RACH-Core/Perf]

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**Email discussion: [98e][224] NR\_2step\_RACH\_RRM**

**R4-2103463 Email discussion summary: [98e][224] NR\_2step\_RACH\_RRM***Type: other For: Information  
Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**Tdoc decisions**

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| --- | --- |
| **Tdoc** | **Decision** |
| R4-2100115 | Merged |
| R4-2100580 | Agreed |

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**R4-2100115 [CR] Applicability rule for 2-step RA**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1434 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Merged.**

**R4-2100116 [CR] Applicability rule for 2-step RA (Cat A)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1435 Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Abstract:**

This is a cat A CR for Release 17.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100580 2-step RACH RRM performance requirements corrections**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1501 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100581 2-step RACH RRM performance requirements corrections**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1502 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100835 Update the applicability rule for 2-step RA**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102277 2-step RACH RRM performance requirements corrections**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1704 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102278 2-step RACH RRM performance requirements corrections**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1705 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

### 7.19 R16 NR maintenance [WI code or TEI16]

#### 7.19.5 RRM [WI code or TEI16]

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**Email discussion: [98e][204] R16\_NR\_RRM\_maintenance**

**R4-2103443 Email discussion summary: [98e][204] R16\_NR\_RRM\_maintenance***Type: other For: Information  
Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103686 (from R4-2103443).**

**R4-2103686 Email discussion summary: [98e][204] R16\_NR\_RRM\_maintenance***Type: other For: Information  
Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**Decisions**

Issue 1-1: the legacy serving cell measurement and evaluation requirement in IDLE/INACTIVE mode shall not be changed by introducing SMTC2-LP.

Agreement: the legacy serving cell measurement and evaluation requirement in IDLE/INACTIVE mode shall not be changed by introducing SMTC2-LP

Issue 1-4: revise the maximum interruption requirement in paging reception

Agreement: Revise the maximum interruption requirement in paging reception in TS38.133 section 4.2.2.6 as:

At intra-frequency and inter-frequency cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency and inter-frequency cell for paging reception. The interruption time shall not exceed TSI-NR + 2\*Ttarget\_cell\_SMTC\_period ms. **Ttarget\_cell\_SMTC\_period is the periodicity of the SMTC occasions configured for the target NR cell. If the target cell is in the PCI list of smtc2-LP, the SMTC periodicityfollows smtc2-LP; otherwise, the SMTC periodicity follows smtc.**

**New tdocs**

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| R4-2103505 | WF on MRTD/MTTD for intra-band non-contiguous CA and EN-DC | Apple |

**Tdoc decisions**

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| --- | --- |
| **Tdoc** | **Decision** |
| R4-2100186 | Revised |
| R4-2101681 | Return to |
| R4-2101861 | Return to |
| R4-2100117 | Agreed |
| R4-2100234 | Revised |
| R4-2101075 | Revised |
| R4-2101530 | Revised |
| R4-2101531 | Revised |
| R4-2102250 | Agreed |
| R4-2102889 | Revised |
|  |  |

2nd round email discussion conclusions

**Tdoc decisions**

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| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103506 | Agreed |
| R4-2103505 | Withdrawn |
| R4-2101681 | Postponed |
| R4-2101861 | Postponed |
| R4-2103507 | Agreed |
| R4-2103508 | Agreed |
| R4-2103509 | Agreed |
| R4-2103510 | Agreed |
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**R4-2103505 WF on MRTD/MTTD for intra-band non-contiguous CA and EN-DC**

*Type: other For: Approval  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Withdrawn.**

**R4-2100117 [CR] Core maintenance for 38.133**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1436 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

This CR tends to fix some errors existing in the current specification TS 38.133.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100118 [CR] Core maintenance for 38.133 (Cat A)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1437 Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Abstract:**

This is a cat A CR for Release 17.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100185 On R16 IDLE and INACTIVE RRM requirement with SMTC2-LP**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100186 CR on IDLE/INACTIVE RRM requirement with SMTC2-LP R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1449 Cat: B (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103506 (from R4-2100186).**

**R4-2103506 CR on IDLE/INACTIVE RRM requirement with SMTC2-LP R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1449 Cat: B (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100187 CR on IDLE/INACTIVE RRM requirement with SMTC2-LP R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1450 Cat: A (Rel-17)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100234 Interruption requirements maintenance in NR-DC (R16)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1464 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

Session chair: Cover sheet errors (What is the work item? It reads NR\_newRAT-Core on the cover page but the Tdoc is reserved for TEI16.)

**Decision: Revised to R4-2103507 (from R4-2100234).**

**R4-2103507 Interruption requirements maintenance in NR-DC (R16)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1464 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100235 Interruption requirements maintenance in NR-DC (R17)**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1465 Cat: A (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101011 Interruption requirements maintenance in NR-DC (R17)**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1542 Cat: A (Rel-17)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101075 CR for measurement period requirements correction**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1555 Cat: F (Rel-16)  
  
 Source: NEC*

**Abstract:**

Measurement period requirements are corrected

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103508 (from R4-2101075).**

**R4-2103508 CR for measurement period requirements correction**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1555 Cat: F (Rel-16)  
  
 Source: NEC*

**Abstract:**

Measurement period requirements are corrected

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101076 CR for measurement period requirements correction**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1556 Cat: A (Rel-17)  
  
 Source: NEC*

**Abstract:**

Measurement period requirements are corrected

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101530 Maintenance CR on interruption at EUTRA SRS carrier switching in 38.133**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1609 Cat: F (Rel-16)  
  
 Source: OPPO*

**Discussion:**

[report of discussion]

Session chair: Cover sheet errors (What is the work item? It reads NR\_RRM\_Enh-Core on the cover page but the Tdoc is reserved for TEI16. What is the revision number? It reads revision number 1 on the cover page but the Tdoc is not reserved for a revision.)

**Decision: Revised to R4-2103509 (from R4-2101530).**

**R4-2103509 Maintenance CR on interruption at EUTRA SRS carrier switching in 38.133**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1609 Cat: F (Rel-16)  
  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2103722 Maintenance CR on interruption at EUTRA SRS carrier switching in 38.133**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-TBA Cat: A (Rel-17)  
  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101531 Maintenance CR on SCell activation delay requirement in TS38.133**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1610 Cat: F (Rel-16)  
  
 Source: OPPO*

**Discussion:**

[report of discussion]

Session chair: Cover sheet errors (What is the work item? It reads NR\_RRM\_Enh-Core on the cover page but the Tdoc is reserved for TEI16. What is the revision number? It reads revision number 1 on the cover page but the Tdoc is not reserved for a revision.)

**Decision: Revised to R4-2103510 (from R4-2101531).**

**R4-2103510 Maintenance CR on SCell activation delay requirement in TS38.133**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1610 Cat: F (Rel-16)  
  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2103723 Maintenance CR on SCell activation delay requirement in TS38.133**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-TBA Cat: A (Rel-17)  
  
 Source: OPPO*

**Discussion:**

**Decision: Agreed.**

**R4-2101680 Discussion on MRTD/MTTD requirements for FR1 intra-band CA/DC**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101681 CR on MRTD/MTTD requirements for FR1 intra-band CA/DC R16**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1644 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon, LG Uplus, SoftBank Corp.*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2101682 CR on MRTD/MTTD requirements for FR1 intra-band CA/DC R17**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1645 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon, LG Uplus, SoftBank Corp.*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101860 MRTD and MTTD in non-contiguous CA in FR1**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

MRTD and MTTD in non-contiguous CA in FR1. This is based on an issue initiated by Huawei to allow non-colocated NCCA deployments.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101861 MRTD and MTTD in non-contiguous CA in FR1**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1686 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

MRTD and MTTD in non-contiguous CA in FR1. This is based on an issue initiated by Huawei to allow non-colocated NCCA deployments.

**Discussion:**

[report of discussion]

Session chair: Cover sheet errors (What is the CR category? It reads B on the cover page but the Tdoc is reserved for category F.)

**Decision: Postponed.**

**R4-2104051 MRTD and MTTD in non-contiguous CA in FR1**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1686 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

MRTD and MTTD in non-contiguous CA in FR1. This is based on an issue initiated by Huawei to allow non-colocated NCCA deployments.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101862 MRTD and MTTD in non-contiguous CA in FR1**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1687 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

MRTD and MTTD in non-contiguous CA in FR1. This is based on an issue initiated by Huawei to allow non-colocated NCCA deployments.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102250 Correction of band group notation for FR2**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1696 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102251 Correction of band group notation for FR2**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1697 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102889 Cat-F CR to addition of TRS Configurations in Rel-16 Test Case**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1787 Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

Session chair: Cover sheet errors (What is the release? It reads Rel-15 on the cover page but the Tdoc is reserved for Rel-16.)

**Decision: Revised to R4-2103511 (from R4-2102889).**

**R4-2103511 Cat-F CR to addition of TRS Configurations in Rel-16 Test Case**

*Type: CR For: Agreement  
 38.133 v16.6.0 CR-1787 Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102890 Cat-A CR to addition of TRS Configurations in Rel-17 Test Case**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1788 Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

## 8 Rel-16 UE feature list

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GTW session (January 27, 2021)

Issue 1-1: New feature simultaneous dormant BWP switching

Agreement:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | 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 |
| 6. LTE\_NR\_DC\_CA\_enh | 6-[X] | Dormant BWP switching on multiple CCs RRM requirements | Incremental delay for BWP switch processing on additional SCells in DCI based simultaneous dormant BWP switching on multiple SCells | RAN1 feature 18-4 or 18-4a | Yes | N/A | There may be additional unclear BWP switching delay if network trigger dormant BWP switching on multiple SCells simultaneously. | Per UE | No | No | N/A | For component 2), the candidate values are:  ● {100us, 200us} for UE indicates type1 in bwp-SwitchingDelay  ● {200us, 400us, 800us, 1000us} for UE indicates type 2 in bwp-SwitchingDelay  The total BWP switching delay will be captured in TS38.133  UE needs to indicate either of the candidate values in case it supports dormant BWP | Optional with capability signalling |

Discussion

* Huawei: Dormant BWP switching cannot be timer-based
  + QC: agree
* Session chair: Agreed capability needs to be captured in the LS to RAN2/1 on UE feature list.

Issue 2-1: New per BC indication of the per-FR gap

* Option 1 (Huawei): The per-BC indication of the per-FR gap to be introduced and the original per-UE indication to be kept.

Discussion

* Huawei: We provide analysis based on the previous meeting discussion
* MTK: We do not understand why it should be linked with band combinations and number of CCs
* QC: Support Huawei’s proposal. Current capability signalling limits the UE implementation in terms of baseband complexity. The problem is that feature gradually gets extended and has impact on BB implementation complexity (e.g. multiple BPW switching, multiple SCell activation, …). Now this is not pure RF capability.
* E///: We are not convinced that per-BC per-FR gap indication is needed. Per-BC indication will complicate gNB scheduler.
* Apple: Agree with E/// and MTK. Current capability is enough. Per-FR gap is not related to BB complexity and is mainly RF constraint. The issues mentioned by QC can be addressed in a different manner.
* Huawei: Agree that per-FR gap has impact on baseband capabilities.
* E///: one conclusion is that this is not a RF issue. We can try to address in a different way. For per-FR gap we can keep it as per-UE.
* Apple: we already have examples when we introduced some limitations to control BB complexity (e.g. searcher limitations, scaling factors…). We can follow a similar approach.
* MTK: Agree with E/// and Apple. Can handle the issues case by case.
* Session chair: Continue discussion. Identify the implementation constraints which may come from per-UE per-FR gap capability. Further capture the conclusion in the WF in the 2nd round.

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**R4-2103479 Updated RAN4 UE features list for Rel-16**

*Type: other For: Approval  
 Source: CMCC*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2103480 LS on updated Rel-16 RAN4 UE features lists for NR and LTE**

*Type: LS out For: Approval  
To: RAN2 Cc: RAN1  
Source: CMCC*

**Abstract:**

**Discussion:**

**Decision: Approved.**

## 9 Rel-17 spectrum related Work Items for NR

### 9.24 Introduction of FR2 FWA UE with maximum TRP of 23dBm for band n257 and n258 [NR\_FR2\_FWA\_Bn257\_Bn258]

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**Email discussion: [98e][228] NR\_FR2\_FWA\_Bn257\_Bn258\_RRM**

**R4-2103467 Email discussion summary: [98e][228] NR\_FR2\_FWA\_Bn257\_Bn258\_RRM***Type: other For: Information  
Source: Moderator (Huawei)*

**Decision: Revised to R4-2103709 (from R4-2103467).**

**R4-2103709 Email discussion summary: [98e][228] NR\_FR2\_FWA\_Bn257\_Bn258\_RRM***Type: other For: Information  
Source: Moderator (Huawei)*

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103664 | WF on FR2 new FWA UE RRM performance requirements | Huawei |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2101684 | Revised |
|  |  |
|  |  |

2nd round email discussion conclusions

**Tdoc decisions**

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| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103664 | Approved |
| R4-2103665 | Agreed |

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#### 9.24.2 RRM Core requirements (38.133) [NR\_FR2\_FWA\_Bn257\_Bn258-Core]

#### 9.24.3 RRM Perf. requirements (38.133) [NR\_FR2\_FWA\_Bn257\_Bn258-Perf]

**R4-2103664 WF on FR2 new FWA UE RRM performance requirements**

*Type: other For: Approval  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2101683 Discussion on conditions for FR2 new FWA UE**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101684 CR on condition requirements for UE power class 5 in TS38.133**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1646 Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103665 (from R4-2101684).**

**R4-2103665 CR on condition requirements for UE power class 5 in TS38.133**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1646 Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

### 9.25 Introduction of NR 47 GHz band [NR\_47GHz\_Band]

#### 9.25.3 RRM (38.133) [NR\_47GHz\_Band-Core]

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**Email discussion: [98e][229] NR\_47GHz\_Band\_RRM**

**R4-2103468 Email discussion summary: [98e][229] NR\_47GHz\_Band\_RRM***Type: other For: Information  
Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103710 (from R4-2103468).**

**R4-2103710 Email discussion summary: [98e][229] NR\_47GHz\_Band\_RRM***Type: other For: Information  
Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2102654 | Revised |
|  |  |
|  |  |

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103666 | Agreed |

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**R4-2102653 Analysis of RRM requirements for band n62**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

This document analysis RRM requirements for new band on 47 GHz (n62)

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102654 RRM core requirements for band n62**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1740 Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The CR on RRM requirements for new band on 47 GHz

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103666 (from R4-2102654).**

**R4-2103666 RRM core requirements for band n62**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1740 Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The CR on RRM requirements for new band on 47 GHz

**Discussion:**

[report of discussion]

**Decision: Agreed.**

## 10 Reply to ITU-R LS (RP-200042)

### 10.1 Study on IMT parameters for frequency ranges 6.425-7.125GHz and 10.0-10.5GHz [FS\_6425\_10500MHz \_NR]

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

### 11.1 Multiple Input Multiple Output (MIMO) Over-the-Air (OTA) requirements for NR UEs [NR\_MIMO\_OTA]

### 11.2 RF requirements enhancement for NR frequency range 1 (FR1) [NR\_RF\_FR1\_enh]

### 11.3 NR RF requirement enhancements for frequency range 2 (FR2) [NR\_RF\_FR2\_req\_enh2]

#### 11.3.5 RRM core requirements [NR\_RF\_FR2\_req\_enh2-Core]

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**Email discussion: [98e][230] NR\_RF\_FR2\_req\_enh2\_RRM**

**R4-2103469 Email discussion summary: [98e][230] NR\_RF\_FR2\_req\_enh2\_RRM***Type: other For: Information  
Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103711 (from R4-2103469).**

**R4-2103711 Email discussion summary: [98e][230] NR\_RF\_FR2\_req\_enh2\_RRM***Type: other For: Information  
Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103671 | WF on RRM requirements for FR2 Inter-band DL CA and UL CA | Nokia |

GTW session (February 03, 2021)

Issue 1-1-2: UE assumptions for CBM

* 1st round tentative agreements:
  + For CBM capable UE, UE is assumed to receive with one beam at a time, i.e. similar to Rel-15 baseline UE assumption
* Proposals
  + Option 1: Similar to Rel-15 baseline UE assumption i.e. UE can receive with one panel at a time.
  + Option 2: The implementation assumptions for antenna panel and RF architecture for CBM UE needs RF inputs.
* Discussion
  + Huawei: prefer not to mention panels
  + QC: what Huawei wanted to say is that we don’t need to make assumptions on the panels. It was not explicitly mentioned in the spec how many panels we have
  + Apple: Option 1 does not imply single panel implementation. For Rel-17 we can assume that UE is using a single panel at a time.
  + Huawei: this means that UE cannot use 2 panels for same direction in one time.
  + E///: we already have 1st round tentative agreement
  + Nokia: 1st round tentative agreement is ok. How UE forms the beam is up to implementation. The key is that UE can receive with one beam at a time which is same as Rel-15
  + Intel: number of panels is up to RF session and in RRM we need to focus on number of beams. Can remove the wording “similar to Rel-15”
  + LGE: Support 1st round tentative agreement. For RRM we don’t consider the number of panels. We think there should be no impact from number of panels.
  + Apple: it is a bit dangerous to assume that UE can form 1 beam using multiple panels. In this case we’ll need to revisit RF requirements (e.g. spherical coverage). We can go with Option 1 or wait RF session conclusions. We prefer not to leave any ambiguity here.
  + Nokia: the question can be split into beam and panel discussions
  + QC: if UE forms single beam using multiple panels, then it will be seen as a single panel. RF session should discuss this.
  + MTK: we should not consider advanced UE implementations (>1 panel)
  + E///: number of panels is contentious.
  + OPPO: Number of panels will not have impact on RRM requirements and can be up to UE implementation.
  + Session chair: does the number of panels have impact on requirements.
    - Apple: Potentially, yes. For instance, for 2 panels we may need to consider additional activation time.
* Agreements
  + For CBM capable UE
    - UE is assumed to make reception with one beam at a time, i.e. similar to Rel-15 baseline UE assumption
    - FFS for number of panels UE can use for CBM and it is up to RF session conclusions. At least one active panel at a time can be assumed as baseline for RRM requirements definition.

Issue 1-1-4: UE assumptions for IBM

* Proposals
  + Option 1: Capture that it is baseline UE requirement for an IBM capable UE, with more than 1 panel, to be able to have multiple panels active simultaneously.
  + Option 2: Baseline requirement should be based on R15 assumption, and it should allow UE to receive 2 bands with 1 panel
  + Option 3: Any requirements have not been specified with assumption of multiple panels active simultaneously. For consistency, one panel active from more than 1 panel needs to be kept
  + Option 4: IBM UE is assumed to be ~~only~~ capable of receiving signals for FR2 inter-bands CA with different beam directions (Huawei)
  + Option 5: Discuss in RF session
* Discussion
  + Huawei: focus on beams.
  + Nokia: Option 1 or 4. Prefer to avoid panel discussion. Still we can make some assumptions on IBM
  + E///: Option 4 is fine for us. Can limit discussion to beam-level
  + MTK: Option 2. Option 4 is fine for us.
  + NEC: For Option 4 does it include different beam directions active at the same time?
    - Huawei: yes, we can include it
  + LGE: RF session is discussing CBM and IBM definitions. After RF session conclusions, we can follow these conclusions.
  + Apple: both Option 1 and 4 are ok. Option 1 is more accurate. For number of panels this may not have impact on requirements. IBM was introduced in Rel-16. In Rel-16 EIS requirements imply at least 2 panels active at a time (spherical coverage is broader than for Rel-15 UE which can be achieved via using multi-panel implementation).
  + Xiaomi: Ok with Option 4. Do we need to limit the number of directions which UE can receive at the same time (e.g. 2 directions)?
  + QC: IBM UE requires 2 separate resources for beam management (for each band). UE finds the best beam for each band. For CBM UE uses resources in one band to form the beam in another band. No need to discuss number of panels.
* Agreements
  + IBM capable UE is assumed to be capable of receiving signals for FR2 inter-band CA with different beam directions at the same time

Issue 1-2-2: How to determine MRTD for FR2 inter-band CA for CBM?

* Proposals
  + Option 1: Reuse FR2 intra-band MRTD i.e. 260ns (Apple, Intel, OPPO, MTK, LG, QC, Xiaomi)
  + Option 2: 3us (NEC, Nokia, E///)
  + Option 3: 3us MRTD requirements can be applied for co-located deployment and >3us MRTD requirements can be applied for non-co-located deployment (Huawei)
* Discussion
  + Nokia: from RF session conclusions there are no restrictions on co-located and non-co-located deployments
  + Apple: no conclusion in RF session. MRTD > CP will result in performance degradation. Suggest to limit to co-located case in RRM session.
  + E///: Option 2. Also ok with Option 3. For co-located case the TAE will result in 3us.
  + Huawei: same view as E/// for co-located case. For non-co-located case we need to consider propagation delay.
  + Xiaomi: for RF session – from deployment perspective both co-located and non-co-located deployments are supported. For UE requirements – they are derived based on co-located case only.
  + Nokia: CBM should not be limited to co-located. Same view as E/// and Huawei. Option 2 and 3 are ok for us.
  + QC: Need to have separate discussion for deployment and MRTD. We cannot preclude non-co-located scenarios, but the MRTD requirements may not necessarily take this into account. There will be performance degradation.
  + vivo: Option 1.
  + LGE: RF session conclusions are limited to the UE RF requirements.
  + Intel: Option 1. Same time MRTD depends on TAE which is 3us based on current specs. We would like to check if it is feasible to achieve better TAE (e.g. intra-band TAE)
  + Nokia: tentative agreement is fine for us
  + E///: non-co-located deployment will require additional component
  + Huawei: prefer to include non-co-located deployments
  + ZTE: prefer not to preclude non-co-located deployments
  + Intel: for non-co-located deployment Option 3 may not work. We can have a single set of requirements. UE does not know the deployment characteristics. It is up to network to decide whether to use CBM depending on the actual deployment. There still may be IBM UEs which can have better characteristics. There is no harm to have tighter requirements. If we define high MRTD then we have a risk that CBM will simply not be implemented.
    - Apple: agree
  + Apple: we cannot purely rely on RF session decisions. Co-location assumption have impact on : 1) timing (RRM aspect) and 2) power imbalance (RF aspect). We can further align with RF but think the decision can be made in RRM room for RRM requirements.
  + QC/vivo/Xiaomi: same view as Apple and Intel.
  + vivo: RF session agreements may not take into account the RRM constraints. Non-co-located scenarios are not precluded.
  + Xiaomi: need to have analysis on performance impacts for different MRTD
  + E///: disagree to preclude non-co-located deployments.
  + Apple: E/// was fine with Option 2 which implies co-located deployment. What has changed? It is not abnormal in RAN4 to define requirements for a subset of scenarios.
    - E///: we are fine with 3us for co-located case. Non-co-located case will require more than 3us due to additional RF propagation.
  + E///: tentative agreement is ok for co-located case. Need to additionally consider non-co-located. Disagree with tentative agreement.
* Tentative agreements
  + Inter-band MRTD is FFS
    - MRTD requirements are derived under assumption of co-located deployments
      * Note: this does not preclude using co-located or non-co-located deployments in the field
    - MRTD value
      * Option 1: 260ns (i.e. FR2 intra-band MRTD)
      * Option 2: 3us
      * Other options are not precluded
    - Companies are encouraged to evaluate the impact on the performance in case of using MRTD larger than CP
* Session chair: No consensus reached. Continue the discussion.

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103671 | Return to |

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**R4-2103671 WF on RRM requirements for FR2 Inter-band DL CA and UL CA**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2104095 (from R4-2103671).**

**R4-2104095 WF on RRM requirements for FR2 Inter-band DL CA and UL CA**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2100241 On MRTD for CBM for FR2 interband CA**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100640 Discussion on MRTD and MTTD requirements on CBM and IBM for FR2 inter-band CA**

*Type: discussion For: Discussion  
 Source: LG Electronics*

**Abstract:**

It discusses MRTD and MTTD requirements on CBM and IBM for FR2 inter-band CA.

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.3.5.1 Inter-band DL CA enhancements [NR\_RF\_FR2\_req\_enh2-Core]

**R4-2101077 Discussion on FR2 inter-band DL CA enhancements**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

We provide our views on some of the FR2 enhancements and MRTD requirement for FR2 inter-band CA

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101266 RRM requirements for inter-band DL CA in NR FR2**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101540 Discussion on RRM requirements for FR2 inter-band DL CA enhancements**

*Type: discussion For: Discussion  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101686 Discussion on RRM impacts for FR2 inter-band DL CA enhancement in Rel-17**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101867 Support up to 3 us MRTD**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this contribution we develop why at least 3us MRTD is feasible from both from a network perspective and a UE perspective, for co-located deployments.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101868 Updates on MRTD requirements for FR2 inter-band DL CA**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1688 Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Updates on MRTD requirements for FR2 inter-band DL CA

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2102267 Discussion on FR2 RF RRM**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.3.5.2 Inter-band UL CA [NR\_RF\_FR2\_req\_enh2-Core]

**R4-2101687 Discussion on RRM impacts for FR2 inter-band UL CA in Rel-17**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101869 Updates on MTTD requirements for FR2 inter-band DL CA**

*Type: CR For: Agreement  
 38.133 v17.0.0 CR-1689 Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Updates on MTTD requirements for FR2 inter-band DL CA

**Discussion:**

[report of discussion]

**Decision: Postponed.**

### 11.4 Further RRM enhancement for NR and MR-DC [NR\_RRM\_enh2]

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**Email discussion: [98e][231] NR\_RRM\_enh2\_1**

**R4-2103470 Email discussion summary: [98e][231] NR\_RRM\_enh2\_1***Type: other For: Information  
Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103712 (from R4-2103470).**

**R4-2103712 Email discussion summary: [98e][231] NR\_RRM\_enh2\_1***Type: other For: Information  
Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103672 | WF on further RRM enhancement for NR and MR-DC - SRS antenna port switching | Apple |
| R4-2103673 | WF on further RRM enhancement for NR and MR-DC – Handover with PSCell | Apple |
| R4-2103674 | LS on handover with PSCell | Apple |

GTW session (February 01, 2021)

**SRS antenna port switching**

Issue 1-1-2: whether delay requirement would be defined in RRM for SRS antenna port switching

* Proposals
  + Option 2 (OPPO, NEC, Apple, Xiaomi, Intel, CATT, QC, Huawei?): No need to define SRS antenna port switching delay requirement in RRM.
  + Option 3 (Ericsson, MTK, Nokia): FFS: whether delay requirement would be defined in RRM for SRS antenna port switching
* Discussion
  + E///: this is the first meeting and prefer to keep it open and further double check
  + Nokia: we do not see necessity to define delay requirements. Wondering of other companies see any additional components. We are fine with Option 2.
  + MTK: we are ok to support Option 2.
  + E///: Typically we define delay and interruption requirements. Companies refer to SRS carrier switching requirements. Delay can be important for SRS antenna port switching.
  + QC: SRS antenna switching delay is already defined in RF standards. No additional requirements we need to define in RRM.
  + Apple: same view as QC. The delay is quite small and we cannot test it in RAN4.
  + Chair: is there is anything in RAN1?
    - Apple: RAN1 specified guard symbols.
  + E///: RF includes retuning time. RAN1 guard symbol is another thing. We would like to check if there is anything else. The delay will include at least RF retuning time.
  + QC: RF specs have a lot of ON/OFF masks which are not included in the RRM specs.
* Agreements
  + RRM delay requirement for SRS antenna port switching is FFS
    - Option 1: Do not define SRS antenna port switching delay requirement in RRM.
    - Option 2: Define SRS antenna port switching delay requirement same as RF retuning time.
    - Option 3: Define SRS antenna port switching delay requirement. FFS for the value. At least RF retuning time shall be included.

Issue 1-1-3: Impact of SRS antenna port switching to other RRM requirements

* Proposals
  + Option 1 (Apple, Huawei, OPPO, NEC, Xiaomi, Intel, CATT, QC, MTK): Take the SRS carrier switching as the starting point to identify the impact on other RRM requirements.
  + Option 2 (Ericsson): RAN4 to discuss the impact of SRS antenna port switching on timing measurements (e.g., UE Rx-Tx time difference, gNB Rx-Tx time difference, and UL RTOA measurements) and corresponding measurement requirements.
  + Option 3 (Ericsson):
* Take the SRS carrier switching as the starting point to identify the impact on other RRM requirements.
  + FFS: RAN4 to discuss the impact of SRS antenna port switching on timing measurements (e.g., UE Rx-Tx time difference, gNB Rx-Tx time difference, and UL RTOA measurements) and corresponding measurement requirements
  + Option 4 (Nokia): FFS on whether take the SRS carrier switching as the starting point to identify the impact on other RRM requirements
* Discussion
  + E///: we can combine Option 1 and 2
  + Nokia: SRS carrier switching and antenna port switching are different and not sure we can use SRS carrier switching can be used as a starting point
  + QC: using SRS carrier switching as baseline is fine. Need to identify first and define requirements as the second step.
  + Apple: agree with E/// suggestion
  + Intel: what is the impact on gNB requirements from UE SRS antenna port switching?
    - E///: UE is making transmission then gNB measurements may be affected.
    - Intel: need more to check if any enhancement to gNB requirements are needed. We need to be careful on the wording.
  + NEC: for timing measurements – is it only from the perspective of positioning measurements
    - E///: not necessarily related to positioning only
* Agreements
  + Further identify impact of SRS antenna port switching on RRM requirements, e.g.
    - Timing measurements and corresponding measurement requirements
    - Other RRM requirements

Issue 1-1-4: RAN4 defines the requirement only for SRS antenna port switching in FR1 or in both FR1 and FR2

* Proposals
  + Option 1 (QC, OPPO): only SRS antenna port switching in FR1 is considered
  + Option 2 (Apple, Xiaomi, MTK, Intel, NEC, E///): SRS antenna port switching in FR1 and FR2 are considered
  + Option 3 (Nokia, OPPO, Apple, LG, Xiaomi, vivo, Intel, CATT, QC, MTK): define the RRM requirements at SRS antenna switching only for FR1 unless the transient period in FR2 gets clarified in RF session (the scope of “RRM requirements” here depends on the conclusions from issue 1-1-1 and issue 1-1-2)
  + Option 4 (Huawei): wait for the conclusion from RAN1 and RF
* Discussion
  + NEC: Initially we considered FR1 and FR2. If there is no conclusion from RAN1 then we can descope FR2.
  + Huawei: There is some ongoing discussion in RAN1 for multi-panel case for FR2.
  + QC: we can extend Option 3 to include RAN1 conclusions.
  + E///: Prefer Option 2.
  + Chair: there is no RF scope in this WI. How do we trigger discussion on FR2?
    - Apple: Encourage delegates to check with RF experts. For RAN1 – also it is not clear what they discuss, since SRS antenna port switching was defined in Rel-15.
  + Apple: need to make decision to include at least for FR1.
  + QC: agree with Apple
  + NEC: we prefer not to delay the requirements for FR2.
  + QC: how do we start the discussion for FR2 if we don’t have RF
* Agreements
  + Define the RRM requirements for SRS antenna port switching for FR1.
  + FFS for FR2 SRS antenna port switching requirements:
    - Further identify the applicability of the existing RF transient period for SRS antenna port switching.

**HO with PSCell**

Issue 2-1-1: Scenarios for RRM requirement of HO with PSCell

* Proposals
  + Option 1(Apple, CMCC, NEC, Xiaomi, QC): RAN4 specifies RRM requirement for HO with PSCell for following scenarios:
    - from NR SA to EN-DC
    - from EN-DC to EN-DC
    - from NE-DC to NE-DC
    - from NR-DC to NR-DC
  + Option 2(Ericsson): RAN4 specifies RRM requirement for HO with PSCell for following scenarios:
    - from EN-DC to EN-DC
    - from NE-DC to NE-DC
    - from NR-DC to NR-DC
    - Use case for handover with PSCell between NR SA and EN-DC needs to be clarified and justified. Particularly, it needs to be clarified whether it is applicable to SA to EN-DC, SA to NGEN-DC, or both, and priority for development of RRM requirements shall be thereafter.
  + Option 3(HW): Consider the feasible scenarios for HO with PSCell configurations for:
    - NR to EN-DC （NR HO to LTE with NR PSCell configuration）
    - NR to NE-DC （NR HO to NR with LTE PSCell configuration）
    - NR to NR-DC（NR HO to LTE with NR PSCell configuration）
    - LTE to EN-DC （LTE HO to LTE with NR PSCell configuration）
    - NE-DC to NE-DC（NR HO to NR with LTE PSCell configuration）
    - NR-DC to NR-DC（NR HO to NR with NR PSCell configuration）
    - EN-DC to EN-DC（LTE HO to LTE with NR PSCell configuration）
  + Option 4 (HW, OPPO, Apple, Xiaomi, Intel, CATT, Ericsson, DCM, MTK, Nokia): RAN4 specifies RRM requirement for HO with PSCell for following scenarios:
    - from EN-DC to EN-DC
    - from NE-DC to NE-DC
    - from NR-DC to NR-DC
    - FFS on other scenarios
* Discussion
  + E///: “NR SA to EN-DC” is quite specific scenario. We prefer to look more into this.
  + CMCC: we support Option 1. SA – EN-DC scenario is already supported by RAN2 and they have already sent LS to RAN4. We simply need to specify the requirements.
    - E///: we are ok
  + CATT: for NR SA to EN-DC, what do we mean by “with PSCell”. Is it like HO with PSCell addition?
    - Apple: yes. Definition introduced by RAN2.
    - Huawei: “with PSCell” means that PSCell configuration comes in the same IE as HO
* Agreements
  + Define RRM requirement for HO with PSCell for following scenarios:
    - from NR SA to EN-DC
    - from EN-DC to EN-DC
    - from NE-DC to NE-DC
    - from NR-DC to NR-DC
    - FFS on other scenarios

Issue 2-2-3: timeline for HO with PSCell

* Proposals
  + Option 1 (ZTE, Apple, Xiaomi): PCell HO and PSCell addition is performed in a sequential order.
  + Option 2 (CATT, CMCC, QC, Huawei, OPPO, Intel, DCM, MTK, Nokia): PCell HO and PSCell addition is performed in parallel.
  + Option 2a (NEC): cell search can be performed in parallel and TA acquisition and application on PCell, RRC reconfig complete on PCell and RACH to PSCell can be in sequential order
  + Option 3 (Huawei): RAN4 should discuss whether the procedures could be performed in parallel based on the existing requirements.
* Discussion
  + Apple: Prefer Option 1. This is the worst case.
  + QC: it was RAN2 intention that PCell HO and PSCell addition can be performed in parallel
  + Huawei: there are multiple procedures included in HO and PSCell addition and need to discuss case by case
  + Xiaomi: Option 1. Do not consider additional RRC processing time. Synch procedure may need sequential processing.
  + NEC: we are ok with Option 2. Option 2a is a compromise between Option 1 and 2.
  + Nokia: UE should perform procedures in parallel in general. For some components we can further check if sequential processing is needed.
  + E///: Agree with Huawei.
  + OPPO: the motivation is to shorten timeline. No additional RRC processing time is needed. At least same RRC processing time is needed. Ok with Huawei proposal.
  + DOCOMO: Prefer Option 2.
* Agreement
  + Identify the detailed components of “HO with PSCell” procedure
    - Further discuss whether the procedures could be performed in parallel or sequentially based on the existing requirements.

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103672 | Approved |
| R4-2104048 | Return to |
| R4-2103673 | Approved |
| R4-2103674 | Approved |

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**Email discussion: [98e][232] NR\_RRM\_enh2\_2**

**R4-2103471 Email discussion summary: [98e][232] NR\_RRM\_enh2\_2***Type: other For: Information  
Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103713 (from R4-2103471).**

**R4-2103713 Email discussion summary: [98e][232] NR\_RRM\_enh2\_2***Type: other For: Information  
Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103675 | WF on further RRM enhancement for NR and MR-DC - PUCCH SCell activation/deactivation requirements | CATT |
|  |  |  |
|  |  |  |

GTW session (February 01, 2021)

Issue 1-1-0: Whether CSI report of PUCCH SCell is transmitted on PCell or PUCCH SCell to be activated?

* Proposals:
  + Option 1:
    - PUCCH of PCell.
  + Option 2:
    - PUCCH of PUCCH SCell to be activated.
* Discussion
  + Apple: It is up to network. Both Option 1 and 2 are possible
  + Huawei: It depends on how we define the ending point. Option 2 is more reasonable
  + E///: Both options are possible.
  + Nokia: Does the “CSI report” refer to the first valid report? The first valid report shall be transmitted in PUCCH SCell
  + QC: we have same understanding as Apple and Huawei. We need to discuss details of both.
  + CATT: Agree with Huawei. Both Option 1 and 2 are possible.
  + CMCC: Same question as Nokia. If this refers to the valid CSI report and it is transmitted in PCell, then do we need to consider invalid TA case?
    - Apple: PUCCH on PCell – UE will report out of range and when UE completes the procedure UE will report a valid value. For PUCCH on SCell – it is different and UE will transmit a valid CQI from the first occasion.
* Agreements
  + Further study the procedures for the following 2 scenarios
    - CSI report of PUCCH SCell is transmitted on PUCCH PCell
    - CSI report of PUCCH SCell is transmitted on PUCCH SCell to be activated
    - FFS whether to define requirements for both cases.

Issue 1-1-4: Whether the beam information is needed for NW to initiate the RA for TA updating by a PDCCH order?

* Proposals:
  + Option 1: (Huawei, Apple, Qualcomm, OPPO, NTT DOCOMO, MTK, Nokia)
    - The beam information is needed for NW to initiate the RA for TA updating by a PDCCH order
  + Option 2:  (Ericsson)
    - Depends on what activation sequence we are assuming.
* Discussion
  + E///: we can agree with Option 1. But it depends on how the NW gets this information
  + Nokia: RA procedure is initiate by UE.
  + NEC: it depends on the ending point for issues 1-1-0. If CSI report is sent on PCell then we do not need RA at all.
    - QC: if TA is invalid then UE needs to establish UL synch first. This is not related to where UE makes CSI report.
    - Apple: If CQI is on PCell we still needed RACH on target SCell. We need to discuss the ending point.
    - CATT: do we have common understanding on the ending point?
    - Apple: need further discussion
  + QC: the definition of beam information is unclear.
    - Huawei: this is SSB index. SSB index should be explicitly indicated by the NW
* Agreements
  + The beam information (SSB index) is needed for NW to initiate the PDCCH order to trigger RA

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103713 | Approved |
|  |  |

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#### 11.4.1 General and work plan [NR\_RRM\_enh2-Core]

#### 11.4.2 RRM core requirements [NR\_RRM\_enh2-Core]

##### 11.4.2.1 SRS antenna port switching [NR\_RRM\_enh2-Core]

**R4-2103672 WF on further RRM enhancement for NR and MR-DC - SRS antenna port switching**

*Type: other For: Approval  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2104048 LS on SRS antenna port switching**

*Type: LS out For: Approval  
 To: RAN1*

*Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**R4-2100192 On SRS antenna port switching**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100400 Discussion on SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100634 SRS antenna switch discussion**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100655 Discussion on interruption due to SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100726 Discussion on SRS antenna switching RRM requirements**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101078 Discussion on SRS antenna port switching**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

We analyze the interruption requirements for SRS antenna port switching

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101223 Discussion on SRS antenna port switching**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101379 Considerations on SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101392 Discussion on the interruption requirements at SRS antenna port switching**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101414 Discussion on SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101656 Discussion on requirements for SRS antenna switching**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102534 On RRM requirements for SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On RRM requirements for SRS antenna port switching

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.4.2.2 HO with PSCell [NR\_RRM\_enh2-Core]

**R4-2103673 WF on further RRM enhancement for NR and MR-DC – Handover with PSCell**

*Type: other For: Approval  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2103674 LS on handover with PSCell**

*Type: LS Out For: Approval  
 To: RAN2  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2100114 Discussion on handover with PSCell**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100193 On RRM requirement for handover with PSCell**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100401 Discussion on HO with PSCell**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100710 Discussion on RRM requirements for handover with PSCell**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100867 Discussion on HO with PSCell**

*Type: discussion For: Approval  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101079 Discussion on PSCell HO**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

We analyze the requirements for HO with PSCell

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101112 Views on HO with PSCell**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: NTT DOCOMO, INC.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101415 Discussion on HO with PSCell**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101657 Discussion on requirements for HO with PSCell**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102364 On handover with PSCell**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on handover with PSCell

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102625 Views on specifying the requirements for HO with PSCell**

*Type: discussion For: (not specified)  
 38.133 v..  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Views on what to consider when discussing the requirements for HO with PSCell

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.4.2.3 PUCCH SCell activation/deactivation [NR\_RRM\_enh2-Core]

**R4-2103675 WF on further RRM enhancement for NR and MR-DC - PUCCH SCell activation/deactivation requirements**

*Type: other For: Approval  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2100194 On PUCCH SCell activation and deactivation**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100402 Discussion on PUCCH SCell activationdeactivation**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100711 Discussion on SCell activation and deactication requirements for PUCCH Scell**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100872 Discussion on PUCCH SCell activation/deactivation**

*Type: discussion For: Approval  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101046 Discussions on PUCCH SCell Activation/Deactivation delay requirements**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: NTT DOCOMO, INC.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101080 Discussion on PUCCH SCell activation**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

We analyze the requirements for PUCCH SCell activation/deactivation for single and multiple SCells

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101380 Considerations on PUCCH SCell activation and deactivation**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101391 Discussion on the activation and deactivation delay requirements for PUCCH SCell**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101536 Views on RRM requirements for PUCCH SCell Activation/Deactivation**

*Type: discussion For: Discussion  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101658 Discussion on requirements for PUCCH SCell activation**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102365 On SCell (de)activation with PUCCH**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on SCell activation and deactivation for PUCCH SCell.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102892 Discussion on PUCCH SCell Activation**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Noted.**

### 11.5 NR and MR-DC measurement gap enhancements [NR\_MG\_enh]

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**Email discussion: [98e][233] NR\_MG\_enh\_1**

**R4-2103472 Email discussion summary: [98e][233] NR\_MG\_enh\_1***Type: other For: Information  
Source: Moderator (MediaTek)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103714 (from R4-2103472).**

**R4-2103714 Email discussion summary: [98e][233] NR\_MG\_enh\_1***Type: other For: Information  
Source: Moderator (MediaTek)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**Issue 1-1: Work plan**

Session chair: Rapporteurs are encouraged to reflect extended Rel-17 timelines in the WID in the next plenary. The work plan can be updated afterwards.

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103676 | WF on R17 NR MG enhancements - Multiple concurrent and independent MG patterns | MediaTek |
|  |  |  |

GTW session (February 02, 2021)

Issue 2-1: Definition of concurrent gaps

* Proposals
  + Option 1: (ZTE)
    - Two MGs are considered concurrent if they overlap with each other partly or completely
  + Option 2: (LGE)
    - Multiple same MG pattern IDs with different MG offset
    - Different MG pattern IDs with different MG offset
    - Single MG pattern ID with multiple MG offsets
  + Option 3: (Intel, Huawei)
    - The gap patterns defined in Rel16 can be reused for the gap instances being included in the multiple concurrent gap pattern.
* Recommended WF for the 2nd round
  + Concurrent gaps are multiple MG patterns that are configured during a common period of time,
    - Gap patterns are selected from at least Rel-16 gap patterns #0 to #23.
    - Note: The definition can be further revised in the future based on consensus
* Discussion
  + E///: We have 26 gaps. #24 and #25 were added in the NR Pos WI. Prefer not to specify the exact set of gaps.
  + Nokia: Also need to take into account whether the MGs are actively used by UE to perform the measurements. It is early to preclude any MG patterns.
  + Intel: Concurrent pattern = multiple configured patterns with concurrent measurements cycles. MG patterns for PRS measurements shall not be precluded.
  + MTK: Agree with MTK, E///, Nokia to keep all MG patterns. To Nokia – our understanding that multiple configured MGs are used for measurements.
  + QC: need to clarify that the MGs shall be active (i.e. UE is performing the measurements in the gaps)
  + NEC: Need to include offset into the definition. Multiple MGs have different offsets
  + Huawei: this is also relevant to the next issue (independent gaps). Agree with NEC that offset shall be considered. Remove set of patterns. All configured MGs are active and no need to mention this.
  + LGE: Need to reduce performance degradation due to multiple MGs. This is the reason to preclude some MG patterns.
  + Apple: we need to guarantee the some parameters for the configured MGs shall be different.
  + CATT: This is also relevant to independent gap definition. What is the “common period of time”. Does this mean overlapping / non-overlapping?
  + vivo: Agree with CATT that concurrent/independent MGs shall be discussed jointly. Need to clarify what concurrent means (e.g. MGL overlap). MG for NR positioning should be kept.
  + OPPO: Rel-16 MG patterns can be reused. Pre-configured gaps are not precluded.
* Agreements
  + Concurrent MG definition
    - Concurrent MGs are multiple MGs that are configured for measurements during a common period of time
      * Exact definition of common period of time is FFS
      * UE behavior for non-overlapping, partially or fully overlapped cases is irrelevant to the definition and will be discussed separately.
      * Note 1: current definition does not address pre-configured MG patterns and NCSG. FFS how to address pre-configured MG patterns and NCSG.
  + Concurrent MG patterns
    - MG patterns are selected from Rel-16 gap patterns #0 to #25.

2nd round email discussion conclusions

**Tdoc decisions**

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| **Tdoc** | **Decision** |
| R4-2103676 | Return to |
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**Email discussion: [98e][234] NR\_MG\_enh\_2**

**R4-2103473 Email discussion summary: [98e][234] NR\_MG\_enh\_2***Type: other For: Information  
Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103715 (from R4-2103473).**

**R4-2103715 Email discussion summary: [98e][234] NR\_MG\_enh\_2***Type: other For: Information  
Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

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| R4-2103677 | WF on R17 NR MG enhancements – Pre-configured MG patterns and NCSG | Intel Corporation |
|  |  |  |

GTW session (February 02, 2021)

Issue 1-0-0: General procedures of pre-configured MG

* Proposals
  + Option 1. The basic procedures for pre-configured MG include:
    - Step 1. Configuration of the pre-configured MG
    - Step 2. Activation the pre-configured MG when BWP switching
    - Step 3. Deactivation the pre-configured MG
* Discussion
  + OPPO: Concern on the 2nd step. Activation can happen without BWP switching.
  + E///: BWP switching should trigger activation. Removing BWP switching will broaden the scope.
  + Huawei: Does this imply any specific order?
    - Intel: no specific order
  + MTK: Is pre-configured MG same or different to legacy MG? For activation we need to consider MO configuration
  + Xiaomi: do we need another procedure for activation of the pre-configured MG after the RRC configuration
* Agreements
  + Further study the following procedures for pre-configured MGs:
    - 1. (Re)Configuration of the pre-configured MG
      * FFS if specific procedure for activation after the RRC configuration is needed
    - 2. Activation the pre-configured MG following a DCI or timer-based BWP switch
    - 3. Deactivation the pre-configured MG following a DCI or timer-based BWP switch
    - Note 1: The conditions and details of each procedure are FFS
    - Note 2: MG activation in this context means that both NW and UE assume that the pre-configured MG will be used for measurements.
    - Note 3: MG deactivation in this context means that both NW and UE assume that the pre-configured MG will not be used for measurements and UE should be able to receive scheduled data.

Issue 2-1-1 NCSG scenarios

* Proposals
  + Option 1 (Intel): RAN4 can prioritize the following NR NCSG using scenario: Eliminate/reduce interruptions to the serving carriers due to RF chain states transition when measuring the deactivated SCells
  + Option 1a (Qualcomm, Intel): use cases of NCSG can be two scenarios,
    - When measurement gap is not configured at all, NCSG can be explicitly provided to UE for minimal interruptions on a serving carrier while an idle chain is employed for measurement.
    - When measurement gap is configured for some carriers but not the others, NCSG can be implicitly configured on serving carriers, where the serving carrier can be PCC or SCC.
  + Option 1b (Ericsson, Intel, Nokia):
    - Case 1: If NCSG is configured then the interruptions on PCell, PSCell or activated SCell(s) due to measurements on PCell, PSCell, activated SCell, deactivated SCell, SCell with dormant BWP or unused RF chain shall not occur outside the visible interruption length before measurement (VIL1) and the visible interruption length after measurement (VIL2).
    - Case 2: If NCSG is pre-configured then after switching from non-dormant BWP to dormant BWP on a SCell, then interruptions on PCell, PSCell or activated SCell(s) due to measurements on the SCell with dormant BWP shall not occur outside the visible interruption length before measurement (VIL1) and the visible interruption length after measurement (VIL2).
    - Case 3: For UE capable of per UE gaps, NCSG pattern can be configured to avoid interruptions provided that the UE is not configured with any legacy gap pattern defined in Table 9.1.2-1, TS 38.133.
    - Case 4: For UE capable of per FR gaps:
      * NCSG pattern cannot be configured in parallel with any legacy gap pattern (defined in Table 9.1.2-1, TS 38.133) on the same FR.
      * NCSG pattern can be configured on an FR to avoid interruptions provided that on the same FR the UE is not configured with any legacy gap pattern defined in Table 9.1.2-1, TS 38.133.
    - Case 5: If UE capable of NCSG and per UE gaps is configured with any legacy gap pattern defined in Table 9.1.2-1, TS 38.133 and there is no inter-frequency or inter-RAT carrier to monitor, then the UE shall not cause any interruption PCell, PSCell or activated SCells due to measurements on PCell, PSCell or SCells.
    - Case 6: If UE capable of NCSG and per FR gaps is configured with any legacy gap pattern defined in Table 9.1.2-1, TS 38.133 on an FR and there is no inter-frequency or inter-RAT carrier to monitor on that FR, then the UE shall not cause any interruption PCell, PSCell or activated SCells on that FR due to measurements on PCell, PSCell or SCells of that FR.
  + Option 2. (MTK): Intra-frequency measurements with MG, inter-frequency measurements with MG or Inter-RAT measurements may use NCSG instead of MG when UE supports related band combination and have additional RF chains during the measurements
  + Option 3. (Huawei): Support per UE and per FR NCSG for RRM measurement based on UE capability reporting (e.g. extension to Rel-16 NeedForGap signaling).
  + Option 4. (Apple): When UE is to measure an intra-band target cell, it is sometimes feasible for UE to enlarge BW of the RF chain to cover target SSB
  + Option 5. (Nokia): NCSG should address similar aspects as was addressed in LTE
* Discussion
  + MTK: This is should be very similar to LTE scenarios. It can be used as baseline
  + E///: This can be applicable to different periodic measurements to avoid interruption on Serving cell. This also includes measurements on SCell Dormancy
  + Huawei: Prefer to utilize to minimize interruptions due to MG-based measurements. For SCell dormancy CQI measurements, we need to have more time to check
  + Apple: Prefer not to include any assumptions to the RF chain. There may be different UE implementations. Need to further discuss if per-CC gap is in the scope
  + Intel: Need to have a high-level criteria 1) UE performs MG-based measurements in another CC 2) UE has capability to perform additional measurements using another RF chain (or can use the same chain to make additional measurements)
  + QC: the main use case is to avoid interruptions on the serving cell. UE has spare RF chain depending on the BC. Per-CC can be discussed separately.
  + Nokia: LTE should be the baseline. Option 1b includes SCell dormancy and should be further considered.

2nd round email discussion conclusions

**Tdoc decisions**

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| **Tdoc** | **Decision** |
| R4-2103677 | Approved |
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**R4-2103676 WF on R17 NR MG enhancements - Multiple concurrent and independent MG patterns**

*Type: other For: Approval  
 Source: MediaTek*

**Abstract:**

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104096 (from R4-2103676).**

**R4-2104096 WF on R17 NR MG enhancements - Multiple concurrent and independent MG patterns**

*Type: other For: Approval  
 Source: MediaTek*

**Abstract:**

**Discussion:**

[report of discussion]

Nokia: have concerns on Slide 9 “Definition of number of layers”

**Decision: Approved.**

**R4-2103677 WF on R17 NR MG enhancements – Pre-configured MG patterns and NCSG**

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

**Abstract:**

**Discussion:**

**Decision: Approved.**

#### 11.5.1 General and work plan [NR\_MG\_enh-Core]

**R4-2101061 Work plan of R17 NR and MR-DC measurement gap enhancements WI**

*Type: discussion For: Approval  
 Source: MediaTek Inc., Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

#### 11.5.2 RRM core requirements [NR\_MG\_enh-Core]

##### 11.5.2.1 Pre-configured MG pattern(s) [NR\_MG\_enh-Core]

**R4-2100221 Consideration on preconfigured measurement gap patterns**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100454 Initial discussion on pre-configured MG pattern**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100712 Discussion on pre-configured MG pattern for NR**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100871 Discussion on pre-configured MG pattern(s)**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101062 Pre-configured MG pattern(s) per configured BWP**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101269 Discussion on pre-configured measurement gap**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101381 Considerations on pre-configured MG patterns**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101537 Views on pre-configured MG pattern(s) for NR\_MG\_enh**

*Type: discussion For: Discussion  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102268 Discussion on Pre-configured MG pattern(s)**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102622 Views on pre-configured MG patterns**

*Type: discussion For: (not specified)  
 38.133 v..  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Views on necessary issues for clarifications on preconfigured MG

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102655 Overview of requirements for pre-configured measurement gaps**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

This document analysis RRM requirements for pre-configured MG in NR and MR-DC

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102810 Initial discussion on (de)activation of pre-configured MGs**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.5.2.2 Multiple concurrent and independent MG patterns [NR\_MG\_enh-Core]

**R4-2100113 Discussion on independent and concurrent MGs**

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

**Abstract:**

This paper discusses some conceptual issues related to concurrent MGs.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100222 Discussion on multiple concurrent and independent MG patterns**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100455 Initial discussion on multiple concurrent and independent MG patterns**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100641 Discussion on multiple concurrent and independent MG patterns**

*Type: discussion For: Discussion  
 Source: LG Electronics*

**Abstract:**

It discusses multiple concurrent and independent MG patterns.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100713 Discussion on multiple concurrent and independent MG patterns for NR**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100870 Discussion on multiple concurrent and independent MG patterns**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101063 Multiple concurrent and independent gap patterns**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101081 Discussion on NR measurement gap enhancements requirements**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

We discuss the principle for defining requirements for multiple concurrent and independent MG patterns

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101270 Discussion on multiple and independent concurrent measurement gaps in NR**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101538 Views on Multiple concurrent and independent MG patterns for NR\_MG\_enh**

*Type: discussion For: Discussion  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102269 Discussion on multiple concurrent and independent MG patterns**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102297 On requirements for mulitple concurrent and independent MG patterns**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102535 On parallel measurement gap patterns**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On parallel measurement gap patterns

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102811 Initial discussion on multiple concurrent MGs**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.5.2.3 Network Controlled Small Gap [NR\_MG\_enh-Core]

**R4-2100223 On network controlled small gap**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100456 Initial discussion on Network Controlled Small Gap (NCSG)**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100460 CR on NCSG in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v17.0.0  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2101064 Network Controlled Small Gap**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101271 Discussion on NCSG in NR**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101382 Considerations on network controlled small gap**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101539 Views on pre-configured MG pattern(s) for NR\_MG\_enh**

*Type: discussion For: Discussion  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102611 Discussion on network controlled small gap**

*Type: discussion For: (not specified)  
 38.133 v..  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Views on requirements and issues suggested for clarifications on NCSG

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102656 Overview of requirements for network controlled small gap**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

This document analysis RRM requirements for NCSG in NR and MR-DC

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102689 On Introduction of Network Controlled Small Gaps for NR**

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

**Abstract:**

Discussion on introduction of NCSG for NR

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102812 Initial discussion on NCSG**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

### 11.6 Enhancement for NR high speed train scenario in FR1 [NR\_HST\_FR1\_enh-Core]

#### 11.6.1 General and work plan [NR\_HST\_FR1\_enh-Core]

#### 11.6.2 RRM core requirements [NR\_HST\_FR1\_enh-Core]

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**Email discussion: [98e][235] NR\_HST\_FR1\_enh\_RRM**

**R4-2103474 Email discussion summary: [98e][235] NR\_HST\_FR1\_enh\_RRM***Type: other For: Information  
Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103716 (from R4-2103474).**

**R4-2103716 Email discussion summary: [98e][235] NR\_HST\_FR1\_enh\_RRM***Type: other For: Information  
Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

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| R4-2103678 | WF on FR1 HST RRM requirements | CMCC |

GTW session (February 03, 2021)

Issue 2-1-2: enhancement on PSS/SSS detection for deactivated Scell, intra-frequency measurement without measurement gap

* Proposals
  + Option 1: similar enhancement to PCell measurement in R16 HST can be used as baseline for PSS/SSS detection enhancement on deactivated Scell.
  + Option 2:

|  |  |
| --- | --- |
| **DRX cycle** | **TPSS/SSS\_sync\_intra** |
| No DRX | 5 x measCycleSCell x CSSFintra |
| With DRX | Max(800ms, 5 x max(measCycleSCell, DRX cycle)) x CSSFintra |

* Discussion
  + QC: Originally proposed Option 2 but can support Option 1.
  + E///: Option 1.
  + Huawei: Will Kp issue be fixed in Option 1? Will we apply same agreements for HST?
  + Nokia: Kp factor is under discussion in Rel-16.
  + CMCC: Kp is under discussion in R16 maintenance. Need to check on Kp.
  + Apple: support Huawei view that Kp is necessary.
* Agreement
  + Similar enhancement to PCell measurement in R16 HST can be used as baseline for PSS/SSS detection enhancement on deactivated Scell.
    - FFS whether Rel-16 Kp requirements modifications (if any) shall also apply for R17 HST

Issue 2-1-3: enhancement on time index detection for deactivated Scell, intra-frequency measurement without measurement gap

* Proposals
  + Option 1: similar enhancement to PCell measurement in R16 HST can be used as baseline for time index detection enhancement on deactivated Scell.
  + Option 2:

|  |  |
| --- | --- |
| **DRX cycle** | **TSSB\_time\_index\_intra** |
| No DRX | 3 x measCycleSCell x CSSFintra |
| With DRX | 3 x max(measCycleSCell, DRX cycle)) x CSSFintra |

* Discussion
  + QC: ok with Option 1
* Agreement
  + Similar enhancement to PCell measurement in R16 HST can be used as baseline for time index detection enhancement on deactivated Scell.
    - FFS whether Rel-16 Kp requirements modifications (if any) shall also apply for R17 HST

Issue 2-1-4: enhancement on measurement period for deactivated Scell, intra-frequency measurement without measurement gap

* Proposals
  + Option 1: similar enhancement to PCell measurement in R16 HST can be used as baseline for measurement period enhancement on deactivated Scell.
  + Option 2 (Qualcomm):

|  |  |
| --- | --- |
| **DRX cycle** | **TSSB\_measurement\_period\_intra** |
| No DRX | 5 x measCycleSCell x CSSFintra |
| DRX cycle≤ 320ms | Max(800ms, 5 x max(measCycleSCell, DRX cycle)) x CSSFintra |
| DRX cycle> 320ms | 3  x max(measCycleSCell, DRX cycle) x CSSFintra |

* Discussion
  + QC: New option is to add scaling factor of M2 in DRX cycle less or equal to 320ms. Replace 3 by Y for DRX cycle > 320 ms. M2 and Y are defined for PCell measurements.
  + Apple: Is it correct understanding that M2 does not apply for No DRX? If so we are fine with QC proposal
    - QC: yes
  + CMCC: not ok with QC proposal. For 160ms DRX in R16 HST WI we have 4 samples. Based on QC proposal the number of samples is relaxed to 5.
  + E///: ok with Option 1. Open to further evaluate QC proposal.
  + Nokia: need to check
* Agreements
  + Further study the following solutions
    - Option 1: similar enhancement to PCell measurement in R16 HST can be used as baseline for measurement period enhancement on deactivated Scell.
    - Option 2:

|  |  |
| --- | --- |
| **DRX cycle** | **TSSB\_measurement\_period\_intra** |
| No DRX | 5 x measCycleSCell x CSSFintra |
| DRX cycle≤ 320ms | ceil(M2 x 5) x max(measCycleSCell, DRX cycle) x CSSFintra |
| DRX cycle> 320ms | Y  x max(measCycleSCell, DRX cycle) x CSSFintra |

* + FFS whether Rel-16 Kp requirements modifications (if any) shall also apply for R17 HST

Issue 2-2-1: if the issue on cell identification requirements for SCell for non-HST scenario in R15 exists (as described in R4-2101707), for Rel-17 FR1 HST, how to specify the PSS/SSS detection, time index detection, and measurement period for deactivated SCell for the scenario of intra-f measurement with MG to support HST.

* Background: The issue on cell identification requirements for deactivated SCell with MG for non-HST scenario is discussed in Rel-15 maintenance AI. Based on the 1st round discussion of email thread #201, companies share the same understanding that deactivated SCell measurement does not belong to intra-frequency measurement with MG, since deactivated SCell does not have active BWP.  In the GTW discussion of email thread #201, following agreement was reached:
  + *Not to introduce the intra-frequency de-activated SCell measurement requirement with MG.*
* Recommended WF
  + Companies are encouraged to check whether following suggestion is OK.
    - Following the same approach in non-HST scenario, for deactivated SCell, no need to consider the case of intra-frequency measurement with measurement gap.
* Discussion
* Agreements
  + Do not introduce the intra-frequency de-activated SCell measurement requirement with MG.

Issue 4-2-1: except the requirements related with Scell activation/deactivation, other requirements to be discussed on whether to be enhanced to support HST with CA

* Proposals
  + Option 1: The requirements of timing, interruption, UL carrier RRC reconfiguration delay, link recovery (BFD/CBD), CSSF, L1-RSRP measurement and measurement accuracy for L1-SINR measurement shall be further discussed in the work item of HST with CA.
* Discussion
  + QC: would like to hear more justifications
  + MTK: Timing, Interruption, L1-RSRP, RRC reconfiguration delay requirements can be reused. Some requirements cover multiple carriers and should be analyzed (CSSF, link recovery for SCell, L1-SINR measurements).
  + Huawei: Would like to hear more justification on timing? Timing is related to velocity and UL BW. No impact from CA.
    - MTK: timing can be reused
  + Apple: do not see good justification but open to discuss and encourage companies to bring more analysis.

2nd round email discussion conclusions

**Tdoc decisions**

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| **Tdoc** | **Decision** |
| R4-2103678 | Approved |
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**R4-2103678 WF on FR1 HST RRM requirements**

*Type: other For: Approval  
 Source: CMCC*

**Abstract:**

**Discussion:**

**Decision: Approved.**

##### 11.6.2.1 UE RRM core requirements for CA scenario [NR\_HST\_FR1\_enh-Core]

**R4-2100224 On R17 FR1 HST RRM measurement requirement**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100475 Discussion on CA for NR FR1 HST**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100633 FR1 HST RRM discussion**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100857 General discussion on NR HST RRM enhancement for FR1 CA scenario**

*Type: discussion For: Approval  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101140 On SCell RRM enhancement for NR high speed train scenario in FR1**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Ericsson*

**Abstract:**

Discuss Scell RRM enhancement for high speed train in FR1

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101141 On SCell RRM enhancement for NR high speed train scenario in FR1**

*Type: draftCR For: Endorsement  
 38.133 v17.0.0  
 Source: Ericsson*

**Abstract:**

Discuss Scell RRM enhancement for high speed train in FR1

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2101173 Discussion on high speed train for CA in FR1**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101707 Discussion on Enhancement for NR high speed train scenario in FR1**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102863 On RRM enhancements for HST scenarios for FR1 CA**

*Type: other For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

The document discusses the measurement requirement for SCells under HST scenarios.

**Discussion:**

[report of discussion]

**Decision: Noted.**

### 11.7 NR support for high speed train scenario in FR2 [NR\_HST\_FR2\_enh]

#### 11.7.4 RRM core requirements [NR\_HST\_FR2\_enh-Core]

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**Email discussion: [98e][236] NR\_HST\_FR2\_enh\_RRM**

**R4-2103475 Email discussion summary: [98e][236] NR\_HST\_FR2\_enh\_RRM***Type: other For: Information  
Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103717 (from R4-2103475).**

**R4-2103717 Email discussion summary: [98e][236] NR\_HST\_FR2\_enh\_RRM***Type: other For: Information  
Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103679 | WF on Rel-17 NR HST FR2 RRM Requirements | Nokia, Nokia Shanghai Bell |

GTW session (February 02, 2021)

Issue 2-1: Idle/inactive mode

* Proposals
  + Option 1 (Nokia, QC, Samsung): IDLE/INACTIVE state mobility is not applicable for Rel-17 HST FR2 deployment.
  + Option 2 (Ericsson): Enhancement in idle/inactive mode maybe is not prioritized.
  + Option 3: Need to consider IDLE/INACTIVE mode in HST FR2 deployment.
* Discussion
  + Samsung: Based on WID this WI focuses on train-mounted CPE. Power saving is not critical and we can preclude IDLE/INACTIVE modes.
  + Intel: Agree that most of time UE will be in a CONNECTED mode. How do we skip the procedures for IDLE/INACTIVE? What would be UE behavior and requirements in case it is still in IDLE/INACTIVE mode? What is UE behavior in case of connection failure?
  + E///: IDLE mode may not be typical but still can happen. Agree with Intel that UE behavior needs to be clarified. If UE looses the connection then UE needs to get to the IDLE mode. Need to further discuss how to handle this.
  + QC: Do not fully agree with Option 1. IDLE/INACTIVE modes can happen but the key question is whether we need to discuss any enhancements. We prefer no enhancement for IDLE/INACTIVE mode mobility requirements.
  + Huawei: For Option 1 does it mean that we don’t have any enhancements or does it mean that we don’t apply existing requirements?
  + Nokia: QC option seem to be a reasonable WF.
  + Samsung: we don’t plan to change the basic NR design. We are talking on the RRM requirements and their applicability. Option 1 wording may cause some confusion. We can consider to reuse the R16 requirements but not define any enhancements. Some requirements should be in place.
  + E///: At least we need to support existing requirements. Prefer not to preclude enhancements at this moment.
  + Intel: In case we keep Rel-16 requirements, would it mean that UE will be able to reconnect only in low mobility conditions?
    - Samsung: yes
* Agreements
  + Idle/Inactive mode requirements
    - Option 1: Reuse existing Rel-16 requirements
    - Option 2: Study and define enhancements to support FR2 HST conditions

Issue 2-2: DRX mode

* Proposals
  + Option 1 (Nokia, Ericsson, Huawei, CATT, Samsung): Do not include DRX mode in the requirements for a CPE operating in HST mode in FR2.
  + Option2 (Intel): DRX mode in the requirements for a CPE operating in HST mode in FR2 might be needed.
* Discussion
  + Huawei: There may be 2 interpretations for Option 1 - A) define requirements for the case of no DRX for connected mode B) define requirements for DRX but without any enhancements. We prefer “1A”.
  + Intel: We are ok 1A.
  + QC: DRX mode is not very common use case. No enhancements for DRX mode are needed. We prefer not preclude DRX mode but Rel-16 requirements would apply.
  + Samsung: 1A. The question is whether network is allowed to configure the DRX mode. We may need to clarify what happens in this case.
  + E///: We can still consider short DRX. We prefer not to restrict NW configuration.
  + Nokia: DRX is related to Connected mode. Option 1 in our interpretation means that DRX is not configured by the network.
  + Samsung: Not sure why we need short DRX and long DRX. DRX is not needed for power saving.
  + Nokia: what is the purpose of short DRX? Is it power saving?
* Agreements
  + RRC CONNECTED mode requirements for DRX
    - Option 1: Do not define enhanced requirements for the case DRX is configured
      * Option 1A: Legacy NR R16 requirements (non-HST) will apply for the case DRX is configured
      * Option 1B: No RRM requirements will be defined for the case DRX is configured
    - Option 2: Define requirements for the short DRX configurations (e.g. up to 80ms).

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103679 | Approved |
|  |  |

================================================================================

**R4-2103679 WF on Rel-17 NR HST FR2 RRM Requirements**

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

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2100220 Discussion on RRM requirement for high speed train scenario in FR2**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100476 Discussion on NR FR2 HST**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100477 Initial performance evaluation for cell identification in NR FR2 HST scenario**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100866 General discussion on RRM requirements for FR2 HST**

*Type: discussion For: Approval  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100917 Discussion on RRM requirement for FR2 HST**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101138 On expected RRM impact for HST in FR2**

*Type: discussion For: Discussion  
 Source: Nokia*

**Abstract:**

Discussion about RRM sections to have potential impact due to the introduciton of HST in FR2.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101142 Overview of RRM requirements for NR high speed train scenario in FR2**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Ericsson*

**Abstract:**

an overview of which spec. should be considered in order to support FR2 HST scenario.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101268 RRM requirements for NR HST in FR2**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101708 Preliminary discussion on NR support for high speed train scenario in FR2**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

### 11.8 Solutions for NR to support non-terrestrial networks (NTN) [NR\_NTN\_solutions]

#### 11.8.4 RRM core requirements [NR\_NTN\_solutions-Core]

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**Email discussion: [98e][237] NR\_NTN\_solutions\_RRM**

**R4-2103476 Email discussion summary: [98e][237] NR\_NTN\_solutions\_RRM***Type: other For: Information  
Source: Moderator (Fraunhofer HHI)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103718 (from R4-2103476).**

**R4-2103718 Email discussion summary: [98e][237] NR\_NTN\_solutions\_RRM***Type: other For: Information  
Source: Moderator (Fraunhofer HHI)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103680 | WF on NTN RRM requirements | Fraunhofer |
| R4-2103681 | WF on NTN RRM timing related requirements | Xiaomi |
| R4-2103682 | WF on NTN RRM measurement requirements | Qualcomm |

GTW session (February 01, 2021)

Issue 1-1: Send information LS to RAN1 regarding reference point to be considered for time and frequency synchronization

* Proposals
  + R4-2101864 (Ericsson): Proposal 1: Sent information LS to RAN1 with RAN4 implications for different reference points.
  + **Proposal for GTW**: Ericsson should clarify content of LS
* Discussion
  + Moderator: most companies prefer to wait.
  + E///: We provided LS draft.
  + Chair: is RAN1 aware that they will need to define reference point
    - E///: Yes. The idea is provide information on possible RAN4 implications.
  + MTK: LS needs further discussion to identify on possible RAN4 impacts.
  + Xiaomi: Prefer not to send LS to RAN1. These are purely RAN1 issues.
  + Apple: Same view as MTK
  + CMCC: same view with MTK.
  + QC: this is already addressed in RAN1 discussion.
  + Session chair: Defer the LS. Further discuss the impacts of different reference points on RRM requirements and inform RAN1 in case any common observations are identified.

Issue 1-2: Possibility of using satellite and gNB as time and frequency reference

* Proposals
  + R4-2101865 (Ericsson): Proposal 1: RAN4 to investigate the impact on existing gNB requirements for the cases when satellite and gNB is time and frequency reference.
  + Options considered in 1st round discussion:
    - Option A: satellite and gNB is time and frequency reference
    - Option B: satellite is frequency and gNB is time reference
    - Option C: satellite is time reference and gNB is frequency reference
  + **Proposal**: RAN4 should discuss which of the options to investigate, and send a LS to RAN1 with RAN4 input if necessary.
* Discussion
  + E///: this depends on 1-1. We are ok to discuss.
  + QC: having reference point at gNB is not always possible.
  + Thales: for frequency the satellite can be chosen as the reference point, for timing – it can be either gNB or satellite.
  + Thales: For time RAN1 is still discussing this. For frequency – it is not decided yet.
  + QC: RAN1 already introduced some decisions on reference points which allow different scenarios for timing. For frequency – satellite will always be the reference.
  + E///: In our understanding RAN1 has not concluded yet.
  + Huawei: which exactly gNB requirements we need to check?
    - Xiaomi: gNB RRM requirements are out of scope of WID.
    - E///: nominal DL and UL timing delay.
* Agreements
  + Further investigate the impact of different timing and frequency reference points based on RAN1 design on the RRM requirements. Inform RAN1 if any issues are identified.

Issue 4-3: Impact of delay compensation on TA error

* Proposals
  + R4-2101541 (OPPO): Proposal 2: NTN delay compensation has impact on TA error.
  + **Supporting companies should elaborate further in GTW**
* Discussion
  + OPPO: TA error depends on delay compensation error.
  + CMCC: NTN delay compensation is UE specific TA estimation
  + MTK: In the requirements we have TA adjustment accuracy. Compensation error is always there and should be accounted in Te.
  + Huawei: this is related to other issues on Te and TA
  + Xiaomi: Same view as MTK. This is related to Te. RAN1 is discussing on the timing drift and already addressing it.
  + QC: we are ok with proposal but we need to discuss more details
  + Apple: NTN delay compensation will affect autonomous TA error (Te)
  + Thales: agree with MTK
  + Ericsson: Same view as MTK
  + OPPO: agree that it should be Te
  + Thales: we should differentiate Connected and Idle modes.
  + Huawei: suggest to replace “NTN delay compensation” with “UE-specific TA estimation”
  + Xiaomi: “UE-specific TA estimation” is a different issue.
  + Thales: “NTN delay compensation” we can replace with “NTN full TA estimation”
  + Huawei: does it mean that “UE-specific TA estimation” is a part of “NTN full TA estimation”
  + Thales: NTN full TA estimation includes “UE-specific TA estimation” + “Common TA”
  + Xiaomi: need to further check on the terminology
  + Thales: in the end we are talking that NTN timing compensation accuracy has impact on the UE timing accuracy
* Tentative agreements
  + NTN timing compensation accuracy has impact on Te timing error requirements for CONNECTED mode. FFS for IDLE mode.

Issue 6-3: Use of propagation delay information

* Proposals
  + R4-2100646 (LGE): Proposal 3**:** Consider propagation delay information from satellite/HAPS to configure SMTC or MG, and FFS for detail procedure.
  + **Proposal for GTW**: Further discuss if this is relevant to RAN4 and/or if a LS to RAN2 is necessary.
* Discussion
  + LGE: Due to propagation delay UE can miss the SMTC from the neighboring cell. Such information can be helpful for UE to perform neighbor cell measurements
  + QC: This is well-known issue in RAN2 and it is already under discussion. This is not in RAN4 discussion scope.
  + Xiaomi: It is up to RAN2 design.
  + MTK: Need more from RAN2.
  + LGE: we can further investigate in RAN4 and send LS to RAN2.
  + Session chair: recommend to wait for RAN2 conclusions.

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103680 | Approved |
| R4-2103681 | Approved |
| R4-2103682 | Approved |

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**R4-2103680 WF on NTN RRM requirements**

*Type: other For: Approval  
 Source: Fraunhofer*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2103681 WF on NTN RRM timing related requirements**

*Type: other For: Approval  
 Source: Xiaomi*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2103682 WF on NTN RRM measurement requirements**

*Type: other For: Approval  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2101882 NTN PVT Accuracy Aspects**

*Type: discussion For: Information  
 Source: THALES*

**Abstract:**

The goal of this document is to recall some basic principles required for the PVT (Position Velocity and Time) computation and distribution to UEs.

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.8.4.1 General [NR\_NTN\_solutions-Core]

**R4-2100780 Discussion on UE Pre-compensation for UL synchronization for in NTN**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101864 Architecture and reference point**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Discussion with draft LS for information from RAN4 to RAN1 about impact of different reference points.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102813 Discussion on general issues for NTN RRM**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102893 Discussion on RRM in NTN Systems**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.8.4.2 Timing requirements [NR\_NTN\_solutions-Core]

**R4-2100647 Discussion on timing requirements for NTN**

*Type: discussion For: Discussion  
 Source: LG Electronics UK*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100714 Discussion on timing requirements for NTN**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100819 Discussion on NTN timing requirements**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101541 Discussion on timing requirements for NR NTN RRM**

*Type: discussion For: Discussion  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101865 RRM Timing requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

RRM timing requirements discussion and analysis.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102814 Discussion on NTN timing related requirements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.8.4.3 Measurement requirements [NR\_NTN\_solutions-Core]

**R4-2100646 Discussion on measurement requirements for NTN**

*Type: discussion For: Discussion  
 Source: LG Electronics UK*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100715 Discussion on measurement requirements for NTN**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100802 Discussion on NTN RRM measurement requirements**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101712 Discussion on NTN measurement**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101866 RRM Measurement Requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

RRM measurements requirements discussion and analysis.

**Discussion:**

[report of discussion]

**Decision: Noted.**

### 11.9 UE Power Saving Enhancements [NR\_UE\_pow\_sav\_enh]

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**Email discussion: [98e][238] NR\_UE\_pow\_sav\_enh\_RRM**

**R4-2103477 Email discussion summary: [98e][238] NR\_UE\_pow\_sav\_enh\_RRM***Type: other For: Information  
Source: Moderator (MediaTek)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103719 (from R4-2103477).**

**R4-2103719 Email discussion summary: [98e][238] NR\_UE\_pow\_sav\_enh\_RRM***Type: other For: Information  
Source: Moderator (MediaTek)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103670 | WF on R17 UE power saving RLM/BM relaxation | MediaTek |

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2101221 | Revised |
|  |  |
|  |  |

GTW session (February 03, 2021)

Issue 2-2-1: Confirmation on beneficial Scenarios, from UE power saving gain perspective

* Proposals
  + Option 1 (MTK): RAN4 to confirm that from UE power saving gain perspective, it is beneficial to relax SSB-based RLM/BFD measurement and CSI-RS based RLM/BFD measurement in both FR1 and FR2.
  + Option 2 (Vivo): RAN4 to conclude the exact power saving gain if RLM/BFD are relaxed in low mobility and/or high/medium SINR region.
    - RAN4 should strive to identify the scenarios that can achieve power saving gain when RLM/BFD are relaxed. (Vivo)
    - The RSs for RLM/BFD, especially the periodicity/bandwidth of these RSs and the relation to RSs for RRM, need careful consideration in R17 RLM/BFD relaxation. (Vivo)
  + Option 3 (Huawei): RAN4 to study the power saving gain level at which RLM/BFD measurement relaxation is considered as feasible.
    - When the power saving gain level is higher than the threshold, it is considered that the benefit is big enough to support RLM/BFD measurement relaxation.
    - To study the threshold is useful for RAN4 to identify the feasible scenarios.
  + Recommended WF:
    - To capture the summary of simulation results for power saving gain in WF
* 1st round summary
  + All companies are fine to capture the summary of simulation results for power saving gain in WF. However, some clarification questions were raised as follows.
    - Q1: Is the simulation results for delta PDCCH?
    - Q2: To clarify if in their simulations they have relaxed also RRM measurements and/or L1-RSRP measurements or not
* Discussion
  + Nokia: not sure how extended RRM measurement period should be handled in this WI. What is the justification to do it? It should be very clearly clarified on the respective assumptions in the simulation assumptions. It has major impact on power saving gains.
  + vivo: Extending L1 RRM measurements is up to UE implementation. For L3 measurement requirements UE can use 5 samples which is required for low SINR. For this item we consider higher SNR and there will be no impact on requirements.
  + E///: RRM measurement relaxation is out of scope. We did not consider this.
  + Huawei: Same view as E///. RRM and L1-RSRP relaxations are out of scope.
  + MTK: agree with vivo’s observation. We do not extend agreed RRM measurement period.
  + Apple: same view as vivo and MTK. As long as measurement accuracy can be satisfied, the exact period can be reduced. What delta PDCCH means?
  + QC: it make sense to consider both RLM and RRM relaxations. It seems a reasonable assumption for low mobility case
  + CMCC: Same view as E/// and Huawei. Need to evaluate the accuracy for proposed RRM relaxations.
  + E///: need to clarify WI scope. RRM measurement relaxations are out of scope.
  + QC: we can consider Rel-16 power saving relaxations
    - E///: Rel-16 focus on different case
  + E///: should we consider impact on PDCCH monitoring due to BFD relxation
    - MTK: this is under discussion in RAN1
* Agreements
  + Further evaluate UE power saving gains for the following UE implementations:
    - UE meets Rel-15 RRM measurement period and accuracy requirements
    - Option 1:
      * UE uses all L1 samples for RRM measurements based on Rel-15 assumptions
    - Option 2:
      * How many L1 samples UE applies for RRM measurements is up to UE implementation (e.g. UE can use lower number of measurement samples for RRM measurements)
      * Further discuss how many samples to use for evaluations
      * Companies shall evaluate RRM measurements accuracy for the proposed number of samples.
    - FFS whether Option 2 can be considered for requirements definition
    - Further assess impact on PDCCH monitoring due to relax UE measurements for RLM/BFD

2nd round email discussion conclusions

**Tdoc decisions**

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2103669 | Approved |
| R4-2103670 | Approved |
| R4-2104066 | Approved |
|  |  |
|  |  |

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#### 11.9.1 General and work plan [NR\_UE\_pow\_sav\_enh-Core]

**R4-2101221 Work plan of Rel-17 Power Saving Enhancements**

*Type: Work Plan For: Approval  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103669 (from R4-2101221).**

**R4-2103669 Work plan of Rel-17 Power Saving Enhancements**

*Type: Work Plan For: Approval  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Approved.**

#### 11.9.2 UE measurements relaxation for RLM and/or BFD [NR\_UE\_pow\_sav\_enh-Core]

**R4-2103670 WF on R17 UE power saving RLM/BM relaxation**

*Type: other For: Approval  
 Source: MediaTek*

**Abstract:**

**Discussion:**

E///: For issue 2-5-4 – it contradicts to the GTW agreements

Agreement: Issue 2-5-4 Relaxation on PDCCH monitoring is kept as FFS

**Decision: Approved.**

**R4-2100043 On RLM and RLF relaxation for UE power saving**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100219 UE measurements relaxation for RLM and/or BFD**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100474 Discussion on RLM/BFD relaxation factor**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100478 Initial performance evaluation for for RLM/BFD relaxation factor**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100725 Discussion on relaxation of RLM/BFD measurements**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100821 Discussion on RLM/BFD relaxation for NR power saving enhancement**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101139 Discussion and simulation results for RLM/BFD measurement relaxation**

*Type: discussion For: Discussion  
 Source: Nokia*

**Abstract:**

System level and power saving evaluation based on simulation assumptions, and other discussion related to RLM/BFD measurement relaxation.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101222 Evaluation on Rel-17 RLM/BFD measurement relaxation**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101461 Updated evaluation assumptions for R17 RLM/BFD relaxation**

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

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103724 (from R4-2101461).**

**R4-2103724 Updated evaluation assumptions for R17 RLM/BFD relaxation**

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

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2104066 (from R4-2103724).**

**R4-2104066 Updated evaluation assumptions for R17 RLM/BFD relaxation**

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

**Discussion:**

[report of discussion]

**Decision: Approved.**

**R4-2101462 Discussion on R17 RLM/BFD relaxation**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101463 Simulation results for R17 RLM/BFD relaxation**

*Type: other For: Information  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101542 Discussion on UE measurement relaxation for RLM and/or BFD**

*Type: discussion For: Discussion  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101685 Discussion on feasibility of RLM/BFD measurement relaxation scheme for power saving enhancements**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102239 Updated simulation assumptions for evaluating UE power saving for RLM and BM**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In contribution contains updated simulation assumptions for evluating UE power saving for RLM and BM.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102240 Simulation results on UE power saving for RLM and BM**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we present the SINR difference (delta SINR) for RLM-RS based on SSB for different relaxation factors and UE speeds as in agreed in previous meeting.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102241 Discussions on UE power saving for RLM and BM**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we continue the discussions on release 17 UE power saving based on the identified issues from last meeting.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102587 Discussion on RLM/BFD Relaxation**

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

**Abstract:**

According to the Work Plan in [4], in the upcoming RAN4 meeting beneficial relaxation method and corresponding criteria for UE to enter the relaxation mode should be discussed. In the following sections our company’s views on the issues to be studied are

**Discussion:**

[report of discussion]

**Decision: Noted.**

### 11.10 NR Sidelink enhancement [NRSL\_enh]

### 11.11 NR repeater

## 12 Rel-17 Study Items for NR

### 12.1 Study on enhanced test methods for FR2 in NR [FS\_FR2\_enhTestMethods]

### 12.2 Study on supporting NR from 52.6 GHz to 71 GHz [FS\_NR\_52\_to\_71GHz]

### 12.3 Study on Efficient utilization of licensed spectrum that is not aligned with existing NR channel bandwidths [FS\_NR\_eff\_BW\_util]

### 12.4 Study on extended 600MHz NR band [FS\_NR\_600MHz\_ext]

### 12.5 Study on high power UE (power class 2) for one NR FDD band [FS\_NR\_PC2\_UE\_FDD]

## 13 Rel-17 Work Items for LTE

## 14 Rel-17 Study Items for LTE

## 15 Liaison and output to other groups

### 15.1 R17 related

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**Email discussion: [98e][239] R17\_LS\_RS\_for\_Scell\_activation**

**R4-2103478 Email discussion summary: [98e][239] R17\_LS\_RS\_for\_Scell\_activation***Type: other For: Information  
Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103720 (from R4-2103478).**

**R4-2103720 Email discussion summary: [98e][239] R17\_LS\_RS\_for\_Scell\_activation***Type: other For: Information  
Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2103667 | WF on temporary RS for efficient SCell activation in NR CA | Huawei, HiSilicon |
| R4-2103668 | Reply LS on temporary RS for efficient SCell activation in NR CA | Huawei, HiSilicon |

GTW session (February 04, 2021)

**RAN1 questions (R1-2009798)**

* Q1: to expedite SCell activation, RAN1 is studying whether and under which conditions (e.g. FR1/FR2, known/unknown cell, etc.), how many temporary RS bursts/symbols are required to achieve both UE AGC setting and time/frequency tracking. Does RAN4 have any information to share for these aspects?
* Q2: for AGC setting in intra-band CA comprising of a to-be-activated SCell and an activated serving cell, when a temporary RS is transmitted on the to-be-activated SCell, whether and under which conditions (e.g., FR1/FR2, known/unknown cell, etc.) the UE may require to receive another RS transmitted also on the other activated serving cell in the same band?
* Q3: does the RAN1 working assumption for temporary RS (i.e., reuse existing Rel-15/16 TRS structure) provides reduction in maximum allowed activation delay requirements (specified in subclause 8.3.2 of TS 38.133)? Also, are there any suggested changes from RAN4 perspective?

**Sub-topic 1: SCell being activated is known and belongs to FR1**

**Sub-topic 1-1: If SCell measurement cycle is equal to or smaller than 160ms**

Issue 1-1-2: How many temporary RS bursts are required for fine time tracking? (It is agreed in 1st round, the temporary RS can be used for fine time tracking)

* Background
  + In the incoming LS [R1-2009798], a burst of temporary RS is notated as

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| * + A burst of temporary RS is notated as in S5.1.6.1.1 of TS 38.214     - “2-slot with four CSI-RSs resources (4 samples)” for FR1     - either “1-slot with two CSI-RSs resources (2 samples)” or “2-slot with four CSI-RSs resources (4 samples)” for FR2 |

* Proposals
  + Option 1: 1 burst (2-slot with four CSI-RSs resources)
  + Option 2: 1 burst (1-slot with two CSI-RSs resources)
* Discussion
  + MTK: If AGC gain is not needed, then we may use smaller number of resources. Option 2.
  + Apple: Need to follow RAN1 working assumption (i.e. only “2-slot with four CSI-RSs resources (4 samples)” in FR1.
  + vivo: same understanding as Apple. RAN1 is not asking RAN4 to further evaluate other options.
  + Huawei: In SSB-based SCell activation, 1 SSB sample is needed and same can apply for temporary RS. Option 2 can be formulated as 1/2 burst.
  + Intel: Although the LS says “2-slot with four CSI-RSs resources (4 samples)” for FR1, 1-slot may still be considered/configured by RAN1 spec. Need to understand how to cope with this.
  + OPPO: Same view as vivo and Huawei. The question in RAN1 LS how many RS bursts or symbols is needed. Number of slots can have impact on performance.
  + Intel: 1 burst is acceptable
* Agreements
  + Provide the following reply to RAN1
    - *If SCell measurement cycle is equal to or smaller than 160ms*
      * *Temporary RS can be used for time/frequency tracking*
        + *1 burst (2-slot with four CSI-RSs resources) is required based on RAN1 working assumptions on temporary RS design provided in the LS R1-2009798*

**Sub-topic 1-2: If SCell measurement cycle is larger than 160ms**

* Agreements
  + Provide the following reply to RAN1
    - *If SCell measurement cycle is larger than 160ms*
      * *temporary RS can be used for AGC*
        + *1 burst (2-slot with four CSI-RSs resources) is required*
      * *temporary RS can be used for time/frequency tracking*
        + *1 separate burst (2-slot with four CSI-RSs resources) is required in addition to the one burst required for AGC*
    - *The agreements above apply based on RAN1 working assumptions on temporary RS design provided in the LS R1-2009798*

**Sub-topic 5: Answers to Q3**

Agreement: Reply to Q3

**Q3:** does the RAN1 working assumption for temporary RS (i.e., reuse existing Rel-15/16 TRS structure) provide reduction in maximum allowed activation delay requirements (specified in subclause 8.3.2 of TS 38.133)? Also, are there any suggested changes from RAN4 perspective?

[RAN4 Response]: RAN1 working assumption for temporary RS (i.e., reuse existing Rel-15/16 TRS structure) can provide reduction in maximum allowed activation delay at least for some cases as listed above. RAN4 will continue the discussion if there are any suggested changes from RAN4 perspective and will provide additional agreements (if any) in RAN4 #99-e.

2nd round email discussion conclusions

**Tdoc decisions**

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| --- | --- |
| **Tdoc** | **Decision** |
| R4-2104083 | Return to |
| R4-2104067 | Return to |
|  |  |

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**R4-2103667 WF on temporary RS for efficient SCell activation in NR CA**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2104083 (from R4-2103667).**

**R4-2104083 WF on temporary RS for efficient SCell activation in NR CA**

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

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2103668 Reply LS on temporary RS for efficient SCell activation in NR CA**

*Type: LS out For: Approval  
 to RAN1  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2104067 (from R4-2103668).**

**R4-2104067 Reply LS on temporary RS for efficient SCell activation in NR CA**

*Type: LS out For: Approval  
 to RAN1  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2100236 Discussion on RAN1 LS on temporary RS for efficient SCell activation in NR CA**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101543 Reply LS on temporary RS for efficient SCell activation in NR CA**

*Type: LS out For: Approval  
 to RAN1  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101709 Discussion on temporary RS for efficient SCell activation in NR CA**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102894 Discussion on temporary RS for efficient SCell activation in NR CA**

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

**Discussion:**

[report of discussion]

**Decision: Noted.**

### 15.2 Others

## 16 Revision of the Work Plan

### 16.1 Simplification of band combinations in RAN4 specifications

### 16.2 R17 new proposals

#### 16.2.1 Spectrum related

#### 16.2.2 Non-spectrum related

### 16.3 Others

## 17 Any other business

**R4-2102236 Inclusive language review in TS 36.133**

*Type: CR For: Agreement  
 36.133 v17.0.0 CR-7035 Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Inclusive language review of TS 36.133 according to decision in RP-202179.

**Discussion:**

[report of discussion]

Apple (TS 38.133 editor): also checked the TS 38.133 and there are no issues.

**Decision: For email approval.**

## 18 Close of the E-meeting