**3GPP TSG-RAN4 Meeting #95-e *R4-200xxxx***

**Electronic meeting, 25th May – 5th June 2020**

**Agenda item: 4.9.2, 4.10.2, 6.21.3**

**Source:** Moderator (Apple)

**Title:** [95][221] NR\_RRM\_maintenance

**Document for:** Information

# Introduction

The email discussion is to cover the following issues

* CR on TS38.133 for modification on number of cells and number of SSB to be measured for FR2 intra-freqency measurement
* CR on measurement gap applicability in TS38.133 for R16
* CR to 38.133 on intra frequency measurements without gaps
* On potential enhancement for TCI switching
* Editorial clean up in TS38.133-g30 and f90

# Topic #1: Modification on number of cells and number of SSB to be measured for FR2 intra-frequency measurement

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2006880**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006880.zip) | Mediatek Inc., Huawei, Hisilicon, Apple, Intel | Cat F CR which was endorsed in R4-2005411 in RAN4#94e-bis |
| R4-2006881 | Mediatek Inc., Huawei, Hisilicon, Apple, Intel | Cat A CR of 6880 |
|  |  |  |

## Summary of Open Issues

No open issue

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  |  |
|  |  |
|  |  |

### CRs/TPs comments collection

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

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| [**R4-2006880**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006880.zip)  CR on TS38.133 for modification on number of cells and number of SSB to be measured for FR2 intra-freqency measurement | Company A |
| Company B |
|  |
| Company B |
|  |

## Summary for 1st round

### Status Summary

### Open issues

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

|  |  |
| --- | --- |
|  | **Status summary** |
|  |  |
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*Recommendations on WF/LS assignment*

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

### CRs/TPs

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

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

## Discussion on 2nd round (if applicable)

## Companies views’ collection for 2nd round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  |  |

## Summary on 2nd round (if applicable)

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

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

# Topic #2: measurement gap applicability in TS38.133 for R16

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2006184**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006184.zip) | Apple | Cat. F CR  Mis-alignment between R15 and R16 spec.  The applicability for gap pattern configurations supported by the UE with NR standalone operation is not correct when serving cell is FR2 and applicable MG pattern is 12-23. |
|  |  |  |

## Summary of Open Issues

Agree R4-2006184 to make R16 spec consistent with R15 spec in 38.133

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  |  |
|  |  |
|  |  |

### CRs/TPs comments collection

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

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| [**R4-2006184**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006184.zip)  CR on measurement gap applicability in TS38.133 for R16 | Company A |
| Company B |
|  |
| Company B |
|  |

## Summary for 1st round

### Status Summary

### Open issues

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

|  |  |
| --- | --- |
|  | **Status summary** |
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|  |  |

*Recommendations on WF/LS assignment*

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

### CRs/TPs

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

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

## Discussion on 2nd round (if applicable)

## Companies views’ collection for 2nd round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  |  |

## Summary on 2nd round (if applicable)

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

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

# Topic #3: On intra frequency measurements without gaps

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2007657**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007657.zip) | ZTE | Cat. F CR  If the UE reports “no-gap”, it indicates measurement gap is not needed no matter the SSB is within active BWP or not. |
|  |  |  |

## Summary of Open Issues

*If the related IE has been agreed in RAN2, can we agree on this CR?*

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  |  |
|  |  |
|  |  |

### CRs/TPs comments collection

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

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| [**R4-2007657**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007657.zip)  CR to 38.133 on intra frequency measurements without gaps | Company A |
| Company B |
|  |
| Company B |
|  |

## Summary for 1st round

### Status Summary

### Open issues

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

|  |  |
| --- | --- |
|  | **Status summary** |
|  |  |
|  |  |

*Recommendations on WF/LS assignment*

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

### CRs/TPs

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

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

## Discussion on 2nd round (if applicable)

## Companies views’ collection for 2nd round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  |  |

## Summary on 2nd round (if applicable)

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

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

# Topic #4: On potential enhancement for TCI switching

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2006616**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006616.zip) | Apple | ***Proposal: RAN4 to further discuss if UE behavior can be enhanced to receive DL data during the time gap of Tfirst-SSB in future release.*** |
|  |  |  |

## Summary of Open Issues



Issue 4-1:

Proposal: As shown in the figure above, UE should be able for DL reception with old TCI until the beginning of slot which contains “First SSB”

* Option 1: Yes
* Option 2: No
* Option 3: FFS

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  |  |
|  |  |
|  |  |

### CRs/TPs comments collection

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

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
|  | Company A |
| Company B |
|  |
| Company B |
|  |

## Summary for 1st round

### Status Summary

### Open issues

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

|  |  |
| --- | --- |
|  | **Status summary** |
|  |  |
|  |  |

*Recommendations on WF/LS assignment*

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

### CRs/TPs

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

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

## Discussion on 2nd round (if applicable)

## Companies views’ collection for 2nd round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  |  |

## Summary on 2nd round (if applicable)

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

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

# Topic #5: Editorial CR for TS38.133 (R15/16)

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2006030**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006030.zip) | ZTE | Cat.F, R15, performance part |
| [**R4-2006064**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006064.zip) | ZTE | Cat.F,R16, performance part |
| [**R4-2006027**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006027.zip) | ZTE | Cat.F, R15, core part |
| [**R4-2006029**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006029.zip) | ZTE | Cat.F, R16, core part |
| [**R4-2006218**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006218.zip) | Apple | Cat.D, R15, section 1-10 |
| [**R4-2007715**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007715.zip) | Huawei, HiSilicon | Cat.F, R15, section 9.2.5.2, 9.2.6.2 |
| [**R4-2006217**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006217.zip) | Apple | Cat.D, R16, section 1-10 |

## Summary of Open Issues

### Issue 5-1:

(section 6.1.3.2.1, TS38.133-f30 )

After successful RACH procedure of the target cell, when the UE receives a [TBD] message implying source cell release command, the UE shall accomplish the release actions specified in TS 38.331 [2] within Dhandover2.

Dhandover2 = TRRC\_procedure+ Tinterrupt2

(section 6.1.3.3.1, TS38.133-f30 )

After successful RACH procedure of the target cell, when the UE receives a [TBD] message implying source cell release command, the UE shall accomplish the release actions specified in TS 38.331 [2] within Dhandover2.

Dhandover2 = TRRC\_procedure+ Tinterrupt2

(section 6.1.3.4.1, TS38.133-f30 )

After successful RACH procedure of the target cell, when the UE receives a [TBD] message implying source cell release command, the UE shall accomplish the release actions specified in TS 38.331 [2] within Dhandover2.

Dhandover2 = TRRC\_procedure+ Tinterrupt2

### Issue 5-2:

(section 6.1.3.2.2, TS38.133-f30 )

Table 6.1.3.2.2-1: Tinterrupt1 for FR1-to-FR1 intra-frequency DAPS HO

|  |  |  |
| --- | --- | --- |
|  | NR Slot length (ms) | Interruption length X (slotsNote 1) |
|
| 0 | 1 | 1 |
| 1 | 0.5 | 2 |
| 2 | 0.25 | [TBD] |
| Note 1: The same SCS of source cell and target cell is assumed.  Note 2: It is assumed that the BWP of target cell is no larger than the BWP of source cell.  Note 3: The power imbalance between source cell and target cell shall be within [TBD] dB. | | |

*Editor’s Note: FFS on the interruption requirement when the relationship between CBW of target and source cell is different the relationship between BWP of target and source cell.*

Table 6.1.3.2.2-4: Tinterrupt2 for FR1-to-FR1 intra-frequency DAPS HO

|  |  |  |
| --- | --- | --- |
|  | NR Slot length (ms) | Interruption length X (slotsNote 1) |
|
| 0 | 1 | 1 |
| 1 | 0.5 | 2 |
| 2 | 0.25 | [TBD] |
| Note 1: The same SCS of source cell and target cell is assumed.  Note 2: It is assumed that the BWP of target cell is the same as the BWP of source cell.  Note 3: The power imbalance between source cell and target cell shall be within [TBD] dB. | | |

### Issue 5-3:

(section 8.2.4.1, TS38.133-f30, TS38.133-g90)

This clause contains the requirements related to the interruptions on PCell, PSCell and activated SCell if configured, when

up to TBD SCells are configured, deconfigured, activated or deactivated or,

a supplementary UL carrier or an UL carrier is configured or de-configured, or

(section 8.2.4.2.1, TS38.133-f30, TS38.133-g90)

When PSCell or any number of SCells between one and TBD is added or released using the same *RRCConnectionReconfiguration* message as defined in TS 38.331 [2], the UE is allowed an interruption on any activated serving cell during the RRC reconfiguration procedure as follows:

### Issue 5-4:

**Table 10.1.22.1.1-2: SRS-RSRP absolute accuracy in FR2**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Accuracy** | | | | **Conditions** | | | | |
| **Normal condition** | | **Extreme condition** | | **SRS Ês/Iot** | **Io Note 1 range** | | | |
| **Minimum Io** | | | **Maximum Io** |
| **dB** | | | | **dB** | **dBm / SCSSRS Note 2** | | **dBm/BWChannel** | **dBm/BWChannel** |
| **SCSSRS (kHz)** | | **SCSSRS (kHz)** | | **SCSSRS = 60kHz** | **SCSSRS = 120kHz** |
| **60** | **120** | **60** | **120** |
| ±6.5 | TBD | ±9.5 | TBD | ≥1 | Same value as SRS\_RP in Table TBD, according to UE Power class, operating band and angle of arrival | | N/A | -70 |
| ±9.5 | TBD | ±11.5 | TBD | ≥1 | N/A | | -70 | -50 |
| NOTE 1: Io specified at the Reference point, and assumed to have constant EPRE across the bandwidth.  NOTE 2: Values based on Refsens and EIS spherical coverage as defined in clauses 7.3.2 and 7.3.4 of TS 38.101-2 [19]. Applicable side condition selected depending on angle of arrival.  NOTE 3: In the test cases, the SSB Ês/Iot and related parameters may need to be adjusted to ensure Ês/Iot at UE baseband is above the value defined in this table. | | | | | | | | |

### Issue 5-5:

**Table 10.1.22.2.1-2: CLI-RSSI absolute accuracy in FR2**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Accuracy** | | **Conditions** | | | |
| **Normal condition** | **Extreme condition** | **Io Note 1 range** | | | |
| **Minimum Io** | | | **Maximum Io** |
| **dB** | **dB** | **dBm / SCSSRS Note 2** | | **dBm/BWChannel** | **dBm/BWChannel** |
| **SCSSRS = 60kHz** | **SCSSRS = 120kHz** |
| ±5 | ±8 | Same value as SRS\_RP in Table TBD, according to UE Power class, operating band and angle of arrival | | N/A | -70 |
| ±7 | ±10 | Note 4 | | -70 | -50 |
| NOTE 1: Io specified at the Reference point, and assumed to have constant EPRE across the bandwidth.  NOTE 2: Values based on Refsens and EIS spherical coverage as defined in clauses 7.3.2 and 7.3.4 of TS 38.101-2 [19]. Applicable side condition selected depending on angle of arrival.  NOTE 3: In the test cases, the SSB Ês/Iot and related parameters may need to be adjusted to ensure Ês/Iot at UE baseband is above the value defined in this table.  NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. | | | | | |

### Issue 5-6: V2X

(section 12.4, TS38.133-f30)

V2X SyncRef UE is considered to be detectable when

- S-RSRP related side conditions given in Section [TBD] are fulfilled for a corresponding Band,

- V2X SCH\_RP and SCH Ês/Iot according to Annex [TBD] for a corresponding Band are fulfilled.

(section 12.5.2, TS38.133-f30)

The UE physical layer shall be capable of performing the L1 SL-RSRP measurements on the carrier operating V2X sidelink communication for determining the subset of resources to be excluded in PSSCH resource selection in sidelink transmission mode 2. The L1 SL-RSRP measurement period corresponds to [TBD] and the measurement shall meet the L1 SL-RSRP measurement accuracy requirement in Section [TBD].

(section 12.6, TS38.133-f30)

The S-RSSI measurement performed according to this section shall meet the S-RSSI measurement accuracy requirements defined in Section [TBD].

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  |  |
|  |  |
|  |  |

### CRs/TPs comments collection

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

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| [**R4-2006030**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006030.zip) |  |
| [**R4-2006064**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006064.zip) |  |
| [**R4-2006027**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006027.zip) |  |
| [**R4-2006029**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006029.zip) |  |
| [**R4-2006218**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006218.zip) |  |
| [**R4-2007715**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007715.zip) |  |
| [**R4-2006217**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006217.zip) | Company A |
| Company B |
|  |
| Company B |
|  |

## Summary for 1st round

### Status Summary

### Open issues

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

|  |  |
| --- | --- |
|  | **Status summary** |
|  |  |
|  |  |

*Recommendations on WF/LS assignment*

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

### CRs/TPs

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

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

## Discussion on 2nd round (if applicable)

## Companies views’ collection for 2nd round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  |  |

## Summary on 2nd round (if applicable)

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

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