**3GPP TSG-RAN WG4 Meeting # 97-e R4-2017021**

**Electronic Meeting, 2 – 13 Nov., 2020**

**Agenda item:** 7.14.2.2

**Source:** Moderator (OPPO)

**Title:** Email discussion summary for [97e][222] NR\_CSIRS\_L3meas\_RRM\_2

**Document for:** Information

# Introduction

*Briefly introduce background, the scope of this email discussion and provide some guidelines for email discussion if necessary.*

Test cases for CSI-RS L3 measurements are to be discussed in this email discussion. This is the 1st meeting for performance discussion, which is aiming to decide the structure of test cases and endorse some CRs for this meeting.

* The structure of test cases
  + event triggered reporting tests for intra-frequency measurement
  + event triggered reporting tests for inter-frequency measurement
  + CSI-RSRP, CSI-RSRQ, CSI-SINR accuracy requirements and related test cases
* Draft CRs for test cases (according to CR splits in the reflector)

*List of candidate target of email discussion for 1st round and 2nd round*

* 1st round: discuss the structure of test cases and comments on companies’ CRs
* 2nd round: try to agree on some CRs for test cases in this meeting, and CR split for preparation of next meeting

# Topic #1: Test cases

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2014699**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014699.zip) | CMCC | Proposal 1: it is proposed to define following test cases for Rel-16 CSI-RS based RRM measurement:   * intra-frequency measurement without gap (event triggered reporting tests for intra-frequency measurement without gap) * inter-frequency measurement with gap (event triggered reporting tests for inter-frequency measurement with gap) * measurement accuracy requirements and related test cases, including CSI-RSRP, CSI-RSRQ, CSI-SINR, for both intra-frequency measurement and inter-frequency measurement   Proposal 2: both DRX and non-DRX need to be tested for CSI-RS based measurement. And for the case with DRX, both short DRX (e.g. 40 ms) and long DRX (e.g. 640 ms) are necessary to be tested.  Proposal 3: for the measurement gap configuration, it is proposed to test both per-UE gap and per-FR gap. One test is provided with per-UE gap (e.g. MG pattern # 0) for UE that does not support per-FR gap, and the other test is provided with per-FR gap (e.g. MG pattern # 4 for FR1, e.g. MG pattern # 13 for FR2) for UE that supports per-FR gap. UE only need to pass one test per frequency range based on its supported gap patterns. |
|  |  |  |
| [**R4-2014189**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014189.zip) | Qualcomm | Draft test case CR on EN-DC event triggered reporting tests without gap for NR neighbor cell in FR2 |
| [**R4-2014287**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014287.zip) | Qualcomm | Draft test case CR on EN-DC CSI-RSRP measurement accuracy for NR neighbor cell in FR2 |
| [**R4-2014444**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014444.zip) | CATT | CR on test case for CSI-RS based L3 measurement |
| [**R4-2014626**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014626.zip) | MediaTek inc. | Introduction of CSI-SINR measurement accuracy for FR2 SA |
| [**R4-2014665**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014665.zip) | Xiaomi | RRM test cases for CSI-RS L3 intra-frequency and inter-frequency measurements |
| [**R4-2014793**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014793.zip) | OPPO | CR to TS 38.133: EN-DC event triggered reporting tests for NR neighbor cell in FR2(PScell in FR1) for CSI-RS L3 inter-frequency measurements(A.5.6.x) |
| [**R4-2014794**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014794.zip) | OPPO | CR to TS 38.133: TC for EN-DC CSI-RSRQ measurement accuracy for all NR cells in FR1(A.4.7.x) |
| [**R4-2014795**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014795.zip) | OPPO | CR to TS 38.133: TC for EN-DC CSI-RSRQ measurement accuracy for all NR cells in FR2(A.5.7.x) |
| [**R4-2014532**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014532.zip) | vivo | CR on test cases for EN-DC CSI-SINR measurement accuracy |
| [**R4-2015586**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015586.zip) | ZTE | Draft CR on test case for SA CSI-RS based measurement in FR2 and CSI-RSRQ accuracy in FR2 |
| [**R4-2015789**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015789.zip) | Huawei, HiSilicon | CR to introduce TC for CSI-SINR measurement accuracy for FR1 SA and FR2 EN-DC |
| [**R4-2016050**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2016050.zip) | Nokia, Nokia Shanghai Bell | 38133 CR for test case of EN-DC event triggered reporting in FR1 |
| [**R4-2016051**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2016051.zip) | Nokia, Nokia Shanghai Bell | 38133 CR for Test Case of EN-DC CSI-RSRP accuracy requirements in FR1 |
| [**R4-2014433**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014433.zip) | CATT | CR on CSI-RS configuration for mobility |
| [**R4-2014666**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014666.zip) | Xiaomi | RRM test cases for CSI-RS L3 measurement performance |
| [**R4-2015213**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015213.zip) | Xiaomi | CR on introduce the gain to CSI-RSRP measurements point in FR1 and FR2 |
| [**R4-2014288**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014288.zip) | Qualcomm | CR on introducing CSI-RS configurations for RRM |

## Open issues summary

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

### Sub-topic 1-1

*Sub-topic description:*

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

**Issue 1-1: The structure of test cases**

* Proposals
  + Option 1 (CMCC): define following test cases for Rel-16 CSI-RS based RRM measurement
  + intra-frequency measurement without gap (event triggered reporting tests for intra-frequency measurement without gap)
  + inter-frequency measurement with gap (event triggered reporting tests for inter-frequency measurement with gap)
  + measurement accuracy requirements and related test cases, including CSI-RSRP, CSI-RSRQ, CSI-SINR, for both intra-frequency measurement and inter-frequency measurement
* Recommended WF
  + Support Option 1
  + Companies are encouraged to define test cases as the following list provided by Rapporteur in the reflector
* 1. Intra-frequency measurement

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test No. | Test | Tentative section number | Company | Note |
| TC1 | SA event triggered reporting tests without gap for NR neighbor cell in FR1 | A6.6.x | CATT | Test with non-DRX |
| TC2 | SA event triggered reporting tests without gap for NR neighbor cell in FR2 | A7.6.x | Xiaomi | Test with DRX |
| TC3 | EN-DC event triggered reporting tests without gap for NR neighbor cell in FR1 | A4.6.x | Nokia | Test with DRX |
| TC4 | EN-DC event triggered reporting tests without gap for NR neighbor cell in FR2 | A5.6.x | Qualcomm | Test with non-DRX |

* 2. Inter-frequency measurement

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test No. | Test | Tentative section number | Company | Note |
| **TC1** | SA event triggered reporting tests with gap（all NR cells in FR1） | **A6.6.y** | **CATT** | **Test with non-DRX** |
| **TC2** | SA event triggered reporting tests with gap for NR neighbor cell in FR2（PCell in FR2） | **A7.6.y.2** | **ZTE** | **Test with DRX** |
| **TC3** | EN-DC event triggered reporting tests with gap（all NR cells in FR1） | **A4.6.y** | Xiaomi | **Test with DRX** |
| **TC4** | EN-DC event triggered reporting tests with gap for NR neighbor cell in FR2（PScell in FR1） | **A5.6.y.1** | OPPO | **Test with non-DRX** |

* 3. Measurement performance

|  |  |  |  |
| --- | --- | --- | --- |
| Test No. | Test | Tentative section number | Company |
| **TC1** | SA：CSI-RSRP measurement accuracy for（all NR cells in FR1） | A6.7.x | CATT |
| **TC2** | SA：CSI-RSRQ measurement accuracy for（all NR cells in FR1） | A6.7.y | **Xiaomi** |
| **TC3** | SA：CSI-SINR measurement accuracy for（all NR cells in FR1） | A6.7.z | **Huawei** |
| **TC4** | SA：CSI-RSRP measurement accuracy for NR neighbor cell in FR2 | A7.7.x | **Xiaomi** |
| **TC5** | SA：CSI-RSRQ measurement accuracy for NR neighbor cell in FR2 | A7.7.y | **ZTE** |
| **TC6** | SA：CSI-SINR measurement accuracy for NR neighbor cell in FR2 | A7.7.z | **MediaTek** |
| **TC7** | EN-DC：CSI-RSRP measurement accuracy for（all NR cells in FR1） | A4.7.x | Nokia |
| **TC8** | EN-DC：CSI-RSRQ measurement accuracy for（all NR cells in FR1） | A4.7.y | OPPO |
| **TC9** | EN-DC：CSI-SINR measurement accuracy for（all NR cells in FR1） | A4.7.z | vivo |
| **TC10** | EN-DC：CSI-RSRP measurement accuracy for NR neighbor cell in FR2 | A5.7.x | Qualcomm |
| **TC11** | EN-DC：CSI-RSRQ measurement accuracy for NR neighbor cell in FR2 | A5.7.y | OPPO |
| **TC12** | EN-DC：CSI-SINR measurement accuracy for NR neighbor cell in FR2 | A5.7.z | **Huawei** |
| Note: for each row in this table, two test cases, one for intra-frequency and one for inter-frequency, will be defined. | | | |

### Sub-topic 1-2

**Issue 1-2: Whether both DRX and non-DRX need to be tested ?**

* Proposals
  + Option 1: YES
    - Especially, for the case with DRX, both short DRX (e.g. 40 ms) and long DRX (e.g. 640 ms) are necessary to be tested.(CMCC)
  + Option 2: NO
* Recommended WF
  + Option 2

### Sub-topic 1-3

**Issue 1-3: Whether test cases with both per UE gap and per-FR gap need to be tested?**

* Proposals
  + Option 1: YES
    - For the measurement gap configuration, it is proposed to test both per-UE gap and per-FR gap.
      * One test is provided with per-UE gap (e.g. MG pattern # 0) for UE that does not support per-FR gap, and the other test is provided with per-FR gap (e.g. MG pattern # 4 for FR1, e.g. MG pattern # 13 for FR2) for UE that supports per-FR gap. UE only need to pass one test per frequency range based on its supported gap patterns.(CMCC)
  + Option 2: NO
* Recommended WF
  + TBA

### Sub-topic 1-4

**Issue 1-4: CSI-RS configuration for RRM measurement**

[Moderator]: 4 tables for CSI-RS configuration, including

* FDD: CSI-RS configuration with SCS = 15KHz
* TDD: CSI-RS configuration with SCS=15kHz, 30kHz, 120kHz
* Proposals
  + Option 1(CATT): Based on CR R4-2014433. For example,

**Table A.3.19.1.1-1: CSI-RS for mobility for SCS=15kHz**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | |
|  |  | **Set 1** | **Set 2** |
| Reference channel |  | CSI-RS-L3 1.1-1 FDD | CSI-RS-L3 1.1-2 FDD |
| Bandwidth |  | BW of Active BWPNote 1 | |
| SCS | kHz | 15 | |
| First subcarrier index in the PRB used for CSI-RS |  | k0=0 for CSI-RS resource 1,2 | |
| First OFDM symbol in the slot used for CSI-RS |  | l0 = 5 for CSI-RS resource 1  l0 = 9 for CSI-RS resource 2 | |
| Number of CSI-RS ports (X) |  | 1 for CSI-RS resource 1,2 | |
| CDM Type |  | ‘No CDM’ for all CSI-RS resources | |
| Density (ρ) |  | 3 for CSI-RS resource 1,2 | |
| CSI-RS periodicity | slots | 40 for CSI-RS resource 1,2 | |
| CSI-RS offset | slots | 2 for CSI-RS resource 1,2 | 12 CSI-RS resource 1,2 |
| EPRE ratio to SSS | dB | 0Note 2 | |
| Associated with SSB |  | Yes | |
| QCLed with SSB |  | Yes | |
| Note 1: BW of CSI-RS is configured same as the BW size of UE active BWP in the RRM test cases  Note 2: Unless otherwise specified in the test case | | | |

* + Option 2(Qualcomm): Based on CR R4-2014288. For example,

**Table A.3.X.1-1: CSI-RS RRM Reference Measurement Channels for SCS=15kHz**

|  |  |  |
| --- | --- | --- |
|  | **CSI-RS.RRM.1.1 FDD** | **CSI-RS.RRM.1.2 FDD** |
| **CSI-RS-ResourceConfigMobility** |  |  |
| subcarrierSpacing | 15 | 15 |
| **CSI-RS-CellMobility** |  |  |
| cellIdnote1 | 489 | 0 |
| nrofPRBs | 48 | 48 |
| startPRB | 0 | 0 |
| density | 3 | 3 |
| **CSI-RS-Resource-Mobility** |  |  |
| csi-RS-Index | 0 | 1 |
| slotConfig: ms20 | slot9 | slot10 |
| **associatedSSB** |  |  |
| ssb-Index | 0 | 0 |
| isQuasiColocated | True | True |
| firstOFDMSymbolInTimeDomain | 6 | 10 |
| sequenceGenerationConfig | 0 | 0 |
| Note1: cellid can be overridden by Physical cell ID in the test case | | |

* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

|  |  |  |
| --- | --- | --- |
| **Company** | | **Comments** |
| MTK | | Issue 1-1: The structure of test cases  OK with current test case list  Issue 1-2: Whether both DRX and non-DRX need to be tested ?  Slightly prefer to test with non-DRX and short DRX only. UE’s measurement behaviour has not essential difference between short DRX and long DRX. To save testing time, we prefer not to add test cases for long DRX.  Issue 1-3: Whether test cases with both per UE gap and per-FR gap need to be tested?  Fine with Option 1 since it does not add more test cases that UE needs to take.  Issue 1-4: CSI-RS configuration for RRM measurement  On SCS and TDD/FDD, Suggest to align with Rel-15 test cases as much as possible, i.e.,   * FR1 FDD: 15KHz * FR1 TDD: 15 and 30 KHz * FR2: 120KHz   Regarding the CSI-RS configuration, suggest to merge to proposals.  Others: |
| Xiaomi | | Issue 1-1: The structure of test cases  We are fine with the current test case list.  Issue 1-2: Whether both DRX and non-DRX need to be tested ?  We are fine to test both DRX and non-DRX cases based on the current test case list.  Issue 1-3: Whether test cases with both per UE gap and per-FR gap need to be tested?  We are fine with option 1.  Issue 1-4: CSI-RS configuration for RRM measurement  For SCS, we support moderator’s suggest:   * FR1 FDD: 15KHz * FR1 TDD: 15 and 30 KHz * FR2: 120KHz   Regarding CSI-RS configuration:  Option 1: we prefer to have 1 set of configuration |
| Huawei | | Issue 1-1: The structure of test cases  We are fine with the current test case list.  Issue 1-2: Whether both DRX and non-DRX need to be tested ?  We are fine to test both DRX and non-DRX, but we do not see the need to duplicate each test case just for DRX and non-DRX, for short and long DRX cycles. We prefer to keep the test case list as in Issue 1-1. For DRX cycles, one way to distribute short DRX and long DRX in the test cases with DRX.  Issue 1-3: Whether test cases with both per UE gap and per-FR gap need to be tested?  We are fine with option 1 as it is aligned with the principle for SSB event triggered reporting tests.  Issue 1-4: CSI-RS configuration for RRM measurement  On option 1: Why do we need 2 sets of RMC in each table? The index of associated SSB needs to be defined.  On option 2: We typically do not fix the cellId in RMC. Are the two resources supposed to be transmitted by two cells in the test? |
| CATT | | Issue 1-1: The structure of test cases  Support the current test case list.  Issue 1-2: Whether both DRX and non-DRX need to be tested ?  Have no strong view. We are fine to test both DRX and non-DRX cases.  Issue 1-3: Whether test cases with both per UE gap and per-FR gap need to be tested?  Support option 1. Two gap configurations can be tested.  Issue 1-4: CSI-RS configuration for RRM measurement  Support option 1.   * We give two sets of CSI-RS resources configuration in case that different CSI-RS resources are needed for the two cells in inter-frequency test case. But we are also fine to keep 1 set of configuration. That means the CSI-RS in serving cell and neighbor cell will be the same configuration including time offset and frequency domain offset. * the index of associated SSB can be given by the SSB configuration in the same test case * Option 1 and option 2 can be merged and there is no need to define signaling here in our understanding. |
| OPPO | | Issue 1-1: The structure of test cases  OK with current test case list  Issue 1-2: Whether both DRX and non-DRX need to be tested ?  Prefer to follow the test case list as in Issue 1-1. It is also ok to re-distribute short DRX and long DRX for test cases with DRX.  Issue 1-3: Whether test cases with both per UE gap and per-FR gap need to be tested?  Fine with Option 1, to align with the methods for SSB.  Issue 1-4: CSI-RS configuration for RRM measurement  Agree to align with Rel-15 test cases , i.e., FR1 FDD: 15KHz, FR1 TDD: 15 and 30 KHz , FR2: 120KHz. Also agree to add the index of associated SSB, and suggest to merge to the 2 proposals  Others: |
| Qualcomm | **Issue 1-1: The structure of test cases**  Recommend WF is agreeable.  11-05 update:  We are not sure if TC04 is designed properly as it is aimed to measure FR1 neighbor cell from FR2 PSCELL. In our view, this is not an inter-frequency case?  **Issue 1-2: Whether both DRX and non-DRX need to be tested ?**  Prefer to arbitrarily specify non-DRX and short-DRX for test cases,  **Issue 1-3: Whether test cases with both per UE gap and per-FR gap need to be tested?**  Option1 can be supported.  **Issue 1-4: CSI-RS configuration for RRM measurement**  We are fine with merging the two options, but we prefer to include specific parameters for CSI-RS RRM rather than generic parameters for CSI-RS for L1.  We are ok to compromise to one set of RMC but we need to specify how to distinguish serving CSI-RS resource versus neighbor CSI-RS resource, which is described in our draft CR R4-2014287. The purpose is to test if UE can locate the serving CSI-RS for determining whether a CSI-RS resource being intra v.s inter-frequency measurements, which implies different behaviors. | |
| CMCC | | **Issue 1-1: The structure of test cases**  In general, we are OK with the test case list, but the last column about non-DRX/ DRX (short DRX/ long DRX) may need to be updated based on Issue 1-2.  **Issue 1-2: Whether both DRX and non-DRX need to be tested**  Prefer Option 1, considering that the CSI-RS measurement requirements are different for non-DRX, short DRX and long DRX, it is better to test all the scenario to guarantee measurement performance. For the test cases on SSB based L3 measurement, non-DRX, short DRX (40ms), long DRX (640ms) are considered, CSI-RS based L3 measurement shall follow the same approach as that of SSB.  **Issue 1-3: Whether test cases with both per UE gap and per-FR gap need to be tested**  Option 1 |
| vivo | | **Issue 1-1: The structure of test cases**  We are fine with current test case list.  **Issue 1-2: Whether both DRX and non-DRX need to be tested**  We are fine to test both DRX and non-DRX. However, the use case for configuring both long DRX (e.g. 640ms) and CSI-RS based L3 measurement is not very clear to us. In our understanding SSB-based L3 measurement is more suitable for this case. Therefore we slightly prefer not to consider long DRX.  **Issue 1-3: Whether test cases with both per UE gap and per-FR gap need to be tested**  We can support option 1  **Issue 1-4: CSI-RS configuration for RRM measurement**  For intra-frequency and inter-frequency event triggered reporting, in our understanding one set of CSI-RS parameters would be enough for both serving cell and neighbour cell. |
| Nokia | | **Issue 1-1: The structure of test cases**  We support the recommended WF. Current list of test cases is fine.  **Issue 1-2: whether both DRX and non-DRX need to be tested**  We are fine to consider the different DRX configurations in the test case. But probably there is no need to define the three cases for each scenario. In current test case list, some test cases are defined with DRX and others with non-DRX. We may select some cases to configure long or short DRX to test the different requirements.  **Issue 1-3: Whether test cases with both per UE gap and per-FR gap need to be tested**  We are fine with the proposal.  **Issue 1-4: CSI-RS configuration for RRM measurement**  We prefer Option2. It is easier to map with the CSI-RS based measurement configuration. |
| Apple | | **Issue 1-1:**  the list of test cases is OK for us.  **Issue 1-2:**  **We don’t see the strong need to test both DRX and non-DRX. But we can follow the majority.**  **Issue 1-3:**  **Per-FR gap as a feature has been tested in other test cases. We don’t see the need to test both perUE and per FR gap.**  **Issue 1-4:**  **Fine with option 2** |
| ZTE | | **Issue 1-1: The structure of test cases**  Fine with recommended WF.  **Issue 1-2: Whether both DRX and non-DRX need to be tested ?**  It would be necessary to test both  **Issue 1-3: Whether test cases with both per UE gap and per-FR gap need to be tested?**  Support option 1.  **Issue 1-4: CSI-RS configuration for RRM measurement**  Prefer option 2. One RMC is enough for all the cells. |

### 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** |
| [**R4-2014189**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014189.zip)  Qualcomm | Draft test case CR on EN-DC event triggered reporting tests without gap for NR neighbor cell in FR2  MTK:   * suggest to remove 240KHz SSB configurations, which is irrelevant to CSI-RS test case actually * suggest to keep TBD for time offset between Cell 2 and Cell 3 * Table A.5.6.X.1.1-4 and Table A.5.6.X.2.1-4. We do not need to consider 240KHz SCS for CSI-RSRP.   Qualcomm: to MTK, we are fine with the suggestions. |
| **[R4-2014287](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014287.zip)** Qualcomm | Draft test case CR on EN-DC CSI-RSRP measurement accuracy for NR neighbor cell in FR2  MTK: Not sure if adding servingCellMO and MeasObjectId would make the test case more clear or more confusing.  CATT: Do not understand the intention to add servingCellMO and MeasObjectId.  Qualcomm: to MTK and CATT, the reason to add these parameters is intended for UE to locate the serving cell CSI-RS resource for deciding on intra v.s. inter frequency measurements. |
| [**R4-2014444**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014444.zip)  CATT | CR on test case for CSI-RS based L3 measurement  MTK: Suggest to put TBD for time offset between serving and neighbour cells  Company B: |
| [**R4-2014626**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014626.zip) MediaTek | Introduction of CSI-SINR measurement accuracy for FR2 SA  CATT: WI code should be NR\_CSIRS\_L3meas-Perf. Company B: |
| [**R4-2014665**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014665.zip) Xiaomi | RRM test cases for CSI-RS L3 intra-frequency and inter-frequency measurements  MTK:   * Suggest to put “48 PRB, 3 REs/PRB” in the detail CSI-RS configuration for mobility, not in Table for supported test configurations.   [Xiaomi]: OK with the suggestion   * Suggest to put TBD for time offset between serving and neighbour cells   [Xiaomi]: Depend on how to define the accuracy requirement. And how much time offset can be assumed between serving cell and neighbour cell.  Company B: |
| [**R4-2014793**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014793.zip) OPPO | CR to TS 38.133: EN-DC event triggered reporting tests for NR neighbor cell in FR2(PScell in FR1) for CSI-RS L3 inter-frequency measurements(A.5.6.x)  CATT:   * WI code should be NR\_CSIRS\_L3meas-Perf.   The test purpose should be to verify the CSI-RS based inter-frequency measurement requirements. Company B: |
| [**R4-2014794**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014794.zip) OPPO | CR to TS 38.133: TC for EN-DC CSI-RSRQ measurement accuracy for all NR cells in FR1(A.4.7.x)  Company A:  Company B: |
| [**R4-2014795**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014795.zip) OPPO | CR to TS 38.133: TC for EN-DC CSI-RSRQ measurement accuracy for all NR cells in FR2(A.5.7.x)  Company A:  Company B: |
| [**R4-2014532**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014532.zip)  vivo | CR on test cases for EN-DC CSI-SINR measurement accuracy  Company A:  Company B: |
| [**R4-2015586**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015586.zip)  ZTE | Draft CR on test case for SA CSI-RS based measurement in FR2 and CSI-RSRQ accuracy in FR2  CATT:WI code is incorrect  Company B: |
| [**R4-2015789**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015789.zip)  Huawei | CR to introduce TC for CSI-SINR measurement accuracy for FR1 SA and FR2 EN-DC  Company A:  Company B: |
| [**R4-2016050**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2016050.zip)  Nokia | 38133 CR for test case of EN-DC event triggered reporting in FR1  MTK: • Suggest to put TBD for time offset between serving and neighbour cells  CATT:WI code is incorrect  Nokia: We will update as suggested. |
| [**R4-2016051**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2016051.zip) Nokia | 38133 CR for Test Case of EN-DC CSI-RSRP accuracy requirements in FR1  CATT: WI code is incorrect  Nokia: We will update as suggested. |
| [**R4-2014288**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014288.zip)  Qualcomm | CR on introducing CSI-RS configurations for RRM  MTK: Suggest to merge with 14433  Qualcomm: we are fine with the suggestion and will wait for moderator to assign the work. |
| [**R4-2014433**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014433.zip)  CATT | CR on CSI-RS configuration for mobility  MTK: Suggest to merge with 14288  Company B: |
| [**R4-2014666**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014666.zip)  Xiaomi | RRM test cases for CSI-RS L3 measurement performance  Company A:  Company B: |
| [**R4-2015213**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015213.zip)  Xiaomi | CR on introduce the gain to CSI-RSRP measurements point in FR1 and FR2  Company A:  Company B: |

## Summary for 1st round

### Open issues

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

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | **Issue 1-1: The structure of test cases**  *Tentative agreements:*  *Support the current test case list. (NOTE the DRX issue can be discussed in issue 1-2.)*  1.Intra-frequency measurement3   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Test No. | Test | Tentative section number | Company | Note | | TC1 | SA event triggered reporting tests without gap for NR neighbor cell in FR1 | A6.6.x | CATT | Test with non-DRX | | TC2 | SA event triggered reporting tests without gap for NR neighbor cell in FR2 | A7.6.x | Xiaomi | Test with DRX | | TC3 | EN-DC event triggered reporting tests without gap for NR neighbor cell in FR1 | A4.6.x | Nokia | Test with DRX | | TC4 | EN-DC event triggered reporting tests without gap for NR neighbor cell in FR2 | A5.6.x | Qualcomm | Test with non-DRX |   2. Inter-frequency measurement   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Test No. | Test | Tentative section number | Company | Note | | **TC1** | SA event triggered reporting tests with gap（all NR cells in FR1） | **A6.6.y** | **CATT** | **Test with non-DRX** | | **TC2** | SA event triggered reporting tests with gap for NR neighbor cell in FR2（PCell in FR2） | **A7.6.y.2** | **ZTE** | **Test with DRX** | | **TC3** | EN-DC event triggered reporting tests with gap（all NR cells in FR1） | **A4.6.y** | Xiaomi | **Test with DRX** | | **TC4** | EN-DC event triggered reporting tests with gap for NR neighbor cell in FR2（PScell in FR1） | **A5.6.y.1** | OPPO | **Test with non-DRX** |    3. Measurement performance   |  |  |  |  | | --- | --- | --- | --- | | Test No. | Test | Tentative section number | Company | | **TC1** | SA：CSI-RSRP measurement accuracy for（all NR cells in FR1） | A6.7.x | CATT | | **TC2** | SA：CSI-RSRQ measurement accuracy for（all NR cells in FR1） | A6.7.y | **Xiaomi** | | **TC3** | SA：CSI-SINR measurement accuracy for（all NR cells in FR1） | A6.7.z | **Huawei** | | **TC4** | SA：CSI-RSRP measurement accuracy for NR neighbor cell in FR2 | A7.7.x | **Xiaomi** | | **TC5** | SA：CSI-RSRQ measurement accuracy for NR neighbor cell in FR2 | A7.7.y | **ZTE** | | **TC6** | SA：CSI-SINR measurement accuracy for NR neighbor cell in FR2 | A7.7.z | **MediaTek** | | **TC7** | EN-DC：CSI-RSRP measurement accuracy for（all NR cells in FR1） | A4.7.x | Nokia | | **TC8** | EN-DC：CSI-RSRQ measurement accuracy for（all NR cells in FR1） | A4.7.y | OPPO | | **TC9** | EN-DC：CSI-SINR measurement accuracy for（all NR cells in FR1） | A4.7.z | vivo | | **TC10** | EN-DC：CSI-RSRP measurement accuracy for NR neighbor cell in FR2 | A5.7.x | Qualcomm | | **TC11** | EN-DC：CSI-RSRQ measurement accuracy for NR neighbor cell in FR2 | A5.7.y | OPPO | | **TC12** | EN-DC：CSI-SINR measurement accuracy for NR neighbor cell in FR2 | A5.7.z | **Huawei** | | Note: for each row in this table, two test cases, one for intra-frequency and one for inter-frequency, will be defined. | | | |   *Candidate options: N/A*  *Recommendations for 2nd round: N/A* |
| **Sub-topic 1-2** | **Issue 1-2: Whether both DRX and non-DRX need to be tested**  *Tentative agreements:*  *Majority view is to test DRX and non-DRX cases as listed in issue 1-1.*  *Candidate options:*  *Option 1(CATT, Xiaomi): Test both DRX and non-DRX cases based on the current test case list*  *Option 1a(Huawei, OPPO, Nokia): For DRX cycles, distribute short DRX and long DRX in the test cases with DRX.*  *Option 1b(MTK, QC, vivo): For DRX cycles, short DRX applies in the test cases with DRX.*  *Option 2(CMCC): non-DRX + short DRX + long DRX ( for each scenario)*  *Recommendations for 2nd round: More discussion.* |
| **Sub-topic 1-3** | **Issue 1-3: Whether test cases with both per UE gap and per-FR gap need to be tested?**  *Tentative agreements:*  *Majority view is option 1 to test both per-UE gap and per-FR gap.*  *Candidate options:*  *Option 1: MTK, Xiaomi, Huawei, CATT, OPPO, Qualcomm, CMCC, vivo, Nokia, ZTE*  *Option 2: Apple*  *Recommendations for 2nd round: Is option 1 agreeable?* |
| **Sub-topic 1-4** | **Issue 1-4: CSI-RS configuration for RRM measurement\**  *Tentative agreements:*  *Majority view is to merge 2 options (*CR R4-2014433 + R4-2014288*).*   * *keep 1 set of configuration.* * *the index of associated SSB*   *Candidate options:*  *Option 1: CATT, CMCC*  *Option 2: Qualcomm, Apple, Nokia, ZTE*  *Option 3: merging the 2 options (MTK, CATT, Huawei, Xiaomi, OPPO, vivo)*  *Recommendations for 2nd round: Further discuss CSI-RS configuration based on merging CR.* |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 | WF on test cases for Rel-16 CSI-RS based RRM measurement: | OPPO |

### 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** |
| **[R4-2014288](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014288.zip)**  Qualcomm | *To be merged* |
| **[R4-2014433](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014433.zip)**  CATT | *To be merged* |
| **[R4-2014189](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014189.zip)**  Qualcomm | *to be revised* |
| **[R4-2014287](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014287.zip)** Qualcomm | *to be revised* |
| **[R4-2014444](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014444.zip)**  CATT | *to be revised* |
| **[R4-2014665](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014665.zip)** Xiaomi | *to be revised* |
| **[R4-2014626](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014626.zip)** MediaTek | *Postponed /To be revised*  *(Due to incorrect cover sheet)* |
| **[R4-2014793](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014793.zip)** OPPO |
| **[R4-2015586](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015586.zip)**  ZTE |
| **[R4-2016050](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2016050.zip)**  Nokia |
| **[R4-2016051](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2016051.zip)** Nokia |
| **[R4-2014794](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014794.zip)** OPPO  **[R4-2014795](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014795.zip)** OPPO  **[R4-2014532](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014532.zip)**  vivo  **[R4-2015789](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015789.zip)**  Huawei  **[R4-2014666](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014666.zip)**  Xiaomi  **[R4-2015213](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015213.zip)**  Xiaomi | *No comments received during 1st round.*  *Further discussion may be needed.* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

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

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