**3GPP TSG-RAN WG4 Meeting #110 R4-2401082**

**Athens, GR, Feb.-Mar. 2024**

**Agenda item:** 8.3.5

**Source:** Moderator (Qualcomm)

**Title:** Topic summary for [110][123] FR2\_multiRx\_UERF\_part1

**Document for:** Information

# Introduction

Agenda items : 8.3.1, 8.3.1.x.

Proposals pertaining to the UE RF requirement are treated in topic #1. Proposals pertaining to TR38.751 are treated in topic #2.

# Topic #1: Edits to the UE RF requirement

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2400427 | Apple | CR on FR2 multi-RX |
| R4-2400962 | Huawei, HiSilicon | Draft CR for TS 38.101-2: MultiRx PC3 RF requirement applicable frequency range |
| R4-2401204 | Xiaomi | CR for Rel-18 38.101-2 to change the suffix K to M for simultaneous reception or transmission in multiple directions. |
| R4-2401509 | vivo | Observation 1: The current multi-Rx requirements is applicable for both 28GHz and 39GHz bands.  Observation 2: The performance of n262 lacks sufficient evaluation so far.  Proposal: It is suggested to preclude n262 from the current spec until sufficient evaluations are presented. |
| R4-2401510 | vivo | draft CR to 38.101-2 on initial UE orientation of FR2-1 multiRx |
| R4-2401511 | vivo | draft editorial correction on FR2-1 multiRx |
| R4-2402252 | Samsung | Observation 1: It was agreed to define complete RF requirements for 28GHz bands first, and 39GHz and 47GHz bands can be evaluated if time allows.  Observation 2:there was already baseline calibration method before RAN4 agreed to evaluate 28GHz firstly  Observation 3: simulation results comparison between 39GHz and 28GHz shows that the performance gap is not very large but still not negligible even there is calibration process.  Observation 4: Multi-RX DL 2AoA spherical coverage requirements for PC3 were agreed to be derived based on the antenna pattern from electromagnetic simulation.  Proposal 1: RAN4 to complete the PC3 Multi-RX DL 2AoA spherical coverage requirement for 28GHz & 39GHz in Rel-18 stage including maintenance phase, and postpone the requirement applicability at 47GHz in future release when EM simulation is available. |
| R4-2402253 | Samsung | Clarification on operating bands for simultaneous reception or transmission in multiple directions |

## Open issues summary

*(continued…)*

### Applicable bands for the UE RF requirement

Background: An early agreement was to focus on 28 GHz, but a later agreement adopted a calibration procedure that applied a band specific DL power for test. The earlier agreement was not explicitly revisited after adoption of the new calibration procedure.

Options:

1. Remove n259, n260, n262
2. Remove n262
3. Remove n262, also re-evaluate requierments for n259, n260
4. Remove no bands, capture note in TR38.751 to leave door open to revisit requirements for one or more high frequency bands
5. No band applicablity change

***Discussion:***

Vivo: on the requirements, they can be applied to any band. That is why we include all the FR2-1 bands. In this meeting, Vivo and Samsung provided more simulation results which show the requirements can be applied. N262 can be removed

Samsung: following the previous agreement, we should go with Option 1. But based on the contributions, we can preclude 47GHz, which has no implementation for it. We can go with option 2.

LGE: last year, we have many times to complete the requirements. We can remove 47GHz.

Agreement: Remove n262

### Void section 5.5 K (R4-2400427)?

Clause 5.5K references sub-clause 5.5, which in turn, only contains CA configurations. On the other hand, this feature is only defined for single CC operation in Rel-18.

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Options: Agree/disagree

***Discussion:***

R&S: will it not CA? Can we keep the section with empty text?

LGE: K means UAV in FR1. For FR2, K is CA. Can we align them?

Moderator: that is the next issue.

Agreement: Retain the title and remove the text for clause of 5.5K.

### Suffix change to M?

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Options: Agree/disagree

***Discussion:***

LGE: We are OK to change the suffix to M. We would like to check with MCC.

**Agreement:**

* **Change the suffix for FR2 Multi-Rx and STxMP from K to M**
* **Void 5.xK and leave the content in the clause empty**

### Annex L, include ’In the test, n is set to 2’?

‘n’ is the maximum number of unique AoApairs that the TE can generate with one source at coordinates (θ1,φ1).

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Options:

1. Yes, n = 2 should be included in the Annex
2. No, most points have n = 2, but the poles can have more than 2 AoA pairs associated with them

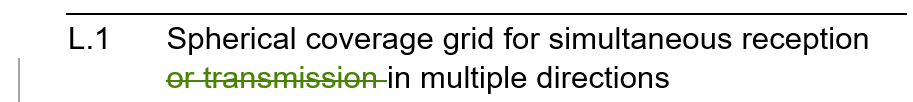
***Discussion:***

Agreement:

* No, most points have n = 2, but the poles can have more than 2 AoA pairs associated with them
  + Further check with TE vendor

### Annex L, remove applicability to ’transmission’

Background: Wording was intended to be inclusive of the STxMP confiured power requirment



Options: Agree/disagree

***Discussion:***

Moderator: transmission should not be taken out.

Vivo: our concern is that for STxMP we did not touch the configuration accordingly.

Samsung: We also think for STxMP we did not agree. More safe way is to remove transmission.

Qualcomm: it is true STxMP is premature. We did not want new test configuration for STxMP and we want to reuse.

### Annex L, add reference coordinate system illustration

Background: Wording was intended to be inclusive of the STxMP confiured power requirment

A diagram of a sphere with a wire and a ball

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Options:

1. Yes, add illustration
2. No, illustration of positioner is not general enough

***Discussion:***

R&S: Not a good idea to include this one. As long as we have update the feeders.

### Annex J, add explicit list of permitted UE alignments

Proposed new table of UE orientations is reproduced below:

A table of numbers and symbols

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Options:

1. Yes, spec. needs this list documented in the Annex
2. No, current format and wording are sufficient

*Discussion:*

R&S: The full tables with example figure. We have CR to maintain the table. It is better to have full table with the picture of feeders.

Moderator: one way out is to add the missing diagram rather than add the full table.

R&S: we need capture the three missing orientations.

Agreement: figure out the way to capture the three missing orientations.

### Remove redundant RMC information from PC6?

General section 7.3K introduced RMC info, so not necessary to retain for PC6. Proposal:

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Options: Agree/disagree

***Discussion:***

Agreement: agree on the proposal of removing redundant RMC information from PC6 as above.

# Topic #2: Edits to TR38.751

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2400428 | Apple | CR on reasoning of defining multi-RX RF requirements for all FR2-1 bands based on 28GHz simulation results |
| R4-2401512 | vivo | draft CR to 38.751 on update of UE orientation |

## Open issues summary

### Band applicability justification

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Options: Agree/disagree

***Discussion***:

Chair: further check the text offline.

### Documentation of additional UE orientation to meet the requirement

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Options: Agree/disagree

***Discussion****:*