**3GPP TSG-RAN WG4 Meeting # 101-bis-e R4-220XXXX**

**Electronic Meeting, 17th – 25th Jan., 2022**

**Agenda item:** 6.2.2.3, 6.2.2.4

**Source:** Moderator (OPPO)

**Title:** Email discussion summary for [101-bis-e] [326] FR1\_TRP\_TRS\_Part2

**Document for:** Information

# Introduction

*Contributions submitted to AI 6.2.2.3 UE with multiple antennas test methodology and AI 6.2.2.4 Test time reduction of FR1 TRP TRS WI are captured in this email discussion. Test strategy and methodology on multiple antennas and test time reduction will be discussed.*

# Topic #1: Test methodology for UE with multi-antenna

*The following multi-antenna technics will be discussed in this section.*

* *UL Transmit Diversity*
* *Transmit Antenna Switch*
* *Multi Antenna Receivers*

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2200786 | Qualcomm Incorporated | **Proposal 1:** To define a new figure of metric for the UE radiated performance with TAS ON. The requirement similar to EIRP spherical covaege could be an example.  **Proposal 2:** RAN4 to study the corresponding test methodology. The test solution should resue the current test ecosystem as much as possible. |
| R4-2201284 | OPPO | **Proposal:** consider the influenced factors with the recommended priorities in the below table.   |  |  |  |  | | --- | --- | --- | --- | | **Factor ID** | **Potential Influence factors** | **Priority** | **Note** | | Factor 1 | Downlink Rx signal | High | High priority. Further study is needed to refine the procedure of test method to make the UE worked under effective Tx antenna switch state. | | Factor 2 | Near-body/object sensor | Low | Low priority. | | Factor 3 | USIM card setting | Low | Low priority. PLMN should be checked to ensure Tx antenna switch function worked in correct status. | | Factor 4 | Base station signalling | TBD | The mechanism of base station signalling impact on Tx antenna switch need to be further clarified and discussed. | | Factor 5 | Particular optimization algorithms | TBD |  | | Factor 6 | Efficacy of the TAS ON methodology (i.e. ability to rank devices based on lab test to be correlated to ranking based on field performance) | NA | The efficacy of the TAS ON methodology is the same as that of TRP TRS methodology. | |
| R4-2201286 | OPPO | **Proposal:** discuss the test methodology based on the above two test methods as a start point. |
| R4-2201285 | OPPO | TP to TR 38.834 on multi antenna |

## Open issues summary

### Sub-topic 1-1: Figure of Metric for the UE radiated performance with TAS ON

* Proposal 1: To define a new figure of metric for the UE radiated performance with TAS ON. The requirement similar to EIRP spherical coverage could be an example.
* Proposal 2: RAN4 to study the corresponding test methodology. The test solution should resue the current test ecosystem as much as possible.
* Recommended WF
  + TBA

### Sub-topic 1-2: Priorities of the influenced factors on TAS ON

* Proposal: consider the influenced factors with the recommended priorities in the below table.

|  |  |  |  |
| --- | --- | --- | --- |
| **Factor ID** | **Potential Influence factors** | **Priority** | **Note** |
| Factor 1 | Downlink Rx signal | High | High priority. Further study is needed to refine the procedure of test method to make the UE worked under effective Tx antenna switch state. |
| Factor 2 | Near-body/object sensor | Low | Low priority. |
| Factor 3 | USIM card setting | Low | Low priority. PLMN should be checked to ensure Tx antenna switch function worked in correct status. |
| Factor 4 | Base station signalling | TBD | The mechanism of base station signalling impact on Tx antenna switch need to be further clarified and discussed. |
| Factor 5 | Particular optimization algorithms | TBD |  |
| Factor 6 | Efficacy of the TAS ON methodology (i.e. ability to rank devices based on lab test to be correlated to ranking based on field performance) | NA | The efficacy of the TAS ON methodology is the same as that of TRP TRS methodology. |

### Sub-topic 1-3: Test methodology for UE with Tx Diversity

* Proposal: discuss the test methodology based on the two proposed test methods as a start point.

## Companies views’ collection for 1st round

### Open issues

**Sub-topic 1-1: Figure of Metric for the UE radiated performance with TAS ON**

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

**Sub-topic 1-2: Priorities of the influenced factors on TAS ON**

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

**Sub-topic 1-3: Test methodology for UE with Tx Diversity**

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

### CRs/TPs comments collection

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

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2201285 | Company A |
| Company B |
|  |
| YYY | 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** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

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

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

|  |  |
| --- | --- |
| **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)

# Topic #2: Test time reduction

*The following aspects for test time reduction will be discussed in this section.*

* *Reduce EN-DC combinations*
* *Reduce SA test time*
* *Other techniques to reduce the FR1 OTA test time*

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2200980 | vivo | **Proposal 1:** Adopt Single Point Offset test method as one of the alternative test methodologies to reduce TRP TRS OTA test time. |

## Open issues summary

### Sub-topic 2-1 Signle Point Offset method to reduce TRP TRS OTA test time

* Proposal: Adopt Single Point Offset test method as one of the alternative test methodologies to reduce TRP TRS OTA test time.
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

**Sub topic 2-1 Signle Point Offset method to reduce TRP TRS OTA test time**

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

### 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** |
| XXX | Company A |
| Company B |
|  |
| YYY | 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** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

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

|  |  |
| --- | --- |
| **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)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on … | YYY |  |
| LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
|  |  |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents

## 2nd round

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-210xxxx | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-210xxxx | LS on … | ZZZ | Agreeable, Revised, Noted |  |
|  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. Do not include hyper-links in the documents

# Annex

Contact information

|  |  |  |
| --- | --- | --- |
| **Company** | **Name** | **Email address** |
|  |  |  |

Note:

1. Please add your contact information in above table once you make comments on this email thread.
2. If multiple delegates from the same company make comments on single email thread, please add you name as suffix after company name when make comments i.e. Company A (XX, XX)