**3GPP TSG-RAN WG4 Meeting #102-e R4-2207164**

**Electronic Meeting, Feb 21st – Mar 3rd, 2022**

**Agenda item:** 10.12.3

**Source:** Moderator (Huawei, HiSilicon)

**Title:** Email discussion summary for [102-e][324] NR\_perf\_enh2\_Demod\_Part3

**Document for:** Information

# Introduction

RAN4#100-e: all open issues are finalized as per WF R4-2115748 approved in RAN4#100-e, the general simulation assumptions are captured here for information:

|  |  |
| --- | --- |
| **Parameter** | **Value** |
| Transform precoding | Disabled |
| CP | Normal CP |
| Number of Tx | 1 |
| Number of Rx | 2, 4, 8 |
| Number of layers | 1 |
| TDD pattern | 15kHz SCS: 3D1S1U, S=10D:2G:2U30kHz SCS: 7D1S2U, S=6D:4G:4U |
| DM-RS sequence generation | NID=0, nSCID=0  |
| DMRS type | Type 1 with single-symbol DM-RS |
| Number of DMRS symbols | 1+1 |
| Number of DM-RS CDM groups without data | 2 |
| Ratio of PUSCH EPRE to DM-RS EPRE | -3dB |
| symbols length | 14 |
| start symbol index | 0 |
| Time domain resource allocation type | type A and B |
| Frequency domain resource | Full applicable test bandwidth |
| MCS index | 20 |
| Carrier frequency (GHz) | 4 |
| Propagation condition | TDLA30-10 Low |
| SCS and BW | 15kHz: 5MHz, 10MHz; 30kHz: 10MHz, 40MHz, 100MHz  |
| SRS, PT-RS | Not configured |
| Phase noise modelling | No explicit PN modelling (Note 1) |
| Tx EVM | No explicit 3.5% Tx EVM modelling (Note 2) |
| Timing offset, Frequency offset | 0, 0 |
| Code block group, Frequency hopping, Limited buffer rate matching | Disabled |
| Number of HARQ transmissions and RV sequence | 4, {0,2,3,1} |
| Testing metric | SNR @70% of maximum throughput |
| Note 1: The phase noise impact can be included in the impairment results, but it is left up to companiesNote 2: Consider 3.5% Tx EVM impact in the impaired results, but it is left up to companies. |

RAN4#101-e: Initial simulation alignment was performed as captured in simulation results summary R4-2119028; Further alignment rules and derivation for final performance requirements were agreed as in the approved WF R4-2120717; CR work splitting is conducted and confirmed by interested companies as captured in the summary after 2nd round discussion R4-2120739.

RAN4#101bis-e: Simulation results are aligned with updated simulation results submitted from some companies as captured in R4-2201019; Draft CRs are endorsed.

RAN4#102-e:

1st round discussion:

* Draft CRs review
* Discussion on square bracket removal for the final performance requirements considering no further updated results submitted by companies for this meeting.

2nd round discussion:

* TBD

# Topic #1: Test parameters

## Companies’ contributions summary

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Company** | **Title** | **Proposals / Observations** |
| [**R4-2203550**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203550.zip) | Samsung | draft CR on FR1 PUSCH 256QAM FRC for TS 38.141-1 | FRC for TS 38.141-1Resubmission of R4-2200753 which was endorsed in RAN4#101-bis-e meeting |
| [**R4-2203551**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203551.zip) | Samsung | draft CR on FR1 PUSCH 256QAM FRC for TS 38.141-2 | FRC for TS 38.141-2Resubmission of R4-2200754 which was endorsed in RAN4#101-bis-e meeting |
| R4-2204026 | Ericsson | Big CR for TS38.141-2 FR1 PUSCH 256QAM | Withdrawn |
| [**R4-2204529**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204529.zip) | CMCC | Draft CR for TS38.141-2 Requirements for PUSCH with transform precoding disabled for BS type 1-O | OTA requirements for TS 38.141-2.Resubmission of R4-2203003 endorsed in RAN4#101-bis-e meeting |
| [**R4-2205127**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205127.zip) | Ericsson | Draft big CR for TS38.141-2 FR1 PUSCH 256QAM | Big CR for TS 38.141-2 by implemented the following endorsed draft CRs in RAN4$#101-bis-e:R4-2203001: Introduction of manufacture declarationR4-2203003: Requirements for PUSCH with transform precoding disabled for BS type 1-OR4-2200754: FR1 PUSCH 256QAM FRC |
| [**R4-2205810**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205810.zip) | Huawei,HiSilicon | draft CR for FR1 PUSCH 256QAM requirements in TS 38.141-1 | Conducted requirements for TS 38.141-1Removed square brackets compared the endorsed CR R4-2203004 endorsed in RAN4#101-bis-e meeting |
| R4-2205811 | Huawei,HiSilicon | BigCR for FR1 PUSCH 256QAM requirements in TS 38.104 | Withdrawn |
| R4-2205812 | Huawei,HiSilicon | Summary of simulation results for FR1 PUSCH 256QAM performance requirements | Summary of simulation results to capture the possible updated results from companies. |
| [**R4-2205816**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205816.zip) | Intel Corporation | Draft CR for TS 38.104: FR1 256QAM PUSCH requirements | Resubmission of Draft CR R4-2203002 endorsed in RAN4#101-bis-e meeting |
| R4-2205824 | Huawei,HiSilicon | BigCR for FR1 PUSCH 256QAM requirements in TS 38.141-1 | Big CR Tdoc# reservation for TS 38.141-1 |

## Open issues summary

In this section, Simulation results alignment and draft CRs review for FR1 PUSCH 256QAM demodulation performance requirements will be discussed.

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

### Performance requirements definition

**Issue 1: Removal of square bracket for the final performance requirements**

Moderator’s observation

* + No updated results submitted for this meeting. As per the discussion in last meeting (R4-2203005), removal of the square brackets in this meeting needs discussion and confirmation.
* Proposals
	+ Remove the square brackets and endorse the draft CRs during this meeting.
* Recommended WF

## Companies views’ collection for 1st round

### Simulation results alignment

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Intel | We are fine to remove the square brackets. |
| Ericsson | We are fine with the Proposal to remove the brackets during this meeting. |
| Huawei | We are also fine to remove the square brackets during this meeting. |
| CMCC | Fine to remove the brackets |
| CATT | Fine to remove the brackets. |
| NOKIA | We are fine to remove the brackets |
|  |  |

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| [**R4-2203550**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203550.zip)(Samsung, FRC for TS 38.141-1) | Moderator: Resubmission of R4-2200753 endorsed in RAN4#101-bis-e meeting |
| Nokia: We are not able to find  |
|  |
|  |
| [**R4-2203551**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203551.zip)(Samsung: FRC for TS 38.141-2) | Moderator: Resubmission of R4-2200754 endorsed in RAN4#101-bis-e meeting |
|  |
|  |
|  |
| [**R4-2205816**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205816.zip)(Intel: Requirements for TS 38.104) | Moderator: Resubmission of Draft CR R4-2203002 endorsed in RAN4#101-bis-e meeting |
| Intel: In case the removing of [] will be agreed in this meeting, we plan to revise this Draft CR. In case not, probably this Draft CR can be postponed to the next meeting. |
|  |
| [**R4-2205810**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205810.zip)(Huawei: Conducted requirements for TS 38.141-1) | Moderator: Updates of R4-2203004 endorsed in RAN4#101-bis-e meeting with removal of square brackets. This needs to wait for the discussion on removal of square brackets for this meeting. |
|  |
|  |
| [**R4-2204529**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204529.zip)(CMCC: OTA requirements for TS 38.141-2) | Moderator: Resubmission of R4-2203003 endorsed in RAN4#101-bis-e meeting |
| CMCC: In case the removing of [] will be agreed in this meeting, we plan to revise this Draft CR.  |
|  |
| [**R4-2205127**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205127.zip)(Ericsson, Draft big CR for TS38.141-2) | Moderator: Need updates based on the latest discussion for this meetingImplementation of endorsed draft R4-2200754: FR1 PUSCH 256QAM FRC is missing. |
| Ericsson: Thanks for the checking. We will add FRC in the next version. |
|  |
| Big CR for TS 38.104 | NOKIA: What is the best way to handle this Big CR? We can not find a corresponding FRC draft CR. |

## 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.*

|  |  |
| --- | --- |
| **Sub-topic#** | **Status summary**  |
| Simulation results alignment | All interesting companies are fine to remove the square brackets during this meeting.Tentative agreement:* Revise the draft CRs for performance requirements definition to remove the square brackets
* Endorse the draft CRs during this meeting
* Merger all endorsed draft CRs into the corresponding big CR for approval during this meeting.
 |

### CRs/TPs

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| **[R4-2203550](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203550.zip)** (Samsung, FRC for TS 38.141-1) | Agreeable |
| **[R4-2203551](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203551.zip)**(Samsung: FRC for TS 38.141-2) | Agreeable |
| **[R4-2205816](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205816.zip)**(Intel: Requirements for TS 38.104) | *To be revised* |
| **[R4-2205810](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205810.zip)**(Huawei: Conducted requirements for TS 38.141-1) | *Agreeable* |
| **[R4-2204529](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204529.zip)**(CMCC: OTA requirements for TS 38.141-2) | *To be revised* |
| R4-220xxxxx (Nokia, Big CR for TS 38.104) | *New big CR application: bigCR for TS38.104: Introduction of conformance testing requirements for FR1 PUSCH 256QAM (Nokia, Nokia Shanghai Bell)**Need to merge the following draft CRs:** *Revised R4-2205816 (Intel, requirements for TS 38.104)*
* *R4-2201802 (ZTE, FRC for TS 38.104) endorsed in last meeting*
 |
| R4-2205824(Huawei, Big CR for TS 38.141-1) | *Return to**Need to merge the following draft CRs:** *R4-2200132 (CATT, for TS 38.141-1* on manufacture declaration *) endorsed in last meeting*
* *R4-2205810 (Huawei, Conducted performance requirements) agreeable after 1st round discussion*
* *R4-2203550 (Samsung, FRC for TS 38.141-1) agreeable after 1st round discussion*
 |
| **[R4-2205127](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205127.zip)**(Ericsson, Draft big CR for TS38.141-2) | *To be revised**Need to merge the following draft CRs:** *R4-2203001 (CATT, for TS 38.141-2* on manufacture declaration *) endorsed in last meeting*
* *Revised R4-2204529 (CMCC, OTA requirements for TS 38.141-2)*
* *R4-2203551 (Samsung, FRC for TS 38.141-2) agreeable after 1st round discussion*
 |

## Discussion on 2nd round

## Summary for 2nd 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.*

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| bigCR for TS38.104: Introduction of conformance testing requirements for FR1 PUSCH 256QAM | Nokia, Nokia Shanghai Bell | Big CR to merge the endorsed CRs during this meeting and for post-meeting formal approval |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation**  | **Comments** |
| [R4-2203550](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203550.zip) | draft CR on FR1 PUSCH 256QAM FRC for TS 38.141-1 | Samsung | Agreeable |  |
| [R4-2203551](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203551.zip) | draft CR on FR1 PUSCH 256QAM FRC for TS 38.141-2 | Samsung | Agreeable |  |
| R4-2204026 | Big CR for TS38.141-2 FR1 PUSCH 256QAM | Ericsson | Withdrawn |  |
| [R4-2204529](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204529.zip) | Draft CR for TS38.141-2 Requirements for PUSCH with transform precoding disabled for BS type 1-O | CMCC | Revised | to remove the square brackets |
| [R4-2205127](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205127.zip) | Draft big CR for TS38.141-2 FR1 PUSCH 256QAM | Ericsson | Revised | To implement the endorsed draft R4-2200754Change the CR type to formal CR and for post-meeting approval |
| [R4-2205810](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205810.zip) | draft CR for FR1 PUSCH 256QAM requirements in TS 38.141-1 | Huawei,HiSilicon | Agreeable |  |
| R4-2205811 | BigCR for FR1 PUSCH 256QAM requirements in TS 38.104 | Huawei,HiSilicon | Withdrawn |  |
| R4-2205812 | Summary of simulation results for FR1 PUSCH 256QAM performance requirements | Huawei,HiSilicon | Withdrawn |  |
| [R4-2205816](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205816.zip) | Draft CR for TS 38.104: FR1 256QAM PUSCH requirements | Intel Corporation | Revised | to remove the square brackets |
| R4-2205824 | BigCR for FR1 PUSCH 256QAM requirements in TS 38.141-1 | Huawei,HiSilicon | Return to | To merge all endorsed draft CRs for 38.141-1 and for post-meeting approval |

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

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** |
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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)