**3GPP TSG-RAN WG4 Meeting # 98-e R4-21XXXXX**

**Electronic Meeting, 25 January – 5 February 2021**

**Agenda item:** 4.2.3, 7.5.1, 15.2

**Source:** Ericsson

**Title:** Email discussion summary for [98e][108] LTE\_NR\_DC\_CA\_enh\_RF

**Document for:** Information

# Introduction

This email discussion concerns three topics

1. Maintenance of 38.101-1, 38.101-3 and 38.307 (EN-DC and NR-DC)
2. Reply LS to RAN2 on P-Max for FR2
3. Single uplink operation (including action upon the LS from RAN in RP-202622)

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

* 1st round:
  + decide on which of the maintenance CRs to pursue
  + decide on which one of the submitted draft RAN2 reply LSs to send
  + decision on how to capture single-UL only (SUO) in the RAN4 specifications and need for an LS to RAN/RAN2
* 2nd round: TBA

# Topic #1: Maintenance of 38.101-1, 38.101-3 and 38.307

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [R4-2100798](ftp://ftp.3gpp.org/tsg_ran/WG4_Radio/TSGR4_98_e/Docs/R4-2100798.zip) | MediaTek Inc. | MSD due to wider BW evaluation for DC\_28\_n5  (Background to CR in R4-2100844) |
| [R4-2100844](ftp://ftp.3gpp.org/tsg_ran/WG4_Radio/TSGR4_98_e/Docs/R4-2100844.zip) | MediaTek Inc. | Title: CR for 38.101-3 Correction on EN-DC MSD due to cross band isolation for DC\_28\_n5 (R16)  CR to 38.101-3 Rel-16 (Cat F)  Reason for change:  MSD due to introducing wider CBW was further discussed and more IMD impairment shall be considered due to wider NR channel BW. There is MSD due to CIM5 for DC\_28\_n5. Corrections are needed.  Summary of change:  Add MSD due to CIM5 due to NR wider CBW according to R4-2100798 |
| [R4-2102207](ftp://ftp.3gpp.org/tsg_ran/WG4_Radio/TSGR4_98_e/Docs/R4-2102207.zip) | ZTE Corporation, CHTTL | Title: CR to TS 38.307 on the definition of the duplex-mode for the band configurations  CR to 38.307 (Rel-15)  Reason for change:  In current 38.307 spec, there are no definitions for the ‘duplex-mode’ in the table. Due to there are lots of types of band configurations including ENDC, NR-CA, SUL, etc, it is necessary to add the NOTE in the table to describe the meaning of the ‘duplex-mode’ for a certain type of band configuration, especially more and more types of configurations will be added in future.  Also, several ‘FDD and TDD’ inter-band ENDC for PC3 are defined in Rel-15.  Summary of change:  By using the similar method of TS36.307, the NOTE for each ‘duplex-mode’ in the table is added. Also duplex mode of ‘FDD and TDD’ is added for PC3 inter-band ENDC.  *Moderator comment: related CR in R4-2101989 under agenda 4.2.1 [102]* |
| [R4-2102408](ftp://ftp.3gpp.org/tsg_ran/WG4_Radio/TSGR4_98_e/Docs/R4-2102408.zip) | Qualcomm Incorporated | Title: Missing parent clause for NR-DC PCMAX  CR to 38.101-1 (Rel-16)  Reason for change:  Sub-clauses 6.2B.4.1 and 6.2B.4.2 without parent clause 6.2B.4.  Summary of change:  Add missing parent clause |

## Open issues summary

No open issues listed, the CRs submitted are for ‘close-to-finalized Rel-16’ work (comments in sub-clause 1.3.2).

### Sub-topic 1-1

*Sub-topic description:*

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

**Issue 1-1: TBA**

* Proposals
  + Option 1: TBA
  + Option 2: TBA
* Recommended WF
  + TBA

### Sub-topic 1-2

*Sub-topic description*

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

**Issue 1-2: TBA**

* Proposals
  + Option 1: TBA
  + Option 2: TBA
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

Comments on the CRs in the next sub-clause.

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 1-1:  Sub topic 1-2:  ….  Others: |

### 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** |
| [R4-2100844](ftp://ftp.3gpp.org/tsg_ran/WG4_Radio/TSGR4_98_e/Docs/R4-2100844.zip)  TS 38.101-3 CR 449  Rel-16 Cat-F | Company A |
| Company B |
|  |
| [R4-2102207](ftp://ftp.3gpp.org/tsg_ran/WG4_Radio/TSGR4_98_e/Docs/R4-2102207.zip)  TS 38.307 CR 0055  Rel-15 Cat-F | Ericsson: overlaps with R4-2101989 (proposes to remove the duplex modes) |
| Company B |
|  |
| R4-2102208  TS 38.307 CR 0056  Rel-16 Cat-A |  |
|  |
| R4-2102209  TS 38.307 CR 0057  Rel-17 Cat-A |  |
|  |
| [R4-2102408](ftp://ftp.3gpp.org/tsg_ran/WG4_Radio/TSGR4_98_e/Docs/R4-2102408.zip)  TS 38.101-1 CR 0689  Rel-16 Cat-F | Ericsson: agreed. |
|  |
| R4-2102409  TS 38.101-1 CR 0690  Rel-17 Cat-A |  |
|  |

## 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:* |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### 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)

## 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: Reply LS to RAN2 on P-Max for FR2

RAN4 has received a LS from RAN4 on p-NR-FR2, a UE-specific P-Max on a cell group in FR2. RAN4 has not agreed upon inclusion of a UE-specific P-Max in the configured maximum output power in the Rel-16 specification.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [R4-2102044](ftp://ftp.3gpp.org/tsg_ran/WG4_Radio/TSGR4_98_e/Docs/R4-2102044.zip) | Ericsson | Title: LS reply to RAN2 on power control for NR-DC |
| [R4-2102711](ftp://ftp.3gpp.org/tsg_ran/WG4_Radio/TSGR4_98_e/Docs/R4-2102711.zip) | vivo | Title: Discussion and reply LS on p-NR-FR2  **Observation 1**: RAN1 defined p-NR-FR1 and p-NR-FR2 for a certain frequency range as maximum power for uplink power control in MR-DC. P-NR-FR1 is defined for FR1 in EN-DC/NE-DC/NR-DC, while p-NR-FR2 is only defined for FR2 in NR-DC.  **Observation 2**: RAN4 use p-NR-FR1 in EN-DC/NE-DC/NR-DC in the calculation of configured transmitted power, while did not use p-NR-FR2.  **Observation 3:** For FR2, the configured transmitted power is indirectly restricted using Pumax and PTmax, and no place to use p-NR-FR2.  **Observation 4**: For FR2, there is currently no definition and requirements for NR-DC.  **Observation 5**: p-NR-FR2 is similar to p-UE-FR2 in that EIRP and TRP control feasibility problem persists.  **Proposal**: Not using p-NR-FR2 at least in Rel-16, based on similar reason to p-UE-FR2, and also no NR-DC requirements in Rel-16 RAN4. |

## 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 2-1

*Sub-topic description:*

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

**Issue 2-1: Reply LS to RAN2**

* Proposals
  + Option 1: Reply in accordance with R4-2102044
  + Option 2: Reply in accordance with R4-2102711
  + Option 3: other (specify what)
* Recommended WF
  + Choose one of these two available drafts (possibly modified) for a reply this meeting, RAN4 has not agreed to include a UE-specific P-Max for Rel-16.

### Sub-topic 2-2

*Sub-topic description*

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

**Issue 2-2: TBA**

* Proposals
  + Option 1: TBA
  + Option 2: TBA
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 2-1:  Sub topic 2-2:  ….  Others: |
| OPPO | **Issue 2-1: Reply LS to RAN2**  Option 2. |
| Ericsson | **Issue 2-1:**  Option 1, the same intent as Option 2 but answers both questions, |

### 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:* |

*Suggestion on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### 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)

## 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: Single-uplink operation

RAN4 has received an LS from RAN on single-uplink only (SUO) operation in RP-202622 with the following action.

**ACTION:** RAN respectfully requests RAN2/RAN4 to check if any specification clarification is needed to ensure there is no inter-operability issue between the UE side and network side, considering the report of singleUL-Transmission as described in RP-202622.

Moreover, a potential signaling issue for band combinations with several parts allowing single-UL transmission has been identified, and discussions on a SUO capability for a roaming situation will be continued (from RAN4#97-e)

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [R4-2101144](ftp://ftp.3gpp.org/tsg_ran/WG4_Radio/TSGR4_98_e/Docs/R4-2101144.zip) | MediaTek Inc. | Title: Discussion on the reply to LS on single UL operation  **Observation 1: Current feature set reporting allows UE to indicate which pair(s) of CCs that UE can support UL transmission in a single band combination.**  **Observation 2: Single singleUL-Transmission but is not sufficient for UE to indicate dual UL in one UL CC pair and single UL in another CC pair in one band combination.**  **Proposal 1: In Rel-15, to indicate a different singleUL-Transmission capability for a particular UL pair in a high level band combination, UE may additionally report the corresponding fallback band combination with a different singleUL-Transmission capability.**  **Proposal 2: Reply LS to RAN2 with RAN4’s suggestions, but leave it to RAN2 on whether to resolve this issue in R15 or in later releases.** |
| [R4-2101718](ftp://ftp.3gpp.org/tsg_ran/WG4_Radio/TSGR4_98_e/Docs/R4-2101718.zip) | Ericsson | Title: Correction to applicability of simultaneous RX/TX and single-UL transmission  CR to 38.101-3 (Rel-15)  Reason for change (SUO part only):  2. The applicability of single-switched uplink is unclear (LS to RAN4 from RAN in RP-202932).  Summary of change (SUO part only)  2. Clause 5.3B.1.3 and 5.5B.1 (general): The statement that “only single-switched UL is supported” (not the scope of 38.101-3) is replaced by statements that minimum requirements are only specified for single-switched UL and it is clarified that the UE may include the field singleUL-Transmission.  Clause 5.5B, 6.2B.1.2 and 7.3B.2.2: the applicability specified in BCS band combination tables.  Annex H: the applicability for the DC\_3-n3 configuration removed (specified in the band combination tables). |
| [R4-2101820](ftp://ftp.3gpp.org/tsg_ran/WG4_Radio/TSGR4_98_e/Docs/R4-2101820.zip) | Huawei, HiSilicon | Title: Further discussion on RF requirements about Multi-RAT Dual-Connectivity  **Proposal 1:** **There are some specific situation such as roaming in which UE could report “singleUL-Transmission”, which can bring benefits in business application.**  **Proposal 2:** **To introduce a new UE capability for specific ENDC band combinations in roaming situation. This capability can be reported to network with existing capability “singleUL-Transmission” together or separately.** **In this situation, the UE can report roaming indication to clarify the roaming status to the base station together or separately.** |
| [R4-2102387](ftp://ftp.3gpp.org/tsg_ran/WG4_Radio/TSGR4_98_e/Docs/R4-2102387.zip) | Huawei, HiSilicon | Title: On SUO for intra-band EN-DC  ***Proposal: It is proposed to send LS to RAN2 asking some clarification in RAN2 spec that that for intra-band EN-DC combinations which support only single switched UL, the capability singleUL-Transmission must be reported.*** |

## Open issues summary

### Sub-topic 3-1 Clarification of SUO specification

*Sub-topic description: the action in RP-202622*

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

**Issue 3-1-1: Clarification is needed to ensure there is no inter-operability issue between the UE side and network side (RAN LS in RP-202622)**

* Proposals
  + Option 1: Clarification as proposed in R4-2101718 (specify the cases in which the UE includes the *single-UL Transmission*), no LS needed
  + Option 2: Reply LS to RAN/RAN2 that for intra-band EN-DC combinations which support only single switched UL, the capability *single-UL Transmission* must be reported as proposed in R4-2102387, no change to RAN4 specifications
  + Option 3: other (specify which)
* Recommended WF
  + TBA

**Issue 3-1-2: Single UL allowed for several band pairs part of an indicated band combination**

* Proposals
  + Option 1: LS to RAN2 with recommendations according to proposals in R4-2101144
  + Option 2: LS to RAN2 describing the identified issue only
  + Option 3: no need for any changes (no LS)
  + Option 4: other (specify which)
* Recommended WF
  + TBA

### Sub-topic 3-2 Single UL in a roaming scenario

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

**Issue 3-2-1: UE capability for specific ENDC band combinations in roaming situation**

* Proposals
  + Option 1: introduce a SUO capability for specific ENDC band combinations in roaming situation as proposed in R4-2101820 (*Correction by moderator*)
  + Option 2: do not introduce a SUO capability for specific ENDC band combinations in a roaming situation
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 2-1:  Sub topic 2-2:  ….  Others: |
| OPPO | **Issue 3-1-1: Clarification is needed to ensure there is no inter-operability issue between the UE side and network side (RAN LS in RP-202622)**  Option 2, to make the same understanding among groups. |
| Ericsson | **Issue 3-1-1: Clarification is needed to ensure there is no inter-operability issue between the UE side and network side (RAN LS in RP-202622)**  Option 1.  SUO is an *incapability* that should not be mandated in the absence of RAN4 requirements for a band combination. The 38.306 specifies that “The UE may only include this field [*singleUL-Transmission*] for certain band combinations defined in TS 38.101-3 [4].” The 38.101-3 should specify when the UE may include (or when it includes) the *singleUL-Transmission.*  No RAN2 changes needed.  **Issue 3-1-2: Single UL allowed for several band pairs part of an indicated band combination**  Option 2, describing the issue without proposing signalling changes.  On the R4-2101144, we do not agree with the proposal  Proposal 1: In Rel-15, to indicate a different singleUL-Transmission capability for a particular UL pair in a high level band combination, UE may additionally report the corresponding fallback band combination with a different singleUL-Transmission capability.  The capability of a top-level band combination should not be dependent on that of any included fallback combination, this would break the capability signalling.  **Issue 3-2-1: UE capability for specific ENDC band combinations in roaming situation**  Option 2. |

### CRs/TPs comments collection

For R4-2101718, comments only on the SUO part.

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| [R4-2101718](ftp://ftp.3gpp.org/tsg_ran/WG4_Radio/TSGR4_98_e/Docs/R4-2101718.zip)  TS 38.101-3 CR 0461  Rel-15 Cat-F | Company A |
| Company B |
|  |
| R4-2101719  TS 38.101-3 CR 0462  Rel-16 Cat-A | Company A |

## 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:* |

*Suggestion on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### 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)

## 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”* |