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

**Electronic Meeting, Apr. 12-20, 2021**

**Agenda item:** 7.41, 7.42

**Source:** Moderator (CMCC)

**Title:** Email discussion summary for [98-bis-e][126] HPUE\_n34\_n39

**Document for:** Information

# Introduction

WI(s) on introduction of PC2 n34 band (RP-210844) and PC2 n39 band (RP-210845) for NR was approved in RAN#91-e meeting.

This email discussion includes contributions in agenda 7.41 and 7.42, the targets of email discussion based on companies’ contributions submitted in this e-meeting are as below:

* 1st round:
  + Discuss RF requirements for PC2 n34 and n39, and provide comments on the Draft CRs and contributions.
* 2nd round:
  + Strive to approve Draft CRs or WF.

# Topic #1: Introduction of PC2 n34 for NR

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2105014**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2105014.zip) | CMCC | **Proposal 1: The MOP and Tolerance are to be specified as 26dBm ±2 dB for band n34 of power class 2.**  **Proposal 2: The MOP and Tolerance for UL MIMO are to be specified as 26dBm +2/-3 dB for n34 of power class 2.**  **Proposal 3: The n34 power class 2 can be supported form Rel-15 by release independent manner.** |
| [**R4-2105015**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2105015.zip) | CMCC | **Draft CR on PC2 UE RF requirements of n34 in Rel-17 TS 38.101-1** |
| [**R4-2106548**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106548.zip) | Xiaomi | **Proposal 1: the power tolerance for PC2 for n34 is +2/-3 regardless of single antenna case or UL MIMO case.**  **Observation 1: the current general PC2 MPR requirement specified in table 6.2.2-2 in TS 38.101-1 can be reused for PC2 n34.**  **Observation 2: no additional A-MPR requirement for PC2 n34.** |

## 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 UE RF Requirements

**Issue 1-1-1: UE MOP and Tx power tolerance for n34 of Power class 2**

* Proposals
  + Option1: The MOP and Tolerance for single antenna port are to be specified as 26dBm ±2 dB for band n34 of power class 2, and The MOP and Tolerance for UL MIMO are to be specified as 26dBm +2/-3 dB for n34 of power class 2.
  + Option2: The power tolerance for PC2 for n34 is +2/-3. Regardless of single antenna port or UL MIMO case.
* Recommended WF
  + TBA. Collect companies’ view in 1st round

**Issue 1-1-2: MPR and A-MPR**

* Proposals
  + No changes to PC2 MPR and A-MPR requirements for n34.
* Recommended WF
  + TBA. Collect companies’ view in 1st round

**Issue 1-1-3:Release independent issue**

* Proposals
  + The n34 power class 2 can be supported form Rel-15 by release independent manner.
* Recommended WF
  + TBA. Collect companies’ view in 1st round

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 1-1-1:  Issue 1-1-2:  ….  Others: |
| Apple | Issue 1-1-1: Option 2. The current spec defines PC2 with a tolerance of +2/-3. Hence, specifying n34 with the same tolerance falls in line with other bands. If there is no strong reason why it should be tighter for n34 then there should be no exception.  Issue 1-1-2: Changes to PC2 MPR and A-MPR do not seem to be necessary. |
| Skyworks | Issue 1-1-1: PC2 is defined with +2/-3dB => option 2  Issue 1-1-2: No changes to PC2 MPR and A-MPR requirements for n34 |
| Xiaomi | Issue 1-1-1: Option 2  Issue 1-1-2: No changes to PC2 MPR and A-MPR requirements for n34. |

### 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** |
|  | 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:* |

*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: Introduction of PC2 n39 for NR

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2105016**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2105016.zip) | CMCC | **Proposal 1: The MOP and Tolerance are to be specified as 26dBm ±2 dB for band n39 of power class 2.**  **Proposal 2: The MOP and Tolerance for UL MIMO are to be specified as 26dBm +2/-3 dB for n39 of power class 2.**  **Proposal 3: The n39 power class 2 can be supported form Rel-15 by release independent manner.** |
| [**R4-2105017**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2105017.zip) | CMCC | **Draft CR on PC2 UE RF requirements of n39 in Rel-17 TS 38.101-1** |
| [**R4-2106549**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106549.zip) | Xiaomi | **Proposal 1: the power tolerance for PC2 for n39 is +2/-3 regardless of single antenna case or UL MIMO case.**  **Observation 1: the current general PC2 MPR requirement specified in table 6.2.2-2 in TS 38.101-1 can be reused for PC2 n39.**  **Observation 2: the A-MPR requirements for NS\_50 shall be evaluated for PC2 n39.** |

## 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 UE RF Requirements

**Issue 2-1-1: UE MOP and Tx power tolerance for n39 of Power class 2**

* Proposals
  + Option1: The MOP and Tolerance for single antenna port are to be specified as 26dBm ±2 dB for band n39 of power class 2, and The MOP and Tolerance for UL MIMO are to be specified as 26dBm +2/-3 dB for n39 of power class 2.
  + Option2: The power tolerance for PC2 for n39 is +2/-3. Regardless of single antenna port or UL MIMO case.
* Recommended WF
  + TBA. Collect companies’ view in 1st round

**Issue 2-1-2: MPR and A-MPR**

* Proposals
  + No changes to PC2 MPR and A-MPR requirements for n39.
* Recommended WF
  + TBA. Collect companies’ view in 1st round

**Issue 2-1-3:Release independent issue**

* Proposals
  + The n39 power class 2 can be supported form Rel-15 by release independent manner.
* Recommended WF
  + TBA. Collect companies’ view in 1st round

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 2-1-1:  Issue 2-1-2:  ….  Others: |
| Apple | Issue 2-1-1: Option 2. The current spec defines PC2 with a tolerance of +2/-3. Specifying n39 with the same tolerance falls in line with other bands. If there is no strong reason why it should be tighter for n39 then there should be no exception.  Issue 2-1-2: Changes to general PC2 MPR do not seem to be necessary. However due to the 3dB increased power output of PC2 the Note 33 has to be checked. It might be necessary to redefine the frequency and RB requirements in order to guarantee that PC2 MPR is sufficient. Furthermore, since the protected region of NS\_50 is affected by IM3 and IM5 the A-MPR should be re-examined for PC2. |
| Skyworks | Issue 1-1-1: PC2 is defined with +2/-3dB => option 2  Issue 1-1-2: No changes to PC2 MPR for n39. Some aspects of Table 6.5.3.2-1: Requirements for spurious emissions for UE co-existence for n39 may need revisiting for PC2. NS-50 A-MPR needs to be re-evaluated for PC2 |
| Qualcomm | Issue 1-1-2: NS\_50 A-MPR needs re-evaluation for PC2, especially for the wider bandwidths but we should check the smaller ones also with the higher power. |
| Xiaomi | Issue 2-1-1: Option 2  Issue 2-1-2: the A-MPR requirements for NS\_50 shall be evaluated for PC2 n39. |

### 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** |
|  | 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:* |

*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”* |

# 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