**3GPP TSG-RAN WG4 Meeting # 104-e R4-210XXXX**

**Electronic Meeting, 15 Aug– 26 Aug 2022**

**Agenda item:** 9.11.4

**Source:** Moderator (ZTE)

**Title:** Email discussion summary for [104-e][309] NTN\_Solutions\_UERF\_Maintenance

**Document for:** Information

# Introduction

The e-mail discussion covers NTN UE RF requirement, TP to TS 38.101-5 and TP to TR 38.863 on NTN UE RF part.

All contributions submitted are divided into the following Topics:

1. NTN UE Tx requirement
2. NTN UE Rx requirement
3. TP to TS 38.101-5
4. TP to TR 38.863

# Topic #1: UE Tx requirement

## Companies’ contributions summary

(Cat A CRs are not listed)

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| **R4-2212158** | MediaTek (Chengdu) Inc. | NR NTN UE frequency error requirement testing  **Proposal 1: Clarify the intended modelling of doppler shift in the requirements description of inform RAN5.**  **Proposal 2: For NGSO, recommend to RAN5 that the frequency error be measured under varying doppler shift for the non-zero doppler shift case. For zero doppler shift case, a GSO satellite is proposed be modelled.**  **Proposal 3: GSO-only NTN-supporting UEs should not be required to pass the non-zero doppler test, and maybe NGSO-only NTN supporting UEs could not be required to pass the zero doppler test.**  **Proposal 4: Re-use the existing AT command: “Update UE Location Information”, defined in TS 38.509 to provide the UE with location coordinates for usage with precompensation in the Frequency Error test case.** |
| R4-2214046 | Qualcomm Incorporated | Doppler pre-compensation in RF requirements  **Proposal 1: Doppler is set to zero for other than frequency error UE RF requirements**  **Observation: Doppler is real NTN system is not necessary constant**  **Proposal 2: Frequency error with non-zero doppler is required to be within +/- 0.1 ppm in constant doppler conditions.** |

## 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 frequency error for NTN UE conformance testing

*Sub-topic description:*

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

**Issue 1-1: Frequency error assumption for UE RF requirements other than frequency error testing**

* Proposals
  + Option 1: Doppler is set to zero for other than frequency error UE RF requirements [Qualcomm]
  + Option 2: others
* Recommended WF

**Issue 1-2: Frequency error assumption for non-zero doppler**

* Proposals
  + Option 1: Frequency error with non-zero doppler is required to be within +/- 0.1 ppm in constant doppler conditions. [Qualcomm]
  + Option 2: under varying doppler shift for the non-zero doppler shift case [MTK]
  + Option 3: other
* Recommended WF

**Issue 1-3: Recommendation to RAN5 on frequency error measurement**

* Proposals
  + Proposal 1: Clarify the intended modelling of doppler shift in the requirements description of inform RAN5.
  + Proposal 2: For NGSO, recommend to RAN5 that the frequency error be measured under varying doppler shift for the non-zero doppler shift case. For zero doppler shift case, a GSO satellite is proposed be modelled.
  + Proposal 3: GSO-only NTN-supporting UEs should not be required to pass the non-zero doppler test, and maybe NGSO-only NTN supporting UEs could not be required to pass the zero doppler test.
  + Proposal 4: Re-use the existing AT command: “Update UE Location Information”, defined in TS 38.509 to provide the UE with location coordinates for usage with precompensation in the Frequency Error test case.
* Recommended WF

## Companies views’ collection for 1st round

### Open issues

**Issue 1-1:**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Company A | **Issue 1-1:** *Comment* |
| Company B |  |

**Issue 1-2:**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Company A | **Issue 1-2-1:** *Comment*  **Issue 1-2-2:** *Comment*  **Issue 1-2-3:** *Comment* |
| Company B |  |

**Issue 1-3:**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Company A | **Issue 1-3-1:** *Comment*  **Issue 1-3-2:** *Comment*  **Issue 1-3-3:** *Comment* |
| Company B |  |

**Issue 1-4:**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Company A | **Issue 1-4-1:** *Comment*  **Issue 1-4-2:** *Comment*  **Issue 1-4-3:** *Comment* |
| Company B |  |

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
|  | Company A |
| Company B |
|  |
|  | 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 #3: UE Rx requirement

## Companies’ contributions summary

(Cat A CRs are not listed)

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2212165 | Skyworks Solutions Inc. | Band n256 requirement gap for out of-band blocking |
| R4-2212652 | Ericsson | NTN satellite UE out of band blocking requirement |
| R4-2213711 | ZTE Corporation | Further discussion on NTN UE Rx RF requirements |

## 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 OOBB requirements for n256

*Sub-topic description:*

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

**Issue 2-1:**

* Proposals
  + Option 1: Skyworks, ZTE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Operating Band | Parameter | Unit | Range 1 | Range 2 | Range 3 |
|  | Pinterferer | dBm | -44 | -303 | -154 |
| n255 | Finterferer (CW) | MHz | -60 < f – FDL\_low < -15  or  15 < f – FDL\_high < 60 | -85 < f – FDL\_low ≤ -60  or  60 ≤ f – FDL\_high < 85 | 1 ≤ f ≤ FDL\_low – 85  or  FDL\_high + 85 ≤ f  ≤ 12750 |
| n2561 | Finterferer (CW) | MHz | [-100] < f – FDL\_low < -15  or  15 < f – FDL\_high < 60 | [-145] < f – FDL\_low ≤ [-100]  or  60 ≤ f – FDL\_high < 85 | 1 ≤ f ≤ FDL\_low – [145]  or  FDL\_high + 85 ≤ f ≤ 12750 |
| NOTE 1: Band n256 lower frequency ranges are modified to enable specific implementations  NOTE 2: Void  NOTE 3: For band n256 in Range 2 requirement, the Pinterferer should be modified as [-30]  NOTE 4: For band n256 in Range 3 requirement, the Pinterferer should be modified as [-15] | | | | | |

* + Option 2: Ericsson [ keep the same width for range 2 of n256 as the 25 MHz width of usual TN range 2 ]

Table 1: Out of-band blocking for NR satellite bands with FDL\_high < 2700 MHz and FUL\_high < 2700 MHz

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Operating Band | Parameter | Unit | Range 1 | Range 2 | Range 3 |
|  | Pinterferer | dBm | -44 | [-30] | -15 |
| n255,  n256 | Finterferer (CW) | MHz | -60 < f – FDL\_low < -15  or  15 < f – FDL\_high < 60 | -85 < f – FDL\_low ≤ -60  or  60 ≤ f – FDL\_high < 85 | 1 ≤ f ≤ FDL\_low – 85  or  FDL\_high + 85 ≤ f  ≤ 12750 |
| NOTE 1: For band n256 in Range 1 requirement, the applicable lower frequency range should be modified as -100 < f – FDL\_low ≤ -15.  For band n256 in Range 2 requirement, the applicable lower frequency range should be modified as -125 < f – FDL\_low ≤ -100.  ~~NOTE 2:~~ For band n256 in Range 3 requirement, the applicable lower frequency range should be modified as 1 ≤ f ≤ FDL\_low –125  ~~NOTE 3: For band n256 in Range 2 requirement, the P~~~~interferer~~ ~~should be modified as [-30]~~  ~~NOTE 4: For band n256 in Range 3 requirement, the P~~~~interferer~~ ~~should be modified as [-15]~~ | | | | | |

## Companies views’ collection for 1st round

### Open issues

**Issue 2-1:**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Company A | **Issue 2-1:** *Comment* |
| Company B |  |

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **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”.*

# Topic #3: TP to TS 38.101-5

## Companies views’ collection for 1st round

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| **R4-2212645**  **CR to TS 38.101-5 - Tx requirements issues fixes**  **Ericsson** | Company A |
| Company B |
|  |
| **R4-2213156**  **CR for 38.101-5 to further improve the wording for frequency error requirements**  **Huawei, HiSilicon** | Company A |
| Company B |
|  |
| **R4-2212601**  **CR to 38.101-5: Corrections on Rx requirements for NTN UE**  **Xiaomi** |  |
|  |
|  |
| **R4-2212646**  **CR to TS 38.101-5 - Rx requirements issues fixes**  **Ericsson** |  |
|  |
|  |

# Topic #4: TP to TR 38.863

## Companies views’ collection for 1st round

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| **R4-2213155**  **CR for 38.863 to maintain UE RF parts**  **Huawei, HiSilicon** | Company A |
| Company B |
|  |

# Recommendations for Tdocs

## 1st round

**New tdocs**

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

**Existing tdocs**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tdoc number** | **Revised to** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-22xxxxx |  | 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** | **Revised to** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-22xxxxx |  | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-22xxxxx |  | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-22xxxxx |  | 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)