**3GPP TSG-RAN WG4 Meeting #95-e R4-20xxxxx**

**Electronic Meeting, 25 May – 5 June, 2020**

**Agenda item:** 6.4.3.2

**Source:** Moderator (CATT)

**Title:** Email discussion summary for [95e][112] 5G\_V2X\_NRSL\_UE\_RF\_RX

**Document for:** Information

# Introduction

In RAN4#94-e-bis meeting, the corresponding CRs on Rx RF for NR V2X for TS 38.101-1 were endorsed. However, the maximum input level has not reached consensus, and companies still have concern on REFSENS and ACS for Case 2. This email discussion summary will discuss the remaining Rx RF requirements for NR V2X, including REFSENS, the maximum input level and ACS for Case 2.

The candidate targets of this email discussion for 1st round and 2nd round:

* 1st round
  + Discuss the remaining issues and provide comments to make alignments.
  + Companies to review the associated CR and TP, and provide comments for correction if needed.
  + Assign the corresponding WF after the 1st round discussion if needed.
* 2nd round
  + Further discuss the WF and revised CR if any for alignment.
  + Recommend the final statuses of the WF, CR and TP.

# Topic #1: Rx RF requirements

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2006259 | CATT | Proposal 1: The same NF value (13dB) as n47 should be used for n38 REFSENS. The REFSENS of NR V2X bands are specified as Table 1.  Proposal 2: The maximum input level for NR Uu can be reused for NR V2X as specified in Table 2.  Proposal 3: The test parameters for ACS for V2X Case 2 are specified as Table 3. |
| R4-2006261 | CATT | According to [1], the remaining issues on Rx RF requirements for NR V2X are captured in this paper. |
| R4-2006262 | CATT | Draft CR R4-2005633 was endorsed in RAN4#94-e-bis meeting.  The reference sensitivity for band n38, maximum input level and adjacent channel selectivity for case 2 are updated based on R4-2005633. |
| R4-2006821 | Qualcomm Incorporated | Proposal 1: Use a value of 2.5 dB for diversity gain for NR V2X REFSENS calculations.  Proposal 2: Use Reference measurement channel and simulation assumptions given in table 1 for NR V2X REFSENSE target SNR simulation. |
| R4-2008223 | Huawei, HiSilicon | Proposal 1: It is proposed to define a single value maximum input level for all V2X CBWs, and -25dBm as well as -27dBm are proposed to be defined for 64QAM and 256QAM respectively.  Proposal 2: It is proposed to define aligned values of ACS Case 2 with NR Uu. |
| [R4-2006746](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006746.zip) | LG Electronics France | TP on remaining issues for NR V2X UE  The Rx RF part will be treated in this thread. |

## Open issues summary

### Sub-topic 1-1: REFSENS

**Issue 1-1-1: Diversity gain**

* Proposals
  + Option 1: Use a value of 2.5 dB for diversity gain for NR V2X REFSENS calculations.
  + Option 2: Keep the previous agreements to define 3dB diversity gain.
* Recommended WF
  + Need more discussion.

**Issue 1-1-2: Noise figure in licensed band (band n38)**

* Proposals
  + Option 1: Define NF of 13dBm for band n38 like band n47.
  + Option 2: Keep the previous agreements to define NF of 9dB like NR Uu.
* Recommended WF
  + Need more discussion.

**Issue 1-1-3: Reference measurement channel and simulation assumptions for REFSENS target SNR level**

* Proposals
  + Option 1: Use the reference measurement channel and simulation assumptions to derive REFSENSE target SNR level based on R4-2006821 from Qualcomm.
  + Option 2: Keep the previous agreements to define target SNR level as -1dB for REFSENS.
* Recommended WF
  + Need more discussion.

**Issue 1-1-4: ΔRIB,c for V2X\_20\_n38**

* Proposals
  + Option 1: 0.2dB (Note: 3rd harmonic from B20 impact into n38. Harmonic trap filter used to reduce the self desense for reception of NR Band n38)
  + Option 2: Other options are not precluded.
* Recommended WF
  + Need more discussion.

### Sub-topic 1-2: Maximum input level

**Issue 1-2-1: The maximum input level**

* Proposals
  + Option 1: Follow the maximum input levels for NR Uu for 64QAM and 256QAM.
  + Option 2: -25dBm for 64QAM and -27dBm for 256QAM applicable to all CBWs.
* Recommended WF
  + Need more discussion.

### Sub-topic 1-3: ACS for Case 2

**Issue 1-3-1: Power in transmission bandwidth configuration**

* Proposals
  + Option 1: Follow the proposals from CATT and Huawei (R4-2006259 and R4-2008223), decreased by 3dB by following the decision on the maximum input level.
  + Option 2: Keep the previous agreements.
* Recommended WF
  + Need more discussion.

## Companies views’ collection for 1st round

### Open issues

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| **Company** | **Comments** |
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### 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.*

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| **CR/TP number** | **Comments collection** |
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## 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.*

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|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
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*Recommendations on WF/LS assignment*

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

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

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| **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”* |
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## Discussion on 2nd round (if applicable)

## Companies views’ collection for 2st round

### Open issues

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| **Company** | **Comments** |
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### CRs/TPs comments collection

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| **CR/TP number** | **Comments collection** |
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## 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*

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| **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”* |
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