**3GPP TSG-RAN WG4 Meeting # 98-e R4-210xxxx**

**Electronic Meeting, 25th Jan. – 05th Feb., 2021**

**Agenda item:** 7.3.1, 7.3.2 & 7.3.3

**Source:** Moderator (LG Electronics)

**Title:** Email discussion summary for [98e][107] 5G\_V2X\_NRSL\_UE\_RF

**Document for:** Information

# Introduction

In this paper, RAN4 treat the maintenance for UE transmitter/Receiver requirements for single carrier and con-current operation for 5G V2X UE.

The provided technical docs list of email discussion are shown in Reference in the end of the paper.

Candidate target of email discussion for 1st round are listed as following

* 1st round: Treat correction CR and discuss the remaining open issue for switching period between LTE SL and NR SL at ITS spectrum.
  + Topic #1: V2X UE RF requirements
  + Sub-Topic #1-1: Correction CR for TS38.101-1 and TR38.886
    - CR contents from LGE and CATT
  + Sub-Topic #1-2: Correction CR for TS38.101-3
    - CR contents from CATT
  + Sub-Topic #1-3: Position of switching period between LTE SL and NR SL
    - Discussion paper : CATT/vivo/Xiaomi/Huawei
    - CR TS38.101-3 for switching period : Xiaomi/Huawei
* 2nd round: FFS

# Topic #1: Maintenance of V2X UE requirements

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2100280 | LG Electronics | Editorial correction CR in TS38.101-1.  - This CR is to modify some editorial correction as follow  - Changed wording as con-current operation  - Remove NS\_34  - Add Note 1 in Table 6.5.3.4.2-2 for EIRP definition  - Editorial correction in in On/Off time mask  - Correction on the referencing as Annexes A.7.3 and 7.4 for Maximum input levels according to 64QAM and 256QAM. |
| R4-2100404 | CATT | Editorial correction CR in TS38.101-1.  - Transmit OFF power for V2X  - S-SSB time mask for V2X  - Transmit signal quality for V2X  - Spectrum emission mask for V2X  - Additional SEM for V2X |
| R4-2100406 | CATT | CR for TR38.886 v16.2.0  - Correct the tolerance of MOP in clause 8.1.1.  - Change HD to TDD for band n38 in clause 9.1.1.  - Remove the square brackets for maximum input level in clause 9.1.2. |
| R4-2102382 | Huawei | CR for TS38.101-1 to revise FRC parameters  - Parameter sl-PSSCH-DMRS-TimePattern is revised to Number of PSSCH DM-RS to align with RAN1 specification. |
| R4-2100405 | CATT | CR for TS38.101-3  - Correct some reference clause or table numberings.  - Add the requirement description of inter-band con-current operation between NR Uu and E-UTRA V2X in subclauses. |
| [R4-2101870](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101870.zip) | Xiaomi | CR for TS 38.101-3 switching period  1, A Reference to TS 38.213 is added.  2, The switching period requirement is added.    Figure 6.3E.2-1: Time mask for switching between NR V2X SL and E-UTRA V2X SL, where the switching period is located in NR V2X SL    Figure 6.3E.2-2: Time mask for switching between E-UTRA V2X SL and NR V2X SL, where the switching period is located in E-UTRA V2X SL |
| [R4-2102381](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102381.zip) | Huawei, HiSilicon | CR for TS 38.101-3 NR V2X switching period  - Specify the switching period requirement    Figure 6.3E.2-1: Time mask for switching between NR V2X SL and E-UTRA V2X SL |
| [R4-2100403](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100403.zip) | CATT | Discussion on switching period position in ITS band  **Observation 1: There is no dedicated slot configured independent from LTE V2X and NR V2X. The switching period can only be located in either LTE V2X side or NR V2X side.**  **Observation 2: If the specific priority between LTE V2X and NR V2X is specified in RAN1/RAN2, the switching period can be located on the RAT side of lower priority. Otherwise, the switching period position can be left to UE implementation.** |
| [R4-2100783](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100783.zip) | vivo | Further discussion on switching period in the ITS band  **Observation 1: The simultaneous transmission case defined in RAN1 is not the same with the switching case from one transmission to another in RAN4.**  **Observation 2: If the priority information defined in RAN1 is used in deciding the switching period position, there will be an impact on RAN1.**  **Proposal: It is suggested that the whole switching time including switching period as well as transient periods shall be placed at the previous E-UTRA sub-frame or NR slot.** |
| [R4-2101876](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101876.zip) | Xiaomi | switching period  **Observation 1: The 150us is switching period is decided, however, the switching period location needs to be determined in RAN4#98-e.**  **Observation 2: Scheduling restriction in RRM session does not decide where to locate the switching period.**  **Observation 3: Option 4 and 6 don’t give hint to locate the switching period position but can be further discussed as complementary method to improve performance of the switching.**  **Observation 4: The network needs to know the switching period position and option 5 is not acceptable.**  **Observation 5: Priority mechanism has been defined in RAN1 and to locate the switching period position in the lower priority RAT guarantee the interruption will not happen in the higher priority RAT.**  **Observation 6: It is the scheduling restriction causing specific interruption during the switching.**  *The switching periods are located in the lower priority carrier of the NR sidelink and LTE sidelink while the priority is determined by the SCI formats scheduling the transmissions of the channel(s)/signal(s), or, is indicated by higher layers in case of a S-SS/PSBCH block or a sidelink synchronization signal using E-UTRA radio access, or, is equal to the priority of the corresponding PSSCH in case of PSFCH as defined in TS 38.213.*  **Proposal: To capture the above statement in TS 38.101-3.** |
| [R4-2102380](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102380.zip) | Huawei, HiSilicon | SL switching period  ***Proposal 1: It is proposed to consider the SL switching period position based on priority to align with RAN1 specification***  ***Proposal 2: It is proposed to define the time mask for SL switching as in Figure 1 and clarifies the condition of applicability of the priorities.*** |

## 1.2 Open issues summary

*Based on provided contributions, RAN4 mainly treat the correction CRs for TS38.101-1 and TS38.101-3. Based on the agreement, the TR38.886 also can be updated.*

*For the position of switching period, RAN4 will discussed where the switching period can be applied between LTE SL and NR SL at n47 in 1st round.*

* + Topic #1: V2X UE RF requirements
  + Sub-Topic #1-1: Correction CR for TS38.101-1 and TR38.886
    - CR contents from LGE and CATT
  + Sub-Topic #1-2: Correction CR for TS38.101-3
    - CR contents from CATT
  + Sub-Topic #1-3: Position of switching period between LTE SL and NR SL
    - Discussion paper : CATT/vivo/Xiaomi/Huawei
    - CR TS38.101-3 for switching period : Xiaomi/Huawei

### 1.2.1 Sub-topic #1-1

*Sub-topic description:* **Correction CRs in TS38.101-1 and TR38.886**

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

**Issue 1-1-1: *Editorial correction in TS38.101-1***

* Proposals
  + Option 1: Based on 1st round feedback, RAN4 can update the CR (R4-2100280) from LGE as baseline to merge with the contents in CATT CR (R4-2100405).
  + Option 2: Other proposal are not precluded
* Recommended WF
  + RAN4 can agree to the merged CR in 2nd round.

**Issue 1-1-2: *Correction CR in FRC table in TS38.101-1***

* Proposals
  + Option 1: Agree contents in CR from Huawei (R4-2102382).
  + Option 2: Other proposal are not precluded.
* Recommended WF
  + RAN4 will decide one option in 1st round.

**Issue 1-1-3: *Editorial Correction in TR38.886***

* Proposals
  + Option 1: Agree contents in CR from CATT (R4-2100406).
  + Option 2: Other proposal are not precluded.
* Recommended WF
  + RAN4 will decide one option in 1st round.

### 1.2.2 Sub-topic #1-2

*Sub-topic description:* **Correction CRs in TS38.101-3**

**Issue 1-2-1: *CR in TS38.101-3***

* Proposals
  + Option 1: Based on 1st round feedback, RAN4 can update the CR from CATT (R4-2100405).
  + Option 2: Other proposal are not precluded.
* Recommended WF
  + RAN4 will decide one option in 1st round.

### 1.2.3 Sub-topic #1-3

*Sub-topic description:* **Position of****Switching period between LTE SL and NR SL**

*There are 4 discussion papers and two CRs to update switching period for 5G V2X UE.*

*Previous approved WF on switching period between LTE SL and NR SL as follow*

* *Due to large switching period defined in RRM spec, no need to consider the RF test for switching time requirement if defined*
* *Specific switching time 150us is captured in TR only*
* *Switching period position will be determined in RAN4#98e with consideration of feedback from RAN1/RAN2 on priority as well*
* *Option of no RF time mask requirement and leave it to UE implementation can also be considered in RAN4#98e*

**Issue 1-3-1: Can RAN4 need to apply the priority mechanism in RAN1/RAN2 for switching period related requirements when the priority of one of the SL operation is higher than the priority of the other SL operation?**

* Proposals
  + Option 1: Yes
  + Option 2: No
* Recommended WF
  + RAN4 will further discuss based on 1st round feedback

**Issue 1-3-2: Can RAN4 need to apply the priority mechanism in RAN1/RAN2 for switching period related requirements when the priority of one of the SL operation is same as the priority of the other SL operation?**

* Proposals
  + Option 1: Yes
  + Option 2: No
* Recommended WF
  + RAN4 will further discuss based on 1st round feedback

**Issue 1-3-3: CRs for the position of switching period in TS38.101-3**

* Proposals
  + Option 1: Follow Xiaomi proposal in CR (R4-2101876).
  + Option 2: Follow Huawei proposal in CR (R4-2102386)
  + Option 3: No need to define Time mask in TS38.101-3 for switching between NR SL and LTE SL
* Recommended WF
  + RAN4 will further discuss based on 1st round feedback

## 1.3 Companies views’ collection for 1st round

### 1.3.1 Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| xxx | Sub topic 1-1: Correction CRs in TS38.101-1 and TR38.886  **Issue 1-1-1: *Editorial correction in TS38.101-1***  **Issue 1-1-2: *Correction CR in FRC table in TS38.101-1***  **Issue 1-1-3: *Editorial Correction in TR38.886***  Sub topic 1-2: Correction CRs in TS38.101-3  **Issue 1-2-1: *CR in TS38.101-3***  Sub topic 1-3: Position of Switching period between LTE SL and NR SL  **Issue 1-3-1: Can RAN4 need to apply the priority mechanism in RAN1/RAN2 for switching period related requirements when the priority of one of the SL operation is higher than the priority of the other SL operation?**  **Issue 1-3-2: Can RAN4 need to apply the priority mechanism in RAN1/RAN2 for switching period related requirements when the priority of one of the SL operation is same as the priority of the other SL operation?**  **Issue 1-3-3: CRs for the position of switching period in TS38.101-3** |
| yyy |  |
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|  |  |
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### 1.3.2 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** |
| **R4-2100280** | **XXX** |
| **YYY** |
| **ZZZ** |
| **R4-2100404** | **XXX** |
| **YYY** |
| **ZZZ** |
| **R4-2100405** | **XXX** |
| **YYY** |
| **ZZZ** |
| **R4-2100406** | **XXX** |
| **YYY** |
| **ZZZ** |
| **R4-2102382** | **XXX** |
| **YYY** |
| **ZZZ** |
| **R4-2101870** | **XXX** |
| **YYY** |
| **ZZZ** |
| **R4-2102381** | **XXX** |
| **YYY** |
| **ZZZ** |

## 1.4 Summary for 1st round

### 1.4.1 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#1-1**  **Correction CRs in TS38.101-1 and TR38.886** | **Issue 1-1-1: *Editorial correction in TS38.101-1*** |
| **Issue 1-1-2: *Correction CR in FRC table in TS38.101-1*** |
| **Issue 1-1-3: *Editorial Correction in TR38.886*** |
| **Sub-Topic#1-2**  **Correction CRs in TS38.101-3** | **Issue 1-2-1: C*orrection CR in TS38.101-3*** |
| **Sub-Topic#1-3**  **Position of Switching period between LTE SL and NR SL** | **Issue 1-3-1: Can RAN4 need to apply the priority mechanism in RAN1/RAN2 for switching period related requirements when the priority of one of the SL operation is higher than the priority of the other SL operation?** |
| **Issue 1-3-2: Can RAN4 need to apply the priority mechanism in RAN1/RAN2 for switching period related requirements when the priority of one of the SL operation is same as the priority of the other SL operation?** |
| **Issue 1-3-3: CRs for the position of switching period in TS38.101-3** |

*Recommendations on WF/LS assignment*

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

### 1.4.2 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** |
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## 1.5 Discussion on 2nd round (if applicable)

RAN4 will further discuss based on the WF and revised TPs/CRs in 2nd round.

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| **T-doc number** | **Company** | **Comments** |
|  |  |  |
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## 1.6 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** |
|  |  |
|  |  |

# Reference Tdoc lists

|  |  |  |  |
| --- | --- | --- | --- |
| **TDoc** | **Title** | **Source** | **Type** |
| [**R4-2100280**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100280.zip) | CR on editorial correction on V2X operation in TS38.101-1 in Rel-16 | LG Electronics France | CR |
| R4-2100281 | CR on editorial correction on V2X operation in TS38.101-1 in Rel-17 | LG Electronics France | CR |
| [**R4-2100403**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100403.zip) | Discussion on switching period position in ITS band | CATT | discussion |
| [**R4-2100404**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100404.zip) | CR for TS 38.101-1, General corrections for NR V2X | CATT | CR |
| [**R4-2100405**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100405.zip) | CR for TS 38.101-3, General corrections for NR V2X | CATT | CR |
| [**R4-2100406**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100406.zip) | CR for 38.886, General corrections for NR V2X | CATT | CR |
| R4-2100499 | CR for TS 38.101-1, General corrections for NR V2X | CATT | CR |
| R4-2100500 | CR for TS 38.101-3, General corrections for NR V2X | CATT | CR |
| [**R4-2100783**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100783.zip) | Further discussion on switching period in the ITS band | vivo | discussion |
| [**R4-2101870**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101870.zip) | CR for TS 38.101-3 switching period for V2X con-current operation Rel-16 | Xiaomi | CR |
| R4-2101871 | CR for TS 38.101-3 switching period for V2X con-current operation Rel-17 | Xiaomi | CR |
| [**R4-2101876**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101876.zip) | on switching period | Xiaomi | discussion |
| [**R4-2102380**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102380.zip) | On SL switching period | Huawei, HiSilicon | other |
| [**R4-2102381**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102381.zip) | CR for TS 38.101-3 NR V2X switching period | Huawei, HiSilicon | CR |
| [**R4-2102382**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102382.zip) | CR for 38.101-1 correction of NR V2X FRC parameter | Huawei, HiSilicon | CR |