**3GPP TSG-RAN WG4 Meeting # 98-e *R4-2103815***

**Electronic Meeting, 25 Jan. - 5 Feb., 2021**

|  |
| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **38.101-4** | **CR** | **-** | **rev** | **1** | **Current version:** | **16.3.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

|  |
| --- |
|  |
| ***Title:***  | Draft CR for PSSCH demodulation requirements for NR V2X |
|  |  |
| ***Source to WG:*** | LG Electronics |
| ***Source to TSG:*** | RAN4 |
|  |  |
| ***Work item code:*** | 5G\_V2X\_NRSL-Perf |  | ***Date:*** | 2021-01-15 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-16 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | According to Big draft CR approach, draft CR for PSSCH demodulation requirements were submitted based on RAN4#97-e meeting agreements. |
|  |  |
| ***Summary of change:*** | The PSSCH demodulation requirements have been added. |
|  |  |
| ***Consequences if not approved:*** | The performance requirements will be incompleted. |
|  |  |
| ***Clauses affected:*** |  |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** | **X** |  |  Test specifications | TS38.521-4  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

**----- << Start of Change 1>> -----**

# 11 V2X Requirements

## 11.1 Demodulation performance requirements (conducted requirements)

### 11.1.1 General

### 11.1.2 PSSCH performance requirements

The purpose of the requirements in this subclause is to verify the PSSCH for V2X demodulation performance with a single active PSSCH link.

The minimum requirements are specified in Table 11.1.2-2 with the test parameters specified in Table 11.1.2-1. In this test scenario, GNSS or GNSS-equivalent synchronization source is used and sidelink UE 1 transmits PSCCH and PSSCH.

Table 11.1.2-1: Test parameters

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Unit** | **Value**  |
| **Test 1** | **[Test 2]** | **Test 3** |
| Resource pool configuration |  | As specified in Table A.y-1 (Configuration #1-V2X) |
|  |  |  |
| Active cell(s) |  | None |
| Sidelink UE 1 | Sidelink transmissions |  | PSCCH + PSSCH  |
| 2nd stage SCI format 2-A configuration | Payloads | Bits | 35 | 35 | 35 |
| *α* |  | 1 | 1 | 1 |
| *βoffset* |  | 3.5 | 5 | 5 |
| *γ* | Bits | 4 | 8 | 3 |
| Timing offset (Note 1) |  | CP/2-12\*64\*Tc |
| Frequency offset (Note 2) | Hz | +600 |
| Synchronization |  | GNSS or GNSS-equivalent |
| Antenna configuration |  | 1x2 |
| PSFCH resource period | Slot | [4] | 4 | [4] |
| MinTimeGapPSFCH | Slot | [3] | 3 | [3] |
| Note 1: Time offset of sidelink UE receive signal with respect to GNSS referring timing.Note 2: Frequency offset of sidelink UE with respect to GNSS reference frequency. |

Table 11.1.2‑2: Minimum performance

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |
| **Test num.** | **Reference channel** | **Bandwidth (MHz)/Subcarrier spacing(kHz)** | **Modulation format and code rate** | **Propagation condition** | **Reference value** |
| **PSSCH BLER (%)** | **SNR(dB) of PSSCH** |
| 1 | CD.1 | 20 / 30 | QPSK, 0.30 | TDLA30-2700 | 10% | TBD |
| [2] | CD.2 | 20 / 30 | 16QAM, 0.37 | TDLA-1400 | TBD |
| 3 | CD.3 | 20 / 30 | 64QAM, 0.43 | TDLA-180 | TBD |

**----- << End of Change 1>> -----**

**----- << Start of Change 2>> -----**

# A.x V2X reference measurement channels

## A.x.1 General

The transport block size (TBS) determination procedure is described in clause 8.1.3 of TS 38.214 [12].

## A.x.2 Reference measurement channels for PSSCH performance requirements

Table A.x.2-1: PSSCH Reference Channel for V2X

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Unit** | **Value** |
| Reference channel |  | CD.1 | [CD.2] | CD.3 |  |
| Channel bandwidth | MHz | 20 | 20 | 20 |  |
| Subcarrier spacing | kHz | 30 | 30 | 30 |  |
| Allocated resource blocks | RB | 20 | [20] | [10] |  |
| CP-OFDM symbols for slot with PSFCH(Note 1) |  | [9] | 9 | [9] |  |
| CP-OFDM symbols for slot without PSFCH  |  | [12] | 12 | [12] |  |
| DMRS symbols for slot with PSFCH |  | [3] | [2] | 2 |  |
| DMRS symbols for slot without PSFCH |  | [4] | [3] | 2 |  |
| Modulation order |  | QPSK | 16QAM | 64QAM |  |
| MCS index |  | 4 | 11 | 17 |  |
| Number of MIMO layers |  | 1 | 1 | 1 |  |
| Number of DMRS REs |  |  |  |  |  |
| Transport Block Size for slot with PSFCH | Bits | [704] | [1928] | [984] |  |
| Transport Block Size for slot without PSFCH | Bits | [1064] | [2856] | [1928] |  |
| Transport block CRC | Bits | 24 | 24 | 24 |  |
| Maximum number of HARQ transmissions |  | 1 | 1 | 1 |  |
| Binary Channel Bits for slots with PSFCH |  | [2304] | [5088] | [2232] |  |
| Binary Channel Bits for slots without PSFCH | Bits | [3504] | [7728] | [4392] |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Note 1: OFDM symbols is for PSCCH/PSSCH transmission not including first symbol (AGC) and PSFCH symbols. |

**----- << End of Change 2>> -----**

**----- << Start of Change 3>> -----**

# A.y V2X reference resource pool configurations

Table A.y-1 V2X sidelink communication resource pool for PSSCH tests (Configuration #1-V2X)

|  |  |
| --- | --- |
| **Information Element** | **Value** |
| **CD.1** | **[CD.2]** | **CD.3** |
| SL-ResourcePool-r16 | sl-PSCCH-Config-r16 | sl-TimeResourcePSCCH-r16 | n2 | n2 | n2 |
|  |  | sl-FreqResourcePSCCH-r16 | n10 | n10 | n10 |
|  | sl-SyncAllowed-r16 |  | gnss-Sync-r16 | gnss-Sync-r16 | gnss-Sync-r16 |
|  | sl-SubchannelSize-r16 |  | [n10] | [n10] | [n10] |
|  | sl-TimeResource-r16 |  | 160 | 160 | 160 |
|  | sl-StartRB-Subchannel-r16 |  | 0 | 0 | 0 |
|  | sl-NumSubchannel-r16 |  | [2] | [2] | [1] |
|  | sl-Additional-MCS-Table-r16 |  | Not presented | Not presented | Not presented |
|  | sl-RB-Number-r16 |  | 51 | 51 | 51 |
|  | sl-X-Overhead-r16 |  | n0 | n0 | n0 |

**----- << End of Change 3>> -----**