3GPP TSG-RAN WG4 Meeting # 99-e R4-21xxxxx

Electronic Meeting, May. 19-27, 2021

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **38.101-4** | **CR** |  | **rev** | **-** | **Current version:** | **16.4.0** |  |
|  |
| *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 |  |

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|  |
| ***Title:***  | Draft CR: Demod HARQ buffer soft combining test cases for NR V2X  |
|  |  |
| ***Source to WG:*** | Qualcomm Incorporated |
| ***Source to TSG:*** | RAN4 |
|  |  |
| ***Work item code:*** | 5G\_V2X\_NRSL-Perf |  | ***Date:*** | 2021-05-11 |
|  |  |  |  |  |
| ***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:*** | Add the demod HARQ buffer soft combining test cases for Rel-16 NR V2X |
|  |  |
| ***Summary of change:*** | Rel-16 NR V2X demod HARQ buffer soft combining test cases |
|  |  |
| ***Consequences if not approved:*** | The demod HARQ buffer soft combining test cases for Rel-16 NR V2X not be added. |
|  |  |
| ***Clauses affected:*** | (New clause) 11.1.7, A.6.6 |
|  |  |
|  | **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>> -----**

### 11.1.7 HARQ buffer soft combining test

#### 11.1.7.1 2Rx requirement

##### 11.1.7.1.1 Minimum requirement

The purpose of this test is to verify the maximum number of HARQ processes per TTI supported by the V2X UE.

The minimum requirement is specified in Table 11.1.7.1.1-2 with the test parameters specified in Table 11.1.7.1.1-1.

Table 11.1.7.1.1-1: Test Parameters

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Test 1 |
| Active cell(s) |  | None |
| Active Sidelink UE(s) |  | Sidelink UE i, 0 ≤ i ≤ *n* (Note 1,2) |
| Sidelink UE i,0 ≤ i ≤ *n* | Sidelink Transmissions |  | PSCCH + PSSCH |
| PSSCH DMRS pattern  |  | {2} |
| Time gap between initial transmission and retransmission | Slots | [*n* (Note 3)] |
| Timing offset (Note 4) | μs | 0 |
| Frequency offset (Note 5) | Hz | 0 |
| Synchronization source |  | GNSS or GNSS-equivalent |
| Antenna configuration |  | 1x2 Low |
| Redundancy version coding sequence |  | {0,2} |
| PSFCH resource period | Slots | 1 |
| Note 1: *n* is the number of HARQ process UE can support (based on IE harq-RxProcessSidelink)Note 2: When *n* = 16 or 24, sidelink UEs transmit one by one circularly for every slot; When *n*=32, the first 31 UEs transmit signal one by one circularly for every slot and in the first subchannel, and the 32nd UE transmits signal in the first slot but in the second subchannel; When *n*=48, the first 31 UEs transmit signal one by one circularly for every slot and in the first subchannel, the next 17 UEs transmit signal in the same slot as the first 17 UEs but in the second subchannel; When *n*=64, first 31 UEs transmit signal one by one circularly for every slot and in the first subchannel, the next 31 UEs transmit signal one by one circularly for every slot and in the second subchannel, the last 2 UEs transmit signal in the same slot as the first 2 UEs in the third subchannel Note 3: *k* = *n* if *n* < 32, otherwise *k* = 31Note 4: Time offset of Sidelink UE receive signal is with respect to GNSS reference timing.Note 5: Frequency offset of Sidelink UE receive signal is with respect to GNSS reference frequency. |

Table 11.1.7.1.1-2: Minimum performance

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test num. | Bandwidth (MHz) /Subcarrier spacing(kHz) | PSSCH Reference channel | Propagation condition | Reference value |
| PSSCH BLER (%) | SNR (dB) of PSSCH |
| 1 | 20 / 30 | R.PSSCH.2-1.5 | AWGN | 5 | 10.9 |

## A.6.6 Reference measurement channels for HARQ buffer soft combining test

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Unit** | **Value** |
| Reference channel |  | R.PSSCH.2-1.x |  |  |  |
| Channel bandwidth | MHz | 20 |  |  |  |
| Subcarrier spacing | kHz | 30 |  |  |  |
| Allocated resource blocks | RB | 10 |  |  |  |
| CP-OFDM symbols for slot with PSFCH(Note 1) |  | 9 |  |  |  |
| Modulation order |  | 64QAM |  |  |  |
| MCS index |  | 27 |  |  |  |
| Number of MIMO layers |  | 1 |  |  |  |
| Number of DMRS REs |  | 12 |  |  |  |
| Number of REs for SCI format 1-A |  | 240 |  |  |  |
| 2nd stage SCI format 2-A configuration | payloads |  | 35 |  |  |  |
| *α* |  | 1 |  |  |  |
| *βoffset* |  | 2.5 |  |  |  |
| Overhead for TBS determination |  | 0 |  |  |  |
| Transport Block Size for slot with PSFCH | Bits | 3496 |  |  |  |
| Transport block CRC | Bits | 16 |  |  |  |
| Maximum number of HARQ transmissions |  | 2 |  |  |  |
| Binary Channel Bits for slots with PSFCH |  | 3816 |  |  |  |
| Note 1: OFDM symbols is for PSCCH/PSSCH transmission not including first symbol (AGC), PSFCH symbols, and guard symbols. |

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