**3GPP TSG-RAN WG1 Meeting #102-e *R1-200xxxx***

**e-Meeting, August 17th – 28th, 2020**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **DRAFT CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.212** | **CR** |  | **rev** | **-** | **Current version:** | **16.2.0** |  |
|  | | | | | | | | |
| *For* [***HELP***](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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Corrections on 5G V2X sidelink features | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei | | | | | | | | | |
| ***Source to TSG:*** | R1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_V2X\_NRSL-Core | | | | |  | ***Date:*** | | | 2020-09-01 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***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 can be 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-12 (Release 12) Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Corrections based on text-proposals/agreements made at RAN1#102-e including alignment across specifications. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Correction based on email thread [102-e-NR-5G\_V2X\_NRSL-PHYstructure-01] (R1-2007160); 2. Correction based on email thread [102-e-NR- 5G\_V2X\_NRSL-PHYprocedure-01] (R1-2007349); 3. Correction based on email thread [102-e-NR-5G\_V2X\_NRSL-Mode-1-01] (R1-2007415); 4. Correction based on the RAN1#102-e agreement: “ = - - -” is replaced with “” in clause 8.4.4, including removal of corresponding definition on and. 5. In SCI format 1-A, remove the incorrect case of *sl-PSSCH-DMRS-TimePatternList* being not configured. 6. Correction to DCI format 3\_0 and SCI formats 2-A/2-B to set the HARQ process number field size to 4 bits based on the value range of *sl-NrOfHARQ-Processes* being always (1…16) in TS 38.331. 7. Reference alignment and editorial changes  * For SCI format 2-B:   + “Communication range requirement” is provided by higher layer parameter *sl-ZoneConfigMCR-Index* in TS 38.331 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Incomplete specification of 5G V2X sidelink. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 7.3.1.0.1(new), 7.3.1.4.1, 8.3.1.1, 8.4.1.1, 8.4.1.2, 8.4.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 38.211, TS 38.213, TS 38.214 | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

7 Downlink transport channels and control information

< Unchanged parts are omitted >

### 7.3.1 DCI formats

< Unchanged parts are omitted >

#### 7.3.1.0 DCI size alignment

< Unchanged parts are omitted >

##### 7.3.1.0.1 DCI size alignment for DCI formats for scheduling of sidelink

If DCI format 3\_0 or DCI format 3\_1 is monitored on a cell, DCI size alignment for DCI format 3\_0 and DCI format 3\_1 is performed as described in this clause after performing the DCI size alignment described in Clause 7.3.1.0. The size(s) of the DCI formats configured to monitor for a cell in this clause refers to that after performing the DCI size alignment described in Clause 7.3.1.0.

If DCI format 3\_0 or DCI format 3\_1 is monitored on a cell and the total number of DCI sizes of the DCI formats configured to monitor for the cell and DCI format 3\_0 or DCI format 3\_1 is more than 4, zeros shall be appended to DCI format 3\_0 if configured and DCI format 3\_1 if configured, until the payload size of DCI format 3\_0 or DCI format 3\_1 equals that of the smallest DCI format configured to monitor for the cell that is larger than DCI format 3\_0 or DCI format 3\_1.

The UE is not expected to handle a configuration that results in:

- the total number of different DCI sizes configured to monitor for the cell and DCI format 3\_0 or DCI format 3\_1 is more than 4; and

- the payload size of DCI format 3\_0 or DCI format 3\_1 is larger than the payload size of all other DCI formats configured to monitor for the cell.

7.3.1.4.1 Format 3\_0

DCI format 3\_0 is used for scheduling of NR PSCCH and NR PSSCH in one cell.

The following information is transmitted by means of the DCI format 3\_0 with CRC scrambled by SL-RNTI or SL-CS-RNTI:

- Resource pool index – bits, where *I* is the number of resource pools for transmission configured by the higher layer parameter *sl-TxPoolScheduling*.

- Time gap – 3 bits determined by higher layer parameter *sl-DCI-ToSL-Trans,* as defined in clause 8.1.2.1 of [6, TS 38.214]

- HARQ process number – 4 bitsas defined in clause 16.4 of [5, TS 38.213]

< Unchanged parts are omitted >

# 8 Sidelink transport channels and control information

< Unchanged parts are omitted >

### 8.3.1 1st-stage SCI formats

< Unchanged parts are omitted >

#### 8.3.1.1 SCI format 1-A

SCI format 1-A is used for the scheduling of PSSCH and 2nd-stage-SCI on PSSCH

The following information is transmitted by means of the SCI format 1-A:

- Priority – 3 bits as specified in clause 5.4.3.3 of [12, TS 23.287] and clause 5.22.1.3.1 of [8, TS 38.321].

- Frequency resource assignment – bits when the value of the higher layer parameter *sl-MaxNumPerReserve* is configured to 2; otherwise bits when the value of the higher layer parameter *sl-MaxNumPerReserve* is configured to 3, as defined in clause 8.1.2.2 of [6, TS 38.214].

- Time resource assignment – 5 bits when the value of the higher layer parameter *sl-MaxNumPerReserve* is configured to 2; otherwise 9 bits when the value of the higher layer parameter *sl-MaxNumPerReserve* is configured to 3, as defined in clause 8.1.2.1 of [6, TS 38.214].

- Resource reservation period – bits as defined in clause 8.1.4 of [6, TS 38.214], where is the number of entries in the higher layer parameter *sl-ResourceReservePeriodList*, if higher layer parameter *sl-MultiReserveResource* is configured; 0 bit otherwise.

- DMRS pattern – bits as defined in clause 8.4.1.1.2 of [4, TS 38.211], where is the number of DMRS patterns configured by higher layer parameter *sl-PSSCH-DMRS-TimePatternList*.

< Unchanged parts are omitted >

### 8.4.1 2nd-stage SCI formats

< Unchanged parts are omitted >

#### 8.4.1.1 SCI format 2-A

SCI format 2-A is used for the decoding of PSSCH, with HARQ operation when HARQ-ACK information includes ACK or NACK, when HARQ-ACK information includes only NACK, or when there is no feedback of HARQ-ACK information.

The following information is transmitted by means of the SCI format 2-A:

- HARQ process number – 4 bits as defined in clause 16.4 of [5, TS 38.213].

- New data indicator – 1 bit as defined in clause 16.4 of [5, TS 38.213].

- Redundancy version – 2 bits as defined in clause 16.4 of [6, TS 38.214].

- Source ID – 8 bits as defined in clause 8.1 of [6, TS 38.214].

- Destination ID – 16 bits as defined in clause 8.1 of [6, TS 38.214].

- HARQ feedback enabled/disabled indicator – 1 bit as defined in clause 16.3 of [5, TS 38.213].

- Cast type indicator – 2 bits as defined in Table 8.4.1.1-1.

- CSI request – 1 bit as defined in clause 8.2.1 of [6, TS 38.214].

Table 8.4.1.1-1: Cast type indicator

|  |  |
| --- | --- |
| **Value of Cast type indicator** | **Cast type** |
| 00 | Broadcast |
| 01 | Groupcast  when HARQ-ACK information includes ACK or NACK |
| 10 | Unicast |
| 11 | Groupcast  when HARQ-ACK information includes only NACK |

#### 8.4.1.2 SCI format 2-B

SCI format 2-B is used for the decoding of PSSCH, with HARQ operation when HARQ-ACK information includes only NACK, or when there is no feedback of HARQ-ACK information.

The following information is transmitted by means of the SCI format 2-B:

- HARQ process number – 4 bits as defined in clause 16.4 of [5, TS 38.213].

- New data indicator – 1 bit as defined in clause 16.4 of [5, TS 38.213].

- Redundancy version – 2 bits as defined in clause 16.4 of [6, TS 38.214].

- Source ID – 8 bits as defined in clause 8.1 of [6, TS 38.214].

- Destination ID – 16 bits as defined in clause 8.1 of [6, TS 38.214].

- HARQ feedback enabled/disabled indicator – 1 bit as defined in clause 16.3 of [5, TS 38.213].

- Zone ID – 12 bits as defined in clause 5.8.11 of [9, TS 38.331].

- Communication range requirement – 4 bits determined by higher layer parameter *sl-ZoneConfigMCR-Index*.

< Unchanged parts are omitted >

### 8.4.4 Rate Matching

For 2nd-stage SCI transmission on PSSCH with SL-SCH, the number of coded modulation symbols generated for 2nd-stage SCI transmission prior to duplication for the 2nd layer if present, denoted as, is determined as follows:

where

-  is the number of the 2nd-stage SCI bits

-  is the number of CRC bits for the 2nd-stage SCI, which is 24 bits.

-  is indicated in the corresponding 1st-stage SCI.

- is the scheduled bandwidth of PSSCH transmission, expressed as a number of subcarriers.

- is the number of subcarriers in OFDM symbol that carry PSCCH and PSCCH DMRS associated with the PSSCH transmission.

-  is the number of resource elements that can be used for transmission of the 2nd-stage SCI in OFDM symbol , for and for , in PSSCH transmission, where = *sl-lengthSymbols* - 2, where *sl-lengthSymbols* is the number of sidelink symbols within the slot provided by higher layers as defined in [6, TS 38.214]. If higher layer parameter *sl-PSFCH-Period* = 2 or 4, = 3 if "PSFCH overhead indication" field of SCI format 1-A indicates "1", and = 0 otherwise. If higher layer parameter *sl-PSFCH-Period* = 0, . If higher layer parameter *sl-PSFCH-Period* is 1, .

-

- is the number of vacant resource elements in the resource block to which the last coded symbol of the 2nd-stage SCI belongs.

- is the coding rate as indicated by "Modulation and coding scheme" field in SCI format 1-A.

- is configured by higher layer parameter *sl-Scaling*.

The input bit sequence to rate matching is, where is the number of coded bits.

Rate matching is performed according to Clause 5.4.1 by setting.

The output bit sequence after rate matching is denoted as, where and is modulation order of the 2nd-stage SCI. A UE is not expected to have.

< Unchanged parts are omitted >