**3GPP TSG-RAN WG4 Meeting # 102-e R4-2204173 R4-22xxxxx**

**Electronic Meeting, February 21 – March 3, 2022**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.101-3** | **CR** | **-** | **rev** | **-** | **Current version:** | **17.4.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

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

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Big CR for 38.101-3, Introduce new band combination for V2X con-current operation | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | CATT | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_LTE\_V2X\_PC5\_combos-Core | | | | |  | ***Date:*** | | | 2022-03-04 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The con-current operation should be introduced based on request. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The following endorsed CR are merged:  1. R4-2200147\_Draft CR for TS 38.101-3, Introduce new band combination of V2X\_n8A\_47A and V2X\_8A\_n47A  2. R4-2206444\_Draft CR for TS 38.101-3, Introduce new band combination of V2X\_n1A\_47A and V2X\_1A\_n47A | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The con-current operation of such band combinations would not be defined in 38.101-3. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.2E.2, 5.5E.4, 6.5E.3.2.2, 7.3E.2.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS 38.521-3 | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

*<Start of Change 1>*

### 5.2E.2 Inter-band V2X bands

NR V2X operation is designed to operate concurrent with E-UTRA uplink/downlink on the operating bands combinations listed in Table 5.2E.2-1.

Table 5.2E.2-1: Inter-band con-current V2X operating bands

|  |  |  |
| --- | --- | --- |
| E-UTRA-NR V2X Band Combination | E-UTRA or NR Band | Interface |
| V2X\_1\_n47 | 1 | Uu |
| n47 | PC5 |
| V2X\_n1\_47 | n1 | Uu |
|  | 47 | PC5 |
| V2X\_8\_n47 | 8 | Uu |
| n47 | PC5 |
| V2X\_n8\_47 | n8 | Uu |
|  | 47 | PC5 |
| V2X\_3\_n47 | 3 | Uu |
| n47 | PC5 |
| V2X\_20\_n38 | 20 | Uu |
|  | n38 | PC5 |
| V2X\_n39\_47 | 47 | PC5 |
|  | n39 | Uu |
| V2X\_39\_n47 | 39 | Uu |
|  | n47 | PC5 |
| V2X\_n40\_47 | 47 | PC5 |
|  | n40 | Uu |
| V2X\_40\_n47 | 40 | Uu |
|  | n47 | PC5 |
| V2X\_n71\_47 | 47 | PC5 |
|  | n71 | Uu |
| V2X\_41\_n47 | 41 | Uu |
| n47 | PC5 |
| V2X\_n71\_47 | 47 | PC5 |
| n71 | Uu |
| V2X\_n71-(n)471 | 47 | PC5 |
|  | n47 | PC5 |
|  | n71 | Uu |
| V2X\_n78\_47 | 47 | PC5 |
| n78 | Uu |
| V2X\_n79\_47 | 47 | PC5 |
| n79 | Uu |
| NOTE 1: Only single switched SL in ITS band is supported. | | |

*<End of Change 1>*

*<Start of Change 2>*

### 5.5E.4 Inter-band V2X operation in FR1

#### 5.5E.4.1 Inter-band V2X configurations within FR1 (two bands)

Table 5.5E.4.1-1: Inter-band V2X configurations

|  |  |
| --- | --- |
| V2X  configuration | V2X transmission configuration |
| V2X\_1A\_n47A | V2X\_1A\_n47A |
| V2X\_n1A\_47A | V2X\_n1A\_47A |
| V2X\_8A\_n47A | V2X\_8A\_n47A |
| V2X\_n8A\_47A | V2X\_n8A\_47A |
| V2X\_3A\_n47A | V2X\_3A\_n47A |
| V2X\_20A\_n38A | V2X\_20A\_n38A |
| V2X\_n39A\_47A | V2X\_n39A\_47A |
| V2X\_39A\_n47A | V2X\_39A\_n47A |
| V2X\_n40A\_47A | V2X\_n40A\_47A |
| V2X\_40A\_n47A | V2X\_40A\_n47A |
| V2X\_n71A\_47A | V2X\_n71A\_47A |
| V2X\_n78A\_47A | V2X\_n78A\_47A |
| V2X\_n79A\_47A | V2X\_n79A\_47A |
| NOTE 1: V2X transmission configurations are the configurations supported by the present release of specifications. | |

*<End of Change 2>*

*<Start of Change 3>*

##### 6.5E.3.2.2 Spurious emission band UE co-existence

For the inter-band con-current NR V2X operation, the UE-coexistence requirements in Table 6.5E.3.2.2-1 apply for the corresponding inter-band con-current operation with transmission assigned to both E-UTRA uplink in licensed band and sidelink in NR Band n47.

Table 6.5E.3.2.2-1: Requirements for inter-band con-current V2X operation

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| V2X con-current operating band cofiguration | Spurious emission | | | | | | |
|  | Protected band | Frequency range (MHz) | | | Maximum Level (dBm) | MBW (MHz) | NOTE |
| V2X\_1A\_n47A | E-UTRA Band 1, 3, 5, 7, 8, 22, 26, 28, 34, 40, 41, 42, 44, 45, 65, 68, 72, 73  NR Band n77, n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| V2X\_n1A\_47A | E-UTRA Band 1, 3, 5, 7, 8, 22, 26, 28, 34, 40, 41, 42, 44, 45, 65, 68, 72, 73  NR Band n77, n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| V2X\_8A\_n47A | E-UTRA Band 1, 3, 7, 8, 22, 28, 34, 39, 40, 41, 42, 45, 65, 68, 72, 73  NR Band n77, n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| V2X\_n8A\_47A | E-UTRA Band 1, 3, 7, 8, 28, 34, 39, 40, 45, 65, 68, 72, 73  NR Band n77, n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| V2X\_3\_n47 | E-UTRA Band 1, 5, 7, 8, 26, 28, 34, 39, 40, 41, 44, 45, 65, 68, 72, 73  NR Band n77, n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | E-UTRA Band 42 | FDL\_low | - | FDL\_high | -50 | 1 | 1 |
|  | Frequency range | 1884.5 | - | 1915.7 | -41 | 0.3 |  |
| V2X\_20\_n38 | E-UTRA Band 1, 3, 8, 22, 31, 32, 33, 34, 40, 43, 50, 51, 65, 67, 68, 72, 74, 75, 76 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | E-UTRA Band 42, 52 | FDL\_low | - | FDL\_high | -50 | 1 | 1 |
|  | E-UTRA Band 20 | FDL\_low | - | FDL\_high | -50 | 1 | 2 |
|  | NR Band n77, n78 | FDL\_low | - | FDL\_high | -50 | 1 | 1 |
| V2X\_n39\_47 | E-UTRA Band 1, 8, 22, 26, 28, 34, 40, 41, 42, 44, 45  NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n77, n78 | FDL\_low | - | FDL\_high | -50 | 1 | 1 |
|  | Frequency range | 5925 | - | 5950 | -30 | 1 | 3, 4 |
|  | Frequency range | 5815 | - | 5855 | -30 | 1 | 3 |
| V2X\_39\_n47 | E-UTRA Band 1, 8, 22, 26, 28, 34, 40, 41, 42, 44, 45  NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n77, n78 | FDL\_low | - | FDL\_high | -50 | 1 | 1 |
|  | Frequency range | 5925 | - | 5950 | -30 | 1 | 3, 4 |
|  | Frequency range | 5815 | - | 5855 | -30 | 1 | 3 |
| V2X\_n40\_47 | E-UTRA Band 1, 3, 5, 7, 8, 22, 26, 28, 34, 39, 42, 44, 45, 65, 68, 72  NR Band n77, n78 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 | 1 |
|  | Frequency range | 5925 | - | 5950 | -30 | 1 | 3, 4 |
|  | Frequency range | 5815 | - | 5855 | -30 | 1 | 3 |
| V2X\_40\_n47 | E-UTRA Band 1, 3, 5, 7, 8, 22, 26, 27, 28, 34, 39, 41, 42, 44, 45, 65, 68, 72, 73  NR Band n77, n78 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 | 1 |
|  | Frequency range | 5925 | - | 5950 | -30 | 1 | 3, 4 |
|  | Frequency range | 5815 | - | 5855 | -30 | 1 | 3 |
| V2X\_n71\_47 | E-UTRA Band 4, 5, 12, 13, 14, 17, 24, 26, 30, 48, 66, 85 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | E-UTRA Band 2, 25, 41, 70 | FDL\_low | - | FDL\_high | -50 | 1 | 1 |
|  | E-UTRA Band 29 | FDL\_low | - | FDL\_high | -38 | 1 | 2 |
|  | NR Band n71 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | Frequency range | 5925 | - | 5950 | -30 | 1 | 3, 4 |
|  | Frequency range | 5815 | - | 5855 | -30 | 1 | 3 |
| V2X\_n78\_47 | E-UTRA Band 1, 3, 5, 7, 8, 26, 28, 34, 39, 40, 41, 65 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| Frequency range | 5925 | - | 5950 | -30 | 1 | 3, 4 |
| Frequency range | 5815 | - | 5855 | -30 | 1 | 3 |
| V2X\_n79\_47 | E-UTRA Band 1, 3, 5, 8, 28, 34, 39, 40, 41, 42, 65 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| Frequency range | 5925 | - | 5950 | -30 | 1 | 3, 4 |
| Frequency range | 5815 | - | 5855 | -30 | 1 | 3 |
| NOTE 1: As exceptions, measurements with a level up to the applicable requirements defined in Table 6.6.3.1-2 are permitted for each assigned E-UTRA carrier used in the measurement due to 2nd, 3rd, 4th [or 5th] harmonic spurious emissions. In case the exceptions are allowed due to spreading of the harmonic emission the exception is also allowed for the first 1 MHz frequency range immediately outside the harmonic emission on both sides of the harmonic emission. This results in an overall exception interval centred at the harmonic emission of (2MHz + N x LCRB x 180kHz), where N is 2, 3 or 4 for the 2nd, 3rd or 4th harmonic respectively. The exception is allowed if the measurement bandwidth (MBW) totally or partially overlaps the overall exception interval.  NOTE 2: These requirements also apply for the frequency ranges that are less than FOOB (MHz) in Table 6.6.3.1-1 and Table 6.6.3.1A-1 from the edge of the aggregated channel bandwidth.  NOTE 3: Applicable when NS\_33 is configured by the pre-configured radio parameters for power class 3 V2X UE.  NOTE 4: In the frequency range x-5950MHz, SE requirement of -30dBm/MHz should be applied; where x = max (5925, fc + 15), where fc is the channel centre frequency. | | | | | | | |

*<End of Change 3>*

*<Start of Change 4>*

#### 7.3E.2.3 Inter-band V2X con-current operation

#### 7.3E.2.3.0 General

When UE is configured for NR V2X reception on V2X carrier con-current with E-UTRA uplink and downlink, NR V2X sidelink throughput for the carrier shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annexes A.7.2 with parameters specified in table 7.3E.2-1 and 7.3E.2-2 in TS 38.101-1. Also the E-UTRA downlink throughput shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annexes A.3 with parameters specified in Table 7.3.1-1 and Table 7.3.1-2 in TS 36.101.

When UE is configured for E-UTRA V2X reception on V2X carrier con-current with NR uplink and downlink, E-UTRA V2X sidelink throughput for the carrier shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annexes A.8.2 with parameters specified in Table 7.3.1G-1 in TS 36.101. Also the NR downlink throughput shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annexes A.2.2.2, A3.2 and A.3.3 with parameters specified in Table 7.3.2-1a, Table 7.3.2-1b and Table 7.3.2-2 in TS 38.101-1.



The reference sensitivity is defined to be met with all downlink component carriers active. The REFSENS of Uu downlink and PC5 sidelink will be tested at the same time.Table 7.3E.2.3.0-1: Void

Table 7.3E.2.3.0-2 is specified the additional Rx insertion loss according to different RF architecture with DC/CA UE with same band combinations to reduce the self interference problem based on specific self desense analysis according to specific NR V2X inter-band con-current operation.

Table 7.3E.2.3.0-2: ΔRIB,V2X (two bands)

|  |  |  |
| --- | --- | --- |
| V2X inter-band con-current band Combination | E-UTRA or NR Band | ΔRIB,V2X [dB] |
| V2X\_20\_n38 | 20 | 0.01 |
| V2X\_n79-47 | n79 | TBD |
| 47 | TBD |
| Note 1: The ΔRIB,V2X is applied on top of ΔRIB,c of DC\_20\_n38 UE that is considered harmonic trap filter to reduce 3rd harmonic impact from Band 20. | | |



Table 7.3E.2.3.0-3: Void



Table 7.3E.2.3.0-4: Void

*<End of Change 4>*