**3GPP TSG-RAN WG4 Meeting #105 R4-2218443**

**Toulouse, France, November 14 – November 18, 2022**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **38.101-1** | **CR** | **1228** | **rev** | **-** | **Current version:** | **17.7.0** |  |
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| *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:***  | Big CR for TS 38.101-1, Introduction of new R18 Uu+V2X band combinations |
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| ***Source to WG:*** | CATT |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_LTE\_V2X\_PC5\_combos\_R18-Core |  | ***Date:*** | 2022-11-29 |
|  |  |  |  |  |
| ***Category:*** | B |  | ***Release:*** | Rel-18 |
|  | *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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | This big CR merges the multiple endorsed draft CRs in RAN4#105. The reason for change in each endorsed draft CR is copied below.1. R4-2220459 Draft CR for TS 38.101-1, Introduce new band combination of V2X\_n3A-n47A
	* The con-current operation of V2X\_n3A-n47A should be introduced based on request.
2. R4-2220462 Draft CR for TS 38.101-1, Introduce new band combination of V2X\_n34A-n47A
	* The con-current operation of V2X\_n34A-n47A should be introduced based on request.
 |
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| ***Summary of change:*** | The summary of change in each endorsed draft CR is copied below.1. R4-2220459 Draft CR for TS 38.101-1, Introduce new band combination of V2X\_n3A-n47A
	* Add operating bands for V2X\_n3A-n47A in Table 5.2E.2-1 in clause 5.2E.2.
	* Add channel bandwidths for V2X\_n3A-n47A in table Table 5.3E.2-1 in clause 5.3E.2.
	* Add spurious emissions for UE co-existence in Table 6.5E.3.3-1 in clause 6.5E.3.3.
2. R4-2220462 Draft CR for TS 38.101-1, Introduce new band combination of V2X\_n34A-n47A
	* Add operating bands for V2X\_n34A-n47A in Table 5.2E.2-1 in clause 5.2E.2.
	* Add channel bandwidths for V2X\_n34A-n47A in table Table 5.3E.2-1 in clause 5.3E.2.
	* Add spurious emissions for UE co-existence in Table 6.5E.3.3-1 in clause 6.5E.3.3.
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|  |  |
| ***Consequences if not approved:*** | The consequences if not approved for each endorsed draft CR are coppied below.1. R4-2220459 Draft CR for TS 38.101-1, Introduce new band combination of V2X\_n3A-n47A
	* The con-current operation of V2X\_n3A-n47A would not be defined in 38.101-1.
2. R4-2220462 Draft CR for TS 38.101-1, Introduce new band combination of V2X\_n34A-n47A
	* The con-current operation of V2X\_n34A-n47A would not be defined in 38.101-1.
 |
|  |  |
| ***Clauses affected:*** | The clauses affected for each endorsed draft CR are coppied below.1. R4-2220459 Draft CR for TS 38.101-1, Introduce new band combination of V2X\_n3A-n47A
	* 5.2E.2, 5.3E.2, 6.5E.3.3
2. R4-2220462 Draft CR for TS 38.101-1, Introduce new band combination of V2X\_n34A-n47A
	* 5.2E.2, 5.3E.2, 6.5E.3.3
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|  | **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:*** | Introduction of Release 18 specification |
|  |  |
| ***This CR's revision history:*** |  |

## *<Start of Change 1>*

### 5.2E.2 V2X operating bands for con-current operation

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

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

|  |  |  |
| --- | --- | --- |
| V2X con-current operating Band | NR or V2X Operating Band | Interface |
| V2X\_n1-n47 | n1 | Uu |
|  | n47 | PC5 |
| V2X\_n3-n47 | n3 | Uu |
| n47 | PC5 |
| V2X\_n5-n47 | n5 | Uu |
|  | n47 | PC5 |
| V2X\_n8-n47 | n8 | Uu |
|  | n47 | PC5 |
| V2X\_n34-n47 | n34 | Uu |
| n47 | PC5 |
| V2X\_n39-n47 | n39 | Uu |
|  | n47 | PC5 |
| V2X\_n40-n47 | n40 | Uu |
|  | n47 | PC5 |
| V2X\_n41-n47 | n41 | Uu |
|  | n47 | PC5 |
| V2X\_n71-n47 | n71 | Uu |
|  | n47 | PC5 |
| V2X\_n78-n47 | n78 | Uu |
|  | n47 | PC5 |
| V2X\_n79-n47 | n79 | Uu |
|  | n47 | PC5 |

Table 5.2E.2-2 Intra-band con-current V2X operating bands

|  |  |  |
| --- | --- | --- |
| V2X con-current operating Band | NR or V2X Operating Band | Interface |
| V2X\_n79-n79 | n79 | Uu |
|  | n79 | PC5 |

## *<End of Change 1>*

## *<Start of Change 2>*

### 5.3E.2 Channel bandwidth for V2X concurrent operation

For NR V2X inter-band con-current operation in FR1, the NR V2X channel bandwidths for each operating band is specified in Table 5.3E.2-1.

Table 5.3E.2-1: Inter-band con-current operation configurations

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| NR V2X inter-band con-current operating configuration | NR Band | Interface | Channel bandwidth (MHz) (NOTE 3) | Bandwidth combination set |
| V2X\_n1A-n47A | n1 | Uu | 5, 10, 15, 20, 25, 30, 40, 45, 50 | 0 |
|  | n47 | PC5 | 10, 20, 30, 40 |  |
| V2X\_n3A-n47A | n3 | Uu | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 | 0 |
| n47 | PC5 | 10, 20, 30, 40 |
| V2X\_n5A-n47A | n5 | Uu | 5, 10, 15, 20, 25 | 0 |
|  | n47 | PC5 | 10, 20, 30, 40 |  |
| V2X\_n8A-n47A | n8 | Uu | 5, 10, 15, 20, 35 | 0 |
|  | n47 | PC5 | 10, 20, 30, 40 |  |
| V2X\_n34A-n47A | n34 | Uu | 5, 10, 15 | 0 |
| n47 | PC5 | 10, 20, 30, 40 |  |
| V2X\_n39A-n47A | n39 | Uu | 5, 10, 15, 20, 25, 30, 40 | 0 |
|  | n47 | PC5 | 10, 20, 30, 40 |  |
| V2X\_n40A-n47A | n40 | Uu | 5, 10, 15, 20, 25, 30, 40, 50, 60, 80 | 0 |
|  | n47 | PC5 | 10, 20, 30, 40 |  |
| V2X\_n41A-n47A | n41 | Uu | 10, 15, 20, 25, 30, 40, 50, 60, 80, 90, 100 | 0 |
|  | n47 | PC5 | 10, 20, 30, 40 |  |
| V2X\_n71A-n47A | n71 | Uu | 5, 10, 15, 20 | 0 |
|  | n47 | PC5 | 10, 20, 30, 40 |  |
| V2X\_n78A-n47A | n78 | Uu | 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 | 0 |
|  | n47 | PC5 | 10, 20, 30, 40 |  |
| V2X\_n79A-n47A | n79 | Uu | 40, 50, 60, 80, 100 | 0 |
|  | n47 | PC5 | 10, 20, 30, 40 |  |
| NOTE 1: The SCS of each channel bandwidth for NR band refers to Table 5.3.5-1. |

For NR V2X intra-band con-current operation in FR1, the NR V2X channel bandwidths for each operating band is specified in Table 5.3E.2-2.

Table 5.3E.2-2: Intra-band con-current operation configurations

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| NR V2X intra-band con-current operating configuration | NR Band | Interface | Channel bandwidth (MHz) (NOTE 3) | Bandwidth combination set |
| V2X\_n79B | n79 | Uu | 40, 50, 60, 80, 100 | 0 |
|  | n79 | PC5 | 10, 20, 30, 40 |  |
| NOTE 1: The SCS of each channel bandwidth for NR band refers to Table 5.3.5-1. |

## *<End of Change 2>*

## *<Start of Change 3>*

#### 6.5E.3.3 Spurious emissions for UE co-existence for V2X con-current operation

For the inter-band con-current NR V2X operation, the UE-coexistence requirements in Table 6.5E.3.3-1 apply for the corresponding inter-band con-current operation with transmission assigned to both uplink in licensed band and sidelink in Band n47.

**Table 6.5E.3.3-1: Requirements for inter-band con-current V2X operation**

|  |  |
| --- | --- |
| V2X | Spurious emission |
| con-current operating band configuration | Protected band | Frequency range (MHz) | Maximum Level (dBm) | MBW (MHz) | NOTE |
| V2X\_n1A-n47A | E-UTRA Band 1, 3, 5, 7, 8, 22 26, 28, 34, 40, 41, 42, 44, 45, 65, 68, 72, 73 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n77, n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 | 1 |
| V2X\_n3A-n47A | E-UTRA Band 1, 3, 5, 7, 8, 26, 28, 34, 39, 40, 41, 44, 45, 65, 68, 72, 73 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| NR Band n77, n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 | 1 |
| Frequency range | 5925 | - | 5950 | -30 | 1 | 3, 4 |
| Frequency range | 5815 | - | 5855 | -30 | 1 | 3 |
| V2X\_n5A-n47A | E-UTRA Band 1, 3, 5, 7, 8, 26, 28, 34, 40, 42, 45, 65, 73 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n79 | FDL\_low | - | FDL\_high | -50 | 1 | 1 |
| V2X\_n8A-n47A | E-UTRA Band 1, 3, 7, 8, 22, 28, 34, 39, 40, 41, 42, 45, 65, 68, 72, 73 | FDL\_low | - | FDL\_high | -50 | 1 |  |
|  | NR Band n77, n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 | 1 |
| V2X\_n34A-n47A | E-UTRA Band 1, 3, 7, 8, 22, 26, 28, 39, 40, 41, 42, 44, 45, 65, 72 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| NR Band n77, n78, n79 | FDL\_low | - | FDL\_high | -50 | 1 | 1 |
| Frequency range | 5925 | - | 5950 | -30 | 1 | 3, 4 |
| Frequency range | 5815 | - | 5855 | -30 | 1 | 3 |
| V2X\_n39A-n47A | E-UTRA Band 1, 8, 22, 26, 28, 34, 40, 41, 42, 44, 45NR 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\_n40A-n47A | E-UTRA Band 1, 3, 5, 7, 8, 22, 26, 28, 34, 39, 42, 44, 45, 68, 72NR 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\_n41A-n47A | E-UTRA Band 1, 3, 5, 8, 26, 28, 34, 39, 42, 44, 45, 65, 73NR 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\_n71A-n47A | E-UTRA Band 4, 5, 12, 13, 14, 17, 24, 26, 30, 48, 66, 85, 103 | 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\_n78A-n47A | 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\_n79A-n47A | E-UTRA Band 1, 3, 5, 8, 28, 34, 39, 40, 41, 42, 65 | FDL\_low | - | FDL\_high | -50 | 1 |  |
| 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. |

For the intra-band NR V2X transmission where Uu and SLoverlap in time , the UE-coexistence requirements in Table 6.5A.3.2.1-1 apply for the corresponding intra-band con-current operation for the both uplink and sidelink transmission in licensed band.

## *<End of Change 3>*