**3GPP TSG-RAN4 Meeting # 94-e**

**Electronic Meeting, 24th Feb. – 6th Mar. 2020**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **<Spec#>** | **CR** | **<CR#>** | **rev** | **<Rev#>** | **Current version:** | **16.2.0** |  |
|  | | | | | | | | |
| *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:*** | CR on UE system parameters for NR V2X UE for TS 38.101-1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | vivo | | | | | | | | | |
| ***Source to TSG:*** | RAN4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_V2X\_NRSL | | | | |  | ***Date:*** | | | 2020-2-9 |
|  |  | | | |  | |  | | |  |
| ***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 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:*** | | Introduction of system parameters in band n47 for NR V2X operation. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Add content of operating bands for NR V2X to Section 5.2E;  Add content of channel bandwidth for NR V2X to Section 5.3E;  Add content of channel raster and sync raster to Section 5.4E. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | No system parameters defined for NR V2X operation in band n47. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.2E, 5.3E, 5.4E | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**<Start of Changes>**

5.2E Operating bands for V2X Communication

NR V2X communication is designed to operate in the operating bands in FR1 defined in Table 5.2E-1.

**Table 5.2E-1 NR V2X operating bands in FR1**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **NR V2X Operating Band** | **Sidelink (SL) Transmission operating band** | | | **Sidelink (SL) Reception operating band** | | | **Duplex Mode** | **Interface** |
| **FUL\_low – FUL\_high** | | | **FDL\_low – FDL\_high** | | |
| n47 | 5855 MHz | - | 5925 MHz | 5855 MHz | - | 5925 MHz | TDD | PC5 |

5.3E UE channel bandwidth for V2X Communication

The NR V2X Communication channel bandwidths and operating bands are shown in Table 5.3E-1. The same (symmetrical) channel bandwidth is specified for both the TX and RX path.

**Table 5.3E-1 NR V2X Communication channel bandwidth**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **NR V2X band /SCS/ V2X channel bandwidth** | | | | | | | | |
| **NR V2X Operating Band** | **SCS**  **kHz** | **10 MHz** | **20 MHz** | **30 MHz** | **40 MHz** | **50 MHz** | **60 MHz** | **80 MHz** | **90 MHz** | **100 MHz** |
| n47 | 15 | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 30 | Yes | Yes | Yes | Yes |  |  |  |  |  |
| 60 | Yes | Yes | Yes | Yes |  |  |  |  |  |

5.4E Channel arrangement for V2X Communication

5.4.1E Channel spacing for V2X Communication

5.4.2E Channel raster for V2X Communication

5.4.2.1E NR-ARFCN and channel raster

The NR-ARFCN and channel raster defined in subclause 5.4.2.1 in TS38.101-1 are applied for NR V2X.

For NR V2X UE, the reference frequency can be shifted by configuration.

FREF\_V2X = FREF + Δshift + N \* 5 kHz

where

Δshift = 0 kHz or 7.5 kHz indicated in IE (*frequencyShift7p5khz*), and

N can be set as one of following values {-1, 0, 1}, are signalled by the network in higher layer parameters or configured by pre-configuration parameters.

5.4.2.2E Channel raster to resource element mapping

Channel raster to resource element mapping defined in subclause 5.4.2.2 in TS38.101-1 are applied for NR V2X.

5.4.2.3E Channel raster entries for each operating band

The channel raster entries for each operating band defined in subclause 5.4.2.3 in TS38.101-1 are applied for NR V2X. The RF channel positions on the channel raster in each NR V2X operating band are given through the applicable NR-ARFCN in Table 5.4.2.3E-1, using the channel raster to resource element mapping in subclause 5.4.2.2E.

For NR V2X operating band n47, ΔFRaster = *I* × ΔFGlobal, where *I ϵ {1}.* Every *Ith* NR‑ARFCN within the operating band are applicable for the channel raster within the operating band and the step size for the channel raster in table 5.4.2.3E-1 is given as <*I*>.

**Table 5.4.2.3E-1: Applicable NR-ARFCN for NR V2X operating band**

|  |  |  |  |
| --- | --- | --- | --- |
| **NR operating band** | **ΔFRaster**  **(kHz)** | **Uplink range of NREF**  **(First – <Step size> – Last)** | **Downlink range of NREF**  **(First – <Step size> – Last)** |
| n47 | 15 | 790334 – <1> – 795000 | 790334 – <1> – 795000 |

5.4.3E Synchronization raster for V2X Communication

There is no synchronization raster definition for NR V2X for both licensed bands and unlicensed bands.

5.4.4E TX–RX frequency separation for V2X Communication

**<End of Changes>**