**3GPP RAN WG4 Meeting #94-e R4-2002228**

**Online, 24th February – 6th March 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.133** | **CR** | 0473 | **Rev** | **1** | **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)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network |  |

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| ***Title:*** | CR of NR V2X RRM(introduction & reliability of GNSS signal) | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | LG Electronics | | | | | | | | | |
| ***Source to TSG:*** | RAN4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_V2X\_NRSL-Core | | | | |  | ***Date:*** | | | 2020-02-12 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | Add 12.1 Introduction and 12.8 Reliability of GNSS signal for NR V2X RRM requirements based on the endorsed draft CR(R4-1915921).  Add 12.4 Selection/Reselction of V2X Synchronization Reference Source, based on the endorsed draft CR(R4-1915922)  Add 12.5 L1 SL-RSRP measurements  Add 12.6 Congestion Control measurements, based on the endorsed draft CR(R4-1915922) | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Add  12.1 Introduction  12.4 Selection/Reselction of V2X Synchronization Reference Source  12.5 L1 SL-RSRP measurements  12.6 Congestion Control measurements  12.8 Reliability of GNSS signal | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Miss introduction and reliability of GNSS signal in NR V2X RRM requirements | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 12, 12.1, 12.4, 12.5, 12.6, 12.8 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 CHANGE #1 >

# 12 V2X Requirements

## 12.1 Introduction

This section contains the requirements for the UE capable of V2X sidelink communication when the UE is out of coverage on the carrier used for V2X sidelink operation, as defined in [1]. The requirements apply when the UE is:

- in any cell selection state, or,

- configured for V2X SL operation on a V2X carrier which is dedicated to only V2X SL operation and configured with only a PCell on WAN carrier.Note: Any cell selection state refers to a UE that is out of network coverage and is not associated with a serving cell on any carrier [1].

Note: When a UE in RRC\_CONNECTED state is performing transmissions and/or reception for V2X sidelink communication, the UE shall meet all the requirements specified in Section 9 assuming that UE has a dedicated RX/TX chain for V2X sidelink communication. Otherwise, the UE may interrup the V2X sidelink communication in order to meet the measurement requirements specified in Section 9.

< END OF CHANGE #1 >

< START OF CHANGE #2 >

## 12.4 Selection / Reselection of V2X Synchronization Reference Source

[The requirements defined in section 12.4 do not apply to the UEs that do not support transmission and reception of SLSS.]

A V2X SyncRef UE is considered to be detectable when

- S-RSRP related side conditions given in Section [TBD] are fulfilled for a corresponding Band,

- V2X SCH\_RP and SCH Ês/Iot according to Annex [TBD] for a corresponding Band are fulfilled.

When GNSS synchronization reference source is configured as the highest priority and

- UE is synchronized to GNSS directly,

- UE shall not drop any V2X SLSS and data transmission for the purpose of selection/reselection to the SyncRef UE.

- UE is synchronized to a SyncRef UE that is synchronized to GNSS directly or in-directly,

- UE shall not drop any V2X data transmission for the purpose of selection/reselection to the SyncRef UE. The UE shall be able to identify newly detectable intra-frequency V2X SyncRef UE within Tdetect,SyncRef UE\_V2X seconds if the V2X SyncRef UE meets the selection / reselection criterion defined in TS 38.331. Tdetect,SyncRef UE\_V2X is defined as [1.6] seconds at SCH Es/Iot ≥ [0] dB, provided that the UE is allowed to drop a maximum of [30]% of its SLSS transmissions during Tdetect,SyncRef UE\_V2X for the purpose of selection / reselection to the SyncRef UE.

- in other case

- The UE shall be able to identify newly detectable intra-frequency V2X SyncRef UE within Tdetect,SyncRef UE\_V2X seconds if the SyncRef UE meets the selection / reselection criterion defined in TS 38.331. Tdetect,SyncRef UE\_V2X is defined as [8] seconds at SCH Es/Iot ≥ [0] dB, provided that the UE is allowed to drop a maximum of [6] % of its V2X data and SLSS transmissions during Tdetect,SyncRef UE\_V2X for the purpose of selection / reselection to the SyncRef UE.

- UE is allowed to drop up to 2 slots of its V2X data reception per PSBCH monitoring occasion and overall drop rate shall not exceed [0.3%] of its V2X data reception during Tdetect,SyncRef UE\_V2X for the purpose of selection / reselection to the SyncRef UE.

When serving cell/PCell synchronization reference source is configured as the highest priority,

- UE shall be able to identify newly detectable intra-frequency V2X SyncRef UE within Tdetect,SyncRef UE\_V2X seconds if the SyncRef UE meets the selection / reselection criterion defined in TS 38.331. Tdetect,SyncRef UE\_V2X is defined as [8] seconds at SCH Es/Iot ≥ [0] dB, provided that the V2X UE is allowed to drop a maximum of [6] % of its V2X data and SLSS transmissions for the purpose of selection / reselection to the SyncRef UE.

- UE is allowed to drop up to 2 slots of its V2X data reception per PSBCH monitoring occasion and overall drop rate shall not exceed [0.3%] of its V2X data reception during Tdetect,SyncRef UE\_V2X for the purpose of selection / reselection to the SyncRef UE.

UE shall be capable of performing S-RSRP measurements for [3] identified intra-frequency V2X SyncRef UE with the measurement period of [320] ms. It is assumed that the V2X SyncRef UE do not drop or delay any SLSS transmission within the measurement period. Otherwise, the measurement period may be extended.

When UE is synchronized to GNSS directly, before selection / reselection of the new synchronization reference source UE shall evaluate the GNSS synchronization source reliability for at least [20] seconds before changing the synchronization reference from GNSS to another synchronization reference source. UE shall be always synchronized to GNSS directly during the evaluation of GNSS synchronization source reliability.

## 12.5 L1 SL-RSRP measurements

## 12.5.1 Introduction

This section contains the measurement requirements related to resource reselection and resource pre-emption of the UE capable of V2X sidelink communication.

## 12.5.2 SL-RSRP measurements

The UE physical layer shall be capable of performing the L1 SL-RSRP measurements on the carrier operating V2X sidelink communication for determining the subset of resources to be excluded in PSSCH resource selection in sidelink transmission mode 2. The L1 SL-RSRP measurement period corresponds to [TBD] and the measurement shall meet the L1 SL-RSRP measurement accuracy requirement in Section [TBD].

[When the pre-emption mechanism is enabled for the resource pool that UE is monitoring and selecting resource from,] after UE selects from the resource not excluded based on L1 SL-RSRP measurement procedure, the UE shall be capable of triggering reselection of already signalled resource(s) as a resource reservation when the conditions specified in [16] are satisfied.

## 12.6 Congestion Control measurements

The UE shall be capable of estimating the channel busy ratio for one or more transmission pools indicated by higher layers [16], based on S-RSSI measurements provided by the physical layer.

When no sidelink transmissions occur, the UE physical layer shall perform a single-shot S-RSSI measurement for each sub-channel included in all the slots configured as transmission pools.

The S-RSSI measurement performed according to this section shall meet the S-RSSI measurement accuracy requirements defined in Section [TBD].

The UE shall perform channel busy ratio (CBR) measurement based on S-RSSI measurements as described in TS 38.215.

< END OF CHANGE #2 >

< START OF CHANGE #3 >

## 12.8 Reliability of GNSS signal

This clause contains requirements regarding reliability of GNSS signal for the UE capable of V2X sidelink communication under the following additional condition:

- The UE is configured or pre-configured with parameters for enabling the UE to acquire the GNSS synchronization.

If UE considers GNSS is a reliable synchronization reference, the UE shall meet timing accuracy requirement as specified in 12.2 and frequency accuracy requirement as specified in [6.4E] of TS38.101-1. [Otherwise, the UE shall be capable to select another synchronization reference source.]

< END OF CHANGE #3 >