**3GPP TSG-RAN4 Meeting #102-e *R4-2205360***

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

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **-** | **rev** | **-** | **Current version:** | **16.10.0** |  |
|  | | | | | | | | |
| *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 | **x** | Radio Access Network |  | Core Network |  |

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| ***Title:*** | CR on CSI-RS measurement requirements R16 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_CSIRS\_L3meas-Core | | | | |  | ***Date:*** | | | 2022-01-29 |
|  |  | | | |  | |  | | |  |
| ***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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In current requirements for intra-frequency CSI-RS measurement, the SFN reading time is defined for both FR1 and FR2. The requirement for FR2 is unclear because the referred “TSSB\_time\_index\_intra in Clause 9.2.5.1” is only defined for FR1. Moreover, it is specified that when deriveSSB-IndexFromCell is true (which is always the case for FR2), the time period for SFN reading is zero. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Remove the requirements on SFN reading time for FR2. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | It is confusing whether SFN reading time for FR2 is zero or not. | | | | | | | | |
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| ***Clauses affected:*** | | 9.10.2.5 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

<Start of Change 1>

#### 9.10.2.5 Intra-frequency measurements without measurement gaps

If a UE is configured with the higher layer parameters *CSI-RS-Resource-Mobility* and *associatedSSB*, the CSI-RS based measurement shall include PSS/SSS detection time of associatedSSB, the time period used to acquire the SFN information and CSI-RS based measurement period without gap.

PSS/SSS detection time of associatedSSB is the intra-frequency TPSS/SSS\_sync\_intra in Clause 9.2.5.1.

The time period used to acquire the SFN information is equal to 0 if the UE is indicated that the neighbour cell is synchronous with the serving cell (*deriveSSB-IndexFromCell* is enabled). Otherwise, the time period used to acquire the SFN information is TCSI-RS\_SFN\_intra as shown in Table 9.10.2.5-3 for FR1. It is assumed that *deriveSSB-IndexFromCell* is always enabled for FR1 TDD and FR2.

If the associatedSSB, which has been detectable at least for the time period Tidentify\_intra\_with\_index defined in clause 9.2.5.1, becomes undetectable for a period ≤ 5 seconds and then the associatedSSB becomes detectable again with the same spatial reception parameter provided the timing to that cell has not changed more than  3200 Tc, PSS/SSS detection time and time period used to acquire the SFN information are equal to 0.

The measurement period for CSI-RS based intra-frequency measurements without gaps is as shown in table 9.10.2.5-1and Table 9.10.2.5-2.

Additionally, for a given CSI-RS resource, if the associated SS/PBCH block is configured but not detected by the UE, or if CSI-RS is configured with associated SSB but not QCL-ed to the associated SSB, the UE is not required to monitor the corresponding CSI-RS resource.

Table 9.10.2.5-1: Measurement period for intra-frequency CSI-RS based measurements without gaps (FR1)

|  |  |
| --- | --- |
| DRX cycle | T CSI-RS\_measurement\_period\_intra |
| No DRX | max(200ms, ceil( 5 x Kp\_CSI-RS) x CSI-RS period) x CSSFintra |
| DRX cycle≤ 320ms | max(200ms, ceil(1.5x 5 x Kp\_CSI-RS) x max(CSI-RS period, DRX cycle)) x CSSFintra |
| DRX cycle>320ms | ceil( 5 x Kp\_CSI-RS) x DRX cycle x CSSFintra |
| NOTE 1: The requirements apply assuming CSI-RS configuration with {D=3 with PRBs ≥ 48}. D is frequency domain density for the 1-port CSI-RS for L3 mobility defined in clause 7.4.1 of TS38.211 [6]. | |

Table 9.10.2.5-2: Measurement period for intra-frequency CSI-RS based measurements without gaps (FR2)

|  |  |
| --- | --- |
| DRX cycle | T CSI-RS\_measurement\_period\_intra |
| No DRX | max(400ms, ceil(Mmeas\_period\_w/o\_gaps x Kp\_CSI-RS) x CSI-RS period) x CSSFintra |
| DRX cycle≤ 320ms | max(400ms, ceil(1.5x Mmeas\_period\_w/o\_gaps x Kp\_CSI-RS) x max(CSI-RS period,DRX cycle)) x CSSFintra |
| DRX cycle>320ms | Mmeas\_period\_w/o\_gaps x DRX cycle x CSSFintra |
| NOTE 1: The requirements apply assuming CSI-RS configuration with {D=3 with PRBs ≥ 48}. D is frequency domain density for the 1-port CSI-RS for L3 mobility defined in clause 7.4.1 of TS38.211 [6]. | |

Table 9.10.2.5-3: Time period for SFN acquisition for intra-frequency CSI-RS based measurements without gaps (FR1)

|  |  |
| --- | --- |
| DRX cycle | TCSI-RS\_SFN\_intra |
| No DRX | max(200ms, ceil(5 x Kp )x SMTC period)Note 1 x CSSFintra |
| DRX cycle≤ 320ms | max(2000ms, ceil (1.5 x 5 x Kp) x max(SMTC period,DRX cycle)) x CSSFintra |
| DRX cycle>320ms | Ceil(5 x Kp) x DRX cycle x CSSFintra |
| NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is the one used by the cell being identified | |

Mmeas\_period\_w/o\_gaps : For a UE supporting power class 1, Mmeas\_period\_w/o\_gaps = 40. For a UE supporting FR2 power class 2, Mmeas\_period\_w/o\_gaps = 24. For a UE supporting power class 3, Mmeas\_period\_w/o\_gaps = 24. For a UE supporting power class 4, Mmeas\_period\_w/o\_gaps = 24.

CSSFintra: it is a carrier specific scaling factor and is determined according to CSSFoutside\_gap,i in clause 9.1.5.

- if intra-frequency CSI-RS resource is fully non overlapping with measurement gaps, Kp\_CSI-RS=1;

- if intra-frequency CSI-RS resource is partially overlapping with measurement gaps, Kp\_CSI-RS = 1/(1- (CSI-RS resource period /MGRP)), where CSI-RS resource period < MGRP.

<End of Change 1>