**3GPP TSG RAN WG1 Meeting #110R1-220XXXX**

**Toulouse, France, August 22 – 26, 2022**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **38.211** | **CR** |  | **rev** | **-** | **Current version:** | **17.2.0** |  |
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| *For* [***HELP***](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 | **x** | Core Network |  |

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| ***Title:***  | Corrections on UE Power Saving Enhancements for NR in TS 38.211 |
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| ***Source to WG:*** | MediaTek, Huawei, HiSilicon, ZTE, Sanechips |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** | NR\_UE\_pow\_sav\_enh-Core |  | ***Date:*** | 2022-08-26 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***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 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:*** | 1. It is specified in clause 7.3.1.5 of TS 38.211 that PDSCH shall not be mapped to resource elements used for non-zero-power CSI-RS according to clause 7.4.1.5, if the corresponding physical resource blocks are for a PDSCH scheduled by a PDCCH with the CRC scrambled by C-RNTI, MCS-C-RNTI, CS-RNTI, G-RNTI, G-CS-RNTI, MCCH-RNTI, or a PDSCH with SPS. Based on the description of clause 7.4.1.5, non-zero-power (NZP) CSI-RS can be defined for a non-zero-power CSI-RS configured by the *TRS-ResourceSet IE.* According to the above descripton of TS 38.211, the NZP-CSI-RS configured by *TRS-ResourceSet* IE shall not be used for PDSCH scheduled for a connected mode UE. This does not align with the agreement made in RAN1 #109-e that “*TRS-ResourceSetConfig* IE does not affect the UE behaviour in CONNECTED mode and can be ignored by UE in CONNECTED mode”.
2. The parameter *l*1 is not needed for the time-domain location determination of TRS configured for RRC idle/inactive state UEs.
3. The slot determination of of TRS configured for RRC idle/inactive state UEs is not captured.
4. It should be clarified that theTRS configured for RRC idle/inactive state UEs is only valid in the validity period in clause 10.4B in TS38.213.
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| ***Summary of change:*** | 1. Clarify that TRS configured *TRS-ResourceSet* IE does not affect PDSCH mapping scheduled for a UE in CONNECTED mode.
2. Remove the parameter *l*1 for TRS configured for RRC idle/inactive state UE.
3. Capture slot determination of of TRS configured for RRC idle/inactive state UEs.
4. Clarify that theTRS configured for RRC idle/inactive state UEs is only valid in the validity period.
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| ***Consequences if not approved:*** | Incorrect behaviour of UE |
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| ***Clauses affected:*** | 7.3.1.5, 7.4.1.5.3 |
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|  | **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 ...  |
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| ***Other comments:*** |  |
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| ***This CR's revision history:*** |  |

#### < Unchanged parts are omitted >

#### 7.3.1.5 Mapping to virtual resource blocks

The UE shall, for each of the antenna ports used for transmission of the physical channel, assume the block of complex-valued symbols conform to the downlink power allocation specified in [6, TS 38.214] and are mapped in sequence starting with to resource elements in the virtual resource blocks assigned for transmission which meet all of the following criteria:

- they are in the virtual resource blocks assigned for transmission;

- the corresponding physical resource blocks are declared as available for PDSCH according to clause 5.1.4 of [6, TS 38.214];

- the corresponding resource elements in the corresponding physical resource blocks are

- not used for transmission of the associated DM-RS or DM-RS intended for other co-scheduled UEs as described in clause 7.4.1.1.2;

- not used for non-zero-power CSI-RS, which is according to clause 7.4.1.5 and not configured by *TRS-ResourceSet* IE, if the corresponding physical resource blocks are for a PDSCH scheduled by a PDCCH with the CRC scrambled by C-RNTI, MCS-C-RNTI, CS-RNTI, G-RNTI, G-CS-RNTI, MCCH-RNTI, or a PDSCH with SPS, except if the non-zero-power CSI-RS is a CSI-RS configured by the higher-layer parameter *CSI-RS-Resource-Mobility* in the *MeasObjectNR* IE or except if the non-zero-power CSI-RS is an aperiodic non-zero-power CSI-RS resource;

- not used for PT-RS according to clause 7.4.1.2;

- not declared as 'not available for PDSCH according to clause 5.1.4 of [6, TS 38.214].

The mapping to resource elements allocated for PDSCH according to [6, TS 38.214] and not reserved for other purposes shall be in increasing order of first the index over the assigned virtual resource blocks, where is the first subcarrier in the lowest-numbered virtual resource block assigned for transmission, and then the index .

#### < Unchanged parts are omitted >

7.4.1.5.3 Mapping to physical resources

#### < Unchanged parts are omitted >

The time-domain locations and are provided by the higher-layer parameters *firstOFDMSymbolInTimeDomain* and *firstOFDMSymbolInTimeDomain2*, respectively, in the *CSI-RS-ResourceMapping* IE or the *CSI-RS-ResourceConfigMobility* IE and defined relative to the start of a slot. For NZP CSI-RS configured by *TRS-ResourceSet* IE, the time-domain location is provided by the higher-layer parameter *firstOFDMSymbolInTimeDomain* or *firstOFDMSymbolInTimeDomain*+4.

#### < Unchanged parts are omitted >

For a CSI-RS resource configured as periodic or semi-persistent by the higher-layer parameter *resourceType,* configured by the higher-layer parameter *CSI-RS-CellMobility* or configured by the higher-layer parameter *TRS-ResourceSet-r17*, the UE shall assume that the CSI-RS is transmitted in slots satisfying



where the periodicity  (in slots) and slot offset  are obtained from the higher-layer parameter *CSI-ResourcePeriodicityAndOffset*, *slotConfig or periodicityAndOffset-r17*. The UE shall assume that CSI-RS is transmitted in a candidate slot as described in clause 11.1 of [5, TS 38.213], clause 10.4B of [5, TS 38.213].

#### < Unchanged parts are omitted >