**3GPP TSG-RAN WG1 Meeting #118 R1-2407407**

**Maastricht, NL, August 19th – 23rd, 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.213** | **CR** | **0658** | **rev** | **-** | **Current version:** | **18.3.0** |  |
|  | | | | | | | | |
| *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 | **X** | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | CR on FR2-NTN inclusion to TS 38.213 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Moderator(vivo), Nokia, Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_NTN\_enh-Core | | | | |  | ***Date:*** | | | 2024-08-22 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***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 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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Frequency bands FR2-NTN are agreed, however, in TS 38.213, these frequency bands are not yet included for the procedure on determining physical downlink control channel assignment and Type0-PDCCH CSS sets in 38.213. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Update of UE procedure for determining physical downlink control channel assignment to include FR2-NTN.  Update of UE procedure for monitoring Type0-PDCCH CSS sets to include FR2-NTN. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | NR over NTN in frequency bands defined by FR2-NTN is not complete. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 10.1, 13 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | |  | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

# 10 UE procedure for receiving control information

< Unchanged parts are omitted >

## 10.1 UE procedure for determining physical downlink control channel assignment

< Unchanged parts are omitted >

The UE may assume that the DM-RS antenna port associated with PDCCH receptions in the CORESET configured by *pdcch-ConfigSIB1* in *MIB*, the DM-RS antenna port associated with corresponding PDSCH receptions, and the corresponding SS/PBCH block are quasi co-located with respect to average gain, quasi co-location 'typeA' and 'typeD' properties, when applicable [6, TS 38.214], if the UE is not provided a TCI state indicating quasi co-location information of the DM-RS antenna port for PDCCH reception in the CORESET. The value for the DM-RS scrambling sequence initialization is the cell ID. For operation without shared spectrum channel access in FR1, FR2-1 and FR2-NTN, a SCS is provided by *subCarrierSpacingCommon* in *MIB*. For operation with shared spectrum channel access in FR1 and for operation in FR2-2, a SCS is same as the SCS of a corresponding SS/PBCH block.

< Unchanged parts are omitted >

# 13 UE procedure for monitoring Type0-PDCCH CSS sets

If during cell search a UE determines from *MIB* that a CORESET for Type0-PDCCH CSS set is present, as described in clause 4.1, the UE determines a number of consecutive resource blocks and a number of consecutive symbols for the CORESET of the Type0-PDCCH CSS set from *controlResourceSetZero* in *pdcch-ConfigSIB1*, as described in Tables 13-0 through 13-10, for operation without shared spectrum channel access in FR1, FR2-1 and FR2-NTN, or as described in Tables 13-1A and 13-4A for operation with shared spectrum channel access in FR1, or as described in Table 13-10A for FR2-2, and determines PDCCH monitoring occasions from *searchSpaceZero* in *pdcch-ConfigSIB1*, included in *MIB*, as described in Tables 13-11 through 13-15A. and are the SFN and slot index within a frame of the CORESET based on SCS of the CORESET and and are the SFN and slot index based on SCS of the CORESET, respectively, where the SS/PBCH block with index overlaps in time with system frame and slot . The symbols of the CORESET associated with *pdcch-ConfigSIB1* in *MIB* or with *searchSpaceSIB1* in *PDCCH-ConfigCommon* have normal cyclic prefix. In Table 13-0, configurations with index 0 to 9 are applicable when an associated SS/PBCH block is located according to Table 5.4.3.3-2 in [8-1, TS 38.101-1], configurations with index 10 to 11 are applicable when an associated SS/PBCH block is located according to NOTE 12 of Table 5.4.3.3-1 in [8-1, TS 38.101-1], and non-interleaved CCE-to-REG mapping applies for configurations with index 6 to 9. In Table 13-1, the associated SS/PBCH block is not located according to NOTE 12 of Table 5.4.3.3-1 in [8-1, TS 38.101-1].

For operation with shared spectrum channel access in FR2-2 and for operation without shared spectrum channel access, a UE assumes that the offset in Tables 13-0 through 13-10A is defined with respect to the SCS of the CORESET for Type0-PDCCH CSS set from the smallest RB index of the CORESET for Type0-PDCCH CSS set to the smallest RB index of the common RB overlapping with the first RB of the corresponding SS/PBCH block, after puncturing if any [4, TS 38.211]. The SCS of the CORESET for Type0-PDCCH CSS set is provided by *subCarrierSpacingCommon* for FR1 , FR2-1 and FR2-NTN, and same as the SCS of the corresponding SS/PBCH block for FR2-2. In Tables 13-7, 13-8, and 13-10, is defined in [4, TS 38.211].

< Unchanged parts are omitted >

Table 13-8: Set of resource blocks and slot symbols of CORESET for Type0-PDCCH search space set when {SS/PBCH block, PDCCH} SCS is {120, 120} kHz for FR2-1 and FR2-NTN

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Index | SS/PBCH block and CORESET multiplexing pattern | Number of RBs | Number of Symbols | Offset (RBs) |
| 0 | 1 | 24 | 2 | 0 |
| 1 | 1 | 24 | 2 | 4 |
| 2 | 1 | 48 | 1 | 14 |
| 3 | 1 | 48 | 2 | 14 |
| 4 | 3 | 24 | 2 | -20 if  -21 if |
| 5 | 3 | 24 | 2 | 24 |
| 6 | 3 | 48 | 2 | -20 if  -21 if |
| 7 | 3 | 48 | 2 | 48 |
| 8 | Reserved | | | |
| 9 | Reserved | | | |
| 10 | Reserved | | | |
| 11 | Reserved | | | |
| 12 | Reserved | | | |
| 13 | Reserved | | | |
| 14 | Reserved | | | |
| 15 | Reserved | | | |

< Unchanged parts are omitted >

Table 13-12: Parameters for PDCCH monitoring occasions for Type0-PDCCH CSS set - SS/PBCH block and CORESET multiplexing pattern 1 and FR2-1, or SS/PBCH block and CORESET multiplexing pattern 1 and FR2-NTN, or SS/PBCH block and CORESET multiplexing pattern 1 and {SS/PBCH block, PDCCH} SCS {120, 120} kHz in FR2-2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Index |  | Number of search space sets per slot |  | **First symbol index** |
| 0 | 0 | 1 | 1 | 0 |
| 1 | 0 | 2 | 1/2 | {0, if is even}, {7, if is odd} |
| 2 | 2.5 | 1 | 1 | 0 |
| 3 | 2.5 | 2 | 1/2 | {0, if is even}, {7, if is odd} |
| 4 | 5 | 1 | 1 | 0 |
| 5 | 5 | 2 | 1/2 | {0, if is even}, {7, if is odd} |
| 6 | 0 | 2 | 1/2 | {0, if is even}, {, if is odd} |
| 7 | 2.5 | 2 | 1/2 | {0, if is even}, {, if is odd} |
| 8 | 5 | 2 | 1/2 | {0, if is even}, {, if is odd} |
| 9 | 7.5 | 1 | 1 | 0 |
| 10 | 7.5 | 2 | 1/2 | {0, if is even}, {7, if is odd} |
| 11 | 7.5 | 2 | 1/2 | {0, if is even}, {, if is odd} |
| 12 | 0 | 1 | 2 | 0 |
| 13 | 5 | 1 | 2 | 0 |
| 14 | Reserved | | | |
| 15 | Reserved | | | |

< Unchanged parts are omitted >

If a UE detects a first SS/PBCH block and determines that a CORESET for Type0-PDCCH CSS set is not present, and for for FR1 or for for FR2, the UE may determine the nearest (in the corresponding frequency direction) global synchronization channel number (GSCN) of a second SS/PBCH block having a CORESET for an associated Type0-PDCCH CSS set as . is the GSCN of the first SS/PBCH block, in FR1, FR2-1 and FR2-NTN, 3 in FR2-2, and is a GSCN offset provided by Table 13-16 for FR1 and Table 13-17 for FR2. If the UE detects the second SS/PBCH block and the second SS/PBCH block does not provide a CORESET for Type0-PDCCH CSS set, as described in clause 4.1, the UE may ignore the information related to GSCN of SS/PBCH block locations for performing cell search.