**3GPP TSG-RAN WG4 Meeting #** **112 *R4-24xxxxx***

**Maastricht, Netherlands,19th-23rd August, 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.101-4** | **CR** | 0610 | **rev** | **1** | **Current version:** | **18.4.0** |  |
|  | | | | | | | | |
| *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 for 38.101-4 Corrections on less than 5MHz PDCCH demodulation requirements | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei,HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_FR1\_lessthan\_5MHz\_BW-Perf | | | | |  | ***Date:*** | | | 2024-07-31 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | 1. There is one editorial typo 2. For the note1 in Table 5.3.2.1.7-1 and Table 5.3.3.1.6-1, CORESET #0 has 15PRBs (RB#0~RB#14), the last RB of PDCCH is out of CORESET #0 rather than in CORESET#0 3. The requirements are still with square brackets | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Correct the typo 2. Change Note1 in Table 5.3.2.1.1-1 and Table 5.3.3.1.6-1”The last PDCCH RB in CORESET0 (RB#15) is punctured and not transmitted.” to ”The last PDCCH RB out of CORESET0 (RB#15) is punctured and not transmitted.” 3. Remove the square brackets | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | 1. The typo will still be presents 2. The note1 will still be incorrect 3. The square brackets will still be present | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.3.2.1.7, 5.3.3.1.6 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS 38.521-4 | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

## 5.3 PDCCH demodulation requirements

### 5.3.2 2RX requirements

#### 5.3.2.1 FDD

The parameters specified in Table 5.3.2.1-1 are valid for all FDD tests unless otherwise stated.

Table 5.3.2.1-1: Test Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **1 Tx Antenna** | **2 Tx Antenna** | 4 Tx Antenna |
| CCE to REG mapping type |  | nonInterleaved | | |
| REG bundle size |  | 6 | | |
| Shift index |  | 0 | | |

##### 5.3.2.1.7 Minimum requirements for 3 MHz channel bandwidth

During the test the UE shall be configured to monitor CORESET#0 with *searchSpaceType=common* using *DCI Format* *1-0*.

The parameters specified in Table 5.3.2.1.7-1 are valid for FDD test in this clause unless otherwise stated.

Table 5.3.2.1.7-1: Test Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | | Unit | 1 Tx Antenna |
| Frequency domain resource allocation for PDCCH | Start | RB Index | 8 |
| Length | RBs | 7 (Note 1) |
| Allocation |  | Contiguous |
| CCE to REG mapping type | |  | nonInterleaved |
| REG bundle size | |  | 6 |
| Shift Index | |  | NA |
| Note 1: The last PDCCH RB that is out of CORESET0,i.e.,RB#15, is punctured and not transmitted. | | | |

For the parameters specified in Table 5.3.2.1.7-1, the average probability of a missed downlink scheduling grant (Pm-dsg) shall be below the specified value in Table 5.3.2.1.7-2. The downlink physical setup is in accordance with Annex C.3.1.

Table 5.3.2.1.7-2: Minimum performance for 3 MHz CBW

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Test number | Bandwidth (MHz) | CORESET0 RB | CORESET0 duration | Aggregation level | Reference Channel | Propagation Condition | Antenna configuration and correlation Matrix | Reference value | |
| Pm-dsg (%) | SNR (dB) |
| 1-1 | 3 | 15 | 3 | 4 | R.PDCCH. 1-3.1 FDD | TDLA30-10 | 1x2 Low | 1 | 7.2 |

### 5.3.3 4RX requirements

#### 5.3.3.1 FDD

##### 5.3.3.1.6 Minimum requirements for 3 MHz channel bandwidth

During the test the UE shall be configured to monitor CORESET0 with *searchSpaceType=common* using *DCI Format* *1-0*.

The parameters specified in Table 5.3.3.1.6-1 are valid for FDD test in this clause unless otherwise stated.

Table 5.3.3.1.6-1: Test Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | | Unit | 2 Tx Antennas |
| Frequency domain resource allocation for PDCCH | Start | RB Index | 8 |
| Length | RBs | 7 (Note 1) |
| Allocation |  | Contiguous |
| CCE to REG mapping type | |  | nonInterleaved |
| REG bundle size | |  | 6 |
| Shift Index | |  | NA |
| Note 1: The last PDCCH RB out of CORESET0, i.e.RB#15, is punctured and not transmitted. | | | |

For the parameters specified in Table 5.3.3.1.6-1, the average probability of a missed downlink scheduling grant (Pm-dsg) shall be below the specified value in Table 5.3.3.1.6-2. The downlink physical setup is in accordance with Annex C.3.1.

Table 5.3.3.1.6-2: Minimum performance for 3 MHz CBW

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Test number | Bandwidth (MHz) | CORESET0 RB | CORESET0 duration | Aggregation level | Reference Channel | Propagation Condition | Antenna configuration and correlation Matrix | Reference value | |
| Pm-dsg (%) | SNR (dB) |
| 1-1 | 3 | 15 | 3 | 4 | R.PDCCH. 1-3.1 FDD | TDLC300-100 | 2x4 Low | 1 | -1 |

<Next Changes>

## A.3.3 Reference measurement channels for PDCCH performance requirements

### A.3.3.1 FDD

#### A.3.3.1.1 Reference measurement channels for SCS 15 kHz FR1

Table A.3.3.1.1-1: PDCCH Reference Channels (Time domain allocation 1 symbol)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | | | | | |
| Reference channel |  | R.PDCCH.1-1.1 FDD | R.PDCCH.1-1.2 FDD | R.PDCCH.1-1.3 FDD |  |  |  |
| Subcarrier spacing | kHz | 15 | 15 | 15 |  |  |  |
| CORESET frequency domain allocation |  | 48 | 48 | 48 |  |  |  |
| CORESET time domain allocation |  | 1 | 1 | 1 |  |  |  |
| Aggregation level |  | 4 | 4 | 8 |  |  |  |
| DCI Format |  | 1\_0 | 1\_1 | 1\_1 |  |  |  |
| Payload (without CRC) | Bits | 39 | 52 | 52 |  |  |  |

Table A.3.3.1.1-2: PDCCH Reference Channel (Time domain allocation 2 symbols)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | | | | | | | | |
| Reference channel |  | R.PDCCH.1-2.1 FDD | R.PDCCH.1-2.2 FDD | R.PDCCH.1-2.3 FDD | R.PDCCH.1-2.4 FDD | R.PDCCH.1-2.5 FDD | R.PDCCH.1-2.6 FDD | R.PDCCH.1-2.7 FDD | R.PDCCH.1-2.8 FDD | R.PDCCH.1-2.9 FDD |
| Subcarrier spacing | kHz | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| CORESET frequency domain allocation |  | 24 | 24 | 24 | 48 | 48 | 48 | 48 | 48 | 48 |
| CORESET time domain allocation |  | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Aggregation level |  | 2 | 4 | 2 | 4 | 8 | 16 | 8 | 4 | 8 |
| DCI Format |  | 1\_0 | 1\_0 | 1\_1 | 1\_1 | 1\_1 | 1\_0 | 2\_6 | 1\_0 | 1\_0 |
| Payload (without CRC) | Bits | 39 | 39 | 52 | 52 | 52 | 39 | 12 | 39 | 39 |

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#### A.3.3.1.2 Reference measurement channels for SCS 30 kHz FR1

Table A.3.3.1.2-1: PDCCH Reference Channels (Time domain allocation 1 symbol)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | | | | | |
| Reference channel |  | R.PDCCH.2-1.1 FDD | R.PDCCH.2-1.2 FDD | R.PDCCH.2-1.3 FDD |  |  |  |
| Subcarrier spacing | kHz | 30 | 30 | 30 |  |  |  |
| CORESET frequency domain allocation |  | 102 | 102 | 90 |  |  |  |
| CORESET time domain allocation |  | 1 | 1 | 1 |  |  |  |
| Aggregation level |  | 2 | 4 | 8 |  |  |  |
| DCI Format |  | 1\_0 | 1\_1 | 1\_1 |  |  |  |
| Payload (without CRC) | Bits | 41 | 53 | 53 |  |  |  |

Table A.3.3.1.2-2: PDCCH Reference Channel (Time domain allocation 2 symbols)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | | | | | |
| Reference channel |  | R.PDCCH.2-2.1 FDD |  |  |  |  |  |
| Subcarrier spacing | kHz | 30 |  |  |  |  |  |
| CORESET frequency domain allocation |  | 48 |  |  |  |  |  |
| CORESET time domain allocation |  | 2 |  |  |  |  |  |
| Aggregation level |  | 16 |  |  |  |  |  |
| DCI Format |  | 1\_0 |  |  |  |  |  |
| Payload (without CRC) | Bits | 41 |  |  |  |  |  |

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