**3GPP TSG- Meeting #**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** |  | **rev** | 1 | **Current version:** |  |  |
|  | | | | | | | | |
| *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:*** |  | | | | | | | | | |
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| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *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:*** | | Introduction of enhanced MPDCCH demodulation requirements. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Introduction of enhanced MPDCCH demodulation requirements.  Set the requirements according to R4-2010475. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Enhanced MPDCCH demodulation requirements are missing. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 8.11.2.1.5 (new), 8.11.2.2.5 (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **x** |  | Test specifications | | | | TS36.521-1 CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

----------------------------------------------------- Beginning of Change ------------------------------------------------------------

##### 8.11.2.1.5 CE Mode A and CE Mode B when CRS-ChEstMPDCCH-Config is configured

For the parameters specified in Table 8.11.2.1.5-1 the average probability of a missed downlink scheduling grant (Pm-dsg) shall be below the specified value in Table 8.11.2.1.5-2 for CE Mode A and in Table 8.11.2.1.5-3 for CE Mode B. The downlink physical setup is in accordance with Annex C.3.2.

Table 8.11.2.1.5-1: Test Parameters for MPDCCH (Category M1)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | CE Mode A (Test 1) | CE Mode B (Test 1) |
| OFDM starting symbol (startSymbolLC) | | symbols | 2 | 2 |
| Unused RE-s and PRB-s | |  | OCNG | OCNG |
| Cell ID | |  | 0 | 0 |
| Downlink power allocation |  | dB | -3 | 0 |
|  | dB | -3 | 0 |
| σ | dB | 0 | -3 |
| δ | dB | 3 | 0 |
| at antenna port | | dBm/15kHz | -98 | -98 |
| Cyclic prefix | |  | Normal | Normal |
| Subframe Configuration | |  | Non-MBSFN | Non-MBSFN |
| Precoder Update Granularity | | PRB | N/A | Note 2 |
| ms | N/A | Note 2 |
| Beamforming Pre-Coder | |  | Note 2 | Note 2 |
| Cell Specific Reference Signal | |  | Port 0 and 1 | Port 0 and 1 |
| Number of PRB per MPDCCH Set | |  | 4 | 2+4 |
| Transmission type | |  | Distributed | Localized |
| Frequency hopping | |  | Disabled | Enabled |
| Number of frequency hopping narrowbands | |  | N/A | 4 |
| Frequency hopping offset | |  | N/A | 1 |
| Frequency hopping interval | | ms | N/A | 16 |
| Value of G in MPDCCH start subframe (*mpdcch-startSF-UESS*) (Note 3) | |  | 1.5 | 1.5 |
| Maximum number of repetitions (*mPDCCH-NumRepetition*) | |  | 16 | 32 |
| MPDCCH repetition number | |  | 16 | 32 |
| MPDCCH narrowband (*mpdcch-Narrowband*) | |  | 1 | 7 |
| PDSCH TM | |  | TM2 | TM2 |
| DCI Format | |  | 6-1A | 6-1B |
| fdd-DownlinkOrTddSubframeBitmapBR | |  | 1111111111 | 1111111111 |
| mpdcch-crs-config | |  | Configured | Configured |
| Power offset between CRS and DMRS antenna ports of MPDCCH | | dB | 0 | 0 |
| mpdcch-crs-localized-mapping-type | |  | N/A | Not configured |
| Note 1: For each test, DC subcarrier puncturing shall be considered.  Note 2: TS 36.211 6.8B.5.  Note 3: For MPDCCH UE-specific search space the formula for the start subframe k0 is given in TS 36.213 [6] clause 9.1.5.  Note 4: If not otherwise stated, the values in this table refer to parameters in TS 36.211 [4] or/and TS 36.213 [6] as appropriate. | | | | |

Table 8.11.2.1.5-2: Minimum performance CE Mode A MPDCCH

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Test number | Bandwidth | Aggregation level | Reference Channel | OCNG Pattern | Propagation Condition | Antenna configuration and correlation Matrix | Reference value | | UE  Category |
| Pm-dsg (%) | SNR (dB) |
| 1 | 10 MHz | 16 ECCE | R.82 FDD | OP.2 FDD | EPA5 | 2 x 1 Low | 1 | [-3.4] | M1 |

Table 8.11.2.1.5-3: Minimum performance CE Mode B MPDCCH

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Test number | Bandwidth | Aggregation level | Reference Channel | OCNG Pattern | Propagation Condition | Antenna configuration and correlation Matrix | Reference value | | UE  Category |
| Pm-dsg (%) | SNR (dB) |
| 1 | 10 MHz | 24 ECCE | R.83 FDD | OP.2 FDD | ETU1 | 2 x 1 Low | 1 | [-9.5] | M1 |

------------------------------------------------- Unchanged sections omitted --------------------------------------------------------

##### 8.11.2.2.5 CE Mode A and CE Mode B when CRS-ChEstMPDCCH-Config is configured

For the parameters specified in Table 8.11.2.2.5-1 the average probability of a missed downlink scheduling grant (Pm-dsg) shall be below the specified value in Table 8.11.2.2.5-2 for CE Mode A and in Table 8.11.2.2.5-3 for CE Mode B. The downlink physical setup is in accordance with Annex C.3.2.

Table 8.11.2.2.5-1: Test Parameters for MPDCCH (Category M1)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | CE Mode A | CE Mode B |
| OFDM starting symbol (startSymbolLC) | | symbols | 2 | 2 |
| Unused RE-s and PRB-s | |  | OCNG | OCNG |
| Cell ID | |  | 0 | 0 |
| Downlink power allocation |  | dB | -3 | 0 |
|  | dB | -3 | 0 |
| σ | dB | 0 | -3 |
| δ | dB | 3 | 0 |
| at antenna port | | dBm/15kHz | -98 | -98 |
| Cyclic prefix | |  | Normal | Normal |
| Subframe Configuration | |  | Non-MBSFN | Non-MBSFN |
| Precoder Update Granularity | | PRB | N/A | Not e2 |
| ms | N/A | Note 2 |
| Beamforming Pre-Coder | |  | Note 2 | Note 2 |
| Cell Specific Reference Signal | |  | Port 0 and 1 | Port 0 and 1 |
| Number of PRB per MPDCCH Set | |  | 4 | 2+4 |
| Transmission type | |  | Distributed | Localized |
| Frequency hopping | |  | Disabled | Enabled |
| Number of frequency hopping narrowbands | |  | N/A | 4 |
| Frequency hopping offset | |  | N/A | 1 |
| Frequency hopping interval | | ms | N/A | 20 |
| Value of G in MPDCCH start subframe (*mpdcch-startSF-UESS*) (Note 4) | |  | 5 | 5 |
| Maximum number of repetitions  (*mPDCCH-NumRepetition*) | |  | 16 | 32 |
| MPDCCH repetition number | |  | 16 | 32 |
| MPDCCH narrowband (*mpdcch-Narrowband*) | |  | 1 | 7 |
| PDSCH TM | |  | TM2 | TM2 |
| DCI Format | |  | 6-1A | 6-1B |
| TDD UL/DL Configuration | |  | 0 | 0 |
| TDD Special Subframe | |  | 1 | 1 |
| fdd-DownlinkOrTddSubframeBitmapBR | |  | 1000010000 | 1000010000 |
| mpdcch-crs-config | |  | Configured | Configured |
| Power offset between CRS and DMRS antenna ports of MPDCCH | | dB | 0 | 0 |
| mpdcch-crs-localized-mapping-type | |  | N/A | Not configured |
| Note 1: For each test, DC subcarrier puncturing shall be considered.  Note 2: TS 36.211 6.8B.5  Note 3: The special subframes are not supported by MPDCCH and are assumed as non- BL/CE DL subframes.  Note 4: For MPDCCH UE-specific search space the formula for the start subframe k0 is given in TS 36.213 [6] clause 9.1.5.  Note 5: If not otherwise stated, the values in this table refer to parameters in TS 36.211 [4] or/and TS 36.213 [6] as appropriate. | | | | |

Table 8.11.2.2.5-2: Minimum performance CE Mode A MPDCCH

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Test number | Bandwidth | Aggregation level | Reference Channel | OCNG Pattern | Propagation Condition | Antenna configuration and correlation Matrix | Reference value | | UE  Category |
| Pm-dsg (%) | SNR (dB) |
| 1 | 10 MHz | 16 ECCE | R.82 TDD | OP.2 TDD | EPA5 | 2 x 1 Low | 1 | [-4.1] | M1 |

Table 8.11.2.2.5-3: Minimum performance CE Mode B MPDCCH

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Test number | Bandwidth | Aggregation level | Reference Channel | OCNG Pattern | Propagation Condition | Antenna configuration and correlation Matrix | Reference value | | UE  Category |
| Pm-dsg (%) | SNR (dB) |
| 1 | 10 MHz | 24 ECCE | R.83 TDD | OP.2 TDD | ETU1 | 2 x 1 Low | 1 | [-9.7] | M1 |

------------------------------------------------------------- End of change ------------------------------------------------------------