**3GPP TSG- Meeting #**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
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|  |  | **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:***  | CR to 38.101-4 on PDSCH demod requirements for mDCI fully-overlapping with multi-RX in FR2 |
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| ***Source to WG:*** |  |
| ***Source to TSG:*** | RAN4 |
|  |  |
| ***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 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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | CR R4-2407244 was not correctly implemented – only the title was kept but content was from another CR R4-2409840. The changes to section 7.2.2.2 from CR R4-2409840 should have been in under 7.2.2.2.8, and will be captured in R4-2413558. |
|  |  |
| ***Summary of change:*** | Added back the requirements for FR2 Multi-RX with mDCI fully overlapping from CR R4-2407244. Deleted the FR2 HST requirements to be added in new section in another CR. |
|  |  |
| ***Consequences if not approved:*** | FR2 Multi-RX with mDCI fully overlapping requirements will be missingThe FR2 HST requirements will be under the wrong clause name |
|  |  |
| ***Clauses affected:*** | 7.2.2.2.6 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  |  |
| ***affected:*** | **X** |  |  Test specifications | TS 38.521-4  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications |  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** | Revision of R4-2411379 |

Change 1

7.2.2.2.6 Minimum requirements for PDSCH Multi-DCI based transmission scheme

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The performance requirements are specified in Table 7.2.2.2.6-3, with the addition of test parameters in Table 7.2.2.2.6-2 and the downlink physical channel setup according to Annex C.3.1.

The test purposes are specified in Table 7.2.2.2.6-1.

**Table 7.2.2.2.6-1: Tests purpose**

|  |  |
| --- | --- |
| Purpose | Test index |
| Verify the PDSCH performance when UE is configured two different values of CORESETPoolIndex in ControlResourceSet and when UE receives multiple PDCCHs scheduling fully-overlapping PDSCHs with simultaneous reception | 1-1 |

**Table 7.2.2.2.6-2: Test parameters**

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| TRxP #1(Note 1) | TRxP #2(Note 1) |
| SSB |  | SSB#0 | SSB#1 |
| PDCCH configuration | TCI state |  | TCI State #0 | TCI State #1 |
| CORESETPoolIndex |  | 0,1 |
| CSI-RS for tracking | First subcarrier index in the PRB used for CSI-RS |  | k0=0 for CSI-RS resources 1,2,3,4 | k0=1 for CSI-RS resources 5,6,7,8 |
| First OFDM symbol in the PRB used for CSI-RS |  | l0 = 6 for CSI-RS resources 1 and 3l0 = 10 for CSI-RS resources 2 and 4 | l0 = 6 for CSI-RS resources 5 and 7l0 = 10 for CSI-RS resources 6 and 8 |
| Number of CSI-RS ports (X) |  | 1 for CSI-RS resource 1,2,3,4 | 1 for CSI-RS resource 5,6,7,8 |
| CDM Type |  | ‘No CDM’ for CSI-RS resource 1,2,3,4,5,6,7,8 |
| Density |  | 3 |
| CSI-RS periodicity | Slots | 160 |
| CSI-RS offset | Slots | 80 for CSI-RS resources 1 and 281 for CSI-RS resources 3 and 4 | 80 for CSI-RS resources 5 and 681 for CSI-RS resources 7 and 8 |
| QCL info |  | TCI state #0 | TCI state #1 |
| CSI-RS for beam refinement | First subcarrier index in the PRB used for CSI-RS |  | k0=0 for CSI-RS resources 1,2 | k0=1 for CSI-RS resources 3,4 |
| First OFDM symbol in the PRB used for CSI-RS |  | l0 = 8 for CSI-RS resource 1 l0 = 9 for CSI-RS resource 2  | l0 = 8 for CSI-RS resource 3 l0 = 9 for CSI-RS resource 4  |
| Number of CSI-RS ports (X) |  | 1 for CSI-RS resource 1,2 | 1 for CSI-RS resource 3,4 |
| CDM Type |  | ‘No CDM’ for CSI-RS resource 1,2,3,4 |
| Density |  | 3 |
| CSI-RS periodicity | Slots | 160 |
| CSI-RS offset | Slots | 0 for CSI-RS resources 1,2  | 0 for CSI-RS resources 3, 4 |
| QCL info |  | TCI state #2 | TCI state #3 |
| PTRS | Frequency density (*KPT-RS*) |  | 2 | 2 |
| Time density (*LPT-RS*) |  | 1 | 1 |
| Resource Element Offset |  | 2 | 0 |
| Duplex mode |  | TDD |
| Active DL BWP index |  | 1 |
| PDSCH configuration | Mapping type |  | Type A |
| k0 |  | 0 |
| Starting symbol (S)  |  | 2 |
| Length (L) |  | 12 |
| PRB bundling type |  | Static |
| PRB bundling size |  | 2 |
| Resource allocation type |  | Type 1 |
| RBG size |  | Config2 |
| VRB-to-PRB mapping type |  | Non-interleaved |
| VRB-to-PRB mapping interleaver bundle size |  | N/A |
| Num CDM groups without data |  | 2 | 2 |
| PDSCH DMRS configuration | Antenna port indexes |  | {1000} | {1002} |
| TCI state |  | TCI State #0 | TCI State #1 |
| DMRS Type |  | Type 1 |
| Number of additional DMRS |  | 1 |
| Maximum number of OFDM symbols for DL front loaded DMRS |  | 1 |
| TCI State #0 | Type 1 QCL information | SSB resource |  | SSB #0 | N/A |
| QCL Type |  | Type C | N/A |
| Type 2 QCL information | SSB resource |  | SSB #0 | N/A |
| QCL Type |  | Type D | N/A |
| TCI State #1 | Type 1 QCL information | SSB resource |  | N/A | SSB #1 |
| QCL Type |  | N/A | Type C |
| Type 2 QCL information | SSB resource |  | N/A | SSB #1 |
| QCL Type |  | N/A | Type D |
| TCI State #2 | Type 1 QCL information | CSI-RS resource |  | CSI-RS resource 1 from 'CSI-RS for tracking’ configuration | N/A |
| QCL Type |  | Type A | N/A |
| Type 2 QCL information | CSI-RS resource |  | CSI-RS resource 1 from 'CSI-RS for tracking’ configuration | N/A |
| QCL Type |  | Type D | N/A |
| TCI State #3 | Type 1 QCL information | CSI-RS resource |  | N/A | CSI-RS resource 5 from 'CSI-RS for tracking’ configuration |
| QCL Type |  | N/A | Type A |
| Type 2 QCL information | CSI-RS resource |  | N/A | CSI-RS resource 5 from 'CSI-RS for tracking’ configuration |
| QCL Type |  | N/A | Type D |
| Resource allocation |  | Fully-overlapping |
| Timing offset of the second TRxP from the first TRxP | us | -0.0625 |
| Frequency offset of the second TRxP from the first TRxP | Hz | 600 |
| Number of HARQ Processes |  | 8  |
| The number of slots between PDSCH and corresponding HARQ-ACK information |  | Specific to each TDD UL-DL pattern and as defined in Annex A.1.2 |
| Precoding configuration |  | SP Type I, independent precoding generation is applied for both TRxPs, random per slot with PRB bundling granularity |
| Note 1: PDSCH transmission is done from both TRxPs. Transmission from TRxP #1 uses CORESETPoolIndex 0 and transmission from TRxP #2 uses CORESETPoolIndex 1 |

**Table 7.2.2.2.6-3: Minimum performance**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Test num. | Reference channel | Bandwidth (MHz) / Subcarrier spacing (kHz) | Modulation format and code rate | TDD UL-DL pattern | Propagation condition(Note 1) | Correlation matrix and antenna configuration(Note 2) | Reference value |
| Fraction of maximum throughput (%) | SNR (dB)(Note 3) |
| 1-1 | TRxP #1 | TRxP #2 | 100 / 120 | 64QAM, 0.43 | FR2.120-1 | TDLA30-75 | 4x4 FR2- mTRxP-mRX=-12dB | 70 | [14.8] |
| R.PDSCH.5-3.3 TDD | R.PDSCH.5-3.3 TDD |
| Note 1: The propagation conditions apply to each of TRxP #1 and TRxP #2 and are statistically independentNote 2: Correlation matrix according to the RFR2-mTxRP-mRX in B.2.3.3. TRxP#1 uses TX antenna indices (1,2) and TRxP#2 uses TX antenna indices (3,4) corresponding to the respective antenna configuration matrix rows. Note 3: SNR is defined per UE Rx chain. SNR of Rx chain i (i=1,2) is derived based on Es from TRxP#i, as defined in 4.5.2.  |