**3GPP TSG- Meeting #96-e**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** | **0077** | **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 on Corrections in 38.101-4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***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:*** | | 1. PDCCH allocation for LTE-NR coexistence PDSCH tests is not clear. 2. Test 2-1 in Section 5.2.3.1.1 should have 4 HARQ processes 3. PDSCH precoding configuration for FR2 SDR tests is incorrect. 4. Editor’s note in Annex C.3.1 and Annex C.5.1 is not needed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. PDCCH allocation for LTE-NR coexistence PDSCH tests is specified. PDCCH is allocated on symbol 2. 2. Number of HARQ processes for Test 2-1 in Section 5.2.3.1.1 is fixed. 3. PDSCH precoding configuration for FR2 SDR tests is fixed. 4. Editor’s notes are removed in Annex C.3.1 and C.5.1 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Test setup will not be clear. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.2.2.1.4, 5.2.3.1.4, 7.5A, C.3.1, C.5.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

<< Start of change 1 >>

**Table 5.2.2.1.4-2: Test parameters**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** |
| Duplex mode | |  | FDD |
| Active DL BWP index | |  | 1 |
| NR UL transmission with a 7.5 kHz shift to the LTE raster | |  | true |
| PDCCH configuration | Symbols with PDCCH |  | Symbol# 2 |
| PDSCH configuration | Mapping type |  | Type A |
| k0 |  | 0 |
| Starting symbol (S) |  | 3 |
| Length (L) |  | 9 for Test 1-1 11 for Test 1-2 |
| PDSCH aggregation factor |  | 1 |
| PRB bundling type |  | Static |
| PRB bundling size |  | 2 |
| Resource allocation type |  | Type 0 |
| RBG size |  | Config2 |
| VRB-to-PRB mapping type |  | Non-interleaved |
| VRB-to-PRB mapping interleaver bundle size |  | N/A |
| PDSCH DMRS configuration | DMRS Type |  | Type 1 |
| Position of the first DM-RS for downlink |  | 3 |
| Number of additional DMRS |  | 1 |
| Maximum number of OFDM symbols for DL front loaded DMRS |  | 1 |
| CRS for rate matching (Note 1) | LTE carrier centre subcarrier location |  | Same as NR carrier centre subcarrier location |
| LTE carrier BW | MHz | 10 |
| Number of antenna ports |  | 4 |
| v-shift |  | 0 |
| Number of HARQ Processes | |  | 4 |
| The number of slots between PDSCH and corresponding HARQ-ACK information | |  | 2 |
| Note 1: No MBSFN is configured on LTE carrier | | | |

<< End of change 1 >>

<< Start of change 2 >>

**Table 5.2.3.1.4-2: Test parameters**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** |
| Duplex mode | |  | FDD |
| Active DL BWP index | |  | 1 |
| NR UL transmission with a 7.5 kHz shift to the LTE raster | |  | true |
| PDCCH configuration | Symbols with PDCCH |  | Symbol# 2 |
| PDSCH configuration | Mapping type |  | Type A |
| k0 |  | 0 |
| Starting symbol (S) |  | 3 |
| Length (L) |  | 9 for Test 1-1 11 for Test 1-2 |
| PDSCH aggregation factor |  | 1 |
| PRB bundling type |  | Static |
| PRB bundling size |  | 2 |
| Resource allocation type |  | Type 0 |
| RBG size |  | Config2 |
| VRB-to-PRB mapping type |  | Non-interleaved |
| VRB-to-PRB mapping interleaver bundle size |  | N/A |
| PDSCH DMRS configuration | DMRS Type |  | Type 1 |
| Position of the first DM-RS for downlink |  | 3 |
| Number of additional DMRS |  | 1 |
| Maximum number of OFDM symbols for DL front loaded DMRS |  | 1 |
| CRS for rate matching (Note 1) | LTE carrier centre subcarrier location |  | Same as NR carrier centre subcarrier location |
| LTE carrier BW | MHz | 10 |
| Number of antenna ports |  | 4 |
| v-shift |  | 0 |
| Number of HARQ Processes | |  | 4 |
| The number of slots between PDSCH and corresponding HARQ-ACK information | |  | 2 |
| Note 1: No MBSFN is configured on LTE carrier | | | |

<< End of change 2 >>

<< Start of change 3 >>

**Table 5.2.3.1.1-2: Test parameters**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** |
| Duplex mode | |  | FDD |
| Active DL BWP index | |  | 1 |
| PDSCH configuration | Mapping type |  | Type A |
| k0 |  | 0 |
| Starting symbol (S) |  | 2 |
| Length (L) |  | 12 |
| PDSCH aggregation factor |  | 1 |
| PRB bundling type |  | Static |
| PRB bundling size |  | 4 for Test 1-1 WB for Test 3-1  2 for other tests |
| Resource allocation type |  | Test 1-2: Type 1 with start RB = 23, LRBs = 6  Other test: Type 0 |
| RBG size |  | Test 1-2: N/A  Other tests: Config2 |
| VRB-to-PRB mapping type |  | Non-interleaved |
| VRB-to-PRB mapping interleaver bundle size |  | N/A |
| PDSCH DMRS configuration | DMRS Type |  | Type 1 |
| Number of additional DMRS |  | 2 for Test 1-1, 1-5  1 for other tests |
| Maximum number of OFDM symbols for DL front loaded DMRS |  | 1 |
| CSI-RS for tracking | CSI-RS periodicity | Slots | Test 1-5: 10 for CSI-RS resource 1,2,3,4.  Other tests: Table 5.2-1. |
| CSI-RS offset | Slots | Test 1-5: 1 for CSI-RS resource 1 and 2 2 for CSI-RS resource 3 and 4.  Other tests: Table 5.2-1. |
| Number of HARQ Processes | |  | 8 for Test 1-4  4 for other tests |
| The number of slots between PDSCH and corresponding HARQ-ACK information | |  | 2 |

<< End of change 3 >>

<< Start of change 4 >>

**Table 7.5A.1-1: Test parameters for FR2 TDD**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | | **Unit** | **Value** |
| PDSCH transmission scheme | | |  | Transmission scheme 1 |
| PTRS epre-Ratio | | |  | 0 |
| Channel bandwidth | | | MHz | Channel bandwidth from selected CA bandwidth combination |
| Common serving cell parameters | Physical Cell ID | |  | 0 |
| SSB position in burst | |  | First SSB in Slot #0 |
| SSB periodicity | | ms | 20 |
| First DMRS position for Type A PDSCH mapping | |  | 2 |
| Cross carrier scheduling | | |  | Not configured |
| Active DL BWP index | | |  | 1 |
| Actual carrier configuration | Offset between Point A and the lowest usable subcarrier on this carrier (Note 3) | | RBs | 0 |
| Subcarrier spacing | | kHz | 60 or 120 |
| DL BWP configuration #1 | RB Offset | |  | 0 |
| Number of contiguous PRB | |  | Maximum transmission bandwidth configuration as specified in clause 5.3.2 of TS 38.101-2 [7] for tested channel bandwidth and subcarrier spacing |
| Subcarrier spacing | | kHz | 60 or 120 |
| Cyclic prefix | |  | Normal |
| PDCCH configuration | Slots for PDCCH monitoring | |  | Each slot |
| Symbols with PDCCH | |  | Symbols #0 |
| Number of PRBs in CORESET | |  | Table 7.5A.1-2 |
| Number of PDCCH candidates and aggregation levels | |  | 1/8 |
| CCE-to-REG mapping type | |  | Non-interleaved |
| DCI format | |  | 1-1 |
| TCI State | |  | TCI state #1 |
| PDCCH &PDCCH DMRS Precoding configuration | |  | Single Panel Type I, Random per slot with equal probability of precoder index 0 and 2, and with REG bundling granularity for number of Tx larger than 1 |
| PDSCH configuration | Mapping type | |  | Type A |
| k0 | |  | 0 |
| PDSCH aggregation factor | |  | 1 |
| PRB bundling type | |  | Static |
| PRB bundling size | |  | WB |
| Resource allocation type | |  | Type 0 |
| RBG size | |  | Config2 |
| VRB-to-PRB mapping type | |  | Non-interleaved |
| VRB-to-PRB mapping interleaver bundle size | |  | N/A |
| Starting symbol (S) | |  | 1 |
| Length (L) | |  | 13 |
| PDSCH DMRS configuration | DMRS Type | |  | Type 1 |
| Number of additional DMRS | |  | 1 |
| Length | |  | 1 |
| Antenna ports indexes | |  | {1000} for 1 Layer CCs {1000, 1001} for 2 Layers CCs |
| Number of PDSCH DMRS CDM group(s) without data | |  | 1 |
| PTRS configuration | Frequency density (*KPT-RS*) | |  | 2 |
| Time density (*LPT-RS*) | |  | 1 |
| CSI-RS for tracking | Subcarrier indexes in the PRB used for CSI-RS | |  | k0 = 3 for CSI-RS resource 1,2,3,4 |
| OFDM symbols in the PRB used for CSI-RS | |  | l0 = 6 for CSI-RS resource 1 and 3  l0 = 10 for CSI-RS resource 2 and 4 |
| Number of CSI-RS ports (X) | |  | 1 for CSI-RS resource 1,2,3,4 |
| CDM Type | |  | 'No CDM' for CSI-RS resource 1,2,3,4 |
| Density (ρ) | |  | 3 for CSI-RS resource 1,2,3,4 |
| CSI-RS periodicity | | Slots | 60 kHz SCS: 80 for CSI-RS resource 1,2,3,4  120 kHz SCS: 160 for CSI-RS resource 1,2,3,4 |
| CSI-RS offset | | Slots | 60 kHz SCS:  40 for CSI-RS resource 1 and 2  41 for CSI-RS resource 3 and 4  120 kHz SCS:  80 for CSI-RS resource 1 and 2  81 for CSI-RS resource 3 and 4 |
| Frequency Occupation | |  | Start PRB 0  Number of PRB = BWP size |
| QCL info | |  | TCI state #0 |
| NZP CSI-RS for CSI acquisition | Subcarrier indexes in the PRB used for CSI-RS | |  | k0 = 4 |
| OFDM symbols in the PRB used for CSI-RS | |  | l0 = 13 |
| Number of CSI-RS ports (X) | |  | Same as number of transmit antenna |
| CDM Type | |  | 'FD-CDM2' |
| Density (ρ) | |  | 1 |
| CSI-RS periodicity | | Slots | 60 kHz SCS: 80  120 kHz SCS: 160 |
| CSI-RS offset | |  | 0 |
| Frequency Occupation | |  | Start PRB 0  Number of PRB = BWP size |
| QCL info | |  | TCI state #1 |
| ZP CSI-RS for CSI acquisition | Subcarrier indexes in the PRB used for CSI-RS | |  | k0 = 0 |
| OFDM symbols in the PRB used for CSI-RS | |  | l0 = 12 |
| Number of CSI-RS ports (X) | |  | 4 |
| CDM Type | |  | 'FD-CDM2' |
| Density (ρ) | |  | 1 |
| CSI-RS periodicity | | Slots | 60 kHz SCS: 80  120 kHz SCS: 160 |
| CSI-RS offset | |  | 0 |
| Frequency Occupation | |  | Start PRB 0  Number of PRB = BWP size |
| CSI-RS for beam refinement | First subcarrier index in the PRB used for CSI-RS | |  | k0=0 for CSI-RS resource 1,2 |
| First OFDM symbol in the PRB used for CSI-RS | |  | l0 = 8 for CSI-RS resource 1  l0 = 9 for CSI-RS resource 2 |
| Number of CSI-RS ports (X) | |  | 1 for CSI-RS resource 1,2 |
| CDM Type | |  | 'No CDM' for CSI-RS resource 1,2 |
| Density (ρ) | |  | 3 for CSI-RS resource 1,2 |
| CSI-RS periodicity | | Slots | 60 kHz SCS: 80 for CSI-RS resource 1,2  120 kHz SCS: 160 for CSI-RS resource 1,2 |
| CSI-RS offset | | Slots | 0 for CSI-RS resource 1,2 |
| Repetition | |  | ON |
| QCL info | |  | TCI state #1 |
| TCI state #0 | Tyoe 1 QCL information | SSB index |  | SSB #0 |
| QCL Type |  | Type C |
| Tyoe 2 QCL information | SSB index |  | SSB #0 |
| QCL Type |  | Type D |
| TCI state #1 | Tyoe 1 QCL information | CSI-RS resource |  | CSI-RS resource 1 from 'CSI-RS for tracking' configuration |
| QCL Type |  | Type A |
| Tyoe 2 QCL information | CSI-RS resource |  | CSI-RS resource 1 from 'CSI-RS for tracking' configuration |
| QCL Type |  | Type D |
| Maximum number of code block groups for ACK/NACK feedback | | |  | 1 |
| Number of HARQ Processes | | |  | 10 for FR2.60-1 and 8 for FR2.120-1 |
| K1 value | | |  | Specific to each UL-DL pattern |
| Maximum number of HARQ transmission | | |  | 4 |
| HARQ ACK/NACK bundling | | |  | Multiplexed |
| Redundancy version coding sequence | | |  | {0,2,3,1} |
| TDD UL-DL pattern | | |  | 60 kHz SCS: FR2.60-1  120 kHz SCS: FR2.120-1 |
| PDSCH & PDSCH DMRS Precoding configuration | | |  | Single Panel Type I, Precoder index 0 per slot with Wideband granularity for Rank 2 |
| Symbols for all unused REs | | |  | OCNG Annex A.5 |
| Propagation condition | | |  | Static propagation condition  No external noise sources are applied |
| Antenna configuration | 1 layer CCs | |  | 1x2 or 1x4 |
| 2 layers CCs | |  | 2x2 or 2x4 |
| Physical signals, channels mapping and precoding | | |  | As specified in Annex B.4.1 |
| Note 1: PDSCH is scheduled only on full DL slots not containing SSB or TRS.  Note 2: UE assumes that the TCI state for the PDSCH is identical to the TCI state applied for the PDCCH transmission.  Note 3: Point A coincides with minimum guard band as specified in Table 5.3.3-1 from TS 38.101-2 [7] for tested channel bandwidth and subcarrier spacing. | | | | |

<< End of change 4 >>

<< Start of change 5 >>

C.3.1 Measurement of Performance requirements

Table C.3.1-1 is applicable for measurements in which uniform RS-to-EPRE boosting for all downlink physical channels, unless otherwise stated.

<< End of change 5 >>

<< Start of change 6 >>

C.5.1 Measurement of Receiver Characteristics

Table C.5.1-1 is applicable for measurements in which uniform RS-to-EPRE boosting for all downlink physical channels, unless otherwise stated.

<< End of change 6 >>