**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 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-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.
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| ***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
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|  |  |
| ***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 1-111 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 1-111 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 1-1WB for Test 3-12 for other tests |
| Resource allocation type |  | Test 1-2: Type 1 with start RB = 23, LRBs = 6Other test: Type 0 |
| RBG size |  | Test 1-2: N/AOther 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, 1-51 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 22 for CSI-RS resource 3 and 4.Other tests: Table 5.2-1. |
| Number of HARQ Processes |  | 8 for Test 1-44 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 3l0 = 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 1,2,3,4120 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 241 for CSI-RS resource 3 and 4120 kHz SCS:80 for CSI-RS resource 1 and 281 for CSI-RS resource 3 and 4 |
| Frequency Occupation |  | Start PRB 0Number 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: 80120 kHz SCS: 160  |
| CSI-RS offset |  | 0 |
| Frequency Occupation |  | Start PRB 0Number 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: 80120 kHz SCS: 160 |
| CSI-RS offset |  | 0 |
| Frequency Occupation |  | Start PRB 0Number 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 1l0 = 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 1,2120 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: FR2.60-1120 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 conditionNo 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 >>