**3GPP TSG- Meeting # *draft***

**, , -**

|  |
| --- |
| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** |  | **rev** |  | **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)*.* |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

|  |
| --- |
|  |
| ***Title:***  | BigCR for 38.101-4: Type 2 UE NonCol NR-CA PDSCH demodulation requirements |
|  |  |
| ***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 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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | Introduction of agreed type 2 UE NonCol NR-CA PDSCH demodulation requirements. |
|  |  |
| ***Summary of change:*** | Introduction of agreed type 2 UE NonCol NR-CA PDSCH demodulation requirements.Combines the following endorsed draftCRs:R4-2321094, Draft CR to 38.101-4 demodulation requirements for non-collocated NR-CAAdd the requirements for non-collocated scenarios for intra-band non-contiguous NR-CAThe requirements are set according to R4-2321053.R4-2321096, Draft CR on introduction of performance requirements for intra-band EN-DC/NR-CACaptured applicability rules for PDSCH requirements for intra-band non-colocated CA.R4-2321095, draftCR on FRC for Non-colocated Intraband CAIntroduce Non Colocated Intraband UE Demodulation Requirements – FRC |
|  |  |
| ***Consequences if not approved:*** | Missing agreed type 2 UE NonCol NR-CA PDSCH demodulation requirements. |
|  |  |
| ***Clauses affected:*** | 5.1.1.3 [R4-2321096]5.2A.2.6 (new) [R4-2321094]A.3.2.2.2 [R4-2321095] |
|  |  |
|  | **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:*** | AI 8.11.4 |
|  |  |
| ***This CR's revision history:*** |  |

***<Start of change 1 [R4-2321096]>***

# 5 Demodulation performance requirements (Conducted requirements)

#### 5.1.1.3 Applicability of requirements for optional UE features

Table 5.1.1.3-1: Requirements applicability for optional UE features

|  |  |  |  |
| --- | --- | --- | --- |
| UE feature/capability [14] | Test type | Test list | Applicability notes |
| SU-MIMO Interference Mitigation advanced receiver | FR1 FDD | PDSCH | Clause 5.2.2.1.1 (Test 3-1)Clause 5.2.3.1.1 (Test 5-1) |  |
|  | FR1 TDD | PDSCH | Clause 5.2.2.2.1 (Test 3-1)Clause 5.2.3.2.1 (Test 5-1) |  |
| Alternative additional DMRS position for co-existence with LTE CRS *(additionalDMRS-DL-Alt)* | FR1 FDD | PDSCH | Clause 5.2.2.1.4 (Test 1-2)Clause 5.2.3.1.4 (Test 1-2) |  |
|  | FR1 TDD | PDSCH | Clause 5.2.2.2.4 (Test 1-2)Clause 5.2.3.2.4 (Test 1-2) |  |
| Basic DL NR-NR CA operation (*supportedBandCombinationList*) | NR CA | SDR | Clause 5.5A.1 | 1)Up to 16 DL carriers2)Same numerology across carrier for data/control channel at a given time |
| Enhanced demodulation processing for HST-SFN joint transmission scheme with velocity up to 500km/h | FR1 FDD | PDSCH | Clause 5.2.2.1.9 (Test 1-1)Clause 5.2.3.1.9 (Test 1-1) |  |
|  | FR1 TDD | PDSCH | Clause 5.2.2.2.9 (Test 1-1)Clause 5.2.3.2.9 (Test 1-1) |  |
| Alternative 64QAM MCS table for PDSCHNew 64QAM MCS table for PDSCH (*dl-64QAM-MCS-TableAlt*) | FR1 FDD | PDSCH | Clause 5.2.2.1.5Clause 5.2.3.1.5Clause 5.2.2.1.6Clause 5.2.3.1.6 |  |
|  | FR1 TDD | PDSCH | Clause 5.2.2.2.5Clause 5.2.3.2.5Clause 5.2.2.2.6Clause 5.2.3.2.6 |  |
| CQI table with target BLER of 10^-5New CQI table (cqi-TableAlt) | FR1 FDD | PDSCH | Clause 5.2.2.1.5Clause 5.2.3.1.5 |  |
|  | FR1 TDD | PDSCH | Clause 5.2.2.2.5Clause 5.2.3.2.5 |  |
| PDSCH repetitions over multiple slots *(pdsch-RepetitionMultiSlots)*  | FR1 FDD | PDSCH | Clause 5.2.2.1.6Clause 5.2.3.1.6 |  |
|  | FR1 TDD | PDSCH | Clause 5.2.2.2.6Clause 5.2.3.2.6 |  |
| UE PDSCH processing capability #2 *(pdsch-ProcessingType2)* | FR1 FDD | PDSCH | Clause 5.2.2.1.7Clause 5.2.3.1.7 |  |
|  | FR1 TDD | PDSCH | Clause 5.2.2.2.7Clause 5.2.3.2.7 |  |
| Pre-emption indication for DL *(pre-EmptIndication-DL)* | FR1 FDD | PDSCH | Clause 5.2.2.1.8Clause 5.2.3.1.8 |  |
|  | FR1 TDD | PDSCH | Clause 5.2.2.2.8Clause 5.2.3.2.8 |  |
| Single DCI based SDM transmission for multi-TRxP (singleDCI-SDM-scheme-r16) | FR1 FDD | PDSCH | Clause 5.2.2.1.11Clause 5.2.3.1.11 |  |
| FR1 TDD | PDSCH | Clause 5.2.2.2.11Clause 5.2.3.2.11 |  |
| Multi DCI based multi-TRxP support (multiDCI-MultiTRP-r16) | FR1 FDD | PDSCH | Clause 5.2.2.1.12Clause 5.2.3.1.12 |  |
| FR1 TDD | PDSCH | Clause 5.2.2.2.12Clause 5.2.3.2.12 |  |
| Single DCI based FDM Scheme-A for multi-TRxP(supportFDM-SchemeA-r16) | FR1 FDD | PDSCH | Clause 5.2.2.1.13Clause 5.2.3.1.13 |  |
| FR1 TDD | PDSCH | Clause 5.2.2.2.13Clause 5.2.3.2.13 |  |
| Single DCI based inter-slot TDM for multi-TRxP (supportInter-slotTDM-r16) | FR1 FDD | PDSCH | Clause 5.2.2.1.14Clause 5.2.3.1.14 |  |
| FR1 TDD | PDSCH | Clause 5.2.2.2.14Clause 5.2.3.2.14 |  |
| Maximum number of TCI states in Single-DCI based inter-slot TDM (maxNumberTCI-states-r16) | FR1 FDD | PDSCH | Clause 5.2.2.1.14Clause 5.2.3.1.14 | The requirements apply only when maxNumberTCI-states-r16 = 2. |
| FR1 TDD | PDSCH | Clause 5.2.2.2.14Clause 5.2.3.2.14 |
| DRX Adaptation (*drx-Adaptation-r16*) | FR1 FDD | PDCCH | Clause 5.3.2.1.3 | If the Test 1 in Clause 5.3.2.1.3 is passed, the test coverage can be considered fulfilled without executing Test 3 in clause 5.3.2.1.1. |
| FR1 TDD | PDCCH | Clause 5.3.2.2.3 | If the Test 1 in Clause 5.3.2.2.3 is passed, the test coverage can be considered fulfilled without executing Test 2 in clause 5.3.2.2.1. |
| FR1 FDD | PDCCH | Clause 5.3.3.1.3 | If the Test 1 in Clause 5.3.3.1.3 is passed, the test coverage can be considered fulfilled without executing Test 3 in clause 5.3.3.1.1. |
| FR1 TDD | PDCCH | Clause 5.3.3.2.3 | If the Test 1 in Clause 5.3.3.2.3 is passed, the test coverage can be considered fulfilled without executing Test 2 in clause 5.3.3.2.1. |
| Validating P/SP-CSI-RS reception (*periodicAndSemi-PersistentCSI-RS-r16*) | FR1 TDD | PDSCH | Clause 5.2.2.2.15Clause 5.2.3.2.15Clause 5.2A.2.3Clause 5.2A.3.3 | The requirements apply only in case tested UE supporting operations in shared spectrum access and validation of P/SP-CSI-RS reception based on DCI |
| Supported UL channels for dynamic channel access mode (*ul-DynamicChAccess-r16*) or UL channel access for semi-static channel access mode (ul-Semi-StaticChAccess-r16) or both | FR1 TDD | PDSCH | Clause 5.2.2.2.15Clause 5.2.3.2.15 | The requirements apply only in case tested UE supports one of UL channels for dynamic channel access mode and UL channel access for semi-static channel access mode |
| 1024QAM modulation for PDSCH for FR1 (*pdsch-1024QAM-FR1-r17* or *pdsch-1024QAM-2MIMO-FR1-r17*) | FR1 FDD | PDSCH | Clause 5.2.2.1.1 (Test 1-8)Clause 5.2.3.1.1 (Test 1-8) |  |
|  | FR1 TDD | PDSCH | Clause 5.2.2.2.1 (Test 1-12)Clause 5.2.3.2.1 (Test 1-12) |  |
|  |  | SDR | Clause 5.5.1Clause 5.5A.1 | 1024QAM MCS indexes are used only if UE supports 1024QAM for FR1 DL. |
| Support of neighboring LTE cell CRS-IM in DSS scenario with NR 15 kHz SCS ( *CRS-IM-DSS-15kHzSCS-r17*)  | FR1 FDD | PDSCH | Clause 5.2.2.1.18Clause 5.2.3.1.17 | UE can support the feature on the CC(s) in a band only if the UE indicates support of rateMatchingLTE-CRS on that band. |
| FR1 TDD | PDSCH | Clause 5.2.2.2.19Clause 5.2.3.2.18 |
| Support of neighboring LTE cell CRS-IM in non-DSS and 15 kHz NR SCS scenario, without the assistance of network signaling on LTE channel bandwidth (*CRS-IM-nonDSS-15kHzSCS-r17*) | FR1 FDD | PDSCH | Clause 5.2.2.1.19 (Test 2-1)Clause 5.2.3.1.18 (Test 2-1) | The UE can perform CRS-IM when MeasObjectEUTRA IE is configured, and the configured measurement gaps overlap with neighbour LTE cell PBCH position. |
| FR1 TDD | PDSCH | Clause 5.2.2.2.20 (Test 2-1)Clause 5.2.3.2.19 (Test 2-1) |
| Support of neighboring LTE cell CRS-IM in non-DSS and 15 kHz NR SCS scenario, with the assistance of network signaling on LTE channel bandwidth (*CRS-IM-nonDSS-NWA-15kHzSCS-r17*) | FR1 FDD | PDSCH | Clause 5.2.2.1.19 (Test 1-1)Clause 5.2.3.1.18 (Test 1-1) | If the Test 2-1 in Clause 5.2.2.1.19 is passed, the test coverage can be considered fulfilled without executing Test 1-1 in clause 5.2.2.1.19.If the Test 2-1 in Clause 5.2.3.1.18 is passed, the test coverage can be considered fulfilled without executing Test 1-1 in clause 5.2.3.1.18. |
| FR1 TDD | PDSCH | Clause 5.2.2.2.20 (Test 1-1)Clause 5.2.3.2.19 (Test 1-1) | If the Test 2-1 in Clause 5.2.2.2.20 is passed, the test coverage can be considered fulfilled without executing Test 1-1 in clause 5.2.2.2.20.If the Test 2-1 in Clause 5.2.3.2.19 is passed, the test coverage can be considered fulfilled without executing Test 1-1 in clause 5.2.3.2.19. |
| CRS-IM in non-DSS and 30 kHz NR SCS scenario, without the assistance of network signaling on LTE channel bandwidth (*crs-IM-nonDSS-30kHzSCS-r17*) | FR1 TDD | PDSCH | Clause 5.2.2.2.20 (Test 2-2)Clause 5.2.3.2.19 (Test 2-2) | The UE can perform CRS-IM when MeasObjectEUTRA IE is configured, and the configured measurement gaps overlap with neighbour LTE cell PBCH position. |
| CRS-IM in non-DSS and 30 kHz NR SCS scenario, with the assistance of network signaling on LTE channel bandwidth (crs*-IM-nonDSS-NWA-30kHzSCS-r17*) | FR1 TDD | PDSCH | Clause 5.2.2.2.20 (Test 1-2)Clause 5.2.3.2.19 (Test 1-2) | If the Test 2-2 in Clause 5.2.2.2.20 is passed, the test coverage can be considered fulfilled without executing Test 1-2 in clause 5.2.2.2.20.If the Test 2-2 in Clause 5.2.3.2.19 is passed, the test coverage can be considered fulfilled without executing Test 1-2 in clause 5.2.3.2.19. |
| Support for SFN scheme A for PDCCH scheduling SFN Scheme A PDSCH *(sfn-SchemeA-r17)* | FR1 FDD | PDSCH | Clause 5.2.2.1.20Clause 5.2.3.1.19 |  |
|  | FR1 TDD | PDSCH | Clause 5.2.2.2.21Clause 5.2.3.2.20 |  |
| Support for SFN scheme B for PDCCH scheduling SFN Scheme B PDSCH *(sfn-SchemeB-r17)* | FR1 FDD | PDSCH | Clause 5.2.2.1.21Clause 5.2.3.1.20 |  |
|  | FR1 TDD | PDSCH | Clause 5.2.2.2.22Clause 5.2.3.2.21 |  |
| Support for PDCCH with intra-slot repetition *(mTRP-PDCCH-Repetition-r17)* | FR1 FDD | PDCCH | Clause 5.3.2.1.5Clause 5.3.3.1.4 |  |
|  | FR1 TDD | PDCCH | Clause 5.3.2.2.5Clause 5.3.3.2.4 |  |
| Support for TDD-TDD intra-band non-colocated NR-CA deployment (intraBandNR-CA-non-collocated-r18) | FR1 TDD | PDSCH | Clause 5.2A.2.6 | The requirements apply on in case the UE indicates support of 256QAM modulation scheme for PDSCH for FR1 (pdsch-256QAM-FR1) |

***<End of change 1 [R4-2321096]>***

***<Start of change 2 [R4-2321094]>***

#### 5.2A.2.6 Minimum requirements for non-collocated scenarios for intra-band non-contiguous NR-CA

The performance requirements are specified in Table 5.2A.2.6-5 based on the single carrier requirements for different bandwidth specified in Table 5.2A.2.6-3 and Table 5.2A.2.6-4, with the addition of test parameters in Table 5.2A.2.6-2 and the downlink physical channel setup according to Annex C.3.1.

The test purposes are specified in Table 5.2A.2.6-1.

Table 5.2A.2.6-1: Tests purpose

|  |  |
| --- | --- |
| Purpose | Test index |
| Verify the ability of an FR1 intra-band non-contiguous NR-CA UE in non-colocated scenarios to demodulate the signal transmitted by the PCell and SCell. Throughput is measured on the PCell and SCell simultaneously. | 1 |

Table 5.2A.2.6-2: Test parameters

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Duplex mode |  | TDD |
| Active DL BWP index |  | 1 |
| PDSCH configuration | Mapping type |  | Type A |
| k0 |  | 0 |
| Starting symbol (S)  |  | 2 |
| Length (L) |  | 12 for DL slot, 4 for special slot |
| 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 |
| Number of additional DMRS |  | 1 |
| Maximum number of OFDM symbols for DL front loaded DMRS |  | 1 |
| Number of HARQ Processes |  | 1 |
| Redundancy version coding sequence |  | {0} |
| TDD UL-DL pattern |  | 30kHz SCS: FR1.30-1 |
| SSB transmission |  | Slot#0 with periodicity 20ms |
| Timing offset of the SCell from the PCell  | us | 33 |
| NonCollocatedTypeNR-CA-r18 |  | Not configured |

Table 5.2A.2.6-3 Performance of single carrier with lower power for TDD 30 kHz SCS for non-co-located CA configurations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Bandwidth (MHz)  | Reference channel | Modulation format and code rate | Propagation condition | Antenna configuration | Reference value |
| Fraction of maximum throughput (%) | SNR (dB) |
| 40 | [R.PDSCH.2-1.6 TDD] | [QPSK.0.30] | Static channel specified in Annex B.1.1 | 2x2 | 70 | [-0.8] |

Table 5.2A.2.6-4 Performance of single carrier with higher power for TDD 30 kHz SCS for non-co-located CA configurations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Bandwidth (MHz)  | Reference channel | Modulation format and code rate | Propagation condition | Antenna configuration | Reference value |
| Fraction of maximum throughput (%) | SNR (dB) |
| 40 | [R.PDSCH.2-4.4 TDD] | [256QAM, 0.69] | Static channel specified in Annex B.1.1 | 2x2 | 70 | [24.5] |

Table 5.2A.2.6-5: Minimum performance for multiple CA configurations

|  |  |  |
| --- | --- | --- |
| Test number | CA duplex mode | Minimum performance requirements |
| 1 | TDD 30 kHz + TDD 30 kHz | As defined in Table 5.2A.2.6-3 and Table 5.2A.2.6-4 per CC |

***<End of change 2 [R4-2321094]>***

***<Start of change 3 [R4-2321095]>***

### A.3.2.2 TDD

[Unchanged parts skipped]

#### A.3.2.2.2 Reference measurement channels for SCS 30 kHz FR1

Table A.3.2.2.2-1: PDSCH Reference Channel for TDD UL-DL pattern FR1.30-1 and FR1.30-1A (QPSK)

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Unit** | **Value** |
| Reference channel |  | R.PDSCH.2-1.1 TDD | R.PDSCH.2-1.2 TDD | R.PDSCH.2-1.3 TDD | R.PDSCH.2-1.4 TDD | R.PDSCH.2-1.5 TDD | R.PDSCH.2-1.6 TDD |
| Channel bandwidth | MHz | 40 | 40 | 40 | 40 | 20 | 40 |
| Subcarrier spacing | kHz | 30 | 30 | 30 | 30 | 30 | 30 |
| Allocated resource blocks | PRBs | 106 | 6 | 106 | 106 | 51 | 106 |
| Number of consecutive PDSCH symbols |  |  |  |  |  |  |  |
|  For Slots 0 and Slot i, if mod(i, 10) = {8,9} for i from {0,…,39} |  | N/A | N/A | N/A | N/A | N/A | N/A |
|  For Slot i, if mod(i, 10) = 7 for i from {0,…,39} |  | 4 | 4 | N/A | N/A | 4 | 4 |
|  For Slot i, if mod(i, 10) = {0,1,2,3,4,5,6} for i from {1,…,39} |  | 12 | 12 | 7 | 12 | 12 | 12 |
| Allocated slots per 2 frames |  | 31 | 31 | 27 | 27 | 31 | 31 |
| MCS table |  | 64QAM | 64QAM | 64QAM | 64QAMLowSE | 64QAM | 64QAM |
| MCS index |  | 4 | 4 | 4 | 14 | 4 | 4 |
| Modulation |  | QPSK | QPSK | QPSK | QPSK | QPSK | QPSK |
| Target Coding Rate |  | 0.30 | 0.30 | 0.30 | 0.59 | 0.30 | 0.30 |
| Number of MIMO layers |  | 1 | 1 | 1 | 1 | 1 | 1 |
| Number of DMRS REs |  |  |  |  |  |  |  |
| For Slots 0 and Slot i, if mod(i, 10) = {8,9} for i from {0,…,39} |  | N/A | N/A | N/A | N/A | N/A | N/A |
|  For Slot i, if mod(i, 10) = 7 for i from {0,…,39} |  | 6 | 6 | N/A | N/A | 6 | 6 |
|  For Slot i, if mod(i, 10) = {0,1,2,3,4,5,6} for i from {1,…,39} |  | 18 | 12 | 12 | 12 | 18 | 12 |
| Overhead for TBS determination |  | 0 | 0 | 0 | 0 | 0 | 0 |
| Information Bit Payload per Slot  |  |  |  |  |  |  |  |
|  For Slots 0 and Slot i, if mod(i, 10) = {8,9} for i from {0,…,39} | Bits | N/A | N/A | N/A | N/A | N/A | N/A |
|  For Slot i, if mod(i, 10) = 7 for i from {0,…,39} | Bits | 2664 | 144 | N/A | N/A | 1288 | 2664 |
|  For Slot i, if mod(i, 10) = {0,1,2,3,4,5,6} for i from {1,…,39} | Bits | 8064 | 480 | 4608 | 16392 | 3840 | 8456 |
| Transport block CRC per Slot |  |  |  |  |  |  |  |
|  For Slots 0 and Slot i, if mod(i, 10) = {8,9} for i from {0,…,39} | Bits | N/A | N/A | N/A | N/A | N/A | N/A |
|  For Slot i, if mod(i, 10) = 7 for i from {0,…,39} | Bits | 16 | 16 | N/A | N/A | 16 | 16 |
|  For Slot i, if mod(i, 10) = {0,1,2,3,4,5,6} for i from {1,…,39} | Bits | 24 | 16 | 24 | 24 | 24 | 24 |
| Number of Code Blocks per Slot |  |  |  |  |  |  |  |
|  For Slots 0 and Slot i, if mod(i, 10) = {8,9} for i from {0,…,39} | CBs | N/A | N/A | N/A | N/A | N/A | N/A |
|  For Slot i, if mod(i, 10) = 7 for i from {0,…,39} | CBs | 1 | 1 | N/A | N/A | 1 | 1 |
|  For Slot i, if mod(i, 10) = {0,1,2,3,4,5,6} for i from {1,…,39} | CBs | 1 | 1 | 1 | 2 | 1 | 1 |
| Binary Channel Bits Per Slot |  |  |  |  |  |  |  |
|  For Slots 0 and Slot i, if mod(i, 10) = {8,9} for i from {0,…,39} | Bits | N/A | N/A | N/A | N/A | N/A | N/A |
|  For Slots i = 20, 21 | Bits | 25464 | 1512 | 14640 | 26736 | 12276 | 26712 |
|  For Slot i, if mod(i, 10) = 7 for i from {0,…,39} | Bits | 8904 | 504 | N/A | N/A | 4284 | 8904 |
|  For Slot i, if mod(i, 10) = {0,1,2,3,4,5,6} for i from {1,…,19,22,…,39} | Bits | 26712 | 1584 | 15264 | 27984 | 12852 | 27984 |
| Max. Throughput averaged over 2 frames | Mbps | 11.419 | 0.677 | 6.221 | 22.129 | 5.442 | 11.948 |
| Note 1: SS/PBCH block is transmitted in slot #0 with periodicity 20 msNote 2: Slot i is slot index per 2 frames |

[Unchanged parts skipped]

Table A.3.2.2.2-4: PDSCH Reference Channel for TDD UL-DL pattern FR1.30-1 (256QAM)

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Unit** | **Value** |
| Reference channel |  | R.PDSCH.2-4.1 TDD | R.PDSCH.2-4.2 TDD | R.PDSCH.2-4.3 TDD | R.PDSCH.2-4.4 TDD |  |
| Channel bandwidth | MHz | 40 | 20 | 20 | 40 |  |
| Subcarrier spacing | kHz | 30 | 30 | 30 | 30 |  |
| Allocated resource blocks | PRBs | 106 | 51 | 51 | 106 |  |
| Number of consecutive PDSCH symbols |  |  |  |  |  |  |
|  For Slots 0 and Slot i, if mod(i, 10) = {8,9} for i from {0,…,39} |  | N/A | N/A | N/A | N/A |  |
|  For Slot i, if mod(i, 10) = 7 for i from {0,…,39} |  | 4 | 4 | 4 | 4 |  |
|  For Slot i, if mod(i, 10) = {0,1,2,3,4,5,6} for i from {1,…,39} |  | 12 | 12 | 12 | 12 |  |
| Allocated slots per 2 frames |  | 31 | 31 | 31 | 31 |  |
| MCS table |  | 256QAM | 256QAM | 256QAM | 256QAM |  |
| MCS index |  | 24 | 24 | 20 | 21 |  |
| Modulation |  | 256QAM | 256QAM | 256QAM | 256QAM |  |
| Target Coding Rate |  | 0.82 | 0.82 | 0.67 | 0.69 |  |
| Number of MIMO layers |  | 1 | 1 | 1 | 2 |  |
| Number of DMRS REs |  |  |  |  |  |  |
|  For Slots 0 and Slot i, if mod(i, 10) = {8,9} for i from {0,…,39} |  | N/A | N/A | N/A | N/A |  |
|  For Slot i, if mod(i, 10) = 7 for i from {0,…,39} |  | 6 | 6 | 6 | 6 |  |
|  For Slot i, if mod(i, 10) = {0,1,2,3,4,5,6} for i from {1,…,39} |  | 12 | 12 | 12 | 12 |  |
| Overhead for TBS determination |  | 0 | 0 | 0 | 0 |  |
| Information Bit Payload per Slot  |  |  |  |  |  |  |
|  For Slots 0 and Slot i, if mod(i, 10) = {8,9} for i from {0,…,39} | Bits | N/A | N/A | N/A | N/A |  |
|  For Slot i, if mod(i, 10) = 7 for i from {0,…,39} | Bits | 29192 | 14088 | 11528 | 49176 |  |
|  For Slot i, if mod(i, 10) = {0,1,2,3,4,5,6} for i from {1,…,39} | Bits | 92200 | 44040 | 35856 | 155776 |  |
| Transport block CRC per Slot |  |  |  |  |  |  |
|  For Slots 0 and Slot i, if mod(i, 10) = {8,9} for i from {0,…,39} | Bits | N/A | N/A | N/A | N/A |  |
|  For Slot i, if mod(i, 10) = 7 for i from {0,…,39} | Bits | 24 | 24 | 24 | 24 |  |
|  For Slot i, if mod(i, 10) = {0,1,2,3,4,5,6} for i from {1,…,39} | Bits | 24 | 24 | 24 | 24 |  |
| Number of Code Blocks per Slot |  |  |  |  |  |  |
|  For Slots 0 and Slot i, if mod(i, 10) = {8,9} for i from {0,…,39} | CBs | N/A | N/A | N/A | N/A |  |
|  For Slot i, if mod(i, 10) = 7 for i from {0,…,39} | CBs | 4 | 2 | 2 | 6 |  |
|  For Slot i, if mod(i, 10) = {0,1,2,3,4,5,6} for i from {1,…,39} | CBs | 11 | 6 | 5 | 19 |  |
| Binary Channel Bits Per Slot |  |  |  |  |  |  |
|  For Slots 0 and Slot i, if mod(i, 10) = {8,9} for i from {0,…,39} | Bits | N/A | N/A | N/A | N/A |  |
|  For Slots i = 20, 21 | Bits | 106944 | 51552 | 51552 |  |  |
|  For Slot i, if mod(i, 10) = 7 for i from {0,…,39} | Bits | 35616 | 17136 | 17136 | 71232 |  |
|  For Slot i, if mod(i, 10) = {0,1,2,3,4,5,6} for i from {1,…,19,22,…,39} | Bits | 111936 | 53856 | 53856 | 223872 |  |
| Max. Throughput averaged over 2 frames | Mbps | 130.308 | 62.272 | 50.711 | 220.133 |  |
| Note 1: SS/PBCH block is transmitted in slot #0 with periodicity 20 msNote 2: Slot i is slot index per 2 frames |

***<End of change 3 [R4-2321095]>***