**3GPP TSG-RAN WG4 Meeting #101-e *R4-2117995***

**E-meeting, 1st November – 12th November 2021**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.101-4** | **CR** | **-** | **rev** | **-** | **Current version:** | **15.11.0** |  |
|  | | | | | | | | |
| *For* [***HELP***](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:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Intel Corporation | | | | | | | | | |
| ***Source to TSG:*** | RAN4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Perf | | | | |  | ***Date:*** | | | 2021-10-22 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-15 |
|  | *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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | CSI-RS type in Note 2 of CSI RMCs is not clarified | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Type of CSI-RS for PDSCH scheduling assumptions in CSI RMC is clarified | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | PDSCH scheduling for CSI RMC is confusing | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | A.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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**

A.4 CSI reference measurement channels

This clause defines the DL signal applicable to the reporting of channel state information (Clause X).

Tables in this clause specifies the mapping of CQI index to Information Bit payload, which complies with the CQI definition specified in clause 5.2.2.1 of TS 38.214 [12] and with MCS definition specified in clause 5.1.3 of TS 38.214 [12].

**Table A.4-1: Mapping of CQI Index to Information Bit payload (CQI table 1)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TBS Scheme | | | | TBS.1-1 | TBS.1-2 |  |  |  |  |
| MCS table | | | | 64QAM | | | | | |
| Number of allocated PDSCH resource blocks | | | | 66 | 66 |  |  |  |  |
| Number of consecutive PDSCH symbols | | | | 12 | 12 |  |  |  |  |
| Number of PDSCH MIMO layers | | | | 1 | 2 |  |  |  |  |
| Number of DMRS REs (Note 1) | | | | 24 | 24 |  |  |  |  |
| Overhead for TBS determination | | | | 6 | 6 |  |  |  |  |
| Available RE-s | | | | 7590 | 7590 |  |  |  |  |
| CQI index | Spectral efficiency | MCS index | Modulation | Information Bit Payload per Slot | | | | | |
| 0 | OOR | OOR | OOR | N/A | N/A |  |  |  |  |
| 1 | 0.2344 | 0 | QPSK | 1800 | 3624 |  |  |  |  |
| 2 | 0.2344 | 0 | 1800 | 3624 |  |  |  |  |
| 3 | 0.3770 | 2 | 2856 | 5640 |  |  |  |  |
| 4 | 0.6016 | 4 | 4480 | 8968 |  |  |  |  |
| 5 | 0.8770 | 6 | 6528 | 13064 |  |  |  |  |
| 6 | 1.1758 | 8 | 8712 | 17928 |  |  |  |  |
| 7 | 1.4766 | 11 | 16QAM | 11016 | 22032 |  |  |  |  |
| 8 | 1.9141 | 13 | 14343 | 28680 |  |  |  |  |
| 9 | 2.4063 | 15 | 17928 | 35856 |  |  |  |  |
| 10 | 2.7305 | 18 | 64QAM | 20496 | 40976 |  |  |  |  |
| 11 | 3.3223 | 20 | 25104 | 50184 |  |  |  |  |
| 12 | 3.9023 | 22 | 29192 | 58384 |  |  |  |  |
| 13 | 4.5234 | 24 | 33816 | 67584 |  |  |  |  |
| 14 | 5.1152 | 26 | 38936 | 77896 |  |  |  |  |
| 15 | 5.5547 | 28 | 42016 | 83976 |  |  |  |  |
| Note 1: Number of DMRS REs includes the overhead of the DM-RS CDM groups without data  Note 2: PDSCH is not scheduled on slots containing CSI-RS for tracking, CSI-RS for CSI acquisition and CSI-RS for beam refinement or slots which are not full DL  Note 3: PDSCH is not scheduled on slots containing PBCH, i.e. slot#0 per 20ms periodicity  Note 4: Spectral efficiency is based on MCS Table defined in Table 5.1.3.1-1 of TS 38.214 [12] | | | | | | | | | |

**Table A.4-2: Mapping of CQI Index to Information Bit payload (CQI table 2, Rank 1 and Rank 2)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TBS Scheme | | | | TBS.2-1 | TBS.2-2 | TBS.2-3 | TBS.2-4 | TBS.2-5 | TBS.2-6 |
| MCS table | | | | 256QAM | | | | | |
| Number of allocated PDSCH resource blocks | | | | 52 | 52 | 106 | 106 | 8 | 16 |
| Number of consecutive PDSCH symbols | | | | 12 | 12 | 12 | 12 | 12 | 12 |
| Number of PDSCH MIMO layers | | | | 1 | 2 | 1 | 2 | 1 | 1 |
| Number of DMRS REs (Note 1) | | | | 24 | 24 | 24 | 24 | 24 | 24 |
| Overhead for TBS determination | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Available RE-s for PDSCH | | | | 6240 | 6240 | 12720 | 12720 | 960 | 1920 |
| CQI index | Spectral efficiency | MCS index | Modulation | Information Bit Payload per Slot | | | | | |
| 0 | OOR | OOR | OOR | N/A | N/A | N/A | N/A | N/A | N/A |
| 1 | 0.2344 | 0 | QPSK | 1480 | 2976 | 2976 | 5896 | 224 | 456 |
| 2 | 0.3770 | 1 | 2408 | 4744 | 4744 | 9480 | 368 | 736 |
| 3 | 0.8770 | 3 | 5504 | 11016 | 11016 | 22536 | 848 | 1736 |
| 4 | 1.4766 | 5 | 16QAM | 9224 | 18432 | 18960 | 37896 | 1416 | 2856 |
| 5 | 1.9141 | 7 | 12040 | 24072 | 24576 | 49176 | 1864 | 3752 |
| 6 | 2.4063 | 9 | 15112 | 30216 | 30728 | 61480 | 2408 | 4608 |
| 7 | 2.7305 | 11 | 64QAM | 16896 | 33816 | 34816 | 69672 | 2600 | 5248 |
| 8 | 3.3223 | 13 | 20496 | 40976 | 42016 | 83976 | 3240 | 6400 |
| 9 | 3.9023 | 15 | 24576 | 49176 | 49176 | 98376 | 3752 | 7424 |
| 10 | 4.5234 | 17 | 28168 | 56368 | 57376 | 114776 | 4352 | 8712 |
| 11 | 5.1152 | 19 | 31752 | 63528 | 65576 | 131176 | 4864 | 9736 |
| 12 | 5.5547 | 21 | 256QAM | 34816 | 69672 | 69672 | 139376 | 5248 | 10760 |
| 13 | 6.2266 | 23 | 38936 | 77896 | 79896 | 159880 | 6016 | 12040 |
| 14 | 6.9141 | 25 | 43032 | 86040 | 88064 | 176208 | 6656 | 13320 |
| 15 | 7.4063 | 27 | 46104 | 92200 | 94248 | 188576 | 7040 | 14088 |
| Note 1: Number of DMRS REs includes the overhead of the DM-RS CDM groups without data  Note 2: PDSCH is not scheduled on slots containing CSI-RS for tracking and CSI-RS for for CSI acquisition or slots which are not full DL  Note 3: PDSCH is not scheduled on slots containing PBCH, i.e. slot#0 per 20ms periodicity  Note 4: Spectral efficiency is based on MCS Table defined in Table 5.1.3.1-2 of TS 38.214 [12] | | | | | | | | | |

**Table A.4-3: Mapping of CQI Index to Information Bit payload (CQI table 2, Rank 3 and Rank 4)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TBS Scheme | | | | TBS.3-1 | TBS.3-2 | TBS.3-3 | TBS.3-4 |  |  |
| MCS table | | | | 256QAM | | | | | |
| Number of allocated PDSCH resource blocks | | | | 52 | 52 | 106 | 106 |  |  |
| Number of consecutive PDSCH symbols | | | | 12 | 12 | 12 | 12 |  |  |
| Number of PDSCH MIMO layers | | | | 3 | 4 | 3 | 4 |  |  |
| Number of DMRS REs (Note 1) | | | | 24 | 24 | 24 | 24 |  |  |
| Overhead for TBS determination | | | | 0 | 0 | 0 | 0 |  |  |
| Available RE-s for PDSCH | | | | 6240 | 6240 | 12720 | 12720 |  |  |
| CQI index | Spectral efficiency | MCS index | Modulation | Information Bit Payload per Slot | | | | | |
| 0 | OOR | OOR | OOR | N/A | N/A | N/A | N/A |  |  |
| 1 | 0.2344 | 0 | QPSK | 4360 | 5896 | 8976 | 11784 |  |  |
| 2 | 0.3770 | 1 | 7048 | 9480 | 14344 | 18976 |  |  |
| 3 | 0.8770 | 3 | 16392 | 22032 | 33816 | 45096 |  |  |
| 4 | 1.4766 | 5 | 16QAM | 27656 | 36896 | 56368 | 75792 |  |  |
| 5 | 1.9141 | 7 | 35856 | 48168 | 73776 | 98376 |  |  |
| 6 | 2.4063 | 9 | 45096 | 60456 | 92200 | 122976 |  |  |
| 7 | 2.7305 | 11 | 64QAM | 51216 | 67584 | 104496 | 139376 |  |  |
| 8 | 3.3223 | 13 | 62504 | 81976 | 127080 | 167976 |  |  |
| 9 | 3.9023 | 15 | 73776 | 98376 | 147576 | 196776 |  |  |
| 10 | 4.5234 | 17 | 83976 | 112648 | 172176 | 229576 |  |  |
| 11 | 5.1152 | 19 | 96264 | 127080 | 196776 | 262376 |  |  |
| 12 | 5.5547 | 21 | 256QAM | 104496 | 139376 | 213176 | 278776 |  |  |
| 13 | 6.2266 | 23 | 116792 | 155776 | 237776 | 319784 |  |  |
| 14 | 6.9141 | 25 | 129128 | 172176 | 262376 | 352440 |  |  |
| 15 | 7.4063 | 27 | 139376 | 184424 | 278776 | 376896 |  |  |
| Note 1: Number of DMRS REs includes the overhead of the DM-RS CDM groups without data  Note 2: PDSCH is not scheduled on slots containing CSI-RS for tracking and CSI-RS for for CSI acquisition or slots which are not full DL  Note 3: PDSCH is not scheduled on slots containing PBCH, i.e. slot#0 per 20ms periodicity  Note 4: Spectral efficiency is based on MCS Table defined in Table 5.1.3.1-2 of TS 38.214 [12] | | | | | | | | | |

**END OF CHANGE**