**3GPP TSG-RAN WG4 Meeting #97-e *R4-2017455***

 **Electronic Meeting, 2 - 13 Nov, 2020**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **36.101** | **CR** | **5697** | **rev** | **1** | **Current version:** | **15.12.0** |  |
|  |
| *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 for 36.101: Cleanup for performance requirements of sTTI (Rel-15) |
|  |  |
| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | LTE\_sTTIandPT-Perf  |  | ***Date:*** | 2020-11-11 |
|  |  |  |  |  |
| ***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 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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | SNR test points and CQI reporting requirements are in [] |
|  |  |
| ***Summary of change:*** | Removal of [] from SNR test points and CQI reporting requirements |
|  |  |
| ***Consequences if not approved:*** | CQI reporting test for sTTI is not completed |
|  |  |
| ***Clauses affected:*** | 9.12.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **x** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** | **x** |  |  Test specifications | TS 36.521-1  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** | Revised from R4-2015668 |

**<Start of First change>**

### 9.12.2 CQI reporting under fading conditions (CSI Reference Symbol)

#### 9.12.2.1 FDD

For the parameters specified in Table 9.12.2.1-1, Table 9.12.2.1-2, and Table 9.12.2.1-3 using the downlink physical channels specified in Annex C.3.2, the minimum requirements are specified in Table 9.12.2.1-4 by the following

a) a CQI index not in the set {median CQI -1, median CQI, median CQI +1} shall be reported at least ** % of the time;

b) the ratio of the throughput obtained when transmitting the transport format indicated by each reported wideband CQI index and that obtained when transmitting a fixed transport format configured according to the wideband CQI median shall be ≥ **;

c) when transmitting the transport format indicated by each reported wideband CQI index, the average BLER for the indicated transport formats shall be greater or equal to [0.02].

Table 9.12.2.1-1: Fading test for slot-PDSCH (FDD)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Test 1 | Test 2 |
| Bandwidth | MHz | 10 MHz |
| Transmission mode |  | 9 |
| Downlink power allocation |  | dB | 0 |
|  | dB | 0 |
| σ | dB | -3 |
| SNR (Note 3) | dB | 3 | 4 | 12 | 13 |
|  | dB[mW/15kHz] | -95 | -94 | -86 | -85 |
|  | dB[mW/15kHz] | -98 | -98 |
| Propagation channel |  | EPA5 |
| Correlation and antenna configuration |  | High (2 x 2) |
| Beamforming Model |  | As specified in Section B.4.3 |
| Cell-specific reference signals |  | Antenna ports 0,1 |
| CSI reference signals |  | Antenna ports 15,16 |
| CSI-RS periodicity and subframe offset*T*CSI-RS / *∆*CSI-RS |  | 5/1 |
| CSI-RS reference signal configuration |  | 0 |
| Reporting mode |  | PUSCH 1-1 |
| Reporting interval | ms | 5 |
| CQI delay | slots | 8 |
| Max number of HARQ transmissions |  | 1 |
| CodeBookSubsetRestriction bitmap |  | 00 0001 |
| DL TTI length |  | Slot |
| Configured SPDCCH-PRB sets |  | {Set 1} |
| SPDCCH-PRB set used for DCI transmission |  | Set 1 |
| Note 1: For slot-PDSCH, if the UE reports in an available uplink reporting instance at slot #n based on CQI estimation at a downlink slot not later than slot #(n-4), this reported wideband CQI cannot be applied at the eNB downlink before slot #(n+4).Note 2: Reference measurement channel RC.27 FDD according to Table A.4-1 for Categories 2 or higher with one sided dynamic OCNG Pattern OP.1 FDD as described in Annex A.5.1.1. Note 3: For each test, the minimum requirements shall be fulfilled for at least one of the two SNR(s) and the respective wanted signal input level.  |

Table 9.12.2.1-2: Fading test for subslot-PDSCH (FDD)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Test 3 | Test 4 |
| Bandwidth | MHz | 10 MHz |
| Transmission mode |  | 9 |
| Downlink power allocation |  | dB | 0 |
|  | dB | 0 |
| σ | dB | -3 |
| SNR (Note 3) | dB | 4 | 5 | 12 | 13 |
|  | dB[mW/15kHz] | -94 | -93 | -86 | -85 |
|  | dB[mW/15kHz] | -98 | -98 |
| Propagation channel |  | EPA5 |
| Correlation and antenna configuration |  | High (2 x 2) |
| Beamforming Model |  | As specified in Section B.4.3 |
| Cell-specific reference signals |  | Antenna ports 0,1 |
| CSI reference signals |  | Antenna ports 15,16 |
| CSI-RS periodicity and subframe offset*T*CSI-RS / *∆*CSI-RS |  | 5/1 |
| CSI-RS reference signal configuration |  | 0 |
| Reporting mode |  | PUSCH 1-1 |
| Reporting interval | ms | 5 |
| CQI delay | subslots | 8 or 12 (Note 1) |
| Max number of HARQ transmissions |  | 1 |
| CodeBookSubsetRestriction bitmap |  | 00 0001 |
| DL TTI length |  | Subslot |
| Configured SPDCCH-PRB sets |  | {Set 1} |
| SPDCCH-PRB set used for DCI transmission |  | Set 1 |
| Note 1: If the UE reports in an available uplink reporting instance at subslot #n based on CQI estimation at a downlink slot not later than subslot #(n-k), this reported wideband CQI cannot be applied at the eNB downlink before subslot #(n+k), where k = 4 for UE capability *ProcessingTimelineSet=set1* and k=6 for UE capability *ProcessingTimelineSet=set2.*Note 2: Reference measurement channel RC.29 FDD according to Table A.4-1 for Categories 2 or higher with one sided dynamic OCNG Pattern OP.1 FDD as described in Annex A.5.1.1.Note 3: For each test, the minimum requirements shall be fulfilled for at least one of the two SNR(s) and the respective wanted signal input level.  |

Table 9.12.2.1-3: SPDCCH parameters (FDD)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Set 1 |
| Refence symbol |  | CRS |
| Number of PRB per SPDCCH-PRB set |  | 16 |
| Transmission type |  | Localized |
| Number of OFDM symbols |  | 2 |
| Number of PRBs per SPDCCH-PRB set (Note 1) |  | 16 |
| Rate Matching mode |  | Mode 1 |
| SPDCCH L1 Reuse Indication |  | Not configured |
| Aggregatoin level | SCCE | 8 |
| Note 1: PRB = {0, 1, …, 15}.  |

Table 9.12.2.1-4: Minimum requirement for slot/subslot-PDSCH (FDD)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Test 1 | Test 2 | Test 3 | Test 4 |
| ** [%] | 20 | 20 | 20 | 20 |
| **  | 1.05 | 1.05 | 1.05 | 1.05 |
| UE Category | ≥2 | ≥2 | ≥2 | ≥2 |

#### 9.12.2.2 TDD

For the parameters specified in Table 9.12.2.2-1and Table 9.12.2.2-2 using the downlink physical channels specified in Annex C.3.2, the minimum requirements are specified in Table 9.12.2.2-3 by the following

a) a CQI index not in the set {median CQI -1, median CQI, median CQI +1} shall be reported at least ** % of the time;

b) the ratio of the throughput obtained when transmitting the transport format indicated by each reported wideband CQI index and that obtained when transmitting a fixed transport format configured according to the wideband CQI median shall be ≥ **;

c) when transmitting the transport format indicated by each reported wideband CQI index, the average BLER for the indicated transport formats shall be greater or equal to [0.02].

Table 9.12.2.2-1: Fading test for slot-PDSCH (TDD)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Test 1 | Test 2 |
| Bandwidth | MHz | 10 MHz |
| Transmission mode |  | 9 |
| Uplink downlink configuration |  | 2 |
| Special subframe configuration |  | 4 |
| Downlink power allocation |  | dB | 0 |
|  | dB | 0 |
| σ | dB | -3 |
| SNR (Note 3) | dB | 3 | 4 | 12 | 13 |
|  | dB[mW/15kHz] | -95 | -94 | -86 | -85 |
|  | dB[mW/15kHz] | -98 | -98 |
| Propagation channel |  | EPA5 |
| Correlation and antenna configuration |  | High (2 x 2) |
| Beamforming Model |  | As specified in Section B.4.3 |
| Cell-specific reference signals |  | Antenna ports 0,1 |
| CSI reference signals |  | Antenna ports 15,16 |
| CSI-RS periodicity and subframe offset*T*CSI-RS / *∆*CSI-RS |  | 5/1 |
| CSI-RS reference signal configuration |  | 0 |
| Reporting mode |  | PUSCH 1-1 |
| Reporting interval | ms | 5 |
| CQI delay | Slots | 8 |
| Max number of HARQ transmissions |  | 1 |
| CodeBookSubsetRestriction bitmap |  | 00 0001 |
| DL TTI length |  | Slot |
| Configured SPDCCH-PRB sets |  | {Set 1} |
| SPDCCH-PRB set used for DCI transmission |  | Set 1 |
| ACK/NACK feedback mode |  | Multiplexing |
| Note 1: If the UE reports in an available uplink reporting instance at slot #n based on CQI estimation at a downlink slot not later than slot #(n-4), this reported wideband CQI cannot be applied at the eNB downlink before slot #(n+4).Note 2: Reference measurement channel RC.27 TDD according to Table A.4-1 for Categories 2 or higher with one sided dynamic OCNG Pattern OP.1 TDD as described in Annex A.5.1.1.Note 3: For each test, the minimum requirements shall be fulfilled for at least one of the two SNR(s) and the respective wanted signal input level. |

Table 9.12.2.2-2: SPDCCH parameters (TDD)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Set 1 |
| Refence symbol |  | CRS |
| Number of PRB per SPDCCH-PRB set |  | 16 |
| Transmission type |  | Localized |
| Number of OFDM symbols |  | 2 |
| Number of PRBs per SPDCCH-PRB set (Note 1) |  | 16 |
| Rate Matching mode |  | Mode 1 |
| SPDCCH L1 Reuse Indication |  | Not configured |
| Aggregatoin level | SCCE | 8 |
| Note 1: PRB = {0, 1, …, 15}. |

Table 9.12.2.2-3: Minimum requirement for slot-PDSCH (TDD)

|  |  |  |
| --- | --- | --- |
|  | Test 1 | Test 2 |
| ** [%] | 20 | 20 |
| **  | 1.05 | 1.05 |
| UE Category | ≥2 | ≥2 |

**<end of First change>**