**3GPP TSG-RAN4 Meeting #94-e *draftR4-2001694***

**Online, , 24th Feb 2020 - 6th Mar 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **38.141-2** | **CR** |  | **rev** | **1** | **Current version:** | **16.2.0** |  |
|  |
| *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 |  | Radio Access Network | **x** | Core Network |  |

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| ***Title:***  | CR for 38.141-2: Radiated test requirements for FR2 PUSCH 2T2R 16QAM |
|  |  |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** | RAN4 |
|  |  |
| ***Work item code:*** | NR\_perf\_enh-Perf |  | ***Date:*** | 2020-03-02 |
|  |  |  |  |  |
| ***Category:*** | **C** |  | ***Release:*** | Rel-16 |
|  | *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:*** | SNR of performance requirements for FR2 PUSCH 2T2R 16QAM, in section 8 is unachievable. |
|  |  |
| ***Summary of change:*** | This draftCR changes the performance requirement tables for FR2, to implement the following agreements:[R4-1910006]:Agree to change all the existing FR2 2T2R MCS16 requirements with MCS12 in TS 38.104 and TS 38.141-2.Reuse the agreed simulation assumptions for FR2 2T2R cases with MCS 16 by referring to Slide#6 in [R4-1907241].[R4-1912722]:The PUSCH FR2 2T2R with MCS 12 requirements are applicable from Rel-16.[R4-1913188]:Simulation result delivery.[R4-1912671]:The requirements removed in this WF are re-introduced in R16. |
|  |  |
| ***Consequences if not approved:*** | Requirements remain incomplete. |
|  |  |
| ***Clauses affected:*** | 8.2.1.5.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **x** |  Other core specifications  |  |
| ***affected:*** |  | **x** |  Test specifications |  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications |  |
|  |  |
| ***Other comments:*** | Agenda item: 8.18.2.2 |
|  |  |
| ***This CR's revision history:*** | R4-2001694 |

**<<Start of change>>**

##### 8.2.1.5.2 Test requirement for *BS type 2-O*

The throughput measured according to subclause 8.2.1.4.2 shall not be below the limits for the SNR levels specified in table 8.2.1.5.2-1 to 8.2.1.5.2-5.

Table 8.2.1.5.2-1: Test requirements for PUSCH, 50 MHz Channel Bandwidth, 60 kHz SCS

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number of TX antennas | Number of demodulation branches | Cyclic prefix | Propagation conditions and correlation matrix (annex G) | Fraction of maximum throughput | FRC(annex A) | Additional DM-RS position | PT-RS | SNR(dB) |
| 1 | 2 | Normal | TDLA30-300 Low | 70 % | G-FR2-A3-1 | pos0 | No | -1.4 |
| G-FR2-A3-13 | pos1 | No | -1.6 |
| Normal | TDLA30-300 Low | 70 % | G-FR2-A4-1 | pos0 | Yes | 12.6 |
| No | 12.1 |
| G-FR2-A4-11 | pos1 | Yes | 11.3 |
| No | 11.3 |
| Normal | TDLA30-75 Low | 70 % | G-FR2-A5-1 | pos0 | Yes | 14.3 |
| No | 13.7 |
| G-FR2-A5-6 | pos1 | Yes | 14.0 |
| No | 13.5 |
| 2 | Normal | TDLA30-300 Low | 70 % | G-FR2-A3-6 | pos0 | No | 2.3 |
| G-FR2-A3-18 | pos1 | No | 2.0 |
| Normal | TDLA30-300 Low | 70 % | G-FR2-A7-1 | pos0 | Yes | [16.0] |
| No | [15.1] |
| G-FR2-A7-6 | pos1 | Yes | [14.6] |
| No | [13.8] |

Table 8.2.1.5.2-2: Test requirements for PUSCH, 100 MHz Channel Bandwidth, 60 kHz SCS

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number of TX antennas | Number of demodulation branches | Cyclic prefix | Propagation conditions and correlation matrix (annex G) | Fraction of maximum throughput | FRC(annex A) | Additional DM-RS position | PT-RS | SNR(dB) |
| 1 | 2 | Normal | TDLA30-300 Low | 70 % | G-FR2-A3-2  |  pos0 | No | -1.5 |
| G-FR2-A3-14  |  pos1 | No | -1.8 |
| Normal | TDLA30-300 Low | 70 % | G-FR2-A4-2  |  pos0 | Yes | 12.8 |
| No | 11.8 |
| G-FR2-A4-12 |  pos1 | Yes | 11.8 |
| No | 11.2 |
| Normal | TDLA30-75 Low | 70 % | G-FR2-A5-2  |  pos0 | Yes | 14.8 |
| No | 13.9 |
| G-FR2-A5-7 |  pos1 | Yes | 14.3 |
| No | 13.7 |
| 2 | Normal | TDLA30-300 Low | 70 % | G-FR2-A3-7  |  pos0 | No | 2.3 |
| G-FR2-A3-19 |  pos1 | No | 2.0 |
| Normal | TDLA30-300 Low | 70 % | G-FR2-A7-2 | pos0 | Yes | [16.8] |
| No | [17.7] |
| G-FR2-A7-7 | pos1 | Yes | [14.6] |
| No | [13.9] |

Table 8.2.1.5.2-3: Test requirements for PUSCH, 50 MHz Channel Bandwidth, 120 kHz SCS

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number of TX antennas | Number of demodulation branches | Cyclic prefix | Propagation conditions and correlation matrix (annex G) | Fraction of maximum throughput | FRC(annex A) | Additional DM-RS position | PT-RS | SNR(dB) |
| 1 | 2 | Normal | TDLA30-300 Low | 70 % | G-FR2-A3-3 | pos0 | No | -1.2 |
| G-FR2-A3-15 | pos1 | No | -1.5 |
| Normal | TDLA30-300 Low | 70 % | G-FR2-A4-3 | pos0 | Yes | 12.2 |
| No | 11.5 |
| G-FR2-A4-13 | pos1 | Yes | 11.5 |
| No | 11.1 |
| Normal | TDLA30-75 Low | 70 % | G-FR2-A5-3 | pos0 | Yes | 14.3 |
| No | 13.7 |
| G-FR2-A5-8 | pos1 | Yes | 13.8 |
| No | 13.6 |
| 2 | Normal | TDLA30-300 Low | 70 % | G-FR2-A3-8 | pos0 | No | 2.2 |
| G-FR2-A3-20 | pos1 | No | 2.1 |
| Normal | TDLA30-300 Low | 70 % | G-FR2-A7-3 | pos0 | Yes | [15.0] |
| No | [14.4] |
|  G-FR2-A7-8 | Pos1 | Yes | [14.7] |
| No | [13.9] |

Table 8.2.1.5.2-4: Test requirements for PUSCH, 100 MHz Channel Bandwidth, 120 kHz SCS

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number of TX antennas | Number of demodulation branches | Cyclic prefix | Propagation conditions and correlation matrix (annex G) | Fraction of maximum throughput | FRC(annex A) | Additional DM-RS position | PT-RS | SNR(dB) |
| 1 | 2 | Normal | TDLA30-300 Low | 70 % | G-FR2-A3-4  | pos0 | No | -1.8 |
| G-FR2-A3-16 | pos1 | No | -1.9 |
| Normal | TDLA30-300 Low | 70 % | G-FR2-A4-4  | pos0 | Yes | 12.5 |
| No | 11.1 |
| G-FR2-A4-14 | pos1 | Yes | 11.7 |
| No | 11.1 |
| Normal | TDLA30-75 Low | 70 % | G-FR2-A5-4  | pos0 | Yes | 14.1 |
| No | 13.5 |
| G-FR2-A5-9 | pos1 | Yes | 14.0 |
| No | 13.4 |
| 2 | Normal | TDLA30-300 Low | 70 % | G-FR2-A3-9  | pos0 | No | 2.2 |
| G-FR2-A3-21 | pos1 | No | 2.0 |
| Normal | TDLA30-300 Low | 70 % | G-FR2-A7-4 | pos0 | Yes | [14.7] |
| No | [14.0] |
| G-FR2-A7-9 | pos1 | Yes | [14.3] |
| No | [13.7] |

Table 8.2.1.5.2-5: Test requirements for PUSCH, 200 MHz Channel Bandwidth, 120 kHz SCS

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number of TX antennas | Number of demodulation branches | Cyclic prefix | Propagation conditions and correlation matrix (annex G) | Fraction of maximum throughput | FRC(annex A) | Additional DM-RS position | PT-RS | SNR(dB) |
| 1 | 2 | Normal | TDLA30-300 Low | 70 % | G-FR2-A3-5  | pos0 | No | -1.5 |
| G-FR2-A3-17 | pos1 | No | -1.8 |
| Normal | TDLA30-300 Low | 70 % | G-FR2-A4-5  | pos0 | Yes | 11.9 |
| No | 11.5 |
| G-FR2-A4-15 | pos1 | Yes | 11.8 |
| No | 11.3 |
| Normal | TDLA30-75 Low | 70 % | G-FR2-A5-5  | pos0 | Yes | 14.7 |
| No | 14.0 |
| G-FR2-A5-10 | pos1 | Yes | 14.3 |
| No | 13.9 |
| 2 | Normal | TDLA30-300 Low | 70 % | G-FR2-A3-10  | pos0 | No | 2.2 |
| G-FR2-A3-22 | pos1 | No | 1.9 |
| Normal | TDLA30-300 Low | 70 % | G-FR2-A7-5  | pos0 | Yes | [14.8] |
| No | [14.1] |
| G-FR2-A7-10 | pos1 | Yes | [14.4] |
| No | [13.8] |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex C.

**<<End of change>>**