**3GPP TSG-RAN WG4 Meeting #98-e *R4-2103842***

**Electronic Meeting, Jan. 25th – Feb. 5th, 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.101-4** | **CR** | **0149** | **rev** | **1** | **Current version:** | **16.3.0** |  |
|  | | | | | | | | |
| *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 38.101-4: Applicability for NR PMI requirements with Tx ports larger than 8 and up to 32 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_perf\_enh-Perf | | | | |  | ***Date:*** | | | 2021-1-15 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***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 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:*** | | There is no applicability for Type II codebook of NR PMI reporting test with larger Tx ports. Besides, the applicability for Type I codebook of NR PMI reporting test with larger Tx ports is in the wrong chapter | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Introduces the applicability rule for Type II codebook of NR PMI requirements with Tx ports larger than 8 and up to 32 2. Move applicability of Type I codebook of NR PMI requirements with Tx ports larger than 8 and up to 32 to proper chapter | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Applicability for PMI reporting test with larger Tx ports is not completed | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.1.1.3, 6.1.1.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | Resubmission of technically endorsed CR R4-2015659 | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Revised from R4-2101322 | | | | | | | | |

**<Start of First change>**

# 6 CSI reporting requirements (Conducted requirements)

## 6.1 General

This clause includes conducted requirements for the reporting of channel state information (CSI).

### 6.1.1 Applicability of requirements

#### 6.1.1.1 General

The minimum performance requirements are applicable to all FR1 operating bands defined in TS 38.101-1 [6].

The minimum performance requirements in Clause 6 are mandatary for UE supporting NR operation, except test cases listed in Clause 6.1.1.3, 6.1.1.4.

#### 6.1.1.2 Applicability of requirements for different number of RX antenna ports

The number of RX antenna ports for different RF operating bands is up to UE declaration.

The UE shall support 2 or 4 RX antenna ports for different RF operating bands. The operating bands, where 4 RX antenna ports shall be the baseline, are defined in clause 7.2 of TS 38.101-1 [6]. The UE requirements applicability for UEs with different number of RX antenna ports is defined in Table 6.1.1.2-1.

Table 6.1.1.2-1: Requirements applicability

|  |  |  |
| --- | --- | --- |
| Supported RX antenna ports | Test type | Test list |
| UE supports only 2RX | CQI | All tests in Clause 6.2.2 |
| PMI | All tests in Clause 6.3.2 |
| RI | All tests in Clause 6.4.2 |
| UE supports only 4RX or both 2RX and 4RX | CQI | All tests in Clause 6.2.3 |
| PMI | All tests in Clause 6.3.3 |
| RI | All tests in Clause 6.4.3 |

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

The performance requirements in Table 6.1.1.3-1 shall apply for UEs which support optional UE features only.

Table 6.1.1.3-1: Requirements applicability for optional UE features

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| UE feature/capability [14] | Test type | | | Test list | | Applicability notes |
| Supported maximum number of ports across all configured NZP-CSI-RS resources per CC (*maxConfigNumberPortsAcrossNZP-CSI-RS-PerCC*)  A list of supported combinations, each combination is {Max # of Tx ports in one resource, Max # of resources and total # of Tx ports} across all CCs simultaneously  (*supportedCSI-RS-ResourceList*)  Supported Codebook Mode(s)  (*modes*)  Max # of CSI-RS resource in a resource set  (*maxNumberCSI-RS-PerResourceSet*) | | FR1 FDD | PMI | | Clause 6.3.2.1.3  Clause 6.3.2.1.4  Clause 6.3.3.1.3  Clause 6.3.3.1.4 | The requirements apply only in case that UE supports Type I single panel with Tx ports larger than 8 |
| FR1 TDD | PMI | | Clause 6.3.2.2.3  Clause 6.3.2.2.4  Clause 6.3.3.2.3  Clause 6.3.3.2.4 |
| A list of supported combinations, each combination is {Max # of Tx ports in one resource, Max # of resources and total # of Tx ports} across all CCs simultaneously.  (*supportedCSI-RS-ResourceList*)  Parameter "Lx" (number of beams) in codebook generation, where x is index of Tx ports, corresponding to 4,8,12,16,24 and 32 ports. (*parameterLx*)  Support amplitude scaling type  (*amplitudeScalingType*)  Support amplitude subset restriction level  (*amplitudeSubsetRestriction*) | | FR1 FDD | PMI | | Clause 6.3.2.1.5  Clause 6.3.3.1.5 | The requirements apply only in case that UE supports Type II codebook |
| FR1 TDD | PMI | | Cluase 6.3.2.2.5  Cluase 6.3.3.2.5 |

#### 6.1.1.4 Applicability of requirements for mandatory UE features with capability signalling

The performance requirements in Table 6.1.1.4-1 shall apply for UEs which support mandatory UE features with capability signalling only.

Table 6.1.1.4-1: Requirements applicability for mandatory features with UE capability signalling

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| UE feature/capability [14] | Test type | | Test list | Applicability notes |
| Supported maximum number of PDSCH MIMO layers (*maxNumberMIMO-LayersPDSCH*) | FR1 FDD | CQI | Clause 6.2.3.1.1.1 | The requirements apply only in case the PDSCH MIMO rank in the test case does not exceed UE PDSCH MIMO layers capability |
| PMI | Clause 6.3.3.1.2 |
| RI | Clause 6.4.2.1  Clause 6.4.3.1 |
| FR1 TDD | CQI | Clause 6.2.3.2.1.1 |
| PMI | Clause 6.3.3.2.2 |
| RI | Clause 6.4.2.2  Clause 6.4.3.2 |
| Supported maximum number of ports across all configured NZP-CSI-RS resources per CC (*maxConfigNumberPortsAcrossNZP-CSI-RS-PerCC*) | FR1 FDD | PMI | Clause 6.3.2.1.1  Clause 6.3.2.1.2  Clause 6.3.3.1.1  Clause 6.3.3.1.2 | The requirements apply only in case the number of NZP-CSI-RS ports in the test case satisfies UE capability on maximum number of NZP-CSI-RS ports |
| RI | Clause 6.4.3.1 (Test 4) |
| FR1 TDD | PMI | Clause 6.3.2.2.1  Clause 6.3.2.2.2Clause 6.3.3.2.1  Clause 6.3.3.2.2 |
| RI | Clause 6.4.3.2 (Test 4) |

**<end of First change>**