**3GPP TSG-RAN WG4 Meeting #111 *R4-2408495***

**Fukuoka City, Fukuoka, Japan, 20th – 24th May, 2024**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** | **0530** | **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:*** | CR on applicability of requirements for FR2 multi-Rx | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_FR2\_multiRx\_DL-Perf | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** | ***F*** |  | | | | | ***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 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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19) Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | There are some problems of the applicability of FR2 multi-Rx requirements. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The summary of changes in this CR as below:   * update requirements in Clause   7.1.1.3  7.1.1.4  7.1.1.9 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | * The applicability of FR2 multi-Rx requirements is not right. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 7.1.1.3  7.1.1.4  7.1.1.9 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**<Start of changes>**

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

The performance requirements in Table 7.1.1.3-1 shall apply for UEs which support optional UE features only.

Table 7.1.1.3-1: Requirements applicability for optional UE features

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| UE feature/capability [14] | Test type | | Test list | Applicability notes | |
| SU-MIMO Interference Mitigation advanced receiver | FR2-1 TDD | PDSCH | Clause 7.2.2.2.1 (Test 3-1) |  | |
| Basic DL NR-NR CA operation (*supportedBandCombinationList*) | NR CA | SDR | Clause 7.5A.1 | 1) Up to 16 DL carriers  2) Same numerology across carrier for data/control channel at a given time | |
| PDSCH repetitions over multiple slots *(pdsch-RepetitionMultiSlots)* | FR2-1 TDD | PDSCH | Clause 7.2.2.2.2 |  | |
| Alternative 64QAM MCS table for PDSCHNew 64QAM MCS table for PDSCH (*dl-64QAM-MCS-TableAlt*) | FR2 TDD | PDSCH | Clause 7.2.2.2.2 | |  |
| DRX Adaptation (*drx-Adaptation-r16*) | FR2-1 TDD | PDCCH | Clause 7.3.2.2.3 | If the Test 3-1 in Clause 7.3.2.2.3 is passed, the test coverage can be considered fulfilled without executing Test 1-2 in clause 7.3.2.2.1. | |
| 256QAM for PDSCH  (*pdsch-256QAM-FR2*) | FR2-1 TDD | PDSCH | Clause 7.2.2.2.1 (Test 1-4) |  | |
| 256QAM for PDSCH (*pdsch-256QAM-FR2*) | FR2-1 TDD | SDR | Clause 7.5A.1 | For UE capable of *pdsch-256QAM-FR2* for certain band(s), *mcs-Table* is configured to ‘64QAM’ for SDR test. | |
| Support of FR2 HST operation [(FR2 UE power class PC6 signalling is used to indicate support of feature group)] | FR2-1 TDD | PDSCH | [Clause 7.2.2.2.4] |  | |
| Support of Single Carrier operations with 120kHz SCS for FR2-2  (*initialAccessSSB-120kHz-r17)* | FR2-2 TDD | PDSCH | Clause 7.2.2.2.1  (Table 7.2.2.2.1-6: Test 4-1, 4-2, 4-3, 4-4) |  | |
|  |  | PDCCH | Clause 7.3.2.2  (Table 7.3.2.2.1-2: Test 1a-1, 1a-2, 1a-3)  (Table 7.3.2.2.2-2, Test 3-1, 3-2) |  | |
|  |  | PBCH | Clause 7.4.2.2  (Table 7.4.2.2-2: Test 3) |  | |
| Support of 480kHz SCS for FR2-2  (*ul-FR2-2-SCS-480kHz-r17* and *initialAccessSSB-480kHz-r17)* | FR2-2 TDD | PDSCH | Clause 7.2.2.2.1  (Table 7.2.2.2.1-6: Test 4-5, 4-6) |  | |
|  |  | PDCCH | Clause 7.3.2.2  (Table 7.3.2.2.1-2: Test 1a-4) (Table 7.3.2.2.2-2, Test 3-3) |  | |
|  |  | PBCH | Clause 7.4.2.2  (Table 7.4.2.2-2: Test 4) |  | |
| Support simultaneous reception with different QCL Type-D RSs (simultaneousReceptionDiffTypeD-r16) | FR2  TDD | PDSCH | Clause 7.2.2.2.5  Clause 7.2.2.2.6  Clause 7.2.2.2.7 |  | |
| Single DCI based SDM transmission for simultaneous reception support (singleDCI-SDM-scheme-r16) | FR2  TDD | PDSCH | Clause 7.2.2.2.7 |  | |
| Multi DCI based simultaneous reception non-overlapping support (multiDCI-MultiTRP-r16) | FR2  TDD | PDSCH | Clause 7.2.2.2.5 |  | |
| Multi DCI based simultaneous reception fully-overlapping support (overlapPDSCHsFullyFreqTime-r16) | FR2  TDD | PDSCH | Clause 7.2.2.2.6 |  | |
| Support of 2-port DL PTRS (supportTwoPortDL-PTRS-r16) | FR2  TDD | PDSCH | Clause 7.2.2.2.7 Test 1-2 |  | |

7.1.1.4 Applicability of requirements for mandatory UE features with capability signalling

The performance requirements in Table 7.1.1.4-1 shall apply for UEs which support mandatory UE features with capability signalling only.

Table 7.1.1.4-1: 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)* | FR2 TDD | PDSCH | Clause 7.2.2.2.1 (Tests from 2-1 to 2-6) | The requirements apply only in case the PDSCH MIMO rank in the test case does not exceed UE PDSCH MIMO layers capability |
| Support of PT-RS with one antenna port for DL reception (*onePortsPTRS*) | FR2 TDD | PDSCH | Clause 7.2 |  |
| SDR | Clause 7.5.1  Clause 7.5A.1 |
| PCell operation on FR2 (*pCell-FR2*) | FR2 TDD | SDR | Clause 7.5A.1 |  |
| PDSCH mapping type B (*pdsch-MappingTypeB*) | FR2 TDD | PDSCH | Clause 7.2.2.2.3 |  |
| Support number of active TCI states per BWP per CC, including control and data (maxNumberActiveTCI-PerBWP) | FR2 TDD | PDSCH | Clause 7.2.2.2.4 (Test 1-2) | The requirements apply only when maxNumberActiveTCI-PerBWP is other than n1. |
| Support for maximum number of TRS resource sets per CC which the UE can track simultaneously (*maxSimultaneousResourceSetsPerCC*) | FR2 TDD | PDSCH | Clause 7.2.2.2.5  Clause 7.2.2.2.6  Clause 7.2.2.2.7 | The requirements apply only when *maxSimultaneousResourceSetsPerCC* ≥ 2 |

**<< Unchanged sections omitted >>**

7.1.1.9 Applicability of different requirements with simultaneous reception

The applicability rules for different requirements with simultaneous reception transmission schemes in section 7 are specified in Table 7.1.1.9-1.

Table 7.1.1.9-1: Applicability of different requirements with simultaneous reception

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| If UE has passed | | | UE can skip | | | Applicability notes |
| Test type | | Test list | Test type | | Test list |
| FR2 TDD | PDSCH | Clause 7.2.2.2.7 (Test 1-1) | FR2 TDD | PDSCH | Clause 7.2.2.2.7 (Test 1-2) | If UE supports one PTRS port per TRxP configuration, UE is not tested for one PTRS port across TRxPs; |

**<End of changes>**