**3GPP TSG-RAN WG4 Meeting #94-e revision of R4-2001683**

**Electronic meeting, 24th Feb – 6th Mar 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **38.141-2** | **CR** | **0129** | **rev** | **1** | **Current version:** | **15.4.0** |  |
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| *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 to 38.141-2 updates for reference to annex F and OFDM symbol TX power  |
|  |  |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell  |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_newRAT-Perf |  | ***Date:*** | 2020-02-14 |
|  |  |  |  |  |
| ***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-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
|  |  |
| ***Reason for change:*** | This CR update references to Annex F, that was change to Annex L. However in subclause 6.4.3 still referencies to Annex F exist. |
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| ***Summary of change:*** | 1. Aligment with OFDM symbol TX power deifnition in Annex L (addition of PDCCH)
2. References to Annex F are change to Annex L.
3. Removel of additional pointer for step 3 in procedure in 6.4.3.4.2.
4. Update for OFDM symbol TX power to align with defienition in annex L.
5. Update of description of Total power dynamic range in sublcuases 4.9.2.2.2 and 4.9.2.2.3.
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| ***Consequences if not approved:*** | Specification would be missleading.  |
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| ***Clauses affected:*** | 4.9.2.2.2, 4.9.2.2.3, 6.4.3 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **N** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **N** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **N** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** | Corrections from Annex I to Annex L in the coverpage and in proposed changes. |

### <start of changes>

##### 4.9.2.2.2 NR FR2 test model 2 (NR-FR2-TM2)

This model shall be used for tests on:

- Total power dynamic range (lower OFDM symbol TX power limit (OSTP) at min power)

- EVM of single 64QAM PRB allocation (at min power)

- Frequency error (at min power)

Common physical channel parameters are defined in clause 4.9.2.2. Specific physical channel parameters for NR-FR2-TM2 are defined in table 4.9.2.2.2-1.

Table 4.9.2.2.2-1: Specific physical channel parameters of NR-FR2-TM2

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| --- | --- |
| Parameter | Value |
| # of 64QAM PDSCH PRBs  | 1 |
| Level of boosting (dB)  | 0 |
| Location of 64QAM PRB |

|  |  |  |
| --- | --- | --- |
| Slot | RB | n |
| 3*n* | 0 | $$n=0,…,\left⌈\frac{10×2^{μ}}{3}\right⌉-1$$ |
| 3*n*+1 | $$\left⌊\frac{N\_{RB}}{2}\right⌋$$ | $$n=0,…,\left⌈\frac{10×2^{μ}-1}{3}\right⌉-1$$ |
| 3*n*+2 | $$N\_{RB}-1$$ | $$n=0,…,\left⌈\frac{10×2^{μ}-2}{3}\right⌉-1$$ |

 |
| # of PDSCH PRBs which are not allocated | $$N\_{RB}-1$$ |

##### 4.9.2.2.3 NR FR2 test model 3.1 (NR-FR2-TM3.1)

This model shall be used for tests on:

- Output power dynamics

- Total power dynamic range (upper OFDM symbol TX power limit (OSTP) at max power with all 64QAM PRBs allocated)

- Transmitted signal quality

- Frequency error

- EVM for 64QAM modulation (at max power)

NOTE: EVM shall be evaluated over PDSCH allocated PRBs with $n\_{RNTI}=0$ and $n\_{RNTI}=2.$

Common physical channel parameters are defined in clause 4.9.2.2. Specific physical channel parameters for NR-FR2-TM3.1 shall be defined in table 4.9.2.2.1-1 with all QPSK PDSCH PRBs replaced by 64QAM.

### <unchanged sections omitted>

### 6.4.3 OTA total power dynamic range

#### 6.4.3.1 Definition and applicability

The OTA total power dynamic range is the difference between the maximum and the minimum transmit power of an OFDM symbol for a specified reference condition.

This requirement shall apply at each RIB supporting transmission in the *operating band*.

NOTE: The upper limit of the OTA total power dynamic range is the BS maximum carrier EIRP (Pmax,c,EIRP) when transmitting on all RBs. The lower limit of the OTA total power dynamic range is the average EIRP for single RB transmission in the same direction using the same beam. The OFDM symbols shall carry PDSCH and not contain PDCCH, RS or SSB.

#### 6.4.3.2 Minimum requirement

The minimum requirement for *BS type 1-O* is in TS 38.104 [2], subclause 9.4.3.2.

The minimum requirement for *BS type 2-O* is in TS 38.104 [2], subclause 9.4.3.3.

#### 6.4.3.3 Test purpose

The test purpose is to verify that the total power dynamic range is within the limits specified by the minimum requirement.

#### 6.4.3.4 Method of test

##### 6.4.3.4.1 Initial conditions

Test environment: Normal, see annex B.2.

RF channels to be tested for single carrier: M; see subclause 4.9.1.

Beams to be tested: Declared beam with the highest intended EIRP for the narrowest intended beam corresponding to the smallest BeWθ, or for the narrowest intended beam corresponding to the smallest BeWϕ (D.3, D.11).

Directions to be tested: The *OTA peak directions set reference beam direction pair* (D.8).

##### 6.4.3.4.2 Procedure

1) Place the BS at the positioner.

2) Align the manufacturer declared coordinate system orientation (D.2) of the BS with the test system.

3) Orient the positioner (and BS) in order that the direction to be tested aligns with the test antenna.

4) Configure the beam peak direction of the BS according to the declared beam direction pair.

5) For *BS type 1-O*, set the BS to transmit a signal according to the applicable test configuration in subclause 4.8 using the corresponding test models:

- NR-FR1-TM3.1a in TS 38.141-1 [3] subclause 4.9.2.2.6 if 256QAM is supported by BS without power back off;

- or NR-FR1-TM3.1 in TS 38.141-1 [3] subclause 4.9.2.2.5 if 256QAM is not supported by BS;

- or NR-FR1-TM3.1 in TS 38.141-1 [3] subclause 4.9.2.2.5 if 256QAM is supported by BS with power back off;

 For *BS type 2-O*, set the BS to transmit a signal according to the applicable test configuration in subclause 4.8 using the corresponding test models:

- NR-FR2-TM3.1 with 64QAM signals if 64QAM is supported by BS without power back off;

- or NR-FR2-TM3.1 with highest modulation order supported without power back off if 64QAM is not supported by BS;

- or NR-FR2-TM3.1with highest modulation order supported without power back off if 64QAM is supported by BS with power back off;

6) Measure the OFDM symbol TX power as defined in annex L by measuring the EIRP for any two orthogonal polarizations (denoted p1 and p2) and calculate total radiated transmit power for particular *beam direction pair* as EIRP = EIRPp1 + EIRPp2.

7) For *BS type 1-O*, set the BS to transmit a signal according to the applicable test configuration in subclause 4.8 using the corresponding test models:

- NR-FR1-TM2a in TS 38.141-1 [3] subclause 4.9.2.2.4 if 256QAM is supported by BS;

- or NR-FR1-TM2 in TS 38.141-1 [3] subclause 4.9.2.2.3 if 256QAM is not supported by BS;

For *BS type 2-O*, set the BS to transmit a signal according to the applicable test configuration in subclause 4.8 using the corresponding test models:

- NR-FR2-TM2 if 64QAM is supported by BS;

- or NR-FR2-TM2 with highest modulation order supported if 64QAM is not supported by BS;

8) Measure the OFDM symbol TX power (OSTP) as defined in annex L by measuring the EIRP for any two orthogonal polarizations (denoted p1 and p2) and calculate total radiated transmit power for particular *beam direction pair* as EIRP = EIRPp1 + EIRPp2.

The measured OFDM symbols shall not contain RS or SSB.

In addition, for *multi-band RIB(s)*, the following steps shall apply:

9) For *multi-band RIBs* and single band tests, repeat the steps above per involved band where single band test configurations and test models shall apply with no carrier activated in the other band.

### <end of changes>