**3GPP TSG-RAN WG4 Meeting # 94-e *R4-2002459***

**Online, 24 February – 6 March 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **38.141-1** | **CR** | **0089** | **rev** | **1** | **Current version:** | **15.4.0** |  |
|  |
| *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 to TR 38.141-1: Corrections on rated carrier output power symbols |
|  |  |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_newRAT-Perf |  | ***Date:*** | 2020-03-04 |
|  |  |  |  |  |
| ***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:*** | The symbol ‘PRated‘ is used in a few places instead of the defined symbol ‘Prated‘. |
|  |  |
| ***Summary of change:*** | Correct the symbol ‘PRated‘ to the defined symbol ‘Prated‘. |
|  |  |
| ***Consequences if not approved:*** | Errors remain and would lead to different interpretations. |
|  |  |
| ***Clauses affected:*** | 6.2.1, 6.2.5, 6.4.2.4.2, 7.2.4.2, 7.4.1.4.2, 7.4.2.4.2, 7.4.2.4.3, 7.6.4.2, 7.7.4.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

**<Start of change>**

### 6.2.1 Definition and applicability

The conducted BS output power requirements are specified at *single-band connector*, or at *multi-band connector*.

The *rated carrier output power* of the *BS type 1-C* shall be as specified in table 6.2.1-1.

Table 6.2.1-1: *Rated carrier output power* limits for *BS type 1-C*

|  |  |
| --- | --- |
| BS class | Prated,c,AC |
| Wide Area BS | (Note) |
| Medium Range BS | ≤ 38 dBm |
| Local Area BS | ≤ 24 dBm |
| NOTE: There is no upper limit for the Prated,c,AC rated output power of the Wide Area Base Station. |

The *rated carrier output power* of the *BS type 1-H* shall be as specified in table 6.2.1-2.

Table 6.2.1-2: *Rated carrier output power* limits for *BS type 1-H*

| BS class | Prated,c,sys | Prated,c,TABC |
| --- | --- | --- |
| Wide Area BS | (Note) | (Note) |
| Medium Range BS | ≤ 38 dBm +10log(NTXU,counted) | ≤ 38 dBm |
| Local Area BS | ≤ 24 dBm +10log(NTXU,counted) | ≤ 24 dBm |
| NOTE: There is no upper limit for the Prated,c,sys or Prated,c,TABC of the Wide Area Base Station. |

The output power limit for the respective BS classes in tables 6.2.1.-1 and 6.2.1-2 shall be compared to the rated output power and the declared BS class. It is not subject to testing.

**<Next change>**

### 6.2.5 Test requirement

For each *single-band connector* or *multi-band connector* under test, the power measured in clause 6.2.4.2 in step 3 shall remain within the values provided in table 6.2.5-1 for normal and extreme test environments, relative to the manufacturer's declared Prated,c,AC for *BS type 1-C*, or relative to the manufacturer's declared Prated,c,TABC for *BS type 1-H* (D.21):

Table 6.2.5-1: Test requirement for conducted BS output power

|  |  |  |
| --- | --- | --- |
|  | Normal test environment | Extreme test environment |
| *BS type 1-C*,*BS type 1-H* | f ≤ 3.0 GHz: ± 2.7 dB | f ≤ 3.0 GHz: ± 3.2 dB |
| 3.0 GHz < f ≤ 6.0 GHz: ± 3.0 dB | 3.0 GHz < f ≤ 6.0 GHz: ± 3.5 dB |

**<Next change>**

##### 6.4.2.4.2 Procedure

The minimum requirement is applied to all *antenna connectors* or *TAB connectors*, they may be tested one at a time or multiple *antenna connectors* or *TAB connectors* may be tested in parallel as shown in annex D.1.1 for *BS type 1-C* or in annex D.3.1 for *BS type 1-H*. Whichever method is used the procedure is repeated until all *antenna connectors* or *TAB connectors* necessary to demonstrate conformance have been tested.

1) Connect *antenna connector* or *TAB connector* to measurement equipment as shown in annex D.1.1 for *BS type 1-C* or in annex D.3.1 for *BS type 1-H*. All *antenna connectors* or *TAB connectors* not under test shall be terminated.

 As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity, efficiency and avoiding e.g. carrier leakage, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

2) For single carrier set the *antenna connector* or *TAB connector* under test to transmit according to the applicable test configuration in clause 4.8 using the corresponding test models or set of physical channels in clause 4.9.2 at manufacturers declared *rated carrier output power* per *antenna connector* or *TAB connector* (Prated,c,AC, or Prated,c,TABC, D.21).

For a connector under test declared to be capable of multi-carrier and/or CA operation (D.15-D.16) set the connector under test to transmit on all carriers configured using the applicable test configuration and corresponding power setting specified in clauses 4.7 and 4.8 using the corresponding test models or set of physical channels in clause 4.9.2.

3) Measure the mean power spectral density over 70/N μs filtered with a square filter of bandwidth equal to the RF bandwidth of the *antenna connector* or *TAB connector* centred on the central frequency of the RF bandwidth. 70/N μs average window centre is set from 35/N μs after end of one transmitter ON period + 10 μs to 35/N μs before start of next transmitter ON period – 10 μs. N = SCS/15, where SCS is Sub Carrier Spacing in kHz.

4) For an *antenna connector* or *TAB connector* supporting contiguous CA, measure the mean power spectral density over 70/N μs filtered with a square filter of bandwidth equal to the *aggregated BS channel bandwidth* BWChannel\_CA centred on (Fedge\_high+Fedge\_low)/2. 70/N μs average window centre is set from 35/N μs after end of one transmitter ON period + 10 μs to 35/N μs before start of next transmitter ON period – 10 μs. N = SCS/15, where SCS is the smallest supported Sub Carrier Spacing in kHz in the *aggregated BS channel bandwidth*.

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

5) For *multi-band connectors* 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.

**<Next change>**

#### 7.2.4.2 Procedure

The minimum requirement is applied to all connectors under test.

For *BS type 1-H* the procedure is repeated until all *TAB connectors* necessary to demonstrate conformance have been tested; see clause 7.1.

1) Connect the connector under test to measurement equipment as shown in annex D.2.1 for *BS type 1-C* and in annex D.4.1 for *BS type 1-H*.

2) Set the BS to transmit a signal according to clause 4.9.2, for *BS type 1-C* set the *antenna connector* to the manufacturers declared *rated carrier output power* (Prated,c,AC or Prated,c,TABC, D.21).

3) Start the signal generator for the wanted signal to transmit the Fixed Reference Channels for reference sensitivity according to annex A.1.

4) Set the signal generator for the wanted signal power as specified in clause 7.2.5.

5) Measure the throughput according to annex A.1.

In addition, for a *multi-band connector*, the following steps shall apply:

6) For *multi-band connector* 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.

**<Next change>**

##### 7.4.1.4.2 Procedure

The minimum requirement is applied to all connectors under test.

For *BS type 1-H* the procedure is repeated until all *TAB connectors* necessary to demonstrate conformance have been tested; see clause 7.1.

1) Connect the connector under test to measurement equipment as shown in annex D.2.3 for *BS type 1-C* and in annex D.4.3 for *BS type 1-H*.

2) Set the BS to transmit:

- For single carrier operation set the connector under test to transmit at manufacturers declared *rated carrier output power* (Prated,c,AC or Prated,c,TABC, D.21).

- For a connector under test declared to be capable of multi-carrier and/or CA operation (D.15-D.16) set the connector under test to transmit on all carriers configured using the applicable test configuration and corresponding power setting specified in clauses 4.7 and 4.8 using the corresponding test models or set of physical channels in clause 4.9.2

3) Set the signal generator for the wanted signal to transmit as specified in table 7.4.1.5-1.

4) Set the signal generator for the interfering signal to transmit at the frequency offset and as specified in table 7.4.1.5-1 and 7.4.1.5-2.

5) Measure the throughput according to annex A.1.

In addition, for a *multi-band* *connector*, the following steps shall apply:

6) For *multi-band* *connector* 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.

**<Next change>**

##### 7.4.2.4.2 Procedure for general blocking

The minimum requirement is applied to all connectors under test.

For *BS type 1-H* the procedure is repeated until all *TAB connectors* necessary to demonstrate conformance have been tested; see clause 7.1.

1) Connect the connector under test to measurement equipment as shown in annex D.2.3 for *BS type 1-C* and in annex D.4.3 for *BS type 1-H*.

2) Set the BS to transmit:

- For single carrier operation set the connector under test to transmit at manufacturers declared *rated carrier output power* (Prated,c,AC or Prated,c,TABC, D.21).

- For a connector under test declared to be capable of multi-carrier and/or CA operation (D.15-D.16) set the connector under test to transmit on all carriers configured using the applicable test configuration and corresponding power setting specified in clauses 4.7 and 4.8 using the corresponding test models or set of physical channels in clause 4.9.2.

3) Set the signal generator for the wanted signal to transmit as specified in table 7.4.2.5-1.

4) Set the signal generator for the interfering signal to transmit at the frequency offset and as specified in table 7.4.2.5-1. The interfering signal shall be swept with a step size of 1 MHz starting from the minimum offset to the channel edges of the wanted signals as specified in table 7.4.2.5-1.

5) Measure the throughput according to annex A.1.

In addition, for a *multi-band* *connector*, the following steps shall apply:

6) For *multi-band* *connector* 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.

##### 7.4.2.4.3 Procedure for narrowband blocking

The minimum requirement is applied to all connectors under test.

For *BS type 1-H* the procedure is repeated until all *TAB connectors* necessary to demonstrate conformance have been tested; see clause 7.1.

1) Connect the connector under test to measurement equipment as shown in annex D.2.3 for *BS type 1-C* and in annex D.4.3 for *BS type 1-H*.

2) Set the BS to transmit:

- For single carrier operation set the connector under test to transmit at manufacturers declared *rated carrier output power* (Prated,c,AC or Prated,c,TABC, D.21).

- For a connector under test declared to be capable of multi-carrier and/or CA operation (D.15-D.16) set the connector under test to transmit on all carriers configured using the applicable test configuration and corresponding power setting specified in clauses 4.7 and 4.8 using the corresponding test models or set of physical channels in clause 4.9.2.

3) Set the signal generator for the wanted signal to transmit as specified in table 7.4.2.5-2.

4) Set the signal generator for the interfering signal to transmit at the frequency offset and as specified in table 7.4.2.5-2 and 7.4.2.5-3. Set-up and sweep the interfering RB centre frequency offset to the channel edge of the wanted signal according to table 7.4.2.5-3.

5) Measure the throughput according to annex A.1.

In addition, for a *multi-band* *connector*, the following steps shall apply:

6) For *multi-band* *connector* 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.

**<Next change>**

#### 7.6.4.2 Procedure

The minimum requirement is applied to all connectors under test,

For *BS type 1-H* where there may be multiple *TAB connectors* they may be tested one at a time or multiple *TAB connectors* may be tested in parallel as shown in annex D.4.4. Whichever method is used the procedure is repeated until all *TAB connectors* necessary to demonstrate conformance have been tested.

1) Connect the connector under test to measurement equipment as shown in annex D.2.6 for *BS type 1-C* and in annex D.4.4 for *BS type 1-H*.

2) For separate RX only connectors with single carrier operation set the connector under test to transmit at manufacturers declared *rated carrier output power* (Prated,c,AC or Prated,c,TABC, D.21). Channel set-up shall be according to NR-FR1-TM 1.1.

 For separate RX only connectors declared to be capable of multi-carrier and/or CA operation (D.15-D.16) set the connector under test to transmit on all carriers configured using the applicable test configuration and corresponding power setting specified in clauses 4.7 and 4.8 using the corresponding test models or set of physical channels in clause 4.9.

 For TDD connectors capable of transmit and receive ensure the transmitter is OFF.

3) Set the measurement equipment parameters as specified in table 7.6.5.1-1.

4) Measure the spurious emissions over each frequency range described in table 7.6.5.1-1.

In addition, for a *multi-band* *connector*, the following steps shall apply:

5) For *multi-band* *connector* 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.

**<Next change>**

#### 7.7.4.2 Procedure

The minimum requirement is applied to all connectors under test.

For *BS type 1-H* the procedure is repeated until all *TAB connectors* necessary to demonstrate conformance have been tested; see clause 7.1.

1) Connect the connector under test to measurement equipment as shown in annex D.2.7 for *BS type 1-C* and in annex D.4.6 for *BS type 1-H*.

2) Set the BS to transmit:

- For single carrier operation set the connector under test to transmit at manufacturers declared *rated carrier output power* (Prated,c,AC or Prated,c,TABC, D.21).

- For a connector under test declared to be capable of multi-carrier and/or CA operation (D.15-D.16) set the connector under test to transmit on all carriers configured using the applicable test configuration and corresponding power setting specified in clauses 4.7 and 4.8 using the corresponding test models or set of physical channels in clause 4.9.2.

3) Set the signal generator for the wanted signal to transmit as specified in table 7.7.5-1 and 7.7.5-3.

4) Set the signal generator(s) for the interfering signals to transmit at the frequency offset and as specified in table 7.7.5-2 and 7.7.5-4.

5) Measure the throughput according to annex A.1.

In addition, for a *multi-band* *connector*, the following steps shall apply:

6) For *multi-band* *connector* 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 change>**