**3GPP TSG-RAN WG4 Meeting #104e *R4-22xxxx***

**Electronic meeting, 15th – 26th Aug, 2022**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **38.176-1** | **CR** | **-** | **rev** | **-** | **Current version:** | **17.1.0** |  |
|  |
| *For* ***[HE](http://www.3gpp.org/3G_Specs/CRs.htm%22%20%5Cl%20%22_blank)******[LP](http://www.3gpp.org/3G_Specs/CRs.htm%22%20%5Cl%20%22_blank)*** *on using this form: comprehensive instructions can be found at <http://www.3gpp.org/Change-Requests>.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | × | Core Network |  |

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| ***Title:***  | Draft CR to TS38.176-1 on IAB output power |
|  |  |
| ***Source to WG:*** |  ZTE  |
| ***Source to TSG:*** |  R4 |
|  |  |
| ***Work item code:*** |  NR\_IAB\_enh-Perf |  | ***Date:*** | 2022-08-15 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-17 |
|  | *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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | To update the test method for simultaneous Tx between IAB-MT and IAB-DU |
|  |  |
| ***Summary of change:*** | Test method is updated for simultaneous TX between IAB-MT and IAB-DU in requirement of output power.  |
|  |  |
| ***Consequences if not approved:*** | No corresponding test method for IAB node supporting simultaneous TX operation.  |
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| ***Clauses affected:*** | 6.2 |
|  |  |
|  | **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 1>***

## 6.2 IAB output power

### 6.2.1 General

The IAB type 1-H conducted output power requirement is at *TAB connector* for *IAB type 1-H*.

The *rated carrier output power* of the *IAB type 1-H* shall be as specified in table 6.2.1-1 for *IAB-DU* and in table 6.2.1-2 for *IAB-MT*.

Table 6.2.1-1: *IAB type 1-H* rated output power limits for IAB-DU classes

| IAB-DU class | Prated,c,sys | Prated,c,TABC |
| --- | --- | --- |
| Wide Area IAB-DU | (Note) | (Note) |
| Medium Range IAB-DU | ≤ 38 dBm +10log(NTXU,counted) | ≤ 38 dBm |
| Local Area IAB-DU | ≤ 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 IAB-DU. |

Table 6.2.1-2: *IAB type 1-H* rated output power limits for IAB-MT classes

| IAB-MT class | Prated,c,sys | Prated,c,TABC |
| --- | --- | --- |
| Wide Area IAB-MT | (Note) | (Note) |
| Local Area IAB-MT | ≤ 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 IAB-MT. |

### 6.2.2 Minimum requirement

The minimum requirement *IAB type 1-H* applies per *single-band connector*, or per *multi-band connector* supporting transmission in the *operating band*.

The minimum requirement for *IAB-DU* is defined in TS 38.174 [2], clause 6.2.2.

The minimum requirement for *IAB-MT* is defined in TS 38.174 [2], clause 6.2.2.

### 6.2.3 Test purpose

The test purpose is to verify the accuracy of the *maximum carrier output power* across the frequency range and under normal and extreme conditions.

### 6.2.4 Method of test

#### 6.2.4.1 Initial conditions

Test environment:

- Normal, see annex B.2,

- Extreme, see annexes B.3 and B.5.

RF channels to be tested for single carrier: B, M and T; see clause 4.9.1

*IAB RF Bandwidth* positions to be tested for multi-carrier and/or CA:

- BRFBW, MRFBW and TRFBW for *single-band connector(s)*, see clause 4.9.1.

- BRFBW\_T'RFBW and B'RFBW\_TRFBW for *multi-band connector(s)*, see clause 4.9.1.

Under extreme test environment, it is sufficient to test on one NR-ARFCN or one RF bandwidth position, and with one applicable test configuration defined in clauses 4.7 and 4.8. Testing shall be performed under extreme power supply conditions, as defined in Annex B.5.

NOTE: Tests under extreme power supply conditions also test extreme temperatures.

#### 6.2.4.2 Procedure

For *IAB 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.1.1. If IAB simultaneous transmission is declared to be supported (see D.XX in table 4.6-1), connectors for IAB-MT and IAB-DU may be tested simultaneously as shown in figure D.1.1 (shared connector or separate connectors for IAB-DU and IAB-MT are not precluded for IAB simultaneous transmission). Whichever method is used the procedure is repeated until all *TAB connectors* necessary to demonstrate conformance have been tested.

1) Connect the power measuring equipment to *single-band connector(s)* or to *multi-band connector(s)* under test as shown in annex D.1.1 for *IAB type 1-H*. All connectors not under test shall be terminated.

2) For single carrier set the 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 *rated carrier output power* Prated,c,TABC for *IAB type 1-H* (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 *maximum carrier output power* (Pmax,c,TABC for *IAB type 1-H)* for each carrier at each connector under test.

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

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

### 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,TABC for *IAB type 1-H* (D.21):

Table 6.2.5-1: Test requirement for conducted IAB-DU and IAB-MT output power

|  |  |  |
| --- | --- | --- |
|  | Normal test environment | Extreme test environment |
| *IAB-DU,* | f ≤ 3.0 GHz: ± 2.7 dB | f ≤ 3.0 GHz: ± 3.2 dB |
| *IAB-MT* | 3.0 GHz < f ≤ 6.0 GHz: ± 3.0 dB | 3.0 GHz < f ≤ 6.0 GHz: ± 3.5 dB |

***<End of change 1>***