**3GPP TSG-RAN WG4 Meeting #98-e R4-210xxxx**

Online, 12 - 20 Apr 2021

**Source:** Huawei

**Title:** TP to TS 38.176-1 - Rx dynamic range, clause 7.3

**Agenda Item:** 5.3.2.3.2.

**Document for:** Approval

# Introduction

This is a revision of R4-2107102 after 1st round review in RAN4#98e-bis, the following corrections have been made

BS in header of table 7.3.5-3 has been corrected to IAB-DU

This text proposal completes clause 7.3 conducted Rx dynamic range.

The text is based on the NR BS test spec TS 38.141-1 and the core requirements in the IAB spec TS 38.174.

In this case the requirements only applies to the IAB-DU type 1-H so the section is very similar to 38.141-2, the following modifications have been made:

* The 5MHz channel has been removed

# TP to TS 38.176-1 v0.0.1

**--- Start of changes ---**

## 7.3 Dynamic range

### 7.3.1 Definition and applicability

The dynamic range is specified as a measure of the capability of the receiver to receive a wanted signal in the presence of an interfering signal at the *TAB connector* for *IAB-DU type 1-H* inside the received *IAB-DU channel bandwidth*. In this condition, a throughput requirement shall be met for a specified reference measurement channel. The interfering signal for the dynamic range requirement is an AWGN signal.

### 7.3.2 Minimum requirement

The minimum requirement for *IAB-DU type 1-H* is in TS 38.174 [2], clause 7.3.1.

### 7.3.3 Test purpose

To verify that the IAB-DU *type 1-H* *TAB connector* receiver dynamic range, the relative throughput shall fulfil the specified limit.

### 7.3.4 Method of test

#### 7.3.4.1 Initial conditions

Test environment: Normal; see annex B.2.

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

#### 7.3.4.2 Procedure

The minimum requirement is applied to all connectors under test.

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.4.2 .

2) Set the signal generator for the wanted signal to transmit as specified in table 7.3.5-1 to table 7.3.5-3 according to the appropriate IAB class.

3) Set the Signal generator for the AWGN interfering signal at the same frequency as the wanted signal to transmit as specified in table 7.3.5-1 to table 7.3.5-3 according to the appropriate IAB class.

4) Measure the throughput according to annex A.2.

In addition, for a *multi-band TAB 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.

### 7.3.5 Test requirements

The throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel as specified in annex A.2 with parameters specified in table 7.3.2-1 for Wide Area IAB-DU, in table 7.3.2-2 for Medium Range IAB-DU and in table 7.3.2-3 for Local Area IAB-DU.

Table 7.3.5-1: Wide Area IAB-DU dynamic range

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *IAB-DU channel bandwidth* (MHz) | Subcarrier spacing (kHz) | Reference measurement channel | Wanted signal mean power (dBm) | Interfering signal mean power (dBm) / BWConfig | Type of interfering signal |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| 10 | 15 | G-FR1-A2-1 | -70.4 | -79.3 | AWGN |
|  | 30 | G-FR1-A2-2 | -71.1 |  |  |
|  | 60 | G-FR1-A2-3 | -68.1 |  |  |
| 15 | 15 | G-FR1-A2-1 | -70.4 | -77.5 | AWGN |
|  | 30 | G-FR1-A2-2 | -71.1 |  |  |
|  | 60 | G-FR1-A2-3 | -68.1 |  |  |
| 20 | 15 | G-FR1-A2-4 | -64.2 | -76.2 | AWGN |
|  | 30 | G-FR1-A2-5 | -64.2 |  |  |
|  | 60 | G-FR1-A2-6 | -64.5 |  |  |
| 25 | 15 | G-FR1-A2-4 | -64.2 | -75.2 | AWGN |
|  | 30 | G-FR1-A2-5 | -64.2 |  |  |
|  | 60 | G-FR1-A2-6 | -64.5 |  |  |
| 30 | 15 | G-FR1-A2-4 | -64.2 | -74.4 | AWGN |
|  | 30 | G-FR1-A2-5 | -64.2 |  |  |
|  | 60 | G-FR1-A2-6 | -64.5 |  |  |
| 40 | 15 | G-FR1-A2-4 | -64.2 | -73.1 | AWGN |
|  | 30 | G-FR1-A2-5 | -64.2 |  |  |
|  | 60 | G-FR1-A2-6 | -64.5 |  |  |
| 50 | 15 | G-FR1-A2-4 | -64.2 | -72.1 | AWGN |
|  | 30 | G-FR1-A2-5 | -64.2 |  |  |
|  | 60 | G-FR1-A2-6 | -64.5 |  |  |
| 60 | 30 | G-FR1-A2-5 | -64.2 | -71.3 | AWGN |
|  | 60 | G-FR1-A2-6 | -64.5 |  |  |
| 70 | 30 | G-FR1-A2-5 | -64.2 | -70.7 | AWGN |
|  | 60 | G-FR1-A2-6 | -64.5 |  |  |
| 80 | 30 | G-FR1-A2-5 | -64.2 | -70.1 | AWGN |
|  | 60 | G-FR1-A2-6 | -64.5 |  |  |
| 90 | 30 | G-FR1-A2-5 | -64.2 | -69.5 | AWGN |
|  | 60 | G-FR1-A2-6 | -64.5 |  |  |
| 100 | 30 | G-FR1-A2-5 | -64.2 | -69.1 | AWGN |
|  | 60 | G-FR1-A2-6 | -64.5 |  |  |
| NOTE: The wanted signal mean power is the power level of a single instance of the corresponding reference measurement channel. This requirement shall be met for each consecutive application of a single instance of the reference measurement channel mapped to disjoint frequency ranges with a width corresponding to the number of resource blocks of the reference measurement channel each, except for one instance that might overlap one other instance to cover the full *IAB-DU channel bandwidth*. | | | | | |

Table 7.3.5-2: Medium Range IAB-DU dynamic range

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *IAB-DU channel bandwidth* (MHz) | Subcarrier spacing (kHz) | Reference measurement channel | Wanted signal mean power (dBm) | Interfering signal mean power (dBm) / BWConfig | Type of interfering signal |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| 10 | 15 | G-FR1-A2-1 | -65.4 | -74.3 | AWGN |
|  | 30 | G-FR1-A2-2 | -66.1 |  |  |
|  | 60 | G-FR1-A2-3 | -63.1 |  |  |
| 15 | 15 | G-FR1-A2-1 | -65.4 | -72.5 | AWGN |
|  | 30 | G-FR1-A2-2 | -66.1 |  |  |
|  | 60 | G-FR1-A2-3 | -63.1 |  |  |
| 20 | 15 | G-FR1-A2-4 | -59.2 | -71.2 | AWGN |
|  | 30 | G-FR1-A2-5 | -59.2 |  |  |
|  | 60 | G-FR1-A2-6 | -59.5 |  |  |
| 25 | 15 | G-FR1-A2-4 | -59.2 | -70.2 | AWGN |
|  | 30 | G-FR1-A2-5 | -59.2 |  |  |
|  | 60 | G-FR1-A2-6 | -59.5 |  |  |
| 30 | 15 | G-FR1-A2-4 | -59.2 | -69.4 | AWGN |
|  | 30 | G-FR1-A2-5 | -59.2 |  |  |
|  | 60 | G-FR1-A2-6 | -59.5 |  |  |
| 40 | 15 | G-FR1-A2-4 | -59.2 | -68.1 | AWGN |
|  | 30 | G-FR1-A2-5 | -59.2 |  |  |
|  | 60 | G-FR1-A2-6 | -59.5 |  |  |
| 50 | 15 | G-FR1-A2-4 | -59.2 | -67.1 | AWGN |
|  | 30 | G-FR1-A2-5 | 59.8 |  |  |
|  | 60 | G-FR1-A2-6 | -59.5 |  |  |
| 60 | 30 | G-FR1-A2-5 | -59.2 | -66.3 | AWGN |
|  | 60 | G-FR1-A2-6 | -59.5 |  |  |
| 70 | 30 | G-FR1-A2-5 | -59.2 | -65.7 | AWGN |
|  | 60 | G-FR1-A2-6 | -59.5 |  |  |
| 80 | 30 | G-FR1-A2-5 | -59.2 | -65.1 | AWGN |
|  | 60 | G-FR1-A2-6 | -59.5 |  |  |
| 90 | 30 | G-FR1-A2-5 | -59.2 | -64.5 | AWGN |
|  | 60 | G-FR1-A2-6 | -59.5 |  |  |
| 100 | 30 | G-FR1-A2-5 | -59.2 | -64.1 | AWGN |
|  | 60 | G-FR1-A2-6 | -59.5 |  |  |
| NOTE: The wanted signal mean power is the power level of a single instance of the corresponding reference measurement channel. This requirement shall be met for each consecutive application of a single instance of the reference measurement channel mapped to disjoint frequency ranges with a width corresponding to the number of resource blocks of the reference measurement channel each, except for one instance that might overlap one other instance to cover the full *IAB-DU channel bandwidth*. | | | | | |

Table 7.3.5-3: Local Area IAB-DU dynamic range

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *IAB-DU channel bandwidth* (MHz) | Subcarrier spacing (kHz) | Reference measurement channel | Wanted signal mean power (dBm) | Interfering signal mean power (dBm) / BWConfig | Type of interfering signal |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| 10 | 15 | G-FR1-A2-1 | -62.4 | -71.3 | AWGN |
|  | 30 | G-FR1-A2-2 | -63.1 |  |  |
|  | 60 | G-FR1-A2-3 | -60.1 |  |  |
| 15 | 15 | G-FR1-A2-1 | -62.4 | -69.5 | AWGN |
|  | 30 | G-FR1-A2-2 | -63.1 |  |  |
|  | 60 | G-FR1-A2-3 | -60.1 |  |  |
| 20 | 15 | G-FR1-A2-4 | -56.2 | -68.2 | AWGN |
|  | 30 | G-FR1-A2-5 | -56.2 |  |  |
|  | 60 | G-FR1-A2-6 | -56.5 |  |  |
| 25 | 15 | G-FR1-A2-4 | -56.2 | -67.2 | AWGN |
|  | 30 | G-FR1-A2-5 | -56.2 |  |  |
|  | 60 | G-FR1-A2-6 | -56.5 |  |  |
| 30 | 15 | G-FR1-A2-4 | -56.2 | -66.4 | AWGN |
|  | 30 | G-FR1-A2-5 | -56.2 |  |  |
|  | 60 | G-FR1-A2-6 | -56.5 |  |  |
| 40 | 15 | G-FR1-A2-4 | -56.2 | -65.1 | AWGN |
|  | 30 | G-FR1-A2-5 | -56.2 |  |  |
|  | 60 | G-FR1-A2-6 | -56.5 |  |  |
| 50 | 15 | G-FR1-A2-4 | -56.2 | -64.1 | AWGN |
|  | 30 | G-FR1-A2-5 | -56.2 |  |  |
|  | 60 | G-FR1-A2-6 | -56.5 |  |  |
| 60 | 30 | G-FR1-A2-5 | -56.2 | -63.3 | AWGN |
|  | 60 | G-FR1-A2-6 | -56.5 |  |  |
| 70 | 30 | G-FR1-A2-5 | -56.2 | -62.7 | AWGN |
|  | 60 | G-FR1-A2-6 | -56.5 |  |  |
| 80 | 30 | G-FR1-A2-5 | -56.2 | -62.1 | AWGN |
|  | 60 | G-FR1-A2-6 | -56.5 |  |  |
| 90 | 30 | G-FR1-A2-5 | -56.2 | -61.5 | AWGN |
|  | 60 | G-FR1-A2-6 | -56.5 |  |  |
| 100 | 30 | G-FR1-A2-5 | -56.2 | -61.1 | AWGN |
|  | 60 | G-FR1-A2-6 | -56.5 |  |  |
| NOTE: The wanted signal mean power is the power level of a single instance of the corresponding reference measurement channel. This requirement shall be met for each consecutive application of a single instance of the reference measurement channel mapped to disjoint frequency ranges with a width corresponding to the number of resource blocks of the reference measurement channel each, except for one instance that might overlap one other instance to cover the full *IAB-DU channel bandwidth*. | | | | | |

**--- End of changes ---**