**3GPP TSG-RAN WG4 Meeting #104e *R4-2212478***

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

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.176-2** | **CR** | **-** | **rev** | **-** | **Current version:** | **17.1.0** |  |
|  | | | | | | | | |
| *For* ***[HE](http://www.3gpp.org/3G_Specs/CRs.htm" \l "_blank)******[LP](http://www.3gpp.org/3G_Specs/CRs.htm" \l "_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 TS38.176-2 on IAB unwanted emissions | | | | | | | | | |
|  |  | | | | | | | | | |
| ***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 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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***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 unwanted emissions. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | No corresponding test method for IAB node supporting simultaneous TX operation. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.7 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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>***

## 6.7 OTA unwanted emissions

### 6.7.1 General

Unwanted emissions consist of so-called out-of-band emissions and spurious emissions according to ITU definitions ITU-R SM.329 [10]. In ITU terminology, out of band emissions are unwanted emissions immediately outside the *channel bandwidth* resulting from the modulation process and non-linearity in the transmitter but excluding spurious emissions. Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out of band emissions.

The OTA out-of-band emissions requirement for the *IAB-MT type 1-O. IAB-DU type 1-O, IAB-DU type 1-O* and *IAB-DU type 2-O* transmitter is specified both in terms of Adjacent Channel Leakage power Ratio (ACLR) and operating band unwanted emissions (OBUE). OTA Unwanted emissions outside of this frequency range are limited by an OTA spurious emissions requirement.

The maximum offset of the operating band unwanted emissions mask from the *operating band* edge is ΔfOBUE. The value of ΔfOBUE is defined in table 6.7.1-1 *IAB-DU type 1-O* and *type 2-O* and in table 6.7.1-2 *IAB-MT type 1-O* and *type 2-O* for NR *operating bands*.

Table 6.7.1-1: Maximum offset ΔfOBUE outside the downlink *operating band* for IAB-DU

|  |  |  |
| --- | --- | --- |
| **IAB-DU type** | ***Operating band* characteristics** | **ΔfOBUE (MHz)** |
| *IAB-DU type 1-O* | FDL,high – FDL,low < 100 MHz | 10 |
|  | 100 MHz ≤ FDL,high – FDL,low ≤ 900 MHz | 40 |
| *IAB-DU type 2-O* | FDL,high – FDL,low ≤ 4000 MHz | 1500 |

Table 6.7.1-2: Maximum offset ΔfOBUE outside the uplink *operating band* for IAB-MT

|  |  |  |
| --- | --- | --- |
| **IAB-MT type** | ***Operating band* characteristics** | **ΔfOBUE (MHz)** |
| *IAB-MT type 1-O* | FUL,high – FUL,low < 100 MHz | 10 |
|  | 100 MHz ≤ FUL,high – FUL,low ≤ 900 MHz | 40 |
| *IAB-MT type 2-O* | FUL,high – FUL,low ≤ 4000 MHz | 1500 |

The unwanted emission requirements are applied per cell for all the configurations. Requirements for OTA unwanted emissions are captured using TRP, *directional requirements* or co-location requirements as described per requirement.

There is in addition a requirement for occupied bandwidth.

### 6.7.2 OTA occupied bandwidth

#### 6.7.2.1 Definition and applicability

The OTA occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage /2 of the total mean transmitted power. See also recommendation ITU-R SM.328 [13].

The value of /2 shall be taken as 0.5%.

The OTA occupied bandwidth requirement shall apply during the *transmitter ON period* for a single transmitted carrier. The minimum requirement below may be applied regionally. There may also be regional requirements to declare the OTA occupied bandwidth according to the definition in the present clause.

The OTA occupied bandwidth is defined as a *directional requirement* and shall be met in the manufacturer's declared *OTA coverage range* at the RIB.

#### 6.7.2.2 Minimum requirement

The minimum requirement for *IAB-DU type 1-O* and *IAB-DU type 2-O* are in TS 38.174 [2], clause 9.7.2.2.

The minimum requirement for *IAB-MT type 1-O* and *IAB-MT type 2-O* are in TS 38.174 [2], clause 9.7.2.3.

#### 6.7.2.3 Test purpose

The test purpose is to verify that the emission at the *RIB* does not occupy an excessive bandwidth for the service to be provided and is, therefore, not likely to create interference to other users of the spectrum beyond undue limits.

#### 6.7.2.4 Method of test

##### 6.7.2.4.1 Initial conditions

Test environment: Normal, see annex B.2.

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

Directions to be tested: OTA coverage range reference direction (D.35).

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).

*Aggregated IAB channel bandwidth* positions to be tested for contiguous carrier aggregation: MBW Channel CA; see clause 4.9.1.

For a IAB declared to be capable of single carrier operation, start transmission according to the applicable test configuration in clause 4.8 using the corresponding test model IAB-DU-FR1-TM1.1 for *IAB-DU type 1-O*, IAB-MT-FR1-TM1.1 for *IAB-MT type 1-O,* IAB-DU-FR2-TM1.1 for *IAB-DU type 2-O* or IAB-MT-FR2-TM1.1 for *IAB-MT type 2-O* in clause 4.9.2 at manufacturers declared rated carrier EIRP (Prated,c,EIRP, D.11).

For a IAB declared to be capable of contiguous carrier aggregation operation, set the IAB to transmit according to IABDU-FR1-TM1.1 for *IAB-DU type 1-O,* IAB-MT-FR1-TM1.1 for *IAB-MT type 1-O,* IAB-DU-FR2-TM1.1 for *IAB-DU type 2-O* or IAB-MT-FR2-TM1.1 for *IAB-MT type 2-O* in clause 4.9.2 on all carriers configured using the applicable test configuration and corresponding power setting specified in clauses 4.7.2.3.1 and 4.8.

For an IAB declared to be capable of Simultaneous transmission between IAB-DU and IAB-MT (D.XX), set the IAB to transmit according to IABDU-FR1-TM1.1 for *IAB-DU type 1-O,* IAB-MT-FR1-TM1.1 for *IAB-MT type 1-O,* IAB-DU-FR2-TM1.1 for *IAB-DU type 2-O* or IAB-MT-FR2-TM1.1 for *IAB-MT type 2-O* in clause 4.9.2 using the applicable test configuration and corresponding power setting specified in clauses 4.7.2 and 4.8.

##### 6.7.2.4.2 Procedure

1) Place the IAB at the positioner.

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

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

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

5) Set the IAB to transmit signal.

6) Measure the spectrum emission of the transmitted signal using at least the number of measurement points, and across a span, as listed in table 6.7.2.4.2-1 and table 6.7.2.4.2-2. The selected resolution bandwidth (RBW) filter of the analyser shall be 30 kHz or less.

NOTE: The detection mode of the spectrum analyser will not have any effect on the result if the statistical properties of the out-of-OBW power are the same as those of the inside-OBW power. Both are expected to have the Rayleigh distribution of the amplitude of Gaussian noise. In any case where the statistics are not the same, though, the detection mode is power responding. There are at least two ways to be power responding. The spectrum analyser can be set to "sample" detection, with its video bandwidth setting at least three times its RBW setting. Or the analyser may be set to respond to the average of the power (root-mean-square of the voltage) across the measurement cell.

Table 6.7.2.4.2-1: Span and number of measurement points for OBW measurements for FR1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Bandwidth** | **IAB channel bandwidth**  **BWChannel (MHz)** | | | | **Aggregated IAB channel bandwidth BWChannel\_CA (MHz)** |
|  | **10** | **15** | **20** | **> 20** | **> 20** |
| Span (MHz) | 20 | 30 | 40 |  |  |
| Minimum number of measurement points | 400 | 400 | 400 |  |  |

Table 6.7.2.4.2-2: Span and number of measurement points for OBW measurements for FR2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Bandwidth** | **IAB channel bandwidth**  **BWChannel (MHz)** | | | | **Aggregated IAB channel bandwidth BWChannel\_CA (MHz)** |
|  | **50** | **100** | **200** | **400** | **> 50** |
| Span (MHz) |  | | | |  |
| Minimum number of measurement points |  | | | |  |

7) Compute the total of the EIRP, P0, (in power units, not decibel units) of all the measurement cells in the measurement span. Compute P1, the EIRP outside the occupied bandwidth on each side. P1 is half of the total EIRP outside the bandwidth. P1 is half of (100 % - (occupied percentage)) of P0. Measure 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.

8) Determine the lowest frequency, f1, for which the sum of all EIRP in the measurement cells from the beginning of the span to f1 exceeds P1.

9) Determine the highest frequency, f2, for which the sum of all EIRP in the measurement cells from the end of the span to f2 exceeds P1.

10) Compute the OTA occupied bandwidth as f2 - f1.

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

11) For *multi-band RIBs* and single band tests, repeat the steps 6) - 10) above per involved band where single band test configurations and test models shall apply with no carriers activated in the other band.

#### 6.7.2.5 Test requirement

##### 6.7.2.5.1 *IAB-DU type 1-O* and *IAB-DU type 2-O*

The OTA occupied bandwidth for each NR carrier shall be less than the *IAB-DU channel bandwidth*. For intra-band contiguous CA, the OTA occupied bandwidth shall be less than or equal to the *Aggregated IAB-DU Channel Bandwidth*.

##### 6.7.2.5.2 *IAB-MT type 1-O* and *IAB-MT type 2-O*

The OTA occupied bandwidth for each NR carrier shall be less than the *IAB-MT channel bandwidth*. For intra-band contiguous CA, the OTA occupied bandwidth shall be less than or equal to the *Aggregated IAB-MT Channel Bandwidth*.

### 6.7.3 OTA Adjacent Channel Leakage Power Ratio (ACLR)

#### 6.7.3.1 Definition and applicability

OTA Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the filtered mean power centred on the assigned channel frequency to the filtered mean power centred on an adjacent channel frequency. The measured power is TRP.

The requirement shall be applied per RIB during the *transmitter ON period*.

#### 6.7.3.2 Minimum requirement

The minimum requirement for *IAB-DU type 1-O* and *IAB-MT type 1-O* is in TS 38.174 [2], clause 9.7.3.2.

The minimum requirement for *IAB-DU type 2-O* and *Wide Area IAB-MT type 2-O* is in TS 38.174 [2], clause 9.7.3.3.

#### 6.7.3.3 Test purpose

To verify that the OTA adjacent channel leakage ratio requirement shall be met as specified by the minimum requirement.

#### 6.7.3.4 Method of test

##### 6.7.3.4.1 Initial conditions

Test environment: normal; see annex B.2.

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

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

- BRFBW and TRFBW in single-band operation, see clause 4.9.1;

- BRFBW\_T'RFBW and B'RFBW\_TRFBW in multi-band operation, see clause 4.9.1.

Directions to be tested: As the requirement is TRP the beam pattern(s) may be set up to optimise the TRP measurement procedure (see annex I) as long as the required TRP level is achieved.

##### 6.7.3.4.2 Procedure

The following procedure for measuring TRP is based on the directional power measurements as described in annex I. An alternative method to measure TRP is to use a characterized and calibrated reverberation chamber if so follow steps 1, 3, 4, 6, 8, 9, 10, 11, 12 and 13.

1) Place the IAB at the positioner.

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

3) The measurement devices characteristics shall be:

- measurement filter bandwidth: defined in clause 6.7.3.5.

- detection mode: true RMS voltage or true power averaging.

4) For single carrier operation, set the IAB to transmit according to the applicable test configuration in clause 4.8 using the corresponding test model(s) in clause 4.9.2 at manufacturers declared *rated carrier output power* (Prated,c,TRP).

For a IAB declared to be capable of multi-carrier and/or CA operation use the applicable test signal configuration and corresponding power setting specified in clauses 4.7.2 and 4.8 using the corresponding test model(s) in clause 4.9.2 on all carriers configured.

For an IAB node declared to be capable of Simultaneous transmission between IAB-DU and IAB-MT (D.XX), use the applicable test signal configuration and corresponding power setting in clauses 4.7.2 and 4.8 using the corresponding test model(s) in clause 4.9.2 for IAB-MT and IAB-DU.

5) Orient the positioner (and IAB) in order that the direction to be tested aligns with the test antenna such that measurements to determine TRP can be performed (see annex I).

6) Measure the absolute power of the assigned channel frequency and the (adjacent channel frequency).

7) Repeat step 5-6 for all directions in the appropriated TRP measurement grid needed for TRPEstimate (see annex I).

8) Calculate TRPEstimate for the absolute total radiated power of the wanted channel and the adjacent channel using the measurements made in Step 7.

9) Calculate relative ACLR estimate.

NOTE 1: ACLR is calculated by the ratio of the absolute TRP of the assigned channel frequency and the absolute TRP of the adjacent frequency channel.

NOTE 2: For FR1 the measurement uncertainty of the reverberation chamber for the relative ACLR is higher than the measurement uncertainty in clause 4.1.2 the test requirements in table 6.7.3.5.1-1 shall be tightened following the procedure in clause 4.1.3.

10) Measure OTA ACLR for the frequency offsets both side of channel frequency as specified in table 6.7.3.5.1-1 for *IAB type 1-O* or table 6.7.3.5.2-1for *IAB type 2-O* respectively. In multiple carrier case only offset frequencies below the lowest and above the highest carrier frequency used shall be measured.

11) For the OTA ACLR requirement applied inside sub-block gap for non-contiguous spectrum operation or inside *Inter RF Bandwidth gap* for multi-band operation:

a) Measure OTA ACLR inside sub-block gap or *Inter RF Bandwidth gap*, if applicable.

b) Measure OTA CACLR inside sub-block gap or *Inter RF Bandwidth gap*, if applicable.

12) Repeat the test with the channel set-up using IAB- FR1-TM1.2 defined in clause 4.9.2 in TS 38.176-1 [3] for *IAB type 1-O*.

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

13) For *IAB type 1-O* and *multi-band RIB* 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.

#### 6.7.3.5 Test requirements

##### 6.7.3.5.1 *IAB-DU type 1-O* and *IAB-MT type 1-O*

For the OTA ACLR requirement either the OTA ACLR limits in tables 6.7.3.5.1-1/3 or the OTA ACLR absolute limits in table 6.7.3.5.1-2 shall apply, whichever is less stringent. The OTA CACLR limits in table 6.7.3.5.1-4 or the OTA CACLR absolute limits in table 6.7.3.5.1-5 shall apply, whichever is less stringent.

The CACLR in a sub-block gap and Inter RF Bandwidth gap is the ratio of:

a) the sum of the filtered mean power centred on the assigned channel frequencies for the two carriers adjacent to each side of the sub-block gap or the Inter RF Bandwidth gap, and

b) the filtered mean power centred on a frequency channel adjacent to one of the respective sub-block edges or Base Station RF Bandwidth edges.

The assumed filter for the adjacent channel frequency is defined in table 6.7.3.5.1-4 and the filters on the assigned channels are defined in table 6.7.3.5.1-6.

For operation in paired and unpaired spectrum, the OTA ACLR measurement result shall not be less than the OTA ACLR limit specified in table 6.7.3.5.1-1.

Table 6.7.3.5.1-1: *IAB-DU* and *IAB-MT type 1-O* ACLR limit

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *IAB channel bandwidth* of lowest/highest NR carrier transmitted BWChannel (MHz) | IAB adjacent channel centre frequency offset below the lowest or above the highest carrier centre frequency transmitted | Assumed adjacent channel carrier (informative) | Filter on the adjacent channel frequency and corresponding filter bandwidth | OTA ACLR limit  (0 – 3 GHz) | OTA ACLR limit (3 – 6 GHz) |
| 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90,100 | BWChannel | NR of same BW (Note 2) | Square (BWConfig) | 44 dB | 43.8 dB |
|  | 2 x BWChannel | NR of same BW (Note 2) | Square (BWConfig) | 44 dB | 43.8 dB |
|  | BWChannel /2 + 2.5 MHz | 5 MHz E-UTRA | Square (4.5 MHz) | 44 dB (Note 3) | 43.8 dB (Note 3) |
|  | BWChannel /2 + 7.5 MHz | 5 MHz E-UTRA | Square (4.5 MHz) | 44 dB (Note 3) | 43.8 dB (Note 3) |
| NOTE 1: BWChannel and BWConfig are the *IAB channel bandwidth* and transmission bandwidth configuration of the lowest/highest NR carrier transmitted on the assigned channel frequency.  NOTE 2: With SCS that provides largest transmission bandwidth configuration (BWConfig).  NOTE 3: The requirements are applicable when the band is also defined for E-UTRA or UTRA. | | | | | |

The absolute total power measurement shall not exceed the OTA ACLR absolute limit specified in table 6.7.3.5.1-2.

Table 6.7.3.5.1-2: *IAB-DU* and *IAB-MT type 1-O* ACLR absolutelimit

|  |  |
| --- | --- |
| IAB category / IAB class | OTA ACLR absolute limit |
| Category A Wide Area IAB-DU and Category A Wide Area IAB-MT | -4 dBm/MHz |
| Category B Wide Area IAB-DU and Category B Wide Area IAB-MT | -6 dBm/MHz |
| Medium Range IAB-DU | -16 dBm/MHz |
| Local Area IAB-DU and  Local Area IAB-MT | -23 dBm/MHz |
| NOTE 1: The test requirement is derived from the basic limit a scaling factor of 9 dB and any applicable TT. | |

For operation in non-contiguous spectrum or multiple bands, the OTA ACLR measurement result shall not be less than the OTA ACLR limit specified in table 6.7.3.5.1-3.

Table 6.7.3.5.1-3: *IAB-DU* and *IAB-MT type 1-O* ACLR limit in non-contiguous spectrum or multiple bands

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *IAB-DU* and *IAB-MT channel bandwidth* of lowest/highest NR carrier transmitted BWChannel (MHz) | Sub-block or Inter RF Bandwidth gap size (Wgap) where the limit applies (MHz) | *IAB-DU* and *IAB-MT* adjacent channel centre frequency offset below or above the sub-block or Base Station RF Bandwidth edge (inside the gap) | Assumed adjacent channel carrier | Filter on the adjacent channel frequency and corresponding filter bandwidth | OTA ACLR limit  (0-3GHz) | OTA ACLR limit (3-6GHz) |
| 10, 15, 20 | Wgap ≥ 15 (Note 3)  Wgap ≥ 45 (Note 4) | 2.5 MHz | 5 MHz NR (Note 2) | Square (BWConfig) | 44 dB | 43.8 dB |
|  | Wgap ≥ 20 (Note 3)  Wgap ≥ 50 (Note 4) | 7.5 MHz | 5 MHz NR (Note 2) | Square (BWConfig) | 44 dB | 43.8 dB |
| 25, 30, 40, 50, 60, 70, 80, 90, 100 | Wgap ≥ 60 (Note 4)  Wgap ≥ 30 (Note 3) | 10 MHz | 20 MHz NR (Note 2) | Square (BWConfig) | 44 dB | 43.8 dB |
|  | Wgap ≥ 80 (Note 4)  Wgap ≥ 50 (Note 3) | 30 MHz | 20 MHz NR (Note 2) | Square (BWConfig) | 44 dB | 43.8 dB |
| NOTE 1: BWConfig is the transmission bandwidth configuration of the assumed adjacent channel carrier.  NOTE 2: With SCS that provides largest transmission bandwidth configuration (BWConfig).  NOTE 3: Applicable in case the *IAB channel bandwidth* of the NR carrier transmitted at the other edge of the gap is 10, 15, 20 MHz.  NOTE 4: Applicable in case the *IAB channel bandwidth* of the NR carrier transmitted at the other edge of the gap is 25, 30, 40, 50, 60, 70, 80, 90, 100 MHz. | | | | | | |

The OTA CACLR measurement result shall not less than the OTA CACLR limit specified in table 6.7.3.5.1-4.

Table 6.7.3.5.1-4: *IAB-DU* and *IAB-MT type 1-O* CACLR limit

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *IAB-DU* and *IAB-MT channel bandwidth* of lowest/highest NR carrier transmitted BWChannel (MHz) | Sub-block or Inter RF Bandwidth gap size (Wgap) where the limit applies (MHz) | *IAB-DU* and *IAB-MT* adjacent channel centre frequency offset below or above the sub-block or Base Station RF Bandwidth edge (inside the gap) | Assumed adjacent channel carrier | Filter on the adjacent channel frequency and corresponding filter bandwidth | OTA CACLR limit  (0-3 GHz) | OTA CACLR limit (3-6 GHz) |
| 10, 15, 20 | 5 ≤ Wgap < 15 (Note 3)  5 ≤ Wgap < 45 (Note 4) | 2.5 MHz | 5 MHz NR (Note 2) | Square (BWConfig) | 44 dB | 43.8 dB |
|  | 10 < Wgap < 20 (Note 3)  10 ≤ Wgap < 50 (Note 4) | 7.5 MHz | 5 MHz NR (Note 2) | Square (BWConfig) | 44 dB | 43.8 dB |
| 25, 30, 40, 50, 60, 70, 80,90, 100 | 20 ≤ Wgap < 60 (Note 4)  20 ≤ Wgap < 30 (Note 3) | 10 MHz | 20 MHz NR (Note 2) | Square (BWConfig) | 44 dB | 43.8 dB |
|  | 40 < Wgap < 80 (Note 4)  40 ≤ Wgap < 50 (Note 3) | 30 MHz | 20 MHz NR (Note 2) | Square (BWConfig) | 44 dB | 43.8 dB |
| NOTE 1: BWConfig is the transmission bandwidth configuration of the assumed adjacent channel carrier.  NOTE 2: With SCS that provides largest transmission bandwidth configuration (BWConfig).  NOTE 3: Applicable in case the *IAB channel bandwidth* of the NR carrier transmitted at the other edge of the gap is 10, 15, 20 MHz.  NOTE 4: Applicable in case the *IAB channel bandwidth* of the NR carrier transmitted at the other edge of the gap is 25, 30, 40, 50, 60, 70, 80, 90, 100 MHz. | | | | | | |

The absolute total power measurement shall not exceed the OTA CACLR absolute limit specified in table 6.7.3.5.1-5.

Table 6.7.3.5.1-5: *IAB-DU* and *IAB-MT type 1-O* CACLR absolutelimit

|  |  |
| --- | --- |
| IAB category / IAB class | OTA CACLR absolutelimit |
| Category A Wide Area IAB-DU and Category A Wide Area IAB-MT | -4 dBm/MHz |
| Category B Wide Area IAB-DU and Category B Wide Area IAB-MT | -6 dBm/MHz |
| Medium Range IAB-DU | -16 dBm/MHz |
| Local Area IAB-DU and  Local Area IAB-MT | -23 dBm/MHz |
| NOTE 1: The test requirement is derived from the basic limit a scaling factor of 9 dB and any applicable TT. | |

Table 6.7.3.5.1-6: Filter parameters for the assigned channel

|  |  |
| --- | --- |
| RAT of the carrier adjacent to the sub-block or Inter RF Bandwidth gap | Filter on the assigned channel frequency and corresponding filter bandwidth |
| NR | NR of same BW with SCS that provides largest transmission bandwidth configuration |

##### 6.7.3.5.2 *IAB-DU type 2-O* and *Wide Area IAB-MT type 2-O*

The OTA ACLR absolute limit in table 6.7.3.5.2-2 or the OTA ACLR limit in table 6.7.3.5.2-1/3, whichever is less stringent, shall apply. The OTA CACLR absolute limit in table 6.7.3.5.2-5 or the OTA CACLR limit in table 6.7.3.5.2-4, whichever is less stringent, shall apply.

For a *RIB* operating in multi-carrier or contiguous CA, the OTA ACLR requirements in table 6.7.3.5.2-1 shall apply to *IAB-DU* and *IAB-MT channel bandwidths* of the outermost carrier for the frequency ranges defined in the table. For a RIB operating in *non-contiguous spectrum*, the OTA ACLR requirement in table 6.7.3.5.2-3 shall apply in *sub-block gaps* for the frequency ranges defined in the table, while the OTA CACLR requirement in table 6.7.3.5.2-4 shall apply in *sub-block gaps* for the frequency ranges defined in the table.

The CACLR in a *sub-block gap* is the ratio of:

a) the sum of the filtered mean power centred on the assigned channel frequencies for the two carriers adjacent to each side of the *sub-block gap*, and

b) the filtered mean power centred on a frequency channel adjacent to one of the respective *sub-block* edges.

The assumed filter for the adjacent channel frequency is defined in table 6.7.3.5.2-4 and the filters on the assigned channels are defined in table 6.7.3.5.2-6.

For operation in *non-contiguous spectrum*, the CACLR for NR carriers located on either side of the *sub-block gap* shall be higher than the value specified in table 6.7.3.5.2-4.

Table 6.7.3.5.2-1: *IAB-DU type 2-O* and Wide area *IAB-MT type 2-O* ACLR limit

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IAB-DU and IAB-MT channel bandwidth of lowest/highest carrier transmitted  BWChannel (MHz) | IAB-DU and IAB-MT adjacent channel centre frequency offset below the lowest or above the highest carrier centre frequency transmitted | Assumed adjacent channel carrier | Filter on the adjacent channel frequency and corresponding filter bandwidth | ACLR limit  (dB) |
| 50, 100, 200, 400 | BWChannel | NR of same BW (Note 2) | Square (BWConfig) | 25.7 for IAB-DU (Note 3)  23.4 for IAB-DU (Note 4)  25.2 for IAB-MT (Note 3)  23.1 for IAB-MT (Note 4) |
| NOTE 1: BWChannel and BWConfig are the *IAB-DU* and *IAB-MT channel bandwidth* and *transmission bandwidth configuration* of the *lowest/highest carrier* transmitted on the assigned channel frequency.  NOTE 2: With SCS that provides largest *transmission bandwidth configuration* (BWConfig).  NOTE 3: Applicable to bands defined within the frequency spectrum range of 24.25 – 33.4 GHz  NOTE 4: Applicable to bands defined within the frequency spectrum range of 37 – 52.6 GHz | | | | |

Table 6.7.3.5.2-2: *IAB-DU type 2-O* and Wide area I*AB-MT type 2-O* ACLR absolute limit

|  |  |
| --- | --- |
| **IAB-DU and IAB-MT class** | **ACLR absolute limit** |
| Wide area IAB-DU | -10.3 dBm/MHz |
| Wide Area IAB-MT | -10.1 dBm/MHz (Note 1)  -10.0 dBm/MHz (Note 2) |
| Medium range IAB-DU | -17.3 dBm/MHz |
| Local area IAB-DU | -17.3 dBm/MHz |
| NOTE 1: Applicable to bands defined within the frequency spectrum range of 24.25 – 33.4 GHz  NOTE 2: Applicable to bands defined within the frequency spectrum range of 37 – 52.6 GHz | |

Table 6.7.3.5.2-3: *IAB DU type 2-O* and Wide Area *IAB-MT type 2-O* ACLR limit in non-contiguous spectrum

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IAB-DU and IAB-MT channel bandwidth of lowest/highest carrier transmitted (MHz) | Sub-block gap size (Wgap) where the limit applies (MHz) | IAB-DU and IAB-MT adjacent channel centre frequency offset below or above the sub-block edge (inside the gap) | Assumed adjacent channel carrier | Filter on the adjacent channel frequency and corresponding filter bandwidth | ACLR limit  (dB) |
| 50, 100 | Wgap≥ 100 (Note 5)  Wgap≥ 250 (Note 6) | 25 MHz | 50 MHz NR (Note 2) | Square (BWConfig) | 25.7 for IAB-DU (Note 3)  23.4 for IAB-DU (Note 4)  25.2 for IAB-MT (Note 3)  23.1 for IAB-MT (Note 4) |
| 200, 400 | Wgap≥ 400 (Note 6)  Wgap≥ 250 (Note 5) | 100 MHz | 200 MHz NR (Note 2) | Square (BWConfig) | 25.7 for IAB-DU (Note 3)  23.4 for IAB-DU (Note 4)  25.2 for IAB-MT (Note 3)  23.1 for IAB-MT (Note 4) |
| NOTE 1: BWConfig is the *transmission bandwidth configuration* of the assumed adjacent channel carrier.  NOTE 2: With SCS that provides largest *transmission bandwidth configuration* (BWConfig).  NOTE 3: Applicable to bands defined within the frequency spectrum range of 24.25 – 33.4 GHz.  NOTE 4: Applicable to bands defined within the frequency spectrum range of 37 – 52.6 GHz.  NOTE 5: Applicable in case the *IAB-DU or IAB-MT channel bandwidth* of the NR carrier transmitted at the other edge of the gap is 50 or 100 MHz.  NOTE 6: Applicable in case the *IAB-DU or IAB-MT channel bandwidth* of the NR carrier transmitted at the other edge of the gap is 200 or 400 MHz. | | | | | |

Table 6.7.3.5.2-4: *IAB DU type 2-O* and Wide Area *IAB-MT type 2-O* CACLR limit in non-contiguous spectrum

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IAB-DU and IAB-MT channel bandwidth of lowest/highest carrier transmitted (MHz) | Sub-block gap size (Wgap) where the limit applies (MHz) | IAB-DU and IAB-MT adjacent channel centre frequency offset below or above the sub-block edge (inside the gap) | Assumed adjacent channel carrier | Filter on the adjacent channel frequency and corresponding filter bandwidth | CACLR limit  (dB) |
| 50, 100 | 50 ≤Wgap< 100 (Note 5)  50 ≤Wgap< 250 (Note 6) | 25 MHz | 50 MHz NR (Note 2) | Square (BWConfig) | 25.7 for IAB-DU (Note 3)  23.4 for IAB-DU (Note 4)  25.2 for IAB-MT (Note 3)  23.1 for IAB-MT (Note 4) |
| 200, 400 | 200 ≤Wgap< 400 (Note 6)  200 ≤Wgap< 250 (Note 5) | 100 MHz | 200 MHz NR (Note 2) | Square (BWConfig) | 25.7 for IAB-DU (Note 3)  23.4 for IAB-DU (Note 4)  25.2 for IAB-MT (Note 3)  23.1 for IAB-MT (Note 4) |
| NOTE 1: BWConfig is the transmission bandwidth configuration of the assumed adjacent channel carrier.  NOTE 2: With SCS that provides largest transmission bandwidth configuration (BWConfig).  NOTE 3: Applicable to bands defined within the frequency spectrum range of 24.25 – 33.4 GHz.  NOTE 4: Applicable to bands defined within the frequency spectrum range of 37 – 52.6 GHz.  NOTE 5: Applicable in case the *IAB-DU* or *IAB-MT channel bandwidth* of the NR carrier transmitted at the other edge of the gap is 50 or 100 MHz.  NOTE 6: Applicable in case the *IAB-DU* or *IAB-MT channel bandwidth* of the NR carrier transmitted at the other edge of the gap is 200 or 400 MHz. | | | | | | |

Table 6.7.3.5.2-5: *IAB-DU type 2-O* and Wide area *IAB-MT type 2-O* CACLR absolute limit

|  |  |
| --- | --- |
| IAB-DU and IAB-MT class | CACLR absolute limit |
| Wide area IAB-DU | -10.3 dBm/MHz |
| Wide area IAB-MT | -10.1 dBm/MHz (Note 1)  -10.0 dBm/MHz (Note 2) |
| Medium range IAB-DU | -17.3 dBm/MHz |
| Local area IAB-DU | -17.3 dBm/MHz |
| NOTE 1: Applicable to bands defined within the frequency spectrum range of 24.25 – 33.4 GHz  NOTE 2: Applicable to bands defined within the frequency spectrum range of 37 – 52.6 GHz | |

Table 6.7.3.5.2-6: Filter parameters for the assigned channel

|  |  |
| --- | --- |
| **RAT of the carrier adjacent to the *sub-block gap*** | **Filter on the assigned channel frequency and corresponding filter bandwidth** |
| NR | NR of same BW with SCS that provides largest *transmission bandwidth configuration* |

##### 6.7.3.5.3 *Local Area IAB-MT type 2-O*

The OTA ACLR absolute limit in table 6.7.3.5.3-2 or the ACLR limit in table 6.7.3.5.3-1/3, whichever is less stringent, shall apply. The OTA CACLR absolute limit in table 6.7.3.5.3-5 or the CACLR limit in table 6.7.3.5.3-4, whichever is less stringent, shall apply.

Requirements specified for Local Area *IAB-DU type 2-O* in clause 6.7.3.5.3 shall apply to Local Area *IAB-MT type 2-O* during transmission in DL timeslot.

For a *RIB* operating in multi-carrier or contiguous CA, the OTA ACLR requirements in table 6.7.3.5.3-1 shall apply to *IAB-MT channel bandwidths* of the outermost carrier for the frequency ranges defined in the table. For a RIB operating in *non-contiguous spectrum*, the OTA ACLR requirement in table 6.7.3.5.3-3 shall apply in *sub-block gaps* for the frequency ranges defined in the table, while the OTA CACLR requirement in table 6.7.3.5.3-4 shall apply in *sub-block gaps* for the frequency ranges defined in the table.

The CACLR in a *sub-block gap* is the ratio of:

a) the sum of the filtered mean power centred on the assigned channel frequencies for the two carriers adjacent to each side of the *sub-block gap*, and

b) the filtered mean power centred on a frequency channel adjacent to one of the respective *sub-block* edges.

The assumed filter for the adjacent channel frequency is defined in table 6.7.3.5.3-4 and the filters on the assigned channels are defined in table 6.7.3.5.3-6.

For operation in *non-contiguous spectrum*, the CACLR for NR carriers located on either side of the *sub-block gap* shall be higher than the value specified in table 6.7.3.5.3-4.

Table 6.7.3.3.5-1: Local Area *IAB-MT type 2-O* ACLR limit

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IAB-MT channel bandwidth of lowest/highest carrier transmitted  BWChannel (MHz) | IAB-MT adjacent channel centre frequency offset below the lowest or above the highest carrier centre frequency transmitted | Assumed adjacent channel carrier | Filter on the adjacent channel frequency and corresponding filter bandwidth | ACLR limit  (dB) |
| 50, 100, 200, 400 | BWChannel | NR of same BW (Note 2) | Square (BWConfig) | 21.2 (Note 3)  21.1 (Note 4) |
| NOTE 1: BWChannel and BWConfig are the *IAB-MT channel bandwidth* and *transmission bandwidth configuration* of the *lowest/highest carrier* transmitted on the assigned channel frequency.  NOTE 2: With SCS that provides largest *transmission bandwidth configuration* (BWConfig).  NOTE 3: Applicable to bands defined within the frequency spectrum range of 24.25 – 33.4 GHz  NOTE 4: Applicable to bands defined within the frequency spectrum range of 37 – 52.6 GHz | | | | |

Table 6.7.3.5.3-2: Local Area *IAB-MT type 2-O* ACLR absolute limit

|  |  |
| --- | --- |
| IAB-MT class | ACLR absolute limit |
| Local area IAB-MT | -17.1 dBm/MHz (Note 1)  -17.0 dBm/MHz (Note 2) |
| NOTE 1: Applicable to bands defined within the frequency spectrum range of 24.25 – 33.4 GHz  NOTE 2: Applicable to bands defined within the frequency spectrum range of 37 – 52.6 GHz | |

Table 6.7.3.5.3-3: Local Area *IAB-MT type 2-O* ACLR limit in non-contiguous spectrum

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IAB-MT channel bandwidth of lowest/highest carrier transmitted (MHz) | Sub-block gap size (Wgap) where the limit applies (MHz) | IAB-MT adjacent channel centre frequency offset below or above the sub-block edge (inside the gap) | Assumed adjacent channel carrier | Filter on the adjacent channel frequency and corresponding filter bandwidth | ACLR limit |
| 50, 100 | Wgap≥ 100 (Note 4)  Wgap≥ 250 (Note 5) | 25 MHz | 50 MHz NR (Note 2) | Square (BWConfig) | 21.2 (Note 3)  21.1 (Note 6) |
| 200, 400 | Wgap≥ 400 (Note 5)  Wgap≥ 250 (Note 4) | 100 MHz | 200 MHz NR (Note 2) | Square (BWConfig) | 21.2 (Note 3)  21.1 (Note 6) |
| NOTE 1: BWConfig is the *transmission bandwidth configuration* of the assumed adjacent channel carrier.  NOTE 2: With SCS that provides largest *transmission bandwidth configuration* (BWConfig).  NOTE 3: Applicable to bands defined within the frequency spectrum range of 24.25 – 33.4 GHz.  NOTE 4: Applicable in case the *IAB-MT channel bandwidth* of the NR carrier transmitted at the other edge of the gap is 50 or 100 MHz.  NOTE 5: Applicable in case the *IAB-MT channel bandwidth* of the NR carrier transmitted at the other edge of the gap is 200 or 400 MHz.  NOTE 6: Applicable to bands defined within the frequency spectrum range of 37 – 52.6 GHz. | | | | | |

Table 6.7.3.5.3-4: Local Area *IAB-MT type 2-O* CACLR limit in non-contiguous spectrum

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IAB-MT channel bandwidth of lowest/highest carrier transmitted (MHz) | Sub-block gap size (Wgap) where the limit applies (MHz) | IAB-MT adjacent channel centre frequency offset below or above the sub-block edge (inside the gap) | Assumed adjacent channel carrier | Filter on the adjacent channel frequency and corresponding filter bandwidth | CACLR limit |
| 50, 100 | 50 ≤Wgap< 100 (Note 4)  50 ≤Wgap< 250 (Note 5) | 25 MHz | 50 MHz NR (Note 2) | Square (BWConfig) | 21.2 (Note 3)  21.1 (Note 6) |
| 200, 400 | 200 ≤Wgap< 400 (Note 5)  200 ≤Wgap< 250 (Note 4) | 100 MHz | 200 MHz NR (Note 2) | Square (BWConfig) | 21.2 (Note 3)  21.1 (Note 6) |
| NOTE 1: BWConfig is the transmission bandwidth configuration of the assumed adjacent channel carrier.  NOTE 2: With SCS that provides largest transmission bandwidth configuration (BWConfig).  NOTE 3: Applicable to bands defined within the frequency spectrum range of 24.25 – 33.4 GHz.  NOTE 4: Applicable in case the *IAB-MT channel bandwidth* of the NR carrier transmitted at the other edge of the gap is 50 or 100 MHz.  NOTE 5: Applicable in case the *IAB-MT channel bandwidth* of the NR carrier transmitted at the other edge of the gap is 200 or 400 MHz. | | | | | | |

Table 6.7.3.5.3-5: Local Area *IAB-MT type 2-O* CACLR absolute limit

|  |  |
| --- | --- |
| IAB-MT class | CACLR absolute limit |
| Local area IAB-MT | -17.1 dBm/MHz (Note 1)  -17.0 dBm/MHz (Note 2) |
| NOTE 1: Applicable to bands defined within the frequency spectrum range of 24.25 – 33.4 GHz  NOTE 2: Applicable to bands defined within the frequency spectrum range of 37 – 52.6 GHz | |

Table 6.7.3.5.3-6: Filter parameters for the assigned channel

|  |  |
| --- | --- |
| **RAT of the carrier adjacent to the *sub-block gap*** | **Filter on the assigned channel frequency and corresponding filter bandwidth** |
| NR | NR of same BW with SCS that provides largest *transmission bandwidth configuration* |

### 6.7.4 OTA operating band unwanted emissions

#### 6.7.4.1 Definition and applicability

The OTA limits for operating band unwanted emissions are specified as TRP per RIB, unless otherwise stated.

##### 6.7.4.1.1 *IAB-DU type 1-O*

For *IAB-DU type 1-O*, for a *RIB* operating in multi-carrier or contiguous CA, the requirements apply to *IAB-DU channel bandwidths* of the outermost carrier. In addition, for a *RIB* operating in non-contiguous spectrum, the requirements shall apply inside any sub-block gap. In addition, for a *multi-band RIB*, the requirements shall apply inside any Inter RF Bandwidth gap.

##### 6.7.4.1.2 *IAB-MT type 1-O*

For *IAB-MT type 1-O*, for a *RIB* operating in multi-carrier or contiguous CA, the requirements apply to *IAB-MT channel bandwidths* of the outermost carrier. In addition, for a *RIB* operating in non-contiguous spectrum, the requirements shall apply inside any sub-block gap. In addition, for a *multi-band RIB*, the requirements shall apply inside any Inter RF Bandwidth gap.

##### 6.7.4.1. 3 *IAB-DU type 2-O* and *IAB-MT type 2-O*

For *IAB-DU type 2-O* and *IAB-MT type 2-O*, for a *RIB* operating in multi-carrier or contiguous CA, the requirements apply to the frequencies (ΔfOBUE) starting from the edge of the *contiguous transmission bandwidth.* In addition, for a *RIB* operating in non-contiguous spectrum, the requirements apply inside any sub-block gap.

#### 6.7.4.2 Minimum requirement

The minimum requirement for *IAB-DU type 1-O* is defined in TS 38.174 [2], clause 9.7.4.2.

The minimum requirement for IA*B-MT type 1-O* is defined in TS 38.174 [2], clause 9.7.4.3.

The minimum requirement for IA*B-DU type 2-O* and IA*B-MT type 2-O* are defined in TS 38.174 [2], clause 9.7.4.5.

#### 6.7.4.3 Test purpose

This test measures the emissions of the IAB-Node, close to the assigned channel bandwidth of the wanted signal, while the IAB-Node is in operation.

#### 6.7.4.4 Method of test

##### 6.7.4.4.1 Initial conditions

Test environment: normal; see annex B.2.

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 in single-band operation, see clause 4.9.1;

- BRFBW\_T'RFBW and B'RFBW\_TRFBW in multi-band operation, see clause 4.9.1.

Directions to be tested: As the requirement is TRP the beam pattern(s) may be set up to optimise the TRP measurement procedure (see annex I) as long as the required TRP level is achieved.

##### 6.7.4.4.2 Procedure

The following procedure for measuring TRP is based on the directional power measurements as described in annex I. An alternative method to measure TRP is to use a characterized and calibrated reverberation chamber if so follow steps 1, 3, 4, 6 and 9.

1) Place the IAB-Node at the positioner.

2) Align the manufacturer declared coordinate system orientation (D.2) of the IAB-Node with the test system.

3) The measurement devices characteristics shall be:

- measurement filter bandwidth: defined in clause 6.7.4.5.

- detection mode: true RMS voltage or true power averaging.

4) For single carrier operation, set the IAB-Node to transmit according to the applicable test configuration in clause 4.8 using the corresponding test model(s) in clause 4.9.2 at manufacturers declared *rated carrier output power* (Prated,c,TRP).

For a IAB declared to be capable of multi-carrier and/or CA operation, use the applicable test signal configuration and corresponding power setting specified in clause 4.7.2 and 4.8 using the corresponding test model(s) in clause 4.9.2 on all carriers configured.

For an IAB node declared to be capable of Simultaneous transmission between IAB-DU and IAB-MT (D.XX), use the applicable test signal configuration and corresponding power setting in clauses 4.7.2 and 4.8 using the corresponding test model(s) in clause 4.9.2 for IAB-DU and IAB-MT.

5) Orient the positioner (and IAB) in order that the direction to be tested aligns with the test antenna such that measurements to determine TRP can be performed (see annex I).

6) Sweep the centre frequency of the measurement filter in contiguous steps and measure emission power within the specified frequency ranges with the specified measurement bandwidth.

7) Repeat step 5-6 for all directions in the appropriated TRP measurement grid needed for TRPEstimate (see annex I).

8) Calculate TRPEstimate using the measurements made in step 6.

9) For *IAB type 1-O* and *multi-band RIB* 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.

#### 6.7.4.5 Test requirements

##### 6.7.4.5.1 *IAB* *type 1-O*

The emission measurement result shall not exceed the maximum levels specified in tables 6.7.4.5.1.1-1 to 6.7.4.5.1.5-3, where:

- Δf is the separation between the channel edge frequency and the nominal -3dB point of the measuring filter closest to the carrier frequency.

- f\_offset is the separation between the channel edge frequency and the centre of the measuring filter.

- f\_offsetmax is the offset to the frequency ΔfOBUE MHz outside the downlink operating band.

- Δfmax is equal to f\_offsetmax minus half of the bandwidth of the measuring filter.

For a *multi-band RIB* inside any *Inter RF Bandwidth gaps* with Wgap < 2\*ΔfOBUE, emissions shall not exceed the cumulative sum of the test requirements specified at the *IAB RF Bandwidth edges* on each side of the *Inter RF Bandwidth gap*. The test requirement for *IAB RF Bandwidth edge* is specified in the tables 6.7.4.5.1.1-1 to 6.7.4.5.1.5-3 below, where in this case:

- Δf is the separation between the *IAB RF Bandwidth edge* frequency and the nominal -3 dB point of the measuring filter closest to the *IAB RF Bandwidth edge*.

- f\_offset is the separation between the *IAB RF Bandwidth edge* frequency and the centre of the measuring filter.

- f\_offsetmax is equal to the *Inter RF Bandwidth gap* minus half of the bandwidth of the measuring filter.

- Δfmax is equal to f\_offsetmax minus half of the bandwidth of the measuring filter.

For a *multi-band RIB*, the operating band unwanted emission limits apply also in a supported operating band without any carrier transmitted, in the case where there are carrier(s) transmitted in another supported operating band. In this case, no cumulative limit is applied in the *inter-band gap* between a supported downlink operating band with carrier(s) transmitted and a supported downlink operating band without any carrier transmitted and

- In case the *inter-band gap* between a supported downlink operating band with carrier(s) transmitted and a supported downlink operating band without any carrier transmitted is less than 2\*ΔfOBUE, f\_offsetmax shall be the offset to the frequency ΔfOBUE MHz outside the outermost edges of the two supported downlink operating bands and the operating band unwanted emission limit of the band where there are carriers transmitted, as defined in the tables of the present clause, shall apply across both downlink bands.

- In other cases, the operating band unwanted emission limit of the band where there are carriers transmitted, as defined in the tables of the present clause for the largest frequency offset (Δfmax), shall apply from ΔfOBUE MHz below the lowest frequency, up to ΔfOBUE MHz above the highest frequency of the supported downlink operating band without any carrier transmitted.

For a multicarrier *single-band RIB* or a *single-band RIB* configured for intra-band contiguous or non-contiguous carrier aggregation the definitions above apply to the lower edge of the carrier transmitted at the lowest carrier frequency and the upper edge of the carrier transmitted at the highest carrier frequency within a specified frequency band.

In addition inside any sub-block gap for a *single-band RIB* operating in non-contiguous spectrum, emissions shall not exceed the cumulative sum of the test requirements specified for the adjacent sub blocks on each side of the sub block gap. The test requirement for each sub block is specified in the tables 6.7.4.5.1.1-1 to 6.7.4.5.1.5-3 below, where in this case:

- Δf is the separation between the sub block edge frequency and the nominal -3 dB point of the measuring filter closest to the sub block edge.

- f\_offset is the separation between the sub block edge frequency and the centre of the measuring filter.

- f\_offsetmax is equal to the sub block gap bandwidth minus half of the bandwidth of the measuring filter.

- Δfmax is equal to f\_offsetmax minus half of the bandwidth of the measuring filter.

6.7.4.5.1.1 Wide Area IAB-DU and Wide Area IAB-MT (Category A)

For operating in Bands n41, n77, n78, n79, emissions shall not exceed the maximum levels specified in tables 6.7.4.5.1.1-1 to 6.7.4.5.1.1-3:

Table 6.7.4.5.1.1-1: Wide Area IAB-DU and Wide Area IAB-MT *operating band* unwanted emission limits   
(1 GHz < NR bands ≤ 3 GHz) for Category A

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Test requirement (Note 1, 2, 4)** | **Measurement bandwidth** |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz | 3.8 dBm - 7/5(f\_offset/MHz - 0.05) dB | 100 kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset <  min(10.05 MHz, f\_offsetmax) | -3.2 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -4 dBm (Note 3) | 100 kHz |
| NOTE 1: For a IAB supporting non-contiguous spectrum operation within any *operating band*, the emission limits within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the sub-block gap, where the emission limits within sub-block gaps shall be -4 dBm/100 kHz.  NOTE 2: For a *multi-band RIB* with Inter RF Bandwidth gap < 2\*ΔfOBUE the emission limits within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap.  NOTE 3: The requirement is not applicable when Δfmax < 10 MHz.  NOTE 4: The test requirement is derived from the basic limit a scaling factor of 9 dB and any applicable TT. | | | |

Table 6.7.4.5.1.1-2: Wide Area IAB-DU and Wide Area IAB-MT *operating band* unwanted emission limits   
(3 GHz < NR bands ≤ 4.2 GHz) for Category A

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Test requirement (Note 1, 2, 4)** | **Measurement bandwidth** |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz | 4 dBm-7/5(f\_offset/MHz-0.05)dB | 100 kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset <  min(10.05 MHz, f\_offsetmax) | -3 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.5 MHz ≤ f\_offset < f\_offsetmax | -4 dBm (Note 3) | 1MHz |
| NOTE 1: For a IAB supporting non-contiguous spectrum operation within any *operating band*, the emission limits within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the sub-block gap, where the emission limits within sub-block gaps shall be ‑4 dBm/1 MHz.  NOTE 2: For a *multi-band RIB* with Inter RF Bandwidth gap < 2\*ΔfOBUE the emission limits within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or RF Bandwidth.  NOTE 3: The requirement is not applicable when Δfmax < 10 MHz.  NOTE 4: The test requirement is derived from the basic limit a scaling factor of 9 dB and any applicable TT. | | | |

Table 6.7.4.5.1.1-3: Wide Area IAB-DU and Wide Area IAB-MT *operating band* unwanted emission limits   
(4.2 GHz < NR bands ≤ 6 GHz) for Category A

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Test requirement (Note 1, 2, 4)** | **Measurement bandwidth** |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz | 4 dBm-7/5(f\_offset/MHz-0.05)dB | 100 kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset <  min(10.05 MHz, f\_offsetmax) | -3 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.5 MHz ≤ f\_offset < f\_offsetmax | -4 dBm (Note 3) | 1MHz |
| NOTE 1: For a IAB supporting non-contiguous spectrum operation within any *operating band*, the emission limits within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the sub-block gap, where the emission limits within sub-block gaps shall be ‑4 dBm/1 MHz.  NOTE 2: For a *multi-band RIB* with Inter RF Bandwidth gap < 2\*ΔfOBUE the emission limits within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or RF Bandwidth.  NOTE 3: The requirement is not applicable when Δfmax < 10 MHz.  NOTE 4: The test requirement is derived from the basic limit a scaling factor of 9 dB and any applicable TT.  NOTE 5: Void | | | |

6.7.4.5.1.2 Wide Area IAB-DU and Wide Area IAB-MT (Category B)

For IAB-DU and IAB-MT operating in Bands n41, n77, n78, n79 for Category B emissions shall not exceed the maximum levels specified in tables 6.7.4.5.1.2-1 to 6.7.4.5.1.2-3:

Table 6.7.4.5.1.2-1: Wide Area IAB-DU and IAB-MT operating band unwanted emission limits   
(1 GHz < NR bands ≤ 3 GHz) for Category B

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Test requirement (Note 1, 2, 4)** | **Measurement bandwidth** |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz | 3.8 dBm-7/5(f\_offset/MHz-0.05)dB | 100 kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset <  min(10.05 MHz, f\_offsetmax) | -3.2 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.5 MHz ≤ f\_offset < f\_offsetmax | -6 dBm (3) | 1MHz |
| NOTE 1: For a IAB supporting non-contiguous spectrum operation within any *operating band*, the emission limits within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the sub-block gap, where the emission limits within sub-block gaps shall be ‑6 dBm/1 MHz.  NOTE 2: For a *multi-band RIB* with Inter RF Bandwidth gap < 2\*ΔfOBUE the emission limits within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or RF Bandwidth.  NOTE 3: The requirement is not applicable when Δfmax < 10 MHz.  NOTE 4: The test requirement is derived from the basic limit a scaling factor of 9 dB and any applicable TT. | | | |

Table 6.7.4.5.1.2-2: Wide Area IAB-DU and IAB-MT operating band unwanted emission limits   
(1 GHz < NR bands ≤ 3 GHz) for Category B

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Test requirement (Note 1, 2, 4)** | **Measurement bandwidth** |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz | 4 dBm-7/5(f\_offset/MHz-0.05)dB | 100 kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset <  min(10.05 MHz, f\_offsetmax) | -3 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.5 MHz ≤ f\_offset < f\_offsetmax | -6 dBm (Note 3) | 1MHz |
| NOTE 1: For a IAB supporting non-contiguous spectrum operation within any *operating band*, the emission limits within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the sub-block gap, where the emission limits within sub-block gaps shall be ‑6 dBm/1 MHz.  NOTE 2: For a *multi-band RIB* with Inter RF Bandwidth gap < 2\*ΔfOBUE the emission limits within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or RF Bandwidth.  NOTE 3: The requirement is not applicable when Δfmax < 10 MHz.  NOTE 4: The test requirement is derived from the basic limit a scaling factor of 9 dB and any applicable TT. | | | |

Table 6.7.4.5.1.2-2: Wide Area IAB-DU and IAB-MT operating band unwanted emission limits   
(4.2 GHz < NR bands ≤ 6 GHz) for Category B

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Test requirement (Note 1, 2, 4)** | **Measurement bandwidth** |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz | 4 dBm-7/5(f\_offset/MHz-0.05)dB | 100 kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset <  min(10.05 MHz, f\_offsetmax) | -3 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.5 MHz ≤ f\_offset < f\_offsetmax | -6 dBm (Note 3) | 1MHz |
| NOTE 1: For a IAB supporting non-contiguous spectrum operation within any *operating band*, the emission limits within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the sub-block gap, where the emission limits within sub-block gaps shall be ‑6 dBm/1 MHz.  NOTE 2: For a *multi-band RIB* with Inter RF Bandwidth gap < 2\*ΔfOBUE the emission limits within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or RF Bandwidth.  NOTE 3: The requirement is not applicable when Δfmax < 10 MHz.  NOTE 4: The test requirement is derived from the basic limit a scaling factor of 9 dB and any applicable TT. | | | |

##### 6.7.4.6.1 Medium Range IAB-DU (Category A and B)

For Medium Range IAB-DU in NR bands ≤ 3 GHz, emissions shall not exceed the maximum levels specified in tables 6.7.4.6.1-1 and 6.7.4.6.1-4.

For Medium Range IAB-DU in 3GHz <NR bands ≤ 4.2 GHz, emissions shall not exceed the maximum levels specified in tables 6.7.4.6.1-2 and 6.7.4.6.1-5.

For Medium Range IAB-DU in 4.2GHz <NR bands ≤ 6 GHz, emissions shall not exceed the maximum levels specified in tables 6.7.4.6.1-3 and 6.7.4.6.1-6.

For the tables in this clause for *IAB-DU type 1-H* and *IAB-DU type 1-O* Prated,x = Prated,c,cell – 10\*log10(NTXU,countedpercell),

Table 6.7.4.6.1-1: Medium Range IAB-DU *operating band* unwanted emission limits, 31< Prated,x ≤ 38 dBm (NR bands ≤ 3 GHz)

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Test requirement (Note 1, 2, 4) | Measurement bandwidth |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | – 58.2 dB | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | Min(Prated,c,TRP - 60 dB, -16 dBm)  (Note 3) | 100 kHz |
| NOTE 1: For a IAB supporting non-contiguous spectrum operation within any *operating band* the emission limits within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the sub-block gap, where the emission limits within sub-block gaps shall be Min(Prated,c,TRP – 60 dB, ‑16 dBm)/100kHz.  NOTE 2: For a *multi-band RIB* with Inter RF Bandwidth gap < 2\*ΔfOBUE the emission limits within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap.  NOTE 3: The requirement is not applicable when Δfmax < 10 MHz.  NOTE 4: The test requirement is derived from the basic limit a scaling factor of 9 dB and any applicable TT. | | | |

Table 6.7.4.6.1-2: Medium Range IAB-DU *operating band* unwanted emission limits, 31< Prated,x ≤ 38 dBm (3 GHz < NR bands ≤ 4.2 GHz)

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Test requirement (Note 1, 2, 4) | Measurement bandwidth |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | Prated,c,TRP - 58 dB | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | Min(Prated,c,TRP – 60 dB, -16 dBm)  (Note 3) | 100 kHz |
| NOTE 1: For a IAB supporting non-contiguous spectrum operation within any *operating band* the emission limits within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the sub-block gap, where the emission limits within sub-block gaps shall be Min(Prated,c,TRP – 60 dB, ‑16 dBm)/100kHz.  NOTE 2: For a *multi-band RIB* with Inter RF Bandwidth gap < 2\*ΔfOBUE the emission limits within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap.  NOTE 3: The requirement is not applicable when Δfmax < 10 MHz.  NOTE 4: The test requirement is derived from the basic limit a scaling factor of 9 dB and any applicable TT. | | | |

Table 6.7.4.6.1-3: Medium Range IAB-DU *operating band* unwanted emission limits, 31< Prated,x ≤ 38 dBm (3 GHz < NR bands ≤ 4.2 GHz)

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Test requirement (Note 1, 2, 4) | Measurement bandwidth |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | Prated,c,TRP - 58 dB | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | Min(Prated,c,TRP – 60 dB, -16 dBm)  (Note 3) | 100 kHz |
| NOTE 1: For a IAB supporting non-contiguous spectrum operation within any *operating band* the emission limits within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the sub-block gap, where the emission limits within sub-block gaps shall be Min(Prated,c,TRP – 60 dB, ‑16 dBm)/100kHz.  NOTE 2: For a *multi-band RIB* with Inter RF Bandwidth gap < 2\*ΔfOBUE the emission limits within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap.  NOTE 3: The requirement is not applicable when Δfmax < 10 MHz.  NOTE 4: The test requirement is derived from the basic limit a scaling factor of 9 dB and any applicable TT. | | | |

Table 6.7.4.6.1-4: Medium Range IAB-DU operating band unwanted emission limits, Prated,x ≤ 31 dBm (NR bands ≤ 3 GHz)

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Test requirement (Note 1, 2, 4) | Measurement bandwidth |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | -18.2 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -20 dBm (Note 3) | 100 kHz |
| NOTE 1: For a IAB supporting non-contiguous spectrum operation within any *operating band* the emission limits within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the sub-block gap, where the emission limits within sub-block gaps shall be -20 dBm/100kHz.  NOTE 2: For a *multi-band RIB* with Inter RF Bandwidth gap < 2\*ΔfOBUE the emission limits within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap.  NOTE 3: The requirement is not applicable when Δfmax < 10 MHz.  NOTE 4: The test requirement is derived from the basic limit a scaling factor of 9 dB and any applicable TT. | | | |

Table 6.7.4.6.1-5: Medium Range IAB-DU operating band unwanted emission limits, Prated,x ≤ 31 dBm (3 GHz < NR bands ≤ 4.2 GHz)

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Test requirement (Note 1, 2, 4) | Measurement bandwidth |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | -18 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -20 dBm (Note 3) | 100 kHz |
| NOTE 1: For a IAB supporting non-contiguous spectrum operation within any *operating band* the emission limits within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the sub-block gap, where the emission limits within sub-block gaps shall be -20 dBm/100kHz.  NOTE 2: For a *multi-band RIB* with Inter RF Bandwidth gap < 2\*ΔfOBUE the emission limits within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap.  NOTE 3: The requirement is not applicable when Δfmax < 10 MHz.  NOTE 4: The test requirement is derived from the basic limit a scaling factor of 9 dB and any applicable TT. | | | |

Table 6.7.4.6.1-6: Medium Range IAB-DU operating band unwanted emission limits, Prated,x ≤ 31 dBm (4.2 GHz < NR bands ≤ 6 GHz)

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Test requirement (Note 1, 2, 4) | Measurement bandwidth |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | -18 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -20 dBm (Note 3) | 100 kHz |
| NOTE 1: For a IAB supporting non-contiguous spectrum operation within any *operating band* the emission limits within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the sub-block gap, where the emission limits within sub-block gaps shall be -20 dBm/100kHz.  NOTE 2: For a *multi-band RIB* with Inter RF Bandwidth gap < 2\*ΔfOBUE the emission limits within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap.  NOTE 3: The requirement is not applicable when Δfmax < 10 MHz.  NOTE 4: The test requirement is derived from the basic limit a scaling factor of 9 dB and any applicable TT. | | | |

##### 6.7.4.6.2 Local Area IAB-DU and Local Area IAB-MT (Category A and B)

For Local Area IAB-DU and Local Area IAB-MT in NR bands ≤ 3 GHz, emissions shall not exceed the maximum levels specified in table 6.7.4.6.2-1.

For Local Area IAB-DU and Local Area IAB-MT in 3 GHz < NR bands ≤ 4.2 GHz, emissions shall not exceed the maximum levels specified in table 6.7.4.6.2-2.

For Local Area IAB-DU and Local Area IAB-MT in 4.2 GHz < NR bands ≤ 6 GHz, emissions shall not exceed the maximum levels specified in table 6.7.4.6.2-3.

Table 6.7.4.6.2-1: Local Area IAB-DU and Local Area IAB-MT operating band unwanted emission limits (NR bands ≤ 3 GHz)

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Test requirement (Note 1, 2, 4) | Measurement bandwidth |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | -26.2 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -28 dBm (Note 3) | 100 kHz |
| NOTE 1: For a IAB supporting non-contiguous spectrum operation within any *operating band* the emission limits within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the sub-block gap, where the emission limits within sub-block gaps shall be -28 dBm/100kHz.  NOTE 2: For a *multi-band RIB* with Inter RF Bandwidth gap < 2\*ΔfOBUE the emission limits within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap.  NOTE 3: The requirement is not applicable when Δfmax < 10 MHz.  NOTE 4: The test requirement is derived from the basic limit a scaling factor of 9 dB and any applicable TT.  NOTE 5: Void | | | |

Table 6.7.4.6.2-2: Local Area IAB-DU and Local Area IAB-MT operating band unwanted emission limits (3 GHz < NR bands ≤ 4.2 GHz)

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Test requirement (Note 1, 2, 4) | Measurement bandwidth |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | -26 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -28 dBm (Note 3) | 100 kHz |
| NOTE 1: For a IAB supporting non-contiguous spectrum operation within any *operating band* the emission limits within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the sub-block gap, where the emission limits within sub-block gaps shall be -28 dBm/100kHz.  NOTE 2: For a *multi-band RIB* with Inter RF Bandwidth gap < 2\*ΔfOBUE the emission limits within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap.  NOTE 3: The requirement is not applicable when Δfmax < 10 MHz.  NOTE 4: The test requirement is derived from the basic limit a scaling factor of 9 dB and any applicable TT. | | | |

Table 6.7.4.6.2-3: Local Area IAB-DU and Local Area IAB-MT operating band unwanted emission limits (4.2 GHz < NR bands ≤ 6 GHz)

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Test requirement (Note 1, 2, 4) | Measurement bandwidth |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | -26 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -28 dBm (Note 3) | 100 kHz |
| NOTE 1: For a IAB supporting non-contiguous spectrum operation within any *operating band* the emission limits within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the sub-block gap, where the emission limits within sub-block gaps shall be -28 dBm/100kHz.  NOTE 2: For a *multi-band RIB* with Inter RF Bandwidth gap < 2\*ΔfOBUE the emission limits within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap.  NOTE 3: The requirement is not applicable when Δfmax < 10 MHz.  NOTE 4: The test requirement is derived from the basic limit a scaling factor of 9 dB and any applicable TT. | | | |

##### 6.7.4.6.3 Additional requirements

6.7.4.6.3.1 Limits in FCC Title 47

In addition to the requirements in clauses 6.6.4.2.1, 6.6.4.2.2, 6.6.4.2.3 and 6.6.4.2.4 in TS 38.174 [2], the IAB-DU and IAB-MT may have to comply with the applicable emission limits established by FCC Title 47 [14], when deployed in regions where those limits are applied, and under the conditions declared by the manufacturer.

##### 6.7.4.6.4 *IAB type 2-O*

The requirements of either clause 6.7.4.6.4.1 (Category A limits) or clause 6.7.4.6.4.1 (Category B limits) shall apply. The application of either Category A or Category B limits shall be the same as for General OTA transmitter spurious emissions requirements (*IAB type 2-O*) in clause 6.7.5.2.5.2. In addition, the limits in clause 6.7.4.5.2.4 may also apply. The emission measurement result shall not exceed the maximum levels specified in the tables below, where:

- Δf is the separation between the *contiguous transmission bandwidth* edge frequency and the nominal -3dB point of the measuring filter closest to the *contiguous transmission bandwidth* edge.

- f\_offset is the separation between the *contiguous transmission bandwidth* edge frequency and the centre of the measuring filter.

- f\_offsetmax is the offset to the frequency ΔfOBUE outside thedownlink *operating band*, where ΔfOBUE is defined in table 6.7.1-1.

In addition, inside any sub-block gap for a *RIB* operating in non-contiguous spectrum, emissions shall not exceed the cumulative sum of the test requirements specified for the adjacent sub blocks on each side of the sub block gap. The test requirement for each sub-block is specified in the clauses 6.7.4.5.2.2 and 6.7.4.5.2.3 below, where in this case:

- Δf is the separation between the sub block edge frequency and the nominal -3 dB point of the measuring filter closest to the sub block edge.

- f\_offset is the separation between the sub block edge frequency and the centre of the measuring filter.

- f\_offsetmax is equal to the sub block gap bandwidth minus half of the bandwidth of the measuring filter.

- Δfmax is equal to f\_offsetmax minus half of the bandwidth of the measuring filter.

6.7.4.6.4.1 OTA operating band unwanted emission limits (Category A)

The power of unwanted emission of IAB-DU shall not exceed the limits in table 6.7.4.6.4.1-1 or 6.7.4.6.4.1-2. The power of unwanted emission of IAB-MT shall not exceed the limits in table 6.7.4.6.4.1-3 or 6.7.4.6.4.1-4.

Table 6.7.4.6.4.1-1: OBUE limits applicable for IAB-DU in the frequency range 24.25 – 33.4 GHz

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter -3 dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Test limit | Measurement bandwidth |
| 0 MHz ≤ Δf < 0.1\*BWcontiguous | 0.5 MHz ≤ f\_offset < 0.1\* BWcontiguous +0.5 MHz | Min(-2.3 dBm, Max(Prated,t,TRP – 32.3 dB, -9.3 dBm)) | 1 MHz |
| 0.1\*BWcontiguous ≤ Δf < Δfmax | 0.1\* BWcontiguous +0.5 MHz ≤ f\_offset < f\_ offsetmax | Min(-13 dBm, Max(Prated,t,TRP – 43 dB, -20 dBm)) | 1 MHz |
| NOTE: For non-contiguous spectrum operation within any operating band the limitwithin sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap. | | | |

Table 6.7.4.6.4.1-2: OBUE limits applicable for IAB-DU in the frequency range 37 GHz – 52.6 GHz

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter -3 dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Test limit | Measurement bandwidth |
| 0 MHz ≤ Δf < 0.1\*BWcontiguous | 0.5 MHz ≤ f\_offset < 0.1\* BWcontiguous +0.5 MHz | Min(-2.3 dBm, Max(Prated,t,TRP – 30.3 dB, -9.3 dBm)) | 1 MHz |
| 0.1\*BWcontiguous ≤ Δf < Δfmax | 0.1\* BWcontiguous +0.5 MHz ≤ f\_offset < f\_ offsetmax | Min(-13 dBm, Max(Prated,t,TRP – 41 dB, -20 dBm)) | 1 MHz |
| NOTE: For non-contiguous spectrum operation within any operating band the limitwithin sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap. | | | |

Table 6.7.4.6.4.1-3: OBUE limits applicable for IAB-MT in the frequency range 24.25 – 33.4 GHz

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter -3 dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Test limit | Measurement bandwidth |
| 0 MHz ≤ Δf < 0.1\*BWcontiguous | 0.5 MHz ≤ f\_offset < 0.1\* BWcontiguous +0.5 MHz | Min(-2.1 dBm, Max(Prated,t,TRP – 32.1 dB, -9.1 dBm)) | 1 MHz |
| 0.1\*BWcontiguous ≤ Δf < Δfmax | 0.1\* BWcontiguous +0.5 MHz ≤ f\_offset < f\_ offsetmax | Min(-13 dBm, Max(Prated,t,TRP – 43 dB, -20 dBm)) | 1 MHz |
| NOTE: For non-contiguous spectrum operation within any operating band the limitwithin sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap. | | | |

Table 6.7.4.6.4.1-4: OBUE limits applicable for IAB-MT in the frequency range 37 GHz – 52.6 GHz

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter -3 dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Test limit | Measurement bandwidth |
| 0 MHz ≤ Δf < 0.1\*BWcontiguous | 0.5 MHz ≤ f\_offset < 0.1\* BWcontiguous +0.5 MHz | Min(-2.0 dBm, Max(Prated,t,TRP – 30.0 dB, -9.0 dBm)) | 1 MHz |
| 0.1\*BWcontiguous ≤ Δf < Δfmax | 0.1\* BWcontiguous +0.5 MHz ≤ f\_offset < f\_ offsetmax | Min(-13 dBm, Max(Prated,t,TRP – 41 dB, -20 dBm)) | 1 MHz |
| NOTE: For non-contiguous spectrum operation within any operating band the limitwithin sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap. | | | |

6.7.4.6.4.2 OTA operating band unwanted emission limits (Category B)

The power of unwanted emission of IAB-DU shall not exceed the limits in table 6.7.4.6.4.2-1 or 6.7.4.6.4.2-2. The power of unwanted emission of IAB-MT shall not exceed the limits in table 6.7.4.6.4.2-3 or 6.7.4.6.4.2-4.

Table 6.7.4.6.4.2-1: OBUE limits applicable for IAB-DU in the frequency range 24.25 – 33.4 GHz

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter -3 dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Test limit | Measurement bandwidth |
| 0 MHz ≤ Δf < 0.1\*BWcontiguous | 0.5 MHz ≤ f\_offset < 0.1\* BWcontiguous +0.5 MHz | Min(-2.3 dBm, Max(Prated,t,TRP – 32.3 dB, -9.3 dBm)) | 1 MHz |
| 0.1\*BWcontiguous ≤ Δf < ΔfB | 0.1\* BWcontiguous +0.5 MHz ≤ f\_offset < ΔfB +0.5 MHz | Min(-13 dBm, Max(Prated,t,TRP – 43 dB, -20 dBm)) | 1 MHz |
| ΔfB ≤ Δf < Δfmax | ΔfB +5 MHz ≤ f\_offset < f\_ offsetmax | Min(-5 dBm, Max(Prated,t,TRP – 33 dB, -10 dBm)) | 10 MHz |
| NOTE 1: For non-contiguous spectrum operation within any *operating band* the limitwithin sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap.  NOTE 2: ΔfB = 2\*BWcontiguous when BWcontiguous ≤ 500 MHz, otherwise ΔfB = BWcontiguous + 500 MHz. | | | |

Table 6.7.4.6.4.2-2: OBUE limits applicable for IAB-DU in the frequency range 37 – 52.6 GHz

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter -3 dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Test limit | Measurement bandwidth |
| 0 MHz ≤ Δf < 0.1\*BWcontiguous | 0.5 MHz ≤ f\_offset < 0.1\* BWcontiguous +0.5 MHz | Min(-2.3 dBm, Max(Prated,t,TRP – 30.3 dB, -9.3 dBm)) | 1 MHz |
| 0.1\*BWcontiguous ≤ Δf < ΔfB | 0.1\* BWcontiguous +0.5 MHz ≤ f\_offset < ΔfB +0.5 MHz | Min(-13 dBm, Max(Prated,t,TRP – 41 dB, -20 dBm)) | 1 MHz |
| ΔfB ≤ Δf < Δfmax | ΔfB +5 MHz ≤ f\_offset < f\_ offsetmax | Min(-5 dBm, Max(Prated,t,TRP – 31 dB, -10 dBm)) | 10 MHz |
| NOTE 1: For non-contiguous spectrum operation within any *operating band* the limitwithin sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap.  NOTE 2: ΔfB = 2\*BWcontiguous when BWcontiguous ≤ 500 MHz, otherwise ΔfB = BWcontiguous + 500 MHz. | | | |

Table 6.7.4.6.4.2-3: OBUE limits applicable for IAB-MT in the frequency range 24.25 – 33.4 GHz

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter -3 dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Test limit | Measurement bandwidth |
| 0 MHz ≤ Δf < 0.1\*BWcontiguous | 0.5 MHz ≤ f\_offset < 0.1\* BWcontiguous +0.5 MHz | Min(-2.1 dBm, Max(Prated,t,TRP – 32.1 dB, -9.1 dBm)) | 1 MHz |
| 0.1\*BWcontiguous ≤ Δf < ΔfB | 0.1\* BWcontiguous +0.5 MHz ≤ f\_offset < ΔfB +0.5 MHz | Min(-13 dBm, Max(Prated,t,TRP – 43 dB, -20 dBm)) | 1 MHz |
| ΔfB ≤ Δf < Δfmax | ΔfB +5 MHz ≤ f\_offset < f\_ offsetmax | Min(-5 dBm, Max(Prated,t,TRP – 33 dB, -10 dBm)) | 10 MHz |
| NOTE 1: For non-contiguous spectrum operation within any *operating band* the limitwithin sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap.  NOTE 2: ΔfB = 2\*BWcontiguous when BWcontiguous ≤ 500 MHz, otherwise ΔfB = BWcontiguous + 500 MHz. | | | |

Table 6.7.4.6.4.2-4: OBUE limits applicable for IAB- MT in the frequency range 37 – 52.6 GHz

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter -3 dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Test limit | Measurement bandwidth |
| 0 MHz ≤ Δf < 0.1\*BWcontiguous | 0.5 MHz ≤ f\_offset < 0.1\* BWcontiguous +0.5 MHz | Min(-2.0 dBm, Max(Prated,t,TRP – 30.0 dB, -9.0 dBm)) | 1 MHz |
| 0.1\*BWcontiguous ≤ Δf < ΔfB | 0.1\* BWcontiguous +0.5 MHz ≤ f\_offset < ΔfB +0.5 MHz | Min(-13 dBm, Max(Prated,t,TRP – 41 dB, -20 dBm)) | 1 MHz |
| ΔfB ≤ Δf < Δfmax | ΔfB +5 MHz ≤ f\_offset < f\_ offsetmax | Min(-5 dBm, Max(Prated,t,TRP – 31 dB, -10 dBm)) | 10 MHz |
| NOTE 1: For non-contiguous spectrum operation within any *operating band* the limitwithin sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap.  NOTE 2: ΔfB = 2\*BWcontiguous when BWcontiguous ≤ 500 MHz, otherwise ΔfB = BWcontiguous + 500 MHz. | | | |

6.7.4.6.4.3 Additional OTA operating band unwanted emission limits

6.7.4.6.4.3.1 Protection of Earth Exploration Satellite Service

For IAB-Node operating in the frequency range 24.25 – 27.5 GHz, the power of unwanted emission shall not exceed the limits in table 6.7.4.6.4.3.1-1.

Table 6.7.4.6.4.3.1-1: OBUE limits for protection of Earth Exploration Satellite Service

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency range | Measurement filter centre frequency range | Limit | Measurement Bandwidth |
| 23.6 – 24 GHz | 23.7 – 23.9 GHz | -3 dBm (Note 1) | 200 MHz |
| 23.6 – 24 GHz | 23.7 – 23.9 GHz | -9 dBm (Note 2) | 200 MHz |
| NOTE 1: This limit applies to IAB-DU and IAB-MT brought into use on or before 1 September 2027.  NOTE 2: This limit applies to IAB-DU and IAB-MT brought into use after 1 September 2027. | | | |

### 6.7.5 OTA transmitter spurious emissions

#### 6.7.5.1 General

For IAB-DU, the OTA transmitter spurious emission limits for FR1 shall apply from 30 MHz to 12.75 GHz, excluding the frequency range from ΔfOBUE below the lowest frequency of each supported downlink *operating band*, up to ΔfOBUE above the highest frequency of each supported downlink *operating band*, where the ΔfOBUE is defined in table 9.7.1-1. For some FR1 *operating bands*, the upper limit is higher than 12.75 GHz in order to comply with the 5th harmonic limit of the downlink *operating band*, as specified in Recommendation ITU-R SM.329 [10].

For IAB-MT, the OTA transmitter spurious emission limits for FR1 shall apply from 30 MHz to 12.75 GHz, excluding the frequency range from ΔfOBUE below the lowest frequency of each supported uplink *operating band*, up to ΔfOBUE above the highest frequency of each supported uplink *operating band*, where the ΔfOBUE is defined in table 9.7.1-2. For some FR1 *operating bands*, the upper limit is higher than 12.75 GHz in order to comply with the 5th harmonic limit of the uplink *operating band*, as specified in Recommendation ITU-R SM.329 [10].

For *multi-band RIB* each supported *operating band* and ΔfOBUE MHz around each band are excluded from the OTA transmitter spurious emissions requirements.

The requirements shall apply whatever the type of transmitter considered (single carrier or multi-carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

*IAB-DU type 1-O* and *IAB-MT type 1-O* requirements consist of OTA transmitter spurious emission requirements based on TRP and co-location requirements not based on TRP.

#### 6.7.5.2 General OTA transmitter spurious emissions requirements

##### 6.7.5.2.1 Definition and applicability

The general OTA transmitter spurious emissions requirements are specified as TRP per RIB, per cell, unless otherwise specified.

##### 6.7.5.2.2 Minimum requirement

The minimum requirement for *IAB type 1-O* is specified in TS 38.174 [2], clause 9.7.5.2.

The minimum requirement for *IAB type 2-O* is specified in TS 38.174 [2], clause 9.7.5.3.

##### 6.7.5.2.3 Test purpose

The test purpose is to verify if the radiated spurious emissions from the IAB at the RIB are within the specified minimum requirements.

##### 6.7.5.2.4 Method of test

6.7.5.2.4.1 Initial conditions

Test environment: Normal; see annex B.2.

RF channels to be tested for single carrier, see clause 4.9.1:

- For FR1:

- B when testing from 30 MHz to FDL\_low - ΔfOBUE for IAB-DU or FUL\_low - ΔfOBUE for IAB-MT

- T when testing from FDL\_high + ΔfOBUE for IAB-DU or FUL\_high + ΔfOBUE for IAB-MT to 12.75 GHz (or to 5th harmonic)

- For FR2:

- B when testing from 30 MHz to FDL\_low - ΔfOBUE for IAB-DU or FUL\_low - ΔfOBUE for IAB-MT

- T when testing from FDL\_high + ΔfOBUE for IAB-DU or FUL\_high + ΔfOBUE for IAB-MT to 2nd harmonic (or to 60 GHz)

RF bandwidth positions to be tested in single-band multi-carrier operation, see clause 4.9.1:

- For FR1:

- BRFBW when testing from 30 MHz to FDL\_low - ΔfOBUE for IAB-DU or FUL\_low - ΔfOBUE for IAB-MT

- TRFBW when testing from FDL\_high + ΔfOBUE for IAB-DU or FUL\_high + ΔfOBUE for IAB-MT to 12.75 GHz (or 5th harmonic)

- For FR2:

- BRFBW when testing from 30 MHz to FDL\_low - ΔfOBUE for IAB-DU or FUL\_low - ΔfOBUE for IAB-MT

- TRFBW when testing from FDL\_high + ΔfOBUE for IAB-DU or FUL\_high + ΔfOBUE for IAB-MT to 2nd harmonic (or to 60 GHz)

RF bandwidth positions to be tested in multi-band multi-carrier operation, see clause 4.9.1:

- For FR1:

- BRFBW\_T'RFBW when testing from 30 MHz to FDL\_Blow\_low - ΔfOBUE for IAB-DU or FUL\_Blow\_low - ΔfOBUE for IAB-M

- B'RFBW\_TRFBW when testing from FDL\_Bhigh\_high + ΔfOBUE for IAB-DU or FUL\_Bhigh\_high + ΔfOBUE for IAB-MT to 12.75 GHz (or to 5th harmonic)

- BRFBW\_T'RFBW and B'RFBW\_TRFBW when testing from FDL\_Blow\_high + ΔfOBUE to FDL\_Bhigh\_low - ΔfOBUE for IAB-DU or FUL\_Blow\_high + ΔfOBUE to FUL\_Bhigh\_low - ΔfOBUE for IAB-MT

Directions to be tested: As the requirement is TRP the beam pattern(s) may be set up to optimise the TRP measurement procedure (see annex I) as long as the required TRP level is achieved.

6.7.5.2.4.2 Procedure

The following procedure for measuring TRP is based on directional power measurements as described in annex I. An alternative method to measure TRP is to use a characterized and calibrated reverberation chamber if so follow steps 1, 3, 4, 5, 7 and 10.

1) Place the IAB-Node at the positioner.

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

3) Measurements shall use a measurement bandwidth in accordance to the conditions in clause 6.7.5.2.5.

4) The measurement device characteristics shall be:

- Detection mode: True RMS.

5) Set the IAB to transmit:

- For RIBdeclared to be capable of single carrier operation only, set the RIB to transmit a signal according to the applicable test configuration in clause 4.8 using the corresponding test model in clause 4.9.2 (i.e.IAB-DU-FR1-TM1.1 for *IAB-DU type 1-O,* IAB-MT-FR1-TM1.1 for *IAB-MT type 1-O,* IAB-DU-FR2-TM1.1 for *IAB-DU type 2-O* or IAB-MT-FR2-TM1.1 for *IAB-MT type 2-O*), at manufacturer's declared rated output power Prated,c,TRP.

- For a RIB declared to be capable of multi-carrier and/or CA operation, set the RIB to transmit according to the corresponding test model in clause 4.9.2 on all carriers configured using the applicable test configuration and corresponding power setting specified in clause 4.7.2 and 4.8.

- For an IAB node declared to be capable of Simultaneous transmission between IAB-DU and IAB-MT (D.XX), using the corresponding test model(s) in clause 4.9.2 for IAB-MT and IAB-DU using the applicable test configuration and corresponding power setting specified in clause 4.7.2 and 4.8.

6) Orient the positioner (and IAB) in order that the direction to be tested aligns with the test antenna such that measurements to determine TRP can be performed (see annex I).

7) Measure the emission at the specified frequencies with specified measurement bandwidth.

8) Repeat step 6-7 for all directions in the appropriated TRP measurement grid needed for full TRP estimation (see annex I).

NOTE 1: The TRP measurement grid may not be the same for all measurement frequencies.

NOTE 2: The frequency sweep or the TRP measurement grid sweep may be done in any order.

9) Calculate TRP at each specified frequency using the directional measurements.

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

10) For *IAB type 1-O* and *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.

##### 6.7.5.2.5 Test requirement

6.7.5.2.5.1 Test requirement for *IAB type 1-O*

For a IAB meeting category A the TRP of any spurious emission shall not exceed the limits in table 6.7.5.2.5.1-1.

Table 6.7.5.2.5.1-1: General IAB-DU and IAB-MT transmitter spurious emission limits in FR1 (Category A)

|  |  |  |  |
| --- | --- | --- | --- |
| **Spurious frequency range** | **Test limit** | **Measurement bandwidth** | **Notes** |
| 30 MHz – 1 GHz | -13 + X dBm | 100 kHz | Note 1, Note 6 |
| 1 GHz – 12.75 GHz |  | 1 MHz | Note 1, Note 2, Note 6 |
| 12.75 GHz – 5th harmonic of the upper frequency edge of the DL *operating band* in GHz |  | 1 MHz | Note 1, Note 2, Note 3, Note 6 |
| NOTE 1: Measurement bandwidths as in ITU-R SM.329 [10], s4.1.  NOTE 2: Upper frequency as in ITU-R SM.329 [10], s2.5 table 1.  NOTE 3: This spurious frequency range applies only for *operating bands* for which the 5th harmonic of the upper frequency edge of the DL *operating band* is reaching beyond 12.75 GHz.  NOTE 4: Void.  NOTE 5: Void.  NOTE 6: X = 9 dB, unless stated differently in regional regulation. | | | |

For a IAB meeting category B the TRP of any spurious emission shall not exceed the limits in table 6.7.5.2.5.1-2.

Table 6.7.5.2.5.1-2: General IAB-DU and IAB-MT transmitter spurious emission limits in FR1 (Category B)

|  |  |  |  |
| --- | --- | --- | --- |
| **Spurious frequency range** | **Test limit** | **Measurement bandwidth** | **Notes** |
| 30 MHz – 1 GHz | -36 + X dBm | 100 kHz | Note 1, Note 5 |
| 1 GHz – 12.75 GHz | -30 + X dBm | 1 MHz | Note 1, Note 2, Note 5 |
| 12.75 GHz – 5th harmonic of the upper frequency edge of the DL *operating band* in GHz |  | 1 MHz | Note 1, Note 2, Note 3, Note 5 |
| NOTE 1: Measurement bandwidths as in ITU-R SM.329 [10], s4.1.  NOTE 2: Upper frequency as in ITU-R SM.329 [105], s2.5 table 1.  NOTE 3: This spurious frequency range applies only for *operating bands* for which the 5th harmonic of the upper frequency edge of the DL *operating band* is reaching beyond 12.75GHz.  NOTE 4: Void.  NOTE 5: X = 9 dB, unless stated differently in regional regulation. | | | |

6.7.5.2.5.2 Test requirement for *IAB type 2-O*

6.7.5.2.5.2.1 General

The requirements of either clause 6.7.5.2.5.2.2 (Category A limits) or clause 6.7.5.2.5.2.3 (Category B limits) shall apply. The application of either Category A or Category B limits shall be the same as for Operating band unwanted emissions in clause 6.7.1.

6.7.5.2.5.2.2 OTA transmitter spurious emissions (Category A)

The power of any spurious emission shall not exceed the limits in table 6.7.5.2.5.2.2-1.

Table 6.7.5.2.5.2.2-1: General IAB-DU and IAB-MT transmitter spurious emission limits in FR2 (Category A)

|  |  |  |  |
| --- | --- | --- | --- |
| **Spurious frequency range** | **Test limit** | **Measurement bandwidth** | **Notes** |
| 30 MHz – 1 GHz | -13 dBm | 100 kHz | Note 1 |
| 1 GHz – min(2nd harmonic of the upper frequency edge of the DL operating band in GHz; 60 GHz) |  | 1 MHz | Note 1, Note 2 |
| NOTE 1: Measurement bandwidth as in ITU-R SM.329 [10], s4.1.  NOTE 2: Upper frequency as in ITU-R SM.329 [10], s2.5 table 1. | | | |

6.7.5.2.5.2.3 OTA transmitter spurious emissions (Category B)

The power of any spurious emission shall not exceed the limits in table 6.7.5.2.5.2.3-1.

Table 6.7.5.2.5.2.3-1: IAB-DU and IAB-MT radiated Tx spurious emission limits in FR2 (Category B)

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency range  (Note 4)** | **Test limit** | **Measurement Bandwidth** | **Note** |
| 30 MHz ↔ 1 GHz | -36 dBm | 100 kHz | Note 1 |
| 1 GHz ↔ 18 GHz | -30 dBm | 1 MHz | Note 1 |
| 18 GHz ↔ Fstep,1 | -20 dBm | 10 MHz | Note 2 |
| Fstep,1 ↔ Fstep,2 | -15 dBm | 10 MHz | Note 2 |
| Fstep,2 ↔ Fstep,3 | -10 dBm | 10 MHz | Note 2 |
| Fstep,4 ↔ Fstep,5 | -10 dBm | 10 MHz | Note 2 |
| Fstep,5 ↔ Fstep,6 | -15 dBm | 10 MHz | Note 2 |
| Fstep,6 ↔ min(2nd harmonic of the upper frequency edge of the DL operating band in GHz; 60 GHz) | -20 dBm | 10 MHz | Note 2, Note 3 |
| NOTE 1: Bandwidth as in ITU-R SM.329 [10], s4.1  NOTE 2: Limit and bandwidth as in ERC Recommendation 74-01 [11], annex 2.  NOTE 3: Upper frequency as in ITU-R SM.329 [10], s2.5 table 1.  NOTE 4: The step frequencies Fstep,X are defined in table 6.7.5.2.5.2.3-2. | | | |

Table 6.7.5.2.5.2.3-2: Step frequencies for defining the IAB-DU and IAB-MT radiated Tx spurious emission limits in FR2 (Category B)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Operating band** | **Fstep,1 (GHz)** | **Fstep,2 (GHz)** | **Fstep,3 (GHz) (Note 2)** | **Fstep,4 (GHz) (Note 2)** | **Fstep,5 (GHz)** | **Fstep,6 (GHz)** |
| n257 | 18 | 23.5 | 25 | 31 | 32.5 | 41.5 |
| n258 | 18 | 21 | 22.75 | 29 | 30.75 | 40.5 |
| n259 | 23.5 | 35.5 | 38 | 45 | 47.5 | 59.5 |
| NOTE 1: Fstep,X are based on ERC Recommendation 74-01 [11], annex 2.  NOTE 2: Fstep,3 and Fstep,4 are aligned with the values for ΔfOBUE in table 6.7.1-1. | | | | | | |

#### 6.7.5.3 Void

#### 6.7.5.4 Additional spurious emissions requirements

##### 6.7.5.4.1 Definition and applicability

These requirements may be applied for the protection of systems operating in frequency ranges other than the IAB downlink operating band. The limits may apply as an optional protection of such systems that are deployed in the same geographical area as the IAB-Node, or they may be set by local or regional regulation as a mandatory requirement for an NR operating band. It is in some cases not stated in the present document whether a requirement is mandatory or under what exact circumstances that a limit applies, since this is set by local or regional regulation. An overview of regional requirements in the present document is given in clause 4.4.

Some requirements may apply for the protection of specific equipment (UE, MS and/or BS) or equipment operating in specific systems (GSM, CDMA, UTRA, E-UTRA, NR, etc.).

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

All additional spurious requirements are TRP unless otherwise stated.

##### 6.7.5.4.2 Minimum Requirement

The minimum requirement for *IAB type 1-O* is specified in TS 38.174 [2], clause 9.7.5.2.3.

The minimum requirement for *IAB type 2-O* is specified in TS 38.174 [2], clause 9.7.5.3.3.

##### 6.7.5.4.3 Test purpose

The test purpose is to verify the radiated spurious emissions from the IAB at the RIB are within the specified additional spurious emissions requirements.

##### 6.7.5.4.4 Method of test

6.7.5.4.4.1 Initial conditions

Test environment: Normal; see annex B.2.

RF channels to be tested for single carrier:

- For FR1:

- B when testing from 30 MHz to FDL\_low - ΔfOBUE for IAB-DU or FUL\_low - ΔfOBUE for IAB-MT

- T when testing from FDL\_high + ΔfOBUE for IAB-DU or FUL\_high + ΔfOBUE for IAB-MT to 12.75 GHz (or to 5th harmonic)

- For FR2:

- B when testing from 30 MHz to FDL\_low - ΔfOBUE for IAB-DU or FUL\_low - ΔfOBUE for IAB-MT

- T when testing from FDL\_high + ΔfOBUE for IAB-DU or FUL\_high + ΔfOBUE for IAB-MT to 60 GHz (or to 2nd harmonic)

RF bandwidth positions to be tested in single-band multi-carrier operation:

- For FR1:

- BRFBW when testing from 30 MHz to FDL\_low - ΔfOBUE for IAB-DU or FUL\_low - ΔfOBUE for IAB-MT

- TRFBW when testing from FDL\_high + ΔfOBUE for IAB-DU or FUL\_high + ΔfOBUE for IAB-MT to 12.75 GHz (or to 5th harmonic)

- For FR2:

- BRFBW when testing from 30 MHz to FDL\_low - ΔfOBUE for IAB-DU or FUL\_low - ΔfOBUE for IAB-MT

- TRFBW when testing from FDL\_high + ΔfOBUE for IAB-DU or FUL\_high + ΔfOBUE for IAB-MT to 60 GHz (or to 2nd harmonic)

RF bandwidth positions to be tested in multi-band multi-carrier operation:

- For FR1:

- BRFBW\_T'RFBW when testing from 30 MHz to FDL\_Blow\_low - ΔfOBUE for IAB-DU or FUL\_low - ΔfOBUE for IAB-MT

- B'RFBW\_TRFBW when testing from FDL\_Bhigh\_high + ΔfOBUE for IAB-DU or FUL\_Bhigh\_high + ΔfOBUE for IAB-MT to 12.75 GHz (or to 5th harmonic)

- BRFBW\_T'RFBW and B'RFBW\_TRFBW when testing from FDL\_Blow\_high + ΔfOBUE to FDL\_Bhigh\_low - ΔfOBUE for IAB-DU or FUL\_Blow\_high + ΔfOBUE to FUL\_Bhigh\_low - ΔfOBUE for IAB-MT

Directions to be tested: As the requirements are TRP the beam pattern(s) may be set up to optimise the TRP measurement procedure (see annex I) as long as the required TRP level is achieved.

6.7.5.4.4.2 Procedure

The following procedure for measuring TRP is based on the directional power measurements as described in annex I. An alternative method to measure TRP is to use a characterized and calibrated reverberation chamber if so follow steps 1, 3, 4, 5, 7 and 10.

1) Place the IAB-Node at the positioner.

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

3) Measurements shall use a measurement bandwidth in accordance to the conditions in clause 6.7.5.4.5.

4) The measurement device characteristics shall be:

- Detection mode: True RMS.

5) Set the IAB-Node to transmit:

- For RIBdeclared to be capable of single carrier operation only, set the RIB to transmit a signal according to the applicable test configuration in clause 4.8 using the corresponding test model in clause 4.9.2 (IAB-DU-FR1-TM1.1 for *IAB-DU type 1-O,* IAB-MT-FR1-TM1.1 for *IAB-MT type 1-O, IAB-DU-FR2-TM1.1* for *IAB-DU type 2-O* or IAB-MT-FR2-TM1.1 for *IAB-MT type 2-O*), at manufacturer's declared rated output power Prated,c,TRP.

- For a RIB declared to be capable of multi-carrier and/or CA operation, set the RIB to transmit according to IAB-DU-FR1-TM1.1 for *IAB-DU type 1-O,* IAB-MT-FR1-TM1.1 for *IAB-MT type 1-O,* IAB-DU-FR2-TM1.1 for *IAB-DU type 2-O* or IAB-MT-FR2-TM1.1 for *IAB-MT type 2-O* in clause 4.9.2 on all carriers configured using the applicable test configuration and corresponding power setting specified in clause 4.7.2 and 4.8.

- For an IAB node declared to be capable of Simultaneous transmission between IAB-DU and IAB-MT (D.XX), set the RIB to transmit according to IAB-DU-FR1-TM1.1 for *IAB-DU type 1-O,* IAB-MT-FR1-TM1.1 for *IAB-MT type 1-O,* IAB-DU-FR2-TM1.1 for *IAB-DU type 2-O* or IAB-MT-FR2-TM1.1 for *IAB-MT type 2-O* in clause 4.9.2 using the applicable test configuration and corresponding power setting specified in clause 4.7.2 and 4.8.

6) Orient the positioner (and IAB) in order that the direction to be tested aligns with the test antenna such that measurements to determine TRP can be performed (see annex I).

7) Measure the emission at the specified frequencies with specified measurement bandwidth.

8) Repeat step 6-7 for all directions in the appropriated TRP measurement grid needed for full TRP estimation (see annex I).

NOTE 1: The TRP measurement grid may not be the same for all measurement frequencies.

NOTE 2: The frequency sweep or the TRP measurement grid sweep may be done in any order.

9) Calculate TRP at each specified frequency using the directional measurements.

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

10) 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.

##### 6.7.5.4.5 Test requirement

6.7.5.4.5.1 Test requirement for *IAB type 1-O*

The power of any spurious emission shall not exceed the test limits in table 6.7.5.4.5-1 for a IAB where requirements for co-existence with the system listed in the first column apply. For a *multi-band RIB*, the exclusions and conditions in the Note column of table 6.7.5.4.5-1 apply for each supported *operating band*.

Table 6.7.5.4.5.1-1: IAB-DU and IAB-MT spurious emissions basic limits for co-existence with systems operating in other frequency bands

| System type to co-exist with | Frequency range for co-existence requirement | Test limits | Measurement bandwidth | Note |
| --- | --- | --- | --- | --- |
| GSM900 | 921 – 960 MHz | -45.4 dBm | 100 kHz |  |
|  | 876 – 915 MHz | -49.4 dBm | 100 kHz |  |
| DCS1800 | 1805 – 1880 MHz | -35.4 dBm | 100 kHz |  |
|  | 1710 – 1785 MHz | -49.4 dBm | 100 kHz |  |
| PCS1900 | 1930 – 1990 MHz | -35.4 dBm | 100 kHz |  |
|  | 1850 – 1910 MHz | -49.4 dBm | 100 kHz |  |
| GSM850 or | 869 – 894 MHz | -45.4 dBm | 100 kHz |  |
| CDMA850 | 824 – 849 MHz | -49.4 dBm | 100 kHz |  |
| UTRA FDD | 2110 – 2170 MHz | -40.4 dBm | 1 MHz |  |
| Band I or  E-UTRA Band 1 or NR Band n1 | 1920 – 1980 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD | 1930 – 1990 MHz | -40.4 dBm | 1 MHz |  |
| Band II or  E-UTRA Band 2 or NR Band n2 | 1850 – 1910 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD | 1805 – 1880 MHz | -40.4 dBm | 1 MHz |  |
| Band III or  E-UTRA Band 3 or NR Band n3 | 1710 – 1785 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD Band IV or  E-UTRA Band 4 | 2110 – 2155 MHz | -40.4 dBm | 1 MHz |  |
|  | 1710 – 1755 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD Band V or  E-UTRA Band 5 or NR Band n5 | 869 – 894 MHz | -40.4 dBm | 1 MHz |  |
|  | 824 – 849 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD | 860 – 890 MHz | -40.4 dBm | 1 MHz |  |
| Band VI, XIX or | 815 – 830 MHz | -37.4 dBm | 1 MHz |  |
| E-UTRA Band 6, 18, 19 or NR Band n18 | 830 – 845 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD Band VII or  E-UTRA Band 7 or NR Band n7 | 2620 – 2690 MHz | -40.4 dBm | 1 MHz |  |
|  | 2500 – 2570 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD Band VIII or  E-UTRA Band 8 or NR Band n8 | 925 – 960 MHz | -40.4 dBm | 1 MHz |  |
|  | 880 – 915 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD Band IX or  E-UTRA Band 9 | 1844.9 – 1879.9 MHz | -40.4 dBm | 1 MHz |  |
|  | 1749.9 – 1784.9 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD Band X or  E-UTRA Band 10 | 2110 – 2170 MHz | -40.4 dBm | 1 MHz |  |
|  | 1710 – 1770 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD Band XI or XXI or  E-UTRA Band 11 or 21 | 1475.9 – 1510.9 MHz | -40.4 dBm | 1 MHz |  |
|  | 1427.9 – 1447.9 MHz | -37.4 dBm | 1 MHz |  |
|  | 1447.9 – 1462.9 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD Band XII or  E-UTRA Band 12 or NR Band n12 | 729 – 746 MHz | -40.4 dBm | 1 MHz |  |
|  | 699 – 716 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD Band XIII or  E-UTRA Band 13 | 746 – 756 MHz | -40.4 dBm | 1 MHz |  |
|  | 777 – 787 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD Band XIV or  E-UTRA Band 14 or NR band n14 | 758 – 768 MHz | -40.4 dBm | 1 MHz |  |
|  | 788 – 798 MHz | -37.4 dBm | 1 MHz |  |
| E-UTRA Band 17 | 734 – 746 MHz | -40.4 dBm | 1 MHz |  |
|  | 704 – 716 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD Band XX or E-UTRA Band 20 or NR Band n20 | 791 – 821 MHz | -40.4 dBm | 1 MHz |  |
|  | 832 – 862 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD Band XXII or E-UTRA Band 22 | 3510 – 3590 MHz | -40 dBm | 1 MHz | This requirement does not apply to IAB-DU and IAB-MT operating in band n77 or n78. |
|  | 3410 – 3490 MHz | -37 dBm | 1 MHz | This requirement does not apply to IAB-DU and IAB-MT operating in band n77 or n78. |
| E-UTRA Band 24 | 1525 – 1559 MHz | -40.4 dBm | 1 MHz |  |
|  | 1626.5 – 1660.5 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD Band XXV or  E-UTRA Band 25 or NR band n25 | 1930 – 1995 MHz | -40.4 dBm | 1 MHz |  |
|  | 1850 – 1915 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD Band XXVI or  E-UTRA Band 26 or NR Band n26 | 859 – 894 MHz | -40.4 dBm | 1 MHz |  |
|  | 814 – 849 MHz | -37.4 dBm | 1 MHz |  |
| E-UTRA Band 27 | 852 – 869 MHz | -40.4 dBm | 1 MHz |  |
|  | 807 – 824 MHz | -37.4 dBm | 1 MHz |  |
| E-UTRA Band 28 or NR Band n28 | 758 – 803 MHz | -40.4 dBm | 1 MHz |  |
|  | 703 – 748 MHz | -37.4 dBm | 1 MHz |  |
| E-UTRA Band 29 or NR Band n29 | 717 – 728 MHz | -40.4 dBm | 1 MHz |  |
| E-UTRA Band 30 or NR Band n30 | 2350 – 2360 MHz | -40.4 dBm | 1 MHz |  |
|  | 2305 – 2315 MHz | -37.4 dBm | 1 MHz |  |
| E-UTRA Band 31 | 462.5 – 467.5 MHz | -40.4 dBm | 1 MHz |  |
|  | 452.5 – 457.5 MHz | -37.4 dBm | 1 MHz |  |
| UTRA FDD band XXXII or E-UTRA band 32 | 1452 – 1496 MHz | -40.4 dBm | 1 MHz |  |
| UTRA TDD Band a) or E-UTRA Band 33 | 1900 – 1920 MHz | -40.4 dBm | 1 MHz |  |
| UTRA TDD Band a) or E-UTRA Band 34 or NR band n34 | 2010 – 2025 MHz | -40.4 dBm | 1 MHz |  |
| UTRA TDD Band b) or E-UTRA Band 35 | 1850 – 1910 MHz | -40.4 dBm | 1 MHz |  |
| UTRA TDD Band b) or E-UTRA Band 36 | 1930 – 1990 MHz | -40.4 dBm | 1 MHz |  |
| UTRA TDD Band c) or E-UTRA Band 37 | 1910 – 1930 MHz | -40.4 dBm | 1 MHz |  |
| UTRA TDD Band d) or E-UTRA Band 38 or NR Band n38 | 2570 – 2620 MHz | -40.4 dBm | 1 MHz |  |
| UTRA TDD Band f) or E-UTRA Band 39 or NR band n39 | 1880 – 1920MHz | -40.4 dBm | 1 MHz |  |
| UTRA TDD Band e) or E-UTRA Band 40 or NR Band n40 | 2300 – 2400MHz | -40.4 dBm | 1 MHz |  |
| E-UTRA Band 41 or NR Band n41, n90 | 2496 – 2690 MHz | -40.4 dBm | 1 MHz | This is not applicable IAB-DU and IAB-MT operating in Band n41. |
| E-UTRA Band 42 | 3400 – 3600 MHz | -40 dBm | 1 MHz | This is not applicable to IAB-DU and IAB-MT operating in Band n77 or n78. |
| E-UTRA Band 43 | 3600 – 3800 MHz | -40 dBm | 1 MHz | This is not applicable to IAB-DU and IAB-MT operating in Band n77 or n78. |
| E-UTRA Band 44 | 703 – 803 MHz | -40.4 dBm | 1 MHz |  |
| E-UTRA Band 45 | 1447 – 1467 MHz | -40.4 dBm | 1 MHz |  |
| E-UTRA Band 46 or NR Band n46 | 5150 – 5925 MHz | -39.5 dBm | 1 MHz |  |
| E-UTRA Band 47 | 5855 – 5925 MHz | -39.5 dBm | 1 MHz |  |
| E-UTRA Band 48 or NR Band n48 | 3550 – 3700 MHz | -40 dBm | 1 MHz | This is not applicable to IAB-DU and IAB-MT operating in Band n77 or n78. |
| E-UTRA Band 50 or NR band n50 | 1432 – 1517 MHz | -40.4 dBm | 1 MHz |  |
| E-UTRA Band 51 or NR Band n51 | 1427 – 1432 MHz | -40.4 dBm | 1 MHz |  |
| E-UTRA Band 53 or NR Band n53 | 2483.5 - 2495 MHz | -40.4 dBm | 1 MHz | This is not applicable to IAB-DU and IAB-MT operating in Band n41. |
| E-UTRA Band 65 or NR Band n65 | 2110 – 2200 MHz | -40.4 dBm | 1 MHz |  |
|  | 1920 – 2010 MHz | -37.4 dBm | 1 MHz |  |
| E-UTRA Band 66 or NR Band n66 | 2110 – 2200 MHz | -40.4 dBm | 1 MHz |  |
|  | 1710 – 1780 MHz | -37.4 dBm | 1 MHz |  |
| E-UTRA Band 67 | 738 – 758 MHz | -40.4 dBm | 1 MHz |  |
| E-UTRA Band 68 | 753 -783 MHz | -40.4 dBm | 1 MHz |  |
|  | 698-728 MHz | -37.4 dBm | 1 MHz |  |
| E-UTRA Band 69 | 2570 – 2620 MHz | -40.4 dBm | 1 MHz |  |
| E-UTRA Band 70 or NR Band n70 | 1995 – 2020 MHz | -40.4 dBm | 1 MHz |  |
|  | 1695 – 1710 MHz | -37.4 dBm | 1 MHz |  |
| E-UTRA Band 71 or NR Band n71 | 617 – 652 MHz | -40.4 dBm | 1 MHz |  |
|  | 663 – 698 MHz | -37.4 dBm | 1 MHz |  |
| E-UTRA Band 72 | 461 – 466 MHz | -40.4 dBm | 1 MHz |  |
|  | 451 – 456 MHz | -37.4 dBm | 1 MHz |  |
| E-UTRA Band 74 or NR Band n74 | 1475 – 1518 MHz | -40.4 dBm | 1 MHz |  |
|  | 1427 – 1470 MHz | -37.4 dBm | 1MHz |  |
| E-UTRA Band 75 or NR Band n75 | 1432 – 1517 MHz | -40.4 dBm | 1 MHz |  |
| E-UTRA Band 76 or NR Band n76 | 1427 – 1432 MHz | -40.4 dBm | 1 MHz |  |
| NR Band n77 | 3.3 – 4.2 GHz | -40 dBm | 1 MHz | This requirement does not apply to IAB-DU and IAB-MT operating in Band n77 or n78 |
| NR Band n78 | 3.3 – 3.8 GHz | -40 dBm | 1 MHz | This requirement does not apply to IAB-DU and IAB-MT operating in Band n77 or n78 |
| NR Band n79 | 4.4 – 5.0 GHz | -39.5 dBm | 1 MHz | This requirement does not apply to IAB-DU and IAB-MT operating in Band n79 |
| NR Band n80 | 1710 – 1785 MHz | -37.4 dBm | 1 MHz |  |
| NR Band n81 | 880 – 915 MHz | -40.4 dBm | 1 MHz |  |
| NR Band n82 | 832 – 862 MHz | -45.4 dBm | 1 MHz |  |
| NR Band n83 | 703 – 748 MHz | -49.4 dBm | 1 MHz |  |
| NR Band n84 | 1920 – 1980 MHz | -35.4 dBm | 1 MHz |  |
| E-UTRA Band 85 or NR Band n85 | 728 – 746 MHz | -49.4 dBm | 1 MHz |  |
|  | 698 – 716 MHz | -35.4 dBm | 1 MHz |  |
| NR Band n86 | 1710 – 1780 MHz | -49.4 dBm | 1 MHz |  |
| NR Band n89 | 824 – 849 MHz | -45.4 dBm | 1 MHz |  |
| NR Band n91 | 1427 – 1432 MHz | -49.4 dBm | 1 MHz |  |
|  | 832 – 862 MHz | -40.4 dBm | 1 MHz |  |
| NR Band n92 | 1432 – 1517 MHz | -37.4 dBm | 1 MHz |  |
|  | 832 – 862 MHz | -40.4 dBm | 1 MHz |  |
| NR Band n93 | 1427 – 1432 MHz | -37.4 dBm | 1 MHz |  |
|  | 880 – 915 MHz | -40.4 dBm | 1 MHz |  |
| NR Band n94 | 1432 – 1517 MHz | -37.4 dBm | 1 MHz |  |
|  | 880 – 915 MHz | -40.4 dBm | 1 MHz |  |
| NR Band n95 | 2010 – 2025 MHz | -37.4 dBm | 1 MHz |  |
| NR Band n96 | 5925 – 7125 MHz | -39.5 dBm | 1 MHz |  |
| NR Band n97 | 2300 – 2400MHz | -40.4 dBm | 1 MHz |  |
| NR Band n98 | 1880 – 1920MHz | -40.4 dBm | 1 MHz |  |
| NR Band n99 | 1626.5 – 1660.5 MHz | -37.4 dBm | 1 MHz |  |
| NR Band n101 | 1900 - 1910 MHz | -40.4 dBm | 1 MHz |  |
| NR Band n102 | 6425 – 7125 MHz | -39.5 dBm | 1 MHz |  |
| E-UTRA Band 103 | 757 – 758 MHz | -40.4 dBm | 1 MHz |  |
|  | 787 – 788 MHz | -37.4 dBm | 1 MHz |  |
| NR Band n104 | 6425 – 7125 MHz | -39.5 dBm | 1 MHz |  |

NOTE 1: As defined in the scope for spurious emissions in this clause the co-existence requirements in table 6.7.5.4.5.1-1do not apply for the ΔfOBUE frequency range immediately outside the downlink *operating band* (see table 5.2-1). Emission limits for this excluded frequency range may be covered by local or regional requirements.

NOTE 2: Table 6.7.5.4.5.1-1 assumes that two *operating bands*, where the frequency ranges in table 5.2-1 would be overlapping, are not deployed in the same geographical area. For such a case of operation with overlapping frequency arrangements in the same geographical area, special co-existence requirements may apply that are not covered by the 3GPP specifications.

#### 6.7.5.5 Co-location requirements

##### 6.7.5.5.1 Definition and applicability

These requirements may be applied for the protection of other BS, IAB-DU or IAB-MT receivers when GSM900, DCS1800, PCS1900, GSM850, CDMA850, UTRA FDD, UTRA TDD, E-UTRA, NR BS, IAB-DU or IAB-MT are co-located with IAB-MT and/or IAB-DU.

The requirements assume a 30 dB coupling loss between transmitter and receiver and are based on co-location with same class.

##### 6.7.5.5.2 Minimum requirements

The minimum requirement for *IAB type 1-O* is defined in TS 38.174 [2], clause 9.7.5.2.

##### 6.7.5.5.3 Test purpose

For OTA co-locate spurious emission, the test purpose is to verify that the emission is within the specified requirement limits at the CLTA conducted output(s).

##### 6.7.5.5.4 Method of test

6.7.5.5.4.1 Initial conditions

Test environment: normal; see clause B.2.

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

*IAB RF Bandwidth* positions to be tested for multi-carrier:

- MRFBW in *single-band RIB*, see clause 4.9.1;

- BRFBW\_T'RFBW and B'RFBW\_TRFBW in *multi-band RIB*, see clause 4.9.1.

In addition, for *multi-band RIB*:

- For BRFBW\_T'RFBW, emission testing above the highest operating band may be omitted.

- For B'RFBW\_TRFBW, emission testing below the lowest operating band may be omitted.

Directions to be tested: The FR1 requirement is specified as co-location requirement. For general description of co-location requirements, refer to clause 4.12.

The co-location spurious emission is measured at the CLTA conducted output(s).

6.7.5.5.4.2 Procedure

1) Select and place the IAB-Node and CLTA as described in clause 4.12, with parameters as specified in table 4.12.2.2-1 and table 4.12.2.3-1.

2) Several CLTAs might be required to cover the whole co-location spurious emission frequency ranges.

3) Place test antenna in reference direction at far-field distance, aligned in all supported polarizations (single or dual) with the IAB-Node as depicted in annex E.1.3.

4) The test antenna shall be dual (or single) polarized with the same frequency range as the IAB-Node for co-location spurious emission test case.

5) Connect test antenna and CLTA to the measurement equipment as depicted in annex E.1.3.

6) OTA co-location spurious emission is measured as the power sum over all supported polarizations at the CLTA conducted output(s).

7) The measurement device (signal analyser) characteristics shall be:

- Detection mode: True RMS.

8) Set the *IAB type 1-O* to transmit:

- Set the IAB-Nodeto transmit maximum power 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.

- For the IAB-Node declared to be capable of multi-carrier and/or CA operation, set the IAB-Node to transmit according to the applicable test configuration and corresponding power setting specified in clause 4.7.2 and 4.8 using the corresponding test models on all carriers configured.

- For an IAB-Node declared to be capable of Simultaneous transmission between IAB-DU and IAB-MT (D.XX), set the IAB-Node to transmit according to the applicable test configuration and corresponding power setting specified in clause 4.7.2 and 4.8 for IAB-DU and IAB-MT.

9) Measure the emission at the specified frequencies with specified measurement bandwidth.

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

10) For *multi-band RIB* 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.

##### 6.7.5.5.5 Test requirements

6.7.5.5.5.1 Test requirement for *IAB type 1-O*

These requirements may be applied for the protection of other IAB receivers when GSM900, DCS1800, PCS1900, GSM850, CDMA850, UTRA FDD, UTRA TDD, E-UTRA and/or NR BS are co-located with a IAB Node.

The requirements assume co-location with base stations of the same class.

NOTE: For co-location with UTRA, the requirements are based on co-location with UTRA FDD or TDD base stations.

This requirement is a co-location requirement as defined in clause 4.9, in TS 38.174 [2], the power levels are specified at the CLTAoutput.

The output of the CLTA of any spurious emission shall not exceed the test limit in table 6.7.5.5.5.1-1.

For a *multi-band RIB*, the exclusions and conditions in the notes column of table 6.7.5.5.5.1-1 apply for each supported operating band.

Table 6.7.5.5.5.1-1: *IAB-DU and IAB-MT spurious emissions basic limits for co-location with BS or IAB-Node*

| Co-located system | Frequency range for | Test limits | | | Measurement | Note |
| --- | --- | --- | --- | --- | --- | --- |
|  | co-location requirement | WA IAB-DU and WA IAB-MT | MR IAB-DU | LA IAB-DU and LA IAB-MT | bandwidth |  |
| GSM900 | 876 – 915 MHz | -115.9 dBm | -108.9 dBm | -87.9 dBm | 100 kHz |  |
| DCS1800 | 1710 – 1785 MHz | -115.9 dBm | -108.9 dBm | --97.9 dBm | 100 kHz |  |
| PCS1900 | 1850 – 1910 MHz | -115.9 dBm | -108.9 dBm | --97.9 dBm | 100 kHz |  |
| GSM850 or CDMA850 | 824 – 849 MHz | -115.9 dBm | -108.9 dBm | -87.9 dBm | 100 kHz |  |
| UTRA FDD Band I or E-UTRA Band 1 or NR Band n1 | 1920 – 1980 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band II or E-UTRA Band 2 or NR Band n2 | 1850 – 1910 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band III or E-UTRA Band 3 or NR Band n3 | 1710 – 1785 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band IV or E-UTRA Band 4 | 1710 – 1755 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band V or E-UTRA Band 5 or NR Band n5 | 824 – 849 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band VI, XIX or E-UTRA Band 6, 19 | 830 – 845 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band VII or E-UTRA Band 7 or NR Band n7 | 2500 – 2570 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band VIII or E-UTRA Band 8 or NR Band n8 | 880 – 915 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band IX or E-UTRA Band 9 | 1749.9 – 1784.9 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band X or E-UTRA Band 10 | 1710 – 1770 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band XI or E-UTRA Band 11 | 1427.9 –1447.9 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band XII or  E-UTRA Band 12 or NR Band n12 | 699 – 716 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band XIII or  E-UTRA Band 13 | 777 – 787 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band XIV or  E-UTRA Band 14 or NR Band n14 | 788 – 798 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 17 | 704 – 716 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 18 or NR Band n18 | 815 – 830 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band XX or E-UTRA Band 20 or NR Band n20 | 832 – 862 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band XXI or E-UTRA Band 21 | 1447.9 – 1462.9 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band XXII or E-UTRA Band 22 | 3410 – 3490 MHz | -113.7 dBm | -108.7 dBm | -105.7 dBm | 100 kHz | This is not applicable to IAB-DU and IAB-MT operating in Band n77 or n78 |
| E-UTRA Band 23 | 2000 – 2020 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 24 | 1626.5 – 1660.5 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band XXV or  E-UTRA Band 25 or NR Band n25 | 1850 – 1915 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA FDD Band XXVI or  E-UTRA Band 26 or NR Band n26 | 814 – 849 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 27 | 807 – 824 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 28 or NR Band n28 | 703 – 748 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 30 or NR Band n30 | 2305 – 2315 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 31 | 452.5 – 457.5 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA TDD Band a) or E-UTRA Band 33 | 1900 – 1920 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA TDD Band a) or E-UTRA Band 34 or NR band n34 | 2010 – 2025 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA TDD Band b) or E-UTRA Band 35 | 1850 – 1910 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA TDD Band b) or E-UTRA Band 36 | 1930 – 1990 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA TDD Band c) or E-UTRA Band 37 | 1910 – 1930 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA TDD Band d) or E-UTRA Band 38 or NR Band n38 | 2570 – 2620 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA TDD Band f) or E-UTRA Band 39 or NR band n39 | 1880 – 1920MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| UTRA TDD Band e) or E-UTRA Band 40 or NR Band n40 | 2300 – 2400MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 41 or NR Band n41, n90 | 2496 – 2690 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz | This is not applicable to IAB-DU and IAB-MT operating in Band n41 |
| E-UTRA Band 42 | 3400 – 3600 MHz | -113.7 dBm | -108.7 dBm | -105.7 dBm | 100 kHz | This is not applicable to IAB-DU and IAB-MT operating in Band n77 or n78 |
| E-UTRA Band 43 | 3600 – 3800 MHz | -113.7 dBm | -108.7 dBm | -105.7 dBm | 100 kHz | This is not applicable to IAB-DU and IAB-MT operating in Band n77 or n78 |
| E-UTRA Band 44 | 703 – 803 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 45 | 1447 – 1467 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 46 or NR Band n46 | 5150 – 5925 MHz | N/A | -108.6 dBm | -105.6 dBm | 100 kHz |  |
| E-UTRA Band 48 or NR Band n48 | 3550 – 3700 MHz | -113.7 dBm | -108.7 dBm | -105.7 dBm | 100 kHz | This is not applicable to IAB-DU and IAB-MT operating in Band n77 or n78 |
| E-UTRA Band 50 or NR Band n50 | 1432 – 1517 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 51 or NR Band n51 | 1427 – 1432 MHz | N/A | N/A | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 53 or NR Band n53 | 2483.5 – 2495 MHz | N/A | -108.9 dBm | -105.9 dBm | 100 kHz | This is not applicable to IAB-DU and IAB-MT operating in Band n41 |
| E-UTRA Band 65 or NR Band n65 | 1920 – 2010 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 66 or NR Band n66 | 1710 – 1780 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 68 | 698 – 728 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 70 or NR Band n70 | 1695 – 1710 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 71 or NR Band n71 | 663 – 698 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 72 | 451 – 456 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 74 or NR Band n74 | 1427 – 1470 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n77 | 3.3 – 4.2 GHz | -113.7 dBm | -108.7 dBm | -105.7 dBm | 100 kHz | This is not applicable to IAB-DU and IAB-MT operating in Band n77 or n78 |
| NR Band n78 | 3.3 – 3.8 GHz | -113.7 dBm | -108.7 dBm | -105.7 dBm | 100 kHz | This is not applicable to IAB-DU and IAB-MT operating in Band n77 or n78 |
| NR Band n79 | 4.4 – 5.0 GHz | -113.6 dBm | -108.6 dBm | -105.6 dBm | 100 kHz | This is not applicable to IAB-DU and IAB-MT operating in Band n79 |
| NR Band n80 | 1710 – 1785 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n81 | 880 – 915 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n82 | 832 – 862 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n83 | 703 – 748 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n84 | 1920 – 1980 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| E-UTRA Band 85 or NR Band n85 | 698 – 716 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n86 | 1710 – 1780 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n89 | 824 – 849 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n91 | 832 – 862 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n92 | 832 – 862 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n93 | 880 – 915 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n94 | 880 – 915 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n95 | 2010 – 2025 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n96 | 5925 – 7125 MHz | N/A | -107.6 dBm | -104.6 dBm | 100 kHz |  |
| NR Band n97 | 2300 – 2400MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n98 | 1880 – 1920 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n99 | 1626.5 – 1660.5 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR band n101 | 1900 - 1910 MHz | -113.9 dBm | NA | NA | 100 kHz |  |
| NR Band n102 | 6425 – 7125 MHz | N/A | -107.6 dBm | -104.6 dBm | 100 kHz |  |
| E-UTRA Band 103 | 787 – 788 MHz | -113.9 dBm | -108.9 dBm | -105.9 dBm | 100 kHz |  |
| NR Band n104 | 6425 – 7125 MHz | -112.6 dBm | -107.6 dBm | -104.6 dBm | 100 kHz |  |

NOTE 1: As defined in the scope for spurious emissions in this clause, the co-location requirements in table 6.6.5.2.3-1 do not apply for the frequency range extending ΔfOBUE immediately outside the transmit frequency range of a IAB-MT and IAB-DU. The current state-of-the-art technology does not allow a single generic solution for co-location with other system on adjacent frequencies for 30dB antenna to antenna minimum coupling loss. However, there are certain site-engineering solutions that can be used. These techniques are addressed in TR 25.942 [15].

NOTE 2: Table 6.6.5.2.3-1 assumes that two operating bands, where the corresponding transmit and receive frequency ranges in table 5.2-1 would be overlapping, are not deployed in the same geographical area. For such a case of operation with overlapping frequency arrangements in the same geographical area, special co-location requirements may apply that are not covered by the 3GPP specifications.

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