**3GPP TSG-RAN4 Meeting # 97-e  *R4-2017473***

**Electronic Meeting, 2nd – 13th Nov, 2020**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.809** | **CR** | **0001** | **rev** | **1** | **Current version:** | **16.0.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Correction CR on TR38.809 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Samsung | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_IAB-Core | | | | |  | ***Date:*** | | | 2020-10-22 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | There are sub-clauses voided in version submitted to RAN#89e which can be cleanup in Nov meeting according to guidance shared in RAN4 reflector. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Update the voided subcluases，which is empty due to no input，with RAN4 agreement.  Incorperate draft CR endorsed during RAN4#97e as below:  R4-2016259 CR on general requirements in TR 38.809  R4-2016260 CR on System parameters  R4-2016264 CR on Tx Power related requirements chapter  R4-2016265 CR on unwanted emission requirements chapter  R4-2016262 CR on Sensitivity and dynamic range related requirements chapter  R4-2016261 CR on Inband selectivity and blocking requirements chapter  R4-2016028 DraftCR for TR38.809: IAB RRM general  R4-2017477 Draft CR to TS 38.809: Transmitted signal quality maintainance  R4-2017478 CR on Tx signal quality related requirements chapter | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Necessary content will be absent in this TR even though there are related RAN4 agreement | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.5, 5.3, 7.3.1, 7.5, 8.2.2, 8.4, 8.5, 9.3 9.4,9.6, 9.7, 10.3.2, 10.5.2, 10.6 and 11 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | This is revision of R4-2014752 to include more draft CRs endorsed during meeting. | | | | | | | | |

**<Start of changes>**

## 4.5 IAB architecture

The logical architecture (considering the RF interfaces) of the IAB is as follows:



Figure 4.5-1: Logical IAB functions showing RF interfaces

In the RF specification these logical functions have been separated into the HW entities the IAB-DU and the IAB-MT. The HW entities may be implemented in the same radio hardware as shown in Figure 4.5-2 or separate radio hardware as shown in Figure 4.5-3, the diagrams show the OTA architecture but the same applies for the hybrid architecture.



Figure 4.5-2: Shared IAB hardware



Figure 4.5-3: Separate IAB hardware

The figures show the hardware as either completely shared or completely separate, there are of course many levels of possible integration in between these 2 extremes.

When considering the OTA architecture and specifications the nature of HW is not relevant as the node can be treated as a black box, however in deriving the requirements for the IAB nodes it is important to consider both implementations so that both can be implemented if required.

**<Unchanged sub-clause skipped>**

## 5.3 Channel bandwidth

Channel bandwidth covers definitions on the transmission bandwidth configuration, minimum guard band, RB alignment and channel bandwidth per operating band. For the transmission bandwidth configuration and minimum guard band, existing NR definition for BS and UE for each frequency range is the same. And they should be applied for IAB as it is. For RB alignment the IAB-DU should follow NR BS definition, And IAB-MT should follow NR UE definition. Regarding Channel bandwidth per operating band, it is agreed to incorporate only the bands and associated channel bandwidth to be supported for IAB in IAB specification.

**<Unchange part skipped>**

### 7.3.1 Power control

The power control requirements are not defined to the wide area IAB-MT, as the tolerances for power control are large compared to the minimum requirement for dynamic range.

For the local area IAB-MT, the absolute power tolerance was not defined as the dynamic range defined for the local area IAB-MT is not large enough compared to the tolerance value from UE requirement.

For local area IAB-MT, the relative and aggregate power tolerance requirements are taken into use with the requirement values to be modified compared to the UE specification.

**<Unchange part skipped>**

## 7.5 Transmitted signal quality

### 7.5.1 IAB-DU transmitted signal quality

As the IAB-DU behavior is very similar with BS, all of the transmitted signal quality requirements can be imported from BS. Therefore, the frequency error, modulation quality and time alignment error requirements in clause 6.5.1, 6.5.2, 6.5.3 for BS type 1-H in TS 38.104 [2] apply to IAB-DU type 1-H.

### 7.5.2 IAB-MT transmitted signal quality

#### 7.5.2.1 Frequency error

As IAB-MT function is more like a UE, UE frequency error correction can be a reference. When BS transmits DL signal to UE, UE does frequency error correction algorithm to make sure UE follows BS with a relative low residual frequency error.The residual frequency error after compensation should be less than one percent of the subcarrier interval.

If 15KHz SCS is used, one percent is 150 Hz which is 0.1 ppm for 1.5 GHz and less than 0.1 ppm of the higher carrier frequency. For higher modulation such as 256 QAM, the residual frequency error should be much smaller. Therefore, in order to support high modulation, UE frequency offset correction algorithm should make the residual frequency error less than +/- 0.1ppm. The UE frequency offset correction algorithm follows BS carrier frequency through DL signals that's why the UE frequency error should be defined as relative frequency error not absolute frequency error.

When IAB-MT receives IAB-DU DL signal, the similar frequency error correction algorithmmay be used to make high modulation support possible.

Therefore, IAB-MT frequency error requirement is defined to reuse UE requirements as ± 0.1 PPM compared to the carrier frequency received from the parent node

#### 7.5.2.2 Error Vector Magnitude

EVM performance is the SNR performance of the transmitted signal. In order to have the same link performance, IAB-MT output signal quality should have the same performance as UE then guarantee the link quality. UE requirements are reused by IAB-MT EVM requirements. The difference is that BPSK EVM requirement is removed considering BPSK modulation is not likely to be used by the backhaul link. As IAB-MT is part of IAB node which is a network node, the principle of EVM frame structure for IAB-MT measurement can reuse BS EVM frame structure.

**<Unchange part skipped>**

### 8.2.2 IAB-MT Reference sensitivity

The IAB-MT uses similar assumptions for antenna architecture and gain as the IAB-DU, it is also assumed that the front end HW is similar and has the same NF.

As such the IAB-MT reference sensitivity will be derived using the same assumptions as the BS. The IAB-MT sensitivity is given by:



Where:

- BW is the maximum transmission bandwidth for the FRC

- NF is the noise figure

- IM is the implementation margin.

- SNR is the SNR value for which we reach 95% throughput. Each company provided simulation results, and average will be done for each BW.

The NF and the IM margin are hardware dependent and taken from the BS:

NF = 5dB for wide area IAB-MT and 13dB for local area IAB-MT

IM is 2dB

As the IAB-MT operated on the DL the FRC's and the associated SNR requirements could be based on the UE FRCs. There are many more FRC's for the UE for each of the channel BW's however it is sufficient to specify a limited number of FRC's in the same way as the BS. For each BS FRC there is a UE FRC of the same transmission BW and hence these can be used for the IAB-MT as shown in table 8.2.2-1.

The UE FRC definition is more complex than the BS and includes some parameters which require communication between eth UE and the BS test emulator. The method for conformance for the IAB-MT has not yet been agreed and hence the definition of the FRC is simplified in order to avoid any test implications. As such we keep the MCS, PRB allocation, SCS and CHBW information in FRC for core requirements; further discuss other detailed parameters in conformance phase

In addition for the current IAB FR1 bands only TDD are specified so there is no need for 15 kHz SCS at this release.

Table 8.2.2-1: FRC's for the FR1 IAB-MT

|  |  |
| --- | --- |
| BS Reference channel | equivalent UE reference channel (TS 38.101-1 [3], Annex A3.3) |
| G-FR1-A1-2 | Table A.3.3.2-2, 5MHz CBW |
| G-FR1-A1-3 | Table A.3.3.2-3, 10MHz CBW |
| G-FR1-A1-5 | Table A.3.3.2-2, 20MHz CBW |
| G-FR1-A1-6 | Table A.3.3.2-3, 20MHz CBW |

The SNR for the BS varies between -0.8dB to -1.2dB for each of the BS FRC's, however the UE uses a figure of -1dB for all FRC's. As the SNR is dependent on the modulation the UE figure is used.

Applying these number to the equation gives:

Table 8.2.2-2: NR Wide Area IAB-MT reference sensitivity levels

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| IAB-MT channel bandwidth (MHz) | Sub-carrier spacing (kHz) | Reference measurement channel  Ref TS 38.101-1 [3] Annex A | signal BW | IM | SNR | NF | IAB-MT reference sensitivity power level |
|  |  |  | MHz | dB | dB | dB | dBm |
| 10, 15 | 30 | Table A.3.3.2-2, 5MHz CBW | 3.96 | 2 | -1 | 5 | -102.0 |
| 10, 15 | 60 | Table A.3.3.2-3, 10MHz CBW | 7.92 | 2 | -1 | 5 | -99.0 |
| 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 | 30 | Table A.3.3.2-2, 20MHz CBW | 18.36 | 2 | -1 | 5 | -95.4 |
| 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 | 60 | Table A.3.3.2-3, 20MHz CBW | 17.28 | 2 | -1 | 5 | -95.6 |

Table 8.2.2-3: NR Local Area IAB-MT reference sensitivity levels

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| IAB-MT channel bandwidth (MHz) | Sub-carrier spacing (kHz) | Reference measurement channel  Ref TS 38.101-1 [3] Annex A | signal BW | IM | SNR | NF | IAB-MT reference sensitivity power level |
|  |  |  | MHz | dB | dB | dB | dBm |
| 10, 15 | 30 | Table A.3.3.2-2, 5MHz CBW | 3.96 | 2 | -1 | 13 | -94.0 |
| 10, 15 | 60 | Table A.3.3.2-3, 10MHz CBW | 8.92 | 2 | -1 | 13 | -91.0 |
| 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 | 30 | Table A.3.3.2-2, 20MHz CBW | 18.36 | 2 | -1 | 13 | -87.4 |
| 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 | 60 | Table A.3.3.2-3, 20MHz CBW | 17.28 | 2 | -1 | 13 | -87.6 |

The simplified FRCs are defined as follows:

Table 8.2.2-4: FRC parameters for FR1 reference sensitivity level for IAB-MT.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Reference channel | G-FR1-A1-22 | G-FR1-A1-23 | G-FR1-A1-25 | G-FR1-A1-26 |
| Subcarrier spacing (kHz) | 30 | 60 | 30 | 60 |
| Allocated resource blocks | 11 | 11 | 51 | 24 |
| CP-OFDM Symbols per slot (Note 1) | 9 | 9 | 9 | 9 |
| Modulation | QPSK | QPSK | QPSK | QPSK |
| Code rate (Note 2) | 1/3 | 1/3 | 1/3 | 1/3 |
| NOTE 1: *DL-DMRS-config-type* = 1 with *DL-DMRS-max-len* = 1, *DL-DMRS-add-pos* = pos2 with = 2, = 6 and 9 as per Table 7.4.1.1.2-3 of TS 38.211 [3].  NOTE 2: MCS index 4 and target coding rate = 308/1024 are adopted to calculate payload size for receiver sensitivity | | | | |

**<Unchange part skipped>**

## 8.4 In-band selectivity and blocking

For IAB-MT it is agreed to reuse gNB requirement with update on interfering signal type as CP-OFDM.

## 8.5 Out-of-band blocking

Considereing the deployment scenario of IAB node, it is agreed to reuse the same gNB requirement for both IAB-MT and IAB-DU.

**<Unchange part skipped>**

## 9.3 IAB OTA output power

IAB OTA output power is a TRP requirement, defined for a RIB. For IAB-MT and IAB-DU type 1-O, the TRP limits are different for each class. IAB-DU type 1-O limits were defined to be the same as for NR BS. For local area IAB-MT, due to no minimum required number of transmitters, the rated carrier TRP limits can be scaled from 24 dBm to 33 dBm, depending on the number of active transmitter units. No upper limit for OTA output power is specified for wide area IAB-MT and IAB-DU.

For IAB-MT and IAB-DU type 2-O no absolute power limits are associated with IAB OTA output power requirements and only accuracy requirement towards to declared value is specified.

## 9.4 OTA output power dynamics

For IAB-MT to enable the adjustment UL transmission power to maintain proper link level, it is agreed to define 5dB power dynamaic range for Wide Area IAB-MT without corresponding power control requirement. And for Local Area IAB-MT the power dynamic range is agreed as 10dB with relative and aggregated power tolerance defined as stated in 7.3.1.

**<Unchange part skipped>**

## 9.6 OTA transmitted signal quality

### 9.6.1 IAB-DU OTA transmitted signal quality

As the IAB-DU behavior is very similar with BS, all of the transmitted signal quality requirements can be imported from BS. Therefore, the frequency error, modulation quality and time alignment error requirements in clause 9.6.1, 9.6.2 and 9.6.3 for BS type 1-O and type 2-O in TS 38.104 [2] apply to IAB-DU type 1-O and type 2-O respectively.

### 9.6.2 IAB-MT OTA transmitted signal quality

#### 9.6.2.1 Frequency error

IAB-MT OTA transmitted signal quality requirement analysis is the same as the conducted requirements in 7.5.2.1. The IAB-MT frequency must be within a certain error limit relative to of the parent node's center frequency. . IAB-MT type 1-O and type 2-O OTA frequency error reuses UE requirements to be +/-0.1 PPM relative to received signal from parent node.

#### 9.6.2.2 Error Vector Magnitude

IAB-MT OTA EVM requirement analysis is the same as the conducted requirement in 7.5.2.2. IAB-MT type1-O EVM requirements should be the same with conducted requirements. IAB-MT type2-O EVM requirement reuses UE FR2 EVM requirements with the exception that BPSK requirement is removed. As IAB-MT is part of IAB node which is a network node, the principle of EVM frame structure for IAB-MT measurement can reuse BS EVM frame structure.

**<Unchange part skipped>**

## 9.7 OTA unwanted emissions

OTA Unwanted emissions cover the definitions and requirements for OOB boundary, occupied bandwidth, ACLR including also absolute ACLR, OBUE, and spurious emissions.

For IAB-DU all unwanted emissions requirements, except for the protection of the BS receiver of own or different BS, are the same as specified for NR BS. The background for these requirements can be found from TR 38.817-02 [7]. The requirement for the own or other receiver is not specified, as for NR BS the requirement applies only for FDD operation and no FDD band is defined for IAB.

Wide area IAB-MT requirements were agreed to be the same as defined for wide area IAB-DU both in FR1 and FR2. In FR1 also local area IAB-MT requirements were agreed to be the same as defined for local area IAB-DU but in FR2 it was agreed that 24 dBc ACLR is sufficient, otherwise requirements for local area IAB-MT were agreed to be the same as defined for local area IAB-DU. It is agreed that when type 2-O local area IAB-MT transmit during DL time slot, the ACLR requirement will be the same as local area IAB-DU.

**<Unchange part skipped>**

### 10.3.2 IAB-MT OTA reference sensitivity

#### 10.3.2.1 FR1

The IAB-MT antenna and front end is similar to that of a BS so the OTA reference sensitivity requirements will be based upon the same assumptions as the BS. As with the other IAB-MT sensitivity requirements however the FRC's and the associated SNR requirement will be taken from the UE. The UE FRC's will be of the same signal BW as the associated BS FRC's for the requirement.

The FR1 OTA reference sensitivity level is calculated based on the required equivalent passive antenna gain if a receiver were to meet the conducted reference sensitivity requirements and cover a declared OTA reference sensitivity RoAoA (see TS 38.141-2 [6]).

The FR1 IAB-MT reference sensitivity therefore uses the same set of declarations as the BS, however the calculation is modified to correspond to the DL FRC's and their associated SNR values. The OTA reference sensitivities are hence offset from the conducted reference sensitivity values given in tables 8.2.2-1 and 8.2.2-2 as shown in tables 10.3.2.1-1 and 10.3.2.1-2.

Table 10.3.2-1: Wide Area IAB-MT reference sensitivity levels

|  |  |  |  |
| --- | --- | --- | --- |
| BS channel bandwidth (MHz) | Sub-carrier spacing (kHz) | Reference measurement channel  Ref TS 38.101-1 [3] Annex A | OTA reference sensitivity level, EISREFSENS  (dBm) |
| 10, 15 | 30 | Table A.3.3.2-2, 5MHz CBW | -102.0 – ΔOTAREFSENS |
| 10, 15 | 60 | Table A.3.3.2-3, 10MHz CBW | -99.0 – ΔOTAREFSENS |
| 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 | 30 | Table A.3.3.2-2, 20MHz CBW | -95.4 – ΔOTAREFSENS |
| 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 | 60 | Table A.3.3.2-3, 20MHz CBW | -95.6 – ΔOTAREFSENS |

Table 10.3.2-2: Local Area IAB-MT reference sensitivity levels

|  |  |  |  |
| --- | --- | --- | --- |
| BS channel bandwidth (MHz) | Sub-carrier spacing (kHz) | Reference measurement channel  Ref TS 38.101-1 [3] Annex A | OTA reference sensitivity level, EISREFSENS  (dBm) |
| 10, 15 | 30 | Table A.3.3.2-2, 5MHz CBW | -94.0 – ΔOTAREFSENS |
| 10, 15 | 60 | Table A.3.3.2-3, 10MHz CBW | -91.0 – ΔOTAREFSENS |
| 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 | 30 | Table A.3.3.2-2, 20MHz CBW | -87.4 – ΔOTAREFSENS |
| 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 | 60 | Table A.3.3.2-3, 20MHz CBW | -87.6 – ΔOTAREFSENS |

The FRCs are the same as those defined for conducted reference sensitivity in clause 8.2.2.

#### 10.3.2.2 FR2

The FR2 IAB-MT antenna and front end is similar to that of a BS so the OTA reference sensitivity requirements will be based upon the same assumptions as the BS.The BS FR2 OTA reference sensitivity level is based on a declared EIS value within a specified range, the range is calculated based on the useful range of antenna gains expected for the BS class. And is calculated as follows:

Hence for a wide area BS



Where: BW is the noise BW of the FRC, NF is the noise figure, IM is implantation margin not related to antenna array, SNR is the required SNR for demodulation and G is the antenna gain and RF losses.

The expected gain range is the same as the BS, however as there is no medium range IAB-MT the local area gain range is expanded to cover the medium range also:

Table 10.3.2.2-1: G assumptions for calculating FR2 WA and LA OTA REFSENS range

|  |  |  |
| --- | --- | --- |
| IAB-MT class | G | |
|  | 30 GHz  (24.25 – 33.4 GHz) | 45GHz  (37 – 52.6 GHz) |
| WA | 10 to 33 dBi | 12 to 35 dBi |
| LA | 0 to 28 dBi | 2 to 30 dBi |

The FRC's and the associated SNR values are also based on the DL values used for the UE. There are UE FRC's defined which have the same signal BW as the BS FRC's as shown un table 10.3.2.2-2

Table 10.3.2.2-2 FR2 equivalent IAB-MT FRC's

|  |  |
| --- | --- |
| BS Reference channel | equivalent UE reference channel (TS 38.101-2[4], Annex A3.3) |
| G-FR2-A1-1 | Table A.3.3.2-1, 50MHz CBW |
| G-FR2-A1-2 | Table A.3.3.2-2, 50MHz CBW |
| G-FR2-A1-3 | Table A.3.3.2-3, 100MHz CBW |

The SNR for the BS FRCs range from -1.1 to -1.2 dB , the UE SNR assumption is -1dB, however as the declaration ranges and declared values are rounded to integer values this makes no difference to the final range. As such the FR2 IAB-MT range is the same as the BS, as follows:

For Wide Area IAB-MT, EISREFSENS\_50M is an integer value in the range -96 to -119 dBm. The specific value is declared by the vendor.

For Local Area IAB-MT, EISREFSENS\_50M is an integer value in the range -86 to -114 dBm. The specific value is declared by the vendor.

The FR2 IAB-MT FRC definitions in the core specification in a similar way to the FR1 RFCs as explained in clause 8.2.2. The simplified FR2 FRCs are defined as follows:

Table 10.3.2.2-3: FRC parameters for FR2 reference sensitivity level for IAB-MT.

|  |  |  |  |
| --- | --- | --- | --- |
| Reference channel | G-FR2-A1-21 | G-FR2-A1-22 | G-FR2-A1-23 |
| Subcarrier spacing (kHz) | 60 | 120 | 120 |
| Allocated resource blocks | 66 | 32 | 66 |
| CP-OFDM Symbols per slot (Note 1) | 9 | 9 | 9 |
| Modulation | QPSK | QPSK | QPSK |
| Code rate (Note 2) | 1/3 | 1/3 | 1/3 |
| NOTE 1: DM-RS configuration type = 1 with DM-RS duration = single-symbol DM-RS, additional DM-RS position = pos2 with *l0* = 2, *l* = 6 and 9 as per Table 7.4.1.1.2-3 of TS 38.211 [3].  NOTE 2: MCS index 4 and target coding rate = 308/1024 are adopted to calculate payload size. | | | |  |

**<Unchange part skipped>**

### 10.5.2 In-band blocking for IAB-MT

Traditionally for UTRA the in-band blocker is set according to the 99.99% probability of interferer cdf curve. It is recommended in [7] that between 99% and 99.9% could be considered due to the NR OFDMA scheme does not suffer greatly as for WCDMA.

As the interfere level to IAB-MT receiver relates to the distance between victim IAB and aggressor BS, coexisting simulation is done assuming the 40m, 50m , 60m and 80m and companies result is captured in Table 10.5.2-1.

Table 10.5.2-1: Coexisting simulation result for In-band blocking level comparison

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Company | Blocker level @99 Percentile point  (dBm) | Blocker level @ 99.9 perncentile point  (dBm) | Physical distance to Agressor BS  (m) | Simulation scenario  (Acc. To R4-1907825) | RAN4 contribution |
| Ericsson | -67.5 | -65.5 | 40 | Layout 2 for FR2 | R4-2001873 |
|  | -75 | -66 | 50 |  |  |
|  | -81 | -75 | 60 |  |  |
|  | -55 | -48 | 40 | Layout 2 for FR1 |  |
| Nokia | -52 | -45 | 40 | Layout 2 for FR2 | R4-2001432 |
|  | -55 | -54 | Max grid shift |  |  |
| QUALCOMM incorporation | -45 |  | 40 | Layout 2 for FR2 | R4-2001282 |
|  | -49 |  | 60 |  |  |
|  | -53 |  | 80 |  |  |
| Huawei | -64 |  | 40 | Layout 2 for FR2 (element OTA result) | R4-1914757 |
|  | -69 |  | 60 |  |  |
| ZTE | -42 |  | 40 | Layout 2 for FR1(element OTA result) | R4-2000977 |

It is concluded from the coexisting simulation results in Table 10.5.2-1 that IAB-MT can reuse the OTA BS blocking requirement with CP-OFDM interferer signal. Therefore, the inband blocking level for wide area IAB-MT of type 2-O is specified with 33 dB higher than OTA REFSENS power level with inteferer signal of CP-OFDM waveform. The inband blocking level for local area IAB-MT of type 2-O is specified with 35.5 dB higher than OTA REFSENS power level with inteferer signal of CP-OFDM waveform for bands n257, n258, n261. The inband blocking level for local area IAB-MT of type 2-O is specified with 34.5 dB higher than OTA REFSENS power level with CP-OFDM waveform of inteferer signal for bands n260.

**<Unchange part skipped>**

## 10.6 OTA Out-of-band blocking

Considereing the deployment scenario of IAB node, it is agreed to reuse the same gNB requirement for both IAB-MT and IAB-DU.

**<Unchange part skipped>**

# 11 IAB RRM requirements

## 11.1 General

In Rel-16, the WI on IAB is considered for physically fixed deployment only. In light of the characteristic of Rel-16 IAB (e.g. fixed operation) and the differences between UE and IAB-MT (e.g. power saving consideration and seeking for higher throughput), selected RRM requirements in TS 38.133 are considered fundamentals and defined for Rel-16 IAB. Based on this background the RRM requirements defined for Rel-16 IAB are agreed as table 11-1.

Table 11-1: Summary on RRM requirement applicability for IAB-MT

|  |  |  |  |
| --- | --- | --- | --- |
| **Requirement** | **Items** | **Comments** | **Applicability** |
| RRC Connection Mobility Control | * RRC re-establishment * Random access * RRC release with redirection | To make sure IAB can remain RRC connection after link failure with original parent node. | Apply for both Local Area and Wide Area IAB-MT. |
| Radio Link Monitoring | * Requirements for radio link monitoring | Feature to maintain PCell’s MT link with parent node. | Apply for Local Area IAB-MT only.  Requirements are defined for no-DRX only. |
| Link Recovery Procedures | * Requirements for beam failure detection * Requirements for candidate beam detection | Feature to maintain PCell’s MT beam management with parent node. | Apply for Local Area IAB-MT only.  Requirements are defined for no-DRX only. |
| MT Timing related requirements | * MT transmit timing * Timing Advance | The same as UE related requirement which is reused for IAB-MT | Apply for both Local Area and Wide Area IAB-MT. |
| DU Timing related requirements | * Cell phase synchronization accuracy | Reuse the requirement 3 µs in TS38.133 | Apply for IAB-DU. |

For other UE or BS RRM requirements in TS38.133, including handover, interruptions, (de)activation delay, addition/release delay, active BWP switching, measurement related requirements and so forth, are not defined or not decided for IAB in Rel-16 due to various reasons such as fixed IAB operation where the link remains comparatively stable for longer periods of time. The requirements which are not defined not necessarily indicate the corresponding features are not supported by IAB.

**<End of changes>**