**3GPP TSG-WG4 Meeting #111  *R4-2409979***

**Fukuoka, Japan, May 20 - May 24, 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.176-2** | **CR** | **Draft** | **rev** | **1** | **Current version:** | **18.4.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **x** | Core Network |  |

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| ***Title:*** | Draft CR to 38.176-2 on mIAB-MT Radiated Performance Requirements | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_mobile\_IAB-Perf | | | | |  | ***Date:*** | | | 2024-05-23 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Introdcue new mIAB-MT related radiated performance requirements | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Introduced new PDSCH, PDCCH, CSI reporting (Wideband CQI, and sub-band CQI) test cases, and a comment on PBCH requirements. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | mIAB-MT test coverage will not be sufficeint. There will be inconsistincies in between specification and RAN4 agreements. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 8.2.2.2, 8.2.2.2.3, 8.2.3, 8.2.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | |  | | |
| ***affected:*** | |  | **x** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Revision of R4-2408661. | | | | | | | | |

## <Start of Change #1>

##### 8.2.2.2.5B Test requirements for mobile IAB

8.2.2.2.5B.1 Test requirement for mobile *IAB type 1-O*

The throughput shall be equal to or larger than the fraction of maximum throughput for the FRCs stated in Tables 8.2.2.2.5B.1-1 at the given SNR with the test parameters stated in Table 8.2.2.2.4.2-1.

Table 8.2.2.2.5B.1-1: Minimum requirements for PDSCH Type A with Rank 1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Test number** | **FRC (Annex A)** | **Bandwidth (MHz) / Subcarrier spacing (kHz)** | **Propagation conditions (Annex J)** | **Antenna configuration** | **Fraction of maximum throughput (%)** | **SNR**  **(dB)** |
| 1-1 | M-FR1-A.3.1-1 | 40/30 | TDLA300-100 | 2x2, ULA Low | 30 | 2.6 |
| 1-2 | M-FR1-A.x.x-x | 40/30 | TDLB100-400 | 2x2, ULA Low | 70 | 0.0 |

8.2.2.2.5B.2 Test requirement for mobile *IAB type 2-O*

The throughput shall be equal to or larger than the fraction of maximum throughput for the FRCs stated in Tables 8.2.2.2.5B.2-1 and 8.2.2.2.5B.2-2 at the given SNR with the test parameters stated in Table 8.2.2.2.4.2-1.

Table 8.2.2.2.5B.2-1: Minimum requirements for PDSCH Type A with Rank 1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Test number** | **FRC (Annex A)** | **Bandwidth (MHz) / Subcarrier spacing (kHz)** | **Propagation conditions (Annex J)** | **Antenna configuration** | **Fraction of maximum throughput (%)** | **SNR**  **(dB)** |
| 1-1 | M-FR2-A.3.2-1 | 100/120 | TDLA30-300 | 2x2, XPL Medium | 70 | 14.2 |

Table 8.2.2.2.5B.2-2: Minimum requirements for PDSCH Type A with Rank 2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Test number** | **FRC (Annex A)** | **Bandwidth (MHz) / Subcarrier spacing (kHz)** | **Propagation conditions (Annex J)** | **Antenna configuration** | **Fraction of maximum throughput (%)** | **SNR**  **(dB)** |
| 2-1 | M-FR2-A.3.1-2 | 100/120 | TDLA30-300 | 2x2, ULA Low | 70 | 16.4 |

## <End Change #1>

## <Start of Change #2>

##### 8.2.2.3.5B Test requirements for mobile IAB

8.2.2.3.5B.1 Test requirement for mobile *IAB type 1-O*

The Pm-dsg shall be equal to or smaller than 1%, for the cases stated in Table 8.2.2.3.5B.1-1 at the given SNR with the test parameters stated in Table 8.2.2.3.4.2-1.

Table 8.2.2.3.5B.1-1: Minimum requirements for PDCCH

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Test number** | **Bandwidth (MHz) / Subcarrier spacing (kHz)** | **CORESET RB** | **CORESET duration** | **Aggregation level** | **FRC (Annex A)** | **Propagation conditions (Annex J)** | **Antenna configuration** | **Pm-dsg (%)** | **SNR**  **(dB)** |
| 1 | 40/30 | 102 | 1 | 4 | M-FR1-A.3.4-2 | TDLA300-100 | 1x2, ULA Low | 1 | 3.9 |
| 2 | 40/30 | 90 | 1 | 8 | M-FR1-A.3.4-3 | TDLA300-100 | 2x2, ULA Low | 1 | -0.3 |

8.2.2.3.5B.2 Test requirement for *mIAB type 2-O*

The Pm-dsg shall be equal to or smaller than 1%, for the cases stated in Table 8.2.2.3.5B.2-1 at the given SNR with the test parameters stated in Table 8.2.2.3.4.2-1.

Table 8.2.2.3.5B.2-1: Minimum requirements for PDCCH

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Test number** | **Bandwidth (MHz) / Subcarrier spacing (kHz)** | **CORESET RB** | **CORESET duration** | **Aggregation level** | **FRC (Annex A)** | **Propagation conditions (Annex J)** | **Antenna configuration** | **Pm-dsg (%)** | **SNR**  **(dB)** |
| 1 | 100/120 | 60 | 1 | 4 | M-FR2-A.3.4-2 | TDLA30-300 | 1x2, ULA Low | 1 | 4.7 |

## <End Change #2>

## <Start of Change #3>

#### 8.2.3.2B Reporting of Channel Quality Indicator (CQI) under fading conditions for mobile IAB

##### 8.2.3.2B.1 Reporting of wideband Channel Quality Indicator (CQI) under fading conditions for mobile IAB

###### 8.2.3.2B.1.1 Definition and applicability

The purpose of the test is to verify that the mAIB-MT is tracking the channel variations and selecting the largest transport format possible according to the prevailing channel state for the frequency non-selective scheduling.

The reporting accuracy of CQI under frequency non-selective fading conditions is determined by the reporting variance, the relative increase of the throughput obtained when the transport format is indicated by the reported CQI compared to the throughput obtained when a fixed transport format is configured according to the reported median CQI, and a minimum BLER using the transport formats indicated by the reported CQI. To account for sensitivity of the input SNR the reporting definition is considered to be verified if the reporting accuracy is met for at least one of two SNR levels separated by an offset of 1 dB.

###### 8.2.3.2B.1.2 Minimum requirement

The minimum requirement for *mIAB-MT type 1-O* is in TS 38.174 [2] clause 11.2.3B.1.2

The minimum requirement for *mIAB-MT type 2-O* is in TS 38.174 [2] clause 11.2.3B.2.2.

###### 8.2.3.2B.1.3 Test purpose

To verify the variance of the wideband CQI reports is within the limits defined, that the ratio of the throughput is within the limits defined and that the average PDSCH BLER is greater than or equal to 1% for the indicated transport format.

###### 8.2.3.2B.1.4 Method of test

8.2.3.2B.1.4.1 Initial conditions

Test environment: Normal, see annex B.2.

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

RF channels to be tested for carrier aggregation: MBW Channel CA; see clause 4.9.1.

Direction to be tested: OTA REFSENS *receiver target reference direction* (see D.54 in table 4.6-1).

8.2.3.2B.1.4.2 Procedure

1) Place the mIAB-MT with its manufacturer declared coordinate system reference point in the same place as calibrated point in the test system, as shown in annex E.3.

2) Align the manufacturer declared coordinate system orientation of the mIAB-MT with the test system.

3) Set the mIAB-MT in the declared direction to be tested.

4) Connect the mIAB-MT tester generating the wanted signal and AWGN generators to a test antenna via a combining network in OTA test setup, as shown in annex E.3. Each of the demodulation branch signals should be transmitted on one polarization of the test antenna(s).

5) The characteristics of the wanted signal shall be configured according to the corresponding DL reference measurement channel defined in annex A, and according to additional test parameters listed in table 8.2.3.2B.1.4.2-1 or 8.2.3.2B.1.4.2-2.

Table 8.2.3.2B.1.4.2-1: Test parameters for testing CQI reporting requirements for FR1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | | Unit | Test 1 | | Test 2 | |
| Bandwidth | | | MHz | 40 | | | |
| Subcarrier spacing | | | kHz | 30 | | | |
| Duplex Mode | | |  | TDD | | | |
| SNR | | | dB | 8 | 9 | 14 | 15 |
| Propagation channel | | |  | TDLA30-35 | | | |
| Antenna configuration | | |  | 2×2 with static channel specified in Annex J.1 | | | |
| Beamforming Model | | |  | As specified in Annex J.3.1 | | | |
| NZP CSI-RS for CSI acquisition | CSI-RS resource Type | |  | Periodic | | | |
| Number of CSI-RS ports (*X*) | |  | 2 | | | |
| CDM Type | |  | FD-CDM2 | | | |
| Density (ρ) | |  | 1 | | | |
| First subcarrier index in the PRB used for CSI-RS (k0, k1 ) | |  | Row 3,(6,-) | | | |
| First OFDM symbol in the PRB used for CSI-RS (l0) | |  | 13 | | | |
| NZP CSI-RS-timeConfig  periodicity and offset | | slot | 10/1 | | | |
| ReportConfigType | | |  | Periodic | | | |
| CQI-table | | |  | Table 2 | | | |
| reportQuantity | | |  | cri-RI-PMI-CQI | | | |
| cqi-FormatIndicator | | |  | Wideband | | | |
| pmi-FormatIndicator | | |  | Wideband | | | |
| Sub-band Size | | | RB | 16 | | | |
| Csi-ReportingBand | | |  | 1111111 | | | |
| CSI-Report periodicity and offset | | | slot | 10/9 | | | |
| Codebook configuration | | Codebook Type |  | typeI-SinglePanel | | | |
| Codebook Mode |  | 1 | | | |
| (CodebookConfig-N1,CodebookConfig-N2) |  | Not configured | | | |
| CodebookSubsetRestriction |  | 000001 | | | |
| RI Restriction |  | N/A | | | |
| CQI/RI/PMI delay | | | ms | 9.5 | | | |
| Maximum number of HARQ transmission | | |  | 1 | | | |
| Measurement channel | | |  | [As specified in Table A.2.6-1, M-FR1-A.3.5-1] | | | |
| Note 1: The same requirements are applicable for TDD with different UL-DL pattern.  Note 2: SSB, TRS, CSI-RS and/or other unspecified test parameters with respect to TS 38.101-4 [18] are left up to test implementation, if transmitted or needed.  Note 3: If the mIAB-MT reports in an available uplink reporting instance at slot #n based on CQI estimation at a downlink slot not later than slot#(n-4), this reported CQI cannot be applied at the gNB downlink before slot#(n+4). | | | | | | | |

Table 8.2.3.2B.1.4.2-2: Test parameters for testing CQI reporting requirements for FR2

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | | Unit | Test 1 | | Test 2 | |
| Bandwidth | | | MHz | 100 | | | |
| Subcarrier spacing | | | kHz | 120 | | | |
| Duplex Mode | | |  | TDD | | | |
| SNRBB | | | dB | 8 | 9 | 14 | 15 |
| Propagation channel | | |  | TDLA30-35 | | | |
| Antenna configuration | | |  | 2×2 with static channel specified in Annex J.1 | | | |
| Beamforming Model | | |  | As specified in Annex J.3.1 | | | |
| NZP CSI-RS for CSI acquisition | CSI-RS resource Type | |  | Periodic | | | |
| Number of CSI-RS ports (*X*) | |  | 2 | | | |
| CDM Type | |  | fd-CDM2 | | | |
| Density (ρ) | |  | 1 | | | |
| First subcarrier index in the PRB used for CSI-RS (k0, k1 ) | |  | 6 | | | |
| First OFDM symbol in the PRB used for CSI-RS (l0, l1) | |  | 13 | | | |
| NZP CSI-RS-timeConfig  periodicity and offset | | slot | 5/1 | | | |
| ReportConfigType | | |  | Periodic | | | |
| CQI-table | | |  | Table 1 | | | |
| reportQuantity | | |  | cri-RI-PMI-CQI | | | |
| timeRestrictionForChannelMeasurements | | |  | Not configured | | | |
| timeRestrictionForInterferenceMeasurements | | |  | Not configured | | | |
| cqi-FormatIndicator | | |  | Wideband | | | |
| pmi-FormatIndicator | | |  | Wideband | | | |
| Sub-band Size | | | RB | 8 | | | |
| csi-ReportingBand | | |  | 111111111 | | | |
| CSI-Report periodicity and offset | | | slot | 5/4 | | | |
| Codebook configuration | | Codebook Type |  | typeI-SinglePanel | | | |
| Codebook Mode |  | 1 | | | |
| (CodebookConfig-N1,CodebookConfig-N2) |  | Not configured | | | |
| CodebookSubsetRestriction |  | 000001 | | | |
| RI Restriction |  | N/A | | | |
| CQI/RI/PMI delay | | | ms | 1.75 | | | |
| Maximum number of HARQ transmission | | |  | 1 | | | |
| Measurement channel | | |  | [As specified in Table A.2.6-3, M-FR2-A.3.5-2] | | | |
| Note 1: The same requirements are applicable for TDD with different UL-DL pattern.  Note 2: SSB, TRS, CSI-RS and/or other unspecified test parameters with respect to TS 38.101-4 [18] are left up to test implementation, if transmitted or needed.  Note 3: If the mIAB-MT reports in an available uplink reporting instance at slot #n based on CQI estimation at a downlink slot not later than slot#(n-4), this reported CQI cannot be applied at the gNB downlink before slot#(n+4). | | | | | | | |

7) Adjust the test signal mean power so the calibrated radiated SNR value at the mIAB-MT receiver is as specified in clause 8.2.3.2B.1.5.1 and 8.2.3.2B.1.5.2 for *mIAB type 1-O* and *mIAB type 2-O* respectively, and that the SNR at the mIAB-MT receiver is not impacted by the noise floor.

The power level for the transmission may be set such that the AWGN level at the RIB is equal to the AWGN level in table 8.2.3.2B.1.4.2-3.

Table 8.2.3.2B.1.4.2-3: AWGN power level at the mIAB-MT input

|  |  |  |  |
| --- | --- | --- | --- |
| BS type | Sub-carrier spacing (kHz) | Channel bandwidth (MHz) | AWGN power level |
| *mIAB-MT type 1-O* | 30 | 40 | -77.2 - ΔOTAREFSENS dBm / 38.16 MHz |
| *mIAB-MT type 2-O* | 120 | 100 | EISREFSENS\_50M + ΔFR2\_REFSENS + 18 dBm / 95.04 MHz |
| NOTE 1: ΔOTAREFSENS as declared in D.53 in table 4.6-1 and clause 7.1.  NOTE 2: ΔFR2\_REFSENS = -3 dB as described in clause 7.1, since the OTA REFSENS reference direction (as declared in D.54 in table 4.6-1) is used for testing.  NOTE 3: EISREFSENS\_50M as declared in D.28 in table 4.6-1. | | | |

8) For reference channels applicable to the mIAB-MT, measure the median CQI and the BLER at (median CQI +1) and (median CQI -1).

###### 8.2.3.2B.1.5 Test requirement

8.2.3.2B.1.5.1 Test requirement for mobile *IAB type 1-O*

For the parameters specified in Table 8.2.3.2B.1.4.2-1 and using the downlink physical channels specified in Annex A, the minimum requirements are specified by the following:

a) a CQI index not in the set {median CQI -1, median CQI, median CQI +1} shall be reported at least α % of the time, where α% is specified in Table 8.2.3.2B.1.5.1-1;

b) the ratio of the throughput obtained when transmitting the transport format indicated by each reported wideband CQI index and that obtained when transmitting a fixed transport format configured according to the wideband CQI median shall be ≥ γ, where γ is specified in Table 8.2.3.2B.1.5.2-1;

c) when transmitting the transport format indicated by each reported wideband CQI index, the average BLER for the indicated transport formats shall be greater or equal to 0.01.

**Table 8.2.3.2B.1.5.1-1 Wideband CQI reporting requirements for FR1**

|  |  |  |
| --- | --- | --- |
|  | **Test 1** | **Test 2** |
| ** [%] | 2 | 2 |
| ** | 1.05 | 1.05 |

8.2.3.2B.1.5.2 Test requirement for *mobile IAB type 2-O*

For the parameters specified in Table 8.2.3.2B.5.1.2-1 and using the downlink physical channels specified in Annex A, the minimum requirements are specified by the following:

a) a CQI index not in the set {median CQI -1, median CQI, median CQI +1} shall be reported at least α % of the time, where α% is specified in Table 8.2.3.2B.1.5.2-1;

b) the ratio of the throughput obtained when transmitting the transport format indicated by each reported wideband CQI index and that obtained when transmitting a fixed transport format configured according to the wideband CQI median shall be ≥ γ, where γ is specified in Table 8.2.3.2B.1.5.2-1;

c) when transmitting the transport format indicated by each reported wideband CQI index, the average BLER for the indicated transport formats shall be greater or equal to 0.01.

**Table 8.2.3.2B.1.5.2-1 Wideband CQI reporting requirements for FR2-1**

|  |  |  |
| --- | --- | --- |
|  | **Test 1** | **Test 2** |
| ** [%] | 2 | 2 |
| ** | 1.05 | 1.05 |

##### 8.2.3.2B.2 Reporting of sub-band Channel Quality Indicator (CQI) under fading conditions for mobile *IAB type 1-O*

###### 8.2.3.2B.2.1 Definition and applicability

The purpose of the test is to verify that the preferred sub-bands can be used for frequency-selective scheduling under the frequency-selective fading conditions.

The accuracy of sub-band channel CQI reporting under the frequency-selective fading conditions is determined by a double-sided percentile of the reported differential CQI offset level 0 per sub-band, and the relative increase of the throughput obtained when transmitting the transport format indicated by the corresponding reported sub-band CQI on a randomly selected sub-band among the sub-bands with the highest reported differential CQI offset level compared to the throughput when transmitting a fixed transport format according to the wideband CQI median on a randomly selected sub-band among all the sub-bands. To account for sensitivity of the input SNR the sub-band CQI reporting under frequency selective fading conditions is considered to be verified if the reporting accuracy is met for at least one of two SNR levels separated by an offset of 1 dB.

###### 8.2.3.2B.2.2 Minimum requirement

The minimum requirement for *mIAB-MT type 1-O* is in TS 38.174 [2] clause 11.2.3B.1.3.

###### 8.2.3.2B.2.3 Test purpose

The purpose of the test is to verify that the preferred sub-bands can be used for frequency-selective scheduling under the frequency-selective fading conditions.

###### 8.2.3.2B.2.4 Method of test

8.2.3.2B.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.

RF channels to be tested for carrier aggregation: MBW Channel CA; see clause 4.9.1.

Direction to be tested: OTA REFSENS *receiver target reference direction* (see D.54 in table 4.6-1).

8.2.3.2B.2.4.2 Procedure

1) Place the mIAB-MT with its manufacturer declared coordinate system reference point in the same place as calibrated point in the test system, as shown in annex E.3.

2) Align the manufacturer declared coordinate system orientation of the mIAB-MT with the test system.

3) Set the mIAB-MT in the declared direction to be tested.

4) Connect the mIAB-MT tester generating the wanted signal and AWGN generators to a test antenna via a combining network in OTA test setup, as shown in annex E.3. Each of the demodulation branch signals should be transmitted on one polarization of the test antenna(s).

5) The characteristics of the wanted signal shall be configured according to the corresponding DL reference measurement channel defined in annex A, and according to additional test parameters listed in table 8.2.3.2B.2.4.2-1.

**Table 8.2.3.2B.2.4.2-1: Test parameters**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | | **Unit** | **Test 1** | | **Test 2** | |
| Bandwidth | | | MHz | 40 | | | |
| Subcarrier spacing | | | kHz | 30 | | | |
| Duplex Mode | | |  | TDD | | | |
| Default TDD UL-DL pattern (Note 1) | | |  | 7D1S2U | | | |
| Special Slot Configuration | | |  | 6D+4G+4U | | | |
| SNRBB | | | dB | 8 | 9 | 14 | 15 |
| Propagation channel | | |  | Two tap model specified in Annex TBD with *a*=1, *f*D = 5Hz, and τd=0.1125μs | | | |
| Antenna configuration | | |  | 2×2 | | | |
| Beamforming Model | | |  | As specified in Annex I.3.1 | | | |
| NZP CSI-RS for CSI acquisition | CSI-RS resource Type | |  | *Periodic* | | | |
| Number of CSI-RS ports (*X*) | |  | 2 | | | |
| CDM Type | |  | *FD-CDM2* | | | |
| Density (ρ) | |  | 1 | | | |
| First subcarrier index in the PRB used for CSI-RS (k0, k1 ) | |  | 6 | | | |
| First OFDM symbol in the PRB used for CSI-RS (l0, l1) | |  | 13 | | | |
| NZP CSI-RS-timeConfig  periodicity and offset | | slot | 10/1 | | | |
| ReportConfigType | | |  | *Periodic* | | | |
| CQI-table | | |  | Table 2 | | | |
| reportQuantity | | |  | *cri-RI-PMI-CQI* | | | |
| cqi-FormatIndicator | | |  | *Subband* | | | |
| pmi-FormatIndicator | | |  | *Wideband* | | | |
| Sub-band Size | | | RB | 16 | | | |
| csi-ReportingBand | | |  | 1111111 | | | |
| CSI-Report periodicity and offset | | | slot | 10/9 | | | |
| Codebook configuration | | Codebook Type |  | *typeI-SinglePanel* | | | |
| Codebook Mode |  | 1 | | | |
| (CodebookConfig-N1,CodebookConfig-N2) |  | *Not configured* | | | |
| CodebookSubsetRestriction |  | 000001 | | | |
| RI Restriction |  | N/A | | | |
| CQI/RI/PMI delay | | | ms | 9.5 | | | |
| Maximum number of HARQ transmission | | |  | 1 | | | |
| Measurement channel | | |  | TBD | | | |
| Note 1: The same requirements are applicable to with different UL-DL patterns.  Note 2: SSB, TRS, CSI-RS, and/or other unspecified test parameters with respect to TS 38.101-4 [28] are left up to test implementation, if transmitted or needed.  Note 3: If the mIAB-MT reports in an available uplink reporting instance at slot #n based on CQI estimation at a downlink slot not later than slot#(n-4), this reported CQI cannot be applied at the gNB downlink before slot#(n+4). | | | | | | | |

7) Adjust the test signal mean power so the calibrated radiated SNR value at the mIAB-MT receiver is as specified in clause 8.2.3.2B.2.5, and that the SNR at the mIAB-MT receiver is not impacted by the noise floor.

The power level for the transmission may be set such that the AWGN level at the RIB is equal to the AWGN level in table 8.2.3.2B.2.4.2-2.

Table 8.2.3.2B.2.4.2-2: AWGN power level at the mIAB-MT input

|  |  |  |  |
| --- | --- | --- | --- |
| BS type | Sub-carrier spacing (kHz) | Channel bandwidth (MHz) | AWGN power level |
| *mIAB-MT type 1-O* | 30 | 40 | -77.2 - ΔOTAREFSENS dBm / 38.16 MHz |
| *mIAB-MT type 2-O* | 120 | 100 | EISREFSENS\_50M + ΔFR2\_REFSENS + 18 dBm / 95.04 MHz |
| NOTE 1: ΔOTAREFSENS as declared in D.53 in table 4.6-1 and clause 7.1.  NOTE 2: ΔFR2\_REFSENS = -3 dB as described in clause 7.1, since the OTA REFSENS reference direction (as declared in D.54 in table 4.6-1) is used for testing.  NOTE 3: EISREFSENS\_50M as declared in D.28 in table 4.6-1. | | | |

8) For reference channels applicable to the mIAB-MT, measure the median CQI and the BLER at (median CQI +1) and (median CQI -1).

###### 8.2.3.2B.2.5 Test requirement

For the parameters specified in Table 8.2.3.2C.4.2-1 and using the downlink physical channels specified in Annex A, the minimum requirements are specified by the following:

a) A sub-band differential CQI offset level of 0 shall be reported at least α% of the time but less than β% of the time for each sub-band, where α and β are specified in Table 8.2.3.2B.2.5-1;

b) The ratio of the throughput obtained when transmitting the corresponding transport format on a randomly selected sub-band among the sub-bands with the highest differential CQI offset level and that obtained when transmitting the transport format indicated by the reported wideband CQI median on a randomly selected sub-band among all the sub-bands shall be ≥ *γ*, where *γ* is specified in Table 8.2.3.2B.2.5-1;

c) When transmitting the corresponding transport format on a randomly selected sub-band among the sub-bands with the highest differential CQI offset level, the average BLER for the indicated transport format shall be greater than or equal to 0.02.

The requirements only apply for sub-bands of full size and the random scheduling across the sub-bands is done by selecting a new sub-band in each available downlink transmission instance for TDD.

**Table 8.2.3.2B.2.5-1 Sub-band CQI reporting requirements**

|  |  |  |
| --- | --- | --- |
|  | **Test 1** | **Test 2** |
| ** [%] | 2 | 2 |
| *β* [%] | 55 | 55 |
| ** | 1.05 | 1.05 |

## <End Change #3>

## <Start of Change #4>

### 8.2.4 Void

### 8.2.4B PBCH demodulation requirements for mobile IAB

TS 38.174 specify the PBCH performance requirements for mIAB-MT, but these requirements do not need to be tested.

## <End Change #4>