**3GPP TSG-RAN4 Meeting #116bis *R4-25xxxxx***

**Prague, Czech Republic, 13rd – 17th October 2025**

**Agenda item:**  4.1.3

**Source:** CMCC

**Title:** WF on [116bis][326] A-IoT\_Maintenance

**Document for:** Approval

# Introduction

This document captures the agreements on A-IoT\_Maintenance in RAN4#116bis.

# Topic #1: RF requirements for A-IoT device

**Issue 1-1: backscatter power**

**WF:**

Further consider these two options:

* Option 1: Use the test configuration in Table 2 for D2R measurement.

Table 2: Test configuration for D2R measurement

|  |  |
| --- | --- |
| **Measurement parameter** | **Value** |
| **CW frequency (FCW)** | According to TS 38.192 |
| **Filter passband range for D2R upper sideband** | $F\_{CW}+\frac{R\_{SFS}-1}{T\_{b}}\*0.9$ to $F\_{CW}+\frac{R\_{SFS}+1}{T\_{b}}\*1.1$ |
| **Filter passband range for D2R lower sideband** | $F\_{CW}-\frac{R\_{SFS}+1}{T\_{b}}\*1.1$ to $F\_{CW}-\frac{R\_{SFS}-1}{T\_{b}}\*0.9$ |

* Option 2: The test configuration in Table A.1-1 is defined to be used for testing the backscattering loss requirement defined in section 6.1.1, the filter position is illustrated in Figure A.1-1.

Table A.1-1: Test configuraton

|  |  |
| --- | --- |
| Test parameter | value |
| filter bandwidth (kHz) | 1Tb\* 1.1/0.9 |
| CW frequency (MHz) | According to TS 38.194 |
| Filter center frequency offset to CW frequency | 1/Tc |



Figure A.1-1: illustration of measurement filter configuration

**Issue 1-2: REFSENSE**

**WF:**

* Single M =6
* RAN4 can only retain 1PRB and delete 2/3/4PRB configurations for measurement channel

**Issue 1-3: maximum input level**

**Agreement:**

* Table 4 with M=24 and 3 PRBs.

**Table 4: Fixed Reference Channels for maximum input level**

|  |  |  |  |
| --- | --- | --- | --- |
| **Component** | **Parameter** | **Unit** | **Value** |
| **General** | PRB | RBs | 3 |
| SCS | kHz | 15 |
| **SIP** | Bit length | Bits | 8 |
| Mapping to OFDM | Chips/Symbol | 4 |
| **CAP** | Bit length | Bits | 4 |
| M | Chips/Symbol | 24 |
| **PRDCH** | TBS | Bits | Depending on the size of the MAC PDU of A-IoT CFA paging message |
| CRC | Bits | 16 |
| M | Chips/Symbol | 24 |
| **Postamble** | Bit length | Bits | 4 |
| M | Chips/Symbol | 24 |
| **Padding** | Padding per OFDM symbol excluding SIP and Postamble | Chips | 2 |
| **Padding** | Padding for last OFDM symbol | Chips | Depending on the TBS |

**Issue 1-4: Other requirements**

**WF:**

* Use the D2R RMC in Table 6 to test spurious emission requirement.
	+ FFS Parameters for backscatter power.

**Table 6: FRC for [backscatter power,] SEM and spurious emissions**

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Unit** | **Value** |
| Transmission BW | kHz | 15 |
| TBS | Bits | Depending on the length of AIoT device ID |
| CRC | Bits | 16 |
| FEC code rate |  | 1/3 |
| Block repetition number |  | 1 |
| Preamble length | Bits | 31 |
| Midamble length | Bits | 31 |
| Interval for midamble insersion | Bits | 48 |
| Additional midamble insertion |  | No |
| Small frequency shift | kHz | 480 |
| Modulation |  | BPSK/OOK (NOTE1) |
| NOTE 1: The modulation scheme used is up to device implementation. |

# Topic #2: RF requirements for A-IoT BS and CW

**Issue 2-1: ACLR limit**

**Agreement:**

* No need to define ACLR absolute limit for A-IoT BS.

**Issue 2-2: Foffset for A-IoT operation**

**WF:**

* For Tx side of A-IoT operation, A-IoT requirements for receiver and transmitter shall apply with a frequency offset Foffset as defined in Table 3 below where CBW is defined in 5.3.1 and 5.3.2 of TS38.194.

**Table 3 Foffset for A-IoT operation**

|  |  |
| --- | --- |
| **Carrier** | **Foffset** |
| Ambient IoT  | 100 kHz+CBW/2 |

* FFS on the Rx side.

**Issue 2-3: CW phase noise**

**WF:**

* FFS RAN4 to further check whether it is necessary to modify above CW phase noise based on CW’s implementation performance.

**Issue 2-4: interfering signal**

**WF:**

* FFS whether to update the interfering signal for ACS, in-band blocking, and narrowband intermodulation from 3 MHz E-UTRA/NR to 5 MHz NR.The motivation is that 5 MHz NR is more widely deployed than 3 MHz NR, making these requirements more representative of real-world conditions.