**3GPP TSG-RAN WG4 Meeting#116 R4-2511127**

**Bengaluru, India, August 25th – 29th, 2025**

**Agenda item: 7.22.3.1**

**Source: ZTE Corporation, Sanechips**

**Title: TP to TS38.194: REFSENS requirement for A-IoT BS and FRC**

**Document for:** **Approval**

1. Introduction

In the RAN#106 meeting, New WID on Rel-19 Ambient IoT [7] was approved and it’s expected to start the normative work from the Feb, 2025 meeting. In this contribution, we would like to provide TP for REFSENS requirement for A-IoT BS and also Annex for FRC for REFSENS requirement definition.

1. References
2. RP-250796, Core part: Solutions for Ambient IoT (Internet of Things) in NR, Approved.
3. TS 38.194 NR; Ambient IoT Base Station (BS) and Carrier-Wave (CW) node radio transmission and reception
4. TP

# 7 Conducted receiver characteristics

## 7.1 General

Conducted receiver characteristics are specified at the *antenna connector* for *BS type 1-C* , with full complement of transceivers for the configuration in normal operating condition.

Unless otherwise stated, the following arrangements apply for conducted receiver characteristics requirements in clause 7:

- Requirements apply during the BS receive period.

- Reference requirements defined for the conducted receiver characteristics do not assume HARQ retransmissions.

NOTE 1: In normal operating condition, A-IoT BS is configured as HD-FDD operation.

## 7.2 Reference sensitivity level

### 7.2.1 General

The reference sensitivity power level PREFSENS is the minimum mean power received at the *antenna connector* for *BS type 1-C* at which a BLER requirement shall be met for a specified reference measurement channel.

### 7.2.2 Minimum requirements for *BS type 1-C*

The BLER shall be less than or equal to 10% of the reference measurement channel as specified in annex A.1 with parameters specified in table 7.2.2-1 for A-IoT Medium range BS.

Table 7.2.2-1: A-IoT Medium range BS reference sensitivity levels

|  |  |  |  |
| --- | --- | --- | --- |
| *BS channel bandwidth* (KHz) | DSB (kHz) | Reference measurement channel | Reference sensitivity power level, PREFSENS  (dBm) |
| 200 | 15 | A-FR1-A1-1 | -95.2 |
| A-FR1-A1-2 | -92.2 |
| 3520 | 2880 | A-FR1-A1-3 | -72.4 |
| A-FR1-A1-4 | -69.4 |
| NOTE: Reference sensitivity power level is defined based on the CW power from real CW node at the BS antenna connector as -38dBm without the cancellation of CW phase noise considered. | | | |

Annex A (normative):  
Reference measurement channels

# A.1 Fixed Reference Channels for reference sensitivity level, ACS, in-band blocking, out-of-band blocking, (BPSK, OOK)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Reference channel | A-FR1-A1-1 | A-FR1-A1-2 | A-FR1-A1-3 | A-FR1-A1-4 |
| DSB (kHz) | 15 | 15 | 2880 | 2880 |
| Payload size (bits) | 96 | 96 | 96 | 96 |
| CRC (bits) | 16 | 16 | 16 | 16 |
| Preamble length | 31 | 31 | 31 | 31 |
| Midamble length | 31 | 31 | 31 | 31 |
| Midamble configuration I | 48 | 48 | 48 | 48 |
| FEC | 1/3 | 1/3 | 1/3 | 1/3 |
| Line code | Manchester | Manchester | Manchester | Manchester |
| Modulation | BPSK | OOK | BPSK | OOK |
| Waveform (CW) | unmodulated single tone | Unmodulated single tone | unmodulated single tone | unmodulated single tone |
| Sampling frequency（SFO） | between 0.01 and 0.1 | Between 0.01 and 0.1 | between 0.01 and 0.1 | Between 0.01 and 0.1 |
| Total symbols | 398 | 398 | 398 | 398 |