**3GPP TSG-RAN WG4 Meeting # 116bis draft R4-2514437**

**Prague, Czech Republic, Oct. 13-17, 2025**

**Agenda item:** 6.14.1

**Source:** Moderator (Huawei)

**Title:** Topic summary for [116bis][314] A-IoT\_BSCW

**Document for:** Information

# Introduction

The thread [116bis] [314] A-IoT\_BSCW is on Rel-19 WI on solutions for Ambient IoT in NR (RP-243326 in RAN#106, revised to RP-250796 in RAN#107). The core part of WI on solutions for Ambient IoT in NR has been completed at RAN#109 and TS38.194 has been released. The objective of performance part WI are as follows:

*Copied from RP-250796:*

### Objective of Performance part WI

* Specify the necessary conformance testing for Ambient-IoT BS
* Specify the necessary RRM performance requirements for device 1
* Specify the necessary demodulation performance requirements for device 1 and Ambient-IoT BS

The summary covers contributions submitted under the agenda item:

6.14.2 Conformance testing for Ambient-IoT BS and CW

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# Topic #1: TS skeleton

## Companies’ contributions summary

Companies’ contributions are as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| **TDoc** | **Title** | **Source** | **Agenda item** |
| R4-2513774 | TS skeleton for A-IOT BS conformance testing | Huawei, HiSilicon | 6.14.2 |

## Open issues summary

### Issue 1-1: TS skeleton

* Recommended WF
	+ Use R4-2513383 as the starting point for TS skeleton and discuss whether any revisions needed.

# Topic #2: General test conditions

## Companies’ contributions summary

Companies’ contributions are as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| **TDoc** | **Title** | **Source** | **Agenda item** |
| R4-2513382 | Discussion on R19 A-IoT BS and CW conformance testing | Huawei, HiSilicon | 6.14.2 |
| R4-2514267 | Discussion on conformance testing for Rel-19 Ambient-IoT BS and CW | ZTE Corporation, Sanechips | 6.14.2 |
| R4-2514365 | A-IoT BS conformance overview | Ericsson | 6.14.2 |

## Open issues summary

### Issue 2-1: MU(Measurement uncertainties)

* Proposals:
	+ **Proposal 1**: Apply the same MU/TT of BS type 1-C from less than 3GHz in TS 38.141 as baseline; (R4-2514267, ZTE)
	+ **Proposal 2**: Reuse as much as possible the MU from TS38141-1 for less than 3GHz BS type 1-C. MU for Modulation quality is FFS.MU for Occupied bandwidth is ±[2]kHz（R4-2513382, Huawei）
	+ **Proposal 3**: MU for timing mask requirement is the 1/8 symbol time.（R4-2514365, Ericsson）
* Recommended WF
	+ Use the MU of sub 3GHz BS type 1-C in TS 38.141-1 as baseline, with adaption when needed.
	+ MU for Occupied bandwidth: ±[2]kHz
	+ MU for timing mask: ±1/8 Tc chip duration

### Issue 2-2: Manufacturer declaration

* Proposals: Adopt the manufacturer declarations for A-IoT BS test requirements in Table 1. （R4-2513382, Huawei）
* Table 1 Manufacturer declarations for A-IoT BS test requirements

|  |  |
| --- | --- |
| **Declaration** | **Applicability** |
| BS requirements set | x |
| *Operating bands* and frequency ranges | x |
| Spurious emission category | x |
| Additional operating band unwanted emissions | x |
| Co-existence with other systems | x |
| Co-location with other base stations | x |
| Maximum *Base Station RF Bandwidth* | x |
| A-IoT supported channel bandwidths and SCS | x |
| Rated carrier output power(Prated,c,AC, or Prated,c,TABC) | x |
| R*ated total output power* (Prated,t,AC, or Prated,t,TABC) | x |
| Equivalent connectors | x |
| Connecting network loss range for BS testing with ancillary RF amplifiers | x |

* Recommended WF
	+ Use Table 1 as the starting point for manufacturer declarations, details for further discussion

### Issue 2-3: Test signal

* Proposals:
	+ **Proposal 1**: Use 200kHz as default carrier bandwidth for conformance testing otherwise the supported narrow bandwidth should be used for the conformance testing. (R4-2514267, ZTE)
	+ **Proposal 2**: Test signal construction for TC1 (multi-carrier operation)as below .（R4-2514365, Ericsson）

Table 2: Signal to be used to build A-IoT TCs

|  |  |
| --- | --- |
| Operating Band characteristics | Operation band specified in clause 5.2 |
| TC signal  | BWchannel | 200kHz |
| characteristics | Subcarrier spacing | 15 kHz |
|  |

* Recommended WF
	+ Use 200kHz as default carrier bandwidth for conformance testing, otherwise the supported narrow bandwidth should be used

### Issue 2-4: Test model

[background from TS38.191]

## B.2 R2D reference measurement channels

### B.2.1 Fixed Reference Channels for reference sensitivity level (OOK)

Table B.2.1-1: Fixed Reference Channels for reference sensitivity level (OOK)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Reference channel | Configuration | A-FR1-B1-1 | A-FR1-B1-2 | A-FR1-B1-3 | A-FR1-B1-4 |
| SIP | SCS | 15 | 15 | 15 | 15 |
| PRB | 1 | 2 | 3 | 4 |
| Bit length | 8 | 8 | 8 | 8 |
| M\_SIP | 4 | 4 | 4 | 4 |
| OFDM | 2 | 2 | 2 | 2 |
| CAP | Bit length | 4 | 4 | 4 | 4 |
| M | 2 | 2 | 2 | 2 |
| OFDM | 2  | 2  | 2  | 2  |
| PRDCH | TBS | 96 | 96 | 96 | 96 |
| CRC | 16 | 16 | 16 | 16 |
| Line encoding |  |  |  |  |
| M | 2 | 2 | 2 | 2 |
| postamble | Bit length | 4 | 4 | 4 | 4 |
| M | 6 | 12 | 2 | 2 |
|  | chip number except for SIP,padding | 228 | 228 | 228 | 228 |
|  | Padding | 6 | 12 | 2 | 2 |

* Proposals:
	+ **Option 1**: Use the A-FR1-B1-1/2/3/4 configuration for the conformance testing. (R4-2514267, ZTE; R4-2513382, Huawei)
	+ **Option 2**: Use the A-FR1-B1-1 signal configuration for test signal model.（R4-2514365, Ericsson）
* Recommended WF
	+ Consider that at least R2D CBW，OBW and OBUE have different requirements for different RB numbers, use Option 1 as baseline, and discuss whether certain requirements(such as modulation quality etc.) can be tested only under A-FR1-B1-1 to optimize testing efficiency.

### Issue 2-5: A-IoT test configuration

* Proposals:
	+ **Proposal 1**: Consider the single carrier operation only for A-IoT BS conformance testing. (R4-2514267, ZTE; R4-2513382, Huawei)
	+ **Proposal 2**: For RX, test configuration for MC operation can be specified. （R4-2514365, Ericsson）
	+ **Proposal 3**: Applicability of test configurations as follows.（R4-2514365, Ericsson）

|  |  |
| --- | --- |
| BS test case | MC capable BS |
| 6.2 Base station output power | SC |
| 6.3 Transmit ON/OFF power | SC |
| 6.4 Transmitted signal quality | SC |
| 6.6 Unwanted emissions | SC |
|  |  |
| 7.2 Reference sensitivity level | SC |
| 7.3 In-channel selectivity and blocking | TC1\* |
| 7.4 Out-of-band blocking | TC1\* |
| 7.5 Receiver spurious emissions | TC1\* |
| 7.6 Receiver intermodulation | TC1\* |

\*TC1: A-IoT multi-carrier operation

* Recommended WF
	+ Use the single carrier operation for A-IoT BS R2D conformance testing
	+ Use the single carrier operation only for A-IoT BS Reference sensitivity level conformance testing
	+ For D2R performance requirements other than Reference sensitivity level, further discuss the adoption of multi-carrier operation

### Issue 2-6: Test procedure

* Proposals:
	+ **Proposal 1**: Use the existing test procedure of NR BS type 1-C as baseline with the necessary modification except for REFSENS requirement; (R4-2514267, ZTE)
	+ **Proposal 2**: For the A-IoT BS REFSENS requirement, propose to add the CW signal as input for test procedure. (R4-2514267, ZTE)
* Recommended WF
	+ Except for REFSENS requirement, use the existing test procedure of NR BS type 1-C as baseline with the necessary modification;
	+ For the A-IoT BS REFSENS requirement, add the CW signal as input for test procedure.

### Issue 2-7:. Test setup

* Proposals:
	+ **Proposal 1**: For test setup for A-IoT BS and CW node, propose to apply the existing test setup for BS type 1-C for it except the REFSENS conformance testing as shown in Figure 2.5-1. (R4-2514267, ZTE)



Figure 2.5-1. Illustration of the test setup for A-IoT BS REFSENS requirement

* + **Proposal 2**: The receiver measurement system set-up should be updated considering the CWT signal injection and discuss if the dedicated CW signal can be generated with specified phase noise profile.（R4-2514365, Ericsson）
* Recommended WF
	+ Apply the existing test setup for BS type 1-C for it except the REFSENS conformance testing as shown in Figure 2.5-1
	+ Details can be further discuss if the dedicated CW signal can be generated with specified phase noise profile

# Topic #3: draft TP to TS38.195

## Companies’ contributions summary

Companies’ contributions are as follows:

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| --- | --- | --- | --- |
| **TDoc** | **Title** | **Source** | **Agenda item** |
| R4-2513383 | draft TP for TS 38195 on A-IoT BS and CW conformance testing | Huawei, HiSilicon | 6.14.2 |

## Open issues summary

### Issue 3-1: draft TP

* Recommended WF
	+ Discuss whether to agree with or revise the draft TP: