



## Compliance Certification Services (Kunshan) Inc.

Report No.: KSCR221200241501

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# TEST REPORT

**Application No.:** KSCR2212002415AT  
**FCC ID:** WBKCPX80I  
**Applicant:** BTI Wireless  
**Address of Applicant:** 14600 Industry Circle La Mirada, CA 90638  
**Manufacturer:** BTI Wireless  
**Address of Manufacturer:** 14600 Industry Circle La Mirada, CA 90638  
**Factory:** Sunwave Communications Co., Ltd.  
**Address of Factory:** 581 Huoju Avenue, Binjiang District, Hangzhou, China  
**Equipment Under Test (EUT):**  
**EUT Name:** 5G CPE  
**Model No.:** CPX80I  
**Standard(s):** CBRSA-TS-9001-V1.2.1  
WINNF-TS-0122-V1.0.2  
FCC 47 CFR Part 96  
KDB 940660 D01 V03  
**Date of Receipt:** 2022-12-12  
**Date of Test:** 2022-12-13 to 2022-12-17  
**Date of Issue:** 2022-12-19

|                     |              |
|---------------------|--------------|
| <b>Test Result:</b> | <b>Pass*</b> |
|---------------------|--------------|

\* In the configuration tested, the EUT complied with the standards specified above.

Eric Lin  
Laboratory Manager



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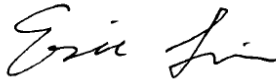
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| Revision Record |             |            |        |
|-----------------|-------------|------------|--------|
| Version         | Description | Date       | Remark |
| 00              | Original    | 2022-12-19 | /      |
|                 |             |            |        |
|                 |             |            |        |

|                          |  |   |  |
|--------------------------|--|---|--|
| Authorized for issue by: |  |   |  |
|                          |  |    |  |
|                          |  | Cloud Peng/ Project Engineer  |  |
|                          |  |  |  |
|                          |  | Eric Lin / Reviewer   |  |



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## 2 Test Summary

| Item  | Standard             | Test Case ID      | Result |
|---|----------------------|-------------------|--------|
| Multi-Step registration   | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.REG.1  | Pass   |
| Missing Required parameters (responseCode 102)                                | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.REG.8  | Pass   |
| Pending registration (responseCode 200)                                       | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.REG.10 | Pass   |
| Invalid parameter (responseCode 103)  | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.REG.12 | Pass   |
| Blacklisted CBSD (responseCode 101)   | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.REG.14 | Pass   |
| Unsupported SAS protocol version (responseCode 100)                           | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.REG.16 | Pass   |
| Group Error (responseCode 201)  | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.REG.18 | Pass   |
| Unsuccessful Grant responseCode=400 (INTERFERENCE)                            | WINNF-TS-0122-V1.0.2 | WINNF.FT.D.GRA.1  | Pass   |
| Unsuccessful Grant responseCode=401 (GRANT_CONFLICT)                          | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.GRA.2  | Pass   |
| Heartbeat Success Case (first Heartbeat Response)                             | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.HBT.1  | Pass   |
| Heartbeat responseCode=105 (DEREGISTER)                                       | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.HBT.3  | Pass   |
| Heartbeat responseCode=500 (TERMINATED_GRANT)                                 | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.HBT.4  | Pass   |
| Heartbeat responseCode=501 (SUSPENDED_GRANT) in First Heartbeat Response      | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.HBT.5  | Pass   |
| Heartbeat responseCode=501 (SUSPENDED_GRANT) in Subsequent Heartbeat Response | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.HBT.6  | Pass   |
| Heartbeat responseCode=502 (UNSYNC_OP_PARAM)                                  | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.HBT.7  | Pass   |
| Heartbeat Response Absent (First Heartbeat)                                   | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.HBT.9  | Pass   |
| Heartbeat Response Absent (Subsequent Heartbeat)                              | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.HBT.10 | Pass   |
| Successful Grant Renewal in Heartbeat Test Case                               | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.HBT.11 | Pass   |



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| Item   | Standard             | Test Case ID     | Result |
|--|----------------------|------------------|--------|
| Grant Response contains measReportConfig                             | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.MES.3 | Pass   |
| Heartbeat Response contains measReportConfig                         | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.MES.4 | Pass   |
| Successful Relinquishment  | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.RLQ.1 | Pass   |
| Deregistration responseCode=102                                      | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.RLQ.3 | Pass   |
| Deregistration responseCode=103                                      | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.RLQ.5 | Pass   |
| Successful Deregistration  | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.DRG.1 | Pass   |
| Deregistration responseCode=102                                      | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.DRG.3 | Pass   |
| Deregistration responseCode=103                                      | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.DRG.5 | Pass   |
| Successful TLS connection between UUT and SAS Test Harness           | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.SCS.1 | Pass   |
| TLS failure due to revoked certificate                               | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.SCS.2 | Pass   |
| TLS failure due to expired server certificate                        | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.SCS.3 | Pass   |
| TLS failure when SAS Test Harness certificate is issue by unknown CA | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.SCS.4 | Pass   |
| TLS failure when certificate at the SAS Test Harness is corrupted    | WINNF-TS-0122-V1.0.2 | WINNF.FT.C.SCS.5 | Pass   |
| UUT RF Transmit Power Measurement                                    | WINNF-TS-0122-V1.0.2 | WINNF.PT.C.HBT   | Pass   |
| SAS Version: 1.0.0.3   |                      |                  |        |

The UUT is a CPE-CBSD product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

## Test standards:

### CBRSA-TS-9001-V1.0.0

CBRS Alliance Certification Test Plan

### WINNF-TS-0122-V1.0.2

Test and Certification for Citizens Broadband Radio Service (CBRS); Conformance and Performance Test Technical Specification; CBSD/DP as Unit Under Test (UUT)

### KDB 940660 D01 Part 96 CBRS Eqpt v03



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## 4 General Information

### 4.1 Details of E.U.T.

|                              |  |
|------------------------------|--|
| Power supply:                | Adaptor Model: ASSA67A-240100<br>Input: 100-240V~50/60Hz, 0.8A<br>Output: 24.0V-1A |
| Serial Number of Tested EUT: | PX80IX02224900001  |
| CBSD Class:                  | Category B CBSD  |
| Transmitter Frequency Band:  | n48/n78(3550-3700MHz)  |
| Transmitter Frequency Range: | 3550~3700MHz   |
| Hardware Version:            | V1.0   |
| Software Version:            | CPX60P-V2-PC4P-V2.1.10   |
| Test sample:                 | PX80IX02224900001  |
| Antenna Gain:                | Ant1:1.29dBi   |



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## 4.2 Description of CBSD/DP Support Features

| Condition | Feature Description  | Supported |
|-----------|--|-----------|
| C1        | Mandatory for UUT which supports multi-step registration message.  | Y         |
| C2        | Mandatory for UUT which supports single-step registration with no CPI-signed data in the registration message. By definition, this is a subset of Category A devices which determine all registration information, including location, without CPI intervention. | N         |
| C3        | Mandatory for UUT which supports single-step registration containing CPI-signed data in the registration message.  | N         |
| C4        | Mandatory for UUT which supports RECEIVED_POWER_WITHOUT_GRANT measurement report type.   | N         |
| C5        | Mandatory for UUT which supports RECEIVED_POWER_WITH_GRANT measurement report type.  | Y         |
| C6        | Mandatory for UUT which supports parameter change being made at the UUT and prior to sending a deregistration.   | N         |

Y: Supported

N: Not supported



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## 4.3 Summary of Test Results

| WINNF-TS-0122      |                 |            |               |
|--------------------|-----------------|------------|---------------|
| Classes            | Test Case Items | Pass Items | Pass Rate (%) |
| FT (CBSD, DP/CBSD) | 31              | 31         | 100           |
| PT (CBSD, DP/CBSD) | 1               | 1          | 100           |
| Total              | 32              | 32         | 100           |

Note:

1. Functional Test (FT): Test to validate the conformance of the Protocols and functionalities implemented in the CBSD/DP UUT to the requirements developed by WinnForum and supporting FCC/DoD requirements.
2. Field/Performance Test (PT): Test to check the capability of the CBSD/DP UUT to support various traffic models and actual operations in the field.

| Duration and Duty Cycle |           |             |
|-------------------------|-----------|-------------|
| Period                  | Limit     | Test Result |
| 10-second               | 1-second  | Pass        |
| 300-second              | 10-second | Pass        |
| 3600-second             | 20-second | Pass        |

Note: limited in duration and duty cycle to the minimum time necessary to get a grant from the SAS; this time should not exceed 1 second within any 10-second period, 10seconds within any 300-second period, or 20 seconds within any 3600-second period.

## 4.4 Measurement Uncertainty

| No. | Item               | Measurement Uncertainty   |
|-----|--------------------|---------------------------|
| 1   | Radio Frequency    | $\pm 7.25 \times 10^{-8}$ |
| 2   | RF conducted power | $\pm 0.75\text{dB}$       |
| 3   | Temperature test   | $\pm 1^{\circ}\text{C}$   |
| 4   | Humidity test      | $\pm 3\%$                 |
| 5   | Supply voltages    | $\pm 1.5\%$               |
| 6   | Time               | $\pm 3\%$                 |



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## Compliance Certification Services (Kunshan) Inc.

Report No.: KSCR221200241501

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### 4.5 Description of Support Units

| Description       | Manufacturer | Model No.                     | Serial No.      |
|-------------------|--------------|-------------------------------|-----------------|
| 5GC               | astir        | astir_5GC                     | A372768X0507398 |
| Router            | TP-Link      | TL-R860+                      | 1175379002425   |
| Base Band Unit    | BTI          | sCELL- G52091NAX              | L603JESE1I      |
| Remote Radio Unit | BTI          | RU4370<br>(FCC ID: WBKRU4370) | C0214921000004S |

### 4.6 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888

Fax: +86 512 5737 0818

No tests were sub-contracted.



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## 5 Equipment List

| Test Equipment                   | Manufacturer  | Model No.        | Inventory No.     | Cal. Date<br>(yyyy-mm-dd) | Cal. Due date<br>(yyyy-mm-dd) |
|----------------------------------|---------------|------------------|-------------------|---------------------------|-------------------------------|
| Laptop                           | Lenovo        | Y510P            | HFL000026         | N/A                       | N/A                           |
| Spectrum Analyzer                | KEYSIGHT      | N9020A           | KUS2001M00<br>1-2 | 2022/8/22                 | 2023/8/21                     |
| Shield Room                      | 研创            | N/A              | KS301115-2        | N/A                       | N/A                           |
| Coaxial Cable                    | Thermax       | N/A              | 13                | 2022/9/16                 | 2023/9/15                     |
| Attenuator                       | Mini-Circuits | NAT-6-2W         | 15542-1           | N.C.R.                    | N.C.R.                        |
| Humidity / Temperature Indicator | Renke         | RS-WS-<br>N01-6J | 1032844           | 2022/4/1                  | 2023/3/31                     |



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## 6 Test Method and Environment

### 6.1 CBSD/DP Conformance and Performance

Test Requirement: CBRS CBSD Test Specification WINNF-TS-0122-V1.0.2

Test Method: CBRS CBSD Test Specification WINNF-TS-0122-V1.0.2  
WINNF-IN-0156\_WInnForum\_SAS\_Test\_Harness\_CBSD\_UUT\_Tutorial\_v1\_0\_0\_1

### 6.2 CBSD Test Procedure

- Connect the UUT to SAS Test Harness system and RF Test instruments via the CBSD interface and RF components. The highest level is set to test configuration.
- UUT shall be UTC time synchronized
- The frequency band is granted and set as UUT supported Modulation and Channels, transmitted power of the UUT according to it granted parameters from the SAS TestHarness.
- Each test case results were recorded and validated by SAS Test Harness system and RF instruments test cases was recorded test results from SAS Test Harness system.

### 6.3 Test Environment

Test Harness Version: V1.0.0.3

Operating System: Microsoft Windows 10

TLS Version: 1.2

Python Version: 2.7.13

Environmental Conditions: 25deg. C, 65%RH



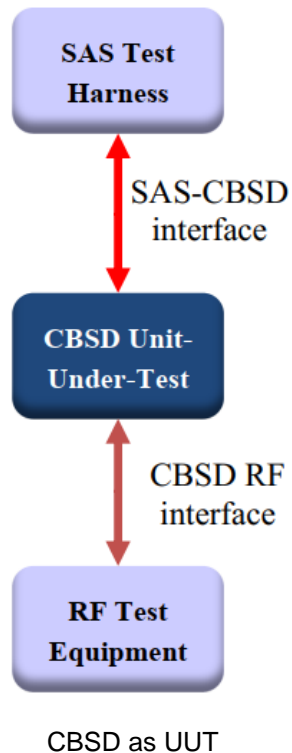
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### 6.4 Test Setup



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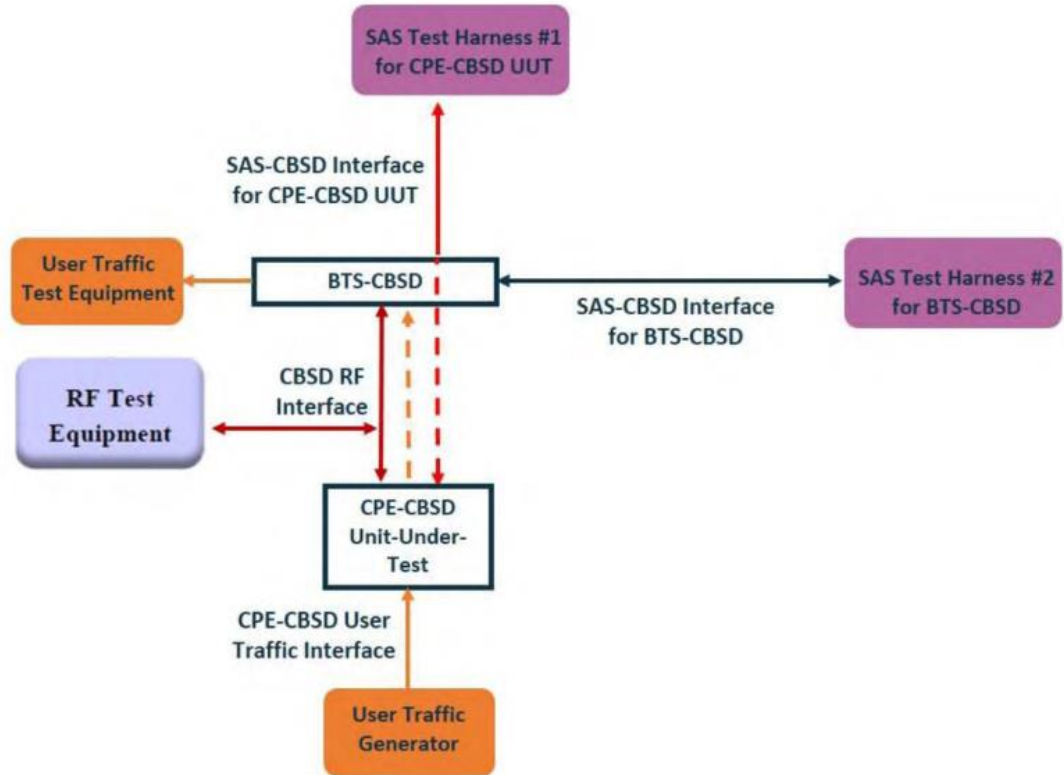
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Test setup diagram for WINNF.PT.C.HBT Test case



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## 7 Test Data

### 7.1 CBSD Registration Process

#### 7.1.1 WINNF.FT.C.REG.1

| # | Test Execution Steps  | Results           |                   |
|---|---|-------------------|-------------------|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>UUT has successfully completed SAS Discovery and Authentication with the SAS Test Harness</li> <li>UUT is in the Unregistered state</li> </ul>  | --                | --                |
| 2 | <p>CBSD sends correct Registration request information, as specified in [n.5], to the SAS Test Harness:</p> <ul style="list-style-type: none"> <li>The required userId, fcId and cbsdSerialNumber registration parameters shall be sent from the CBSD and conform to proper format and acceptable ranges.</li> <li>Any REG-conditional or optional registration parameters that may be included in the message shall be verified that they conform to proper format and are within acceptable ranges.</li> </ul> <p>Note: It is outside the scope of this document to test the Registration information that is supplied via another means.</p> | <div>■ Pass</div> | <div>□ Fail</div> |
| 3 | <p>SAS Test Harness sends a CBSD Registration Response as follows:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>measReportConfig shall not be included</li> <li>responseCode = 0</li> </ul>   | --                | --                |
| 4 | <p>After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.</p>   | --                | --                |
| 5 | <p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none"> <li>UUT shall not transmit RF</li> </ul>  | <div>■ Pass</div> | <div>□ Fail</div> |



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### 7.1.2 WINNF.FT.C.REG.8

| # | Test Execution Steps  | Results                                  |                               |
|---|---|--|-------------------------------|
| 1 | Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>UUT is in the Unregistered state</li> </ul> | --                                       | --                            |
| 2 | CBSD sends a Registration request to SAS Test Harness.  | --                                       | --                            |
| 3 | SAS Test Harness rejects the request by sending a CBSD Registration Response as follows: <ul style="list-style-type: none"> <li>SAS response does not include cbsdId</li> <li>responseCode = 102</li> </ul>                               | --                                       | --                            |
| 4 | After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.  | --                                       | --                            |
| 5 | Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none"> <li>UUT shall not transmit RF</li> </ul>                           | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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### 7.1.3 WINNF.FT.C.REG.10

| # | Test Execution Steps  | Results                                  |                               |
|---|---|--|-------------------------------|
| 1 | Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>UUT is in the Unregistered state</li> </ul> | --                                       | --                            |
| 2 | CBSD sends a Registration request to SAS Test Harness.  | --                                       | --                            |
| 3 | SAS Test Harness rejects the request by sending a CBSD Registration Response as follows: <ul style="list-style-type: none"> <li>SAS response does not include cbsdId</li> <li>responseCode = 200</li> </ul>                               | --                                       | --                            |
| 4 | After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=200) to further request messages from the UUT.  | --                                       | --                            |
| 5 | Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none"> <li>UUT shall not transmit RF</li> </ul>                           | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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### 7.1.4 WINNF.FT.C.REG.12

| # | Test Execution Steps  | Results                                  |                               |
|---|---|--|-------------------------------|
| 1 | Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>UUT is in the Unregistered state</li> </ul> | --                                       | --                            |
| 2 | CBSD sends a Registration request to SAS Test Harness.  | --                                       | --                            |
| 3 | SAS Test Harness rejects the request by sending a CBSD Registration Response as follows: <ul style="list-style-type: none"> <li>SAS response does not include cbsdId</li> <li>responseCode = 103</li> </ul>                               | --                                       | --                            |
| 4 | After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=103) to further request messages from the UUT.  | --                                       | --                            |
| 5 | Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none"> <li>UUT shall not transmit RF</li> </ul>                           | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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### 7.1.5 WINNF.FT.C.REG.14

| # | Test Execution Steps   | Results                                  |                               |
|---|--|--|-------------------------------|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>UUT is in the Unregistered state</li> </ul> | --                                       | --                            |
| 2 | CBSD sends a Registration request to SAS Test Harness.   | --                                       | --                            |
| 3 | <p>SAS Test Harness rejects the request by sending a CBSD Registration Response as follows:</p> <ul style="list-style-type: none"> <li>SAS response does not include cbsdId</li> <li>responseCode = 101</li> </ul>                               | --                                       | --                            |
| 4 | After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=101) to further request messages from the UUT.   | --                                       | --                            |
| 5 | <p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none"> <li>UUT shall not transmit RF</li> </ul>                           | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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### 7.1.6 WINNF.FT.C.REG.16

| # | Test Execution Steps  | Results                                  |                               |
|---|---|--|-------------------------------|
| 1 | Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>UUT is in the Unregistered state</li> </ul> | --                                       | --                            |
| 2 | CBSD sends a Registration request to SAS Test Harness.  | --                                       | --                            |
| 3 | SAS Test Harness rejects the request by sending a CBSD Registration Response as follows: <ul style="list-style-type: none"> <li>SAS response does not include cbsdId</li> <li>responseCode = 100</li> </ul>                               | --                                       | --                            |
| 4 | After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=100) to further request messages from the UUT.  | --                                       | --                            |
| 5 | Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none"> <li>UUT shall not transmit RF</li> </ul>                           | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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### 7.1.7 WINNF.FT.C.REG.18

| # | Test Execution Steps  | Results                                  |                               |
|---|---|--|-------------------------------|
| 1 | Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>UUT is in the Unregistered state</li> </ul> | --                                       | --                            |
| 2 | CBSD sends a Registration request to SAS Test Harness.  | --                                       | --                            |
| 3 | SAS Test Harness rejects the request by sending a CBSD Registration Response as follows: <ul style="list-style-type: none"> <li>SAS response does not include cbsdId</li> <li>responseCode = 201</li> </ul>                               | --                                       | --                            |
| 4 | After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=201) to further request messages from the UUT.  | --                                       | --                            |
| 5 | Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none"> <li>UUT shall not transmit RF</li> </ul>                           | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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### 7.2 CBSD Spectrum Grant Process

#### 7.2.1 WINNF.FT.C.GRA.1

| # | Test Execution Steps  | Results           |                   |
|---|---|-------------------|-------------------|
| 1 | Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>UUT has registered successfully with SAS Test Harness, with cbsdId = C</li> </ul>                                | --                | --                |
| 2 | UUT sends valid Grant Request.  | <div>■ Pass</div> | <div>□ Fail</div> |
| 3 | SAS Test Harness sends a Grant Response message, including <ul style="list-style-type: none"> <li>cbsdId=C</li> <li>responseCode = 400</li> </ul>   | --                | --                |
| 4 | After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.  | --                | --                |
| 5 | Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none"> <li>UUT shall not transmit RF</li> </ul> | <div>■ Pass</div> | <div>□ Fail</div> |



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### 7.2.2 WINNF.FT.C.GRA.2

| # | Test Execution Steps   | Results |        |
|---|--|---------|--------|
| 1 | Ensure the following conditions are met for test entry:<br>● UUT has registered successfully with SAS Test Harness, with cbsdId = C                                | --      | --     |
| 2 | UUT sends valid Grant Request.   | ■ Pass  | □ Fail |
| 3 | SAS Test Harness sends a Grant Response message, including<br>- cbsdId=C<br>- responseCode = 401   | --      | --     |
| 4 | After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=401) to further request messages from the UUT.                   | --      | --     |
| 5 | Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:<br>● UUT shall not transmit RF | ■ Pass  | □ Fail |



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### 7.3 CBSD HeartBeat Process

#### 7.3.1 WINNF.FT.C.HBT.1

| # | Test Execution Steps  | Results |        |
|---|---|---------|--------|
| 1 | Ensure the following conditions are met for test entry:<br>● UUT has registered successfully with SAS Test Harness, with cbsdId = C   | --      | --     |
| 2 | UUT sends a message:<br>● If message is type Spectrum Inquiry Request, go to step 3, or<br>● If message is type Grant Request, go to step 5   | --      | --     |
| 3 | UUT sends Spectrum Inquiry Request. Validate:<br>● cbsdId = C<br>● List of frequencyRange objects sent by UUT are within the CBRS frequency range   | ■ Pass  | □ Fail |
| 4 | SAS Test Harness sends a Spectrum Inquiry Response message, including the following parameters:<br>● cbsdId = C<br>● availableChannel is an array of availableChannel objects<br>● responseCode = 0                                     | --      | --     |
| 5 | UUT sends Grant Request message. Validate:<br>● cbsdId = C<br>● maxEIRP is at or below the limit appropriate for CBSD category as defined by Part 96<br>● operationFrequencyRange, F, sent by UUT is a valid range within the CBRS band | ■ Pass  | □ Fail |
| 6 | SAS Test Harness sends a Grant Response message, including the parameters:<br>● cbsdId = C<br>● grantId = G = a valid grant ID<br>● grantExpireTime = UTC time greater than duration of the test<br>● responseCode = 0                  | --      | --     |
| 7 | UUT sends a first Heartbeat Request message.<br>Verify Heartbeat Request message is formatted correctly, including:<br>● cbsdId = C<br>● grantId = G<br>● operationState = "GRANTED"  | ■ Pass  | □ Fail |
| 8 | SAS Test Harness sends a Heartbeat Response message, with the following parameters:<br>● cbsdId = C<br>● grantId = G<br>● transmitExpireTime = current UTC time + 200 seconds<br>● responseCode = 0                                     | --      | --     |



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|    |   |  |                               |
|----|---|--|-------------------------------|
| 9  | <p>For further Heartbeat Request messages sent from UUT after completion of step 8, validate message is sent within latest specified heartbeatInterval, and:</p> <ul style="list-style-type: none"> <li>● cbsdId = C</li> <li>● grantId = G</li> <li>● operationState = "AUTHORIZED"</li> </ul> <p>and SAS Test Harness responds with a Heartbeat Response message including the following parameters:</p> <ul style="list-style-type: none"> <li>● cbsdId = C</li> <li>● grantId = G</li> <li>● transmitExpireTime = current UTC time + 200 seconds</li> <li>● responseCode = 0</li> </ul> | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 10 | <p>Monitor the RF output of the UUT from start of test until UUT transmission commences. Verify:</p> <ul style="list-style-type: none"> <li>● UUT does not transmit at any time prior to completion of the first heartbeat response</li> <li>● UUT transmits after step 8 is complete, and its transmission is limited to within the bandwidth range F.</li> </ul>  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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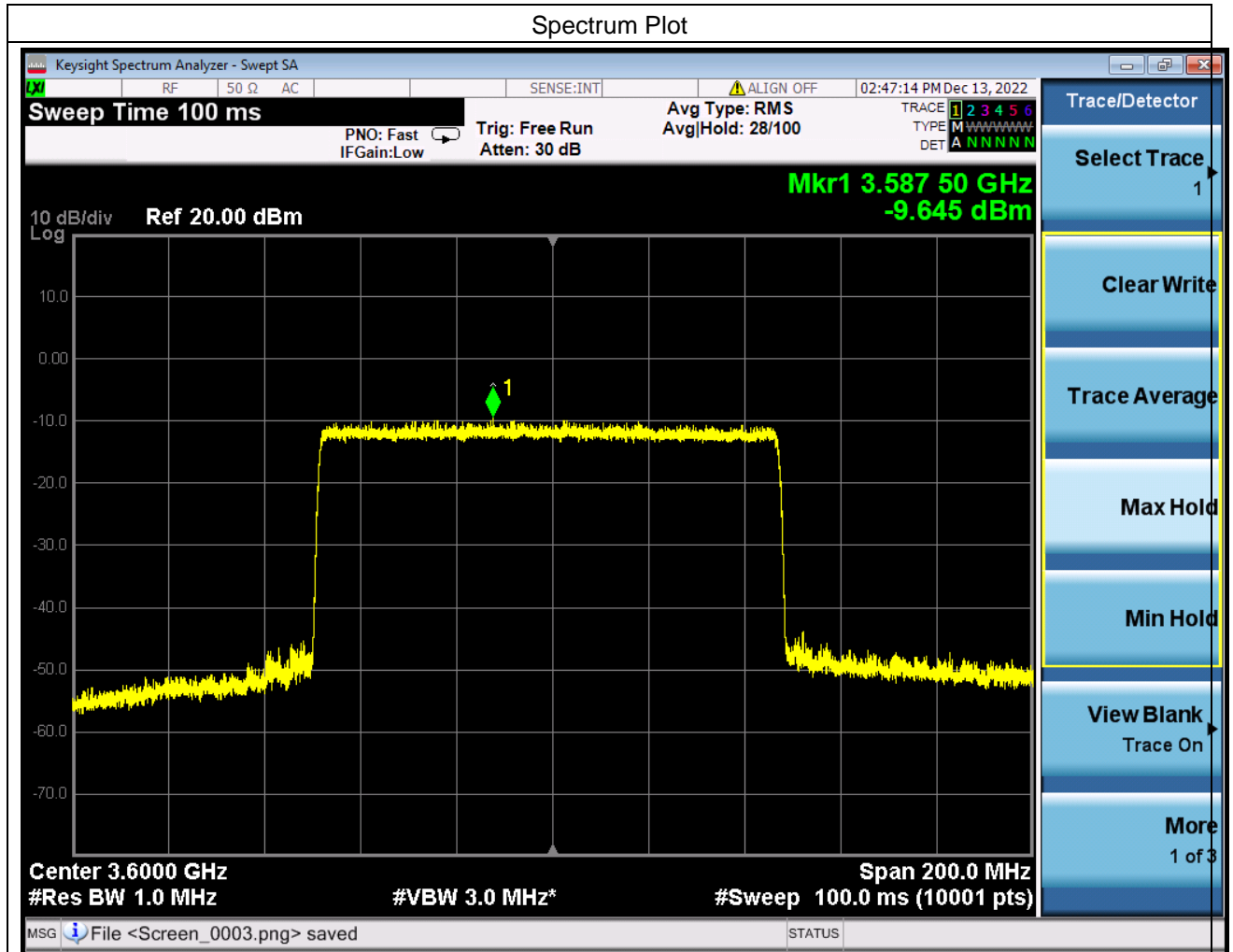
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### 7.3.2 WINNF.FT.C.HBT.3

| # | Test Execution Steps  | Results                                  |                               |
|---|---|--|-------------------------------|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>UUT has registered successfully with SAS Test Harness</li> <li>UUT has a valid single grant as follows: <ul style="list-style-type: none"> <li>valid cbsdId = C</li> <li>valid grantId = G</li> <li>grant is for frequency range F, power P</li> <li>grantExpireTime = UTC time greater than duration of the test</li> </ul> </li> <li>UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface</li> </ul> | --                                       | --                            |
| 2 | <p>UUT sends a Heartbeat Request message.</p> <p>Ensure Heartbeat Request message is sent within Heartbeat Interval specified in the latest Heartbeat Response, and formatted correctly, including:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>operationState = "AUTHORIZED"</li> </ul>  | --                                       | --                            |
| 3 | <p>SAS Test Harness sends a Heartbeat Response message, including the following parameters:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>transmitExpireTime = T = Current UTC time</li> <li>responseCode = 105 (DEREGISTER)</li> </ul>   | --                                       | --                            |
| 4 | After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.   | --                                       | --                            |
| 5 | <p>Monitor the RF output of the UUT. Verify:</p> <ul style="list-style-type: none"> <li>UUT shall stop transmission within (T + 60 seconds) of completion of step 3</li> </ul>  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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### 7.3.3 WINNF.FT.C.HBT.4

| # | Test Execution Steps  | Results                                  |                               |
|---|---|--|-------------------------------|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>UUT has registered successfully with SAS Test Harness</li> <li>UUT has a valid single grant as follows: <ul style="list-style-type: none"> <li>valid cbsdId = C</li> <li>valid grantId = G</li> <li>grant is for frequency range F, power P</li> <li>grantExpireTime = UTC time greater than duration of the test</li> </ul> </li> <li>UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface</li> </ul> | --                                       | --                            |
| 2 | <p>UUT sends a Heartbeat Request message.<br/>Ensure Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>operationState = "AUTHORIZED"</li> </ul>   | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 3 | <p>SAS Test Harness sends a Heartbeat Response message, including the following parameters:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>transmitExpireTime = T = current UTC time</li> <li>responseCode = 500 (TERMINATED_GRANT)</li> </ul>   | --                                       | --                            |
| 4 | <p>After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.</p>  | --                                       | --                            |
| 5 | <p>Monitor the RF output of the UUT. Verify:</p> <ul style="list-style-type: none"> <li>UUT shall stop transmission within (T + 60 seconds) of completion of step 3</li> </ul>  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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### 7.3.4 WINNF.FT.C.HBT.5

| # | Test Execution Steps   | Results                                  |                               |
|---|--|--|-------------------------------|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>UUT has registered successfully with SAS Test Harness</li> <li>UUT has a valid single grant as follows: <ul style="list-style-type: none"> <li>valid cbsdId = C</li> <li>valid grantId = G</li> <li>grant is for frequency range F, power P</li> <li>grantExpireTime = UTC time greater than duration of the test</li> </ul> </li> <li>UUT is in GRANTED, but not AUTHORIZED state (i.e. has not performed its first Heartbeat Request)</li> </ul>   | --                                       | --                            |
| 2 | <p>UUT sends a Heartbeat Request message.<br/>Verify Heartbeat Request message is formatted correctly, including:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>operationState = "GRANTED"</li> </ul>  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 3 | <p>SAS Test Harness sends a Heartbeat Response message, including the following parameters:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>transmitExpireTime = T = current UTC time</li> <li>?responseCode = 501 (SUSPENDED_GRANT)</li> </ul>  | --                                       | --                            |
| 4 | <p>After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.</p>   | --                                       | --                            |
| 5 | <p>Monitor the SAS-CBSD interface. Verify either A OR B occurs:</p> <p>A. UUT sends a Heartbeat Request message. Ensure message is sent within latest specified heartbeatInterval, and is correctly formatted with parameters:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>operationState = "GRANTED"</li> </ul> <p>B. UUT sends a Relinquishment request message. Ensure message is correctly formatted with parameters:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> </ul> <p>Monitor the RF output of the UUT. Verify:</p> <ul style="list-style-type: none"> <li>UUT does not transmit at any time</li> </ul> | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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### 7.3.5 WINNF.FT.C.HBT.6

| # | Test Execution Steps   | Results                                  |                               |
|---|--|--|-------------------------------|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>UUT has registered successfully with SAS Test Harness</li> <li>UUT has a valid single grant as follows: <ul style="list-style-type: none"> <li>valid cbsdId = C</li> <li>valid grantId = G</li> <li>grant is for frequency range F, power P</li> <li>grantExpireTime = UTC time greater than duration of the test</li> </ul> </li> <li>UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface</li> </ul>  | --                                       | --                            |
| 2 | <p>UUT sends a Heartbeat Request message. Ensure Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>operationState = "AUTHORIZED"</li> </ul>  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 3 | <p>SAS Test Harness sends a Heartbeat Response message, including the following parameters:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>transmitExpireTime = T = current UTC time</li> <li>responseCode = 501 (SUSPENDED_GRANT)</li> </ul>   | --                                       | --                            |
| 4 | <p>After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.</p>   | --                                       | --                            |
| 5 | <p>Monitor the SAS-CBSD interface. Verify either A OR B occurs:</p> <p>A. UUT sends a Heartbeat Request message. Ensure message is sent within latest specified heartbeatInterval, and is correctly formatted with parameters:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>operationState = "GRANTED"</li> </ul> <p>B. UUT sends a Relinquishment request message. Ensure message is correctly formatted with parameters:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> </ul> <p>Monitor the RF output of the UUT. Verify:</p> <ul style="list-style-type: none"> <li>UUT shall stop transmission within (T+60) seconds of completion of step 3</li> </ul> | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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### 7.3.6 WINNF.FT.C.HBT.7

| # | Test Execution Steps  | Results                                  |                               |
|---|---|--|-------------------------------|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>UUT has registered successfully with SAS Test Harness</li> <li>UUT has a valid single grant as follows: <ul style="list-style-type: none"> <li>valid cbsdId = C</li> <li>valid grantId = G</li> <li>grant is for frequency range F, power P</li> <li>grantExpireTime = UTC time greater than duration of the test</li> </ul> </li> <li>UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface</li> </ul> | --                                       | --                            |
| 2 | <p>UUT sends a Heartbeat Request message.<br/>Ensure Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>operationState = "AUTHORIZED"</li> </ul>   | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 3 | <p>SAS Test Harness sends a Heartbeat Response message, including the following parameters:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>transmitExpireTime = T = current UTC time</li> <li>responseCode = 502 (UNSYNC_OP_PARAM)</li> </ul>  | --                                       | --                            |
| 4 | <p>After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.</p>  | --                                       | --                            |
| 5 | <p>Monitor the SAS-CBSD interface. Verify:</p> <ul style="list-style-type: none"> <li>UUT sends a Grant Relinquishment Request message. Verify message is correctly formatted with parameters: <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> </ul> </li> </ul> <p>Monitor the RF output of the UUT. Verify:</p> <ul style="list-style-type: none"> <li>UUT shall stop transmission within (T+60) seconds of completion of step 3</li> </ul>   | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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### 7.3.7 WINNF.FT.C.HBT.9

| # | Test Execution Steps  | Results                                  |                               |
|---|---|--|-------------------------------|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>UUT has registered successfully with SAS Test Harness</li> <li>UUT has a valid single grant as follows: <ul style="list-style-type: none"> <li>valid cbsdId = C</li> <li>valid grantId = G</li> <li>grant is for frequency range F, power P</li> <li>grantExpireTime = UTC time greater than duration of the test</li> </ul> </li> <li>UUT is in GRANTED, but not AUTHORIZED state(i.e. has not performed its first Heartbeat Request)</li> </ul> | --                                       | --                            |
| 2 | <p>UUT sends a Heartbeat Request message.<br/>Ensure Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>operationState = "GRANTED"</li> </ul>  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 3 | <p>After completion of step 2, SAS Test Harness does not respond to any further</p> <ul style="list-style-type: none"> <li>messages from UUT to simulate loss of network connection</li> </ul>  | --                                       | --                            |
| 4 | <p>Monitor the RF output of the UUT from start of test to 60 seconds after step 3. Verify:<br/>At any time during the test, UUT shall not transmit on RF interface</p>  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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### 7.3.8 WINNF.FT.C.HBT.10

| # | Test Execution Steps  | Results                                  |                               |
|---|---|--|-------------------------------|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>UUT has registered successfully with SAS Test Harness</li> <li>UUT has a valid single grant as follows: <ul style="list-style-type: none"> <li>valid cbsdId = C</li> <li>valid grantId = G</li> <li>grant is for frequency range F, power P</li> <li>grantExpireTime = UTC time greater than duration of the test</li> </ul> </li> <li>UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface</li> </ul> | --                                       | --                            |
| 2 | <p>UUT sends a Heartbeat Request message.<br/>Verify Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>operationState = "AUTHORIZED"</li> </ul>   | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 3 | <p>SAS Test Harness sends a Heartbeat Response message, including the following parameters:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>transmitExpireTime = T = current UTC time + 200 seconds</li> <li>responseCode = 0</li> </ul>  | --                                       | --                            |
| 4 | <p>After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.</p>  | --                                       | --                            |
| 5 | <p>Monitor the RF output of the UUT. Verify:</p> <ul style="list-style-type: none"> <li>UUT shall stop all transmission on RF interface within (transmitExpireTime + 60 seconds), using the transmitExpireTime sent in Step 3.</li> </ul>   | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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### 7.3.9 WINNF.FT.C.HBT.11

| # | Test Execution Steps  | Results           |                   |
|---|---|-------------------|-------------------|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>UUT has registered successfully with SAS Test Harness</li> <li>UUT has a valid single grant as follows: <ul style="list-style-type: none"> <li>valid cbsdId = C</li> <li>valid grantId = G</li> <li>grant is for frequency range F, power P</li> </ul> </li> <li>UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface.</li> <li>Grant has the following parameters at the start of the test: <ul style="list-style-type: none"> <li>grantExpireTime = UTC time equal to time at start of test + 300 seconds = Tgrant_expire</li> <li>transmitExpireTime = UTC time equal to time at start of test + 200 seconds</li> <li>heartbeatInterval = 60 seconds</li> </ul> </li> </ul> | --                | --                |
| 2 | <p>UUT sends a Heartbeat Request message.</p> <p>If Heartbeat Request message contains grantRenew = TRUE, go to Step 6, else go to Step 3.</p>  | --                | --                |
| 3 | <p>Verify Heartbeat Request message is sent within the latest specified heartbeatInterval, and is formatted correctly, including:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>operationState = "AUTHORIZED"</li> </ul>  | <div>■</div> Pass | <div>□</div> Fail |
| 4 | <p>SAS Test Harness sends a Heartbeat Response message, with the following parameters:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>transmitExpireTime = current UTC + 200 seconds</li> <li>grantExpireTime = same as Step 1</li> <li>responseCode = 0</li> </ul>  | --                | --                |
| 5 | Go to Step 2  | --                | --                |
| 6 | <p>Verify Heartbeat Request message is sent within the latest specified heartbeatInterval, and is formatted correctly, including:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>operationState = "AUTHORIZED"</li> <li>grantRenew = TRUE</li> </ul>   | <div>■</div> Pass | <div>□</div> Fail |
| 7 | <p>SAS Test Harness sends a Heartbeat Response message, with the following parameters:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>grantExpireTime = UTC time set far in the future</li> <li>transmitExpireTime = current UTC time + 200 seconds</li> <li>responseCode = 0</li> </ul>   | --                | --                |



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|   |  |  |                               |
|---|--|--|-------------------------------|
| 8 | Continue to respond to any subsequent Heartbeat Request from CBSD with Heartbeat Response with the following parameters:<br><ul style="list-style-type: none"> <li>● cbsdId = C</li> <li>● grantId = G</li> <li>● transmitExpireTime = same as Step 7</li> <li>● responseCode = 0</li> </ul> | --                                       | --                            |
| 9 | Monitor RF transmission of UUT from start of test until Tgrant_expire + 60 seconds and ensure UUT continues to transmit throughout the time period.  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |

### 7.4 CBSD Measurement Report

#### 7.4.1 WINNF.FT.C.MES.3

| # | Test Execution Steps   | Results                                  |                               |
|---|--|--|-------------------------------|
| 1 | Ensure the following conditions are met for test entry:<br><ul style="list-style-type: none"> <li>● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>● UUT has successfully registered with SAS Test Harness, with cbsdId=C and measCapability = "RECEIVED_POWER_WITH_GRANT"</li> </ul>  | --                                       | --                            |
| 2 | UUT sends a Grant Request message. Verify Grant Request message contains all required parameters properly formatted, and specifically:<br><ul style="list-style-type: none"> <li>● cbsdId = C</li> <li>● operationParam is present and format is valid</li> </ul>  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 3 | SAS Test Harness sends a Grant Response message, with the following parameters:<br><ul style="list-style-type: none"> <li>● cbsdId = C</li> <li>● grantId = G = valid grant ID</li> <li>● grantExpireTime = UTC time in the future</li> <li>● heartbeatInterval = 60 seconds</li> <li>● measReportConfig= "RECEIVED_POWER_WITH_GRANT"</li> <li>● operationParam is set to valid operating parameters</li> <li>● channelType = "GAA"</li> <li>● responseCode = 0</li> </ul>                 | --                                       | --                            |
| 4 | UUT sends a Heartbeat Request message. Verify message contains all required parameters properly formatted, and specifically:<br><ul style="list-style-type: none"> <li>● cbsdId = C</li> <li>● grantId = G</li> <li>● operationState = "GRANTED"</li> </ul>  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 5 | If Heartbeat Request message (step 4) contains measReport object, then:<br><ul style="list-style-type: none"> <li>● verify measReport is properly formatted as object rcvdPowerMeasReport</li> <li>● end test, with PASS result</li> </ul> else, if Heartbeat Request message (step 4) does not contain measReport object, then:<br><ul style="list-style-type: none"> <li>● If number of Heartbeat Requests sent by UUT after Step 3 is =5, then stop test with result of FAIL</li> </ul> | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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|   |   |    |    |
|---|---|----|----|
| 6 | <p>SAS Test Harness sends a Heartbeat Response message, containing all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none"> <li>● cbsId = C</li> <li>● grantId = G</li> <li>● transmitExpireTime = current UTC time + 200 seconds</li> <li>● responseCode = 0</li> </ul> <p>Go to Step 4, above</p> | -- | -- |
|---|---|----|----|



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### 7.4.2 WINNF.FT.C.MES.4

| # | Test Execution Steps  | Results                                  |                               |
|---|---|--|-------------------------------|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>UUT has successfully registered with SAS Test Harness, with cbsdId=C and measCapability = "RECEIVED_POWER_WITH_GRANT"</li> <li>UUT has received a valid grant with grantId = G</li> <li>UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant.</li> <li>Grant has heartbeatInterval = 60 seconds</li> </ul> | --                                       | --                            |
| 2 | <p>UUT sends a Heartbeat Request message.<br/>Verify Heartbeat Request message contains all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>operationState = "AUTHORIZED"</li> </ul>  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 3 | <p>SAS Test Harness sends a Heartbeat Response message, containing all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>measReportConfig= "RECEIVED_POWER_WITH_GRANT"</li> <li>responseCode = 0</li> </ul>   | --                                       | --                            |
| 4 | <p>UUT sends a Heartbeat Request message. Verify message contains all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>operationState = "AUTHORIZED"</li> </ul>  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 5 | <p>If Heartbeat Request message (step 4) contains measReport object, then:</p> <ul style="list-style-type: none"> <li>verify measReport is properly formatted as object</li> <li>rcvdPowerMeasReport</li> <li>end test, with PASS result</li> </ul> <p>else, if Heartbeat Request message (step 4) does not contain measReport object, then:</p> <ul style="list-style-type: none"> <li>If number of Heartbeat Requests sent by UUT after Step 3 is = 5, then stop test with result of FAIL</li> </ul>  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 6 | <p>SAS Test Harness sends a Heartbeat Response message, containing all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>responseCode = 0</li> </ul> <p>Go to Step 4, above</p>   | --                                       | --                            |



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### 7.5 CBSD Relinquishment Process

#### 7.5.1 WINNF.FT.C.RLQ.1

| # | Test Execution Steps   | Results                                  |                               |
|---|--|--|-------------------------------|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>UUT has successfully registered with SAS Test Harness, with cbsdId=C</li> <li>UUT has received a valid grant with grantId = G</li> <li>UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant.</li> </ul> <p>Invoke trigger to relinquish UUT Grant from the SAS Test Harness</p> | --                                       | --                            |
| 2 | <p>UUT sends a Relinquishment Request message. Verify message contains all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> </ul>   | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 3 | <p>SAS Test Harness shall approve the request with a Relinquishment Response message with parameters:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>responseCode = 0</li> </ul>  | --                                       | --                            |
| 4 | <p>After completion of step 3, SAS Test Harness will not provide any additional positive</p> <ul style="list-style-type: none"> <li>response (responseCode=0) to further request messages from the UUT</li> </ul>  | --                                       | --                            |
| 5 | <p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none"> <li>UUT shall stop RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request</li> </ul>   | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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### 7.5.2 WINNF.FT.C.RLQ.3

| # | Test Execution Steps   | Results                                   |   |
|---|--|---|---|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>● UUT has successfully registered with SAS Test Harness, with cbsdId=C</li> <li>● UUT has received a valid grant with grantId = G</li> <li>● UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant.</li> </ul> <p>Invoke trigger to relinquish UUT Grant from the SAS Test Harness</p> | --  | --  |
| 2 | <p>UUT sends a Relinquishment Request message. Verify message contains all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none"> <li>● cbsdId = C</li> <li>● grantId = G</li> </ul>   | --  | --  |
| 3 | <p>SAS Test Harness shall approve the request with a Relinquishment Response message with parameters:</p> <ul style="list-style-type: none"> <li>- cbsdId = C</li> <li>- grantId = G</li> <li>● responseCode = R</li> </ul>  | --  | --  |
| 4 | <p>After completion of step 3, SAS Test Harness will not provide any additional positive</p> <ul style="list-style-type: none"> <li>● response (responseCode=0) to further request messages from the UUT</li> </ul>  | --  | --  |
| 5 | <p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none"> <li>● UUT shall stop RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request</li> </ul>   | <div> <div>■</div> <div>Pass</div> </div> | <div> <div>□</div> <div>Fail</div> </div> |



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### 7.5.3 WINNF.FT.C.RLQ.5

| # | Test Execution Steps   | Results                                  |                               |
|---|--|--|-------------------------------|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>UUT has successfully registered with SAS Test Harness, with cbsdId=C</li> <li>UUT has received a valid grant with grantId = G</li> <li>UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant.</li> </ul> <p>Invoke trigger to relinquish UUT Grant from the SAS Test Harness</p> | --                                       | --                            |
| 2 | <p>UUT sends a Relinquishment Request message. Verify message contains all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> </ul>   | --                                       | --                            |
| 3 | <p>SAS Test Harness shall approve the request with a Relinquishment Response message with parameters:</p> <ul style="list-style-type: none"> <li>- cbsdId = C</li> <li>- grantId = G</li> <li>● responseCode = 103</li> </ul>  | --                                       | --                            |
| 4 | <p>After completion of step 3, SAS Test Harness will not provide any additional positive</p> <ul style="list-style-type: none"> <li>● response (responseCode=0) to further request messages from the UUT</li> </ul>  | --                                       | --                            |
| 5 | <p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none"> <li>UUT shall stop RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request</li> </ul>   | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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### 7.6 CBSD Deregistration Process

#### 7.6.1 WINNF.FT.C.DRG.1

| # | Test Execution Steps   | Results                                  |                               |
|---|--|--|-------------------------------|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>• UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>• UUT has successfully registered with SAS Test Harness, with cbsdId=C</li> <li>• UUT has received a valid grant with grantId = G</li> <li>• UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant.</li> </ul> <p>Invoke trigger to deregister UUT from the SAS Test Harness</p> | --                                       | --                            |
| 2 | <p>UUT sends a Relinquishment request and receives Relinquishment response with</p> <ul style="list-style-type: none"> <li>• responseCode=0</li> </ul>   | --                                       | --                            |
| 3 | <ul style="list-style-type: none"> <li>• UUT sends Deregistration Request to SAS Test Harness with cbsdId = C.</li> </ul>  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 4 | <p>SAS Test Harness shall approve the request with a Deregistration Response message with parameters:</p> <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• responseCode = 0</li> </ul>   | --                                       | --                            |
| 5 | <p>After completion of step 3, SAS Test Harness will not provide any additional positive</p> <ul style="list-style-type: none"> <li>• response (responseCode=0) to further request messages from the UUT.</li> </ul>   | --                                       | --                            |
| 6 | <p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 4 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none"> <li>• UUT stopped RF transmission at any time between triggering the deregistration and either A OR B occurs:             <ul style="list-style-type: none"> <li>A. UUT sending a Registration Request message, as this is not mandatory</li> <li>B. UUT sending a Deregistration Request message</li> </ul> </li> </ul>                         | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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### 7.6.2 WINNF.FT.C.DRG.3

| # | Test Execution Steps   | Results           |                   |
|---|--|-------------------|-------------------|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>• UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>• UUT has successfully registered with SAS Test Harness, with cbsdId=C</li> <li>• UUT has received a valid grant with grantId = G</li> <li>• UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant.</li> </ul> <p>Invoke trigger to deregister UUT from the SAS Test Harness</p> | --                | --                |
| 2 | UUT sends a Relinquishment request and receives Relinquishment response with responseCode=0  | --                | --                |
| 3 | <ul style="list-style-type: none"> <li>• UUT sends Deregistration Request to SAS Test Harness with cbsdId = C.</li> </ul>  | --                | --                |
| 4 | <p>The SAS Test Harness sends the Deregistration Response Message to UUT with:</p> <ul style="list-style-type: none"> <li>• No cbsdId</li> <li>• responseCode = 103</li> </ul>   | --                | --                |
| 5 | After completion of step 3, SAS Test Harness will not provide any additional positive response (responseCode=0) to further request messages from the UUT.  | --                | --                |
| 6 | <p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 4 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none"> <li>• UUT stopped RF transmission at any time between triggering the deregistration and either A OR B occurs: <ul style="list-style-type: none"> <li>A. UUT sending a Registration Request message, as this is not mandatory</li> <li>B. UUT sending a Deregistration Request message</li> </ul> </li> </ul>                                     | <div>■</div> Pass | <div>□</div> Fail |



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### 7.6.3 WINNF.FT.C.DRG.5

| # | Test Execution Steps   | Results                                  |                               |
|---|--|--|-------------------------------|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>UUT has successfully registered with SAS Test Harness, with cbsdId=C</li> <li>UUT has received a valid grant with grantId = G</li> <li>UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant.</li> </ul> <p>Invoke trigger to deregister UUT from the SAS Test Harness</p> | --                                       | --                            |
| 2 | UUT sends a Relinquishment request and receives Relinquishment response with responseCode=0  | --                                       | --                            |
| 3 | <ul style="list-style-type: none"> <li>UUT sends Deregistration Request to SAS Test Harness with cbsdId = C.</li> </ul>  | --                                       | --                            |
| 4 | <p>The SAS Test Harness sends the Deregistration Response Message to UUT with:</p> <ul style="list-style-type: none"> <li>cbsdId=C</li> <li>responseCode = 103</li> </ul>  | --                                       | --                            |
| 5 | After completion of step 3, SAS Test Harness will not provide any additional positive response (responseCode=0) to further request messages from the UUT.  | --                                       | --                            |
| 6 | <p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 4 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none"> <li>UUT stopped RF transmission at any time between triggering the deregistration and either A OR B occurs:</li> </ul> <p>C. UUT sending a Registration Request message, as this is not mandatory</p> <p>D. UUT sending a Deregistration Request message</p>   | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |



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### 7.7 CBSD Security Validation

#### 7.7.1 WINNF.FT.C.SCS.1

| # | Test Execution Steps   | Results                                  |                               |
|---|--|--|-------------------------------|
| 1 | <ul style="list-style-type: none"> <li>UUT shall start CBSD-SAS communication with the security procedure</li> <li>The UUT shall establish a TLS handshake with the SAS Test Harness using configured certificate.</li> <li>Configure the SAS Test Harness to accept the security procedure and establish the connection</li> </ul>  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 2 | <ul style="list-style-type: none"> <li>Make sure that Mutual authentication happens between UUT and the SAS Test Harness.</li> <li>Make sure that UUT uses TLS v1.2</li> <li>Make sure that cipher suites from one of the following is selected,               <ul style="list-style-type: none"> <li>TLS_RSA_WITH_AES_128_GCM_SHA256</li> <li>TLS_RSA_WITH_AES_256_GCM_SHA384</li> <li>TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256</li> <li>TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384</li> <li>TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256</li> </ul> </li> </ul> | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 3 | A successful registration is accomplished using one of the test cases described in section 6.1.4.1, depending on CBSD capability.<br>E. UUT sends a registration request to the SAS Test Harness and the SAS Test Harness sends a Registration Response with responseCode = 0 and cbsdId.  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 4 | Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none"> <li>UUT shall not transmit RF</li> </ul>  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |

#### 7.7.2 WINNF.FT.C.SCS.2

| # | Test Execution Steps   | Results                                  |                               |
|---|--|--|-------------------------------|
| 1 | <ul style="list-style-type: none"> <li>UUT shall start CBSD-SAS communication with the security procedures</li> </ul>  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 2 | <ul style="list-style-type: none"> <li>Make sure that UUT uses TLS v1.2 for security establishment.</li> <li>Make sure UUT selects the correct cipher suite.</li> <li>UUT shall use CRL or OCSP to verify the validity of the server certificate.</li> <li>Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness.</li> </ul> | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 3 | F. UUT may retry for the security procedure which shall fail.  | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail |
| 4 | <ul style="list-style-type: none"> <li>SAS Test-Harness shall not receive any Registration request or any application data.</li> </ul>   | --                                       | --                            |
| 5 | Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:  | <input checked="" type="checkbox"/>      | <input type="checkbox"/>      |



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|                             |      |      |
|-----------------------------|------|------|
| ● UUT shall not transmit RF | Pass | Fail |
|-----------------------------|------|------|

### 7.7.3 WINNF.FT.C.SCS.3

| # | Test Execution Steps   | Results   |           |
|---|--|-----------|-----------|
| 1 | ● UUT shall start CBSD-SAS communication with the security procedures  | ■<br>Pass | □<br>Fail |
| 2 | <ul style="list-style-type: none"> <li>● Make sure that UUT uses TLS v1.2 for security establishment.</li> <li>● Make sure UUT selects the correct cipher suite.</li> <li>● UUT shall use CRL or OCSP to verify the validity of the server certificate.</li> <li>● Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness.</li> </ul> | ■<br>Pass | □<br>Fail |
| 3 | G. UUT may retry for the security procedure which shall fail.  | ■<br>Pass | □<br>Fail |
| 4 | ● SAS Test-Harness shall not receive any Registration request or any application data.   | --        | --        |
| 5 | Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:<br>● UUT shall not transmit RF   | ■<br>Pass | □<br>Fail |

### 7.7.4 WINNF.FT.C.SCS.4

| # | Test Execution Steps  | Results   |           |
|---|---|-----------|-----------|
| 1 | ● UUT shall start CBSD-SAS communication with the security procedures   | ■<br>Pass | □<br>Fail |
| 2 | <ul style="list-style-type: none"> <li>● Make sure that UUT uses TLS v1.2 for security establishment.</li> <li>● Make sure UUT selects the correct cipher suite.</li> <li>● UUT shall use CRL or OCSP to verify the validity of the server certificate</li> <li>● Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness.</li> </ul> | ■<br>Pass | □<br>Fail |
| 3 | H. UUT may retry for the security procedure which shall fail.   | ■<br>Pass | □<br>Fail |
| 4 | ● SAS Test-Harness shall not receive any Registration request or any application data.  | --        | --        |
| 5 | Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:<br>● UUT shall not transmit RF  | ■<br>Pass | □<br>Fail |



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### 7.7.5 WINNF.FT.C.SCS.5

| # | Test Execution Steps  | Results                                     |                                  |
|---|---|---|----------------------------------|
| 1 | <ul style="list-style-type: none"> <li>UUT shall start CBSD-SAS communication with the security procedures</li> </ul>   | <input checked="" type="checkbox"/><br>Pass | <input type="checkbox"/><br>Fail |
| 2 | <ul style="list-style-type: none"> <li>Make sure that UUT uses TLS v1.2 for security establishment.</li> <li>Make sure UUT selects the correct cipher suite.</li> <li>UUT shall use CRL or OCSP to verify the validity of the server certificate</li> <li>Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness.</li> </ul> | <input checked="" type="checkbox"/><br>Pass | <input type="checkbox"/><br>Fail |
| 3 | I. UUT may retry for the security procedure which shall fail.   | <input checked="" type="checkbox"/><br>Pass | <input type="checkbox"/><br>Fail |
| 4 | <ul style="list-style-type: none"> <li>SAS Test-Harness shall not receive any Registration request or any application data.</li> </ul>  | --  | --                               |
| 5 | Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none"> <li>UUT shall not transmit RF</li> </ul>   | <input checked="" type="checkbox"/><br>Pass | <input type="checkbox"/><br>Fail |



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### 7.8 CBSD RF Power Measurement

#### 7.8.1 WINNF.PT.C.HBT

| # | Test Execution Steps  | Results           |                   |
|---|---|-------------------|-------------------|
| 1 | <p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>UUT has successfully completed SAS Discovery and Authentication with the SAS Test Harness</li> <li>UUT has registered with the SAS, with CBSD ID = C</li> <li>UUT has a single valid grant G with parameters {lowFrequency = FL, highFrequency = FH, maxEirp = Pi}, with grant in AUTHORIZED state, and grantExpireTime set to a value far past the duration of this test case</li> <li>Note: in order for the UUT to request a grant with the parameters {lowFrequency, highFrequency, maxEirp}, the SAS Test Harness may need to provide appropriate guidance in the availableChannel object of the spectrumInquiry response message, and the operationParam object of the grant response message. Alternately, the UUT vendor may provide the ability to set those parameters on the UUT so that the UUT will request a grant with those parameters</li> </ul> | --                | --                |
| 2 | <p>UUT and SAS Test Harness perform a series of Heartbeat Request/Response cycles, which continues until the other test steps are complete. Messaging for each cycle is as follows:</p> <ul style="list-style-type: none"> <li>UUT sends Heartbeat Request, including: <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> </ul> </li> <li>SAS Test Harness responds with Heartbeat Response, including: <ul style="list-style-type: none"> <li>cbsdId = C</li> <li>grantId = G</li> <li>transmitExpireTime = current UTC time + 200 seconds</li> <li>responseCode = 0</li> </ul> </li> </ul>   | --                | --                |
| 3 | <p>Tester performs power measurement on RF interface(s) of UUT, and verifies it complies with the maxEirp setting, Pi. The RF measurement method is out of scope of this document, but may include additional configuration of the UUT, as required, to fulfill the requirements of the power measurement method.</p> <p>J. Note: it may be required for the vendor to provide a method or configuration to bring the UUT to a mode which is required by the measurement methodology. Any such mode is vendor-specific and depends upon UUT behavior and the measurement methodology.</p>   | <div>■</div> Pass | <div>□</div> Fail |



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RF measurement plot for Test Case:

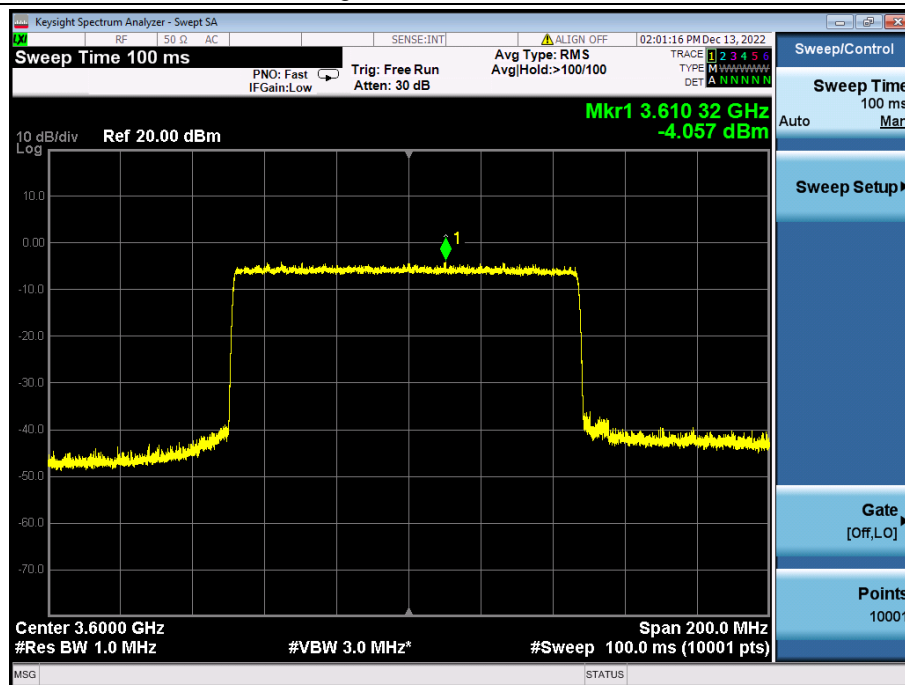
- Tester performs power measurement on RF interface(s) of UUT, and verifies it complies with the max EIRP setting, Pi. The RF measurement method is out of scope of this document, but may include additional configuration of the UUT, as required, to fulfill the requirements of the power measurement method.

| Frequency (MHz) | Channel Bandwidth (MHz) | Granted maxEIRP (dBm/MHz) | Conducted PSD (dBm/MHz) | Antenna Gain (dBi) | Cable Loss (dB) | maxEIRP (dBm/MHz) |
|-----------------|-------------------------|---------------------------|-------------------------|--------------------|-----------------|-------------------|
| 3600            | 100                     | 37                        | -4.057                  | 1.290              | 5.810           | 3.043             |
| 3600            | 100                     | 25                        | -7.409                  | 1.290              | 5.810           | -0.309            |
| 3600            | 100                     | 20                        | -9.637                  | 1.290              | 5.810           | -2.537            |
| 3600            | 100                     | 10                        | -9.645                  | 1.290              | 5.810           | -2.545            |

Note:

1.maxEIRP= Conducted PSD+ Antenna Gain+ Cable loss

Target Power: 37 dBm/MHz



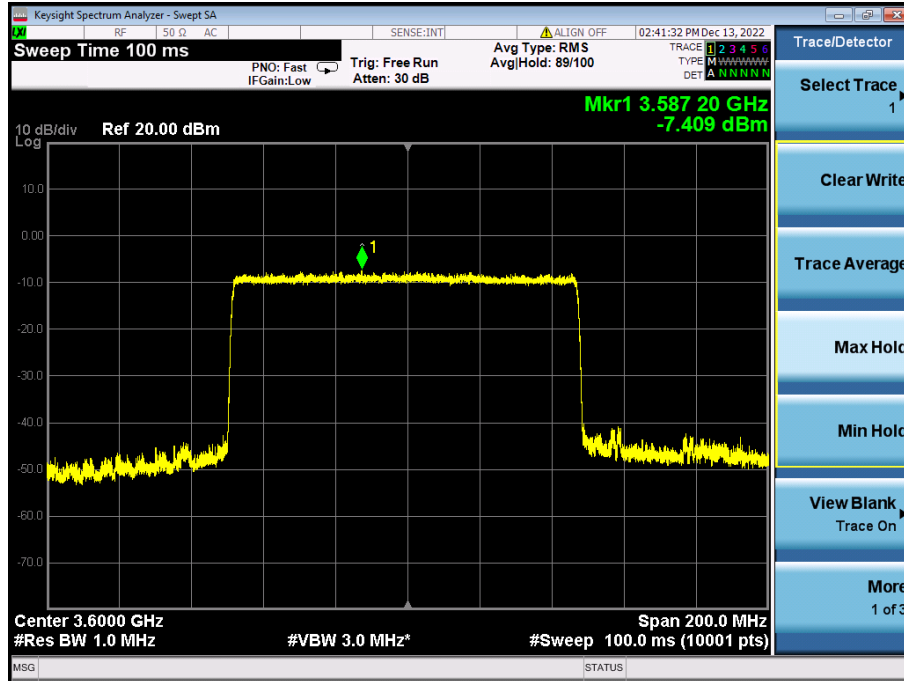
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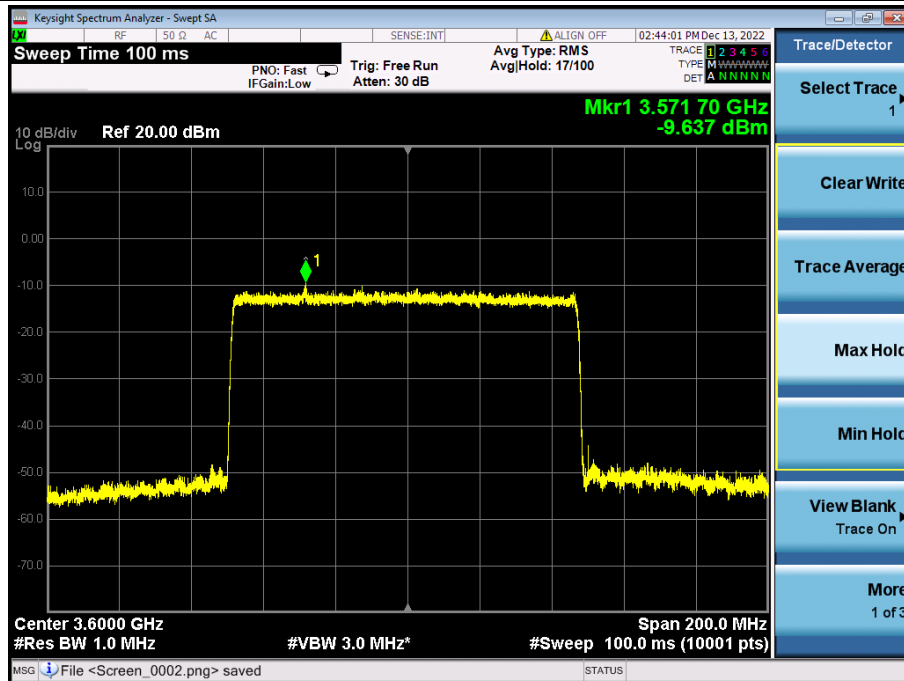
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### Target Power: 25 dBm/MHz



### Target Power: 15 dBm/MHz



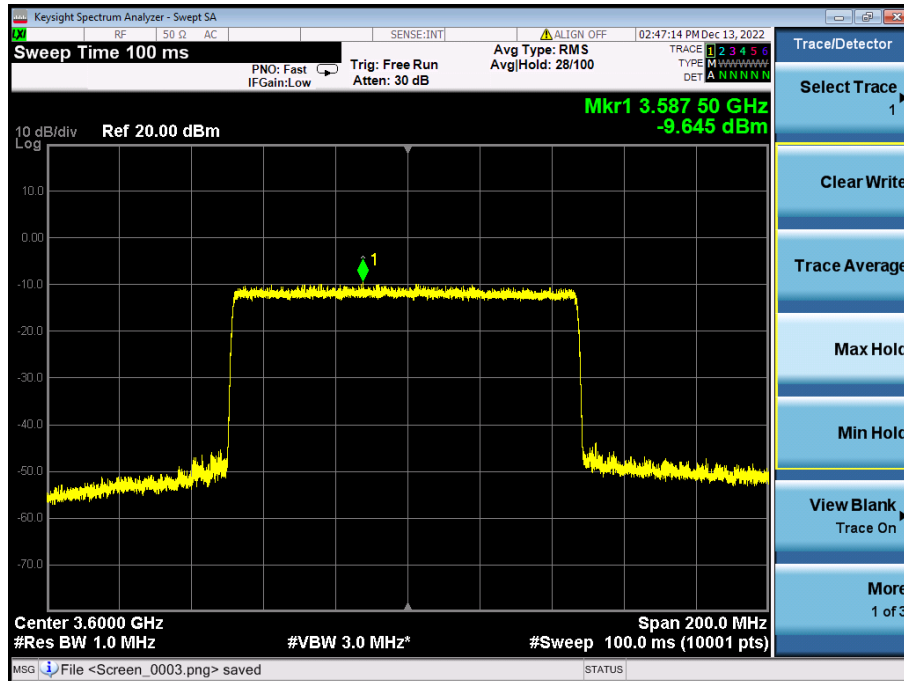
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Target Power: 10 dBm/MHz



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## 8 Test Data Log

Test data log refer to log files (Log files appendix) except for security test cases which shows below.

### 8.1 WINNF.FT.C.SCS.1

| No.  | Time      | Source       | Destination  | Protocol | Length | Info  |
|------|-----------|--------------|--------------|----------|--------|---|
| 8246 | 42.427567 | 10.5.251.14  | 10.88.140.53 | TLSv1.2  | 571    | Client Hello  |
| 8247 | 42.427713 | 10.88.140.53 | 10.5.251.14  | TLSv1.2  | 1514   | Server Hello  |
| 8248 | 42.427713 | 10.88.140.53 | 10.5.251.14  | TLSv1.2  | 1514   | Certificate [TCP segment of a reassembled PDU]  |
| 8249 | 42.427713 | 10.88.140.53 | 10.5.251.14  | TLSv1.2  | 58     | Certificate Request, Server Hello Done  |
| 8427 | 42.518041 | 10.5.251.14  | 10.88.140.53 | TLSv1.2  | 1514   | Certificate [TCP segment of a reassembled PDU]  |
| 8428 | 42.518041 | 10.5.251.14  | 10.88.140.53 | TLSv1.2  | 515    | Client Key Exchange, Certificate Verify, Change Cipher Spec, Encrypted Handshake Message            |
| 8430 | 42.520462 | 10.88.140.53 | 10.5.251.14  | TLSv1.2  | 105    | Change Cipher Spec, Encrypted Handshake Message   |
| 8642 | 42.597504 | 10.5.251.14  | 10.88.140.53 | TLSv1.2  | 370    | Application Data  |
| 8652 | 42.605554 | 10.88.140.53 | 10.5.251.14  | TLSv1.2  | 100    | Application Data  |
| 8993 | 42.672607 | 10.88.140.53 | 10.5.251.14  | TLSv1.2  | 545    | Application Data, Application Data, Application Data, Application Data, Application Data, Applic... |
| 9021 | 45.418198 | 10.5.251.14  | 10.88.140.53 | TLSv1.2  | 470    | Application Data  |
| 9022 | 45.421958 | 10.88.140.53 | 10.5.251.14  | TLSv1.2  | 100    | Application Data  |
| 9024 | 45.452750 | 10.88.140.53 | 10.5.251.14  | TLSv1.2  | 540    | Application Data, Application Data, Application Data, Application Data, Application Data, Applic... |
| 9026 | 46.583637 | 10.5.251.14  | 10.88.140.53 | TLSv1.2  | 335    | Application Data  |
| 9027 | 46.589166 | 10.88.140.53 | 10.5.251.14  | TLSv1.2  | 100    | Application Data  |
| 9029 | 46.613437 | 10.88.140.53 | 10.5.251.14  | TLSv1.2  | 547    | Application Data, Application Data, Application Data, Application Data, Application Data, Applic... |

|   |  |
|---|--|
| Handshake Protocol: Server Hello              |  |
| Handshake Type: Server Hello (2)              |  |
| Length:                                       | 82   |
| Version:                                      | TLS 1.2 (0x0303)   |
| Random:                                       | 2b7f65bef7df81dcf3ebfd5ea88dd6b1c9ce9ecd145a6c8fcc14f1a92b48e7d5 |
| Session ID Length:                            | 32   |
| Session ID:                                   | c5d08f93b845d75c24e64f8ad78f3a5e10053af9a731686b501659987d11d34f |
| Cipher Suite:                                 | TLS_RSA_WITH_AES_256_GCM_SHA384 (0x009d)                         |
| Compression Method:                           | null (0)   |
| Extensions Length:                            | 10   |
| Extension:                                    | renegotiation_info (len=1)                                       |
| Extension:                                    | heartbeat (len=1)  |
| [JA3S Fullstring: 771,157,65281-15]           |  |
| [JA3S: 2455f6a1535964e2a4e07022e2b0a0a7a4a63] |  |

|      |                         |                         |                  |
|------|-------------------------|-------------------------|------------------|
| 0000 | 00 30 64 eb 23 da 00 0e | c6 b6 72 c7 00 00 45 00 | ..odkw...P...E.. |
| 0010 | 05 dc d8 d3 40 00 80 06 | 80 a7 0a 58 8c 35 0a 05 | ...@...X5...     |
| 0020 | fb 0e 13 88 97 2e 1c be | 20 08 9a ac 16 2d 50 10 | ...L...P...      |
| 0030 | 04 00 dd 4e 00 00 16 03 | 03 00 56 02 00 00 52 03 | ...N...V...R...  |
| 0040 | 03 2b 7f 65 b0 f7 df 81 | dc f3 eb fd 5e a8 8d d6 | ...+e...A...     |
| 0050 | b1 c9 ce 9e cd 14 5a 6c | 8f cc 14 f1 a9 2b 48 e7 | .....Zl.....H..  |



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## 8.2 WINNF.FT.C.SCS.2

SCS.2.pcapng

文件(F) 编辑(E) 视图(V) 捕获(C) 分析(A) 统计(S) 电话(T) 无线(W) 工具(I) 帮助(H)

| No. | Time      | Source       | Destination  | Protocol | Length | Info   |
|-----|-----------|--------------|--------------|----------|--------|--|
| 19  | 3.845215  | 10.5.251.113 | 10.88.140.53 | TLSv1.2  | 571    | Client Hello   |
| 20  | 3.845452  | 10.88.140.53 | 10.5.251.113 | TLSv1.2  | 1514   | Server Hello   |
| 22  | 3.845452  | 10.88.140.53 | 10.5.251.113 | TLSv1.2  | 192    | Certificate, Certificate Request, Server Hello Done    |
| 26  | 3.863157  | 10.5.251.113 | 10.88.140.53 | TLSv1.2  | 61     | Alert (Level: Fatal, Description: Certificate Revoked) |
| 30  | 4.005515  | 192.168.1.10 | 192.168.1.1  | TLSv1.2  | 1379   | Application Data                                       |
| 34  | 4.049787  | 192.168.1.1  | 192.168.1.10 | TLSv1.2  | 912    | Application Data                                       |
| 39  | 5.002260  | 192.168.1.10 | 192.168.1.1  | TLSv1.2  | 1096   | Application Data                                       |
| 45  | 5.007289  | 192.168.1.1  | 192.168.1.10 | TLSv1.2  | 422    | Application Data                                       |
| 67  | 9.551292  | 10.5.251.113 | 10.88.140.53 | TLSv1.2  | 571    | Client Hello   |
| 68  | 9.552015  | 10.88.140.53 | 10.5.251.113 | TLSv1.2  | 1514   | Server Hello   |
| 70  | 9.552015  | 10.88.140.53 | 10.5.251.113 | TLSv1.2  | 192    | Certificate, Certificate Request, Server Hello Done    |
| 74  | 9.570722  | 10.5.251.113 | 10.88.140.53 | TLSv1.2  | 61     | Alert (Level: Fatal, Description: Certificate Revoked) |
| 88  | 11.003041 | 192.168.1.10 | 192.168.1.1  | TLSv1.2  | 1096   | Application Data                                       |
| 89  | 11.008487 | 192.168.1.1  | 192.168.1.10 | TLSv1.2  | 422    | Application Data                                       |
| 93  | 13.726468 | 192.168.1.10 | 192.168.1.1  | TLSv1.2  | 1379   | Application Data                                       |
| 95  | 13.768929 | 192.168.1.1  | 192.168.1.10 | TLSv1.2  | 912    | Application Data                                       |

> Frame 26: 61 bytes on wire (488 bits), 61 bytes captured (488 bits) on interface \Device\NPF\_{0CE3A0EC-75F3-46DE-BD1E-73C39F15F349}, id 0

> Ethernet II, Src: AdlinkTe\_6b:23:da (00:30:64:b6:23:da), Dst: AsixElec\_b6:72:c7 (00:0e:c6:b6:72:c7)

> Internet Protocol Version 4, Src: 10.5.251.113, Dst: 10.88.140.53

> Transmission Control Protocol, Src Port: 40782, Dst Port: 5007, Seq: 518, Ack: 3059, Len: 7

> Transport Layer Security

> TLSv1.2 Record Layer: Alert (Level: Fatal, Description: Certificate Revoked)

> Content Type: Alert (21)

> Version: TLS 1.2 (0x0303)

> Length: 2

> Alert Message

> Level: Fatal (2)

> Description: Certificate Revoked (44)

0000 00 0e c6 b6 72 c7 00 30 64 b6 23 da 08 00 45 00 .....dkE..E..

0010 00 2f 2a 35 40 00 3f 06 75 90 0a 05 fb 71 0a 58 ../\*SQ-? u...qX

0020 8c 35 9f 4e 13 8f 6b 04 e7 3c 64 7a 73 cb 50 18 ..5N-k->cdzs-P-

0030 01 1b ef 3c 00 00 15 03 03 00 02 02 2c .....<....,

SCS.2-下载OK.pcapng

文件(F) 编辑(E) 视图(V) 捕获(C) 分析(A) 统计(S) 电话(T) 无线(W) 工具(I) 帮助(H)

| No. | Time      | Source        | Destination   | Protocol  | Length | Info  |
|-----|-----------|---------------|---------------|-----------|--------|---|
| 2   | 0.000707  | 192.168.1.10  | 192.168.1.1   | HTTP      | 908    | GET /data.html?method=obj_get&param=X5B%22cbdsCurrentStatus%22%2C%22cbdsPccFreq%22%2C%22cb... |
| 5   | 0.005678  | 192.168.1.1   | 192.168.1.10  | HTTP      | 390    | HTTP/1.1 200 OK (text/html)   |
| 25  | 2.985834  | 192.168.5.120 | 192.168.5.115 | HTTP/1... | 905    | POST /public/cgi-bin/information.cgi HTTP/1.1, JavaScript Object Notation (application/js...  |
| 34  | 3.427575  | 192.168.5.115 | 192.168.5.120 | HTTP      | 326    | HTTP/1.0 200 OK (text/html)   |
| 53  | 4.977619  | 192.168.1.10  | 192.168.1.1   | HTTP      | 1191   | GET /data.html?method=obj_get&param=X5B%22systemRebootFlag%22%2C%22webGuiRestartFlag%22%2C... |
| 55  | 5.021172  | 192.168.1.1   | 192.168.1.10  | HTTP      | 883    | HTTP/1.1 200 OK (text/html)   |
| 76  | 5.978507  | 192.168.1.10  | 192.168.1.1   | HTTP      | 908    | GET /data.html?method=obj_get&param=X5B%22cbdsCurrentStatus%22%2C%22cbdsPccFreq%22%2C%22cb... |
| 78  | 5.984492  | 192.168.1.1   | 192.168.1.10  | HTTP      | 390    | HTTP/1.1 200 OK (text/html)   |
| 90  | 6.288709  | 10.5.251.17   | 10.88.140.53  | HTTP      | 138    | GET /cbds.crl HTTP/1.1  |
| 93  | 6.301682  | 10.88.140.53  | 10.5.251.17   | HTTP      | 1090   | HTTP/1.1 200 OK   |
| 109 | 7.976383  | 192.168.5.120 | 192.168.5.115 | HTTP/1... | 905    | POST /public/cgi-bin/information.cgi HTTP/1.1, JavaScript Object Notation (application/js...  |
| 112 | 8.081310  | 192.168.5.115 | 192.168.5.120 | HTTP      | 326    | HTTP/1.0 200 OK (text/html)   |
| 119 | 9.841032  | 192.168.1.10  | 192.168.1.1   | HTTP      | 600    | GET /sessionstatus.html HTTP/1.1  |
| 120 | 9.844243  | 192.168.1.1   | 192.168.1.10  | HTTP      | 352    | HTTP/1.1 200 OK (text/html)   |
| 136 | 11.980537 | 192.168.1.10  | 192.168.1.1   | HTTP      | 908    | GET /data.html?method=obj_get&param=X5B%22cbdsCurrentStatus%22%2C%22cbdsPccFreq%22%2C%22cb... |
| 137 | 11.986458 | 192.168.1.1   | 192.168.1.10  | HTTP      | 390    | HTTP/1.1 200 OK (text/html)   |

> Frame 90: 138 bytes on wire (1104 bits), 138 bytes captured (1104 bits) on interface \Device\NPF\_{0CE3A0EC-75F3-46DE-BD1E-73C39F15F349}, id 0

> Ethernet II, Src: AdlinkTe\_6b:23:da (00:30:64:b6:23:da), Dst: AsixElec\_b6:72:c7 (00:0e:c6:b6:72:c7)

> Internet Protocol Version 4, Src: 10.5.251.17, Dst: 10.88.140.53

> Transmission Control Protocol, Src Port: 40366, Dst Port: 80, Seq: 1, Ack: 1, Len: 84

> Hypertext Transfer Protocol

> GET /cbds.crl HTTP/1.1\r\n

Host: 10.88.140.53\r\n

User-Agent: curl/7.58.0\r\n

Accept: \*/\*\r\n

\r\n

[Full request URI: http://10.88.140.53/cbds.crl]

[HTTP request 1/1]

[Response in frame: 93]

0000 00 0e c6 b6 72 c7 00 30 64 b6 23 da 08 00 45 00 .....dkE..E..

0010 00 7c f1 b8 40 00 3f 06 ae 1f 0a 05 fb 11 0a 58 ..|..@-? .....X

0020 8c 35 9d ae 00 50 32 90 14 70 d6 22 bb 47 50 18 ..5..P2- .p..GP-

0030 00 e5 be db 00 00 47 45 54 20 2f 63 62 73 64 2e .....GE T /cbds.

0040 63 72 6c 20 48 54 54 50 2f 31 2e 31 0d 0a 48 6f ..crl HTTP /1.1--Ho

0050 73 74 3a 20 31 30 2e 38 38 2e 31 34 30 2e 35 33 st: 10.8.140.53

## 8.3 WINNF.FT.C.SCS.3

SCS.3.pcap

文件(F) 编辑(E) 视图(V) 捕获(C) 分析(A) 统计(S) 电话(T) 无线(W) 工具(I) 帮助(H)

| No. | Time      | Source       | Destination  | Protocol | Length | Info   |
|-----|-----------|--------------|--------------|----------|--------|--|
| 4   | 0.018719  | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 571    | Client Hello   |
| 6   | 0.041024  | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Server Hello   |
| 9   | 0.041151  | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Certificate [TCP segment of a reassembled PDU]         |
| 11  | 0.041223  | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 58     | Certificate Request, Server Hello Done                 |
| 13  | 0.054110  | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 61     | Alert (Level: Fatal, Description: Certificate Expired) |
| 25  | 5.679035  | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 571    | Client Hello   |
| 27  | 5.700930  | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Server Hello   |
| 30  | 5.701102  | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Certificate [TCP segment of a reassembled PDU]         |
| 32  | 5.701154  | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 58     | Certificate Request, Server Hello Done                 |
| 34  | 5.714027  | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 61     | Alert (Level: Fatal, Description: Certificate Expired) |
| 43  | 11.348804 | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 571    | Client Hello   |
| 52  | 11.383337 | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 61     | Alert (Level: Fatal, Description: Certificate Expired) |
| 61  | 17.008959 | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 571    | Client Hello   |
| 70  | 17.044279 | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 61     | Alert (Level: Fatal, Description: Certificate Expired) |
| 83  | 22.668735 | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 571    | Client Hello   |
| 85  | 22.690972 | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Server Hello   |
| 89  | 23.694130 | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Certificate [TCP segment of a reassembled PDU]         |

> Frame 13: 61 bytes on wire (488 bits), 61 bytes captured (488 bits)  
> Ethernet II, Src: SunwaveC\_0f:5e:6c (68:1d:64:0f:5e:6c), Dst: SunwaveC\_0f:5e:6c (68:1d:64:0f:5e:6c)  
> Internet Protocol Version 4, Src: 10.5.251.80, Dst: 10.88.140.53  
> Transmission Control Protocol, Src Port: 41212, Dst Port: 5001, Seq: 518, Ack: 2925, Len: 7  
v Transport Layer Security  
v TLSv1.2 Record Layer: Alert (Level: Fatal, Description: Certificate Expired)  
Content Type: Alert (21)  
Version: TLS 1.2 (0x0303)  
Length: 2  
v Alert Message  
Level: Fatal (2)  
Description: Certificate Expired (45)

0000 68 1d 64 0f 5e 6c 68 1d 64 0f 5e 6c 08 00 45 00 h-d-A]h-d-A]·E·  
0010 00 2f c7 a4 00 00 40 06 d7 41 0a 05 fb 50 0a 58 ·/·@·@·A·P·X  
0020 8c 35 a0 fc 13 89 90 10 54 15 e1 1d ca b2 50 18 ·5·T·P·  
0030 01 12 87 4f 00 00 15 03 03 00 02 02 2d ··O·P·



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### 8.4 WINNF.FT.C.SCS.4

| No. | Time      | Source       | Destination  | Protocol | Length | Info   |
|-----|-----------|--------------|--------------|----------|--------|--|
| 4   | 0.018984  | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 571    | Client Hello                                   |
| 13  | 0.042240  | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 61     | Alert (Level: Fatal, Description: Unknown CA)  |
| 30  | 5.668810  | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 571    | Client Hello                                   |
| 32  | 5.698793  | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Server Hello                                   |
| 35  | 5.698909  | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Certificate [TCP segment of a reassembled PDU] |
| 37  | 5.698966  | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 58     | Certificate Request, Server Hello Done         |
| 39  | 5.692132  | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 61     | Alert (Level: Fatal, Description: Unknown CA)  |
| 55  | 11.319261 | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 571    | Client Hello                                   |
| 57  | 11.341107 | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Server Hello                                   |
| 60  | 11.341241 | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Certificate [TCP segment of a reassembled PDU] |
| 62  | 11.341291 | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 58     | Certificate Request, Server Hello Done         |
| 64  | 11.342410 | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 61     | Alert (Level: Fatal, Description: Unknown CA)  |
| 73  | 16.969019 | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 571    | Client Hello                                   |
| 75  | 16.991020 | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Server Hello                                   |
| 78  | 16.991162 | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Certificate [TCP segment of a reassembled PDU] |
| 80  | 16.991214 | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 58     | Certificate Request, Server Hello Done         |

Frame 39: 61 bytes on wire (488 bits), 61 bytes captured (488 bits) on interface 0  
 Ethernet II, Src: SunwaveC\_0f:5e:6c (68:1d:64:0f:5e:6c), Dst: SunwaveC\_0f:5e:6c (68:1d:64:0f:5e:6c)  
 Internet Protocol Version 4, Src: 10.5.251.80, Dst: 10.88.140.53  
 Transmission Control Protocol, Src Port: 41934, Dst Port: 5001, Seq: 518, Ack: 2925, Len: 7  
 Transport Layer Security  
 TLSv1.2 Record Layer: Alert (Level: Fatal, Description: Unknown CA)  
 Content Type: Alert (21)  
 Version: TLS 1.2 (0x0303)  
 Length: 2  
 Alert Message  
 Level: Fatal (2)  
 Description: Unknown CA (48)

0000 68 1d 64 0f 5e 6c 68 1d 64 0f 5e 6c 00 00 45 00 h-d-1h- d-1-E-  
 0010 00 2f 4e 3f 40 00 40 06 50 a7 0a 05 fb 50 0a 58 ./N?@ @ P...P-X  
 0020 8c 35 a3 ce 13 89 0b 54 22 e8 37 e6 24 a9 50 18 .S...T "-7-\$-P-  
 0030 01 09 86 b1 00 00 15 03 03 00 02 02 30 .....-0



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## 8.5 WINNF.FT.C.SCS.5

SCS.5.pcap

文件(F) 编辑(E) 视图(V) 捕获(C) 分析(A) 统计(S) 电话(T) 无线(W) 工具(I) 帮助(H)

| No. | Time      | Source       | Destination  | Protocol | Length | Info   |
|-----|-----------|--------------|--------------|----------|--------|--|
| 4   | 0.027550  | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 571    | Client Hello                                     |
| 6   | 0.049463  | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Server Hello                                     |
| 9   | 0.049608  | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Certificate [TCP segment of a reassembled PDU]   |
| 11  | 0.049659  | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 58     | Certificate Request, Server Hello Done           |
| 13  | 0.062232  | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 61     | Alert (Level: Fatal, Description: Decrypt Error) |
| 22  | 5.687300  | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 571    | Client Hello                                     |
| 24  | 5.709279  | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Server Hello                                     |
| 27  | 5.709417  | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Certificate [TCP segment of a reassembled PDU]   |
| 29  | 5.709467  | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 58     | Certificate Request, Server Hello Done           |
| 31  | 5.722011  | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 61     | Alert (Level: Fatal, Description: Decrypt Error) |
| 44  | 11.347327 | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 571    | Client Hello                                     |
| 46  | 11.369213 | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Server Hello                                     |
| 49  | 11.369351 | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 90     | Certificate [TCP segment of a reassembled PDU]   |
| 51  | 11.369402 | 10.88.140.53 | 10.5.251.80  | TLSv1.2  | 58     | Certificate Request, Server Hello Done           |
| 53  | 11.381996 | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 61     | Alert (Level: Fatal, Description: Decrypt Error) |
| 73  | 17.007510 | 10.5.251.80  | 10.88.140.53 | TLSv1.2  | 571    | Client Hello                                     |

Frame 13: 61 bytes on wire (488 bits), 61 bytes captured (488 bits) on interface 0  
Ethernet II, Src: SunwaveC\_0f:5e:6c (68:1d:64:0f:5e:6c), Dst: SunwaveC\_0f:5e:6c (68:1d:64:0f:5e:6c)  
Internet Protocol Version 4, Src: 10.5.251.80, Dst: 10.88.140.53  
Transmission Control Protocol, Src Port: 41998, Dst Port: 5001, Seq: 518, Ack: 2925, Len: 7  
Transport Layer Security  
TLSv1.2 Record Layer: Alert (Level: Fatal, Description: Decrypt Error)  
Content Type: Alert (21)  
Version: TLS 1.2 (0x0303)  
Length: 2  
Alert Message  
Level: Fatal (2)  
Description: Decrypt Error (51)

0000 68 1d 64 0f 5e 6c 68 1d 64 0f 5e 6c 00 00 45 00 h d A l h d A l E  
0010 00 2f b9 8a 40 00 40 06 e5 5b 0a 05 fb 50 0a 58 ./ @ @ . [ . . P X  
0020 8c 35 a4 0e 13 89 fb 65 19 6b c0 54 8f d9 50 18 S . . . . e k T P  
0030 01 09 a9 3d 00 00 15 03 03 00 02 02 33 . . . . . 3



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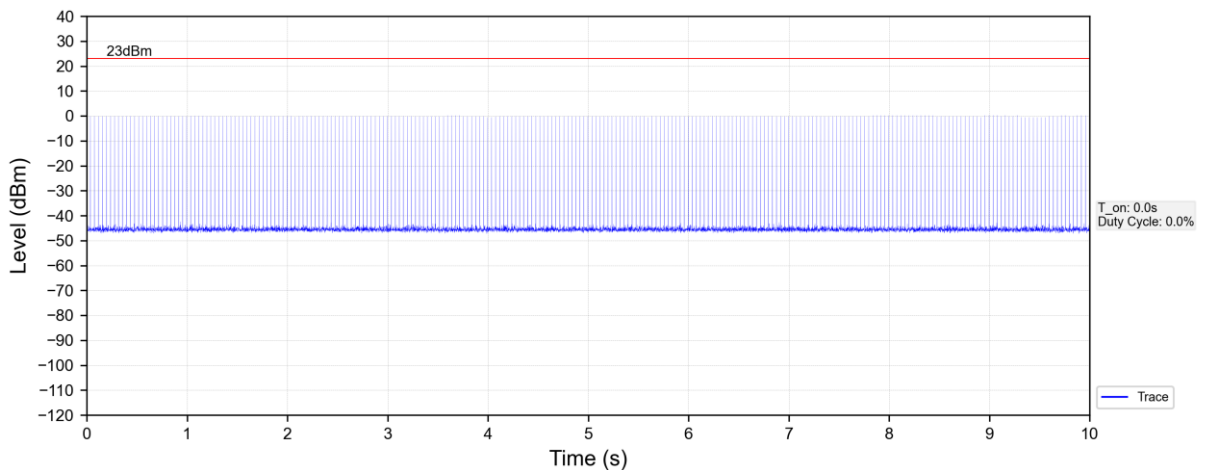
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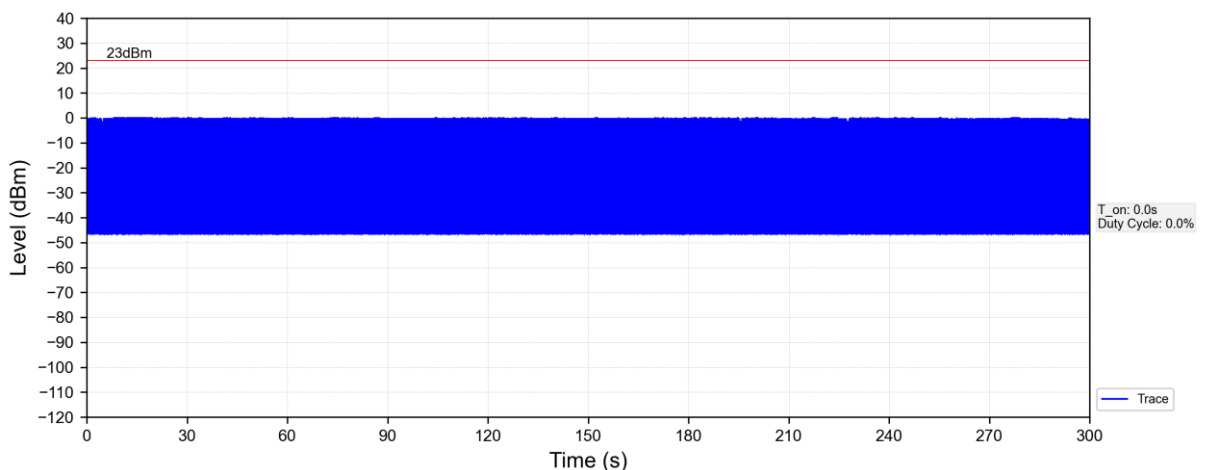
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## 9 Result of Time test for getting Grant

### 9.1 1 second within any 10-second period



### 9.2 10 seconds within any 300-second period



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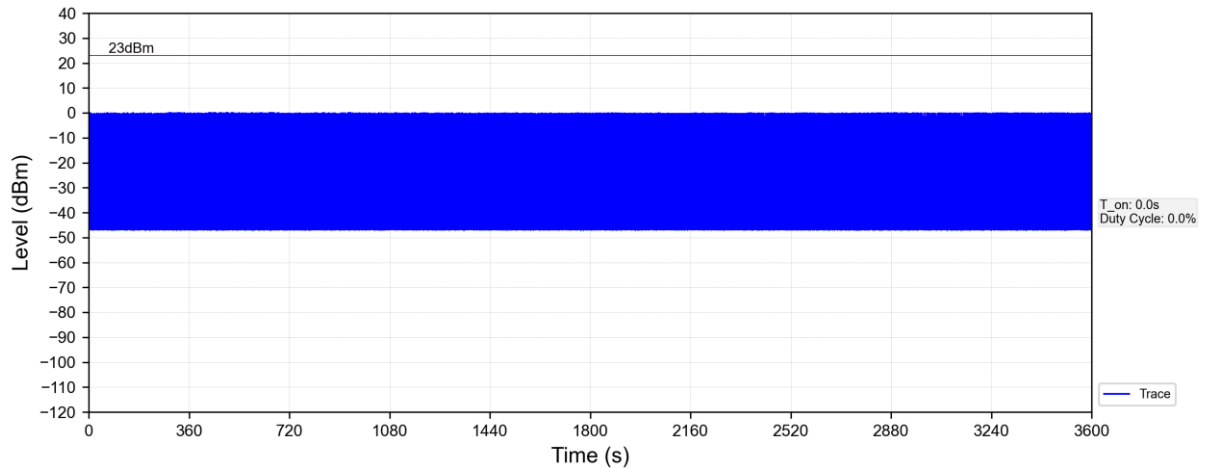
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20 seconds within any 3600-second period



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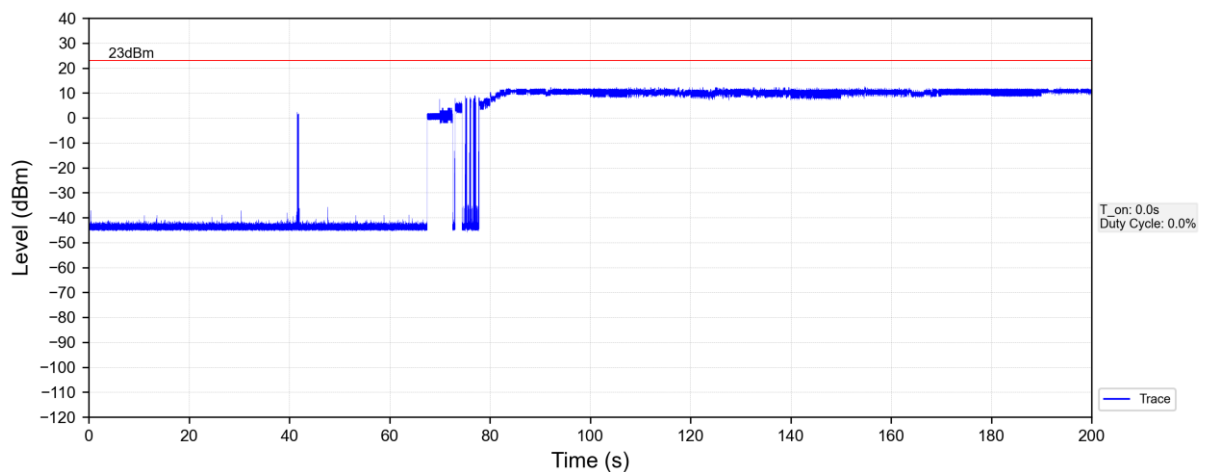
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### 10 Verify that the device will register with a SAS when operating below 23 dBm

Verified in test case WINNF.PT.C.HBT.1, the CPE-CBSD as UUT default EIRP is under 23 dBm and can register success with SAS. After granted, the CPE-CBSD UUT will adjust the EIRP by maxEirp.



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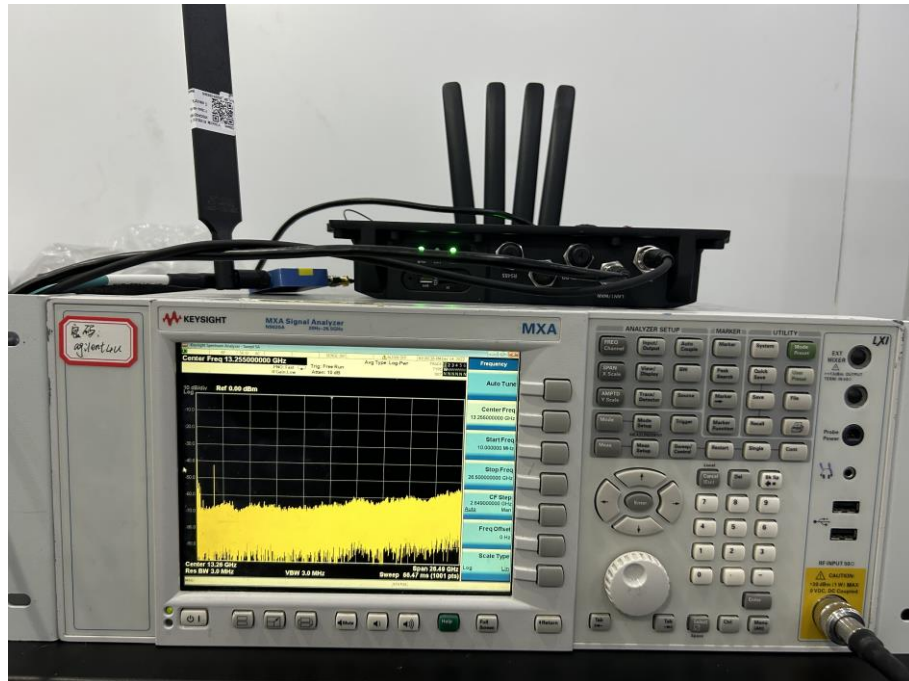
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## 11 Photographs

### 11.1 EUT Constructional Details (EUT Photos)



- End of the Report -



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