



## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR231200229401

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# TEST REPORT

**Application No.:** KSCR2312002294AT  
**Applicant:** Sercomm Corporation  
**Address of Applicant:** 8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan  
**Manufacturer:** Sercomm Corporation  
**Address of Manufacturer:** 8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan  
**Equipment Under Test (EUT):**  
**EUT Name:** Bridgestone  
**Model No.:** SCE5164-B48  
**Trade Mark:** Sercomm  
**FCC ID:** P27-SCE5164-B48  
**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:** 2023-12-15  
**Date of Test:** 2023-12-23 to 2024-01-10  
**Date of Issue:** 2024-01-15

<b>Test Result:</b>	<b>Pass*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

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<i>Revision Record</i>			
<i>Version</i>	<i>Description</i>	<i>Date</i>	<i>Remark</i>
00	Original	2024-01-15	/

<b>Authorized for issue by:</b>			
<b>Tested By</b>		<i>Damon Zhou</i>	
		<hr/> Damon_Zhou/Project Engineer	
<b>Approved By</b>		<i>Terry Hou</i>	
		<hr/> Terry Hou /Reviewer	

## 2 Test Summary

Item	Standard	Test Case ID	Result
Domain Proxy Multi-Step registration	WINNF-TS-0122-V1.0.2	WINNF.FT.D.REG.2	Pass
Domain Proxy Single-Step registration for Cat A CBSD	WINNF-TS-0122-V1.0.2	WINNF.FT.D.REG.4	Pass
Domain Proxy Single-Step registration for CBSD with CPI signed data	WINNF-TS-0122-V1.0.2	WINNF.FT.D.REG.6	Pass
Registration due to change of an installation parameter	WINNF-TS-0122-V1.0.2	WINNF.FT.C.REG.7	Pass
Domain Proxy Missing Required parameters (responseCode 102)	WINNF-TS-0122-V1.0.2	WINNF.FT.D.REG.9	Pass
Domain Proxy Pending registration (responseCode 200)	WINNF-TS-0122-V1.0.2	WINNF.FT.D.REG.11	Pass
Domain Proxy Invalid parameters (responseCode 103)	WINNF-TS-0122-V1.0.2	WINNF.FT.D.REG.13	Pass
Domain Proxy Blacklisted CBSD (responseCode 101)	WINNF-TS-0122-V1.0.2	WINNF.FT.D.REG.15	Pass
Domain Proxy Unsupported SAS protocol version responseCode 100)	WINNF-TS-0122-V1.0.2	WINNF.FT.D.REG.17	Pass
Domain Proxy Group Error (responseCode 201)	WINNF-TS-0122-V1.0.2	WINNF.FT.D.REG.19	Pass
Category A CBSD location update	WINNF-TS-0122-V1.0.2	WINNF.FT.C.REG.20	Pass
Unsuccessful Grant responseCode=400 (INTERFERENCE)	WINNF-TS-0122-V1.0.2	WINNF.FT.C.GRA.1	Pass
Unsuccessful Grant responseCode=401 (GRANT_CONFLICT)	WINNF-TS-0122-V1.0.2	WINNF.FT.C.GRA.2	Pass
Domain Proxy Heartbeat Success Case (first Heartbeat Response)	WINNF-TS-0122-V1.0.2	WINNF.FT.D.HBT.2	Pass
Heartbeat responseCode=105 (DEREGISTER)	WINNF-TS-0122-V1.0.2	WINNF.FT.C.HBT.3	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
Domain Proxy Heartbeat responseCode=500 (TEMINATED_GRANT)	WINNF-TS-0122-V1.0.2	WINNF.FT.D.HBT.8	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



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Item	Standard	Test Case ID	Result
Domain Proxy Registration Response contains measReportConfig	WINNF-TS-0122-V1.0.2	WINNF.FT.D.MES.2	Pass
Domain Proxy Successful Relinquishment	WINNF-TS-0122-V1.0.2	WINNF.FT.D.RLQ.2	Pass
Domain Proxy Unsuccessful Relinquishment, responseCode=102	WINNF-TS-0122-V1.0.2	WINNF.FT.D.RLQ.4	Pass
Domain Proxy Unsuccessful Relinquishment, responseCode=103	WINNF-TS-0122-V1.0.2	WINNF.FT.D.RLQ.6	Pass
Domain Proxy Successful Deregistration	WINNF-TS-0122-V1.0.2	WINNF.FT.D.DRG.2	Pass
Domain Proxy Deregistration responseCode=102	WINNF-TS-0122-V1.0.2	WINNF.FT.D.DRG.4	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.1	Pass
SAS Version: 1.0.0.3			

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

### **CBRSA-TS-9001-V1.2.1**

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.

Product Information:	Bridgestone
Power supply:	19Vdc from adapter 56Vdc from POE
Sample Type:	Fixed device
CBSD Class:	A
Transmitter Frequency Band:	5G NR n48
Transmitter Frequency Range:	3550~3700MHz
Hardware Version:	DR600NOC-1.6
Software Version:	DG5605@2209281146
Test sample:	SN1: 2209DR6000150 SN2: 2209DR6000083
Antenna Gain:	6.0dBi
MIMO supported	2*2 UL/DL
Antenna Type:	Dipole Antenna
<p>Note: This is a BTS-CBSD communication with Domain Proxy. Domain Proxy information show as below: Name of Domain Proxy: MosoLabs Domain Proxy/UDM Domain Proxy (Note: The above two DP are just name differences) Software Version of Domain Proxy: V1.3.7.1222</p>	

**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.	Y
C3	Mandatory for UUT which supports single-step registration containing CPI-signed data in the registration message.	Y
C4	Mandatory for UUT which supports RECEIVED_POWER_WITHOUT_GRANT measurement report type.	Y
C5	Mandatory for UUT which supports RECEIVED_POWER_WITH_GRANT measurement report type.	N
C6	Mandatory for UUT which supports parameter change being made at the UUT and prior to sending a deregistration.	Y

Y: Supported

N: Not supported



### 4.3 Summary of Test Results

WINNF-TS-0122			
Classes	Test Case Items	Pass Items	Pass Rate (%)
FT (CBSD, DP/CBSD)	33	33	100
PT (CBSD, DP/CBSD)	1	1	100
Total	34	34	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.

### 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	$\pm 3\%$

### 4.5 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Mobile	OSOM	OV1	/
CPE	SUNWAVE	CPX80I	/
Router	TP-LINK	TL-R860+	1175379002425

### 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.

Note:

- 1.SGS is not responsible for wrong test results due to incorrect information (e.g., max. internal working frequency, antenna gain, cable loss, etc) is provided by the applicant. (If applicable).
- 2.SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (If applicable).
3. Sample source: sent by customer.

### 4.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

#### • A2LA

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

#### • FCC

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

#### • ISED

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 2324E

#### • VCCI

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

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### 5 Equipment List

Test Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Laptop	Lenovo	Y510P	HFL000026	N/A	N/A
Spectrum Analyzer	KEYSIGHT	N9020A	KUS2001M00 1-2	2023/08/24	2024/08/23
Shield Room	YanChuang	N/A	KS301115-2	N/A	N/A
Coaxial Cable	Thermax	N/A	13	2023/09/15	2024/09/14
Attenuator	Mini-Circuits	NAT-6-2W	15542-1	N.C.R.	N.C.R.
Humidity / Temperature Indicator	Renke	RS-WS-N01- 6J	1032844	2023/03/22	2024/03/21

## **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**

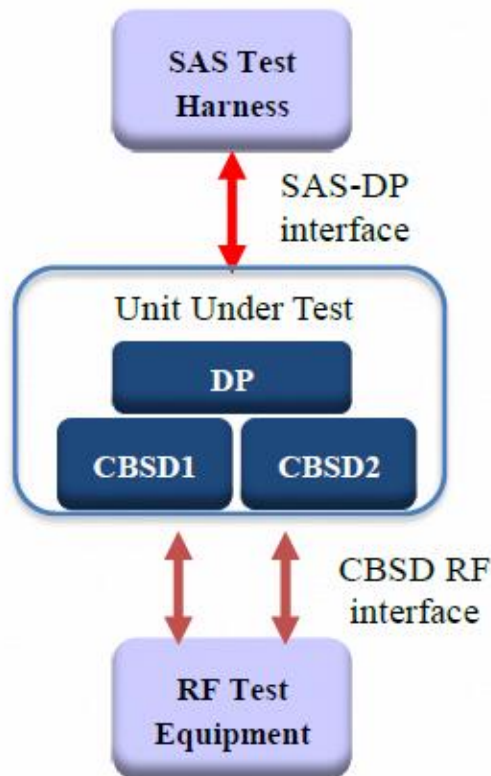
- a. Connect the UUT to SAS Test Harness system and RF Test instruments via the DP interface and RF components. The highest level is set to test configuration.
- b. UUT shall be UTC time synchronized
- c. The frequency band is granted and set as UUT supported Modulation and Channels, transmitted power of the UUT according to it granted parameters from the SAS TestHarness.
- d. 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
Input Power:	120Vac, 60Hz

### 6.4 Test Setup

- 1) DP is deployed on the network management, and the registration of DP to SAS is to register with SAS according to the granularity of CBSID ID;
- 2) The DP and the network element communicate messages according to the cell granularity, and each CBSIDID corresponds to a cell of an RRU which belongs to a base station.



DP/CBSD as UUT, BTS-CBSD communication with Domain Proxy

## 7 Test Data

### 7.1 CBSD Registration Process

#### 7.1.1 WINNF.FT.D.REG.2

#	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>DP with two CBSD sends correct Registration request information, as specified in [n.5], in the form of one 2-element Array or as individual messages to the SAS Test Harness:</p> <ul style="list-style-type: none"> <li>● The required userId, fcId and cbsdSerialNumber registration parameters shall be sent for each 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>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<ul style="list-style-type: none"> <li>● SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or individual messages as follows:             <ul style="list-style-type: none"> <li>- cbsdId = Ci</li> <li>- measReportConfig shall not be included</li> <li>- responseCode = 0 for each CBSD</li> </ul> </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>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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### 7.1.2 WINNF.FT.D.REG.4

#	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 the SAS Test Harness</li> <li>● UUT is in the Unregistered state</li> </ul>	--	--
2	The DP with two CBSDs sends Registration requests in the form of one 2-element Array or as individual messages to SAS Test Harness. <ul style="list-style-type: none"> <li>● The required userId, fcId and cbsdSerialNumber and REG-Conditional cbsdCategory, airInterface, installationParam, and measCapability registration parameters shall be sent from the CBSD and conform to proper format and acceptable ranges.</li> <li>● Any 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>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<ul style="list-style-type: none"> <li>● SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or individual messages as follows:               <ul style="list-style-type: none"> <li>- cbsdId = Ci</li> <li>- measReportConfig for each CBSD shall not be included</li> <li>- responseCode = 0 for each CBSD</li> </ul> </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.D.REG.6

#	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> <li>● All of the required and REG-Conditional parameters shall be configured and CPI signature provided</li> </ul>	--	--
2	The DP with two CBSDs sends Registration requests in the form of one 2-element Array or as individual messages to the SAS Test Harness: <ul style="list-style-type: none"> <li>● The required userId, fcId and cbsdSerialNumber and REG-Conditional cbsdCategory, airInterface, measCapability and cpiSignatureData registration parameters shall be sent from the CBSD and conform to proper format and acceptable ranges.</li> <li>● Any 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>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<ul style="list-style-type: none"> <li>● SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or individual messages as follows:               <ul style="list-style-type: none"> <li>- cbsdId = Ci</li> <li>- measReportConfig for each CBSD shall not be included</li> <li>- responseCode = 0 for each CBSD</li> </ul> </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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### 7.1.4 WINNF.FT.C.REG.7

#	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> </ul>	--	--
2	UUT has successfully registered with SAS Test Harness	--	--
3	Change an installation parameters at the UUT (time T) <ul style="list-style-type: none"> <li>- Tester needs to record the current time at which the parameter change is executed.</li> </ul>	--	--
4	Monitor the SAS-CBSD interface. UUT sends a deregistrationRequest to the SAS Test Harness The deregistration request shall be sent within (T + 60 seconds) from step 3.	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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### 7.1.5 WINNF.FT.D.REG.9

#	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	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to SAS Test Harness.	--	--
3	SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or as individual messages as follows: <ul style="list-style-type: none"> <li>- SAS response does not include a cbsdId.</li> <li>- responseCode = 102 for CBSD1 and CBSD2</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

### 7.1.6 WINNF.FT.D.REG.11

#	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	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to SAS Test Harness.	--	--
3	SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or as individual messages as follows: <ul style="list-style-type: none"> <li>- SAS response does not include a cbsdId.</li> <li>- responseCode = 200 for CBSD1 and CBSD2</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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### 7.1.7 WINNF.FT.D.REG.13

#	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	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to SAS Test Harness.	--	--
3	SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or as individual messages as follows: <ul style="list-style-type: none"> <li>- SAS response does not include a cbsdId.</li> <li>- responseCode = 0 for CBSD1</li> <li>- responseCode = 103 for CBSD2</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

### 7.1.8 WINNF.FT.D.REG.15

#	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	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to SAS Test Harness.	--	--
3	SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or as individual messages as follows: <ul style="list-style-type: none"> <li>- SAS response does not include a cbsdId.</li> <li>- responseCode = 0 for CBSD1</li> <li>- responseCode = 101 for CBSD2</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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### 7.1.9 WINNF.FT.D.REG.17

#	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	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to SAS Test Harness.	--	--
3	SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or as individual messages as follows: <ul style="list-style-type: none"> <li>- SAS response does not include a cbsdId.</li> <li>- responseCode = 100 for CBSD1 and CBSD2</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

### 7.1.10 WINNF.FT.D.REG.19

#	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	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to SAS Test Harness.	--	--
3	SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or as individual messages as follows: <ul style="list-style-type: none"> <li>- SAS response does not include a cbsdId.</li> <li>- responseCode = 0 for CBSD1</li> <li>- responseCode = 201 for CBSD2</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

**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: ● UUT has registered successfully with SAS Test Harness, with cbsdId = C	--	--
2	UUT sends valid Grant Request.	--	--
3	SAS Test Harness sends a Grant Response message, including - cbsdId=C - responseCode = 400	--	--
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: ● UUT shall not transmit RF	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

**7.2.2 WINNF.FT.C.GRA.2**

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: ● UUT has registered successfully with SAS Test Harness, with cbsdId = C	--	--
2	UUT sends valid Grant Request.	--	--
3	SAS Test Harness sends a Grant Response message, including - cbsdId=C - responseCode = 400	--	--
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: ● UUT shall not transmit RF	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

**7.3 CBSD HeartBeat Process**

**7.3.1 WINNF.FT.D.HBT.2**

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>● DP has two CBSD registered successfully with SAS Test Harness, with <math>cbsdId = C_i, i=\{1,2\}</math></li> </ul>	--	--
2	DP sends a message: <ul style="list-style-type: none"> <li>● If message is type Spectrum Inquiry Request, go to step 3, or</li> <li>● If message is type Grant Request, go to step 5</li> </ul>	--	--
3	DP sends a Spectrum Inquiry Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Spectrum Inquiry Request message is formatted correctly for each CBSD, including for $CBSD_i, i=\{1,2\}$ : <ul style="list-style-type: none"> <li>● <math>cbsdId = C_i</math></li> <li>● List of frequencyRange objects sent by DP are within the CBRS frequency range</li> </ul>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
4	If a separate Spectrum Inquiry Request message was sent for each CBSD, the SAS Test Harness shall respond to each Spectrum Inquiry Request message with a separate Spectrum Inquiry Response message. If a single Spectrum Inquiry Request message was sent containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Spectrum Inquiry Response message containing a 2-object array. Verify parameters for each CBSD within the Spectrum Inquiry Response message are as follows, for $CBSD_i, i=\{1,2\}$ : <ul style="list-style-type: none"> <li>● <math>cbsdId = C_i</math></li> <li>● availableChannel is an array of availableChannel objects</li> <li>● responseCode = 0</li> </ul>	--	--
5	DP sends a Grant Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Grant Request message is formatted correctly for each CBSD, including for $CBSD_i, i=\{1,2\}$ : <ul style="list-style-type: none"> <li>● <math>cbsdId = C</math></li> <li>● maxEIRP is at or below the limit appropriate for CBSD category as defined by Part 96</li> <li>● operationFrequencyRange, <math>F_i</math>, sent by UUT is a valid range within the CBRS band</li> </ul>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
6	If a separate Grant Request message was sent for each CBSD, the SAS Test Harness shall respond to each Grant Request message with a separate Grant Response message.  If a single Grant Request message was sent containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Grant Response message containing a 2-object array.  Verify parameters for each CBSD within the Grant Response message are as follows, for $CBSD_i, i=\{1,2\}$ : <ul style="list-style-type: none"> <li>● <math>cbsdId = C_i</math></li> <li>● grantId = <math>G_i</math> = a valid grant ID</li> <li>● grantExpireTime = UTC time greater than duration of the test</li> <li>● responseCode = 0</li> </ul>	--	--

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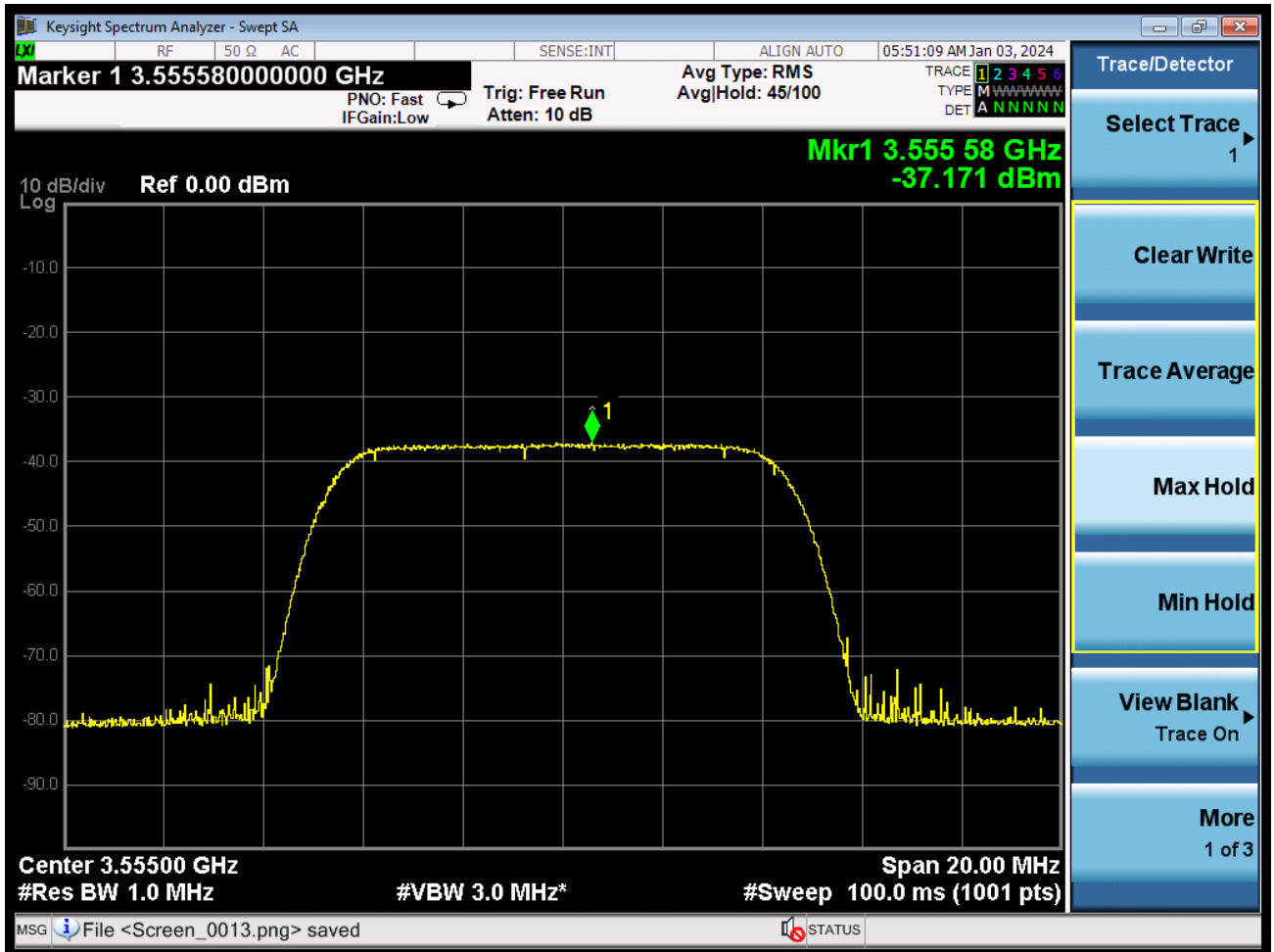
7	<p>Ensure DP sends first Heartbeat Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Heartbeat Request message is formatted correctly for each CBSD, including, for CBSDi i={1,2}:</p> <ul style="list-style-type: none"> <li>● cbsdId = Ci, i={1,2}</li> <li>● grantId = Gi, i={1,2}</li> <li>● operationState = "GRANTED"</li> </ul>	<p>■ Pass</p>	<p>□ Fail</p>
8	<p>If a separate Heartbeat Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each Heartbeat Request message with a separate Heartbeat Response message. If a single Heartbeat Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Heartbeat Response message containing a 2-object array. Verify parameters for each CBSD within the Heartbeat Response message are as follows, for CBSDi:</p> <ul style="list-style-type: none"> <li>● cbsdId = Ci</li> <li>● grantId = Gi</li> <li>● transmitExpireTime = current UTC time + 200 seconds</li> <li>● responseCode = 0</li> </ul>	<p>--</p>	<p>--</p>
9	<p>For further Heartbeat Request messages sent from DP after completion of step 8, validate message is sent within latest specified heartbeatInterval for CBSDi:</p> <ul style="list-style-type: none"> <li>● cbsdId = Ci</li> <li>● grantId = Gi</li> <li>● operationState = "AUTHORIZED"</li> </ul> <p>and SAS Test Harness responds with a Heartbeat Response message including the following parameters, for CBSDi</p> <ul style="list-style-type: none"> <li>● cbsdId = Ci</li> <li>● grantId = Gi</li> <li>● transmitExpireTime = current UTC time + 200 seconds</li> <li>● responseCode = 0</li> </ul>	<p>■ Pass</p>	<p>□ Fail</p>
10	<p>Monitor the RF output of the UUT from start of test until UUT transmission commences. Monitor the RF output of the UUT from start of test until RF 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 Fi.</li> </ul>	<p>■ Pass</p>	<p>□ Fail</p>

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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. 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>	<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 = 105 (DEREGISTER)</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

**7.3.3 WINNF.FT.C.HBT.5**

#	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</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	UUT sends a Heartbeat Request message. Verify Heartbeat Request message is formatted correctly, including: <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	SAS Test Harness sends a Heartbeat Response message, including the following parameters: <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	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.	--	--
5	Monitor the SAS-CBSD interface. Verify either A OR B occurs: <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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### 7.3.4 WINNF.FT.C.HBT.6

#	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</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	UUT sends a Heartbeat Request message. Ensure Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including: <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	SAS Test Harness sends a Heartbeat Response message, including the following parameters: <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	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.	--	--
5	Monitor the SAS-CBSD interface. Verify either A OR B occurs: <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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### 7.3.5 WINNF.FT.C.HBT.7

#	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</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	UUT sends a Heartbeat Request message. Ensure Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including: <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	SAS Test Harness sends a Heartbeat Response message, including the following parameters: <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	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.	--	--
5	Monitor the SAS-CBSD interface. Verify: <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> Monitor the RF output of the UUT. Verify: <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.D.HBT.8

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>● DP has two CBSD registered successfully with SAS Test Harness</li> <li>● Each CBSD {1,2} has a valid single grant as follows <ul style="list-style-type: none"> <li>○ valid cbsdId = Ci, i={1,2}</li> <li>○ valid grantId = Gi, i={1,2}</li> <li>○ grant is for frequency range Fi, power Pi</li> <li>○ grantExpireTime = UTC time greater than duration of the test</li> </ul> </li> <li>● Both CBSD are in AUTHORIZED state and transmitting within their granted bandwidth on RF interface</li> </ul>	--	--
2	<p>DP sends a Heartbeat Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of size 2. Verify Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly for each CBSD, including, for CBSDi i={1,2}:</p> <ul style="list-style-type: none"> <li>● cbsdId = Ci, i = {1,2}</li> <li>● grantId = Gi, i = {1,2}</li> <li>● operationState = "AUTHORIZED"</li> </ul>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<p>If separate Heartbeat Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each Heartbeat Request message with a separate Heartbeat Response message.  If a single Heartbeat Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Heartbeat Response message containing a 2-object array.  Parameters for each CBSD within the Heartbeat Response message should be as follows, for CBSDi:</p> <ul style="list-style-type: none"> <li>● cbsdId = Ci</li> <li>● grantId = Gi</li> <li>● For CBSD1: <ul style="list-style-type: none"> <li>○ transmitExpireTime = current UTC time + 200 seconds</li> <li>○ responseCode = 0</li> </ul> </li> <li>● For CBSD2: <ul style="list-style-type: none"> <li>○ transmitExpireTime = T = current UTC time</li> <li>○ responseCode = 500 (TERMINATED_GRANT)</li> </ul> </li> </ul>	--	--
4	<p>After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.  If CBSD sends further Heartbeat Request messages for CBSD1, SAS Test Harness shall respond with a Heartbeat Response message with parameters:</p> <ul style="list-style-type: none"> <li>● cbsdId = C1</li> <li>● grantId = G1</li> <li>● transmitExpireTime = current UTC time + 200 seconds</li> <li>● responseCode = 0</li> <li>● Heartbeat Request message is within heartbeatInterval of previous Heartbeat Request message</li> </ul>	--	--



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5	Monitor the RF output of CBSD2. Verify: <ul style="list-style-type: none"><li>● CBSD2 shall stop transmission within bandwidth F2 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	Ensure the following conditions are met for test entry: <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	UUT sends a Heartbeat Request message. Ensure Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including: <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	After completion of step 2, SAS Test Harness does not respond to any further <ul style="list-style-type: none"> <li>● messages from UUT to simulate loss of network connection</li> </ul>	--	--
4	Monitor the RF output of the UUT from start of test to 60 seconds after step 3. Verify: <ul style="list-style-type: none"> <li>● At any time during the test, UUT shall not transmit on RF interface</li> </ul>	<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	Ensure the following conditions are met for test entry: <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	UUT sends a Heartbeat Request message. Verify Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including: <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	SAS Test Harness sends a Heartbeat Response message, including the following parameters: <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	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.	--	--
5	Monitor the RF output of the UUT. Verify: <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



**7.4 CBSD Measurement Report**

**7.4.1 WINNF.FT.D.MES.2**

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>● DP has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> </ul>	--	--
2	DP sends a Registration Request message for each of two CBSD. This may occur in a separate Request message per CBSD, or together in a single Request message with array of 2. Verify Registration Request message contains all required parameters properly formatted for CBSD <sub>i</sub> , i={1,2}, and specifically: <ul style="list-style-type: none"> <li>● userId is present and correct</li> <li>● fcld is present and correct</li> <li>● cbsdSerialNumber is present and correct</li> <li>● measCapability = "RECEIVED_POWER_WITHOUT_GRANT"</li> </ul>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	If a separate Registration Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each Registration Request message with a separate Registration Response message. If a single Registration Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Registration Response message containing a 2-object array. Parameters for each CBSD within the Registration Response message should be as follows, for CBSD <sub>i</sub> : <ul style="list-style-type: none"> <li>● cbsdId = C<sub>i</sub></li> <li>● measReportConfig= "RECEIVED_POWER_WITHOUT_GRANT"</li> <li>● responseCode = 0</li> </ul>	--	--
4	UUT sends a message: <ul style="list-style-type: none"> <li>● If message is type Spectrum Inquiry Request, go to step 5, or</li> <li>● If message is type Grant Request, go to step 7</li> </ul>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
5	UUT sends message type Spectrum Inquiry Request. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Spectrum Inquiry Request message contains all required parameters properly formatted for CBSD <sub>i</sub> , i= {1,2}, and specifically: <ul style="list-style-type: none"> <li>● cbsdId = C<sub>i</sub></li> <li>● measReport is present, and is a properly formatted rcvdPowerMeasReport.</li> </ul>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
6	If a separate Spectrum Inquiry Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each Spectrum Inquiry Request message with a separate Spectrum Inquiry Response message.  If a single Spectrum Inquiry Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Spectrum Inquiry Response message containing a 2-object array.  Parameters for each CBSD within the Spectrum Inquiry Response message should be as follows: <ul style="list-style-type: none"> <li>● cbsdId = C<sub>i</sub></li> <li>● availableChannel is an array of availableChannel objects</li> <li>● responseCode = 0</li> </ul>	--	--



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7	UUT sends message type Grant Request message. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify the Grant Request message contains all required parameters properly formatted for CBSDi, i= {1,2}, and specifically: <ul style="list-style-type: none"><li>● cbsdId = Ci</li><li>● measReport is present, and is a properly formatted rcvdPowerMeasReport.</li></ul>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
---	---	---	----------------------------------

**7.5 CBSD Relinquishment Process**

**7.5.1 WINNF.FT.D.RLQ.2**

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>● DP has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>● DP has successfully registered 2 CBSD with SAS Test Harness, each with cbsdId=Ci, i={1,2}</li> <li>● DP has received a valid grant with grantId = Gi, i={1,2} for each CBSD</li> <li>● Both CBSD are in Grant State AUTHORIZED and actively transmitting within the bounds of their grants.</li> </ul> <p>Invoke trigger to relinquish UUT Grant from the SAS Test Harness</p>	--	--
2	<p>Verify DP sends a Relinquishment Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2.</p> <p>Verify Relinquishment Request message contains all required parameters properly formatted for each CBSD, specifically, for CBSDi:</p> <ul style="list-style-type: none"> <li>● cbsdId = Ci</li> <li>● grantId = Gi</li> </ul>	<p>■ Pass</p>	<p>□ Fail</p>
3	<p>If a separate Relinquishment Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each request message with a separate response message.</p> <p>If a single Relinquishment Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Response message containing a 2-object array.</p> <p>Parameters for each CBSD within the Relinquishment Response shall be as follows:</p> <ul style="list-style-type: none"> <li>● cbsdId = Ci</li> <li>● grantId = Gi</li> <li>● responseCode = 0</li> </ul>	--	--
4	<p>After completion of step 3, SAS Test Harness will not provide any additional positive response (responseCode=0) to further request messages from the UUT.</p>	--	--
5	<p>Monitor the RF output of each 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 relinquishments and UUT sending the relinquishment requests for each CBSD.</li> </ul>	<p>■ Pass</p>	<p>□ Fail</p>

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### 7.5.2 WINNF.FT.D.RLQ.4

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>● DP has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>● DP has successfully registered 2 CBSD with SAS Test Harness, each with <math>cbsdId=C_i, i=\{1,2\}</math></li> <li>● DP has received a valid grant with <math>grantId = G_i, i=\{1,2\}</math> for each CBSD</li> <li>● Both CBSD are in Grant State AUTHORIZED and actively transmitting within the bounds of their grants.</li> </ul> <p>Invoke trigger to relinquish UUT Grant from the SAS Test Harness</p>	--	--
2	<p>DP with two CBSDs sends Relinquishment Request with two objects to the SAS Test Harness. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify DP sends a Relinquishment Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Relinquishment Request message contains all required parameters properly formatted for each CBSD, specifically, for <math>CBSD_i</math>:</p> <ul style="list-style-type: none"> <li>● <math>cbsdId = C_i</math></li> <li>● <math>grantId = G_i</math></li> </ul>	<p>■ Pass</p>	<p>□ Fail</p>
3	<p>If a separate Relinquishment Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each request message with a separate response message. If a single Relinquishment Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Response message containing a 2-object array. Parameters for each CBSD within the Relinquishment Response shall be as follows:</p> <ul style="list-style-type: none"> <li>● <math>cbsdId = C_i</math></li> <li>● <math>grantId = G_i</math></li> <li>● <math>responseCode = R_i</math></li> </ul>	--	--
4	<p>After completion of step 3, SAS Test Harness will not provide any additional positive response (<math>responseCode=0</math>) to further request messages from the UUT.</p>	--	--
5	<p>Monitor the RF output of each UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:</p> <p>A. UUT stopped RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request</p>	<p>■ Pass</p>	<p>□ Fail</p>



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### 7.5.3 WINNF.FT.D.RLQ.6

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>● DP has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>● DP has successfully registered 2 CBSD with SAS Test Harness, each with cbsdId=Ci, i={1,2}</li> <li>● DP has received a valid grant with grantId = Gi, i={1,2} for each CBSD</li> <li>● Both CBSD are in Grant State AUTHORIZED and actively transmitting within the bounds of their grants.</li> </ul> <p>Invoke trigger to relinquish UUT Grant from the SAS Test Harness</p>	--	--
2	<p>DP with two CBSDs sends Relinquishment Request with two objects to the SAS Test Harness. This may occur in a separate message per CBSD, or together in a single message with array of 2.</p> <p>Verify DP sends a Relinquishment Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2.</p> <p>Verify Relinquishment Request message contains all required parameters properly formatted for each CBSD, specifically, for CBSDi:</p> <ul style="list-style-type: none"> <li>● cbsdId = Ci</li> <li>● grantId = Gi</li> </ul>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<p>If a separate Relinquishment Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each request message with a separate response message.</p> <p>If a single Relinquishment Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Response message containing a 2-object array.</p> <p>Parameters for each CBSD within the Relinquishment Response shall be as follows:</p> <ul style="list-style-type: none"> <li>● cbsdId = Ci</li> <li>● grantId = Gi</li> <li>● responseCode = 103</li> </ul>	--	--
4	<p>After completion of step 3, SAS Test Harness will not provide any additional positive response (responseCode=0) to further request messages from the UUT.</p>	--	--
5	<p>Monitor the RF output of each UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:</p> <p>A. UUT stopped RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request</p>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

**7.6 CBSD Deregistration Process**

**7.6.1 WINNF.FT.D.DRG.2**

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>● DP has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>● DP has successfully registered 2 CBSD with SAS Test Harness, each with <math>cbsdId=C_i, i=\{1,2\}</math></li> <li>● DP has received a valid grant with <math>grantId = G_i, i=\{1,2\}</math> for each CBSD</li> <li>● Both CBSD are in Grant State AUTHORIZED and actively transmitting within the bounds of their grants.</li> </ul> Invoke trigger to relinquish UUT Grant from the SAS Test Harness	--	--
2	UUT may send a Relinquishment request and receives Relinquishment response with $responseCode=0$ for each CBSD	--	--
3	Verify DP sends a Deregistration Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Deregistration Request message contains all required parameters properly formatted for each CBSD, specifically, for $CBSD_i$ : <ul style="list-style-type: none"> <li>● <math>cbsdId = C_i</math></li> </ul>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
4	If a separate Deregistration Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each request message with a separate response message. If a single Deregistration Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Response message containing a 2-object array. Parameters for each CBSD within the Deregistration Response shall be as follows: <ul style="list-style-type: none"> <li>● No <math>cbsdId</math> in either response</li> <li>● <math>responseCode = R_i</math></li> </ul>	--	--
5	After completion of step 3, SAS Test Harness will not provide any positive response ( $responseCode=0$ ) to further request messages from the UUT.	--	--
6	Monitor the RF output of each UUT from start of test until 60 seconds after Step 4 is complete. This is the end of the test. Verify: <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.D.DRG.4

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>● Each UUT has successfully registered with SAS Test Harness</li> <li>● Each UUT is in the authorized state</li> <li>● DP has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>● DP has successfully registered 2 CBSD with SAS Test Harness, each with <math>cbsdId=C_i, i=\{1,2\}</math></li> <li>● DP has received a valid grant with <math>grantId = G_i, i=\{1,2\}</math> for each CBSD</li> <li>● Both CBSD are in Grant State AUTHORIZED and actively transmitting within the bounds of their grants.</li> </ul> <p>Invoke trigger to relinquish UUT Grant from the SAS Test Harness</p>	--	--
2	UUT sends a Relinquishment request and receives Relinquishment response with $responseCode=0$	--	--
3	<p>Verify DP sends a Deregistration Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Deregistration Request message contains all required parameters properly formatted for each CBSD, specifically, for <math>CBSDi</math>:</p> <ul style="list-style-type: none"> <li>● <math>cbsdId = C_i</math></li> </ul>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
4	<p>If a separate Deregistration Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each request message with a separate response message.</p> <p>If a single Deregistration Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Response message containing a 2-object array.</p> <p>Parameters for each CBSD within the Deregistration Response shall be as follows:</p> <ul style="list-style-type: none"> <li>● <math>cbsdId = C_i</math></li> <li>● <math>responseCode = 0</math></li> </ul>	--	--
5	After completion of step 4, SAS Test Harness will not provide any positive response ( $responseCode=0$ ) to further request messages from the UUT.	--	--
6	<p>Monitor the RF output of each 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>A. UUT sending a Registration Request message, as this is not mandatory B. UUT sending a Deregistration Request message</p>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> 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: <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



**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	<p>A successful registration is accomplished using one of the test cases described in section 6.1.4.1, depending on CBSD capability.</p> <ul style="list-style-type: none"> <li>UUT sends a registration request to the SAS Test Harness and the SAS Test Harness sends a Registration Response with responseCode = 0 and cbsdId.</li> </ul>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
4	<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

**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	<ul style="list-style-type: none"> <li>UUT may retry for the security procedure which shall fail.</li> </ul>	<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	<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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### 7.7.3 WINNF.FT.C.SCS.3

#	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	<ul style="list-style-type: none"> <li>UUT may retry for the security procedure which shall fail.</li> </ul>	<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: <ul style="list-style-type: none"> <li>UUT shall not transmit RF</li> </ul>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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

#	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	<ul style="list-style-type: none"> <li>UUT may retry for the security procedure which shall fail.</li> </ul>	<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: <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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### 7.7.5 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"/> 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	<ul style="list-style-type: none"> <li>UUT may retry for the security procedure which shall fail.</li> </ul>	<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: <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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### 7.8 CBSD RF Power Measurement

#### 7.8.1 WINNF.PT.C.HBT.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 has registered with the SAS, with CBSID = 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> <ul style="list-style-type: none"> <li>● 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.</li> </ul>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> 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 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.

5G NR							
Freq. (MHz)	Conducted PSD (dBm/MHz)	Path Loss (dB)	Antenna Gain (dBi)	Array Gain (dB)	EIRP PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
3555	-25.522	36	6	3.01	19.488	20	Pass
3555	-31.341	36	6	3.01	13.669	15	
3555	-37.171	36	6	3.01	7.839	8	Pass
Note: 1. Array Gain=10log(n), n is the antenna number, for this test the n=2 2. EIRP PSD= Conducted PSD+ Path Loss+ Antenna Gain+ Array Gain							

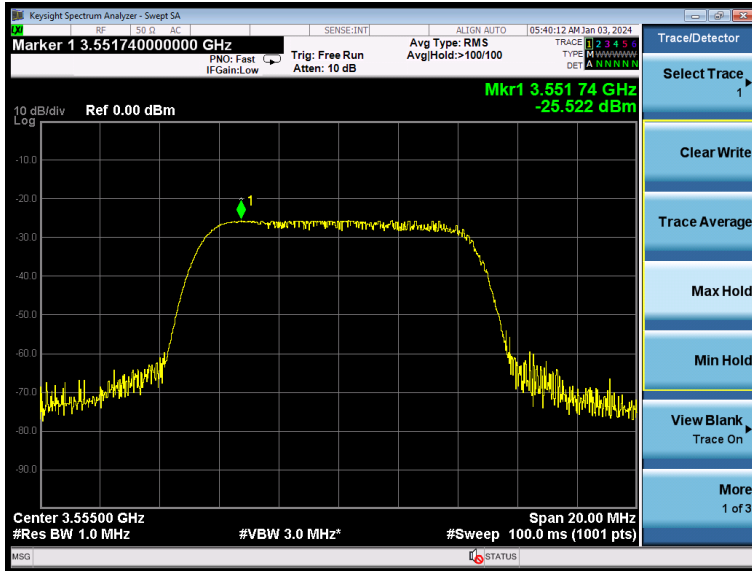
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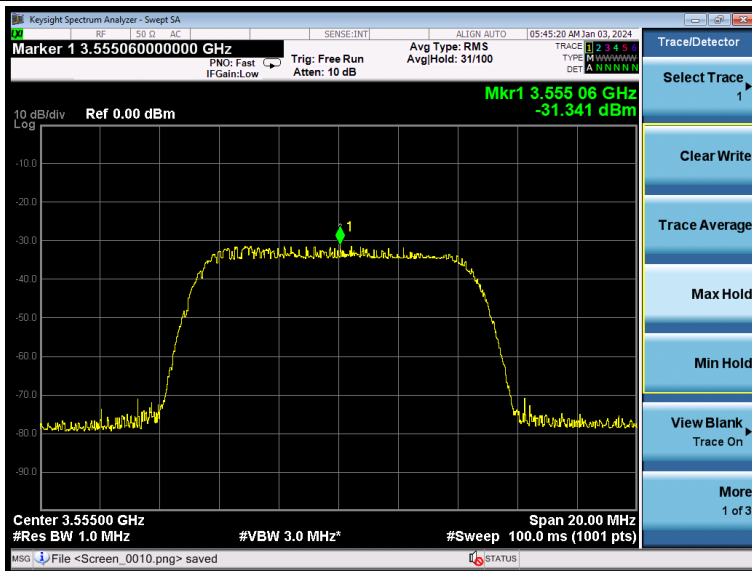
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### 5GNR Target Power: 20dBm/MHz



### 5GNR Target Power: 15dBm/MHz



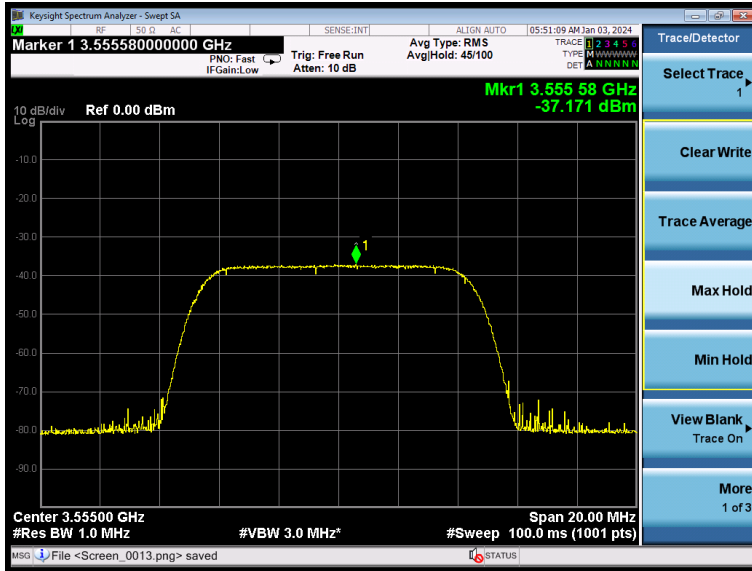
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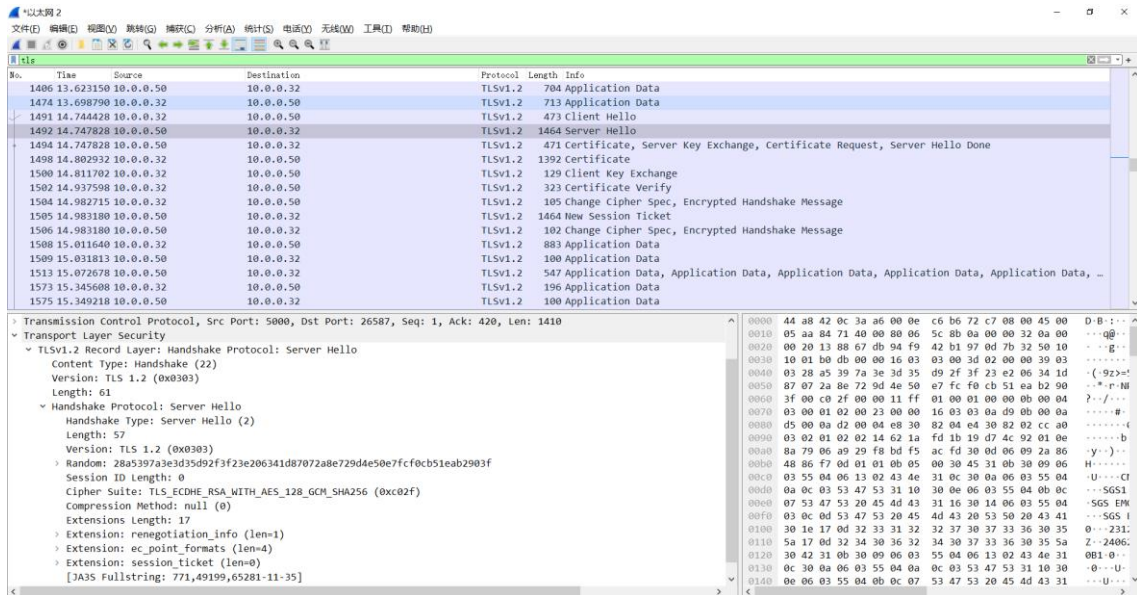
### 5GNR Target Power: 8dBm/MHz



## 8 Test Data Log

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

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



The screenshot displays a network traffic capture in a tool like Wireshark. The top pane shows a list of packets, with several TLSv1.2 packets highlighted. The bottom pane provides a detailed view of a TLSv1.2 Record Layer: Handshake Protocol: Server Hello. The details include:

- Content Type: Handshake (22)
- Version: TLS 1.2 (0x0303)
- Length: 61
- Handshake Protocol: Server Hello
- Handshake Type: Server Hello (2)
- Length: 57
- Version: TLS 1.2 (0x0303)
- Random: 28a5397a3e3d35d92f3f23e206341d87072a8e729d4e50e7fcfcb51eab2903f
- Session ID Length: 0
- Cipher Suite: TLS\_ECDHE\_RSA\_WITH\_AES\_128\_GCM\_SHA256 (0xc02f)
- Compression Method: null (0)
- Extensions Length: 17
- Extensions: renegotiation\_info (len=1), ec\_point\_formats (len=4), session\_ticket (len=0)
- [JA3S Fullstring: 771,49199,65281-11-35]

The right pane shows the raw packet data in hexadecimal and ASCII format.



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

The screenshot shows a Wireshark capture of an HTTP GET request. The packet list pane shows a packet of 1090 bytes on wire (8720 bits) captured on interface \Device\NPF\_{26A42197-2E...}. The packet details pane shows the following structure:

- Ethernet II, Src: AsixElec\_b6:72:c7 (00:0e:c6:b6:72:c7), Dst: Dell\_0c:3a:a6 (44:a8:42:0c:3a:a6)
- Internet Protocol Version 4, Src: 10.0.0.50, Dst: 10.0.0.32
- Transmission Control Protocol, Src Port: 80, Dst Port: 65398, Seq: 326, Ack: 162, Len: 1036
- [2 Reassembled TCP Segments (1361 bytes): #1838(325), #1839(1036)]
- Hypertext Transfer Protocol
  - HTTP/1.1 200 OK\r\n
  - Content-Type: application/octet-stream\r\n
  - Content-Length: 1036\r\n
  - Accept-Ranges: bytes\r\n
  - Server: HFS 2.3m\r\n
  - Set-Cookie: HFS\_SID\_0.686745365848765; path=/; HttpOnly\r\n
  - ETag: 3D575772E14B83D75187AF6636943807\r\n
  - Last-Modified: Wed, 27 Dec 2023 07:57:21 GMT\r\n
  - Content-Disposition: attachment; filename="crlserver.crl";\r\n
  - \r\n
  - [HTTP response 1/1]
  - [Time since request: 0.008717000 seconds]
  - [Request in frame: 1837]

The packet bytes pane shows the raw data of the response, including the status bar: "Frame 1090 bytes | Reassembled TCP (1361 bytes) | 分组: 3581 | 已显示: 2 (0.1%) | 配置: Default"

The screenshot shows a Wireshark capture of a TLSv1.2 Alert (Fatal) message. The packet list pane shows a packet of 61 bytes on wire (488 bits) captured on interface \Device\NPF\_{26A42197-2E27-4220...}. The packet details pane shows the following structure:

- Ethernet II, Src: Dell\_0c:3a:a6 (44:a8:42:0c:3a:a6), Dst: AsixElec\_b6:72:c7 (00:0e:c6:b6:72:c7)
- Internet Protocol Version 4, Src: 10.0.0.32, Dst: 10.0.0.50
- Transmission Control Protocol, Src Port: 4783, Dst Port: 5000, Seq: 420, Ack: 3368, 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)

The packet bytes pane shows the raw data of the alert message, including the status bar: "Frame 1842: 61 bytes on wire (488 bits), 61 bytes captured (488 bits) on interface \Device\NPF\_{26A42197-2E27-4220...} | 分组: 3581 | 已显示: 321 (9.0%) | 配置: Default"



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

The screenshot shows a Wireshark capture of network traffic. The main pane displays a list of packets, with packet 1545 highlighted. The packet list table is as follows:

No.	Time	Source	Destination	Protocol	Length	Info
1507	15.105189	10.0.0.32	10.0.0.50	TLSv1.2	957	Application Data
1519	15.106845	10.0.0.32	10.0.0.50	TLSv1.2	1302	Application Data
1538	15.702536	10.0.0.32	10.0.0.50	TLSv1.2	473	Client Hello
1539	15.705555	10.0.0.50	10.0.0.32	TLSv1.2	1464	Server Hello
1541	15.705555	10.0.0.50	10.0.0.32	TLSv1.2	471	Certificate, Server Key Exchange, Certificate Request, Server Hello Done
1545	15.710368	10.0.0.32	10.0.0.50	TLSv1.2	61	Alert (Level: Fatal, Description: Certificate Expired)
1562	16.029058	10.0.0.50	10.0.0.32	TLSv1.2	1309	Application Data
1568	16.029108	10.0.0.50	10.0.0.32	TLSv1.2	662	Application Data
1578	16.104399	10.0.0.32	10.0.0.50	TLSv1.2	713	Application Data
1686	19.019261	10.0.0.50	10.0.0.32	TLSv1.2	1309	Application Data
1692	19.019295	10.0.0.50	10.0.0.32	TLSv1.2	684	Application Data
1705	19.092520	10.0.0.32	10.0.0.50	TLSv1.2	737	Application Data
1717	20.026374	10.0.0.50	10.0.0.32	TLSv1.2	1129	Application Data
1731	20.057492	10.0.0.32	10.0.0.50	TLSv1.2	957	Application Data
1744	20.129001	10.0.0.32	10.0.0.50	TLSv1.2	957	Application Data
1757	20.130634	10.0.0.32	10.0.0.50	TLSv1.2	957	Application Data

The packet details pane for packet 1545 shows the following structure:

- Frame 1545: 61 bytes on wire (488 bits), 61 bytes captured (488 bits) on interface \Device\NPF\_{26A42197-2E27-4220-...}
- Ethernet II, Src: Dell\_0c:3a:a6 (44:a8:42:0c:3a:a6), Dst: AsixElec\_b6:72:c7 (00:0e:c6:b6:72:c7)
- Internet Protocol Version 4, Src: 10.0.0.32, Dst: 10.0.0.50
- Transmission Control Protocol, Src Port: 9288, Dst Port: 5000, Seq: 420, Ack: 3238, Len: 7
- Transport Layer Security
  - TLSv1.2 Record Layer: Alert (Level: Fatal, Description: Certificate Expired)
    - Content Type: Alert (21)
    - Version: TLS 1.2 (0x0303)
    - Length: 2
    - Alert Message
      - Level: Fatal (2)
      - Description: Certificate Expired (45)

The packet bytes pane shows the raw hex data for the alert message:

```
0000 00 0e c6 b6 72 c7 44 a8 42 0c 3a a6 08 00 45 00 ...
0010 00 2f d3 a9 40 00 3f 06 53 ce 0a 00 00 20 0a 00 ...
0020 00 32 24 48 13 88 b1 ec 17 50 3b ba 5c a7 50 18 ...
0030 01 ed b9 13 00 00 15 03 03 00 02 02 2d ...
```

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

The screenshot shows a Wireshark capture of network traffic. The main pane displays a list of packets, with frame 517 highlighted. The packet list pane shows the following details for frame 517:

No.	Time	Source	Destination	Protocol	Length	Info
517	5.525479	10.0.0.32	10.0.0.50	TLSv1.2	61	Alert (Level: Fatal, Description: Certificate Unknown)

The packet details pane for frame 517 shows the following structure:

- Transport Layer Security
  - TLSv1.2 Record Layer: Alert (Level: Fatal, Description: Certificate Unknown)
    - Content Type: Alert (21)
    - Version: TLS 1.2 (0x0303)
    - Length: 2
    - Alert Message
      - Level: Fatal (2)
      - Description: Certificate Unknown (46)

The packet bytes pane shows the raw data for the alert message:

```

0000 00 0e c6 b6 72 c7 44 a8 42 0c 3a a6 08 00 45 00  ...r...
0010 00 2f e5 23 40 00 3f 06 42 54 0a 00 00 20 0a 00  -/#@
0020 00 32 07 b0 13 88 21 f0 e6 80 eb f4 d8 a6 50 18  -2....
0030 01 ed 69 3d 00 00 15 03 03 00 02 02 2e          -i=...
  
```

The status bar at the bottom indicates the current protocol is Transport Layer Security: Protocol, with 3964 bytes displayed at 203 bytes/sec (5.1%).

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

The screenshot shows a Wireshark capture of network traffic. The main pane displays a list of packets with the following details:

No.	Time	Source	Destination	Protocol	Length	Info
426	4.185876	10.0.0.50	10.0.0.32	TLSV1.2	734	Application Data
441	4.285108	10.0.0.32	10.0.0.50	TCP	1464	8181 → 58092 [ACK] Seq=228733 Ack=10061 Win=2182 Len=1410 [TCP segment of a reassembled PDU]
446	4.285108	10.0.0.32	10.0.0.50	TLSV1.2	707	Application Data
520	4.930687	10.0.0.32	10.0.0.50	TLSV1.2	473	Client Hello
521	4.946061	10.0.0.50	10.0.0.32	TLSV1.2	1464	Server Hello
523	4.946061	10.0.0.50	10.0.0.32	TLSV1.2	471	Certificate, Server Key Exchange, Certificate Request, Server Hello Done
527	5.043046	10.0.0.32	10.0.0.50	TLSV1.2	61	Alert (Level: Fatal, Description: Decrypt Error)
710	7.186742	10.0.0.50	10.0.0.32	TLSV1.2	1309	Application Data
711	7.186792	10.0.0.50	10.0.0.32	TCP	1464	58092 → 8181 [ACK] Seq=11316 Ack=236436 Win=512 Len=1410 [TCP segment of a reassembled PDU]
716	7.186792	10.0.0.50	10.0.0.32	TLSV1.2	749	Application Data
724	7.266539	10.0.0.32	10.0.0.50	TCP	1464	8181 → 58092 [ACK] Seq=236436 Ack=19052 Win=2336 Len=1410 [TCP segment of a reassembled PDU]

The packet details pane for frame 527 shows the following structure:

- Frame 527: 61 bytes on wire (488 bits), 61 bytes captured (488 bits) on interface \Device\NPF\_{26A42197-2E27-4220-8...}
- Ethernet II, Src: Dell\_0c:3a:a6 (44:a8:42:0c:3a:a6), Dst: AsixElec\_b6:72:c7 (00:0e:c6:b6:72:c7)
- Internet Protocol Version 4, Src: 10.0.0.32, Dst: 10.0.0.50
- Transmission Control Protocol, Src Port: 12916, Dst Port: 5000, Seq: 420, Ack: 3238, 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)

The packet bytes pane shows the raw data for the alert message:

```

0000  00 0e c6 b6 72 c7 44 a8 42 0c 3a a6 08 00 45 00  ....
0010  00 2f 21 2b 40 00 3f 06 06 4d 0a 00 00 20 0a 00  -/14
0020  00 32 32 74 13 88 51 18 bd ef 07 4d 1b 9d 50 18  -22T
0030  01 e8 d5 18 00 00 15 03 03 00 02 02 33  ....
  
```



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## **9 Photographs**

Refer to Appendix - Test Setup Photo for KSCR2312002294AT

- End of the Report -