

TEST REPORT

Application No.: KSCR2201000160AT
FCC ID: 2AU8HSRT321-CBRS
Applicant: Smawave Technology Co.,Ltd
Address of Applicant: 3/F, Building 8, 1001 North Qinzhou Road, Xuhui District, Shanghai, China
Manufacturer: Smawave Technology Co.,Ltd
Address of Manufacturer: 3/F, Building 8, 1001 North Qinzhou Road, Xuhui District, Shanghai, China

Equipment Under Test (EUT):

EUT Name: Indoor CPE
Model No.: SRT321
Standard(s): CBRSA-TS-9001-V1.0.0
 WINNF-TS-0122-V1.0
 FCC 47 CFR Part 96
 KDB 940660 D01 V03

Date of Receipt: 2022-2-9
Date of Test: 2022-2-19 to 2022-2-26
Date of Issue: 2022-03-01

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Eric Lin
Laboratory Manager



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Revision Record			
Version	Description	Date	Remark
00	Original	2022-02-28	/

Authorized for issue by:			
		<i>Milo Li</i>	
		Milo_Li / Project Engineer	
		<i>Eric Lin</i>	
		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
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



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Item	Standard	Test Case ID	Result
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: BY-SKY120200U71L Input: 100-240V~50/60Hz, 0.7A Output: 12.0V-2A
Cable(s):	1.0m LAN Cable
Serial Number of Tested EUT:	RT321X02220700001
Sample Type:	Mobile device
CBSD Class:	Category A CBSD
Transmitter Frequency Band:	LTE Band 48/42H/43L
Transmitter Frequency Range:	3550~3700MHz
Hardware Version:	V1.0
Software Version:	ICB6FW_Codium_CBSD_V1.01
Test sample:	RT321X02220700001
Antenna Gain:	3.55dBi
MIMO Type:	1T4R

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.



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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.
EPC	Lanner Electronics Inc.	LICA-1513A	LR202002004052
Router	TP-Link	TL-R860+	1175379002425
Base station	Baicells	mBS105 (FCC ID:2AG32MBS110596)	120200007219BSP0001

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.

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No tests were sub-contracted.



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5 Equipment List

Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
Laptop	Lenovo	Y510P	HFL000026	N/A	N/A
Spectrum Analyzer	KEYSIGHT	N9020A	KUS2001M00 1-2	2021/7/13	2022/7/12
Shield Room	研创	N/A	KS301115-2	N/A	N/A
Coaxial Cable	Thermax	N/A	14	2021/10/16	2022/10/15
Attenuator	Mini-Circuits	NAT-6-2W	15542-1	N.C.R.	N.C.R.
Humidity / Temperature Indicator	Anymetre	TH603	CZ700001(4/7)	2021/10/14	2022/10/13



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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

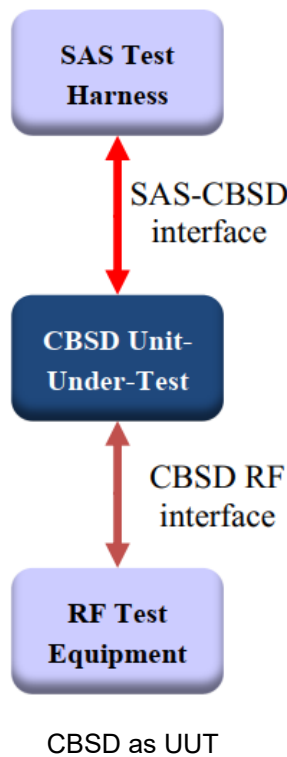
- a. Connect the UUT to SAS Test Harness system and RF Test instruments via the CBSD interface and RF components. The highest level is set to test configuration.
- b. UUT shall be UTC time synchronized
- c. The frequency band is granted and set as UUT supported Modulation and Channels, transmitted power 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.



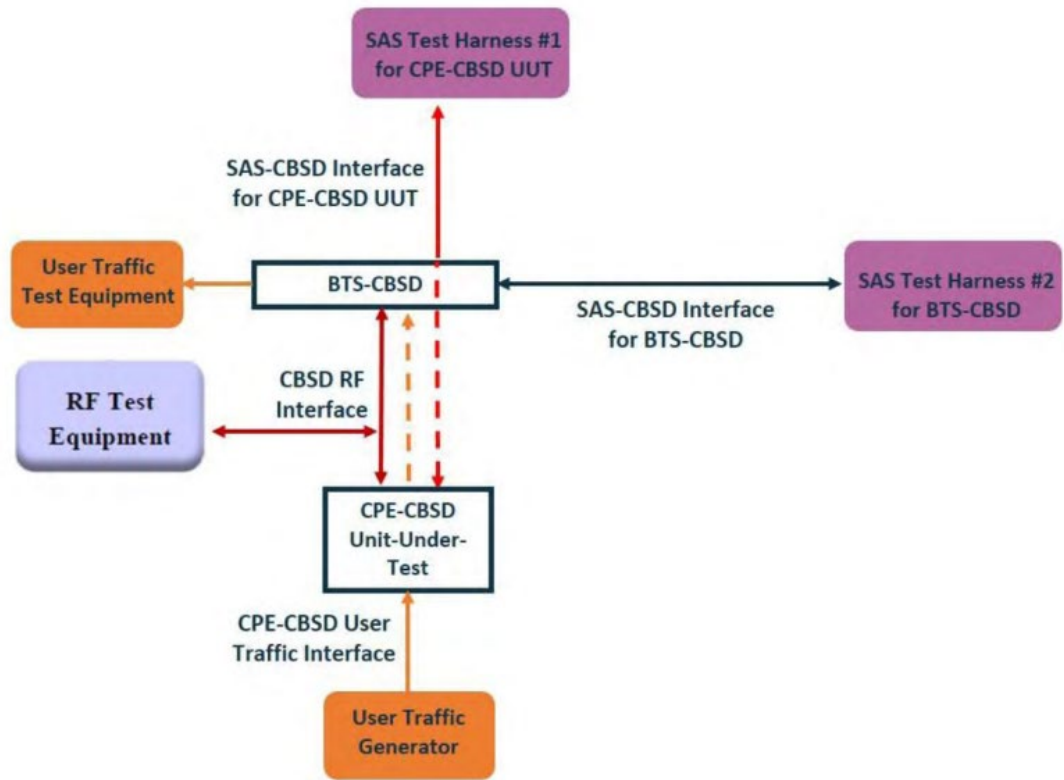
6.3 Test Environment

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

6.4 Test Setup



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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"> UUT has successfully completed SAS Discovery and Authentication with the SAS Test Harness UUT is in the Unregistered state 	--	--
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"> The required userId, fcld and cbsdSerialNumber registration parameters shall be sent from the CBSD and conform to proper format and acceptable ranges. 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. <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	<p>SAS Test Harness sends a CBSD Registration Response as follows:</p> <ul style="list-style-type: none"> cbsdId = C measReportConfig shall not be included responseCode = 0 	--	--
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"> UUT shall not transmit RF 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail



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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"> ● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness ● UUT is in the Unregistered state 	--	--
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"> - SAS response does not include cbsdId - responseCode = 102 	--	--
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"> ● UUT shall not transmit RF 	<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"> ● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness ● UUT is in the Unregistered state 	--	--
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"> - SAS response does not include cbsdId - responseCode = 200 	--	--
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"> ● UUT shall not transmit RF 	<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"> ● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness ● UUT is in the Unregistered state 	--	--
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"> - SAS response does not include cbsdId - responseCode = 103 	--	--
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"> ● UUT shall not transmit RF 	<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"> ● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness ● UUT is in the Unregistered state 	--	--
2	<p>CBSD sends a Registration request to SAS Test Harness.</p>	--	--
3	<p>SAS Test Harness rejects the request by sending a CBSD Registration Response as follows:</p> <ul style="list-style-type: none"> - SAS response does not include cbsdId - responseCode = 101 	--	--
4	<p>After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=101) 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"> ● UUT shall not transmit RF 	<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"> ● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness ● UUT is in the Unregistered state 	--	--
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"> - SAS response does not include cbsdId - responseCode = 100 	--	--
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"> ● UUT shall not transmit RF 	<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"> ● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness ● UUT is in the Unregistered state 	--	--
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"> - SAS response does not include cbsdId - responseCode = 201 	--	--
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"> ● UUT shall not transmit RF 	<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"> UUT has registered successfully with SAS Test Harness, with cbsdId = C 	--	--
2	UUT sends valid Grant Request.	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	SAS Test Harness sends a Grant Response message, including <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> UUT shall not transmit RF 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail



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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: <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> cbsdId=C 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: <ul style="list-style-type: none"> UUT shall not transmit RF 	■ Pass	□ Fail



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7.3 CBSD HeartBeat Process

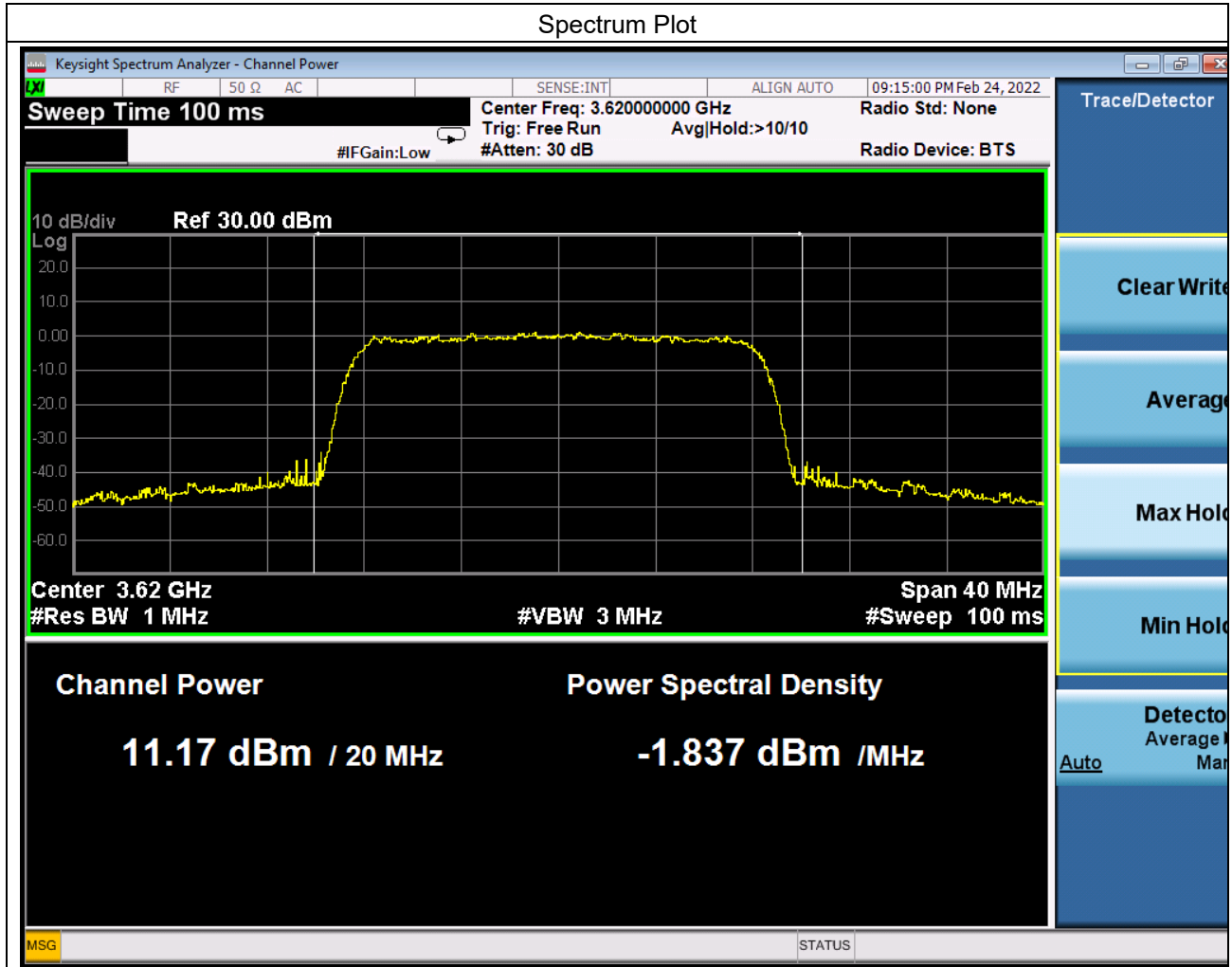
7.3.1 WINNF.FT.C.HBT.1

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: ● UUT has registered successfully with SAS Test Harness, with cbsdId = C	--	--
2	UUT sends a message: ● If message is type Spectrum Inquiry Request, go to step 3, or ● If message is type Grant Request, go to step 5	--	--
3	UUT sends Spectrum Inquiry Request. Validate: ● cbsdId = C ● 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: ● cbsdId = C ● availableChannel is an array of availableChannel objects ● responseCode = 0	--	--
5	UUT sends Grant Request message. Validate: ● cbsdId = C ● maxEIRP is at or below the limit appropriate for CBSD category as defined by Part 96 ● 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: ● cbsdId = C ● grantId = G = a valid grant ID ● grantExpireTime = UTC time greater than duration of the test ● responseCode = 0	--	--
7	UUT sends a first Heartbeat Request message. Verify Heartbeat Request message is formatted correctly, including: ● cbsdId = C ● grantId = G ● operationState = "GRANTED"	■ Pass	□ Fail
8	SAS Test Harness sends a Heartbeat Response message, with the following parameters: ● cbsdId = C ● grantId = G ● transmitExpireTime = current UTC time + 200 seconds ● responseCode = 0	--	--
9	For further Heartbeat Request messages sent from UUT after completion of step 8, validate message is sent within latest specified heartbeatInterval, and: ● cbsdId = C ● grantId = G ● operationState = "AUTHORIZED" and SAS Test Harness responds with a Heartbeat Response message including the following parameters: ● cbsdId = C ● grantId = G ● transmitExpireTime = current UTC time + 200 seconds ● responseCode = 0	■ Pass	□ Fail



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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"> UUT does not transmit at any time prior to completion of the first heartbeat response UUT transmits after step 8 is complete, and its transmission is limited to within the bandwidth range F. 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
----	--	--	-------------------------------



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"> ● UUT has registered successfully with SAS Test Harness ● UUT has a valid single grant as follows: <ul style="list-style-type: none"> ○ valid cbsdId = C ○ valid grantId = G ○ grant is for frequency range F, power P ○ grantExpireTime = UTC time greater than duration of the test ● UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface 	--	--
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"> ● cbsdId = C ● grantId = G ● operationState = "AUTHORIZED" 	--	--
3	<p>SAS Test Harness sends a Heartbeat Response message, including the following parameters:</p> <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G ● transmitExpireTime = T = Current UTC time ● responseCode = 105 (DEREGISTER) 	--	--
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"> ● UUT shall stop transmission within (T + 60 seconds) of completion of step 3 	<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	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> ● UUT has registered successfully with SAS Test Harness ● UUT has a valid single grant as follows: <ul style="list-style-type: none"> ○ valid cbsId = C ○ valid grantId = G ○ grant is for frequency range F, power P ○ grantExpireTime = UTC time greater than duration of the test ● UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface 	--	--
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"> ● cbsId = C ● grantId = G ● operationState = "AUTHORIZED" 	<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"> ● cbsId = C ● grantId = G ● transmitExpireTime = T = current UTC time ● responseCode = 500 (TERMINATED_GRANT) 	--	--
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"> ● UUT shall stop transmission within (T + 60 seconds) of completion of step 3 	<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"> ● UUT has registered successfully with SAS Test Harness ● UUT has a valid single grant as follows: <ul style="list-style-type: none"> ○ valid cbsdId = C ○ valid grantId = G ○ grant is for frequency range F, power P ○ grantExpireTime = UTC time greater than duration of the test ● UUT is in GRANTED, but not AUTHORIZED state (i.e. has not performed its first Heartbeat Request) 	--	--
2	<p>UUT sends a Heartbeat Request message. Verify Heartbeat Request message is formatted correctly, including:</p> <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G ● operationState = "GRANTED" 	<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"> ● cbsdId = C ● grantId = G ● transmitExpireTime = T = current UTC time ● ?responseCode = 501 (SUSPENDED_GRANT) 	--	--
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"> ● cbsdId = C ● grantId = G ● operationState = "GRANTED" <p>B. UUT sends a Relinquishment request message. Ensure message is correctly formatted with parameters:</p> <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G <p>Monitor the RF output of the UUT. Verify:</p> <ul style="list-style-type: none"> ● UUT does not transmit at any time 	<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"> ● UUT has registered successfully with SAS Test Harness ● UUT has a valid single grant as follows: <ul style="list-style-type: none"> ○ valid cbsdId = C ○ valid grantId = G ○ grant is for frequency range F, power P ○ grantExpireTime = UTC time greater than duration of the test ● UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface 	--	--
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"> ● cbsdId = C ● grantId = G ● operationState = "AUTHORIZED" 	<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"> <input type="checkbox"/> cbsdId = C <input type="checkbox"/> grantId = G <input type="checkbox"/> transmitExpireTime = T = current UTC time ● responseCode = 501 (SUSPENDED_GRANT) 	--	--
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"> ● cbsdId = C ● grantId = G ● operationState = "GRANTED" <p>B. UUT sends a Relinquishment request message. Ensure message is correctly formatted with parameters:</p> <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G <p>Monitor the RF output of the UUT. Verify:</p> <ul style="list-style-type: none"> ● UUT shall stop transmission within (T+60) seconds of completion of step 3 	<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	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> ● UUT has registered successfully with SAS Test Harness ● UUT has a valid single grant as follows: <ul style="list-style-type: none"> ○ valid cbsdId = C ○ valid grantId = G ○ grant is for frequency range F, power P ○ grantExpireTime = UTC time greater than duration of the test ● UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface 	--	--
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"> ● cbsdId = C ● grantId = G ● operationState = "AUTHORIZED" 	<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"> <input type="checkbox"/> cbsdId = C <input type="checkbox"/> grantId = G <input type="checkbox"/> transmitExpireTime = T = current UTC time ● responseCode = 502 (UNSYNC_OP_PARAM) 	--	--
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"> ● UUT sends a Grant Relinquishment Request message. Verify message is correctly formatted with parameters: <ul style="list-style-type: none"> ○ cbsdId = C ○ grantId = G Monitor the RF output of the UUT. Verify: <ul style="list-style-type: none"> ● UUT shall stop transmission within (T+60) seconds of completion of step 3 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail



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"> ● UUT has registered successfully with SAS Test Harness ● UUT has a valid single grant as follows: <ul style="list-style-type: none"> ○ valid cbsdId = C ○ valid grantId = G ○ grant is for frequency range F, power P ○ grantExpireTime = UTC time greater than duration of the test ● UUT is in GRANTED, but not AUTHORIZED state(i.e. has not performed its first Heartbeat Request) 	--	--
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"> ● cbsdId = C ● grantId = G ● operationState = "GRANTED" 	<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"> ● messages from UUT to simulate loss of network connection 	--	--
4	<p>Monitor the RF output of the UUT from start of test to 60 seconds after step 3. Verify: 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"> ● UUT has registered successfully with SAS Test Harness ● UUT has a valid single grant as follows: <ul style="list-style-type: none"> ○ valid cbsdId = C ○ valid grantId = G ○ grant is for frequency range F, power P ○ grantExpireTime = UTC time greater than duration of the test ● UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface 	--	--
2	<p>UUT sends a Heartbeat Request message. Verify Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including:</p> <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G ● operationState = "AUTHORIZED" 	<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"> <input type="checkbox"/> cbsdId = C <input type="checkbox"/> grantId = G <input type="checkbox"/> transmitExpireTime = T = current UTC time + 200 seconds ● responseCode = 0 	--	--
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"> ● UUT shall stop all transmission on RF interface within (transmitExpireTime + 60 seconds), using the transmitExpireTime sent in Step 3. 	<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	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> ● UUT has registered successfully with SAS Test Harness ● UUT has a valid single grant as follows: <ul style="list-style-type: none"> ○ valid cbsdId = C ○ valid grantId = G ○ grant is for frequency range F, power P ● UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface. ● Grant has the following parameters at the start of the test: <ul style="list-style-type: none"> ○ grantExpireTime =UTC time equal to time at start of test + 300 seconds = Tgrant_expire ○ transmitExpireTime = UTC time equal to time at start of test + 200 seconds ○ heartbeatInterval = 60 seconds 	--	--
2	UUT sends a Heartbeat Request message. If Heartbeat Request message contains grantRenew = TRUE, go to Step 6, else go to Step 3.	--	--
3	Verify Heartbeat Request message is sent within the latest specified heartbeatInterval, and is formatted correctly, including: <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G ● operationState = "AUTHORIZED" 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
4	SAS Test Harness sends a Heartbeat Response message, with the following parameters: <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G ● transmitExpireTime = current UTC + 200 seconds ● grantExpireTime = same as Step 1 ● responseCode = 0 	--	--
5	Go to Step 2	--	--
6	Verify Heartbeat Request message is sent within the latest specified heartbeatInterval, and is formatted correctly, including: <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G ● operationState = "AUTHORIZED" ● grantRenew = TRUE 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
7	SAS Test Harness sends a Heartbeat Response message, with the following parameters: <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G ● grantExpireTime = UTC time set far in the future ● transmitExpireTime = current UTC time + 200 seconds ● responseCode = 0 	--	--
8	Continue to respond to any subsequentHeartbeat Request from CBSD with Heartbeat Response with the following parameters: <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G ● transmitExpireTime = same as Step 7 ● responseCode = 0 	--	--



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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
---	---	---	----------------------------------



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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: <ul style="list-style-type: none"> UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT has successfully registered with SAS Test Harness, with cbsdId=C and measCapability = "RECEIVED_POWER_WITH_GRANT" 	--	--
2	UUT sends a Grant Request message. Verify Grant Request message contains all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> cbsdId = C operationParam is present and format is valid 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	SAS Test Harness sends a Grant Response message, with the following parameters: <ul style="list-style-type: none"> cbsdId = C grantId = G = valid grant ID grantExpireTime = UTC time in the future heartbeatInterval = 60 seconds measReportConfig= "RECEIVED_POWER_WITH_GRANT" operationParam is set to valid operating parameters channelType = "GAA" responseCode = 0 	--	--
4	UUT sends a Heartbeat Request message. Verify message contains all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> cbsdId = C grantId = G operationState = "GRANTED" 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
5	If Heartbeat Request message (step 4) contains measReport object, then: <ul style="list-style-type: none"> verify measReport is properly formatted as object rcvdPowerMeasReport end test, with PASS result else, if Heartbeat Request message (step 4) does not contain measReport object, then: <ul style="list-style-type: none"> If number of Heartbeat Requests sent by UUT after Step 3 is =5, then stop test with result of FAIL 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
6	SAS Test Harness sends a Heartbeat Response message, containing all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> cbsdId = C grantId = G transmitExpireTime = current UTC time + 200 seconds responseCode = 0 Go to Step 4, above	--	--



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7.4.2 WINNF.FT.C.MES.4

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



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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"> ● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness ● UUT has successfully registered with SAS Test Harness, with cbsdId=C ● UUT has received a valid grant with grantId = G ● UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant. <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"> ● cbsdId = C ● grantId = G 	<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"> - cbsdId = C - grantId = G ● responseCode = 0 	--	--
4	<p>After completion of step 3, SAS Test Harness will not provide any additional positive</p> <ul style="list-style-type: none"> ● response (responseCode=0) 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"> ● UUT shall stop RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request 	<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"> ● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness ● UUT has successfully registered with SAS Test Harness, with cbsdId=C ● UUT has received a valid grant with grantId = G ● UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant. <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"> ● cbsdId = C ● grantId = G 	--	--
3	<p>SAS Test Harness shall approve the request with a Relinquishment Response message with parameters:</p> <ul style="list-style-type: none"> - cbsdId = C - grantId = G ● responseCode = R 	--	--
4	<p>After completion of step 3, SAS Test Harness will not provide any additional positive</p> <ul style="list-style-type: none"> ● response (responseCode=0) 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"> ● UUT shall stop RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail



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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"> ● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness ● UUT has successfully registered with SAS Test Harness, with cbsdId=C ● UUT has received a valid grant with grantId = G ● UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant. <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"> ● cbsdId = C ● grantId = G 	--	--
3	<p>SAS Test Harness shall approve the request with a Relinquishment Response message with parameters:</p> <ul style="list-style-type: none"> - cbsdId = C - grantId = G ● responseCode = 103 	--	--
4	<p>After completion of step 3, SAS Test Harness will not provide any additional positive</p> <ul style="list-style-type: none"> ● response (responseCode=0) 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"> ● UUT shall stop RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request 	<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	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> ● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness ● UUT has successfully registered with SAS Test Harness, with cbsdId=C ● UUT has received a valid grant with grantId = G ● UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant. Invoke trigger to deregister UUT from the SAS Test Harness	--	--
2	UUT sends a Relinquishment request and receives Relinquishment response with <ul style="list-style-type: none"> ● responseCode=0 	--	--
3	<ul style="list-style-type: none"> ● UUT sends Deregistration Request to SAS Test Harness with cbsdId = C. 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
4	SAS Test Harness shall approve the request with a Deregistration Response message with parameters: <ul style="list-style-type: none"> ● cbsdId = C ● responseCode = 0 	--	--
5	After completion of step 3, SAS Test Harness will not provide any additional positive <ul style="list-style-type: none"> ● response (responseCode=0) to further request messages from the UUT. 	--	--
6	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: <ul style="list-style-type: none"> ● UUT stopped RF transmission at any time between triggering the deregistration and either A OR B occurs: <ul style="list-style-type: none"> A. UUT sending a Registration Request message, as this is not mandatory B. UUT sending a Deregistration Request message 	<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	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT has successfully registered with SAS Test Harness, with cbsdId=C UUT has received a valid grant with grantId = G UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant. Invoke trigger to deregister UUT from the SAS Test Harness	--	--
2	UUT sends a Relinquishment request and receives Relinquishment response with responseCode=0	--	--
3	<ul style="list-style-type: none"> UUT sends Deregistration Request to SAS Test Harness with cbsdId = C. 	--	--
4	The SAS Test Harness sends the Deregistration Response Message to UUT with: <ul style="list-style-type: none"> No cbsdId responseCode = 103 	--	--
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	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: <ul style="list-style-type: none"> UUT stopped RF transmission at any time between triggering the deregistration and either A OR B occurs: <ol style="list-style-type: none"> UUT sending a Registration Request message, as this is not mandatory UUT sending a Deregistration Request message 	<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"> UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT has successfully registered with SAS Test Harness, with cbsdId=C UUT has received a valid grant with grantId = G UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant. <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"> UUT sends Deregistration Request to SAS Test Harness with cbsdId = C. 	--	--
4	<p>The SAS Test Harness sends the Deregistration Response Message to UUT with:</p> <ul style="list-style-type: none"> cbsdId=C responseCode = 103 	--	--
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"> UUT stopped RF transmission at any time between triggering the deregistration and either A OR B occurs: <ul style="list-style-type: none"> C. UUT sending a Registration Request message, as this is not mandatory D. UUT sending a Deregistration Request message 	<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"> UUT shall start CBSD-SAS communication with the security procedure The UUT shall establish a TLS handshake with the SAS Test Harness using configured certificate. Configure the SAS Test Harness to accept the security procedure and establish the connection 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
2	<ul style="list-style-type: none"> Make sure that Mutual authentication happens between UUT and the SAS Test Harness. Make sure that UUT uses TLS v1.2 Make sure that cipher suites from one of the following is selected, <ul style="list-style-type: none"> TLS_RSA_WITH_AES_128_GCM_SHA256 TLS_RSA_WITH_AES_256_GCM_SHA384 TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384 TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 	<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. 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"> UUT shall not transmit RF 	<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"> UUT shall start CBSD-SAS communication with the security procedures 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
2	<ul style="list-style-type: none"> Make sure that UUT uses TLS v1.2 for security establishment. Make sure UUT selects the correct cipher suite. UUT shall use CRL or OCSP to verify the validity of the server certificate. Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness. 	<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"> 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: <ul style="list-style-type: none"> UUT shall not transmit RF 	<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"> UUT shall start CBSD-SAS communication with the security procedures 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
2	<ul style="list-style-type: none"> Make sure that UUT uses TLS v1.2 for security establishment. Make sure UUT selects the correct cipher suite. UUT shall use CRL or OCSP to verify the validity of the server certificate. Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness. 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	G. 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"> 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: <ul style="list-style-type: none"> UUT shall not transmit RF 	<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"> UUT shall start CBSD-SAS communication with the security procedures 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
2	<ul style="list-style-type: none"> Make sure that UUT uses TLS v1.2 for security establishment. Make sure UUT selects the correct cipher suite. UUT shall use CRL or OCSP to verify the validity of the server certificate Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness. 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	H. 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"> 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: <ul style="list-style-type: none"> UUT shall not transmit RF 	<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"> UUT shall start CBSD-SAS communication with the security procedures 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
2	<ul style="list-style-type: none"> Make sure that UUT uses TLS v1.2 for security establishment. Make sure UUT selects the correct cipher suite. UUT shall use CRL or OCSP to verify the validity of the server certificate Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness. 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	I. 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"> 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: <ul style="list-style-type: none"> UUT shall not transmit RF 	<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

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> UUT has successfully completed SAS Discovery and Authentication with the SAS Test Harness UUT has registered with the SAS, with CBSID = C 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 <p>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</p>	--	--
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"> UUT sends Heartbeat Request, including: <ul style="list-style-type: none"> cbsid = C grantId = G SAS Test Harness responds with Heartbeat Response, including: <ul style="list-style-type: none"> cbsid = C grantId = G transmitExpireTime = current UTC time + 200 seconds responseCode = 0 	--	--
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>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail



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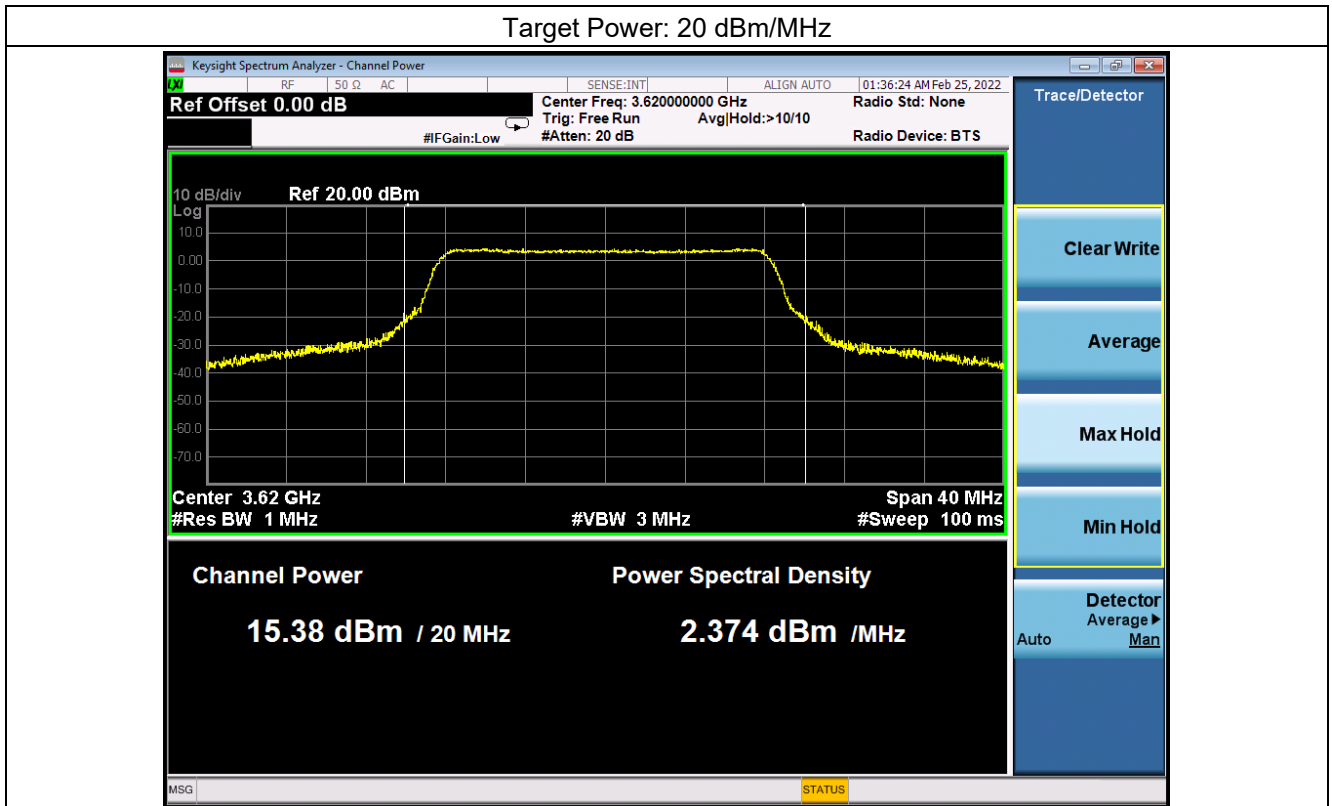
RF measurement plot for Test Case:

- 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.

Frequency (MHz)	Channel Bandwidth (MHz)	Granted maxEIRP (dBm/MHz)	Conducted PSD (dBm/MHz)	Antenna Gain (dBi)	Cable Loss (dB)	maxEIRP (dBm/MHz)
3620	20	20	2.37	3.55	2.5	8.42
3620	20	12	2.12	3.55	2.5	8.17
3620	20	10	1.67	3.55	2.5	7.72
3620	20	7	0.39	3.55	2.5	6.44
3620	20	5	-1.67	3.55	2.5	4.38

Note:

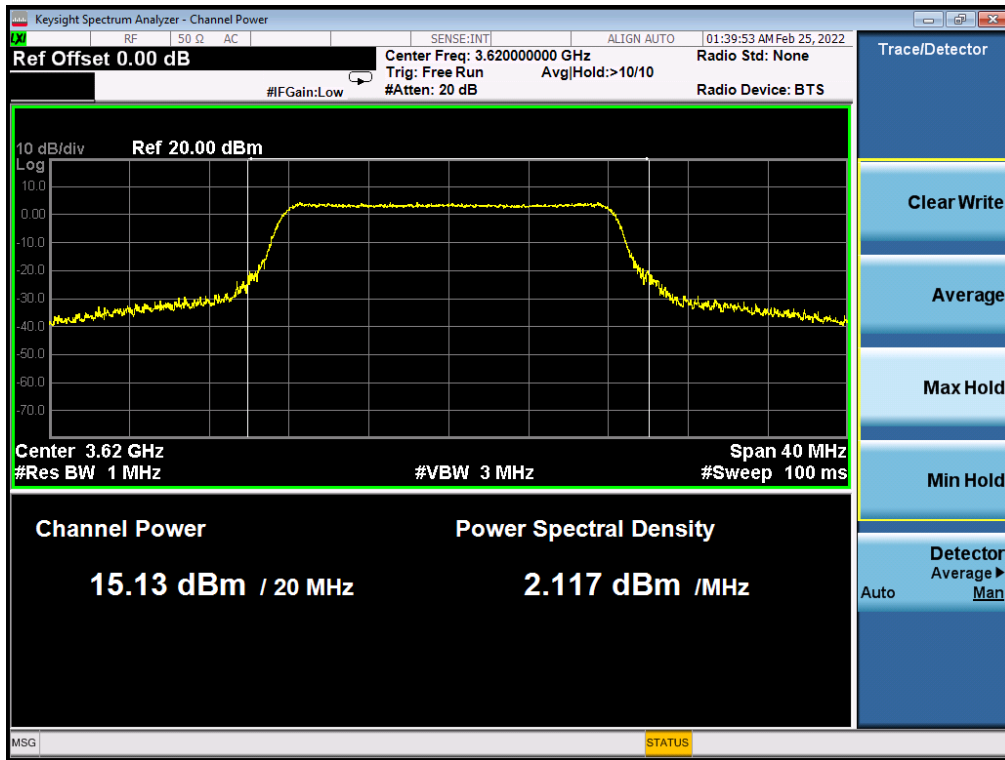
1.maxEIRP= Conducted PSD+ Antenna Gain+ Cable loss



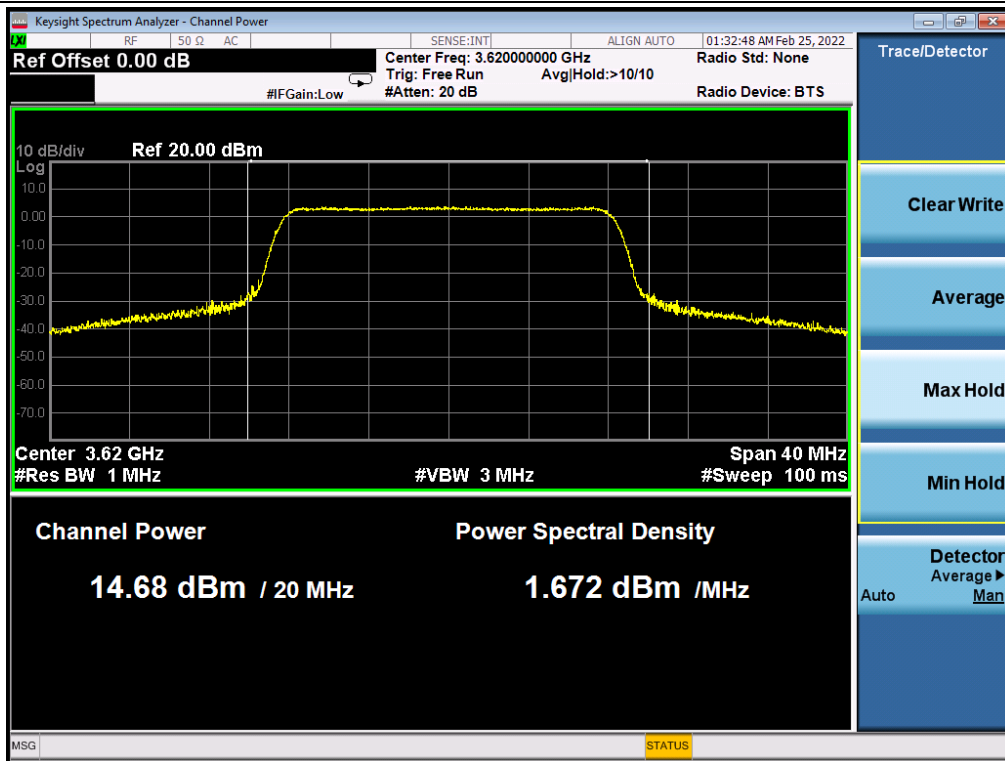
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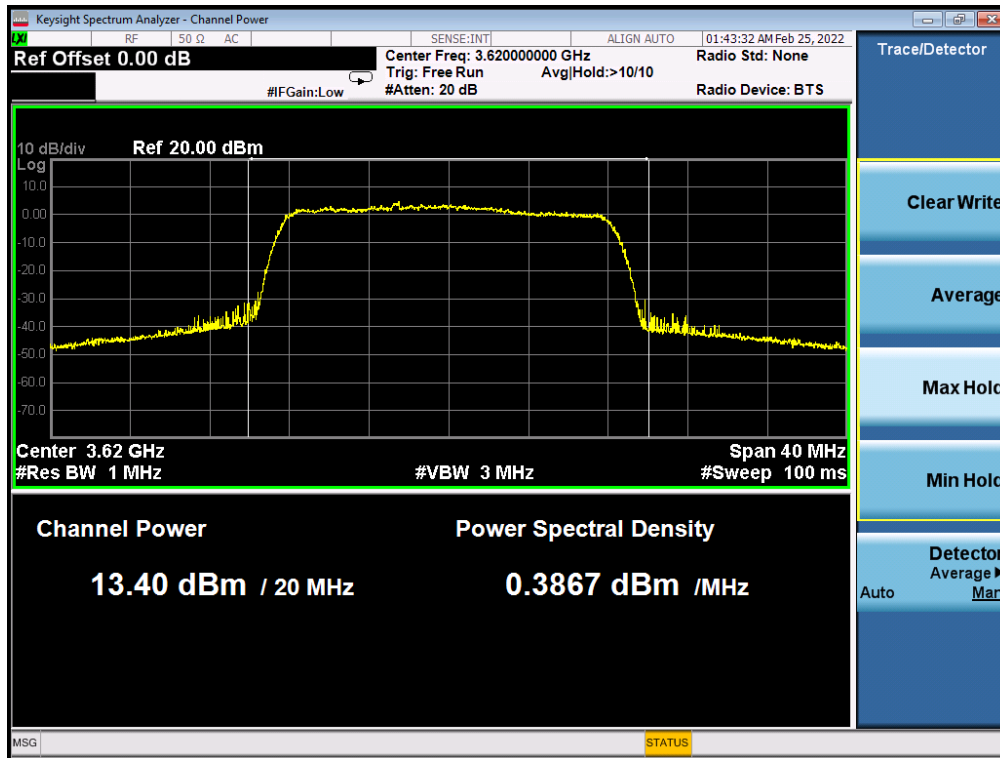
Target Power: 12 dBm/MHz



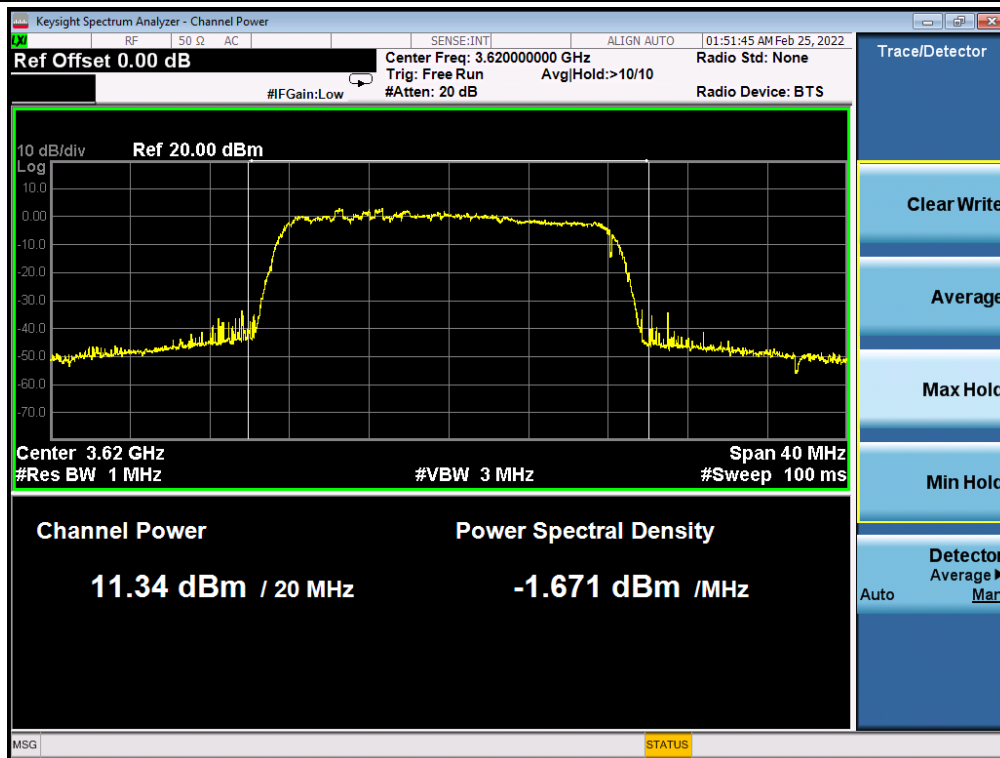
Target Power: 10 dBm/MHz



Target Power: 7 dBm/MHz



Target Power: 5 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

The screenshot displays a network traffic capture in Wireshark. The main pane shows a list of packets, with packet 60 selected. The packet list includes:

No.	Time	Source	Destination	Protocol	Length	Info
60	105.246...	192.168.24.2	192.168.24.100	TLSv1.2	571	Client Hello
61	105.247...	192.168.24.100	192.168.24.2	TLSv1.2	1514	Server Hello
62	105.247...	192.168.24.100	192.168.24.2	TLSv1.2	1514	Certificate [TCP segment of a reassembled PDU]
63	105.247...	192.168.24.100	192.168.24.2	TLSv1.2	58	Certificate Request, Server Hello Done
68	105.466...	192.168.24.2	192.168.24.100	TCP	1514	57589 → 5000 [ACK] Seq=518 Ack=2925 Win=20448 Len=1460 [TCP segment of a reassembled PDU]
69	105.466...	192.168.24.2	192.168.24.100	TLSv1.2	1514	Certificate [TCP segment of a reassembled PDU]
71	105.475...	192.168.24.2	192.168.24.100	TLSv1.2	522	Client Key Exchange, Certificate Verify, Change Cipher Spec, Encrypted Handshake Message
72	105.482...	192.168.24.100	192.168.24.2	TLSv1.2	105	Change Cipher Spec, Encrypted Handshake Message
74	105.530...	192.168.24.2	192.168.24.100	TLSv1.2	379	Application Data
75	105.554...	192.168.24.100	192.168.24.2	TLSv1.2	598	Application Data, Application Data, Application Data, Application Data, Application Data, Applic...
81	107.861...	192.168.24.2	192.168.24.100	TLSv1.2	480	Application Data
82	107.863...	192.168.24.100	192.168.24.2	TLSv1.2	161	Application Data, Application Data
84	107.895...	192.168.24.100	192.168.24.2	TLSv1.2	480	Application Data, Application Data, Application Data, Application Data, Application Data, Applic...

The packet details pane for packet 60 shows:

- Content Type: Handshake (22)
- Version: TLS 1.2 (0x0303)
- Length: 86
- Handshake Protocol: Server Hello
- Handshake Type: Server Hello (2)
- Length: 82
- Version: TLS 1.2 (0x0303)
- Random: efb45bfd40af905afefabaf12fb5bf6e83c785475e8c779183a727d4eefc0e9063
- Session ID Length: 32
- Session ID: 1914fdb8369c83937470ae980b704970f40537daccf16bf28d2653673ea04e9e
- Cipher Suite: TLS_RSA_WITH_AES_256_GCM_SHA384 (0x009d)
- Compression Method: null (0)
- Extensions Length: 10
- Extensions: renegotiation_info (len=1), heartbeat (len=1), JA3S Fullstring: 771,157,65281-15, JA3S: 6d37fb1b3306d6e9f875650d8eb74b4f

The packet bytes pane shows the raw hex and ASCII data for the selected packet.



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8.2 WINNF.FT.C.SCS.2

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No.	Time	Source	Destination	Protocol	Length	Info
64	129.524..	192.168.24.2	192.168.24.100	TLSv1.2	571	Client Hello
65	129.524..	192.168.24.100	192.168.24.2	TLSv1.2	1514	Server Hello
67	129.524..	192.168.24.100	192.168.24.2	TLSv1.2	205	Certificate, Certificate Request, Server Hello Done
86	135.404..	192.168.24.2	192.168.24.100	TLSv1.2	571	Client Hello
87	135.404..	192.168.24.100	192.168.24.2	TLSv1.2	1514	Server Hello
89	135.404..	192.168.24.100	192.168.24.2	TLSv1.2	205	Certificate, Certificate Request, Server Hello Done
93	135.443..	192.168.24.2	192.168.24.100	TLSv1.2	61	Alert (Level: Fatal, Description: Certificate Revoked)
105	141.003..	192.168.24.2	192.168.24.100	TLSv1.2	571	Client Hello
106	141.016..	192.168.24.100	192.168.24.2	TLSv1.2	1514	Server Hello
108	141.016..	192.168.24.100	192.168.24.2	TLSv1.2	205	Certificate, Certificate Request, Server Hello Done
112	141.063..	192.168.24.2	192.168.24.100	TLSv1.2	61	Alert (Level: Fatal, Description: Certificate Revoked)
117	146.603..	192.168.24.2	192.168.24.100	TLSv1.2	571	Client Hello
118	146.604..	192.168.24.100	192.168.24.2	TLSv1.2	1514	Server Hello

Transmission Control Protocol, Src Port: 35608, Dst Port: 5000, Seq: 1, Ack: 1, Len: 517

Transport Layer Security

TLSv1.2 Record Layer: Handshake Protocol: Client Hello

Content Type: Handshake (22)

Version: TLS 1.0 (0x0301)

Length: 512

Handshake Protocol: Client Hello

Handshake Type: Client Hello (1)

Length: 508

Version: TLS 1.2 (0x0303)

Random: 7f2cd602c8bfa75e5ec40805f7faab6a328c8ab0d5e385788d70a14509ed9aaf

Session ID Length: 0

Cipher Suites Length: 138

Cipher Suites (69 suites)

Compression Methods Length: 1

Compression Methods (1 method)

```

0000 00 0e c6 b6 72 c7 48 bf 74 0c ba 1d 08 00 45 00  ...P.H.t....E-
0010 02 2d 89 85 40 00 00 06 fd 8e c0 a8 18 02 c0 a8  ...@.....
0020 18 64 8b 18 13 88 95 7f a3 c4 19 19 d8 da 50 18  ...d.....P-
0030 03 91 83 7d 00 00 16 03 01 02 00 01 00 01 fc 03  ...}.....
0040 03 7f 2c d6 02 c8 bf a7 5e 5e c4 08 05 f7 fa ab  ...-.....
0050 6a 32 8c 8a b0 d5 e3 85 78 8d 70 a1 45 09 ed 9a  j2.....X.p.E-

```

Transport Layer Security: Protocol

分組: 339 · 已显示: 47 (13.9%)

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No.	Time	Source	Destination	Protocol	Length	Info
46	123.563..	192.168.24.2	192.168.24.100	HTTP	145	GET /crlserver.crl HTTP/1.1
48	123.568..	192.168.24.100	192.168.24.2	HTTP	1090	HTTP/1.1 200 OK

Frame 48: 1090 bytes on wire (8720 bits), 1090 bytes captured (8720 bits) on interface \Device\NPF_{0CE3A0EC-75F3-46DE-BD1E-73C39F15F349}, id 0

Ethernet II, Src: AsixEtc_b6:72:c7 (00:0e:c6:b6:72:c7), Dst: BaiCells_oc:ba:1d (48:bf:74:0c:ba:1d)

Internet Protocol Version 4, Src: 192.168.24.100, Dst: 192.168.24.2

Transmission Control Protocol, Src Port: 80, Dst Port: 42349, Seq: 326, Ack: 92, Len: 1036

[2 Reassembled TCP Segments (1361 bytes): #47(325), #48(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_=0.848954292479903; path=/; HttpOnly\r\n

Etag: 7c746a5a6b68b7abfeb6ec94de038c89\r\n

Last-Modified: Fri, 18 Feb 2022 08:12:11 GMT\r\n

Content-Disposition: attachment; filename="crlserver.crl";\r\n

\r\n

[HTTP response 1/1]

```

0000 48 bf 74 0c ba 1d 00 0e c6 b6 72 c7 08 00 45 00  H-t.....E-
0010 04 34 31 e8 40 00 80 06 13 25 c0 a8 18 64 c0 a8  ...1@...%...d-
0020 18 02 00 50 a5 6d 6a 30 20 93 5c 00 12 07 50 18  ...P.mj0 \...P-
0030 02 00 b5 6c 00 00 2d 2d 2d 2d 42 45 47 49 4e  ...-1-...-BEGIN
0040 20 58 35 30 39 20 43 52 4c 2d 2d 2d 2d 0d 0a  X509 CR L-----

```

Frame (1090 bytes) Reassembled TCP (1361 bytes)

Hypertext Transfer Protocol: Protocol

分組: 128 · 已显示: 2 (1.6%)



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8.3 WINNF.FT.C.SCS.3

No.	Time	Source	Destination	Protocol	Length	Info
36	22.941953	192.168.24.2	192.168.24.100	TLSv1.2	571	Client Hello
37	22.942459	192.168.24.100	192.168.24.2	TLSv1.2	1514	Server Hello
38	22.942459	192.168.24.100	192.168.24.2	TLSv1.2	1514	Certificate [TCP segment of a reassembled PDU]
39	22.942459	192.168.24.100	192.168.24.2	TLSv1.2	58	Certificate Request, Server Hello Done
44	22.991982	192.168.24.2	192.168.24.100	TLSv1.2	61	Alert (Level: Fatal, Description: Certificate Expired)
62	30.142256	192.168.24.2	192.168.24.100	TLSv1.2	571	Client Hello
63	30.143540	192.168.24.100	192.168.24.2	TLSv1.2	1514	Server Hello
64	30.143540	192.168.24.100	192.168.24.2	TLSv1.2	1514	Certificate [TCP segment of a reassembled PDU]
65	30.143540	192.168.24.100	192.168.24.2	TLSv1.2	58	Certificate Request, Server Hello Done
69	30.192335	192.168.24.2	192.168.24.100	TLSv1.2	61	Alert (Level: Fatal, Description: Certificate Expired)

Frame 36: 571 bytes on wire (4568 bits), 571 bytes captured (4568 bits) on interface \Device\NPF_{0CE3A0EC-75F3-46DE-BD1E-73C39F15F349}, id 0
 > Ethernet II, Src: Baicells_0c:ba:1d (48:bf:74:0c:ba:1d), Dst: AsixElec_b6:72:c7 (00:0e:c6:b6:72:c7)
 > Internet Protocol Version 4, Src: 192.168.24.2, Dst: 192.168.24.100
 > Transmission Control Protocol, Src Port: 49323, Dst Port: 5000, Seq: 1, Ack: 1, Len: 517
 > Transport Layer Security

```

0000  00 0e c6 b6 72 c7 48 bf 74 0c ba 1d 08 00 45 00  ....P.H.t.....E
0010  02 2d ab 4e 40 00 40 06 db c5 c0 a8 18 02 c0 a8  ....N@.....
0020  18 64 c0 ab 13 88 af 1a b5 59 6b 72 0d d6 50 18  ..d.....Ykr..P
0030  03 91 b0 b1 00 00 16 03 01 02 00 01 00 01 fc 03  .........
0040  03 31 a4 45 5f 07 85 22 0d b6 18 5b 7f 34 e7 84  ..1E...[.4..
0050  96 ba 47 0e bd f2 58 ba 65 01 7a f3 d7 22 10 87  ..G..X.e.z....
    
```



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8.4 WINNF.FT.C.SCS.4

正在捕获 以太网 5

No.	Time	Source	Destination	Protocol	Length	Info
30	19.444006	192.168.24.2	192.168.24.100	TLSv1.2	571	Client Hello
31	19.453985	192.168.24.100	192.168.24.2	TLSv1.2	1467	Server Hello, Certificate, Certificate Request, Server Hello Done
33	19.493451	192.168.24.2	192.168.24.100	TLSv1.2	61	Alert (Level: Fatal, Description: Unknown CA)
38	26.583487	192.168.24.2	192.168.24.100	TLSv1.2	571	Client Hello
39	26.584111	192.168.24.100	192.168.24.2	TLSv1.2	1467	Server Hello, Certificate, Certificate Request, Server Hello Done
41	26.633529	192.168.24.2	192.168.24.100	TLSv1.2	61	Alert (Level: Fatal, Description: Unknown CA)

Frame 30: 571 bytes on wire (4568 bits), 571 bytes captured (4568 bits) on interface \Device\NPF_{0CE3A0EC-75F3-46DE-BD1E-73C39F15F349}, id 0
 Ethernet II, Src: Baicells_0c:ba:1d (48:bf:74:0c:ba:1d), Dst: AsixElec_b6:72:c7 (00:0e:c6:b6:72:c7)
 Internet Protocol Version 4, Src: 192.168.24.2, Dst: 192.168.24.100
 Transmission Control Protocol, Src Port: 51527, Dst Port: 5000, Seq: 1, Ack: 1, Len: 517
 Transport Layer Security

```

0000  00 0e c6 b6 72 c7 48 bf 74 0c ba 1d 08 00 45 00  ...P.H.t.....E
0010  02 2d f0 e9 40 00 06 96 2a c0 a8 18 02 c0 a8  ...@.@.*.....
0020  18 64 c9 47 13 88 c9 40 9c 32 fd 61 93 86 50 18  ..d.G...@-2.a..P
0030  03 91 84 24 00 06 10 03 01 02 00 01 00 01 fc 03  ...$......
0040  03 1a 2a bf d8 fc 1e 7b 56 08 0c 13 c7 47 10 19  ...*...{V...G-
0050  73 46 0e 43 ef 12 da a0 17 78 c3 23 30 f3 c7 3c  sF.C....x.#0...
  
```

以太网 5: [live capture in progress] 分组: 42 · 已显示: 6 (14.3%) 配置: Default

正在捕获 以太网 5

No.	Time	Source	Destination	Protocol	Length	Info
30	19.444006	192.168.24.2	192.168.24.100	TLSv1.2	571	Client Hello
31	19.453985	192.168.24.100	192.168.24.2	TLSv1.2	1467	Server Hello, Certificate, Certificate Request, Server Hello Done
33	19.493451	192.168.24.2	192.168.24.100	TLSv1.2	61	Alert (Level: Fatal, Description: Unknown CA)
38	26.583487	192.168.24.2	192.168.24.100	TLSv1.2	571	Client Hello
39	26.584111	192.168.24.100	192.168.24.2	TLSv1.2	1467	Server Hello, Certificate, Certificate Request, Server Hello Done
41	26.633529	192.168.24.2	192.168.24.100	TLSv1.2	61	Alert (Level: Fatal, Description: Unknown CA)
48	33.723475	192.168.24.2	192.168.24.100	TLSv1.2	571	Client Hello
49	33.723943	192.168.24.100	192.168.24.2	TLSv1.2	1467	Server Hello, Certificate, Certificate Request, Server Hello Done
51	33.773644	192.168.24.2	192.168.24.100	TLSv1.2	61	Alert (Level: Fatal, Description: Unknown CA)
108	40.883430	192.168.24.2	192.168.24.100	TLSv1.2	571	Client Hello
109	40.884214	192.168.24.100	192.168.24.2	TLSv1.2	1467	Server Hello, Certificate, Certificate Request, Server Hello Done
111	40.933351	192.168.24.2	192.168.24.100	TLSv1.2	61	Alert (Level: Fatal, Description: Unknown CA)
121	47.603448	192.168.24.2	192.168.24.100	TLSv1.2	571	Client Hello

Transmission Control Protocol, Src Port: 5000, Dst Port: 51527, Seq: 1, Ack: 518, Len: 1413
 Transport Layer Security
 TLSv1.2 Record Layer: Handshake Protocol: Server Hello
 Content Type: Handshake (22)
 Version: TLS 1.2 (0x0303)
 Length: 86
 Handshake Protocol: Server Hello
 Handshake Type: Server Hello (2)
 Length: 82
 Version: TLS 1.2 (0x0303)
 Random: 3cb1a9a61ccc8799c701da0a8319d95c10e57f16bbb304b7e275ef7ed4bd2514
 Session ID Length: 32
 Session ID: 8fe8ddcf2f9929a42cb1faa6fe79e8d2cdc74a1ea2f68c262138894856d4f6fe
 Cipher Suite: TLS_RSA_WITH_AES_256_GCM_SHA384 (0x009d)
 Compression Method: null (0)
 Extensions Length: 10
 Extension: renegotiation_info (len=1)

```

0000  f6 f6 0d 0d 00 00 0a ff 01 00 01 00 00 0f 00 01  ..f..d..d...a..ff.01.00.01.00.00.0f.00.01
0010  01 16 03 03 04 f2 0b 00 04 ee 00 04 eb 00 04 e8  ...1.16.03.03.04.f2.0b.00.04.ee.00.04.eb.00.04.e8
0020  30 82 04 e4 30 82 02 cc a0 03 02 01 02 02 14 3c  0...0...<
0030  cf aa 31 44 ca 9a 8f fd 2d 81 be b2 41 08 d1 1a  ...ID...A...
0040  0a ba 6b 30 0d 06 09 2a 86 48 86 f7 0d 01 01 0b  ...k...*..H....
0050  05 00 30 45 31 0b 30 09 06 03 55 04 06 13 02 43  ...0E1.0...U...C
  
```

Cipher Suite (tls.handshake.ciphersuite), 2 bytes(s) 分组: 607 · 已显示: 15 (2.5%) 配置: Default



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8.5 WINNF.FT.C.SCS.5

No.	Time	Source	Destination	Protocol	Length	Info
95	62.969684	192.168.24.2	192.168.24.100	TLSv1.2	571	Client Hello
96	62.971613	192.168.24.100	192.168.24.2	TLSv1.2	1514	Server Hello
97	62.971613	192.168.24.100	192.168.24.2	TLSv1.2	1514	Certificate [TCP segment of a reassembled PDU]
98	62.971613	192.168.24.100	192.168.24.2	TLSv1.2	58	Certificate Request, Server Hello Done
102	63.019666	192.168.24.2	192.168.24.100	TLSv1.2	61	Alert (Level: Fatal, Description: Decrypt Error)
111	69.649949	192.168.24.2	192.168.24.100	TLSv1.2	571	Client Hello
112	69.651197	192.168.24.100	192.168.24.2	TLSv1.2	1514	Server Hello
113	69.651197	192.168.24.100	192.168.24.2	TLSv1.2	1514	Certificate [TCP segment of a reassembled PDU]
114	69.651197	192.168.24.100	192.168.24.2	TLSv1.2	58	Certificate Request, Server Hello Done
118	69.699964	192.168.24.2	192.168.24.100	TLSv1.2	61	Alert (Level: Fatal, Description: Decrypt Error)
125	76.809899	192.168.24.2	192.168.24.100	TLSv1.2	571	Client Hello
126	76.811094	192.168.24.100	192.168.24.2	TLSv1.2	1514	Server Hello
127	76.811094	192.168.24.100	192.168.24.2	TLSv1.2	1514	Certificate [TCP segment of a reassembled PDU]

> Frame 102: 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: Baicells_0c:ba:1d (48:bf:74:0c:ba:1d), Dst: AsixElec_b6:72:c7 (00:0e:c6:b6:72:c7)
 > Internet Protocol Version 4, Src: 192.168.24.2, Dst: 192.168.24.100
 > Transmission Control Protocol, Src Port: 54813, Dst Port: 5000, Seq: 518, Ack: 2925, Len: 7
 > Transport Layer Security

```

0000  00 0e c6 b6 72 c7 48 bf 74 0c ba 1d 08 00 45 00  . . . . .
0010  00 2f d9 6a 40 00 40 06 af a7 c0 a8 18 02 c0 a8  . . . . .
0020  18 64 d6 1d 13 88 ea 83 1a fb d5 b3 22 e3 50 18  . . . . .
0030  04 fe c4 4f 00 00 15 03 03 00 02 02 33          . . . . .
  
```

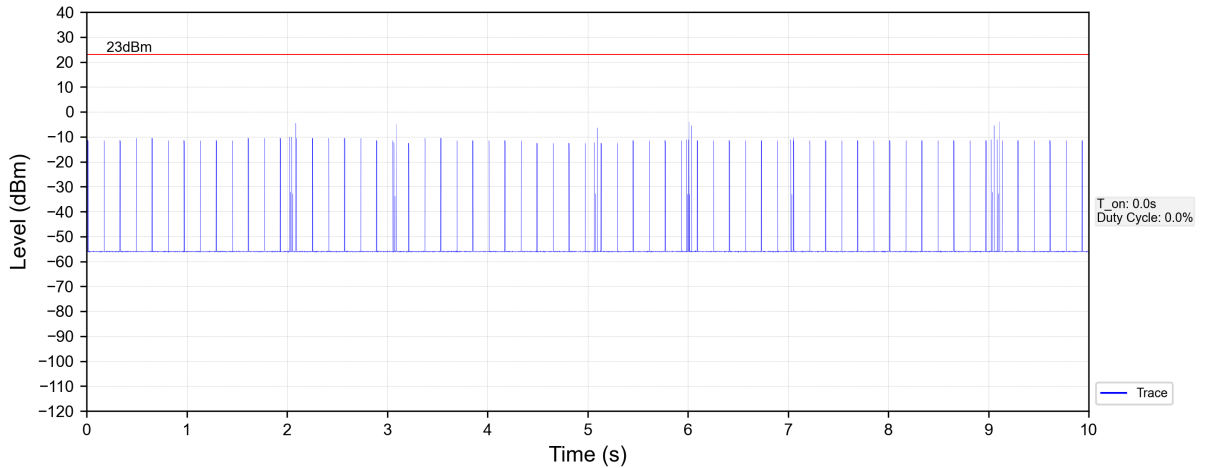


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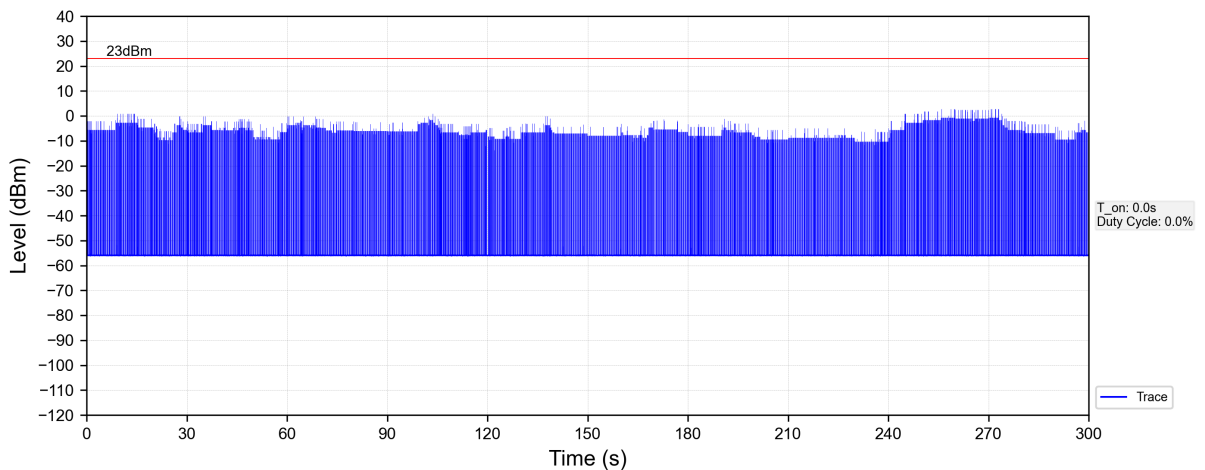
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9 Result of Time test for getting Grant

9.1 1 second within any 10-second period

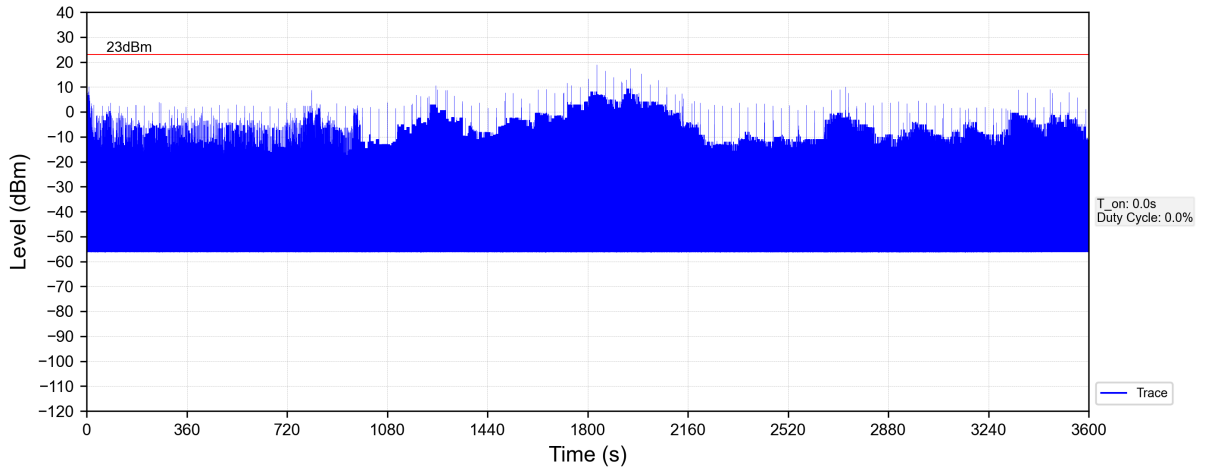


9.2 10 seconds within any 300-second period



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9.3 20 seconds within any 3600-second period



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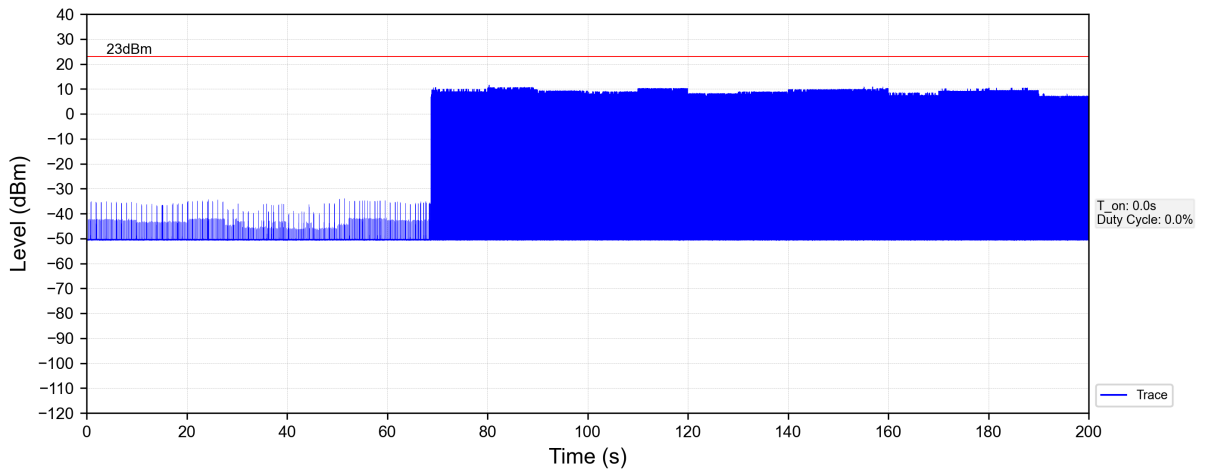
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10 Verify that the device will register with a SAS when operating below 23 dBm

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.



11 Photographs

11.1 EUT Constructional Details (EUT Photos)

Please Refer to Integral and internal photos for details.

- End of the Report -



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