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TEST REPORT

Test Result:	Pass*
Date of Issue:	2022-11-22
Date of Test:	2022-10-17 to 2022-11-21
Date of Receipt:	2022-10-17
	KDB 940660 D01 V03
	FCC 47 CFR Part 96
	WINNF-TS-0122-V1.0.2
Standard(s):	CBRSA-TS-9001-V1.2.1
Model No.:	CPX80P
EUT Name:	5G CPE
Equipment Under Test (EU	Т):
Address of Manufacturer:	14600 Industry Circle La Mirada, CA 90638
Manufacturer:	BTI Wireless
Address of Applicant:	14600 Industry Circle La Mirada, CA 90638
Applicant:	BTI Wireless
FCC ID:	WBKCPX80P
Application No.:	KSCR2210001943AT

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

Ena fri

Eric Lin Laboratory Manager



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Revision Record				
Version	Description	Date	Remark	
00	Original	2022-11-22	/	

Authorized for issue by:	
	cloudpeng
	Cloud.Pen/Project Engineer
	Eni fri
	Eric Lin / Reviewer



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2 Test Summary

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



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

4.1 Details of E.U.T. Power supply: DC 24V/1A,24W by Adapter Adapter Model: ASSA67A-240100 Input:100-240V~50/60Hz,0.8A Output: DC 24V 1A Cable(s): 1.0m LAN Cable Serial Number of Tested EUT: PX80PB02223300003 CBSD Class: Category B CBSD **Transmitter Frequency Band:** N48/n78(3550-3700MHz) Transmitter Frequency Range: 3550~3700MHz Hardware Version: V1.0 Software Version: CPX80P-B2H-PC4P-V2.1.6-D1 PX80PB02223300003 Test sample: Ant1:14.32dBi Antenna Gain: Ant2:14.35dBi Antenna Delivery: 2T2R

Note: EUT Support ULMIMO Only

4.2 Description of CBSD/DP Support Features

Condition	Feature Description	Supported
C1	Mandatory for UUT which supports multi-step registration message.	Y
C2	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.	
C3	Mandatory for UUT which supports single-step registration containing CPI- signed data in the registration message.	N
C4 Mandatory for UUT which supports RECEIVED_POWER_WITHOUT_GRANT measurement report type.		N
C5	Mandatory for UUT which supports RECEIVED_POWER_WITH_GRANT measurement report type.	Y
C6	Mandatory for UUT which supports parameter change being made at the UUT and prior to sending a deregistration.	N

Y: Supported

N: Not supported



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4.3 Summary of Test Results

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

Note:

1. Functional Test (FT): Test to validate the conformance of the Protocols and functionalities implemented in the CBSD/DP UUT to the requirements developed by WInnForum and supporting FCC/DoD requirements.

2. Field/Performance Test (PT): Test to check the capability of the CBSD/DP UUT to support various traffic models and actual operations in the field.

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

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

4.4 Measurement Uncertainty

No.	ltem	Measurement Uncertainty
1	Radio Frequency	± 7.25 x 10 ⁻⁸
2	RF conducted power	± 0.75dB
3	Temperature test	± 1°C
4	Humidity test	± 3%
5	Supply voltages	± 1.5%
6	Time	± 3%



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4.5 Description of Support Units

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

4.6 Test Location

All tests were performed at: Compliance Certification Services (Kunshan) Inc. No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China. Tel: +86 512 5735 5888 Fax: +86 512 5737 0818 No tests were sub-contracted.



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Member of the SGS Group (SGS SA)



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4.7 Test Facility

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

CNAS (No. CNAS L4354)

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• A2LA (Certificate No. 2541.01)

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

• FCC (Designation Number: CN1172)

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

Designation Number: CN1172.

• ISED (CAB identifier: CN0072)

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 (Member No.: 1938)

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.

4.8 Deviation from Standards

None

4.9 Abnormalities from Standard Conditions

None



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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	2022/8/22	2023/8/21
Shield Room	研创	N/A	KS301115-2	N/A	N/A
Coaxial Cable	Thermax	N/A	13	2022/9/16	2023/9/15
Attenuator	Mini-Circuits	NAT-6-2W	15542-1	N.C.R.	N.C.R.
Humidity / Temperature Indicator	Renke	RS-WS- N01-6J	1032844	2022/4/1	2023/3/31



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6 Test Method and Environment

6.1 CBSD/DP Conformance and Performance

Test Requirement:	CBRS CBSD Test Specification WINNF-TS-0122-V1.0.2
Test Method:	CBRS CBSD Test Specification WINNF-TS-0122-V1.0.2
	WINNF-IN-0156_WInnForum_SAS_Test_Harness_CBSD_UUT_Tutorial_
	v1_0_0_1

6.2 CBSD Test Procedure

- 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 Test Harness.
- 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



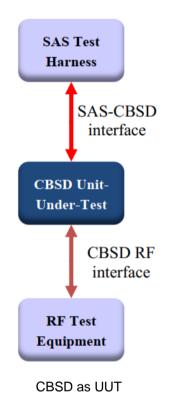
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6.4 Test Setup



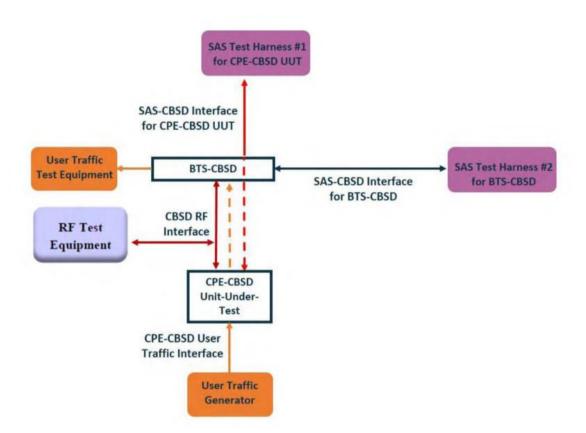


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Test setup diagram for WINNF.PT.C.HBT Test case



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Test Report Form Version: Rev01



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7 Test Data

7.1 CBSD Registration Process

7.1.1 WINNF.FT.C.REG.1

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with the SAS Test Harness UUT is in the Unregistered state 		
2	 CBSD sends correct Registration request information, as specified in [n.5], to the SAS Test Harness: The required userId, fccId 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. Note: It is outside the scope of this document to test the Registration information that is supplied via another means. 	∎ Pass	□ Fail
3	SAS Test Harness sends a CBSD Registration Response as follows: - cbsdld = C - measReportConfig shall not be included - responseCode = 0		
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 	∎ Pass	□ Fail



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7.1.2 WINNF.FT.C.REG.8

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: 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: SAS response does not include cbsdld 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: UUT shall not transmit RF 	∎ Pass	□ Fail



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7.1.3 WINNF.FT.C.REG.10

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: 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: SAS response does not include cbsdld 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: UUT shall not transmit RF 	∎ Pass	□ Fail



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7.1.4 WINNF.FT.C.REG.12

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: 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: SAS response does not include cbsdld 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: UUT shall not transmit RF 	∎ Pass	□ Fail



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7.1.5 WINNF.FT.C.REG.14

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: 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: SAS response does not include cbsdld responseCode = 101 		
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=101) to further request messages from the UUT.		
5	 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 	∎ Pass	□ Fail



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7.1.6 WINNF.FT.C.REG.16

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: 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: SAS response does not include cbsdld 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: UUT shall not transmit RF 	∎ Pass	□ Fail



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7.1.7 WINNF.FT.C.REG.18

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: 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: SAS response does not include cbsdld 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: UUT shall not transmit RF 	∎ Pass	□ Fail



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7.2 CBSD Spectrum Grant Process

7.2.1 WINNF.FT.C.GRA.1

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has registered successfully with SAS Test Harness, with cbsdld = C 		
2	UUT sends valid Grant Request.	∎ Pass	□ Fail
3	 SAS Test Harness sends a Grant Response message, including cbsdld=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:	∎ Pass	□ Fail



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7.2.2 WINNF.FT.C.GRA.2

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has registered successfully with SAS Test Harness, with cbsdld = C 		
2	UUT sends valid Grant Request.	∎ Pass	□ Fail
3	SAS Test Harness sends a Grant Response message, including - cbsdld=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: 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	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has registered successfully with SAS Test Harness, with cbsdld = 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: cbsdld = 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: cbsdld = C availableChannel is an array of availableChannel objects responseCode = 0 		
5	 UUT sends Grant Request message. Validate: cbsdld = 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: cbsdld = 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: cbsdld = C grantId = G operationState = "GRANTED" 	∎ Pass	□ Fail
8	 SAS Test Harness sends a Heartbeat Response message, with the following parameters: cbsdld = C grantld = G transmitExpireTime = current UTC time + 200 seconds responseCode = 0 		



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9	 For further Heartbeat Request messages sent from UUT after completion of step 8, validate message is sent within latest specified heartbeatInterval, and: cbsdld = C grantld = G operationState = "AUTHORIZED" and SAS Test Harness responds with a Heartbeat Response message including the following parameters: cbsdld = C grantld = G grantld = G transmitExpireTime = current UTC time + 200 seconds responseCode = 0 	∎ Pass	□ Fail
10	 Monitor the RF output of the UUT from start of test until UUT transmission commences. Verify: 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. 	∎ Pass	□ Fail



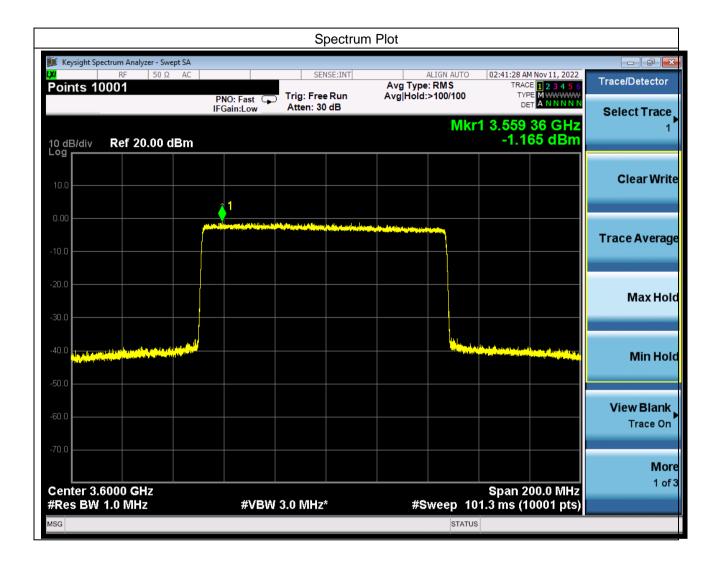
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7.3.2 WINNF.FT.C.HBT.3

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has registered successfully with SAS Test Harness UUT has a valid single grant as follows: valid cbsdld = 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 Heartbeat Interval specified in the latest Heartbeat Response, and formatted correctly, including: cbsdld = C grantId = G operationState = "AUTHORIZED" 		
3	 SAS Test Harness sends a Heartbeat Response message, including the following parameters: cbsdld = C grantId = G transmitExpireTime = T = Current UTC time responseCode = 105 (DEREGISTER) 		
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: UUT shall stop transmission within (T + 60 seconds) of completion of step 3 	∎ Pass	□ Fail



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7.3.3 WINNF.FT.C.HBT.4

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has registered successfully with SAS Test Harness UUT has a valid single grant as follows: valid cbsdld = 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: cbsdld = C grantId = G operationState = "AUTHORIZED" 	∎ Pass	□ Fail
3	 SAS Test Harness sends a Heartbeat Response message, including the following parameters: cbsdld = 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: UUT shall stop transmission within (T + 60 seconds) of completion of step 3 	∎ Pass	□ Fail



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7.3.4 WINNF.FT.C.HBT.5

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has registered successfully with SAS Test Harness UUT has a valid single grant as follows: valid cbsdld = C valid grantld = 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	 UUT sends a Heartbeat Request message. Verify Heartbeat Request message is formatted correctly, including: cbsdld = C grantId = G operationState = "GRANTED" 	∎ Pass	□ Fail
3	 SAS Test Harness sends a Heartbeat Response message, including the following parameters: cbsdld = C grantId = G transmitExpireTime = T = current UTC time ?responseCode = 501 (SUSPENDED_GRANT) 		
4	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.		
	Monitor the SAS-CBSD interface. Verify either A OR B occurs: A. UUT sends a Heartbeat Request message. Ensure message is sent within	∎ Pass	□ Fail
5	 latest specified heartbeatInterval, and is correctly formatted with parameters: cbsdld = C grantld = G operationState = "GRANTED" B. UUT sends a Relinquishment request message. Ensure message is correctly formatted with parameters: cbdsld = C grantld = G Monitor the RF output of the UUT. Verify: UUT does not transmit at any time 		



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7.3.5 WINNF.FT.C.HBT.6

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has registered successfully with SAS Test Harness UUT has a valid single grant as follows: valid cbsdld = 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: cbsdld = C grantId = G operationState = "AUTHORIZED" 	∎ Pass	□ Fail
3	SAS Test Harness sends a Heartbeat Response message, including the following parameters: cbsdld = C grantId = G transmitExpireTime = T = current UTC time • responseCode = 501 (SUSPENDED_GRANT)		
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: A. UUT sends a Heartbeat Request message. Ensure message is sent within latest specified heartbeatInterval, and is correctly formatted with parameters: cbsdld = C grantld = G operationState = "GRANTED" B. UUT sends a Relinquishment request message. Ensure message is correctly formatted with parameters: cbdsld = C grantld = G operationState = "GRANTED" B. UUT sends a Relinquishment request message. Ensure message is correctly formatted with parameters: cbdsld = C grantld = G Monitor the RF output of the UUT. Verify: UUT shall stop transmission within (T+60) seconds of completion of step 3 	∎ Pass	□ Fail



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7.3.6 WINNF.FT.C.HBT.7

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has registered successfully with SAS Test Harness UUT has a valid single grant as follows: valid cbsdld = 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: cbsdld = C grantId = G operationState = "AUTHORIZED" 	∎ Pass	□ Fail
3	SAS Test Harness sends a Heartbeat Response message, including the following parameters: cbsdld = C grantId = G 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: UUT sends a Grant Relinquishment Request message. Verify message is correctly formatted with parameters: cbsdld = C grantId = G Monitor the RF output of the UUT. Verify: UUT shall stop transmission within (T+60) seconds of completion of step 3 	∎ Pass	□ Fail



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7.3.7 WINNF.FT.C.HBT.9

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has registered successfully with SAS Test Harness UUT has a valid single grant as follows: valid cbsdld = C valid grantld = 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	 UUT sends a Heartbeat Request message. Ensure Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including: cbsdld = C grantId = G operationState = "GRANTED" 	∎ Pass	□ Fail
3	 After completion of step 2, SAS Test Harness does not respond to any further messages from UUT to simulate loss of network connection 		
4	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	∎ Pass	□ Fail



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7.3.8 WINNF.FT.C.HBT.10

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has registered successfully with SAS Test Harness UUT has a valid single grant as follows: valid cbsdld = C valid grantId = G grant is for frequency range F, power P grantExpireTime = UTC time greater than duration of the test 		
2	 UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface UUT sends a Heartbeat Request message. Verify Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including: cbsdld = C grantId = G operationState = "AUTHORIZED" 	∎ Pass	□ Fail
3	SAS Test Harness sends a Heartbeat Response message, including the following parameters: cbsdld = C grantId = G transmitExpireTime = T = current UTC time + 200 seconds • responseCode = 0		
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: UUT shall stop all transmission on RF interface within (transmitExpireTime + 60 seconds), using the transmitExpireTime sent in Step 3. 	∎ Pass	□ Fail



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7.3.9 WINNF.FT.C.HBT.11

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has registered successfully with SAS Test Harness UUT has a valid single grant as follows: valid cbsdld = C valid grantld = 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: grantExpireTime =UTC time equal to time at start of test + 300 seconds = Tgrant_expire <i>transmitExpireTime</i> = UTC time equal to time at start of test + 200 seconds <i>heartbeatInterval</i> = 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: cbsdld = C grantId = G operationState = "AUTHORIZED" 	∎ Pass	□ Fail
4	 SAS Test Harness sends a Heartbeat Response message, with the following parameters: cbsdld = C grantld = 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: cbsdld = C grantId = G operationState = "AUTHORIZED" grantRenew = TRUE 	∎ Pass	□ Fail
7	 SAS Test Harness sends a Heartbeat Response message, with the following parameters: cbsdld = 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 subsquentHeartbeat Request from CBSD with Heartbeat		



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	Response with the following parameters: • cbsdld = C • grantId = G • transmitExpireTime = same as Step 7 • responseCode = 0		
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.	∎ Pass	□ Fail



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7.4 CBSD Measurement Report

7.4.1 WINNF.FT.C.MES.3

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT has successfully registered with SAS Test Harness, with cbsdld=C and measCapability = "RECEIVED_POWER_WITH_GRANT" 	1	
2	 UUT sends a Grant Request message. Verify Grant Request message contains all required parameters properly formatted, and specifically: cbsdld = C operationParam is present and format is valid 	∎ Pass	□ Fail
3	 SAS Test Harness sends a Grant Response message, with the following parameters: cbsdld = C grantld = 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: cbsdld = C grantId = G operationState = "GRANTED" 	∎ Pass	□ Fail
5	 If Heartbeat Request message (step 4) contains measReport object, then: 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: If number of Heartbeat Requests sent by UUT after Step 3 is =5, then stop test with result of FAIL 	∎ Pass	□ Fail
6	SAS Test Harness sends a Heartbeat Response message, containing all required parameters properly formatted, and specifically: cbsdld = 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	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT has successfully registered with SAS Test Harness, with cbsdld=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: cbsdld = C grantld = G operationState = "AUTHORIZED" 	∎ Pass	□ Fail
3	 SAS Test Harness sends a Heartbeat Response message, containing all required parameters properly formatted, and specifically: cbsdld = C grantld = 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: cbsdld = C grantId = G operationState = "AUTHORIZED" 	∎ Pass	□ Fail
5	 If Heartbeat Request message (step 4) contains measReport object, then: 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: If number of Heartbeat Requests sent by UUT after Step 3 is = 5, then stop test with result of FAIL 	∎ Pass	□ Fail
6	 SAS Test Harness sends a Heartbeat Response message, containing all required parameters properly formatted, and specifically: cbsdld = C grantld = 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	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT has successfully registered with SAS Test Harness, with cbsdld=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 relinquish UUT Grant from the SAS Test Harness 		
2	 UUT sends a Relinquishment Request message. Verify message contains all required parameters properly formatted, and specifically: cbsdld = C grantId = G 	∎ Pass	□ Fail
3	SAS Test Harness shall approve the request with a Relinquishment Response message with parameters: - cbsdld = C - grantld = G • responseCode = 0		
4	 After completion of step 3, SAS Test Harness will not provide any additional 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 stop RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request 	∎ Pass	□ Fail



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7.5.2 WINNF.FT.C.RLQ.3

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT has successfully registered with SAS Test Harness, with cbsdld=C UUT has received a valid grant with grantld = G UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant. Invoke trigger to relinquish UUT Grant from the SAS Test Harness 		
2	 UUT sends a Relinquishment Request message. Verify message contains all required parameters properly formatted, and specifically: cbsdld = C grantId = G 		
3	SAS Test Harness shall approve the request with a Relinquishment Response message with parameters: - cbsdld = C - grantld = G • responseCode = R		
4	 After completion of step 3, SAS Test Harness will not provide any additional 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 stop RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request 	∎ Pass	□ Fail



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7.5.3 WINNF.FT.C.RLQ.5

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT has successfully registered with SAS Test Harness, with cbsdld=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 relinquish UUT Grant from the SAS Test Harness 		
2	 UUT sends a Relinquishment Request message. Verify message contains all required parameters properly formatted, and specifically: cbsdld = C grantId = G 		
3	SAS Test Harness shall approve the request with a Relinquishment Response message with parameters: - cbsdld = C - grantld = G • responseCode = 103		
4	 After completion of step 3, SAS Test Harness will not provide any additional 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 stop RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request 	∎ Pass	□ Fail



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7.6 CBSD Deregistration Process

7.6.1 WINNF.FT.C.DRG.1

#	Test Execution Steps	Re	sults
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT has successfully registered with SAS Test Harness, with cbsdld=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	 UUT sends Deregistration Request to SAS Test Harness with cbsdld = C. 	∎ Pass	□ Fail
4	 SAS Test Harness shall approve the request with a Deregistration Response message with parameters: cbsdId = C responseCode = 0 		
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: UUT stopped RF transmission at any time between triggering the deregistration and either A OR B occurs: UUT sending a Registration Request message, as this is not mandatory B. UUT sending a Deregistration Request message 	∎ Pass	□ Fail



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7.6.2 WINNF.FT.C.DRG.3

#	Test Execution Steps	F	Results
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT has successfully registered with SAS Test Harness, with cbsdld=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	 UUT sends Deregistration Request to SAS Test Harness with cbsdld = C. 		
4	 The SAS Test Harness sends the Deregistration Response Message to UUT with: No cbsdld 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: UUT stopped RF transmission at any time between triggering the deregistration and either A OR B occurs: A. UUT sending a Registration Request message, as this is not mandatory B. UUT sending a Deregistration Request message 	∎ Pass	□ Fail



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7.6.3 WINNF.FT.C.DRG.5

#	Test Execution Steps	F	Results
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT has successfully registered with SAS Test Harness, with cbsdld=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	 UUT sends Deregistration Request to SAS Test Harness with cbsdld = C. 		
4	 The SAS Test Harness sends the Deregistration Response Message to UUT with: cbsdld=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	 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: UUT stopped RF transmission at any time between triggering the deregistration and either A OR B occurs: UUT sending a Registration Request message, as this is not mandatory D. UUT sending a Deregistration Request message 	∎ Pass	□ Fail



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7.7 CBSD Security Validation

7.7.1 WINNF.FT.C.SCS.1

#	Test Execution Steps	Res	sults
1	 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 	∎ Pass	□ Fail
2	 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, 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_ECDSA_WITH_AES_256_GCM_SHA384 TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 	∎ Pass	□ 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 cbsdld.	∎ Pass	□ 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: • UUT shall not transmit RF	∎ Pass	□ Fail



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7.7.2 WINNF.FT.C.SCS.2

#	Test Execution Steps	Res	sults
1	 UUT shall start CBSD-SAS communication with the security procedures 	∎ Pass	□ Fa il
2	 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. 	∎ Pass	□ Fa il
3	F. UUT may retry for the security procedure which shall fail.	∎ Pass	□ Fa il
4	 SAS Test-Harness shall not receive any Registration request or any application data. 		
5	 Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF 	∎ Pass	□ Fail

7.7.3 WINNF.FT.C.SCS.3

#	Test Execution Steps	Res	sults
1	 UUT shall start CBSD-SAS communication with the security procedures 	∎ Pass	□ F ail
2	 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. 	∎ Pass	□ F ail
3	G. UUT may retry for the security procedure which shall fail.	∎ Pass	□ F ail
4	 SAS Test-Harness shall not receive any Registration request or any application data. 		
5	 Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF 	∎ Pass	□ Fail



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#	Test Execution Steps	Res	sults
1	UUT shall start CBSD-SAS communication with the security procedures	∎ Pass	□ F ail
2	 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. 	∎ Pass	□ F ail
3	H. UUT may retry for the security procedure which shall fail.	∎ Pass	□ F ail
4	 SAS Test-Harness shall not receive any Registration request or any application data. 		
5	 Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF 	∎ Pass	□ Fail

7.7.4 WINNF.FT.C.SCS.4



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7.7.5 WINNF.FT.C.SCS.5

#	Test Execution Steps	Res	sults
1	 UUT shall start CBSD-SAS communication with the security procedures 		
1		Pass	Fail
2	 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. 	∎ Pass	□ Fail
3	I. UUT may retry for the security procedure which shall fail.	∎ Pass	□ Fail
4	 SAS Test-Harness shall not receive any Registration request or any application data. 		
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF 	∎ Pass	□ Fail



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7.8 CBSD RF Power Measurement

7.8.1 WINNF.PT.C.HBT

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with the SAS Test Harness UUT has registered with the SAS, with CBSD ID = 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 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 		
2	 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: UUT sends Heartbeat Request, including: cbsdld = C grantld = G SAS Test Harness responds with Heartbeat Response, including: o cbsdld = C grantld = G transmitExpireTime = current UTC time + 200 seconds responseCode = 0 		
3	 Tesponsecode = 0 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. 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. 	∎ Pass	□ Fail



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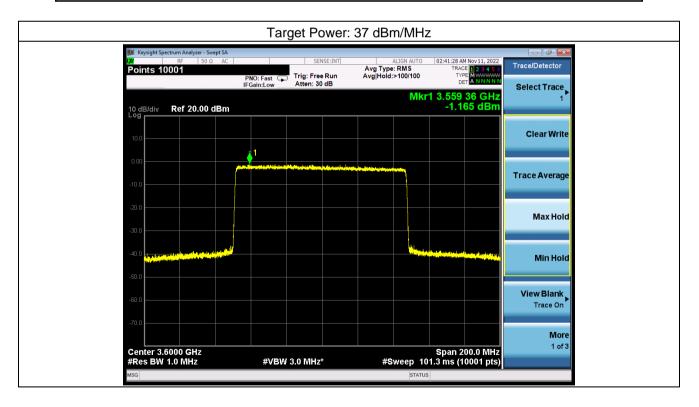
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RF measurement plot for Test Case:

 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	Channel Bandwidth	Granted maxEIRP	Conducted PSD	Antenna Gain	MIMO Factor	Cable Loss	maxEIRP
Frequency (MHz)	(MHz)	(dBm/MHz)	(dBm/MHz)	(dBi)	(dBi)	(dB)	(dBm/MHz)
3600	100	37	-1.165	14.350	3.000	5.250	21.435
3600	100	25	-1.770	14.350	3.000	5.250	20.830
3600	100	20	-3.803	14.350	3.000	5.250	18.797
3600	100	10	-14.157	14.350	3.000	5.250	8.443
Note:	•						

1.maxEIRP= Conducted PSD+ Antenna Gain+ Cable loss + MIMO Factor 2.EUT support 2*2 ULMIMO



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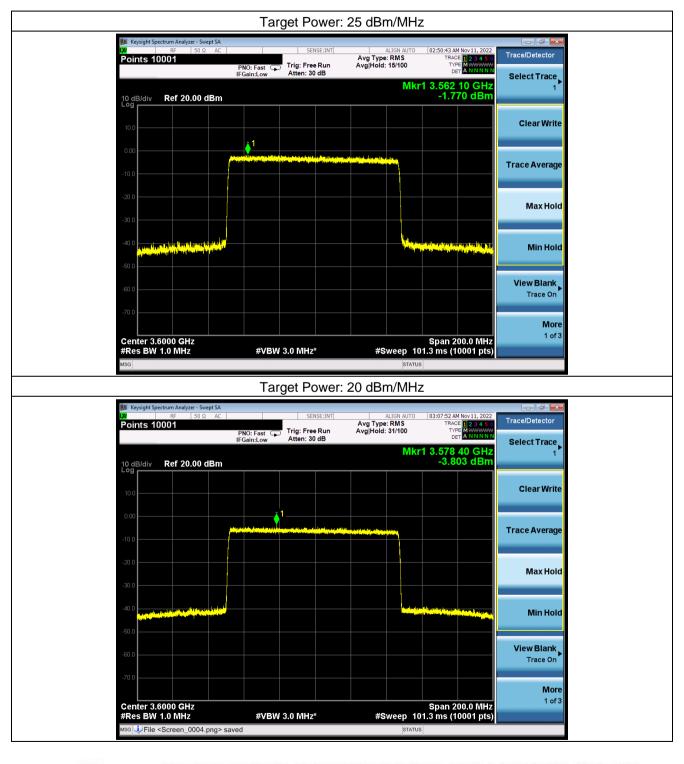
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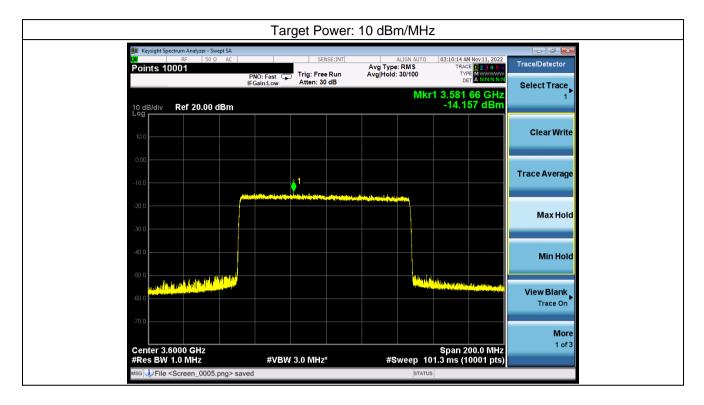


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8 Test Data Log

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

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833 31.712349 192.168.225.1	192.168.225.100	TLSv1.2	381 Application Data	
859 41.663348 192.168.225.100	192.168.225.1	TLSv1.2	1383 Application Data	
861 41.725925 192.168.225.1	192.168.225.100	TLSv1.2	906 Application Data	
877 46.887686 10.5.251.172	10.88.140.53	TLSv1.2	571 Client Hello	
878 46.888178 10.88.140.53	10.5.251.172	TLSv1.2	1514 Server Hello	
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880 46.888178 10.88.140.53	10.5.251.172	TLSv1.2	58 Certificate Request, Server Hello Done	
885 46.957408 10.5.251.172	10.88.140.53	TLSv1.2	1514 Certificate [TCP segment of a reassembled PDU]	
				>
Version: TLS 1.2 (0x0303) Length: 86 ~ Handshake Protocol: Server He Handshake Type: Server Hel Length: 82				
Length: 86 > Handshake Protocol: Server Hel Length: 82 Version: TLS 1.2 (0x0303) > Random: 7f191add1b1adc9e6e Session ID: hpsdfrabtfad5 Session ID: 7b9dfrabtfad5	lo (2) cb924a25f9c49d014cc6d59fc109de41 454a77752e7969bda6f36e805ea84186			
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Approximation of the second sec	(④) 捕获(〇) 分析((④) 捕获(〇) 分析((●) ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● 2 ● 2 d 2 d	Q Q Q Y Destination 192.168.5.115 192.168.5.120 192.168.5.120 192.168.5.120 192.168.5.120 192.168.5.120 192.168.5.120 192.168.5.120 Port: 80, Dst Port: 429 192.168.5.120 Port: 80, Dst Port: 429 192.168.5.120 Port: 80, Dst Port: 429 192.168.5.120 Stream\r\n 780248; path=/; Httponly FC17C2\r\n 07:36:25 GMT\r\n filename="cbsd.crl"; \r' scconds] 3/cbsd.crl] 3039204352422d2d2d2d2d2d2d2d2d2d2d2d2d2d2d2d2d2d	Protocol HTTP/J HTTP/J HTTP/J HTTP HTTP	 637 POST /public/cg 328 HTTP/1.0 200 OK 637 POST /public/cg 328 HTTP/1.0 200 OK 138 GET /cbsd.crl H 1090 HTTP/1.1 200 OK 637 POST /public/cg 328 HTTP/1.0 200 OK 	i-bin/information.cgi HTTP/1.1 (text/html) i-bin/information.cgi HTTP/1.1 (text/html) TTP/1.1 i-bin/information.cgi HTTP/1.1	, JavaScript Object Notation , JavaScript Object Notation	- (application/json (application/json

8.3 WINNF.FT.C.SCS.3



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Tine Source 51.617219 19.5.251.107 61.617524 19.88.140.53 71.617584 19.88.140.53 81.617584 19.88.140.53 121.642048 19.5.251.107 035.762034 19.21.63.225.100 305.761817 192.166.225.100 305.761817 192.163.225.1107 447.462144 19.88.140.53	Image: Control of the state of the	TLSv1.2 TLSv1.2 TLSv1.2	Length Info 571 Client Hello	8 🗆 •
Tiae Source 5 1.617219 10.5251.1107 6 1.617584 10.88.140.53 7 1.617584 10.88.140.53 8 1.617584 10.88.140.53 12 1.642048 10.5.251.107 28 5.702034 192.168.225.100 30 5.761817 192.168.225.1107	10.88.140.53 10.5.251.107 10.5.251.107 10.5.251.107 10.88.140.53	TLSv1.2 TLSv1.2 TLSv1.2		
51.617219 10.5.251.107 61.617584 10.88.140.53 71.617584 10.88.140.53 81.617584 10.88.140.53 121.642048 10.5.251.107 126.5702034 105.251.107 305.761817 102.168.225.107	10.88.140.53 10.5.251.107 10.5.251.107 10.5.251.107 10.88.140.53	TLSv1.2 TLSv1.2 TLSv1.2		
6 1.617584 10.88.140.53 7 1.617584 10.88.140.53 8 1.617584 10.88.140.53 12 1.642048 10.5.251.107 28 5.702034 192.168.225.100 30 5.761817 192.168.225.1 43 7.461892 10.5.251.107	10.5.251.107 10.5.251.107 10.5.251.107 10.88.140.53	TLSv1.2 TLSv1.2		
7 1.617584 10.88.140.53 8 1.617584 10.88.140.53 12 1.642048 10.5.251.107 28 5.702034 192.168.225.100 30 5.761817 192.168.225.1 43 7.461892 10.5.251.107	10.5.251.107 10.5.251.107 10.88.140.53	TLSv1.2	1514 Server Hello	
8 1.617584 10.88.140.53 12 1.642048 10.5,251.107 28 5.702034 192.168.225.100 30 5.761817 192.168.225.1 43 7.461892 10.5,251.107	10.5.251.107 10.88.140.53		1514 Certificate [TCP segment of a reassembled PDU]	
12 1.642048 10.5.251.107 28 5.702034 192.168.225.100 30 5.761817 192.168.225.1 43 7.461892 10.5.251.107	10.88.140.53	TLSv1.2		
28 5.702034 192.168.225.100 30 5.761817 192.168.225.1 43 7.461892 10.5.251.107			61 Alert (Level: Fatal, Description: Certificate Expired)	
30 5.761817 192.168.225.1 43 7.461892 10.5.251.107			1383 Application Data	
43 7.461892 10.5.251.107	192.168.225.100		912 Application Data	
	10.88.140.53		571 Client Hello	
	10.5.251.107		1514 Server Hello	
45 7.462114 10.88.140.53	10.5.251.107	TLSv1.2	1514 Certificate [TCP segment of a reassembled PDU]	
Content Type: Alert (21) Version: TLS 1.2 (0x0303) Length: 2 Alert Message Level: Fatal (2) Description: Certificate Exp: 00 0e c6 b6 72 c7 00 30 64 6b 2 00 2f 1c de 40 00 3f 06 82 ed 0	23 da 08 00 45 00 ····r··0 dk#···E· 0a 05 fb 6b 0a 5a ·/··@·?·····k·X f5 3a 13 b 25 01 8 ·5···R···k.X	vired)		
Transport Layer Security: Protocol	02 02 20		/ 均額: 70 ・ 己星示: 12 (17.1%)	配置: Def

 ov 1.vev149/19/2.108.225.10
 192.168.225.11
 TLS1.2
 1383 Application Data

 B217.066169 192.168.225.1
 192.168.225.10
 TLS1.2
 1923 Application Data

 Frame 42: 61 bytes on wire (488 bits), 61 bytes captured (488 bits) on interface \bevice\NPF_{0CE3ABEC-75F3-46DE-BDIE-73C39F15F349}, id 0

 Ethernet II, Src: AdlinkTe_6b:23:da (00:30:64:6b:23:da), DSt: AsixEle_b5:72:C7 (00:00:66:66:72:C7)

 Internet Protocol Version 4, Src: 105.551.107, DSt: 10.88.140.53

 Transmission Control Protocol, Src Port: 46333, DSt Port: 5004, Seq: 518, Ack: 2925, Len: 7

Transmission Control Protocol, Src Port: 46333, Dst Port: 5004, Seq: 5 Transport Layer Security ~ TLSv1.2 Record Layer: Alert (Level: Fatal, Description: Unknown CA) Content Type: Alert (21) Version: TLS 1.2 (0x0303) Length: 2

> Alert Message Level: Fatal (2) Description: Unknown CA (48)

○ Z Transport Layer Security: Protocol

| 分组: 110 · 已显示: 21 (19.1%) 配置: Default



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tls			× 💷 •
. Time Source	Destination	Protocol Length Info	
708 8383.56 192.168.225.100	192.168.225.1	TLSv1.2 1383 Application Data	
708 8383.62 192.168.225.1	192.168.225.100	TLSv1.2 906 Application Data	
7088387.00 192.168.225.100	192.168.225.1	TLSv1.2 792 Application Data	
7088387.00 192.168.225.1	192.168.225.100	TLSv1.2 381 Application Data	
708 8387.88 10.5.251.107	10.88.140.53	TLSv1.2 571 Client Hello	
7088387.88 10.88.140.53	10.5.251.107	TLSv1.2 1514 Server Hello	
708 8387.88 10.88.140.53	10.5.251.107	TLSv1.2 1514 Certificate [TCP segment of a reassembled PDU]	
708 8387.88 10.88.140.53	10.5.251.107	TLSv1.2 58 Certificate Request, Server Hello Done	
708 8387.90 10.5.251.107	10.88.140.53	TLSv1.2 61 Alert (Level: Fatal, Description: Decrypt Error)	
Transmission Control Protocol, Sr Transport Layer Security ~ TLSv1.2 Record Layer: Alert (Le Content Type: Alert (21)	c Port: 55129, Dst Port: 5004, 5	eq: 518, Ack: 2925, Len: 7	
	c Port: 55129, Dst Port: 5004, 5	eq: 518, Ack: 2925, Len: 7	
<pre>Transmission Control Protocol, Sr Transport Layer Security</pre>	c Port: 55129, Dst Port: 5004, S vel: Fatal, Description: Decryp	eq: 518, Ack: 2925, Len: 7	
Transmission Control Protocol, Sr Transport Layer Security ~ TLSV1.2 Record Layer: Alert (Le Content Type: Alert (21) Version: TLS 1.2 (0x0303) Length: 2 ~ Alert Message	c Port: 55129, Dst Port: 5004, S vel: Fatal, Description: Decryp	eq: 518, Ack: 2925, Len: 7	





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9.1

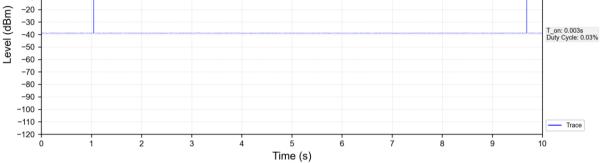
Compliance Certification Services (Kunshan) Inc.

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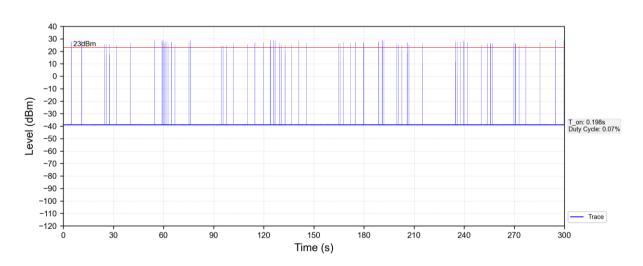
9 Result of Time test for getting Grant

1 second within any 10-second period

40 30 23dBm 10 -10 -20







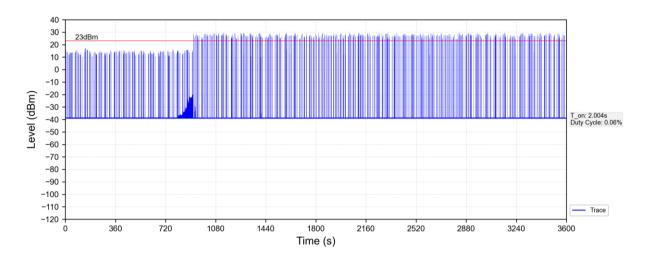


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9.3 20 seconds within any 3600-second period



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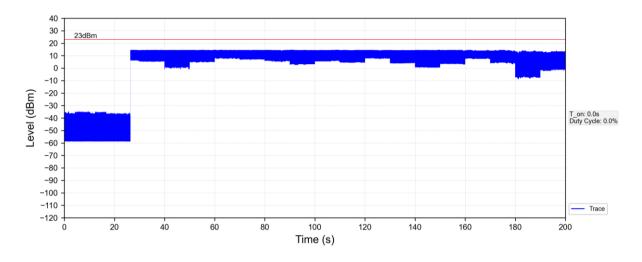
Test Report Form Version: Rev01



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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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