



SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

SZEMC-TRF-01 Rev. A/1

Report No.: SZCR240600210405

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TEST REPORT

Application No.: SZCR2406002104AT
Applicant: Baicells Technologies Co., Ltd.
Address of Applicant: 9-10F,1stBldg.,No.81BeiqingRoad,Haidian District,Beijing,China
Manufacturer: Baicells Technologies Co., Ltd.
Address of Manufacturer: 9-10F,1stBldg.,No.81BeiqingRoad,Haidian District,Beijing,China
Equipment Under Test (EUT):
EUT Name: 5G Outdoor CPE
Model No.: EG8561A-NR6
Trade Mark: Baicells
FCC ID: 2AG32EG8561ANR6
Standard(s) : FCC 47 CFR Part 96
CBRSA-TS-9001-V1.2.1
WINNF-19-IN-00033 V1.0
KDB 940660 D01 Part 96 CBRS Eqpt v03
KDB 940660 D02 CPE-CBSD Handshake Procedures v02
WINNF-TS-0122-V1.0.2 CBRS CBSD Test Specification
Date of Receipt: 2024-06-05
Date of Test: 2024-06-07 to 2024-07-02
Date of Issue: 2024-09-14

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

Keny Xu

Keny Xu
EMC Laboratory Manager



SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch (EMC Laboratory)

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2024-09-14		Original

Authorized for issue by:				
		Frank Chen		
		Frank Chen /Project Engineer		
		Eric Fu		
		Eric Fu/Reviewer		



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2 Test Summary

Test Summary for Standalone CBSD			
Item	Standard	Test Case ID	Result
Multi-Step registration	WINNF-TS-0122-V1.0.2	WINNF.FT.C.REG.1	Pass
Single-Step registration for CBSD with CPI signed data	WINNF-TS-0122-V1.0.2	WINNF.FT.C.REG.5	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 Relinquishment	WINNF-TS-0122-V1.0.2	WINNF.FT.C.RLQ.1	Pass
Successful Deregistration	WINNF-TS-0122-V1.0.2	WINNF.FT.C.DRG.1	Pass



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Test Summary for Standalone CBSD			
Item	Standard	Test Case ID	Result
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-V1.2.1

CBRS Alliance Certification Test Plan

WINNF-TS-0122-V1.0.2

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

WINNF-19-IN-00033 V1.0

CBRS CPE-CBSD as UUT Test Guidelines

KDB 940660 D01 Part 96 CBRS Eqpt v03

KDB 940660 D02 CPE-CBSD Handshake Procedures v02



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4 General Information

4.1 Details of E.U.T.

Power supply:	POE POWER SUPPLY Model: RP025-2401000YG Input Power: AC 100-240V 50-60Hz 0.7A Max DC Output: 24V 1A
Sample Type:	Fixed device
CBSD Class:	B
Transmitter Frequency Band:	LTE: Band 48; 5G NR: n48
Transmitter Frequency Range:	3550~3700MHz
Hardware Version:	VER.B
Software Version:	BaiCE_BQ_1.2.x_NA
Test sample:	120300017923CSD0045
Antenna Gain:	6.05dBi
MIMO supported	2*2
Antenna Type:	Directional Antenna



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.	Y
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.	N
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

4.3 Summary of Test Results

WINNF-TS-0122			
Classes	Test Case Items	Pass Items	Pass Rate (%)
FT (CBSD, DP/CBSD)	25	25	100
PT (CBSD, DP/CBSD)	1	1	100
Total	26	26	100

Note:

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

4.4 Measurement Uncertainty

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

4.5 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
EPC	Lanner Electronics Inc.	LICA-1513A	LR202002004052
Router	TP-LINK	TL-R860+	1175379002425
LTE Base station	Baicells	mBS1105 (FCC ID: 2AG32MBS110596N)	120200007219BSP0001
5G NR Base station	Baicells	BSC7048A243 (FCC ID: 2AG32BSC7048A243)	1202000577233VB0002



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4.6 Test Location

All tests were performed at:

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No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.7 Test Facility

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

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI (Member No. 1937)**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1336**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.



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5 Equipment List

Test Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Laptop (With SAS Test harness)	Lenovo	T14	/	/	/
Spectrum Analyzer	Keysight	N9020A	SEM004-21	2024-03-18	2025-03-17
Shield Room	SAEMC	MSR433	SEM001-11	2024-03-11	2027-03-10
Coaxial Cable	SGS	N/A	SEM031-01	2023-07-11	2024-07-10
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Splitter	MACOM	2090-6214-00	N/A	N/A	N/A
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2023-09-27	2024-09-26



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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: WINNF-IN-0156_WinnForum_SAS_Test_Harness_CBSD_UUT_Tutorial_v1_0_0_1

6.2 CPE-CBSD Handshake Procedures

Test Requirement: KDB 940660 D02 CPE-CBSD Handshake Procedures v02
 Test Method: WINNF-19-IN-00033 V1.0
 KDB 940660 D02 CPE-CBSD Handshake Procedures v02

6.3 CBSD Test Procedure

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

6.4 Duration and Duty Cycle Measurement

The CPE-CBSD shall validate and ensure that limited in duration and duty cycle to the minimum time necessary to get a grant from the SAS.

6.5 Duration and Duty Cycle Test Procedure

- CPE-CBSD as UUT does not receive any RF signal from its "Compatible BTS-CBSD" (FCC ID: 2AG32BSC7048A243), so CPE-CBSD as UUT does not transmit. UUT shall be UTC time synchronized.
- Use the WinnForum SAS Harness #1 for CPE-CBSD as UUT and run test case WINNF.FT.C.GRA.1 for CPE-CBSD as UUT.
- CPE-CBSD as UUT starts to receive the RF signal from its "Compatible BTS-CBSD", so CPE-CBSD can start communicating with the WinnForum SAS Harness #1. Make note of the time when RF Test equipment logs the first transmission from CPE-CBSD which is above 23dBm/10MHz – this is the start time of the {X time out of Y time}.
- When the test case WINNF.FT.C.GRA.1 finishes and the questions appear on the WinnForum SAS Harness #1 console, do NOT answer the questions. Wait until Y time has passed from step #3. During this Y time, the RF test equipment is logging the amount of time CPE-CBSD as UUT transmitted EIRP above 23dBm/10MHz. The amount of time logged for transmitting EIRP above 23dBm/10MHz is the X time.
- Answer the questions on the WinnForum SAS Harness #1 console so the WinnForum SAS

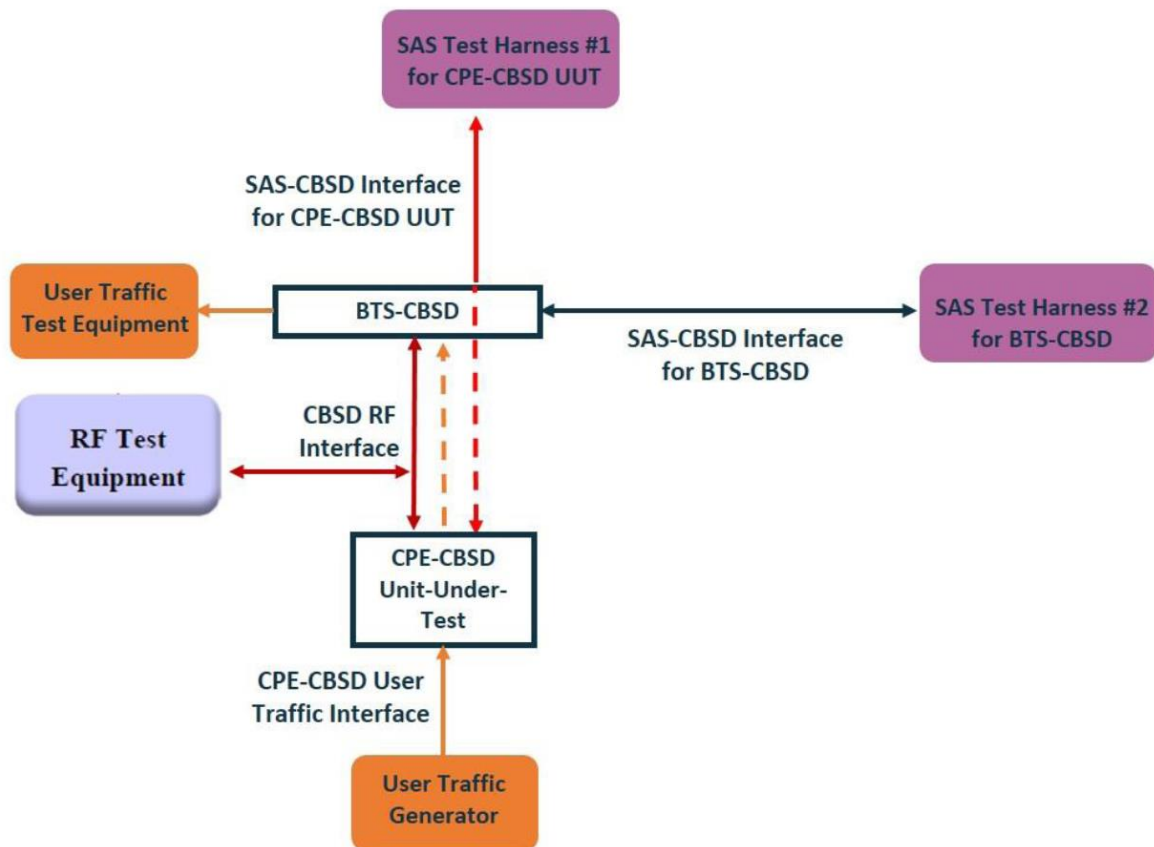


Harness #1 is ready for the next test.

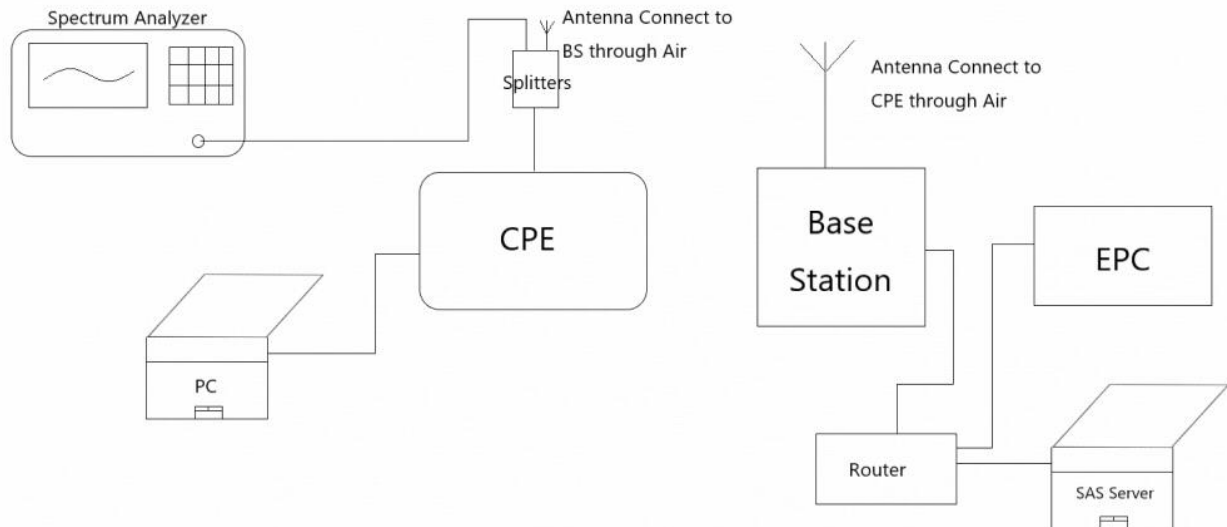
6.6 Test Environment

Test Harness Version: V1.0.0.3
 Operating System: Microsoft Windows 10
 TLS Version: 1.2
 Python Version: 2.7.13
 Environmental Conditions: 25deg. C, 65%RH
 Input Power: 120Vac, 60Hz

6.7 Test Setup



CPE-CBSD as UUT, BTS-CBSD direct communication without Domain Proxy



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



7 Test Data

7.1 CBSD Registration Process

7.1.1 WINNF.FT.C.REG.1

#	Test Execution Steps	Results	
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, fcId 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: - cbsdId = 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.5

#	Test Execution Steps	Results	
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 - All of the required and REG-Conditional parameters shall be configured and CPI signature provided	--	--
2	CBSD sends Registration request to the SAS Test Harness: - The required userId, fcclId and cbsdSerialNumber and REG-Conditional cbsdCategory, airInterface, measCapability and cpiSignatureData registration parameters shall be sent from the CBSD and conform to proper format and acceptable ranges. - Any optional registration parameters that may be included in the message shall be verified that they conform to proper format and are within acceptable ranges.	☒ Pass	☐ Fail
3	SAS Test Harness sends a CBSD Registration Response as follows: - cbsdId = 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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7.1.3 WINNF.FT.C.REG.8

#	Test Execution Steps	Results	
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 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: UUT shall not transmit RF	☒ Pass	☐ Fail



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7.1.4 WINNF.FT.C.REG.10

#	Test Execution Steps	Results	
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 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: UUT shall not transmit RF	☒ Pass	☐ Fail



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7.1.5 WINNF.FT.C.REG.12

#	Test Execution Steps	Results	
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 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: UUT shall not transmit RF	☒ Pass	☐ Fail



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7.1.6 WINNF.FT.C.REG.14

#	Test Execution Steps	Results	
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 cbsdId - 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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7.1.7 WINNF.FT.C.REG.16

#	Test Execution Steps	Results	
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 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: UUT shall not transmit RF	☒ Pass	☐ Fail



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7.1.8 WINNF.FT.C.REG.18

#	Test Execution Steps	Results	
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 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: 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	Results	
1	Ensure the following conditions are met for test entry: ● UUT has registered successfully with SAS Test Harness, with cbsdId = C	--	--
2	UUT sends valid Grant Request.	■ Pass	□ Fail
3	SAS Test Harness sends a Grant Response message, including ● cbsdId=C - responseCode = 400	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: ● UUT shall not transmit RF	■ Pass	□ Fail

7.2.2 WINNF.FT.C.GRA.2

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



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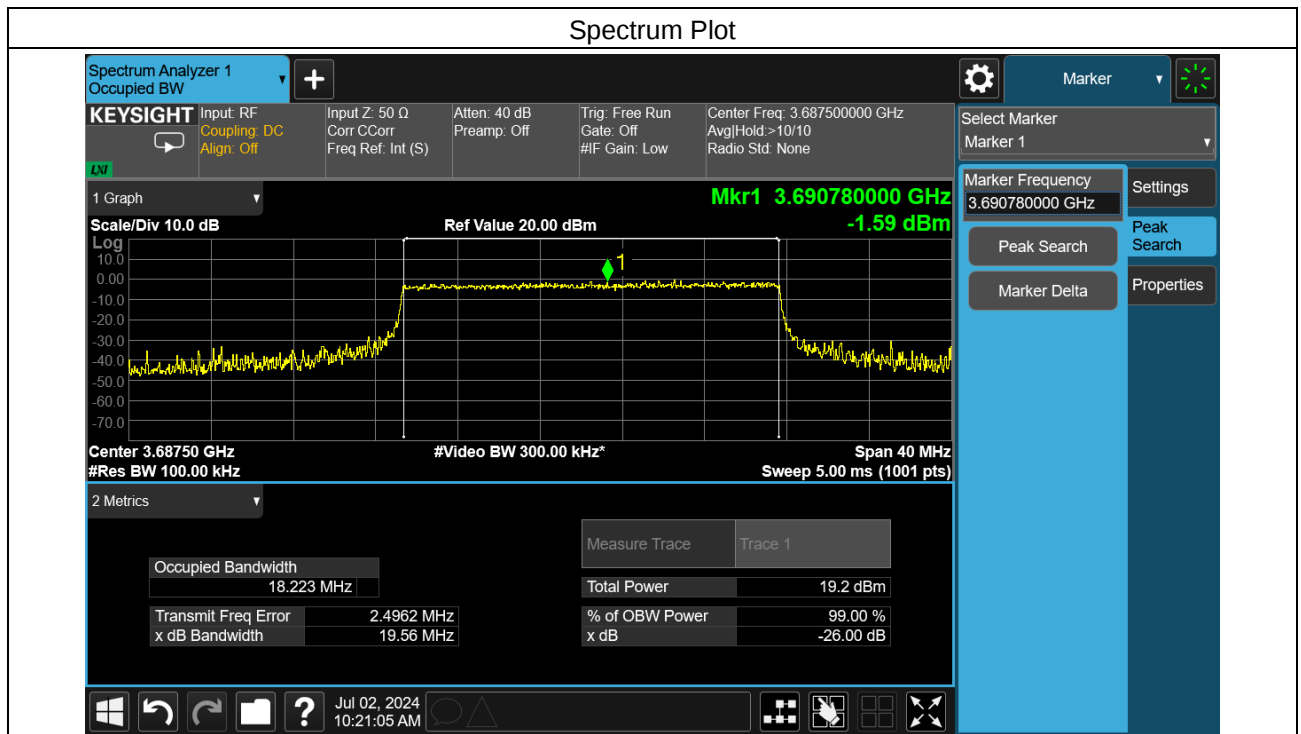
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9	For further Heartbeat Request messages sent from UUT after completion of step 8, validate message is sent within latest specified heartbeatInterval, and: - cbsId = C - grantId = G - operationState = "AUTHORIZED" and SAS Test Harness responds with a Heartbeat Response message including the following parameters: - cbsId = C - grantId = 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	Results	
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 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 Heartbeat Interval specified in the latest Heartbeat Response, and formatted correctly, including: ● cbsdId = C ● grantId = G ● operationState = "AUTHORIZED"	--	--
3	SAS Test Harness sends a Heartbeat Response message, including the following parameters: ● cbsdId = 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	Results	
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 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: ● cbsdId = C ● grantId = G ● operationState = "AUTHORIZED"	■ Pass	□ Fail
3	SAS Test Harness sends a Heartbeat Response message, including the following parameters: ● cbsdId = 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	Results	
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 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	UUT sends a Heartbeat Request message. Verify Heartbeat Request message is formatted correctly, including: ● cbsdId = C ● grantId = G ● operationState = "GRANTED"	■ Pass	□ Fail
3	SAS Test Harness sends a Heartbeat Response message, including the following parameters: ● cbsdId = 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: ● cbsdId = C ● grantId = G ● operationState = "GRANTED" B. UUT sends a Relinquishment request message. Ensure message is correctly formatted with parameters: ● cbsdId = C ● grantId = G Monitor the RF output of the UUT. Verify: ● UUT does not transmit at any time	■ Pass	□ Fail



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7.3.5 WINNF.FT.C.HBT.6

#	Test Execution Steps	Results	
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 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: ● cbsdId = C ● grantId = G ● operationState = "AUTHORIZED"	☒ Pass	☐ Fail
3	SAS Test Harness sends a Heartbeat Response message, including the following parameters: ● cbsdId = 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: ● cbsdId = C ● grantId = G ● operationState = "GRANTED" B. UUT sends a Relinquishment request message. Ensure message is correctly formatted with parameters: ● cbsdId = 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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7.3.6 WINNF.FT.C.HBT.7

#	Test Execution Steps	Results	
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 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: - cbsdId = C - grantId = G - operationState = "AUTHORIZED"	■ Pass	□ Fail
3	SAS Test Harness sends a Heartbeat Response message, including the following parameters: - cbsdId = 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: - cbsdId = 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	Results	
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 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	UUT sends a Heartbeat Request message. Ensure Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including: ● cbsdId = 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	Results	
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 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. Verify Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including: - cbsdId = C - grantId = G - operationState = "AUTHORIZED"	■ Pass	□ Fail
3	SAS Test Harness sends a Heartbeat Response message, including the following parameters: - cbsdId = 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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7.4 CBSD Relinquishment Process

7.4.1 WINNF.FT.C.RLQ.1

#	Test Execution Steps	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 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 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: - cbsdId = C - grantId = G	■ Pass	□ Fail
3	SAS Test Harness shall approve the request with a Relinquishment Response message with parameters: - cbsdId = C - grantId = 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



7.5 CBSD Deregistration Process

7.5.1 WINNF.FT.C.DRG.1

#	Test Execution Steps	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 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	• UUT sends Deregistration Request to SAS Test Harness with cbsdId = 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: A. UUT sending a Registration Request message, as this is not mandatory B. UUT sending a Deregistration Request message	☒ Pass	☐ Fail



7.6 CBSD Security Validation

7.6.1 WINNF.FT.C.SCS.1

#	Test Execution Steps	Results	
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_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. UUT sends a registration request to the SAS Test Harness and the SAS Test Harness sends a Registration Response with responseCode = 0 and cbsdId.	☒ 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

7.6.2 WINNF.FT.C.SCS.2

#	Test Execution Steps	Results	
1	UUT shall start CBSD-SAS communication with the security procedures	☒ 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	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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7.6.3 WINNF.FT.C.SCS.3

#	Test Execution Steps	Results	
1	UUT shall start CBSD-SAS communication with the security procedures	☒ 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	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

7.6.4 WINNF.FT.C.SCS.4

#	Test Execution Steps	Results	
1	UUT shall start CBSD-SAS communication with the security procedures	☒ 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	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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7.6.5 WINNF.FT.C.SCS.5

#	Test Execution Steps	Results	
1	UUT shall start CBSD-SAS communication with the security procedures	☒ 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	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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7.7 CBSD RF Power Measurement

7.7.1 WINNF.PT.C.HBT

#	Test Execution Steps	Results	
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: - cbsdId = C - grantId = G - SAS Test Harness responds with Heartbeat Response, including: - cbsdId = C - grantId = G - transmitExpireTime = current UTC time + 200 seconds - responseCode = 0	--	--
3	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. 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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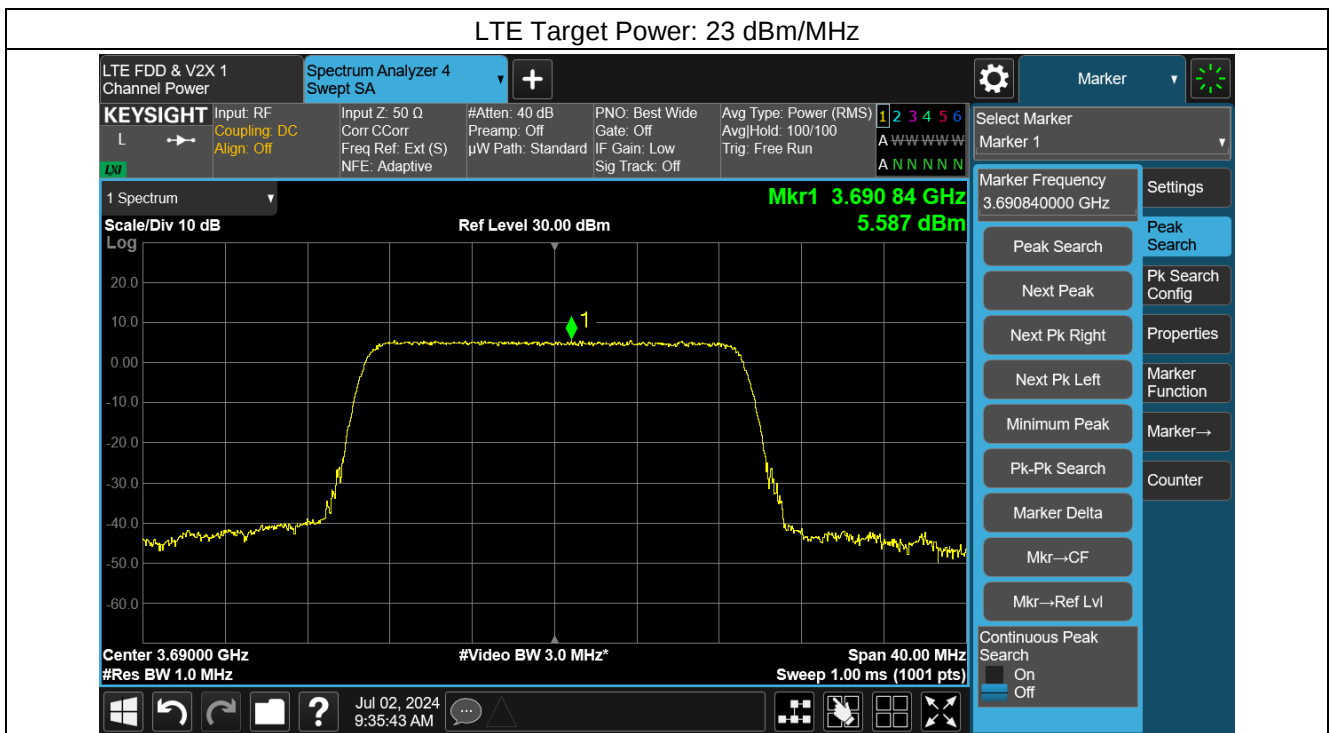
RF measurement plot for Test Case:

- 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.

Freq. (MHz)	Conducted PSD (dBm/MHz)	Antenna Gain (dBi)	Loss (dB)	Array Gain (dB)	EIRP PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
LTE							
3690	5.587	6.05	6	3.01	20.647	23	Pass
3690	-5.784	6.05	6	3.01	9.276	10	Pass
5G NR							
3690	5.173	6.05	6	3.01	20.233	23	Pass
3690	-5.893	6.05	6	3.01	9.167	10	Pass

Note:

- Array Gain=10log(n), n is the antenna number, for this test the n=2
- EIRP PSD= Conducted PSD+ Antenna Gain+ Array Gain
- Loss includes cable loss and loss of attenuator



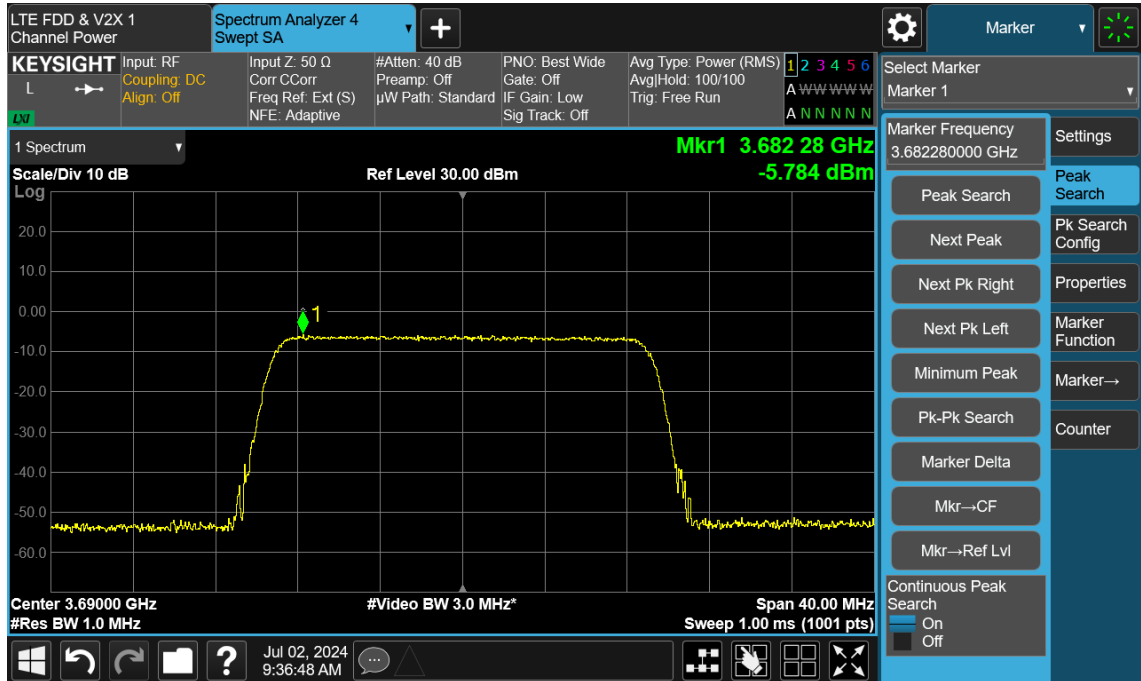
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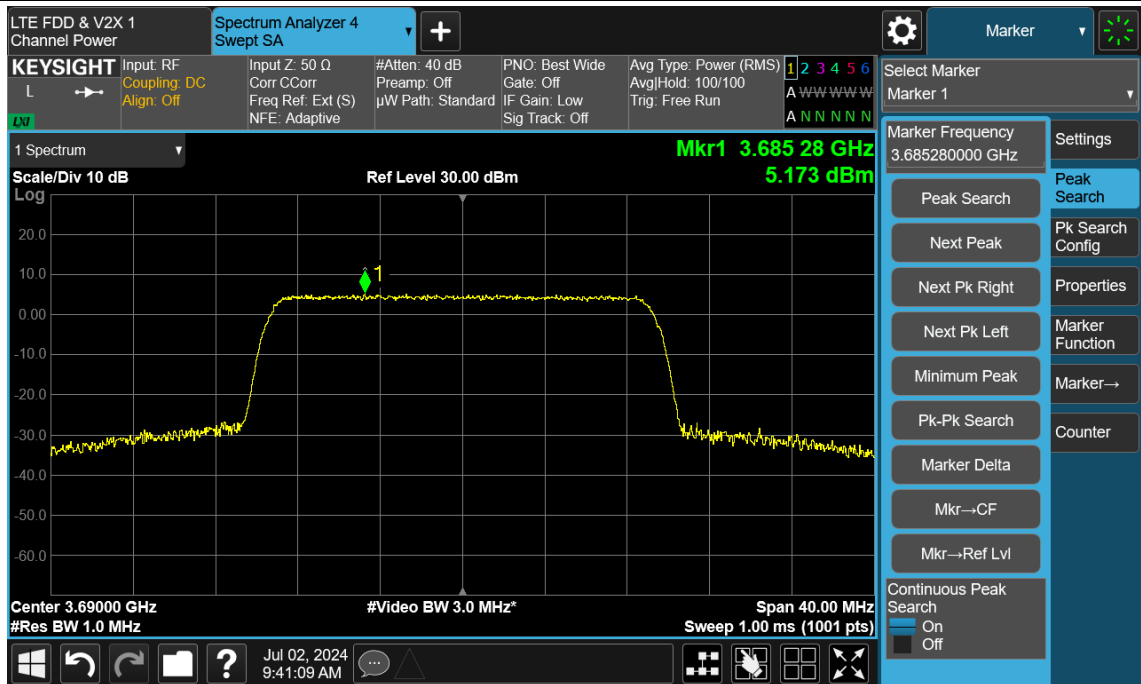
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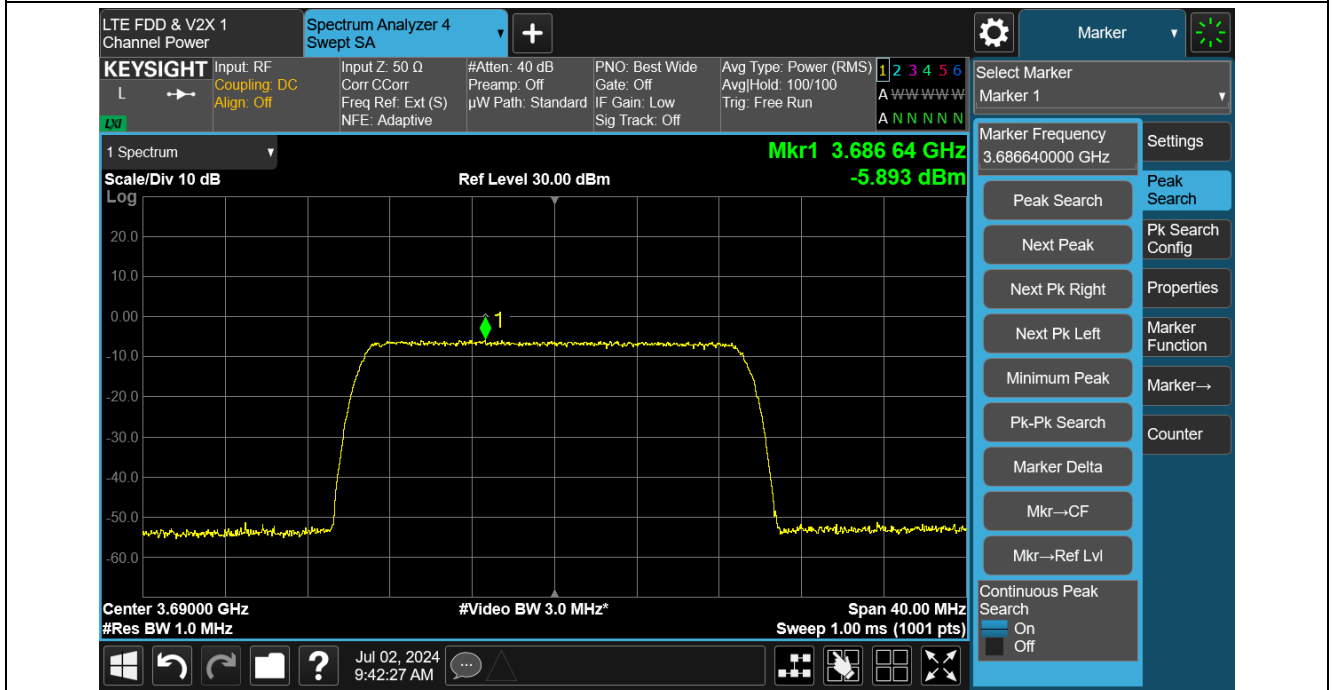
LTE Target Power: 10 dBm/MHz



5G NR Target Power: 23 dBm/MHz



5G NR Target Power: 10 dBm/MHz

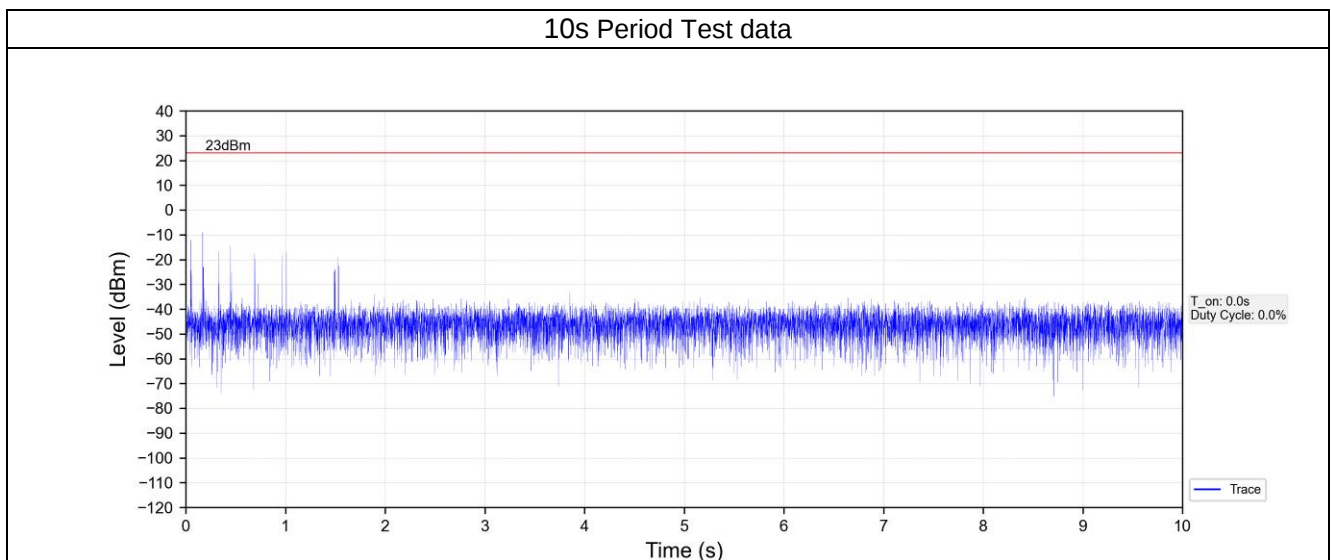


7.8 Duration and Duty Cycle

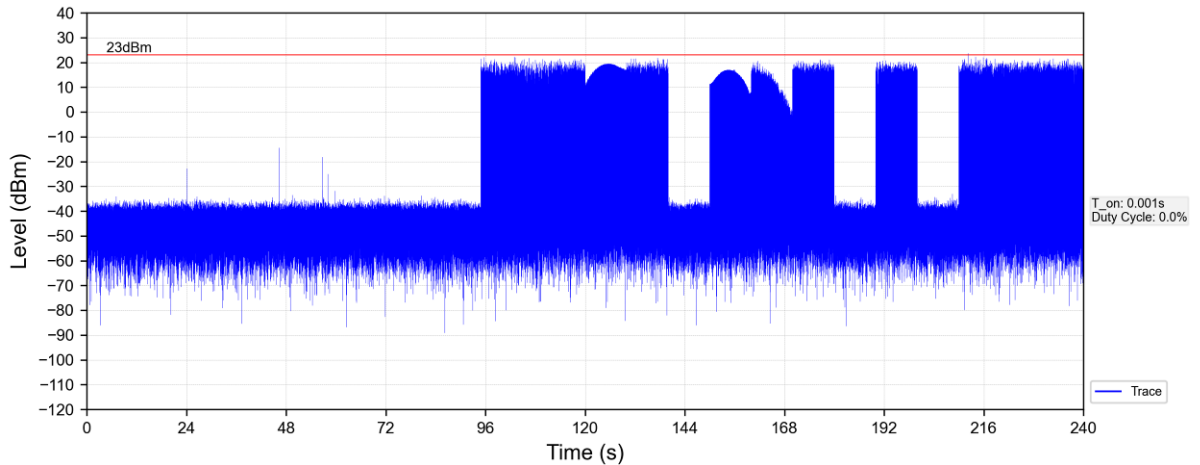
Duration and Duty Cycle			
Period	Minimum Time (s)	Limit (s)	Pass / Fail
10-second	0.0	1-second	Pass
300-second	0.001	10-second	Pass
3600-second	0.0	20-second	Pass

Note:

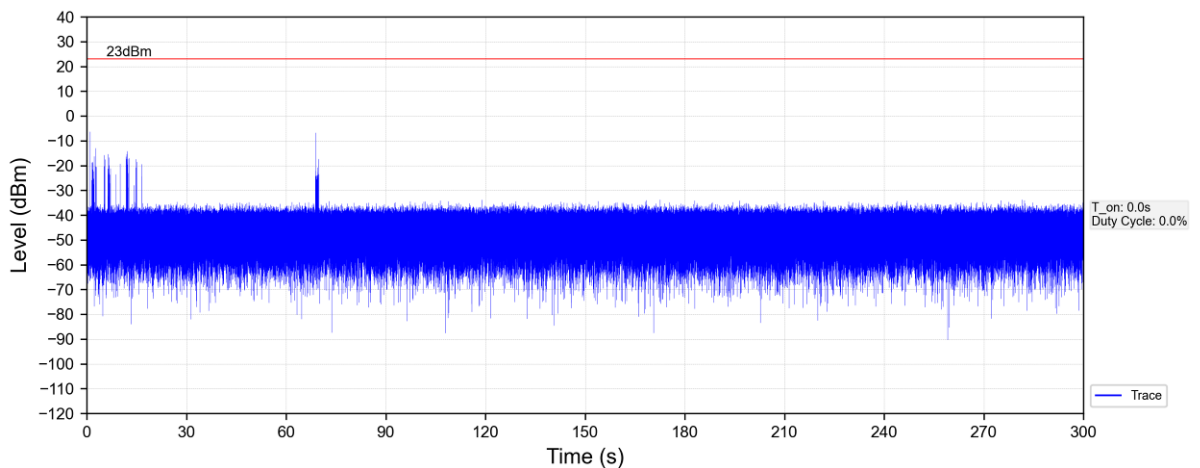
- Limited in duration and duty cycle to the minimum time necessary to get a grant from the SAS. This time should not exceed 1 second within any 10-second period, 10seconds within any 300-second period, or 20 seconds within any 3600-second period.
- Pass = Minimum Time < Limit



300s Period Test data

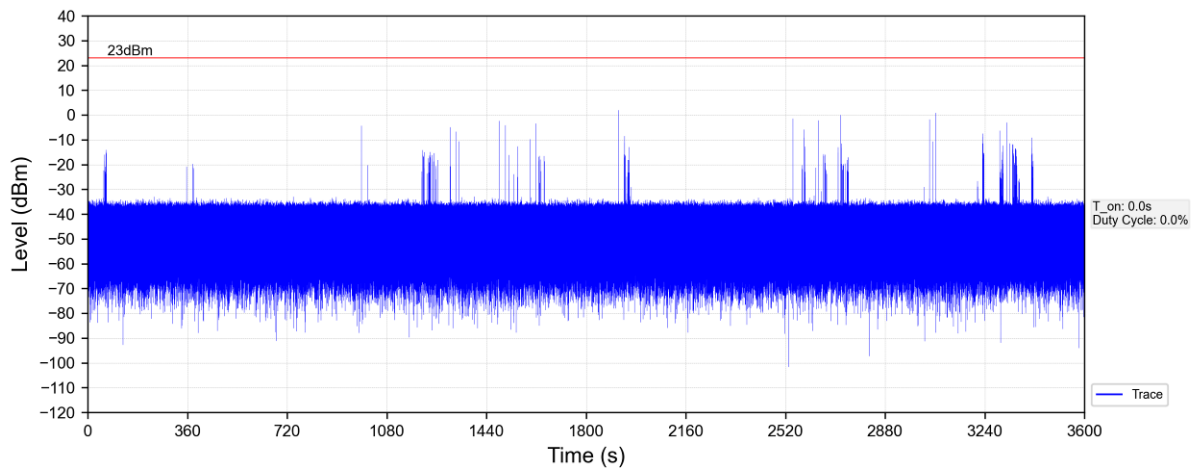


3600s Period Test data



7.9 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.



Note:

1. Red color line in above plot represents the 23 dBm.
2. When Granted the product will transmit at power level above 23dBm.
3. Only when the product sends packets the product will work at max EIRP.



8 Test Data Log For Standalone CBSD

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

8.1 WINNF.FT.C.SCS.1

No.	Time	Source	Destination	Protocol	Length	Info
4	0.090446	192.168.24.200	192.168.24.103	TLSv1.2	571	Client Hello
5	0.096044	192.168.24.103	192.168.24.200	TLSv1.2	3503	Server Hello, Certificate, Server Key Exchange, Certificate Request, Server Hello Done
9	0.209686	192.168.24.200	192.168.24.103	TCP	1514	37812 → 5000 [ACK] Seq=518 Ack=3450 Win=38016 Len=1460 [TCP PDU reassembled in 10]
10	0.209686	192.168.24.200	192.168.24.103	TLSv1.2	1514	Certificate
12	0.210392	192.168.24.200	192.168.24.103	TLSv1.2	432	Client Key Exchange, Certificate Verify, Change Cipher Spec, Encrypted Handshake Message
13	0.211826	192.168.24.103	192.168.24.200	TLSv1.2	385	Change Cipher Spec, Encrypted Handshake Message
15	0.240260	192.168.24.200	192.168.24.103	TLSv1.2	248	Application Data
16	0.240587	192.168.24.103	192.168.24.200	TLSv1.2	188	Application Data
17	0.290178	192.168.24.200	192.168.24.103	TCP	1514	37812 → 5000 [ACK] Seq=4010 Ack=3555 Win=38016 Len=1460 [TCP PDU reassembled in 18]

> Frame 5: 3503 bytes on wire (28024 bits), 3503 bytes captured (28024 bits) on interface \Device\NPF_{AC3A16E7-F178-468A-860A-2420B984A620}, id 0
 > Ethernet II, Src: RealtekSemi_36:04:7d (08:00:0c:36:04:7d), Dst: BaicellsTech_2c:d1:b2 (48:bf:74:2c:d1:b2)
 > Internet Protocol Version 4, Src: 192.168.24.103, Dst: 192.168.24.200
 > Transmission Control Protocol, Src Port: 5000, Dst Port: 37812, Seq: 1, Ack: 518, Len: 3449
 > Transport Layer Security
 > TLSv1.2 Record Layer: Handshake Protocol: Server Hello
 Content Type: Handshake (22)
 Version: TLS 1.2 (0x0303)
 Length: 89
 > Handshake Protocol: Server Hello
 Handshake Type: Server Hello (2)
 Length: 85
 Version: TLS 1.2 (0x0303)
 > Random: 7201d330ac4838445831e63393ee5ca5aa1219c65aa387a6e50d464dbc62cbb
 GMT Unix Time: Aug 12, 2030 07:43:44.000000000 中国标准时间
 Random Bytes: ac4838445831e63393ee5ca5aa1219c65aa387a6e50d464dbc62cbb
 Session ID Length: 32
 Session ID: 029a5d1a8e69f786c6fe597b1726b4b41e1444fa84a62c1ab32a3e80b5acaf9
 Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02f)
 Compression Method: null (0)
 Extensions Length: 13
 > Extension: renegotiation_info (len=1)
 Type: renegotiation_info (65281)
 Length: 1
 > Renegotiation Info extension
 Renegotiation info extension length: 0
 > Extension: ec_point_formats (len=4)
 Type: ec_point_formats (11)
 Length: 4
 EC point formats Length: 3
 > Elliptic curves point formats (3)
 EC point format: uncompressed (0)
 EC point format: ansiX962_compressed_prime (1)
 EC point format: ansiX962_compressed_char2 (2)
 [JA3S Fullstring: 771,49199,65281-11]
 [JA3S: 303951d4c50efb2e991652225a6f02b1]
 > TLSv1.2 Record Layer: Handshake Protocol: Certificate
 Content Type: Handshake (22)
 Version: TLS 1.2 (0x0303)

8.2 WINNF.FT.C.SCS.2

SCS2.pcapng						
文件(F) 编辑(E) 视图(V) 跳转(G) 捕获(C) 分析(A) 统计(S) 电话(Y) 无线(W) 工具(T) 帮助(H)						
http						
No.	Time	Source	Destination	Protocol	Length	Info
34	0.520251	192.168.24.200	192.168.24.103	HTTP	150	GET /criserver.crl HTTP/1.1
36	0.529920	192.168.24.103	192.168.24.200	HTTP	1134	HTTP/1.1 200 OK (application/octet-stream)

> Frame 36: 1134 bytes on wire (9072 bits), 1134 bytes captured (9072 bits) on interface \Device\NPF_{AC3A16E7-F178-468A-860A-2420B984A620}, id 0 > Ethernet II, Src: RealtekSemi_36:04:7d (00:e0:4c:36:04:7d), Dst: BaicellsTech_2c:d1:b2 (48:bf:74:2c:d1:b2) > Internet Protocol Version 4, Src: 192.168.24.103, Dst: 192.168.24.200 > Transmission Control Protocol, Src Port: 8080, Dst Port: 57496, Seq: 326, Ack: 97, Len: 1080 > [2 Reassembled TCP Segments (1405 bytes): #35(325), #36(1080)] > Hypertext Transfer Protocol > Media Type						
---	--	--	--	--	--	--

Hypertext Transfer Protocol: Protocol				分组: 90 · Displayed: 2 (2.2%)		
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No.	Time	Source	Destination	Protocol	Length	Info
4	0.060187	192.168.24.200	192.168.24.103	TLSv1.2	571	Client Hello
5	0.065598	192.168.24.103	192.168.24.200	TLSv1.2	3637	Server Hello, Certificate, Server Key Exchange, Certificate Request, Server Hello Done
10	0.255591	192.168.24.200	192.168.24.103	TLSv1.2	452	[TCP Previous segment not captured], Ignored Unknown Record
18	0.337787	192.168.24.103	192.168.24.200	TLSv1.2	185	Change Cipher Spec, Encrypted Handshake Message
20	0.370116	192.168.24.200	192.168.24.103	TLSv1.2	227	Application Data
21	0.373799	192.168.24.103	192.168.24.200	TLSv1.2	119	Application Data
23	0.440193	192.168.24.103	192.168.24.200	TLSv1.2	643	Application Data, Application Data, Application Data, Application Data, Application Data, Application Data
46	0.605158	192.168.24.200	192.168.24.103	TLSv1.2	571	Client Hello
47	0.610684	192.168.24.103	192.168.24.200	TLSv1.2	3637	Server Hello, Certificate, Server Key Exchange, Certificate Request, Server Hello Done

> Frame 5: 3637 bytes on wire (29096 bits), 3637 bytes captured (29096 bits) on interface \Device\NPF_{AC3A16E7-F178-468A-860A-2420B984A620}, id 0

> Ethernet II, Src: RealtekSemi_36:04:7d (08:e0:4c:36:04:7d), Dst: BaicellsTech_2c:d1:b2 (48:bf:74:2c:d1:b2)

> Internet Protocol Version 4, Src: 192.168.24.103, Dst: 192.168.24.200

> Transmission Control Protocol, Src Port: 5000, Dst Port: 51512, Seq: 1, Ack: 518, Len: 3583

> Transport Layer Security

- ✓ TLSv1.2 Record Layer: Handshake Protocol: Server Hello
 - Content Type: Handshake (22)
 - Version: TLS 1.2 (0x0303)
 - Length: 89
 - ✓ Handshake Protocol: Server Hello
 - Handshake Type: Server Hello (2)
 - Length: 85
 - Version: TLS 1.2 (0x0303)
 - ✓ Random: 428fd16e8058da77d64475f8240cc71686180b98d5f0b4356f7b38bac0a39cbe
 - GMT Unix Time: May 22, 2005 08:25:18.000000000 中国标准时间
 - Random Bytes: 8058da77d64475f8240cc71686180b98d5f0b4356f7b38bac0a39cbe
 - Session ID Length: 32
 - Session ID: b0caaf8761b1cc109a08c3b3b09d5a264bb0b9b951ab49898dfc7cc63fad65f
 - Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02f)
 - Compression Method: null (0)
 - Extensions Length: 13
 - ✓ Extension: renegotiation_info (len=1)
 - Type: renegotiation_info (65281)
 - Length: 1
 - ✓ Renegotiation Info extension
 - Renegotiation info extension length: 0
 - ✓ Extension: ec_point_formats (len=4)
 - Type: ec_point_formats (11)
 - Length: 4
 - EC point formats Length: 3
 - ✓ Elliptic curves point formats (3)
 - EC point format: uncompressed (0)
 - EC point format: ansiX962_compressed_prime (1)
 - EC point format: ansiX962_compressed_char2 (2)
 - [JA3S Fullstring: 771.49199,65281-11]
 - [JA3S: 303951d4c50efb2e991652225a6f02b1]
 - ✓ TLSv1.2 Record Layer: Handshake Protocol: Certificate
 - Content Type: Handshake (22)
 - Version: TLS 1.2 (0x0303)



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8.3 WINNF.FT.C.SCS.3

SCS3.pcapng					
文件(F) 编辑(E) 视图(V) 跳转(G) 捕获(C) 分析(A) 统计(S) 电话(V) 无线(W) 工具(T) 帮助(H)					
tts					
No.	Time	Source	Destination	Protocol	Length Info
4	0.850050	192.168.24.200	192.168.24.103	TLSv1.2	571 Client Hello
5	0.857311	192.168.24.103	192.168.24.200	TLSv1.2	3502 Server Hello, Certificate, Server Key Exchange, Certificate Request, Server Hello Done
9	0.879954	192.168.24.200	192.168.24.103	TLSv1.2	61 Alert (Level: Fatal, Description: Certificate Expired)

> Frame 5: 3502 bytes on wire (28016 bits), 3502 bytes captured (28016 bits) on interface \Device\NPF_{AC3A16E7-F178-468A-860A-2420B984A620}, id 0 > Ethernet II, Src: RealtekSemi_36:04:7d (08:e0:4c:36:04:7d), Dst: BaicellsTech_2c:d1:b2 (48:bf:74:2c:d1:b2) > Internet Protocol Version 4, Src: 192.168.24.103, Dst: 192.168.24.200 > Transmission Control Protocol, Src Port: 5000, Dst Port: 42150, Seq: 1, Ack: 518, Len: 3448 > Transport Layer Security > TLSv1.2 Record Layer: Handshake Protocol: Server Hello Content Type: Handshake (22) Version: TLS 1.2 (0x0303) Length: 89 > Handshake Protocol: Server Hello Handshake Type: Server Hello (2) Length: 85 Version: TLS 1.2 (0x0303) > Random: cf0c57163d7b705280b569cbb6d550f612be612837bfbfcb6ebbf1834795bcb GMT Unix Time: Jun 10, 2000 14:32:54.000000000 中国标准时间 Random Bytes: 3d7b705280b569cbb6d550f612be612837bfbfcb6ebbf1834795bcb Session ID Length: 32 Session ID: 3827bffa59bd0d9781d6eee7e0985a49c0ec8245a944eaebe65ad6680a4d1b6 Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02f) Compression Method: null (0) Extensions Length: 13 > Extension: renegotiation_info (len=1) Type: renegotiation_info (65281) Length: 1 > Renegotiation Info extension Renegotiation info extension length: 0 > Extension: ec_point_formats (len=4) Type: ec_point_formats (11) Length: 4 EC point formats Length: 3 > Elliptic curves point formats (3) EC point format: uncompressed (0) EC point format: ansiX962_compressed_prime (1) EC point format: ansiX962_compressed_char2 (2) [2A35 Fullstring: 771,49199,65281-11] [2A35: 303951d4c50efb2e991652225a6f02b1] > TLSv1.2 Record Layer: Handshake Protocol: Certificate Content Type: Handshake (22) Version: TLS 1.2 (0x0303) Cipher Suite (tls.handshake.ciphersuite), 2 byte(s)					
分框: 14 - Displayed: 3 (21.4%)					

8.4 WINNF.FT.C.SCS.4

No.	Time	Source	Destination	Protocol	Length	Info
8	7.698999	192.168.24.200	192.168.24.103	TLSv1.2	571	Client Hello
9	7.783842	192.168.24.103	192.168.24.200	TLSv1.2	3504	Server Hello, Certificate, Server Key Exchange, Certificate Request, Server Hello Done
13	7.728374	192.168.24.200	192.168.24.103	TLSv1.2	61	Alert (Level: Fatal, Description: Unknown CA)

```

> Frame 9: 3504 bytes on wire (28032 bits), 3504 bytes captured (28032 bits) on interface \Device\NPF_{AC3A16E7-F178-468A-860A-2420B98A620}, id 0
> Ethernet II, Src: RealtekSemi_36:04:7d (08:e0:4c:36:04:7d), Dst: BaicellsTech_2c:d1:b2 (48:bf:74:2c:d1:b2)
> Internet Protocol Version 4, Src: 192.168.24.103, Dst: 192.168.24.200
> Transmission Control Protocol, Src Port: 5000, Dst Port: 42318, Seq: 1, Ack: 518, Len: 3450
> Transport Layer Security
  > TLSv1.2 Record Layer: Handshake Protocol: Server Hello
    Content Type: Handshake (22)
    Version: TLS 1.2 (0x0303)
    Length: 89
    > Handshake Protocol: Server Hello
      Handshake Type: Server Hello (2)
      Length: 85
      Version: TLS 1.2 (0x0303)
      > Random: 35a3796db4f4ed366346c40e72f3473e1f5eb499d378b3fe1eb4e0a7db5ccf5b
        GMT Unix Time: Jul 8, 1998 21:51:41.000000000 中国标准时间
        Random Bytes: b4f4ed366346c40e72f3473e1f5eb499d378b3fe1eb4e0a7db5ccf5b
      Session ID Length: 32
      Session ID: 7da5e0be1ade8b779326100947ff48cd673e9e2f9ae2d4221d79bbc13db95fa2
      Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02f)
      Compression Method: null (0)
      Extensions Length: 13
      > Extension: renegotiation_info (len=1)
        Type: renegotiation_info (65281)
        Length: 1
        > Renegotiation Info extension
          Renegotiation info extension length: 0
      > Extension: ec_point_formats (len=4)
        Type: ec_point_formats (11)
        Length: 4
        > EC point formats Length: 3
          EC point format: uncompressed (0)
          EC point format: ansiX962_compressed_prime (1)
          EC point format: ansiX962_compressed_char2 (2)
          [JA3S: Fullstring: 771,49199,65281-11]
          [JA3S: 303951d4c50efb2e991652225a6f02b1]
      > TLSv1.2 Record Layer: Handshake Protocol: Certificate
        Content Type: Handshake (22)
        Version: TLS 1.2 (0x0303)
        Cipher Suite (tls.handshake.ciphersuite), 2 byte(s)

```

8.5 WINNF.FT.C.SCS.5

SCS.5.pcapng						
文件(F) 编辑(E) 视图(V) 捕获(C) 分析(A) 统计(S) 电话(V) 无线(W) 工具(T) 帮助(H)						
[Icons]						
[Filter:]						
No.	Time	Source	Destination	Protocol	Length	Info
7	6.193636	192.168.24.200	192.168.24.103	TLSv1.2	571	Client Hello
8	6.198662	192.168.24.103	192.168.24.200	TLSv1.2	3503	Server Hello, Certificate, Server Key Exchange, Certificate Request, Server Hello Done
12	6.223495	192.168.24.200	192.168.24.103	TLSv1.2	61	Alert (Level: Fatal, Description: Decrypt Error)
19	12.393580	192.168.24.200	192.168.24.103	TLSv1.2	571	Client Hello
20	12.398259	192.168.24.103	192.168.24.200	TLSv1.2	3503	Server Hello, Certificate, Server Key Exchange, Certificate Request, Server Hello Done
24	12.423558	192.168.24.200	192.168.24.103	TLSv1.2	61	Alert (Level: Fatal, Description: Decrypt Error)

> Frame 8: 3503 bytes on wire (28024 bits), 3503 bytes captured (28024 bits) on interface \Device\NPF_{AC3A16E7-F178-468A-860A-2420B984A620}, id 0 > Ethernet II, Src: RealtekSemic_36:04:7d (00:e0:4c:36:04:7d), Dst: BaicellsTech_2c:d1:b2 (48:bf:74:2c:d1:b2) > Internet Protocol Version 4, Src: 192.168.24.103, Dst: 192.168.24.200 > Transmission Control Protocol, Src Port: 5000, Dst Port: 42498, Seq: 1, Ack: 518, Len: 3449 > Transport Layer Security v TLSv1.2 Record Layer: Handshake Protocol: Server Hello Content Type: Handshake (22) Version: TLS 1.2 (0x0303) Length: 89 v Handshake Protocol: Server Hello Handshake Type: Server Hello (2) Length: 85 Version: TLS 1.2 (0x0303) v Random: 9b77f4a556d1408f30f830b910e50657da7ff06618d9b2b4dfba850f8439599 GMT Unix Time: Aug 27, 2052 08:04:53.000000000 中国标准时间 Random Bytes: 56d1408f30f830b910e50657da7ff06618d9b2b4dfba850f8439599 Session ID Length: 32 Session ID: 2a61661b2e7199e567ff6e2fae320fab02a36264ba5ee40b310c3312a2f94db Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02f) Compression Method: null (0) Extensions Length: 13 v Extension: renegotiation_info (len=1) Type: renegotiation_info (65281) Length: 1 v Renegotiation Info extension Renegotiation info extension length: 0 v Extension: ec_point_formats (len=4) Type: ec_point_formats (11) Length: 4 EC point formats Length: 3 v Elliptic curves point formats (3) EC point format: uncompressed (0) EC point format: ansiX962_compressed_prime (1) EC point format: ansiX962_compressed_char2 (2) [JAS5 Fullstring: 771,49199,65281-11] [JAS5: 303951d4c50efb2e991652225a6f02b1] v TLSv1.2 Record Layer: Handshake Protocol: Certificate Content Type: Handshake (22) Version: TLS 1.2 (0x0303) Cipher Suite (tls.handshake.ciphersuite), 2 bytes(s)		分帧: 27 - Discarded: 6 (22.2%)	
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9 Photographs

9.1 EUT Constructional Details (EUT Photos)

Please Refer to external and internal photos for details.

- End of the Report -

