ELEMENT WASHINGTON DC LLC
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TEST REPORT
CBSD-SAS Interoperability

Applicant Name:
Wilson Electronics
3301 E. Deseret Dr.
St. George, UT 84790
United States

Date of Testing:
3/24/25 – 3/25/25
Test Report Issue Date:
6/9/2025
Test Site/Location:
Element lab. Columbia, MD, USA
Test Report Serial No.:
1M2505270053-02.UPO

FCC ID:	**UPO308-0007-2**
APPLICANT:	**Wilson Electronics**

Application Type:	Certification
Model:	308-0007-02
EUT Type:	Optical Radio Unit
Frequency Range:	3550 – 3700 MHz
FCC Classification:	Category A and B Citizens Broadband Radio Service Devices (CBD)
FCC Rule Part(s):	Part 96
Test Procedure(s):	KDB 940660 D01 v03, KDB 940660 D02 v01, WINNF-TS-0122

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in the test procedures listed above. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

RJ Ortanez
Executive Vice President

Authorized Test Lab

ACCREDITED
CERT #2041.01

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1.0 INTRODUCTION

1.1 Scope

Measurement and determination of compliance with the technical rules and regulations of the Federal Communications Commission.

1.2 Element Test Location

These measurement tests were conducted at the Element laboratory located at 7185 Oakland Mills Road, Columbia, MD 21046.

1.3 Test Facility / Accreditations

Measurements were performed at Element lab located in Columbia, MD 21046, U.S.A.

- Element is a CBRS Alliance (OnGo) Approved Test Lab
- Element is a WInnForum Approved Test Lab
- Element is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for CBRS Alliance Certification Test Plan and WInnForum Conformance and Performance Test Technical Standard.
- Element is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- Element TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- Element facility is a registered (2451B) test laboratory with the site description on file with ISED.
- Element Washington DC LLC is a Recognized U.S. Certification Assessment Body (CAB # US0110) for ISED Canada as designated by NIST under the U.S. and Canada Mutual Recognition Agreement.

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **FCC ID: UPO308-0007-2.** The test data contained in this report pertains only to CBSD-SAS interoperability. The EUT can operate as a Category A or B CBSD depending on the installation and the antenna used. The EUT is managed with a domain proxy.

Test Device Serial Number(s): 900200000479
Test Device Hardware Version: 2.0
Test Device Software Version: 5.69

2.2 Device Capabilities

This device contains the following capabilities:

LTE Band 48

This device supports the following conditional features:

	Conditional Test Case Definitions	Supported
C1	Mandatory for UUT which supports multi-step registration message	☒
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.	☐
C4	Mandatory for UUT which supports RECEIVED_POWER_WITHOUT_GRANT measurement report type.	☐
C5	Mandatory for UUT which supports RECEIVED_POWER_WITH_GRANT measurement report type.	☐
C6	Mandatory for UUT which supports parameter change being made at the UUT and prior to sending a deregistration	☐

Table 2-1. Conditional Features

2.3 Test Configuration

The EUT was connected to the SAS Test Harness developed by WINNF WG4-CBSD. The SAS Test Harness (V1.0.0.2) provided by CBRS Alliance was used. The SAS Test Harness is synchronized to UTC time.

2.4 Modifications

No modifications were made to EUT during testing.

3.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	N9030A	PXA Signal Analyzer	4/23/2025	Annual	4/23/2025	US46470561
Dell	Latitude 5580	Test Harness Laptop	N/A	N/A	N/A	N/A

Table 3-1 Annual Test Equipment Calibration Schedule

4.0 ENVIRONMENTAL CONDITIONS

The temperature is controlled within range of 15°C to 35°C. The relative humidity is controlled within range of 10% to 75%. The atmospheric pressure is monitored within the range 86-106kPa (860-1060mbar).

5.0 EVALUATION PROCEDURE

The measurement procedure described in KDB 940660 D01 v03, KDB 940660 D02 v01 and WINNF-TS-0122-V1.0.2 was used in the measurement of the EUT.

Deviation from measurement procedure…….....None

6.0 TEST SUMMARY

6.1 Summary

Company Name: Wilson Electronics

FCC ID: UPO308-0007-2

Table 6-1. Summary of Test Results

FCC Part Section(s)	KDB940660 D01 Section 3.3 a)	Test Case Description	WInnForum Test Case	Test Result
96.39 (c)	1	Confirm that the device will only transmit after it receives authorization from a SAS	WINNF.FT.D.REG.2 WINNF.FT.D.REG.9 WINNF.FT.D.REG.11 WINNF.FT.D.REG.13 WINNF.FT.D.REG.15 WINNF.FT.D.REG.17 WINNF.FT.D.REG.19 WINNF.FT.C.GRA.1 WINNF.FT.C.GRA.2 WINNF.FT.C.HBT.5	Pass
96.39 (c)	2	Check the device registration and authorization with the SAS – determine if the device behaves appropriately for successful and unsuccessful registrations. The device should not be transmitting without authorization from the SAS.	WINNF.FT.D.REG.2 WINNF.FT.D.REG.9 WINNF.FT.D.REG.11 WINNF.FT.D.REG.13 WINNF.FT.D.REG.15 WINNF.FT.D.REG.17 WINNF.FT.D.REG.19	Pass
96.39(c)(1)	3	Confirm that the device changes its operating power and/or channel in response to a command from the SAS.	WINNF.FT.D.HBT.2	Pass
96.39	4	Confirm that the device correctly configures based on the different license classes	N/A	Pass
96.39(c)(1)	5	Confirm that the device transmits at a power level less than or equal to the maximum power level approved by the SAS.	WINNF.PT.C.HBT.1	Pass
96.39(b)(c)	6	Confirm that the device transmits with a bandwidth less than or equal to the SAS specified bandwidth.	WINNF.FT.D.HBT.2	Pass
96.39(c)(2)	7	Confirm that the device transmits on the SAS specified frequency.	WINNF.FT.D.HBT.2	Pass
96.39(c)(2)	8	Confirm that the device stops transmission in response to a command from the SAS, within a period as required by Part 96.	WINNF.FT.C.HBT.3 WINNF.FT.C.HBT.6 WINNF.FT.C.HBT.7 WINNF.FT.D.HBT.8 WINNF.FT.C.HBT.10 WINNF.FT.D.RLQ.2 WINNF.FT.D.DRG.2	Pass

96.39 (c)	9	Confirm that the device sends measurements data in response to the command from the SAS.	N/A	Pass
96.39(a)	10	For devices with geo-location, confirm that it notifies the SAS of a new location when it is beyond the required distance parameter (±50 m) within the required time frame.	N/A	N/A
96.39 (c)	11	Confirm that the device is capable of reporting the signal level (measurement data) and frequency to SAS.	N/A	Pass
96 E	12	When CBSDs communicate through a management system, confirm compliance with all requirements.	N/A	Pass
96.39	13	When communication between the CBSD and SAS is lost: i) Describe how the CBSD would react if the communications between the device and the SAS is lost. Confirm that the CBSD stops transmission once it loses the link to the SAS. ii) Describe the process for re-establishment of the communications and confirm that the CBSD acts accordingly. iii) Confirm power-on restart process for registration (re-registration) occurs as expected. iv) Confirm the process for de-registration occurs as expected.	WINNF.FT.C.HBT.9 WINNF.FT.C.HBT.10	Pass
96.39(f)	KDB940660 D01 Section 4	SAS and Device Security Requirements	WINNF.FT.C.SCS.1 WINNF.FT.C.SCS.2 WINNF.FT.C.SCS.3 WINNF.FT.C.SCS.4 WINNF.FT.C.SCS.5	Pass
96.39€	N/A	The CBSD must report to the SAS which available channels of frequencies it will use	WINNF.PT.C.HBT.1 WINNF.FT.D.HBT.2 WINNF.FT.C.HBT.3 WINNF.FT.C.HBT.5 WINNF.FT.C.HBT.7 WINNF.FT.D.HBT.8 WINNF.FT.C.HBT.9 WINNF.FT.C.HBT.10 WINNF.FT.D.RLQ.2 WINNF.FT.D.DRG.2	Pass

Notes:

- Test cases denoted as “N/A” in the table above are not applicable to the EUT and are either Optional or Conditional per Section 6 of WINNF-TS-0122.
- Please see Appendices for test data.

7.0 CONCLUSION

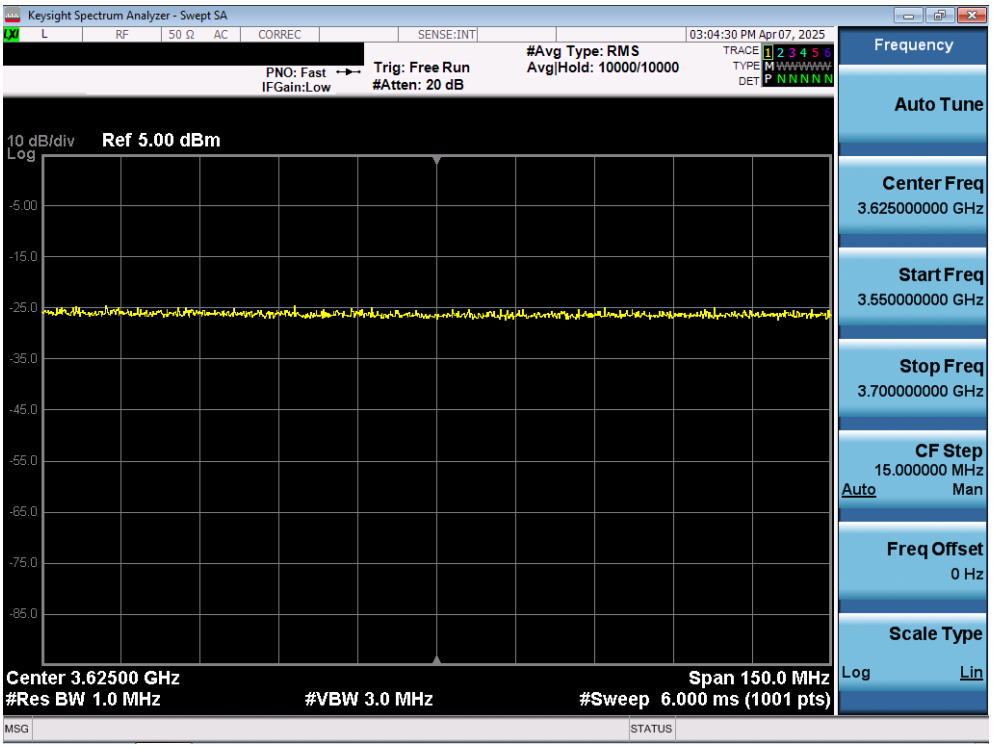
The data collected relate only to the item(s) tested and show that the **, FCC ID:** UPO308-0007-2 has been tested to show compliance with Part 96 and WINNF-TS-0122.

APPENDIX A – TEST RESULT AND DATA

A1 [WINNF.FT.D.REG.2] Domain Proxy Multi-Step registration

	Test Execution Steps	PASS	FAIL
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	• DP with two CBSD sends correct Registration request information, as specified in [n.5], in the form of one 2-element Array or as individual messages to the SAS Test Harness: • The required userId, fccId and cbsdSerialNumber registration parameters shall be sent for each 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.	☒	☐
3	• SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or individual messages as follows: - cbsdId = Ci - measReportConfig shall not be included - responseCode = 0 for each CBSD	--	--
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 each 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	☒	☐

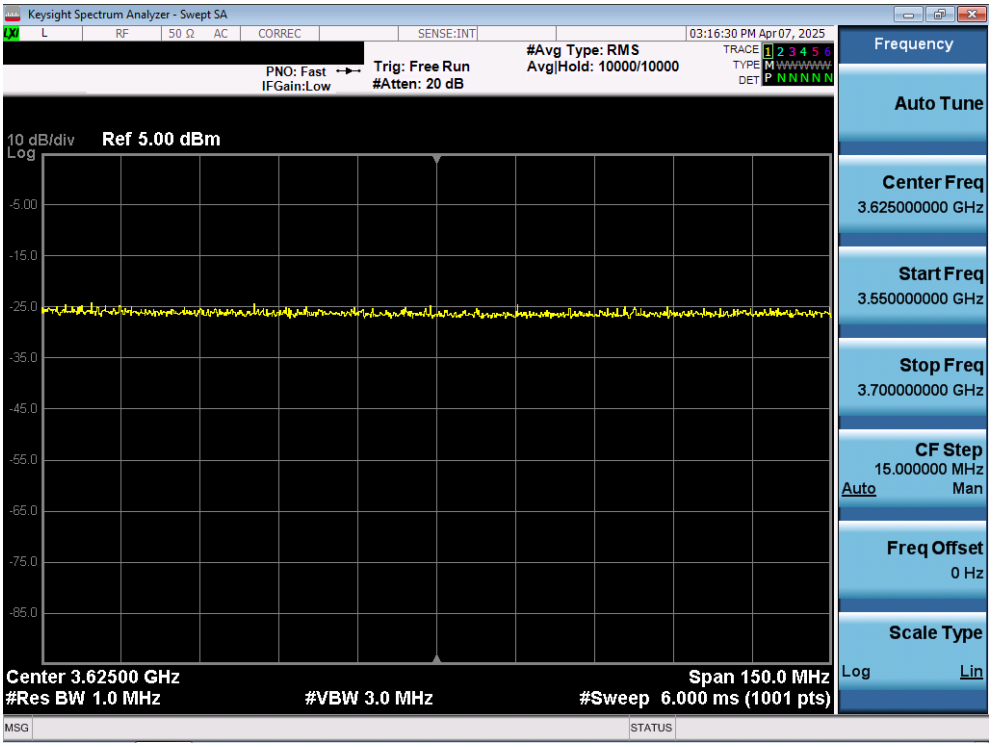
Test Plots:



Plot 1. Conducted Measurement – No RF transmission in entire band for 60s of elapsed time (WINNF.FT.D.REG.2)

A3 [WINNF.FT.D.REG.9] Domain Proxy Missing Required parameters (responseCode 102)

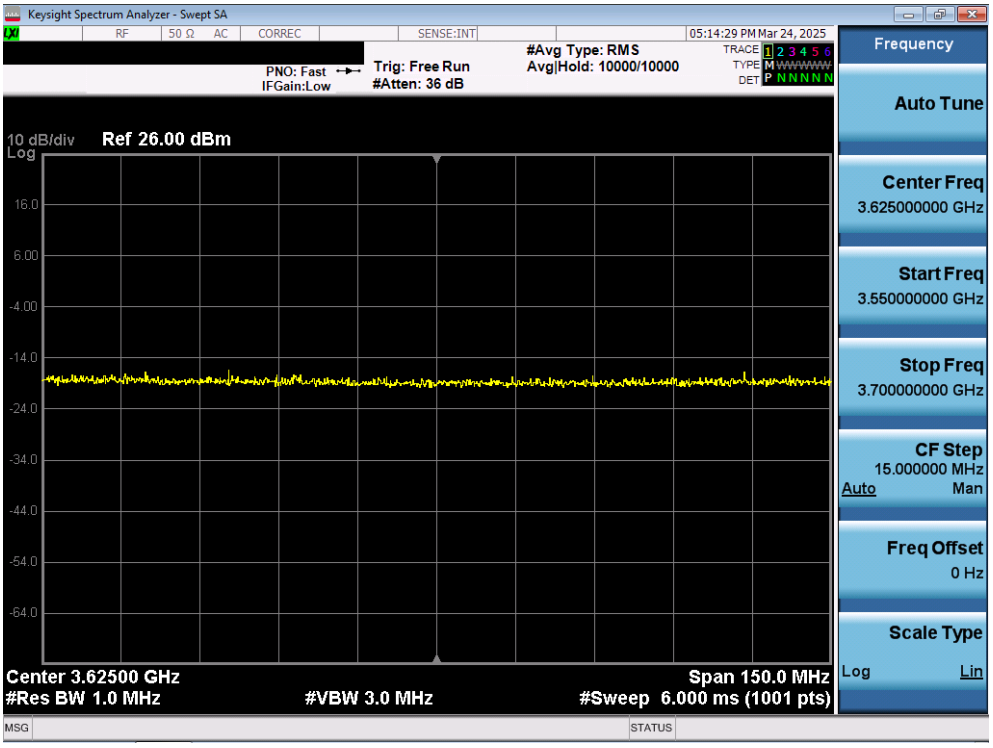
	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: • UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness • UUT is in the Unregistered state	--	--
2	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to the SAS Test Harness:	--	☐
3	• SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or as individual messages as follows: - SAS response does not include a cbsdID - responseCode = 102 for CBSD1 and CBSD2	--	--
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 each 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	☒	☐



Plot 2. Conducted Measurement – No RF transmission in entire band for 60s of elapsed time (WINNF.FT.D.REG.9)

A4 [WINNF.FT.D.REG.11] Domain Proxy Pending Registration (responseCode 200)

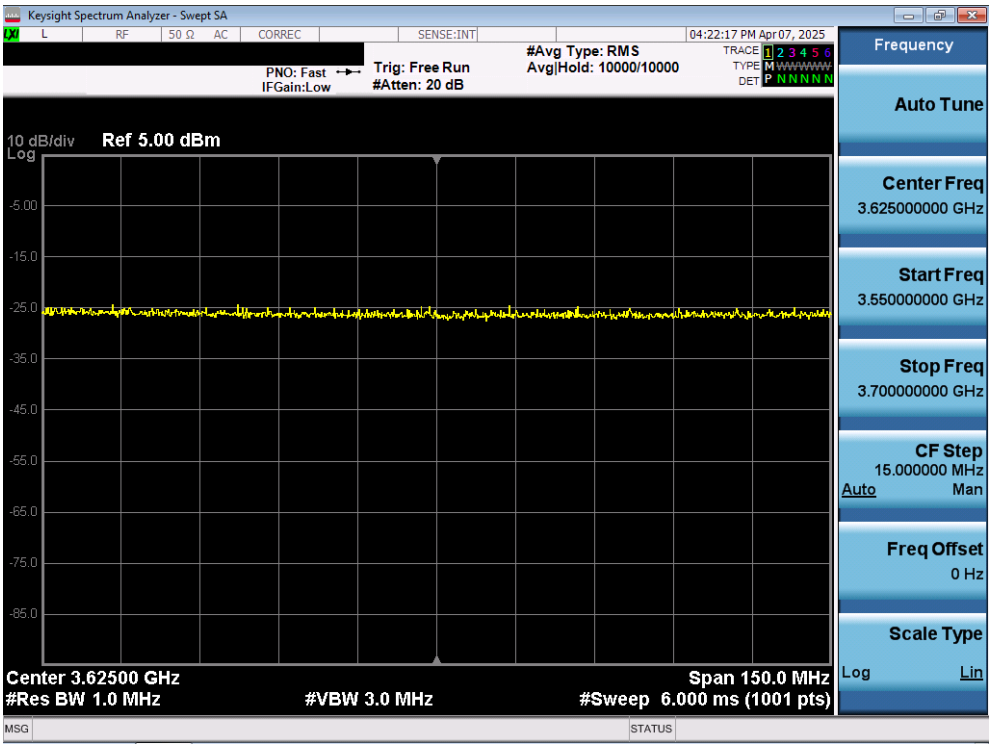
	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: • UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness • UUT is in the Unregistered state	--	--
2	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to the SAS Test Harness:	☒	☐
3	• SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or as individual messages as follows: - SAS response does not include a cbsdID - responseCode = 200 for CBSD1 and CBSD2	--	--
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 each 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	☒	☐



Plot 3. Conducted Measurement – No RF transmission in entire band for 60s of elapsed time (WINNF.FT.D.REG.11)

A5 [WINNF.FT.D.REG.13] Domain Proxy Invalid parameters (responseCode 103)

	Test Execution Steps	PASS	FAIL
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	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to the SAS Test Harness:	☒	☐
3	• SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or as individual messages as follows: - SAS response does not include a cbsdID - responseCode = 103 for CBSD1 and CBSD2	--	--
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 each UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:	☒	☐

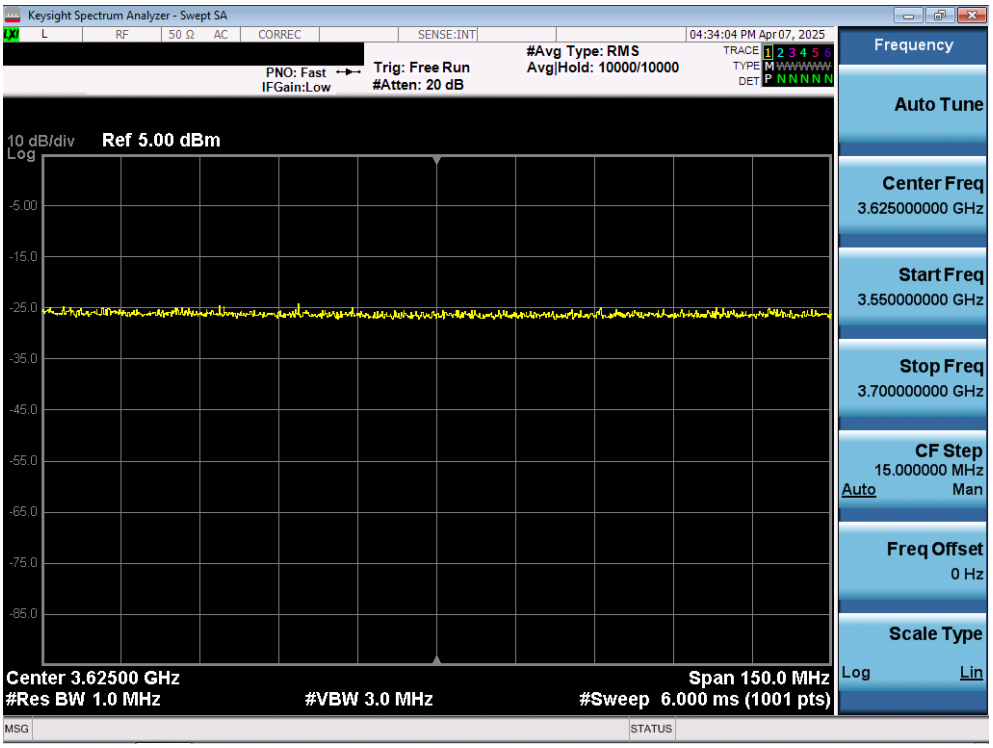


Plot 4. Conducted Measurement – No RF transmission in entire band for 60s of elapsed time (WINNF.FT.D.REG.13)

A6 [WINNF.FT.D.REG.15] Domain Proxy Blacklisted CBSD (responseCode 101)

	Test Execution Steps	PASS	FAIL
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	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to the SAS Test Harness:	☒	☐
3	• SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or as individual messages as follows: - SAS response does not include a cbsdID - responseCode = 0 for CBSD1 - responseCode = 101 and CBSD2	--	--
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 each UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:	☒	☐

Test Plots:

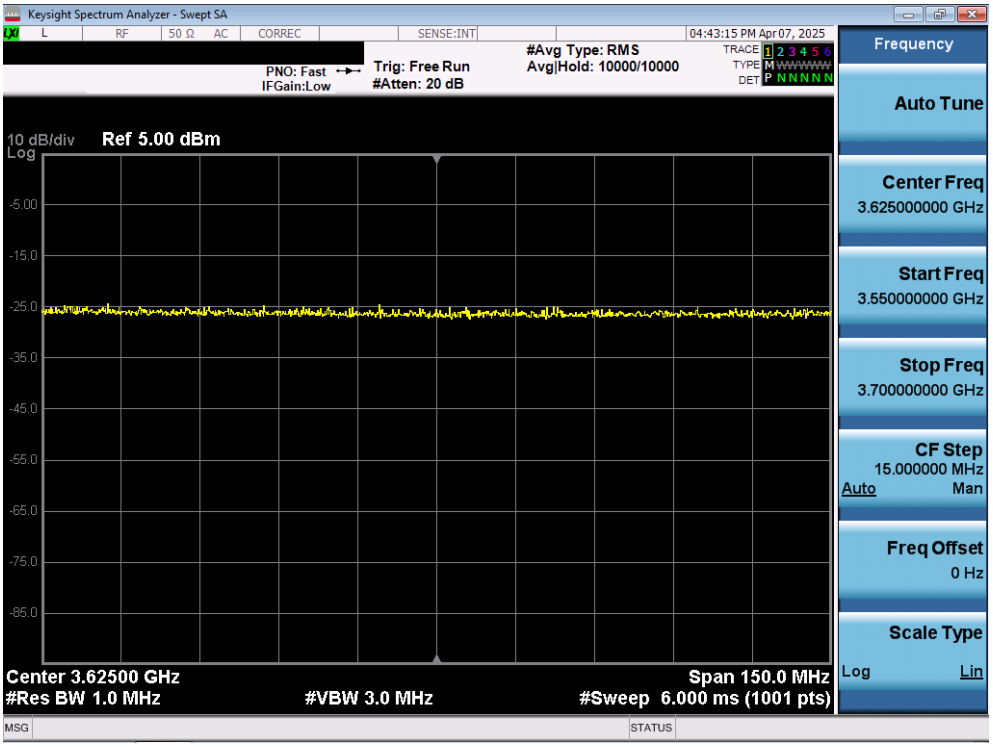


Plot 5. Conducted Measurement – No RF transmission in entire band for 60s of elapsed time (WINNF.FT.D.REG.15)

A7 [WINNF.FT.D.REG.17] Domain Proxy Unsupported SAS protocol version (responseCode100)

	Test Execution Steps	PASS	FAIL
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	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to the SAS Test Harness:	☒	☐
3	• SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or as individual messages as follows: - SAS response does not include a cbsdID - responseCode = 100 for each CBSD	--	--
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 each UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:	☒	☐

Test Plots:

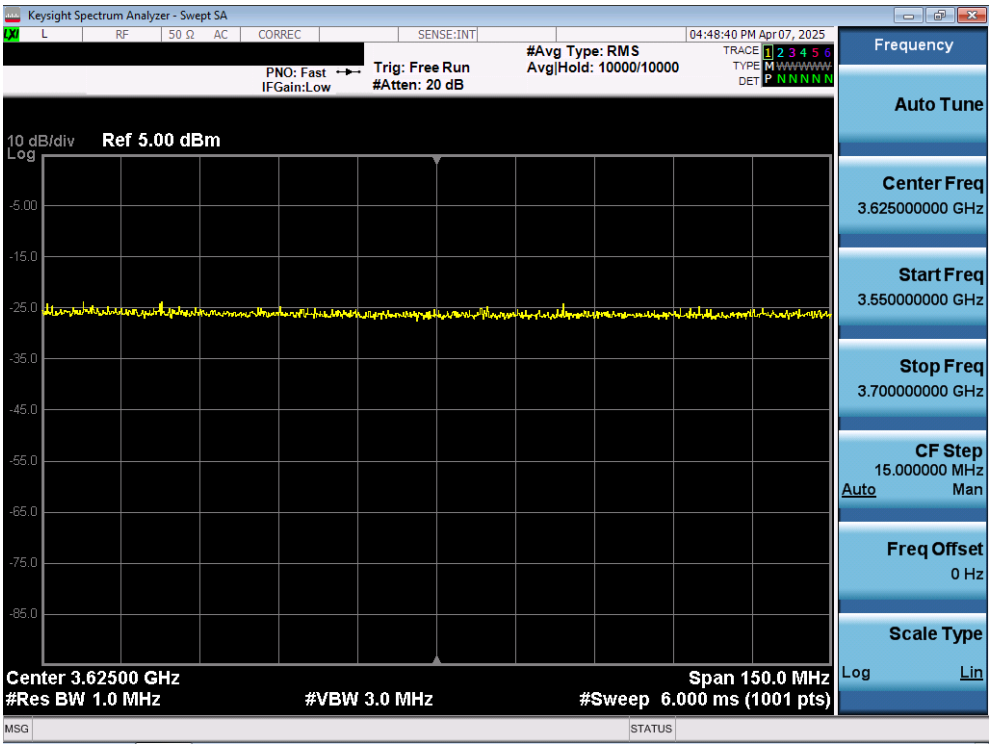


Plot 6. Conducted Measurement – No RF transmission in entire band for 60s of elapsed time (WINNF.FT.C.REG.17)

A8 [WINNF.FT.D.REG.19] Domain Proxy Group Error (responseCode 201)

	Test Execution Steps	PASS	FAIL
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	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to the SAS Test Harness:	☒	☐
3	• SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or as individual messages as follows: - SAS response does not include a cbsdID - responseCode = 0 for CBSD1 - responseCode = 201 and CBSD2	--	--
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 each UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:	☒	☐

Test Plots:

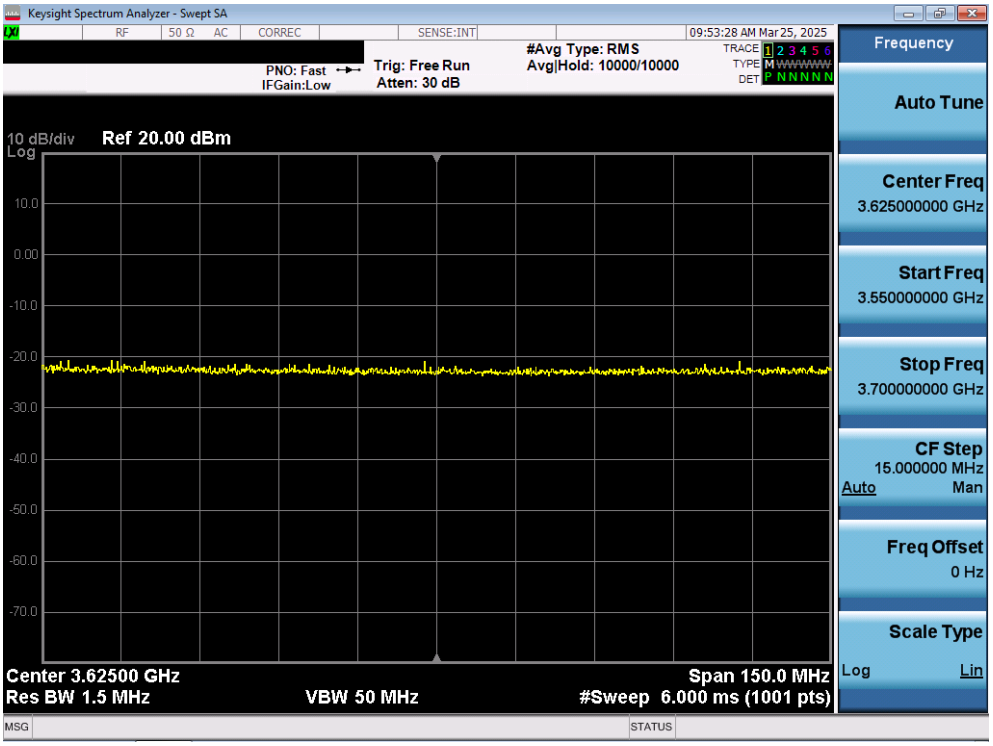


Plot 7. Conducted Measurement – No RF transmission in entire band for 60s of elapsed time (WINNF.FT.D.REG.19)

A10 [WINNF.FT.C.GRA.1] Unsuccessful Grant responseCode=400 (INTERFERENCE)

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: • UUT has registered successfully with SAS Test Harness, with cbsdId = C	--	--
2	UUT sends valid Grant Request.	--	--
3	SAS Test Harness sends a Grant Response message, including • cbsdId=C • responseCode = R	--	--
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	☒	☐

Test Plots:

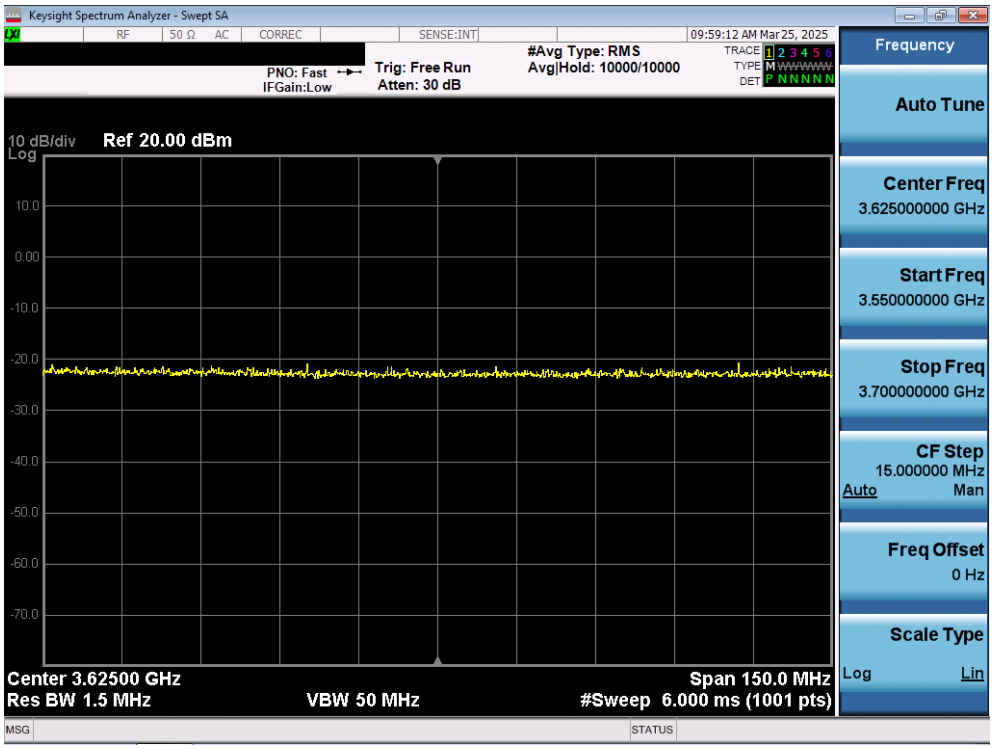


Plot 8. Conducted Measurement – No RF transmission in entire band for 60s of elapsed time (WINNF.FT.C.GRA.1)

A11 [WINNF.FT.C.GRA.2] Unsuccessful Grant responseCode=401 (GRANT_CONFLICT)

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: • UUT has registered successfully with SAS Test Harness, with cbsdId = C	--	--
2	UUT sends valid Grant Request.	--	--
3	SAS Test Harness sends a Grant Response message, including • cbsdId=C • responseCode = R	--	--
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	☒	☐

Test Plots:



Plot 9. Conducted Measurement – No RF transmission in entire band for 60s of elapsed time (WINNF.FT.C.GRA.2)

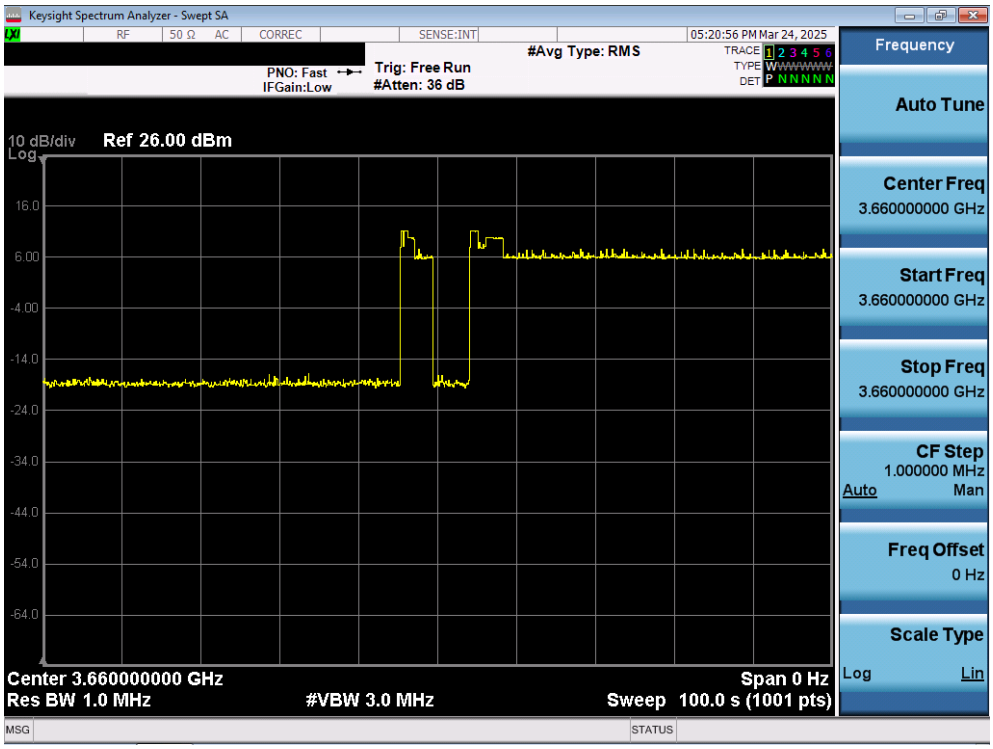
A12 [WINNF.FT.D.HBT.2] Domain ProxyHeartbeat Success Case (first Heartbeat Response)

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: • DP has two CBSD registered successfully with SAS Test Harness, with cbsdID = Ci, i={1,2}	--	--
2	DP 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	DP sends a Spectrum Inquiry Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Spectrum Inquiry Request message is formatted correctly for each CBSD, including for CBSDi, i={1,2}: • cbsdId = Ci • List of frequencyRange objects sent by DP are within the CBRS frequency range	☒	☐
4	If a separate Spectrum Inquiry Request message was sent for each CBSD, the SAS Test Harness shall respond to each Spectrum Inquiry Request message with a separate Spectrum Inquiry Response message. If a single Spectrum Inquiry Request message was sent containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Spectrum Inquiry Response message containing a 2-object array. Verify parameters for each CBSD withing the Spectrum Inquiry Response message are as follows, for CBSDi, i={1,2}: • cbsdId = Ci • availableChannel is an array of availableChannel objects • responseCode = 0	--	--
5	DP sends Grant Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Grant Request message is formatted correctly for each CBSD including for CBSDi, i={1,2} • cbsdId = Ci • maxEIRP is at or below the limit appropriate for CBSD category as defined by Part 96 • operationFrequencyRange, Fi, sent by UUT is a valid range within the CBRS band	☒	☐

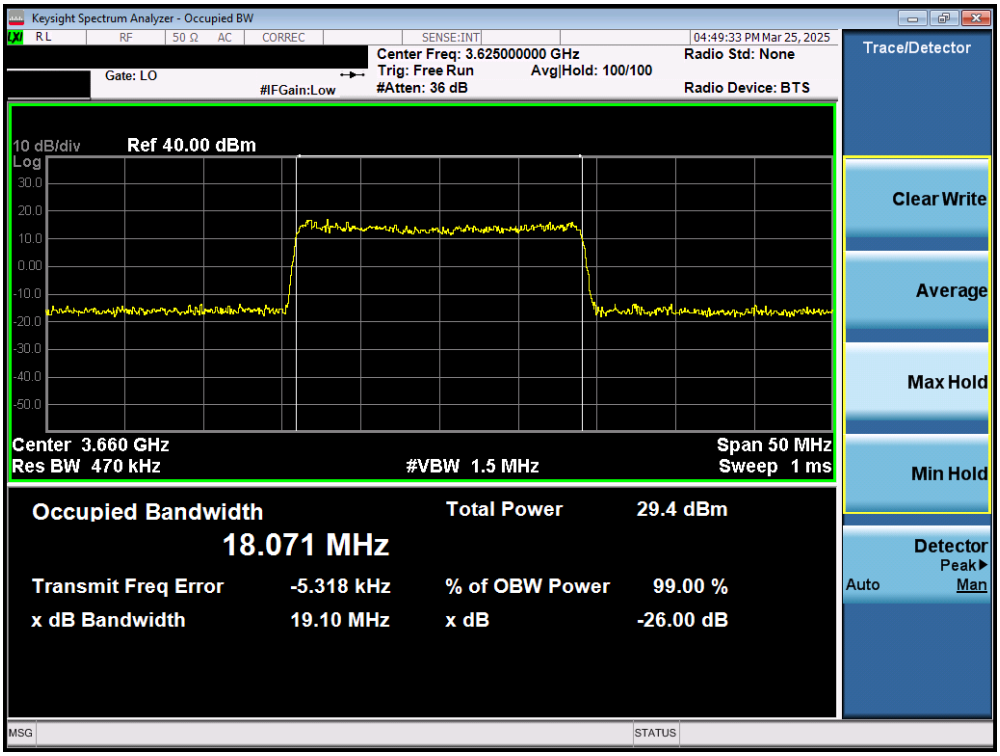
6	If a separate Grant Request message was sent ofr each CBSD, the SAS Test Harness shall respond to each Grant Request message with a separate Grant Response message. If a single Grant Request message was sent containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Grant Response message containing a 2-object array. Verify parameters for each CBSD within the Grant Response message are as follows, for CBSDi, i={1,2} • cbsdId = Ci • grantId = Gi = a valid grant ID • grantExpireTime = UTC time greater than duration of the test • responseCode = 0	--	--
7	Ensure DP sends first Heartbeat Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Heartbeat Request message is formatted correctly for each CBSD, including, for CBSDi i={1,2} • cbsdId = Ci, i={1,2} • grantId = G, i={1,2} • operationState = "GRANTED"	☒	☐
8	If a separate Heartbeat Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each Heartbeat Request message with a separate Heartbeat Response message. If a single Heartbeat Request message was sent for each CBSD by the D containing a 2-object arry (one per CBSD), the SAS Test Harness shall respond with a single Heartbeat Response message containing a 2-object array. Verify parameters for each CBSD within the Heartbeat Response message are as follows, for CBSDi: • cbsdId = Ci • grantId = Gi • transmitExpireTime = current UTC time + 200 seconds • responseCode = 0	--	--
9	For further Heartbeat Request messages sent from DP after completion of step 8, validate message is sent within latest specified heartbeatInterval for CBSDi, and: • cbsdId = Ci • grantId = Gi	☒	☐

	• operationState = “AUTHORIZED” and SAS Test Harness responds with a Heartbeat Response message including the following parameters: • cbsdId = Ci • grantId = Gi • transmitExpireTime = current UTC time + 200 seconds • responseCode = 0		
10	Monitor the RF output of each UUT from start of test until UUT transmission commences. Verify: • Each UUT does not transmit at any time prior to completion of the first heartbeat response • Each UUT transmits after step 8 is complete, and its transmission is limited to within the bandwidth range F	☒	☐

Test Plots:



Plot 10. Conducted Measurement - RF transmission after SAS heartbeat response (WINNF.FT.D.HBT.2)

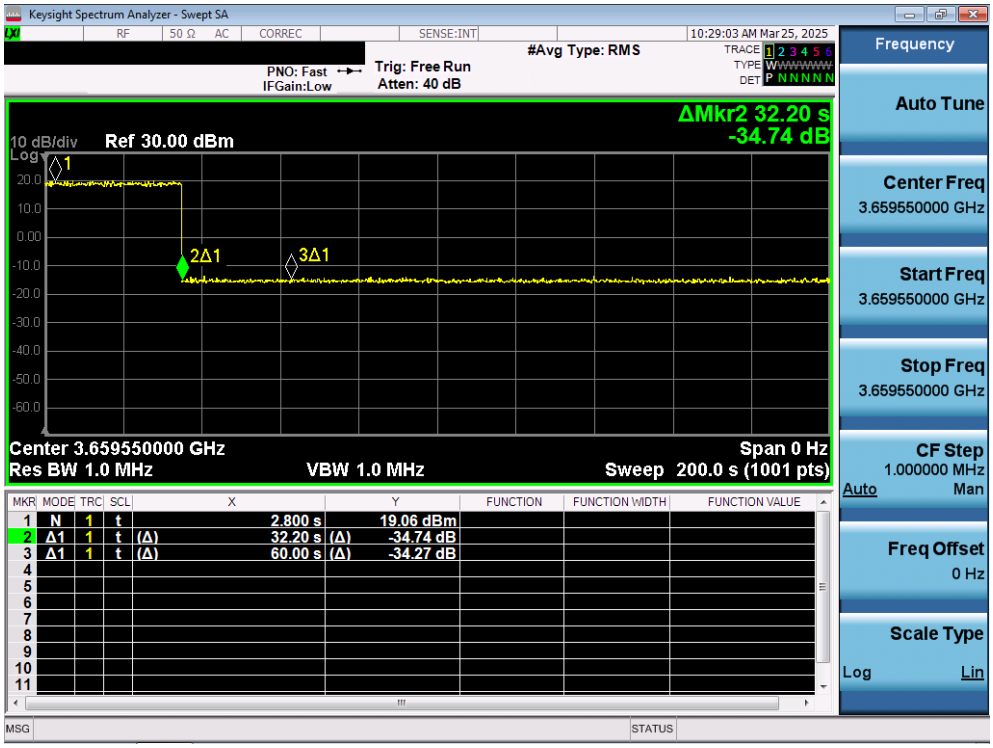


Plot 11. Conducted Measurement Occupied Bandwidth for 20MHz (WINNF.FT.D.HBT.2)

A13 [WINNF.FT.C.HBT.3] Heartbeat responseCode=105 (DEREGISTER)

	Test Execution Steps	PASS	FAIL
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: o valid cbsdId = C o valid grantId = G o grant is for frequency range F, power P o 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	☒	☐

Test Plots:

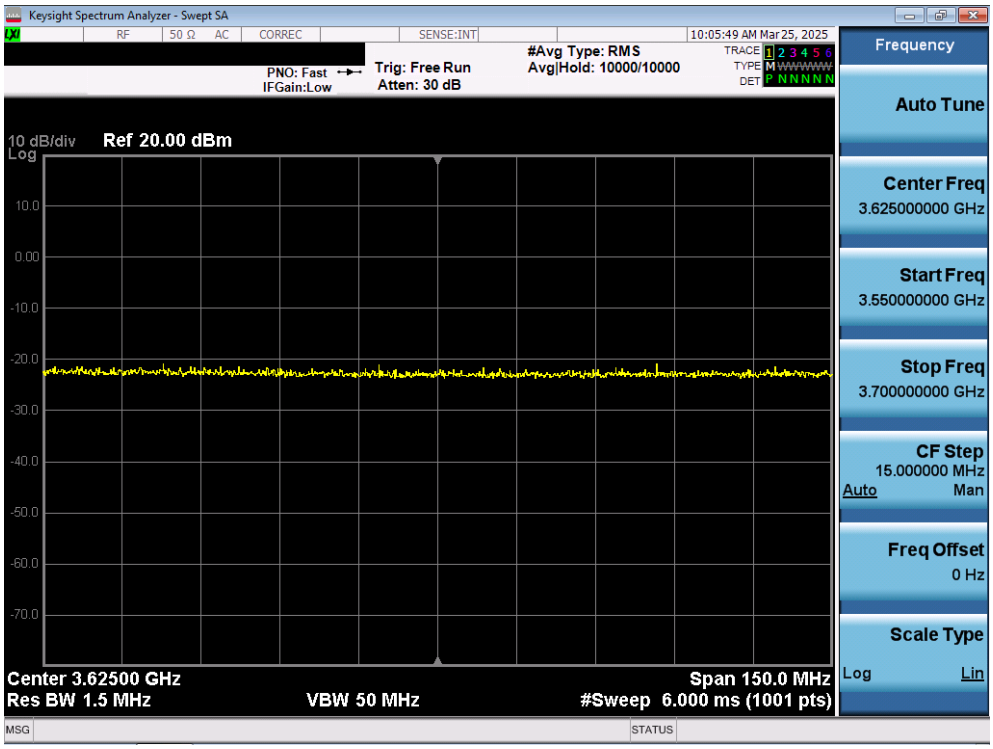


Plot 11.Conducted Measurement – RF transmission ceased (M2) withing 60s (M3) after SAS heartbeat response (M1) (WINNF.FT.C.HBT.3)

A14 [WINNF.FT.C.HBT.5] Heartbeat responseCode=501 (SUSPENDED_GRANT) in First Heartbeat Response

	Test Execution Steps	PASS	FAIL
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: o valid cbsdId = C o valid grantId = G o grant is for frequency range F, power P o 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 = “GRANTED”	☒	☐
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: • cbdsId = C • grantId = G Monitor the RF output of the UUT. Verify: • UUT does not transmit at any time	☒	☐

Test Plots:

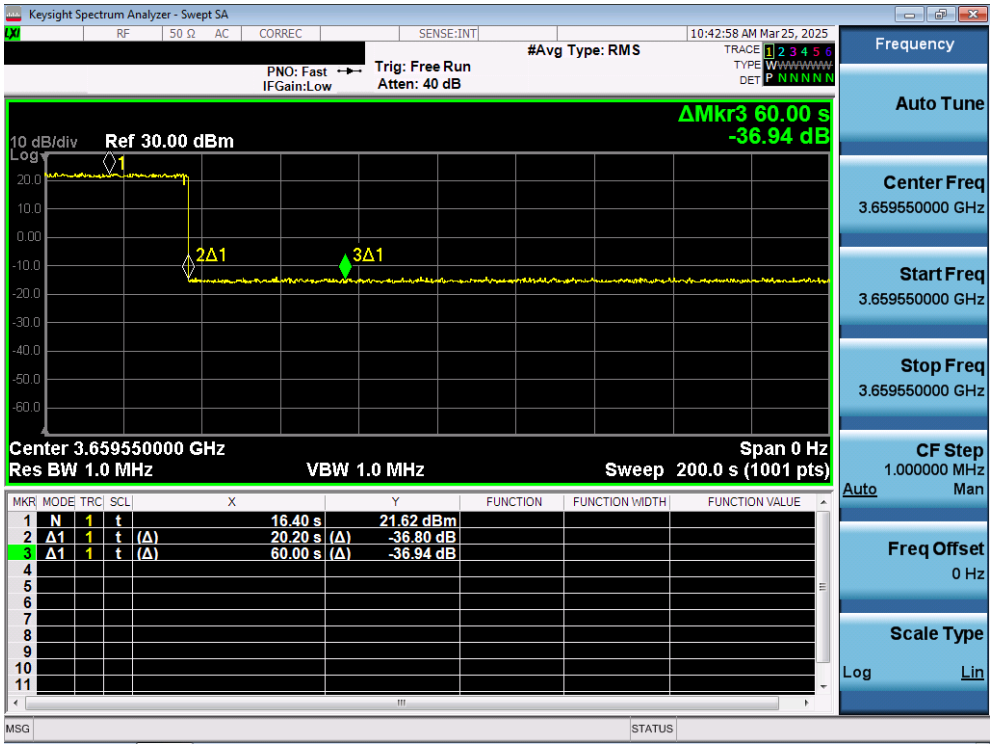


Plot 12.Conducted Measurement – No RF transmission in entire band at any time (WINNF.FT.C.HBT.5)

A15 [WINNF.FT.C.HBT.6] Heartbeat responseCode=501 (SUSPENDED_GRANT) in Subsequent Heartbeat Response

	Test Execution Steps	PASS	FAIL
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: o valid cbsdId = C o valid grantId = G o grant is for frequency range F, power P o 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 = 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: • cbdsId = C • grantId = G Monitor the RF output of the UUT. Verify: • UUT shall stop transmission within (T + 60 seconds) of completion of step 3	☒	☐

Test Plots:

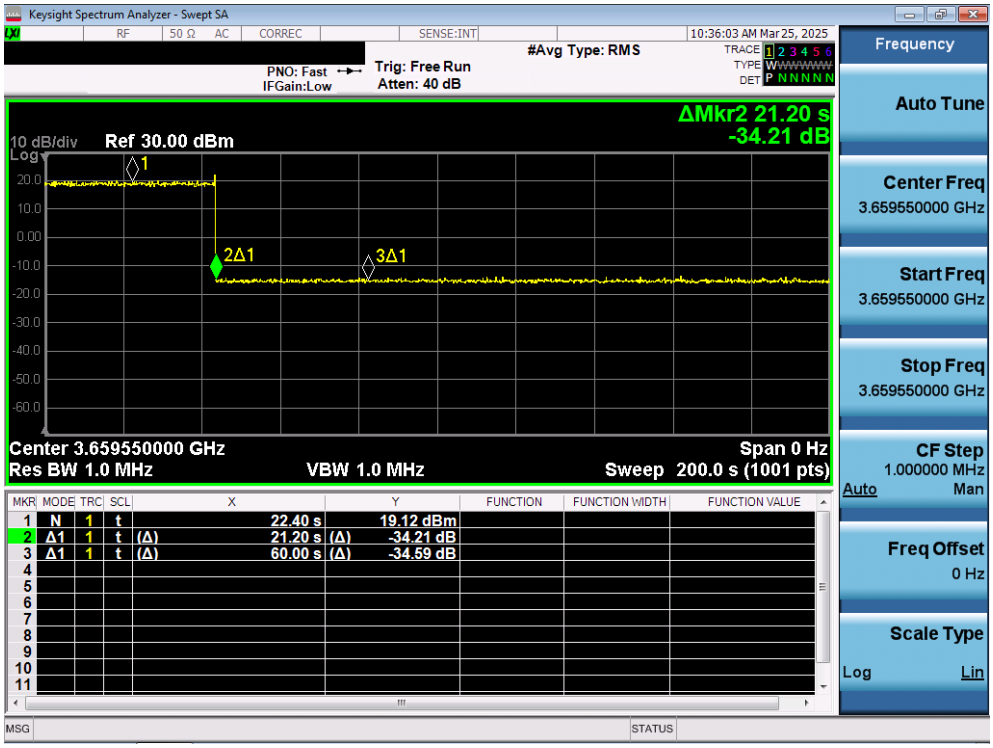


Plot 13. Conducted Measurement – RF transmission ceased (M2) withing 60s (M3) after SAS heartbeat response (M1) (WINNF.FT.C.HBT.6)

A16 [WINNF.FT.C.HBT.7] Heartbeat responseCode=502 (UNSYNC_OP_PARAM)

	Test Execution Steps	PASS	FAIL
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: o valid cbsdId = C o valid grantId = G o grant is for frequency range F, power P o 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 = 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: o cbdsId = C o grantId = G Monitor the RF output of the UUT. Verify: • UUT shall stop transmission within (T+60) seconds of completion of step 3.	☒	☐

Test Plots:

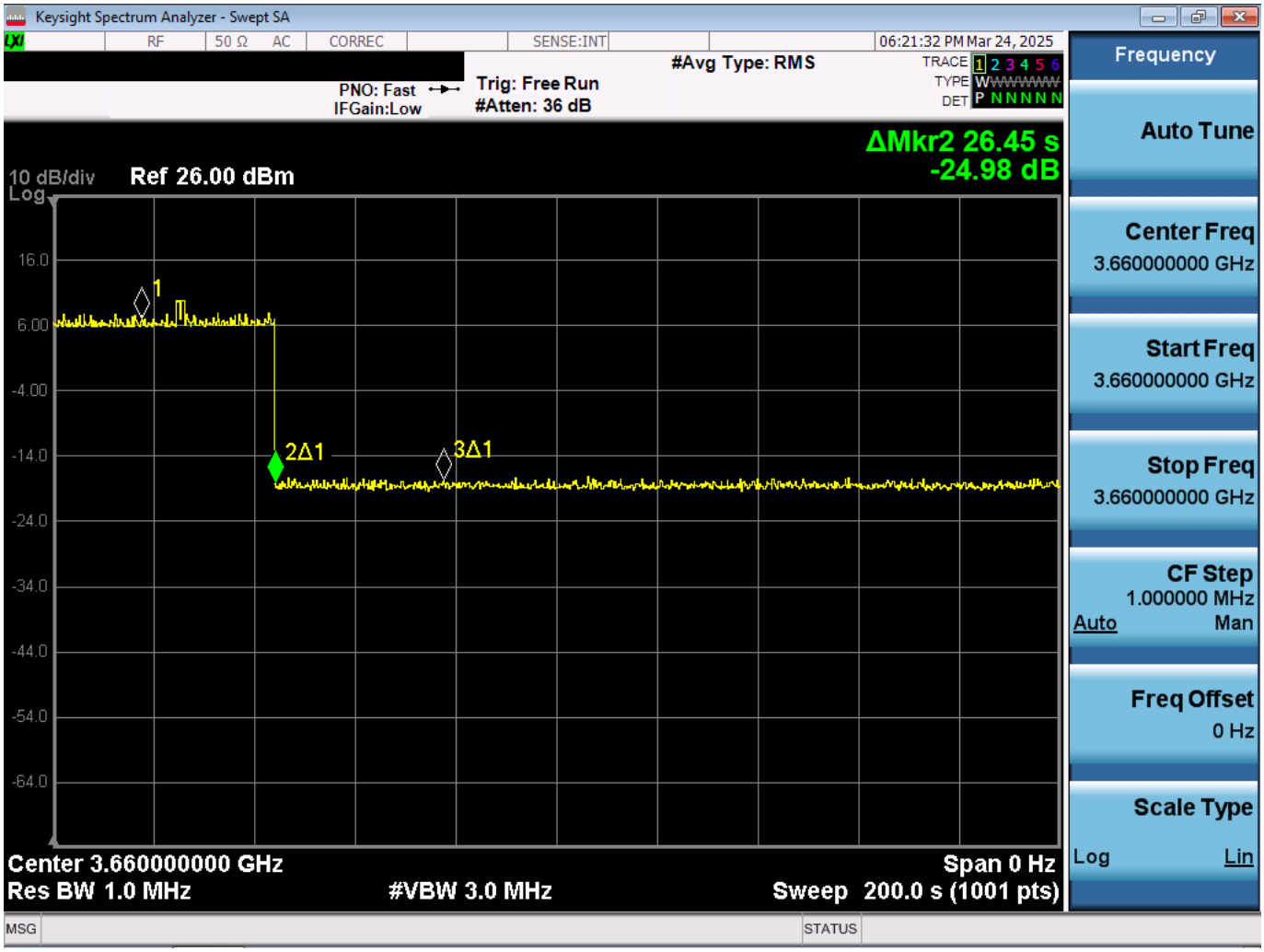


Plot 14. Conducted Measurement – RF transmission ceased (M2) withing 60s (M3) after SAS heartbeat response (M1) (WINNF.FT.C.HBT.7)

A17 [WINNF.FT.D.HBT.8] Domain Proxy Hearbeat responseCode=500 (TERMINATED_GRANT)

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: • DP has two CBSD registered successfully with SAS Test Harness • Each CBSD {1,2} has a valid single grant as follows: o valid cbsdId = Ci, i={1,2} o valid grantId = Gi, i={1,2} o grant is for frequency range Fi, power Pi o grantExpireTime = UTC time greater than duration of the test • Both CBSD are in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface	--	--
2	DP sends a Heartbeat Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of size 2. Verify Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly for each CBSD, including, for CBSDi i={1,2}: • cbsdId = Ci, i={1,2} • grantId = Gi, i={1,2} • operationState = "AUTHORIZED"	☒	☐
3	If separate Heartbeat Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each Heartbeat Request message with a separate Heartbeat Response message. If a single Heartbeat Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Heartbeat Response message containing a 2-object array. Parameters for each CBSD within the Heartbeat Response message should be as follows, for CBSDi: • cbsdId = Ci, i={1,2} • grantId = Gi, i={1,2} For CBSD1: • transmitExpireTime = T = Current UTC time + 200 seconds • responseCode = 0 For CBSD2 • 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. If CBSD sneds further Heartbeat Request messages for CBSD1, SAS Test Harness shall respond with a Heartbeat Response message with parameters: • cbsdId = C1 • grantId = G1 • transmitExpireTime = current UTS time + 200 seconds • response Code = 0	--	--

	• Heartbeat Resuest message is withing heartbeatInterval of previous Heartbeat Request message		
5	Montior the RF output of CBSD2. Verify: • CBSD2 shall stop transmission within bandwidth F2 within (T + 60 seconds) of completion of step 3	☒	☐

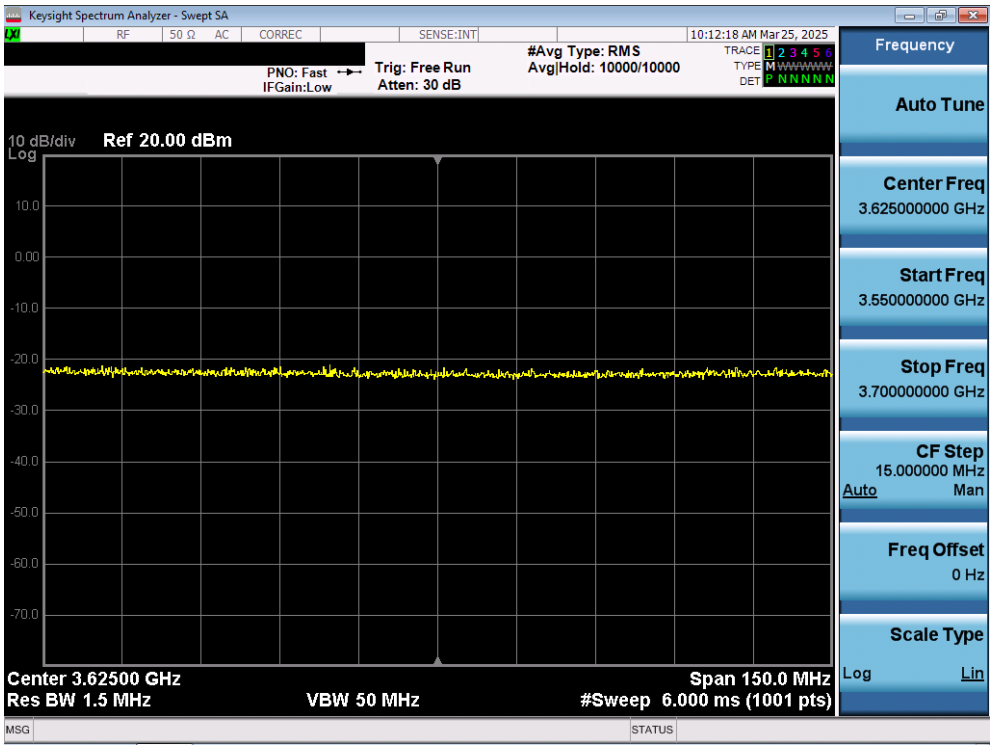


Plot 15.Conducted Measurement - RF transmission ceased (M2) withing 60s (M3) after SAS heartbeat response (M1) (WINNF.FT.C.HBT.8)

A18 [WINNF.FT.C.HBT.9] Heartbeat Response Absent (First Heartbeat)

	Test Execution Steps	PASS	FAIL
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: o valid cbsdId = C o valid grantId = G o grant is for frequency range F, power P o 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”	☒	☐
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	☒	☐

Test Plots:

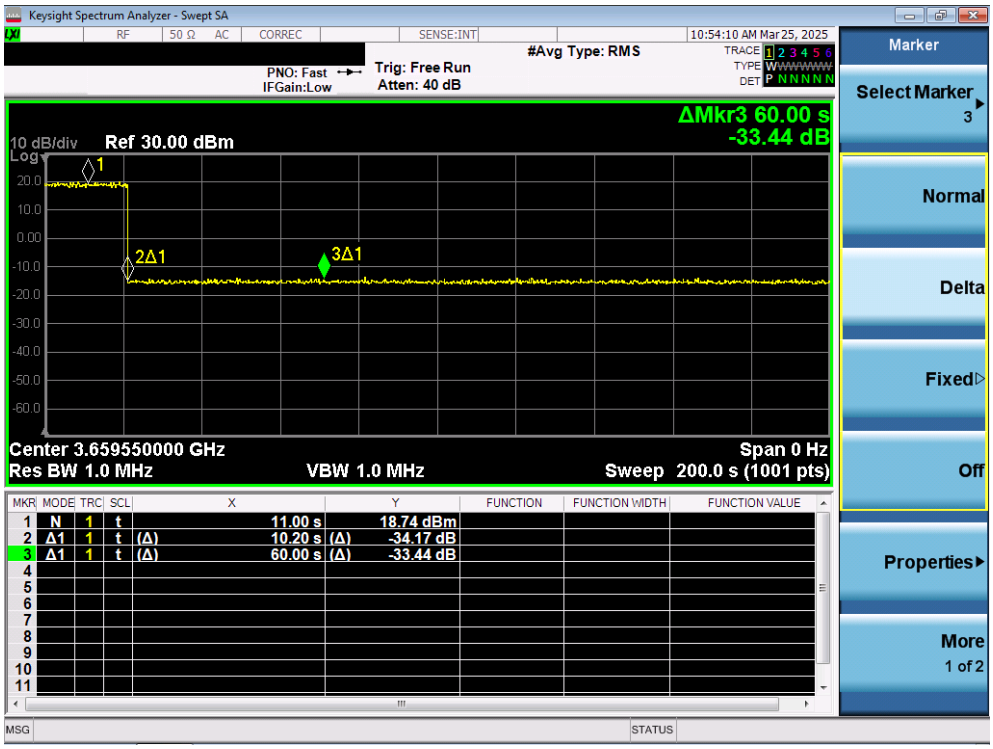


Plot 16.Conducted Measurement – No RF transmission in entire band at anytime (WINNF.FT.C.HBT.9)

A19 [WINNF.FT.C.HBT.10] Heartbeat Response Absent (Subsequent Heartbeat)

	Test Execution Steps	PASS	FAIL
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: o valid cbsdId = C o valid grantId = G o grant is for frequency range F, power P o 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 issent within the latest specified heartbeatInterval, and is 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 = current UTC time + 200 seconds • responseCode = 0	--	--
4	After completion of Step 3, SAS Test Harness does not respond to any further messages from 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.	☒	☐

Test Plots:

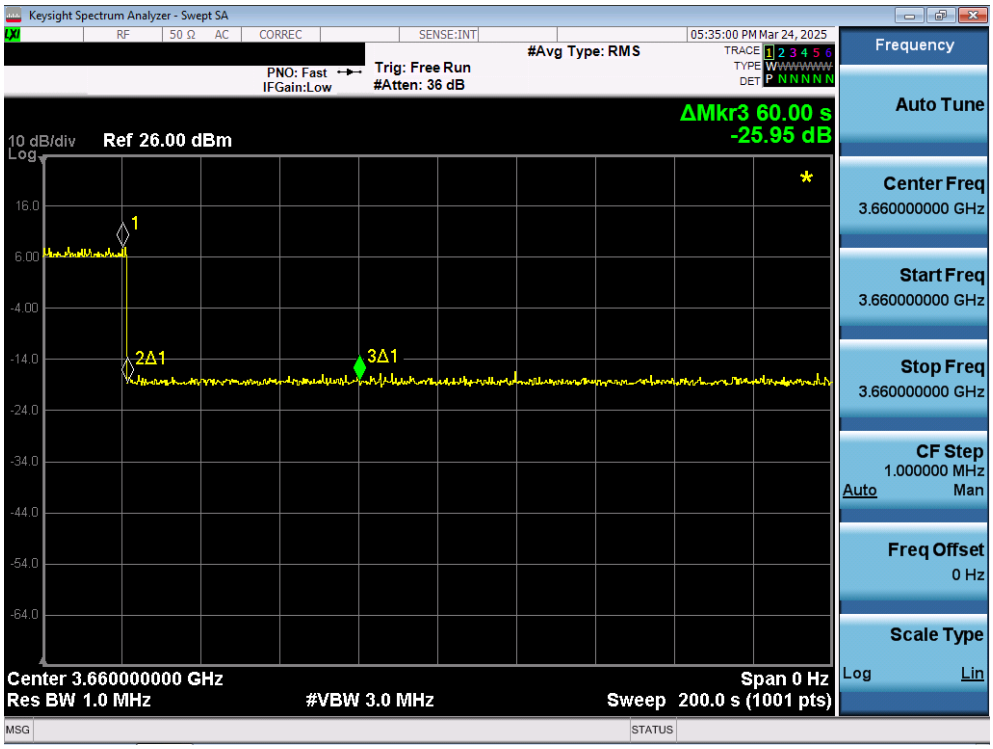


Plot 17. Conducted Measurement - RF transmission ceased (M2) withing 60s (M3) after SAS heartbeat response (M1) (WINNF.FT.C.HBT.10)

A20 [WINNF.FT.D.RLQ.2] Domain Proxy Successful Relinquishment

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: • DP has successfully completed SAS Discovery and Authentication with SAS Test Harness • DP has successfully registered 2 CBSD with SAS Test Harness, with cbsdId=Ci, I={1,2} • DP has received a valid grant with grantId = Gi, i={1,2} for each CBSD • Both CBSD are in Grant State AUTHORIZED and is actively transmitting within the bounds of their grant. Invoke trigger to relinquish UUT Grant from the SAS Test Harness	--	--
2	Verify DP sends a Relinquishment Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Relinquishment Request message contains all required parameters properly formatted for each CBSD, specifically for CBSDi: • cbsdId = Ci • grantId = Gi	☒	☐
3	If a separate Relinquishment Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each request message with a separate response message. If a single Relinquishment Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Repsonse message containing a 2-object array. Parameters for each CBSD within the Relinquishment Response shall be as follows: • cbsdId = Ci • grantId = Gi • 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 each 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	☒	☐

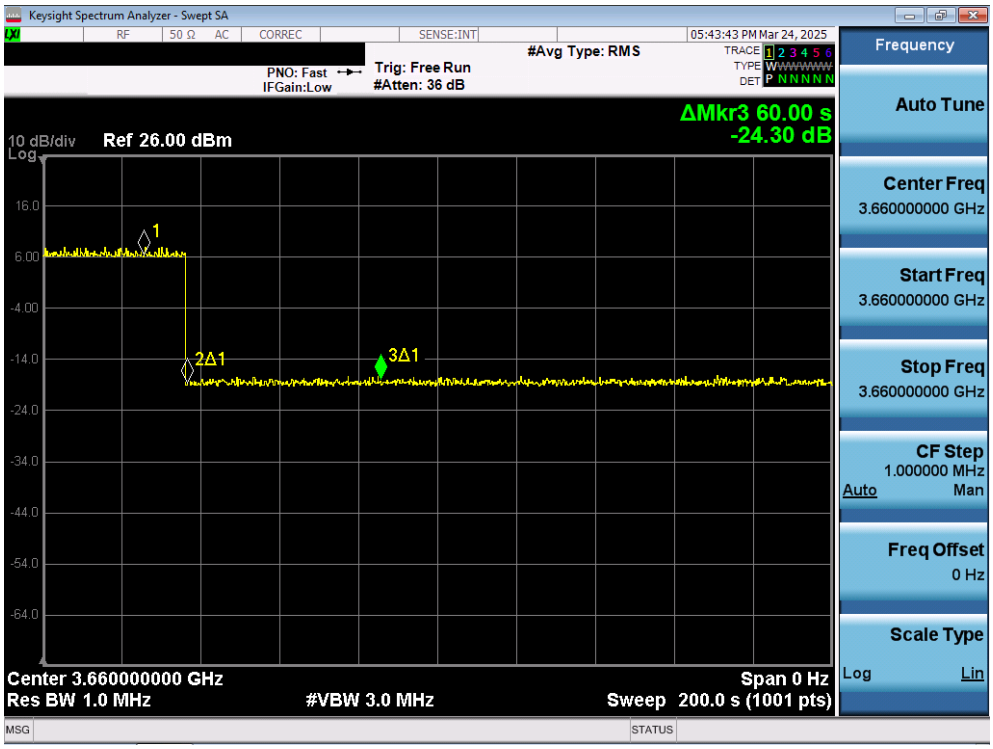
Test Plots:



Plot 18. Conducted Measurement – RF transmission ceased (M2) withing 60s (M3) after SAS relinquishment response (M1) (WINNF.FT.D.RLQ.2)

A21 [WINNF.FT.D.DRG.2] Domain Proxy Successful Deregistration

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: • Each UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness • Each UUT is in the authorized state • DP has successfully registered 2 CBSD with SAS Test Harness, each with cbsdId=Ci, I = {1,2} • DP has received a valid grant with grandId = Gi, i={1,2} for each CBSD • Both CBSD are in Grant State AUTHORIZED and 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	Verify DP sends a Deregistration Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Deregistration Request message contains all required parameters properly formatted ofr each CBSD, specifically, for CBSDi" • cbsdId = Ci	☒	☐
4	If a separate Deregistraion Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each request message with a separate response message. If a single Deregistration Requet message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Response message containing a 2-object array. Parameters for each CBSD within the Deregistration Response shall be as follows: • cbsdId = Ci • responseCode = 0	--	--
5	After completion of step 4, 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 each 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	☒	☐

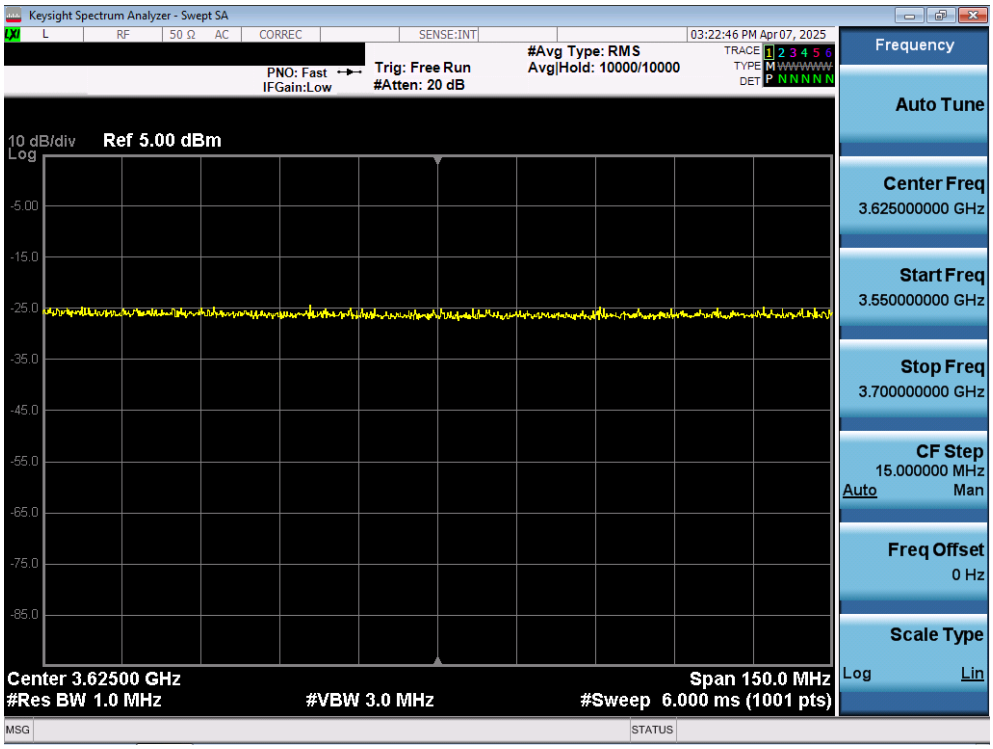


Plot 19. Conducted Measurement – RF transmission ceased (M2) withing 60s (M3) after SAS deregistration response (M1) (WINNF.FT.D.DRG.2)

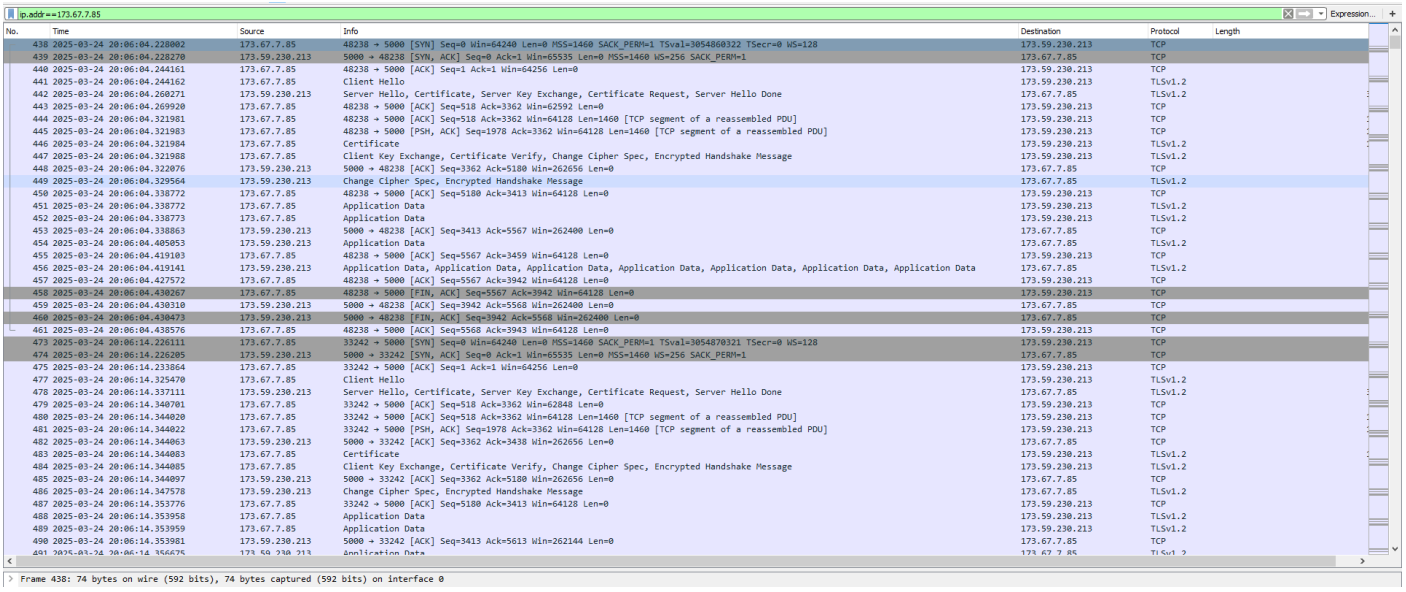
A22 [WINNF.FT.C.SCS.1] Successful TLS connection between UUT and SAS Test Harness

	Test Execution Steps	PASS	FAIL
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	☒	☐
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	☒	☐
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.	☒	☐
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	☒	☐

Test Plots:



Plot 20.Conducted Measurement – No RF Transmission for 60s of elapsed time (WINNF.FT.C.SCS.1)

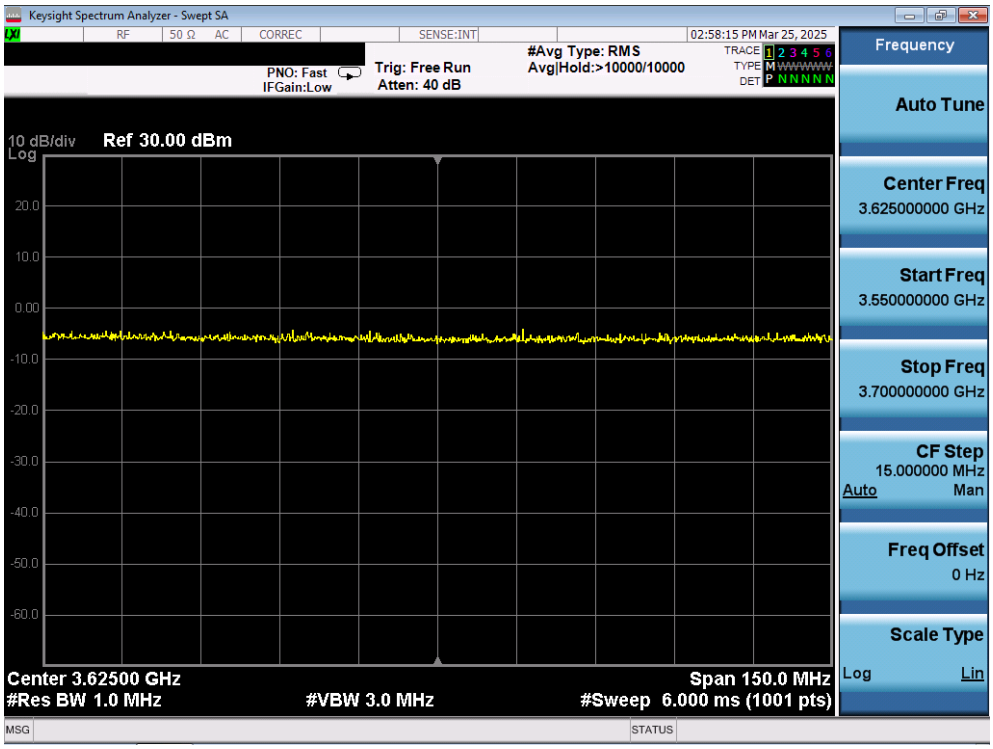


Plot 21.WireShark Screenshot – Successful Handshake (WINNF.FT.C.SCS.1)

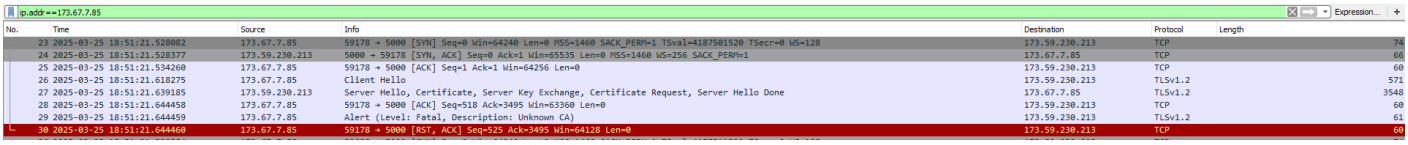
A23 [WINNF.FT.C.SCS.2] TLS failure due to revoked certificate

	Test Execution Steps	PASS	FAIL
1	• UUT shall start CBSD-SAS communication with the security procedure	☒	☐
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	☒	☐
3	UUT may retry for the security procedure which shall 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	☒	☐

Test Plots:



Plot 22. Conducted Measurement – No RF Transmission for 60s of elapsed time (WINNF.FT.C.SCS.2)

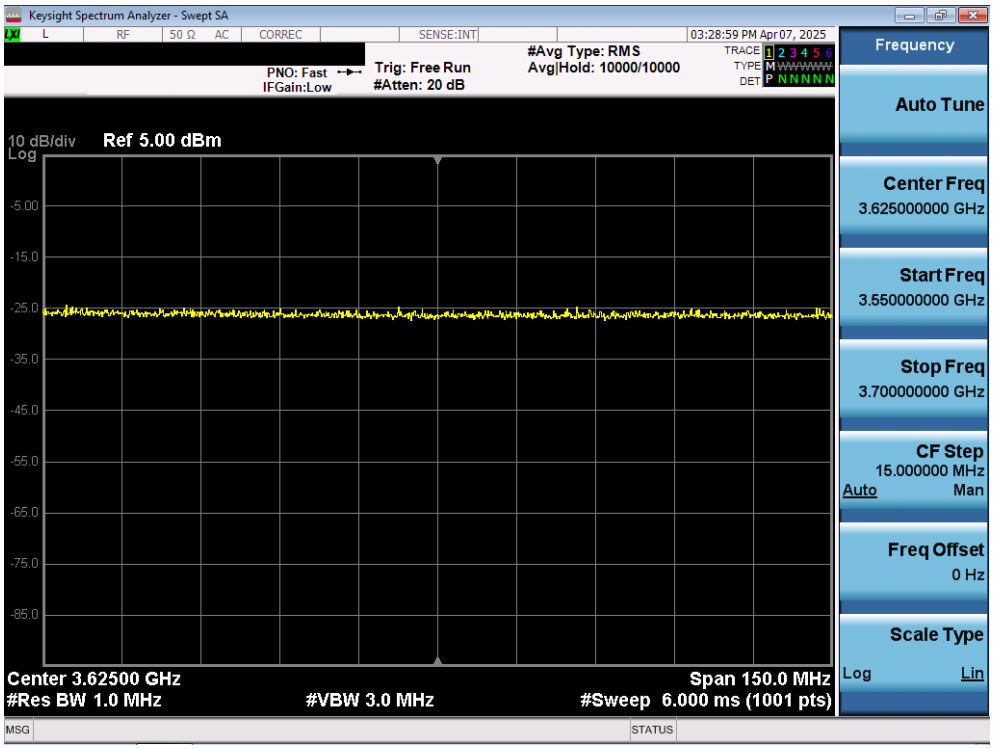


Plot 23.WireShark Screenshot 1 - Failed Handshake (WINNF.FT.C.SCS.2)

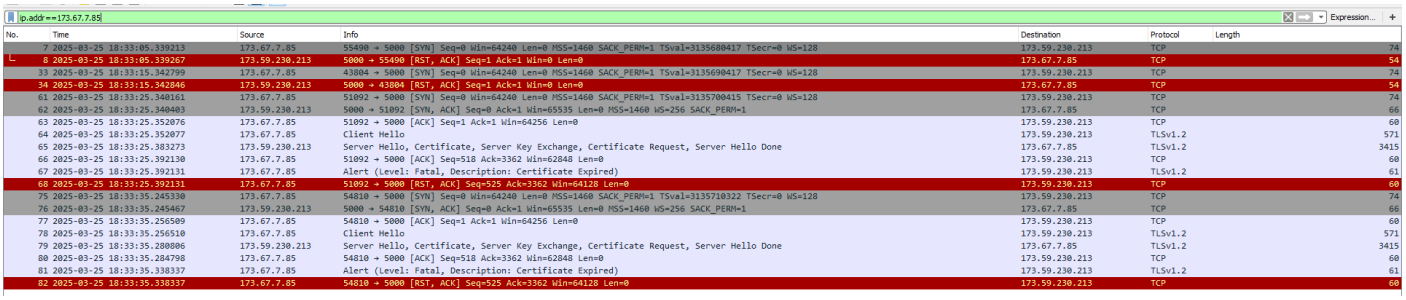
A24 [WINNF.FT.C.SCS.3] TLS failure due to expired server certificate

	Test Execution Steps	PASS	FAIL
1	• UUT shall start CBSD-SAS communication with the security procedure	☒	☐
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.	☒	☐
3	UUT may retry for the security procedure which shall 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	☒	☐

Test Plots:



Plot 24.Conducted Measurement – No RF Transmission for 60s of elapsed time (WINNF.FT.C.SCS.3)



ip.addr==173.67.7.85

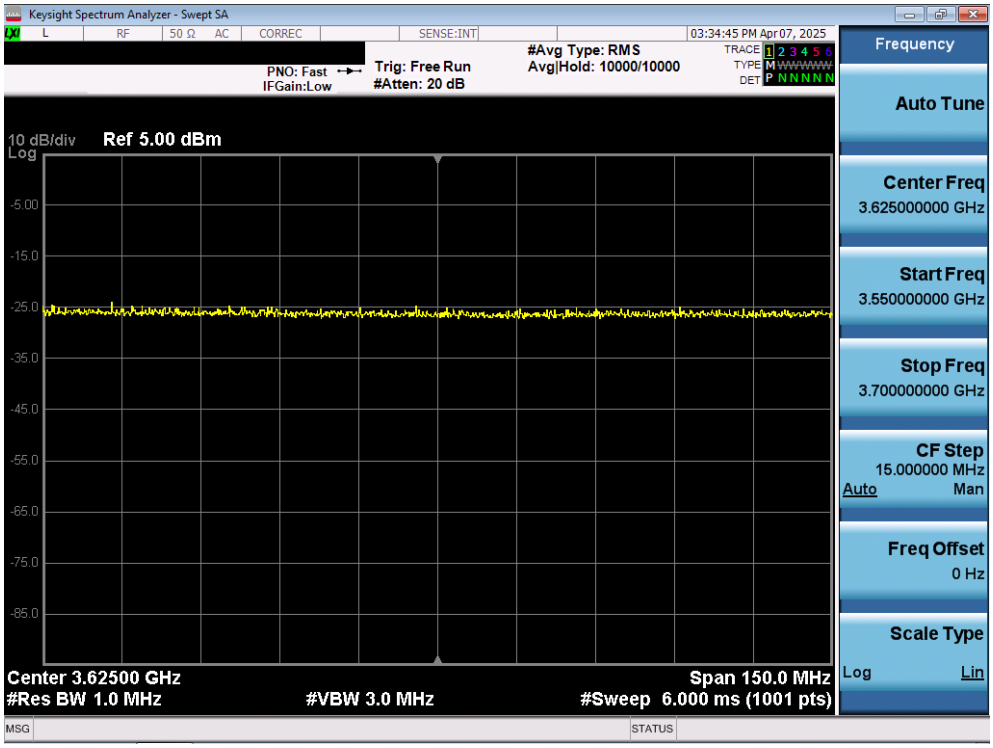
No.	Time	Source	Info	Destination	Protocol	Length
7	2025-03-25 18:33:05.339213	173.67.7.85	55490 → 5000 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SACK_PERM=1 TSval=3135680417 TSecr=0 WS=128	173.59.230.213	TCP	74
8	2025-03-25 18:33:05.339267	173.59.230.213	5000 → 55490 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0	173.67.7.85	TCP	54
33	2025-03-25 18:33:15.342799	173.67.7.85	43804 → 5000 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SACK_PERM=1 TSval=3135690417 TSecr=0 WS=128	173.59.230.213	TCP	74
34	2025-03-25 18:33:15.342846	173.59.230.213	5000 → 43804 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0	173.67.7.85	TCP	54
61	2025-03-25 18:33:25.340161	173.67.7.85	51092 → 5000 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SACK_PERM=1 TSval=3135700415 TSecr=0 WS=128	173.59.230.213	TCP	74
62	2025-03-25 18:33:25.340403	173.59.230.213	5000 → 51092 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM=1	173.67.7.85	TCP	66
63	2025-03-25 18:33:25.352076	173.67.7.85	51092 → 5000 [ACK] Seq=1 Ack=1 Win=64256 Len=0	173.59.230.213	TCP	60
64	2025-03-25 18:33:25.352077	173.67.7.85	Client Hello	173.59.230.213	TLSv1.2	571
65	2025-03-25 18:33:25.383273	173.59.230.213	Server Hello, Certificate, Server Key Exchange, Certificate Request, Server Hello Done	173.67.7.85	TLSv1.2	3415
66	2025-03-25 18:33:25.392130	173.67.7.85	51092 → 5000 [ACK] Seq=518 Ack=3362 Win=62848 Len=0	173.59.230.213	TCP	60
67	2025-03-25 18:33:25.392131	173.67.7.85	Alert (Level: Fatal, Description: Certificate Expired)	173.59.230.213	TLSv1.2	61
68	2025-03-25 18:33:25.392131	173.67.7.85	51092 → 5000 [RST, ACK] Seq=525 Ack=3362 Win=64128 Len=0	173.59.230.213	TCP	60
75	2025-03-25 18:33:35.245330	173.67.7.85	54810 → 5000 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SACK_PERM=1 TSval=3135710322 TSecr=0 WS=128	173.59.230.213	TCP	74
76	2025-03-25 18:33:35.245467	173.59.230.213	5000 → 54810 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM=1	173.67.7.85	TCP	66
77	2025-03-25 18:33:35.256509	173.67.7.85	54810 → 5000 [ACK] Seq=1 Ack=1 Win=64256 Len=0	173.59.230.213	TCP	60
78	2025-03-25 18:33:35.256510	173.67.7.85	Client Hello	173.59.230.213	TLSv1.2	571
79	2025-03-25 18:33:35.280006	173.59.230.213	Server Hello, Certificate, Server Key Exchange, Certificate Request, Server Hello Done	173.67.7.85	TLSv1.2	3415
80	2025-03-25 18:33:35.284798	173.67.7.85	54810 → 5000 [ACK] Seq=518 Ack=3362 Win=62848 Len=0	173.59.230.213	TCP	60
81	2025-03-25 18:33:35.338337	173.67.7.85	Alert (Level: Fatal, Description: Certificate Expired)	173.59.230.213	TLSv1.2	61
82	2025-03-25 18:33:35.338337	173.67.7.85	54810 → 5000 [RST, ACK] Seq=525 Ack=3362 Win=64128 Len=0	173.59.230.213	TCP	60

Plot 25.WireShark Screenshot - Failed Handshake (WINNF.FT.C.SCS.3)

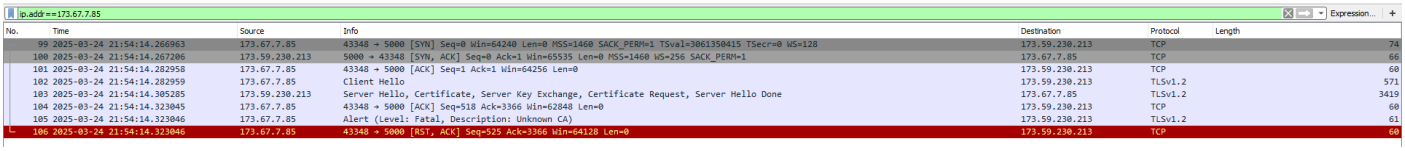
A25 [WINNF.FT.C.SCS.4] TLS failure when SAS Test Harness certificate is issued by an unknown CA

	Test Execution Steps	PASS	FAIL
1	• UUT shall start CBSD-SAS communication with the security procedure	☒	☐
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.	☒	☐
3	UUT may retry for the security procedure which shall 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	☒	☐

Test Plots:



Plot 26.Conducted Measurement – No RF Transmission for 60s of elapsed time (WINNF.FT.C.SCS.4)

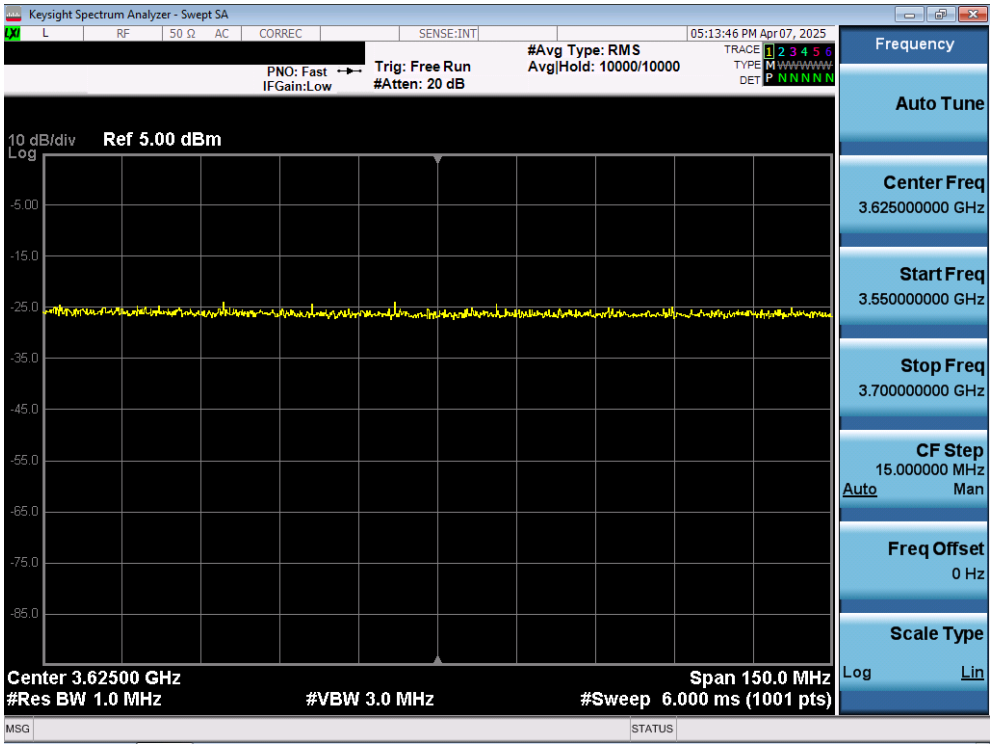


Plot 27.WireShark Screenshot - Failed Handshake (WINNF.FT.C.SCS.4)

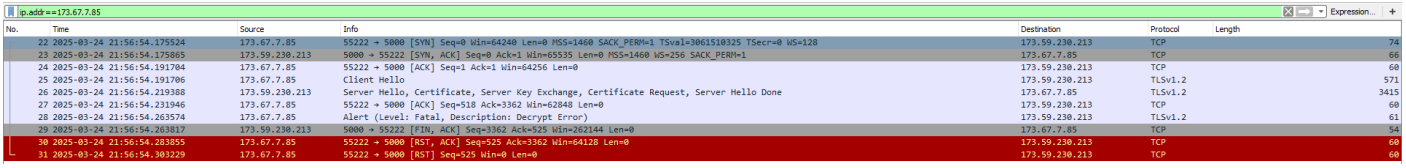
A26 [WINNF.FT.C.SCS.5] TLS failure when certificate at the SAS Test Harness is corrupted

	Test Execution Steps	PASS	FAIL
1	• UUT shall start CBSD-SAS communication with the security procedure	☒	☐
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.	☒	☐
3	UUT may retry for the security procedure which shall 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	☒	☐

Test Plots:



Plot 28.Conducted Measurement – No RF Transmission for 60s of elapsed time (WINNF.FT.C.SCS.5)



Plot 29.WireShark Screenshot - Failed Handshake (WINNF.FT.C.SCS.5)

A27 [WINNF.PT.C.HBT.1] UUT RF Transmit Power Measurement

	Test Execution Steps	PASS	FAIL
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: o cbsdId = C o grantId = G • SAS Test Harness responds with Heartbeat Response, including: o cbsdId = C o grantId = G o transmitExpireTime = current UTC time + 200 seconds o 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 fulfil 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.*	☒	☐

RF Power Measurements:

Testing is performed per KDB 971168 D01 and across the transmit dynamic range of 8dBm/MHz to 6dBm/MHz for 20MHz Bandwidth.

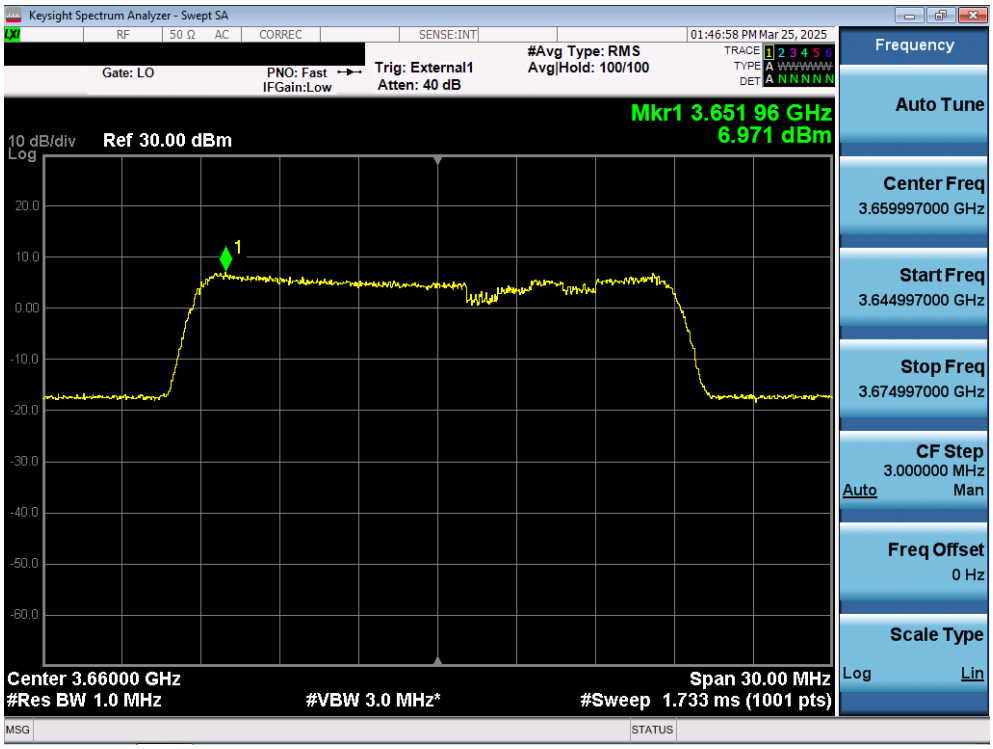
EIRP PSD is found by adding antenna gain to the conducted PSD level.

SAS granted EIRP [dBm/MHz]	Conducted PSD [dBm/MHz]	Antenna Gain [dBi]	EIRP PSD [dBm/MHz]	Margin
8	7.31	0.00	7.31	-0.69
7	6.97	0.00	6.97	-0.03
6	5.58	0.00	5.58	-0.42

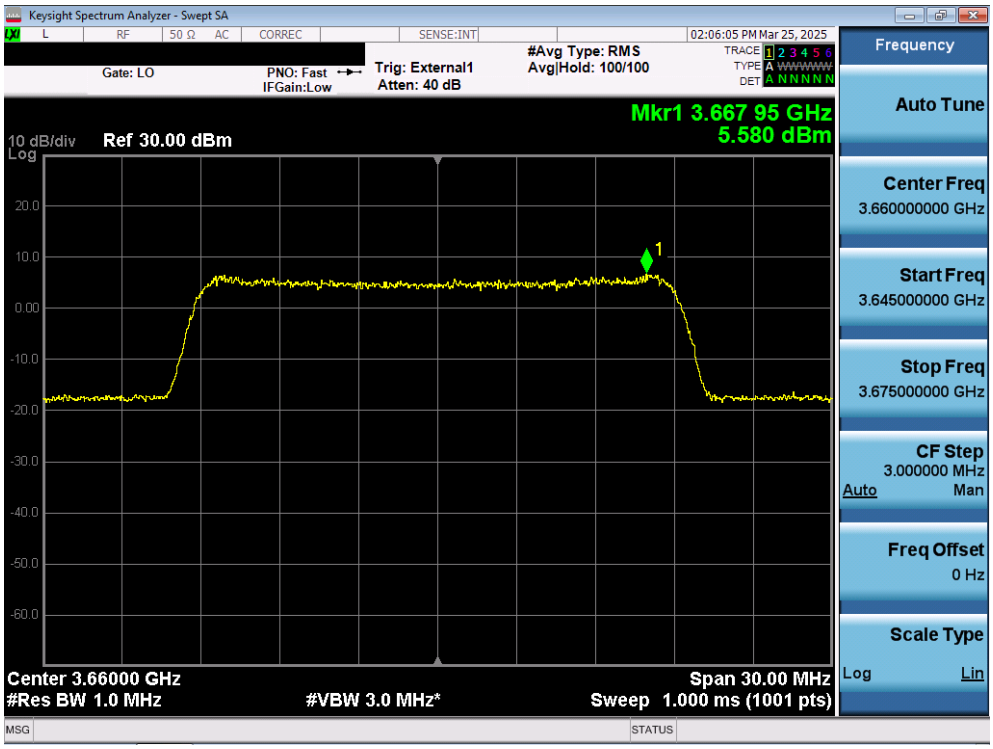
Table 7-1 RF Output Power Measurements (WINNF.PT.C.HBT.1)

Test Plots:

Plot 30. Conducted PSD, SAS Granted maxEIRP 8dBm/MHz



Plot 31. Conducted PSD, SAS Granted maxEIRP 7dBm/MHz



Plot 32. Conducted PSD, SAS Granted maxEIRP 6dBm/MHz

APPENDIX B – TEST LOGS

Logs are available upon request