



# PCTEST ENGINEERING LABORATORY, INC.

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## TEST REPORT CBSD-SAS Interoperability

**Applicant Name:**  
Council Rock Enterprises LLC  
11 Centre Park  
Rochester, NY 14614  
United States

**Date of Testing:**  
08/27/2021 – 10/19/2021  
**Test Site/Location:**  
PCTEST Lab. Columbia, MD, USA  
**Test Report Serial No.:**  
1M2108120093-01.2AL52

<b>FCC ID:</b>	<b>2AL52CR00LB18</b>
<b>APPLICANT:</b>	<b>Council Rock Enterprises LLC</b>

**Application Type:** Certification  
**Model:** CR00LB18  
**EUT Type:** Outdoor LTE Router  
**Frequency Range:** 3550 – 3700 MHz  
**FCC Classification:** Citizens Band Category B Devices (CBD)  
**FCC Rule Part(s):** Part 96  
**Test Procedure(s):** KDB 940660 D01 v02, KDB 940660 D02 v01, WINNF-TS-0122-V1.0.2, CBRSA-TS-9001 V.1.0.0, [WINNF-19-IN-00033] CBRS CPE-CBSD as UUT Test Guidelines Version V1.0

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.

  
Randy Ortanez  
President



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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 PCTEST Test Location

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046.

## 1.3 Test Facility / Accreditations

**Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.**

- PCTEST is a OnGo Alliance Approved Test Lab
- PCTEST is a WinnForum Approved Test Lab
- PCTEST is an ISO 17025-2005 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.
- PCTEST is an ISO 17025-2005 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.
- PCTEST 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).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

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## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Council Rock Enterprises LLC, Outdoor LTE Router FCC ID: 2AL52CR00LB18**. The test data contained in this report pertains only to CBSD-SAS interoperability. The EUT is not a Domain Proxy

**Test Device Serial Number(s):** 812157  
**Test Device Hardware Version:** 1.1  
**Test Device Software Version:** 2.5.2-CBSD

### 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	<input checked="" type="checkbox"/>
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.	<input type="checkbox"/>
C3	Mandatory for UUT which supports single-step registration containing CPI-signed data in the registration message.	<input type="checkbox"/>
C4	Mandatory for UUT which supports RECEIVED_POWER_WITHOUT_GRANT measurement report type.	<input type="checkbox"/>
C5	Mandatory for UUT which supports RECEIVED_POWER_WITH_GRANT measurement report type.	<input type="checkbox"/>
C6	Mandatory for UUT which supports parameter change being made at the UUT and prior to sending a deregistration	<input type="checkbox"/>

**Table 2-1. Conditional Features**

### 2.3 Test Configuration

Test configuration is setup per [WINNF-19-IN-00033] CBRS CPE-CBSD as UUT Test Guidelines Version V1.0. The EUT was connected to the SAS Test Harness developed by WINNF WG4-CBSD. The BTS-CBSD used is the Ruckus Q710 (FCC ID: S9GQ910US00). The latest version of the SAS Test Harness (V1.0.0.2) provided by CBRS Alliance was used for BTS-CBSD and CPE-CBSD. The SAS Test Harnesses are synchronized to UTC time.

### 2.4 Modifications

No modifications were made to EUT during testing.

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### 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	N9020A	MXA Spectrum Analyzer	2/24/2021	Annual	2/24/2022	MY48010233
Dell	Latitude 5580	Test Harness Laptop	N/A	N/A	N/A	N/A
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	2/10/2021	Annual	2/10/2022	161662
Tripplet	Isolatory 144	RF Isolation Chamber	N/A	N/A	N/A	N/A

**Table 3-1 Annual Test Equipment Calibration Schedule**

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## 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).

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## 5.0 EVALUATION PROCEDURE

The measurement procedure described in KDB 940660 D01 v01 and WINNF-TS-0122-V1.0.0 was used in the measurement of the EUT.

**Deviation from measurement procedure.....None**

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## 6.0 TEST SUMMARY

### 6.1 Summary

Company Name: Council Rock Enterprises LLC  
 FCC ID: 2AL52CR00LB18

**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.C.REG.1 WINNF.FT.C.REG.8 WINNF.FT.C.REG.10 WINNF.FT.C.REG.12 WINNF.FT.C.REG.14 WINNF.FT.C.REG.16 WINNF.FT.C.REG.18 WINNF.FT.C.GRA.1 WINNF.FT.C.GRA.2	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.C.REG.1 WINNF.FT.C.REG.8 WINNF.FT.C.REG.10 WINNF.FT.C.REG.12 WINNF.FT.C.REG.14 WINNF.FT.C.REG.16 WINNF.FT.C.REG.18	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.C.HBT.1	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	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.C.HBT.1	Pass
96.39(c)(2)	7	Confirm that the device transmits on the SAS specified frequency.	WINNF.FT.C.HBT.1	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.4 WINNF.FT.C.HBT.5 WINNF.FT.C.HBT.6 WINNF.FT.C.HBT.7 WINNF.FT.C.HBT.9 WINNF.FT.C.HBT.10 WINNF.FT.C.RLQ.1 WINNF.FT.C.DRG.1	Pass

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**Table 6-2. Summary of Test Results (continued)**

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 ( $\pm 50$ m) within the required time frame.	N/A	N/A
	12	For a device that operates as a Category A CBSD and then desires to operate as a Category B CBSD (or vice versa), confirm that it re-registers with the SAS for the updated authorization status.	N/A	Pass
96 E	13	When CBSDs communicate through a management system, confirm compliance with all requirements.	N/A	Pass
96.39	14	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

**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.
- The antenna RF output port was monitored during testing.
- Spectrum analyzer plots show that the device is transmitting on a channel used by or indicated by the BTS-CBSD after receiving an authorization signal from the BTS-CBSD.
- Please see Appendices for test data.

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## 7.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Council Rock Enterprises LLC, Outdoor LTE Router FCC ID: 2AL52CR00LB15** has been tested to show compliance with Part 96 and KDB 940660 D01 v01.

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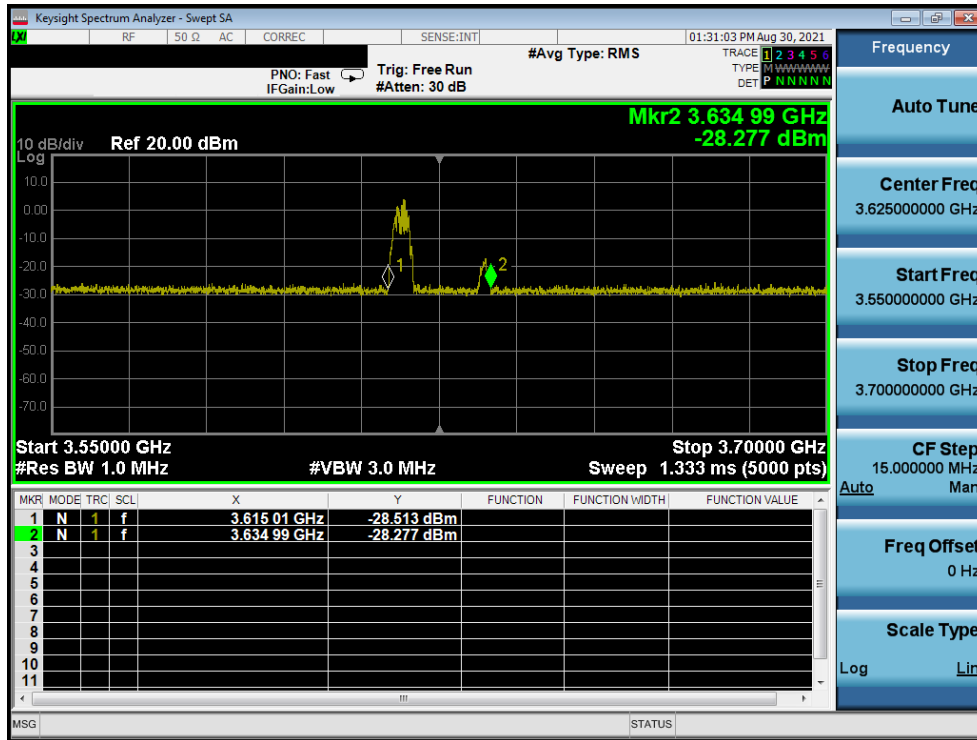
## APPENDIX A – TEST RESULT AND DATA

### A1 [WINNF.FT.C.REG.1] Multi-Step registration

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>• UUT has successfully completed SAS Discovery and Authentication with the SAS Test Harness</li> <li>• UUT is in the Unregistered state</li> </ul> CBSD sends correct Registration request information, as specified in [n.5], to the SAS Test Harness:	--	--
2	<ul style="list-style-type: none"> <li>• The required userId, fcId and cbsdSerialNumber registration parameters shall be sent from the CBSD and conform to proper format and acceptable ranges.</li> <li>• Any REG-conditional or optional registration parameters that may be included in the message shall be verified that they conform to proper format and are within acceptable ranges.</li> </ul> Note: It is outside the scope of this document to test the Registration information that is supplied via another means.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	<ul style="list-style-type: none"> <li>• SAS Test Harness sends a CBSD Registration Response as follows:               <ul style="list-style-type: none"> <li>- cbsdId = Ci</li> <li>- measReportConfig shall not be included</li> <li>- responseCode = 0</li> </ul> </li> </ul>	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none"> <li>• UUT shall not transmit RF</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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**Test Plots:**



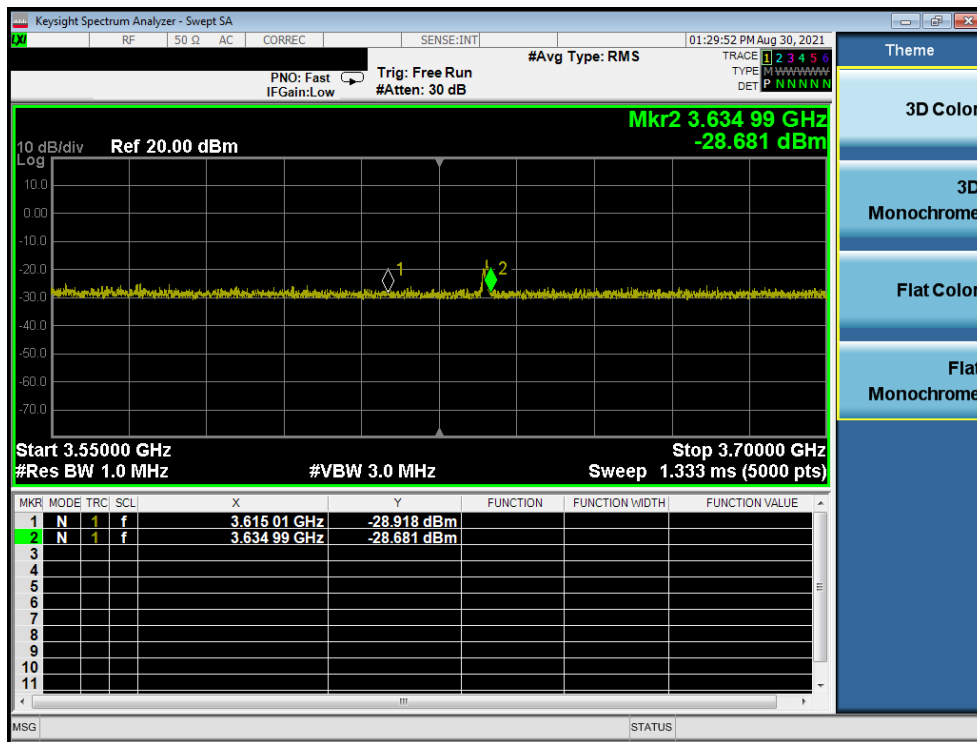
**Plot 1. Conducted Measurement – No RF transmission in entire band for 60s of elapsed time (WINNF.T.C.REG.1)**

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### A3 [WINNF.FT.C.REG.8] Missing Required parameters (responseCode 102)

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>• UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>• UUT is in the Unregistered state</li> </ul>	--	--
2	CBSD sends a Registration request to SAS Test Harness.	--	--
3	SAS Test Harness rejects the request by sending a CBSD Registration Response as follows: <ul style="list-style-type: none"> <li>- SAS response does not include cbsdId</li> <li>- responseCode = R</li> </ul>	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none"> <li>• UUT shall not transmit RF</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### Test Plots:



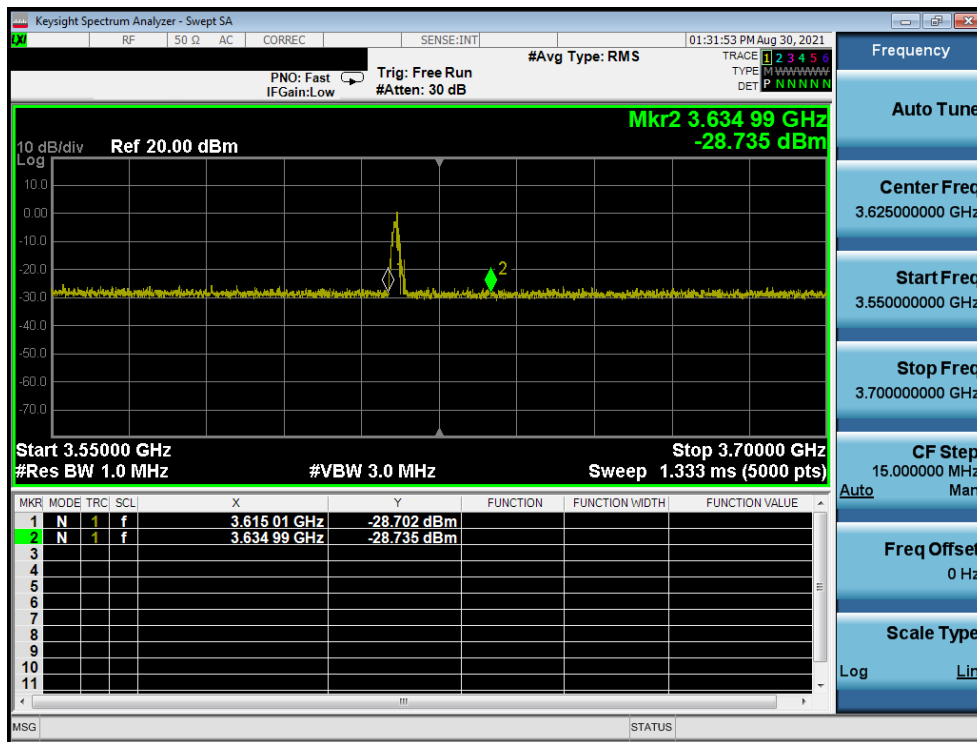
**Plot 2. Conducted Measurement – No RF transmission in entire band for 60s of elapsed time (WINNF.FT.C.REG.8)**

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### A4 [WINNF.FT.C.REG.10] Pending registration (responseCode 200)

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>• UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>• UUT is in the Unregistered state</li> </ul>	--	--
2	CBSD sends a Registration request to SAS Test Harness.	--	--
3	SAS Test Harness rejects the request by sending a CBSD Registration Response as follows: <ul style="list-style-type: none"> <li>- SAS response does not include cbsdId</li> <li>- responseCode = R</li> </ul>	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none"> <li>• UUT shall not transmit RF</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### Test Plots:



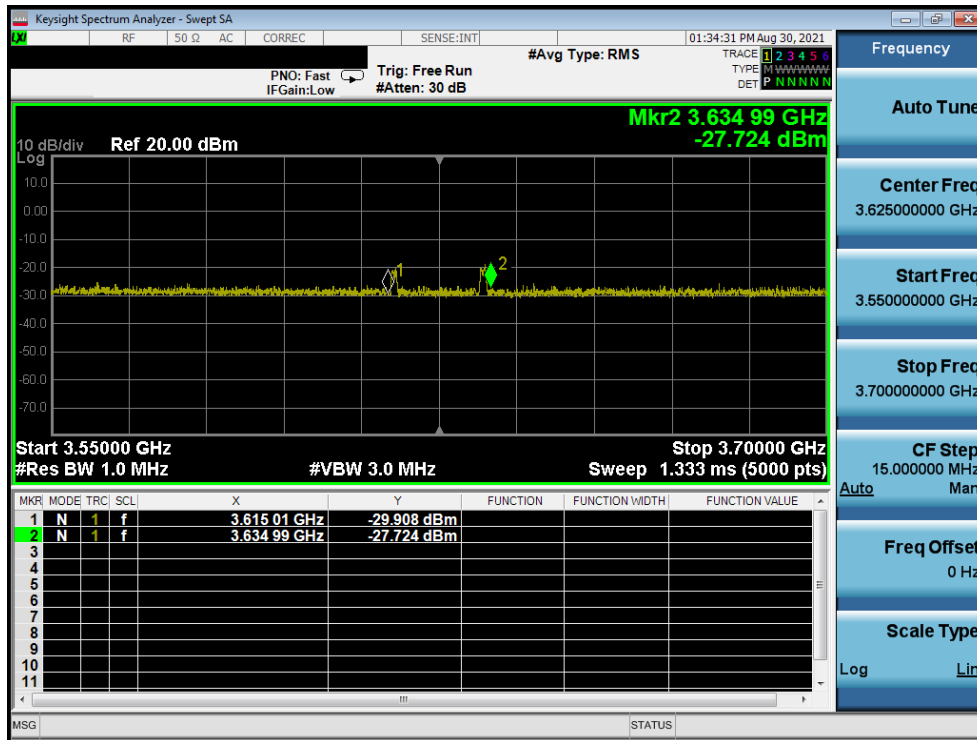
Plot 3. Conducted Measurement – No RF transmission in entire band for 60s of elapsed time (WINNF.FT.C.REG.10)

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### A5 [WINNF.FT.C.REG.12] Invalid parameter (responseCode 103)

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>• UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>• UUT is in the Unregistered state</li> </ul>	--	--
2	CBSD sends a Registration request to SAS Test Harness.	--	--
3	SAS Test Harness rejects the request by sending a CBSD Registration Response as follows: <ul style="list-style-type: none"> <li>- SAS response does not include cbsdId</li> <li>- responseCode = R</li> </ul>	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none"> <li>• UUT shall not transmit RF</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### Test Plots:



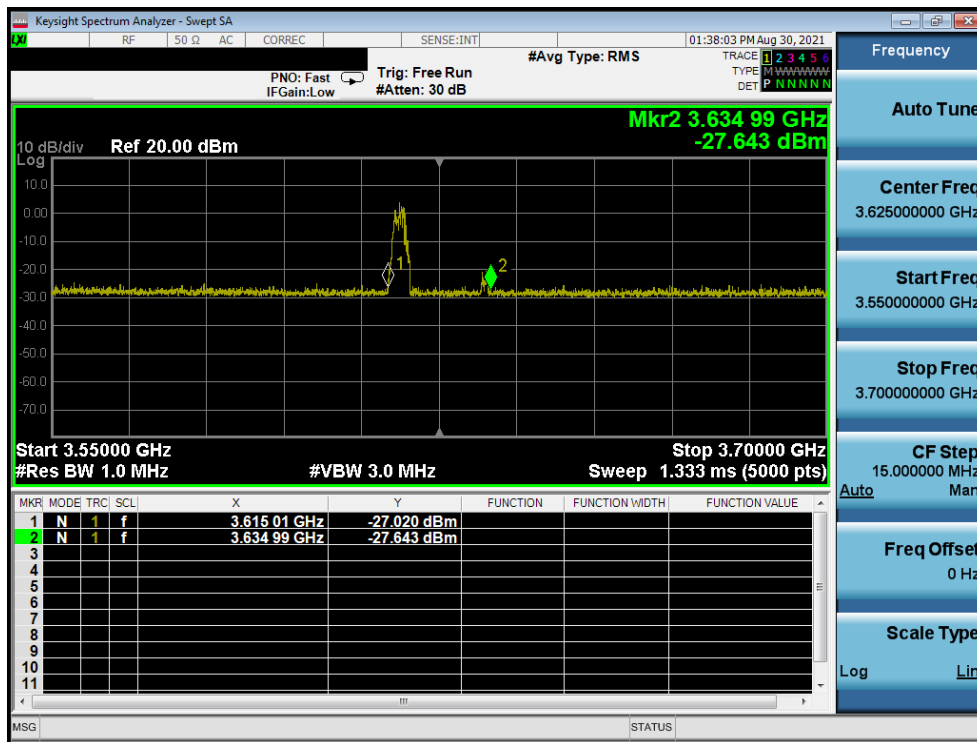
Plot 4. Conducted Measurement – No RF transmission in entire band for 60s of elapsed time (WINNF.FT.C.REG.12)

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### A6 [WINNF.FT.C.REG.14] Blacklisted CBSD (responseCode 101)

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>• UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>• UUT is in the Unregistered state</li> </ul>	--	--
2	CBSD sends a Registration request to SAS Test Harness.	--	--
3	SAS Test Harness rejects the request by sending a CBSD Registration Response as follows: <ul style="list-style-type: none"> <li>- SAS response does not include cbsdId</li> <li>- responseCode = R</li> </ul>	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none"> <li>• UUT shall not transmit RF</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### Test Plots:



Plot 5. Conducted Measurement – No RF transmission in entire band for 60s of elapsed time (WINNF.FT.C.REG.14)

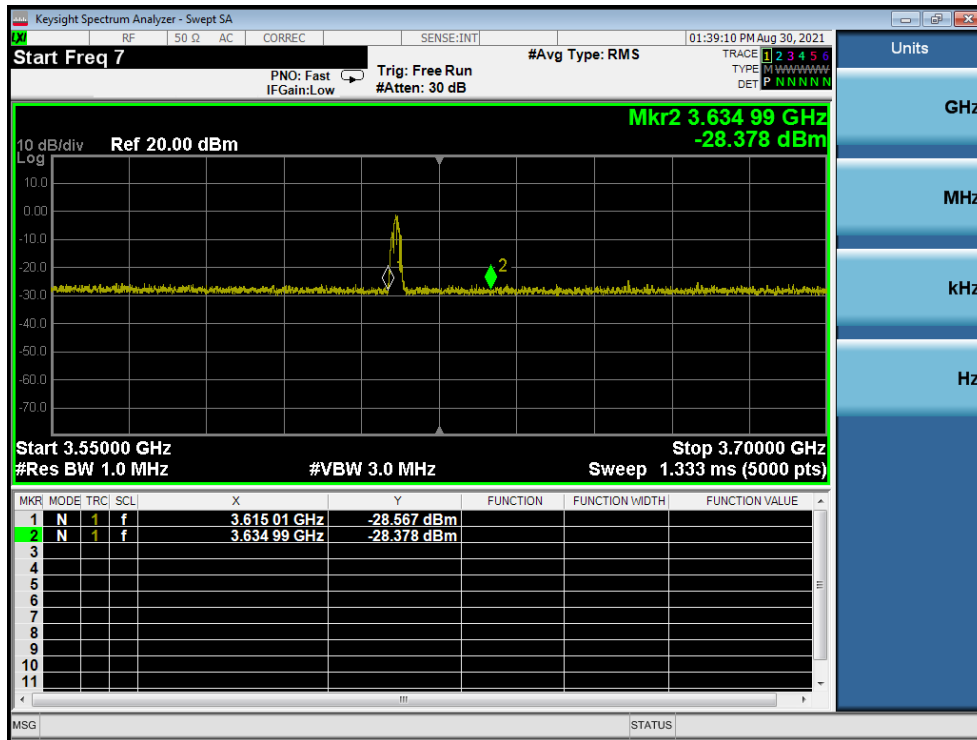
FCC ID: 2AL52CR00LB18		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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### A7 [WINNF.FT.C.REG.16] Unsupported SAS protocol version (responseCode 100)

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>• UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>• UUT is in the Unregistered state</li> </ul>	--	--
2	CBSD sends a Registration request to SAS Test Harness.	--	--
3	SAS Test Harness rejects the request by sending a CBSD Registration Response as follows: <ul style="list-style-type: none"> <li>- SAS response does not include cbsdId</li> <li>- responseCode = R</li> </ul>	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none"> <li>• UUT shall not transmit RF</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### Test Plots:



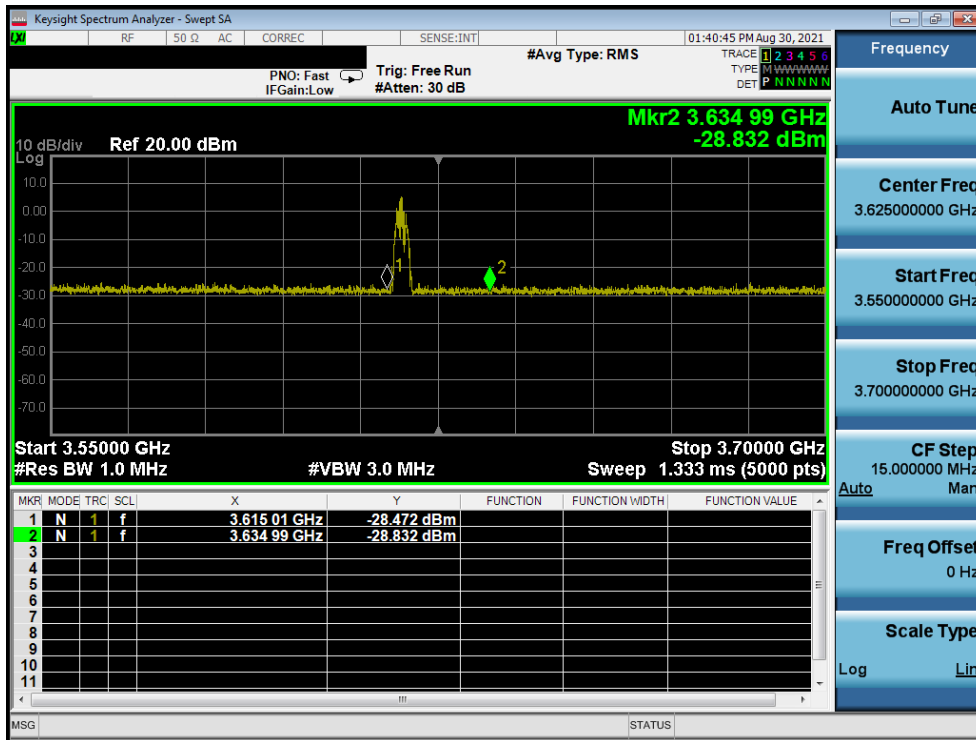
**Plot 6. Conducted Measurement – No RF transmission in entire band for 60s of elapsed time (WINNF.FT.C.REG.16)**

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### A8 [WINNF.FT.C.REG.18] Group Error (responseCode 201)

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>• UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>• UUT is in the Unregistered state</li> </ul>	--	--
2	CBSD sends a Registration request to SAS Test Harness.	--	--
3	SAS Test Harness rejects the request by sending a CBSD Registration Response as follows: <ul style="list-style-type: none"> <li>- SAS response does not include cbsdId</li> <li>- responseCode = R</li> </ul>	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none"> <li>• UUT shall not transmit RF</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### Test Plots:



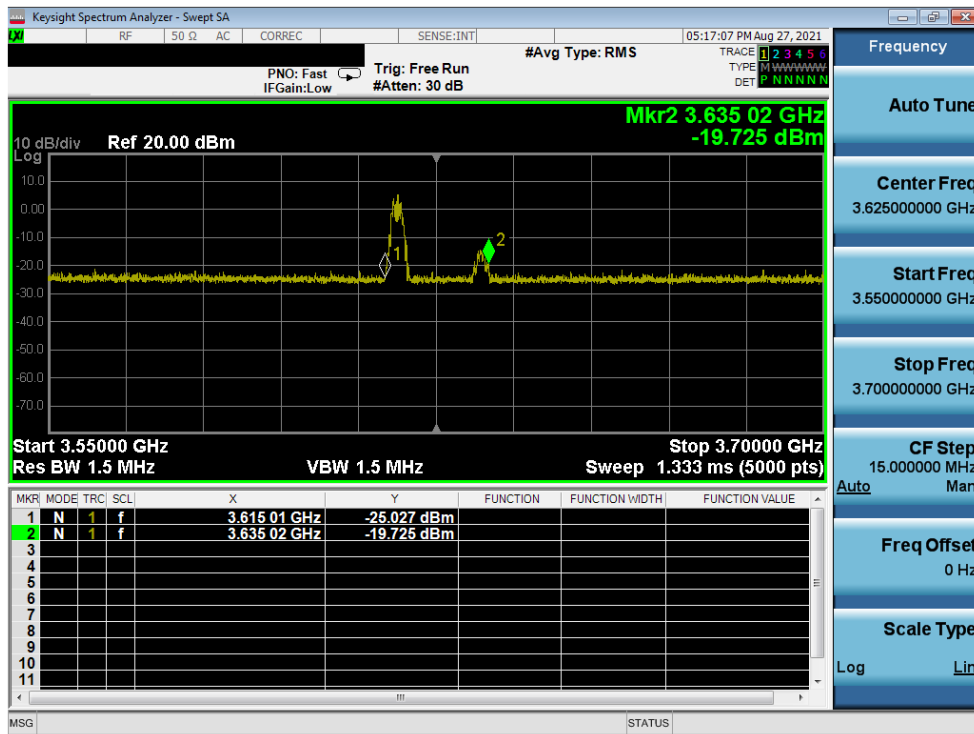
Plot 7. Conducted Measurement – No RF transmission in entire band for 60s of elapsed time (WINNF.FT.C.REG.18)

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### A9 [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	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### Test Plots:



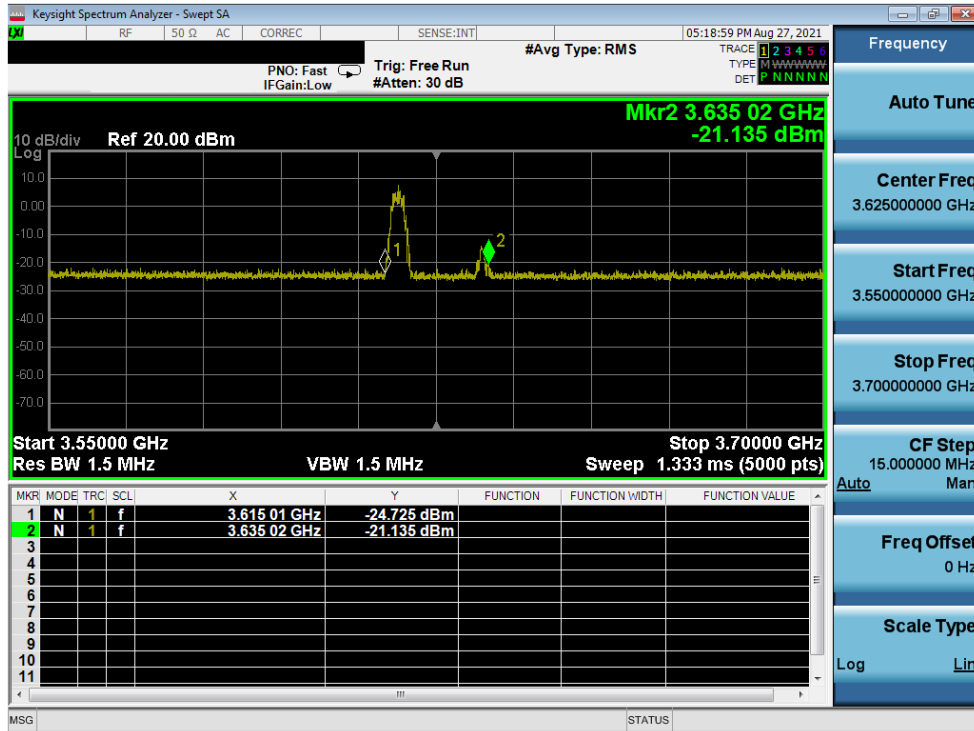
**Plot 8. Conducted Measurement – No RF transmission in entire band for 60s of elapsed time (WINNF.FT.C.GRA.1)**

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**A10 [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	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Test Plots:**



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

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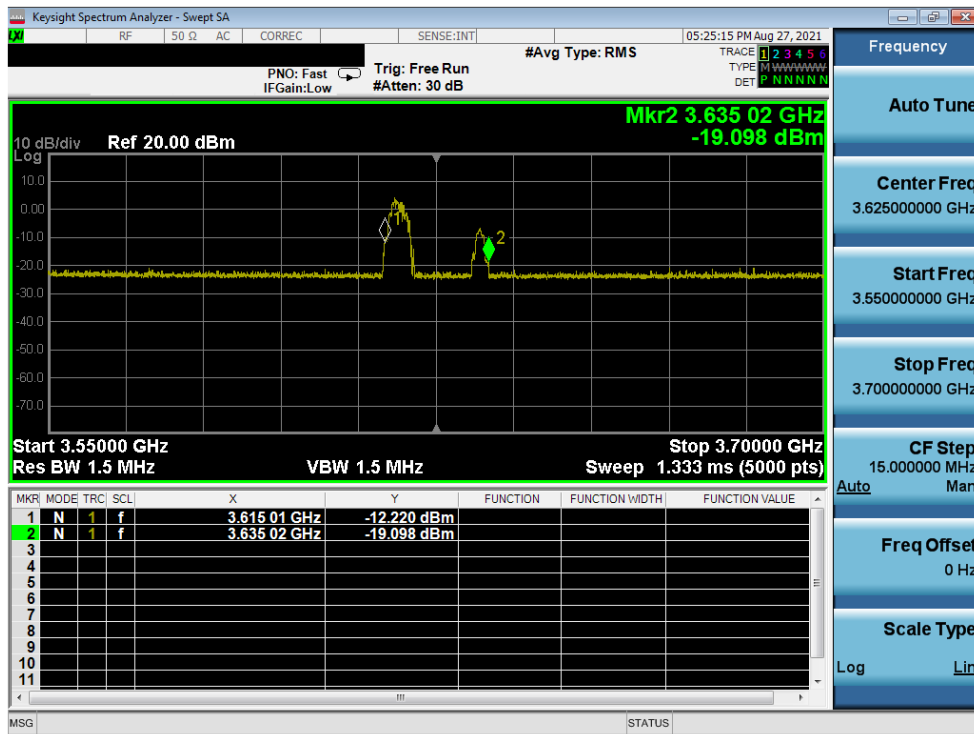
### A11 [WINNF.FT.C.HBT.1] Heartbeat Success Case (first Heartbeat Response)

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: • UUT has registered successfully with SAS Test Harness, 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	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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"	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8	SAS Test Harness sends a Heartbeat Response message, with the following parameters: • cbsdId = C • grantId = G • transmitExpireTime = current UTC time + 200 seconds • responseCode = 0	--	--
9	For further Heartbeat Request messages sent from UUT after completion of step 8, validate message is sent within latest specified heartbeatInterval, and: • cbsdId = C • grantId = G • operationState = "AUTHORIZED" and SAS Test Harness responds with a Heartbeat Response message including the following parameters:	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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	<ul style="list-style-type: none"> <li>• cbsId = C</li> <li>• grantId = G</li> <li>• transmitExpireTime = current UTC time + 200 seconds</li> <li>• responseCode = 0</li> </ul>		
10	<p>Monitor the RF output of the UUT from start of test until UUT transmission commences. Verify:</p> <ul style="list-style-type: none"> <li>• UUT does not transmit at any time prior to completion of the first heartbeat response</li> <li>• UUT transmits after step 8 is complete, and its transmission is limited to within the bandwidth range F</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### Test Plots:



**Plot 10. Conducted Measurement – UUT RF transmission range and bandwidths are less or equal to the frequency range and bandwidth of compatible BTS-CBSD (WINNF.FT.C.HBT.1)**

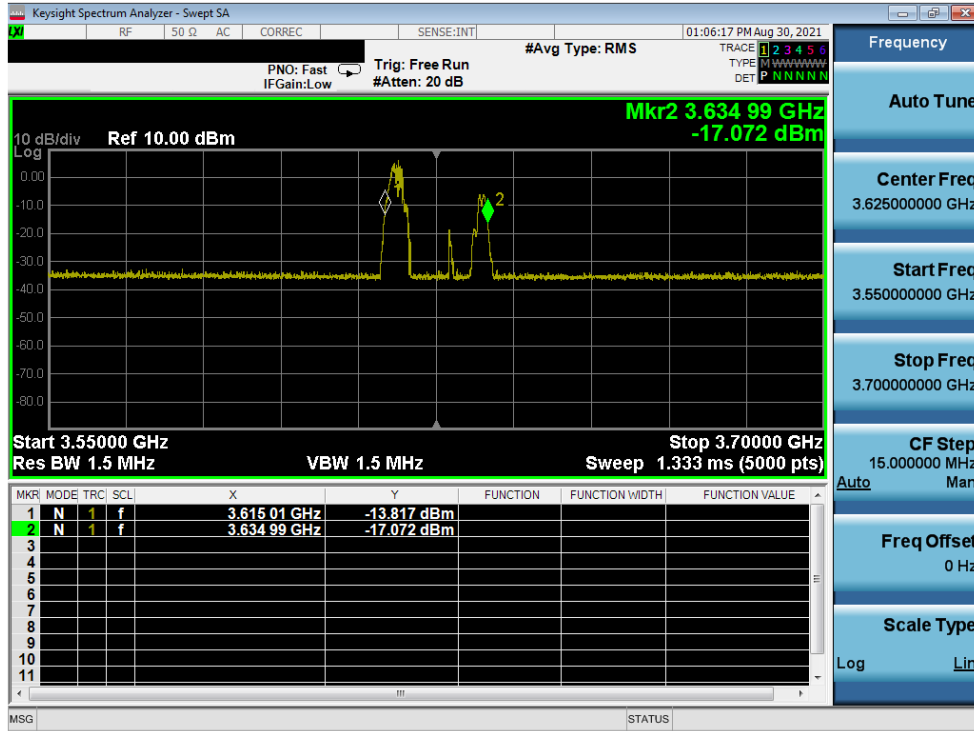
FCC ID: 2AL52CR00LB18			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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**A12 [WINNF.FT.C.HBT.3] Heartbeat responseCode=105 (DEREGISTER)**

	<b>Test Execution Steps</b>	<b>PASS</b>	<b>FAIL</b>
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>• UUT has registered successfully with SAS Test Harness</li> <li>• UUT has a valid single grant as follows:               <ul style="list-style-type: none"> <li>o valid cbsdId = C</li> <li>o valid grantId = G</li> <li>o grant is for frequency range F, power P</li> <li>o grantExpireTime = UTC time greater than duration of the test</li> </ul> </li> <li>• UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface</li> </ul>	--	--
2	UUT sends a Heartbeat Request message. Ensure Heartbeat Request message is sent within Heartbeat Interval specified in the latest Heartbeat Response, and formatted correctly, including: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• operationState = "AUTHORIZED"</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	SAS Test Harness sends a Heartbeat Response message, including the following parameters: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• transmitExpireTime = T = Current UTC time</li> <li>• responseCode = 105 (DEREGISTER)</li> </ul>	--	--
4	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.	--	--
5	Monitor the RF output of the UUT. Verify: <ul style="list-style-type: none"> <li>• UUT shall stop transmission within (T + 60 seconds) of completion of step 3</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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**Test Plots:**



**Plot 11. Conducted Measurement - UUT RF transmission range and bandwidths are less or equal to frequency range and bandwidth of compatible BTS-CBSD (WINNF.FT.C.HBT.3)**

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**A13 [WINNF.FT.C.HBT.4] Heartbeat responseCode=500 (TERMINATED\_GRANT)**

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>• UUT has registered successfully with SAS Test Harness</li> <li>• UUT has a valid single grant as follows:               <ul style="list-style-type: none"> <li>o valid cbsdId = C</li> <li>o valid grantId = G</li> <li>o grant is for frequency range F, power P</li> <li>o grantExpireTime = UTC time greater than duration of the test</li> </ul> </li> <li>• UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface</li> </ul>	--	--
2	UUT sends a Heartbeat Request message. Ensure Heartbeat Request message is sent within Heartbeat Interval specified in the latest Heartbeat Response, and formatted correctly, including: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• operationState = "AUTHORIZED"</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	SAS Test Harness sends a Heartbeat Response message, including the following parameters: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• transmitExpireTime = T = Current UTC time</li> <li>• responseCode = 500 (TERMINATED_GRANT)</li> </ul>	--	--
4	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.	--	--
5	Monitor the RF output of the UUT. Verify: <ul style="list-style-type: none"> <li>• UUT shall stop transmission within (T + 60 seconds) of completion of step 3</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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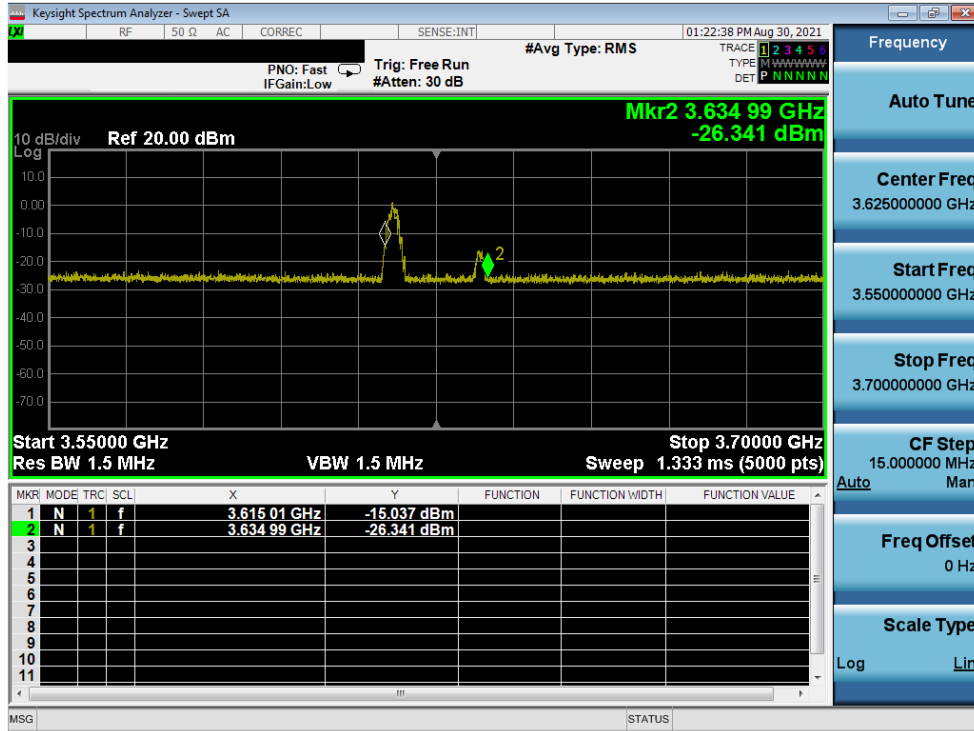


**A14 [WINNF.FT.C.HBT.5] Heartbeat responseCode=501 (SUSPENDED\_GRANT) in First Heartbeat Response**

	Test Execution Steps	PASS	FAIL
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>• UUT has registered successfully with SAS Test Harness</li> <li>• UUT has a valid single grant as follows: <ul style="list-style-type: none"> <li>o valid cbsdId = C</li> <li>o valid grantId = G</li> <li>o grant is for frequency range F, power P</li> <li>o grantExpireTime = UTC time greater than duration of the test</li> </ul> </li> <li>• UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface</li> </ul>	--	--
2	<p>UUT sends a Heartbeat Request message.</p> <p>Ensure Heartbeat Request message is sent within Heartbeat Interval specified in the latest Heartbeat Response, and formatted correctly, including:</p> <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• operationState = "GRANTED"</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	<p>SAS Test Harness sends a Heartbeat Response message, including the following parameters:</p> <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• transmitExpireTime = T = Current UTC time</li> <li>• responseCode = 501 (SUSPENDED_GRANT)</li> </ul>	--	--
4	<p>After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.</p>	--	--
5	<p>Monitor the SAS-CBSD interface. Verify either A OR B occurs:</p> <p>A. UUT sends a Heartbeat Request message. Ensure message is sent within latest specified heartbeatInterval, and is correctly formatted with parameters:</p> <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• operationState = "GRANTED"</li> </ul> <p>B. UUT sends a Relinquishment request message. Ensure message is correctly formatted with parameters:</p> <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> </ul> <p>Monitor the RF output of the UUT. Verify:</p> <ul style="list-style-type: none"> <li>• UUT does not transmit at any time</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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**Test Plots:**



**Plot 13. Conducted Measurement – UUT RF transmission range and bandwidths are less or equal to frequency range and bandwidth of compatible BTS-CBSD (WINNF.FT.C.HBT.5)**

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**A15 [WINNF.FT.C.HBT.6] Heartbeat responseCode=501 (SUSPENDED\_GRANT) in Subsequent Heartbeat Response**

	Test Execution Steps	PASS	FAIL
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>• UUT has registered successfully with SAS Test Harness</li> <li>• UUT has a valid single grant as follows: <ul style="list-style-type: none"> <li>o valid cbsdId = C</li> <li>o valid grantId = G</li> <li>o grant is for frequency range F, power P</li> <li>o grantExpireTime = UTC time greater than duration of the test</li> </ul> </li> <li>• UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface</li> </ul>	--	--
2	<p>UUT sends a Heartbeat Request message. Ensure Heartbeat Request message is sent within Heartbeat Interval specified in the latest Heartbeat Response, and formatted correctly, including:</p> <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• operationState = "AUTHORIZED"</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	<p>SAS Test Harness sends a Heartbeat Response message, including the following parameters:</p> <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• transmitExpireTime = T = Current UTC time</li> <li>• responseCode = 501 (SUSPENDED_GRANT)</li> </ul>	--	--
4	<p>After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.</p>	--	--
5	<p>Monitor the SAS-CBSD interface. Verify either A OR B occurs:</p> <p>A. UUT sends a Heartbeat Request message. Ensure message is sent within latest specified heartbeatInterval, and is correctly formatted with parameters:</p> <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• operationState = "GRANTED"</li> </ul> <p>B. UUT sends a Relinquishment request message. Ensure message is correctly formatted with parameters:</p> <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> </ul> <p>Monitor the RF output of the UUT. Verify:</p> <ul style="list-style-type: none"> <li>• UUT shall stop transmission within (T + 60 seconds) of completion of step 3</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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A16 [WINNF.FT.C.HBT.7] Heartbeat responseCode=502 (UNSYNC\_OP\_PARAM)

	Test Execution Steps	PASS	FAIL
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>• UUT has registered successfully with SAS Test Harness</li> <li>• UUT has a valid single grant as follows: <ul style="list-style-type: none"> <li>o valid cbsdId = C</li> <li>o valid grantId = G</li> <li>o grant is for frequency range F, power P</li> <li>o grantExpireTime = UTC time greater than duration of the test</li> </ul> </li> <li>• UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface</li> </ul>	--	--
2	<p>UUT sends a Heartbeat Request message.</p> <p>Ensure Heartbeat Request message is sent within Heartbeat Interval specified in the latest Heartbeat Response, and formatted correctly, including:</p> <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• operationState = "AUTHORIZED"</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	<p>SAS Test Harness sends a Heartbeat Response message, including the following parameters:</p> <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• transmitExpireTime = T = Current UTC time</li> <li>• responseCode = 502 (UNSYNC_OP_PARAM)</li> </ul>	--	--
4	<p>After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.</p>	--	--
5	<p>Monitor the SAS-CBSD interface. Verify:</p> <ul style="list-style-type: none"> <li>• UUT sends a Grant Relinquishment Request message. Verify message is correctly formatted with parameters: <ul style="list-style-type: none"> <li>o cbsdId = C</li> <li>o grantId = G</li> </ul> </li> </ul> <p>Monitor the RF output of the UUT. Verify:</p> <ul style="list-style-type: none"> <li>• UUT shall stop transmission within (T+60) seconds of completion of step 3.</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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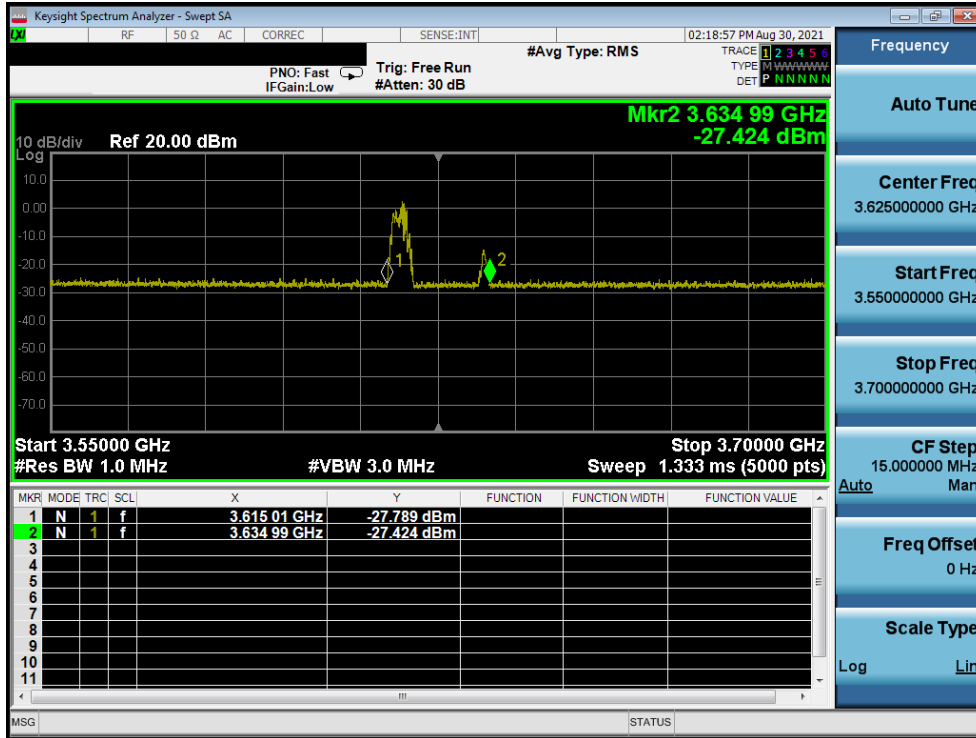


### A17 [WINNF.FT.C.HBT.9] Heartbeat Response Absent (First Heartbeat)

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>• UUT has registered successfully with SAS Test Harness</li> <li>• UUT has a valid single grant as follows:               <ul style="list-style-type: none"> <li>o valid cbsdId = C</li> <li>o valid grantId = G</li> <li>o grant is for frequency range F, power P</li> <li>o grantExpireTime = UTC time greater than duration of the test</li> </ul> </li> <li>• UUT is in GRANTED, but not AUTHORIZED state (i.e. has not performed its first Heartbeat Request)</li> </ul>	--	--
2	UUT sends a Heartbeat Request message. Ensure Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• operationState = "GRANTED"</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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: <ul style="list-style-type: none"> <li>• At any time during the test, UUT shall not transmit on RF interface</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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**Test Plots:**



**Plot 16. Conducted Measurement – UUT RF transmission range and bandwidths are less or equal to frequency range and bandwidth of compatible BTS-CBSD (WINNF.FT.C.HBT.9)**

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### A18 [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: <ul style="list-style-type: none"> <li>• UUT has registered successfully with SAS Test Harness</li> <li>• UUT has a valid single grant as follows:               <ul style="list-style-type: none"> <li>o valid cbsdId = C</li> <li>o valid grantId = G</li> <li>o grant is for frequency range F, power P</li> <li>o grantExpireTime = UTC time greater than duration of the test</li> </ul> </li> <li>• UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface</li> </ul>	--	--
2	UUT sends a Heartbeat Request message. Verify Heartbeat Request message is sent within the latest specified heartbeatInterval, and is formatted correctly, including: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• operationState = "AUTHORIZED"</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	SAS Test Harness sends a Heartbeat Response message, including the following parameters: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• transmitExpireTime = current UTC time + 200 seconds</li> <li>• responseCode = 0</li> </ul>	--	--
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: <ul style="list-style-type: none"> <li>• UUT shall stop all transmission on RF interface within (transmitExpireTime + 60 seconds), using the transmitExpireTime sent in Step 3.</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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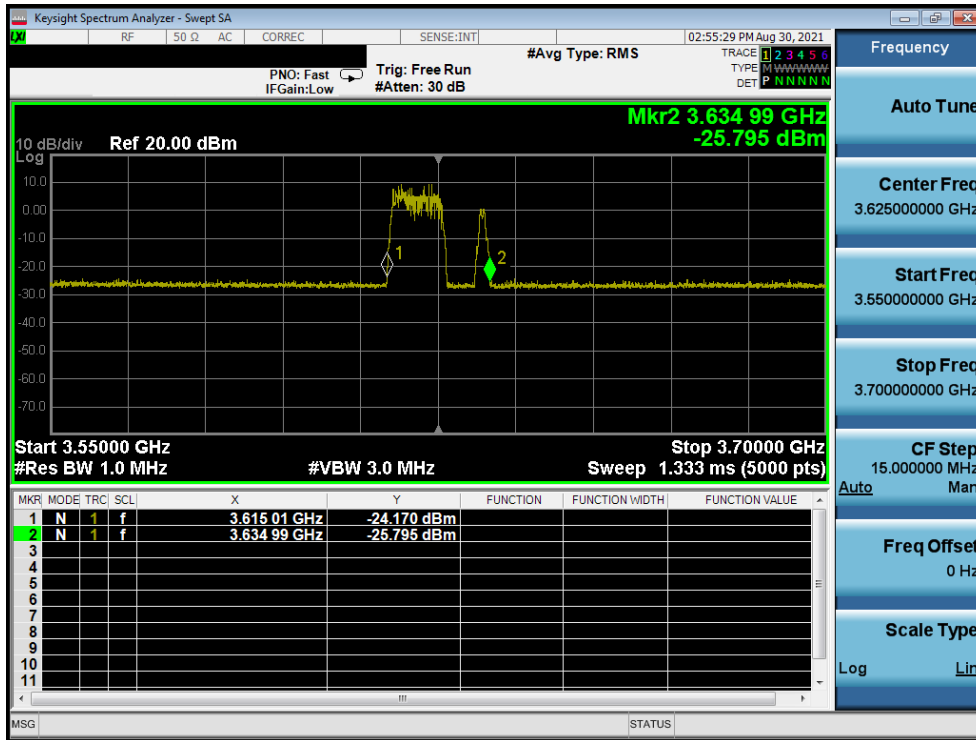


### A19 [WINNF.FT.C.RLQ.1] Successful Relinquishment

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>• UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>• UUT has successfully registered with SAS Test Harness, with cbsdId=C</li> <li>• UUT has received a valid grant with grantId = G</li> <li>• UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant.</li> </ul> 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: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	SAS Test Harness shall approve the request with a Relinquishment Response message with parameters: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• responseCode = 0</li> </ul>	--	--
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: <ul style="list-style-type: none"> <li>• UUT shall stop RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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**Test Plots:**



**Plot 18. Conducted Measurement - UUT RF transmission range and bandwidths are less or equal to frequency range and bandwidth of compatible BTS-CBSD (WINNF.FT.C.RLQ.1)**

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**A20 [WINNF.FT.C.DRG.1] Successful Deregistration**

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>• UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>• UUT has successfully registered with SAS Test Harness, with cbsdId=C</li> <li>• UUT has received a valid grant with grantId = G</li> <li>• UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant.</li> </ul> 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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	SAS Test Harness shall approve the request with a Deregistration Response message with parameters: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• responseCode = 0</li> </ul>	--	--
5	After completion of step 3, SAS Test Harness will not provide any additional positive response (responseCode=0) to further request messages from the UUT	--	--
6	Monitor the RF output of the UUT from start of test until 60 seconds after Step 4 is complete. This is the end of the test. Verify: <ul style="list-style-type: none"> <li>• UUT stopped RF transmission at any time between triggering the deregistration and either A OR B occurs:               <ul style="list-style-type: none"> <li>A. UUT sending a Registration Request message, as this is not mandatory</li> <li>B. UUT sending a Deregistration Request message</li> </ul> </li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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**Test Plots:**




**Plot 19. Conducted Measurement - UUT RF transmission range and bandwidths are less or equal to frequency range and bandwidth of compatible BTS-CBSD (WINNF.FT.C.DRG.1)**

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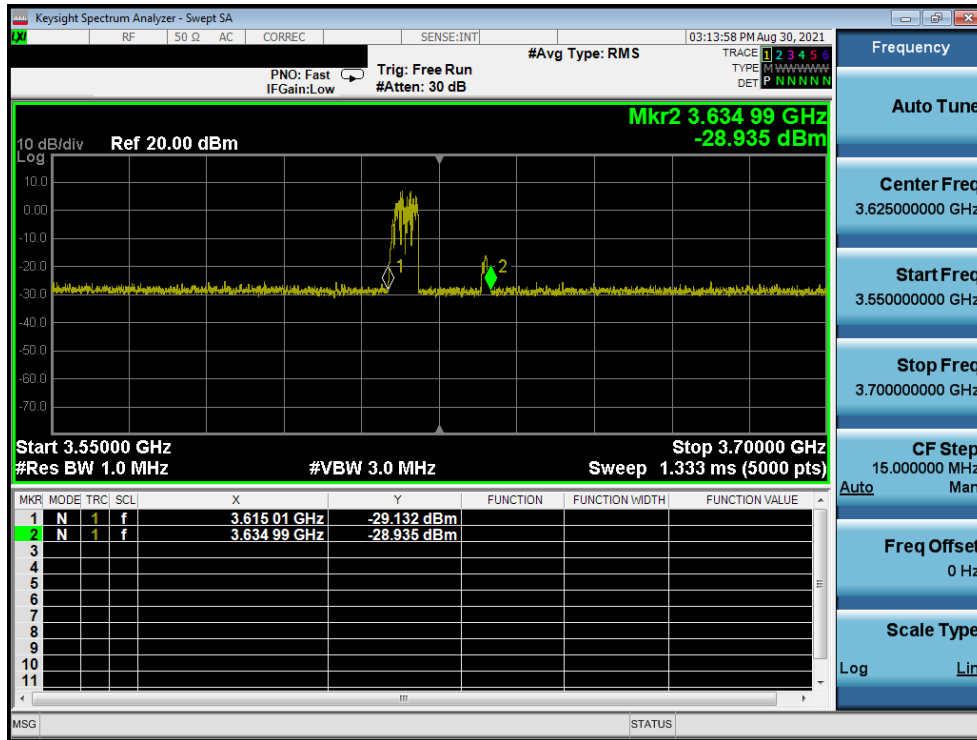


**A21 [WINNF.FT.C.SCS.1] Successful TLS connection between UUT and SAS Test Harness**

	Test Execution Steps	PASS	FAIL
1	<ul style="list-style-type: none"> <li>• UUT shall start CBSD-SAS communication with the security procedure</li> <li>• The UUT shall establish a TLS handshake with the SAS Test Harness using configured certificate.</li> <li>• Configure the SAS Test Harness to accept the security procedure and establish the connection</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	<ul style="list-style-type: none"> <li>• Make sure that Mutual authentication happens between UUT and the SAS Test Harness.</li> <li>• Make sure that UUT uses TLS v1.2</li> <li>• Make sure that cipher suites from one of the following is selected,</li> <li>• TLS_RSA_WITH_AES_128_GCM_SHA256</li> <li>• TLS_RSA_WITH_AES_256_GCM_SHA384</li> <li>• TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256</li> <li>• TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384</li> <li>• TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	<p>A successful registration is accomplished using one of the test cases described in section 6.1.4.1, depending on CBSD capability.</p> <ul style="list-style-type: none"> <li>• UUT sends a registration request to the SAS Test Harness and the SAS Test Harness sends a Registration Response with responseCode = 0 and cbsdId.</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	<p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none"> <li>• UUT shall not transmit RF</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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### Test Plots:



Plot 20. Conducted Measurement – UUT RF transmission range and bandwidths are less or equal to frequency range and bandwidth of compatible BTS-CBSD (WINNF.FT.C.SCS.1)

No.	Time	Source	Destination	Protocol	Length	Info
77	2021-08-30 19:09:45.538284	35.237.131.87	173.59.230.213	TLSv1.2		571 Client Hello
78	2021-08-30 19:09:45.563166	173.59.230.213	35.237.131.87	TLSv1.2		3268 Server: Hello, Certificate, Server Key Exchange, Certificate Request, Server Hello Done
80	2021-08-30 19:09:45.674910	35.237.131.87	173.59.230.213	TCP	60	60640 → 443 [ACK] Seq=518 Ack=1301 Win=30592 Len=0
81	2021-08-30 19:09:45.683674	35.237.131.87	173.59.230.213	TCP	60	60640 → 443 [ACK] Seq=518 Ack=2601 Win=33408 Len=0
82	2021-08-30 19:09:45.683675	35.237.131.87	173.59.230.213	TCP	60	60640 → 443 [ACK] Seq=518 Ack=3215 Win=35968 Len=0
84	2021-08-30 19:09:45.720871	35.237.131.87	173.59.230.213	TCP	1354	60640 → 443 [ACK] Seq=518 Ack=3215 Win=35968 Len=1300 [TCP segment of a reassembled PDU]
85	2021-08-30 19:09:45.720872	35.237.131.87	173.59.230.213	TCP	1354	60640 → 443 [ACK] Seq=1218 Ack=3215 Win=35968 Len=1300 [TCP segment of a reassembled PDU]
86	2021-08-30 19:09:45.720873	35.237.131.87	173.59.230.213	TLSv1.2	613	Certificate, Client Key Exchange, Certificate Verify, Change Cipher Spec, Encrypted Handshake Message
87	2021-08-30 19:09:45.720944	173.59.230.213	35.237.131.87	TCP	54	443 → 60640 [ACK] Seq=3215 Ack=3677 Win=262400 Len=0
88	2021-08-30 19:09:45.727737	173.59.230.213	35.237.131.87	TLSv1.2	1576	New Session Ticket, Change Cipher Spec, Encrypted Handshake Message
90	2021-08-30 19:09:45.829066	35.237.131.87	173.59.230.213	TCP	60	60640 → 443 [ACK] Seq=3677 Ack=4515 Win=30784 Len=0
91	2021-08-30 19:09:45.838221	35.237.131.87	173.59.230.213	TCP	60	60640 → 443 [ACK] Seq=3677 Ack=4737 Win=41344 Len=0
92	2021-08-30 19:09:45.847373	35.237.131.87	173.59.230.213	TLSv1.2	313	Application Data
93	2021-08-30 19:09:45.847374	35.237.131.87	173.59.230.213	TLSv1.2	230	Application Data
94	2021-08-30 19:09:45.847446	173.59.230.213	35.237.131.87	TCP	54	443 → 60640 [ACK] Seq=4737 Ack=4112 Win=262144 Len=0
95	2021-08-30 19:09:45.849408	173.59.230.213	35.237.131.87	TLSv1.2	100	Application Data
96	2021-08-30 19:09:45.993460	35.237.131.87	173.59.230.213	TCP	60	60640 → 443 [ACK] Seq=4112 Ack=4783 Win=41344 Len=0
97	2021-08-30 19:09:45.993520	173.59.230.213	35.237.131.87	TLSv1.2	791	Application Data, Application Data, Application Data, Application Data, Application Data, Application Data, Application Data
98	2021-08-30 19:09:46.094305	35.237.131.87	173.59.230.213	TCP	60	60640 → 443 [ACK] Seq=4112 Ack=5520 Win=44032 Len=0
99	2021-08-30 19:09:46.103269	35.237.131.87	173.59.230.213	TCP	60	60640 → 443 [FIN, ACK] Seq=4112 Ack=5520 Win=44032 Len=0
100	2021-08-30 19:09:46.103349	173.59.230.213	35.237.131.87	TCP	54	443 → 60640 [ACK] Seq=5520 Ack=4113 Win=262144 Len=0
101	2021-08-30 19:09:46.103640	173.59.230.213	35.237.131.87	TCP	54	443 → 60640 [FIN, ACK] Seq=5520 Ack=4113 Win=262144 Len=0
102	2021-08-30 19:09:46.212067	35.237.131.87	173.59.230.213	TCP	60	60640 → 443 [ACK] Seq=4113 Ack=5521 Win=44032 Len=0
103	2021-08-30 19:09:46.304523	35.237.131.87	173.59.230.213	TCP	74	60642 → 443 [SYN] Seq=0 Win=27800 Len=0 MSS=1308 SACK_PERM=1 TSval=1445030514 TSecr=0 WS=128
104	2021-08-30 19:09:46.304636	173.59.230.213	35.237.131.87	TCP	66	443 → 60642 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM=1
105	2021-08-30 19:09:46.414877	35.237.131.87	173.59.230.213	TCP	60	60642 → 443 [ACK] Seq=1 Ack=1 Win=27904 Len=0

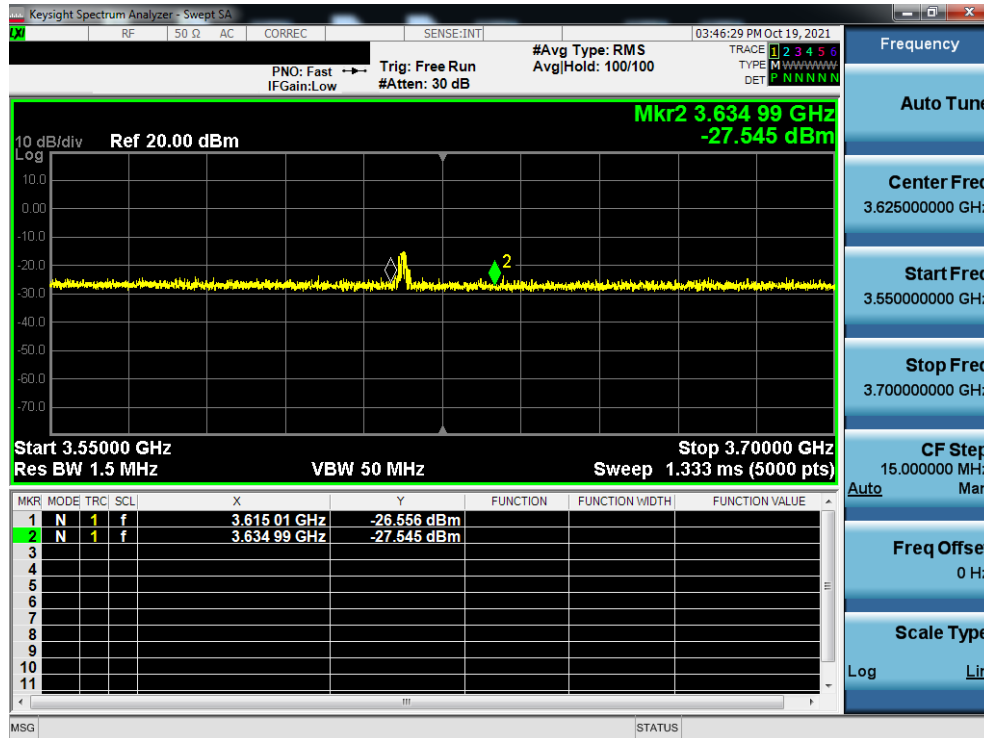
Plot 21. WireShark Screenshot (WINNF.FT.C.SCS.1)

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## A22 [WINNF.FT.C.SCS.2] TLS failure due to revoked certificate

	Test Execution Steps	PASS	FAIL
1	<ul style="list-style-type: none"> <li>UUT shall start CBSD-SAS communication with the security procedure</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	<ul style="list-style-type: none"> <li>Make sure that UUT uses TLS v1.2 for security establishment.</li> <li>Make sure UUT selects the correct cipher suite.</li> <li>UUT shall use CRL or OCSP to verify the validity of the server certificate.</li> <li>Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	UUT may retry for the security procedure which shall fail	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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: <ul style="list-style-type: none"> <li>UUT shall not transmit RF</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### Test Plots:



Plot 22. Conducted Measurement – UUT RF transmission range and bandwidths are less than or equal to frequency range and bandwidth of compatible BTS-CBSD (WINNF.FT.C.SCS.2)

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\*Ethernet (Not Responding)

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

ip.addr == 35.237.131.87

No.	Time	Source	Destination	Protocol	Length	Info
26	2021-10-19 19:36:21.145064	35.237.131.87	173.59.230.213	TCP	74	44816 → 5000 [SYN] Seq=0 Win=27800 Len=0 MSS=1300 SACK_PERM=1 TSval=541271696 TSecr=0 WS=128
27	2021-10-19 19:36:21.145156	173.59.230.213	35.237.131.87	TCP	60	5000 → 44816 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM=1
29	2021-10-19 19:36:21.235726	35.237.131.87	173.59.230.213	TCP	60	44816 → 5000 [ACK] Seq=1 Ack=1 Win=27904 Len=0
30	2021-10-19 19:36:21.243229	35.237.131.87	173.59.230.213	TLV1.2	571	Client Hello
31	2021-10-19 19:36:21.253500	173.59.230.213	35.237.131.87	TLV1.2	3535	Server Hello, Certificate, Server Key Exchange, Certificate Request, Server Hello Done
32	2021-10-19 19:36:21.354256	35.237.131.87	173.59.230.213	TCP	60	44816 → 5000 [ACK] Seq=518 Ack=1301 Win=30592 Len=0
33	2021-10-19 19:36:21.360926	35.237.131.87	173.59.230.213	TCP	60	44816 → 5000 [ACK] Seq=518 Ack=2601 Win=33400 Len=0
34	2021-10-19 19:36:21.361038	35.237.131.87	173.59.230.213	TCP	60	44816 → 5000 [ACK] Seq=518 Ack=3482 Win=35968 Len=0
36	2021-10-19 19:36:21.404199	35.237.131.87	173.59.230.213	TCP	1354	44816 → 5000 [ACK] Seq=518 Ack=3482 Win=35968 Len=1300 [TCP segment of a reassembled PDU]
37	2021-10-19 19:36:21.404200	35.237.131.87	173.59.230.213	TCP	1354	44816 → 5000 [ACK] Seq=1818 Ack=3482 Win=35968 Len=1300 [TCP segment of a reassembled PDU]
38	2021-10-19 19:36:21.404206	173.59.230.213	35.237.131.87	TCP	54	5000 → 44816 [ACK] Seq=3482 Ack=518 Win=262400 Len=0
39	2021-10-19 19:36:21.419322	35.237.131.87	173.59.230.213	TLV1.2	709	Certificate, Client Key Exchange, Certificate Verify, Change Cipher Spec, Encrypted Handshake Message
40	2021-10-19 19:36:21.412936	173.59.230.213	35.237.131.87	TLV1.2	1592	New Session Ticket, Change Cipher Spec, Encrypted Handshake Message
41	2021-10-19 19:36:21.511097	35.237.131.87	173.59.230.213	TCP	60	44816 → 5000 [ACK] Seq=3773 Ack=4782 Win=30784 Len=0
42	2021-10-19 19:36:21.521429	35.237.131.87	173.59.230.213	TCP	60	44816 → 5000 [ACK] Seq=3773 Ack=5020 Win=41344 Len=0
43	2021-10-19 19:36:21.521430	35.237.131.87	173.59.230.213	TCP	60	44816 → 5000 [FIN, ACK] Seq=3773 Ack=5000 Win=41344 Len=0
44	2021-10-19 19:36:21.521475	173.59.230.213	35.237.131.87	TCP	54	5000 → 44816 [ACK] Seq=5020 Ack=3774 Win=261888 Len=0
45	2021-10-19 19:36:21.521694	173.59.230.213	35.237.131.87	TCP	54	5000 → 44816 [FIN, ACK] Seq=5020 Ack=3774 Win=261888 Len=0
46	2021-10-19 19:36:21.617326	35.237.131.87	173.59.230.213	TCP	60	44816 → 5000 [ACK] Seq=3774 Ack=5021 Win=41344 Len=0
47	2021-10-19 19:36:21.711150	35.237.131.87	173.59.230.213	TCP	74	33062 → 80 [SYN] Seq=0 Win=27800 Len=0 MSS=1300 SACK_PERM=1 TSval=541272252 TSecr=0 WS=128
48	2021-10-19 19:36:21.711389	173.59.230.213	35.237.131.87	TCP	60	80 → 33062 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM=1
50	2021-10-19 19:36:21.796180	35.237.131.87	173.59.230.213	TCP	60	33062 → 80 [ACK] Seq=1 Ack=1 Win=27904 Len=0
51	2021-10-19 19:36:21.804500	35.237.131.87	173.59.230.213	HTTP	213	GET /criserver.cn1 HTTP/1.1
52	2021-10-19 19:36:21.853839	173.59.230.213	35.237.131.87	TCP	54	80 → 33062 [ACK] Seq=1 Ack=160 Win=262400 Len=0
53	2021-10-19 19:36:21.908538	173.59.230.213	35.237.131.87	PKIX-CRL	1347	Certificate Revocation List
55	2021-10-19 19:36:22.011054	35.237.131.87	173.59.230.213	TCP	60	33062 → 80 [ACK] Seq=160 Ack=1294 Win=30592 Len=0
56	2021-10-19 19:36:22.021142	35.237.131.87	173.59.230.213	TCP	60	33062 → 80 [FIN, ACK] Seq=160 Ack=1294 Win=30592 Len=0
57	2021-10-19 19:36:22.021288	173.59.230.213	35.237.131.87	TCP	54	80 → 33062 [FIN, ACK] Seq=1294 Ack=161 Win=262400 Len=0
58	2021-10-19 19:36:22.119161	35.237.131.87	173.59.230.213	TCP	60	33062 → 80 [ACK] Seq=161 Ack=1295 Win=26592 Len=0
60	2021-10-19 19:36:22.207699	35.237.131.87	173.59.230.213	TCP	74	44820 → 5000 [SYN] Seq=0 Win=27800 Len=0 MSS=1300 SACK_PERM=1 TSval=541272746 TSecr=0 WS=128
61	2021-10-19 19:36:22.207815	173.59.230.213	35.237.131.87	TCP	60	5000 → 44820 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM=1
62	2021-10-19 19:36:22.296901	35.237.131.87	173.59.230.213	TCP	60	44820 → 5000 [ACK] Seq=1 Ack=1 Win=27904 Len=0
63	2021-10-19 19:36:22.307215	35.237.131.87	173.59.230.213	TLV1.2	305	Client Hello
64	2021-10-19 19:36:22.331090	173.59.230.213	35.237.131.87	TLV1.2	3535	Server Hello, Certificate, Server Key Exchange, Certificate Request, Server Hello Done
65	2021-10-19 19:36:22.434287	35.237.131.87	173.59.230.213	TCP	60	44820 → 5000 [ACK] Seq=312 Ack=1301 Win=30592 Len=0
66	2021-10-19 19:36:22.444056	35.237.131.87	173.59.230.213	TCP	60	44820 → 5000 [ACK] Seq=312 Ack=2601 Win=33400 Len=0
67	2021-10-19 19:36:22.444058	35.237.131.87	173.59.230.213	TCP	60	44820 → 5000 [ACK] Seq=312 Ack=3482 Win=35968 Len=0
68	2021-10-19 19:36:22.444058	35.237.131.87	173.59.230.213	TLV1.2	61	Alert (Level: Fatal, Description: Certificate Revoked)
69	2021-10-19 19:36:22.444059	35.237.131.87	173.59.230.213	TCP	60	44820 → 5000 [RST, ACK] Seq=110 Ack=4520 Win=0 Len=0

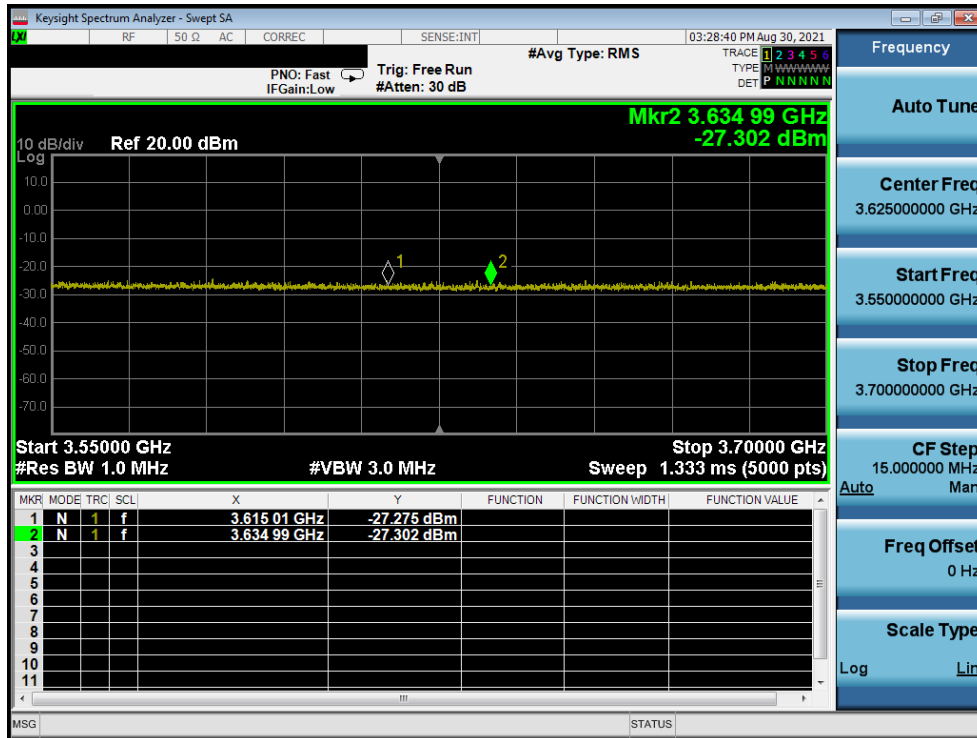
Plot 23. WireShark Screenshot 1 (WINNF.FT.C.SCS.2)

FCC ID: 2AL52CR00LB18		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
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**A23 [WINNF.FT.C.SCS.3] TLS failure due to expired server certificate**

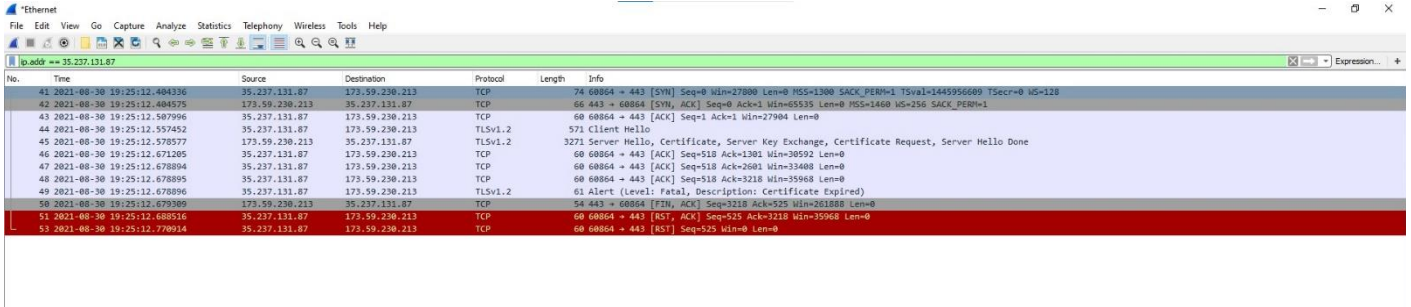
	Test Execution Steps	PASS	FAIL
1	• UUT shall start CBSD-SAS communication with the security procedure	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	• Make sure that UUT uses TLS v1.2 for security establishment. • Make sure UUT selects the correct cipher suite. • UUT shall use CRL or OCSP to verify the validity of the server certificate. • Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	UUT may retry for the security procedure which shall fail	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Test Plots:**



**Plot 24. Conducted Measurement – UUT RF transmission range and bandwidths are less or equal to frequency range and bandwidth of compatible BTS-CBSD (WINNF.FT.C.SCS.3)**

FCC ID: 2AL52CR00LB18		<b>MEASUREMENT REPORT (CERTIFICATION)</b>	Approved by: Quality Manager
Test Report S/N: 1M2108120093-01.2AL52	Test Dates: 08/27/2021 – 10/19/2021	EUT Type: Outdoor LTE Router	Page 45 of 57



No.	Time	Source	Destination	Protocol	Length	Info
41	2021-00-30 19:25:12.404336	35.237.131.87	173.59.230.213	TCP	74	60864 → 443 [SYN] Seq=0 Win=27800 Len=0 MSS=1380 SACK_PERM=1 TSval=1445956609 TSecr=0 WS=128
42	2021-00-30 19:25:12.404575	173.59.230.213	35.237.131.87	TCP	66	443 → 60864 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM=1
43	2021-00-30 19:25:12.587996	35.237.131.87	173.59.230.213	TCP	60	60864 → 443 [ACK] Seq=1 Ack=1 Win=27904 Len=0
44	2021-00-30 19:25:12.557452	35.237.131.87	173.59.230.213	TLSv1.2	571	Client Hello
45	2021-00-30 19:25:12.578577	173.59.230.213	35.237.131.87	TLSv1.2	3271	Server Hello, Certificate, Server Key Exchange, Certificate Request, Server Hello Done
46	2021-00-30 19:25:12.671205	35.237.131.87	173.59.230.213	TCP	60	60864 → 443 [ACK] Seq=518 Ack=1301 Win=30592 Len=0
47	2021-00-30 19:25:12.678894	35.237.131.87	173.59.230.213	TCP	60	60864 → 443 [ACK] Seq=518 Ack=2091 Win=34488 Len=0
48	2021-00-30 19:25:12.678895	35.237.131.87	173.59.230.213	TCP	60	60864 → 443 [ACK] Seq=518 Ack=3218 Win=35968 Len=0
49	2021-00-30 19:25:12.678896	35.237.131.87	173.59.230.213	TLSv1.2	61	Alert (Level: Fatal, Description: Certificate Expired)
50	2021-00-30 19:25:12.679309	173.59.230.213	35.237.131.87	TCP	54	443 → 60864 [FIN, ACK] Seq=3218 Ack=525 Win=261888 Len=0
51	2021-00-30 19:25:12.688516	35.237.131.87	173.59.230.213	TCP	60	60864 → 443 [RST, ACK] Seq=525 Ack=3218 Win=35968 Len=0
53	2021-00-30 19:25:12.770914	35.237.131.87	173.59.230.213	TCP	60	60864 → 443 [RST] Seq=525 Win=0 Len=0

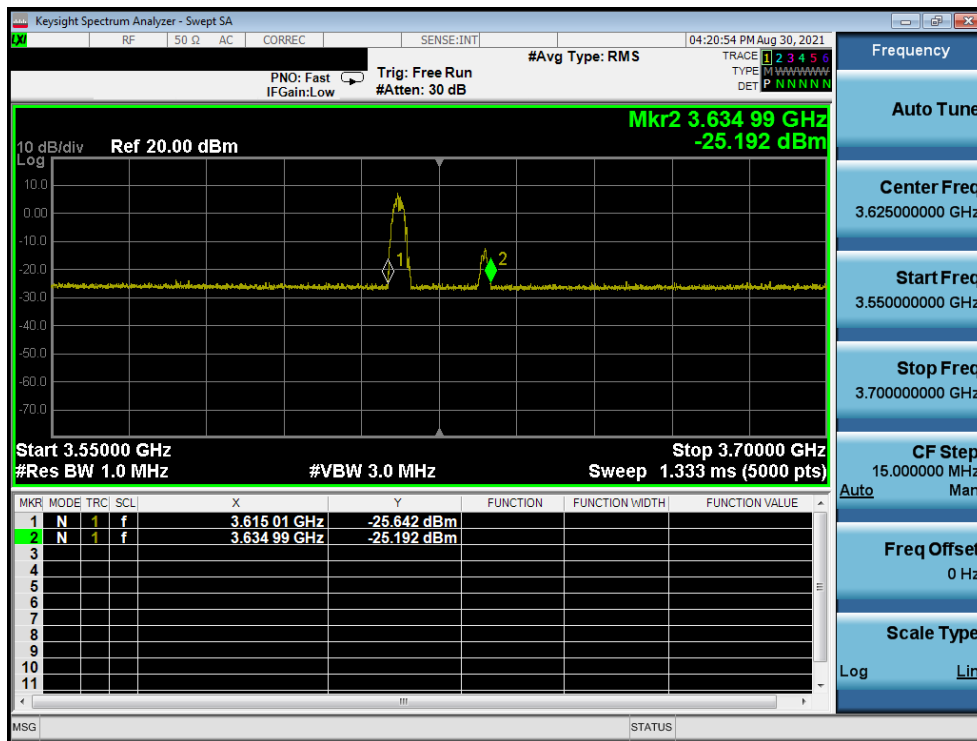
**Plot 25. WireShark Screenshot (WINNF.FT.C.SCS.3)**

<b>FCC ID:</b> 2AL52CR00LB18		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M2108120093-01.2AL52	<b>Test Dates:</b> 08/27/2021 – 10/19/2021	<b>EUT Type:</b> Outdoor LTE Router		Page 46 of 57

**A24 [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	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	UUT may retry for the security procedure which shall fail	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Test Plots:**



**Plot 26. Conducted Measurement – UUT RF transmission range and bandwidths are less or equal to frequency range and bandwidth of compatible BTS-CBSD (WINNF.FT.C.SCS.4)**

FCC ID: 2AL52CR00LB18		<b>MEASUREMENT REPORT (CERTIFICATION)</b>	Approved by: Quality Manager
Test Report S/N: 1M2108120093-01.2AL52	Test Dates: 08/27/2021 – 10/19/2021	EUT Type: Outdoor LTE Router	Page 47 of 57



**Plot 27. WireShark Screenshot (WINNF.FT.C.SCS.4)**

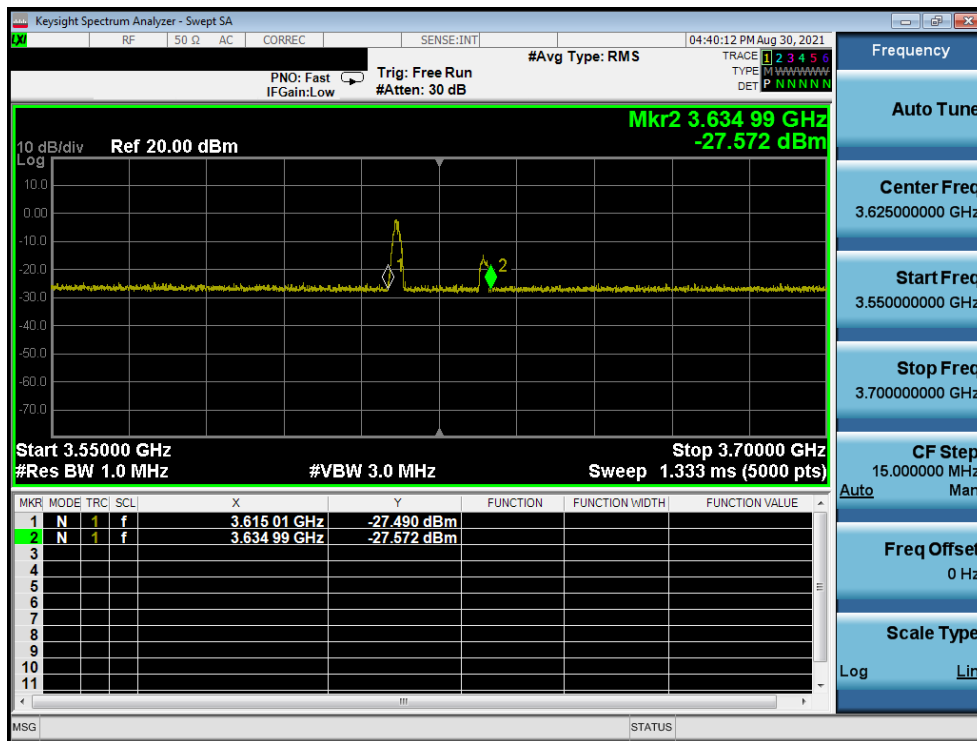
<b>FCC ID:</b> 2AL52CR00LB18	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M2108120093-01.2AL52	<b>Test Dates:</b> 08/27/2021 – 10/19/2021	<b>EUT Type:</b> Outdoor LTE Router	Page 48 of 57



**A25 [WINNF.FT.C.SCS.5] TLS failure when certificate at the SAS Test Harness is corrupted**

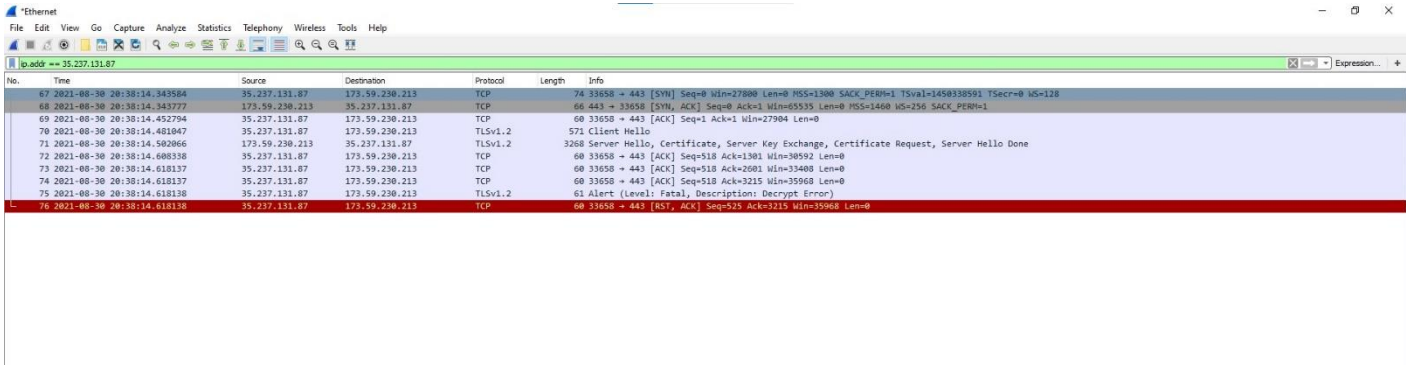
	Test Execution Steps	PASS	FAIL
1	• UUT shall start CBSD-SAS communication with the security procedure	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	• Make sure that UUT uses TLS v1.2 for security establishment. • Make sure UUT selects the correct cipher suite. • UUT shall use CRL or OCSP to verify the validity of the server certificate. • Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	UUT may retry for the security procedure which shall fail	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Test Plots:**



**Plot 28. Conducted Measurement – UUT RF transmission range and bandwidths are less or equal to frequency range and bandwidth of compatible BTS-CBSD (WINNF.FT.C.SCS.5)**

FCC ID: 2AL52CR00LB18		<b>MEASUREMENT REPORT (CERTIFICATION)</b>	Approved by: Quality Manager
Test Report S/N: 1M2108120093-01.2AL52	Test Dates: 08/27/2021 – 10/19/2021	EUT Type: Outdoor LTE Router	Page 49 of 57



**Plot 29. WireShark Screenshot (WINNF.FT.C.SCS.5)**

<b>FCC ID:</b> 2AL52CR00LB18	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M2108120093-01.2AL52	<b>Test Dates:</b> 08/27/2021 – 10/19/2021	<b>EUT Type:</b> Outdoor LTE Router	Page 50 of 57

## A26 [WINNF.PT.C.HBT.1] UUT RF Transmit Power Measurement

	Test Execution Steps	PASS	FAIL
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> <li>• UUT has successfully completed SAS Discovery and Authentication with the SAS Test Harness</li> <li>• UUT has registered with the SAS, with CBSID ID = C</li> <li>• UUT has a single valid grant G with parameters {lowFrequency = FL, highFrequency = FH, maxEirp = Pi}, with grant in AUTHORIZED state, and grantExpireTime set to a value far past the duration of this test case</li> </ul> <p><i>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.</i></p>	--	--
2	<p>UUT and SAS Test Harness perform a series of Heartbeat Request/Response cycles, which continues until the other test steps are complete. Messaging for each cycle is as follows:</p> <ul style="list-style-type: none"> <li>• UUT sends Heartbeat Request, including: <ul style="list-style-type: none"> <li>o cbsdId = C</li> <li>o grantId = G</li> </ul> </li> <li>• SAS Test Harness responds with Heartbeat Response, including: <ul style="list-style-type: none"> <li>o cbsdId = C</li> <li>o grantId = G</li> <li>o transmitExpireTime = current UTC time + 200 seconds</li> <li>o responseCode = 0</li> </ul> </li> </ul>	--	--
3	<p>Tester performs power measurement on RF interface(s) of UUT, and verifies it complies with the maxEirp setting, Pi. The RF measurement method is out of scope of this document, but may include additional configuration of the UUT, as required, to fulfil the requirements of the power measurement method.</p> <p><i>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.</i></p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

FCC ID: 2AL52CR00LB18	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M2108120093-01.2AL52	Test Dates: 08/27/2021 – 10/19/2021	EUT Type: Outdoor LTE Router	Page 51 of 57

### RF Power Measurements:

Testing is performed per KDB 971168 D01 and across the transmit dynamic range of 37dBm/MHz to 14dBm/MHz for 20MHz Bandwidth.

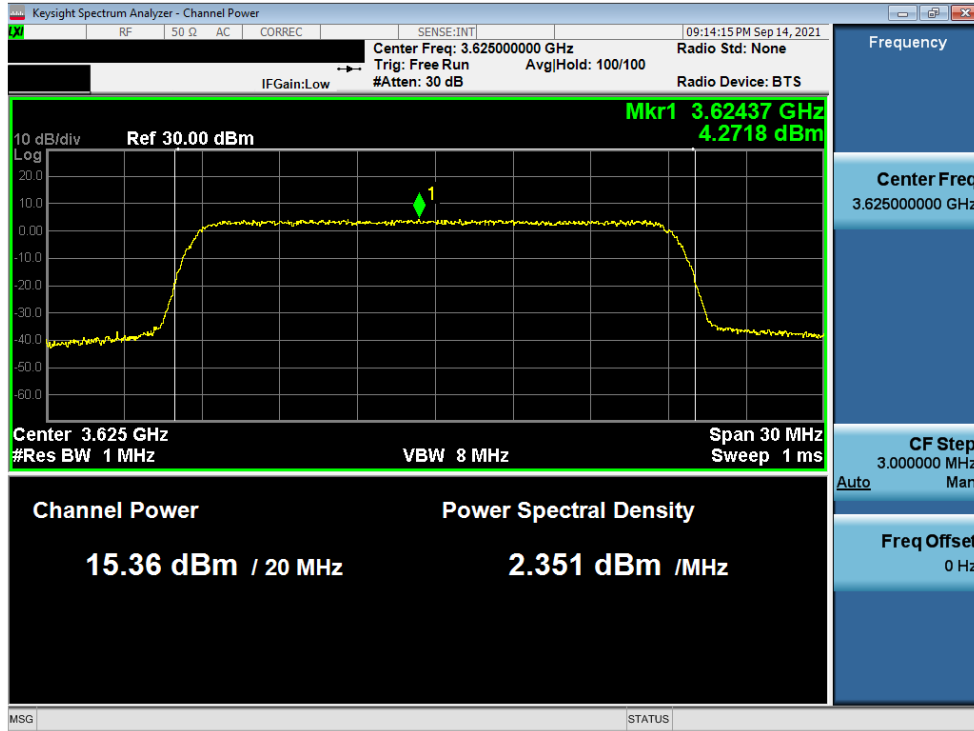
The EIRP was calculated by adding the antenna gain to the conducted power level.

Freq [MHz]	SAS Granted maxEIRP [dBm/MHz]	Tx1 Conducted PSD [dBm/MHz]	Ant Gain [dBi]	maxEIRP [dBm/MHz]	Margin [dB]
3625	37	4.2718	25.5	29.8	-7.2282
3625	25	-2.951	25.5	22.5	-2.451
3625	14	-11.813	25.5	13.7	-0.313

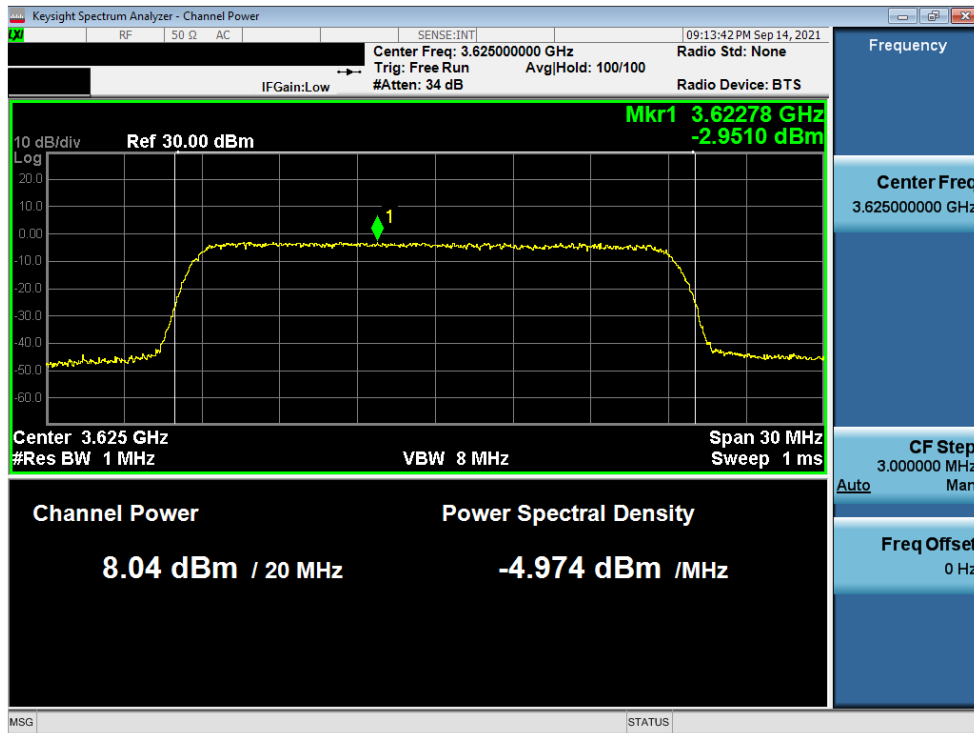
**Table 7-1 RF Output Power Measurements (WINNF.PT.C.HBT.1)**

<b>FCC ID:</b> 2AL52CR00LB18			<b>MEASUREMENT REPORT (CERTIFICATION)</b>	<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M2108120093-01.2AL52	<b>Test Dates:</b> 08/27/2021 – 10/19/2021	<b>EUT Type:</b> Outdoor LTE Router		Page 52 of 57

**Test Plots:**

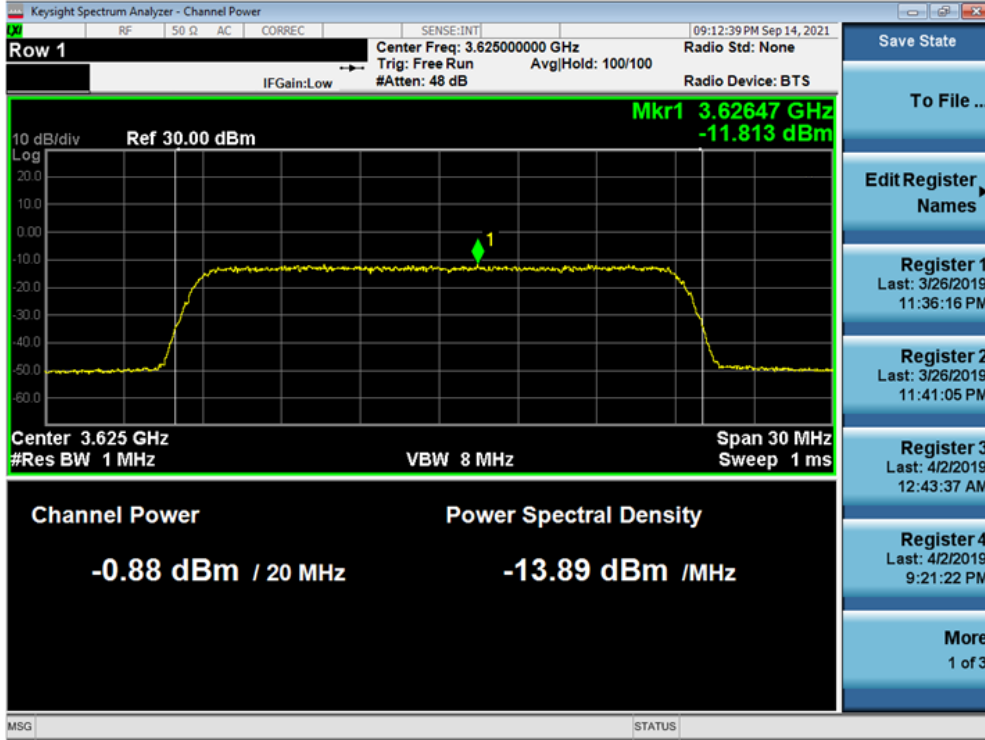


**Plot 30. Conducted PSD, SAS Granted maxEIRP 37**



**Plot 31. Conducted PSD, SAS Granted maxEIRP 25**

FCC ID: 2AL52CR00LB18		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M2108120093-01.2AL52	Test Dates: 08/27/2021 – 10/19/2021	EUT Type: Outdoor LTE Router	Page 53 of 57



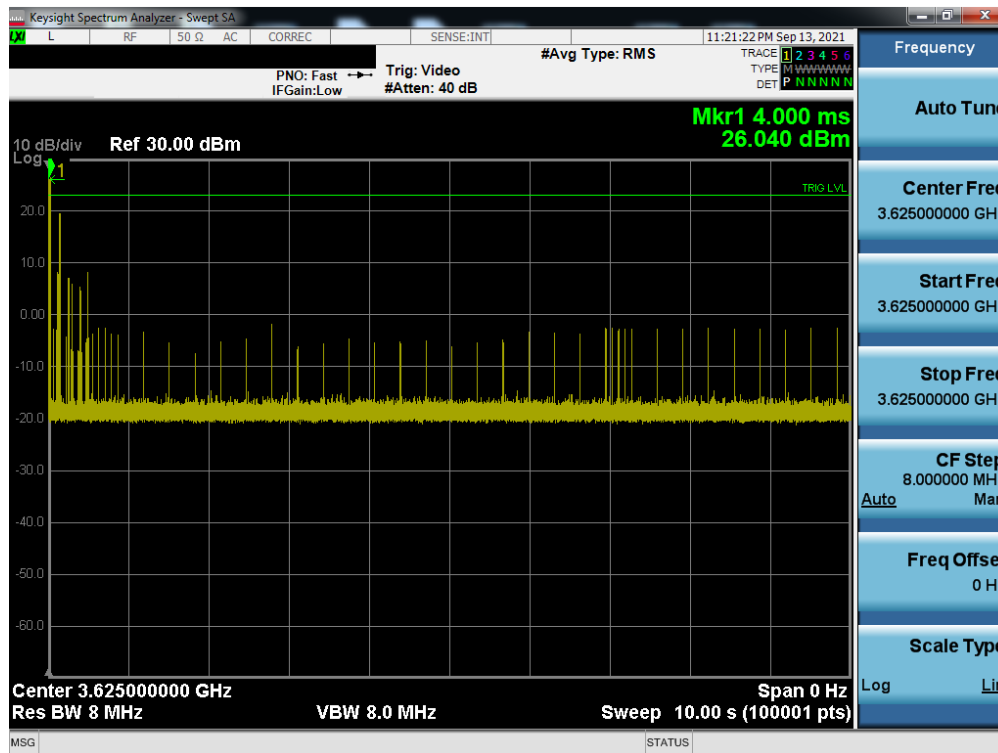
Plot 32. Conducted PSD, SAS Granted maxEIRP 14

FCC ID: 2AL52CR00LB18	<b>PCTEST</b> ENGINEERING LABORATORY, INC.		<b>MEASUREMENT REPORT (CERTIFICATION)</b>	Approved by: Quality Manager
Test Report S/N: 1M2108120093-01.2AL52	Test Dates: 08/27/2021 – 10/19/2021	EUT Type: Outdoor LTE Router		Page 54 of 57

## APPENDIX B – CPE-CBSD INITIAL SAS COMMUNICATIONS DUTY CYCLE (X OF Y)

Testing is performed per [WINNF-19-IN-00033] CBRS CPE\_CBSD as UUT Test Guidelines Version 1.0 Using a spectrum analyzer, time domain sweeps were performed at each time duration: 10s, 300s, and 3600s

Time allowed per KDB	Aggregate amount of time >23dB,
1s of 10s period	0.005s
10s of 300s period	0.216s
20s of 3600s period	8.856s



**Plot 33. 10s Time Domain Sweep**































<b>FCC ID:</b> 2AL52CR00LB18		<b>MEASUREMENT REPORT (CERTIFICATION)</b>	<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M2108120093-01.2AL52	<b>Test Dates:</b> 08/27/2021 – 10/19/2021	<b>EUT Type:</b> Outdoor LTE Router	Page 55 of 57





## APPENDIX C – TEST LOGS

Logs are available upon request

 WINNF.FT.C.DRG.5_2019-05-02T04.37.42Z.log Text Document	 WINNF.FT.C.GRA.1_2019-05-02T01.31.12Z.log Text Document	 WINNF.FT.C.GRA.2_2019-05-02T01.45.25Z.log Text Document
 WINNF.FT.C.HBT.3_2019-05-02T03.33.51Z.log Text Document	 WINNF.FT.C.HBT.5_2019-05-02T02.38.31Z.log Text Document	 WINNF.FT.C.HBT.6_2019-05-02T03.25.35Z.log Text Document
 WINNF.FT.C.HBT.7_2019-05-02T03.41.44Z.log Text Document	 WINNF.FT.C.HBT.9_2019-05-02T03.50.07Z.log Text Document	 WINNF.FT.C.HBT.10_2019-05-02T04.00.08Z.log Text Document
 WINNF.FT.C.HBT.11_2019-05-07T02.47.36Z.log Text Document	 WINNF.FT.C.SCS.1_2019-05-06T23.22.32Z.log Text Document	 WINNF.FT.C.SCS.2_2019-05-09T19.18.19Z.log Text Document
 WINNF.FT.C.SCS.3_2019-05-06T23.57.48Z.log Text Document	 WINNF.FT.C.SCS.4_2019-05-07T00.10.31Z.log Text Document	 WINNF.FT.C.SCS.5_2019-05-07T00.34.31Z.log Text Document
 WINNF.FT.D.DRG.2_2019-05-03T23.12.07Z.log Text Document	 WINNF.FT.D.DRG.4_2019-05-03T23.26.56Z.log Text Document	 WINNF.FT.D.HBT.2_2019-05-08T00.22.40Z.log Text Document
 WINNF.FT.D.HBT.8_2019-05-07T00.54.55Z.log Text Document	 WINNF.FT.D.MES.2_2019-05-02T20.33.42Z.log Text Document	 WINNF.FT.D.REG.2_2019-05-03T18.34.14Z.log Text Document
 WINNF.FT.D.REG.9_2019-05-03T18.44.41Z.log Text Document	 WINNF.FT.D.REG.11_2019-05-03T19.28.09Z.log Text Document	 WINNF.FT.D.REG.13_2019-05-03T19.38.45Z.log Text Document
 WINNF.FT.D.REG.15_2019-05-03T19.43.36Z.log Text Document	 WINNF.FT.D.REG.17_2019-05-03T19.48.02Z.log Text Document	 WINNF.FT.D.REG.19_2019-05-03T19.51.18Z.log Text Document
 WINNF.FT.D.RLQ.2_2019-05-03T23.46.26Z.log Text Document	 WINNF.FT.D.RLQ.4_2019-05-04T00.30.06Z.log Text Document	 WINNF.FT.D.RLQ.6_2019-05-04T00.17.28Z.log Text Document

<b>FCC ID:</b> 2AL52CR00LB18	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M2108120093-01.2AL52	<b>Test Dates:</b> 08/27/2021 – 10/19/2021	<b>EUT Type:</b> Outdoor LTE Router	Page 57 of 57