

# RADIO TEST REPORT – 392367-2TRFWL

Type of assessment:

**Final product testing**

Applicant:

**Redline Communications Inc.**

Product name (type):

**LTE Base Station**

Model:

**Ellipse 4G HP Band 48**

FCC ID:

**QC8-B48**

Specifications:

- ◆ WINNF-TS-0122, Version V1.0.1
- ◆ WINNF-IN-00129, Version V1.0.0.0

Date of issue: April 22, 2020

**Andrey Adelberg, Senior EMC/RF Specialist**

Tested by



Signature

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Reviewed by



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	Test site registration	<b>Organization</b> FCC/ISED	<b>Recognition numbers and location</b> FCC: CA2040; IC: 2040A-4 (Ottawa/Almonte); FCC: CA2041; IC: 2040G-5 (Montreal); CA0101 (Cambridge)	
Website	<a href="http://www.nemko.com">www.nemko.com</a>			

## Limits of responsibility

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Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contained in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

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## Section 1 Report summary

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### 1.1 Test specifications and methods

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WINNF-TS-0122 Version V1.0.1, Sep 2018	Test and Certification for Citizens Broadband Radio Service (CBRS); Conformance and Performance Test Technical Specification; CBSD/DP as Unit Under Test (UUT)
WINNF-IN-00129, Version V1.0.0.0	WInnForum CBSD/DP UUT Security Test 6 Cases Tutorial
FCC 47 CFR Part 96	Citizens Broadband Radio Service
WINNF-TS-0016 Version V1.2.4	Signaling Protocols and Procedures for Citizens Broadband Radio Service (CBRS): Spectrum Access System (SAS) - Citizens Broadband Radio Service Device (CBSD) Interface Technical Specification
940660 D01 Part 96 CBRS Eqpt v02	Certification and test procedures for Citizens Broadband Radio Service devices authorized under Part 96

### 1.2 Exclusions

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None

### 1.3 Statement of compliance

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In the configuration tested, the EUT was found compliant.

Testing was performed against all relevant requirements of the test standard except as noted in section 1.2 above. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See “Summary of test results” for full details.

### 1.4 Test report revision history

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**Table 1.4-1: Test report revision history**

Revision #	Date of issue	Details of changes made to test report
TRF	April 22, 2020	Original report issued

## Section 2 Engineering considerations

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### 2.1 Modifications incorporated in the EUT for compliance

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There were no modifications performed to the EUT during this assessment.

### 2.2 Technical judgment

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None

### 2.3 Deviations from laboratory tests procedures

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No deviations were made from laboratory procedures.

## Section 3 Test conditions

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### 3.1 Atmospheric conditions

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Temperature	15 °C – 35 °C
Relative humidity	20 % – 75 %
Air pressure	86 kPa (860 mbar) – 106 kPa (1060 mbar)

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

### 3.2 Power supply range

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The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages  $\pm 5\%$ , for which the equipment was designed.

## Section 4 Measurement uncertainty

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### 4.1 Uncertainty of measurement

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UKAS Lab 34 and TIA-603-B have been used as guidance for measurement uncertainty reasonable estimations with regards to previous experience and validation of data. Nemko Canada, Inc. follows these test methods in order to satisfy ISO/IEC 17025 requirements for estimation of uncertainty of measurement for wireless products.

Measurement uncertainty budgets for the tests are detailed below. Measurement uncertainty calculations assume a coverage factor of  $K = 2$  with 95% certainty.

**Table 4.1-1: Measurement uncertainty calculations for Radio**

Test name	Measurement uncertainty, $\pm$ dB
All antenna port measurements	0.55
Occupied bandwidth	4.45
Conducted spurious emissions	1.13
Radiated spurious emissions	3.78
AC power line conducted emissions	3.55



## Section 5 Information provided by the applicant

### 5.1 Disclaimer

This section contains information provided by the applicant and has been utilized to support the test plan. Inaccurate information provided by the applicant can affect the validity of the results contained within this test report. Nemko accepts no responsibility for the information contained within this section and the impact it may have on the test plan and resulting measurements.

### 5.2 Applicant/manufacture

	Applicant	Manufacturer
Company name	Redline Communications	Redline Communications
Address	302 Town Center Blvd. Markham, ON, L3R 0E8 Canada	302 Town Center Blvd. Markham, ON, L3R 0E8 Canada

### 5.3 EUT information

Product name	LTE Base Station – Band 48
Model	Ellipse 4G HP Band 48
Serial number	360RM19230002
Part number	6K-ELL-B48-HPRF-DC-01
Operating conditions	SW: 1.3.0.11; HW: 16May19-005131; FW: 2013.01-svn826 (Apr 04 2018 - 19:58:11)
Product description and theory of operation	Ellipse 4G HP B04 is an all outdoor LTE eNodeB (E-UTRAN Node B) single band base station operating in LTE Band 48 (3550–3700 MHz)

### 5.4 Technical information

Type of equipment	<input checked="" type="checkbox"/> CBSD <input type="checkbox"/> Domain Proxy and CBSD
CBSD Category	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Frequency band	3550–3700 MHz
Power supply requirements	48 V <sub>DC</sub> 5 A via Power supply powered from 120 V <sub>AC</sub> / 60 Hz

## 5.5 EUT setup details

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### 5.5.1 EUT Exercise and monitoring

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**Methods used to exercise the EUT and all relevant ports:**

- EUT was controlled from laptop used to run test cases and connect to SAS Harness emulator.

**Configuration details:**

- The EUT setup in a configuration that was expected to produce the highest amplitude emissions relative to the limit and that satisfy normal operation/installation practice by the end user.
- The type and construction of cables used in the measurement set-up were consistent with normal or typical use. Cables with mitigation features (for example, screening, tighter/more twists per length, ferrite beads) have been noted below:
  - The following deviations were:
    - None
- The EUT was setup in a manner that was consistent with its typical arrangement and use. The measurement arrangement of the EUT, local AE and associated cabling was representative of normal practice. Any deviations from typical arrangements have been noted below:
  - The following deviations were:
    - None

**Monitoring details:**

- UT status was monitored using web GUI. Power meter was used to monitor Tx power.

5.5.2 EUT test configuration

**Table 5.5-1: EUT interface ports**

Description	Qty.
RF ports	2
Power port	1
Ethernet port	1
GPS port	1

**Table 5.5-2: Support equipment used for testing**

Description	Brand name	Model, Part number, Serial number, Revision level
Power Supply	Delta Electronics	MN: DRP048V250W1BN, SN: D482401BN00L13520086
EPC	Intel	MN: NUC8i3BEH1 SN: G6BE92400CBL
Ethernet switch	Netgear	MN: GC110, SN: 4WR4817480184
Laptop	Dell	MN: Latitude E6230 SN: DDK69W1
Laptop	Lenovo	MN: X250 SN: R90PVBEM
UE	Cradlepoint	PN: 170700-000, SN: MM170035500864

**Table 5.5-3: Inter-connection cables**

Cable description	From	To	Length (m)
Cat-5	EUT	Ethernet switch	2
Cat-5	EPC	Ethernet switch	2
RF cable N/SMA	EUT	EU (subscriber)	0.5
RF cable N/N	EUT	Antenna	0.3
DC shielded outdoor power cable	EUT	Power supply	3
GPS Cable TNC/TNC	EUT	GPS Antenna	As required

5.5.2 EUT test configuration, continued

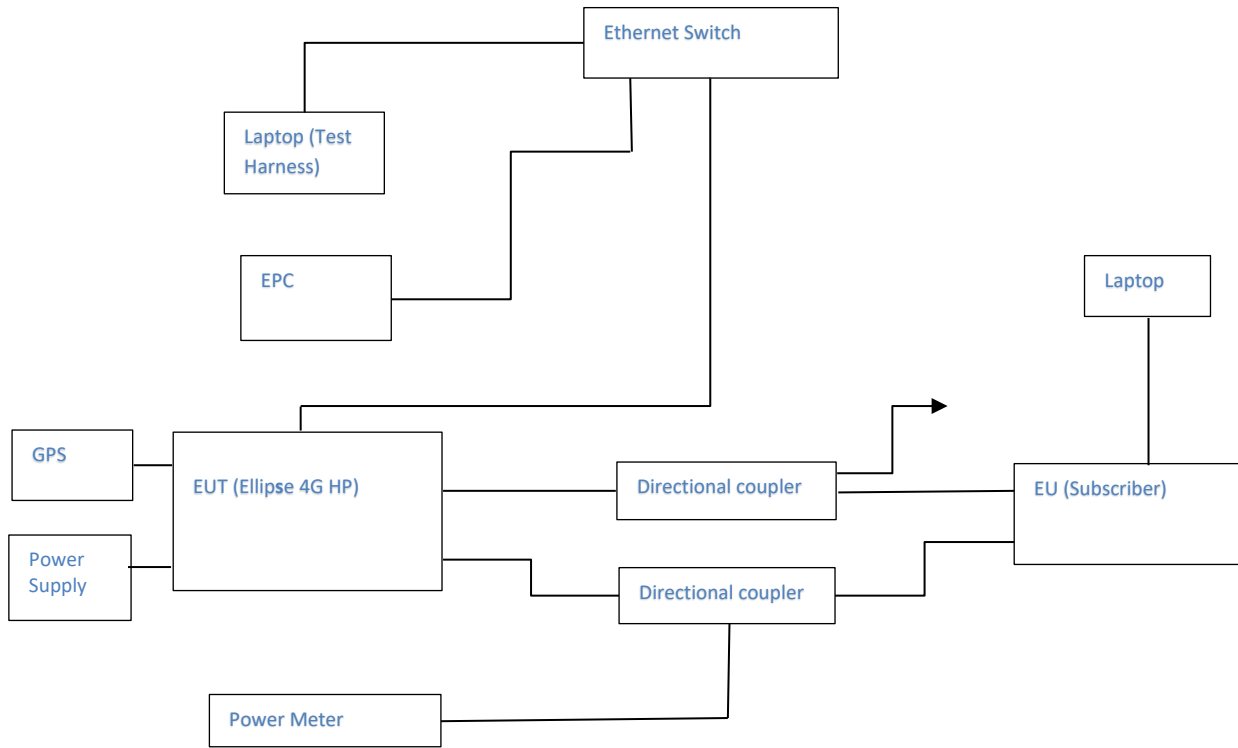


Figure 5.5-1: Setup block diagram

5.6 EUT security per CBRS requirements

Requirement	Compliance
What communication protocol is used between the SAS and the CBSD?	The SAS-CBSD communication is done using on the HTTPS (HTTP over TLS version 1.2). The HTTPS protocol provides transport level assurance that a message has been received by the intended recipient.
How are communications initiated?	Per standard specification, SAS server discovery: SAS server URL is provided to CBSD's as a configuration parameter. CBSD communicates to server using URL provided and TLS mutual authentication will be performed. The CBSD initiating the TLS connection shall authenticate the SAS, and the SAS shall authenticate the CBSD.
How does the CBSD validate messages from the SAS?	Each message session is encrypted and validated with TLSv1.2 and CA certificates verification. Messages are also checked against protocol structure.
How does the device handle failure to communicate or authenticate the SAS?	On communication failure/authentication, devices will re-try to communicate if fails, alarm will raise, TX will stop based on action required by SAS-CBSD protocol.
How does the SAS validate messages from a CBSD?	Each message session is encrypted and validated with TLSv1.2 and CA certificates verification. Messages are also checked against protocol structure.
What encryption method is used?	TLS_RSA_WITH_AES_256_GCM_SHA384
How does the SAS ensure secure registration of protected devices?	By using username and ID

Note: Protocols in accordance with: Document WINNF-TS-0016 Version V1.2.4 from June 26, 2019

## Section 6 Summary of test results

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### 6.1 Testing location

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Test location (s)	Ottawa
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### 6.2 Testing period

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Test start date	March 23, 2020	Test end date	March 31, 2020
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### 6.3 Sample information

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Receipt date	March 23, 2020	Nemko sample ID number(s)	1
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### 6.4 KDB-940660-D02-CPE requirement test results

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**Table 6.4-1: CPE additional requirement results**

Test description	Verdict
CPE handshake timing requirements	Not applicable

## 6.5 WINNF-TS-0122 CBRS requirements test results

**Table 6.5-1: CBSD requirements results**

Section	Test description	Verdict
6.1.4.1.1 <sup>2</sup>	Multi-Step registration	Pass
6.1.4.1.3 <sup>3</sup>	Single-Step registration for Category A CBSD	Not applicable
6.1.4.1.5 <sup>4</sup>	Single-Step registration for CBSD with CPI signed data	Not applicable
6.1.4.1.7 <sup>7</sup>	Registration due to change of an installation parameter	Not applicable
6.1.4.2.1	Missing Required parameters (responseCode 102)	Pass
6.1.4.2.3	Pending registration (responseCode 200)	Pass
6.1.4.2.5	Invalid parameter (responseCode 103)	Pass
6.1.4.2.7	Blacklisted CBSD (responseCode 101)	Pass
6.1.4.2.9	Unsupported SAS protocol version (responseCode 100)	Pass
6.1.4.2.11	Group Error (responseCode 201)	Pass
6.1.4.3.1 <sup>3</sup>	Category A CBSD location update	Not applicable
6.3.4.2.1	Unsuccessful Grant responseCode=400 (INTERFERENCE)	Pass
6.3.4.2.2	Unsuccessful Grant responseCode=401 (GRANT_CONFLICT)	Pass
6.4.4.1.1 <sup>8</sup>	Heartbeat Success Case (first Heartbeat Response)	Pass
6.4.4.2.1 <sup>8</sup>	Heartbeat responseCode=105 (DEREGISTER)	Pass
6.4.4.2.2 <sup>8</sup>	Heartbeat responseCode=500 (TERMINATED_GRANT)	Pass
6.4.4.2.3 <sup>8</sup>	Heartbeat responseCode=501 (SUSPENDED_GRANT) in First Heartbeat Response	Pass
6.4.4.2.4 <sup>8</sup>	Heartbeat responseCode=501 (SUSPENDED_GRANT) in Subsequent Heartbeat Response	Pass
6.4.4.2.5 <sup>8</sup>	Heartbeat responseCode=502 (UNSYNC_OP_PARAM)	Pass
6.4.4.3.1 <sup>8</sup>	Heartbeat Response Absent (First Heartbeat)	Pass
6.4.4.3.2 <sup>8</sup>	Heartbeat Response Absent (Subsequent Heartbeat)	Pass
6.4.4.4.1 <sup>1</sup>	Successful Grant Renewal in Heartbeat Test Case	Not tested
6.5.4.2.1 <sup>5</sup>	Registration Response contains measReportConfig	Not applicable
6.5.4.2.3 <sup>6</sup>	Grant Response contains measReportConfig	Pass
6.5.4.2.4 <sup>6</sup>	Heartbeat Response contains measReportConfig	Pass
6.6.4.1.1	Successful Relinquishment	Pass
6.6.4.2.1 <sup>1</sup>	Unsuccessful Relinquishment, responseCode=102	Pass
6.6.4.3.1 <sup>1</sup>	Unsuccessful Relinquishment, responseCode=103	Pass
6.7.4.1.1	Successful Deregistration	Pass
6.7.4.2.1 <sup>1</sup>	Deregistration responseCode=102	Pass
6.7.4.3.1 <sup>1</sup>	Deregistration responseCode=103	Pass
6.8.4.1.1	Successful TLS connection between UUT and SAS Test Harness	Pass
6.8.4.2.1	TLS failure due to revoked certificate	Pass
6.8.4.2.2	TLS failure due to expired server certificate	Pass
6.8.4.2.3	TLS failure when SAS Test Harness certificate is issue by unknown CA	Pass
6.8.4.2.4	TLS failure when certificate at the SAS Test Harness is corrupted	Pass
7.1.4.1.1	UUT RF Transmit Power Measurement	Pass

Notes: <sup>1</sup>Optional requirements

<sup>2</sup>Mandatory for UUT which supports multi-step registration message

<sup>3</sup>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.

<sup>4</sup>Mandatory for UUT which supports single-step registration containing CPI-signed data in the registration message.

<sup>5</sup>Mandatory for UUT which supports RECEIVED\_POWER\_WITHOUT\_GRANT measurement report type.

<sup>6</sup>Mandatory for UUT which supports RECEIVED\_POWER\_WITH\_GRANT measurement report type.

<sup>7</sup>Mandatory for UUT which supports parameter change being made at the UUT and prior to sending a deregistration.

<sup>8</sup>Heartbeat interval was increased from 60 s to 120 s to accommodate EUT's longer start-up time

## Section 7 Test equipment

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### 7.1 Test equipment list

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*Table 7.1-1: Equipment list*

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
Power sensor	Rohde & Schwarz	NRP-Z23	100173	3 y	August 30, 2021
Directional coupler	Pasternak	PE2209-20	–	–	N/A

Note: N/A - not applicable

## Section 8 Testing data

### 8.1 6.1.4.1.1 [WINNF.FT.C.REG.1] Multi-Step registration

#### 8.1.1 References, definitions and limits

6.1 CBSD Registration Process; 6.1.4.1 Successful registration (responseCode 0)

This section provides test steps, conditions and procedures to test the conformance of the CBSD implementation for the CBSD Registration Procedure. A precondition is the CBSD has successfully discovered the SAS it wants to register with.

Upon a successful response from the SAS (responseCode = 0), the CBSD will generate its next message to the SAS. The SAS Test Harness when configured for verification of a particular CBSD-SAS protocol procedure (i.e. registration), will / may not respond to any subsequent messages sent by CBSD once the procedure being tested is complete.

#### 8.1.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 18, 2020

#### 8.1.3 Observations, settings and special notes

None

#### 8.1.4 Test data

**Table 8.1-1: WINNF.FT.C.REG.1 test results**

Step	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 correct Registration request information, as specified in [n.5], to the SAS Test Harness: <ul style="list-style-type: none"> <li>• The required <code>userId</code>, <code>fcld</code> and <code>cbdsSerialNumber</code> 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	• SAS Test Harness sends a CBSD Registration Response as follows: <ul style="list-style-type: none"> <li>○ <code>cbstdId = C</code></li> <li>○ <code>measReportConfig</code> shall not be included</li> <li>○ <code>responseCode = 0</code></li> </ul>	-	-
4	After completion of step 3, SAS Test Harness will not provide any positive response ( <code>responseCode=0</code> ) 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"/>

For the test log please refer to Section 9 of this test report.



## 8.2 6.1.4.2.1 [WINNF.FT.C.REG.8] Missing Required parameters (responseCode 102)

### 8.2.1 References, definitions and limits

6.1 CBSD Registration Process; 6.1.4.2 Unsuccessful registration: non-zero responseCodes

This section provides test steps, conditions and procedures to test the conformance of the CBSD implementation for the CBSD Registration Procedure. A precondition is the CBSD has successfully discovered the SAS it wants to register with.

CBSD under test cannot be expected to generate a message with a missing or invalid parameter. To test for responseCode not equal to 0, the SAS Test Harness will respond to a valid registrationRequest message with a registrationResponse with a non-zero responseCode.

The purpose of these tests is to ensure that the CBSD does not transmit when a responseCode other than 0 is received. The information sent in the registration request message is not important, only that it shall conform to the protocol.

Missing/Invalid response codes are tested by injecting those responseCodes into the SAS Test Harness generated response message, even though the UUT has sent a valid message

### 8.2.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 18, 2020

### 8.2.3 Observations, settings and special notes

None

### 8.2.4 Test data

The following are the test execution steps where the Registration response contains *responseCode* (R) = 102

**Table 8.2-1: WINNF.FT.C.REG.8 test results**

Step	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 <i>cbsdd</i></li> <li>○ <i>responseCode</i> (R) = 102</li> </ul>	–	–
4	After completion of step 3, SAS Test Harness will not provide any positive response ( <i>responseCode</i> =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"/>

For the test log please refer to Section 9 of this test report.

### 8.3 6.1.4.2.3 [WINNF.FT.C.REG.10] Pending registration (responseCode 200)

#### 8.3.1 References, definitions and limits

6.1 CBSD Registration Process; 6.1.4.2 Unsuccessful registration: non-zero responseCodes

This section provides test steps, conditions and procedures to test the conformance of the CBSD implementation for the CBSD Registration Procedure. A precondition is the CBSD has successfully discovered the SAS it wants to register with.

CBSD under test cannot be expected to generate a message with a missing or invalid parameter. To test for responseCode not equal to 0, the SAS Test Harness will respond to a valid registrationRequest message with a registrationResponse with a non-zero responseCode.

The purpose of these tests is to ensure that the CBSD does not transmit when a responseCode other than 0 is received. The information sent in the registration request message is not important, only that it shall conform to the protocol.

Missing/Invalid response codes are tested by injecting those responseCodes into the SAS Test Harness generated response message, even though the UUT has sent a valid message

#### 8.3.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 18, 2020

#### 8.3.3 Observations, settings and special notes

None

#### 8.3.4 Test data

The following are the test execution steps where the Registration response contains *responseCode* (R) = 200

**Table 8.3-1: WINNF.FT.C.REG.10 test results**

Step	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 <i>cbstdId</i></li> <li>○ – <i>responseCode</i> (R) = 200</li> </ul>	–	–
4	After completion of step 3, SAS Test Harness will not provide any positive response ( <i>responseCode</i> =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"/>

For the test log please refer to Section 9 of this test report.

## 8.4 6.1.4.2.5 [WINNF.FT.C.REG.12] Invalid parameter (responseCode 103)

### 8.4.1 References, definitions and limits

#### 6.1 CBSD Registration Process; 6.1.4.2 Unsuccessful registration: non-zero responseCodes

This section provides test steps, conditions and procedures to test the conformance of the CBSD implementation for the CBSD Registration Procedure. A precondition is the CBSD has successfully discovered the SAS it wants to register with.

CBSD under test cannot be expected to generate a message with a missing or invalid parameter. To test for responseCode not equal to 0, the SAS Test Harness will respond to a valid registrationRequest message with a registrationResponse with a non-zero responseCode.

The purpose of these tests is to ensure that the CBSD does not transmit when a responseCode other than 0 is received. The information sent in the registration request message is not important, only that it shall conform to the protocol.

Missing/Invalid response codes are tested by injecting those responseCodes into the SAS Test Harness generated response message, even though the UUT has sent a valid message

### 8.4.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 18, 2020

### 8.4.3 Observations, settings and special notes

None

### 8.4.4 Test data

The following are the test execution steps where the Registration response contains *responseCode* (R) = 103

**Table 8.4-1: WINNF.FT.C.REG.12 test results**

Step	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 <i>cbstdId</i></li> <li>○ – <i>responseCode</i> (R) = 103</li> </ul>	–	–
4	After completion of step 3, SAS Test Harness will not provide any positive response ( <i>responseCode</i> =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"/>

For the test log please refer to Section 9 of this test report.

## 8.5 6.1.4.2.7 [WINNF.FT.C.REG.14] Blacklisted CBSD (responseCode 101)

### 8.5.1 References, definitions and limits

#### 6.1 CBSD Registration Process; 6.1.4.2 Unsuccessful registration: non-zero responseCodes

This section provides test steps, conditions and procedures to test the conformance of the CBSD implementation for the CBSD Registration Procedure. A precondition is the CBSD has successfully discovered the SAS it wants to register with.

CBSD under test cannot be expected to generate a message with a missing or invalid parameter. To test for responseCode not equal to 0, the SAS Test Harness will respond to a valid registrationRequest message with a registrationResponse with a non-zero responseCode.

The purpose of these tests is to ensure that the CBSD does not transmit when a responseCode other than 0 is received. The information sent in the registration request message is not important, only that it shall conform to the protocol.

Missing/Invalid response codes are tested by injecting those responseCodes into the SAS Test Harness generated response message, even though the UUT has sent a valid message

### 8.5.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 18, 2020

### 8.5.3 Observations, settings and special notes

None

### 8.5.4 Test data

The following are the test execution steps where the Registration response contains *responseCode* (R) = 101

**Table 8.5-1: WINNF.FT.C.REG.14 test results**

Step	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 <i>cbstdid</i></li> <li>○ – <i>responseCode</i> (R) = 101</li> </ul>	–	–
4	After completion of step 3, SAS Test Harness will not provide any positive response ( <i>responseCode</i> =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"/>

For the test log please refer to Section 9 of this test report.

## 8.6 6.1.4.2.9 [WINNF.FT.C.REG.16] Unsupported SAS protocol version (responseCode 100)

### 8.6.1 References, definitions and limits

#### 6.1 CBSD Registration Process; 6.1.4.2 Unsuccessful registration: non-zero responseCodes

This section provides test steps, conditions and procedures to test the conformance of the CBSD implementation for the CBSD Registration Procedure. A precondition is the CBSD has successfully discovered the SAS it wants to register with.

CBSD under test cannot be expected to generate a message with a missing or invalid parameter. To test for responseCode not equal to 0, the SAS Test Harness will respond to a valid registrationRequest message with a registrationResponse with a non-zero responseCode.

The purpose of these tests is to ensure that the CBSD does not transmit when a responseCode other than 0 is received. The information sent in the registration request message is not important, only that it shall conform to the protocol.

Missing/Invalid response codes are tested by injecting those responseCodes into the SAS Test Harness generated response message, even though the UUT has sent a valid message

### 8.6.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 18, 2020

### 8.6.3 Observations, settings and special notes

None

### 8.6.4 Test data

The following are the test execution steps where the Registration response contains *responseCode* (R) = 100

**Table 8.6-1: WINNF.FT.C.REG.16 test results**

Step	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 <i>cbstdid</i></li> <li>○ - <i>responseCode</i> (R) = 100</li> </ul>	-	-
4	After completion of step 3, SAS Test Harness will not provide any positive response ( <i>responseCode</i> =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"/>

For the test log please refer to Section 9 of this test report.

## 8.7 6.1.4.2.11 [WINNF.FT.C.REG.18] Group Error (responseCode 201)

### 8.7.1 References, definitions and limits

#### 6.1 CBSD Registration Process; 6.1.4.2 Unsuccessful registration: non-zero responseCodes

This section provides test steps, conditions and procedures to test the conformance of the CBSD implementation for the CBSD Registration Procedure. A precondition is the CBSD has successfully discovered the SAS it wants to register with.

CBSD under test cannot be expected to generate a message with a missing or invalid parameter. To test for responseCode not equal to 0, the SAS Test Harness will respond to a valid registrationRequest message with a registrationResponse with a non-zero responseCode.

The purpose of these tests is to ensure that the CBSD does not transmit when a responseCode other than 0 is received. The information sent in the registration request message is not important, only that it shall conform to the protocol.

Missing/Invalid response codes are tested by injecting those responseCodes into the SAS Test Harness generated response message, even though the UUT has sent a valid message

### 8.7.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 18, 2020

### 8.7.3 Observations, settings and special notes

The registrationRequest groupingParam is an optional field and will be validated by the SAS Test Harness if provided in the Registration Request message. This test will validate that the CBSD will remain Unregistered after receiving responseCode 201.

### 8.7.4 Test data

The following are the test execution steps where the Registration response contains *responseCode* (R) = 201

**Table 8.7-1: WINNF.FT.C.REG.18 test results**

Step	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 <i>cbstdId</i></li> <li>○ - <i>responseCode</i> (R) = 201</li> </ul>	-	-
4	After completion of step 3, SAS Test Harness will not provide any positive response ( <i>responseCode</i> =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"/>

For the test log please refer to Section 9 of this test report.

## 8.8 6.3.4.2.1 [WINNF.FT.C.GRA.1] Unsuccessful Grant responseCode=400 (INTERFERENCE)

### 8.8.1 References, definitions and limits

6.3 CBSD Spectrum Grant Process; 6.3.4.2 Unsuccessful responses from the SAS Test Harness

This section provides test steps, condition and procedures to test the conformance of the CBSD implementation for the CBSD Spectrum Grant Procedure. A precondition is the CBSD has successfully discovered the SAS it wants to communicate with.

Each test generates a CBSD spectrum grant request and validates the CBSD takes the appropriate action following the SAS spectrum grant response.

### 8.8.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 18, 2020

### 8.8.3 Observations, settings and special notes

None

### 8.8.4 Test data

The following steps describe the test execution where the Grant response contains responseCode (R) = 400.

**Table 8.8-1: WINNF.FT.C.GRA.1 test results**

Step	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, with <i>cbstdId</i> = C</li> </ul>	-	-
2	UUT sends valid Grant Request.	-	-
3	SAS Test Harness sends a Grant Response message, including <ul style="list-style-type: none"> <li>• <i>cbstdId</i>=C</li> <li>• <i>responseCode</i> (R) = 400</li> </ul>	-	-
4	After completion of step 3, SAS Test Harness will not provide any positive response ( <i>responseCode</i> =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"/>

For the test log please refer to Section 9 of this test report.

## 8.9 6.3.4.2.2 [WINNF.FT.C.GRA.2] Unsuccessful Grant responseCode=401 (GRANT\_CONFLICT)

### 8.9.1 References, definitions and limits

6.3 CBSD Spectrum Grant Process; 6.3.4.2 Unsuccessful responses from the SAS Test Harness

This section provides test steps, condition and procedures to test the conformance of the CBSD implementation for the CBSD Spectrum Grant Procedure. A precondition is the CBSD has successfully discovered the SAS it wants to communicate with.

Each test generates a CBSD spectrum grant request and validates the CBSD takes the appropriate action following the SAS spectrum grant response.

### 8.9.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 27, 2020

### 8.9.3 Observations, settings and special notes

None

### 8.9.4 Test data

The following steps describe the test execution where the Grant response contains responseCode (R) = 401.

**Table 8.9-1: WINNF.FT.C.GRA.2 test results**

Step	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, with <i>cbstdId</i> = C</li> </ul>	-	-
2	UUT sends valid Grant Request.	-	-
3	SAS Test Harness sends a Grant Response message, including <ul style="list-style-type: none"> <li>• <i>cbstdId</i>=C</li> <li>• <i>responseCode</i> (R) = 401</li> </ul>	-	-
4	After completion of step 3, SAS Test Harness will not provide any positive response ( <i>responseCode</i> =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"/>

For the test log please refer to Section 9 of this test report.





## 8.10 6.4.4.1.1 [WINNF.FT.C.HBT.1] Heartbeat Success Case (first Heartbeat Response)

### 8.10.1 References, definitions and limits

#### 6.4 CBSD Heart Beat Process; 6.4.4.1 Successful Heartbeat (responseCode=0)

This section provides procedures for testing CBSD behavior during the Heartbeat Process. It assumes as precondition that CBSD has successfully discovered the SAS that it wants to register with, has successfully registered, has a successful Grant request, and is in the Granted or Authorized state.

This test case incorporates validation of successful Spectrum Inquiry messaging (if present) and successful Grant messaging into the Heartbeat Success case.

### 8.10.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 27, 2020

### 8.10.3 Observations, settings and special notes

None

### 8.10.4 Test data

**Table 8.10-1: WINNF.FT.C.HBT.1 test results**

Step	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, with <i>cbsdId</i> = C</li> </ul>	-	-
2	UUT sends a message: <ul style="list-style-type: none"> <li>• If message is type Spectrum Inquiry Request, go to step 3, or</li> <li>• If message is type Grant Request, go to step 5</li> </ul>	-	-
3	UUT sends Spectrum Inquiry Request. Validate: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• List of frequencyRange objects sent by UUT are within the CBRS frequency range</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	SAS Test Harness sends a Spectrum Inquiry Response message, including the following parameters: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• <i>availableChannel</i> is an array of availableChannel objects</li> <li>• <i>responseCode</i> = 0</li> </ul>	-	-
5	UUT sends Grant Request message. Validate: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• maxEIRP is at or below the limit appropriate for CBSD category as defined by Part 96</li> <li>• operationFrequencyRange, F, sent by UUT is a valid range within the CBRS band</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	SAS Test Harness sends a Grant Response message, including the parameters: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G = a valid grant ID</li> <li>• <i>grantExpireTime</i> = UTC time greater than duration of the test</li> <li>• <i>responseCode</i> = 0</li> </ul>	-	-
7	UUT sends a first Heartbeat Request message. Verify Heartbeat Request message is formatted correctly, including: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>operationState</i> = "GRANTED"</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>



Step	Test Execution Steps	Pass	Fail
8	SAS Test Harness sends a Heartbeat Response message, with the following parameters: <ul style="list-style-type: none"><li>• <i>cbsdId</i> = C</li><li>• <i>grantId</i> = G</li><li>• <i>transmitExpireTime</i> = current UTC time + 200 seconds</li><li>• <i>responseCode</i> = 0</li></ul>	–	–
9	For further Heartbeat Request messages sent from UUT after completion of step 8, validate message is sent within latest specified <i>heartbeatInterval</i> , and: <ul style="list-style-type: none"><li>• <i>cbsdId</i> = C</li><li>• <i>grantId</i> = G</li><li>• <i>operationState</i> = "AUTHORIZED"</li></ul> and SAS Test Harness responds with a Heartbeat Response message including the following parameters: <ul style="list-style-type: none"><li>• <i>cbsdId</i> = C</li><li>• <i>grantId</i> = G</li><li>• <i>transmitExpireTime</i> = current UTC time + 200 seconds</li><li>• <i>responseCode</i> = 0</li></ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10	Monitor the RF output of the UUT from start of test until UUT transmission commences. Verify: <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"/>

For the test log please refer to Section 9 of this test report.

## 8.11 6.4.4.2.1 [WINNF.FT.C.HBT.3] Heartbeat responseCode=105 (DEREGISTER)

### 8.11.1 References, definitions and limits

6.4 CBSD Heart Beat Process; 6.4.4.2 Unsuccessful Heartbeat Test Cases (responseCode != 0)

This section provides procedures for testing CBSD behavior during the Heartbeat Process. It assumes as precondition that CBSD has successfully discovered the SAS that it wants to register with, has successfully registered, has a successful Grant request, and is in the Granted or Authorized state.

The test cases in this section cover Heartbeat Response messages with non-zero responseCodes. Part of the pass/fail criteria of these test cases is the cessation of all UUT RF transmission. Therefore, in all test cases, after the non-zero responseCode is sent, the SAS Test Harness shall not allow any new Grant Request from the UUT to succeed.

### 8.11.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 27, 2020

### 8.11.3 Observations, settings and special notes

None

### 8.11.4 Test data

**Table 8.11-1:** WINNF.FT.C.HBT.3 test results

Step	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>◦ valid <i>cbsdId</i> = C</li> <li>◦ valid <i>grantId</i> = G</li> <li>◦ grant is for frequency range F, power P</li> <li>◦ <i>grantExpireTime</i> = 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>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>operationState</i> = "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>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>transmitExpireTime</i> = T = Current UTC time</li> <li>• <i>responseCode</i> = 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"/>

For the test log please refer to Section 9 of this test report.

## 8.12 6.4.4.2.2 [WINNF.FT.C.HBT.4] Heartbeat responseCode=500 (TERMINATED\_GRANT)

### 8.12.1 References, definitions and limits

6.4 CBSD Heart Beat Process; 6.4.4.2 Unsuccessful Heartbeat Test Cases (responseCode != 0)

This section provides procedures for testing CBSD behavior during the Heartbeat Process. It assumes as precondition that CBSD has successfully discovered the SAS that it wants to register with, has successfully registered, has a successful Grant request, and is in the Granted or Authorized state.

The test cases in this section cover Heartbeat Response messages with non-zero responseCodes. Part of the pass/fail criteria of these test cases is the cessation of all UUT RF transmission. Therefore, in all test cases, after the non-zero responseCode is sent, the SAS Test Harness shall not allow any new Grant Request from the UUT to succeed.

### 8.12.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 27, 2020

### 8.12.3 Observations, settings and special notes

None

### 8.12.4 Test data

**Table 8.12-1:** WINNF.FT.C.HBT.4 test results

Step	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 <i>cbsdId</i> = C</li> <li>o valid <i>grantId</i> = G</li> <li>o grant is for frequency range F, power P</li> <li>o <i>grantExpireTime</i> = 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>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>operationState</i> = "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>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>transmitExpireTime</i> = T = Current UTC time</li> <li>• <i>responseCode</i> = 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"/>

For the test log please refer to Section 9 of this test report.

### 8.13 6.4.4.2.3 [WINNF.FT.C.HBT.5] Heartbeat responseCode=501 (SUSPENDED\_GRANT) in First Heartbeat Response

#### 8.13.1 References, definitions and limits

6.4 CBSD Heart Beat Process; 6.4.4.2 Unsuccessful Heartbeat Test Cases (responseCode != 0)

This section provides procedures for testing CBSD behavior during the Heartbeat Process. It assumes as precondition that CBSD has successfully discovered the SAS that it wants to register with, has successfully registered, has a successful Grant request, and is in the Granted or Authorized state.

The test cases in this section cover Heartbeat Response messages with non-zero responseCodes. Part of the pass/fail criteria of these test cases is the cessation of all UUT RF transmission. Therefore, in all test cases, after the non-zero responseCode is sent, the SAS Test Harness shall not allow any new Grant Request from the UUT to succeed.

#### 8.13.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 27, 2020

#### 8.13.3 Observations, settings and special notes

None

#### 8.13.4 Test data

**Table 8.13-1:** WINNF.FT.C.HBT.5 test results

Step	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 <i>cbsdId</i> = C</li> <li>o valid <i>grantId</i> = G</li> <li>o grant is for frequency range F, power P</li> <li>o <i>grantExpireTime</i> = 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. Verify Heartbeat Request message is formatted correctly, including: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>operationState</i> = "GRANTED"</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>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>transmitExpireTime</i> = T = Current UTC time</li> <li>• <i>responseCode</i> = 501 (SUSPENDED_GRANT)</li> </ul>	-	-
4	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.	-	-



Step	Test Execution Steps	Pass	Fail
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: <ul style="list-style-type: none"><li>• <i>cbsdId</i> = C</li><li>• <i>grantId</i> = G</li><li>• <i>operationState</i> = "GRANTED"</li></ul> B. UUT sends a Relinquishment request message. Ensure message is correctly formatted with parameters: <ul style="list-style-type: none"><li>• <i>cbsdId</i> = C</li><li>• <i>grantId</i> = G</li></ul> Monitor the RF output of the UUT. Verify: <ul style="list-style-type: none"><li>• UUT does not transmit at any time</li></ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

For the test log please refer to Section 9 of this test report.



## 8.14 6.4.4.2.4 [WINNF.FT.C.HBT.6] Heartbeat responseCode=501 (SUSPENDED\_GRANT) in Subsequent Heartbeat Response

### 8.14.1 References, definitions and limits

6.4 CBSD Heart Beat Process; 6.4.4.2 Unsuccessful Heartbeat Test Cases (responseCode != 0)

This section provides procedures for testing CBSD behavior during the Heartbeat Process. It assumes as precondition that CBSD has successfully discovered the SAS that it wants to register with, has successfully registered, has a successful Grant request, and is in the Granted or Authorized state.

The test cases in this section cover Heartbeat Response messages with non-zero responseCodes. Part of the pass/fail criteria of these test cases is the cessation of all UUT RF transmission. Therefore, in all test cases, after the non-zero responseCode is sent, the SAS Test Harness shall not allow any new Grant Request from the UUT to succeed.

### 8.14.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 27, 2020

### 8.14.3 Observations, settings and special notes

None

### 8.14.4 Test data

**Table 8.14-1:** WINNF.FT.C.HBT.6 test results

Step	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 <i>cbsdId</i> = C</li> <li>o valid <i>grantId</i> = G</li> <li>o grant is for frequency range F, power P</li> <li>o <i>grantExpireTime</i> = 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 latest specified <i>heartbeatInterval</i> , and is formatted correctly, including: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>operationState</i> = "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>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>transmitExpireTime</i> = T = Current UTC time</li> <li>• <i>responseCode</i> = 501 (SUSPENDED_GRANT)</li> </ul>	-	-
4	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.	-	-



**Section 8**      *Testing data*  
**Test name**      6.4.4.2.4 [WINNF.FT.C.HBT.6] Heartbeat responseCode=501 (SUSPENDED\_GRANT) in Subsequent Heartbeat Response  
**Specification**      WINNF-TS-0122-V1.0.1

Step	Test Execution Steps	Pass	Fail
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: <ul style="list-style-type: none"><li>• <i>cbsdId</i> = C</li><li>• <i>grantId</i> = G</li><li>• <i>operationState</i> = "GRANTED"</li></ul> B. UUT sends a Relinquishment Request message. Ensure message is correctly formatted with parameters: <ul style="list-style-type: none"><li>• <i>cbsdId</i> = C</li><li>• <i>grantId</i> = G</li></ul> 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"/>

For the test log please refer to Section 9 of this test report.



## 8.15 6.4.4.2.5 [WINNF.FT.C.HBT.7] Heartbeat responseCode=502 (UNSYNC\_OP\_PARAM)

### 8.15.1 References, definitions and limits

6.4 CBSD Heart Beat Process; 6.4.4.2 Unsuccessful Heartbeat Test Cases (responseCode != 0)

This section provides procedures for testing CBSD behavior during the Heartbeat Process. It assumes as precondition that CBSD has successfully discovered the SAS that it wants to register with, has successfully registered, has a successful Grant request, and is in the Granted or Authorized state.

The test cases in this section cover Heartbeat Response messages with non-zero responseCodes. Part of the pass/fail criteria of these test cases is the cessation of all UUT RF transmission. Therefore, in all test cases, after the non-zero responseCode is sent, the SAS Test Harness shall not allow any new Grant Request from the UUT to succeed.

### 8.15.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 27, 2020

### 8.15.3 Observations, settings and special notes

None

### 8.15.4 Test data

**Table 8.15-1:** WINNF.FT.C.HBT.7 test results

Step	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 <i>cbsdId</i> = C</li> <li>o valid <i>grantId</i> = G</li> <li>o grant is for frequency range F, power P</li> <li>o <i>grantExpireTime</i> = 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 latest specified <i>heartbeatInterval</i> , and is formatted correctly, including: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>operationState</i> = "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>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>transmitExpireTime</i> = T = Current UTC time</li> <li>• <i>responseCode</i> = 502 (UNSYNC_OP_PARAM)</li> </ul>	–	–
4	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.	–	–



**Section 8**      *Testing data*  
**Test name**     6.4.4.2.5 [WINNF.FT.C.HBT.7] Heartbeat responseCode=502 (UNSYNC\_OP\_PARAM)  
**Specification**   WINNF-TS-0122-V1.0.1

Step	Test Execution Steps	Pass	Fail
5	Monitor the SAS-CBSD interface. Verify: <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 <i>cbdsId</i> = C</li><li>o <i>grantId</i> = G</li></ul></li></ul> 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"/>

For the test log please refer to Section 9 of this test report.

## 8.16 6.4.4.3.1 [WINNF.FT.C.HBT.9] Heartbeat Response Absent (First Heartbeat)

### 8.16.1 References, definitions and limits

6.4 CBSD Heart Beat Process; 6.4.4.3 Heartbeat Response Absent Test Cases

This section provides procedures for testing CBSD behavior during the Heartbeat Process. It assumes as precondition that CBSD has successfully discovered the SAS that it wants to register with, has successfully registered, has a successful Grant request, and is in the Granted or Authorized state.

These test cases cover the case where communication is lost between the UUT and the SAS during the Heartbeat Process.

### 8.16.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 27, 2020

### 8.16.3 Observations, settings and special notes

None

### 8.16.4 Test data

**Table 8.16-1:** WINNF.FT.C.HBT.9 test results

Step	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 <i>cbsdId</i> = C</li> <li>o valid <i>grantId</i> = G</li> <li>o grant is for frequency range F, power P</li> <li>o <i>grantExpireTime</i> = 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 <i>heartbeatInterval</i> , and is formatted correctly, including: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>operationState</i> = “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"/>

For the test log please refer to Section 9 of this test report.



## 8.17 6.4.4.3.2 [WINNF.FT.C.HBT.10] Heartbeat Response Absent (Subsequent Heartbeat)

### 8.17.1 References, definitions and limits

6.4 CBSD Heart Beat Process; 6.4.4.3 Heartbeat Response Absent Test Cases

This section provides procedures for testing CBSD behavior during the Heartbeat Process. It assumes as precondition that CBSD has successfully discovered the SAS that it wants to register with, has successfully registered, has a successful Grant request, and is in the Granted or Authorized state.

These test cases cover the case where communication is lost between the UUT and the SAS during the Heartbeat Process.

### 8.17.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 28, 2020

### 8.17.3 Observations, settings and special notes

None

### 8.17.4 Test data

**Table 8.17-1:** WINNF.FT.C.HBT.10 test results

Step	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 <i>cbsdId</i> = C</li> <li>o valid <i>grantId</i> = G</li> <li>o grant is for frequency range F, power P</li> <li>o <i>grantExpireTime</i> = 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 <i>heartbeatInterval</i> , and is formatted correctly, including: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>operationState</i> = "AUTHORIZED"</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	SAS Test Harness sends a Heartbeat Response message, with the following parameters: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>transmitExpireTime</i> = current UTC time + 200 seconds</li> <li>• <i>responseCode</i> = 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 (<i>transmitExpireTime</i> + 60 seconds), using the <i>transmitExpireTime</i> sent in Step 3.</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

For the test log please refer to Section 9 of this test report.

## 8.18 6.5.4.2.3 [WINNF.FT.C.MES.3] Grant Response contains measReportConfig

### 8.18.1 References, definitions and limits

6.5 CBSD Measurement Report; 6.5.4.2 Measurement Report Test Cases

This section explains test steps/condition/procedure for CBSD behavior for Measurement Reports.

The main test cases for Measurement Report are outlined below, in terms of Measurement Report Stimulus (in a Response message from SAS) and a Measurement Report Response (in the subsequent Request message from the UUT).

Devices which support one measurement capability must satisfy the test cases mandatory for that measurement capability. Devices which support multiple measurement capabilities must satisfy the test cases mandatory for each type of supported measurement capability.

This test case is mandatory for UUT supporting RECEIVED\_POWER\_WITH\_GRANT measurement reports.

### 8.18.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 28, 2020

### 8.18.3 Observations, settings and special notes

None

### 8.18.4 Test data

**Table 8.18-1:** WINNF.FT.C.MES.3 test results

Step	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 <i>cbsdId</i>=C and <i>measCapability</i> = "RECEIVED_POWER_WITH_GRANT"</li> </ul>	-	-
2	UUT sends a Grant Request message. Verify Grant Request message contains all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• <i>operationParam</i> is present and format is valid</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	SAS Test Harness sends a Grant Response message, with the following parameters: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G = valid grant ID</li> <li>• <i>grantExpireTime</i> = UTC time in the future</li> <li>• <i>heartbeatInterval</i> = 60 seconds</li> <li>• <i>measReportConfig</i> = "RECEIVED_POWER_WITH_GRANT"</li> <li>• <i>channelType</i> = "GAA"</li> <li>• <i>responseCode</i> = 0</li> </ul>	-	-
4	UUT sends a Heartbeat Request message. Verify message contains all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>operationState</i> = "GRANTED"</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>



Step	Test Execution Steps	Pass	Fail
5	If Heartbeat Request message (step 4) contains <i>measReport</i> object, then: <ul style="list-style-type: none"><li>• verify <i>measReport</i> is properly formatted as object rcvdPowerMeasReport</li><li>• end test, with PASS result</li></ul> else, if Heartbeat Request message (step 4) does not contain <i>measReport</i> object, then: <ul style="list-style-type: none"><li>• if number of Heartbeat Requests sent by UUT after Step 3 is = 5, then stop test with result of FAIL</li></ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	SAS Test Harness sends a Heartbeat Response message, containing all required parameters properly formatted, and specifically: <ul style="list-style-type: none"><li>• <i>cbsdId</i> = C</li><li>• <i>grantId</i> = G</li><li>• <i>transmitExpireTime</i> = current UTC time + 200 seconds</li><li>• <i>responseCode</i> = 0</li></ul> Go to Step 4, above	–	–

For the test log please refer to Section 9 of this test report.

## 8.19 6.5.4.2.4 [WINNF.FT.C.MES.4] Heartbeat Response contains measReportConfig

### 8.19.1 References, definitions and limits

6.5 CBSD Measurement Report; 6.5.4.2 Measurement Report Test Cases

This section explains test steps/condition/procedure for CBSD behavior for Measurement Reports.

The main test cases for Measurement Report are outlined below, in terms of Measurement Report Stimulus (in a Response message from SAS) and a Measurement Report Response (in the subsequent Request message from the UUT).

Devices which support one measurement capability must satisfy the test cases mandatory for that measurement capability. Devices which support multiple measurement capabilities must satisfy the test cases mandatory for each type of supported measurement capability.

This test case is mandatory for UUT supporting RECEIVED\_POWER\_WITH\_GRANT measurement reports.

### 8.19.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 27, 2020

### 8.19.3 Observations, settings and special notes

None

### 8.19.4 Test data

**Table 8.19-1:** WINNF.FT.C.MES.4 test results

Step	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 <i>cbsdId</i>=C and <i>measCapability</i> = "RECEIVED_POWER_WITH_GRANT"</li> <li>• UUT has received a valid grant with <i>grantId</i> = G</li> <li>• UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant.</li> <li>• Grant has <i>heartbeatInterval</i> = 60 seconds</li> </ul>	-	-
2	UUT sends a Heartbeat Request message. Verify Heartbeat Request message contains all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>operationState</i> = "AUTHORIZED"</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	SAS Test Harness sends a Heartbeat Response message, containing all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>measReportConfig</i> = "RECEIVED_POWER_WITH_GRANT"</li> <li>• <i>responseCode</i> = 0</li> </ul>	-	-
4	UUT sends a Heartbeat Request message. Verify message contains all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> <li>• <i>operationState</i> = "AUTHORIZED"</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>



Step	Test Execution Steps	Pass	Fail
5	If Heartbeat Request message (step 4) contains <i>measReport</i> object, then: <ul style="list-style-type: none"><li>• verify <i>measReport</i> is properly formatted as object rcvdPowerMeasReport</li><li>• end test, with PASS result</li></ul> else, if Heartbeat Request message (step 4) does not contain <i>measReport</i> object, then: <ul style="list-style-type: none"><li>• If number of Heartbeat Requests sent by UUT after Step 3 is = 5, then stop test with result of FAIL</li></ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	SAS Test Harness sends a Heartbeat Response message, containing all required parameters properly formatted, and specifically: <ul style="list-style-type: none"><li>• <i>cbsdId</i> = C</li><li>• <i>grantId</i> = G</li><li>• <i>responseCode</i> = 0</li></ul> Go to Step 4, above	–	–

For the test log please refer to Section 9 of this test report.





## 8.20 6.6.4.1.1 [WINNF.FT.C.RLQ.1] Successful Relinquishment

### 8.20.1 References, definitions and limits

6.6 CBSD Relinquishment Process; 6.6.4.1 Successful Relinquishment Request (responseCode 0)

This section provides test steps, condition and procedures to test the conformance of the CBSD implementation for the CBSD Relinquishment Procedure. A precondition is the CBSD has successfully discovered the SAS it wants to communicate with.

Each test generates a CBSD relinquishment request and validates the CBSD takes the appropriate action following the SAS relinquishment response. The CBSD shall send the Relinquishment request message after stopping the RF transmission.

### 8.20.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 30, 2020

### 8.20.3 Observations, settings and special notes

None

### 8.20.4 Test data

**Table 8.20-1:** WINNF.FT.C.RLQ.1 test results

Step	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"/>

For the test log please refer to Section 9 of this test report.



## 8.21 6.6.4.2.1 [WINNF.FT.C.RLQ.3] Unsuccessful Relinquishment, responseCode=102

### 8.21.1 References, definitions and limits

6.6 CBSD Relinquishment Process; 6.6.4.2 Missing Parameter (responseCode 102)

This section provides test steps, condition and procedures to test the conformance of the CBSD implementation for the CBSD Relinquishment Procedure. A precondition is the CBSD has successfully discovered the SAS it wants to communicate with.

Each test generates a CBSD relinquishment request and validates the CBSD takes the appropriate action following the SAS relinquishment response. The CBSD shall send the Relinquishment request message after stopping the RF transmission.

CBSD under test cannot be expected to generate a message with a missing or invalid parameter. To test for responseCode not equal to 0, the SAS Test Harness will respond to a message with a non-zero responseCode.

### 8.21.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 30, 2020

### 8.21.3 Observations, settings and special notes

None

### 8.21.4 Test data

The following are the test execution steps where the Relinquishment response contains *responseCode* (R) = 102.

**Table 8.21-1:** WINNF.FT.C.RLQ.3 test results

Step	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 <i>cbsdId</i>=C</li> <li>• UUT has received a valid grant with <i>grantId</i> = 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>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> </ul>	–	–
3	SAS Test Harness shall send a Relinquishment Response message with parameters: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• No <i>grantId</i></li> <li>• <i>responseCode</i> (R) = 102</li> </ul>	–	–
4	After completion of step 3, SAS Test Harness will not provide any positive response ( <i>responseCode</i> =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 stopped RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

For the test log please refer to Section 9 of this test report.

## 8.22 6.6.4.3.1 [WINNF.FT.C.RLQ.5] Unsuccessful Relinquishment, responseCode=103

### 8.22.1 References, definitions and limits

6.6 CBSD Relinquishment Process; 6.6.4.3 Invalid Parameter (responseCode 103)

This section provides test steps, condition and procedures to test the conformance of the CBSD implementation for the CBSD Relinquishment Procedure. A precondition is the CBSD has successfully discovered the SAS it wants to communicate with.

Each test generates a CBSD relinquishment request and validates the CBSD takes the appropriate action following the SAS relinquishment response. The CBSD shall send the Relinquishment request message after stopping the RF transmission.

CBSD under test cannot be expected to generate a message with a missing or invalid parameter. To test for responseCode not equal to 0, the SAS Test Harness will respond to a message with a non-zero responseCode.

### 8.22.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 30, 2020

### 8.22.3 Observations, settings and special notes

None

### 8.22.4 Test data

The following are the test execution steps where the Relinquishment response contains *responseCode* (R) = 103 and *responseData* = "grantId".

**Table 8.22-1:** WINNF.FT.C.RLQ.5 test results

Step	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 <i>cbsdId</i>=C</li> <li>• UUT has received a valid grant with <i>grantId</i> = 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>• <i>cbsdId</i> = C</li> <li>• <i>grantId</i> = G</li> </ul>	-	-
3	SAS Test Harness shall send a Relinquishment Response message with parameters: <ul style="list-style-type: none"> <li>• <i>cbsdId</i> = C</li> <li>• <i>responseData</i> = "grantId"</li> <li>• <i>responseCode</i> (R) = 103</li> </ul>	-	-
4	After completion of step 3, SAS Test Harness will not provide any positive response ( <i>responseCode</i> =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 stopped RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

For the test log please refer to Section 9 of this test report.

## 8.23 6.7.4.1.1 [WINNF.FT.C.DRG.1] Successful Deregistration

### 8.23.1 References, definitions and limits

6.7 CBSD Deregistration Process; 6.7.4.1 Successful Deregistration Request (responseCode 0)

This section explains test steps/condition/procedure for the CBSD Deregistration Request and its subsequent actions following the reception of the Deregistration Responses from the SAS.

A Deregistration request is issued by a CBSD to request a SAS to deregister the CBSD from the SAS. A Deregistration Request Message issued by a CBSD is provided in [n.5], Section 10.11.

In the Deregistration Response message, the SAS should echo back an array of DeregistrationResponse object. Each deregistrationResponse object consists of a cbsdId and a responseCode. If the deregistration request was successful, the responseCode should be set to 0, otherwise responseCode is set to appropriate error value. The deregistrationResponse Message and the deregistrationResponse object are provided in [n.5], Section 10.12.

Each test generates a CBSD deregistration request and validates the CBSD takes the appropriate actions following the SAS deregistration response.

These deregistration test cases assume the CBSD is the source (operator initiated, for instance reset site). Deregistrations triggered by the SAS in a response message with a responseCode of 105 are covered in other test cases.

A Deregistration request is issued by a CBSD to request a SAS to deregister the CBSD from the SAS. A Deregistration Request Message issued by a CBSD is provided in [n.5], Section 10.11.

### 8.23.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 30, 2020

### 8.23.3 Observations, settings and special notes

None

### 8.23.4 Test data

**Table 8.23-1: WINNF.FT.C.DRG.1 test results**

Step	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 <i>cbsdId=C</i></li> <li>• UUT has received a valid grant with <i>grantId = G</i></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 may send a Relinquishment request and receives Relinquishment response with <i>responseCode=0</i>	-	-
3	UUT sends Deregistration Request to SAS Test Harness with <i>cbsdId = C</i> .	<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>• <i>cbsdId = C</i></li> <li>• <i>responseCode = 0</i></li> </ul>	-	-
5	After completion of step 3, SAS Test Harness will not provide any additional positive response ( <i>responseCode=0</i> ) 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"/>

For the test log please refer to Section 9 of this test report.

## 8.24 6.7.4.2.1 [WINNF.FT.C.DRG.3] Deregistration responseCode=102

### 8.24.1 References, definitions and limits

#### 6.7 CBSD Deregistration Process; 6.7.4.2 Missing Parameter (responseCode 102)

This section explains test steps/condition/procedure for the CBSD Deregistration Request and its subsequent actions following the reception of the Deregistration Responses from the SAS.

A Deregistration request is issued by a CBSD to request a SAS to deregister the CBSD from the SAS. A Deregistration Request Message issued by a CBSD is provided in [n.5], Section 10.11.

In the Deregistration Response message, the SAS should echo back an array of DeregistrationResponse object. Each deregistrationResponse object consists of a cbsdId and a responseCode. If the deregistration request was successful, the responseCode should be set to 0, otherwise responseCode is set to appropriate error value. The deregistrationResponse Message and the deregistrationResponse object are provided in [n.5], Section 10.12.

Each test generates a CBSD deregistration request and validates the CBSD takes the appropriate actions following the SAS deregistration response.

These deregistration test cases assume the CBSD is the source (operator initiated, for instance reset site). Deregistrations triggered by the SAS in a response message with a responseCode of 105 are covered in other test cases.

CBSD under test cannot be expected to generate a message with a missing or invalid parameter. To test for responseCode not equal to 0, the SAS Test Harness will respond to a message with a non-zero responseCode.

### 8.24.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 30, 2020

### 8.24.3 Observations, settings and special notes

None

### 8.24.4 Test data

The following are the test execution steps where the Deregistration response contains *responseCode* (R) = 102.

**Table 8.24-1: WINNF.FT.C.DRG.3 test results**

Step	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 <i>cbsdId</i>=C</li> <li>• UUT has received a valid grant with <i>grantId</i> = 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 may send a Relinquishment request and receives Relinquishment response with <i>responseCode</i> =0	–	–
3	UUT sends Deregistration Request to SAS Test Harness with <i>cbsdId</i> = C	–	–
4	The SAS Test Harness sends the Deregistration Response Message to UUT with: <ul style="list-style-type: none"> <li>• No <i>cbsdId</i></li> <li>• <i>responseCode</i> (R) = 102</li> </ul>	–	–
5	After completion of step 3, SAS Test Harness will not provide any positive response ( <i>responseCode</i> =0) to further request messages from the UUT.	–	–



**Section 8**      *Testing data*  
**Test name**     6.7.4.2.1 [WINNF.FT.C.DRG.3] Deregistration responseCode=102  
**Specification**   WINNF-TS-0122-V1.0.1

Step	Test Execution Steps	Pass	Fail
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"/>

For the test log please refer to Section 9 of this test report.

## 8.25 6.7.4.3.1 [WINNF.FT.C.DRG.5] Deregistration responseCode=103

### 8.25.1 References, definitions and limits

#### 6.7 CBSD Deregistration Process; 6.7.4.3 Invalid Parameter (responseCode 103)

This section explains test steps/condition/procedure for the CBSD Deregistration Request and its subsequent actions following the reception of the Deregistration Responses from the SAS.

A Deregistration request is issued by a CBSD to request a SAS to deregister the CBSD from the SAS. A Deregistration Request Message issued by a CBSD is provided in [n.5], Section 10.11.

In the Deregistration Response message, the SAS should echo back an array of DeregistrationResponse object. Each deregistrationResponse object consists of a cbsdId and a responseCode. If the deregistration request was successful, the responseCode should be set to 0, otherwise responseCode is set to appropriate error value. The deregistrationResponse Message and the deregistrationResponse object are provided in [n.5], Section 10.12.

Each test generates a CBSD deregistration request and validates the CBSD takes the appropriate actions following the SAS deregistration response.

These deregistration test cases assume the CBSD is the source (operator initiated, for instance reset site). Deregistrations triggered by the SAS in a response message with a responseCode of 105 are covered in other test cases.

CBSD under test cannot be expected to generate a message with a missing or invalid parameter. To test for responseCode not equal to 0, the SAS Test Harness will respond to a message with a non-zero responseCode.

### 8.25.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 30, 2020

### 8.25.3 Observations, settings and special notes

None

### 8.25.4 Test data

The following are the test execution steps where the Deregistration response contains *responseCode* (R) = 103 and *responseData* = "cbsdId"..

**Table 8.25-1: WINNF.FT.C.DRG.5 test results**

Step	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 <i>cbsdId</i>=C</li> <li>• UUT has received a valid grant with <i>grantId</i> = 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 may send a Relinquishment request and receives Relinquishment response with <i>responseCode</i> =0	–	–
3	UUT sends Deregistration Request to SAS Test Harness with <i>cbsdId</i> = C	–	–
4	The SAS Test Harness sends the Deregistration Response Message to UUT with: <ul style="list-style-type: none"> <li>• <i>responseData</i> = <i>cbsdId</i></li> <li>• <i>responseCode</i> (R) = 103</li> </ul>	–	–
5	After completion of step 3, SAS Test Harness will not provide any positive response ( <i>responseCode</i> =0) to further request messages from the UUT.	–	–



**Section 8**      *Testing data*  
**Test name**     6.7.4.3.1 [WINNF.FT.C.DRG.5] Deregistration responseCode=103  
**Specification**   WINNF-TS-0122-V1.0.1

Step	Test Execution Steps	Pass	Fail
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"/>

For the test log please refer to Section 9 of this test report.





## 8.26 6.8.4.1.1 [WINNF.FT.C.SCS.1] Successful TLS connection between UUT and SAS Test Harness

### 8.26.1 References, definitions and limits

#### 6.8 CBSD Security Validation; 6.8.4.1 Successful TLS connection

This section provides test steps, condition and procedures to test the conformance of the CBSD implementation for the Security Establishment Procedure. A precondition is the CBSD has successfully discovered the SAS it wants to communicate with.

Certificate generation for executing the security test cases shall be according to section 9.1.

Each test initiates communication between CBSD and SAS and verifies that the communication is started over a secured communication.

In all test cases under this category, the TLS connection is established successfully between the SAS Test Harness and CBSD. A pre-condition for these tests is that Certificates at CBSD and SAS Test Harness are correct and valid. The security procedure is irrespective of the procedures defined for the SAS Test Harness to CBSD communication.

### 8.26.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 31, 2020

### 8.26.3 Observations, settings and special notes

Place in the WinnForum SAS Test Harness the correct SAS Test Harness X.509 certificates for this test case. Edit the conf.xml file appropriately for use of this certificate.

Verify the SAS Test Harness X.509 certificate is the correct X.509 certificate for this test case by inspecting its content as described in the "readme\_file\_x509\_RSA\_certs\_test\_labs.txt" [WINNF-IN-0156 Version V1.0.0.1]. For test case [WINNF.FT.C.SCS.1] the X.509 certificate is the regular SAS Test Harness X.509 certificate used for the Interface Conformance Testing in [WINNF-TS-0122 Version V1.0.0].

The method for executing CBSD/DP UUT security test case is via Wireshark.

### 8.26.4 Test data

**Table 8.26-1:** WINNF.FT.C.SCS.1 alternative test results

Step	Test Execution Steps	Pass	Fail
1	Verify in Wireshark the following in the captured packets: 1. Wireshark "Protocol" column shows "TLSv1.2" 2. CBSD/DP UUT sends "Client Hello" message to WinnForum SAS Test Harness WinnForum SAS Test Harness sends "Server Hello" message to CBSD/DP UUT. • The "Server Hello" message "Handshake Protocol" IE includes the "Cipher Suite" IE. • Verify the "Cipher Suite" shown in Wireshark is one of the following: 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. "Application Data" messages are exchanged between WinnForum SAS Test Harness and CBSD/DP UUT.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Verify that WinnForum SAS Test Harness Command Prompt shows Registration Request Message from CBSD/DP UUT	<input checked="" type="checkbox"/>	<input type="checkbox"/>

For the WhiteShark screenshots please refer to Section 9 of this test report.

## 8.27 6.8.4.2.1 [WINNF.FT.C.SCS.2] TLS failure due to revoked certificate

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### 8.27.1 References, definitions and limits

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6.8 CBSD Security Validation; 6.8.4.2 Unsuccessful TLS connection

This section provides test steps, condition and procedures to test the conformance of the CBSD implementation for the Security Establishment Procedure.

A precondition is the CBSD has successfully discovered the SAS it wants to communicate with.

Certificate generation for executing the security test cases shall be according to section 9.1.

Each test initiates communication between CBSD and SAS and verifies that the communication is started over a secured communication.

In all test cases under this category, the TLS connection is not established successfully between the SAS Test Harness and CBSD. The security procedure is irrespective of the procedures defined for the SAS Test Harness to CBSD communication.

### 8.27.2 Test summary

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Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 31, 2020

### 8.27.3 Observations, settings and special notes

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Test case pre-requisite:

- The certificate at the SAS Test Harness shall be marked as revoked.

### 8.27.4 Test data

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#### Alternative method

Place in the WinnForum SAS Test Harness the correct SAS Test Harness X.509 certificates for this test case. Edit the conf.xml file appropriately for use of this certificate.

Verify the SAS Test Harness X.509 certificate is the correct X.509 certificate for this test case by inspecting its content as described in the "readme\_file\_x509\_RSA\_certs\_test\_labs.txt" [WINNF-IN-0156 Version V1.0.0.1]. For test case [WINNF.FT.C.SCS.2] the X.509 certificate has

- Proper Validity time (the X.509 certificate is not expired)
- X.509v3 extension of "Authority Information Access: OCSP - URI: http://ocsp.testharness.cbrstestlab.com" (this URI is an example of the OCSP server available for the test lab)
- X.509v3 extension of "CRL Distribution Points: Full Name: URI: http://crlserver.testharness.cbrstestlab.com/crlserver.crl" (this URI is an example of the CRL server and CRL file available for the test lab)
- Certificate Serial Number appears as "Revoked" in the CRL file located in the CRL server available for the test lab or appears as "Revoked" in the OCSP server available for the test lab.

For execution of this test case the CRL file must have proper validity. If this test is intended to be executed when the validity date of the CRL file has expired, a new CRL file with proper validity needs to be generated as described in the "readme\_file\_x509\_RSA\_certs\_test\_labs.txt" [WINNF-IN-0156 Version V1.0.0.1].

For execution of this test case, the test lab also requires an available DNS server to resolve FQDNs of the OCSP server or CRL server.

The method for executing CBSD/DP UUT security test case is via Wireshark.



**Table 8.27-1:** WINNF.FT.C.SCS.2 alternative test results

Step	Test Execution Steps	Pass	Fail
1	Verify in Wireshark the following in the captured packets: <ol style="list-style-type: none"> <li>1. Wireshark "Protocol" column shows "TLSv1.2"</li> <li>2. CBSD/DP UUT sends "Client Hello" message to WInnForum SAS Test Harness</li> <li>3. WInnForum SAS Test Harness sends "Server Hello" message to CBSD/DP UUT.               <ul style="list-style-type: none"> <li>• The "Server Hello" message "Handshake Protocol" IE includes the "Cipher Suite" IE.</li> <li>• Verify the "Cipher Suite" shown in Wireshark is one of the following:                    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</li> </ul> </li> <li>4. CBSD/DP UUT performs DNS resolution for the FQDN of the CRL server, or OCSP server, or both listed in the X.509v3 extensions described above for the X.509 certificate of SAS Test Harness.</li> <li>5. CBSD/DP UUT:               <ul style="list-style-type: none"> <li>• Download the CRL file according to the full URI listed in X.509v3 extension of "CRL Distribution Points" described above.</li> </ul>               OR               <ul style="list-style-type: none"> <li>• Send to the OCSP server an OCSP "Request" message containing the certificate serial number, and OCSP server replies.</li> </ul>               OR               <ul style="list-style-type: none"> <li>• Both CRL file download and OCSP transaction as described above.</li> </ul> </li> <li>6. "Application Data" messages are not seen between WInnForum SAS Test Harness and CBSD/DP UUT.</li> <li>7. CBSD/DP UUT may send a TLS "Alert" message to WInnForum SAS Test Harness notifying of rejecting the TLS connection before attempting to establish the TLS connection again.</li> </ol>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Verify that WInnForum SAS Test Harness Command Prompt does not show any Request Message from CBSD/DP UUT	<input checked="" type="checkbox"/>	<input type="checkbox"/>

For the WhiteShark screenshots please refer to Section 9 of this test report.

## 8.28 6.8.4.2.2 [WINNF.FT.C.SCS.3] TLS failure due to expired server certificate

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### 8.28.1 References, definitions and limits

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6.8 CBSD Security Validation; 6.8.4.2 Unsuccessful TLS connection

This section provides test steps, condition and procedures to test the conformance of the CBSD implementation for the Security Establishment Procedure.

A precondition is the CBSD has successfully discovered the SAS it wants to communicate with.

Certificate generation for executing the security test cases shall be according to section 9.1.

Each test initiates communication between CBSD and SAS and verifies that the communication is started over a secured communication.

In all test cases under this category, the TLS connection is not established successfully between the SAS Test Harness and CBSD. The security procedure is irrespective of the procedures defined for the SAS Test Harness to CBSD communication.

### 8.28.2 Test summary

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Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 31, 2020

### 8.28.3 Observations, settings and special notes

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Test case pre-requisite:

- Configure the SAS Test Harness such that server certificate is valid but expired.

### 8.28.4 Test data

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#### Alternative method

Place in the WinnForum SAS Test Harness the correct SAS Test Harness X.509 certificates for this test case. Edit the conf.xml file appropriately for use of this certificate.

Verify the SAS Test Harness X.509 certificate is the correct X.509 certificate for this test case by inspecting its content as described in the "readme\_file\_x509\_RSA\_certs\_test\_labs.txt" [WINNF-IN-0156 Version V1.0.0.1]. For test case [WINNF.FT.C.SCS.3] the X.509 certificate has

- Expired Validity time. The date appearing in the "Not After" parameter of the X.509 certificate has passed.

The method for executing CBSD/DP UUT security test case is via Wireshark.



**Table 8.28-1:** WINNF.FT.C.SCS.3 alternative test results

Step	Test Execution Steps	Pass	Fail
1	Verify in Wireshark the following in the captured packets: <ol style="list-style-type: none"><li>1. Wireshark "Protocol" column shows "TLSv1.2"</li><li>2. CBSD/DP UUT sends "Client Hello" message to WInnForum SAS Test Harness</li><li>3. WInnForum SAS Test Harness sends "Server Hello" message to CBSD/DP UUT.<ul style="list-style-type: none"><li>• The "Server Hello" message "Handshake Protocol" IE includes the "Cipher Suite" IE.</li><li>• Verify the "Cipher Suite" shown in Wireshark is one of the following: 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</li></ul></li><li>4. "Application Data" messages are exchanged between WInnForum SAS Test Harness and CBSD/DP UUT.</li></ol>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Verify that WInnForum SAS Test Harness Command Prompt does not show any Request Message from CBSD/DP UUT	<input checked="" type="checkbox"/>	<input type="checkbox"/>

For the WhiteShark screenshots please refer to Section 9 of this test report.

---

## 8.29 6.8.4.2.3 [WINNF.FT.C.SCS.4] TLS failure when SAS Test Harness certificate is issued by an unknown CA

---

### 8.29.1 References, definitions and limits

---

6.8 CBSD Security Validation; 6.8.4.2 Unsuccessful TLS connection

This section provides test steps, condition and procedures to test the conformance of the CBSD implementation for the Security Establishment Procedure.

A precondition is the CBSD has successfully discovered the SAS it wants to communicate with.

Certificate generation for executing the security test cases shall be according to section 9.1.

Each test initiates communication between CBSD and SAS and verifies that the communication is started over a secured communication.

In all test cases under this category, the TLS connection is not established successfully between the SAS Test Harness and CBSD. The security procedure is irrespective of the procedures defined for the SAS Test Harness to CBSD communication.

### 8.29.2 Test summary

---

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 31, 2020

### 8.29.3 Observations, settings and special notes

---

Test case pre-requisite:

- Equip the SAS Test Harness with certificate signed by an unknown CA to the CBSD.

### 8.29.4 Test data

---

#### Alternative method

Place in the WinnForum SAS Test Harness the correct SAS Test Harness X.509 certificates for this test case. Edit the conf.xml file appropriately for use of this certificate.

Verify the SAS Test Harness X.509 certificate is the correct X.509 certificate for this test case by inspecting its content as described in the "readme\_file\_x509\_RSA\_certs\_test\_labs.txt" [WINNF-IN-0156 Version V1.0.0.1]. For test case [WINNF.FT.C.SCS.4] the X.509 certificate has

- PKI chain which is not known to the CBSD/DP UUT, and is different from the PKI chain of the SAS Test Harness X.509 certificate used in test WINNF.FT.C.SCS.1.

The method for executing CBSD/DP UUT security test case is via Wireshark.



**Table 8.29-1:** WINNF.FT.C.CSC.4 alternative test results

Step	Test Execution Steps	Pass	Fail
1	Verify in Wireshark the following in the captured packets: <ol style="list-style-type: none"><li>1. Wireshark "Protocol" column shows "TLSv1.2"</li><li>2. CBSD/DP UUT sends "Client Hello" message to WinnForum SAS Test Harness</li><li>3. WinnForum SAS Test Harness sends "Server Hello" message to CBSD/DP UUT.<ul style="list-style-type: none"><li>• The "Server Hello" message "Handshake Protocol" IE includes the "Cipher Suite" IE.</li><li>• Verify the "Cipher Suite" shown in Wireshark is one of the following: 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</li></ul></li><li>4. "Application Data" messages are not seen between WinnForum SAS Test Harness and CBSD/DP UUT.</li><li>5. CBSD/DP UUT may send a TLS "Alert" message to WinnForum SAS Test Harness notifying of rejecting the TLS connection before attempting to establish the TLS connection again.</li></ol>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Verify that WinnForum SAS Test Harness Command Prompt does not show any Request Message from CBSD/DP UUT	<input checked="" type="checkbox"/>	<input type="checkbox"/>

For the WhiteShark screenshots please refer to Section 9 of this test report.

## 8.30 6.8.4.2.4 [WINNF.FT.C.SCS.5] TLS failure when certificate at the SAS Test Harness is corrupted

---

### 8.30.1 References, definitions and limits

---

6.8 CBSD Security Validation; 6.8.4.2 Unsuccessful TLS connection

This section provides test steps, condition and procedures to test the conformance of the CBSD implementation for the Security Establishment Procedure.

A precondition is the CBSD has successfully discovered the SAS it wants to communicate with.

Certificate generation for executing the security test cases shall be according to section 9.1.

Each test initiates communication between CBSD and SAS and verifies that the communication is started over a secured communication.

In all test cases under this category, the TLS connection is not established successfully between the SAS Test Harness and CBSD. The security procedure is irrespective of the procedures defined for the SAS Test Harness to CBSD communication.

### 8.30.2 Test summary

---

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 31, 2020

### 8.30.3 Observations, settings and special notes

---

Test case pre-requisite:

- The end-entity certificate at the SAS Test Harness shall be corrupted

### 8.30.4 Test data

---

#### Alternative method

Place in the WinnForum SAS Test Harness the correct SAS Test Harness X.509 certificates for this test case. Edit the conf.xml file appropriately for use of this certificate.

Verify the SAS Test Harness X.509 certificate is the correct X.509 certificate for this test case by inspecting its content as described in the "readme\_file\_x509\_RSA\_certs\_test\_labs.txt" [WINNF-IN-0156 Version V1.0.0.1]. For test case [WINNF.FT.C.SCS.5] the X.509 certificate has

- Invalid Signature as described in the "readme\_file\_x509\_RSA\_certs\_test\_labs.txt" [WINNF-IN-0156 Version V1.0.0.1].

The method for executing CBSD/DP UUT security test case is via Wireshark.





**Table 8.30-1:** WINNF.FT.C.SCS.5 alternative test results

Step	Test Execution Steps	Pass	Fail
1	Verify in Wireshark the following in the captured packets: <ol style="list-style-type: none"><li>1. Wireshark "Protocol" column shows "TLSv1.2"</li><li>2. CBSD/DP UUT sends "Client Hello" message to WinnForum SAS Test Harness</li><li>3. WinnForum SAS Test Harness sends "Server Hello" message to CBSD/DP UUT.<ul style="list-style-type: none"><li>• The "Server Hello" message "Handshake Protocol" IE includes the "Cipher Suite" IE.</li><li>• Verify the "Cipher Suite" shown in Wireshark is one of the following: 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</li></ul></li><li>4. "Application Data" messages are not seen between WinnForum SAS Test Harness and CBSD/DP UUT.</li><li>5. CBSD/DP UUT may send a TLS "Alert" message to WinnForum SAS Test Harness notifying of rejecting the TLS connection before attempting to establish the TLS connection again.</li></ol>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Verify that WinnForum SAS Test Harness Command Prompt does not show any Request Message from CBSD/DP UUT	<input checked="" type="checkbox"/>	<input type="checkbox"/>

For the WhiteShark screenshots please refer to Section 9 of this test report.

## 8.31 7.1.4.1.1 [WINNF.PT.C.HBT.1] UUT RF Transmit Power Measurement

### 8.31.1 References, definitions and limits

7.1 CBSD RF Power Measurement; 7.1.4.1 UUT RF Transmit Power Measurement Performance Test Case

This section provides test steps, condition and procedures to demonstrate conformance of the CBSD to limitations on transmit power due to maxEirp setting of AUTHORIZED grants for that CBSD.

This test case places the UUT in REGISTERED state, with a grant in AUTHORIZED state, with grant parameters: {lowFrequency, highFrequency, maxEirp}. The maxEirp value is varied by performing multiple iterations of the test case.

### 8.31.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	March 31, 2020

### 8.31.3 Observations, settings and special notes

Given a combination of grant parameters: {lowFrequency = FL, highFrequency = FH, Occupied Bandwidth (OBW), where  $OBW \leq (FH - FL)$ , maxEirp = Pi}, this test case enables the UUT to obtain a grant with those parameters, to allow verification that the UUT complies to the maxEirp value of the grant.

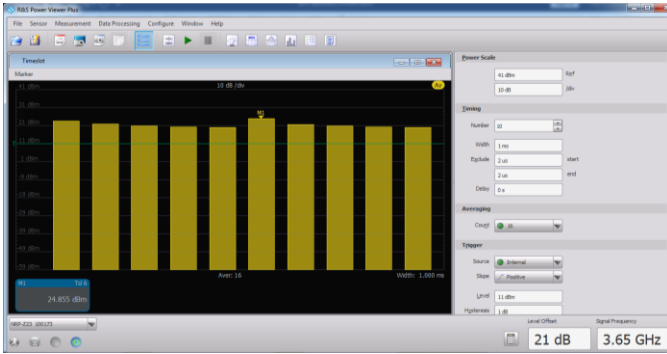
### 8.31.4 Test data

The test execution steps below will yield a single measurement case. The test steps are to be repeated for each power measurement step, Pi, i = {1...N}.

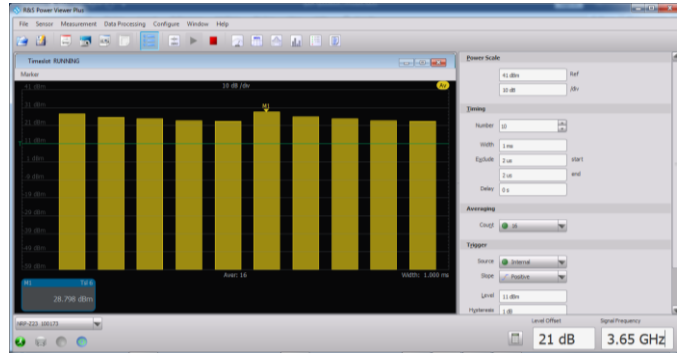
**Table 8.31-1: WINNF.PT.C.HBT.1 test results**

Step	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 has registered with the SAS, with CBSD 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> <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>	–	–
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: <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>	–	–

Step	Test Execution Steps	Pass	Fail
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>Note: it may be required for the vendor to provide a method or configuration to bring the UUT to a mode which is required by the measurement methodology. Any such mode is vendor-specific and depends upon UUT behavior and the measurement methodology.</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>



**Figure 8.31-1:** Output power and power density validation when maxEirp setting  $P_i = 25$ , AG 10 dBi



**Figure 8.31-2:** Output power and power density validation when maxEirp setting  $P_i = 29$ , AG 10 dBi

Note: the conducted output power was set to 25 dBm and 29 dBm. With 10 dBi antenna gain setting, EIRPs are 35 dBm and 39 dBm accordingly.

## Section 9 Log files library

### 9.1 Log file for test case ID: WINNF.FT.C.REG.1

2020-03-18T18:15:02.188Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13  
 2020-03-18T18:15:02.190Z - INFO - the selected test from the user : WINNF.FT.C.REG.1 is starting now  
 2020-03-18T18:15:27.953Z - INFO - registration request from CBRS : {

```
"registrationRequest": [
  {
    "airInterface": {
      "radioTechnology": "E_UTRA"
    },
    "callSign": "",
    "cbsdCategory": "B",
    "cbsdInfo": {
      "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
      "hardwareVersion": "16May19-005131",
      "model": "Redline PPP360",
      "softwareVersion": "1.3.0.11",
      "vendor": "Redline Communications Inc."
    },
    "cbsdSerialNumber": "360RM19230002",
    "fccid": "QC8-B48",
    "installationParam": {
      "antennaAzimuth": 180,
      "antennaBeamwidth": 45,
      "antennaDowntilt": -5,
      "antennaGain": 11,
      "eirpCapability": 41,
      "height": 6,
      "heightType": "AGL",
      "indoorDeployment": false,
      "latitude": 41.57073,
      "longitude": -90.60271
    },
    "measCapability": [
      "RECEIVED_POWER_WITH_GRANT"
    ],
    "userId": "user1"
  }
]
```

2020-03-18T18:15:27.984Z - INFO - engine sent successfully, the response to CBRS : {

```
"registrationResponse": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "response": {
      "responseCode": 0
    }
  }
]
```

2020-03-18T18:15:29.191Z - INFO - arrived to nstep starting question answer session with the technician  
 2020-03-18T18:15:29.230Z - INFO - the question is : Were there RF transmissions from the CBSD1 during the test? please choose one of the answers :  
 2020-03-18T18:16:37.953Z - INFO - for the question : Were there RF transmissions from the CBSD1 during the test?, the user choose n  
 2020-03-18T18:16:47.829Z - INFO - The final result of the test : WINNF.FT.C.REG.1 is - passed and :the additional comments for the current test are : n

## 9.2 Log file for test case ID: WINNF.FT.C.REG.8

---

```

2020-03-18T18:52:41.214Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-18T18:52:41.214Z - INFO - the selected test from the user : WINNF.FT.C.REG.8 is starting now
2020-03-18T18:53:05.621Z - INFO - registration request from CBRS : {
  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",
        "vendor": "Redline Communications Inc."
      },
      "cbsdSerialNumber": "360RM19230002",
      "fccId": "QC8-B48",
      "installationParam": {
        "antennaAzimuth": 180,
        "antennaBeamwidth": 45,
        "antennaDowntilt": -5,
        "antennaGain": 11,
        "eirpCapability": 41,
        "height": 6,
        "heightType": "AGL",
        "indoorDeployment": false,
        "latitude": 41.57073,
        "longitude": -90.60271
      },
      "measCapability": [
        "RECEIVED_POWER_WITH_GRANT"
      ],
      "userId": "user1"
    }
  ]
}
2020-03-18T18:53:05.706Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "response": {
        "responseCode": 102
      }
    }
  ]
}
2020-03-18T18:53:07.217Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-18T18:53:07.219Z - INFO - the question is : Were there RF transmissions from the CBSD1 during the test? please choose one of the answers :
2020-03-18T18:53:33.647Z - INFO - for the question : Were there RF transmissions from the CBSD1 during the test? , the user choose n
2020-03-18T18:53:37.467Z - INFO - The final result of the test : WINNF.FT.C.REG.8 is - passed

```

### 9.3 Log file for test case ID: WINNF.FT.C.REG.10

---

2020-03-18T19:11:46.729Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13  
 2020-03-18T19:11:46.730Z - INFO - the selected test from the user : WINNF.FT.C.REG.10 is starting now  
 2020-03-18T19:11:49.355Z - INFO - registration request from CBRS : {

```
"registrationRequest": [
  {
    "airInterface": {
      "radioTechnology": "E_UTRA"
    },
    "callSign": "",
    "cbsdCategory": "B",
    "cbsdInfo": {
      "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
      "hardwareVersion": "16May19-005131",
      "model": "Redline PPP360",
      "softwareVersion": "1.3.0.11",
      "vendor": "Redline Communications Inc."
    },
    "cbsdSerialNumber": "360RM19230002",
    "fccId": "QC8-B48",
    "installationParam": {
      "antennaAzimuth": 180,
      "antennaBeamwidth": 45,
      "antennaDowntilt": -5,
      "antennaGain": 11,
      "eirpCapability": 41,
      "height": 6,
      "heightType": "AGL",
      "indoorDeployment": false,
      "latitude": 41.57073,
      "longitude": -90.60271
    },
    "measCapability": [
      "RECEIVED_POWER_WITH_GRANT"
    ],
    "userId": "user1"
  }
]
```

2020-03-18T19:11:49.417Z - INFO - engine sent successfully, the response to CBRS : {

```
"registrationResponse": [
  {
    "response": {
      "responseCode": 200
    }
  }
]
```

2020-03-18T19:11:50.732Z - INFO - arrived to nstep starting question answer session with the technician  
 2020-03-18T19:11:50.733Z - INFO - the question is : Were there RF transmissions from the CBS1 during the test? please choose one of the answers :  
 2020-03-18T19:12:04.160Z - INFO - for the question : Were there RF transmissions from the CBS1 during the test?, the user choose n  
 2020-03-18T19:12:06.381Z - INFO - The final result of the test : WINNF.FT.C.REG.10 is - passed

## 9.4 Log file for test case ID: WINNF.FT.C.REG.12

---

```

2020-03-18T19:14:10.470Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-18T19:14:10.473Z - INFO - the selected test from the user : WINNF.FT.C.REG.12 is starting now
2020-03-18T19:14:12.924Z - INFO - registration request from CBRS : {
  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",
        "vendor": "Redline Communications Inc."
      },
      "cbsdSerialNumber": "360RM19230002",
      "fccId": "QC8-B48",
      "installationParam": {
        "antennaAzimuth": 180,
        "antennaBeamwidth": 45,
        "antennaDowntilt": -5,
        "antennaGain": 11,
        "eirpCapability": 41,
        "height": 6,
        "heightType": "AGL",
        "indoorDeployment": false,
        "latitude": 41.57073,
        "longitude": -90.60271
      },
      "measCapability": [
        "RECEIVED_POWER_WITH_GRANT"
      ],
      "userId": "user1"
    }
  ]
}
2020-03-18T19:14:12.983Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "response": {
        "responseCode": 103
      }
    }
  ]
}
2020-03-18T19:14:14.477Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-18T19:14:14.482Z - INFO - the question is : Were there RF transmissions from the CBS1 during the test? please choose one of the answers :
2020-03-18T19:14:22.989Z - INFO - for the question : Were there RF transmissions from the CBS1 during the test?, the user choose n
2020-03-18T19:14:25.651Z - INFO - The final result of the test : WINNF.FT.C.REG.12 is - passed

```

## 9.5 Log file for test case ID: WINNF.FT.C.REG.14

---

```

2020-03-18T19:18:31.443Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-18T19:18:31.444Z - INFO - the selected test from the user : WINNF.FT.C.REG.14 is starting now
2020-03-18T19:18:39.628Z - INFO - registration request from CBRS : {
  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",
        "vendor": "Redline Communications Inc."
      },
      "cbsdSerialNumber": "360RM19230002",
      "fccId": "QC8-B48",
      "installationParam": {
        "antennaAzimuth": 180,
        "antennaBeamwidth": 45,
        "antennaDowntilt": -5,
        "antennaGain": 11,
        "eirpCapability": 41,
        "height": 6,
        "heightType": "AGL",
        "indoorDeployment": false,
        "latitude": 41.57073,
        "longitude": -90.60271
      },
      "measCapability": [
        "RECEIVED_POWER_WITH_GRANT"
      ],
      "userId": "user1"
    }
  ]
}
2020-03-18T19:18:39.691Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "response": {
        "responseCode": 101
      }
    }
  ]
}
2020-03-18T19:18:41.450Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-18T19:18:41.450Z - INFO - the question is : Were there RF transmissions from the CBSD1 during the test? please choose one of the answers :
2020-03-18T19:19:06.217Z - INFO - for the question : Were there RF transmissions from the CBSD1 during the test? , the user choose n
2020-03-18T19:19:08.956Z - INFO - The final result of the test : WINNF.FT.C.REG.14 is - passed

```



## 9.6 Log file for test case ID: WINNF.FT.C.REG.16

---

```

2020-03-18T19:24:33.318Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-18T19:24:33.319Z - INFO - the selected test from the user : WINNF.FT.C.REG.16 is starting now
2020-03-18T19:25:02.255Z - INFO - registration request from CBRS : {
  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",
        "vendor": "Redline Communications Inc."
      },
      "cbsdSerialNumber": "360RM19230002",
      "fccId": "QC8-B48",
      "installationParam": {
        "antennaAzimuth": 180,
        "antennaBeamwidth": 45,
        "antennaDowntilt": -5,
        "antennaGain": 11,
        "eirpCapability": 41,
        "height": 6,
        "heightType": "AGL",
        "indoorDeployment": false,
        "latitude": 41.57073,
        "longitude": -90.60271
      },
      "measCapability": [
        "RECEIVED_POWER_WITH_GRANT"
      ],
      "userId": "user1"
    }
  ]
}
2020-03-18T19:25:02.283Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "response": {
        "responseCode": 100
      }
    }
  ]
}
2020-03-18T19:25:03.323Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-18T19:25:03.325Z - INFO - the question is : Were there RF transmissions from the CBSD1 during the test? please choose one of the answers :
2020-03-18T19:25:19.844Z - INFO - for the question : Were there RF transmissions from the CBSD1 during the test? , the user choose n
2020-03-18T19:25:23.134Z - INFO - The final result of the test : WINNF.FT.C.REG.16 is - passed

```

## 9.7 Log file for test case ID: WINNF.FT.C.REG.18

---

2020-03-18T19:27:34.193Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13  
 2020-03-18T19:27:34.194Z - INFO - the selected test from the user : WINNF.FT.C.REG.18 is starting now  
 2020-03-18T19:27:38.529Z - INFO - registration request from CBRS : {

```
"registrationRequest": [
  {
    "airInterface": {
      "radioTechnology": "E_UTRA"
    },
    "callSign": "",
    "cbsdCategory": "B",
    "cbsdInfo": {
      "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
      "hardwareVersion": "16May19-005131",
      "model": "Redline PPP360",
      "softwareVersion": "1.3.0.11",
      "vendor": "Redline Communications Inc."
    },
    "cbsdSerialNumber": "360RM19230002",
    "fccId": "QC8-B48",
    "installationParam": {
      "antennaAzimuth": 180,
      "antennaBeamwidth": 45,
      "antennaDowntilt": -5,
      "antennaGain": 11,
      "eirpCapability": 41,
      "height": 6,
      "heightType": "AGL",
      "indoorDeployment": false,
      "latitude": 41.57073,
      "longitude": -90.60271
    },
    "measCapability": [
      "RECEIVED_POWER_WITH_GRANT"
    ],
    "userId": "user1"
  }
]
```

2020-03-18T19:27:38.611Z - INFO - engine sent successfully, the response to CBRS : {

```
"registrationResponse": [
  {
    "response": {
      "responseCode": 201
    }
  }
]
```

2020-03-18T19:27:40.197Z - INFO - arrived to nstep starting question answer session with the technician

2020-03-18T19:27:40.198Z - INFO - the question is : Were there RF transmissions from the CBSD1 during the test? please choose one of the answers :

2020-03-18T19:27:59.986Z - INFO - for the question : Were there RF transmissions from the CBSD1 during the test?, the user choose n

2020-03-18T19:28:03.131Z - INFO - The final result of the test : WINNF.FT.C.REG.18 is - passed

## 9.8 Log file for test case ID: WINNF.FT.C.GRA.1

---

2020-03-20T16:09:42.954Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13

2020-03-20T16:09:42.957Z - INFO - the selected test from the user : WINNF.FT.C.GRA.1 is starting now

2020-03-20T16:09:51.933Z - INFO - registration request from CBRS : {

```
"registrationRequest": [
  {
    "airInterface": {
      "radioTechnology": "E_UTRA"
    },
    "callSign": "",
    "cbsdCategory": "B",
    "cbsdInfo": {
      "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
      "hardwareVersion": "16May19-005131",
      "model": "Redline PPP360",
      "softwareVersion": "1.3.0.11",
      "vendor": "Redline Communications Inc."
    },
    "cbsdSerialNumber": "360RM19230002",
    "fccId": "QC8-B48",
    "installationParam": {
      "antennaAzimuth": 180,
      "antennaBeamwidth": 45,
      "antennaDowntilt": -5,
      "antennaGain": 11,
      "eirpCapability": 41,
      "height": 6,
      "heightType": "AGL",
      "indoorDeployment": false,
      "latitude": 41.57073,
      "longitude": -90.60271
    },
    "measCapability": [
      "RECEIVED_POWER_WITH_GRANT"
    ],
    "userId": "user1"
  }
]
```

2020-03-20T16:09:51.997Z - INFO - engine sent successfully, the response to CBRS : {

```
"registrationResponse": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "response": {
      "responseCode": 0
    }
  }
]
```

2020-03-20T16:09:54.003Z - INFO - spectrumInquiry request from CBRS : {

```
"spectrumInquiryRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "inquiredSpectrum": [
      {
        "highFrequency": 3700000000,
        "lowFrequency": 3550000000
      }
    ],
    "measReport": {
      "rcvdPowerMeasReports": [

```

```

    {
      "measBandwidth": 180000,
      "measFrequency": 3685500000,
      "measRcvdPower": -100
    },
    {
      "measBandwidth": 180000,
      "measFrequency": 3694320000,
      "measRcvdPower": -100
    }
  ]
}
}
]
}
}
2020-03-20T16:09:54.059Z - INFO - engine sent successfully, the response to CBRS : {
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3700000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
}
2020-03-20T16:09:57.065Z - INFO - grant request from CBRS : {
  "grantRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      },
      "operationParam": {
        "maxEirp": 29,
        "operationFrequencyRange": {
          "highFrequency": 3695000000,
          "lowFrequency": 3685000000
        }
      }
    }
  ]
}
}
2020-03-20T16:09:57.112Z - INFO - engine sent successfully, the response to CBRS : {
  "grantResponse": [

```

```
{
  "cbsdId": "QC8-B48Mock-SAS360RM19230002",
  "response": {
    "responseCode": 400
  }
}
```

2020-03-20T16:09:58.960Z - INFO - arrived to nstep starting question answer session with the technician  
 2020-03-20T16:09:58.960Z - INFO - the question is : Were there RF transmissions from the CBSD1 during the test? please choose one of the answers :  
 2020-03-20T16:11:47.273Z - INFO - for the question : Were there RF transmissions from the CBSD1 during the test? , the user choose n  
 2020-03-20T16:11:52.342Z - INFO - The final result of the test : WINNF.FT.C.GRA.1 is - passed

## 9.9 Log file for test case ID: WINNF.FT.C.GRA.2

2020-03-27T21:55:05.716Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13  
 2020-03-27T21:55:05.717Z - INFO - the selected test from the user : WINNF.FT.C.GRA.2 is starting now  
 2020-03-27T21:55:13.532Z - INFO - registration request from CBRS : {

```
"registrationRequest": [
  {
    "airInterface": {
      "radioTechnology": "E_UTRA"
    },
    "callSign": "CallSign123",
    "cbsdCategory": "B",
    "cbsdInfo": {
      "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
      "hardwareVersion": "16May19-005131",
      "model": "Redline PPP360",
      "softwareVersion": "1.3.0.11",
      "vendor": "Redline Communications Inc."
    },
    "cbsdSerialNumber": "360RM19230002",
    "fcclId": "QC8-B48",
    "installationParam": {
      "antennaAzimuth": 180,
      "antennaBeamwidth": 45,
      "antennaDowntilt": -5,
      "antennaGain": 11,
      "eirpCapability": 41,
      "height": 6,
      "heightType": "AGL",
      "indoorDeployment": false,
      "latitude": 41.57073,
      "longitude": -90.60271
    },
    "measCapability": [
      "RECEIVED_POWER_WITH_GRANT"
    ],
    "userId": "user1"
  }
]
```

2020-03-27T21:55:13.562Z - INFO - engine sent successfully, the response to CBRS : {

```
"registrationResponse": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "response": {
      "responseCode": 0
    }
  }
]
```

2020-03-27T21:55:15.609Z - INFO - spectrumInquiry request from CBRS : {

```
"spectrumInquiryRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "inquiredSpectrum": [
      {
        "highFrequency": 3700000000,

```



```

}
}
}
2020-03-27T21:55:19.719Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-27T21:55:19.720Z - INFO - the question is : Were there RF transmissions from the CBSD1 during the test? please choose one of the answers :
2020-03-27T21:55:36.331Z - INFO - for the question : Were there RF transmissions from the CBSD1 during the test? , the user choose n
2020-03-27T21:55:38.275Z - INFO - The final result of the test : WINNF.FT.C.GRA.2 is - passed

```

## 9.10 Log file for test case ID: WINNF.FT.C.HBT.1

---

```

2020-03-27T22:00:48.464Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-27T22:00:48.466Z - INFO - the selected test from the user : WINNF.FT.C.HBT.1 is starting now
2020-03-27T22:00:57.217Z - INFO - registration request from CBRS : {

```

```

  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "CallSign123",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",
        "vendor": "Redline Communications Inc."
      },
      "cbsdSerialNumber": "360RM19230002",
      "fccId": "QC8-B48",
      "installationParam": {
        "antennaAzimuth": 180,
        "antennaBeamwidth": 45,
        "antennaDownTilt": -5,
        "antennaGain": 11,
        "eirpCapability": 41,
        "height": 6,
        "heightType": "AGL",
        "indoorDeployment": false,
        "latitude": 41.57073,
        "longitude": -90.60271
      },
      "measCapability": [
        "RECEIVED_POWER_WITH_GRANT"
      ],
      "userId": "user1"
    }
  ]
}

```

```

2020-03-27T22:00:57.305Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

```

```

2020-03-27T22:00:59.357Z - INFO - spectrumInquiry request from CBRS : {
  "spectrumInquiryRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "inquiredSpectrum": [
        {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        }
      ],
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,

```

```
        "measFrequency": 3685500000,
        "measRcvdPower": -100
    },
    {
        "measBandwidth": 180000,
        "measFrequency": 3694320000,
        "measRcvdPower": -100
    }
]
}
}
}
}
2020-03-27T22:00:59.364Z - INFO - engine sent successfully, the response to CBRS : {
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3700000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
}
}
2020-03-27T22:01:02.369Z - INFO - grant request from CBRS : {
  "grantRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      },
      "operationParam": {
        "maxEirp": 29,
        "operationFrequencyRange": {
          "highFrequency": 3695000000,
          "lowFrequency": 3685000000
        }
      }
    }
  ]
}
}
}
2020-03-27T22:01:02.385Z - INFO - engine sent successfully, the response to CBRS : {
  "grantResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "channelType": "GAA",
      "grantExpireTime": "2020-04-03T22:01:02Z",
      "grantId": "343594665",
      "heartbeatInterval": 120,
      "response": {
        "responseCode": 0
      }
    }
  ]
}
}
}
```



```
2020-03-27T22:01:04.391Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "343594665",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    },
    "operationState": "GRANTED"
  ]
}
```

```
2020-03-27T22:01:04.430Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "343594665",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-27T22:04:24Z"
    }
  ]
}
```

```
2020-03-27T22:02:05.440Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "343594665",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    },
    "operationState": "AUTHORIZED"
  ]
}
```

2020-03-27T22:02:05.444Z - INFO - Time interval between two heartbeat request messages is: 61.049, limit is: 125.0

```
2020-03-27T22:02:05.454Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "343594665",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-27T22:05:25Z"
    }
  ]
}
```

```
2020-03-27T22:03:06.497Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
```

```

{
  "cbsdId": "QC8-B48Mock-SAS360RM19230002",
  "grantId": "343594665",
  "grantRenew": false,
  "measReport": {
    "rcvdPowerMeasReports": [
      {
        "measBandwidth": 180000,
        "measFrequency": 3685500000,
        "measRcvdPower": -100
      },
      {
        "measBandwidth": 180000,
        "measFrequency": 3694320000,
        "measRcvdPower": -100
      }
    ]
  }
},
"operationState": "AUTHORIZED"
}
]
}
2020-03-27T22:03:06.500Z - INFO - Time interval between two heartbeat request messages is: 61.058, limit is: 125.0
2020-03-27T22:03:06.516Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "343594665",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-27T22:06:26Z"
    }
  ]
}
2020-03-27T22:04:07.523Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "343594665",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "AUTHORIZED"
}
]
}
2020-03-27T22:04:07.526Z - INFO - Time interval between two heartbeat request messages is: 61.026, limit is: 125.0
2020-03-27T22:04:07.543Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "343594665",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-27T22:07:27Z"
    }
  ]
}
]
}
2020-03-27T22:05:08.601Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {

```

```

"cbid": "QC8-B48Mock-SAS360RM19230002",
"grantId": "343594665",
"grantRenew": false,
"measReport": {
  "rcvdPowerMeasReports": [
    {
      "measBandwidth": 180000,
      "measFrequency": 3685500000,
      "measRcvdPower": -100
    },
    {
      "measBandwidth": 180000,
      "measFrequency": 3694320000,
      "measRcvdPower": -100
    }
  ]
},
"operationState": "AUTHORIZED"
}
}
}
2020-03-27T22:05:08.605Z - INFO - Time interval between two heartbeat request messages is: 61.077, limit is: 125.0
2020-03-27T22:05:08.621Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbid": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "343594665",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-27T22:08:28Z"
    }
  ]
}
}
2020-03-27T22:06:09.619Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbid": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "343594665",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      },
      "operationState": "AUTHORIZED"
    }
  ]
}
}
}
2020-03-27T22:06:09.622Z - INFO - Time interval between two heartbeat request messages is: 61.018, limit is: 125.0
2020-03-27T22:06:09.640Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbid": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "343594665",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-27T22:09:29Z"
    }
  ]
}
}
}
2020-03-27T22:06:11.467Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-27T22:06:11.470Z - INFO - the question is : Did CBSD1 transmit power prior to AUTHORIZED state (first successful HBT response)? please choose one of the answers :
2020-03-27T22:07:08.739Z - INFO - for the question : Did CBSD1 transmit power prior to AUTHORIZED state (first successful HBT response)? , the user choose n
2020-03-27T22:07:08.743Z - INFO - the question is : Did CBSD1 transmit only within the frequency range specified in its grantRequest message? please choose one of the answers :

```

2020-03-27T22:07:20.687Z - INFO - for the question : Did CBSD1 transmit only within the frequency range specified in its grantRequest message?, the user choose y  
 2020-03-27T22:07:22.812Z - INFO - The final result of the test : WINNF.FT.C.HBT.1 is - passed

### 9.11 Log file for test case ID: WINNF.FT.C.HBT.3

2020-03-27T22:30:09.668Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13  
 2020-03-27T22:30:09.670Z - INFO - the selected test from the user : WINNF.FT.C.HBT.3 is starting now  
 2020-03-27T22:30:15.013Z - INFO - registration request from CBRS : {

```
"registrationRequest": [
  {
    "airInterface": {
      "radioTechnology": "E_UTRA"
    },
    "callSign": "CallSign123",
    "cbsdCategory": "B",
    "cbsdInfo": {
      "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
      "hardwareVersion": "16May19-005131",
      "model": "Redline PPP360",
      "softwareVersion": "1.3.0.11",
      "vendor": "Redline Communications Inc."
    },
    "cbsdSerialNumber": "360RM19230002",
    "fcclId": "QC8-B48",
    "installationParam": {
      "antennaAzimuth": 180,
      "antennaBeamwidth": 45,
      "antennaDowntilt": -5,
      "antennaGain": 11,
      "eirpCapability": 41,
      "height": 6,
      "heightType": "AGL",
      "indoorDeployment": false,
      "latitude": 41.57073,
      "longitude": -90.60271
    },
    "measCapability": [
      "RECEIVED_POWER_WITH_GRANT"
    ],
    "userId": "user1"
  }
]
```

2020-03-27T22:30:15.065Z - INFO - engine sent successfully, the response to CBRS : {  
 "registrationResponse": [
 {
 "cbsdId": "QC8-B48Mock-SAS360RM19230002",
 "response": {
 "responseCode": 0
 }
 }
 ]
}

```
2020-03-27T22:30:17.072Z - INFO - spectrumInquiry request from CBRS : {
  "spectrumInquiryRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "inquiredSpectrum": [
        {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        }
      ],
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          }
        ],
        {
          "measBandwidth": 180000,

```

```

        "measFrequency": 3694320000,
        "measRcvdPower": -100
    }
}
}
}
}
}
2020-03-27T22:30:17.081Z - INFO - engine sent successfully, the response to CBRS : {
"spectrumInquiryResponse": [
{
"availableChannel": [
{
"channelType": "GAA",
"frequencyRange": {
"highFrequency": 3700000000,
"lowFrequency": 3550000000
},
"ruleApplied": "FCC_PART_96"
}
],
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"response": {
"responseCode": 0
}
}
]
}
2020-03-27T22:30:20.095Z - INFO - grant request from CBRS : {
"grantRequest": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"measReport": {
"rcvdPowerMeasReports": [
{
"measBandwidth": 180000,
"measFrequency": 3685500000,
"measRcvdPower": -100
},
{
"measBandwidth": 180000,
"measFrequency": 3694320000,
"measRcvdPower": -100
}
]
}
},
"operationParam": {
"maxEirp": 29,
"operationFrequencyRange": {
"highFrequency": 3695000000,
"lowFrequency": 3685000000
}
}
}
]
}
}
2020-03-27T22:30:20.111Z - INFO - engine sent successfully, the response to CBRS : {
"grantResponse": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"channelType": "GAA",
"grantExpireTime": "2020-04-03T22:30:20Z",
"grantId": "402801078",
"heartbeatInterval": 120,
"response": {
"responseCode": 0
}
}
]
}
}
2020-03-27T22:30:22.124Z - INFO - heartbeat request from CBRS : {
"heartbeatRequest": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"grantId": "402801078",

```

```

"grantRenew": false,
"measReport": {
  "rcvdPowerMeasReports": [
    {
      "measBandwidth": 180000,
      "measFrequency": 3685500000,
      "measRcvdPower": -100
    },
    {
      "measBandwidth": 180000,
      "measFrequency": 3694320000,
      "measRcvdPower": -100
    }
  ]
},
"operationState": "GRANTED"
}
]
}

```

2020-03-27T22:30:22.131Z - INFO - engine sent successfully, the response to CBRS : {

```

"heartbeatResponse": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "402801078",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-03-27T22:33:42Z"
  }
]
}

```

2020-03-27T22:31:23.246Z - INFO - heartbeat request from CBRS : {

```

"heartbeatRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "402801078",
    "grantRenew": false,
    "measReport": {
      "rcvdPowerMeasReports": [
        {
          "measBandwidth": 180000,
          "measFrequency": 3685500000,
          "measRcvdPower": -100
        },
        {
          "measBandwidth": 180000,
          "measFrequency": 3694320000,
          "measRcvdPower": -100
        }
      ]
    }
  }
],
"operationState": "AUTHORIZED"
}
]
}

```

2020-03-27T22:31:23.249Z - INFO - Time interval between two heartbeat request messages is: 61.122, limit is: 125.0

2020-03-27T22:31:23.262Z - INFO - engine sent successfully, the response to CBRS : {

```

"heartbeatResponse": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "402801078",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-03-27T22:34:43Z"
  }
]
}

```

2020-03-27T22:32:24.410Z - INFO - heartbeat request from CBRS : {

```

"heartbeatRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "402801078",
    "grantRenew": false,
    "measReport": {

```

```

    "rcvdPowerMeasReports": [
      {
        "measBandwidth": 180000,
        "measFrequency": 3685500000,
        "measRcvdPower": -100
      },
      {
        "measBandwidth": 180000,
        "measFrequency": 3694320000,
        "measRcvdPower": -100
      }
    ]
  },
  "operationState": "AUTHORIZED"
}
]
}
2020-03-27T22:32:24.413Z - INFO - Time interval between two heartbeat request messages is: 61.164, limit is: 125.0
2020-03-27T22:32:24.428Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "402801078",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-27T22:35:44Z"
    }
  ]
}
}
2020-03-27T22:33:25.549Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "402801078",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "AUTHORIZED"
}
]
}
2020-03-27T22:33:25.552Z - INFO - Time interval between two heartbeat request messages is: 61.14, limit is: 125.0
2020-03-27T22:33:25.561Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "402801078",
      "response": {
        "responseCode": 105
      },
      "transmitExpireTime": "2020-03-27T22:33:25Z"
    }
  ]
}
}
2020-03-27T22:33:27.013Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-27T22:33:27.016Z - INFO - the question is : Did the CBSD stop RF transmission within 60 seconds of receiving Heartbeat response with responseCode = 105? please choose one of the answers :
2020-03-27T22:34:10.671Z - INFO - for the question : Did the CBSD stop RF transmission within 60 seconds of receiving Heartbeat response with responseCode = 105? , the user choose y
2020-03-27T22:34:13.217Z - INFO - The final result of the test : WINNF.FT.C.HBT.3 is - passed

```

## 9.12 Log file for test case ID: WINNF.FT.C.HBT.4

```

2020-03-27T22:45:51.591Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-27T22:45:51.592Z - INFO - the selected test from the user : WINNF.FT.C.HBT.4 is starting now
2020-03-27T22:45:53.647Z - INFO - registration request from CBRS : {
  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "CallSign123",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",
        "vendor": "Redline Communications Inc."
      },
      "cbsdSerialNumber": "360RM19230002",
      "fccId": "QC8-B48",
      "installationParam": {
        "antennaAzimuth": 180,
        "antennaBeamwidth": 45,
        "antennaDownTilt": -5,
        "antennaGain": 11,
        "eirpCapability": 41,
        "height": 6,
        "heightType": "AGL",
        "indoorDeployment": false,
        "latitude": 41.57073,
        "longitude": -90.60271
      },
      "measCapability": [
        "RECEIVED_POWER_WITH_GRANT"
      ],
      "userId": "user1"
    }
  ]
}
2020-03-27T22:45:53.721Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
2020-03-27T22:45:55.720Z - INFO - spectrumInquiry request from CBRS : {
  "spectrumInquiryRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "inquiredSpectrum": [
        {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        }
      ],
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
}

```



```

    }
  ]
}
}
}
}
}
2020-03-27T22:45:55.733Z - INFO - engine sent successfully, the response to CBRS : {
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3700000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
}
}
2020-03-27T22:45:58.732Z - INFO - grant request from CBRS : {
  "grantRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationParam": {
    "maxEirp": 29,
    "operationFrequencyRange": {
      "highFrequency": 3695000000,
      "lowFrequency": 3685000000
    }
  }
}
}
}
}
}
2020-03-27T22:45:58.747Z - INFO - engine sent successfully, the response to CBRS : {
  "grantResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "channelType": "GAA",
      "grantExpireTime": "2020-04-03T22:45:58Z",
      "grantId": "689445457",
      "heartbeatInterval": 120,
      "response": {
        "responseCode": 0
      }
    }
  ]
}
}
}
}
}
2020-03-27T22:46:00.750Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "689445457",
      "grantRenew": false,
      "measReport": {

```

```

    "rcvdPowerMeasReports": [
      {
        "measBandwidth": 180000,
        "measFrequency": 3685500000,
        "measRcvdPower": -100
      },
      {
        "measBandwidth": 180000,
        "measFrequency": 3694320000,
        "measRcvdPower": -100
      }
    ]
  },
  "operationState": "GRANTED"
}
}
}
2020-03-27T22:46:00.769Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "689445457",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-27T22:49:20Z"
    }
  ]
}
}
2020-03-27T22:47:01.609Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "689445457",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "AUTHORIZED"
}
}
}
2020-03-27T22:47:01.611Z - INFO - Time interval between two heartbeat request messages is: 60.859, limit is: 125.0
2020-03-27T22:47:01.618Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "689445457",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-27T22:50:21Z"
    }
  ]
}
}
}
2020-03-27T22:48:02.510Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "689445457",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [

```

```

        "measBandwidth": 180000,
        "measFrequency": 3685500000,
        "measRcvdPower": -100
    },
    {
        "measBandwidth": 180000,
        "measFrequency": 3694320000,
        "measRcvdPower": -100
    }
]
},
"operationState": "AUTHORIZED"
}
}
}
2020-03-27T22:48:02.513Z - INFO - Time interval between two heartbeat request messages is: 60.901, limit is: 125.0
2020-03-27T22:48:02.519Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "689445457",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-27T22:51:22Z"
    }
  ]
}
}
2020-03-27T22:49:03.438Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "689445457",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "AUTHORIZED"
}
}
}
2020-03-27T22:49:03.440Z - INFO - Time interval between two heartbeat request messages is: 60.928, limit is: 125.0
2020-03-27T22:49:03.447Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "689445457",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-27T22:52:23Z"
    }
  ]
}
}
}
2020-03-27T22:50:04.433Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "689445457",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,

```

```

        "measFrequency": 368550000,
        "measRcvdPower": -100
    },
    {
        "measBandwidth": 180000,
        "measFrequency": 3694320000,
        "measRcvdPower": -100
    }
]
},
"operationState": "AUTHORIZED"
}
}
}
2020-03-27T22:50:04.437Z - INFO - Time interval between two heartbeat request messages is: 60.994, limit is: 125.0
2020-03-27T22:50:04.460Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "689445457",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-27T22:53:24Z"
    }
  ]
}
}
2020-03-27T22:51:22.361Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "689445457",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
},
  "operationState": "AUTHORIZED"
}
}
}
2020-03-27T22:51:22.364Z - INFO - Time interval between two heartbeat request messages is: 77.929, limit is: 125.0
2020-03-27T22:51:22.391Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "689445457",
      "response": {
        "responseCode": 500
      },
      "transmitExpireTime": "2020-03-27T22:51:22Z"
    }
  ]
}
}
}
2020-03-27T22:51:23.986Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-27T22:51:23.990Z - INFO - the question is : Did the CBSD1 stop RF transmission within 60 seconds of receiving Heartbeat response with responseCode = 500? please choose one of the answers :
2020-03-27T22:51:42.901Z - INFO - for the question : Did the CBSD1 stop RF transmission within 60 seconds of receiving Heartbeat response with responseCode = 500? , the user choose y
2020-03-27T22:51:44.309Z - INFO - The final result of the test : WINNF.FT.C.HBT.4 is - passed

```

### 9.13 Log file for test case ID: WINNF.FT.C.HBT.5

---

```

2020-03-27T23:05:28.516Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-27T23:05:28.519Z - INFO - the selected test from the user : WINNF.FT.C.HBT.5 is starting now
2020-03-27T23:05:30.811Z - INFO - registration request from CBRS : {
  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "CallSign123",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",
        "vendor": "Redline Communications Inc."
      },
      "cbsdSerialNumber": "360RM19230002",
      "fccId": "QC8-B48",
      "installationParam": {
        "antennaAzimuth": 180,
        "antennaBeamwidth": 45,
        "antennaDowntilt": -5,
        "antennaGain": 11,
        "eirpCapability": 41,
        "height": 6,
        "heightType": "AGL",
        "indoorDeployment": false,
        "latitude": 41.57073,
        "longitude": -90.60271
      },
      "measCapability": [
        "RECEIVED_POWER_WITH_GRANT"
      ],
      "userId": "user1"
    }
  ]
}

```

```

2020-03-27T23:05:30.861Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

```

```

2020-03-27T23:05:32.868Z - INFO - spectrumInquiry request from CBRS : {
  "spectrumInquiryRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "inquiredSpectrum": [
        {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        }
      ],
      "measReport": {
        "rcvdPowerMeasReports": [

```

```

    {
      "measBandwidth": 180000,
      "measFrequency": 3685500000,
      "measRcvdPower": -100
    },
    {
      "measBandwidth": 180000,
      "measFrequency": 3694320000,
      "measRcvdPower": -100
    }
  ]
}
}
]
}
}
}
2020-03-27T23:05:32.887Z - INFO - engine sent successfully, the response to CBRS : {
"spectrumInquiryResponse": [
{
"availableChannel": [
{
"channelType": "GAA",
"frequencyRange": {
"highFrequency": 3700000000,
"lowFrequency": 3550000000
},
"ruleApplied": "FCC_PART_96"
}
],
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"response": {
"responseCode": 0
}
}
]
}
}
2020-03-27T23:05:35.894Z - INFO - grant request from CBRS : {
"grantRequest": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"measReport": {
"rcvdPowerMeasReports": [
{
"measBandwidth": 180000,
"measFrequency": 3685500000,
"measRcvdPower": -100
},
{
"measBandwidth": 180000,
"measFrequency": 3694320000,
"measRcvdPower": -100
}
]
},
"operationParam": {
"maxEirp": 29,
"operationFrequencyRange": {
"highFrequency": 3695000000,
"lowFrequency": 3685000000
}
}
}
]
}
}
}
2020-03-27T23:05:35.910Z - INFO - engine sent successfully, the response to CBRS : {
"grantResponse": [

```

```

{
  "cbsdId": "QC8-B48Mock-SAS360RM19230002",
  "channelType": "GAA",
  "grantExpireTime": "2020-04-03T23:05:35Z",
  "grantId": "547362780",
  "heartbeatInterval": 120,
  "response": {
    "responseCode": 0
  }
}
]
}
2020-03-27T23:05:37.917Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "547362780",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "GRANTED"
}
]
}
2020-03-27T23:05:37.931Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "547362780",
      "response": {
        "responseCode": 501
      },
      "transmitExpireTime": "2020-03-27T23:05:37Z"
    }
  ]
}
}
2020-03-27T23:06:38.913Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "547362780",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
}
}

```

```

    }
  ]
},
"operationState": "GRANTED"
}
]
}
2020-03-27T23:06:38.918Z - INFO - Time interval between two heartbeat request messages is: 60.996, limit is: 125.0
2020-03-27T23:06:38.934Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "547362780",
      "response": {
        "responseCode": 501
      },
      "transmitExpireTime": "2020-03-27T23:06:38Z"
    }
  ]
}
2020-03-27T23:06:40.502Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-27T23:06:40.503Z - INFO - the question is : Did the CBSD transmit at any time during the test? please choose one of the answers :
2020-03-27T23:06:50.246Z - INFO - for the question : Did the CBSD transmit at any time during the test? , the user choose n
2020-03-27T23:06:52.869Z - INFO - The final result of the test : WINNF.FT.C.HBT.5 is - passed

```

## 9.14 Log file for test case ID: WINNF.FT.C.HBT.6

```

2020-03-27T23:27:29.627Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-27T23:27:29.628Z - INFO - the selected test from the user : WINNF.FT.C.HBT.6 is starting now
2020-03-27T23:27:42.674Z - INFO - registration request from CBRS : {
  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "CallSign123",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",
        "vendor": "Redline Communications Inc."
      },
      "cbsdSerialNumber": "360RM19230002",
      "fcclId": "QC8-B48",
      "installationParam": {
        "antennaAzimuth": 180,
        "antennaBeamwidth": 45,
        "antennaDowntilt": -5,
        "antennaGain": 11,
        "eirpCapability": 41,
        "height": 6,
        "heightType": "AGL",
        "indoorDeployment": false,
        "latitude": 41.57073,
        "longitude": -90.60271
      },
      "measCapability": [
        "RECEIVED_POWER_WITH_GRANT"
      ],
      "userId": "user1"
    }
  ]
}

```



```
}
]
}
2020-03-27T23:27:42.734Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
2020-03-27T23:27:44.786Z - INFO - spectrumInquiry request from CBRS : {
  "spectrumInquiryRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "inquiredSpectrum": [
        {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        }
      ],
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
}
2020-03-27T23:27:44.808Z - INFO - engine sent successfully, the response to CBRS : {
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3700000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
2020-03-27T23:27:47.813Z - INFO - grant request from CBRS : {
  "grantRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "measReport": {
```

```
"rcvdPowerMeasReports": [
  {
    "measBandwidth": 180000,
    "measFrequency": 3685500000,
    "measRcvdPower": -100
  },
  {
    "measBandwidth": 180000,
    "measFrequency": 3694320000,
    "measRcvdPower": -100
  }
]
},
"operationParam": {
  "maxEirp": 29,
  "operationFrequencyRange": {
    "highFrequency": 3695000000,
    "lowFrequency": 3685000000
  }
}
}
]
}
}
2020-03-27T23:27:47.828Z - INFO - engine sent successfully, the response to CBRS : {
  "grantResponse": [
    {
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
      "channelType": "GAA",
      "grantExpireTime": "2020-04-03T23:27:47Z",
      "grantId": "933498334",
      "heartbeatInterval": 120,
      "response": {
        "responseCode": 0
      }
    }
  ]
}
}
2020-03-27T23:27:49.835Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "933498334",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "GRANTED"
}
]
}
}
2020-03-27T23:27:49.852Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
```

```

    "grantId": "933498334",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-03-27T23:31:09Z"
  }
}
}
2020-03-27T23:28:50.861Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "933498334",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    },
    "operationState": "AUTHORIZED"
  ]
}
}
2020-03-27T23:28:50.864Z - INFO - Time interval between two heartbeat request messages is: 61.025, limit is: 125.0
2020-03-27T23:28:50.878Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "933498334",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-27T23:32:10Z"
    }
  ]
}
}
2020-03-27T23:29:51.928Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "933498334",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
}

```

```

    "operationState": "AUTHORIZED"
  }
}
}
2020-03-27T23:29:51.931Z - INFO - Time interval between two heartbeat request messages is: 61.068, limit is: 125.0
2020-03-27T23:29:51.946Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "933498334",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-27T23:33:11Z"
    }
  ]
}
}
2020-03-27T23:30:52.948Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "933498334",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      },
      "operationState": "AUTHORIZED"
    }
  ]
}
}
}
2020-03-27T23:30:52.951Z - INFO - Time interval between two heartbeat request messages is: 61.02, limit is: 125.0
2020-03-27T23:30:52.966Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "933498334",
      "response": {
        "responseCode": 501
      },
      "transmitExpireTime": "2020-03-27T23:30:52Z"
    }
  ]
}
}
}
2020-03-27T23:30:54.976Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "933498334",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,

```

```

    "measRcvdPower": -100
  },
  {
    "measBandwidth": 180000,
    "measFrequency": 3694320000,
    "measRcvdPower": -100
  }
]
},
"operationState": "GRANTED"
}
]
}
2020-03-27T23:30:54.980Z - INFO - Time interval between two heartbeat request messages is: 2.028, limit is: 125.0
2020-03-27T23:30:54.997Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "933498334",
      "response": {
        "responseCode": 501
      },
      "transmitExpireTime": "2020-03-27T23:30:54Z"
    }
  ]
}
}
2020-03-27T23:30:56.638Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-27T23:30:56.641Z - INFO - the question is : Did the CBSD stop RF transmission within 60 seconds of receiving Heartbeat response with responseCode = 501? please choose one of the answers :
2020-03-27T23:31:52.880Z - INFO - for the question : Did the CBSD stop RF transmission within 60 seconds of receiving Heartbeat response with responseCode = 501? , the user choose y
2020-03-27T23:31:53.812Z - INFO - The final result of the test : WINNF.FT.C.HBT.6 is - passed

```

## 9.15 Log file for test case ID: WINNF.FT.C.HBT.7

```

2020-03-27T23:41:26.437Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-27T23:41:26.440Z - INFO - the selected test from the user : WINNF.FT.C.HBT.7 is starting now
2020-03-27T23:41:34.711Z - INFO - registration request from CBRS : {
  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "CallSign123",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",
        "vendor": "Redline Communications Inc."
      },
      "cbsdSerialNumber": "360RM19230002",
      "fcid": "QC8-B48",
      "installationParam": {
        "antennaAzimuth": 180,
        "antennaBeamwidth": 45,
        "antennaDowntilt": -5,
        "antennaGain": 11,
        "eirpCapability": 41,
        "height": 6,
        "heightType": "AGL",
        "indoorDeployment": false,

```

```

        "latitude": 41.57073,
        "longitude": -90.60271
    },
    "measCapability": [
        "RECEIVED_POWER_WITH_GRANT"
    ],
    "userId": "user1"
}
]
}
2020-03-27T23:41:34.802Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
}
2020-03-27T23:41:36.812Z - INFO - spectrumInquiry request from CBRS : {
  "spectrumInquiryRequest": [
    {
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
      "inquiredSpectrum": [
        {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        }
      ],
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
}
}
2020-03-27T23:41:36.829Z - INFO - engine sent successfully, the response to CBRS : {
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3700000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
}

```

```

]
}
2020-03-27T23:41:39.845Z - INFO - grant request from CBRS : {
  "grantRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      },
      "operationParam": {
        "maxEirp": 29,
        "operationFrequencyRange": {
          "highFrequency": 3695000000,
          "lowFrequency": 3685000000
        }
      }
    }
  ]
}
2020-03-27T23:41:39.861Z - INFO - engine sent successfully, the response to CBRS : {
  "grantResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "channelType": "GAA",
      "grantExpireTime": "2020-04-03T23:41:39Z",
      "grantId": "967172981",
      "heartbeatInterval": 120,
      "response": {
        "responseCode": 0
      }
    }
  ]
}
2020-03-27T23:41:41.875Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "967172981",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      },
      "operationState": "GRANTED"
    }
  ]
}

```

```

}
]
}
2020-03-27T23:41:41.891Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "967172981",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-27T23:45:01Z"
    }
  ]
}
}
2020-03-27T23:42:43.029Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "967172981",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "AUTHORIZED"
}
]
}
2020-03-27T23:42:43.032Z - INFO - Time interval between two heartbeat request messages is: 61.155, limit is: 125.0
2020-03-27T23:42:43.046Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "967172981",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-27T23:46:03Z"
    }
  ]
}
}
2020-03-27T23:43:44.219Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "967172981",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],

```



```

    {
      "measBandwidth": 180000,
      "measFrequency": 3694320000,
      "measRcvdPower": -100
    }
  ],
  "operationState": "AUTHORIZED"
}
}
}
2020-03-27T23:43:44.220Z - INFO - Time interval between two heartbeat request messages is: 61.189, limit is: 125.0
2020-03-27T23:43:44.226Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "967172981",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-27T23:47:04Z"
    }
  ]
}
}
2020-03-27T23:44:44.358Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "967172981",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "AUTHORIZED"
}
}
}
2020-03-27T23:44:44.359Z - INFO - Time interval between two heartbeat request messages is: 60.14, limit is: 125.0
2020-03-27T23:44:44.368Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "967172981",
      "response": {
        "responseCode": 502
      },
      "transmitExpireTime": "2020-03-27T23:44:44Z"
    }
  ]
}
}
}
2020-03-27T23:45:21.451Z - INFO - relinquishment request from CBRS : {
  "relinquishmentRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",

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    "grantId": "967172981"
  }
}
}
2020-03-27T23:45:21.463Z - INFO - engine sent successfully, the response to CBRS : {
  "relinquishmentResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "967172981",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
}
2020-03-27T23:45:22.937Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-27T23:45:22.938Z - INFO - the question is : Did the CBSD stop RF transmission within 60 seconds of receiving Heartbeat response with responseCode = 502? please choose
one of the answers :
2020-03-27T23:45:42.875Z - INFO - for the question : Did the CBSD stop RF transmission within 60 seconds of receiving Heartbeat response with responseCode = 502? , the user
choose y
2020-03-27T23:45:44.049Z - INFO - The final result of the test : WINNF.FT.C.HBT.7 is - passed

```

## 9.16 Log file for test case ID: WINNF.FT.C.HBT.9

---

```

2020-03-27T23:56:08.326Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-27T23:56:08.328Z - INFO - the selected test from the user : WINNF.FT.C.HBT.9 is starting now
2020-03-27T23:56:09.479Z - INFO - registration request from CBRS : {
  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "CallSign123",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",
        "vendor": "Redline Communications Inc."
      },
      "cbsdSerialNumber": "360RM19230002",
      "fcclId": "QC8-B48",
      "installationParam": {
        "antennaAzimuth": 180,
        "antennaBeamwidth": 45,
        "antennaDowntilt": -5,
        "antennaGain": 11,
        "eirpCapability": 41,
        "height": 6,
        "heightType": "AGL",
        "indoorDeployment": false,
        "latitude": 41.57073,
        "longitude": -90.60271
      },
      "measCapability": [
        "RECEIVED_POWER_WITH_GRANT"
      ],
      "userId": "user1"
    }
  ]
}
}
2020-03-27T23:56:09.562Z - INFO - engine sent successfully, the response to CBRS : {

```

```

"registrationResponse": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "response": {
      "responseCode": 0
    }
  }
]
}
}
2020-03-27T23:56:11.566Z - INFO - spectrumInquiry request from CBRS : {
"spectrumInquiryRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "inquiredSpectrum": [
      {
        "highFrequency": 3700000000,
        "lowFrequency": 3550000000
      }
    ],
    "measReport": {
      "rcvdPowerMeasReports": [
        {
          "measBandwidth": 180000,
          "measFrequency": 3685500000,
          "measRcvdPower": -100
        },
        {
          "measBandwidth": 180000,
          "measFrequency": 3694320000,
          "measRcvdPower": -100
        }
      ]
    }
  }
]
}
}
}
2020-03-27T23:56:11.578Z - INFO - engine sent successfully, the response to CBRS : {
"spectrumInquiryResponse": [
  {
    "availableChannel": [
      {
        "channelType": "GAA",
        "frequencyRange": {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        },
        "ruleApplied": "FCC_PART_96"
      }
    ],
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "response": {
      "responseCode": 0
    }
  }
]
}
}
2020-03-27T23:56:14.585Z - INFO - grant request from CBRS : {
"grantRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "measReport": {
      "rcvdPowerMeasReports": [
        {
          "measBandwidth": 180000,
          "measFrequency": 3685500000,

```

```
        "measRcvdPower": -100
      },
      {
        "measBandwidth": 180000,
        "measFrequency": 3694320000,
        "measRcvdPower": -100
      }
    ]
  },
  "operationParam": {
    "maxEirp": 29,
    "operationFrequencyRange": {
      "highFrequency": 3695000000,
      "lowFrequency": 3685000000
    }
  }
}
}
}
2020-03-27T23:56:14.595Z - INFO - engine sent successfully, the response to CBRS : {
  "grantResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "channelType": "GAA",
      "grantExpireTime": "2020-04-03T23:56:14Z",
      "grantId": "421128485",
      "heartbeatInterval": 120,
      "response": {
        "responseCode": 0
      }
    }
  ]
}
2020-03-27T23:56:16.601Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "421128485",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "GRANTED"
}
}
}
2020-03-27T23:56:58.611Z - INFO - relinquishment request from CBRS : {
  "relinquishmentRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "421128485"
    }
  ]
}
}
```

```

2020-03-27T23:56:58.611Z - INFO - request message received while HBT is absent, sleep 162 sec before responding
2020-03-27T23:57:41.599Z - INFO - deregistration request from CBRS : {
  "deregistrationRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002"
    }
  ]
}
2020-03-27T23:57:41.599Z - INFO - request message received while HBT is absent, sleep 120 sec before responding
2020-03-27T23:59:36.634Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "421128485",
      "response": {
        "responseCode": 501
      },
      "transmitExpireTime": "2020-03-27T23:59:36Z"
    }
  ]
}
2020-03-27T23:59:38.358Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-27T23:59:38.361Z - INFO - the question is : Were there RF transmissions from the CBSD during the test? please choose one of the answers :
2020-03-27T23:59:40.638Z - INFO - engine sent successfully, the response to CBRS : "list index out of range"
2020-03-27T23:59:41.634Z - INFO - engine sent successfully, the response to CBRS : "list index out of range"
2020-03-28T00:00:07.907Z - INFO - for the question : Were there RF transmissions from the CBSD during the test? , the user choose n
2020-03-28T00:00:19.359Z - INFO - The final result of the test : WINNF.FT.C.HBT.9 is - passed

```

## 9.17 Log file for test case ID: WINNF.FT.C.HBT.10

```

2020-03-28T00:19:05.720Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-28T00:19:05.720Z - INFO - the selected test from the user : WINNF.FT.C.HBT.10 is starting now
2020-03-28T00:19:10.844Z - INFO - registration request from CBRS : {
  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "CallSign123",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",
        "vendor": "Redline Communications Inc."
      },
      "cbsdSerialNumber": "360RM19230002",
      "fcclD": "QC8-B48",
      "installationParam": {
        "antennaAzimuth": 180,
        "antennaBeamwidth": 45,
        "antennaDowntilt": -5,
        "antennaGain": 11,
        "eirpCapability": 41,
        "height": 6,
        "heightType": "AGL",
        "indoorDeployment": false,
        "latitude": 41.57073,
        "longitude": -90.60271
      },
      "measCapability": [
        "RECEIVED_POWER_WITH_GRANT"
      ]
    }
  ]
}

```

```

    ],
    "userId": "user1"
  }
]
}
2020-03-28T00:19:10.917Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
2020-03-28T00:19:12.966Z - INFO - spectrumInquiry request from CBRS : {
  "spectrumInquiryRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "inquiredSpectrum": [
        {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        }
      ],
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
}
2020-03-28T00:19:12.976Z - INFO - engine sent successfully, the response to CBRS : {
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3700000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
2020-03-28T00:19:15.982Z - INFO - grant request from CBRS : {
  "grantRequest": [
    {

```



```

{
  "cbsdId": "QC8-B48Mock-SAS360RM19230002",
  "grantId": "181237111",
  "response": {
    "responseCode": 0
  },
  "transmitExpireTime": "2020-03-28T00:22:38Z"
}
]
}
2020-03-28T00:20:19.036Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "181237111",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "AUTHORIZED"
}
]
}
2020-03-28T00:20:19.036Z - INFO - Time interval between two heartbeat request messages is: 61.037, limit is: 125.0
2020-03-28T00:20:19.045Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "181237111",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-28T00:23:39Z"
    }
  ]
}
}
2020-03-28T00:21:20.105Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "181237111",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
}

```



```

    ]
  },
  "operationState": "AUTHORIZED"
}
]
}

```

2020-03-28T00:21:20.105Z - INFO - Time interval between two heartbeat request messages is: 61.069, limit is: 125.0

2020-03-28T00:21:20.108Z - INFO - LAST HBT RESPONSE THAT SET TRANSMIT\_EXPIRE\_TIME WAS AT: 2020-03-28 00:20:19.036000

2020-03-28T00:22:21.117Z - INFO - heartbeat request from CBRS : {

```

"heartbeatRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "181237111",
    "grantRenew": false,
    "measReport": {
      "rcvdPowerMeasReports": [
        {
          "measBandwidth": 180000,
          "measFrequency": 3685500000,
          "measRcvdPower": -100
        },
        {
          "measBandwidth": 180000,
          "measFrequency": 3694320000,
          "measRcvdPower": -100
        }
      ]
    }
  },
  "operationState": "AUTHORIZED"
}
]
}

```

2020-03-28T00:22:21.117Z - INFO - request message received while HBT is absent, sleep 143 sec before responding

2020-03-28T00:23:22.128Z - INFO - heartbeat request from CBRS : {

```

"heartbeatRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "181237111",
    "grantRenew": false,
    "measReport": {
      "rcvdPowerMeasReports": [
        {
          "measBandwidth": 180000,
          "measFrequency": 3685500000,
          "measRcvdPower": -100
        },
        {
          "measBandwidth": 180000,
          "measFrequency": 3694320000,
          "measRcvdPower": -100
        }
      ]
    }
  },
  "operationState": "AUTHORIZED"
}
]
}

```

2020-03-28T00:23:22.128Z - INFO - request message received while HBT is absent, sleep 82 sec before responding

2020-03-28T00:24:04.095Z - INFO - heartbeat request from CBRS : {

```

"heartbeatRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "181237111",
    "grantRenew": false,
    "measReport": {

```

```

"rcvdPowerMeasReports": [
  {
    "measBandwidth": 180000,
    "measFrequency": 3685500000,
    "measRcvdPower": -100
  },
  {
    "measBandwidth": 180000,
    "measFrequency": 3694320000,
    "measRcvdPower": -100
  }
]
},
"operationState": "GRANTED"
}
]
}
2020-03-28T00:24:04.095Z - INFO - request message received while HBT is absent, sleep 41 sec before responding
2020-03-28T00:24:39.997Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "181237111",
      "response": {
        "responseCode": 501
      },
      "transmitExpireTime": "2020-03-28T00:24:39Z"
    }
  ]
}
}
2020-03-28T00:24:41.667Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-28T00:24:41.671Z - INFO - the question is : Did the CBSD stop RF transmissions within (transmitExpireTime + 60seconds) of last valid heartbeat response? please choose one of the answers :

2020-03-28T00:24:47.240Z - INFO - for the question : Did the CBSD stop RF transmissions within (transmitExpireTime + 60seconds) of last valid heartbeat response? , the user choose y
2020-03-28T00:24:49.989Z - INFO - The final result of the test : WINNF.FT.C.HBT.10 is - passed

```

## 9.18 Log file for test case ID: WINNF.FT.C.MES.3

```

2020-03-28T00:53:30.983Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-28T00:53:30.984Z - INFO - the selected test from the user : WINNF.FT.C.MES.3 is starting now
2020-03-28T00:53:34.085Z - INFO - registration request from CBRS : {
  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "CallSign123",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",
        "vendor": "Redline Communications Inc."
      },
      "cbsdSerialNumber": "360RM19230002",
      "fccId": "QC8-B48",
      "installationParam": {
        "antennaAzimuth": 180,
        "antennaBeamwidth": 45,
        "antennaDownTilt": -5,

```

```

    "antennaGain": 11,
    "eirpCapability": 41,
    "height": 6,
    "heightType": "AGL",
    "indoorDeployment": false,
    "latitude": 41.57073,
    "longitude": -90.60271
  },
  "measCapability": [
    "RECEIVED_POWER_WITH_GRANT"
  ],
  "userId": "user1"
}
]
}
2020-03-28T00:53:34.187Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
}
2020-03-28T00:53:36.194Z - INFO - spectrumInquiry request from CBRS : {
  "spectrumInquiryRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "inquiredSpectrum": [
        {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        }
      ]
    },
    {
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
}
}
}
2020-03-28T00:53:36.211Z - INFO - engine sent successfully, the response to CBRS : {
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3700000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ]
    }
  ],

```

```

"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"response": {
  "responseCode": 0
}
}
]
}
2020-03-28T00:53:39.220Z - INFO - grant request from CBRS : {
"grantRequest": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"measReport": {
"rcvdPowerMeasReports": [
{
"measBandwidth": 180000,
"measFrequency": 3685500000,
"measRcvdPower": -100
},
{
"measBandwidth": 180000,
"measFrequency": 3694320000,
"measRcvdPower": -100
}
]
},
},
"operationParam": {
"maxEirp": 29,
"operationFrequencyRange": {
"highFrequency": 3695000000,
"lowFrequency": 3685000000
}
}
}
]
}
2020-03-28T00:53:39.236Z - INFO - Response message contains measReportConfig
2020-03-28T00:53:39.237Z - INFO - engine sent successfully, the response to CBRS : {
"grantResponse": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"channelType": "GAA",
"grantExpireTime": "2020-04-04T00:53:39Z",
"grantId": "24890660",
"heartbeatInterval": 120,
"measReportConfig": [
"RECEIVED_POWER_WITH_GRANT"
],
"response": {
"responseCode": 0
}
}
]
}
}
2020-03-28T00:53:41.244Z - INFO - heartbeat request from CBRS : {
"heartbeatRequest": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"grantId": "24890660",
"grantRenew": false,
"measReport": {
"rcvdPowerMeasReports": [
{
"measBandwidth": 180000,
"measFrequency": 3685500000,
"measRcvdPower": -100
}
]
}
}
]
}

```

```

    },
    {
      "measBandwidth": 180000,
      "measFrequency": 3694320000,
      "measRcvdPower": -100
    }
  ]
},
"operationState": "GRANTED"
}
]
}
2020-03-28T00:53:41.247Z - INFO - measReport received in heartbeat message
2020-03-28T00:53:41.253Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "24890660",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-28T00:57:01Z"
    }
  ]
}
}
2020-03-28T00:54:42.269Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "24890660",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "AUTHORIZED"
}
}
}
2020-03-28T00:54:42.272Z - INFO - Time interval between two heartbeat request messages is: 61.024, limit is: 125.0
2020-03-28T00:54:42.285Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "24890660",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-28T00:58:02Z"
    }
  ]
}
}
}
2020-03-28T00:55:43.351Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {

```

```
"cbsdId": "QC8-B48Mock-SAS360RM19230002",
"grantId": "24890660",
"grantRenew": false,
"measReport": {
  "rcvdPowerMeasReports": [
    {
      "measBandwidth": 180000,
      "measFrequency": 3685500000,
      "measRcvdPower": -100
    },
    {
      "measBandwidth": 180000,
      "measFrequency": 3694320000,
      "measRcvdPower": -100
    }
  ]
},
"operationState": "AUTHORIZED"
}
]
}
2020-03-28T00:55:43.355Z - INFO - Time interval between two heartbeat request messages is: 61.083, limit is: 125.0
2020-03-28T00:55:43.368Z - INFO - engine sent successfully, the response to CBRS : {
"heartbeatResponse": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "24890660",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-03-28T00:59:03Z"
  }
]
}
2020-03-28T00:56:44.388Z - INFO - heartbeat request from CBRS : {
"heartbeatRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "24890660",
    "grantRenew": false,
    "measReport": {
      "rcvdPowerMeasReports": [
        {
          "measBandwidth": 180000,
          "measFrequency": 3685500000,
          "measRcvdPower": -100
        },
        {
          "measBandwidth": 180000,
          "measFrequency": 3694320000,
          "measRcvdPower": -100
        }
      ]
    }
  },
  "operationState": "AUTHORIZED"
}
]
}
2020-03-28T00:56:44.391Z - INFO - Time interval between two heartbeat request messages is: 61.036, limit is: 125.0
2020-03-28T00:56:44.405Z - INFO - engine sent successfully, the response to CBRS : {
"heartbeatResponse": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "24890660",
    "response": {
```

```

    "responseCode": 0
  },
  "transmitExpireTime": "2020-03-28T01:00:04Z"
}
]
}
2020-03-28T00:57:45.477Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "24890660",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    },
    "operationState": "AUTHORIZED"
  ]
}
}
2020-03-28T00:57:45.480Z - INFO - Time interval between two heartbeat request messages is: 61.091, limit is: 125.0
2020-03-28T00:57:45.490Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "24890660",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-28T01:01:05Z"
    }
  ]
}
}
2020-03-28T00:57:47.028Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-28T00:58:11.684Z - INFO - The final result of the test : WINNF.FT.C.MES.3 is - passed

```

## 9.19 Log file for test case ID: WINNF.FT.C.MES.4

```

2020-03-30T18:17:47.555Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-30T18:17:47.556Z - INFO - the selected test from the user : WINNF.FT.C.MES.4 is starting now
2020-03-30T18:17:57.118Z - INFO - registration request from CBRS : {
  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "CallSign123",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",

```

```

    "vendor": "Redline Communications Inc."
  },
  "cbsdSerialNumber": "360RM19230002",
  "fccId": "QC8-B48",
  "installationParam": {
    "antennaAzimuth": 180,
    "antennaBeamwidth": 45,
    "antennaDowntilt": -5,
    "antennaGain": 11,
    "eirpCapability": 41,
    "height": 6,
    "heightType": "AGL",
    "indoorDeployment": false,
    "latitude": 41.57073,
    "longitude": -90.60271
  },
  "measCapability": [
    "RECEIVED_POWER_WITH_GRANT"
  ],
  "userId": "user1"
}
]
}
2020-03-30T18:17:57.161Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
}
2020-03-30T18:17:59.203Z - INFO - spectrumInquiry request from CBRS : {
  "spectrumInquiryRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "inquiredSpectrum": [
        {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        }
      ],
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
}
}
2020-03-30T18:17:59.221Z - INFO - engine sent successfully, the response to CBRS : {
  "spectrumInquiryResponse": [
    {
      "availableChannel": [

```



```

    "channelType": "GAA",
    "frequencyRange": {
      "highFrequency": 3700000000,
      "lowFrequency": 3550000000
    },
    "ruleApplied": "FCC_PART_96"
  }
],
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"response": {
  "responseCode": 0
}
}
]
}

```

2020-03-30T18:18:02.232Z - INFO - grant request from CBRS : {

```

"grantRequest": [
  {
    "cbstdId": "QC8-B48Mock-SAS360RM19230002",
    "measReport": {
      "rcvdPowerMeasReports": [
        {
          "measBandwidth": 180000,
          "measFrequency": 3685500000,
          "measRcvdPower": -100
        },
        {
          "measBandwidth": 180000,
          "measFrequency": 3694320000,
          "measRcvdPower": -100
        }
      ]
    },
    "operationParam": {
      "maxEirp": 29,
      "operationFrequencyRange": {
        "highFrequency": 3695000000,
        "lowFrequency": 3685000000
      }
    }
  }
]
}

```

2020-03-30T18:18:02.250Z - INFO - engine sent successfully, the response to CBRS : {

```

"grantResponse": [
  {
    "cbstdId": "QC8-B48Mock-SAS360RM19230002",
    "channelType": "GAA",
    "grantExpireTime": "2020-04-06T18:18:02Z",
    "grantId": "934556321",
    "heartbeatInterval": 120,
    "response": {
      "responseCode": 0
    }
  }
]
}

```

2020-03-30T18:18:04.259Z - INFO - heartbeat request from CBRS : {

```

"heartbeatRequest": [
  {
    "cbstdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "934556321",
    "grantRenew": false,
    "measReport": {
      "rcvdPowerMeasReports": [

```

```

    {
      "measBandwidth": 180000,
      "measFrequency": 3685500000,
      "measRcvdPower": -100
    },
    {
      "measBandwidth": 180000,
      "measFrequency": 3694320000,
      "measRcvdPower": -100
    }
  ]
},
"operationState": "GRANTED"
}
]
}

```

2020-03-30T18:18:04.279Z - INFO - engine sent successfully, the response to CBRS : {

```

"heartbeatResponse": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "934556321",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-03-30T18:21:24Z"
  }
]
}

```

2020-03-30T18:19:05.288Z - INFO - heartbeat request from CBRS : {

```

"heartbeatRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "934556321",
    "grantRenew": false,
    "measReport": {
      "rcvdPowerMeasReports": [
        {
          "measBandwidth": 180000,
          "measFrequency": 3685500000,
          "measRcvdPower": -100
        },
        {
          "measBandwidth": 180000,
          "measFrequency": 3694320000,
          "measRcvdPower": -100
        }
      ]
    }
  }
],
"operationState": "AUTHORIZED"
}
]
}

```

2020-03-30T18:19:05.289Z - INFO - Time interval between two heartbeat request messages is: 61.028, limit is: 125.0

2020-03-30T18:19:05.296Z - INFO - engine sent successfully, the response to CBRS : {

```

"heartbeatResponse": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "934556321",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-03-30T18:22:25Z"
  }
]
}

```

2020-03-30T18:20:06.354Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "934556321",
    "grantRenew": false,
    "measReport": {
      "rcvdPowerMeasReports": [
        {
          "measBandwidth": 180000,
          "measFrequency": 3685500000,
          "measRcvdPower": -100
        },
        {
          "measBandwidth": 180000,
          "measFrequency": 3694320000,
          "measRcvdPower": -100
        }
      ]
    }
  }
],
"operationState": "AUTHORIZED"
}
```

2020-03-30T18:20:06.355Z - INFO - Time interval between two heartbeat request messages is: 61.066, limit is: 125.0

2020-03-30T18:20:06.362Z - INFO - Response message contains measReportConfig

2020-03-30T18:20:06.364Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "934556321",
    "measReportConfig": [
      "RECEIVED_POWER_WITH_GRANT"
    ],
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-03-30T18:23:26Z"
  }
]
```

2020-03-30T18:21:07.365Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "934556321",
    "grantRenew": false,
    "measReport": {
      "rcvdPowerMeasReports": [
        {
          "measBandwidth": 180000,
          "measFrequency": 3685500000,
          "measRcvdPower": -100
        },
        {
          "measBandwidth": 180000,
          "measFrequency": 3694320000,
          "measRcvdPower": -100
        }
      ]
    }
  }
],
"operationState": "AUTHORIZED"
}
```

2020-03-30T18:21:07.367Z - INFO - Time interval between two heartbeat request messages is: 61.011, limit is: 125.0

2020-03-30T18:21:07.368Z - INFO - measReport received in heartbeat message

2020-03-30T18:21:07.375Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "934556321",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-03-30T18:24:27Z"
  }
]
```

2020-03-30T18:22:08.477Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "934556321",
    "grantRenew": false,
    "measReport": {
      "rcvdPowerMeasReports": [
        {
          "measBandwidth": 180000,
          "measFrequency": 3685500000,
          "measRcvdPower": -100
        },
        {
          "measBandwidth": 180000,
          "measFrequency": 3694320000,
          "measRcvdPower": -100
        }
      ]
    },
    "operationState": "AUTHORIZED"
  }
]
```

2020-03-30T18:22:08.480Z - INFO - Time interval between two heartbeat request messages is: 61.113, limit is: 125.0

2020-03-30T18:22:08.493Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "934556321",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-03-30T18:25:28Z"
  }
]
```

2020-03-30T18:23:09.503Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "934556321",
    "grantRenew": false,
    "measReport": {
      "rcvdPowerMeasReports": [
        {
          "measBandwidth": 180000,
          "measFrequency": 3685500000,
          "measRcvdPower": -100
        }
      ]
    }
  }
]
```

```

        "measBandwidth": 180000,
        "measFrequency": 3694320000,
        "measRcvdPower": -100
    }
}
},
"operationState": "AUTHORIZED"
}
}
}
2020-03-30T18:23:09.506Z - INFO - Time interval between two heartbeat request messages is: 61.025, limit is: 125.0
2020-03-30T18:23:09.520Z - INFO - engine sent successfully, the response to CBRS : {
"heartbeatResponse": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"grantId": "934556321",
"response": {
"responseCode": 0
},
"transmitExpireTime": "2020-03-30T18:26:29Z"
}
]
}
}
2020-03-30T18:24:09.584Z - INFO - heartbeat request from CBRS : {
"heartbeatRequest": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"grantId": "934556321",
"grantRenew": false,
"measReport": {
"rcvdPowerMeasReports": [
{
"measBandwidth": 180000,
"measFrequency": 3685500000,
"measRcvdPower": -100
},
{
"measBandwidth": 180000,
"measFrequency": 3694320000,
"measRcvdPower": -100
}
]
},
"operationState": "AUTHORIZED"
}
]
}
}
2020-03-30T18:24:09.586Z - INFO - Time interval between two heartbeat request messages is: 60.082, limit is: 125.0
2020-03-30T18:24:09.601Z - INFO - engine sent successfully, the response to CBRS : {
"heartbeatResponse": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"grantId": "934556321",
"response": {
"responseCode": 0
},
"transmitExpireTime": "2020-03-30T18:27:29Z"
}
]
}
}
}
2020-03-30T18:25:10.628Z - INFO - heartbeat request from CBRS : {
"heartbeatRequest": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"grantId": "934556321",

```

```

"grantRenew": false,
"measReport": {
  "rcvdPowerMeasReports": [
    {
      "measBandwidth": 180000,
      "measFrequency": 3685500000,
      "measRcvdPower": -100
    },
    {
      "measBandwidth": 180000,
      "measFrequency": 3694320000,
      "measRcvdPower": -100
    }
  ]
},
"operationState": "AUTHORIZED"
}
]
}
}
2020-03-30T18:25:10.631Z - INFO - Time interval between two heartbeat request messages is: 61.043, limit is: 125.0
2020-03-30T18:25:10.645Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "934556321",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-30T18:28:30Z"
    }
  ]
}
}
}
2020-03-30T18:25:12.575Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-30T18:25:19.923Z - INFO - The final result of the test : WINNF.FT.C.MES.4 is - passed

```

## 9.20 Log file for test case ID: WINNF.FT.C.RLQ.1

---

```

2020-03-30T18:55:52.568Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-30T18:55:52.571Z - INFO - the selected test from the user : WINNF.FT.C.RLQ.1 is starting now
2020-03-30T18:55:53.377Z - INFO - registration request from CBRS : {
  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "CallSign123",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",
        "vendor": "Redline Communications Inc."
      },
      "cbsdSerialNumber": "360RM19230002",
      "fcclId": "QC8-B48",
      "installationParam": {
        "antennaAzimuth": 180,
        "antennaBeamwidth": 45,
        "antennaDowntilt": -5,
        "antennaGain": 11,
        "eirpCapability": 41,
        "height": 6,

```

```

    "heightType": "AGL",
    "indoorDeployment": false,
    "latitude": 41.57073,
    "longitude": -90.60271
  },
  "measCapability": [
    "RECEIVED_POWER_WITH_GRANT"
  ],
  "userId": "user1"
}
]
}
2020-03-30T18:55:53.433Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
2020-03-30T18:55:55.440Z - INFO - spectrumInquiry request from CBRS : {
  "spectrumInquiryRequest": [
    {
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
      "inquiredSpectrum": [
        {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        }
      ],
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
}
2020-03-30T18:55:55.460Z - INFO - engine sent successfully, the response to CBRS : {
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3700000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

```

```
}
}
]
}
2020-03-30T18:55:58.470Z - INFO - grant request from CBRS : {
  "grantRequest": [
    {
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    },
    {
      "operationParam": {
        "maxEirp": 29,
        "operationFrequencyRange": {
          "highFrequency": 3695000000,
          "lowFrequency": 3685000000
        }
      }
    }
  ]
}
2020-03-30T18:55:58.486Z - INFO - engine sent successfully, the response to CBRS : {
  "grantResponse": [
    {
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
      "channelType": "GAA",
      "grantExpireTime": "2020-04-06T18:55:58Z",
      "grantId": "874210249",
      "heartbeatInterval": 120,
      "response": {
        "responseCode": 0
      }
    }
  ]
}
2020-03-30T18:56:00.497Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "874210249",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
}
```



```

    },
    "operationState": "GRANTED"
  }
]
}

```

2020-03-30T18:56:00.516Z - INFO - engine sent successfully, the response to CBRS : {

```

"heartbeatResponse": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "874210249",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-03-30T18:59:20Z"
  }
]
}

```

2020-03-30T18:57:01.528Z - INFO - heartbeat request from CBRS : {

```

"heartbeatRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "874210249",
    "grantRenew": false,
    "measReport": {
      "rcvdPowerMeasReports": [
        {
          "measBandwidth": 180000,
          "measFrequency": 3685500000,
          "measRcvdPower": -100
        },
        {
          "measBandwidth": 180000,
          "measFrequency": 3694320000,
          "measRcvdPower": -100
        }
      ]
    },
    "operationState": "AUTHORIZED"
  }
]
}

```

2020-03-30T18:57:01.529Z - INFO - Time interval between two heartbeat request messages is: 61.03, limit is: 125.0

2020-03-30T18:57:01.546Z - INFO - engine sent successfully, the response to CBRS : {

```

"heartbeatResponse": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "874210249",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-03-30T19:00:21Z"
  }
]
}

```

2020-03-30T18:58:02.599Z - INFO - heartbeat request from CBRS : {

```

"heartbeatRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "grantId": "874210249",
    "grantRenew": false,
    "measReport": {
      "rcvdPowerMeasReports": [
        {
          "measBandwidth": 180000,
          "measFrequency": 3685500000,

```

```

        "measRcvdPower": -100
      },
      {
        "measBandwidth": 180000,
        "measFrequency": 3694320000,
        "measRcvdPower": -100
      }
    ]
  },
  "operationState": "AUTHORIZED"
}
]
}
2020-03-30T18:58:02.602Z - INFO - Time interval between two heartbeat request messages is: 61.072, limit is: 125.0
2020-03-30T18:58:02.615Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "874210249",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-30T19:01:22Z"
    }
  ]
}
2020-03-30T18:59:03.631Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "874210249",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "AUTHORIZED"
}
]
}
2020-03-30T18:59:03.634Z - INFO - Time interval between two heartbeat request messages is: 61.032, limit is: 125.0
2020-03-30T18:59:03.648Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "874210249",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-30T19:02:23Z"
    }
  ]
}
]
}
2020-03-30T19:00:04.711Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [

```

```

{
  "cbsdId": "QC8-B48Mock-SAS360RM19230002",
  "grantId": "874210249",
  "grantRenew": false,
  "measReport": {
    "rcvdPowerMeasReports": [
      {
        "measBandwidth": 180000,
        "measFrequency": 3685500000,
        "measRcvdPower": -100
      },
      {
        "measBandwidth": 180000,
        "measFrequency": 3694320000,
        "measRcvdPower": -100
      }
    ]
  },
  "operationState": "AUTHORIZED"
}
]
}
2020-03-30T19:00:04.713Z - INFO - Time interval between two heartbeat request messages is: 61.08, limit is: 125.0
2020-03-30T19:00:04.723Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "874210249",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-30T19:03:24Z"
    }
  ]
}
}
2020-03-30T19:00:18.730Z - INFO - relinquishment request from CBRS : {
  "relinquishmentRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "874210249"
    }
  ]
}
}
2020-03-30T19:00:18.743Z - INFO - engine sent successfully, the response to CBRS : {
  "relinquishmentResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "874210249",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
}
}
2020-03-30T19:00:20.591Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-30T19:00:20.631Z - INFO - the question is : Did CBSD1 cease RF transmission before receipt of Relinquishment Request by Test Harness? please choose one of the answers
:
2020-03-30T19:00:59.036Z - INFO - for the question : Did CBSD1 cease RF transmission before receipt of Relinquishment Request by Test Harness? , the user choose y
2020-03-30T19:01:04.571Z - INFO - The final result of the test : WINNF.FT.C.RLQ.1 is - passed

```

## 9.21 Log file for test case ID: WINNF.FT.C.RLQ.3

---

```

2020-03-30T19:07:43.721Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-30T19:07:43.723Z - INFO - the selected test from the user : WINNF.FT.C.RLQ.3 is starting now
2020-03-30T19:07:51.323Z - INFO - registration request from CBRS : {
  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "CallSign123",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",
        "vendor": "Redline Communications Inc."
      },
      "cbsdSerialNumber": "360RM19230002",
      "fccId": "QC8-B48",
      "installationParam": {
        "antennaAzimuth": 180,
        "antennaBeamwidth": 45,
        "antennaDowntilt": -5,
        "antennaGain": 11,
        "eirpCapability": 41,
        "height": 6,
        "heightType": "AGL",
        "indoorDeployment": false,
        "latitude": 41.57073,
        "longitude": -90.60271
      },
      "measCapability": [
        "RECEIVED_POWER_WITH_GRANT"
      ],
      "userId": "user1"
    }
  ]
}

```

```

2020-03-30T19:07:51.361Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

```

```

2020-03-30T19:07:53.365Z - INFO - spectrumInquiry request from CBRS : {
  "spectrumInquiryRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "inquiredSpectrum": [
        {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        }
      ],
      "measReport": {
        "rcvdPowerMeasReports": [

```

```

    {
      "measBandwidth": 180000,
      "measFrequency": 3685500000,
      "measRcvdPower": -100
    },
    {
      "measBandwidth": 180000,
      "measFrequency": 3694320000,
      "measRcvdPower": -100
    }
  ]
}
}
]
}

```

2020-03-30T19:07:53.374Z - INFO - engine sent successfully, the response to CBRS : {

```

"spectrumInquiryResponse": [
  {
    "availableChannel": [
      {
        "channelType": "GAA",
        "frequencyRange": {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        },
        "ruleApplied": "FCC_PART_96"
      }
    ],
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "response": {
      "responseCode": 0
    }
  }
]
}

```

2020-03-30T19:07:56.378Z - INFO - grant request from CBRS : {

```

"grantRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "measReport": {
      "rcvdPowerMeasReports": [
        {
          "measBandwidth": 180000,
          "measFrequency": 3685500000,
          "measRcvdPower": -100
        },
        {
          "measBandwidth": 180000,
          "measFrequency": 3694320000,
          "measRcvdPower": -100
        }
      ]
    },
    "operationParam": {
      "maxEirp": 29,
      "operationFrequencyRange": {
        "highFrequency": 3695000000,
        "lowFrequency": 3685000000
      }
    }
  }
]
}

```

2020-03-30T19:07:56.384Z - INFO - engine sent successfully, the response to CBRS : {

```

"grantResponse": [

```

```

{
  "cbsdId": "QC8-B48Mock-SAS360RM19230002",
  "channelType": "GAA",
  "grantExpireTime": "2020-04-06T19:07:56Z",
  "grantId": "955910461",
  "heartbeatInterval": 120,
  "response": {
    "responseCode": 0
  }
}
]
}
2020-03-30T19:07:58.392Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "955910461",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    },
    "operationState": "GRANTED"
  ]
}
}
2020-03-30T19:07:58.401Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "955910461",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-30T19:11:18Z"
    }
  ]
}
}
2020-03-30T19:08:59.417Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "955910461",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
}

```

```

    }
  ]
},
"operationState": "AUTHORIZED"
}
]
}
2020-03-30T19:08:59.417Z - INFO - Time interval between two heartbeat request messages is: 61.024, limit is: 125.0
2020-03-30T19:08:59.424Z - INFO - engine sent successfully, the response to CBRS : {
"heartbeatResponse": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"grantId": "955910461",
"response": {
"responseCode": 0
},
"transmitExpireTime": "2020-03-30T19:12:19Z"
}
]
}
2020-03-30T19:09:59.505Z - INFO - heartbeat request from CBRS : {
"heartbeatRequest": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"grantId": "955910461",
"grantRenew": false,
"measReport": {
"rcvdPowerMeasReports": [
{
"measBandwidth": 180000,
"measFrequency": 3685500000,
"measRcvdPower": -100
},
{
"measBandwidth": 180000,
"measFrequency": 3694320000,
"measRcvdPower": -100
}
]
}
]
},
"operationState": "AUTHORIZED"
}
]
}
2020-03-30T19:09:59.506Z - INFO - Time interval between two heartbeat request messages is: 60.088, limit is: 125.0
2020-03-30T19:09:59.513Z - INFO - engine sent successfully, the response to CBRS : {
"heartbeatResponse": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"grantId": "955910461",
"response": {
"responseCode": 0
},
"transmitExpireTime": "2020-03-30T19:13:19Z"
}
]
}
}
2020-03-30T19:11:00.528Z - INFO - heartbeat request from CBRS : {
"heartbeatRequest": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"grantId": "955910461",
"grantRenew": false,
"measReport": {
"rcvdPowerMeasReports": [

```

```

    {
      "measBandwidth": 180000,
      "measFrequency": 3685500000,
      "measRcvdPower": -100
    },
    {
      "measBandwidth": 180000,
      "measFrequency": 3694320000,
      "measRcvdPower": -100
    }
  ]
},
"operationState": "AUTHORIZED"
}
]
}
2020-03-30T19:11:00.529Z - INFO - Time interval between two heartbeat request messages is: 61.023, limit is: 125.0
2020-03-30T19:11:00.538Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "955910461",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-30T19:14:20Z"
    }
  ]
}
}
2020-03-30T19:11:33.546Z - INFO - relinquishment request from CBRS : {
  "relinquishmentRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "955910461"
    }
  ]
}
}
2020-03-30T19:11:33.549Z - INFO - engine sent successfully, the response to CBRS : {
  "relinquishmentResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 102,
        "responseData": [
          "grantId"
        ]
      }
    }
  ]
}
}
}
2020-03-30T19:11:34.759Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-30T19:11:34.759Z - INFO - the question is : Did CBS1 cease RF transmission before receipt of Relinquishment Request by Test Harness? please choose one of the answers
:
2020-03-30T19:11:43.690Z - INFO - for the question : Did CBS1 cease RF transmission before receipt of Relinquishment Request by Test Harness? , the user choose y
2020-03-30T19:12:07.628Z - INFO - The final result of the test : WINNF.FT.C.RLQ.3 is - passed

```



## 9.22 Log file for test case ID: WINNF.FT.C.RLQ.5

---

```
2020-03-30T19:43:42.744Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-30T19:43:42.744Z - INFO - the selected test from the user : WINNF.FT.C.RLQ.5 is starting now
2020-03-30T19:43:51.183Z - INFO - registration request from CBRS : {
  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "CallSign123",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",
        "vendor": "Redline Communications Inc."
      },
      "cbsdSerialNumber": "360RM19230002",
      "fccId": "QC8-B48",
      "installationParam": {
        "antennaAzimuth": 180,
        "antennaBeamwidth": 45,
        "antennaDowntilt": -5,
        "antennaGain": 11,
        "eirpCapability": 41,
        "height": 6,
        "heightType": "AGL",
        "indoorDeployment": false,
        "latitude": 41.57073,
        "longitude": -90.60271
      },
      "measCapability": [
        "RECEIVED_POWER_WITH_GRANT"
      ],
      "userId": "user1"
    }
  ]
}
2020-03-30T19:43:51.217Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
2020-03-30T19:43:53.256Z - INFO - spectrumInquiry request from CBRS : {
  "spectrumInquiryRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "inquiredSpectrum": [
        {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        }
      ],
      "measReport": {
        "rcvdPowerMeasReports": [

```



```

{
  "cbsdId": "QC8-B48Mock-SAS360RM19230002",
  "channelType": "GAA",
  "grantExpireTime": "2020-04-06T19:43:56Z",
  "grantId": "12822192",
  "heartbeatInterval": 120,
  "response": {
    "responseCode": 0
  }
}
]
}
2020-03-30T19:43:58.285Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "12822192",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    },
    "operationState": "GRANTED"
  ]
}
}
2020-03-30T19:43:58.290Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "12822192",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-30T19:47:18Z"
    }
  ]
}
}
2020-03-30T19:44:59.298Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "12822192",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
}
}

```

```

    }
  ]
},
"operationState": "AUTHORIZED"
}
]
}
2020-03-30T19:44:59.299Z - INFO - Time interval between two heartbeat request messages is: 61.013, limit is: 125.0
2020-03-30T19:44:59.303Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "12822192",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-30T19:48:19Z"
    }
  ]
}
2020-03-30T19:45:59.346Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "12822192",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "AUTHORIZED"
}
]
}
2020-03-30T19:45:59.348Z - INFO - Time interval between two heartbeat request messages is: 60.049, limit is: 125.0
2020-03-30T19:45:59.352Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "12822192",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-30T19:49:19Z"
    }
  ]
}
}
2020-03-30T19:47:00.361Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "12822192",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [

```

```

    {
      "measBandwidth": 180000,
      "measFrequency": 3685500000,
      "measRcvdPower": -100
    },
    {
      "measBandwidth": 180000,
      "measFrequency": 3694320000,
      "measRcvdPower": -100
    }
  ]
},
"operationState": "AUTHORIZED"
}
]
}
2020-03-30T19:47:00.361Z - INFO - Time interval between two heartbeat request messages is: 61.014, limit is: 125.0
2020-03-30T19:47:00.367Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "12822192",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-30T19:50:20Z"
    }
  ]
}
}
2020-03-30T19:48:01.415Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "12822192",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "AUTHORIZED"
}
]
}
}
2020-03-30T19:48:01.417Z - INFO - Time interval between two heartbeat request messages is: 61.055, limit is: 125.0
2020-03-30T19:48:01.421Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "12822192",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-30T19:51:21Z"
    }
  ]
}
}

```

```

}
2020-03-30T19:49:02.430Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "12822192",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "AUTHORIZED"
}
}
}
2020-03-30T19:49:02.431Z - INFO - Time interval between two heartbeat request messages is: 61.015, limit is: 125.0
2020-03-30T19:49:02.437Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "12822192",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-30T19:52:22Z"
    }
  ]
}
}
2020-03-30T19:50:03.492Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "12822192",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "AUTHORIZED"
}
}
}
2020-03-30T19:50:03.493Z - INFO - Time interval between two heartbeat request messages is: 61.061, limit is: 125.0
2020-03-30T19:50:03.499Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [

```

```

{
  "cbsdId": "QC8-B48Mock-SAS360RM19230002",
  "grantId": "12822192",
  "response": {
    "responseCode": 0
  },
  "transmitExpireTime": "2020-03-30T19:53:23Z"
}
]
}
2020-03-30T19:50:15.506Z - INFO - relinquishment request from CBRS : {
  "relinquishmentRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "12822192"
    }
  ]
}
2020-03-30T19:50:15.509Z - INFO - engine sent successfully, the response to CBRS : {
  "relinquishmentResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 103,
        "responseData": [
          "grantId"
        ]
      }
    }
  ]
}
}
2020-03-30T19:50:16.756Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-30T19:50:16.756Z - INFO - the question is : Did CBSD1 cease RF transmission before receipt of Relinquishment Request by Test Harness? please choose one of the answers
:
2020-03-30T19:51:19.516Z - INFO - for the question : Did CBSD1 cease RF transmission before receipt of Relinquishment Request by Test Harness? , the user choose y
2020-03-30T19:51:21.927Z - INFO - The final result of the test : WINNF.FT.C.RLQ.5 is - passed

```

### 9.23 Log file for test case ID: WINNF.FT.C.DRG.1

2020-03-30T20:18:21.344Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13  
 2020-03-30T20:18:21.345Z - INFO - the selected test from the user : WINNF.FT.C.DRG.1 is starting now  
 2020-03-30T20:18:26.056Z - INFO - registration request from CBRS : {

```

"registrationRequest": [
  {
    "airInterface": {
      "radioTechnology": "E_UTRA"
    },
    "callSign": "CallSign123",
    "cbsdCategory": "B",
    "cbsdInfo": {
      "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
      "hardwareVersion": "16May19-005131",
      "model": "Redline PPP360",
      "softwareVersion": "1.3.0.11",
      "vendor": "Redline Communications Inc."
    },
    "cbsdSerialNumber": "360RM19230002",
    "fccId": "QC8-B48",
    "installationParam": {
      "antennaAzimuth": 180,
      "antennaBeamwidth": 45,
      "antennaDowntilt": -5,
      "antennaGain": 11,

```

```

    "eirpCapability": 41,
    "height": 6,
    "heightType": "AGL",
    "indoorDeployment": false,
    "latitude": 41.57073,
    "longitude": -90.60271
  },
  "measCapability": [
    "RECEIVED_POWER_WITH_GRANT"
  ],
  "userId": "user1"
}
]
}
2020-03-30T20:18:26.085Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
}
2020-03-30T20:18:28.089Z - INFO - spectrumInquiry request from CBRS : {
  "spectrumInquiryRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "inquiredSpectrum": [
        {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        }
      ]
    },
    {
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
}
}
2020-03-30T20:18:28.096Z - INFO - engine sent successfully, the response to CBRS : {
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3700000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",

```



```

    "response": {
      "responseCode": 0
    }
  }
}
}
2020-03-30T20:18:31.105Z - INFO - grant request from CBRS : {
  "grantRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      },
      "operationParam": {
        "maxEirp": 29,
        "operationFrequencyRange": {
          "highFrequency": 3695000000,
          "lowFrequency": 3685000000
        }
      }
    }
  ]
}
2020-03-30T20:18:31.111Z - INFO - engine sent successfully, the response to CBRS : {
  "grantResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "channelType": "GAA",
      "grantExpireTime": "2020-04-06T20:18:31Z",
      "grantId": "370879292",
      "heartbeatInterval": 120,
      "response": {
        "responseCode": 0
      }
    }
  ]
}
2020-03-30T20:18:33.118Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "370879292",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
}

```

```

    }
  ]
},
"operationState": "GRANTED"
}
]
}
2020-03-30T20:18:33.128Z - INFO - engine sent successfully, the response to CBRS : {
"heartbeatResponse": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"grantId": "370879292",
"response": {
"responseCode": 0
},
"transmitExpireTime": "2020-03-30T20:21:53Z"
}
]
}
2020-03-30T20:19:34.145Z - INFO - heartbeat request from CBRS : {
"heartbeatRequest": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"grantId": "370879292",
"grantRenew": false,
"measReport": {
"rcvdPowerMeasReports": [
{
"measBandwidth": 180000,
"measFrequency": 3685500000,
"measRcvdPower": -100
},
{
"measBandwidth": 180000,
"measFrequency": 3694320000,
"measRcvdPower": -100
}
]
}
],
"operationState": "AUTHORIZED"
}
]
}
2020-03-30T20:19:34.148Z - INFO - Time interval between two heartbeat request messages is: 61.027, limit is: 125.0
2020-03-30T20:19:34.154Z - INFO - engine sent successfully, the response to CBRS : {
"heartbeatResponse": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"grantId": "370879292",
"response": {
"responseCode": 0
},
"transmitExpireTime": "2020-03-30T20:22:54Z"
}
]
}
2020-03-30T20:20:35.223Z - INFO - heartbeat request from CBRS : {
"heartbeatRequest": [
{
"cbstdId": "QC8-B48Mock-SAS360RM19230002",
"grantId": "370879292",
"grantRenew": false,
"measReport": {
"rcvdPowerMeasReports": [
{

```

```

        "measBandwidth": 180000,
        "measFrequency": 3685500000,
        "measRcvdPower": -100
    },
    {
        "measBandwidth": 180000,
        "measFrequency": 3694320000,
        "measRcvdPower": -100
    }
]
},
"operationState": "AUTHORIZED"
}
]
}
2020-03-30T20:20:35.223Z - INFO - Time interval between two heartbeat request messages is: 61.077, limit is: 125.0
2020-03-30T20:20:35.233Z - INFO - engine sent successfully, the response to CBRS : {
"heartbeatResponse": [
{
"cbid": "QC8-B48Mock-SAS360RM19230002",
"grantId": "370879292",
"response": {
"responseCode": 0
},
"transmitExpireTime": "2020-03-30T20:23:55Z"
}
]
}
2020-03-30T20:21:36.239Z - INFO - heartbeat request from CBRS : {
"heartbeatRequest": [
{
"cbid": "QC8-B48Mock-SAS360RM19230002",
"grantId": "370879292",
"grantRenew": false,
"measReport": {
"rcvdPowerMeasReports": [
{
"measBandwidth": 180000,
"measFrequency": 3685500000,
"measRcvdPower": -100
},
{
"measBandwidth": 180000,
"measFrequency": 3694320000,
"measRcvdPower": -100
}
]
}
]
},
"operationState": "AUTHORIZED"
}
]
}
2020-03-30T20:21:36.240Z - INFO - Time interval between two heartbeat request messages is: 61.016, limit is: 125.0
2020-03-30T20:21:36.246Z - INFO - engine sent successfully, the response to CBRS : {
"heartbeatResponse": [
{
"cbid": "QC8-B48Mock-SAS360RM19230002",
"grantId": "370879292",
"response": {
"responseCode": 0
},
"transmitExpireTime": "2020-03-30T20:24:56Z"
}
]
}
}

```

```

2020-03-30T20:22:28.312Z - INFO - relinquishment request from CBRS : {
  "relinquishmentRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "370879292"
    }
  ]
}
2020-03-30T20:22:28.319Z - INFO - engine sent successfully, the response to CBRS : {
  "relinquishmentResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "370879292",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
2020-03-30T20:22:31.326Z - INFO - deregistration request from CBRS : {
  "deregistrationRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002"
    }
  ]
}
2020-03-30T20:22:31.351Z - INFO - engine sent successfully, the response to CBRS : {
  "deregistrationResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
2020-03-30T20:22:32.371Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-30T20:22:32.372Z - INFO - the question is : Did CBSD1 cease RF transmission before receipt of Relinquishment request (if sent) or Deregistration request at Test Harness?
please choose one of the answers :
2020-03-30T20:22:40.428Z - INFO - for the question : Did CBSD1 cease RF transmission before receipt of Relinquishment request (if sent) or Deregistration request at Test Harness?
, the user choose y
2020-03-30T20:22:41.674Z - INFO - The final result of the test : WINNF.FT.C.DRG.1 is - passed

```

## 9.24 Log file for test case ID: WINNF.FT.C.DRG.3

```

2020-03-30T20:27:38.980Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-30T20:27:38.980Z - INFO - the selected test from the user : WINNF.FT.C.DRG.3 is starting now
2020-03-30T20:27:54.250Z - INFO - registration request from CBRS : {
  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "CallSign123",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",
        "vendor": "Redline Communications Inc."
      },
      "cbsdSerialNumber": "360RM19230002",
      "fcclId": "QC8-B48",
      "installationParam": {

```

```

    "antennaAzimuth": 180,
    "antennaBeamwidth": 45,
    "antennaDownTilt": -5,
    "antennaGain": 11,
    "eirpCapability": 41,
    "height": 6,
    "heightType": "AGL",
    "indoorDeployment": false,
    "latitude": 41.57073,
    "longitude": -90.60271
  },
  "measCapability": [
    "RECEIVED_POWER_WITH_GRANT"
  ],
  "userId": "user1"
}
]
}
2020-03-30T20:27:54.285Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
}
2020-03-30T20:27:56.332Z - INFO - spectrumInquiry request from CBRS : {
  "spectrumInquiryRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "inquiredSpectrum": [
        {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        }
      ],
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
}
}
2020-03-30T20:27:56.338Z - INFO - engine sent successfully, the response to CBRS : {
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3700000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
}

```

2020-03-30T20:27:58.344Z - INFO - spectrumInquiry request from CBRS : {

```
"spectrumInquiryRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "inquiredSpectrum": [
      {
        "highFrequency": 3700000000,
        "lowFrequency": 3550000000
      }
    ],
    "measReport": {
      "rcvdPowerMeasReports": [
        {
          "measBandwidth": 180000,
          "measFrequency": 3685500000,
          "measRcvdPower": -100
        },
        {
          "measBandwidth": 180000,
          "measFrequency": 3694320000,
          "measRcvdPower": -100
        }
      ]
    }
  }
]
```

2020-03-30T20:27:58.351Z - INFO - engine sent successfully, the response to CBRS : {

```
"spectrumInquiryResponse": [
  {
    "availableChannel": [
      {
        "channelType": "GAA",
        "frequencyRange": {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        },
        "ruleApplied": "FCC_PART_96"
      }
    ],
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "response": {
      "responseCode": 0
    }
  }
]
```

2020-03-30T20:28:02.357Z - INFO - grant request from CBRS : {

```
"grantRequest": [
  {
    "cbsdId": "QC8-B48Mock-SAS360RM19230002",
    "measReport": {
      "rcvdPowerMeasReports": [
        {
          "measBandwidth": 180000,
          "measFrequency": 3685500000,
          "measRcvdPower": -100
        },
        {
          "measBandwidth": 180000,
          "measFrequency": 3694320000,
          "measRcvdPower": -100
        }
      ]
    },
    "operationParam": {
      "maxEirp": 29,
      "operationFrequencyRange": {
        "highFrequency": 3695000000,
        "lowFrequency": 3685000000
      }
    }
  }
]
```

2020-03-30T20:28:02.361Z - INFO - engine sent successfully, the response to CBRS : {  
"grantResponse": [

```
{
  "cbsdId": "QC8-B48Mock-SAS360RM19230002",
  "channelType": "GAA",
  "grantExpireTime": "2020-04-06T20:28:02Z",
  "grantId": "531854981",
  "heartbeatInterval": 120,
  "response": {
    "responseCode": 0
  }
}
```

2020-03-30T20:28:04.369Z - INFO - heartbeat request from CBRS : {  
"heartbeatRequest": [

```
{
  "cbsdId": "QC8-B48Mock-SAS360RM19230002",
  "grantId": "531854981",
  "grantRenew": false,
  "measReport": {
    "rcvdPowerMeasReports": [
      {
        "measBandwidth": 180000,
        "measFrequency": 3685500000,
        "measRcvdPower": -100
      },
      {
        "measBandwidth": 180000,
        "measFrequency": 3694320000,
        "measRcvdPower": -100
      }
    ]
  }
},
"operationState": "GRANTED"
}
```

2020-03-30T20:28:04.384Z - INFO - engine sent successfully, the response to CBRS : {  
"heartbeatResponse": [

```
{
  "cbsdId": "QC8-B48Mock-SAS360RM19230002",
  "grantId": "531854981",
  "response": {
    "responseCode": 0
  },
  "transmitExpireTime": "2020-03-30T20:31:24Z"
}
```

2020-03-30T20:29:05.394Z - INFO - heartbeat request from CBRS : {  
"heartbeatRequest": [

```
{
  "cbsdId": "QC8-B48Mock-SAS360RM19230002",
  "grantId": "531854981",
  "grantRenew": false,
  "measReport": {
    "rcvdPowerMeasReports": [
      {
        "measBandwidth": 180000,
        "measFrequency": 3685500000,
        "measRcvdPower": -100
      },
      {
        "measBandwidth": 180000,
        "measFrequency": 3694320000,
        "measRcvdPower": -100
      }
    ]
  }
},
"operationState": "AUTHORIZED"
}
```

2020-03-30T20:29:05.395Z - INFO - Time interval between two heartbeat request messages is: 61.025, limit is: 125.0

```

2020-03-30T20:29:05.401Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "531854981",
      "response": {
        "responseCode": 0
      }
    },
    "transmitExpireTime": "2020-03-30T20:32:25Z"
  ]
}
2020-03-30T20:30:06.444Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "531854981",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "AUTHORIZED"
}
2020-03-30T20:30:06.447Z - INFO - Time interval between two heartbeat request messages is: 61.051, limit is: 125.0
2020-03-30T20:30:06.453Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "531854981",
      "response": {
        "responseCode": 0
      }
    },
    "transmitExpireTime": "2020-03-30T20:33:26Z"
  ]
}
2020-03-30T20:31:40.461Z - INFO - relinquishment request from CBRS : {
  "relinquishmentRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "531854981"
    }
  ]
}
2020-03-30T20:31:40.466Z - INFO - engine sent successfully, the response to CBRS : {
  "relinquishmentResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "531854981",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
2020-03-30T20:31:43.470Z - INFO - deregistration request from CBRS : {
  "deregistrationRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002"
    }
  ]
}

```



```

2020-03-30T20:31:43.473Z - INFO - engine sent successfully, the response to CBRS : {
  "deregistrationResponse": [
    {
      "response": {
        "responseCode": 102
      }
    }
  ]
}
2020-03-30T20:31:44.983Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-30T20:31:44.983Z - INFO - the question is : Did CBSD1 cease RF transmission before receipt of Relinquishment request (if sent) or Deregistration request at Test Harness?
please choose one of the answers :
2020-03-30T20:32:04.779Z - INFO - for the question : Did CBSD1 cease RF transmission before receipt of Relinquishment request (if sent) or Deregistration request at Test Harness?
, the user choose y
2020-03-30T20:32:07.470Z - INFO - The final result of the test : WINNF.FT.C.DRG.3 is - passed

```

## 9.25 Log file for test case ID: WINNF.FT.C.DRG.5

---

```

2020-03-30T20:37:59.055Z - INFO - WINNF TEST HARNESS RELEASE: 1.0.0.3 - 2018-November-13
2020-03-30T20:37:59.055Z - INFO - the selected test from the user : WINNF.FT.C.DRG.5 is starting now
2020-03-30T20:38:09.956Z - INFO - registration request from CBRS : {

```

```

  "registrationRequest": [
    {
      "airInterface": {
        "radioTechnology": "E_UTRA"
      },
      "callSign": "CallSign123",
      "cbsdCategory": "B",
      "cbsdInfo": {
        "firmwareVersion": "2013.01-svn826 (Apr 04 2018 - 19:58:11)",
        "hardwareVersion": "16May19-005131",
        "model": "Redline PPP360",
        "softwareVersion": "1.3.0.11",
        "vendor": "Redline Communications Inc."
      },
      "cbsdSerialNumber": "360RM19230002",
      "fcclId": "QC8-B48",
      "installationParam": {
        "antennaAzimuth": 180,
        "antennaBeamwidth": 45,
        "antennaDownTilt": -5,
        "antennaGain": 11,
        "eirpCapability": 41,
        "height": 6,
        "heightType": "AGL",
        "indoorDeployment": false,
        "latitude": 41.57073,
        "longitude": -90.60271
      },
      "measCapability": [
        "RECEIVED_POWER_WITH_GRANT"
      ],
      "userId": "user1"
    }
  ]
}
2020-03-30T20:38:10.016Z - INFO - engine sent successfully, the response to CBRS : {
  "registrationResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

```

```
}
2020-03-30T20:38:12.020Z - INFO - spectrumInquiry request from CBRS : {
  "spectrumInquiryRequest": [
    {
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
      "inquiredSpectrum": [
        {
          "highFrequency": 3700000000,
          "lowFrequency": 3550000000
        }
      ],
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
}
2020-03-30T20:38:12.028Z - INFO - engine sent successfully, the response to CBRS : {
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3700000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
2020-03-30T20:38:15.035Z - INFO - grant request from CBRS : {
  "grantRequest": [
    {
      "cbsId": "QC8-B48Mock-SAS360RM19230002",
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ]
}
```

```

    },
    "operationParam": {
      "maxEirp": 29,
      "operationFrequencyRange": {
        "highFrequency": 3695000000,
        "lowFrequency": 3685000000
      }
    }
  }
}
]
}
}
2020-03-30T20:38:15.045Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "channelType": "GAA",
      "grantExpireTime": "2020-04-06T20:38:15Z",
      "grantId": "827187604",
      "heartbeatInterval": 120,
      "response": {
        "responseCode": 0
      }
    }
  ]
}
}
2020-03-30T20:38:17.051Z - INFO - heartbeat request from CBRS :{
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "827187604",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "GRANTED"
}
}
2020-03-30T20:38:17.061Z - INFO - engine sent successfully, the response to CBRS :{
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "827187604",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-30T20:41:37Z"
    }
  ]
}
}
2020-03-30T20:39:18.071Z - INFO - heartbeat request from CBRS :{
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",

```

```

"grantId": "827187604",
"grantRenew": false,
"measReport": {
  "rcvdPowerMeasReports": [
    {
      "measBandwidth": 180000,
      "measFrequency": 3685500000,
      "measRcvdPower": -100
    },
    {
      "measBandwidth": 180000,
      "measFrequency": 3694320000,
      "measRcvdPower": -100
    }
  ]
},
"operationState": "AUTHORIZED"
}
]
}
}
2020-03-30T20:39:18.072Z - INFO - Time interval between two heartbeat request messages is: 61.02, limit is: 125.0
2020-03-30T20:39:18.078Z - INFO - engine sent successfully, the response to CBRS : {
"heartbeatResponse": [
{
  "cbsdId": "QC8-B48Mock-SAS360RM19230002",
  "grantId": "827187604",
  "response": {
    "responseCode": 0
  },
  "transmitExpireTime": "2020-03-30T20:42:38Z"
}
]
}
}
2020-03-30T20:40:19.119Z - INFO - heartbeat request from CBRS : {
"heartbeatRequest": [
{
  "cbsdId": "QC8-B48Mock-SAS360RM19230002",
  "grantId": "827187604",
  "grantRenew": false,
  "measReport": {
    "rcvdPowerMeasReports": [
      {
        "measBandwidth": 180000,
        "measFrequency": 3685500000,
        "measRcvdPower": -100
      },
      {
        "measBandwidth": 180000,
        "measFrequency": 3694320000,
        "measRcvdPower": -100
      }
    ]
  }
},
"operationState": "AUTHORIZED"
}
]
}
}
}
2020-03-30T20:40:19.121Z - INFO - Time interval between two heartbeat request messages is: 61.049, limit is: 125.0
2020-03-30T20:40:19.128Z - INFO - engine sent successfully, the response to CBRS : {
"heartbeatResponse": [
{
  "cbsdId": "QC8-B48Mock-SAS360RM19230002",
  "grantId": "827187604",
  "response": {
    "responseCode": 0
  }
}
]
}
}
}

```

```

    },
    "transmitExpireTime": "2020-03-30T20:43:39Z"
  }
}
}
2020-03-30T20:41:20.137Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "827187604",
      "grantRenew": false,
      "measReport": {
        "rcvdPowerMeasReports": [
          {
            "measBandwidth": 180000,
            "measFrequency": 3685500000,
            "measRcvdPower": -100
          },
          {
            "measBandwidth": 180000,
            "measFrequency": 3694320000,
            "measRcvdPower": -100
          }
        ]
      }
    }
  ],
  "operationState": "AUTHORIZED"
}
]
}
2020-03-30T20:41:20.138Z - INFO - Time interval between two heartbeat request messages is: 61.017, limit is: 125.0
2020-03-30T20:41:20.148Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "827187604",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-03-30T20:44:40Z"
    }
  ]
}
}
2020-03-30T20:42:13.194Z - INFO - relinquishment request from CBRS : {
  "relinquishmentRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "827187604"
    }
  ]
}
}
2020-03-30T20:42:13.200Z - INFO - engine sent successfully, the response to CBRS : {
  "relinquishmentResponse": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002",
      "grantId": "827187604",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
}
2020-03-30T20:42:16.203Z - INFO - deregistration request from CBRS : {
  "deregistrationRequest": [
    {
      "cbsdId": "QC8-B48Mock-SAS360RM19230002"
    }
  ]
}
}

```

```
}
]
}
2020-03-30T20:42:16.207Z - INFO - engine sent successfully, the response to CBRS : {
  "deregistrationResponse": [
    {
      "response": {
        "responseCode": 103,
        "responseData": [
          "cbsdId"
        ]
      }
    }
  ]
}
}
}
2020-03-30T20:42:18.058Z - INFO - arrived to nstep starting question answer session with the technician
2020-03-30T20:42:18.058Z - INFO - the question is : Did CBSD1 cease RF transmission before receipt of Relinquishment request (if sent) or Deregistration request at Test Harness?
please choose one of the answers :
2020-03-30T20:42:46.980Z - INFO - for the question : Did CBSD1 cease RF transmission before receipt of Relinquishment request (if sent) or Deregistration request at Test Harness?
, the user choose y
2020-03-30T20:42:48.880Z - INFO - The final result of the test : WINNF.FT.C.DRG.5 is - passed
```

## 9.26 Wireshark capture screenshot for test case ID: WINNF.FT.C.SCS.1

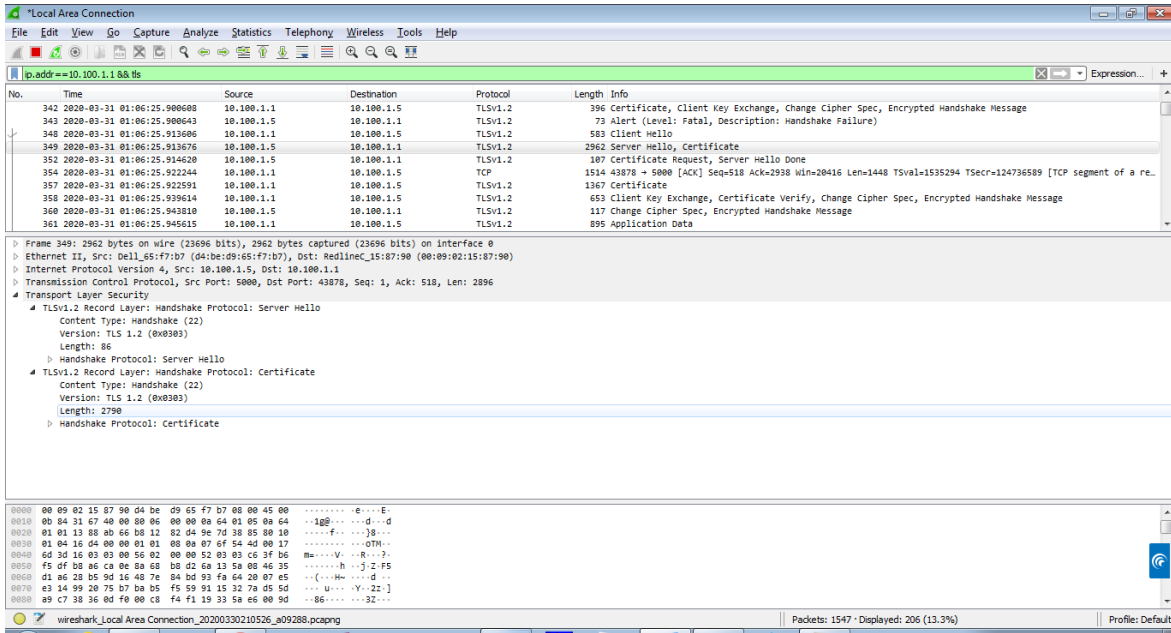


Figure 9.26-1: Client hello

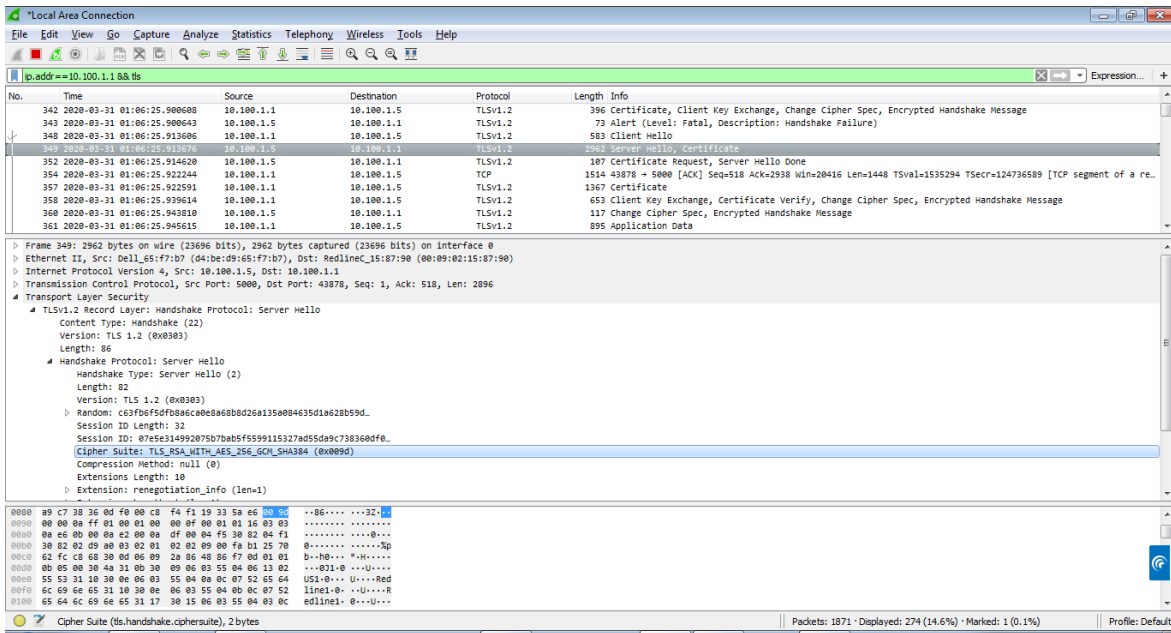


Figure 9.26-2: Cipher suit

### 9.27 Wireshark capture screenshot for test case ID: WINNF.FT.C.SCS.2

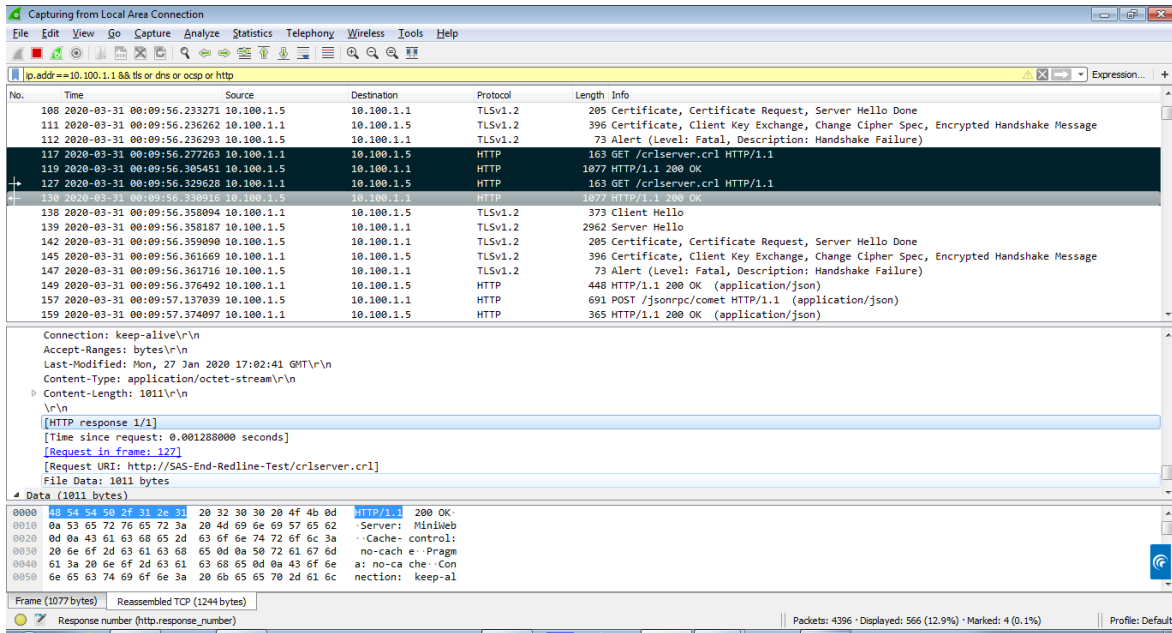


Figure 9.27-1: GET with CRL file

### 9.28 Wireshark capture screenshot for test case ID: WINNF.FT.C.SCS.3

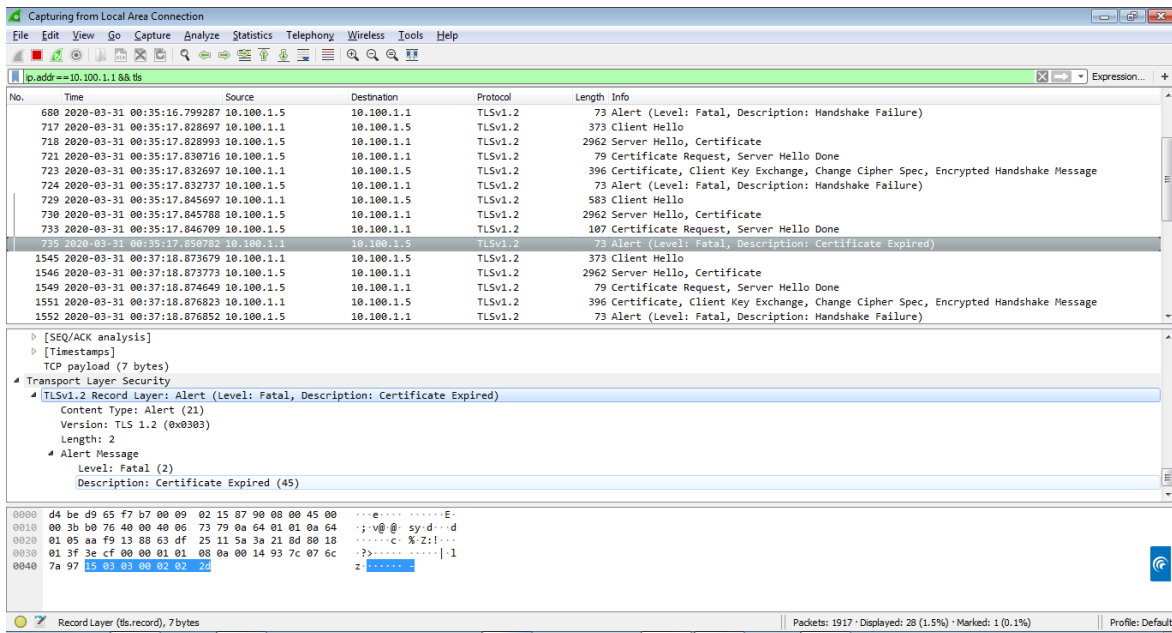


Figure 9.28-1: Client hello



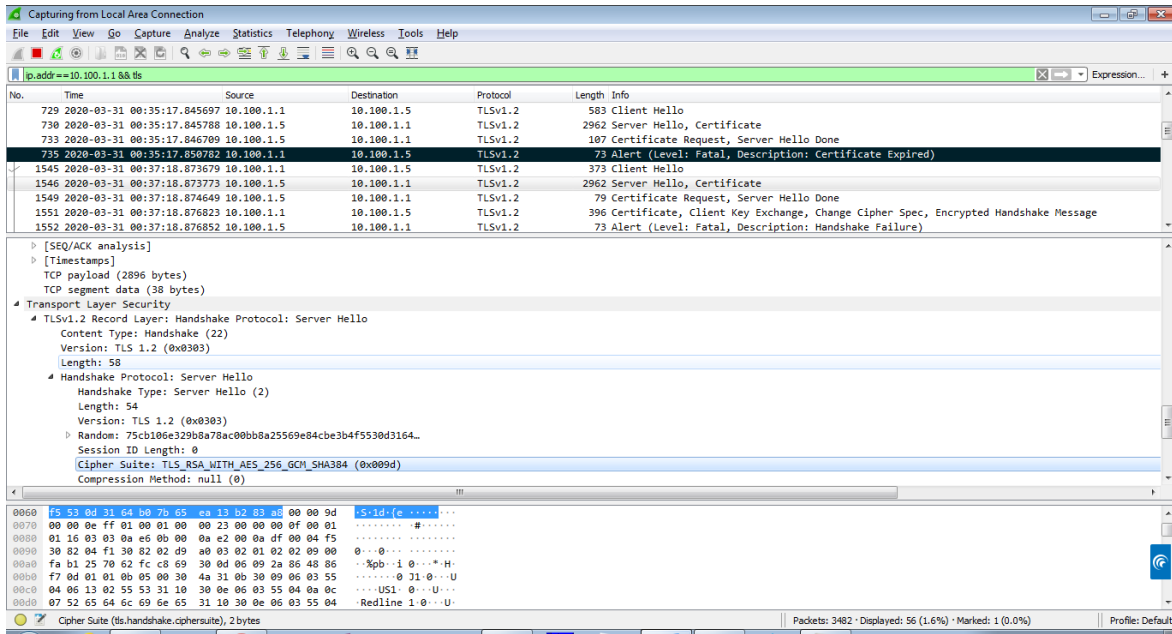


Figure 9.28-2: Close connection - Certificate Expired

9.29 Wireshark capture screenshot for test case ID: WINNF.FT.C.SCS.4

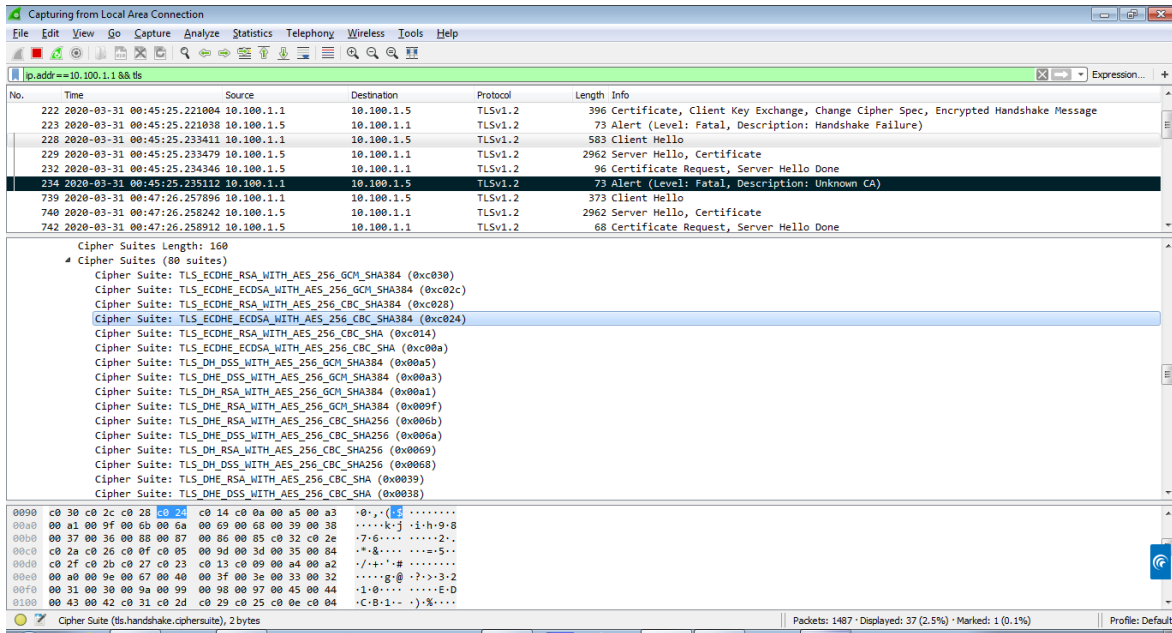


Figure 9.29-1: Client hello – Unknown CA

### 9.30 Wireshark capture screenshot for test case ID: WINNF.FT.C.SCS.5

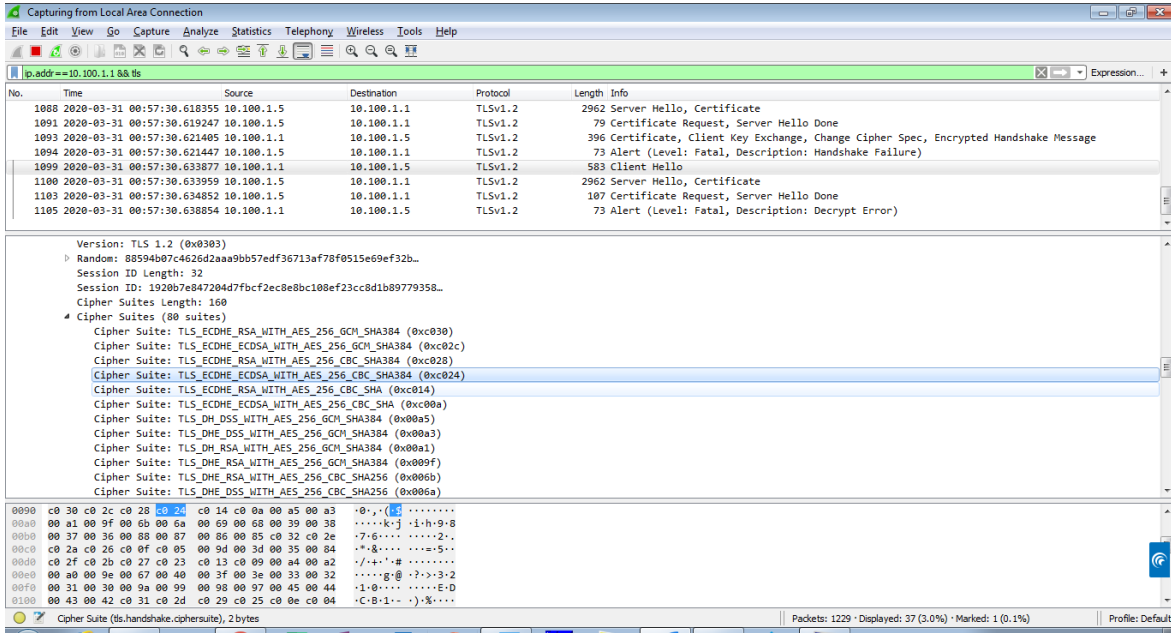


Figure 9.30-1: Client hello

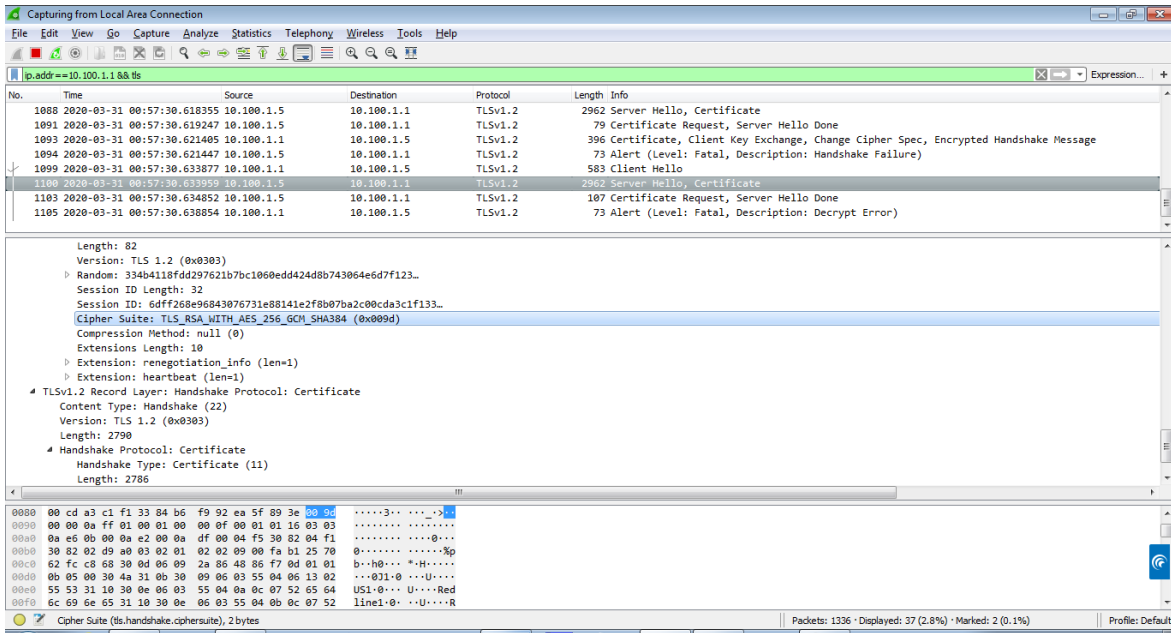


Figure 9.30-2: Certificate

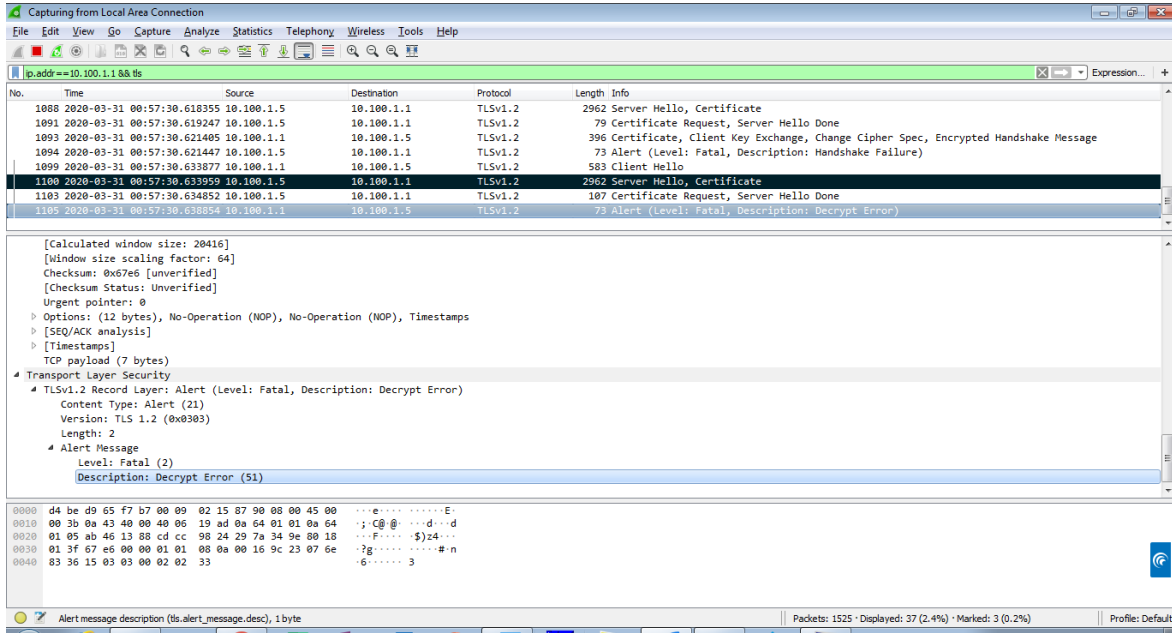


Figure 9.30-3: Decrypt error

End of the test report