

Compliance Certification Services (Kunshan) Inc.

Report No.: KSCR220500078601 Page: 1 of 46

TEST REPORT

Application No.:	KSCR2205000786AT (SZCR2205001574AT)	
FCC ID:	CID: 2AG32BS6430E	
Applicant:	Baicells Technologies Co., Ltd.	
Address of Applicant:	9-10F, 1stBldg., No.81BeiqingRoad, Haidian District, Beijing, China	
Manufacturer:	Baicells Technologies Co., Ltd.	
Address of Manufacturer:	9-10F, 1stBldg., No.81BeiqingRoad, Haidian District, Beijing, China	
Equipment Under Test (EU	IT):	
EUT Name:	LTE-Turbo BS	
Model No.:	BS6430E	
Trade Mark:	Baicells	
Standard(s):	FCC 47 CFR Part 96	
	KDB 940660 D01 V03	
	CBRSA-TS-9001-V1.2.1	
	WINNF-TS-0122-V1.0.2	
Date of Receipt:	2022-05-10	
Date of Test:	2022-05-15 to 2022-05-19	
Date of Issue:	2022-05-20	
Test Result:	Pass*	

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

Tom fin

Eric Lin Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



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Report No.: KSCR220500078601 Page: 2 of 46

Revision Record			
Version Description Date Remark			
00	Original	2022-05-20	/

Authorized for issue by:		
	Damon zhou	
	Damon Zhou / Project Engineer	—
	Eni fri	
	Eric Lin / Reviewer	—



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Report No.: KSCR220500078601 Page: 3 of 46

2 Test Summary

Item	Standard	Test Case ID	Result
Domain Proxy Multi-Step registration	WINNF-TS-0122- V1.0.0	WINNF.FT.D.REG.2	Pass
Domain Proxy Single-Step registration for CBSD with CPI signed data	WINNF-TS-0122- V1.0.0	WINNF.FT.D.REG.6	Pass
Domain Proxy Missing Required parameters (responseCode 102)	WINNF-TS-0122- V1.0.0	WINNF.FT.D.REG.9	Pass
Domain Proxy Pending registration (responseCode 200)	WINNF-TS-0122- V1.0.0	WINNF.FT.D.REG.11	Pass
Domain Proxy Invalid parameters (responseCode 103)	WINNF-TS-0122- V1.0.0	WINNF.FT.D.REG.13	Pass
Domain Proxy Blacklisted CBSD (responseCode 101)	WINNF-TS-0122- V1.0.0	WINNF.FT.D.REG.15	Pass
Domain Proxy Unsupported SAS protocol version responseCode 100)	WINNF-TS-0122- V1.0.0	WINNF.FT.D.REG.17	Pass
Domain Proxy Group Error (responseCode 201)	WINNF-TS-0122- V1.0.0	WINNF.FT.D.REG.19	Pass
Unsuccessful Grant responseCode=400 (INTERFERENCE)	WINNF-TS-0122- V1.0.0	WINNF.FT.C.GRA.1	Pass
Unsuccessful Grant responseCode=401 (GRANT_CONFLICT)	WINNF-TS-0122- V1.0.0	WINNF.FT.C.GRA.2	Pass
Domain Proxy Heartbeat Success Case (first Heartbeat Response)	WINNF-TS-0122- V1.0.0	WINNF.FT.D.HBT.2	Pass
Heartbeat responseCode=105 (DEREGISTER)	WINNF-TS-0122- V1.0.0	WINNF.FT.C.HBT.3	Pass
Heartbeat responseCode=501 (SUSPENDED_GRANT) in First Heartbeat Response	WINNF-TS-0122- V1.0.0	WINNF.FT.C.HBT.5	Pass
Heartbeat responseCode=501 (SUSPENDED_GRANT) in Subsequent Heartbeat Response	WINNF-TS-0122- V1.0.0	WINNF.FT.C.HBT.6	Pass
Heartbeat responseCode=502 (UNSYNC_OP_PARAM)	WINNF-TS-0122- V1.0.0	WINNF.FT.C.HBT.7	Pass
Domain Proxy Heartbeat responseCode=500 (TEMINATED_GRANT)	WINNF-TS-0122- V1.0.0	WINNF.FT.D.HBT.8	Pass
Heartbeat Response Absent (First Heartbeat)	WINNF-TS-0122- V1.0.0	WINNF.FT.C.HBT.9	Pass
Heartbeat Response Absent (Subsequent Heartbeat)	WINNF-TS-0122- V1.0.0	WINNF.FT.C.HBT.10	Pass
Domain Proxy Registration Response contains measReportConfig	WINNF-TS-0122- V1.0.0	WINNF.FT.D.MES.2	Pass



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Report No.: KSCR220500078601 Page: 4 of 46

Item	Standard	Test Case ID	Result
Grant Response contains measReportConfig	WINNF-TS-0122- V1.0.0	WINNF.FT.C.MES.3	Pass
Domain Proxy Heartbeat Response contains measReportConfig	WINNF-TS-0122- V1.0.0	WINNF.FT.D.MES.5	Pass
Domain Proxy Successful Relinquishment	WINNF-TS-0122- V1.0.0	WINNF.FT.D.RLQ.2	Pass
Domain Proxy Successful Deregistration	WINNF-TS-0122- V1.0.0	WINNF.FT.D.DRG.2	Pass
Successful TLS connection between UUT and SAS Test Harness	WINNF-TS-0122- V1.0.0	WINNF.FT.C.SCS.1	Pass
TLS failure due to revoked certificate	WINNF-TS-0122- V1.0.0	WINNF.FT.C.SCS.2	Pass
TLS failure due to expired server certificate	WINNF-TS-0122- V1.0.0	WINNF.FT.C.SCS.3	Pass
TLS failure when SAS Test Harness certificate is issue by unknown CA	WINNF-TS-0122- V1.0.0	WINNF.FT.C.SCS.4	Pass
TLS failure when certificate at the SAS Test Harness is corrupted	WINNF-TS-0122- V1.0.0	WINNF.FT.C.SCS.5	Pass
UUT RF Transmit Power Measurement	WINNF-TS-0122- V1.0.0	WINNF.PT.C.HBT.1	Pass
SAS Version: 1.0.0.3			

The UUT is a BTS-CBSD with Domain Proxy. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards:

CBRSA-TS-9001-V1.2.1

CBRS Alliance Certification Test Plan

WINNF-TS-0122-V1.0.2

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

KDB 940660 D01 Part 96 CBRS Eqpt v03



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Report No.: KSCR220500078601 5 of 46 Page:

3 Contents

			Page
1	COVE	ER PAGE	1
2	TEST	SUMMARY	3
~			
3	CON	TENTS	5
4	GENE	ERAL INFORMATION	7
	4.1	DETAILS OF E.U.T.	7
	4.2	DESCRIPTION OF CBSD/DP SUPPORT FEATURES	7
		SUMMARY OF TEST RESULTS	
		MEASUREMENT UNCERTAINTY	
		DESCRIPTION OF SUPPORT UNITS	
		TEST LOCATION	
5	EQUI	PMENT LIST	9
6	TEST	METHOD AND ENVIRONMENT	10
	6.1	CBSD/DP CONFORMANCE AND PERFORMANCE	10
	6.2	CBSD Test Procedure	10
	6.3	TEST ENVIRONMENT	11
	6.4	TEST SETUP	11
7	TEST	⁻ DATA	12
	7.1	CBSD REGISTRATION PROCESS	12
	7.1.1	WINNF.FT.D.REG.2	12
	7.1.2		
	7.1.3		
	7.1.4		
	7.1.5	WINNF.FT.D.REG.13	
	7.1.6	WINNF.FT.D.REG.15	
	7.1.7 7.1.8	WINNF.FT.D.REG.17 WINNF.FT.D.REG.19	
	-	CBSD Spectrum Grant Process	
	7.2.1	WINNF.FT.C.GRA.1	
	7.2.2		
		CBSD HEARTBEAT PROCESS	
	7.3.1	WINNF.FT.D.HBT.2	
	7.3.2	WINNF.FT.C.HBT.3	21
	7.3.3		
	7.3.4		
	7.3.5		
	7.3.6		
	7.3.7		
	7.3.8		
	7.4.1	WINNF.FT.D.MES.2	



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Compliance Certification Services (Kunshan) Inc.

Report No.: KSCR220500078601

Page: 6 of 46

7.4.2	2 WINNF.FT.C.MES.3	
7.4.3	3 WINNF.FT.D.MES.5	
7.5	CBSD RELINQUISHMENT PROCESS	
7.5.	1 WINNF.FT.D.RLQ.2	
7.6	CBSD DEREGISTRATION PROCESS	34
7.6.1		
7.7	CBSD SECURITY VALIDATION	
7.7.1		
7.7.2		
7.7.3	3 WINNF.FT.C.SCS.3	
7.7.4	4 WINNF.FT.C.SCS.4	
7.7.8	5 WINNF.FT.C.SCS.5	
78	CBSD RF Power Measurement	38
7.0		
7.8.		
7.8.	1 WINNF.PT.C.HBT.1	
7.8. ⁻ 8 TES	1 WINNF.PT.C.HBT.1 T DATA LOG	
7.8. 8 TES 8.1	1 WINNF.PT.C.HBT.1 T DATA LOG WINNF.FT.C.SCS.1	
7.8. ⁻ 8 TES 8.1 8.2	1 WINNF.PT.C.HBT.1 T DATA LOG WINNF.FT.C.SCS.1 WINNF.FT.C.SCS.2	
7.8. ⁻ 8 TES 8.1 8.2 8.3	1 WINNF.PT.C.HBT.1 T DATA LOG WINNF.FT.C.SCS.1 WINNF.FT.C.SCS.2 WINNF.FT.C.SCS.3	
7.8. ⁻ 8 TES 8.1 8.2 8.3 8.4	1 WINNF.PT.C.HBT.1 T DATA LOG WINNF.FT.C.SCS.1 WINNF.FT.C.SCS.2 WINNF.FT.C.SCS.3 WINNF.FT.C.SCS.4	38 41 41 42 43 44
7.8. ⁻ 8 TES 8.1 8.2 8.3	1 WINNF.PT.C.HBT.1 T DATA LOG WINNF.FT.C.SCS.1 WINNF.FT.C.SCS.2 WINNF.FT.C.SCS.3	38 41 41 42 43 44
7.8. 8 TES 8.1 8.2 8.3 8.4 8.5	1 WINNF.PT.C.HBT.1 T DATA LOG WINNF.FT.C.SCS.1 WINNF.FT.C.SCS.2 WINNF.FT.C.SCS.3 WINNF.FT.C.SCS.4	38 41 41 42 43 43 44 45



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 Report No.:
 KSCR220500078601

 Page:
 7 of 46

4 General Information

4.1 Details of E.U.T.

Power supply:	Adapter Model NO.: G0566-480-100			
	Input: 100-240V~50/60Hz, 1.5A			
	Output: 48V, 1.0A			
Sample Type:	Fixed device			
CBSD Class:	В			
Transmitter Frequency Band:	LTE Band 48			
Transmitter Frequency Range:	3550~3700MHz			
Hardware Version:	BoardV3			
Software Version:	BaiBS_QRTB_2.10.0			
Test sample:	SN1: 120300010220B6B0002			
	SN2: 1202000240194DP0023(FCC ID: 2AG32MBS3100196N)			
Antenna Gain:	17dBi			
Supported Carrier:	Max 2			
MIMO Type:	2*2 MIMO			
Note: This is a BTS-CBSD comr below:	Note: This is a BTS-CBSD communication with Domain Proxy. Domain Proxy information show as below:			
Model No. of Domain Proxy: LICA	4-1513A			
Software Version of Domain Proxy: BaiOMC_7.0.3				

4.2 Description of CBSD/DP Support Features

Condition	Feature Description	Supported
C1	Mandatory for UUT which supports multi-step registration message.	Y
C2	Mandatory for UUT which supports single-step registration with no CPI- signed data in the registration message. By definition, this is a subset of Category A devices which determine all registration information, including location, without CPI intervention.	N
C3	Mandatory for UUT which supports single-step registration containing CPI- signed data in the registration message.	Y
C4	Mandatory for UUT which supports RECEIVED_POWER_WITHOUT_GRANT measurement report type.	Y
C5	Mandatory for UUT which supports RECEIVED_POWER_WITH_GRANT measurement report type.	Y
C6	Mandatory for UUT which supports parameter change being made at the UUT and prior to sending a deregistration.	N

Y: Supported

N: Not supported



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 Report No.:
 KSCR220500078601

 Page:
 8 of 46

4.3 Summary of Test Results

WINNF-TS-0122				
Classes Test Case Items Pass Items Pass Rate (%)				
FT (CBSD, DP/CBSD)	28	28	100	
PT (CBSD, DP/CBSD)	1	1	100	
Total	29	29	100	

Note:

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

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

4.4 Measurement Uncertainty

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

4.5 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
CPE	SMAWAVE	USB Dongle	1
EPC	Lanner Electronics Inc.	LICA-1513A	LR202002004052
Router	TP-LINK	TL-R860+	1175379002425

4.6 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

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No tests were sub-contracted.



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Report No.: KSCR220500078601 Page: 9 of 46

5 Equipment List

Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
Laptop	Lenovo	Y510P	HFL000026	N/A	N/A
Spectrum Analyzer	KEYSIGHT	N9030B	KSEM021-1	2022/01/22	2023/01/22
Shield Room	研创	N/A	KS301115-2	N/A	N/A
Coaxial Cab `le	Thermax	N/A	14	2021/10/16	2022/10/15
Attenuator	Mini-Circuits	NAT-6-2W	15542-1	N.C.R.	N.C.R.
Humidity / Temperature Indicator	Anymetre	TH603	CZ700001(4/7	2021/10/14	2022/10/13



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Report No.: KSCR220500078601 Page: 10 of 46

6 Test Method and Environment

6.1 CBSD/DP Conformance and Performance

 Test Requirement:
 CBRS CBSD Test Specification WINNF-TS-0122-V1.0.2

 Test Method:
 CBRS CBSD Test Specification WINNF-TS-0122-V1.0.2

 WINNF-IN-0156_WInnForum_SAS_Test_Harness_CBSD_UUT_Tutorial_
 v1_0_0_1

6.2 CBSD Test Procedure

- a. Connect the UUT to SAS Test Harness system and RF Test instruments via the CBSD interface and RF components. The highest level is set to test configuration.
- b. UUT shall be UTC time synchronized
- c. The frequency band is granted and set as UUT supported Modulation and Channels, transmitted power of the UUT according to it granted parameters from the SAS Test Harness.
- d. Each test case results were recorded and validated by SAS Test Harness system and RF instruments test cases was recorded test results from SAS Test Harness system.



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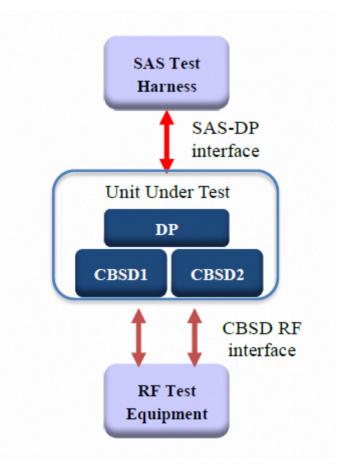


Report No.: KSCR220500078601 Page: 11 of 46

6.3 Test Environment

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

6.4 Test Setup



DP/CBSD as UUT, BTS-CBSD communication with Domain Proxy



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Report No.: KSCR220500078601 Page: 12 of 46

7 Test Data

7.1 CBSD Registration Process

7.1.1 WINNF.FT.D.REG.2

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with the SAS Test Harness UUT is in the Unregistered state 		
2	 DP with two CBSD sends correct Registration request information, as specified in [n.5], in the form of one 2-element Array or as individual messages to the SAS Test Harness: The required userId, fccId and cbsdSerialNumber registration parameters shall be sent for each CBSD and conform to proper format and acceptable ranges. Any REG-conditional or optional registration parameters that may be included in the message shall be verified that they conform to proper format and are within acceptable ranges. Note: It is outside the scope of this document to test the Registration information that is supplied via another means. 	∎ Pass	□ Fail
3	 SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or individual messages as follows: cbsdld = Ci measReportConfig shall not be included responseCode = 0 for each CBSD 		
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.		
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF	∎ Pass	□ Fail



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Report No.: KSCR220500078601 Page: 13 of 46

7.1.2 WINNF.FT.D.REG.6

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with the SAS Test Harness UUT is in the Unregistered state All of the required and REG-Conditional parameters shall be configured and CPI signature provided 		
2	 DP with two CBSD sends correct Registration request information, as specified in [n.5], in the form of one 2-element Array or as individual messages to the SAS Test Harness: The required userId, fccId and cbsdSerialNumber and REG-Conditional cbsdCategory, airInterface, measCapability and cpiSignatureData registration parameters shall be sent from the CBSD and conform to proper format and acceptable ranges. Any optional registration parameters that may be included in the message shall be verified that they conform to proper format and are within acceptable ranges. 	∎ Pass	□ Fail
3	 SAS Test Harness sends a CBSD Registration Response in the form of one 2-element Array or individual messages as follows: cbsdld = Ci measReportConfig shall not be included responseCode = 0 for each CBSD 		
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.		
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF	∎ Pass	□ Fail



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Report No.: KSCR220500078601 Page: 14 of 46

7.1.3 WINNF.FT.D.REG.9

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT is in the Unregistered state 		
2	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to SAS Test Harness.		
3	SAS Test Harness sends a CBSD Registration Response in the form of one 2- element Array or as individual messages as follows: - SAS response does not include a cbsdld. - responseCode = 102 for CBSD1 and CBSD2		
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.		
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF	∎ Pass	□ Fail

7.1.4 WINNF.FT.D.REG.11

#	Test Execution Steps	Re	sults
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT is in the Unregistered state 		
2	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to SAS Test Harness.		
3	SAS Test Harness sends a CBSD Registration Response in the form of one 2- element Array or as individual messages as follows: - SAS response does not include a cbsdld. - responseCode = 200 for CBSD1 and CBSD2		
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.		
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF	∎ Pass	□ Fail



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Report No.: KSCR220500078601 Page: 15 of 46

7.1.5 WINNF.FT.D.REG.13

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT is in the Unregistered state 		
2	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to SAS Test Harness.		
3	SAS Test Harness sends a CBSD Registration Response in the form of one 2- element Array or as individual messages as follows: - SAS response does not include a cbsdld. - responseCode = 0 for CBSD1 - responseCode = 103 for CBSD2		
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.		
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF	∎ Pass	□ Fail

7.1.6 WINNF.FT.D.REG.15

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT is in the Unregistered state 		
2	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to SAS Test Harness.		
3	SAS Test Harness sends a CBSD Registration Response in the form of one 2- element Array or as individual messages as follows: - SAS response does not include a cbsdld. - responseCode = 0 for CBSD1 - responseCode = 101 for CBSD2		
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.		
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF	∎ Pass	□ Fail



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Report No.: KSCR220500078601 Page: 16 of 46

7.1.7 WINNF.FT.D.REG.17

#	Test Execution Steps	Results	
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT is in the Unregistered state 		
2	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to SAS Test Harness.		
3	SAS Test Harness sends a CBSD Registration Response in the form of one 2- element Array or as individual messages as follows: - SAS response does not include a cbsdld. - responseCode = 100 for CBSD1 and CBSD2		
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.		
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF	∎ Pass	□ Fail

7.1.8 WINNF.FT.D.REG.19

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT is in the Unregistered state 		
2	The DP with two CBSDs sends a Registration request in the form of one 2-element Array or as individual messages to SAS Test Harness.		
3	SAS Test Harness sends a CBSD Registration Response in the form of one 2- element Array or as individual messages as follows: - SAS response does not include a cbsdld. - responseCode = 0 for CBSD1 - responseCode = 201 for CBSD2		
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.		
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF	∎ Pass	□ Fail



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Report No.: KSCR220500078601 Page: 17 of 46

7.2 CBSD Spectrum Grant Process

7.2.1 WINNF.FT.C.GRA.1

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

7.2.2 WINNF.FT.C.GRA.2

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



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Report No.: KSCR220500078601 Page: 18 of 46

7.3 CBSD HeartBeat Process

7.3.1 WINNF.FT.D.HBT.2

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: DP has two CBSD registered successfully with SAS Test Harness, with cbsdld = Ci, i={1,2} 		
2	 DP sends a message: If message is type Spectrum Inquiry Request, go to step 3, or If message is type Grant Request, go to step 5 		
3	 DP sends a Spectrum Inquiry Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Spectrum Inquiry Request message is formatted correctly for each CBSD, including for CBSDi, i={1,2}: cbsdld = Ci List of frequencyRange objects sent by DP are within the CBRS frequency range 	∎ Pass	□ Fail
4	If a separate Spectrum Inquiry Request message was sent for each CBSD, the SAS Test Harness shall respond to each Spectrum Inquiry Request message with a separate Spectrum Inquiry Response message. If a single Spectrum Inquiry Request message was sent containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Spectrum Inquiry Response message containing a 2-object array. Verify parameters for each CBSD within the Spectrum Inquiry Response message are as follows, for CBSDi, i={1,2}: cbsdld = Ci availableChannel is an array of availableChannel objects responseCode = 0 	-	
5	 DP sends a Grant Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Grant Request message is formatted correctly for each CBSD, including for CBSDi, i={1,2}: cbsdld = C maxEIRP is at or below the limit appropriate for CBSD category as defined by Part 96 operationFrequencyRange, Fi, sent by UUT is a valid range within the CBRS band 	∎ Pass	□ Fail
6	If a separate Grant Request message was sent for each CBSD, the SAS Test Harness shall respond to each Grant Request message with a separate Grant Response message. If a single Grant Request message was sent containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Grant Response message containing a 2-object array. Verify parameters for each CBSD within the Grant Response message are as follows, for CBSDi, i={1,2}: cbsdld = Ci grantId = Gi = a valid grant ID		



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Report No.: KSCR220500078601

Page: 19 of 46

	• month of the second state of the second stat		
	 grantExpireTime = UTC time greater than duration of the test responseCode = 0 		
7	 Ensure DP sends first Heartbeat Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Heartbeat Request message is formatted correctly for each CBSD, including, for CBSDi i={1,2}: cbsdld = Ci, i={1,2} grantId = Gi, i={1,2} operationState = "GRANTED" 	∎ Pass	□ Fail
8	If a separate Heartbeat Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each Heartbeat Request message with a separate Heartbeat Response message. If a single Heartbeat Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Heartbeat Response message containing a 2-object array. Verify parameters for each CBSD within the Heartbeat Response message are as follows, for CBSDi:		
9	 For further Heartbeat Request messages sent from DP after completion of step 8, validate message is sent within latest specified heartbeatInterval for CBSDi: cbsdld = Ci grantId = Gi operationState = "AUTHORIZED" and SAS Test Harness responds with a Heartbeat Response message including the following parameters, for CBSDi cbsdld = Ci grantId = Gi transmitExpireTime = current UTC time + 200 seconds responseCode = 0 	∎ Pass	□ Fail
10	 Monitor the RF output of the UUT from start of test until UUT transmission commences. Monitor the RF output of the UUT from start of test until RF transmission commences. Verify: UUT does not transmit at any time prior to completion of the first heartbeat response UUT transmits after step 8 is complete, and its transmission is limited to within the bandwidth range Fi. 	∎ Pass	□ Fail



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Page: 20 of 46

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Report No.: KSCR220500078601 Page: 21 of 46

7.3.2 WINNF.FT.C.HBT.3

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has registered successfully with SAS Test Harness UUT has a valid single grant as follows: valid cbsdld = C valid grantId = G grant is for frequency range F, power P grantExpireTime = UTC time greater than duration of the test UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface 		
2	UUT sends a Heartbeat Request message. Ensure Heartbeat Request message is sent within Heartbeat Interval specified in the latest Heartbeat Response, and formatted correctly, including:	∎ Pass	□ Fail
3	 SAS Test Harness sends a Heartbeat Response message, including the following parameters: cbsdld = C grantld = G transmitExpireTime = T = Current UTC time responseCode = 105 (DEREGISTER) 		
4	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.		
5	 Monitor the RF output of the UUT. Verify: UUT shall stop transmission within (T + 60 seconds) of completion of step 3 	∎ Pass	□ Fail



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 Report No.:
 KSCR220500078601

 Page:
 22 of 46

7.3.3 WINNF.FT.C.HBT.5

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



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 Report No.:
 KSCR220500078601

 Page:
 23 of 46

7.3.4 WINNF.FT.C.HBT.6

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has registered successfully with SAS Test Harness UUT has a valid single grant as follows: valid cbsdld = C valid grantld = G grant is for frequency range F, power P grantExpireTime = UTC time greater than duration of the test UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface 		
2	 UUT sends a Heartbeat Request message. Ensure Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including: cbsdld = C grantId = G operationState = "AUTHORIZED" 	∎ Pass	□ Fail
3	 SAS Test Harness sends a Heartbeat Response message, including the following parameters: cbsdld = C grantId = G transmitExpireTime = T = current UTC time responseCode = 501 (SUSPENDED_GRANT) 		
4	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.		
5	 Monitor the SAS-CBSD interface. Verify either A OR B occurs: A. UUT sends a Heartbeat Request message. Ensure message is sent within latest specified heartbeatInterval, and is correctly formatted with parameters: cbsdld = C grantld = G operationState = "GRANTED" B. UUT sends a Relinquishment request message. Ensure message is correctly formatted with parameters: cbdsld = C grantld = G b. UUT sends a Relinquishment request message. Ensure message is correctly formatted with parameters: cbdsld = C grantld = G Monitor the RF output of the UUT. Verify: UUT shall stop transmission within (T+60) seconds of completion of step 3 	∎ Pass	□ Fail



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 Report No.:
 KSCR220500078601

 Page:
 24 of 46

7.3.5 WINNF.FT.C.HBT.7

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has registered successfully with SAS Test Harness UUT has a valid single grant as follows: valid cbsdld = C valid grantld = G grant is for frequency range F, power P grantExpireTime = UTC time greater than duration of the test UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface 		
2	UUT sends a Heartbeat Request message. Ensure Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including: • cbsdld = C • grantId = G • operationState = "AUTHORIZED"	■ Pass	□ Fail
3	 SAS Test Harness sends a Heartbeat Response message, including the following parameters: cbsdld = C grantld = G transmitExpireTime = T = current UTC time responseCode = 502 (UNSYNC_OP_PARAM) 		
4	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.		
5	 Monitor the SAS-CBSD interface. Verify: UUT sends a Grant Relinquishment Request message. Verify message is correctly formatted with parameters: Cbsdld = C GrantId = G Monitor the RF output of the UUT. Verify: UUT shall stop transmission within (T+60) seconds of completion of step 3 	∎ Pass	□ Fail



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Report No.: KSCR220500078601 Page: 25 of 46

7.3.6 WINNF.FT.D.HBT.8

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: DP has two CBSD registered successfully with SAS Test Harness Each CBSD {1,2} has a valid single grant as follows valid cbsdld = Ci, i={1,2} valid grantId = Gi, i={1,2} grant is for frequency range Fi, power Pi grantExpireTime = UTC time greater than duration of the test Both CBSD are in AUTHORIZED state and transmitting within their granted bandwidth on RF interface 		
2	 DP sends a Heartbeat Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of size 2. Verify Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly for each CBSD, including, for CBSDi i={1,2}: cbsdld = Ci, i = {1,2} grantId = Gi, i = {1,2} operationState = "AUTHORIZED" 	∎ Pass	□ Fail
3	If separate Heartbeat Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each Heartbeat Request message with a separate Heartbeat Response message. If a single Heartbeat Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Heartbeat Response message containing a 2-object array. Parameters for each CBSD within the Heartbeat Response message should be as follows, for CBSDi: cbsdld = Ci grantId = Gi For CBSD1: o transmitExpireTime = current UTC time + 200 seconds o responseCode = 0 For CBSD2: o transmitExpireTime = T = current UTC time		
4	 o responseCode = 500 (TERMINATED_GRANT) After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT. If CBSD sends further Heartbeat Request messages for CBSD1, SAS Test Harness shall respond with a Heartbeat Response message with parameters: cbsdld = C1 grantId = G1 transmitExpireTime = current UTC time + 200 seconds responseCode = 0 Heartbeat Request message is within heartbeatInterval of previous Heartbeat Request message 		
5	 Monitor the RF output of CBSD2. Verify: CBSD2 shall stop transmission within bandwidth F2 within (T + 60 seconds) of completion of step 3 	∎ Pass	□ Fail



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 Report No.:
 KSCR220500078601

 Page:
 26 of 46

7.3.7 WINNF.FT.C.HBT.9

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has registered successfully with SAS Test Harness UUT has a valid single grant as follows: valid cbsdld = C valid grantId = G grant is for frequency range F, power P grantExpireTime = UTC time greater than duration of the test UUT is in GRANTED, but not AUTHORIZED state(i.e. has not performed its first Heartbeat Request) 		-
2	UUT sends a Heartbeat Request message. Ensure Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including:	∎ Pass	□ Fail
3	After completion of step 2, SAS Test Harness does not respond to any further messages from UUT to simulate loss of network connection		
4	 Monitor the RF output of the UUT from start of test to 60 seconds after step 3. Verify: At any time during the test, UUT shall not transmit on RF interface 	∎ Pass	□ Fail



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Report No.: KSCR220500078601 Page: 27 of 46

7.3.8 WINNF.FT.C.HBT.10

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has registered successfully with SAS Test Harness UUT has a valid single grant as follows: valid cbsdld = C valid grantld = G grant is for frequency range F, power P grantExpireTime = UTC time greater than duration of the test UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface 		
2	UUT sends a Heartbeat Request message. Verify Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including:	∎ Pass	□ Fail
3	 SAS Test Harness sends a Heartbeat Response message, including the following parameters: cbsdld = C grantId = G transmitExpireTime = T = current UTC time + 200 seconds responseCode = 0 		
4	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.		
5	 Monitor the RF output of the UUT. Verify: UUT shall stop all transmission on RF interface within (transmitExpireTime + 60 seconds), using the transmitExpireTime sent in Step 3. 	∎ Pass	□ Fail



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 Report No.:
 KSCR220500078601

 Page:
 28 of 46

7.4 CBSD Measurement Report

7.4.1 WINNF.FT.D.MES.2

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: DP has successfully completed SAS Discovery and Authentication with SAS Test Harness 		
2	DP sends a Registration Request message for each of two CBSD. This may occur in a separate Request message per CBSD, or together in a single Request message with array of 2. Verify Registration Request message contains all required parameters properly formatted for CBSDi, i={1,2}, and specifically:	∎ Pass	□ Fail
3	If a separate Registration Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each Registration Request message with a separate Registration Response message. If a single Registration Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Registration Response message containing a 2-object array. Parameters for each CBSD within the Registration Response message should be as follows, for CBSDi: • cbsdld = Ci • measReportConfig= "RECEIVED_POWER_WITHOUT_GRANT" • responseCode = 0		_
4	 UUT sends a message: If message is type Spectrum Inquiry Request, go to step 5, or If message is type Grant Request, go to step 7 		
5	 UUT sends message type Spectrum Inquiry Request. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Spectrum Inquiry Request message contains all required parameters properly formatted for CBSDi, i= {1,2}, and specifically: cbsdld = Ci measReport is present, and is a properly formatted rcvdPowerMeasReport. 	∎ Pass	□ Fail
6	If a separate Spectrum Inquiry Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each Spectrum Inquiry Request message with a separate Spectrum Inquiry Response message. If a single Spectrum Inquiry Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Spectrum Inquiry Response message containing a 2-object array. Parameters for each CBSD within the Spectrum Inquiry Response message should be as follows: • cbsdld = Ci • availableChannel is an array of availableChannel objects		



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Page: 29 of 46

	responseCode = 0		
7	UUT sends message type Grant Request message. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify the Grant Request message contains all required parameters properly formatted for CBSDi, i= {1,2}, and specifically:	∎ Pass	□ Fail



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Report No.: KSCR220500078601 Page: 30 of 46

7.4.2 WINNF.FT.C.MES.3

#	Test Execution Steps				
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness UUT has successfully registered with SAS Test Harness, with cbsdld=C and measCapability = "RECEIVED_POWER_WITH_GRANT" 				
2	 UUT sends a Grant Request message. Verify Grant Request message contains all required parameters properly formatted, and specifically: cbsdld = C operationParam is present and format is valid 	∎ Pass	□ Fail		
3	 SAS Test Harness sends a Grant Response message, with the following parameters: cbsdld = C grantId = G = valid grant ID grantExpireTime = UTC time in the future heartbeatInterval = 60 seconds measReportConfig= "RECEIVED_POWER_WITH_GRANT" operationParam is set to valid operating parameters channelType = "GAA" responseCode = 0 				
4	UUT sends a Heartbeat Request message. Verify message contains all required parameters properly formatted, and specifically:	∎ Pass	□ Fail		
5	 If Heartbeat Request message (step 4) contains measReport object, then: verify measReport is properly formatted as object rcvdPowerMeasReport end test, with PASS result else, if Heartbeat Request message (step 4) does not contain measReport object, then: If number of Heartbeat Requests sent by UUT after Step 3 is = 5, then stop test with result of FAIL 	∎ Pass	□ Fail		
6	 SAS Test Harness sends a Heartbeat Response message, containing all required parameters properly formatted, and specifically: cbsdld = C grantId = G transmitExpireTime = current UTC time + 200 seconds responseCode = 0 				
	Go to Step 4, above				



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Report No.: KSCR220500078601 31 of 46 Page:

7.4.3 WINNF.FT.D.MES.5

	Test Execution Steps						
	 Ensure the following conditions are met for test entry: DP has successfully completed SAS Discovery and Authentication with SAS Test Harness DP has successfully registered 2 CBSD with SAS Test Harness, each with cbsdld=Ci, i={1,2} and measCapability = 						
1	 "RECEIVED_POWER_WITH_GRANT" DP has received a valid grant with grantId = Gi, i={1,2} for each CBSD Both CBSD are in Grant State AUTHORIZED and actively transmitting within the bounds of their grants. Grants have heartbeatInterval =60 seconds 		 Fail				
2	 Verify DP sends a Heartbeat Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Heartbeat Request message contains all required parameters properly formatted for each CBSD, specifically, for CBSDi: cbsdld = Ci grantld = Gi operationState = "AUTHORIZED" 	∎ Pass	□ Fail				
3	If a separate Heartbeat Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each Heartbeat Request message with a separate Heartbeat Response message. If a single Heartbeat Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Heartbeat Response message containing a 2-object array. Parameters for each CBSD within the Heartbeat Response message containing all required parameters properly formatted, and specifically: • cbsdld = Ci • grantld = Gi						
4	 measReportConfig= "RECEIVED_POWER_WITH_GRANT" responseCode = 0 Verify DP sends a Heartbeat Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Heartbeat Request message contains all required parameters properly formatted for each CBSD, and specifically, for CBSDi, i = {1,2}: cbsdld = Ci grantld = Gi operationState = "AUTHORIZED" Check whether measReport is present, and if present, ensure it is a properly formatted rcvdPowerMeasReport object, and record its reception for each CBSDi, i = {1,2}. 	∎ Pass	□ Fail				
5	 CBSDI, I = {1,2}. If Heartbeat Request message (step 4) contains measReport object, then: Verify measReport is properly formatted as object rcvdPowerMeasReport record which CBSD have successfully sent a measReport object If all CBSDi, i = {1,2} have successfully sent a measReport object, then 						



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Compliance Certification Services (Kunshan) Inc.



Report No.: KSCR220500078601

Page: 32 of 46

	 end test, with PASS result else, if the number of Heartbeat Requests sent per CBSD is 5 or more, then stop test with result of FAIL 	
6	If a separate Heartbeat Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each Heartbeat Request message with a separate Heartbeat Response message. If a single Heartbeat Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Heartbeat Response message containing a 2-object array. Parameters for each CBSD within the Heartbeat Response message containing all required parameters properly formatted, and specifically: cbsdld = Ci grantId = Gi responseCode = 0 Go to Step 4, above.	



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Report No.: KSCR220500078601 Page: 33 of 46

7.5 CBSD Relinquishment Process

7.5.1 WINNF.FT.D.RLQ.2

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: DP has successfully completed SAS Discovery and Authentication with SAS Test Harness DP has successfully registered 2 CBSD with SAS Test Harness, each with cbsdld=Ci, i={1,2} DP has received a valid grant with grantId = Gi, i={1,2} for each CBSD Both CBSD are in Grant State AUTHORIZED and actively transmitting within the bounds of their grants. 		_
2	Verify DP sends a Relinquishment Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Relinquishment Request message contains all required parameters properly formatted for each CBSD, specifically, for CBSDi:	∎ Pass	□ Fail
3	If a separate Relinquishment Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each request message with a separate response message. If a single Relinquishment Request message was sent by the DP containing a 2- object array (one per CBSD), the SAS Test Harness shall respond with a single Response message containing a 2-object array. Parameters for each CBSD within the Relinquishment Response shall be as follows:		
4	After completion of step 3, SAS Test Harness will not provide any additional positive response (responseCode=0) to further request messages from the UUT.		
5	 Monitor the RF output of each UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall stop RF transmission at any time between triggering the relinquishments and UUT sending the relinquishment requests for each CBSD. 	∎ Pass	□ Fail



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 Report No.:
 KSCR220500078601

 Page:
 34 of 46

7.6 CBSD Deregistration Process

7.6.1 WINNF.FT.D.DRG.2

#	Test Execution Steps	Res	sults			
1	 Ensure the following conditions are met for test entry: Each UUT has successfully registered with SAS Test Harness Each UUT is in the authorized state DP has successfully completed SAS Discovery and Authentication with SAS Test Harness DP has successfully registered 2 CBSD with SAS Test Harness, each with cbsdld=Ci, i={1,2} DP has received a valid grant with grantId = Gi, i={1,2} for each CBSD Both CBSD are in Grant State AUTHORIZED and actively transmitting within the bounds of their grants. 					
2	UUT sends a Relinquishment request and receives Relinquishment response with responseCode=0					
3	 Verify DP sends a Deregistration Request message for each CBSD. This may occur in a separate message per CBSD, or together in a single message with array of 2. Verify Deregistration Request message contains all required parameters properly formatted for each CBSD, specifically, for CBSDi: cbsdld = Ci 	∎ Pass	□ Fail			
4	If a separate Deregistration Request message was sent for each CBSD by the DP, the SAS Test Harness shall respond to each request message with a separate response message. If a single Deregistration Request message was sent by the DP containing a 2-object array (one per CBSD), the SAS Test Harness shall respond with a single Response message containing a 2-object array. Parameters for each CBSD within the Deregistration Response shall be as follows: • cbsdld = Ci • responseCode = 0					
5	After completion of step 4, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.					
6	 Monitor the RF output of each UUT from start of test until 60 seconds after Step 4 is complete. This is the end of the test. Verify: UUT stopped RF transmission at any time between triggering the deregistration and either A OR B occurs: A. UUT sending a Registration Request message, as this is not mandatory B. UUT sending a Deregistration Request message 	∎ Pass	□ Fail			



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Report No.: KSCR220500078601 Page: 35 of 46

7.7 CBSD Security Validation

7.7.1 WINNF.FT.C.SCS.1

#	Test Execution Steps	Res	sults
1	 UUT shall start CBSD-SAS communication with the security procedure The UUT shall establish a TLS handshake with the SAS Test Harness using configured certificate. Configure the SAS Test Harness to accept the security procedure and establish the connection 	∎ Pass	□ Fail
2	 Make sure that Mutual authentication happens between UUT and the SAS Test Harness. Make sure that UUT uses TLS v1.2 Make sure that cipher suites from one of the following is selected, TLS_RSA_WITH_AES_128_GCM_SHA256 TLS_RSA_WITH_AES_256_GCM_SHA384 TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384 TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA384 TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA384 TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA384 	■ Pass	□ Fail
3	 A successful registration is accomplished using one of the test cases described in section 6.1.4.1, depending on CBSD capability. UUT sends a registration request to the SAS Test Harness and the SAS Test Harness sends a Registration Response with responseCode = 0 and cbsdld. 	∎ Pass	□ Fail
4	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF 	∎ Pass	□ Fail

7.7.2 WINNF.FT.C.SCS.2

#	Test Execution Steps	Res	sults	
1	UUT shall start CBSD-SAS communication with the security procedures	∎ Pass	□ Fail	
2	 Make sure that UUT uses TLS v1.2 for security establishment. Make sure UUT selects the correct cipher suite. UUT shall use CRL or OCSP to verify the validity of the server certificate. Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness. 	Pass	Fail	
3	• UUT may retry for the security procedure which shall fail.	∎ Pass	□ Fail	
4	 SAS Test-Harness shall not receive any Registration request or any application data. 			
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF	∎ Pass	□ Fail	



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Report No.: KSCR220500078601 Page: 36 of 46

7.7.3 WINNF.FT.C.SCS.3

#	Test Execution Steps	Res	sults
1	 UUT shall start CBSD-SAS communication with the security procedures 		
		Pass	Fail
2	 Make sure that UUT uses TLS v1.2 for security establishment. Make sure UUT selects the correct cipher suite. UUT shall use CRL or OCSP to verify the validity of the server certificate. Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness. 	∎ Pass	□ Fail
3	• UUT may retry for the security procedure which shall fail.	∎ Pass	□ Fail
4	 SAS Test-Harness shall not receive any Registration request or any application data. 		
5	 Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF 	∎ Pass	□ Fail

7.7.4 WINNF.FT.C.SCS.4

#	Test Execution Steps	Res	sults
1	 UUT shall start CBSD-SAS communication with the security procedures 		
		Pass	Fail
2	 Make sure that UUT uses TLS v1.2 for security establishment. Make sure UUT selects the correct cipher suite. UUT shall use CRL or OCSP to verify the validity of the server certificate Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness. 	∎ Pass	□ Fail
3	• UUT may retry for the security procedure which shall fail.	∎ Pass	□ Fail
4	 SAS Test-Harness shall not receive any Registration request or any application data. 		
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: • UUT shall not transmit RF	∎ Pass	□ Fail



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Report No.: KSCR220500078601 Page: 37 of 46

7.7.5 WINNF.FT.C.SCS.5

#	Test Execution Steps	Res	sults
	 UUT shall start CBSD-SAS communication with the security procedures 		
1		Pass	Fail
2	 Make sure that UUT uses TLS v1.2 for security establishment. Make sure UUT selects the correct cipher suite. UUT shall use CRL or OCSP to verify the validity of the server certificate Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness. 	∎ Pass	□ Fail
3	• UUT may retry for the security procedure which shall fail.	∎ Pass	□ Fail
4	 SAS Test-Harness shall not receive any Registration request or any application data. 		
5	 Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF 	∎ Pass	□ Fail



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Report No.: KSCR220500078601 Page: 38 of 46

7.8 CBSD RF Power Measurement

7.8.1 WINNF.PT.C.HBT.1

#	Test Execution Steps	Res	sults
1	 Ensure the following conditions are met for test entry: UUT has successfully completed SAS Discovery and Authentication with the SAS Test Harness UUT has registered with the SAS, with CBSD ID = C UUT has a single valid grant G with parameters {lowFrequency = FL, highFrequency = FH, maxEirp = Pi}, with grant in AUTHORIZED state, and grantExpireTime set to a value far past the duration of this test case Note: in order for the UUT to request a grant with the parameters {lowFrequency, highFrequency, maxEirp), the SAS Test Harness may need to provide appropriate guidance in the availableChannel object of the spectrumInquiry response message, and the operationParam object of the grant response message. Alternately, the UUT vendor may provide the ability to set those parameters on the UUT so that the UUT will request a grant with those parameters 		
2	 UUT and SAS Test Harness perform a series of Heartbeat Request/Response cycles, which continues until the other test steps are complete. Messaging for each cycle is as follows: UUT sends Heartbeat Request, including: cbsdld = C grantld = G SAS Test Harness responds with Heartbeat Response, including: o cbsdld = C grantld = G transmitExpireTime = current UTC time + 200 seconds 		
3	 responseCode = 0 Tester performs power measurement on RF interface(s) of UUT, and verifies it complies with the maxEirp setting, Pi. The RF measurement method is out of scope of this document, but may include additional configuration of the UUT, as required, to fulfill the requirements of the power measurement method. Note: it may be required for the vendor to provide a method or configuration to bring the UUT to a mode which is required by the measurement methodology. Any such mode is vendor-specific and depends upon UUT behavior and the measurement methodology. 	∎ Pass	□ Fail



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Report No.: KSCR220500078601 Page: 39 of 46

RF measurement plot for Test Case:

Tester performs power measurement on RF interface(s) of UUT, and verifies it complies with the maxEirp setting, Pi. The RF measurement method is out of scope of this document, but may include additional configuration of the UUT, as required, to fulfill the requirements of the power measurement method.

Freq. (MHz)	Conducted PSD (dBm/MHz)	Antenna Gain (dBi)	Loss (dB)	Array Gain (dB)	EIRP PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
3555	10.060	17.0	3.5	3.01	33.570	34	Pass
3555	-8.622	17.0	3.5	3.01	14.888	17	Pass
Note:		•	•				

Note:

1. Array Gain=10log(n), n is the antenna number, for this test the n=2

- 2. EIRP PSD= Conducted PSD+ Antenna Gain+ Array Gain
- 3. Loss includes cable loss and loss of attenuator



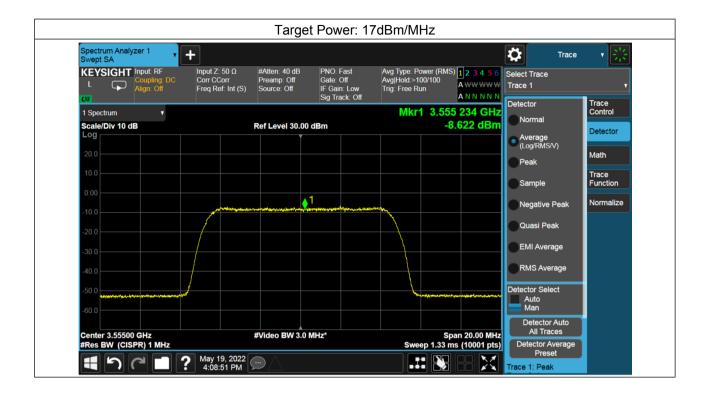


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Report No.: KSCR220500078601 Page: 40 of 46





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Report No.: KSCR220500078601 Page: 41 of 46

8 Test Data Log

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

8.1 WINNF.FT.C.SCS.1

				X 🗔 🔹
Time	Source	Destination	Protocol	Length Info
122 93.052084	192.168.24.151	192.168.24.103	TLSv1.2	169 Client Hello
123 93.052576	192.168.24.103	192.168.24.151	TLSv1.2	2955 Server Hello, Certificate, Certificate Request, Server Hello Done
126 93.113938	192.168.24.151	192.168.24.103	TCP	1514 52098 → 5000 [ACK] Seq=116 Ack=2902 Win=35072 Len=1460 [TCP segment of
129 93.114338	192.168.24.151	192.168.24.103	TLSv1.2	119 Certificate, Client Key Exchange
131 93.286227	192.168.24.151	192.168.24.103	TLSv1.2	323 Certificate Verify
132 93.286227	192.168.24.151	192.168.24.103	TLSv1.2	60 Change Cipher Spec
133 93.286227	192.168.24.151	192.168.24.103	TLSv1.2	99 Encrypted Handshake Message
135 93.296050	192.168.24.103	192.168.24.151	TLSv1.2	105 Change Cipher Spec. Encrypted Handshake Message
Content Type: Version: TLS Length: 81 ~ Handshake Pro Handshake T	ayer: Handshake Prot Handshake (22) 1.2 (0x0303) tocol: Server Hello ype: Server Hello (2			
Length: 77				
	S 1.2 (0x0303)	reheboogtoodhooforzt (617-07db0200	220-0-dF4
		290003501360063102/11	01/69/009208	550C0du54
> Random: 1c6	Lengen. Jz	421460099295000097612	1ad00138f5b	794396964b195
> Random: 1c6 Session ID	1404bbc1d8c60a01643			
Random: 1c6 Session ID Session ID:	1404bbc1d8c60a01643 e: TLS RSA WITH AES			
> Random: 1c6 Session ID Session ID: Cipher Suit	e: TLS_RSA_WITH_AES_	128_GCM_SHA256 (0x009		
> Random: 1c6 Session ID Session ID: Cipher Suit	e: TLS_RSA_WITH_AES_ Method: null (0)			
 Random: 1c6 Session ID Session ID: Cipher Suit Compression Extensions 	e: TLS_RSA_WITH_AES_ Method: null (0)	128_GCM_SHA256 (0x009		
 Random: 1c6 Session ID Session ID: Cipher Suit Compression Extensions Extension: 	e: TLS_RSA_WITH_AES_ Method: null (0) Length: 5	128_GCM_SHA256 (0x009 len=1)		



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Report No.: KSCR220500078601 42 of 46

Page:

8.2 WINNF.FT.C.SCS.2

	8 0 0 0 0 0 0 0 0 0				
	3 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				\times \rightarrow
Time	Source	Destination		Length Info	
11 0.397647 13 0.430721	192.168.24.151 192.168.24.103	192.168.24.103 192.168.24.151	HTTP	216 GET /crlserver.crl HTTP/1.1 1086 HTTP/1.1 200 OK	
chernet II, Src: L Iternet Protocol V	annerEl_87:88:98 (00 /ersion 4, Src: 192.1		t: RealtekS_ 168.24.103	on interface \Device\NPF_{80251832-D67B-4D3A-8151-977586750910 36:01:4e (00:e0:4c:36:01:4e) ck: 1. len: 162	1}, id 0
/pertext Transfer GET /crlserver.cu	Protocol rl HTTP/1.1\r\n	,	.,,.		
	-Alive\r\n he-HttpClient/4.5.6	(Java/1.8.0_232)\r\n			
\r\n	<pre>gzip,deflate\r\n I: http://192.168.24</pre>	.103/crlserver.crll			
[HTTP request 1/: [Response in fram	1]	.105/(1136) ver.(11]			
	ccol: Protocol			│ /今祖: 45 • 己星示: 2 (4.46)	- O
載む に 大明		统计(5) 电话(2) 无线(W)	工具(I) 帮助(L		- 0
載む に 大明	跳转(G) 捕获(C) 分析(A))	- 0
	路转(⑤) / 捕获(℃) 分析(Δ) ② ♀ ⇔ ⇔ 肇 爭 <u>▲</u> Source 192.168.24.151	Destination 192.168.24.103	Protocol TLSv1.2) Legth Info 207 Client Hello	- 0
破以大用 日 編編(E) 税図(V) 5 【 2 ⑧ 二 〇 次 3 Time	離検(G) 挿枝(C) 分析(A) ② 9 ※ ※ 警 至 <u>ま</u> Source	Destination	Protocol TLSv1.2) Length Info	- 0
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RF ULH# つ 編明(2) 視測(2) 視測(2) 1 (2 ④ 一 ① 文 名 17 25.052641 18 25.052891 21 25.195397 ame 21: 61 bytes hernet II, Src: L ternet Protocol V ansport Layer Sec TLSV1.2 Record L Content Type: Version: TLS 1	8株(G) 株苡(G) 分析(A) 「ママン・「ママン・「ママン・「ママン・「ママン・「ママン・「ママン・「ママン	Bestination 192.168.24.103 192.168.24.151 192.168.24.151 192.168.24.103 61 bytes captured (4 190:087:88:98), DS 68.24.151, DSt: 192.	Protecol TLSv1.2 TLSv1.2 TLSv1.2 88 bits) on t: Realtek5 168.24.103 000, Seq: 15	<pre>ltegth Info 207 Client Hello 3091 Server Hello, Certificate, Certificate Request, Server Hel 61 Alert (Level: Fatal, Description: Certificate Revoked) interface \Device\NPF_(B0251832-D67B-4D3A-8151-977586750910}, in 36:01:4e (00:e0:4c:36:01:4e) 4, Ack: 3038, Len: 7</pre>	- ø
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Page: 43 of 46

8.3 WINNF.FT.C.SCS.3

s							$X \Rightarrow$
	Time	Source	Destination	Protocol	Length Info		
	31 19.539211	192.168.24.151	192.168.24.103	TLSv1.2			
	32 19.539414	192.168.24.103	192.168.24.151	TLSv1.2		Certificate, Certificate Request,	Server Hello Done
	35 19.543406	192.168.24.151	192.168.24.103	TLSv1.2		Fatal, Description: Certificate E	
						IPF {B0251832-D678-4D3A-8151-977586	
	sport Layer Se	curity .ayer: Alert (Level:	Fatal Description				
	Content Type: Version: TLS Length: 2 Alert Message	Alert (21) 1.2 (0x0303)	Fatai, Description.	Cert1+1cate	Expired)		
	Content Type: Version: TLS Length: 2 Alert Message Level: Fata	Alert (21) 1.2 (0x0303)		Certificate	Expired)		
	Content Type: Version: TLS Length: 2 Alert Message Level: Fata	Alert (21) 1.2 (0x0303) 01 (2)		Certificate	Expired)		
	Content Type: Version: TLS Length: 2 Alert Message Level: Fata	Alert (21) 1.2 (0x0303) 01 (2)		Certificate	Expired)		
	Content Type: Version: TLS Length: 2 Alert Message Level: Fata	Alert (21) 1.2 (0x0303) 01 (2)		Certificate	Expired)		



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Page: 44 of 46

8.4 WINNF.FT.C.SCS.4

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Time 7 3.457771	Source 192.168.24.151	Destination 192.168.24.103		Length Info 169 Client Hello	
8 3.458074	192.168.24.103	192.168.24.151		3091 Server Hello, Certificate, Certificate Request, Server Hello D	one
11 3.463614	192.168.24.151	192.168.24.103	TLSv1.2	61 Alert (Level: Fatal, Description: Certificate Unknown)	
ernet II, Sr ernet Protoco insmission Co insport Layer TLSv1.2 Recor Content Typ	c: LannerEl_87:88:98 (00 ol Version 4, Src: 192.3 ntrol Protocol, Src Port	0:90:0b:87:88:98), Ds 168.24.151, Dst: 192. t: 40524, Dst Port: 5	t: RealtekS 168.24.103 000, Seq: 11		
Length: 2 ~ Alert Mess Level: F	age	n (46)			
f Transport Layer Se	curity: Protocol			分組: 90 • 己显示: 3 (3.3%)	158
					_
)编辑(E)视图(2) 跳转(5) 捕获(2) 分析(6) ○ ● ○ ● ● ● ● ● ● ● ● ●		工具(I) 帮助(Ð	
)编辑(E)视图() 2 ⑧ 📄 🗎	\$ \$ \$ \$ \$ \$				
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Page: 45 of 46

8.5 WINNF.FT.C.SCS.5

Time Source Destination Protocol Length Info 12 7.031932 192.168.24.151 192.168.24.193 TLSV1.2 207 Client Hello 13 7.03207 192.168.24.151 192.168.24.193 TLSV1.2 295 Server Hello, Certificate, Certificate Request, Server Hello Done 16 7.038208 192.168.24.151 192.168.24.193 TLSV1.2 61 Alert (Level: Fatal, Description: Decrypt Error)	Time Searce Destination Protoci Length Info 12 7.031932 192.168.24.151 192.168.24.131 1192.168.24.131 TLSV1.2 207 Client Hello 13 7.032076 192.168.24.151 192.168.24.131 192.168.24.131 TLSV1.2 295 Server Hello, Certificate, Certificate Request, Server Hello Done 16 7.038208 192.168.24.151 192.168.24.103 TLSV1.2 61 Alert (Level: Fatal, Description: Decrypt Error)						$\times \rightarrow$
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	Description: Decrypt Error (51)	Control Protocol, Src Por rer Security cord Layer: Alert (Level: Type: Alert (21) TLS 1.2 (0x0303) 2 ssage	t: 37529, Dst Port: 5	000, Seq: 154, Ack: 2902, 1	Len: 7		
			32 192.168.24.151 76 192.168.24.103 08 192.168.24.103 bytes on wire (488 bits), Src: LannerEl_87:88:98 (6 cocol Version 4, Src: 192. Control Protocol, Src Por rer Security cord Layer: Alert (Level: Type: Alert (21) TLS 1.2 (0x0303) 2 ssage : Fatal (2)	32 192.168.24.151 192.168.24.103 76 192.168.24.103 192.168.24.151 98 192.168.24.151 192.168.24.151 98 192.168.24.151 192.168.24.163 bytes on wire (488 bits), 61 bytes captured (4 Src: LannerEl_87:88:98 (00:90:0b:87:88:98), 05 socol Version 4, Src: 192.168.24.151, Dst: 192. Control Protocol, Src Port: 37529, Dst Port: 5 rer Security cord Layer: Alert (Level: Fatal, Description: D Type: Alert (21) TLS 1.2 (0x0303) 2 ssage : Fatal (2)	32 192.168.24.151 192.168.24.103 TLSv1.2 207 Client He 76 192.168.24.103 192.168.24.151 TLSv1.2 2955 Server He 08 192.168.24.151 192.168.24.163 TLSv1.2 2955 Server He 08 192.168.24.151 192.168.24.103 TLSv1.2 295 Server He 08 192.168.24.151 192.168.24.103 TLSv1.2 216 Let (Let (Let (Let (Let (Let (Let (Let	32 192.168.24.151 192.168.24.103 TLSv1.2 207 Client Hello 76 192.168.24.103 192.168.24.151 TLSv1.2 295 Server Hello, Certificate, Certif 08 192.168.24.151 192.168.24.103 TLSv1.2 61 Alert (Level: Fatal, Description: bytes on wire (488 bits), 61 bytes captured (488 bits) on interface \Device\NPF_{B0251832-D678-40 Src: LannerEl_87:88:98 (00:90:0b:87:88:98), Dst: Realteks_36:01:4e (00:e0:4c:36:01:4e) cool Version 4, Src: 192.168.24.151, Dst: 192.168.24.103 Control Protocol, Src Port: 3729, Dst Port: 5000, Seq: 154, Ack: 2902, Len: 7 rer Security cord Layer: Alert (Level: Fatal, Description: Decrypt Error) Type: Alert (21) TLS 1.2 (0x0303) 2 ssage : Fatal (2)	32 192.168.24.151 192.168.24.103 TLSv1.2 207 Client Hello 76 192.168.24.103 192.168.24.151 TLSv1.2 295 Server Hello, Certificate, Certificate Request, Server Hello 88 192.168.24.151 192.168.24.163 TLSv1.2 295 Server Hello, Certificate, Certificate Request, Server Hello 98 192.168.24.151 192.168.24.103 TLSv1.2 61 Alert (Level: Fatal, Description: Decrypt Error) bytes on wire (488 bits), 61 bytes captured (488 bits) on interface \Device\NPF_{80251832-D678-4D3A-8151-977586750910}, id 0 Src: LannerEl_87:88:98 (00:90:0b:87:88:98), Dst: RealtekS_36:01:4e (00:e0:4c:36:01:4e) 00:e0:24:36:01:4e) cool Version 4, Src: 192.168.24.151, Dst: 192.168.24.103 Control Protocol, Src Port: 37529, Dst Port: 5000, Seq: 154, Ack: 2902, Len: 7 rev Security cord Layer: Alert (Level: Fatal, Description: Decrypt Error) Type: Alert (21) TLS 1.2 (0x0303) 2 ssage ssage : Fatal (2)



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Report No.: KSCR220500078601 Page: 46 of 46

9 Photographs

9.1 EUT Constructional Details (EUT Photos) Please Refer to Integral and internal photos for details.

- End of the Report -



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