Test Report

As per

FCC Part 96 SAS requirements (CBRS Test Plan)



Add value. **Inspire trust.**

on the

Ericsson Remote Radio Unit LTE KRC 161 711/1 Radio 2208 B48 (3550-3700MHz)

Issued by: TÜV SÜD Canada Inc. 1280 Teron Rd Ottawa, ON K2K 2C1 Canada

Testing produced for

Ericcson Canada

See Appendix A for full client & EUT details.

Scott Drysdale. Test Personnel

240H) Drysdale Ar --

Glen WestWell **Report Reviewer**



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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

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Authorization transmit after it receives authorization from a SAS	29 Id
Confirm that the device transmits at a power level less than or equal to the maximum power	
level approved by the SAS	
WINNF Security Test Case Analysis 5 WINNF.FT.C.SCS.1 5 WINNF.FT.C.SCS.2 5 WINNF.FT.C.SCS.3 6 WINNF.FT.C.SCS.4 6 WINNF.FT.C.SCS.5 7	52 56 52 57
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Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
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Report Scope

This report addresses the EMC verification testing and test results of the LTE KRC 161 711/1 Radio 2208 B48(3550-3700 MHz) herein referred to as EUT (Equipment Under Test). The EUT was tested for compliance against the following standards:

FCC Part 96 SAS requirements (CBRS Test Plan)

. Test procedures, results, justifications, and engineering considerations, if any, follow later in this report.

For a more detailed list of the standards and the revision used, see the "Applicable Standards, Specifications and Methods" section of this report.

This report does not imply product endorsement by any government, accreditation agency, or TÜV SÜD Canada Inc.

Opinions or interpretations expressed in this report, if any, are outside the scope of TÜV SÜD Canada Inc accreditations. Any opinions expressed do not necessarily reflect the opinions of TÜV SÜD Canada Inc, unless otherwise stated.

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Summary

The results contained in this report relate only to the item(s) tested.

Equipment Under Test (EUT)	LTE KRC 161 711/1 Radio 2208 B48(3550-3700 MHz)	
EUT passed all tests performed	Yes	
Tests conducted by	Scott Drysdale	

For testing dates, see 'Testing Environmental Conditions and Dates'.

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Test Results Summary

Section	CBS	D	Test Case ID	Test Case Title	RF Measurement	Pass / Fail
6.1.4.1.	D X	Р	WINNF.FT.C.R	Multi Stor	Requirement Monitor for 60	
1			EG.1	Multi-Step registration	seconds after REG message sent. No transmission during test.	N/A
6.1.4.1. 2		X	WINNF.FT.D.R EG.2	Domain Proxy Multi-Step registration	Monitor for 60 seconds after REG message sent. No transmission during test.	Р
6.1.4.1. 3	X		WINNF.FT.C.R EG.3	Single-Step registration for Category A CBSD	Monitor for 60 seconds after REG message sent. No transmission during test.	N/A
6.1.4.1. 4		X	WINNF.FT.D.R EG.4	Domain Proxy Single-Step registration for Cat A CBSD (Note: Mandatory for without CPI, if EUT will always have signed CPI – asked for email waiver)	Monitor for 60 seconds after REG message sent. No transmission during test.	N/A
6.1.4.1. 5	Х		WINNF.FT.C.R EG.5	Single-Step registration for CBSD with CPI signed data	Monitor for 60 seconds after REG message sent. No transmission during test.	N/A
6.1.4.1. 6		X	WINNF.FT.D.R EG.6	Domain Proxy Single-Step registration for CBSD with CPI signed data	Monitor for 60 seconds after REG message sent. No transmission during test.	Р
6.1.4.1. 7	X	X	WINNF.FT.C.R EG.7	Registration due to change of an installation parameter	Test waits until transmission starts, then trigger an	N/A

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					installationParam change.	
					Record time at which	
					transmission stops. Time	
					must be within 60	
					seconds of the	
					installationPa ram change	
					taking effect.	
6.1.4.2. 1	Х		WINNF.FT.C.R EG.8	Missing Required parameters	Monitor for 60 seconds after REG	N/A
				(responseCode 102)	message sent. No transmission during test.	
6.1.4.2.		X	WINNF.FT.D.R EG.9	Domain Proxy	Monitor for 60 seconds after REG	Р
2			EG.9	Missing Required parameters	message sent. No	
				(responseCode 102)	transmission during test.	
6.1.4.2. 3	Х		WINNF.FT.C.R EG.10	Pending registration (responseCode 200)	Monitor for 60 seconds after REG	N/A
5			20.10	(responsecode 200)	message sent. No transmission during	
					test.	
6.1.4.2. 4		Х	WINNF.FT.D.R EG.11	Domain Proxy Pending registration	Monitor for 60 seconds after REG	Р
+			20.11	(responseCode 200)	message sent. No	
					transmission during test.	
6.1.4.2. 5	Х		WINNF.FT.C.R EG.12	Invalid parameter (responseCode 103)	Monitor for 60 seconds after REG	N/A
			20.12		message sent. No transmission during	
					test.	
6.1.4.2. 6		Х	WINNF.FT.D.R EG.13	Domain Proxy Invalid parameters	Monitor for 60 seconds after REG	Р
			20.15	(responseCode 103)	message sent. No	
					transmission during test.	
6.1.4.2. 7	Х		WINNF.FT.C.R EG.14	Blacklisted CBSD (responseCode 101)	Monitor for 60 seconds after REG	N/A
<i>'</i>					message sent. No	

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					transmission during	
					test.	
6.1.4.2. 8		X	WINNF.FT.D.R EG.15	Domain Proxy Blacklisted CBSD (responseCode 101)	Monitor for 60 seconds after REG message sent. No transmission during test.	Ρ
6.1.4.2. 9	X		WINNF.FT.C.R EG.16	Unsupported SAS protocol version (responseCode 100)	Monitor for 60 seconds after REG message sent. No transmission during test.	N/A
6.1.4.2. 10		X	WINNF.FT.D.R EG.17	Domain Proxy Unsupported SAS protocol version responseCode 100)	Monitor for 60 seconds after REG message sent. No transmission during test.	Ρ
6.1.4.2. 11	X		WINNF.FT.C.R EG.18	Group Error (responseCode 201)	Monitor for 60 seconds after REG message sent. No transmission during test.	N/A
6.1.4.2. 12		X	WINNF.FT.D.R EG.19	Domain Proxy Group Error (responseCode 201)	Monitor for 60 seconds after REG message sent. No transmission during test.	Ρ
6.1.4.3. 1	X	Х	WINNF.FT.C.R EG.20	Category A CBSD location update		N/A
6.3.4.2. 1	X	X	WINNF.FT.C.G RA.1 (TYPO FIXED D TO C)	Unsuccessful Grant responseCode=400 (INTERFERENCE)	Monitor for 60 seconds after REG message sent. No transmission during test.	Ρ
6.3.4.2. 2	X	X	WINNF.FT.C.G RA.2	Unsuccessful Grant responseCode=401 (GRANT_CONFLIC T)	Monitor for 60 seconds after REG message sent. No transmission during test.	Ρ
6.4.4.1. 1	X		WINNF.FT.C.H BT.1	Heartbeat Success Case (first Heartbeat Response)	Monitor RF from start of test. Ensure that: • Transmission does not start until time of first	N/A

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					 heartbeat response or after. After transmission starts, meas ure that transmission is within the granted channel (frequencyLo w, freque ncyHigh) 	
6.4.4.1. 2		X	WINNF.FT.D.H BT.2	Domain Proxy Heartbeat Success Case (first Heartbeat Response)	Monitor RF from start of test. Ensure that: Transmission does not start until time of first heartbeat response or after. After transmission starts, meas ure that transmission is within the granted channel (frequencyLo w, freque ncyHigh)	Ρ
6.4.4.2.	X	X	WINNF.FT.C.H BT.3	Heartbeat responseCode=105 (DEREGISTER)	Monitor RF transmission. Ensur e that: • CBSD stops transmission within 60 seconds of the heartbeatRe sponse which contains	Ρ

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					responseCod	
					e = 105	
6.4.4.2. 2	X		WINNF.FT.C.H BT.4	Heartbeat responseCode=500 (TERMINATED_G RANT)		N/A
6.4.4.2. 3	X	X	WINNF.FT.C.H BT.5	Heartbeat responseCode=501 (SUSPENDED_GR ANT) in First Heartbeat Response	Monitor RF transmission from start of test. Ensure there is no transmission during the test	р
6.4.4.2.	X	X	WINNF.FT.C.H BT.6	Heartbeat responseCode=501 (SUSPENDED_GR ANT) in Subsequent Heartbeat Response	Monitor RF transmission. Ensur e: • CBSD stops transmission within 60 seconds of heartbeatRe sponse which contains responseCod e=501	р
6.4.4.2. 5	X	X	WINNF.FT.C.H BT.7	Heartbeat responseCode=502 (UNSYNC_OP_PA RAM)	Monitor RF transmission. Ensur e: • CBSD stops transmission within 60 seconds of heartbeatRe sponse which contains responseCod e=502	ρ
6.4.4.2. 6		X	WINNF.FT.D.H BT.8	Domain Proxy Heartbeat responseCode=500 (TEMINATED_GR ANT)	Monitor RF transmission. CBSD s will have different behavior: • CBSD1: will continue to transmit to end of test	Ρ

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					 (this is not a pass/fail criteria, but check) CBSD2: must stop transmission within 60 seconds of being sent heartbeatRe sponse with responseCod e = 500 	
6.4.4.3. 1	Х	Х	WINNF.FT.C.H BT.9	Heartbeat Response Absent (First Heartbeat)	Monitor RF from start of test to 60 seconds after last heartbeatResponse message was sent. CBSD should not transmit at any time during test	Ρ
6.4.4.3.	x	X	WINNF.FT.C.H BT.10	Heartbeat Response Absent (Subsequent Heartbeat)	Monitor RF transmission. Verify: • CBSD must stop transmission within transmitExpir eTime+60 seconds, where transmitExpir eTime is from last successful heartbeatRe sponse message	Ρ
6.5.4.2. 1	Х		WINNF.FT.C.M ES.1	Registration Response contains measReportConfig	No RF monitoring	N/A
6.5.4.2. 2		X	WINNF.FT.D.M ES.2	Domain Proxy Registration Response contains measReportConfig	No RF monitoring	Р

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6.5.4.2. 3	X	X	WINNF.FT.C.M ES.3	Grant Response contains measReportConfig	No RF monitoring	Р
6.5.4.2. 4	Х		WINNF.FT.C.M ES.4	Heartbeat Response contains measReportConfig	No RF monitoring	N/A
6.5.4.2. 5		X	WINNF.FT.D.M ES.5	Domain Proxy Heartbeat Response contains measReportConfig	No RF monitoring	Р
6.6.4.1.	X		WINNF.FT.C.R LQ.1	Successful Relinquishment	Monitor RF transmission. Ensur e: • CBSD stops transmission at any time prior to sending the relinquishme ntRequest message.	N/A
6.6.4.1. 2		X	WINNF.FT.D.R LQ.2	Domain Proxy Successful Relinquishment	Monitor RF transmission. Ensure : • CBSD stops transmission at any time prior to sending the relinquishmentReque st message.	Р
6.7.4.1. 1	X		WINNF.FT.C.D RG.1	Successful Deregistration	Monitor RF transmission. Ensur e: • CBSD stops transmission at any time prior to sending the relinquishme ntRequest message or deregistrat ionRequest message (whichever is sent first)	N/A

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6.7.4.1.	1	V	WINNF.FT.D.D	Domain Drowy	Monitor RF	
		Х		Domain Proxy		р
2			RG.2	Successful	transmission. Ensure	Р
				Deregistration		
					CBSD stops	
					transmission at any	
					time prior to sending the	
					relinquishmentReque	
					st message or	
					deregistrationReques	
					t message	
					(whichever is sent	
					first)	
6.8.4.1.	Х	Х	WINNF.FT.C.SC	Successful TLS	No RF transmission	
1			S.1	connection between	during test	Р
				UUT and SAS Test	Check the tcpdump	
				Harness	for the TLS	
					information	
6.8.4.2.	Х	Х	WINNF.FT.C.SC	TLS failure due to	No RF transmission	
1			S.2	revoked certificate	during test	Р
					Check the tcpdump	
					for the TLS	
					information	
6.8.4.2.	Х	Х	WINNF.FT.C.SC	TLS failure due to	No RF transmission	
2			S.3	expired server	during test	Р
				certificate	Check the tcpdump	
					for the TLS	
					information	
6.8.4.2.	Х	Х	WINNF.FT.C.SC	TLS failure when	No RF transmission	
3			S.4	SAS Test Harness	during test	Р
				certificate is issue by	Check the tcpdump	
				unknown CA	for the TLS	
					information	
6.8.4.2.	Х	Х	WINNF.FT.C.SC	TLS failure when	No RF transmission	
4			S.5	certificate at the SAS	during test	Р
				Test Harness is	Check the tcpdump	
				corrupted	for the TLS	
				_	information	
7.1.4.1.	Х	Х	WINNF.PT.C.H	UUT RF Transmit	Power Spectral	
1			BT	Power Measurement	Density test case.	Р
					Assume we use 1	
					carrier bandwidth	

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	(say, 5 or 10 MHz),
	one frequency (say
	middle channel in
	band) for
	test. Measure at max
	transmit power, and
	reduce in steps of 3
	dB to minimum
	declared transmit
	power.

If the product as tested complies with the specification, the EUT is deemed to comply with the standard and is deemed a 'PASS' or 'P' grade. If not 'FAIL' grade is issued. Where 'N/A' is stated this means the test case is not applicable, and see Notes, Justifications or Deviations Section for details.

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Notes, Justifications, or Deviations

The following notes, justifications for tests not performed or deviations from the above listed specifications apply:

A later revision of the standard may have been substituted in place of the previous dated referenced revision. The year of the specification used is listed under applicable standards. Using the later revision accomplishes the goal of ensuring compliance to the intent of the previous specification, while allowing the laboratory to incorporate the extensions and clarifications made available by a later revision.

For the N/A test cases, the following justifications apply:

- a. EUT is a CBSD with Domain Proxy
- b. EUT supports the following Conditional functionality from WINNF-TS-0122-V1.0.0, Table 6-2:
 - i. C3 Single step registration containing CPI-signed data in the registration message (WINNF.FT.D.REG.6)
 - ii. C4 RECEIVED_POWER_WITHOUT_GRANT measurement report (WINNF.FT.D.MES.2)
 - iii. C5 RECEIVED_POWER_WITH_GRANT measurement report (WINNF.FT.D.MES.3, WINNF.FT.D.MES.5)
- c. The only optional test case performed was WINNF.FT.C.HBT.11
- d. The device does not use single-step registration (as defined in condition C2 in WINNF-TS-0122-V1.0.0, Table 6-2), therefore test cases 6.1.4.1.4, and 6.1.4.3.1 are not applicable as per WINNF-TS-0122-V1.0.0, Table 6-3 and therefore not required or performed.

Note, where graph sweeps are incomplete, this was used to set the time stamp of when the events occurred. This can be accomplished by determining the time at which the graph was captured and subtracting the remaining time. For example if there was a 30 second sweep, and 9 out of 10 is complete, that means the end occurred at the 27 second market. If the time on the graph was 12:03:35, this means the graph started at 12:03:08. This allows us to co-ordinate graph with UTC in the logs.

Logs are kept on file.

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Applicable Standards, Specifications and Methods

ANSI C63.4:2014	Methods of Measurement of Radio-Noise Emissions from Low- Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
CFR47 FCC Part 96	Code of Federal Regulations – Citizens Broadband Radio Service
	Conformance and Performance Test Technical Specification; CBSD/DP as Unit Under Test (UUT) Working Document
ISO/IEC 17025:2005	General requirements for the competence of testing and calibration laboratories

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Document Revision Status

Revision 000: Dec 16, 2019

First Revision

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Definitions and Acronyms

The following definitions and acronyms are applicable in this report. See also ANSI C63.14.

AE – Auxiliary Equipment. A digital accessory that feeds data into or receives data from another device (host) that in turn, controls its operation.

AM – Amplitude Modulation

Class A device – A device that is marketed for use in a commercial, industrial or business environment. A 'Class A' device should not be marketed for use by the general public and the instructions for use accompanying the product shall contain the following text:

Caution: This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.

Class B device – A device that is marketed for use in a residential environment and may also be used in a commercial, business or industrial environments.

EMC – Electro-Magnetic Compatibility. The ability of an equipment or system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment.

EMI – Electro-Magnetic Immunity. The ability to maintain a specified performance when the equipment is subjected to disturbance (unwanted) signals of specified levels.

Enclosure Port – Physical boundary of equipment through which electromagnetic fields may radiate or impinge.

EUT – Equipment Under Test. A device or system being evaluated for compliance that is representative of a product to be marketed.

LISN – Line Impedance Stabilization Network

- NCR No Calibration Required
- NSA Normalized Site Attenuation

RF – Radio Frequency

EMC Test Plan – An EMC test plan established prior to testing. See 'Appendix A – EUT & Client Provided Details'.

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Testing Facility

Testing for EMC on the EUT was carried out at customer location as described in Appendix A.

Calibrations and Accreditations

TÜV SÜD Canada Inc is accredited to ISO/IEC 17025 by A2LA with Testing Certificate #2955.19. The laboratory's current scope of accreditation listing can be found as listed on the A2LA website. All measuring equipment is calibrated on an annual or bi-annual basis as listed for each respective test.

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Testing Environmental Conditions and Dates

Following environmental conditions were recorded in the facility during time of testing

Date	Test	Initials	Temperature (ºC)	Humidity (%)	Pressure (kPa)
Nov 22-23 2019	All	SD	20-23	40-55	96.106

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Detailed Test Results Section

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Authorization transmit after it receives authorization from a SAS.

Section	DP	Test Case ID	Test Case Title	Pass / Fail
6.1.4.1.2	X	WINNF.FT.D.REG.2	Domain Proxy Multi-Step registration	Р
Agilent Spectrum		wept SA		
× 50 s Span 100.00	0000 MI		Avg Type: Log-Pwr TRACE 123456	Trace/Det
		ut: RF PN0: Fast Trig: Free Run IFGain:Low #Atten: 10 dB	Avg Hold≫100/100 TYPE MWWWW DET P NNNN Mkr1 3.560 5 GHz -68.413 dBm	Select Trace
-30.0				Clear Write
50.0				Trace Average
60.0	ed Adaman, and	nnenmenhernnessenserheten harde	นะสารสารแรงสารแรงสารแรงสารแรงสารสารแรงสารสารสารสารสารสารสารสารสารสารสารสารสารส	Max Hold
80.0				Min Hold
-100				View/Blank Trace On
Center 3.5600 #Res BW 1.0 I		VBW 3.0 MHz	Span 100.0 MHz Sweep 1.00 ms (1001 pts)	
//SG			STATUS	1

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Р	-	-	Proxy Si ion for C		REG.6	NNF.FT.D	WI	X	5.1.4.1.6
				signed d					
							r - Swept SA		Agilent Spectrum
Trace/Det	MNov 21, 2019 E 1 2 3 4 5 6 E MWWWWW	TRAC	ALIGNAUTO e: Log-Pwr i>100/100		SENSE:INT	A		00000 N	50 50 50 50 50 50 50 50 50 50 50 50 50 5
Select Trace	PNNNNN	De	.>100/100	Avginoid	#Atten: 10 dB	PNO: Fast 😱 IFGain:Low	Input: RF	EAMP	PRE
Trace 1) 5 GHz 13 dBm	r1 3.560 -68.4	Mk				00 dBm	ef -20.00	
									.og
Clear Writ						_	_		30.0
									40.0
Trace Averag									40.0
Trace Averag									50.0
									60.0
Max Hol					and when here and the			4444	
	Act Alexed which	alling to service a service of	ANT 7423	and the second	**************************************	all and the second s	and a construction of the	TRACE OF THE OWNER O	70.0
							_		80.0
Min Ho									
									90.0
View/Blank									100
Trace On									110
									.110
Moi 1 of	00.0 MHz	Span 1					7	00 GH7	enter 3.5600
101		1.00 ms (Sweep		0 MHz	VBW 3	-		Res BW 1.0
		š	STATUS						SG

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Ρ	ers	Proxy M d paramet	Require	REG.9	VINNF.FT.D	X	.1.4.2.2
	2)	eCode 10	(respons		SA	nalvzer - Swep	Agilent Spectrum A
Trace/Det	10:42:31 AMNov 21, 2019 TRACE 1 2 3 4 5 6	ALIGNAUTO e: Log-Pwr					_{50 ຂ} ວan 100.000
Select Trace	DET P N N N N N	l:>100/100	Avg Hol	¹ Trig: Free Run #Atten: 10 dB	F PNO: Fast 🖵 IFGain:Low	Input: I	PREA
Trace 1	1 3.560 5 GHz -67.499 dBm	Mk			n	-20.00 dB	dB/div Ref
ClearWrite							
Trace Average							D.0 D.0
Max Hold		n allinear de calina	Bolie Happan March	umanhaman 1	Jonemational harasterios	Websierenselwenson	D.0
Min Hol							0.0
View/Blank Trace On							00
Mor 1 of 3	Span 100.0 MHz 00 ms (1001 pts)	Sweep 7		.0 MHz	VBW		enter 3.56000 Res BW 1.0 M
		STATUS					G

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

			n Proxy P		G.11	F.FT.D.REG	WINN	Х	4.2.4	6.1.4
Р	eCode	sponse	tion (resp	registra 200)						
							vept SA	nalyzer - Sw	nt Spectrum A	
Trace/Det	44:48 AMNov 21, 2019 TRACE 1 2 3 4 5 6	r	ALIGNAUTO /pe: Log-Pwr Id:>100/100		SENSE:INT	AC Tria: E			50 Ω	<mark>¤</mark> Span
Select Trace	DET P N N N N N		10.2100/100	Avgino	n: 10 dB				PREAM	
Trace 1	.560 5 GHz 57.499 dBm		M				Bm	-20.00 d	div Ref	10 dB
										^{og}
Clear Writ		_		_						-30.0 -
										-40.0
Trace Averag		_								-50.0
Max Hol					1					-60.0
	นใหม่เปราะ ¹ างการให้แร่เรือการ	u tter norskuld	here we serve a start of the server of the s	the way on the	end that	investorie	mandature	after of an an and the	ehan langerige wil	-70.0
										80.0
Min Hol										.00.0
										90.0
View/Blank										-100
Trace On										
										-110 -
Mor										L
1 of	an 100.0 MHz ms (1001 pts)		Sweep		Hz	VBW 3.0 MH			er 3.56000 BW 1.0 M	
		TUS	STATU				d	ng> save	File <reg9.p< td=""><td>ISG 🤳</td></reg9.p<>	ISG 🤳

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.1.4.2.6	X	WINNF.FT.I	D.REG.13	Domain Domain		nvalid oonseCode 103)	Р
Agilent Spectrum		vept SA					
a 50 s Span 100.00	0000 MH		AC SENSE:INT		ALIGNAUTO	TRACE 1 2 3 4 5 6	Trace/Det
PRE		it: RF PNO: Fast G IFGain:Low	,⊖ Trig: Free Run #Atten: 10 dB	Avg Hold		TYPE MWWWW DET P NNNN kr1 3.560 5 GHz	Select Trace Trace 1
0 dB/div Ref	f -20.00 d	Bm				-67.499 dBm	
30.0							Clear Writ
50.0							Trace Averag
60.0 70.0	strand and the second	gardy source and the sector	1 mmilianteraente	Vidde ne week marked and	Lvelliverwithers	help-m-linkitres hypothypothypothypothypothypothypothypot	Max Hol
80.0							Min Hol
100							View/Blank Trace On
Center 3.5600		VBW	3.0 MHz		Sweep	Span 100.0 MHz 1.00 ms (1001 pts)	
sg 🔱 File <reg1< td=""><td>3_0000.png</td><td>]> saved</td><td></td><td></td><td>STATU</td><td></td><td></td></reg1<>	3_0000.png]> saved			STATU		

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.1	.4.2.8	Х	WINI	NF.FT.D	.REG.1	5	Domain CBSD (r	-			Р
D Agi	lent Spectrum	Analyzer - S	wept SA					•			
м Spa	n 100.00	0000 M		NO: Fast	C SB Trig: Free	NSE:INT	Avg Type Avg Hold	ALIGNAUTO e: Log-Pwr :>100/100	TRAC	MNov 21, 2019 E 1 2 3 4 5 6 PE M	Trace/Det
10 dE	PRE/		IF	Gain:Low	#Atten: 10			M	(r1 3.56	0 5 GHz 99 dBm	Select Trace
Log -30.0											Clear Write
-40.0 -50.0											Trace Average
-60.0 -70.0	wheneuterright	stanisma	างชาชาวไห้เขาะห _{ู่} ให้เป	n bidatosut stays	woisthurch	1	windowne	1760-1714-1714, r. 141	istronalistationaritys		Max Hold
-80.0											Min Hold
-100											View/Blank Trace On
	ter 3.5600 s BW 1.0 I			VBW :	3.0 MHz			Sweep		00.0 MHz 1001 pts)	More 1 of 3
MSG 🤇	File <reg1< th=""><th>5.png> sav</th><th>ved</th><th></th><th></th><th></th><th></th><th>STATU</th><th>s</th><th></th><th></th></reg1<>	5.png> sav	ved					STATU	s		

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.1.4	.2.10	Х	WINN	NF.FT.D	0.REG.1		Domain SAS prot response	tocol ve	rsion	ted	Ρ
	t Spectrum A	nalyzer - Sv	vept SA								
LXI	50 Ω			1	7	NSE:INT		ALIGNAUTO : Log-Pwr	TRAC	MNov 21, 2019 E 1 2 3 4 5 6	Trace/Det
	PREAM			NO: Fast 🕞 Gain:Low	Trig: Free #Atten: 10		Avg Hold	>100/100	TYI	ET P N N N N N	Select Trace
10 dB/d		-20.00 d						MI	(r1 3.56) -67.4	05 GHz 99 dBm	Trace 1
-30.0											Clear Write
-40.0 — -50.0 —											Trace Average
-60.0	westernet	n e niewenen	of the total days	- Lindas Lander of the	mainten	1	andrenne	cysen was not an	have a free of the state of the		Max Hold
-80.0											Min Hold
-100											View/Blank Trace On
Center	r 3.56000 3W 1.0 M			VBW	3.0 MHz			Sweep	Span 1 1.00 ms (00.0 MHz 1001 pts)	More 1 of 3
MSG 🔱 F	ile <reg15< td=""><td>_0000.pn</td><td>g> saved</td><td></td><td></td><td></td><td></td><td>STATU</td><td>s</td><td></td><td></td></reg15<>	_0000.pn	g> saved					STATU	s		

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.1	.4.2.1	2	Х	WIN	NF.FT.D	.REG.1	9	Domain (response	-	-	or	Р
🗊 Agi	lent Spec	trum Ana	alyzer - S	wept SA								
		50 Ω					NSE:INT		ALIGNAUTO	TRA	MNov 21, 2019 E 1 2 3 4 5 6 PE MWWWWW	Trace/Det
		PREAM			NO: Fast 🖵 Gain:Low	#Atten: 10		Avg Hold	:>100/100	D	PNNNNN	Select Trace
10 dE	3/div	Ref -:	20.00 (dBm					Mł		0 5 GHz 99 dBm	Trace 1
-30.0												Clear Write
-40.0 -50.0												Trace Average
-60.0 -70.0	witherasteen	winter	mighting	nor here after	- Linda to the state of the sta	waladhave	1	uantron	here was strated	Hunnhahtmarken	in website	Max Hold
-80.0 -90.0												Min Hold
-100												View/Blank Trace On
Cen	ter 3.5 s BW 1				VBW :	3.0 MHz			Sweep	Span 1 1.00 ms (00.0 MHz 1001 pts)	More 1 of 3
MSG 🤇	File <	reg17.p	ng> sav	ved					STATU	S		

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

Check the device registration and authorization with the SAS, Confirm that the device changes its operating power and/or channel in response to a command from the SAS and Confirm that the device correctly configures based on the different license classes.

6.3.4.2.1	WINNF.FT.	C.GRA.	Unsucc	essful C	Grant		Monitor f	or 60	
	1		responseCode=400				seconds		Р
			(INTEF				REG me	ssage	
					(01)		sent. No		
							transmis	sion	
							during te	st.	
Agilent Spectru	m Analyzer - Swept SA								
	ΩΩ		AC SEI	ISE:INT		ALIGN AU		0 PMNov 21, 2019	Save State
Span 200.0	000000 MHz	PNO: Fast	Trig: Free	Run	Avg Type Avg Hold:			CACE 1 2 3 4 5 6	ouro otuto
	inpuc Kr	IFGain:Low	Atten: 10					DET P N N N N N	Register
10 dB/div R	ef 0.00 dBm					r		32 0 GHz 991 dBm	Last:8/23/2019 3:39:46 AN
							1		
									Register 2 Last:9/4/2019
-10.0									11:57:43 PM
-20.0									Register
									Last:6/5/2014
-30.0									2:39:15 AM
-40.0									
40.0									Register 4 Last:6/5/2014
-50.0									2:40:44 AM
-50.0									
-60.0									Register
			≜ ¹						Last:12/3/2015
-70.0	antom a second how me	dwnin www.www.www.	almour with	un war	www.moundaw	ulutant	marter with material	www.www.astrathelyt	1:20:05 AN
-80.0	ļ								Register 6
									Last:5/5/2014 10:33:25 PM
-90.0						-			
Contor 2 654								200.0.8411-	To File
Center 3.650 #Res BW 1.0		#VBM	(3.0 MHz			Swee		200.0 MHz (1001 pts)	
								(1001 pt3)	
ISG						STA	105		

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.3.4.2.	WINNF.FT.C	C.GRA.2		essful C			Monito			
2			responseCode=401			seconds after			Р	
			(GRAN	JT_CON	IFLICT	/		lessage		
					,		sent. N			
							transm			
							during	test.		
DAgilent Spect	rum Analyzer - Swept SA									
	50 Ω		AC SEI	NSE:INT		ALIGN AU		3:17 PM Nov 21, 2019		Span
Span 200.	.000000 MHz Input: RF	PNO: Fast	Trig: Free	Run	Avg Type Avg Hold:			TYPE MWWWW DET P N N N N		opun
	Inpuc RF	IFGain:Low	Atten: 10					DETPNNNN	1	Span
	Def 0.00 dDm					ſ		.632 0 GHz 8.956 dBm		200.000000 MHz
10 dB/div Log	Ref 0.00 dBm							0.300 abii		
-10.0							_			
-20.0							_		⊩–	
-30.0										Full Span
-00.0										
-40.0									⊪—	
-40.0										Zero Span
-50.0										Zero Spari
-50.0										
-60.0			A 1						11	Last Span
halkmain	and the manufacture	mer mall and a string the		a developmentation de la se	Le La o Influe	dun belta a sel	adams	Notion of the second state		Lastopar
-70.0			Control of Allowing Physics of	An Jan was to differ	a de sale et de la se la s	and the state of t	A PART PART PART	under an bewerde an adville.		
-80.0										
-90.0										
										Signal Track
Center 3.65								200.0 MH-		(Span Zoom)
#Res BW 1		#\/R\A	(3.0 MHz			Swee	əp։ ո 100 տ	an 200.0 MHz ns (1001 pts)	On	Off
		#VDV	0.0 10112				•			
MSG						ST	ATUS			

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

			Heartbe	eat Kesp	Jonse)		not of f res	insmissio start unt irst heart ponse or	til time tbeat r after.	
							sta trai witi cha (fre	er transm rts, meas nsmission hin the gr annel equencyLi uencyHig	sure that n is ranted .ow, f gh)	
X	rum Analyzer - Swept SA 50 Q 1e 100.0 s		AC SEN	ISE:INT	Avg Type: I	LIGN AUTO	TRACI	4Nov 21, 2019	Trace/D	_
	Input: RF P	NO: Fast ↔ Gain:Low	Trig: Free Atten: 10				DE		Select T Tra	race
-10.0									Clear	Write
-20.0									Trace Av	erage
-40.0			elis t aduran	,					Max	k Hold
-50.0		Prentastud	war							
-60.0	der normalis iks to also a bis in a last a bis in a								Mir	n Hold
-60.0	**************************************								View/B	

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.4.4.2.1	WINNF.FT.C.H	respons	eat seCode=10 REGISTER)	wi he	F transm 3SD stop thin 60 se eartbeatR ntains re 105	s transm econds o esponse	ission f the which ode	P
	rum Analyzer - Swept SA 50 ฏ	AC SEI	NSE:INT	ALIGN AUTO	02:42:37 PM TRACE	Nov 21, 2019	Save	
	Input: RF PM	10: Fast +++ Trig: Free Gain:Low Atten: 10	Run Avg	Hold:/100	TYPE DET	PNNNN		
10 dB/div	Ref 0.00 dBm					72.72 s 1 dBm		State►
-10.0						*		Frace State)
-20.0								
-30.0								
-40.0		1						Data xport)► race 1
	and the series of the series o	-wy-phillionals.				ŀ		
-60.0 -70.0	untentrations	1984 Epingly 240 Aj.A	والاستعادية المراجع والمراجع					reen nage
-80.0								
-90.0								
Center 3.62 Res BW 1.0	25000000 GHz MHz	#VBW 3.0 MHz		Sweep	Sp 180.0 s (1	oan 0 Hz 001 pts)		
MSG				STATUS				

Tage 32 01 80 Report Issued. 12/10/2017 Report The #. 710/2010/06/06/06/06/06/06/06/06/06/06/06/06/06	Page 32 of 80	Report Issued: 12/16/2019	Report File #: 7169007030-CBRS-000
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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.4.4.2. 3	WINNF.FT.C.HBT.5	Heartbeat responseCode=501 (SUSPENDED_GRANT) in First Heartbeat Response	Monitor RF transmission from start of test. Ensure there is no transmission during the test	р
---------------	------------------	--	---	---

Agilent Spectrum Analyzer - Swep 50 Ω	SA AC	SENSE:INT	ALIGNAUTO	02:45:04 PMNov 21, 2019	
Dan 200.000000 MHz	F PNO: Fast	Trig: Free Run A	Avg Type: Log-Pwr wg Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N	Trace/Det
	IFGain:Low	Atten: 10 dB	Mk	r1 3.605 8 GHz -68.558 dBm	Select Trace Trace
dB/div Ref 0.00 dBm				-00.000 aBiii	
0.0					Clear Wri
0.0					
0.0					Trace Avera
.0					
.0					Max Ho
					Min Ll
.0 Hornardollalaranordithyla	lim-street way and a street		washirman fleshfrazalikate	Lever and a light of the second of the	Min He
0.0					View/Blan Trace O
0.0					
					Mo
enter 3.6250 GHz Res BW 1.0 MHz	#VBW 3	.0 MHz	Sweep	Span 200.0 MHz 1.00 ms (1001 pts)	1 0
3			STATUS		

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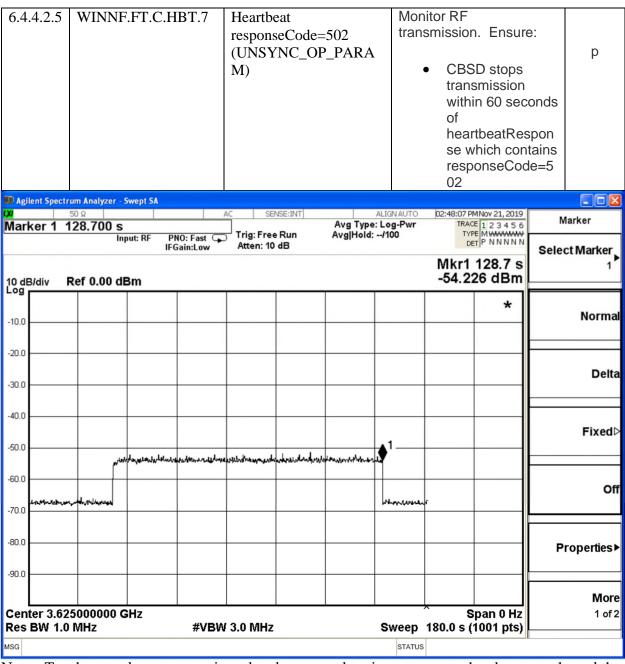
Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.4.4.2.4	WINNF.FT.C.HBT.6	Heartbeat responseCode=501 (SUSPENDED_GR ANT) in Subsequent Heartbeat Response	Monitor RF transmission. Ensure: • CBSD stops transmission within 60 seconds of heartbeatResponse which contains responseCode=501	р
-----------	------------------	--	--	---

50 Ω arker 1 68.0404 s Input: F		ig: Free Run tten: 10 dB	ALIGNAUTO Avg Type: Log-Pwr Avg Hold:/100	03:02:31 PMNov 21, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N	Marker→
dB/div Ref 0.00 dBm				Mkr1 68.04 s -53.644 dBm	Mkr→C
0.0				*	Mkr→CF Ste
0.0				<u> </u>	
0.0					Mkr→Sta
0.0					Mkr→Sto
	And the second and the				
0.0	E. Martha		above approximate		Mkr∆→Spa
0.0					Mkr∆→o
0.0					
enter 3.625000000 GHz es BW 1.0 MHz	#VBW 3.0	MHz	Sweep	Span 0 Hz 180.0 s (1001 pts)	Mkr→RefL
G	#4044 3.0		STATUS		

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Client	Ericsson	
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Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada



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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

MSG							STATUS	\$	1	
Center 3.6 Res BW 1.		00 GH		W 3.0 MHz			Sweep	S 100.0 s (1	pan 0 Hz 1001 pts)	Mo i 1 of
-90.0										
-80.0										Properties
-70.0	ukeruluruwaa	mohelen	normalised and a second second	the later				mmun		
-60.0				Samen	ato, gardelingi dya		leektyteniklaytik/			0
-50.0				1						Fixed
-40.0	_									
-30.0										Del
-20.0										
-10.0										Norm
10 dB/div	Ref 0.0	0 dBn	n						43.40 s 39 dBm	1
	40.400	Input	: RF PNO: Fast + IFGain:Low	Trig: Free Atten: 10					123456 MWWWWW TPNNNNN	Select Marker
Marker 1	50 Ω		pr SA	AC SE	NSE:INT	Avg Type	ALIGNAUTO	12:43:31 PM	4Nov 21, 2019	
							respon	seCode	= 500	
								ls of beir eatRespo	ng sent onse with	
				_	,	•	transm	2: must s ission wi	thin 60	
				(TEMIN D_GRA			but che	eck)		
			0	=500			transm	it to end	of test (this is a second seco	
6			T.D.HBT. 8	Heartbea response		will hav		ent beha 1: will co		Р
6.4.4.2.		Χ	WINNF.F	Domain	Proxy	Monito	r RF tra	nsmissio	n. CBSE	Ds

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.4.4.3.	WINNF.FT.C.	HBT.9		eat Resp			onitor RF			_
1		Absent	(First H	leartbeat	1	st to 60 se		ter last	Р	
							artbeatRe			
							essage wa			
							ould not t		at any	
						tim	ne during	test		
	rum Analyzer - Swept SA									
W Span 200	50 Ω .000000 MHz		AC SE	NSE:INT	Avg Type	LIGN AUT		MNov 21, 2019	Sp	an
	Input: RF	PNO: Fast 🔸	Trig: Free		Avg Hold:		TY			
	1	FGain:Low	Atten: 10	dB						Span
10 dB/div	Ref 0.00 dBm					M	kr1 3.60 -69.6	06 GHz 10 dBm	200.00	0000 MHz
Log										
-10.0										
22.0										
-20.0										
20.0									F	ull Span
-30.0										
-40.0									<u> </u>	
-40.0									70	ro Span
-50.0									20	i o Spair
-55.0										
-60.0										
00.0		1	1						La	ast Span
-70.0			Alt dural day	When have been and the second	A day the prove	and the country of	- Martin Miller	the server and the		
wi			19-1-4 - 14-1	, 1 M Mainer J	a sul sul an an	40101011111	a alaya hi ka ka a ka a ka a ka a ka a ka a ka	a the second		
-80.0										
-90.0										
									Sign	al Track
							On as: 0		/0	an Zoom)
Center 3.62 #Res BW 1		#\/R\/	3.0 MHz			Sween	span 2 1.00 ms (00.0 MHz	On	Off
		#VDVV	5.0 IVI112					1001 pts)		
MSG						STAT	US			

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

Center 3.6	25000000 GHz							p̂an 0 Hz		More
-80.0									Proper	rties►
-70.0	under the state					pegnuidealy-hourse		<u>م</u>		Off
-60.0		LL. โกรง เกม เป็น เป็น เป็น เป็น เป็น เป็น เป็น เป็น	water	L. 21 Land A. J. V. 2014	and the second states					05
-50.0	<u> </u>					1			Fiz	ixed⊳
-40.0										
-20.0									ſ	Delta
-10.0										
Log								*	No	orma
10 dB/div	Ref 0.00 dBm							125.8 s 96 dBm		1
Marker 1		PNO: Fast ↔ IFGain:Low	Trig: Free Atten: 10	Run	Avg Type Avg Hold:	: Log-Pwr	TRAC		Marker Select Mar	
Agilent Spect	rum Analyzer - Swept SA 50 Ω	A	c se	VSE:INT		ALIGN AUTO		MNov 21, 2019		
							heartb messa	eatRespo lige	onse	
								nitExpireT ast succe		
								nitExpireT conds, wh		
			Heartbe	eat)	-	•		must sto nission wi		
2			Heartbe Absent			transn	nission.	Verify:		Ρ

Note: Test harness logs were reviewed and compared to time stamps to the above graph, and the EUT was determined to have met the requirement.

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.5.4.2. 2	WINNF.FT.D.MES.2	Domain Proxy Registration Response	No RF monitoring	Р
		contains measReportConfig		

Pass saw "measreportconfig" in logs

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.5.4.2.	WINNF.FT.C.MES.3	Grant Response contains	No RF monitoring	
3		measReportConfig	_	Р

Pass saw "measreportconfig" in logs

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.5.4.2.	WINNF.FT.D.MES.5	Domain Proxy Heartbeat	No RF monitoring	
5		Response contains		Р
		measReportConfig		

Pass saw "measreportconfig" in logs

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

CBSD stops transmission at any time prior to sending the relinquishmentReques t message. August Spectrum Analyzer - Swept SA Select Marker Select Marker Select Mark	6.6.4.1.	WINNF.FT.D.R			Successful	Monitor R		
Image: Section of the section of th	2		Relinq	uishment				e: P
Applent Spectrum Analyzer Swept SA Applent Spectrum Analyzer Swept SA Marker 1 65.360 s Input: RF PNO: Fast +++ Input: RF Input: RF							-	
the relinquishmentReques Aglent Spectrum Analyzer - Swept SA Image: Server 1 Alconauto D13728PMNov 21,2019 Marker Marker 1 65.3600 s Acc Server 10 dB Aug Type: Log-Pwr Trace [12 3 4 5 6 7 8 4 4 4 4 4 5 6 7 8 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4								
Inductor Selection Accord Selection Accord Selection Marker Solo Accord Selection Accord Selection Accord Selection Marker Selection Marker Selection Marker Selection Selection Marker Selection Marker Selection Selection Marker Selection Selection <td></td> <td></td> <td></td> <td></td> <td></td> <td>- -</td> <td>to sending</td> <td>5</td>						- -	to sending	5
Aglent Spectrum Analyzer - Swept SA Imput: RF PN0: Fast PN0: Fast PN0: Fast PN0: Fast Program Action Auton Auton Auton PD0: S7:29 PNW PMWNN PCP PNWNN PCP PNWNNN PCP PNWNN PCP PNWN PNW PCP PNWN PCP PNWN PCP PNWN PD0 PNWN PNP PNWN PNP PNWN PNP PNWN PNP PNWN						the		
Aglent Spectrum Analyzer - Swept SA AC SENSEINT ALIGNAUTO D13728 PMINOr21,2019 Marker S0 9 AC SENSEINT ALIGNAUTO D13728 PMINOr21,2019 Marker Marker 1 65.3600 s Input: RF PN0: Fast + Trig: Free Run Avg Type: Log-Pwr Inscription 12, 2019 Marker 10 dB/div Ref 0.00 dBm Select Marker 1 -00 Select Marker 1 -00 Select Marker 1 -00 Norma -00						relinquishr	nentRequ	es
302 302 AC SENSE:INT ALIGNAUTO D1:37:28 PMIov 21,20.9 Marker Marker 1 65.360 s Input: RF PNO: Fast						t message.		
Marker 1 65.3600 s Avg Type: Log-Pwr Trace [1:2:3:4:5] Marker Input: RF PN0: Fast Trig: Free Run Atten: 10 dB Mkr1 65.36 s Select Marker 1 10 dB/div Ref 0.00 dBm -52.18 dBm Norma 1	💴 Agilent Spect	rum Analyzer - Swept SA						
Input: RF PNO: Fast Trig: Free Run Atten: 10 dB Mkr1 65.36 s -52.18 dBm Select Marker 1 10 dB/div Ref 0.00 dBm -52.18 dBm -100 <td>IXI Morkor 1</td> <td></td> <td>AC S</td> <td>ENSE:INT</td> <td></td> <td></td> <td></td> <td>Marker</td>	IXI Morkor 1		AC S	ENSE:INT				Marker
Mkr1 65.36 s 1 10 dB/div Ref 0.00 dBm -52.18 dBm -100 -52.18 dBm -52.18 dBm -200 -00 -00 -00 -300 -00 -00 -00 -400 -00 -00 -00 -400 -00 -00 -00 -400 -00 -00 -00 -400 -00 -00 -00 -400 -00 -00 -00 -400 -00 -00 -00 -400 -00 -00 -00 -400 -00 -00 -00 -00 -400 -00 -00 -00 -00 -400 -00 -00 -00 -00 -400 -00 -00 -00 -00 -00 -400 -00 -00 -00 -00 -00 -400 -00 -00 -00 -00 -00 -400 -00 -00 -00 -00 -00 -00 <t< td=""><td>Marker</td><td>Input: RF PN</td><td>O. Fast</td><td></td><td>And They rod.</td><td>TYP</td><td>PE MWWWWW TPNNNNN</td><td>Select Marker</td></t<>	Marker	Input: RF PN	O. Fast		And They rod.	TYP	PE MWWWWW TPNNNNN	Select Marker
.10.0		Ref 0.00 dBm						1
-20.0 -20.0 <td< td=""><td>Log</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Log							
-30.0 -30.0 -30.0 Delta -40.0 -40.0 -40.0 -40.0 -40.0 -50.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -70.0 -40.0 -40.0 -40.0 -40.0 -70.0 -40.0 -40.0 -40.0 -40.0 -70.0 -40.0 -40.0 -40.0 -40.0 -70.0 -40.0 -40.0 -40.0 -40.0 -70.0 -40.0 -40.0 -40.0 -40.0 -70.0 -40.0 -40.0 -40.0	-10.0							Normal
-30.0 -30.0 -30.0 Delta -40.0 -40.0 -40.0 -40.0 -40.0 -50.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -60.0 -40.0 -40.0 -40.0 -40.0 -70.0 -40.0 -40.0 -40.0 -40.0 -70.0 -40.0 -40.0 -40.0 -40.0 -70.0 -40.0 -40.0 -40.0 -40.0 -70.0 -40.0 -40.0 -40.0 -40.0 -70.0 -40.0 -40.0 -40.0 -40.0 -70.0 -40.0 -40.0 -40.0								
-30.0 -40.0 -40.0 -5	-20.0							
-30.0 -40.0 -40.0 -5								Delta
-50.0 -60.0 -70.0 -70.0 -80.0 -80.0 -90.0 -80.0 -90.0 -8	-30.0							
-50.0 -60.0 -70.0 -70.0 -80.0 -80.0 -90.0 -80.0 -90.0 -8								
-50.0 -60.0 -70.0 -70.0 -80.0 -90.0 -80.0 -80.0 -9	-40.0							Fired
-60.0 -70.0	50.0	_ 1						Fixed
-70.0 4	-50.0	und the second						
-70.0 4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.	-60.0							
-70.0 -80.0 -90.0 -90.0 Center 3.625000000 GHz Span 0 Hz 1 of 2								Off
-30.0 Properties -30.0 More Center 3.625000000 GHz Span 0 Hz 1 of 2		\$15435164388787+35-475-478						
-30.0 Properties -30.0 More Center 3.625000000 GHz Span 0 Hz 1 of 2								
-90.0	-80.0			+			├───┤	Properties▶
Center 3.625000000 GHz Span 0 Hz 1 of 2								
Center 3.625000000 GHz 1 of 2	-90.0							
								More
Res BW 1.0 MHz #VBW 3.0 MHz Sweep 360.0 s (1001 pts)						S	pan 0 Hz	1 of 2
	Res BW 1.0) MHz	#VBW 3.0 MHz	<u>.</u>	Sw	eep 360.0 s (1001 pts)	
MSG STATUS	MSG					STATUS		

Note: Test harness logs were reviewed and compared to time stamps to the above graph, and the EUT was determined to have met the requirement.

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.7.4.1.	WINNF	.FT.D.D	RG.2			Successfi		Monitor RF		D
2				Deregis	stration		tı	ransmission. Ens CBSD stop		Р
							tı	ransmission at an	-	
								ime prior to sendi		
								he	8	
							re	elinquishmentRe	ques	
								message or		
								leregistrationReq		
								nessage (whichev	er	
Di Antina Canad							18	s sent first)		
X		Swept SA		AC SEI	VSE:INT		LIGNAUTO			rker
Marker 1			IO: Fast ++	Trig: Free Atten: 10		Avg Type:	Log-Pwr	TRACE 1 2 3 4 5 TYPE MWWWWW DET P N N N N	V N	
	Ref 0.00 dE							Mkr1 57.62 s -55.23 dBn	8	Marker
									1	
10.0										Normal
20.0									1	Dalta
30.0										Delta
40.0									1	Fixed⊳
50.0		Aptrix, instruction	 1							
	approximates		Y							
60.0									1	Off
70.0	**************************************		hand the second second	-},₩₩,₽₩₩,₽₩₩,₩₩,₩₩,₩₩,₩	*******	ed register of a state of the strength of the st	an	***********	╢——	
80.0										
									Pro	operties►
90.0										
										More
	25000000 G	Hz	40 (5)				0	Span 0 H	z	1 of 2
Res BW 1.0	JIVIHZ		#vBW	3.0 MHz				o 180.0 s (1001 pts)	
SG							STAT	US		

Note: Test harness logs were reviewed and compared to time stamps to the above graph, and the EUT was determined to have met the requirement.

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

Confirm that the device transmits at a power level less than or equal to the maximum power level approved by the SAS.

7.1.4.1.	Х	Χ	WINNF.PT.C.H	UUT RF Transmit	Power Spectral	
1			BT	Power Measurement	Density test case.	Р
1			BT	Power Measurement	Assume we use 1 carrier bandwidth (say, 5 or 10 MHz), one frequency (say middle channel in band) for test. Measure at max transmit power, and reduce in steps of 3	Р
					dB to minimum declared transmit	
					power.	

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

		Raw	Raw	Extern al	Condu cted				EIRP 1MHz	EIRP 10 MHz	margin
Freq	1MHz EIRP limit (target) dBm	10 MHz	1MHz	Losses (dB)	dBm/ MHz	antenna gain dBi	po rts	port gain (dB)	dBm/M Hz	dBm	dB
3555-Low	20	-40.04	-49.4	52.6	3.2	12	2	3.0103	18.2103	27.5703	1.7897
3555-High	37	-22.68	-32.08	52.6	20.52	12	2	3.0103	35.5303	44.9303	1.4697
3630-low	20	-40.18	-48.2	52.6	4.4	12	2	3.0103	19.4103	27.4303	0.5897
3630-high	37	-22.82	-30.86	52.6	21.74	12	2	3.0103	36.7503	44.7903	0.2497
3695-low	20	-40.08	-48.1	52.6	4.5	12	2	3.0103	19.5103	27.5303	0.4897
3695-high	37	22.74	-30.93	52.6	21.67	12	2	3.0103	36.6803	90.3503	0.3197

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l

Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

psd low ch 20dbm

Agilent Spect	rum Analyzer - Channel 50 Ω		C SENSE:INT	ALIGNAUTO	09:56:32 AMNov 22, 2019	
	ne 30.0 ms		Center Freq: 3.555		Radio Std: None	Sweep/Control
	PREAMP	#IFGain:Low	#Atten: 10 dB		Radio Device: BTS	Sweep Tin
) dB/div	Ref -10 dBm			Mki	1 3.55502 GHz -49.421 dBm	
-20						
30						Sweep Setu
40						
50						
60						Pau
70						
30						
30						
0						
enter 3.5 Res BW /			#VBW 3M	Hz	Span 20 MHz #Sweep 30 ms	
Chann	el Power		Powe	er Spectral Den	sity	Gat
					-	[Off, LC
	-40.04 dB	m/ 10 MH	z	-110.04 dB	3m/Hz	
						Poir 10
à				STATU	s	
				on no		

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

psd low ch 37dbm

	50 Ω ne 30.0 ms Input: RF PREAMP	#IFGain:Low	Trig: F	SENSE:INT rFreq: 3.555000 ree Run : 10 dB		ALIGN AUTO	09:51:57 A Radio Std: Radio Dev		Sweep/Control
0 dB/div og	Ref -10 dBm					Mkr	1 3.555 -32.0	02 GHz 78 dBm	30.0 m Auto <u>Ma</u>
-20				1					Sweep Setup
-40									Pau
-70 -80 -90							L	~~~~	
enter 3.5 Res BW 1			#	VBW 3 MH	z		Spa #Swee	n 20 MHz ep 30 ms	
Chann	el Power			Power	Spectra		-		Gate [Off, LO
	-22.68 d	Bm/ 10 M	Hz		-92.6	58 dBi	m/Hz		Poin 10
3						STATUS	1 Input O	verload;ADC	over range

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

psd mid ch 20dbm

	eq 3.63000000 C Input: RF PREAMP #II	Trig: I	SENSE:INT er Freg: 3.630000000 (Free Run Avg n: 10 dB	Hold: 100/100	10:57:34 AMNov 22, 2 Radio Std: None Radio Device: BTS	Freq / Channel
dB/div	Ref -10 dBm			Mkr	1 3.62712 GH -48.202 dB	
0						Center Fr 3.630000000 G
0 0 0						-
o o						_
o						CF St
nter 3.6 es BW		#	VBW 3 MHz		Span 20 M #Sweep 30 r	Hz 2.000000 M
Chann	el Power		Power Sp	ectral Dens	sity	
	-40.18 dBm	/ 10 MHz	-1	10.18 dв	m/Hz	
				STATUS	5	

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l

Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

psd mid ch 37dbm

Agnent opeci	trum Analyzer - Channel Power 50 Ω	AC SENSE:INT	ALIGNAUTO	10:15:49 AMNov 22, 2019	
	eq 3.63000000 GHz Input: RF PREAMP #IFGain:L	Center Freq: 3.630000 Trig: Free Run	Avg Hold: 100/100	Radio Std: None Radio Device: BTS	Freq / Channel
dB/div	Ref -10 dBm		Mkr	1 3.62822 GHz -30.862 dBm	
20		1			Center Fr
30			m		3.63000000 G
i0 50					
50					
ro				L	
0					
0					
0					CF St
nter 3.6 es BW		#VBW 3 MHz		Span 20 MHz #Sweep 30 ms	2.000000 M <u>Auto</u> M
Chann	el Power	Power	Spectral Dens	sity	
	-22.82 dBm/ 10	MU-	-92.82 dB	m/Uz	
			-02.02 UB	111/12	
i			STATUS	2	

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

psd high ch 20dbm

	50 Ω eq 3.69500000 Input: RF PREAMP	0 GHz #IFGain:Lo	Center Trig: Fr		ALIGN AUTO 00 GHz Avg Hold: 100/100	10:13:13 AMM Radio Std: N Radio Device	one	Freq / Channel
dB/div	Ref -10 dBm				MI	kr1 3.691 -48.102		
30								Center Fre 3.69500000 GF
40 50								
60 70 80								
0								05.04
enter 3.6 tes BW			#\	/BW 3 MHz		Span #Sweep	20 MHz 30 ms	CF Ste 2.000000 Mi Auto Mi
Chann	el Power			Power S	Spectral Den	sity		
	-40.08 de	3m/ 10	MHz	-	110.08 de	Sm/Hz		
ì					STATU	s		

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

psd high ch 37dbm

	50 Ω eq 3.6950000 Input: R PREAMP		Center Trig: Fr		wg Hold: 100/100	Radio Std: Radio Devi	ce: BTS	Freq / Channel
) dB/div	Ref -10 dBn	<u>n</u>			M	kr1 3.69 -30.92	16 GHz 27 dBm	
-20		• ¹						Center Fre 3.695000000 GH
-40								
-60								
-80								
enter 3.6 Res BW			#\	/BW 3 MHz		Spar #Swee	n 20 MHz p 30 ms	CF Ste 2.000000 MH Auto Ma
	el Power				pectral Den		<u> </u>	
	-22.74 c	IBm/ 10 I	MHz		-92.74 dE	3m/Hz		
G					STATU	IS		

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

DOT CBRS Radio: WINNF / Security Test Case Analysis

WINNF Security Test Case Analysis

WINNF.FT.C.SCS.1

Packet Capture Sequences

WINNF test requirements: WINNF test requirements from WINNF-TS-0122-V1.0.0 CBRS CBSD Test Specification:

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

	Mala and that Matural anti-action have an hatman III IT	+	\vdash
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_ECDHE_ECDSA_WITH_AES_128_GCM_SHA2 56 TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA3 84 TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 	PASS	F.

Analysis of WINNF Test Requirements

1			🖾 🗆 • Expression
Time	Source	Destination	Protocol Length Info
4 2019-11-22 15:22:29,505984	129.192.189.122	129.192.188.123	TLSv2.2 186 Client Hello
6 2019-11-22 15:32:29,506635	129.192.188.123	129.192.188.122	TLSv1.2 IDI4 Server Hello
8 2019-11-22 15:32:29,506655 12 2019-11-22 15:32:29,511788	129.192.180.123 129.192.180.122	129.192.180.122	TLSV1.2 207 Certificate, Certificate Request, Server Hello Done TLSV1.2 1514 Certificate [TCP segment of a reassembled PDU]
13 2019-11-22 15:32:29,511792		129.192.180.123	TLSV.2 650 Client Key Exchange, Certificate Verify, Change Cipher Spec, Encrypted Handshake Message
15 2019-11-22 15:32:29,519039		129.192.188.122	TLSv1,2 117 Change Cipher Spec, Encrypted Handshake Message
16 2019-11-22 15:32:29,519775		129.192.188.123	TL5V1.2 1274 Application Data
17 2019-11-22 15:32:29,519801		129.192.180.123	TLSv1.2 473 Application Date
19 2019-11-22 15:32:29,561461 21 2019-11-22 15:32:29,005768		129.192.160.122 129.192.180.122	TLSv1.2 112 Application Data TLSv1.2 557 Application Data, Application Data, Application Data, Application Data, Application Data, Application Data
23 2019-11-22 15:32:32,846558		129.192.160.123	Tisvi, 2 454 Application Data, Application Data, Application Data, Application Data, Application Data, Application Data
24 2019 11-22 15:32:32,848913		129.192.188.122	TLSVI.2 112 Application Data
26 2019-11-22 15:32:32,849246	129.192.100.123	129.192.180.122	TLSv1.2 815 Application Data, Application Data, Application Data, Application Data, Application Data
28 2019-11-22 15:32:37,107897		129.192.180.123	TLSv1.2 471 Application Data
29 2019-11-22 15:32:37,110173 31 2019-11-22 15:32:37,110567		129.192.180.122	TLSv1.2 112 Application Data TLSv1.2 552 Application Data, Application Data, Application Data, Application Data, Application Data, Application Data
 Handshake Protocol: Client Held Handshake Type: Client Held Length: 111 			
Handshake Type: Client Helle			
Handshake Type: Client Helle Length: 111 Version: TLS 1.2 (0x0303) Random: 49a0718f3c000b43791e	0 (1)	2e54da23f	
Handshake Type: Client Helle Length: 111 Version: TLS 1.2 (0x0303) Random: 49a0718f3c009b43791e Session ID Length: 0	0 (1)	2654da23f	
Handshake Type: Client Held Length: 111 Version: TLS 1.2 (0x0303) Random: 49a0718f3c009b437910 Session ID Length: 0 Cipher Suites Length: 10	0 (1)	2e54da23f	
Handshake Type: Client Hell Length: 111 Version: TLS 1.2 (0x0303) > Random: 49a0718f3c000b437914 Session ID Length: 0 Cipher Suites Length: 10 Cipher Suites (5 suites)	o (1) eald40075d6b732fac9f		
Handshake Type: Client Held Length: 111 Version: TLS 1.2 (0x0303) Random: 49a0718f3c009b437910 Session ID Length: 0 Cipher Suites Length: 10	0 (1) eald40075d6b732fac9f H_AES_256_GCM_SHA384	(0x009d)	
Handshake Type: Client Held Length: 111 Version: TLS 1.2 (0x0303) B Random: 430671875c00043791 Session ID Length: 0 Cipher Suites Length: 10 Cipher Suites (5 suites) Cipher Suite: TLS_RSA_UTT Cipher Suite: TLS_RSA_UTT	0 (1) eald40075d6b732fac9f H_AES_256_GCM_SHA384 H_AES_128_GCM_SHA256 CDSA_WITH_AES_128_GC	(0x009d) ((0x009c) M_SHA256 (0xc02b)	
Handshake Type: Client Held Length: 111 Varsion: 115 1/2 (0x0303) * Random: 430671875c000b3791t Session ID Length: 0 Clipher Suites Length: 10 Clipher Suites (15 suites) Clipher Suite: TLS_RSA_MIT Clipher Suite: TLS_RSA_MIT Clipher Suite: TLS_ECOME_E Clipher Suite: TLS_ECOME_E	 (1) ald40075d6b732fac9f H_AES_256_GCM_SHA304 H_AES_128_GCM_SHA256 CDSA_WITH_AES_128_GC CDSA_WITH_AES_256_GC 	(0x009d) (0x009c) M_SHA256 (0xc02b) M_SHA384 (0xc02c)	
Handshake Type: Client Held Length: 111 Varsion: 115 1,2 (0x0303) * Random: 49a0718f3c000b43791. Session ID Length: 0 Clipher Suites Length: 10 Clipher Suites (15 suites) Clipher Suite: TLS.RSA_MIT Clipher Suite: TLS.RSA_MIT	 (1) ald40075d6b732fac9f H_AES_256_GCM_SHA384 H_AES_128_GCM_SHA256 	(0x009d) 5 (0x009c)	
Handshake Type: Client Held Length: 111 Werston: TLS:1:2 (0x0303) Random: 49m071872c0000437910 Session ID Length: 0 Cipher Suites Length: 10 Cipher Suites (1 suites) Cipher Suite: TLS_RSA_WIT Cipher Suite: TLS_RSA_WIT Cipher Suite: TLS_RSA_WIT	 (1) aid40075d6b732fac9f H_AES_256_GCM_SHA384 H_AES_128_GCM_SHA256 CDSA_WITH_AES_128_GC CDSA_WITH_AES_256_GC SA_WITH_AES_128_GCM 	(0x009d) (0x009c) M_SHA256 (0xc02b) M_SHA384 (0xc02c)	

1. From Client Hello: TLS version = TLS 1.2

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

2. Cipher suite list from Client Hello is from WINNF approved list:

TLS_RSA_WITH_AES_128_GCM_SHA25 TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256

\$ 51					Expression
h	Time	Source	Destination	Protocol	Length Info
	4 2019-11-22 15:32:29,585904	129.192.180.122	129.192.188.123	TLSv1.2	
	6 2019-11-22 15:32:29,500635	129.192.188.123	129.192.188.122	TLSv1.2	1514 Server Hello
	8 2019-11-22 15:32:29,586655	129.192.188.123	129,192.188,122	TLSV1.2	
	12 2819-11-22 15:32:29,511788	129.192.180.122	129,192.188.123	TLSV1.2	
	13 2019-11-22 15:32:29,511792	129.192.180.122	129.192.180.123	TLSv1.2	
	15 2010-11-22 15:32:29,519030	129.192.188.123	129.192.188.122	TLSv1.2	
	16 2019-11-22 15:32:29,519775	129.192.180.122	129.192.180.123	TLSv1.2	
	17 2019-11-22 15:32:29,519801	129,192,180,122	129,192.188.123	TLSV1.2	
	19 2019-11-22 15:32:29,561461	129.192.180.123	129.192.188.122	TLSV1.2	
	21 2019-11-22 15:32:29,605708	129.192.180.123	129.192.180.122	TLSV1.2	
	23 2019-11-22 15:32:32,846558	129.192.180.122	129,192,180,123	TLSv1.2	
	24 2019-11-22 15:32:32,848913	129.192.180.123	129.192.188.122	TLSv1.2	
	26 2019-11-22 15:32:32,849246	129,192,180,123	129,192,180,122	TLSV1.2	
	28 2019-11-22 15:32:37,107897	129.192.188.122	129,192,188,123	TLSV1.2	
	29 2819-11-22 15:32:37,118173	129.192.180.123	129,192.188.122	TLSv1.2	
	31 2019-11-22 15:32:37,110567	129.192.180.123	129.192.180.122	TLSv1.2	552 Application Data, Application Data, Application Data, Application Data, Application Data, Application Data

•		
Content Type: Handshake (22) Version: TLS 1.2 (0x003) Length: 81 • Handshake Type: Server Hello Handshake Type: Server Hello (2)		
Length: 77 Version: TLS 1.2 (0x0303)		
 Random: 662d008fbde5ddc39f2bfb/32762a7e82d0818e90ea6cf83 Session ID Length: 32 Session ID: 1fed9bebdab24889c9ba28cfdfa405cfffc11f5550551fcd 		
Cipher Suite: TLS_RSA_WITH_AES_256_GCM_SHA384 (0x009d) Compression Method: null (0)		
Extensions Length: 5 ▶ Extension: renegotiation_info (len≡1)		-
Cipher Suite (ssl.handshake.ciphersuite), 2 bytes	Packets: 32 - Displayed: 16 (50.0%)	Profile: Default

3. Cipher suite chosen (from Server Hello): TLS_RSA_WITH_AES_128_GCM_SHA256

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

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Ec.	dit Yiew Go Capture Analyze Sta				
-	0 0 0 0 0 0 0	() = = = =			
ડા					🛛 🗂 📩 Expression
	Time.	Source	Destination		Length Info
	4 2019-11-22 15:32:29,505904	129,192,180,122	129.192.180.123		186 Client Hello 1914 Server Hello
-	6 2019-11-22 15:32:29,586635 8 2019-11-22 15:32:29,586655	129.192.188.123	129.192.188.122	TLSV1.2	1014 Server Hello 207 Certificate, Certificate Request, Server Hello Done
	12 2019-11-22 15:32:29,511788	129.192.180.122	129.192.180.122	TLSV1.2	
	13 2019-11-22 15:32:29,511792	129.192.180.122	129.192.180.123	TLSV1.2	656 Client Key Exchange, Certificate Verify, Change Cipher Spec, Encrypted Handshake Message
	15 2019-11-22 15:32:29,519039	129.192.180.123	129.192.188.122	TLSv1.2	117 Change Cipher Spec, Encrypted Handshake Message
	16 2019-11-22 15:32:29,519775	129.192.100.122	129,192,180,123	TLSV1.2	1274 Application Data
	17 2019-11-22 15:32:29,519801	129.192.180.122	129.192.188.123	TLSV1.2	473 Application Data
	19 2019-11-22 15:32:29,561461		129,192.100.122	TLSV1.2	112 Application Data
	21 2019-11-22 15:32:29,685708		129.192.180.122	TLSv1.2	557 Application Data, Application Data, Application Data, Application Data, Application Data
	23 2019-11-22 15:32:32,846558	129.192.188.122	129.192.180.123	TLSv1.2	454 Application Data
	24 2019-11-22 15:32:32,848913		129.192.180.122	TLSV1.2	112 Application Data
	26 2019-11-22 15:32:32,849246		129,192.188.122	TLSV1.2	B15 Application Data, Application Data, Application Data, Application Data, Application Data, Application Data 471 Application Data
	28 2019-11-22 15:32:37,107897 29 2019-11-22 15:32:37,110173		129.192.188.123 129.192.180.122	TLSV1.2 TLSV1.2	4/1 Application Data
	31 2019-11-22 15:32:37,110173		129.192.180.122	TLSV1.2	552 Application Data, Application Data, Application Data, Application Data, Application Data, Application Data
	Content Type: Handahake (22) Marsion: T15.1.2 (Bu303)				
	Version: TLS 1.2 (0x0303)				
		lle			
	Version: TLS 1.2 (0x0303) Length: 81				
	Version: TLS 1.2 (0x0303) Length: 81 Handshake Protocol: Server Hel				
•	Version: TLS 1.2 (0x0303) Length: 81 Handshake Protocol: Server Hel Handshake Type: Server Hell Length: 77 Version: TLS 1.2 (0x0303)	0 (2)			
•	Version: TLS 1.2 (0x0303) Length: 81 Handshake Protocol: Server Hel Handshake Type: Server Hell Length: 77 Version: TLS 1.2 (0x0303) > Random: 662d068fbde5ddc39f2	0 (2)	90ea6c183		
•	Version: TLS 1.2 (0x0303) Length: 81 Handshake Protocol: Server Hell Handshake Type: Server Hell Length: 77 Version: TLS 1.2 (0x0303) + Random: 662d060fbde5ddc39f2l Session ID Length: 32	o (2) bfb732762a7e82d0818e			
•	Version: TLS 1.2 (0x8303) Length: 81 Handshake Protocol: Server Hel Handshake Type: Server Hell Length: 72 Version: TLS 1.2 (0x0303) N Random: 622008fbbe3dc3972) Session ID Length: 32 Session ID: 1fed3bedab2408	0 (2) bfb732762a7e82d0818e 9c9ba28cfdfa405cfffc	11f5550551fcd		
•	Version: TLS 1.2 (0x0303) Length: 81 Handshake Protocol: Server Hell Length: 77 Version: TLS 1.2 (0x0303) • Random: 0620080fbde5ddc3972) • Random: 0620080fbde5ddc3972 Session ID: 1fed9bebdab2400 Cipher Suite: TLS SEA WITH ~	o (2) bfb732762a7e82d0818e 9c9ba28cfdfa405cfffc AES_256_GCM_SHA384 (11f5550551fcd		
•	Version: TLS 1.2 (0x0303) Length: 81 Handshake Protocol: Server Hel Handshake Type: Server Hell Length: 77 Version: TLS 1.2 (0x030) Pandom: 062000617bd630dc3972) Session ID Length: 32 Session ID 1fed9bebdab2400 Coppression Method: null (0	o (2) bfb732762a7e82d0818e 9c9ba28cfdfa405cfffc AES_256_GCM_SHA384 (11f5550551fcd		
•	Version: TLS 1.2 (0x8303) Length: 81 Handshake Protocol: Server Hell Length: 77 Version: TLS 1.2 (0x0303) + Random: 66200807 Mode5ddc3972 Session TD: 1fcd9bedbab2408 Clpher Suite; TLS FSA.WTH4 Compression Method: null (0 Extensions Length: 5	o (2) bfb732762a7e82d0818e 9c9ba28cfdfa403cfffc <u>AES 256 GCM_SHA384 (</u>)	11f5550551fcd		
•	Version: TLS 1.2 (0x0303) Length: 81 Handshake Protocol: Server Hel Handshake Type: Server Hell Length: 77 Version: TLS 1.2 (0x030) Pandom: 062000617bd630dc3972) Session ID Length: 32 Session ID 1fed9bebdab2400 Coppression Method: null (0	o (2) bfb732762a7e82d0818e 9c9ba28cfdfa485cfffc AES_256_6CM_SHA384 () fo (len=1)	11f5550551fcd		Packets: 32 - Disolaved: 16 (50.0%) Profile: Defaul

4. The Registration request message arrived at the Test Harness, so authentication was completed.

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

WINNF.FT.C.SCS.2

and the second				scs2.pcap			•
e <u>E</u> dit <u>V</u> iew <u>Go</u> <u>Capture</u> <u>Analyze</u> <u>S</u> ta							
🔳 🧟 🛞 🚞 🗎 🗙 🙆 Q (() 3 = -1 🔤						
l ocsp							Expression
Time	Source	Destination	Protocol	Length info			
5 2019-11-22 16:32:41,110100	129.192.180.122	129.192.180.123	TLSv1.2	186 Client Hello			
7 2019-11-22 16:32:41,110594		129.192.180.122		1514 Server Hello			
9 2019-11-22 16:32:41,110612		129.192.180.122	TLSV1.2		Certificate Request,	Server Hello Done	
15 2019-11-22 16:32:41,113685		129.192.188.125 129.192.188.122	0CSP 0CSP	348 Request 733 Response			
19 2019-11-22 16:32:41,139717 25 2019-11-22 16:32:41,141037		129,192,188,122	TLSv1.2		: Fatal, Description:	Red Curtificate)	
38 2019-11-22 16:32:53, 144430		129.192.180.123	TLSv1.2	186 Client Hello		pau certificate)	
40 2019-11-22 16:32:53, 144955		129,192,180,122		1514 Server Hello			
42 2019-11-22 16:32:53,144970		129,192,188,122	TLSV1.2		Certificate Request,	Server Hello Done	
48 2019-11-22 16:32:53, 147338		129.192.188.125	OCSP	348 Request			
52 2019-11-22 16:32:53, 153100	129.192.180.125	129.192.180.122	OCSP	733 Response			
55 2019-11-22 16:32:53, 154402	129.192.188.122	129.192.180.123	TLSv1.2	73 Alert (Level	: Fatal, Description:	Bad Certificate)	
ame 25: 73 bytes on wire (584 bi							
ame 25: 73 bytes on wire (584 bi hernet II, Src: Dell Sésai:83 (2) ange Scient Fortocol, Src ange Scient Control Protocol, Src IIS-12 Pecord Layer: Alert (Let Content Type: Alert (21) Version: TLS 1.2 (0x303) Length: 2 Alert Message Level: Fatal (2) Description: Bad Certificat	8c:2c:30:56:a1:83), f 129.192.180.122, Dst : Port: 54102, Dst Pc vel: Fatal, Descript:	ost: Winstars_08:8b:28 129.192.180.123 ort: 5000, Seq: 121, A					
hernet II, Src: Dell_56:ai:83 (3 ternet Protocol Version 4, Src: ansmission Control Protocol, Src Cure Sockets Layer TLSV1.2 Record Layer: Alert (Lev Content Type: Alert (21) Version: TLS 1.2 (0x6303) Length: 2 * Alert Message Level: Fatal (2)	8c:2c:30:56:a1:83), f 129.192.180.122, Dst : Port: 54102, Dst Pc vel: Fatal, Descript:	ost: Winstars_08:8b:28 129.192.180.123 ort: 5000, Seq: 121, A					

WINNF Test Requirements:

WINNF test requirements from WINNF-TS-0122-V1.0.0 CBRS CBSD Test Specification:

 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
oor and the or is rest ramess.	

Analysis of WINNF Test Requirements

1. From Client Hello can read: TLS version = TLS 1.2

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

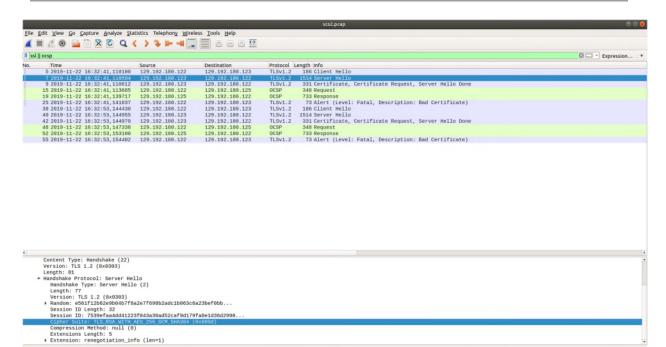
si II ocsp			S + Expression
Time	Source	Destination	Protocol Length Info
5 2019-11-22 16:32:41.110100		129.192.180.123	TLSV1.2 166 Client Hello
7 2019-11-22 16:32:41,110594		129,192,160,122	TLSV1.2 1514 Server Hello
9 2019-11-22 16:32:41,110612	129.192.180.123	129.192.180.122	TL5v1.2 331 Certificate, Certificate Request, Server Hello Done
15 2019-11-22 16:32:41,113685	129.192.180.122	129.192.180.125	OCSP 348 Request
19 2019-11-22 16:32:41,139717		129,192,188,122	OCSP 733 Response
25 2019-11-22 16:32:41,14103		129.192.188.123	TLSv1.2 73 Alert (Level: Fatal, Description: Bad Certificate)
38 2019-11-22 16:32:53,144430		129.192.180.123	TLSV1.2 166 Client Hello
40 2019-11-22 16:32:53,14495 42 2019-11-22 16:32:53,144970		129.192.180.122 129.192.180.122	TLSV1.2 1514 Server Hello TLSV1.2 331 Certificate, Certificate Request, Server Hello Done
48 2019-11-22 16:32:53,14497		129,192,180,122	OCSP 348 Request
52 2019-11-22 16:32:53, 14/330		129.192.180.122	OCSP 733 Response
55 2019-11-22 16:32:53, 15440		129,192,180,123	TLSv1.2 73 Alert (Level: Fatal, Description: Bad Certificate)
Handshake Protocol: Client H Handshake Type: Client He H Handshake Type: Client He H Handshake Type: Client He H H Handshake Type: Client He H			
Handshake Type: Client Hel Length: 111			
Handshake Type: Client Hel	lo (1)	3942d67b4c	

2. From Client Hello, cipher suite list is from WINNF approved list:

TLS_RSA_WITH_AES_128_GCM_SHA25 TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada



○ Z Cipher Suite (ssl.handshake.ciphersuite), 2 bytes

3. From Server Hello, cipher suite chosen: TLS_RSA_WITH_AES_128_GCM_SHA256

Packets: 60 · Displayed: 12 (20.0%)

Profile: Default

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ssl or	csp					Expression
	Time	Source	Destination	Protocol L	Length Info	
	5 2019-11-22 16:32:41,110100	129.192.180.122	129.192.180.123	TLSv1.2	186 Client Hello	
	7 2019-11-22 16:32:41,110594	129.192.188.123	129.192.188.122	TLSV1.2	1514 Server Hello	
	9 2019-11-22 16:32:41,110612	129.192.180.123	129.192.180.122	TLSV1.2	331 Certificate, Certificate Request, Server Hello Done	
	5 2019-11-22 16:32:41,113685	129.192.100.122	129,192.180.125	OCSP	348 Request	
		129.192.188.125 129.192.188.122	129,192,188,122	OCSP TLSV1.2	733 Response 73 Alert (Level: Fatal, Description: Bad Certificate)	
	8 2019-11-22 16:32:53, 144430	129.192.180.122	129.192.180.123	TLSV1.2	186 Client Hello	
		129.192.180.122	129,192,180,122	TLSv1.2	1514 Server Hello	
	2 2019-11-22 16:32:53,144970	129.192.188.123	129,192.180.122	TLSV1.2	331 Certificate, Certificate Request, Server Hello Done	
	8 2019-11-22 16:32:53,147338	129.192.180.122	129,192,180,125	OCSP	348 Request	
		129.192.188.125	129.192.188.122	OCSP	733 Response	
		129.192.180.122	129.192.180.123	TLSv1.2	73 Alert (Level: Fatal, Description: Bad Certificate)	
N	Content Type: Handshake (22) fersion: TLS 1.2 (0x0303) endth: 81					
ľ		10				
ľ	fersion: TLS 1.2 (0x0303) ength: 81					
1 N	Yersion: TLS 1.2 (0x0303) ength: 81 landshake Protocol: Server Hel Handshake Type: Server Hello Length: 77					
• H	<pre>lersion: TLS 1.2 (0x0303) ength: 81 landshake Protocol: Server Hell Handshake Type: Server Hell Length: 77 Version: TLS 1.2 (0x0303) Random: #561f12b62e9b04b7f8a</pre>	(2)	a23bef0bb			
v H	Version: TLS 1.2 (0x0303) ength: 81 Andshake Protocol: Server Hel Handshake Type: Server Hello Length: 77 Version: TLS 1.2 (0x0303)	0 (2) 12e7f698b2adc1b063c6				
v H	<pre>tersion: TLS 1.2 (0x0303) .ength: 81 Andshake Protocol: Server Hell Length: 77 Version: TLS 1.2 (0x0303) · Random: e561f12b62e904b7f8i Session 10 Length: 32</pre>	0 (2) x2e7f698b2adc1b063c6 8f643a30ad52caf9d179	fa8e1d36d2990			
v H	fersion: TLS 1.2 (0x0303) ength: 81 Handshake Protocol: Server Hell Length: 77 Version: TLS 1.2 (0x0303) Random: e561f12b62e004b7f86 Session ID Length: 32 Session ID: 7539efaa4dd41222	0 (2) a2e7f698b2adc1b063c6 3f643a30ad52caf9d179 AES_256_GCM_SHA384 (fa8e1d36d2990			
v v H	fersion: TLS 1.2 (0x0303) ength: 81 Handshake Protocol: Server Hell Handshake Type: Server Hell Length: 77 Version: TLS 1.2 (0x0303) Random: e561f12b52e9004776 Session ID: r539efaa4d64122; Session ID: r539efaa4d64122; Cipher Suite: TLS FSA WITH/ Compression Method: null (0) Extensions Length: 5	o (2) x2e7f698b2adc1b063c6 8f043a30ad52caf9d179 XES_256_GCM_SHA384 ()	fa8e1d36d2990			
, r	fersion: TLS 1.2 (0x6303) ength: 81 Handshake Protocol: Server Hell Handshake Type: Server Hell Length: 77 Version: TLS 1.2 (0x030) Random: e561f12b62e9b04b7f8 Session ID Length: 32 Session ID r539efna4dd4122; Cipher Suite: TLS 66A. WTH./ Compression Method: null (0	o (2) x2e7f698b2adc1b063c6 8f043a30ad52caf9d179 XES_256_GCM_SHA384 ()	fa8e1d36d2990			

4. Read OSCP Request/Response to/from server:

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

ssl ocsp					Expression
Time	Source	Destination	Protocol I	enath Info	
5 2019-11-22 16:32:41,110100	129,192,180,122	129,192,180,123	TLSV1.2	186 Client Mello	
7 2819-11-22 16:32:41,110594		129.192.188.122	TLSv1.2	1514 Server Hello	
9 2019-11-22 16:32:41,110612		129.192.180.122	TLSV1.2	331 Certificate, Certificate Request, Server Hello Done	
15 2019-11-22 16:32:41, 113685		129, 192, 180, 125	OCSP	348 Peruest	
19 2019-11-22 16:32:41.139717		129,192,180,122	OCSP	733 Response	
25 2819-11-22 16:32:41,141837		129.192.188.123	TLSv1.2	73 Alert (Level: Fatal, Description: Bad Certificate)	
38 2019-11-22 16:32:53,144430		129.192.180.123	TL5v1.2	186 Client Hello	
40 2019-11-22 10:32:53, 144955		129.192.180.122	TLSv1.2	1514 Server Hello	
42 2019-11-22 16:32:53, 144970		129,192,180,122	TLSV1.2	331 Certificate, Certificate Request, Server Hello Done	
48 2819-11-22 16:32:53,147338		129.192.188.125	OCSP	348 Request	
52 2019-11-22 16:32:53,153100		129,192,180,122	OCSP	733 Response	
55 2019-11-22 10:32:53, 154402		129,192,189,123	TLSv1.2	73 Alert (Level: Fatal, Description: Bad Certificate)	
ame 15: 348 bytes on wire (2784 hernet II, Src: Dell_56:a1:83 ()					

- online Certificate Status France. tbsRequest requestList: liten request reqCert Algorithm (SHA-1) Algorithm (SHA-1) issuerNameHash: ccb1008f0433045902f51c123551ed38b076a6c58 issuerKeyNash: 7d6dd01001c49027430ccb71ha4000192Abca717 serialNumber: 0x50fc2c3babc347daa608bba621ff09071c4c34cdf

				scsZ.pcap			
Edit View Go Capture Analyze Sta							
🔳 🖉 🙆 🥁 🗂 🕱 🖉 🔍 🤇	())						
ocsp							Expression - Expression
Time	Source	Destination	Protocol	Length Info			
5 2019-11-22 16:32:41,110100	129,192,180,122	129,192,180,123	TLSV1.2				
7 2819-11-22 16:32:41,110594		129.192.188.122		1514 Server Hello			
9 2019-11-22 16:32:41,110612		129.192.180.122	TLSV1.2 OCSP	331 Certificate, 348 Request	Certificate Request,	Server Hello Done	
15 2019-11-22 16:32:41, 113685 19 2019-11-22 16:32:41, 139717		129, 192, 180, 125	OCSP	733 Response			
25 2019-11-22 16:32:41,141037		129,192,180,123	TLSv1.2		Fatal, Description:	Bad Certificate)	
38 2819-11-22 16:32:53, 144438		129.192.188.123	TLSV1.2				
40 2019-11-22 16:32:53, 144955		129,192,180,122		1514 Server Hello			
42 2019-11-22 16:32:53,144970		129.192.180.122	TLSv1.2		Certificate Request,	Server Hello Done	
48 2019-11-22 16:32:53,147338		129.192.180.125	OCSP	348 Request			
52 2019-11-22 16:32:53,153100		129,192.180.122	OCSP	733 Response	and the second	and the second	
55 2819-11-22 16:32:53, 154482	129.192.188.122	129,192,188,123	TL5v1.2	73 Alert (Level	: Fatal, Description:	Bad Certificate)	
ernet II, Src: PcsCompu_1c:7c:b ernet Protocol Version 4, Src. smässion Control Protocol;	129.192.180.125, Dst Port: 80, Dst Port:	: 129.192.180.122 33368, Seq: 2897, Ad					
ernet Protocol Version 4, Src: nsmission Control Protocol, Src Reassembled TCP Segments (3563	129.192.180.125, Dst Port: 80, Dst Port:	: 129.192.180.122 33368, Seq: 2897, Ad					
ernet Protocol Version 4, Src: nsmission Control Protocol, Src Reassembled TCP Segments (3563 ertext Transfer Protocol	129.192.180.125, Dst Port: 80, Dst Port: bytes): #17(1448), #	: 129.192.180.122 33368, Seq: 2897, Ad					
ernet Protocol Version 4, Src:	129.192.180.125, Dst Port: 80, Dst Port: bytes): #17(1448), #	: 129.192.180.122 33368, Seq: 2897, Ad					
ernet Protocol Version 4, Src: nsmission Control Protocol, Src Reassembled TCP Segments (3563 ertext Transfer Protocol ine Certificate Status Protocol responseStatus: successful (0) responseBytes	129.192.180.125, Dst Port: 80, Dst Port: bytes): #17(1448), A	t: 129.192.180.122 : 33368, Seq: 2897, Ac #18(1448), #19(667)]					
ernet Protocal Version 4, Src: nsmission Control Protocol, Src Reassembled TCP Segments (3863) ertext Transfer Protocol ine Certificate Status Protocol esponseStatus: successful (0) esponseBytes ResponseType Id: 1,3.6,1.5.5.7	129.192.180.125, Dst Port: 80, Dst Port: bytes): #17(1448), A	t: 129.192.180.122 : 33368, Seq: 2897, Ac #18(1448), #19(667)]					
ernet Protocol Version 4, Src: smission Control Protocol, Src Reassembled TCP Segments (3563 ertext Transfer Protocol ine Certificate Status Protocol esponseStatus: successful (0) esponseByte Id: 1.3.6.1.5.7.7 BasicOCSPResponse	129.192.180.125, Dst Port: 80, Dst Port: bytes): #17(1448), A	t: 129.192.180.122 : 33368, Seq: 2897, Ac #18(1448), #19(667)]					
ernet Protocol Version 4, Src: smission Control Protocol, Src Reassembled TCP Segments (3563 eftext Transfer Protocol ine Certificate Status Protocol esponseštus: successful (0) esponsebytes Responsefype Id: 1.3.6.1.5.5.7 e BasicoCSPResponse * tbsResponsebata	129.192.180.125, Dst Port: 80, Dst Port: bytes): #17(1448), A	t: 129.192.180.122 : 33368, Seq: 2897, Ac #18(1448), #19(667)]					
ernet Protocol Version 4, Src: ismission Control Protocol, src Reassembled TCP Segments (3563 ertext Transfer Protocol ine Certificate Status Protocol exponseStatus: successful (0) exponseByte Id: 1.3.6.1.5.7.7 BasicOCSPResponse • tbsResponseData • responseDta • responseDta (1)	129.192.180.125, Det Port: 80, Dst Port: bytes): #17(1448), # 7,48.1.1 (id-pkix-oc	t: 129.192.180.122 : 33368, Seq: 2897, Ac #18(1448), #19(667)]					
ernet Protocol Version 4, src: smission control Protocol, src Reassembled TCP Segments (3563 ertext Transfer Protocol Ine Certificate Status Protocol esponseStatus: successful (0) esponseBytes ResponseType Id: 1.3.6.1.5.5.7 BasicOCSPResponse + tbsResponseData + responderID: byName (1) producedAt: 2019-11-22 16	129.192.180.125, Det Port: 80, Dst Port: bytes): #17(1448), # 7,48.1.1 (id-pkix-oc	t: 129.192.180.122 : 33368, Seq: 2897, Ac #18(1448), #19(667)]					
ernet Protocol Version 4, Src: ismission Control Protocol, src Reassembled TCP Segments (3563 ertext Transfer Protocol ine Certificate Status Protocol exponseStatus: successful (0) exponseByte Id: 1.3.6.1.5.7.7 BasicOCSPResponse • tbsResponseData • responseDta • responseDta (1)	129.192.180.125, Det Port: 80, Dst Port: bytes): #17(1448), # 7,48.1.1 (id-pkix-oc	t: 129.192.180.122 : 33368, Seq: 2897, Ac #18(1448), #19(667)]					
ernet Protocol Version 4, src: smission Control Protocol, src Reasembled TCP Segments (3503 ine Certificate Status Protocol esponseStatus successful (0) esponseBytes ResponseType Id: 1.3.6.1.5.5.7 BasicOCOPMesponse + responderTD: byName (1) produceAA:: 2019-11-22 16 + responses: 1 ltem + singleResponse + ceID	129.192.180.125, pst Port: 80, Dst Port: bytes): #17(1448), # 7.48.1.1 (id-pkix-oc :32:41 (UTC)	t: 129.192.180.122 : 33368, Seq: 2897, Ac #18(1448), #19(667)]					
ernet Protocal Version 4, src: smaission cancol, src Reassembled TCP Segments (3563 ertext Transfer Protocal ine Certificate Status Protocal mesponseStatus: successful (0) esponseBytes ResponsePytes Id: 1.3.6.1.5.5.7. BasicOCSPResponse + UbsResponseBata + responderID: byName (12) produceAt: 2019-11.2 + responseS: 1 liten + SingleResponse + certID - certStatus: revoked (129.192.180.125, pst Port: 80, Dst Port: bytes): #17(1448), # 7.48.1.1 (id-pkix-oc :32:41 (UTC)	t: 129.192.180.122 : 33368, Seq: 2897, Ac #18(1448), #19(667)]					
ernet Protocol Version 4, src: smaission control Protocol, src Reassembled TCP Segments (3563 ertext Transfer Protocol ine Certificate Status Protocol ResponseStatus successful (0) esponseBytes ResponseType Id: 1.3.6.1.5.5.7. BasicoCSPResponse + thsResponseTta + thsResponseTta + thsResponse + certStatus: revoked (+ response: + certStatus: revoked (+ revoked	129.192.180.125, pst Port: 80, Dst Port: bytes): #17(1448), # 7.48.1.1 (id-pkix-oc :32:41 (UTC)	t: 129.192.180.122 : 33368, Seq: 2897, Ac #18(1448), #19(667)]					
ernet Protocol Version 4, src: smission Control Protocol, src Reasembled TCP Segments (3563) line Certificate Status Protocol line Certificate Status Protocol MasinceSPheesponse * UbsResponseData heresponderTD: byName (1) produce4At: 2019-11-22 16 * responses: 1 11cm * SingleResponse } treshoft: SingleResponse trespondes: 1 11cm * responses: 1 11cm	129.192.180.125, pst Port: 80, Dst Port: bytes): #17(1448), # ".48.1.1 (id-pkix-oc :32:41 (UTC) 1) 9 21:53:51 (UTC)	t: 129.192.180.122 : 33368, Seq: 2897, Ac #18(1448), #19(667)]					
ernet Protocol Version 4, src: smission Control Protocol, src Reasembled TCP Segments (3563 ertext Transfer Protocol ine Certificate Status Protocol esponseStatus: successful (0) esponseBytes Responstype Id: 1.3.6.1.5.5.7. BasicOCSPMesponse - tisReeponstative - tisReeponstative - tisReeponstative - tisReeponse - certID - certIStatus: revoked (- revoked	129.192.180.125, pst Port: 80, Dst Port: bytes): #17(1448), # ".48.1.1 (id-pkix-oc :32:41 (UTC) 1) 9 21:53:51 (UTC)	t: 129.192.180.122 : 33368, Seq: 2897, Ac #18(1448), #19(667)]				Packets: 60 - Displayed: 12 (20.0%)	Profile: D

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

		the second s		_	scs2.pcap	
	Edit View Go Capture Analyze Sta					
4	ocsp					Expression
	Time	Source	Destination		Length Info	
	5 2019-11-22 16:32:41,110100	129.192.189.122	129.192.180.123	TLSv1.2		
	7 2019-11-22 16:32:41,110594	129,192,180,123	129,192,180,122		1514 Server Hello	
	9 2019-11-22 16:32:41,110612		129,192,180,122	TLSv1.2		
	15 2019-11-22 16:32:41,113685		129.192.180.125	OCSP	348 Request	
	19 2019-11-22 16:32:41,139717		129.192.180.122 129.192.180.123	OCSP TLSv1.2	733 Response	
	25 2019-11-22 16:32:41,141037 38 2019-11-22 16:32:53,144430		129,192,189,123	TLSV1.2 TLSV1.2		
	40 2019-11-22 16:32:53, 144436		129,192,180,123		1514 Server Hello	
	40 2019-11-22 10:32:53, 144955 42 2019-11-22 16:32:53, 144970		129.192.188.122	TL5v1.2		
	48 2019-11-22 16:32:53, 144970		129,192,188,125	OCSP	348 Request	
ł	52 2019-11-22 16:32:53,153100		129,192,180,122	OCSP	733 Resource	
i	55 2019-11-22 16:32:53,154402		129.192.180.123	TLSv1.2		
ł	ame 52: 733 bytes on wire (5864 hernet II, Src: PesCompu_1::7cb	8 (08:00:27:1c:7c:b)	B), Dst: Dell_56:a1:83	3 (3c:2c:30:	:56:a1:83)	
t t	hernet II, Src: PcsCompu_1c:7c:b ternet Protocol Version 4, Src: ansmission Control Protocol, Src	8 (08:00:27:1c:7c:b) 129.192.180.125, Ds Port: 80, Dst Port	<pre>B), Dst: Dell_56:a1:83 t: 129.192.180.122 : 33530, Seq: 2897, Ac</pre>			
ta	hernet II, Src: PcsCompu_1c:7c:b ternet Protocol Version 4, Src: ansmission Control Protocol, Src Reassembled TCP Segments (3563	8 (08:00:27:1c:7c:b) 129.192.180.125, Ds Port: 80, Dst Port	<pre>B), Dst: Dell_56:a1:83 t: 129.192.180.122 : 33530, Seq: 2897, Ac</pre>			
t a	hernet II, Src: PcsCompu_1c:7c:b ternet Protocol Version 4, Src: ansmission Control Protocol, Src Reassembled TCP Segments (3563 pertext Transfer Protocol	8 (08:00:27:1c:7c:b) 129.192.180.125, Dsi Port: 80, Dst Port bytes): #50(1448), #	<pre>B), Dst: Dell_56:a1:83 t: 129.192.180.122 : 33530, Seq: 2897, Ac</pre>			
	hernet II, Src: PcsCompu_lc:7c:b ternet Protocol Version 4, Src: ansmission Control Protocol, Src Reassembled TCP Segnents (3563 pertext Transfer Protocol line Certificate Status Protocol	8 (08:00:27:1c:7c:b) 129.192.180.125, Dsi Port: 80, Dst Port bytes): #50(1448), #	<pre>B), Dst: Dell_56:a1:83 t: 129.192.180.122 : 33530, Seq: 2897, Ac</pre>			
	hernet II, Src: PcsCompu_ic:7c:b ternet Protocol Version 4, Src: ansmission Control Protocol, Src Reassembled TCP Segments (3563 pertext Transfer Protocol line Certificate Status Protocol responseStatus: successful (0)	8 (08:00:27:1c:7c:b) 129.192.180.125, Dsi Port: 80, Dst Port bytes): #50(1448), #	<pre>B), Dst: Dell_56:a1:83 t: 129.192.180.122 : 33530, Seq: 2897, Ac</pre>			
	hernet II, Src: PcsCompu_ic:7c:b ternet Protocol Version 4, Src: ansmission Control Protocol, Src Reassembled TCP Segments (3563 pertext Transfer Protocol line Certificate Status Protocol responseStatus: successful (0)	8 (08:00:27:1c:7c:b) 129.192.180.125, Dsi Port: 80, Dst Port bytes): #50(1448), #	8), Dst: Dell_56:a1:83 t: 129.192.188.122 : 33530, Seq: 2897, Ac #51(1448), #52(667)]			
	hernet II, Src: PesCompu_1c:7c:b ternet Protocol Version 4, Src: ansmission Control Protocol, Src Reassembled TCP Segments (3563 pertext Transfer Protocol line Certificate Status Protocol responseStatus: successful (0) responseStets	8 (08:00:27:1c:7c:b) 129.192.180.125, Dsi Port: 80, Dst Port bytes): #50(1448), #	8), Dst: Dell_56:a1:83 t: 129.192.188.122 : 33530, Seq: 2897, Ac #51(1448), #52(667)]			
	hernet II, Src: Pescompu.lc:7cb ternet Protocol Version 4, Src: ansmission Control Protocol, Src Reassembled TCP Segments (3563 pertext Transfer Protocol line Certificate Status Protocol responseBytus: successful (0) responseBytype Id: 1.3.6.1.5.5.7	8 (08:00:27:1c:7c:b) 129.192.180.125, Dsi Port: 80, Dst Port bytes): #50(1448), #	8), Dst: Dell_56:a1:83 t: 129.192.188.122 : 33530, Seq: 2897, Ac #51(1448), #52(667)]			
	hernet II, Src: PcsCompu.ic/7cb ternet Protocol Version 4, Src: ansmission Control Protocol, Src Reassenbled TCP Segments (3563 inc Certificate Status Protocol inc Certificate Status Protocol responseStatus: successful (0) responseStytes ResponseType Id: 1.3.6.1.5.5.7 # BasicoCSPResponse * tbsResponseData > responseTyte JWaane (1)	8 (08:09:27:1c:7c:bi 129.192.180.125, Dsi Port: B0, Dst Port bytes): #50(1448), # 7.48.1.1 (id-pkix-oc	8), Dst: Dell_56:a1:83 t: 129.192.188.122 : 33530, Seq: 2897, Ac #51(1448), #52(667)]			
	hernet II, Src: PcsCompu.ic.7cb ternet Protocol Version 4, Src: mammassion Control Protocol, Src Reassenbled TCP Segments (3563 pertext Transfer Protocol line Certificate Status Protocol responseStatus: successful (0) BesponseType Id 1.3.6.15.5.7 * BasiLOCSPResponse * tbsReponseData * tbsReponseData	8 (08:09:27:1c:7c:bi 129.192.180.125, Dsi Port: B0, Dst Port bytes): #50(1448), # 7.48.1.1 (id-pkix-oc	8), Dst: Dell_56:a1:83 t: 129.192.188.122 : 33530, Seq: 2897, Ac #51(1448), #52(667)]			
	hernet II, Src: PcsCompu.ic.7cb ternet Protocol Version 4, Src: ansmission Control Protocol, Src Reassenbled TCP Segments (3563 pertext Transfer Protocol line Certificate Status Protocol responseStatus: successful (0) ResponseType Id: 1.3.6.1.5.5.7 BasicoCSPResponse * tbsResponsedata > responsetz 2013-122 16 producedAt: 2013-11-22 16 * responses: 1 liem	8 (08:09:27:1c:7c:bi 129.192.180.125, Dsi Port: B0, Dst Port bytes): #50(1448), # 7.48.1.1 (id-pkix-oc	8), Dst: Dell_56:a1:83 t: 129.192.188.122 : 33530, Seq: 2897, Ac #51(1448), #52(667)]			
	hernet II, Src: PcsCompu.ic.7cb ternet Protocol Version 4, Src: amamission Control Protocol, Src Reassembled TCP Segments (3563 Dertext Transfer Protocol line Certificate Status Protocol responseStatus: successful (0) - responseStre 1:1.3.6.1.5.5.7 - BasiLoCSPResponse + tbsReponseData + tresponseData - responseData - responses: 1:1ee - SingleResponse	8 (08:09:27:1c:7c:bi 129.192.180.125, Dsi Port: B0, Dst Port bytes): #50(1448), # 7.48.1.1 (id-pkix-oc	8), Dst: Dell_56:a1:83 t: 129.192.188.122 : 33530, Seq: 2897, Ac #51(1448), #52(667)]			
	hernet II, Src: PcsCompu.ic.7cb ternet Protocol Version 4, Src: ansmission Control Protocol, Src Reassenbled TCP Segments (3563 pertext Transfer Protocol line Certificate Status Protocol responseStatus: successful (0) ResponseType Id: 1.3.6.1.5.5.7 BasizoCSPResponse * tbsResponsedata > responsetytes (2019-11-22 16 * responses: 1 item * SingleResponse > totpleResponse > totpleResponse > certD	8 (08:00:27:10:7c;10) 170:192:102:103 Port: 80, Dst Port bytes): #50(1448), ('.48.1.1 (id-pkix-oc :32:53 (UTC)	8), Dst: Dell_56:a1:83 t: 129.192.188.122 : 33530, Seq: 2897, Ac #51(1448), #52(667)]			
	hernet II, Src: PcsCompu.ic.7cb ternet Protocol Version 4, Src: amsmission Control Protocol, Src Reassenbled TCP Segments (3563 pertext Transfer Protocol line Certificate Status Protocol responseStatus: successful (0) BesicoSCPPupE Id: 1.3.6.1.5.5.7 BesicoSCPPupE Id: 1.3.6.1.5.5.7 BesicoSCPPupE Id: 1.3.6.1.5.5.7 HersponderID: byName (1) producedAt: 2015.1.5.2 v responses: 1 item • SingleResponse • certID • certStatus: revoked {	8 (08:00:27:10:7c;10) 170:192:102:103 Port: 80, Dst Port bytes): #50(1448), ('.48.1.1 (id-pkix-oc :32:53 (UTC)	8), Dst: Dell_56:a1:83 t: 129.192.188.122 : 33530, Seq: 2897, Ac #51(1448), #52(667)]			
	hernet II, Src: PcsCompu.ic.7cb ternet Protocol Version 4, Src: ansmission Control Protocol, Src Reassenbled TCP Segments (3563 pertext Transfer Protocol line Certificate Status Protocol responseStatus: successful (0) ResponseType Id: 1.3.6.1.5.5.7 BasizoCSPResponse * tbsResponsedata > responsetytes (2019-11-22 16 * responses: 1 item * SingleResponse > totpleResponse > totpleResponse > certD	<pre>8 (08:00:27:1c:7c;b) 120:192:102.103 Port: 80, Dst Port bytes): #50(1448), ('.48.1.1 (id-pkix-oc :32:53 (UTC) 1)</pre>	8), Dst: Dell_56:a1:83 t: 129.192.188.122 : 33530, Seq: 2897, Ac #51(1448), #52(667)]			

5. Authentication exchange ends with TLS Alert message (i.e. authentication fails):

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					ses2.pcap			
Eile Edit Vie	ew Go Capture Analyze Sta	atistics Telephony Wire	less Tools Help					
	🖲 🥁 🗂 🗙 🖸 🔍	() + = =						
ssl ocsp								Expression +
No. Tim	-	Source	Destination	Dreteral	Length info			
	9-11-22 16:32:41,110100	129.192.180.122	129.192.180.123		186 Client Hello			
	19-11-22 16:32:41,116594	129.192.186.123	129.192.180.122		1514 Server Hello			
	9-11-22 16:32:41,110612	129.192.188.123	129,192.180.122	TLSV1.2		Certificate Request,	Server Hello Done	
	19-11-22 16:32:41,113685		129.192.188.125	OCSP	348 Request			
	19-11-22 16:32:41, 139717		129.192.188.122	OCSP	733 Response			
25 201	19-11-22 16:32:41,141037	129.192.180.122	129.192.180.123	TLSV1.2	73 Alert (Level	: Fatal, Description:	Bad Certificate)	
	9-11-22 16:32:53,144430	129.192.180.122	129.192.180.123		186 Client Hello			
	19-11-22 16:32:53,144955	129.192.188.123	129.192.180.122		1514 Server Hello			
			129,192.180.122	TLSV1.2		Certificate Request,	Server Hello Done	
	19-11-22 16:32:53,147338	129.192.188.122	129.192.188.125	OCSP	348 Request			
	19-11-22 16:32:53,153100		129.192.180.122	OCSP	733 Response			
55 201	19-11-22 16:32:53,154402	129.192.180.122	129.192.180.123	TLSv1.2	73 Alert (Level	Fatal, Description:	Bad Certificate)	
Ethernet : Internet :	73 bytes on wire (584 bi II, Sre: Dell.86:at:83 (3 Protocol Version 4, Sre: ion Control Protocol, Src kets Layer	3c:2c:30:56:a1:83), 1 129.192.180.122, Ds	Dst: Winstars_08:8b:2 t: 129.192.180.123					,
Conte Versi Lengt + Alert Lev	Record Layer: Alert (Len nt Type: Alert (21) on: TLS 1.2 (0x0303) h: 2 Message e2: Fatal (2) coription: Bad Certificat		ion: Bad Certificate)					
⊖ ₹ scs2.pe	cap						Packets: 60 - Displayed: 12 (20.0%)	Profile: Default

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6. Registration request message is not received at Test Harness (authentication fails)

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

WINNF.FT.C.SCS.3

Packet Capture Sequence

					scs3.pcap	00
Eile J	dit View Go Capture Analyze Sta	atistics Telephony Wirel	less Tools Help			
41	I 🖉 🛛 🚔 🗋 🕱 🖸 🔍 🤄	()31-4				
	- the test test test					
ssi						Expression
No.	Time	Source	Destination		Length Info	
	4 2019-11-22 17:26:30,021757 6 2019-11-22 17:26:30,022332		129.192.180.123 129.192.180.122	TUSV1.2 TUSV1.2	186 Client Hello 1514 Server Hello	
	8 2019-11-22 17:26:30,022347	129.192.180.123	129.192.180.122	TLSv1.2	207 Certificate, Certificate Request, Server Hello Done	
	11 2019-11-22 17:26:30,023091	129.192.180.122	129.192.180.123	TLSv1.2	73 Alert (Level: Fatal, Description: Bad Certificate)	
•	Length: 115					
	Handshake Protocol: Client Hel	110				
	Handshake Type: Client Hell					
	Length: 111 Version: TLS 1.2 (8x8383)					
	Random: 760bd555e6760f0b63a	71578c6cd47b2ad3bfdc	6fb43ef12			
	Session ID Length: 0					
	Cipher Suites Length: 10					
	 Cipher Suites (5 suites) Cipher Suite: TLS RSA WIT 		(0-0004)			
	Cipher Suite: TLS_RSA_WIT Cipher Suite: TLS_RSA_WIT					
	Cipher Suite: TLS_ECDHE_E					
	Cipher Suite: TLS_ECDHE_E					
	Cipher Suite: TLS_ECDHE_R		_SHA256 (0xc02f)			
	Compression Methods Length: Compression Methods (1 methods)					
	Extensions Length: 60	iou)				
	+ Extension: status_request (.	len=5)				
	c8 c1 16 03 01 00 73 01 00 00		······································			
	55 e6 76 ef eb 63 a7 15 78 ce		U-VC XG;-			
	c6 fb 43 ef 12 12 3d 40 2d 4d 80 9d 80 9c c8 2b c8 2c c8 2t		C···=@ -Le·····			
07	Maximum version supported by client (ssl.handshake.version), 2 b	wtes		Packets: 18 - Displayed: 4 (22.2%)	Profile: Defau

WINNF Test Requirements:

WINNF test requirements from WINNF-TS-0122-V1.0.0 CBRS CBSD Test Specification:

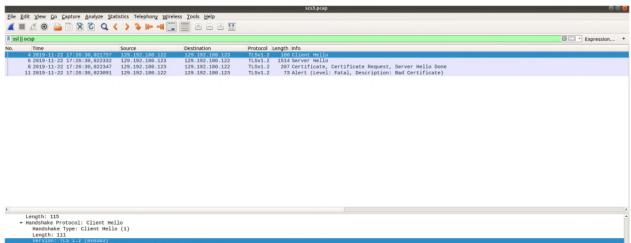
	 Make sure that UUT uses TLS v1.2 for security establishment. 	
	 Make sure UUT selects the correct cipher suite. 	
2	 UUT shall use CRL or OCSP to verify the validity of the server certificate. 	PASS
	 Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness. 	

Analysis of WINNF Test Requirements

1. From Client Hello can read: TLS version = TLS 1.2

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Client	Ericsson	
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Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada



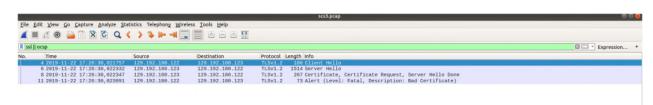
<pre>Length: 115 Handshake Protocol: Client Hello Handshake Protocol: Client Hello (1) Length: 111 Versinn: 115 1.2 (\$\$2023) Randomic 760405562760f60503371578c6cd47b2ad5bfdc6fb43ef12</pre>		9
Session ID Length: 0 Cipher Suites (stautes) Cipher Suites (stautes) Cipher Suite: TLS,RSA, MITH_AES_256_GCM_SHA384 (0x000d) Cipher Suite: TLS,RSA, MITH_AES_120_GCM_SHA256 (0x000d) Cipher Suite: TLS,ECHE_ECOSA, MITH_AES_256_GCM_SHA356 (0x002d) Cipher Suite: TLS_ECHE_ECOSA, MITH_AES_256_GCM_SHA356 (0x002f) Cipher Suite: TLS_ECHE_ECOSA, MITH_AES_256_GCM_SHA256 (0x002f)		
Compression Methods Length: 1 Compression Methods (1 method) Extensions Length: 60 Extension: status_request (1m=5)		
0046 c8 c1 16 03 01 00 73 01 00 00 0 ² 03 00 70 00 05		į
Maximum version supported by client (ssl.handshake.version), 2 bytes	Packets: 18 - Displayed: 4 (22.2%)	Profile: Default

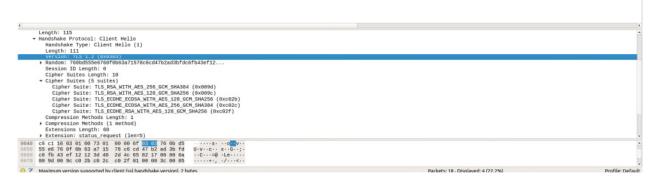
2. From Client Hello, cipher suite list is from WINNF approved list:

TLS_RSA_WITH_AES_128_GCM_SHA25 TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada





3. From Server Hello, cipher suite chosen: TLS_RSA_WITH_AES_128_GCM_SHA256

	Edit View Go Capture Analyze Sta							
ssi	ocsp							Expression *
ło.	Time	Source	Destination	Protocol	Length Info			
	4 2019-11-22 17:26:30,021757	129.192.180.122	129.192.180.123	TLSv1.2	186 Client Hello			
	6 2019-11-22 17:26:30,022332	129.192.180.123	129.192.188.122	TLSv1.2	1514 Server Hello			
	8 2019-11-22 17:26:30,022347	129.192.180.123	129.192.180.122	TLSV1.2	207 Certificate,	Certificate Request, Se	rver Hello Done	
	11 2019-11-22 17:26:30,023091	129.192.180.122	129.192.180.123	TLSv1.2	73 Alert (Level:	Fatal, Description: Ba	d Certificate)	

(•
 Frame 6: 1514 bytes on wire (12112 bits), 1514 bytes c Ethernet II, Src: Winstars_08:8b:28 (60:3f:5d:08:8b:28) Internet Protocol Version 4, Src: 129.192.180.123, Dst Transmission Control Protocol, Src Port: 5000, Dst Por Secure Sockets Laver), Dst: Dell_56:a1:83 (3c:2c:30:56:a1:83) : 129.192.180.122		-
 TLSV1.2 Record Layer: HandShake Protocol: Server Hel Content Type: HandShake (22) Version: TLS 1.2 (0x0303) Length: 81 HandShake Type: Server Hello HandShake Type: Server Hello (2) Version: TLS 1.2 (0x0303) Random: 3a29a75908078f4aBs10e72debh3a0573451f. Session 1D: 09434343290572d2dh3310e6008095ad7 	452380701		
Cipher Suite: TLS GGA WTH AES 256 GCM SHA384 (0 Compression Hethod: null (0) Extensions Length: 5 A Fordamin: Creating and the time of the	Freed) Freedom (1971) Grand (19		
Cipher Suite (ssl.handshake.ciphersuite), 2 bytes		Packets: 18 · Displayed: 4 (22.2%)	Profile: Default

Page 64 of 80 Report Issued: 12/16/2019	Report File #: 7169007030-CBRS-000
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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

4. Authentication exchange ends with TLS Alert message (i.e. authentication fails):

Eile Edit View Go Capture Analyze Sta	tistics Telephony Wirel	ess Iools Help						
🛋 🔳 🖉 😳 🍙 🗋 🗙 🏹 Q, (() 3 1							
II ssl ocsp							Ø	Expression +
No. Time	Source	Destination	Protocol	Length Info				
4 2019-11-22 17:26:30,021757	129.192.180.122	129.192.180.123	TLSv1.2	186 Client Hello				
6 2019-11-22 17:26:30,022332	129.192.180.123	129,192,180,122	TLSV1.2	1514 Server Hello	Constituents Dominant Con	tion Helle Deer		
B 2019-11-22 17:26:30,022347 11 2019-11-22 17:26:30,023091	129.192.180.123	129.192.180.122 129.192.180.123			Certificate Request, Ser Fatal, Description: Bas			
4								
Frame 11: 73 bytes on wire (584 bit)								
Ethernet II, Src: Dell_56:a1:83 (3) Internet Protocol Version 4, Src:			(80:3f:5d	:08:8b:28)				
 Transmission Control Protocol, Src. 			ck: 3038, I	.en: 7				
 Secure Sockets Layer 								
TLSv1.2 Record Layer: Alert (Lev Content Type: Alert (21)	el: Fatal, Descript:	ion: Bad Certificate)						
Version: TLS 1.2 (0x0303)								
Length: 2								
 Alert Message 								
Level: Fatal (2) Description: Bad Certificat	e (42)							
beschaptaon, bus certained	- ()							
0010 00 3b ed 4a 40 00 3f 06 e1 fl	81 c0 b4 7a 81 c0	-;-J0-7z						
8828 b4 7b 9e 68 13 88 d4 9d 61 ca	a e7 d8 ce 01 80 18	{ . h						
8038 01 14 db dc 00 00 01 01 08 6 8048 c8 c2 15 03 03 00 02 02 2a	a e3 70 ba 1e 44 bc	p - D						
								-
Record Layer (ssl.record), 7 bytes						Packets: 18 · Displayed: 4 (22.2%)		Profile: Default

5. Registration request message is not received at Test Harness (authentication fails)

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

Fills Many Co. Contains Applian Cha				scs3.pcap	
	tistics Telephony Wirel				
I d 🛛 🚔 🗋 🗙 🖉 🔍 (()+++				
ocsp					Expression.
Time	Source	Destination		Length Info	
4 2019-11-22 17:26:30,021757		129.192.180.123		2 186 Client Hello	
6 2019-11-22 17:26:30,022332 8 2019-11-22 17:26:30,022347		129.192.180.122	TLSV1.2	2 1514 Server Hello 2 207 Certificate, Certificate Request, Server Hello Done	
11 2019-11-22 17:26:30,0223091		129.192.180.123	TLSV1.2	73 Alert (Level: Fatal, Description: Bad Certificate)	
▼ Certificates (2867 bytes)					
Certificate Length: 1293	02f1a003020102021450	1fc2c3babc347daa6 (1d-at-commo	monMame=129.192.180.123.1d-at-organizationalUnitName=WInnForum SAS Provider Certificate.id-at-organi	zationName=Er
Certificate Length: 1293 • Certificate: 308/25093082 • signedCertificate version: v3 (2) serialNumber: 0x50r(2) > signature (sha250with > issue: rdhSequence (• validity • notBefore: utcTime utcTime: 19-11-1 • notAfter: utcTime	2c3babc347daa698ba62: RESAEncryption) (0) (0) 9 20:48:29 (UTC) (0)		id-at-commo	nonName=129.192.180.123,id-at-organizationalUnitName=WInnForum SAS Provider Certificate,id-at-organi	zationName=Er
Certificate Length: 1233 Certificate: 30820603082 * signedCertificate version: v3 (2) serialNumber: 0x507cf > signature (sha250kit > issuer: rdnSequence (* validity * notBefore: ucTime utClime: 19-11-1 * notAfter: utClime	2c3babc347daa698ba62; hRSAEncryption) (0) 9 28:48:29 (UTC) (0) 6 726:48:29 (UTC)		id-at-conno	monName=129.192.180.123,1d-at-organizationalUnitName=WInnForum SAS Provider Certificate,1d-at-organi	ZationName=Er
Certificate Length: 1293 Certificate: 30820503082 * signedCertificate version: v3 (2) serialNumber: 0x507C + signature (sha250xit + issuer: rdnSequence (villafore: 19-11- + notAfter: utoTime utoTime: 19-11- + subject: rdnSequence	2c3babc347daa698ba62; hRSAEncryption) (0) 9 28:48:29 (UTC) (0) 6 726:48:29 (UTC)		id-at-commo	nonName=129.192.180.123,id-at-organizationalUnitName=WInnForum SAS Provider Certificate,id-at-organi	zationName=Er
Certificate Length: 1233 Certificate: 308205033082 * signedCertificate version: v3 (2) serialNumber: 0x507cf > signature (sha250xiff > issuer: rdn5equence (* validity * notBefore: ucTime utfine: 19-11-1 * notAfter: utfine utfine: 19-11-2	2c3babc347daa698ba62; hRSAEncryption) (0) 9 28:48:29 (UTC) (0) 6 726:48:29 (UTC)		id-at-commo	nonName=129.192.180.123,id-at-organizationalUnitName=WInnForum SAS Provider Certificate,id-at-organi	ZationName=Er
Certificate Length: 1293 Certificate: 30820593382 * signedcertificate version: v3 (2) serialNumber: 0x507C + signature (sha2504it + issuer: rdnSequence (validity * notBefore: utcTime utcTime: 1511e utcTime: 1511e * subjectPublickeyInfo * subjectPublickeyInfo * subjectPublickeyInfo * subjectPublickeyInfo * Extension Idi 2: Extension Idi 2:	2c3babc347daa698ba62; RSAEncryption) (0) (0) 9 20:48:29 (UTC) (0) 9 20:48:29 (UTC) (8) ubjectKeyIdentifier) 5.29.14 (id-ce-subje	1ff99971c4c34cde		nonName=129.192.180.123,id-at-organizationalUnitName=wInnForum SAS Provider Certificate,id-at-organi	ZationName=Er

¹ 0800 <u>31 39 31 31 32 30 32 30 34 38 32 39 50</u> 30 67 31 <u>19112020 48292</u>001 0800 0b 30 09 06 03 55 84 06 13 02 55 53 31 11 30 0f -0...U....US1.0.

Frame (207 bytes) Reassembled TCP (2879 bytes)

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

WINNF.FT.C.SCS.4

Packet Capture Sequence

					*enx803f5d088b28	000
	dit View Go Capture Analyze Statistic					
41	I 🖉 🛛 🚞 🗋 🗙 🙆 🔍 🔹	• • 🕾 Ŧ ± 🗔	0,0,0,1			
II ssi						Expression +
No.	Time	Source	Destination	Protocol	Length info	
1	5 2010-11-22 18:20:03,6166657.	. 129.192.180.122	129.192.180.123	TLSv1.2	185 Client Hello	
	7 2019-11-22 18:20:03,6171850. 9 2019-11-22 18:20:03,6172056.		129.192.180.122 129.192.180.122		1514 Server Hello 211 Certificate, Certificate Request, Server Hello Done	
	12 2019-11-22 18:20:03, 6179351.		129.192.180.122		73 Alert (Level: Fatal, Description: Bad Certificate)	
•	Handshake Protocol: Client Hel					۱ ا
	Handshake Type: Client Hello Length: 111	o (1)				
	Version: TLS 1.2 (0x0303)					
	 Random: 2b0a6de3e3a7786e7a3: Session ID Length: 0 	3a338d8e7711121514582	2cbc4266c			
	Cipher Suites Length: 10					
	 Cipher Suites (5 suites) Cipher Suite: TLS, RSA, WIT Cipher Suite: TLS, RSA, WIT Cipher Suite: TLS, ECDHE_E Cipher Suite: TLS_ECDHE_E Cipher Suite: TLS_ECDHE_E Compression Methods Length: Compression Methods (1 meth- Extensions Length: 60 	H_AES_128_GCM_SHA256 CDSA_WITH_AES_128_GCM CDSA_WITH_AES_128_GCM SA_WITH_AES_128_GCM_S 1	(0x009c) M_SHA256 (0xc02b) M_SHA384 (0xc02c)			
	+ Extension: status_request ()	Len=5)				
9959 9869 9879	d1 dc 16 03 01 00 73 01 00 08 e3 e3 a7 78 6e 7a 33 a3 38 d8 82 cb c4 26 6c 2f 22 88 42 c3 00 9d 00 9c c0 2b c6 2c c0 2f	0 6f 93 03 2b 0a 6d 8 e7 71 11 21 51 45 8 ed 9d 79 00 00 0a 91 00 00 3c 00 05	···xnz3· 8··q·!QE ···&1/" B···y··			
	00 05 01 00 00 00 00 00 0a 00		******			
08	wireshark_enx803f5d088b28_201911221019	39_Mg27jn.pcapng			Packets: 22 - Displayed: 4 (18.2%)	Profile: Default

WINNF Test Requirements:

WINNF test requirements from WINNF-TS-0122-V1.0.0 CBRS CBSD Test Specification:

2	 Make sure that UUT uses TLS v1.2 for set Make sure UUT selects the correct cipher UUT shall use CRL or OCSP to verify th 	r suite.
	 Certificate Make sure that Mutual authentication doe UUT and the SAS Test Harness. 	es not happen between
-		

Analysis of WINNF Test Requirements

1. From Client Hello can read: TLS version = TLS 1.2

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

					*enx803f5d088b28	e e e
File E	dit View Go Capture Analyze Statistic	s Telephony <u>Wireless</u> <u>To</u>	ols <u>H</u> elp			
41	. 2 0 🗖 🗋 🖉 🔍 4		0,0,0,1			
		=	- • • •			
ssi		-				Expression +
No.	Time 5 2019-11-22 18:20:03, 6166657	Source 129, 192, 188, 122	Destination 129.192.180.123	TLSv1.2	Length Info 2 186 Client Hello	
	7 2019-11-22 18:20:03,6171850	. 129.192.188.123	129.192.180.122	TLSv1.2	1514 Server Hello	
	9 2019-11-22 18:20:03,6172056 12 2019-11-22 18:20:03,6179351		129.192.180.122 129.192.180.123	TLSv1.2 TLSv1.2	 211 Certificate, Certificate Request, Server Hello Done 73 Alert (Level: Fatal, Description: Bad Certificate) 	
	16 6010 11 66 10.60.00,0110001	- 250-206-200-256	150.105.100.120	1601212	. is made (Lover, Facar, Beschaptron, and Generationes)	
4						
	- Handshake Protocol: Client He	110				
	Handshake Type: Client Hell	0 (1)				
	Length: 111 Version: TLS 1.2 (0x0303)					
	Random: 2b0a6de3e3a7786e7a3	3a338d8e771112151458	2cbc4266c			
	Session ID Length: 0 Cipher Suites Length: 10					
	 Cipher Suites (5 suites) 					
	Cipher Suite: TLS_RSA_WIT					
	Cipher Suite: TLS_RSA_WIT					
	Cipher Suite: TLS_ECDHE_E Cipher Suite: TLS_ECDHE_E					
	Cipher Suite: TLS_ECDHE_R	SA_WITH_AES_128_GCM_				
	Compression Methods Length:					
	 Compression Methods (1 meth Extensions Length: 60 	od)				
	Extension: status_request (
6649	d1 dc 16 03 01 00 73 01 00 0		·····s· ··o <mark>··</mark> +·m			
0050	e3 e3 a7 78 6e 7a 33 a3 38 d	B e7 71 11 21 51 45	xnz3- 8q-!QE			
8869 8878	82 cb c4 26 6c 2f 22 88 42 c 88 9d 66 9c c8 2b c8 2c c8 2		····&1/"· B····y···			
0070						
07	wireshark enx803f5d088b28 20191122101	939 MgZ7in.pcapng			Packets: 22 - Displayed: 4 (18.2%)	Profile: Default
-						

2. From Client Hello, cipher suite list is from WINNF approved list:

TLS_RSA_WITH_AES_128_GCM_SHA25 TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

					*enx803f5d088	b28		ê G 😣
file	Edit View Go Capture Analyze Statis	ics Telephony <u>Wireless</u>	ols <u>H</u> elp					
	P 🖸 🗶 🗂 🔳 🔘 🔈 📕	*****						
								Expression +
No.	Time	Source	Destination	Protocol	Length Info			
	5 2019-11-22 18:20:03,616665		129.192.180.123	TLSv1.2	186 Client Hello			
	7 2819-11-22 18:28:03,617185 9 2819-11-22 18:28:03,617285		129.192.188.122 129.192.188.122	TLSV1.2	1514 Server Hello	Certificate Request,	Server Hello Done	
	12 2019-11-22 18:20:03, 617935		129.192.180.123	TLSV1.2	73 Alert (Level:	Fatal, Description:	Bad Certificate)	
4								*
	ansmission Control Protocol, Sr cure Sockets Laver	c Port: 5000, Dst Po	rt: 55032, Seq: 1, Ac	k: 121, Len:	: 1448			*
	TLSv1.2 Record Layer: Handshake	Protocol: Server He	110					
	Content Type: Handshake (22)							
	Version: TLS 1.2 (0x0303)							
	Length: 81							
	 Handshake Protocol: Server H Handshake Type: Server Hel 							
	Length: 77	10 (2)						
	Version: TLS 1.2 (0x0303)							
	Random: fca06816ae055398fd	7570b12f4a775555e809t	042d7d424					
	Session ID Length: 32							
_	Session ID: 485762f522b6aa							
	Cipher Suite: TLS_RSA_WITH Compression Method: null (exeead)					
	Extensions Length: 5	0)						
	Extension: renegotiation_i	nfo (len=1)						
0.000	• -		····					
969	ca 08 ec 1d 2b 8e 03 aa e9 00 00 05 ff 01 00 01 00 16		· · · · # · · · · · · · · · · · · · · ·					•
	3a 00 0b 37 00 05 11 30 82		:7					
eeb	03 02 01 02 02 14 06 8e c7	70 1a ca e8 e4 69 73	is					
eec	70 a4 b6 7d d6 2d cf fc 8b	c0 30 6d 66 09 2a 86	p}					

3. From Server Hello, cipher suite chosen: TLS_RSA_WITH_AES_128_GCM_SHA256

file Edit View Go Capture Analyze Statistic	s Telephony Wireless Io	xols <u>H</u> elp			
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ssi 🛛					Expression +
No. Time 5 2019-11-22 18:20:03, 6166657.		Destination 129,192,180,123	TLSv1.2	Length Info 185 Client Hello	
7 2019-11-22 18:20:03,6171850 9 2019-11-22 18:20:03,6172056 12 2019-11-22 18:20:03,6179351	. 129.192.188.123	129.192.180.122 129.192.180.122 129.192.180.123	TLSV1.2 TLSV1.2 TLSV1.2		
 + Transmission Control Protocol, Src * Secure Sockets Layer * TLSV.2 Record Layer : Handshake Content Type: Handshake (22) Version: TLS 1.2 (809303) 			:: 121, Len	: 1448	
Length: 81 + Handshake Protocol: Server Hell Handshake Type: Server Hell Length: 77 Version: TL5 1.2 (0x0303) + Random: fca0001dea055309fd7 Session ID Length: 32 Session ID: 485762f522bdaa6 Cipher Suite: TLS REA WITH SRA	0 (2) 570b12f4a775555e809b 51e8118ff421aa6f550b	3ca08ecid2b8e			
Compression Method: null (0) Extensions Length: 5 > Extension: renegotiation_inf)	executi			
00880 ca 88 ec 1d 2b 8e 83 aa e9 e1 0090 00 60 65 ff 10 01 00 16 03 0090 00 60 65 ff 11 00 16 03 0090 00 60 95 ff 11 00 16 03 0090 33 00 0b 37 09 05 11 38 82 05 0050 03 02 01 02 14 66 8e c7 76 0050 03 02 01 02 02 14 66 8e c7 76 0050 04 16 7 06 2d c7 76	03 0b 3e 0b 00 0b 0d 30 82 02 f5 a0 1a ca e0 e4 69 73	····+···· ···7···6 ···6··· ····p···is p··}····			
O Z Cipher Suite (ssl.handshake.ciphersuite), 2 b	ytes			Packets: 22 - Displayed: 4 (18.2%) - Dropped: 0 (0.0%)	Profile: Defaul

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

4. Authentication exchange ends with TLS Alert message (i.e. authentication fails):

					*enx803f5d088b28				
Elle	Edit View Go Capture Analyze Statistics	s Telephony <u>Wireless</u> To	ols <u>H</u> elp						
	🛋 🗏 🖉 🕋 🛅 🕱 🖸 🤇 🚓 🌩 🎬 🐺 🗮 🔍 🔍 Q. Q. Q. X.								
II ssi						Expression +			
No.	Time	Source	Destination	Protocol	ength Info				
	5 2019-11-22 18:20:03,6166657.	. 129.192.180.122	129.192.180.123	TLSv1.2	186 Client Hello				
	7 2019-11-22 18:20:03,6171850.	. 129.192.180.123	129.192.180.122	TLSv1.2	1514 Server Hello				
	9 2019-11-22 18:20:03, 6172056	. 129.192.180.123	129.192.180.122	TLSv1.2	211 Certificate, Certificate Request, Server Hello De	ne			
1	12 2819-11-22 18:20:83, 5179351.	. 129.192.180.122	129.192.180.123	TL5v1.2	73 Alert (Level: Fatal, Description: Bad Certificate				

•		Þ
 Frame 12: 73 bytes on wire (584 bits), 73 bytes captured (584 bits) on interface 0 Ethernet II, Src: Dell_56:a1:83 (3c:2c:30:56:a1:83), Dst: Winstars_00:8b:28 (40:31:5d:) Internet Protocol Version 4, Src: 122:102:102, 122, Dst: 122:102:100:123 Transmission Control Protocol, Src Port: 55032, Dst Port: 5000, Seq: 121, Ack: 3042, L Secure Sockets Layer 		
 TLSv1.2 Record Layer: Alert (Level: Fatal, Description: Bad Certificate) Content Type: Alert (21) Version: TLS 1.2 (0x8003) Length: 2 Alert Message Level: Fatal (2) 		
Description: Bad Certificate (42)		
0000 00 3f 5d 00 8b 28 3c 2c 30 56 al 83 08 00 45 00 -?](<, 0Y ··· E. 0010 00 3b ec d3 40 00 3f 00 e2 72 8l c0 b4 7a 8l c0 -; 0? · r ·· z. 0028 b4 7h 0f f1 38 80 fc fc c3 37 0c 46 48 cc 68 8l s p d. 0038 b1 4h 0f f3 13 80 00 01 01 68 0a e3 al c2 b2 44 ed p d.		
🔾 🎽 Alert message description (ssl.alert_message.desc), 1 byte	Packets: 22 · Displayed: 4 (18.2%) · Dropped: 0 (0.0%)	Profile: Default

5. Registration request message is not received at Test Harness (authentication fails)

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

WINNF.FT.C.SCS.5

Packet Capture Sequence

					scs5.pcap	e e 🧉
<u>File</u>	Edit View Go Capture Analyze Sta	tistics Telephony Wire	less Iools Help			
41	🛯 🖉 🖸 🚔 🗇 🖉 🖉	3344				
-						
ll ssl						Expression +
NO.	Time 16 2019-11-22 18:40:01,848000	Source	Destination 129.192.180.123		Length Info 186 Client Hello	
			129,192,180,122	TLSv1.2	1514 Server Hello	
	20 2019-11-22 18:40:01,848576 23 2019-11-22 18:40:01,849648		129.192.180.122 129.192.180.123	TLSv1.2 TLSv1.2	207 Certificate, Certificate Request, Server Hello Done 73 Alert (Level: Fatal, Description: Bad Certificate)	
	23 2019-11-22 10:40:01,049040	120,102,100,122	129,192,100,123	15041-5	75 Alert (Level: Falal, Description: Bau Certificate)	
1						
,	 Handshake Protocol: Client Hel Handshake Type: Client Hell 					
	Length: 111	5 (1)				
	Version: TLS 1.2 (0x0303)					
	 Random: 09f7f1beb6947305db8 Session ID Length: 0 	d7f5ce94faebe1cdafc3	3151e0aat0			
	Cipher Suites Length: 10					
	Cipher Suite: TLS_RSA_WIT Cipher Suite: TLS_RSA_WIT					
	Cipher Suite: TLS_ECDHE_E					
	Cipher Suite: TLS_ECDHE_E	CDSA_WITH_AES_256_G	CM_SHA384 (0xc02c)			
	Cipher Suite: TLS_ECDHE_R Compression Methods Length:		_SHA256 (0xc02f)			
	 Compression Methods (1 methods) 					
	Extensions Length: 60					
	Extension: status_request ()					
0040	1a 73 16 03 01 00 73 01 00 00	0 6f 03 03 09 f7 f1	- S · · · · S · · · · 0 · · · · ·			
8650	be b6 94 73 05 db 8d 7f 5c e8 3f 51 e0 aa f0 1f a9 bc 2a d6		····s···· \·0·····			
8070	00 9d 00 9c c0 2b c0 2c c0 21	61 00 00 3c 00 05	·····			
	00 05 01 00 00 00 00 00 0a 00		*******			
07	Maximum version supported by client (ssl.handshake.version), 2 b	ytes		Packets: 26 · Displayed: 4 (15.4%)	Profile: Defaul

WINNF Test Requirements:

WINNF test requirements from WINNF-TS-0122-V1.0.0 CBRS CBSD Test Specification:

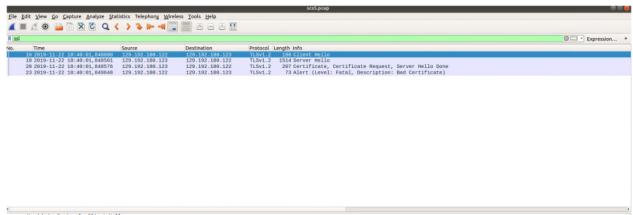
2	 Make sure that UUT uses TLS v1.2 for security establishment. Make sure UUT selects the correct cipher suite. UUT shall use CRL or OCSP to verify the validity of the server certificate. Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness. 	PASS	FAIL
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Analysis of WINNF Test Requirements

1. From Client Hello can read: TLS version = TLS 1.2

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4		P. Contraction of the second sec
 Handshake Protocol: Client Hello 		
Handshake Type: Client Hello (1)		
Length: 111		
Version: TLS 1.2 (0x0303)		
Random: 09f7f1beb6947305db8d7f5ce94faebe1cdafc3f51e0aaf0		
Session ID Length: 0		
Cipher Suites Length: 10		
* Cipher Suites (5 suites)		
Cipher Suite: TLS_RSA_WITH_AES_256_GCM_SHA384 (0x009d)		
Cipher Suite: TLS_RSA_WITH_AES_128_GCM_SHA256 (0x009c)		
Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 (0xc02b)		
Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384 (0xc02c)		
Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02f)		
Compression Methods Length: 1		
 Compression Methods (1 method) 		
Extensions Length: 60		
Extension: status_request (len=5)		
0040 1a 73 16 03 01 00 73 01 00 06 6f 03 03 09 f7 f1 -ss		
8056 be b6 94 73 85 6b 8d 7f 5c 99 4f ae be 1c da fc		
8660 3f 51 e9 aa f9 if a9 bc 2a d6 4c 79 ic 00 00 0a 20 *. v		
8878 88 9d 88 9c c0 2b c8 2c c0 2f 81 88 80 3c 88 85		
SGR# 89 85 61 86 68 68 68 68 68 68 68 68 68 68 69 1d 68		-
Maximum version supported by client (ssl.handshake.version), 2 bytes	Packets: 26 · Displayed: 4 (15.4%)	Profile: Default

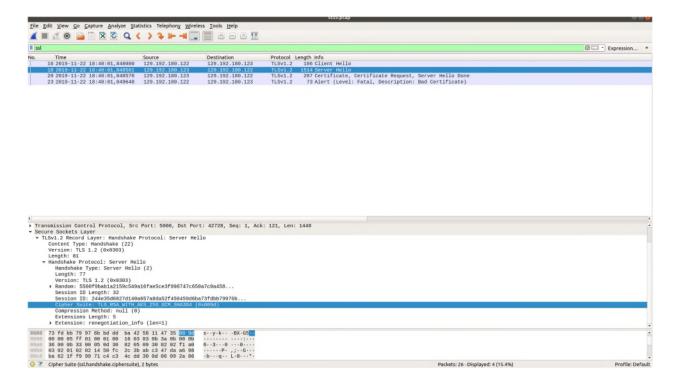
2. From Client Hello, cipher suite list is from WINNF approved list:

TLS_RSA_WITH_AES_128_GCM_SHA25 TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256

3. From Server Hello, cipher suite chosen: TLS_RSA_WITH_AES_128_GCM_SHA256

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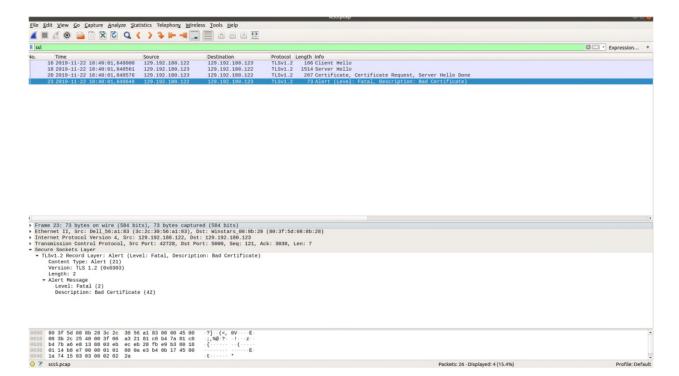
Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
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4. Authentication exchange ends with TLS Alert message (i.e. authentication fails):

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5. Registration request message is not received at Test Harness (authentication fails)

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Client	Ericsson	
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Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

Test Equipment

Instrument	Manufacturer	Type No.	Serial No	Calibration Period (months)	Calibration Due
THG	Fluke	77 IV	34770264	12	18-Apr-2020
DVM	VWR	61161-378	170120564	24	17-Feb-2021
Power Supply	Xantrex	XKW 60-50	E00109863	O/P Mon	-
Spectrum Analyser	Keysight	N9020A	MY49100827	24	27-Dec-2021
Attenuator	Pasternack	PE7004-10	N/S	O/P Mon	-
Switching Control Unit	Hewlett Packard	11713A	3748A060876	O/P Mon	-
RF Switch Unit	Burnsco	RARFSW 4x1	001	O/P Mon	-
Power Supply	Leader	730-3D	9801135	O/P Mon	-

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Client	Ericsson	
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Appendix A – EUT & Client Provided Details

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Client	Ericsson	
Product	LTE KRC 161 711/1 Radio 2208 B48 (3550- 3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

General EUT Description

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Manufacturer	Ericsson
Address	Torshamnsgatan 23 Kista SE-16480 Stockholm Sweden
Product Name	Radio 2208 B48
Serial Number(s)	D828007815 and D828007823
Software Version	CXP 903 4711/4_R1L
Hardware Version	R1B
Test Specification/Issue/Date	FCC CFR 47 Part 96: 2018

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Client	Ericsson	
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Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

Technical Description

The Equipment Under Test (EUT) Radio 2208 B48 KRC 161 711/1 is an Ericsson AB Radio Unit working in the public mobile service (3550-3700 MHz) band which provides communication connections to 3550-3700 MHz network. The Radio 2208 B48 KRC 161 711/1 operates from a - 48V DC or a 120V AC power supply.

The Equipment Under Test (EUT) is shown in the photograph below. A full technical description can be found in the Manufacturer's documentation.



EUT Configuration

Please see Appendix B for close up pictures of the unit as configured during testing

• Cables and earthing when applicable were connected as per manufacturer's specification.

Domain Proxy Software Version: 27.7

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Appendix B – EUT, Peripherals, and Test Setup Photos

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Client	Ericsson	
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Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

Test setup

<Photo kept on file and may be accessed in separate photo exhibit>

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