### **Test Report**

As per

### FCC Part 96 SAS requirements (CBRS Test Plan)



Add value. Inspire trust.

On the Ericsson Remote Radio Unit KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) & KRY 901 516/2 DOT 4469 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.

Steve McFarlane Test Personnel

Scott Drysdale Report Reviewer



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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

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

### **Report Scope**

This report addresses the WINNForum verification testing and test results of the **KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) & KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)** 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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Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

# Summary

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

	KRY 901 516/2 DOT 4469 B48 (3550- 3700MHz)
Equipment Under Test (EUT)	Note: Non-Tested Variant Dot 4459 B48 - KRY 901 516/1 (See Appendix A Technical Description for a similarity description)
EUT passed all tests performed	Yes
Tests conducted by	Steve McFarlane
FCC ID:	TA8AKRY901516-2

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

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

#### Test Results Summary

Section	CBS D	D P	Test Case ID	Test Case Title	RF Measurement Requirement	Pass / Fail
6.1.4.1. 1	X		WINNF.FT.C.R EG.1	Multi-Step registration	Monitor for 60 seconds after REG message sent. No transmission during test.	N/A
6.1.4.1. 2		Х	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	Х	Х	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.	X		WINNF.FT.C.R EG.8	Missing Required parameters (responseCode 102)	Monitor for 60 seconds after REG message sent. No transmission during test.	N/A
6.1.4.2. 2		X	WINNF.FT.D.R EG.9	Domain Proxy Missing Required parameters (responseCode 102)	Monitor for 60 seconds after REG message sent. No transmission during test.	Ρ
6.1.4.2. 3	X		WINNF.FT.C.R EG.10	Pending registration (responseCode 200)	Monitor for 60 seconds after REG message sent. No transmission during test.	N/A
6.1.4.2. 4		X	WINNF.FT.D.R EG.11	Domain Proxy Pending registration (responseCode 200)	Monitor for 60 seconds after REG message sent. No transmission during test.	Ρ
6.1.4.2. 5	X		WINNF.FT.C.R EG.12	Invalid parameter (responseCode 103)	Monitor for 60 seconds after REG message sent. No transmission during test.	N/A
6.1.4.2. 6		X	WINNF.FT.D.R EG.13	Domain Proxy Invalid parameters (responseCode 103)	Monitor for 60 seconds after REG message sent. No transmission during test.	Ρ
6.1.4.2. 7	Х		WINNF.FT.C.R EG.14	Blacklisted CBSD (responseCode 101)	Monitor for 60 seconds after REG message sent. No	N/A

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					transmission during	
61.10					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	Х		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	X	WINNF.FT.C.R EG.20	Category A CBSD location update		N/A
6.3.4.2. 1	Х	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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					<ul> <li>heartbeat response or after.</li> <li>After transmission starts, meas ure that transmission is within the granted channel (frequencyLo w, freque ncyHigh)</li> </ul>	
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	Ρ
6.4.4.2. 4	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	Ρ
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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					<ul> <li>(this is not a pass/fail criteria, but check)</li> <li>CBSD2: must stop transmission within 60 seconds of being sent heartbeatRe sponse with responseCod e = 500</li> </ul>	
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. 2	X	х	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	X		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. 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.		Χ	WINNF.FT.D.D	Domain Proxy	Monitor RF	
2		Λ	RG.2	Successful	transmission. Ensure	Р
2			K0.2	Deregistration		1
				Deregistration	<ul> <li>CBSD stops</li> </ul>	
					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	
60.40	<b>X</b> 7	*7			information	
6.8.4.2.	Х	Х	WINNF.FT.C.SC	TLS failure when	No RF transmission	р
3			S.4	SAS Test Harness	during test	Р
				certificate is issue by	Check the tcpdump	
				unknown CA	for the TLS	
6940	v	v		TI C failure	information	
6.8.4.2. 4	Х	Х	WINNF.FT.C.SC	TLS failure when certificate at the SAS	No RF transmission	Р
+			S.5	Test Harness is	during test Check the tcpdump	Г
				corrupted	for the TLS	
				corrupteu	information	
7.1.4.1.	X	X	WINNF.PT.C.H	UUT RF Transmit	Power Spectral	
1.1.4.1.	Λ	Δ	BT	Power Measurement	Density test case.	Р
1					Density test case.	I
					Assume we use 1	
					carrier bandwidth	
	L	I				

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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. C1 Multi-step registration (WINNF.FT.D.REG.2)
  - ii. C3 Single step registration containing CPI-signed data in the registration message (WINNF.FT.D.REG.6)
  - iii. C4 RECEIVED\_POWER\_WITHOUT\_GRANT measurement report (WINNF.FT.D.MES.2)
  - iv. C5 RECEIVED\_POWER\_WITH\_GRANT measurement report (WINNF.FT.D.MES.3, WINNF.FT.D.MES.5)
- c. Optional test cases were not performed

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
WINNF-TS-0122	Conformance and Performance Test Technical Specification;
Version V1.0.0	CBSD/DP as Unit Under Test (UUT)
19 December 2017	Working Document
ISO/IEC 17025:2005	General requirements for the competence of testing and calibration laboratories

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## **Document Revision Status**

Revision 001:	May 31, 2022	First Draft
Revision 002:	June 1, 2022	Minor revisions as per client request, on file.
Revision 003:	June 2, 2022	Minor revisions as per client request, on file.
Revision 004:	June 2, 2022	Minor revisions as per client request, on file.
Revision 005: TCB request.	June 9, 2022	Split into A and B versions for separate FCC IDs as per

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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)
May 11-13, 2022	All	SM	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 Ca	se ID			Test Cas	e Title			Pass / Fail
6.1.4.1.2	X	WINNF	F.FT.D.	REG.2		Domain l registrati		Multi-Stej	р	Р
Keysight Spectrum	Analyzer - Swe	ot SA				<u> </u>				
Average/Hol			Fast 😱	SEN		Avg Type Avg Hold:		TRAC	MJun 12, 2018 E 1 2 3 4 5 6 E MA WWW	Units
	f Offset 41.	IFGai		#Atten: 10				kr1 3.54	28 GHz	Enter
10 dB/div Re	f 41.15 d							-34.3	49 dBm	
31.2						_				
21.2										
11.2										
1.15										
8.85										
.18.9										
-28.9										
-38.9	approximates	prodution consistent of the	with the part	AND FAMILY PLAN	A BAR AND A			ANALAS - DUNNY	a the second second second	
					1. 1	1-1-1-1	1.4.	1		
48.9										
Center 3.6300									00.0 MHz	
#Res BW 1.0	MHz		#VBW	3.0 MHz*	*	#		100.0 ms (	1001 pts)	
ISG							STAT	US		

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.1.4.1.6	X	WINNF.FT.D	.REG.6	Domain Proxy Si registration for C signed data		Ρ
Agilent Spectrum	2		C SENSE:INT	ALIGNAUTO #Avg Type: Pwr(RMS)	02:22:23 PM May 12, 2022 TRACE 1 2 3 4 5 6	BW
RBW 1.0 MH		t: RF PNO: Fast 🖵 IFGain:Low	Trig: Free Run Atten: 10 dB	Avg Hold:>10/10	TYPE MWWWWW DET A S S N N N	Res BW
	f 0.00 dB	m				1.0 MHz Auto <u>Man</u>
-10.0						Video BW 3.0 MHz Auto <u>Man</u>
-20.0						VBW:3dB RBW 100 m <u>Auto</u> Man
-40.0						Span:3dB RBW 106 <u>Auto</u> Man
-60.0						RBW Control [Gaussian,-3 dB]
-80.0			A		an hatan a din ka mandar antan antan	
-90.0						
Center 3.6625 #Res BW 1.0 I		#VBW		#Sweep	Span 150.0 MHz 100 ms (1001 pts)	
MSG				STATUS	\$	

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.1.4.2.2	X	WINNF.FT.I	D.REG.9	Domain Proxy M Required parame (responseCode 10	ters	Ρ
Agilent Spectrum	Ω		AC SENSE:INT	ALIGNAUTO	01:33:49 PM May 12, 2022	Trace/Det
verage/Hol	d Numbe	ut: RF 🛛 PNO: Fast 🗔	Trig: Free Run	#Avg Type: Pwr(RMS) Avg Hold:>10/10	TRACE 1 2 3 4 5 6 TYPE MWWWWWW DET A S S N N N	Trace/Det
10 dB/div Re	f 0.00 dB	IFGain:Low	Atten: 10 dB			Select Trace Trace 1
- <b>og</b> -10.0						Clear Write
30.0						Trace Average
40.0						Max Hold
60.0						Min Hold
80.0					withmore styllmainstan	View/Blank Trace On
90.0 Center 3.6623 Res BW 1.0		#VBM	 	#Sween 3	Span 150.0 MHz 0.0 ms (1001 pts)	More 1 of 3
sg 🗼 File <6.1.4				status		

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.1.4.2.4	X	WINNF.FT.D.	REG.11	Domain Proxy P registration (resp 200)		Р
Agilent Spectrum			OFFAIRE TAIT		01.40.47.01114	
RBW 1.0 MH	z	AC	SENSE:INT	ALIGNAUTO #Avg Type: Pwr(RMS Avg Hold:>10/10	01:43:17 PM May 12, 2022 TRACE 1 2 3 4 5 6 TYPE MWWWWW	Trace/Det
	Inpu 0.00 dB	t: RF PNO: Fast 🖵 IFGain:Low	Atten: 10 dB		DETASSNNN	Select Trace Trace 1
-10.0						Clear Write
-20.0						Trace Average
-40.0						Max Hold
-50.0						Min Hold
-70.0		California (1979) and a star and a star and a star		-u-umeturenumetu	www.	View/Blank
-80.0						Trace On
Center 3.6625 #Res BW 1.0 I		#VBW -		#Sweep	Span 150.0 MHz 30.0 ms (1001 pts)	More 1 of 3
MSG				STATU	s	

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.1.4.2.6	X	WINNF.FT.D	.REG.13	Domain Proxy Ir parameters (resp		Р
💴 Agilent Spectrum A	nalyzer - Swep	ot SA				
50 Ω RBW 1.0 MHz	Input:	RF PNO: Fast 🔾	SENSE:INT	ALIGNAUTO #Avg Type: Pwr(RMS) Avg[Hold>10/10	01:46:30 PM May 12, 2022 TRACE 1 2 3 4 5 6 TYPE MWWWWW	Trace/Det
10 dB/div Ref	0.00 dBm	IFGain:Low	Atten: 10 dB			Select Trace Trace 1
-10.0						Clear Write
-20.0						Trace Average
-40.0						Max Hold
-60.0						Min Hold
-80.0	**************************************	400-00-000 for here - 200,00-0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	*******	palaan kanning palaan madaan	View/Blank Trace On
-90.0 Center 3.66250				#0111-11	Span 150.0 MHz	More 1 of 3
#Res BW 1.0 M		#VBW		#Sweep : STATUS	30.0 ms (1001 pts)	

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.1.4.2.8	Х	WINNF.FT.	D.REG.15	Domain CBSD (r		acklisted Code 101)	Р
💴 Agilent Spectrum Ai	nalyzer - Sw	ept SA					- 6 🛛
50 Ω RBW 1.0 MHz	Inpu	t: RF PNO: Fast C	AC SENSE:IN		ALIGN AUTO : Pwr(RMS) > 10/10	01:49:02 PM May 12, 2022 TRACE 1 2 3 4 5 6 TYPE MWWWWW	Trace/Det
10 dB/div Ref	0.00 dBi	IFGain:Low	Atten: 10 dB			DET A SSNNN	Select Trace
-10.0							Clear Write
-20.0							Trace Average
-40.0							Max Hold
-60.0							Min Hold
-80.0	nnenthed		->>+>=+>=+>=+>++>++++++++++++++++++++++	นะส <b>าให</b> ระสะหนามีการจุมังสา	~~~~~~		View/Blank Trace On
-90.0 Center 3.66250 #Res BW 1.0 M		#VB			iSwoon 20	Span 150.0 MHz 0.0 ms (1001 pts)	
MSG	Π2	#VB	vv	Ŧ	SWEED 3	0.0 ms (1001 pts)	

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.1.4.2.10	Х	WINNF.FT.D	D.REG.17	Domain Proxy U		Р
				SAS protocol ver responseCode 10		I
Agilent Spectrum	Analyzer - Sv	vept SA			•/	
50 S RBW 1.0 MH			AC SENSE:INT	ALIGNAUTO #Avg Type: Pwr(RMS)	01:51:33 PM May 12, 2022 TRACE 1 2 3 4 5 6	Trace/Det
		it: RF PNO: Fast 🖵 IFGain:Low	Trig: Free Run Atten: 10 dB	Avg Hold>10/10	DET A S S N N N	Select Trace
						Trace 1
10 dB/div Ref	0.00 dB	m				
-10.0						Clear Write
-10.0						
-20.0						
-30.0						Trace Average
-40.0						
-40.0						Max Hold
-50.0						
-60.0						Min Hold
-70.0						MITTOR
-70.0			- Managana and a second second	Actor and a state of the state	man the solution of the second second second	) (i aux (Diamite
-80.0						View/Blank Trace On
-90.0						
						More
Center 3.6625 #Res BW 1.0 M		#VBW	·	#Sween	Span 150.0 MHz 30.0 ms (1001 pts)	1 of 3
#RES DVV 1.01		#V DVV		status		

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.1.4.2	.12	Х	WINN	NF.FT.C	).REG.1	9		Proxy Gi eCode 20		or	Р
💴 Agilent Sp		alyzer - Sw	ept SA								<b>.</b> 7
RBW 1.	50 Ω .0 MHz				]	NSE:INT		ALIGNAUTO e: Pwr(RMS)	TRACE	May 12, 2022	Trace/Det
10 dB/div	Ref (	Inpu 0.00 dBr	IFG	IO: Fast 🖵 iain:Low	⊣ Trig: Free Atten: 10		Avg Hold	.>10/10	DET	ASSNNN	Select Trace Trace 1
-10.0											Clear Write
-20.0											Trace Average
-40.0											Max Hold
-60.0											Min Hold
-80.0			an a	<b>₽</b> ₩,₽№,₽₽₩₽₽,₽₽₩₩₩₩	*}	ومنير المبدوي	rrin	-ationde-rown-a			View/Blank Trace On
-90.0 Center 3 #Res BM				#VBW				#Sweep 3	Span 15	0.0 MHz	More 1 of 3
MSG	¥ 1.0 IVII	12		#VBW				STATUS	0.0 115 (1	oo i pis)	

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 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.

Center 3.60 #Res BW 1		#VBW	· · · · · · · · · · · · · · · · · · ·	#	Sweep	Span 1 100 ms (	50.0 MHz 1001 pts)			
-90.0										
-80.0				******						
-70.0									-	
-60.0									V Control sian,-3 dB]	
-50.0								<u>Auto</u>	Man	
-40.0								Span	:3dB RBW	
-30.0								<u>Auto</u>	100 m Man	
-20.0								vвw	:3dB RBW	
-10.0								Auto	Video BW 3.0 MHz Man	
10 dB/div Log	Ref 0.00 dBm							Auto	Man	
	Input: R	F PNO: Fast G IFGain:Low	Trig: Free Run Atten: 10 dB	Avg Hold>		TY	A S S N N N		Res BW	
Agilent Spect	rum Analyzer - Swept 50 ହ MH7		AC SENSE:INT	#Avg Type:	LIGNAUTO Pwr(RMS)	TRAC	M May 12, 2022 ≇ 1 2 3 4 5 6		BW	
			responseCo (INTERFEI	ae=400 RENCE)		ring tes		1 1113		I
6.3.4.2.1	WINNF.FT	C.GRA.1	Unsuccessf				sent. No		fter REG	Р

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

Ρ

6.3.4.2.2	WINNF.FT.C.GRA.2	Unsuccessful ( responseCode: (GRANT_CO	=401	Monitor for 60 sec message sent. No during test.	
	um Analyzer - Swept SA 50 Ω MHZ Input: RF PNO: Fast G IFGain:Low	AC SENSE:INT Trig: Free Run Atten: 10 dB	ALIGN A #Avg Type: Pwr(I Avg Hold:>10/10		BW
10 dB/div I	Ref 0.00 dBm				Auto <u>Man</u>
-10.0					Video BW 3.0 MHz Auto <u>Man</u>
-20.0					VBW:3dB RBW 100 m <u>Auto</u> Man
-40.0					Span:3dB RBW 106 <u>Auto</u> Man
60.0					RBW Control [Gaussian,-3 dB]
80.0				++++++++++++++++++++++++++++++++++++++	
-90.0					
Center 3.66 #Res BW 1.		·	#Swe	Span 150.0 MHz ep 100 ms (1001 pts)	
MSG			s	STATUS	

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.4.4.1.2	WINNF.FT.D.HBT.2	Domain Proxy Heartbeat Success Case (first Heartbeat Response)	<ul> <li>Monitor RF from start of test. Ensure that:</li> <li>Transmission does not start until time of first heartbeat response or after.</li> <li>After transmission starts, measure that transmission is within the granted channel (frequencyLow, frequenc yHigh)</li> </ul>	Ρ
D Agilent Spectrum / 00 50 Ω Span 0.00000	AC SEN	SE:INT ALIGNAUTO D1:55:03 PM May 12, #Avg Type: Pwr(RMS) TRACE 1 2 3 · Run TYPE WWWW dB DET A S S I	456 Trace/Det	
10 dB/div Ref			* Clear Write	
-20.0			Trace Average	
-40.0			Max Hold	
-60.0			Min Hold	
-80.0			View/Blank Trace On	
Center 3.55500 Res BW 1.0 Mł		Span 0 Sweep 100.0 s (1001 p	pts)	

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.4.4.2.1	WINNF.FT.C.HBT.3	Heartbeat responseCode=105 (DEREGISTER)	within 60 second s	F econds of the esponse which sponseCode
Marker 1	trum Analyzer - Swept SA 50 Ω 169.500 S Input: RF PNO: Fast ↔ IFGain:Low Ref 0.00 dBm	AC SENSE:INT ALIGNA #Avg Type: Pwr( Trig: Free Run Atten: 10 dB		Marker Select Marker
-10.0		▲1	*	Normal
-20.0				Delta
-40.0				Fixed⊳
-60.0				Off
-80.0		<sup>2</sup>		Properties►
Center 3.5 Res BW 1.	55000000 GHz 0 MHz #VBW	/ Swe	Span 0 Hz eep 300.0 s (1001 pts)	More 1 of 2

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
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	Monitor RF transmission from start of test. Ensure there is no transmission during the test	р
		Response		

Agilent Spectrum Analyzer - S					
Average/Hold Numbe	ar 100	C SENSE:INT	#Avg Type: Pwr(RMS)	03:48:33 PM May 12, 2022 TRACE 1 2 3 4 5 6	Meas Setup
10 dB/div Ref 0.00 dE	ut: RF PNO: Fast +++ IFGain:Low	Trig: Free Run Atten: 10 dB	Avg Hold: 100/100	TYPE MUMANANA DET A S S N N N	Average/Hold Number 100
0 <b>g</b> 10.0					Average Type Pwr (RMS) Auto <u>Mar</u>
30.0					Limits
40.0					N dB Points -3.01 dE On <u>Of</u>
50.0					PhNoise Op [Fast Tuning] <u>Auto</u> Ma
70.0 <b></b>	annaanalaana	ratulitan di tangga ng kang kang kang kang kang kang k	enill'happinerningernernigeliken	wat-wwaldfujftybalvatiki	ADC Dithe On <u>Auto</u> Ma
90.0 Center 3.6250 GHz #Res BW 1.0 MHz	#VBW		#Sweep 1	Span 200.0 MHz .00 ms (1001 pts)	Mor 1 of:
SG			STATUS		t.

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.4.4.2.4	WINNF.FT.C.HBT.6	Heartbeat	Monitor RF transmission. Ensure:	
		responseCode=501	<ul> <li>CBSD stops transmission</li> </ul>	р
		(SUSPENDED_GRANT)	within 60 seconds of	
		in Subsequent Heartbeat	heartbeatResponse which	
		Response	contains responseCode=501	

arker 2 168.000 s Input: RF	PNO: Fast ++ Trig: Fre IFGain:Low Atten: 1	e Run Avg	g Type: Pwr(RMS)  Hold:/100	03:56:44 PM May 12, 2022 TRACE 1 2 3 4 5 6 TYPE MWAAAAAA DET A S S N N N	Marker Select Marker
dB/div Ref 0.00 dBm				Mkr2 168.0 s -78.885 dBm	2
0.0				*	Norma
0.0					Delta
.0					Fixed
		1			
.0					01
.0		¢ <sup>2</sup>			Properties
.0					Mor
enter 3.625000000 GHz es BW 1.0 MHz	#VBW		Sweep 3	Span 0 Hz 300.0 s (1001 pts)	1 of:

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.4.4.2.5		respo	onseCode=	502 P_PARAM		• CE wit	3SD stop hin 60 se artbeatR	ission. Ensure: s transmission econds of esponse which sponseCode=502	р
Marker 2	Input: RF P		SENSE:INT ree Run 10 dB	ALIC #Avg Type: P Avg Hold:/1		TRACE TYPE DE	1 May 13, 2022 1 2 3 4 5 6 MWWWWW A S S N N N 172.5 S 1 dBm	Marker Select Marker 2	
-10.0							*	Normal	
-20.0								Delta	
-40.0								Fixed⊳	
-60.0	· · · · · · · · · · · · · · · · · · ·		1					Off	
-80.0			¢ <sup>2</sup>					Properties►	
-90.0 Center 3.6 Res BW 1.	25000000 GHz 0 MHz	#VBW		S	weep 3	300.0 s (1	pan 0 Hz 1001 pts)	More 1 of 2	

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.4.4.2.	 Х	WINNF.FT.D.H	Domain Proxy	Monitor RF	D
6		BT.8	Heartbeat responseCode=500 (TEMINATED_GR ANT)	transmission. CBSD s will have different behavior: CBSD1: will continue to transmit to end of test (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	Ρ

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

50 Ω	AC SENSE:INT	ALIGNAUTO	D9:46:48 AM May 13, 2022	
arker 2 168.300 s	PNO: Fast +++ Trig: Free Run Gain:Low Atten: 10 dB	#Avg Type: Pwr(RMS) Avg Hold:/100	TYPE MWWWWW DET A S S N N N	Marker Select Marker
dB/div Ref 0.00 dBm			Mkr2 168.3 s -78.888 dBm	2
			*	Norm
				Del
				Fixed
0.0		1		c
0.0		<b>y</b> <sup>2</sup>		Properties
enter 3.625000000 GHz es BW 1.0 MHz	#VBW	Sween	Span 0 Hz 300.0 s (1001 pts)	<b>Mo</b> 1 o

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

Ρ

.4.4.3.1	WINNF	F.FT.C.H	BT.9		eat Resp : (First H	oonse Ieartbea	t)	secono heartbo	ls afte eatRe BSD	er last spons should	e mes d not tr	test to 60 sage was ansmit at
BW 1.0 M		put: RF PN IFG	IO: Fast ++ iain:Low			#Avg Type Avg Hold:			TYPE M	y 13, 2022 2 3 4 5 6 WWWWW S S N N N	Auto	BW Res BW 1.0 MHz <u>Man</u>
.0											Auto	Video BW 3.0 MHz <u>Man</u>
.0											VBW Auto	:3dB RBW 100 m Man
o											Span <u>Auto</u>	:3d <b>B RBW</b> 106 Man
0												I Control sian,-3 dB] ►
0 0	<b>abd/salaute</b> nsheddarrod	an a	hikikuwathimadi	ngunthin hinden h	hannenvenven	e-h-n-hutallushy	H-WWINDAR-P	anny-mappens	weiten	hter and a state of the state o		
enter 3.55	50 GHz							Sna	an 200.	0 MHz		
tes BW 1.			#VBW			#		30 1.00 n				

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.4.4.3.2	WINNF.FT.C.HBT.10	Heartbeat Response Absent (Subsequent Heartbeat)	seconds, w	st stop on within pireTime+60 where pireTime is uccessful Response	Ρ
LXI	rum Analyzer - Swept SA 50 Ω 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AC SENSE:INT ALIGN #Avg Type: Pwr	(RMS) TRACE 1 2 3 4 5 6	Marker	
marker	Input: RF PNO: Fast ↔ IFGain:Low			Select Marker	
10 dB/div	Ref 0.00 dBm		Mkr1 258.9 s -17.107 dBm	1	
-10.0			* ▲1	Normal	
-20.0				Delta	
-40.0				Fixed⊳	
-60.0				Off	
-80.0				Properties►	
-90.0 Center 3.55 Res BW 1.0	55000000 GHz MHz #VBW		Span 0 Hz eep 300.0 s (1001 pts)	More 1 of 2	
MSG		50	STATUS		

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 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 Respons contains measReportConfig	e No RF monitoring	Р
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Pass saw "measreportconfig" in logs

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

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

Pass saw "measreportconfig" in logs

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

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

Pass saw "measreportconfig" in logs

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.6.4.1.2	WINNF.FT.D	0.RLQ.2	Domai	n Proxy	Success	ful N	Ionitor R	F transm	ission. Ensure:	
				uishmen		•	CE	<b>SD</b> stop	s transmission at	Р
			•			a			ending the	
									uest message.	
Agilent Spect	rum Analyzer - Swept SA									
XI I	50 Ω	1	AC SE	NSE:INT	#Avg Type			May 13, 2022	Marker	
Marker 1	137.880 s Input: RF	PNO: Fast	Trig: Free		Avg Hold:		TYP	E MWWWWW T A SSNNN		
		IFGain:Low	Atten: 10	dB					Select Marker	
	Ref 0.00 dBm						Mkr1 -17.08	137.9 s 33 dBm	1	
-10.0								*	Normal	
-20.0		•								
-30.0									Delta	
-40.0									Fixed⊳	
-50.0										
-60.0									Off	
-70.0			2							
-80.0			K						Properties►	
-90.0										
Center 3.55	55000000 GHz						s	pan 0 Hz	More 1 of 2	
Res BW 1.0	) MHz	#VBW					360.0 s (	001 pts)		
MSG						STATI	JS 🦺 Input O	verload;ADC	C over range	

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.7.4.1.2	WINNF.FT.I	D.DRG.2	Doma	in Proxy	/ Success	ful I	Monitor F	RF transm	ission. Ensure:	
			Dereg	istration	l	•	• C	BSD stop	s transmission at	Р
									ending the	
									uest message or	
									est message	
						(	whicheve	er is sent	first)	
💴 Agilent Spec	trum Analyzer - Swept SA	A.								
Warker 2	<sup>50 Ω</sup> 138.300 s		AC SE	ENSE:INT	#Avg Type	ALIGNAUTO		M May 13, 2022	Marker	
	Input: RF	PNO: Fast ++	Trig: Fre		Avg Hold:		TY	ET A S S N N N		
		IFGain:Low	Atten. I	, a 🗅				138.3 s	Select Marker	
10 dB/div	Ref 0.00 dBm							11 dBm	2	
Log				1	1					
								*	Normal	
-10.0			<b>∩</b> 1						i i i i i i i i i i i i i i i i i i i	
-20.0	,									
-20.0									Dalta	
-30.0									Delta	
-40.0										
									Fixed⊳	
-50.0										
-60.0									Off	
-70.0										
			2							
-80.0			₹.	ļ					Properties►	
-90.0										
									More	
Center 3.5	55000000 GHz	1		·			S	span 0 Hz	1 of 2	
Res BW 1		#VBW	·			Sweep	o 300.0 s (			
MSG						STA	τυs 🔔 Input C	Overload;AD	C over range	

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
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	Х	WINNF.PT.C.H	UUT RF Transmit	Power Spectral	
1			BT	Power Measurement	Density test case.	Р
					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 dB to minimum declared transmit	1
					power.	

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

#### 3555 MHz Low power

🥦 Agilent Spectrum Analyzer - Cha 🗶 50 Ω	innel Power			ALIGN AUTO	11:37:	47 AM May 11, 2022		
Gate Length 3.4835 r Gate: LO Input		Center Freq: 3.55 Trig: Free Run #Atten: 30 dB	5840000 GHz Avg Hold	>10/10		Std: None Device: BTS		Gate Gate
10 dB/div Logj Ref		GATE ST	ART			ATESTOP	<u>On</u>	01
0 MBLFAST -10 Methods and a standard s		Antonia antonia	al an	yahani kana sa		F	<u>On</u>	Gate View O
0 dB/div Ref 20 dB	<u>m</u>		Gate		1 3.5	ime 10.0 ms 5644 GHz 1959 dBm		Gate Vie weep Tim 10.0 m
• g 0 -10 -20 -30	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	<b>Γ-γγ</b> <sup>1</sup> _γ						Gate Dela 5.0915 m
-40 -50 -60 -70						· · · · · · · · · · · ·	G	ate Leng 3.4835 n
Center 3.556 GHz Res BW 1 MHz		#VBW 31	1Hz		S #Sv	pan 20 MHz veep  30 ms	Ga	te Method
Channel Power		Pow	er Specti	ral Dens	ity		_	
0.41	dBm/ 10 MHz	r	-69.	<b>59</b> dB	m/Hz			<b>Moi</b> 1 of
ISG				STATUS				

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

### PSD 3555 MHz High power

Magilent Spectrum Analyzer - Chann	el Power						
LX 50 Ω Sweep Time, 100 mc		NSE:INT ALI reg: 3.555000000 GHz	GNAUTO 02:02:48 PM Radio Std: 1	May 11, 2022 Save			
Sweep Time 100 ms Gate: LO Input: R		Run Avg Hold:>10					
Log		GATE START	GATES	109			
-10 489456559995 (meta-stranger for the two series of two series of the two series of the two series of two series o		anter a subscription of the case	and an well and a second out of				
-30				Trace			
-50 -60 -70	and the second second			(+ State)			
-80		Gate V	iew Sweep Time	10.0 ms			
10 dB/div Ref 10 dBm			Mkr1 3.558				
Log		<b>♦</b> <sup>1</sup>					
-10	- Carlor and an include on the second	4 decision of the second s		Data (Export) ►			
-20			· ~	Trace 1			
-40							
-50				Screen			
-60				Image			
-80							
Center 3.555 GHz #Res BW 1 MHz	#VE	SW 3 MHz	Span #Sweep	20 MHz 100 ms			
Channel Power		Power Spectral	Density				
0.89 d	0.89 dBm/ 10 MHz -69.11 dBm/Hz						
MSG			STATUS				

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

### PSD 3635 MHz High power

🗊 Agilent Sj	pectrum Analyzer	- Channel Powe	er									
(X) Gate De	50 Ω ay 5.1359	me			NSE:INT req: 3.63500	0000 GHz	ALIGNAUTO	01:25: Radio		M May 11, 2022		Gate
Oale De		nput: RF	Gain:Low		Run	Avg Hold:	>10/10			ice: BTS		Gate
10 dB/div			On IGATE STARTI					Off				
		-					-		GATE	STOP		
-20 -30									$\vdash$			Gate View
-10 -20 -30 -40 -50 -60 -70				*****							<u>On</u>	Off
						Gate	View Sw	еер Т	ime	e 10.0 ms		Gate View
10 dB/div	Ref 20	dBm					Mkr			94 GHz 46 dBm		Sweep Time 10.0 ms
Log						1						
-10			hd			p-Jup	~					Gate Delay 5.1359 ms
-20		1					1		_			5.1359 ms
-40									_			
-50		1						L				Gate Length
-70												3.4835 ms
Center 3 #Res BV	3.635 GHz V 1 MHz			#VE	sw змн	z				n 20 MHz ep 30 ms	0	ate Method
Char	nnel Powe	r			Power	Spectr	al Dens	sity				LO
	1.8	1 dBm	/ 10 MH	z		-68.	19 dв	m/Hz				More 1 of 2
🛃 start	a (2 6 🗅	A 🗊	glent Spectrum A	na								🔇 🔟 1:25 PM

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

#### PSD 3560 MHz Low power

						Swept SA	um Analyzer -			
Peak Search	10:54:13 AM May 12, 2022 TRACE 1 2 3 4 5 6 TYPE A WWWWW	ALIGNAUTO ype: Pwr(RMS) old:>10/10	Avg	SENSE:I	Hz NO: Fast G	000000 G			lar	
NextPea	3.568 16 GHz -9.770 dBm	IFGain:Low Atten: 30 dB Mkr1 3.568 16 GH								
Next Righ		1		3					og 0.00	
Next Le				and the second secon	*****				0.0 0.0 0.0 0.0	
Marker Del									0.0 0.0 0.0	
Mkr→C	Span 40.00 MHz 100 ms (1001 pts)		Eurozion		VBW			8 BW 1	Re	
Mkr→RefL	FUNCTION VALUE -0.785 dBm 1.839 dBm	FUNCTION WIDTH 10.00 MHz 20.00 MHz	Band Power	⊻ -9.770 dBm 10.427 dBm 10.427 dBm	0 GHz	× 3.568 1 3.560 0 3.560 0	f f f	1005 TRC N 1 N 1 N 1	1 2	
Moi 1 of									7 9 0 1 2	
		STATUS							G	

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

#### PSD 3560 MHz High power

						er - Swept SA	trum Analyz		
Peak Search	D9:49:08 AM May 12, 2022 TRACE 1 2 3 4 5 6 TYPE A WWWWW	ALIGNAUTO ype: Pwr(RMS) old:>10/10	Avg	C SENSE:I Trig: Free Ru	GHz PN0: Fast	0000000 0	50 Ω 3.56624 Gate: L0		lar
Next Peal	ef 20.00 dBm								
Next Righ		1		2					<b>og</b> 10.0
Next Le				aled de la constant a					0.0 0.0 0.0 0.0
Marker Del	*********					r	**************************************		0.0 0.0 0.0
Mkr→C	Span 40.00 MHz 100 ms (1001 pts)				VBW		6000 GH 1.0 MHz	s BW 1	Re
Mkr→RefL	FUNCTION VALUE 2.817 dBm 5.444 dBm	FUNCTION WIDTH 10.00 MHz 20.00 MHz	FUNCTION Band Power Band Power	Y -5.836 dBm -6.287 dBm -6.287 dBm	6 24 GHz 0 00 GHz 0 00 GHz	3.560	f f f	MODE TRO N 1 N 1 N 1	1 2 3 4 5 6
Moi 1 of									7 8 9 0 1 2
		STATUS							G

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

#### PSD 3640 MHz Low power

										_	nalyzer - S	trum A			
Peak Search	11:26:44 AM May 12, 2022 TRACE 1 2 3 4 5 6 TYPE A WWWWW	RMS)	ALIGN / ype: Pwr( old:>10/10			SENSE:I					46400			ker	lar
NextPea	IFGain:Low Atten: 30 dB Mkr1 3.634 64 GHz								20.00 c	Gate:		B/di			
Next Rig						3		1-							9 0.0 .00
Next Le			La Carriera	աստուլ	իսիսուրդ	որությունը	ստուղո	L T T T T T T T T T T T T T T T T T T T	արիդուսի	1					0.0 0.0 0.0
Marker Del		<b>\</b>								1	der Amilia Andre	****	~~~~~		0.0 0.0
Mkr→C	Span 40.00 MHz 100 ms (1001 pts) FUNCTION VALUE		#Sw(	7104	EUN		 Y	/BW ·	VE		GHz Hz	.0 M		s B	Re
Mkr→RefL	-2.407 dBm 0.247 dBm	MHz	10.00	Power	Band		-11.054	z	4 64 GHz 0 00 GHz 0 00 GHz	3.634		f f f		N N N	1 2 3 4 5 6
Mo 1 of															7 8 9 0 1 2
		STATUS											-		G

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

#### PSD 3640 MHz High power

		11.10	41.07.0	AL TONI		10.177	OF LOT	A.C		SA	- Swept	Analyzer -	ctrum / 50 Ω	int Spec	Agne
Peak Search	TRACE 1 2 3 4 5 6							35480	3.6	er 1	ark				
NextPea	35 48 GHz	1363			Cr.ali		n: 30 dB		0: Fast G ain:Low	IFG	nput: RF	LO II	Gate:		
	7.123 dBm										dBm	20.00	Ref	/div	dB/
Next Rig							-				+		+		0.0
nextrug				unimutur		) COUD 10 POIN	3		an ar an	entr					
	F			- N			_	<u> </u>		1 m	+		_		.0
Next L							-	+					+		.0
											1				.0
Marker De		<b>.</b>	5	_			_					****			.0 =
							+				+		+		.0
	an 40.00 MHz ns (1001 pts)		een	#Sw/					VBW			0 GHz		er 3.6 BW	
Mkr→0			-	FUNCTION	ICTION	FU		Y			×				
							2 <u>3 dBm</u> 07 dBm		GHz GHz	635 4				N 1 N 1	i i
	1.788 dBm		MHz	10.00	Power										
Mkr→RefL	1.788 dBm 4.416 dBm		MHz MHz	10.00 20.00	Power Power		)7 dBm			640 0				N 1	1
Mkr→RefL			MHz MHz	10.00 20.00											5
Mkr→RefL Mo			MHz	10.00											1 5 7 3
			MHz	10.00 20.00											1 5 7

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

#### PSD 3690 MHz Low power

										pt SA	er - Sw			Spect	ilent S	Ag
Peak Search	12:02:26 PM May 12, 2022 TRACE 1 2 3 4 5 6 TYPE A WWWWW	(RMS)	ALIGN			SENSE:I	1			000 0		866			ker	lar
Hz NextPe	3.686 60 GHz -11.008 dBm		old: 10/10	Avg H	n		Trig: Fre Atten: 3	Ŷ	NO: Fast Gain:Lov	IF	Inpu 00 dE		Gate:		B/div	
Next Rig		-				3	<b>●</b> <sup>1</sup>		10-11 H-11-14-							og 10.0 0.00
Next L			A. W. M. M. M.													0.0 0.0 0.0
Marker De			-							/						0.0 0.0 0.0
pts) Mkr→	Span 40.00 MHz 100 ms (1001 pts) FUNCTION VALUE		#SW	TION	SUM		-	sw -	VB	×	Iz	0 GI VIHz		W 1	s B	Re
dBm	-1.936 dBm 0.666 dBm	) MHz ) MHz	10.00	Power	Band	dBm	-11.008 ( -12.889 ( -12.889 (		0 GHz	3.686 6 3.690 0 3.690 0				1	N N N	1 2 3 4 5 6
Mc 1 o																7 8 9 0 1 2
		STATUS														G

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

#### LTE 10MHz

10MHz												
			SA Chan nel powe r			SA Marker max value						
Freq	1 MHz EIRP limit (target) dBm	Max EIRP used by DC	Raw dBm/ 10 MHz	Raw 1 MHz dBm/M Hz	Exter nal Losse s (dB)	Raw dBm/M Hz per port	Anten na max gain (dBi)	Num ber of RF Ports	Port gain (dB )	EIRP 1 MHz (dBm/ MHz) total EIRP	Marg in (dB)	EIRP 10 MHz total EIRP
	dBm/M Hz	dBm/M Hz	dBm/ 10 MHz		dB		dBi	#	dB	dBm/M Hz	dB	dBm
3555	20	20	2.9	8.6353	14.3	-5.66	5.29	4	6.02	19.95	0.05	28.51
3555	18	18	0.9	6.52	14.3	-7.78	5.29	4	6.02	17.83	0.17	26.51
3635	20	20	1.81	6.74	14.3	-7.56	5.29	4	6.02	18.05	1.95	27.42
3635	18	18	-0.4	5.1785	14.3	-9.12	5.29	4	6.02	16.49	1.51	25.21
3695	20	20	1.7	7.4908	14.3	-6.81	5.29	4	6.02	18.80	1.20	27.31
3695	18	18	-0.37	5.46	14.3	-8.84	5.29	4	6.02	16.77	1.23	25.24

Note: EIRP Target was the SAS grant target value.

#### NR 20MHz

ZUMITZ												
	SAS Grant		SA Chan nel powe r			SA Marker max value						
Freq	1 MHz EIRP limit (target) dBm	Max EIRP used by DC	Raw dBm/ 10 MHz	Raw 1 MHz dBm/M Hz	Exter nal Losse s (dB)	Raw dBm/M Hz per port	Anten na max gain (dBi)	Num ber of RF Ports	Port gain (dB)	EIRP 1 MHz (dBm/ MHz) total EIRP	Marg in (dB)	EIRP 10 MHz total EIRP
	dBm/M Hz	dBm/M Hz	dBm/ 10 MHz		dB		dBi	#	dB	dBm/M Hz	dB	dBm
3560	20	20	2.82	8.5	14.3	-5.80	5.29	4	6.02	19.81	0.19	28.43
3560	16	16	-0.8	4.58	14.3	-9.72	5.29	4	6.02	15.89	0.11	24.81
3640	20	20	1.78	7.25	14.3	-7.05	5.29	4	6.02	18.56	1.44	27.39
3640	16	16	-2.4	3.247	14.3	-11.05	5.29	4	6.02	14.56	1.44	23.21
3690	20	20	1.72	7.41	14.3	-6.89	5.29	4	6.02	18.72	1.28	27.33
3690	16	16	-1.94	3.31	14.3	-10.99	5.29	4	6.02	14.62	1.38	23.67

Note: EIRP Target was the SAS grant target value.

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
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

WINNF.FT.C.SCS.1_DOT_ssl.pcap [Wi	reshark 2.2.7 (v2.2.7-0-g1861a96)]						- 0 ×
ile <u>E</u> dit <u>V</u> iew <u>Go</u> <u>C</u> apture <u>A</u> n	alyze Statistics Telephony Tool	ls Internals <u>H</u> elp					
	8 9 4 4 4 5 2		🖉 🗹 👧 🖇	k   🙀			
ilter:		Expression Clear Apply	Save				
o. Time	Source	Destination	Protocol	Length Channel	MAC Channel Info	Type Subtype	Source Port
57461 16:46:59.539109	10.10.0.206	10.10.0.163	TLSV1.2	191	Client Hello		
5000 16:46:59.540089	10.10.0.163	10.10.0.206	TLSV1.2	4162	Server Hello		500
5000 16:46:59.540266	10.10.0.163	10.10.0.206	TL5v1.2	544	Certificate, Certificate Request, Server Hell		500
57461 16:46:59.605401	10.10.0.206	10.10.0.163	TCP	2862	[TCP segment of a reassembled PDU]		5746
7461 16:46:59.605418	10.10.0.206	10.10.0.163	TL5V1.2	422	Certificate, Client Key Exchange		5746
57461 16:46:59.636332	10.10.0.206	10.10.0.163	TL5V1.2	335	Certificate Verify		5746
57461 16:46:59.636380	10,10,0,206	10.10.0.163	TLSV1.2	72	Change Cipher Spec		5746
57461 16:46:59.660995	10.10.0.206	10.10.0.163	TLSV1.2	111	Hello Request, Hello Request		5746
5000 16:46:59.661442	10.10.0.163	10.10.0.206	TL5V1.2	117	Change Cipher Spec, Encrypted Handshake Messa		500
57461 16:46:59.675090	10.10.0.206	10.10.0.163	TL5V1.2	327	Application Data		5746
57461 16:46:59.677897	10.10.0.206	10.10.0.163	TCP	2862	[TCP segment of a reassembled PDU]		5746
57461 16:46:59.677914	10.10.0.206	10.10.0.163	TL5V1.2	190	Application Data		5746
5000 16:46:59.723727	10.10.0.163	10.10.0.206	TL5V1.2	112	Application Data		500
5000 16:46:59.763561	10.10.0.163	10.10.0.206	TL5V1.2	671	Application Data, Application Data, Applicati		500
57462 16:47:01.890633	10.10.0.206	10.10.0.163	TL5V1.2	191	Client Hello		5746
5000 16:47:01.891008	10.10.0.163	10,10,0,206	TL5V1.2	2862	Server Hello		500
5000 16:47:01.891027	10,10,0,163	10, 10, 0, 206	TCP	1366	[TCP segment of a reassembled PDU]		500
5000 16:47:01.891319	10, 10, 0, 163	10, 10, 0, 206	TL5v1.2	544	Certificate, Certificate Request, Server Hell		500
7462 16:47:01.896952	10.10.0.206	10.10.0.163	TCP	2862	[TCP segment of a reassembled PDU]		5746
7463 46.47.04 006063	10 10 0 300	10 10 0 103		122	constitues of a reason of a root		C742

#### WINNF test requirements:

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

1	Page 55 of 86	Report Issued: 6/9/2022	Report File #: 7169011341B-CBRS-005

Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

2	<ul> <li>Make sure that Mutual authentication happens between UUT and the SAS Test Harness.</li> <li>Make sure that UUT uses TLS v1.2</li> <li>Make sure that cipher suites from one of the following is selected,</li> <li>TLS_RSA_WITH_AES_128_GCM_SHA256</li> <li>TLS_RSA_WITH_AES_256_GCM_SHA384</li> <li>TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA2 56</li> <li>TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA3 84</li> <li>TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA3 84</li> <li>TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256</li> </ul>	PASS	FAIL
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## Analysis of WINNF Test Requirements

## 1. From Client Hello: TLS version = TLS 1.2

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

57461 16:46:59.539109 10.10.0.206 10.10.0.163 TLSv1.2 191 Client Hello 57461	
■ Frame 1: 191 bytes on wire (1528 bits), 191 bytes captured (1528 bits) ■ Ethernet II, Src: fa:16:3e:56:06:a3 (fa:16:3e:56:06:a3), Dst: fa:16:3e:b1:8d:79 (fa:16:3e:b1:8d:79)	
Internet Protocol Version 4, Src: 10.10.0.206, Dst: 10.10.0.163	
Internet Protocol Version 4, Stc. 10.10.0.200, DSC. 10.10.0.103 It ransmission Control Protocol, Src Port: 57461, Dst Port: 5000, Seq: 1, Ack: 1, Len: 125	
Secure Sockets Layer	
Secure Sockets Layer TLSv1.2 Record Layer: Handshake Protocol: Client Hello	
Content Type: Handshake (22)	
Version: TLS 1.2 (0x0303)	
Lenath: 120	
Handshake Protocol: Client Hello	
Handshake Type: Client Hello (1)	
Length: 116	
Version: TLS 1.2 (0x0303)	
Random	
Session ID Length: 0	
Cipher Suites Length: 6	
□ Cipher Suites (3 suites)	
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_RSA_WITH_AES_128_GCM_SHA256 (0xc02f)	
Compression Methods Length: 1	
€ Compression Methods (1 method)	
Extensions Length: 69	
Extension: elliptic_curves	
B Extension. Tenegotiation_Into	
0040 ac 00 16 03 03 00 78 01 00 00 74 03 03 5b 1e dfxt[	
050 c3 b2 0c 4e 57 29 19 11 7e f8 21 6f 3f 97 ae 81 NW) ~.!o?	
	Г
2060 01 db 73 1e 88 1f 19 ef 7d d5 83 25 b7 00 00 06s }%	
0060 01 d0 /3 16 88 17 19 eT / 0 d5 83 25 0/ 00 00 06	

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

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

57461 16:46:59.539109 10.10.0.206 10.10.0.163 TLSv1.2 191 Client Hello 57461	
Frame 1: 191 bytes on wire (1528 bits), 191 bytes captured (1528 bits)	
Ethernet II, Src: fa:16:3e:56:06:a3 (fa:16:3e:56:06:a3), Dst: fa:16:3e:b1:8d:79 (fa:16:3e:b1:8d:79)	
Internet Protocol Version 4, Src: 10.10.0.206, Dst: 10.10.0.163	
Transmission Control Protocol, Src Port: 57461, Dst Port: 5000, Seq: 1, Ack: 1, Len: 125	
Secure Sockets Layer	
ILSv1.2 Record Layer: Handshake Protocol: Client Hello	
Content Type: Handshake (22)	
Version: TLS 1.2 (0x0303)	
Length: 120	
Handshake Protocol: Client Hello	
Handshake Type: Client Hello (1)	
Length: 116	
Version: TLS 1.2 (0x0303)	
🖻 Random	
Session ID Length: 0	
Cipher Suites Length: 6	
<pre>Cipher Suites (3 suites) Cipher Suite: TL5_RSA_WITH_AES_128_GCM_SHA256 (0x009c)</pre>	
Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 (0xc02b)	
Cipher Suite: TLS_ECOME_EXSA.WITH_AES_122_GCM_SHA256 (0xC02f)	
Compression Methods Length: 1	
Compression Methods (1 method)	
Extensions Length: 69	
Extension: ec_point_formats	
Excelsion. Telegoriario_mio	
1070 00 9c c0 2b c0 2f 01 00 00 45 00 0a 00 16 00 14+./E	
080 00 17 00 18 00 19 00 09 00 0a 00 0b 00 0c 00 0d	
000 06 03 06 01 05 03 05 01 05 03 04 03 04 03 04 01 04 02 03 03	
00b0 03 01 03 02 02 03 02 01 02 02 ff 01 00 01 00	

3. Cipher suite chosen (from Server Hello): TLS\_RSA\_WITH\_AES\_128\_GCM\_SHA256

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

<b>5</b> 00	0 16:46:59.540089 10.10.0.163 10.10.0.206 TLSv1.2 4162 Server Hello 5000	
<ul> <li>              Et</li></ul>	ame 2: 4162 bytes on wire (33296 bits), 4162 bytes captured (33296 bits) hernet II, Src: fa:16:3e:b1:8d:79 (fa:16:3e:b1:8d:79), Dst: fa:16:3e:56:06:a3 (fa:16:3e:56:06:a3) ternet Protocol Version 4, Src: 10.10.0.163, Dst: 10.10.0.206 ansmission Control Protocol, Src Port: 5000, Dst Port: 57461, Seq: 1, Ack: 126, Len: 4096 cure Sockets Layer TLSV1.2 Record Layer: Handshake Protocol: Server Hello Content Type: Handshake (22) Version: TLS 1.2 (0x0303) Length: 81 Handshake Protocol: Server Hello Handshake Type: Server Hello (2) Length: 77	
	<pre>Version: TLS 1.2 (0x0303) Random Session ID Length: 32 Session ID: eaebce6fc96739bb35f7769118a4c71f98f00b97a9001c06 Cipher Suite: TLS_RSA_WITH_AES_128_GCM_SHA256 (0x009c) Compression Method: null (0) Extensions Length: 5 Extension: renegotiation_info</pre>	
0080 0090 00a0 00b0 00c0 00c0	00 00 05 ff 01 00 01 00 16 03 03 11 4e 0b 00 11	-

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

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

## WINNF.FT.C.SCS.2

	cp.pcap [Wireshark 2.2.7 (v2.2.7-0-g:	[861a96)]				
ile <u>E</u> dit <u>V</u> iew <u>G</u> o <u>C</u> apture <u>A</u> r	nalyze <u>S</u> tatistics Telephony <u>T</u> oo	ls Internals <u>H</u> elp				
	: 😂   🔍 🗢 🔿 🐺 🛓		📓 🗹 🖪 🖇	¢   🙀		
ilter:		Expression Clear Apply	Save			
o. Time	Source	Destination	Protocol	Length Channel	MAC Channel Info	Type Subtype SourcePort
57816 17:19:55.936760	10.10.0.206	10.10.0.163	TL5V1.2		Client Hello	
5000 17:19:55.938046	10.10.0.163	10.10.0.206	TLSV1.2	2862	Server Hello	50
5000 17:19:55.938067	10.10.0.163	10.10.0.206	TCP	1366	[TCP segment of a reassembled PDU]	50
5000 17:19:55.938569	10.10.0.163	10.10.0.206	TLSV1.2	561	Certificate, Certificate Request, Server Hell	50
9239 17:19:55.997763	10.10.0.206	10.10.0.163	TCP	74	59239 → 8100 [SYN] Seq=0 win=14600 Len=0 MS5=	592
8100 17:19:55.998336	10.10.0.163	10.10.0.206	TCP	74	8100 - 59239 [SYN, ACK] Seq=0 Ack=1 Win=13980	81
9239 17:19:55.998349	10.10.0.206	10.10.0.163	TCP	66	59239 → 8100 [ACK] Seq=1 Ack=1 Win=14720 Len=	592
9239 17:19:56.001647	10.10.0.206	10.10.0.163	TCP	326	[TCP segment of a reassembled PDU]	592
9239 17:19:56.001695	10.10.0.206	10.10.0.163	OCSP	142	Request	592
8100 17:19:56.002105	10.10.0.163	10.10.0.206	TCP	66	8100 - 59239 [ACK] Seq=1 Ack=261 Win=15104 Le	81
8100 17:19:56.002200	10.10.0.163	10.10.0.206	TCP	66	8100 - 59239 [ACK] Seq=1 Ack=337 Win=15104 Le	81
8100 17:19:56.015976	10.10.0.163	10.10.0.206	TCP	1464	[TCP segment of a reassembled PDU]	81
9239 17:19:56.015983	10.10.0.206	10.10.0.163	TCP	66	59239 → 8100 [ACK] Seq=337 Ack=1399 win=17536	592
8100 17:19:56.015993	10.10.0.163	10.10.0.206	OCSP	1100	Response	81
9239 17:19:56.015995	10.10.0.206	10.10.0.163	TCP	66	59239 → 8100 [ACK] Seg=337 Ack=2433 win=20480	592
8100 17:19:56.016934	10.10.0.163	10.10.0.206	TCP	66	8100 - 59239 [FIN, ACK] Seg=2433 Ack=337 Win=	81
9239 17:19:56.021345	10.10.0.206	10.10.0.163	TCP	66	59239 - 8100 [FIN, ACK] Seg=337 Ack=2434 Win=	592
8100 17:19:56.021755	10.10.0.163	10.10.0.206	TCP	66	8100 - 59239 [ACK] Seg=2434 Ack=338 win=15104	81
7816 17:19:56.039298	10,10,0,206	10.10.0.163	TLSV1.2	73	Alert (Level: Fatal, Description: Certificate	578
Frame 1: 191 bytes on wi Ethernet II, Src: fa:16: Internet Protocol versic Transmission Control Pro Secure Sockets Layer	3e:56:06:a3 (fa:16:3e:56 on 4, 5rc: 10.10.0.206, D	:06:a3), Dst: fa:16:3e:b st: 10.10.0.163				

#### WINNF Test Requirements:

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

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

#### Analysis of WINNF Test Requirements

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

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

57816 17:19:55.936760 10.10.0.206 10.10.0.163 TLSv1.2 191 Client Hello 57816	
<ul> <li>B Frame 6607: 191 bytes on wire (1528 bits), 191 bytes captured (1528 bits)</li> <li>B Ethernet II, Src: fa:16:3e:56:06:a3 (fa:16:3e:56:06:a3), Dst: fa:16:3e:b1:8d:79 (fa:16:3e:b1:8d:79)</li> <li>B Internet Protocol Version 4, Src: 10.10.0.206, Dst: 10.10.0.163</li> <li>B Transmission Control Protocol, Src Port: 57816, Dst Port: 5000, Seq: 1, Ack: 1, Len: 125</li> <li>Secure Sockets Layer</li> <li>■ TLSV1.2 Record Layer: Handshake Protocol: Client Hello Content Type: Handshake (22)</li> </ul>	
Version: TLS 1.2 (0x0303)	
<pre>Length: 120 B Handshake Protocol: Client Hello Handshake Type: Client Hello (1) Length: 116 Version: TLS 1.2 (0x0303) Random Session ID Length: 0 Cipher Suites Length: 6 Cipher Suites (3 suites) Cipher Suite: TLS_RSA_WITH_AES_128_GCM_SHA256 (0x009c) Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02b) Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02f) Compression Methods Length: 1 Compression Methods (1 method) Extensions Length: 69 Extension: elliptic_curves Curves Curve</pre>	Ę
0040       d4       47       16       03       03       00       00       07       03       03       5b       1e       e7       .G Xt[         0050       7b       82       c7       c6       e6       75       37       64       cf       69       49       06       6f       40       18       c3       {u7d       .ii.o@         0060       6e       fe       03       b1       47       d1       00       00       fi       nDl.      G         0070       00       9c       c0       2f       01       00       045       00       0a       016       00       14      +/       E         0070       00       9c       c0       2f       01       00       045       00       0a       016       00       14      +/       E         0080       00       17       01       8       00       00       00       00       00       00       d0      +/       E	

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	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

Z 57816 17:19:55.936760 10.10.0.206 10.10.0.163 TLSv1.2 191 Client Hello 57816	
<ul> <li></li></ul>	(fa:16:3e:b1:8d:79)
Internet Protocol Version 4, Src: 10.10.0.206, Dst: 10.10.0.163	125
Transmission Control Protocol, Src Port: 57816, Dst Port: 5000, Seq: 1, Ack: 1, L     Secure Sockets Layer     Secure Sockets     Secure Socke	Len: 125
TLSv1.2 Record Layer: Handshake Protocol: Client Hello	
Content Type: Handshake (22)	
Version: TLS 1.2 (0x0303)	
Length: 120	
🗆 Handshake Protocol: Client Hello	
Handshake Type: Client Hello (1)	
Length: 116	
Version: TL5 1.2 (0x0303)	-
🕀 Random	-
Session ID Length: 0	
Cipher Suites Length: 6	
■ Cipher Suites (3 suites)	
Cipher Suite: TLS_RSA_WITH_AES_128_GCM_SHA256 (0x009c) Cipher Suite: TLS_ECDHE_ECD5A_WITH_AES_128_GCM_SHA256 (0xc02b)	
Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 (0xc02f) Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02f)	
Compression Methods Length: 1	
Compression Methods (1 method)     English 1	
Extensions Length: 69	
Extension: ec_point_formats	
Extension: signature_algorithms	
Triancion: representation info	
0070 00 9c c0 2b c0 2f 01 00 00 45 00 0a 00 16 00 14+./E	*
0090 00 0e 00 16 00 0b 00 02 01 00 00 0d 00 1c 00 1a	
00a0 06 03 06 01 05 03 05 01 04 03 04 01 04 02 03 03	
00b0 03 01 03 02 02 03 02 01 02 02 ff 01 00 01 00	-

3. From Server Hello, cipher suite chosen: TLS\_RSA\_WITH\_AES\_128\_GCM\_SHA256

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

Z 5000 17:19:55.938046 10.10.0.163 10.10.0.206 TLSv1.2 2862 Server Hello 5000	
<ul> <li>B Frame 6610: 2862 bytes on wire (22896 bits), 2862 bytes captured (22896 bits)</li> <li>B Ethernet II, Src: fa:16:3e:b1:8d:79 (fa:16:3e:b1:8d:79), Dst: fa:16:3e:56:06:a3 (fa:16:3e:56:06:a3</li> <li>B Internet Protocol Version 4, Src: 10.10.0.163, Dst: 10.10.0.206</li> <li>B Transmission Control Protocol, Src Port: 5000, Dst Port: 57816, Seq: 1, Ack: 126, Len: 2796</li> <li>B Secure Sockets Layer</li> <li>□ TLSV1.2 Record Layer: Handshake Protocol: Server Hello Content Type: Handshake (22) Version: TLS 1.2 (0x0303) Length: 81</li> <li>□ Handshake Protocol: Server Hello Handshake Type: Server Hello (2) Length: 77 Version: TLS 1.2 (0x0303)</li> <li>□ Random Session ID Length: 32 Session ID Length: 32 Session ID: eb02152a420a218bab406966ad7871e3c7ab1fd27fe730c0</li> <li>Cipher Suite: TLS_RSA_WITH_AES_128_GCM_SHA256 (0x009c)</li> </ul>	.3)
Compression Method: null (0) Extensions Length: 5 @ Extension: renegotiation_info	

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

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

59239 17:19:56.001695 10.10.0.206 10.10.0.163 OCSP 142 Request 59239	
Frame 6631: 142 bytes on wire (1136 bits), 142 bytes captured (1136 bits)	
Ethernet II, Src: fa:16:3e:56:06:a3 (fa:16:3e:56:06:a3), Dst: fa:16:3e:b1:8d:79 (fa:16:3e:b1:8d:79)	
Internet Protocol Version 4, Src: 10.10.0.206, Dst: 10.10.0.163	
Transmission Control Protocol, Src Port: 59239, Dst Port: 8100, Seq: 261, Ack: 1, Len: 76	
[2 Reassembled TCP Segments (336 bytes): #6630(260), #6631(76)]	
Hypertext Transfer Protocol	
Online Certificate Status Protocol	
□ tbsRequest	
🗆 requestList: 1 item	
Request	
□ reqCert	
□ hashAlgorithm (SHA-1)	
Algorithm Id: 1.3.14.3.2.26 (SHA-1) issuerNameHash: 5368d21d2529427538588c5ccba4c4e6f3b96641	
issuerKeyHash: 28dfa5dc7e01810db98617066e4d66400f514713	
serialNumber: 13733597121043651548	
Seria Inumber: 15/5559/121045051548	
00 0d 0a 0d 0a 30 4a 30 48 30 46 30 44 30 42 30 090JOH OFODOBO	
10 06 05 2b 0e 03 02 1a 05 00 04 14 53 68 d2 1d 25+sh% 20 29 42 75 38 58 8c 5c cb a4 c4 e6 f3 b9 66 41 04 )Bu8x.\fA.	
ime (142 bytes) Reassembled TCP (336 bytes)	

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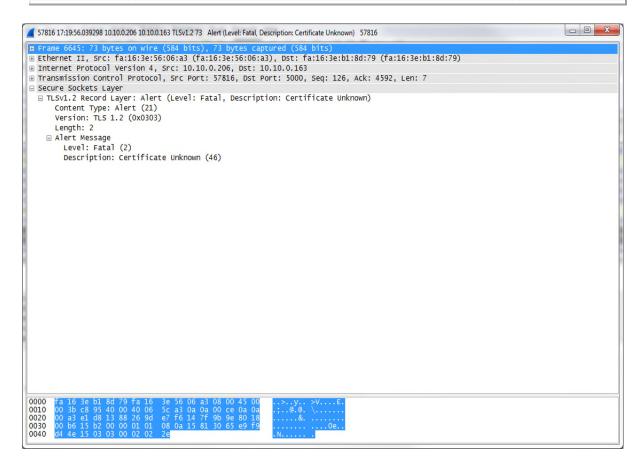
Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

r	
a 8100 17:19:56.015993 10.10.0.163 10.10.0.206 OCSP 1100 Response 8100	
🗄 Frame 6636: 1100 bytes on wire (8800 bits), 1100 bytes captured (8800 bits)	
Ethernet II, Src: fa:16:3e:b1:8d:79 (fa:16:3e:b1:8d:79), Dst: fa:16:3e:56:06:a3 (fa:16:3e:56:06	:a3)
□ Internet Protocol Version 4, Src: 10.10.0.163, Dst: 10.10.0.206	
Transmission Control Protocol, Src Port: 8100, Dst Port: 59239, Seq: 1399, Ack: 337, Len: 1034	
Hypertext Transfer Protocol	
🗆 Online Certificate Status Protocol	
responseStatus: successful (0)	
responseBytes	
ResponseType Id: 1.3.6.1.5.5.7.48.1.1 (id-pkix-ocsp-basic)	
BasicOCSPResponse	
tbsResponseData	
responderID: byName (1)	
producedAt: 2018-06-11 21:19:56 (UTC)	
□ responses: 1 item	
singleResponse	
- certID	
hashAlgorithm (SHA-1)	
Algorithm Id: 1.3.14.3.2.26 (SHA-1)	
issuerNameHash: 5368d21d2529427538588c5ccba4c4e6f3b96641	
issuerKeyHash: 28dfa5dc7e01810db98617066e4d66400f514713	
serialNumber: 13733597121043651548	
■ certStatus: revoked (1)	
🗆 revoked	
revocationTime: 2018-05-24 13:46:38 (UTC)	
thisupdate: 2018-06-11 21:19:56 (UTC)	
B signatureAlgorithm (sha1WithRSAEncryption)	
Padding: 0	
signature: 5f09dfac4aea6a5a68aaa9521bf62720dd5078b0a24a4e72	
🖂 certs: 1 item	
🖂 Certificate (id-at-commonName=SAS.OCSP.EXAMPLE,id-at-organizationalUnitName=WInnForum S	AS OCSP Responder Ce
algorithmIdentifier (sha256WithRSAEncryption)	
Padding: 0	
encrypted: 36db8b95399edae9857a41c7aec684ecfb3b7e2a5a539d25	
4 III	•
0150 60 22 5b dc a1 11 18 0f 32 30 31 38 30 35 32 34 "[ 20180524 0160 31 33 34 36 33 38 5a 18 0f 32 30 31 38 30 36 31 134638zL .2018061	<u>*</u>
0170 31 32 31 31 39 35 36 5a 30 0d 06 09 2a 86 48 86 1211956z 0*.H.	*
Frame (1100 bytes) Reassembled TCP (2432 bytes)	

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

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
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	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

## WINNF.FT.C.SCS.3

WINNF.FT.C.SCS.3_DOT_ssl.pcap [Wi	reshark 2.2.7 (v2.2.7-0-g1861a96)]						_ O _X
ile Edit View Go Capture And	alyze Statistics Telephony Tools	Internals Help					
	2 9 + + 4 7 4		📓 🗹 🐴 🤅				
ilter:		Expression Clear Apply					
o. Time	Source	Destination	Protocol	Length Channel	MAC Channel Info	Type Subtype	Source Port
57576 16:59:49.241435	10.10.0.206	10.10.0.163	TL5V1.2	191	Client Hello		5757
5000 16:59:49.243278	10.10.0.163	10.10.0.206	TL5V1.2	2862	Server Hello		5000
5000 16:59:49.243297	10.10.0.163	10.10.0.206	TCP	1366	[TCP segment of a reassembled PDU]		5000
5000 16:59:49,243788	10.10.0.163	10.10.0.206	TLSV1.2	561	Certificate, Certificate Request, Server Hel		500(
57576 16:59:49.263311	10.10.0.206	10.10.0.163	TLSV1.2	73	Alert (Level: Fatal, Description: Certificat	e	57576
57581 17:00:21,310475	10.10.0.206	10.10.0.163	TLSV1.2	191	Client Hello		5758:
5000 17:00:21,310833	10.10.0.163	10.10.0.206	TLSV1.2	2862	Server Hello		500(
5000 17:00:21.310848	10.10.0.163	10.10.0.206	TCP	1366	[TCP segment of a reassembled PDU]		5000
5000 17:00:21.311019	10.10.0.163	10.10.0.206	TL5V1.2	561	Certificate, Certificate Request, Server Hel	1	5000
57581 17:00:21,315769	10.10.0.206	10.10.0.163	TLSV1.2	73	Alert (Level: Fatal, Description: Certificat	e	5758:
57587 17:00:53,369531	10.10.0.206	10.10.0.163	TLSV1.2	191	Client Hello		5758
5000 17:00:53, 369919	10.10.0.163	10.10.0.206	TLSV1.2	2862	Server Hello		5000
5000 17:00:53.369966	10.10.0.163	10.10.0.206	TCP	1366	[TCP segment of a reassembled PDU]		5000
5000 17:00:53.370114	10.10.0.163	10.10.0.206	TLSV1.2	561	Certificate, Certificate Request, Server Hel	1	5000
57587 17:00:53.374221	10.10.0.206	10.10.0.163	TLSV1.2	73	Alert (Level: Fatal, Description: Certificat	e	5758;
57593 17:01:25.414808	10.10.0.206	10.10.0.163	TLSV1.2	191	Client Hello		5759
5000 17:01:25.415160	10.10.0.163	10.10.0.206	TLSV1.2	2862	Server Hello		500
5000 17:01:25.415177	10.10.0.163	10.10.0.206	TCP	1366	[TCP segment of a reassembled PDU]		500
5000 17:01:25.415375	10.10.0.163	10.10.0.206	TLSV1.2	561	Certificate, Certificate Request, Server Hel	1	500
				ui.			- P

#### WINNF Test Requirements:

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

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

#### Analysis of WINNF Test Requirements

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

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

57576 16:59:49.241435 10.10.0.206 10.10.0.163 TLSv1.2 191 Client Hello 57576	
B Frame 1: 191 bytes on wire (1528 bits), 191 bytes captured (1528 bits) E thernet II, Src: fa:16:3e:56:06:a3 (fa:16:3e:56:06:a3), Dst: fa:16:3e:b1:8d:79 (fa:16:3e:b1:8d:79) Internet Protocol Version 4, Src: 10.10.0.206, Dst: 10.10.0.163 Transmission Control Protocol, Src Port: 57576, Dst Port: 5000, Seq: 1, Ack: 1, Len: 125 Secure Sockets Layer	
□ TLSV1.2 Record Layer: Handshake Protocol: Client Hello	
Content Type: Handshake (22)	
Version: TLS 1.2 (0x0303)	
Length: 120	
🗆 Handshake Protocol: Client Hello	
Handshake Type: Client Hello (1)	
Length: 116	
Version: TLS 1.2 (0x0303)	
🗄 Random	
Session ID Length: 0	
Cipher Suites Length: 6	
□ Cipher Suites (3 suites) Cipher Suite: TLS_RSA_WITH_AES_128_GCM_SHA256 (0x009c)	
Cipher Suite: TLS_KSA_WITH_AES_128_GCM_SHA256 (0x009C) Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 (0xc02b)	
Cipher Suite: TLS_ECONE_ECOSA_WITH_AES_128_GCM_SHA256 (0xC02b)	
Compression Methods Length: 1	
Compression Methods (1 method)	
Extensions Length: 69	
Extension: elliptic_curves	
<ul> <li>Bettension: ec_point_formats</li> <li>Bettension: signature_algorithms</li> <li>Bettension: renegotiation_info</li> </ul>	
<pre>     Extension: ec_point_formats     Extension: signature_algorithms     Extension: renegotiation_info      Odd     6a a3 16 03 03 00 78 01 00 00 74 03 03 5b 1e e2 jxt[ 050 c5 b9 25 83 93 9d 8c d7 62 70 d5 2e 98 5d 83 35 bp].5 </pre>	
<ul> <li></li></ul>	
<pre>     Extension: ec_point_formats     Extension: signature_algorithms     Extension: renegotiation_info      Odd     6a a3 16 03 03 00 78 01 00 00 74 03 03 5b 1e e2 jxt[ 050 c5 b9 25 83 93 9d 8c d7 62 70 d5 2e 98 5d 83 35 bp].5 </pre>	

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	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

2/2/	6 16:59:49.241435 10.10.0.206 10.10.0.163 TLSv1.2 191 Client Hello 57576	
Eth Int Tra Sec T	<pre>me 1: 191 bytes on wire (1528 bits), 191 bytes captured (1528 bits) ernet II, Src: fa:16:3e:56:06:a3 (fa:16:3e:56:06:a3), Dst: fa:16:3e:b1:8d:79 (fa:16:3e:b1:8d:79) ernet Protocol Version 4, Src: 10.10.0.206, Dst: 10.10.0.163 nsmission Control Protocol, Src Port: 57576, Dst Port: 5000, Seq: 1, Ack: 1, Len: 125 ure Sockets Layer LSV1.2 Record Layer: Handshake Protocol: Client Hello Content Type: Handshake (22) Version: TLS 1.2 (0x0303) Length: 120 Handshake Protocol: Client Hello</pre>	
	Handshake Type: Client Hello (1) Length: 116 Version: TLS 1.2 (0x0303) B Random Session ID Length: 0	
	Cipher Suites Length: 6 E Cipher Suites (3 suites)	
	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_RSA_WITH_AES_128_GCM_SHA256 (0xc02f) Compression Methods Length: 1 @ Compression Methods (1 method) Extensions Length: 69 @ Extension: elliptic_curves @ Extension: ec_point_formats @ Extension: signature_algorithms @ Extension: renegotiation_info	
090	00       9c       c0       2b       c0       2f       01       00       045       00       0a       00       16       00       14      +./.	

3. From Server Hello, cipher suite chosen: TLS\_RSA\_WITH\_AES\_128\_GCM\_SHA256

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

🚄 5000 16:59:49.243278 10.10.0.163 10.10.0.206 TLSv1.2 2862 Server Hello 5000	0	
⊕ Frame 2: 2862 bytes on wire (22896 bits), 2862 bytes	captured (22896 bits)	
Ethernet II, Src: fa:16:3e:b1:8d:79 (fa:16:3e:b1:8d:7		
Internet Protocol Version 4, Src: 10.10.0.163, Dst: 1	10.10.0.206	
⊕ Transmission Control Protocol, Src Port: 5000, Dst Po	ort: 57576, Seq: 1, Ack: 126, Len: 2796	
Secure Sockets Layer		
<ul> <li>□ TLSv1.2 Record Layer: Handshake Protocol: Server He Content Type: Handshake (22) Version: TLS 1.2 (0x0303) Length: 81</li> <li>□ Handshake Protocol: Server Hello Handshake Type: Server Hello (2) Length: 77</li> </ul>	e 110	
Version: TL5 1.2 (0x0303)		
Version: TLS 1.2 (0x0303) ⊞ Random Session ID Length: 32		
Version: TLS 1.2 (0x0303) ⊞ Random Session ID Length: 32 Session ID: 7acaf29e8d6f98b94c22e6431d4f614c7bb		
Version: TLS 1.2 (0x0303)		
<pre>Version: TLS 1.2 (0x0303) Random Session ID Length: 32 Session ID: 7acaf29e8d6f98b94c22e6431d4f614c7bb Cipher Suite: TLS_RSA_WITH_AES_128_GCM_SHA256 ( Compression Method: null (0) Extensions Length: 5</pre>		
<pre>Version: TLS 1.2 (0x0303) Random Session ID Length: 32 Session ID: 7acaf29e8d6f98b94c22e6431d4f614c7bb Cipher Suite: TLS_RSA_WITH_AES_128_GCM_SHA256 ( Compression Method: null (0) Extensions Length: 5 @ Extension: renegotiation_info</pre>	(0x009c)	
<pre>Version: TLS 1.2 (0x0303) B Random Session ID Length: 32 Session ID: 7acaf29e8d6f98b94c22e6431d4f614c7bb Cipher Suite: TLS_RSA_WITH_AES_128_GCM_SHA256 ( Compression Method: null (0) Extensions Length: 5 B Extension: renegotiation_info 0080 00 fa f0 a7 84 bc 79 d8 76 76 65 da 52 83 00 9c</pre>	(0x009c)	
Version: TLS 1.2 (0x0303)	(0x009c) y. vve.R	
Version: TLS 1.2 (0x0303) Random Session ID Length: 32 Session ID: 7acaf29e8d6f98b94c22e6431d4f614c7bb Cipher Suite: TLS_RSA_WITH_AES_128_GCM_SHA256 ( Compression Method: null (0) Extensions Length: 5 Extension: renegotiation_info 0080 00 fa f0 a7 84 bc 79 d8 76 76 65 da 52 83 00 9d 0090 00 00 5 ff 01 00 01 00 16 03 03 11 5f 0b 00 11	(0x009c)	, c

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

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

5757	i:59:49.263311 10.10.0.206 10.10.0.163 TLSv1.2 73 Alert (Level: Fatal, Description: Certificate Unknown) 57576	
🗄 Fra	5: 73 bytes on wire (584 bits), 73 bytes captured (584 bits)	
	net II, Src: fa:16:3e:56:06:a3 (fa:16:3e:56:06:a3), Dst: fa:16:3e:b1:8d:79 (fa:16:3e:b1:8d:79) net Protocol Version 4, Src: 10.10.0.206, Dst: 10.10.0.163	
	ission Control Protocol, Src Port: 57576, Dst Port: 5000, Seq: 126, Ack: 4592, Len: 7	
	Sockets Layer	
🖃 T	1.2 Record Layer: Alert (Level: Fatal, Description: Certificate Unknown)	
	ntent Type: Alert (21)	
	arsion: TLS 1.2 (0x0303) anath: 2	
=	ert Message	
	Level: Fatal (2)	
	Description: Certificate Unknown (46)	
	16 3e b1 8d 79 fa 16  3e 56 06 a3 08 00 45 00  >y >VE. 3b 14 da 40 00 40 06  10 5f 0a 0a 00 ce 0a 0a   .;@.@	
0020	a3 e0 e8 13 88 72 47 d3 18 7f c6 0e 70 80 18rgp	
	b6 15 b2 00 00 01 01 08 0a 15 6e c6 6d e9 e7	
0040	ab 15 03 03 00 02 02 2e j	

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

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

## WINNF.FT.C.SCS.4

WINNEFT.CSCS4_DOT_ssipcap [Wireshark 227 (v227-0-g1861a96)]								
<u>File Edit View Go Capture An</u>	alyze <u>Statistics</u> Telephony <u>T</u> ools	Internals Help						
0 0 🦼 🔳 🔬 🗎 🗎 🗎	🛿 🔍 🔶 🛸 🥥 🐺 🛓		📓 🗹 🕵 💈					
Filter:		Expression Clear Apply	Save					
lo. Time	Source	Destination	Protocol	Length Channel	MAC Channel Info	Type Subtype	Source Port	
57658 17:09:02.333839	10.10.0.206	10.10.0.163	TLSV1.2	191	Client Hello			
5000 17:09:02.334266	10.10.0.163	10.10.0.206	TLSV1.2	2862	Server Hello		500	
5000 17:09:02.334284	10.10.0.163	10.10.0.206	TL5v1.2	448	Certificate, Certificate Request, Server Hel		500	
57658 17:09:02.379031	10.10.0.206	10.10.0.163	TLSV1.2	73	Alert (Level: Fatal, Description: Certificat	e	5765	
57662 17:09:32.421212	10.10.0.206	10.10.0.163	TLSV1.2	191	Client Hello		5766	
5000 17:09:32,421510	10,10.0.163	10.10.0.206	TLSV1.2	2862	Server Hello		500	
5000 17:09:32,421523	10,10.0.163	10,10,0,206	TLSV1.2	448	Certificate, Certificate Request, Server Hel		500	
57662 17:09:32,422692	10.10.0.206	10.10.0.163	TLSV1.2	73	Alert (Level: Fatal, Description: Certificat	e	5766	
57667 17:10:02.464877	10.10.0.206	10.10.0.163	TLSV1.2	191	Client Hello		5766	
5000 17:10:02.465265	10.10.0.163	10.10.0.206	TLSV1.2	2862	Server Hello		500	
5000 17:10:02.465280	10.10.0.163	10.10.0.206	TLSV1.2	448	Certificate, Certificate Request, Server Hel		500	
57667 17:10:02.468068	10,10,0,206	10.10.0.163	TLSV1,2	73	Alert (Level: Fatal, Description: Certificat	e	5766	

#### WINNF Test Requirements:

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

	Freedom	1	1
	<ul> <li>Make sure that UUT uses TLS v1.2 for security establishment.</li> </ul>		
	<ul> <li>Make sure UUT selects the correct cipher suite.</li> </ul>		
2	<ul> <li>UUT shall use CRL or OCSP to verify the validity of the server certificate</li> </ul>	PASS	FAIL
	<ul> <li>Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness.</li> </ul>		

#### Analysis of WINNF Test Requirements

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

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

	- 0 X
57658 17:09:02.333839 10.10.0.206 10.10.0.163 TLSv1.2 191 Client Hello 57658	
<ul> <li>B Frame 7126: 191 bytes on wire (1528 bits), 191 bytes captured (1528 bits)</li> <li>B Ethernet II, Src: fa:16:3e:56:06:a3 (fa:16:3e:56:06:a3), Dst: fa:16:3e:b1:8d:79 (fa:16:3e:b1:8d:79</li> <li>B Internet Protocol Version 4, Src: 10.10.0.206, Dst: 10.10.0.163</li> <li>B Transmission Control Protocol, Src Port: 57658, Dst Port: 5000, Seq: 1, Ack: 1, Len: 125</li> <li>□ Secure Sockets Layer</li> <li>□ TLSV1.2 Record Layer: Handshake Protocol: Client Hello Content Type: Handshake (22)</li> </ul>	9)
Version: TLS 1.2 (0x0303)	
Length: 120 Handshake Protocol: Client Hello Handshake Type: Client Hello (1) Length: 116 Version: TLS 1.2 (0x0303) Random Session ID Length: 0 Cipher Suites Length: 6 Cipher Suites (3 suites) Cipher Suite: TLS_RSA_WITH_AES_128_GCM_SHA256 (0x009c) Cipher Suite: TLS_ECOHE_ECDSA_WITH_AES_128_GCM_SHA256 (0xc02b) Cipher Suite: TLS_ECOHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02f) Compression Methods Length: 1 Compression Methods (1 method) Extensions Length: 69 Extension: ec_point_formats Extension: signature_algorithms Extension: renegotiation_info	
0040         db         26         16         03         03         00         07         03         03         5b         1e         e4         .&, x.	* 

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	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

🚄 57658 17:09:02.333839 10.10.0.206 10.10.0.163 TLSv1.2 191 Client Hello 57658	
<pre>S76581/090233383910.100.20610.100.163 [Ext.2191 Chert Hello 5/658 Frame 7126: 191 bytes on wire (1528 bits), 191 bytes captured (1528 bits) E thernet II, Src: fa:16:3e:56:06:a3 (fa:16:3e:56:06:a3), Dst: fa:16:3e:b1:8d:79 (fa:16:3e:b1:8d:79) Internet Protocol Version 4, Src: 10.10.0.206, Dst: 10.10.0.163 Transmission Control Protocol, Src Port: 57658, Dst Port: 5000, Seq: 1, Ack: 1, Len: 125 Secure Sockets Layer TLSV1.2 Record Layer: Handshake Protocol: Client Hello Content Type: Handshake (22) Version: TLS 1.2 (0x0303) Length: 120 Handshake Protocol: Client Hello Handshake Type: Client Hello (1) Length: 116 Version: TLS 1.2 (0x0303) Random Session ID Length: 0 Cipher Suites Length: 6 = Cipher Suites (3 Suites) 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_RSA_WITH_AES_128_GCM_SHA256 (0xc02b) Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02b) Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02b) Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02b) Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 (0xc02b) Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02b) Cip</pre>	
Compression Methods Length: 1 B Compression Methods (1 method) Extensions Length: 69 B Extension: elliptic_curves B Extension: signature_algorithms B Extension: renegotiation_info 0070 00 9c c0 2b c0 2f 01 00 00 45 00 0a 00 16 00 14 Extension: renegotiation_info	
0030         00         00         16         00         00         00         00         00         16         00         00         00         00         00         00         16         00         00         00         00         00         16         00         00         00         00         16         00         00         00         00         16         00         00         00         16         00         00         00         16         00         00         00         16         00         00         00         16         00         00         00         16         00         00         00         16         00         00         00         16         00         00         00         16         00         16         00         1	-

3. From Server Hello, cipher suite chosen: TLS\_RSA\_WITH\_AES\_128\_GCM\_SHA256

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

5000 17:09:02.334266 10.10.0.163 10.10.0.206 TLSv1.2 2862 Server Hello 5000	
	:56:06:a3)
⊕ Internet Protocol Version 4, Src: 10.10.0.163, Dst: 10.10.0.206	
Transmission Control Protocol, Src Port: 5000, Dst Port: 57658, Seg: 1, Ack: 126, Len: 279	96
Secure Sockets Layer	
TLSv1.2 Record Layer: Handshake Protocol: Server Hello	
Content Type: Handshake (22)	
Version: TL5 1.2 (0x0303)	
Length: 81	
🛛 Handshake Protocol: Server Hello	
Handshake Type: Server Hello (2)	
Length: 77	
Version: TLS 1.2 (0x0303) B Random	
Session ID Length: 32	
Session ID: 50ddb23b112926f850acd19623e2c30578a887e3da71c845	
Cipher Suite: TLS_RSA_WITH_AES_128_GCM_SHA256 (0x009c)	
Compression Method: null (0)	
Extensions Length: 5	
Extension: renegotiation_info	
0080 87 e3 da 71 c8 45 47 51 17 22 3c c6 e9 ff 00 9cq.EGQ ."<	100
0090 00 00 05 ff 01 00 01 00 16 03 03 0b da 0b 00 0b	
00a0 d6 00 0b d3 00 05 a0 30 82 05 9c 30 82 03 84 a000	
OOb0         03         02         01         02         09         00         e5         f5         79         29         eb         1a         cd         b6         30	
	*

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

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

57658 17:09:02.379031 10.10.0.206 10.10.0.163 TLSv1.2 73 Alert (Level: Fatal, Description: Certificate Unknown) 57658	
Frame 7134: 73 bytes on wire (584 bits), 73 bytes captured (584 bits) Ethernet II, Src: fa:16:3e:56:06:a3 (fa:16:3e:56:06:a3), Dst: fa:16:3e:b1:8d:79 (fa:16:3e:b1:8d:79) Internet Protocol Version 4, Src: 10.10.0.206, Dst: 10.10.0.163 Transmission Control Protocol, Src Port: 57658, Dst Port: 5000, Seq: 126, Ack: 3179, Len: 7 Secure Sockets Layer TLSV1.2 Record Layer: Alert (Level: Fatal, Description: Certificate Unknown) Content Type: Alert (21) Version: TLS 1.2 (0x0303) Length: 2 Alert Message Level: Fatal (2) Description: Certificate Unknown (46)	
0000       fa 16 3e b1 8d 79 fa 16       3e 56 06 a3 08 00 45 00      >y >VE.         0010       00 3b 0f 07 40 00 40 06       16 32 0a 0a 00 ce 0a 0a      >y >VE.         0020       00 a3 e1 3a 13 88 e8 cb       3a 55 e9 d6 13 3b 80 18        :         0030       00 9f 15 b2 00 00 01 01       08 0a 15 77 37 08 e9 ef	

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

## WINNF.FT.C.SCS.5

### Packet Capture Sequence

0 0 🛋 📕 🔬 🕒 🗎 3	🕻 🔁   🔍 🗢 🌳 🖓 🐺 👱		🏽 🗹 🐻 🖇	6 1					
Filter:		Expression Clear Apply	Save						
o. Time	Source	Destination	Protocol	Length Channel	MAC Channel		Туре	Subtype	Source Port
57690 17:13:07.020079	10.10.0.206	10,10,0,163	TL5V1.2	191		Client Hello			576
5000 17:13:07.021420	10.10.0.163	10.10.0.206	TLSV1.2	2862		Server Hello			50
5000 17:13:07.021437	10.10.0.163	10.10.0.206	TCP	1366		[TCP segment of a reassembled PDU]			50
5000 17:13:07.021690	10.10.0.163	10.10.0.206	TLSV1.2	544		Certificate, Certificate Request, Server			50
57690 17:13:07.064639	10.10.0.206	10.10.0.163	TLSV1.2	73		Alert (Level: Fatal, Description: Certifi	cate		576
57694 17:13:39.098920	10.10.0.206	10.10.0.163	TLSV1.2	191		Client Hello			576
5000 17:13:39.099656	10,10,0,163	10.10.0.206	TLSV1.2	2862		Server Hello			50
5000 17:13:39.099672	10.10.0.163	10.10.0.206	TCP	1366		[TCP segment of a reassembled PDU]	1.1.1		50
5000 17:13:39.099852	10.10.0.163	10.10.0.206	TLSV1.2	544		Certificate, Certificate Request, Server			50
57694 17:13:39.101773	10.10.0.206	10.10.0.163	TLSV1.2	73		Alert (Level: Fatal, Description: Certifi	cate		576

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	TÜV
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

### WINNF Test Requirements:

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

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### Analysis of WINNF Test Requirements

1. From Client Hello can read: TLS version	= TLS 1.2
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a 57690 17:13:07.020079 10.10.0.206 10.10.0.163 TLSv1.2 191 Client Hello 57690	
<ul> <li>              Frame 1: 191 bytes on wire (1528 bits), 191 bytes captured (1528 bits)      </li> <li>             Ethernet II, Src: fa:16:3e:56:06:a3 (fa:16:3e:56:06:a3), Dst: fa:16:3e:b1:8d:79 (fa:16:3e:b1      </li> <li>             Internet Protocol Version 4, Src: 10.10.0.206, Dst: 10.10.0.163         </li> <li>             Transmission Control Protocol, Src Port: 57690, Dst Port: 5000, Seq: 1, Ack: 1, Len: 125         </li> <li>             Secure Sockets Layer         <ul> <li>             TLSV1.2 Record Layer: Handshake Protocol: Client Hello             </li> </ul> </li> </ul>	L:8d:79)
Content Type: Handshake (22) Version: TLS 1.2 (0x0303)	
<pre>Length: 120 B Handshake Protocol: Client Hello Handshake Type: Client Hello (1) Length: 116 Version: TLS 1.2 (0x0303) B Random Session ID Length: 0 Cipher Suites Length: 6 Cipher Suites (3 suites) Cipher Suite: TLS_RSA_WITH_AES_128_GCM_SHA256 (0x009c) Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 (0xc02b) Cipher suite: TLS_ECOHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02f) Compression Methods Length: 1 Compression Methods (1 method) Extensions Length: 69 Extension: elliptic_curves Extension: signature_algorithms Extension: renegotiation_info</pre>	
0040         96         f3         16         03         03         00         00         74         03         03         55         1 <t< td=""><td>·</td></t<>	·

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

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

🚄 57690 17:13:07.020079 10.10.0.206 10.10.0.163 TLSv1.2 191 Client Hello 57690	
<ul> <li>         Frame 1: 191 bytes on wire (1528 bits), 191 bytes captured (1528 bits)     </li> <li>         Ethernet II, Src: fa:16:3e:56:06:a3 (fa:16:3e:56:06:a3), Dst: fa:16:3e:b1:8d:79 (fa:16:3e:b1:8     </li> <li>         Internet Protocol Version 4, Src: 10.10.0.206, Dst: 10.10.0.163         Transmission Control Protocol, Src Port: 57690, Dst Port: 5000, Seq: 1, Ack: 1, Len: 125     </li> </ul>	d:79)
B fransmission control protocol, Src Port. 57090, Dst Port. 5000, Seq. 1, Ack. 1, Len. 125 ⊡ Secure Sockets Laver	
<ul> <li>□ TLSV1.2 Record Layer: Handshake Protocol: Client Hello Content Type: Handshake (22) Version: TLS 1.2 (0x0303) Length: 120</li> <li>□ Handshake Protocol: Client Hello Handshake Type: Client Hello (1) Length: 116 Version: TLS 1.2 (0x0303)</li> <li>□ Random</li> </ul>	
Session ID Length: 0	
Cipher Suites Length: 6 E Cipher Suites (3 suites)	
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_RSA_WITH_AES_128_GCM_SHA256 (0xc02f) Compression Methods Length: 1 Compression Methods (1 method) Extensions Length: 69 Extension: eclpoint_formats Extension: signature_algorithms Extension: renegotiation_info	
0070         00         9c         c0         2f         01         00         045         00         0a         00         16         00         14        +//.          E           0080         00         17         00         18         00         90         00         0a         00         16         00         14        +//.          E           0090         00         0e         00         16         00         <	

3. From Server Hello, cipher suite chosen: TLS\_RSA\_WITH\_AES\_128\_GCM\_SHA256

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

5000 17:13:07.021420 10.10.0.163 10.10.0.206 TLSv1.2 2862 Server Hello 5000				
<ul> <li>⇒ Frame 2: 2862 bytes on wire (22896 bits), 2862 bytes captured (22896 bits)</li> <li>⇒ Ethernet II, Src: fa:16:3e:b1:8d:79 (fa:16:3e:b1:8d:79), Dst: fa:16:3e:56:06:a3 (fa:16:3e:56:06:a3)</li> <li>⇒ Internet Protocol Version 4, Src: 10.10.0.163, Dst: 10.10.0.206</li> <li>⇒ Transmission Control Protocol, Src Port: 5000, Dst Port: 57690, Seq: 1, Ack: 126, Len: 2796</li> <li>⇒ Secure Sockets Layer</li> </ul>				
<ul> <li>□ TLSv1.2 Record Layer: Handshake Protocol: Server Hello Content Type: Handshake (22) Version: TLS 1.2 (0x0303) Length: 81</li> <li>□ Handshake Protocol: Server Hello Handshake Type: Server Hello (2) Length: 77 Version: TLS 1.2 (0x0303)</li> <li>□ Random Session ID Length: 32 Session ID: ad18dd2a99b4d550099735fb8f06edffef9e8cd2a2e9a54c</li> </ul>				
Cipher Suite: TLS_RSA_WITH_AES_128_GCM_SHA256 (0x009c) Compression Method: null (0) Extensions Length: 5 ⊕ Extension: renegotiation_info				
O080         8c d2 a2 e9 a5 4c 3b 0d         55 e9 21 98 0f 68 00 9c        L;         U.!.h,           O090         00 00 5 ff 01 00 01 00         16 03 03 11 4e 0b 00 11        L;         U.!.h,           O0a0         4a 00 11 47 00 05 81 30         82 05 7d 30 82 03 65 a0         JG0}0            O0b0         03 02 01 02 02 09 04 be         97 89 d1 60 22 5b d3 0	*			

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

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

						bits), 06:a3 (							:b1:8d	:79 (fa	:16:3e:b	01:8d:79)	)	
						rc: 10.										_		
			ts Lay		tocol,	Src Po	rt: 5/0	90, D	st Po	ort: 50	000,	seq: 1	26, AC	k: 45/5	, Len: 7	(		
	Cont Vers	.2 Re tent	cord L Type: TLS 1		(21)	(Level:	Fatal	Descr	ripti	ion: Ce	ertif	icate	Unknow	n)				
=			ssage															
			Fatal	(2)														
					ficate	Unknow	n (46)											
					ficate	Unknow	n (46)											

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

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

## Test Equipment

Instrument	Manufacturer	Type No.	Serial No	Calibration Period (months)	Calibration Due
Power Supply	Xantrex	XKW 60-50	E00109863	O/P Mon	-
Signal Analyzer	Agilent	MXA	SSG013930	24 months	2024-04-26
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	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

# Appendix A – EUT & Client Provided Details

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

### General EUT Description

Manufacturer	Ericsson
Address	Torshamnsgatan 23 Kista SE-16480 Stockholm Sweden
Product Name	Dot 4469 B48
	Dot 4459 B48 (Non-Tested Variant. See Technical Description for a similarity description)
Product Number	KRY 901 516/2 KRY 901 516/1 (Non-Tested Variant. See Technical Description for a similarity description)
Serial Number(s)	TD3W213284 & TD3W229778
Software Version	CXP9024418/15-R52A165_R13A190
Domain Proxy Software Version	ERICdomainproxyservice_CXP9035414 1.10.1
Hardware Version	R1A
Test Specification/Issue/Date	FCC CFR 47 Part 96: 2017

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

#### **Technical Description**

Dot 4469 B48 (KRY 901 516/2) are Remote Radio Units forming part of the Ericsson Radio Base Station (RBS) equipment. The Dot provides radio access for mobile and fixed devices and is intended for the indoor environment. The radio operates over 4 Transmit ports in MRO (NR);Single, Multi-Carrier, and MIMO transmission with a maximum rated RF Output of 0.25W per port over an operational temperature of 5°C to +40°C. The unit is designed to be ceiling or wall mounted.

The Dot 4459 and Dot 4469 radios are identical except that Dot 4459 has internal antennas and Dot 4469 has external ports.

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.

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

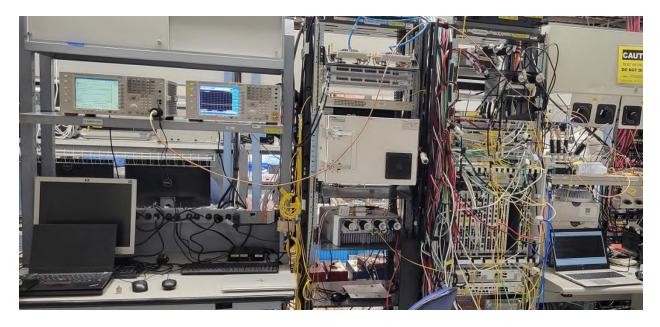
# Appendix B – EUT, Peripherals, and Test Setup Photos

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Client	Ericsson	
Product	KRY 901 516/1 DOT 4459 B48 (3550-3700MHz) KRY 901 516/2 DOT 4469 B48 (3550-3700MHz)	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

## Test setup

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