## **Test Report**

As per

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



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on the

Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station FCC ID: AS57705SARHMC-2B

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

Testing produced for

Nokia

See Appendix A for full client & EUT details.

Scott Drysdale. Test Personnel

590A Drysdale

Steve McFarlane Report Reviewer

Sleve M Farlan



Page 1 of 61 Report Issued: 11/5/2023 Report File #: 7169010408-CBRS2-005 © TÜV SÜD Canada Inc. This test report shall not be reproduced except in full, without written approval of TÜV SÜD Canada Inc

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

# **Table of Contents**

Table of Contents   2	2
Report Scope	3
Summary	4
Test Results Summary    5      Notes, Justifications, or Deviations    10	
Applicable Standards, Specifications and Methods1	1
Document Revision Status	2
Definitions and Acronyms	3
Testing Facility	4
Calibrations and Accreditations	
Detailed Test Results Section	6
Registration17Grant25Heartbeat27Measurement38Relinquishment40Deregistration41Power Level42	5 7 8 0 1
WINNF Security Test Case Analysis	5
WINNF.FT.C.SCS.1       45         WINNF.FT.C.SCS.2       49         WINNF.FT.C.SCS.3       53         WINNF.FT.C.SCS.4       54         WINNF.FT.C.SCS.5       55	9 3 4
Appendix A – EUT & Client Provided Details	9
MAIN EUT	0
Technical Description	1

Page 2 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

### **Report Scope**

This report addresses the SAS protocol verification testing and test results of the **Nokia 7705 SAR-Hmc NA(3HE12473AAA) Base Station (3550-3700 MHz)** herein referred to as EUT (Equipment Under Test). The EUT was tested for compliance against the following standards:

FCC Part 96 SAS requirements (CBRS Test Plan)

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

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

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

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

Page 3 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
--------------	--------------------------	-------------------------------------

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
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.

Equipment Under Test (EUT)	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
EUT passed all tests performed	Yes	
Tests conducted by	Scott Drysdale	

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

Page 4 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
--------------	--------------------------	-------------------------------------

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
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### Test Results Summary

#### Section as per Working Document WINNF-TS-0122

Section	CBSD	DP	Test Case ID	Test Case Title	RF Measurement Requirement	Pass / Fail
6.1.4.1.1	X		WINNF.FT.C.REG.1	Multi-Step registration	Monitor for 60 seconds after REG message sent. No transmission during test.	Р
6.1.4.1.2		Х	WINNF.FT.D.REG.2	Domain Proxy Multi-Step registration	Monitor for 60 seconds after REG message sent. No transmission during test.	N/A
6.1.4.1.3	Х		WINNF.FT.C.REG.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.REG.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.REG.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		Х	WINNF.FT.D.REG.6	Domain Proxy Single-Step registration for CBSD with CPI signed data	Monitor for 60 seconds after REG message sent. No transmission during test.	N/A
6.1.4.1.7	X	X	WINNF.FT.C.REG.7	Registration due to change of an installation parameter	Test waits until transmission starts, then trigger an installationParam change. • Record time at which transmission stops. Time must be within 60 seconds of the installationParam change taking effect.	N/A
6.1.4.2.1	X		WINNF.FT.C.REG.8	Missing Required parameters (responseCode 102)	Monitor for 60 seconds after REG message sent. No transmission during test.	Р
6.1.4.2.2		Х	WINNF.FT.D.REG.9	Domain Proxy Missing Required parameters (responseCode 102)	Monitor for 60 seconds after REG message sent. No transmission during test.	N/A
6.1.4.2.3	Х		WINNF.FT.C.REG.10	Pending registration (responseCode 200)	Monitor for 60 seconds after REG message sent. No transmission during test.	Р
6.1.4.2.4		Х	WINNF.FT.D.REG.11	Domain Proxy Pending registration (responseCode 200)	Monitor for 60 seconds after REG message	N/A

Page 5 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
--------------	--------------------------	-------------------------------------

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
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				Success Case (first Heartbeat Response)	test. Ensure that:	N/A
6.4.4.1.2		X	WINNF.FT.D.HBT.2	Domain Proxy Heartbeat	starts, measure that transmission is within the granted channel (frequencyLow, frequencyHigh) Monitor RF from start of	
					does not start until time of first heartbeat response or after. • After transmission	
6.4.4.1.1	Х		WINNF.FT.C.HBT.1	Heartbeat Success Case (first Heartbeat Response)	Monitor RF from start of test. Ensure that: • Transmission	Р
6.3.4.2.2	X	X	WINNF.FT.C.GRA.2	Unsuccessful Grant responseCode=401 (GRANT_CONFLICT)	Monitor for 60 seconds after REG message sent. No transmission during test.	Р
6.3.4.2.1	X	X	WINNF.FT.C.GRA.1 (TYPO FIXED D TO C)	Unsuccessful Grant responseCode=400 (INTERFERENCE)	Monitor for 60 seconds after REG message sent. No transmission during test.	Р
6.1.4.3.1	X	Х	WINNF.FT.C.REG.20	Category A CBSD location update		Р
				(responseCode 201)	after REG message sent. No transmission during test.	N/A
6.1.4.2.12		X	WINNF.FT.D.REG.19	201) Domain Proxy Group Error	after REG message sent. No transmission during test. Monitor for 60 seconds	Р
6.1.4.2.11	X		WINNF.FT.C.REG.18	SAS protocol version responseCode 100) Group Error (responseCode	sent. No transmission during test. Monitor for 60 seconds	N/A
6.1.4.2.10		x	WINNF.FT.D.REG.17	Domain Proxy Unsupported	during test. Monitor for 60 seconds after REG message	N/A
6.1.4.2.9	Х		WINNF.FT.C.REG.16	Unsupported SAS protocol version (responseCode 100)	Monitor for 60 seconds after REG message sent. No transmission	Р
6.1.4.2.8		X	WINNF.FT.D.REG.15	Domain Proxy Blacklisted CBSD (responseCode 101)	Monitor for 60 seconds after REG message sent. No transmission during test.	N/A
6.1.4.2.7	X		WINNF.FT.C.REG.14	Blacklisted CBSD (responseCode 101)	Monitor for 60 seconds after REG message sent. No transmission during test.	Ρ
6.1.4.2.6		X	WINNF.FT.D.REG.13	Domain Proxy Invalid parameters (responseCode 103)	Monitor for 60 seconds after REG message sent. No transmission during test.	N/A
6.1.4.2.5	Х		WINNF.FT.C.REG.12	Invalid parameter (responseCode 103)	Monitor for 60 seconds after REG message sent. No transmission during test.	Ρ
					sent. No transmission during test.	

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					<ul> <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, frequencyHigh)</li> </ul>	
6.4.4.2.1	X	X	WINNF.FT.C.HBT.3	Heartbeat responseCode=105 (DEREGISTER)	Monitor RF transmission. Ensure that: • CBSD stops transmission within 60 seconds of the heartbeatRespon se which contains responseCode = 105	Ρ
6.4.4.2.2	Х		WINNF.FT.C.HBT.4	Heartbeat responseCode=500 (TERMINATED_GRANT)		Р
6.4.4.2.3	Х	Х	WINNF.FT.C.HBT.5	Heartbeat responseCode=501 (SUSPENDED_GRANT) in First Heartbeat Response	Monitor RF transmission from start of test. Ensure there is no transmission during the test	Р
6.4.4.2.4	X	X	WINNF.FT.C.HBT.6	Heartbeat responseCode=501 (SUSPENDED_GRANT) in Subsequent Heartbeat Response	Monitor RF transmission. Ensure: CBSD stops transmission within 60 seconds of heartbeatRespon se which contains responseCode=5 01	Ρ
6.4.4.2.5	X	X	WINNF.FT.C.HBT.7	Heartbeat responseCode=502 (UNSYNC_OP_PARAM)	Monitor RF transmission. Ensure: • CBSD stops transmission within 60 seconds of heartbeatRespon se which contains responseCode=5 02	Ρ
6.4.4.2.6		X	WINNF.FT.D.HBT.8	Domain Proxy Heartbeat responseCode=500 (TEMINATED_GRANT)	Monitor RF transmission. CBSDs will have different behavior: CBSD1: will continue to transmit to end of test (this is not a pass/fail criteria, but check)	N/A

Page 7 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

					CBSD2: must	
					• CBSD2. Must stop transmission within 60	
					seconds of being sent	
					heartbeatRespon	
					se with responseCode =	
64401	37	N			500	
6.4.4.3.1	X	X	WINNF.FT.C.HBT.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	Ρ
					time during test	
6.4.4.3.2	X	X	WINNF.FT.C.HBT.10	Heartbeat Response Absent (Subsequent Heartbeat)	Monitor RF transmission. Verify: CBSD must stop transmission with in transmitExpireTi me+60 seconds, where transmitExpireTi me is from last successful heartbeatRespon se message	Ρ
6.5.4.2.1	Х		WINNF.FT.C.MES.1	Registration Response contains measReportConfig	No RF monitoring	Р
6.5.4.2.2		X	WINNF.FT.D.MES.2	Domain Proxy Registration		N/A
				Response contains measReportConfig	No RF monitoring	
6.5.4.2.3	Х	Х	WINNF.FT.C.MES.3	Grant Response contains measReportConfig	No RF monitoring	Р
6.5.4.2.4	Х		WINNF.FT.C.MES.4	Heartbeat Response contains measReportConfig	No RF monitoring	Р
6.5.4.2.5		Х	WINNF.FT.D.MES.5	Domain Proxy Heartbeat Response contains measReportConfig	No RF monitoring	N/A
6.6.4.1.1	X		WINNF.FT.C.RLQ.1	Successful Relinquishment	Monitor RF transmission. Ensure: • CBSD stops transmission at any time prior to sending the relinquishmentRe quest message.	Ρ
6.6.4.1.2		X	WINNF.FT.D.RLQ.2	Domain Proxy Successful Relinquishment	Monitor RF transmission. Ensure: • CBSD stops transmission at any time prior to sending the relinquishmentRequest message.	N/A
6.7.4.1.1	X		WINNF.FT.C.DRG.1	Successful Deregistration	Monitor RF transmission. Ensure: • CBSD stops transmission at any time prior to sending the relinquishmentRe	Ρ

	Page 8 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

					quest message or deregistration Request message (whichever is sent first)	
6.7.4.1.2		X	WINNF.FT.D.DRG.2	Domain Proxy Successful Deregistration	Monitor RF transmission. Ensure: • CBSD stops transmission at any time prior to sending the relinquishmentRequest message or deregistrationRequest message (whichever is sent first)	N/A
6.8.4.1.1	X	X	WINNF.FT.C.SCS.1	Successful TLS connection between UUT and SAS Test Harness	No RF transmission during test Check the tcpdump for the TLS information	Р
6.8.4.2.1	X	X	WINNF.FT.C.SCS.2	TLS failure due to revoked certificate	No RF transmission during test Check the tcpdump for the TLS information	Р
6.8.4.2.2	X	Х	WINNF.FT.C.SCS.3	TLS failure due to expired server certificate	No RF transmission during test Check the tcpdump for the TLS information	Р
6.8.4.2.3	X	Х	WINNF.FT.C.SCS.4	TLS failure when SAS Test Harness certificate is issue by unknown CA	No RF transmission during test Check the tcpdump for the TLS information	Р
6.8.4.2.4	X	Х	WINNF.FT.C.SCS.5	TLS failure when certificate at the SAS Test Harness is corrupted	No RF transmission during test Check the tcpdump for the TLS information	Р
7.1.4.1.1	X	x	WINNF.PT.C.HBT	UUT RF Transmit Power Measurement	Power Spectral Density test case. 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 power.	Ρ

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.

Page 9 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005

Client	Nokia	
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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.

Test results were obtained using the model, the client attests the test results are representative or worst case of all models as listed in appendix A

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

- a. EUT is a CBSD without a Domain Proxy
- b. EUT supports the following Conditional functionality from WINNF-TS-0122-V1.0.2, Table 6-2:
  - i. C1 Multi-step registration (WINNF.FT.C.REG.1)
- c. Optional test cases were not performed

Additional testing for power spectral density (PSD) requirements were evaluated as the original EUT firmware was changed to allow for higher conducted power with different antenna gains. All other parameters were deemed to not be affected as there was no other changes.

Note that security case 2 was performed as per customer request. There were no DNS, OCSP or web servers available in the test set-up to allow lookup and download of the CRL file. The CRL file was manually installed on the CBSD for the purposes of these tests.

When the device is not operating in CBSD mode as a category A or category B device, it is operating under modular operation of FCC ID: N7NMC74B. The certification of this module in that mode of operation is not part of this test report.

Logs are kept on file.

Page 10 of 61         Report Issued: 11/5/2023         Report File #: 7169010408-CBRS2-C
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

# 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
Version V1.0.2	Conformance and Performance Test Technical Specification; CBSD/DP as Unit Under Test (UUT) Working Document
ISO/IEC 17025:2017	General requirements for the competence of testing and calibration laboratories

Page 11 of 61         Report Issued: 11/5/2023         Report File #: 7169010408-CBRS2-005	5
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### **Document Revision Status**

000 – Draft issue. January 31, 2022

 $001 - 1^{st}$  issue, Aug 10, 2023. Note due to anomalies, the draft test report for this was not issued to client.

 $002 - 2^{nd}$  issue, Aug 14, 2023. Minor revisions and typographical errors as per client request. Kept on file.

 $003 - 3^{rd}$  issue, Aug 15, 2023. Minor revisions and typographical errors as per client request. Kept on file.

 $004 - 4^{\text{th}}$  issue, Aug 21, 2023. Removed erroneous description on page 3 as per client request kept on file.

 $005 - 5^{\text{th}}$  issue, Nov 5, 2023. Changed the FCC ID as per client request.

Page 12 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
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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'.

Page 13 of 61         Report Issued: 11/5/2023         Report File #: 7169010408-CBRS	2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
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## **Testing Facility**

Testing for SAS protocol compliance on the EUT was carried out at TUV SUD Ottawa.

### **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.

Page 14 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
---------------	--------------------------	-------------------------------------

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
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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)
Jan 11 – 17 <sup>th</sup> , 2022	All (Except security)	SD	20-23	40-55	96.106
Jan 18, 2022	Security test cases	SD	20-23	40-55	96.106

Page 15 of 61         Report Issued: 11/5/2023         Report File #: 7169010408-CBRS2-00	)5
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

## **Detailed Test Results Section**

Page 16 of 61         Report Issued: 11/5/2023         Report File #: 7169010408-CBRS2-00	)5
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

## Registration

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Section	DP	Test Case ID	Test Case Title	Pass / Fail
6.1.4.1.1		WINNF.FT.C.REG.1	Multi-Step registration	Р

Date	Time	Customer traffic Generated	Customer Traffic Transmitted	Comments
01-11-2022	19:27:31	469	471	
01-11-2022	19:27:32	470	472	
01-11-2022	19:27:33	469	473	
01-11-2022	19:27:34	470	472	
01-11-2022	19:27:35	472	0	Customer traffic has stopped
01-11-2022	19:27:36	470	0	
01-11-2022	19:27:37	470	0	
01-11-2027	19:28:33	469	0	
01-11-2028	19:28:34	471	0	
01-11-2029	19:28:35	471	0	End of test

	Page 17 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

.4.2.1	Х		WINNF.FT.C.REG.8			Monitor for 60 seconds after REG message sent. No transmission during test.	P
Date		Time	Customer traffic Generated	Customer Traffic Transmitted		Comments	
11-2022		19:37:4	9 469	46	7		
11-2022		19:37:5	0 469	46	7		
11-2022		19:37:5	1 470	46	3		
11-2022		19:37:5	2 471	46	7		
11-2022		19:37:5	3 469		O Customer traffi	ic has stopped	
11-2022		19:37:5	4 470		)		
11-2022		19:37:5	5 471		)		
11-2022		19:38:5	1 470		)		
11-2022		19:38:5	2 469		)		
11-2022		19:38:5	3 469	(	D End of test		
11-2022		19:38:5	4 469		0		
	Date 11-2022 11-2022 11-2022 11-2022 11-2022 11-2022 11-2022 11-2022 11-2022 11-2022	Date 11-2022 11-2022 11-2022 11-2022 11-2022 11-2022 11-2022 11-2022 11-2022 11-2022 11-2022 11-2022 11-2022 11-2022 11-2022 11-2022	Date         Time           11-2022         19:37:4           11-2022         19:37:5           11-2022         19:37:5           11-2022         19:37:5           11-2022         19:37:5           11-2022         19:37:5           11-2022         19:37:5           11-2022         19:37:5           11-2022         19:37:5           11-2022         19:38:5           11-2022         19:38:5           11-2022         19:38:5           11-2022         19:38:5	Date         Time         Customer traffic Generated           11-2022         19:37:49         469           11-2022         19:37:50         469           11-2022         19:37:51         470           11-2022         19:37:52         471           11-2022         19:37:53         469           11-2022         19:37:53         470           11-2022         19:37:55         471           11-2022         19:37:55         471           11-2022         19:37:55         471           11-2022         19:37:55         471           11-2022         19:38:51         470           11-2022         19:38:52         469           11-2022         19:38:52         469           11-2022         19:38:53         469	Date         Time         Customer traffic Generated         Customer Traffic Transmitted           11-2022         19:37:49         469         467           11-2022         19:37:50         469         467           11-2022         19:37:51         470         468           11-2022         19:37:52         471         466           11-2022         19:37:53         469         66           11-2022         19:37:53         469         66           11-2022         19:37:55         471         66           11-2022         19:37:55         471         66           11-2022         19:37:55         471         66           11-2022         19:38:51         470         66           11-2022         19:38:52         469         66           11-2022         19:38:53         469         66	Date         Time         Customer traffic Generated         Customer Traffic Transmitted           11-2022         19:37:49         469         467           11-2022         19:37:50         469         467           11-2022         19:37:51         470         468           11-2022         19:37:52         471         467           11-2022         19:37:53         469         0         Customer traffic           11-2022         19:37:53         469         0         Customer traffic           11-2022         19:37:53         469         0         Customer traffic           11-2022         19:37:54         470         0         0           11-2022         19:37:55         471         0         0           11-2022         19:38:51         470         0         0           11-2022         19:38:52         469         0         0           11-2022         19:38:53         469         0         End of test	Date         Time         Customer traffic Generated         Customer Traffic Transmitted         Customer traffic Comments           11-2022         19:37:49         469         467           11-2022         19:37:50         469         467           11-2022         19:37:51         470         468           11-2022         19:37:52         471         467           11-2022         19:37:53         469         0           11-2022         19:37:53         469         0           11-2022         19:37:53         469         0           11-2022         19:37:53         469         0           11-2022         19:37:55         471         0           11-2022         19:37:55         471         0           11-2022         19:37:55         471         0           11-2022         19:38:51         470         0           11-2022         19:38:52         469         0           11-2022         19:38:52         469         0           11-2022         19:38:53         469         0           11-2022         19:38:53         469         0

Page 18 of 61Report Issued: 11/5/2023Report File	#: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.1.4.2.3	X	WINNF.FT.C.REG.10	Pending registra (responseCode 2			Ρ
Date	Time	Customer traffic Generated	Customer Traffic Transmitted	Comm	ients	
01-11-2022	19:41:27	469	467			
01-11-2022	19:41:28	469	467			
01-11-2022	19:41:29	469	467			
01-11-2022	19:41:30	469	467			
01-11-2022	19:41:31	469	0	Customer traffic has stopped		
01-11-2022	19:41:32	469	0			
01-11-2022	19:41:34	469	0			
01-11-2022	19:41:35	469	0			
01-11-2022	19:41:36	471	0			
01-11-2022	19:41:37	469	0			
01-11-2022	19:41:38	469	0			
01-11-2022	19:41:39	471	0			
01-11-2022	19:41:40	469	0			
01-11-2022	19:41:41	469	0			
01-11-2022	19:41:42	471	0			
01-11-2022	19:41:43	469	0			
01-11-2022	19:41:44	469	0			
01-11-2022	19:41:45	471	0			
01-11-2022	19:41:46	469	0			
01-11-2022	19:41:47	469	0			
01-11-2022	19:41:48	471	0			
01-11-2022	19:41:49	469	0			
01-11-2022	19:41:50	469	0			
01-11-2022	19:41:51	469	0			
01-11-2022	19:41:52	469	0			
01-11-2022	19:41:53	469	0			
01-11-2022	19:41:54	469	0			
01-11-2022	19:41:55	469	0			
01-11-2022	19:41:56	471	0			
01-11-2022	19:41:57	469	0			
01-11-2022	19:41:58	469	0			
01-11-2022	19:41:59	470	0			
01-11-2022	19:42:00	469	0			
01-11-2022	19:42:01	469	0			

Page 19 of 61

Report Issued: 11/5/2023

Client	Noki	a			
Product			kia 7705 SAI (3HE12473A	R-Hmc NA AA) Base Station	
Standard(	s) FCC	Part 96 SAS	requirements	s (CBRS Test Plan)	Canada
			_		
-11-2022	19:42:02	471	0		
-11-2022	19:42:03	469	0		
-11-2022	19:42:04	469	0		
-11-2022	19:42:05	471	0		
-11-2022	19:42:06	469	0		
-11-2022	19:42:07	469	0		
-11-2022	19:42:08	471	0		
-11-2022	19:42:09	469	0		
-11-2022 -11-2022	19:42:10	469 471	0		
	19:42:11		0		
-11-2022 -11-2022	19:42:12 19:42:13	469 469	0		
-11-2022	19:42:13	409	0		
-11-2022	19:42:14	471	0		
-11-2022	19:42:15	409	0		
-11-2022	19:42:10	469	0		
-11-2022 -11-2022	19:42:18 19:42:19	469 471	0		
-11-2022	19:42:19	471	0		
-11-2022 -11-2022	19:42:21 19:42:22	469 471	0		
-11-2022	19:42:22	471 469	0		
-11-2022	19:42:23	469	0		
-11-2022 -11-2022	19:42:24	469	0		
-11-2022	19:42:25	471	0		
-11-2022	19:42:20	469	0		
-11-2022	19:42:27	409	0		
-11-2022	19:42:28	471	0		
-11-2022	19:42:29	469	0		
-11-2022	19:42:30	409	0	End of test	
-11-2022	19:42:31	471	0		
-11-2022	19:42:32	469	0		
11-2022	13.42.33	403	U		

Page 20 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.1.4.2.5	Х	 WINNF.FT.C.REG.12	Invalid parameter	Monitor for 60 seconds	
			(responseCode 103)	after REG message	Р
				sent. No transmission	
				during test.	

Date	Time	Customer traffic Generated	Customer Traffic Transmitted	Comments
01-11-2022	20:04:08	470	470	
01-11-2022	20:04:09	470	466	
01-11-2022	20:04:10	470	472	
01-11-2022	20:04:11	469	475	
01-11-2022	20:04:12	470	470	
01-11-2022	20:04:13	469	471	
01-11-2022	20:04:14	469	471	
01-11-2022	20:04:15	471	471	
01-11-2022	20:04:16	469	471	
01-11-2022	20:04:17	468	474	
01-11-2022	20:04:18	471	324	
01-11-2022	20:04:19	469	0	Customer traffic has stopped
01-11-2022	20:04:20	469	0	
01-11-2022	20:04:21	471	0	
01-11-2022	20:05:18	469	0	
01-11-2022	20:05:19	469	0	
01-11-2022	20:05:20	469	0	End of test
01-11-2022	20:05:21	471	0	

Page 21 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.1.4.2.7	Х	 WINNF.FT.C.REG.14	Blacklisted CBSD (responseCode 101)	Monitor for 60 seconds after REG message sent. No transmission	Р
				during test.	

Date	Time	Customer traffic Generated	Customer Traffic Transmitted	Comments
01-11-2022	20:07:14	470	472	
01-11-2022	20:07:15	469	466	
01-11-2022	20:07:16	469	467	
01-11-2022	20:07:17	471	471	
01-11-2022	20:07:18	469	469	
01-11-2022	20:07:19	469	0	Customer traffic has stopped
01-11-2022	20:07:20	469	0	
01-11-2022	20:07:21	471	0	
01-11-2022	20:08:17	469	0	
01-11-2022	20:08:18	469	0	
01-11-2022	20:08:19	471	0	End of test
01-11-2022	20:08:20	471	0	
01-11-2022	20:08:21	470	0	

Page 22 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

			L			sent. No transmission during test.	
Date	1	Гime	Customer traffic Generated	Customer Traffic Transmitted		Comments	
01-11-2022	20	:15:59	471	470			
01-11-2022	20	:16:00	469	471			
01-11-2022	20	:16:01	469	475			
01-11-2022	20	:16:02	471	471			
01-11-2022	20	:16:03	469	80			
01-11-2022	20	:16:04	471	0	Customer tra	ffic has stopped	
01-11-2022	20	:16:05	469	0			
01-11-2022	20	:16:06	469	0			
01-11-2022	20	:17:02	470	0			
01-11-2022	20	:17:03	471	0			
01-11-2022	20	:17:04	470	0			
01-11-2022	20	:17:05	469	0	End of test		
01-11-2022	20	:17:06	469	0			
01-11-2022	20	:17:07	469	0			

Page 23 of 61         Report Issued: 11/5/2023         Report File #: 7169010408-CE	RS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.1.4.2.11	Х		WINNF.FT.C.REG.18	Group Error ( 201)	aft	onitor for 60 seconds ter REG message ent. No transmission iring test.	Р
Date		Time	Customer traffic Generated	Customer Traffic Transmitted	Cor	mments	
01-11-2022		20:19:11	471	467			
01-11-2022		20:19:12	469	471			
01-11-2022		20:19:13	469	467			
01-11-2022		20:19:14	471	467			
01-11-2022		20:19:15	469	0	Customer traffic h	as stopped	
01-11-2022		20:19:16	469	0			
01-11-2022		20:19:17	471	0			
01-11-2022		20:20:13	471	0			
01-11-2022		20:20:14	469	0			
01-11-2022		20:20:15	470	0	End of test		
01-11-2022		20:20:16	471	0			

Page 24 of 61         Report Issued: 11/5/2023         Report File #: 7169010408-CBRS2-005	5
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

### Grant

Check the device registration and authorization with the SAS,

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

6.3.4.2. 1	WINNF.FT.C.GRA.1	Unsuccessful Grant responseCode=400 (INTERFERENCE)	Monitor for 60 seconds after REG message sent. No transmission during test.	Р
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Date	Time	Customer traffic Generated	Customer Traffic Transmitted	Comments
01-11-2022	20:24:28	471	467	
01-11-2022	20:24:29	469	469	
01-11-2022	20:24:30	470	468	
01-11-2022	20:24:31	469	471	
01-11-2022	20:24:32	471	323	
01-11-2022	20:24:33	469	0	Customer traffic has stopped
01-11-2022	20:24:34	470	0	
01-11-2022	20:24:35	471	0	
01-11-2022	20:24:36	470	0	
01-11-2022	20:25:32	469	0	
01-11-2022	20:25:33	469	0	
01-11-2022	20:25:34	471	0	
01-11-2022	20:25:35	469	0	End of test
01-11-2022	20:25:36	469	0	
01-11-2022	20:25:37	471	0	

Page 25 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.3.4	4.2.2	WINNF.FT.C.GRA.2	Unsuccessful Grant	Monitor for 60 seconds after REG	
			responseCode=401	message sent. No transmission	Р
			(GRANT_CONFLICT)	during test.	

Date	Time	Customer traffic Generated	Customer Traffic Transmitted	Comments
01-12-2022	14:05:28	469	471	
01-12-2022	14:05:29	469	467	
01-12-2022	14:05:30	471	467	
01-12-2022	14:05:31	471	467	
01-12-2022	14:05:32	470	0	Customer traffic has stopped
01-12-2022	14:05:33	470	0	
01-12-2022	14:05:34	471	0	
01-12-2022	14:06:32	469	0	
01-12-2022	14:06:33	472	0	
01-12-2022	14:06:34	470	0	End of test
01-12-2022	14:06:35	470	0	

Page 26 of 61         Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

### Heartbeat

6.4.4.1.1	Х	 WINNF.FT.C.HBT.1	Heartbeat Success Case (first	Monitor RF from start of	Р
			Heartbeat Response)	test. Ensure that:	
			_	Transmission	
				does not	
				start until time of	
				first heartbeat	
				response or after.	
				After	
				transmission	
				starts, measure	
				that transmission	
				is within the	
				granted channel	
				(frequencyLow,	
				frequencyHigh)	

#### Low Channel

Date	Time	Customer traffic Generated	Customer Traffic Transmitted	Comments
01-12-2022	16:37:04	470	470	
01-12-2022	16:37:05	471	469	
01-12-2022	16:37:06	469	467	
01-12-2022	16:37:07	469	449	
01-12-2022	16:37:08	471	0	Customer traffic has stopped
01-12-2022	16:37:09	469	0	
				Heartbeat response received. Customer
01-12-2022	16:37:10	471	220	traffic started
01-12-2022	16:37:11	469	469	
01-12-2022	16:37:12	471	469	
01-12-2022	16:37:13	469	469	
01-12-2022	16:37:14	469	469	

### High Channel

Date	Time	Customer traffic Generated	Customer Traffic Transmitted	Comments
01-12-2022	16:25:29	471	469	
01-12-2022	16:25:30	469	471	
01-12-2022	16:25:31	469	471	
01-12-2022	16:25:32	471	220	

Page 27 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nok	ia							
Product		Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station							
Standard(s)	FCC	Part 96 S.	AS requiren	nents (CBRS Test Plan) Canada					
01-12-2022 16:2	25:33	469	0	Customer traffic has stopped					
01-12-2022 16:2	25:34	469	0						
01-12-2022 16:2	25:35	471	0						
				Heartbeat response received. Customer traffic					
01-12-2022 16:2	25:36	469	387	started					
01-12-2022 16:2	25:37	469	469						
01-12-2022 16:2	25:38	469	469						
01-12-2022 16:2	25:39	469	471						

#### Low Channel

									ept SA	lyzer - S			ilent	Ag
Marker	M Jan 12, 2022 E 1 2 3 4 5 6 E WWWWWW T A N N N N N	TRAC	ALIGN AUTO pe: Pwr(RMS)	Avg T	un	SENSE		Hz	6739 G		0 Ω . <b>559</b> ite: L0	3 3	ker	ar
Select Marke	90 GHz	3.559	Mkr3 and Pow	E	3	en: 10 df	A	Gain:Low	dB	set 42. 2.20 d	ef Of	F	B/div	
Norn														og 2.2 2.2 2.2
De										3				.20 .80 7.8
Fixe	··									Mark and				.8
(	75.0 MHz 1200 pts) NVALUE		*Sweep	CTION		1	3W	#VI	×		0 kH	3.62 W 20	s B	2e
Propertie	19.62 dBm 25.51 dBm 27.67 dBm	-2	30.00 MHz 200.0 kHz 200.0 kHz	Power Power Power	I E	<u>.98 dBn</u> .69 dBn .61 dBn	-2	3 GHz	3.556 4 3.550 1 3.559 9		f f	1	NNN	1
Мс 1 с														7 B 9 0 1 2
			STATUS						ng> saved					-

	Page 28 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

#### High Channel

	put: RF PNO: Fa		Trig: Free Ri Atten: 10 dE	un	vgiyp	e: Pwr(RMS)		TYPE	1234 WWWW ANNN	****	Select Marker
Ref Offset 42 Ref 42.20 c	.2 dB				в	Mkr3 and Pow					Marker
											Marke
											Marke
					*			-	<b>0</b> °	~	Marke
00 kHz	×		Y			JNCTION WIDTH	5.00	s (1) Ichion	200 p value	ts)	Marke
f f	3.690 00 GH	z	-29.69 dBm	Band Pow	/er	200.0 kHz 200.0 kHz		-30	.50 dE	3m	Marke
											Мо 1 о
	2500 GHz 200 kHz	2500 GHz 22500 GHz 200 kHz #	2500 GHz 22500 GHz 200 kHz	2500 GHz 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2500 GHz 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2500 GHz 100 kHz 100 kHz 10	2500 GHz 2500 GHz 2500 GHz 2500 GHz 2500 GHz 4 VBW #Sweep 5 CL 5 CL	2500 GHz         #VBW         #Sweep 5.00           2500 GHz         #VBW         #Sweep 5.00           2500 GHz         3.695 00 GHz         3.08 dBm           8and Power         30.00 MHz         FUNCTION WIDTH           f         3.695 00 GHz         -29.69 dBm         Band Power	2500 GHz 2500 GHz 2500 GHz	2500 GHz 1 2500 GHz 2500 GHz 1 1 1 1 1 1 1 1 1 1 1 1 1	2500 GHz 2500 GHz 2500 GHz 1 1 1 1 1 2 3.695 00 GHz 1 2.500 GHz 1 1 1 1 1 1 1 1 1 1 1 1 1

Test Harness logs and timing on data was verified, the EUT passed the requirement.

Page 29 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.4.4.2.1	WINNF.FT.C.HBT.3	Heartbeat responseCode=105	Monitor RF transmission. Ensure that:	Р	
		(DEREGISTER)	<ul> <li>CBSD stops transmission within 60 seconds of the heartbeatResponse which contains responseCode</li> <li>105</li> </ul>		

Date	Time	Customer traffic Generated	Customer Traffic Transmitted	Comments
01-12-2022	18:21:04	469	471	
01-12-2022	18:21:05	471	469	
01-12-2022	18:21:06	469	469	
01-12-2022	18:21:07	469	278	
01-12-2022	18:21:08	471	0	Customer traffic has stopped
01-12-2022	18:21:09	469	0	
01-12-2022	18:21:10	469	0	
				Heartbeat response received. Customer traffic
01-12-2022	18:21:11	470	306	started
01-12-2022	18:21:12	469	469	
01-12-2022	18:21:13	469	467	
01-12-2022	18:21:14	471	467	
01-12-2022	18:24:08	471	469	
01-12-2022	18:24:09	469	469	
01-12-2022	18:24:10	469	473	
01-12-2022	18:24:11	471	467	
01-12-2022	18:24:12	469	469	Received heartbeat response code "105"
01-12-2022	18:24:13	469	475	
01-12-2022	18:24:14	471	281	
01-12-2022	18:24:15	469	0	Customer traffic stopped
01-12-2022	18:24:16	469	0	
01-12-2022	18:24:17	471	0	
01-12-2022	18:24:18	470	0	

Page 30 of 61         Report Issued: 11/5/2023         Report File #: 7169010408-CBRS2-00	)5
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Client		No	okia			
Produc	ct		Nokia Variant 2 (3F	SUD		
Standa	ard(s)	FC	CC Part 96 SAS rec	Canada		
			1			1
6.4.4.2.2	Х		WINNF.FT.C.HBT.4	Heartbeat responseCode=500 (TERMINATED_GRANT)		Р

Date	Time	Customer traffic Generated	Customer Traffic Transmitted	Comments
01-12-2022	18:28:03	469	471	
01-12-2022	18:28:04	471	471	
01-12-2022	18:28:05	471	471	
01-12-2022	18:28:06	469	52	
01-12-2022	18:28:07	471	0	Customer traffic has stopped
01-12-2022	18:28:08	469	0	
01-12-2022	18:28:09	470	0	
01-12-2022	18:28:10	471	0	Heartbeat response received.
01-12-2022	18:28:11	471	299	Customer traffic started
01-12-2022	18:28:12	469	469	
01-12-2022	18:28:13	471	471	
01-12-2022	18:33:10	469	471	
01-12-2022	18:33:11	471	469	
01-12-2022	18:33:12	470	472	Heartbeat response code 500 received.
01-12-2022	18:33:13	469	0	Customer traffic has stopped
01-12-2022	18:33:14	471	0	
01-12-2022	18:33:15	471	0	
01-12-2022	18:33:16	472	0	
01-12-2022	18:33:17	470	0	

Page 31 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

ſ	6.4.4.2.3	Х	Х	WINNF.FT.C.HBT.5	Heartbeat responseCode=501	Monitor RF transmission	Р
					(SUSPENDED_GRANT) in	from start of test. Ensure	
					First Heartbeat Response	there is no transmission	
						during the test	

Date	Time	Customer traffic Generated	Customer Traffic Transmitted	Comments
01-12-2022	18:35:57	471	475	
01-12-2022	18:35:58	469	469	
01-12-2022	18:35:59	469	134	
01-12-2022	18:36:00	471	0	Customer traffic has stopped
01-12-2022	18:36:01	469	0	
01-12-2022	18:36:02	469	0	
01-12-2022	18:36:03	471	0	
				Heartbeat request sent with "Granted"
01-12-2022	18:36:04	469	0	state.
01-12-2022	18:36:05	470	0	
01-12-2022	18:36:06	472	0	
01-12-2022	18:36:32	469	0	
01-12-2022	18:36:33	471	0	
				Response received with code "501". Heartbeat request sent with "Granted"
01-12-2022	18:36:34	469	0	state. End of test.
01-12-2022	18:36:35	469	0	
01-12-2022	18:36:36	471	0	
01-12-2022	18:36:37	469	0	

Page 32 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.4.4.2.4	X	X	WINNF.FT.C.HBT.6	Heartbeat responseCode=501 (SUSPENDED_GRANT) in Subsequent Heartbeat Response	Monitor RF transmission. Ensure: • CBSD stops transmission within 60 seconds of heartbeatRespon se which contains responseCode=5	Ρ
					01	

Comments
r traffic has stopped
at request sent with "Authorized" state
er traffic started
at response with code "501" received
er traffic has stopped
at request message sent with "granted"
nd of test

Page 33 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

Date	Time	Customer traffic Generated	Customer Traffic Transmitted	Comments
12-09-2021	15:07:10	470	468	
12-09-2021	15:07:11	471	467	
12-09-2021	15:07:12	469	459	
12-09-2021	15:07:13	469	0	Customer traffic has stopped
12-09-2021	15:07:14	471	0	
12-09-2021	15:07:15	469	0	
12-09-2021	15:07:16	469	471	CBSD received heartbeat response
12-09-2021	15:07:17	472	468	
12-09-2021	15:07:18	469	467	
12-09-2021	15:07:19	469	471	
12-09-2021	15:10:14	469	471	
12-09-2021	15:10:15	469	471	
12-09-2021	15:10:16	469	471	
12-09-2021	15:10:17	471	0	CBSD received code 501
12-09-2021	15:10:18	469	0	
12-09-2021	15:10:19	469	0	
12-09-2021	15:10:43	469	0	
12-09-2021	15:10:44	471	0	
12-09-2021	15:10:45	471	0	CBSD Sent Heartbeat request
12-09-2021	15:10:46	469	0	
12-09-2021	15:10:47	471	0	
12-09-2021	15:10:48	469	0	
12-09-2021	15:10:49	469	0	

Page 34 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.4.4.2.5	Х	X	WINNF.FT.C.HBT.7	Heartbeat responseCode=502 (UNSYNC_OP_PARAM)	Monitor RF transmission. Ensure:	Р
					CBSD stops transmission within 60 seconds of heartbeatRespon se which contains responseCode=5 02	

Date	Time	Customer traffic Generated	Customer Traffic Transmitted	Comments
01-12-2022	18:58:21	471	469	
01-12-2022	18:58:22	469	471	
01-12-2022	18:58:23	469	248	
01-12-2022	18:58:24	471	0	Customer traffic has stopped
01-12-2022	18:58:25	469	0	
01-12-2022	18:58:26	469	0	
01-12-2022	18:58:27	471	389	Customer traffic started
01-12-2022	18:58:28	469	469	
01-12-2022	18:58:29	469	469	
01-12-2022	18:58:30	471	465	
01-12-2022	19:01:27	469	469	
01-12-2022	19:01:28	469	470	
				Heartbeat response received with code "502".
01-12-2022	19:01:29	469	469	Relinquishment request sent.
01-12-2022	19:01:30	469	0	
01-12-2022	19:01:31	469	0	
01-12-2022	19:01:32	471	0	

Pa	ge 35 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.4.4.3.1	X	X	WINNF.FT.C.HBT.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	Ρ
					time during test	

Date	Time	Customer traffic Generated	Customer Traffic Transmitted	Comments
01-12-2022	19:04:35	471	471	
01-12-2022	19:04:36	471	471	
01-12-2022	19:04:37	471	469	
01-12-2022	19:04:38	469	0	Customer traffic has stopped
01-12-2022	19:04:39	469	0	
01-12-2022	19:04:40	471	0	
01-12-2022	19:04:41	469	0	Heartbeat request sent with "Granted" state
01-12-2022	19:04:42	469	0	
01-12-2022	19:04:43	471	0	
01-12-2022	19:08:22	469	0	
01-12-2022	19:08:23	469	0	
01-12-2022	19:08:24	471	0	end of test

Page 36 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.4.4.3.2	X	X	WINNF.FT.C.HBT.10	Heartbeat Response Absent (Subsequent Heartbeat)	Monitor RF transmission. Verify: • CBSD must stop transmission with in transmitExpireTi me+60 seconds, where transmitExpireTi me is from last successful	Ρ
					me is from last successful heartbeatRespon	
					se message	

Date	Time	Customer traffic Generated	Customer Traffic Transmitted	Comments
01-12-2022	19:11:41	471	475	
01-12-2022	19:11:42	469	469	
01-12-2022	19:11:43	469	469	
01-12-2022	19:11:44	471	471	
01-12-2022	19:11:45	469	0	Customer traffic has stopped
01-12-2022	19:11:46	469	0	
01-12-2022	19:11:47	471	0	
01-12-2022	19:11:48	469	0	
01-12-2022	19:11:49	471	0	
				Heartbeat response received. Customer traffic
01-12-2022	19:11:50	469	431	starts
01-12-2022	19:11:51	469	431	
01-12-2022	19:11:52	469	469	
01-12-2022	19:16:08	470	472	
01-12-2022	19:16:09	469	283	
01-12-2022	19:16:10	471	0	Customer traffic has stopped
01-12-2022	19:16:11	471	0	
01-12-				
2022	19:16:12	470	0	
Test Harnes	ss logs and	timing on d	lata was verif	fied, the EUT passed the requirement.

Page 37 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

### Measurement

6.5.4.2.3 X X WINNF.FT.C.MES.3 Grant Response contains No RF monitoring P measReportConfig	6.5.4.2.3		Х			No RF monitoring	Р
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Pass. "measreportconfig" in logs. All other requirements verified.

Page 38 of 61         Report Issued: 11/5/2023         Report File #: 7169010408-CBRS2-005	
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

6.5.4.2.4 X WINNF.FT.C.MES.4	Heartbeat Response contains measReportConfig	No RF monitoring	Р
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Pass. "measreportconfig" in logs. All other requirements verified.

Page 39 of 61         Report Issued: 11/5/2023         Report File #: 7169010408-CBRS2-00	5
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

## Relinquishment

					at any time prior to sending the relinquishmentRe quest message.
					- 🗆 ×
Go Capture	-				
	9 @ @	🕾 ү 👲 📃 🗏 🧕			
					* = *
		Source	Destination	Protocol	Length Info
1-12 19:55:1	7,814830	192,168.168.1	192.168.168.19	ICMP	98 Echo (ping) request id=0x03ec, seq=
1-12 19:55:1	7.832577	192.168.168.19	192.168.168.1	ICMP	98 Echo (ping) reply id=0x03ec, seq=
1-12 19:55:1	8.017538	192,168.168.19	192,168,168,100	TLSv1.2	174 Client Hello Last Customer data
1-12 19:55:1	8.039760	192,168,168,100	192.168.168.19	TLSv1.2	1078 Server Hello packet
1-12 19:55:1	8,040009	192,168,168,100	192.168.168.19	TLSv1.2	1821 Certificate, Certificate Request, Se
1-12 19:55:1	8,300638	192.168.168.19	192,168,168,100	TLSv1.2	1078 Certificate, Client Key Exchange
1-12 19:55:1	8.300654	192,168.168.19	192,168,168,100	TLSv1.2	224 Certificate Verify, Change Cipher Sp
1-12 19:55:1	8.318770	192,168,168,100	192,168,168,19	TLSv1.2	488 New Session Ticket, Change Cipher Sp
1-12 19:55:1	8,352546	192,168.168.19	192.168.168.100	TLSv1.2	197 [TLS segment of a reassembled PDU]
1-12 19:55:1	8,412523	192.168.168.19	192.168.168.100	HTTP/JSON	185 POST /v1.2/relinquishment HTTP/1.1 ,
1-12 19:55:1	8,444969	192,168.168.100	192,168.168.19	TLSv1.2	100 [TLS segment of a reassembled PDU]
1-12 19:55:1	8.445202	192,168,168,100	192,168,168,19	TLSv1.2	115 [TLS segment of a reassembled PDU]
1-12 19:55:1	8.446549	192.168.168.100	192.168.168.19	TLSv1.2	104 [TLS segment of a reassembled PDU]
1-12 19:55:1	8.447345	192.168.168.100	192,168,168,19	TLSv1.2	187 [TLS segment of a reassembled PDU]
1-12 19:55:1	8,448054	192.168.168.100	192,168.168.19	HTTP/JSON	243 HTTP/1.1 200 OK , JavaScript Object
1-12 19:55:1	8.482517	192.168.168.19	192,168,168,100	TLSv1.2	85 Alert (Level: Warning. Description:
75 65 73 74 22 3a 20 22 43 2d 32 4d 38 36 30 31 22 3a 20 22	22 3a 5b 41 53 35 6f 63 6b 39 30 22	20 7b 22 63 62 73 37 37 30 35 53 41 2d 53 41 53 4e 53 2c 22 67 72 61 6e	{"reling uishment Request" :[ {"cbs dId": "A \$577055A RHMC-2Mo ck-5ASNS 21386019 0","gran tId": "3 65424611 "} ] }	Relinquis	hment request
	Go Capture I 1-12 19:55:1 1-12 19:55:1 1-	Image: Constraint of the system         Image: Constraint of the system           11-12         19:55:17.814830           11-12         19:55:17.832577           11-12         19:55:18.017538           11-12         19:55:18.017538           11-12         19:55:18.039760           11-12         19:55:18.309638           11-12         19:55:18.309638           11-12         19:55:18.309634           11-12         19:55:18.352546           11-12         19:55:18.445202           11-12         19:55:18.445202           11-12         19:55:18.445202           11-12         19:55:18.445202           11-12         19:55:18.445202           11-12         19:55:18.445202           11-12         19:55:18.445202           11-12         19:55:18.445202           11-12         19:55:18.445202           11-12         19:55:18.44654           11-12         19:55:18.448054           11-12         19:55:18.448054           11-12         19:55:18.453           11-12         19:55:18.453           11-12         19:55:18.46654           11-12         19:55:18.3482517	Go       Capture       Analyze       Statistics       Telephony       Image: Construct of the statistics         Image: Construct of the statistics       Image: Construct of the statistics       Image: Construct of the statistics       Image: Construct of the statistics       Image: Construct of the statistics         Image: Construct of the statistics       Image: Construct of the statistics       Image: Construct of the statistics       Image: Construct of the statistics         Image: Construct of the statistics       Image: Construct of the statistics       Image: Construct of the statistics       Image: Construct of the statistics         Image: Construct of the statistics       Image: Construct of the statistics       Image: Construct of the statistics       Image: Construct of the statistics         Image: Construct of the statistics       Image: Construct of the statistics       Image: Construct of the statistics       Image: Construct of the statistics         Image: Construct of the statistics       Image: Construct of the statistics       Image: Construct of the statistics       Image: Construct of the statistics         Image: Construct of the statistics       Image: Construct of the statistics       Image: Construct of the statistics       Image: Construct of the statistics         Image: Construct of the statistics       Image: Construct of the statistics       Image: Construct of the statistics       Image: Construct of the statistics         Image: Construct of the stat	Go         Capture         Analyze         Statistics         Telephony         Wireless         Tools         Help           Image: Statistics         Image: Statistics         Telephony         Wireless         Tools         Help           Image: Statistics         Image: Statistics         Image: Statistics         Telephony         Wireless         Tools         Help           Image: Statistics         Image: Statistics <t< td=""><td>Go       Capture       Analyze       Statistics       Telephony       Wireless       Tools       Help</td></t<>	Go       Capture       Analyze       Statistics       Telephony       Wireless       Tools       Help

Page 40 01 01 Report Issued: 11/5/2025 Report File #: 7169010408-CBR52-005	Page 40 of 61         Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

## Deregistration

Test Harness logs and timing on data was verified, the EUT passed the requirement.

6.7.4.1.1	Х	 WINNF.FT.C.DRG.1	Successful Deregistration	Monitor RF	Р
				transmission. Ensure:	
				<ul> <li>CBSD stops</li> </ul>	
				transmission	
				at any time prior	
				to sending the	
				relinquishmentRe	
				quest message	
				or deregistration	
				Request	
				message	
				(whichever is	
				sent first)	

tic	oric	a					27 <u>1</u> =	~~~=		
lo.	UT IC	Time					Source	Destination	Protocol	Length Info Last Customer Tx
	269	2022-01-	13 16	5:50:2	2.232	607	192,168,168,1	192,168,168,19	ICMP	98 Echo (ping) request id=0x03f5, seq=44/11264,
		2022-01-					192,168,168,19	192,168,168,1	ICMP	98 Echo (ping) reply id=0x03f5, seq=44/11264,
	274	2022-01-	13 16	5:50:2	22.436	495	192.168.168.19	192,168,168,100	TLSv1.2	1078 Certificate, Client Key Exchange
	275	2022-01-	13 10	5:50:2	22.436	511	192,168,168,19	192,168,168,100	TLSv1.2	224 Certificate Verify, Change Cipher Spec, Finis
	278	3 2022-01-	13 16	5:50:2	22.450	724	192.168.168.100	192,168,168,19	TLSv1.2	488 New Session Ticket, Change Cipher Spec, Finis
	280	2022-01-	13 10	5:50:2	22.483	411	192,168,168,19	192,168,168,100	TLSv1.2	197 [TLS segment of a reassembled PDU]
	282	2022-01-	13 10	5:50:2	22.548	377	192.168.168.19	192,168,168,100	HTTP/JSON	185 POST /v1.2/relinguishment HTTP/1.1 , JavaScri
	284	2022-01-	13 16	5:50:2	22.596	191	192.168.168.100	192,168,168,19	TLSv1.2	211 [TLS segment of a reassembled PDU]
	285	2022-01-	13 16	5:50:2	22.596	434	192,168,168,100	192,168,168,19	HTTP/JSON	376 HTTP/1.1 200 OK , JavaScript Object Notation
	288	3 2022-01-	13 16	5:50:2	22.627	421	192.168.168.19	192,168,168,100	TLSv1.2	85 Alert (Level: Warning, Description: Close Not
	296	2022-01-	13 16	5:50:2	22.652	433	192.168.168.19	192,168,168,100	TLSv1.2	174 Client Hello
	297	2022-01-	13 16	5:50:2	22.661	951	192,168,168,100	192,168,168,19	TLSv1.2	1078 Server Hello
	298	3 2022-01-	13 16	5:50:2	22.662	194	192.168.168.100	192,168,168,19	TLSv1.2	1821 Certificate, Certificate Request, Server Hell
	304	2022-01-	13 16	5:50:2	22.901	643	192,168,168,19	192,168,168,100	TLSv1.2	1078 Certificate, Client Key Exchange
	305	2022-01-	13 16	5:50:2	22.901	661	192.168.168.19	192,168,168,100	TLSv1.2	224 Certificate Verify, Change Cipher Spec, Finis
	308	3 2022-01-	13 16	5:50:2	22.916	380	192,168,168,100	192,168,168,19	TLSv1.2	488 New Session Ticket, Change Cipher Spec, Finis
	310	2022-01-	13 16	5:50:2	22.948	426	192.168.168.19	192,168,168,100	TLSv1.2	196 [TLS segment of a reassembled PDU]
	312	2 2022-01-	13 16	5:50:2	23.013	395	192.168.168.19	192.168.168.100	HTTP/JSON	162 POST /v1.2/deregistration HTTP/1.1 , JavaScri
	313	8 2022-01-	13 16	5:50:2	23.041	640	192.168.168.100	192,168,168,19	TLSv1.2	100 [TLS segment of a reassembled PDU]
0000							72 61 74 69 6f 6e			
010		2 65 71 75					20 7b 22 63 62 73		Deregist	tration request
020		4 49 64 22					37 37 30 35 53 41 2d 53 41 53 4e 53		Deregisti	ration request
040							7d 20 5d 20 7d	21386019 0"} ] }		

Test Harness logs and timing on data was verified, the EUT passed the requirement.

Shutdown time taken from logs, and shutdown confirmed by external monitoring.

Page 41 of 61Report Issued: 11/5/2023Report	rt File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

## **Power Level**

- 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 power.	

Page 42 of 61         Report Issued: 11/5/2023         Report File #: 7169010408-CBRS2-005	
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

#### **Test Table**

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Freq (Center)	Ca t	1MHz EIRP limit (target) dBm	10MHz EIRP limit (target) dBm	B W	1 MHz	10 MHz	Losses (dB)	dBm/MH z	dBm / 10 MHz	Antenn a gain (dBi)	Margin dB
3552.5	А	20	30	5	12.71	19.19	41.1	19.91	26.39	7.2	0.09
3552.5	в	37	47	5	12.71	19.19	41.1	36.91	43.39	24.2	0.09
3555	А	20	30	10	11.7	21.15	41.1	18.9	28.35	7.2	1.1
3555	В	37	47	10	11.7	21.15	41.1	35.9	45.35	24.2	1.1
3557.5	А	20	30	15	7.93	18.03	41.1	15.13	25.23	7.2	4.77
3557.5	в	37	47	15	7.93	18.03	41.1	32.13	42.23	24.2	4.77
3560	А	20	30	20	6.81	16.87	41.1	14.01	24.07	7.2	5.93
3560	В	37	47	20	6.81	16.87	41.1	31.01	41.07	24.2	5.93
3625	А	20	30	5	11.71	18.2	41.1	18.91	25.4	7.2	1.09
3625	В	37	47	5	11.71	18.2	41.1	35.91	42.4	24.2	1.09
3625	А	20	30	10	10.85	20.32	41.1	18.05	27.52	7.2	1.95
3625	В	37	47	10	10.85	20.32	41.1	35.05	44.52	24.2	1.95
3625	А	20	30	15	7.05	17.1	41.1	14.25	24.3	7.2	5.7
3625	В	37	47	15	7.05	17.1	41.1	31.25	41.3	24.2	5.7
3625	А	20	30	20	5.88	15.94	41.1	13.08	23.14	7.2	6.86
3625	В	37	47	20	5.88	15.94	41.1	30.08	40.14	24.2	6.86
3697.5	А	20	30	5	11.81	18.28	41.1	19.01	25.48	7.2	0.99
3697.5	В	37	47	5	11.81	18.28	41.1	36.01	42.48	24.2	0.99
3695	А	20	30	10	10.98	20.42	41.1	18.18	27.62	7.2	1.82
3695	В	37	47	10	10.98	20.42	41.1	35.18	44.62	24.2	1.82
3692.5	А	20	30	15	7.29	17.71	41.1	14.49	24.91	7.2	5.09
3692.5	В	37	47	15	7.29	17.71	41.1	31.49	41.91	24.2	5.09
3690	А	20	30	20	6.16	16.21	41.1	13.36	23.41	7.2	6.59
3690	В	37	47	20	6.16	16.21	41.1	30.36	40.41	24.2	6.59

Page 43 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

Worst case reading(s)

Marker	M Jan 14, 2022 E 1 2 3 4 5 6 WWWWWW T A A N N N N	TRAC	ALIGN AUTO pe: Pwr(RMS)	Avg T	SENSE:IN		0000 GHz t: RF PNO: Fast IFGain:Low		50 Ω 3.55 Gate:		rke
Select Marke	50 GHz 71 dBm	3.552 ver 12.	Mkr3 Band Pov				dB	Offset 41.1 42.20 dl		div	dB/d
Norn											2
											2
De											0
				-							8
Fixe		• ···· · ····									8
	0.00 MHz 1200 pts)		#Sweep			BW	#V	) GHz (Hz		er 3.5 BW 2	
	IN VALUE	,	FUNCTION WIDTH 30.00 MHz	FUNCTION Ind Power	4 dBm	5.74	× 3.552 50 GHz		f		N
Propertie	<u>19.19 dBm</u> 12.71 dBm		10.00 MHz 1.000 MHz	nd Power nd Power	4 dBm 4 dBm		3.552 50 GHz 3.552 50 GHz		f		N
<b>M</b> (											
											1

	Page 44 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

## **WINNF Security Test Case Analysis**

## WINNF.FT.C.SCS.1

#### Packet Capture Sequence

tis	or icmp						X 🗆	- +
).	Time	Source	Destination	Protocol	Length Info			
	11 2022-01-18 15:15:09.604087	192.168.168.1	192.168.168.19	ICMP	98 Echo (ping) request	id=0x03f8, seq=46/11	776, ttl=64	(rep
	12 2022-01-18 15:15:09.625038	192.168.168.19	192.168.168.1	ICMP	98 Echo (ping) reply	id=0x03f8, seq=46/11	776, ttl=62	(req
	13 2022-01-18 15:15:11.603609	192.168.168.1	192.168.168.19	ICMP	98 Echo (ping) request	id=0x03f8, seq=47/12	032, ttl=64	(rep
	14 2022-01-18 15:15:11.621008	192.168.168.19	192.168.168.1	ICMP	98 Echo (ping) reply	id=0x03f8, seq=47/12	032, ttl=62	(req
	18 2022-01-18 15:15:11.805948	192.168.168.19	192.168.168.100	TLSv1.2	174 Client Hello	Last Customer Tx	Packet	
	19 2022-01-18 15:15:11.822417	192.168.168.100	192.168.168.19	TLSv1.2	1078 Server Hello			
	20 2022-01-18 15:15:11.822647	192.168.168.100	192.168.168.19	TLSv1.2	1821 Certificate, Certifi	icate Request, Server	Hello Done	
	26 2022-01-18 15:15:12.045977	192.168.168.19	192.168.168.100	TLSv1.2	1078 Certificate, Client			
_	27 2022-01-18 15:15:12.045993	192.168.168.19	192.168.168.100	TI 5v1.2	224 Certificate Verify.	Change Cinher Snec. F	inished	
*	TLSv1.2 Record Layer: Handshake Content Type: Handshake (22) Version: TLS 1.0 (0x0301)		2110					
*			2110					
*	Content Type: Handshake (22) Version: TLS 1.0 (0x0301) Length: 115	ello llo (1)		39e2b56				

	Pag	e 45 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada
WINNE.FT.C.SCS.1 2202-01-18	T15.14.35.pcap e Analyze Statistics Telephony Wireless Tools Help	- 0

			an and an interaction of the		
	27 2022-01-18 15:15:12.045993	192.168.168.19	192.168.168.100	TLSv1.2	224 Certificate Verify, Change Cipher Spec, Finished
	30 2022-01-18 15:15:12.063309	192.168.168.100	192.168.168.19	TLSv1.2	488 New Session Ticket, Change Cipher Spec, Finished
	32 2022-01-18 15:15:12.090967	192.168.168.19	192.168.168.100	TLSv1.2	85 Alert (Level: Warning, Description: Close Notify)
	38 2022-01-18 15:15:12.120917	192.168.168.19	192.168.168.100	TLSv1.2	174 Client Hello
	39 2022-01-18 15:15:12.127514	192,168,168,100	192.168.168.19	TLSv1.2	1078 Server Hello
	40 2022-01-18 15:15:12.127779	192.168.168.100	192.168.168.19	TLSv1.2	1821 Certificate, Certificate Request, Server Hello Done
	46 2022-01-18 15:15:12.345972	192.168.168.19	192.168.168.100	TLSv1.2	1078 Certificate, Client Key Exchange
	47 2022-01-18 15:15:12.345988	192.168.168.19	192.168.168.100	TLSv1.2	224 Certificate Verify, Change Cipher Spec, Finished
	50 2022-01-18 15:15:12.361647	192.168.168.100	192.168.168.19	TLSv1.2	488 New Session Ticket, Change Cipher Spec, Finished
	52 2022-01-18 15:15:12.385983	192.168.168.19	192.168.168.100	TLSv1.2	195 [TLS segment of a reassembled PDU]
	54 2022-01-18 15:15:12.455963	192.168.168.19	192.168.168.100	HTTP/JSON	261 POST /v1.2/registration HTTP/1.1 , JavaScript Object Nota
+	56 2022-01-18 15:15:12.505441	192.168.168.100	192.168.168.19	TLSv1.2	211 [TLS segment of a reassembled PDU]
4-	57 2022-01-18 15:15:12.505683	192.168.168.100	192.168.168.19	HTTP/JSON	352 HTTP/1.1 200 OK , JavaScript Object Notation (application
	60 2022-01-18 15:15:12.530971	192.168.168.19	192.168.168.100	TLSv1.2	85 Alert (Level: Warning, Description: Close Notify)
· · ·	70 2022-01-18 15:15:12.565937	192.168.168.19	192.168.168.100	TLSv1.2	174 Client Hello
	71 2022-01-18 15:15:12.571735	192.168.168.100	192.168.168.19	TLSv1.2	1078 Server Hello
<					3
8080	7b 22 72 65 67 69 73 74 72 6	1 74 69 6f 6e 52 65	{"regist rationRe		
9818	73 70 6f 6e 73 65 22 3a 5b 7	b 22 63 62 73 64 49	sponse": [{"cbsdI	Packet 54 shows UL	JT registragtion request.
0028	64 22 3a 22 41 53 35 37 37 3	0 35 53 41 52 48 4d	d":"AS57 705SARHM	packet 57 shows SA	STest Harness registration response with code "O"
0030	43 2d 32 4d 6f 63 6b 2d 53 4	1 53 4e 53 32 31 33	C-2Mock- SASN5213		
0040	38 36 30 31 39 30 22 2c 22 7	2 65 73 70 6f 6e 73	860190", "respons		
0050	65 22 3a 7b 22 72 65 73 70 6	f 6e 73 65 43 6f 64	e":{"res ponseCod		
0060	65 22 3a 30 7d 7d 5d 7d 0a		e":0}}]}		
Frame	(352 bytes) Decrypted TLS (38 bytes)	Decrypted TLS (37 bytes)	Decrypted TLS (2 bytes)	Decrypted TLS (10	05 bytes) Reassembled SSL (252 bytes)

Profile: Default

Packets: 194 · Displayed: 107 (55.2%)

O WINNF.FT.C.SCS.1 2202-01-18T15.14.35.pcap

Page 46 of 61
 Report Issued: 11/5/2023
 Report File #: 7169010408-CBRS2-005

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

#### WINNF test requirements:

WINNF test requirements from WINNF-TS-0122-V1.0.2 CBRS CBSD Test Specification:

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_ECDHE_ECDSA_WITH_AES_128_GCM_SHA384</li> <li>TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256</li> <li>TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384</li> <li>TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384</li> <li>TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384</li> <li>TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384</li> </ul>	PASS
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Page 47 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

Page 48 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005

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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

## WINNF.FT.C.SCS.2

#### Packet Capture Sequence

No. Tme Source Desthation Protocol Length Info 12 2022-01-18 15:30:56.957097 192.168.168.19 192.168.168.1 ICMP 98 Echo (ping) reply id=0x0379, seq=7/179 13 2022-01-18 15:30:58.936329 192.168.168.19 192.168.168.19 ICMP 98 Echo (ping) request id=0x0379, seq=8/204 14 2022-01-18 15:30:59.9192040 192.168.168.19 192.168.168.10 TLSv1.2 19 2022-01-18 15:30:59.9192040 192.168.168.109 192.168.168.19 TLSv1.2 10 20 2022-01-18 15:30:59.209309 192.168.168.100 192.168.168.19 TLSv1.2 10 20 2022-01-18 15:31:00.936150 192.168.168.10 192.168.168.19 ICMP 98 Echo (ping) request id=0x0379, seq=9/230 26 2022-01-18 15:31:00.936150 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x0379, seq=9/128 30 2022-01-18 15:31:00.935028 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x0379, seq=11/28 30 2022-01-18 15:31:00.935028 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x0379, seq=11/28 31 2022-01-18 15:31:00.935028 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x0379, seq=11/28 31 2022-01-18 15:31:00.935028 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x0379, seq=11/28 31 2022-01-18 15:31:00.935027 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x0379, seq=11/28 32 2022-01-18 15:31:00.935028 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x0379, seq=11/28 32 2022-01-18 15:31:00.935028 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x0379, seq=11/28 32 Echo (ping) request id=0x0379, seq=11/28 33 2022-01-18 15:31:00.936267 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x0379, seq=11/28 24 Extension: runegotiation_info (len=1) Extension: extended_master_seccret (len=0) 52 Extension: extended_master_seccret (len=0) 52	× +
13 2022-01-18 15:30:58.936329 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=8/204/ 14 2022-01-18 15:30:58.957180 192.168.168.19 192.168.168.10 TLSv1.2 174 Client Hello Last customer Tx pac 19 2022-01-18 15:30:59.209553 192.168.168.100 192.168.168.19 TLSv1.2 1078 Server Hello 20 2022-01-18 15:30:59.209553 192.168.168.100 192.168.168.19 TLSv1.2 1078 Server Hello 20 2022-01-18 15:30:59.209553 192.168.168.100 192.168.168.19 TLSv1.2 686 Certificate, Certificate Request, Server 1 22 2022-01-18 15:31:00.935150 192.168.168.10 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=9/230 26 2022-01-18 15:31:00.935150 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=10/251 29 2022-01-18 15:31:00.93528 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=11/281 30 2022-01-18 15:31:00.935027 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=11/281 30 2022-01-18 15:31:00.935027 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=11/281 30 2022-01-18 15:31:00.935027 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/303 31 2022-01-18 15:31:00.935027 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/303 32 2022-01-18 15:31:00.935027 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/303 32 2022-01-18 15:31:00.935027 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/303 Version: TLS 1.2 (0x0303) Andom: da5b41b6bcf2f36975fc2344f8a9fed78e59e7a3cded5df3490863918762bece Session ID Length: 0 Cipher Suite: TLS RSA_WITH_AES_256_6CM_SHA384 (0x009d) Compression Method: null (0) Extension: renegotiation_info (len=1) > Extension: renegotiation_info (len=1) > Extension: extended_master_secret (len=0) > Extension: extended_master_secret (len=0)	
14 2022-01-18 15:30:58.957180 192.168.168.19 192.168.168.10 17LSv1.2 18 2022-01-18 15:30:59.192040 192.168.168.19 192.168.168.10 12LSv1.2 19 2022-01-18 15:30:59.20209 192.168.168.10 192.168.168.19 1LSv1.2 20 2022-01-18 15:30:59.20209 192.168.168.10 192.168.168.19 1LSv1.2 20 2022-01-18 15:30:59.20209 192.168.168.19 192.168.168.19 1LSv1.2 20 2022-01-18 15:30:59.20209 192.168.168.10 192.168.168.19 1LSv1.2 20 2022-01-18 15:30:09.20209 192.168.168.10 192.168.168.19 1LSv1.2 20 2022-01-18 15:31:00.936150 192.168.168.1 192.168.168.19 1CMP 98 Echo (ping) request id=0x03f9, seq=10/25 20 2022-01-18 15:31:00.936150 192.168.168.1 192.168.168.19 1CMP 98 Echo (ping) request id=0x03f9, seq=11/28 30 2022-01-18 15:31:04.935073 192.168.168.1 192.168.168.19 1CMP 98 Echo (ping) request id=0x03f9, seq=11/28 30 2022-01-18 15:31:04.935073 192.168.168.1 192.168.168.19 1CMP 98 Echo (ping) request id=0x03f9, seq=11/28 30 2022-01-18 15:31:04.935073 192.168.168.1 192.168.168.19 1CMP 98 Echo (ping) request id=0x03f9, seq=11/28 30 2022-01-18 15:31:04.9350257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=11/28 30 2022-01-18 15:31:04.9350257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/30 31 2022-01-18 15:31:04.9350257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/30 30 2022-01-18 15:31:04.9350257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/30 30 2022-01-18 15:31:04.9350257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/30 30 2022-01-18 15:31:04.9350257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/30 30 202-01-18 15:31:04.9350257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/30 30 Echo (ping) request id=0x03f9, seq=13/33 Echostin reston method: null (0) Extension: Length: 3 Extension: renegotiation_info (len=1) Extension: extended_master_secret (len=0)	, ttl=62 (reque
18 2022-01-18 15:30:59.192040       192.168.168.19       192.168.168.100       TLSv1.2       174 Client Hello       Last customer Tx paction         19 2022-01-18 15:30:59.209309       192.168.168.100       192.168.168.19       TLSv1.2       1078 Server Hello         20 2022-01-18 15:30:59.209309       192.168.168.100       192.168.168.19       TLSv1.2       1078 Server Hello         20 2022-01-18 15:30:59.209309       192.168.168.100       192.168.168.19       TLSv1.2       686 Certificate, Certificate Request, Server I         20 202-01-18 15:31:00.936150       192.168.168.11       192.168.168.19       ICMP       98 Echo (ping) request id-0x03f9, seq=9/230-26 2022-01-18 15:31:00.936280       192.168.168.1       192.168.168.19       ICMP       98 Echo (ping) request id-0x03f9, seq=10/255         20 2022-01-18 15:31:00.93628       192.168.168.1       192.168.168.19       ICMP       98 Echo (ping) request id-0x03f9, seq=11/28         30 2022-01-18 15:31:00.93628       192.168.168.1       192.168.168.19       ICMP       98 Echo (ping) request id-0x03f9, seq=12/30         31 2022-01-18 15:31:00.936257       192.168.168.1       192.168.168.19       ICMP       98 Echo (ping) request id-0x03f9, seq=12/30         32 2022-01-18 15:31:00.936257       192.168.168.1       192.168.168.19       ICMP       98 Echo (ping) request id-0x03f9, seq=12/30         31 2022-01-18 15:31:00.936257       1	, ttl=64 (reply
19 2022-01-18 15:30:59.209309 192.168.168.100 192.168.168.19 TLSv1.2 20 2022-01-18 15:30:59.20953 192.168.168.100 192.168.168.19 TLSv1.2 22 2022-01-18 15:30:59.22098 192.168.168.19 192.168.168.19 TLSv1.2 22 2022-01-18 15:31:00.936150 192.168.168.1 192.168.168.19 TLSv1.2 26 2022-01-18 15:31:00.936150 192.168.168.1 192.168.168.19 TLSv1.2 20 2022-01-18 15:31:00.936150 192.168.168.1 192.168.168.19 TLSv1.2 20 2022-01-18 15:31:00.936150 192.168.168.1 192.168.168.19 TLSvP 20 2022-01-18 15:31:00.936150 192.168.168.1 192.168.168.19 TLSVP 20 2022-01-18 15:31:00.936257 192.168.168.1 192.168.168.19 TLSVP 30 2022-01-18 15:31:00.936257 192.168.168.1 192.168.168.19 TLSVP 31 2022-01-18 15:31:00.936257 192.168.168.1 192.168.168.19 TLSP 31 2022-01-18 15:31:00.936257 192.168.168.1 192.168.168.19 TLSP 31 2022-01-18 15:31:00.936257 192.168.168.1 192.168.168.19 TLSP 31 2022-01-18 15:31:00.9356257 192.168.168.1 192.168.168.19 TLSP 32 Echo (ping) request id-0x03f9, seq=12/30 31 2022-01-18 15:31:00.9356257 192.168.168.1 192.168.168.19 TLSP 31 2022-01-18 15:31:00.9356257 192.168.168.1 192.168.168.19 TLSP 32 Echo (ping) request id-0x03f9, seq=13/33 Version: TLS 1.2 (0x0303) 32 Random: da5b41b6bcf2f36975fc2344f8a0fed78e59e7a3cded5df3490863918762bece Session TL Length: 3 32 Extension: session_ticket (len=0) 33 Extension: extended_master_secret (len=0)	, ttl=62 (reque
20 2022-01-18 15:30:59.20953 192.168.168.100 192.168.168.19 TLSv1.2 22 2022-01-18 15:30:59.22098 192.168.168.19 192.168.168.19 TLSv1.2 22 2022-01-18 15:31:00.936150 192.168.168.1 192.168.168.19 TLSv1.2 26 2022-01-18 15:31:02.936269 192.168.168.1 192.168.168.19 TLMP 98 Echo (ping) request id=0x0379, seq=10/25 29 2022-01-18 15:31:04.935973 192.168.168.1 192.168.168.19 TLMP 98 Echo (ping) request id=0x0379, seq=11/28 30 2022-01-18 15:31:06.935028 192.168.168.1 192.168.168.19 TLMP 98 Echo (ping) request id=0x0379, seq=11/28 30 2022-01-18 15:31:06.935028 192.168.168.1 192.168.168.19 TLMP 98 Echo (ping) request id=0x0379, seq=11/28 30 2022-01-18 15:31:06.935028 192.168.168.1 192.168.168.19 TLMP 98 Echo (ping) request id=0x0379, seq=12/30 31 2022-01-18 15:31:06.935027 192.168.168.1 192.168.168.19 TLMP 98 Echo (ping) request id=0x0379, seq=12/30 30 2022-01-18 15:31:06.935028 192.168.168.1 192.168.168.19 TLMP 98 Echo (ping) request id=0x0379, seq=12/30 30 2022-01-18 15:31:06.935028 192.168.168.1 192.168.168.19 TLMP 98 Echo (ping) request id=0x0379, seq=12/30 30 2022-01-18 15:31:06.9350257 192.168.168.1 192.168.168.19 TLMP 98 Echo (ping) request id=0x0379, seq=12/30 30 2022-01-18 15:31:06.9350257 192.168.168.1 192.168.168.19 TLMP 98 Echo (ping) request id=0x0379, seq=13/33 4 Ength: 53 Version: TLS 1.2 (0x0303) Andom: da5b41b6bcf2f36975fc2344f8a0fed78e59e7a3cded5df3490863918762bece Session ID Length: 0 Cipher Suite: TLS RSA_WITH_AES_256_GCM_SHA384 (0x009d) Compression Method: null (0) Extension: renegotiation_info (len=1) > Extension: session_ticket (len=0) > Extension: extended_master_secret (len=0)	(et
22 2022-01-18 15:30:59.232098 192.168.168.19 192.168.168.100 TLSv1.2 25 2022-01-18 15:31:00.936150 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=9/230 26 2022-01-18 15:31:02.936209 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=11/28; 29 2022-01-18 15:31:04.935973 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=11/28; 30 2022-01-18 15:31:06.935828 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=11/28; 31 2022-01-18 15:31:06.935827 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/30; 31 2022-01-18 15:31:08.936257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=13/33; 4 Cersion: TLS 1.2 (0x0303) > Random: da5b1b6bcf2f56975fc2344f8a0fed78e59e7a3cded5df3490863918762bece Session ID Length: 0 Cipher Suite: TLS_RSA_WITH_AES_256_GCM_SHA384 (0x009d) Compression Method: null (0) Extension: renegotiation_info (len=1) > Extension: session_ticket (len=0) > Extension: extended_master_secret (len=0)	
25 2022-01-18 15:31:00.936150 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=9/230- 26 2022-01-18 15:31:02.936209 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=10/251 29 2022-01-18 15:31:06.936828 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=11/281 31 2022-01-18 15:31:06.936827 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/301 20 2022-01-18 15:31:06.936828 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/301 31 2022-01-18 15:31:06.936827 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/301 20 2022-01-18 15:31:06.936828 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/301 20 2022-01-18 15:31:06.936257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/301 20 2022-01-18 15:31:06.936257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/301 20 2022-01-18 15:31:06.936257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/301 20 2022-01-18 15:31:06.936257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=13/333 20 20 20 20 20 20 20 20 20 20 20 20 20 2	ello Done
26 2022-01-18 15:31:02.936209 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=10/250 29 2022-01-18 15:31:06.935828 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/30 30 2022-01-18 15:31:06.935828 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/30 31 2022-01-18 15:31:08.936257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/30 32 2022-01-18 15:31:08.936257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/30 32 2022-01-18 15:31:08.936257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/30 32 2022-01-18 15:31:08.936257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=13/33 32 2022-01-18 15:31:08.936257 192.168.168.10 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=13/33 32 2022-01-18 15:31:08.936257 192.168.168.10 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=13/33 33 2022-01-18 15:31:08.936257 192.168.168.10 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=13/33 34 2022-01-18 15:31:08.936257 192.168.168.10 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=13/33 35 2022-01-18 15:31:08.936257 192.168.168.10 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=13/33 35 2022-01-18 15:31:08.936257 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=13/33 35 2022-01-18 15:31:08.936257 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=13/33 36 2022-01-18 10 2000 2000 2000 2000 2000 2000 2000	ificate)
29 2022-01-18 15:31:04.935973 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id-0x03f9, seq=11/28 30 2022-01-18 15:31:06.935828 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id-0x03f9, seq=12/30 1 2022-01-18 15:31:08.936257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id-0x03f9, seq=13/33 Uersion: TL5 1.2 (0x0303) > Random: da5b1b6bcf2f36975fc2344f8a0fed78e59e7a3cded5df3490863918762bece Session ID Length: 0 Cipher Suite: TL5_RSA_WITH_AES_256_GCM_SHA384 (0x009d) Compression Method: null (0) Extension: Length: 13 > Extension: renegotiation_info (len=1) > Extension: extended_master_secret (len=0)	, ttl=64 (no re
30 2022-01-18 15:31:06.935828 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=12/30 31 2022-01-18 15:31:08.936257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id=0x03f9, seq=13/33 Version: TLS 1.2 (0x0303) > Random: da5b41b6bcf2f36975fc2344f8a0fed78e59e7a3cded5df3490863918762bece Session ID Length: 0 Cipher Suite: TLS_RSA_WITH_AES_256_6CM_SHA384 (0x009d) Compression Method: null (0) Extension: Length: 13 > Extension: renegotiation_info (len=1) > Extension: extended_master_secret (len=0)	0, ttl=64 (no r
31 2022-01-18 15:31:08.936257 192.168.168.1 192.168.168.19 ICMP 98 Echo (ping) request id-0x03f9, seq=13/333 Length: 53 Version: TLS 1.2 (0x0303) > Random: da5b41b6bcf2f36975fc2344f8a0fed78e59e7a3cded5df3490863918762bece Session ID Length: 0 Cipher Suite: TLS_RSA_WITH_AE5_256_GCM_SHA384 (0x009d) Compression Method: null (0) Extension: Length: 13 > Extension: renegotiation_info (len=1) > Extension: extended_master_secret (len=0)	6, ttl=64 (no r
Length: 53 Version: TLS 1.2 (0x0303) Random: da5b41b6bcf2f36975fc2344f8a0fed78e59e7a3cded5df3490863918762bece Session ID Length: 0 Cipher Suite: TLS_RSA_WITM_AES_256_GCM_SHA384 (0x009d) Compression Method: null (0) Extensions Length: 13 > Extension: renegotiation_info (len=1) > Extension: extended_master_secret (len=0) > Extension: extended_master_secret (len=0)	2, ttl=64 (no r
<pre>Version: TLS 1.2 (0x0303) &gt; Random: da5b41b6bcf2f36975fc2344f8a0fed78e59e7a3cded5df3490863918762bece Session ID Length: 0 Cipher Suite: TLS_RSA_WITH_AES_256_GCM_SHA384 (0x009d) Compression Method: null (0) Extensions Length: 13 &gt; Extension: renegotiation_info (len=1) &gt; Extension: session_ticket (len=0) &gt; Extension: extended_master_secret (len=0)</pre>	8, ttl=64 (no r
<pre>Version: TLS 1.2 (0x0303) &gt; Random: da5b41b6bcf2f36975fc2344f8a0fed78e59e7a3cded5df3490863918762bece Session ID Length: 0 Cipher Suite: TLS_RSA_WITH_AES_256_GCM_SHA384 (0x009d) Compression Method: null (0) Extensions Length: 13 &gt; Extension: renegotiation_info (len=1) &gt; Extension: ession_ticket (len=0) &gt; Extension: extended_master_secret (len=0)</pre>	>
Compression Method: null (0) Extensions Length: 13 > Extension: renegotiation_info (len=1) > Extension: session_ticket (len=0) > Extension: extended_master_secret (len=0)	
Extensions Length: 13 > Extension: renegotiation_info (len=1) > Extension: session_ticket (len=0) > Extension: extended_master_secret (len=0)	
<pre>&gt; Extension: renegotiation_info (len=1) &gt; Extension: session_ticket (len=0) &gt; Extension: extended_master_secret (len=0)</pre>	
<pre>&gt; Extension: session_ticket (len=0) &gt; Extension: extended_master_secret (len=0)</pre>	
Extension: extended_master_secret (len=0)	
[JA35 Fullstring: 771.157.65281-35-23]	
[JA35: 75559800d0a8083dc4d7d6fddca6cf22]	

#### WINNF Test Requirements:

#### WINNF test requirements from WINNF-TS-0122-V1.0.2 CBRS CBSD Test Specification:

<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>
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#### Analysis of WINNF Test Requirements

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

Γ	Page 49 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

>	Frame 3440: 195 bytes on wire (1560 bits), 195 bytes captured (1560 bits)
>	Ethernet II, Src: fa:16:3e:17:b4:ec (fa:16:3e:17:b4:ec), Dst: fa:16:3e:41:fa:8b (fa:16:3e:41:fa:8b)
>	Internet Protocol Version 4, Src: 10.10.0.61, Dst: 10.10.0.124
>	Transmission Control Protocol, Src Port: 55972, Dst Port: 5000, Seq: 1, Ack: 1, Len: 129
v	Transport Layer Security
•	Y TLSv1.2 Record Layer: Handshake Protocol: Client Hello Content Type: Handshake (22) Version: TLS 1.2 (0x0303) Length: 124 Y Handshake Protocol: Client Hello Handshake Type: Client Hello (1) Length: 120 Version: TLS 1.2 (0x0303)
	Random: 5d6e7837c5e3315b08e80a896946254509886b3c5b562820
	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: 73
	Extension: supported_groups (len=22)
	Extension: ec_point_formats (len=2)
	<pre>&gt; Extension: signature_algorithms (len=28)</pre>
	<pre>&gt; Extension: extended_master_secret (len=0)</pre>
	<pre>&gt; Extension: renegotiation_info (len=1)</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

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

	Page 50 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

> Frame 3442: 2862 bytes on wire (22896 bits), 2862 bytes captured (22896 bits) > Ethernet II, Src: fa:16:3e:41:fa:8b (fa:16:3e:41:fa:8b), Dst: fa:16:3e:17:b4:ec (fa:16:3e:17:b4:ec) > Internet Protocol Version 4, Src: 10.10.0.124, Dst: 10.10.0.61 Transmission Control Protocol, Src Port: 5000, Dst Port: 55972, Seq: 1, Ack: 130, Len: 2796 ✓ Transport Layer Security ✓ 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 Version: TLS 1.2 (0x0303) > Random: 5d6e7842d84d8cbfc7078fe9e913fcf7eb0fe3354f54f192... Session ID Length: 32 Session ID: e50dd1e43d8d5028f12ae61800ad52ffd4fe63dce8630ea5... Cipher Suite: TLS\_RSA\_WITH\_AES\_128\_GCM\_SHA256 (0x009c) Compression Method: null (0) Extensions Length: 5 > Extension: renegotiation\_info (len=1)

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

> Frame 3451: 142 bytes on wire (1136 bits), 142 bytes captured (1136 bits)
> Ethernet II, Src: fa:16:3e:17:b4:ec (fa:16:3e:17:b4:ec), Dst: fa:16:3e:41:fa:8b (fa:16:3e:41:fa:8b)
> Internet Protocol Version 4, Src: 10.10.0.61, Dst: 10.10.0.124

> Transmission Control Protocol, Src Port: 42352, Dst Port: 8100, Seq: 261, Ack: 1, Len: 76

```
> [2 Reassembled TCP Segments (336 bytes): #3450(260), #3451(76)]
```

```
> Hypertext Transfer Protocol
```

```
v Online Certificate Status Protocol
v tbsRequest
v requestList: 1 item
v Request
v reqCert
v hashAlgorithm (SHA-1)
Algorithm Id: 1.3.14.3.2.26 (SHA-1)
issuerNameHash: 5368d21d2529427538588c5ccba4c4e6f3b96641
issuerKeyHash: 5b63d7bb6e95ca42c49450451b47e5cd6ee1fdb4
serialNumber: 18248749012425898463
```

Page 51 of 61         Report Issued: 11/5/2023         Report File #: 7169010408-CBRS2-005	5
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Client	Nokia	
Product	SUD	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada
	(19984 bits), 2498 bytes captured (19984 bits)	
	a:8b (fa:16:3e:41:fa:8b), Dst: fa:16:3e:17:b4:ec (fa:16:3e:17:b4:ec)	
	c: 10.10.0.124, Dst: 10.10.0.61 Src Port: 8100, Dst Port: 42352, Seq: 1, Ack: 337, Len: 2432	
pertext Transfer Protocol		
line Certificate Status Proto	col	
responseStatus: successful (0)		
responseBytes		
	5.5.7.48.1.1 (id-pkix-ocsp-basic)	
✓ BasicOCSPResponse ✓ tbsResponseData		
> responderID: byName		
producedAt: 2019-09		
✓ responses: 1 item		
✓ SingleResponse		
✓ certID		
✓ hashAlgorit		
	n Id: 1.3.14.3.2.26 (SHA-1)	
	ash: 5368d21d2529427538588c5ccba4c4e6f3b96641	
	sh: 5b63d7bb6e95ca42c49450451b47e5cd6ee1fdb4 r: 18248749012425898463	
✓ certStatus: re		
✓ revoked	ter ter	
	onTime: 2019-09-02 13:59:41 (UTC)	
	19-09-03 14:27:14 (UTC)	
ht along the stand the date		

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

```
> Frame 3461: 73 bytes on wire (584 bits), 73 bytes captured (584 bits)
> Ethernet II, Src: fa:16:3e:17:b4:ec (fa:16:3e:17:b4:ec), Dst: fa:16:3e:41:fa:8b (fa:16:3e:41:fa:8b)
> Internet Protocol Version 4, Src: 10.10.0.61, Dst: 10.10.0.124
> Transmission Control Protocol, Src Port: 55972, Dst Port: 5000, Seq: 130, Ack: 3147, Len: 7
> Transport Layer Security
> 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)
```

signedCertificate > algorithmIdentificate Padding: 0 encrypted: 88a547c487789b3ad084c353a8cc7d0ff2c507626662494b...

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

Page 52 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

## WINNF.FT.C.SCS.3

#### Packet Capture Sequence

tis	or icmp						X	1	)+
	Time	Source	Destination	Protocol	Length Info				
	10 2022-01-18 15:42:16.230844	192.168.168.19	192.168.168.1	ICMP	98 Echo (ping) reply	id=0x03fa, seq=7/1792,	tt1=62	(req	ue
	11 2022-01-18 15:42:18.211088	192.168.168.1	192.168.168.19	ICMP	98 Echo (ping) request	id=0x03fa, seq=8/2048,	tt1=64	(rep.	ly
	12 2022-01-18 15:42:18.230908	192.168.168.19	192.168.168.1	ICMP	98 Echo (ping) reply	id=0x03fa, seq=8/2048,	tt1=62	(req	ue
	13 2022-01-18 15:42:20.211546	192.168.168.1	192.168.168.19	ICMP	98 Echo (ping) request	id=0x03fa, seq=9/2304,	tt1=64	(rep.	ly
	14 2022-01-18 15:42:20.230972	192.168.168.19	192.168.168.1	ICMP	98 Echo (ping) ceply	id=0x03fa, seq=9/2304,	ttl=62	(req	ue
	18 2022-01-18 15:42:20.400846	192.168.168.19	192.168.168.100	TLSv1.2	174 Client Hello	t customer traffic packet	Start o	ftes	+
	19 2022-01-18 15:42:20.414427	192.168.168.100	192.168.168.19	TLSv1.2	1078 Server Hello	e costonner a onne poener	u start c	rices	-
	20 2022-01-18 15:42:20.414668	192.168.168.100	192.168.168.19	TLSv1.2	539 Certificate, Certific	cate Request, Server He	llo Done	2	
	22 2022-01-18 15:42:20.435904	192.168.168.19	192.168.168.100	TLSv1.2	61 Alert (Level: Fatal,	Description: Bad Certi	ficate)		
	25 2022-01-18 15:42:22.211636	192.168.168.1	192.168.168.19	ICMP	98 Echo (ping) request	id=0x03fa, seq=10/2560	, ttl=64	(no	1
							-		3
	Version: TLS 1.2 (0x0303) Random: bc67385f5c6b83b0c Session ID Length: 0 Cipher Suites Length: 6		137bbBc6f9b0b22808c7c5	53896a8					
	✓ Cipher Suites (3 suites)			Packet 1/	Start of test, Last customer 1	Tv nacket			
	Cipher Suite: TLS_RSA_U Cipher Suite: TLS_RSA_U	WITH_AES_256_GCM_SHA	384 (0x009d)	Packet 18 Packet 22	- CBSD uses TLSv1.2. Correct of - Authentication failed.	ipher used.			
	Cipher Suite: TLS_EMPT	"ACHEGOITATION IN O		Packet 64	CBSD retry of security procedu	re tails			
	Cipher Suite: TLS_EMPT Compression Methods Lengt								
		h: 1			mer traffic during test.				
	Compression Methods Lengt	h: 1			mer traffic during test.				
	Compression Methods Lengt	h: 1 thod)			mer traffic during test.				

#### WINNF Test Requirements:

#### WINNF test requirements from WINNF-TS-0122-V1.0.2 CBRS CBSD Test Specification:

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

#### Analysis of WINNF Test Requirements

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

Page 53 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

## WINNF.FT.C.SCS.4

#### Packet Capture Sequence

He I	l 🔬 💿 🧧 🛅 🔀 🛅 🍳 👄 🖷 or long		Q, Q, Q, II				+
10.	Time	Source	Destination	Protocol	Length Info		
0.	15 2022-01-18 15:51:54.156784	192.168.168.1	192.168.168.19	ICMP		id=0x03fb, seq=9/2304,	++1=64 (renly
	16 2022-01-18 15:51:54.176796	192.168.168.19	192.168.168.1	ICMP	98 Echo (ping) request	id=0x03fb, seq=9/2304,	
	17 2022-01-18 15:51:56.156972	192.168.168.1	192.168.168.19	ICMP		id=0x03fb, seq=10/2560	
	18 2022-01-18 15:51:56.176844	192,168,168,19	192.168.168.1	ICMP	98 Echo (ping) reply	id=0x03fb, seg=10/2560	
	19 2022-01-18 15:51:58.156953	192.168.168.1	192.168.168.19	ICMP		id=0x03fb, seq=11/2816	
	20 2022-01-18 15:51:58.176905	192,168,168,19	192,168,168,1	ICMP	98 Echo (ping) ceply	id=0x03fb, seq=11/2816	
	24 2022-01-18 15:51:59,590989	192.168.168.19	192.168.168.100	TLSv1.2	174 Client Hello		
	25 2022-01-18 15:51:59.609929	192.168.168.100	192.168.168.19	TLSv1.2	1078 Server Hello St	tart of test. Last custome	Tx packet.
	26 2022-01-18 15:51:59.610173	192.168.168.100	192.168.168.19	TLSv1.2	541 Certificate, Certifi	cate Request, Server He	llo Done
	28 2022-01-18 15:51:59.631883	192.168.168.19	192.168.168.100	TLSv1.2	61 Alert (Level: Fatal,	Description: Bad Certi	ficate)
	31 2022-01-18 15:52:00.157849	192.168.168.1	192.168.168.19	ICMP	98 Echo (ping) request	id=0x03fb, seq=12/3072	ttl=64 (no re
	32 2022-01-18 15:52:02.157672	192.168.168.1	192.168.168.19	ICMP	98 Echo (ping) request	id=0x03fb, seq=13/3328	ttl=64 (no re
:						** ** · ·	>
	<ul> <li>Random: 0a79e7876e87a7d63</li> <li>Session ID Length: 0</li> <li>Cipher Suites Length: 6</li> <li>Cipher Suite: TLS_RSA_</li> <li>Cipher Suite: TLS_RSA_</li> <li>Cipher Suite: TLS_ENPT</li> <li>Compression Methods Lengt</li> <li>Compression Methods Lengt</li> <li>Compression Methods Lengt</li> <li>Compression Length: 64</li> <li>Extension: session ticket</li> </ul>	NITH_AES_128_GCM_SHA WITH_AES_256_GCM_SHA Y_RENEGOTIATION_INFC h: 1 thod)	256 (0x009c) 384 (0x009d)	Packet 20 – St Packet 24 – TL Packet 26 – CE No registration	art of test. Last customer Tx pa Sv1.2. CBSD uses correct ciphe SD sents Alert message and fai requests or application data. raffic during test.	ir.	
	Extension: session_ticket						
	- Filenston' PACEVAL TAPA M	2.pcap			Packets: 126 · Display		Profile: Default

#### WINNF Test Requirements:

WINNF test requirements from WINNF-TS-0122-V1.0.2 CBRS CBSD Test Specification:

	<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
	<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

Page 54 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005

Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	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

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

## WINNF.FT.C.SCS.5

#### Packet Capture Sequence

	2.550						1973	
s or	icmp							
	Time	Source	Destination	Protocol	Length Info			
	13 2022-01-18 16:16:09.646668	192.168.168.1	192.168.168.19	ICMP	98 Echo (ping) request			
	14 2022-01-18 16:16:09.666972	192.168.168.19	192.168.168.1	ICMP	98 Echo (ping) ceply	id=0x03fc, seq=9/2304	, ttl=62	(reques
	18 2022-01-18 16:16:09.821944	192.168.168.19	192.168.168.100	TLSv1.2	174 Client Hello	Start of test. Last custor	ner Tx pa	cket
	19 2022-01-18 16:16:09.838505	192.168.168.100	192.168.168.19	TLSv1.2	1078 Server Hello			
	20 2022-01-18 16:16:09.838747	192.168.168.100	192.168.168.19	TLSv1.2	540 Certificate, Certifi	icate Request, Server H	ello Done	
	22 2022-01-18 16:16:09.866076	192.168.168.19	192.168.168.100	TLSv1.2	61 Alert (Level: Fatal,	, Description: Bad Cert	ificate)	
	27 2022-01-18 16:16:11.646720	192.168.168.1	192.168.168.19	ICMP	98 Echo (ping) request	id=0x03fc, seq=10/256	0, ttl=64	(no re
	28 2022-01-18 16:16:13.647098	192.168.168.1	192.168.168.19	ICMP	98 Echo (ping) request	id=0x03fc, seq=11/281	6, ttl=64	(no re
	32 2022-01-18 16:16:15.646115	192.168.168.1	192.168.168.19	ICMP	98 Echo (ping) request	id=0x03fc, seq=12/307	2, ttl=64	(no re
	33 2022-01-18 16:16:17.647460	192.168.168.1	192.168.168.19	ICMP	98 Echo (ping) request	id=0x03fc, seq=13/332	8, ttl=64	(no re
	34 2022-01-18 16:16:19.646921	192.168.168.1	192.168.168.19	ICMP	98 Echo (ping) request	id=0x03fc, seq=14/358	4, ttl=64	(no re
	35 2022-01-18 16:16:21.646215	192.168.168.1	192.168.168.19	ICMP	98 Echo (ping) request	id=0x03fc, seq=15/384	0, ttl=64	(no re
								>
-	Session ID Length: 0							
	Cipher Suites Length: 6							
	V Cipher Suites (3 suites)							
	Cipher Suite: TLS RSA W	VITH AES 128 GCM SHA	256 (0x009c)	Packet 14 - S	tart of test. Last customer Tx p	backet.		
	Cipher Suite: TLS RSA W			Packet 18 - T	LSv1.2. CBSD uses correct ciph	ier.		
	Cipher Suite: TLS EMPTY			Packet 20 - A	lert message by CBSD.			
Compression Methods Length: 1				n requests or application data.				
	Compression Methods (1 method)			No registration requests of application data.				
	Extensions Length: 64			No customer	tranic during test.			
	> Extension: session ticket	(len=0)						
	> Extension: encrypt then ma							
	Fxtension: extended master							_
100.0	WINNF.FT.C.SCS.5 2202-01-18T16.15.32				Packets: 140 * Display	1	II multi	: Default

Page 55 of 61         Report Issued: 11/5/2023         Report File #: 7169010408-CBRS2-005	5
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Client	Nokia						
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station						
Standard(s)	) FCC Part 96 SAS requirements (CBRS Test Plan) Can						
WINNF, FT.C. SCS.5 2202-01-18T	1615 22				п×		
	Analyze Statistics Telephony	Wireless Tools Help			u ^		
	Statistics teephony						
ls or icmp		• • • • •			*		
Time	Source	Destination	Protocol	Length Info			
13 2022-01-18 16:16:0	a second s	192.168.168.19	ICMP	98 Echo (ping) request id=0x03fc, seq=9/2304, tt)	=64 (renly		
14 2022-01-18 16:16:0		192.168.168.1	ICMP	98 Echo (ping) reply id=0x03fc, seq=9/2304, tt]			
18 2022-01-18 16:16:0		192.168.168.100	TLSv1.2				
19 2022-01-18 16:16:0		192.168.168.19	TLSv1.2	174 Client Hello Start of test. Last customer 7 1078 Server Hello	храскет		
20 2022-01-18 16:16:0		192.168.168.19	TLSv1.2	540 Certificate, Certificate Request, Server Hello	Done		
22 2022-01-18 16:16:0		192.168.168.100	TLSv1.2	61 Alert (Level: Fatal, Description: Bad Certifica			
27 2022-01-18 16:16:1		192.168.168.19	ICMP	98 Echo (ping) request id=0x03fc, seq=10/2560, tt			
28 2022-01-18 16:16:1		192.168.168.19	ICMP	98 Echo (ping) request id=0x03fc, seq=11/2816, tt			
32 2022-01-18 16:16:1		192.168.168.19	ICMP	98 Echo (ping) request id=0x03fc, seq=12/3072, tt			
33 2022-01-18 16:16:1		192.168.168.19	ICMP	98 Echo (ping) request id=0x03fc, seq=13/3328, tt			
34 2022-01-18 16:16:1		192.168.168.19	ICMP	98 Echo (ping) request id=0x03fc, seq=14/3584, tt			
35 2022-01-18 16:16:2		192.168.168.19	ICMP	98 Echo (ping) request id=0x03fc, seq=15/3840, tt			
				so cello (pane) reducse in exercit sed istrate) et			
Session ID Lengt							
Cipher Suites Le							
V Cipher Suites (3							
	TLS_RSA_WITH_AES_128_GCM_SHA	256 (8v889c)	Packet 14 - S	art of test. Last customer Tx packet.			
	TLS RSA WITH AES 256 GCM SHA		Packet 18 – TLSv1.2. CBSD uses correct cipher.				
	TLS EMPTY RENEGOTIATION INFO			lert message by CBSD.			
Compression Meth		_sect (shadin)		n requests or application data.			
> Compression Meth				traffic during test.			
Extensions Lengt			No customer	tranic during test.			
> Extension: sessi							
	pt then mac (len=0)						
> Extension exter	ded master secret (len=0)						

#### WINNF Test Requirements:

#### WINNF test requirements from WINNF-TS-0122-V1.0.2

#### 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> </ul>	PASS
	<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

	Page 56 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	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

- 3. From Server Hello, cipher suite chosen: TLS\_RSA\_WITH\_AES\_128\_GCM\_SHA256
- 4. Authentication exchange ends with TLS Alert message (i.e. authentication fails):

 $\circ$  Confirmed

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

o Confirmed

Page 57 of 61         Report Issued: 11/5/2023         Report File #: 7169010408-CBRS2-00	)5
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

### Test Equipment

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Instrument Power Supply	Manufacturer Xantrex	Type No. XKW 60-50	Serial No E00109863	Calibration Due
Signal Analyzer	Agilent	MXA	SSG013930	2024-04-26
Attenuator	Pasternack	PE7004-10	N/S	-
Switching Control Unit	Hewlett Packard	11713A	3748A060876	-
RF Switch Unit	Burnsco	RARFSW 4x1	001	-
Power Supply	Leader	730-3D	9801135	-

Page 58 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

# Appendix A – EUT & Client Provided Details

Page 59 of 61         Report Issued: 11/5/2023         Report File #: 7169010408-CBRS2-005	5
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

#### General EUT Description

MAIN EUT	
	Padia aminmant
MANUFACTURING DESCRIPTION	Radio equipment
MANUFACTURER	Nokia
ТҮРЕ	Remote Radio Base Station
PRODUCT NUMBER	3HE12473AAA
SERIAL NUMBER	NS213860190
HARDWARE VERSION	V.1.2
SOFTWARE VERSION	TIMOS-B-21-10.B1-7
TRANSMITTER OPERATING RANGE	B48 3550 – 3700 MHz (TDD)
RECEIVER OPERATING RANGE	B48 3550 – 3700 MHz (TDD)
COUNTRY OF ORIGIN	China
INTERMEDIATE FREQUENCIES	DL: 110 – 150MHz, UL: 40 – 80MHz
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	LTE 5M00 W7D 10M0 W7D 15M0 W7D 20M0 W7D
MODULATION TYPES: (i.e. GMSK, QPSK)	LTE: QPSK, 16QAM
Antenna Gain	Cat A: 7.1 Cat B: 24.1
HIGHEST INTERNALLY GENERATED FREQUENCY	3.7 GHz
OUTPUT POWER (W or dBm)	18dBm
FCC ID	AS57705SARHMC-2B
INDUSTRY CANADA ID	NA
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The Nokia 7705 SAR-Hm series includes feature-rich IP/MPLS service routers in a ruggedized and compact platform. With these routers, operators are able to support IP VPN, VPLS, and VPWS services over wireless networks, enabling an end-to-end, seamless, IP/MPLS service offering between wireless and wired devices. This enables critical infrastructure operators to fully realize the promise of smart grids, smart cities, and public safety mobile broadband to enhance safety, efficiency and responsiveness. The 7705 SAR-Hm series can be used in fixed or mobile locations for a variety of applications, such as supervisory control and data acquisition (SCADA), security monitoring, workforce voice and data connectivity in offices or vehicles, mass transit, fleet management, and vehicle remote control and monitoring.

#### Table 1 – Declaration

		Page 60 of 61	Report Issued: 11/5/2023	Report File #: 7169010408-CBRS2-005
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Client	Nokia	
Product	Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station	SUD
Standard(s)	FCC Part 96 SAS requirements (CBRS Test Plan)	Canada

#### **Technical Description**

The Equipment Under Test (EUT) Nokia 7705 SAR-Hmc NA Variant 2 (3HE12473AAA) Base Station is an Nokia Radio Unit working in the public mobile service (3550-3700 MHz) band which provides communication connections to 3550-3700 MHz network. The EUT operates from a 12/24/-48V DC power supply.

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



#### **EUT** Configuration

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

Page 61 of 61         Report Issued: 11/5/2023         Report File #: 7169010408-CB	RS2-005
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