

Radio Test Report Application for a Class II Permissive Change of Equipment Authorization FCC Part 22 and IC RSS-132 [869MHz – 894MHz]

> FCC ID: VBNAHBCA-01 IC ID: 661W-AHBCA

Nokia Solutions and Networks Airscale Base Transceiver Station Remote Radio Head Model: AHBCA

Report # NOKI0009





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CERTIFICATE OF TEST



Last Date of Test: February 12, 2020 Nokia Solutions and Networks EUT: Airscale Base Transceiver Station Remote Radio Head Model AHBCA

Radio Equipment Testing

Standards

Specification	Method
Code of Federal Regulations (CFR) Title 47 Part 2 (Radio Standards Specification) RSS-Gen Issue 6: 2019 CFR Title 47 Part 22 Subpart H – Cellular Radiotelephone Service RSS-132 Issue 3 - January, 2013 – Cellular Telephone Systems	ANSI C63.26-2015 with FCC KDB 971168 D01 v03r01 FCC KDB 662911D01 v02r01

Results

Test Description	Applied	Results	Comments
Duty Cycle	No	N/A	Not requested.
Band Edge Compliance	Yes	Pass	
Output Power	Yes	Pass	
Peak to Average Power (PAPR)/CCDF	Yes	Pass	
Band Edge Compliance	Yes	Pass	
Spurious Emissions at the Antenna Terminals	Yes	Pass	
Spurious Radiated Emissions	No	N/A	Not requested.

Deviations From Test Standards

None

Approved By:

Kyle Holgate, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

REVISION HISTORY



Revision Number	Description	Date (yyyy-mm-dd)	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS



United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC 17065 as a product certifier. This allows Element to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) and as a CAB for the acceptance of test data.

European Union

European Commission – Within Element, we have a EU Notified Body validated for the EMCD and RED Directives.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIT / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

SCOPE

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FACILITIES





California Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Oregon Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Washington Labs NC01-05 19201 120 th Ave NE Bothell, WA 98011 (425)984-6600
		NVLAP		
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
	Innovation, Sci	ence and Economic Develop	ment Canada	
2834B-1, 2834B-3	2834E-1, 2834E-3	2834D-1	2834G-1	2834F-1
		BSMI		
SL2-IN-E-1154R	SL2-IN-E-1152R	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
		VCCI		
A-0029	A-0109	A-0108	A-0201	A-0110
Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA				
US0158	US0175	US0017	US0191	US0157



MEASUREMENT UNCERTAINTY



Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable test description page. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

Test	+ MU	- MU
Frequency Accuracy	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	1.2 dB	-1.2 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.1 dB	-5.1 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

Test Setup Block Diagrams





PRODUCT DESCRIPTION



Company Name:	Nokia Solutions and Networks
Address:	6000 Connection Drive
City, State, Zip:	Irving, TX 75039
Test Requested By:	Steve Mitchell
EUT:	Airscale Base Transceiver Station Remote Radio Head Model AHBCA
First Date of Test:	February 11, 2020
Last Date of Test:	February 12, 2020
Receipt Date of Samples:	February 11, 2020
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Client and Equipment Under Test (EUT) Information

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

A class II permissive change on the original filing is being pursued to add 5G NR (new radio) carriers to the Airscale BTS RRH model AHBCA FCC and ISED radio certifications. The original FCC certification submittal (FCC ID: VBNAHBCA-01) and the original ISED certification submittal (IC ID: 661W-AHBCA) was NTS Test Report Number PR081649 Revision 2 dated July 2, 2018. The original test effort includes testing for LTE technologies. Please refer to the test report on the original certification for details on all required testing.

All conducted RF testing performed for the original certification testing has been repeated using 5G NR carriers for this class II permissive change per correspondence/guidance from Nemko TCB. The same test methodology used in the original certification testing was used in this class II permissive change test effort. 5G NR carrier bandwidths of 5MHz and 10MHz with QPSK, 16QAM, 64QAM and 256QAM modulation types were verified under this effort. Tests performed under the class II change effort include RF power, peak to average power ratio, emission bandwidth (99% and 26 dB down), band edge spurious emissions, and conducted spurious emissions. The 5G NR carriers/modulation types for this testing are based upon 3GPP TS 38.141-1 Test Models and are NR-FR1-TM 1.1 (QPSK modulation type), NR-FR1-TM 3.2 (16QAM modulation type), NR-FR1-TM 3.1 (64QAM modulation type), and NR-FR1-TM 3.1a (256QAM modulation type).

The testing was performed on the same hardware (AHBCA) as the original certification test. The same AHBCA RF port (Antenna 2) determined in the original certification testing to be the highest power port was used for all testing in this effort. The base station and remote radio head software for this testing is an updated release that includes 5G NR carrier support.

The radiated emissions and frequency stability measurements performed in the original certification was not repeated under this effort per TCB guidance. The radiated emission and frequency stability/accuracy results from the original certification had enough margin to preclude requiring additional testing. The same frequency stability/accuracy radio design is the same for all radio technologies/modulation types.

The equipment under test (EUT) is a Nokia Solutions and Networks AirScale Base Transceiver Station (BTS) Remote Radio Head (RRH) module, model AHBCA. The AHBCA remote radio head is a multistandard multicarrier radio module designed to support LTE, narrow band IoT (internet of things) operations (in-band, guard band, standalone) and 5G NR. The scope of testing in this effort is for 5G NR operations.

PRODUCT DESCRIPTION



The AHBCA RRH has four transmit/four receive antenna ports (4TX/4RX for Band 5 and 4TX/4RX for Band 13). Each antenna port supports 3GPP frequency band 5 (BTS Rx: 824 to 849 MHz/BTS TX: 869 to 894 MHz) and 3GPP frequency band 13 (BTS Rx: 777 to 787 MHz/BTS TX: 746 to 756 MHz). The maximum RF output power of the RRH is 160 Watts (40 watts per carrier, 40 watts per antenna port). The RRH can be operated as a 4x4 MIMO, 2x2 MIMO or as non-MIMO. The TX and RX instantaneous bandwidth cover the full operational bandwidth. The RRH supports 5G NR channel bandwidths of 5MHz and 10MHz for 3GPP frequency bands n5 operations. The RRH supports four 5G NR downlink modulation types (QPSK, 16QAM, 64QAM and 256QAM).

The RRH has external interfaces including DC power (DC In), ground, transmit/receive (ANT), external alarm (EAC), optical CPRI (OPT) and remote electrical tilt (RET). The RRH with applicable installation kit may be pole or wall mounted. The RRH may be configured with optional cooling fan.

The AHBCA 5G NR channel bandwidths are 5 and 10MHz. The channel spacing is 100 kHz between channel numbers. The AHBCA 5G NR downlink channel numbers and frequencies for Band n5 are as follows:

	Downlink	Downlink	5G NR Chann	nel Bandwidth
	NR-ARFCN	Frequency (MHz)	5 MHz	10 MHz
3, 4)	173800	869.0	Band Edge	Band Edge
Ant 1, 2,	174300	871.5	Bottom Ch	
nd n5 (/	174800	874.0		Bottom Ch
NR Ba	176300	881.5	Middle Ch	Middle Ch
CA 5G	177800	889.0		Top Channel
AHB	178200	891.5	Top Channel	
	178800	894.0	Band Edge	Band Edge

AHBCA Downlink Band Edge 5G NR Band n5 Frequency Channels

PRODUCT DESCRIPTION



AHBCA Connector Layout:



EUT External Interfaces

Name	Qty	Connector Type	Purpose (and Description)
DC In	1	Quick Disconnect	2-pole Power Circular Connector
GND	1	Screw lug (2xM5/1xM8)	Ground
ANT	4	4.3-10	RF signal for Transmitter/Receiver (50 Ohm)
Unit	1	LED	Unit Status LED
EAC	1	MDR26	External Alarm Interface (4 alarms)
ΟΡΤ	2	SFP+ cage	Optical CPRI Interface up to 10 Gps.
RET	1	8-pin circular connector conforming to IEC 60130-9 – Ed.3.0	AISG 2.0 to external devices
Fan	1	Molex Microfit	Power for RRH Fan. Located on the side of RRH.

Testing Objective:

A class II permissive change on the original filing is being pursued to add 5G NR (new radio) carriers to the Airscale BTS RRH model AHBCA FCC and ISED radio certifications.



Configuration NOKI0009-1

Software/Firmware Running during test			
Description	Version		
Radio module Software	FRM 50.01.R20		
BTS Software Version	5G20A_GNB_0000_000840_000232		

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Airscale BTS Remote Radio Head Model AHBCA	Nokia Solutions and Networks	474241A.101	BL1818M0028

Peripherals in test setup boundary				
Description	Manufacturer	Model/Part Number	Serial Number	
AMIA (BTS system Module)	Nokia Solutions and Networks	473098A.101	RK182307104	
ASIK (BTS system Module)	Nokia Solutions and Networks	474021A.102	AH173111443	
ABIL (BTS system Module)	Nokia Solutions and Networks	474020A.102	L1183605740	
Attenuator 250W/30dB	Weinschel corp.	58-30-34	LL627	
SFP+ 9.8G,300M,850NM	NOKIA	473842.A101	KR160900020030	
SFP+9.8G,300M,850NM	NOKIA	473842.A101	MA17331610207	
HP ProBook 5470b	HP	B2G14EC#ABA	CNU246B8XP	
HP-DC System power supply	HP	6032A	3440A-10308	
FPAC (DC-pwr supply)	Nokia	472438A.101	G7111007146	
2 Meter RF cable	Times Microwave Systems	SPP250NM43MR2.0M	463559- 00005TMC	
2 Meter RF cable	Times Microwave Systems	SPP250NM43MR2.0M	463559- 00006TMC	
2 Meter RF cable	Times Microwave Systems	SPP250NM43MR2.0M	463559- 00002TMC	
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC867	
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TV066	
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC870	
5watt Low Pass filter	Mini-Circuits	NLP-550	1	
5watt Low Pass filter	Mini-Circuits	NLP-550	2	
5watt Low Pass filter	Mini-Circuits	NLP-550	3	
Fiber Optic cable 0300 mm	Amphenol	E201648	11C	
CATe data cable	LEONI L	64867m	146180	
FYGB GPS receiver	Nokia	472748A	71231431	
WebEM- PC	Lenovo	20HES2141X	None	
RF cable HS-SUCOFLEX_106	Huber+Suhner Inc.	HS-SUCOFLEX_106	SN297372	
RF cable HS-SUCOFLEX_104	Huber+Suhner Inc.	HS-SUCOFLEX_104	SN551123/4	
CAT-5e cable	CSA	LL73189	E151955	



Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
RF cable HS- SUCFLEX_106	Yes	2.0 m	No	AHBCA [RRH] RF Port 2	Attenuator 250W/30dB
Amphenol Fiber Optic cable	No	7.0 m	No	ASIK	AHBCA
Cat-5e cable	Yes	7.0 m	No	ASIK	WebEM- PC
CAT5e data cable	Yes	25 m	No	ASIK	FYGB GPS receiver
RF cable Port 1	Yes	2.0 m	No	AHBCA [RRH] RF Port 1	250W 50 ohm Load
RF cable Port 3	Yes	2.0 m	No	AHBCA [RRH] RF Port 3	250W 50 ohm Load
RF cable Port 4	Yes	2.0 m	No	AHBCA [RRH] RF Port 4	250W 50 ohm Load
RF cable HS- SUCFLEX_104	Yes	1.0 m	No	5watt Low Pass filter	Analyzer



Configuration NOKI0009-2

Software/Firmware Running during test	
Description	Version
Radio module Software	FRM 50.01.R20
BTS Software Version	5G20A_GNB_0000_000840_000232

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Airscale BTS Remote Radio Head Model AHBCA	Nokia Solutions and Networks	474241A.101	BL1818M0028

Peripherals in test setup bour	ndary		
Description	Manufacturer	Model/Part Number	Serial Number
AMIA (BTS system Module)	Nokia Solutions and	4730984 101	PK182307104
	Networks	473098A.101	111102307104
ASIK (BTS system Module)	Nokia Solutions and	474021A 102	AH173111443
	Networks	47402171.102	
ABIL (BTS system Module)	Nokia Solutions and	474020A.102	L1183605740
	Networks	11 1020/ 11 02	21100000110
Attenuator 250W/30dB	Weinschel corp.	58-30-34	LL627
SFP+ 9.8G,300M,850NM	NOKIA	473842.A101	KR160900020030
SFP+9.8G,300M,850NM	NOKIA	473842.A101	MA17331610207
HP ProBook 5470b	HP	B2G14EC#ABA	CNU246B8XP
HP-DC System power supply	HP	6032A	3440A-10308
FPAC (DC-pwr supply)	Nokia	472438A.101	G7111007146
2 Motor BE coblo	Times Microwave		463559-
	Systems	3FF2301010143101R2.0101	00005TMC
2 Motor PE cable	Times Microwave		463559-
	Systems	3FF230110143101K2.0101	00006TMC
2 Motor PE cable	Times Microwave	SPP250NIM43MP2 0M	463559-
	Systems	3112301014310112.0101	00002TMC
250W -50ohm -Terminating	API Weinschel inc	1433-3-1 IM	TC867
Load	All Weinschei inc	1433-3-2111	10007
250W -50ohm -Terminating	API Weinschel inc	1433-3-1 IM	TV066
Load			1 0000
250W -50ohm -Terminating	API Weinschel inc	1433-3-1 IM	TC870
Load			10070
Fiber Optic cable 0300 mm	Amphenol	E201648	11C
CATe data cable	LEONI L	64867m	146180
FYGB GPS receiver	Nokia	472748A	71231431
WebEM- PC	Lenovo	20HES2141X	None
RF cable HS-SUCOFLEX_106	Huber+Suhner Inc.	HS-SUCOFLEX_106	SN297372
RF cable HS-SUCOFLEX_104	Huber+Suhner Inc.	HS-SUCOFLEX_104	SN551123/4
CAT-5e cable	CSA	LL73189	E151955



Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
RF cable HS- SUCFLEX_106	Yes	2.0 m	No	AHBCA [RRH] RF Port 2	Attenuator 250W/30dB
RF cable HS- SUCFLEX_104	Yes	1.0 m	No	Attenuator 250W/30dB	Analyzer
Amphenol Fiber Optic cable	No	7.0 m	No	ASIK	AHBCA
Cat-5e cable	Yes	7.0 m	No	ASIK	WebEM- PC
CAT5e data cable	Yes	25 m	No	ASIK	FYGB GPS receiver
RF cable Port 1	Yes	2.0 m	No	AHBCA [RRH] RF Port 1	250W 50 ohm Load
RF cable Port 3	Yes	2.0 m	No	AHBCA [RRH] RF Port 3	250W 50 ohm Load
RF cable Port 4	Yes	2.0 m	No	AHBCA [RRH] RF Port 4	250W 50 ohm Load



Configuration NOKI0009-3

Software/Firmware Running during test	
Description	Version
Radio module Software	FRM 50.01.R20
BTS Software Version	5G20A_GNB_0000_000840_000232

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Airscale BTS Remote Radio Head Model AHBCA	Nokia Solutions and Networks	474241A.101	BL1818M0028

Peripherals in test setup bound	dary		
Description	Manufacturer	Model/Part Number	Serial Number
AMIA (BTS system Module)	Nokia Solutions and Networks	473098A.101	RK182307104
ASIK (BTS system Module)	Nokia Solutions and Networks	474021A.102	AH173111443
ABIL (BTS system Module)	Nokia Solutions and Networks	474020A.102	L1183605740
High Pass Filter 1.2 GHz	RLC Electronics	F-14699	0050
Attenuator 150W/20dB	AeroflexWeinschel	66-20-33	BZ2075
SFP+ 9.8G,300M,850NM	NOKIA	473842.A101	KR160900020030
SFP+9.8G,300M,850NM	NOKIA	473842.A101	MA17331610207
HP ProBook 5470b	HP	B2G14EC#ABA	CNU246B8XP
HP-DC System power supply	HP	6032A	3440A-10308
FPAC (DC-pwr supply)	Nokia	472438A.101	G7111007146
2 Meter RF cable	Times Microwave Systems	SPP250NM43MR2.0M	463559- 00005TMC
2 Meter RF cable	Times Microwave Systems	SPP250NM43MR2.0M	463559- 00006TMC
2 Meter RF cable	Times Microwave Systems	SPP250NM43MR2.0M	463559- 00002TMC
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC867
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TV066
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC870
Fiber Optic cable 0300 mm	Amphenol	E201648	11C
CATe data cable	LEONI L	64867m	146180
FYGB GPS receiver	Nokia	472748A	71231431
WebEM- PC	Lenovo	20HES2141X	None
RF cable HS-SUCOFLEX_106	Huber+Suhner Inc.	HS-SUCOFLEX_106	SN297372
RF cable HS-SUCOFLEX_104	Huber+Suhner Inc.	HS-SUCOFLEX_104	SN551123/4
CAT-5e cable	CSA	LL73189	E151955



Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Amphenol Fiber Optic cable	No	7.0 m	No	ASIK	AHBCA
Cat-5e cable	Yes	7.0 m	No	ASIK	WebEM- PC
CAT5e data cable	Yes	25 m	No	ASIK	FYGB GPS receiver
RF cable Port 1	Yes	2.0 m	No	AHBCA [RRH] RF Port	250W 50 ohm Load
RF cable Port 3	Yes	2.0 m	No	AHBCA [RRH] RF Port 3	250W 50 ohm Load
RF cable Port 4	Yes	2.0 m	No	AHBCA [RRH] RF Port 4	250W 50 ohm Load
RF cable HS- SUCFLEX_106	Yes	2.0 m	No	AHBCA [RRH] RF Port 2	Attenuator 150W/20dB
RF cable HS- SUCFLEX_104	Yes	1.0 m	No	High Pass Filter 1.2 GHz	Analyzer

MODIFICATIONS



Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2020-02-12	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2020-02-14	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2020-02-14	Peak to Average Power (PAPR)/CCDF	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2020-02-17	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	2020-02-17	Spurious Emissions at the Antenna Terminals	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.



Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-19	19-Mar-20

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in the available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge.

All limits were adjusted by a factor of [-10*log(4)] dB to account for the device operation as a 4 port MIMO transmitter, as per FCC KDB 622911.

Per FCC 22.917(b)and RSS-132 paragraph 5.5, the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm [-13 dBm -10 log (4)] per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

Per FCC 22.917(b)(1)and RSS-132 paragraph 5.5, emissions seen up to 1 MHz outside of authorized operating frequency range band edges shell be measured with a RBW of 1% of the measured emission bandwidth. Any emission seen to be > 1 MHz further outside the band edges shall be measured with a RBW of 100 kHz. However, a narrower RBW of at least 1% of the emission bandwidth is still allowed provided that the measured power is integrated over the full reference bandwidth of 100 kHz or 1% of the emission bandwidth.



							XMit 2019.09.05
EUT:	Airscale Bas	e Transceive	er Station Remote Radio Head Mo	del AHBCA	Work Order:	NOKI0009	
Serial Number:	BL1818M002	28			Date:	17-Feb-20	
Customer:	Nokia Soluti	ons and Net	works		Temperature:	23 °C	
Attendees:	Mitch Hill Jo	ohn Rattanav	ong		Humidity:	45.2% RH	
Project:	None				Barometric Pres :	1009 mbar	
Tested by:	Brandon Ho	hhs		Power: 54 VDC	Joh Site:	TYNG	
TEST SPECIFICATI	IONS			Test Method	000 01101		
FCC 22H-2020				ANSI C63 26:2015			
DES 122-2012				PSS 122:2012			
COMMENTS				103-132.2013			
COMMENTS							
All measurement p	ath losses we	ere accounte	d for in the reference level offset	including any attenuators, filters and DC blocks. The highes	st power port operating at maximum p	ower was used for a	all testing. Worst
case port was testi	ng can be fou	und in the ori	iginal report.				
DEVIATIONS FROM	I IESI SIAN	DARD					
None							
				1 1 1			
Configuration #	-	2		Frittent			
			Signature	, ()			
					Value (dBm)	Limit (dBm)	Result
Band 5 (Single Carri	er) Port 2						
	5 MHz						
		QPSK					
			Low Channel, 871.5 MHz				
			Frequency Range 1		-25.1	-19	Pass
			Frequency Range 3		-27.2	-19	Pass
			High Channel, 891.5 MHz				
			Frequency Range 1		-25.4	-19	Pass
			Frequency Range 3		-32.8	-19	Pass
		16-QAM	1				
			Low Channel, 871.5 MHz				
			Frequency Range 1		-25.9	-19	Pass
			Frequency Range 3		-26.6	-19	Pass
			High Channel 891 5 MHz		2010	10	1 400
			Frequency Range 1		-25.2	-19	Pass
			Frequency Range 3		-32.8	-19	Pass
		64-0AM	r requeries r range e		02.0	10	1 400
		04 00/101	Low Chappel 871 5 MHz				
			Erequency Range 1		-25.1	-10	Page
			Frequency Range 2		-23.1	-13	Page
			High Chappel 201 5 MHz		-27.0	-19	Pass
			Fight Champel, 891.5 MHZ		25.9	10	Deee
			Frequency Range 1		-25.6	-19	Pass
		250 0414	Frequency Range 3		-32.7	-19	Pass
		256-QAIVI	Law Observal 074 5 MU				
			Low Channel, 8/1.5 MHz		00.0	10	
			Frequency Range 1		-26.2	-19	Pass
			Frequency Range 3		-28.0	-19	Pass
			High Channel, 891.5 MHz		00.0	10	Deer
			Frequency Range 1		-26.6	-19	Pass
			Frequency Range 3		-32.3	-19	Pass
	10 MHz						
		QPSK					
			Low Channel, 874 MHz				
			Frequency Range 1		-24.7	-19	Pass
			Frequency Range 3		-27.1	-19	Pass
			High Channel, 889 MHz				
			Frequency Range 1		-25.7	-19	Pass
			Frequency Range 3		-32.2	-19	Pass
		16-QAM					
			Low Channel, 874 MHz				
			Frequency Range 1		-25.6	-19	Pass
			Frequency Range 3		-27.8	-19	Pass
			High Channel, 889 MHz				
			Frequency Range 1		-26.0	-19	Pass
			Frequency Range 3		-32.4	-19	Pass
		64-QAM					
			Low Channel, 874 MHz				
			Frequency Range 1		-24.5	-19	Pass
			Frequency Range 3		-27.6	-19	Pass
			High Channel, 889 MHz				
			Frequency Range 1		-25.7	-19	Pass
			Frequency Range 3		-32.1	-19	Pass
		256-QAM	· · · •				
			Low Channel, 874 MHz				
			Frequency Range 1		-24.5	-19	Pass
			Frequency Range 3		-27.3	-19	Pass
			High Channel, 889 MHz				
			Frequency Range 1		-26.1	-19	Pass
			Frequency Range 3		-32.0	-19	Pass
			, · · · · · · · · · · · · · · · ·			-	



		١	/alue (dBm)	Limit (dBm)	Result
			-25.107	-19	Pass
📕 Keysight Spectrum Analyzer - Element Mate	erials Technology				
LXI RL RF 50 Ω AC	5	ENSE:INT	ALIGN OFF #Avg Type:	RMS	08:06:14 PM Feb 11, 2020 TRACE 1 2 3 4 5 6
	PNO: Wide ↔ IFGain:Low	#Atten: 30 dB	Avg Hold: 1	100/100	DET A NNNN
Ref Offset 29.42 dB				Mkr	1 869.000 MHz -25.107 dBm
Log					
36.4					
26.4					
46.4					
10,41					
6.42		/	/		
-3.58					
-13.6					
22.6					-19.00 dBm
20.0					
-33.6					
-43.6					
Start 808.000 MHZ					
#Res BW 51 kHz	#VB	N 160 kHz* z, QPSK, Low Chann	status el, 871.5 MHz, (alue (dBm)	#Sweep	ge 3 Result
#Res BW 51 kHz Band 5 (Singl	#VBV	N 160 kHz* z, QPSK, Low Chann	status el, 871.5 MHz, /alue (dBm) -27.156	#Sweep	ge 3 Result Pass
#Res BW 51 kHz MSG Band 5 (Singl Keysight Spectrum Analyzer - Element Mate RE S0 Q AC	#VEV	N 160 kHz*	status el, 871.5 MHz, /alue (dBm) -27.156 ALIGN OFF #Avg Type: Aver Type:	#Sweep	Je 0 ms (601 pts) ge 3 Result Pass 08:08:55 PM Feb 11, 2020 TRACE 0234 State 234 State
#Res BW 51 kHz MSG Band 5 (Singl Band 5 (Singl Keysight Spectrum Analyzer - Element Mature Keysight Spectrum Analyzer - Element Analyzer - Element Mature Keysight Spectrum Analyzer - Element Analyzer - E	#VEV le Carrier) Port 2, 5 MH :erials Technology Erials Technology PNO: Wide ↔ IFGain:Low	N 160 kHz* z, QPSK, Low Chann ENSE:INT Trig: Free Run #Atten: 30 dB	STATUS el, 871.5 MHz, /alue (dBm) -27.156 ALIGN OFF #Avg Type: Avg Hold: 1	#Sweep	Stop ar 0.000 mm2 Sol1.0 ms (601 pts) ge 3 Result Pass 08:08:55 PMFeb 11, 2020 TRACE 12 3 4 5 0
#Res BW 51 kHz MSG Band 5 (Singl Keysight Spectrum Analyzer - Element Mat REF 50 Q AC Ref Offset 29.42 dB Ref 46.42 dBm	#VEV le Carrier) Port 2, 5 MH erials Technology PNO: Wide → IFGain:Low	N 160 kHz* z, QPSK, Low Chann	STATUS el, 871.5 MHz, /alue (dBm) -27.156 ALIGN OFF #Avg Type: Avg Hold: 1	#Sweep Frequency Rang Limit (dBm) -19 RMS 00/100 Mkr	Biop Brocoop mile 501.0 ms (601 pts) ge 3 Result Pass 08:08:55 PM Feb 11, 2020 TRACE 12.34 56 TRACE 12.34 56 DET ANNANCE TRACE 13.45 66 TRACE 12.34 56 TRACE 12.34 56 TRACE 12.34 56 TRACE 13.45 66 TRACE 12.34 56 TRACE 13.45 66 TRACE 12.34 56 TRACE 13.45 66
#Res BW 51 kHz MSG Band 5 (Singl Band 5 (Singl Band 5 (Singl Keysight Spectrum Analyzer - Element Matu RL RF 50 Ω AC Control Control C	#VEV le Carrier) Port 2, 5 MH	X 160 kHz* z, QPSK, Low Chann ENSE:INT ENSE:INT Trig: Free Run #Atten: 30 dB	STATUS el, 871.5 MHz, /alue (dBm) -27.156 ALIGN OFF #Avg Type: Avg Hold: 1	#Sweep	Stop ar 0.000 mm2 S01.0 ms (601 pts) ge 3 Result Pass 08:08:55 PMFeb 11,2020 TRACE 11,2020 TRACE 12,345 G DET ALMININ 1 867.9000 MHz -27.156 dBm
#Res BW 51 kHz MSG Band 5 (Singl Band 5 (Singl Band 5 (Singl Keysight Spectrum Analyzer - Element Matc Ref S0 Ω AC Ref Offset 29.42 dB 10 dB/div Ref 46.42 dBm 35.4	#VEV	N 160 kHz* z, QPSK, Low Chann	STATUS el, 871.5 MHz, /alue (dBm) -27.156	#Sweep	Stop ar 0.000 mm2 S01.0 ms (601 pts) ge 3 Result Pass 08:08:35 PM Feb 11, 2020 TRACE [1 2 3 4 5 0 TABLE
#Res BW 51 kHz MsG Band 5 (Single Band 5 (Single Band 5 (Single Image: Section of the section o	#VEV le Carrier) Port 2, 5 MH	X 160 kHz* z, QPSK, Low Chann Kense:INT Kense:INT Trig: Free Run #Atten: 30 dB	STATUS el, 871.5 MHz, /alue (dBm) -27.156 ALIGN OFF #Avg Type: Avg Hold: 1	#Sweep	ee 3 Result Pass 08:08:55 PM Feb 11, 2020 TRACE 12 34 5 6 TRACE 12 34 5 6
#Res BW 51 kHz MSG Band 5 (Sing) ■ Ref Sight Spectrum Analyzer - Element Matu Ref Offset 29.42 dB 10 dB/div Ref 46.42 dBm 36.4 25.4 16.4	#VEV	N 160 kHz* z, QPSK, Low Chann	STATUS el, 871.5 MHz, /alue (dBm) -27.156	#Sweep	Stolp ar 0.000 militz Stoll 0 ms (601 pts) ge 3 Result Pass 08:08:55 PM reb 11, 2020 TRAC [2 3 4 5 6 TYPE 1 Stole 1 and 1
#Res BW 51 kHz MSG Band 5 (Singl	#VEV	X 160 kHz*	STATUS el, 871.5 MHz, /alue (dBm) -27.156 Aug OFF #Avg Type: Avg Hold: 1	#Sweep Frequency Rang Limit (dBm) -19 RMS 00/100 Mikr	Stoll or of coordinate Stoll or ms (601 pts) ge 3 Result Pass OB:00:55 PMFeb 11, 2020 TRACE [1:3:45 or of the text of t
#Res BW 51 kHz MSG Band 5 (Sing)	#VEV	V 160 kHz*	STATUS el, 871.5 MHz, /alue (dBm) -27.156	#Sweep	Stolp ar 0.000 mm/z Stoll 0 ms (601 pts) ge 3 Result Pass 08:08:55 PM Feb 11, 2020 TRAE [] 2 3 4 5 0 TYPE [] 2 3 4 5 0 Per All NMN N 1 867.900 MHz -27.156 dBm
#Res BW 51 kHz MSG Band 5 (Single ■	#VEV	N 160 kHz*	STATUS	#Sweep	1 867.900 MHz 27.156 dBm
#Res BW 51 kHz MSG Band 5 (Single Band 5 (Single Band 5 (Single	#VEV	X 160 kHz*	STATUS el, 871.5 MHz, /alue (dBm) -27.156 ALIGN OFF #Avg Type: Avg Hold: 1	#Sweep	Je 3 Result Pass 06:06:55 PMFeb 11, 2020 TRACE 12, 24 5 6 TRACE 12, 24 5 6 TR
#Res BW 51 kHz MSG Band 5 (Sing) ■ Band 5 (Sing) <td>#VEV</td> <td>N 160 kHz*</td> <td>STATUS</td> <td>#Sweep</td> <td>Contraction of the second seco</td>	#VEV	N 160 kHz*	STATUS	#Sweep	Contraction of the second seco
#Res BW 51 kHz MSG Band 5 (Single Image: Sector and	#VEV	X 160 kHz*	STATUS	#Sweep	Je 3 Result Pass 08:08:55 PM Feb 11, 2020 TRACE [] 2 3 4 5 0 TYPE [] 2 4 5 0
#Res BW 51 kHz MSG Band 5 (Single Band 5 (Single Band 5 (Single	#VEV	X 160 kHz*	STATUS	#Sweep	Je 3 Result Pass 06:00:55 PM Feb 11, 2020 TRACE 12.24 45 0 TYPE 12.24
#Res BW 51 kHz MSG Band 5 (Single Image: Sector and	#VEV	X 160 kHz*	STATUS	#Sweep	Je 3 Result Pass 08:00:55 PM Feb 11, 2020 TRACE 2 3 45 6 TYPE NNNNN 1 867.900 MHz -27.156 dBm































			Value	e (dBm)	Limit (dB	m) F	Result
			-24	4.747	-19		Pass
Keysight Spectrum Analyzer - Element Materials 1	Technology	SENSE:INT		IN OFF		07:43	23 DM Feb 11, 202
	PNO: Wide ↔ ➡→	Trig: Free Rur	1	#Avg Type: Avg Hold: 1	RMS 100/100	07.42	TRACE 1 2 3 4 5 TYPE A WWWW
	IFGain:Low	#Atten: 30 dB				Mkr1 86	
Ref Offset 29.42 dB 10 dB/div Ref 46.42 dBm					•	-24	4.747 dBn
36.4							
26.4							
16.4				/			
6.42			/	/			
2.50							
-13.6		1					-19.00 dB
-23.6							
33.6							
-43.6							
Start 868.000 MHz #Res BW 100 kHz ^{wsg} Band 5 (Single C	VBM Carrier) Port 2, 10 M	/ 300 kHz* IHz, QPSK, Lo	w Channel, Value	STATUS 874 MHz, e (dBm)	#Swee Frequency F	Stop 8 ep 601.0 Range 3 m) F	370.000 MH ms (601 pts Result
Start 868.000 MHz #Res BW 100 kHz MSG Band 5 (Single C	VBM Carrier) Port 2, 10 M	/ 300 kHz* IHz, QPSK, Lo	w Channel, Value -27	874 MHz, e (dBm) 7.144	#Swer Frequency F Limit (dBr -19	Stop 3 ep 601.0 Range 3 m) F	870.000 MH ms (601 pts Result Pass
Start 868.000 MHz #Res BW 100 kHz Band 5 (Single C Band 5 (Single C	VBW Carrier) Port 2, 10 M	/ 300 kHz* IHz, QPSK, Lo	w Channel, Value -27	874 MHz, 874 MHz, e (dBm) 7.144	#Swe Frequency F Limit (dBr -19	Stop 2 ep 601.0 Range 3 m) F	Result Pass
Start 868.000 MHz #Res BW 100 kHz #sg Band 5 (Single C Band 5 (Single C Keysight Spectrum Analyzer - Element Materials RL RF 50 Q AC	VBW Carrier) Port 2, 10 M	(300 kHz* IHz, QPSK, Lo	w Channel, Value -27	874 MHz, 874 MHz, e (dBm) 7.144	#Swer	Stop 8 ep 601.0 Range 3 m) F	Result Pass Result Pass Result Pass Result Pass Result Pass Result Result Result Result Result
Start 868.000 MHz #Res BW 100 kHz Msg Band 5 (Single C Band 5 (Single C Keysight Spectrum Analyzer - Element Materials T X RL RF 50Ω AC Bef Offset 29.42 dB	VBM Carrier) Port 2, 10 M I I Technology PNO: Wide	f 300 kHz* IHz, QPSK, Lo SENSE:INT Trig: Free Run #Atten: 30 dB	w Channel, Value -27	STATUS 874 MHz, e (dBm) 7.144 SN OFF #Avg Type: Avg Hold: 1	#Swer	Stop 8 ep 601.0 Range 3 m) F 07:45	B70.000 MH ms (601 pts Result Pass 009 PM Feb 11, 202 TRACE TYPE A VANNAN TYPE TA VANNAN TOTAL NINNAN TOTAL NINNAN
Start 868.000 MHz #Res BW 100 kHz #sg Band 5 (Single C Band 5 (Single C Keysight Spectrum Analyzer - Element Materials R RL RF S0 Q AC Ref Offset 29.42 dB Ref Offset 29.42 dB Ref A6.42 dBm	VBW Carrier) Port 2, 10 M	/ 300 kHz* IHz, QPSK, Lo SENSE:JNT Trig: Free Rur #Atten: 30 dB	w Channel, Value -27	status 874 MHz, e (dBm) 7.144 sn ope #Avg Type: Avg Hold: 1	#Swer	Stop 8 ep 601.0 Range 3 m) F 07:45 07:45	Result Pass Cos Process Cos Pr
Start 868.000 MHz #Res BW 100 kHz Isg Band 5 (Single C Band 5 (Single C Keysight Spectrum Analyzer - Element Materials 1 R R RF S0 Ω AC Ref Offfset 29.42 dB Ref 46.42 dBm Og 36.4	VBW Carrier) Port 2, 10 M	(300 kHz* IHz, QPSK, Lo sense:INT Trig: Free Rur #Atten: 30 dB	w Channel, Value -27	STATUS 874 MHz, e (dBm) 7.144	#Swer	Stop 8 ep 601.0 Range 3 m) F 07:45 Mkr1 86 -21	B70.000 MH ms (601 pts) Result Pass 008 PMFeb 11, 202 TTME A MMAN Der A MNNN 7.967 MH 7.144 dBr
Start 868.000 MHz #Res BW 100 kHz #sg Band 5 (Single C Band 5 (Single C Keysight Spectrum Analyzer - Element Materials R L RF Start 86 Start 86 RL Ref 0ffset 29.42 dB Band 5 (Single C Start 86	VBW Carrier) Port 2, 10 M	/ 300 kHz* IHz, QPSK, Lo SENSE:JNT Trig: Free Rur #Atten: 30 dB	w Channel, Value -27	874 MHz, e (dBm) 7.144 *Avg Type: Avg Hold: 1	#Swei	Stop 8 ep 601.0 Range 3 m) F 07:45 Mkr1 86 -27	Result Pass Cos Processing States Pass Cos Processing States Cos Processing States Det Annun 7.967 MH 7.144 dBr
Start 868.000 MHz #Res BW 100 kHz #sg Band 5 (Single C Band 5 (Single C Keysight Spectrum Analyzer - Element Materials 1 R L RF RE S0 Ω AC Ref Offset 29.42 dB Ref 46.42 dBm °g 36.4 26.4	VBW Carrier) Port 2, 10 M	(300 kHz* IHz, QPSK, Lo SENSE:INT Trig: Free Rur #Atten: 30 dB	w Channel, Value -27	STATUS 874 MHz, e (dBm) 7.144	#Swer	Stop 8 ep 601.0 Range 3 m) F 07:45 Mkr1 86 -2	Result Pass Result Result Pass Result Result Result Pass Result Res
Start 868.000 MHz #Res BW 100 kHz #Res BW 100 kHz Band 5 (Single C Band 5 (Single C Results Spectrum Analyzer - Element Materials 7 R RL RF 50 Ω AC 0 dB/dlv Ref 46.42 dBm 36.4 16.4	VBW Carrier) Port 2, 10 M Intechnology	/ 300 kHz* IHz, QPSK, Lo SENSE:INT Trig: Free Run #Atten: 30 dB	w Channel, Value -27	STATUS 874 MHz, e (dBm) 7.144 "N OFF #Avg Type: Avg Hold: 1	#Swer	Stop 8 ep 601.0 Range 3 m) F 07:45 Mkr1 86 -27	Result Pass CORPMENT 1202 TRACE 12.345 DET ANNINA 7.967 MH 7.144 dBr
Start 868.000 MHz #Res BW 100 kHz Isg Band 5 (Single C Example 1 Ref Offset 29.42 dB Ref 0ffset 29.42 dB Ref 46.42 dBm 9 36.4 16.4 6.42	VBW Carrier) Port 2, 10 M I Technology PNO: Wide IFGain:Low	1 300 kHz* IHz, QPSK, Lo SENSE:INT Trig: Free Rur #Atten: 30 dB	w Channel, Value -27	STATUS 874 MHz, e (dBm) 7.144	#Swer	Stop 8 ep 601.0 Range 3 m) F 07:45 Mkr1 86 -21	Result Pass Correction of the second
Start 868.000 MHz #Res BW 100 kHz #Res BW 100 kHz Isg Band 5 (Single C Ref Offset 29.42 dB 0 dB/div Ref Offset 29.42 dB 0 dB/div Ref 46.42 dBm 36.4 16.4 3.58	VBW	IHZ, QPSK, LO	w Channel, Value -27	STATUS 874 MHz, e (dBm) 7.144 #Avg Type: Avg Hold: 1	#Swer	Stop 8 ep 601.0 Range 3 m) F 07:45 Mkr1 86 -27	B70.000 MH ms (601 pts Result Pass 009 PM Feb 11, 202 TRACE 12, 3, 4, 5 TYPE 1, 200 TRACE 12, 3, 4, 5 TYPE 1, 200 TAGE 11, 200 TRACE 12, 3, 4, 5 TYPE 1, 200 TAGE 11, 200 TAGE 12, 3, 4, 5 TYPE 1, 200 Det A NNNN T, 144 dBr
Start 868.000 MHz #Res BW 100 kHz Isg Band 5 (Single C Expression Ref Offset 29.42 dB Od B/div Ref Offset 29.42 dB Od B/div Ref 46.42 dB 9 36.4 16.4 16.4 16.4 16.4	VBW Carrier) Port 2, 10 M Technology PNO: Wide IFGain:Low	/ 300 kHz* IHz, QPSK, Lo SENSE:INT Trig: Free Rur #Atten: 30 dB	w Channel, Value -27	STATUS 874 MHz, e (dBm) 7.144	#Swei	Stop 8 ep 601.0 Range 3 m) F 07:45 Mkr1 86 -27	Result Pass Result Result Pass Result Result Pass Result Pass Result R
Start 868.000 MHz #Res BW 100 kHz #sg Band 5 (Single C Band 5 (Single C Image: Start 868.000 MHz Band 5 (Single C Image: Start 868.000 MHz	VBW	IHZ, QPSK, LO	w Channel, Value -27	STATUS 874 MHz, e (dBm) 7.144	#Swer	Stop 8 ep 601.0 Range 3 m) F 07:45 Mkr1 86 -27	370.000 MH ms (601 pts Result Pass 009 PM Feb 11, 202 TRACE 2.3.4.5 TYPE A WMWN 7.967 MH 7.144 dBr
Start 868.000 MHz #Res BW 100 kHz Msg Band 5 (Single C Image: Start 868.000 MHz Band 5 (Single C Image: Start 868.000 MHz Band 5 (Single C Image: Start 868.000 MHz Image: Star	VBM Carrier) Port 2, 10 M	/ 300 kHz* IHz, QPSK, Lo SENSE:INT Trig: Free Rur #Atten: 30 dB	w Channel, Value -27	STATUS 874 MHz, e (dBm) 7.144 #Avg Type: AvgHold: 1	#Swei	Stop 8 ep 601.0 Range 3 m) F 07:45 07:45 -27	370.000 MH ms (601 pts Result Pass 009 PM Feb 11,202 TRACE 12,34 5 7.967 MH 7.144 dBr
Start 868.000 MHz #Res BW 100 kHz #sg Band 5 (Single C Band 5 (Single C Band 5 (Single C Keysight Spectrum Analyzer - Element Materials 1 RE RL RF S0 Ω AC Ref Offset 29.42 dB Ref 46.42 dBm Band 5 (Single C 36.4 Image: Additional start in the start i	VBW	IHZ, QPSK, Lo	w Channel, Value -27	STATUS 874 MHz, e (dBm) 7.144 */vg Type: Avg Hold: 1	#Swer	Stop 8 ep 601.0 Range 3 m) F 07:45 Mkr1 86 -21	370.000 MH ms (601 pts Result Pass 08 PMFeb 11, 202 TRACE 12 34 5 TYPE A MINN 7.967 MH 7.144 dBn
Start 868.000 MHz #Res BW 100 kHz #sg Band 5 (Single C Band 5 (Single C Ba	VBM Carrier) Port 2, 10 M	IHZ, QPSK, LO	w Channel, Value -27	STATUS 874 MHz, e (dBm) 7.144 #Avg Type: AvgHold: 1	#Swer	Stop 8 ep 601.0 Range 3 m) F 07:45 Mkr1 86 -27	370.000 MH ms (601 pts Result Pass 009 PM reb 11.202 TRACE 12.3 4 5 TYPE A NUMBER 7.967 MH 7.144 dBr



		Value (dBm) -25.708	Limit (dBm) -19	Result Pass
Keysight Spectrum Analyzer - Element Materi	ials Technology			
	PNO: Wide Trig: Free Run IFGain:Low #Atten: 30 dB	#Aug Type Avg Hold:	: RMS 100/100	07:11:08 PM Feb 11, 2020 TRACE 1 2 3 4 5 TYPE A WWWW DET A NNNN
Ref Offset 29.42 dB 10 dB/div Ref 46.42 dBm			Mkr1	894.000 MH -25.708 dBn
36.4				
26.4				
16.4				
6.42				
-3.68				
				-19.00 dBi
-22.0				
13.6				
Baaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa				
Start 893.000 MHz #Res BW 100 kHz ^{Msg} Band 5 (Single	VBW 300 KHZ*	STATUS Channel, 889 MHz Value (dBm)	S #Sweep 6 Frequency Range Limit (dBm)	top 895.000 MH; 01.0 ms (601 pts 9 3 Result
Start 893.000 MHz #Res BW 100 kHz Band 5 (Single	VBW 300 kHz*	STATUS Channel, 889 MHz Value (dBm) -32.229	S #Sweep 61 Frequency Range Limit (dBm) -19	top 895.000 MH; 01.0 ms (601 pts 3 3 Result Pass 07:15:49 PHFeb 11, 2020
Start 893.000 MHz #Res BW 100 kHz Band 5 (Single	VBW 300 kHz*	STATUS Channel, 889 MHz Value (dBm) -32.229	S #Sweep 6 Frequency Range Limit (dBm) -19 -19 RMS 100/100	top 895.000 MH; 01.0 ms (601 pts 3 8 3 Result Pass 07:15:49 PM Feb 11, 2020 TRACE 12, 34 5 TYPE DET ANNING
Start 893.000 MHz #Res BW 100 kHz MSG Band 5 (Single Band 5 (Single Keysight Spectrum Analyzer - Element Materi M RL RF 50 Ω AC REf Offset 29.42 dB	VBW 300 kHz*	STATUS Channel, 889 MHz Value (dBm) -32.229	S #Sweep 64 Frequency Range Limit (dBm) -19 -19 RMS 100/100 Mkr1	top 895.000 MH; 01.0 ms (601 pts 3 8 8 8 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
Start 893.000 MHz #Res BW 100 KHz MSG Band 5 (Single Band 5 (Single Keysight Spectrum Analyzer - Element Materi RL RF 50 Ω AC RL RF 50 Ω AC C	VBW 300 kHz*	STATUS Channel, 889 MHz Value (dBm) -32.229	S #Sweep 64 Frequency Range Limit (dBm) -19 : RMS 100/100 Mkr1	top 895.000 MH3 01.0 ms (601 pts 2 3 Result Pass 07.15.49 PMFeb 11, 202 TRACE 12 3 4 5 TRACE 12 3 5 TRACE 12 5 TRACE 12
Start 893.000 MHz #Res BW 100 kHz MsG Band 5 (Single Band 5 (Single Image: Sector and Sector	VBW 300 kHz*	STATUS Channel, 889 MHz Value (dBm) -32.229 ▲ ALIGN OFF #Avg Type Avg Hoid:>	S #Sweep 61 Frequency Range Limit (dBm) -19 :RMS 100/100 Mkr1	top 895.000 MH; 01.0 ms (601 pts 2 3 Result Pass 07:5:49 Mreb 11, 202 TRACE [] 2 3 4 5 TRACE [] 3 4 5 TRACE [
Start 893.000 MHz #Res BW 100 kHz MsG Band 5 (Single Image: Sector Analyzer - Element Materia Image: Sector Analyzer - Element Analyzer - Element Materia Image: Sector Analyzer - Element Analyzer - Element Materia Image: Sector Analyzer - Element Analyzer - Element Materia Image: Sector Analyzer - Element Analyze	VBW 300 kHz*	STATUS Channel, 889 MHz Value (dBm) -32.229	S #Sweep 64 Frequency Range Limit (dBm) -19 :RMS 100/100 Mkr1	top 895.000 MH; 01.0 ms (601 pts 3 3 Result Pass 07.15:49 PMFeb 11, 2021 TRACE 12, 24 45 TRACE 14, 24 45 TRACE 12, 24 45 TRACE 14, 24
Start 893.000 MHz #Res BW 100 kHz Msg Band 5 (Single Image: Sector and Sec	VBW 300 kHz*	STATUS Channel, 889 MHz Value (dBm) -32.229 ▲ ALIGN OFF #Avg Hoid:>	S #Sweep 64 Frequency Range Limit (dBm) -19 RMS 100/100 Mkr1	top 895.000 MH; 01.0 ms (601 pts 3 8 3 Result Pass 07:15:49 PM reb 11,202 07:15:49 PM reb 1
Start 893.000 MHz #Res BW 100 kHz MsG Band 5 (Single Band 5 (Single Ref 0ffset 29.42 dB 0 dB/div Ref 0ffset 29.42 dB 0 dB/div Ref 46.42 dBm 36.4 16.4 36.5	VBW 300 kHz*	STATUS Channel, 889 MHz Value (dBm) -32.229	RMS 100/100	top 895.000 MH; 01.0 ms (601 pts 3 3 Result Pass 07:15:49 PMFeb 11, 2022 TRACE 12, 3 4 5 TYPE A MINININ 8955.000 MH; -32.229 dBn
Start 893.000 MHz #Res BW 100 kHz MsG Band 5 (Single Band 6 (Algorithm) Band 7 (Band 7	VBW 300 kHz*	STATUS Channel, 889 MHz Value (dBm) -32.229	S #Sweep 64	top 895.000 MH; 01.0 ms (601 pts 2 3 Result Pass 07:15:49 Pt 61 1, 202 TRACE 12 3 4 5 TOPE A HINNN 8955.000 MH; -32.229 dBn
Start 893.000 MHz #Res BW 100 KHz MsG Band 5 (Single Image: Sector and Sec	VBW 300 kHz*	STATUS Channel, 889 MHz Value (dBm) -32.229	S #Sweep 64	top 895.000 MH; 01.0 ms (601 pts 2 3 Result Pass 07:15:49 PMFeb 11,202 TRACE 12,34 5 TRACE 12,34 5 Struct 12,34 5 TRACE 12,34 5 Struct 12,34
Start 893.000 MHz #Res BW 100 kHz MISG Band 5 (Single Band 5 (Single Image: Sector and Sector a	VBW 300 kHz*	STATUS Channel, 889 MHz Value (dBm) -32.229	S #Sweep 64	top 895.000 MH; 01.0 ms (601 pts a 3 Result Pass 07:15:49 PMFeb 11, 2020 TRACE 12 24 5 TYRACE 12 5
Start 893.000 MHz #Res BW 100 kHz MsG Band 5 (Single	VBW 300 kHz*	STATUS Channel, 889 MHz Value (dBm) -32.229	S #Sweep 64 Frequency Range Limit (dBm) -19 :RMS 100/100 Mkr1	top 895.000 MH; 01.0 ms (601 pts 2 3 Result Pass 07:15:49 PMFeb 11, 2022 TRACE 12, 24 5 TYPE A WINNIN 895.000 MH; -32.229 dBn -19:00:49



Image: Second Section Acalgor 10 and Materials Technology PROX.Mil Acalgo ref PROX.Mil PROX.Mil <t< th=""><th>Keysight Spectrum Analyzer - Element Materials Te RL RF 50 Ω AC Ref Offset 29.42 dB 10 dB/div Ref 46.42 dBm 36.4</th><th>chnology PNO: Wide → IFGain:Low</th><th>SENSE:INT</th><th>A</th><th>-25.561</th><th>-19</th><th>P</th><th>ass</th></t<>	Keysight Spectrum Analyzer - Element Materials Te RL RF 50 Ω AC Ref Offset 29.42 dB 10 dB/div Ref 46.42 dBm 36.4	chnology PNO: Wide → IFGain:Low	SENSE:INT	A	-25.561	-19	P	ass
Exception Section According to the section of the sect	Keysight Spectrum Analyzer - Element Materials Te R RF 50 Ω AC Ref Offset 29.42 dB 10 dB/div Ref 46.42 dBm 36.4	PNO: Wide	SENSE:INT	A 🔬	LIGN OFF			
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Image: Start 868.000 MHz Stop 870.000 F 335	26.4							
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36.4								
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-13.6	-3.58		ليتتبعهم					
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		Val	lue (dBm)	Limit (dBm) Re	sult
		-	-24.477	-19	Pa	ass
Kaurinht Spactrum Analyzar - Elamant Matarials	Technology		bio contra contra contra con			
LX RL RF 50 Ω AC	SENSE:II	NT A		RMS	07:52:25	PM Feb 11, 2020
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10 dB/div Ref 46.42 dBm					-24.4	4// aBm
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Start 868 000 MHz				l	A t	0.000 8411-
#Res BW 100 kHz	VBW 300	kHz*		#Swee	stop 87 p 601.0 m	s (601 pts)
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#Res BW 100 kHz Msg Band 5 (Single Calculation of the second of the sec	VBW 300 arrier) Port 2, 10 MHz, 64 Technology IEChnology PNO: Wide ↔ Trig IFGain:Low #At	kHz* -QAM, Low Chann Val - - - - - - - - - - - - - - - - - - -	STATUS hel, 874 MHz lue (dBm) -27.594 LIGN OFF Avg Type Avg Hold:	#Swee x, Frequency F Limit (dBm -19 :RMS 100/100	Stop 87 p 601.0 m Range 3) Re: 07:54:06 TR TR TR	sult ass PMFeb 11,2020 PMFeb 11,2020 PMFeb 12,2020 SVPEA
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#Res BW 100 kHz Msg Band 5 (Single Calculation of the second se	VBW 300 arrier) Port 2, 10 MHz, 64	kHz* I-QAM, Low Chann Val - - - - - - - - - - - - - - - - - - -	STATUS hel, 874 MHz 27.594 LIGN OFF #Avg Type Avg Hold: '	#Swee z, Frequency F Limit (dBm -19 :RMS 100/100	Stop 87 p 601.0 m Range 3) Re: 07:54:06 TR 07:54:06 TR 07:54:06 TR 07:54:06 TR 07:54:06	Sult ass PMFeb 11,2020 Soft MHz 967 MHz 594 dBm
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#Res BW 100 kHz Iwsg Band 5 (Single Calculation of the second of the s	VBW 300 arrier) Port 2, 10 MHz, 64	KHZ* I-QAM, Low Chann Val	STATUS hel, 874 MHz 27.594 LIGN OFF #Avg Type Avg Hold: *	#Swee	Stop 87 p 601.0 m Range 3) Re: 07:54:06 TR 07:54:06 TR 07:54:06 TR 07:54:06 TR 07:54:06 TR 07:54:06	s (601 pts) s (601 pts) sult ass PMFeb 11,2020 647 Pt 42 S94 dBm
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#Res BW 100 kHz INSG Band 5 (Single Calculation of the second of the s	VBW 300 arrier) Port 2, 10 MHz, 64 Technology PNO: Wide ↔ Trig IFGain:Low #At	KHz*	STATUS hel, 874 MHz lue (dBm) -27.594 LIGN OFF #Avg Type Avg Hold: '	#Swee	Stop 87 p 601.0 m Range 3) Re: 07:54:06 TR 07:54:06 TR 7 1 kr1 867. -27.4	.19 00 dBm
#Res BW 100 kHz INSG Band 5 (Single C: Image: Sector and Sector	VBW 300 arrier) Port 2, 10 MHz, 64 Technology Technology PNO: Wide ++ Trig IFGain:Low Trig	KHz*	STATUS hel, 874 MHz lue (dBm) -27.594 LIGN OFF #Avg Type Avg Hold: '	#Swee	Stop 87 p 601.0 m Range 3) Re: 07:54:06 TR T kr1 867. -27.4	s (601 pts) sult ass PMFeb 11,2020 6XACEI 1234 SP4 to the sum of t
#Res BW 100 kHz MsG Band 5 (Single Calculation of the second of the se	VBW 300 arrier) Port 2, 10 MHz, 64 Technology PNO: Wide +++ Trig IFGain:Low #At	KHz*	STATUS hel, 874 MHz lue (dBm) -27.594 LIGN OFF Avg Type Avg Hold: '	#Swee	Stop 87 p 601.0 m Range 3) Re: 07:54:06 TR 7 1kr1 867. -27.	s (601 pts) sult ass PMFeb 11,2020 ACC 12 34 5 ° YPE A WAYNER 594 dBm -19.00 dBm







		Value (dBm) Limit (dBm)	Result
		-24.483 -19	Pass
Keysight Spectrum Analyzer - Element Materials	s Technology	•	
μα R L R - 50 Ω AC		#Avg Type: RMS AvglHold: 100/100	07:57:40 PM Feb 11, 2020 TRACE 1 2 3 4 5 6 TYPE A WWWWW
	IFGain:Low #Atten: 30 dB		
Ref Offset 29.42 dB 10 dB/div Ref 46.42 dBm		WIKI	-24.483 dBm
Log			
36.4			
26.4			
16.4			
6.42			
-3.58			
-13.6			
-23.6			-19.00 dBm
22.5			
-JJ.b			
-43.6			
Start 868.000 MHz			top 870.000 MHz
Start 868.000 MHz #Res BW 100 kHz MSG Band 5 (Single Ca	VBW 300 kHz* arrier) Port 2, 10 MHz, 256-QAM, Low (STATUS STATUS Channel, 874 MHz, Frequency Ran	top 870.000 MHz 01.0 ms (601 pts) ge 3
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Start 868.000 MHz #Res BW 100 kHz MsG Band 5 (Single Ca Band 5 (Single Ca Image: Spectrum Analyzer - Element Materials Ref Offset 29.42 dB 10 dB/div Ref Offset 29.42 dB Spectrum Analyzer - Element Materials Ref Offset 29.42 dB 36.4	VBW 300 kHz*	Status (STATUS) Channel, 874 MHz, Frequency Ran Value (dBm) Limit (dBm) -27.342 -19 Aug Type: RMS Avg Hold: 100/100 Mkr	top 870.000 MHz 01.0 ms (601 pts) ge 3 Result Pass 07:56:11 PMFeb 11, 2000 TTYPE 234 5 0 TTYPE 244 5
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Start 868.000 MHz #Res BW 100 kHz MsG Band 5 (Single Ca Band 5 (Single Ca <tr< td=""><td>VBW 300 kHz* arrier) Port 2, 10 MHz, 256-QAM, Low (Technology PNO: Wide PNO: Wide FGain:Low Free Run #Atten: 30 dB</td><td>Status (STATUS) Channel, 874 MHz, Frequency Ran Value (dBm) Limit (dBm) -27.342 -19 ALIGN OFF #Avg Type: RMS Avg Hold: 100/100 Mkr</td><td>top 870.000 MHz 01.0 ms (601 pts) ge 3 Result Pass 07:56:11 PHFeb 11, 200 TRACE 2 3 4 5 TYPE A WINNIN 1 867.967 MHz -27.342 dBm</td></tr<>	VBW 300 kHz* arrier) Port 2, 10 MHz, 256-QAM, Low (Technology PNO: Wide PNO: Wide FGain:Low Free Run #Atten: 30 dB	Status (STATUS) Channel, 874 MHz, Frequency Ran Value (dBm) Limit (dBm) -27.342 -19 ALIGN OFF #Avg Type: RMS Avg Hold: 100/100 Mkr	top 870.000 MHz 01.0 ms (601 pts) ge 3 Result Pass 07:56:11 PHFeb 11, 200 TRACE 2 3 4 5 TYPE A WINNIN 1 867.967 MHz -27.342 dBm
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Start 868.000 MHz #Res BW 100 kHz #MSG Band 5 (Single Ca Band 5 (Single Ca Image: Spectrum Analyzer - Element Materials Ref Offset 29.42 dB 10 dB/div Ref Offset 29.42 dB 36.4 26.4 16.4 6.42 3.58	VBW 300 KHz*	Status Status Channel, 874 MHz, Frequency Ran Value (dBm) Limit (dBm) -27.342 -19 AuglHoid: 100/100 Mkr Mkr	top 870.000 MHz 01.0 ms (601 pts) ge 3 Result Pass 07:56:11 PMFeb 11, 2020 TRACE 2:34 5 0 TYPE 2:35
Start 868.000 MHz #Res BW 100 kHz MsG Band 5 (Single Ca #RL RL RF So Ω AC Band 5 (Single Ca Band 5 (Band Ca	VEW 300 kHz* arrier) Port 2, 10 MHz, 256-QAM, Low (Technology PNO: Wide Trig: Free Run IFGain:Low Trig: Free Run #Atten: 30 dB	Status Status Channel, 874 MHz, Frequency Ran Value (dBm) Limit (dBm) -27.342 -19 ▲ALIGN OFF: #Avg Type: RMS Avg Held: 100/100 Mkr	top 870.000 MHz 01.0 ms (601 pts) ge 3 Result Pass 07:5:11 PMFeb 11, 2020 TRACE 2 3 4 3 TYPE A WINNIN 1 867.967 MHz -27.342 dBm
Start 868.000 MHz #Res BW 100 kHz Mss Band 5 (Single Ca Band 5 (Single Ca Image: Start 868.000 MHz Mss Band 5 (Single Ca Image: Start 868.000 MHz	VEW 300 kHz* arrier) Port 2, 10 MHz, 256-QAM, Low (Technology PNO: Wide PNO: Wide FGain:Low Trig: Free Run #Atten: 30 dB	Status Status Channel, 874 MHz, Frequency Ran Value (dBm) Limit (dBm) -27.342 -19 AuglHold: 100/100 Mkr Mkr	top 870.000 MHz 01.0 ms (601 pts) ge 3 Result Pass 07:56:11 PMFeb 11, 2020 TRACE 2.34.5 TRACE 2.35.5 TRACE 2.
Start 868.000 MHz #Res BW 100 kHz MsG Band 5 (Single Ca Band 5 (Single Ca Image: Spectrum Analyzer - Element Materials Ref Offset 29.42 dB 10 dB/div Ref Offset 29.42 dB 36.4 26.4 16.4 -3.68 -13.6 -23.6	VEW 300 KHz* arrier) Port 2, 10 MHz, 256-QAM, Low (Technology PNO: Wide PNO: Wide Trig: Free Run #Atten: 30 dB	Status Status Channel, 874 MHz, Frequency Ran Value (dBm) Limit (dBm) -27.342 -19 Aug Type: RMS Avg Hoid: 100/100 Mkr	top 870.000 MHz 01.0 ms (601 pts) ge 3 <u>Result</u> Pass 07:56:11 PMFeb 11, 2020 TRACE 23 4 9 0 TRACE 1000 der
Start 868.000 MHz #Res BW 100 kHz MsG Band 5 (Single Ca Band 5 (Single Ca RL RF S0 Ω AC RL RF S0 Ω AC RL RF S0 Ω AC Band 5 (Single Ca RL RF S0 Ω AC AC AC Band 5 (Single Ca RL RF S0 Ω AC Band 5 (Single Ca RL RF S0 Ω AC Band 5 (Single Ca RL RF S0 Ω AC Band 5 (Single Ca Band 5 (Band Ca Band 5 (B	VEW 300 kHz* arrier) Port 2, 10 MHz, 256-QAM, Low (trechnology PNO: Wide PNO: Wide Trig: Free Run #Atten: 30 dB	Status Status Channel, 874 MHz, Frequency Ran Value (dBm) Limit (dBm) -27.342 -19 ALIGN OFF RAVg Type: RMS Avg Hold: 100/100 Mkr	top 870.000 MHz 01.0 ms (601 pts) ge 3 <u>Result</u> Pass 07:56:11 PMFeb 11, 2020 TRACE 2 3 4 3 0 TRACE 2 3 0 T
Start 868.000 MHz #Res BW 100 kHz MsG Band 5 (Single Ca Band 5 (Single Ca Ref Offset 29.42 dB 10 dB/div Ref Offset 29.42 dB 10 dB/div Ref Offset 29.42 dB 16.4 -3.68 -13.6 -43.6	VBW 300 kHz* arrier) Port 2, 10 MHz, 256-QAM, Low (Technology PNO: Wide PNO: Wide PNO: Wide PNO: Wide Atten: 30 dB Atten: 40	Status Status Channel, 874 MHz, Frequency Ran Value (dBm) Limit (dBm) -27.342 -19 AuglHold: 100/100 Mkr Mkr	top 870.000 MHz 01.0 ms (601 pts) ge 3 Result Pass 07:56:11 PM reb 11, 2020 TRACE 2 34 5 0 TYPE 2 35







XMit 2019.09.05

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-19	19-Mar-20

TEST DESCRIPTION

The measurement was made using a direct connection between the Rf output of the EUT and a spectrum analyzer. The fundamental emission output power (maximum average conducted output power) was measured using the channels and modes as called out on the following data sheets. The transmit power was set to its default maximum.

The method in section 5.2.4.4 of ANSI C63.26 was used to make the measurement. This method uses trace averaging across ON and OFF times of the EUT transmissions in the spectrum analyzer channel power function using an RMS detector. Following the measurement a duty cycle correction was applied by adding [10 log (1 / D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times.

Per FCC part 22.913 and per RSS 132 paragraph 5.4/SRSP 503 paragraph 5.1.1, the EIRP limits are 1640 watts. The Effective Radiated Power (ERP) of the transceiver cannot exceed 500 Watts.



XMit 2019.09.0 EUT: Airscale Base Transceiver Station Remote Radio Head Model AHBCA Serial Number: BL1818M0028 Customer: Nokia Solutions and Networks Work Order: NOKI0009 Date: 14-Feb-20 Temperature: 21.7 °C Attendees: Mitch Hill, John Rattanavong Humidity: 26.5% RH Project: None Barometric Pres.: 1036 mba Tested by: Brandon Hobbs TEST SPECIFICATIONS Power: 54 VDC Test Method Job Site: TX09 ANSI C63.26:2015 FCC 22H:2020 RSS-132:2013 -132:2013 COMMENTS All measurement path losses were accounted for in the reference level offset including any attenuators, filters and DC blocks. The highest power port operating at maximum power was used for all testing. Worst case port was tested for and found in the original report. DEVIATIONS FROM TEST STANDARD Non Configuration # 2 1 7 Signature Initial Pov Duty Cycle Factor (dB) Antenna Gain Final w/o Ant Gain dBd=(dBi) - 2.15dB Value (dBm/OBW) Limit ERF (dBm/OBW) Results (dBm/OBW) Band 5 (Single Carrier) Port 2 5 MHz QPSK Low Channel, 871,5 MHz 45.5 0 Not Provided 45.5 57 Pass Mid Channel, 881.5 MHz 45.5 0 Not Provided 45.5 57 Pass High Channel, 891.5 MHz 45.4 0 Not Provided 45.4 57 Pass 16-QAM Low Channel, 871.5 MHz Mid Channel, 881.5 MHz 45.7 45.5 Not Provided Not Provided Pass Pass 0 0 45.7 57 57 45.5 High Channel, 891.5 MHz 45.4 0 Not Provided 45.4 57 Pass 64-QAM Low Channel, 871.5 MHz Mid Channel, 881.5 MHz 45.4 0 Not Provided 45.4 57 Pass Not Provided 57 45.3 45.3 0 Pass High Channel, 891.5 MHz 45.2 0 Not Provided 45.2 57 Pass 256-QAM Low Channel, 871.5 MHz Mid Channel, 881.5 MHz 45.3 0 Not Provided 45.3 57 Pass Not Provided 57 45.2 0 45.2 Pass High Channel, 891.5 MHz 45.1 0 Not Provided 45.1 57 Pass 10 MHz QPSK Low Channel, 874 MHz 45.5 Not Provided 45.5 Pass 0 57 Mid Channel, 881.5 MHz 45.4 0 Not Provided 45.4 57 Pass High Channel, 889 MHz 45.6 Not Provided 45.6 57 Pass 0 16-QAM Low Channel, 874 MHz 45.6 0 Not Provided 45.6 57 Pass Mid Channel, 881.5 MHz 45.4 0 Not Provided 45.4 57 Pass High Channel, 889 MHz 45.6 Not Provided 45.6 57 Pass 0 64-QAM Low Channel, 874 MHz 45.5 Not Provided 0 45.5 Pass 57 Mid Channel, 881.5 MHz 45.3 0 Not Provided 45.3 57 57 Pass High Channel, 889 MHz 45.6 Not Provided 45.6 Pass 0 256-QAM Low Channel, 874 MHz 45.4 0 Not Provided 45.4 57 Pass Mid Channel, 881.5 MHz 45.2 0 Not Provided 45.2 57 Pass High Channel, 889 MHz 45.5 Not Provided 45.5 57 0 Pass











Initial Power	Duty Cycle	Antenna Gain	Final w/o Ant Gain	Limit ERP	
 (dBm/OBW)	Factor (dB)	dBd=(dBi) - 2.15dB	Value (dBm/OBW)	(dBm/OBW)	Results
45.656	0	Not Provided	45.7	57	Pass







	Initial Power	Duty Cycle	Antenna Gain	Final w/o Ant Gain	Limit ERP	
	(dBm/OBW)	Factor (dB)	dBd=(dBi) - 2.15dB	Value (dBm/OBW)	(dBm/OBW)	Results
	45.405	0	Not Provided	45.4	57	Pass













































10 dB/div Ref 35.00 dB	m _			
25 D				
23.0				
15.0				
5.00				
-5,00				
-15.0				
-25.0				
-35.0				
-45.0				
-55.0				
Center 881.5 MHz #Res BW 200 kHz		#VBW 620	kHz	Span 25 MHz #Sweep 601.1 ms
		D		
Channel Power		Power Spec	tral Density	
45.34 dBm	/ 10 MHz	-24.6	etral Density 6 dBm /Hz	
Channel Power 45.34 dBm	/ 10 MHz	-24.6	tral Density 6 dBm /Hz	
Channel Power 45.34 dBm	/ 10 MHz	-24.6	tral Density 6 dBm /Hz	
Channel Power 45.34 dBm	/ 10 MHz	-24.6	tral Density 6 dBm /Hz	











