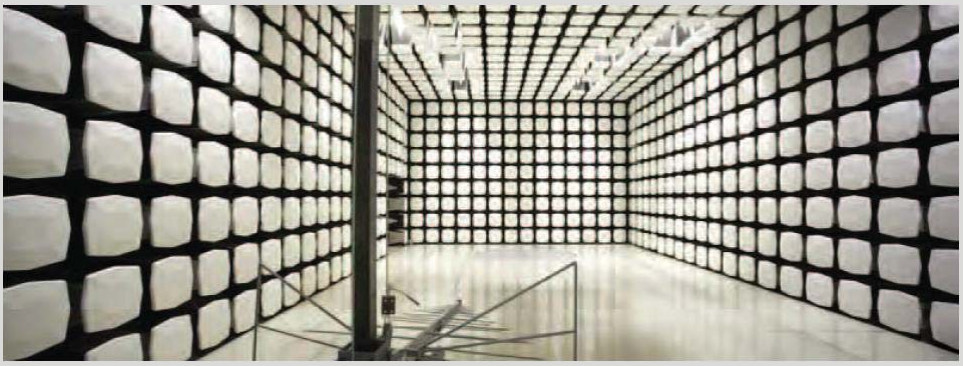
Radio Test Report
Application for a Permissive Change of Equipment Authorization
FCC Part 24 and IC RSS-133
[1930MHz – 1995MHz]

FCC Part 27 and IC RSS-139
[2110MHz – 2200MHz]

FCC ID: VBNAHFII-01
IC ID: 661W-AHFII

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

Report: NOKI0054.0 Rev. 0, Issue Date: March 29, 2023



CERT #3310.03

CERTIFICATE OF TEST

Last Date of Test: March 3, 2023
Nokia of America Corporation
EUT: Airscale Base Transceiver Station Remote Radio Head Model AHFII

Radio Equipment Testing

Standards

Specification	Method
Code of Federal Regulations (CFR) Title 47 Part 2 (Radio Standards Specification) RSS-Gen Issue 5 CFR Title 47 Part 24 Subpart E – Broadband PCS RSS-133 Issue 6 - January 18, 2018 – 2GHz Personal Communications Services CFR Title 47 Part 27 RSS-139 Issue 4 – September 29, 2022– Advanced Wireless Services (AWS) SRSP-513 issue 4 Sept 29, 2022 SRSP-519 issue 2 Sept 29, 2022	ANSI C63.26-2015 with FCC KDB 971168 D01 v03r01 FCC KDB 971168 D03 v01 FCC KDB 662911D01 v02r01 FCC KDB 662911D02 v01

Results

Test Description	Result	Comments
Duty Cycle	N/A	Not requested.
Occupied Bandwidth	Pass	
Output Power	Pass	
Peak to Average Power (PAPR)CCDF	Pass	
Band Edge Compliance	Pass	
Spurious Conducted Emissions	Pass	
Spurious Radiated Emissions	N/A	Not requested.
Power Spectral Density and EIRP Calculations	Pass	

Deviations From Test Standards

None

Approved By:

Adam Bruno, 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 - Each laboratory is accredited by A2LA to ISO / IEC 17025, and as a product certifier to ISO / IEC 17065 which allows Element to certify transmitters to FCC and IC specifications.

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 – Recognized as an EU Notified Body validated for the EMCD and RED Directives.

United Kingdom

BEIS – Recognized by the UK as an Approved Body under the UK Radio Equipment and UK EMC Regulations.

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

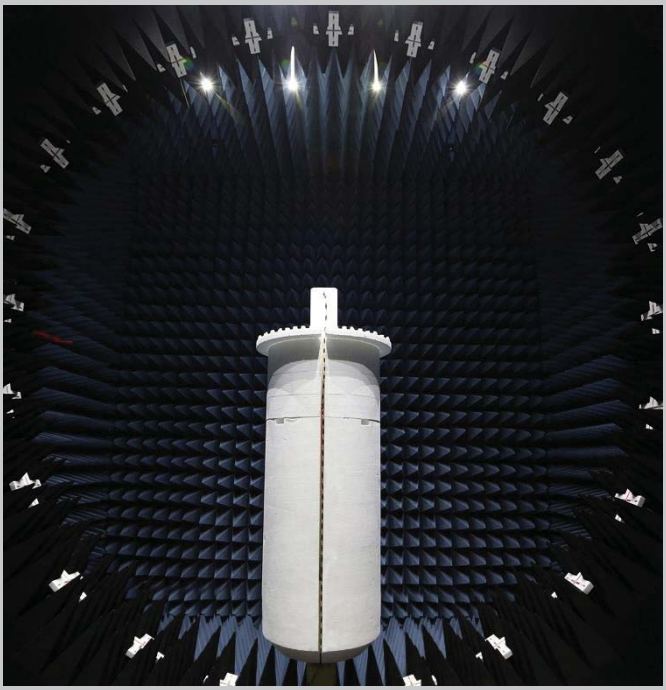
For details on the Scopes of our Accreditations, please visit:

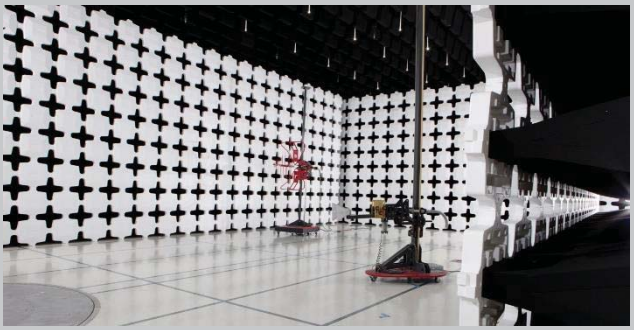
California Minnesota Oregon Texas Washington

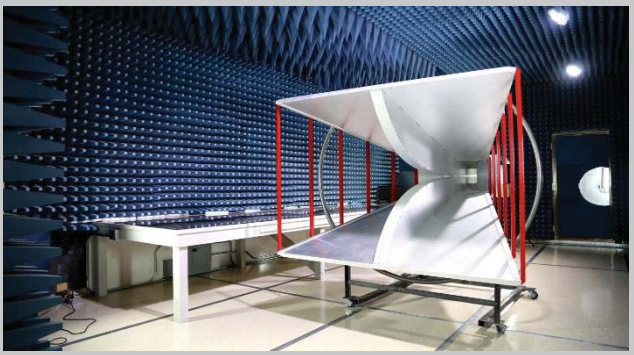
FACILITIES

element
2020.12.15

California	Minnesota	Oregon	Texas	Washington
Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-11 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th Ave NE Bothell, WA 98011 (425)984-6600
A2LA				
Lab Code: 3310.04	Lab Code: 3310.05	Lab Code: 3310.02	Lab Code: 3310.03	Lab Code: 3310.06
Innovation, Science and Economic Development 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

element
TMU.2015.07.10

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 in the table below. A lab specific value may also be found in the applicable test description section. 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)	3.1 dB	-3.1 dB

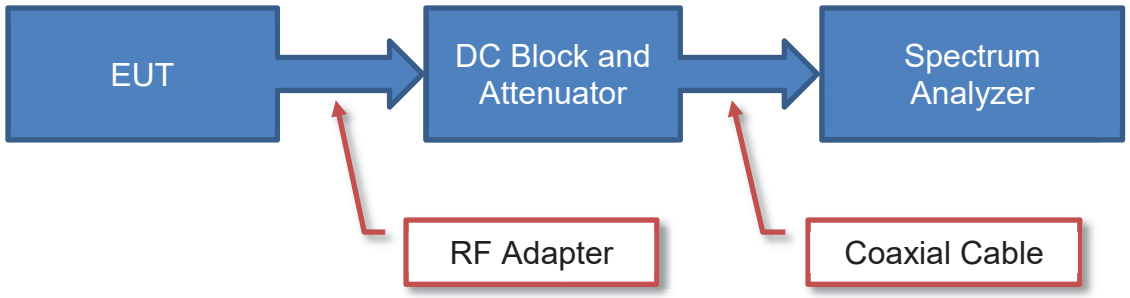
TEST SETUP BLOCK DIAGRAMS

Measurement Bandwidths

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

Unless otherwise stated, measurements were made using the bandwidths and detectors specified. No video filter was used.

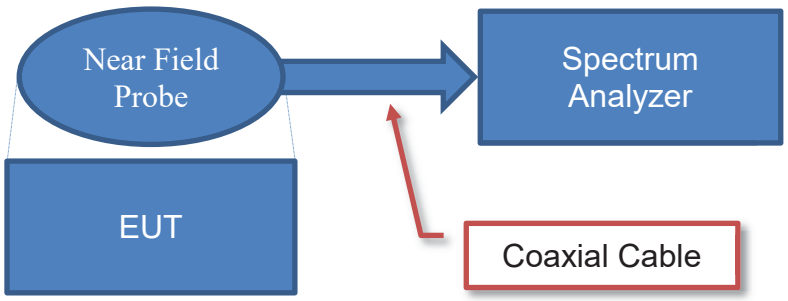
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

Near Field Test Fixture Measurements

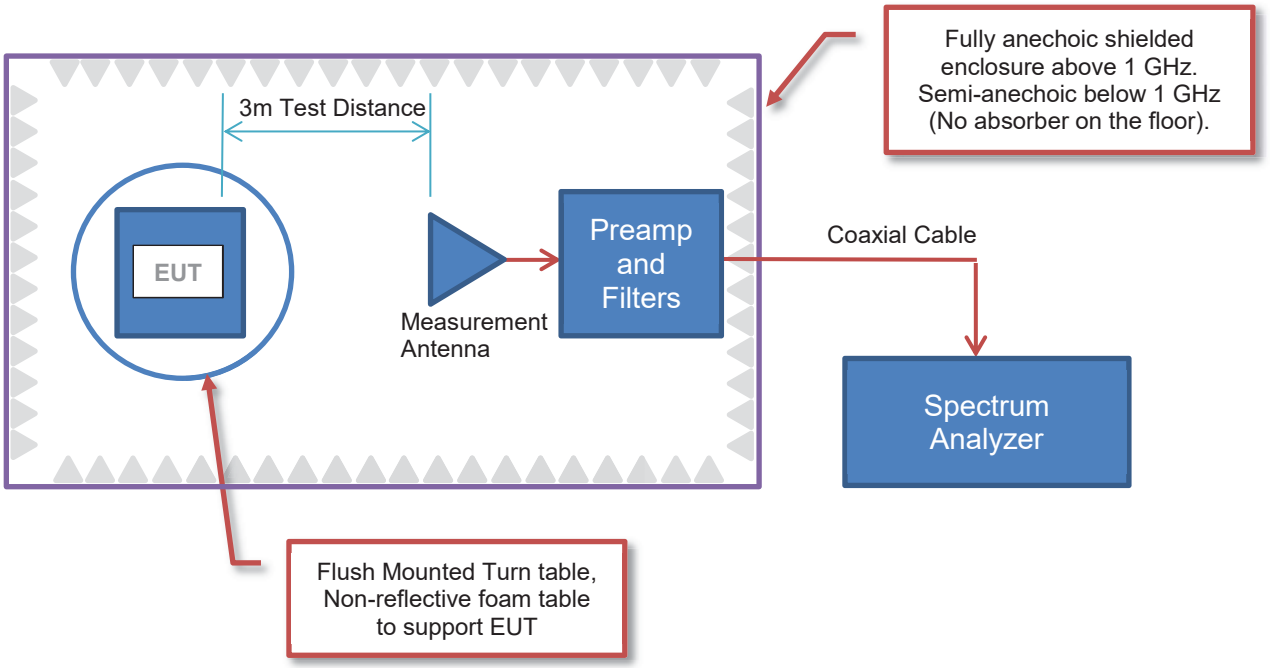


Sample Calculation (logarithmic units)

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

TEST SETUP BLOCK DIAGRAMS

Emissions Measurements



Sample Calculation (logarithmic units)

Radiated Emissions:

Measured Level (Amplitude)		Factor: Antenna Factor		Factor: Cable Factor		Factor: Amplifier Gain		Distance Adjustment Factor		External Attenuation		Field Strength
42.6	+	28.6	+	3.1	-	40.8	+	0.0	+	0.0	=	**33.5**

Conducted Emissions:

Measured Level (Amplitude)		Factor: Transducer Factor		Factor: Cable Factor		External Attenuation		Adjusted Level
26.7	+	0.3	+	0.1	+	20.0	=	**47.1**

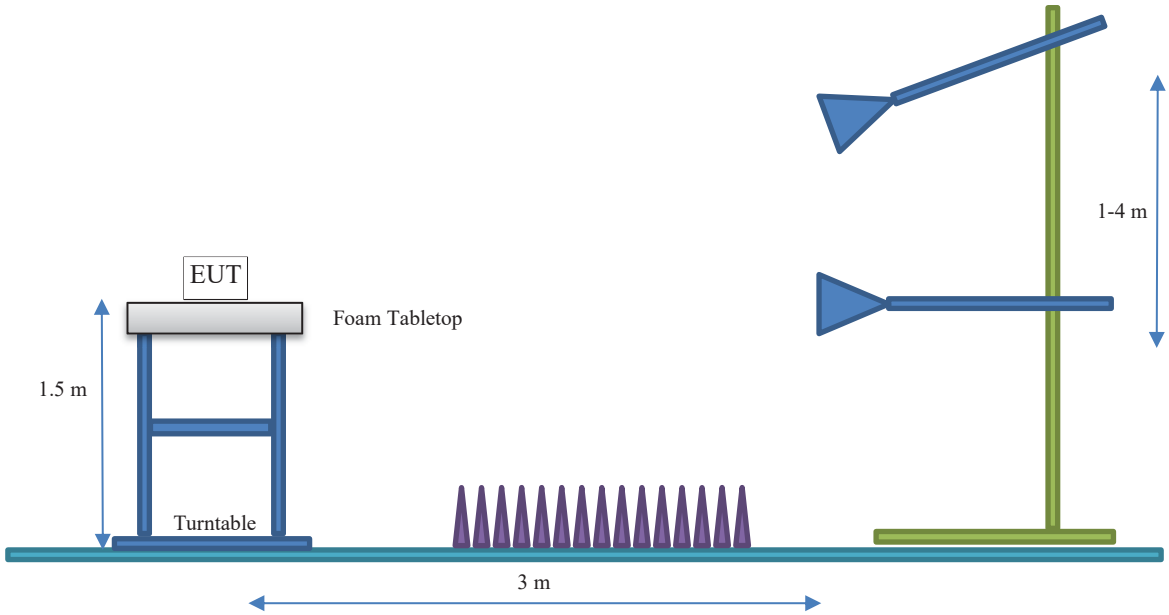
Radiated Power (ERP/EIRP) – Substitution Method:

Measured Level into Substitution Antenna (Amplitude dBm)		Substitution Antenna Factor (dBi)		EIRP to ERP (if applicable)		Measured power (dBm ERP/EIRP)
10.0	+	6.0	-	2.15	=	**13.9/16.0**

TEST SETUP BLOCK DIAGRAMS

Bore Sighting (>1GHz)

The diameter of the illumination area is the dimension of the line tangent to the EUT formed by 3 dB beamwidth of the measurement antenna at the measurement distance. At a 3 meter test distance, the diameter of the illumination area was 3.8 meters at 1 GHz and greater than 2.1 meters up to 6 GHz. Above 1 GHz, when required by the measurement standard, the antenna is pointed for both azimuth and elevation to maintain the receive antenna within the cone of radiation from the EUT. The specified measurement detectors were used for comparison of the emissions to the peak and average specification limits.



PRODUCT DESCRIPTION

ziClient and Equipment under Test (EUT) Information

Company Name:	Nokia of America Corporation
Address:	3201 Olympus Blvd
City, State, Zip:	Dallas, TX 75019
Test Requested By:	Steve Mitchell
EUT:	Airscale Base Transceiver Station Remote Radio Head Model AHFII
First Date of Test:	March 2, 2023
Last Date of Test:	March 3, 2023
Receipt Date of Samples:	March 2, 2023
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

A permissive change on the original filing is being pursued to add the 5G NR (new radio) 25MHz carriers to the AirScale Base Transceiver Station Remote Radio Head Model AHFII FCC and ISED radio certifications. In addition, 4G LTE 1.4 and NB IoT standalone carrier operations were repeated at a 20W rated power level for ISED only. 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 for this permissive change per correspondence/guidance from Nemko TCB. The same test methodology used in the original certification testing was used in this permissive change test effort. Tests performed under the change effort include RF power, PSD, CCDF, emission bandwidth (99% and 26 dB down), band edge spurious emissions, and conducted spurious emissions.

The testing was performed on the same hardware version (AHFII) as the original certification test. The base station and remote radio head software for this testing is an updated release that includes 5G NR 25 MHz carrier support.

The radiated emissions and frequency stability measurements performed in the original certification were 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.

Nokia Solutions and Networks AirScale Base Transceiver Station (BTS) Remote Radio Head (RRH) module, model AHFII is being developed under this effort. The AHFII remote radio head is a multi-standard multi-carrier radio module designed to support GSM/EDGE, WCDMA, LTE, LTE Narrow Band Internet of Things (NB IoT) operations (in-band, guard band, standalone) and 5G NR. The scope of testing in this effort is for the addition of 25MHz bandwidth in 5G NR FDD operations. In addition, 4G LTE1.4 and NB IoT standalone carrier operations were repeated for ISED to show compliance at a 20W rated carrier power.

The AHFII RRH has four transmit/four receive antenna ports (4TX/4RX for Band n25 and 4TX/4RX for Band n66). Each antenna port supports 3GPP frequency band n25 (BTS Rx: 1850 to 1915 MHz/BTS TX: 1930 to 1995 MHz) and 3GPP frequency band n66 (BTS Rx: 1710 to 1780 MHz/BTS TX: 2110 to 2200 MHz). The maximum RF output power of the RRH is 480 Watts (120 watts per port x 4 ports). The maximum power per band (Band n25 or Band n66) is 80 watts. The maximum single carrier power level is 80 watts. The TX and RX instantaneous bandwidth cover the full operational RRH bandwidth. Multi-carrier operation is supported.

The RRH can be operated as a 4x4 MIMO, 2x2 MIMO or as non-MIMO for 5G NR FDD. The RRH supports 5, 10, 15, 20, 25, 30 and 40MHz 5G NR bandwidths. The RRH supports four 5G NR downlink modulation types (QPSK, 16QAM, 64QAM and 256QAM). The 5G NR carriers/modulation types for this testing are setup according to 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 RRH can be operated as a 4x4 MIMO, 2x2 MIMO or as non-MIMO for 4G LTE FDD. The RRH supports 1.4, 3, 5, 10, 15, and 20MHz LTE bandwidths. The RRH supports four LTE downlink modulation types (QPSK, 16QAM, 64QAM and 256QAM). The Narrow band IoT Standalone (NB IoT SA) carrier operations supports a 200kHz bandwidth. The NB IoT SA carrier maximum power is 20W/carrier. The 4G LTE modulation types are setup according to 3GPP TS 36.141 E-UTRA Test Models (E-TM) as follows E-TM 1.1: QPSK, E-TM 3.1: 64QAM, E-TM3.1a: 256QAM and E-TM 3.2: 16QAM. The LTE modulation type for IoT testing is setup according to 3GPP TS 36.141 E-UTRA Test Models and is “E-TM 1.1 (QPSK modulation type) with N-TM (narrow band IoT)”.

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

The PCS Band 5G NR channel bandwidths are 5, 10, 15, 20, 25, 30 and 40MHz. The downlink channel numbers are provided below. The 25MHz carrier bandwidth is tested under this effort; the other carrier bandwidths were verified under previous efforts and are provided for thoroughness.

	Downlink 5G NR NR-ARFCN	Downlink Frequency (MHz)	5G NR Channel Bandwidth						
			5 MHz	10 MHz	15 MHz	20 MHz	25 MHz	30 MHz	40 MHz
AHFII Band n25 (Ant 1 through 4)	386000	1930.0	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge
	386500	1932.5	Bottom Ch						
	387000	1935.0		Bottom Ch					
	387500	1937.5			Bottom Ch				
	388000	1940.0				Bottom Ch			
	388500	1942.5					Bottom Ch		
	389000	1945.0						Bottom Ch	
	390000	1950.0							Bottom Ch
	392500	1962.5	Middle Ch	Middle Ch	Middle Ch	Middle Ch	Middle Ch	Middle Ch	Middle Ch
	395000	1975.0							Top Channel
	396000	1980.0						Top Ch	
	396500	1982.5					Top Ch		
	397000	1985.0				Top Ch			
	397500	1987.5			Top Ch				
	398000	1990.0		Top Ch					
	398500	1992.5	Top Ch						
	399000	1995.0	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge

AHFII Downlink Band Edge 5G NR Band n25 Frequency Channels

The AWS Band 5G NR channel bandwidths are 5, 10, 15, 20, 25, 30 and 40MHz. The downlink channel numbers are provided below. The 25MHz carrier bandwidth is tested under this effort; the other carrier bandwidths were verified under previous efforts and are provided for thoroughness.

	Downlink 5G NR NR-ARFCN	Downlink Frequency (MHz)	5G NR Channel Bandwidth						
			5 MHz	10 MHz	15 MHz	20 MHz	25 MHz	30 MHz	40 MHz
AHFII 5G NR Band n66 (Ant 1 through 4)	422000	2110.0	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge
	422500	2112.5	Bottom Ch						
	423000	2115.0		Bottom Ch					
	423500	2117.5			Bottom Ch				
	424000	2120.0				Bottom Ch			
	424500	2122.5					Bottom Ch		
	425000	2125.0						Bottom Ch	
	426000	2130.0							Bottom Ch
	431000	2155.0	Middle Ch	Middle Ch	Middle Ch	Middle Ch	Middle Ch	Middle Ch	Middle Ch
	436000	2180.0							Top Ch
	437000	2185.0						Top Ch	
	437500	2187.5					Top Ch		
	438000	2190.0				Top Ch			
	438500	2192.5			Top Ch				
	439000	2195.0		Top Ch					
	439500	2197.5	Top Ch						
	440000	2200.0	Band Edge	Band Edge	Band Edge	Band Edge			Band Edge

AHFII Downlink Band Edge 5G NR Band n66 Frequency Channels

The PCS Band LTE channel bandwidths are 1.4, 3, 5, 10, 15, and 20MHz. The NB IoT SA carrier channel bandwidth is 200kHz. The LTE1.4 and LTE3 bandwidths are limited to the 1930 to 1990MHz frequency range. The downlink channel numbers are provided below. The 1.4MHz and IoT SA carriers are tested herein; the other carrier bandwidths were verified under previous efforts and are provided for thoroughness.

	Downlink 4G LTE EARFCN	Downlink Frequency (MHz)	4G LTE Channel Bandwidth						
			IoT SA 200kHz	1.4MHz	3MHz	5MHz	10MHz	15MHz	20MHz
AHFII 4G LTE Band 25 (Ant 1, 2, 3, 4)	8040	1930.0	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge
	.....								
	8042	1930.2	Bot Ch						
	.....								
	8047	1930.7		Bot Ch					
	.....								
	8055	1931.5			Bot Ch				
	.....								
	8065	1932.5				Bot Ch			
	.....								
	8090	1935.0					Bot Ch		
	.....								
	8115	1937.5						Bot Ch	
	.....								
	8140	1940.0							Bot Ch
	.....								
	8365	1962.5	Middle Ch	Middle Ch	Middle Ch	Middle Ch	Middle Ch	Middle Ch	Middle Ch
	.....								
	8590	1985.0							Top Ch
	.....								
	8615	1987.5						Top Ch	
	.....								
	8625	1988.5			Top Ch				
	.....								
	8633	1989.3		Top Ch					
	.....								
	8640	1990.0		Band Edge	Band Edge		Top Ch		
	.....								
	8665	1992.5				Top Ch			
	.....								
	8688	1994.8	Top Ch						
	.....								
	8690	1995.0	Band Edge			Band Edge	Band Edge	Band Edge	Band Edge

AHFII Downlink Band Edge 4G LTE Band 25 Frequency Channels

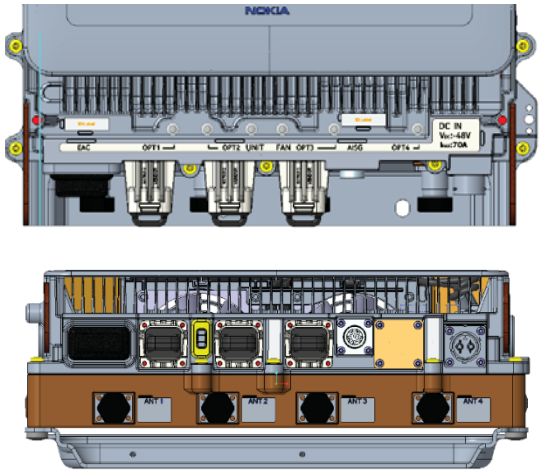
The AWS Band 4G LTE channel bandwidths are 1.4, 3, 5, 10, 15 and 20MHz. The NB IoT SA carrier channel bandwidth is 200kHz. The downlink channel numbers are provided below. The 1.4MHz and IoT SA carriers are tested herein; the other carrier bandwidths were verified under previous efforts and are provided for thoroughness.

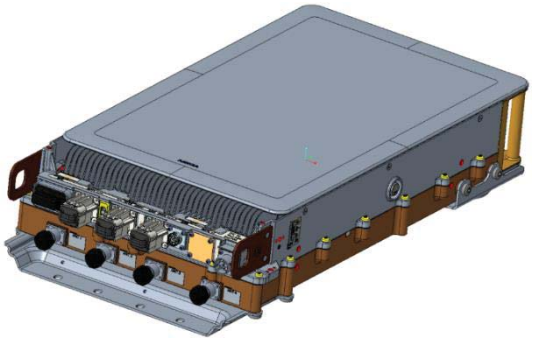
	Downlink 4G LTE EARFCN	Downlink Frequency (MHz)	4G LTE Channel Bandwidth						
			IoT SA 200kHz	1.4MHz	3.0MHz	5MHz	10MHz	15MHz	20MHz
AHFII 4G LTE Band 66 (Ant 1, 2, 3, 4)	66436	2110.0	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge
	.....								
	66438	2110.2	Bot Ch						
	.....								
	66443	2110.7		Bot Ch					
	.....								
	66451	2111.5			Bot Ch				
	.....								
	66461	2112.5				Bot Ch			
	.....								
	66486	2115.0					Bot Ch		
	.....								
	66511	2117.5						Bot Ch	
	.....								
	66536	2120.0							Bot Ch
	.....								
	66886	2155.0	Middle Ch	Middle Ch	Middle Ch	Middle Ch	Middle Ch	Middle Ch	Middle Ch
	.....								
	67236	2190.0							Top Ch
	.....								
	67261	2192.5						Top Ch	
	.....								
	67286	2195.0					Top Ch		
	.....								
	67311	2197.5				Top Ch			
	.....								
	67321	2198.5			Top Ch				
	.....								
	67329	2199.3		Top Ch					
	.....								
	67334	2199.8	Top Ch						
	.....								
	67336	2200.0	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge	Band Edge

AHFII Downlink Band Edge 4G LTE Band 66 Frequency Channels

PRODUCT DESCRIPTION

AHFII Connector Layout





EUT External Interfaces

Name	Qty	Connector Type	Purpose (and Description)
DC In	1	APPG Amphenol	2-pole Power Input Terminal
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
OPT	3	SFP	Optical Interfaces
RET	1	8-pin circular connector	AISG 3.0 to external devices_ RET RS-485

Testing Objective:

A permissive change on the original filing is being pursued to add 5G NR (new radio) 25MHz carrier operations to the Nokia Solutions and Networks Base Transceiver Station (BTS) Remote Radio Head (RRH) model AHFII FCC and ISED radio certifications. The 4G LTE1.4 and NB IoT standalone carriers were verified at a 20W per carrier power level for ISED radio certification.

CONFIGURATIONS

Test Configuration 1 RF Conducted Emissions

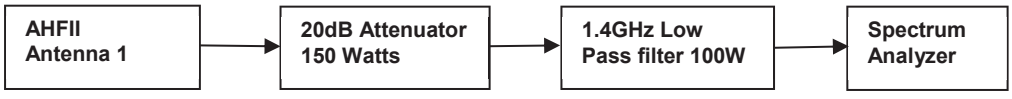
Software/Firmware Running during test	
Description	**Version**
4G/5G BTS Software Version (23R2)	SBTS00_ENB_9999_230209_000006
4G/5G RF Software	RF. FRM5.trunk.20230208.005

Equipment being tested (include Peripherals)			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AMIA (BTS System Module)	Nokia Solutions and Networks	473098A.102	J8173107703
ASIA (4G BTS System Module)	Nokia Solutions and Networks	473095A.101	L1164105428
ABIA (4G BTS Baseband Module)	Nokia Solutions and Networks	473096A.103	AH173006385
ASIB (5G BTS System Module)	Nokia Solutions and Networks	473764A.102	L1224904438
ABIO (5G BTS Baseband Module)	Nokia Solutions and Networks	475266A.104	L1214403575
AHFII (Radio Remote Head)	Nokia Solutions and Networks	475656A.101	BL2235N41PG
Low Pass Filter 1.4GHz/100W	Microwave Circuits,Inc.	L13502G1	SN2454-01
Attenuator 150W/20dB	Weinschel Corp	66-20-33	BZ1165
SFP+ 9.8G,300M,850NM	Nokia	474900A.101	VF2023004CF
SFP+ 9.8G,300M,850NM	Nokia	474900A.101	VF2023000RM
Lenovo T490	HP	T490	PF26RVZ0
Keysight N8757- DC System power supply	Keysight	N8757A	US21D4054S
FPAC (DC-pwr supply)	Nokia	472805A.X21	A9124600282
2 Meter RF cable (Load Cable)	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN531429/6
2 Meter RF cable (Load Cable)	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN531433/6
2 Meter RF cable (Load Cable)	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN531431/6
250W -50ohm -Terminating Load	API Weinschel	1433-3-LIM	TC867
250W -50ohm -Terminating Load	API Weinschel	1433-3-LIM	TC863
250W -50ohm -Terminating Load	API Weinschel	1433-3-LIM	TC870
Cat-5e cable	CSA	LL73189	E151955
6 Meters RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN528837/6
1 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_104	SN551432/4
Fiber Optic cable 2m	Amphenol Fiber Optic	VZ1701	995741A

Cables (Peripheral)					
Description	**Shield (Y/N)**	**Length (m)**	**Ferrite (Y/N)**	**Connection 1 (4G)**	**Connection 2**
Fiber Optic Cables	N	2 meters	N	ABIA/ASIB	AHFII
Cat-5e Cable	Y	7 meters	N	ASIA/ABIO	WebEM- PC
HS-SUCOFLEX_106– RF CABLE	Y	2 meters	N	EUT [AHFII] Ant 2-4	250W -50ohm -Load

Cables					
Description	**Shield (Y/N)**	**Length (m)**	**Ferrite (Y/N)**	**Connection 1**	**Connection 2**
HS-SUCOFLEX_106 1.5dB cable attenuator	Y	6 meters	N	EUT [AHFII] Ant port #1	Attenuator 150W/20dB
Attenuator 150W/20dB	N	N/A	N	RF cable HS-SUCOFLEX_106	1.4GHz Low Pass filter 100W
1.4GHz Low Pass filter 100W	N	N/A	N	Attenuator 150W/20dB	RF cable HS-SUCOFLEX_104
HS-SUCOFLEX_104	Y	1 meter	N	1.4GHz Low Pass filter 100W	Analyzer

RF Test Setup Diagram:



CONFIGURATIONS

Test Configuration 2 RF Conducted Emissions

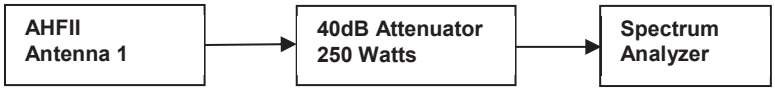
Software/Firmware Running during test	
Description	**Version**
4G/5G BTS Software Version (23R2)	SBTS00_ENB_9999_230209_000006
4G/5G RF Software	RF. FRM5.trunk.20230208.005

Equipment being tested (include Peripherals)			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AMIA (BTS System Module)	Nokia Solutions and Networks	473098A.102	J8173107703
ASIA (4G BTS System Module)	Nokia Solutions and Networks	473095A.101	L1164105428
ABIA (4G BTS Baseband Module)	Nokia Solutions and Networks	473096A.103	AH173006385
ASIB (5G BTS System Module)	Nokia Solutions and Networks	473764A.102	L1224904438
ABIO (5G BTS Baseband Module)	Nokia Solutions and Networks	475266A.104	L1214403575
AHFII (Radio Remote Head)	Nokia Solutions and Networks	475656A.101	BL2235N41PG
Attenuator 40dB/250W	API Weinschel	58-40-43-LIM	TC909
SFP+ 9.8G,300M,850NM	Nokia	474900A.101	VF2023004CF
SFP+ 9.8G,300M,850NM	Nokia	474900A.101	VF2023000RM
Lenovo T490	HP	T490	PF26RVZ0
Keysight N8757- DC System power supply	Keysight	N8757A	US21D4054S
FPAC (DC-pwr supply)	Nokia	472805A.X21	A9124600282
2 Meter RF cable (Load Cable)	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN531429/6
2 Meter RF cable (Load Cable)	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN531433/6
2 Meter RF cable (Load Cable)	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN531431/6
250W -50ohm -Terminating Load	API Weinschel	1433-3-LIM	TC867
250W -50ohm -Terminating Load	API Weinschel	1433-3-LIM	TC863
250W -50ohm -Terminating Load	API Weinschel	1433-3-LIM	TC870
Cat-5e cable	CSA	LL73189	E151955
6 Meters RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN528837/6
1 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_104	SN551432/4
Fiber Optic cable 2m	Amphenol Fiber Optic	VZ1701	995741A

Cables (Peripheral)					
Description	**Shield (Y/N)**	**Length (m)**	**Ferrite (Y/N)**	**Connection 1 (4G)**	**Connection 2**
Fiber Optic Cables	N	2 meters	N	ABIA/ASIB	AHFII
Cat-5e Cable	Y	7 meters	N	ASIA/ABIO	WebEM- PC
HS-SUCOFLEX_106 – RF CABLE	Y	2 meters	N	EUT [AHFII] Ant 2-4	250W -50ohm -Load

Cables					
Description	**Shield (Y/N)**	**Length (m)**	**Ferrite (Y/N)**	**Connection 1**	**Connection 2**
HS-SUCOFLEX_106	Y	6 meters	N	EUT [AHFII] Ant port #1	Attenuator 250W/40dB
Attenuator 250W/40dB	N	NA	N	RF cable HS-SUCOFLEX_106	RF cable HS-SUCOFLEX_104
HS-SUCOFLEX_104	Y	1 meter	N	Attenuator 250W/40dB	Analyzer

RF Test Setup Diagram:



CONFIGURATIONS

Test Configuration 3 RF Conducted Emissions

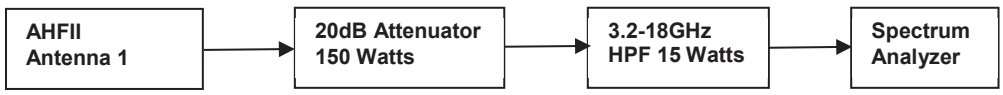
Software/Firmware Running during test	
Description	**Version**
4G/5G BTS Software Version (23R2)	SBTS00_ENB_9999_230209_000006
4G/5G RF Software	RF. FRM5.trunk.20230208.005

Equipment being tested (include Peripherals)			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AMIA (BTS System Module)	Nokia Solutions and Networks	473098A.102	J8173107703
ASIA (4G BTS System Module)	Nokia Solutions and Networks	473095A.101	L1164105428
ABIA (4G BTS Baseband Module)	Nokia Solutions and Networks	473096A.103	AH173006385
ASIB (5G BTS System Module)	Nokia Solutions and Networks	473764A.102	L1224904438
ABIO (5G BTS Baseband Module)	Nokia Solutions and Networks	475266A.104	L1214403575
AHFII (Radio Remote Head)	Nokia Solutions and Networks	475656A.101	BL2235N41PG
High Pass Filter 3.2-18GHz/15W	RL-Lambda	RHPF23G03G18	20121400045
Attenuator 150W/20dB	Aeroflex Weinschel	66-20-33	BZ2075
SFP+ 9.8G,300M,850NM	Nokia	474900A.101	VF2023004CF
SFP+ 9.8G,300M,850NM	Nokia	474900A.101	VF2023000RM
Lenovo T490	HP	T490	PF26RVZ0
Keysight N8757- DC System power supply	Keysight	N8757A	US21D4054S
FPAC (DC-pwr supply)	Nokia	472805A.X21	A9124600282
2 Meter RF cable (Load Cable)	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN531429/6
2 Meter RF cable (Load Cable)	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN531433/6
2 Meter RF cable (Load Cable)	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN531431/6
250W -50ohm -Terminating Load	API Weinschel	1433-3-LIM	TC867
250W -50ohm -Terminating Load	API Weinschel	1433-3-LIM	TC863
250W -50ohm -Terminating Load	API Weinschel	1433-3-LIM	TC870
Cat-5e cable	CSA	LL73189	E151955
6 Meters RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN528837/6
1 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_104	SN551432/4
Fiber Optic cable 2m	Amphenol Fiber Optic	VZ1701	995741A

Cables (Peripheral)					
Description	**Shield (Y/N)**	**Length (m)**	**Ferrite (Y/N)**	**Connection 1** (4G)	**Connection 2**
Fiber Optic Cables	N	2 meters	N	ABIA/ASIB	AHFII
Cat-5e Cable	Y	7 meters	N	ASIA/ABIO	WebEM- PC
HS-SUCOFLEX_106– RF CABLE	Y	2 meters	N	EUT [AHFII] Ant 2-4	250W -50ohm -Load

Cables					
Description	**Shield (Y/N)**	**Length (m)**	**Ferrite (Y/N)**	**Connection 1**	**Connection 2**
HS-SUCOFLEX_106	Y	6 meters	N	EUT [AHFII] Ant port #1	Attenuator 150W/20dB
Attenuator 150W/20dB	N	NA	N	RF cable HS-SUCOFLEX_106	High Pass Filter 3.2-18GHz/15W
High Pass Filter 3.2-18GHz/15W	N	NA	N	Attenuator 150W/20dB	RF cable HS-SUCOFLEX_104
HS-SUCOFLEX_104	Y	1 meter	N	High Pass Filter 3.2-18GHz/15W	Analyzer

RF Test Setup Diagram:



CONFIGURATIONS

Test Configuration 4 RF Conducted Emissions

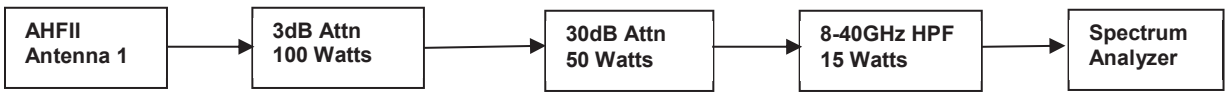
Software/Firmware Running during test	
Description	**Version**
4G/5G BTS Software Version (23R2)	SBTS00_ENB_9999_230209_000006
4G/5G RF Software	RF. FRM5.trunk.20230208.005

Equipment being tested (include Peripherals)			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AMIA (BTS System Module)	Nokia Solutions and Networks	473098A.102	J8173107703
ASIA (4G BTS System Module)	Nokia Solutions and Networks	473095A.101	L1164105428
ABIA (4G BTS Baseband Module)	Nokia Solutions and Networks	473096A.103	AH173006385
ASIB (5G BTS System Module)	Nokia Solutions and Networks	473764A.102	L1224904438
ABIO (5G BTS Baseband Module)	Nokia Solutions and Networks	475266A.104	L1214403575
AHFII (Radio Remote Head)	Nokia Solutions and Networks	475656A.101	BL2235N41PG
Attenuator 100W/3dB	API Weinschel	47-3-33	CC7387
Attenuator 50W/30dB	Narda	776B	30
High Pass Filter 8-40GHz/15W	RF-Lambda	RHPF23G08G40	17102700016
SFP+ 9.8G,300M,850NM	Nokia	474900A.101	VF2023004CF
SFP+ 9.8G,300M,850NM	Nokia	474900A.101	VF2023000RM
Lenovo T490	HP	T490	PF26RVZ0
Keysight N8757- DC System power supply	Keysight	N8757A	US21D4054S
FPAC (DC-pwr supply)	Nokia	472805A.X21	A9124600282
2 Meter RF cable (Load Cable)	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN531429/6
2 Meter RF cable (Load Cable)	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN531433/6
2 Meter RF cable (Load Cable)	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN531431/6
250W -50ohm -Terminating Load	API Weinschel	1433-3-LIM	TC867
250W -50ohm -Terminating Load	API Weinschel	1433-3-LIM	TC863
250W -50ohm -Terminating Load	API Weinschel	1433-3-LIM	TC870
Cat-5e cable	CSA	LL73189	E151955
6 Meters RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN528837/6
1 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_104	SN551432/4
Fiber Optic cable 2m	Amphenol Fiber Optic	VZ1701	995741A

Cables (Peripheral)					
Description	**Shield (Y/N)**	**Length (m)**	**Ferrite (Y/N)**	**Connection 1 (4G)**	**Connection 2**
Fiber Optic Cables	N	2 meters	N	ABIA/ASIB	AHFII
Cat-5e Cable	Y	7 meters	N	ASIA/ABIO	WebEM- PC
HS-SUCOFLEX_106– RF CABLE	Y	2 meters	N	EUT [AHFII] Ant 2-4	250W -50ohm -Load

Cables					
Description	**Shield (Y/N)**	**Length (m)**	**Ferrite (Y/N)**	**Connection 1**	**Connection 2**
HS-SUCOFLEX_106	Y	6 meters	N	EUT [AHFII] Ant port #1	Attenuator 100W/3dB
Attenuator 100W/3dB	N	NA	N	RF cable HS-SUCOFLEX_106	Attenuator 50W/30dB
Attenuator 50W/30dB	N	NA	N	Attenuator 100W/3dB	High Pass Filter 8-40GHz/15W
HS-SUCOFLEX_104	Y	1 meter	N	Attenuator 250W/40dB	Analyzer

RF Test Setup Diagram:



MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2023-03-02	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	2023-03-03	Occupied Bandwidth	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	2023-03-03	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	2023-03-03	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.
5	2023-03-03	Spurious Conducted Emissions	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2023-03-03	Power Spectral Density and EIRP Calculations	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

OCCUPIED BANDWIDTH - BAND n25 5G

XMit 2022.12.28.0

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
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The method in section 5.4 of ANSI C63.26 was used to make this measurement. The spectrum analyzer settings were as follows:

- RBW is 1% - 5% of the occupied bandwidth
- VBW is ≥ 3x the RBW
- Peak Detector was used
- Trace max hold was used

The occupied bandwidth was measured with the EUT configured in the modes called out in the data sheets.
FCC 24.238(b) defines the 26dB emission bandwidth requirement.
RSS GEN Section 6.7 defines the 99% emission bandwidth requirement.

FCC and ISED Emission Designators for Band n25 (1930MHz to 1995MHz)									
Ch BW	Radio Channel	5G-NR: QPSK		5G-NR: 16QAM		5G-NR: 64QAM		5G-NR: 256QAM	
		FCC	ISED	FCC	ISED	FCC	ISED	FCC	ISED
25MHz	Low							25M0G7W	23M8G7W
	Mid	25M0G7W	23M8G7W	25M1G7W	23M9G7W	25M1G7W	23M9G7W	25M1G7W	23M8G7W
	High							25M0G7W	23M8G7W
Note: FCC emission designators are based on 26dB emission bandwidth. ISED emission designators are based on 99% emission bandwidth.									

RF conducted emissions testing was performed on one port. The testing was performed on the same version of hardware (AHFII) as the original certification test. The AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original certifications testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI 63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

OCCUPIED BANDWIDTH - BAND n25 5G

element

TbtTx 2022.05.02.0 XMit 2022.12.28.0

EUT:	Airscale Base Transceiver Station Remote Radio Head Model AHFII			Work Order:	NOKI0054
Serial Number:	BL2235N41PG			Date:	03/02/2023
Customer:	Nokia of America Corporation			Temperature:	22.9°C
Attendees:	John Rattanavong, David Le			Humidity:	44.3%
Project:	None			Barometric Pres.:	977.3 mbar
Tested by:	Brandon Hobbs and Jarrod Brenden	Power:	54 VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 24E:2022	ANSI C63.26:2015
RSS-133 Issue 6:2013+A1:2018	ANSI C63.26:2015

COMMENTS

All measurment path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. Band n25 carriers are enabled as maximum power (80 watts/carrier).

DEVIATIONS FROM TEST STANDARD

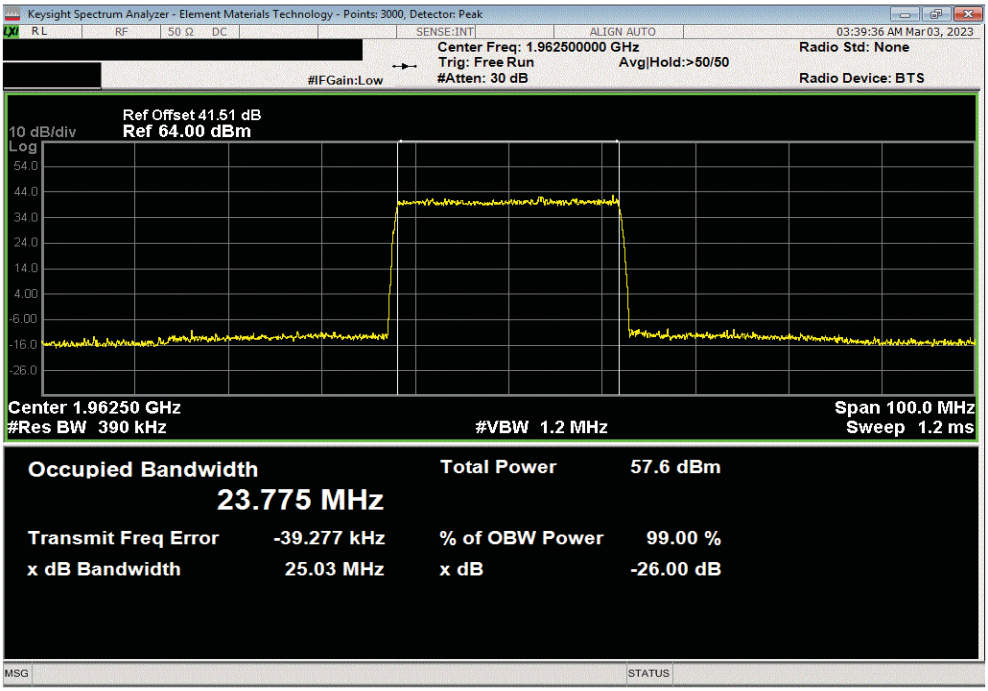
None

Configuration #	NOKI0054-2	Signature

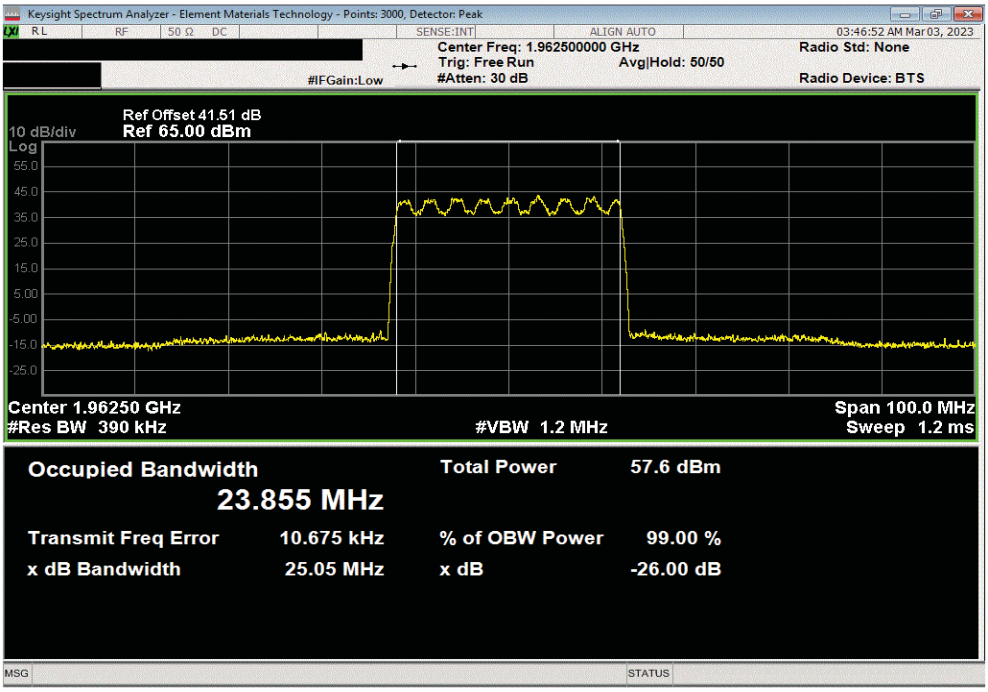
	Value 99% (MHz)	Value 26dB (MHz)	Limt	Result
Band n25 1930 MHz - 1995 MHz, 5G NR				
Port 1				
25 MHz Bandwidth				
QPSK Modulation				
Mid Channel 1962.5 MHz	23.8	25.0	Within Band	Pass
16-QAM Modulation				
Mid Channel 1962.5 MHz	23.9	25.1	Within Band	Pass
64-QAM Modulation				
Mid Channel 1962.5 MHz	23.9	25.1	Within Band	Pass
256-QAM Modulation				
Low Channel 1942.5 MHz	23.8	25.0	Within Band	Pass
Mid Channel 1962.5 MHz	23.8	25.1	Within Band	Pass
High Channel 1982.5 MH:	23.8	25.0	Within Band	Pass

OCCUPIED BANDWIDTH - BAND n25 5G

Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, QPSK Modulation, Mid Channel 1962.5 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limt	Result
			23.775	25.03	Within Band	Pass

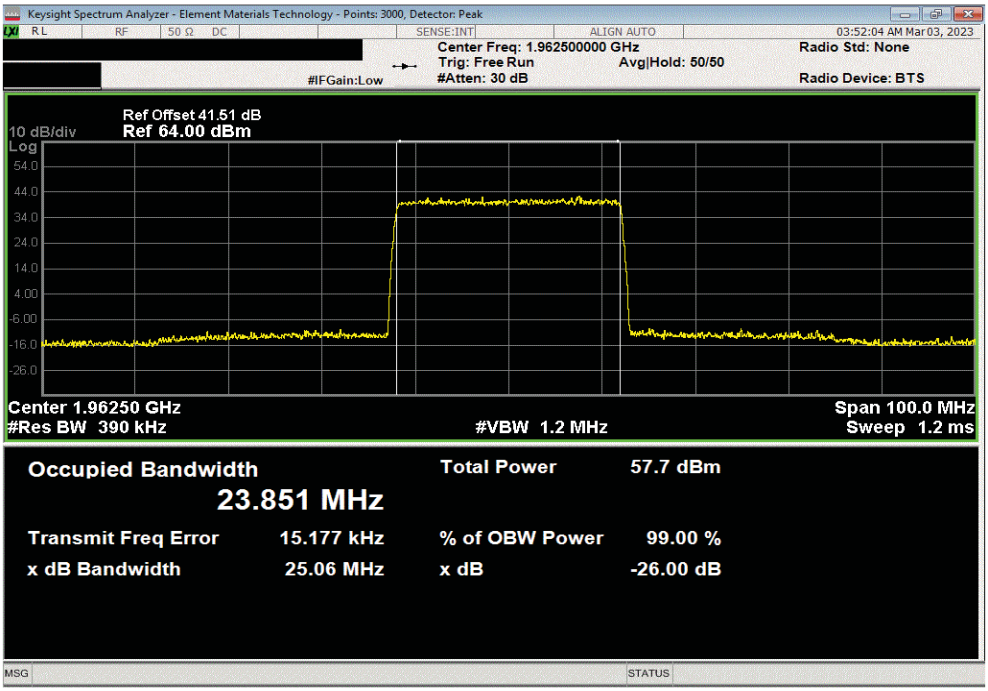


Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 16-QAM Modulation, Mid Channel 1962.5 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limt	Result
			23.855	25.05	Within Band	Pass

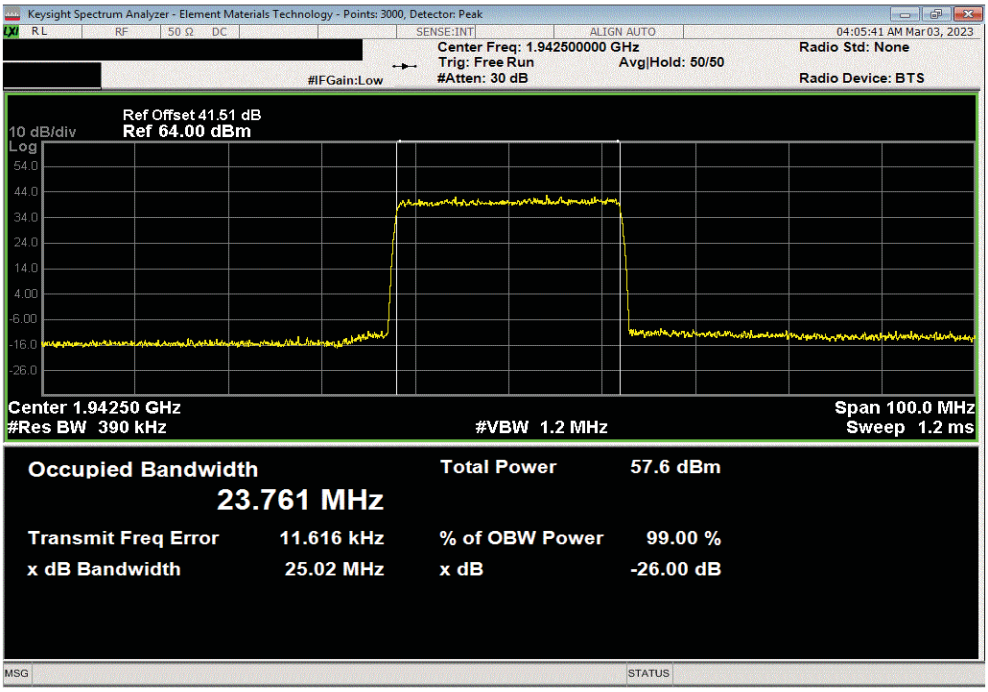


OCCUPIED BANDWIDTH - BAND n25 5G

Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 64-QAM Modulation, Mid Channel 1962.5 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limt	Result
			23.851	25.06	Within Band	Pass

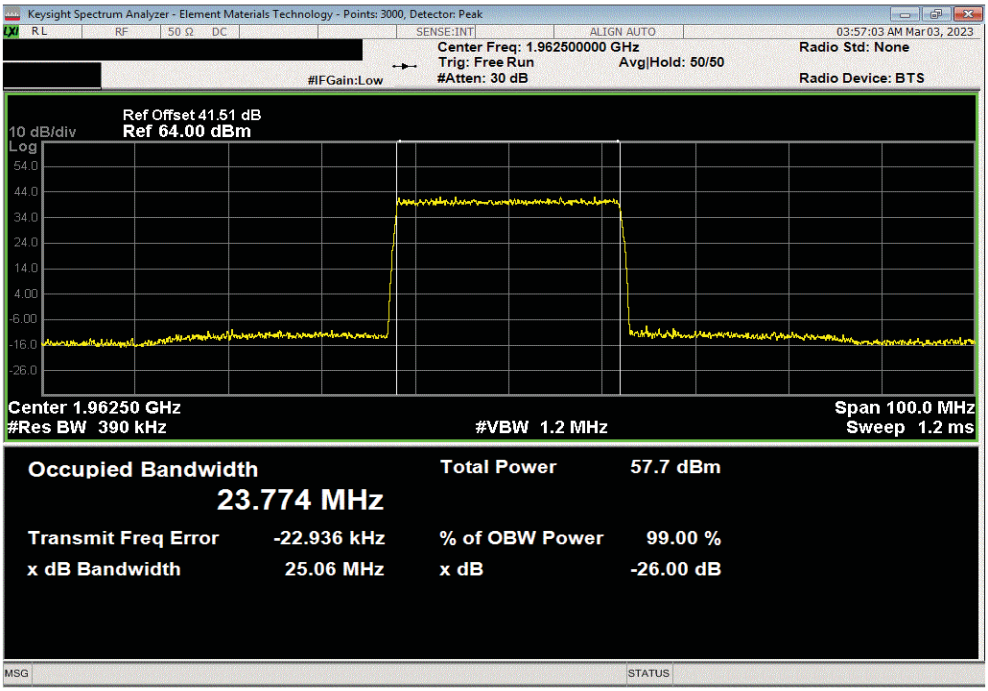


Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 1942.5 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limt	Result
			23.761	25.02	Within Band	Pass

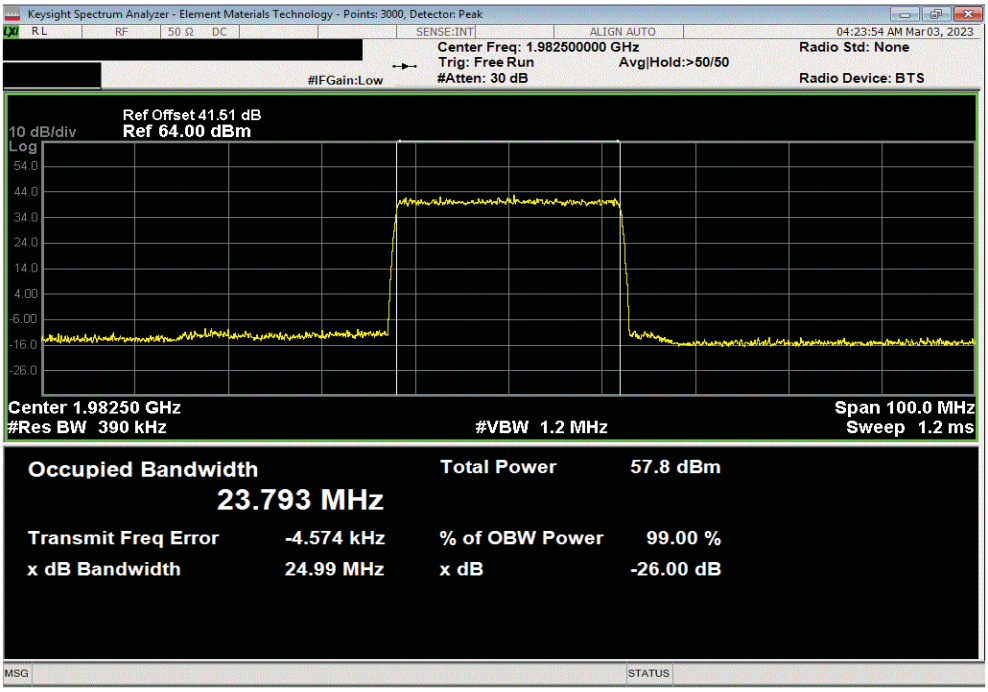


OCCUPIED BANDWIDTH - BAND n25 5G

Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Mid Channel 1962.5 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limt	Result
			23.774	25.06	Within Band	Pass



Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 1982.5 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limt	Result
			23.793	24.99	Within Band	Pass



OCCUPIED BANDWIDTH - Band 25 LTE

XMit 2022.12.28.0

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
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The method in section 5.4 of ANSI C63.26 was used to make this measurement. The spectrum analyzer settings were as follows:

- RBW is 1% - 5% of the occupied bandwidth
- VBW is ≥ 3x the RBW
- Peak Detector was used
- Trace max hold was used

The occupied bandwidth was measured with the EUT configured in the modes called out in the data sheets.
FCC 24.238(b) defines the 26dB emission bandwidth requirement.
RSS GEN Section 6.7 defines the 99% emission bandwidth requirement.

FCC and ISED Emission Designators for Band 25 (1930MHz to 1995MHz)									
Ch BW	Radio Channel	5G-NR: QPSK		5G-NR: 16QAM		5G-NR: 64QAM		5G-NR: 256QAM	
		FCC	ISED	FCC	ISED	FCC	ISED	FCC	ISED
1.4 MHz	Low							1M27F9W	1M11F9W
	Mid	1M26F9W	1M10F9W	1M25F9W	1M10F9W	1M26F9W	1M11F9W	1M27F9W	1M11F9W
	High							1M27F9W	1M11F9W
Note: FCC emission designators are based on 26dB emission bandwidth. ISED emission designators are based on 99% emission bandwidth.									

RF conducted emissions testing was performed on one port. The testing was performed on the same version of hardware (AHFII) as the original certification test. The AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original certification testing) and antenna port 1 was selected to perform testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

OCCUPIED BANDWIDTH - Band 25 LTE

element

TbtTx 2022.05.02.0 XMit 2022.12.28.0

EUT:	Airscale Base Transceiver Station Remote Radio Head Model AHFII			Work Order:	NOKI0054
Serial Number:	BL2235N41PG			Date:	03/03/2023
Customer:	Nokia of America Corporation			Temperature:	23.9°C
Attendees:	John Rattanavong, David Le			Humidity:	38.1%
Project:	None			Barometric Pres.:	983.8 mbar
Tested by:	Brandon Hobbs and Jarrod Brenden	Power:	54 VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 24E:2022	ANSI C63.26:2015
RSS-133 Issue 6:2013+A1:2018	ANSI C63.26:2015

COMMENTS

All measurment path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. The Band 25 LTE 1.4 MHz carriers are enabled at 20 watts/carrier.

DEVIATIONS FROM TEST STANDARD

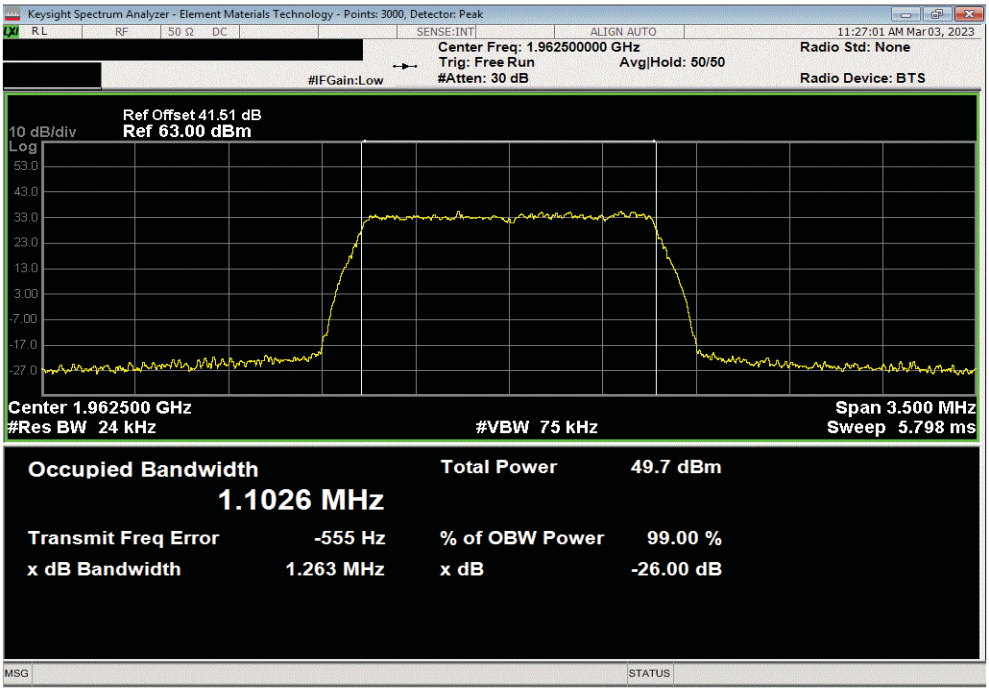
None

Configuration #	NOKI0054-2	Signature

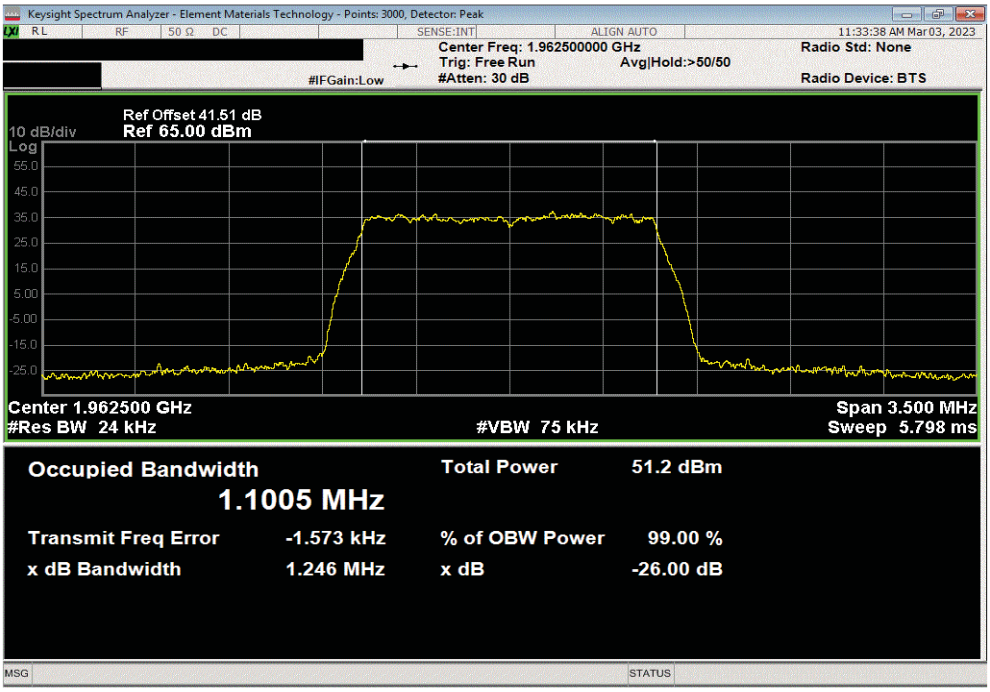
	Value 99% (MHz)	Value 26 dB (MHz)	Limit	Result
Band 25 1930 MHz - 1995 MHz, LTE				
Port 1				
1.4 MHz Bandwidth				
QPSK Modulation				
Mid Channel 1962.5 MHz	1.10	1.26	Within Band	Pass
16-QAM Modulation				
Mid Channel 1962.5 MHz	1.10	1.25	Within Band	Pass
64-QAM Modulation				
Mid Channel 1962.5 MHz	1.11	1.26	Within Band	Pass
256-QAM Modulation				
Low Channel 1930.7 MHz	1.11	1.27	Within Band	Pass
Mid Channel 1962.5 MHz	1.11	1.27	Within Band	Pass
High Channel 1989.3 MHz	1.11	1.27	Within Band	Pass

OCCUPIED BANDWIDTH - Band 25 LTE

Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, QPSK Modulation, Mid Channel 1962.5 MHz						
			Value 99% (MHz)	Value 26 dB (MHz)	Limit	Result
			1.1026	1.263	Within Band	Pass

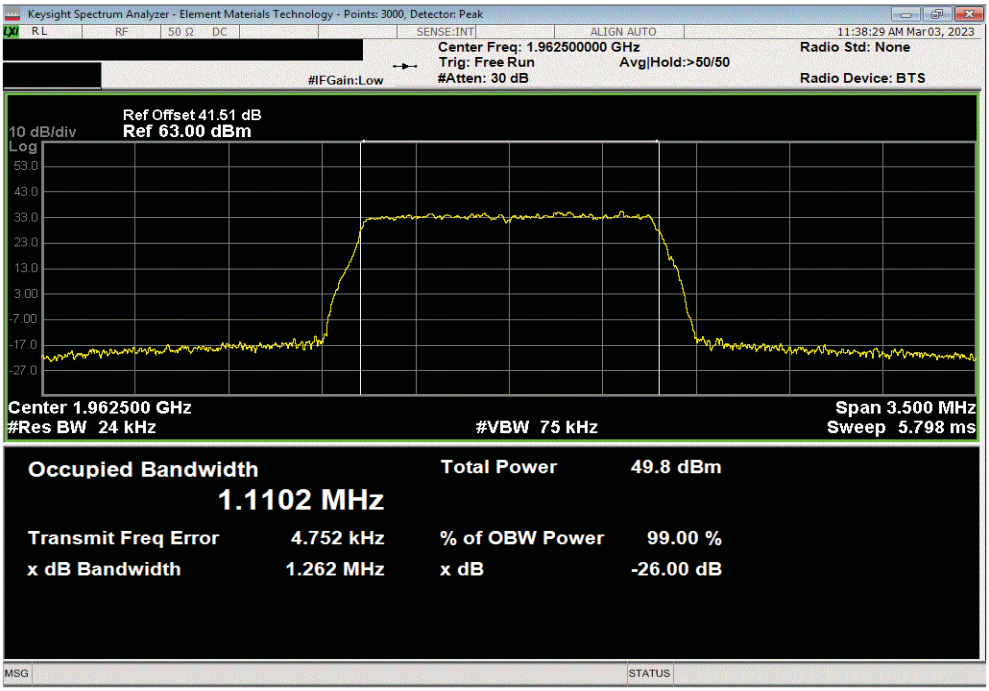


Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 16-QAM Modulation, Mid Channel 1962.5 MHz						
			Value 99% (MHz)	Value 26 dB (MHz)	Limit	Result
			1.1005	1.246	Within Band	Pass

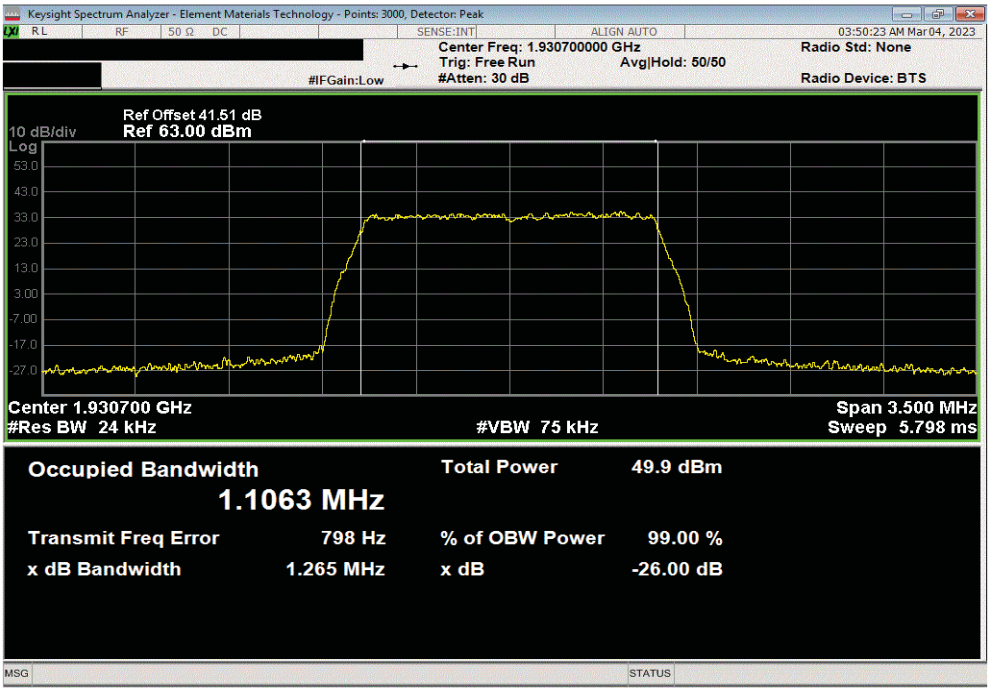


OCCUPIED BANDWIDTH - Band 25 LTE

Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 64-QAM Modulation, Mid Channel 1962.5 MHz						
			Value 99% (MHz)	Value 26 dB (MHz)	Limit	Result
			1.1102	1.262	Within Band	Pass

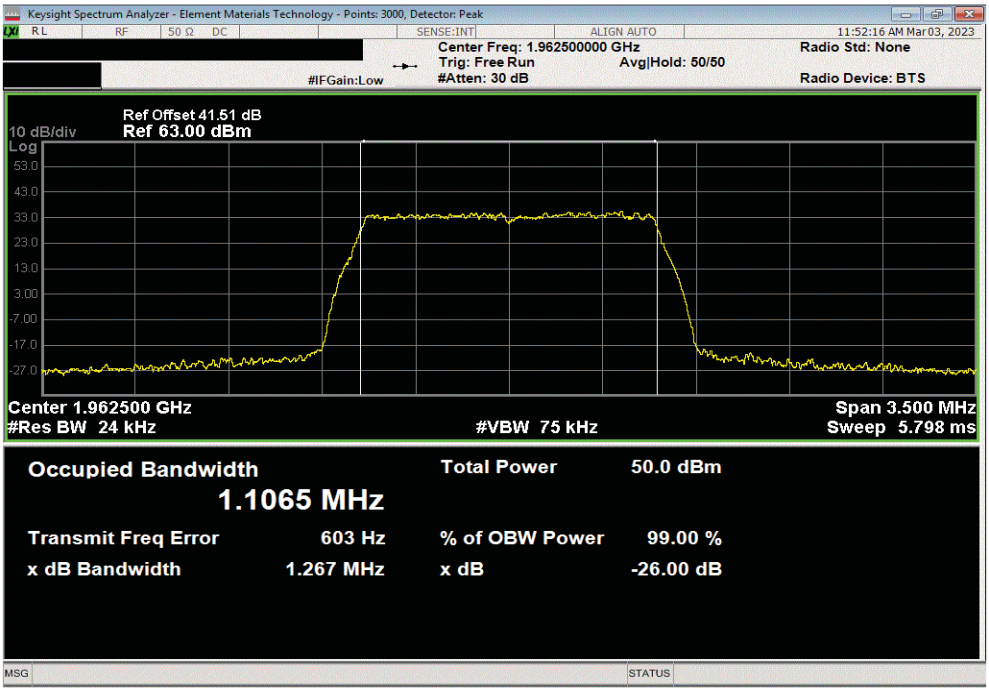


Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, Low Channel 1930.7 MHz						
			Value 99% (MHz)	Value 26 dB (MHz)	Limit	Result
			1.1063	1.265	Within Band	Pass

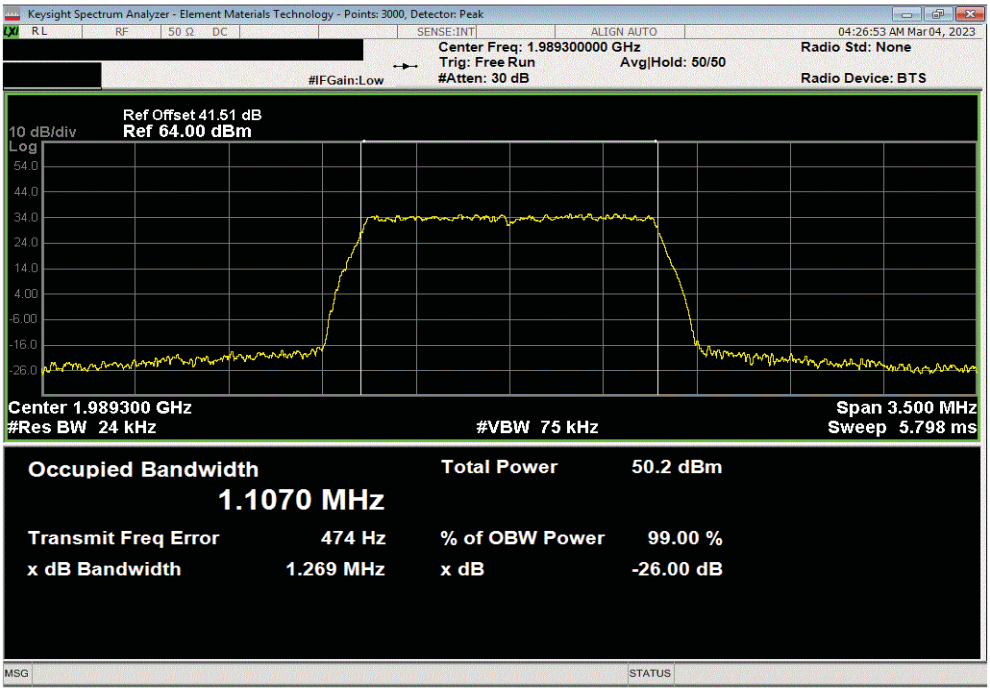


OCCUPIED BANDWIDTH - Band 25 LTE

Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, Mid Channel 1962.5 MHz						
			Value 99% (MHz)	Value 26 dB (MHz)	Limit	Result
			1.1065	1.267	Within Band	Pass



Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, High Channel 1989.3 MHz						
			Value 99% (MHz)	Value 26 dB (MHz)	Limit	Result
			1.107	1.269	Within Band	Pass



OCCUPIED BANDWIDTH - BAND 25 NB-IoT-SA

XMit 2022.12.28.0

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
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The method in section 5.4 of ANSI C63.26 was used to make this measurement. The spectrum analyzer settings were as follows:

- RBW is 1% - 5% of the occupied bandwidth
- VBW is ≥ 3x the RBW
- Peak Detector was used
- Trace max hold was used

The occupied bandwidth was measured with the EUT configured in the modes called out in the data sheets.
FCC 24.238(b) defines the 26dB emission bandwidth requirement.
RSS GEN Section 6.7 defines the 99% emission bandwidth requirement.

FCC and ISED Emission Designators for Band 25 (1930MHz to 1995MHz) Narrow-Band IOT Stand Alone

Ch BW	Radio Channel	4G-LTE: N-TM	
		FCC	ISED
200KHz	Low	274KG7D	191KG7D
	Mid	273KG7D	190KG7D
	High	280KG7D	192KG7D

Note: FCC emission designators are based on 26dB emission bandwidth. ISED emission designators are based on 99% emission bandwidth.

RF conducted emissions testing was performed on one port. The testing was performed on the same version of hardware (AHFII) as the original certification test. The AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original certification testing) and antenna port 1 was selected to perform testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

OCCUPIED BANDWIDTH - BAND 25 NB-IoT-SA

TbtTx 2022.05.02.0 XMit 2022.12.28.0

EUT:	Airscale Base Transceiver Station Remote Radio Head Model AHFII			Work Order:	NOKI0054
Serial Number:	BL2235N41PG			Date:	03/03/2023
Customer:	Nokia of America Corporation			Temperature:	25.6°C
Attendees:	John Rattanavong, David Le			Humidity:	32.5%
Project:	None			Barometric Pres.:	983.8 mbar
Tested by:	Brandon Hobbs and Jarrod Brenden	Power:	54 VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 24E:2022	ANSI C63.26:2015
RSS-133 Issue 6:2013+A1:2018	ANSI C63.26:2015

COMMENTS

All measurment path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. The Band 25 NB IoT SA carriers are enabled at maximum (20 watts/carrier).

DEVIATIONS FROM TEST STANDARD

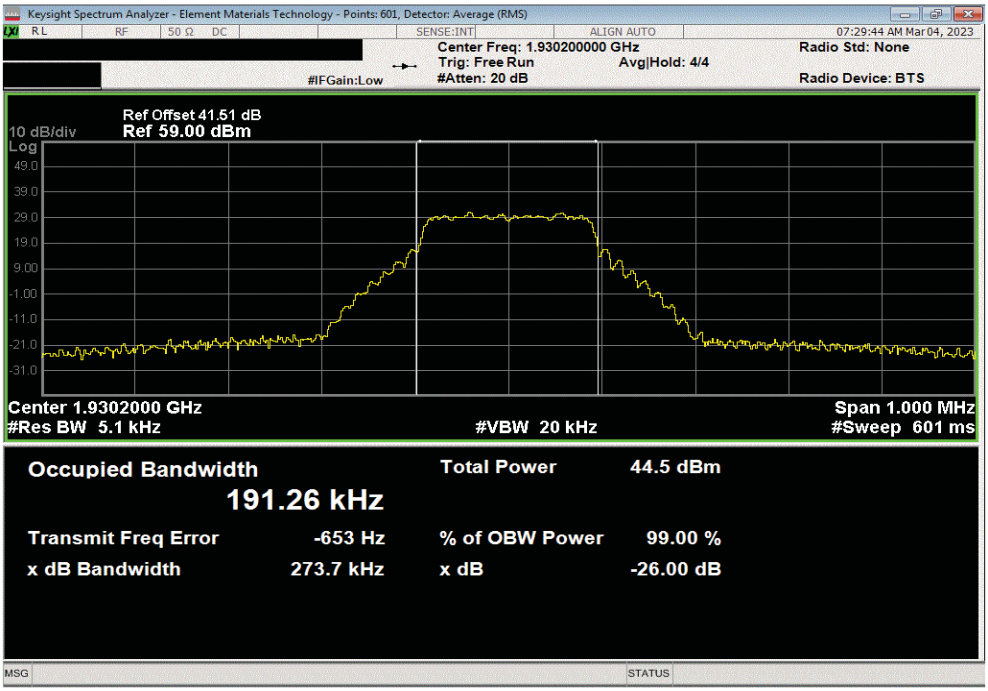
None

Configuration #	NOKI0054-2	Signature

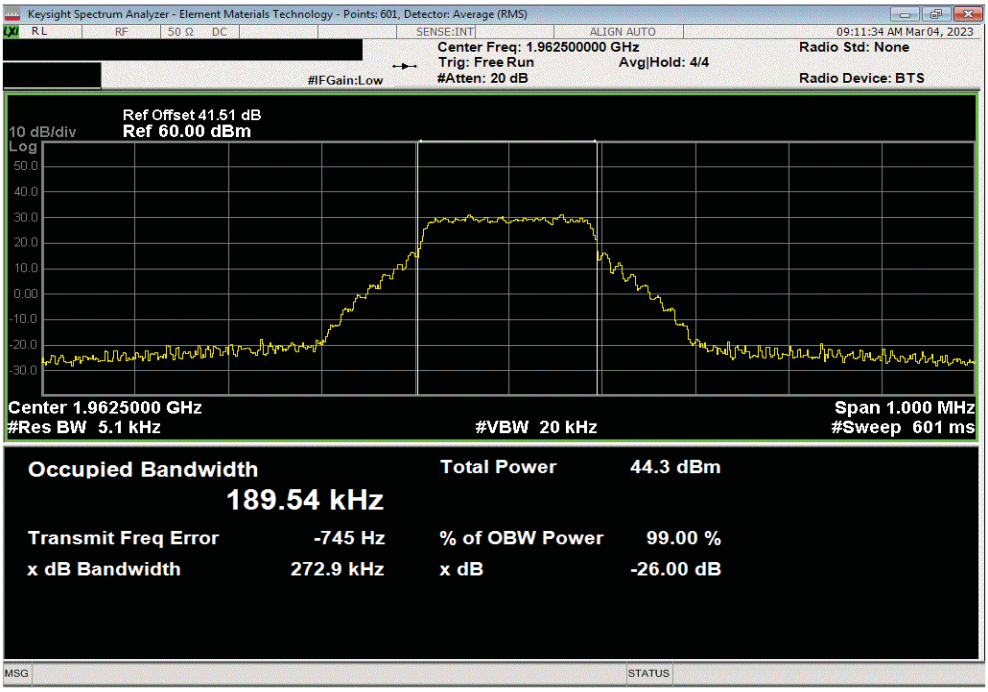
	Value 99% (kHz)	Value 26 dB (kHz)	Limit	Result
Band 25 1930 MHz - 1995 MHz, NB-IoT				
Port 1				
200 KHz Bandwidth				
NTM Modulation				
Low Channel 1930.2 MHz	191.3	273.7	Within Band	Pass
Mid Channel 1962.5 MHz	189.5	272.9	Within Band	Pass
High Channel 1994.8 MHz	192.3	280.5	Within Band	Pass

OCCUPIED BANDWIDTH - BAND 25 NB-IoT-SA

Band 25 1930 MHz - 1995 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, Low Channel 1930.2 MHz						
			Value 99% (kHz)	Value 26 dB (kHz)	Limit	Result
			191.26	273.7	Within Band	Pass

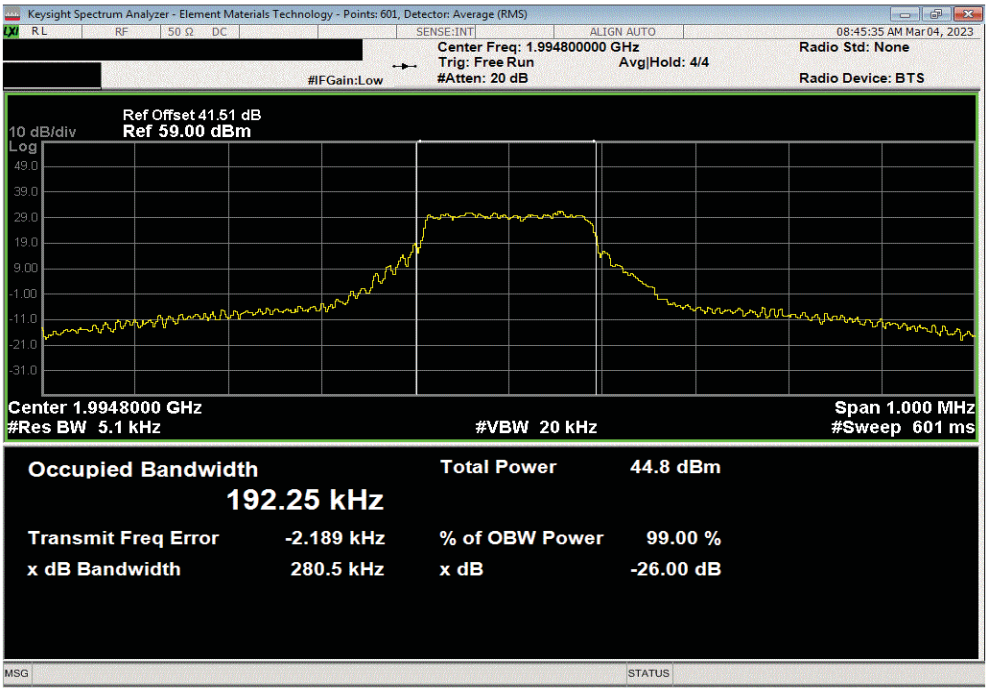


Band 25 1930 MHz - 1995 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, Mid Channel 1962.5 MHz						
			Value 99% (kHz)	Value 26 dB (kHz)	Limit	Result
			189.54	272.9	Within Band	Pass



OCCUPIED BANDWIDTH - BAND 25 NB-IoT-SA

Band 25 1930 MHz - 1995 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, High Channel 1994.8 MHz						
			Value 99% (kHz)	Value 26 dB (kHz)	Limit	Result
			192.25	280.5	Within Band	Pass



OCCUPIED BANDWIDTH - BAND n66 5G

XMit 2022.12.28.0

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
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The method in section 5.4 of ANSI C63.26 was used to make this measurement. The spectrum analyzer settings were as follows:

- RBW is 1% - 5% of the occupied bandwidth
- VBW is ≥ 3x the RBW
- Peak Detector was used
- Trace max hold was used

The occupied bandwidth was measured with the EUT configured in the modes called out in the data sheets.

FCC 27.53(h)(3) defines he 26dB emission bandwidth requirement.

RSS GEN Section 6.7 defines the 99% emission bandwidth requirement.

FCC and ISED Emission Designators Band n66 (2110MHz to 2200MHz)									
Ch BW	Radio Channel	5G-NR: QPSK		5G-NR: 16QAM		5G-NR: 64QAM		5G-NR: 256QAM	
		FCC	ISED	FCC	ISED	FCC	ISED	FCC	ISED
25MHz	Low							25M0G7W	23M7G7W
	Mid	25M0G7W	23M7G7W	25M1G7W	23M9G7W	25M0G7W	23M8G7W	25M1G7W	23M8G7W
	High							25M0G7W	23M8G7W
Note: FCC emission designators are based on 26dB emission bandwidth. ISED emission designators are based on 99% emission bandwidth.									

RF conducted emissions testing was performed on one port. The testing was performed on the same version of hardware (AHFII) as the original certification test. The AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original certification testing) and antenna port 1 was selected to perform testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

OCCUPIED BANDWIDTH - BAND n66 5G

TbtTx 2022.05.02.0 XMit 2022.12.28.0

EUT:	Airscale Base Transceiver Station Remote Radio Head Model AHFII			Work Order:	NOKI0054
Serial Number:	BL2235N41PG			Date:	03/02/2023
Customer:	Nokia of America Corporation			Temperature:	23.3°C
Attendees:	David Le, John Rattanavong			Humidity:	42.6%
Project:	None			Barometric Pres.:	978 mbar
Tested by:	Brandon Hobbs and Jarrod Brenden	Power:	54 VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 27:2023	ANSI C63.26:2015
RSS-139 Issue 4:2022	ANSI C63.26:2015

COMMENTS

All measurment path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. Band n66 carriers are enabled as maximum power (80 watts/carrier).

DEVIATIONS FROM TEST STANDARD

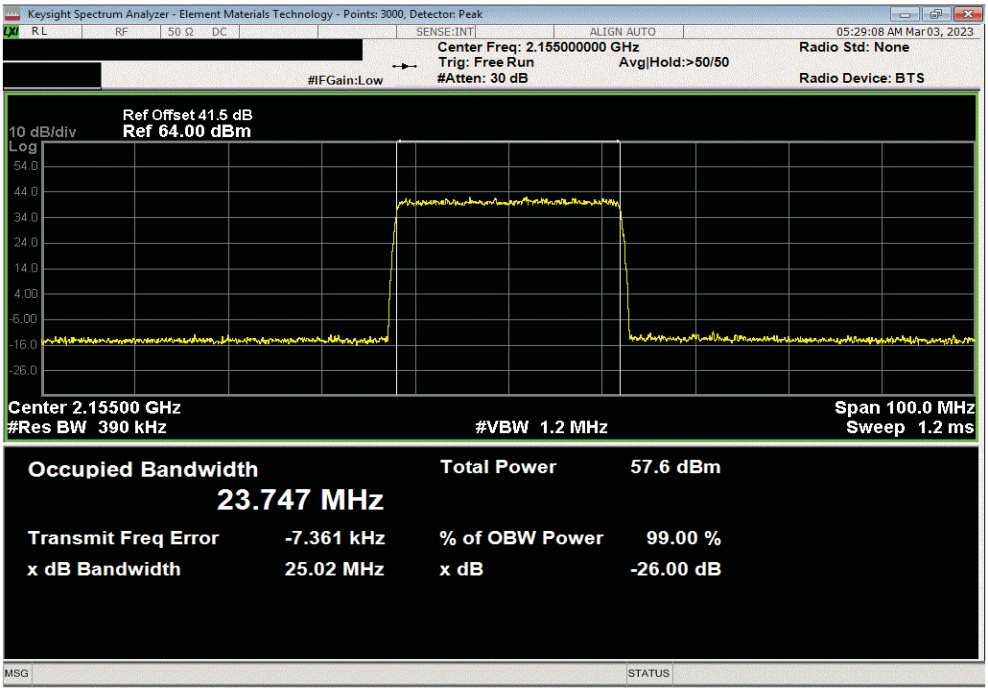
None

Configuration #	NOKI0054-2	Signature

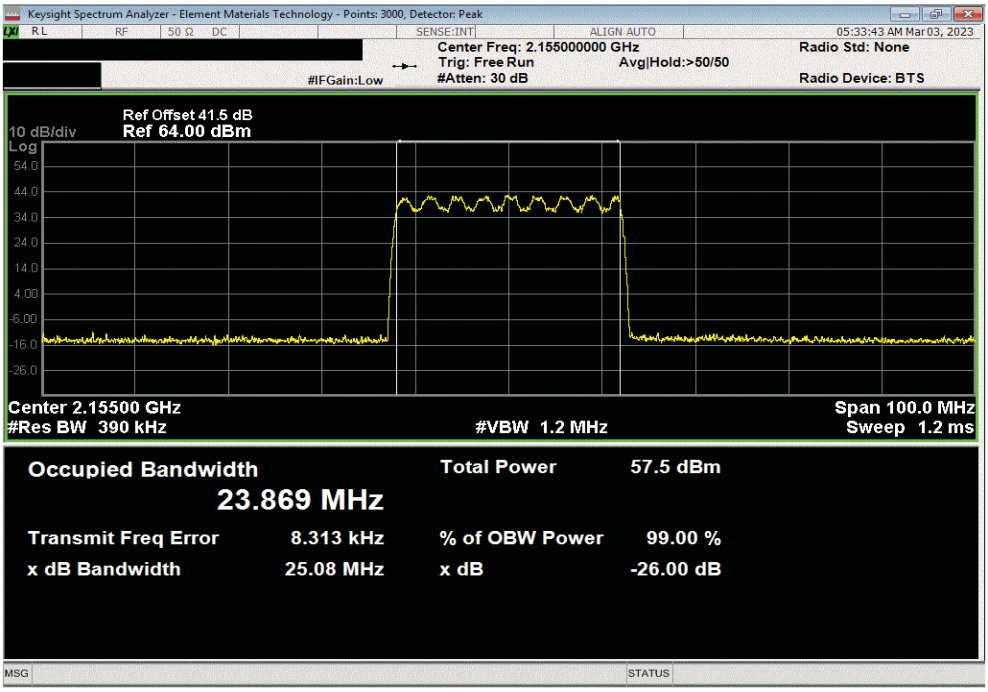
	Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
Band n66 2110 MHz - 2200 MHz, 5G NR				
Port 1				
25 MHz Bandwidth				
QPSK Modulation				
Mid Channel 2155 MHz	23.7	25.0	Within Band	Pass
16-QAM Modulation				
Mid Channel 2155 MHz	23.9	25.1	Within Band	Pass
64-QAM Modulation				
Mid Channel 2155 MHz	23.8	25.0	Within Band	Pass
256-QAM Modulation				
Low Channel 2122.5 MHz	23.7	25.0	Within Band	Pass
Mid Channel 2155 MHz	23.8	25.1	Within Band	Pass
High Channel 2187.5 MH	23.8	25.0	Within Band	Pass

OCCUPIED BANDWIDTH - BAND n66 5G

Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, QPSK Modulation, Mid Channel 2155 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			23.747	25.02	Within Band	Pass

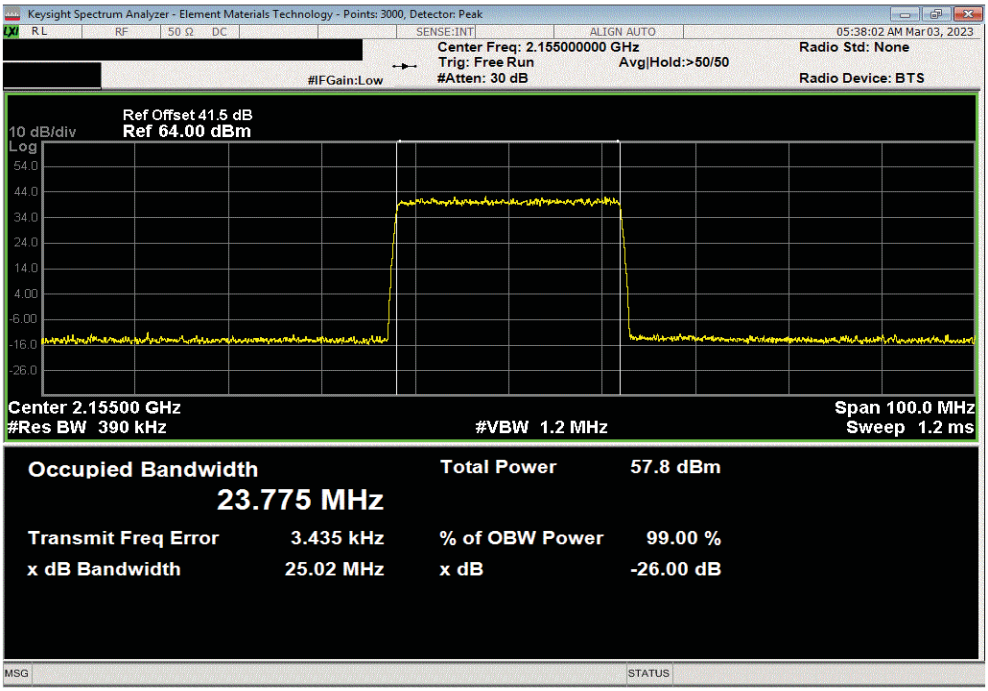


Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 16-QAM Modulation, Mid Channel 2155 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			23.869	25.08	Within Band	Pass

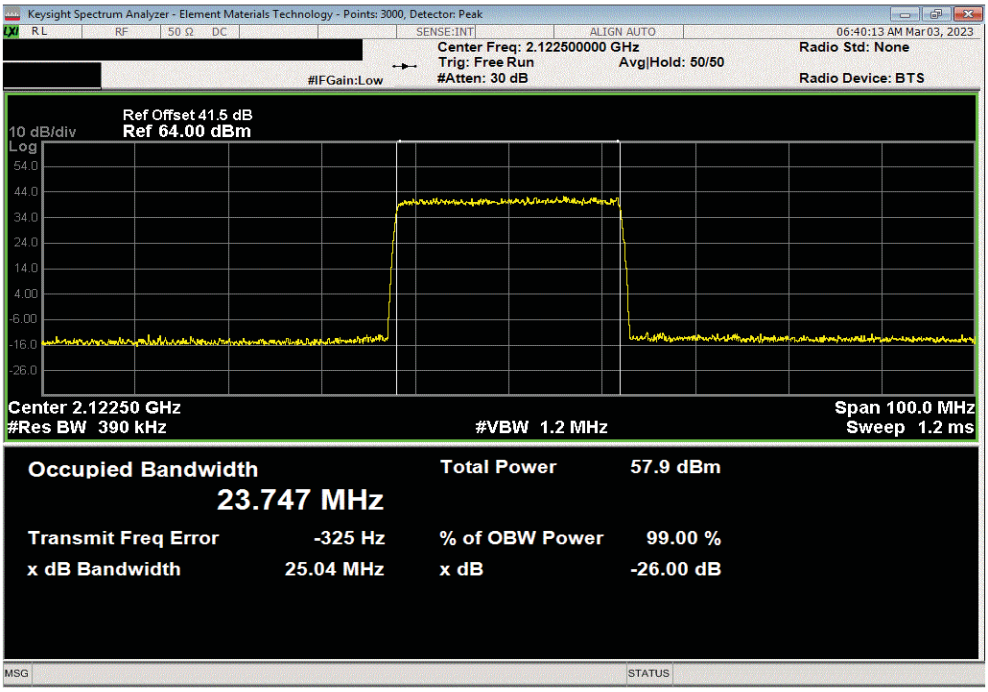


OCCUPIED BANDWIDTH - BAND n66 5G

Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 64-QAM Modulation, Mid Channel 2155 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			23.775	25.02	Within Band	Pass

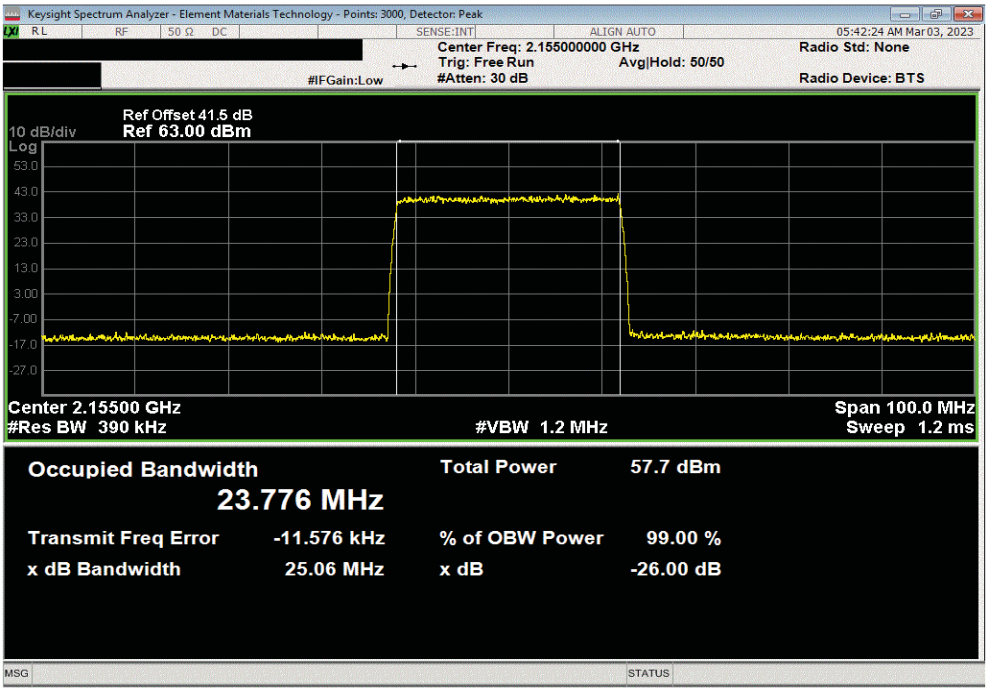


Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 2122.5 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			23.747	25.04	Within Band	Pass

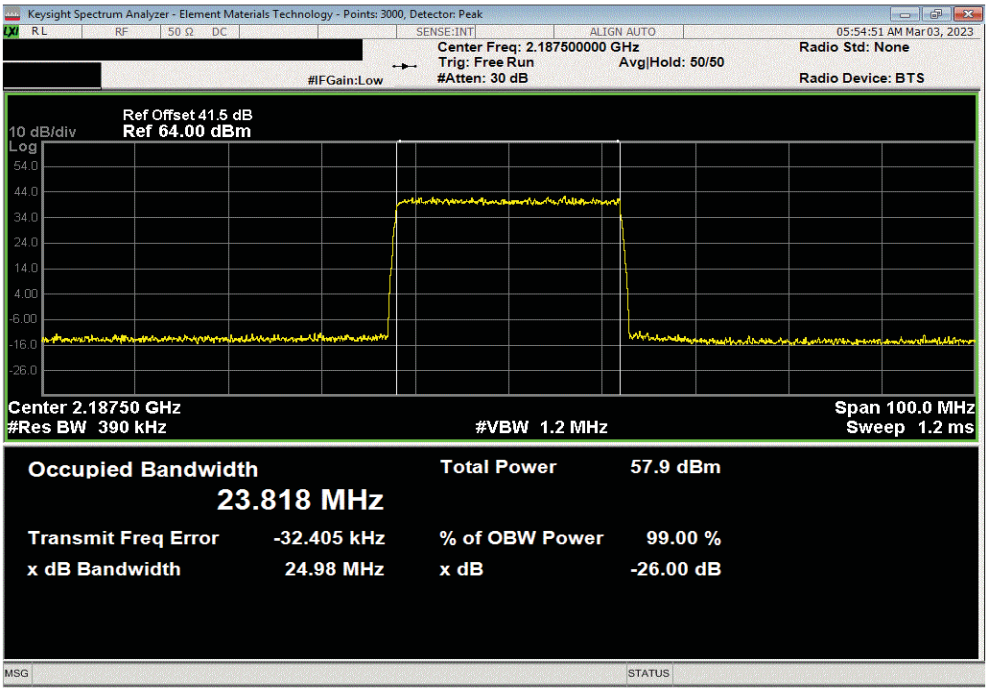


OCCUPIED BANDWIDTH - BAND n66 5G

Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Mid Channel 2155 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			23.776	25.06	Within Band	Pass



Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 2187.5 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			23.818	24.98	Within Band	Pass



OCCUPIED BANDWIDTH - BAND 66 LTE

XMit 2022.12.28.0

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
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The method in section 5.4 of ANSI C63.26 was used to make this measurement. The spectrum analyzer settings were as follows:

- RBW is 1% - 5% of the occupied bandwidth
- VBW is ≥ 3x the RBW
- Peak Detector was used
- Trace max hold was used

The occupied bandwidth was measured with the EUT configured in the modes called out in the data sheets.
FCC 27.53(h)(3) defines he 26dB emission bandwidth requirement.
RSS GEN Section 6.7 defines the 99% emission bandwidth requirement.

FCC and ISED Emission Designators Band 66 (2110MHz to 2200MHz)									
Ch BW	Radio Channel	5G-NR: QPSK		5G-NR: 16QAM		5G-NR: 64QAM		5G-NR: 256QAM	
		FCC	ISED	FCC	ISED	FCC	ISED	FCC	ISED
1.4 MHz	Low							1M26F9W	1M10F9W
	Mid	1M28F9W	1M11F9W	1M25F9W	1M11F9W	1M26F9W	1M10F9W	1M26F9W	1M11F9W
	High							1M26F9W	1M11F9W
Note: FCC emission designators are based on 26dB emission bandwidth. ISED emission designators are based on 99% emission bandwidth.									

RF conducted emissions testing was performed on one port. The testing was performed on the same version of hardware (AHFII) as the original certification test. The AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original certification testing) and antenna port 1 was selected to perform testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

OCCUPIED BANDWIDTH - BAND 66 LTE

TbtTx 2022.05.02.0 XMit 2022.12.28.0

EUT:	Airscale Base Transceiver Station Remote Radio Head Model AHFII			Work Order:	NOKI0054
Serial Number:	BL2235N41PG			Date:	03/03/2023
Customer:	Nokia of America Corporation			Temperature:	24.6°C
Attendees:	John Rattanavong, David Le			Humidity:	36.5%
Project:	None			Barometric Pres.:	983.7 mbar
Tested by:	Brandon Hobbs and Jarrod Brenden	Power:	54 VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 27:2023	ANSI C63.26:2015
RSS-139 Issue 4:2022	ANSI C63.26:2015

COMMENTS

All measurment path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. The Band 66 LTE 1.4 MHz carriers are enables at 20 watts/carrier.

DEVIATIONS FROM TEST STANDARD

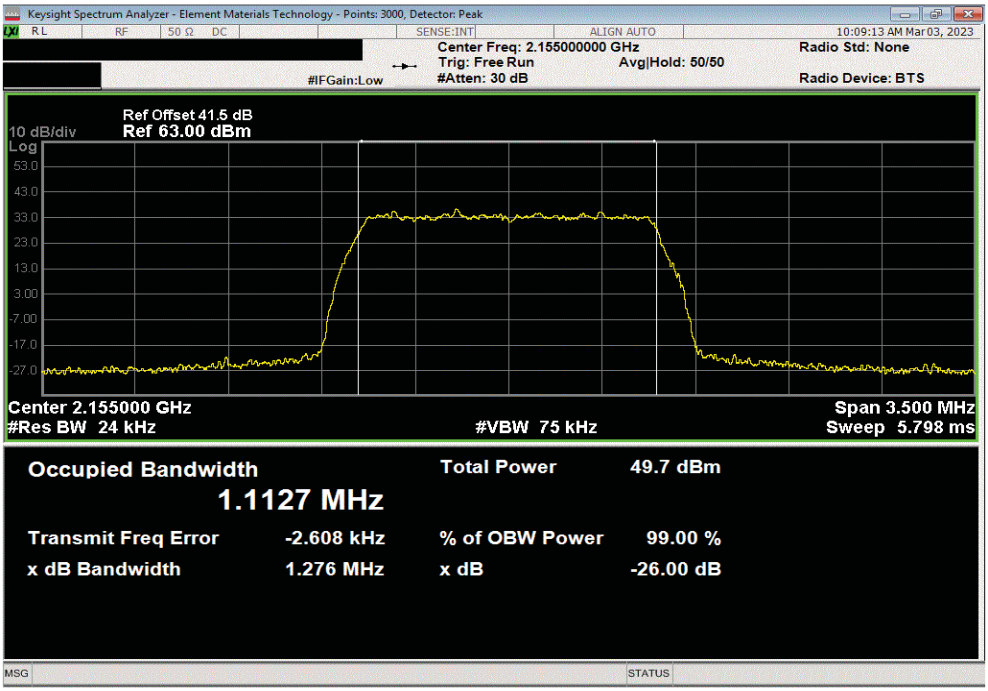
None

Configuration #	NOKI0054-2	Signature

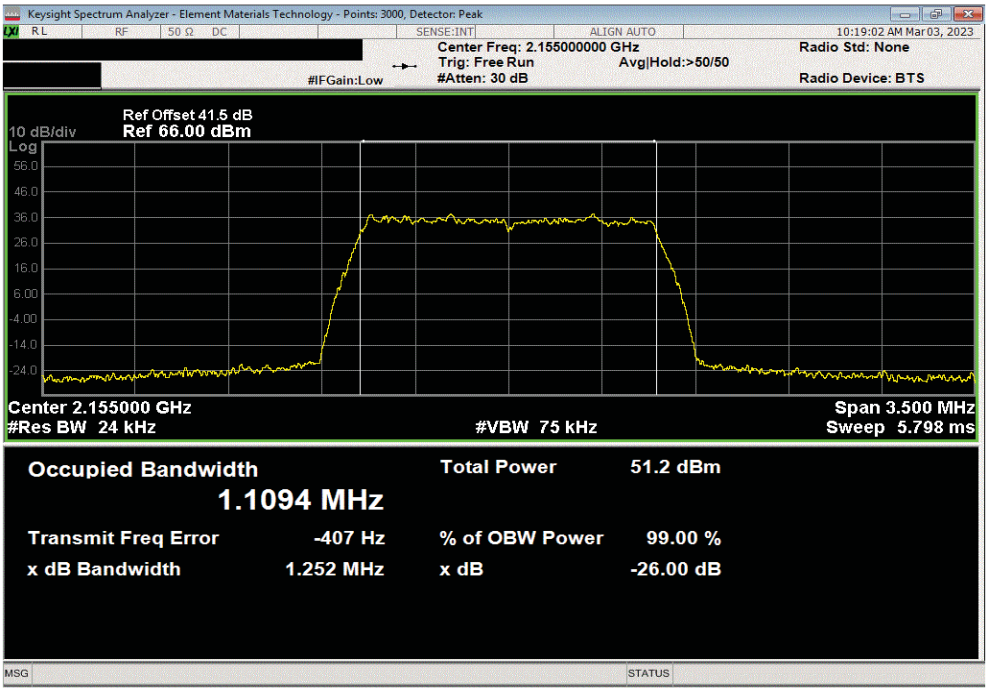
	Value 99% (MHz)	Value 26 dB (MHz)	Limit	Result
Band 66 2110 MHz - 2200 MHz, LTE				
Port 1				
1.4 MHz Bandwidth				
QPSK Modulation				
Mid Channel 2155 MHz	1.11	1.28	Within Band	Pass
16-QAM Modulation				
Mid Channel 2155 MHz	1.11	1.25	Within Band	Pass
64-QAM Modulation				
Mid Channel 2155 MHz	1.10	1.26	Within Band	Pass
256-QAM Modulation				
Low Channel 2110.7 MHz	1.10	1.26	Within Band	Pass
Mid Channel 2155 MHz	1.11	1.26	Within Band	Pass
High Channel 2199.3 MH	1.10	1.26	Within Band	Pass

OCCUPIED BANDWIDTH - BAND 66 LTE

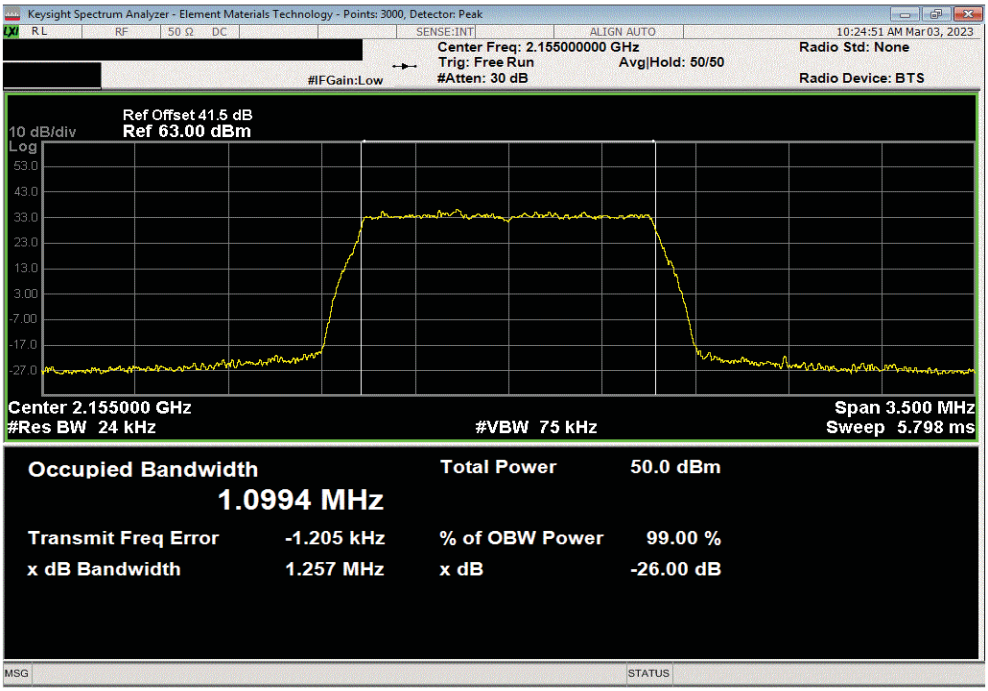
Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, QPSK Modulation, Mid Channel 2155 MHz						
			Value 99% (MHz)	Value 26 dB (MHz)	Limit	Result
			1.1127	1.276	Within Band	Pass



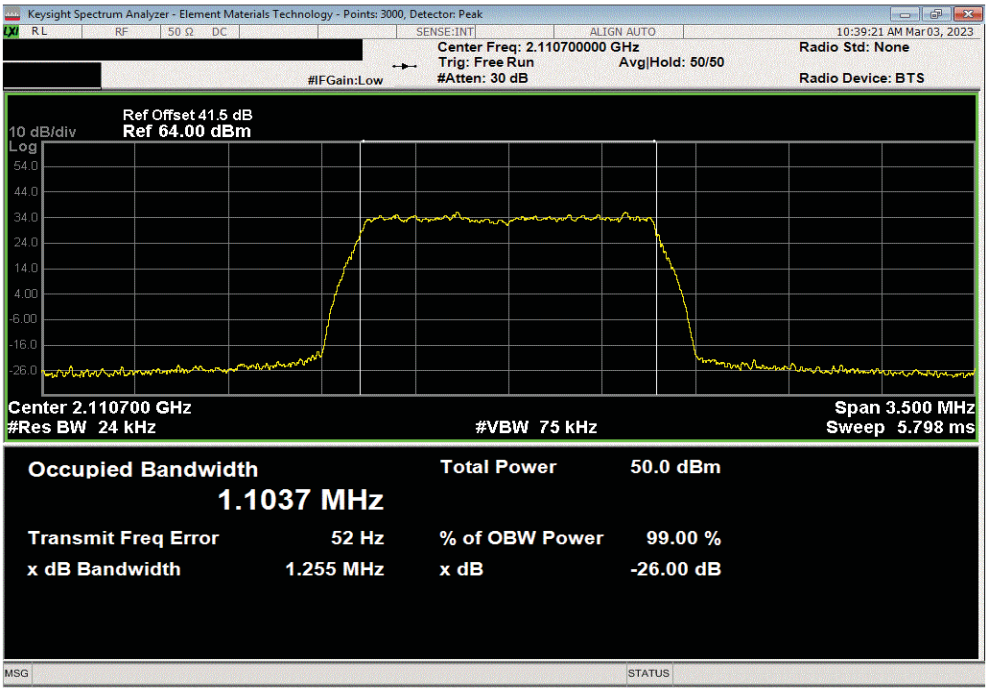
Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 16-QAM Modulation, Mid Channel 2155 MHz						
			Value 99% (MHz)	Value 26 dB (MHz)	Limit	Result
			1.1094	1.252	Within Band	Pass



Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 64-QAM Modulation, Mid Channel 2155 MHz						
			Value 99% (MHz)	Value 26 dB (MHz)	Limit	Result
			1.0994	1.257	Within Band	Pass

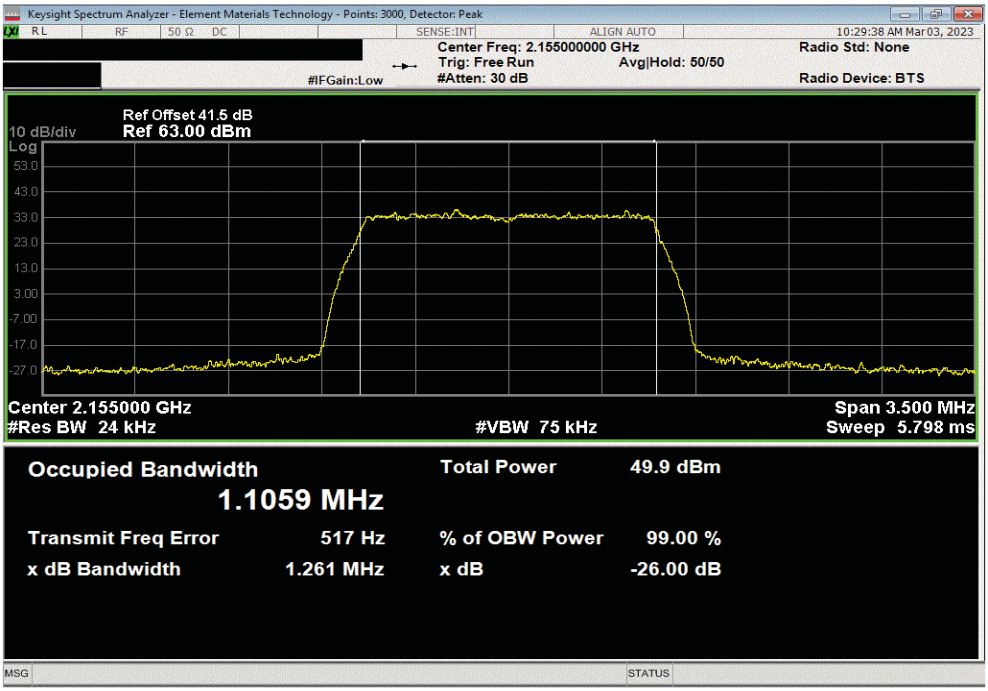


Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, Low Channel 2110.7 MHz						
			Value 99% (MHz)	Value 26 dB (MHz)	Limit	Result
			1.1037	1.255	Within Band	Pass

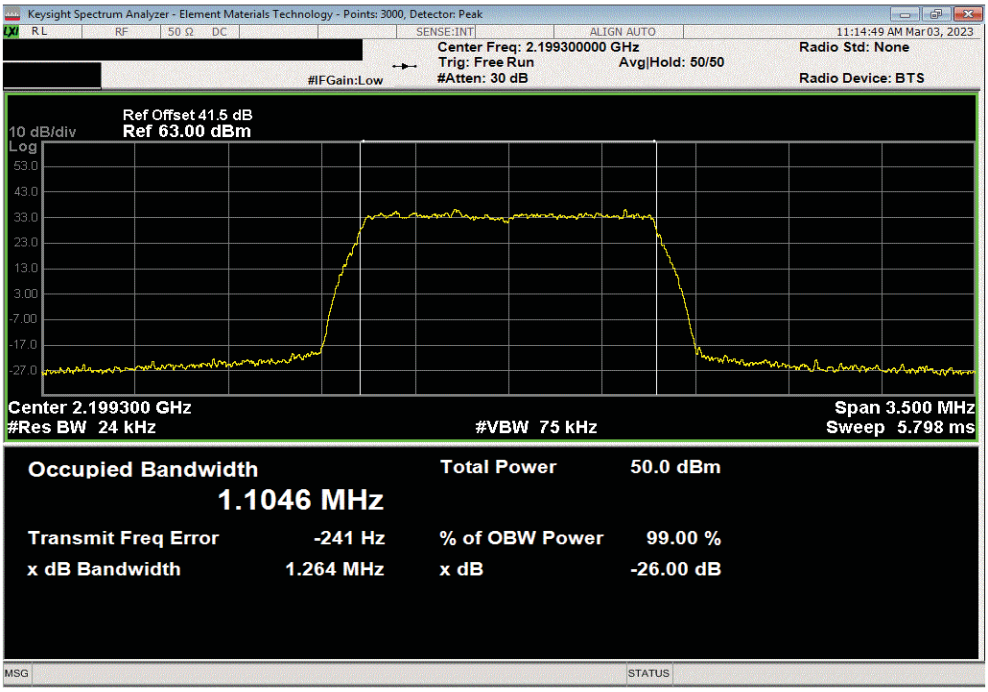


OCCUPIED BANDWIDTH - BAND 66 LTE

Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, Mid Channel 2155 MHz						
			Value 99% (MHz)	Value 26 dB (MHz)	Limit	Result
			1.1059	1.261	Within Band	Pass



Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, High Channel 2199.3 MHz						
			Value 99% (MHz)	Value 26 dB (MHz)	Limit	Result
			1.1046	1.264	Within Band	Pass



OCCUPIED BANDWIDTH - BAND 66 NB-IoT-SA

XMit 2022.12.28.0

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
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The method in section 5.4 of ANSI C63.26 was used to make this measurement. The spectrum analyzer settings were as follows:

- RBW is 1% - 5% of the occupied bandwidth
- VBW is ≥ 3x the RBW
- Peak Detector was used
- Trace max hold was used

The occupied bandwidth was measured with the EUT configured in the modes called out in the data sheets.
FCC 27.53(h)(3) defines he 26dB emission bandwidth requirement.
RSS GEN Section 6.7 defines the 99% emission bandwidth requirement.

FCC and ISED Emission Designators for Band 66 (2110MHz to 2200MHz) Narrow-Band IOT Stand Alone			
Ch BW	Radio Channel	4G-LTE: N-TM	
		FCC	ISED
200KHz	Low	273KG7D	191KG7D
	Mid	271KG7D	190KG7D
	High	273KG7D	191KG7D
Note: FCC emission designators are based on 26dB emission bandwidth. ISED emission designators are based on 99% emission bandwidth.			

RF conducted emissions testing was performed on one port. The testing was performed on the same version of hardware (AHFII) as the original certification test. The AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original certification testing) and antenna port 1 was selected to perform testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

OCCUPIED BANDWIDTH - BAND 66 NB-IoT-SA

TbtTx 2022.05.02.0 XMit 2022.12.28.0

EUT:	Airscale Base Transceiver Station Remote Radio Head Model AHFII			Work Order:	NOKI0054
Serial Number:	BL2235N41PG			Date:	03/03/2023
Customer:	Nokia of America Corporation			Temperature:	27°C
Attendees:	John Rattanavong, David Le			Humidity:	30%
Project:	None			Barometric Pres.:	984 mbar
Tested by:	Brandon Hobbs and Jarrod Brenden	Power:	54 VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 27:2023	ANSI C63.26:2015
RSS-139 Issue 4:2022	ANSI C63.26:2015

COMMENTS

All measurment path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. The Band 66 NB-IoT-SA carriers are enables at maximum (20 watts/carrier).

DEVIATIONS FROM TEST STANDARD

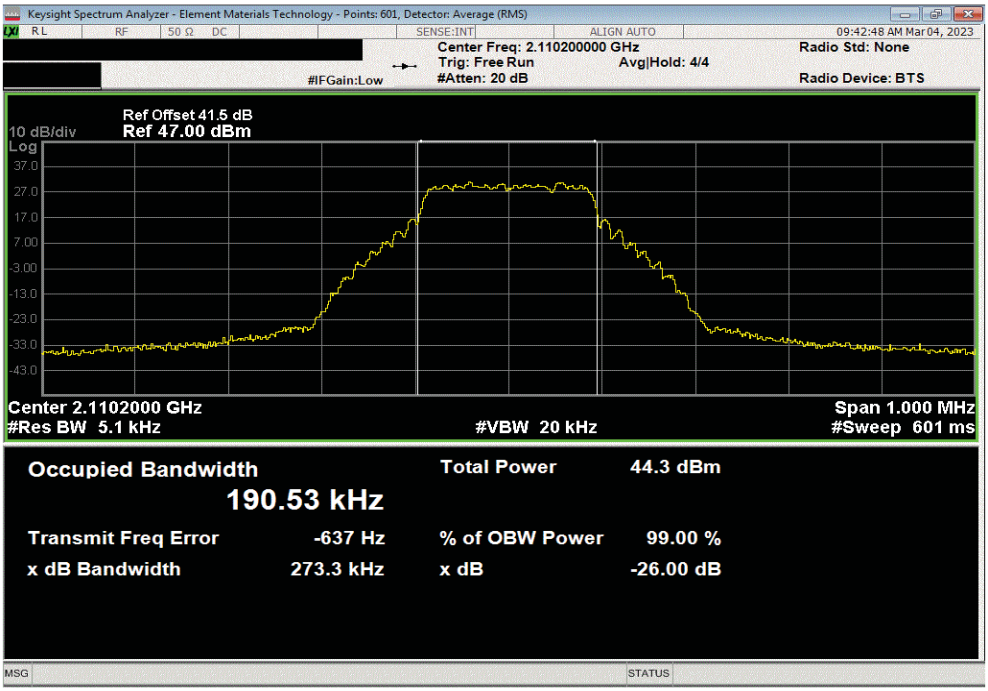
None

Configuration #	NOKI0054-2	Signature

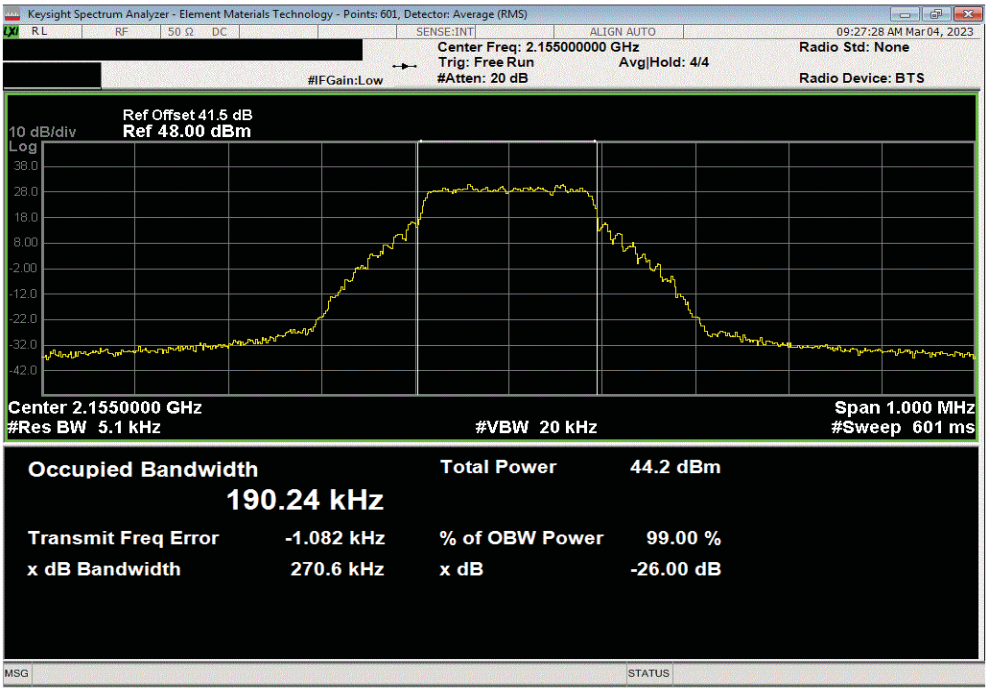
	Value 99% (kHz)	Value 26 dB (kHz)	Limit	Result
Band 66 2110 MHz - 2200 MHz, NB-IoT				
Port 1				
200 KHz Bandwidth				
NTM Modulation				
Low Channel 2110.2 MHz	190.5	273.3	Within Band	Pass
Mid Channel 2155 MHz	190.2	270.6	Within Band	Pass
High Channel 2199.8 MH:	191.1	273.3	Within Band	Pass

OCCUPIED BANDWIDTH - BAND 66 NB-IoT-SA

Band 66 2110 MHz - 2200 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, Low Channel 2110.2 MHz						
			Value 99% (kHz)	Value 26 dB (kHz)	Limit	Result
			190.53	273.3	Within Band	Pass

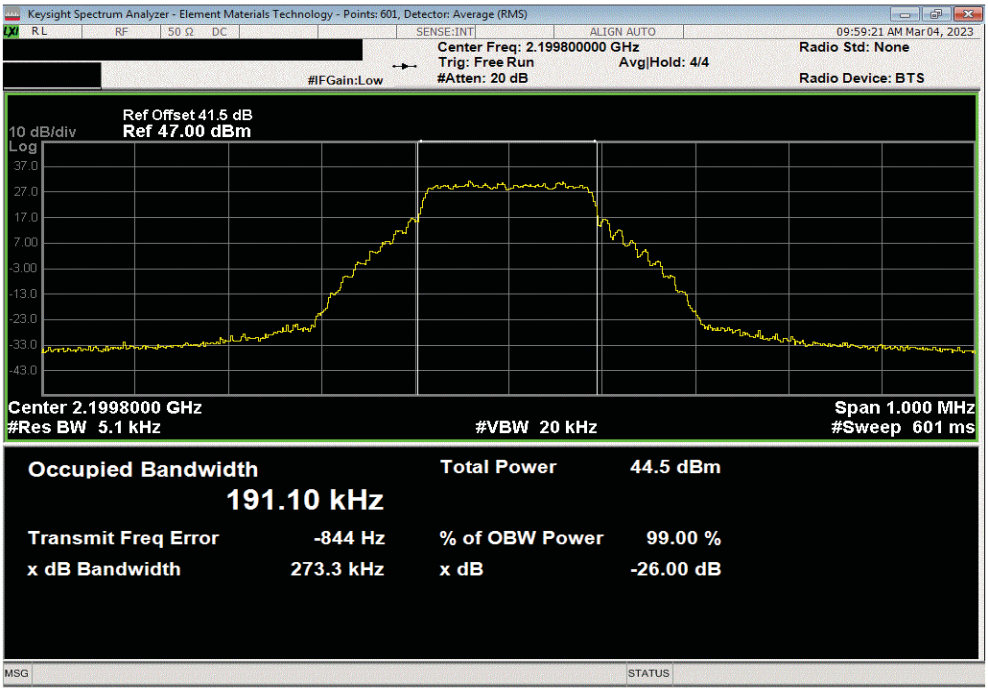


Band 66 2110 MHz - 2200 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, Mid Channel 2155 MHz						
			Value 99% (kHz)	Value 26 dB (kHz)	Limit	Result
			190.24	270.6	Within Band	Pass



OCCUPIED BANDWIDTH - BAND 66 NB-IoT-SA

Band 66 2110 MHz - 2200 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, High Channel 2199.8 MHz						
			Value 99% (kHz)	Value 26 dB (kHz)	Limit	Result
			191.1	273.3	Within Band	Pass



OUTPUT POWER - BAND n25 5G

XMit 2022.12.28.0

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
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

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 measurements. This method uses trace averaging across the 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 in decimal, to the measured power to compute the average power during the actual transmission times

RF conducted emissions testing was performed only on one port. The testing was performed on the same version of hardware (AHFII) as the original certification test. The AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

The total average transmit power of all antenna ports was determined per ANSI C63.26-2105 paragraph 6.4.3.1.

OUTPUT POWER - BAND n25 5G

TbtTx 2022.05.02.0 XMit 2022.12.28.0

EUT:	Airscale Base Transceiver Station Remote Radio Head Model AHFII			Work Order:	NOKI0054
Serial Number:	BL2235N41PG			Date:	03/02/2023
Customer:	Nokia of America Corporation			Temperature:	23.5°C
Attendees:	John Rattanavong, David Le			Humidity:	42.8%
Project:	None			Barometric Pres.:	977.2 mbar
Tested by:	Brandon Hobbs and Jarrod Brenden	Power:	54 VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 24E:2022	ANSI C63.26:2015
RSS-133 Issue 6:2013+A1:2018	ANSI C63.26:2015

COMMENTS

All measurment path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. Band n25 carriers are enabled as maximum power (80 watts/carrier). The following is the output power measurements at the radio output ports. The output power was measured for a single carrier over the carrier channel bandwidthon port 1. The total output power for multiport (2x2 MIMO, 4x4 MIMO) operation was determined based upon ANSI C63.26 clauses 6.4.3.1 and 6.4.3.2.4 (10 log Nout) The total output power for two port operation is the single port power +3 [i.e. 10*log(2)]. The total power for four port operations is single port power +6 dB [i.e. 10*log(4)].

DEVIATIONS FROM TEST STANDARD

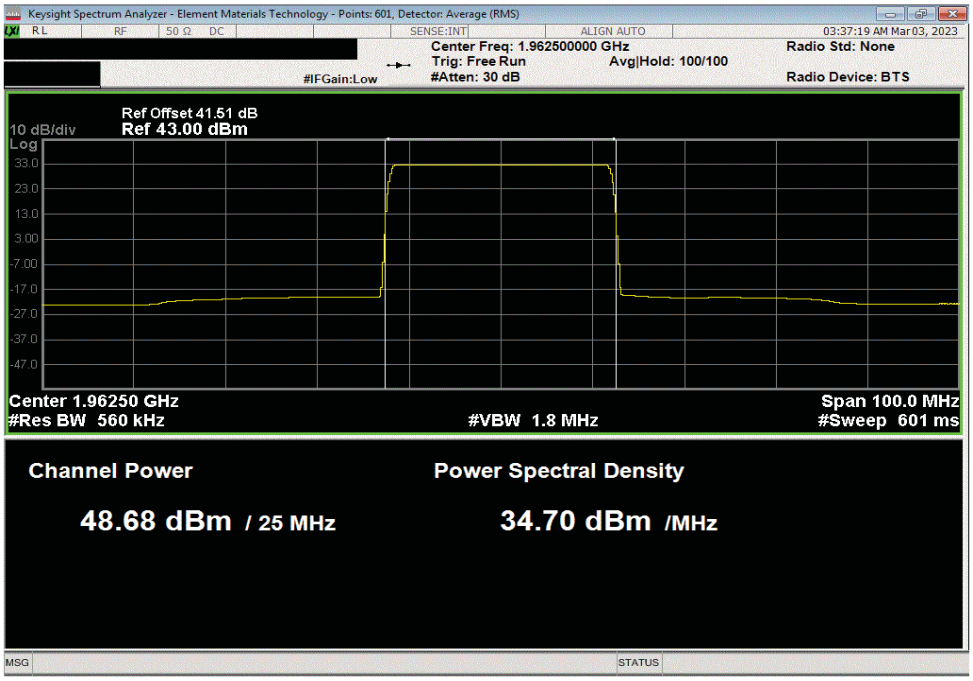
None

Configuration #	NOKI0054-2	Signature

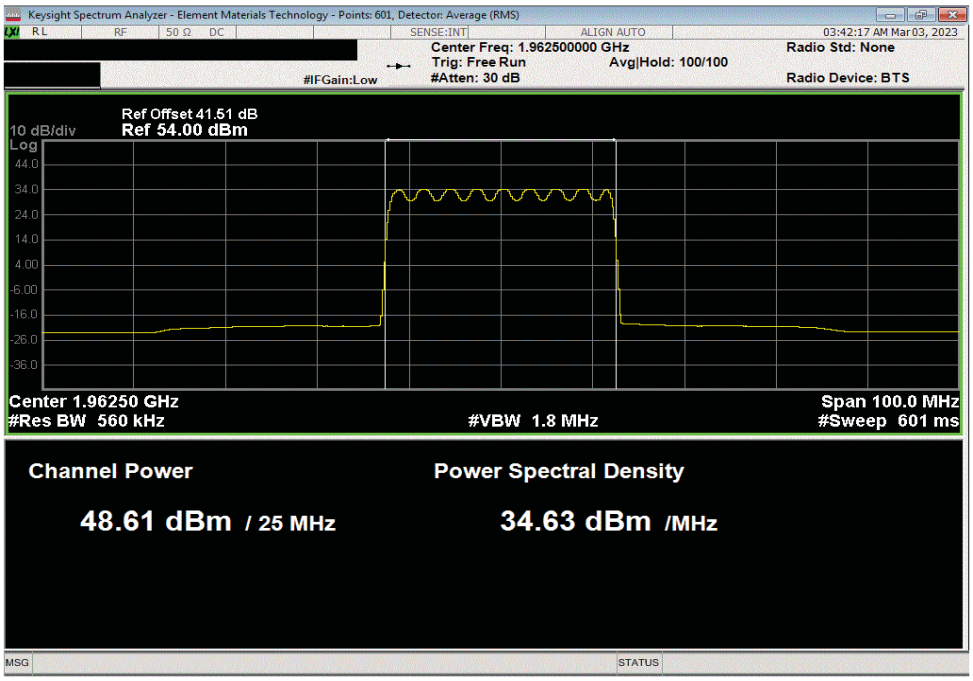
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW
Band n25 1930 MHz - 1995 MHz, 5G NR					
Port 1					
25 MHz Bandwidth					
QPSK Modulation					
Mid Channel 1962.5 MHz	48.679	0	48.7	51.7	54.7
16-QAM Modulation					
Mid Channel 1962.5 MHz	48.614	0	48.6	51.6	54.6
64-QAM Modulation					
Mid Channel 1962.5 MHz	48.716	0	48.7	51.7	54.7
256-QAM Modulation					
Low Channel 1942.5 MHz	48.671	0	48.7	51.7	54.7
Mid Channel 1962.5 MHz	48.734	0	48.7	51.7	54.7
High Channel 1982.5 MHz	48.735	0	48.7	51.7	54.7

OUTPUT POWER - BAND n25 5G

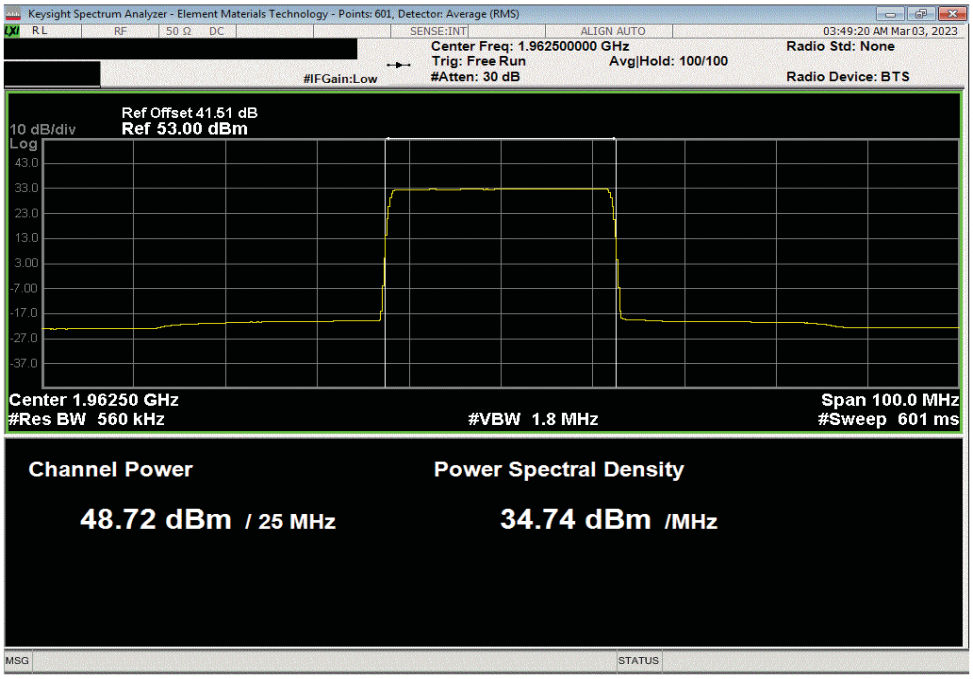
Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, QPSK Modulation, Mid Channel 1962.5 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	48.679	0	48.68	51.68	54.68	



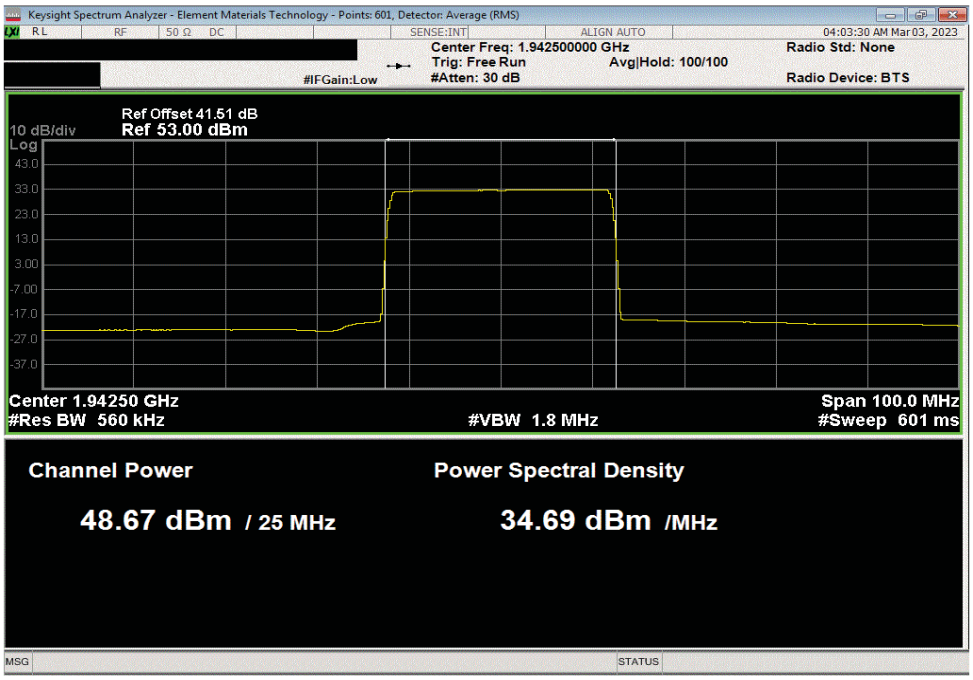
Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 16-QAM Modulation, Mid Channel 1962.5 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	48.614	0	48.61	51.61	54.61	



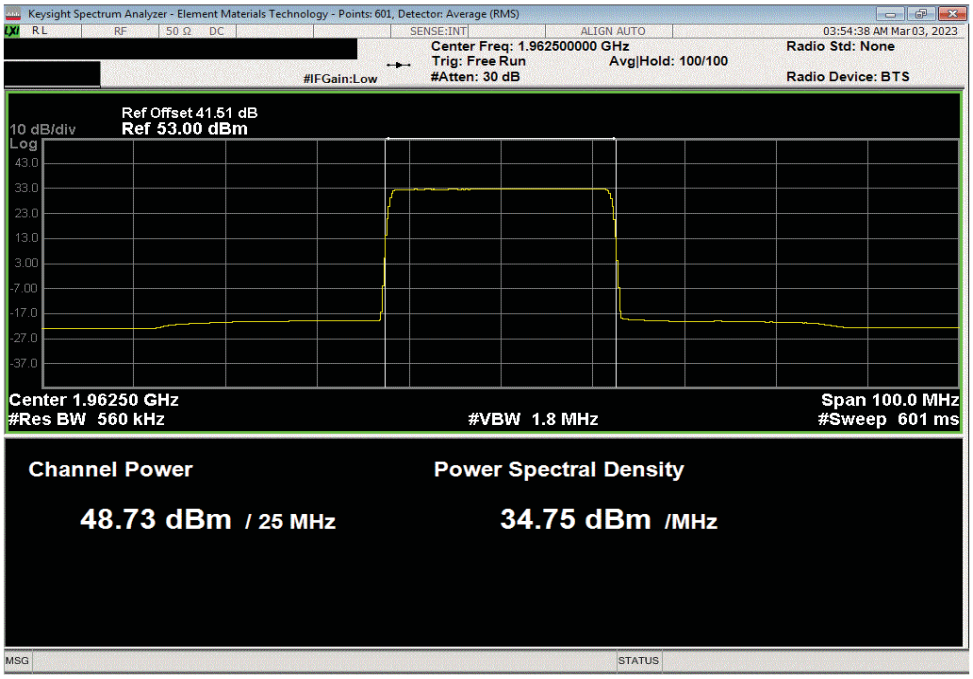
Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 64-QAM Modulation, Mid Channel 1962.5 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	48.716	0	48.72	51.72	54.72	



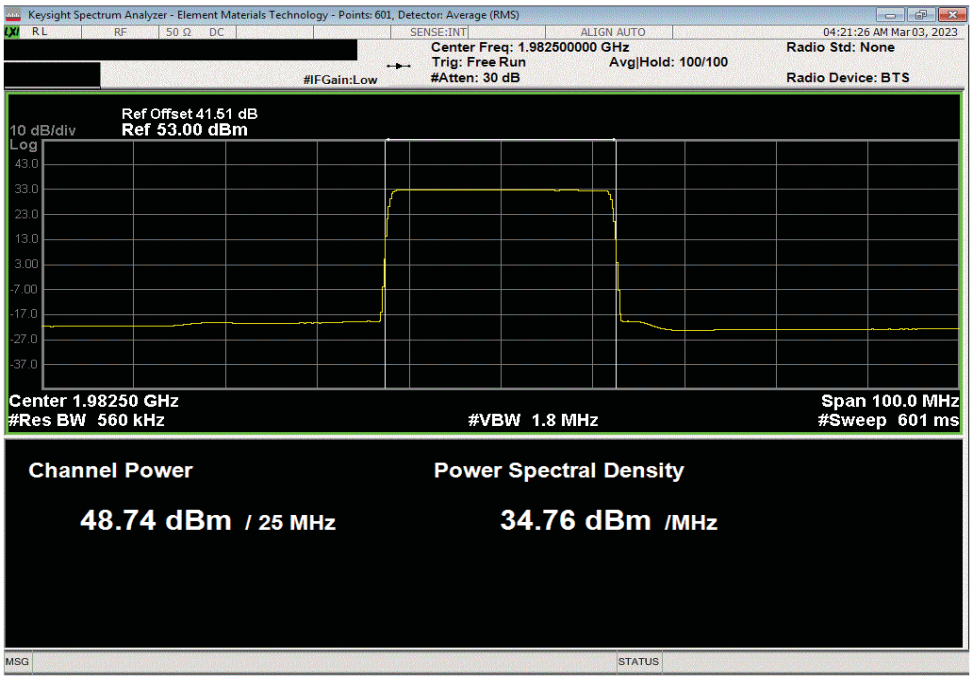
Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 1942.5 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	48.671	0	48.67	51.67	54.67	



Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Mid Channel 1962.5 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	48.734	0	48.73	51.73	54.73	



Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 1982.5 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	48.735	0	48.74	51.74	54.74	



OUTPUT POWER - BAND 25 LTE

XMit 2022.12.28.0

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
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

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 method in section 5.2.4.4 of ANSI C63.26 was used to make the measurements. This method uses trace averaging across the 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 in decimal, to the measured power to compute the average power during the actual transmission times

RF conducted emissions testing was performed only on one port. The testing was performed on the same version of hardware (AHFII) as the original certification test. The AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

The total average transmit power of all antenna ports was determined per ANSI C63.26-2105 paragraph 6.4.3.1.

OUTPUT POWER - BAND 25 LTE

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TbtTx 2022.05.02.0 XMit 2022.12.28.0

EUT:	Airscale Base Transceiver Station Remote Radio Head Model AHFII			Work Order:	NOKI0054
Serial Number:	BL2235N41PG			Date:	03/03/2023
Customer:	Nokia of America Corporation			Temperature:	23.9°C
Attendees:	John Rattanavong, David Le			Humidity:	38.2%
Project:	None			Barometric Pres.:	983.9 mbar
Tested by:	Brandon Hobbs and Jarrod Brenden	Power:	54 VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 24E:2022	ANSI C63.26:2015
RSS-133 Issue 6:2013+A1:2018	ANSI C63.26:2015

COMMENTS

All measurment path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. The LTE 1.4 MHz carriers are enabled at 20 watts/carrier. The following is the output power measurements at the radio output ports. The output power was measured for a single carrier over the carrier channel bandwidthon port 1. The total output power for multiport (2x2 MIMO, 4x4 MIMO) operation was determined based upon ANSI C63.26 clauses 6.4.3.1 and 6.4.3.2.4 (10 log Nout) The total output power for two port operation is the single port power +3 dB [i.e. 10*log(2)]. The total power for four port operations is single port power +6 dB [i.e. 10*log(4)].

DEVIATIONS FROM TEST STANDARD

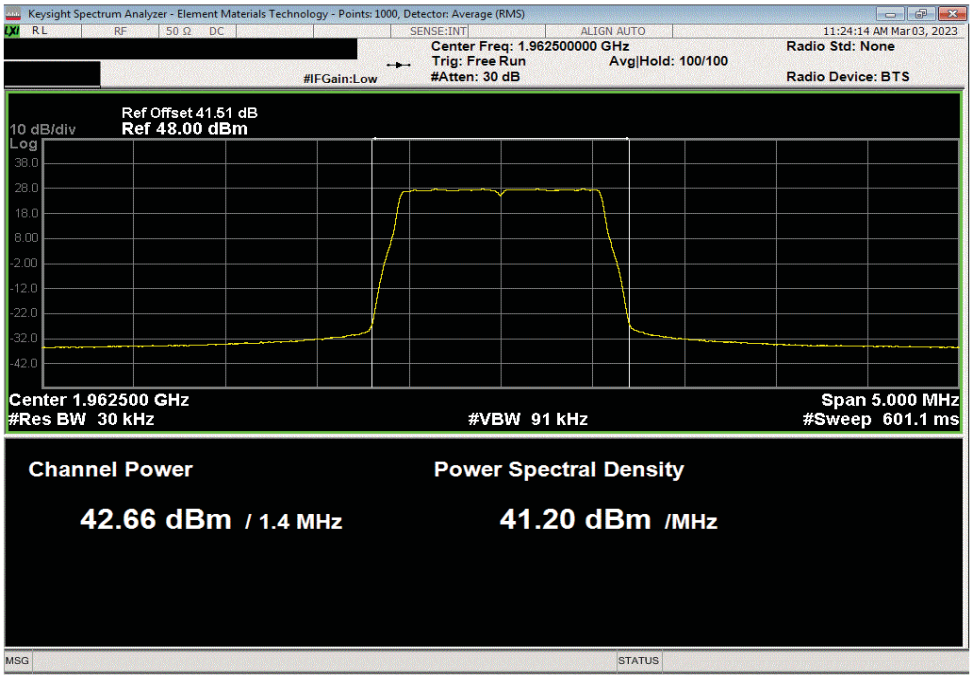
None

Configuration #	NOKI0054-2	Signature

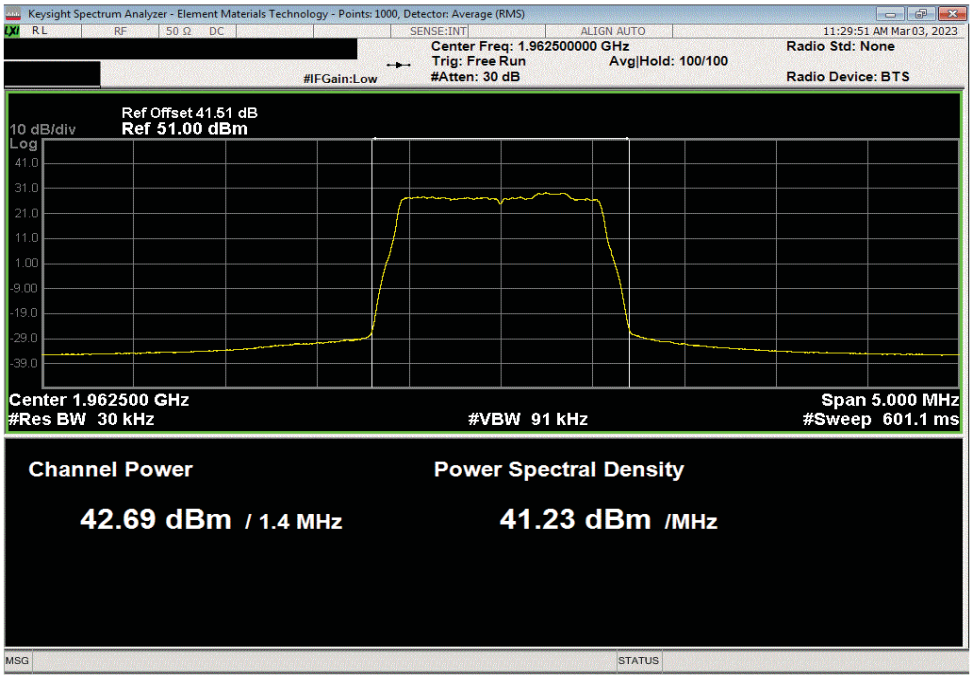
	Avg Cond dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW
Band 25 1930 MHz - 1995 MHz, LTE					
Port 1					
1.4 MHz Bandwidth					
QPSK Modulation					
Mid Channel 1962.5 MHz	42.661	0	42.7	45.7	48.7
16-QAM Modulation					
Mid Channel 1962.5 MHz	42.693	0	42.7	45.7	48.7
64-QAM Modulation					
Mid Channel 1962.5 MHz	42.563	0	42.6	45.6	48.6
256-QAM Modulation					
Low Channel 1930.7 MHz	42.499	0	42.5	45.5	48.5
Mid Channel 1962.5 MHz	42.600	0	42.6	45.6	48.6
High Channel 1989.3 MHz	42.888	0	42.9	45.9	48.9

OUTPUT POWER - BAND 25 LTE

Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, QPSK Modulation, Mid Channel 1962.5 MHz						
	Avg Cond dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	42.661	0	42.661	45.661	48.661	

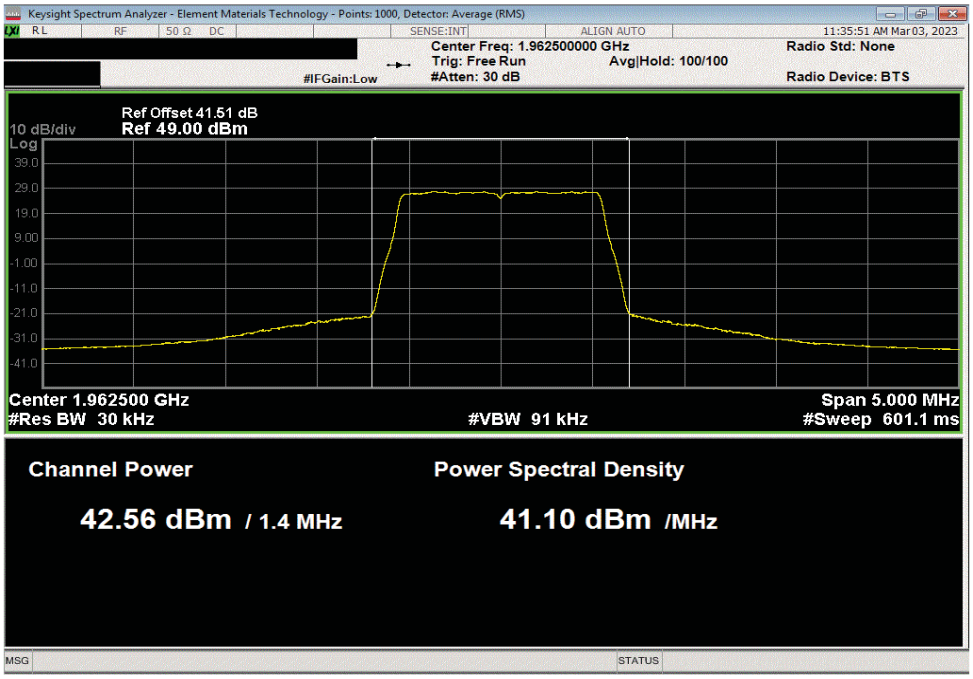


Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 16-QAM Modulation, Mid Channel 1962.5 MHz						
	Avg Cond dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	42.693	0	42.693	45.693	48.693	

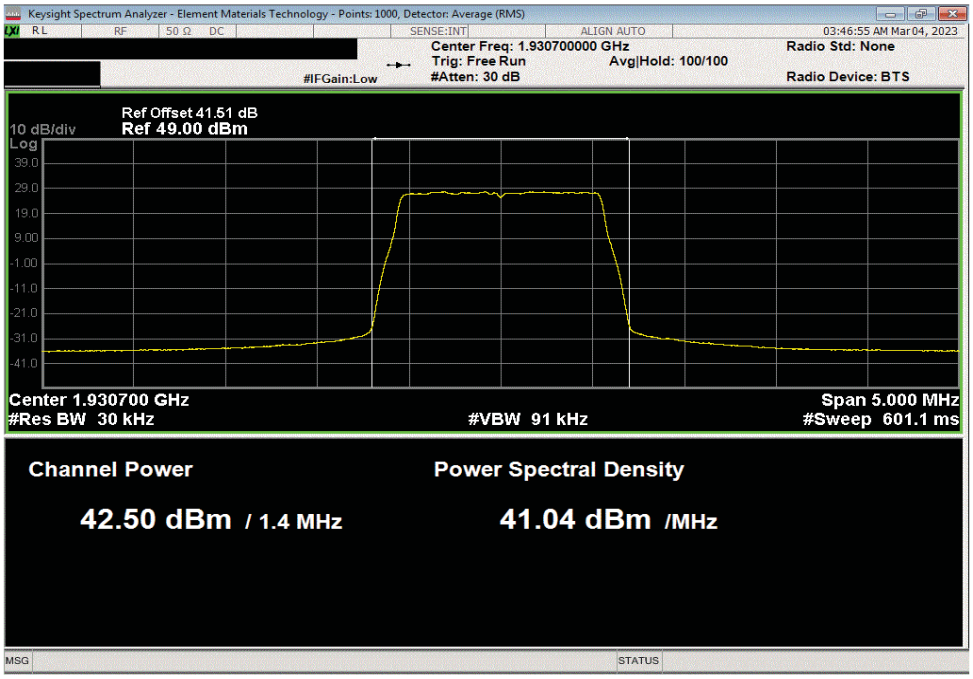


OUTPUT POWER - BAND 25 LTE

Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 64-QAM Modulation, Mid Channel 1962.5 MHz						
	Avg Cond dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	42.563	0	42.563	45.563	48.563	

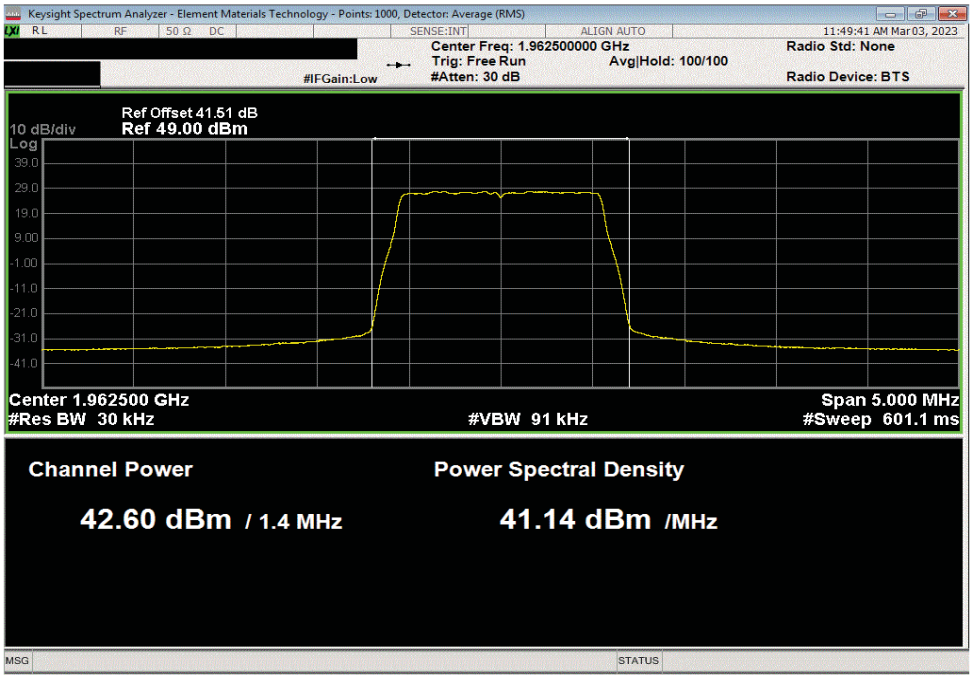


Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, Low Channel 1930.7 MHz						
	Avg Cond dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	42.499	0	42.499	45.499	48.499	

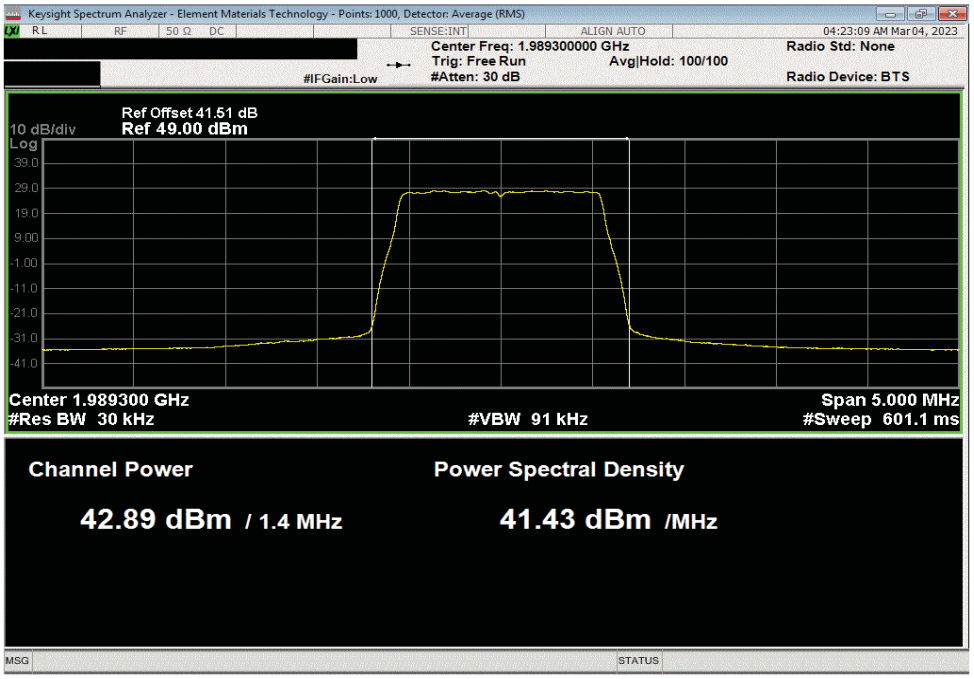


OUTPUT POWER - BAND 25 LTE

Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, Mid Channel 1962.5 MHz						
	Avg Cond dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	42.6	0	42.6	45.6	48.6	



Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, High Channel 1989.3 MHz						
	Avg Cond dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	42.888	0	42.888	45.888	48.888	



OUTPUT POWER - BAND 25 NB-IoT-SA

XMit 2022.12.28.0

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
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

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 measurements. This method uses trace averaging across the 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 in decimal, to the measured power to compute the average power during the actual transmission times

RF conducted emissions testing was performed only on one port. The testing was performed on the same version of hardware (AHFII) as the original certification test. The AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

The total average transmit power of all antenna ports was determined per ANSI C63.26-2105 paragraph 6.4.3.1.

OUTPUT POWER - BAND 25 NB-IoT-SA

element

TbtTx 2022.05.02.0 XMit 2022.12.28.0

EUT:	Airscale Base Transceiver Station Remote Radio Head Model AHFII			**Work Order:**	NOKI0054
Serial Number:	BL2235N41PG			**Date:**	03/03/2023
Customer:	Nokia of America Corporation			**Temperature:**	25.9°C
Attendees:	John Rattanavong, David Le			**Humidity:**	31.8%
Project:	None			**Barometric Pres.:**	983.8 mbar
Tested by:	Brandon Hobbs and Jarrod Brenden	**Power:**	54 VDC	**Job Site:**	TX07

TEST SPECIFICATIONS	Test Method
FCC 24E:2022	ANSI C63.26:2015
RSS-133 Issue 6:2013+A1:2018	ANSI C63.26:2015

COMMENTS

All measurment path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. The NB IoT SA carriers are enabled at maximum power (20 watts/carrier). The following is the output power measurements at the radio output ports. The output power was measured for a single carrier over the carrier channel bandwidthon port 1. The total output power for multiport (2x2 MIMO, 4x4 MIMO) operation was determined based upon ANSI C63.26 clauses 6.4.3.1 and 6.4.3.2.4 (10 log Nout) The total output power for two port operation is the single port power +3 dB [i.e. 10*log(2)]. The total power for four port operations is single port power +6 dB [i.e. 10*log(4)]. The NB IoT SA carrier power level was reduced from maximum (20 watts/carrier) to meet the 1640W/MHz EIRP limit.

DEVIATIONS FROM TEST STANDARD

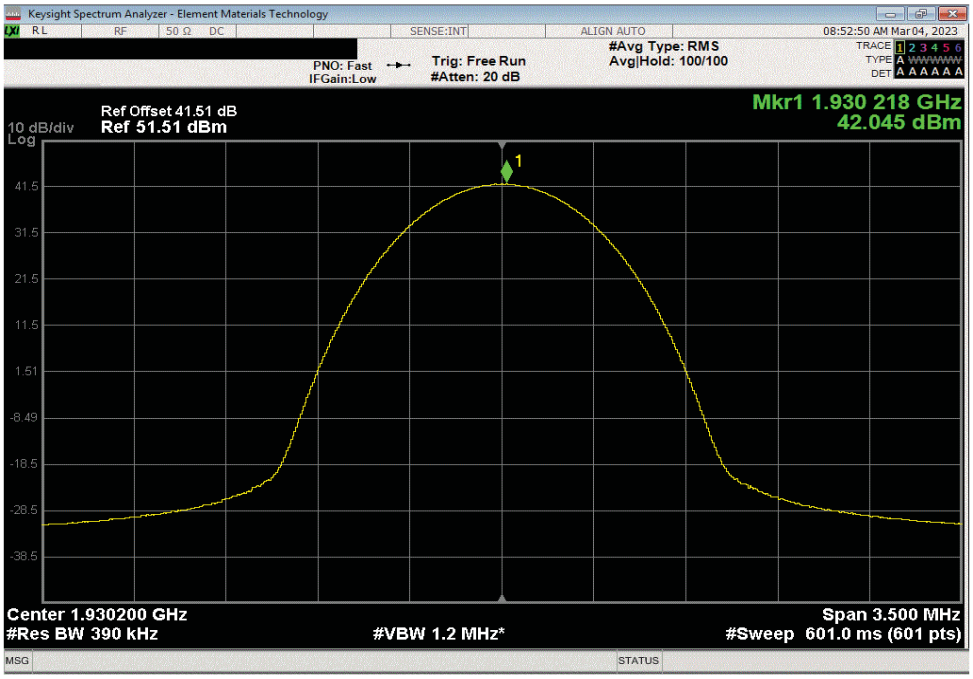
None

Configuration #	NOKI0054-2	Signature

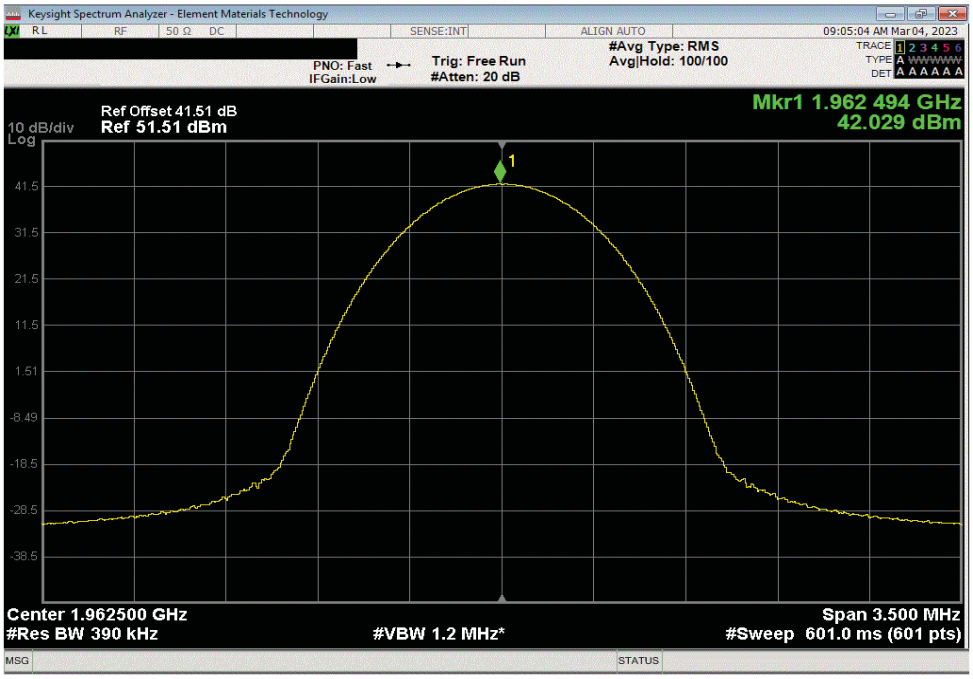
	Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW
Band 25 1930 MHz - 1995 MHz, NB-IoT-SA					
Port 1					
200 KHz Bandwidth					
NTM Modulation					
Low Channel 1930.2 MHz	42.045	0	42.0	45.0	48.0
Mid Channel 1962.5 MHz	42.029	0	42.0	45.0	48.0
High Channel 1994.8 MH	42.242	0	42.2	45.2	48.2
Band 25 1930 MHz - 1995 MHz, NB-IoT-SA Carrier Reduced to meet 1640W/MHz EIRP limit					
Port 1					
200 KHz Bandwidth					
NTM Modulation					
High Channel 1994.8 MH	41.459	0	41.5	44.5	47.5

OUTPUT POWER - BAND 25 NB-IoT-SA

Band 25 1930 MHz - 1995 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, Low Channel 1930.2 MHz						
	Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	42.045	0	42.045	45.045	48.045	

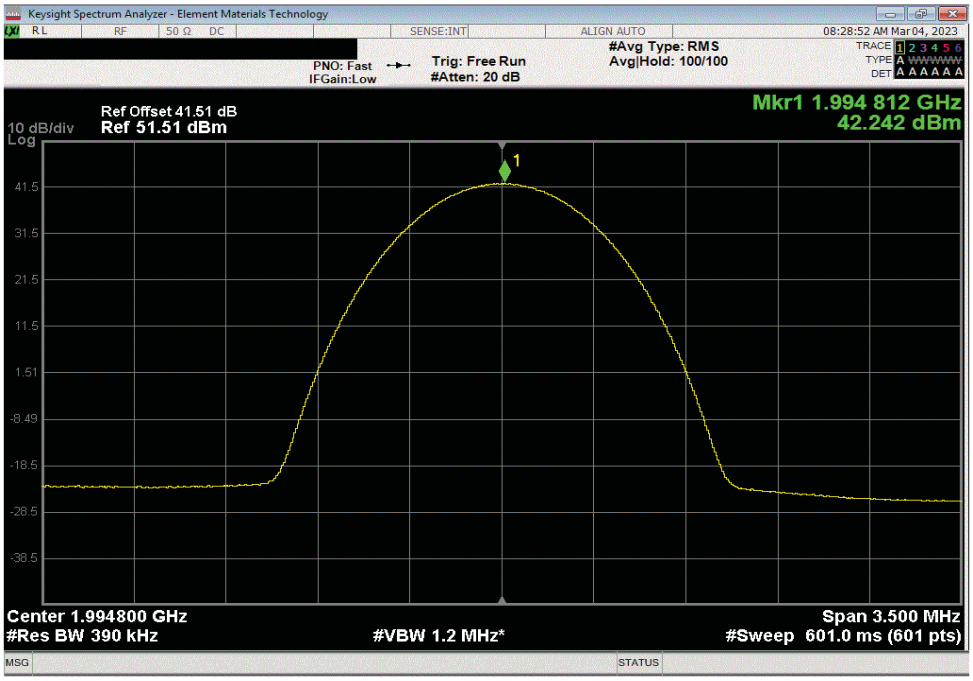


Band 25 1930 MHz - 1995 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, Mid Channel 1962.5 MHz						
	Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	42.029	0	42.029	45.029	48.029	

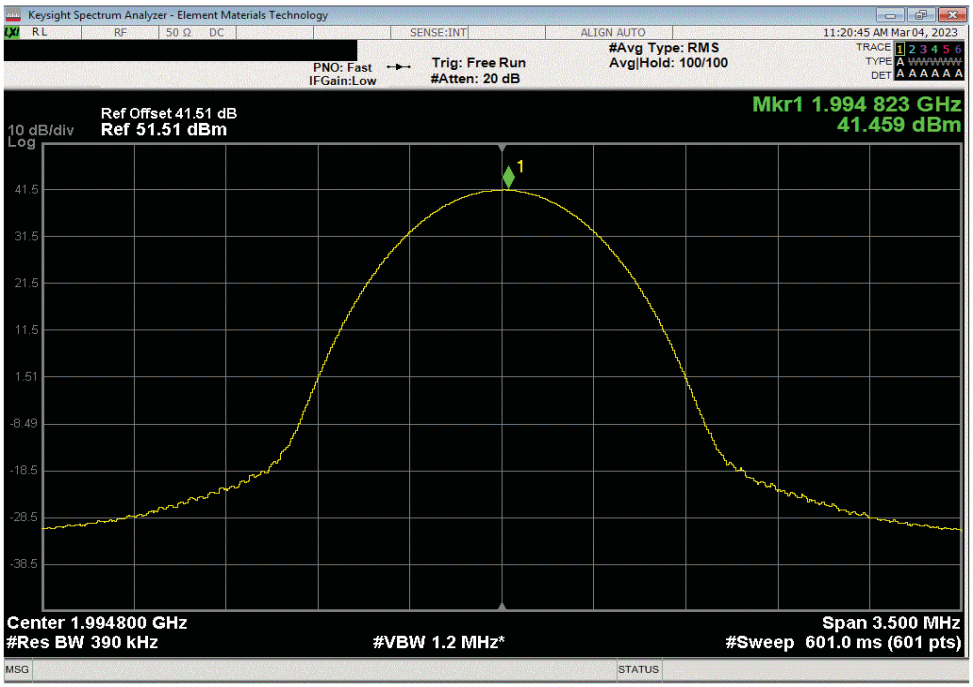


OUTPUT POWER - BAND 25 NB-IoT-SA

Band 25 1930 MHz - 1995 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, High Channel 1994.8 MHz						
	Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	42.242	0	42.242	45.242	48.242	



Band 25 1930 MHz - 1995 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, High Channel 1994.8 MHz, Reduced Power						
	Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dB/Carrier BW	Two Port (2x2 MIMO) dB/Carrier BW	Four Port (4x4 MIMO) dB/Carrier BW	
	41.459	0	41.459	44.459	47.459	



OUTPUT POWER - BAND n66 5G

XMit 2022.12.28.0

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
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

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 measurements. This method uses trace averaging across the 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 in decimal, to the measured power to compute the average power during the actual transmission times

RF conducted emissions testing was performed only on one port. The testing was performed on the same version of hardware (AHFII) as the original certification test. The AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

The total average transmit power of all antenna ports was determined per ANSI C63.26-2105 paragraph 6.4.3.1.

OUTPUT POWER - BAND n66 5G

element

TbtTx 2022.05.02.0 t022.12.28.0

EUT:	Airscale Base Transceiver Station Remote Radio Head Model AHFII			Work Order:	NOKI0054
Serial Number:	BL2235N41PG			Date:	03/02/2023
Customer:	Nokia of America Corporation			Temperature:	23.6°C
Attendees:	David Le, John Rattanavong			Humidity:	42.4%
Project:	None			Barometric Pres.:	977.6 mbar
Tested by:	Brandon Hobbs and Jarrod Brenden	Power:	54 VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 27:2023	ANSI C63.26:2015
RSS-139 Issue 4:2022	ANSI C63.26:2015

COMMENTS

All measurment path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. Band n66 carriers are enabled as maximum power (80 watts/carrier). The following is the output power measurements at the radio output ports. The output power was measured for a single carrier over the carrier channel bandwidthon port 1. The total output power for multiport (2x2 MIMO, 4x4 MIMO) operation was determined based upon ANSI C63.26 clauses 6.4.3.1 and 6.4.3.2.4 (10 log Nout) The total output power for two port operation is the single port power +3 [i.e. 10*log(2)]. The total power for four port operations is single port power +6 dB [i.e. 10*log(4)].

DEVIATIONS FROM TEST STANDARD

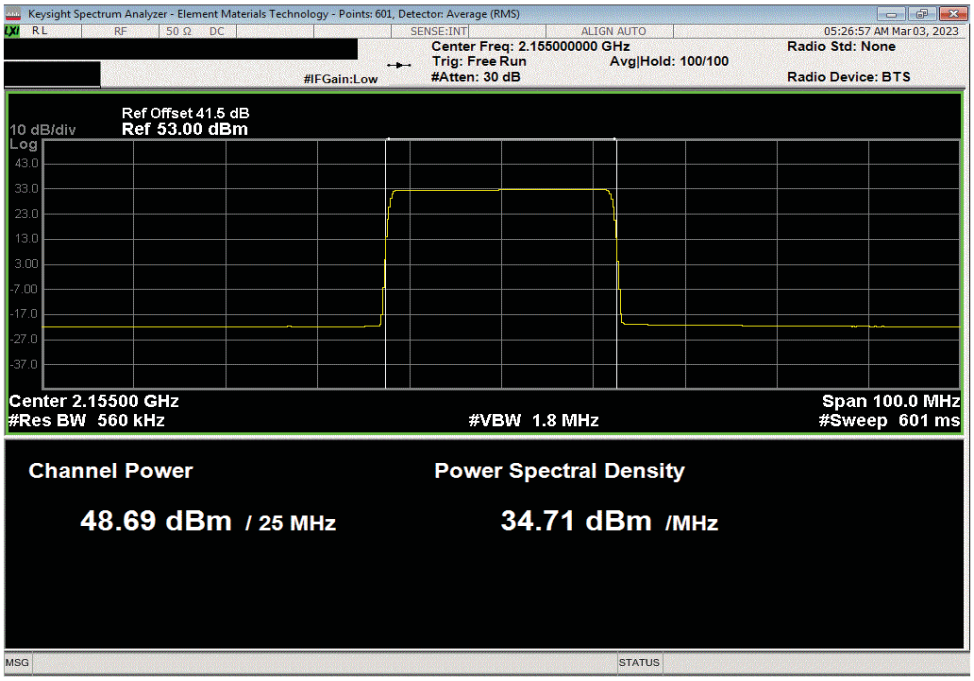
None

Configuration #	NOKI0054-2	Signature

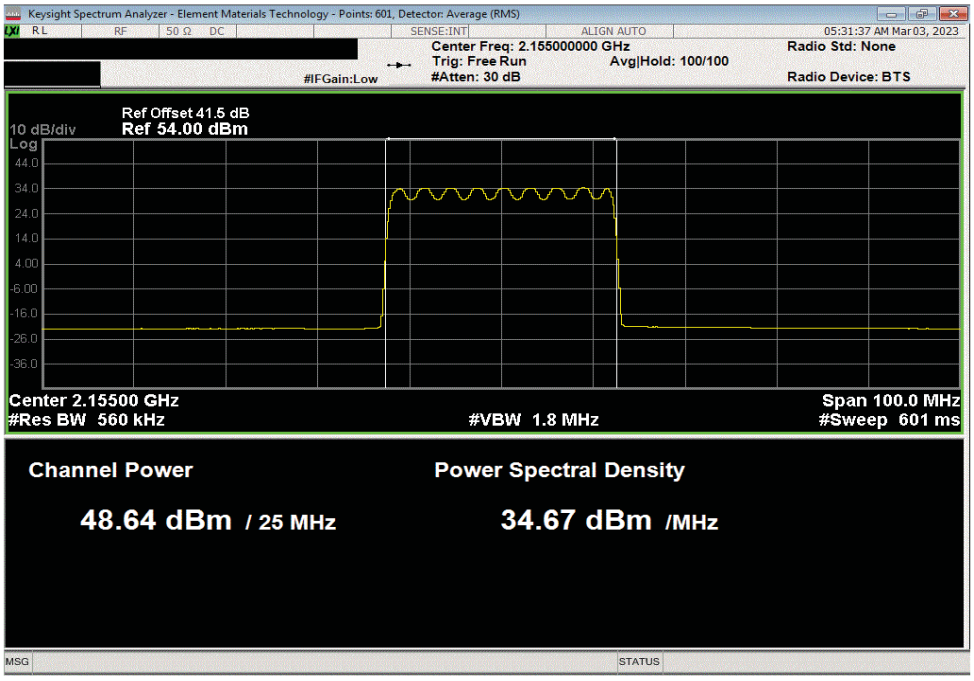
	Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW
Band n66 2110 MHz - 2200 MHz, 5G NR					
Port 1					
25 MHz Bandwidth					
QPSK Modulation					
Mid Channel 2155 MHz	48.685	0	48.7	51.7	54.7
16-QAM Modulation					
Mid Channel 2155 MHz	48.645	0	48.6	51.6	54.6
64-QAM Modulation					
Mid Channel 2155 MHz	48.744	0	48.7	51.7	54.7
256-QAM Modulation					
Low Channel 2122.5 MHz	48.909	0	48.9	51.9	54.9
Mid Channel 2155 MHz	48.752	0	48.8	51.8	54.8
High Channel 2187.5 MH:	48.923	0	48.9	51.9	54.9

OUTPUT POWER - BAND n66 5G

Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, QPSK Modulation, Mid Channel 2155 MHz						
	Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	48.685	0	48.69	51.69	54.69	

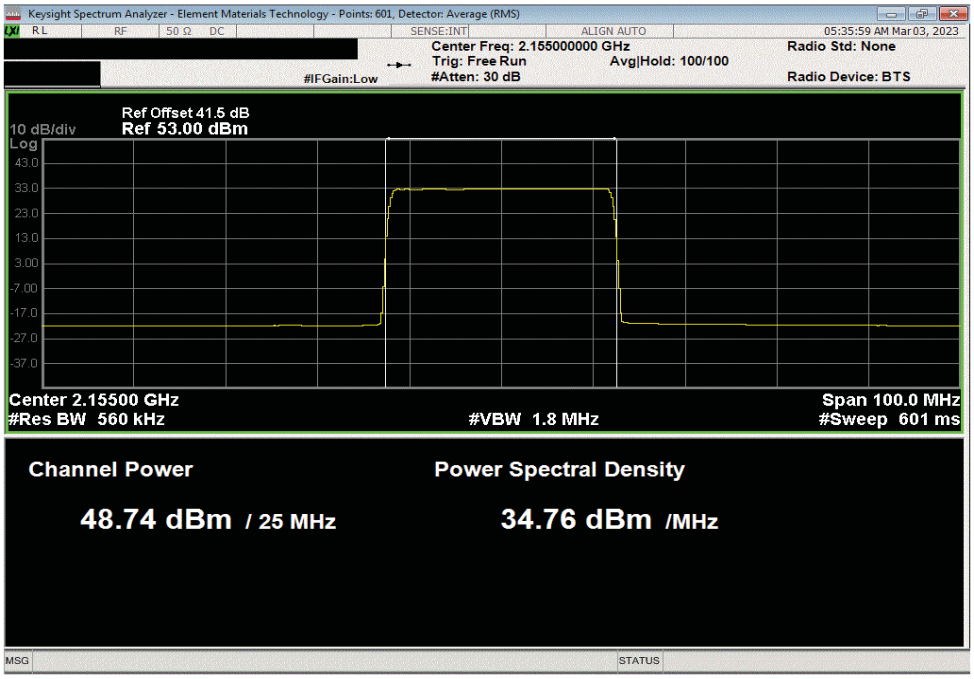


Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 16-QAM Modulation, Mid Channel 2155 MHz						
	Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	48.645	0	48.65	51.65	54.65	

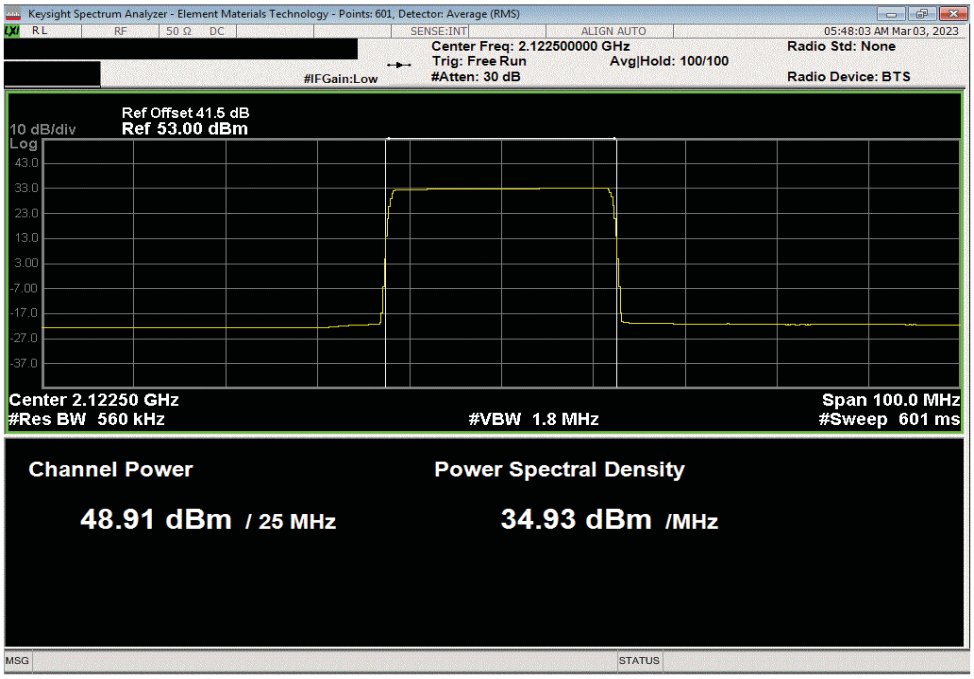


OUTPUT POWER - BAND n66 5G

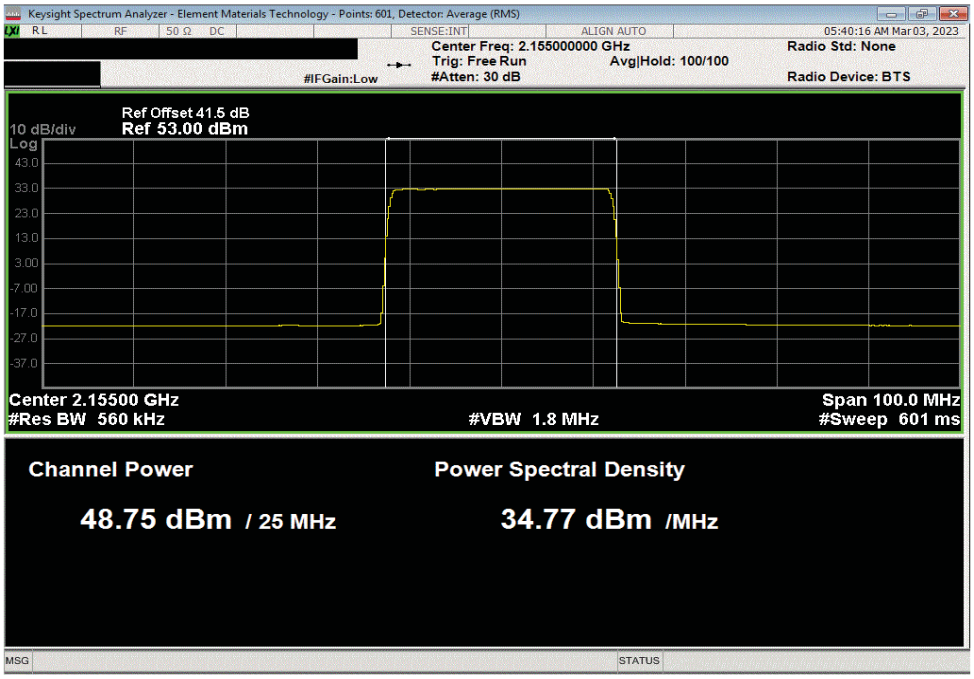
Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 64-QAM Modulation, Mid Channel 2155 MHz						
	Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	48.744	0	48.74	51.74	54.74	



Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 2122.5 MHz						
	Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	48.909	0	48.91	51.91	54.91	



Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Mid Channel 2155 MHz						
	Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	48.752	0	48.75	51.75	54.75	



Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 2187.5 MHz						
	Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	48.923	0	48.92	51.92	54.92