

Radio Test Report Application for Class II Permissive Change of Equipment Authorization

> FCC Part 27 [2496MHz – 2690MHz]

FCC ID: VBNAZHL-01

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

Report: NOKI0067.0 Rev. 0, Issue Date: July 28, 2023





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Last Date of Test: July 14, 2023 Nokia Solutions and Networks EUT: Airscale Base Transceiver Station Remote Radio Head Model AZHL

Radio Equipment Testing

Standards

Specification	Method
Code of Federal Regulations (CFR) Title 47 Part 2 CFR Title 47 Part 27 Subpart C	ANSI C63.26-2015 with FCC KDB 971168 D01 v03r01 FCC KDB 662911D01 v02r01 FCC KDB 662911D02 v01

Results

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

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.

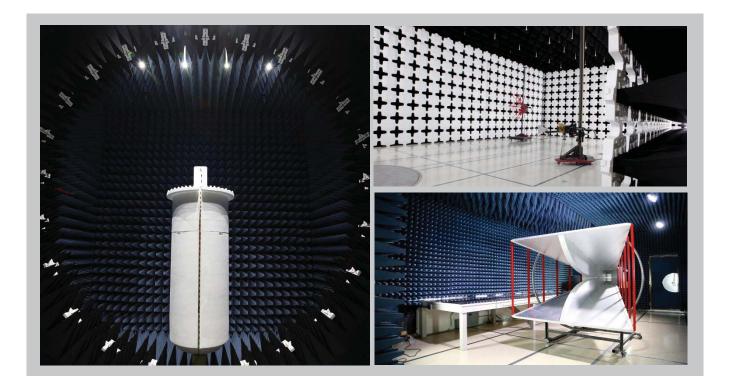
	SCOPE					
	For details on the Scopes of our Accreditations, please visit:					
<u>California</u>	<u>Minnesota</u>	Oregon	Texas	<u>Washington</u>		

FACILITIES





California Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-11 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612) 638-5136	Labs MN01-11 Labs EV01-12 Labs TX01-09 Labs 9349 W Broadway Ave. 6775 NE Evergreen Pkwy #400 3801 E Plano Pkwy 19201 - Brooklyn Park, MN 55445 Hillsboro, OR 97124 Plano, TX 75074 Bothell				
		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



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 Location: Texas

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

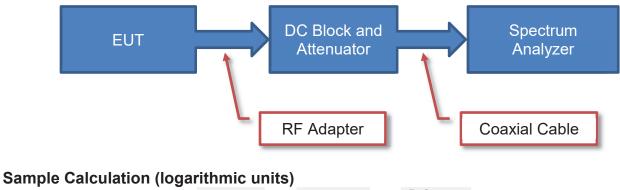


Measurement Bandwidths

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

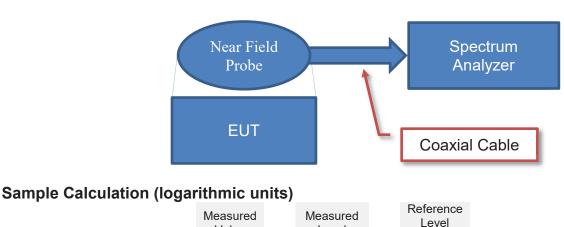
Unless otherwise stated, measurements were made using the bandwidths and detectors specified. No video filter was used.

Antenna Port Conducted Measurements



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

Near Field Test Fixture Measurements



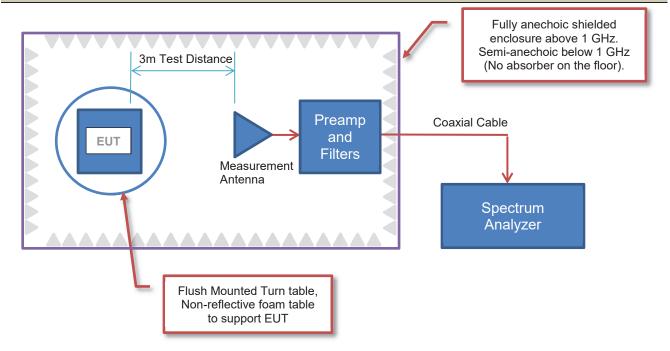
Offset

28.6

TEST SETUP BLOCK DIAGRAMS



Emissions Measurements

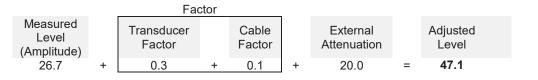


Sample Calculation (logarithmic units)

Radiated Emissions:

				Factor								
Measured Level (Amplitude)		Antenna Factor		Cable 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:



Radiated Power (ERP/EIRP) – Substitution Method:

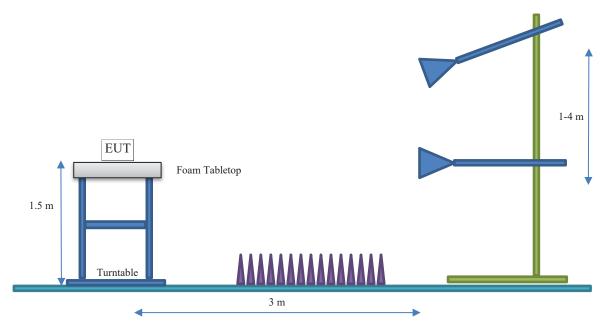
Measured Level into Substitution Antenna (Amplitude dBm)		Substitution Antenna Factor (dBi)		EIRP to ERP (if applicable)		Measured power (dBm ERP/EIRP)
10.0	+	6.0	-	2.15	=	13.9/16.0

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



Company Name:	Nokia Solutions and Networks
Address:	3201 Olympus Blvd
City, State, Zip:	Dallas, TX 75019
Test Requested By:	Steve Mitchell
EUT:	Airscale Base Transceiver Station Remote Radio Head Model AZHL
First Date of Test:	July 13, 2023
Last Date of Test:	July 14, 2023
Receipt Date of Samples:	July 13, 2023
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Client and Equipment under Test (EUT) Information

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

Remote Radio Head (RRH) variant AZHL is being developed under this effort. The AZHL is a multi-standard multi-carrier radio head designed to support 4G LTE TDD and 5G NR TDD. Previous FCC certification efforts demonstrated compliance for 4G LTE TDD single carrier LTE10, LTE15 and LTE20 channel bandwidths and for 5G NR TDD single carrier NR20, NR30, NR40, NR50, NR60, NR70, NR80, NR90 and NR100 channel bandwidths. This FCC permissive class 2 change effort is for add 5G NR TDD 10MHz channel bandwidth. The AZHL RRH has 8 transmit/receive antenna ports that supports 3GPP frequency band 41/band n41 operations (BTS RX: 2496 to 2690 MHz/BTS TX: 2496 to 2690 MHz). The maximum RF output power of each antenna port is 40 watts. The total RF output power for the AZHL remote radio head is 320 watts (8 x 40 watts). The remote radio head software supports 10, 15, and 20MHz 4G LTE TDD bandwidths. The remote radio head software supports 10, 80, 90 and 100MHz 5G NR TDD bandwidths. The maximum RF output power for the AZHL remote radio bandwidths. The maximum RF output power for the add to be a software supports 10, 20, 30, 40, 50, 60, 70, 80, 90 and 100MHz 5G NR TDD bandwidths. The maximum RF output power for the power levels for single carrier operations are provided below.

Single Carrier Maximum RF Output Power per Port for each Radio Access Technology Channel Bandwidth										
LTE10 & NR10	LTE15	LTE20 & NR20	NR30	NR40	NR50	NR60	NR70	NR80	NR90	NR100
4.0 W	5.6 W	7.5 W	11.3 W	15.0 W	18.8 W	22.5 W	26.3 W	30.0 W	33.8 W	40.0 W
or	or	or	or	or	or	or	or	or	or	or
36.0dBm	37.5dBm	38.8dBm	40.5dBm	41.8dBm	42.7dBm	43.5dBm	44.2dBm	44.8dBm	45.3dBm	46.0dBm

The AZHL software supports four downlink modulation types (QPSK, 16QAM, 64QAM, and 256QAM) for 5G technologies. The 5G NR 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). Multicarrier operations will be verified/certified in a separate effort. The instantaneous bandwidth covers the full operational bandwidth.

The AZHL MIMO operating modes include 8T8R, 2x4T4R and 4x2T2R. The AZHL is designed to operate with cross-polarized (orthogonal radiators) antennas only. The eight transmit/receive ports connected to +45° cross-polarized (orthogonal) radiators (four ports are connected to +45° radiators/antennas and four ports are connected to the -45° radiators/antennas).

Tests to be performed include RF channel power, peak to average power ratio, emission bandwidth (99% and 26 dB down), band edge spurious emissions (+ 1MHz), and conducted spurious emissions.

The radiated emissions and frequency stability measurements performed in the original certification does not need to be 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.

PRODUCT DESCRIPTION



3GPP Frequency Band n41 5G-NR Band Edge NR-ARFCNs

The 3GPP frequency band n41 (2496-2690 MHz) band edge NR-ARFCNs for 5G NR channel bandwidths (10, 20, 30, 40, 50, 60, 80, 90 and 100 MHz) are provided in Table below. The NR-ARFCN is defined as New Radio - Absolute Radio Frequency Channel Number.

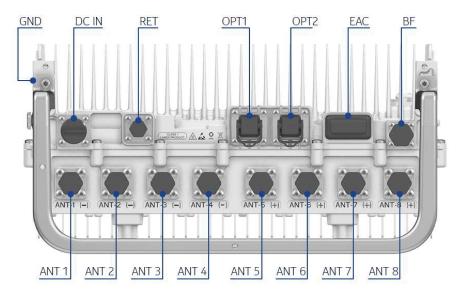
	5G NR	Frequency	5G NR Channel Bandwidth in MHz									
	NR-ARFCN	(MHz)	10	20	30	40	50	60	70	80	90	100
	Band Edge	2496.00				Lo	ower Ba	and Edg	ge			
	500202	2501.01	BC									
I												
	501204	2506.02		BC								
	502200	2511.00			BC							
	503202	2516.01				BC						
	504204	2521.02					BC					
	505200	2526.00						BC				
8)	506202	2531.01							BC			
hguc	507204	2536.02								BC		
1 thre	508200	2541.00									BC	
AZHL Band n41 (Antennas 1 through 8)	509202	2546.01										BC
nter	518598	2592.99				N	/iddle (l Channe	el de la companya de			
A)												
h41	528000	2640.00										TC
and	528996	2644.98									тс	
HL B	529998	2649.99								тс		
ΑZ	531000	2655.00							тс			
	531996	2659.98						тс				
								10				
	532998	2664.99					TC					
	534000	2670.00				тс						
	534996	2674.98			тс							
	535998	2679.99		тс								
	537000	2685.00	тс									
	Band Edge	2690.00	20.00 Upper Band Edge									

AZHL Downlink Band Edge 5G NR Band n41 Frequency Channels

PRODUCT DESCRIPTION



AZHL Connector Layout:



EUT External Interfaces

Name	Qty	Connector Type	Purpose (and Description)
DC In	1	Screw Terminal	2-pole Power Input Terminal
GND	1	Screw lug (2xM5)	Ground
ANT	8	4.3-10	RF signal for Transmitter/Receiver (50 Ohm)
BF	1	4.3-10	Beamforming Calibration
EAC	1	MDR26	External Alarm Interface
OPT	2	SFP28	Optical CPRI Interface
RET	1	8-pin circular connector	AISG 2.0 to external devices
Fan	1	Nokia	Power for RRH Fan. Located on the side of RRH.

Testing Objective:

A class II permissive change on the original filing is being pursued to add additional 5G-NR 10MHz channel to the Airscale Base Transceiver Station Remote Radio Head Model AZHL FCC radio certification.



Test Configuration 1 RF Conducted Emissions

Software/Firmware Running during test					
Description	Version				
BTS Software Version (23R3)	SBTS23R3_ENB_9999_230510_000006				
RF_SW	RF. ERM6.trunk.20230508.011				

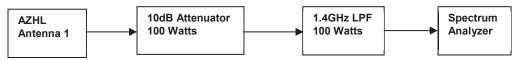
Description	Manufacturer	Model/Part Number	Serial Number
AMIA (AirScale Indoor Subrack)	Nokia Solutions and Networks	473098A.204	UK222201001
ASIB (BTS System Module)	Nokia Solutions and Networks	473764A.102	K9214331950
ABIO (BTS Baseband Module)	Nokia Solutions and Networks	475266A.104	DH223246455
AZHL (Radio Module Model)	Nokia Solutions and Networks	475432A.101	YK203400004
Low Pass Filter 1.4GHz/100W	Microwave Circuits, Inc.	L13502G1	SN2454-01
Attenuator 100W/10dB	Weinschel Corp	48-10-43-LIM	BJ1771
AOMC SFP28 + 9.8G,70M,850NM (BB)	Nokia	474900A.101	FR214716966
AOMC SFP28 + 9.8G,70M,850NM (RRH)	Nokia	474900A.101	FR214719852
ThinkPad T490 (WebEM- PC)	Lenovo	20N3S88012	PF26RVZ0
Keysight- DC System power supply	Keysight	N8757A	US21D4053S
FPAC (DC-PWR supply-BS)	Nokia	472805A.X21	A9124600282
(7) 2 Meter RF Load cables	RD Microwave Systems	CBL-6FT-NMNM-401J-N	19-1570-1941
150W -50ohm -Terminating Load	API Weinschel inc	1435-3-LIM	SR301
150W -50ohm -Terminating Load	API Weinschel inc	1435-3-LIM	SR297
150W -50ohm -Terminating Load	API Weinschel inc	1435-3-LIM	PZ468
150W -50ohm -Terminating Load	API Weinschel inc	1435-3-LIM	SR303
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC869
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	MG870
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC865
Fiber Optic cable 2m	Amphenol Fiber Optic	VZ1701	995741A
GPS cable 100m	FTSH	472577A.103	CA2029
FYGC GPS receiver	Nokia	474074A	1294000684
Cat-5e cable	CSA	LL73189	E151955
2 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN297372
1 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_104	SN551431/4
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-72
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-48



Cables (Peripheral)							
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1 (5G)	Connection 2		
Fiber Optic Cable	Ν	2 meters	Ν	ABIO	AZHL		
GPS Receiver Cable	Y	20 meters	Ν	ASIB	FYGB GPS receiver		
Cat-5e Cable	Y	5 meters	Ν	ASIB	WebEM- PC		
RD Microwave Systems – RF Load Cables (7)	Y	2 meters	Ν	EUT [AZHL] Ant ports 2-8	150W -50ohm/250W - 50ohm -Load		
Reference cables (Frame Clock & Trigger)	Y	1 meter	Ν	ASIB	Analyzer		

Cables								
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1	Connection 2			
HS-SUCOFLEX_106 0.5dB cable attenuator	Y	2 meters	N	EUT [AZHL] Ant port #1	Attenuator 100W/10dB			
Attenuator 100W/10dB	Ν	N/A	N	RF cable HS- SUCOFLEX_106	Low Pass filter 1.4G/100W			
Low Pass Filter 1.4G/100W	Ν	N/A	N	Attenuator 100W/10dB	RF cable HS- SUCOFLEX_104			
HS-SUCOFLEX_104	Y	1 meter	Ν	Low Pass Filter 1.4G/100W	Analyzer			

RF Test Setup Diagram:





Test Configuration 2 RF Conducted Emissions

Software/Firmware Running during test					
Description	Version				
BTS Software Version (23R3)	SBTS23R3_ENB_9999_230510_000006				
RF_SW	RF. ERM6.trunk.20230508.011				

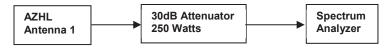
Description	Manufacturer	Model/Part Number	Serial Number
AMIA (AirScale Indoor Subrack)	Nokia Solutions and Networks	473098A.204	UK222201001
ASIB (BTS System Module)	Nokia Solutions and Networks	473764A.102	K9214331950
ABIO (BTS Baseband Module)	Nokia Solutions and Networks	475266A.104	DH223246455
AZHL (Radio Module Model)	Nokia Solutions and Networks	475432A.101	YK203400004
Attenuator 250W/30dB	API Weinschel	58-30-34	LL627
AOMC SFP28 + 9.8G,70M,850NM (BB)	Nokia	474900A.101	FR214716966
AOMC SFP28 + 9.8G,70M,850NM (RRH)	Nokia	474900A.101	FR214719852
ThinkPad T490 (WebEM- PC)	Lenovo	20N3S88012	PF26RVZ0
Keysight- DC System power supply	Keysight	N8757A	US21D4053S
FPAC (DC-PWR supply-BS)	Nokia	472805A.X21	A9124600282
(7) 2 Meter RF Load cables	RD Microwave Systems	CBL-6FT-NMNM-401J-N	19-1570-1941
150W -50ohm -Terminating Load	API Weinschel inc	1435-3-LIM	SR301
150W -50ohm -Terminating Load	API Weinschel inc	1435-3-LIM	SR297
150W -50ohm -Terminating Load	API Weinschel inc	1435-3-LIM	PZ468
150W -50ohm -Terminating Load	API Weinschel inc	1435-3-LIM	SR303
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC869
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	MG870
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC865
Fiber Optic cable 2m	Amphenol Fiber Optic	VZ1701	995741A
GPS cable 100m	FTSH	472577A.103	CA2029
FYGC GPS receiver	Nokia	474074A	1294000684
Cat-5e cable	CSA	LL73189	E151955
2 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN297372
1 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_104	SN551431/4
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-72
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-48



Cables (Peripheral)							
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1 (5G)	Connection 2		
Fiber Optic Cable	N	2 meters	Ν	ABIO	AZHL		
GPS Receiver Cable	Y	20 meters	Ν	ASIB	FYGB GPS receiver		
Cat-5e Cable	Y	5 meters	Ν	ASIB	WebEM- PC		
RD Microwave Systems – RF Load Cables (7)	Y	2 meters	Ν	EUT [AZHL] Ant ports 2-8	150W - 50ohm/250W - 50ohm -Load		
Reference cables (Frame Clock & Trigger)	Y	1 meter	Ν	ASIB	Analyzer		

Cables					
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1	Connection 2
HS-SUCOFLEX_106	Y	2 meters	Ν	EUT [AZHL] Ant port #1	Attenuator 250W/30dB
Attenuator 250W/30dB	N	NA	N	HS-SUCOFLEX_106	RF cable HS- SUCOFLEX_104
HS-SUCOFLEX_104	Y	1 meter	Ν	Attenuator 250W/30dB	Analyzer

RF Test Setup Diagram:





Test Configuration 3 RF Conducted Emissions

Software/Firmware Running during test					
Description	Version				
BTS Software Version (23R3)	SBTS23R3_ENB_9999_230510_000006				
RF_SW	RF. ERM6.trunk.20230508.011				

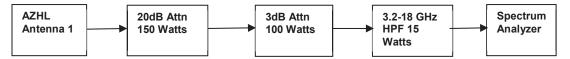
Description	Manufacturer	Model/Part Number	Serial Number
AMIA (AirScale Indoor Subrack)	Nokia Solutions and Networks	473098A.204	UK222201001
ASIB (BTS System Module)	Nokia Solutions and Networks	473764A.102	K9214331950
ABIO (BTS Baseband Module)	Nokia Solutions and Networks	475266A.104	DH223246455
AZHL (Radio Module Model)	Nokia Solutions and Networks	475432A.101	YK203400004
High Pass Filter 3.2-18GHz/15W	RF-Lambda	RHPF23G03G18	20121400045
Attenuator 150W/20dB	Aeroflex Weinschel	66-20-33	BZ1163
Attenuator 100W/3dB	Aeroflex Weinschel	47-3-33	CC7387
AOMC SFP28 + 9.8G,70M,850NM (BB)	Nokia	474900A.101	FR214716966
AOMC SFP28 + 9.8G,70M,850NM (RRH)	Nokia	474900A.101	FR214719852
ThinkPad T490 (WebEM- PC)	Lenovo	20N3S88012	PF26RVZ0
Keysight- DC System power supply	Keysight	N8757A	US21D4053S
FPAC (DC-PWR supply-BS)	Nokia	472805A.X21	A9124600282
(7) 2 Meter RF Load cables	RD Microwave Systems	CBL-6FT-NMNM-401J-N	19-1570-1941
150W -50ohm -Terminating Load	API Weinschel inc	1435-3-LIM	SR301
150W -50ohm -Terminating Load	API Weinschel inc	1435-3-LIM	SR297
150W -50ohm -Terminating Load	API Weinschel inc	1435-3-LIM	PZ468
150W -50ohm -Terminating Load	API Weinschel inc	1435-3-LIM	SR303
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC869
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	MG870
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC865
Fiber Optic cable 2m	Amphenol Fiber Optic	VZ1701	995741A
GPS cable 100m	FTSH	472577A.103	CA2029
FYGC GPS receiver	Nokia	474074A	1294000684
Cat-5e cable	CSA	LL73189	E151955
2 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN297372
1 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_104	SN551431/4
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-72
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-48



Cables (Peripheral)					
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1 (5G)	Connection 2
Fiber Optic Cable	N	2 meters	N	ABIO	AZHL
GPS Receiver Cable	Y	20 meters	Ν	ASIB	FYGB GPS receiver
Cat-5e Cable	Y	5 meters	Ν	ASIB	WebEM- PC
RD Microwave Systems – RF Load Cables (7)	Y	2 meters	Ν	EUT [AZHL] Ant ports 2-8	150W - 50ohm/250W - 50ohm -Load
Reference cables (Frame Clock & Trigger)	Y	1 meter	Ν	ASIB	Analyzer

Cables					
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1	Connection 2
HS-SUCOFLEX_106	Y	2 meters	Ν	EUT [AZHL] Ant Port #1	Attenuator 150W/20dB
Attenuator 150W/20dB	Ν	NA	N	RF cable HS- SUCOFLEX_106	Attenuator 100W/3dB
Attenuator 100W/3dB	Ν	NA	N	Attenuator 150W/20dB	High Pass Filter 3.2-18GHz/15W
High Pass Filter 3.2- 18GHz/15W	Ν	NA	N	Attenuator 100W/3dB	RF cable HS- SUCOFLEX_104
HS-SUCOFLEX_104	Y	1 meter	Ν	High Pass Filter 3.2- 18GHz/15W	Analyzer

RF Test Setup Diagram:





Test Configuration 4 RF Conducted Emissions

Software/Firmware Running during test	
Description	Version
BTS Software Version (23R3)	SBTS23R3_ENB_9999_230510_000006
RF_SW	RF. ERM6.trunk.20230508.011

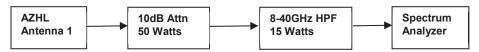
Description	le Peripherals) Manufacturer	Model/Part Number	Serial Number
AMIA (AirScale Indoor Subrack)	Nokia Solutions and Networks	473098A.204	UK222201001
ASIB (BTS System Module)	Nokia Solutions and Networks	473764A.102	K9214331950
ABIO (BTS Baseband Module)	Nokia Solutions and Networks	475266A.104	DH223246455
AZHL (Radio Module Model)	Nokia Solutions and Networks	475432A.101	YK203400004
Attenuator 50W/10dB	RF-Lambda	RFS50G26S10FF	20031702
High Pass Filter 8-40GHz/15W	RF-Lambda	RHPF23G08G40	17102700014
AOMC SFP28 + 9.8G,70M,850NM (BB)	Nokia	474900A.101	FR214716966
AOMC SFP28 + 9.8G,70M,850NM (RRH)	Nokia	474900A.101	FR214719852
ThinkPad T490 (WebEM- PC)	Lenovo	20N3S88012	PF26RVZ0
Keysight- DC System power supply	Keysight	N8757A	US21D4053S
FPAC (DC-PWR supply-BS)	Nokia	472805A.X21	A9124600282
(7) 2 Meter RF Load cables	RD Microwave Systems	CBL-6FT-NMNM-401J-N	19-1570-1941
150W -50ohm -Terminating Load	API Weinschel inc	1435-3-LIM	SR301
150W -50ohm -Terminating Load	API Weinschel inc	1435-3-LIM	SR297
150W -50ohm -Terminating Load	API Weinschel inc	1435-3-LIM	PZ468
150W -50ohm -Terminating Load	API Weinschel inc	1435-3-LIM	SR303
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC869
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	MG870
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC865
Fiber Optic cable 2m	Amphenol Fiber Optic	VZ1701	995741A
GPS cable 100m	FTSH	472577A.103	CA2029
FYGC GPS receiver	Nokia	474074A	1294000684
Cat-5e cable	CSA	LL73189	E151955
2 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_104	SN185855/4
1 Meter RF cable	RF-Lambda	RFC6767A-B7RU1219	AC20040004
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-72
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-48



Cables (Peripheral)					
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1(5G)	Connection 2
Fiber Optic Cable	N	2 meters	N	ABIO	AZHL
GPS Receiver Cable	Y	20 meters	N	ASIB	FYGB GPS receiver
Cat-5e Cable	Y	5 meters	N	ASIB	WebEM- PC
RD Microwave Systems – RF Cables (7)	Y	2 meters	Ν	EUT [AZHL] Ant ports 2-8	150W -50ohm/250W -50ohm -Load
Reference cables (Frame Clock & Trigger)	Y	1 meter	Ν	ASIB	Analyzer

Cables					
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1	Connection 2
HS-SUCOFLEX_104	Y	2 meters	N	EUT [AZHL] Ant port #1	Attenuator 50W/10dB
Attenuator 50W/10dB	Ν	NA	Ν	RF cable HS- SUCOFLEX_104	High Pass Filter 8-40GHz/15W
High Pass Filter 8-40GHz/15W	Ν	NA	Ν	Attenuator 50W/10dB	RF-Lambda - AC20040004
RF-Lambda - AC20040004	Y	1 meter	Ν	High Pass Filter 8-40GHz/15W	Analyzer

RF Test Setup Diagram:



MODIFICATIONS



Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2023-07-14	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	2023-07-14	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	2023-07-14	Output Power	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2023-07-14	Peak to Average Power (PAPR)CCDF	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	2023-07-14	Spurious Conducted Emissions	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	Schedule testing was completed.



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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3235-2148	ANF	2023-05-24	2024-05-24
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Generator - Signal	Agilent	N5183A	TID	2023-05-12	2025-05-12

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

RF conducted emissions testing was performed only on one port. The AZHL antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown during output power testing on 8 ports) 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, 6.4.

The 99% bandwidth was measured utilizing the analyzer's peak detector and measuring the carrier's 26 dB occupied bandwidth based on the peak output power level measured. A plot was taken to show the occupied bandwidth is contained within the allowable transmit band. FCC 27.53(m)(6) defines the emission bandwidth to be used as 26dB down.

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

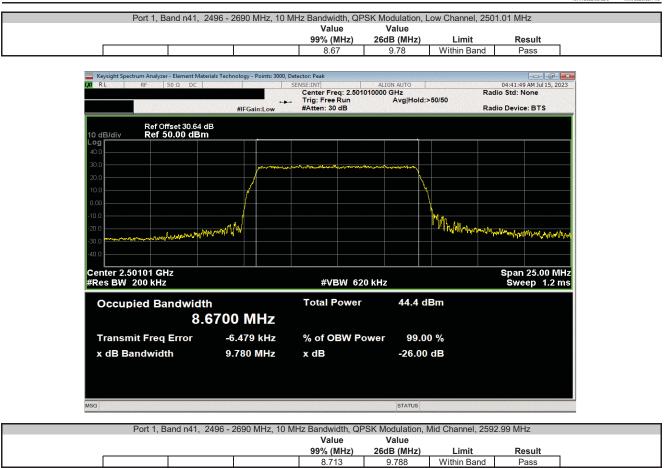
Band n41 (2496 MHz to 2690 MHz) Emission Designators derived from the measurement results

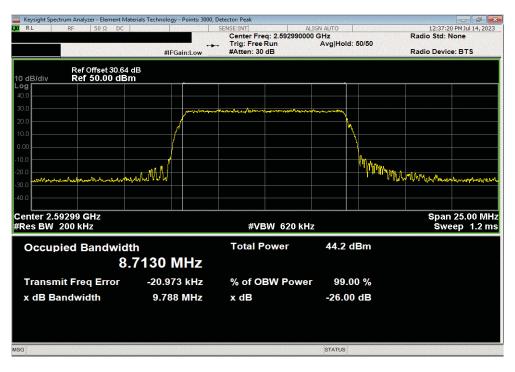
FCC Emission Designators for 5G-NR Band n41 (2496MHz to 2690MHz)							
Ch BW	Radio Channel	QPSK	16QAM	64QAM	256QAM		
	Low	9M78G7W	9M77G7W	9M75G7W	9M77G7W		
10MHz	Mid	9M79G7W	9M67G7W	9M74G7W	9M76G7W		
	High	9M79G7W	9M69G7W	9M79G7W	9M74G7W		
Note: FCC emis	sion designator	s are based on 2	26dB emission b	andwidth.			



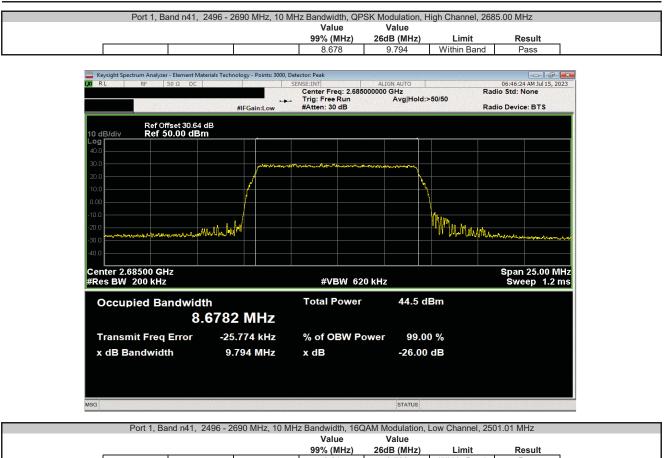
TbtTx 2022.05.02.0 EUT: AZHL Work Order: NOKI0067 Serial Number: YK203400004 Date: 07/14/2023 Customer: Nokia Solutions and Networks Temperature: 22°C Attendees: David Le, Mitchell Hill Humidity: 52.2% Project: None Barometric Pres.: 1016 mbar Power: 54VDC Tested by: Brandon Hobbs Job Site: TX07 TEST SPECIFICATIONS Test Method FCC 27:2023 ANSI C63.26:2015 COMMENTS All measurement path losses were accounted for in the reference level offest including any attenuators, filters and DC blocks. Band n41 carriers are enabled at maximum power (4 Watts/carrier). DEVIATIONS FROM TEST STANDARD None NOKI0067-2 Configuration # 1 Signature Value Value 99% (MHz) 26dB (MHz) Limit Result Port 1 Band n41, 2496 - 2690 MHz 10 MHz Bandwidth QPSK Modulation Low Channel, 2501.01 MHz 8.67 9.78 Within Band Pass Mid Channel, 2592.99 MHz 8.71 9.79 Within Band Pass High Channel, 2685.00 MHz 8.68 9.79 Within Band Pass 16QAM Modulation Low Channel, 2501.01 MHz 8.64 9.77 Within Band Pass Mid Channel, 2592.99 MHz 8.65 9.67 Within Band Pass High Channel, 2685.00 MHz 8.65 9.69 Within Band Pass 64QAM Modulation Low Channel, 2501.01 MHz 8.69 Within Band 9.75 Pass Mid Channel, 2592.99 MHz 9.74 Within Band 8.69 Pass High Channel, 2685.00 MHz 8.68 9.79 Within Band Pass 256QAM Modulation Low Channel, 2501.01 MHz 9.77 8.67 Within Band Pass Mid Channel, 2592.99 MHz 8.67 9.76 Within Band Pass High Channel, 2685.00 MHz 8.66 9.74 Within Band Pass

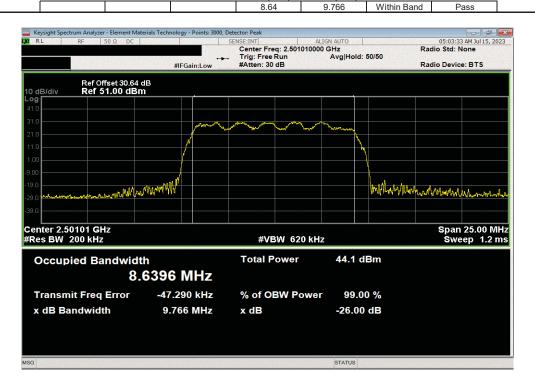




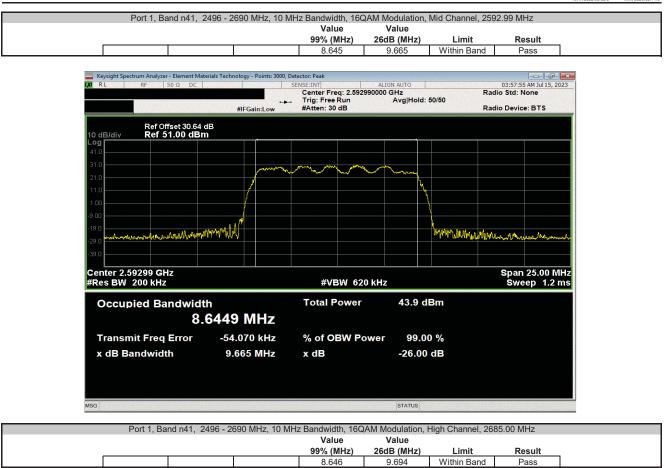


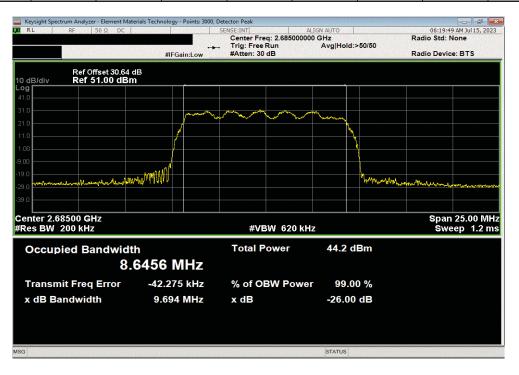




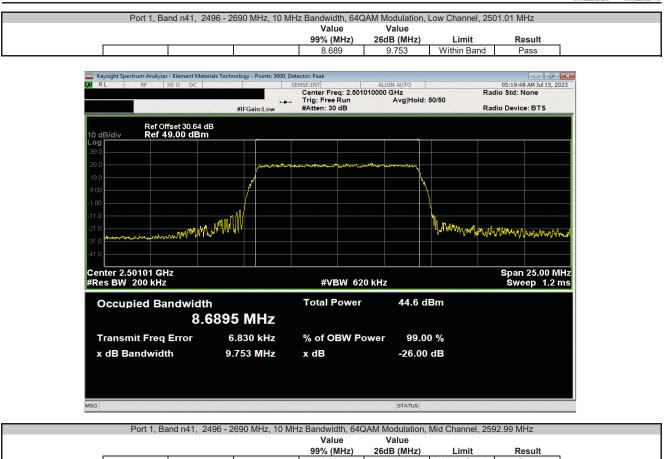


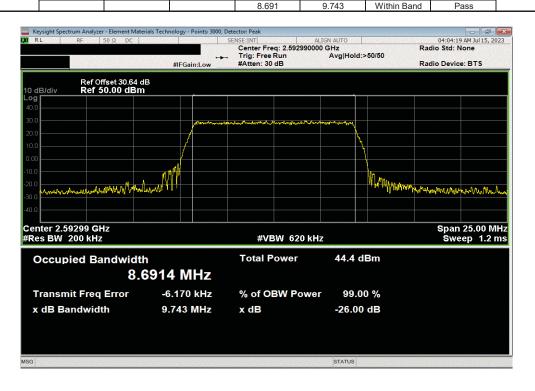




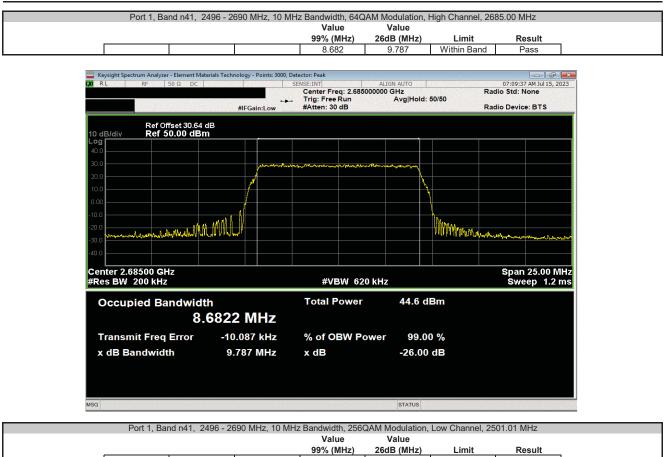


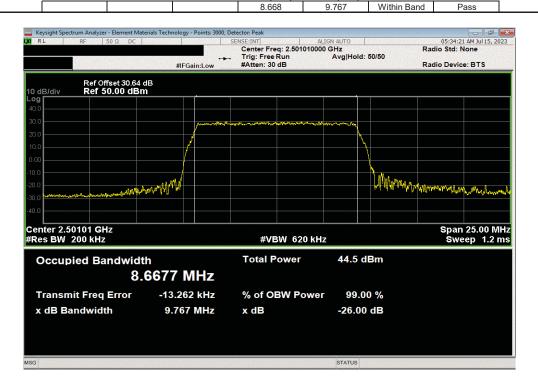




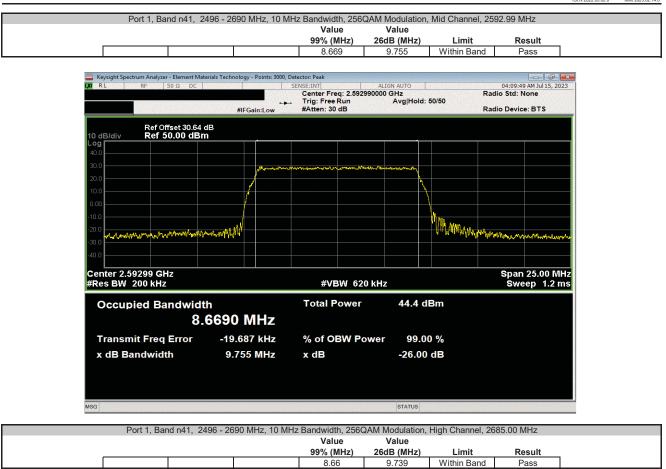


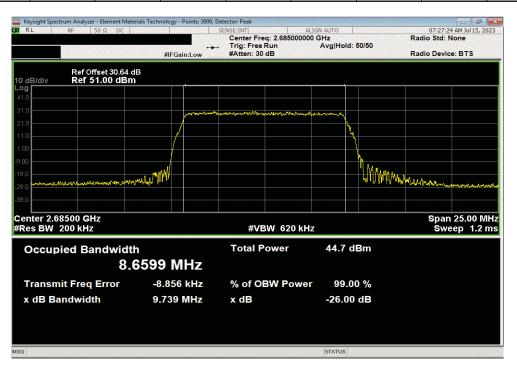














Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this 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	SD3235-2148	ANF	2023-05-24	2024-05-24
Generator - Signal	Agilent	N5183A	TID	2023-05-12	2025-05-12

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 AZHL antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown during 8 port output power 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.

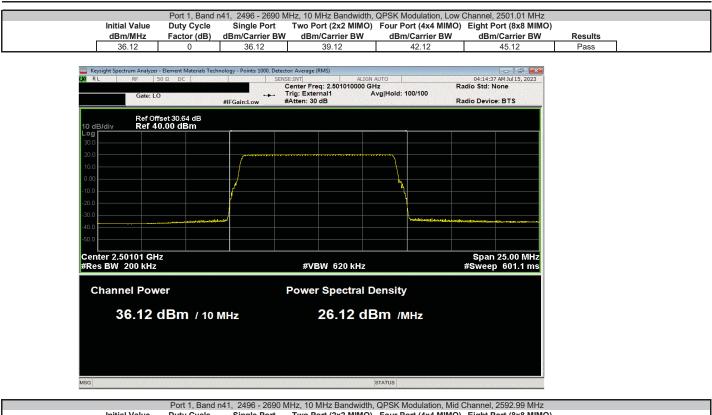
The total average transmit power of all antenna ports was determined per ANSI C63.26-2105 paragraph 6.4.3.1.

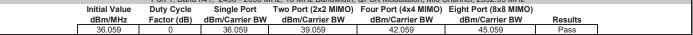
The EIRP limit is defined by FCC Part27.50(h)(ii) as 33dBW+ 10Log(X/Y) dBW + 10 log(360/beamwidth) dBW where X is the channel width in MHz and Y is 5.5 or 6MHz. PSD (power/1MHz) measurements are not required for this radio since the FCC limits for EIRP are defined in watts.



								TbtTx 2022.05.02.0	XMit 2023.
EUT:	AZHL						Work Order:	NOKI0067	
Serial Number:	YK203400004						Date:	07/14/2023	
Customer:	Nokia Solutions and Ne	tworks					Temperature:	21.1°C	
Attendees:	David Le, Mitchell Hill						Humidity:	53.8%	
Project:	None						Barometric Pres.:	1016 mbar	
Tested by:	Brandon Hobbs		Power:	54VDC			Job Site:	TX07	
EST SPECIFICAT	TIONS			Test Method					
CC 27:2023				ANSI C63.26:2	015				
OMMENTS									
4.3.1 and 6.4.3.2	4 (10 log Nout). The tota	gle carrier channel bandwidth on port 1. T I output power for two port operation is s ngle port + 9db [i.e. 10log(8)] All measure	ingle port po	wer + 3dB [i.e.	10log(2)]. The tot	al output power for fo	our port operation is si	ngle port + 6db [i.e. 10log(4)]. The tota
VIATIONS FRO	M TEST STANDARD						- /		
one									
onfiguration #	NOKI0067-2	Signature	-	In	-				
			Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	Eight Port (8x8 MIMO)	
			dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	Results
ort 1	Denda 44 0400 0000 N		dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	Results
ort 1	Band n41, 2496 - 2690 M		dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	Results
ort 1	Band n41, 2496 - 2690 M 10 MHz Ban	idwidth	dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	Results
ort 1		dwidth QPSK Modulation							
ort 1		dwidth QPSK Modulation Low Channel, 2501.01 MHz	36.12	0.000	36.120	39.1	42.1	45.1	Pass
ort 1		ndwidth QPSK Modulation Low Channel, 2501.01 MHz Mid Channel, 2592.99 MHz	36.12 36.059	0.000 0.000	36.120 36.059	39.1 39.1	42.1 42.1	45.1 45.1	Pass Pass
ort 1		dwidth QPSK Modulation Low Channel, 2501.01 MHz Mid Channel, 2592.99 MHz High Channel, 2685.00 MHz	36.12	0.000	36.120	39.1	42.1	45.1	Pass
ort 1		dwidth IQPSK Modulation Low Channel, 2501.01 MHz Mid Channel, 2592.99 MHz High Channel, 2685.00 MHz 16QAM Modulation	36.12 36.059 36.134	0.000 0.000 0.000	36.120 36.059 36.134	39.1 39.1 39.1	42.1 42.1 42.1	45.1 45.1 45.1	Pass Pass Pass
ort 1		dwidth QPSK Modulation Low Channel, 2501.01 MHz Mid Channel, 2592.99 MHz High Channel, 2685.00 MHz 16QAM Modulation Low Channel, 2501.01 MHz	36.12 36.059 36.134 35.78	0.000 0.000 0.000 0.000	36.120 36.059 36.134 35.780	39.1 39.1 39.1 38.8	42.1 42.1 42.1 41.8	45.1 45.1 45.1 44.8	Pass Pass Pass Pass
ort 1		dwidth QPSK Modulation Low Channel, 2501.01 MHz Mid Channel, 2592.99 MHz High Channel, 2685.00 MHz 16QAM Modulation Low Channel, 2501.01 MHz Mid Channel, 2592.99 MHz	36.12 36.059 36.134 35.78 35.753	0.000 0.000 0.000 0.000 0.000	36.120 36.059 36.134 35.780 35.753	39.1 39.1 38.1 38.8 38.8	42.1 42.1 42.1 41.8 41.8	45.1 45.1 45.1 44.8 44.8	Pass Pass Pass Pass Pass
ort 1		dwidth QPSK Modulation Low Channel, 2501.01 MHz Mid Channel, 2592.09 MHz High Channel, 2685.00 MHz 16QAM Modulation Low Channel, 2501.01 MHz Mid Channel, 2592.99 MHz High Channel, 2685.00 MHz	36.12 36.059 36.134 35.78	0.000 0.000 0.000 0.000	36.120 36.059 36.134 35.780	39.1 39.1 39.1 38.8	42.1 42.1 42.1 41.8	45.1 45.1 45.1 44.8	Pass Pass Pass Pass
ort 1		dwidth QPSK Modulation Low Channel, 2501.01 MHz Mid Channel, 2592.99 MHz High Channel, 2685.00 MHz 16QAM Modulation Low Channel, 2592.99 MHz Mid Channel, 2592.99 MHz High Channel, 2685.00 MHz 64QAM Modulation	36.12 36.059 36.134 35.78 35.753 35.924	0.000 0.000 0.000 0.000 0.000 0.000 0.000	36.120 36.059 36.134 35.780 35.753 35.924	39.1 39.1 39.1 38.8 38.8 38.8 38.9	42.1 42.1 42.1 41.8 41.8 41.9	45.1 45.1 45.1 44.8 44.8 44.9	Pass Pass Pass Pass Pass Pass
rt 1		dwidth OPSK Modulation Low Channel, 2501.01 MHz Mid Channel, 2592.99 MHz High Channel, 2685.00 MHz 16QAM Modulation Low Channel, 2501.01 MHz 64QAM Modulation Low Channel, 2501.01 MHz	36.12 36.059 36.134 35.78 35.753 35.924 36.014	0.000 0.000 0.000 0.000 0.000 0.000 0.000	36.120 36.059 36.134 35.780 35.753 35.924 36.014	39.1 39.1 39.1 38.8 38.8 38.9 38.9 39.0	42.1 42.1 42.1 41.8 41.8 41.9 42.0	45.1 45.1 45.1 44.8 44.8 44.9 45.0	Pass Pass Pass Pass Pass Pass Pass
rt 1		dwidth QPSK Modulation Low Channel, 2501.01 MHz Mid Channel, 2592.99 MHz High Channel, 2685.00 MHz I60AM Modulation Low Channel, 2501.01 MHz Mid Channel, 2685.00 MHz 640AM Modulation Low Channel, 2650.101 MHz Mid Channel, 2592.99 MHz	36.12 36.059 36.134 35.78 35.753 35.924 36.014 35.8	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	36.120 36.059 36.134 35.780 35.753 35.924 36.014 35.800	39.1 38.1 38.3 38.8 38.8 38.9 39.0 38.8	42.1 42.1 42.1 41.8 41.8 41.9 42.0 41.8	45.1 45.1 45.1 44.8 44.8 44.9 45.0 44.8	Pass Pass Pass Pass Pass Pass Pass Pass
ort 1		dwidth QPSK Modulation Low Channel, 2501.01 MHz Mid Channel, 2592.99 MHz High Channel, 2685.00 MHz 16QAM Modulation Low Channel, 2552.99 MHz High Channel, 2685.00 MHz 64QAM Modulation Low Channel, 2501.01 MHz Mid Channel, 2502.99 MHz High Channel, 2592.99 MHz	36.12 36.059 36.134 35.78 35.753 35.924 36.014	0.000 0.000 0.000 0.000 0.000 0.000 0.000	36.120 36.059 36.134 35.780 35.753 35.924 36.014	39.1 39.1 39.1 38.8 38.8 38.9 38.9 39.0	42.1 42.1 42.1 41.8 41.8 41.9 42.0	45.1 45.1 45.1 44.8 44.8 44.9 45.0	Pass Pass Pass Pass Pass Pass Pass
ort 1		dwidth QPSK Modulation Low Channel, 2501.01 MHz Mid Channel, 2592.99 MHz High Channel, 2685.00 MHz 16QAM Modulation Low Channel, 2501.01 MHz High Channel, 2685.00 MHz 64QAM Modulation Low Channel, 2501.01 MHz Mid Channel, 2592.99 MHz High Channel, 2685.00 MHz 256QAM Modulation	36.12 36.059 36.134 35.78 35.753 35.924 36.014 35.8	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	36.120 36.059 36.134 35.780 35.753 35.924 36.014 35.800 36.158	39.1 38.1 38.3 38.8 38.8 38.9 39.0 38.8	42.1 42.1 42.1 41.8 41.8 41.9 42.0 41.8	45.1 45.1 45.1 44.8 44.8 44.9 45.0 44.8	Pass Pass Pass Pass Pass Pass Pass Pass
ort 1		dwidth QPSK Modulation Low Channel, 2501.01 MHz Mid Channel, 2592.99 MHz High Channel, 2685.00 MHz 16QAM Modulation Low Channel, 2552.99 MHz High Channel, 2685.00 MHz 64QAM Modulation Low Channel, 2501.01 MHz Mid Channel, 2502.99 MHz High Channel, 2592.99 MHz	36.12 36.059 36.134 35.78 35.753 35.924 36.014 35.8	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	36.120 36.059 36.134 35.780 35.753 35.924 36.014 35.800	39.1 38.1 38.3 38.8 38.8 38.9 39.0 38.8	42.1 42.1 42.1 41.8 41.8 41.9 42.0 41.8	45.1 45.1 45.1 44.8 44.8 44.9 45.0 44.8	Pass Pass Pass Pass Pass Pass Pass Pass
ort 1		dwidth QPSK Modulation Low Channel, 2501.01 MHz Mid Channel, 2592.99 MHz High Channel, 2685.00 MHz 16QAM Modulation Low Channel, 2501.01 MHz High Channel, 2685.00 MHz 64QAM Modulation Low Channel, 2501.01 MHz Mid Channel, 2592.99 MHz High Channel, 2685.00 MHz 256QAM Modulation	36.12 36.059 36.134 35.78 35.753 35.924 36.014 35.8 36.158	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	36.120 36.059 36.134 35.780 35.753 35.924 36.014 35.800 36.158	39.1 39.1 38.8 38.8 38.9 39.0 38.8 39.0 38.8 39.2	42.1 42.1 41.8 41.8 41.9 42.0 41.8 42.2	45.1 45.1 44.8 44.8 44.9 45.0 44.8 45.2	Pass Pass Pass Pass Pass Pass Pass Pass





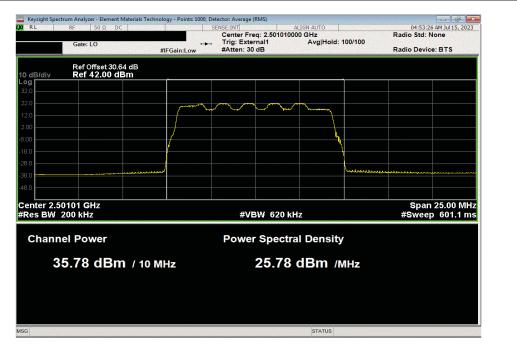


RF 50 Ω DC	#IFGain:Low	SENSE:INT Center Freq: 2.59: Trig: External1 #Atten: 30 dB	12:34:24 PM Jul 14, 2023 Radio Std: None Radio Device: BTS		
Ref Offset 30.64 div Ref 40.00 dBn					
			k		
	/				
					_
ter 2.59299 GHz s BW 200 kHz		#VBW 62	Span 25.00 MHz #Sweep 601.1 ms		
hannel Power		Power Spe			
36.06 dBm / 10 мнz		26.			





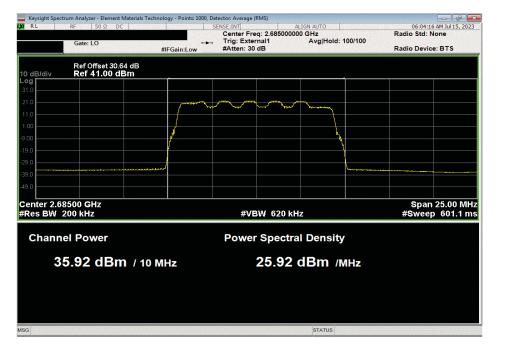
	Port 1, Band n	41, 2496 - 2690 MI	Hz, 10 MHz Bandwidth, 1	16QAM Modulation, Low	Channel, 2501.01 MHz	
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	Eight Port (8x8 MIMO)	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	Results
35.78	0	35.78	38.78	41.78	44.78	Pass



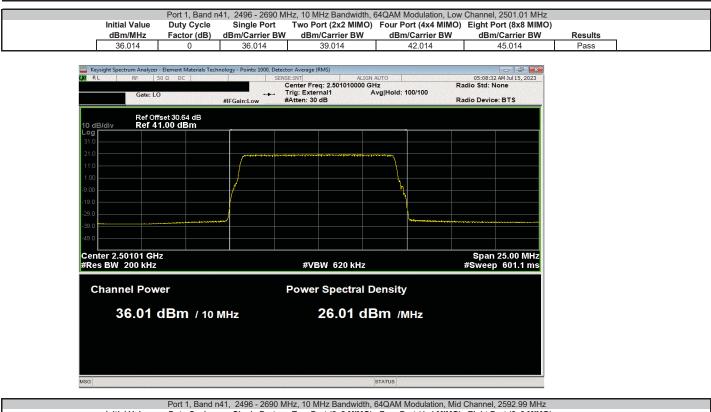




	Port 1, Band n	41, 2496 - 2690 Mł	Hz, 10 MHz Bandwidth, 1	16QAM Modulation, High	Channel, 2685.00 MHz	
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	Eight Port (8x8 MIMO)	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	Results
35.924	0	35.924	38.924	41.924	44.924	Pass





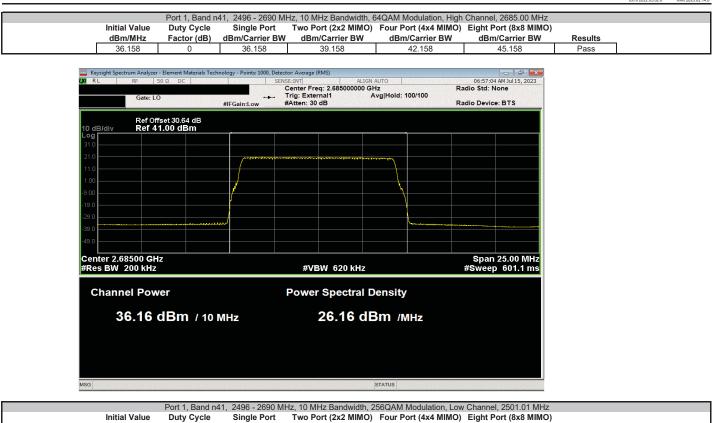


	Port 1, Band r	41, 2496 - 2690 M	Hz, 10 MHz Bandwidth,	64QAM Modulation, Mid	Channel, 2592.99 MHz		
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	Eight Port (8x8 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	Results	
35.8	0	35.8	38.8	41.8	44.8	Pass	

F	RF 50 Ω DC		SENSE:INT	04:03:24 AM Jul 1	5, 2023	
	Gate: LO	#IFGain:Low	Center Freq: 2.592990 Trig: External1 #Atten: 30 dB	0000 GHz Avg Hold: 100/100	Radio Std: None Radio Device: BTS	
/div	Ref Offset 30.64 dB Ref 40.00 dBm					
				·····		
		/				
		/				
		{				
				Laboration and the second s	• • • • • • • • • • • • • • • • • • •	
ter 2.59299 GHz s BW 200 kHz			#VBW 620	Span 25.00 MH; #Sweep 601.1 ms		
			D	-		
hannel Power			Power Spect			
35	.80 dBm / '	10 MHz	25.80	dBm /мнz		

OUTPUT POWER AND EIRP CALCULATIONS



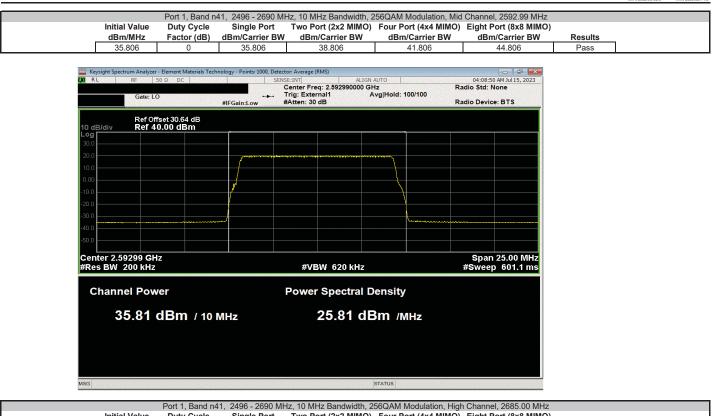


initial value	Duty Cycle	Single Port	Two Port (2x2 WIWO)	Four Port (4x4 WIIWO)	Eight Port (oxo WillviO)	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	Results
36.059	0	36.059	39.059	42.059	45.059	Pass

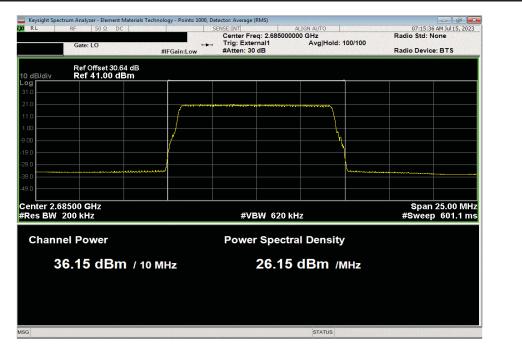
nt Spectrum Analyzer - Element Mate		SENSE:INT	ALIGN AUTO		05:24:32	AM Jul 15, 2023
Gate: LO	#IFGain:Low			d: 100/100	Radio Std: No Radio Device	
Ref Offset 30.64 c						
			ار با به او به او به و بر مواله و م با به برمو د به			
				<u>\</u>		
	manan			ummen	handharadharadh	hand
r 2.50101 GHz 3W 200 kHz		#VBM	/ 620 kHz			25.00 MH; 601.1 ms
annel Power		Power S	Spectral Densi	ty		
36.06 dBm	/ 10 MHz	2	6.06 dBm	/MHz		

OUTPUT POWER AND EIRP CALCULATIONS





			L, IO IIII IL Dailaniani, L	bod, an modulation, righ		
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	Eight Port (8x8 MIMO)	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	Results
36.153	0	36.153	39.153	42.153	45.153	Pass



OUTPUT POWER AND EIRP CALCULATIONS



5G NR EIRP Calculations for Eight Port MIMO Operations

EIRP calculations are needed at each transmitter location to optimize base station operational performance while meeting regulatory requirements. Each cell site installation needs to consider the power measurements in the radio certification report as well as site specific regulatory requirements (such as antenna height, population density, etc.), site installation parameters (line loss between antenna and radio, antenna parameters, etc.) and base station operational parameters (MIMO operational setup, carrier power level, channel bandwidth, modulation type, etc.) to optimize performance. Transmitter output power may be reduced (from maximum) by base station setup parameters. Base station antennas are selected by the customer.

The base station antenna is selected by the customer and this EIRP calculation is based upon a sample worst case antenna. The EIRP calculation is based upon the Commscope Planar Array Antenna model T4-90A-R1-V2. This antenna assembly has four columns with a maximum beamforming gain of 22.3 ± 0.8 dBi. The columns within the antenna have $\pm 45^{\circ}$ cross-polarized (orthogonal) radiators. The eight AZHL transmitter outputs are connected to the columns (four are connected to $\pm 45^{\circ}$ radiators/antennas). The AZHL provides transmitter outputs for one 4-column antenna.

Equivalent Isotropically Radiated Power (EIRP) is calculated (as specified in ANSI C63.26-2015 section 6.4 for a system of correlated output signals) from the results of power measurements (highest measured average power for each channel bandwidth type). The maximum antenna assembly beamforming gain was used for this calculation. The cable loss between the antenna and transmitter is site dependent (will not be 0 dB) but for this worst case EIRP calculation 0 dB was used. Calculations of worst-case EIRP for eight port MIMO are as follows:

Parameter	10 MHz Ch BW
Power Out /Radio Antenna Port	36.2 dBm or 4.17 W
Cable Loss	0 dB
Number of Ant Ports per Polarization	4
Total Power per Polarization	16.6 Watts or 42.2 dBm
Maximum Antenna Beamforming Gain per Polarization	23.1 dBi
EIRP per Polarization	65.3 dBm or 3.39 kW
Number of Polarizations	2
EIRP Total (See Note 1)	65.3 dBm or 3.39 kW
EIRP Limit Calculation (See Note 2)	76.6 dBm

Note 1: The EIRP per antenna polarity is required to be below the regulatory limit as described in ANSI C63.26-2015 section 6.4.6.3 b)2) and KDB 662911 D02v01 page 3 example (2) since the two transmitter outputs to each antenna are 90 degree-phase shifted relative to each other (cross-polarized radiators). Note 2: The EIRP limit is defined by FCC part 27.50(h)(ii) as 33dBW+ 10Log(X/Y) dBW + 10 log(360/beamwidth) dBW where X is the channel width in MHz and Y is 5.5 or 6MHz. The Commscope model T4-90A-R1-V2 antenna has a horizontal beamwidth of 26 degrees. Y was selected to be 6MHz for this calculation.

Calculation Summary

The worst case AZHL eight port MIMO EIRP levels for all 5G NR channel bandwidths using the Commscope antenna assembly model "T4-90A-R1-V2" are less than the FCC regulatory limits.



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
Block - DC	Fairview Microwave	SD3235-2148	ANF	2023-05-24	2024-05-24
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Generator - Signal	Agilent	N5183A	TID	2023-05-12	2025-05-12

TEST DESCRIPTION

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

Because the conducted Output Power was measured using a RMS Average detector, the Peak to Average Power Ratio (PAPR) was measured to show that the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed 13 dB.

The PAPR measurement method is described in ANSI C63.26 section 5.2.3.4.

The PAPR was measured using the CCDF function of the spectrum analyzer.

Per FCC Part 27.50, the PAPR limit shall not exceed 13 dB for more than the ANSI described 0.1% of the time.

RF conducted emissions testing was performed only on one port. The AZHL antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown during output power 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.



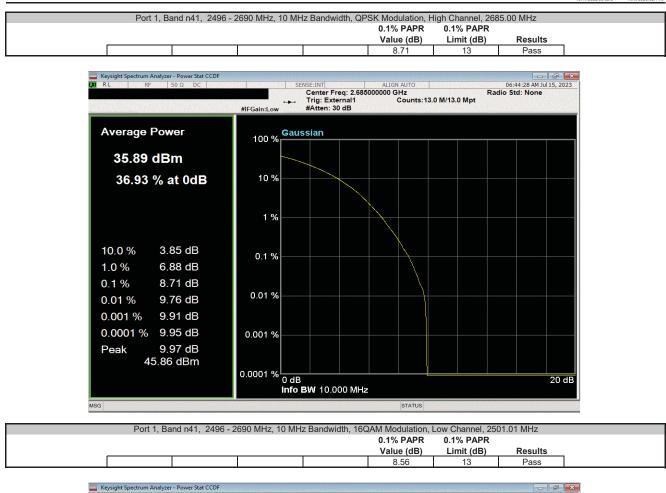
					1Bt1x 2022.05.02.0	XMIt 2023.02.14.0
	AZHL			Work Order:		
Serial Number:					07/14/2023	
	Nokia Solutions and Ne	tworks		Temperature:		
	David Le, Mitchell Hill			Humidity:		
Project:				Barometric Pres.:		
	Brandon Hobbs	Power	: 54VDC	Job Site:	TX07	
TEST SPECIFICAT	IONS		Test Method			
FCC 27:2023			ANSI C63.26:2015			
COMMENTS						
All measurement p	ath losses were account	ted for in the reference level offest including any a	ttenuators, filters and DC blocks. Ban	d n41 carriers are ena	bled at maximu	m power (4
Watts/carrier).						
	M TEST STANDARD					
None						
			1.			
Configuration #	NOKI0067-2	1	-Jal			
		Signature	\sim			
				0.1% PAPR		
				Value (dB)	Limit (dB)	Results
Port 1						
	Band n41, 2496 - 2690 N					
	10 MHz Bar					
		QPSK Modulation				
		Low Channel, 2501.01 MHz		8.85	13	Pass
		Mid Channel, 2592.99 MHz		8.85	13	Pass
		High Channel, 2685.00 MHz		8.71	13	Pass
		16QAM Modulation		0.55	40	
		Low Channel, 2501.01 MHz		8.56	13	Pass
		Mid Channel, 2592.99 MHz		8.62	13	Pass
		High Channel, 2685.00 MHz		8.46	13	Pass
		64QAM Modulation				
		Low Channel, 2501.01 MHz		8.58	13	Pass
		Mid Channel, 2592.99 MHz		8.56	13	Pass
		High Channel, 2685.00 MHz		8.42	13	Pass
		256QAM Modulation				
		Low Channel, 2501.01 MHz		8.68	13	Pass
		Mid Channel, 2592.99 MHz		8.70	13	Pass
		High Channel, 2685.00 MHz		8.50	13	Pass





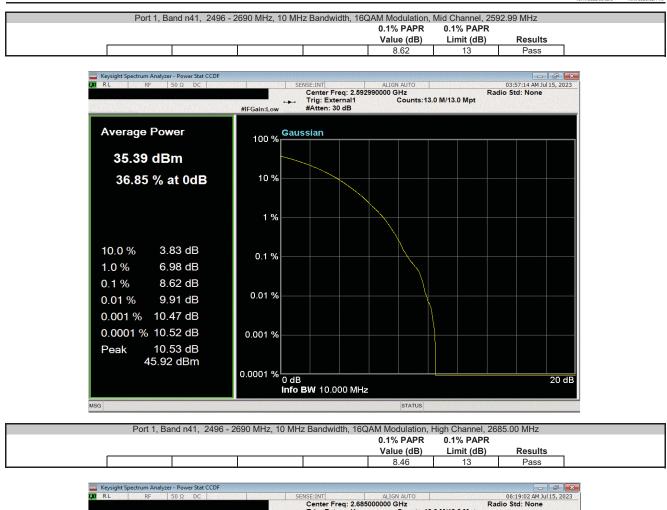
RL RF 50 Ω DC		SENSE:INT Center Freq: 2.		N AUTO		12:30 Radio Sto	5:57 PM Jul 14, 202
	#IFGain:Low			Counts:13.0 M	/13.0 Mpt	Tuulo Ste	
Average Power	100 % Ga	ussian		1 1			
35.66 dBm	_						
36.92 % at 0dB	10 %—						
	1 % —						
10.0 % 3.85 dB 1.0 % 6.88 dB	0.1 %—			$\begin{array}{c} \\ \end{array}$			
0.1 % 8.85 dB 0.01 % 9.71 dB	0.01 % —						
0.001 % 9.84 dB 0.0001 % 9.86 dB	0.001 %—						
Peak 9.87 dB 45.53 dBm	0.001-20						
	0.0001 % 0 c Inf	IB o BW 10.000 M	Hz				20 c

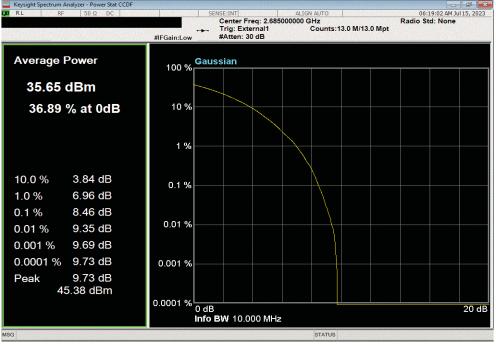




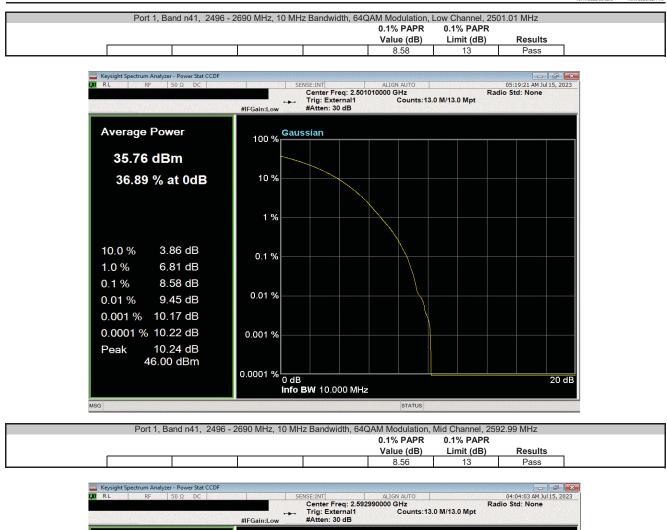
RL RF 50 Ω DC	c	ENSE:INT	ALIGN AUTO		05:03:02 AM	
	#IFGain:Low	Center Freq: 2.501 Trig: External1 #Atten: 30 dB		M/13.0 Mpt	Radio Std: Non	
Average Power	100 % Gau	ıssian				
35.51 dBm	/					
36.82 % at 0dB	10 %					
	1 %					
10.0 % 3.83 dB 1.0 % 6.98 dB	0.1 %					
0.1 % 8.56 dB 0.01 % 9.87 dB	0.01 %					
0.001 % 10.15 dB 0.0001 % 10.19 dB	0.001 %					
Peak 10.20 dB 45.71 dBm	0.0001 %					20-1
	Info	s BW 10.000 MHz				20 d
3			STATUS			

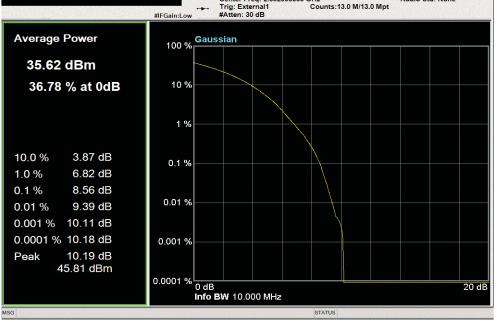






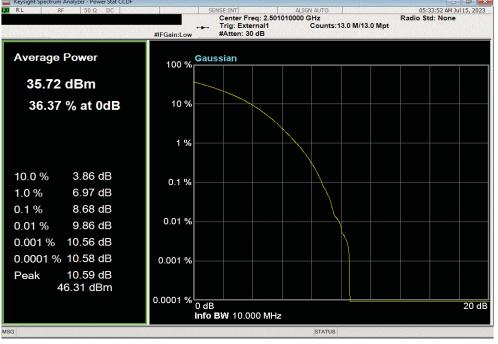






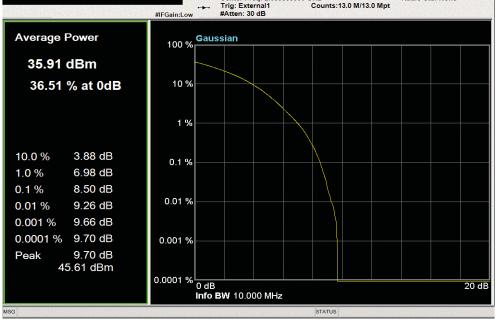














Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this 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
Block - DC	Fairview Microwave	SD3235-2148	ANF	2023-05-24	2024-05-24
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Generator - Signal	Agilent	N5183A	TID	2023-05-12	2025-05-12

TEST DESCRIPTION

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

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

Per FCC Part 27.53(m)(2), the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The BTS may operate as a 8 port MIMO transmitter with transmitter outputs connected to four cross-polarized antennas [four transmitter outputs are connected to (+) radiators and four transmitter outputs are connected to (-) radiators]. The limit is adjusted to -19 dBm [-13 dBm -10 log (4)] per FCC KDB 662911D01 v02r01, ANSI C63.26-2015 section 6.4.6.3 b)2) and KDB 662911 D02v01 page 3 example (2) since the transmitter outputs to each antenna are 90 degree-phase shifted relative to each other (cross-polarized radiators).

Per FCC 27.53(m)(6), "Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.....A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified)".

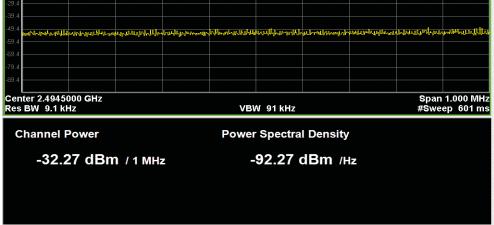
RF conducted emissions testing was performed only on one port. The AZHL antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown during output power testing) and antenna port 1 was selected to perform the testing under this effort as allowed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



						TbtTx 2022.05.02.0	XMit 202
EUT: A	AZHL				Work Order:	IOKI0067	
Serial Number: Y					Date: 0	7/14/2023	
	Nokia Solutions and Net	works		-	Cemperature: 2		
Attendees: D	David Le, Mitchell Hill				Humidity: 5	2.9%	
Project: N				Baro	metric Pres.: 1	015 mbar	
	Brandon Hobbs	Po	ower: 54VDC		Job Site: 1	X07	
EST SPECIFICATIO	DNS		Test Method				
CC 27:2023			ANSI C63.26:2015				
OMMENTS							
II measurement par	th losses were account	ted for in the reference level offest including a	ny attenuators, filters and DC block	s. Band n41 carrier	s are enabled a	t maximum powe	r (4.0
atts/carrier).		C C				•	•
,-							
EVIATIONS FROM	TEST STANDARD						
one							
			1				
onfiguration #	NOKI0067-2		2 And				
		Signature	\sim				
			Frequency	Measured	Max Value	Limit	
ort 1			Range	Freq (MHz)	(dBm)	< (dBm)	Result
		QPSK Modulation Low Channel, 2501.01 MHz	1	2496.0	-32.2	-19	Pass
	10 MHz Ban						
			1	2496.0	-32.2	_10	Pass
		Low Channel, 2501.01 MHz	2	2494.5	-32.3	-19	Pass
		Low Channel, 2501.01 MHz	3	2494.0	-32.1	-19	Pass
		High Channel, 2685.00 MHz	1	2690.0	-31.1	-19	Pass
		High Channel, 2685.00 MHz	2	2691.5	-31.6	-19	Pass
		High Channel, 2685.00 MHz	3	2692.0	-32.1	-19	Pass
		16QAM Modulation	, i i i i i i i i i i i i i i i i i i i	2002.0	02.1	10	1 400
		Low Channel, 2501.01 MHz	4		-32.5		
				2496.0		-19	Pass
			1	2496.0 2494 5		-19 -19	Pass
		Low Channel, 2501.01 MHz	2	2494.5	-32.5	-19	Pass
		Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz	2 3	2494.5 2494.0	-32.5 -32.6	-19 -19	Pass Pass
		Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz	2 3 1	2494.5 2494.0 2690.0	-32.5 -32.6 -32.5	-19 -19 -19	Pass Pass Pass
		Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz	2 3 1 2	2494.5 2494.0 2690.0 2691.5	-32.5 -32.6 -32.5 -31.5	-19 -19 -19 -19	Pass Pass Pass Pass
		Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz	2 3 1	2494.5 2494.0 2690.0	-32.5 -32.6 -32.5	-19 -19 -19	Pass Pass Pass
		Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz 64QAM Modulation	2 3 1 2 3	2494.5 2494.0 2690.0 2691.5 2692.0	-32.5 -32.6 -32.5 -31.5 -32.0	-19 -19 -19 -19 -19	Pass Pass Pass Pass Pass
		Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz 64QAM Modulation Low Channel, 2501.01 MHz	2 3 1 2 3	2494.5 2494.0 2690.0 2691.5 2692.0 2496.0	-32.5 -32.6 -32.5 -31.5 -32.0 -32.3	-19 -19 -19 -19 -19 -19	Pass Pass Pass Pass Pass Pass
		Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz 64QAM Modulation Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz	2 3 1 2 3 1 2 3	2494.5 2494.0 2690.0 2691.5 2692.0 2496.0 2494.5	-32.5 -32.6 -32.5 -31.5 -32.0 -32.3 -32.3 -32.6	-19 -19 -19 -19 -19 -19 -19	Pass Pass Pass Pass Pass Pass Pass
		Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz 64QAM Modulation Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz	2 3 1 2 3 1 2 3	2494.5 2494.0 2690.0 2691.5 2692.0 2496.0 2494.5 2494.0	-32.5 -32.6 -32.5 -31.5 -32.0 -32.3 -32.6 -32.8	-19 -19 -19 -19 -19 -19 -19 -19 -19	Pass Pass Pass Pass Pass Pass Pass Pass
		Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz 64QAM Modulation Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz	2 3 1 2 3 1 2 3 1	2494.5 2494.0 2690.0 2691.5 2692.0 2496.0 2494.5 2494.5 2494.0 2690.0	-32.5 -32.6 -32.5 -31.5 -32.0 -32.3 -32.6 -32.8 -31.5	-19 -19 -19 -19 -19 -19 -19 -19 -19 -19	Pass Pass Pass Pass Pass Pass Pass Pass
		Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz 64QAM Modulation Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz	2 3 1 2 3 1 2 3 1 2 3 1 2	2494.5 2494.0 2690.0 2691.5 2692.0 2496.0 2494.5 2494.0 2690.0 2691.5	-32.5 -32.6 -32.5 -31.5 -32.0 -32.3 -32.6 -32.8 -31.5 -31.2	-19 -19 -19 -19 -19 -19 -19 -19 -19 -19	Pass Pass Pass Pass Pass Pass Pass Pass
		Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz 64QAM Modulation Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz	2 3 1 2 3 1 2 3 1	2494.5 2494.0 2690.0 2691.5 2692.0 2496.0 2494.5 2494.5 2494.0 2690.0	-32.5 -32.6 -32.5 -31.5 -32.0 -32.3 -32.6 -32.8 -31.5	-19 -19 -19 -19 -19 -19 -19 -19 -19 -19	Pass Pass Pass Pass Pass Pass Pass Pass
		Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz G4QAM Modulation Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz	2 3 1 2 3 1 2 3 1 2 3 1 2 3	2494.5 2494.0 2690.0 2691.5 2692.0 2496.0 2494.5 2494.0 2690.0 2691.5 2692.0	-32.5 -32.6 -32.5 -31.5 -32.0 -32.3 -32.6 -32.8 -31.5 -31.2 -32.1	-19 -19 -19 -19 -19 -19 -19 -19 -19 -19	Pass Pass Pass Pass Pass Pass Pass Pass
		Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz 64QAM Modulation Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz Low Channel, 2650.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz Bigh Channel, 2685.00 MHz Cow Channel, 2501.01 MHz	2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1	2494.5 2494.0 2690.0 2691.5 2692.0 2496.0 2494.5 2494.0 2690.0 2691.5 2692.0 2496.0	-32.5 -32.6 -32.5 -31.5 -32.0 -32.3 -32.6 -32.8 -31.5 -31.2 -32.1 -32.1	-19 -19 -19 -19 -19 -19 -19 -19 -19 -19	Pass Pass Pass Pass Pass Pass Pass Pass
		Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz 64QAM Modulation Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz Z56QAM Modulation Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz	2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3	2494.5 2494.0 2690.0 2691.5 2692.0 2496.0 2494.5 2494.0 2690.0 2691.5 2692.0 2496.0 2494.5	-32.5 -32.6 -32.5 -31.5 -32.0 -32.3 -32.6 -32.8 -31.5 -31.2 -32.1 -32.5 -32.6	-19 -19 -19 -19 -19 -19 -19 -19 -19 -19	Pass Pass Pass Pass Pass Pass Pass Pass
		Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz G4QAM Modulation Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz Low Channel, 2685.00 MHz Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz	2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 3	2494.5 2494.0 2690.0 2691.5 2692.0 2496.0 2494.5 2494.0 2690.0 2691.5 2692.0 2496.5 2496.5 2493.9	-32.5 -32.6 -32.5 -31.5 -32.0 -32.3 -32.6 -32.8 -31.5 -31.2 -32.1 -32.1 -32.5 -32.6 -32.0	-19 -19 -19 -19 -19 -19 -19 -19 -19 -19	Pass Pass Pass Pass Pass Pass Pass Pass
		Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz 64QAM Modulation Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz High Channel, 2685.00 MHz Z56QAM Modulation Low Channel, 2501.01 MHz Low Channel, 2501.01 MHz	2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3	2494.5 2494.0 2690.0 2691.5 2692.0 2496.0 2494.5 2494.0 2690.0 2691.5 2692.0 2496.0 2494.5	-32.5 -32.6 -32.5 -31.5 -32.0 -32.3 -32.6 -32.8 -31.5 -31.2 -32.1 -32.5 -32.6	-19 -19 -19 -19 -19 -19 -19 -19 -19 -19	Pass Pass Pass Pass Pass Pass Pass Pass



,	Frequency	, .	IHz Bandwidth, QP Measured	Max Value	Limit		
	Range		Freq (MHz) 2496.0	(dBm)	< (dBm) -19	Result	1
	1		2490.0	-32.2	-19	Pass	
Keysight Spectrum Analyze	er - Element Materials Techno	logy				- 6	
	50 Ω DC		SENSE:INT	ALIGN AUTO		04:23:30 AM Jul 15 2	123
Gate: L	0	PNO: Wide ↔	Trig: External1	Avg Type: Avg Hold:	RMS 5/5	TRACE 1 2 3	
		IFGain:Low	#Atten: 30 dB			DETANN	
Ref Offse	et 30.64 dB				Mkr1 2.	496 000 0 G -32.187 dl	HZ 8m
10 dB/div Ref 30.	64 dBm		¥				
20.6							
10.6							
0.640							
-9.36							
-19.4				,		DL1 -19.00	dBm
-29.4			\$ ¹ ′				
-39.4							
-49.4							
-59.4							
Start 2.495000 GH						top 2.497000 G	
#Res BW 100 kHz		#VB	W 300 kHz*		#Sweep	4.000 s (1000 j	ots)
MSG				STATUS			
Port 1, B	and n41, 2496 - 26	690 MHz, 10 M	1Hz Bandwidth, QP	SK Modulation, L	ow Channel, 250	1.01 MHz	
,	Frequency		Measured	Max Value	Limit		
	Range		Freq (MHz)	(dBm)	< (dBm)	Result	1
l	2		2494.5	-32.3	-19	Pass	
Keysight Spectrum Analyze	er - Element Materials Techno	Jogy - Points 601 De	tector Average (PMS)				82
	50 Ω DC		SENSE:INT	ALIGN AUTO		04:31:08 AM Jul 15, 2	
Gate: L	_0	·•·	Center Freq: 2.494 Trig: External1	500000 GHz Avg Hold: 4	50/50	dio Std: None	
	i	#IFGain:Low	#Atten: 10 dB		Rad	dio Device: BTS	
Ref O	ffset 30.64 dB						
10 dB/div Ref (0.64 dBm						
-9.36							



STATUS



	Frequency		Measured	Max Value	Limit	
	Range		Freq (MHz)	(dBm)	< (dBm)	Result
	3		2494.0	-32.1	-19	Pass
LXI RL	rum Analyzer - Element Materials Techno RF 50 Ω DC		SE:INT	ALIGN AUTO		04:38:36 AM Jul 15, 2023
	Gate: LO	PNO: Fast	Trig: External1 #Atten: 20 dB	Avg Type: Avg Hold:		TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A N N N N N
10 dB/div	Ref Offset 30.64 dB Ref 40.64 dBm				Mkr1	2.494 000 GHz -32.072 dBm
			Ť			
30.6						
30.0						
20.6						
10.6						
0.640						
-9.36						
-19.4						DL1 -19.00 dBm
-29.4						¹
						All and a state of the state of
-39.4						
-49.4						
49.4						
Start 2.4740 #Res BW 1.		#VBW	3.0 MHz*			Stop 2.49400 GHz 4.000 s (1000 pts)
MSG				STATUS		
	Port 1, Band n41, 2496 - 26					

Port 1, Ba	ind n41, 2496 - 2	2690 MHz, 10 MH	z Bandwidth, QP	SK Modulation, H	ligh Channel, 268	85.00 MHz
	Frequency		Measured	Max Value	Limit	
	Range		Freq (MHz)	(dBm)	< (dBm)	Result
			2690.0	21.1	40	Pass





	Frequency		Measured	Max Value	Limit		
	Range		Freq (MHz)	(dBm)	< (dBm)	Result	
	2		2691.5	-31.6	-19	Pass	
Keysight Spectru	um Analyzer - Element Materials Techn	ology - Points: 601, Detector	: Average (RMS)				F .
LXI RL	RF 50 Ω DC		E:INT	ALIGN AUTO		06:33:13 AM Jul 1	5, 2023
			enter Freq: 2.691 rig: External1	500000 GHz Avg Hold: 5		Radio Std: None	
	Gate: LO		Atten: 10 dB	Avginoid. o		Radio Device: BTS	
40 -004-0	Ref Offset 30.64 dB Ref 0.64 dBm						
10 dB/div Log	Rei 0.04 abm						
-9.36							
-19.4							
-29.4							
-39.4							
-49.4 malemanthan		parting and the grand and a	Դուրերությունը Դուրերությունը Դուրերությունը Դուրերությունը	ade for the second s	-	ՙֈ֍֎ֈ֍֍ֈ֍ֈ֍֎ՠֈֈֈֈ֍֎ՠֈֈֈֈ֍֎ՠֈֈֈֈ֍֎ՠֈֈֈֈ֍֎ՠֈֈֈֈ	hanner and
-59.4							
-69.4							
-79.4							
-89.4							
Center 2.69	15000 GHz				II	Span 1.000	MHz
Res BW 9.1			VBW 91 k	Hz		#Sweep 60	
Channe	Power		Power Spe	ctral Density			
onanno			oner oper	beneficity			
21	.62 dBm / 1 мі	-	01 6	2 dBm /н	-		
-31		12	-31.0		Z		

Port 1, Ba	and n41, 2496 - 2	2690 MHz, 10 MH	z Bandwidth, QP	SK Modulation, H	ligh Channel, 268	35.00 MHz
	Frequency		Measured	Max Value	Limit	
	Range		Freq (MHz)	(dBm)	< (dBm)	Result
	3		2692.0	-32.1	-19	Pass

RL	ectrum Analyzer - Element Materials RF 50 Ω DC		SENSE:INT	ALIGN AUTO	06:41:46 AM Jul 15, 202
KL	Gate: LO	PNO: Fast ↔→		Avg Type: RMS Avg Hold: 5/5	TRACE 1 2 3 4 5 TYPE A WWW DET A NNN
dB/div	Ref Offset 30.64 dB Ref 40.64 dBm	in Galin.Low			Mkr1 2.692 040 GH -32.049 dBi
-			Ť		
.6					
.6					
.6					
0					
6					
.4					DL1 -19.00 c
4					
4					
.4					
art 2.69	200 GHz				Stop 2.71200 Gł
	1.0 MHz	#VB	W 3.0 MHz*	#S	weep 4.000 s (1000 pt



	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1	1	2496.0	-32.5	-19	Pass
	lyzer - Element Materials Teo 50 Ω DC		SENSE:INT	ALIGN AUTO		
	e: LO	PNO: Wide +++	Trig: External1	ALIGN AUTO Avg Type: Avg Hold: (04:55:36 AM JULIS, 20 TRACE 1 2 3 4 TYPE A WWW DET A N.N.N
		IFGain:Low	#Atten: 30 dB	-		2.496 000 0 G
10 dB/div Ref 3	fset 30.64 dB 1 0.64 dBm					-32.489 dB
Log			Ĭ			
20.6						
10.6						
0.640						
-9.36						
-19.4						DL1 -19.00
-29.4			1/			
-39.4						
-49.4						
-59.4						
			k			Stop 2 407000 C
Start 2.495000 G #Res BW 100 kH		#VBI	W 300 kHz*			Stop 2.497000 G 5 4.000 s (1000 p
		#VB\	W 300 kHz*	STATUS		
#Res BW 100 kH	Band n41, 2496 -		Hz Bandwidth, 160	QAM Modulation, I	#Sweep	o 4.000 s (1000 p
#Res BW 100 kH	Band n41, 2496 - Frequency Range		Hz Bandwidth, 160 Measured Freq (MHz)	QAM Modulation, I Max Value (dBm)	#Sweep Low Channel, 25 Limit < (dBm)	501.01 MHz Result
#Res BW 100 kH	Band n41, 2496 - Frequency		Hz Bandwidth, 160 Measured	QAM Modulation, I Max Value	#Sweep Low Channel, 2: Limit	501.01 MHz
#Res BW 100 kF	Band n41, 2496 - Frequency Range 2 Ivzer - Element Materials Tec	2690 MHz, 10 MI	Hz Bandwidth, 160 Measured Freq (MHz) 2494.5 tector: Average (RMS)	QAM Modulation, I Max Value (dBm) -32.5	#Sweep Low Channel, 25 Limit < (dBm)	501.01 MHz Result Pass
#Res BW 100 kF	Band n41, 2496 - Frequency Range 2	2690 MHz, 10 MI	Hz Bandwidth, 16(Measured Freq (MHz) 2494.5 tector Average (RMS) SENSE:INT Center Freq: 2.49 Trig: External	QAM Modulation, I Max Value (dBm) -32.5 ALIGN AUTO	#Sweep Low Channel, 29 Limit < (dBm) -19 -19 R	0 4.000 s (1000 p 501.01 MHz Pass 05:00:11 AM Jul 15, 20 ctadio Std: None
#Res BW 100 kF	IZ Band n41, 2496 - Frequency Range 2 lyzer - Element Materials Tec 50 Ω DC B: LO	2690 MHz, 10 MI	Hz Bandwidth, 16(Measured Freq (MHz) 2494.5 tector: Average (RMS) SENSE:INT Center Freq: 2.49	QAM Modulation, I Max Value (dBm) -32.5 ALIGN AUTO 4500000 GHz	#Sweep Low Channel, 29 Limit < (dBm) -19 -19 R	501.01 MHz Result Pass 05:00:11 AM Jul 15, 20
#Res BW 100 kF	Band n41, 2496 - Frequency Range 2 Ivzer - Element Materials Tec 50 Ω DC	2690 MHz, 10 MI	Hz Bandwidth, 16(Measured Freq (MHz) 2494.5 tector Average (RMS) SENSE:INT Center Freq: 2.49 Trig: External	QAM Modulation, I Max Value (dBm) -32.5 ALIGN AUTO 4500000 GHz	#Sweep Low Channel, 29 Limit < (dBm) -19 -19 R	0 4.000 s (1000 p 501.01 MHz Pass 05:00:11 AM Jul 15, 20 ctadio Std: None
#Res BW 100 kF	Iz Band n41, 2496 - Frequency Range 2 2 Vzer - Element Materials Tec 50 Ω DC E: LO	2690 MHz, 10 MI	Hz Bandwidth, 16(Measured Freq (MHz) 2494.5 tector Average (RMS) SENSE:INT Center Freq: 2.49 Trig: External	QAM Modulation, I Max Value (dBm) -32.5 ALIGN AUTO 4500000 GHz	#Sweep Low Channel, 29 Limit < (dBm) -19 R 50/50	0 4.000 s (1000 p 501.01 MHz Pass 05:00:11 AM Jul 15, 20 ctadio Std: None
#Res BW 100 kH	Iz Band n41, 2496 - Frequency Range 2 2 Vzer - Element Materials Tec 50 Ω DC E: LO	2690 MHz, 10 MI	Hz Bandwidth, 16(Measured Freq (MHz) 2494.5 tector Average (RMS) SENSE:INT Center Freq: 2.49 Trig: External	QAM Modulation, I Max Value (dBm) -32.5 ALIGN AUTO 4500000 GHz	#Sweep Low Channel, 29 Limit < (dBm) -19 R 50/50	0 4.000 s (1000 p 501.01 MHz Pass 05:00:11 AM Jul 15, 20 ctadio Std: None
#Res BW 100 kH	Iz Band n41, 2496 - Frequency Range 2 2 Vzer - Element Materials Tec 50 Ω DC E: LO	2690 MHz, 10 MI	Hz Bandwidth, 16(Measured Freq (MHz) 2494.5 tector Average (RMS) SENSE:INT Center Freq: 2.49 Trig: External	QAM Modulation, I Max Value (dBm) -32.5 ALIGN AUTO 4500000 GHz	#Sweep Low Channel, 29 Limit < (dBm) -19 R 50/50	0 4.000 s (1000 p 501.01 MHz Pass 05:00:11 AM Jul 15, 20 ctadio Std: None
#Res BW 100 kH MSG Port 1,	Iz Band n41, 2496 - Frequency Range 2 2 Vzer - Element Materials Tec 50 Ω DC e: LO coffset 30.64 dB f 0.64 dBm	2690 MHz, 10 MI	Hz Bandwidth, 160 Measured Freq (MHz) 2494.5 2494.5 2494.5 2494.5 SENSEINTI Center Freq: 249 Trig: External1 #Atten: 10 dB	AM Modulation, I Max Value (dBm) -32.5 - - - - - - - - - - - - - - - - - - -	#Sweep Low Channel, 25 Limit < (dBm) -19 50/50 R R	0 4.000 s (1000 p 501.01 MHz Pass 05:00:11 AM Jul 15, 20 ctadio Std: None
#Res BW 100 kH	Iz Band n41, 2496 - Frequency Range 2 2 Vzer - Element Materials Tec 50 Ω DC e: LO coffset 30.64 dB f 0.64 dBm	2690 MHz, 10 MI	Hz Bandwidth, 160 Measured Freq (MHz) 2494.5 2494.5 2494.5 2494.5 SENSEINTI Center Freq: 249 Trig: External1 #Atten: 10 dB	AM Modulation, I Max Value (dBm) -32.5 - - - - - - - - - - - - - - - - - - -	#Sweep Low Channel, 25 Limit < (dBm) -19 50/50 R R	0 4.000 s (1000 p 501.01 MHz Result Pass 05:00:11 AM Jul 15, 20 cadio Std: None sadio Device: BTS
#Res BW 100 kF MSG Port 1, Port 1, Keysight Spectrum Ana W RL Ref O dB/div Ref O dB/div Ref -9.36 -19.4 -39.4 -49.4 -59.4 -79.4	Iz Band n41, 2496 - Frequency Range 2 2 Vzer - Element Materials Tec 50 Ω DC e: LO coffset 30.64 dB f 0.64 dBm	2690 MHz, 10 MI	Hz Bandwidth, 160 Measured Freq (MHz) 2494.5 2494.5 2494.5 2494.5 SENSEINTI Center Freq: 249 Trig: External1 #Atten: 10 dB	AM Modulation, I Max Value (dBm) -32.5 - - - - - - - - - - - - - - - - - - -	#Sweep Low Channel, 25 Limit < (dBm) -19 50/50 R R	0 4.000 s (1000 p 501.01 MHz Result Pass 05:00:11 AM Jul 15, 20 cadio Std: None sadio Device: BTS
#Res BW 100 kF MSG Port 1, Port 1, Port 1, Port 1, Ref Od RL Rf Od B/div Ref Od B/div Ref Port 1, Port 1, Port 1, Rf Od B/div Ref Port 2,3,36 Port 1, Port 1, Rf Port 1, Rf Port 1, Rf Gate Rf Port 1, Rf State Rf Port 1, Rf State Rf Port 1, Rf Port 1, Rf State Rf Port 1, Rf	Iz Band n41, 2496 - Frequency Range 2 2 iyzer - Element Materials Tec 50 Ω DC e: LO f Offset 30.64 dB f 0.64 dBm	2690 MHz, 10 MI	Hz Bandwidth, 160 Measured Freq (MHz) 2494.5 2494.5 2494.5 2494.5 SENSEINTI Center Freq: 249 Trig: External1 #Atten: 10 dB	AM Modulation, I Max Value (dBm) -32.5 - - - - - - - - - - - - - - - - - - -	#Sweep Low Channel, 25 Limit < (dBm) -19 50/50 R R	A.000 s (1000 p 501.01 MHz Result Pass 05:00:11 AM Julis, 20 adio Std: None sadio Device: BTS
#Res BW 100 kH #sg Port 1, Port 1, Keysight Spectrum Ana X RL RF Gate	Iz Band n41, 2496 - Frequency Range 2 Vyzer - Element Materials Tec 50 C C C C C C C C C C C C C	2690 MHz, 10 MI	Hz Bandwidth, 160 Measured Freq (MHz) 2494.5 2494.5 2494.5 2494.5 SENSEINTI Center Freq: 249 Trig: External1 #Atten: 10 dB	QAM Modulation, I Max Value (dBm) -32.5 · ALIGN AUTO 4500000 GHz Avg Hold: (#Sweep Low Channel, 25 Limit < (dBm) -19 50/50 R R	0 4.000 s (1000 p 501.01 MHz Result Pass 05:00:11 AM Jul 15, 20 cadio Std: None sadio Device: BTS
Keysight Spectrum Ana X RF Gatt Gatt 0.36 Ref 10.4 B/div	Iz Band n41, 2496 - Frequency Range 2 lyzer - Element Materials Tec 50 2 DC e: LO COffset 30.64 dB f 0.64 dB f 0.64 dB f 0.64 dB f 0.64 dB f 0.64 dB	2690 MHz, 10 MI	Hz Bandwidth, 160 Measured Freq (MHz) 2494.5 tettor: Average (RMS) SENSEINT Center Freq: 2.49 Trig: External 1 #Atten: 10 dB	QAM Modulation, I Max Value (dBm) -32.5 · ALIGN AUTO 4500000 GHz Avg Hold: (#Sweep Low Channel, 24 Limit < (dBm) -19 50/50 R 50/50 R	2 4.000 s (1000 p 501.01 MHz Result Pass 05:00:1 AM Jul 15, 20 Colspan="2">Colspan="2" Colspan="2">Colspan="2" Colspan="2" Colspan="2"

STATUS

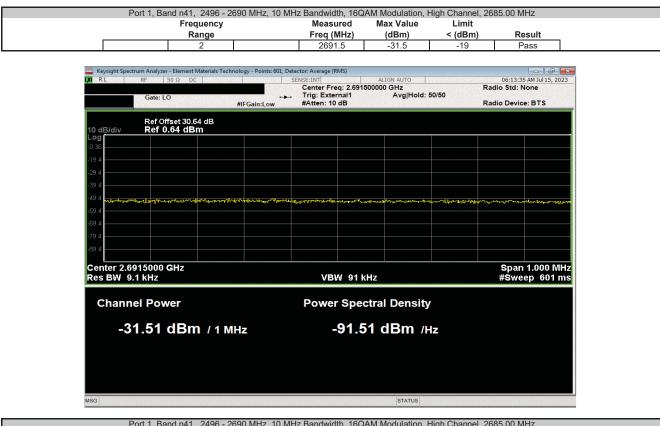


	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	3		2494.0	-32.6	-19	Pass
			1			
Keysight Spectrum Ana	lyzer - Element Materials Techn 50 Ω DC		SENSE:INT	ALIGN AUTO		05:02:15 AM Jul 15, 2023
	e: LO	PNO: Fast		Avg Type: Avg Hold: {	RMS 5/5	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N
10 dB/div Ref 4	fset 30.64 dB 0.64 dBm				Mkr1	2.493 960 GHz -32.614 dBm
Log			Ý			
30.6						
20.6						
10.6						
0.640						
-9.36						
						DL1 -19.00 dBm
-19.4						
-29.4						1
-39.4						
-49.4						
Start 2.47400 GH #Res BW 1.0 MH		#VB	W 3.0 MHz*		#Sweep	Stop 2.49400 GHz 4.000 s (1000 pts)
MSG				STATUS		

	Frequency	Measured	Max Value	Limit	
	Range	Freq (MHz)	(dBm)	< (dBm)	Result
	1	2690.0	-32.5	-19	Pass

ide →→ Trig: Exte ow #Atten: 30	ernal1 0 dB	ALIGN AUTO Avg Ype: R Avg Hold: 5/	5	2.690 0	00 0 GI
			Mkr		
					DL1 -19.00
	1				021-13.00
#VBW 300 kHz	7*		#Swe	Stop 2.6	91000 G
	#VBW 300 kH	#VBW 300 kHz*	#VBW 300 kHz*		#VBW 300 kHz* #Sweep 4.000 s





Port 1, Bai	nd n41, 2496 - 20	690 MHz, 10 MHz	z Bandwidth, 16Q	AM Modulation, I	High Channel, 26	85.00 MHz	
	Frequency		Measured	Max Value	Limit		
	Range		Freq (MHz)	(dBm)	< (dBm)	Result	
	3		2692.0	-32.0	-19	Pass	

RL	ctrum Analyzer - Element Materials RF 50 Ω DC		SENSE:INT	ALIGN AUTO	06:16:	🗖 🗗 🗐
NL .	Gate: LO	PNO: Fast	Trig: External1	Avg Type: RMS Avg Hold: 5/5		TYPE A WWW
		IFGain:Low	#Atten: 20 dB			DETANNN
dB/div	Ref Offset 30.64 dB Ref 40.64 dBm				Mkr1 2.692 -32	2 020 GH
^g	Kei 40.04 übiii		V			
).6						
).6						
).6						
40						
36						
.4						DL1 -19.00 d
.4						
9.4						
.4						
art 2.69	200 GHz		A		Stop 2	.71200 Gł
	1.0 MHz	#VB	W 3.0 MHz*		#Sweep 4.000	s (1000 pi
a Roberts			and south and the state of a state of the state of the state	STATUS		



Port	1, Band n41, 2496 - 269 Frequency	U IVIHZ, TU MH	Measured	Max Value	Low Channel, 250	JI.UT MHZ	
	Range		Freq (MHz)	(dBm)	< (dBm)	Result	
	1		2496.0	-32.3	-19	Pass	
	Analyzer - Element Materials Technolo						
LXI RL RF	50 Ω DC	SE	NSE:INT	ALIGN AUTO Avg Type:	RMS	05:10:42 AM Jul 15, 202 TRACE 1 2 3 4	23
c		PNO: Wide ↔ Gain:Low	Trig: External1 #Atten: 30 dB	Avg Hold:	5/5		NN
10 dB/div Ref	Offset 30.64 dB 5 30.64 dBm				Mkr1 2.	496 000 0 GH -32.322 dB	
	30.04 dBill		Ť				
20.6							
10.6							
0.640							
-9.36							
						DL1 -19.00 d	Bm
-19.4			/				
-29.4			1				
-29.4			y				
-39.4		****					
-49.4							
-59.4							
Start 2.495000						top 2.497000 GI	
#Res BW 100	kHz	#VBW	300 kHz*		#Sweep	4.000 s (1000 pt	s)
MSG				STATUS			
Port	1, Band n41, 2496 - 269	0 MHz, 10 MH:	z Bandwidth, 64C Measured	AM Modulation, I Max Value	ow Channel, 250_ Limit)1.01 MHz	
	Frequency Range		Freq (MHz)	(dBm)	< (dBm)	Result	
	2		2494.5	-32.6	-19	Pass	
· ·	· · · ·					•	
Keysight Spectrum A	Analyzer - Element Materials Technolo						x
K RL RF			NSE:INT Center Freq: 2.494	ALIGN AUTO	Dat	05:15:55 AM Jul 15, 202	
	Gate: LO		Trig: External1	Avg Hold:	50/50		
	#1	FGain:Low	#Atten: 10 dB		Rad	lio Device: BTS	
	Ref Offset 30.64 dB						

Ref Offset 30.64 dB 0 dB/div Ref 0.64 dBm og			
9.4			
9.4			
3.4			 au allara
^{, a} นฏ่ทั่งหางไหญบริถาณหมู่ไปไปการเรียงให้สูงแก้งทั่งหรือไปดูหรือ),4	ՠ֎֏ՠՠՠֈՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠ	ญษณ([[])รีไขให้เร็มใจหารี[[มา]ให้ส่งหนึ่งงไหว่ไหวง 	ԳԱԻՈՆՈՆԱՆԳԱԳՈՒՆԻ ԳԱԻՈՆՈՆԱՆԳԱԳՈՒՆԻ
.4			
enter 2.4945000 GHz		91 kHz	Span 1.000 M #Sweep 601
es BW 9.1 kHz	VBW	91 NHZ	"encop con
		Spectral Density	"oncop con
Channel Power -32.58 dBm / 1 MHz	Power S		
Channel Power	Power S	Spectral Density	
Channel Power	Power S	Spectral Density	
Channel Power	Power S	Spectral Density	



	Frequency	Measu Freq (N		Limit < (dBm)	Result
	Range 3	2494		-19	Pass
I		2101.	02.0	10	1 400
	n Analyzer - Element Materials Techno RF 50 Ω DC	SENSE:INT	ALIGN AUTO		05:17:42 AM Jul 15, 2023
	Gate: LO	PNO: Fast ++- Trig: Extern IFGain:Low #Atten: 20	Avg Type nal1 Avg Hold:	: RMS : 5/5	TRACE 1 2 3 4 5 (TYPE A WWWW DET A NNNN
Re 10 dB/div Re Log	ef Offset 30.64 dB ef 40.64 dBm			Mkr1	2.493 980 GHz -32.779 dBm
			,		
30.6					
20.6					
20.6					
10.6					
0.640					
0.040					
-9.36					
-19.4					DL1 -19.00 dBm
-29.4					
-39.4			· · · · · · · · · · · · · · · · · · ·		
-49.4					
Start 2.47400) GHz				Stop 2.49400 GHz
#Res BW 1.0		#VBW 3.0 MHz*			4.000 s (1000 pts)
MSG			STATUS		
Por	t 1 Band n41 2496 - 26	90 MHz, 10 MHz Bandwidt	h. 64QAM Modulation.	High Channel, 26	85.00 MHz

Port 1, Band n41, 2496 - 2690 MHz, 10 MHz Bandwidth, 64QAM Modulation, High Channel, 2685.00 MHz								
	Frequency		Measured	Max Value	Limit			
Range		Freq (MHz)	(dBm)	< (dBm)	Result			
	1		2690.0	-31.5	-19	Pass		





	Freque	ency	. 10 MHz Bandwidth, 64Q. Measured	Max Value	Limit		
	Ran		Freq (MHz)	(dBm)	< (dBm)	Result	
	2		2691.5	-31.2	-19	Pass	
XI RL RF		erials Technology - Point:	s: 601, Detector: Average (RMS) SENSE:INT Center Freq: 2.691(Trig: External1	ALIGN AUTO 00000 GHz Avg Hold:	50/50	07:04:32 AM Jul 15 Radio Std: None	
Ŭ	ate. EO	#IFGain:Lo				Radio Device: BTS	(a) si a
10 dB/div	tef Offset 30.64 o Ref 0.64 dBm	iВ					
9.36							
19.4							
9.4							
39.4							
49.4 www.www.	๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛	ومهادمها مهالم المعطور	๚ํ๚ๅ๛ฦ๚๚๚๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛	๛๚๛๛๚๚๚๚๚๚๛๛	ห _{มื} นสปปัจจากใจจากเมือง	and the second and the second s	وبالمطاليهم
59.4							-
59.4							
79.4							
-89.4							
Center 2.69150 Res BW 9.1 kH			VBW 91 k	Hz		Span 1.000 #Sweep 60	
Channel F	Power		Power Spec	tral Density	/		
-31.1	l6 dBm	/ 1 MHz	-91.1	6 dBm /⊮	Hz		
MSG				STATUS			0.25 552

Port 1, Band n41, 2496 - 2690 MHz, 10 MHz Bandwidth, 64QAM Modulation, High Channel, 2685.00 MHz								
	Frequency		Measured	Max Value	Limit			
	Range		Freq (MHz)	(dBm)	< (dBm)	Result		
	3		2692.0	-32.1	-19	Pass	1	

Keysight Spectrum Analyzer - Element Materials RL RF 50 Ω DC		SENSE:INT	ALIGN AUTO	07:08:06 AM Jul 15, 202
Gate: LO	PNO: Fast IFGain:Low	T	Avg Type: RMS Avg Hold: 5/5	TRACE 2 3 4 5 TYPE A WWW DET A NN N
Ref Offset 30.64 dB dB/div Ref 40.64 dBm				Mkr1 2.692 040 GH -32.138 dBi
		Ĭ		
D.6				
0.6				
0.6				
40				
36				
.4				DL1 -19.00 c
.4				
.4				
0.4				
art 2.69200 GHz				Stop 2.71200 GF
Res BW 1.0 MHz	#VB	W 3.0 MHz*	#	≄Sweep 4.000 s (1000 pt



Frequency	2690 MHz, 10 MHz Bandwidth, 2560 Measured	Max Value	Limit	_
Range	Freq (MHz)	(dBm)	< (dBm)	Result
1	2496.0	-32.5	-19	Pass
	chaology			
X RL RF 50 Ω DC	SENSE:INT	ALIGN AUTO		05:26:17 AM Jul 15, 202
Gate: LO	PNO: Wide 🛶 Trig: External1	Avg Type: Avg Hold: 5	RMS 5/5	TRACE 1 2 3 4 TYPE A WWWA DET A N N N
	IFGain:Low #Atten: 30 dB			A CONTRACTOR OF
Ref Offset 30.64 dB 10 dB/div Ref 30.64 dBm			MKF1 2.	496 000 0 GH -32.470 dB
10 dB/div Ref 30.64 dBm				
20.6				
10.6				
0.640				
-9.36				
-19.4				DL1 -19.00 d
-19.4				
-29.4	1			
-39.4				
-49.4				
-59.4				
0				
Start 2.495000 GHz				top 2.497000 GI
#Res BW 100 kHz	#VBW 300 kHz*			4.000 s (1000 pi
MSG		STATUS	-	
	2690 MHz, 10 MHz Bandwidth, 2560 Measured	QAM Modulation, Max Value	Low Channel, 25 Limit	01.01 MHz
Frequency Range	Freq (MHz)	(dBm)	< (dBm)	Result
2	2494.5	-32.6	-19	Pass
	· · ·	·		÷
Keysight Spectrum Analyzer - Element Materials Te				
XX RL RF 50 Ω DC	SENSE:INT Center Freq: 2.494			05:30:44 AM Jul 15, 203 dio Std: None
Gate: LO	→ Trig: External1 #IFGain:Low #Atten: 10 dB	Avg Hold: {	50/50	lio Device: BTS
	an Guide Ow		T.u.	
Ref Offset 30.64 dB 10 dB/div Ref 0.64 dBm				

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		equency		Measured	Max Value	Limit	
	I	Range		Freq (MHz)	(dBm)	< (dBm)	Result
		3		2493.9	-32.0	-19	Pass
	trum Analyzer - Elemer	nt Materials Technology	1				
LXI RL	RF 50 Ω [SENSE:INT	ALIGN AUTO Avg Type:		05:32:35 AM Jul 15 2023
	Gate: LO		IO: Fast ↔↔ Gain:Low	Trig: External1 #Atten: 20 dB	Avg Hold:		TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N
10 dB/div	Ref Offset 30.64 Ref 40.64 dB	dB m				Mkr1	2.493 900 GHz -31.973 dBm
Log				Ĭ			
30.6							
00.0							
20.6							
10.6							
0.640							
-9.36							
-9.30							
-19.4							DL1 -19.00 dBm
-29.4							
-39.4							
-49.4							
10.4							
Start 2.474 #Res BW 1			#VBI	N 3.0 MHz*			Stop 2.49400 GHz 4.000 s (1000 pts)
MSG					STATUS		
P	ort 1. Band n41	. 2496 - 2690 M	MHz. 10 MH	lz Bandwidth, 2560	AM Modulation.	High Channel, 26	685.00 MHz
		equency	_,	Measured	Max Value	Limit	
		Range		Freq (MHz)	(dBm)	< (dBm)	Result
1		1		2690.0	-31.8	-19	Pass

	Port 1, Band n41, 2496 - 2690 MHz, 10 MHz Bandwidth, 256QAM Modulation, High Channel, 2685.00 MHz								
	Frequency Mea				Max Value	Limit			
		Range		Freq (MHz)	(dBm)	< (dBm)	Result		
Γ		1		2690.0	-31.8	-19	Pass		





F	Frequency	Measured	Max Value	Limit	
	Range	Freq (MHz)	(dBm)	< (dBm)	Result
	2	2691.5	-31.5	-19	Pass
Keysight Spectrum Analyzer - Eler Keysight Spectrum Analyzer - Eler Gate: LO Gate: LO Ref Offiset Log -9.36 -19.4 -39.4 -49.4 -59.4 -69.4 -79.4	#IFGain:Low 30.64 dB	SENSEINTI Center Freq: 2.691 Trig: External1 #Atten: 10 dB	Avg Hold: {	50/50	07:22:40 AM Jul 15, 20 adio Std: None adio Device: BTS
89.4 Center 2.6915000 GHz Res BW 9.1 kHz	2	VBW 91 k	Hz		Span 1.000 MI #Sweep 601 n
Channel Power		Power Spe	ctral Density	1	
-31.49 dE	3m / 1 мнz	-91.4	9 dBm /⊦	łz	

Port 1, Band n41, 2496 - 2690 MHz, 10 MHz Bandwidth, 256QAM Modulation, High Channel, 2685.00 MHz								
	Frequency		Measured	Max Value	Limit			
	Range		Freq (MHz)	(dBm)	< (dBm)	Result		
	3		2692.0	-31.7	-19	Pass		

RL RF 50 Ω DC		SENSE:INT	ALIGN AUTO	07:25:18 AM Jul 15, 2
Gate: LO	PNO: Fast +++		Avg Type: RMS Avg Hold: 5/5	TRACE 1 2 3 TYPE A WW DET A N N
Ref Offset 30.64 dB dB/div Ref 40.64 dBm	II GUIILEOU			Mkr1 2.692 000 G -31.700 dB
.6				
6				
6				
0				
6				
4				DL1 -19.00
4				
4				
4				
4				
art 2.69200 GHz es BW 1.0 MHz	#VB	W 3.0 MHz*		Stop 2.71200 C Stop 2.71200 G#



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
Generator - Signal	Agilent	N5183A	TID	2023-05-12	2025-05-12
Block - DC	Fairview Microwave	SD3235-2148	ANF	2023-05-24	2024-05-24
Block - DC	Fairview Microwave	SD3379	AMM	2022-09-09	2023-09-09

TEST DESCRIPTION

The antenna port spurious emissions were measured at the RF output terminal of the EUT through 4 different attenuation configurations which continues through to the RF input of the spectrum analyzer. Analyzer plots utilizing a resolution bandwidth called out by the client's test plan were made for each modulation type from 9 KHz to 27 GHz. The conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, were investigated to ensure they were less than the limits also called out by the client's test plan shown below.

The measurement methods are detailed in KDB 971168 D01v03 section 6 and ANSI C63.26-2015.

Per FCC 2.1057(a)(1) and RSS Gen 6.13, the upper level of measurement is the 10th harmonic of the highest fundamental frequency.

These measurements are for the frequency band after the first 1.0 MHz bands immediately outside and adjacent to the frequency block.

RF conducted emissions testing was performed only on one port. The AZHL antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in output power 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.

Per FCC Part 27.53(m)(2), the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The BTS may operate as a 8 port MIMO transmitter with transmitter outputs connected to four cross-polarized antennas [four transmitter outputs are connected to (+) radiators and four transmitter outputs are connected to (-) radiators]. The limit is adjusted to -19 dBm [-13 dBm -10 log (4)] per FCC KDB 662911D01 v02r01, ANSI C63.26-2015 section 6.4.6.3 b)2) and KDB 662911 D02v01 page 3 example (2) since the transmitter outputs to each antenna are 90 degree-phase shifted relative to each other (cross-polarized radiators).

Per FCC 27.53(m)(6), "Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.....A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified)".

The limit for the 9kHz to 150kHz frequency range was adjusted to -49dBm to correct for a spectrum analyzer RBW of 1kHz versus required RBW of 1MHz [i.e.: -49dBm = -19dBm -10log(1MHz/1kHz)]. The limit for the 150kHz to 20MHz frequency range was adjusted to -39dBm to correct for a spectrum analyzer RBW of 10kHz versus required RBW of 1MHz [i.e.: -39dBm = -19dBm -10log(1MHz/10kHz)]. The required limit of -19dBm with a RBW of > 1MHz was used for all other frequency ranges. (See ANSI C63.26-2015 paragraph 5.7.2a for details on the Limit/RBW scaling method)



TbtTx 2022.05.02.0 XMit 2023.02.14.0 Work Order: NOKI0067 EUT: AZHL Serial Number: YK203400004 Date: 07/14/2023 Customer: Nokia Solutions and Networks Temperature: 21.4°C Attendees: David Le, Mitchell Hill Humidity: 52.4% Project: None Barometric Pres.: 1016 mbar Tested by: Brandon Hobbs Power: 54VDC Job Site: TX07 TEST SPECIFICATIONS Test Method ANSI C63.26:2015 FCC 27:2023 COMMENTS All measurement path losses were accounted for in the reference level offest including any attenuators, filters and DC blocks. Band n41 carriers are enabled at maximum power (4 Watts/carrier). DEVIATIONS FROM TEST STANDARD None NOKI0067-1 NOKI0067 Configuration # 2 NOKI0067-3 NOKI0067-4 Signature Max Value Measured Limit Frequency Range < (dBm) Freq (MHz) (dBm) Result Port 1 Band n41, 2496 - 2690 MHz 10 MHz Bandwidth **QPSK** Modulation Mid Channel, 2592.99 MHz 9 kHz - 150 kHz 0.01 -76.6 -49 Pass Mid Channel, 2592,99 MHz 150 kHz - 20 MHz 0.31 -75.6 -39 Pass Mid Channel 2592 99 MHz 20 MHz - 4 GHz 3603 -33.1 -19 Pass Mid Channel, 2592.99 MHz 2.45 GHz - 2.75 GHz -34.1 -19 2730 Pass Mid Channel, 2592.99 MHz 4 GHz - 11 GHz 4010 -48.3 -19 Pass Mid Channel, 2592.99 MHz 11 GHz - 18 GHz 14341 -50.5 -19 Pass Mid Channel, 2592,99 MHz 18 GHz - 27 GHz 26116 -54.1 -19 Pass 16QAM Modulation Mid Channel, 2592.99 MHz 9 kHz - 150 kHz 0.01 -77.6 -49 Pass Mid Channel, 2592.99 MHz 150 kHz - 20 MHz 0.31 -75.2 -39 Pass Mid Channel, 2592.99 MHz 20 MHz - 4 GHz 3603 -34.1 -34.1 -19 Pass Mid Channel, 2592,99 MHz 2.45 GHz - 2.75 GHz 2725 -19 Pass Mid Channel, 2592.99 MHz 4 GHz - 11 GHz 4018 -48.4 Pass -19 Mid Channel, 2592.99 MHz 11 GHz - 18 GHz 13643 -50.6 -19 Pass Mid Channel, 2592.99 MHz 18 GHz - 27 GHz 26117 -54.1 -19 Pass 64QAM Modulation Mid Channel, 2592.99 MHz 9 kHz - 150 kHz 0.01 -77.5 -49 Pass Mid Channel, 2592.99 MHz 150 kHz - 20 MHz 0.31 -75.7 -39 Pass Mid Channel, 2592.99 MHz 20 MHz - 4 GHz 3618 -34.4 -19 Pass Mid Channel, 2592.99 MHz 2.45 GHz - 2.75 GHz 2727 -34.0 -19 Pass Mid Channel, 2592,99 MHz 4 GHz - 11 GHz 4009 -48.2 -19 Pass Mid Channel, 2592.99 MHz 11 GHz - 18 GHz 17716 -50.5 -19 Pass Pass Mid Channel, 2592.99 MHz 18 GHz - 27 GHz 26166 -54.3 -19 256QAM Modulation Mid Channel, 2592.99 MHz Mid Channel, 2592.99 MHz 9 kHz - 150 kHz 0.01 -76.7 -49 Pass 150 kHz - 20 MHz 0.31 -75.4 -39 Pass Mid Channel, 2592.99 MHz 20 MHz - 4 GHz 3614 -33.5 -19 Pass Mid Channel, 2592.99 MHz 2.45 GHz - 2.75 GHz 2716 -34.0 -19 Pass Mid Channel, 2592.99 MHz 4 GHz - 11 GHz 4025 -48.2 -19 Pass Mid Channel, 2592,99 MHz 11 GHz - 18 GHz 17981 -50.5 -19 Pass Mid Channel, 2592.99 MHz 18 GHz - 27 GHz 26112 -53.9 -19 Pass



	Range		Freq (MHz)	(dBm)	< (dBm)	Result
	9 kHz - 150 kHz		0.01	-76.59	-49	Pass
	nalyzer - Element Materials Techr	iology				
LXI RL RF	50 Ω DC		SENSE:INT	ALIGN AUTO Avg Type:	DME	08:20:02 AM Jul 15, 2023
		PNO: Wide ↔ IFGain:Low	 Trig: Free Run #Atten: 6 dB 	Avg Type. Avg Hold:		TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A NNNNN
Ref 10 dB/div Ref Log	Offset 9.2 dB -0.80 dBm					Mkr1 9.000 kHz -76.590 dBm
209			l l			
-10.8						
-20.8						
-30.8						
-40.8						
						DL1 -49.00 dBm
-50.8						001 493.00 (db)
-60.8						
-70.8 - 1						
<u>}</u>						
-80.8						
	m	~~~~				Λ
-90.8			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mmm	Mun	
Start 9.00 kHz #Res BW 1.0 k	Hz	#VB	W 3.0 kHz*		Sweep	Stop 150.00 kHz 56.00 ms (8001 pts)
MSG				STATUS		

Frequency	Measured	Max Value	Limit	
Range	Freq (MHz)	(dBm)	< (dBm)	Result
150 kHz - 20 MHz	0.31	-75.62	-39	Pass

RL	RF 50 Ω DC			SENSE:INT	AL	IGN AUTO		08:21:20	5 AM Jul 15, 202
		F	PNO: Fast 🔸	. Trig: Free #Atten: 6 d	Run IB	Avg Type: Avg Hold: 1	RMS 100/100		ACE 1234 TYPE A WWW DET A NNN
dB/div	Ref Offset 9.4 dB Ref -3.60 dBm								313.8 k⊦ 622 dB
.6									
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				Manager of Strends Park	alythic and the special states of the	angan kabulan katan k	unariatustatastatistas		
art 150	kHz 10 kHz			W 30 kHz*			•	Stop 2 79.47 ms	20.000 MI



	Port 1, Band n41, 2496	- 2690 MHz, 10 M	/IHz Bandwidth, QF	SK Modulation, M	lid Channel, 2592	2.99 MHz
	Frequency		Measured	Max Value	Limit	
	Range	-	Freq (MHz)	(dBm)	< (dBm)	Result
	20 MHz - 4 GH	lz	3603.49	-33.12	-19	Pass
Keysight Spec	trum Analyzer - Element Materials Te RF 50 Ω DC	chnology	SENSE:INT	ALIGN AUTO		08:36:44 AM Jul 15, 2023
	Gate: LO	PNO: Fast ++	. Trig: External1 #Atten: 20 dB	Avg Type: Avg Hold: 1		TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N
10 dB/div	Ref Offset 32.7 dB Ref 42.70 dBm				Mkı	1 3.603 5 GHz -33.121 dBm
			Г Т Т			
32.7						
22.7						
40.7						
12.7						
2.70						
-7.30						
-17.3						DL1 -19.00 dDm
-27.3						_
				lines and		
-37.3			i in a bijende terferste i i se steret de fe	gangalang dan bidan		and the second se
17.0						
-47.3						
Start 20 M #Res BW 1	Hz 1.0 MHz	#VB	W 3.0 MHz*		Sweep 1.	Stop 4.000 GHz 067 ms (8001 pts)
MSG				STATUS		
	Port 1, Band n41, 2496	2600 MH- 10		OSK Modulation	Aid Channel 2500	
	Frequency	- 2090 1/102, 101	Measured	Max Value	Limit	1.99 IVITIZ
	Range		Freq (MHz)	(dBm)	< (dBm)	Result
	2.45 GHz - 2.75	GHz	2730.47	-34.07	-19	Pass

RL RF	Analyzer - Element Materials 50 Ω DC		SENSE:INT	ALIGN AUTO	08:42:00 AM Jul 15, 202
	Gate: LO	PNO: Fast ↔→→ IFGain:Low		Avg Type: RMS Avg Hold: 5/5	TRACE 2 3 4 TYPE A WWW DET A N N N
Ref dB/div Ref	Offset 30.7 dB 5 38.70 dBm			М	kr1 2.730 468 8 GI -34.072 dB
-			Ť		
3.7			\frown		
3.7					
70					
30					
.3					
					DL1 -19.00
.3					. 1
.3					····
.3					
.3					
art 2.4500 G les BW 1.0 N		#VB	W 3.0 MHz*	#\$	Stop 2.7500 G weep 4.000 s (8001 p



Frequenc	У	Measured	Max Value	Limit		
Range		Freq (MHz)	(dBm)	< (dBm)	Result	
4 GHz - 11 (4010.15	-48.25	-19	Pass	
Keysight Spectrum Analyzer - Element Materials						
X RL RF 50 Ω DC CC	RREC	SENSE:INT	ALIGN AUTO Avg Type:	DMS	09:02:28 AM Jul 15, 20	23
	PNO: Fast ++	 Trig: Free Run #Atten: 10 dB 	Avg Hold:		TRACE 1 2 3 4 TYPE A WWW DET A N N N	N N
Ref Offset 26.9 dB 10 dB/div Ref 26.90 dBm				М	kr1 4.010 15 GI -48.247 dB	
		Ĭ				
16.9						
6.90						
-3.10						
-13.1						
						iBm
-23.1						
-33,1						
-43.1 - 1						
4						
-53.1		and the second			and the set of the set	
-63.1						
Start 4.000 GHz #Res BW 1.0 MHz	#VB	W 3.0 MHz*		Sweep	Stop 11.000 GI 12.00 ms (20001 p	
MSG			STATUS			

Port 1, Band n41, 2496 - 2690 MHz, 10 MHz Bandwidth, QPSK Modulation, Mid Channel, 2592.99 MHz								
Frequency	Measured	Max Value	Limit					
Range	Freq (MHz)	(dBm)	< (dBm)	Result				
11 GHz - 18 GHz	14341.45	-50.48	-19	Pass				

RL	RF 50 Ω [CORREC		SENSE:INT		ALIGN AUTO		09:04:03	AM Jul 15, 202
			PNO: Fast + IFGain:Low	► Trig: F #Atten	Free Run 1: 6 dB	Avg Type: Avg Hold: 1		No construction of the	ACE 1 2 3 4 S TYPE A WWWW DET A NNN
dB/div	Ref Offset 29.9 d Ref 25.90 dB	∄B m					M	kr1 14.34 -50.	1 45 GF 480 dB
-									
.9									
30									
0									
.1									
.1									DL1 -19.00 c
.1									
.1					♦ ¹				
1			and a second		and the second as the second as				
.1									
art 11_0	00 GHz							Stop 1	8.000 GF
	1.0 MHz		#V	'BW 3.0 N	1Hz*		Sweep	12.00 ms	(20001 pl



Por	t 1, Band n41, 2496 - 2690 MHz,	10 MHz Bandwidth, QP	SK Modulation.	Mid Channel. 2592	2.99 MHz	
	Frequency	Measured	Max Value	Limit		
	Range	Freq (MHz)	(dBm)	< (dBm)	Result	
	18 GHz - 27 GHz	26115.75	-54.09	-19	Pass	
Keysight Spectrum	Analyzer - Element Materials Technology					
LXI RL RI	50 Ω DC CORREC	SENSE:INT	ALIGN AUTO		09:17:27 AM Jul 15, 2023	
	PNO: Fast IFGain:Low	→ Trig: Free Run #Atten: 6 dB	Avg Type: Avg Hold:		TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A N N N N N	
Ref	Offset 21.4 dB			Mkr1	26.115 75 GHz	
10 dB/div Re	f 17.40 dBm				-54.089 dBm	
		Ť				
7.40						
-2.60						
-12.6						
					DL1 -19.00 dBm	
-22.6						
-32.6						
-42.6						
					.1	
-52.6						
-62.6						
-72.6						
Start 18.000 G #Res BW 1.0		≠VBW 3.0 MHz*			Stop 27.000 GHz 00 ms (20001 pts)	
MSG			STATUS		(100000000)	
mou			STATUS			
 Por	t 1, Band n41, 2496 - 2690 MHz, 1	10 MHz Bandwidth, 160	AM Modulation	Mid Channel, 259	2.99 MHz	
	Frequency	Measured	Max Value	Limit		
	Range	Freq (MHz)	(dBm)	< (dBm)	Result	
	9 kHz - 150 kHz	0.01	-77.59	-49	Pass	

Keysight Spectrum Analyzer - Element Materials Te RL RF 50 Ω DC	SENSE:INT	ALIGN AUTO	08:23:26 AM Jul 15, 202
	PNO: Wide ↔ Trig: Free Run IFGain:Low #Atten: 6 dB	Avg Type: RMS Avg Hold: 100/100	TRACE 1 2 3 4 TYPE A WWW DET A N N N
Ref Offset 9.2 dB dB/div Ref -0.80 dBm			Mkr1 9.000 kł -77.586 dB
~9			
0.8			
0.8			
0.8			
0.0			
0.8			
			DL1 -49.00 (
0.8			
0.8			
0.8			
· ·			
			A
0.8	many	~	
		man h	malin
tart 9.00 kHz			Stop 150.00 kl
Res BW 1.0 kHz	#VBW 3.0 kHz*	Swe	ep 56.00 ms (8001 p



Frequ		Measured	Max Value	Limit		
Ran		Freq (MHz)	(dBm)	< (dBm)	Result	
150 kHz -	20 MHz	0.31	-75.24	-39	Pass	L
Keysight Spectrum Analyzer - Element Mat						
XX RL RF 50Ω DC		SENSE:INT	ALIGN AUTO Avg Type:	RMS	08:24:35 AM Jul 15, 20 TRACE 1 2 3 4	
	PNO: Fast ↔→→ IFGain:Low	Trig: Free Run #Atten: 6 dB	Avg Hold:			
Ref Offset 9.4 dB 10 dB/div Ref -3.60 dBm					Mkr1 313.8 kł -75.242 dB	
Log		Ť				
-13.6						
-13.6						
-23.6						
-23.8						
-33.6						
-55.8						dBm
-43.6						
40.0						
-53.6						
-63.6						
-73.6						
-83.6						
Anna Marine and summer 1.						
-93.6	a faithe ing the pingerstark from the pine of the state of the second second second second second second second					
	A State Contract of the State o	And the state of t	بسيامتنا وبوأهظمه متجوه بمبالتمام	eneralitetetetetetetetete	willingthe prosperation of the second	-
Start 150 kHz		~		0	Stop 20.000 M	Hz
#Res BW 10 kHz	#VB	W 30 kHz*	1	Sweep	79.47 ms (8001 p	us)
MSG			STATUS			1.00

	Port 1, Band n41, 2496 - 2690 MHz, 10	MHz Bandwidth, 160	QAM Modulation,	Mid Channel, 259	2.99 MHz
	Frequency	Measured	Max Value	Limit	
_	Range	Freq (MHz)	(dBm)	< (dBm)	Result
Γ	20 MHz - 4 GHz	3603	-34.12	-19	Pass

RL	RF 50 Ω DC		SENSE:INT	ALIGN AUTO	08:44:53 AM Jul 15, 202
	Gate: LO	PNO: Fast ↔→ IFGain:Low	Trig: External1 #Atten: 20 dB	Avg Type: RMS Avg Hold: 100/100	TRACE 1 2 3 4 3 TYPE A WWW DET A NNNI
dB/div	Ref Offset 32.7 dB Ref 42.70 dBm				Mkr1 3.603 0 GH -34.118 dB
			Ĭ		
2.7					
2.7					
2.7					
70					
.3					DL1 -19:00 c
					021413.001
.3					1
.3				ing and free and the second	
.3					
art 20 M					Stop 4.000 Gł
es BW	1.0 MHz	#VB	W 3.0 MHz*	Sw	eep 1.067 ms (8001 pt



	Frequency Range	, ,	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2.45 GHz - 2.75	GHz	2724.66	-34.1	-19	Pass
CXI RL RF	ilyzer - Element Materials Tr 50 Ω DC	echnology	SENSE:INT	ALIGN AUTO Avg Type:	RMS	08:48:27 AM Jul 15, 2023 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N
Gat	e: LO	PNO: Fast ++ IFGain:Low	 Trig: External1 #Atten: 26 dB 	Avg Hold: {	5/5	DET A NNNN
Ref Of 10 dB/div Ref 3	ffset 30.7 dB 18.70 dBm				Mkr1 2.	724 656 3 GHz -34.099 dBm
28.7			/***\			
18.7						
8.70						
-1.30						
-11.3						DL1 -19.00 dBm
-21.3						
-31.3						≬ 1
-41.3						
51.0						
-51.3						
Start 2.4500 GH #Res BW 1.0 MH	z Iz	#VE	W 3.0 MHz*		#Sweep	Stop 2.7500 GHz 4.000 s (8001 pts)
MSG				STATUS		
Port 1	Band n41, 2496	- 2690 MHz, 10 M	/Hz Bandwidth, 160	OAM Modulation	Mid Channel, 259	2.99 MHz
	Frequency		Measured	Max Value	Limit	
	Range 4 GHz - 11 Gł	- [Freq (MHz) 4017.85	(dBm) -48.36	< (dBm) -19	Result Pass

RL RF 50 Ω DC CORREC		SENSE:INT	ALIGN AUTO		09:05:29 AM	Jul 15, 207
	PNO: Fast ← IFGain:Low		Avg Typ In Avg Hold	e: RMS I: 100/100	TRACI TYP	E 1 2 3 4 5 E A WWW T A N N N
Ref Offset 26.9 dB dB/div Ref 26.90 dBm				N	/kr1 4.017 -48.3	
		Ĭ				
ŝ.9 						
90						
10						
.1						
.1						DL1 -19.00 (
1						
.1 . 1						
.1						
art 4.000 GHz tes BW 1.0 MHz	#\\	'BW 3.0 MHz*		Sween	Stop 11. 12.00 ms (20	000 GI



	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Res	
	11 GHz - 18 GHz		13642.5	-50.59	-19	Pas	
I			10012.0	00.00	10	144	
	er - Element Materials Techr 50 Ω DC CORREC		ENSE:INT	ALIGN AUTO			👝 🛛 🗗 🗖 🗖
	50 S2 DC CORREC	PNO: Fast 🔸	Trig: Free Run	Avg Type: Avg Hold: 1		TRAC	DE 1 2 3 4 5 6 DE A WWWWW ET A N N N N N
	et 29.9 dB	IFGain:Low	#Atten: 6 dB		Mk	r1 13.642	50 GHz
10 dB/div Ref 25.	.90 dBm	1	•		1	-50.5	91 dBm
15.9							
15.9							
5.90							
-4.10							
-14.1							
							DL1 -19.00 dBm
-24.1							
-34.1							
-44.1		. 1					
-54.1		•				Apart di successi di succe	
-64.1							
Start 11.000 GHz						Stop 18	.000 GHz
#Res BW 1.0 MHz		#VB\	V 3.0 MHz*	1	Sweep	12.00 ms (2	
MSG				STATUS			

	Port 1, Band n41, 2496 - 2690 MHz, 10 MI	Hz Bandwidth, 160	AM Modulation,	Mid Channel, 259	2.99 MHz
	Frequency	Measured	Max Value	Limit	
	Range	Freq (MHz)	(dBm)	< (dBm)	Result
1	18 GHz - 27 GHz	26116.65	-54.09	-19	Pass

RL	RF	50 Ω D	C CORREC		SI	ENSE:INT		ALIGN AUTO		09:19	9:49 AM Jul 15, 202
				PNO: Fast IFGain:Low	•••	Trig: Free F #Atten: 6 d	Run B	Avg Type: Avg Hold: 1			TRACE 1 2 3 4 1 TYPE A WWW DET A NNN
dB/div	Ref Offs Ref 17	et 21.4 d .40 dBr	B n						M		16 65 GF 4.092 dB
40											
60											
.6											DL1 -19.00 c
.6											
											1
6											
.6											
art 18.0	00 GHz									Sto	o 27.000 GH
	1.0 MHz			#	VBV	/ 3.0 MHz'	:		Sweep	16.00 m	is (20001 pt



	Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	9 kHz - 150 kHz	0.01	-77.48	-49	Pass
	zer - Element Materials Technology	SENSE:INT	ALIGN AUTO		08:25:52 AM Jul 15, 2023
	PNO: Wid IFGain:Lo	e ↔ Trig: Free Run w #Atten: 6 dB	Avg Type: F Avg Hold: 10	00/100	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN
	set 9.2 dB 80 dBm			'	4 Mkr1 9.282 kHz -77.476 dBm
-10.8					
-30.8					
-40.8					
-50.8					DL1 -49.00 dBm
-60.8					
-70.8					
-90.8	m		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	M	Λ
Start 9.00 kHz					Stop 150.00 kHz
#Res BW 1.0 kHz		#VBW 3.0 kHz*	b 1	Sweep 5	6.00 ms (8001 pts)
MSG			STATUS		

Port 1, Band n41, 2496 - 2690 MHz, 10 MF	iz Bandwidth, 640	AM Modulation,	Mid Channel, 259	92.99 MHz
Frequency	Measured	Max Value	Limit	
Range	Freq (MHz)	(dBm)	< (dBm)	Result
150 kHz - 20 MHz	0.31	-75.71	-39	Pass

RL RF 50 Ω DC		SENSE:INT	AL	IGN AUTO		08:27:3	35 AM Jul 15, 202
	PNO: Fast ↔ IFGain:Low	Trig: Free #Atten: 6 d		Avg Type: Avg Hold:		1	TYPE A WWW DET A NNN
Ref Offset 9.4 dB dB/div Ref -3.60 dBm							313.8 kl .709 dB
5							
.6							
.6							
6							DL1 -39.00
6							
6							
6							
.6 🔶 1							
.6	A CONTRACTOR OF STREET	-					
		100 100 100 100 100 100 100 100 100 100	lander of the second	an in the state of		والمتحقق والمراجع والمراجع والمحافظ	dagenianonitaten
art 150 kHz es BW 10 kHz	#\/	BW 30 kHz*			Swee	Stop p 79.47 m	20.000 M



		Max Value	Limit < (dBm)	Desult
e 1 GHz	Freq (MHz) 3617.92	(dBm) -34.4	-19	Result Pass
0112	0011.02	01	10	1 400
ials Technology				
	SENSE:INT		RMS	08:51:25 AM Jul 15, 2023
PNO: Fast ++- IFGain:Low	Trig: External1 #Atten: 20 dB		100/100	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N
			Mk	r1 3.617 9 GHz -34.397 dBm
	Ť			
				DET -13.00 UDIT
			and the second se	
	A			Stop 4.000 GHz
#VB	W 3.0 MHz*		Sweep 1.	067 ms (8001 pts)
		STATUS		
106 2600 MH- 10 M	ILIZ Rondwidth 640	M Modulation	Mid Channel 250	2 00 MH-
	Measured	Max Value	Limit	
e	Freq (MHz)	(dBm)	< (dBm)	Result
	PNO: Fast IFGain:Low →	PNO: Fast Trig: External1 IFGain:Low Trig: External1 #Atten: 20 dB 	PNO: Fast → Trig: External1 IFGain:Low → Trig: External1 #Atten: 20 dB	PNO: Fast IFGain:Low → Trig: External1 Avg Hold: 100/100 Avg Hold: 100/100 Kk Kk

	ectrum Analyzer - Element Materials	Technology			
RL	RF 50 Ω DC		SENSE:INT	ALIGN AUTO	08:53:42 AM Jul 15, 20
	Gate: LO	PNO: Fast ++ IFGain:Low	Trig: External1 #Atten: 26 dB	Avg Type: RMS Avg Hold: 5/5	TRACE 1 2 3 4 TYPE A WWW DET A NNN
0 dB/div	Ref Offset 30.7 dB Ref 38.70 dBm			l	Mkr1 2.727 056 3 G -33.999 dE
			l l		
28.7			(
18.7					
3.70					
.30					
.30					
1.3					
:1.3					DL1 -19.00
31.3					
11.3					
i1.3					
tart 2.45					Stop 2.7500 G
Res BW	1.0 MHz	#VB	W 3.0 MHz*	#	≇Sweep 4.000 s (8001 p
SG		h shinka ya ƙasar da ma ƙasar ƙwallon		STATUS	



Frequenc Range	У	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	B	sult
4 GHz - 11 0		4009.45	-48.19	-19		ass
4 01/2 - 11 0		4003.45		-15		435
Keysight Spectrum Analyzer - Element Materials		NSE:INT	ALIGN AUTO		00:08:20	AM Jul 15, 2023
	PNO: Fast +++	Trig: Free Run #Atten: 10 dB	Avg Type: I Avg Hold: 1	RMS 00/100	09.08.5 TF	AACE 1 2 3 4 5 6 TYPE A WWWWW DET A NNNNN
Ref Offset 26.9 dB 10 dB/div Ref 26.90 dBm				Μ		9 45 GHz 190 dBm
Log		Ť				
16.9						
6.90						
-3.10						
-13.1						
00.4						DL1 -19.00 dBm
-23.1						
-33.1						
-43.1						
		discontration and the second stream	and the second	-		
-53.1						
-63.1						
Start 4.000 GHz #Res BW 1.0 MHz	#VBW	3.0 MHz*		Sweep	Stop 7 12.00 ms	1.000 GHz (20001 pts)
MSG		ng n	STATUS			

Port 1, Band n41, 2496 - 2690 MHz, 10 MH	z Bandwidth, 640	AM Modulation, I	Mid Channel, 259	2.99 MHz
Frequency	Measured	Max Value	Limit	
Range	Freq (MHz)	(dBm)	< (dBm)	Result
11 GHz - 18 GHz	17716.15	-50.48	-19	Pass

RL RF 50 Ω DC CORREC	S	ENSE:INT	ALIGN AUTO	09:10:09 AM Jul 15, 202
	PNO: Fast ↔ IFGain:Low	Trig: Free Run #Atten: 6 dB	Avg Type: RMS Avg Hold: 100/100	TRACE 1 2 3 4 1 TYPE A WWW DET A NNN
Ref Offset 29.9 dB dB/div Ref 25.90 dBm			I	Wkr1 17.716 15 GH -50.477 dB
		Ĭ		
.9				
00				
0				
1				
1				DL1 -19.00 c
1				
1				1
1				
art 11.000 GHz es BW 1.0 MHz	#VBV	N 3.0 MHz*	Swee	Stop 18.000 GF p 12.00 ms (20001 pt



		ort 1, Band n41, 2496 - 2690 Mł				2.99 MHz
		Frequency	Measured	Max Value	Limit	
		Range	Freq (MHz)	(dBm)	< (dBm)	Result
		18 GHz - 27 GHz	26165.7	-54.34	-19	Pass
		m Analyzer - Element Materials Technology RF 50 Ω DC CORREC	SENSE:INT	ALIGN AUTO		09:22:19 AM Jul 15, 2023
		N JOSE DE CONNEC		Avg Type:		TRACE 1 2 3 4 5 6
		PNO: I IFGain	Fast +++ Trig: Free Run	Avg Hold:	100/100	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N
					Mkr1	26.165 70 GHz
	10 dB/div	tef Offset 21.4 dB Ref 17.40 dBm				-54.340 dBm
	Log		The second secon			
	7.40					
	-2.60					
	-2.60					
	-12.6					
	-12.0					DL1 -19.00 dBm
	-22.6					
	-32.6					
	-42.6					
						1
	-52.6					
	-62.6					
	-72.6					
	-72.0					
	Start 18.000		#\/D\W/ 2 A B4U-*			Stop 27.000 GHz
	#Res BW 1.0		#VBW 3.0 MHz*	hanne an an	Sweep 16.	00 ms (20001 pts)
	MSG			STATUS		
_	Do	rt 1, Band n41, 2496 - 2690 MH	Iz 10 MUz Rondwidth 2560	AM Modulation	Mid Channel 250	00 MH-
	PO	Frequency	Measured	Max Value	Limit	02.99 WITZ
		Range	Freq (MHz)	(dBm)	< (dBm)	Result
		9 kHz - 150 kHz	0.01	-76.69	-49	Pass

	10.8						
Beldiv Ref -0.80 dBm -76.690 dE 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8	4						
28 July Ref -0.80 dBm -76.690 dE 0.8 -76.690 dE 0.9 -76.690 dE <td>'0.8 <mark>- 1</mark></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	'0.8 <mark>- 1</mark>						
28 July Ref -0.80 dBm -76.690 dE 0.8 -76.690 dE 0.9 -76.690 dE <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							
Boldiv Ref -0.80 dBm -76.690 dE 0.8 -76.690 dE 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.9 <td>0.8</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	0.8						
Boldiv Ref -0.80 dBm -76.690 dE 0.8 -76.690 dE 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.8 - 0.9 <td>0.8</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	0.8						
AB/div Ref -0.80 dBm -76.690 dE 0.8 -76.690 dE 0.8 -76.690 dE							DL1 -49.00 c
De Beldiv Ref -0.80 dBm -76.690 dE	0.8						
De Beldiv Ref -0.80 dBm -76.690 dE							
D dB/div Ref -0.80 dBm -76.690 dE	0.8						
D dB/div Ref -0.80 dBm -76.690 dE	0.0						
D dB/div Ref -0.80 dBm -76.690 dE							
Net 018492 48 -76.690 dB	0.8						
Net 018492 48 -76.690 dB							
) dB/div og	Ref -0.80	dBm		 	 -76.	690 dB
		Ref Offset 9	.2 dB				
	RL	RF 50	Ω DC	SENSE:INT	IGN AUTO Avg Type: R Avg Hold: 10	TR	AM Jul 15, 20 ACE 1 2 3 4 YPE A WWW



Frequen		Measured	Max Value	Limit		
Range		Freq (MHz)	(dBm)	< (dBm)	Result	_
150 kHz - 20) MHz	0.31	-75.41	-39	Pass	
Keysight Spectrum Analyzer - Element Materia						J
X RL RF 50 Ω DC		SENSE:INT	ALIGN AUTO Avg Type:	RMS	08:30:09 AM Jul 1 TRACE	2 3 4 5 6
	PNO: Fast ++- IFGain:Low	Trig: Free Run #Atten: 6 dB	Avg Hold:			N N N N N
Ref Offset 9.4 dB 10 dB/div Ref -3.60 dBm					Mkr1 313.8 -75.405	
Log		Y				
-13.6						
22.0						
-23.6						
-33.6						
-33.6					DI1 -	39.00 dBm
-43.6						
-+0						
-53.6						
-63.6						
-73.6						
-83.6						
White the state of						
-93.6	in the second state of the second					
		and the second sec	ng ang pang ang sa	16/74 26/16/16/16/16/16/16/16/16/16/16/16/16/16	and the second second second second	-
Start 150 kHz				, <u> </u>	Stop 20.000	
#Res BW 10 kHz	#VB	W 30 kHz*		Sweep	79.47 ms (800	1 pts)
MSG			STATUS			

Port 1, Band n41, 2496 - 2690 MHz, 10 M	Hz Bandwidth, 256	QAM Modulation,	Mid Channel, 25	92.99 MHz
Frequency	Measured	Max Value	Limit	
Range	Freq (MHz)	(dBm)	< (dBm)	Result
20 MHz - 4 GHz	3613.94	-33.48	-19	Pass

RL RF	50 Ω DC		SENSE:INT	ALIGN AUTO	08:56:58 AM Jul 15, 202
G	Gate: LO	PNO: Fast ↔ IFGain:Low	. Trig: External1 #Atten: 20 dB	Avg Type: RMS Avg Hold: 100/100	TRACE 1234 TYPE A WWW DET A N N N
Ref dB/div Ref g	Offset 32.7 dB 42.70 dBm				Mkr1 3.613 9 GH -33.482 dB
-			Ĭ		
.7					
.7					
70					
30					
3					DL1-13:00
.3					
.3		n fan de skriver de skriver sjelet et s			
.3					
art 20 MHz es BW 1.0 N			W 3.0 MHz*		Stop 4.000 GF Sweep 1.067 ms (8001 pt



Freque		Measured	Max Value	Limit	
2.45 GHz - 2		Freq (MHz) 2715.69	(dBm) -33.95	< (dBm) -19	Result Pass
2.43 GHZ - 2	2.75 GHZ	2715.09	-33.95	-19	Fass
Keysight Spectrum Analyzer - Element Mate RL RF 50 Ω DC		SENSE:INT	ALIGN AUTO		08:59:13 AM Jul 15, 2023
Gate: LO	PNO: Fast ↔→ IFGain:Low		Avg Type: Avg Hold: 5	RMS j/5	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N
Ref Offset 30.7 dB 10 dB/div Ref 38.70 dBm				Mkr1 2.	715 693 8 GHz -33.952 dBm
Log		Ĭ			
28.7					
18.7					
8.70					
-1.30					
-11.3					
-21,3					DL1 -19.00 dBm
					. 1
-31.3				<u> </u>	
-41.3					
-51.3					
Start 2.4500 GHz #Res BW 1.0 MHz	#VB	W 3.0 MHz*		#Sweep	Stop 2.7500 GHz 4.000 s (8001 pts)
MSG			STATUS		
Port 1, Band n41, 24	196 - 2690 MHz, 10 Mł	Hz Bandwidth, 2560	QAM Modulation,	Mid Channel, 259	92.99 MHz
Freque Rang		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
4 GHz - 1		4024.5	-48.16	-19	Pass

RL RF 50 Q DC CORREC		SENSE:INT	ALIGN AUTO		09:12:06 AM Jul 15, 20
	PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 10 dB	Avg Type: R Avg Hold: 10		TRACE 1 2 3 4 TYPE A WWW DET A NNN
Ref Offset 26.9 dB dB/div Ref 26.90 dBm				М	kr1 4.024 50 G -48.161 dB
		Ĭ			
ŝ.9					
30					
0					
.1					
1					
.1					
.1 _ 1					
.1					
art 4.000 GHz tes BW 1.0 MHz	#VB	W 3.0 MHz*		Sweep	Stop 11.000 G 12.00 ms (20001 p



	Frequency	Measured	Max Value	Limit	
	Range	Freq (MHz)	(dBm)	< (dBm)	Result
	11 GHz - 18 GHz	17981.45	-50.54	-19	Pass
	er - Element Materials Technology				
	50 Ω DC CORREC	SENSE:INT	ALIGN AUTO		09:13:42 AM Jul 15, 2023
			Avg Type		TRACE 1 2 3 4 5 (
		: Fast +++ Trig: Free Run n:Low #Atten: 6 dB	Avg Hold:	100/100	TYPE A WWWWW DET A NNNN
10 dB/div Ref 25	et 29.9 dB .90 dBm			Mkr1	17.981 45 GHz -50.536 dBm
Log					
15.9					
-10.0					
5.90					
3.90					
-4.10					
-4.10					
-14.1					
					DL1 -19.00 dBm
-24.1					
-34.1					
-44.1					
-54.1			the subscription of the		and the second
-64.1					
Start 11.000 GHz					Stop 18.000 GHz
#Res BW 1.0 MHz		#VBW 3.0 MHz*		Sweep 12	.00 ms (20001 pts
MSG			STATUS		
		Hz, 10 MHz Bandwidth, 25			

POIL I, DAHU 114 I, 2490 - 2090 MITZ, 10 MIT	iz banuwiuth, 200	QAIN MODULATION,	wid Channel, 25	92.99 MITZ
Frequency	Measured	Max Value	Limit	
Range	Freq (MHz)	(dBm)	< (dBm)	Result
18 GHz - 27 GHz	26111.7	-53.94	-19	Pass

RL	RF 50 Ω D	CORREC		SI	ENSE:INT	AL	IGN AUTO		09:23:5	3 AM Jul 15, 202
			PNO: Fast IFGain:Low	•••	Trig: Free R #Atten: 6 dE	un 3	Avg Type: I Avg Hold: 1		TI	TYPE A WWWW DET A NNN
dB/div g	Ref Offset 21.4 d Ref 17.40 dBn	B n						M	kr1 26.11 -53.	1 70 GH 940 dBi
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	00 GHz 1.0 MHz		4		V 3.0 MHz*			Swoon	Stop 2 16.00 ms	27.000 GH



End of Test Report