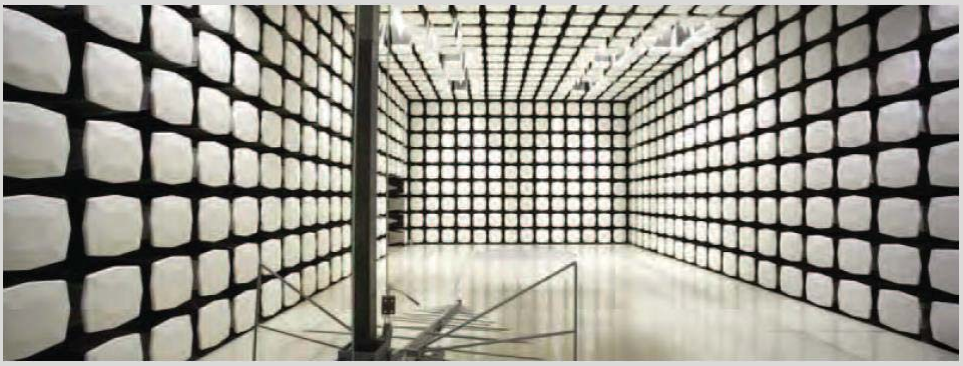
Radio Test Report
Application for a Permissive Change of Equipment Authorization
FCC Part 27 Subpart C and IC RSS-130
729MHz – 745MHz

FCC Part 90 Subpart R and IC RSS-140
758MHz – 768MHz

FCC ID: VBNAHLBBA-01
IC ID: 661W-AHLBBA

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

Report: NOKI0047, Issue Date: September 28, 2022



ACCREDITED
CERT #3310.03

CERTIFICATE OF TEST

Last Date of Test: August 8, 2022
Nokia Solutions and Networks
EUT: Airscale Base Transceiver Station Remote Radio Head Model AHLBBA

Radio Equipment Testing

Standards

Specification	Method
Code of Federal Regulations (CFR) Title 47 Part 2 (Radio Standards specification) RSS-Gen Issue 5 CFR Title 47 Part 27 Subpart C Miscellaneous Wireless Communication Services CFR Title 47 Part 90 Subpart R – Private Land Mobile Radio RSS-130 Issue 2: February 2019 RSS-140 Issue 1 -April 2018	ANSI C63.26-2015 FCC KDB 971168 D01 v03r01 FCC KDB 662911D01 v02r01

Results

Test Description	Applied	Results	Comments
Ouput Power	Yes	Pass	
Occupied Bandwidth	Yes	Pass	
Frequency Stability	No	N/A	Not requested.
Average Power	Yes	Pass	
Peak to Average Power (PAPR)CCDF	Yes	Pass	
Power Spectral Density and EIRP Calcualation	Yes	Pass	
Band Edge Compliance	Yes	Pass	
Spurious Conducted Emissions	Yes	Pass	

Deviations From Test Standards

None

Approved By:

Adam Bruno, Operations Manager

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

REVISION HISTORY

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

ACCREDITATIONS AND AUTHORIZATIONS

United States

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

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

Canada

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

European Union

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

United Kingdom

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

Australia/New Zealand

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

Korea

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

Japan

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

Taiwan

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

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

Singapore

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

Israel

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

Hong Kong

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

Vietnam

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

SCOPE

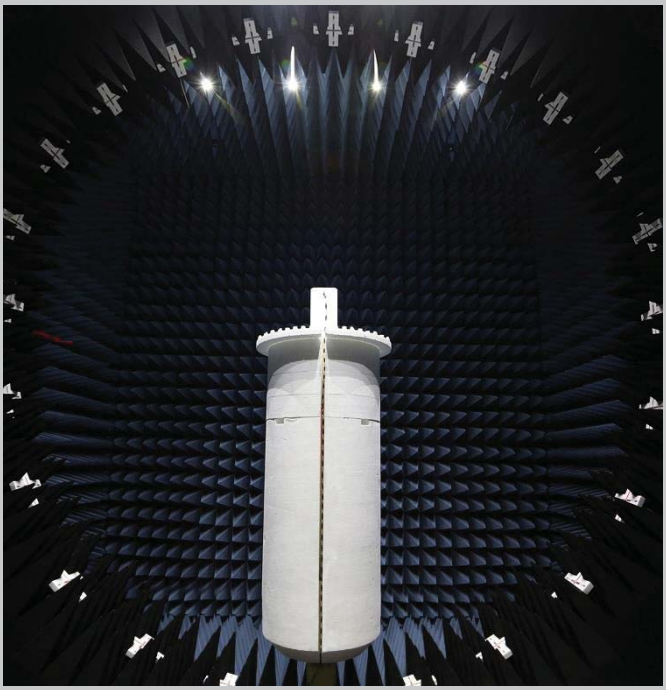
For details on the Scopes of our Accreditations, please visit:

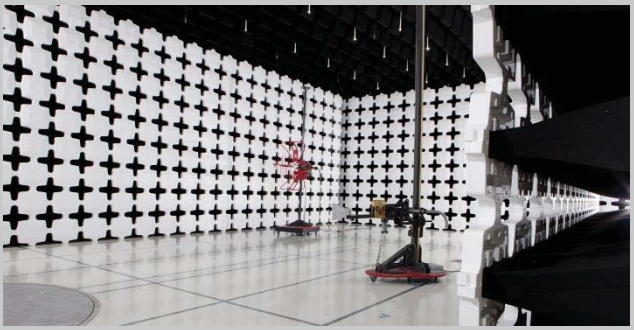
California Minnesota Oregon Texas Washington

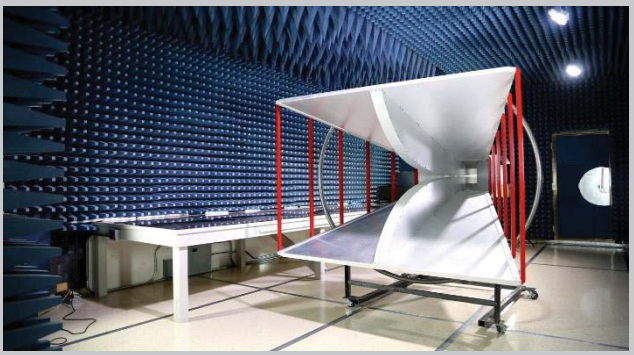
FACILITIES

element
2020.12.15

California	Minnesota	Oregon	Texas	Washington
Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-11 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th Ave NE Bothell, WA 98011 (425)984-6600
A2LA				
Lab Code: 3310.04	Lab Code: 3310.05	Lab Code: 3310.02	Lab Code: 3310.03	Lab Code: 3310.06
Innovation, Science and Economic Development Canada				
2834B-1, 2834B-3	2834E-1, 2834E-3	2834D-1	2834G-1	2834F-1
BSMI				
SL2-IN-E-1154R	SL2-IN-E-1152R	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI				
A-0029	A-0109	A-0108	A-0201	A-0110
Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA				
US0158	US0175	US0017	US0191	US0157







MEASUREMENT UNCERTAINTY

element
TMU.2015.07.10

Measurement Uncertainty

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

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

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

Test	+ MU	- MU
Frequency Accuracy	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	1.2 dB	-1.2 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.1 dB	-5.1 dB
AC Powerline Conducted Emissions (dB)	3.1 dB	-3.1 dB

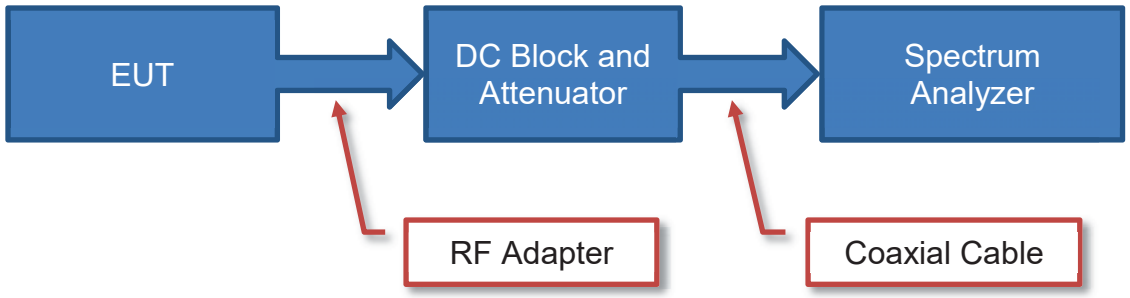
TEST SETUP BLOCK DIAGRAMS

Measurement Bandwidths

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

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

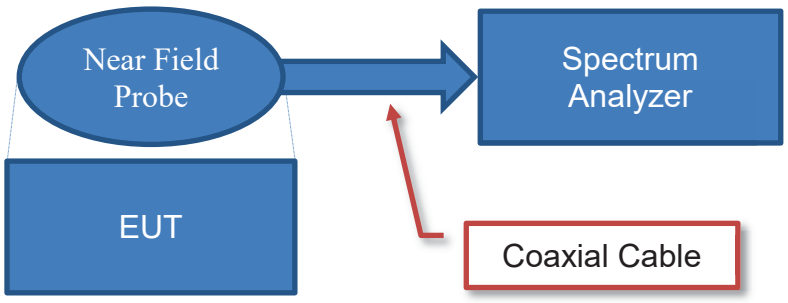
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

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

Near Field Test Fixture Measurements

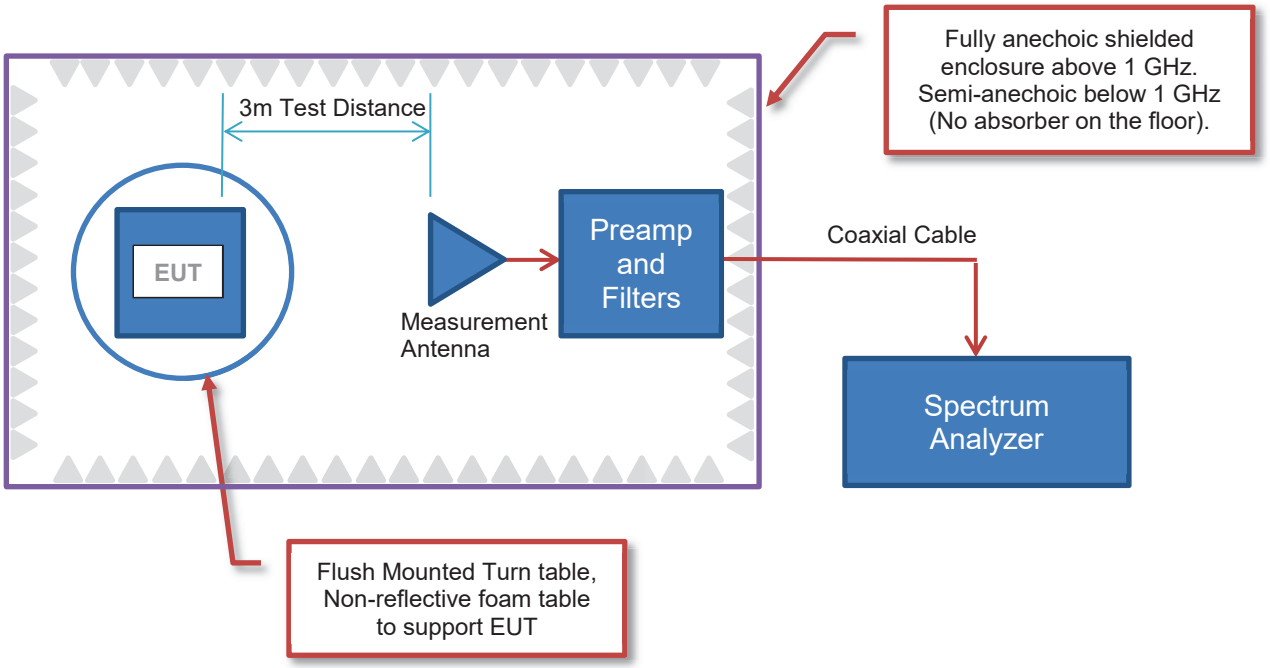


Sample Calculation (logarithmic units)

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

TEST SETUP BLOCK DIAGRAMS

Emissions Measurements



Sample Calculation (logarithmic units)

Radiated Emissions:

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

Conducted Emissions:

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

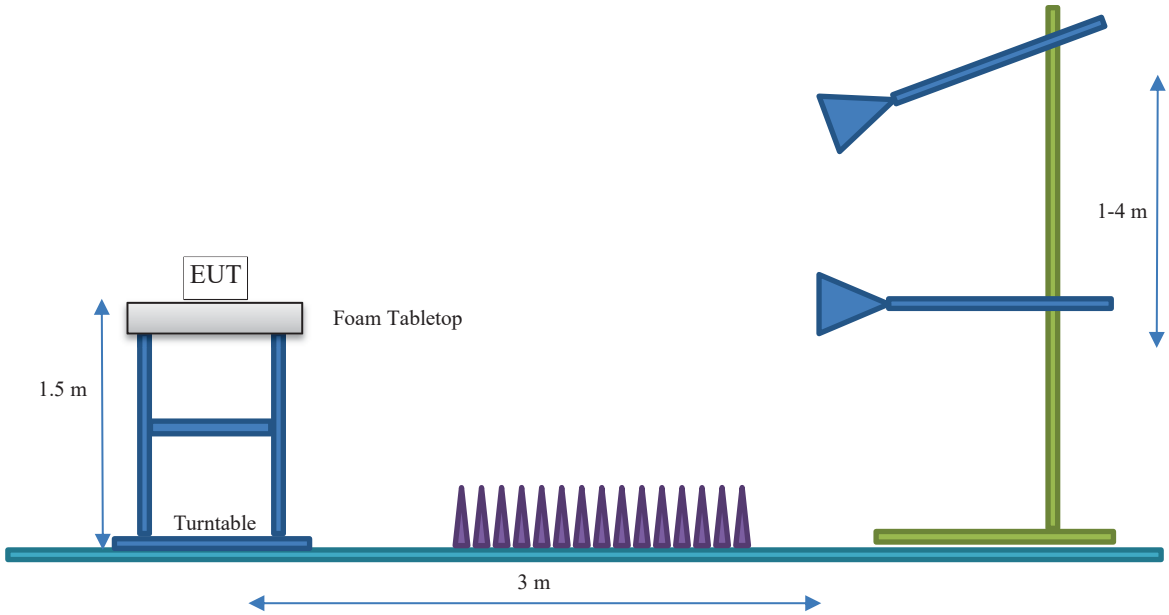
Radiated Power (ERP/EIRP) – Substitution Method:

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

TEST SETUP BLOCK DIAGRAMS

Bore Sighting (>1GHz)

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



PRODUCT DESCRIPTION

Client and Equipment under Test (EUT) Information

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 AHLBBA
First Date of Test:	July 29, 2022
Last Date of Test:	August 8, 2022
Receipt Date of Samples:	July 29, 2022
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

A permissive change on the original filing is being pursued to add 5G NR technologies to the AirScale Base Transceiver Station Remote Radio Head Model AHLBBA FCC and ISED radio certifications. The original test effort includes testing for 4G LTE technologies. Please refer to the test report on the original certification for details on all required testing. "NOKI0013 issue date April 27, 2020"

All conducted RF testing performed for the original certification testing has been repeated using 5G NR carriers for this permissive change per correspondence/guidance from Nemko TCB. The same test methodology used in the original certification testing was used in this permissive change test effort. Tests performed under the change effort include RF power, PSD, CCDF, emission bandwidth (99% and 26 dB down), band edge spurious emissions, and conducted spurious emissions.
The testing was performed on the same hardware version (AHLBBA) as the original certification test. The base station and remote radio head software for this testing is an updated release that includes 5G NR support.
The radiated emissions and frequency stability measurements performed in the original certification were not repeated under this effort per TCB guidance. The radiated emission and frequency stability/accuracy results from the original certification had enough margin to preclude requiring additional testing. The frequency stability/accuracy radio design is the same for all radio technologies/modulation types.

Nokia Solutions and Networks AirScale Base Transceiver Station (BTS) Remote Radio Head (RRH) variant AHLBBA is being developed under this effort. The AHLBBA remote radio head is a multi-standard multi-carrier radio module designed to support 4G LTE, 5G NR, narrow band IoT (internet of things) operations (in-band, guard band, standalone) and Dynamic Spectrum Sharing (DSS). **The scope of testing in this effort is for 5G NR-FDD operations.**

The AHLBBA RRH has four transmit/four receive antenna ports (4TX/4RX for Band n12, 4TX/4RX for Band n14). Antenna ports 1-4 support 3GPP 5G NR frequency band n12 (BTS Rx: 699 to 714 MHz/BTS TX: 729 to 745 MHz) and 3GPP 5G NR frequency band n14 (BTS Rx: 788 to 798 MHz/BTS TX: 758 to 768 MHz) at 80 watts/carrier. Antenna ports 1 & 4 support 3GPP frequency band 29 downlink (BTS TX: 718 to 728 MHz) at 25 watts/carrier; Band 29 is not supported for 5G NR

operations at this time. The AHLBBA radio hardware has design variation between two antenna port set paths, antenna 1&4 have same hardware design, antennas 2&3 have same hardware design. The total output power with 5GNR FDD carriers is 80 watts for each antenna port 1, 2,3 & 4. The maximum RRH RF output power for all 5GNR antenna ports (1 – 4) is 320 Watts. The RRH can be operated as a 4x4 MIMO, 2x2 MIMO or as non-MIMO for Bands 12 & 14. The TX and RX instantaneous bandwidth cover the full operational bandwidth. The RRH supports radio bandwidths of 5, 10, 15MHz for 3GPP frequency band n12 and bandwidths of 5 and 10MHz for band n14. The RRH supports four 5G NR downlink modulation types (QPSK, 16QAM, 64QAM and 256QAM). Multi-carrier operation is supported.
The 5G NR carriers/modulation types for this testing are setup according to 3GPP TS 38.141-1 Test Models and are NR-FR1-TM 1.1 (QPSK modulation type), NR-FR1-TM 3.2 (16QAM modulation type), NR-FR1-TM 3.1 (64QAM modulation type), and NR-FR1-TM 3.1a (256QAM modulation type).
Single carriers are tested at the bottom, middle and top channels provided in Band n12 and Band n14 frequency channel tables. Multicarrier testing is performed at maximum port/carrier power per KDB 971168 D03v01 guidance.
The RRH has external interfaces including DC power (DC In), ground, transmit/receive (ANT), external alarm (EAC), optical CPRI/eCPRI (OPT) and remote electrical tilt (RET). The RRH with applicable installation kit may be pole or wall mounted.

Multicarrier/Multiband test cases have been developed as shown below:

Multi-Carrier Test Case 1 (3GPP Band n12 Multicarrier): Three NR5 carriers using two carriers (with minimum spacing between carrier frequencies) at the lower band (731.5MHz & 736.5MHz) and a third carrier with maximum spacing between the other two carrier frequencies (742.5MHz) at the upper band edge. The NR 5Mhz channel bandwidth was selected to maximize carrier power spectral density. The carriers are operated at maximum power for a total port power of 80 watts (~26.6W/Band n12 carriers).
Multi-Carrier Test Case 2 (3GPP Band n12 and Band n14 Multicarrier/Multiband): In the Band n12 _ Two NR 5MHz carriers at the lower band edge (731.5 & 736.5MHz). In Band n14 one NR 5MHz carrier at the upper band edge 765.5MHz. The carriers are operated at maximum power for a total port power of 80 watts (~26.6W/Band n12/n14 carriers).

AHLBBA 3GPP Frequency Band n12 5GNR Downlink Band Edge ARFCNs

The 3GPP frequency band n12 (729 - 745 MHz) band edge downlink (BTS Transmit) ARFCNs for 5GNR channel bandwidths (5,10, and 15 MHz) are provided below. The ARFCN is defined as Absolute Radio Frequency Channel Number.

	Downlink ARFCN	Downlink Frequency (MHz)	5GNR Channel Bandwidth		
			5 MHz	10 MHz	15 MHz
Band n12 (Ant 1, 2, 3, 4)	145800	729.0	Band Edge	Band Edge	Band Edge
	……				
	146300	731.5	Bottom Ch		
	……				
	146800	734.0		Bottom Ch	
	……				
	147300	736.5			Bottom Ch
	……				
	147400	737	Middle Ch	Middle Ch	Middle Ch
	……				
	147500	737.5			Top Channel
	……				
	148000	740		Top Channel	
	……				
	148500	742.5	Top Channel		
	……				
	149000	745.0	Band Edge	Band Edge	Band Edge

AHLBBA Downlink Band Edge 5GNR Band n12 Frequency Channels

AHLBBA 3GPP Frequency Band n14 5GNR Downlink Band Edge ARFCNs

The 3GPP frequency band n14 (758-768 MHz) band edge downlink (BTS Transmit) ARFCNs for 5GNR channel bandwidths (5 and 10MHz) are provided below. The ARFCN is defined as Absolute Radio Frequency Channel Number.

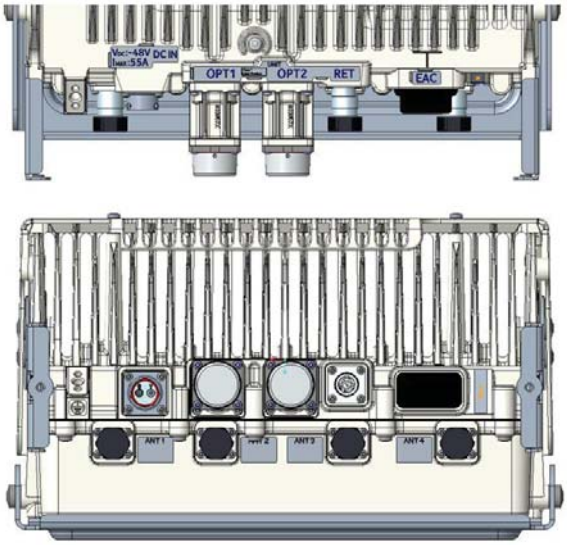
	Downlink ARFCN	Downlink Frequency (MHz)	5GNR Channel Bandwidth	
			5 MHz	10 MHz
Band n14 (Ant 1, 2, 3, 4)	151600	758.0	Band Edge	Band Edge
	……			
	152100	760.5	Bottom Ch	
	……			
	152600	763.0	Middle Ch	Bottom Ch Middle Ch Top Channel
	……			
	153100	765.5	Top Channel	
	……			
	153600	768.0	Band Edge	Band Edge

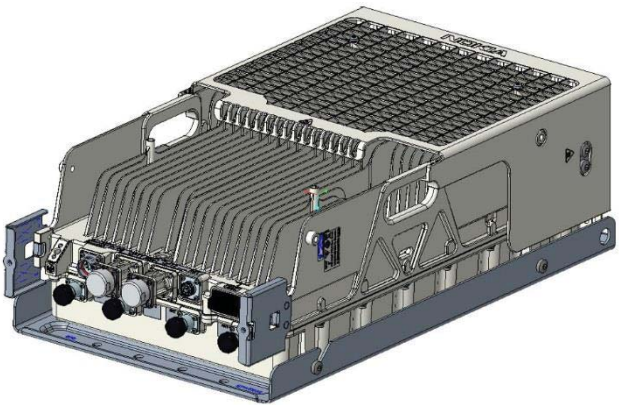
AHLBBA Downlink Band edge 5GNR Band n14 Frequency Channels

PRODUCT DESCRIPTION

element
2018-07-17

I. AHLBBA Connector Layout





AHLBBA External Interfaces

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

Testing Objective:

A permissive change on the original filing is being pursued to add 5G NR operations to the Nokia Solutions and Networks AirScale Base Transceiver Station (BTS) Remote Radio Head (RRH) model AHLBBA FCC and ISED certifications.

CONFIGURATIONS

Configuration NOKI0047- 1

Software/Firmware Running during test	
Description	**Version**
Radio Module Software:(FRM5)	RF.FRM5.trunk.20220621.022
BTS Software Version:(22R4)	SBTS22R4_ENB_9999_22063_000003

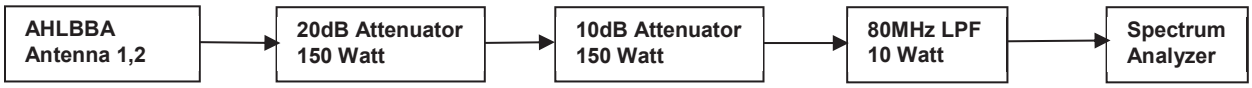
Equipment being tested (include Peripherals)			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AMIA (BTS System Module)	Nokia Solutions and Networks	473098A.203	J818470035
ASIB (BTS System Module)	Nokia Solutions and Networks	473764A.102	DH211165881
ABIO (BTS System Module)	Nokia Solutions and Networks	475266A.102	L1205105845
AHLBBA (Remote Radio Head)	Nokia Solutions and Networks	475082A.101	K9193514835
Low Pass Filter	Mini-Circuits	VLFX-80+	RUU95701952
Attenuator 150W/20dB	AeroflexWeinschel	66-20-33	BZ2075
Attenuator 150W/10dB	AeroflexWeinschel	6375	BJ2483
SFP+ 9.8G,300M,850NM	Nokia	474900A.101	VF2023004CK
SFP+ 9.8G,300M,850NM	Nokia	474900A.101	VF2023002TA
LENOVO T490	LENOVO	B2G14EC#ABA	CNU246B8XP
Keysight- DC System power supply	Keysight	N8757A	US21D4053S
FPAC (DC-pwr supply)	Nokia	472438A.101	G7111007170
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC865
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC066
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC863
Fiber Optic cable 0300 mm	Amphenol	E201648	2701M
CAT5e data cable	LEONI L	64867m	146180
WebEM- PC	LENOVO	T490 ThinkPad	PF26RVZ0
3 Meter RF load cable	Alpha Wire	9214	RG214-1
2 Meter RF load cable	Maketron	706	993437a
1 Meter RF load cable	Maketron	706	993437a-2
1 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_104	SN551123/4
6 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN528836 /6
GPS Receiver	Trimble	92626-60	71231431
GPS cable	Nokia	FTSH 472577A.103	CA2029

Cables (Peripheral)					
Description	**Shield (Y/N)**	**Length (m)**	**Ferrite (Y/N)**	**Connection 1**	**Connection 2**
Amphenol Fiber Optic cable	N	7 meters	N	ABIO	AHLBBA
Cat-5e cable	Y	7 meters	N	ASIB	WebEM- PC
Times Microwave Systems	Y	2 meters	N	EUT [RRH] Ant port as per config 1-2, 3 and 4	250W -50ohm - Load

CONFIGURATIONS

Cables					
Description	**Shield (Y/N)**	**Length (m)**	**Ferrite (Y/N)**	**Connection 1**	**Connection 2**
HS-SUCOFLEX_106	Y	3 meters	N	EUT [AHLBBA] Ant port #1,2	Attenuator 150W/20dB [BZ1165]
Attenuator 150W/20dB	Y	NA	N	RF cable HS-SUCOFLEX_106	Attenuator 150W/10dB
Attenuator 150W/10dB	Y	NA	N	Attenuator 150W/20dB [BZ2075]	Low Pass Filter 80MHz 10W
Low Pass Filter 80MHz 10W	Y	NA	N	Attenuator 100W/10dB	RF cable HS-SUCOFLEX_104
HS-SUCOFLEX_104	Y	1 meter	N	Low Pass Filter 80MHz 10W	Spectrum Analyzer

RF Test Setup Diagram:



CONFIGURATIONS

Configuration NOKI0047- 2

Software/Firmware Running during test	
Description	**Version**
Radio Module Software:(FRM5)	RF.FRM5.trunk.20220621.022
BTS Software Version:(22R4)	SBTS22R4_ENB_9999_22063_000003

Equipment being tested (include Peripherals)			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AMIA (BTS System Module)	Nokia Solutions and Networks	473098A.101	RK182307104
ASIB (BTS System Module)	Nokia Solutions and Networks	474021A.102	L1164105428
ABIO (BTS System Module)	Nokia Solutions and Networks	474020A.102	L1164121378
AHLBBA (Remote Radio Head)	Nokia Solutions and Networks	475082A.101	K9193514835
Attenuator 500W/40dB	API Weinschel	253-40-33-LIM	UP093
SFP+ 9.8G,300M,850NM	Nokia	474900A.101	VF2023004CK
SFP+ 9.8G,300M,850NM	Nokia	474900A.101	VF2023002TA
LENOVO T490	LENOVO	B2G14EC#ABA	CNU246B8XP
Keysight- DC System power supply	Keysight	N8757A	US21D4053S
FPAC (DC-pwr supply)	Nokia	472438A.101	G7111007170
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC865
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC066
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC863
Fiber Optic cable 0300 mm	Amphenol	E201648	2701M
CAT5e data cable	LEONI L	64867m	146180
WebEM- PC	LENOVO	T490 ThinkPad	PF26RVZ0
3 Meter RF load cable	Alpha Wire	9214	RG214-1
2 Meter RF load cable	Maketron	706	993437a
1 Meter RF load cable	Maketron	706	993437a-2
1 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_104	SN551123/4
6 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN528836 /6
GPS Receiver	Trimble	92626-60	71231431
GPS cable	Nokia	FTSH 472577A.103	CA2029

Cables (Peripheral)					
Description	**Shield (Y/N)**	**Length (m)**	**Ferrite (Y/N)**	**Connection 1**	**Connection 2**
Amphenol Fiber Optic cable	N	7 meters	N	ASIB	AHLBBA
Cat-5e cable	Y	7 meters	N	ASIB	WebEM- PC
Times Microwave Systems	Y	2 meters	N	EUT [RRH] Ant ports as per config 1-2, 3 and 4	250W -50ohm - Load

CONFIGURATIONS

Cables					
Description	**Shield (Y/N)**	**Length (m)**	**Ferrite (Y/N)**	**Connection 1**	**Connection 2**
HS-SUCOFLEX_106	Y	2 meters	N	EUT [AHLBBA] Ant port #1,2	Attenuator 500W/40dB
Attenuator 500W/40dB	Y	NA	N	RF cable HS-SUCOFLEX_106	RF cable HS-SUCOFLEX_104
HS-SUCOFLEX_104	Y	1 meter	N	Attenuator 250W/40dB	Spectrum Analyzer

RF Test Setup Diagram:

CONFIGURATIONS

Configuration NOKI0047- 3

Software/Firmware Running during test	
Description	**Version**
Radio Module Software:(FRM5)	RF.FRM5.trunk.20220621.022
BTS Software Version:(22R4)	SBTS22R4_ENB_9999_22063_000003

Equipment being tested (include Peripherals)			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AMIA (BTS System Module)	Nokia Solutions and Networks	473098A.101	RK182307104
ASIB (BTS System Module)	Nokia Solutions and Networks	474021A.102	L1164105428
ABIO (BTS System Module)	Nokia Solutions and Networks	474020A.102	L1164121378
AHLBBA (Remote Radio Head)	Nokia Solutions and Networks	475082A.101	K9193514835
High Pass Filter 2W	RLC Electronics	F-14699	0050
Attenuator 150W/20dB	AeroflexWeinschel	66-20-33	BZ2075
Attenuator 100W/3dB	AeroflexWeinschel	47-3-33	CG5493
SFP+ 9.8G,300M,850NM	Nokia	474900A.101	VF2023004CK
SFP+ 9.8G,300M,850NM	Nokia	474900A.101	VF2023002TA
LENOVO T490	LENOVO	B2G14EC#ABA	CNU246B8XP
Keysight- DC System power supply	Keysight	N8757A	US21D4053S
FPAC (DC-pwr supply)	Nokia	472438A.101	G7111007170
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC865
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC066
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC863
Fiber Optic cable 0300 mm	Amphenol	E201648	2701M
CAT5e data cable	LEONI L	64867m	146180
WebEM- PC	LENOVO	T490 ThinkPad	PF26RVZ0
3 Meter RF load cable	Alpha Wire	9214	RG214-1
2 Meter RF load cable	Maketron	706	993437a
1 Meter RF load cable	Maketron	706	993437a-2
1 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_104	SN551123/4
6 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN528836 /6
GPS Receiver	Trimble	92626-60	71231431
GPS cable	Nokia	FTSH 472577A.103	CA2029

Cables (Peripheral)					
Description	**Shield (Y/N)**	**Length (m)**	**Ferrite (Y/N)**	**Connection 1**	**Connection 2**
Amphenol Fiber Optic cable	N	7 meters	N	ASIB	AHLBBA
Cat-5e cable	Y	7 meters	N	ASIB	WebEM- PC
Times Microwave Systems	Y	2 meters	N	EUT [RRH] Ant ports 1,2, 3 and 4	250W -50ohm - Load

CONFIGURATIONS

Cables					
Description	**Shield (Y/N)**	**Length (m)**	**Ferrite (Y/N)**	**Connection 1**	**Connection 2**
HS-SUCOFLEX_106	Y	2 meters	N	EUT [AHLBBA] Ant port #1,2	Attenuator 150W/20dB [BZ1165]
Attenuator 150W/20dB [BZ2075]	Y	NA	N	RF cable HS-SUCOFLEX_106	Attenuator 100W/3dB
Attenuator 100W/3dB	Y	NA	N	Attenuator 150W/20dB [BZ2075]	High Pass Filter 2W
High Pass Filter 2W	Y	NA	N	Attenuator 100W/3dB	RF cable HS-SUCOFLEX_104
HS-SUCOFLEX_104	Y	1 meter	N	High Pass Filter 2W	Spectrum Analyzer

RF Test Setup Diagram:

CONFIGURATIONS

Configuration NOKI0047- 4

Software/Firmware Running during test	
Description	**Version**
Radio Module Software:(FRM5)	RF.FRM5.trunk.20220621.022
BTS Software Version:(22R4)	SBTS22R4_ENB_9999_22063_000003

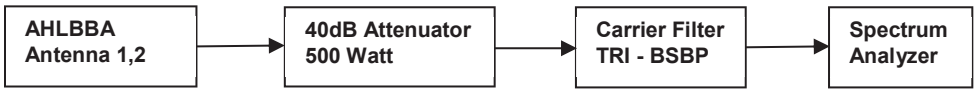
Equipment being tested (include Peripherals)			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AMIA (BTS System Module)	Nokia Solutions and Networks	473098A.101	RK182307104
ASIB (BTS System Module)	Nokia Solutions and Networks	474021A.102	L1164105428
ABIO (BTS System Module)	Nokia Solutions and Networks	474020A.102	L1164121378
AHLBBA (Remote Radio Head)	Nokia Solutions and Networks	475082A.101	K9193514835
Carrier Blocking Filter	Nokia Solutions and Networks	TRI-BSBP	None
Attenuator 500W/40dB	API Weinschel	253-40-33-LIM	UP093
SFP+ 9.8G,300M,850NM	Nokia	474900A.101	VF2023004CK
SFP+ 9.8G,300M,850NM	Nokia	474900A.101	VF2023002TA
LENOVO T490	LENOVO	B2G14EC#ABA	CNU246B8XP
Keysight- DC System power supply	Keysight	N8757A	US21D4053S
FPAC (DC-pwr supply)	Nokia	472438A.101	G7111007170
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC865
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC066
250W -50ohm -Terminating Load	API Weinschel inc	1433-3-LIM	TC863
Fiber Optic cable 0300 mm	Amphenol	E201648	2701M
CAT5e data cable	LEONI L	64867m	146180
WebEM- PC	LENOVO	T490 ThinkPad	PF26RVZ0
3 Meter RF load cable	Alpha Wire	9214	RG214-1
2 Meter RF load cable	Maketron	706	993437a
1 Meter RF load cable	Maketron	706	993437a-2
1 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_104	SN551426/4
1 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_104	SN551432/4
6 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_106	SN528836 /6
GPS Receiver	Trimble	92626-60	71231431
GPS cable	Nokia	FTSH 472577A.103	CA2029

Cables (Peripheral)					
Description	**Shield (Y/N)**	**Length (m)**	**Ferrite (Y/N)**	**Connection 1**	**Connection 2**
Amphenol Fiber Optic cable	N	7 meters	N	ASIB	AHLBBA
Cat-5e cable	Y	7 meters	N	ASIB	WebEM- PC
Times Microwave Systems	Y	2 meters	N	EUT [RRH] Ant ports as per config1-2, 3 and 4	250W -50ohm - Load

CONFIGURATIONS

Cables					
Description	**Shield (Y/N)**	**Length (m)**	**Ferrite (Y/N)**	**Connection 1**	**Connection 2**
HS-SUCOFLEX_106	Y	2 meters	N	EUT [AHLBBA] Ant port #1,2	Attenuator 500W/40dB
Attenuator 500W/40dB	Y	NA	N	RF cable HS-SUCOFLEX_106	Carrier Filter TRI-BSBP
Carrier Filter TRI-BSBP	Y	NA	N	Attenuator 500W/40dB	RF cable HS-SUCOFLEX_104
HS-SUCOFLEX_104	Y	1 meter	N	Carrier Filter TRI-BSBP	Spectrum Analyzer

RF Test Setup Diagram:



MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2022-07-29	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.
2	2022-08-03	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2022-08-03	Peak to Average Power (PAPR)CCDF	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2022-08-04	Power Spectral Density and EIRP Calculation	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	2022-08-08	Average 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.
6	2022-08-08	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.
7	2022-08-08	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

OUTPUT POWER ALL PORTS - BANDS n12 AND n14

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3239	ANC	2022-03-02	2023-03-02
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2022-01-17	2023-01-17

TEST DESCRIPTION

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

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

RF conducted emissions testing was performed on all ports at 5 MHz middle channel with 256QAM modulation for both bands in order to prove the AHLBBA antenna ports are essentially electrically identical. Antenna port 1 and antenna port 2 were selected to perform the remainder of the conducted testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

OUTPUT POWER ALL PORTS - BANDS n12 AND n14

TbtTx 2022.06.03.0 XMit 2022.02.07.0

EUT:	AHLBBA (C2PC/C3PC FCC/ISED)			Work Order:	NOKI0047
Serial Number:	K9193514835			Date:	30-Jul-22
Customer:	Nokia Solutions and Networks			Temperature:	21.1 °C
Attendees:	Mitchel Hill			Humidity:	56.3% RH
Project:	None			Barometric Pres.:	1021 mbar
Tested by:	Marty Martin	Power:	54VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 27:2022	ANSI C63.26:2015
FCC 90R:2022	ANSI C63.26:2015
RSS-130 Issue 2: 2019 and RSS 140 Issue 1: 2018	ANSI C63.26:2015

COMMENTS

All measurement path losses were accounted for in the reference level offset including attenuators, cables, DC block and filter when in use. The carriers were enabled at maximum power.

DEVIATIONS FROM TEST STANDARD

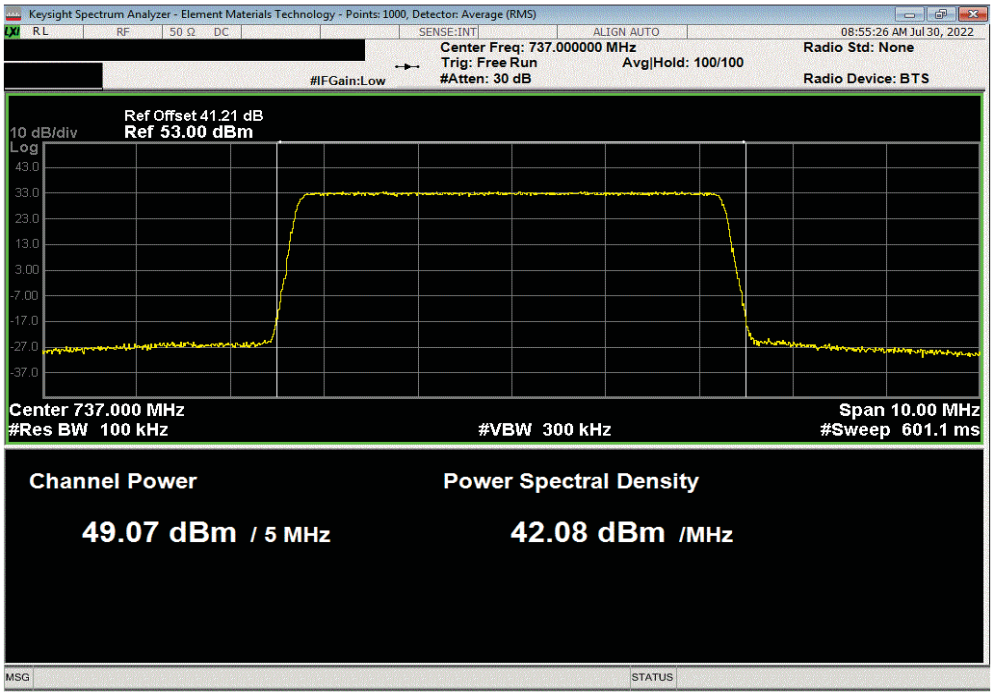
None

Configuration #	2	Signature

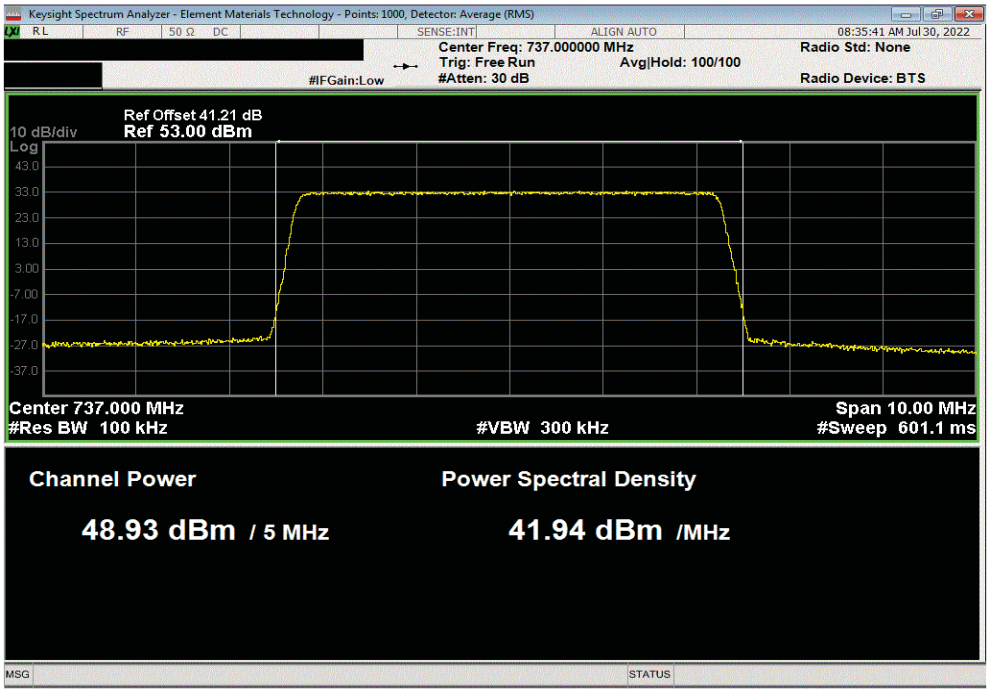
		Initial Value dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	All Ports Value (dBm)	Limit (dBm)	Results
Port 1							
	Band n12, 729 - 745, 5 MHz Bandwidth						
	256 QAM Modulation						
	Mid Ch. 737 MHz	49.07	0	49	N/A	Inside Tolerance	N/A
Port 2							
	Band n12, 729 - 745, 5 MHz Bandwidth						
	256 QAM Modulation						
	Mid Ch. 737 MHz	48.93	0	48.9	N/A	Inside Tolerance	N/A
Port 3							
	Band n12, 729 - 745, 5 MHz Bandwidth						
	256 QAM Modulation						
	Mid Ch. 737 MHz	48.97	0	49	N/A	Inside Tolerance	N/A
Port 4							
	Band n12, 729 - 745, 5 MHz Bandwidth						
	256 QAM Modulation						
	Mid Ch. 737 MHz	49.05	0	49	N/A	Inside Tolerance	N/A
All Ports							
	Band n12, 729 - 745, 5 MHz Bandwidth						
	256 QAM Modulation						
	Mid Ch. 737 MHz	N/A	0	N/A	55.02	N/A	N/A
Port 1							
	Band n14, 758 - 768, 5 MHz Bandwidth						
	256 QAM Modulation						
	Mid Ch. 763 MHz	48.97	0	49	N/A	Inside Tolerance	N/A
Port 2							
	Band n14, 758 - 768, 5 MHz Bandwidth						
	256 QAM Modulation						
	Mid Ch. 763 MHz	48.94	0	48.9	N/A	Inside Tolerance	N/A
Port 3							
	Band n14, 758 - 768, 5 MHz Bandwidth						
	256 QAM Modulation						
	Mid Ch. 763 MHz	48.91	0	49	N/A	Inside Tolerance	N/A
Port 4							
	Band n14, 758 - 768, 5 MHz Bandwidth						
	256 QAM Modulation						
	Mid Ch. 763 MHz	48.92	0	49	N/A	Inside Tolerance	N/A
All Ports							
	Band n14, 758 - 768, 5 MHz Bandwidth						
	256 QAM Modulation						
	Mid Ch. 763 MHz	N/A	0	N/A	54.96	N/A	N/A

OUTPUT POWER ALL PORTS - BANDS n12 AND n14

Port 1, Band n12, 729 - 745, 5 MHz Bandwidth, 256 QAM Modulation, Mid Ch. 737 MHz						
	Initial Value dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	All Ports Value (dBm)	Limit (dBm)	Results
	49.07	0	49	N/A	Inside Tolerance	N/A

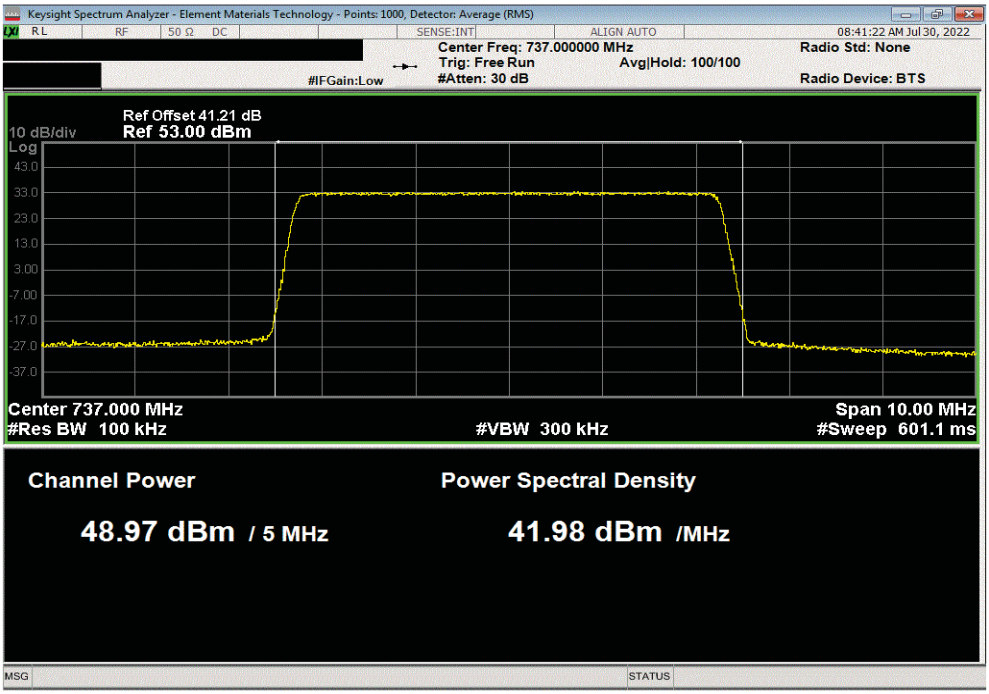


Port 2, Band n12, 729 - 745, 5 MHz Bandwidth, 256 QAM Modulation, Mid Ch. 737 MHz						
	Initial Value dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	All Ports Value (dBm)	Limit (dBm)	Results
	48.93	0	48.9	N/A	Inside Tolerance	N/A

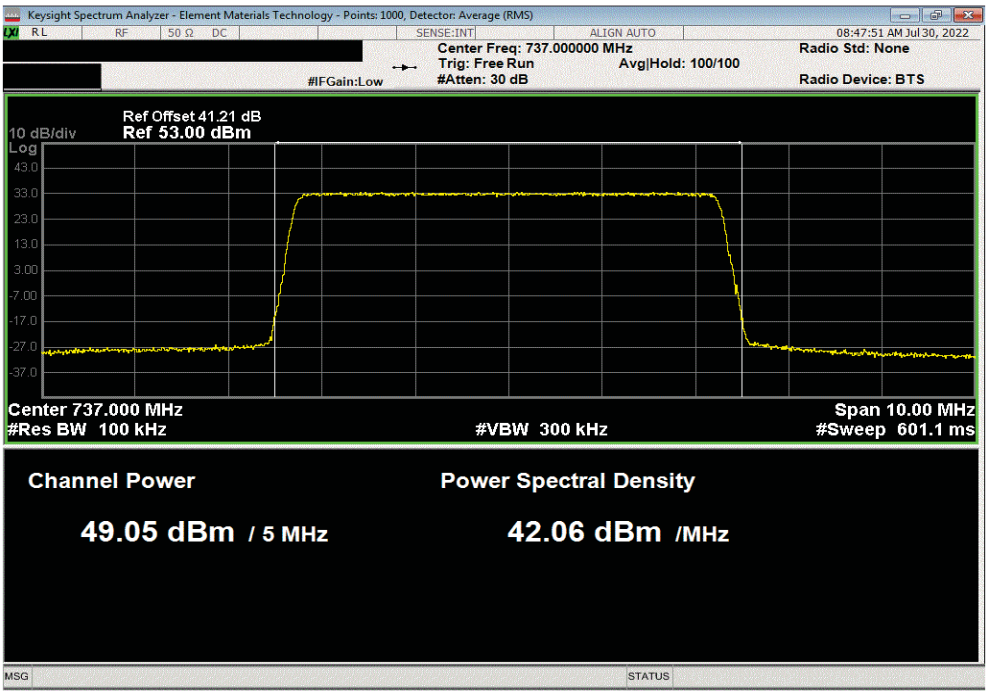


OUTPUT POWER ALL PORTS - BANDS n12 AND n14

Port 3, Band n12, 729 - 745, 5 MHz Bandwidth, 256 QAM Modulation, Mid Ch. 737 MHz						
	Initial Value dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	All Ports Value (dBm)	Limit (dBm)	Results
	48.97	0	49	N/A	Inside Tolerance	N/A

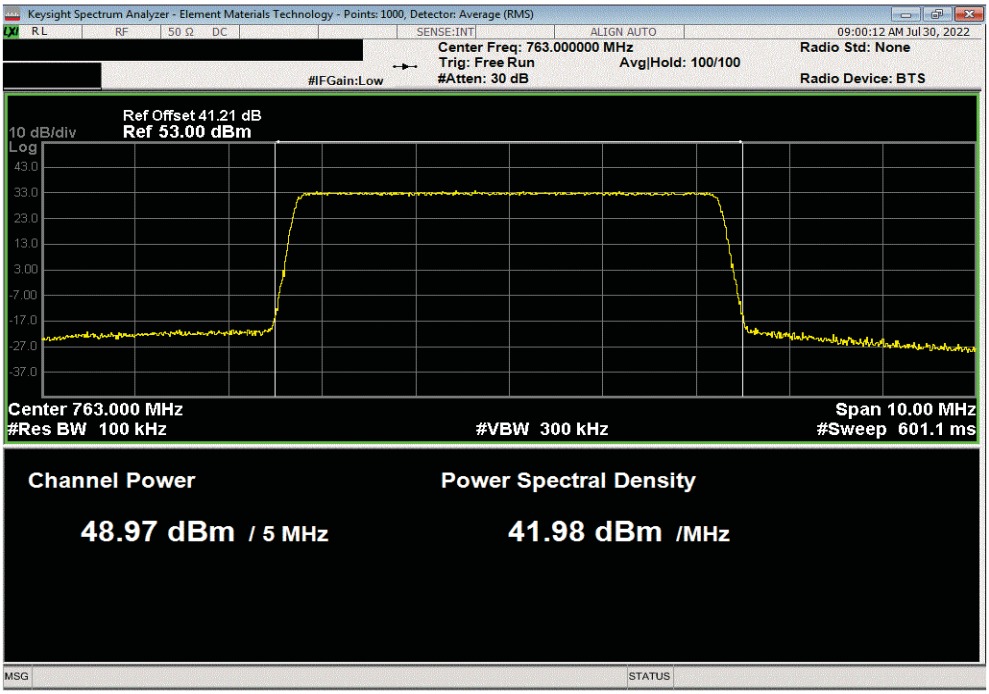


Port 4, Band n12, 729 - 745, 5 MHz Bandwidth, 256 QAM Modulation, Mid Ch. 737 MHz						
	Initial Value dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	All Ports Value (dBm)	Limit (dBm)	Results
	49.05	0	49	N/A	Inside Tolerance	Pass

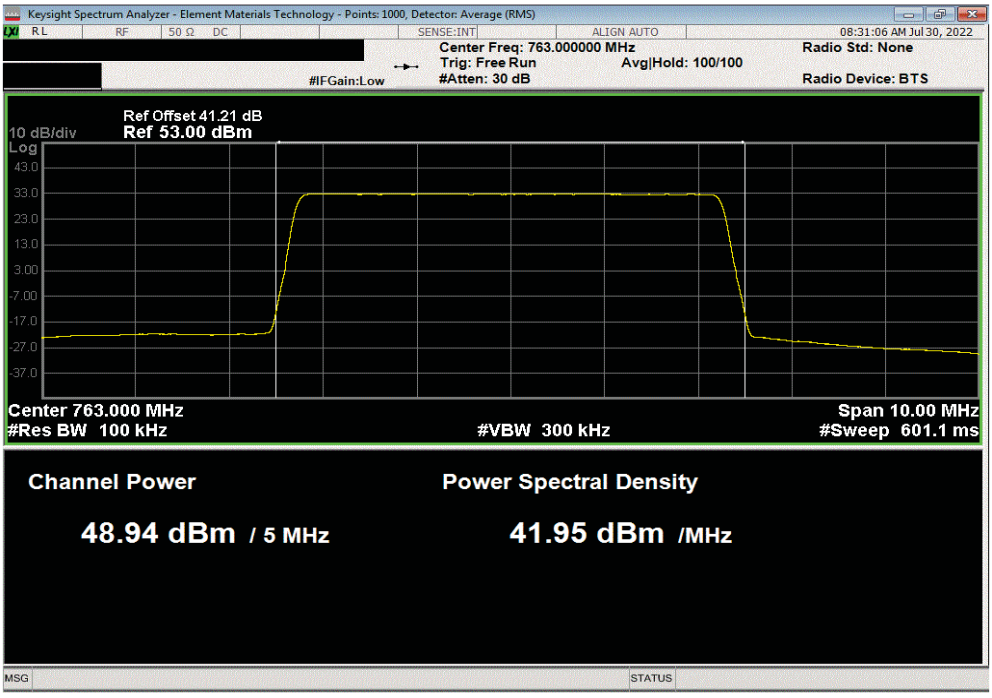


OUTPUT POWER ALL PORTS - BANDS n12 AND n14

Port 1, Band n14, 758 - 768, 5 MHz Bandwidth, 256 QAM Modulation, Mid Ch. 763 MHz						
	Initial Value dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	All Ports Value (dBm)	Limit (dBm)	Results
	48.97	0	49	N/A	Inside Tolerance	N/A

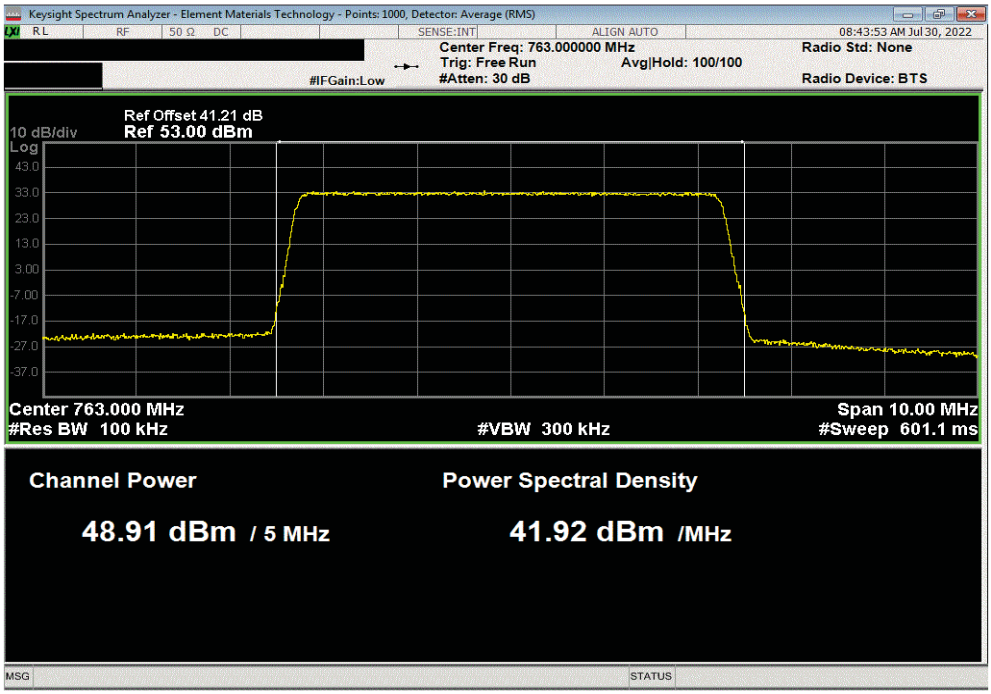


Port 2, Band n14, 758 - 768, 5 MHz Bandwidth, 256 QAM Modulation, Mid Ch. 763 MHz						
	Initial Value dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	All Ports Value (dBm)	Limit (dBm)	Results
	48.94	0	48.9	N/A	Inside Tolerance	N/A

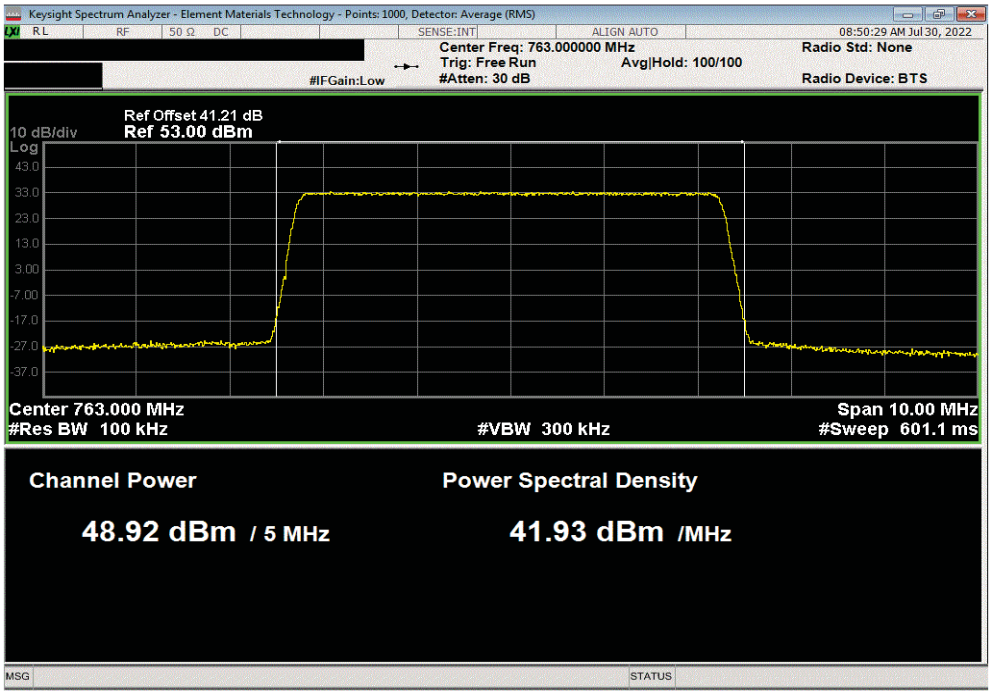


OUTPUT POWER ALL PORTS - BANDS n12 AND n14

Port 3, Band n14, 758 - 768, 5 MHz Bandwidth, 256 QAM Modulation, Mid Ch. 763 MHz						
	Initial Value dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	All Ports Value (dBm)	Limit (dBm)	Results
	48.91	0	49	N/A	Inside Tolerance	N/A



Port 4, Band n14, 758 - 768, 5 MHz Bandwidth, 256 QAM Modulation, Mid Ch. 763 MHz						
	Initial Value dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	All Ports Value (dBm)	Limit (dBm)	Results
	48.92	0	49	N/A	Inside Tolerance	Pass



OUTPUT POWER ALL PORTS - BANDS n12 AND n14

Band n12, 729 - 745, 5 MHz Bandwidth, 256 QAM Modulation, Mid Ch. 737 MHz						
	Initial Value dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	All Ports Value (dBm)	Limit (dBm)	Results
	N/A	0	N/A	55.02	N/A	N/A

AVERAGE POWER PORT SUMMING					
	PORT 1	PORT 2	PORT 3	PORT 4	SUM TOTAL
INITIAL VALUE (dBm)	49.1	48.9	49	49	N/A
INITIAL VALUE (Watts)	81.28	77.62	79.43	79.43	317.76
TOTAL VALUE (dBm)	N/A	N/A	N/A	N/A	55.02

Band n14, 758 - 768, 5 MHz Bandwidth, 256 QAM Modulation, Mid Ch. 763 MHz						
	Initial Value dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	All Ports Value (dBm)	Limit (dBm)	Results
	N/A	0	N/A	54.96	N/A	N/A

AVERAGE POWER PORT SUMMING					
	PORT 1	PORT 2	PORT 3	PORT 4	SUM TOTAL
INITIAL VALUE (dBm)	48.97	48.94	48.91	48.92	N/A
INITIAL VALUE (Watts)	78.88	78.34	77.8	77.98	313
TOTAL VALUE (dBm)	N/A	N/A	N/A	N/A	54.96

OCCUPIED BANDWIDTH - BAND n12

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3239	ANE	2022-03-02	2023-03-02
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2022-01-17	2023-01-17

TEST DESCRIPTION

The measurement was made using a direct connection beteen the RF output of the EUT and a spectrum analyzer. The emissions bandwidth 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 5.4 of ANSI C63.26 was used to make the 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

AHLBBA antenna ports 1&4 are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

AHLBBA antenna ports 2&3 are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 2 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.

FCC 27.53 defines the 26dB emission bandwidth requirement.
RSS GEN Section 6.7 defines the 99% emission bandwidth requirement.

FCC and ISED Emission Designators for Port #1 Band n12 (729MHz to 745MHz)									
Ch BW	Radio Channel	5G-NR: QPSK		5G-NR: 16QAM		5G-NR: 64QAM		5G-NR: 256QAM	
		FCC	ISED	FCC	ISED	FCC	ISED	FCC	ISED
5MHz	Low							4M85G7W	4M48G7W
	Mid	4M84G7W	4M48G7W	4M84G7W	4M51G7W	4M83G7W	4M48G7W	4M81G7W	4M48G7W
	High							4M83G7W	4M48G7W
10MHz	Low							9M89G7W	9M31G7W
	Mid	9M89G7W	9M30G7W	9M82G7W	9M24G7W	9M87G7W	9M29G7W	9M87G7W	9M31G7W
	High							9M86G7W	9M31G7W
15MHz	Low							14M9G7W	14M2G7W
	Mid	15M0G7W	14M1G7W	14M9G7W	14M2G7W	14M9G7W	14M1G7W	14M9G7W	14M1G7W
	High							14M9G7W	14M1G7W
Note: FCC emission designators are based on 26dB emission bandwidth. ISED emission designators are based on 99% emission bandwidth.									

FCC and ISED Emission Designators for Port #2 Band n12 (729MHz to 745MHz)									
Ch BW	Radio Channel	5G-NR: QPSK		5G-NR: 16QAM		5G-NR: 64QAM		5G-NR: 256QAM	
		FCC	ISED	FCC	ISED	FCC	ISED	FCC	ISED
5MHz	Low							4M84G7W	4M48G7W
	Mid	4M85G7W	4M47G7W	4M83G7W	4M50G7W	4M84G7W	4M48G7W	4M83G7W	4M49G7W
	High							4M83G7W	4M49G7W
10MHz	Low							9M88G7W	9M31G7W
	Mid	9M91G7W	9M29G7W	9M83G7W	9M24G7W	9M86G7W	9M29G7W	9M89G7W	9M30G7W
	High							9M88G7W	9M30G7W
15MHz	Low							14M9G7W	14M1G7W
	Mid	14M9G7W	14M2G7W	14M9G7W	14M2G7W	14M9G7W	14M1G7W	14M9G7W	14M1G7W
	High							14M9G7W	14M1G7W
Note: FCC emission designators are based on 26dB emission bandwidth. ISED emission designators are based on 99% emission bandwidth.									

OCCUPIED BANDWIDTH - BAND n12

element

TbtTx 2022.06.03.0 XMit 2022.02.07.0

EUT:	AHLBBA (C2PC/C3PC FCC/ISED)			Work Order:	NOKI0047
Serial Number:	K9193514835			Date:	30-Jul-22
Customer:	Nokia Solutions and Networks			Temperature:	20.6 °C
Attendees:	Mitchell Hill			Humidity:	58.7% RH
Project:	None			Barometric Pres.:	1020 mbar
Tested by:	Marty Martin	Power:	54VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 27:2022	ANSI C63.26:2015
RSS-130 Issue 2: 2019	ANSI C63.26:2015
FCC 90R:2022	ANSI C63.26:2015

COMMENTS

All measurement path losses were accounted for in the reference level offset including attenuators, cables, DC block and filter when in use. The carriers were enabled at maximum power.

DEVIATIONS FROM TEST STANDARD

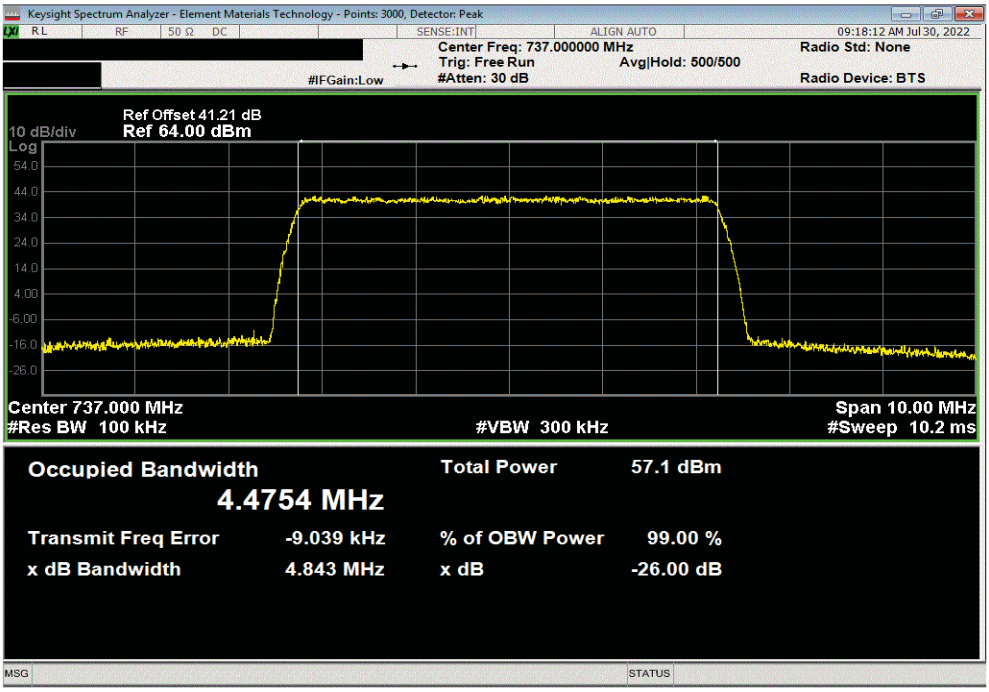
None

Configuration #	2	Signature

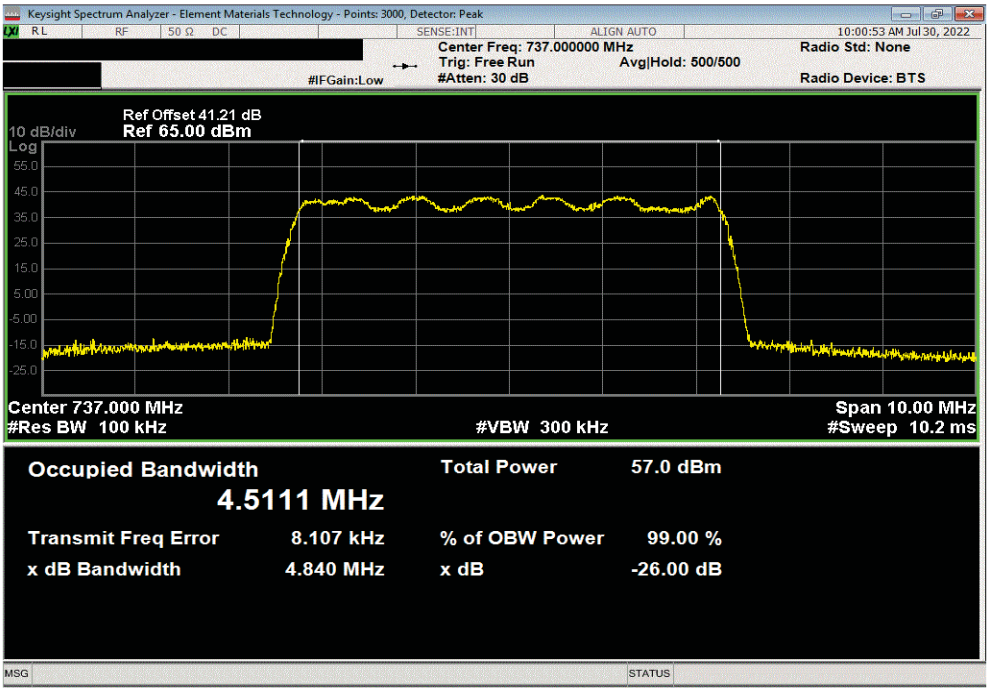
	Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
Port 1				
5G NR Band n12, 729 - 745 Mhz				
5 MHz Bandwidth				
QPSK Modulation				
Mid Channel, 737.0 MHz	4.48	4.84	Within Band	Pass
16QAM Modulation				
Mid Channel, 737.0 MHz	4.51	4.84	Within Band	Pass
64QAM Modulation				
Mid Channel, 737.0 MHz	4.48	4.83	Within Band	Pass
256QAM Modulation				
Low Channel, 731.5 MHz	4.48	4.85	Within Band	Pass
Mid Channel, 737.0 MHz	4.48	4.81	Within Band	Pass
High Channel, 742.5 MHz	4.48	4.83	Within Band	Pass
10 MHz Bandwidth				
QPSK Modulation				
Mid Channel, 737.0 MHz	9.30	9.89	Within Band	Pass
16QAM Modulation				
Mid Channel, 737.0 MHz	9.24	9.82	Within Band	Pass
64QAM Modulation				
Mid Channel, 737.0 MHz	9.29	9.87	Within Band	Pass
256QAM Modulation				
Low Channel, 734 MHz	9.31	9.89	Within Band	Pass
Mid Channel, 737.0 MHz	9.31	9.87	Within Band	Pass
High Channel, 740 MHz	9.31	9.86	Within Band	Pass
15 MHz Bandwidth				
QPSK Modulation				
Mid Channel, 737.0 MHz	14.1	15.0	Within Band	Pass
16QAM Modulation				
Mid Channel, 737.0 MHz	14.2	14.9	Within Band	Pass
64QAM Modulation				
Mid Channel, 737.0 MHz	14.1	14.9	Within Band	Pass
256QAM Modulation				
Low Channel, 736.5 MHz	14.2	14.9	Within Band	Pass
Mid Channel, 737.0 MHz	14.1	14.9	Within Band	Pass
High Channel, 737.5 MHz	14.1	14.9	Within Band	Pass
Port 2				
5G NR Band n12, 729 - 745 Mhz				
5 MHz Bandwidth				
QPSK Modulation				
Mid Channel, 737.0 MHz	4.47	4.85	Within Band	Pass
16QAM Modulation				
Mid Channel, 737.0 MHz	4.50	4.83	Within Band	Pass
64QAM Modulation				
Mid Channel, 737.0 MHz	4.48	4.84	Within Band	Pass
256QAM Modulation				
Low Channel, 731.5 MHz	4.48	4.84	Within Band	Pass
Mid Channel, 737.0 MHz	4.49	4.83	Within Band	Pass
High Channel, 742.5 MHz	4.49	4.83	Within Band	Pass
10 MHz Bandwidth				
QPSK Modulation				
Mid Channel, 737.0 MHz	9.29	9.91	Within Band	Pass
16QAM Modulation				
Mid Channel, 737.0 MHz	9.24	9.83	Within Band	Pass
64QAM Modulation				
Mid Channel, 737.0 MHz	9.29	9.86	Within Band	Pass
256QAM Modulation				
Low Channel, 734 MHz	9.31	9.88	Within Band	Pass
Mid Channel, 737.0 MHz	9.30	9.89	Within Band	Pass
High Channel, 740 MHz	9.30	9.88	Within Band	Pass
15 MHz Bandwidth				
QPSK Modulation				
Mid Channel, 737.0 MHz	14.2	14.9	Within Band	Pass
16QAM Modulation				
Mid Channel, 737.0 MHz	14.2	14.9	Within Band	Pass
64QAM Modulation				
Mid Channel, 737.0 MHz	14.1	14.9	Within Band	Pass
256QAM Modulation				
Low Channel, 736.5 MHz	14.1	14.9	Within Band	Pass
Mid Channel, 737.0 MHz	14.1	14.9	Within Band	Pass
High Channel, 737.5 MHz	14.1	14.9	Within Band	Pass

OCCUPIED BANDWIDTH - BAND n12

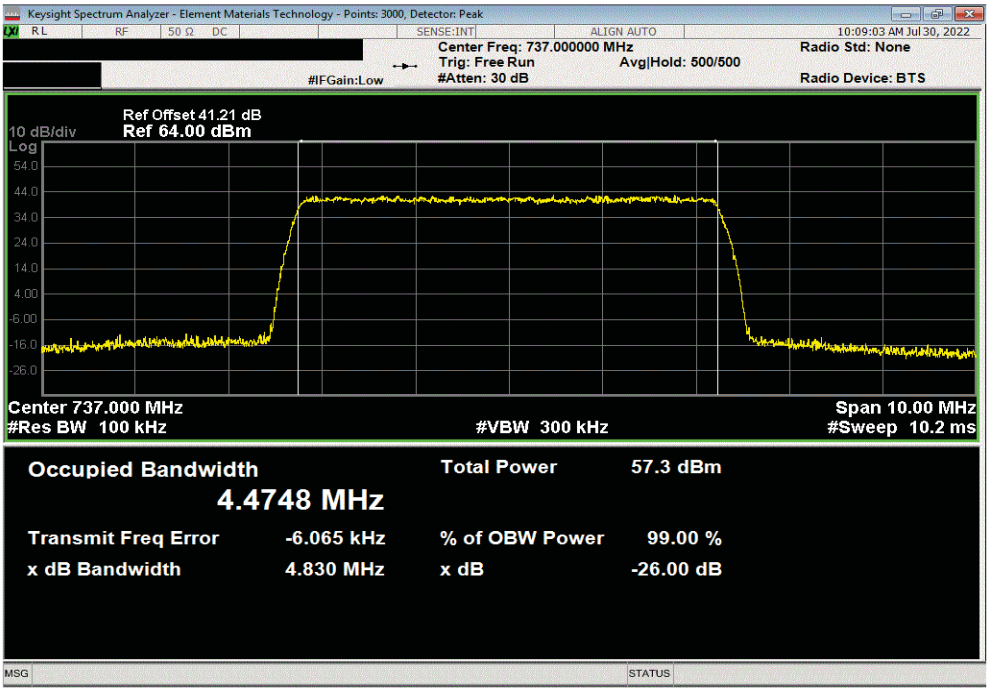
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			4.475	4.843	Within Band	Pass



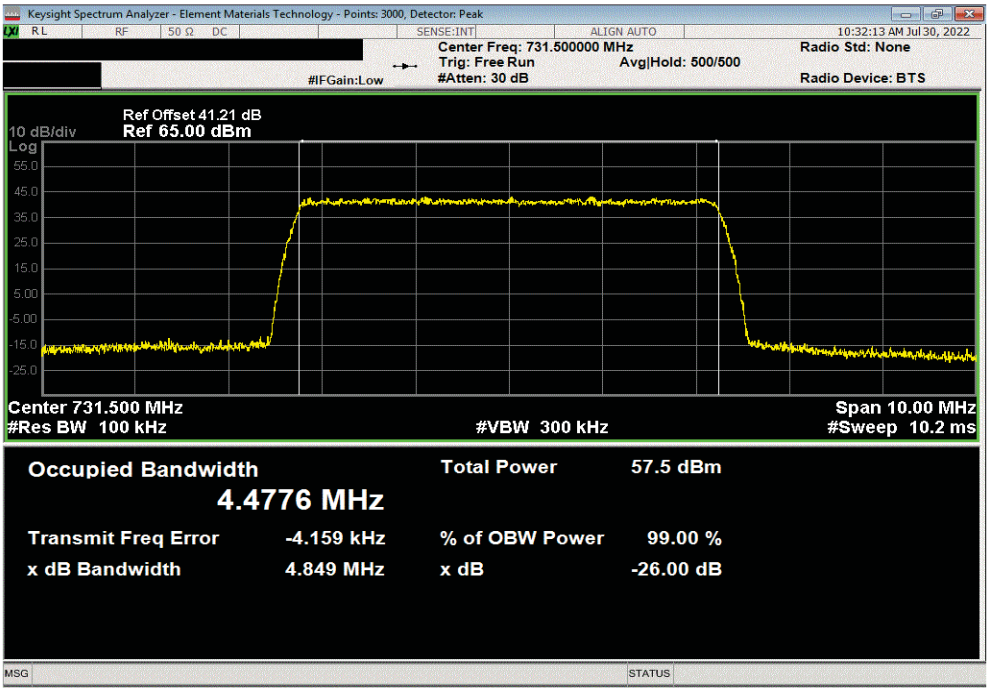
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			4.511	4.84	Within Band	Pass



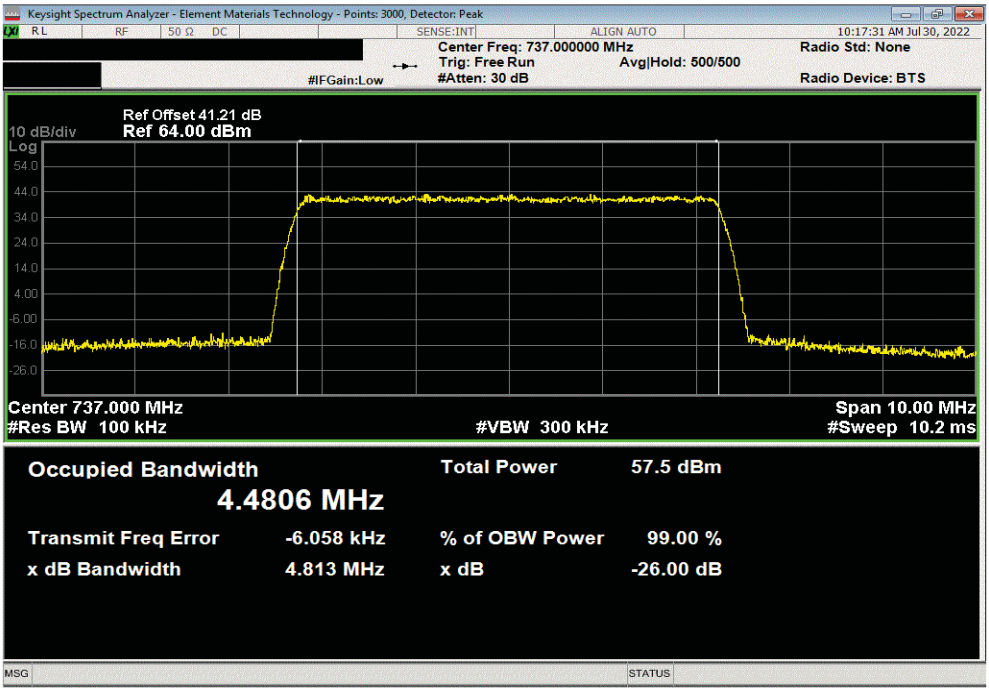
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 64 QAM Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			4.475	4.83	Within Band	Pass



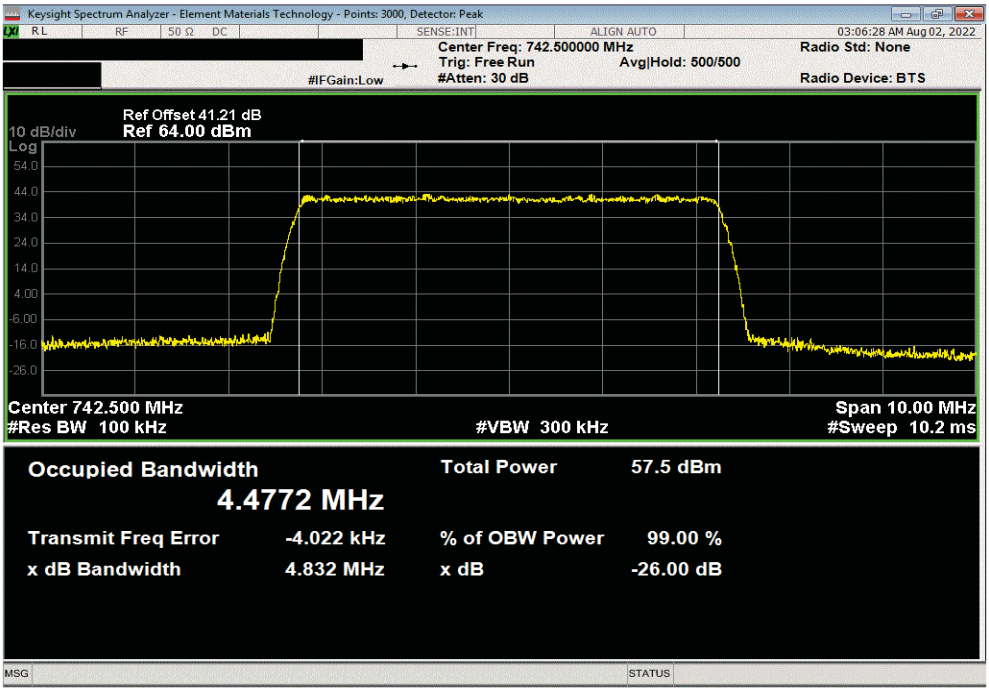
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 731.5 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			4.478	4.849	Within Band	Pass



Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			4.481	4.813	Within Band	Pass

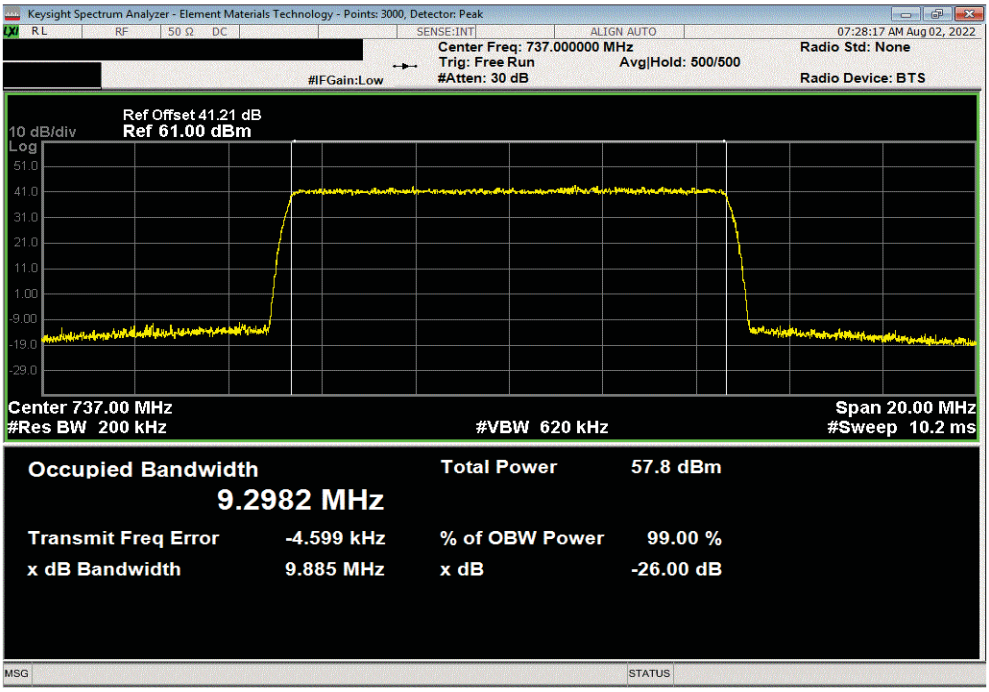


Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 742.5 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			4.477	4.832	Within Band	Pass



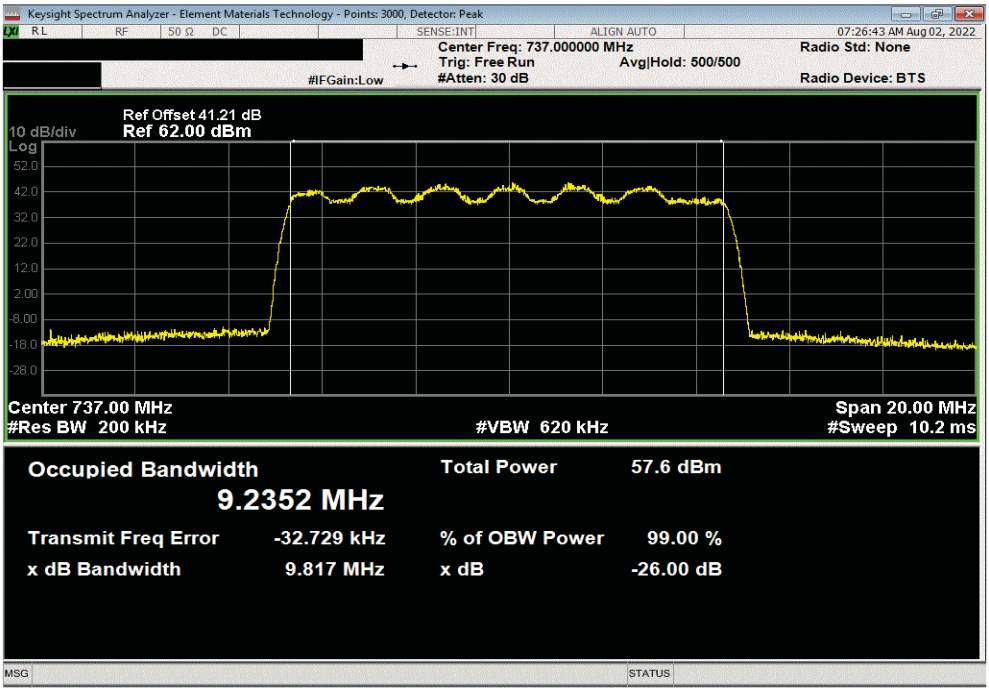
Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, QPSK Modulation, Mid Channel, 737.0 MHz

			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			9.298	9.885	Within Band	Pass



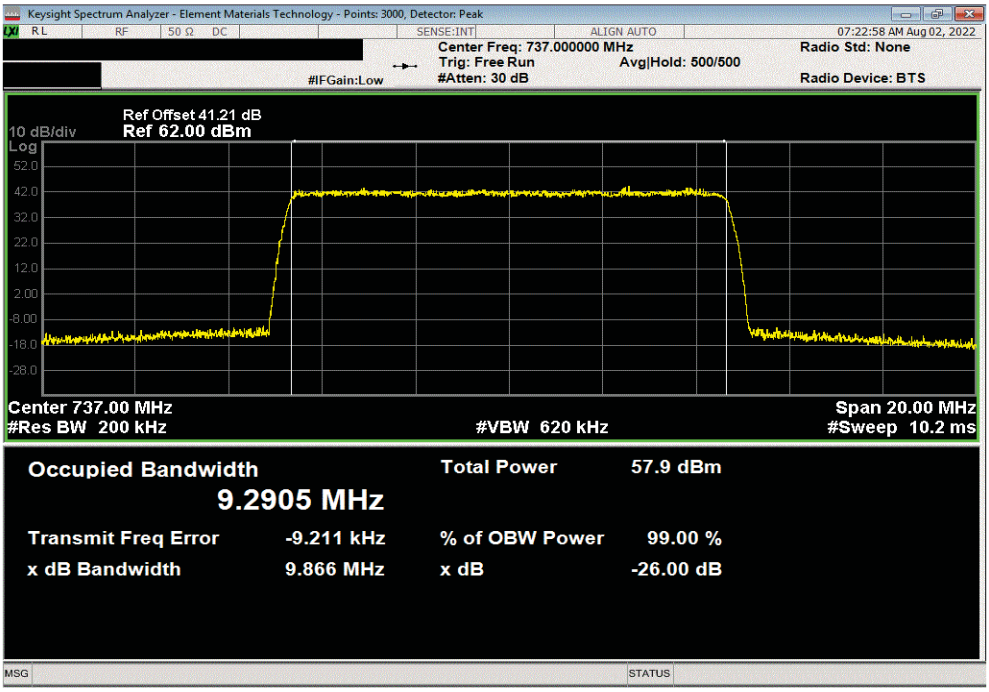
Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 16QAM Modulation, Mid Channel, 737.0 MHz

			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			9.235	9.817	Within Band	Pass



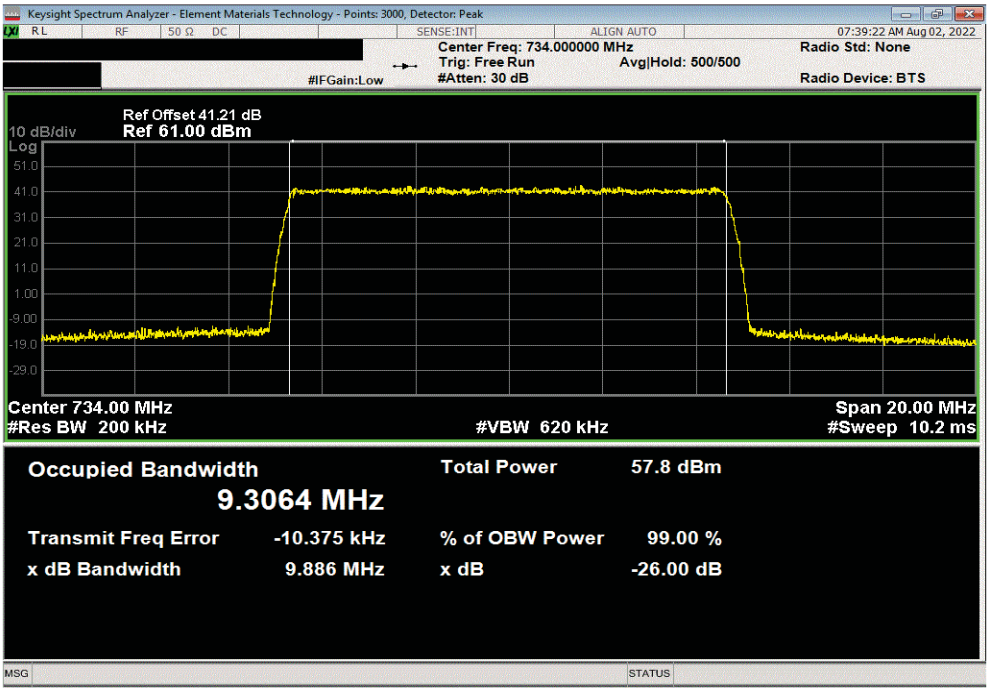
Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 64QAM Modulation, Mid Channel, 737.0 MHz

			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			9.291	9.866	Within Band	Pass

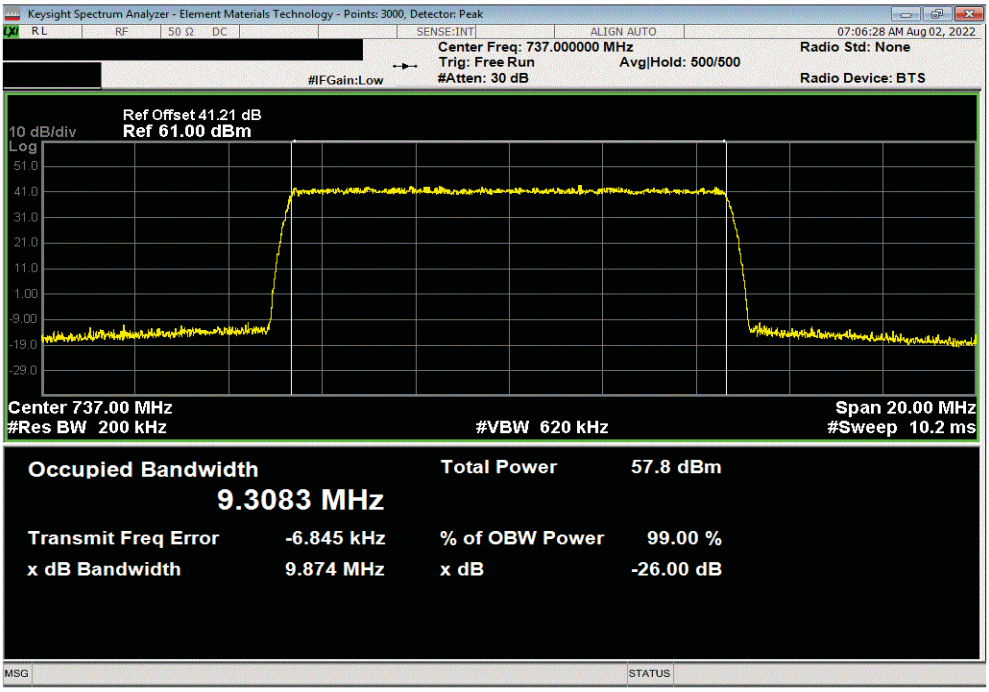


Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Low Channel, 734 MHz

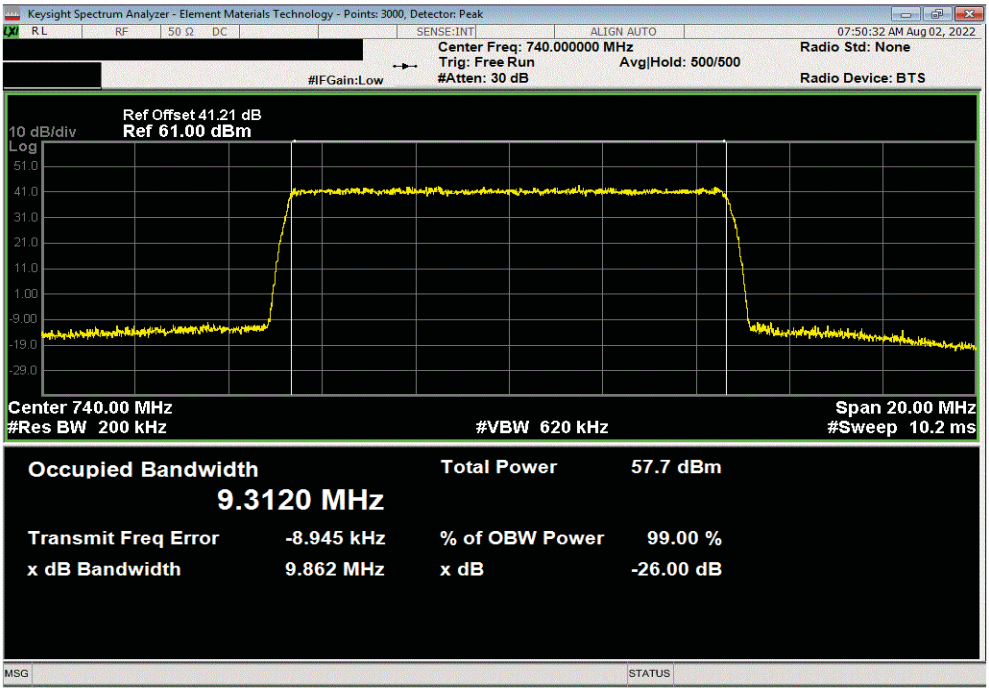
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			9.306	9.886	Within Band	Pass



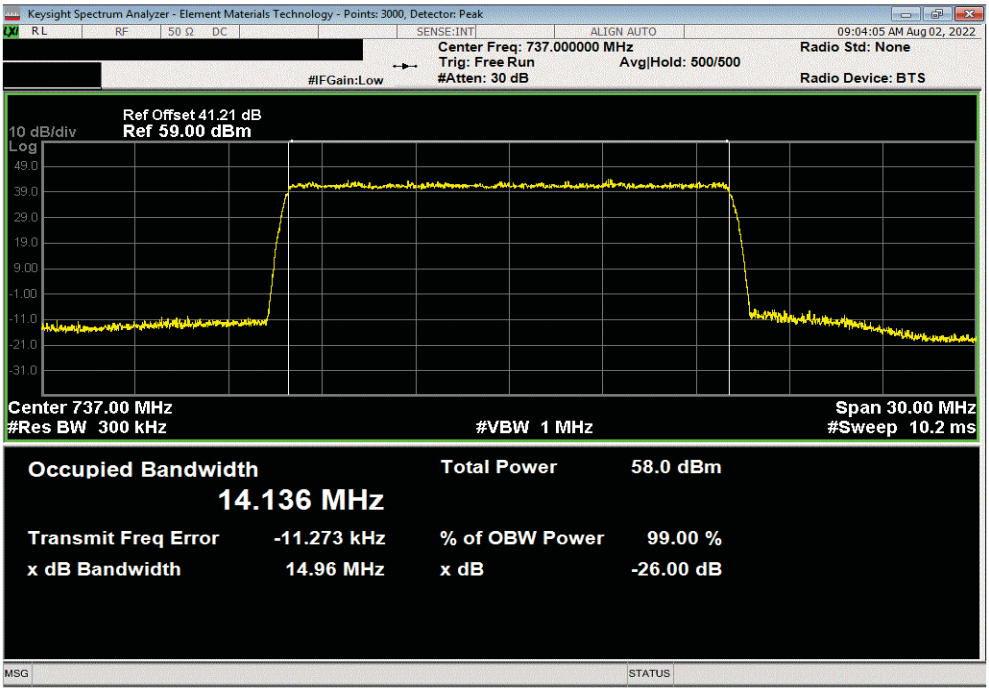
Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			9.308	9.874	Within Band	Pass



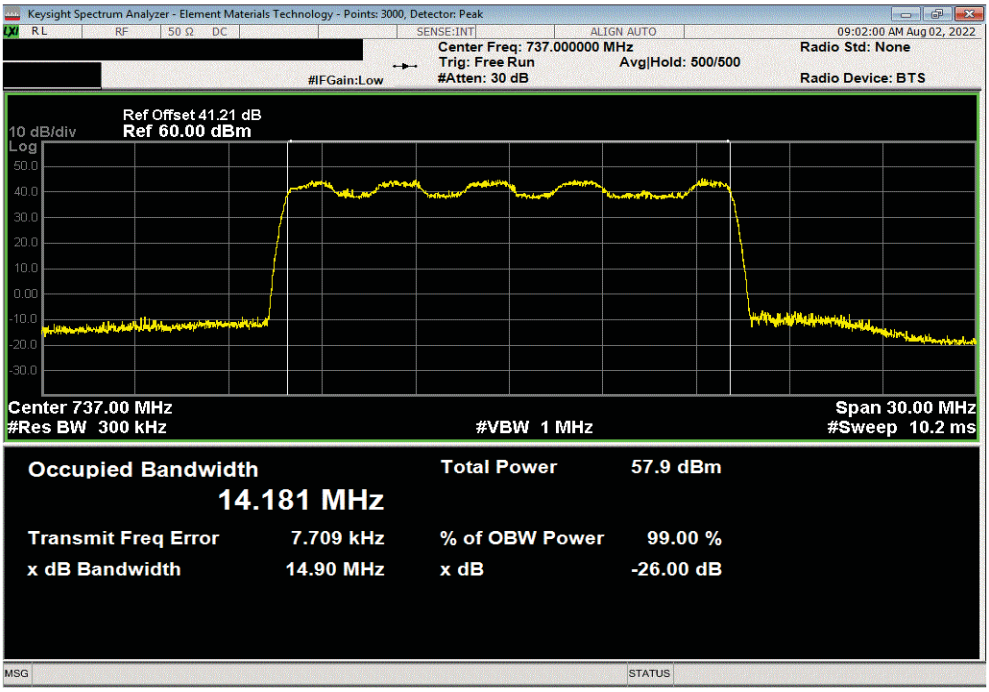
Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, High Channel, 740 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			9.312	9.862	Within Band	Pass



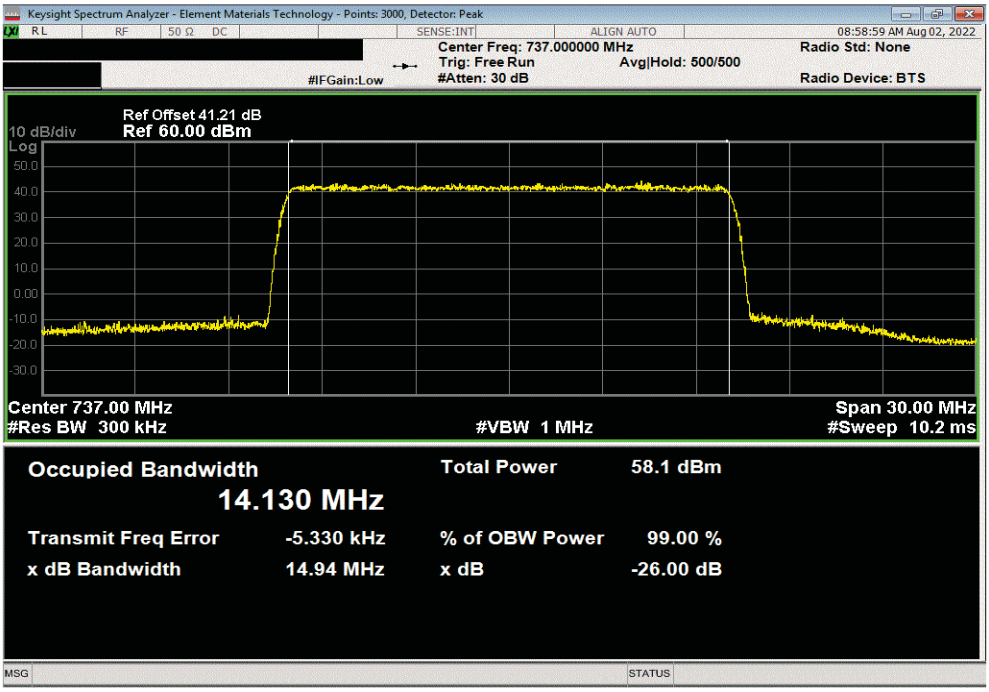
Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, QPSK Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			14.136	14.956	Within Band	Pass



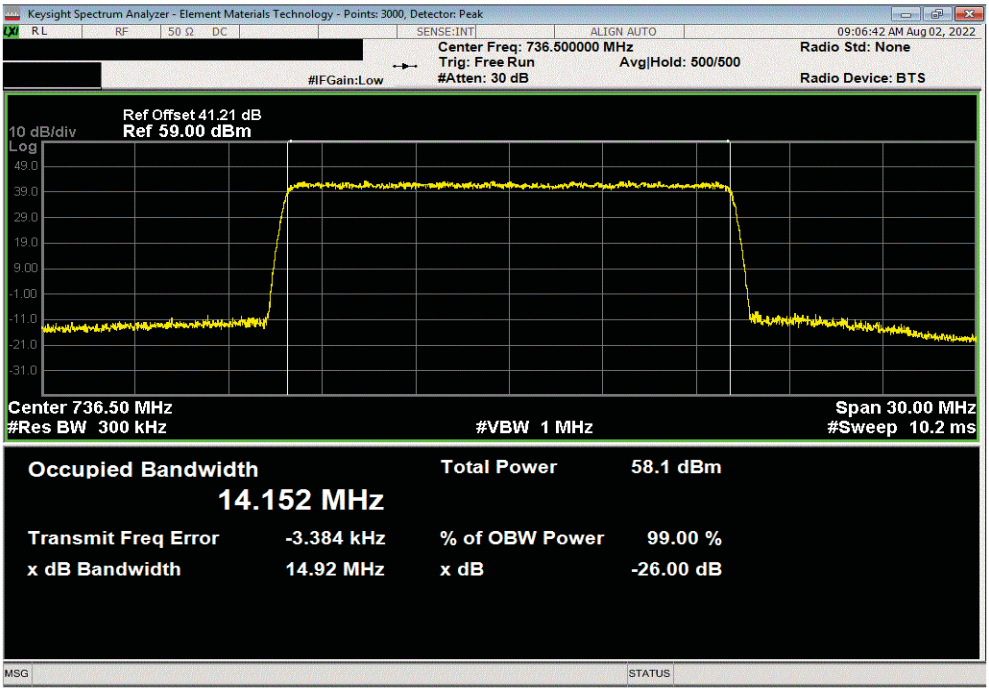
Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 16QAM Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			14.181	14.895	Within Band	Pass



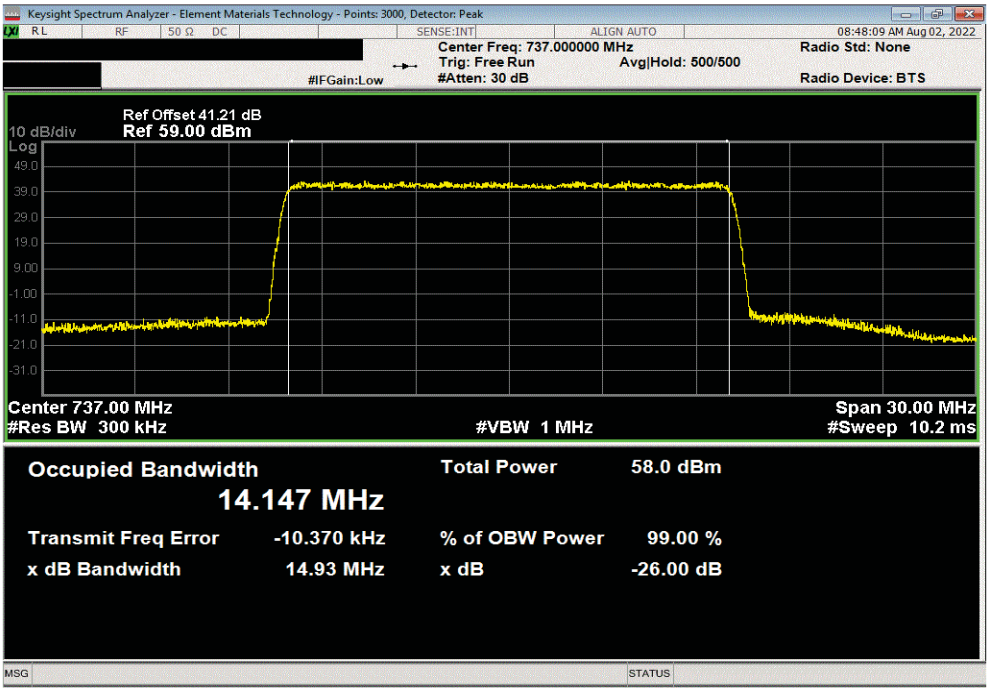
Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 64QAM Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			14.13	14.936	Within Band	Pass



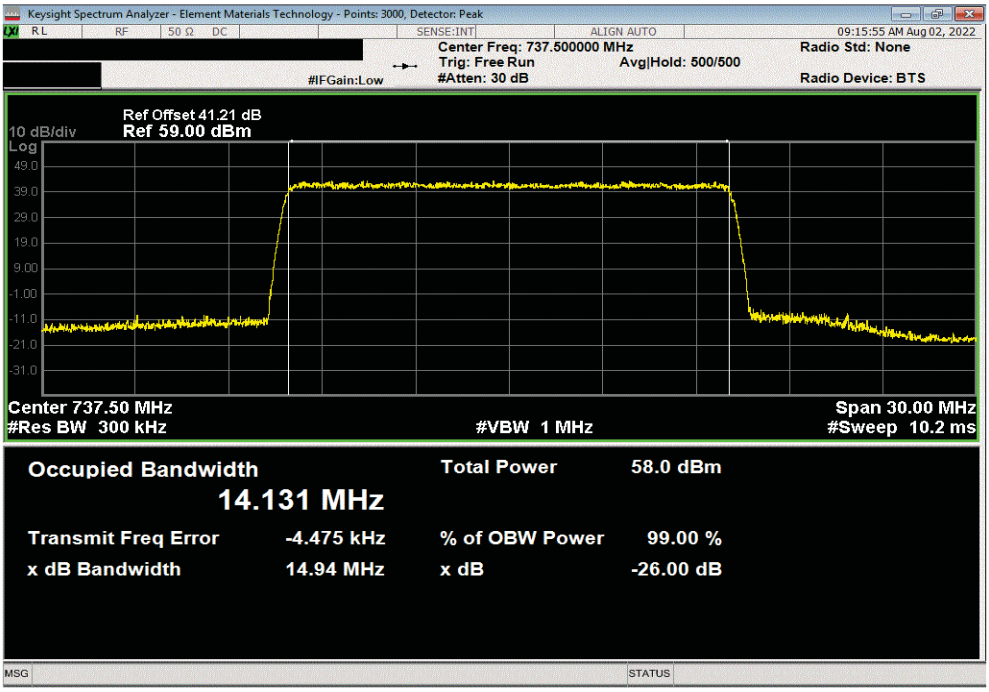
Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Low Channel, 736.5 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			14.152	14.924	Within Band	Pass



Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			14.147	14.932	Within Band	Pass

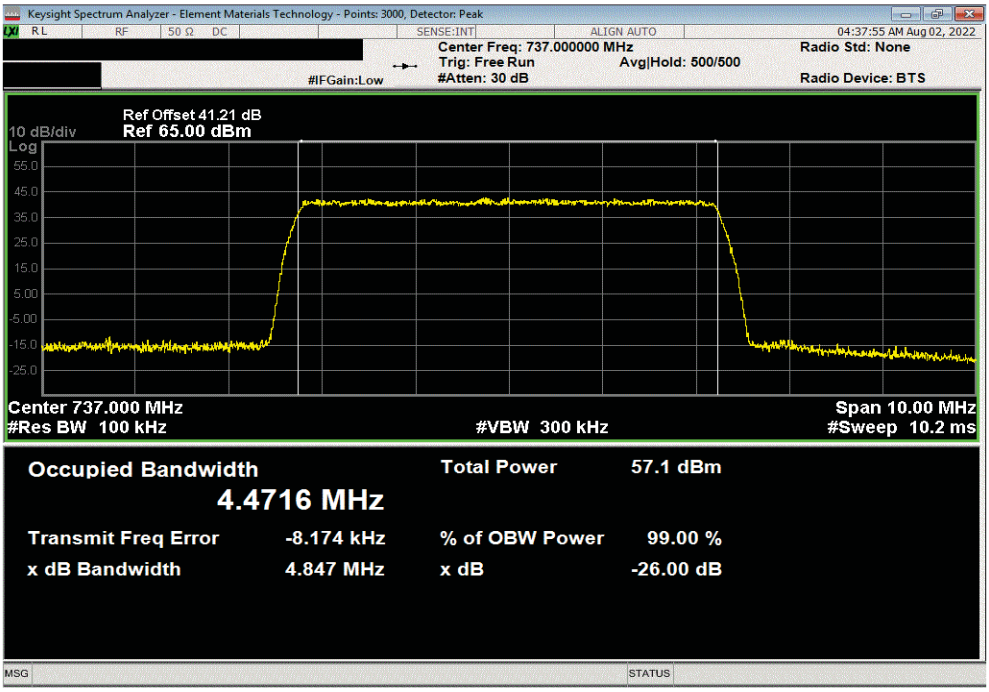


Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, High Channel, 737.5 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			14.131	14.938	Within Band	Pass

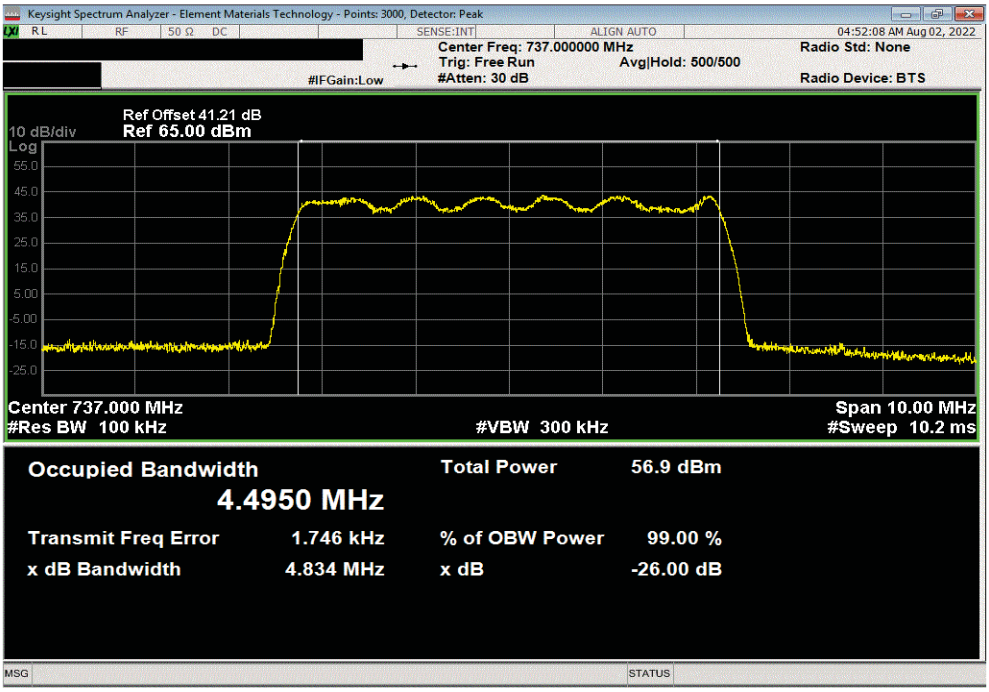


OCCUPIED BANDWIDTH - BAND n12

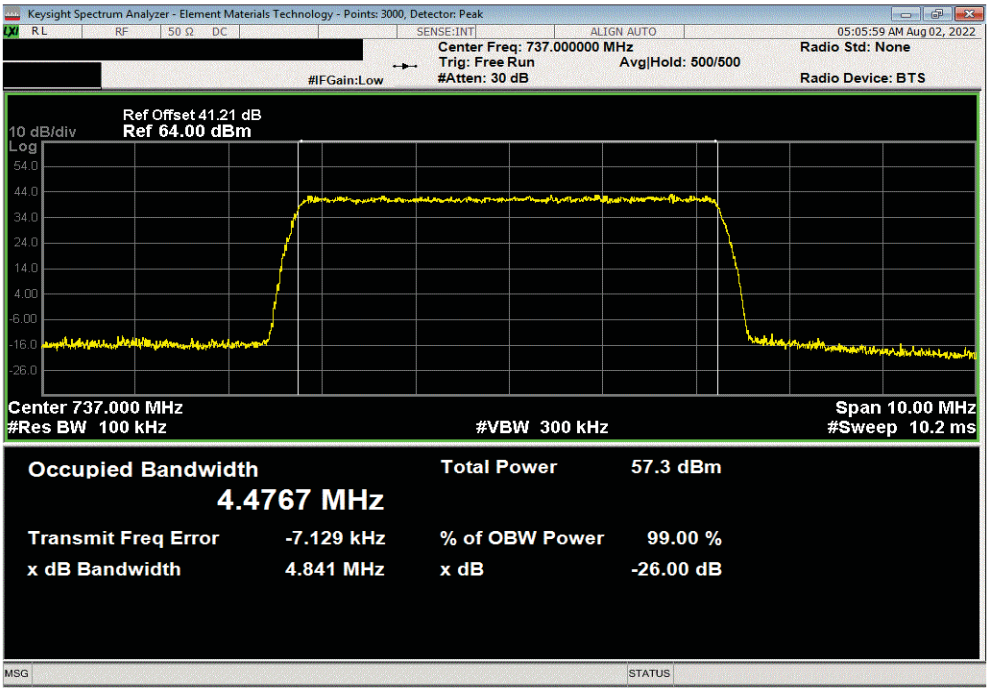
Port 2, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			4.472	4.847	Within Band	Pass



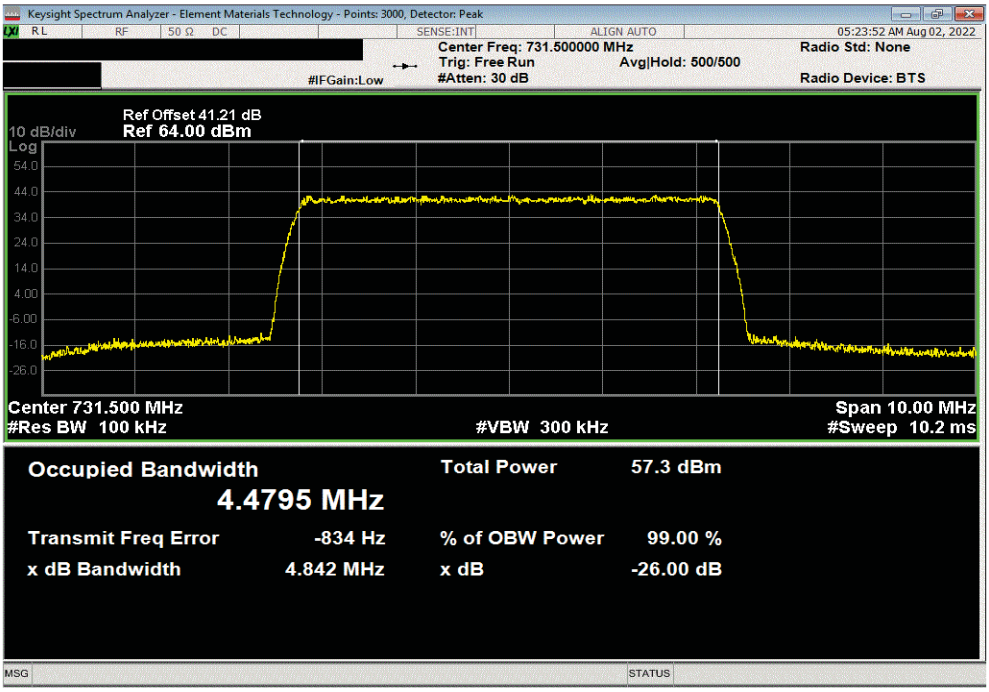
Port 2, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			4.495	4.834	Within Band	Pass



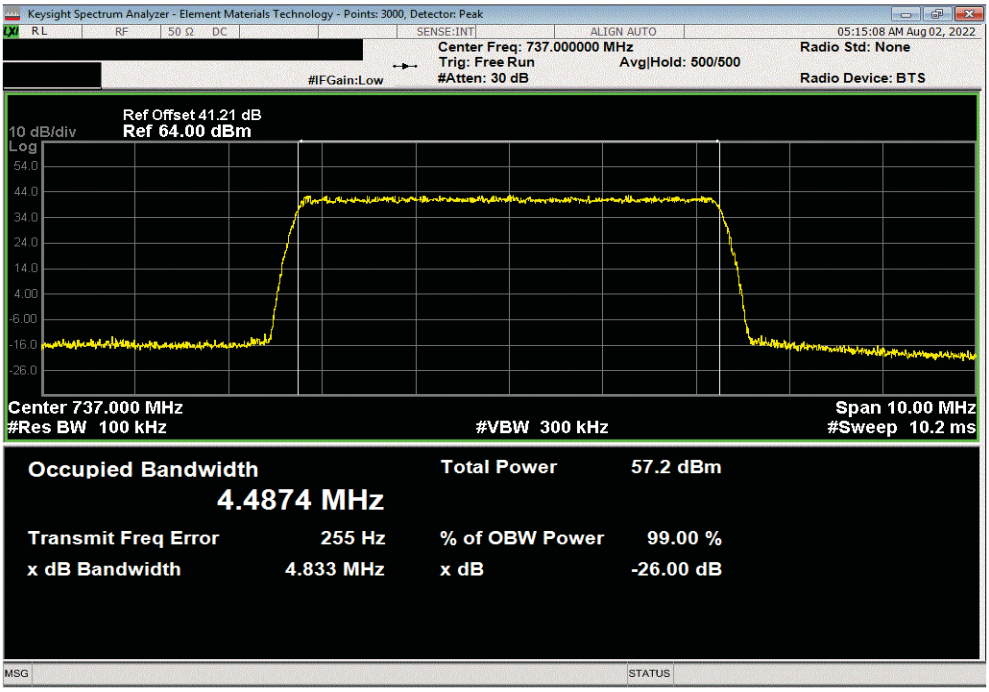
Port 2, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			4.477	4.841	Within Band	Pass



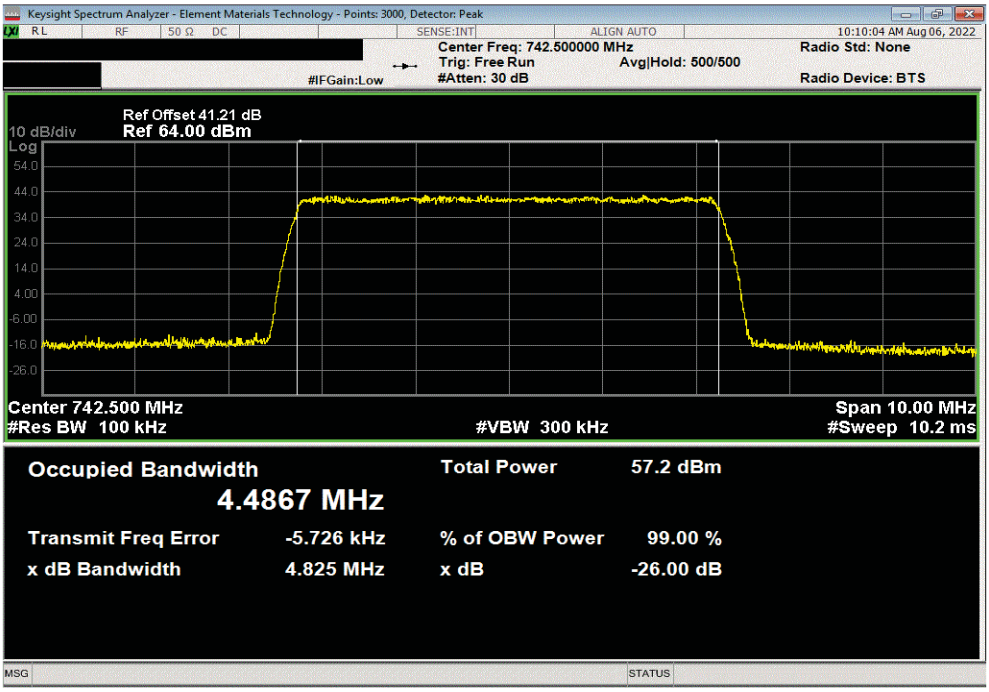
Port 2, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 731.5 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			4.48	4.842	Within Band	Pass



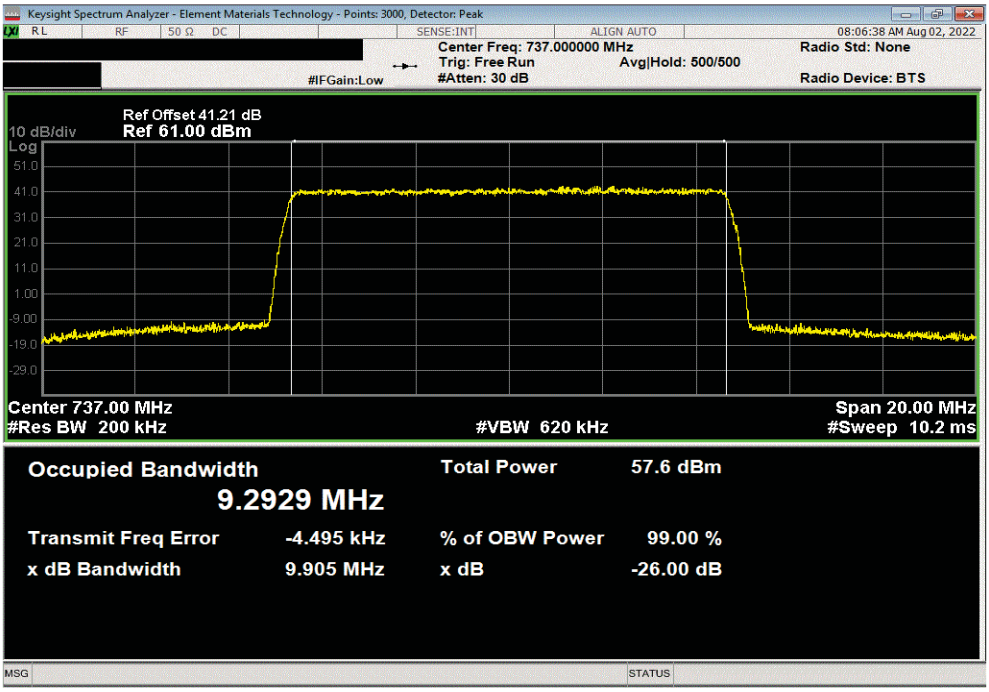
Port 2, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			4.487	4.833	Within Band	Pass



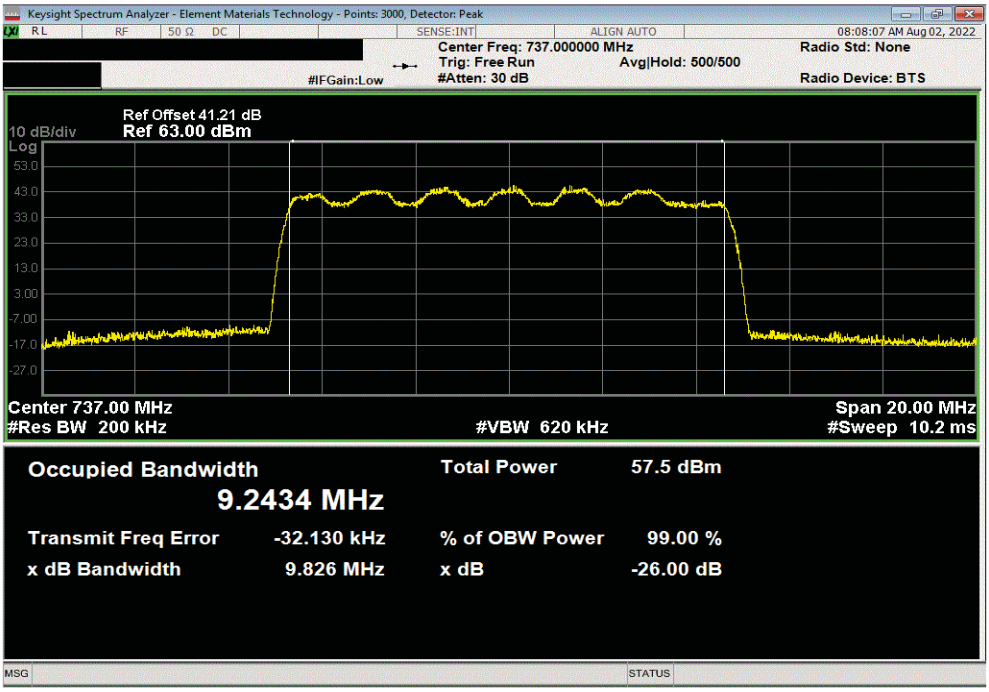
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 742.5 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			4.487	4.825	Within Band	Pass



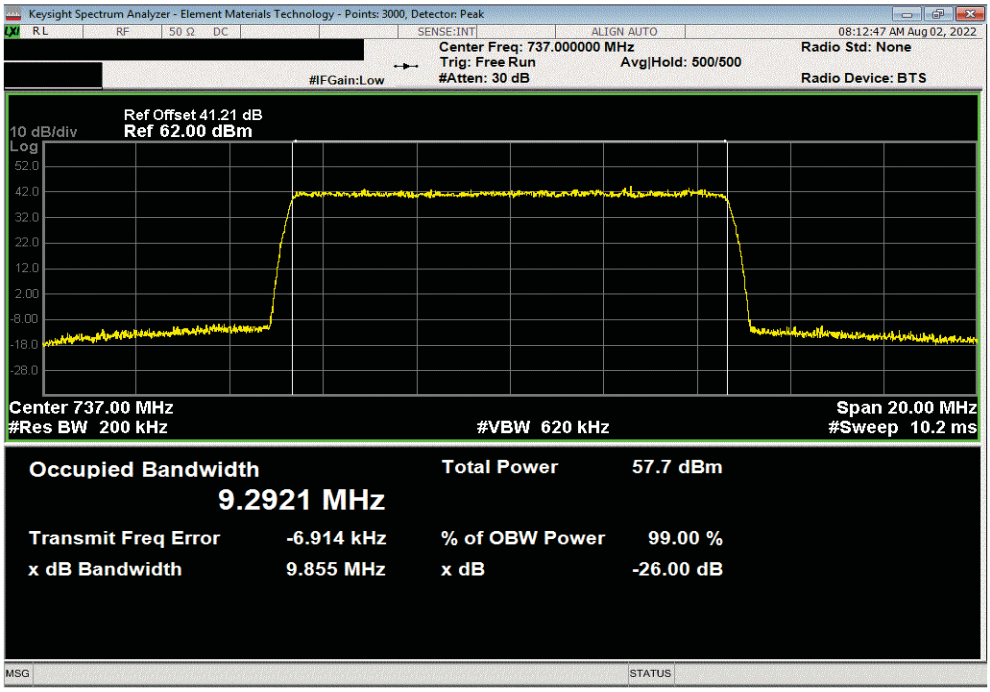
Port 2, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, QPSK Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			9.293	9.905	Within Band	Pass



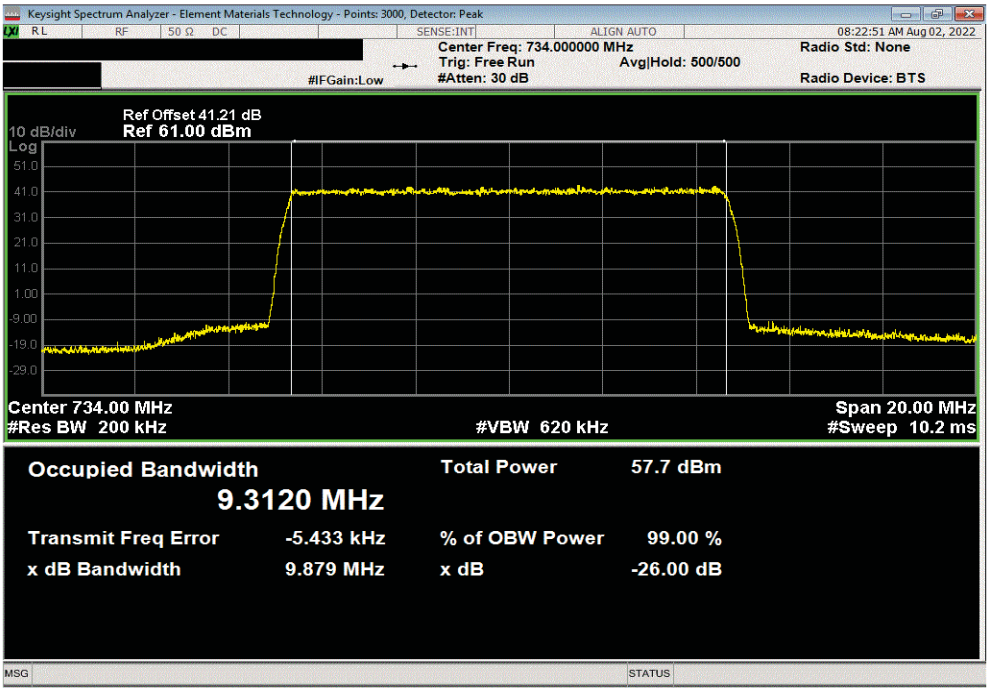
Port 2, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 16QAM Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			9.243	9.826	Within Band	Pass



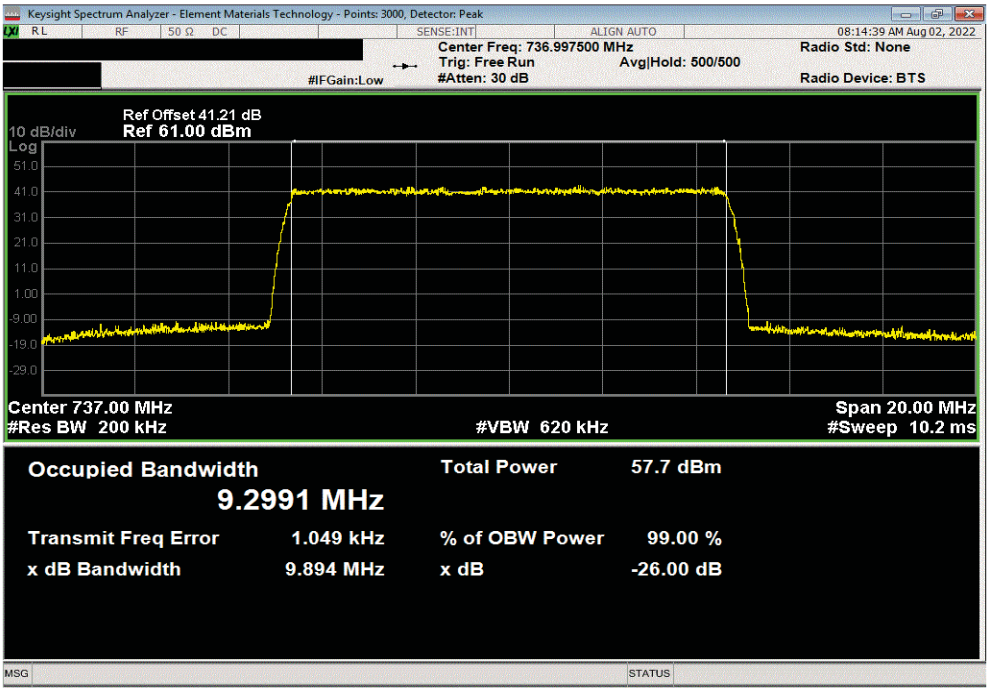
Port 2, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 64QAM Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			9.292	9.855	Within Band	Pass



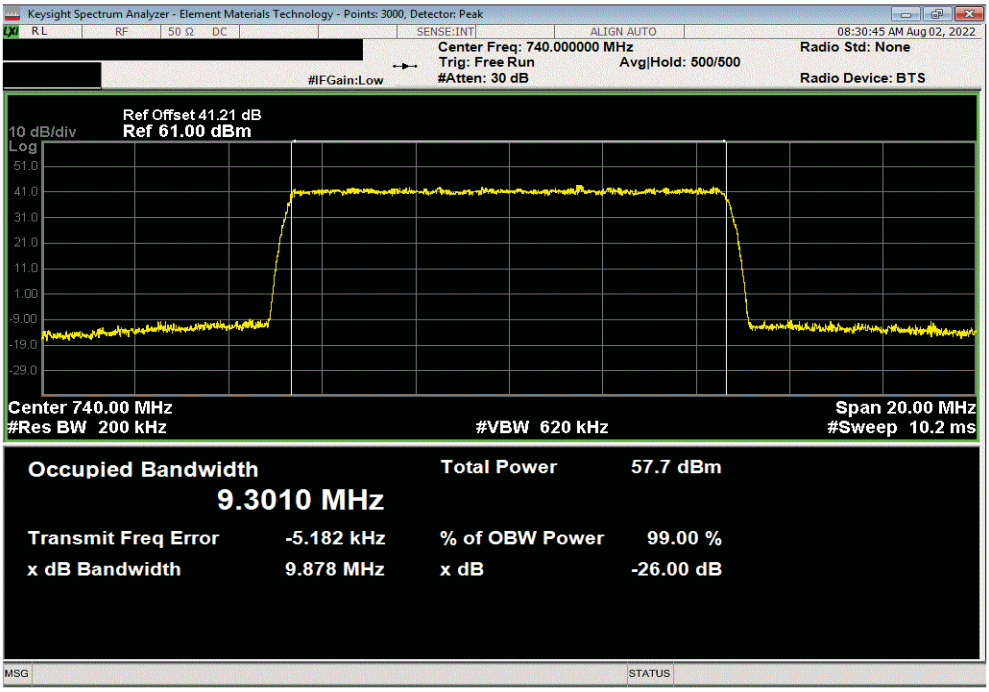
Port 2, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Low Channel, 734 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			9.312 MHz	9.879 MHz	Within Band	Pass



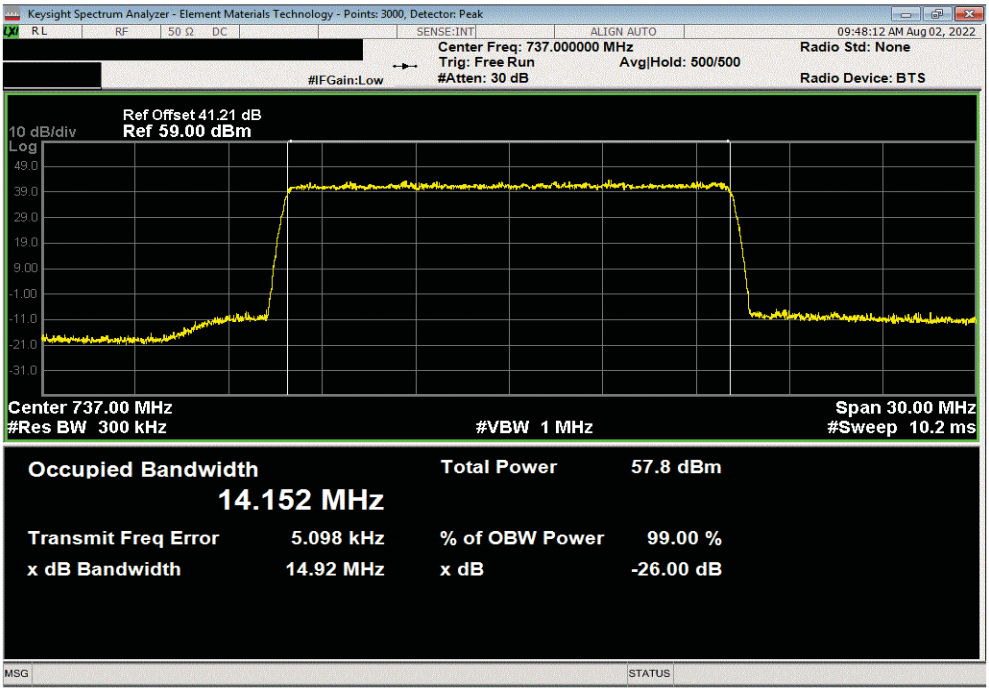
Port 2, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			9.299	9.894	Within Band	Pass



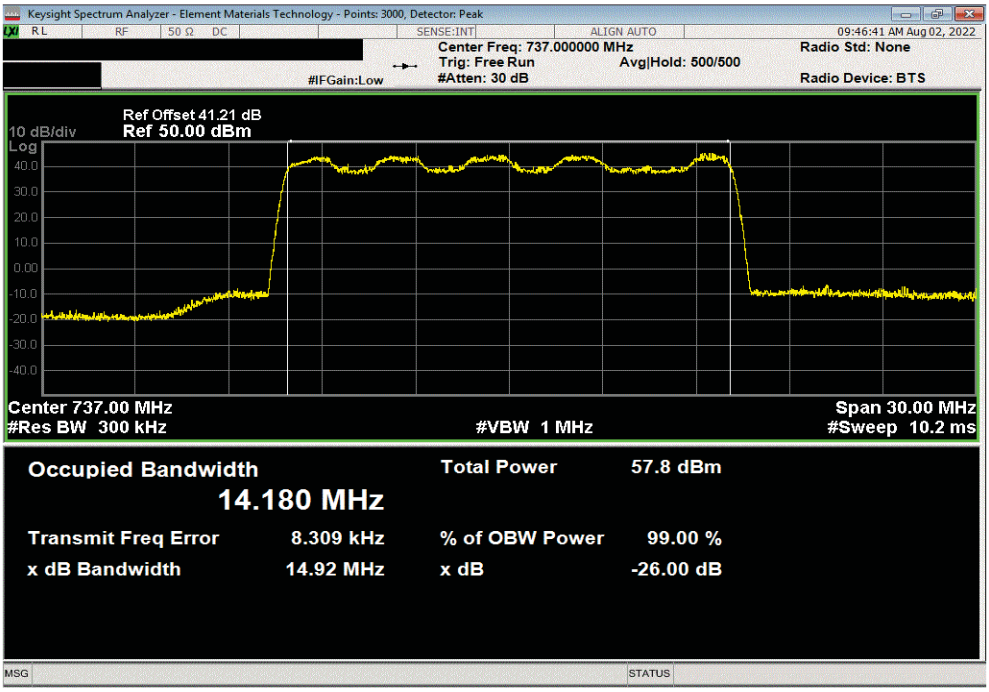
Port 2, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, High Channel, 740 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			9.301	9.878	Within Band	Pass



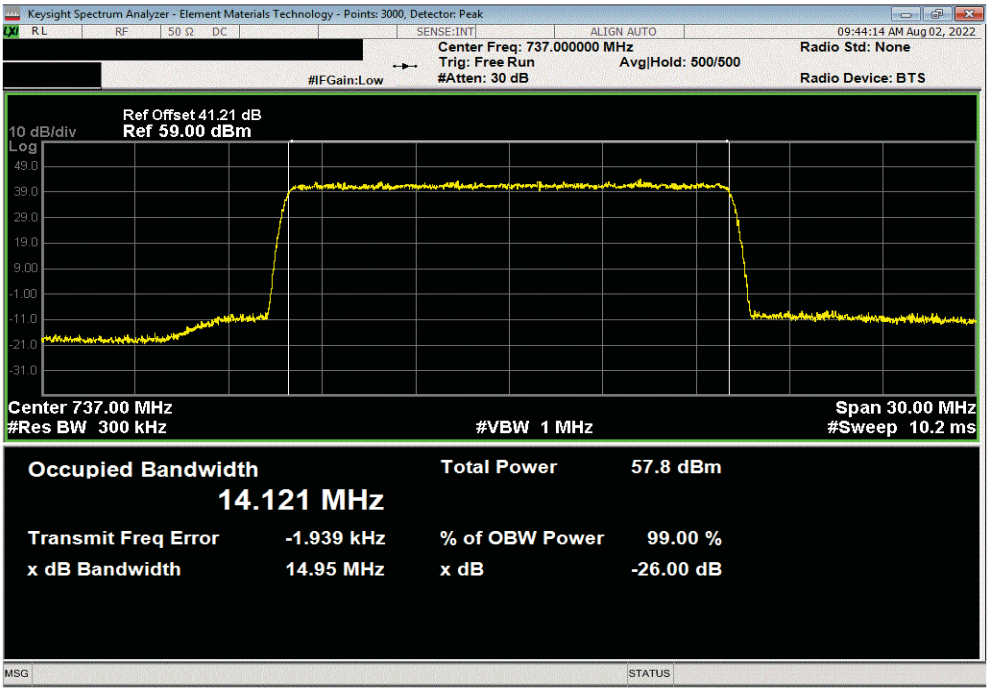
Port 2, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, QPSK Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			14.152	14.923	Within Band	Pass



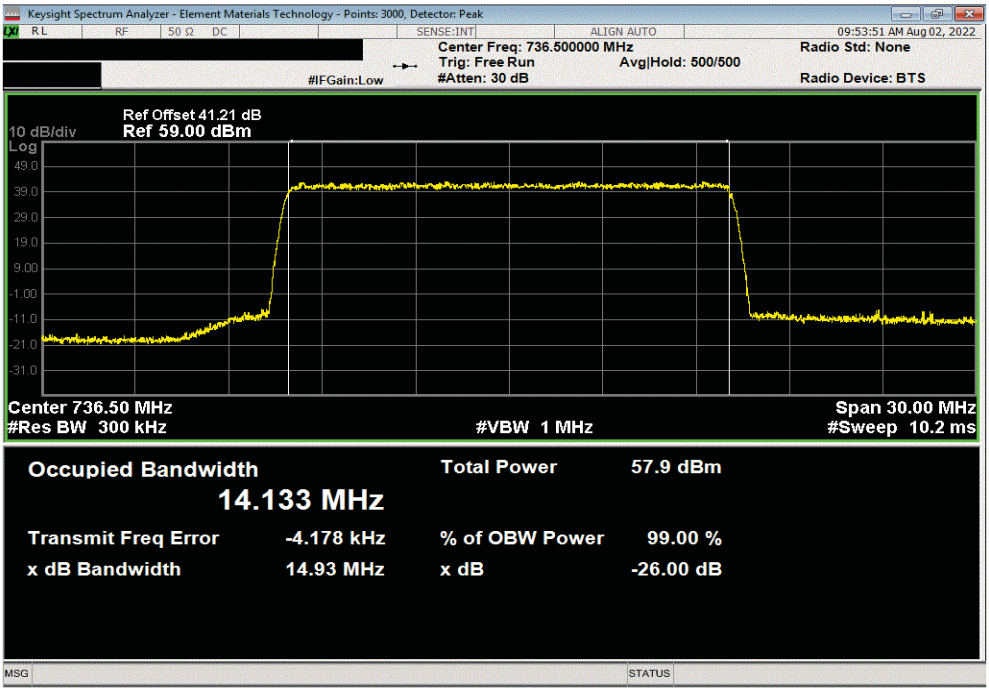
Port 2, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 16QAM Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			14.18	14.92	Within Band	Pass



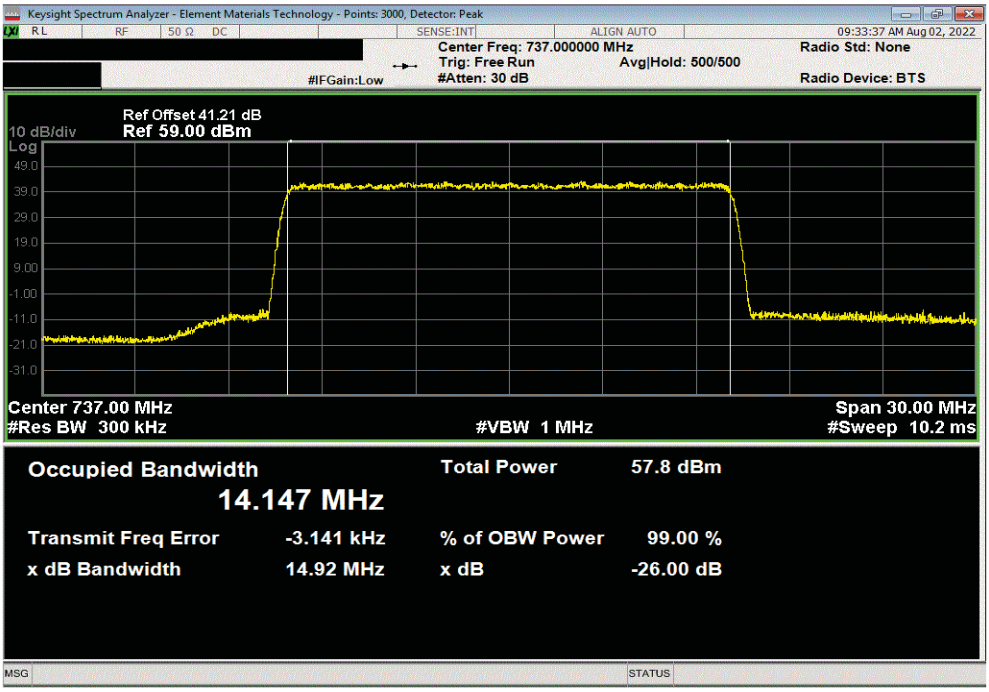
Port 2, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 64QAM Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			14.121	14.947	Within Band	Pass



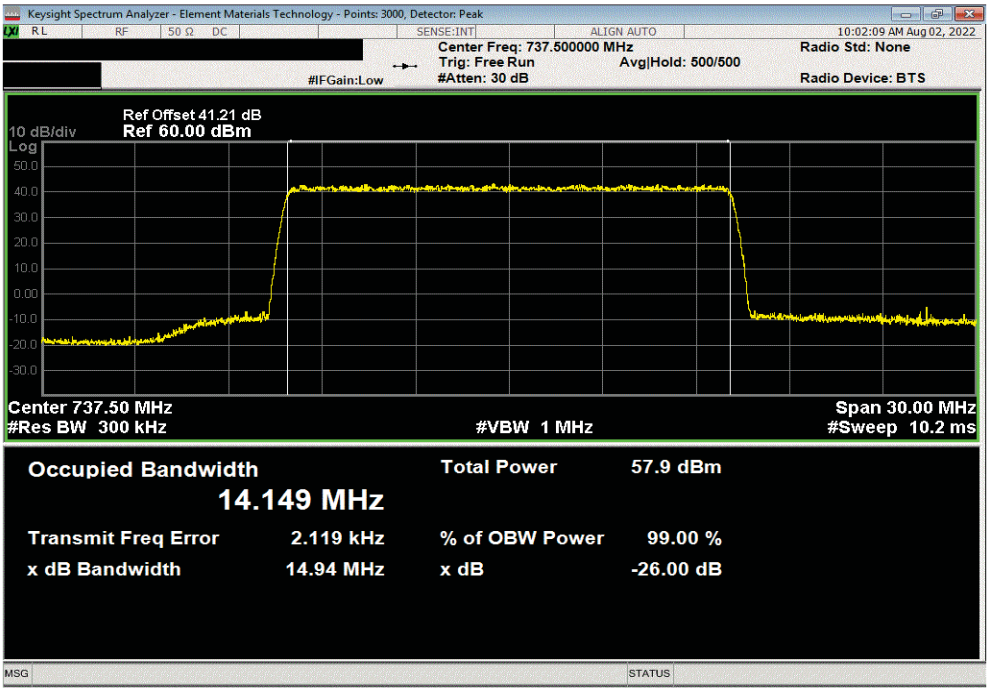
Port 2, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Low Channel, 736.5 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			14.133	14.926	Within Band	Pass



Port 2, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			14.147	14.924	Within Band	Pass



Port 2, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, High Channel, 737.5 MHz						
			Value 99 % (MHz)	Value 26 dB (MHz)	Limit	Result
			14.149	14.939	Within Band	Pass



OCCUPIED BANDWIDTH - BAND n14

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3239	ANE	2022-03-02	2023-03-02
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2022-01-17	2023-01-17

TEST DESCRIPTION

The measurement was made using a direct connection beteen the RF output of the EUT and a spectrum analyzer. The emissions bandwidth 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 5.4 of ANSI C63.26 was used to make the 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

AHLBBA antenna ports 1&4 are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

AHLBBA antenna ports 2&3 are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 2 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.

FCC 2.1049 requires an emission bandwidth measurement.
RSS GEN Section 6.7 defines the 99% emission bandwidth requirement.

FCC and ISED Emission Designators for Port #1 Band n14 (758MHz to 768MHz)									
Ch BW	Radio Channel	5G-NR: QPSK		5G-NR: 16QAM		5G-NR: 64QAM		5G-NR: 256QAM	
		FCC	ISED	FCC	ISED	FCC	ISED	FCC	ISED
5MHz	Low							4M82G7W	4M48G7W
	Mid	4M82G7W	4M48G7W	4M83G7W	4M50G7W	4M84G7W	4M48G7W	4M82G7W	4M48G7W
	High							4M84G7W	4M47G7W
10MHz									
	Mid	9M86G7W	9M27G7W	9M83G7W	9M22G7W	9M84G7W	9M28G7W	9M87G7W	9M29G7W
Note: FCC emission designators are based on 26dB emission bandwidth. ISED emission designators are based on 99% emission bandwidth.									

FCC and ISED Emission Designators for Port #2 Band n14 (758MHz to 768MHz)									
Ch BW	Radio Channel	5G-NR: QPSK		5G-NR: 16QAM		5G-NR: 64QAM		5G-NR: 256QAM	
		FCC	ISED	FCC	ISED	FCC	ISED	FCC	ISED
5MHz	Low							4M85G7W	4M48G7W
	Mid	4M84G7W	4M49G7W	4M83G7W	4M51G7W	4M84G7W	4M48G7W	4M84G7W	4M48G7W
	High							4M84G7W	4M48G7W
10MHz									
	Mid	9M88G7W	9M28G7W	9M84G7W	9M24G7W	9M87G7W	9M29G7W	9M87G7W	9M29G7W
Note: FCC emission designators are based on 26dB emission bandwidth. ISED emission designators are based on 99% emission bandwidth.									

OCCUPIED BANDWIDTH - BAND n14

TbtTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	AHLBBA (C2PC/C3PC FCC/ISED)			Work Order:	NOKI0047
Serial Number:	K9193514835			Date:	3-Aug-22
Customer:	Nokia Solutions and Networks			Temperature:	21.1 °C
Attendees:	Mitchell Hill			Humidity:	55.4% RH
Project:	None			Barometric Pres.:	1019 mbar
Tested by:	Marty Martin	Power:	54VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
RSS 140 Issue 1: 2018	ANSI C63.26:2015
FCC 90R:2022	

COMMENTS

All measurement path losses were accounted for in the reference level offset including attenuators, cables, DC block and filter when in use. The carriers were enabled at maximum power.

DEVIATIONS FROM TEST STANDARD

None

Configuration #	2	Signature

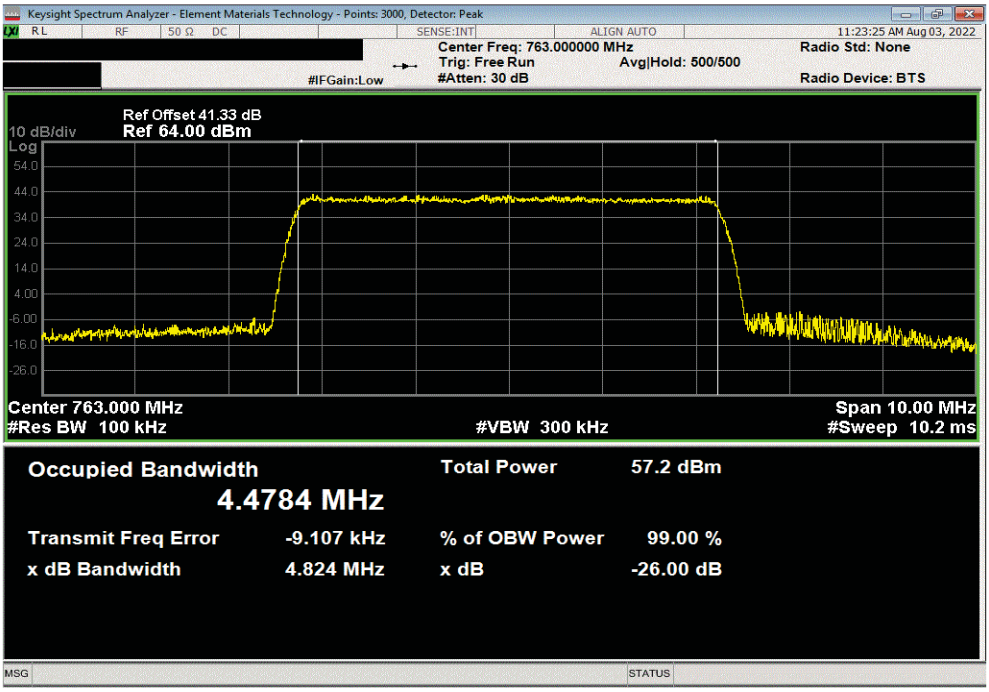
	Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
Port 1				
5G NR Band n14, 758 - 768 Mhz				
5 MHz Bandwidth				
QPSK Modulation				
Mid Channel, 763 MHz	4.48	4.82	Within Band	Pass
16QAM Modulation				
Mid Channel, 763 MHz	4.50	4.83	Within Band	Pass
64QAM Modulation				
Mid Channel, 763 MHz	4.48	4.84	Within Band	Pass
256QAM Modulation				
Low Channel, 760.5 MHz	4.48	4.82	Within Band	Pass
Mid Channel, 763 MHz	4.48	4.82	Within Band	Pass
High Channel, 765.5 MHz	4.47	4.84	Within Band	Pass
10 MHz Bandwidth				
QPSK Modulation				
Mid Channel, 763 MHz	9.27	9.86	Within Band	Pass
16QAM Modulation				
Mid Channel, 763 MHz	9.22	9.83	Within Band	Pass
64QAM Modulation				
Mid Channel, 763 MHz	9.28	9.84	Within Band	Pass
256QAM Modulation				
Mid Channel, 763 MHz	9.29	9.87	Within Band	Pass
Port 2				
5G NR Band n14, 758 - 768 Mhz				
5 MHz Bandwidth				
QPSK Modulation				
Mid Channel, 763 MHz	4.49	4.84	Within Band	Pass
16QAM Modulation				
Mid Channel, 763 MHz	4.51	4.83	Within Band	Pass
64QAM Modulation				
Mid Channel, 763 MHz	4.48	4.84	Within Band	Pass
256QAM Modulation				
Low Channel, 760.5 MHz	4.48	4.85	Within Band	Pass
Mid Channel, 763 MHz	4.48	4.84	Within Band	Pass
High Channel, 765.5 MHz	4.48	4.84	Within Band	Pass
10 MHz Bandwidth				
QPSK Modulation				
Mid Channel, 763 MHz	9.28	9.88	Within Band	Pass
16QAM Modulation				
Mid Channel, 763 MHz	9.24	9.84	Within Band	Pass
64QAM Modulation				
Mid Channel, 763 MHz	9.29	9.87	Within Band	Pass
256QAM Modulation				
Mid Channel, 763 MHz	9.29	9.87	Within Band	Pass

OCCUPIED BANDWIDTH - BAND n14

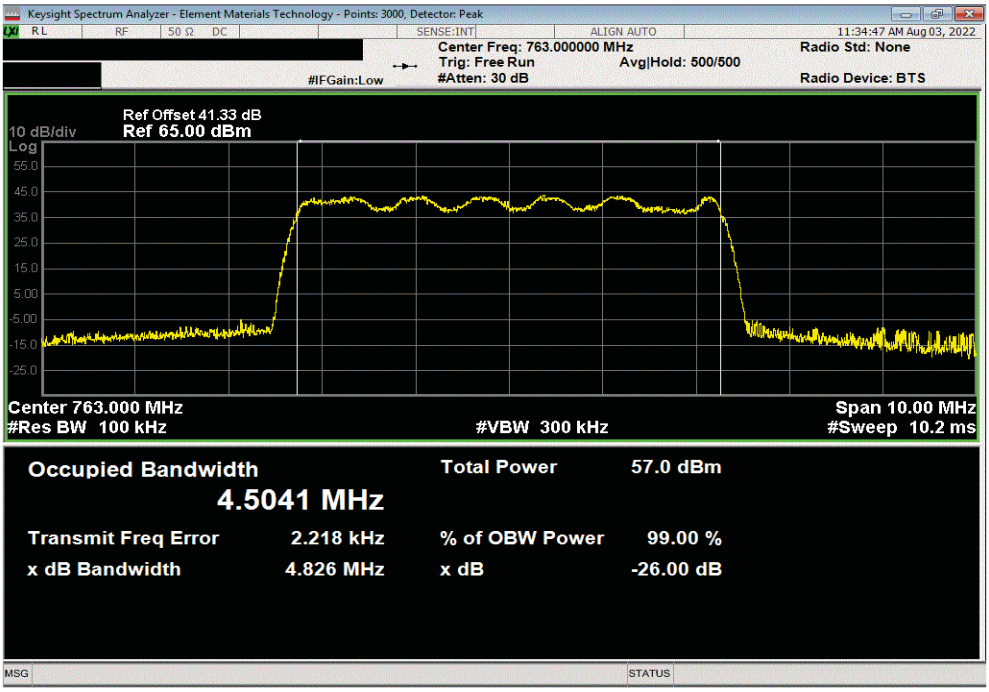
element

TbtTx 2022.05.02.0 XMit 2022.02.07.0

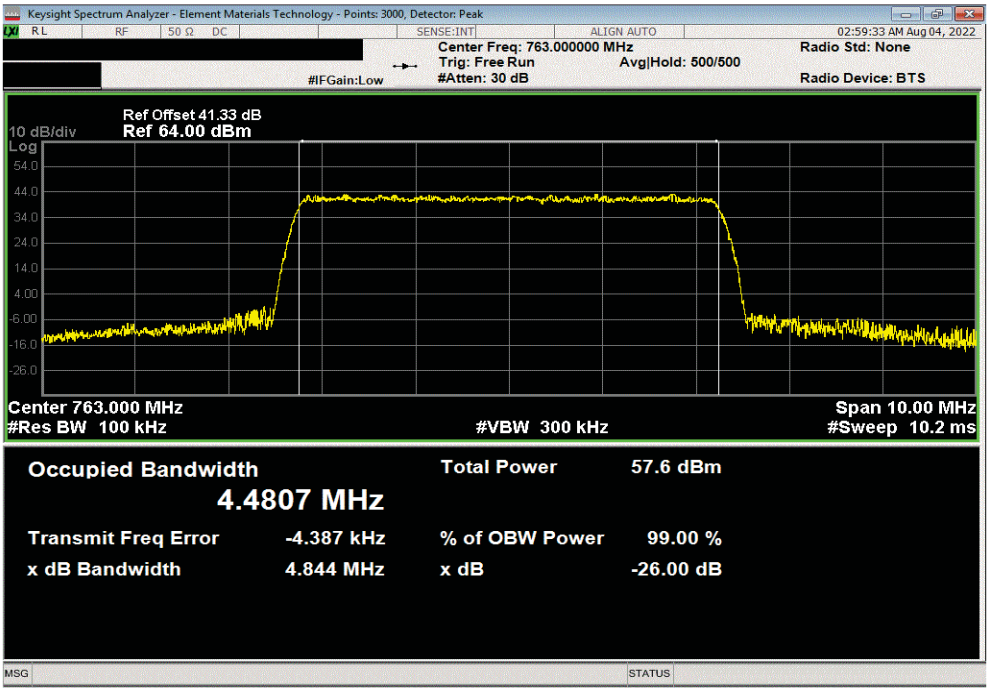
Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 763 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			4.478	4.824	Within Band	Pass



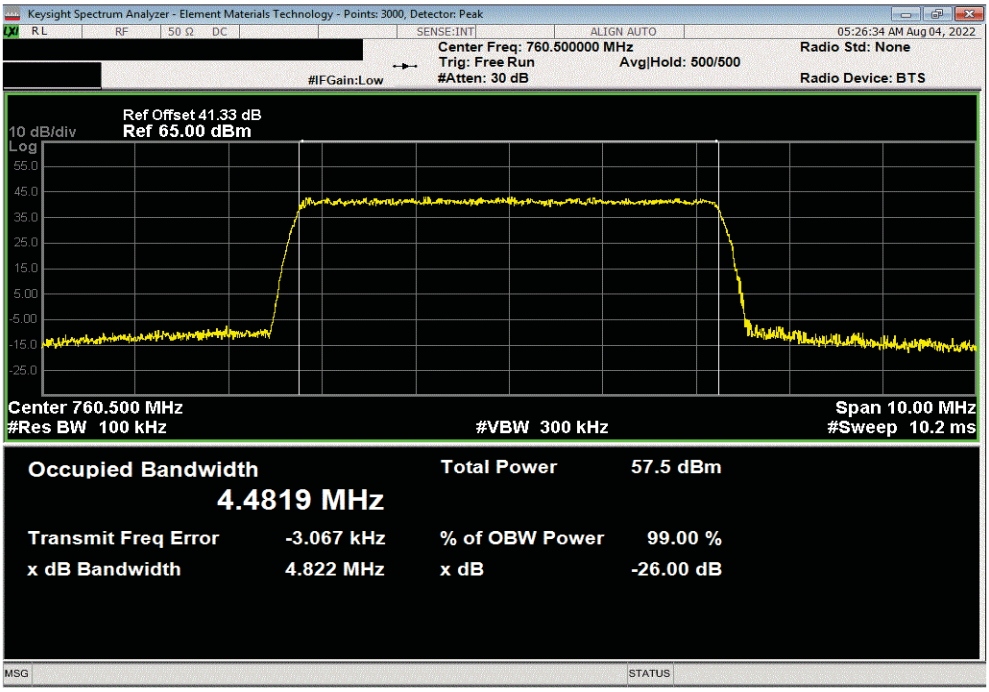
Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 763 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			4.504	4.826	Within Band	Pass



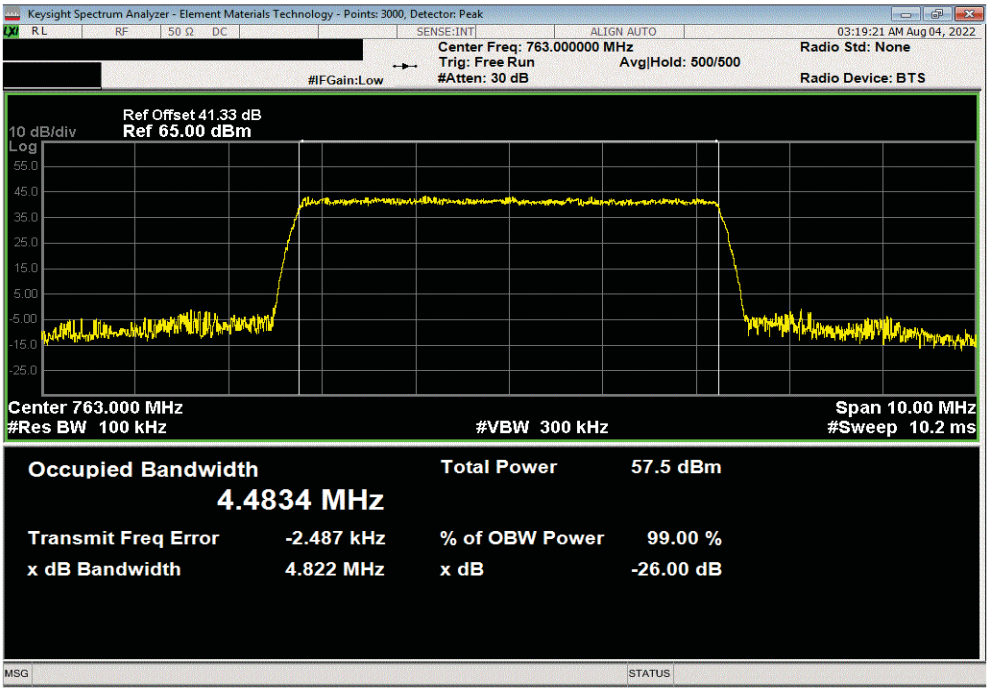
Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 763 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			4.481	4.844	Within Band	Pass



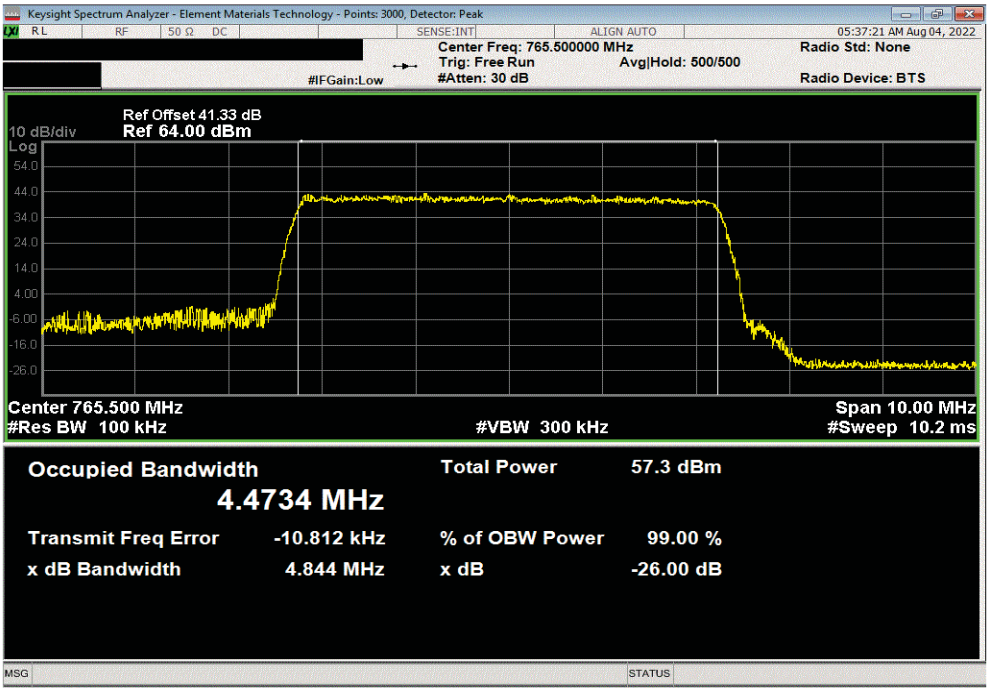
Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 760.5 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			4.482	4.822	Within Band	Pass



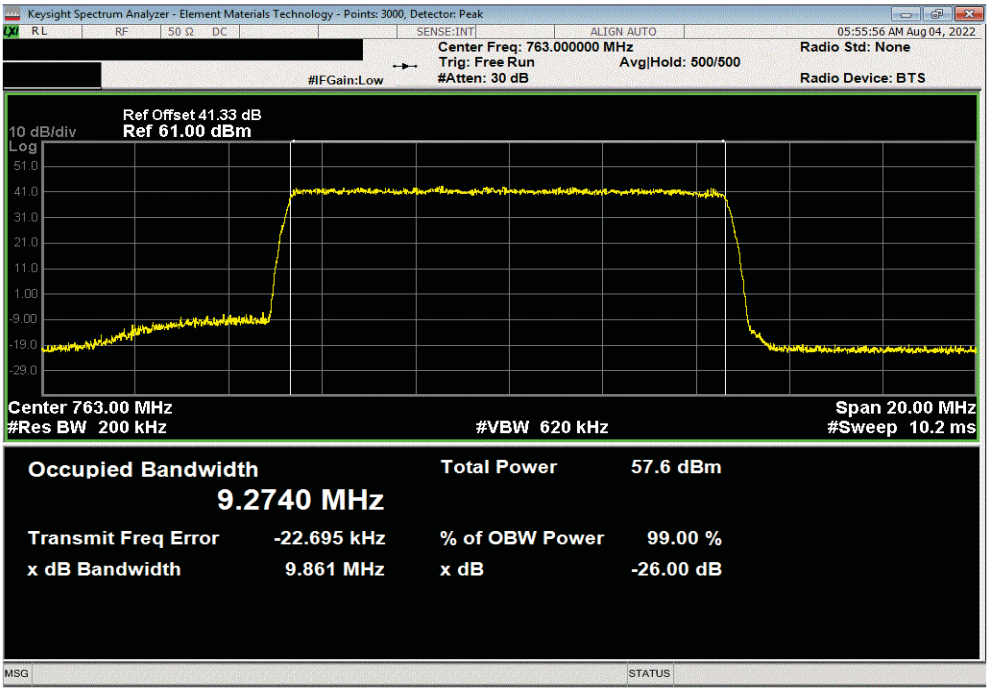
Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			4.483	4.822	Within Band	Pass



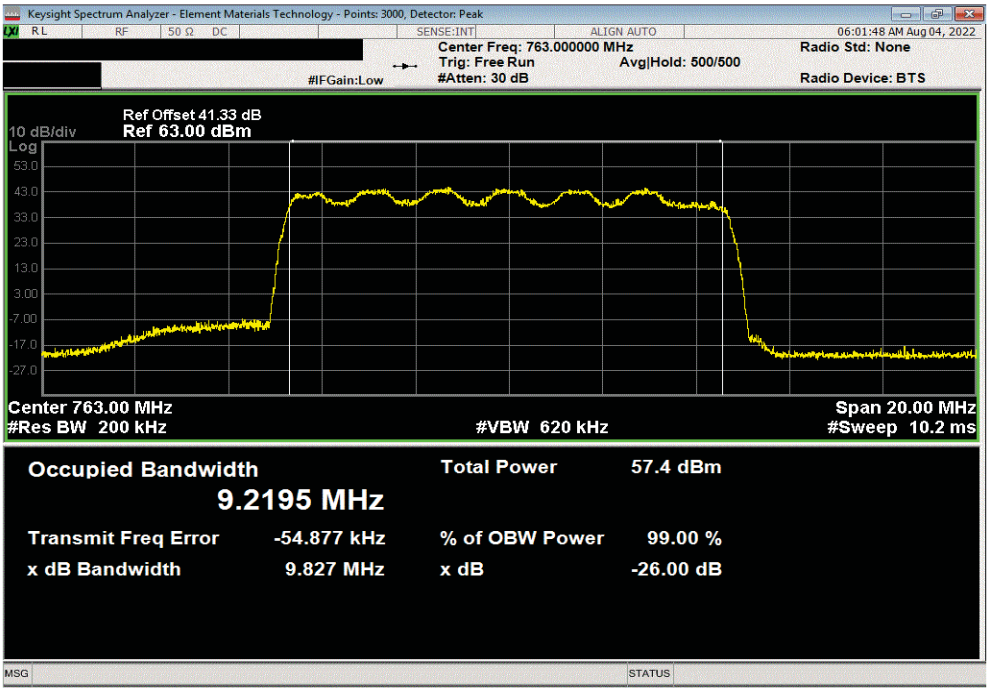
Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			4.473	4.844	Within Band	Pass



Port 1, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, QPSK Modulation, Mid Channel, 763 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			9.274	9.861	Within Band	Pass

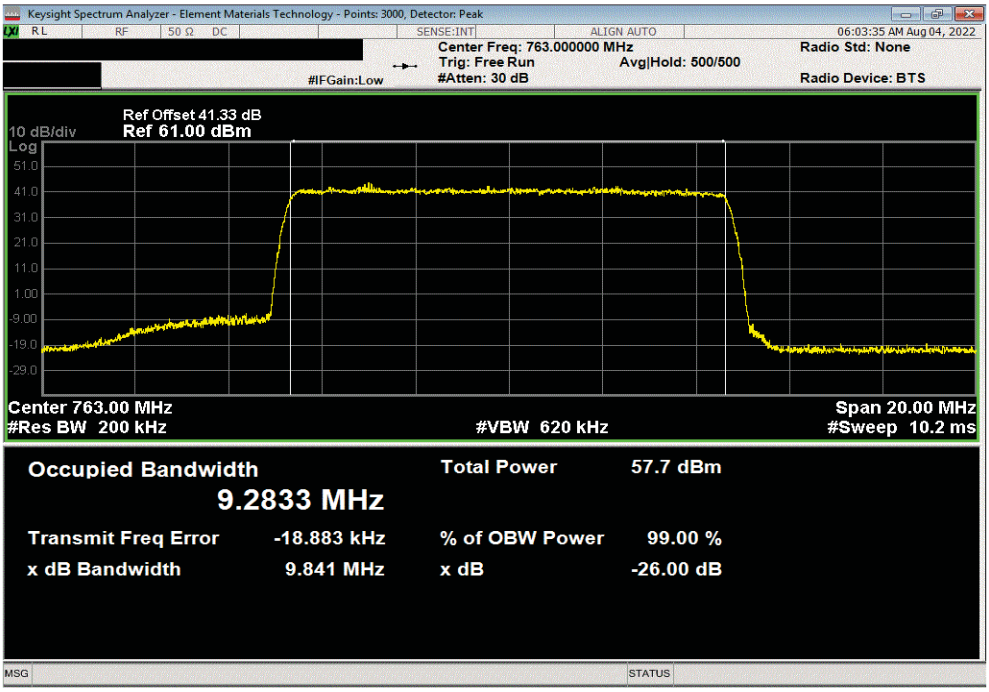


Port 1, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 16QAM Modulation, Mid Channel, 763 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			9.22	9.827	Within Band	Pass



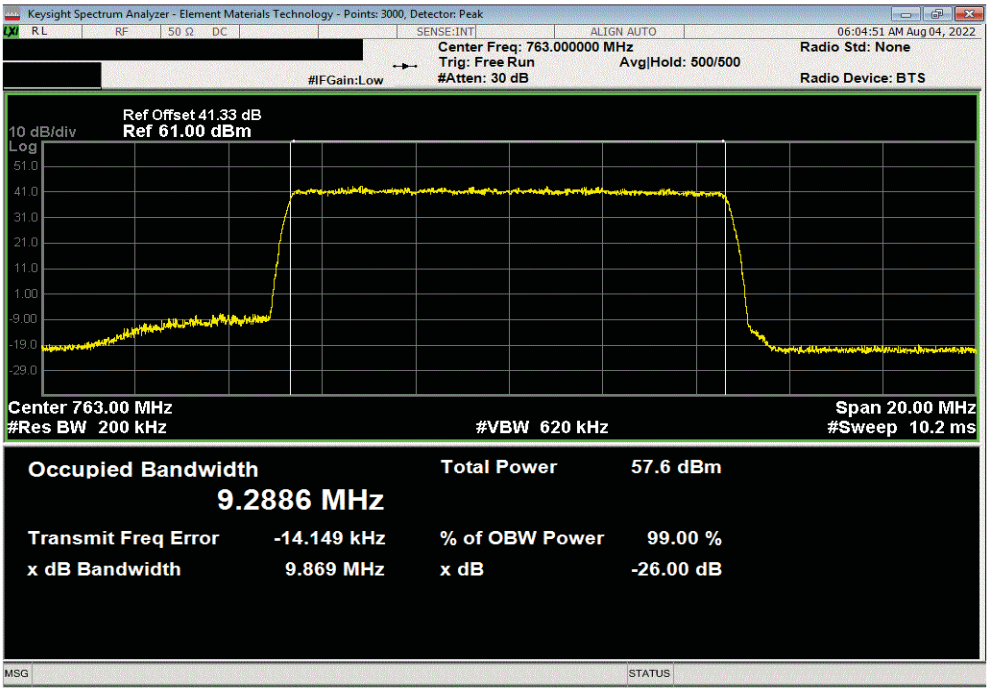
Port 1, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 64QAM Modulation, Mid Channel, 763 MHz

			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			9.283	9.841	Within Band	Pass



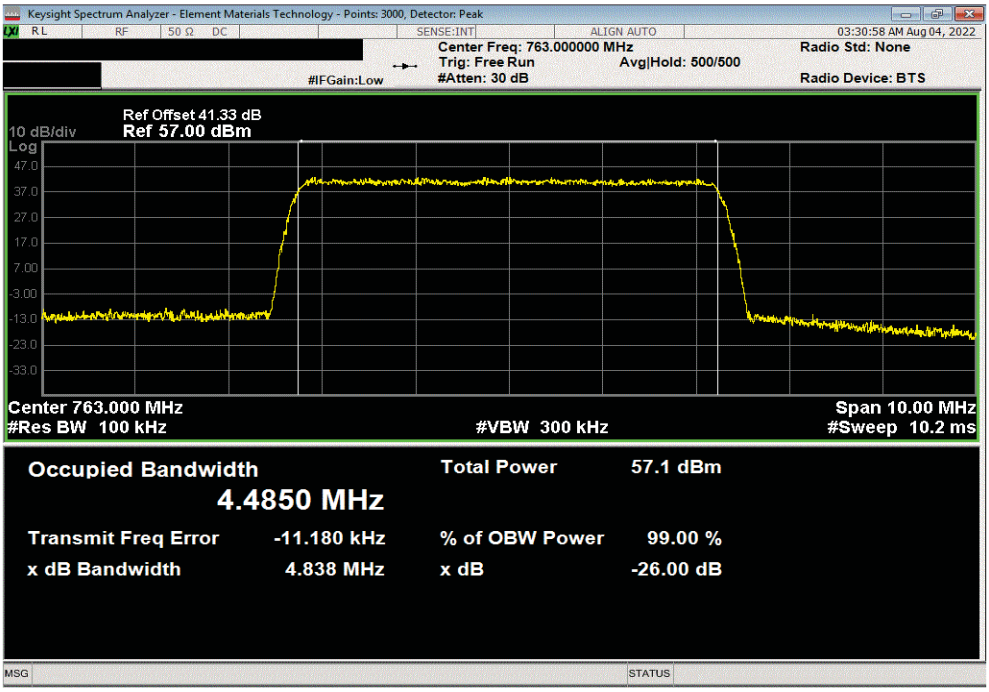
Port 1, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763 MHz

			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			9.289	9.869	Within Band	Pass



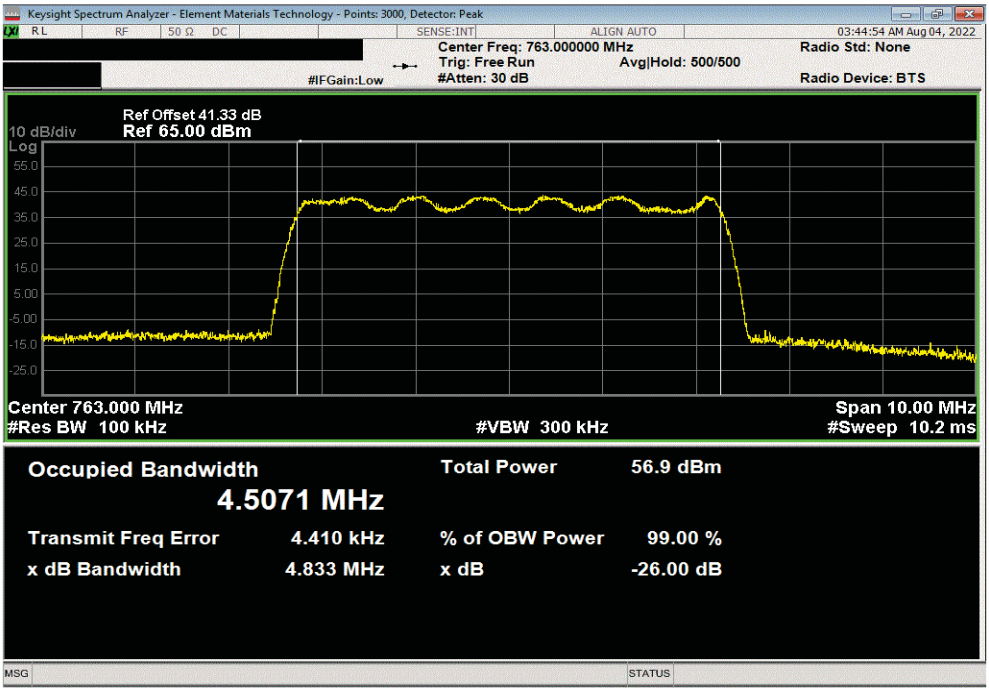
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 763 MHz

			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			4.485	4.838	Within Band	Pass

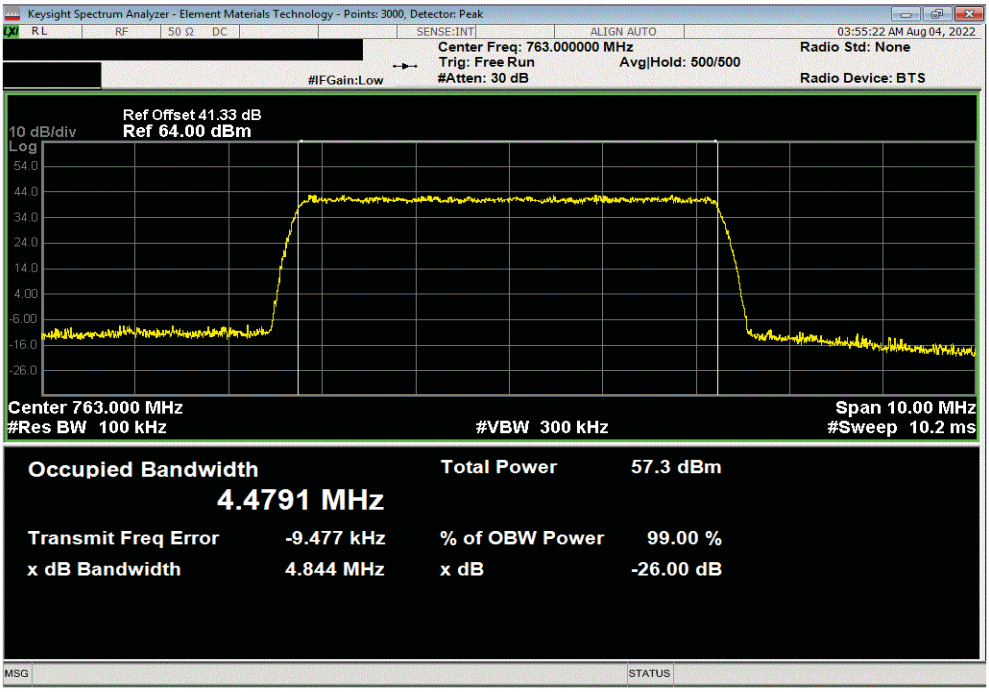


Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 763 MHz

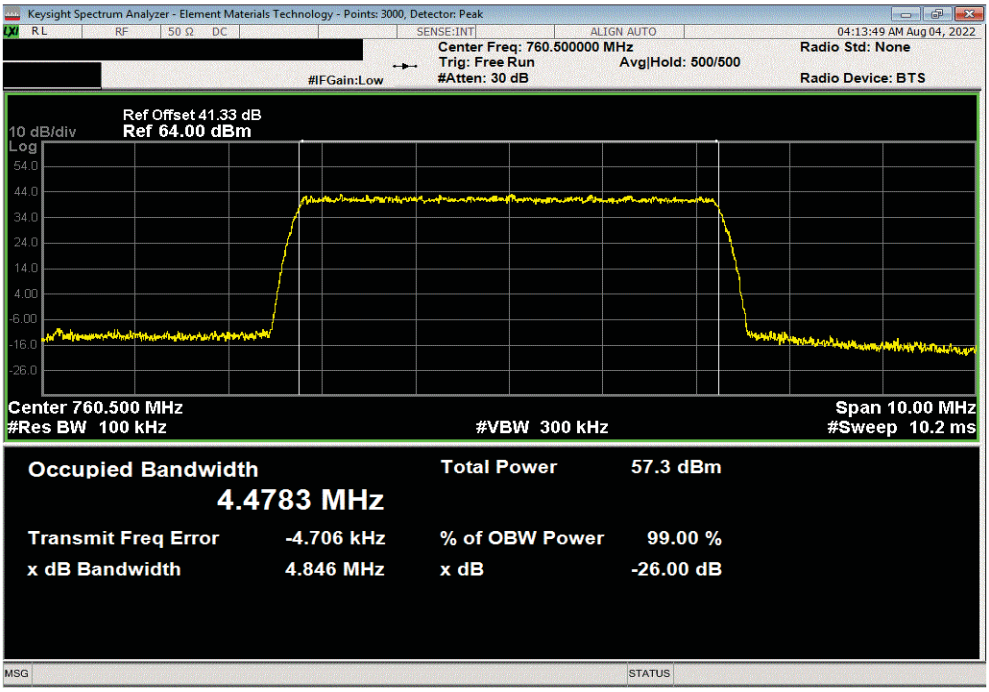
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			4.507	4.833	Within Band	Pass



Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 763 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			4.479	4.844	Within Band	Pass

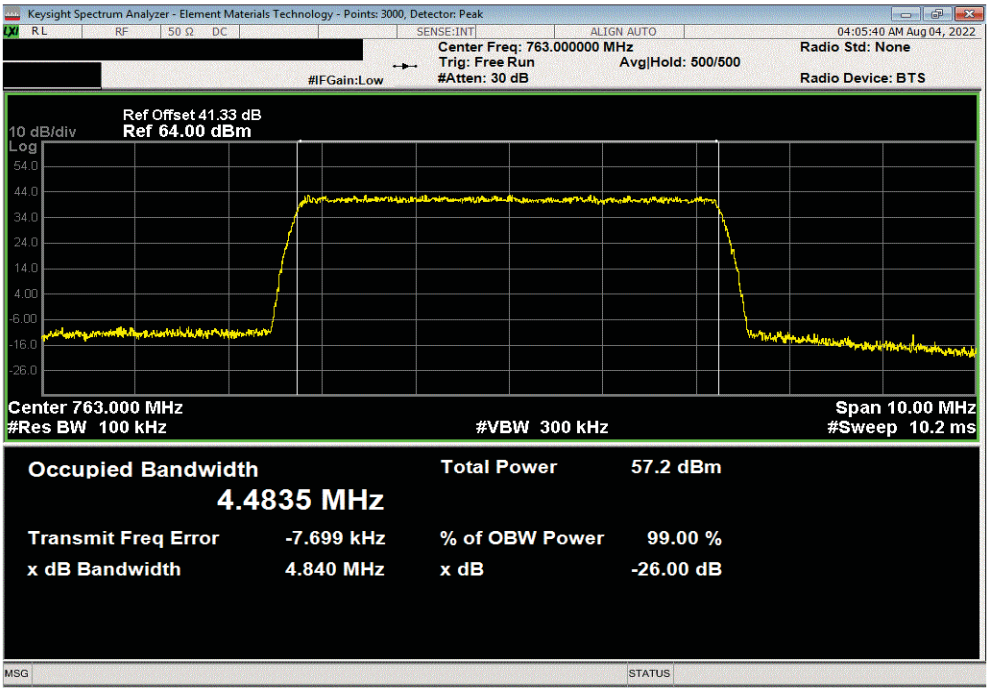


Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 760.5 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			4.478	4.846	Within Band	Pass

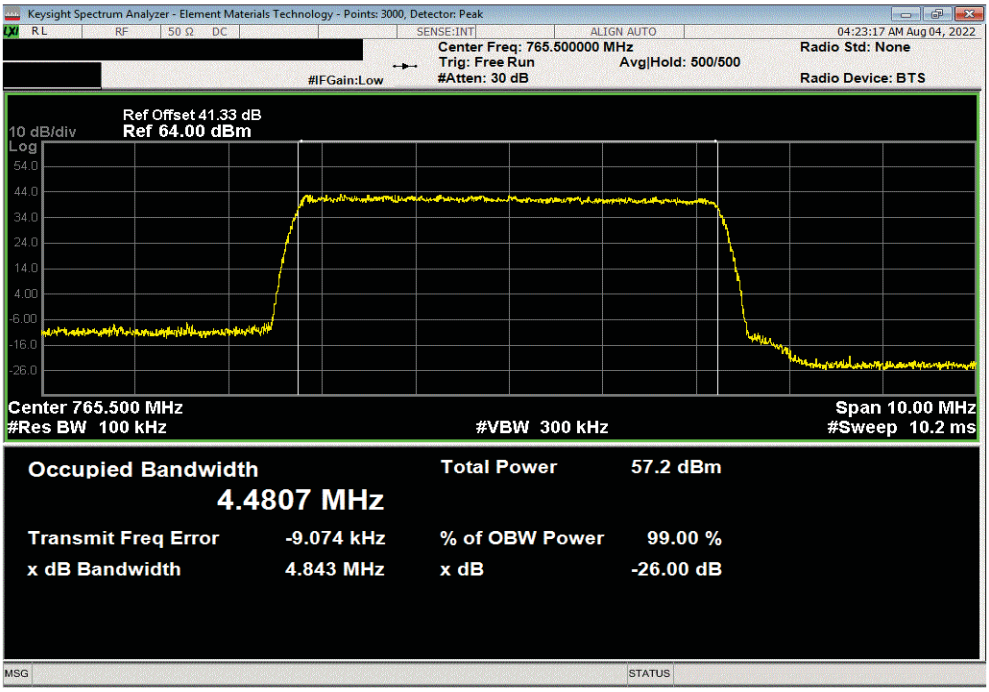


OCCUPIED BANDWIDTH - BAND n14

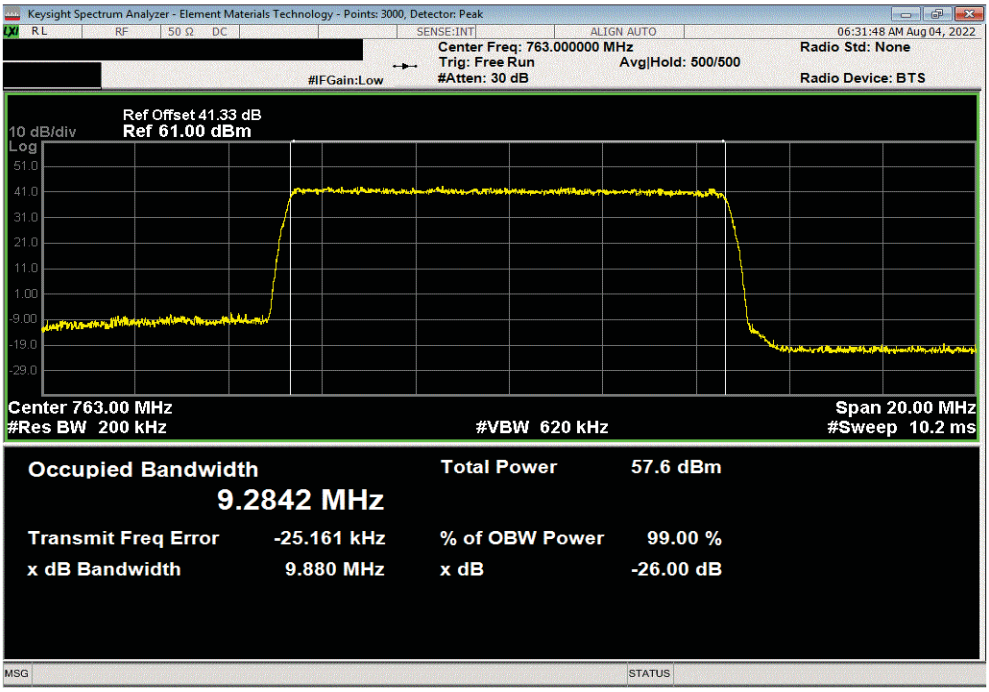
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			4.483	4.84	Within Band	Pass



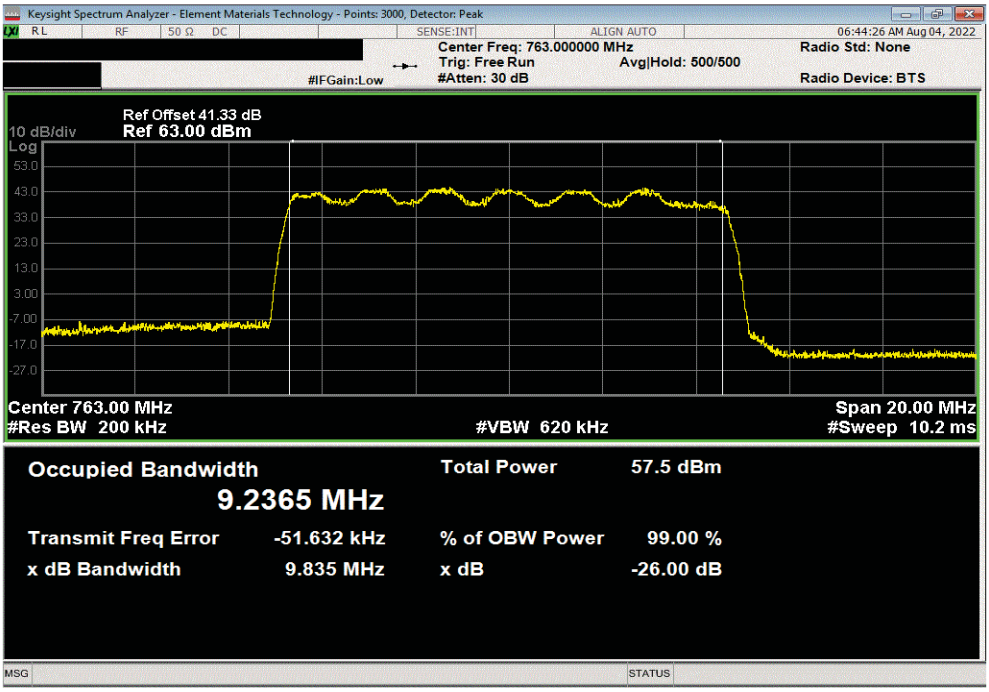
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			4.481	4.843	Within Band	Pass



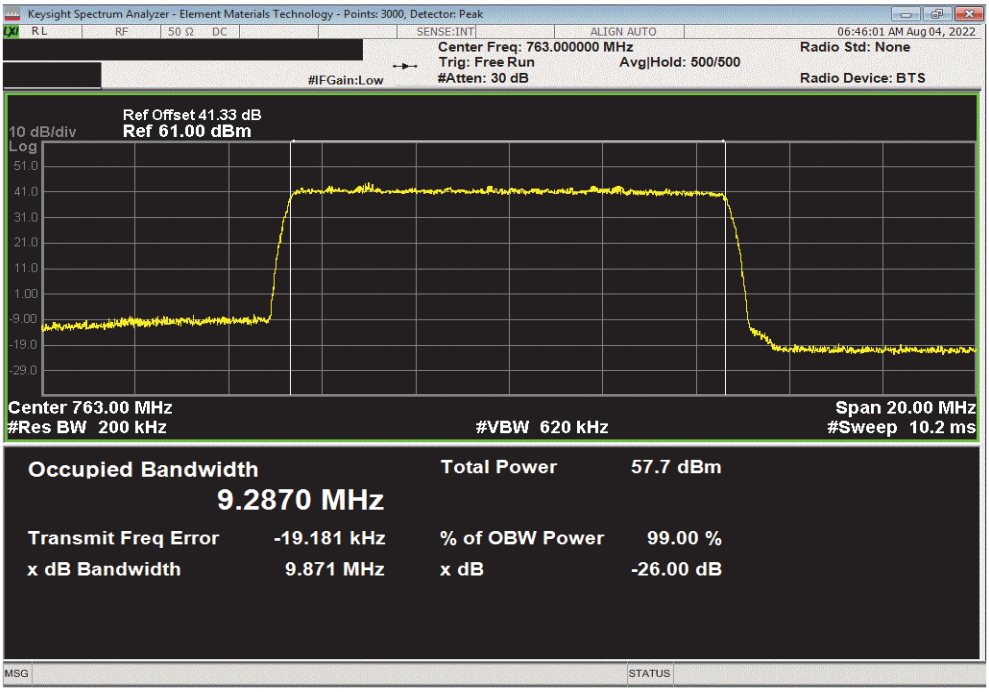
Port 2, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, QPSK Modulation, Mid Channel, 763 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			9.284	9.88	Within Band	Pass



Port 2, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 16QAM Modulation, Mid Channel, 763 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			9.237	9.835	Within Band	Pass



Port 2, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 64QAM Modulation, Mid Channel, 763 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			9.287	9.871	Within Band	Pass



Port 2, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763 MHz						
			Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
			9.293	9.873	Within Band	Pass