Radio Test Report

Application for Grant of Equipment Authorization

FCC Part 27

[2496MHz – 2690MHz]

FCC ID: VBNAVHA-01

Nokia Solutions and Networks

Airscale Base Transceiver Station Radio Unit

Model: AVHA

Report: NOKI0079.1 Rev. 0, Issue Date: November 13, 2024

ACCREDITED
CERT #214.19

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element
2023.04.17

Section	Page Number

CERTIFICATE OF TEST

Last Date of Test: October 18, 2024
Nokia Solutions and Networks
EUT: Airscale Base Transceiver Station Radio Unit
Model AVHA

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 FCC KDB 971168 D01v03

Results

Test Description	Result	Comments
Output Power	Pass	
Peak and Average (PAPR) CCDF	Pass	
Occupied Bandwidth	Pass	
Band Edge Compliance	Pass	
Spurious Conducted Emissions	Pass	
Spurious Radiated Emissions	Pass	
Frequency Stability	Pass	

Deviations From Test Standards

None

Approved By:

Adam Bruno, Operations Manager
Signed for and on behalf of Element

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

element
2024.09.27

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

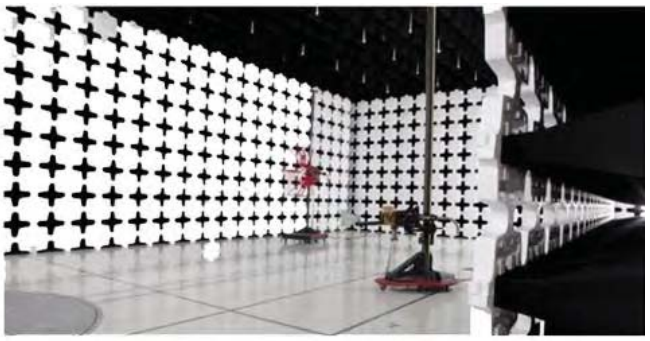
element
2024.09.23

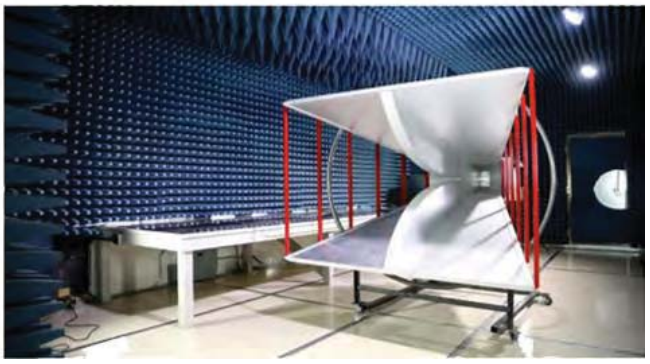
Testing was performed at the following location(s)

	Location	Labs (1)	Address	A2LA (2)	ISED (3)	BSMI (4)	VCCI (5)	CAB (6)	FDA (7)
☐	California	OC01-17	41 Tesla Irvine, CA 92618 (949) 861-8918	3310.04	2834B	SL2-IN-E-1154R	A-0029	US0158	TL-55
☐	Minnesota	MN01-11	9349 W Broadway Ave. Brooklyn Park, MN 55445 (612) 638-5136	3310.05	2834E	SL2-IN-E-1152R	A-0109	US0175	TL-57
☐	Oregon	EV01-12	6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	3310.02	2834D	SL2-IN-E-1017	A-0108	US0017	TL-56
☒	Plano Texas	PT01-15	1701 E Plano Pkwy, Ste 150 Plano, TX 75074 (972) 509-2566	214.19	32637	SL2-IN-E-057R	A-0426	US0054	N/A
☐	Washington	NC01-05	19201 120th Ave NE Bothell, WA 98011 (425) 984-6600	3310.06	2834F	SL2-IN-E-1153R	A-0110	US0157	TL-67
☐	Offsite	N/A	See Product Description	N/A	N/A	N/A	N/A	N/A	N/A

See data sheets for specific labs

(1) The lab designations denote individual rooms within each location. (OC01, OC02, OC03, etc.)
(2) A2LA Certificate No.
(3) ISED Company No.
(4) BSMI No.
(5) VCCI Site Filing No.
(6) CAB Identifier. Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA
(7) FDA ASCA No.





MEASUREMENT UNCERTAINTY

element
MU 2023-09-21

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.

Various Measurements

Test	All Labs (+/-)
Frequency Accuracy (%)	0.0007
Amplitude Accuracy (dB)	1.2
Conducted Power (dB)	1.2
Radiated Power via Substitution (dB)	0.7
Temperature (degrees C)	0.7
Humidity (% RH)	2.5
Voltage (AC) (%)	1
Voltage (DC) (%)	0.7

Field Strength Measurements (dB)

Range	PT01 (+/-)	PT14 (+/-)
10kHz-30MHz	1.8	N/A
30MHz-1GHz 3m	4.9	N/A
1GHz-6GHz	5.1	N/A

AC Powerline Conducted Emissions Measurements (dB)

Range	PT14 (+/-)

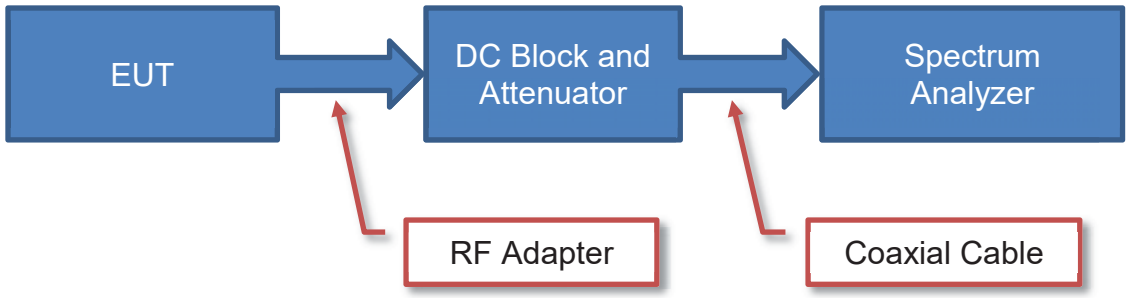
TEST SETUP BLOCK DIAGRAMS

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.

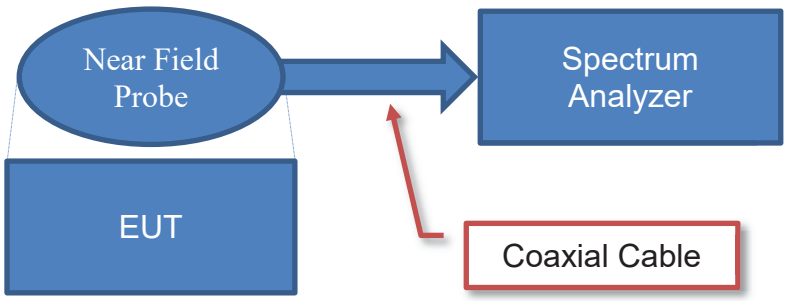
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

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

Near Field Test Fixture Measurements

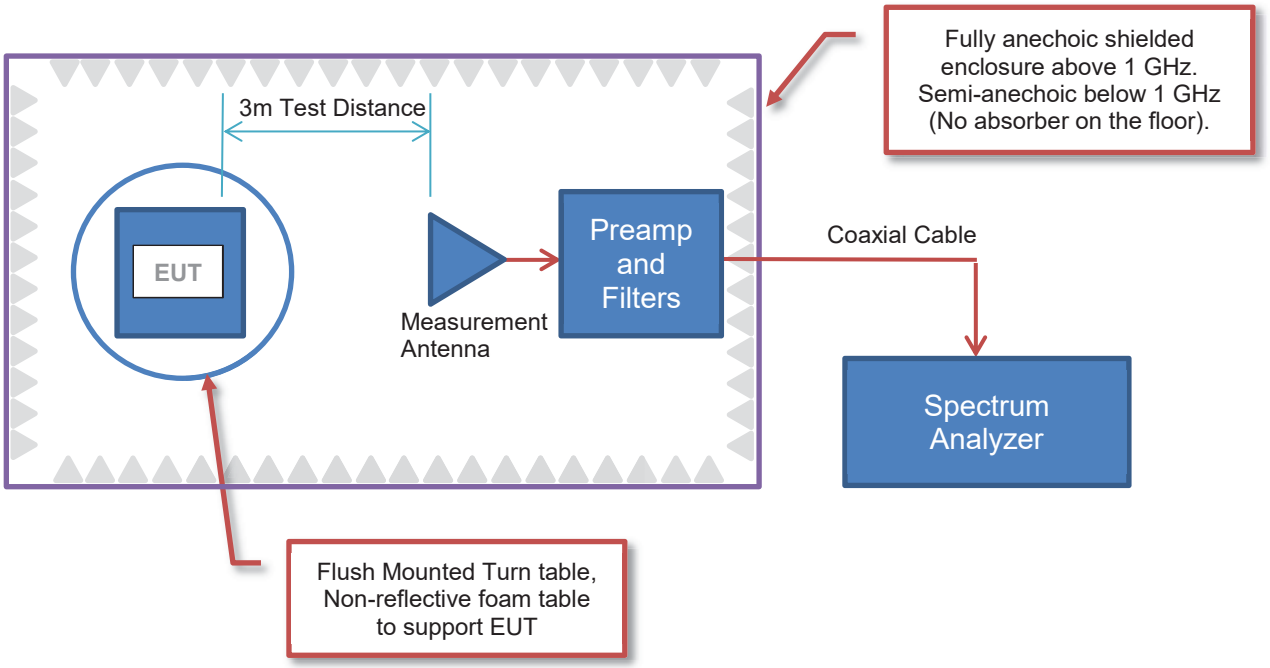


Sample Calculation (logarithmic units)

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**

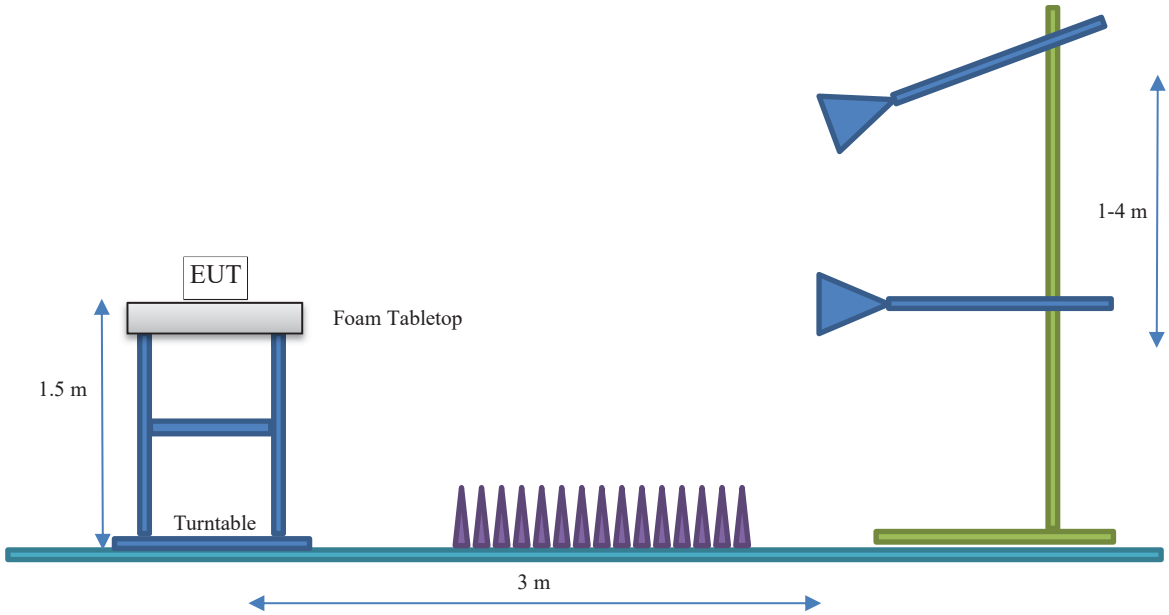
Radiated Power (ERP/EIRP) – Substitution Method:

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 Radio Unit Model AVHA
First Date of Test:	October 3, 2024
Last Date of Test:	October 17, 2024
Receipt Date of Samples:	October 3, 2024
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

AirScale MAA 64T64R 192AE Radio Unit (RU) variant AVHA is being developed under this effort. The AVHA Radio Unit is designed to support 4G LTE and 5G NR (New Radio) TDD (Time Division Duplex) operations. **The scope of this testing effort is the FCC radio certification of the AVHA for 5G NR TDD operations in the N41 BRS/EBS Band.**

The AVHA RU supports 3GPP frequency band n41 operations for the FCC BRS/EBS Band (BTS Tx/Rx: 2496 to 2690 MHz). The AVHA supports up to 64 port MIMO operations. The maximum RF output power is 400 watts (6.25W/TRX x 64 TRXs). The AVHA RU supports 5G NR TDD channel bandwidths of NR10, NR15, NR20, NR30, NR40, NR50, NR60, NR70, NR80, NR90, & NR100. The single carrier channel bandwidth maximum RF output power per TRX are as follows.

AVHA Single Carrier Maximum RF Output Power									
Carrier Power per	**NR10**	**NR15**	**NR20**	**NR30**	**NR40**	**NR50**	**NR60**	**NR70**	**NR80 thru NR100**
TRX	1.25W or 31.0dBm	1.56W or 31.9dBm	1.95W or 32.9dBm	2.34W or 33.7dBm	3.13W or 34.9dBm	3.91W or 35.9dBm	4.69W or 36.7dBm	5.47W or 37.4dBm	6.25W or 38.0dBm
Radio (64 x TRX)	80.0W or 49.0dBm	100W or 50.0dBm	125W or 51.0dBm	150W or 51.8dBm	200W or 53.0dBm	250W or 54.0dBm	300W or 54.8dBm	350W or 55.4dBm	400W or 56.0dBm

The AVHA RU supports four downlink 5G NR modulation types (QPSK, 16QAM, 64QAM and 256QAM). The AVHA RU instantaneous bandwidth is 194MHz and covers the entire FCC BRS/EBS Band. The maximum occupied bandwidth is 190MHz. Multicarrier operation is supported. The 4G LTE radio certification will be performed under a separate effort.

The AVHA antenna assembly has an array of 4 rows and 8 columns of (±45°) cross-polarized (orthogonal) radiators. This antenna assembly has a beamforming gain of 26.0 dBi. The sixty-four AVHA transmitter outputs are connected to the antenna array (thirty-two are connected to +45° radiators/antennas and thirty-two are connected to the -45° radiators/antennas).

PRODUCT DESCRIPTION

The radio unit has external interfaces including DC power (DC IN), ground (GND), optical (OPT1-4) and remote electrical tilt/EAC connector (AISG). The RU with applicable installation kit is pole mounted.

Tests to be performed include RF channel power, CCDF- peak to average power ratio, emission bandwidth (99% and 26 dB down), band edge spurious emissions (± 1MHz), spurious emissions (conducted and radiated), and frequency stability (over required voltage/temperature ranges). 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).

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

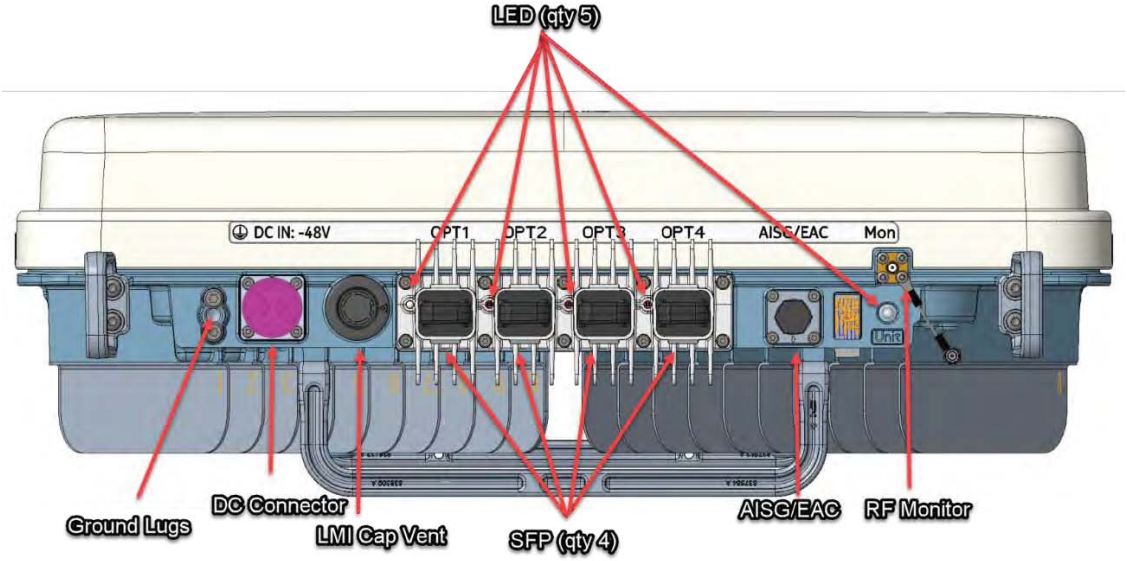
The 3GPP frequency band n41 (2496-2690 MHz) band edge NR-ARFCNs for 5G NR channel bandwidths (10, 15, 20, 30, 40, 50, 60, 80, 90 and 100 MHz) are provided below. The NR-ARFCN is defined as New Radio - Absolute Radio Frequency Channel Number.

5G NR NR-ARFCN	Frequency (MHz)	5G NR Channel Bandwidth in MHz										
		10	15	20	30	40	50	60	70	80	90	100
Band Edge	2496.00	Lower Band Edge										
.....												
500202	2501.01	Bot Ch										
.....												
500700	2503.50		Bot Ch									
.....												
501204	2506.02			Bot Ch								
.....												
502200	2511.00				Bot Ch							
.....												
503202	2516.01					Bot Ch						
.....												
504204	2521.02						Bot Ch					
.....												
505200	2526.00							Bot Ch				
.....												
506202	2531.01								Bot Ch			
.....												
507204	2536.02									Bot Ch		
.....												
508200	2541.00										Bot Ch	
.....												
509202	2546.01											Bot Ch
.....												
518598	2592.99	Middle Channel										
.....												
528000	2640.00											Top Ch
.....												
528996	2644.98										Top Ch	
.....												
529998	2649.99									Top Ch		
.....												
531000	2655.00								Top Ch			
.....												
531996	2659.98							Top Ch				
.....												
532998	2664.99						Top Ch					
.....												
534000	2670.00					Top Ch						
.....												
534996	2674.98				Top Ch							
.....												
535998	2679.99			Top Ch								
.....												
536496	2682.48		Top Ch									
.....												
537000	2685.00	Top Ch										
.....												
Band Edge	2690.00	Upper Band Edge										

PRODUCT DESCRIPTION

element
2018-07-17

AVHA Connector Layout



AVHA External Interfaces

Name	Initials	Purpose	# of lines	Connector type
Power Supply In	DC IN	Power Supply input	1	Circular plug P511466 Circular Con
Grounding (GND Screws)	GND	Grounding		M8, 2 x M5
LMI (Local Management Interface)	LMI	Not for field use.		Minilink42
System Interface	OPT1, OPT2, OPT3, OPT4	eCPRI to/from FSMs	4 x Optical	SFP+ SFP28 SFP56 optical LC-connector
AISG/EAC connector	AISG	Connection for AISG	6 EAC input signals, 1 EAC output signal 1 AISG	Combined AISG / EAC mech CONNECTOR code P597765
RF Monitor	Mon	To measure RF outputs	1	SMA(F)

Testing Objective:

FCC radio certification of the AirScale MAA 64T64R Radio Unit variant AVHA for 5G NR TDD Single Carrier and Multi Carrier operations in the BRS/EBS Band.

MODIFICATIONS

element
2018-07-17

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2024-10-03	Average Power - All Ports	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	2024-10-04	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.
3	2024-10-04	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.
4	2024-10-04	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.
5	2024-10-07	Peak and Average (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.
6	2024-10-07	Band Edge Compliance - Multicarrier	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	2024-10-07	Average Power - Multicarrier	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
8	2024-10-08	Spurious Conducted Emissions - Multicarrier	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
9	2024-10-08	Spurious Conducted Emissions	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
10	2024-10-10	Frequency Stability	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
11	2024-10-17	Spurious Radiated Emissions	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

AVERAGE POWER – ALL PORTS

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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.

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.

RF conducted emissions testing was performed on all ports at 80 MHz middle channel in order to show the Airscale Base Transceiver Station Radio Unit Model AVHA antenna ports are all within the manufacturer's rate output power tolerances (the RF power variation between antenna ports is small as shown in this certification testing).

The RMS average power measurement method for FCC is detailed in section 5.2 of KDB 971168 D01v03r01 and ANSI C63.26-2015 section 5.2.4.4. Measurements shall be performed at full power on the channel(s) and bandwidth(s) specified for 5G NR.

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2024-03-12	2025-03-12
Generator - Signal	Agilent	N5173B	TIW	2023-08-07	2026-08-07
Block - DC	Fairview Microwave	SD3379	AMM	2024-08-15	2025-08-15

AVERAGE POWER – ALL PORTS

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TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Airscale Base Transceiver Station Radio Unit Model AVHA	Work Order:	NOKI0079
Serial Number:	L1242005329	Date:	2024-10-03
Customer:	Nokia Solutions and Networks	Temperature:	23.3°C
Attendees:	Mitch Hill, David Le	Relative Humidity:	56.8%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jarrod Brenden	Job Site:	PT14
Power:	54VDC	Configuration:	NOKI0079-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 27:2024	ANSI C63.26:2015

COMMENTS

All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks. BRS Band n41 carriers were enabled at maximum power levels. All measured power values are within tolerance (i.e. Rated Power ±0.8 dB).

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

TEST RESULTS

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Value (dBm)	Value (W)	Result
80 MHz Channel Bandwidth					
QPSK Modulation					
Middle Channel, 2592.99 MHz					
Port 1	38.253	0	38.3	6.8	Within Tolerance
Port 2	38.071	0	38.1	6.5	Within Tolerance
Port 3	38.148	0	38.1	6.5	Within Tolerance
Port 4	37.85	0	37.9	6.2	Within Tolerance
Port 5	38.322	0	38.3	6.8	Within Tolerance
Port 6	38.294	0	38.3	6.8	Within Tolerance
Port 7	38.208	0	38.2	6.6	Within Tolerance
Port 8	38.152	0	38.2	6.6	Within Tolerance
Port 9	38.318	0	38.3	6.8	Within Tolerance
Port 10	38.17	0	38.2	6.6	Within Tolerance
Port 11	38.1	0	38.1	6.5	Within Tolerance
Port 12	38.176	0	38.2	6.6	Within Tolerance
Port 13	38.271	0	38.3	6.8	Within Tolerance
Port 14	38.126	0	38.1	6.5	Within Tolerance
Port 15	38.173	0	38.2	6.6	Within Tolerance
Port 16	38.257	0	38.3	6.8	Within Tolerance

AVERAGE POWER – ALL PORTS

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Value (dBm)	Value (W)	Result
Port 17	38.389	0	38.4	6.9	Within Tolerance
Port 18	38.076	0	38.1	6.5	Within Tolerance
Port 19	38.08	0	38.1	6.5	Within Tolerance
Port 20	38.28	0	38.3	6.8	Within Tolerance
Port 21	38.145	0	38.1	6.5	Within Tolerance
Port 22	38.114	0	38.1	6.5	Within Tolerance
Port 23	38.05	0	38.1	6.5	Within Tolerance
Port 24	38.062	0	38.1	6.5	Within Tolerance
Port 25	38.508	0	38.5	7.1	Within Tolerance
Port 26	38.291	0	38.3	6.8	Within Tolerance
Port 27	38.429	0	38.4	6.9	Within Tolerance
Port 28	38.532	0	38.5	7.1	Within Tolerance
Port 29	38.346	0	38.3	6.8	Within Tolerance
Port 30	38.166	0	38.2	6.6	Within Tolerance
Port 31	38.333	0	38.3	6.8	Within Tolerance
Port 32	38.333	0	38.3	6.8	Within Tolerance
Port 33	38.167	0	38.2	6.6	Within Tolerance
Port 34	38.131	0	38.1	6.5	Within Tolerance
Port 35	38.229	0	38.2	6.6	Within Tolerance
Port 36	38.288	0	38.3	6.8	Within Tolerance
Port 37	38.27	0	38.3	6.8	Within Tolerance
Port 38	38.336	0	38.3	6.8	Within Tolerance
Port 39	38.118	0	38.1	6.5	Within Tolerance
Port 40	38.132	0	38.1	6.5	Within Tolerance
Port 41	38.232	0	38.2	6.6	Within Tolerance
Port 42	38.153	0	38.2	6.6	Within Tolerance
Port 43	38.03	0	38	6.3	Within Tolerance
Port 44	38.19	0	38.2	6.6	Within Tolerance
Port 45	38.185	0	38.2	6.6	Within Tolerance
Port 46	38.155	0	38.2	6.6	Within Tolerance
Port 47	38.12	0	38.1	6.5	Within Tolerance
Port 48	38.306	0	38.3	6.8	Within Tolerance
Port 49	38.088	0	38.1	6.5	Within Tolerance
Port 50	38.129	0	38.1	6.5	Within Tolerance
Port 51	38.087	0	38.1	6.5	Within Tolerance
Port 52	38.022	0	38	6.3	Within Tolerance
Port 53	38.04	0	38	6.3	Within Tolerance
Port 54	38.035	0	38	6.3	Within Tolerance
Port 55	38.063	0	38.1	6.5	Within Tolerance
Port 56	38.296	0	38.3	6.8	Within Tolerance

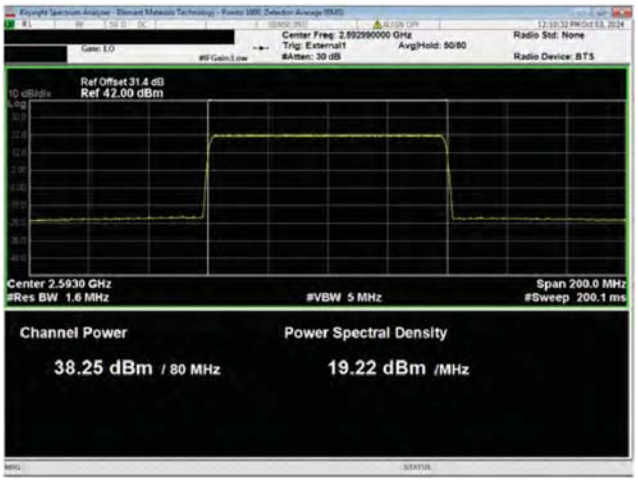
AVERAGE POWER – ALL PORTS

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

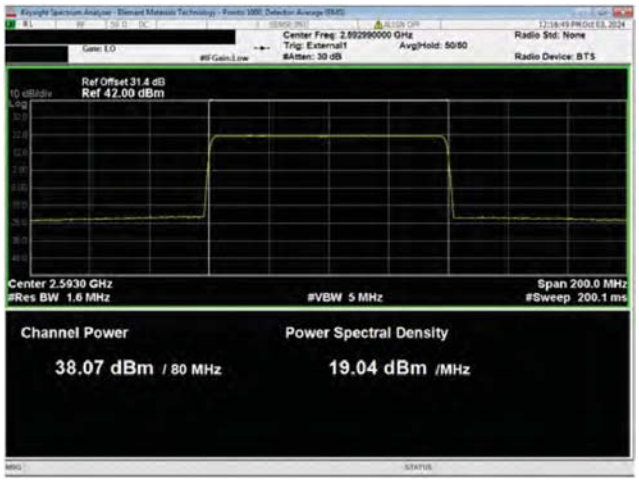
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Value (dBm)	Value (W)	Result
Port 57	38.497	0	38.5	7.1	Within Tolerance
Port 58	38.304	0	38.3	6.8	Within Tolerance
Port 59	38.344	0	38.3	6.8	Within Tolerance
Port 60	38.343	0	38.3	6.8	Within Tolerance
Port 61	38.207	0	38.2	6.6	Within Tolerance
Port 62	38.19	0	38.2	6.6	Within Tolerance
Port 63	38.093	0	38.1	6.5	Within Tolerance
Port 64	38.144	0	38.1	6.5	Within Tolerance
ALL PORTS	N/A	N/A	56.3	423.3	Within Tolerance

AVERAGE POWER – ALL PORTS

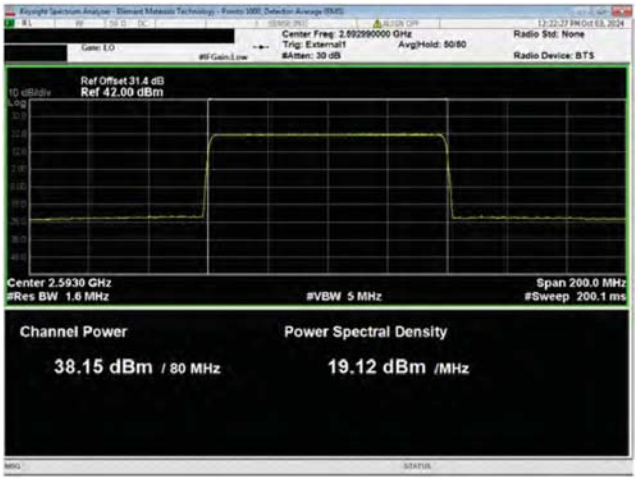
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



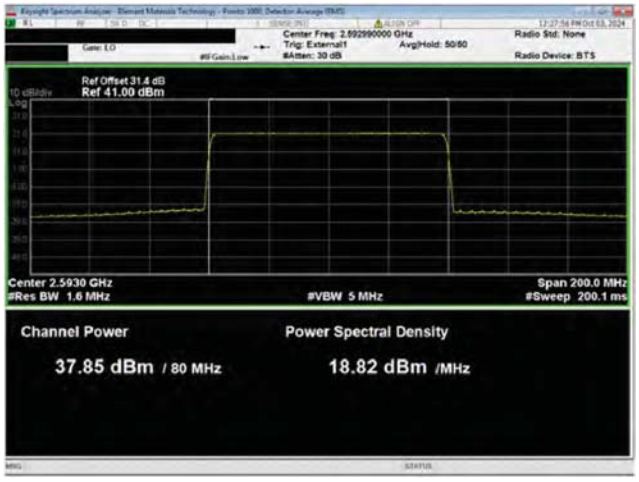
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 1



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 2



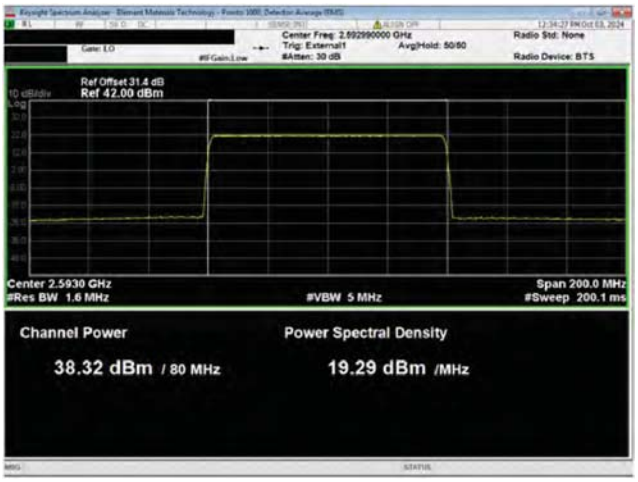
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 3



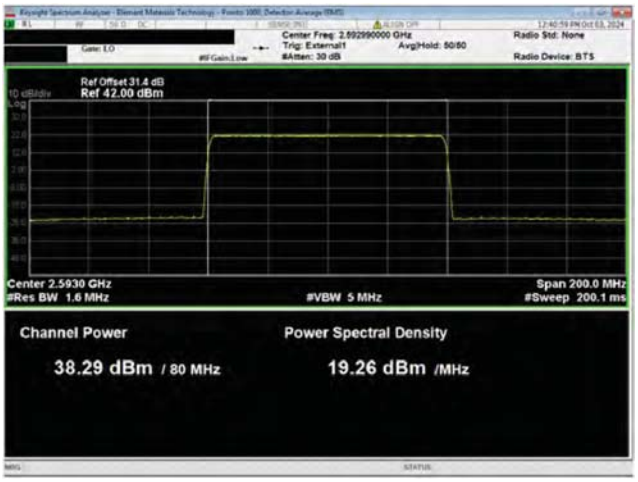
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 4

AVERAGE POWER – ALL PORTS

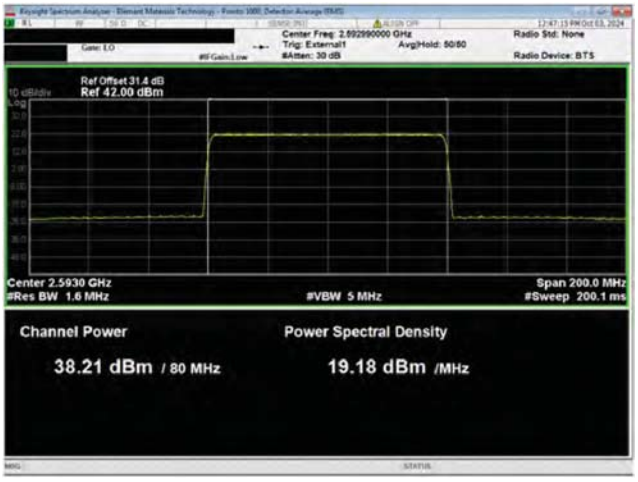
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



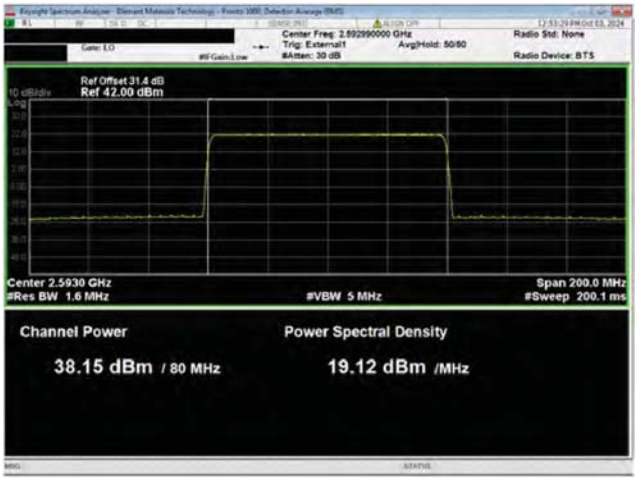
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 5



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 6



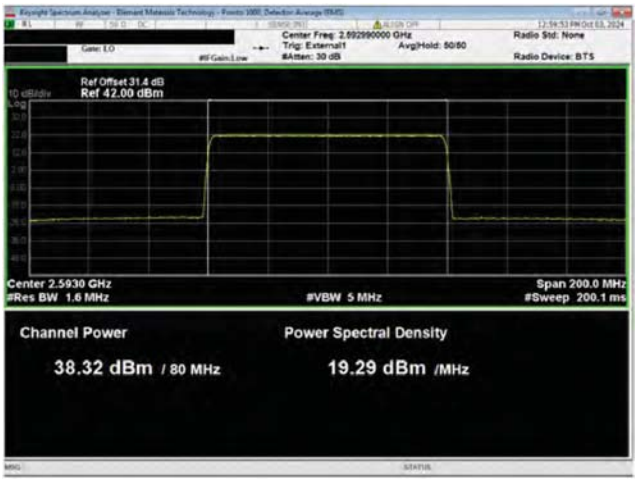
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 7



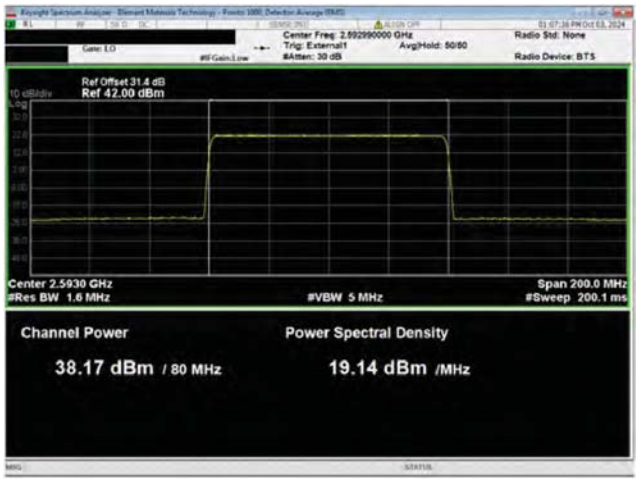
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 8

AVERAGE POWER – ALL PORTS

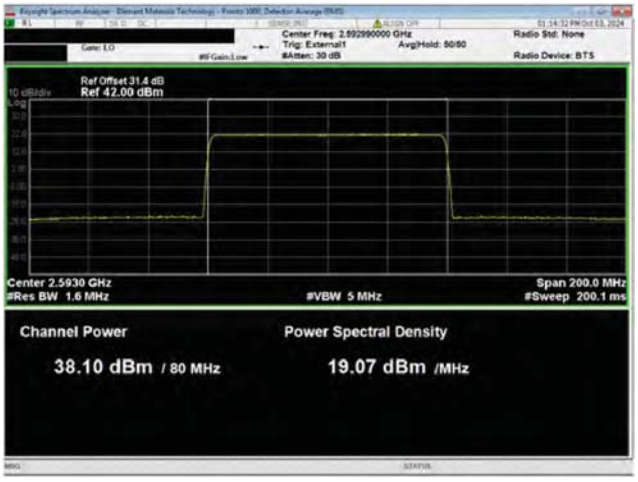
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



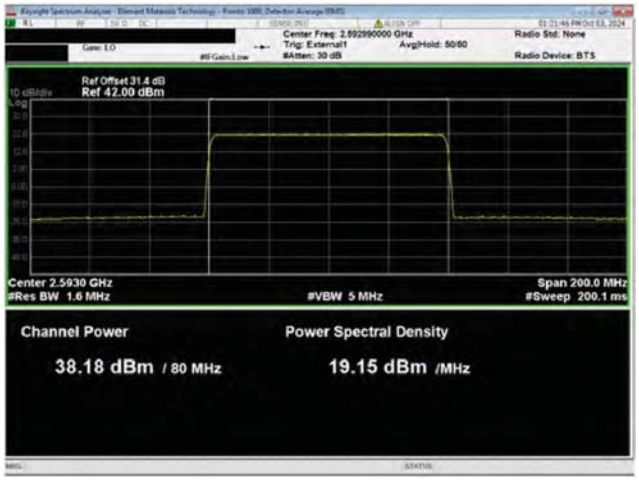
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 9



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 10



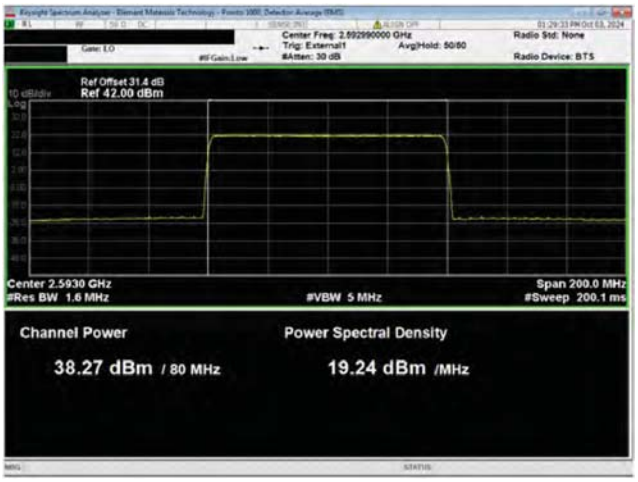
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 11



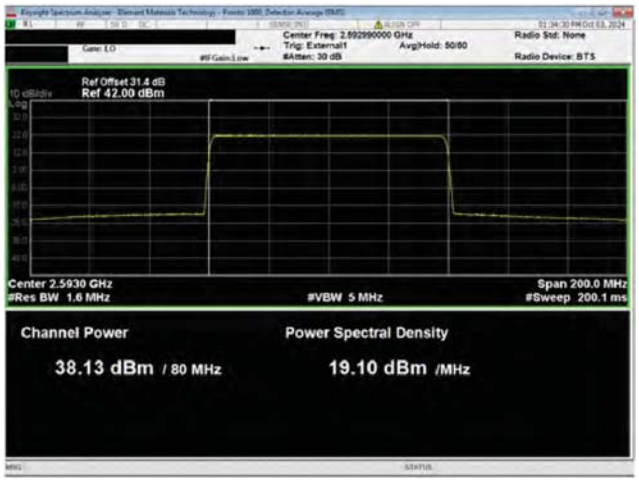
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 12

AVERAGE POWER – ALL PORTS

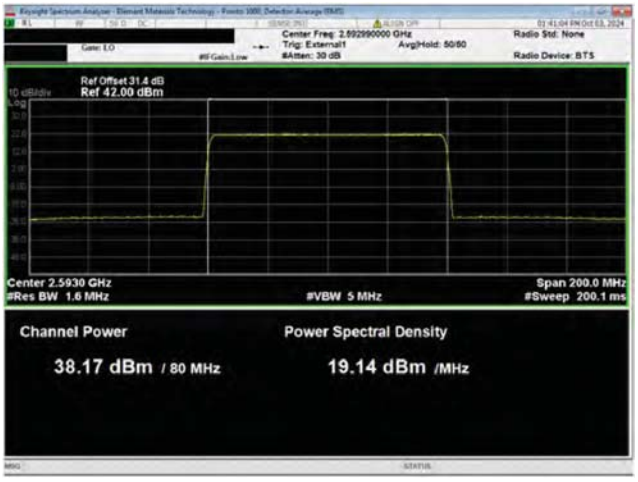
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



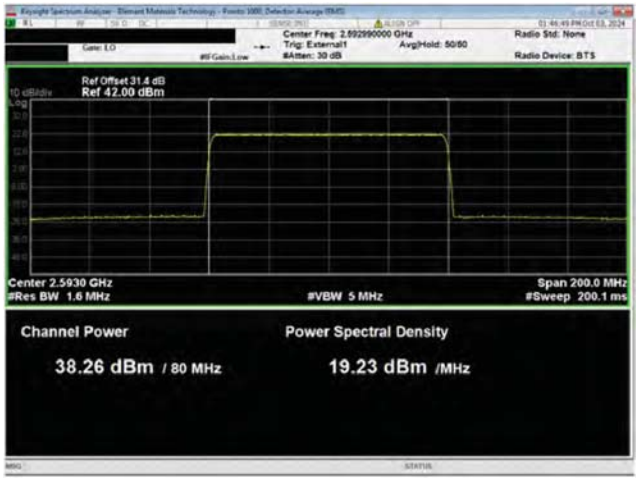
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 13



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 14



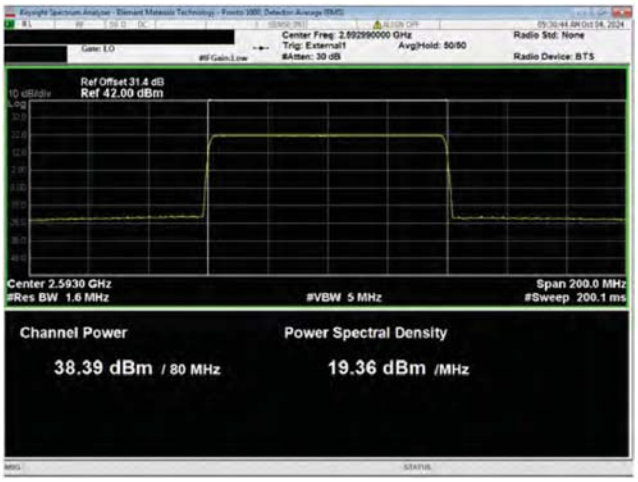
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 15



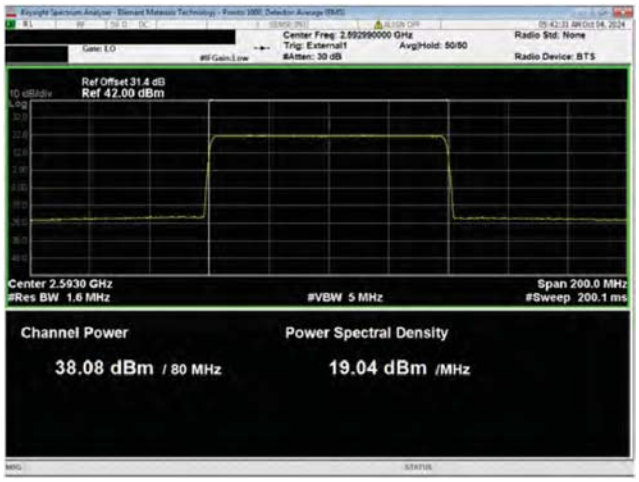
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 16

AVERAGE POWER – ALL PORTS

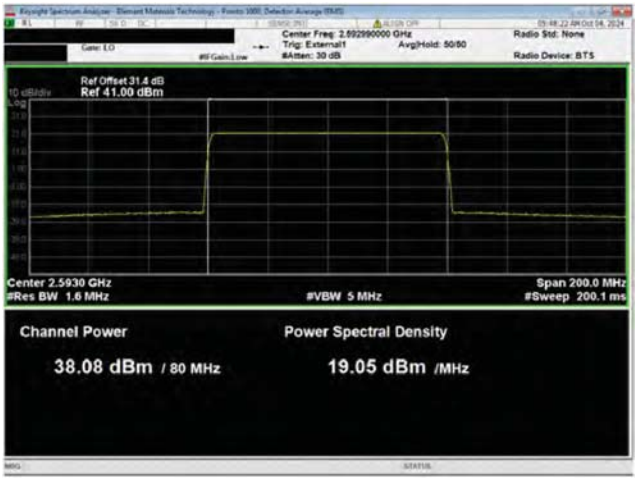
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



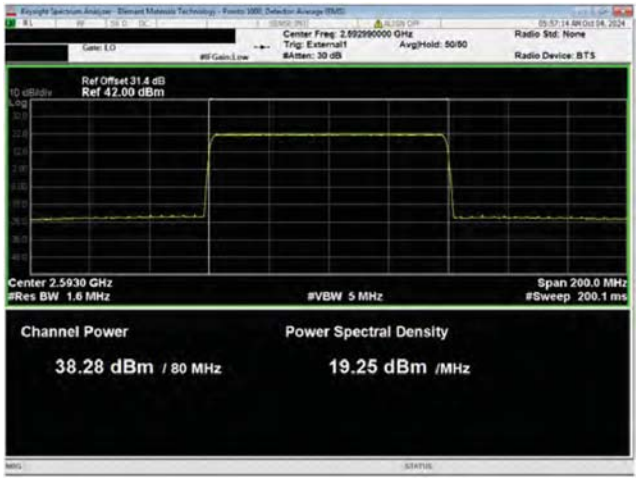
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 17



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 18



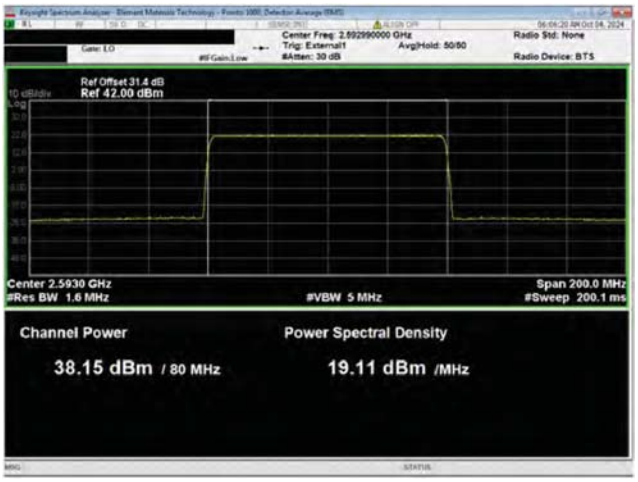
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 19



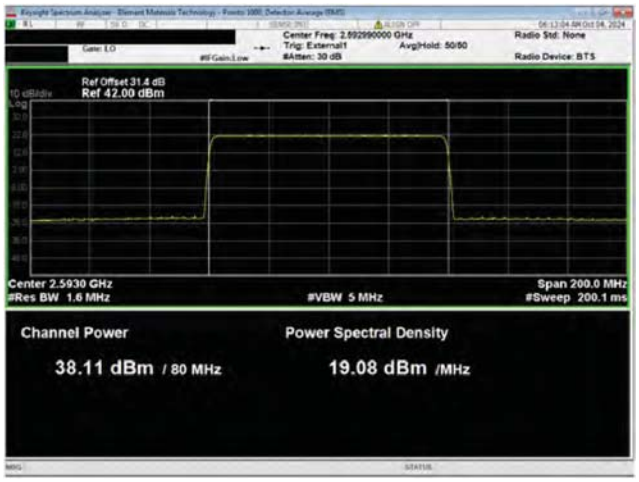
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 20

AVERAGE POWER – ALL PORTS

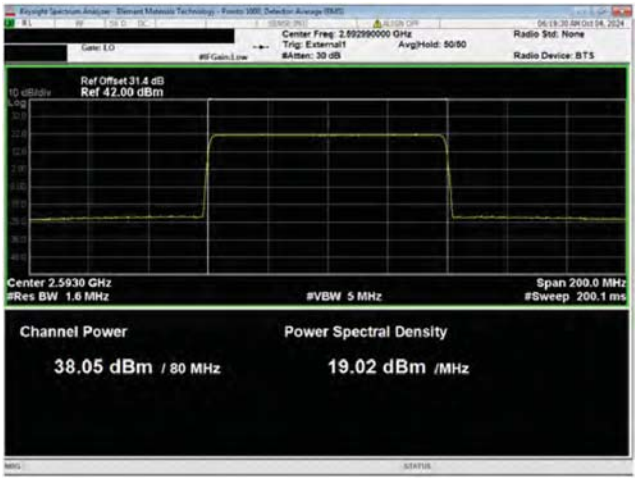
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



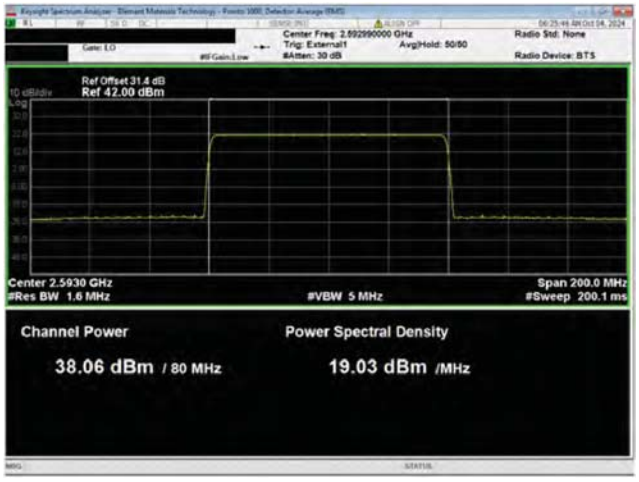
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 21



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 22



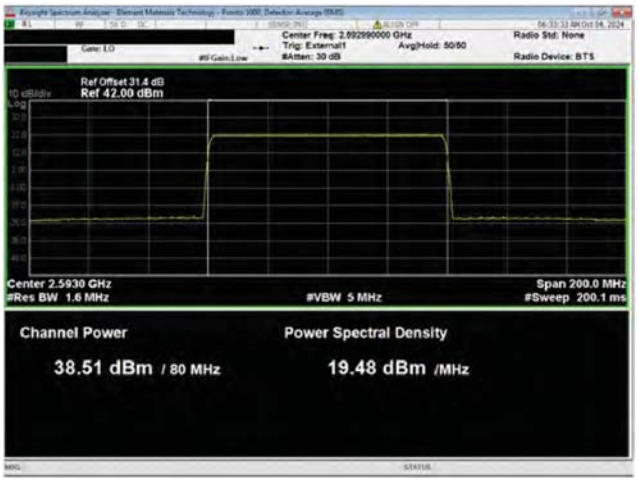
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 23



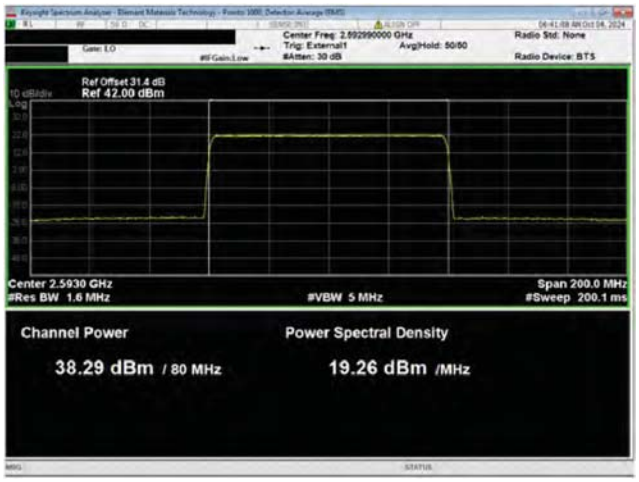
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 24

AVERAGE POWER – ALL PORTS

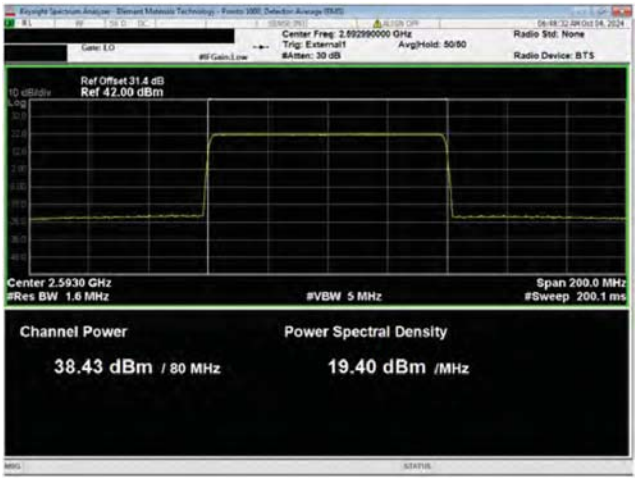
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



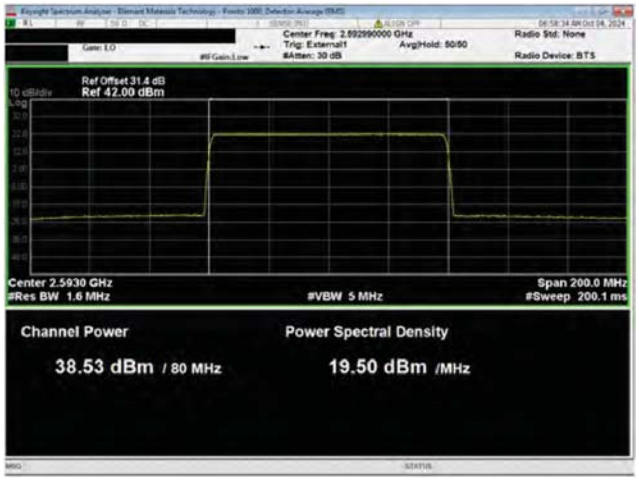
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 25



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 26



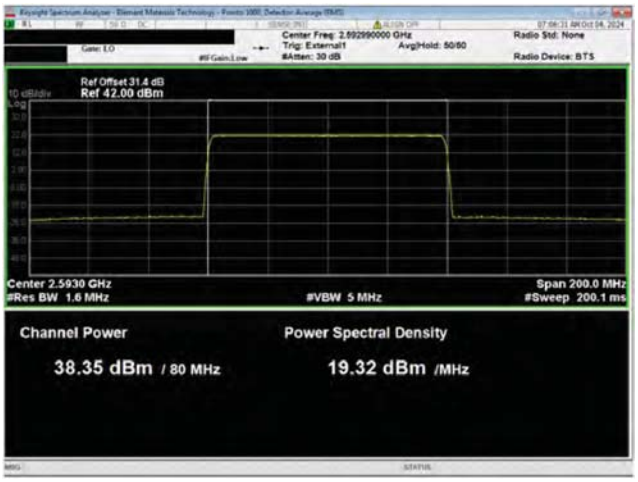
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 27



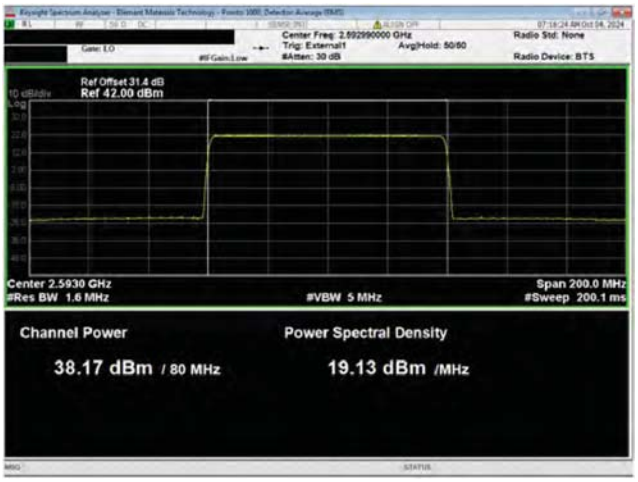
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 28

AVERAGE POWER – ALL PORTS

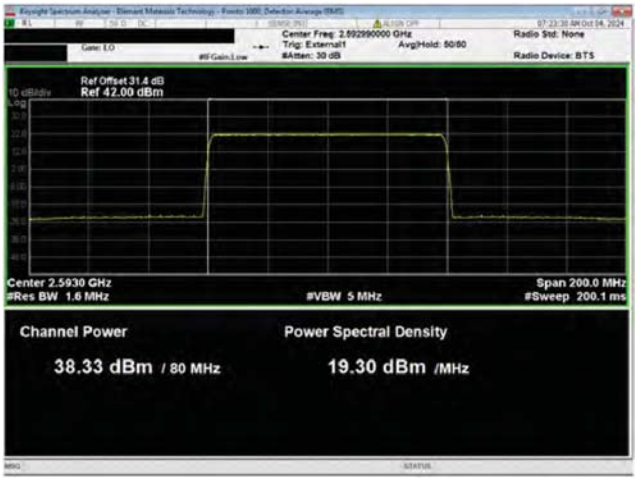
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



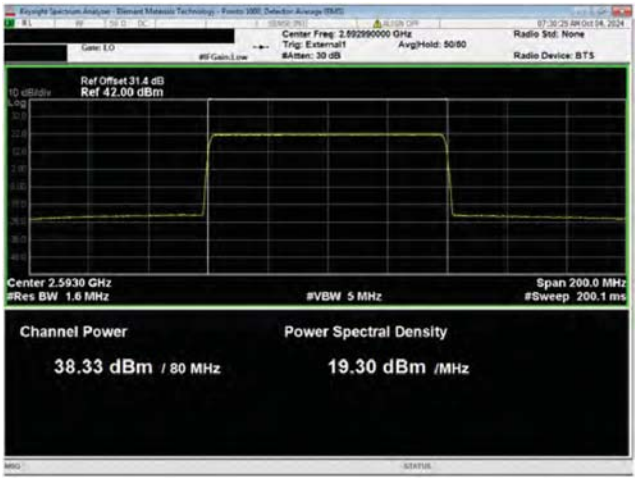
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 29



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 30



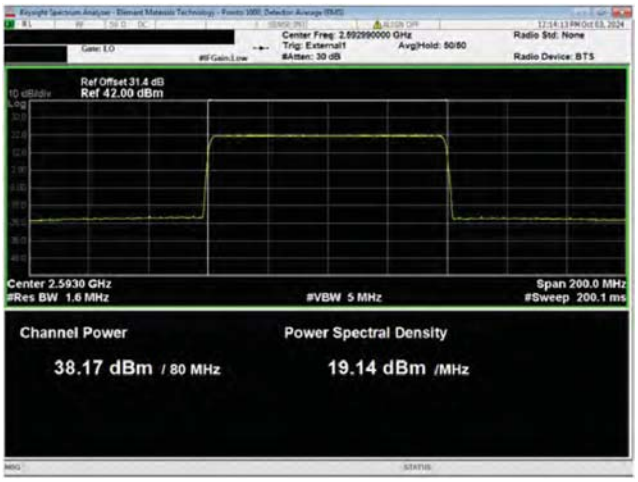
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 31



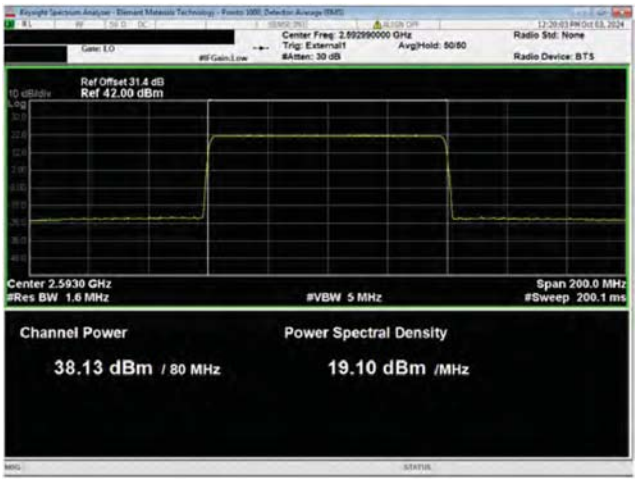
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 32

AVERAGE POWER – ALL PORTS

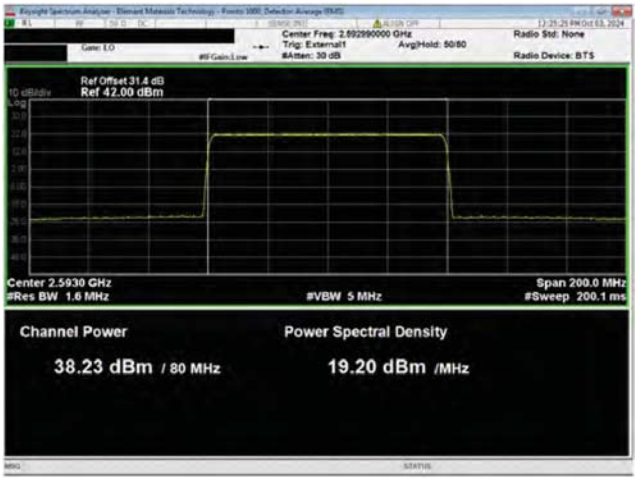
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



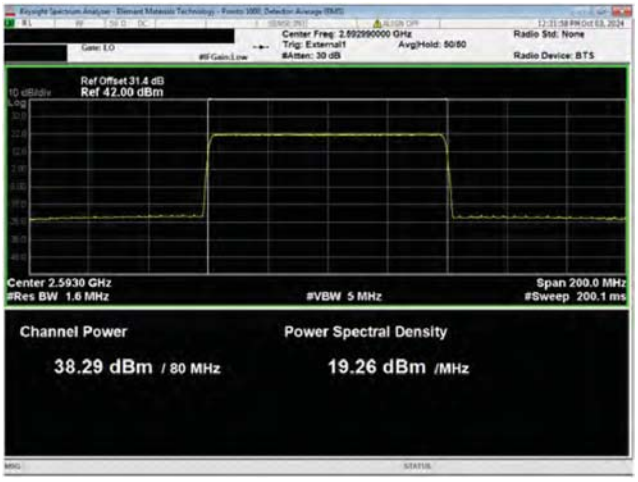
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 33



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 34



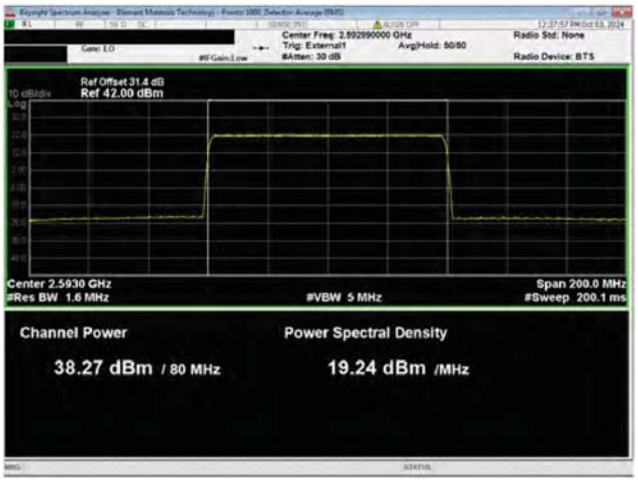
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 35



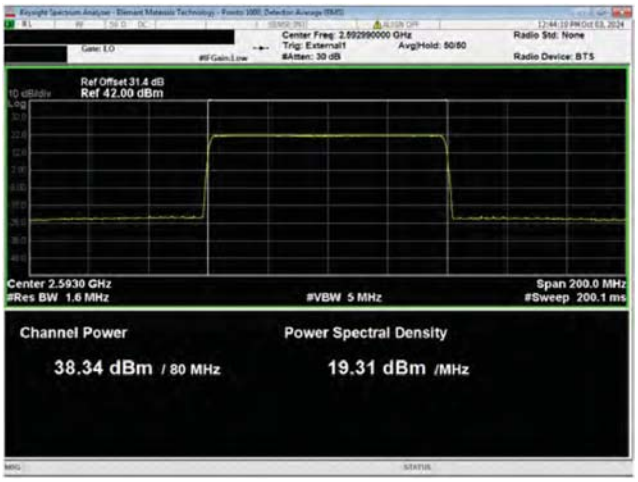
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 36

AVERAGE POWER – ALL PORTS

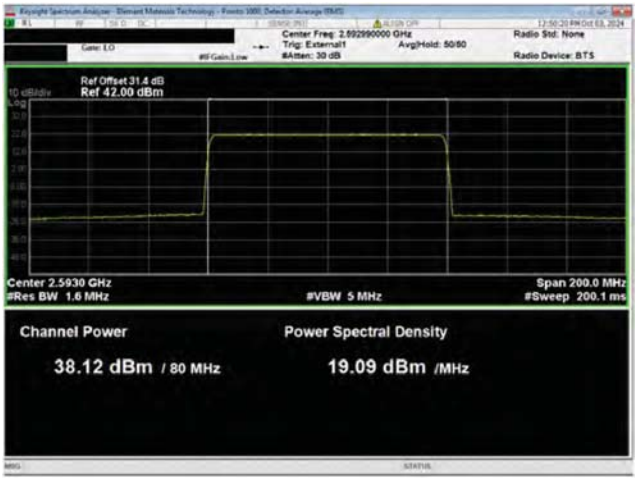
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



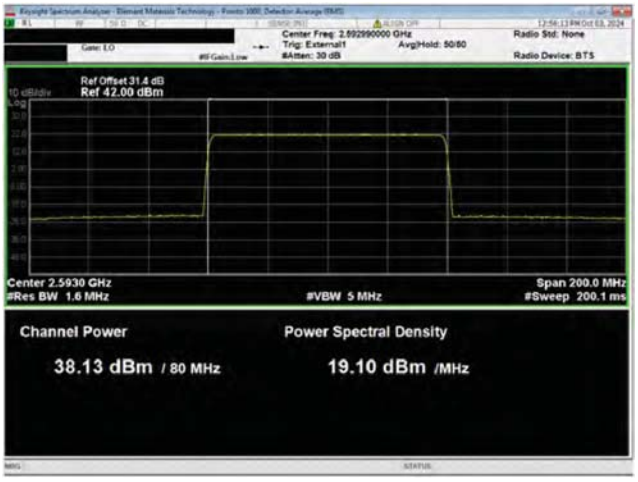
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 37



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 38



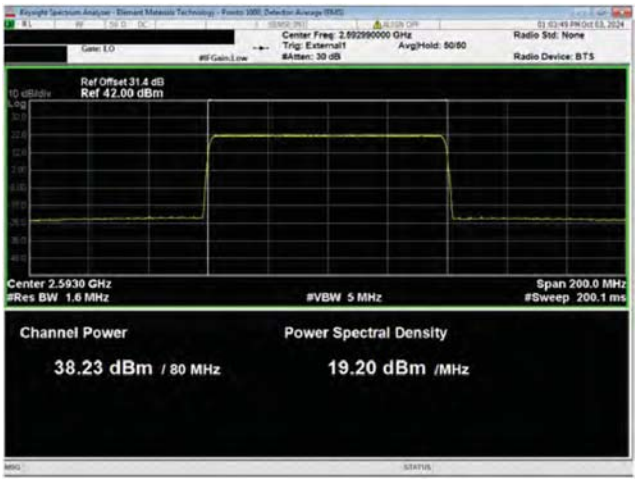
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 39



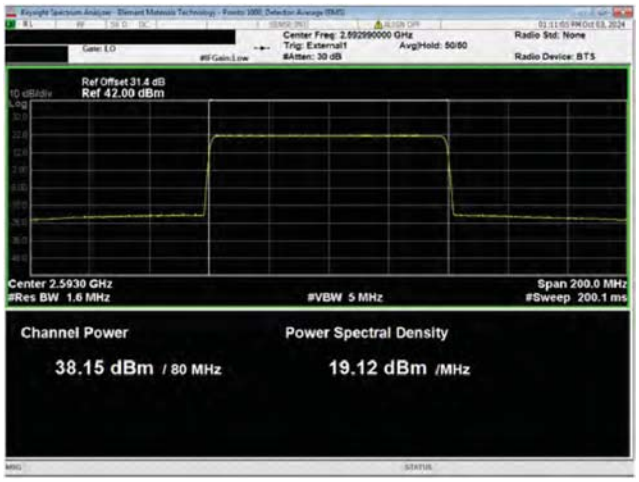
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 40

AVERAGE POWER – ALL PORTS

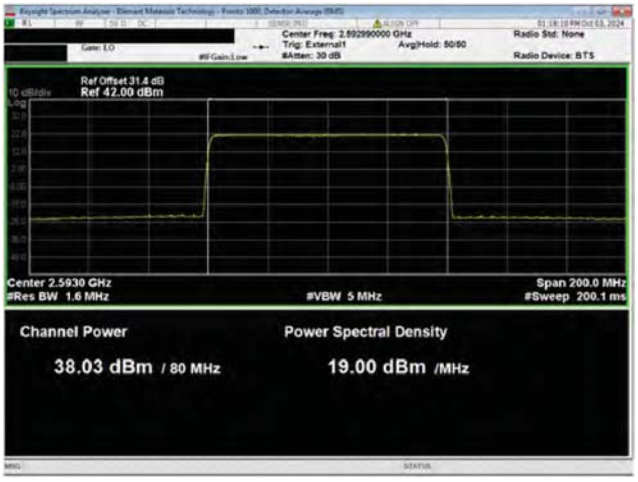
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



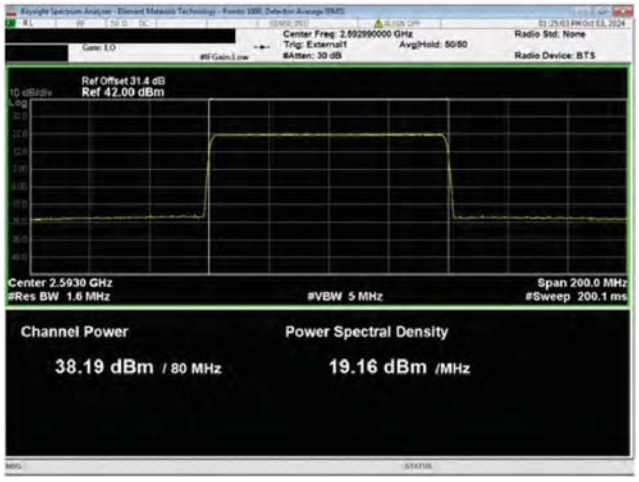
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 41



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 42



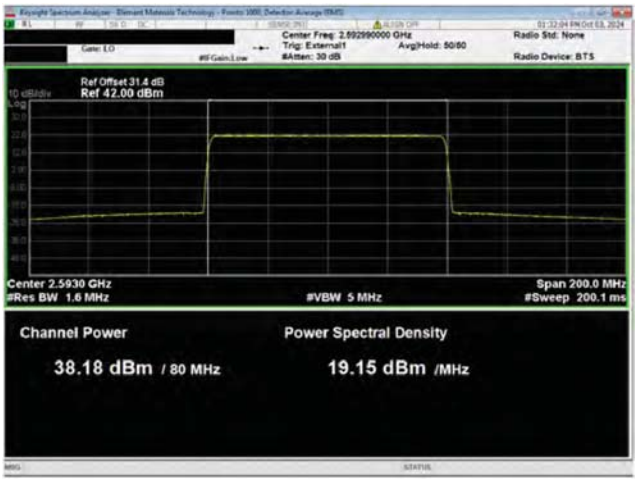
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 43



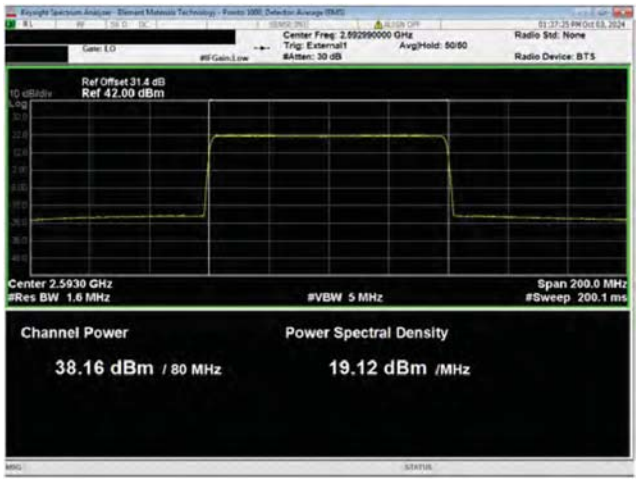
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 44

AVERAGE POWER – ALL PORTS

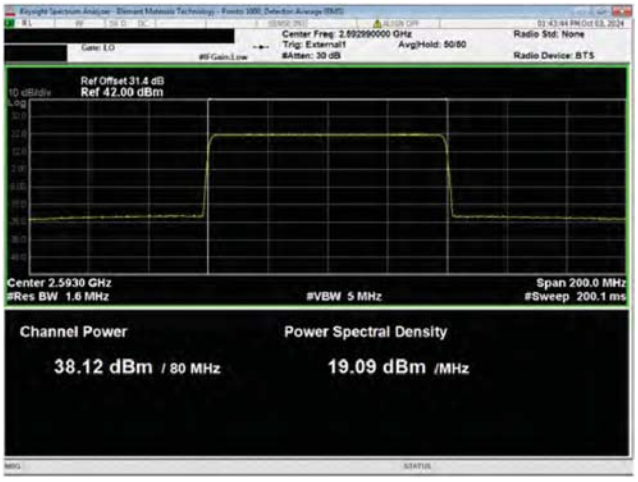
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



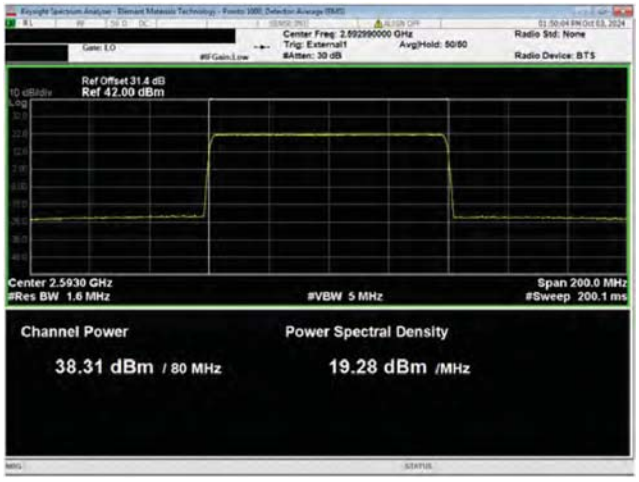
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 45



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 46



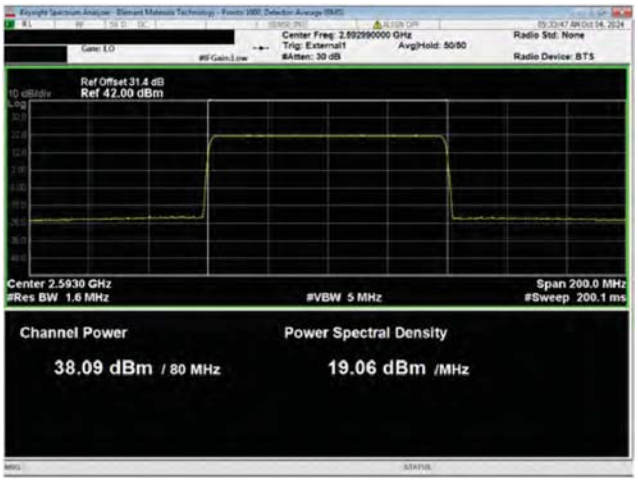
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 47



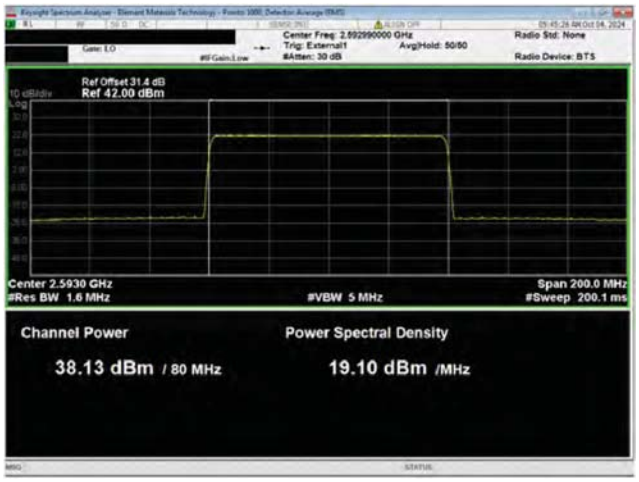
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 48

AVERAGE POWER – ALL PORTS

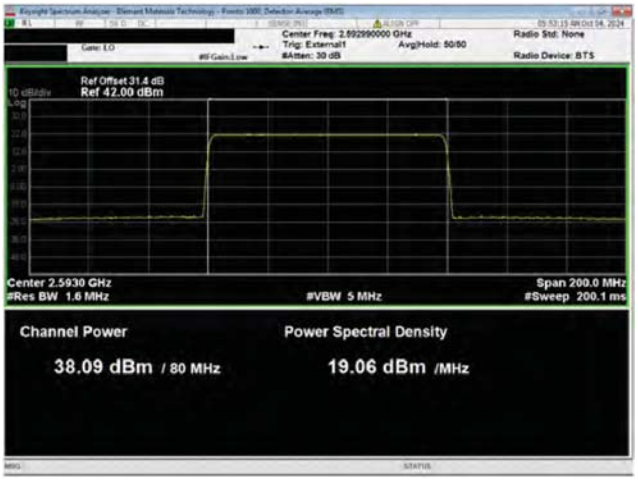
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



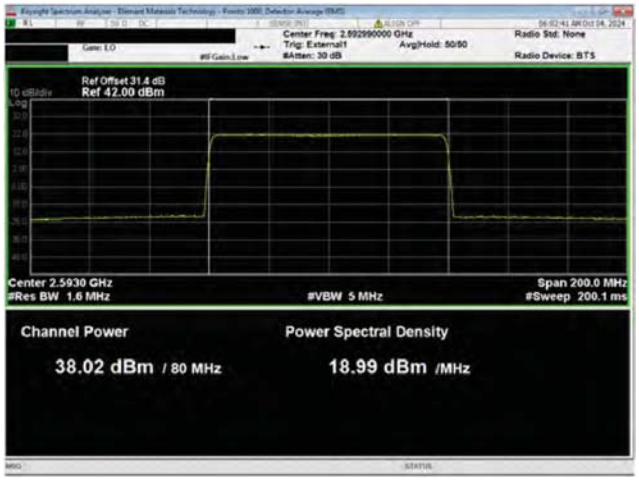
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 49



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 50



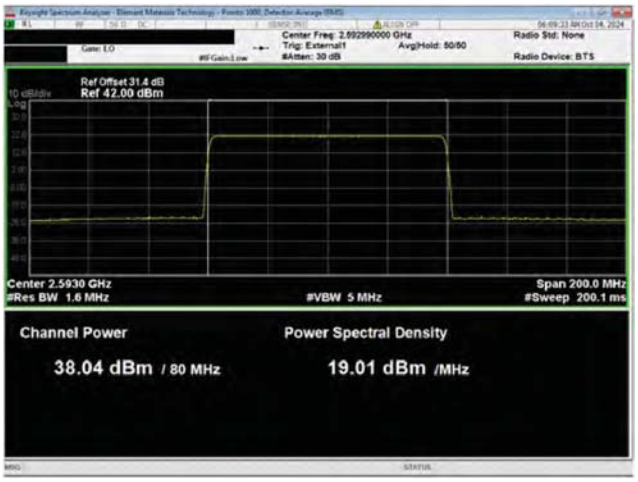
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 51



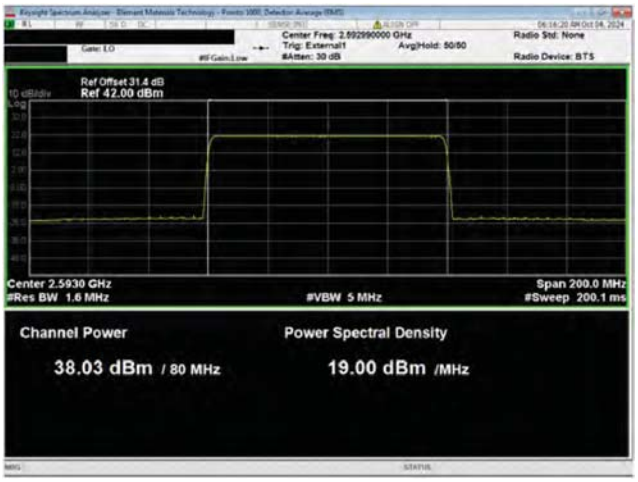
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 52

AVERAGE POWER – ALL PORTS

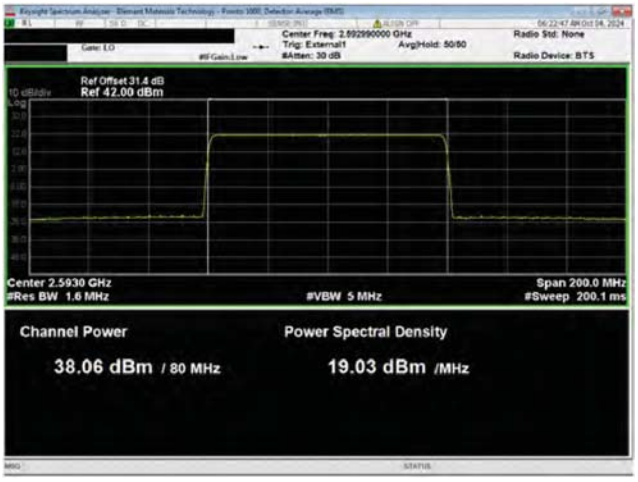
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



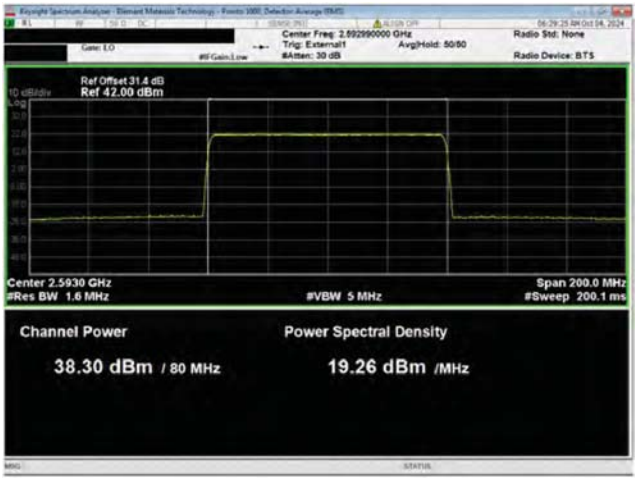
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 53



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 54



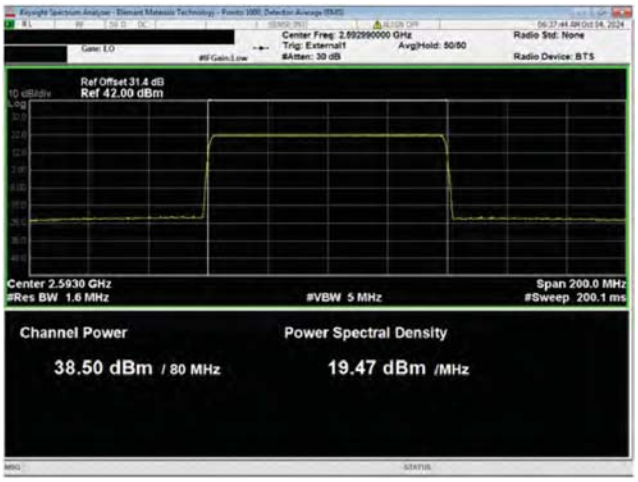
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 55



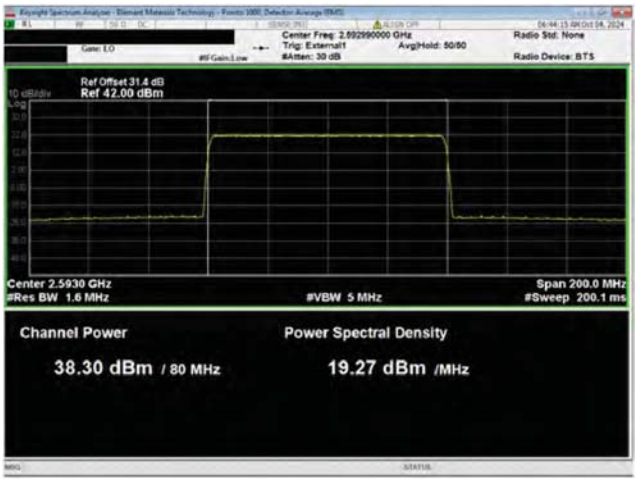
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 56

AVERAGE POWER – ALL PORTS

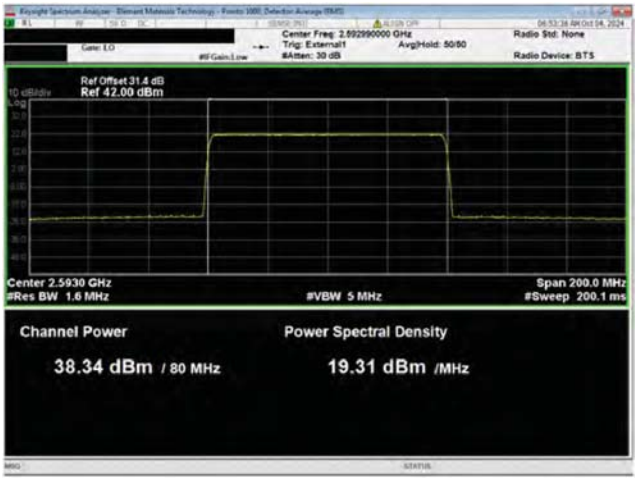
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



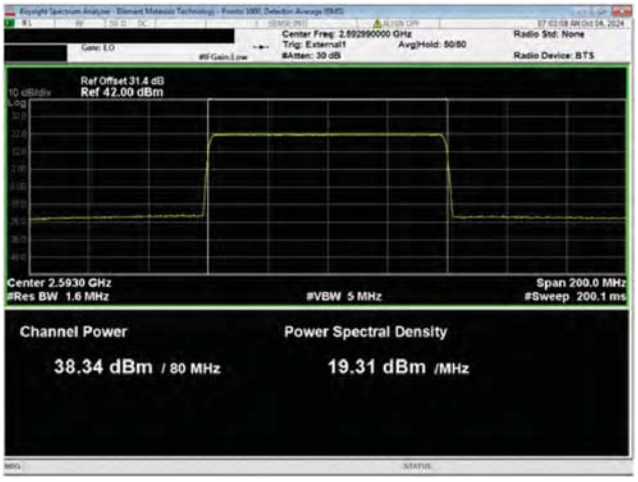
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 57



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 58



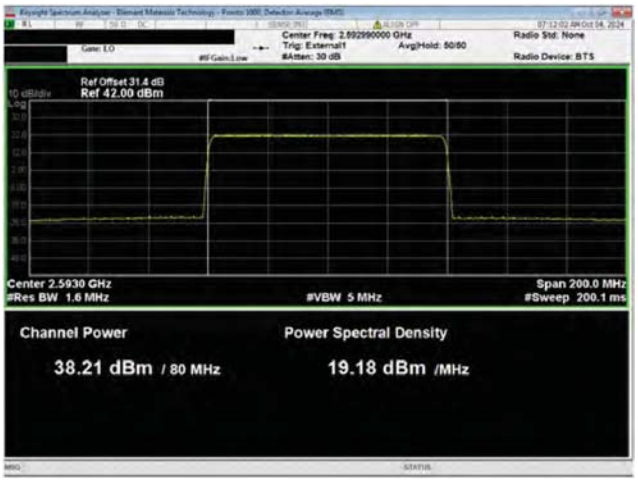
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 59



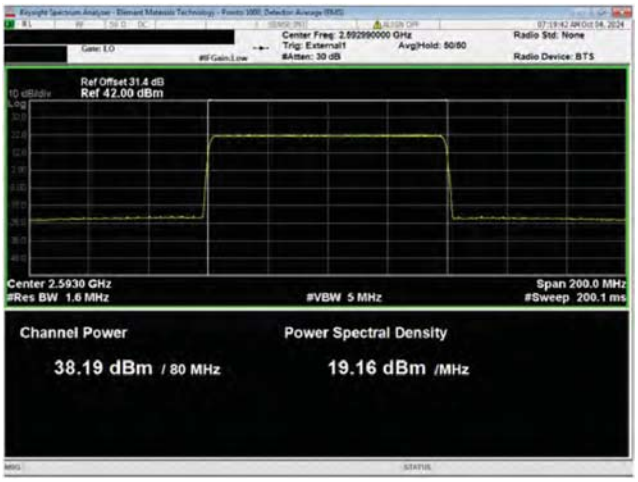
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 60

AVERAGE POWER – ALL PORTS

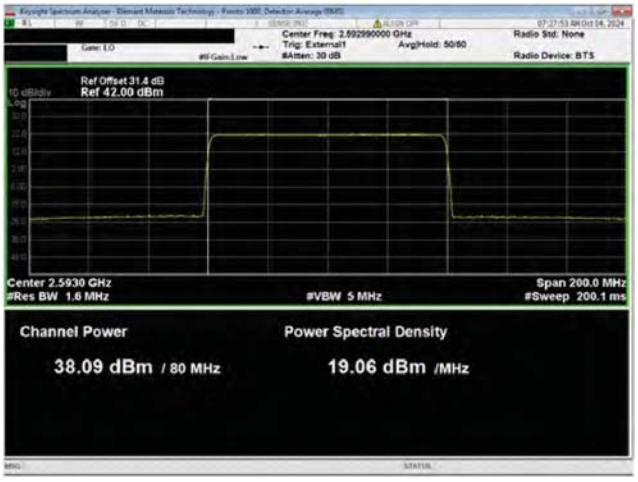
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



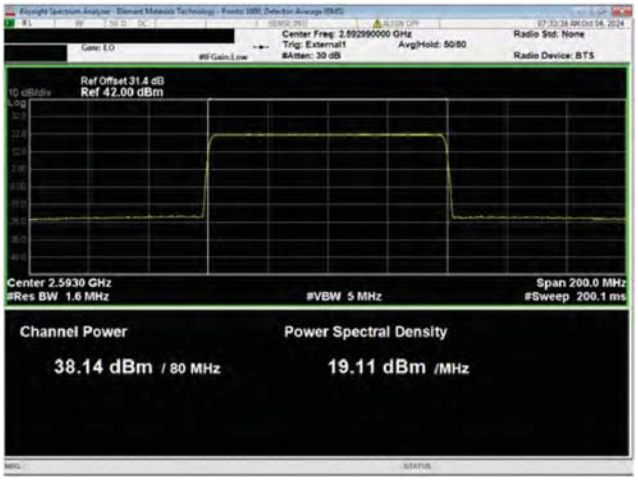
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 61



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 62



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 63



80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 2592.99 MHz
Port 64

AVERAGE POWER AND EIRP CALCULATIONS

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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.

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.

RF conducted emissions testing was performed only on one port. The Airscale Base Transceiver Station Radio Unit Model AVHA antenna ports 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.

The RMS average power measurement method for FCC is detailed in section 5.2 of KDB 971168 D01v03r01 and ANSI C63.26-2015 section 5.2.4.4. Measurements shall be performed at full power on the channel(s) and bandwidth(s) specified for 5G NR.

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.

The output power was measured for a single carrier over the carrier channel bandwidth. The total output power for multiport (64x64 MIMO) operations was determined based per ANSI C63.26 clauses 6.4.3.1 and 6.4.3.2.4 (10 log N_{out}). The total output power for Sixty-Four port operation is single power +18.1 dB [i.e. 10*log(64)].

FCC Requirements: §27.50 Power limits and duty cycle.

27.50 (h)(ii) The following power requirements apply to stations transmitting in the BRS/EBS band:
If a main or booster station sectorizes or otherwise uses one or more transmitting antennas with a non-omnidirectional horizontal plane radiation pattern, the maximum EIRP in dBW in a given direction shall be determined by the following formula: EIRP = 33 dBW + 10 log(X/Y) dBW + 10 log(360/beamwidth) dBW, where X is the actual channel width in MHz, Y is either (i) 6 MHz if prior to transition or the station is in the MBS following transition or (ii) 5.5 MHz if the station is in the LBS and UBS following transition, and beamwidth is the total horizontal plane beamwidth of the individual transmitting antenna for the station or any sector measured at the half-power points.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2024-03-12	2025-03-12
Generator - Signal	Agilent	N5173B	TIW	2023-08-07	2026-08-07
Block - DC	Fairview Microwave	SD3379	AMM	2024-08-15	2025-08-15

AVERAGE POWER AND EIRP CALCULATIONS

element
TbtTx 2024.05.24.1
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5G NR EIRP CALCULATION FOR SIXTY-FOUR 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 within the parameters of the base station configuration.

The AVHA antenna assembly has an array of 4 rows and 8 columns of (±45°) cross-polarized (orthogonal) radiators. This antenna assembly has a maximum beamforming gain of 26.0dBi. The sixty-four AVHA transmitter outputs are connected to the antenna array (thirty-two are connected to +45° radiators/antennas and thirty-two are connected to the -45° radiators/antennas).

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. Calculations of worst-case EIRP for sixty-four port MIMO are as follows:

Parameter	10MHz Ch BW	15MHz Ch BW	20MHz Ch BW	30MHz Ch BW	40MHz Ch BW	50MHz Ch BW	60MHz Ch BW	70MHz Ch BW	80MHz Ch BW	90MHz Ch BW	100MHz Ch BW
Power per Antenna Port	31.4 dBm	32.3 dBm	33.2 dBm	34.1 dBm	35.4 dBm	36.4 dBm	37.1 dBm	37.8 dBm	38.2 dBm	38.3 dBm	38.4 dBm
Ant Ports per Polarization (+15.1dB)	32	32	32	32	32	32	32	32	32	32	32
Total Power per Pol	46.5 dBm	47.4 dBm	48.3 dBm	49.2 dBm	50.5 dBm	51.5 dBm	52.2 dBm	52.9 dBm	53.3 dBm	53.4 dBm	53.5 dBm
Max Ant Beamforming Gain per Pol	26.0dBi	26.0dBi	26.0dBi	26.0dBi	26.0dBi	26.0dBi	26.0dBi	26.0dBi	26.0dBi	26.0dBi	26.0dBi
EIRP per Polarization	72.5 dBm	73.4 dBm	74.3 dBm	75.2 dBm	76.5 dBm	77.5 dBm	78.2 dBm	78.9 dBm	79.3 dBm	79.4 dBm	79.5 dBm
Number of Polarizations	2	2	2	2	2	2	2	2	2	2	2
EIRP Total (See Note 1)	72.5 dBm	73.4 dBm	74.3 dBm	75.2 dBm	76.5 dBm	77.5 dBm	78.2 dBm	78.9 dBm	79.3 dBm	79.4 dBm	79.5 dBm
EIRP Limit Calculation (See Note 2)	79.0 dBm	80.8 dBm	82.0 dBm	83.8 dBm	85.0 dBm	86.0 dBm	86.8 dBm	87.5 dBm	88.0 dBm	88.6 dBm	89.0 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 AVHA antenna horizontal beamwidth is 13 ± 2 degrees or a maximum of 15 degrees. Y was selected to be 6MHz for this calculation.

CALCULATIONS SUMMARY

The worst-case AVHA sixty-four port MIMO EIRP levels for all 5G NR channel bandwidths are less than the FCC regulatory limits.

AVERAGE POWER AND EIRP CALCULATIONS

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Airscale Base Transceiver Station Radio Unit Model AVHA	Work Order:	NOKI0079
Serial Number:	L1242005329	Date:	2024-10-04
Customer:	Nokia Solutions and Networks	Temperature:	23.3°C
Attendees:	Mitch Hill, David Le	Relative Humidity:	41.1%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jarrod Brenden	Job Site:	PT14
Power:	54VDC	Configuration:	NOKI0079-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 27:2024	ANSI C63.26:2015

COMMENTS

All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks. BRS Band n41 carriers were enabled at maximum power levels. All measured power values are within tolerance (i.e. Rated Power ±0.8 dB).

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

TEST RESULTS

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Sixty-four Port (64x64 MIMO) dBm/carrier BW
Port 1				
10 MHz Channel Bandwidth				
QPSK Modulation				
Low Channel, 2501.01 MHz	31.267	0	31.3	49.4
Mid Channel, 2592.99 MHz	31.43	0	31.4	49.5
High Channel, 2685.00 MHz	31.15	0	31.2	49.3
15 MHz Channel Bandwidth				
QPSK Modulation				
Low Channel, 2503.50 MHz	32.079	0	32.1	50.2
Mid Channel, 2592.99 MHz	32.3	0	32.3	50.4
High Channel, 2682.48 MHz	32.11	0	32.1	50.2
20 MHz Channel Bandwidth				
QPSK Modulation				
Low Channel, 2506.02 MHz	33.079	0	33.1	51.2
Mid Channel, 2592.99 MHz	33.243	0	33.2	51.3
High Channel, 2679.99 MHz	32.979	0	33	51.1
30 MHz Channel Bandwidth				
QPSK Modulation				
Low Channel, 2511.00 MHz	33.925	0	33.9	52
Mid Channel, 2592.99 MHz	34.076	0	34.1	52.2

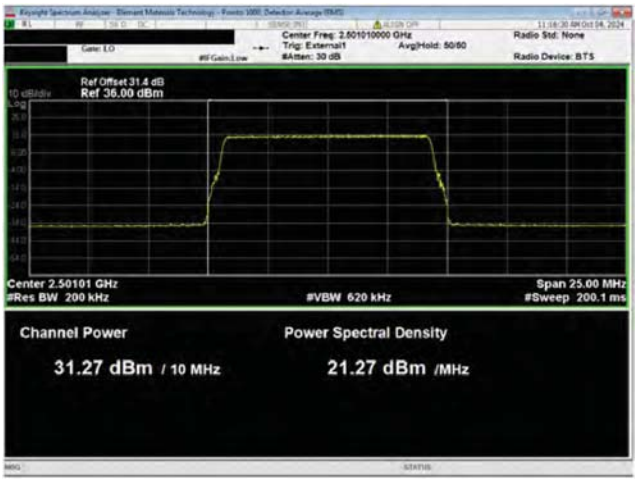
AVERAGE POWER AND EIRP CALCULATIONS

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Sixty-four Port (64x64 MIMO) dBm/carrier BW
High Channel, 2674.98 MHz	33.896	0	33.9	52
40 MHz Channel Bandwidth				
QPSK Modulation				
Low Channel, 2516.01 MHz	35.342	0	35.3	53.4
Mid Channel, 2592.99 MHz	35.394	0	35.4	53.5
High Channel, 2670.00 MHz	35.235	0	35.2	53.3
50 MHz Channel Bandwidth				
QPSK Modulation				
Low Channel, 2521.02 MHz	36.339	0	36.3	54.4
Mid Channel, 2592.99 MHz	36.414	0	36.4	54.5
High Channel, 2664.99 MHz	36.356	0	36.4	54.5
60 MHz Channel Bandwidth				
QPSK Modulation				
Low Channel, 2526.00 MHz	37.061	0	37.1	55.2
Mid Channel, 2592.99 MHz	37.053	0	37.1	55.2
High Channel, 2659.98 MHz	37.023	0	37	55.1
70 MHz Channel Bandwidth				
QPSK Modulation				
Low Channel, 2531.01 MHz	37.71	0	37.7	55.8
Mid Channel, 2592.99 MHz	37.768	0	37.8	55.9
High Channel, 2655.00 MHz	37.679	0	37.7	55.8
80 MHz Channel Bandwidth				
QPSK Modulation				
Low Channel, 2536.02 MHz	38.164	0	38.2	56.3
Mid Channel, 2592.99 MHz	38.167	0	38.2	56.3
High Channel, 2649.99 MHz	38.08	0	38.1	56.2
16QAM Modulation				
Mid Channel, 2592.99 MHz	38.163	0	38.2	56.3
64QAM Modulation				
Mid Channel, 2592.99 MHz	38.153	0	38.2	56.3
256QAM Modulation				
Mid Channel, 2592.99 MHz	38.159	0	38.2	56.3
90 MHz Channel Bandwidth				
QPSK Modulation				
Low Channel, 2541.00 MHz	38.297	0	38.3	56.4
Mid Channel, 2592.99 MHz	38.285	0	38.3	56.4
High Channel, 2644.98 MHz	38.214	0	38.2	56.3
100 MHz Channel Bandwidth				
QPSK Modulation				
Low Channel, 2546.01 MHz	38.188	0	38.2	56.3
Mid Channel, 2592.99 MHz	38.39	0	38.4	56.5
High Channel, 2640.00 MHz	38.235	0	38.2	56.3

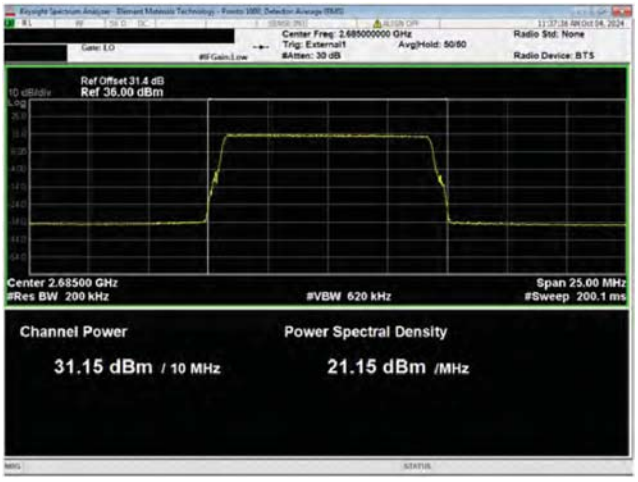
AVERAGE POWER AND EIRP CALCULATIONS

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

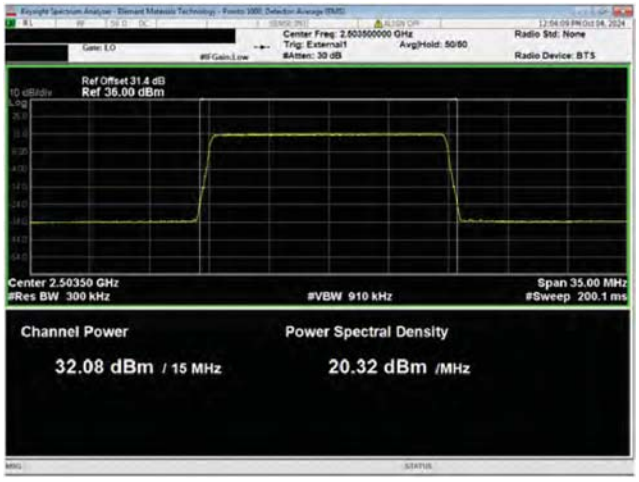


Port 1
10 MHz Channel Bandwidth
QPSK Modulation
Low Channel, 2501.01 MHz

Port 1
10 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz



Port 1
10 MHz Channel Bandwidth
QPSK Modulation
High Channel, 2685.00 MHz

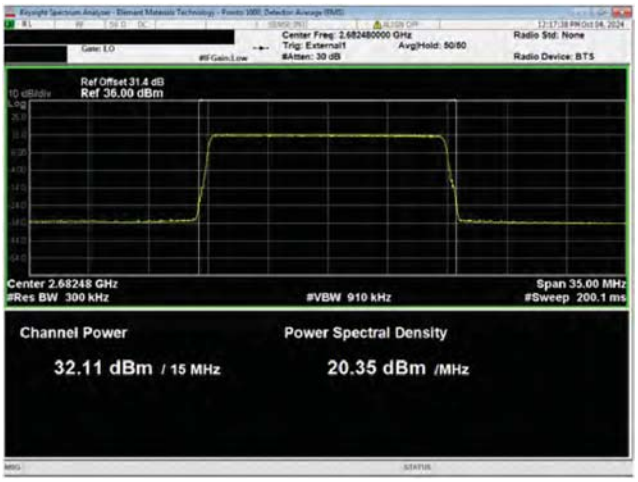


Port 1
15 MHz Channel Bandwidth
QPSK Modulation
Low Channel, 2503.50 MHz

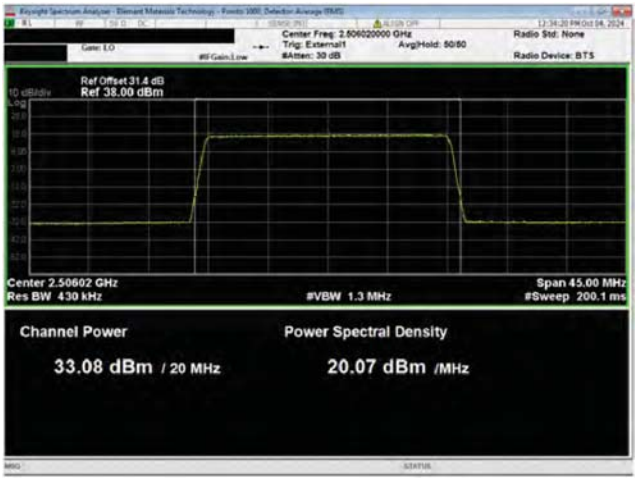
AVERAGE POWER AND EIRP CALCULATIONS

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

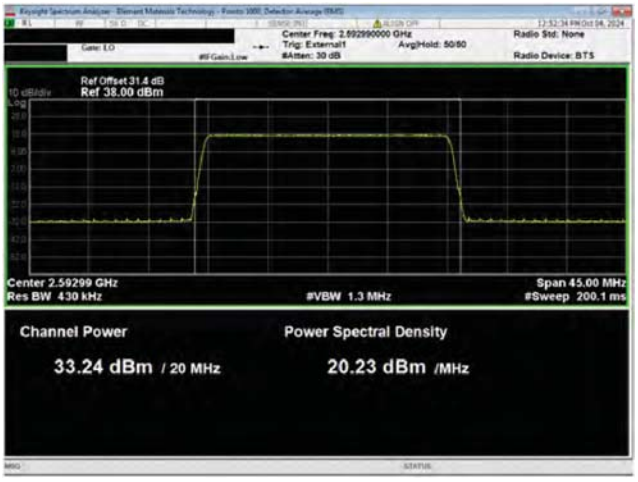
Port 1
15 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz



Port 1
15 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2682.48 MHz



Port 1
20 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2506.02 MHz



Port 1
20 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz

AVERAGE POWER AND EIRP CALCULATIONS

element
TbtTx 2024.05.24.1
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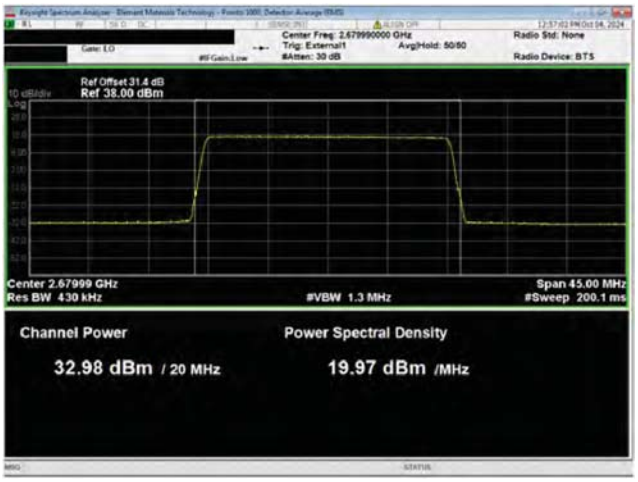
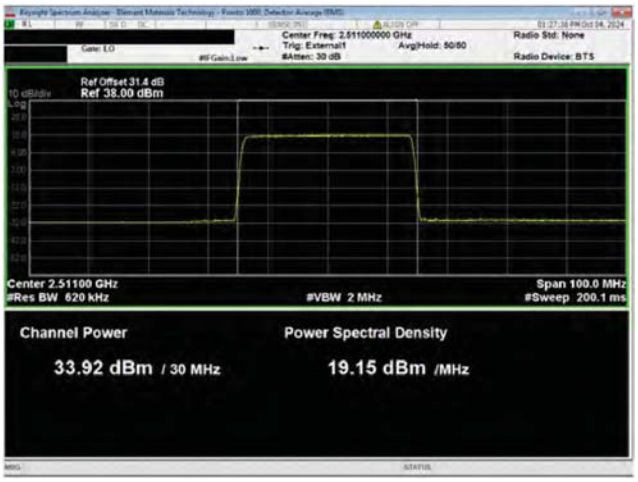
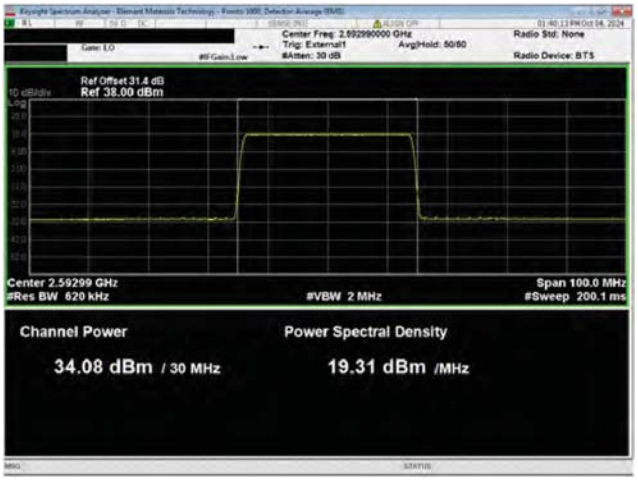


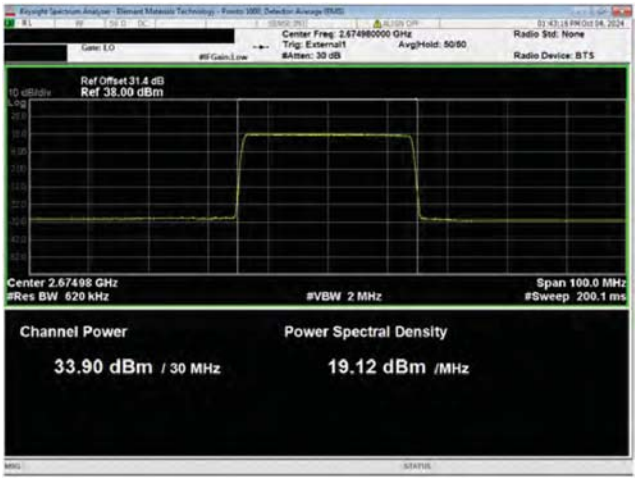
Port 1
20 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2679.99 MHz



Port 1
30 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2511.00 MHz



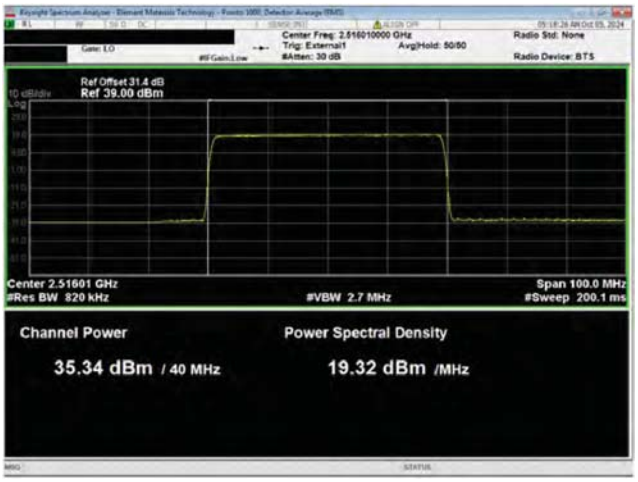
Port 1
30 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz



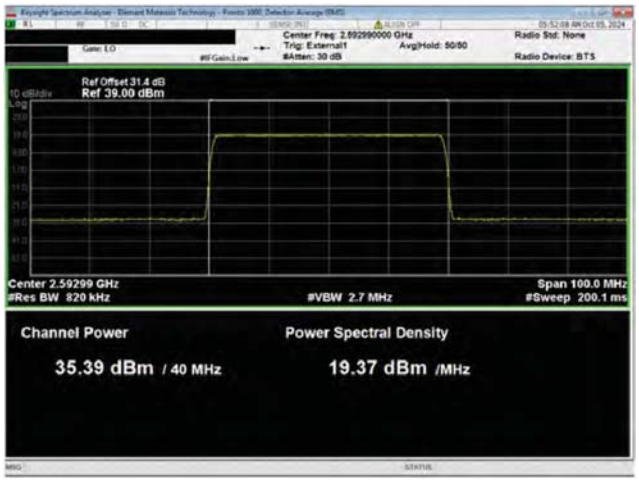
Port 1
30 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2674.98 MHz

AVERAGE POWER AND EIRP CALCULATIONS

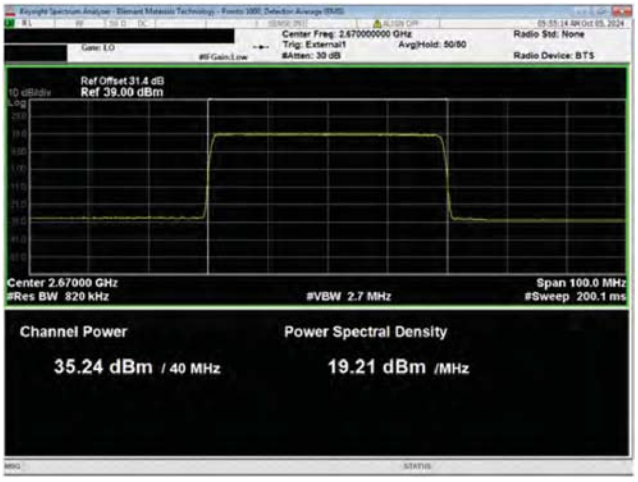
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



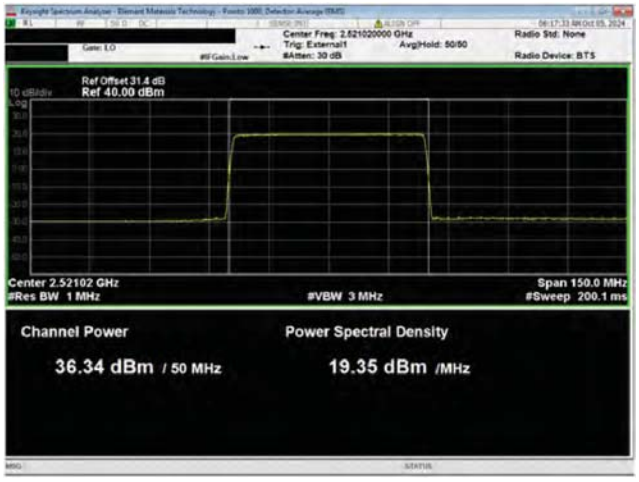
Port 1
40 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2516.01 MHz



Port 1
40 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz



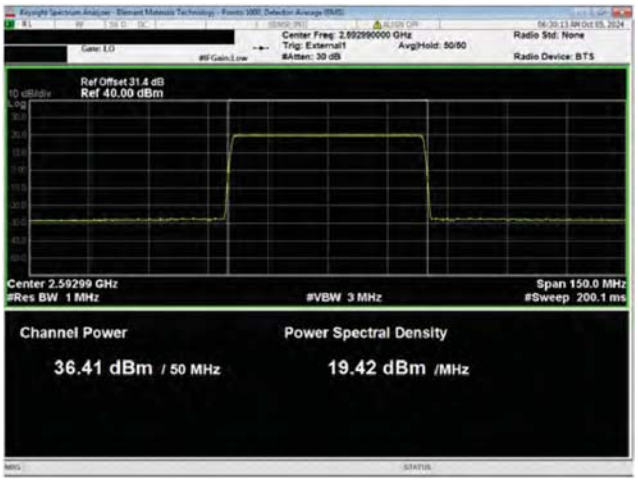
Port 1
40 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2670.00 MHz



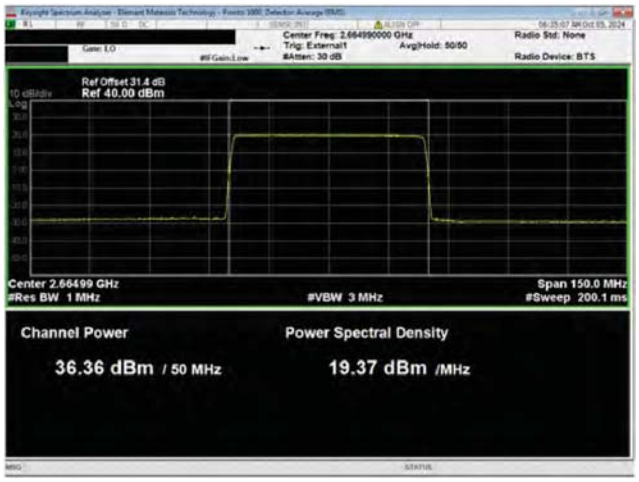
Port 1
50 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2521.02 MHz

AVERAGE POWER AND EIRP CALCULATIONS

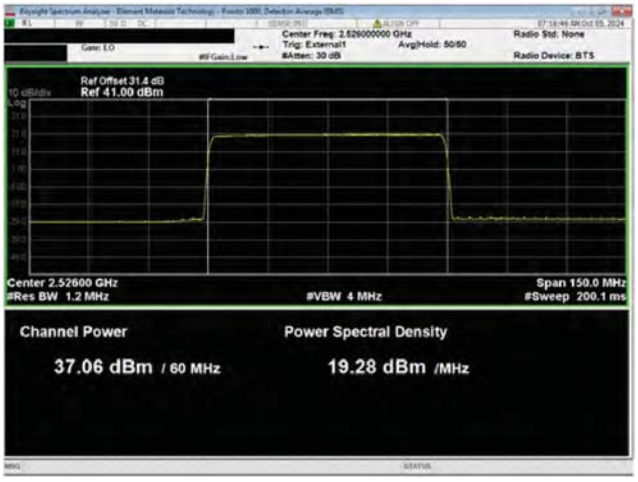
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



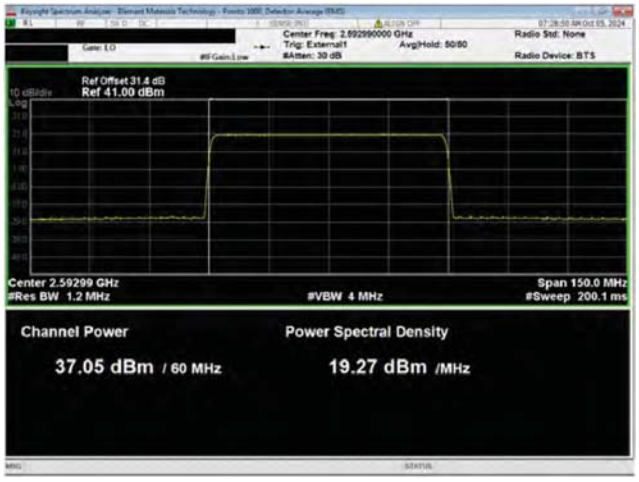
Port 1
50 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz



Port 1
50 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2664.99 MHz



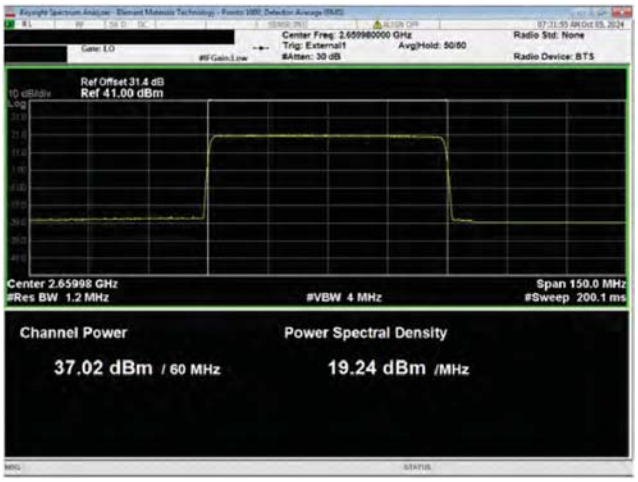
Port 1
60 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2526.00 MHz



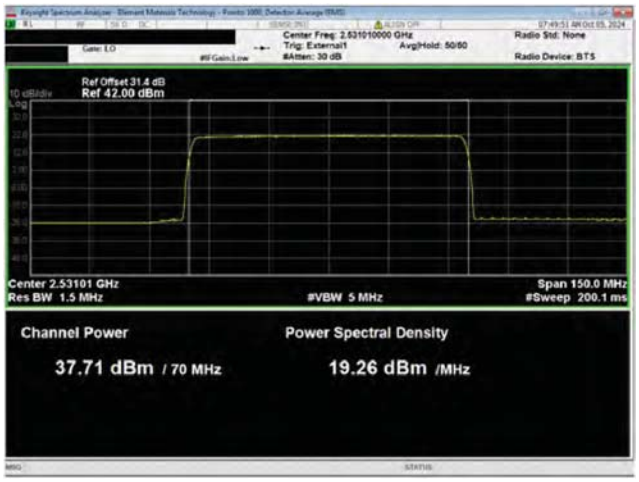
Port 1
60 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz

AVERAGE POWER AND EIRP CALCULATIONS

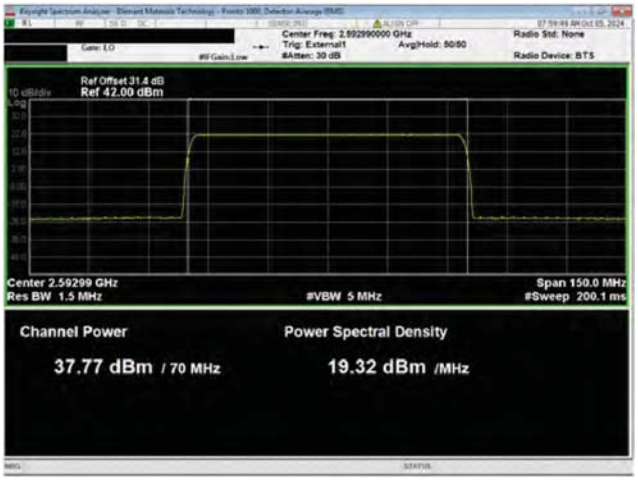
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



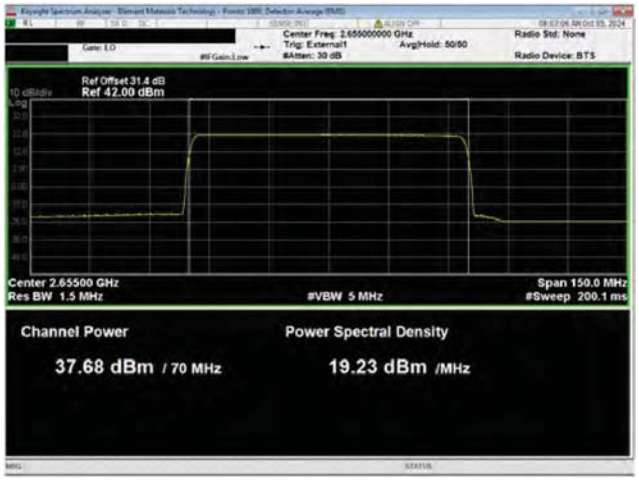
Port 1
60 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2659.98 MHz



Port 1
70 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2531.01 MHz



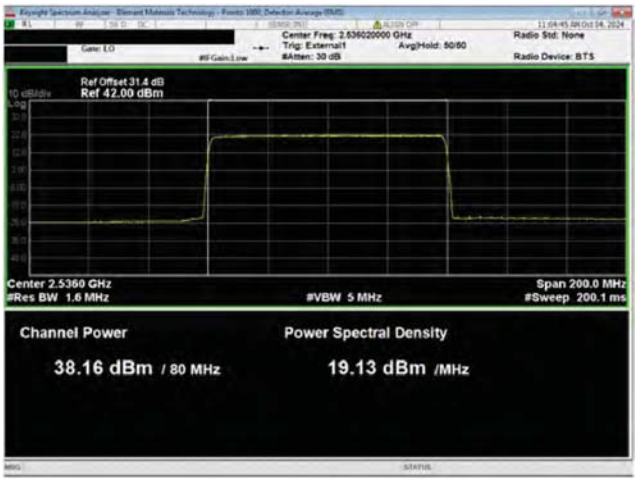
Port 1
70 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz



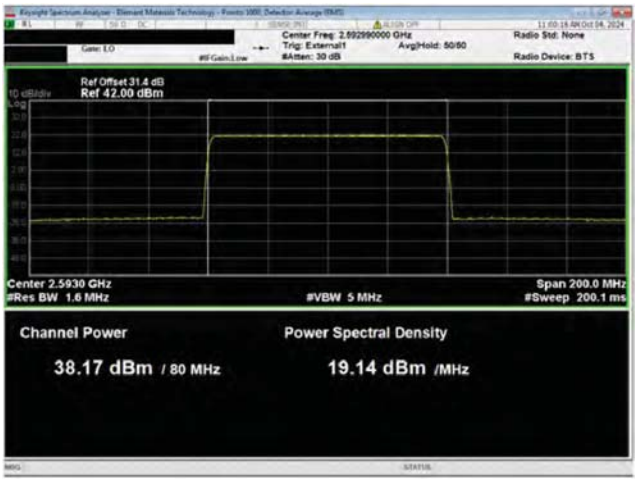
Port 1
70 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2655.00 MHz

AVERAGE POWER AND EIRP CALCULATIONS

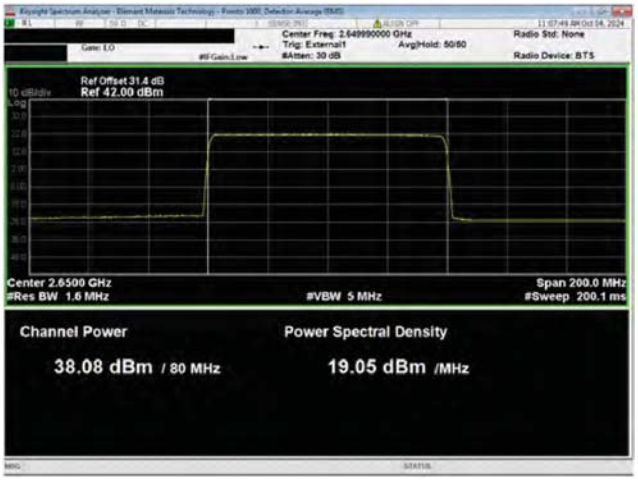
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



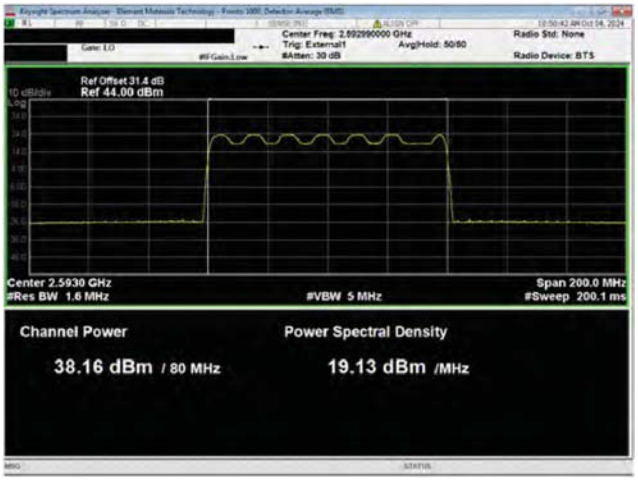
Port 1
80 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2536.02 MHz



Port 1
80 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz



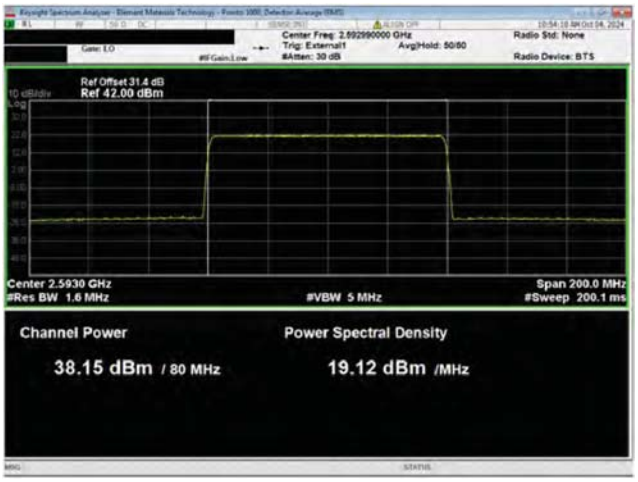
Port 1
80 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2649.99 MHz



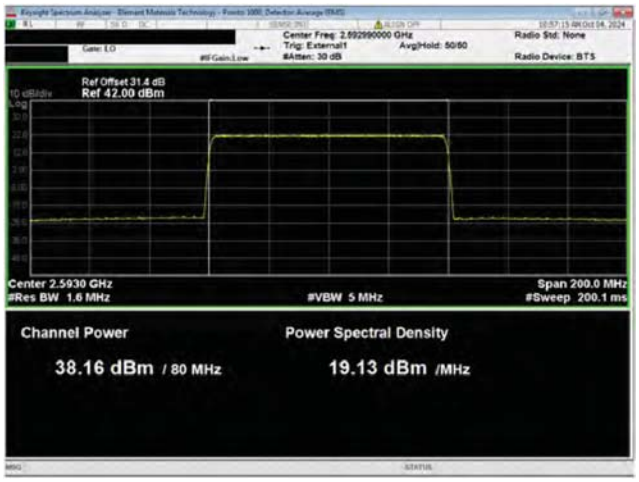
Port 1
80 MHz Channel Bandwidth
16QAM Modulation
Mid Channel, 2592.99 MHz

AVERAGE POWER AND EIRP CALCULATIONS

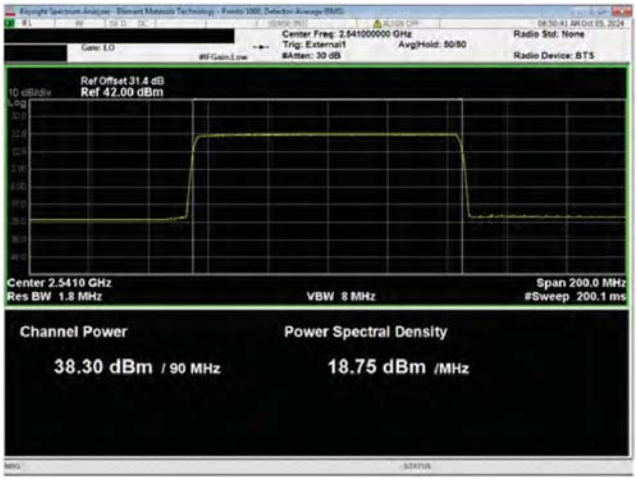
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



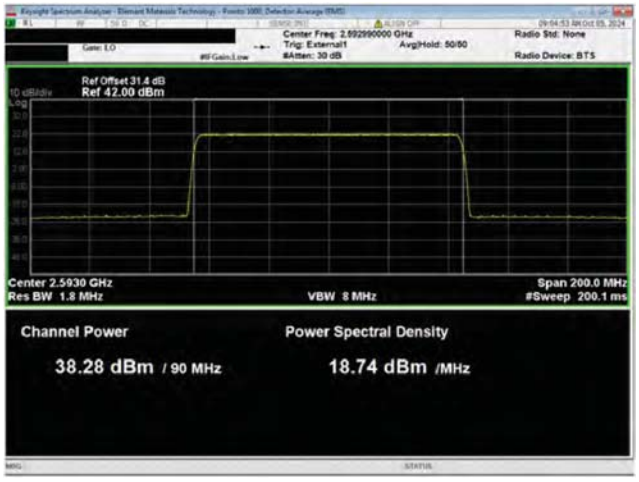
Port 1
80 MHz Channel Bandwidth
64QAM Modulation
Mid Channel, 2592.99 MHz



Port 1
80 MHz Channel Bandwidth
256QAM Modulation
Mid Channel, 2592.99 MHz



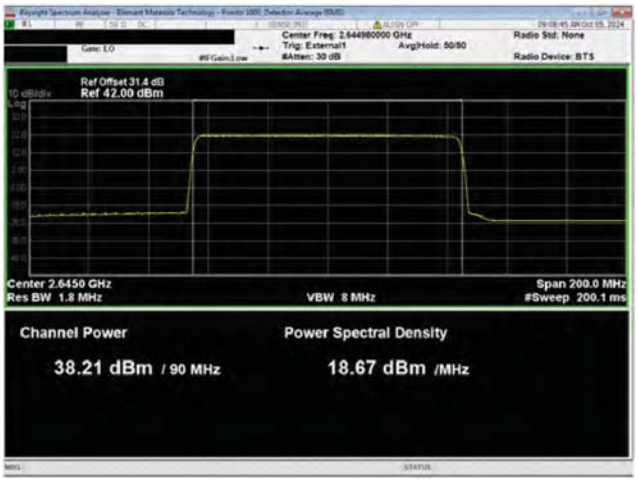
Port 1
90 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2541.00 MHz



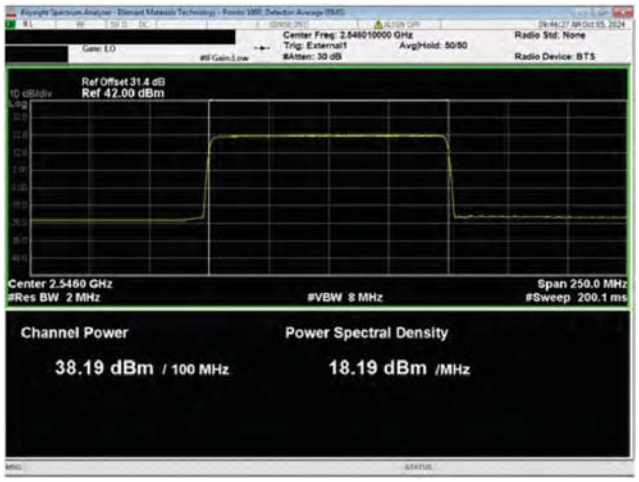
Port 1
90 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz

AVERAGE POWER AND EIRP CALCULATIONS

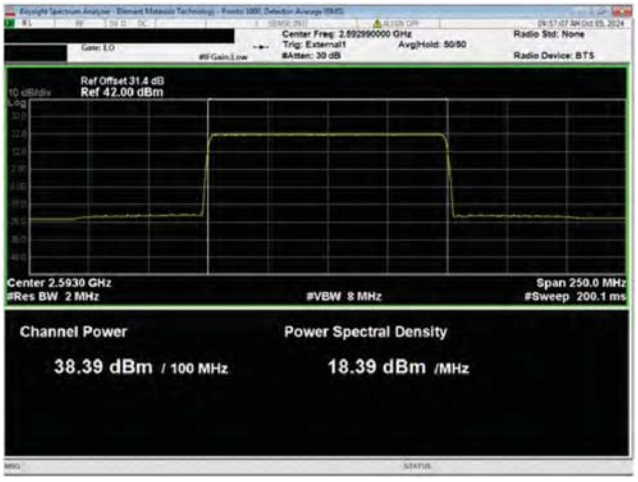
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



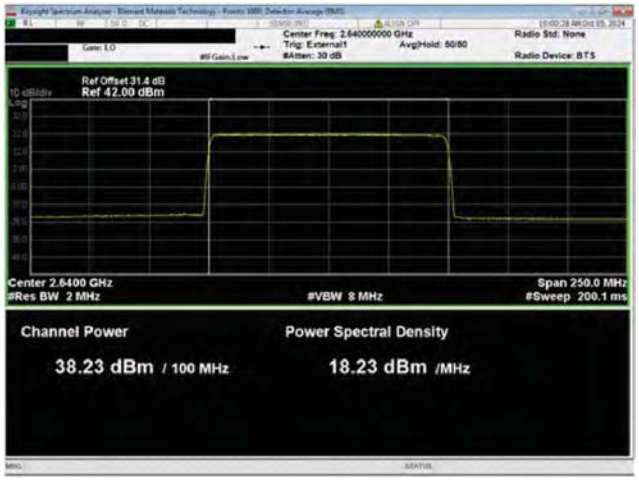
Port 1
90 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2644.98 MHz



Port 1
100 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2546.01 MHz



Port 1
100 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz



Port 1
100 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2640.00 MHz

AVERAGE POWER - MULTICARRIER

element
TbtTx 2024.09.18.0 BETA 0
WTD.2024.01.16.0

TEST DESCRIPTION

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.

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.

RF conducted emissions testing was performed only on one port. The Airscale Base Transceiver Station Radio Unit Model AVHA antenna ports 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.

The RMS average power measurement method for FCC is detailed in section 5.2 of KDB 971168 D01v03r01 and ANSI C63.26-2015 section 5.2.4.4. Measurements shall be performed at full power on the channel(s) and bandwidth(s) specified for 5G NR.

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.

The output power was measured for a single carrier over the carrier channel bandwidth. The total output power for multiport (64x64 MIMO) operations was determined based per ANSI C63.26 clauses 6.4.3.1 and 6.4.3.2.4 (10 log N_{out}). The total output power for Sixty-Four port operation is single power +18.1 dB [i.e. 10*log(64)].

Multicarrier test cases have been developed as shown below:

a) *Multicarrier Test Case 1*: Two contiguous NR10 carriers with minimum spacing between carrier frequencies at the lower band edge (2501.01MHz, 2511.0MHz). The smallest channel bandwidth is selected to maximize carrier power spectral density. The carriers are operated at maximum power [31dBm] (80W/carrier) with a total radio power of 160 watts.

b) *Multicarrier Test Case 2*: Two contiguous NR10 carriers with minimum spacing between carrier frequencies at the upper band edge (2674.98MHz, 2685.00MHz). The smallest channel bandwidth is selected to maximize carrier power spectral density. The carriers are operated at maximum power [31dBm] (80W/carrier) with a total radio power of 160 watts.

c) *Multicarrier Test Case 3*: Two non-contiguous NR10 Carriers at maximum power with one carrier (2501.01MHz) at the bottom channel and one carrier (2685.00MHz) at the top channel. The carrier power for both NR10 is set to [31dBm] (80W/carrier). The total radio power is 160 watts.

d) *Multicarrier Test Case 4*: Two Non-contiguous carriers with one NR100 Carrier (2546.01MHz) at the bottom channel and one NR90 Carrier (2644.98MHz) at the top channel (maximum spacing between carriers). All carriers at the same power level (200W/carrier), (34.8dBm/port). The total radio power is 400 watts.

e) *Multicarrier Test Case 5*: Two Non-contiguous carriers with one NR90 Carrier (2541MHz) at the bottom channel and one NR100 Carrier (2640MHz) at the top channel (maximum spacing between carriers). All carriers at the same power level (200W/carrier). The total radio power is 400 watts.

AVERAGE POWER - MULTICARRIER

element
TbtTx 2024.09.18.0 BETA 0
WTD.2024.01.16.0

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2024-03-12	2025-03-12
Generator - Signal	Agilent	N5173B	TIW	2023-08-07	2026-08-07
Block - DC	Fairview Microwave	SD3379	AMM	2024-08-15	2025-08-15

AVERAGE POWER - MULTICARRIER

element
TbtTx 2024.09.18.0 BETA 0
WTD.2024.01.16.0

EUT:	Airscale Base Transceiver Station Radio Unit Model AVHA	Work Order:	NOKI0079
Serial Number:	L1242005329	Date:	2024-10-07
Customer:	Nokia Solutions and Networks	Temperature:	21.3°C
Attendees:	Mitch Hill, David Le	Relative Humidity:	41.9%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jarrod Brenden	Job Site:	PT14
Power:	54VDC	Configuration:	NOKI0079-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 27:2024	ANSI C63.26:2015

COMMENTS

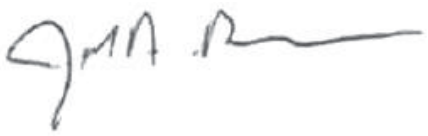
All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks. BRS Band n41 carriers were enabled at maximum power levels. All measured values were within tolerance (i.e. Rated Power ±0.8 dB).

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass



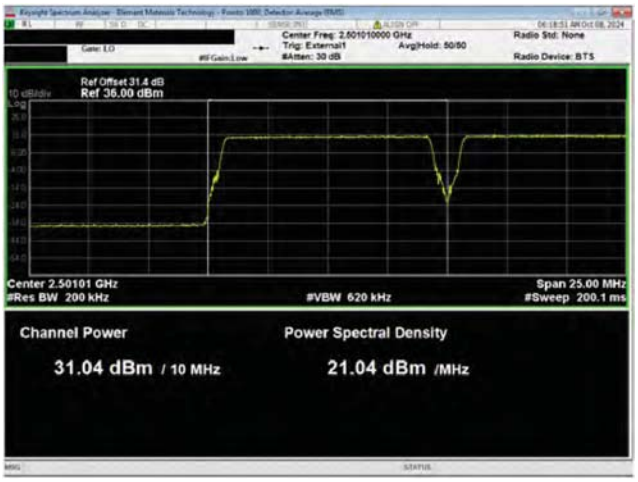
Tested By

TEST RESULTS

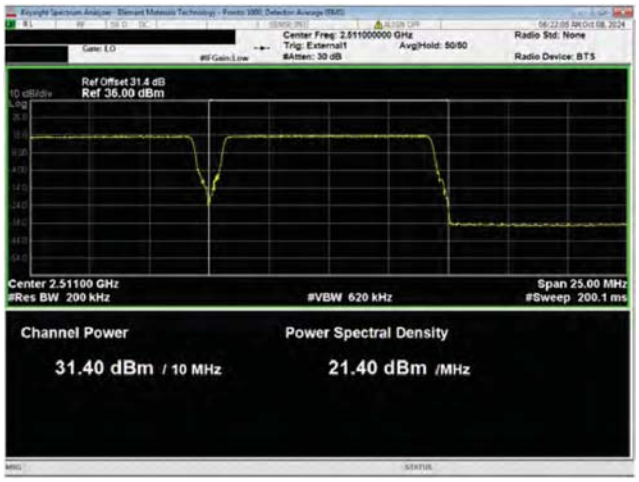
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Sixty-four Port (64x64 MIMO) dBm/carrier BW
Port 1				
QPSK Modulation				
Multicarrier Test Case 1				
NR10, Low Channel, 2501.01 MHz	31.039	0	31	49.1
NR10, Low Channel, 2511.00 MHz	31.403	0	31.4	49.5
Multicarrier Test Case 2				
NR10, High Channel, 2674.98 MHz	31.41	0	31.4	49.5
NR10, High Channel, 2685.00 MHz	31.012	0	31	49.1
Multicarrier Test Case 3				
NR10, Low Channel, 2501.01 MHz	30.92	0	30.9	49.0
NR10, High Channel, 2685.00 MHz	30.962	0	31	49.1
Multicarrier Test Case 4				
NR100, Low Channel, 2546.01 MHz	35.05	0	35.1	53.2
NR90, High Channel, 2644.98 MHz	35.043	0	35	53.1
Multicarrier Test Case 5				
NR90, Low Channel, 2541.00 MHz	35.179	0	35.2	53.3
NR100, High Channel, 2640.00 MHz	35.106	0	35.1	53.2

AVERAGE POWER - MULTICARRIER

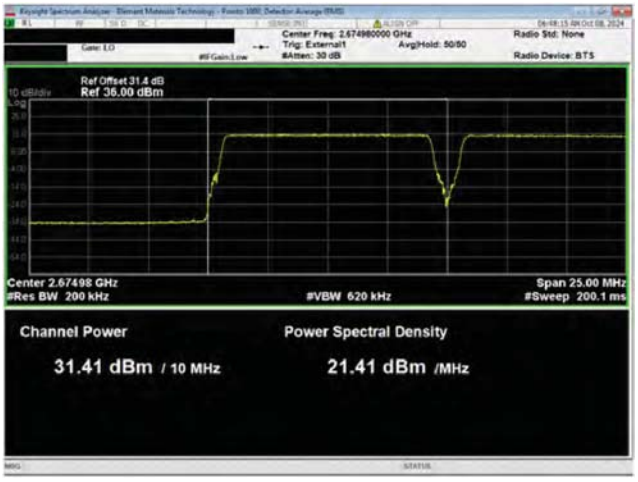
element
TbtTx 2024.09.18.0 BETA 0
WTD.2024.01.16.0



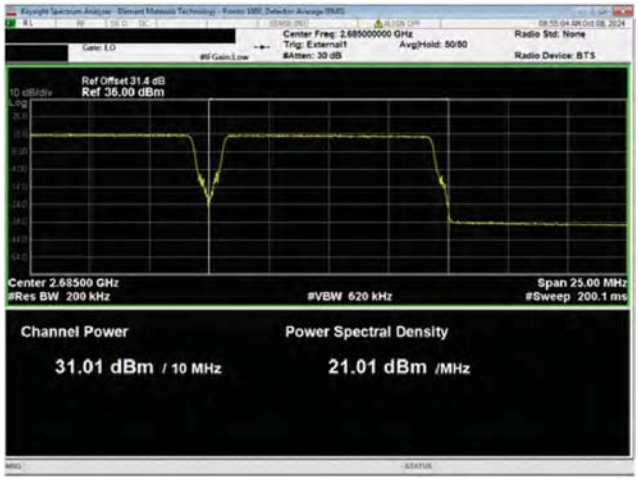
Port 1
QPSK Modulation
Multicarrier Test Case 1
NR10, Low Channel, 2501.01 MHz



Port 1
QPSK Modulation
Multicarrier Test Case 1
NR10, Low Channel, 2511.00 MHz



Port 1
QPSK Modulation
Multicarrier Test Case 2
NR10, High Channel, 2674.98 MHz



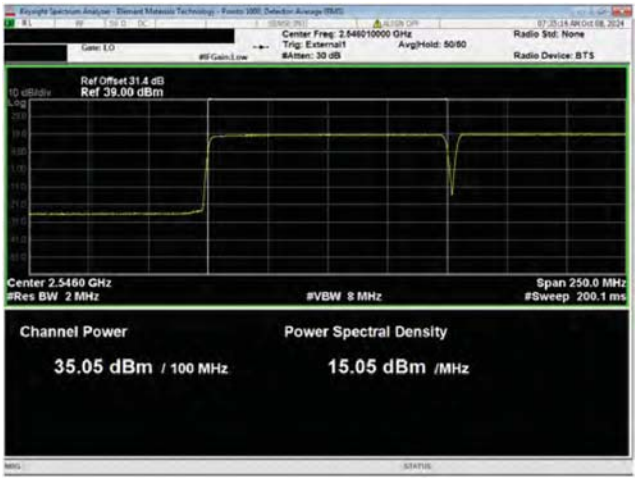
Port 1
QPSK Modulation
Multicarrier Test Case 2
NR10, High Channel, 2685.00 MHz

AVERAGE POWER - MULTICARRIER

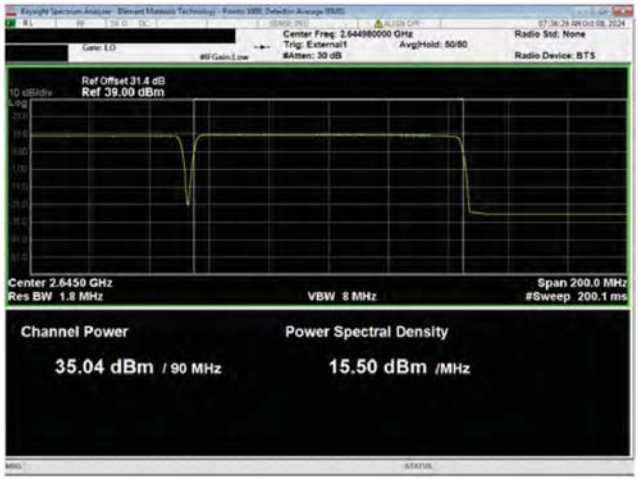
element
TbtTx 2024.09.18.0 BETA 0
WTD.2024.01.16.0

Port 1
QPSK Modulation
Multicarrier Test Case 3
NR10, Low Channel, 2501.01 MHz

Port 1
QPSK Modulation
Multicarrier Test Case 3
NR10, High Channel, 2685.00 MHz



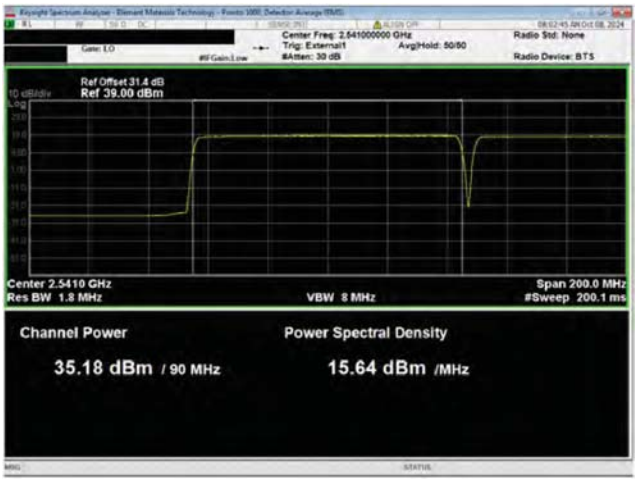
Port 1
QPSK Modulation
Multicarrier Test Case 4
NR100, Low Channel, 2546.01 MHz



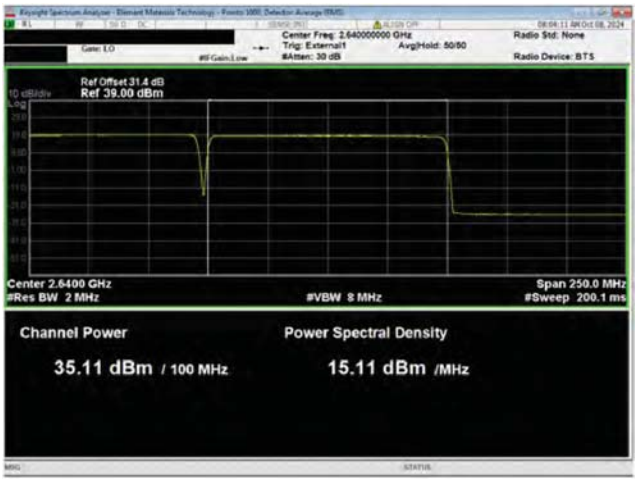
Port 1
QPSK Modulation
Multicarrier Test Case 4
NR90, High Channel, 2644.98 MHz

AVERAGE POWER - MULTICARRIER

element
TbtTx 2024.09.18.0 BETA 0
WTD.2024.01.16.0



Port 1
QPSK Modulation
Multicarrier Test Case 5
NR90, Low Channel, 2541.00 MHz



Port 1
QPSK Modulation
Multicarrier Test Case 5
NR100, High Channel, 2640.00 MHz

PEAK AND AVERAGE (PAPR) CCDF

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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.

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

The fundamental emission Peak to Average 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.

RF conducted emissions testing was performed only on one port. The AVHA antenna ports 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.

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 the rule part defined limit.

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.

The peak-to-average power ratio (PAPR) shall not exceed 13dB for more than the ANSI described 0.1% of the time. The CCDF measurement method for FCC/IC is detailed in section 5.7.2 of KDB971168 D01v03r01 and ANSI C63.26-2015 section 5.2.3.4.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5173B	TIW	2023-08-07	2026-08-07
Spectrum Analyzer	Keysight Technologies, Inc.	N9030B	R336	2024-10-03	2025-10-03

PEAK AND AVERAGE (PAPR) CCDF

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Airscale Base Transceiver Station Radio Unit Model AVHA	Work Order:	NOKI0079
Serial Number:	L1242005329	Date:	2024-10-07
Customer:	Nokia Solutions and Networks	Temperature:	21.3°C
Attendees:	John Rattanavong, David Le	Relative Humidity:	57.8%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jarrod Brenden	Job Site:	PT14
Power:	54VDC	Configuration:	NOKI0079-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 27:2024	ANSI C63.26:2015

COMMENTS

All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks. BRS Band n41 carriers were enabled at maximum power levels.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

TEST RESULTS

	0.1% PAPR Value (dB)	0.1% PAPR Limit (dB)	Results
Port 1			
10 MHz Channel Bandwidth			
QPSK Modulation			
Low Channel, 2501.01 MHz	8.19	13	Pass
Mid Channel, 2592.99 MHz	8.22	13	Pass
High Channel, 2685.00 MHz	8.22	13	Pass
15 MHz Channel Bandwidth			
QPSK Modulation			
Low Channel, 2503.50 MHz	8.2	13	Pass
Mid Channel, 2592.99 MHz	8.17	13	Pass
High Channel, 2682.48 MHz	8.18	13	Pass
20 MHz Channel Bandwidth			
QPSK Modulation			
Low Channel, 2506.02 MHz	8.25	13	Pass
Mid Channel, 2592.99 MHz	8.22	13	Pass
High Channel, 2679.99 MHz	8.22	13	Pass
30 MHz Channel Bandwidth			
QPSK Modulation			
Low Channel, 2511.00 MHz	8.3	13	Pass
Mid Channel, 2592.99 MHz	8.21	13	Pass

PEAK AND AVERAGE (PAPR) CCDF

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

	0.1% PAPR Value (dB)	0.1% PAPR Limit (dB)	Results
High Channel, 2674.98 MHz	8.29	13	Pass
40 MHz Channel Bandwidth			
QPSK Modulation			
Low Channel, 2516.01 MHz	8.28	13	Pass
Mid Channel, 2592.99 MHz	8.17	13	Pass
High Channel, 2670.00 MHz	8.25	13	Pass
50 MHz Channel Bandwidth			
QPSK Modulation			
Low Channel, 2521.02 MHz	8.36	13	Pass
Mid Channel, 2592.99 MHz	8.16	13	Pass
High Channel, 2664.99 MHz	8.3	13	Pass
60 MHz Channel Bandwidth			
QPSK Modulation			
Low Channel, 2526.00 MHz	8.42	13	Pass
Mid Channel, 2592.99 MHz	8.2	13	Pass
High Channel, 2659.98 MHz	8.36	13	Pass
70 MHz Channel Bandwidth			
QPSK Modulation			
Low Channel, 2531.01 MHz	8.5	13	Pass
Mid Channel, 2592.99 MHz	8.23	13	Pass
High Channel, 2655.00 MHz	8.34	13	Pass
80 MHz Channel Bandwidth			
QPSK Modulation			
Low Channel, 2536.02 MHz	8.51	13	Pass
Mid Channel, 2592.99 MHz	8.38	13	Pass
High Channel, 2649.99 MHz	8.47	13	Pass
16QAM Modulation			
Mid Channel, 2592.99 MHz	8.21	13	Pass
64QAM Modulation			
Mid Channel, 2592.99 MHz	8.26	13	Pass
256QAM Modulation			
Mid Channel, 2592.99 MHz	8.24	13	Pass
90 MHz Channel Bandwidth			
QPSK Modulation			
Low Channel, 2541.00 MHz	8.55	13	Pass
Mid Channel, 2592.99 MHz	8.22	13	Pass
High Channel, 2644.98 MHz	8.51	13	Pass
100 MHz Channel Bandwidth			
QPSK Modulation			
Low Channel, 2546.01 MHz	8.53	13	Pass
Mid Channel, 2592.99 MHz	8.23	13	Pass
High Channel, 2640.00 MHz	8.55	13	Pass

PEAK AND AVERAGE (PAPR) CCDF

Port 1
10 MHz Channel Bandwidth
QPSK Modulation
Low Channel, 2501.01 MHz

Port 1
10 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz

PEAK AND AVERAGE (PAPR) CCDF

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

Port 1
10 MHz Channel Bandwidth
QPSK Modulation
High Channel, 2685.00 MHz

Port 1
15 MHz Channel Bandwidth
QPSK Modulation
Low Channel, 2503.50 MHz

PEAK AND AVERAGE (PAPR) CCDF

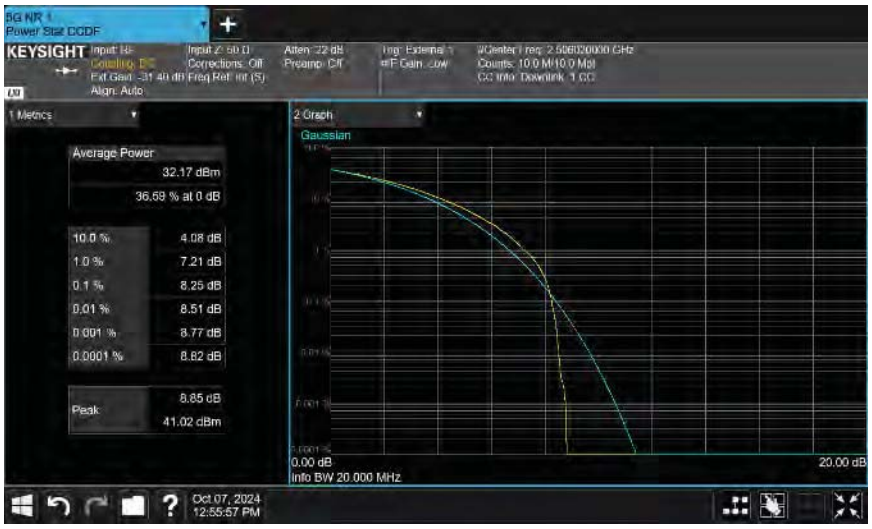
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

Port 1
15 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz

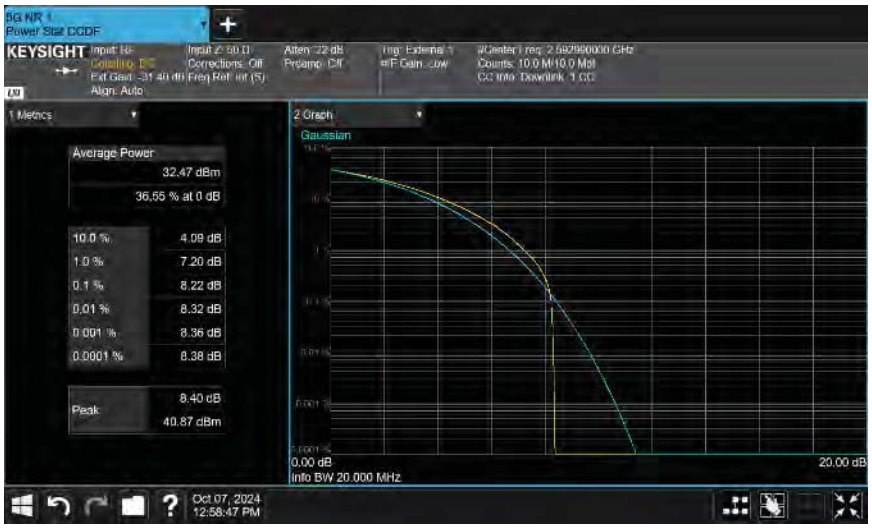
Port 1
15 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2682.48 MHz

PEAK AND AVERAGE (PAPR) CCDF

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



Port 1
20 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2506.02 MHz



Port 1
20 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz

PEAK AND AVERAGE (PAPR) CCDF

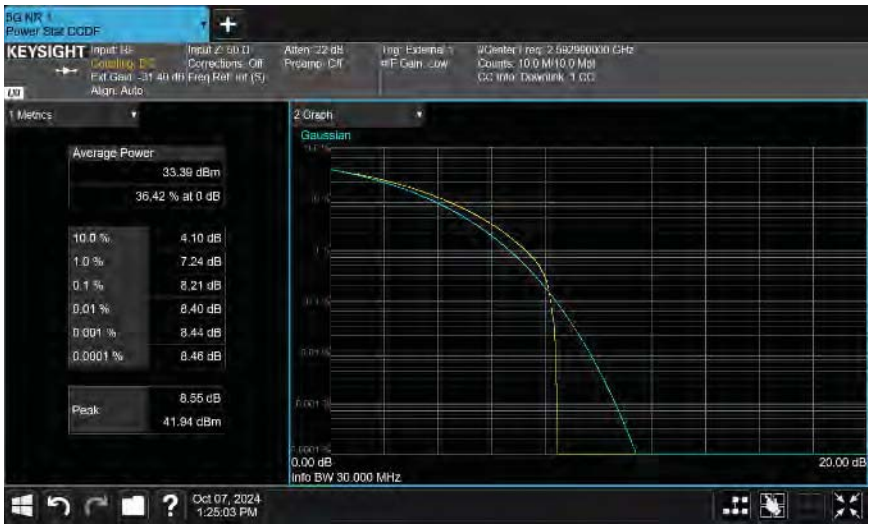
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

Port 1
20 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2679.99 MHz

Port 1
30 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2511.00 MHz

PEAK AND AVERAGE (PAPR) CCDF

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



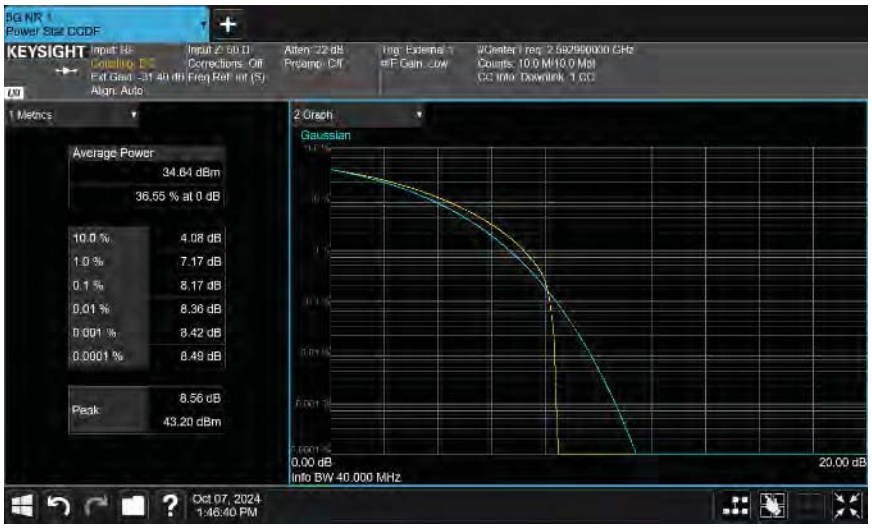
Port 1
30 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz

Port 1
30 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2674.98 MHz

PEAK AND AVERAGE (PAPR) CCDF

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

Port 1
40 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2516.01 MHz



Port 1
40 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz

PEAK AND AVERAGE (PAPR) CCDF

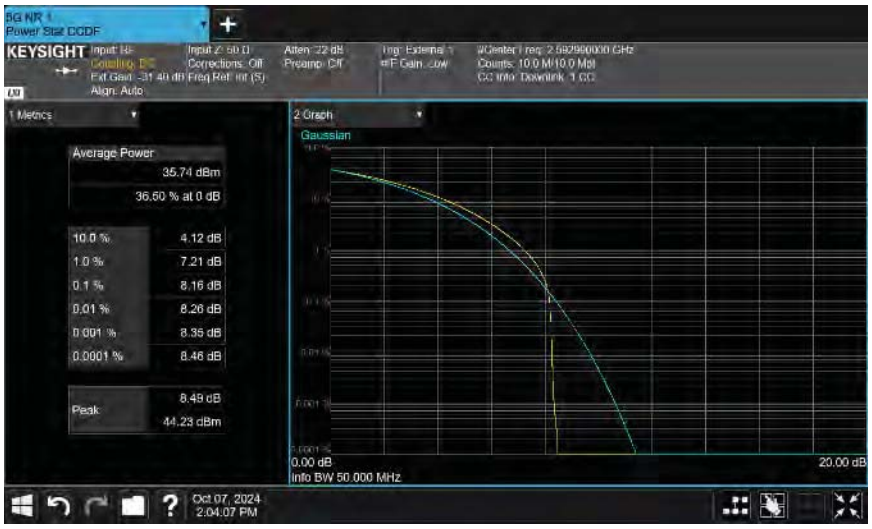
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

Port 1
40 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2670.00 MHz

Port 1
50 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2521.02 MHz

PEAK AND AVERAGE (PAPR) CCDF

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



Port 1
50 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz

Port 1
50 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2664.99 MHz

PEAK AND AVERAGE (PAPR) CCDF

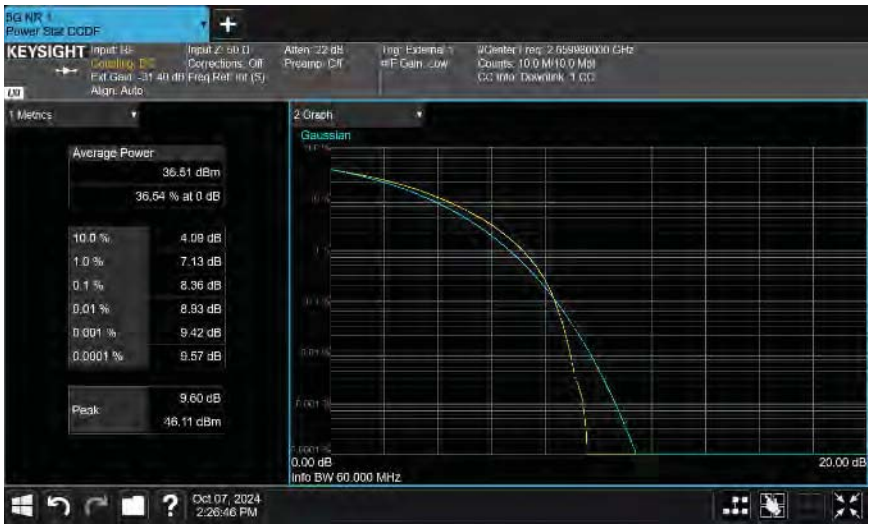
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

Port 1
60 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2526.00 MHz

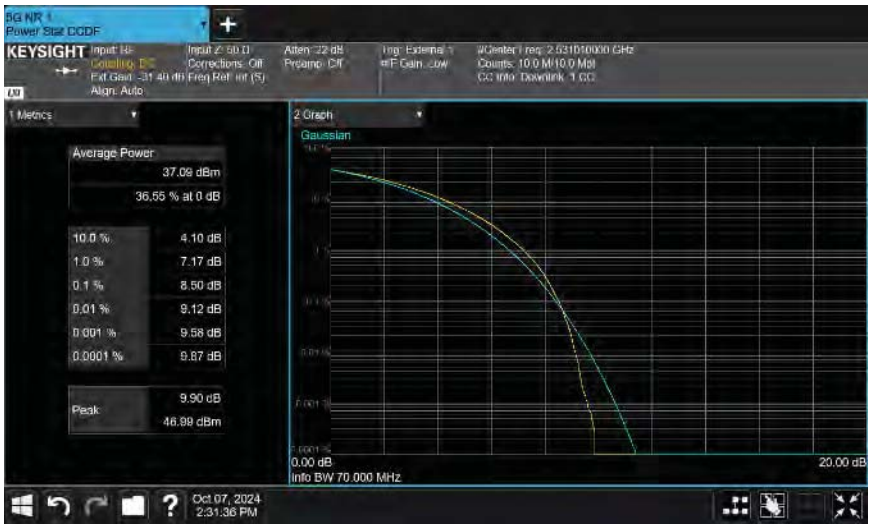
Port 1
60 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz

PEAK AND AVERAGE (PAPR) CCDF

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



Port 1
60 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2659.98 MHz

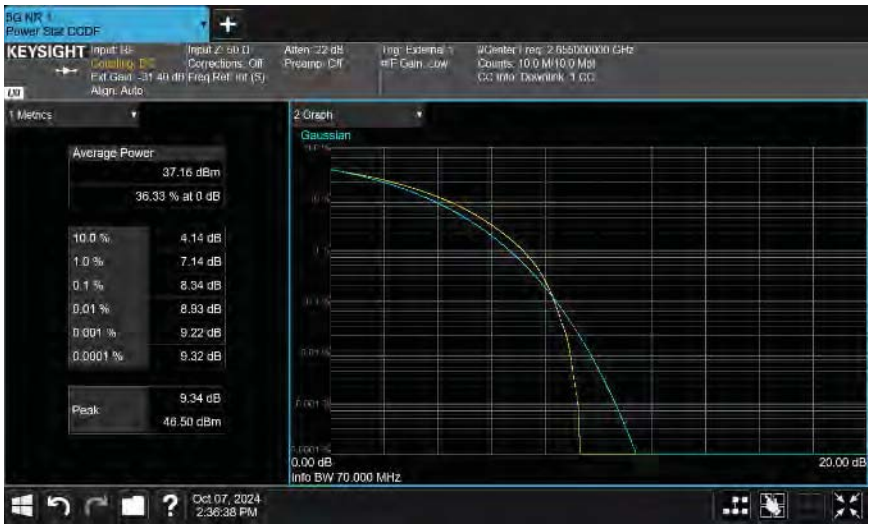


Port 1
70 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2531.01 MHz

PEAK AND AVERAGE (PAPR) CCDF

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

Port 1
70 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz

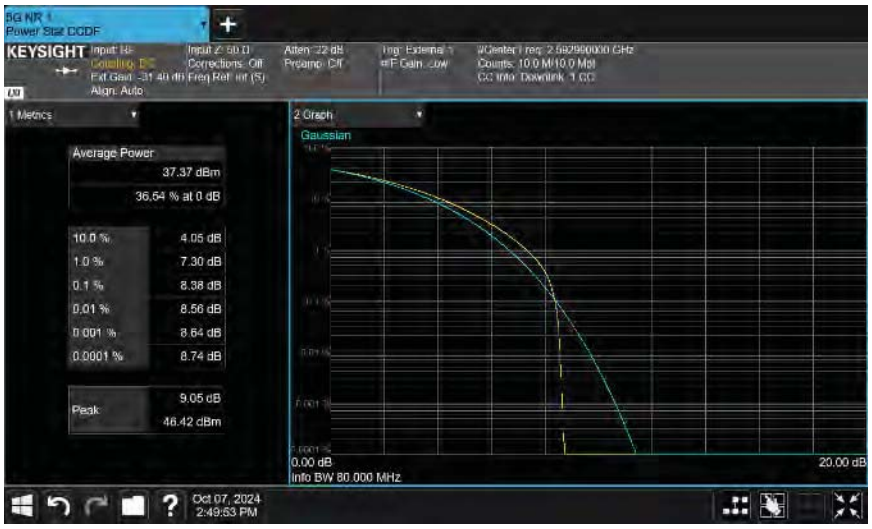


Port 1
70 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2655.00 MHz

PEAK AND AVERAGE (PAPR) CCDF

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

Port 1
80 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2536.02 MHz



Port 1
80 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz

PEAK AND AVERAGE (PAPR) CCDF

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

Port 1
80 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2649.99 MHz

Port 1
80 MHz Channel Bandwidth
16QAM Modulation
Mid Channel, 2592.99 MHz

PEAK AND AVERAGE (PAPR) CCDF

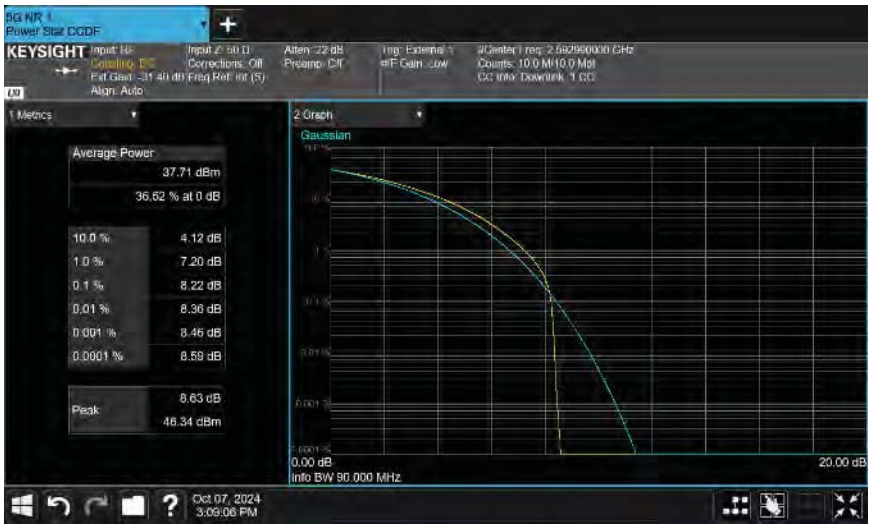
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

Port 1
80 MHz Channel Bandwidth
64QAM Modulation
Mid Channel, 2592.99 MHz

Port 1
80 MHz Channel Bandwidth
256QAM Modulation
Mid Channel, 2592.99 MHz

PEAK AND AVERAGE (PAPR) CCDF

Port 1
90 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2541.00 MHz



Port 1
90 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz

PEAK AND AVERAGE (PAPR) CCDF

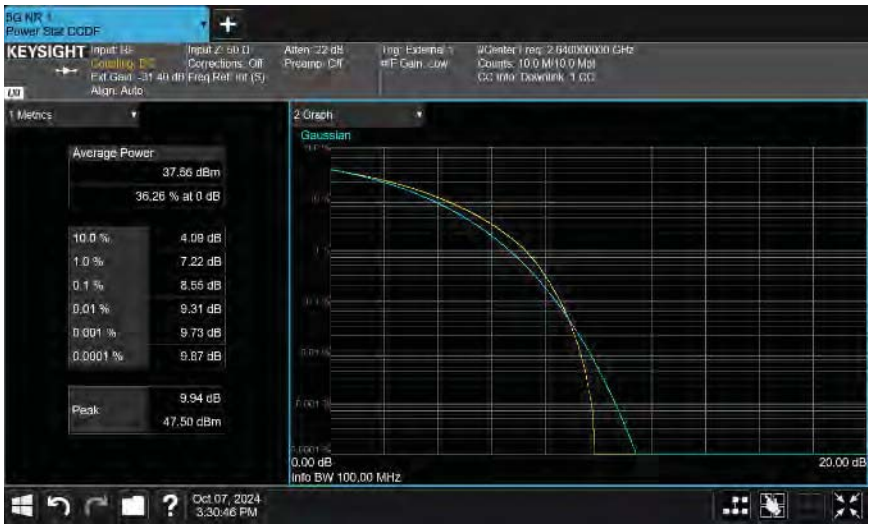
Port 1
90 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2644.98 MHz

Port 1
100 MHz Channel Bandwidth
QPSK Modulation
Low Ch, 2546.01 MHz

PEAK AND AVERAGE (PAPR) CCDF

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

Port 1
100 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz



Port 1
100 MHz Channel Bandwidth
QPSK Modulation
High Ch, 2640.00 MHz