TEST REPORT

Report No.:	BCTC2410830549-3E
Applicant:	Radxa Computer (Shenzhen) Co.,Ltd.
Product Name:	Radxa ZERO 3W
Test Model:	Radxa ZERO 3W D1E0H1W15
Tested Date:	2024-10-10 to 2024-11-15
Issued Date:	2024-11-15

Shenzhen BCTC Testing Co., Ltd.

Product Name:	Radxa ZERO 3W
Trademark:	radxa®
Model/Type reference:	Radxa ZERO 3W D1E0H1W15 Radxa ZERO 3W D1E0H0W15, Radxa ZERO 3W D2E0H0W15, Radxa ZERO 3W D4E0H0W15, Radxa ZERO 3W D8E0H0W15, Radxa ZERO 3W D2E0H1W15, Radxa ZERO 3W D4E0H1W15, Radxa ZERO 3W D8E0H1W15, Radxa ZERO 3W D1E8H0W15, Radxa ZERO 3W D2E16H0W15, Radxa ZERO 3W D4E32H0W15, Radxa ZERO 3W D8E64H0W15, Radxa ZERO 3W D1E8H1W15, Radxa ZERO 3W D2E16H1W15, Radxa ZERO 3W D4E32H1W15, Radxa ZERO 3W D8E64H1W15
Prepared For:	Radxa Computer (Shenzhen) Co.,Ltd.
Address:	1602, Smart Valley, tiezai Road, Gongle community, Xixiang, Baoan, Shenzhen, China
Manufacturer:	Radxa Computer (Shenzhen) Co.,Ltd.
Address:	1602, Smart Valley, tiezai Road, Gongle community, Xixiang, Baoan, Shenzhen, China
Prepared By:	Shenzhen BCTC Testing Co., Ltd.
Address:	1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	2024-10-10
Sample tested Date:	2024-10-10 to 2024-11-15
Issue Date:	2024-11-15
Report No.:	BCTC2410830549-3E
Test Standards:	ARIB STD T-66 Ver.3.7 Article 2 paragraph 1 of item 19 MIC Notice No.88 Appendix No.43
Test Results:	PASS
Remark:	This is JAPAN RADIO test report.

Tested by:

Lei Chen

Lei Chen/Project Handler

Approved by:

Zero Zhou/Reviewer

Table Of Content

(Note: N/A Means Not Applicable)

1. Version

Report No.	Issue Date	Description	Approved
BCTC2410830549-3E	2024-11-15	Original	Valid

2. Test Summary

Test procedures according to the technical standards:

Article 2 paragraph 1 of item 19	
Description of Test	**Result**
Frequency Error	Complies
Occupied Bandwidth (99%) and Spread-spectrum Bandwidth (90%)	Complies
Unwanted Emission Intensity	Complies
Antenna Power Error	Complies
Limitation of Collateral Emission of Receiver	Complies
Transmission Antenna Gain (EIRP Antenna Power)	N/A
Transmission Radiation Angle Width (3dB Bandwidth)	N/A
Radio Interference Prevention Capability	Complies
Carrier Sense Capability	Complies
Construction Protection Confirmation	Complies

NOTE:
(1)" N/A" denotes test is not applicable in this Test Report

3. Measurement Uncertainty

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

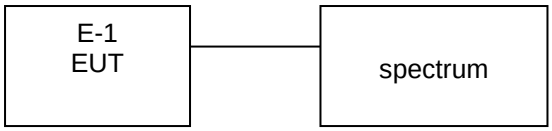
No.	Item	Uncertainty
1	Conducted Emission Test	±3.2dB
2	Radiated Emission Test	±4.7dB
3	RF power, conducted	±0.16dB
4	Spurious emissions, conducted	±0.21dB
5	All emissions, radiated(<1G)	±4.68dB
6	All emissions, radiated(>1G)	±5.0dB
7	frequency error ppm	±0.5ppm

4. Product Information And Test Setup

4.1 Product Information

Model/Type reference:	Radxa ZERO 3W D1E0H1W15 Radxa ZERO 3W D1E0H0W15, Radxa ZERO 3W D2E0H0W15, Radxa ZERO 3W D4E0H0W15, Radxa ZERO 3W D8E0H0W15, Radxa ZERO 3W D2E0H1W15, Radxa ZERO 3W D4E0H1W15, Radxa ZERO 3W D8E0H1W15, Radxa ZERO 3W D1E8H0W15, Radxa ZERO 3W D2E16H0W15, Radxa ZERO 3W D4E32H0W15, Radxa ZERO 3W D8E64H0W15, Radxa ZERO 3W D1E8H1W15, Radxa ZERO 3W D2E16H1W15, Radxa ZERO 3W D4E32H1W15, Radxa ZERO 3W D8E64H1W15
Model differences:	All the model are the same circuit and RF module, except model names and appearance of the color.
Hardware Version:	V1.11
Software Version:	b6
Operation Frequency:	IEEE 802.11b/g/n HT20/ax HE20: 2412-2472MHz IEEE 802.11n HT40/ax HE40: 2422-2462MHz
Rated RF Output Power Density	802.11b:3 mW/MHz, 802.11g:3 mW/MHz 802.11nHT20: 3 mW/MHz, 802.11nHT40: 2 mW/MHz, 802.11axHT20: 3 mW/MHz, 802.11axHT40: 2 mW/MHz
Conducted Power Density	802.11b: 3.02 mW/MHz, 802.11g: 3.33 mW/MHz, 802.11nHT20: 2.83 mW/MHz 802.11nHT40: 1.61 mW/MHz 802.11axHT40: 2.74 mW/MHz 802.11axHT40: 1.64 mW/MHz
Type of Modulation:	OFDM/DSSS/OFDMA
Bit Rate of transmitter	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11n: Up to 150Mbps 802.11ax:400Mbps
channel space	5MHz
Number Of Channel:	13 Channels for 802.11b/g/n(HT20)/ax(HE20) 9 channels for 802.11nHT40/axHE40
Antenna installation:	Chip antenna
Antenna Gain:	1.5 dBi Remark: ☒ The antenna gain of the product comes from the antenna report provided by the customer, and the test data is affected by the customer information. ☐ The antenna gain of the product is provided by the customer, and the test data is affected by the customer information.
Ratings:	DC 5V

4.2 Block Digram Parameters Of Text Software Setting



4.3 Description Of Support Units (Conducted Mode)

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Radxa ZERO 3W	radxa®	Radxa ZERO 3W D1E0H1W15	N/A	EUT

Notes:
1. The support equipment was authorized by Declaration of Confirmation.
2. For detachable type I/O cable should be specified the length in cm in『Length』column
3. “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

4.4 Channel List

Channel List(802.11b/g/n20/ax20)					
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
01	2412	02	2417	03	2422
04	2427	05	2432	06	2437
07	2442	08	2447	09	2452
10	2457	11	2462	12	2467
13	2472				

Channel List(802.11n40/ax40)					
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
03	2422	04	2427	05	2432
06	2437	07	2442	08	2447
09	2452	10	2457	11	2462

4.5 Test Mode

Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description	
Mode1	CH01	802.11b
Mode2	CH07	
Mode3	CH13	
Mode4	RX	
Mode5	CH01	802.11g
Mode6	CH07	
Mode7	CH13	
Mode8	RX	
Mode9	CH01	802.11n20/ax20
Mode10	CH07	
Mode11	CH13	
Mode12	RX	
Mode13	CH03	802.11n40/ax40
Mode14	CH07	
Mode15	CH11	
Mode16	RX	

Notes: This product does not support RU mode.

4.6 Test Conditions

The EUT was tested while in a continuous transmitter/receiver mode.
The EUT was tuned to a low, middle, and high channel for all tests. For all test case pre/scans were completed in all Modes to determine worst case levels.

Power Supply Voltage Fluctuation Test

Voltage Fluctuation Test	Normal Voltage	High Voltage +10% of Normal Voltage	Low Voltage -10% of Normal Voltage
Input DC Power	5V	5.5V	4.5V
Voltage Variation (%)	0%	+10%	-10%

Note:
Voltage Variation (%)= (Output high or Low Voltage - Output Normal Voltage)/ Output Normal Voltage* 100

During the input supply voltage to the EUT from the external power source is varied by ±10%, ±10% of the external power change, will not affect the voltage of the RF, so only operated in normal voltage to test all regulations.

4.7 Table Of Parameters Of Test Software Setting

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters

Test software Version	**CMD**		
Frequency	2412 MHz	2442 MHz	2472 MHz
Parameters	DEF	DEF	DEF
Frequency	2422 MHz	/	2462 MHz
Parameters	DEF	/	DEF

5. Test Facility And Test Instrument Used

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Shenzhen BCTC Testing Co., Ltd. Address:1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.
FCC Test Firm Registration Number: 712850
A2LA certificate registration number is: CN1212
ISED Registered No.: 23583
ISED CAB identifier: CN0017

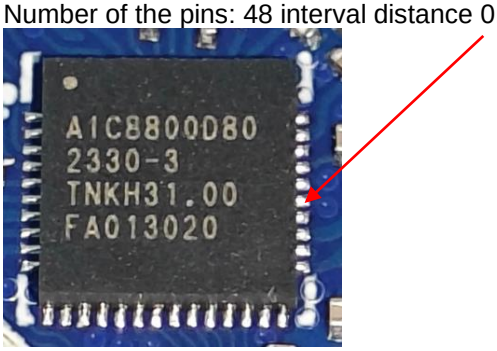
5.2 Test Instrument Used

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1.	Power Metter	Keysight	E4419	\	May 16, 2024	May 15, 2025
2.	Signal Analyzer 20kHz-26.5GHz	Keysight	N9020A	MY49100060	May 16, 2024	May 15, 2025
3.	Signal Generator	Keysight	N5182B	MY56200519	May 16, 2024	May 15, 2025
4	Pulse limiter	Schwarzbeck	VTSD 9561-F	01323	May 16, 2024	May 15, 2025
5	Hygrothermograph	Thermo	HTC-1	\	Nov. 13, 2023	Nov. 12, 2024

Calibration laboratory: CCIC(Shenzhen) Co., Ltd

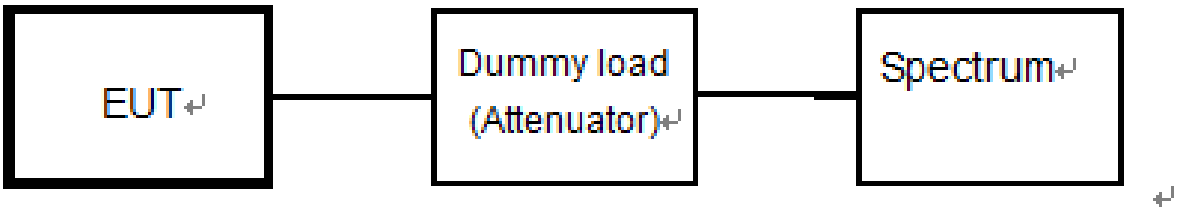
6. RF Shielding Method

Chipset:
The product structure is uses SMD patch process.
As shown in the picture, If the will be open so the product be damage.
Number of the pins: 48 interval distance 0.5mm



7. Frequency Error

7.1 Block Diagram Of Test Setup



7.2 Limit

Item	Limits
Frequency Error	±50ppm

7.3 Measuring Instruments And Setting

The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	10KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

7.4 Test Procedure

(1) In the case of unmodulated signal (continuous or continuous burst), measure the frequency directly by a frequency meter.
(2) In the case of burst waves, the measurement shall be done for enough time in order to obtain the enough measuring accuracy, and the average of the measured values becomes the final value.
(3) In the case of a test mode with a specific frequency spectrum, measure the frequency of the specific spectrum by a spectrum analyzer.
(4) In the cases above, if the frequency equivalent to the test frequency is not directly measured in principle, it shall be obtained by necessary calculation.
In the case of modulated signal, if there is no specific spectrum measurable by a spectrum analyzer but a specific dip is observed, it is allowed to measure the frequency with the signal generator (synthesized). That is, observe a signal of the signal generator concurrently (or alternately) with the tested signal using the spectrum analyzer while setting the frequency of the signal generator to the position of the dip on the screen of the spectrum analyzer, and determine the frequency of the signal generator at the time as a measured value.

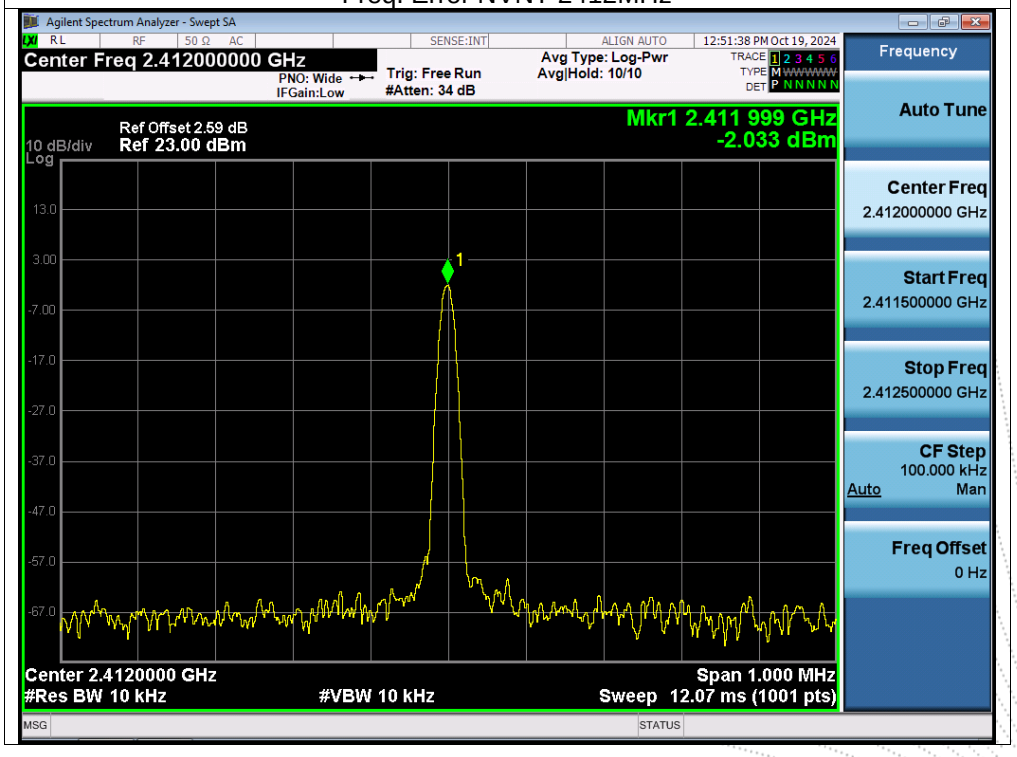
7.5 Test Result

Temperature:	25°C		
Humidity:	55 % RH	Test Voltage	DC 5V

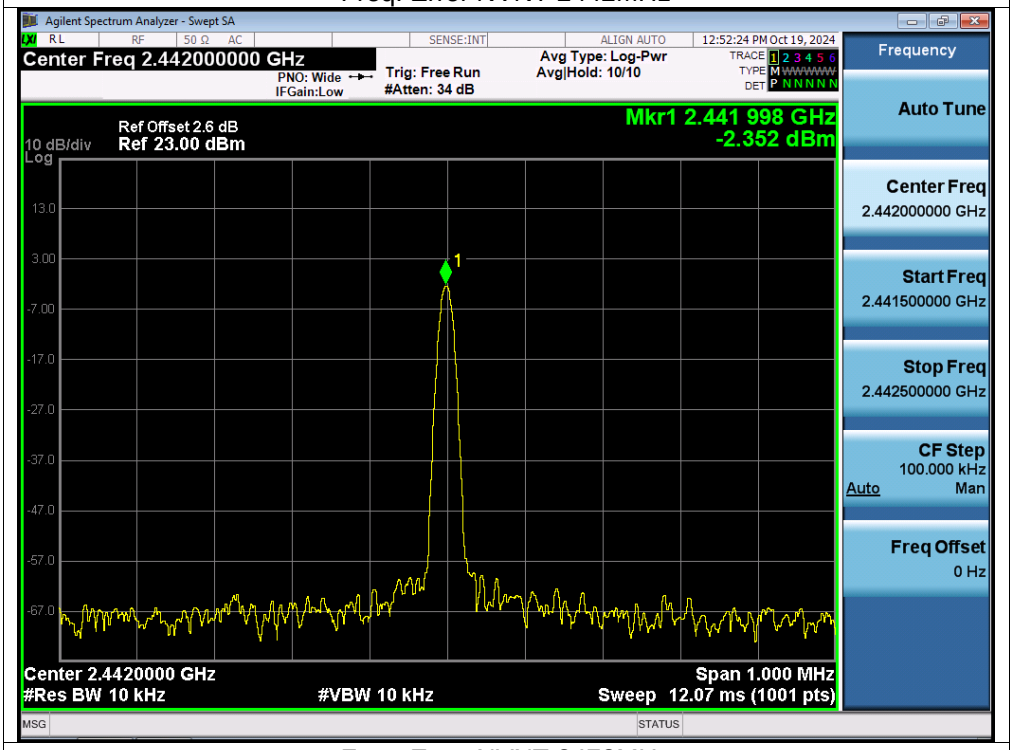
Condition	Frequency (MHz)	Measured Frequency (MHz)	Frequency Error (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
NVNT	2412	2411.999	-1000	-0.41	50	Pass
NVNT	2442	2441.998	-2000	-0.82	50	Pass
NVNT	2472	2471.998	-2000	-0.81	50	Pass
NVNT	2422	2421.998	-2000	-0.83	50	Pass
NVNT	2462	2461.998	-2000	-0.81	50	Pass

Test Graphs

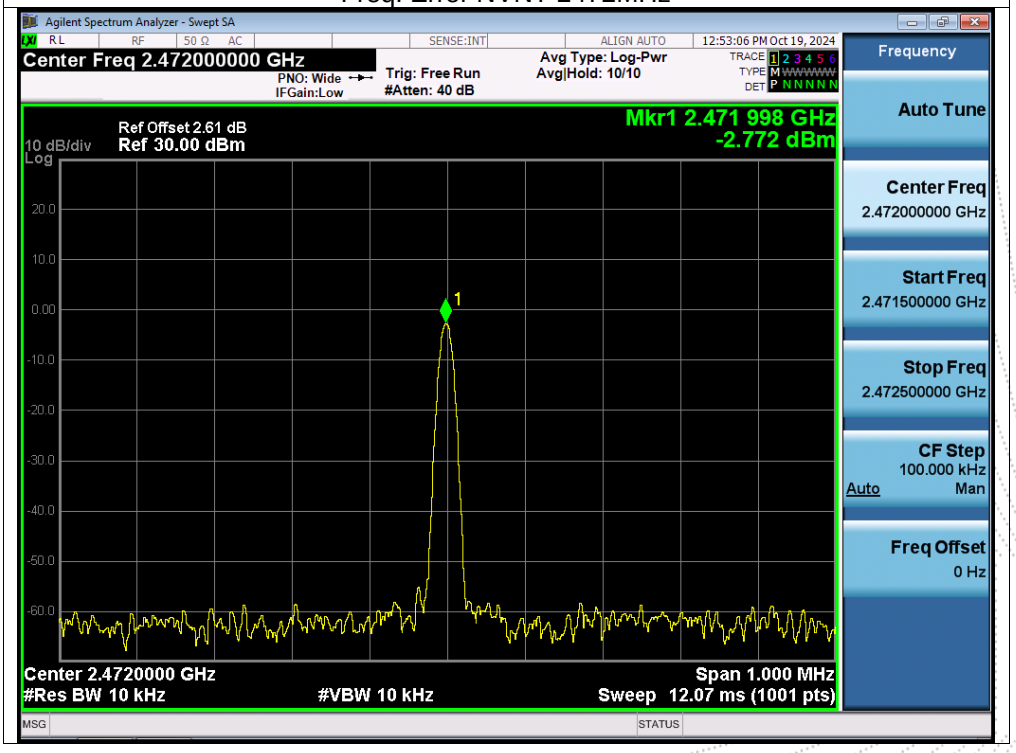
Freq. Error NVNT 2412MHz



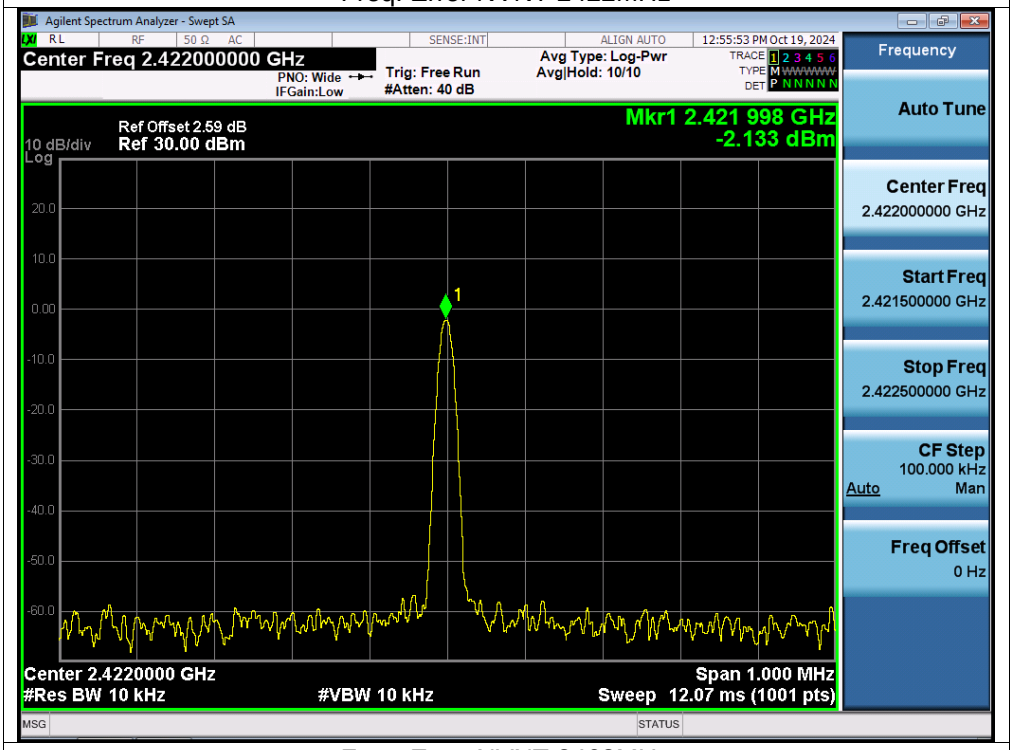
Freq. Error NVNT 2442MHz



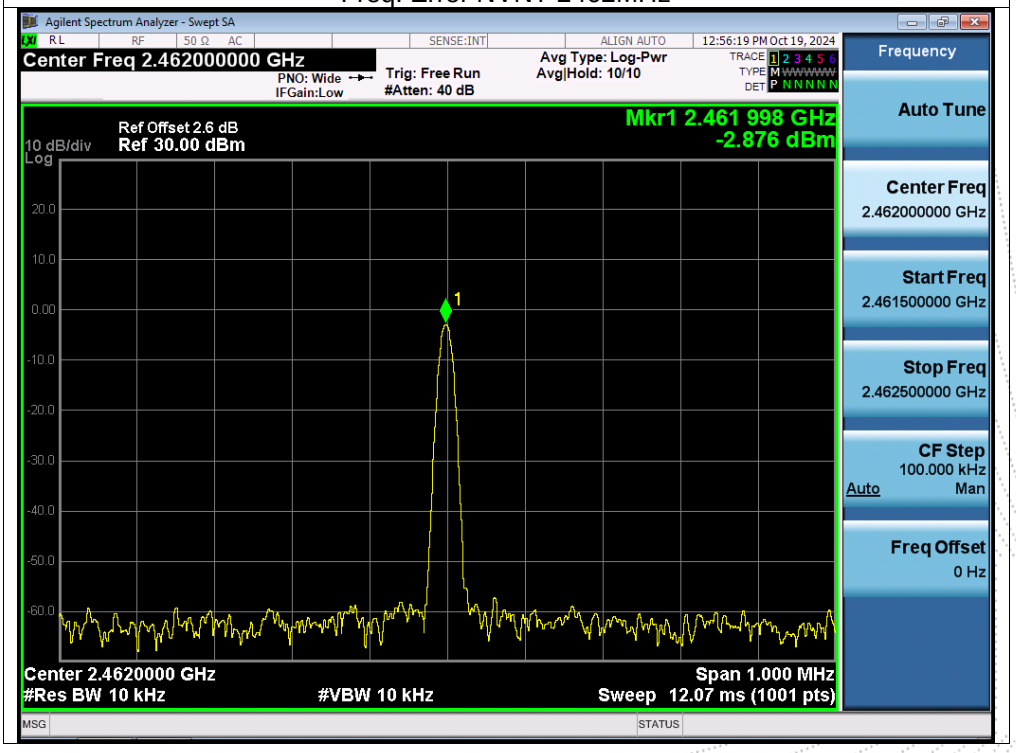
Freq. Error NVNT 2472MHz



Freq. Error NVNT 2422MHz

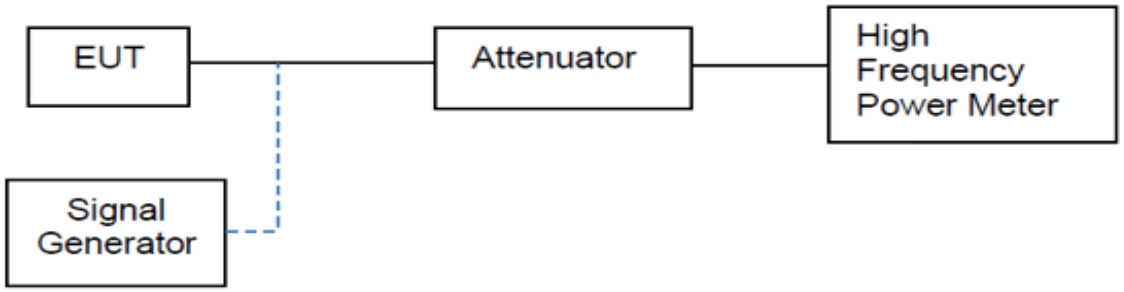


Freq. Error NVNT 2462MHz



8. Antenna Power

8.1 Block Diagram Of Test Setup



8.2 Limit

Item	Limits
Antenna Power Density	(1)≦3mW/MHz (FH,FH+DS,FH+OFDM form 2400 - 2483.5 MHz) (2)≦10mW/MHz (OFDM OBW＜26MHz, DS, FH other than (1)) (3)≦5mW/MHz (OFDM OBW 26-38MHz) (4) ≦10mW (Other than (1) & (2)& (3)
Antenna Power Error	+20%, -80% (Base on manufacturer declare antenna power density)

8.3 Test Procedure

Step 1: Connect the EUT to the Spectrum analyser and use the following settings:
Centre Frequency: The Centre frequency of the channel under test.
RBW: 1 MHz
VBW: 1 MHz
Span: Wide enough to cover the complete power envelope of the signal of the EUT.
Detector: Peak.
Trace Mode: Max Hold.

Step 2: When the trace is complete, find the peak value of the power envelope and record the frequency.

Step 3: Make the following changes to the settings of the Spectrum analyser:
Centre Frequency: Equal to the frequency recorded in step 2.
Span: 0 Hz.
RBW: 1 MHz
VBW: 1 MHz
Detector: Peak.
Trace Mode: Max Hold

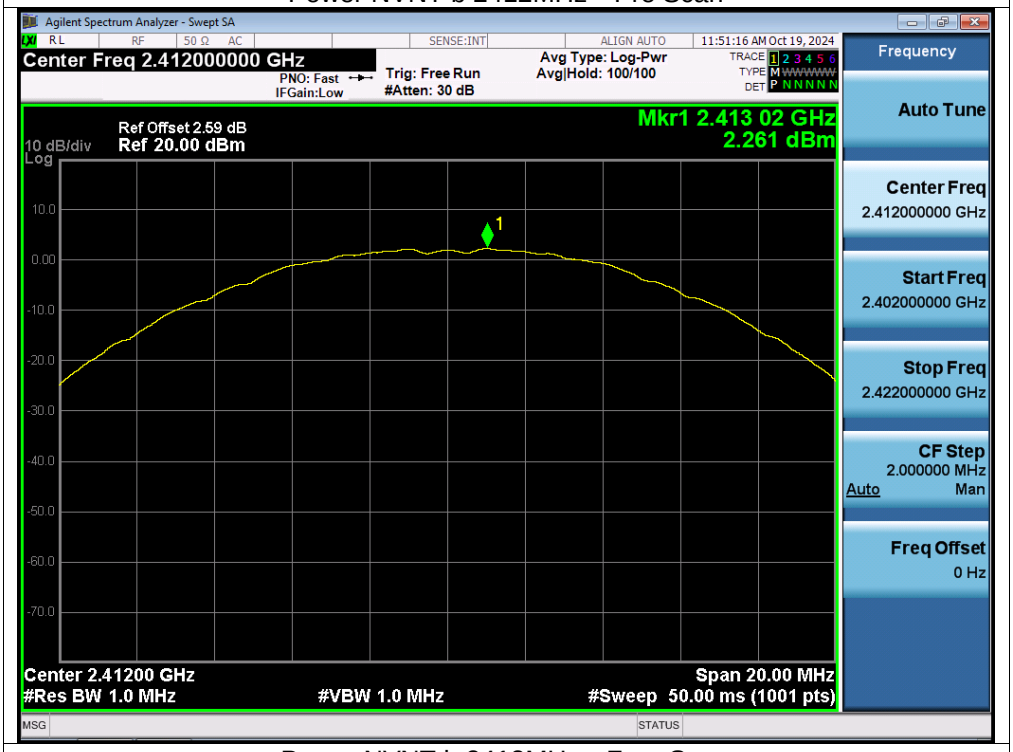
8.4 Test Result

Temperature:	25°C		
Humidity:	55 % RH	Test Voltage	DC 5V

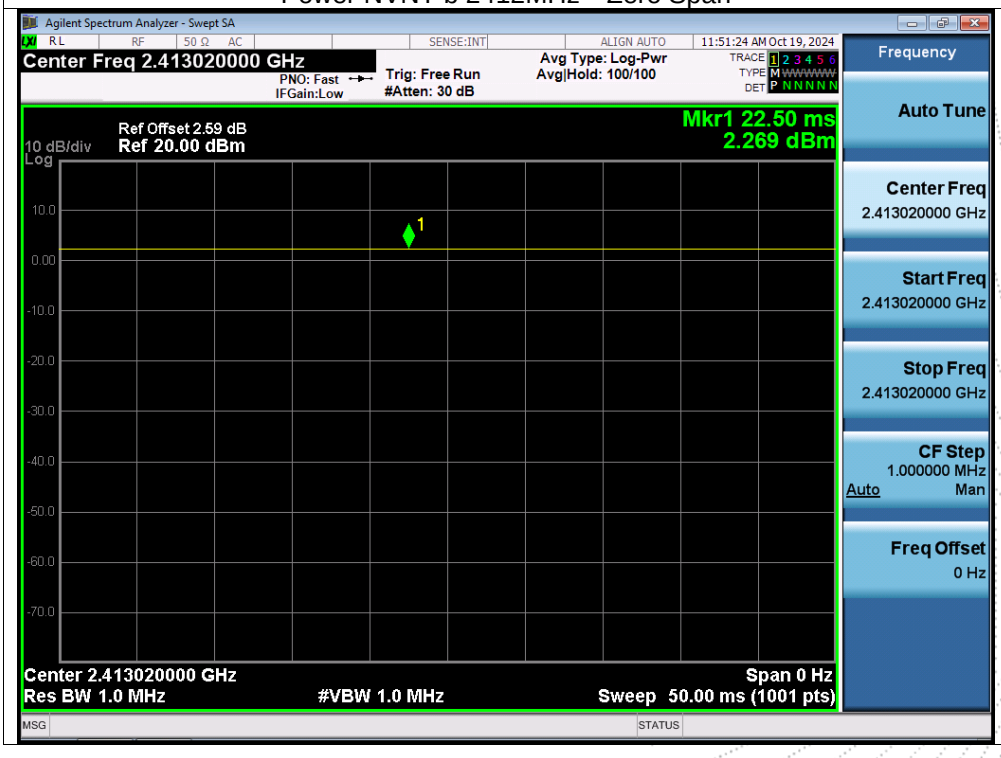
Condition	Mode	Frequency (MHz)	Antenna Power (dBm/MHz)	Antenna Power (mW/MHz)	Rated output power (mW/MHz)	Tolerance (%)	Limit	Verdict
NVNT	b	2412	2.27	1.69	3	-44	10mW/MHz -80%~+20%	Pass
NVNT	b	2442	4.52	2.83	3	-6		Pass
NVNT	b	2472	4.8	3.02	3	1		Pass
NVNT	g	2412	4.3	2.69	3	-10		Pass
NVNT	g	2442	5.23	3.33	3	11		Pass
NVNT	g	2472	3.37	2.17	3	-28		Pass
NVNT	n20	2412	3.18	2.08	3	-31		Pass
NVNT	n20	2442	4.52	2.83	3	-6		Pass
NVNT	n20	2472	3.05	2.02	3	-33		Pass
NVNT	n40	2422	1.42	1.39	2	-31	5mW/MHz -80%~+20%	Pass
NVNT	n40	2442	2.06	1.61	2	-20		Pass
NVNT	n40	2462	1.67	1.47	2	-27		Pass
NVNT	ax20	2412	4.02	2.52	3	-16	10mW/MHz -80%~+20%	Pass
NVNT	ax20	2442	4.38	2.74	3	-9		Pass
NVNT	ax20	2472	4.38	2.74	3	-9		Pass
NVNT	ax40	2422	1.3	1.35	2	-33	5mW/MHz -80%~+20%	Pass
NVNT	ax40	2442	2.14	1.64	2	-18		Pass
NVNT	ax40	2462	2.11	1.63	2	-19		Pass

Test Graphs

Power NVNT b 2412MHz Pre Scan

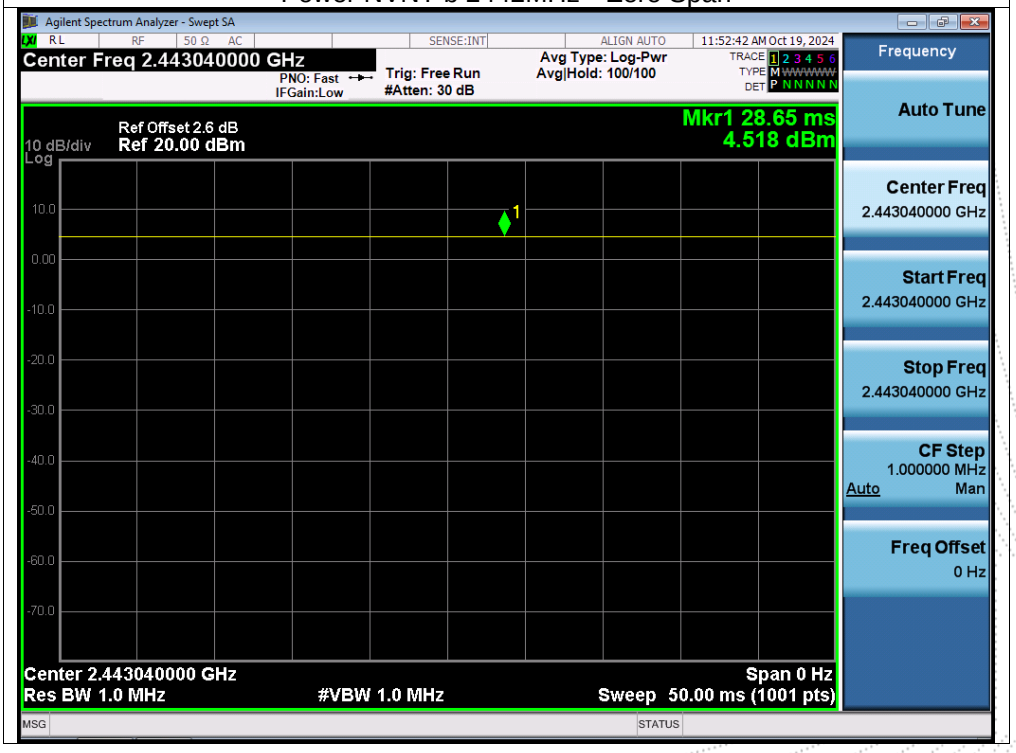


Power NVNT b 2412MHz Zero Span



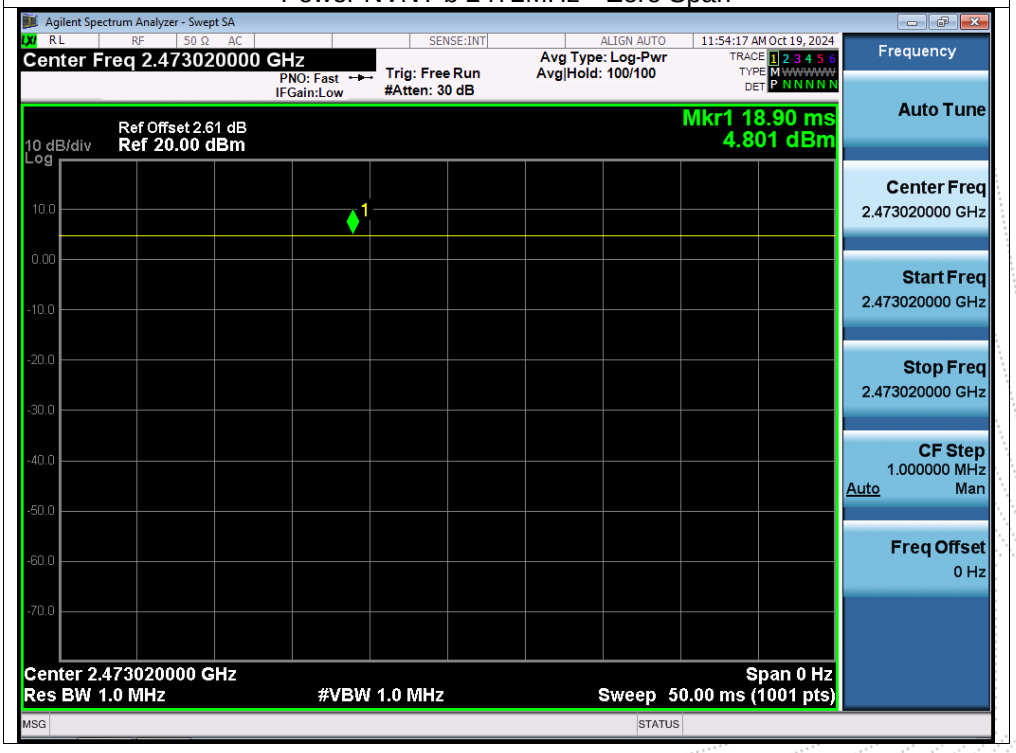
Power NVNT b 2442MHz Pre Scan

Power NVNT b 2442MHz Zero Span



Power NVNT b 2472MHz Pre Scan

Power NVNT b 2472MHz Zero Span



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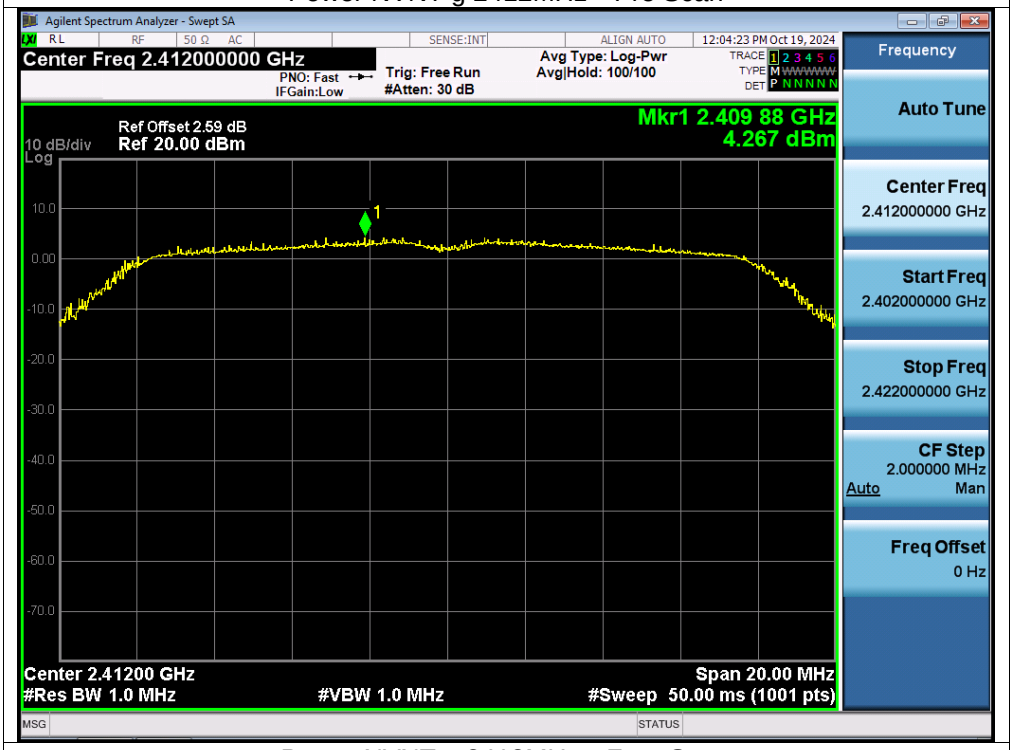

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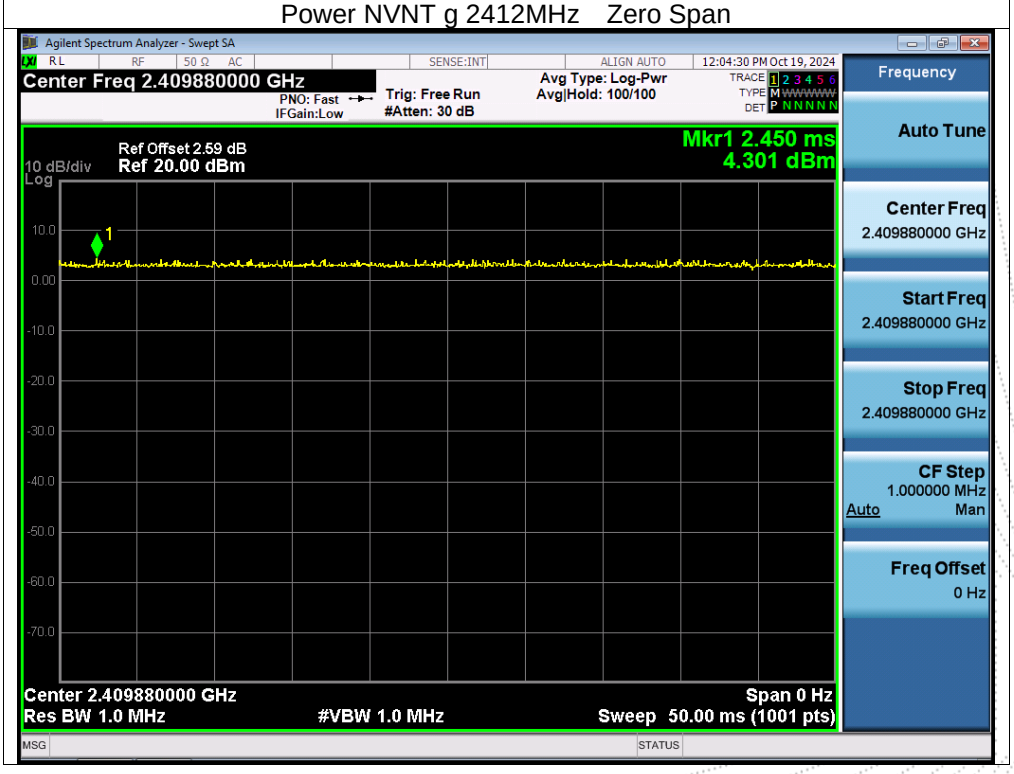
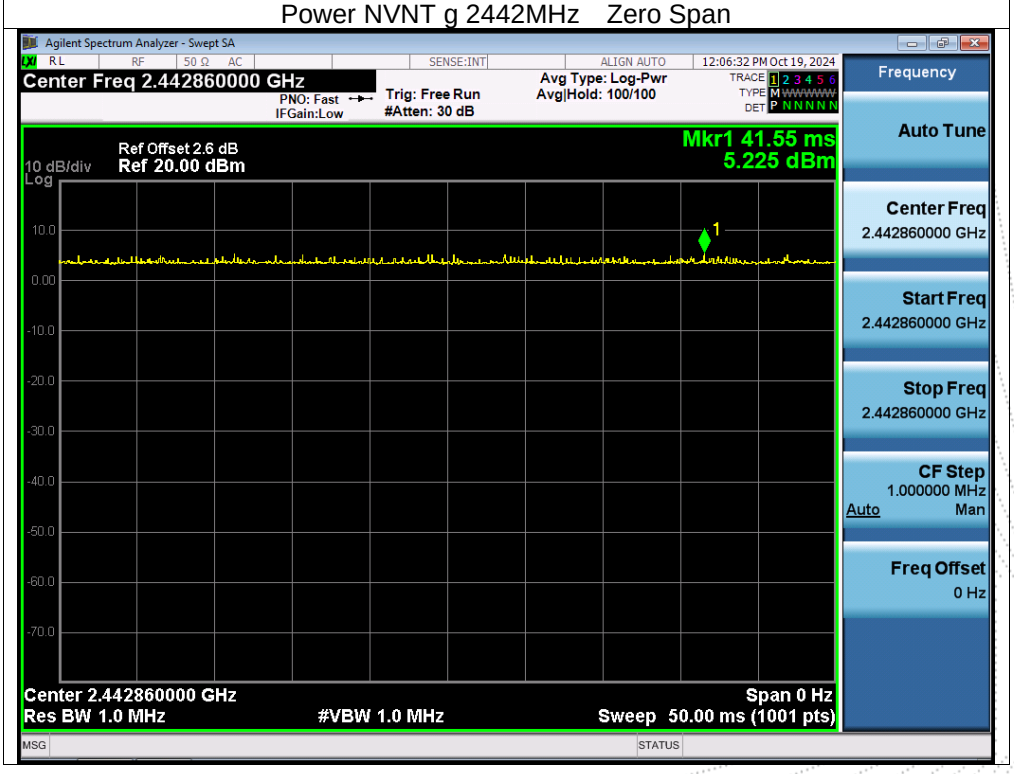


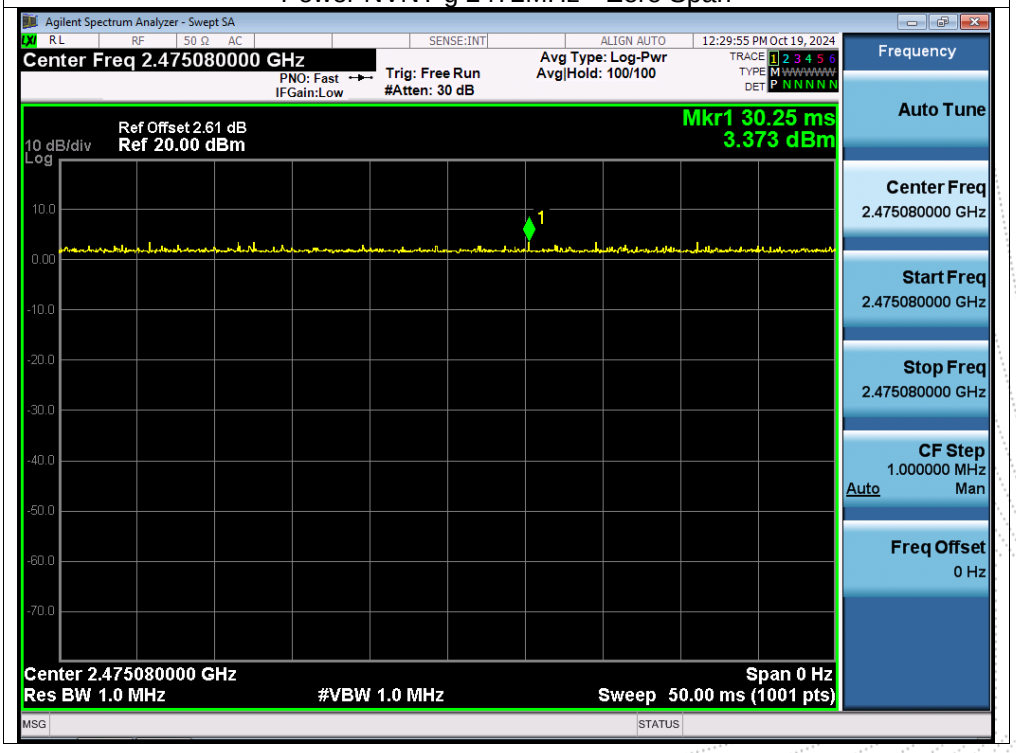
Power NVNT g 2442MHz Pre Scan

Power NVNT g 2442MHz Zero Span

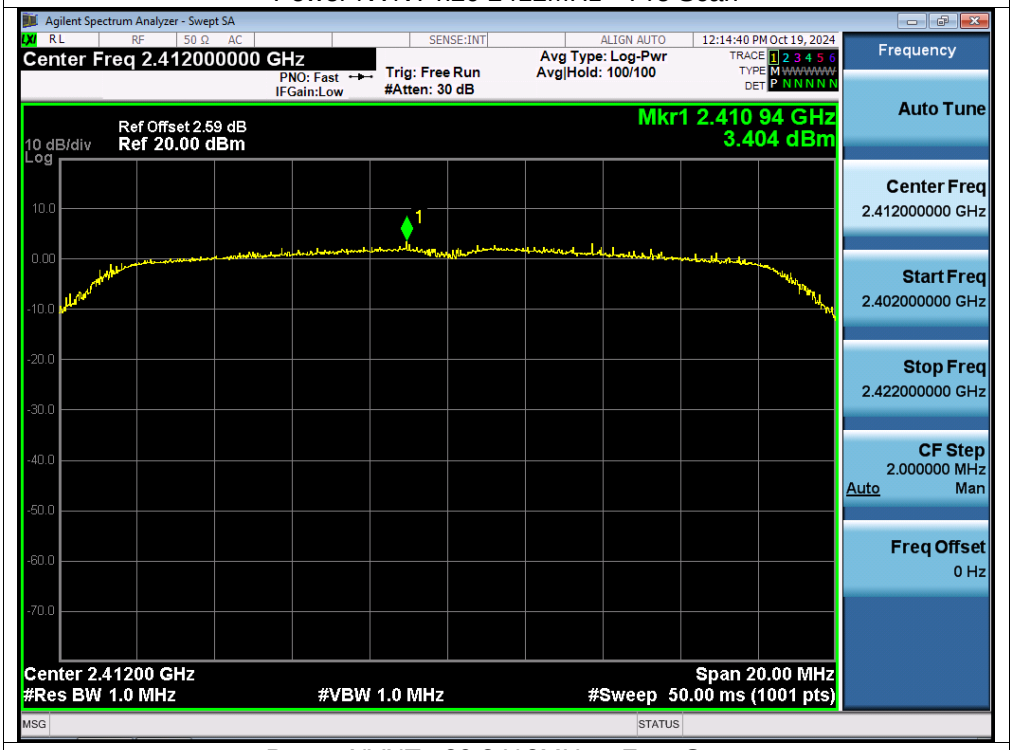


Power NVNT g 2472MHz Pre Scan

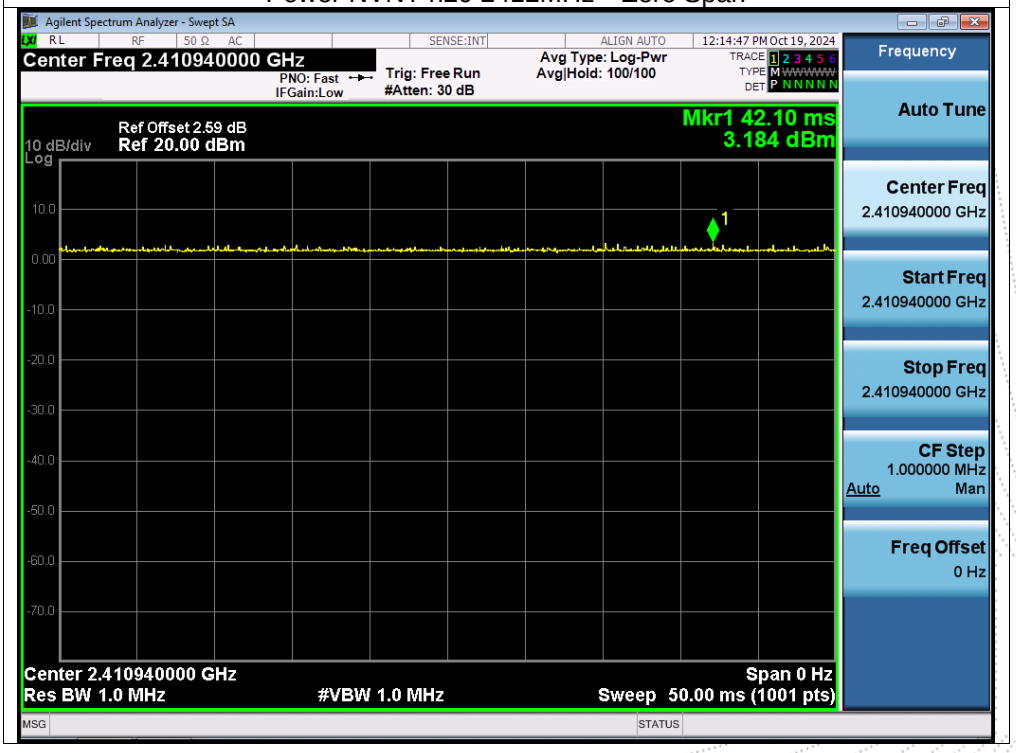
Power NVNT g 2472MHz Zero Span



Power NVNT n20 2412MHz Pre Scan

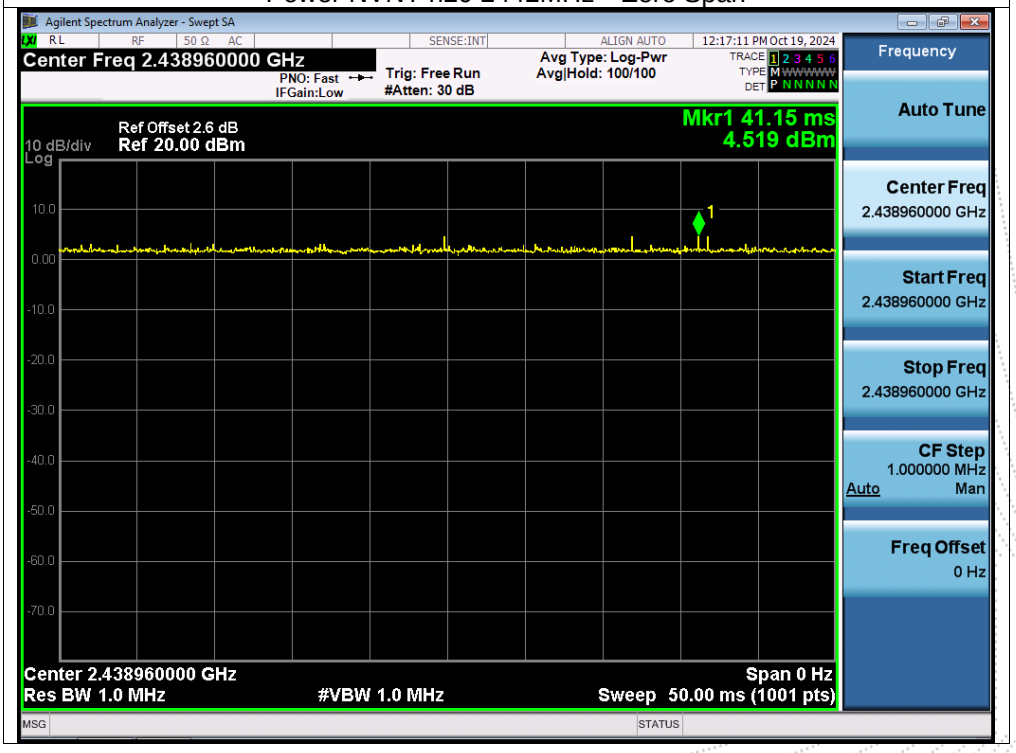


Power NVNT n20 2412MHz Zero Span



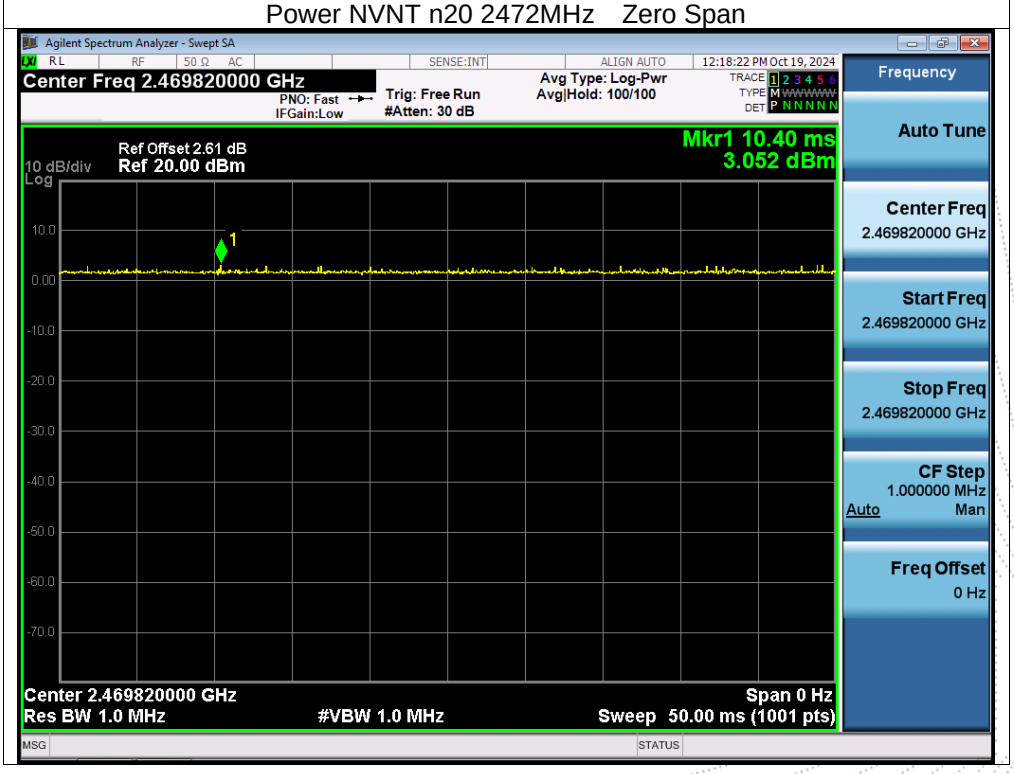
Power NVNT n20 2442MHz Pre Scan

Power NVNT n20 2442MHz Zero Span



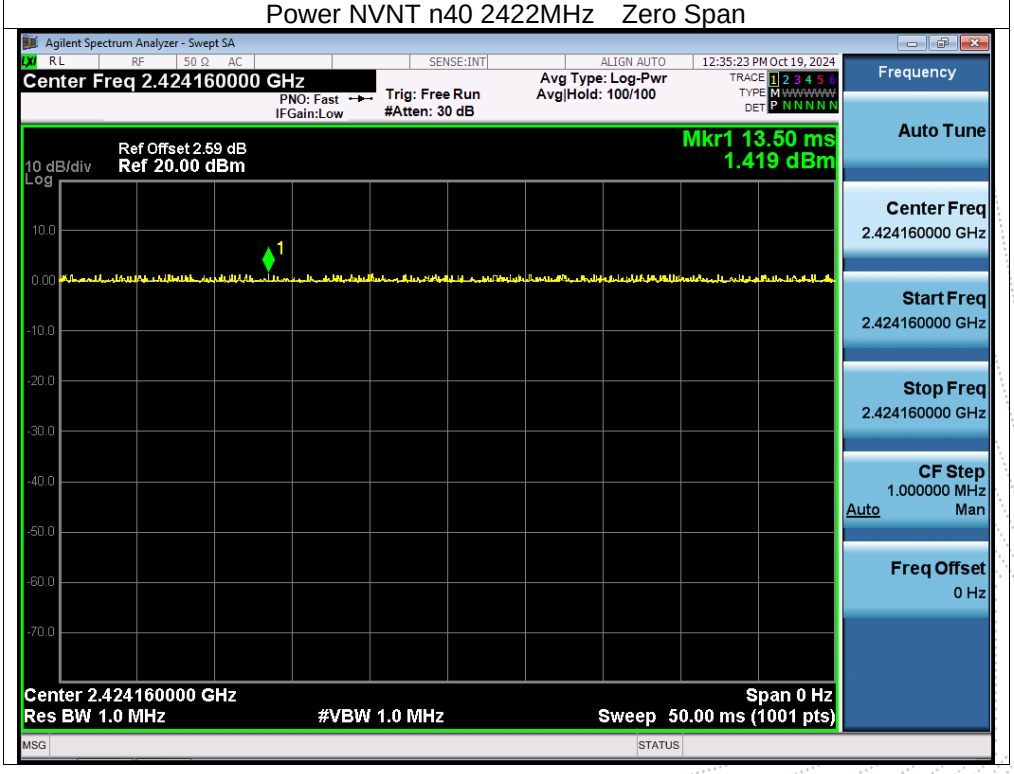
Power NVNT n20 2472MHz Pre Scan

Power NVNT n20 2472MHz Zero Span

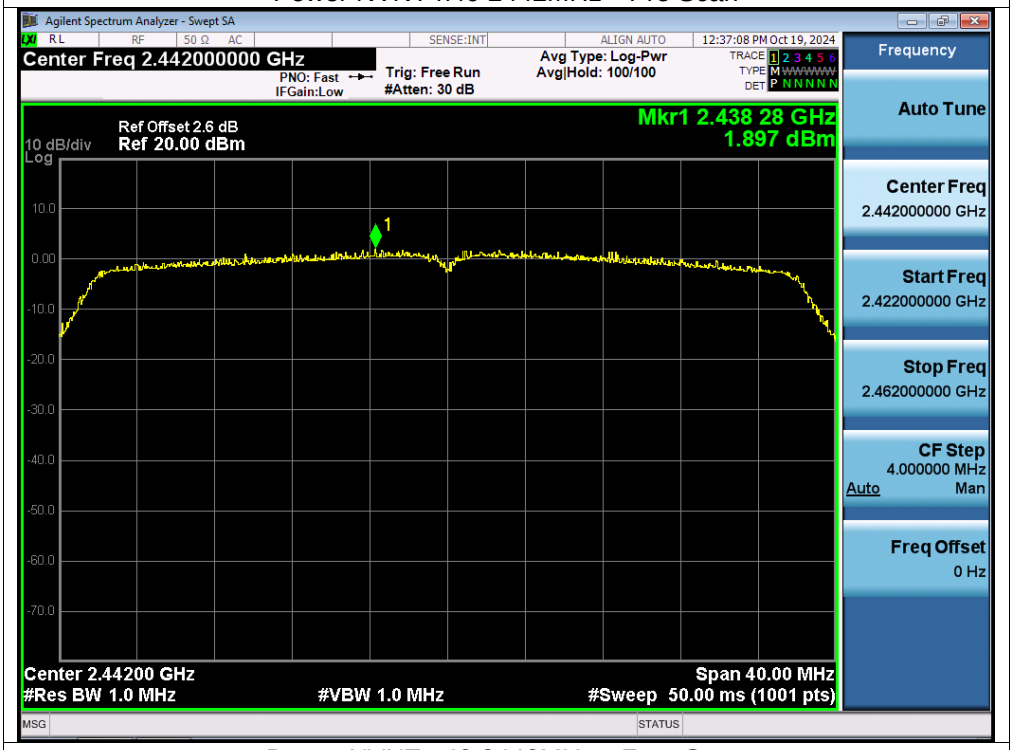


Power NVNT n40 2422MHz Pre Scan

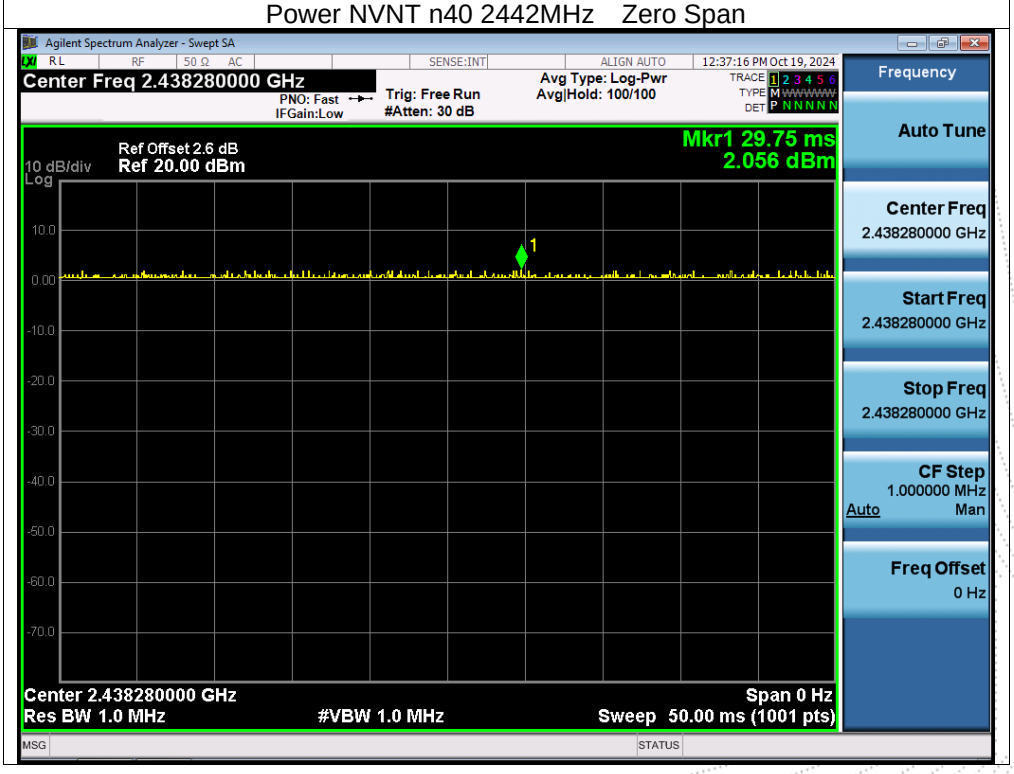
Power NVNT n40 2422MHz Zero Span



Power NVNT n40 2442MHz Pre Scan

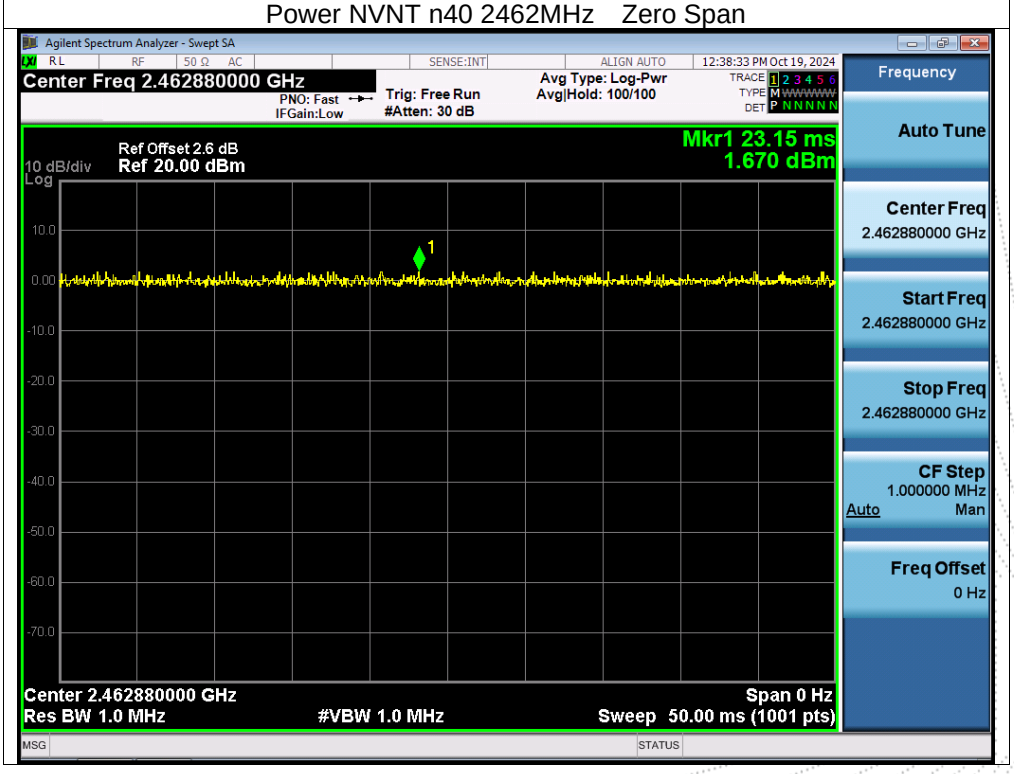


Power NVNT n40 2442MHz Zero Span



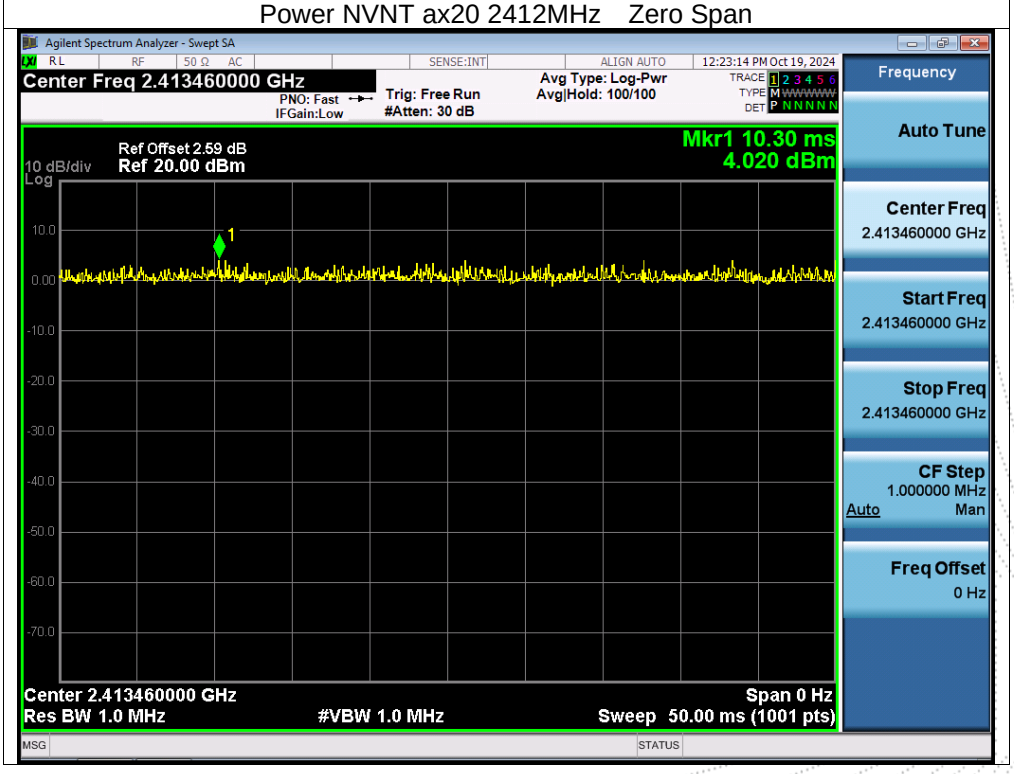
Power NVNT n40 2462MHz Pre Scan

Power NVNT n40 2462MHz Zero Span

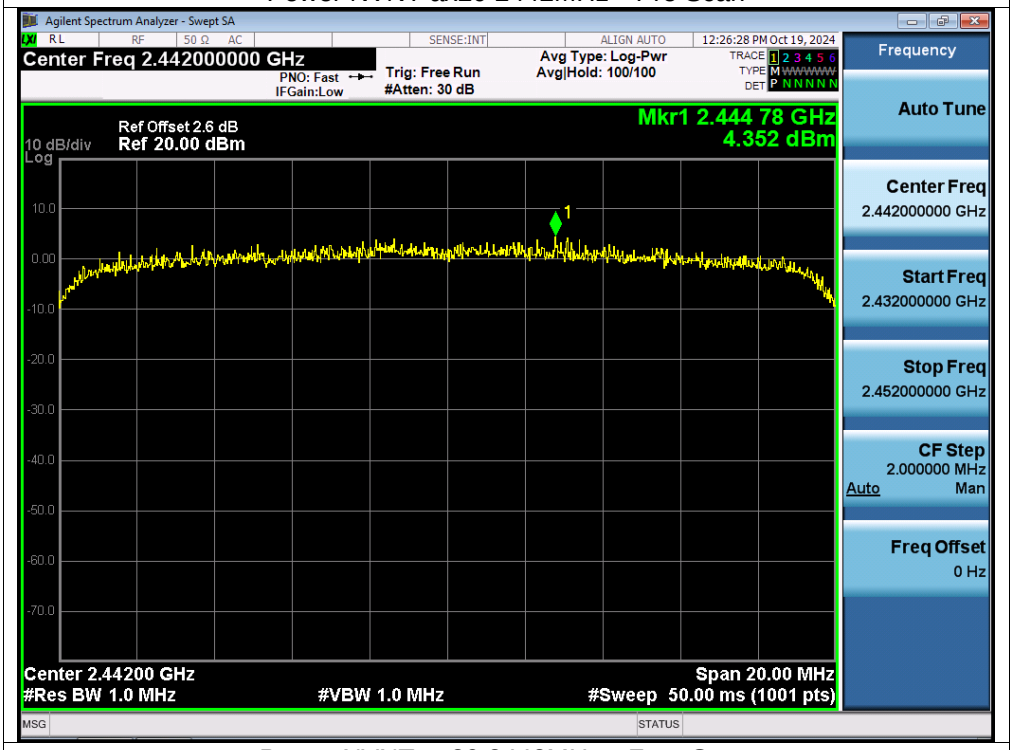


Power NVNT ax20 2412MHz Pre Scan

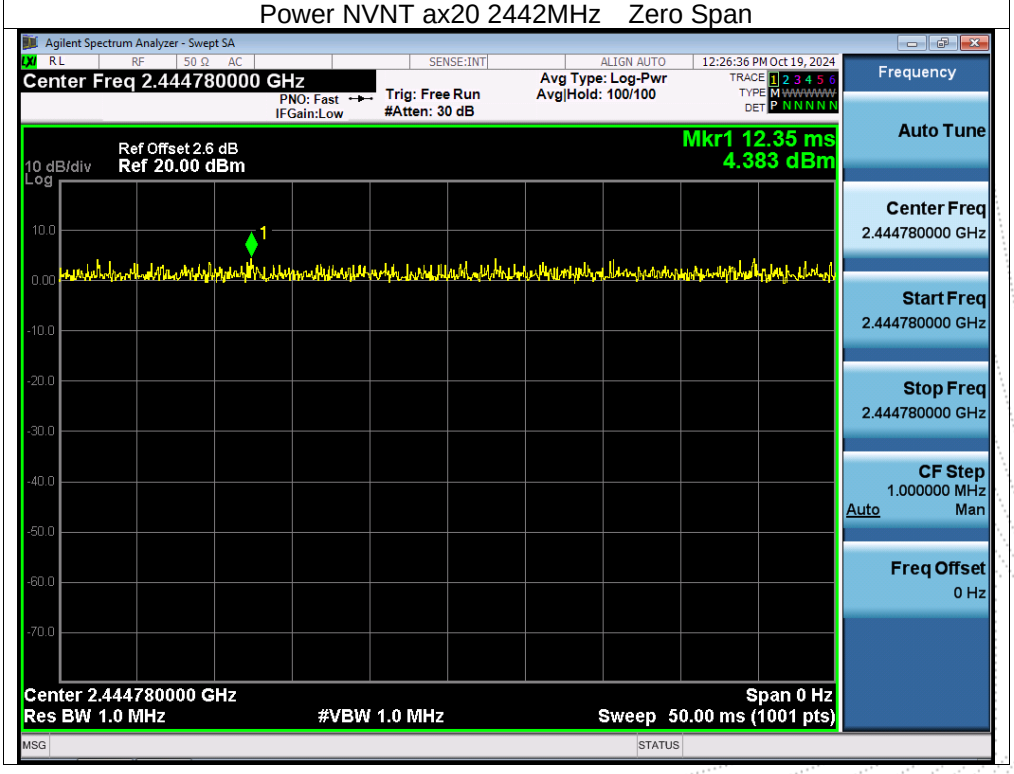
Power NVNT ax20 2412MHz Zero Span



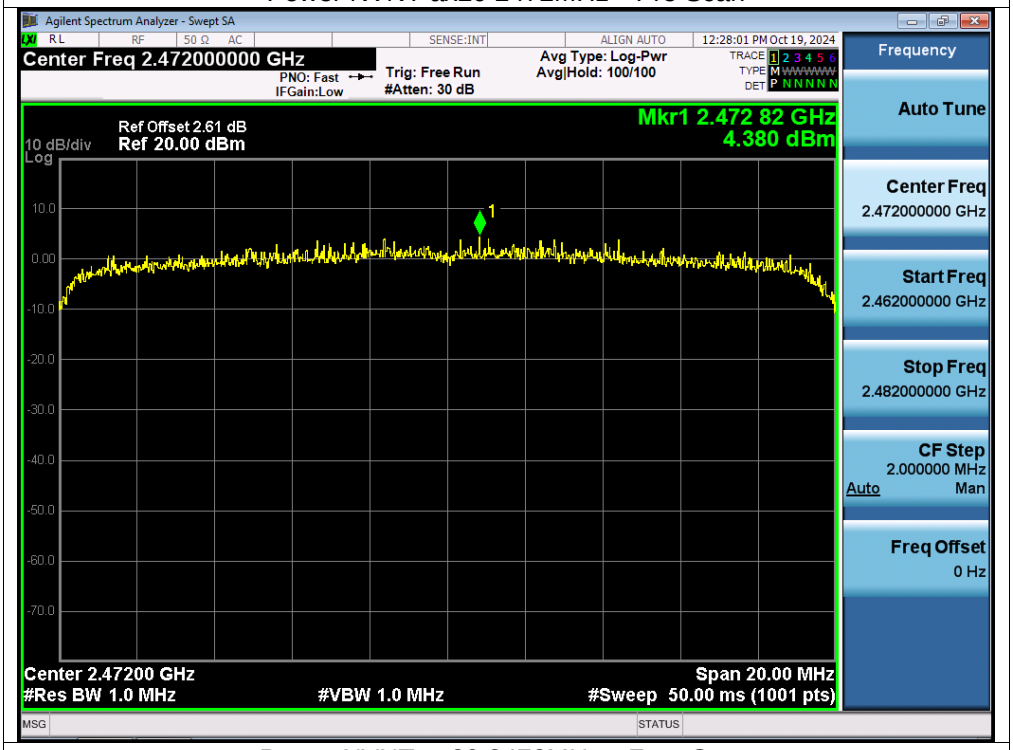
Power NVNT ax20 2442MHz Pre Scan



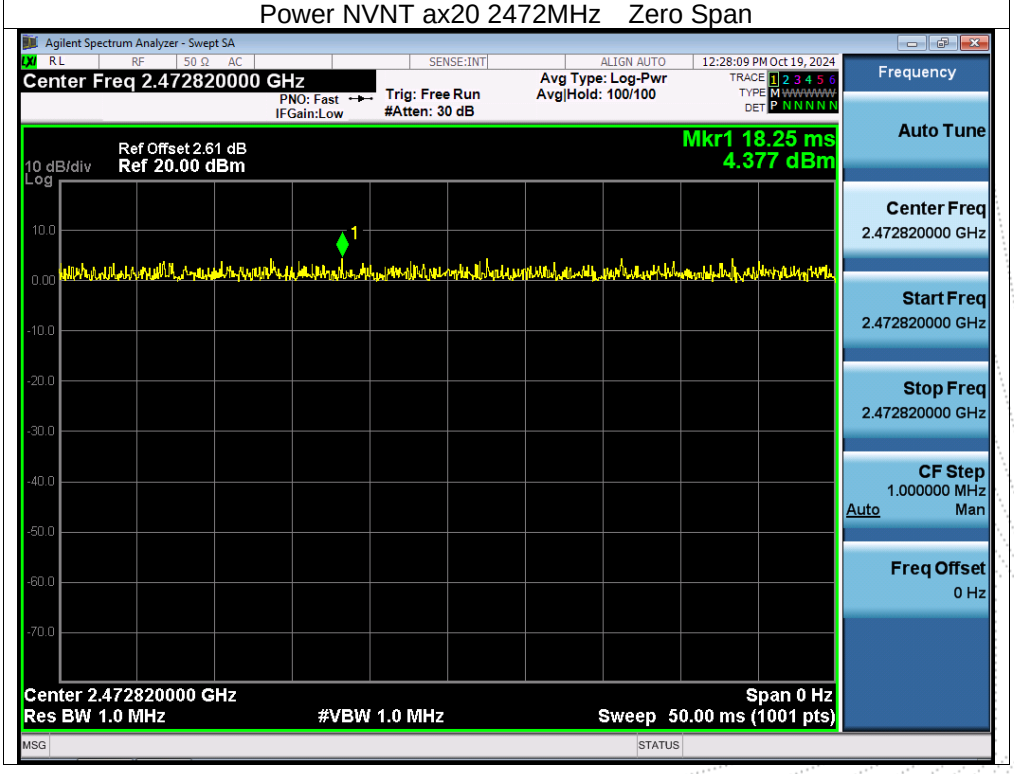
Power NVNT ax20 2442MHz Zero Span



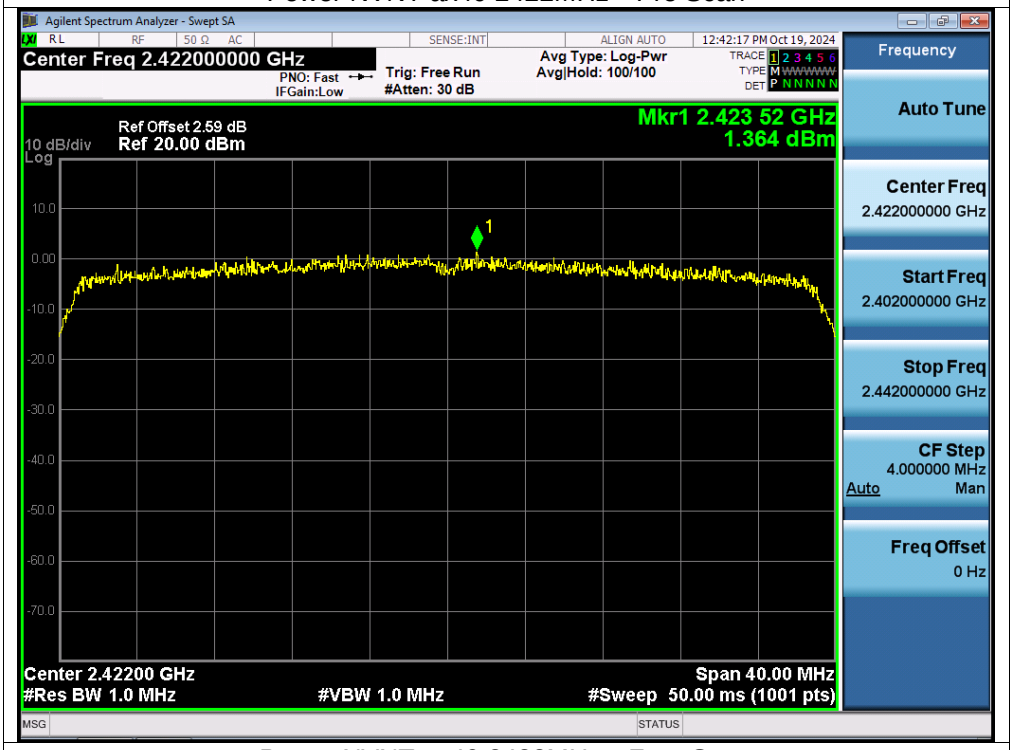
Power NVNT ax20 2472MHz Pre Scan



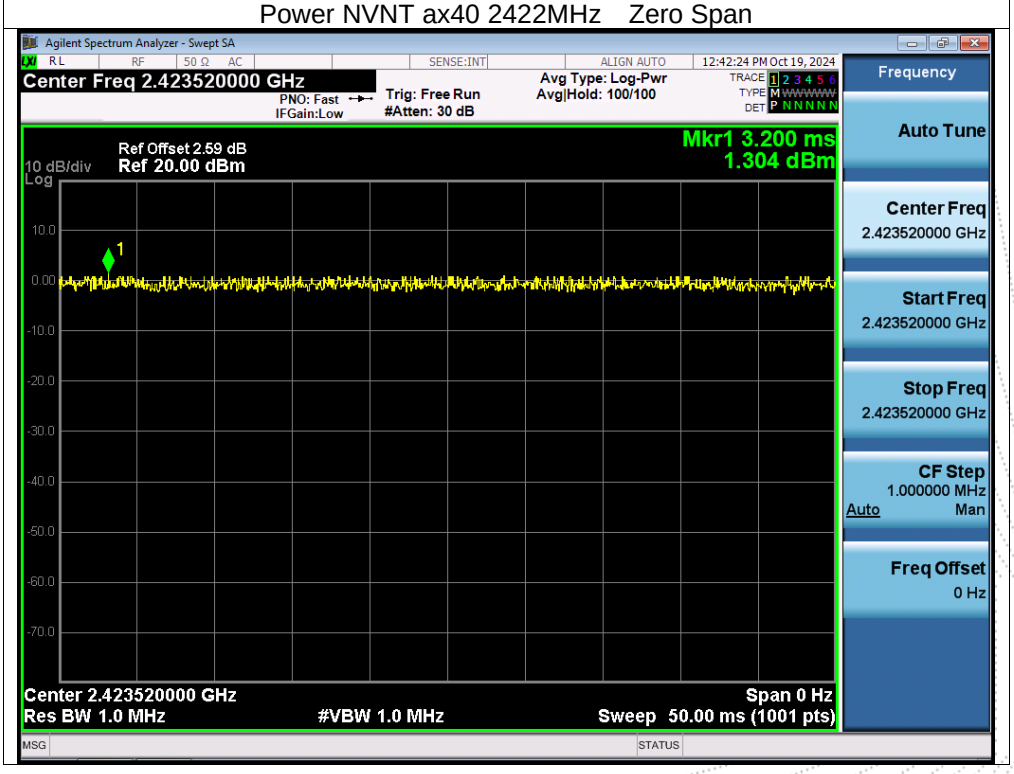
Power NVNT ax20 2472MHz Zero Span



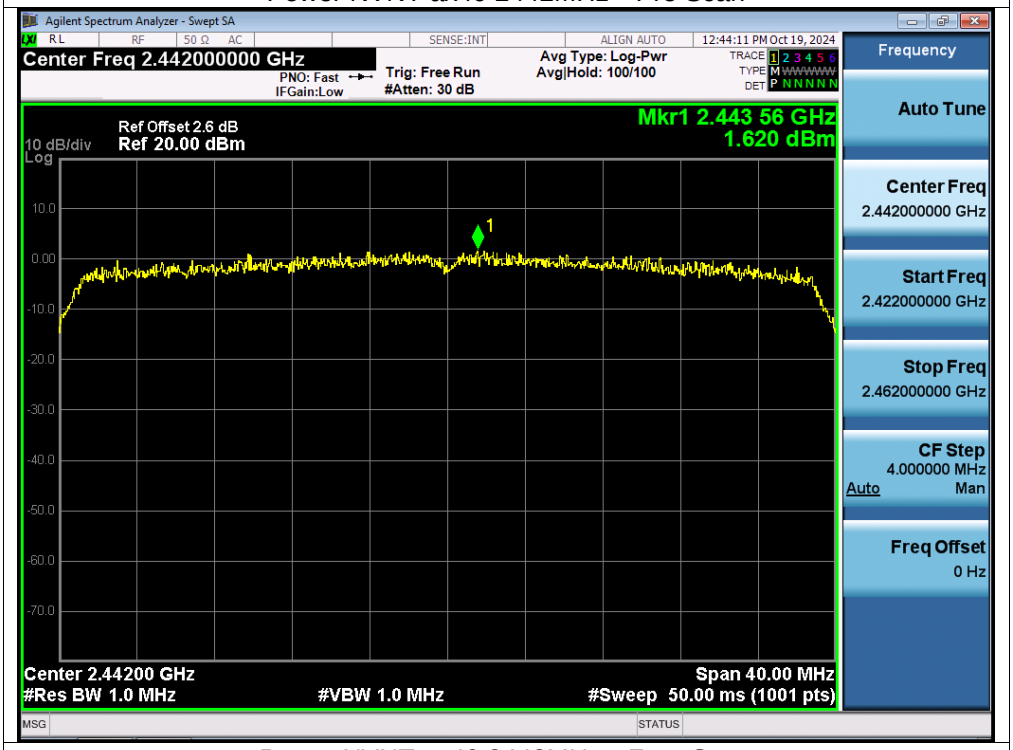
Power NVNT ax40 2422MHz Pre Scan



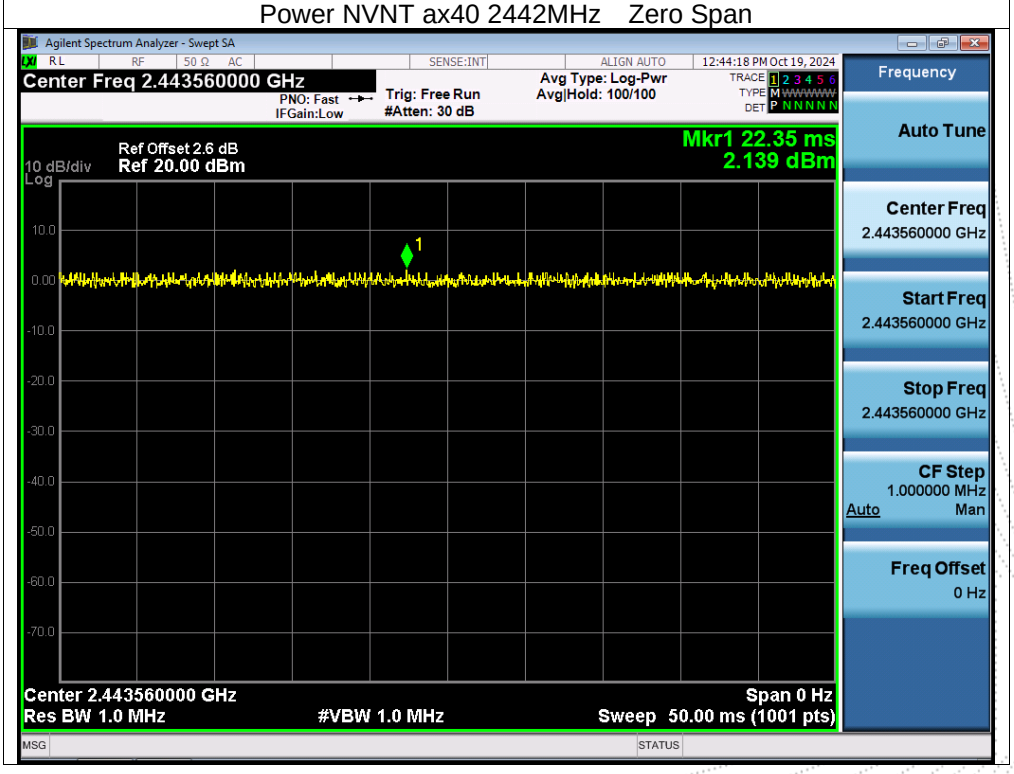
Power NVNT ax40 2422MHz Zero Span



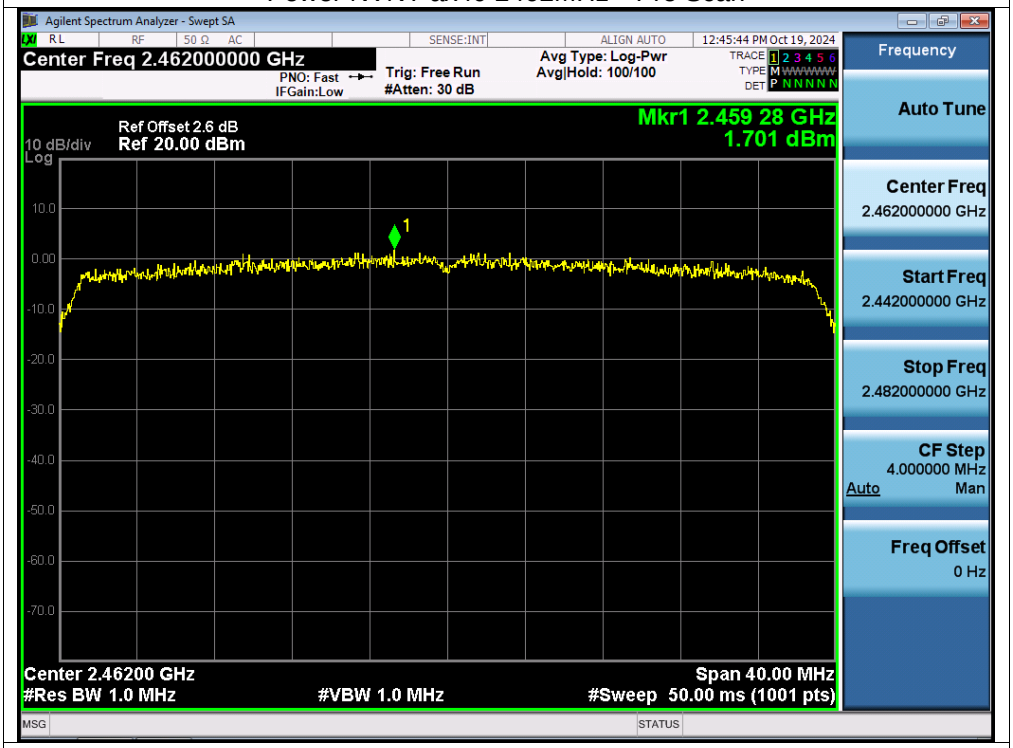
Power NVNT ax40 2442MHz Pre Scan



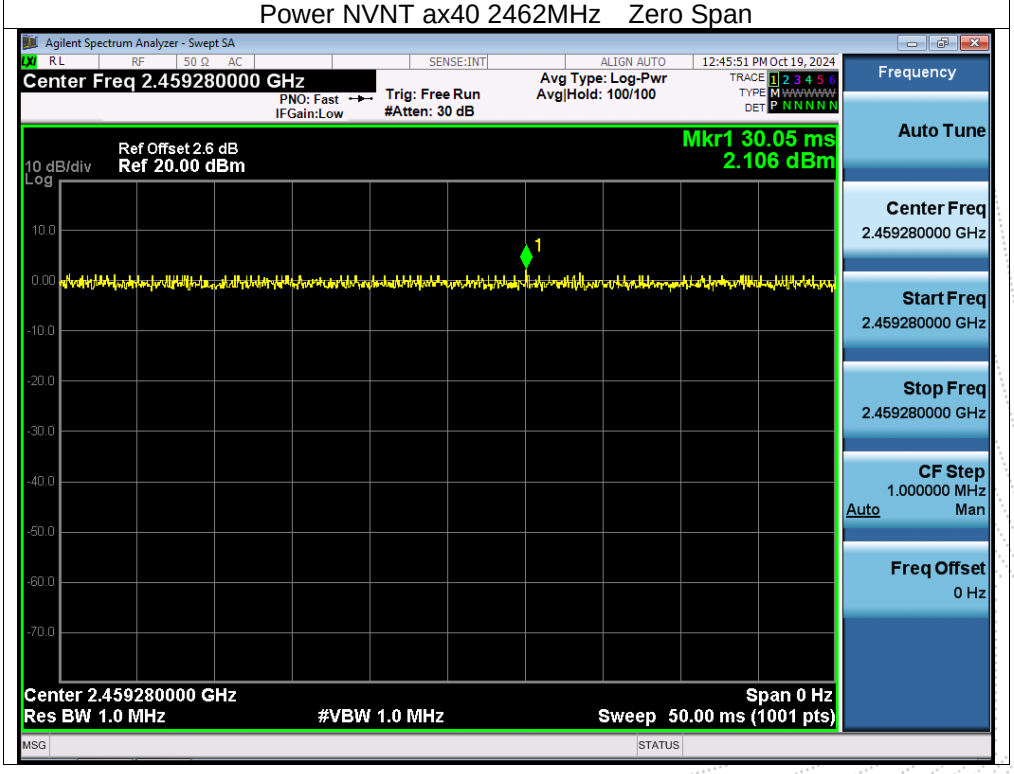
Power NVNT ax40 2442MHz Zero Span



Power NVNT ax40 2462MHz Pre Scan

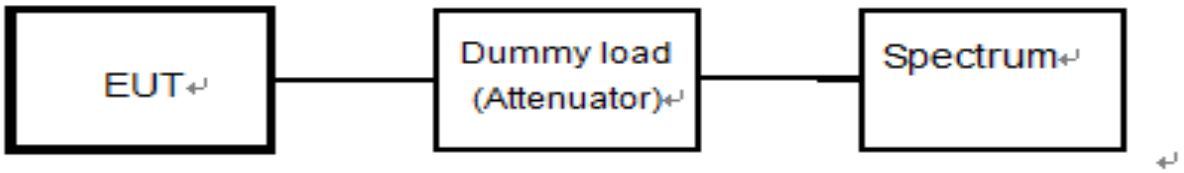


Power NVNT ax40 2462MHz Zero Span



9. Occupied Bandwidth And Spread-Spectrum Bandwidth Measurement

9.1 Block Diagram Of Test Setup



9.2 Limit

Item	Limits
Occupied Band Width:	802.11b,g,n(HT20): 26MHz or less 802.11n(HT40): 38 MHz or less
Spreading Bandwidth:	≧500 kHz (FH, DS)

9.3 Test Procedure

1. Setting of SA is following as: RB: 300kHz / VB:300kHz / SPAN: 3MHz / AT: 20dB Ref: 10dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
2. EUT have transmitted the maximum modulation signal and fixed channelize (For DSSS or OFDM Device) or continuous maximum power of hopping mode (For FHSS Device).
SA set to 99% of occupied bandwidth to measure occupied bandwidth. The limit is less than 26MHz (For DSSS or OFDM Device) or 83.5MHz (For FHSS Device).
3. SA set to 90% of occupied bandwidth to measure Spread Spectrum Bandwidth and must greater than 500kHz.
4. Spread Spectrum Factor = Spread Spectrum Bandwidth / modulation rate of EUT.
5. Spread Spectrum Factor limit is greater than 5

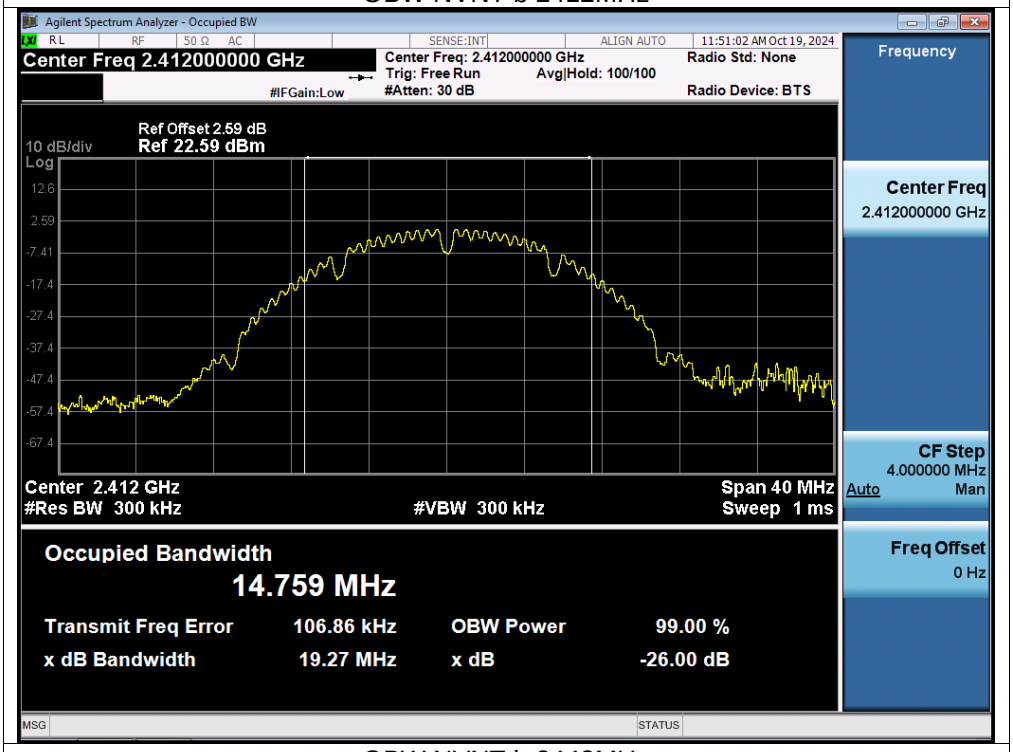
9.4 Test Result

Temperature:	25°C		
Humidity:	55 % RH	Test Voltage	DC 5V

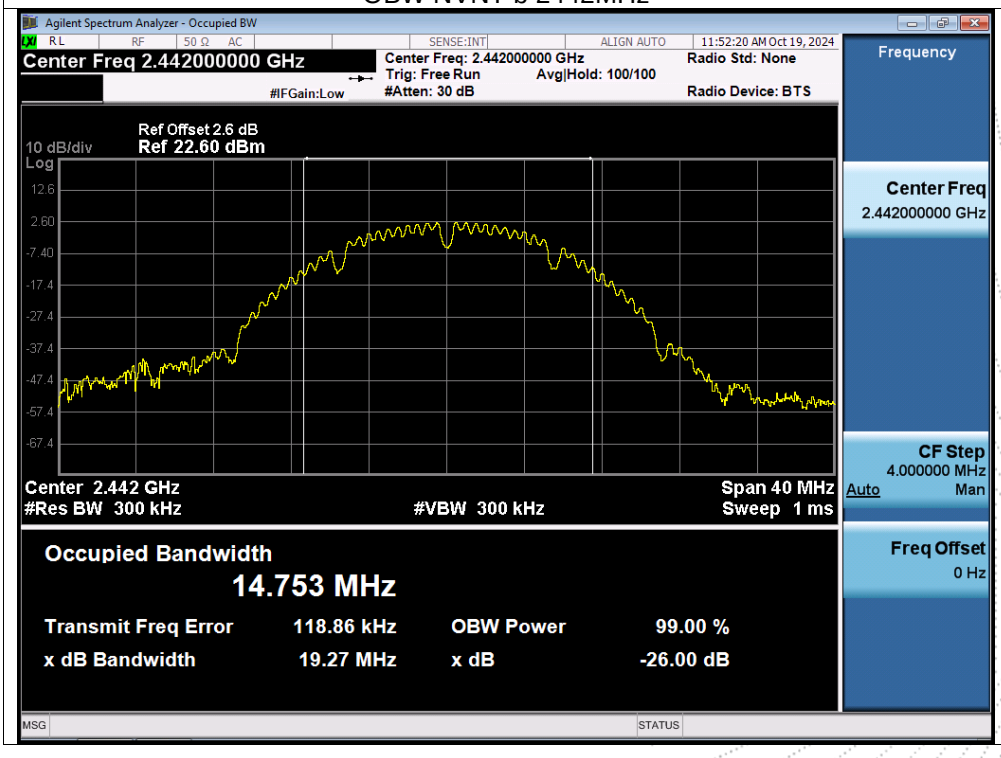
Condition	Mode	Frequency (MHz)	99% OBW (MHz)	90% OBW (MHz)	Spread Factor	90% OBW Limit (MHz)	Verdict
NVNT	b	2412	14.759	9.371	6.815	0.5	Pass
NVNT	b	2442	14.753	9.411	6.844	0.5	Pass
NVNT	b	2472	14.753	9.428	6.857	0.5	Pass
NVNT	g	2412	16.654	14.263	9.509	0.5	Pass
NVNT	g	2442	16.627	14.271	9.514	0.5	Pass
NVNT	g	2472	16.645	14.137	9.425	0.5	Pass
NVNT	n20	2412	17.804	15.075	10.050	0.5	Pass
NVNT	n20	2442	17.82	15.247	10.165	0.5	Pass
NVNT	n20	2472	17.795	15.389	10.259	0.5	Pass
NVNT	n40	2422	36.093	31.207	10.402	0.5	Pass
NVNT	n40	2442	36.121	31.124	10.375	0.5	Pass
NVNT	n40	2462	36.118	31.001	10.334	0.5	Pass
NVNT	ax20	2412	18.957	16.208	10.805	0.5	Pass
NVNT	ax20	2442	18.998	16.01	10.673	0.5	Pass
NVNT	ax20	2472	18.963	16.168	10.779	0.5	Pass
NVNT	ax40	2422	37.612	32.437	10.812	0.5	Pass
NVNT	ax40	2442	37.69	31.708	10.569	0.5	Pass
NVNT	ax40	2462	37.627	32.562	10.854	0.5	Pass

Test Graphs

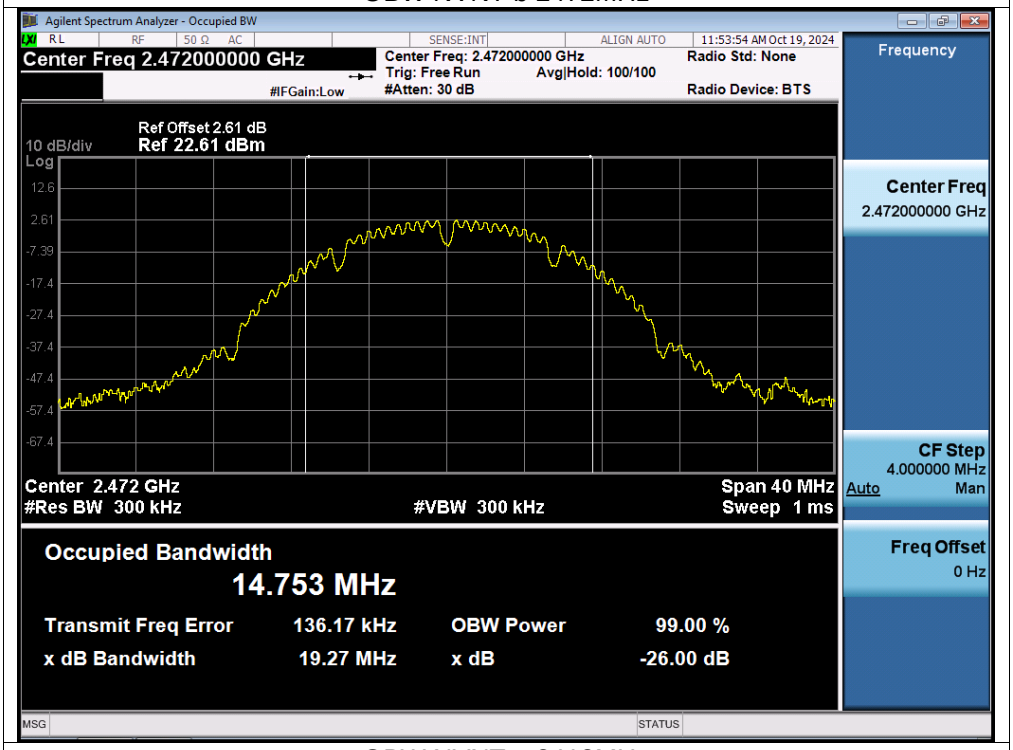
OBW NVNT b 2412MHz



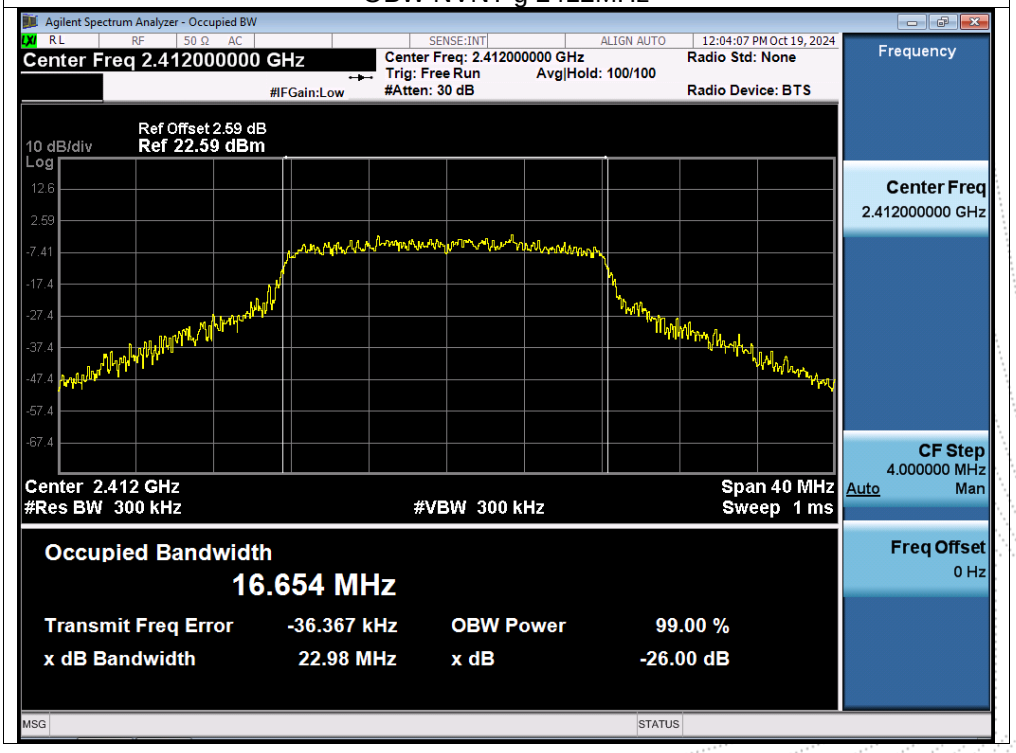
OBW NVNT b 2442MHz



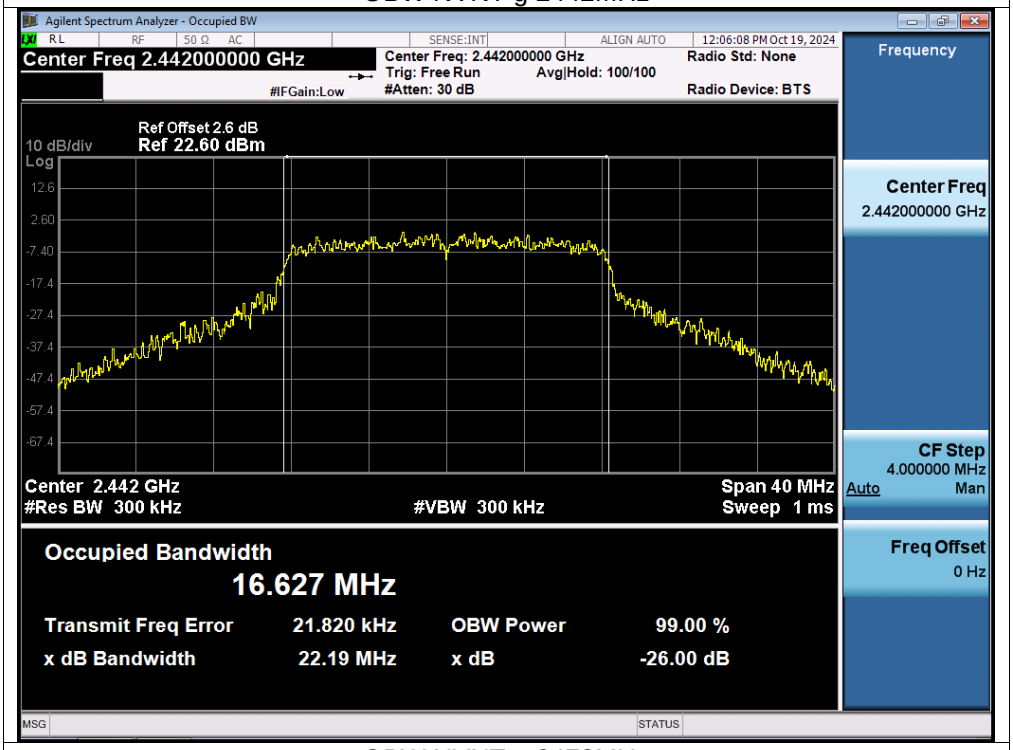
OBW NVNT b 2472MHz



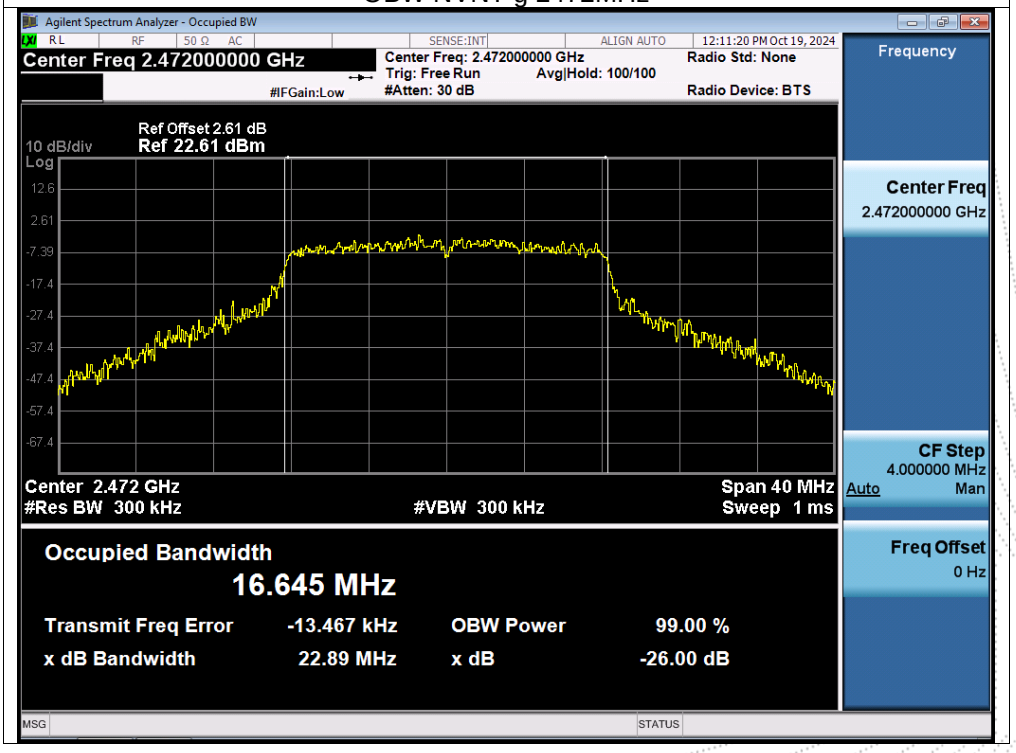
OBW NVNT g 2412MHz



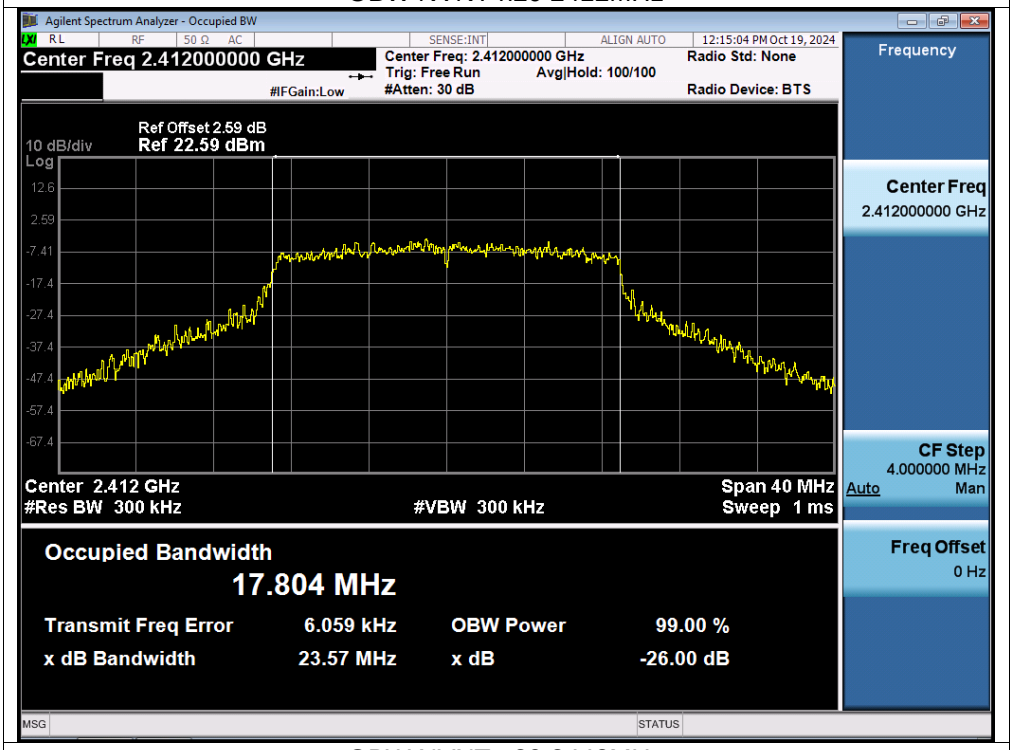
OBW NVNT g 2442MHz



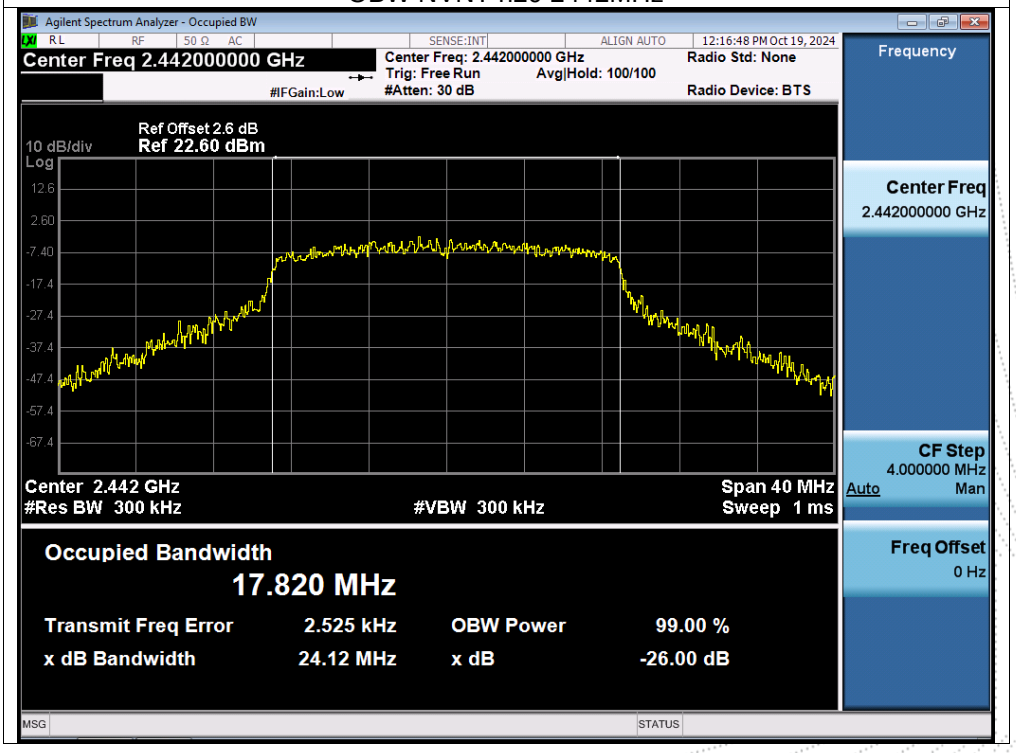
OBW NVNT g 2472MHz



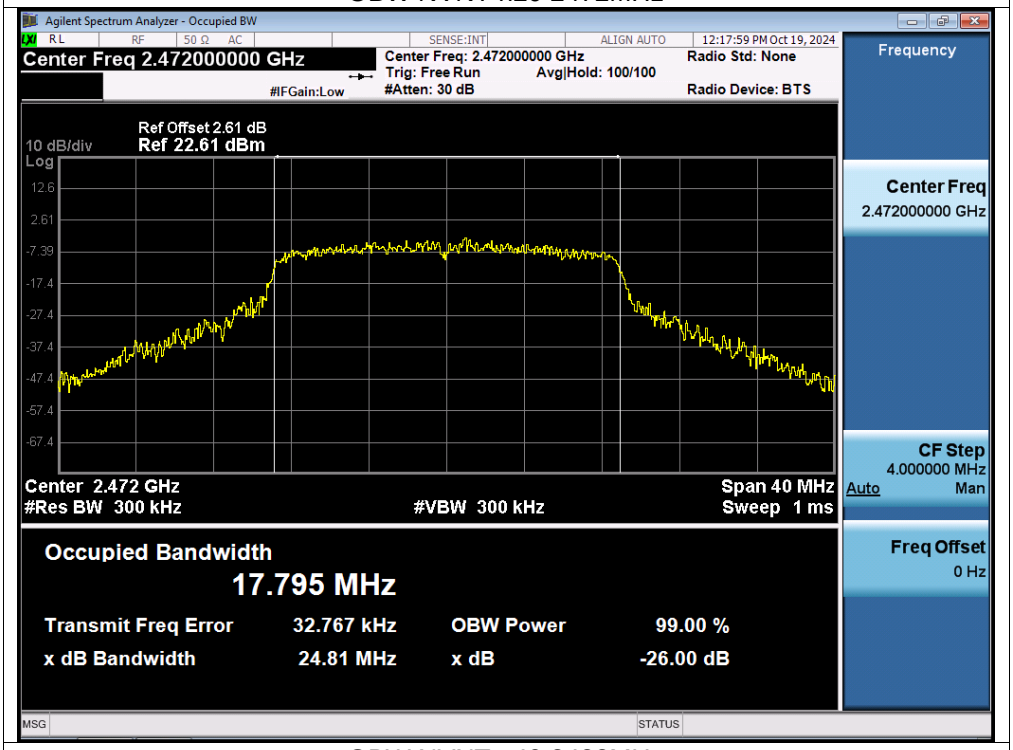
OBW NVNT n20 2412MHz



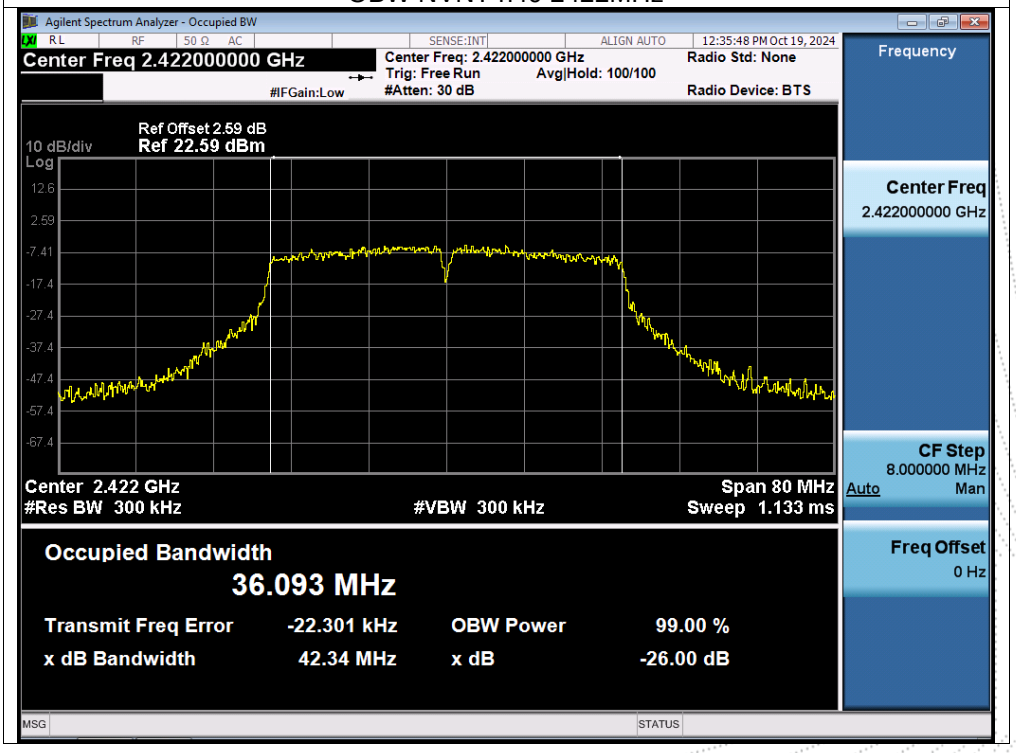
OBW NVNT n20 2442MHz



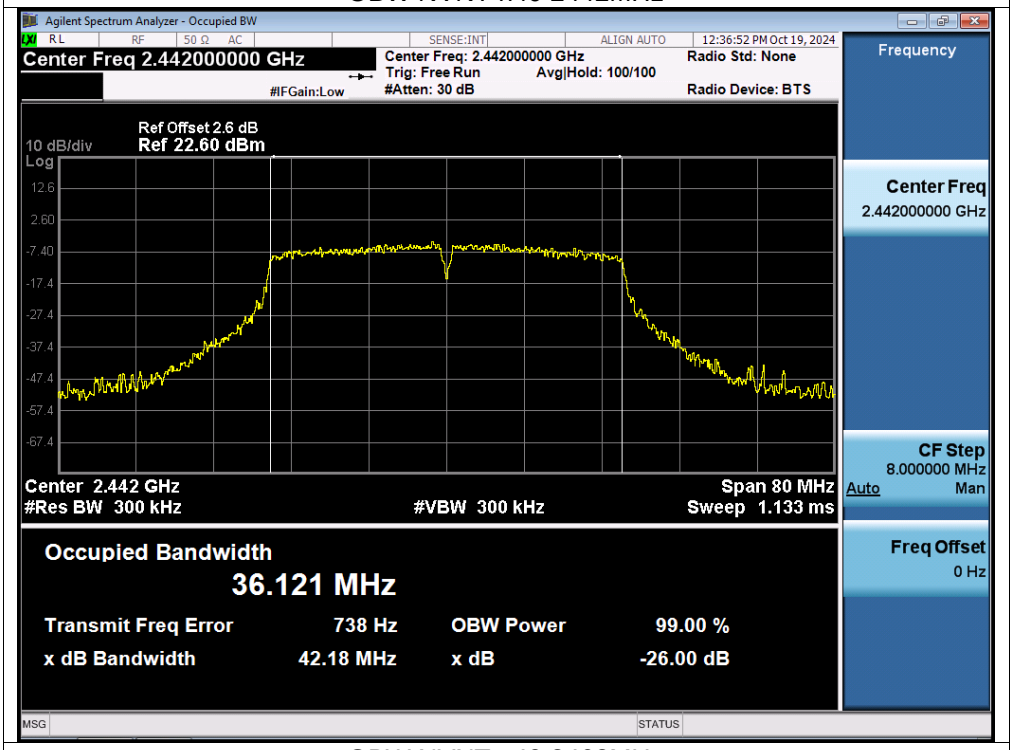
OBW NVNT n20 2472MHz



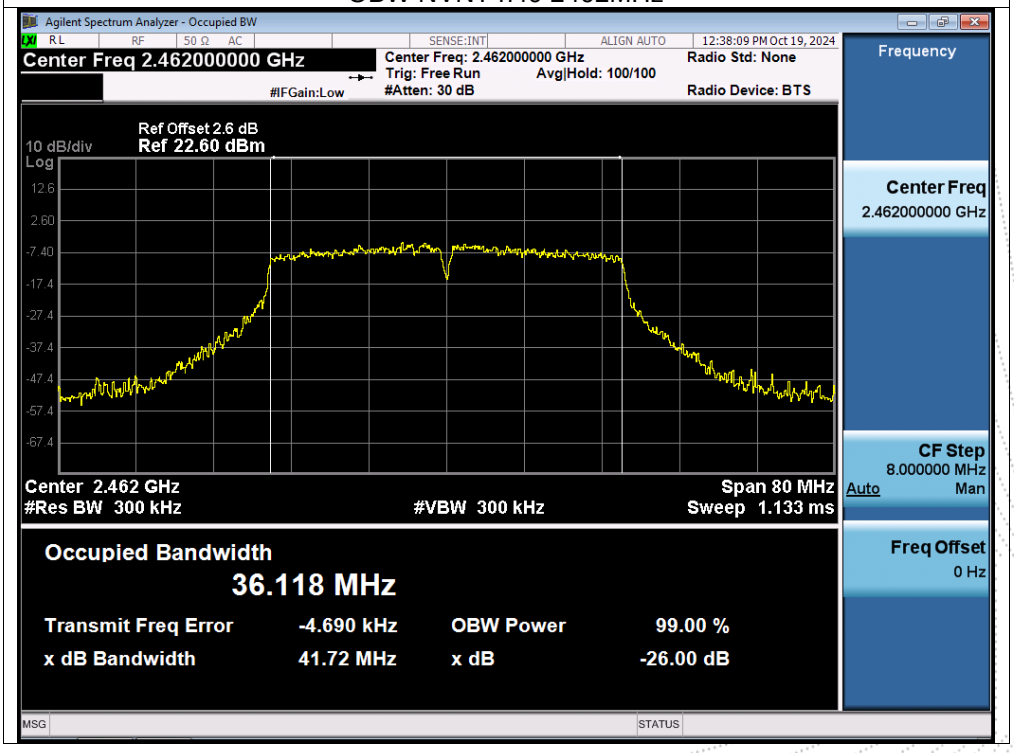
OBW NVNT n40 2422MHz



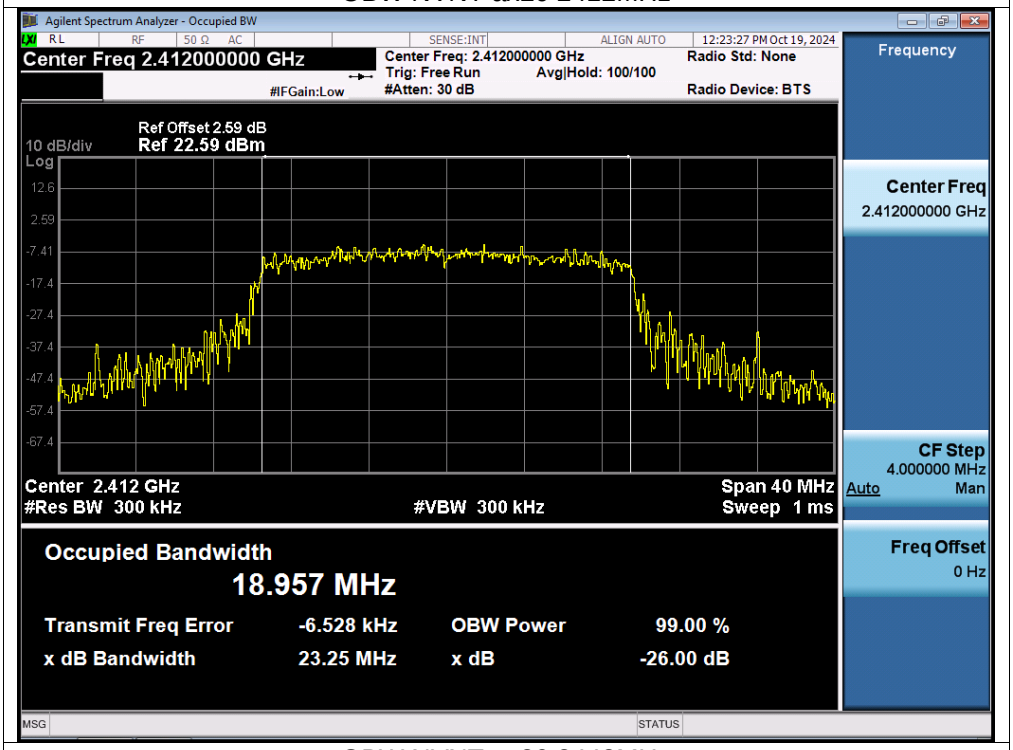
OBW NVNT n40 2442MHz



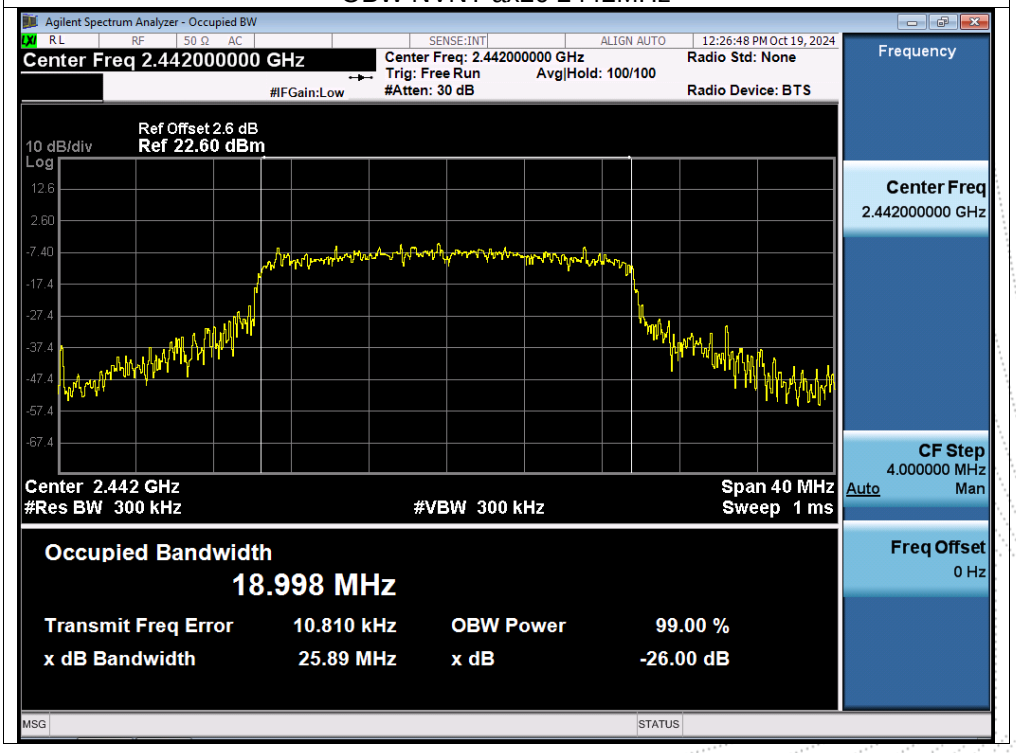
OBW NVNT n40 2462MHz



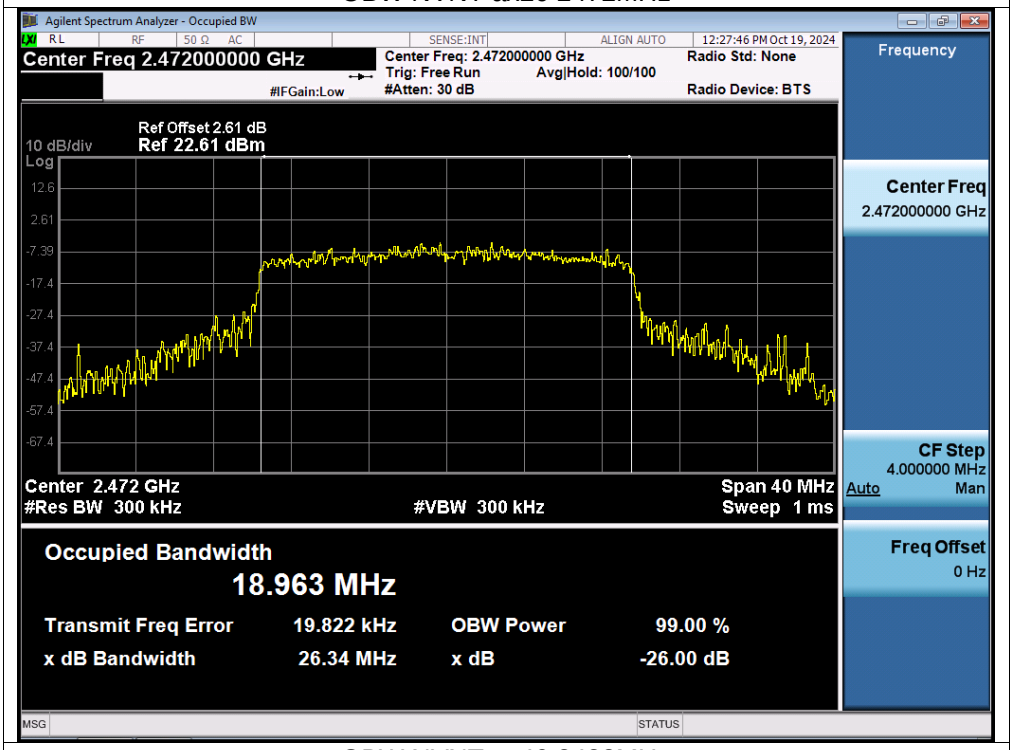
OBW NVNT ax20 2412MHz



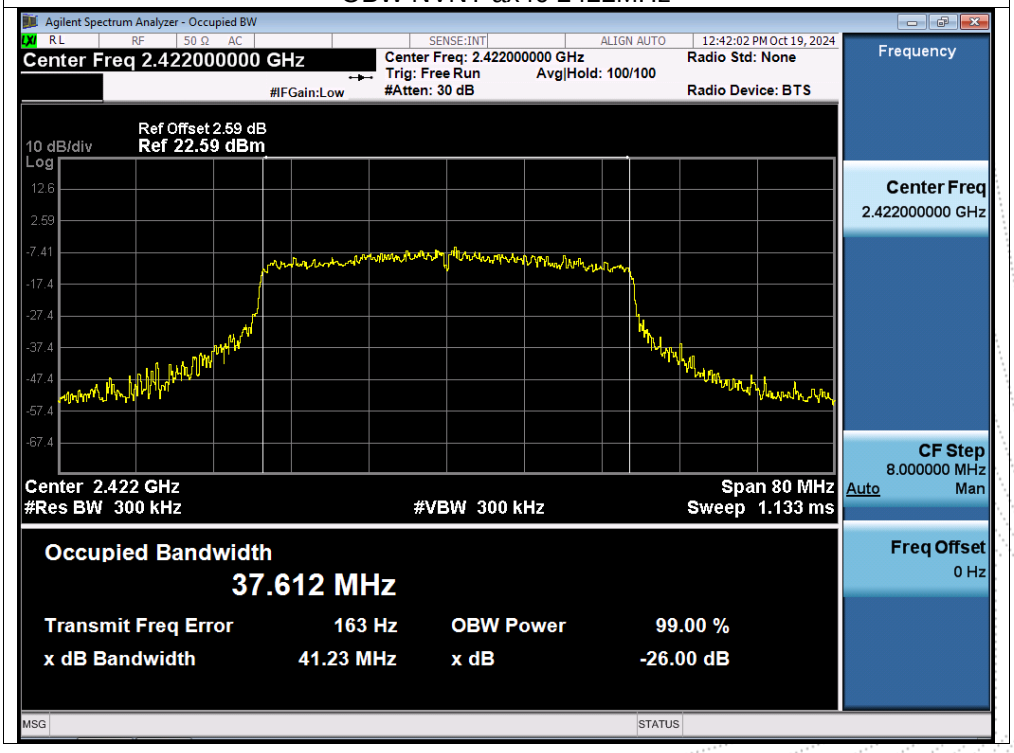
OBW NVNT ax20 2442MHz



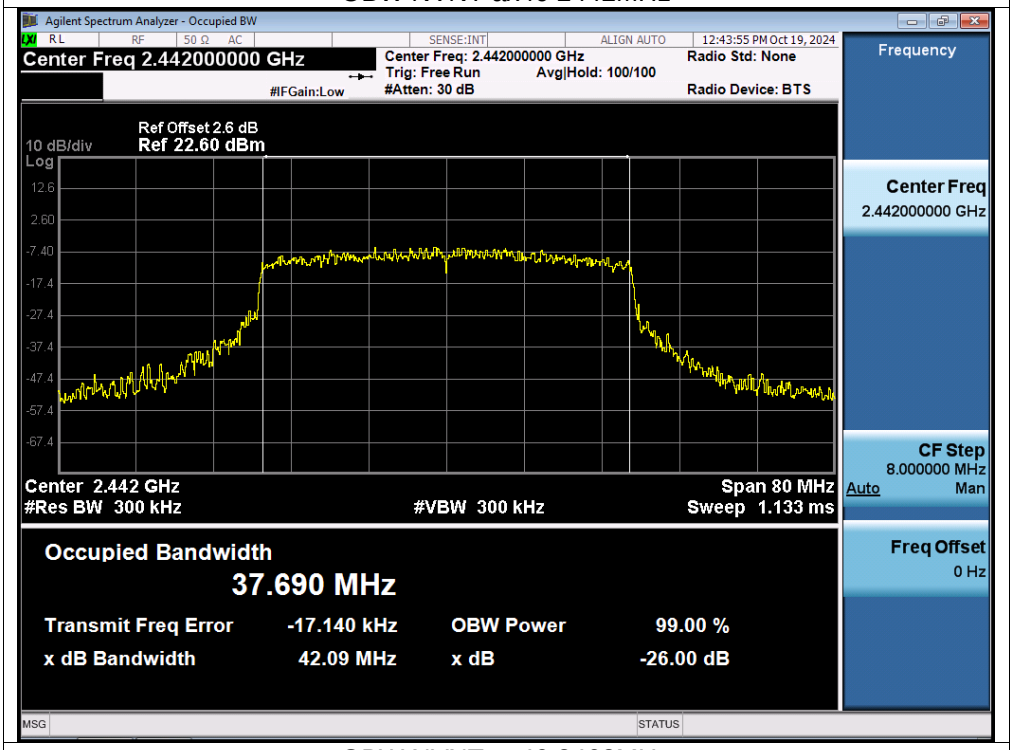
OBW NVNT ax20 2472MHz



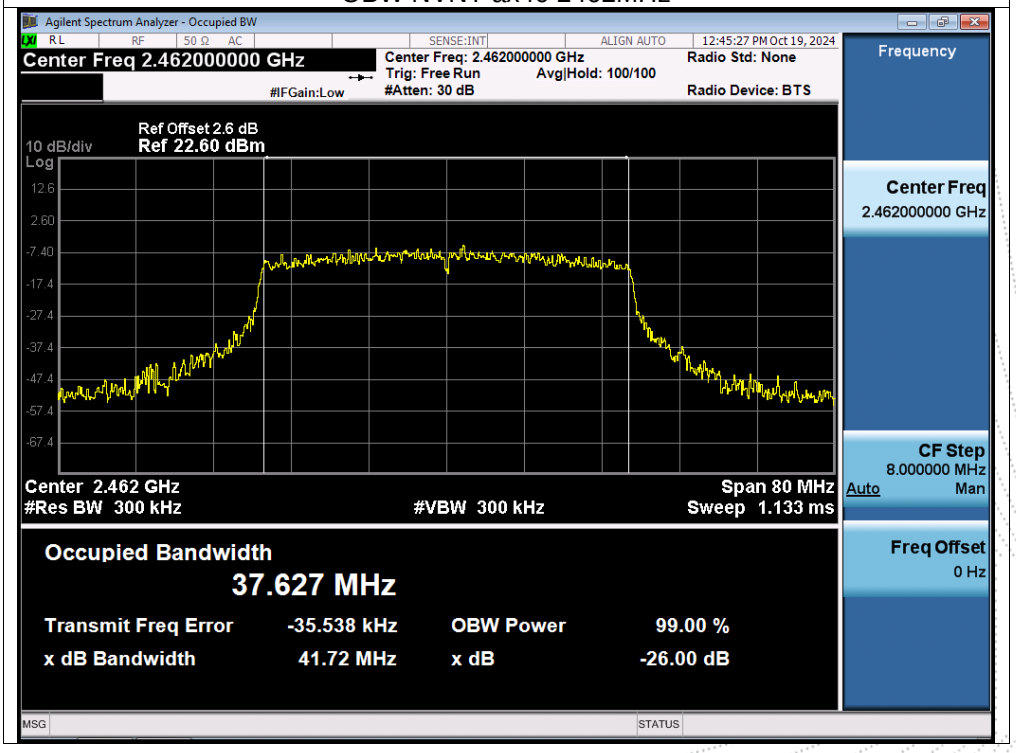
OBW NVNT ax40 2422MHz



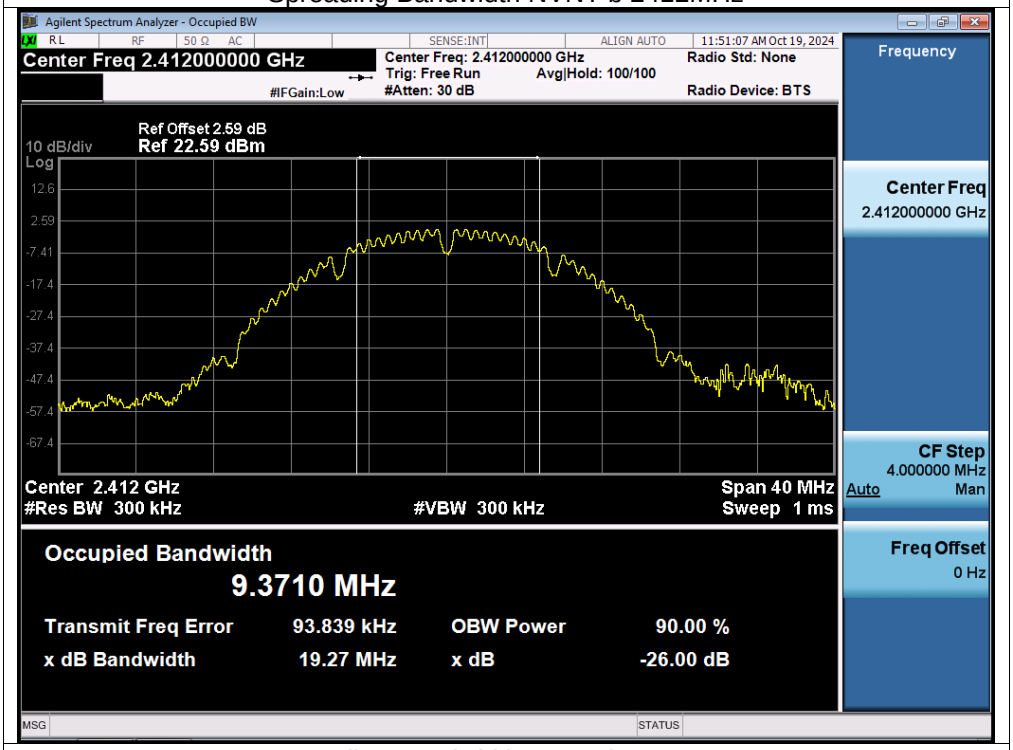
OBW NVNT ax40 2442MHz



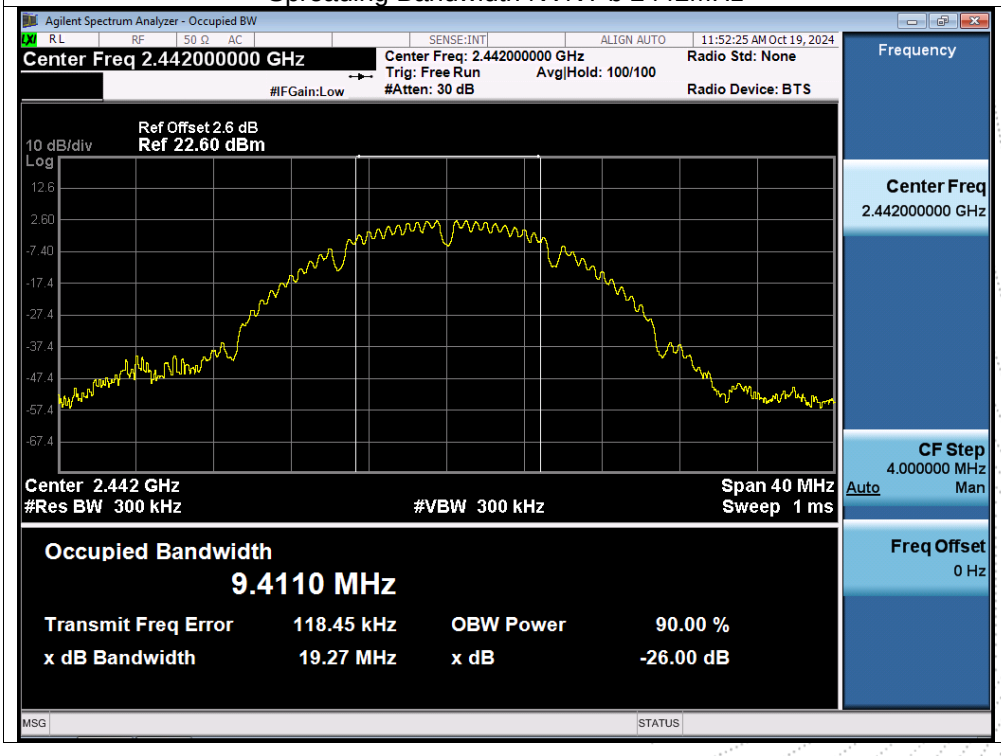
OBW NVNT ax40 2462MHz



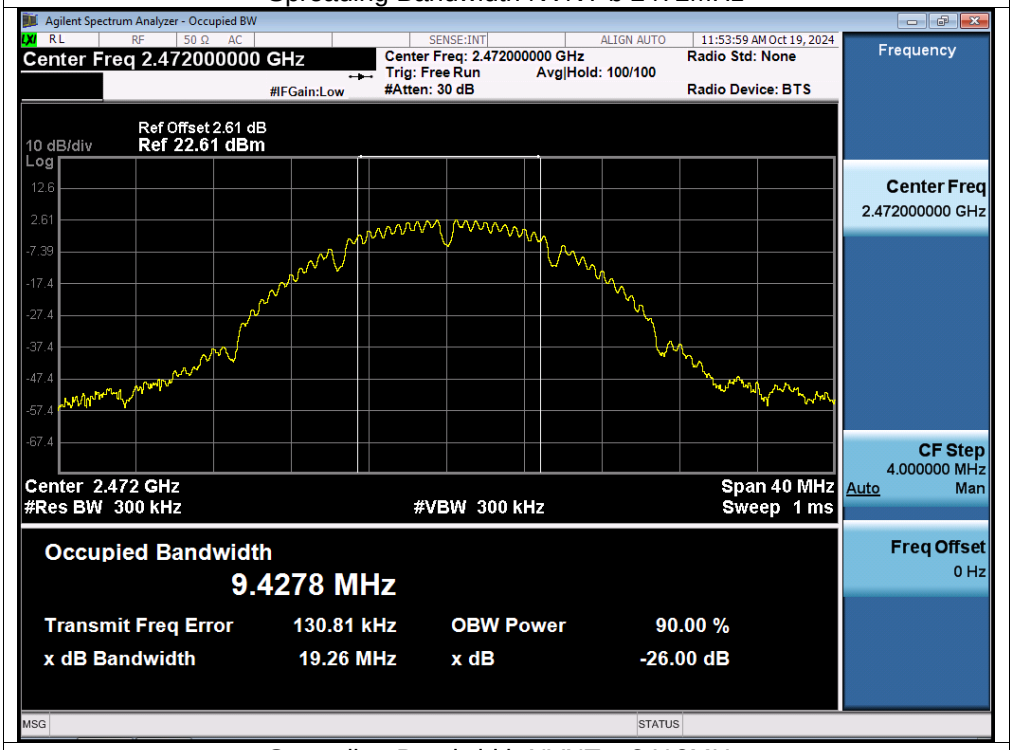
Test Graphs
Spreading Bandwidth NVNT b 2412MHz



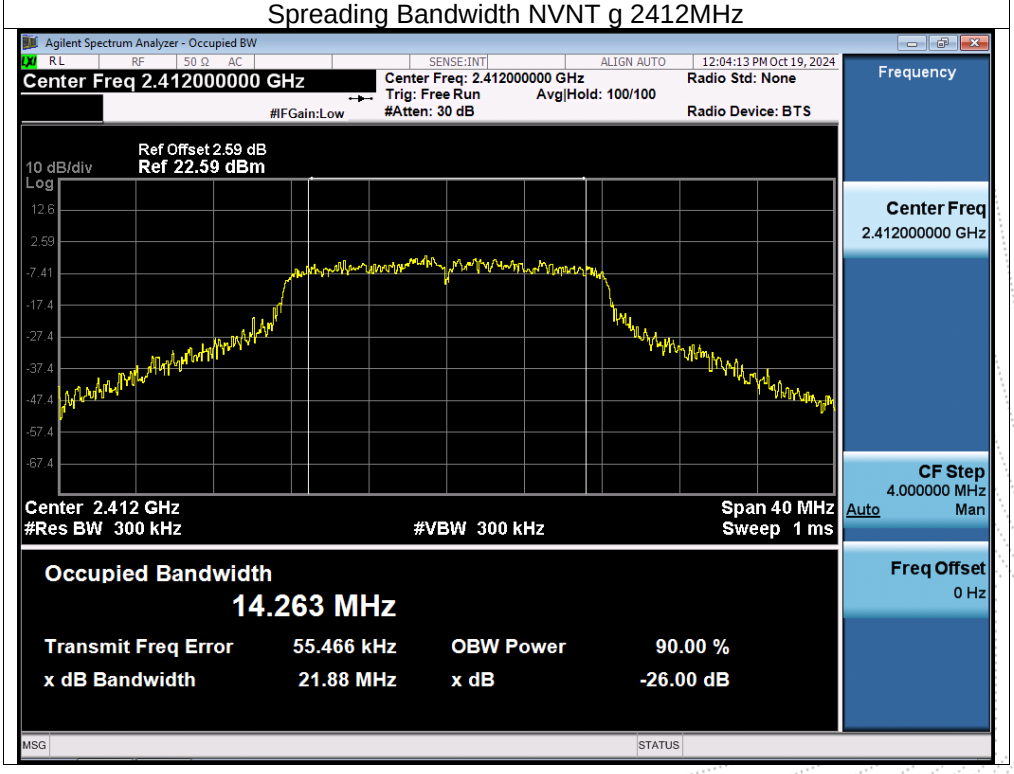
Spreading Bandwidth NVNT b 2442MHz



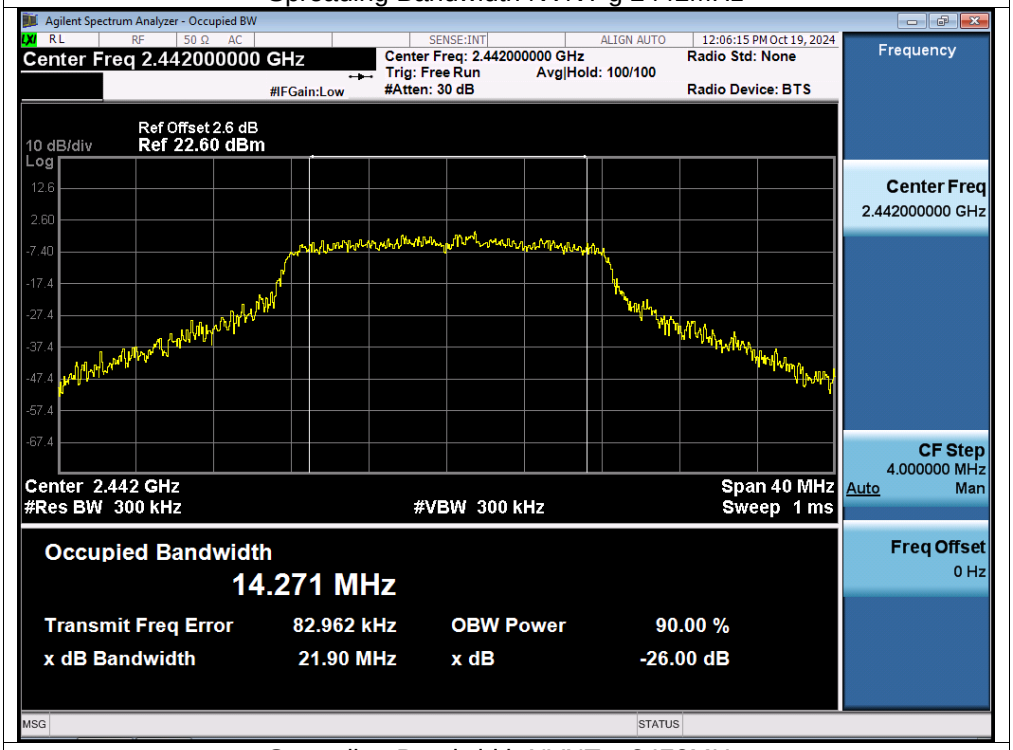
Spreading Bandwidth NVNT b 2472MHz



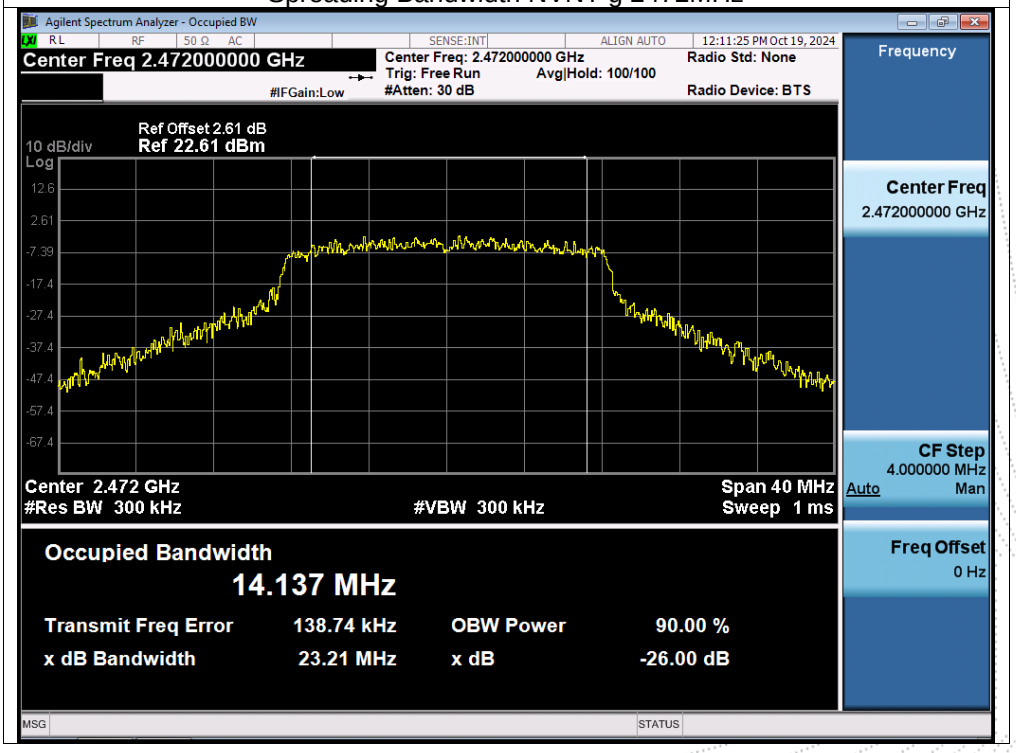
Spreading Bandwidth NVNT g 2412MHz



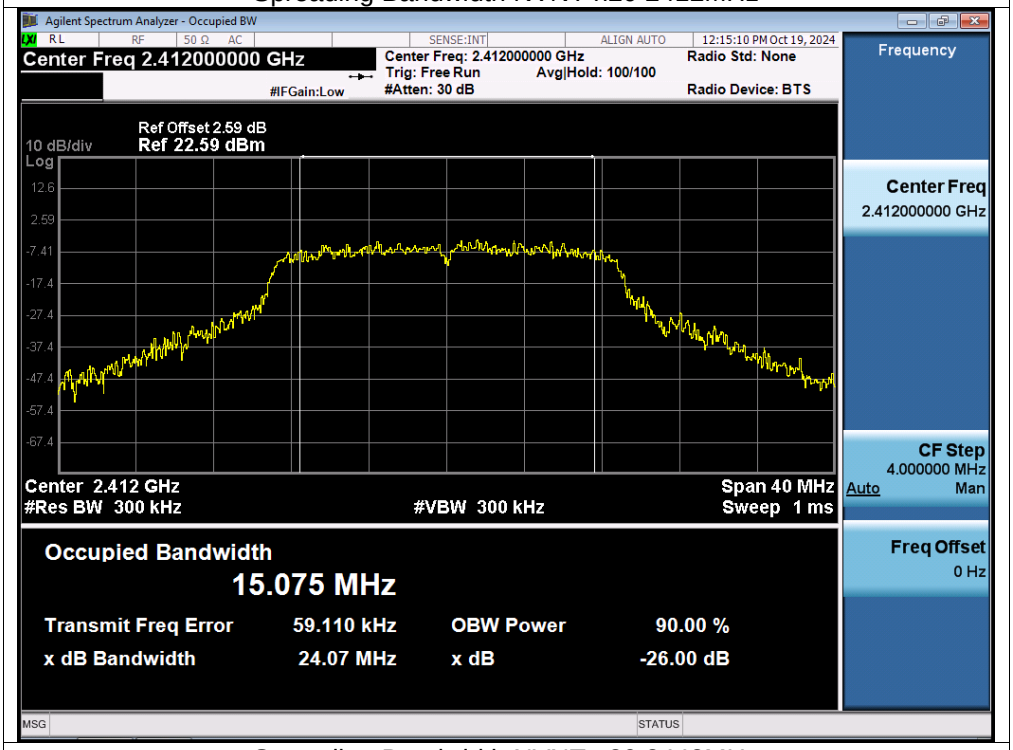
Spreading Bandwidth NVNT g 2442MHz



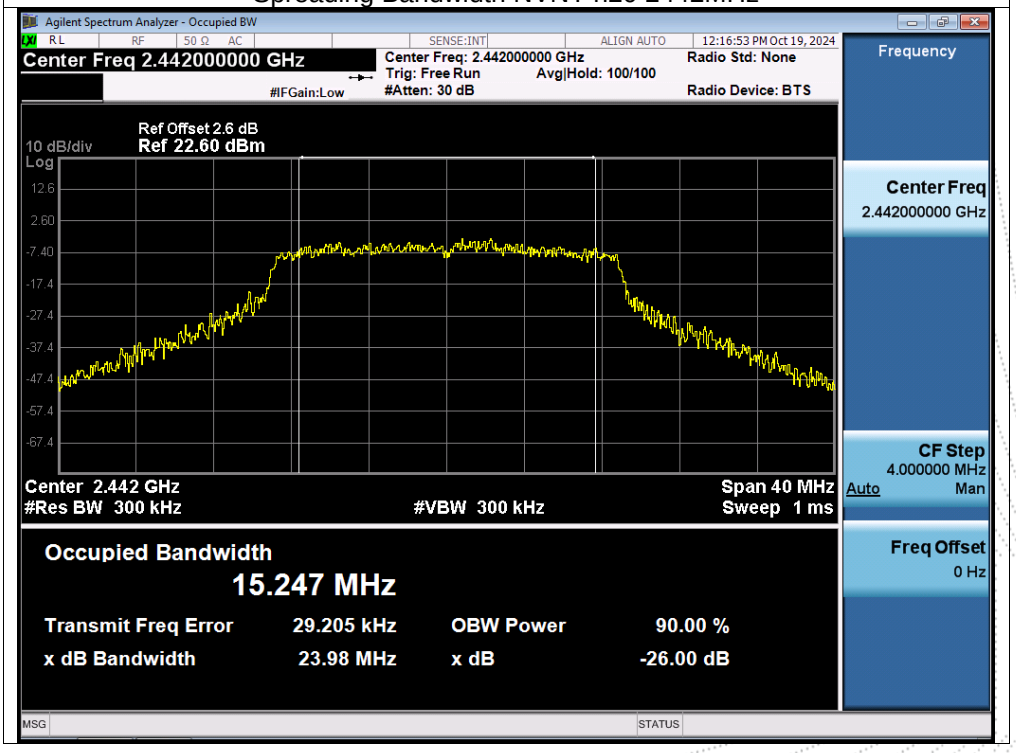
Spreading Bandwidth NVNT g 2472MHz



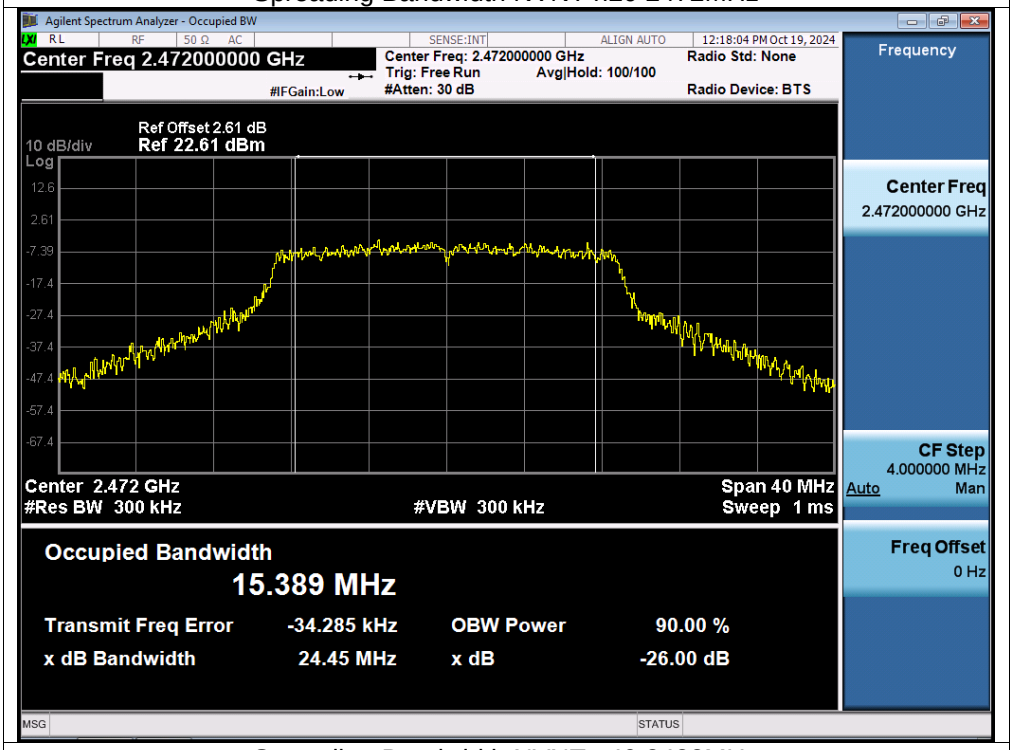
Spreading Bandwidth NVNT n20 2412MHz



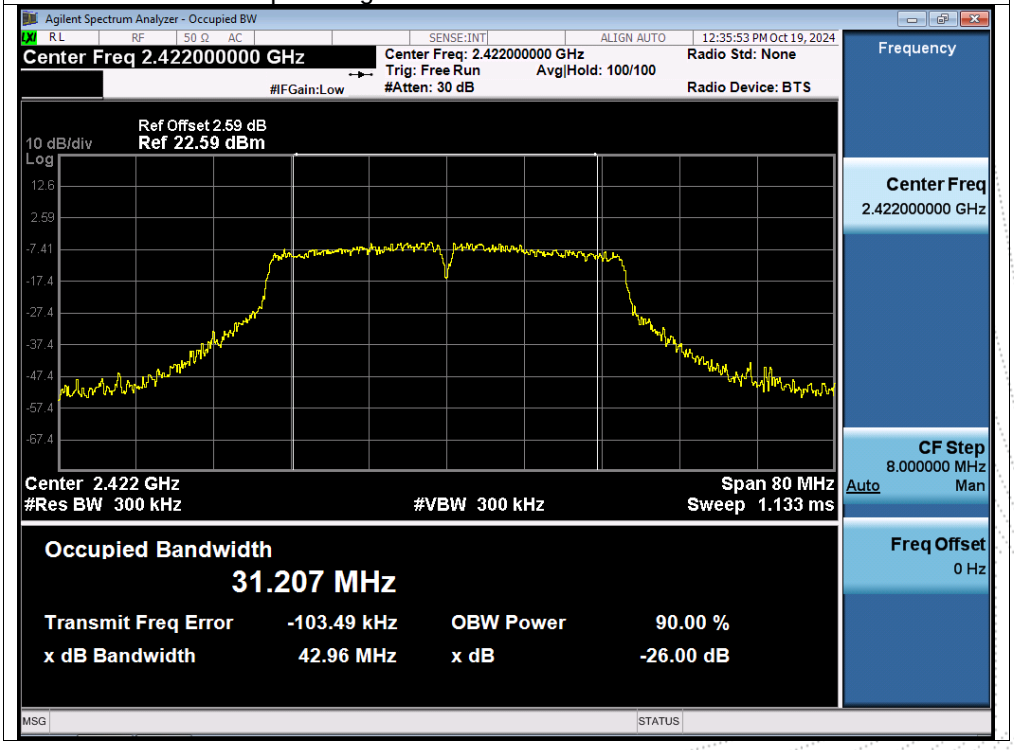
Spreading Bandwidth NVNT n20 2442MHz



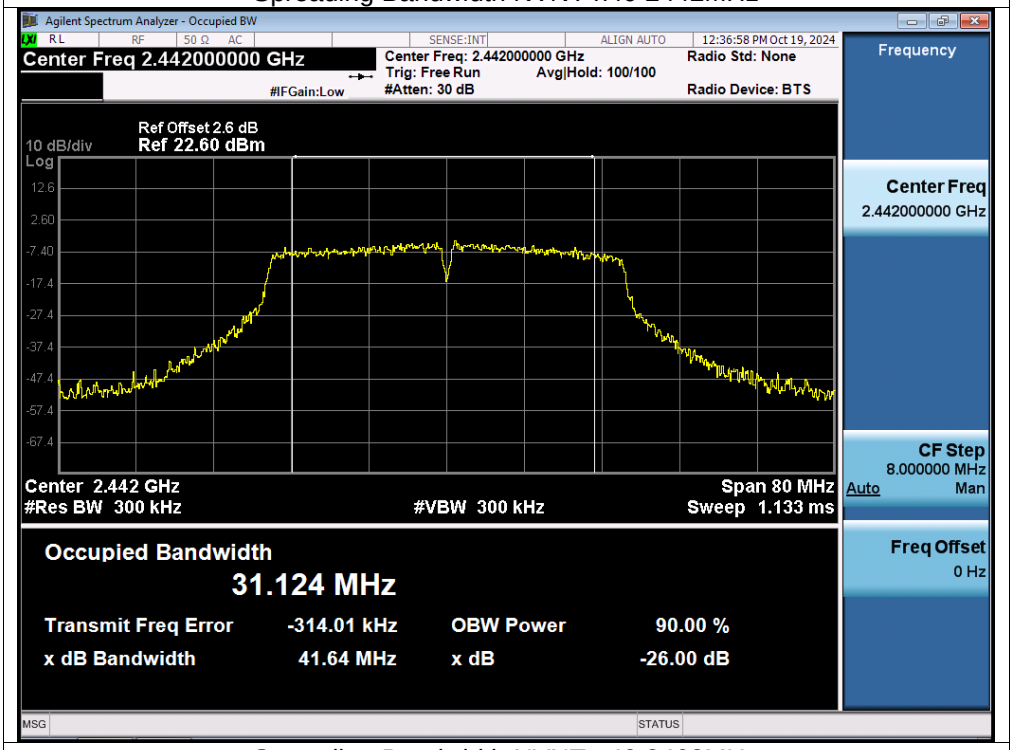
Spreading Bandwidth NVNT n20 2472MHz



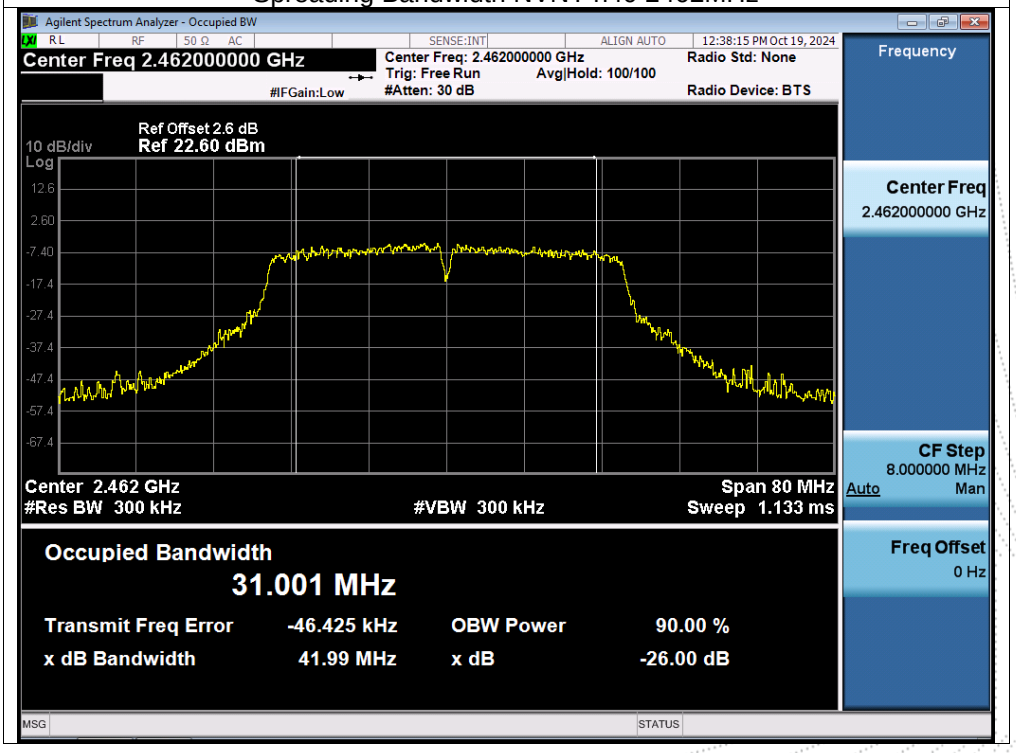
Spreading Bandwidth NVNT n40 2422MHz



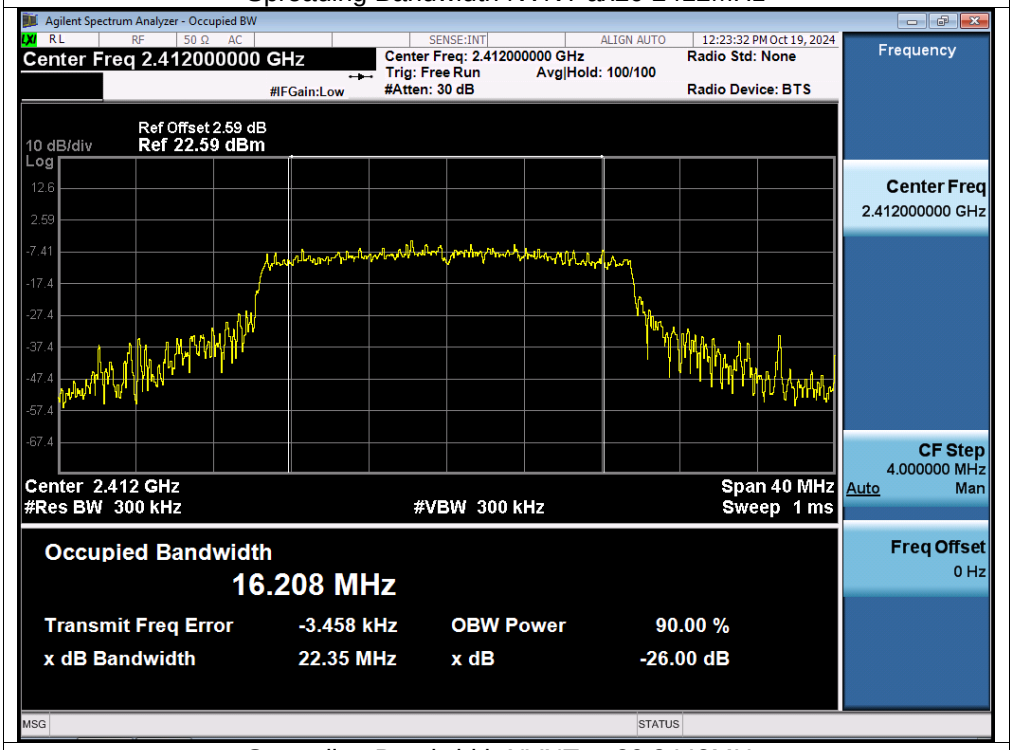
Spreading Bandwidth NVNT n40 2442MHz



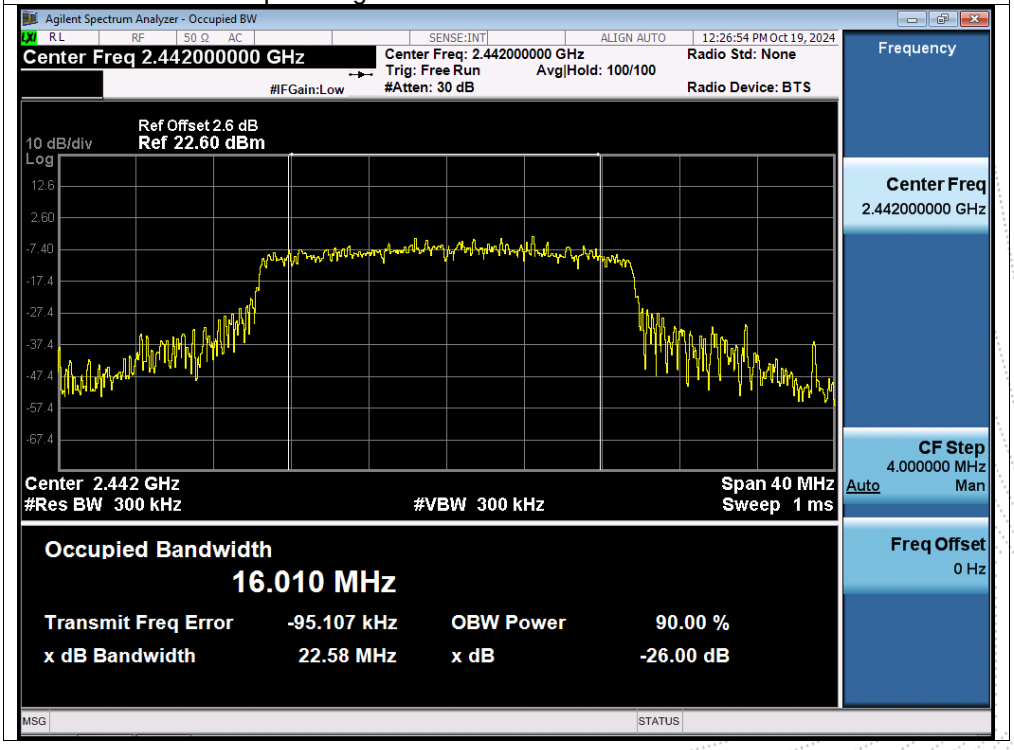
Spreading Bandwidth NVNT n40 2462MHz



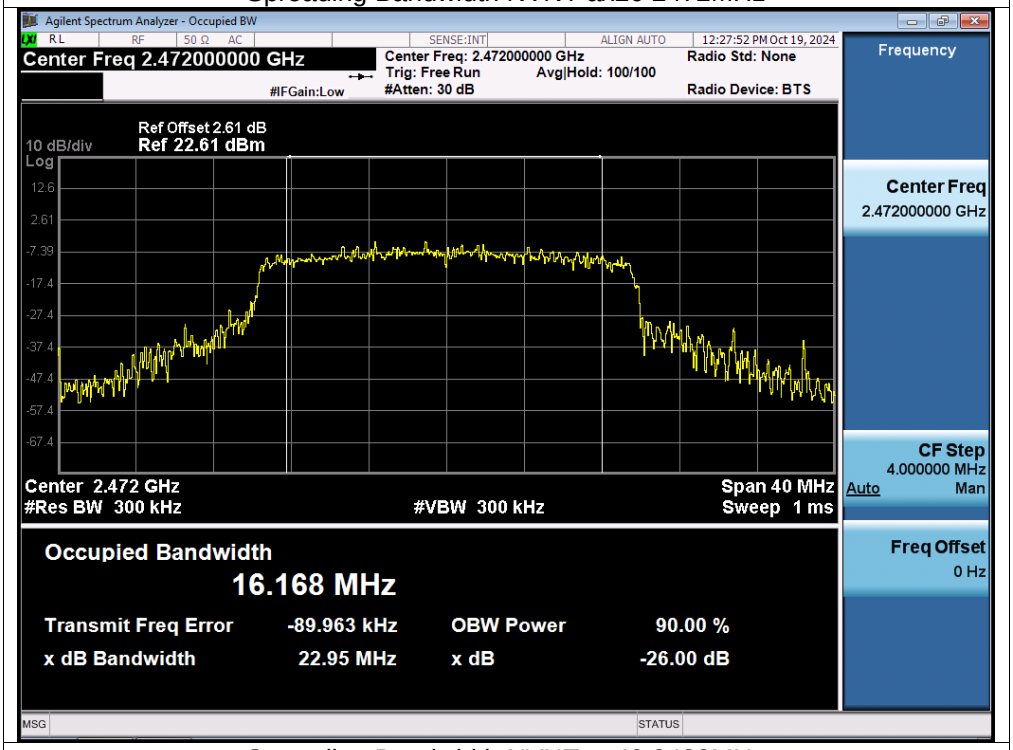
Spreading Bandwidth NVNT ax20 2412MHz



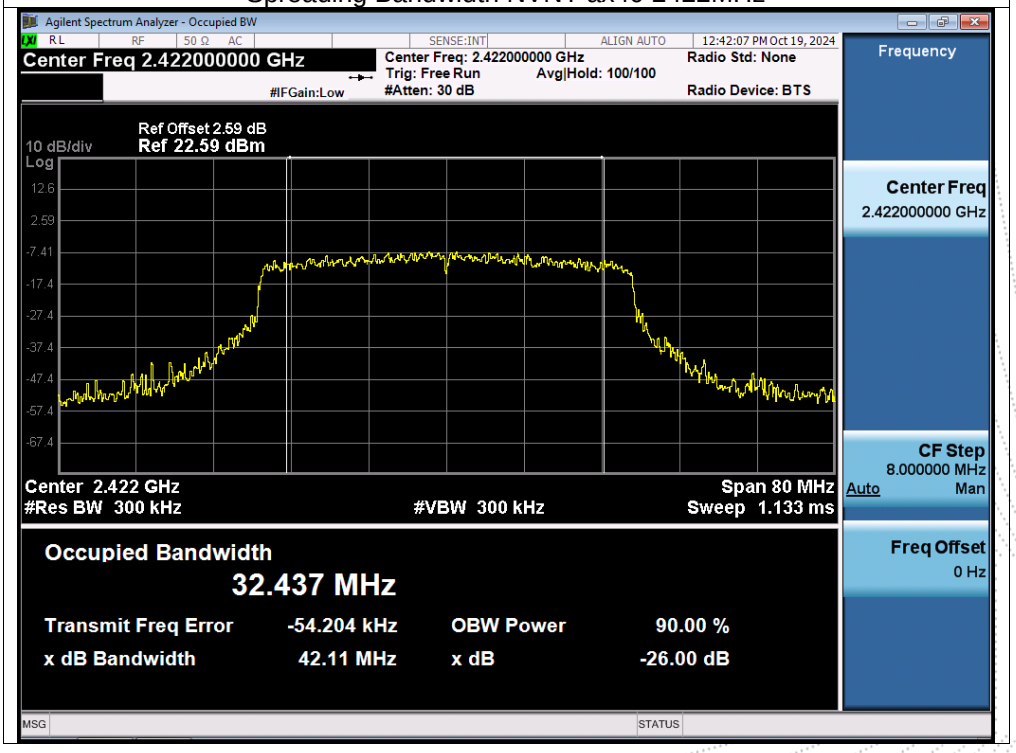
Spreading Bandwidth NVNT ax20 2442MHz



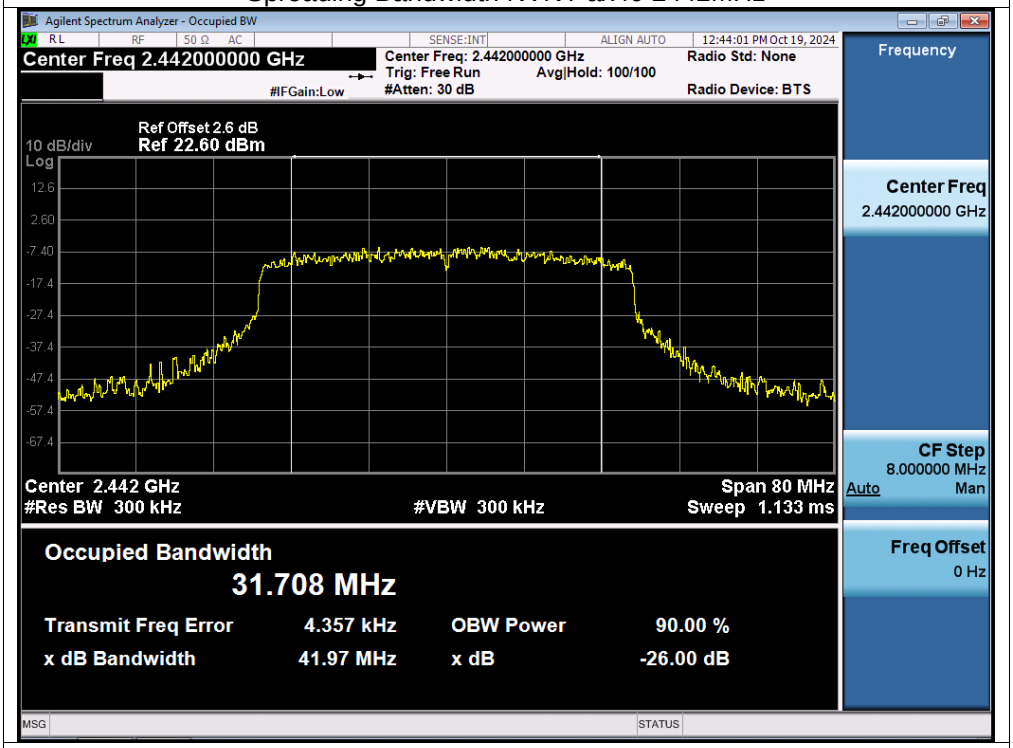
Spreading Bandwidth NVNT ax20 2472MHz



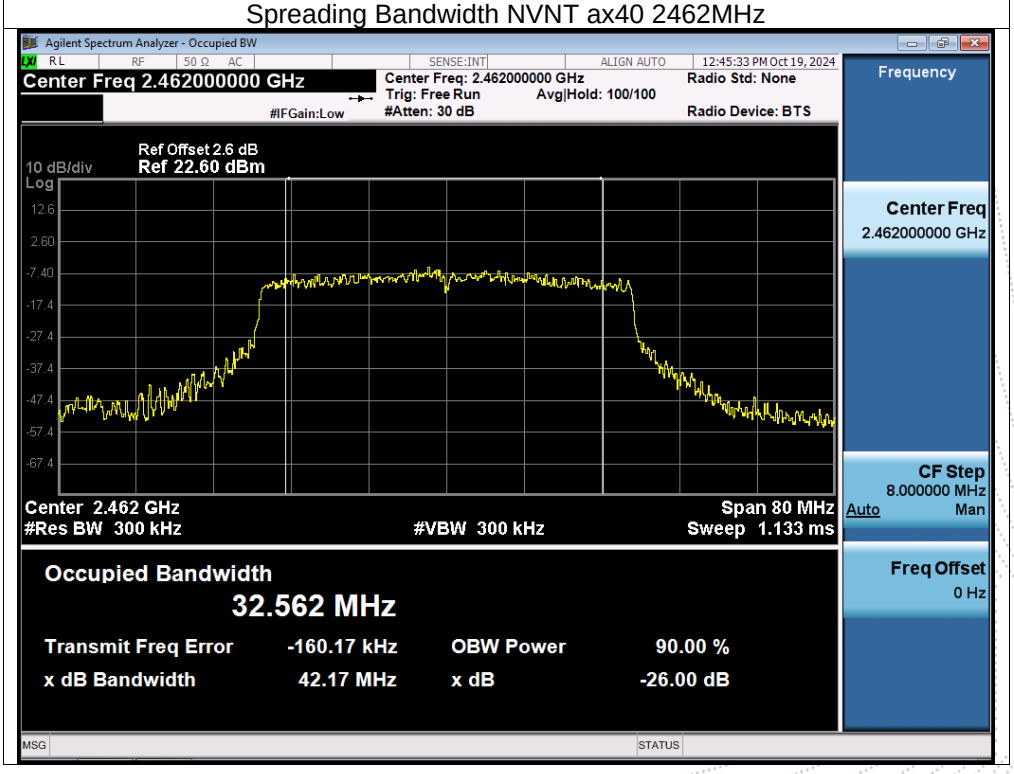
Spreading Bandwidth NVNT ax40 2422MHz



Spreading Bandwidth NVNT ax40 2442MHz

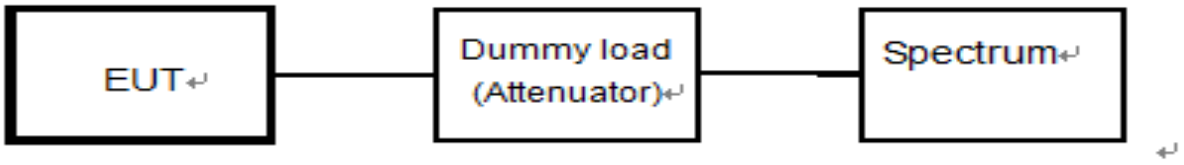


Spreading Bandwidth NVNT ax40 2462MHz



10. Unwanted Emission Intensity Measurement

10.1 Block Diagram Of Test Setup



10.2 Limit

Item	RB / VB	Limits
TX Spurious Emission	100KHz	≦ 0.25 μW（-36dBm） (30MHz≦f≦1000MHz)
	1 MHz	≦2.5 μW （-26dBm (1000MHz<f≦2387MHz)
	1 MHz	≦25 μW （-16dBm (2387MHz<f≦2400MHz)
	1 MHz	≦25 μW（-16dBm (2483.5MHz≦f<2496.5MHz)
	1 MHz	≦2.5 μW（-26dBm (2496.5MHz≦f<12500MHz)

10.3 Measuring Instruments And Setting

Please refer to section 5 in this report. The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	1 MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

10.4 Test Procedure

1. EUT have transmitted the maximum modulation signal and fixed channelize.
2. Setting of SA is following as: Below 1GHz RB:100KHz / VB:100KHz
Above 1GHz RB:1MHz / VB:1MHz / AT: 20dB Ref: 10dBm / Sweep time: Auto
Sweep Mode: Continuous sweep / Detect mode: Positive peak
Trace mode: Max hold
3. Setting of SA is following as 30MHz and stop frequency 1000MHz Then to mark peak reading value + cable loss shall be less than 0.25μW.
4. Setting of SA is following as 1000MHz and stop frequency 2387MHz Then to mark peak reading value + cable loss shall be less than 2.5μW.
5. SA adjusted to start frequency 2387MHz and stop frequency 2400MHz. Then to mark peak reading value + cable loss shall be less than 25μW.
6. SA adjusted to start frequency 2483.5MHz and stop frequency 2496.5MHz Then to mark peak reading value + cable loss shall be less than 25μW
7. SA adjusted to start frequency 2496.5MHz and stop frequency 12500MHz Then to mark peak reading value + cable loss shall be less than 2.5μW

10.5 Test Result

Temperature:	25°C		
Humidity:	55 % RH	Test Voltage	DC 5V

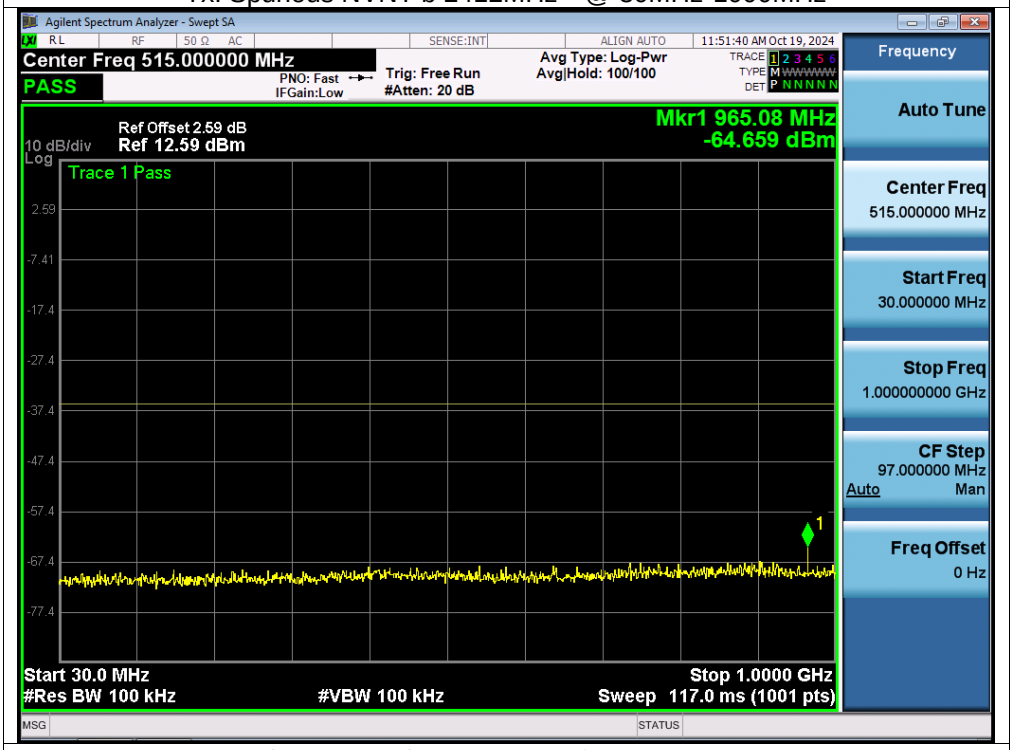
Condition	Mode	Frequency (MHz)	Range (MHz)	Emission Frequency (MHz)	Max Value (dBm)	Limit Start (dBm)	Limit Stop (dBm)	Verdict
NVNT	b	2412	30-1000	965.08	-64.66	-36	-36	Pass
NVNT	b	2412	1000-2387	1445.23	-50.52	-26	-26	Pass
NVNT	b	2412	2387-2400	2399.7	-38.35	-16	-16	Pass
NVNT	b	2412	2483.5-2496.5	2484.76	-52.34	-16	-16	Pass
NVNT	b	2412	2496.5-13000	5742.08	-42.84	-26	-26	Pass
NVNT	b	2442	30-1000	976.72	-64.72	-36	-36	Pass
NVNT	b	2442	1000-2387	1466.03	-49.95	-26	-26	Pass
NVNT	b	2442	2387-2400	2398.87	-53.26	-16	-16	Pass
NVNT	b	2442	2483.5-2496.5	2490.56	-50.72	-16	-16	Pass
NVNT	b	2442	2496.5-13000	2496.5	-50.65	-26	-26	Pass
NVNT	b	2472	30-1000	988.36	-65.91	-36	-36	Pass
NVNT	b	2472	1000-2387	1481.29	-52.01	-26	-26	Pass
NVNT	b	2472	2387-2400	2391.97	-53.61	-16	-16	Pass
NVNT	b	2472	2483.5-2496.5	2483.51	-32.79	-16	-16	Pass
NVNT	b	2472	2496.5-13000	5258.92	-40.19	-26	-26	Pass
NVNT	g	2412	30-1000	779.81	-67.46	-36	-36	Pass
NVNT	g	2412	1000-2387	2385.61	-52.06	-26	-26	Pass
NVNT	g	2412	2387-2400	2399.71	-17.21	-16	-16	Pass
NVNT	g	2412	2483.5-2496.5	2486.62	-55.01	-16	-16	Pass
NVNT	g	2412	2496.5-13000	5258.92	-40.99	-26	-26	Pass
NVNT	g	2442	30-1000	913.67	-67.65	-36	-36	Pass
NVNT	g	2442	1000-2387	1952.87	-53.71	-26	-26	Pass
NVNT	g	2442	2387-2400	2394.85	-52.27	-16	-16	Pass
NVNT	g	2442	2483.5-2496.5	2485.53	-52.27	-16	-16	Pass
NVNT	g	2442	2496.5-13000	5700.07	-52.67	-26	-26	Pass
NVNT	g	2472	30-1000	942.77	-67.13	-36	-36	Pass
NVNT	g	2472	1000-2387	2162.31	-45.87	-26	-26	Pass
NVNT	g	2472	2387-2400	2392.95	-40.78	-16	-16	Pass
NVNT	g	2472	2483.5-2496.5	2483.51	-18.56	-16	-16	Pass
NVNT	g	2472	2496.5-13000	2496.5	-40.7	-26	-26	Pass
NVNT	n20	2412	30-1000	978.66	-67.09	-36	-36	Pass
NVNT	n20	2412	1000-2387	2387	-51.98	-26	-26	Pass
NVNT	n20	2412	2387-2400	2399.65	-18.97	-16	-16	Pass
NVNT	n20	2412	2483.5-2496.5	2486.54	-53.32	-16	-16	Pass
NVNT	n20	2412	2496.5-13000	12600.87	-52.49	-26	-26	Pass
NVNT	n20	2442	30-1000	864.2	-66.52	-36	-36	Pass
NVNT	n20	2442	1000-2387	1954.26	-54.51	-26	-26	Pass
NVNT	n20	2442	2387-2400	2389.73	-52.68	-16	-16	Pass

NVNT	n20	2442	2483.5-2496.5	2484.92	-51.31	-16	-16	Pass
NVNT	n20	2442	2496.5-13000	12411.8	-52.5	-26	-26	Pass
NVNT	n20	2472	30-1000	791.45	-67.45	-36	-36	Pass
NVNT	n20	2472	1000-2387	1977.83	-52.33	-26	-26	Pass
NVNT	n20	2472	2387-2400	2392.43	-51.9	-16	-16	Pass
NVNT	n20	2472	2483.5-2496.5	2483.99	-19.08	-16	-16	Pass
NVNT	n20	2472	2496.5-13000	2496.5	-41.9	-26	-26	Pass
NVNT	n40	2422	30-1000	928.22	-66.76	-36	-36	Pass
NVNT	n40	2422	1000-2387	2385.61	-39.69	-26	-26	Pass
NVNT	n40	2422	2387-2400	2399.65	-22.3	-16	-16	Pass
NVNT	n40	2422	2483.5-2496.5	2486	-42.84	-16	-16	Pass
NVNT	n40	2422	2496.5-13000	2570.02	-52.48	-26	-26	Pass
NVNT	n40	2442	30-1000	835.1	-67.39	-36	-36	Pass
NVNT	n40	2442	1000-2387	1993.09	-44.41	-26	-26	Pass
NVNT	n40	2442	2387-2400	2398.52	-38.81	-16	-16	Pass
NVNT	n40	2442	2483.5-2496.5	2484.83	-39.18	-16	-16	Pass
NVNT	n40	2442	2496.5-13000	5258.92	-40.26	-26	-26	Pass
NVNT	n40	2462	30-1000	919.49	-67.45	-36	-36	Pass
NVNT	n40	2462	1000-2387	1922.36	-49.42	-26	-26	Pass
NVNT	n40	2462	2387-2400	2391.17	-43.33	-16	-16	Pass
NVNT	n40	2462	2483.5-2496.5	2483.66	-21.41	-16	-16	Pass
NVNT	n40	2462	2496.5-13000	2496.5	-35.76	-26	-26	Pass
NVNT	ax20	2412	30-1000	915.61	-67.68	-36	-36	Pass
NVNT	ax20	2412	1000-2387	2387	-52.86	-26	-26	Pass
NVNT	ax20	2412	2387-2400	2399.99	-19.8	-16	-16	Pass
NVNT	ax20	2412	2483.5-2496.5	2493.52	-56.35	-16	-16	Pass
NVNT	ax20	2412	2496.5-13000	5258.92	-41.81	-26	-26	Pass
NVNT	ax20	2442	30-1000	721.61	-62.81	-36	-36	Pass
NVNT	ax20	2442	1000-2387	1954.26	-53.8	-26	-26	Pass
NVNT	ax20	2442	2387-2400	2399.73	-55.16	-16	-16	Pass
NVNT	ax20	2442	2483.5-2496.5	2490.55	-54	-16	-16	Pass
NVNT	ax20	2442	2496.5-13000	2517.51	-45.77	-26	-26	Pass
NVNT	ax20	2472	30-1000	844.8	-67.44	-36	-36	Pass
NVNT	ax20	2472	1000-2387	1979.22	-55.58	-26	-26	Pass
NVNT	ax20	2472	2387-2400	2398.61	-49.09	-16	-16	Pass
NVNT	ax20	2472	2483.5-2496.5	2484.36	-18.64	-16	-16	Pass
NVNT	ax20	2472	2496.5-13000	5269.42	-36.4	-26	-26	Pass
NVNT	ax40	2422	30-1000	845.77	-66.84	-36	-36	Pass
NVNT	ax40	2422	1000-2387	2384.23	-42.32	-26	-26	Pass
NVNT	ax40	2422	2387-2400	2399.6	-24.45	-16	-16	Pass
NVNT	ax40	2422	2483.5-2496.5	2485.57	-45.05	-16	-16	Pass
NVNT	ax40	2422	2496.5-13000	12705.9	-52.38	-26	-26	Pass
NVNT	ax40	2442	30-1000	947.62	-66.71	-36	-36	Pass
NVNT	ax40	2442	1000-2387	2352.32	-54.89	-26	-26	Pass
NVNT	ax40	2442	2387-2400	2396.39	-41.52	-16	-16	Pass
NVNT	ax40	2442	2483.5-2496.5	2484.55	-40.17	-16	-16	Pass

NVNT	ax40	2442	2496.5-13000	5258.92	-42.77	-26	-26	Pass
NVNT	ax40	2462	30-1000	997.09	-66.93	-36	-36	Pass
NVNT	ax40	2462	1000-2387	1922.36	-41.59	-26	-26	Pass
NVNT	ax40	2462	2387-2400	2390.86	-45.57	-16	-16	Pass
NVNT	ax40	2462	2483.5-2496.5	2483.63	-21.78	-16	-16	Pass
NVNT	ax40	2462	2496.5-13000	2496.5	-43.23	-26	-26	Pass

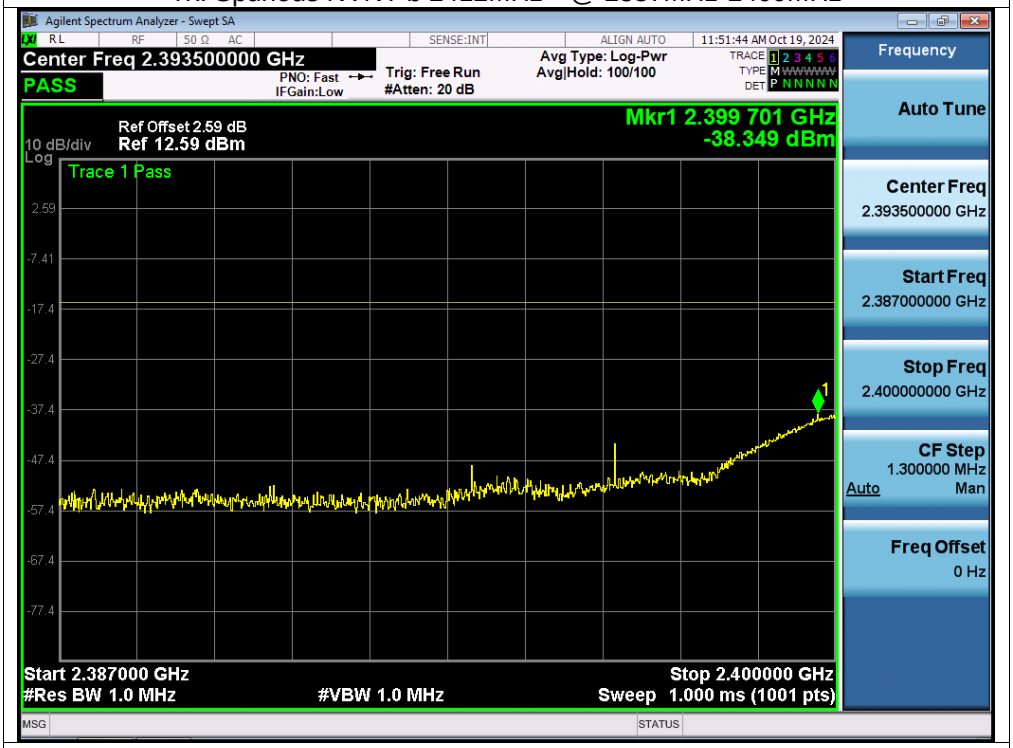
Test Graphs

Tx. Spurious NVNT b 2412MHz @ 30MHz-1000MHz

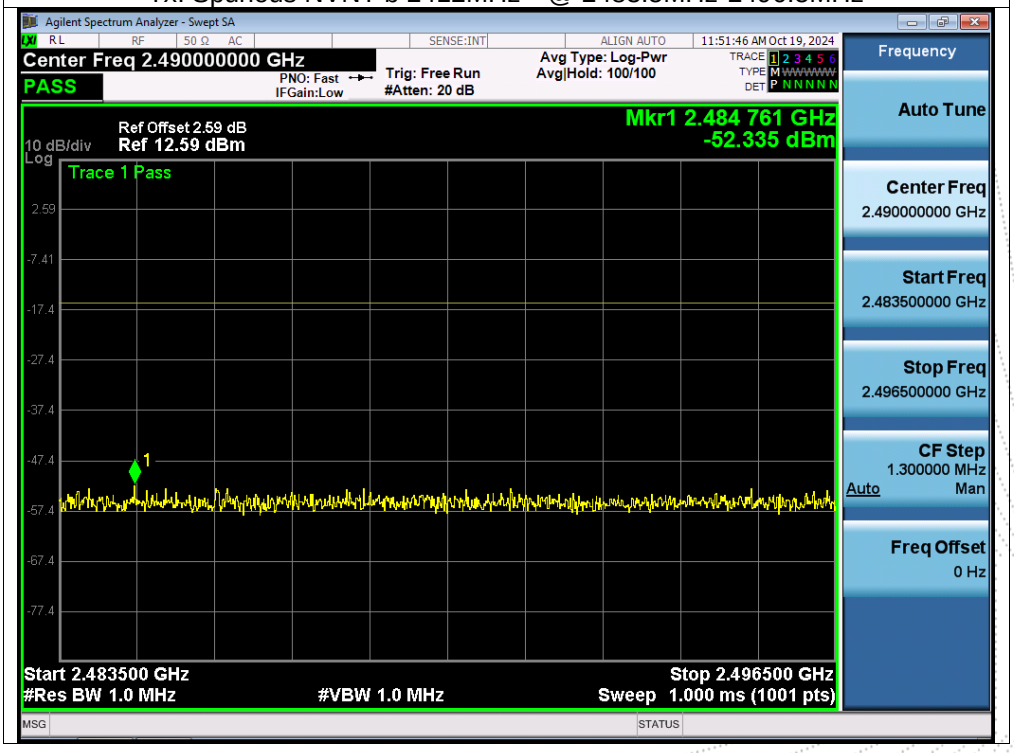


Tx. Spurious NVNT b 2412MHz @ 1000MHz-2387MHz

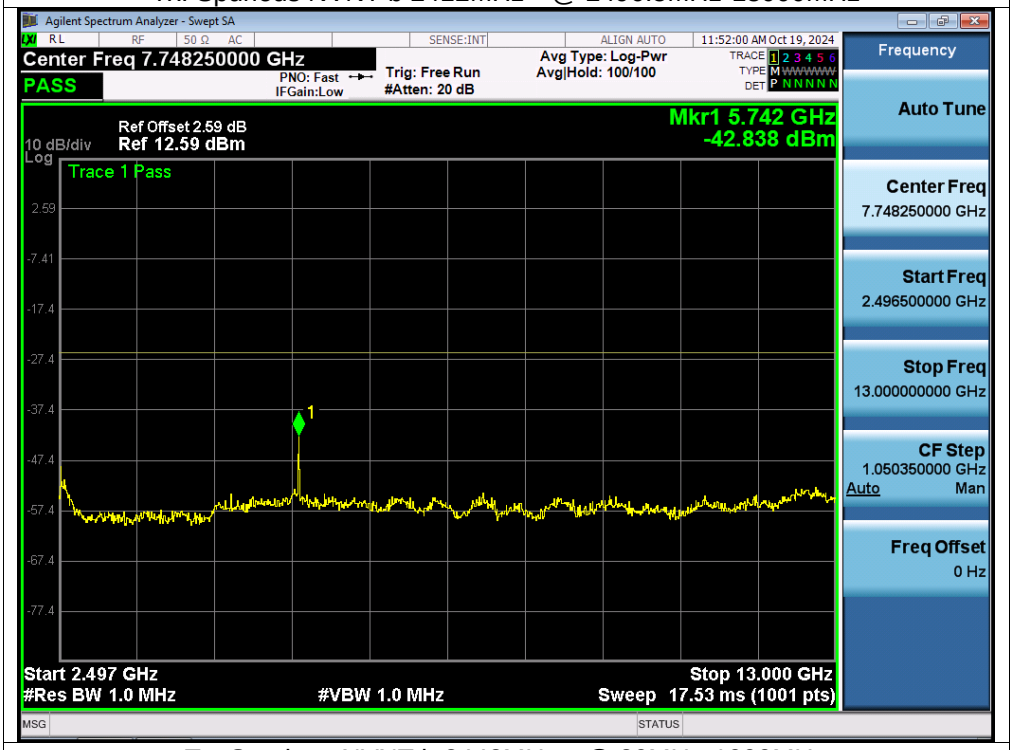
Tx. Spurious NVNT b 2412MHz @ 2387MHz-2400MHz



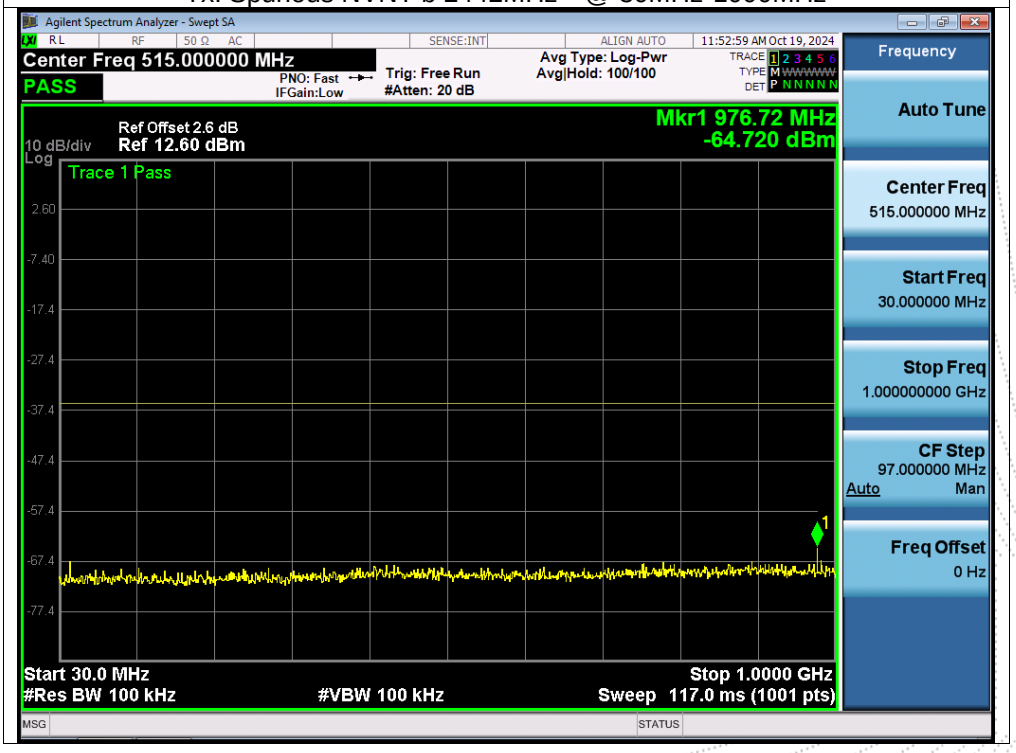
Tx. Spurious NVNT b 2412MHz @ 2483.5MHz-2496.5MHz



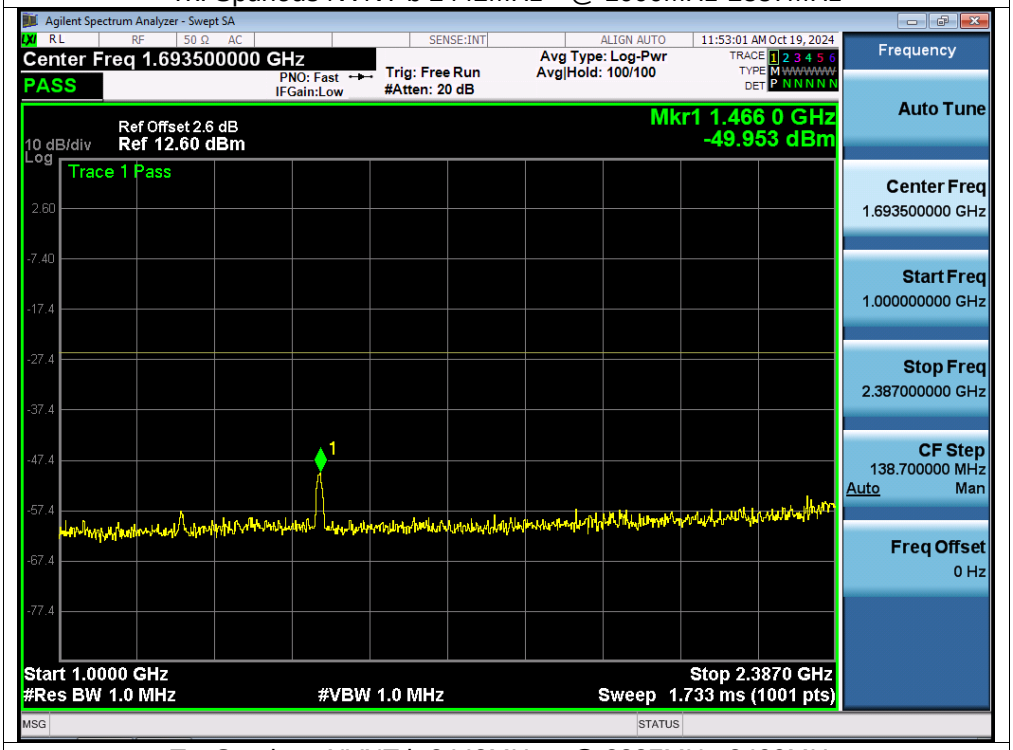
Tx. Spurious NVNT b 2412MHz @ 2496.5MHz-13000MHz



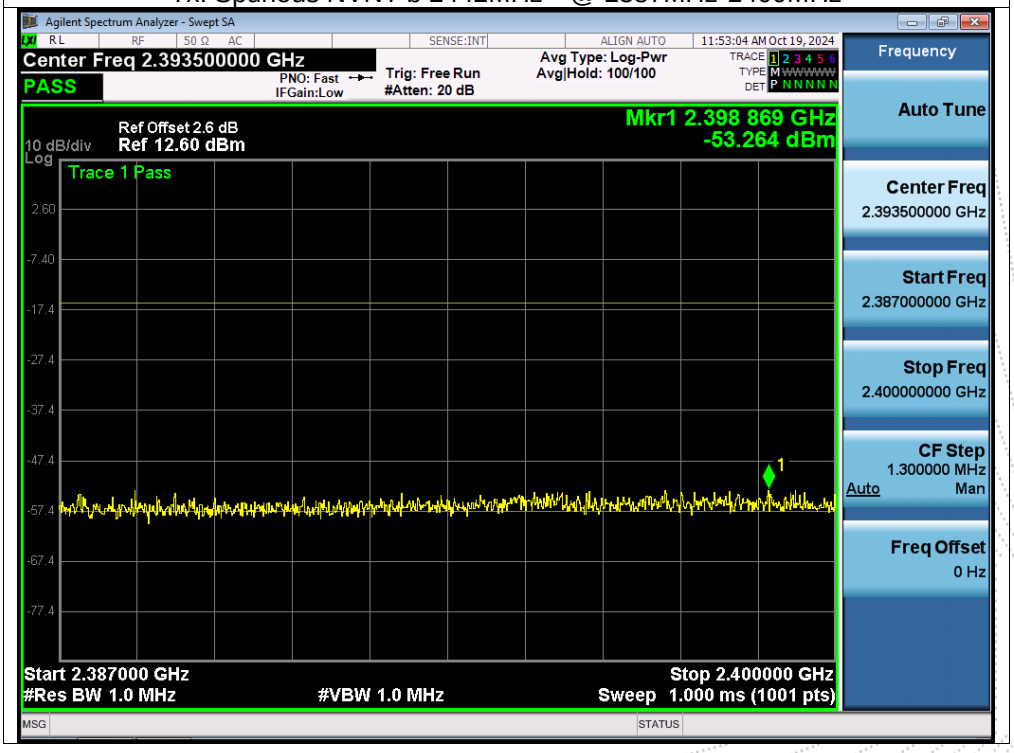
Tx. Spurious NVNT b 2442MHz @ 30MHz-1000MHz



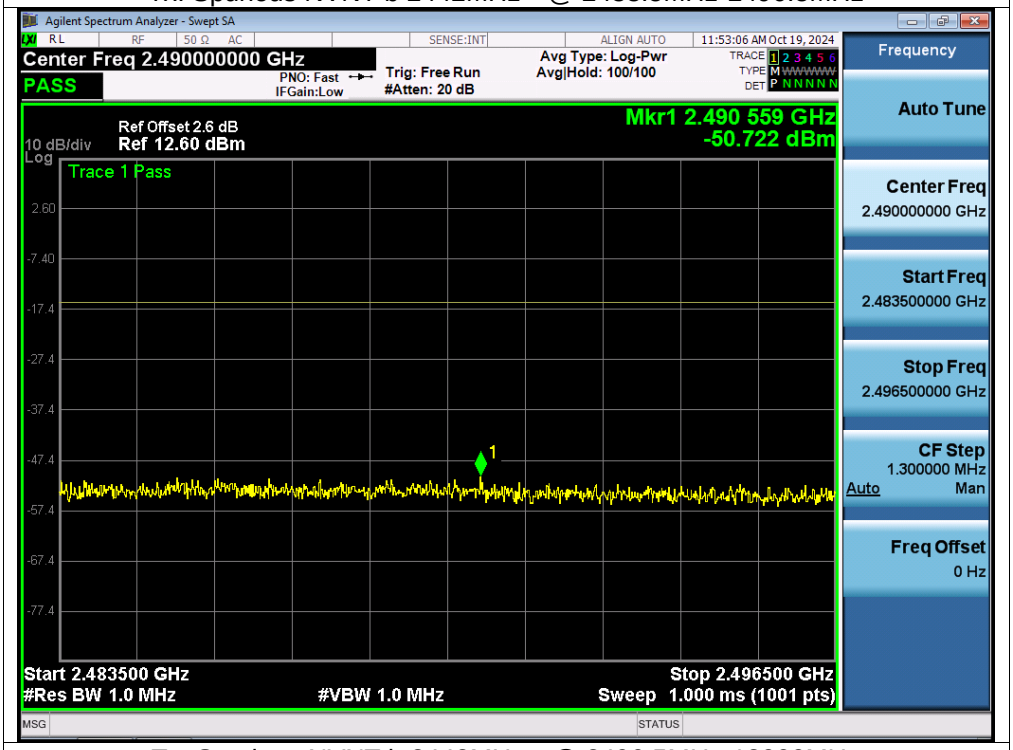
Tx. Spurious NVNT b 2442MHz @ 1000MHz-2387MHz



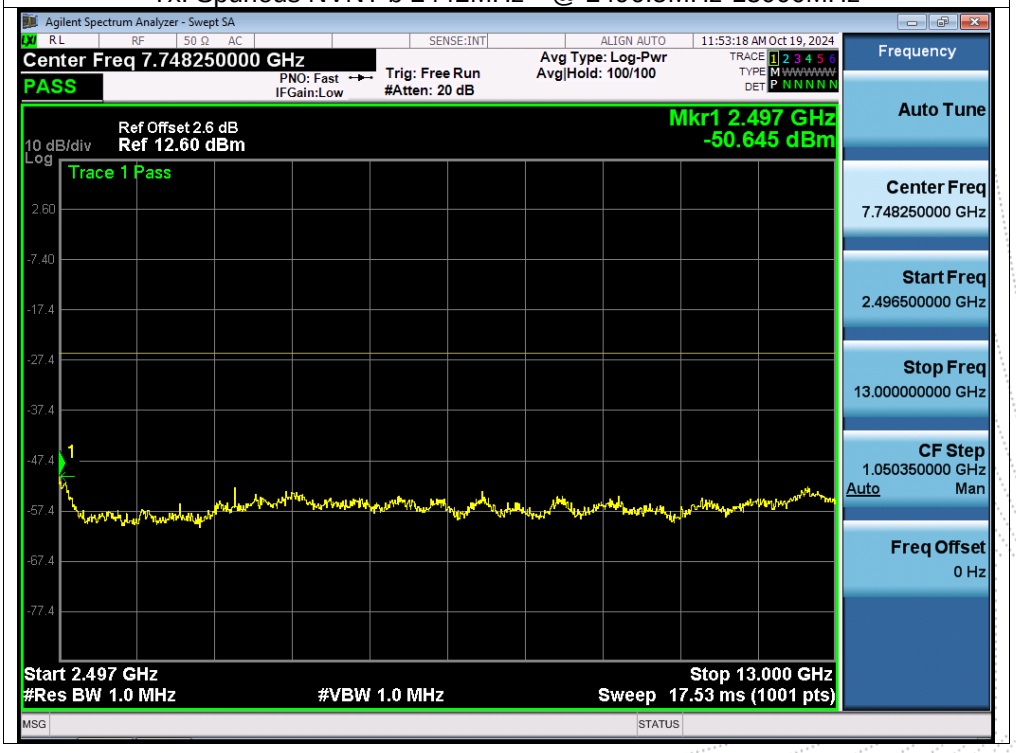
Tx. Spurious NVNT b 2442MHz @ 2387MHz-2400MHz



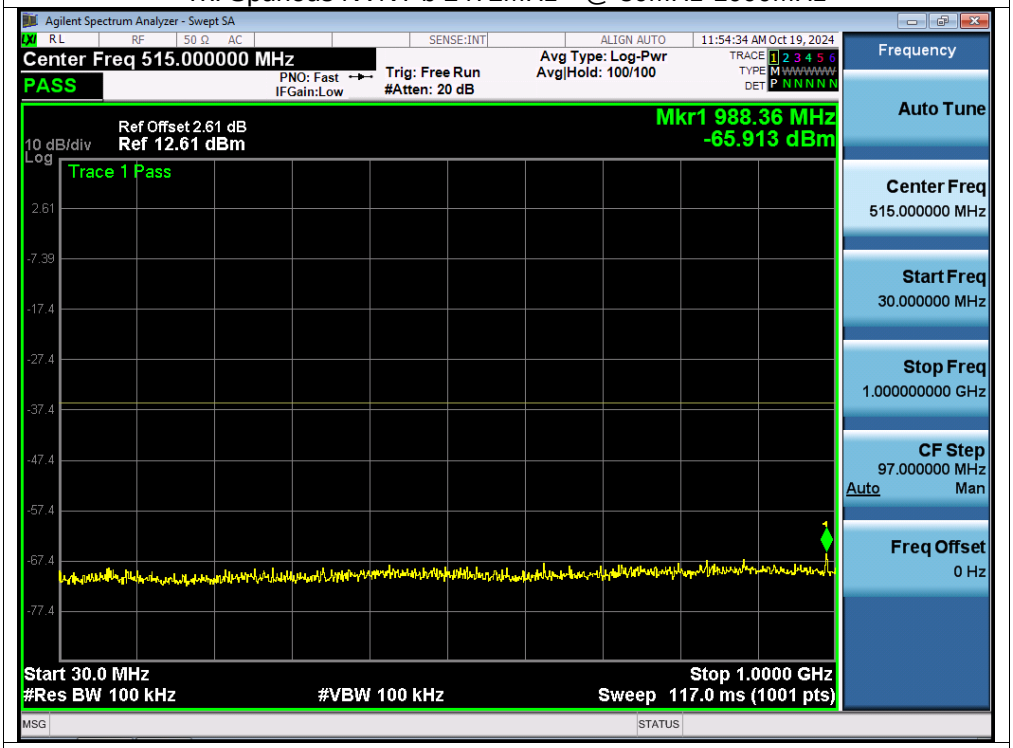
Tx. Spurious NVNT b 2442MHz @ 2483.5MHz-2496.5MHz



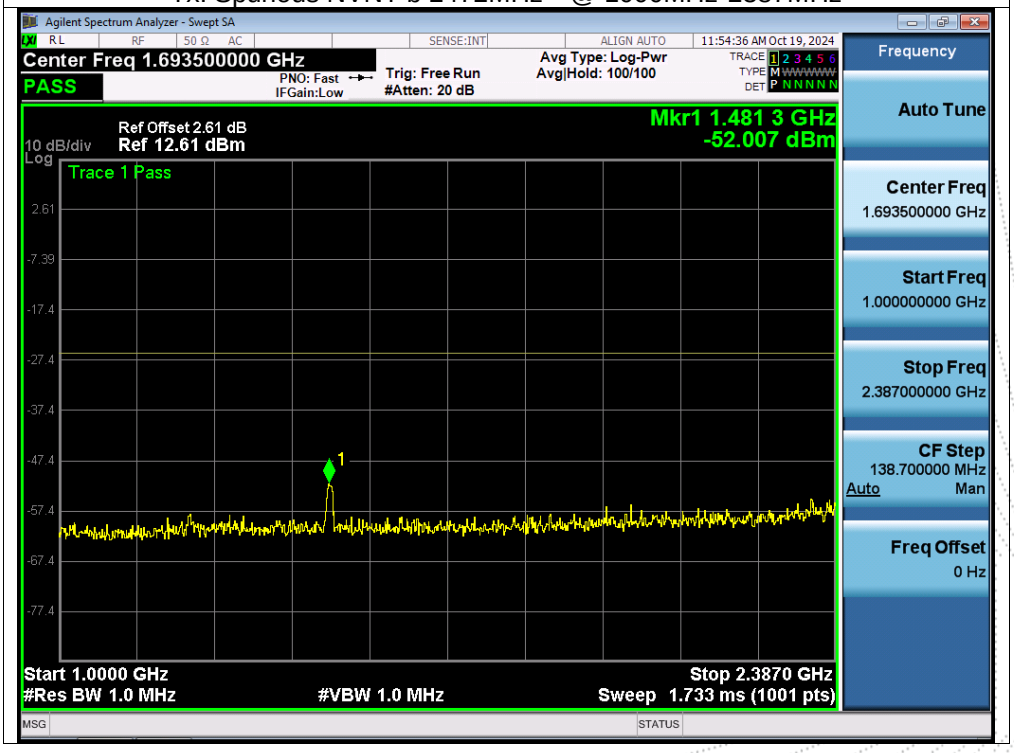
Tx. Spurious NVNT b 2442MHz @ 2496.5MHz-13000MHz



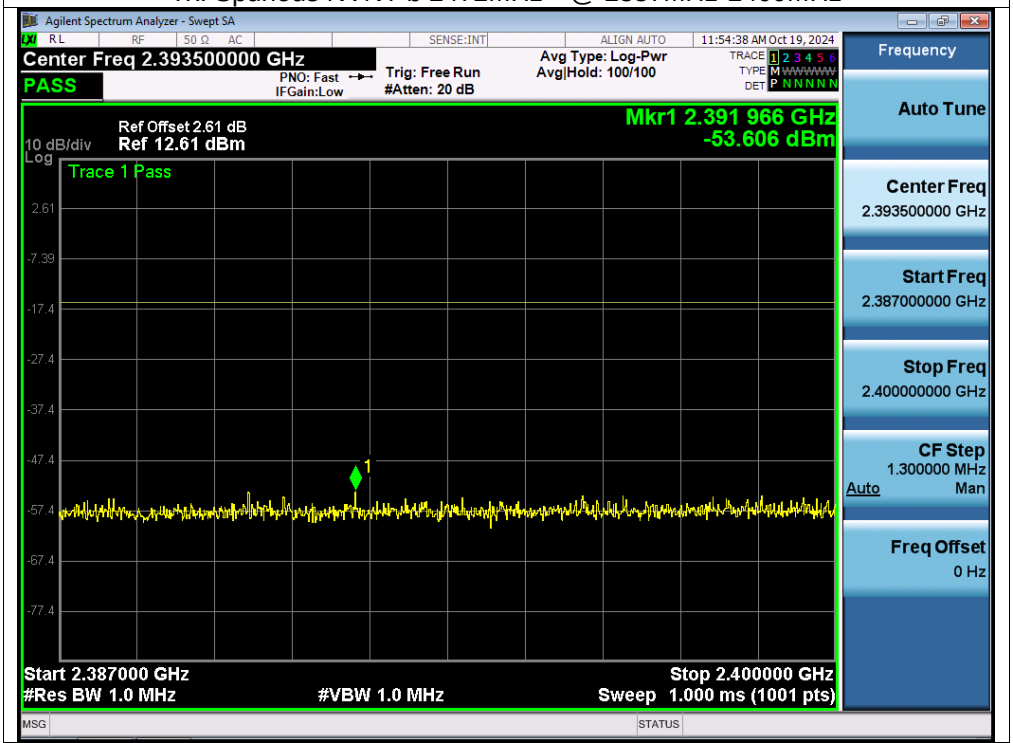
Tx. Spurious NVNT b 2472MHz @ 30MHz-1000MHz



Tx. Spurious NVNT b 2472MHz @ 1000MHz-2387MHz

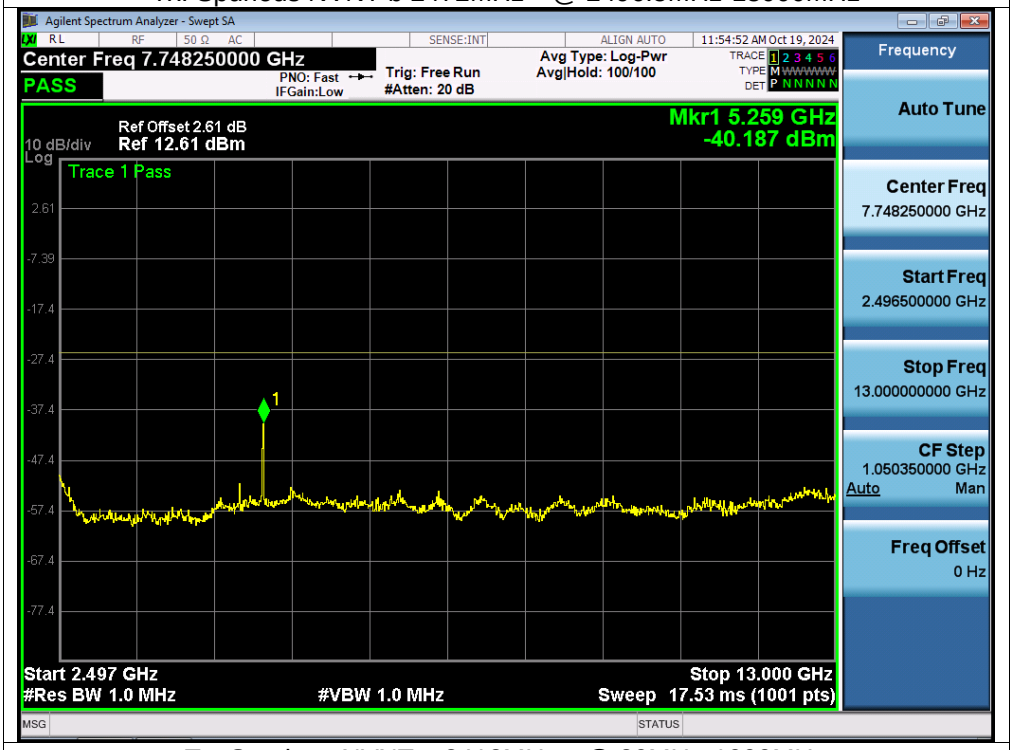


Tx. Spurious NVNT b 2472MHz @ 2387MHz-2400MHz

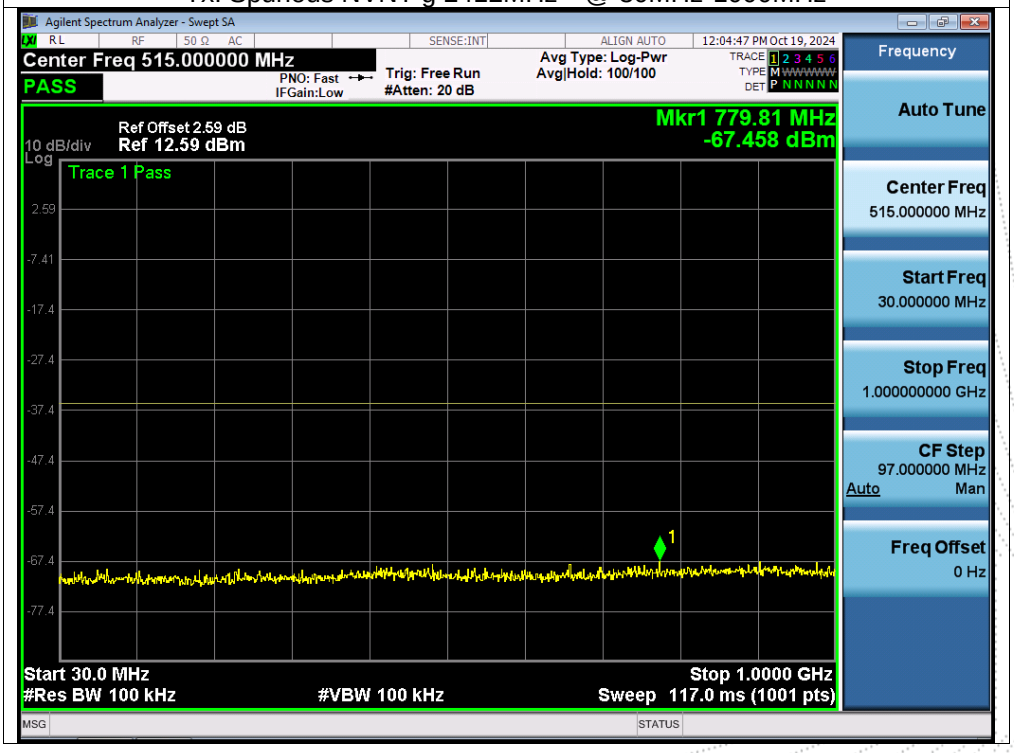


Tx. Spurious NVNT b 2472MHz @ 2483.5MHz-2496.5MHz

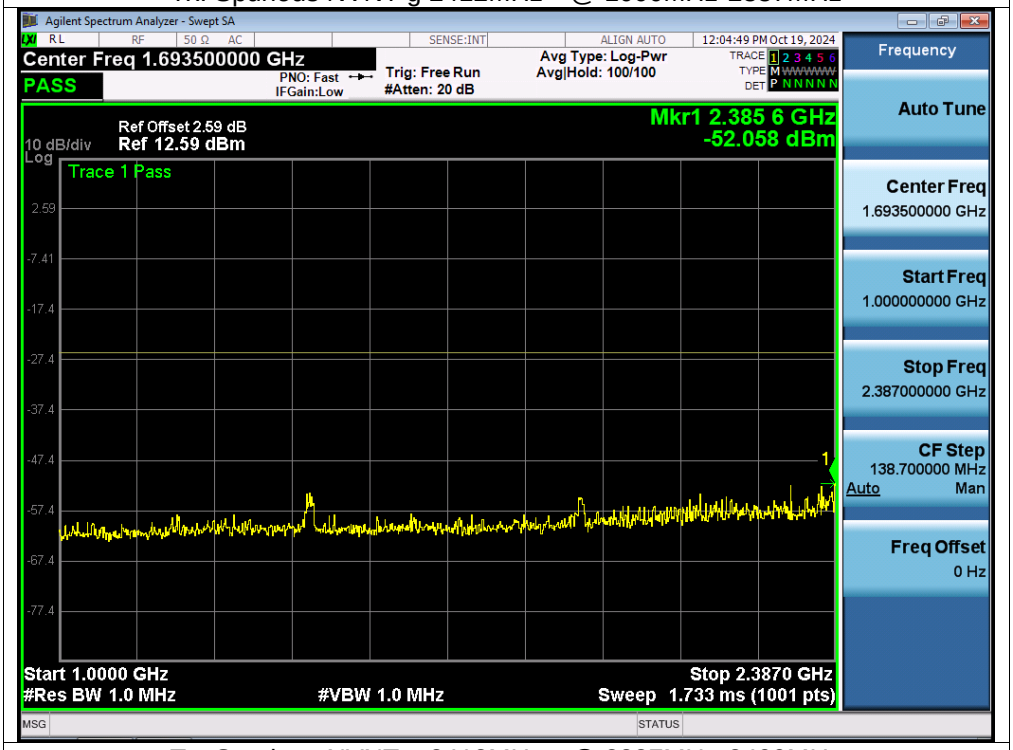
Tx. Spurious NVNT b 2472MHz @ 2496.5MHz-13000MHz



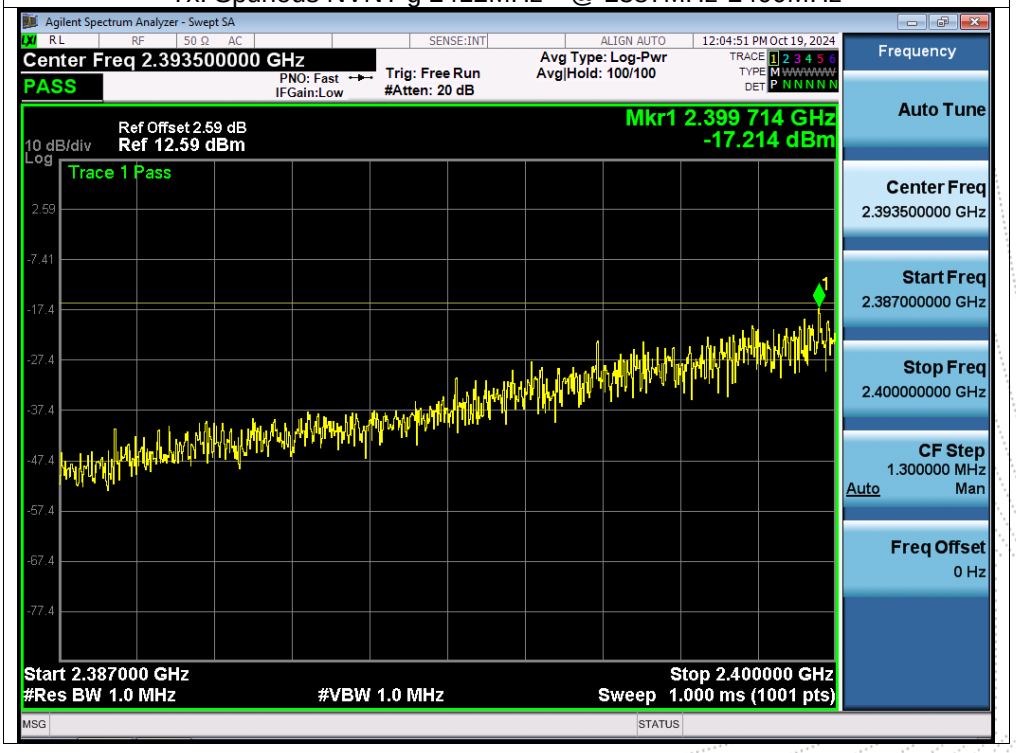
Tx. Spurious NVNT g 2412MHz @ 30MHz-1000MHz



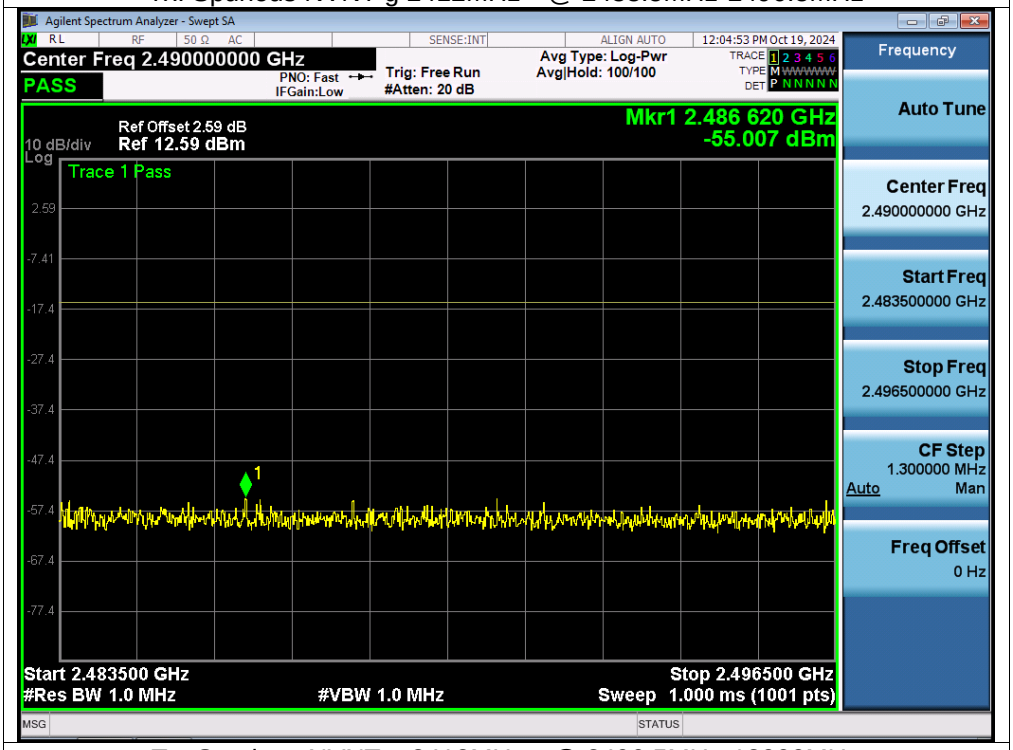
Tx. Spurious NVNT g 2412MHz @ 1000MHz-2387MHz



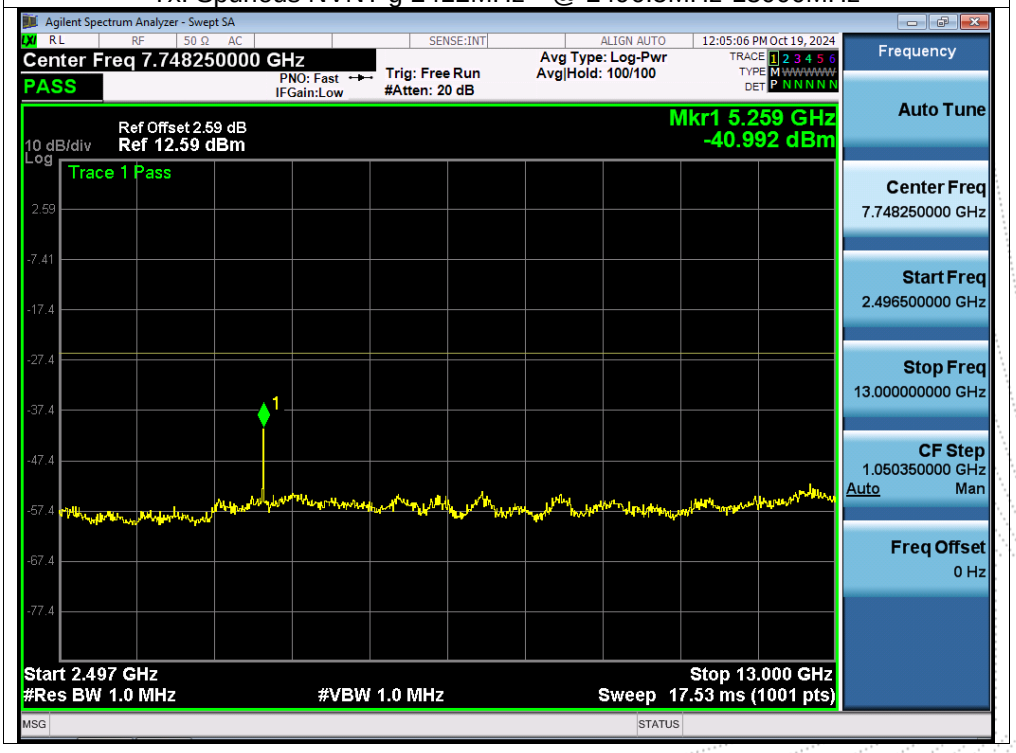
Tx. Spurious NVNT g 2412MHz @ 2387MHz-2400MHz



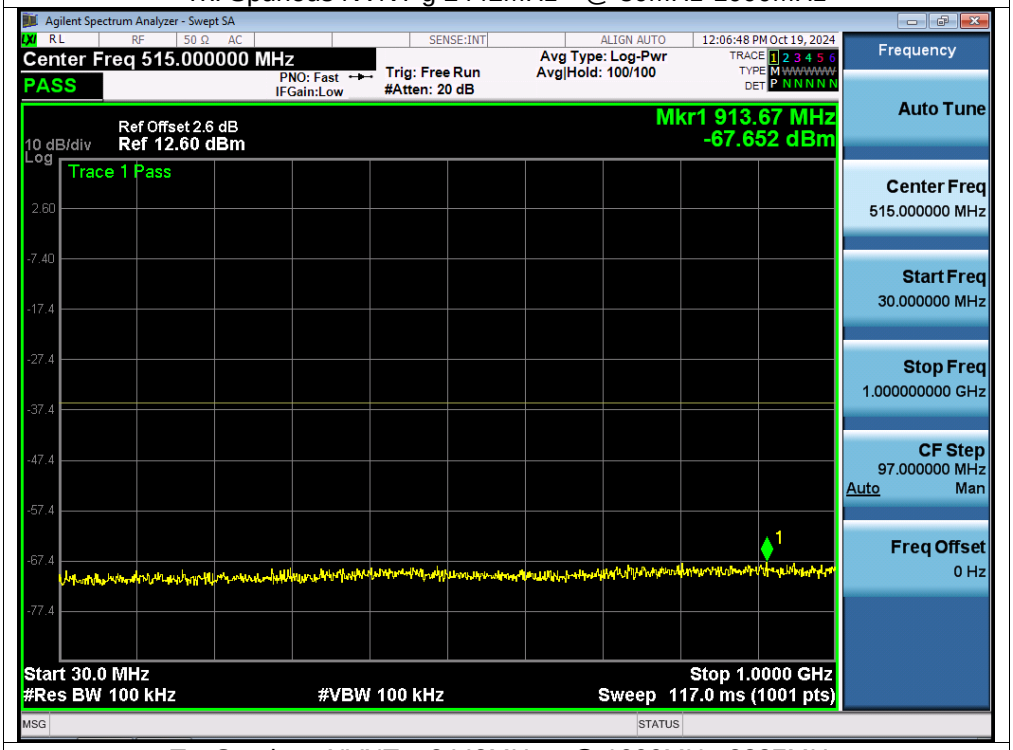
Tx. Spurious NVNT g 2412MHz @ 2483.5MHz-2496.5MHz



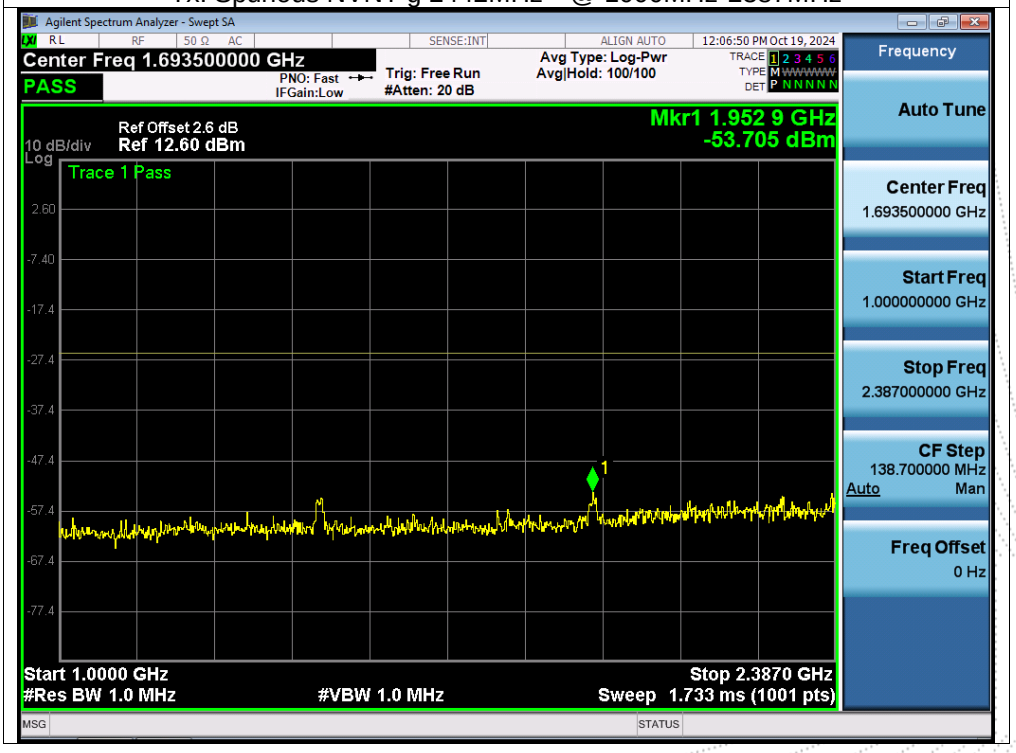
Tx. Spurious NVNT g 2412MHz @ 2496.5MHz-13000MHz



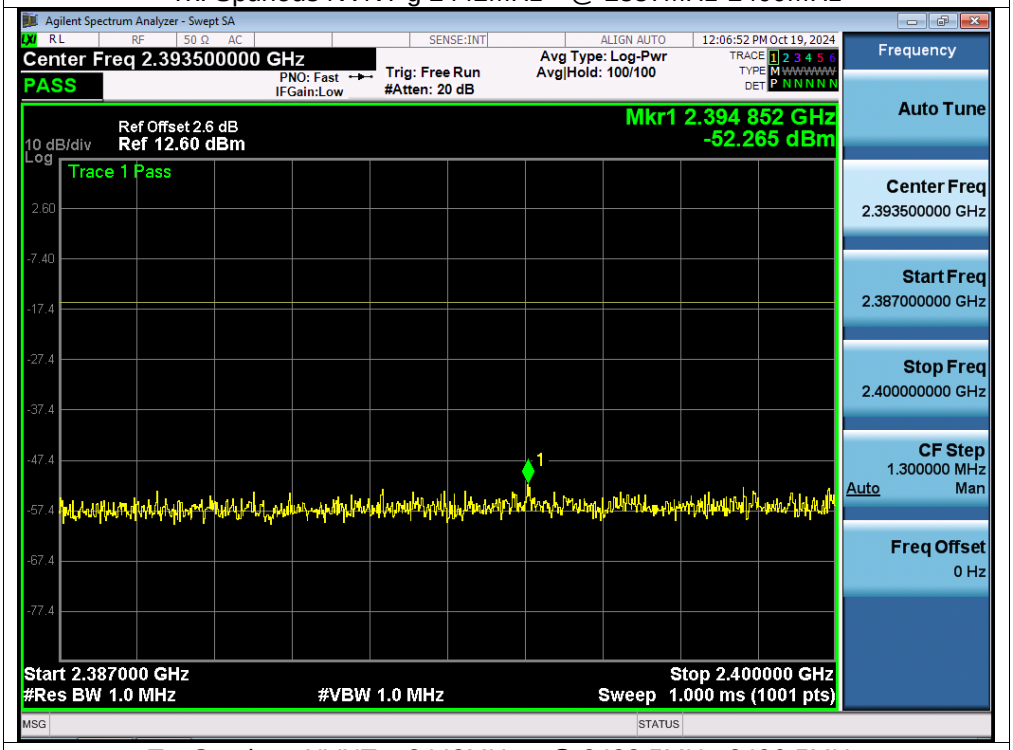
Tx. Spurious NVNT g 2442MHz @ 30MHz-1000MHz



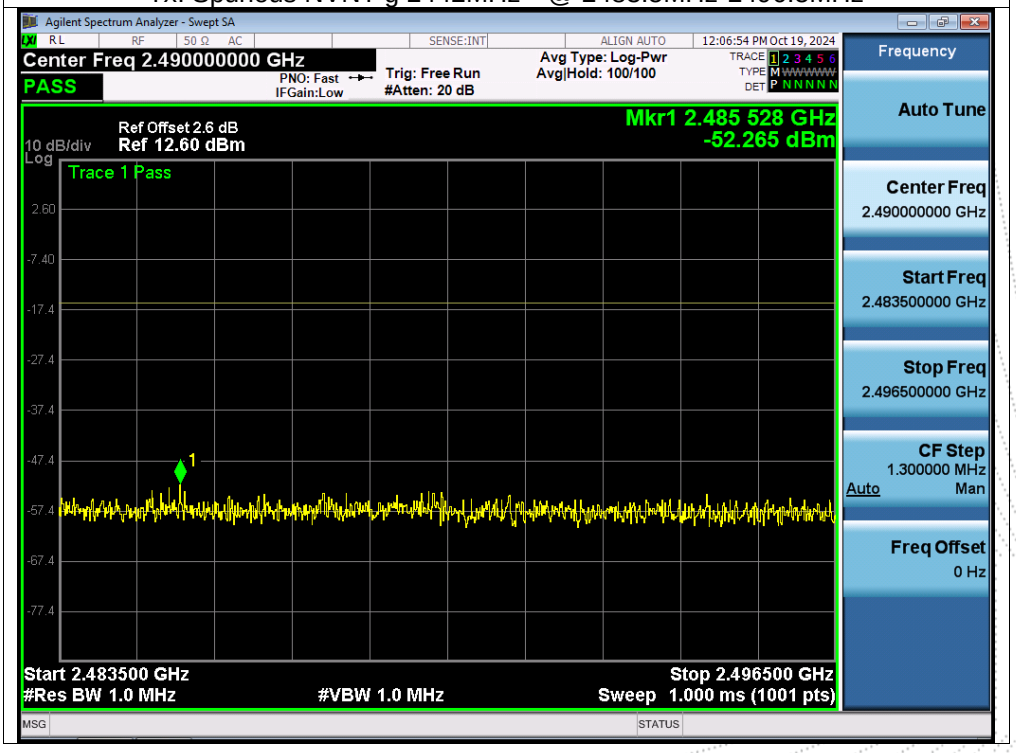
Tx. Spurious NVNT g 2442MHz @ 1000MHz-2387MHz



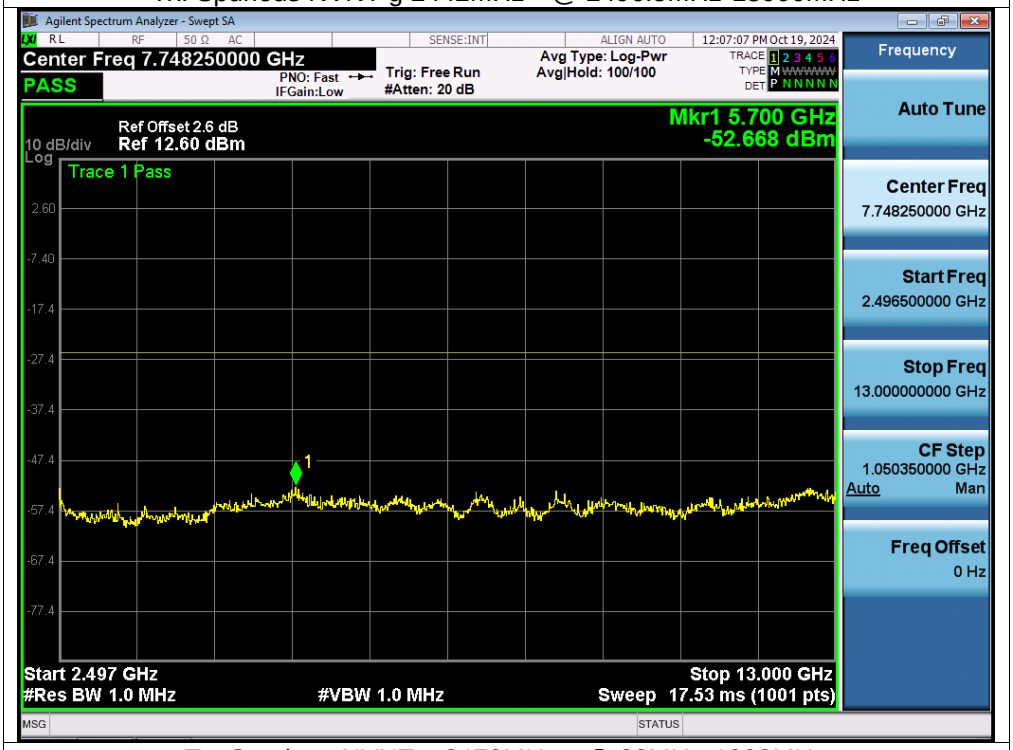
Tx. Spurious NVNT g 2442MHz @ 2387MHz-2400MHz



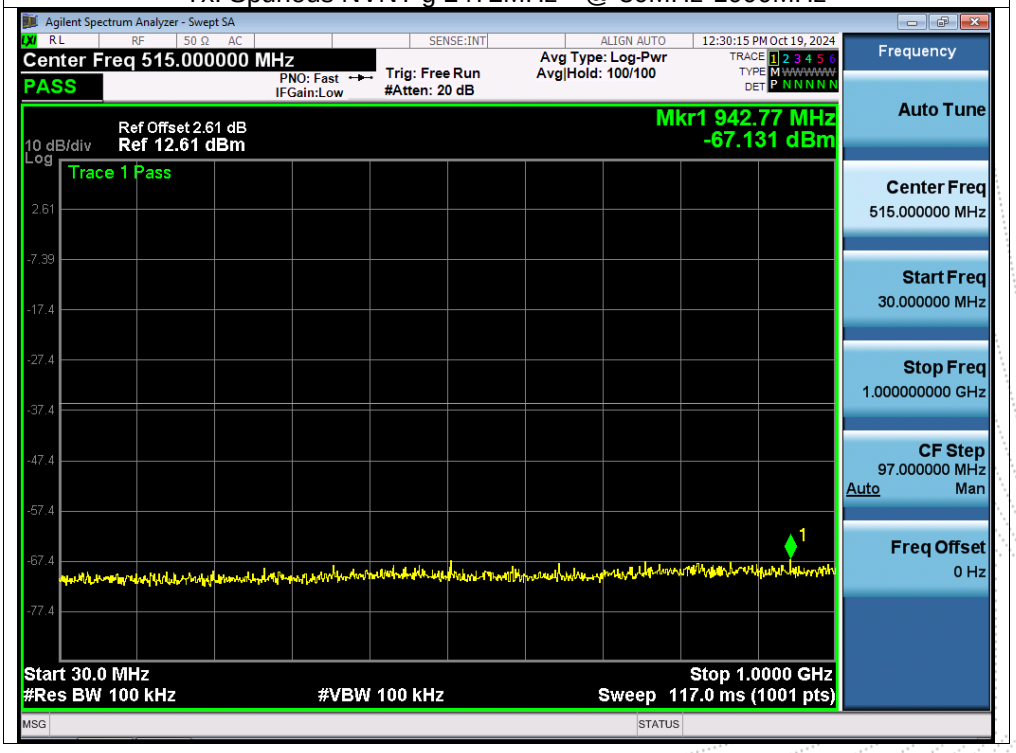
Tx. Spurious NVNT g 2442MHz @ 2483.5MHz-2496.5MHz



Tx. Spurious NVNT g 2442MHz @ 2496.5MHz-13000MHz

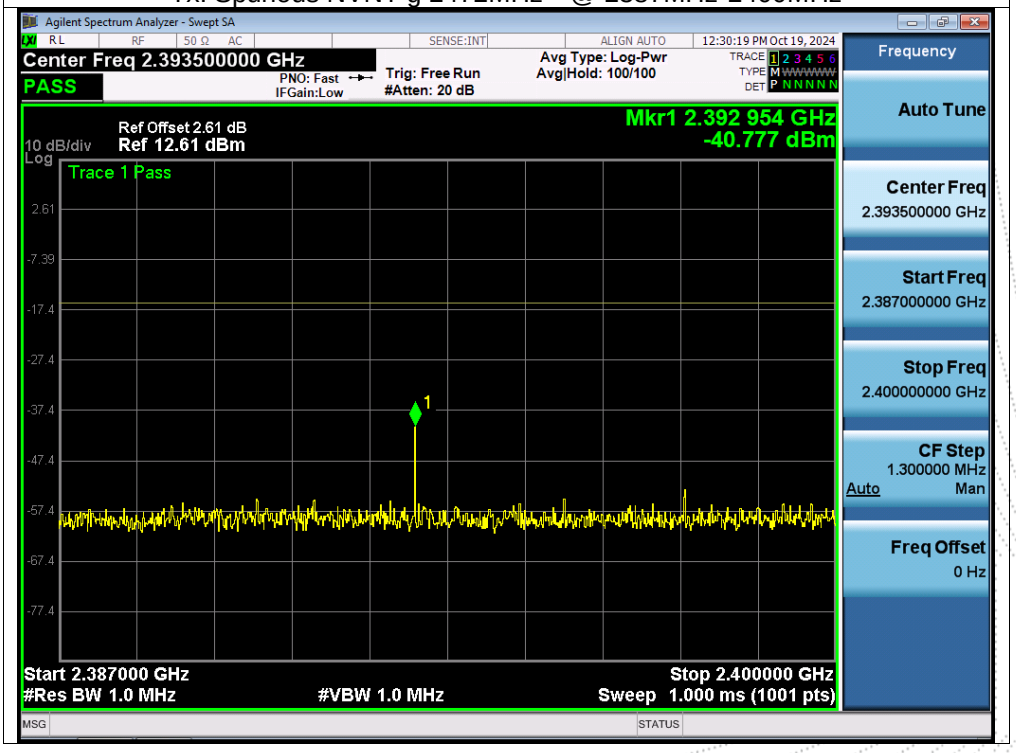


Tx. Spurious NVNT g 2472MHz @ 30MHz-1000MHz

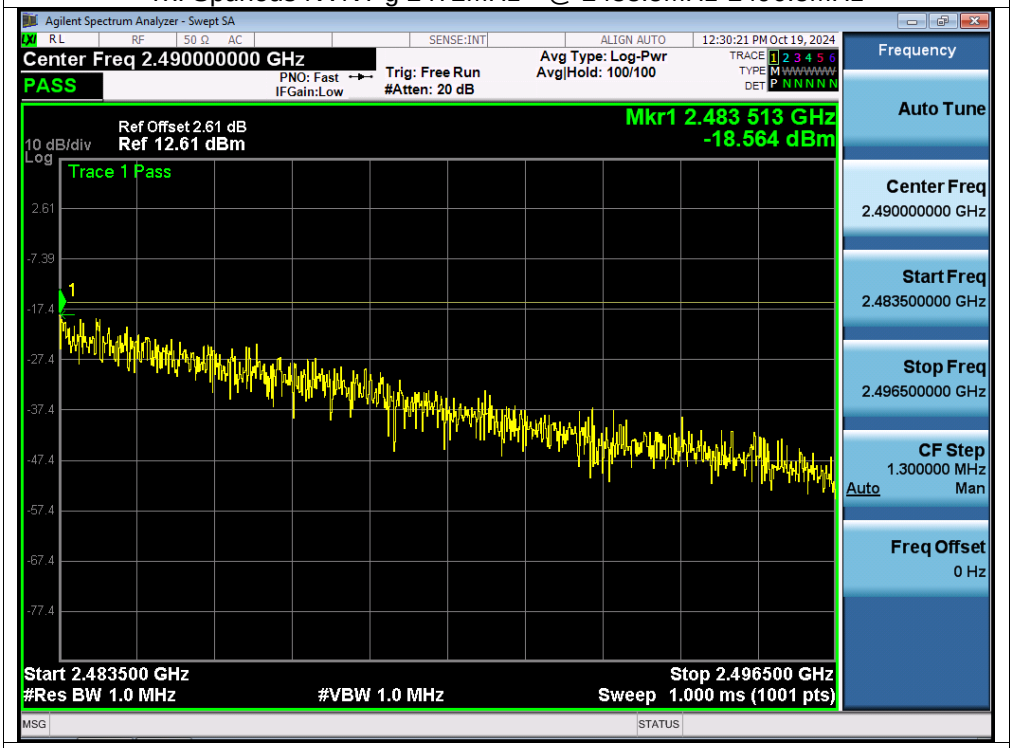


Tx. Spurious NVNT g 2472MHz @ 1000MHz-2387MHz

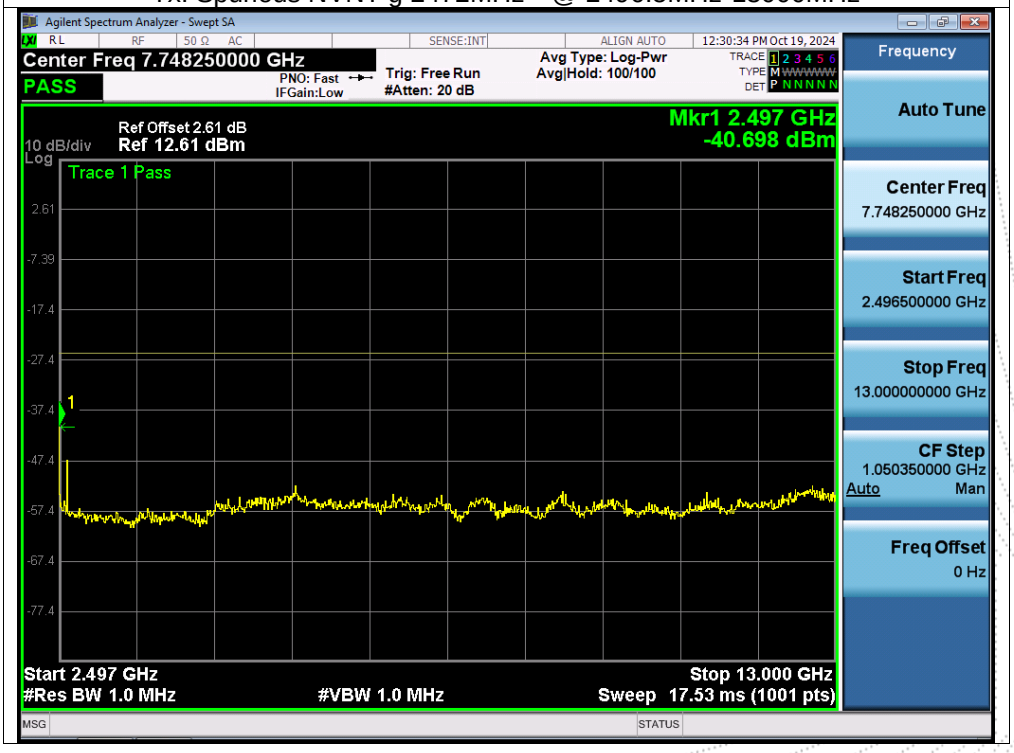
Tx. Spurious NVNT g 2472MHz @ 2387MHz-2400MHz



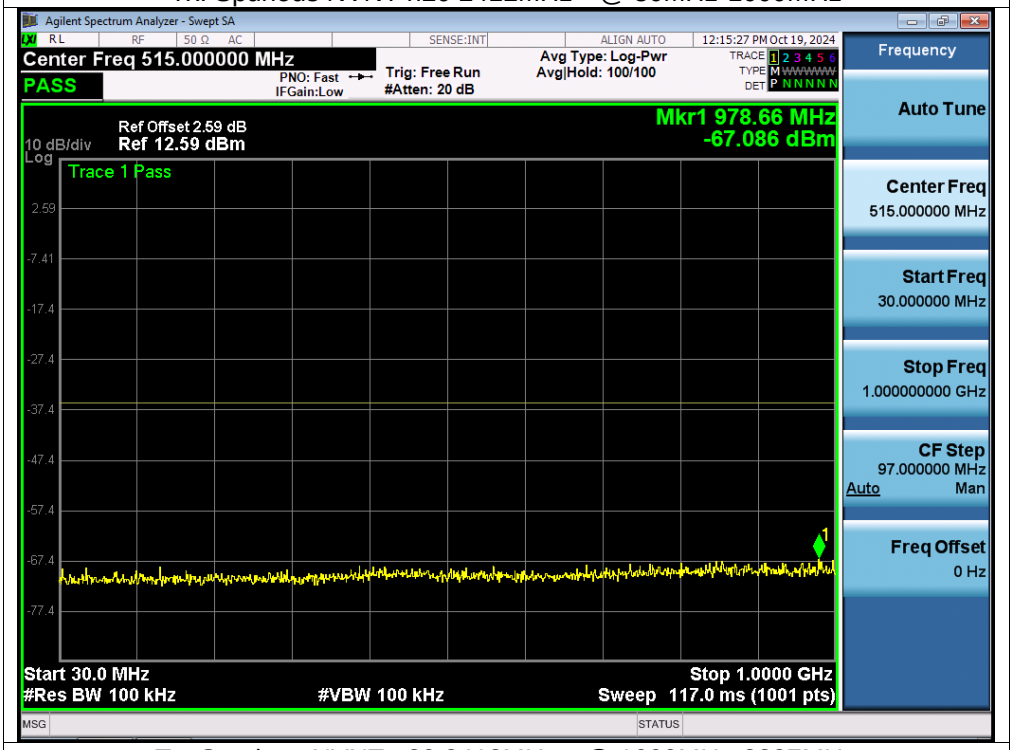
Tx. Spurious NVNT g 2472MHz @ 2483.5MHz-2496.5MHz



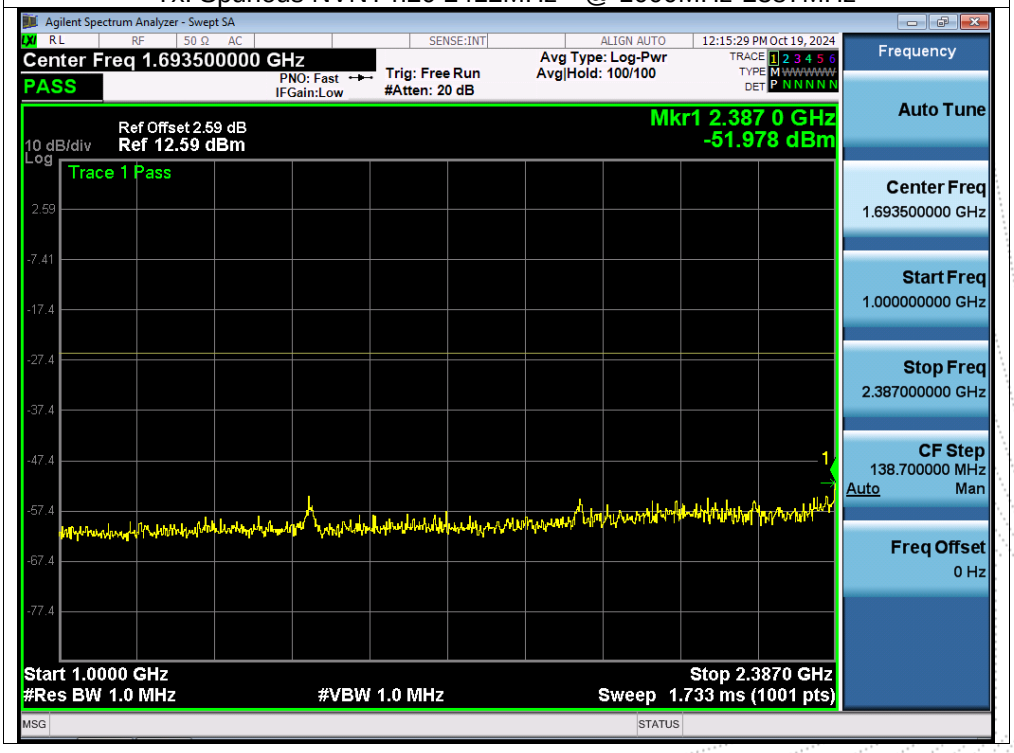
Tx. Spurious NVNT g 2472MHz @ 2496.5MHz-13000MHz



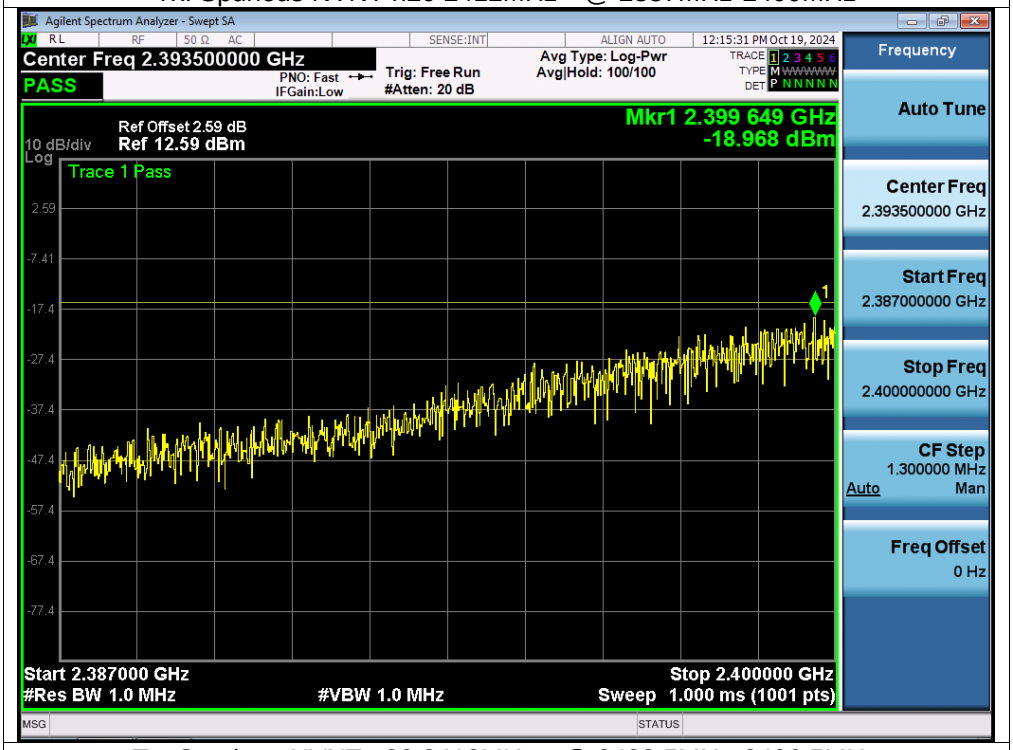
Tx. Spurious NVNT n20 2412MHz @ 30MHz-1000MHz



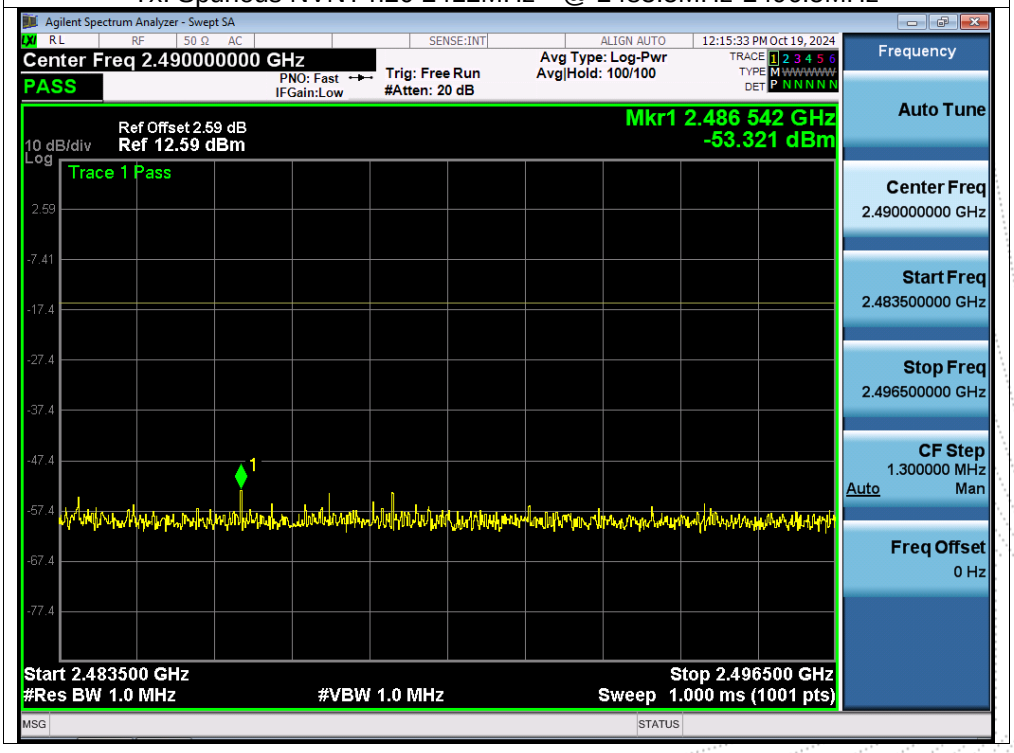
Tx. Spurious NVNT n20 2412MHz @ 1000MHz-2387MHz



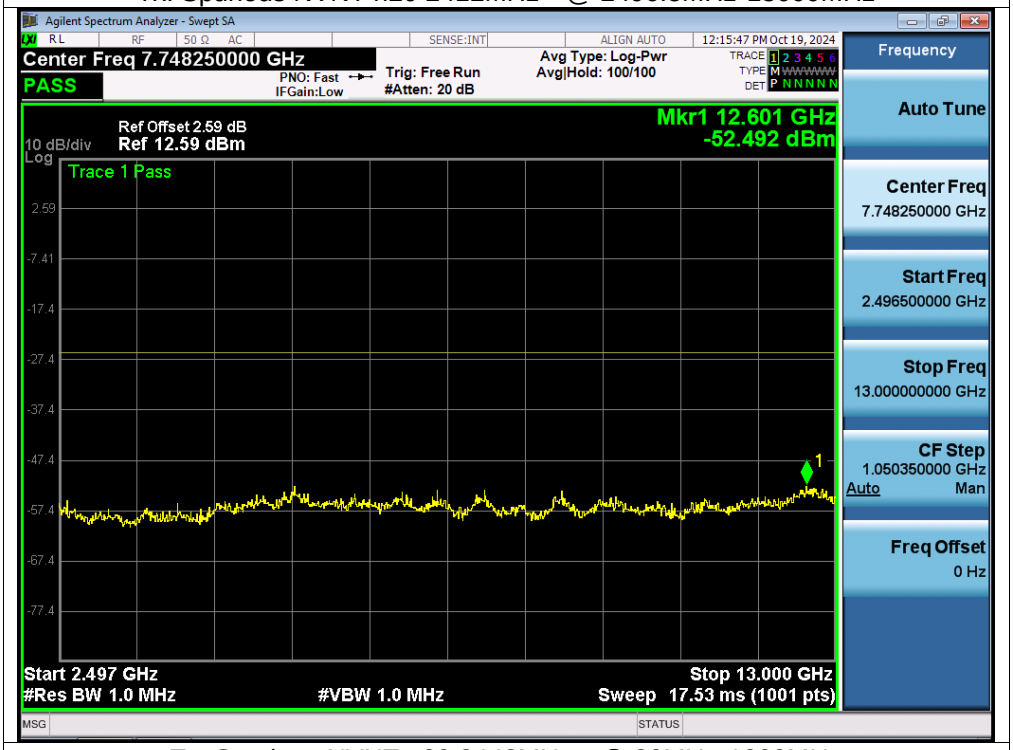
Tx. Spurious NVNT n20 2412MHz @ 2387MHz-2400MHz



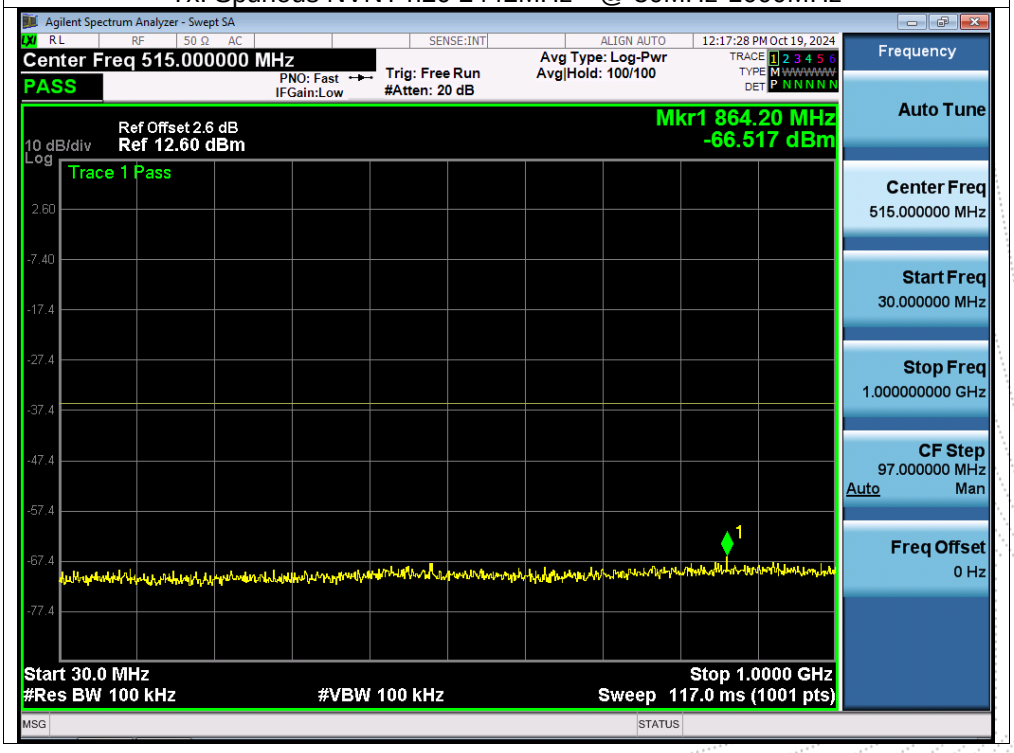
Tx. Spurious NVNT n20 2412MHz @ 2483.5MHz-2496.5MHz



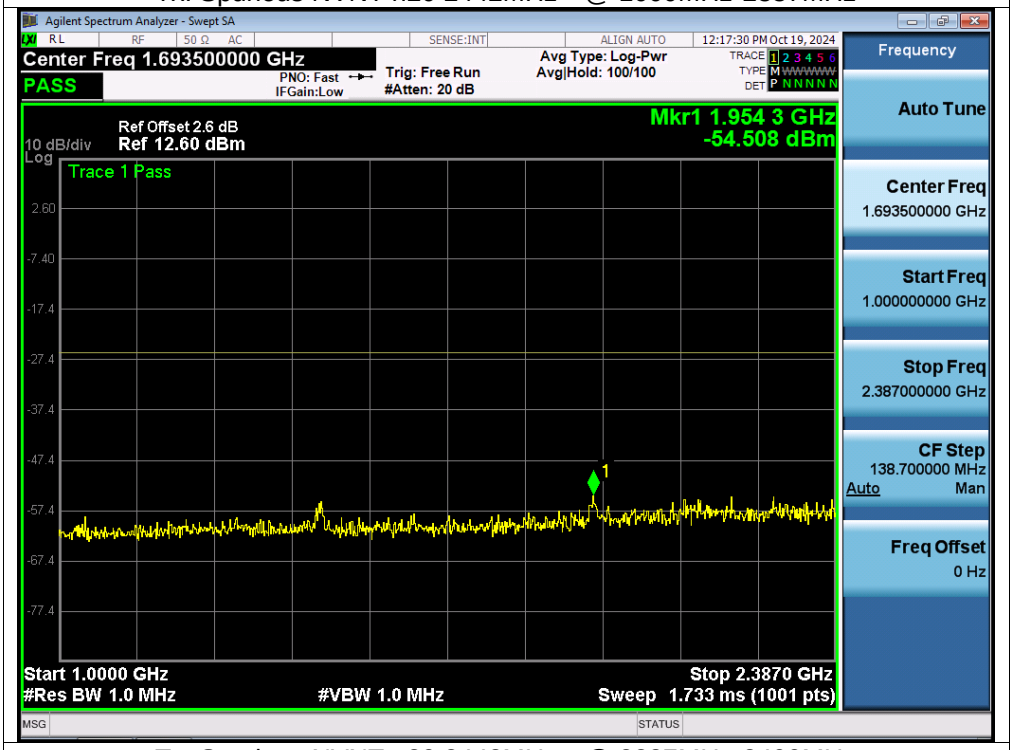
Tx. Spurious NVNT n20 2412MHz @ 2496.5MHz-13000MHz



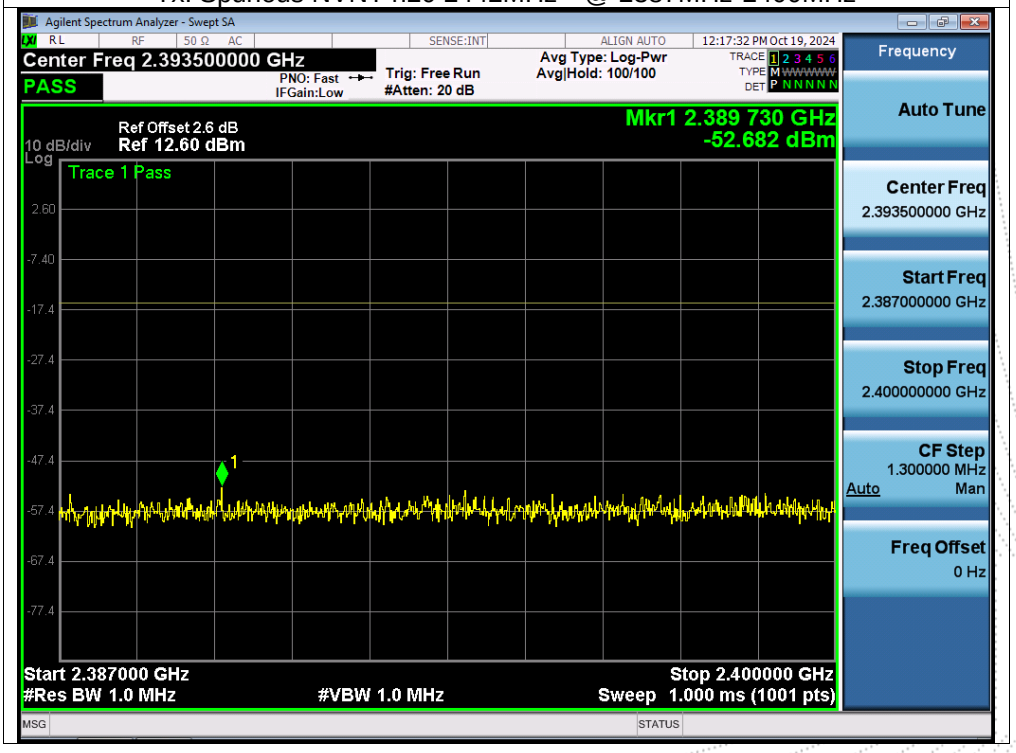
Tx. Spurious NVNT n20 2442MHz @ 30MHz-1000MHz



Tx. Spurious NVNT n20 2442MHz @ 1000MHz-2387MHz



Tx. Spurious NVNT n20 2442MHz @ 2387MHz-2400MHz



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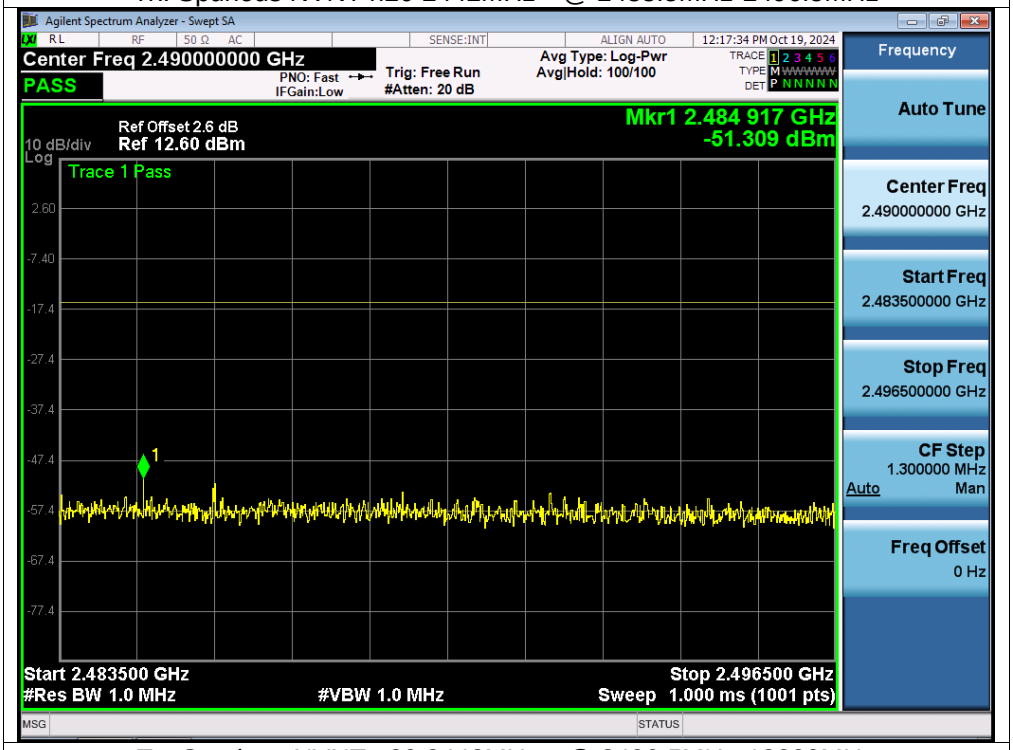
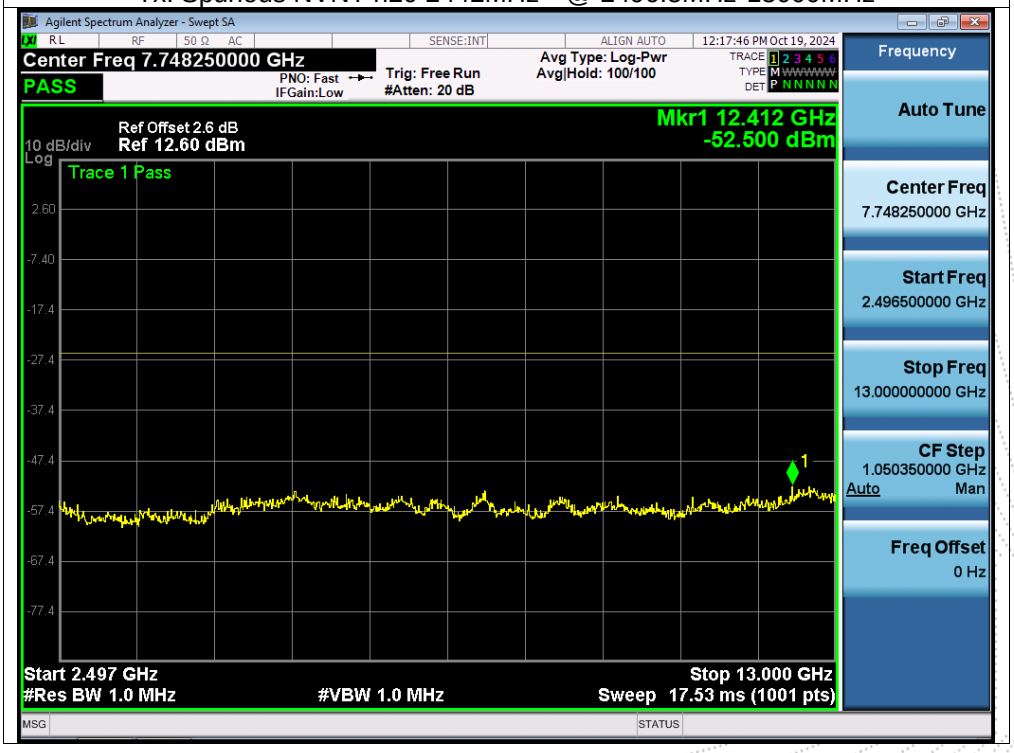
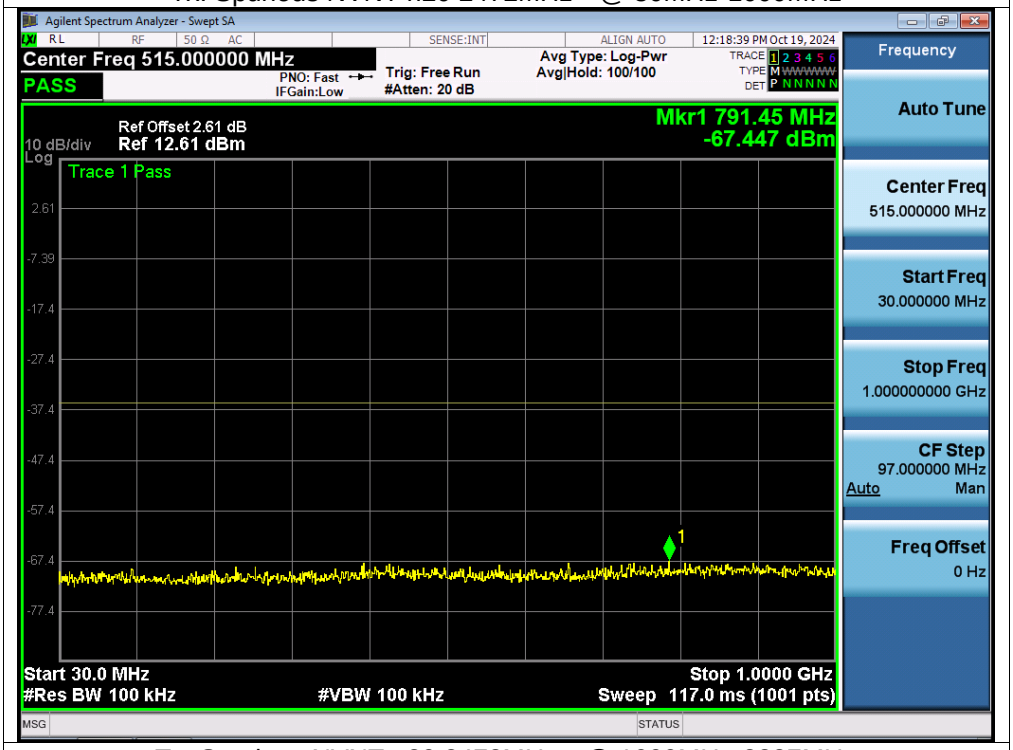


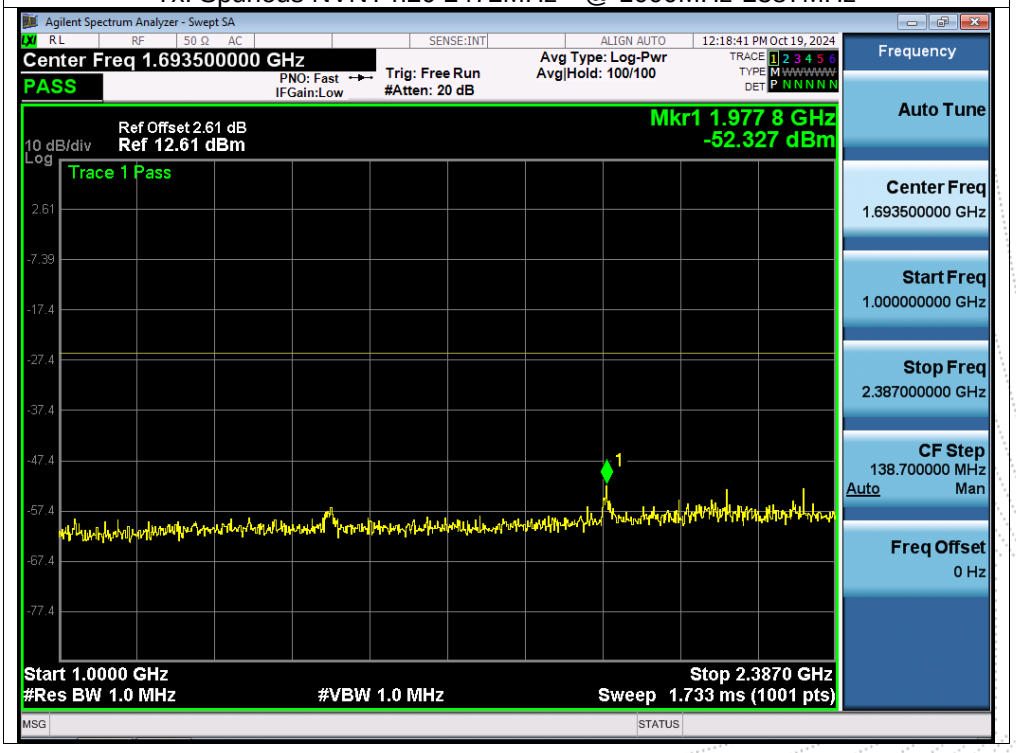
Tx. Spurious NVNT n20 2442MHz @ 2496.5MHz-13000MHz



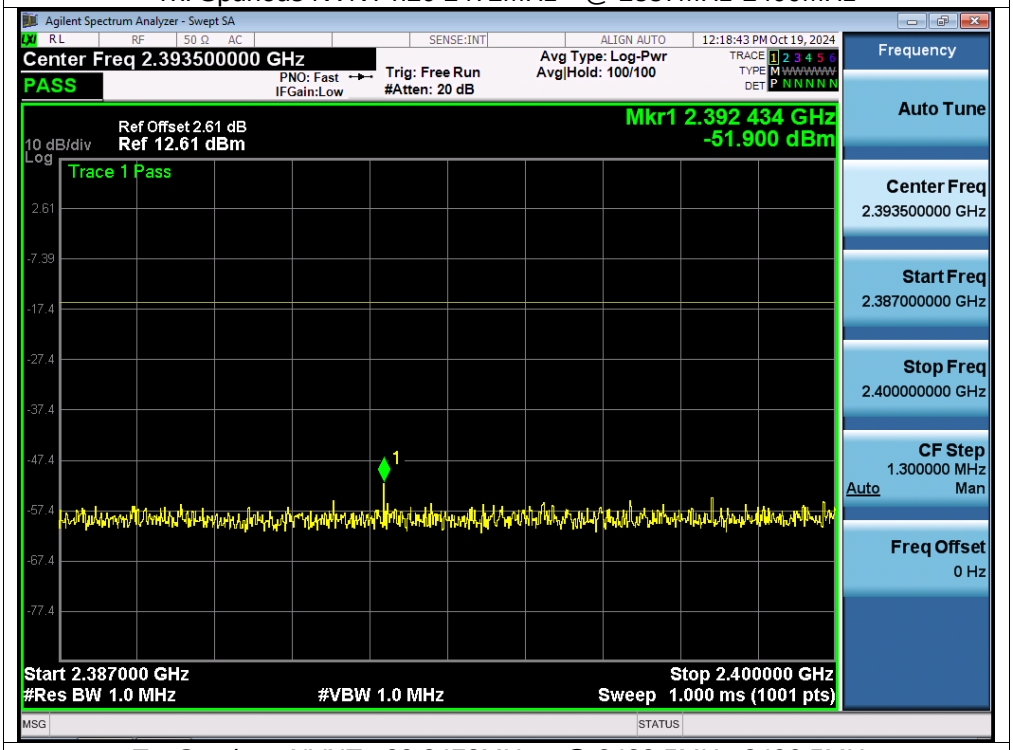
Tx. Spurious NVNT n20 2472MHz @ 30MHz-1000MHz



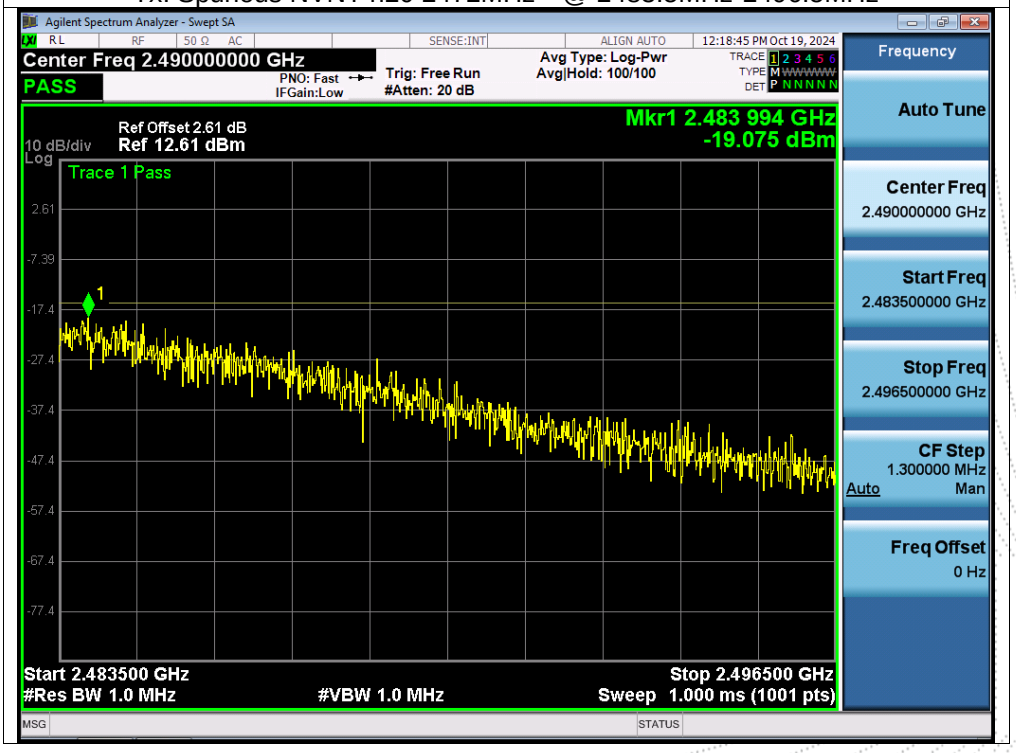
Tx. Spurious NVNT n20 2472MHz @ 1000MHz-2387MHz



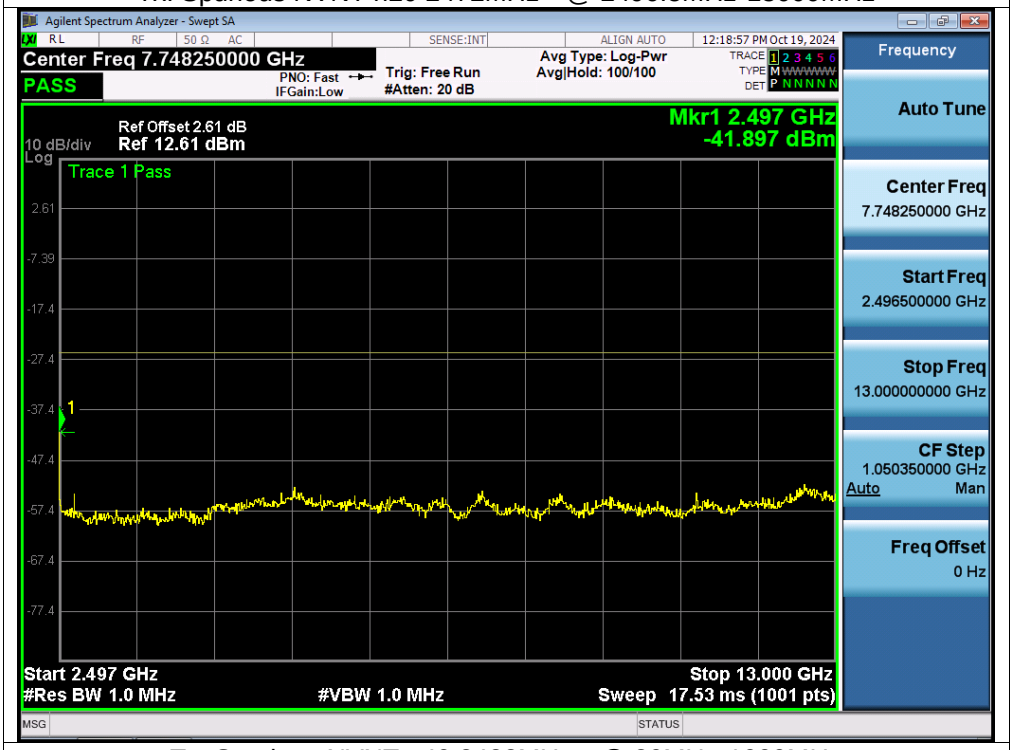
Tx. Spurious NVNT n20 2472MHz @ 2387MHz-2400MHz



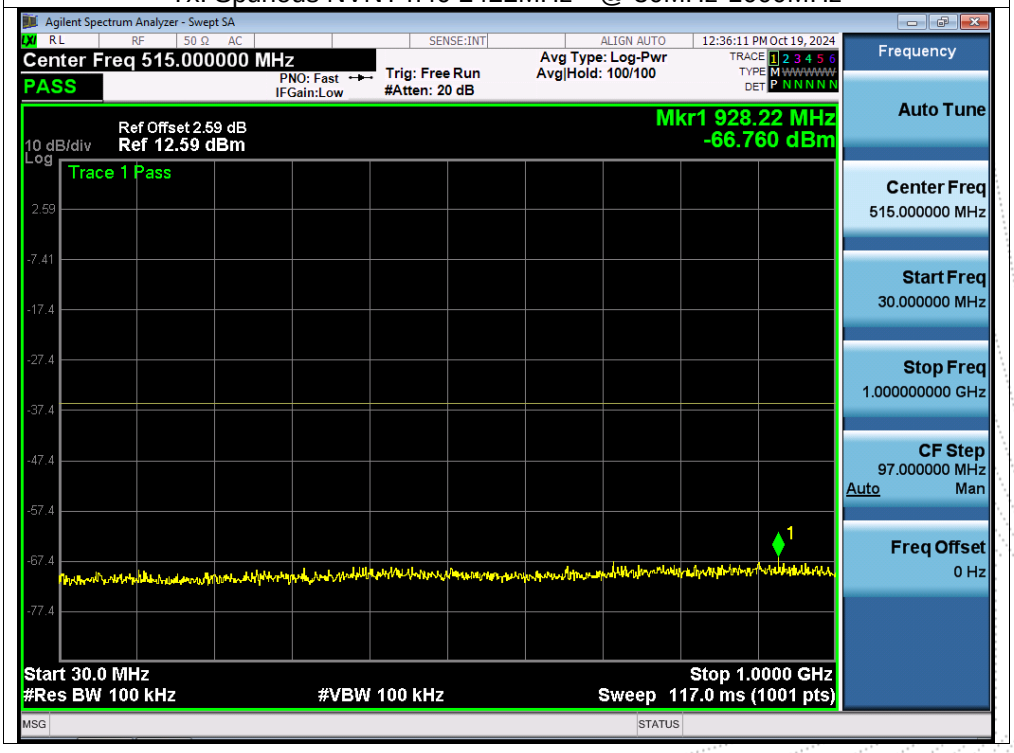
Tx. Spurious NVNT n20 2472MHz @ 2483.5MHz-2496.5MHz



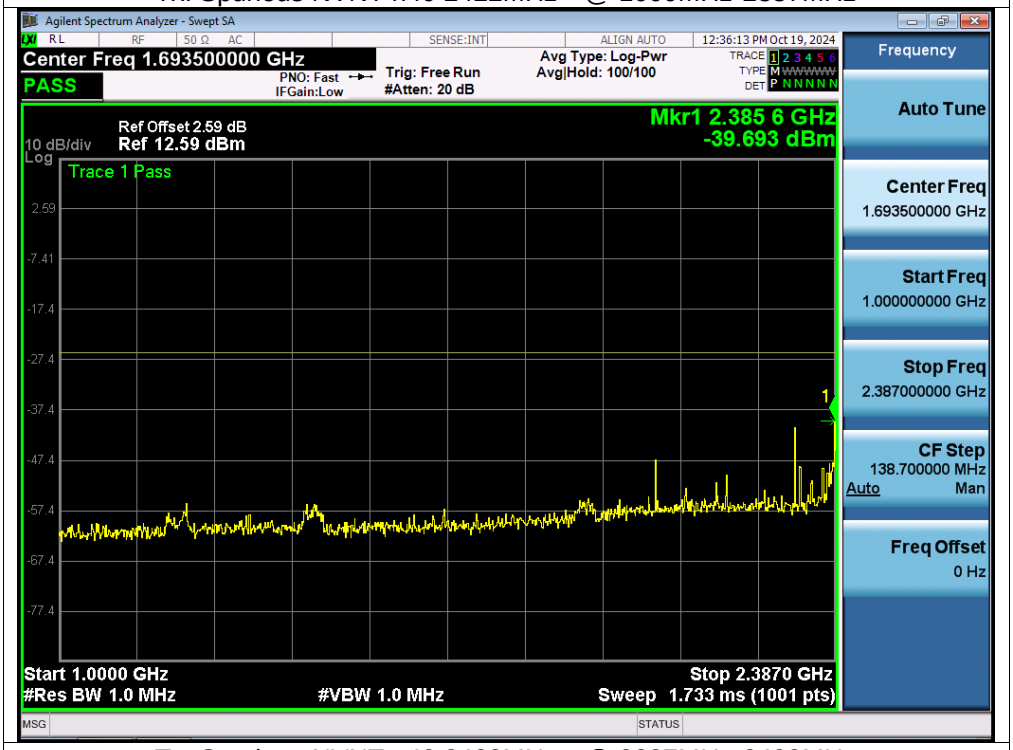
Tx. Spurious NVNT n20 2472MHz @ 2496.5MHz-13000MHz



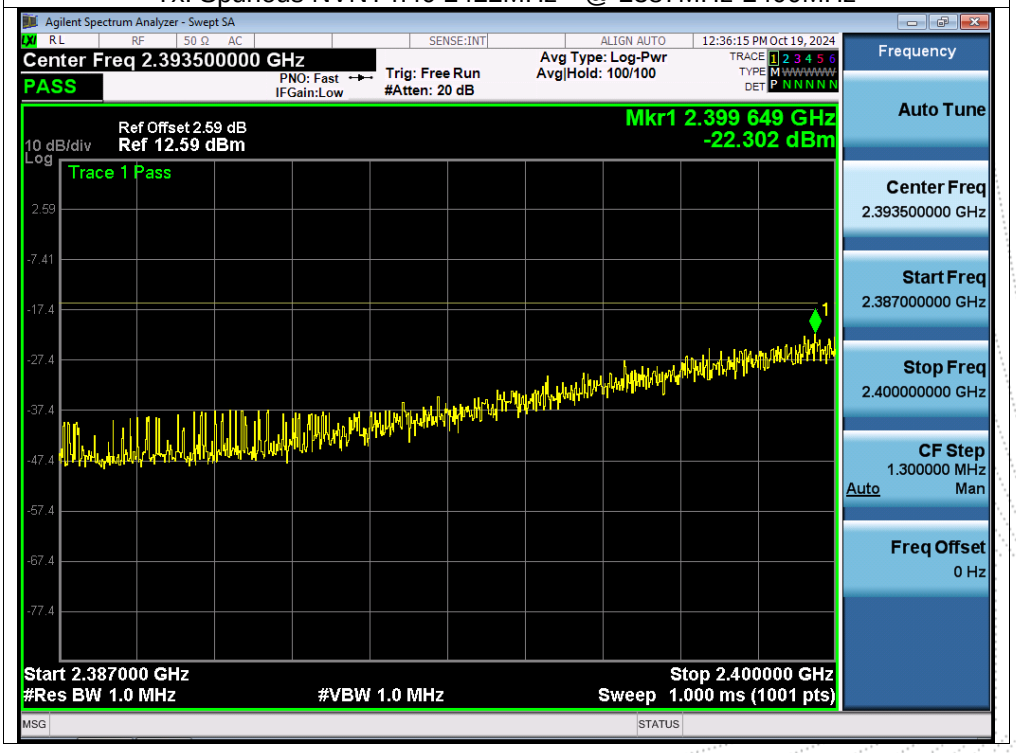
Tx. Spurious NVNT n40 2422MHz @ 30MHz-1000MHz



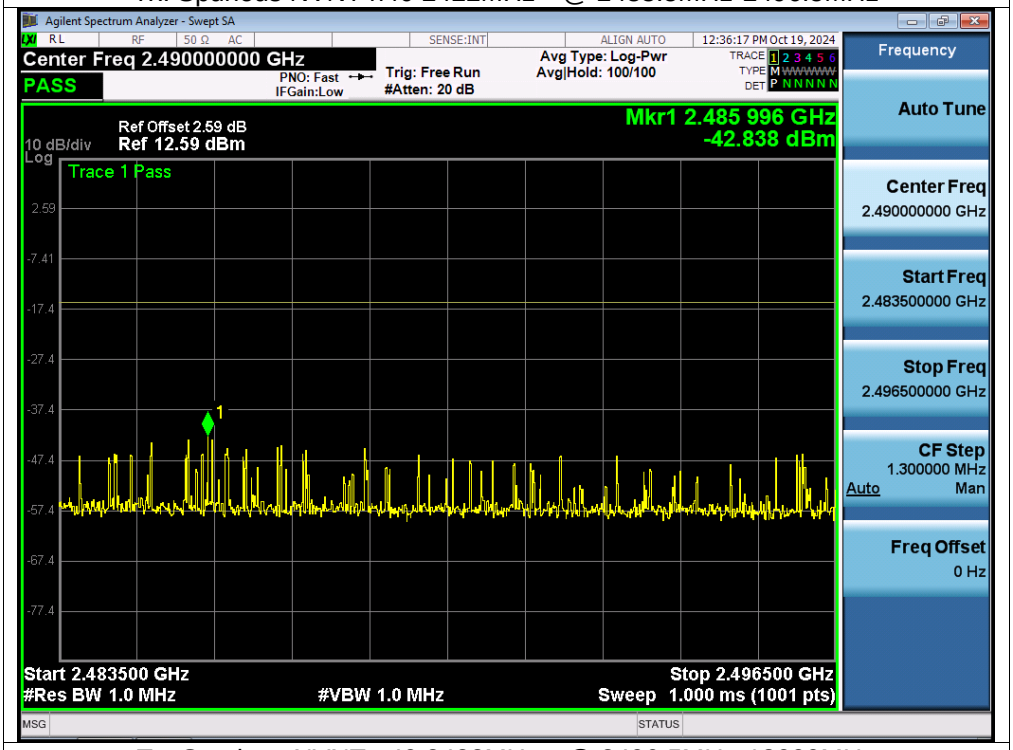
Tx. Spurious NVNT n40 2422MHz @ 1000MHz-2387MHz



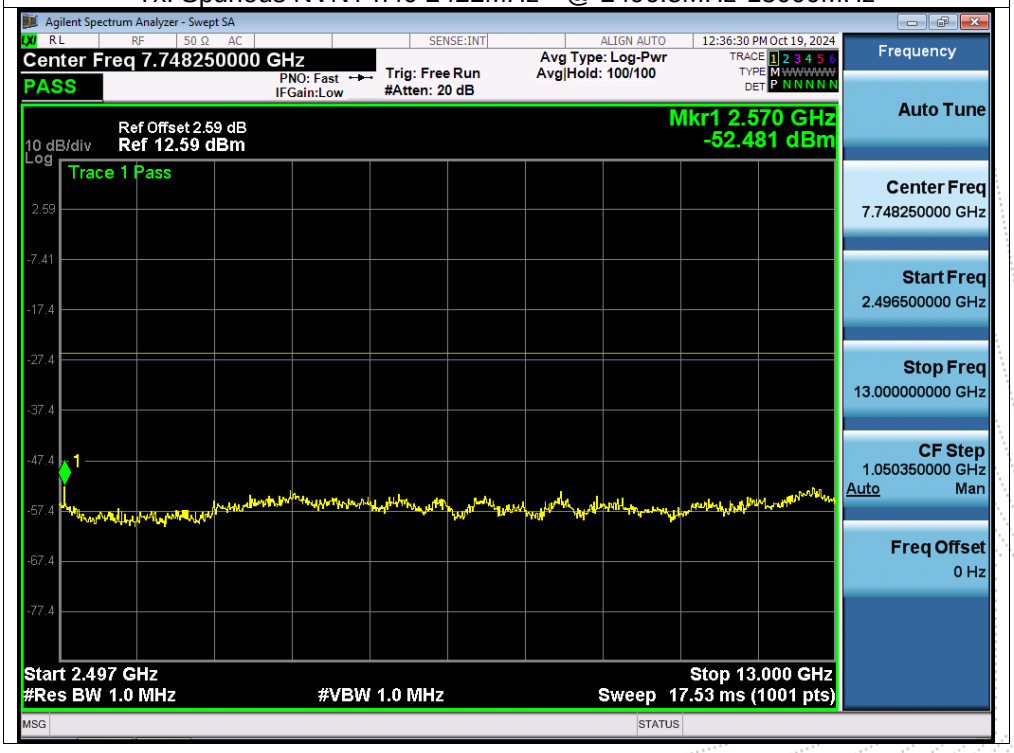
Tx. Spurious NVNT n40 2422MHz @ 2387MHz-2400MHz



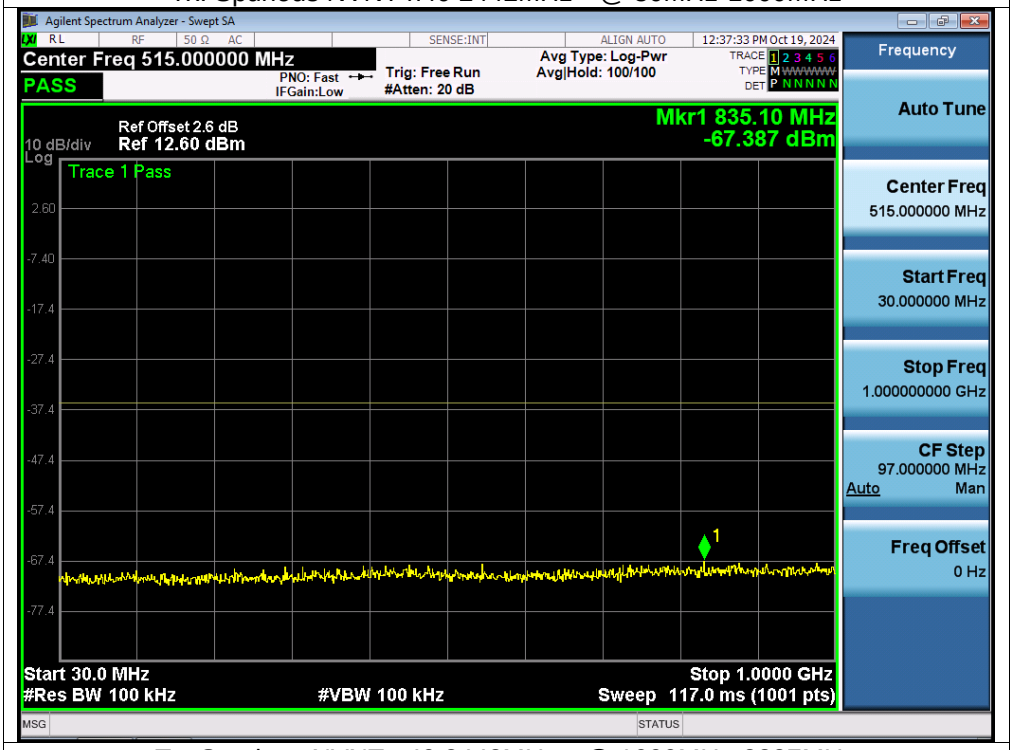
Tx. Spurious NVNT n40 2422MHz @ 2483.5MHz-2496.5MHz



Tx. Spurious NVNT n40 2422MHz @ 2496.5MHz-13000MHz



Tx. Spurious NVNT n40 2442MHz @ 30MHz-1000MHz



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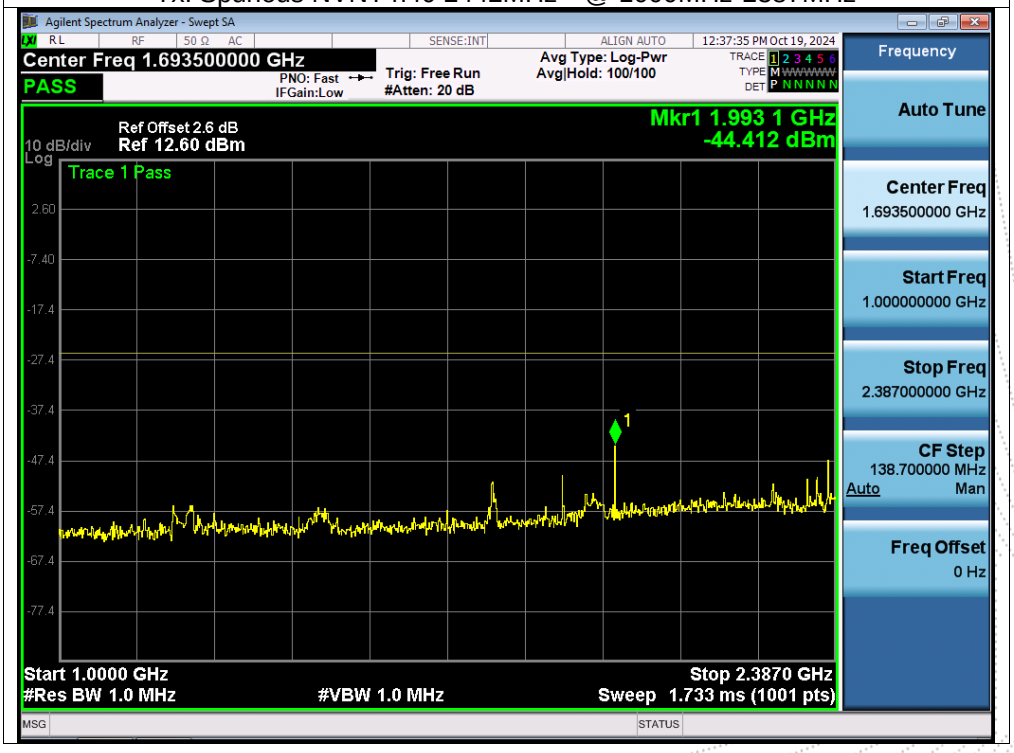
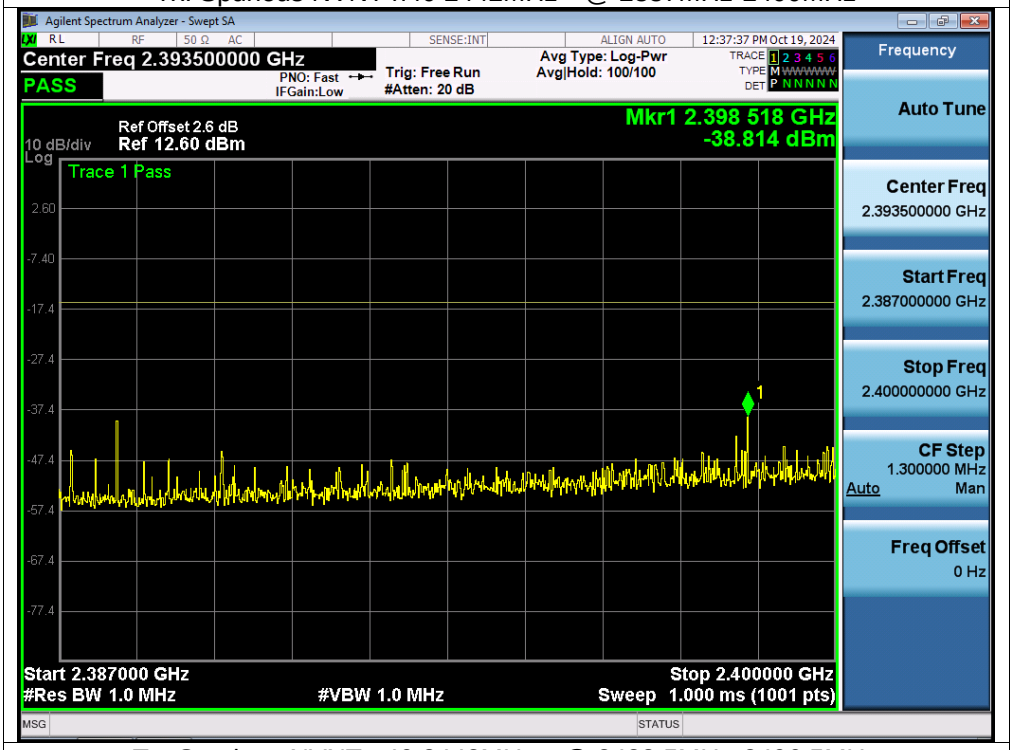
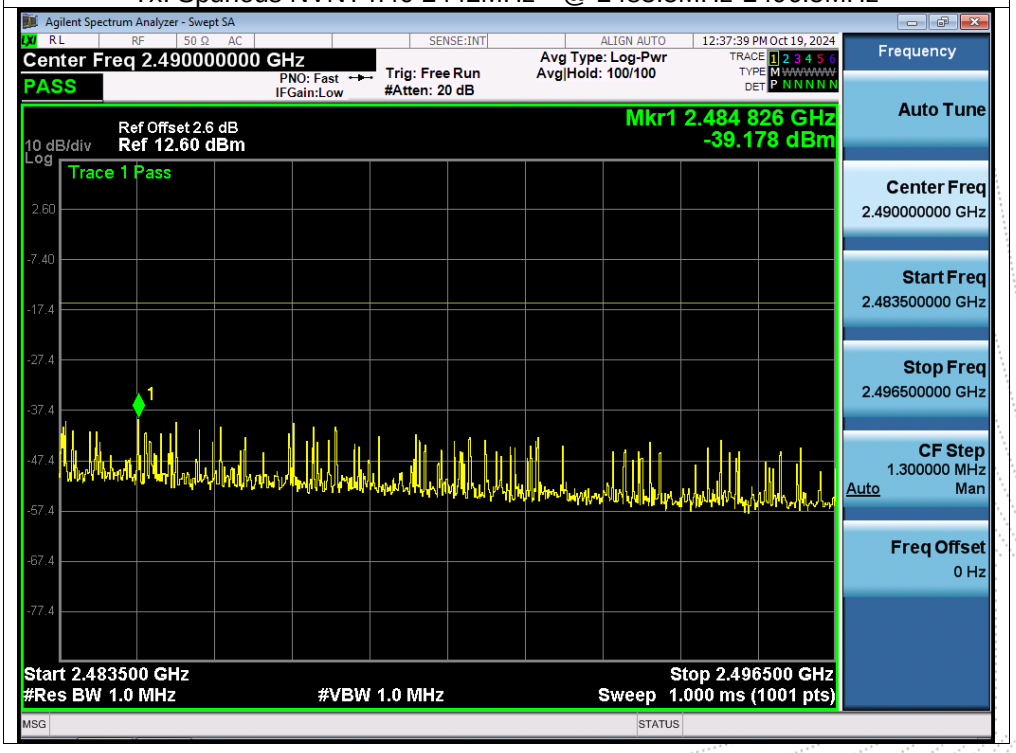


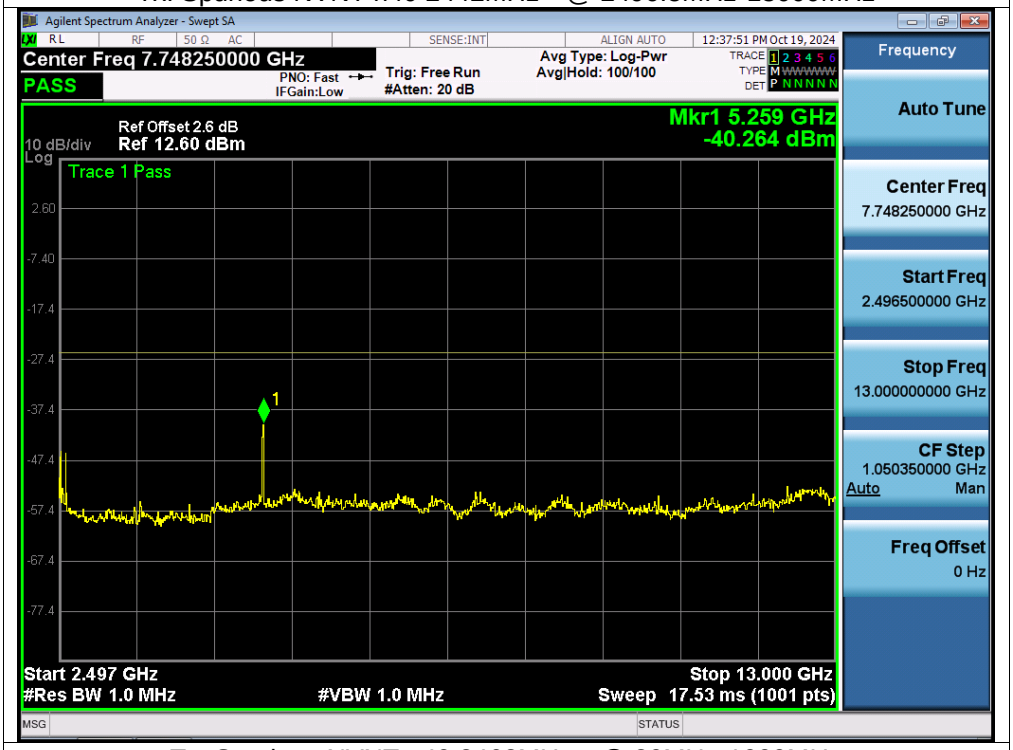
Tx. Spurious NVNT n40 2442MHz @ 2387MHz-2400MHz



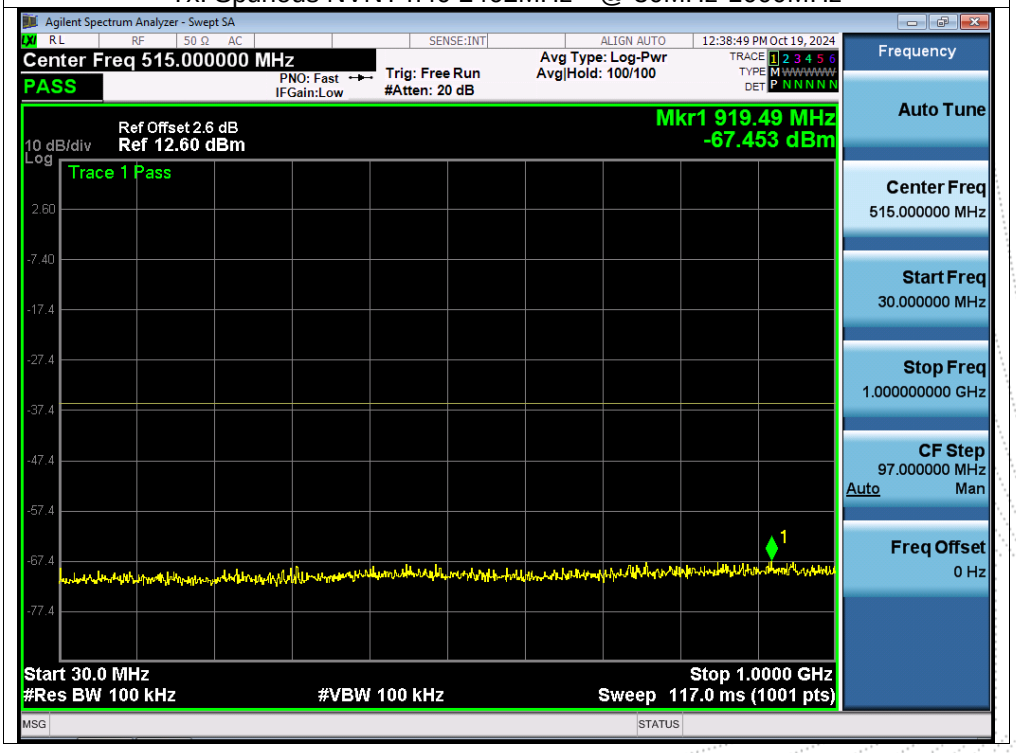
Tx. Spurious NVNT n40 2442MHz @ 2483.5MHz-2496.5MHz



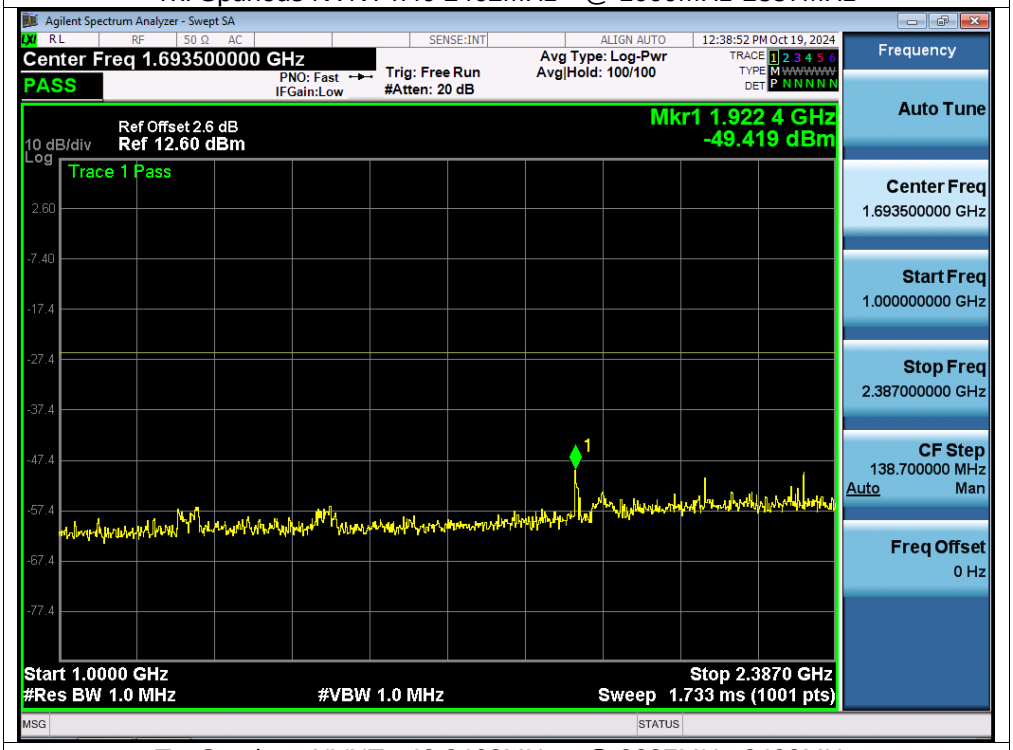
Tx. Spurious NVNT n40 2442MHz @ 2496.5MHz-13000MHz



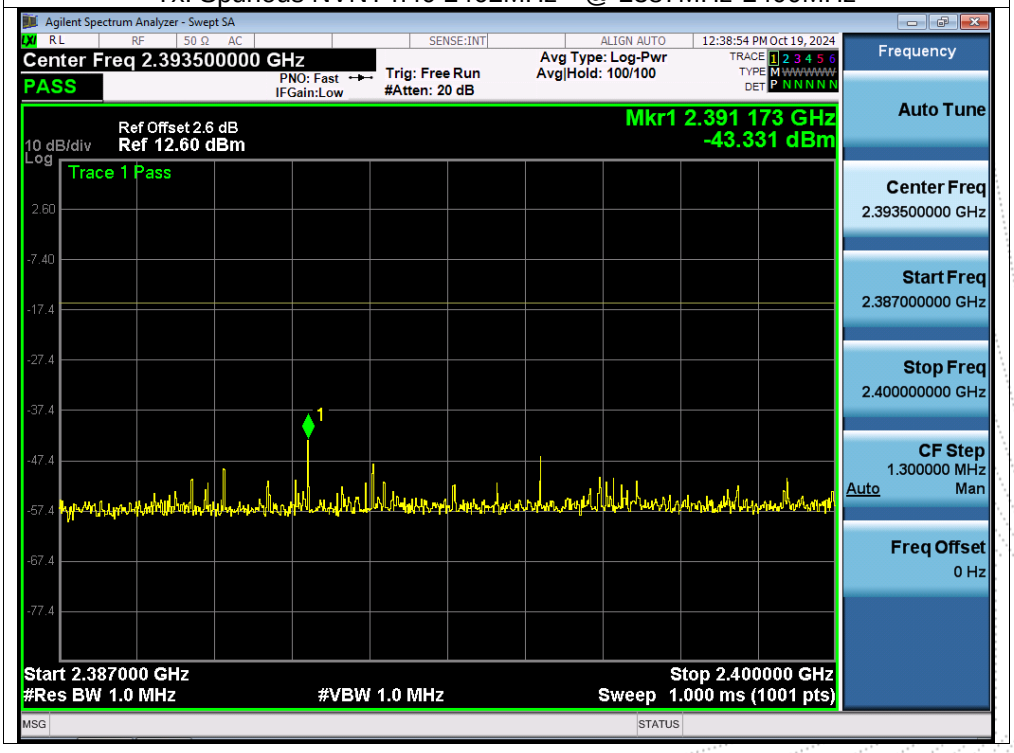
Tx. Spurious NVNT n40 2462MHz @ 30MHz-1000MHz



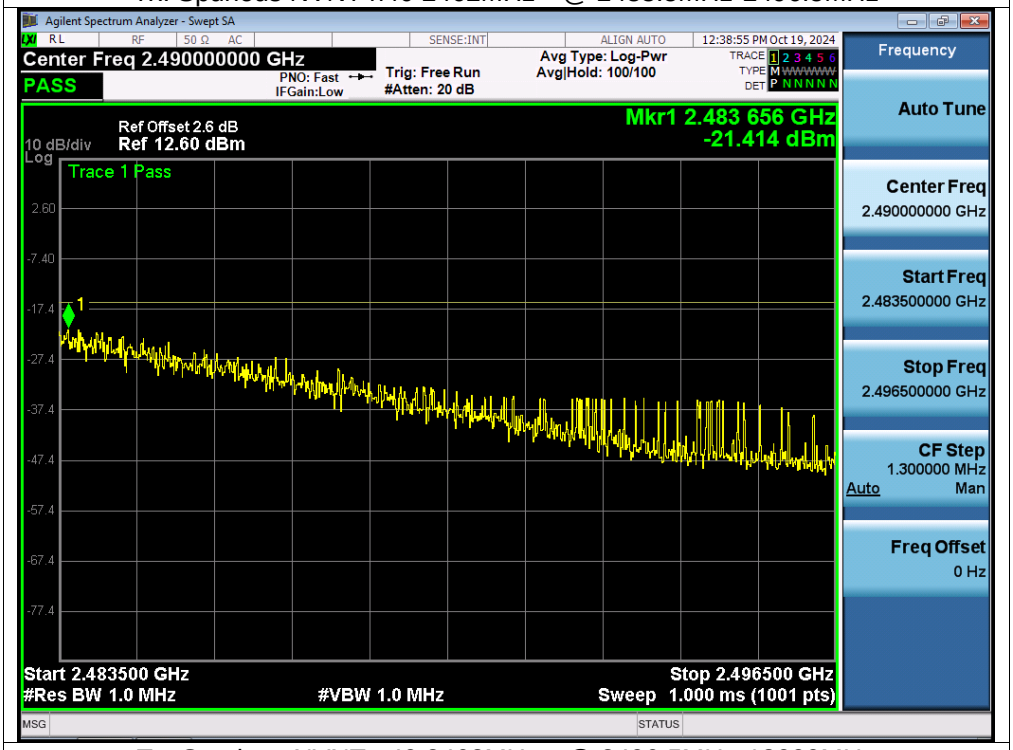
Tx. Spurious NVNT n40 2462MHz @ 1000MHz-2387MHz



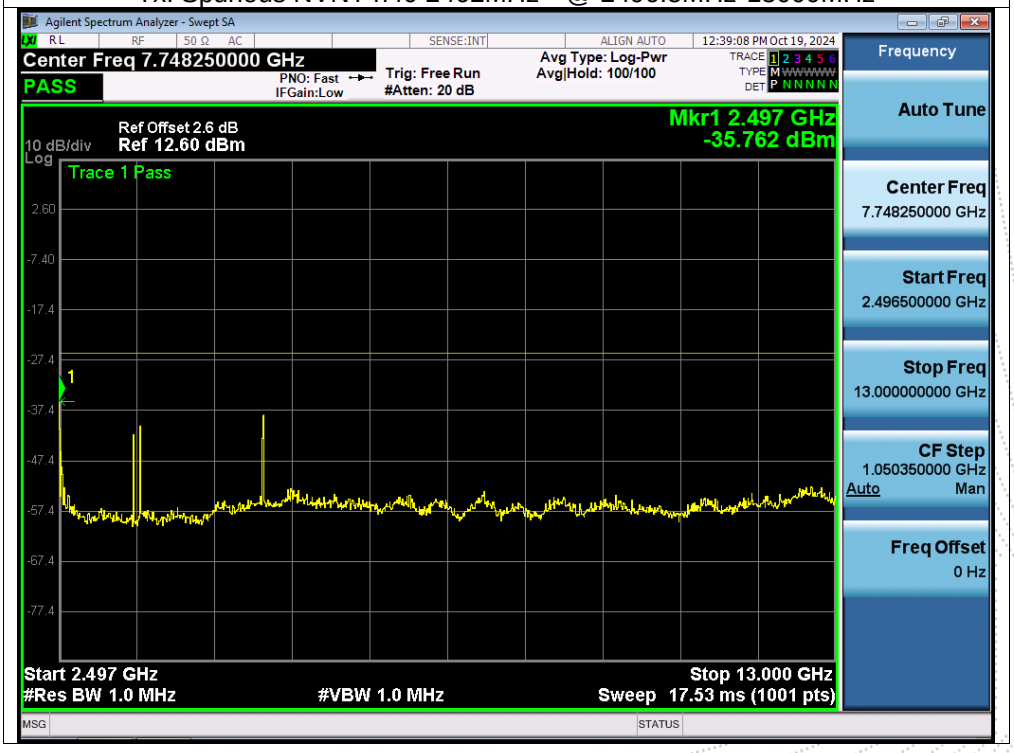
Tx. Spurious NVNT n40 2462MHz @ 2387MHz-2400MHz



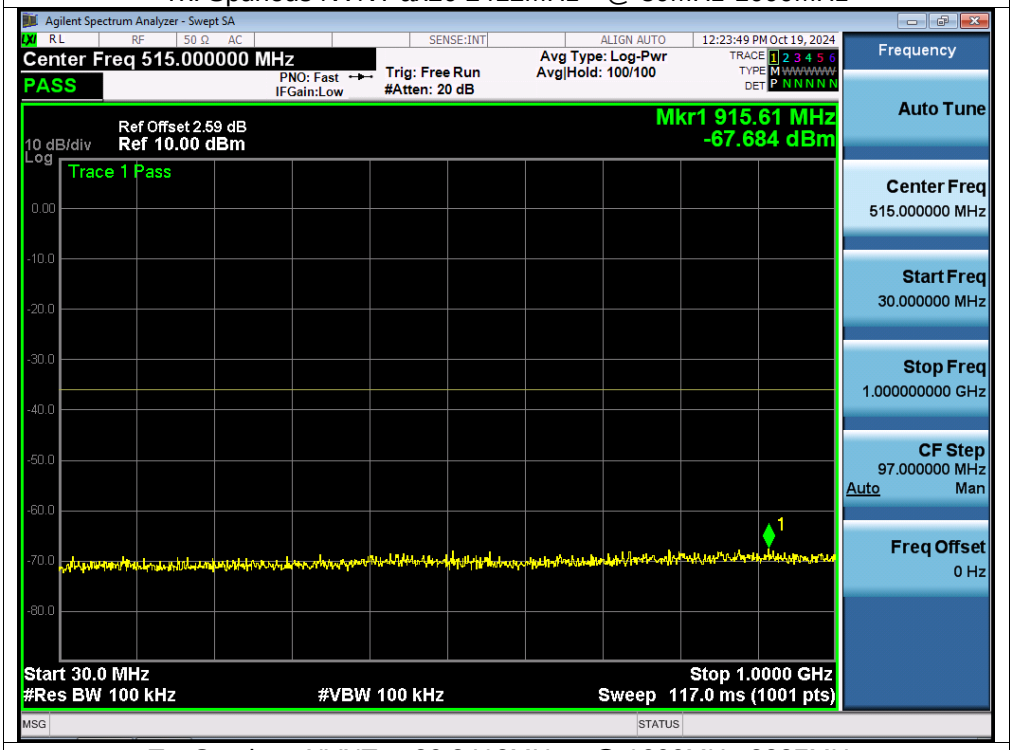
Tx. Spurious NVNT n40 2462MHz @ 2483.5MHz-2496.5MHz



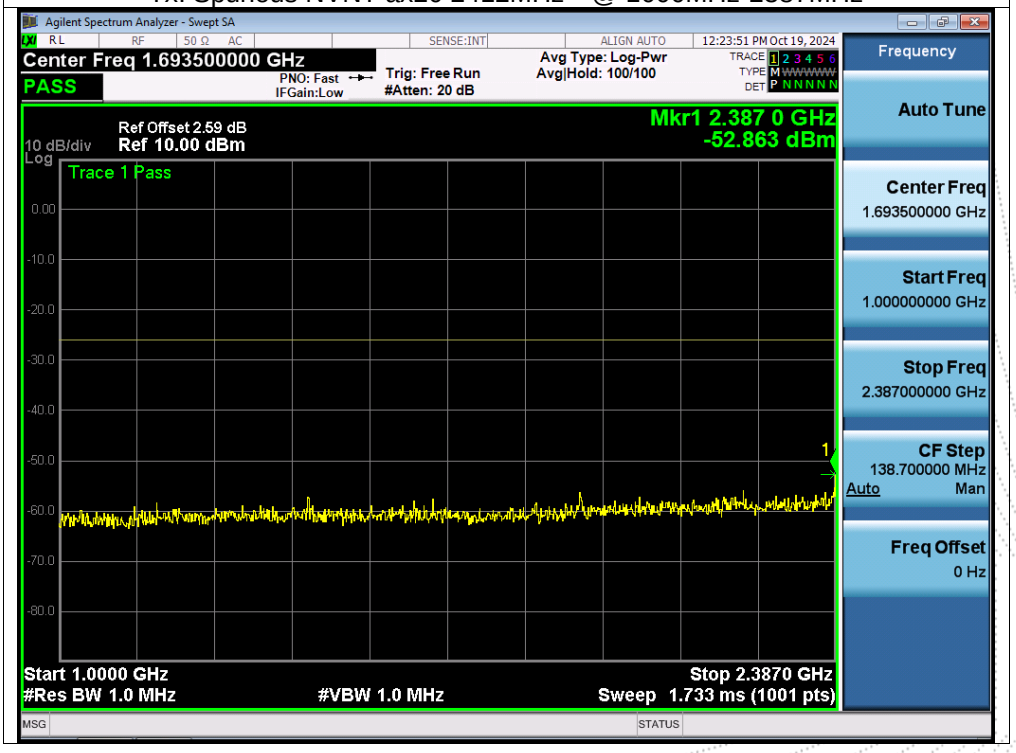
Tx. Spurious NVNT n40 2462MHz @ 2496.5MHz-13000MHz



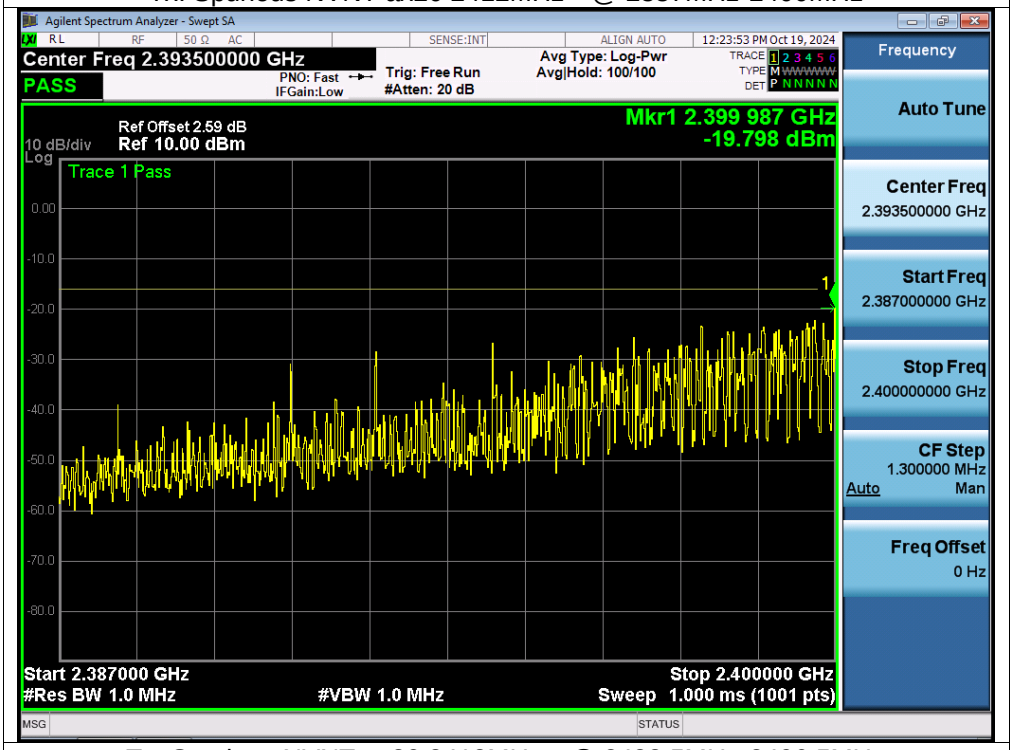
Tx. Spurious NVNT ax20 2412MHz @ 30MHz-1000MHz



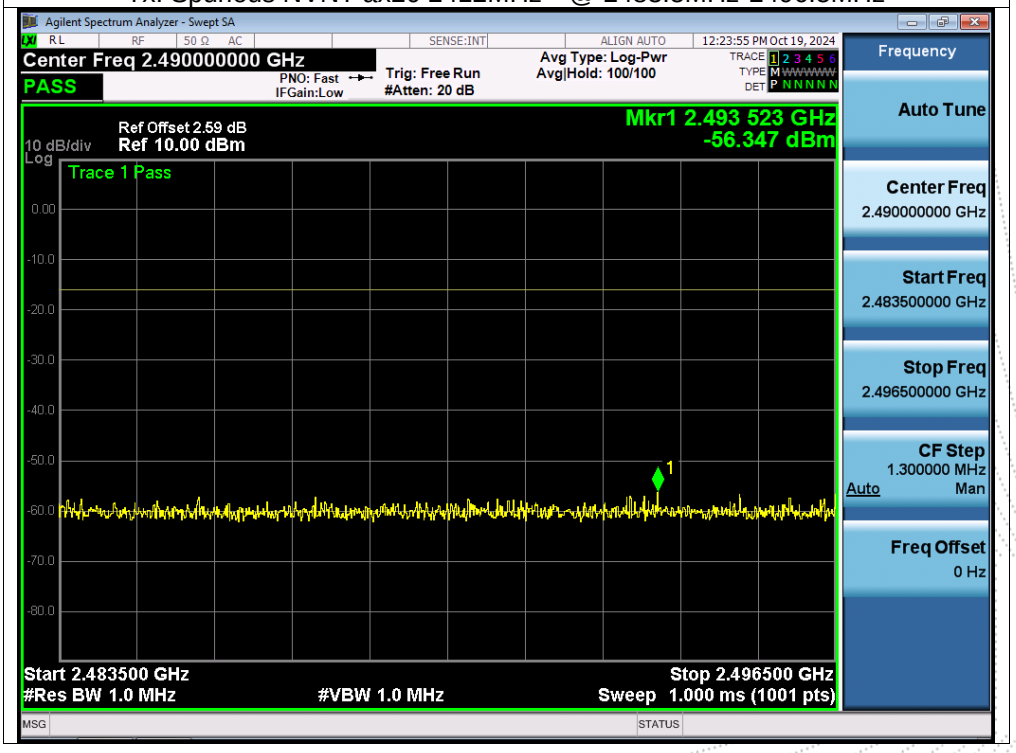
Tx. Spurious NVNT ax20 2412MHz @ 1000MHz-2387MHz



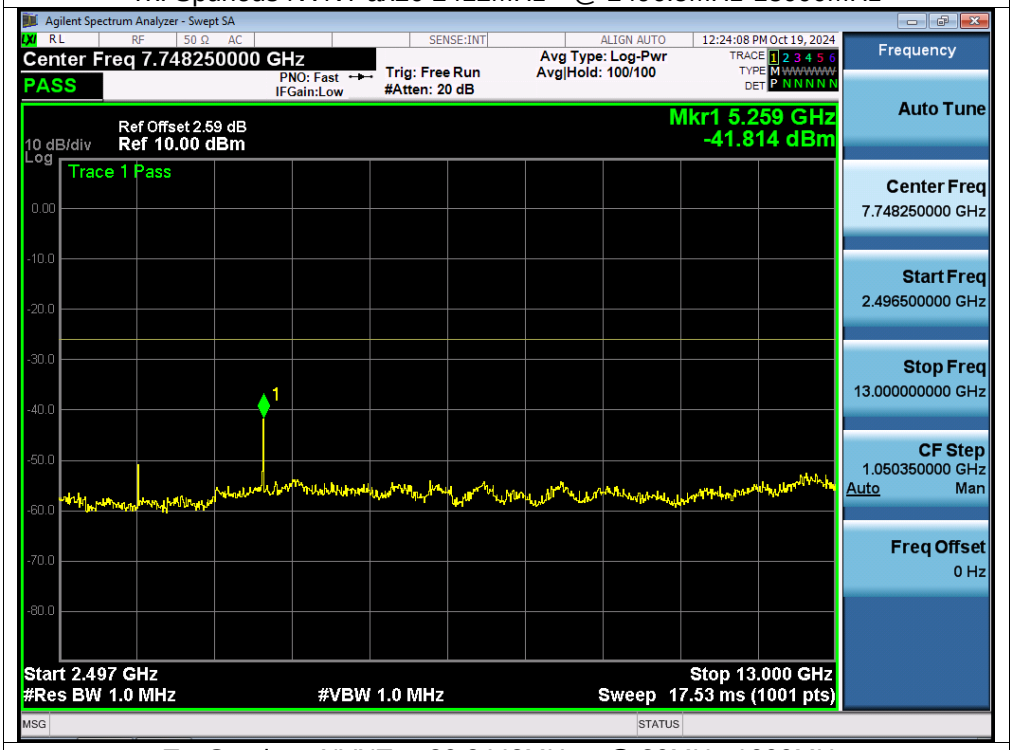
Tx. Spurious NVNT ax20 2412MHz @ 2387MHz-2400MHz



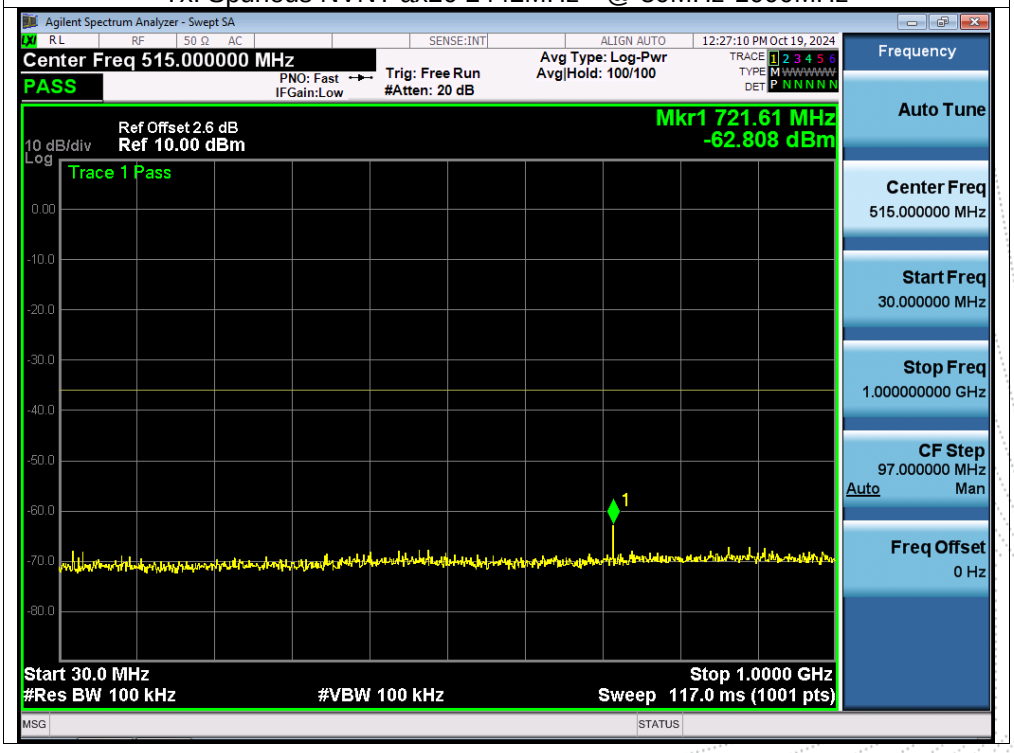
Tx. Spurious NVNT ax20 2412MHz @ 2483.5MHz-2496.5MHz



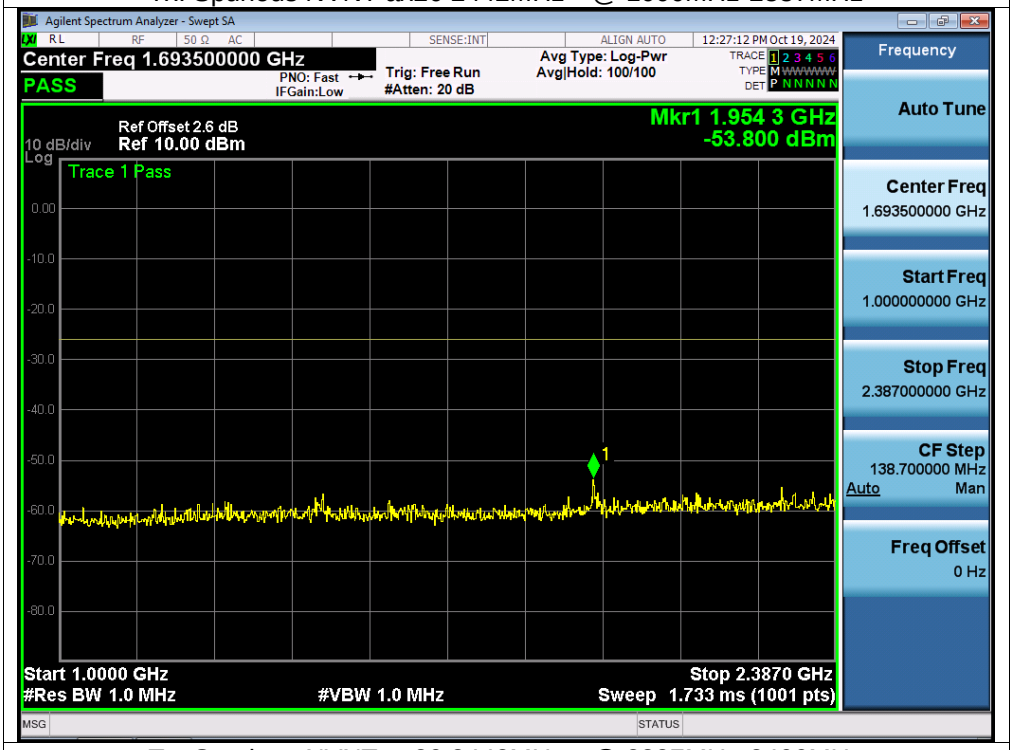
Tx. Spurious NVNT ax20 2412MHz @ 2496.5MHz-13000MHz



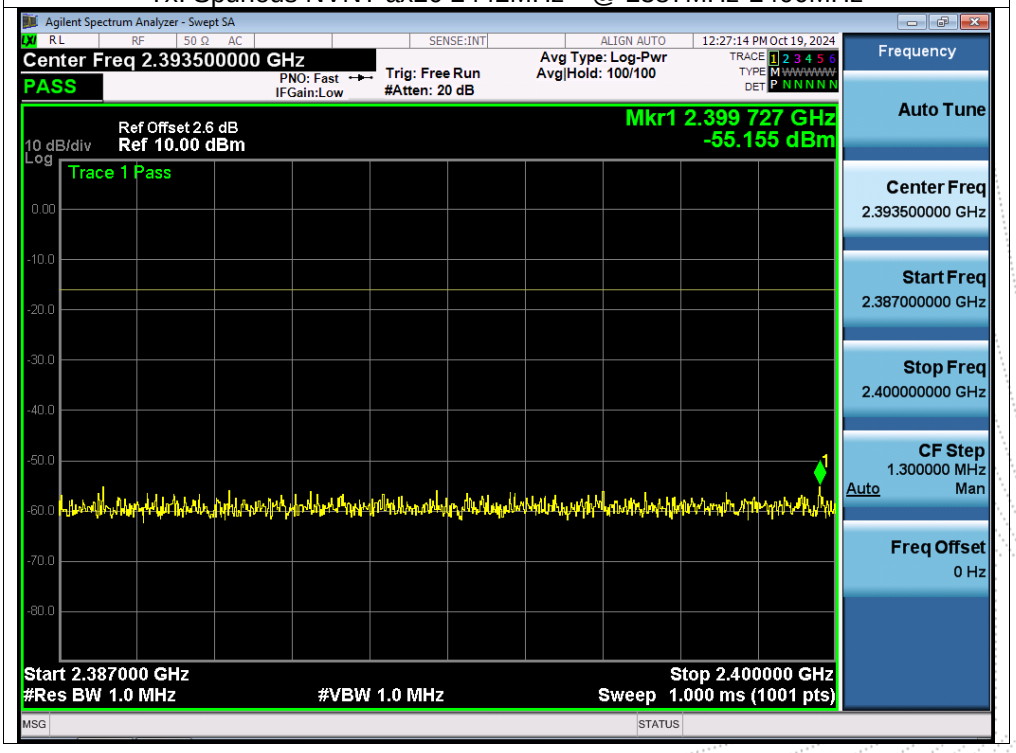
Tx. Spurious NVNT ax20 2442MHz @ 30MHz-1000MHz



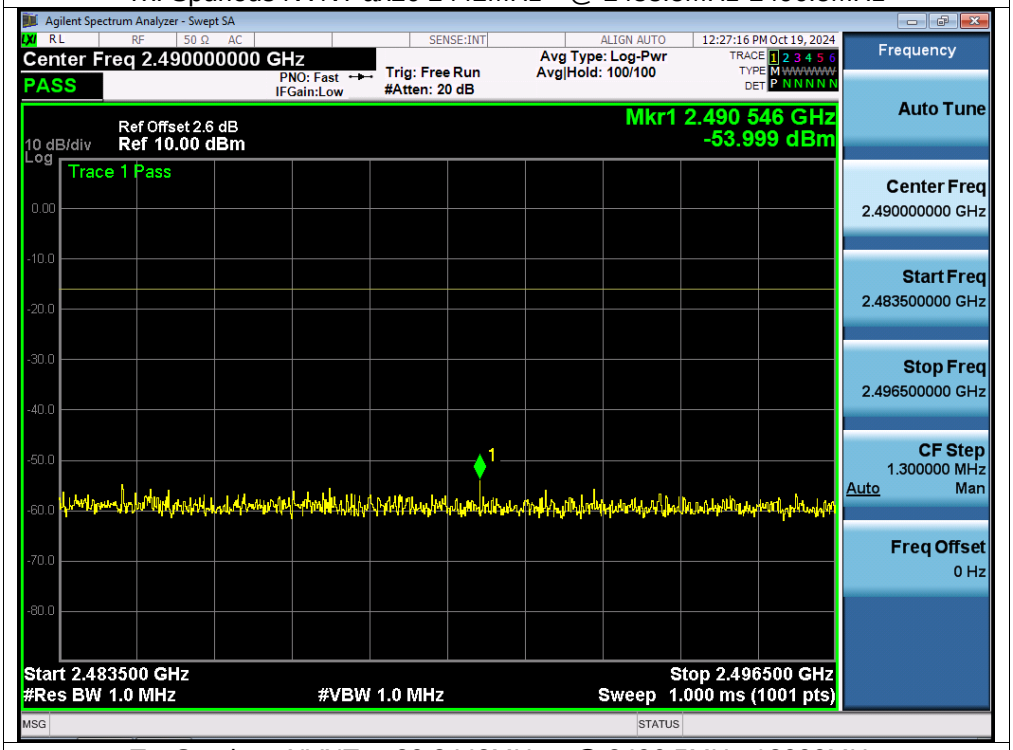
Tx. Spurious NVNT ax20 2442MHz @ 1000MHz-2387MHz



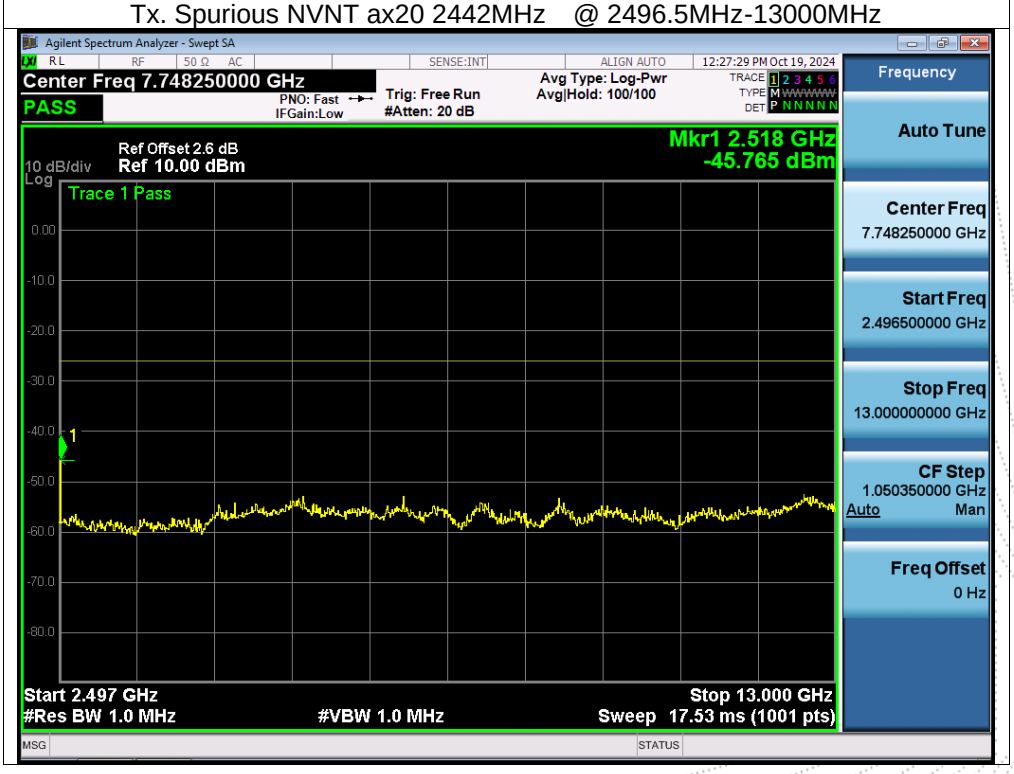
Tx. Spurious NVNT ax20 2442MHz @ 2387MHz-2400MHz



Tx. Spurious NVNT ax20 2442MHz @ 2483.5MHz-2496.5MHz

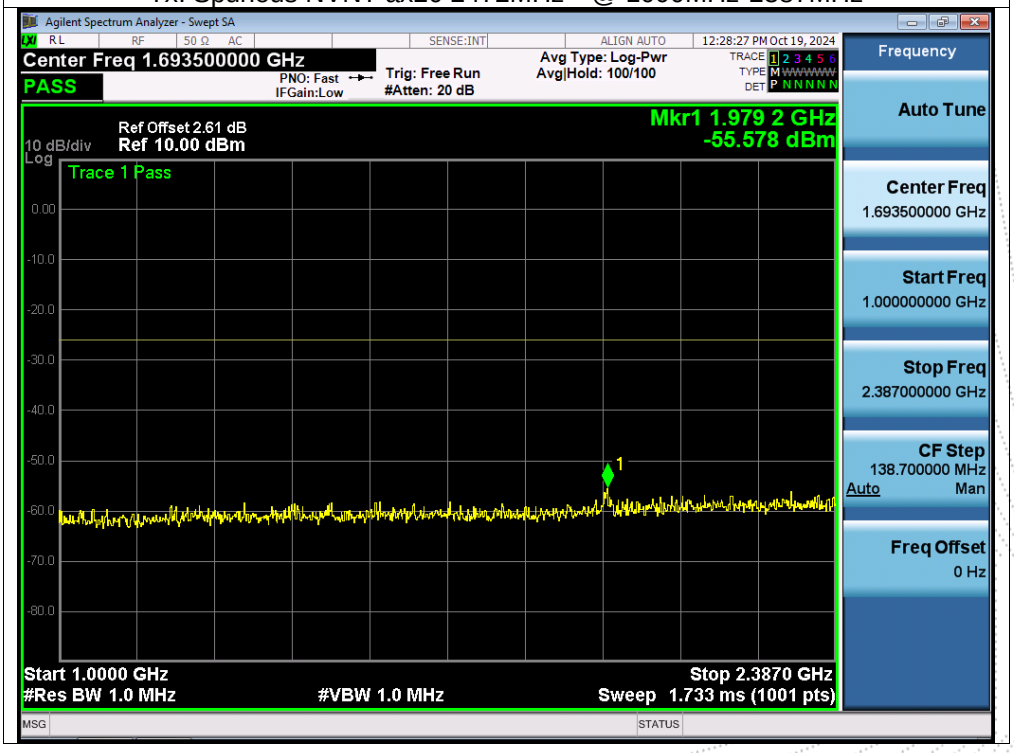


Tx. Spurious NVNT ax20 2442MHz @ 2496.5MHz-13000MHz

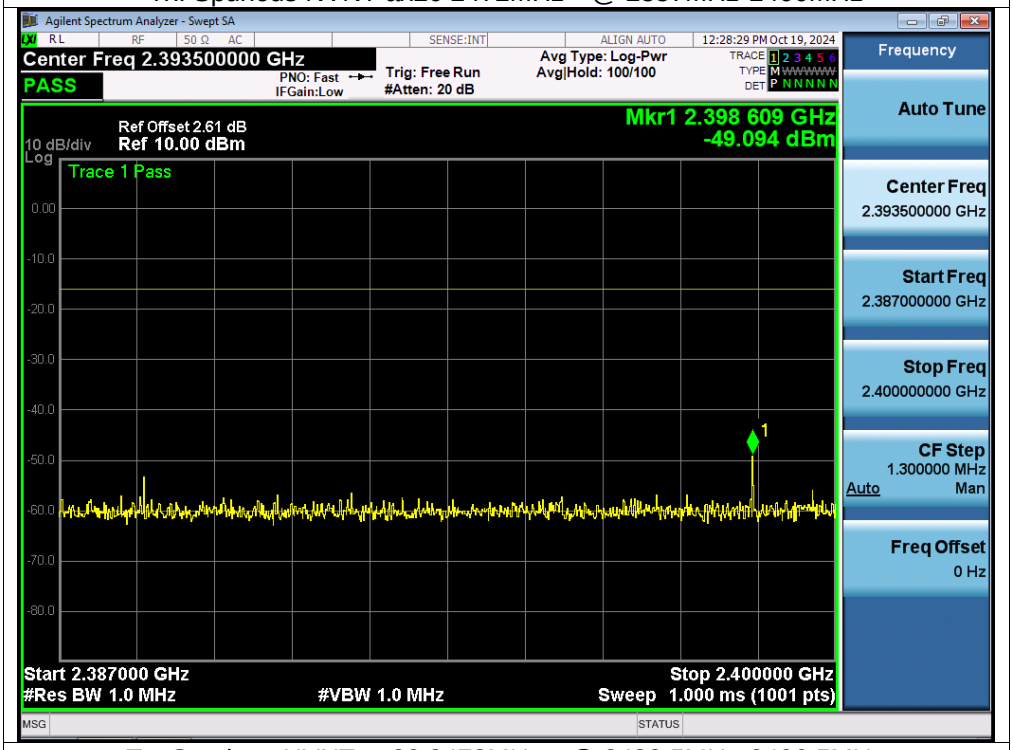


Tx. Spurious NVNT ax20 2472MHz @ 30MHz-1000MHz

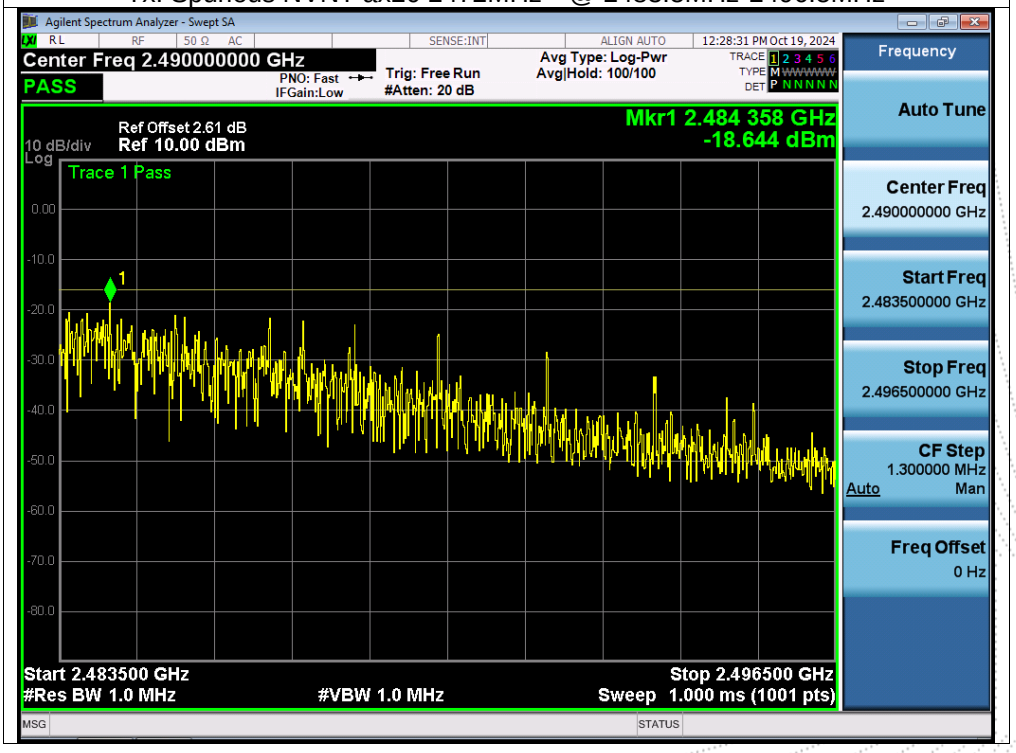
Tx. Spurious NVNT ax20 2472MHz @ 1000MHz-2387MHz



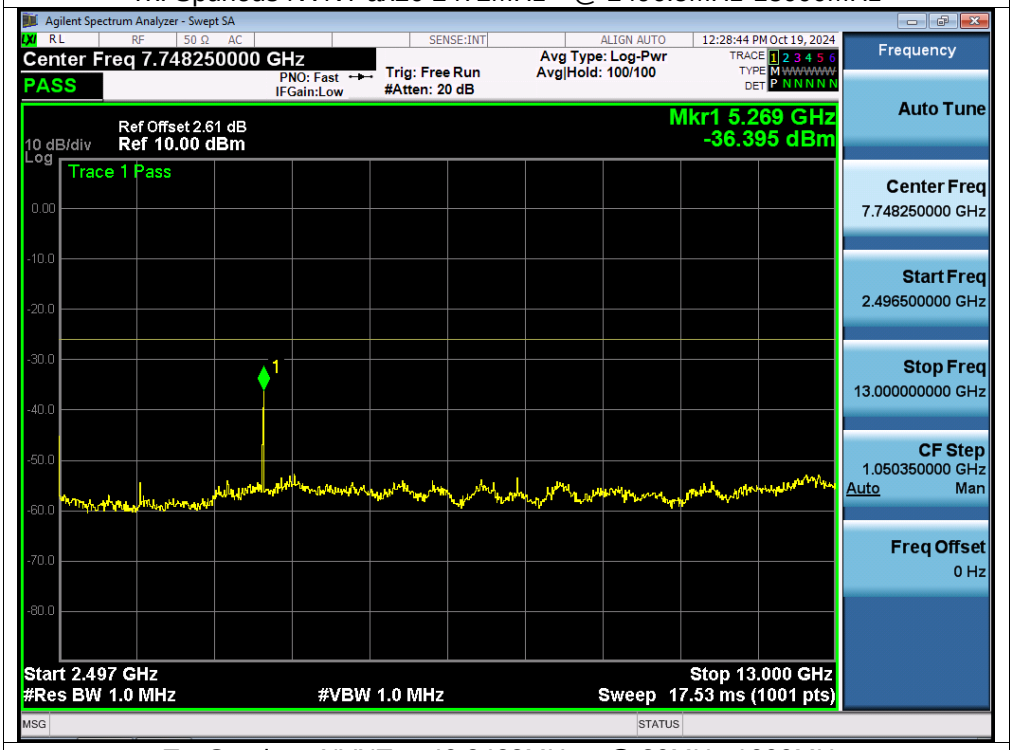
Tx. Spurious NVNT ax20 2472MHz @ 2387MHz-2400MHz



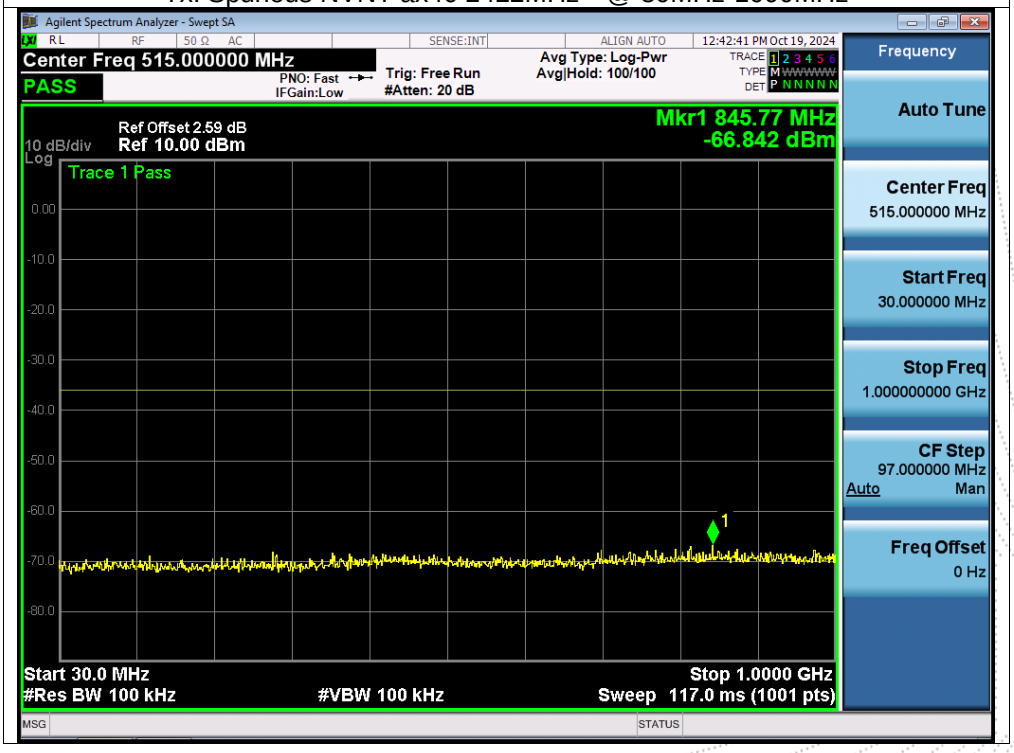
Tx. Spurious NVNT ax20 2472MHz @ 2483.5MHz-2496.5MHz



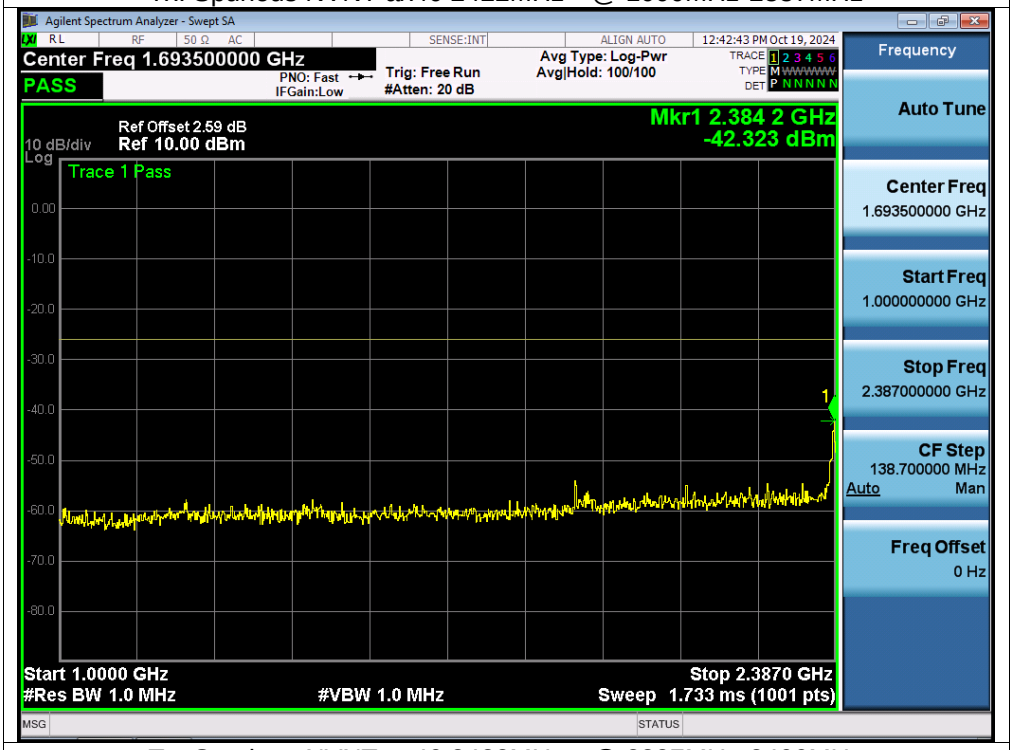
Tx. Spurious NVNT ax20 2472MHz @ 2496.5MHz-13000MHz



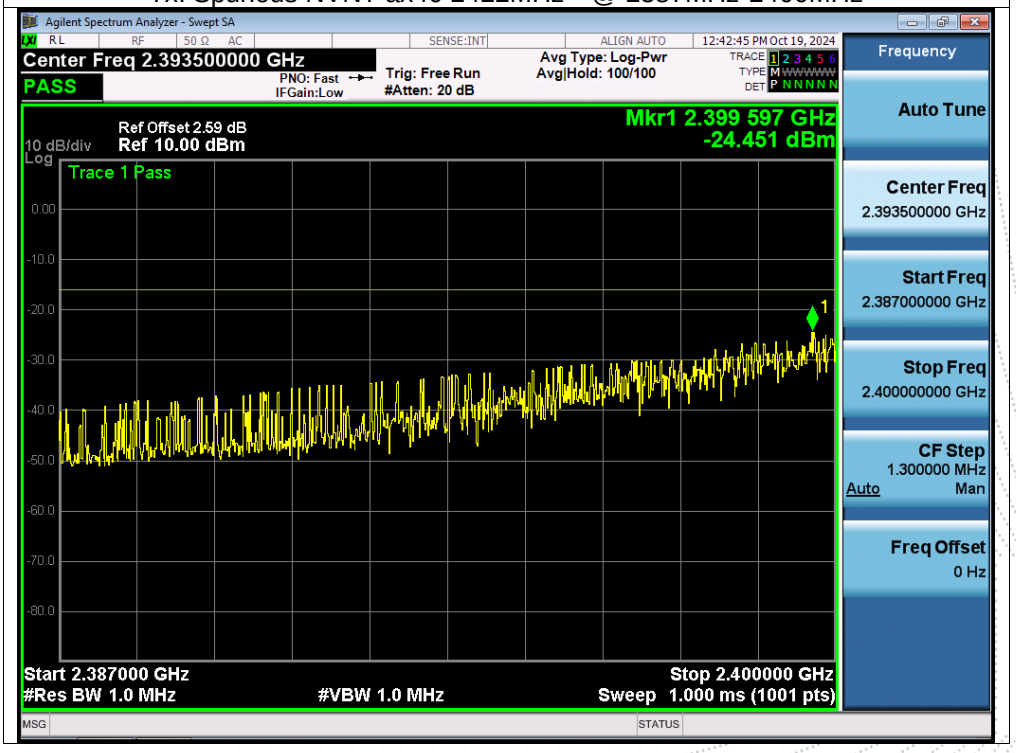
Tx. Spurious NVNT ax40 2422MHz @ 30MHz-1000MHz



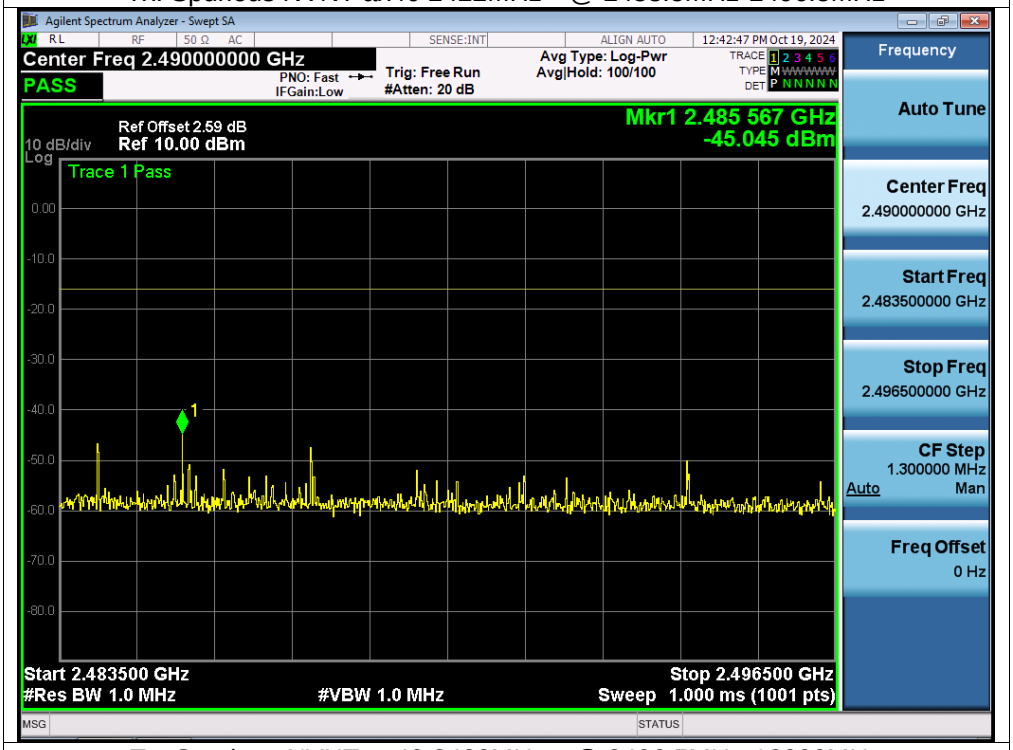
Tx. Spurious NVNT ax40 2422MHz @ 1000MHz-2387MHz



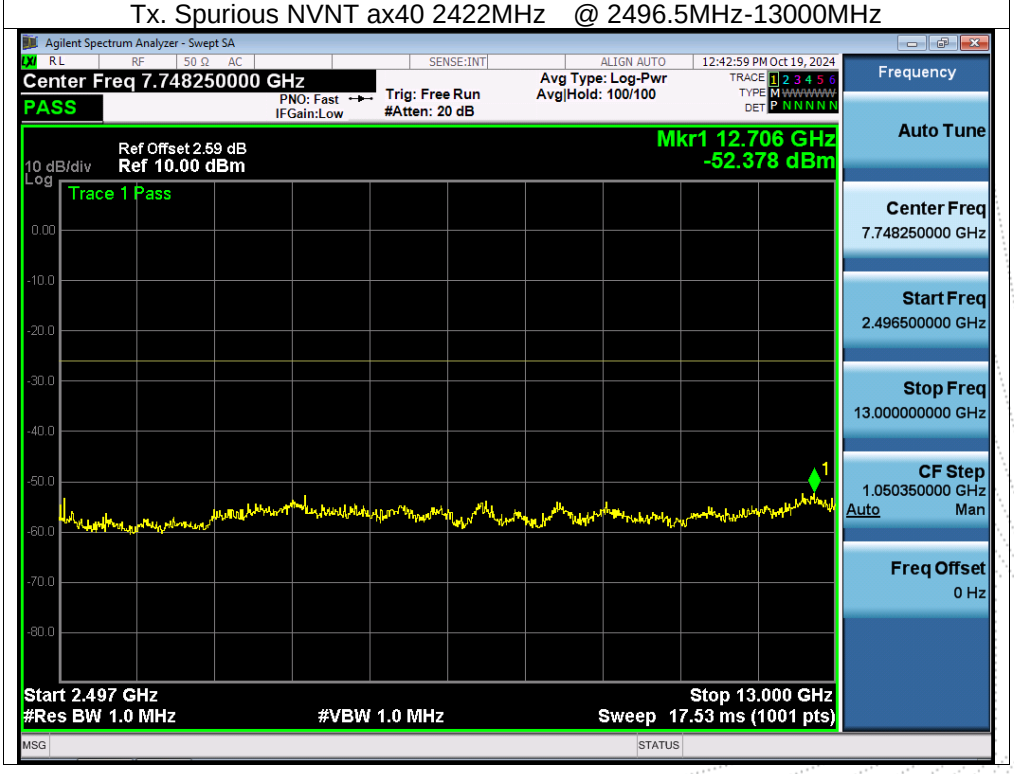
Tx. Spurious NVNT ax40 2422MHz @ 2387MHz-2400MHz



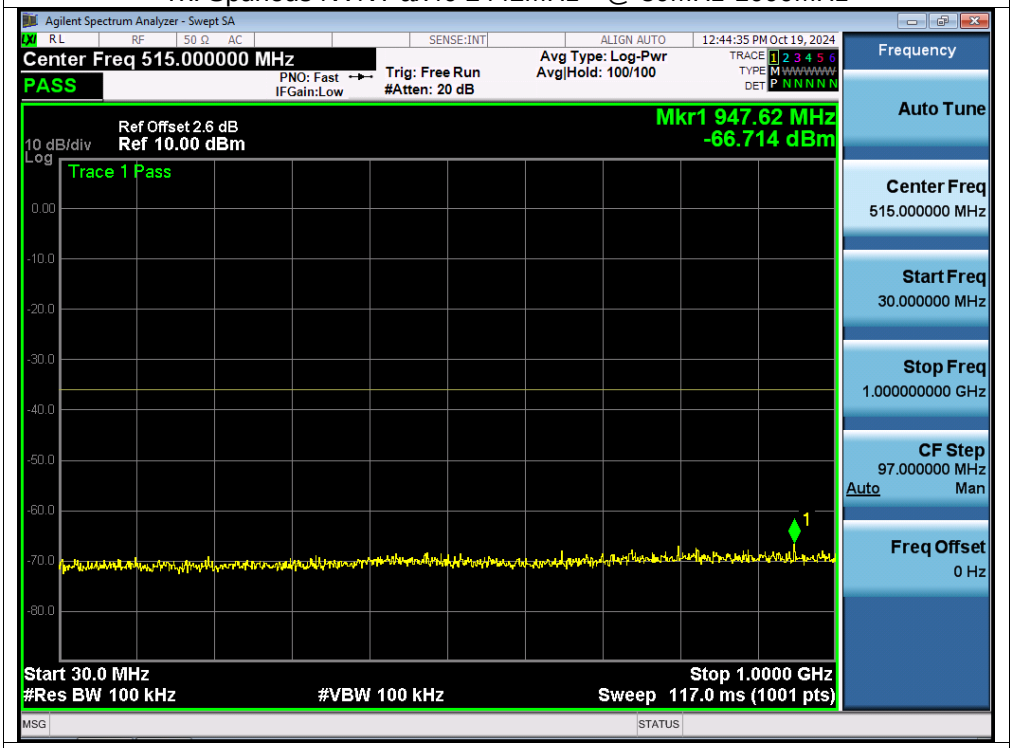
Tx. Spurious NVNT ax40 2422MHz @ 2483.5MHz-2496.5MHz



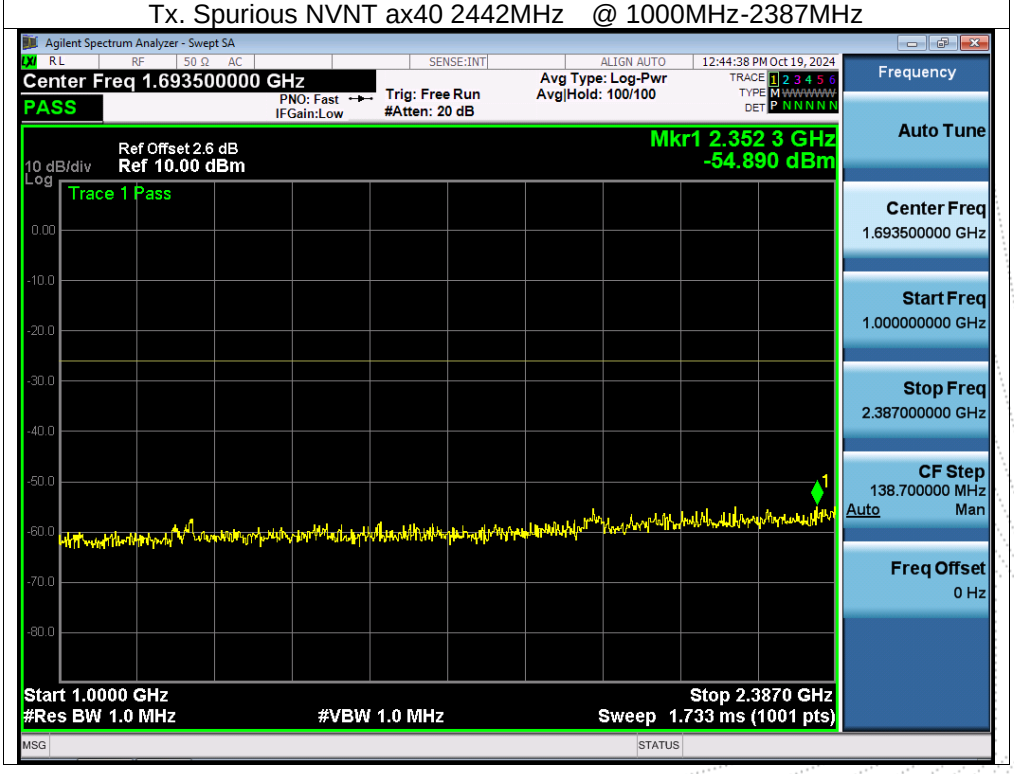
Tx. Spurious NVNT ax40 2422MHz @ 2496.5MHz-13000MHz



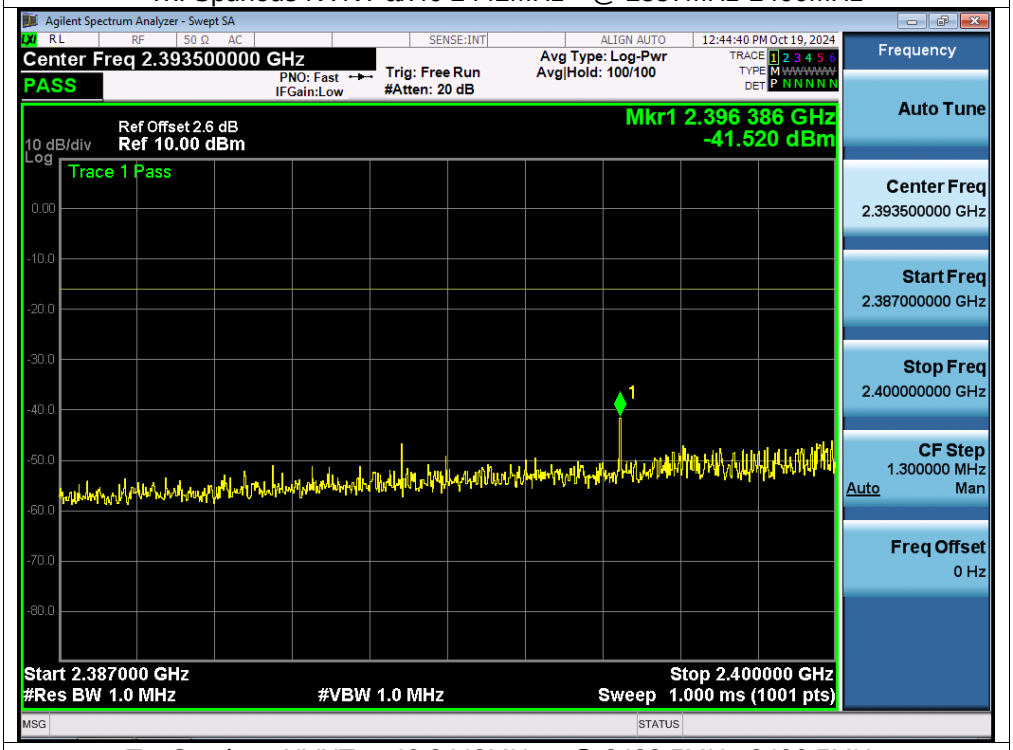
Tx. Spurious NVNT ax40 2442MHz @ 30MHz-1000MHz



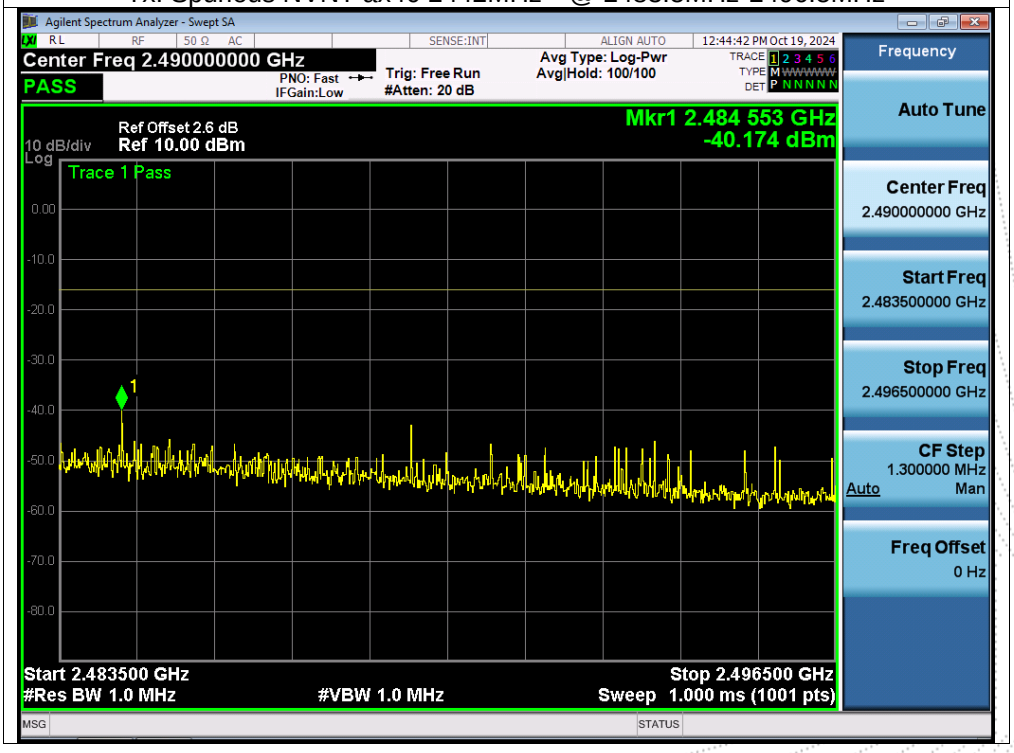
Tx. Spurious NVNT ax40 2442MHz @ 1000MHz-2387MHz



Tx. Spurious NVNT ax40 2442MHz @ 2387MHz-2400MHz

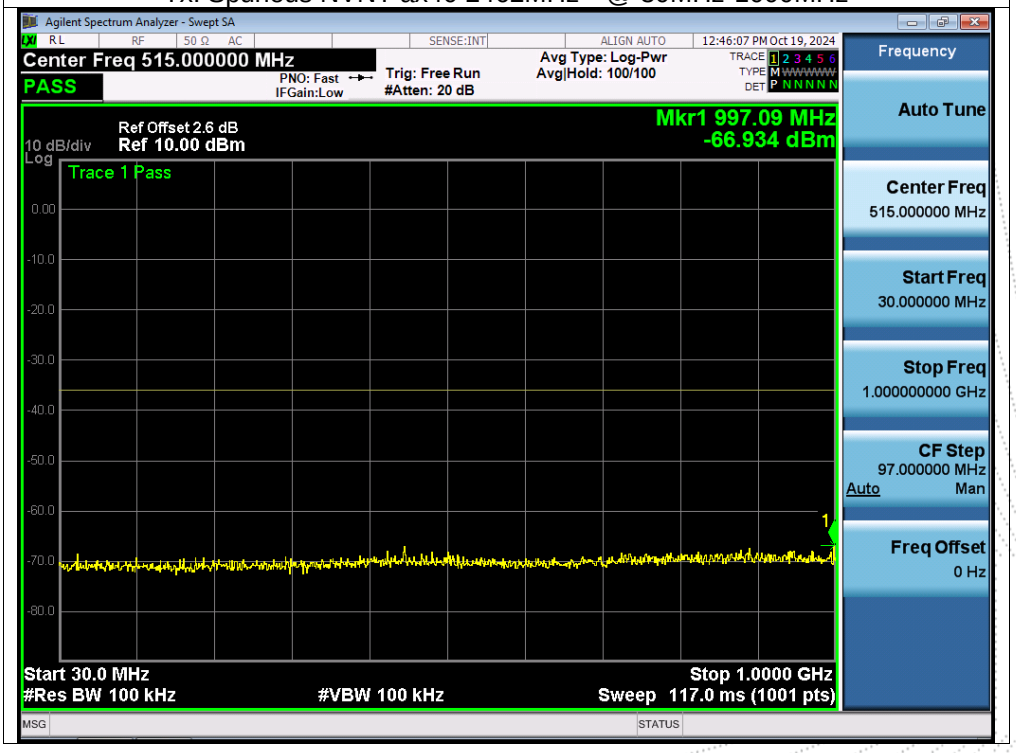


Tx. Spurious NVNT ax40 2442MHz @ 2483.5MHz-2496.5MHz

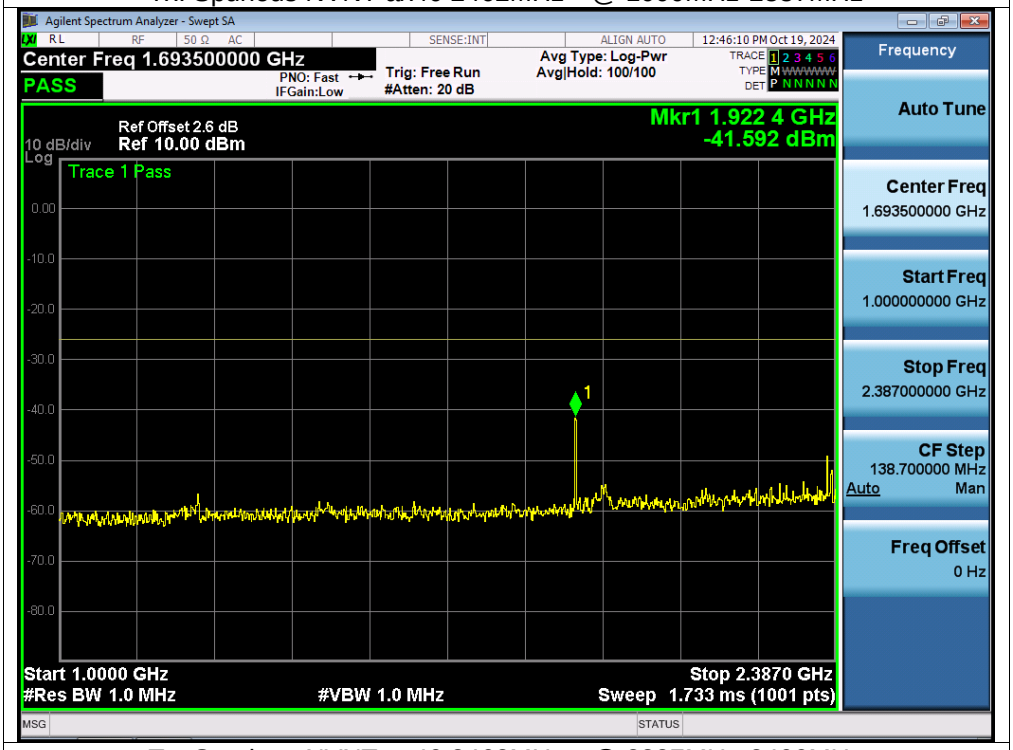


Tx. Spurious NVNT ax40 2442MHz @ 2496.5MHz-13000MHz

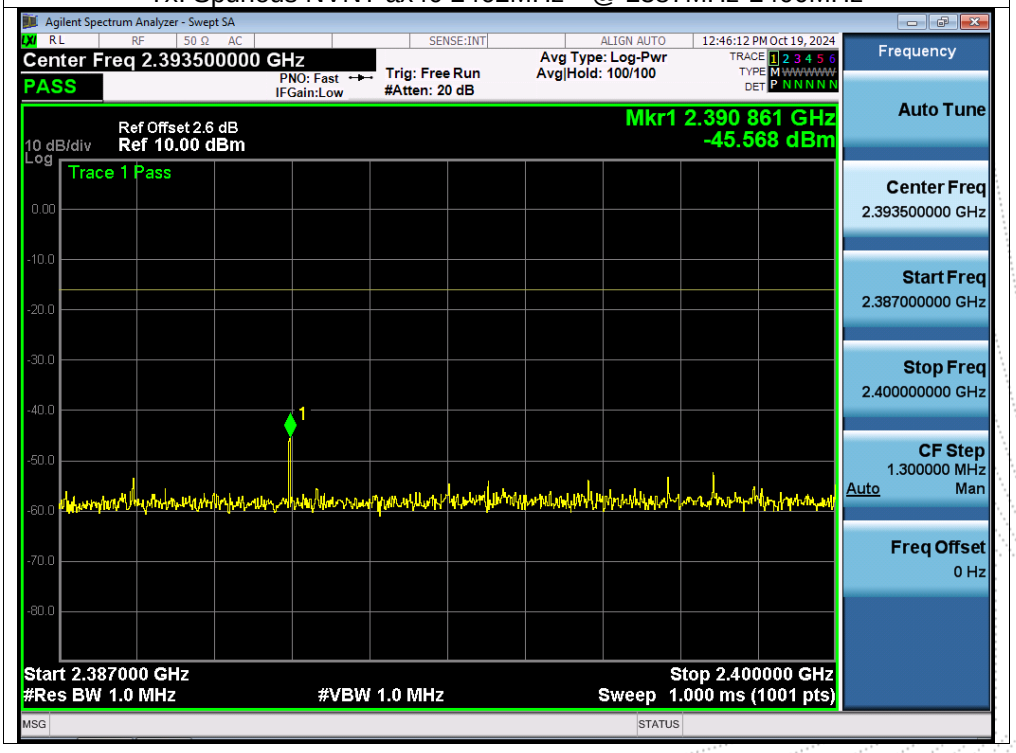
Tx. Spurious NVNT ax40 2462MHz @ 30MHz-1000MHz



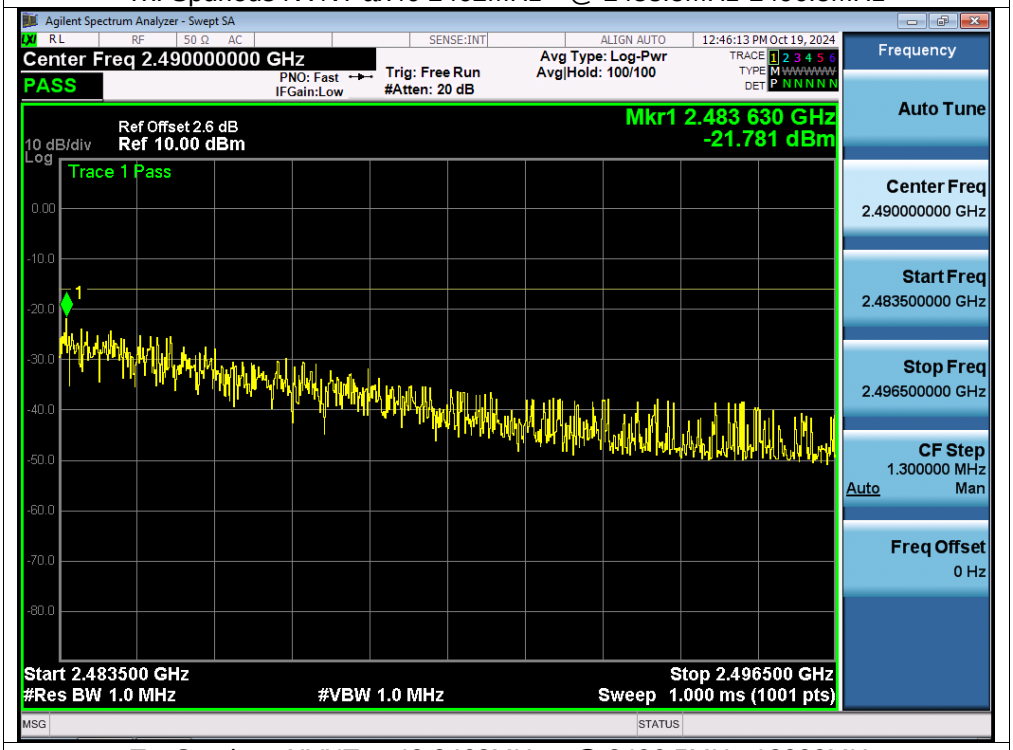
Tx. Spurious NVNT ax40 2462MHz @ 1000MHz-2387MHz



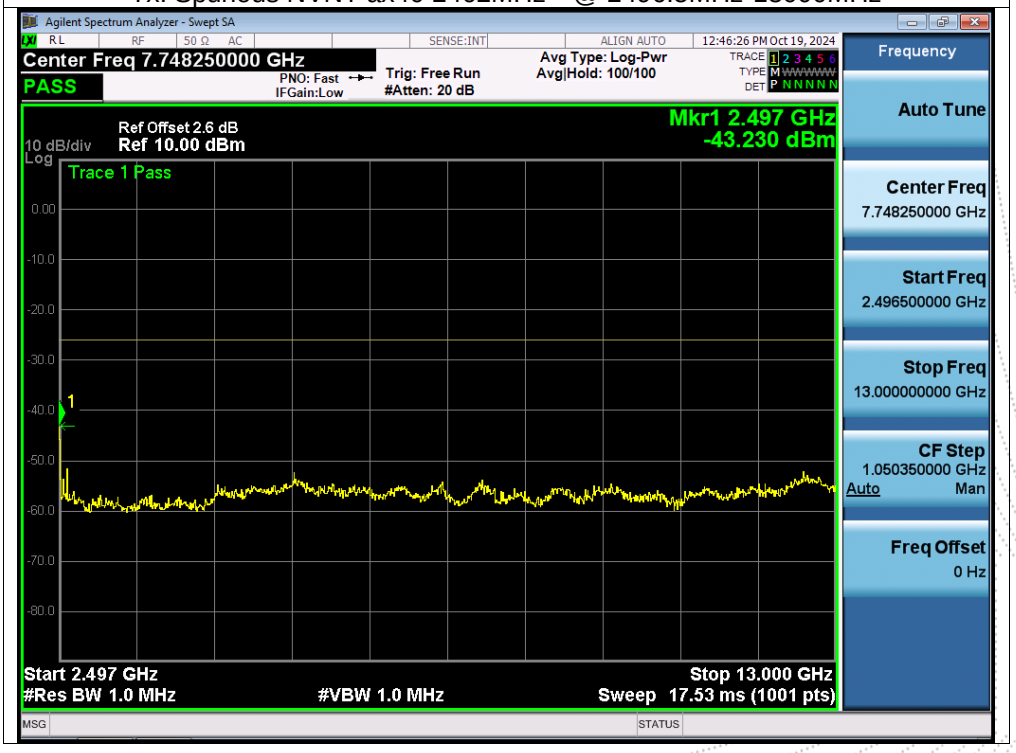
Tx. Spurious NVNT ax40 2462MHz @ 2387MHz-2400MHz



Tx. Spurious NVNT ax40 2462MHz @ 2483.5MHz-2496.5MHz

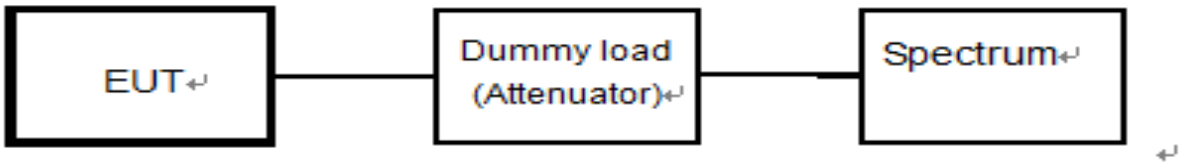


Tx. Spurious NVNT ax40 2462MHz @ 2496.5MHz-13000MHz



11. Imitation Of Collateral Emission Of Receiver Measurement

11.1 Block Diagram Of Test Setup



11.2 Limit

Item	Limits
RX Spurious Emission:	≦4nW（-54dBm） (f<1GHz)
	≦20nW（-47dBm） (1GHz≦f)

11.3 Measuring Instruments And Setting

Please refer to section 5 in this report. The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
VB	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

11.4 Test Procedure

1. EUT have the continuous reception mode and fixed only one channelize.
2. Setting of SA is following as RB / VB: 100 kHz (below 1GHz emissions) / 1 MHz (above 1GHz emissions) /AT: 6dB / Ref: -20dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
3. SA set RB: 100kHz and VB: 100kHz. Then adjust to start frequency 30MHz and stop frequency 1000MHz. Search to mark peak reading value + cable loss shall be less than 4nW
4. SA set RB: 1MHz and VB: 1MHz. Then adjust to start frequency 1000MHz and stop frequency 12500MHz. Search to mark peak reading value + cable loss shall be less than 20nW
5. If power level of lower emissions are more than 1/10 of limit (.0.4nW for f < 1GHz, 2nW for f >= 1GHz), all those are to be indicated in the 2nd and 3rd lines. If others are 1/10 or less more of the limit, no necessary to be indicated.

11.5 Test Result

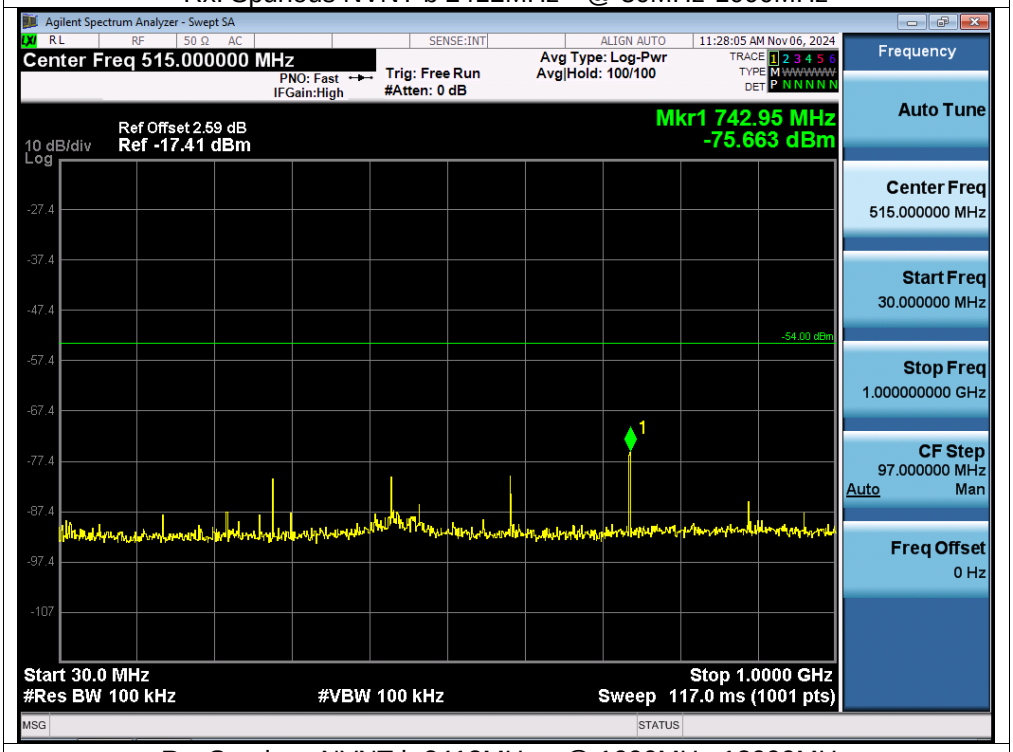
Temperature:	25°C		
Humidity:	55 % RH	Test Voltage	DC 5V

Condition	Mode	Frequency (MHz)	Range (MHz)	Emission Frequency (MHz)	Max Value (dBm)	Limit (dBm)	Verdict
NVNT	b	2412	30-1000	742.95	-75.66	-54	Pass
NVNT	b	2412	1000-13000	4192	-64.88	-47	Pass
NVNT	b	2442	30-1000	742.95	-75.59	-54	Pass
NVNT	b	2442	1000-13000	4192	-65.4	-47	Pass
NVNT	b	2472	30-1000	742.95	-75.8	-54	Pass
NVNT	b	2472	1000-13000	4192	-65.25	-47	Pass
NVNT	n40	2422	30-1000	742.95	-75.53	-54	Pass
NVNT	n40	2422	1000-13000	4192	-65.16	-47	Pass
NVNT	n40	2462	30-1000	742.95	-75.65	-54	Pass
NVNT	n40	2462	1000-13000	4192	-65.04	-47	Pass

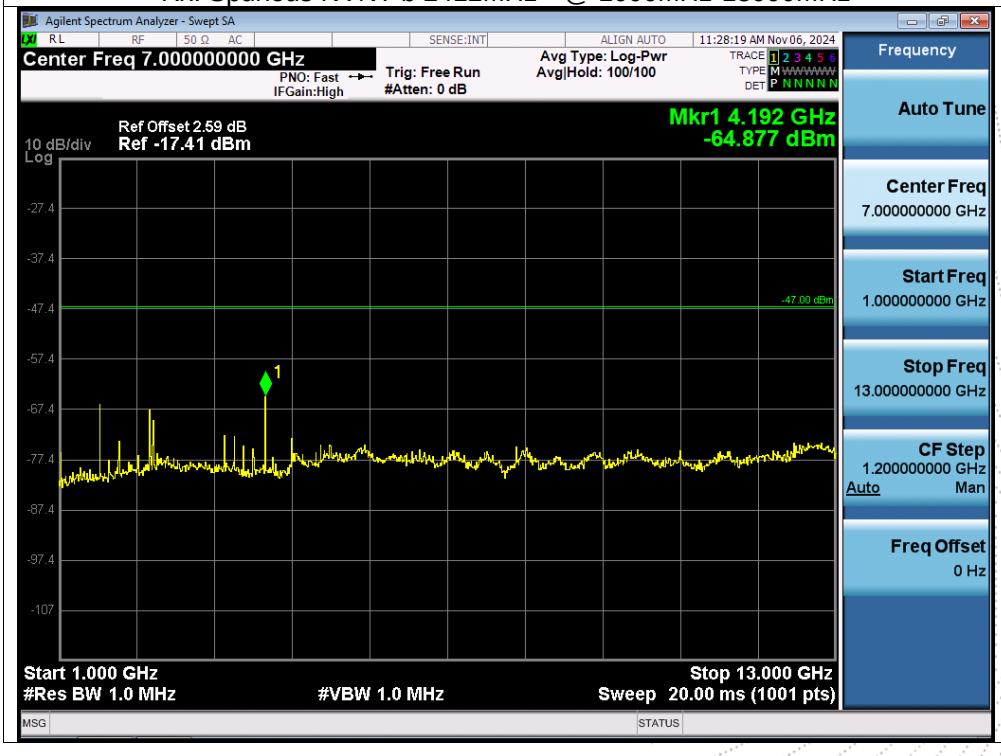
All the modes were tested and only recorded the worst mode in the report.

Test Graphs

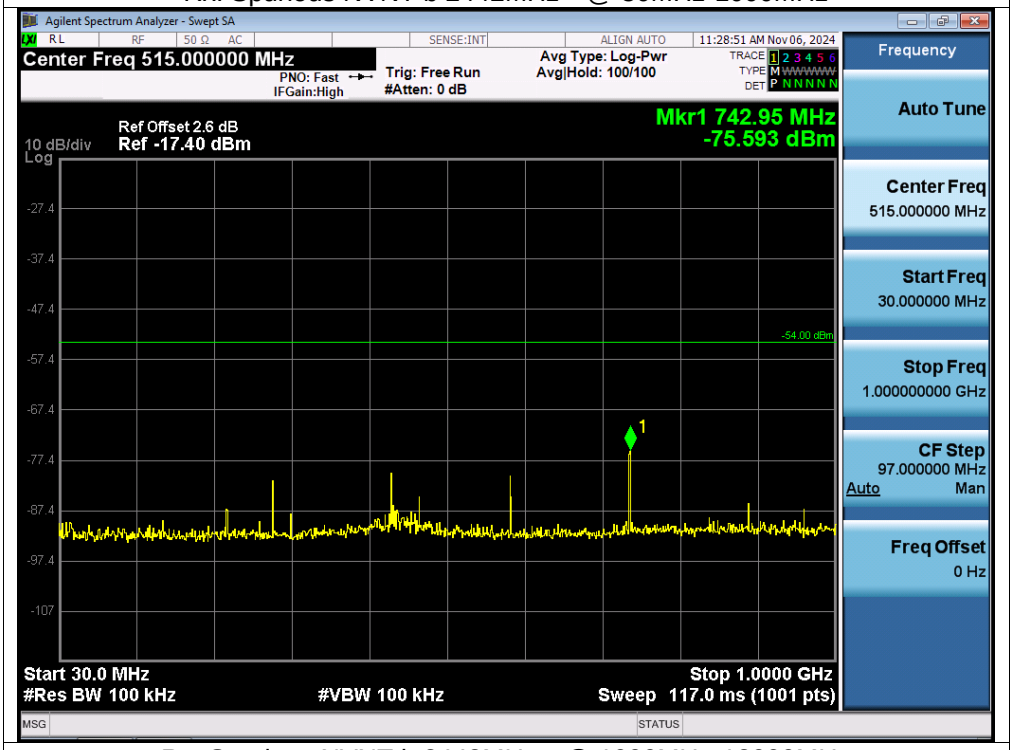
Rx. Spurious NVNT b 2412MHz @ 30MHz-1000MHz



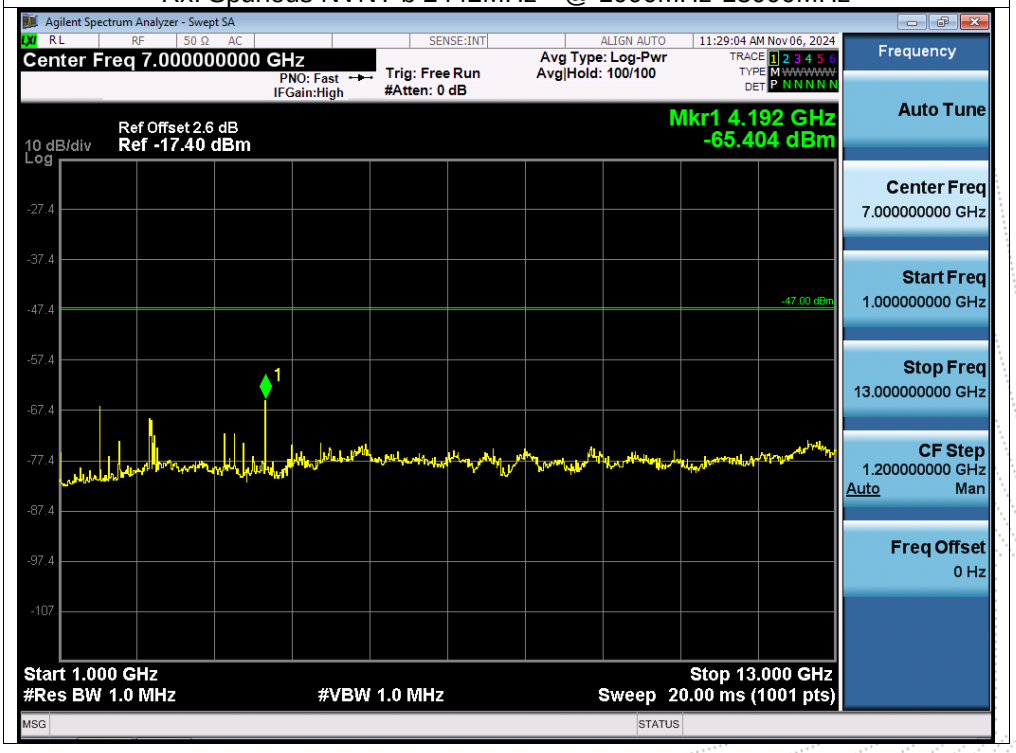
Rx. Spurious NVNT b 2412MHz @ 1000MHz-13000MHz



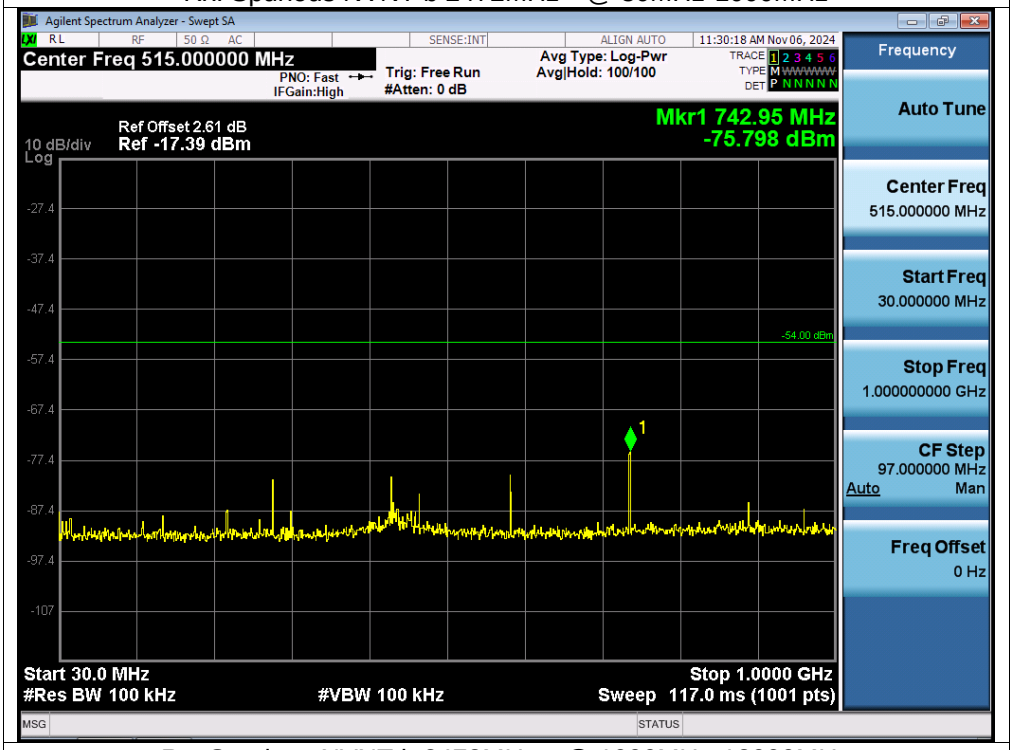
Rx. Spurious NVNT b 2442MHz @ 30MHz-1000MHz



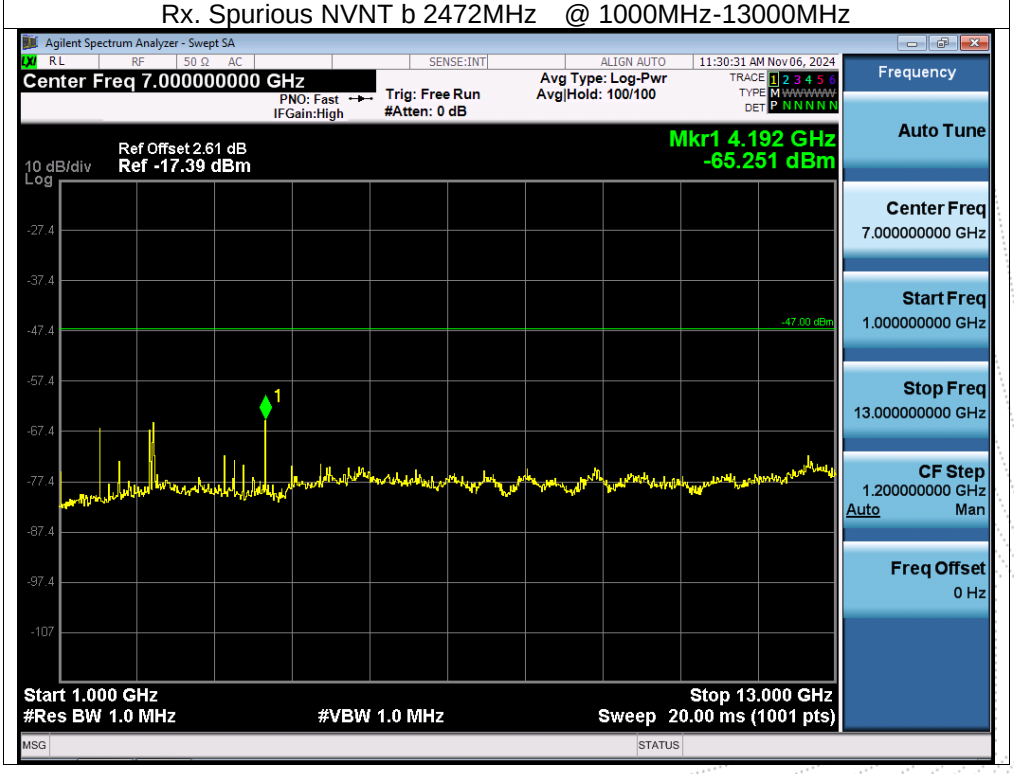
Rx. Spurious NVNT b 2442MHz @ 1000MHz-13000MHz



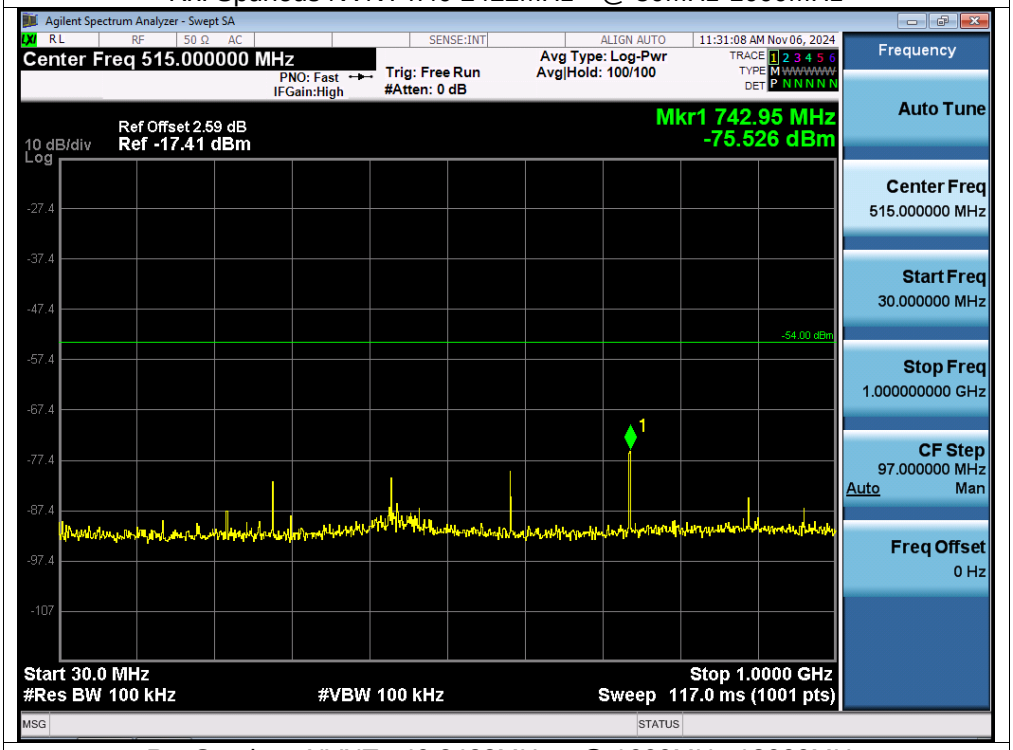
Rx. Spurious NVNT b 2472MHz @ 30MHz-1000MHz



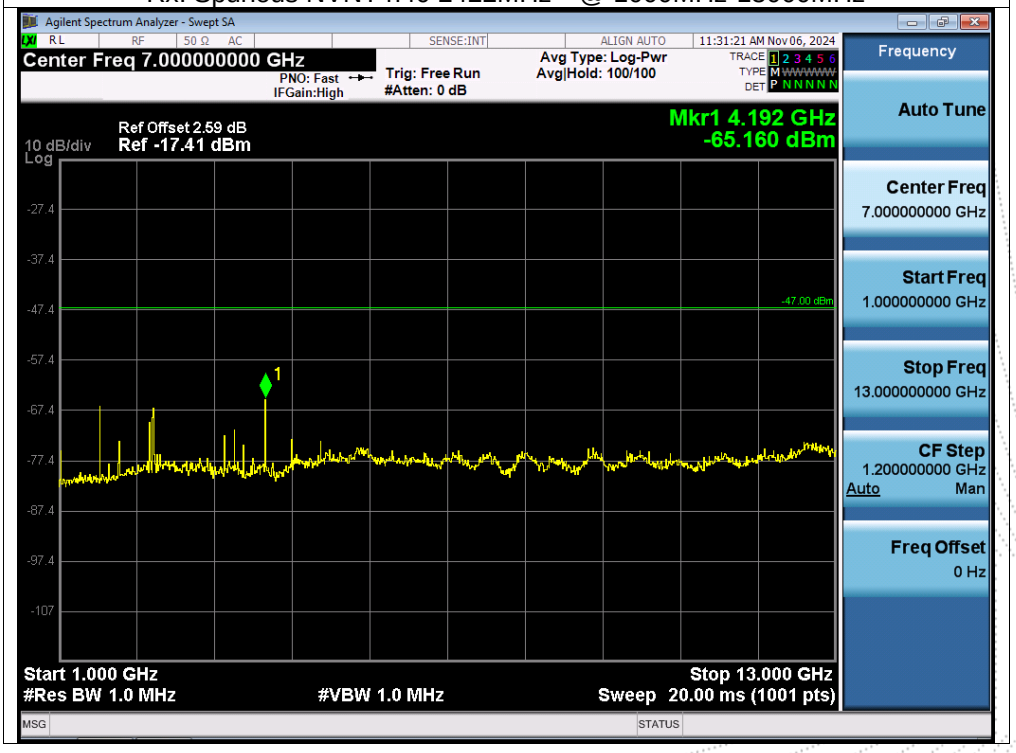
Rx. Spurious NVNT b 2472MHz @ 1000MHz-13000MHz



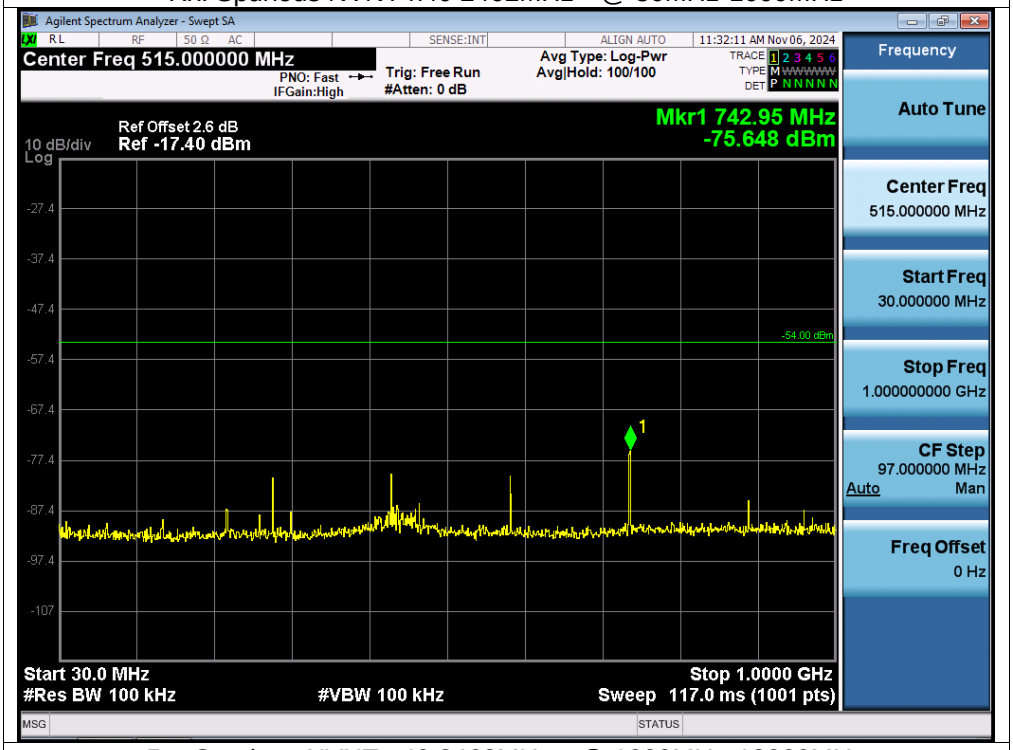
Rx. Spurious NVNT n40 2422MHz @ 30MHz-1000MHz



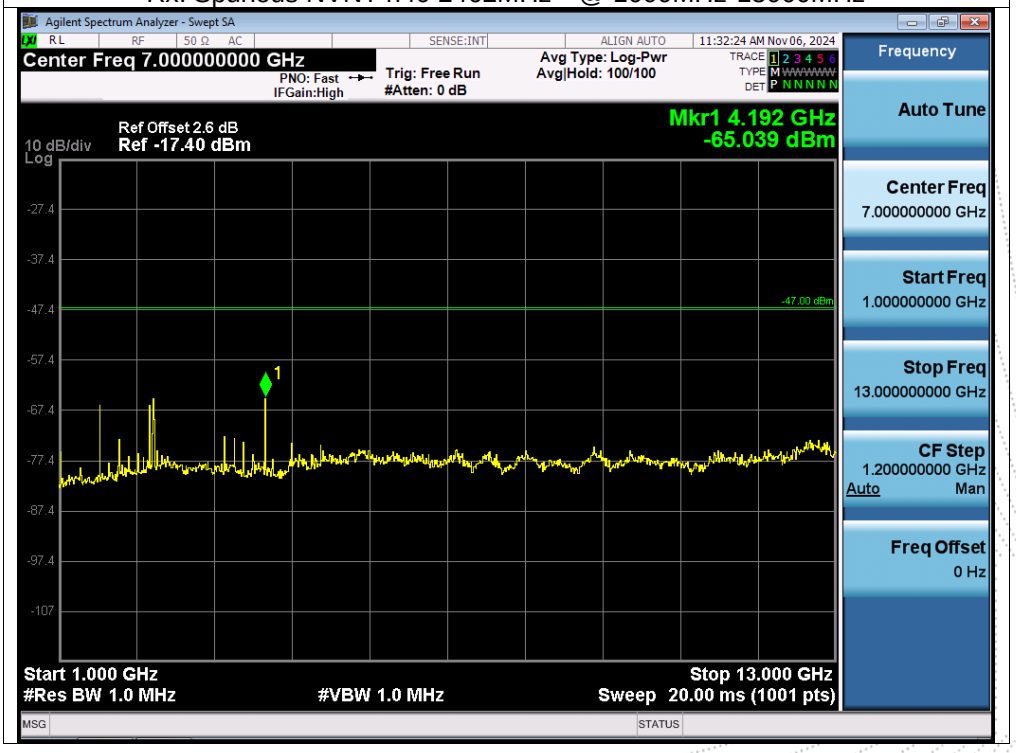
Rx. Spurious NVNT n40 2422MHz @ 1000MHz-13000MHz



Rx. Spurious NVNT n40 2462MHz @ 30MHz-1000MHz



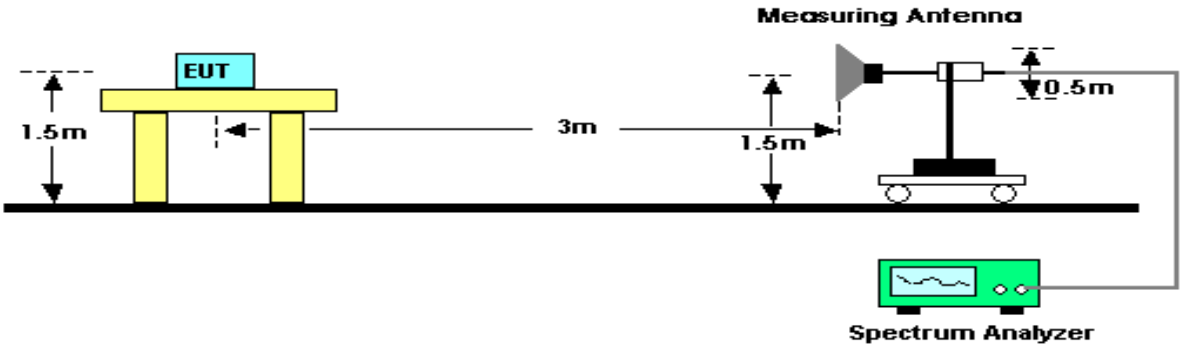
Rx. Spurious NVNT n40 2462MHz @ 1000MHz-13000MHz



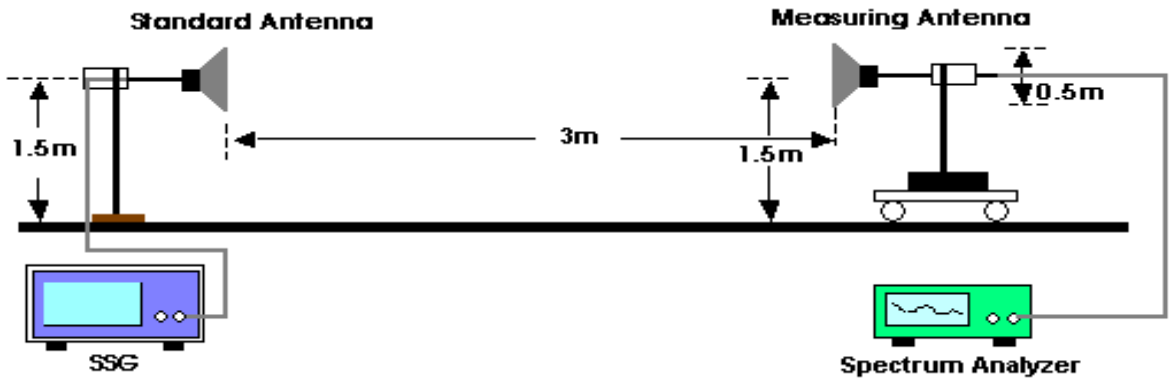
12. Transmission Antenna Gain (EIRP Antenna Power) Measurement

12.1 Block Diagram Of Test Setup

For EUT radiation measurement



For standard antenna measurement



12.2 Limit

Modulation	Frequency band	Antenna power	Max EIRP	
			Non-directional	Beam directional$_{Note1}$
DS	2,400-2,483.5MHz	10mW/MHz	12.14dBm/MHz	22.14dBm/MHz
OFDM1	2,400-2,483.5MHz	10mW/MHz	12.14dBm/MHz	22.14dBm/MHz
OFDM2	2,400-2,483.5MHz	5mW/MHz	9.14dBm/MHz	19.14dBm/MHz
FH,DS-FH, FH-OFDM	2,400-2,483.5MHz	3mW/MHz	6.91dBm/MHz	16.91dBm/MHz
	2,427-2,470.75MHz	10mW/MHz	12.14dBm/MHz	22.14dBm/MHz
Other than those above	2,400-2,483.5MHz	10mW	12.14dBm	22.14dBm

Note: OFDM 1 in the modulation method column indicates that the occupied frequency band width is 26 MHz or less, and OFDM 2 indicates the occupied frequency bandwidth exceeding 26 MHz and 38 MHz or less.

12.3 Measuring Instruments And Setting

Please refer to section 5 in this report. The following table is the setting of spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB/VB	1 MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

12.4 Test Procedure

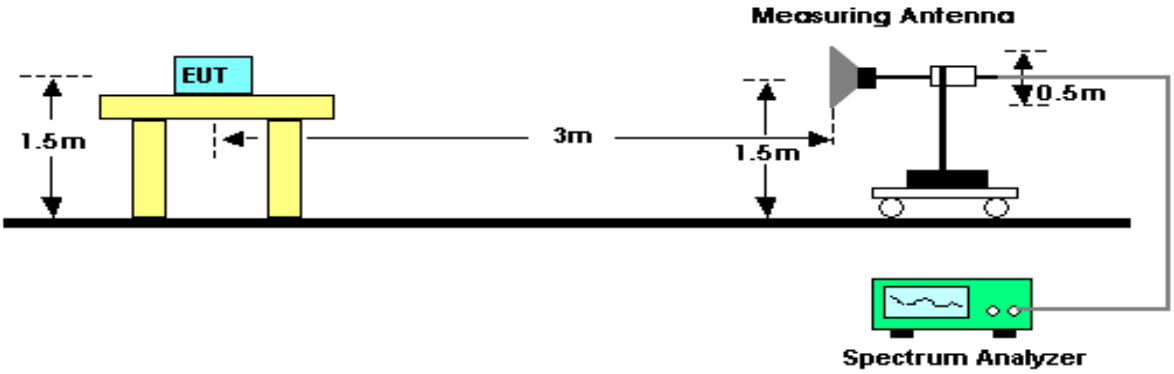
1. Set EUT ad measuring antenna at the same height and roughly facing each other.
2. Move the measuring antenna height up and down within ± 50cm of EUT height and swing it to find the maximum output of the measuring antenna. The output level at the spectrum analyzer is read sa “E“.
3. Remove the EUT from the turn table and put the replacing antenna facing to measuring antenna at same height. Set the standard signal generator (SSG) at same frequency and transmit on then receive the signal
4. Swing the replacing antenna give a maximum receiving level.
5. Move the measuring antenna height up and down within ± 50cm of replacing antenna height and swing it to find the maximum receiving level.
6. Set SSG output power at Pt to give the equivalent output level of “E” or caluate
Pt with SSG output which gives the nearest of “E” and difference (± 1dB). Record the Pt.
7. Calculate EIRP by the formula below EIRP = Gt – L + Pt.
Gt: gain of replacing antenna (dBi)
L: feeder loss between SSG and replacing antenna
Pt: Output power of the SSG
8. If the antenna for the EUT has circular polarization, sum of V-field and H-field will be result if measuring antenna is linear polarization.

12.5 Test Result

Note: This test item will not be applied to the transmission antenna which has a gain of 2.14dBi or less.

13. Transmission Radiation Angle Width (3dB Beamwidth) Measurement

13.1 Block Diagram Of Test Setup



13.2 Limit

Item	Limits
3dB antenna beam width	360/A (If A<1; then A=1) A = {EIRP Power [mW] / 16.36 for DS, OFDM} or A = {EIRP Power [mW] / 4.9 for FH}
Note1: A = E.I.R.P. / (2.14dBi + "Antenna Power (limit)" of each modulation method (*3mW/MHz, 10mW/MHz, etc.)) Note2: This test item is not applied for radio equipment with equivalent isotropic radiation power lower than 12.14dBm/MHz, but Antenna Power(Conducted) limit is 10 mW/MHz (10 dBm/MHz), So the test item will not be applied to the transmission antenna which has a gain of 2.14dBi or less	

13.3 Measuring Instruments And Setting

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	0 MHz
RB	1 MHz
VB	1 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

13.4 Test Procedure

1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Set spectrum analyzer with condition in section 4.7.2 and tune reference level to observe receiving signal position.
3. Rotate directions of the EUT horizontally and ertically to find the maximum receiving power.
4. Move the measuring antenna height up and down within ± 50cm of EUT height and swing it to find the maximum output of measuring antenna. The output level at the spectrum analyzer is read as “E”
5. Calculate permitted radiation angle in horizontal and vertical using EIRP measured in another test method.
6. Calculate 3dB antenna beam width by the formula below 360/A (If A<1; then A=1).
A = {EIRP Power [mW] / 16.36 for DS, OFDM} or
A = {EIRP Power [mW] / 4.9 for FH}

13.5 Test Result

N/A

14. Radio Interference Prevention Capability Measurement

14.1 Block Diagram Of Test Setup

14.2 Limit

Item	Limits
Identification code	≥48 bits

14.3 Measuring Instruments And Setting

Item	Limits
MAC IP List	MAC Scan

14.4 Test Procedure

1. In the case that the EUT has the function of automatically transmitting the identification code:
a. Transmit the predetermined identification codes form EUT.
b. Check the transmitted identification codes with the demodulator.
2. In the case of receiving the identification ocde:
a. Transmit the predetermined identification codes form the counterpart.
b. Check if communication is normal.
c. Transmit the signals other than predetermined ID codes form the counterpart.
d. check if the EUT stops the transmission, or if it displays that idnetification codes are different from the predetermined ones.

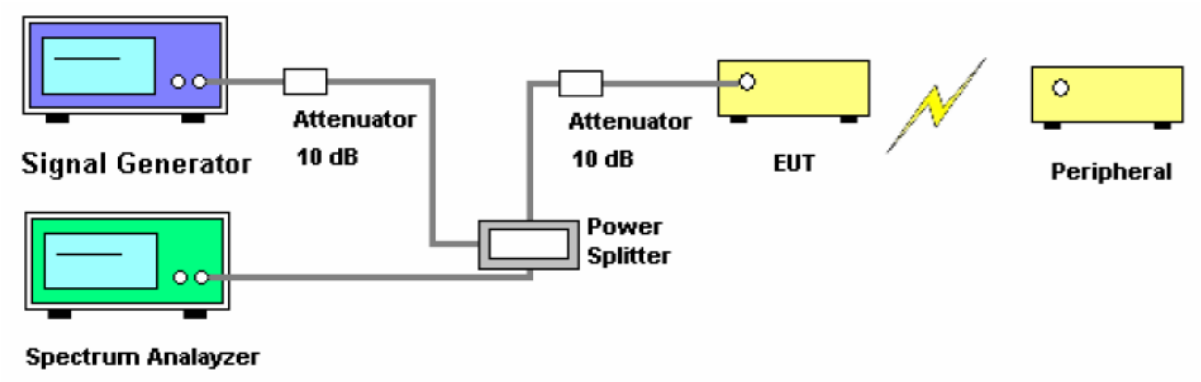
14.5 Test Result

Temperature:	25°C		
Humidity:	55 % RH	Test Voltage	DC 5V

1.MAC: 4c:5d:33:06:8f:02
2.Test result: PASS

15. Carrier Sense Capability Measurement

15.1 Block Diagram Of Test Setup



15.2 Limit

EUT stop RF transmission signal after carrier inject to EUT

15.3 Test Procedure

1. SG adjusted the frequency as same as the EUT transmitted signal and emitted the absence of modulation from SG and power level is (on 22.79+G-20*log(f)dBm)(G is the antenna gain, f is the test frequency).
2. turn off the RF signal of the SG.
3. EUT have transmitted the maximum modulation signal and fixed channelize.
4. Setting of SA :RBW/VBW=1MHz/1MHz,Span=50MHz,Sweep time=auto,
Sweep mode=continuous, Detect mode=positive peak
5. SG RF signal on.
6. EUT shall be stop the transmitted any signal and SG RF signal off, the EUT will be continuous transmitted signal.

15.4 Test Result

Mode	Channel	Result		
		Normal Voltage	High Voltage	Low Voltage
802.11n40	CH3	Pass	Pass	Pass
	CH7	Pass	Pass	Pass
	CH11	Pass	Pass	Pass
802.11ax40	CH3	Pass	Pass	Pass
	CH7	Pass	Pass	Pass
	CH11	Pass	Pass	Pass

Note: For this test just evaluate the mode which bandwidth≥26MHz.
Result: Pass

16. Duty Cycle Of Test Signal

16.1 Standard Requirement

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle. All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage

16.2 Formula

Duty Cycle = Ton / (Ton+Toff)

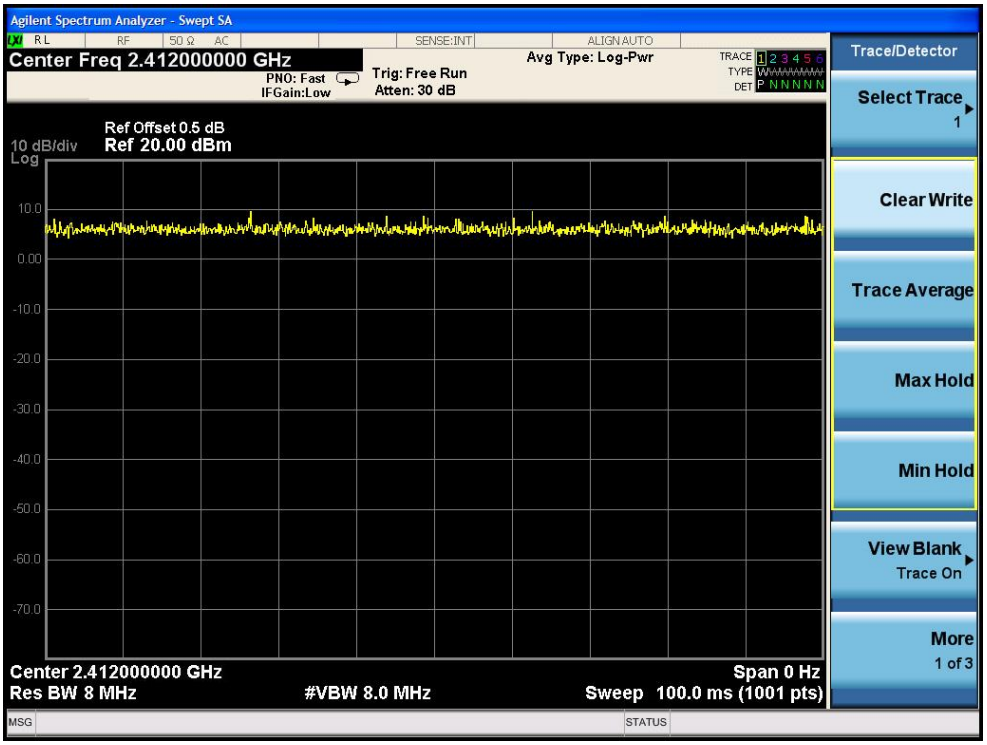
16.3 Test Procedure

1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

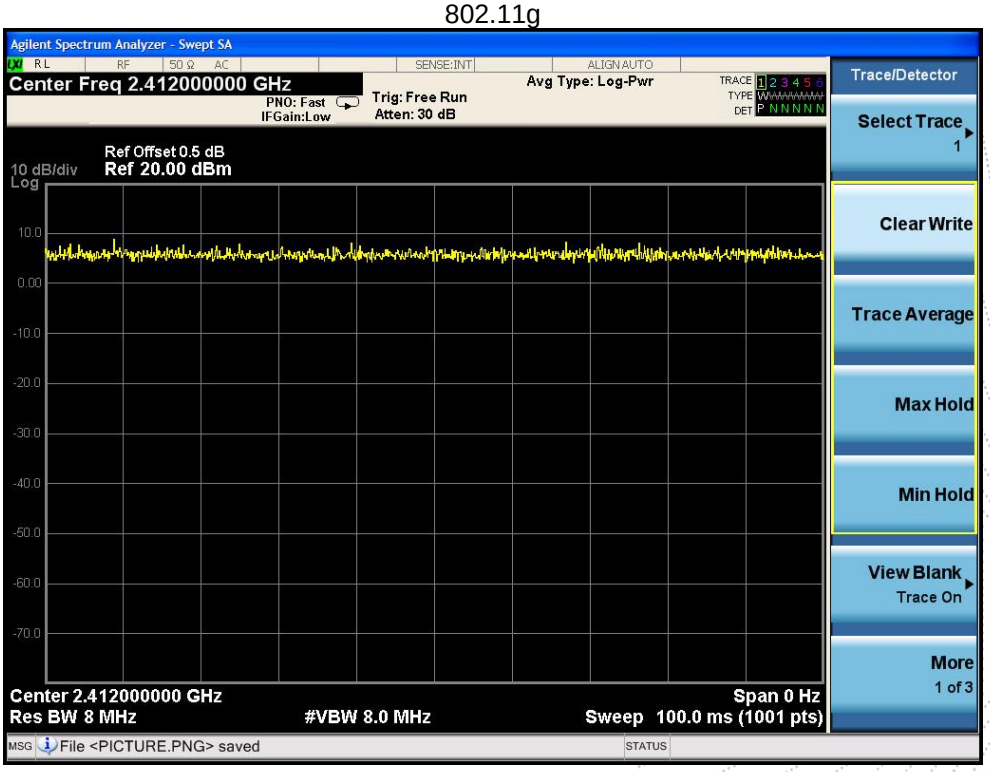
16.4 Test Result

Operation mode	Duty Cycle	Duty Fator (dB)
802.11b	1	0
802.11g	1	0
802.11n(HT20)	1	0
802.11n(HT40)	1	0
802.11ax(HT20)	1	0
802.11ax(HT40)	1	0

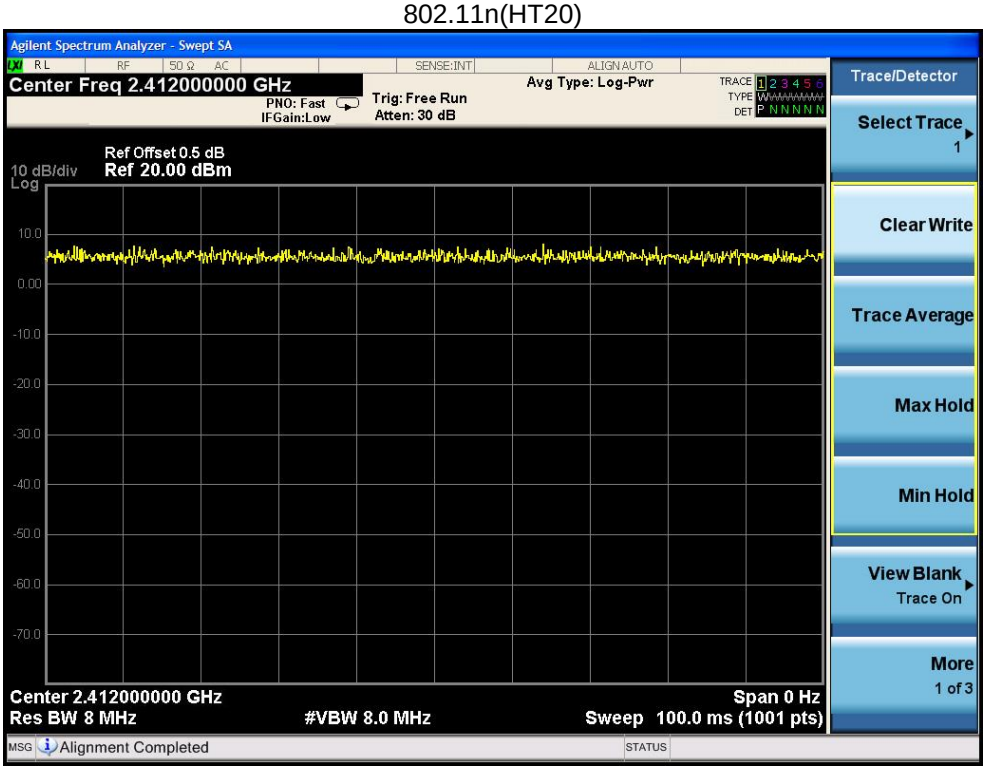
802.11b



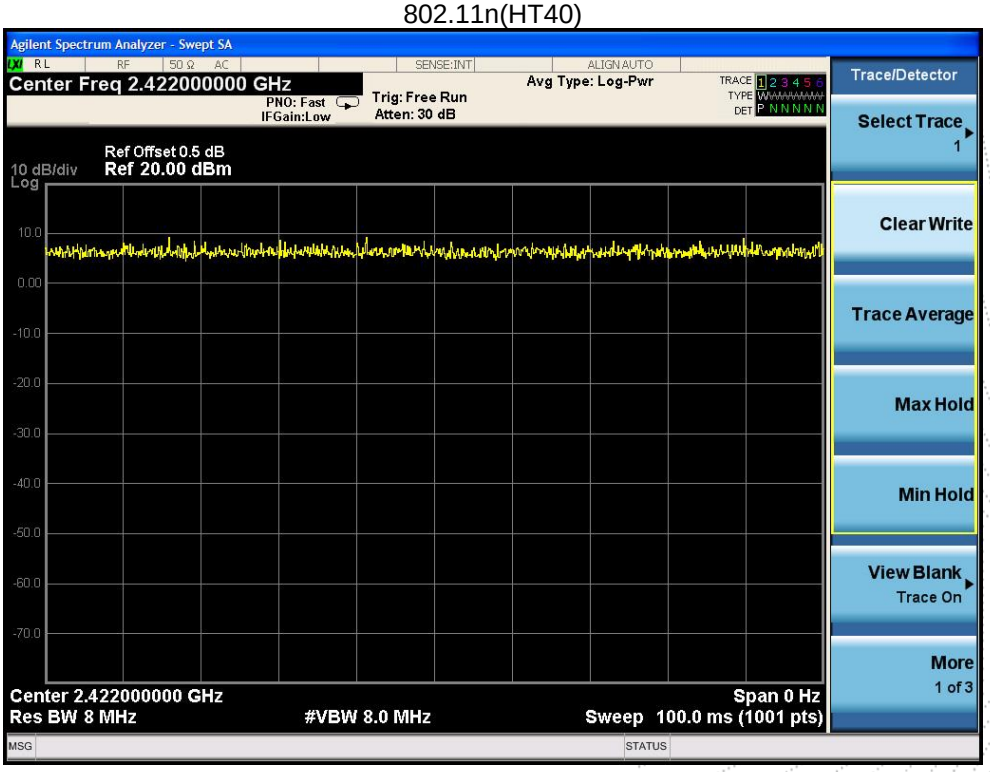
802.11g



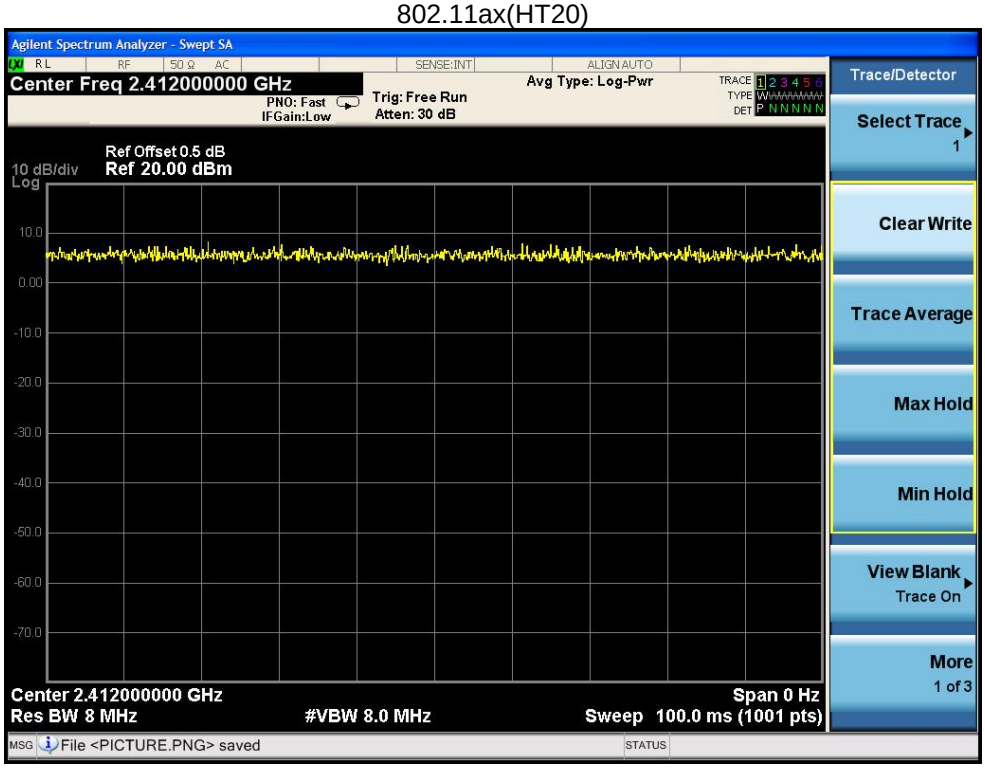
802.11n(HT20)



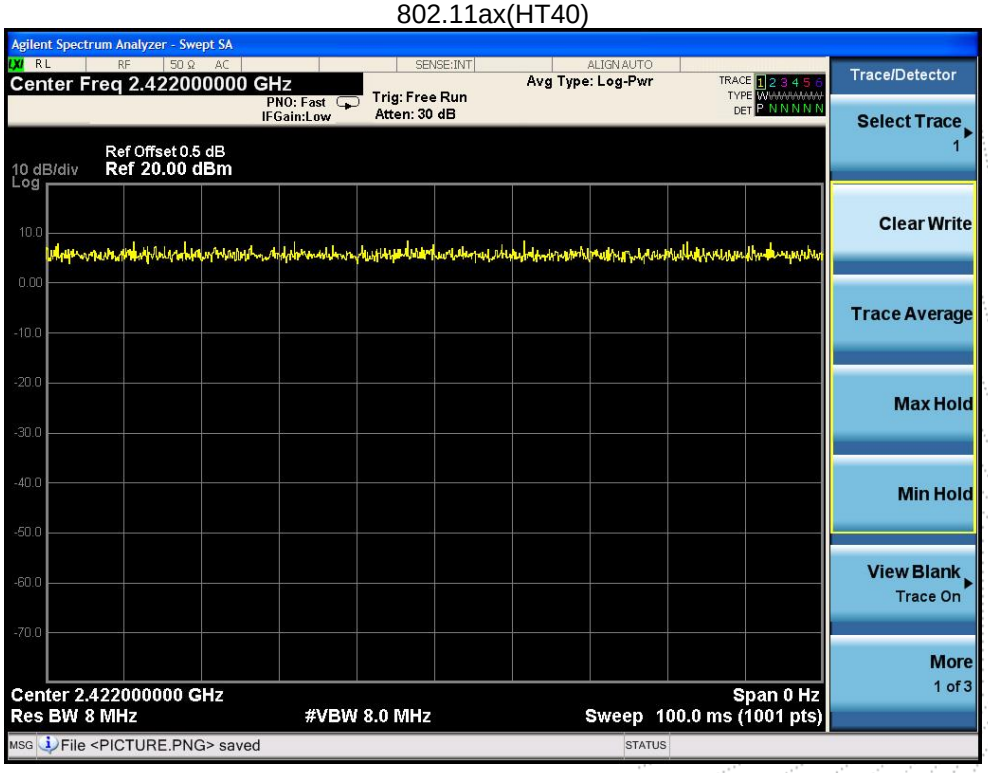
802.11n(HT40)



802.11ax(HT20)

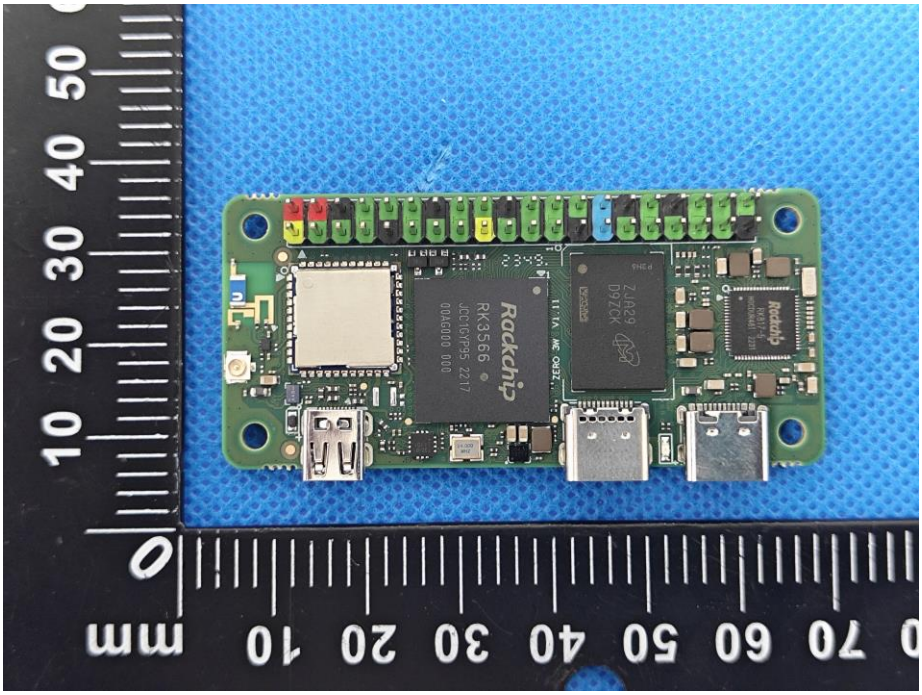


802.11ax(HT40)

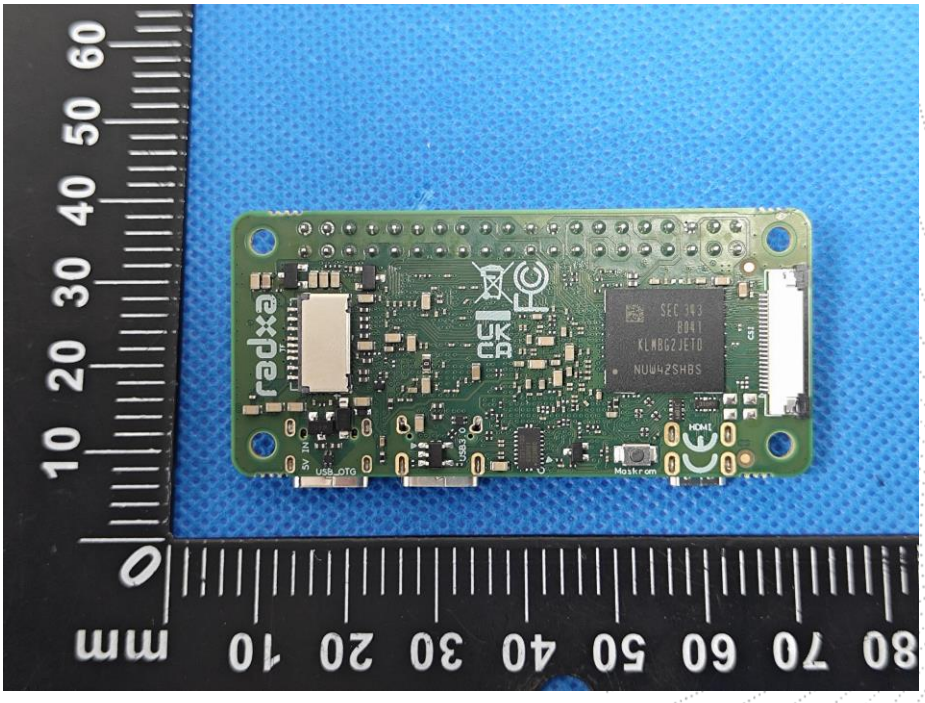


17. EUT Photographs

EUT Photo 1



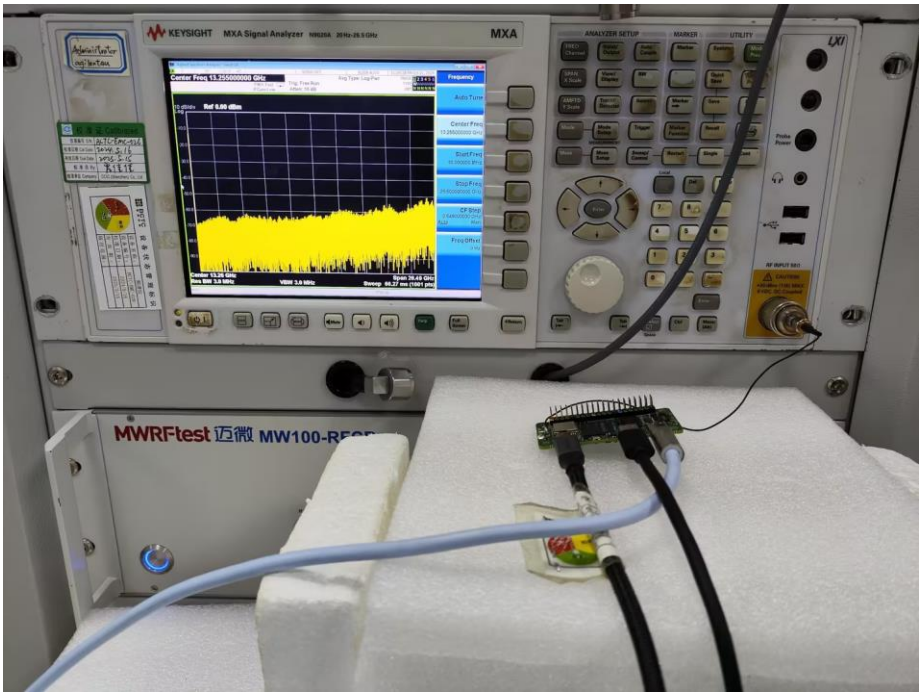
EUT Photo 2

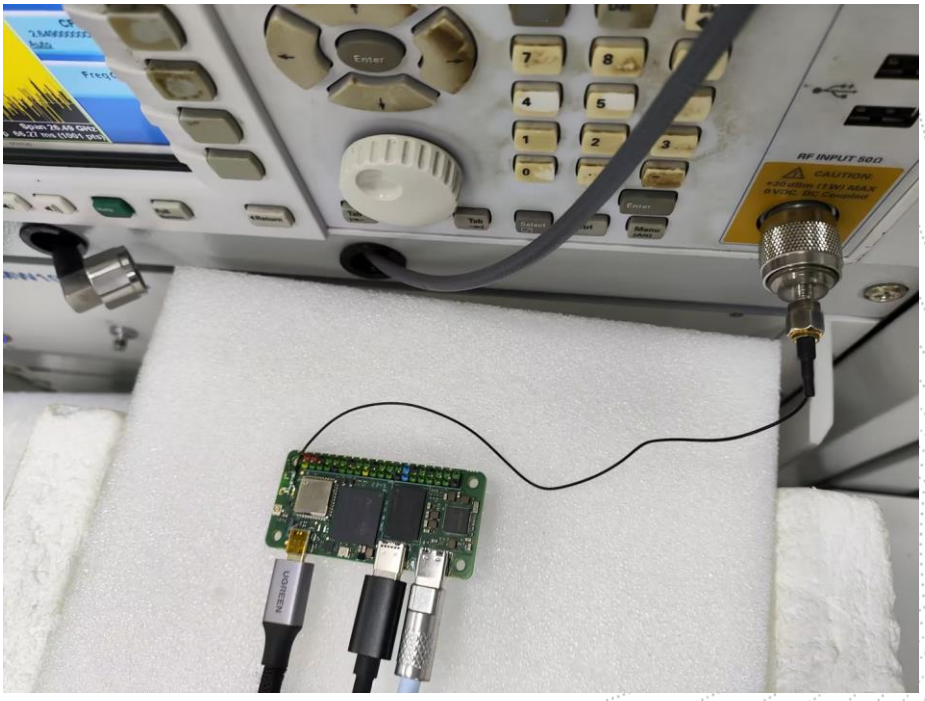


NOTE: Appendix-Photographs Of EUT Constructional Details.

18. EUT Test Setup Photographs

Measurement Photos





STATEMENT

1. The equipment lists are traceable to the national reference standards.

2. The test report can not be partially copied unless prior written approval is issued from our lab.

3. The test report is invalid without the "special seal for inspection and testing".

4. The test report is invalid without the signature of the approver.

5. The test process and test result is only related to the Unit Under Test.

6. Sample information is provided by the client and the laboratory is not responsible for its authenticity.

7. The quality system of our laboratory is in accordance with ISO/IEC17025.

8. If there is any objection to this test report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

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Consultation E-mail: bctc@bctc-lab.com.cn

Complaint/Advice E-mail: advice@bctc-lab.com.cn

※※※※※ END ※※※※※