TEST REPORT

Report No.:	BCTC2607584082E
Applicant:	GEO CORPORATION
Product Name:	Bone-conducting wireless headphones
Test Model:	GRSD-BCH X60-3
Tested Date:	2026-07-01 to 2026-07-07
Issued Date:	2026-07-07

Shenzhen BCTC Testing Co., Ltd.

Product Name:	Bone-conducting wireless headphones
Trademark:	N/A
Model/Type reference:	GRSD-BCH X60-3
Prepared For:	GEO CORPORATION
Address:	OMC Bldg.8-8,Fujimi-cho,Naka-ku,Nagoya-shi,Aichi 460-00014 Japan
Manufacturer:	Shenzhen Sounder Digital Technology Co., Ltd.
Address:	Building 18, Kanier Industrial Zone, Hongye North Road, Tangxia Town, Dongguan, 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:	2026-07-01
Sample tested Date:	2026-07-01 to 2026-07-07
Issue Date:	2026-07-07
Report No.:	BCTC2607584082E
Test Standards:	Article 2 paragraph 1 of item 19 MIC Notice No.88 Appendix No.43
Test Results:	PASS
Remark:	This is JAPAN RADIO test report.

Prepared by:	Reviewed By:	Approved by:
Yukin Liang	Shanshan Zhang	Zero Zhou

The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen BCTC Testing Co., Ltd, this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client.

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(Note: N/A Means Not Applicable)

1. Version

Report No.	Issue Date	Description	Approved
BCTC2607584082E	2026-07-07	Original	Valid

2. Test Summary

Test procedures according to the technical standards:

Article 2 paragraph 1 of item 19			
Standard Section	Test Item	Judgment	Test by
General provisions			
5	Frequency Error	PASS	Hui he Long
6	Occupied Bandwidth	PASS	Hui he Long
7	Spurious Emissions Intensity	PASS	Hui he Long
8	Radio Interference Prevention Capability Measurement	PASS	Hui he Long
Transmitting equipment			
6	Antenna Power	PASS	Hui he Long
Transmitting antenna			
20	Type, Configuration, etc., of Transmitting Antenna	PASS	Hui he Long
22	Direction Pattern of Transmitting Antenna (Provided at Individual Antenna Report)	PASS	Hui he Long
Receiving antenna			
24	Limitation of Collateral Emission of Receiver	PASS	Hui he Long
26	Refer to All Articles for Transmitting Antenna	PASS	Hui he Long
Operating frequency 2400~2483.5MHz			
49.20(1);a	RF Shielding Method	PASS	Hui he Long
49.20(1);a	Communication Method	PASS	Hui he Long
49.20(1);b	Spread-spectrum Method	PASS	Hui he Long
49.20(1);c	Antenna Power	PASS	Hui he Long
49.20(1);d	Absolute Antenna Gain (Provided at Individual Antenna Report)	PASS	Hui he Long
49.20(1);e	Spread-Spectrum Bandwidth	PASS	Hui he Long
49.20(1);f	Spreading Factor	PASS	Hui he Long
49.20(1);g	Hopping Frequency Dwell Time (FH employed)	PASS	Hui he Long

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 %。

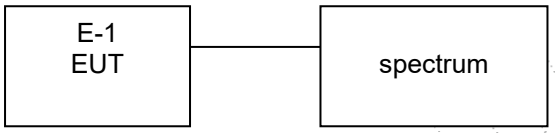
No.	Item	Uncertainty
1	Conducted Emission Test	±3.2dB
2	Radiated Emission Test	±4.7dB
3	RF power,conducted	±0.16dB
4	Spurious emissions,conducted	±0.21dB
5	All emissions,radiated(<1G)	±4.68dB
6	All emissions,radiated(>1G)	±5.0dB
7	frequency error ppm	±0.5ppm

4. Product Information And Test Setup

4.1 Product Information

Model/Type Reference:	GRSD-BCH X60-3
Model Differences:	N/A
Hardware Version:	V1.3
Software Version:	V101
Operation Frequency:	2402-2480MHz
Type of Modulation:	GFSK, π/4-DQPSK, 8DPSK
Number Of Channel:	79 CH
Antenna installation:	Chip Antenna
Antenna Gain:	-1.35 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 laboratory assumes no responsibility for its authenticity. ☐ The antenna gain of the product is provided by the customer, and the test data is affected by the customer information. The laboratory assumes no responsibility for its authenticity.
Ratings:	DC 5V from adapter or DC 3.8V from battery

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	Bone-conducting wireless headphones	N/A	GRSD-BCH X60-3	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					
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

4.5 Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

For All Mode	Description	Modulation Type
Mode 1	CH 00	GFSK
Mode 2	CH 39	
Mode 3	CH 78	
Mode 4	RX	
Mode 5	CH 00	π/4-DQPSK
Mode 6	CH 39	
Mode 7	CH 78	
Mode 8	RX	
Mode 9	CH 00	8DPSK
Mode 10	CH 39	
Mode 11	CH 78	
Mode 12	RX	

4.6 Test Conditions

The EUT module 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	3.8V	4.18V	3.42V
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(DC 3.8V), 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	FCC Assist V1.0.2.2		
Frequency	2402 MHz	2441 MHz	2480 MHz
Parameters	DEF	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.

5.2 Test Instrument Used

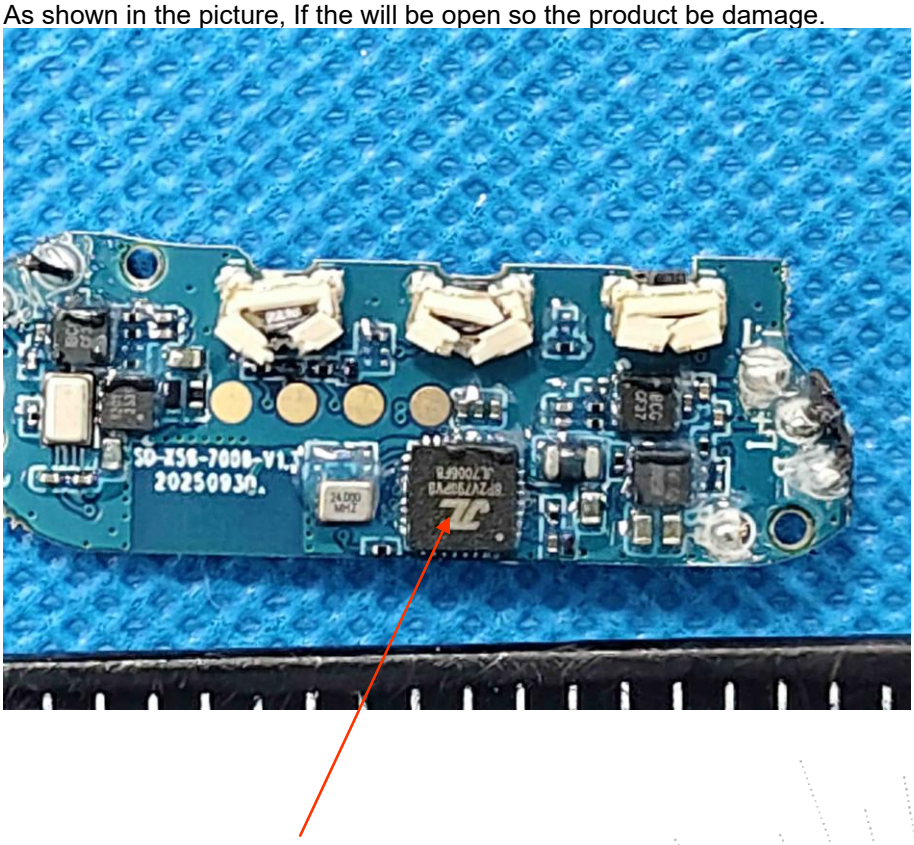
Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1.	Power Meter	Keysight	E4419	A00065	May 09, 2026	May 08, 2027
2.	Power Sensor	Keysight	E9300A	US39211659	May 09, 2026	May 08, 2027
3.	Signal Analyzer 20Hz-26.5GHz	Agilent	N9020A	MY54230579	Oct. 31, 2025	Oct. 30, 2026
4.	D.C. Power Supply	LongWei	TPR-6405D	\	May 09, 2026	May 08, 2027
5.	Signal Generator	Keysight	N5182B	MY56200519	May 09, 2026	May 08, 2027
6.	Pulse limiter	Schwarzbeck	VTSD 9561-F	01323	May 09, 2026	May 08, 2027
7.	Hygrothermograph	Thermo	HTC-1	\	May 09, 2026	May 08, 2027
8.	Software	MTS	8310E	V3.0.0.0	\	\

Calibration laboratory: CCIC(Shenzhen) Co., Ltd

● Calibration Information (Article 24-2, Paragraph 4 of the Radio Act)	
☐	a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) or a designated calibration agency under Article 102-18-1 of the Radio Act
☐	(b) Calibration conducted based on the regulations of Article 135 or 144 of the Measurement Act
☒	(c) Calibration conducted in foreign countries, which is equivalent to calibration conducted by the NICT or a designated calibration agency under Article 102-18-1 of the Radio Act
☐	(d) Calibration, etc. conducted by using measuring instruments and other facilities listed at the bottom of appended table 3 of the Radio Act, which is to have been calibrated as described in (a) through (c) above

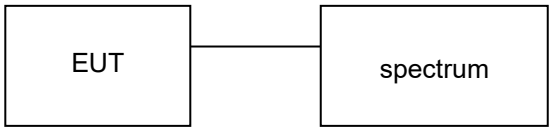
6. RF Shielding Method

Chipset:
The product structure is uses SMD patch process.
As shown in the picture, If the will be open so the product be damage.



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.

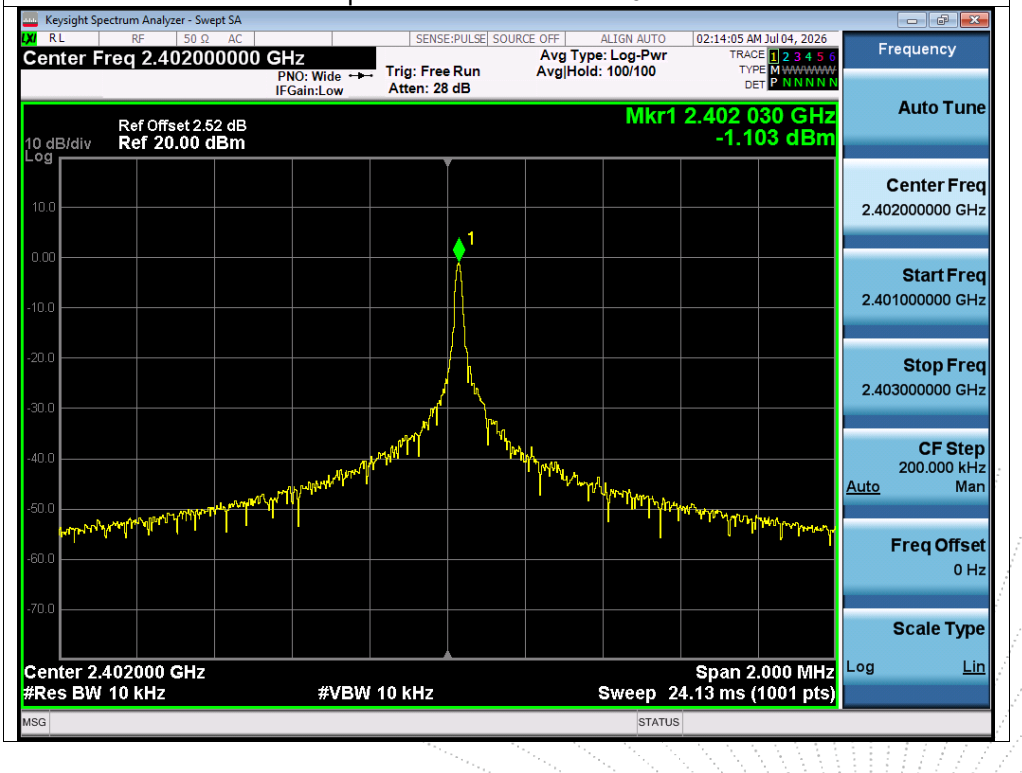
7.5 Test Result

Temperature:	26°C		
Humidity:	54%RH	Test Voltage	DC 3.8V
Condition:	NVNT		

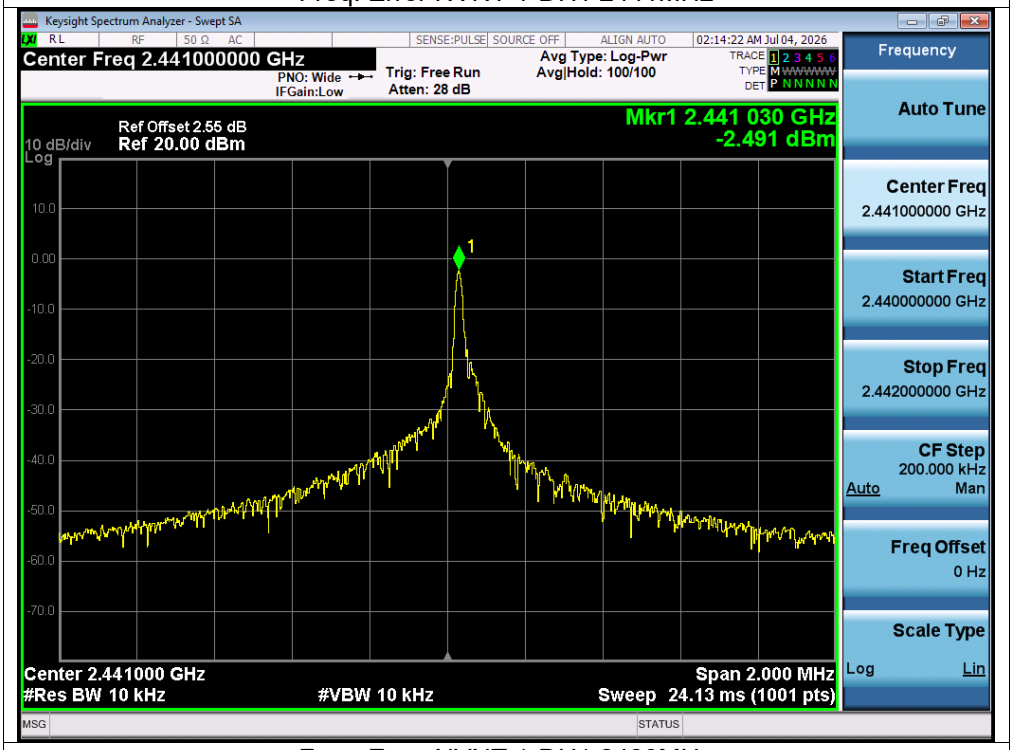
Condition	Mode	Frequency (MHz)	Measured Frequency (MHz)	Deviation (ppm)	Limit (ppm)	Verdict
NVNT	1-DH1	2402	2402.03	12.49	±50	Pass
NVNT	1-DH1	2441	2441.03	12.29	±50	Pass
NVNT	1-DH1	2480	2480.03	12.10	±50	Pass

Test Graphs

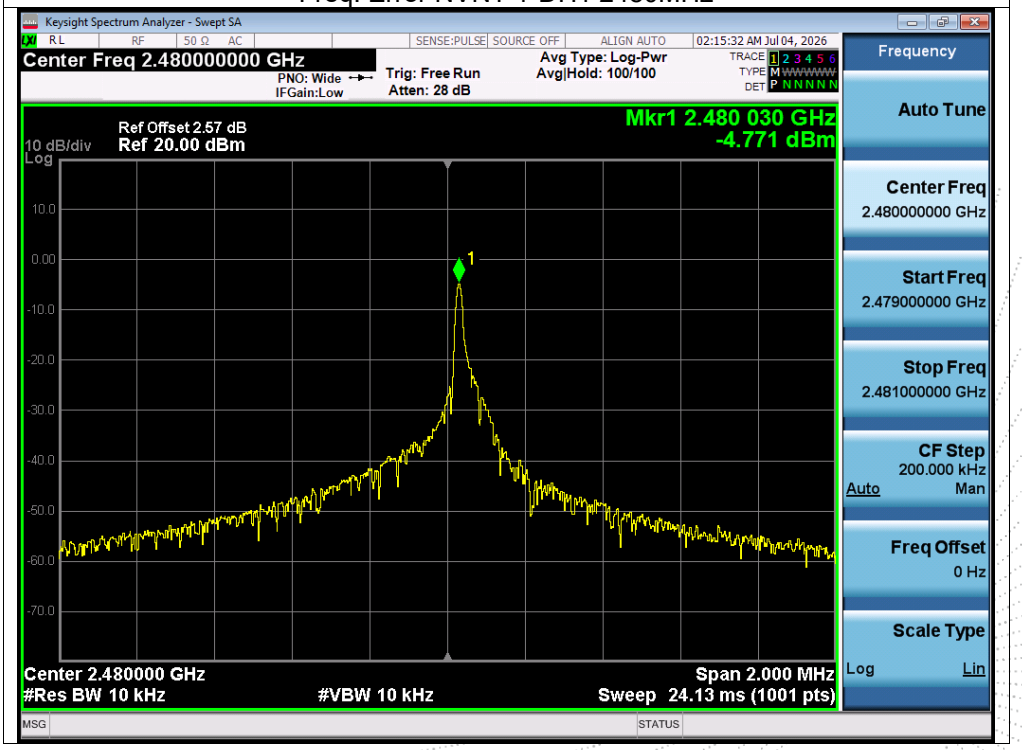
Freq. Error NVNT 1-DH1 2402MHz



Freq. Error NVNT 1-DH1 2441MHz

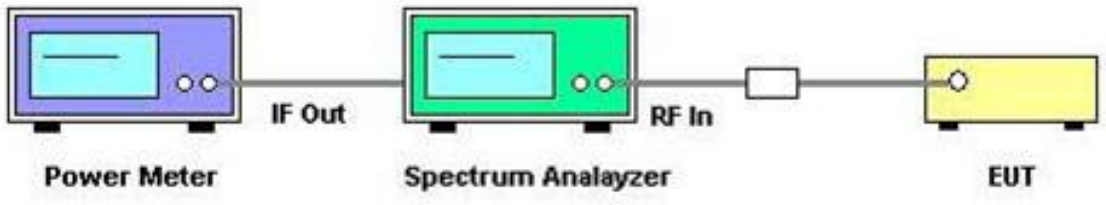


Freq. Error NVNT 1-DH1 2480MHz



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/MHz (Other than (1) & (2)& (3)
Antenna Power Error	+20%, -80% (Base on manufacturer declare antenna power density)

8.3 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

8.4 Test Procedure

1. A power meter is connected on the IF output port of the spectrum analyzer.
2. Adjust the spectrum analyzer to have the center frequency the same with the measured carrier. RBW=VBW=1MHz, detector mode is positive peak. Turn off the averaging function and use zero span.
3. The calibrating signal power shall be reduced to 0 dBm and it shall be verified that the power meter reading also reduces by 10 dB.
4. Connect the equipment to be measured. Using the following settings of the spectrum analyzer in combination with "max hold" function, find the frequency of highest power output in the power envelope: center frequency equal to operating frequency; RBW & VBW: 1 MHz; detector mode: positive peak; averaging: off; span: 3 times the spectrum width; amplitude: adjust for middle of the instrument' range. The frequency found shall be recorded.
5. Set the center frequency of the spectrum analyzer to the found frequency and switch to zero span. The power meter indicates the measured power density “E”.
6. Calculate antenna power density by the formula below PD = P/ Spread bandwidth.
7. Antenna Power Error is definition that actual measure antenna power tolerance between + 20% to - 80% power range that base on manufacturer declare the
conducted power density.

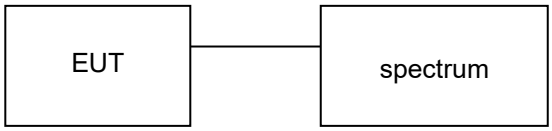
8.5 Test Result

Temperature:	26°C		
Humidity:	54 % RH	Test Voltage	DC 3.8V
Test Mode:	1-DH1, 2-DH1, 3-DH1		

Condition	Conducted RF output power (dBm)	Conducted RF output power (mW)	90% Hopping Occupied bandwidth (MHz)	Conducted RF output power density (mW/MHz)	Rated power density (mW/MHz)	Limit (mW/MHz)	Antenna Power Error (%)	Verdict
NVNT	-1.2	0.76	70.551	0.011	0.015	3	-28	Pass
NVNT	-0.92	0.81	70.632	0.011	0.015	3	-24	Pass
NVNT	-0.89	0.81	70.612	0.012	0.015	3	-23	Pass
Limit: +20%, -80% (Base on manufacturer declare antenna power density) Conducted RF output power density=Antenna Power/ 90%Hopping Occupied bandwidth								

9. Occupied Bandwith

9.1 Block Diagram Of Test Setup



9.2 Limit

Item	Limits
Occupied Band Width:	FH 83.5MHz; OFDM,DS ≤26MHz;Others≤26MHz
Spreading Bandwidth:	≥500 kHz (FH, DS)
Spreading Factor	≧5

9.3 Test Procedure

1. Setting of SA is following as: RB: 1MHz / VB:1MHz / SPAN: 120MHz / 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

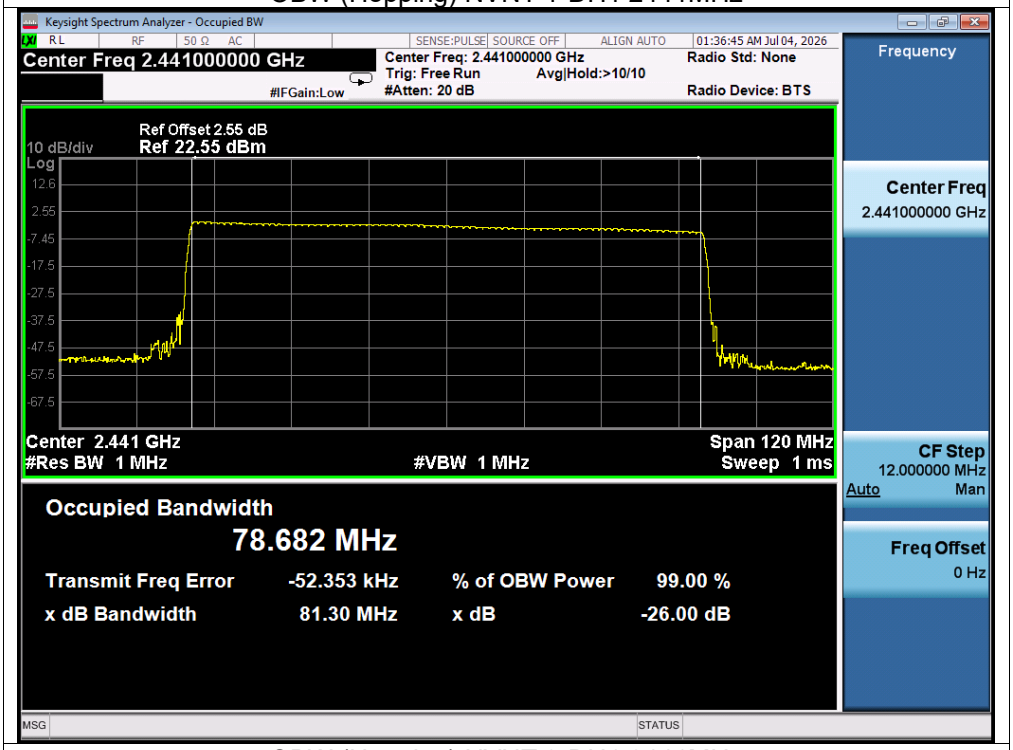
9.4 Test Result

Temperature:	26°C		
Humidity:	54 % RH	Test Voltage	DC 3.8V

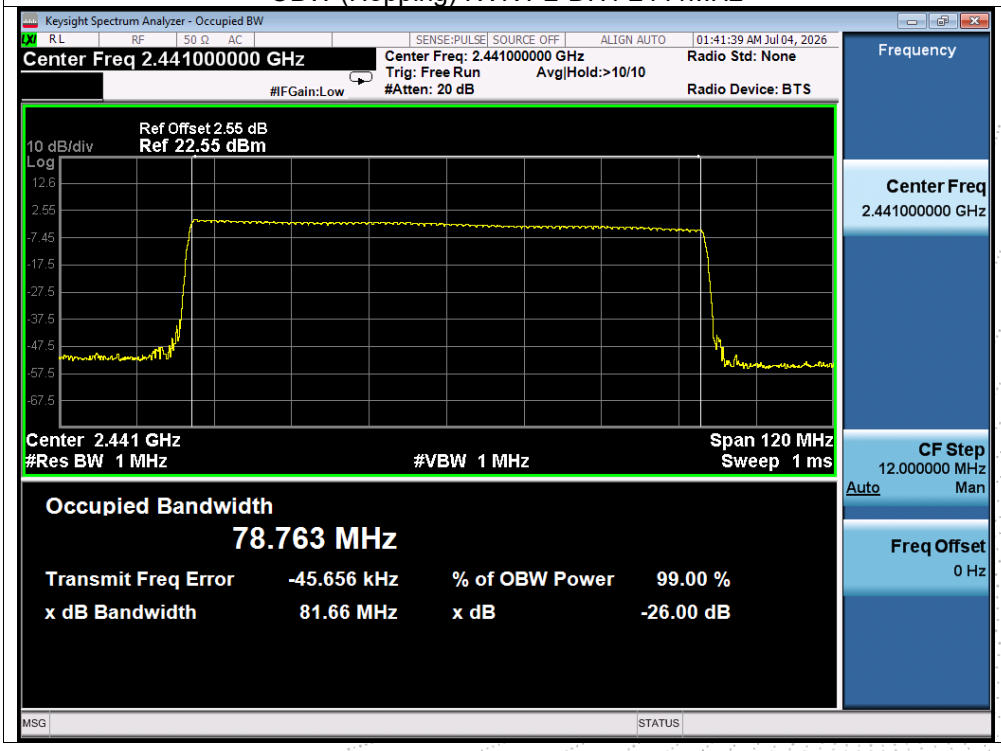
Condition	Mode	99% OBW (MHz)	90% OBW (MHz)	Spreading Factor	Verdict
NVNT	1-DH1	78.682	70.551	70.551	Pass
NVNT	2-DH1	78.763	70.632	35.316	Pass
NVNT	3-DH1	78.726	70.612	23.537	Pass
Remark: 1. Spreading Factor = (90%Hopping Mode(Occupied bandwidth)) / (transmission rate); 2. Transmission Rate=(1-DH1=1Mbps, 2-DH1=2Mbps, 3-DH1=3Mbps)					

Test Graphs

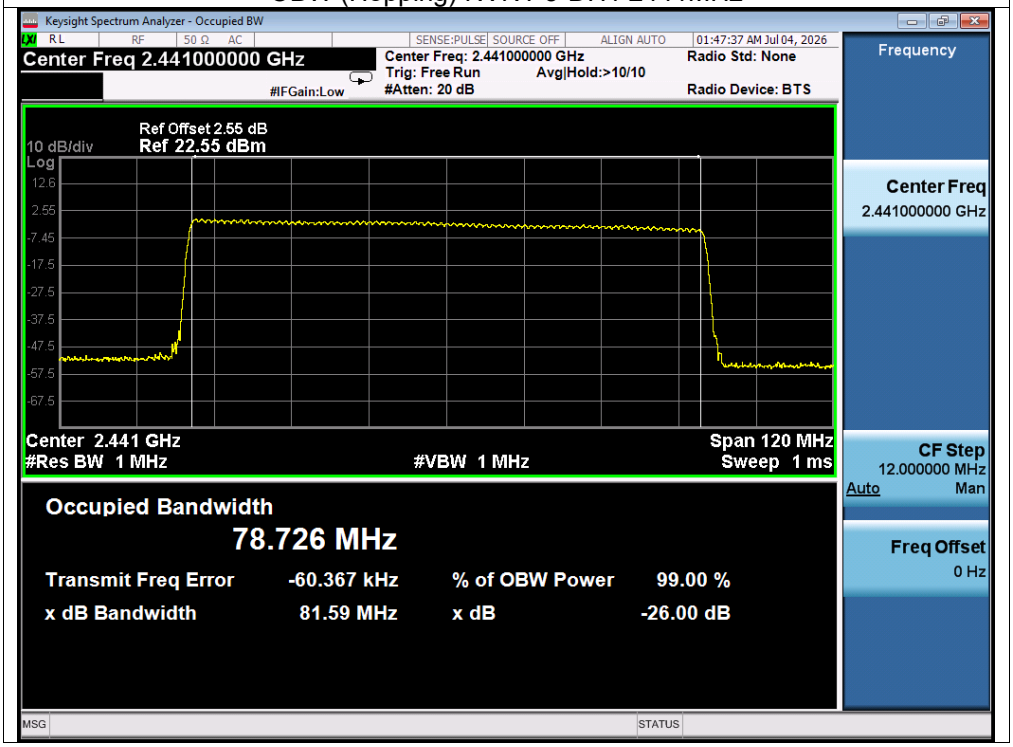
OBW (Hopping) NVNT 1-DH1 2441MHz



OBW (Hopping) NVNT 2-DH1 2441MHz

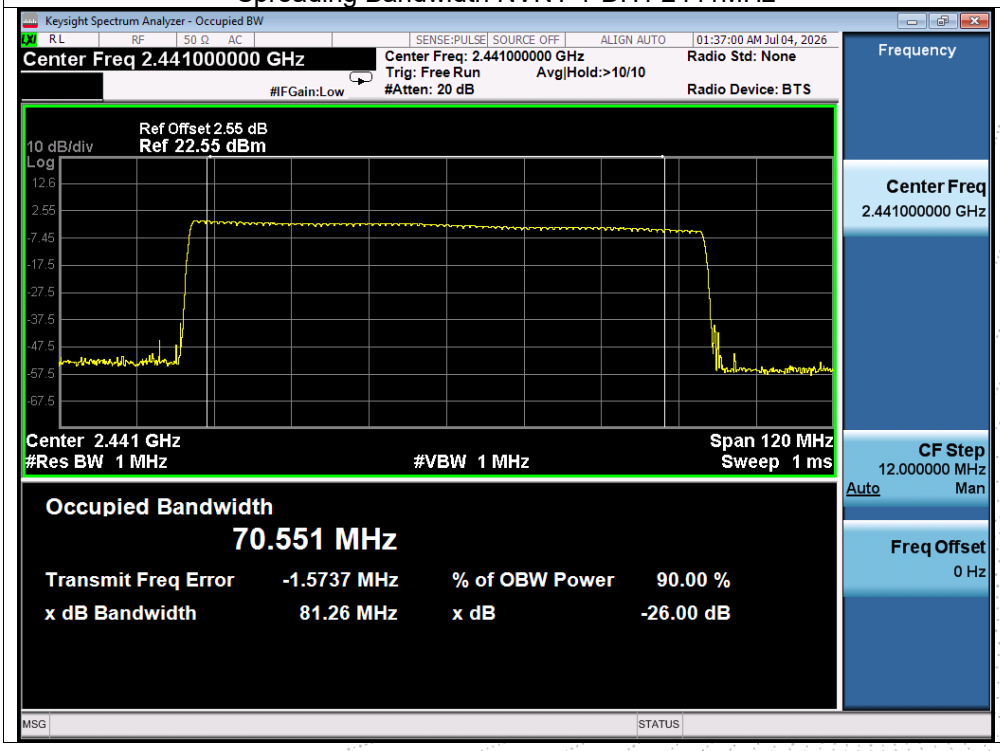


OBW (Hopping) NVNT 3-DH1 2441MHz

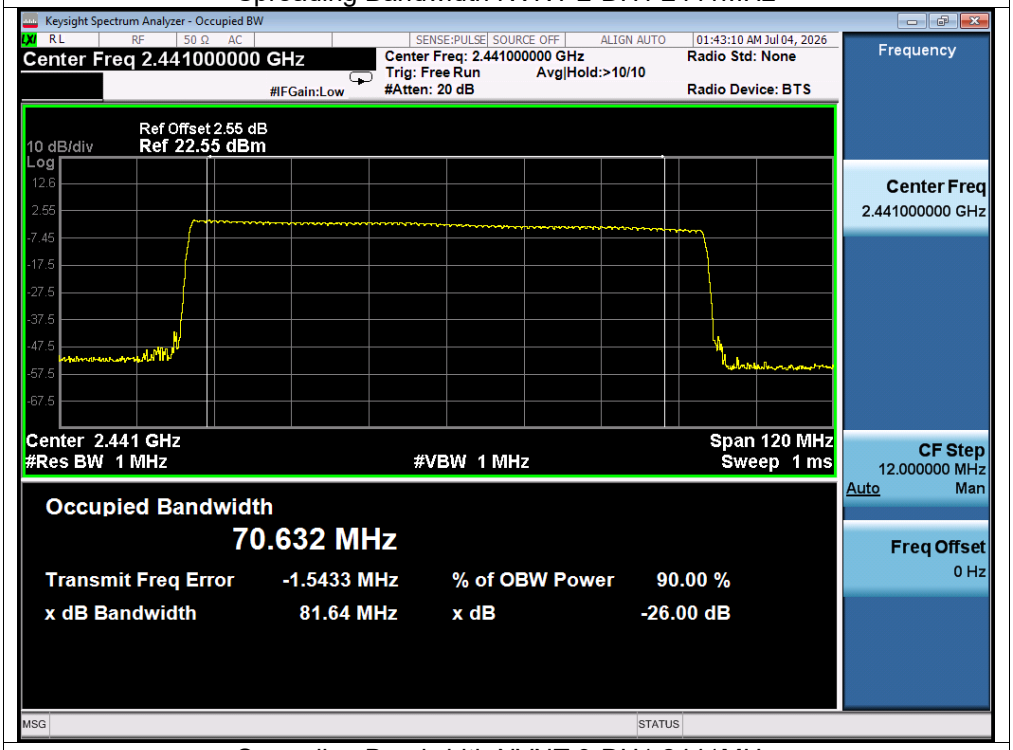


Test Graphs

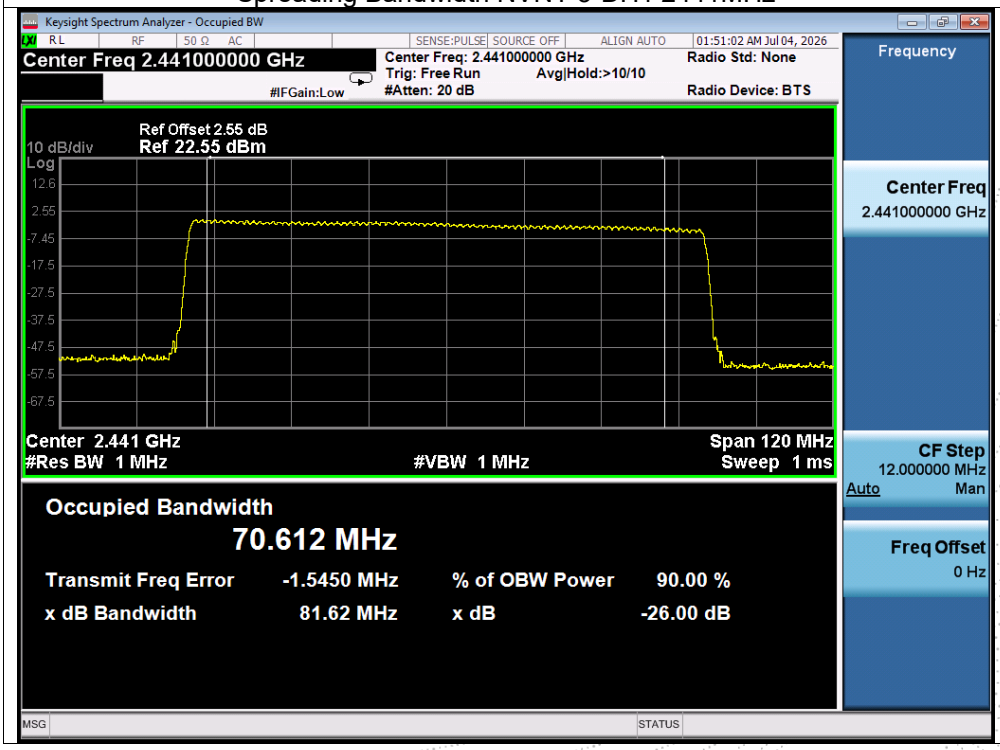
Spreading Bandwidth NVNT 1-DH1 2441MHz



Spreading Bandwidth NVNT 2-DH1 2441MHz

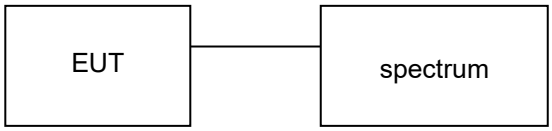


Spreading Bandwidth NVNT 3-DH1 2441MHz



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

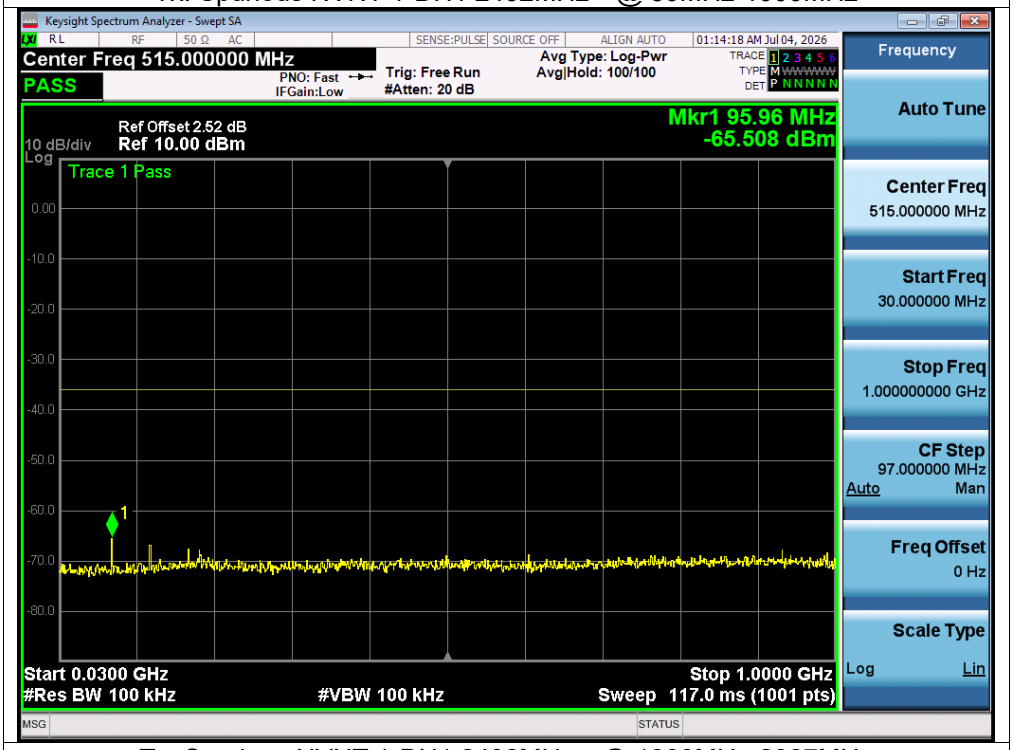
10.5 Test Result

Temperature:	26°C		
Humidity:	54 % RH	Test Voltage	DC 3.8V
Test Mode:	No-hopping		

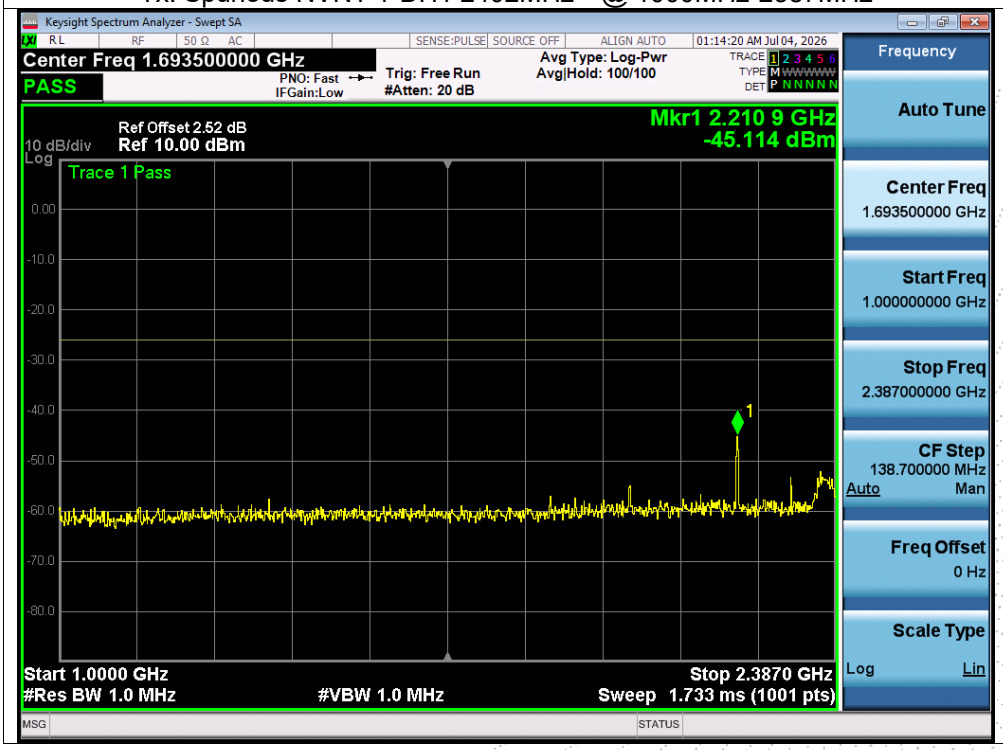
Condition	Mode	Frequency (MHz)	Range (MHz)	Emission Frequency (MHz)	Max Value (dBm)	Max Value (μW/ MHz)	Limit (μW/ MHz)	Verdict
NVNT	1-DH1	2402	30-1000	95.96	-55.51	0.0028	0.25	Pass
NVNT	1-DH1	2402	1000-2387	2210.85	-45.11	0.0308	2.5	Pass
NVNT	1-DH1	2402	2387-2400	2399.9	-34.51	0.3540	25	Pass
NVNT	1-DH1	2402	2483.5-2496.5	2487.18	-56.6	0.0022	25	Pass
NVNT	1-DH1	2402	2496.5-13000	9607.37	-43.74	0.0423	2.5	Pass
NVNT	1-DH1	2441	30-1000	95.96	-55.67	0.0027	0.25	Pass
NVNT	1-DH1	2441	1000-2387	2249.69	-43.97	0.0401	2.5	Pass
NVNT	1-DH1	2441	2387-2400	2399	-51.81	0.0066	25	Pass
NVNT	1-DH1	2441	2483.5-2496.5	2489.32	-53.87	0.0041	25	Pass
NVNT	1-DH1	2441	2496.5-13000	9764.92	-45.15	0.0305	2.5	Pass
NVNT	1-DH1	2480	30-1000	95.96	-54.57	0.0035	0.25	Pass
NVNT	1-DH1	2480	1000-2387	2288.52	-42.99	0.0502	2.5	Pass
NVNT	1-DH1	2480	2387-2400	2395.07	-57.08	0.0020	25	Pass
NVNT	1-DH1	2480	2483.5-2496.5	2483.51	-45.05	0.0313	25	Pass
NVNT	1-DH1	2480	2496.5-13000	9922.47	-43.15	0.0484	2.5	Pass
NVNT	2-DH1	2402	30-1000	191.99	-56.21	0.0024	0.25	Pass
NVNT	2-DH1	2402	1000-2387	2210.85	-44.99	0.0317	2.5	Pass
NVNT	2-DH1	2402	2387-2400	2400	-35.68	0.2704	25	Pass
NVNT	2-DH1	2402	2483.5-2496.5	2484.21	-56.82	0.0021	25	Pass
NVNT	2-DH1	2402	2496.5-13000	9607.37	-44.38	0.0365	2.5	Pass
NVNT	2-DH1	2441	30-1000	144.46	-55.46	0.0028	0.25	Pass
NVNT	2-DH1	2441	1000-2387	2249.69	-44.2	0.0380	2.5	Pass
NVNT	2-DH1	2441	2387-2400	2394.4	-52.33	0.0058	25	Pass
NVNT	2-DH1	2441	2483.5-2496.5	2486.89	-54.71	0.0034	25	Pass
NVNT	2-DH1	2441	2496.5-13000	9764.92	-44.87	0.0326	2.5	Pass
NVNT	2-DH1	2480	30-1000	95.96	-55.05	0.0031	0.25	Pass
NVNT	2-DH1	2480	1000-2387	2288.52	-43.33	0.0465	2.5	Pass
NVNT	2-DH1	2480	2387-2400	2398.82	-57.2	0.0019	25	Pass
NVNT	2-DH1	2480	2483.5-2496.5	2483.69	-47.91	0.0162	25	Pass
NVNT	2-DH1	2480	2496.5-13000	9922.47	-43.05	0.0495	2.5	Pass
NVNT	3-DH1	2402	30-1000	95.96	-55.62	0.0027	0.25	Pass
NVNT	3-DH1	2402	1000-2387	2210.85	-45.25	0.0299	2.5	Pass
NVNT	3-DH1	2402	2387-2400	2400	-34.28	0.3733	25	Pass
NVNT	3-DH1	2402	2483.5-2496.5	2496.21	-57.22	0.0019	25	Pass
NVNT	3-DH1	2402	2496.5-13000	9607.37	-43.51	0.0446	2.5	Pass
NVNT	3-DH1	2441	30-1000	95.96	-54.92	0.0032	0.25	Pass
NVNT	3-DH1	2441	1000-2387	2249.69	-44.75	0.0335	2.5	Pass
NVNT	3-DH1	2441	2387-2400	2398.06	-52.01	0.0063	25	Pass
NVNT	3-DH1	2441	2483.5-2496.5	2484.88	-54.81	0.0033	25	Pass
NVNT	3-DH1	2441	2496.5-13000	9764.92	-45.14	0.0306	2.5	Pass
NVNT	3-DH1	2480	30-1000	95.96	-54.72	0.0034	0.25	Pass
NVNT	3-DH1	2480	1000-2387	2288.52	-43.98	0.0400	2.5	Pass
NVNT	3-DH1	2480	2387-2400	2387.78	-56.71	0.0021	25	Pass
NVNT	3-DH1	2480	2483.5-2496.5	2483.53	-50.39	0.0091	25	Pass
NVNT	3-DH1	2480	2496.5-13000	9922.47	-43.23	0.0475	2.5	Pass

When the RB=100kHz, RB factor = 10log(RB0/RB1) = 10log(1M/100K) = 10dB

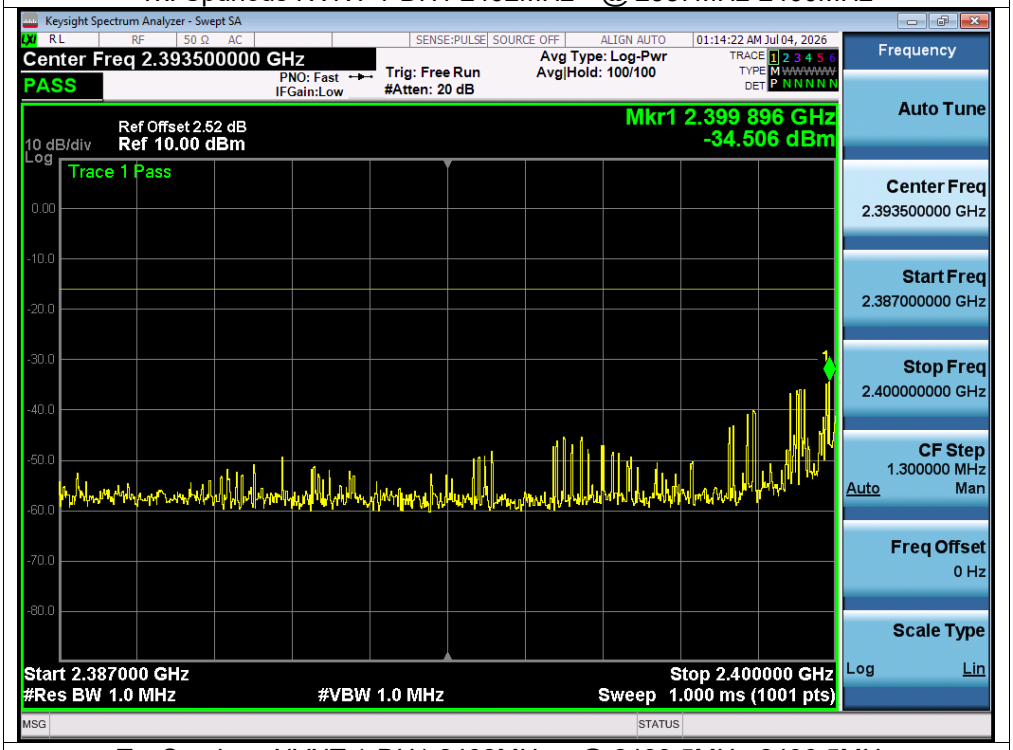
Test Graphs
Tx. Spurious NVNT 1-DH1 2402MHz @ 30MHz-1000MHz



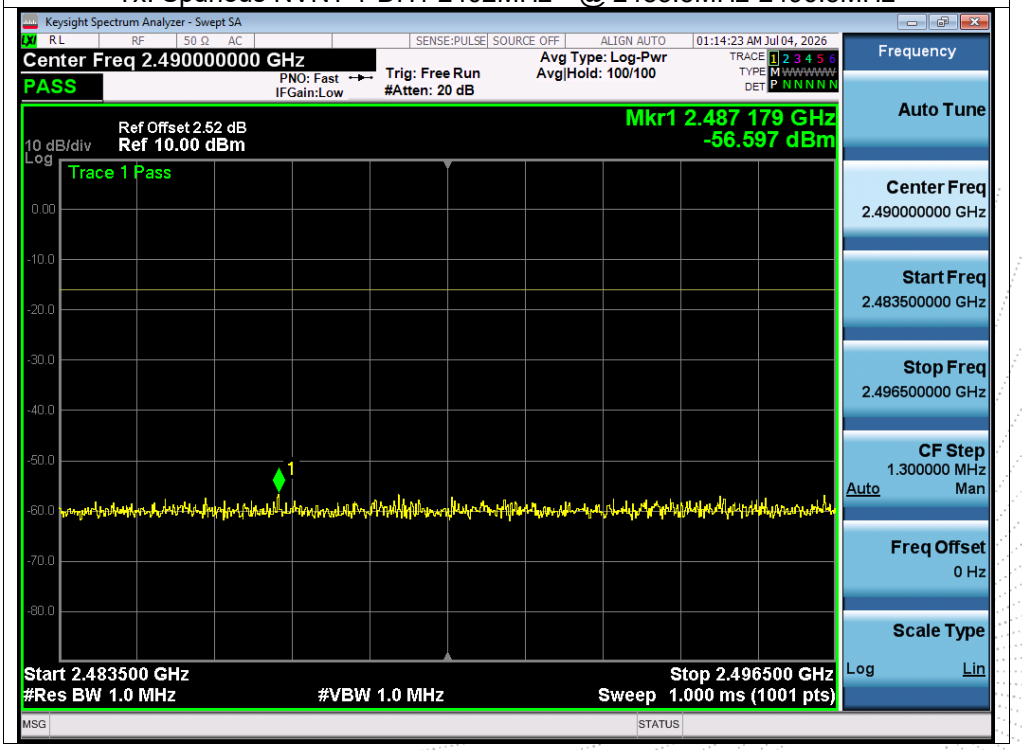
Tx. Spurious NVNT 1-DH1 2402MHz @ 1000MHz-2387MHz



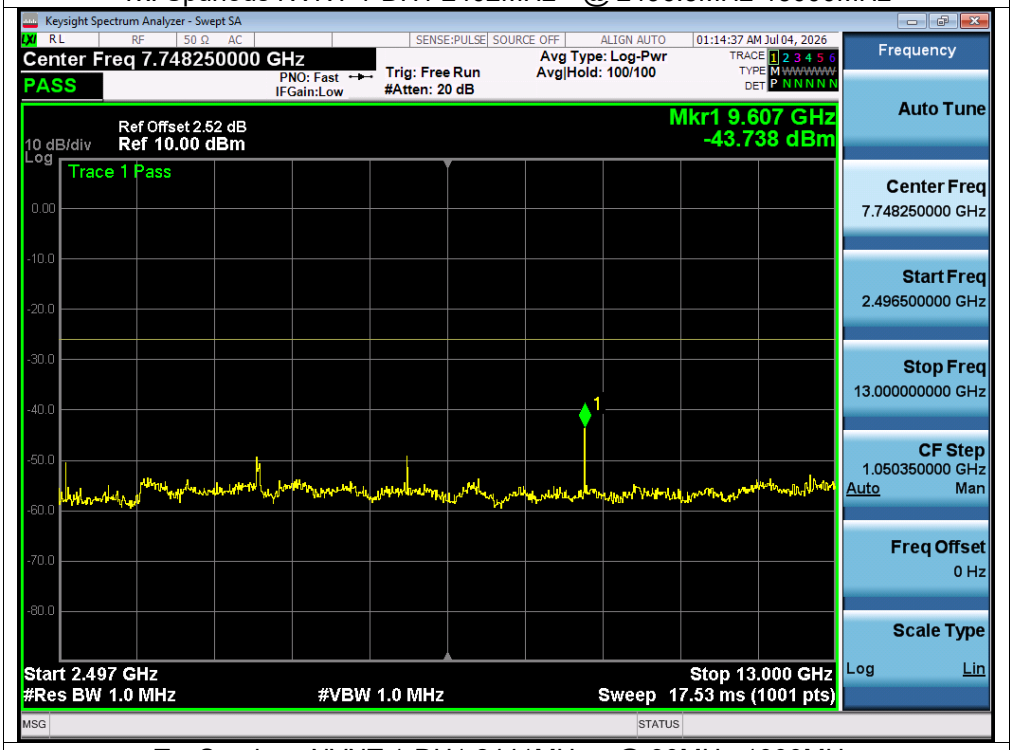
Tx. Spurious NVNT 1-DH1 2402MHz @ 2387MHz-2400MHz



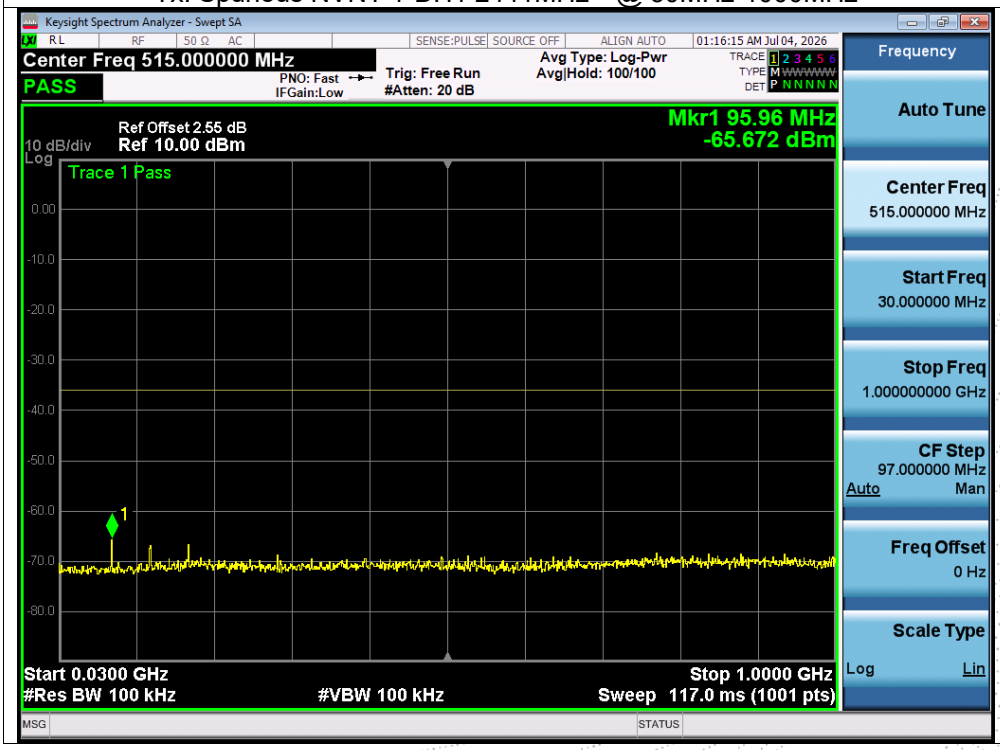
Tx. Spurious NVNT 1-DH1 2402MHz @ 2483.5MHz-2496.5MHz



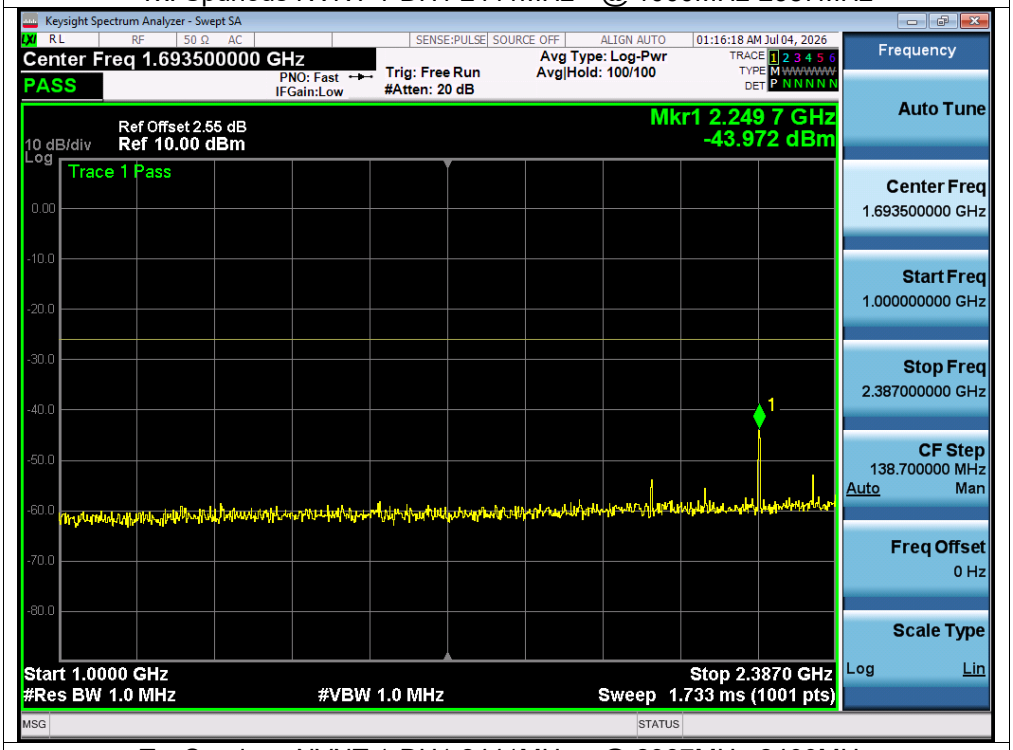
Tx. Spurious NVNT 1-DH1 2402MHz @ 2496.5MHz-13000MHz



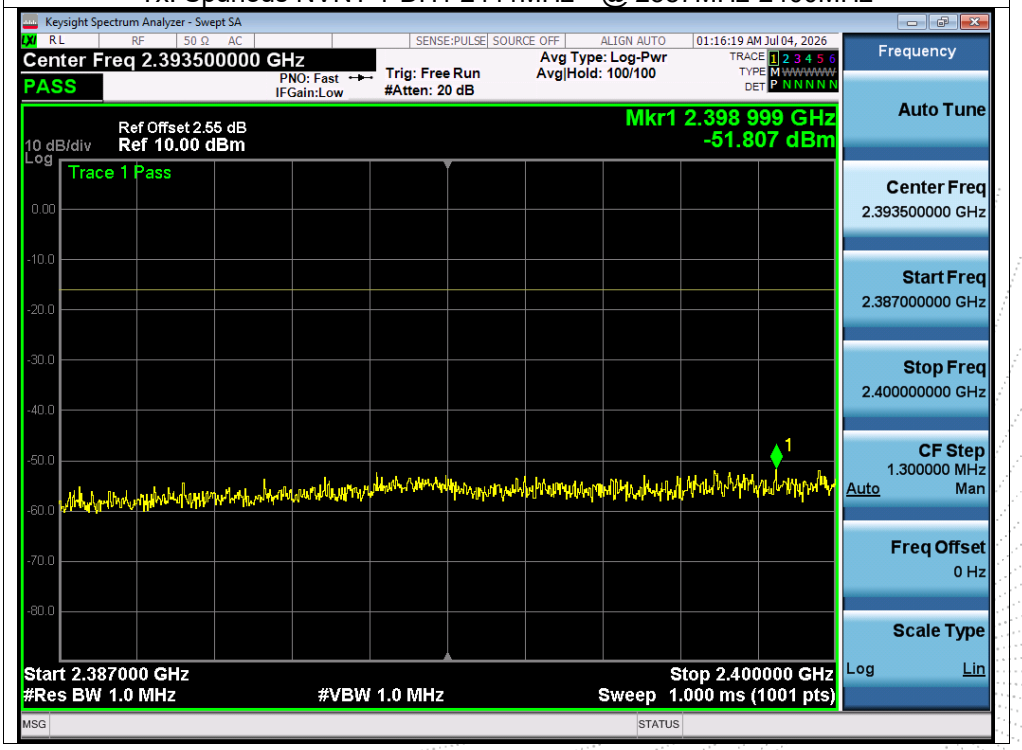
Tx. Spurious NVNT 1-DH1 2441MHz @ 30MHz-1000MHz



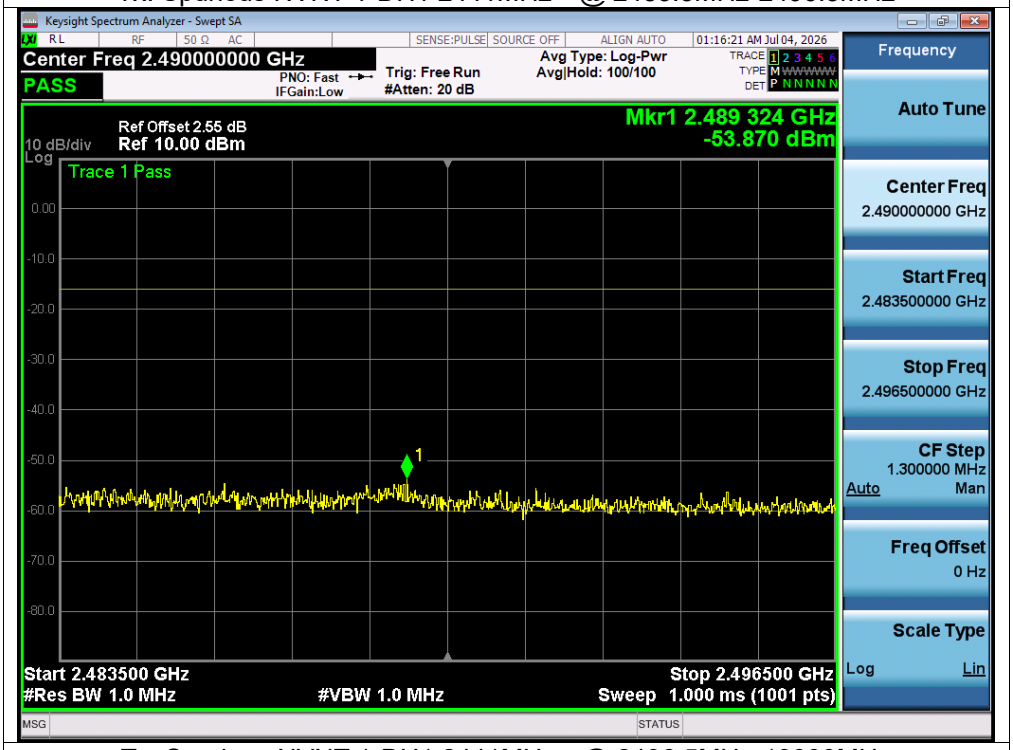
Tx. Spurious NVNT 1-DH1 2441MHz @ 1000MHz-2387MHz



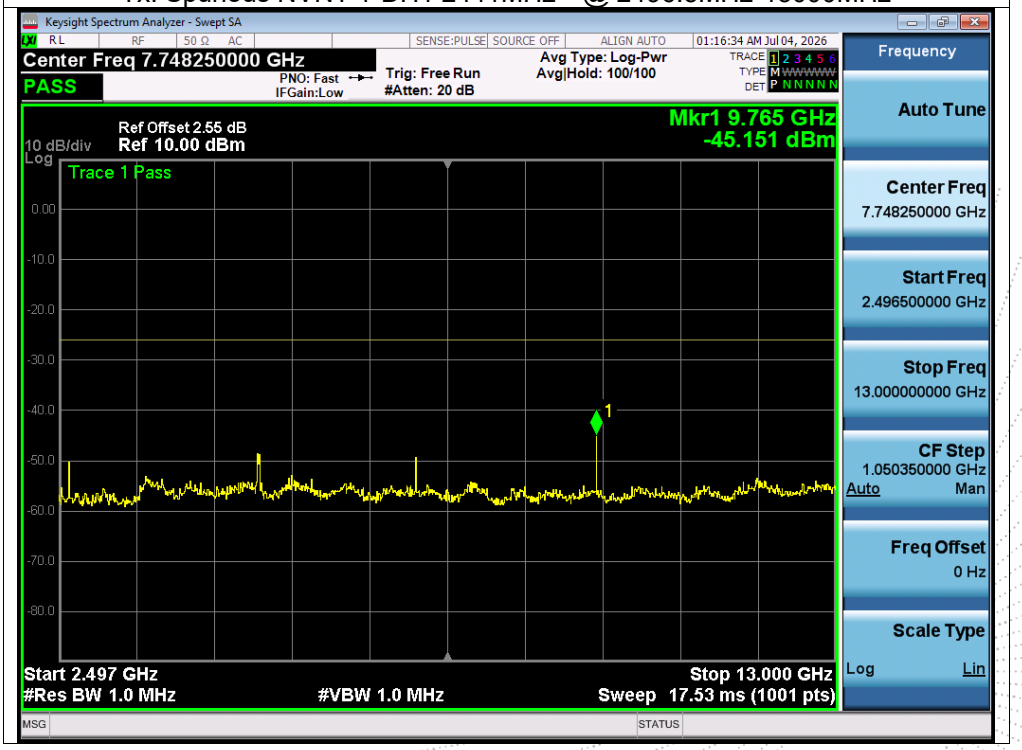
Tx. Spurious NVNT 1-DH1 2441MHz @ 2387MHz-2400MHz



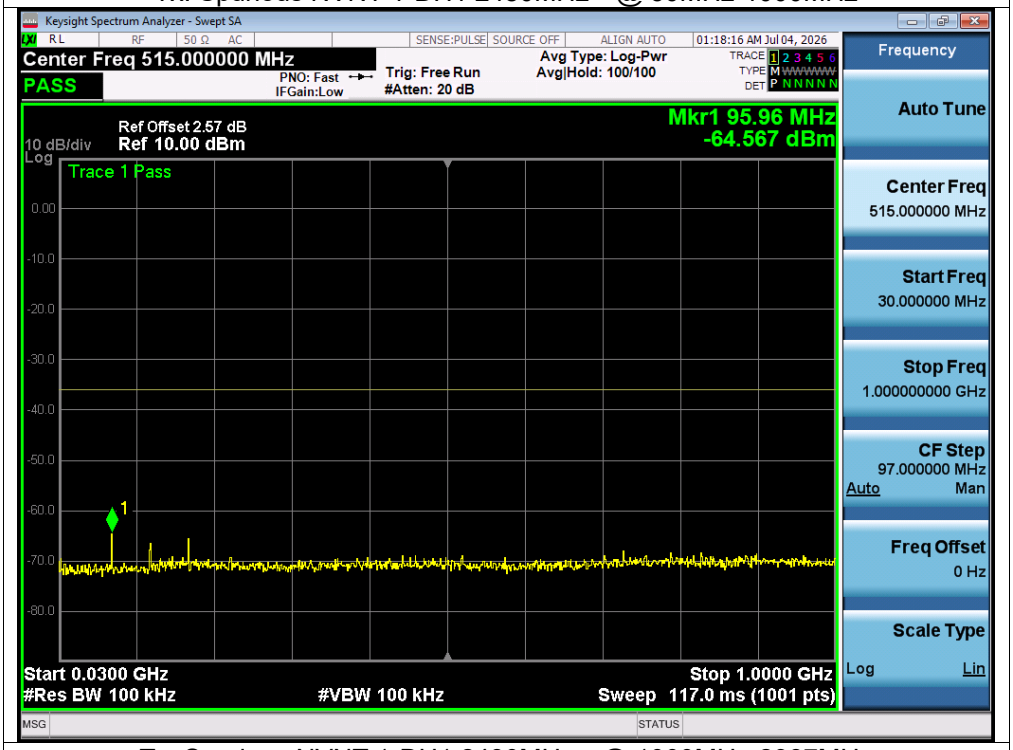
Tx. Spurious NVNT 1-DH1 2441MHz @ 2483.5MHz-2496.5MHz



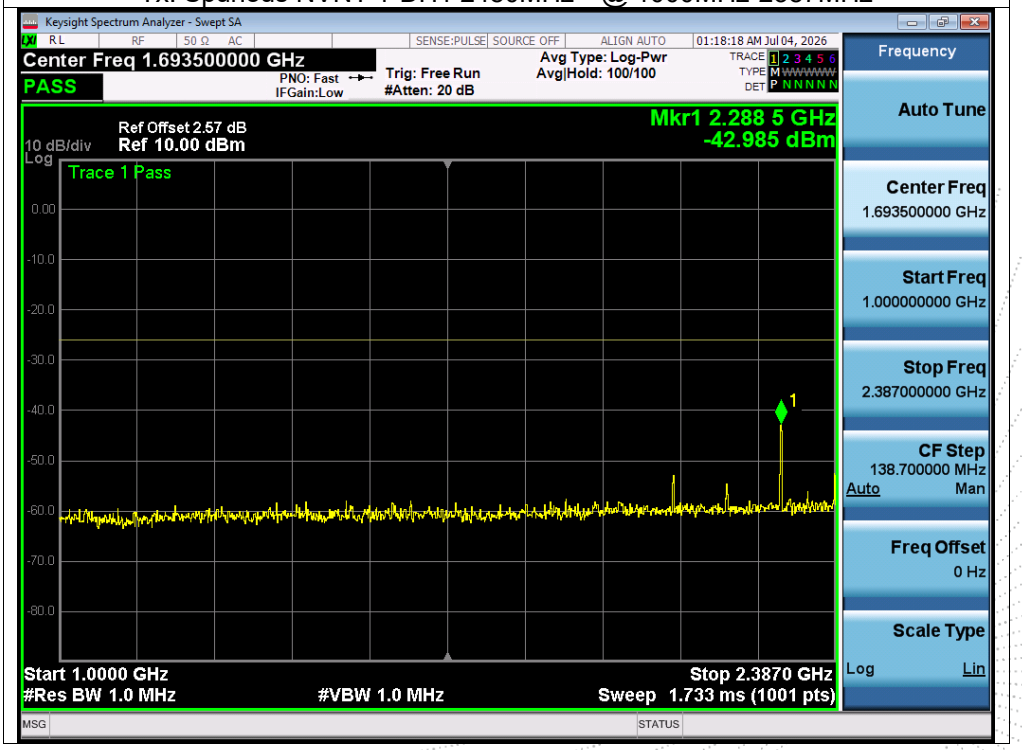
Tx. Spurious NVNT 1-DH1 2441MHz @ 2496.5MHz-13000MHz



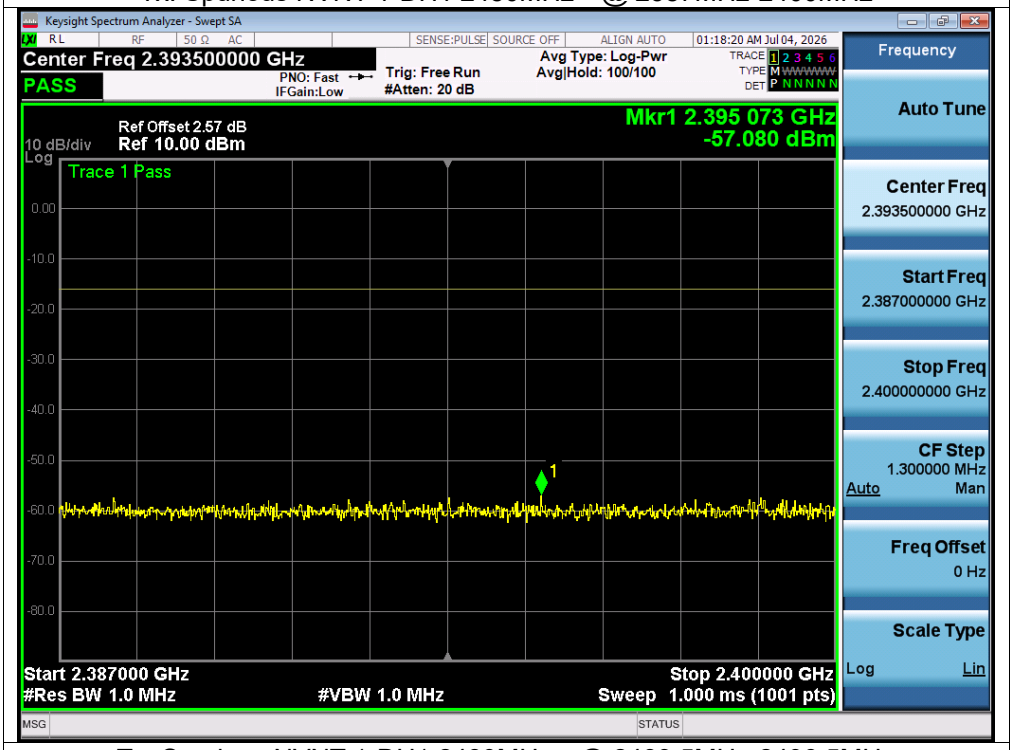
Tx. Spurious NVNT 1-DH1 2480MHz @ 30MHz-1000MHz



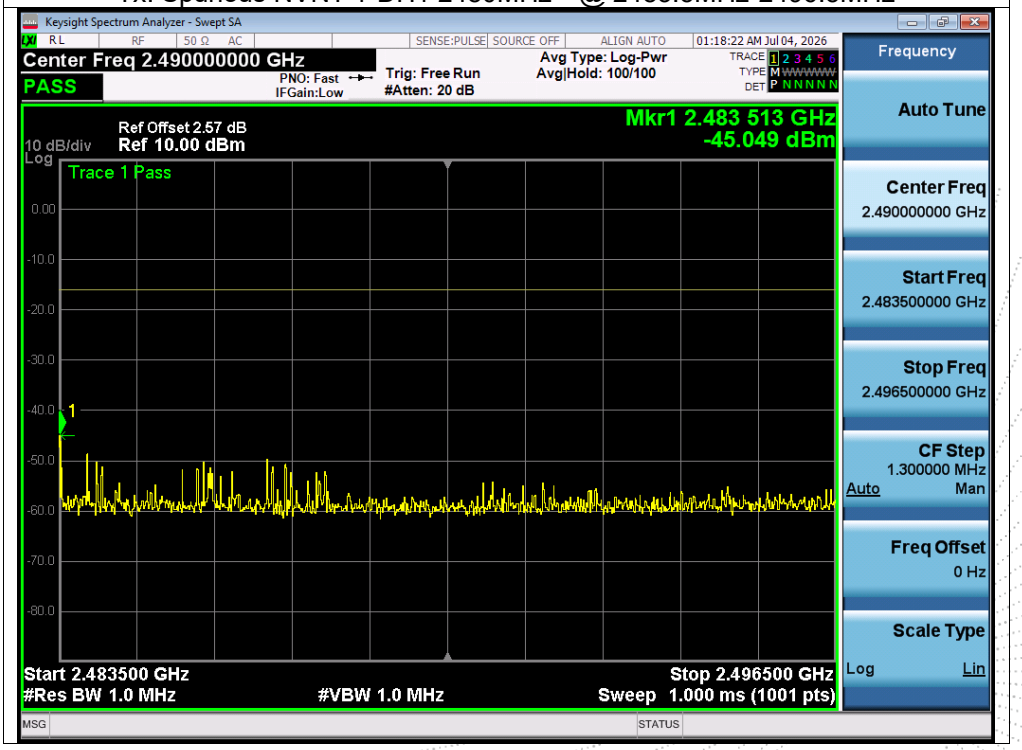
Tx. Spurious NVNT 1-DH1 2480MHz @ 1000MHz-2387MHz



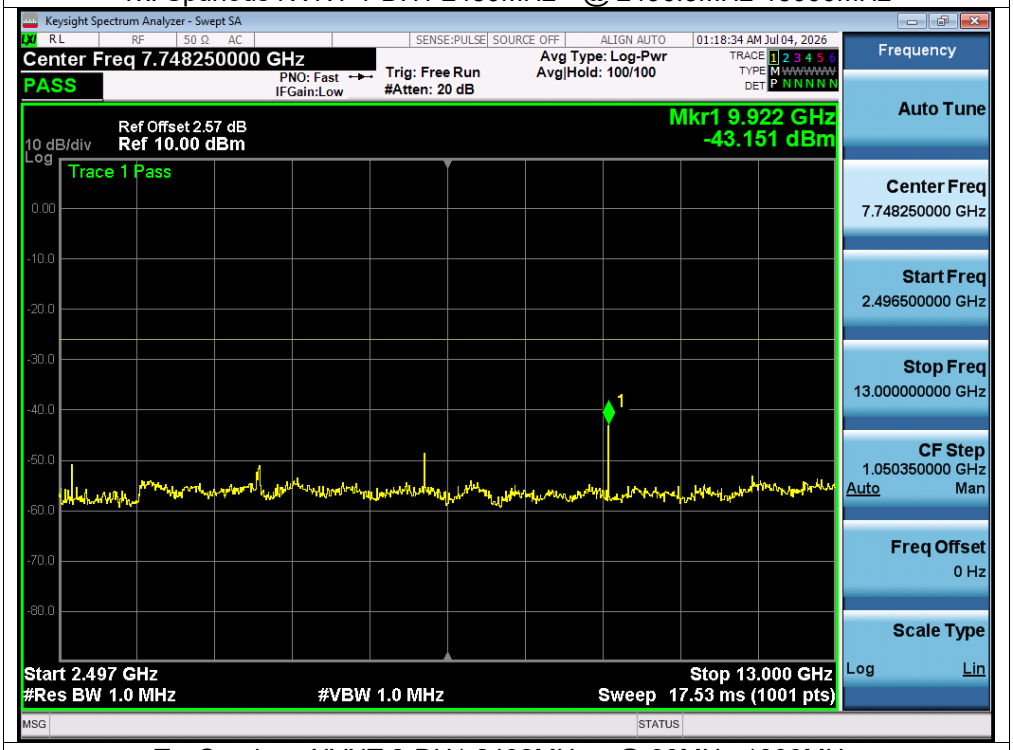
Tx. Spurious NVNT 1-DH1 2480MHz @ 2387MHz-2400MHz



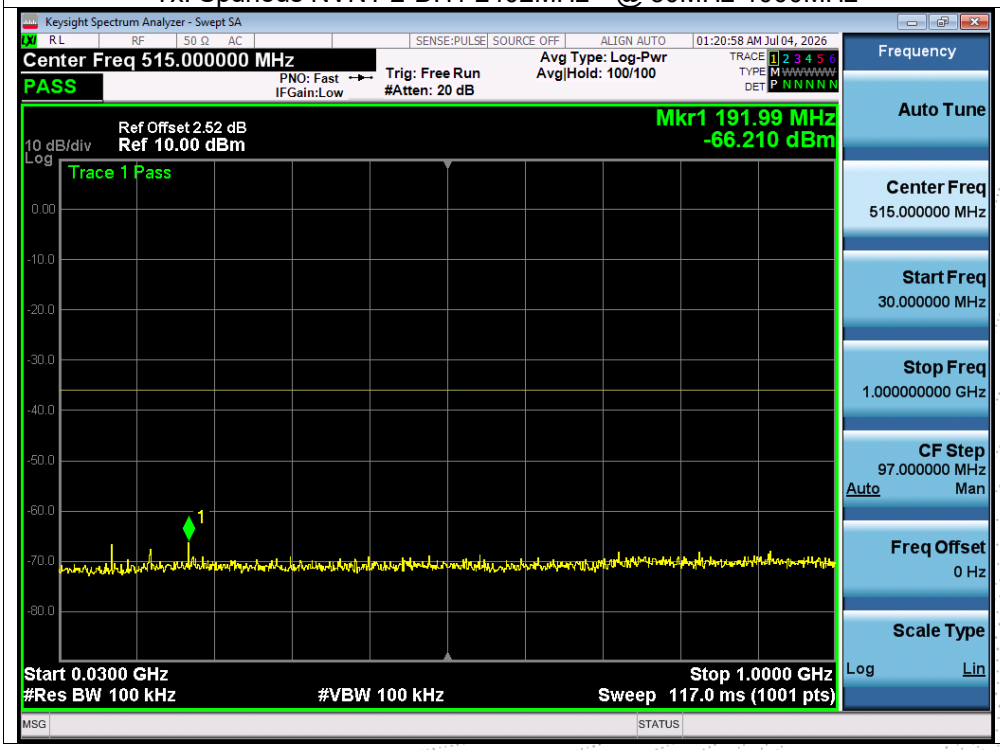
Tx. Spurious NVNT 1-DH1 2480MHz @ 2483.5MHz-2496.5MHz



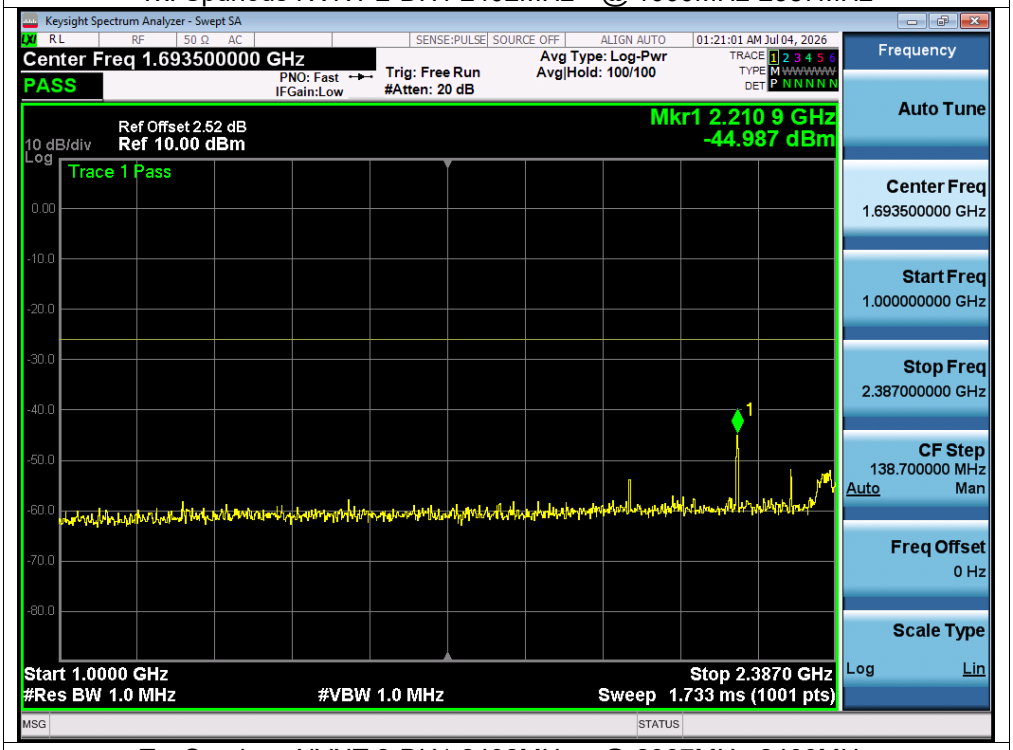
Tx. Spurious NVNT 1-DH1 2480MHz @ 2496.5MHz-13000MHz



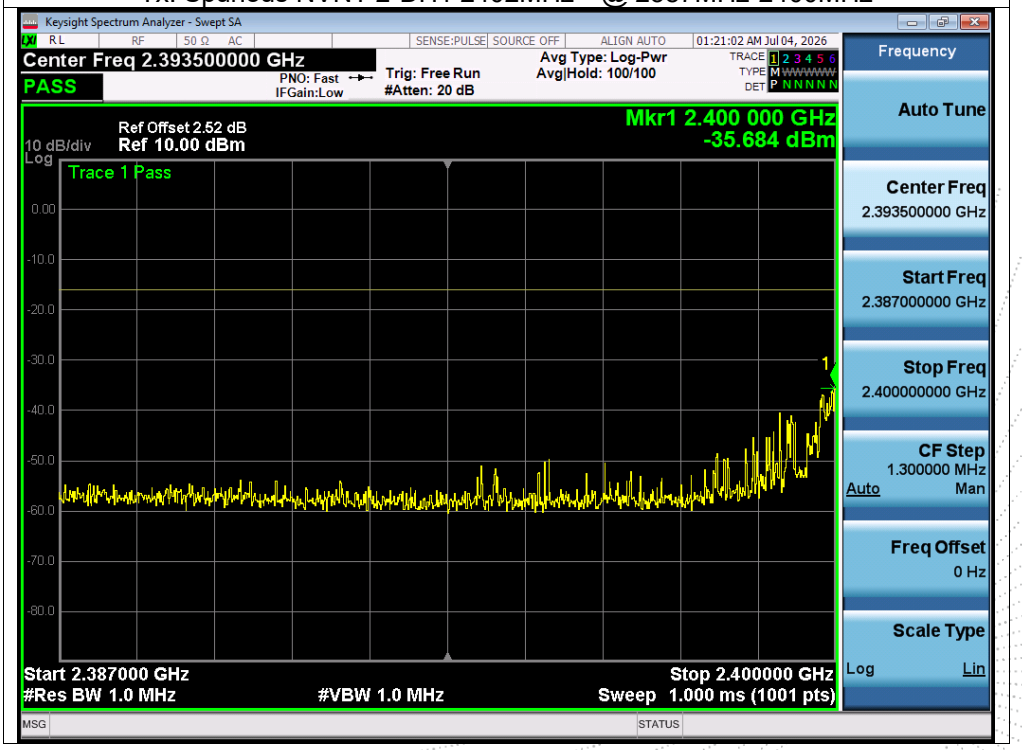
Tx. Spurious NVNT 2-DH1 2402MHz @ 30MHz-1000MHz



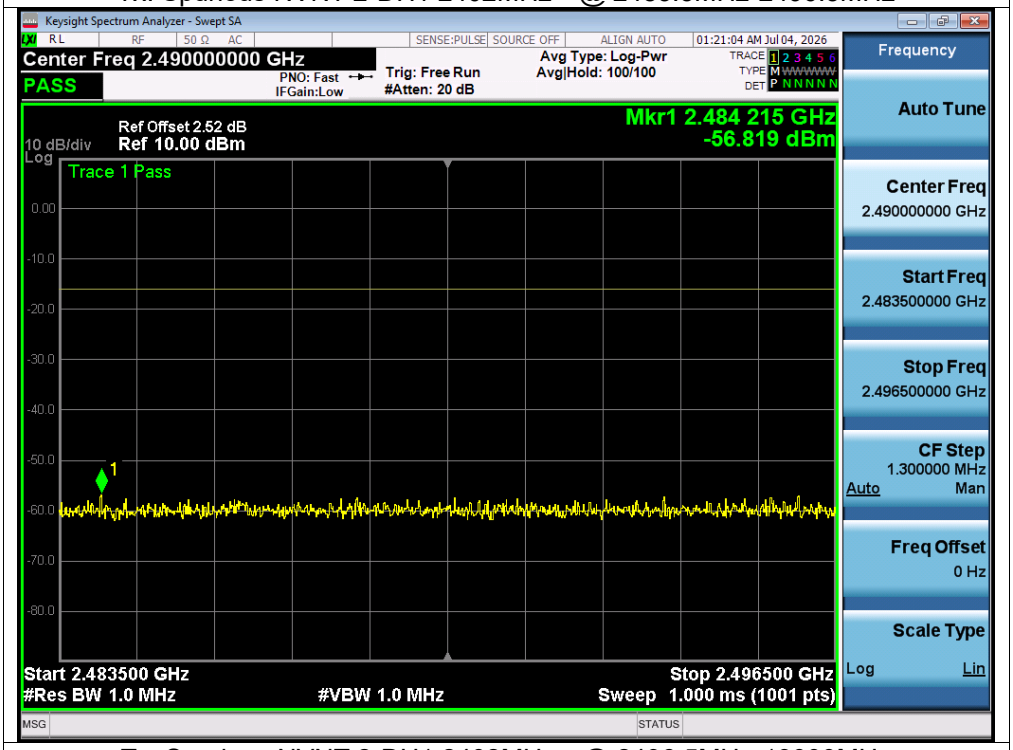
Tx. Spurious NVNT 2-DH1 2402MHz @ 1000MHz-2387MHz



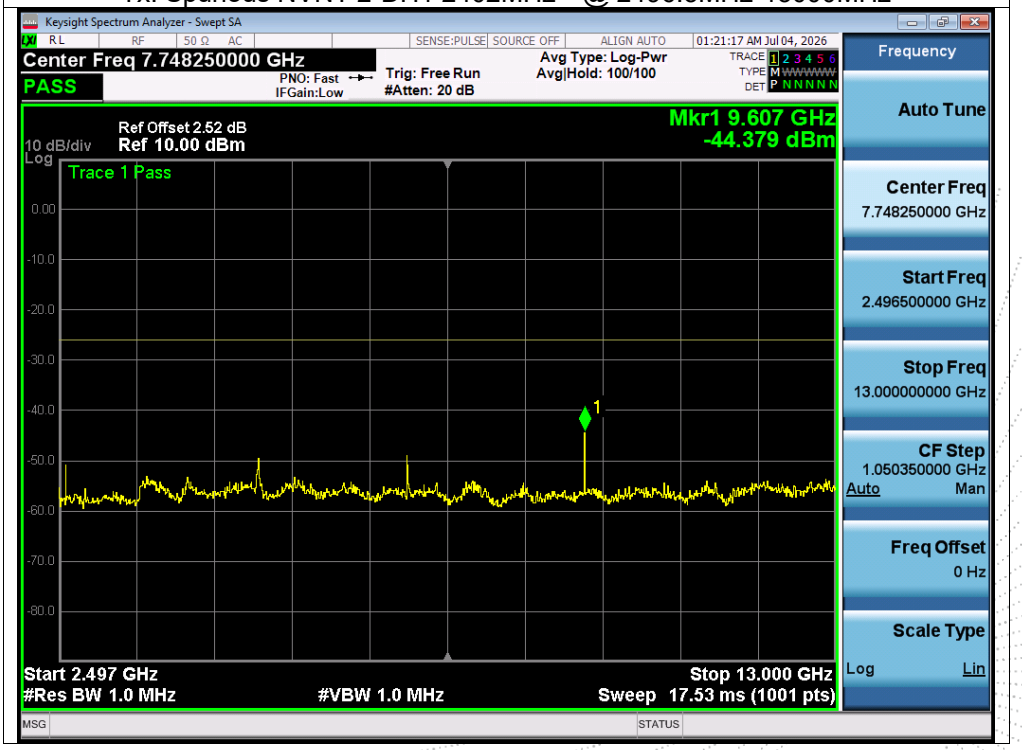
Tx. Spurious NVNT 2-DH1 2402MHz @ 2387MHz-2400MHz



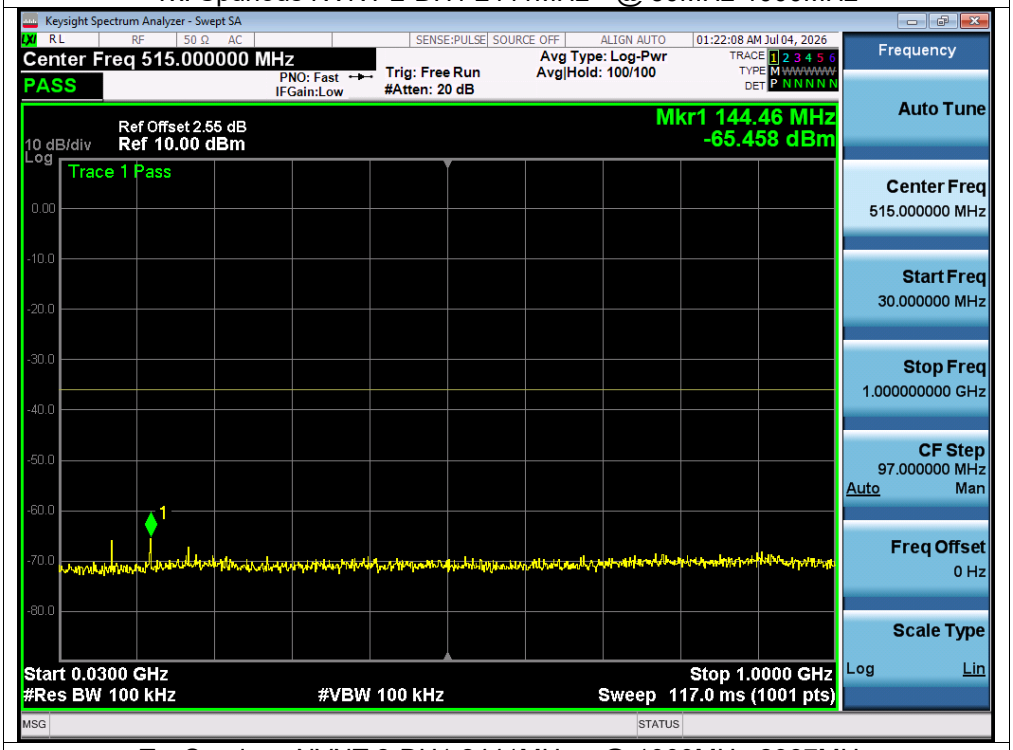
Tx. Spurious NVNT 2-DH1 2402MHz @ 2483.5MHz-2496.5MHz



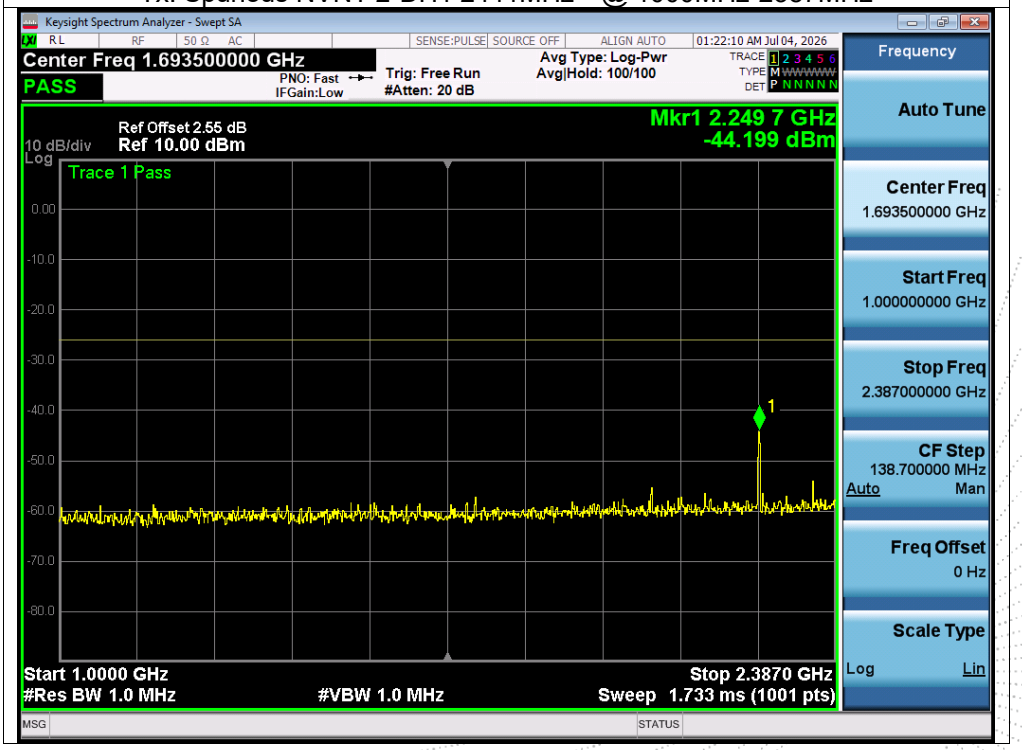
Tx. Spurious NVNT 2-DH1 2402MHz @ 2496.5MHz-13000MHz



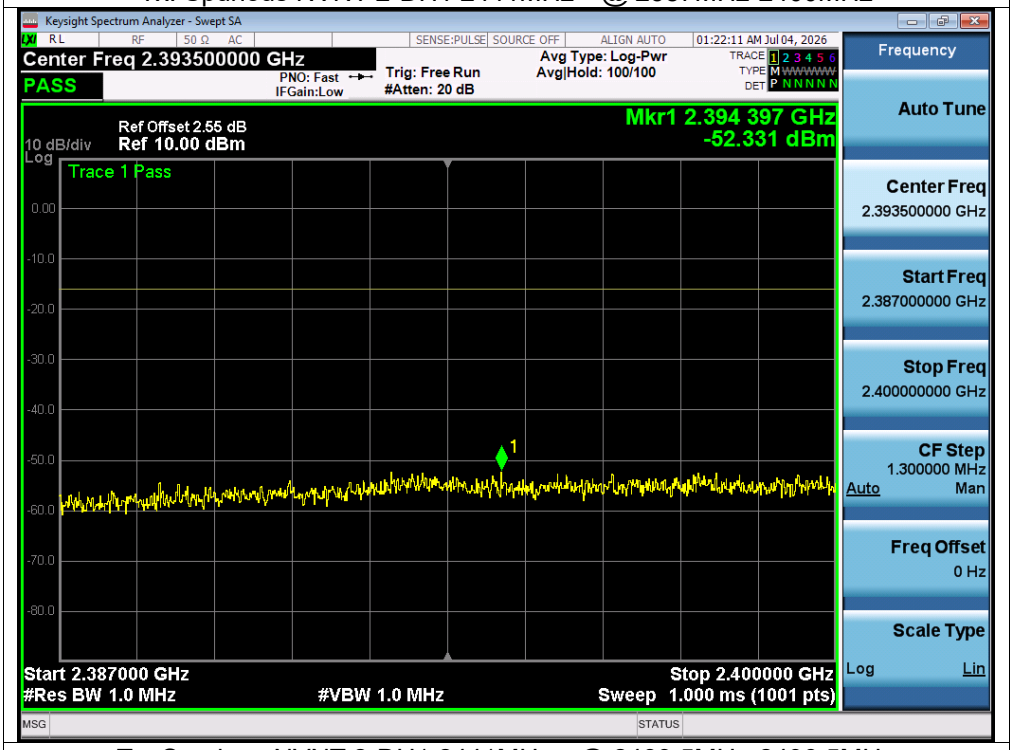
Tx. Spurious NVNT 2-DH1 2441MHz @ 30MHz-1000MHz



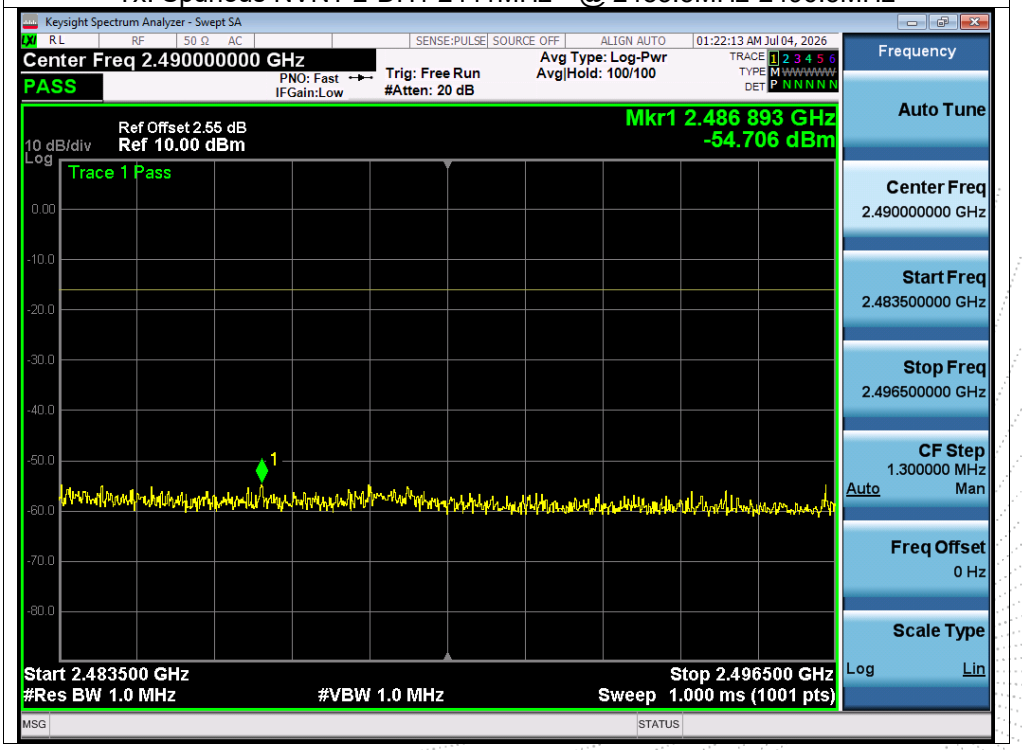
Tx. Spurious NVNT 2-DH1 2441MHz @ 1000MHz-2387MHz



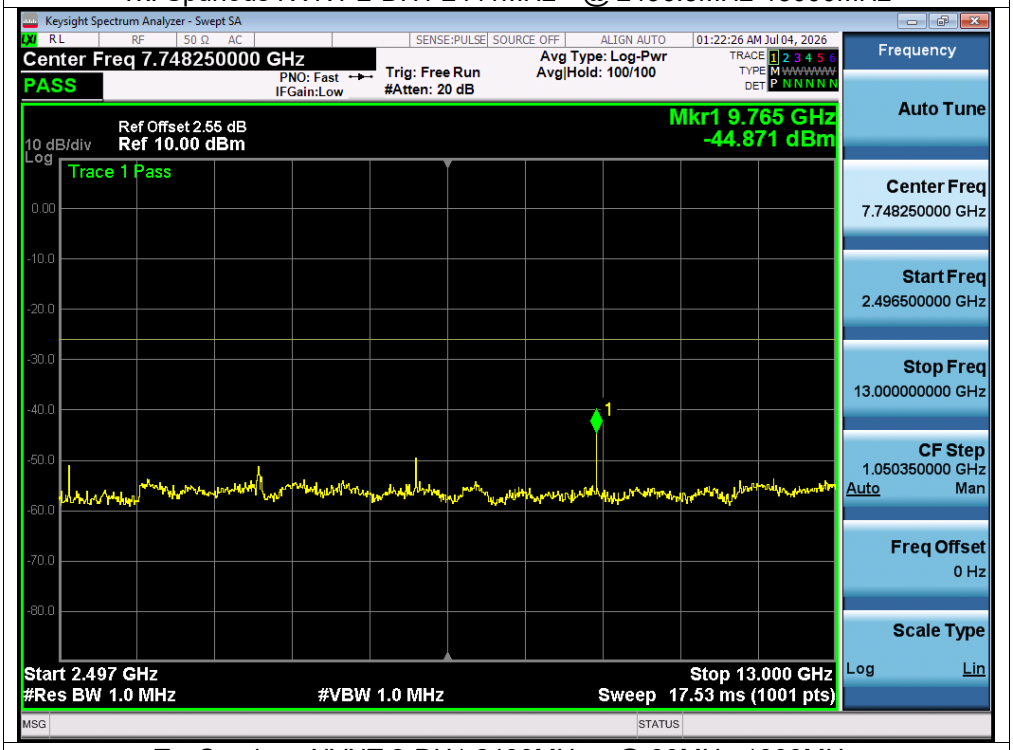
Tx. Spurious NVNT 2-DH1 2441MHz @ 2387MHz-2400MHz



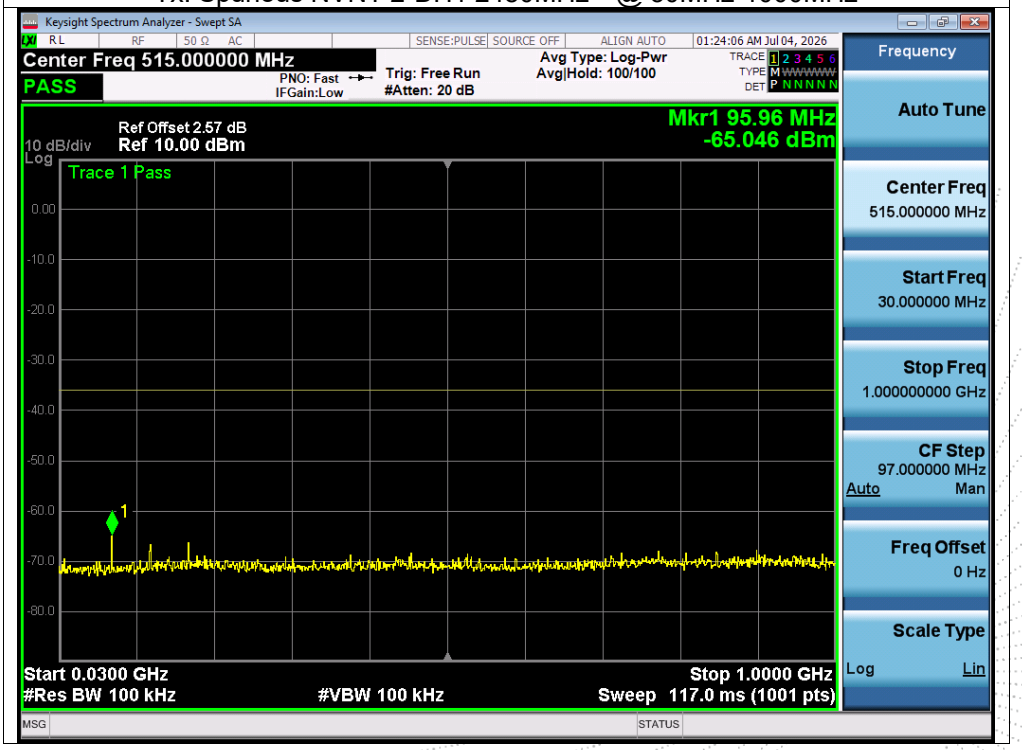
Tx. Spurious NVNT 2-DH1 2441MHz @ 2483.5MHz-2496.5MHz



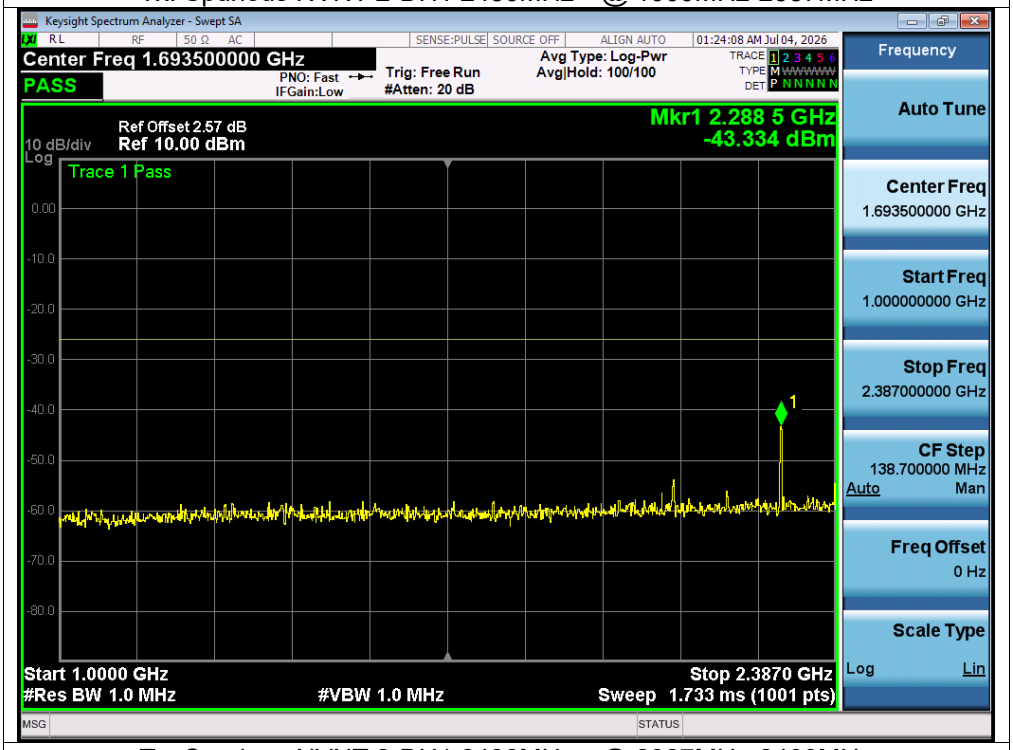
Tx. Spurious NVNT 2-DH1 2441MHz @ 2496.5MHz-13000MHz



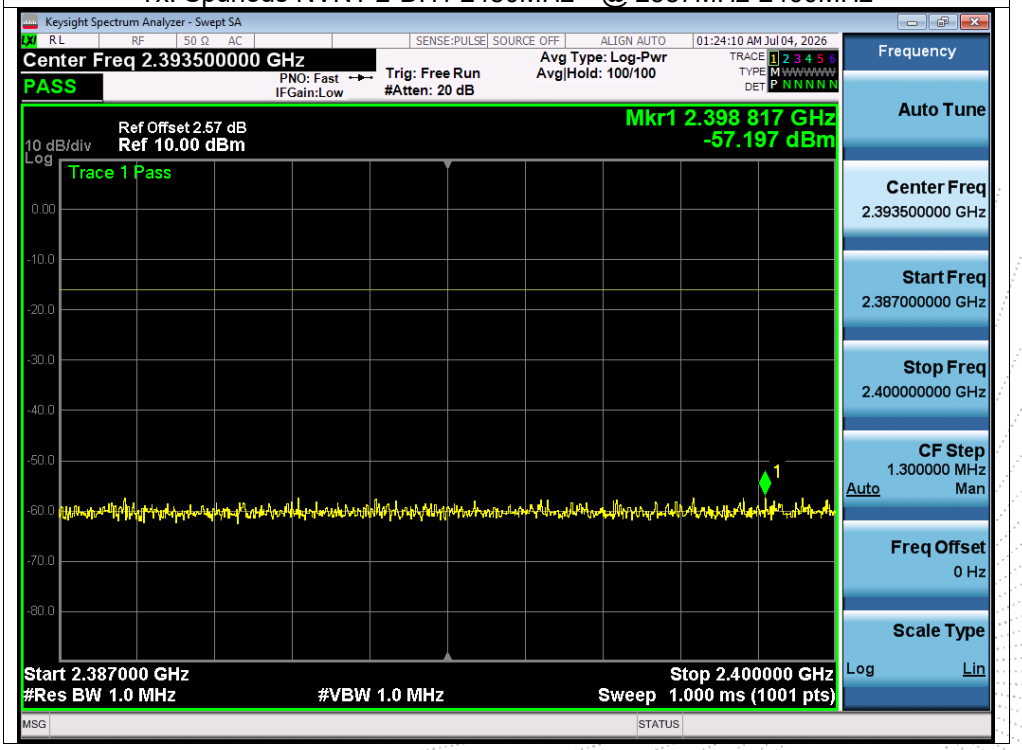
Tx. Spurious NVNT 2-DH1 2480MHz @ 30MHz-1000MHz



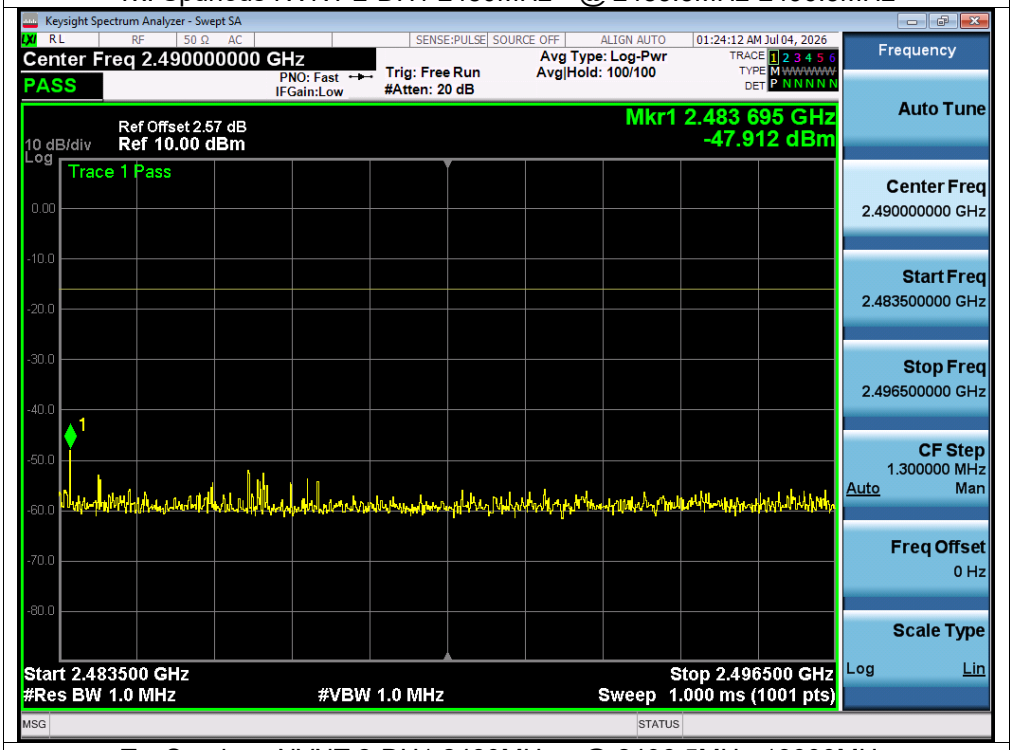
Tx. Spurious NVNT 2-DH1 2480MHz @ 1000MHz-2387MHz



Tx. Spurious NVNT 2-DH1 2480MHz @ 2387MHz-2400MHz

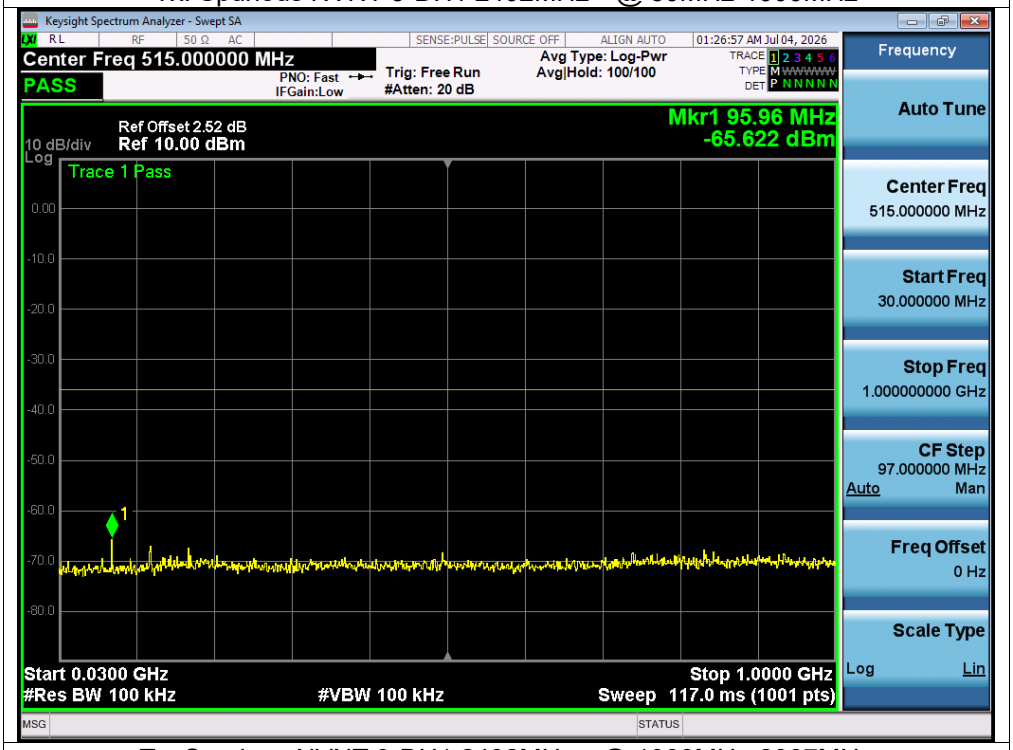


Tx. Spurious NVNT 2-DH1 2480MHz @ 2483.5MHz-2496.5MHz

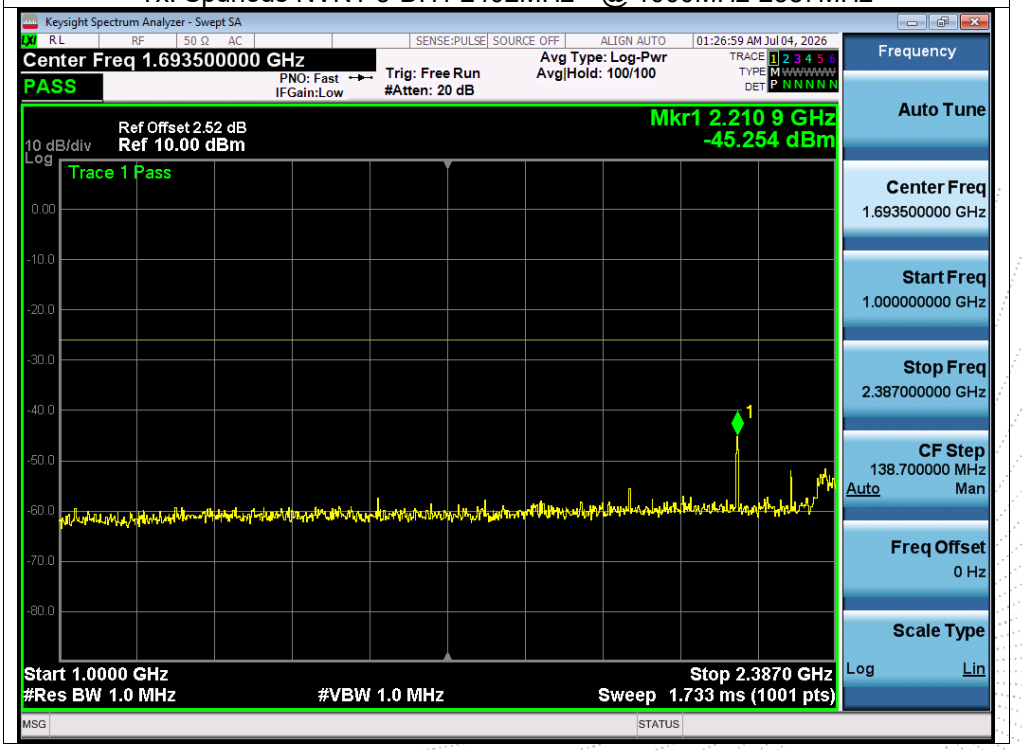


Tx. Spurious NVNT 2-DH1 2480MHz @ 2496.5MHz-13000MHz

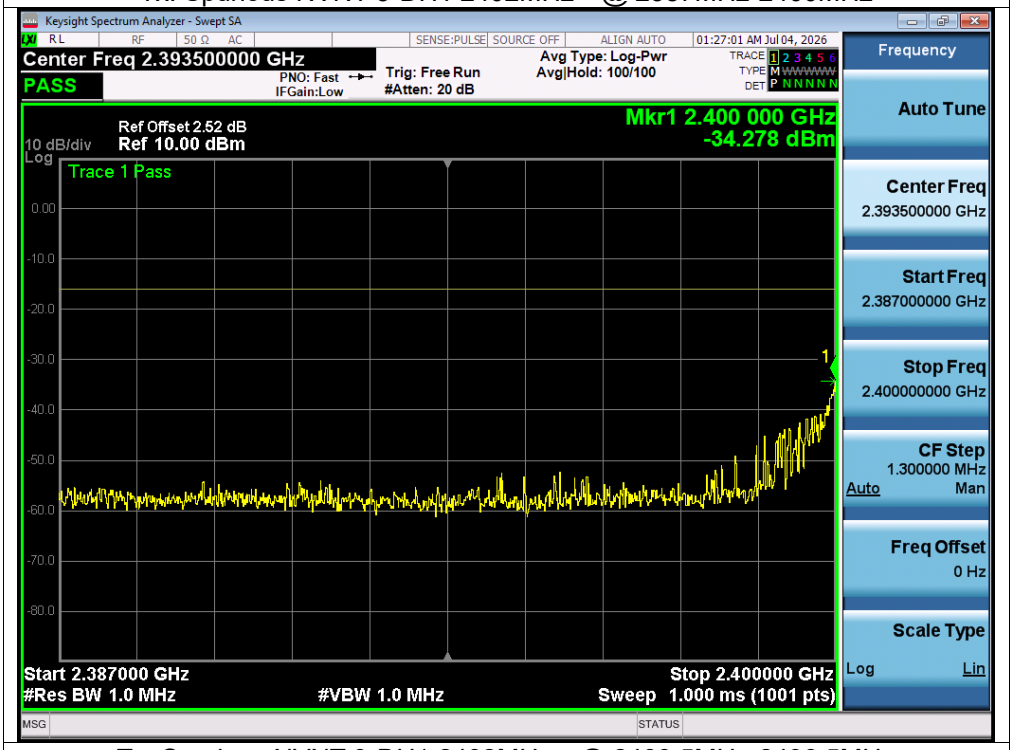
Tx. Spurious NVNT 3-DH1 2402MHz @ 30MHz-1000MHz



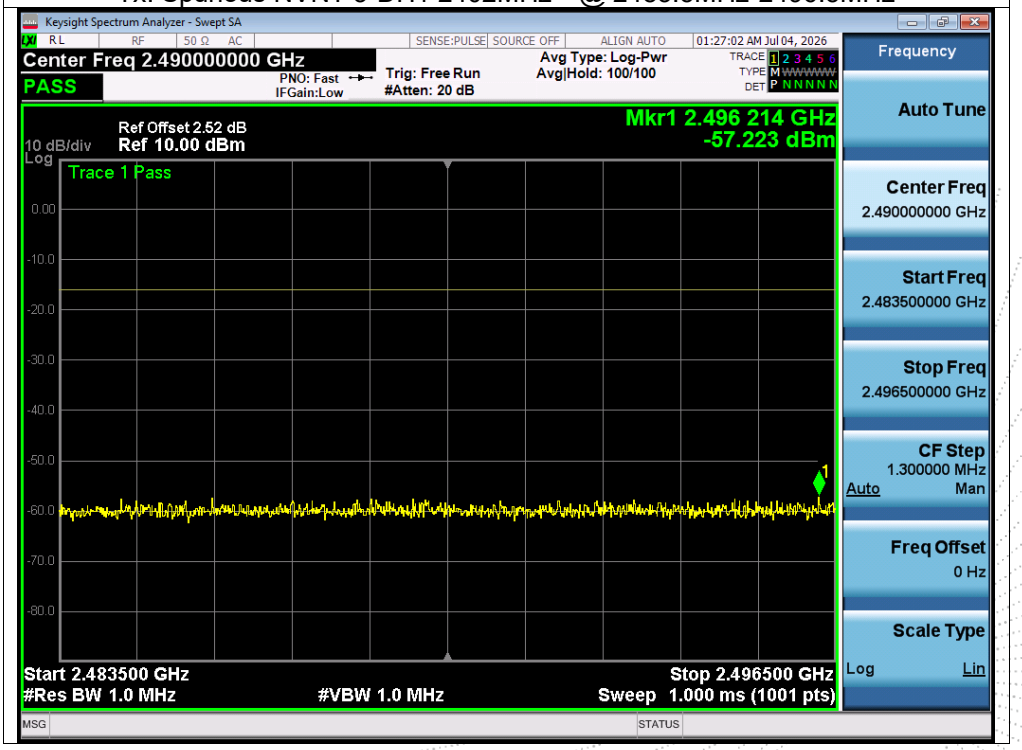
Tx. Spurious NVNT 3-DH1 2402MHz @ 1000MHz-2387MHz



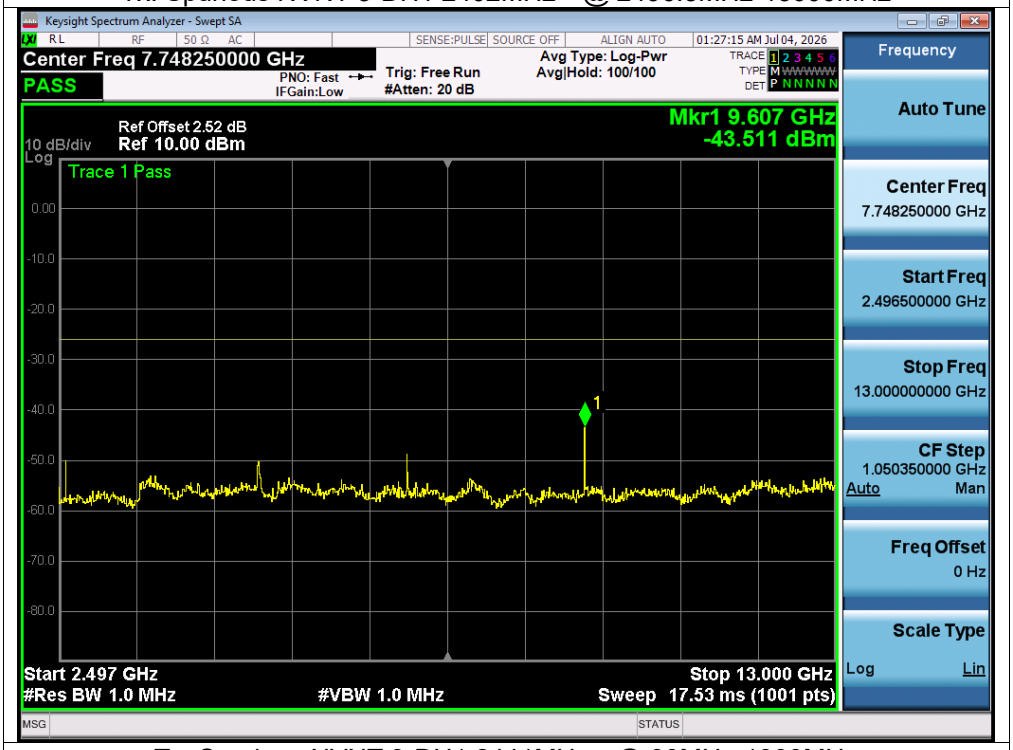
Tx. Spurious NVNT 3-DH1 2402MHz @ 2387MHz-2400MHz



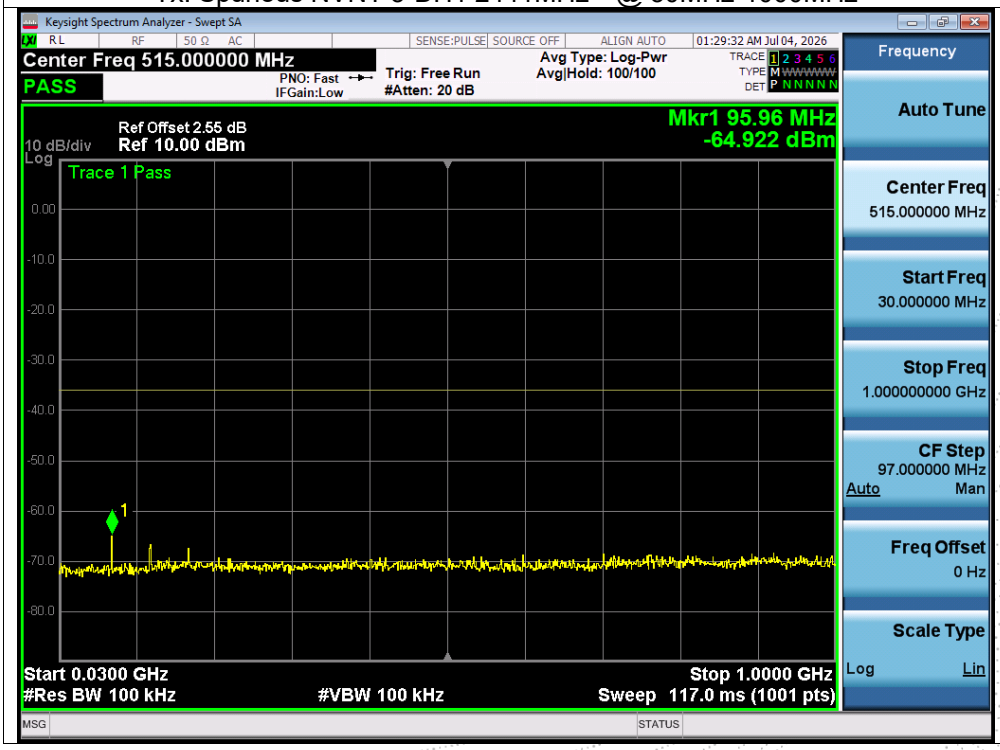
Tx. Spurious NVNT 3-DH1 2402MHz @ 2483.5MHz-2496.5MHz



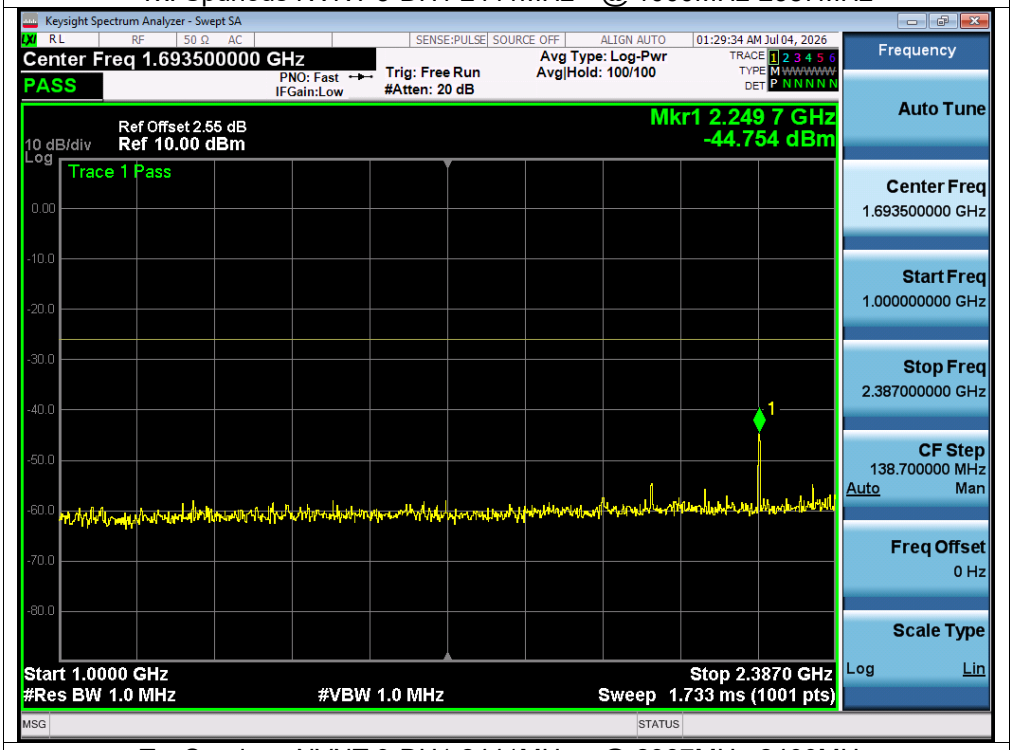
Tx. Spurious NVNT 3-DH1 2402MHz @ 2496.5MHz-13000MHz



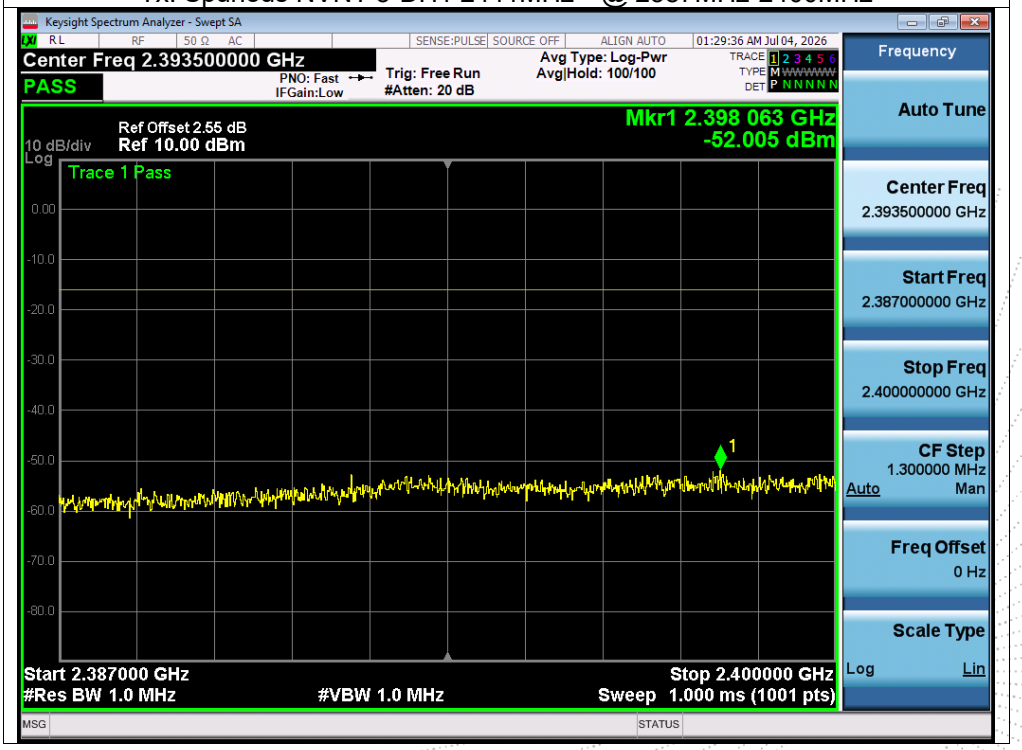
Tx. Spurious NVNT 3-DH1 2441MHz @ 30MHz-1000MHz



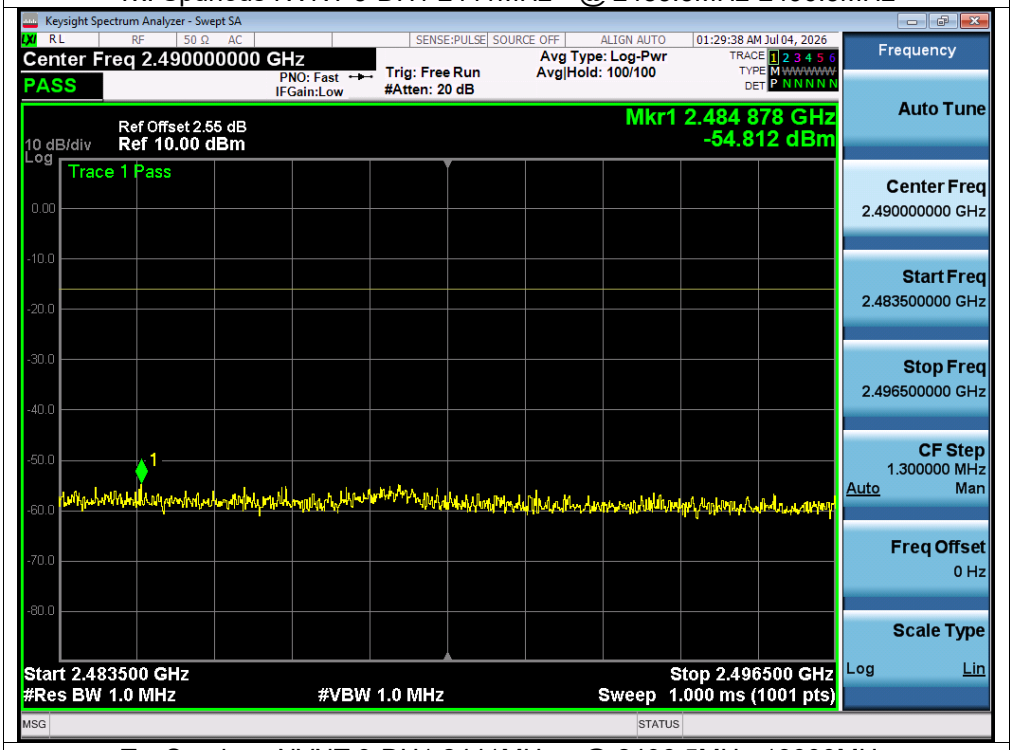
Tx. Spurious NVNT 3-DH1 2441MHz @ 1000MHz-2387MHz



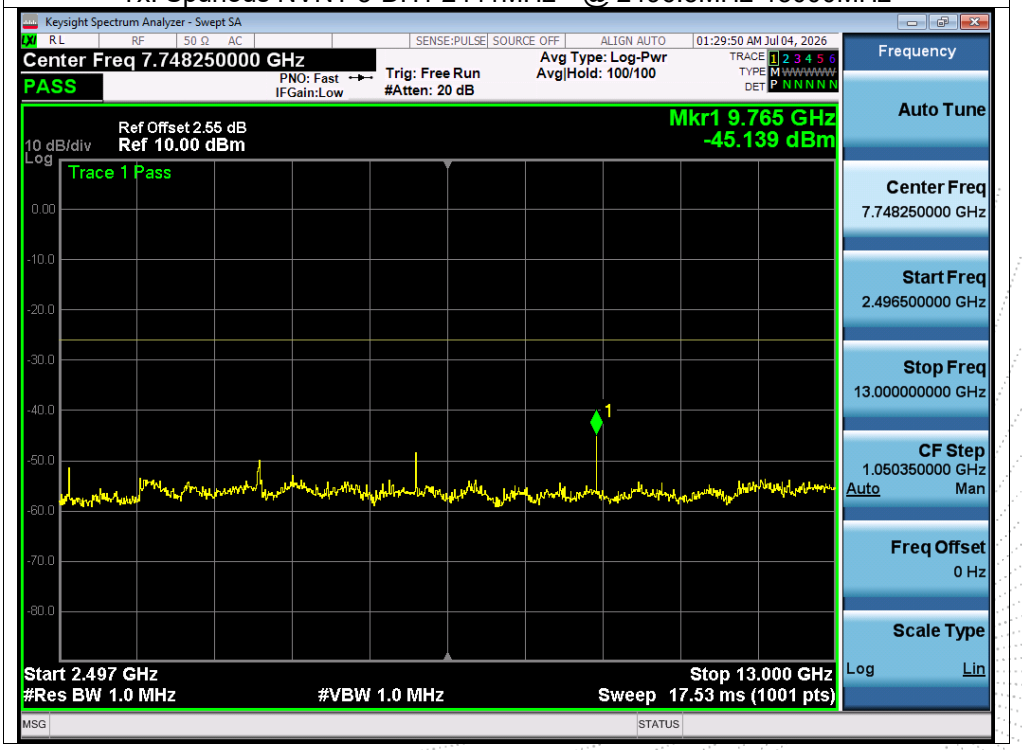
Tx. Spurious NVNT 3-DH1 2441MHz @ 2387MHz-2400MHz



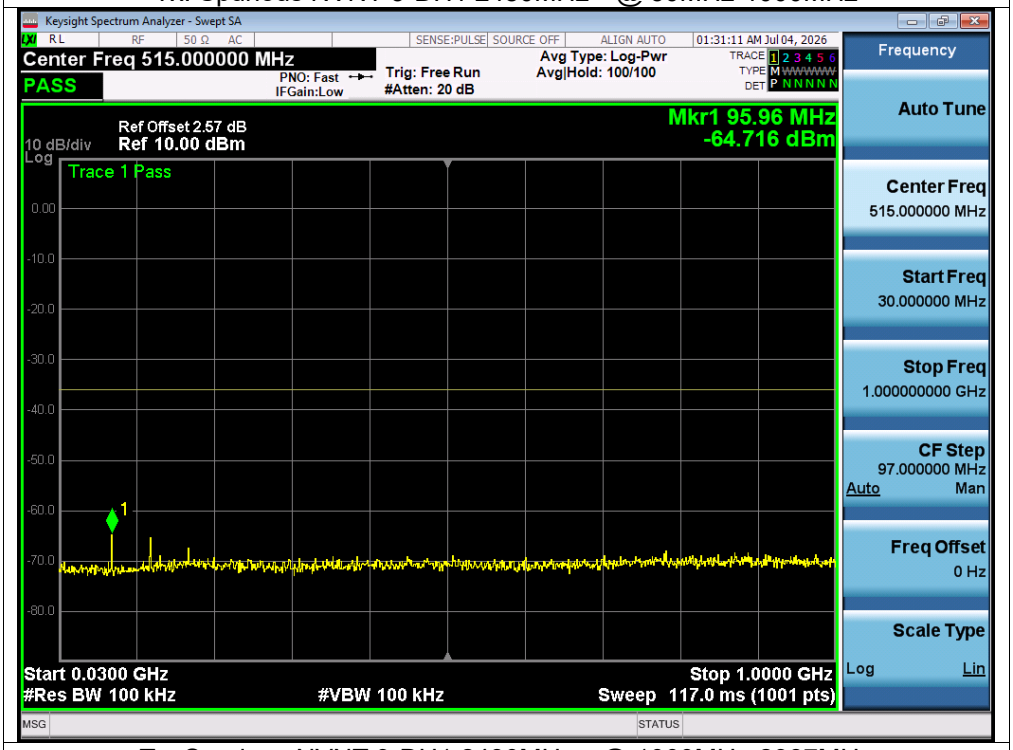
Tx. Spurious NVNT 3-DH1 2441MHz @ 2483.5MHz-2496.5MHz



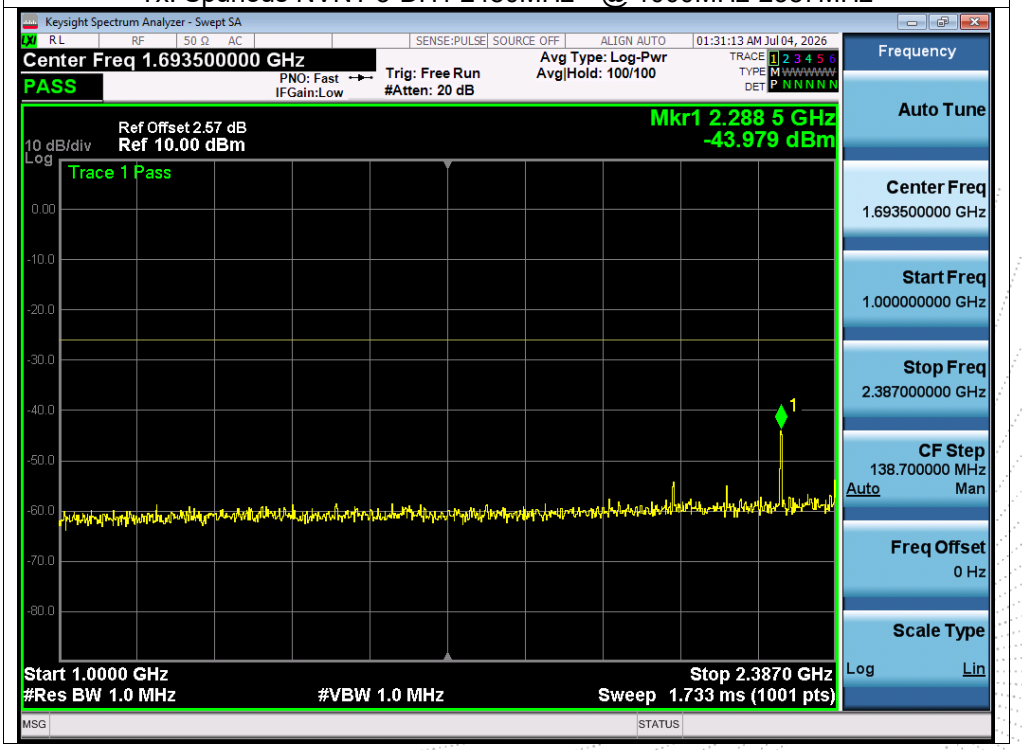
Tx. Spurious NVNT 3-DH1 2441MHz @ 2496.5MHz-13000MHz



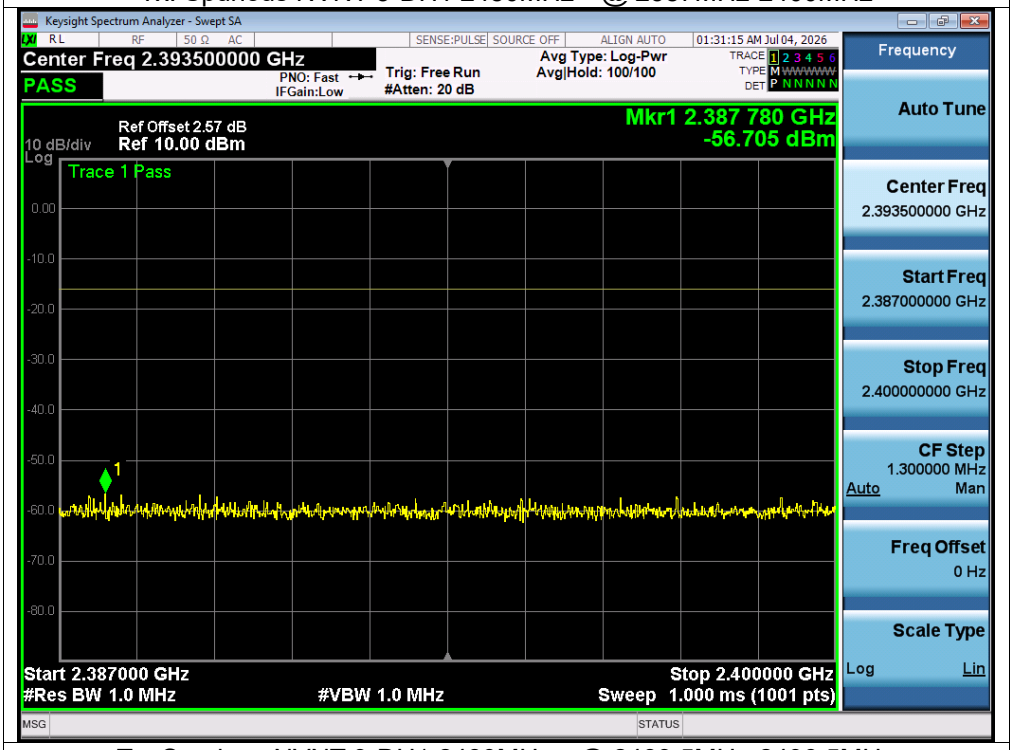
Tx. Spurious NVNT 3-DH1 2480MHz @ 30MHz-1000MHz



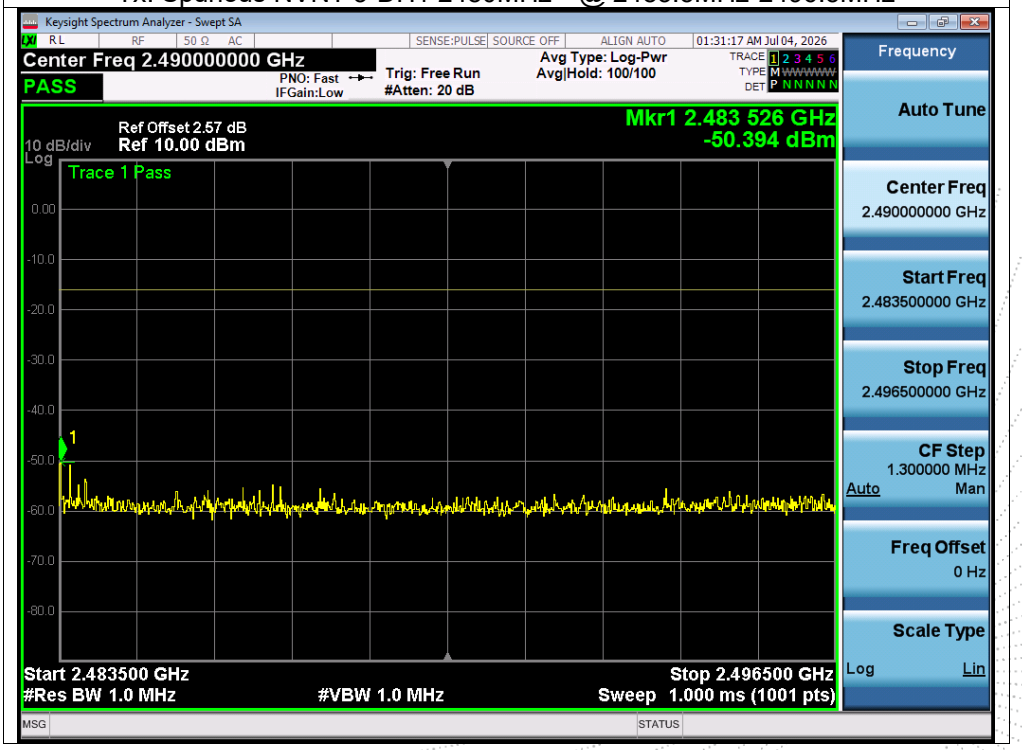
Tx. Spurious NVNT 3-DH1 2480MHz @ 1000MHz-2387MHz



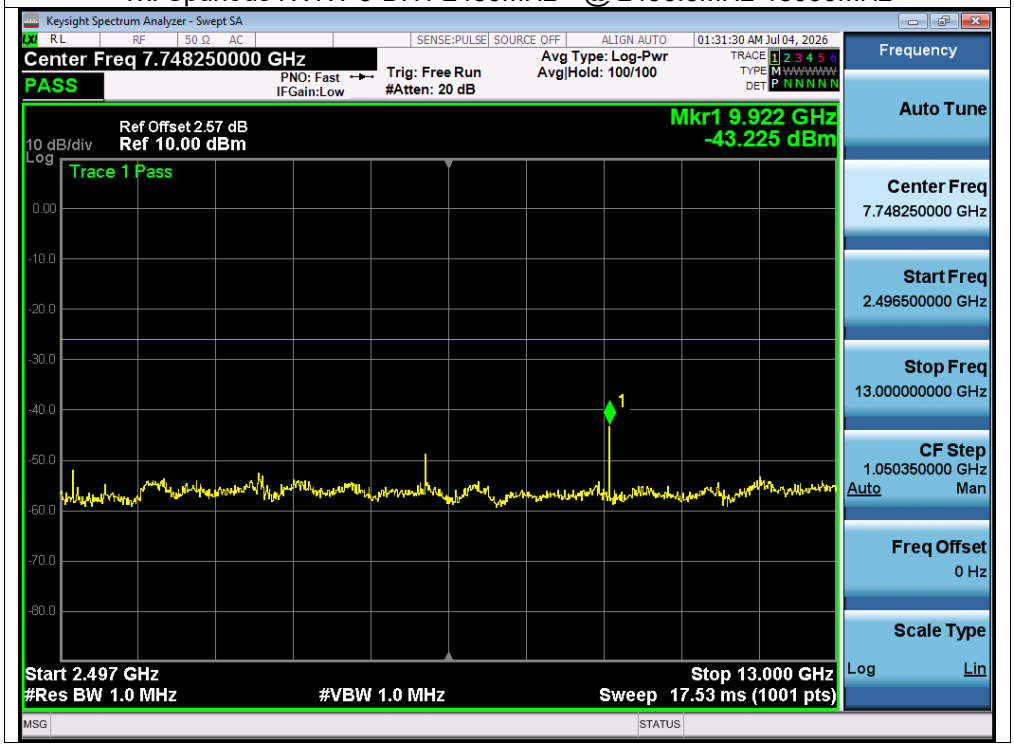
Tx. Spurious NVNT 3-DH1 2480MHz @ 2387MHz-2400MHz



Tx. Spurious NVNT 3-DH1 2480MHz @ 2483.5MHz-2496.5MHz



Tx. Spurious NVNT 3-DH1 2480MHz @ 2496.5MHz-13000MHz

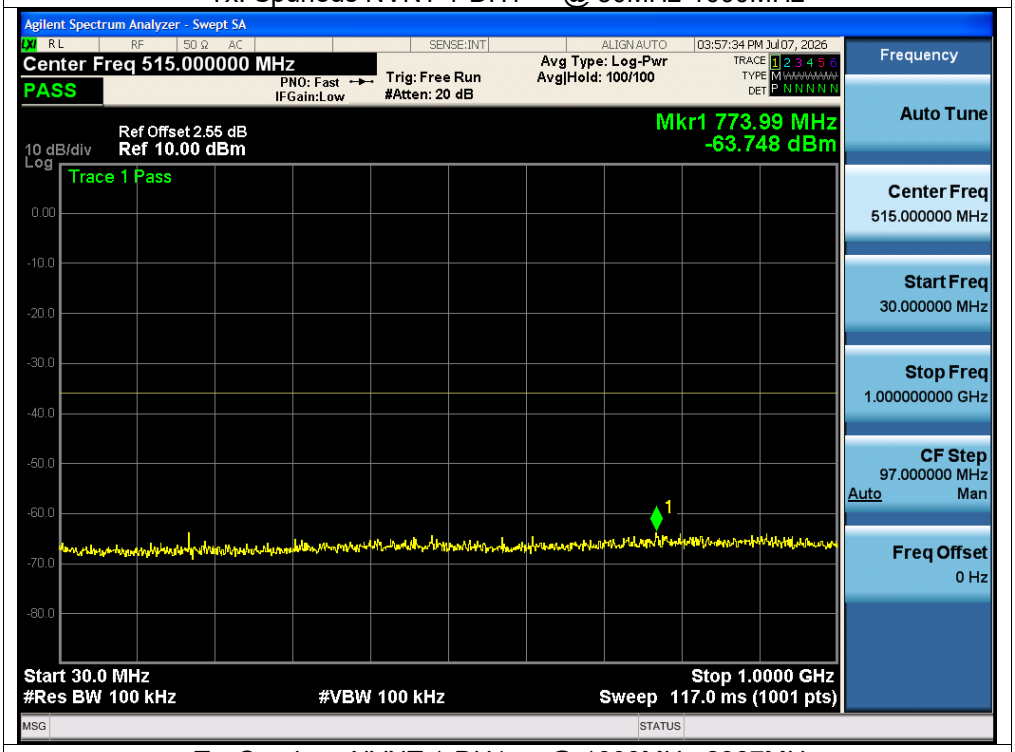


Temperature:	26°C		
Humidity:	54 % RH	Test Voltage	DC 3.8V
Test Mode:	Hopping		

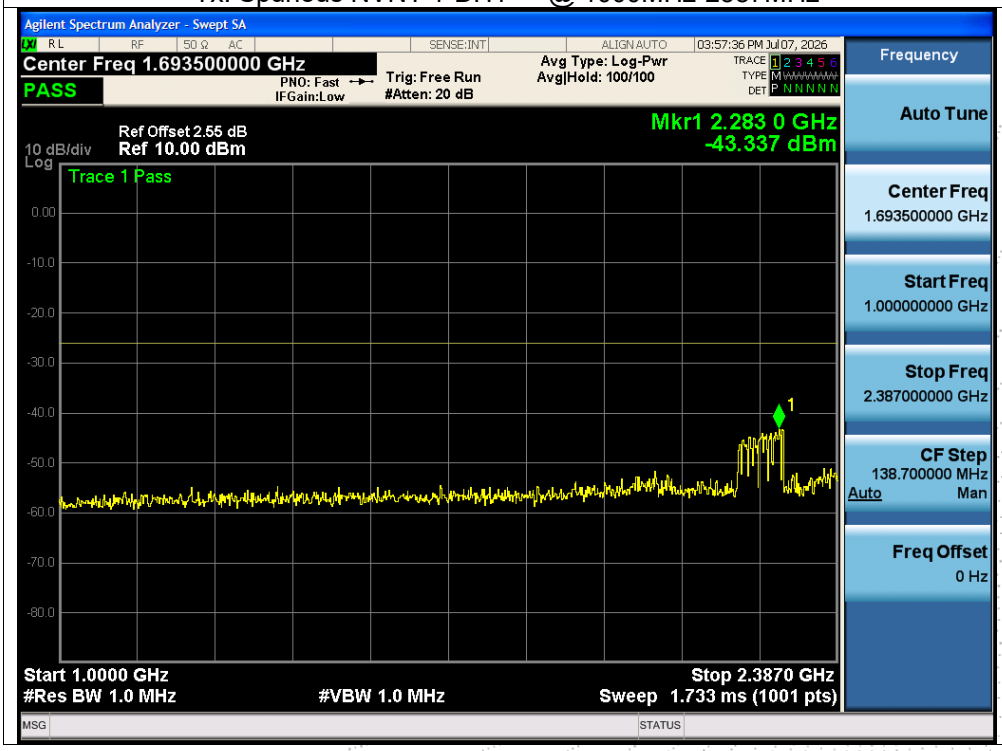
Condition	Mode	Range (MHz)	Emission Frequency (MHz)	Max Value (dBm)	Max Value (μW/ MHz)	Limit (μW/ MHz)	Verdict
NVNT	1-DH1	30-1000	773.99	-63.75	0.0004	0.25	Pass
NVNT	1-DH1	1000-2387	2282.98	-43.34	0.0463	2.5	Pass
NVNT	1-DH1	2387-2400	2399.84	-50.81	0.0083	25	Pass
NVNT	1-DH1	2483.5-2496.5	2485.19	-53.34	0.0046	25	Pass
NVNT	1-DH1	2496.5-13000	9848.95	-42.6	0.0550	2.5	Pass

Test Graphs

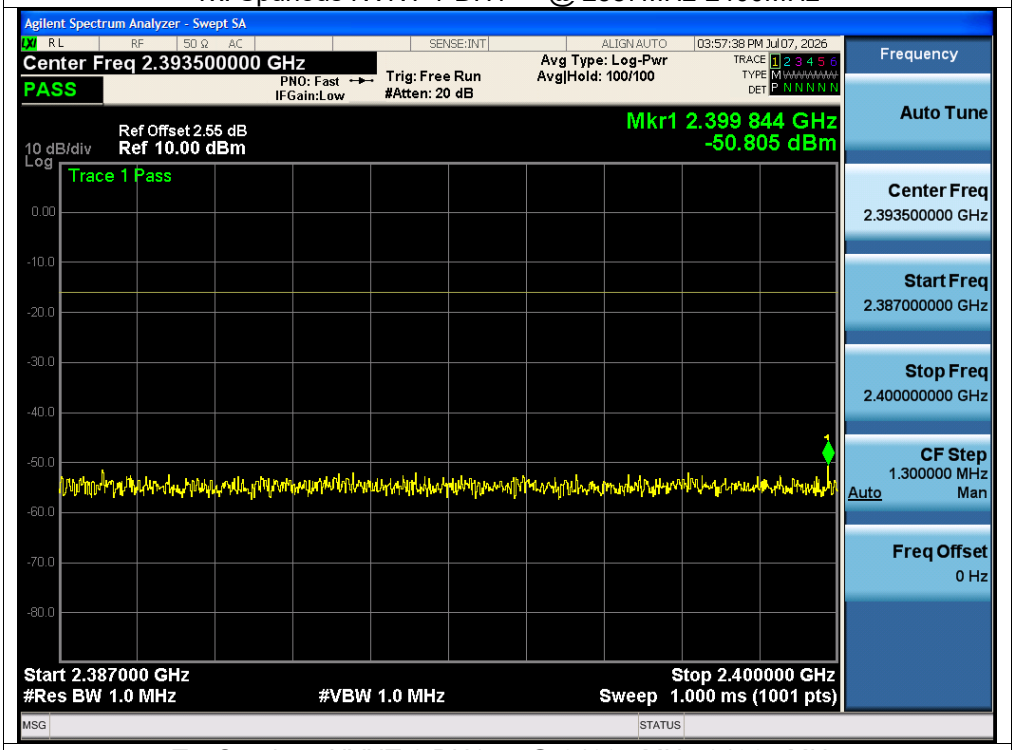
Tx. Spurious NVNT 1-DH1 @ 30MHz-1000MHz



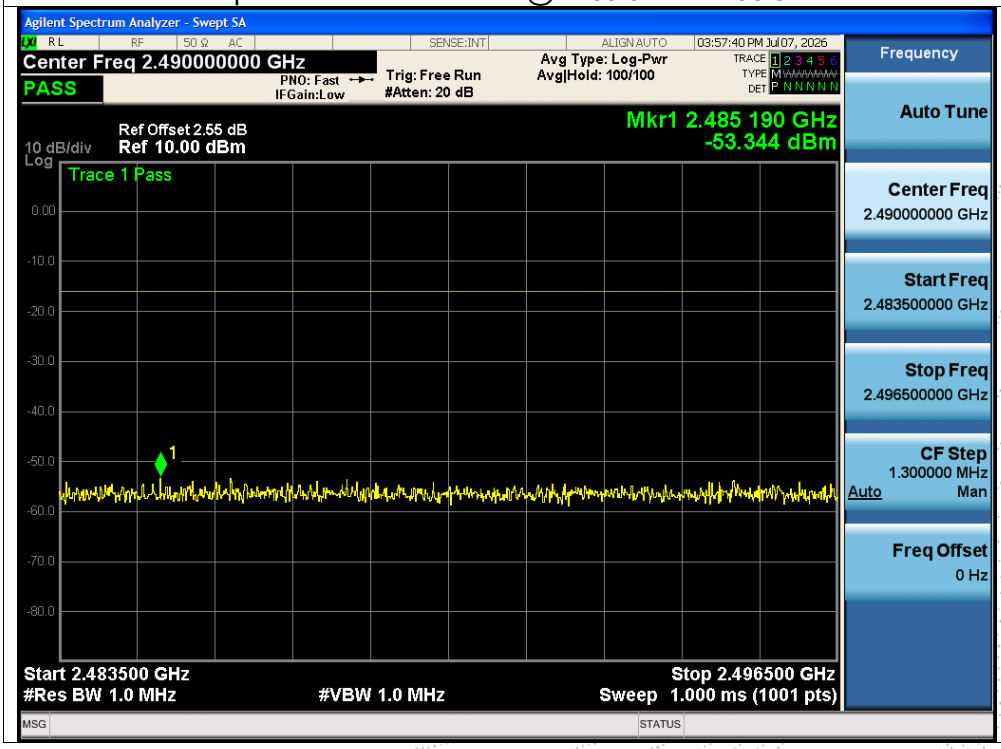
Tx. Spurious NVNT 1-DH1 @ 1000MHz-2387MHz



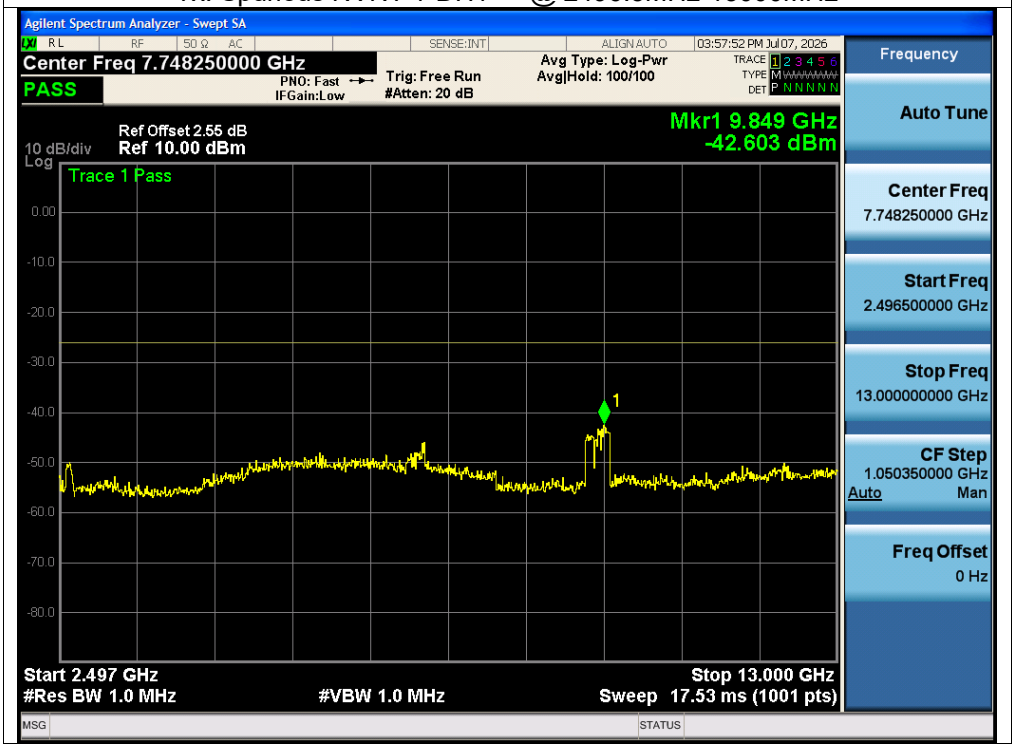
Tx. Spurious NVNT 1-DH1 @ 2387MHz-2400MHz



Tx. Spurious NVNT 1-DH1 @ 2483.5MHz-2496.5MHz

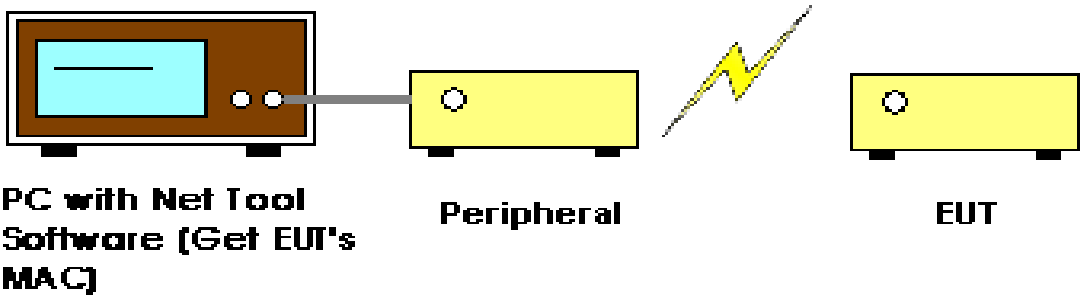


Tx. Spurious NVNT 1-DH1 @ 2496.5MHz-13000MHz



11. Radio Interference Prevention Capability Measurement

11.1 Block Diagram Of Test Setup



11.2 Limit

Item	Limits
Identification code	≧48 bits

11.3 Measuring Instruments And Setting

Item	Limits
MAC IP List	MAC Scan

11.4 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.

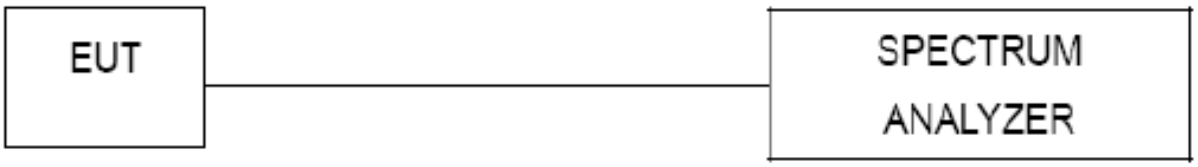
11.5 Test Result

Temperature:	26°C		
Humidity:	54 % RH	Test Voltage	DC 3.8V

1.Bluetooth Device Address: 57-2d-b1-b8-e8-da
2.Test result: PASS

12. Dwell Time

12.1 Block Diagram Of Test Setup



12.2 Limit

Item	Limits
Hopping Freq. Dwell Time	≦ 0.4 sec (In 0.4 sec × spreading rate)

12.3 Measuring Instruments And Setting

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

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

12.4 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer
2. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
3. Use a video trigger with the trigger level set to enable triggering only on full pulses.
4. Sweep Time is more than once pulse time.
5. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
6. Measure the maximum time duration of one single pulse.
7. Set the EUT for DH5, DH3 and DH1 packet transmitting.
8. Measure the maximum time duration of one single pulse.

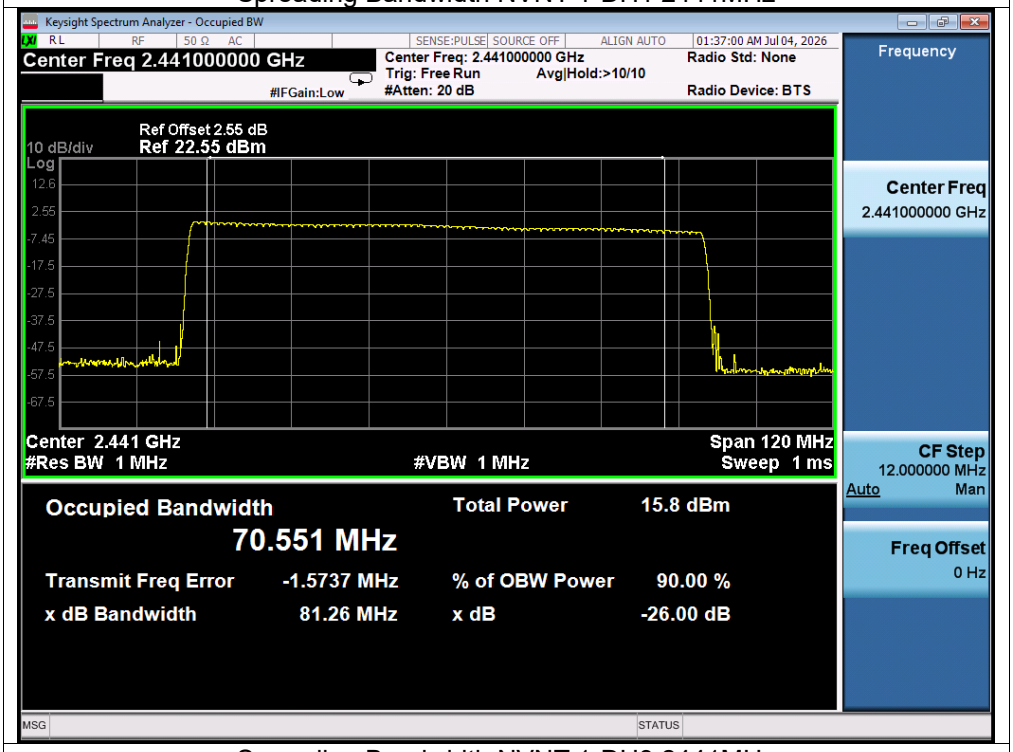
12.5 Test Result

Temperature:	26°C		
Humidity:	54 % RH	Test Voltage	DC 3.8V

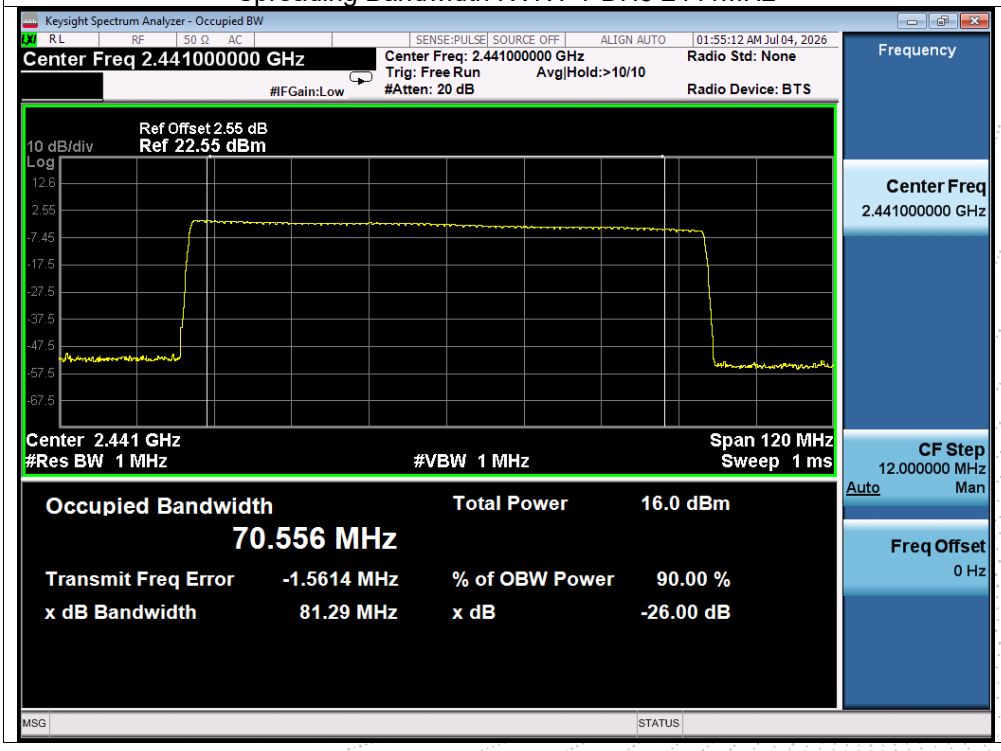
Condition	Mode	Frequency (MHz)	Spreading Bandwidth (MHz)	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH1	2441	70.551	0.383	108.772	284	28220.4	400	Pass
NVNT	1-DH3	2441	70.556	1.639	247.489	151	28222.4	400	Pass
NVNT	1-DH5	2441	70.571	2.885	250.995	87	28228.4	400	Pass
NVNT	2-DH1	2441	70.632	0.386	110.010	285	28252.8	400	Pass
NVNT	2-DH3	2441	70.670	1.644	228.516	139	28268.0	400	Pass
NVNT	2-DH5	2441	70.641	2.886	268.398	93	28256.4	400	Pass
NVNT	3-DH1	2441	70.612	0.392	109.760	280	28244.8	400	Pass
NVNT	3-DH3	2441	70.627	1.643	220.162	134	28250.8	400	Pass
NVNT	3-DH5	2441	70.683	2.893	240.119	83	28273.2	400	Pass

Note:
Period Time= Spreading Bandwidth *0.4
Dwell Time= Pulse Time* Burst Count

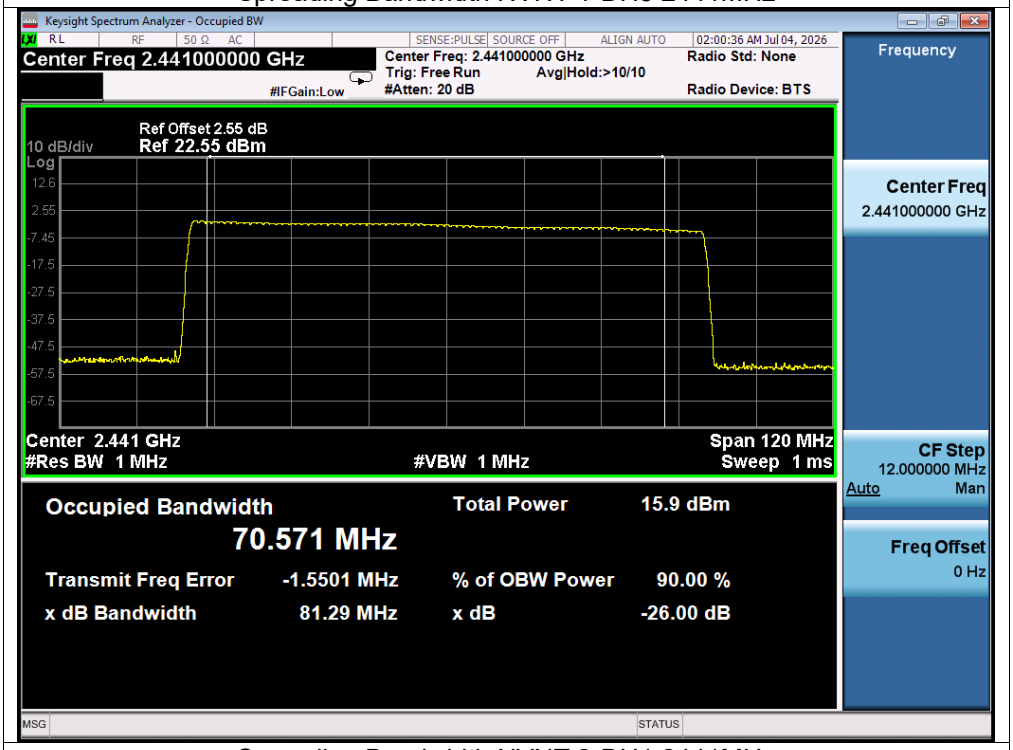
Test Graphs
Spreading Bandwidth NVNT 1-DH1 2441MHz



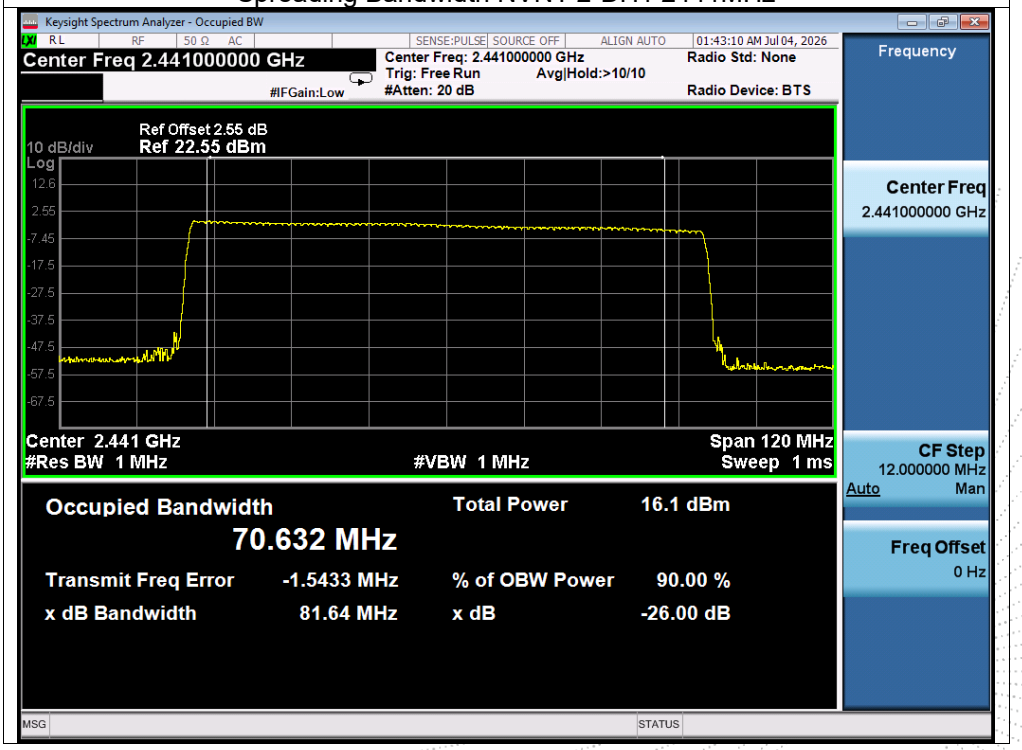
Spreading Bandwidth NVNT 1-DH3 2441MHz



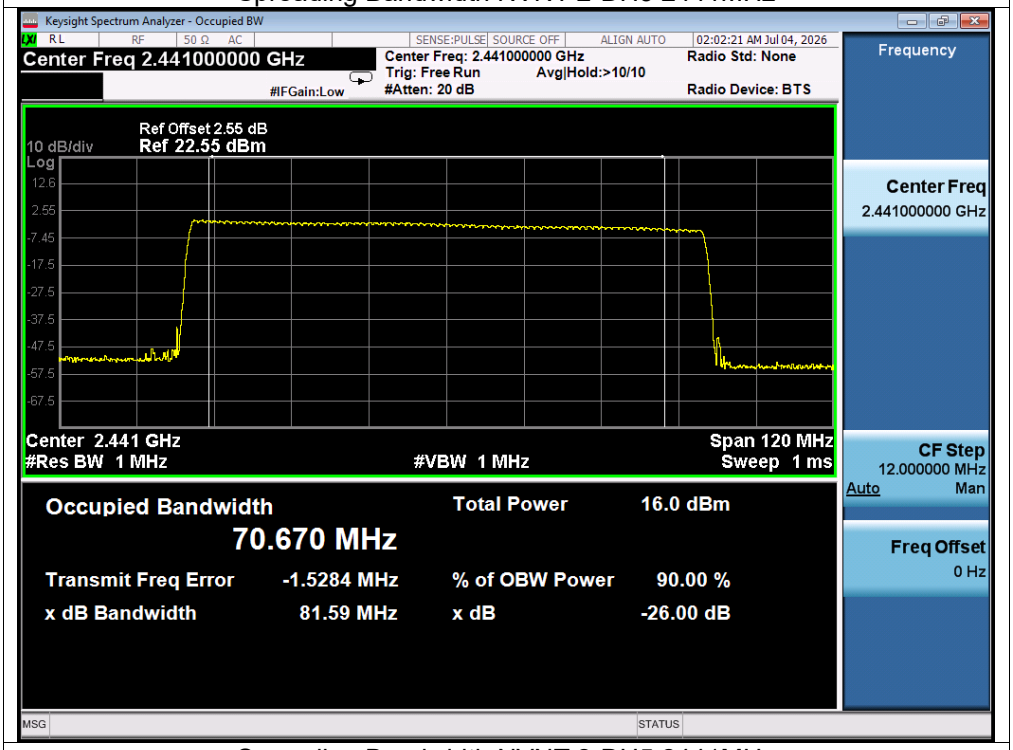
Spreading Bandwidth NVNT 1-DH5 2441MHz



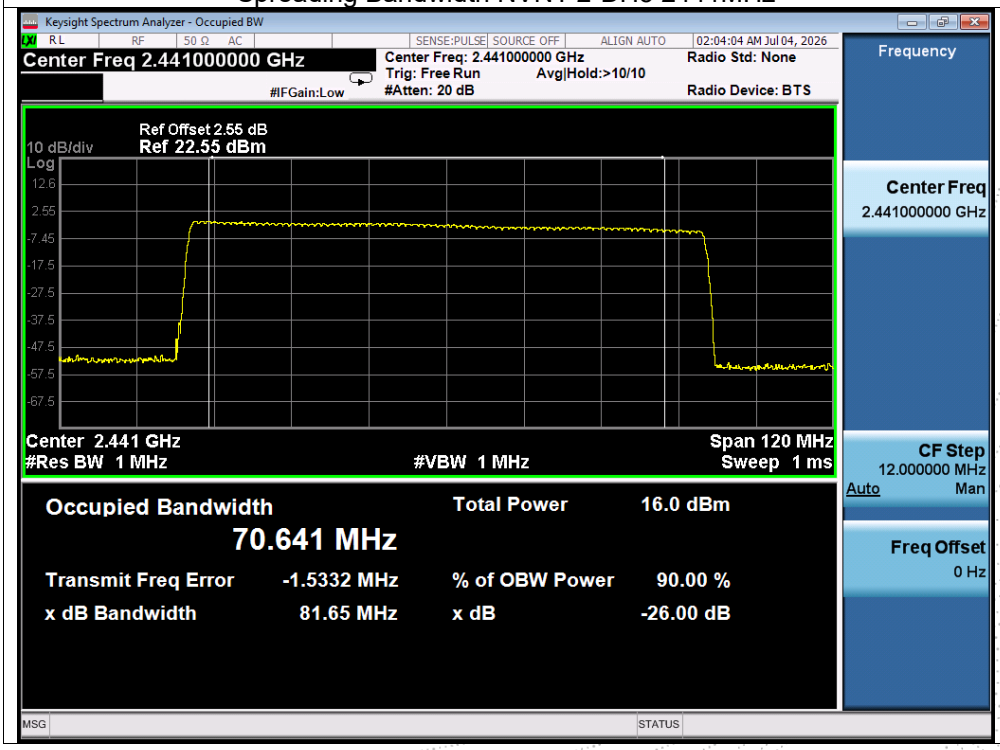
Spreading Bandwidth NVNT 2-DH1 2441MHz



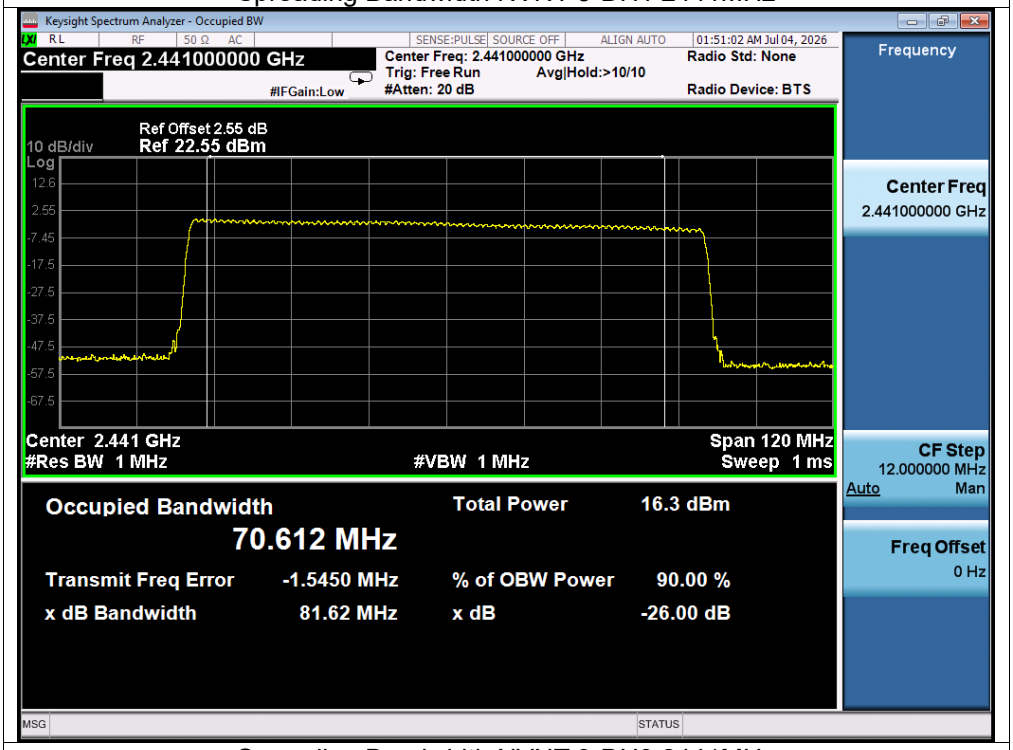
Spreading Bandwidth NVNT 2-DH3 2441MHz



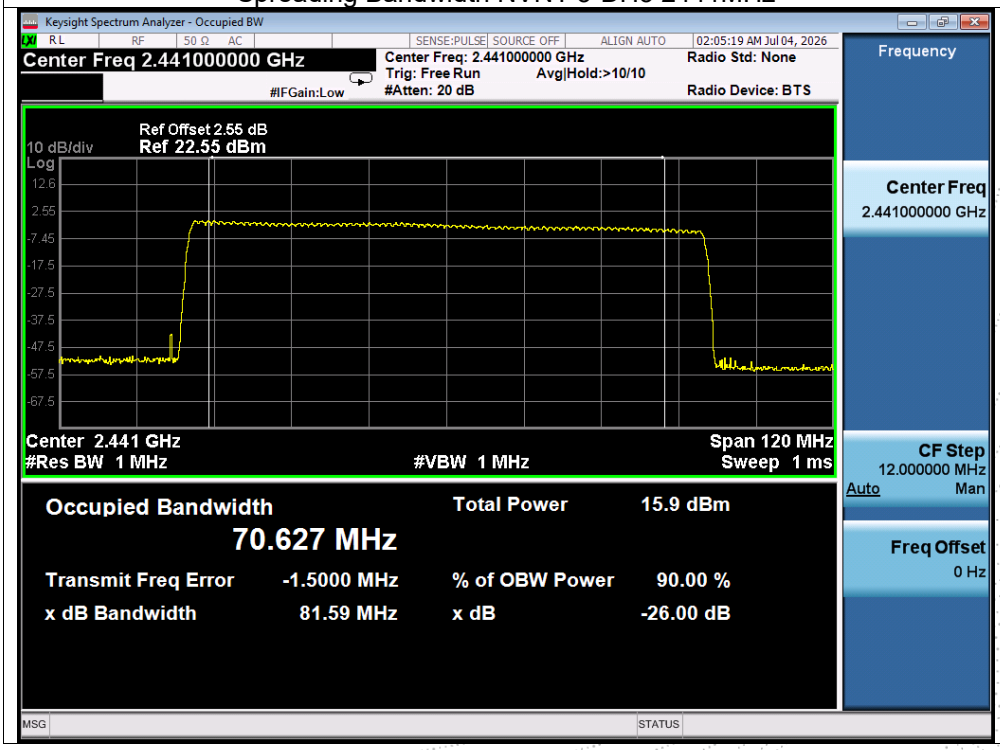
Spreading Bandwidth NVNT 2-DH5 2441MHz



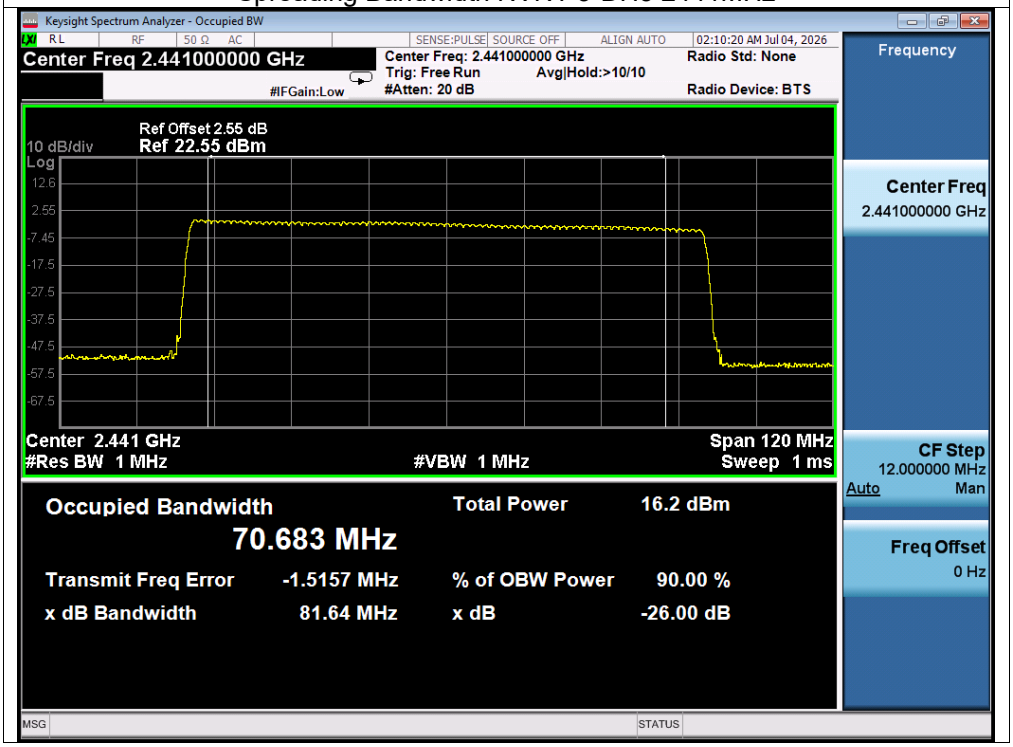
Spreading Bandwidth NVNT 3-DH1 2441MHz



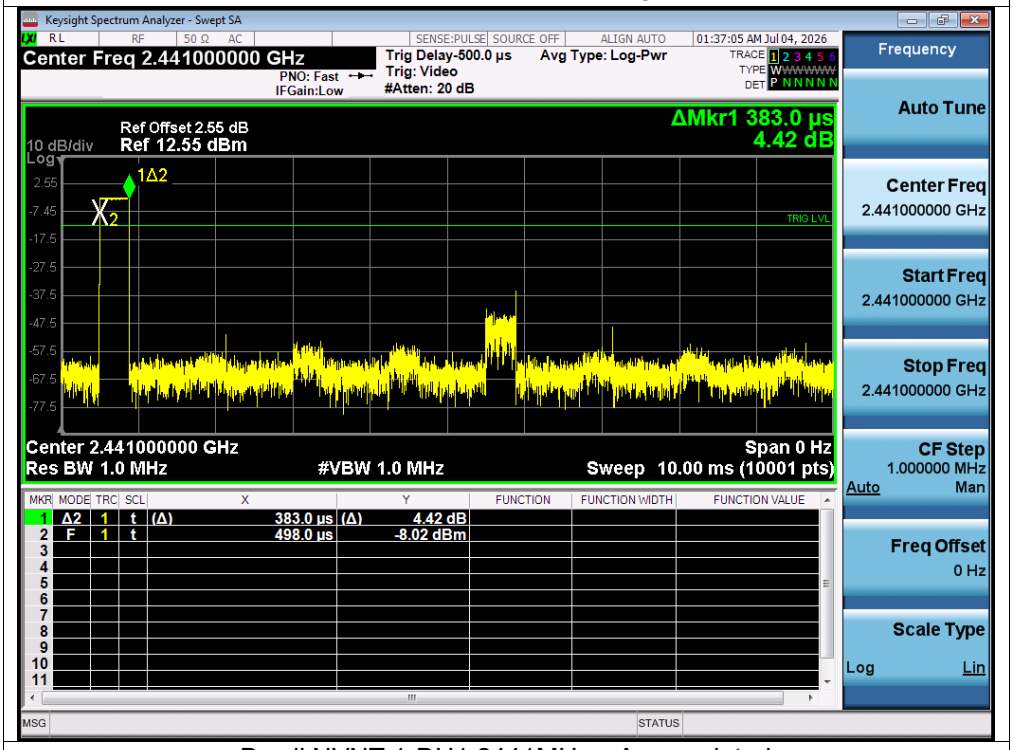
Spreading Bandwidth NVNT 3-DH3 2441MHz



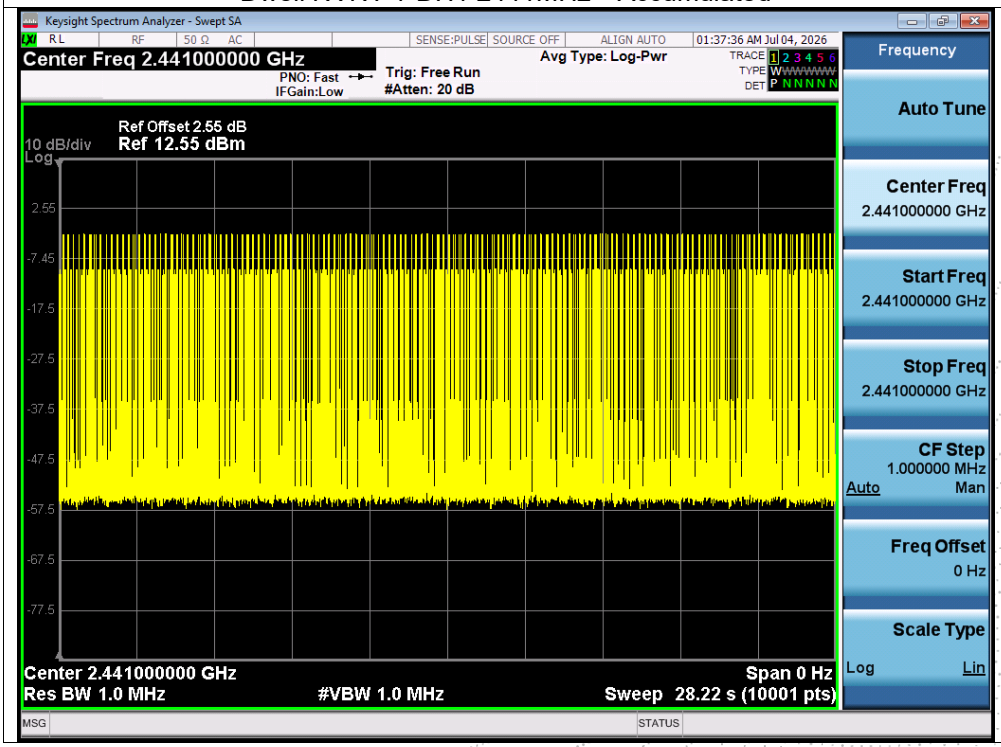
Spreading Bandwidth NVNT 3-DH5 2441MHz



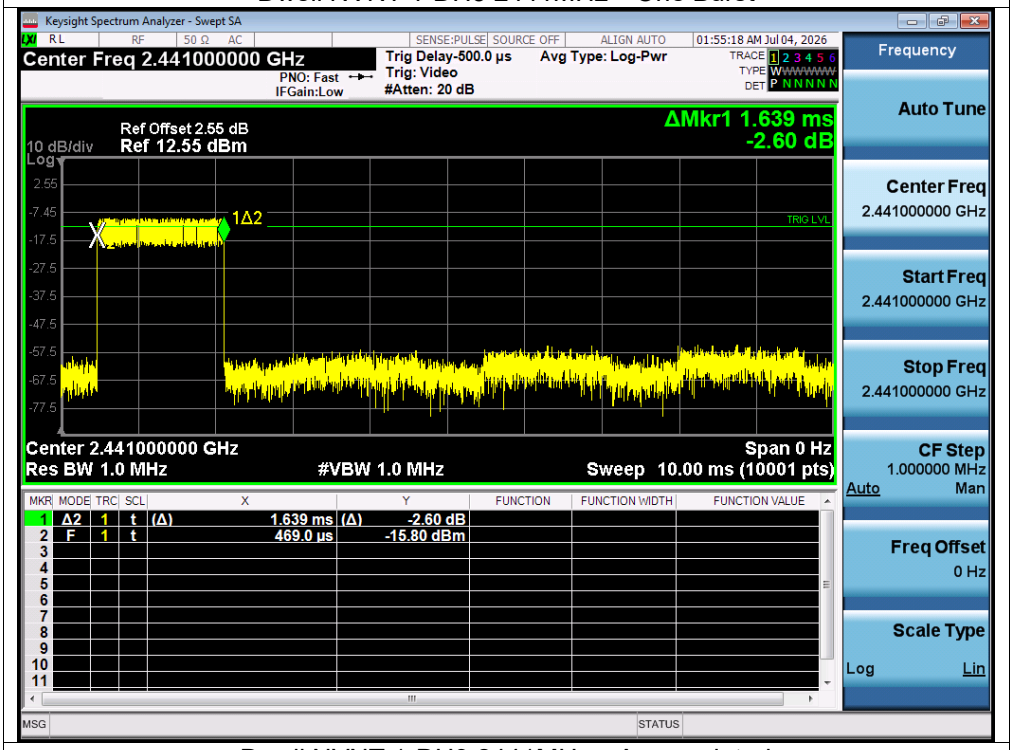
Test Graphs
Dwell NVNT 1-DH1 2441MHz One Burst



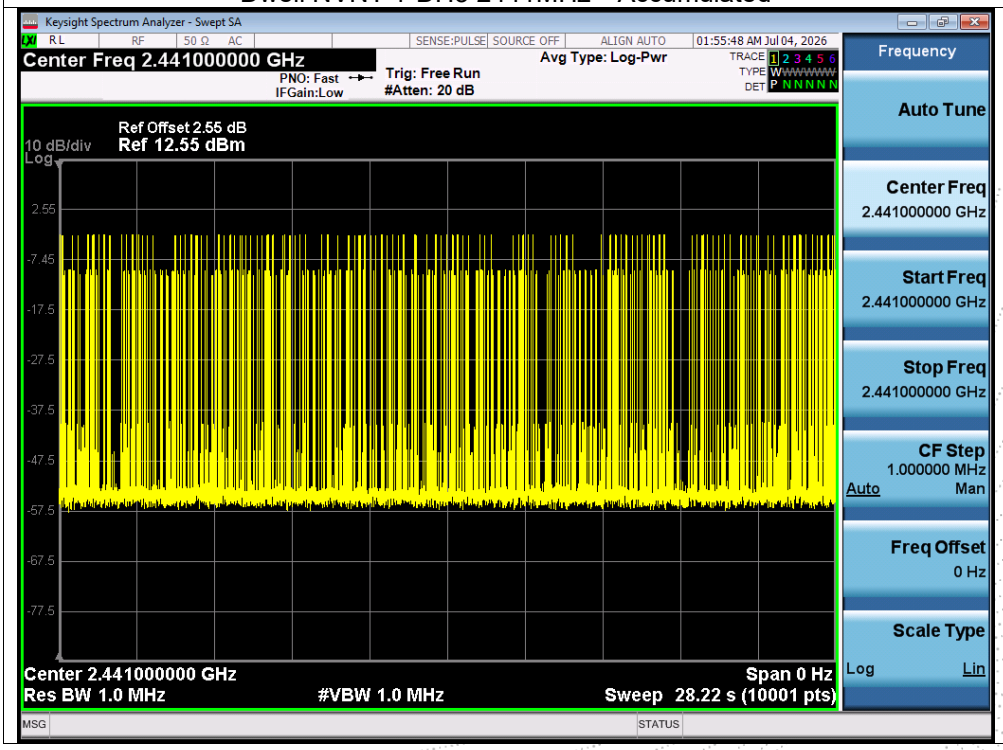
Dwell NVNT 1-DH1 2441MHz Accumulated



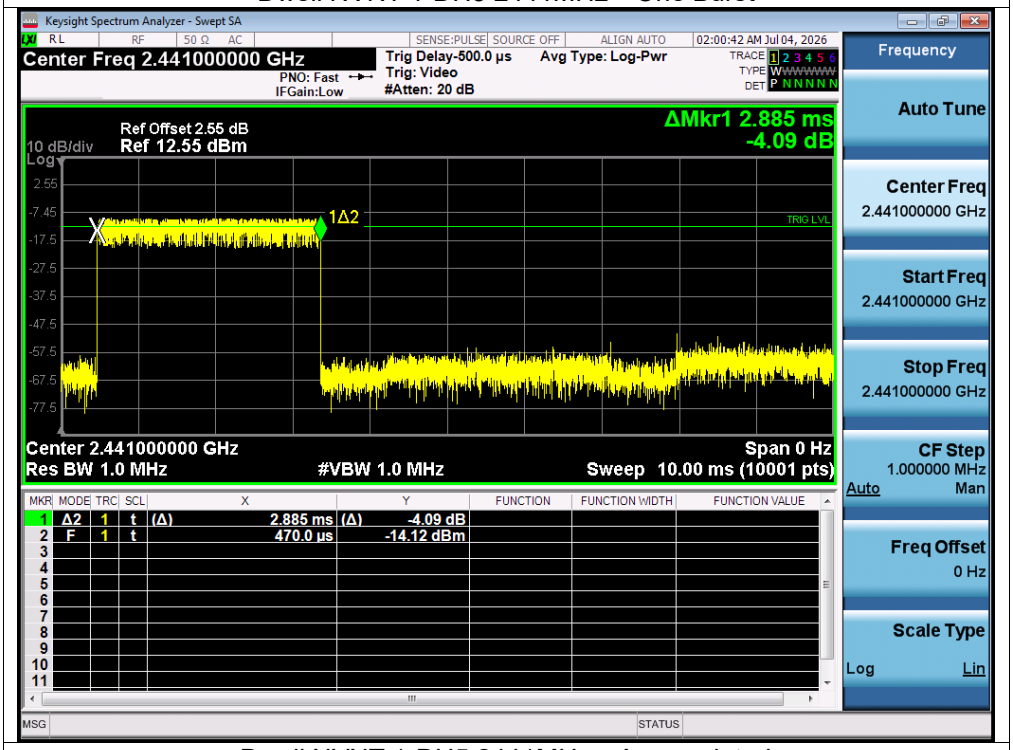
Dwell NVNT 1-DH3 2441MHz One Burst



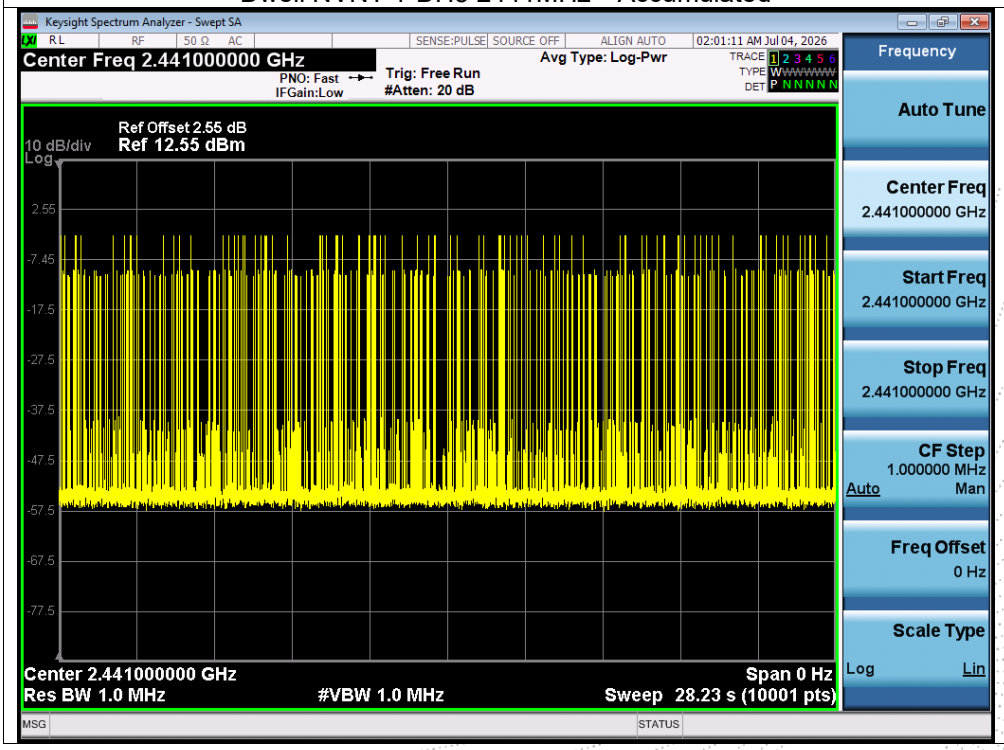
Dwell NVNT 1-DH3 2441MHz Accumulated



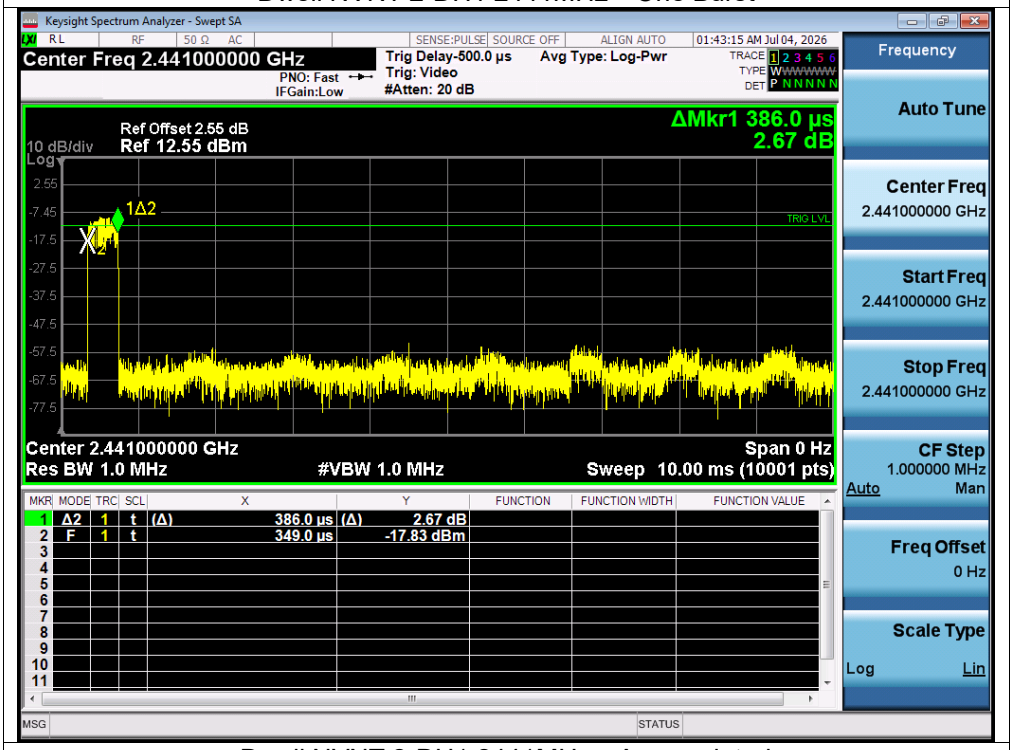
Dwell NVNT 1-DH5 2441MHz One Burst



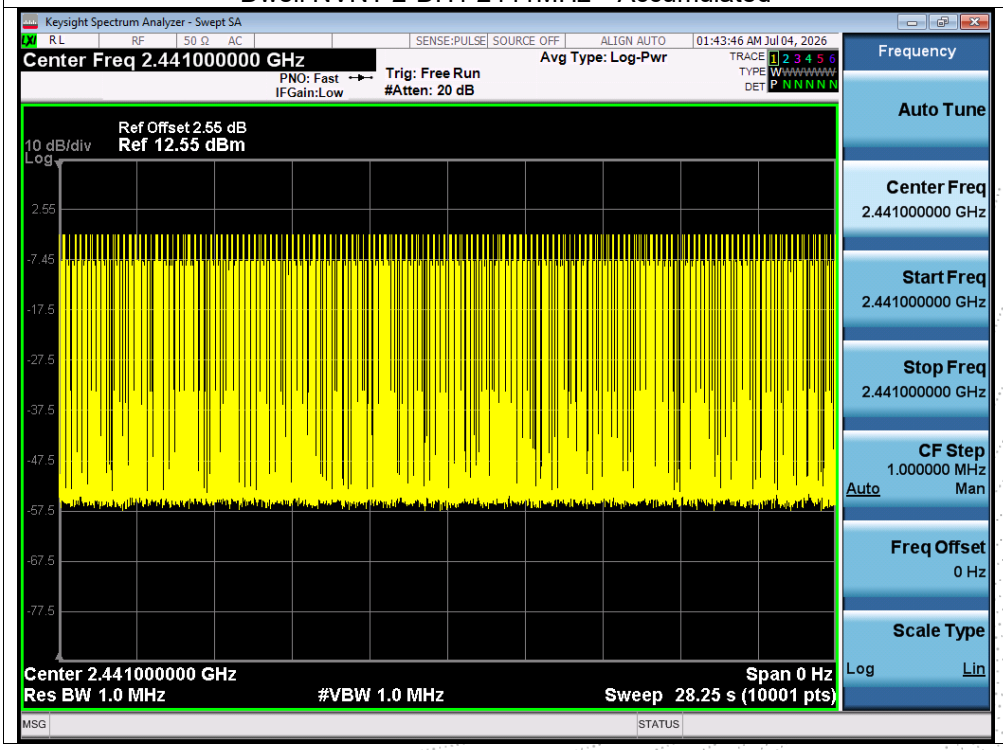
Dwell NVNT 1-DH5 2441MHz Accumulated



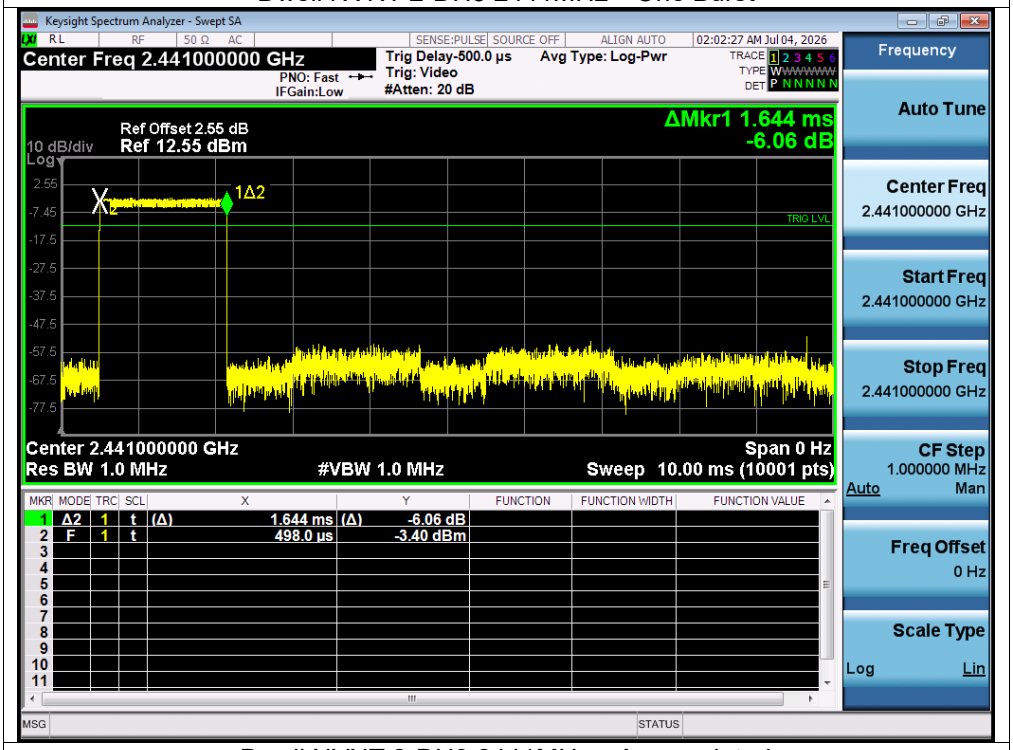
Dwell NVNT 2-DH1 2441MHz One Burst



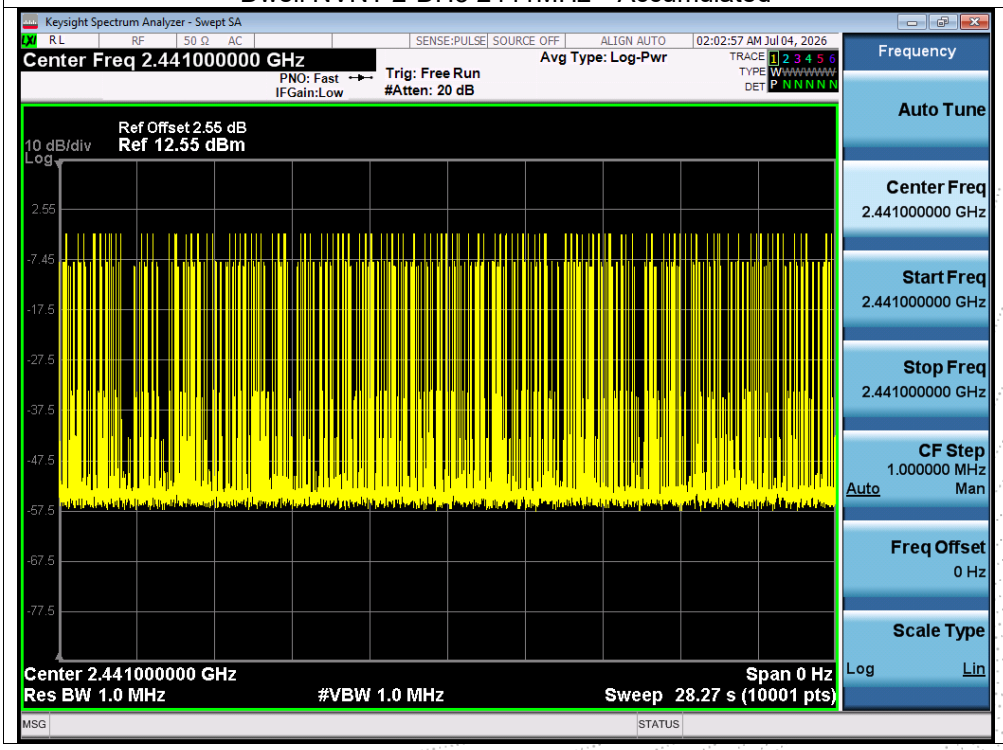
Dwell NVNT 2-DH1 2441MHz Accumulated



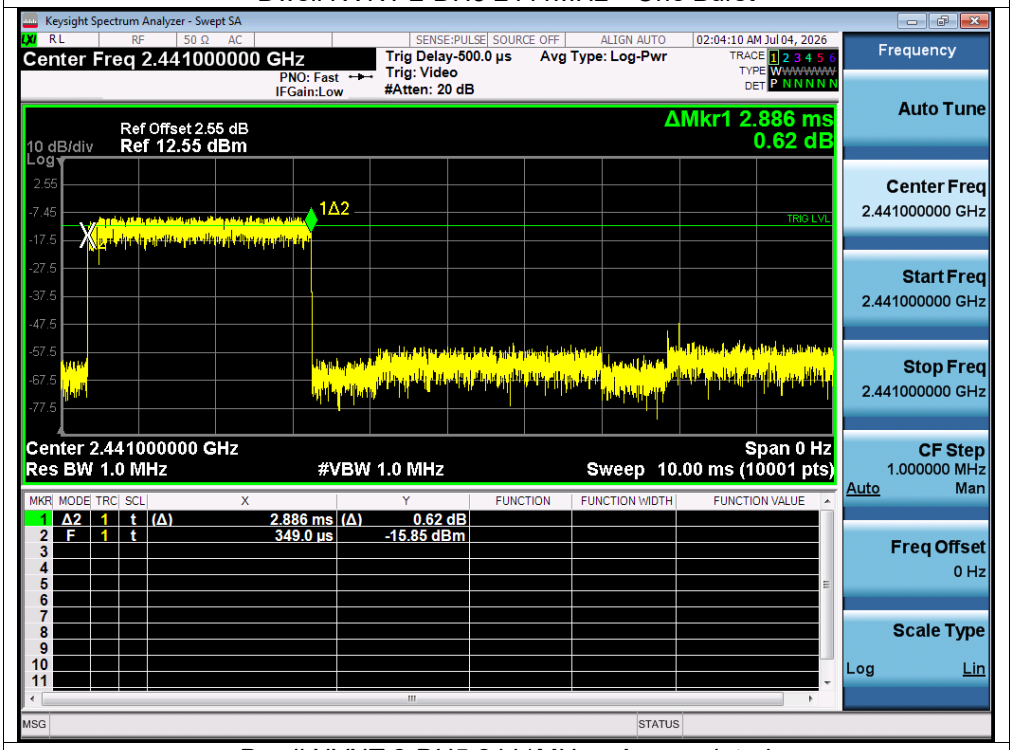
Dwell NVNT 2-DH3 2441MHz One Burst



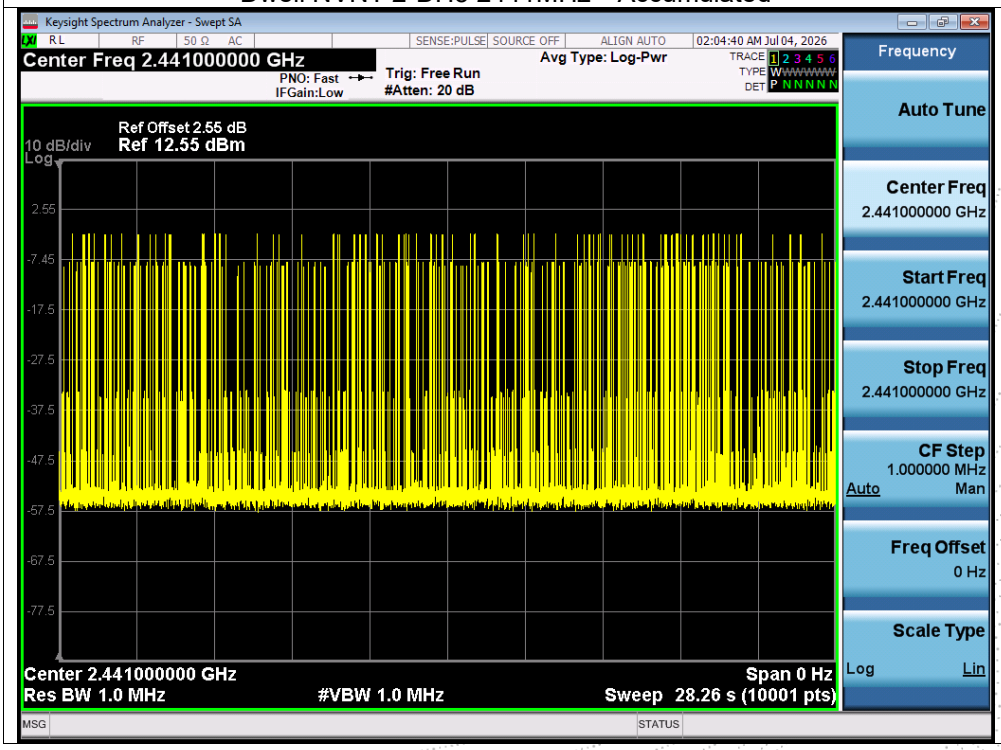
Dwell NVNT 2-DH3 2441MHz Accumulated



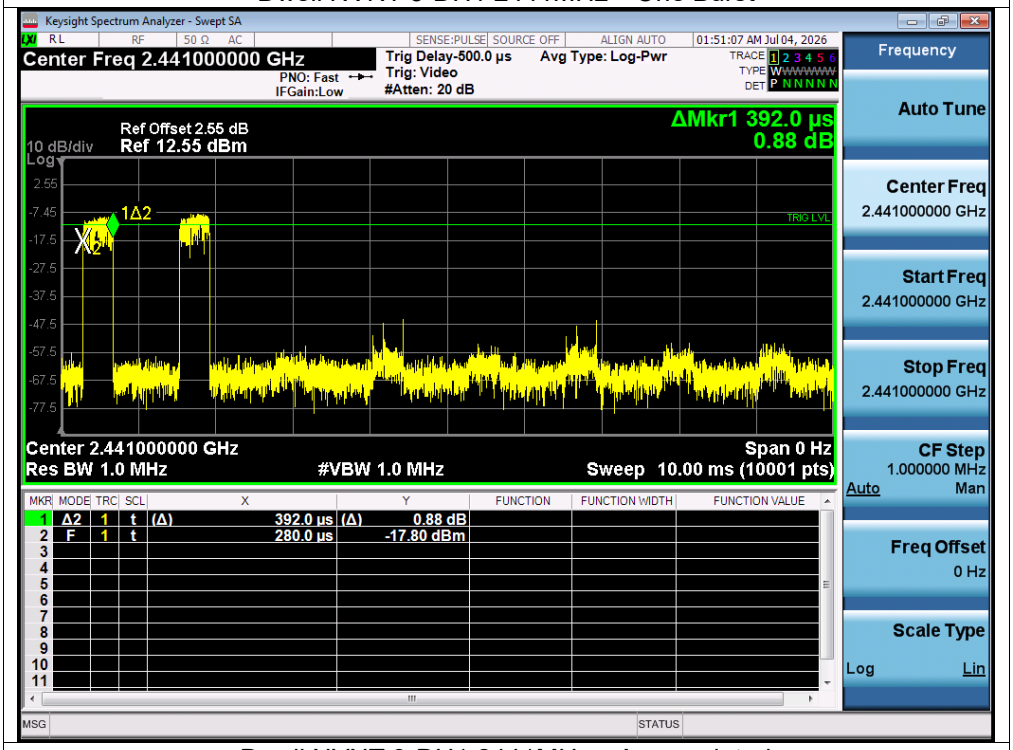
Dwell NVNT 2-DH5 2441MHz One Burst



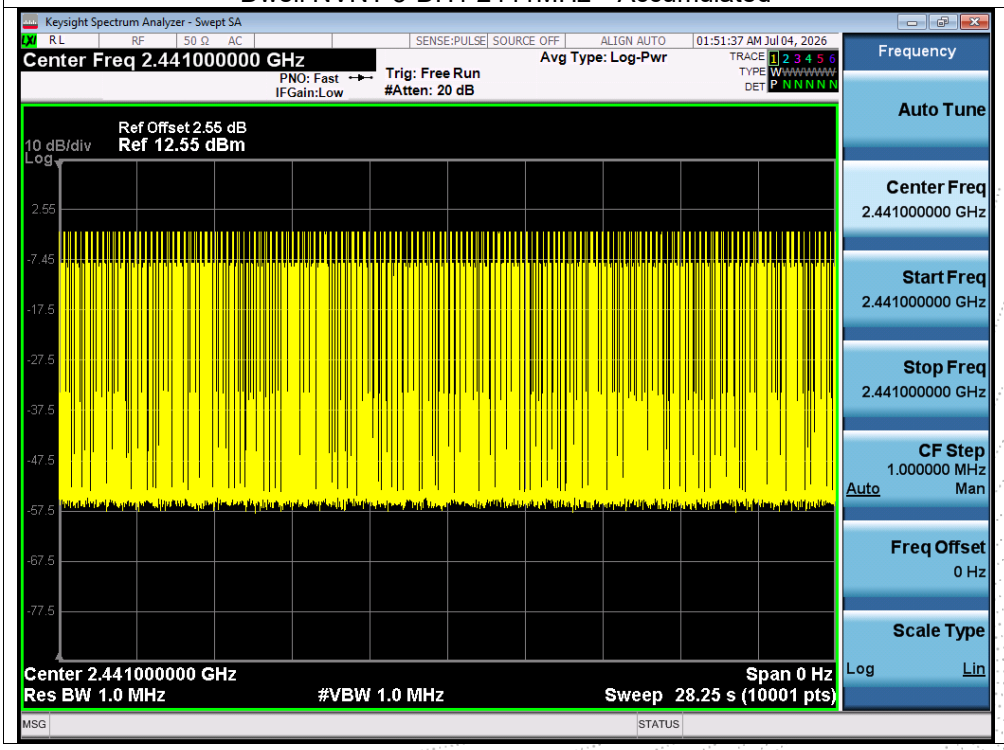
Dwell NVNT 2-DH5 2441MHz Accumulated



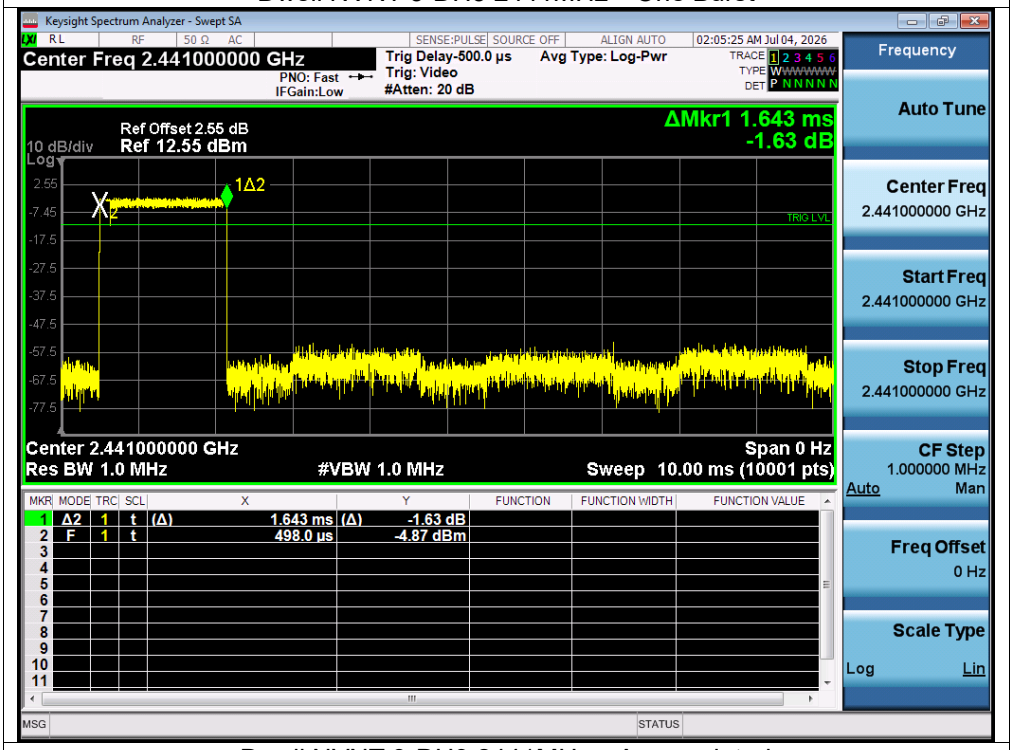
Dwell NVNT 3-DH1 2441MHz One Burst



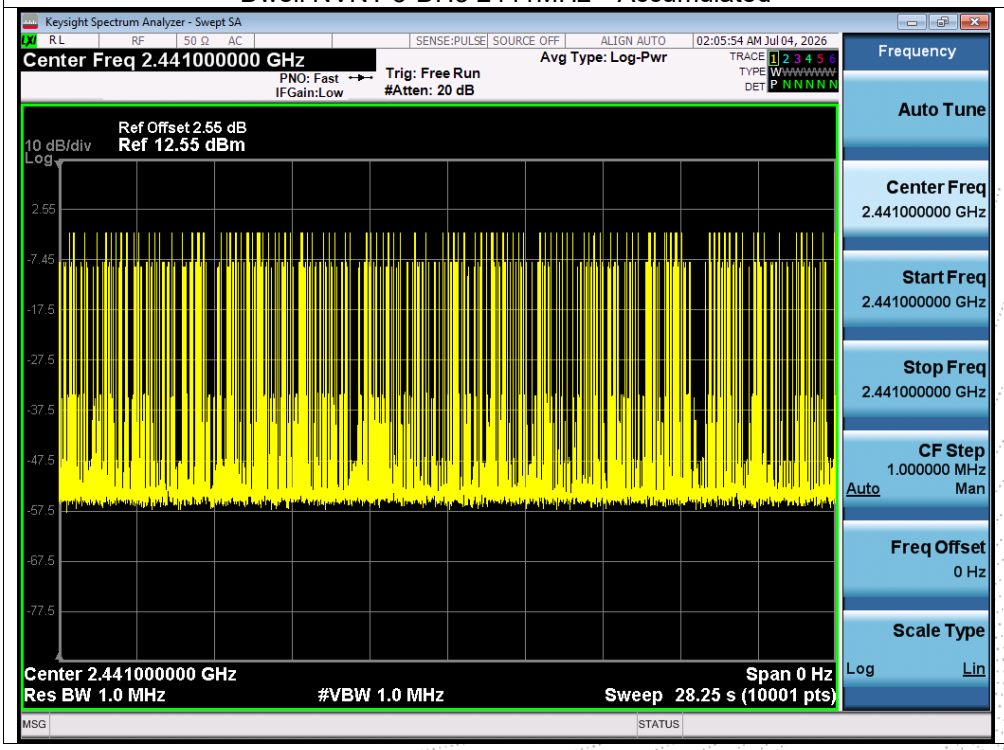
Dwell NVNT 3-DH1 2441MHz Accumulated



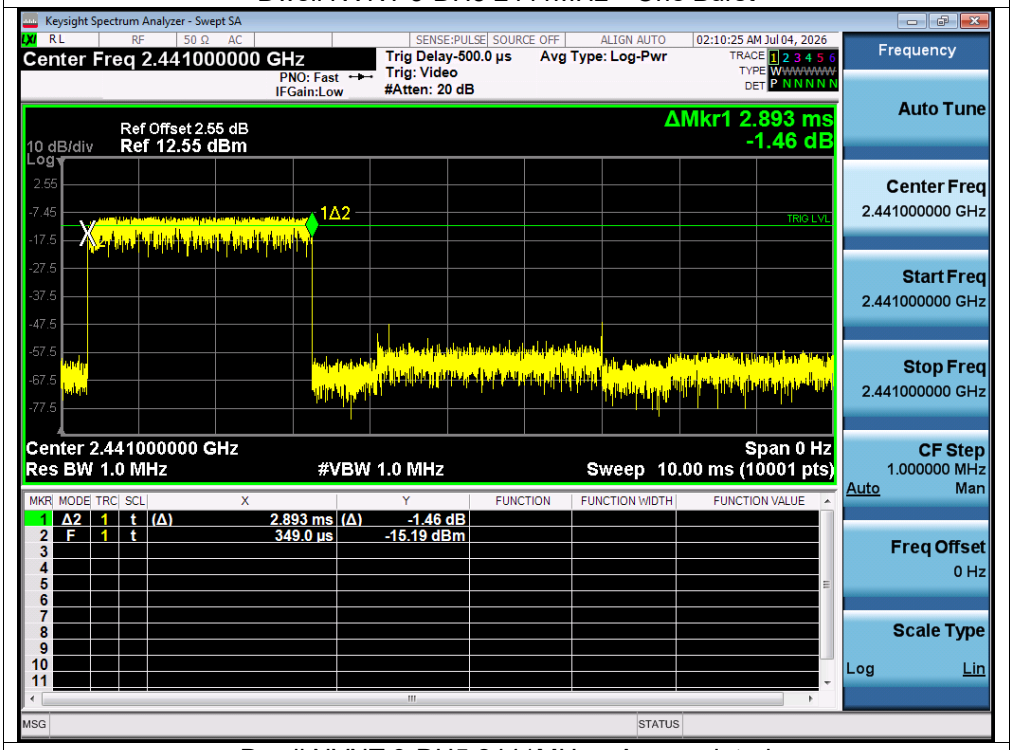
Dwell NVNT 3-DH3 2441MHz One Burst



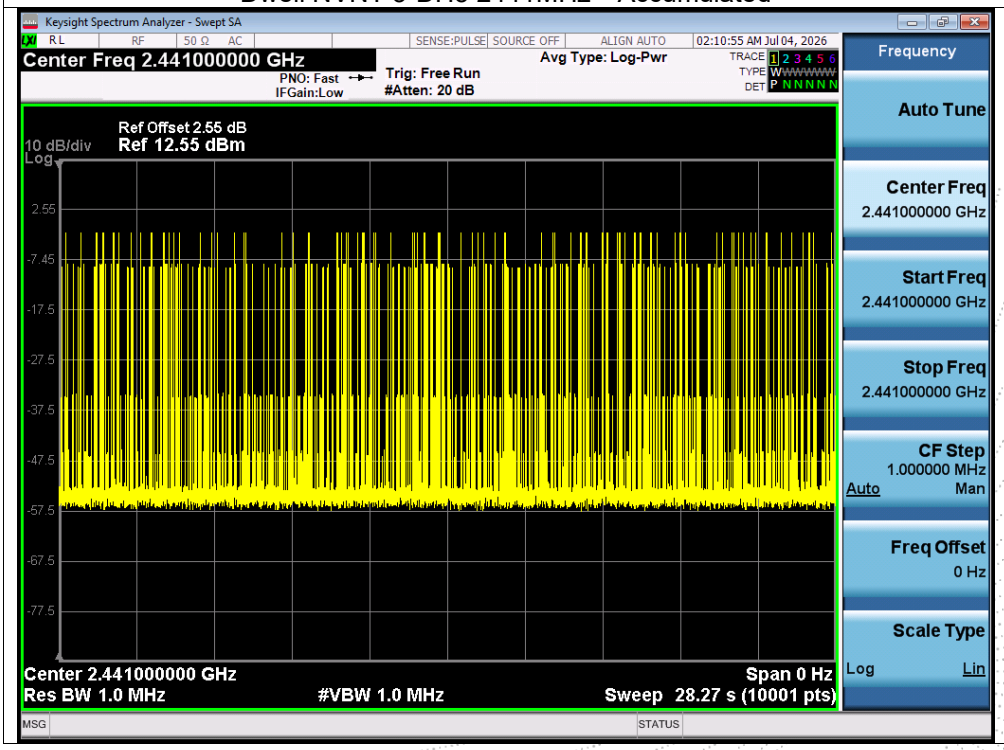
Dwell NVNT 3-DH3 2441MHz Accumulated



Dwell NVNT 3-DH5 2441MHz One Burst



Dwell NVNT 3-DH5 2441MHz Accumulated

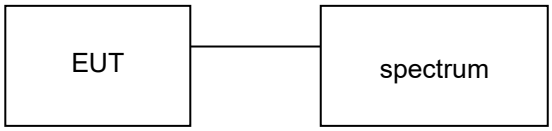


13. Carrier Sense

Not applicable, Since the EUT belong to Bluetooth

14. Imitation Of Collateral Emission Of Receiver Measurement

14.1 Block Diagram Of Test Setup



14.2 Limit

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

14.3 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

14.4 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.

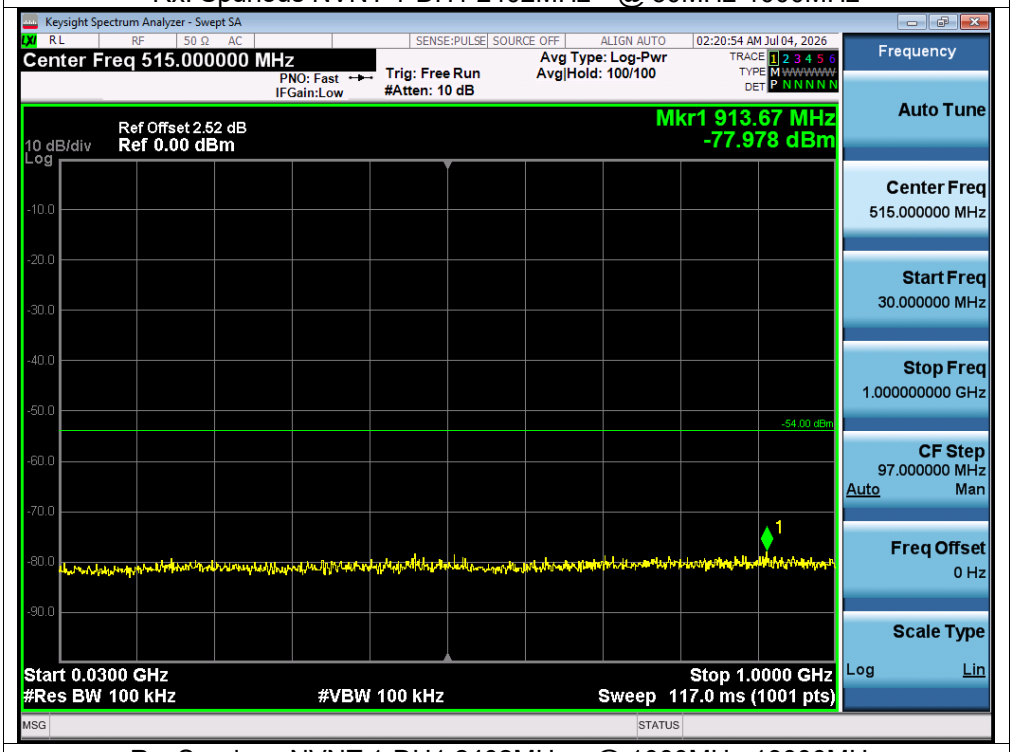
14.5 Test Result

Temperature:	26°C		
Humidity:	54 % RH	Test Voltage	DC 3.8V

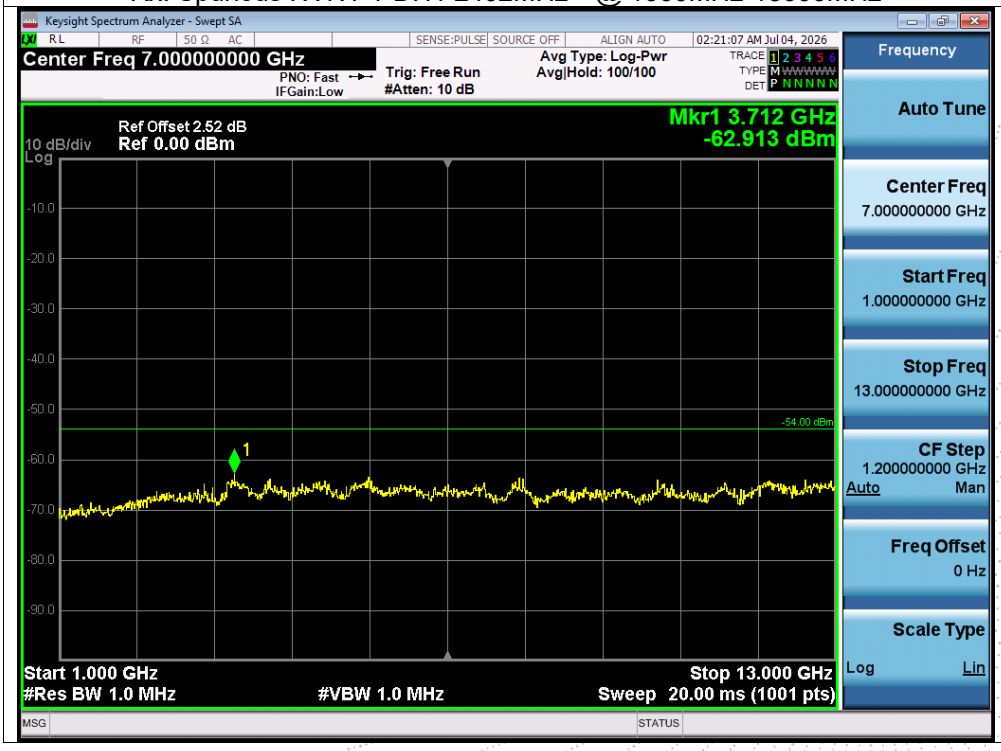
Condition	Mode	Frequency (MHz)	Range (MHz)	Emission Frequency (MHz)	Max Value (dBm)	Max Value (nW)	Limit (nW)	Verdict
NVNT	1-DH1	2402	30-1000	913.67	-77.98	0.0159	4	Pass
NVNT	1-DH1	2402	1000-13000	3712	-62.91	0.5117	20	Pass
NVNT	1-DH1	2441	30-1000	844.8	-78.09	0.0155	4	Pass
NVNT	1-DH1	2441	1000-13000	5812	-63.41	0.4560	20	Pass
NVNT	1-DH1	2480	30-1000	840.92	-77.96	0.0160	4	Pass
NVNT	1-DH1	2480	1000-13000	5200	-63.19	0.4797	20	Pass

Test Graphs

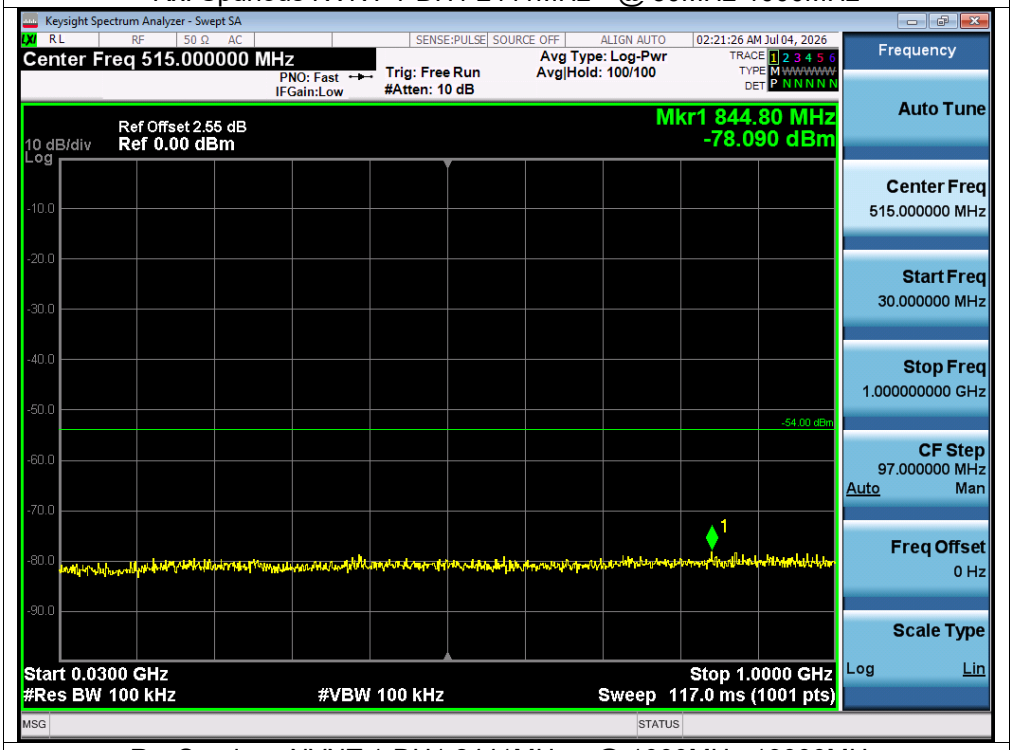
Rx. Spurious NVNT 1-DH1 2402MHz @ 30MHz-1000MHz



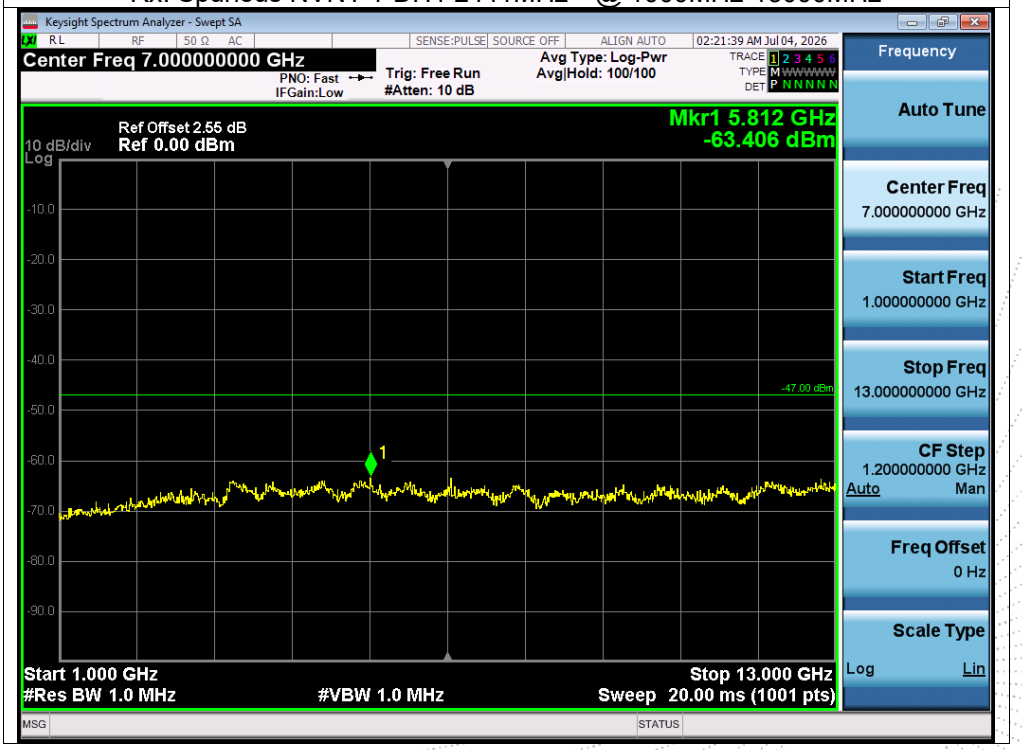
Rx. Spurious NVNT 1-DH1 2402MHz @ 1000MHz-13000MHz



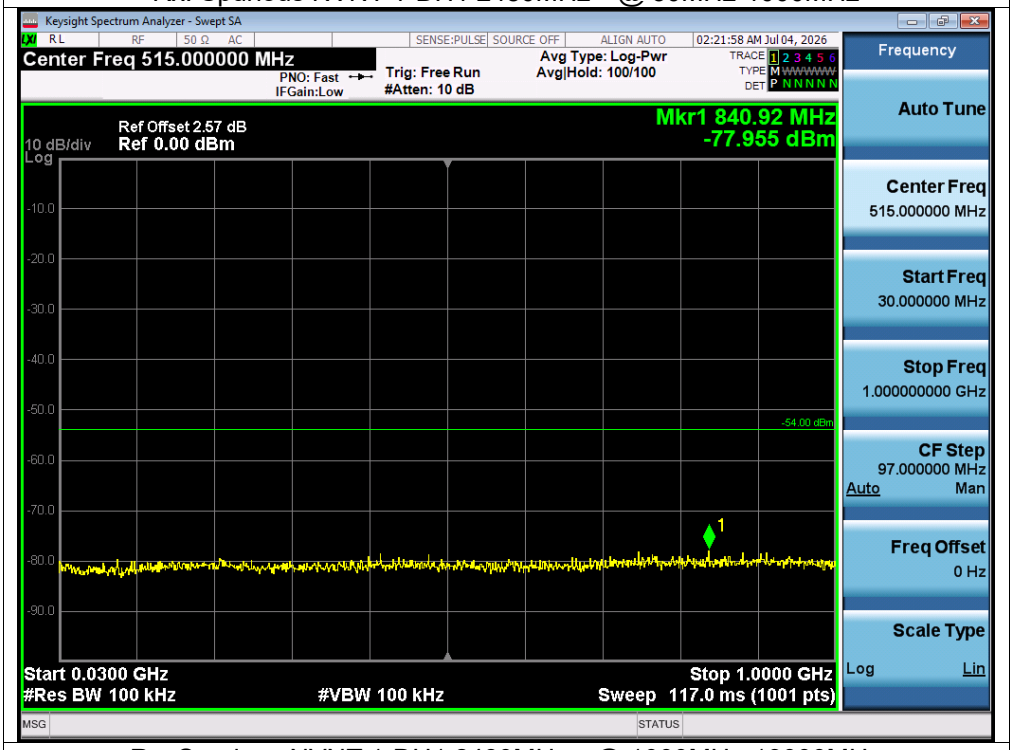
Rx. Spurious NVNT 1-DH1 2441MHz @ 30MHz-1000MHz



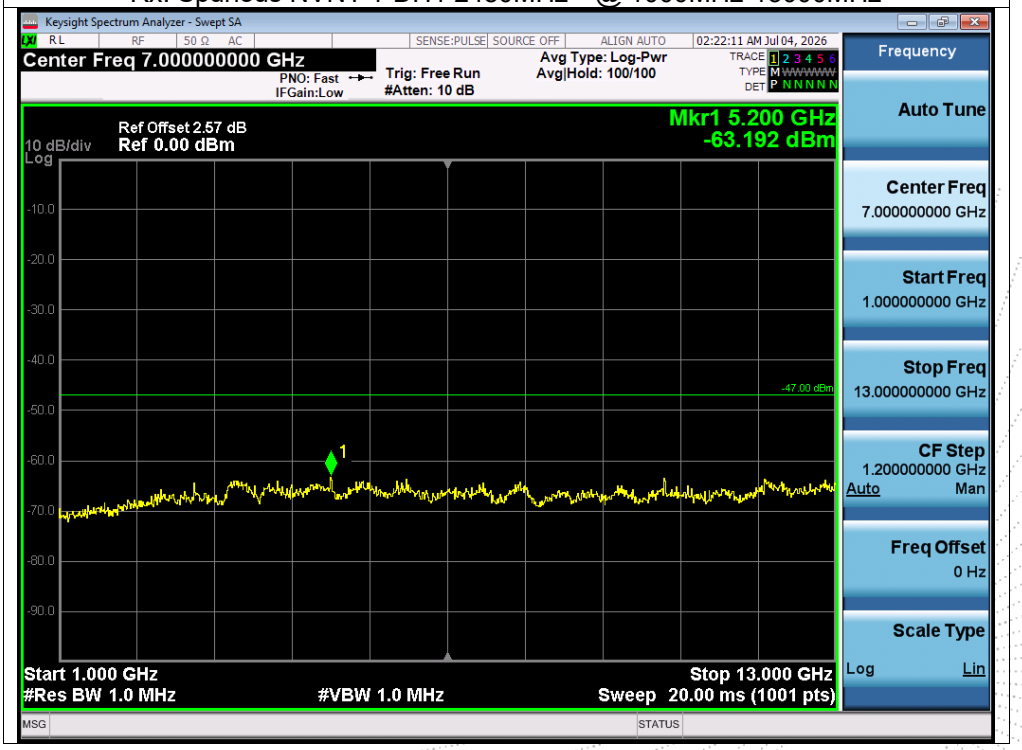
Rx. Spurious NVNT 1-DH1 2441MHz @ 1000MHz-13000MHz



Rx. Spurious NVNT 1-DH1 2480MHz @ 30MHz-1000MHz



Rx. Spurious NVNT 1-DH1 2480MHz @ 1000MHz-13000MHz



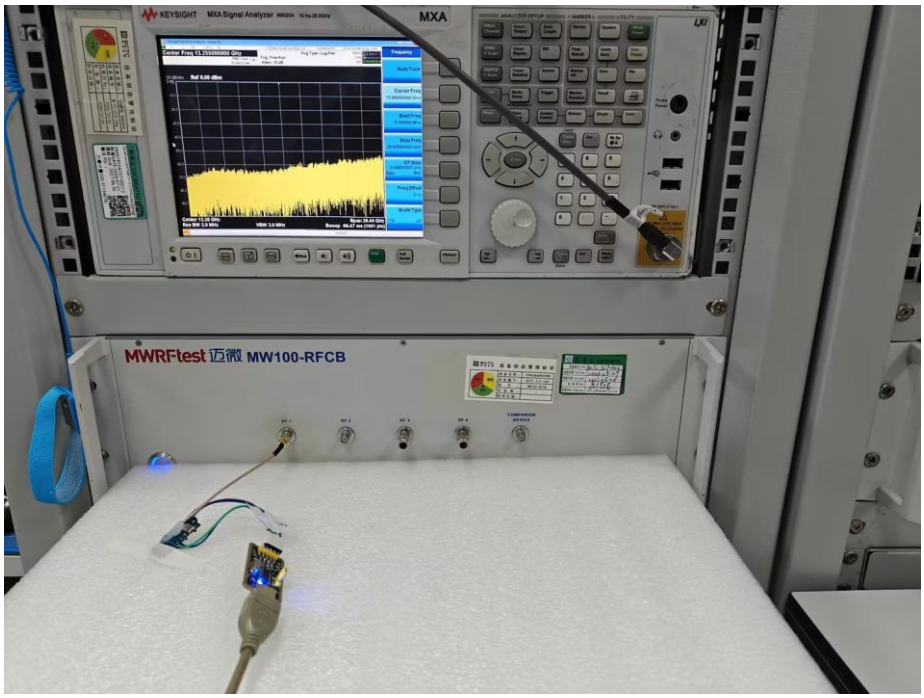
15. EUT Photographs

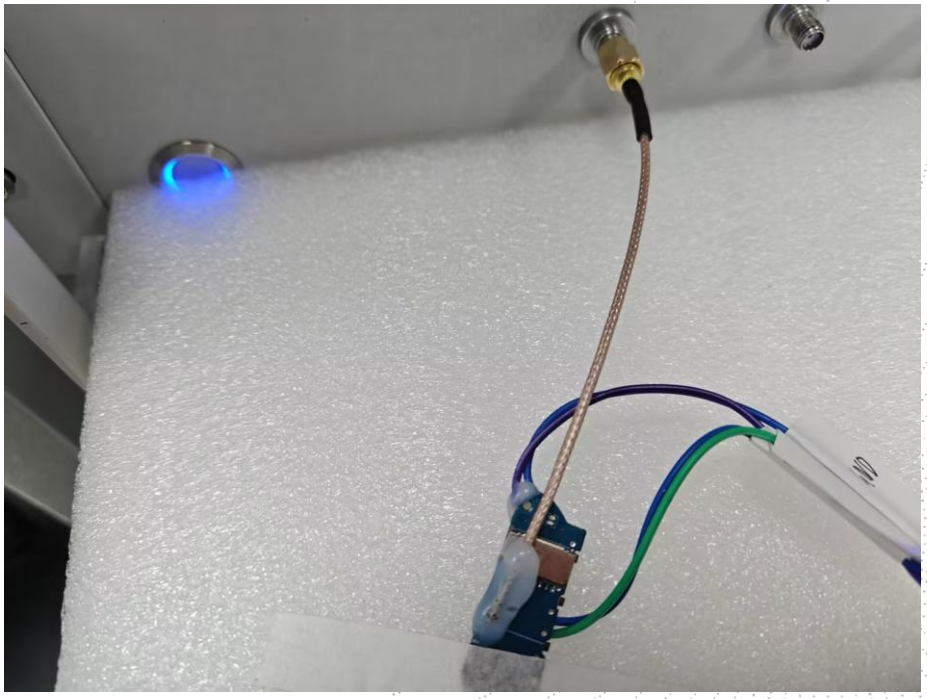
EUT Photo

Appendix-Photographs Of EUT Constructional Details
(GRSD-BCH X60-3_External & Internal Photos)

16. EUT Test Setup Photographs

Measurement Photos





STATEMENT

1. The equipment lists are traceable to the International System of Units (SI).

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/IEC 17025:2017.

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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