TEST REPORT

APPLICANT	:	Qingdao Magene Intelligence Technology Co., Ltd.
PRODUCT NAME	:	Smart GPS Bike Computer
MODEL NAME	:	P0101264
BRAND NAME	:	Magene
FCC ID	:	2ALZG-262
STANDARD(S)	:	47 CFR Part 15 Subpart C
RECEIPT DATE	:	2023-08-21
TEST DATE	:	2023-08-30 to 2023-10-20
ISSUE DATE	:	2023-10-30

Edited by: Peng Mi (Rapporteur)

Approved by: Shen Junsheng (Supervisor)

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DIRECTORY

1. Summary of Test Result ····· 4
1.1. Testing Applied Standards ····· 5
1.2. Test Equipment List ····· 6
1.3. Measurement Uncertainty ····· 8
1.4. Testing Laboratory ····· 8
2. General Description ····· 9
2.1. Information of Applicant and Manufacturer ····· 9
2.2. Information of EUT ····· 9
2.3. Channel List of EUT ····· 10
2.4. Test Configuration of EUT ····· 11
2.5. Test Conditions ····· 11
2.6. Test Setup Layout Diagram ····· 12
3. Test Results ····· 15
3.1. Antenna Requirement ····· 15
3.2. Duty Cycle of Test Signal ····· 16
3.3. Maximum Peak and Average Conducted Output Power ····· 17
3.4. 6 dB Bandwidth ····· 18
3.5. Conducted Spurious Emissions and Band Edge ····· 19
3.6. Power Spectral Density ····· 20
3.7. Conducted Emission ····· 21
3.8. Restricted Frequency Bands ····· 22
3.9. Radiated Emission ····· 23
Annex A Test Data and Result ····· 25

Change History		
Version	**Date**	**Reason for change**
1.0	2023-10-30	First edition

1. Summary of Test Result

No.	Section	Description	Test Date	Test Engineer	Result	Method Determination /Remark
1	15.203	Antenna Requirement	N/A	N/A	PASS	No deviation
2	N/A	Duty Cycle of Test Signal	Sep. 01, 2023	Zhong Yanshan	PASS	No deviation
3	15.247(b)	Maximum Peak Conducted Output Power	Sep. 01, 2023	Zhong Yanshan	PASS	No deviation
4	15.247(b)	Maximum Average Conducted Output Power	Sep. 01, 2023	Zhong Yanshan	PASS	No deviation
5	15.247(a)	Bandwidth	Sep. 01, 2023	Zhong Yanshan	PASS	No deviation
6	15.247(d)	Conducted Spurious Emission and Band Edge	Sep. 01, 2023	Zhong Yanshan	PASS	No deviation
7	15.247(e)	Power Spectral Density	Sep. 01, 2023	Zhong Yanshan	PASS	No deviation
8	15.207	Conducted Emission	Aug. 31, 2023	Wang Deyong	PASS	No deviation
9	15.247(d)	Restricted Frequency Bands	Oct. 20, 2023	Su Zhan	PASS	No deviation
10	15.209, 15.247(d)	Radiated Emission	Oct. 20, 2023	Su Zhan	PASS	No deviation

Note 1: The tests were performed according to the method of measurements prescribed in ANSIC63.10-2013 and KDB558074 D01 v05r02.

Note 2: Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

Note 3: When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.

1.1. Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

• 47 CFR Part 15 Subpart C Radio Frequency Devices

1.2. Test Equipment List

1.2.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
EXA Signal Analzyer	MY53470836	N9010A	Agilent	2023.02.27	2024.02.26
Power Sensor	MY54180008	U2021XA	Agilent	2022.10.11	2023.10.10
				2023.09.19	2024.09.18
Attenuator	MTJ6004-20	VAT-10+	MTJ Cooperation	N/A	N/A
RF Cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
Coaxial Cable	CB02	RF02	Morlab	N/A	N/A
SMA Connector	CN01	RF03	HUBER-SUHNER	N/A	N/A

1.2.2 Conducted Emission Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Receiver	MY56400093	N9038A	KEYSIGHT	2023.02.09	2024.02.08
LISN	8127449	NSLK 8127	Schwarzbeck	2023.02.21	2024.02.20
Pulse Limiter (10dB)	VTSD 9561 F-B #206	VTSD 9561-F	Schwarzbeck	2023.06.27	2024.06.26
RF Coaxial Cable (DC-100MHz)	BNC	MRE04	Qualwave	N/A	N/A

1.2.3 List of Software Used

Description	Manufacturer	Software Version
Test System	MaiWei	2.0.0.0
Morlab EMCR	Morlab	V1.2
TS+ -[JS32-CE]	Tonscend	V2.5.0.0

1.2.4 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Receiver	MY54130016	N9038A	Agilent	2023.06.21	2024.06.20
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2022.05.25	2025.05.24
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2022.02.11	2025.02.10
Test Antenna – Horn	01774	BBHA 9120D	Schwarzbeck	2022.07.13	2025.07.12
Test Antenna – Horn	BBHA9170 #773	BBHA9170	Schwarzbeck	2022.07.14	2025.07.13
Preamplifier (10MHz-6GHz)	46732	S10M100L3802	LUCIX CORP.	2023.06.27	2024.06.26
Preamplifier (2GHz-18GHz)	61171/61172	S020180L3203	LUCIX CORP.	2023.06.27	2024.06.26
Preamplifier (18GHz-40GHz)	DS77209	DCLNA0118-40C-S	Decentest	2023.07.04	2024.07.03
RF Coaxial Cable (DC-18GHz)	MRE001	PE330	Pasternack	2023.06.27	2024.06.26
RF Coaxial Cable (DC-18GHz)	MRE002	CLU18	Pasternack	2023.06.27	2024.06.26
RF Coaxial Cable (DC-18GHz)	MRE003	CLU18	Pasternack	2023.06.27	2024.06.26
RF Coaxial Cable (DC-40GHz)	22290045	QA360-40-KK-0.5	Qualwave	2023.07.04	2024.07.03
RF Coaxial Cable (DC-40GHz)	22290046	QA360-40-KKF-2	Qualwave	2023.07.04	2024.07.03
RF Coaxial Cable (DC-18GHz)	22120181	QA500-18-NN-5	Qualwave	2023.07.04	2024.07.03
Notch Filter	N/A	WRCG-2400-2483.5-60SS	Wainwright	N/A	N/A
Anechoic Chamber	N/A	9m*6m*6m	CRT	2022.05.10	2025.05.09

1.3. Measurement Uncertainty

Test Items	Uncertainty	Remark
Peak Output Power	±2.22dB	Confidence levels of 95%
Power Spectral Density	±2.22dB	Confidence levels of 95%
Bandwidth	±5%	Confidence levels of 95%
Conducted Spurious Emission	±2.77dB	Confidence levels of 95%
Restricted Frequency Bands	±5%	Confidence levels of 95%
Radiated Emission	±2.95dB	Confidence levels of 95%
Conducted Emission	±2.44dB	Confidence levels of 95%

1.4. Testing Laboratory

Laboratory Name	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Telephone	+86 755 36698555
Facsimile	+86 755 36698525
FCC Designation Number	CN1192
FCC Test Firm Registration Number	226174

2. General Description

2.1. Information of Applicant and Manufacturer

Applicant	Qingdao Magene Intelligence Technology Co., Ltd.
Applicant Address	Room 302, Building 3, No.328A Chengkang Road, Xiazhuang Subdistrict, Chengyang District, Qingdao, Shandong, China.
Manufacturer	Qingdao Magene Intelligence Technology Co., Ltd.
Manufacturer Address	Room 302, Building 3, No.328A Chengkang Road, Xiazhuang Subdistrict, Chengyang District, Qingdao, Shandong, China.

2.2. Information of EUT

Product Name:	Smart GPS Bike Computer	
Sample No.:	5#	
Hardware Version:	1.0	
Software Version:	1.0	
Modulation Technology:	DSSS, OFDM	
Modulation Type:	Refer to section1.3	
Wireless Technology:	802.11b, 802.11g, 802.11n (HT20), 802.11n (HT40)	
Operating Frequency Range:	2412MHz–2472MHz	
Antenna Type:	PCB Antenna	
Antenna Gain:	-1.50dBi	
Accessory Information:	Battery	
	Brand Name:	N/A
	Model No.:	YJ604058
	Serial No.:	N/A
	Capacity:	2000mAh
	Rated Voltage:	3.8V
	Charge Limit:	4.35V
	Manufacturer:	YJ POWER GROUP LIMITED

Note 1: We use the dedicated software to control the EUT continuous transmission.

Note 2: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

2.3. Channel List of EUT

Test Mode	Channel	Frequency (MHz)	Channel	Frequency (MHz)
802.11b/g/n (HT20)	**1**	**2412**	8	2447
	2	2417	9	2452
	3	2422	10	2457
	4	2427	11	2462
	5	2432	12	2467
	6	2437	**13**	**2472**
	7	**2442**		
Test Mode	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
802.11n (HT40)	**3**	**2422**	8	2447
	4	2427	9	2452
	5	2432	10	2457
	6	2437	**11**	**2462**
	7	**2442**		

Note 1: The black bold channels were selected for test.

2.4. Test Configuration of EUT

2.4.1. Modulation Type and Data Rate of EUT

Mode	Bandwidth (MHz)	Modulation Technology	Modulation Type	Data Rate	RU Size
802.11b	20	DSSS	**DBPSK**	**1**/2/5.5/11Mbps	N/A
			DQPSK		
			CCK		
802.11g	20	OFDM	**BPSK**	**6**/9/12/18/24/36/48/54 Mbps	N/A
			QPSK		
			16QAM		
			64QAM		
802.11n	20/40 (HT20/40)	OFDM	**BPSK**	**MCS0**~MCS7	N/A
			QPSK		
			16QAM		
			64QAM		

Note1: The worst-case mode (bold face) in all data rates has been determined during the pre-scan, only the test data of the worst-case were recorded in this report.

Note2: The RF signal transmission of EUT is controlled by the build-in engineering mode which is provided by the manufacturer. The recorded power setting value is the maximum that the engineering mode has configuration during testing.

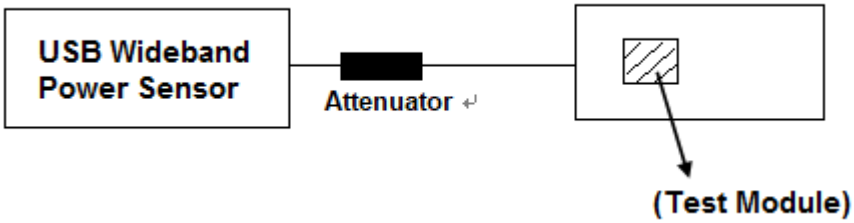
2.5. Test Conditions

Temperature (°C)	15-35
Relative Humidity (%)	30-60
Atmospheric Pressure (kPa)	86-106

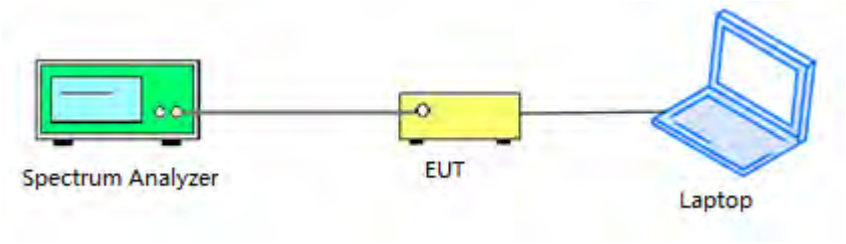
2.6. Test Setup Layout Diagram

2.6.1.Conducted Measurement

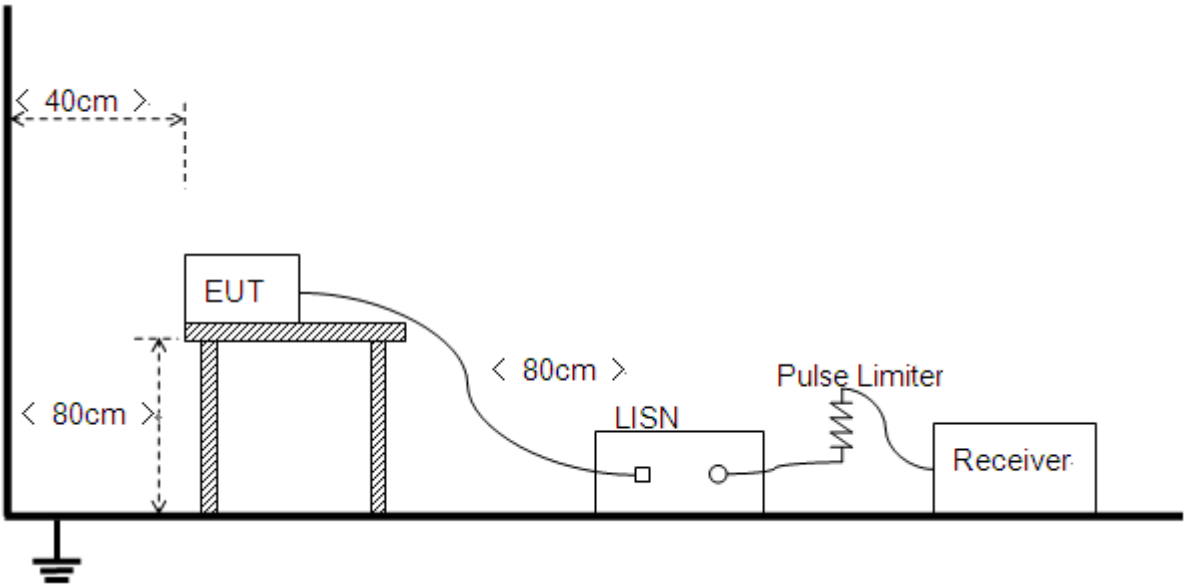
Power item



Other items

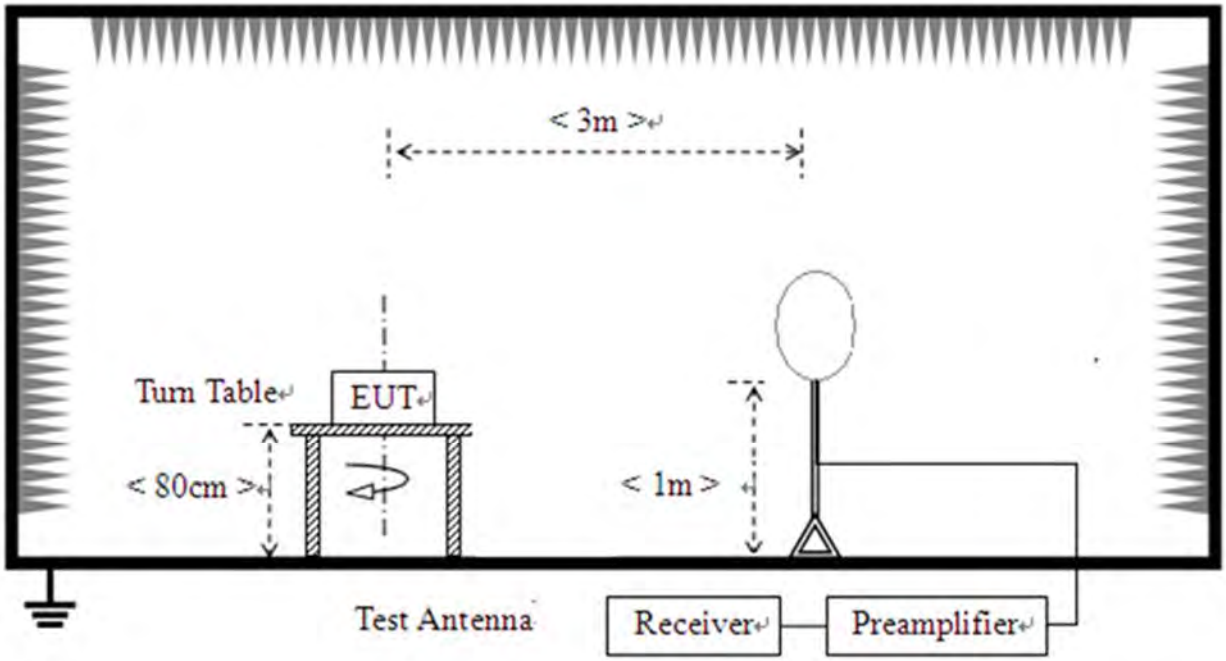


2.6.2.Conducted Emission Measurement

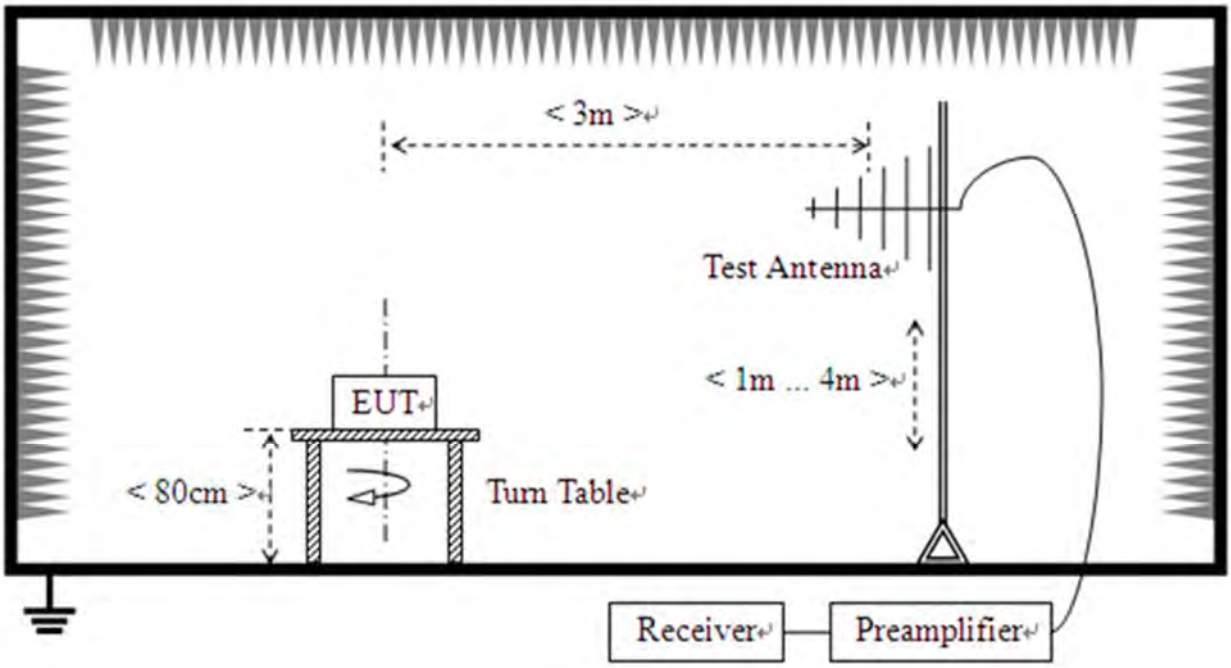


2.6.3.Radiation Measurement

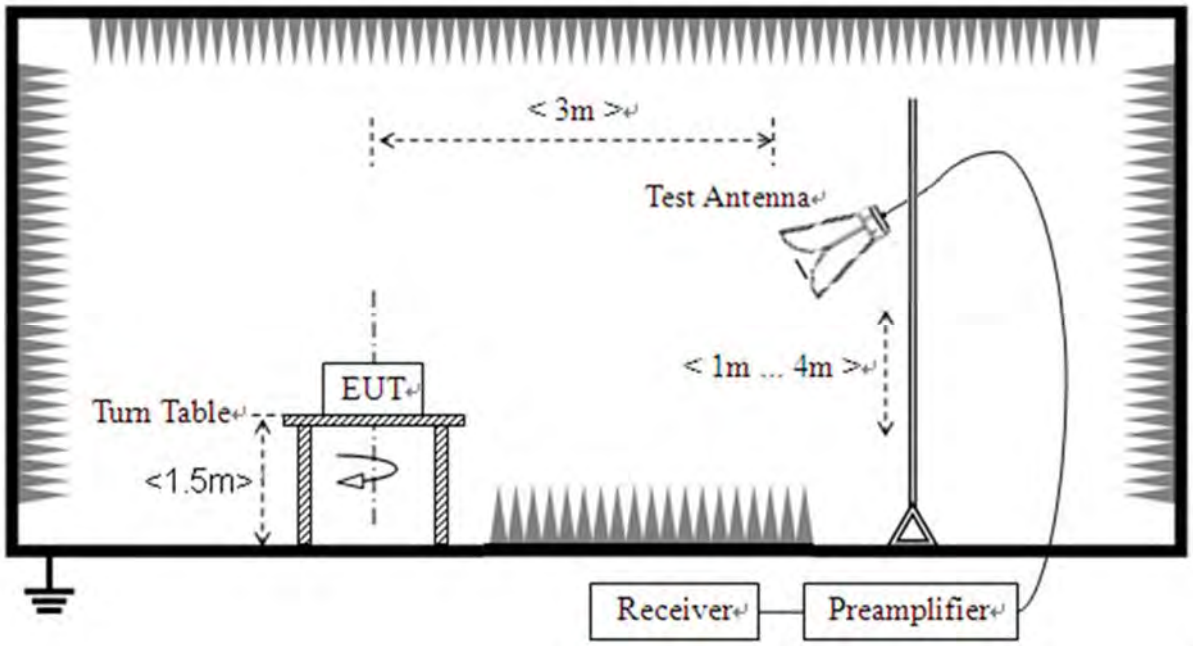
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



3) For radiated emissions above 1GHz



3. Test Results

3.1. Antenna Requirement

3.1.1.Requirement

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

3.1.2.Test Result

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

3.2. Duty Cycle of Test Signal

3.2.1.Requirement

Preferably, all measurements of maximum conducted (average) output power will be performed with the EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%).When continuous operation cannot be realized, then the use of sweep triggering/signal gating techniques can be used to ensure that measurements are made only during transmissions at the maximum power control level. Such sweep triggering/signal gating techniques will require knowledge of the minimum transmission duration(T) over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. Sweep triggering/signal gating techniques can then be used if the measurement/sweep time of the analyzer can be set such that it does not exceed T at any time that data are being acquired (i.e.,no transmitter OFF-time is to be considered).
When continuous transmission cannot be achieved and sweep triggering/signal gating cannot be implemented, alternative procedures are provided that can be used to measure the average power; however, they will require an additional measurement of the transmitter duty cycle (D). Within this sub clause, the duty cycle refers to the fraction of time over which the transmitter is ON and is transmitting at its maximum power control level. The duty cycle is considered to be constant if variations are less than ±2%; otherwise, the duty cycle is considered to be non constant.

3.2.2.Test Result

Refer to Annex A.1 in this report.

3.3. Maximum Peak and Average Conducted Output Power

3.3.1. Requirement

According to FCC section 15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: The maximum conducted output power of the intentional radiator shall not exceed 1 Watt.

3.3.2. Test Procedures

The EUT (Equipment under the test) which is coupled to the USB Wideband Power Sensor; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

3.3.3. Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.3.4. Test Result

Refer to Annex A.2 and A.3 in this report.

3.4.6 dB Bandwidth

3.4.1.Requirement

According to FCC section 15.247(a) (2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

3.4.1.Test Procedures

KDB 558074 Section 8.2 was used in order to prove compliance.

3.4.2.Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.4.3.Test Result

Refer to Annex A.4 in this report.

3.5. Conducted Spurious Emissions and Band Edge

3.5.1. Requirement

According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

3.5.2. Test Procedures

KDB 558074 Section 8.5 and 8.7 was used in order to prove compliance.

3.5.3. Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.5.4. Test Result

Refer to Annex A.5 and A.6 in this report.

3.6. Power Spectral Density

3.6.1.Requirement

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

3.6.2.Test Procedures

The measured power spectral density was calculated by the reading of the spectrum analyzer and calibration. Following is the test procedure for PSD test:
a) Set analyzer center frequency to channel center frequency
b) Set span to1.5 times DTS
c) Set RBW to 30kHz
d) Set VBW to 100kHz
e) Detector = peak
f) Sweep time = auto couple
g) Trace mode = max hold
h) Allow trace to fully stabilize
i) Use the peak marker function to determine the maximum amplitude level and recorded as PD
j) Use below formula to calculate the Conducted PSD value that at specified RBW:
Conducted PSD=PD-10lg(30k/3k)

3.6.3.Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.6.4.Test Result

Refer to Annex A.7 in this report.

3.7. Conducted Emission

3.7.1.Requirement

According to FCC section 15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

Frequency Range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

Note:

(a) The lower limit shall apply at the band edges.

(b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

3.7.2.Test Procedures

The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10: 2013.

3.7.3.Test Setup Layout

Refer to chapter 2.6.2 in this report.

3.7.4.Test Result

Refer to Annex A.8 in this report.

3.8. Restricted Frequency Bands

3.8.1.Requirement

According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

3.8.2.Test Procedures

The EUT is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading.
For the Test Antenna:
Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.
Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1GHz, 100 kHz for f < 1GHz
VBW = 3 MHz
Sweep = auto
Detector function = peak/average
Trace = max hold
Allow the trace to stabilize

3.8.3.Test Setup Layout

Refer to chapter 2.6.3 in this report.

3.8.4.Test Result

Refer to Annex A.9 in this report.

3.9. Radiated Emission

3.9.1.Requirement

According to FCC section 15.247(d), radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Note1: For above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
Note2: For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table).

3.9.2.Test Procedures

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz.The antenna to EUT distance is 3meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 30MHz, the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9kHz-90 kHz, 110kHz-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

For measurements below 1GHz the resolution bandwidth is set to 100kHz for peak detection measurements or 120kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video band width is set to 3MHz for peak measurements and as applicable for average measurements.

The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions. For measurements above 1 GHz, keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.

3.9.3.Test Setup Layout

Refer to chapter 2.6.3 in this report.

3.9.4.Test Result

Refer to Annex A.10 in this report.

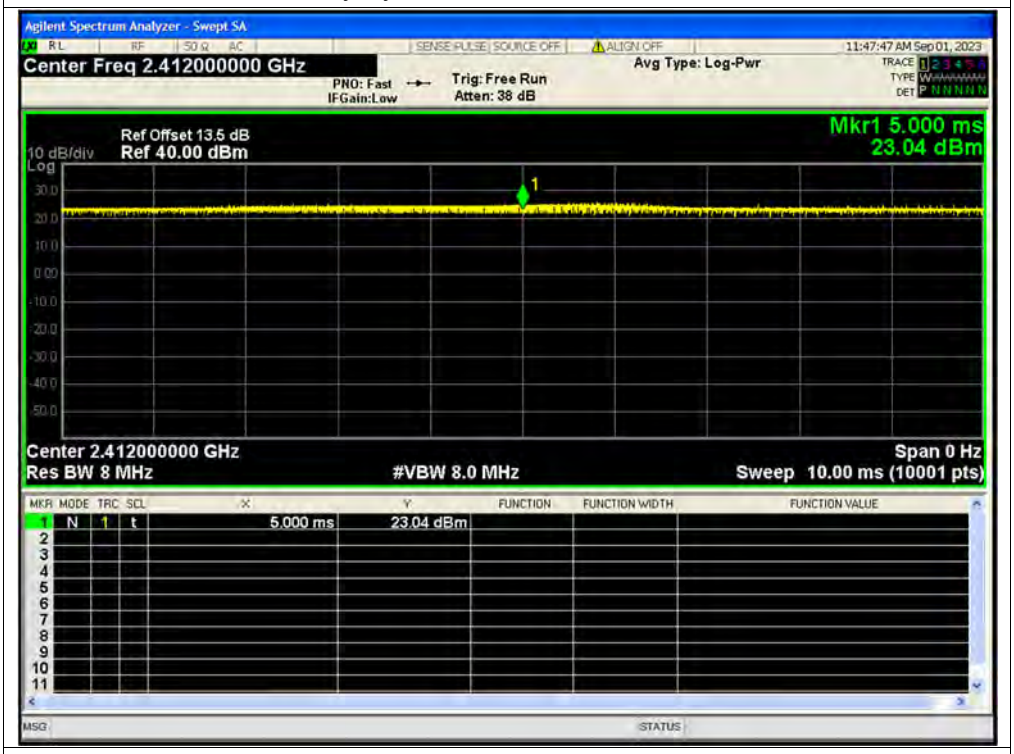
Annex A Test Data and Result

A.1. Duty Cycle of Test Signal

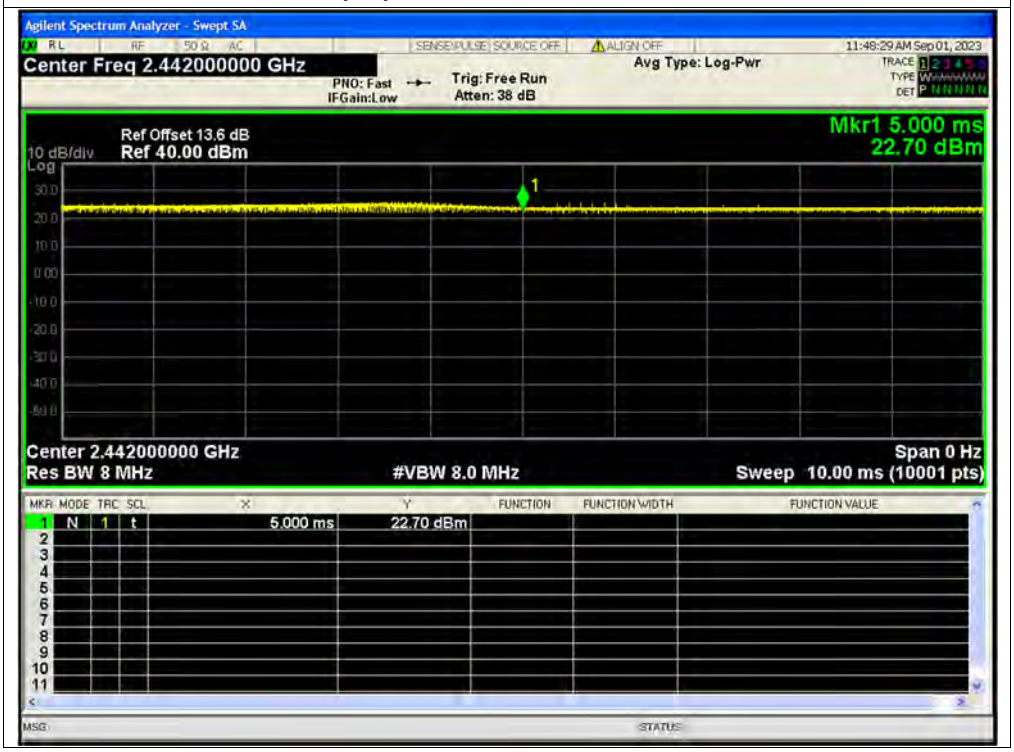
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	b	2412	Ant1	100	0	0
NVNT	b	2442	Ant1	100	0	0
NVNT	b	2472	Ant1	100	0	0
NVNT	g	2412	Ant1	99.56	0.02	0.18
NVNT	g	2442	Ant1	99.56	0.02	0.18
NVNT	g	2472	Ant1	99.53	0.02	0.18
NVNT	n20	2412	Ant1	99.53	0.02	0.2
NVNT	n20	2442	Ant1	99.53	0.02	0.2
NVNT	n20	2472	Ant1	99.49	0.02	0.2
NVNT	n40	2422	Ant1	99.04	0.04	0.4
NVNT	n40	2442	Ant1	98.96	0.05	0.41
NVNT	n40	2462	Ant1	98.96	0.05	0.41

Test Graphs

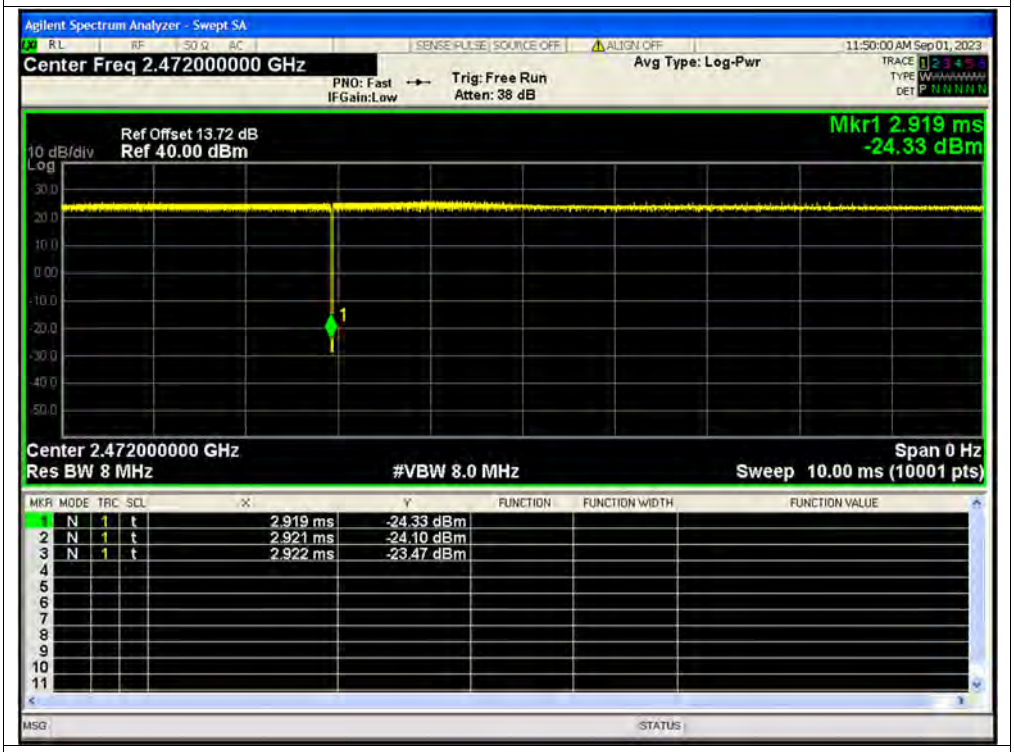
Duty Cycle NVNT b 2412MHz Ant1



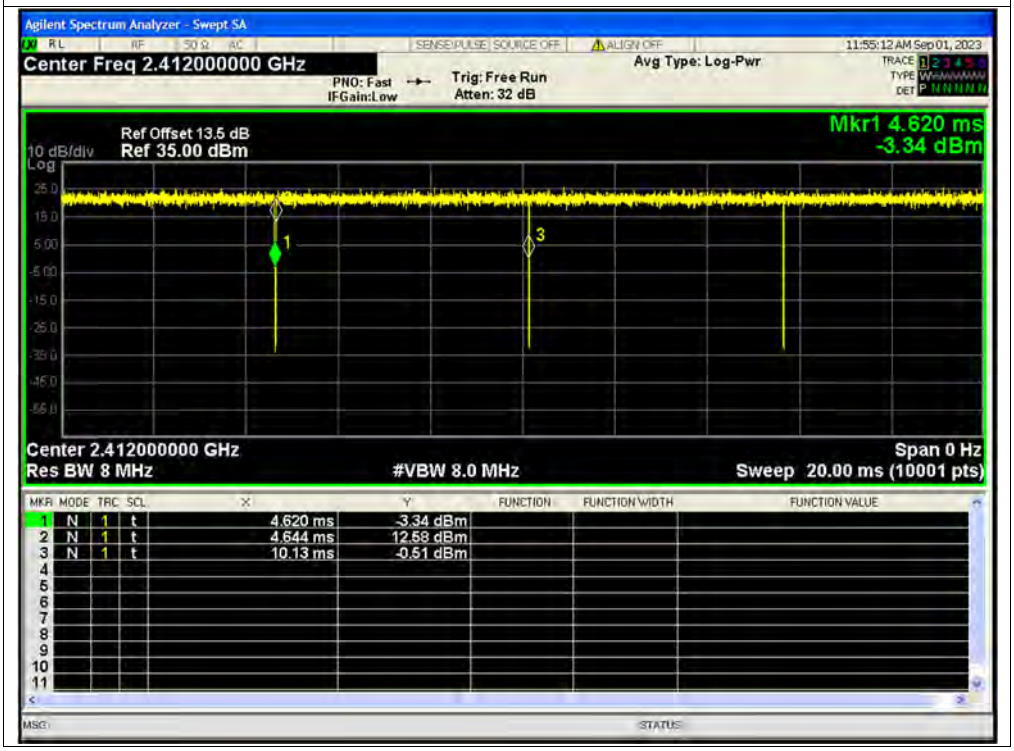
Duty Cycle NVNT b 2442MHz Ant1



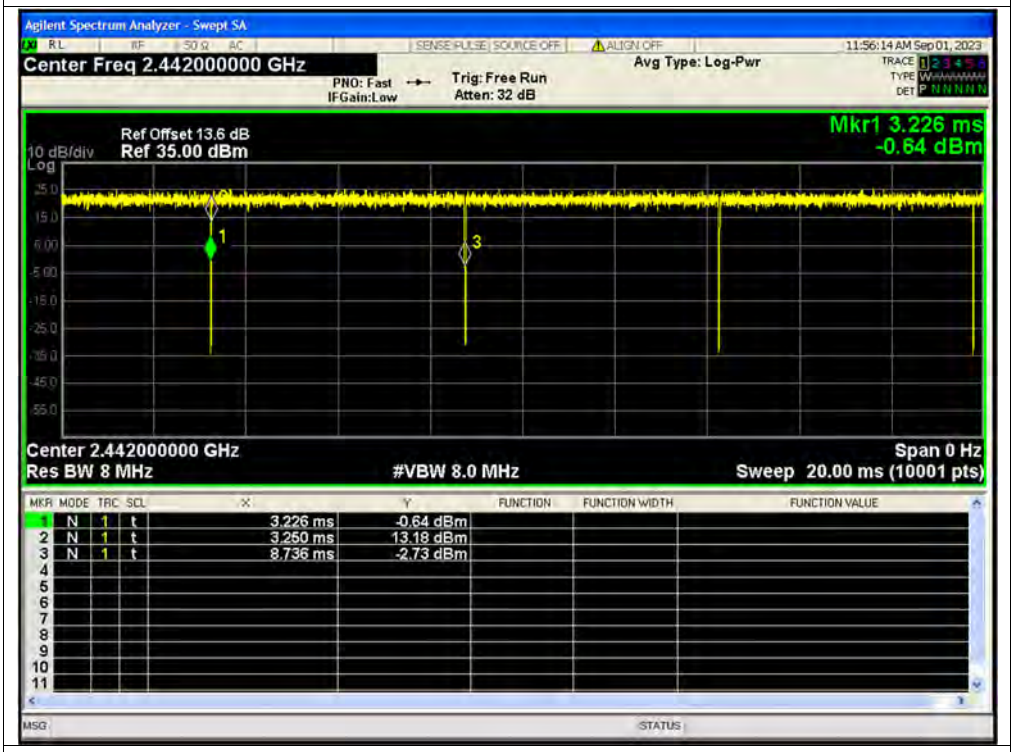
Duty Cycle NVNT b 2472MHz Ant1



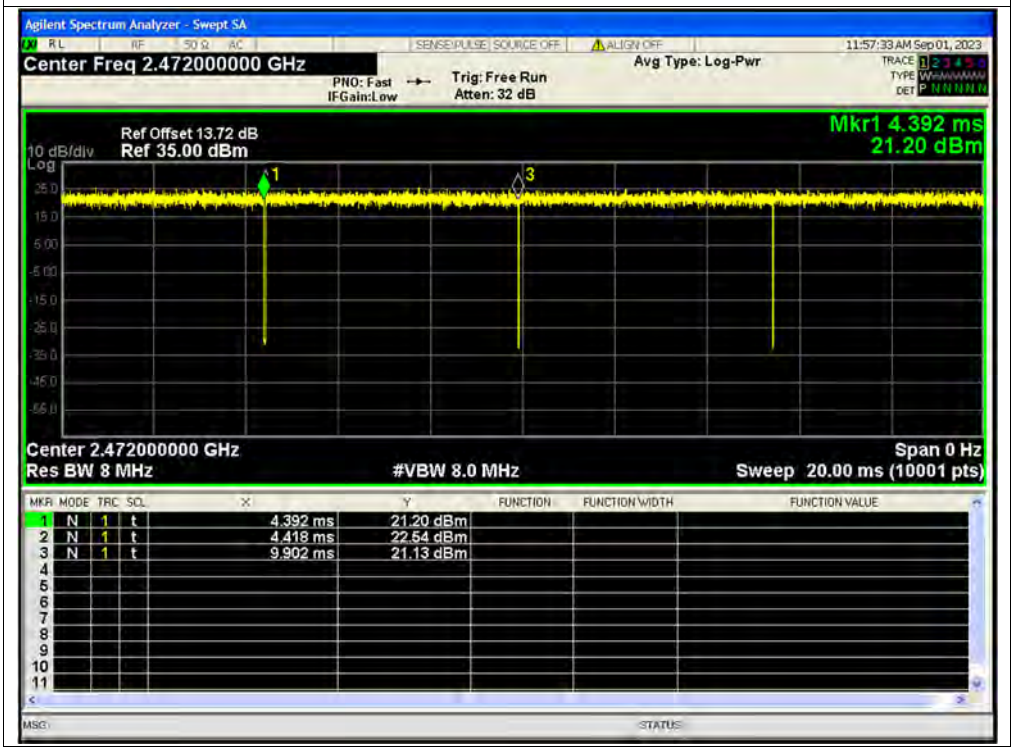
Duty Cycle NVNT g 2412MHz Ant1



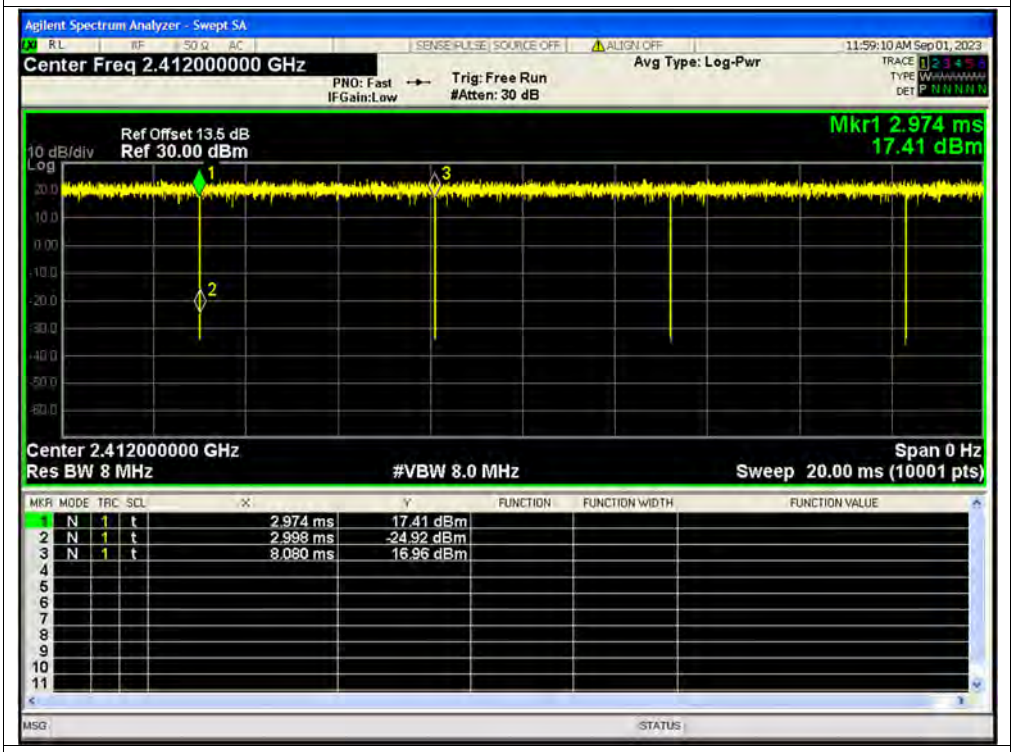
Duty Cycle NVNT g 2442MHz Ant1



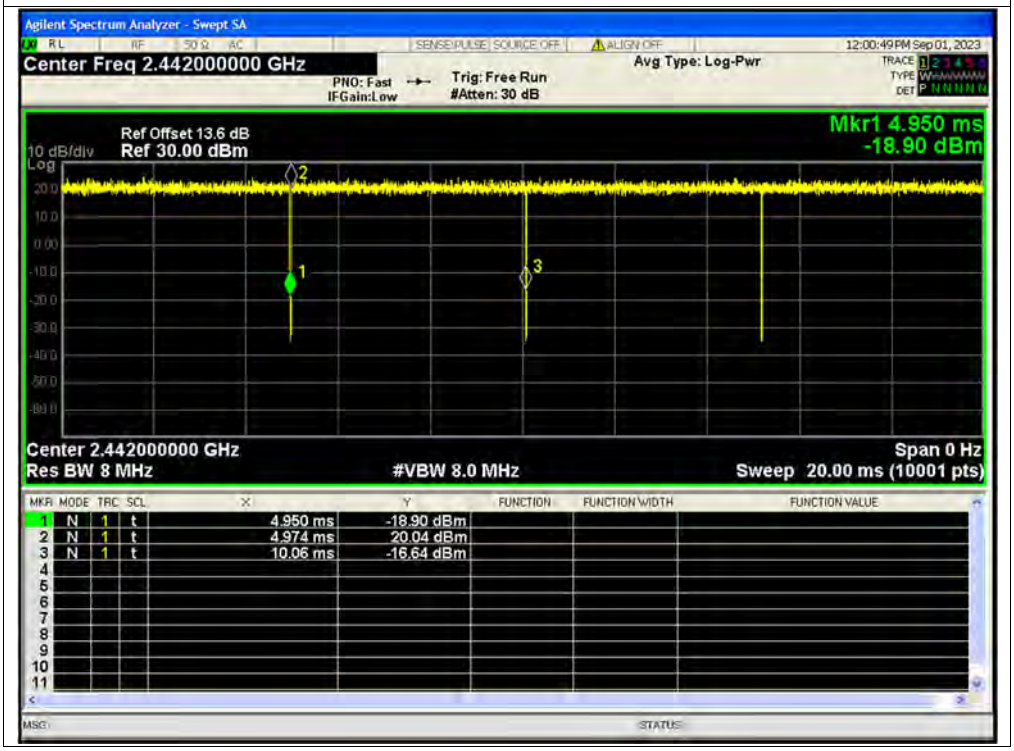
Duty Cycle NVNT g 2472MHz Ant1



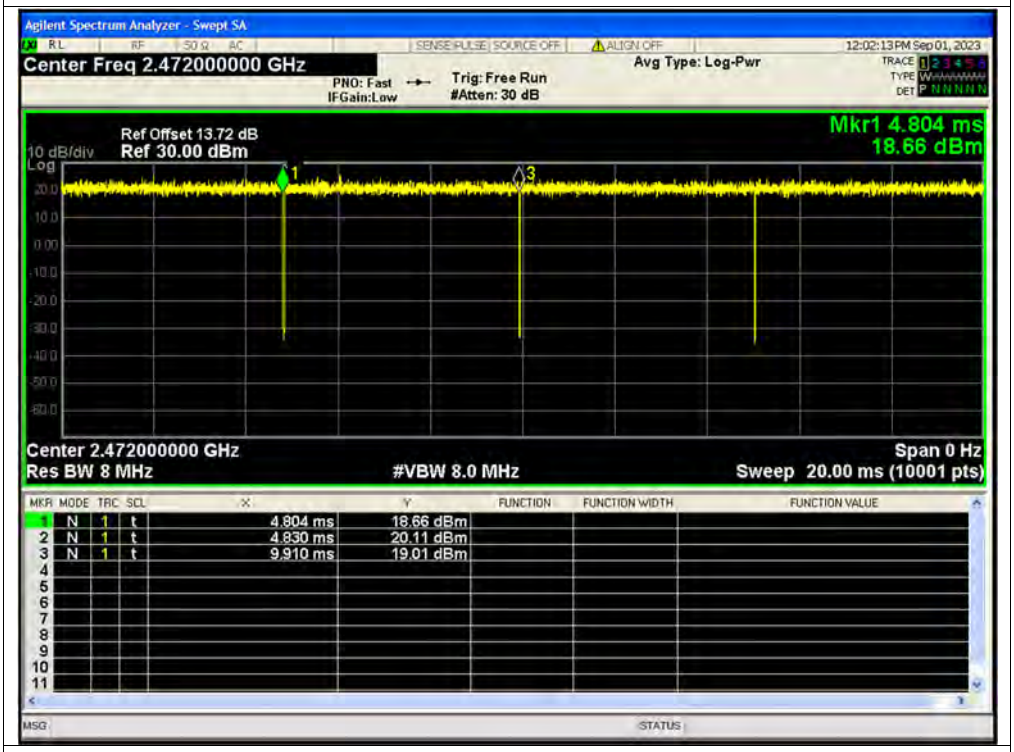
Duty Cycle NVNT n20 2412MHz Ant1



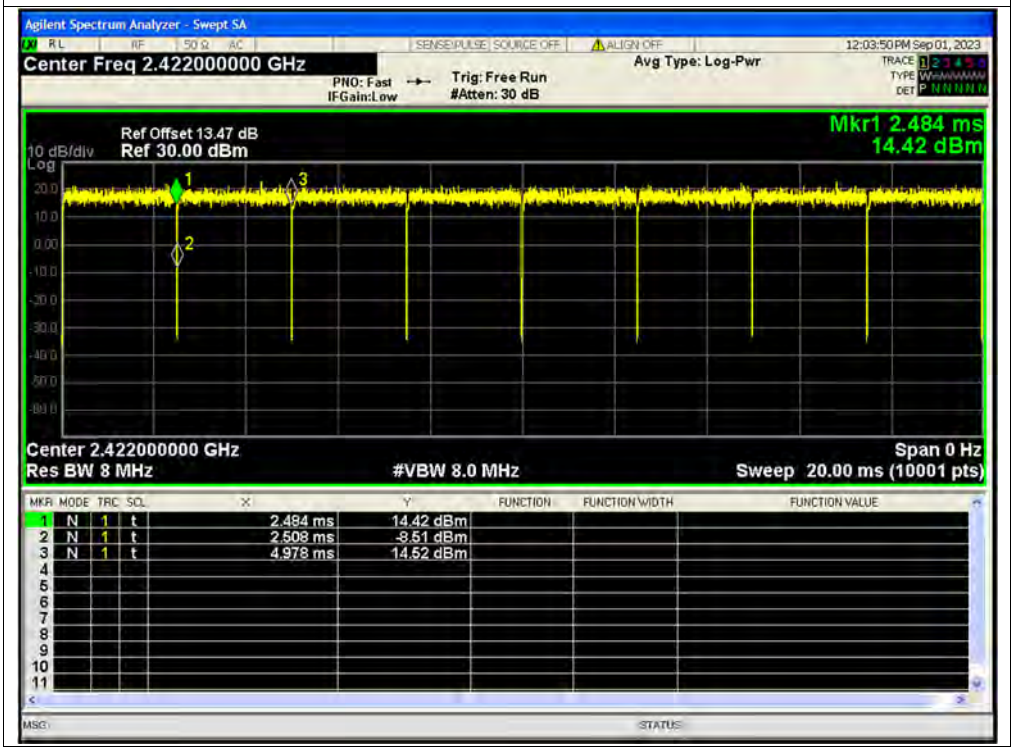
Duty Cycle NVNT n20 2442MHz Ant1



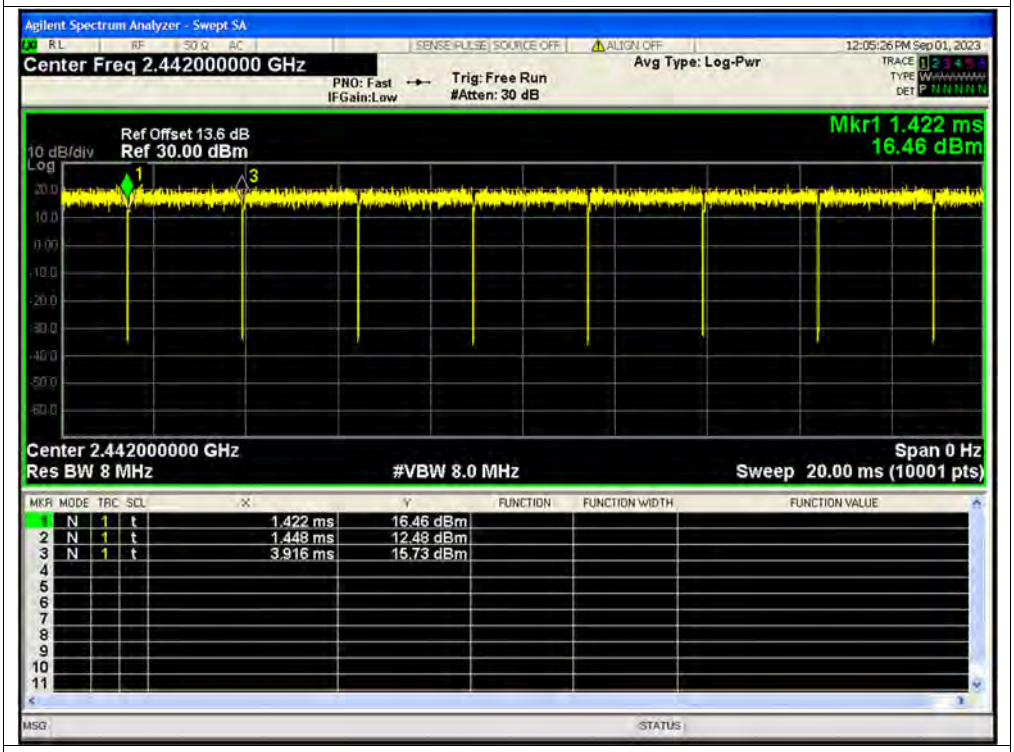
Duty Cycle NVNT n20 2472MHz Ant1



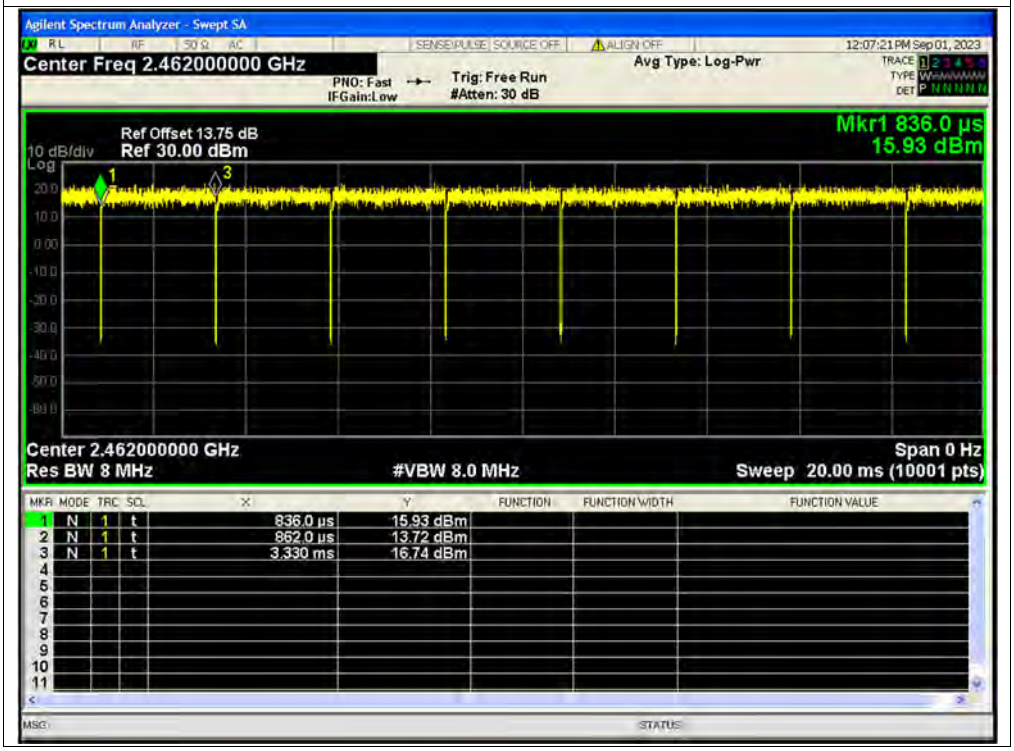
Duty Cycle NVNT n40 2422MHz Ant1



Duty Cycle NVNT n40 2442MHz Ant1



Duty Cycle NVNT n40 2462MHz Ant1

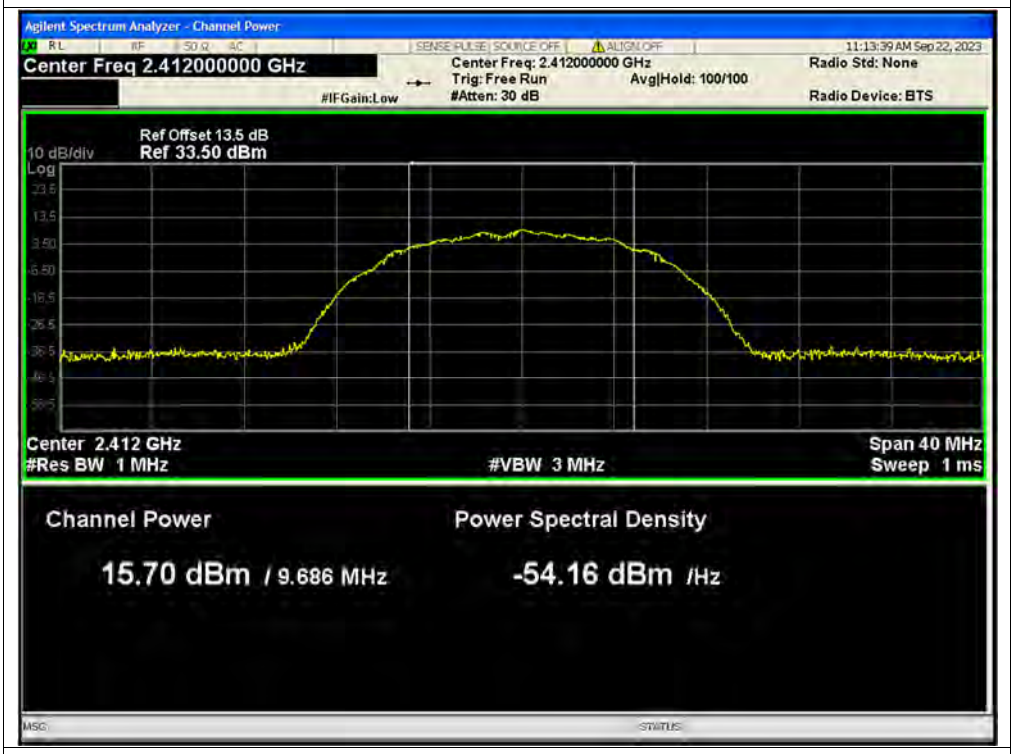


A.2. Maximum Peak Conducted Output Power

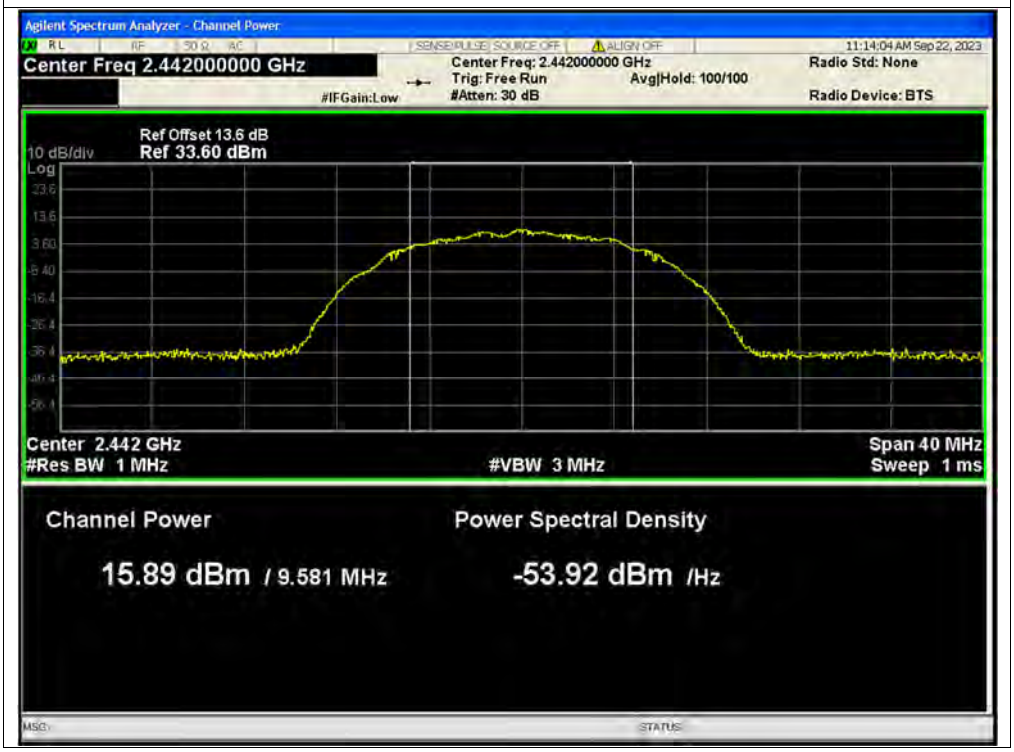
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Total Conducted Power (W)	Limit (dBm)	Verdict
NVNT	b	2412	Ant1	15.7	0	15.7	0.03715	30	Pass
NVNT	b	2442	Ant1	15.89	0	15.89	0.03882	30	Pass
NVNT	b	2472	Ant1	15.53	0	15.53	0.03573	30	Pass
NVNT	g	2412	Ant1	16.76	0	16.76	0.04742	30	Pass
NVNT	g	2442	Ant1	16.89	0	16.89	0.04887	30	Pass
NVNT	g	2472	Ant1	16.73	0	16.73	0.0471	30	Pass
NVNT	n20	2412	Ant1	16.74	0	16.74	0.04721	30	Pass
NVNT	n20	2442	Ant1	16.94	0	16.94	0.04943	30	Pass
NVNT	n20	2472	Ant1	16.34	0	16.34	0.04305	30	Pass
NVNT	n40	2422	Ant1	16.87	0	16.87	0.04864	30	Pass
NVNT	n40	2442	Ant1	16.96	0	16.96	0.04966	30	Pass
NVNT	n40	2462	Ant1	16.8	0	16.8	0.04786	30	Pass

Test Graphs

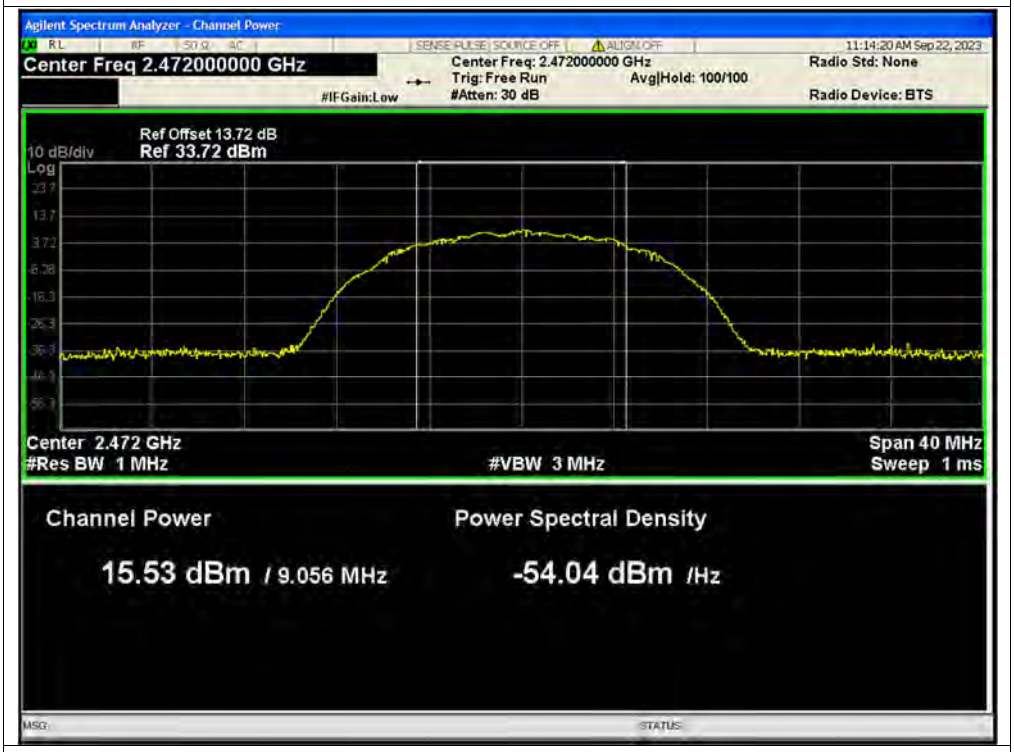
Peak Power NVNT b 2412MHz Ant1



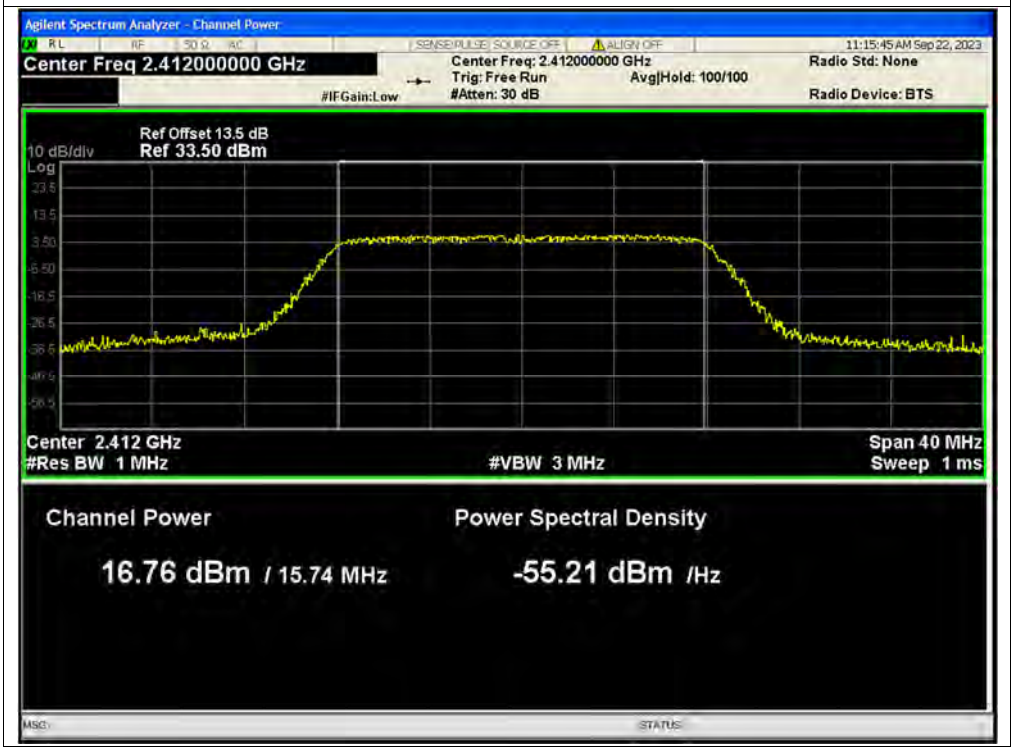
Peak Power NVNT b 2442MHz Ant1



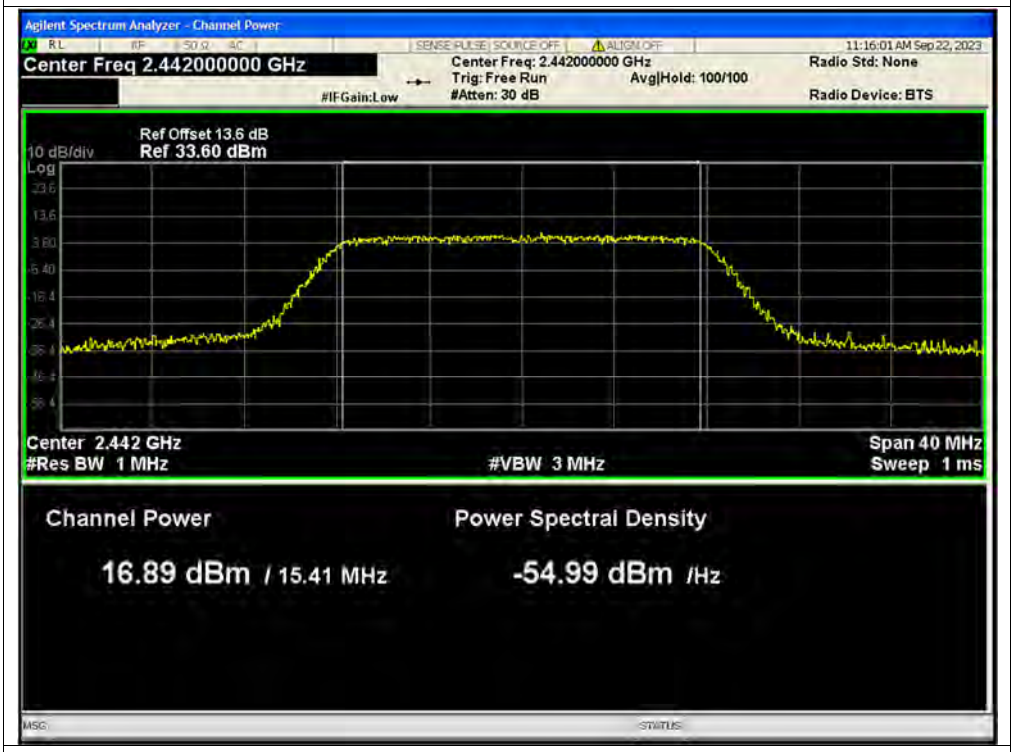
Peak Power NVNT b 2472MHz Ant1



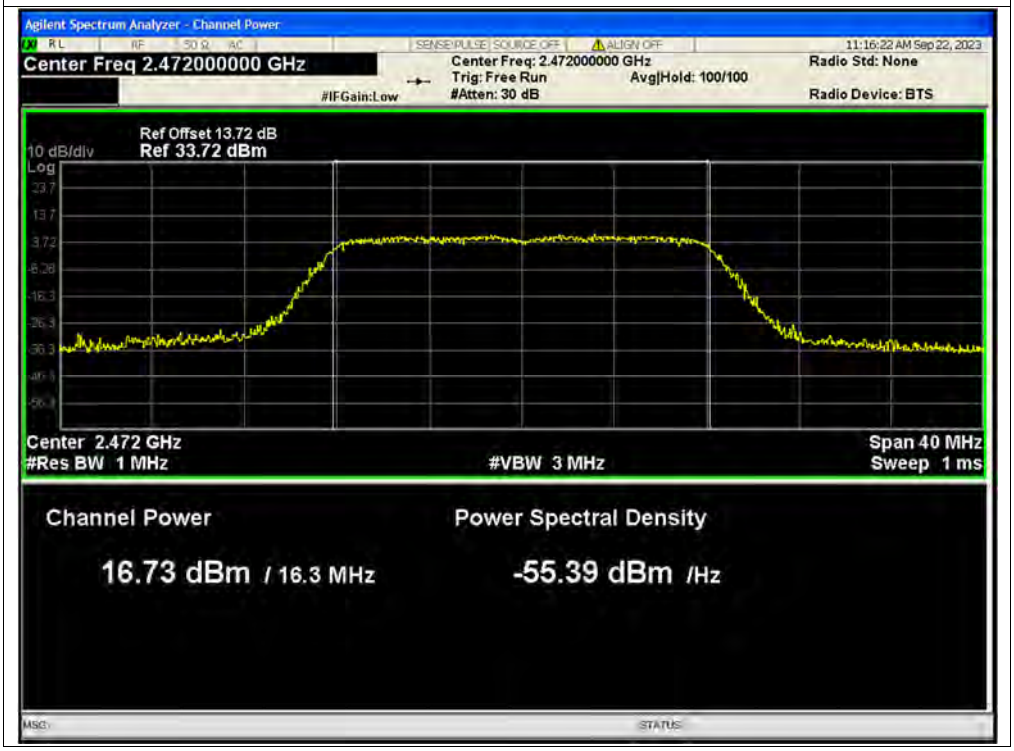
Peak Power NVNT g 2412MHz Ant1



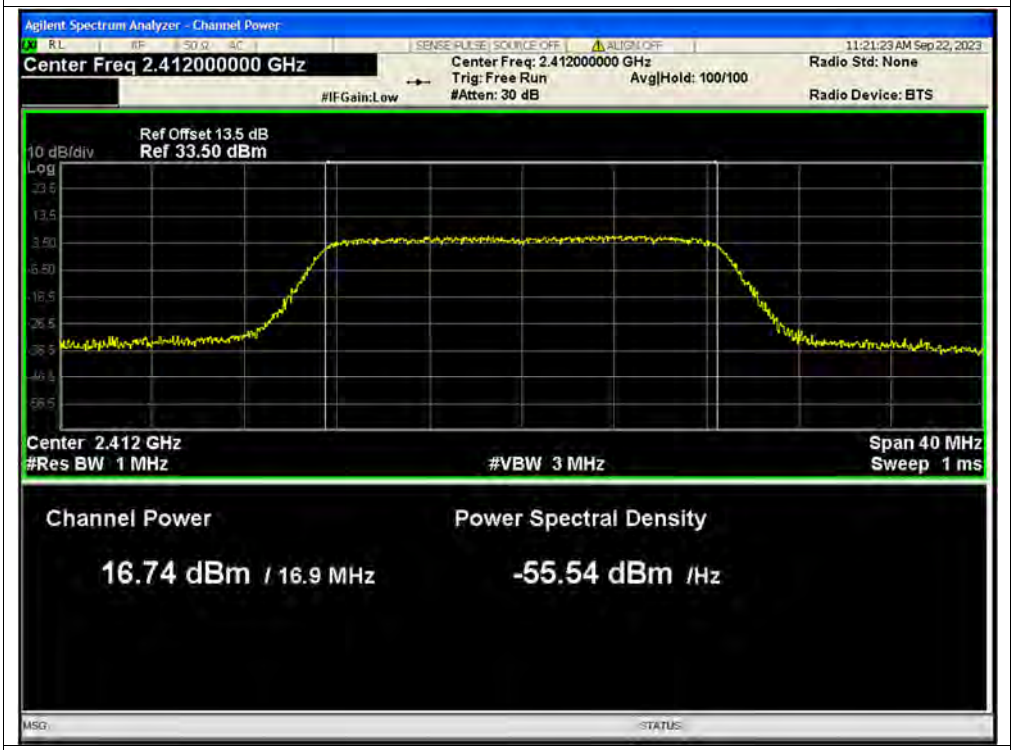
Peak Power NVNT g 2442MHz Ant1



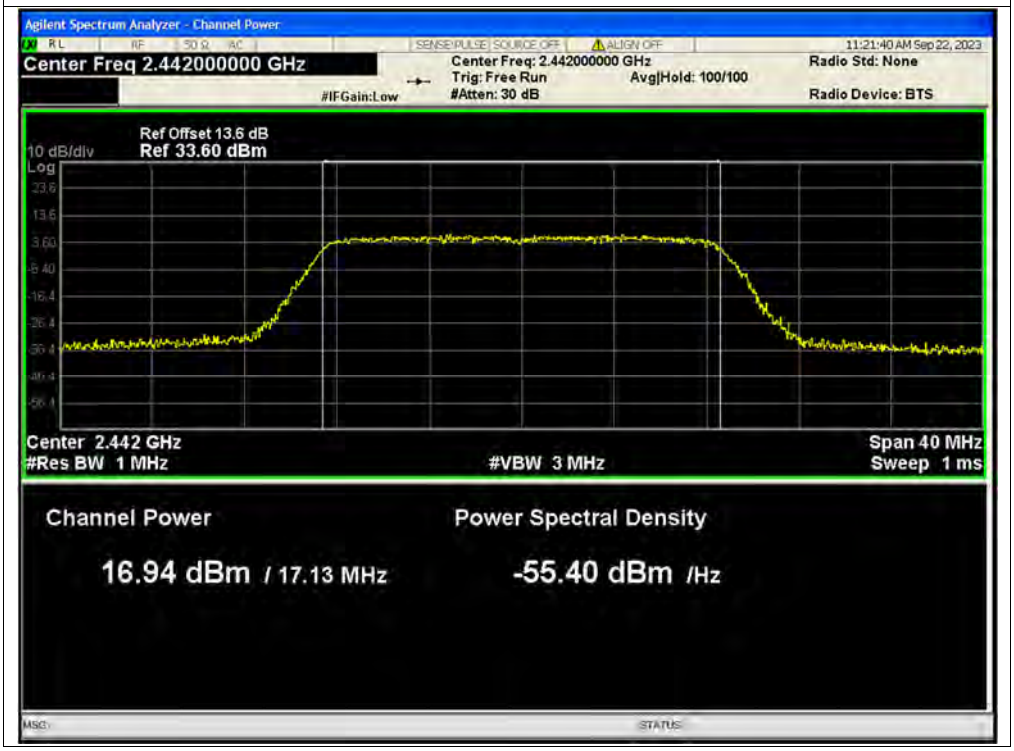
Peak Power NVNT g 2472MHz Ant1



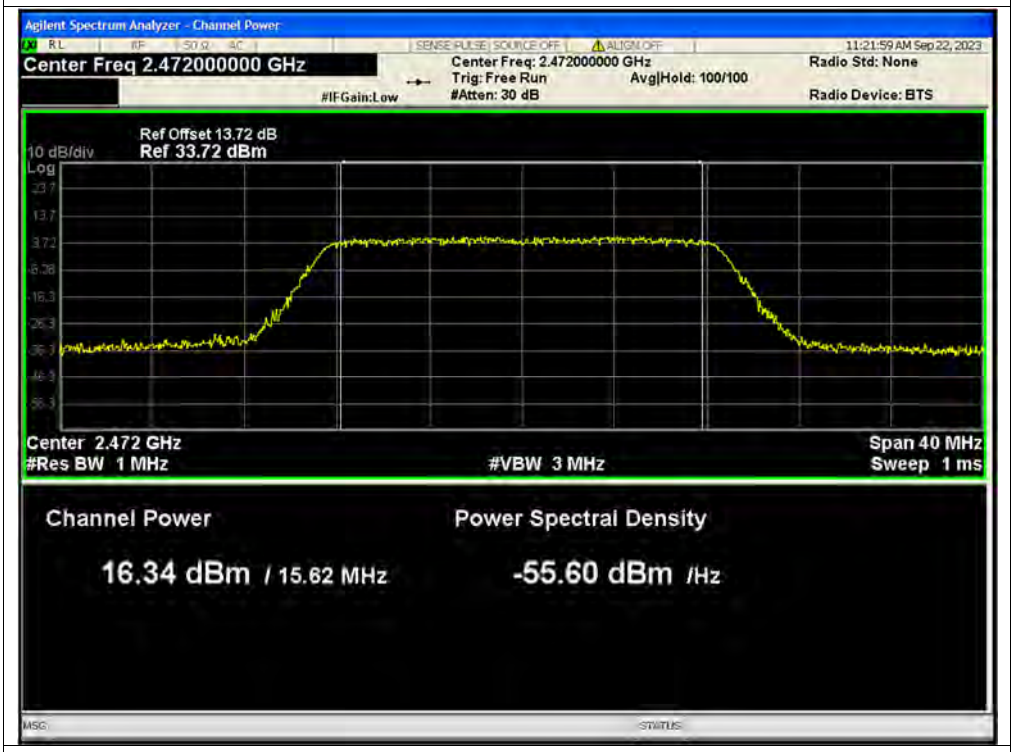
Peak Power NVNT n20 2412MHz Ant1



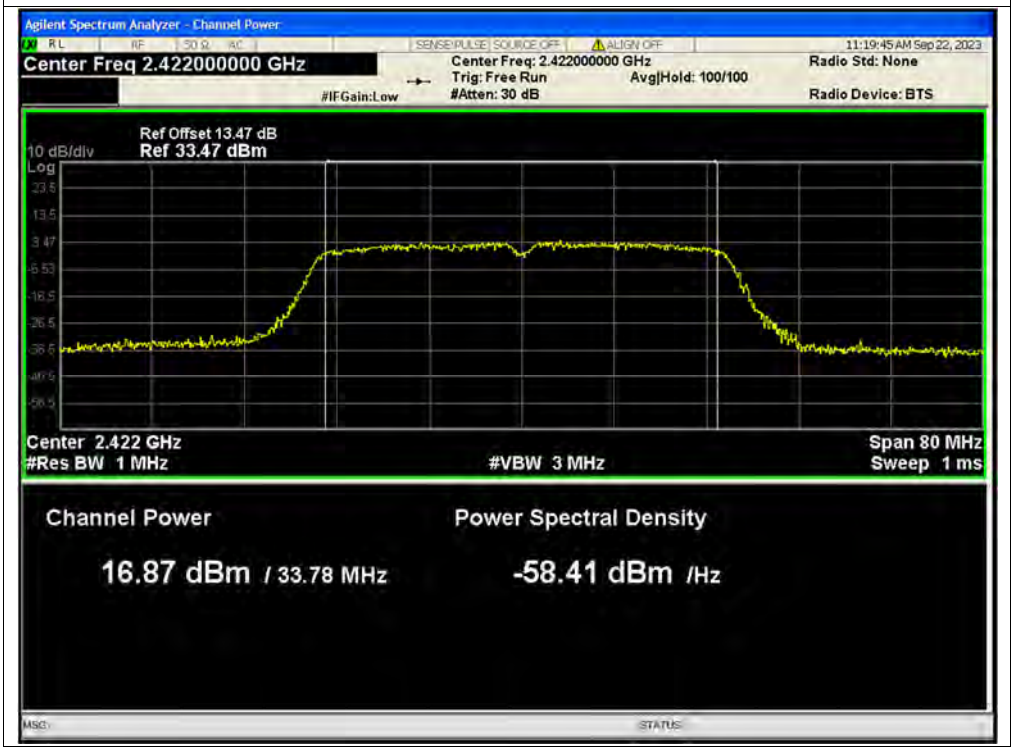
Peak Power NVNT n20 2442MHz Ant1



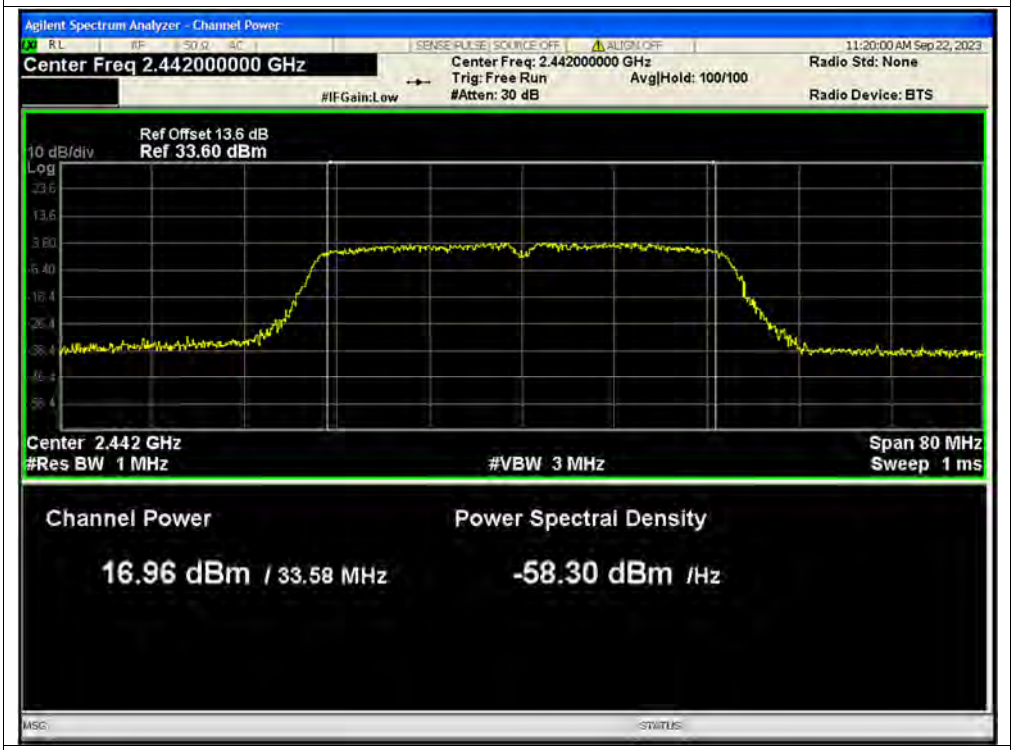
Peak Power NVNT n20 2472MHz Ant1



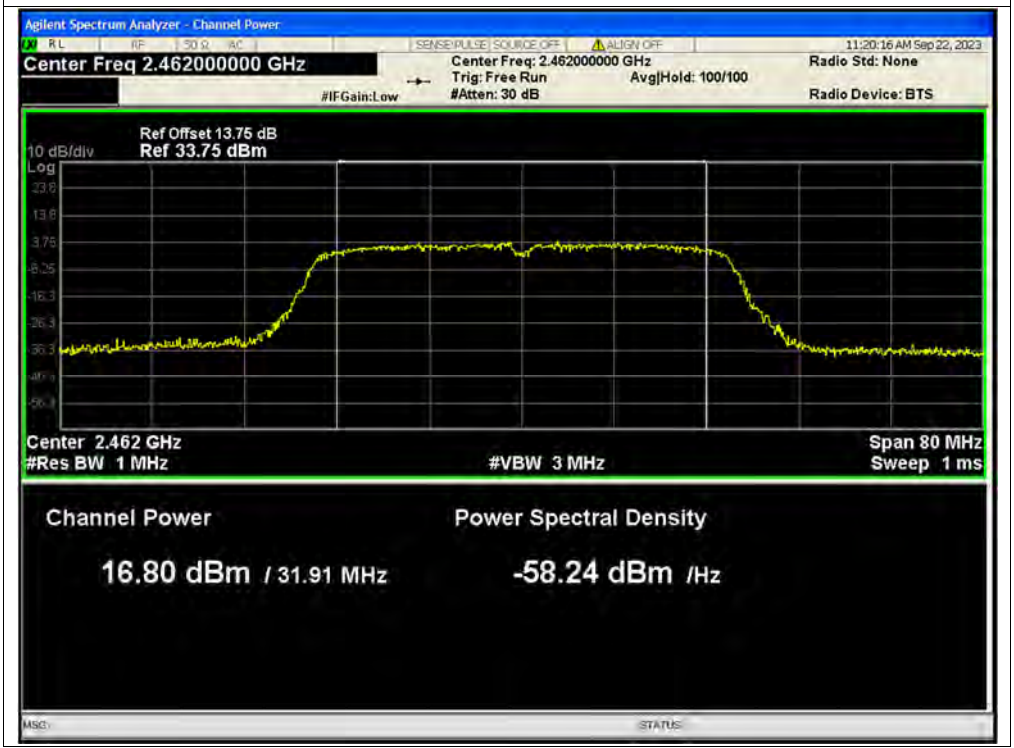
Peak Power NVNT n40 2422MHz Ant1



Peak Power NVNT n40 2442MHz Ant1



Peak Power NVNT n40 2462MHz Ant1

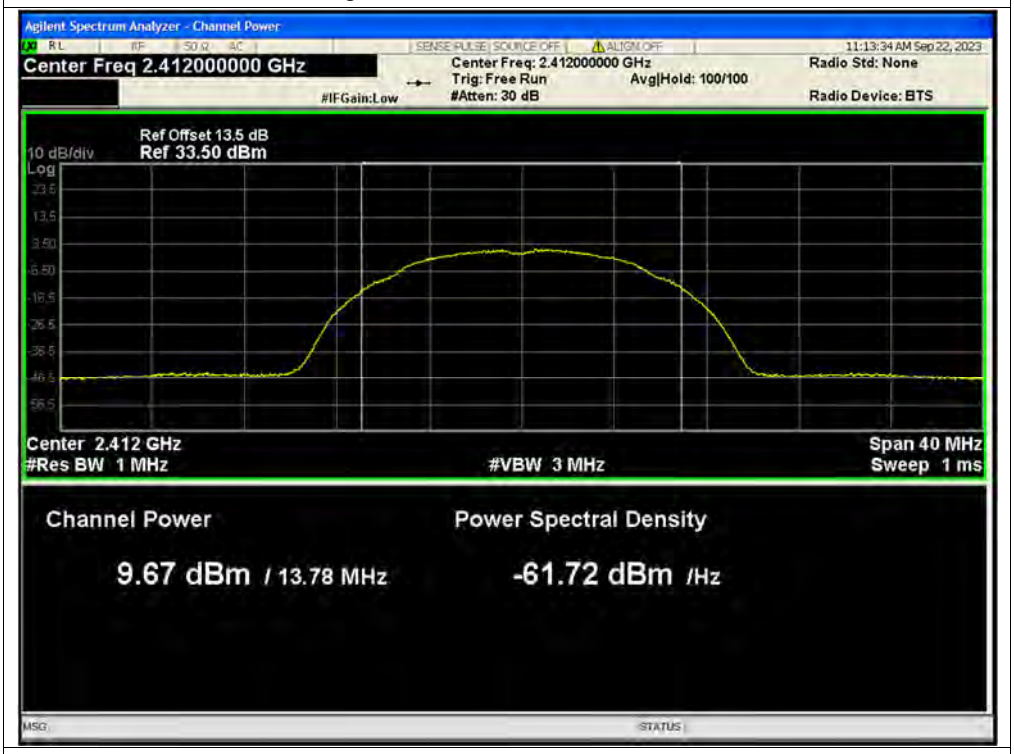


A.3. Maximum Average Conducted Output Power

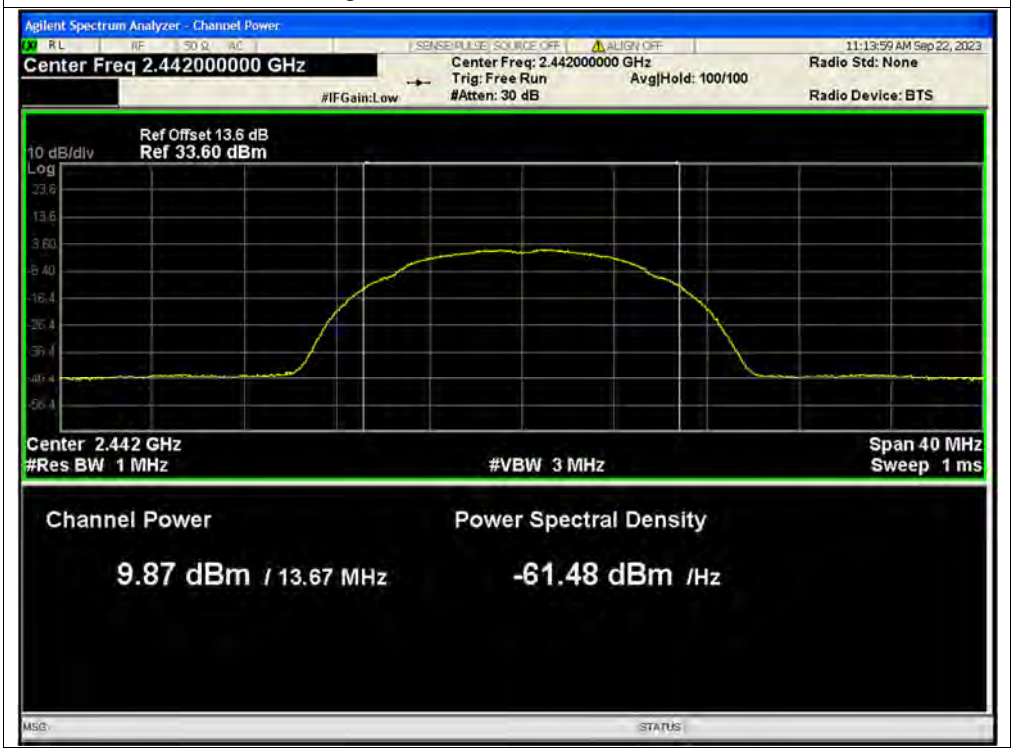
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Total Conducted Power (W)	Limit (dBm)	Verdict
NVNT	b	2412	Ant1	9.67	0	9.67	0.00927	30	Pass
NVNT	b	2442	Ant1	9.87	0	9.87	0.00971	30	Pass
NVNT	b	2472	Ant1	9.6	0	9.6	0.00912	30	Pass
NVNT	g	2412	Ant1	9.71	0.02	9.73	0.0094	30	Pass
NVNT	g	2442	Ant1	9.94	0.02	9.96	0.00991	30	Pass
NVNT	g	2472	Ant1	9.63	0.02	9.65	0.00923	30	Pass
NVNT	n20	2412	Ant1	9.6	0.02	9.62	0.00916	30	Pass
NVNT	n20	2442	Ant1	9.74	0.02	9.76	0.00946	30	Pass
NVNT	n20	2472	Ant1	9.47	0.02	9.49	0.00889	30	Pass
NVNT	n40	2422	Ant1	9.76	0.04	9.8	0.00955	30	Pass
NVNT	n40	2442	Ant1	9.82	0.05	9.87	0.00971	30	Pass
NVNT	n40	2462	Ant1	9.76	0.05	9.81	0.00957	30	Pass

Test Graphs

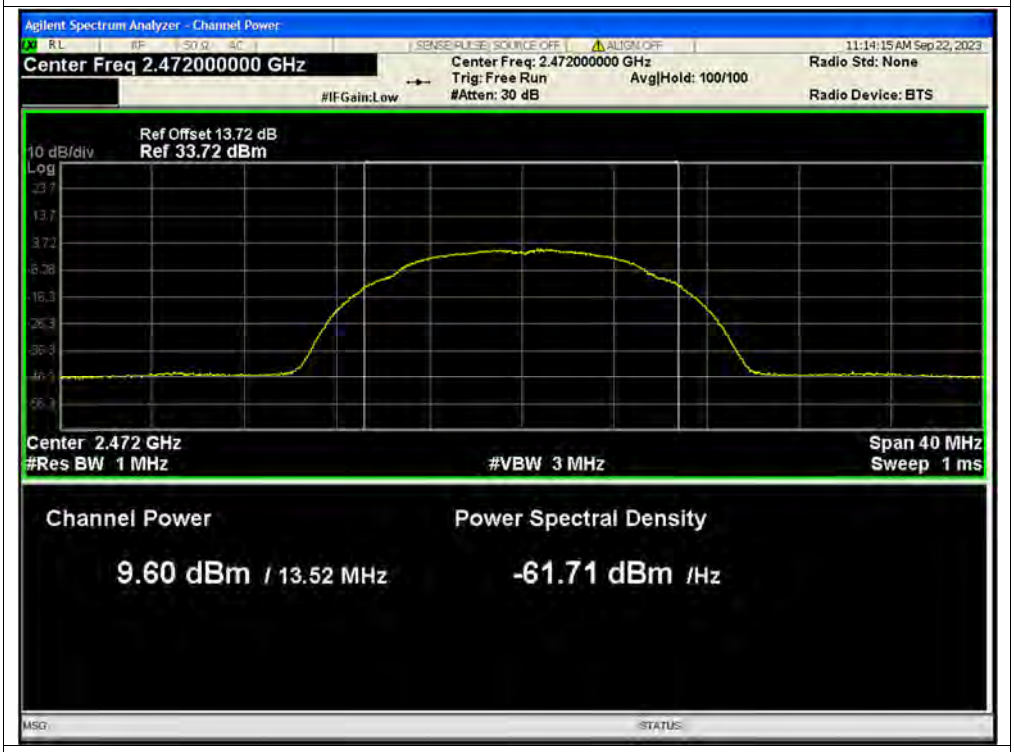
Average Power NVNT b 2412MHz Ant1



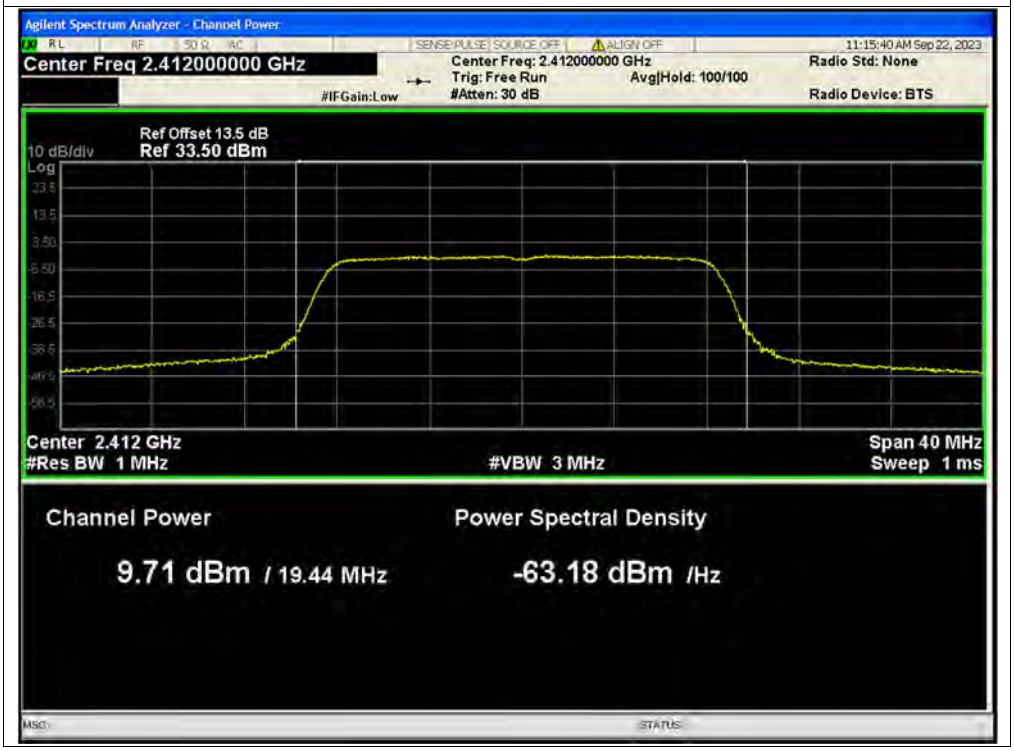
Average Power NVNT b 2442MHz Ant1



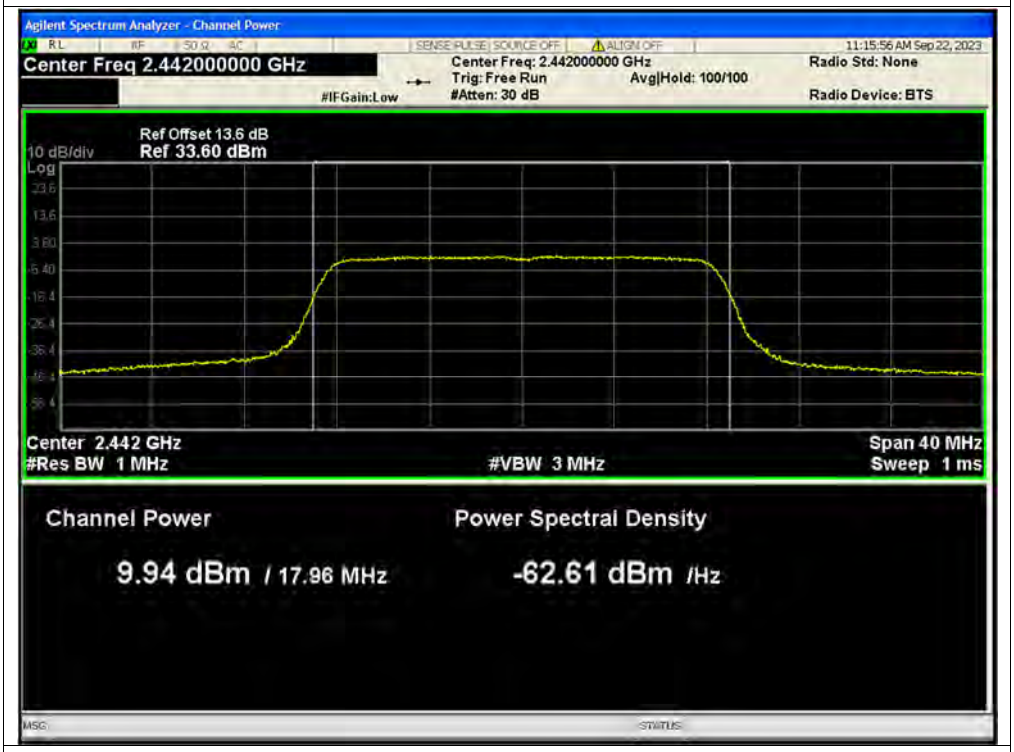
Average Power NVNT b 2472MHz Ant1



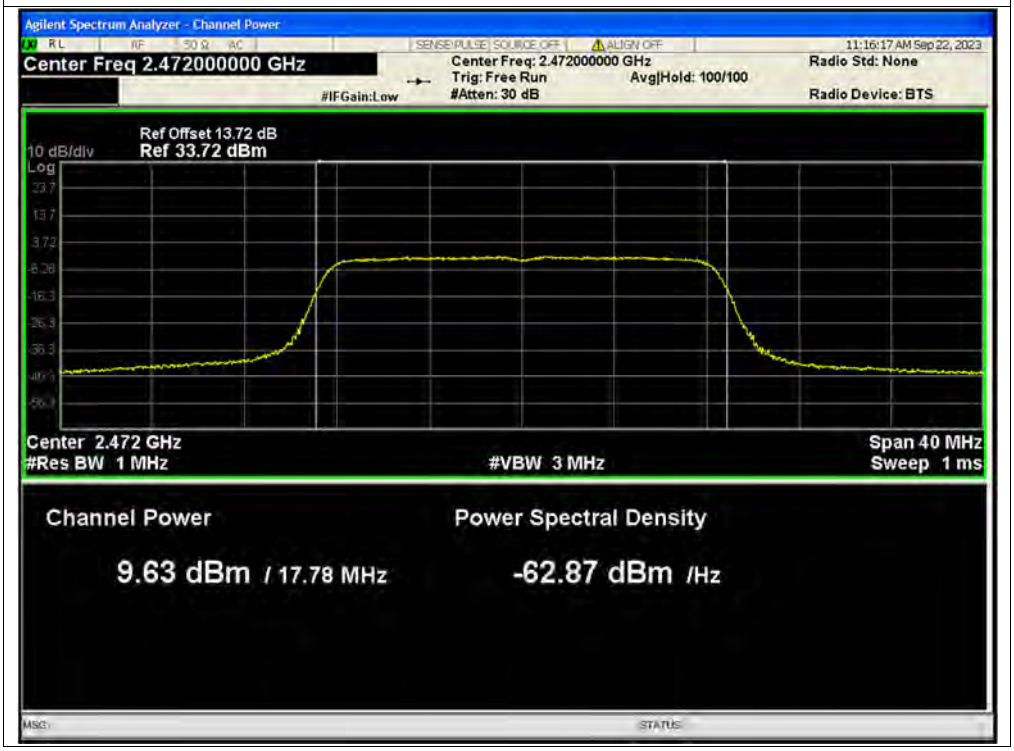
Average Power NVNT g 2412MHz Ant1



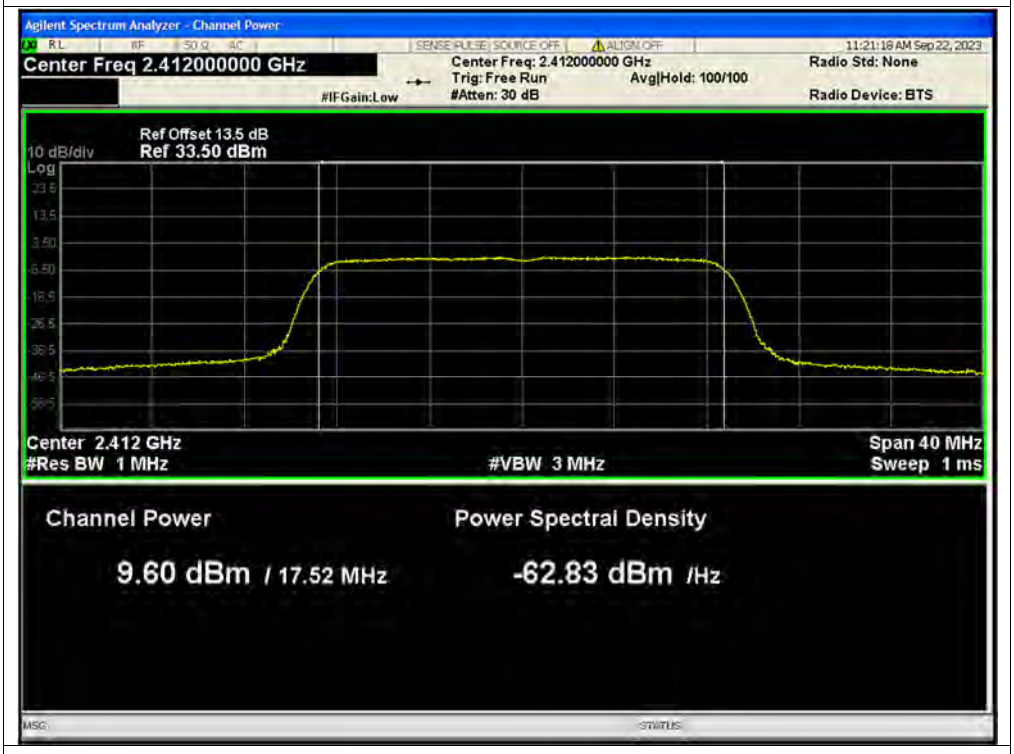
Average Power NVNT g 2442MHz Ant1



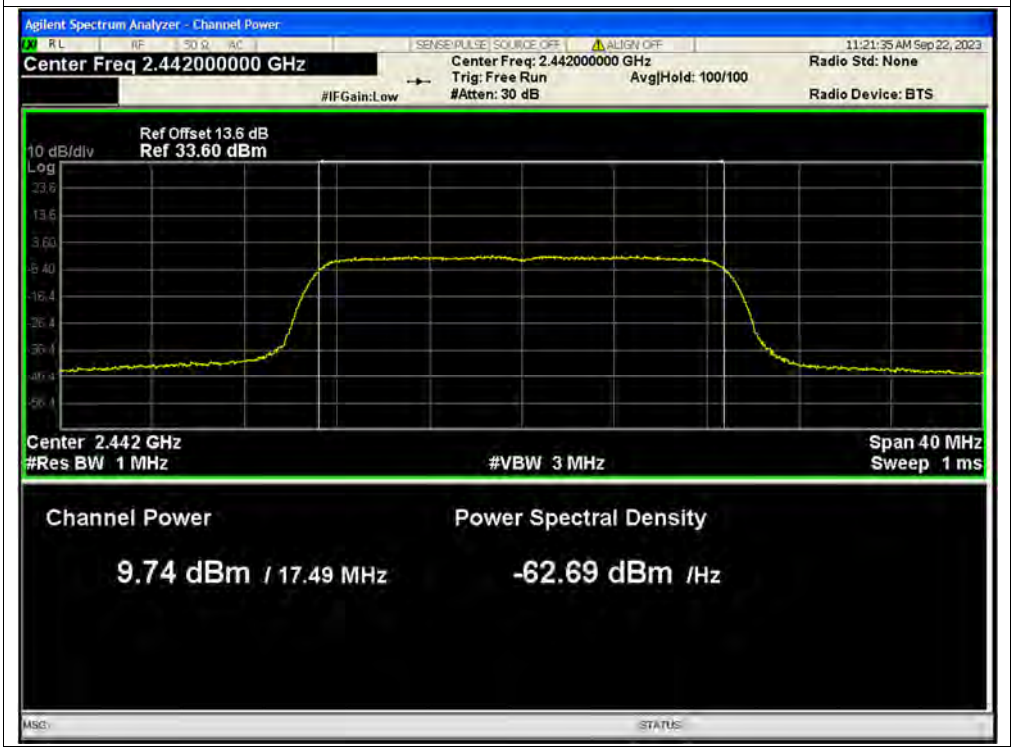
Average Power NVNT g 2472MHz Ant1



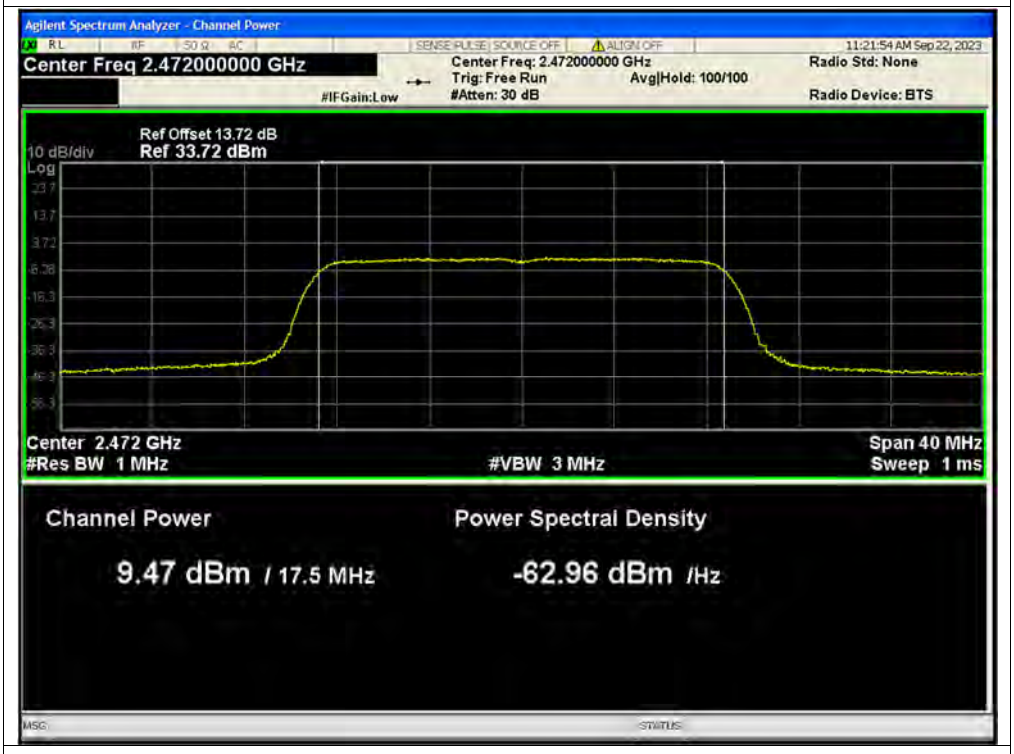
Average Power NVNT n20 2412MHz Ant1



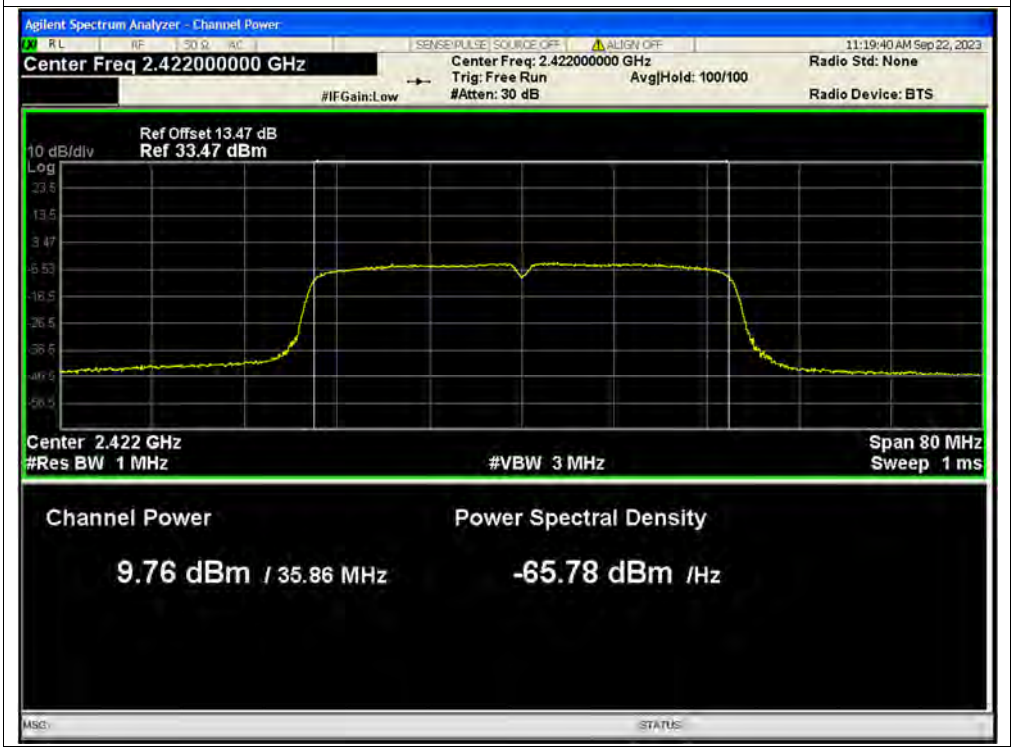
Average Power NVNT n20 2442MHz Ant1



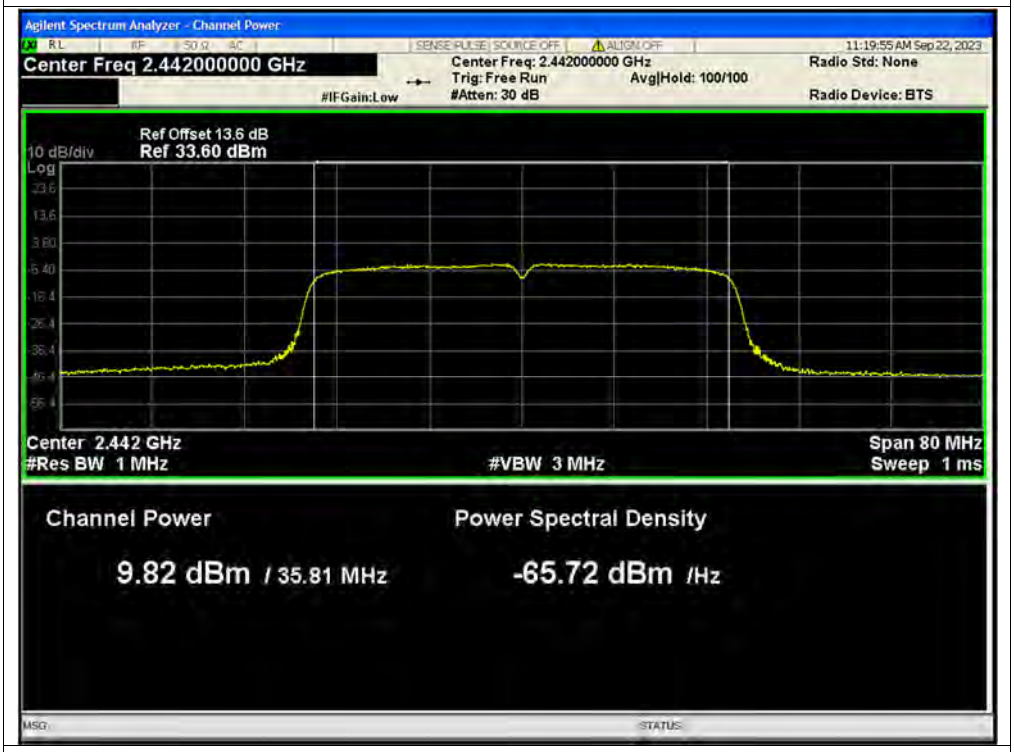
Average Power NVNT n20 2472MHz Ant1



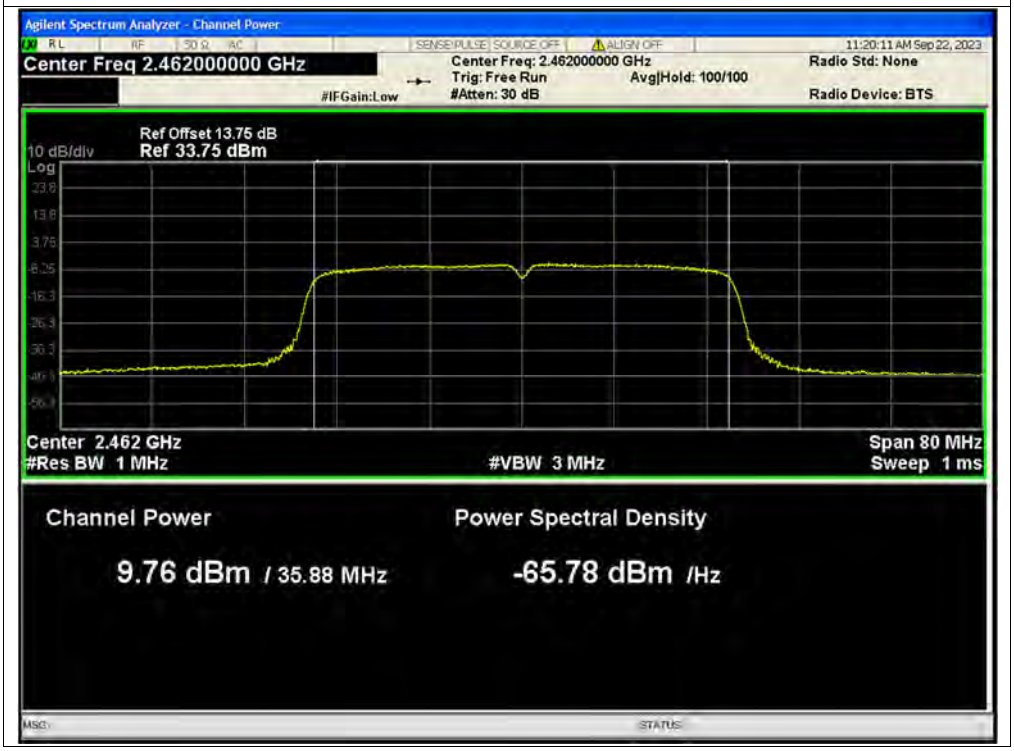
Average Power NVNT n40 2422MHz Ant1



Average Power NVNT n40 2442MHz Ant1



Average Power NVNT n40 2462MHz Ant1

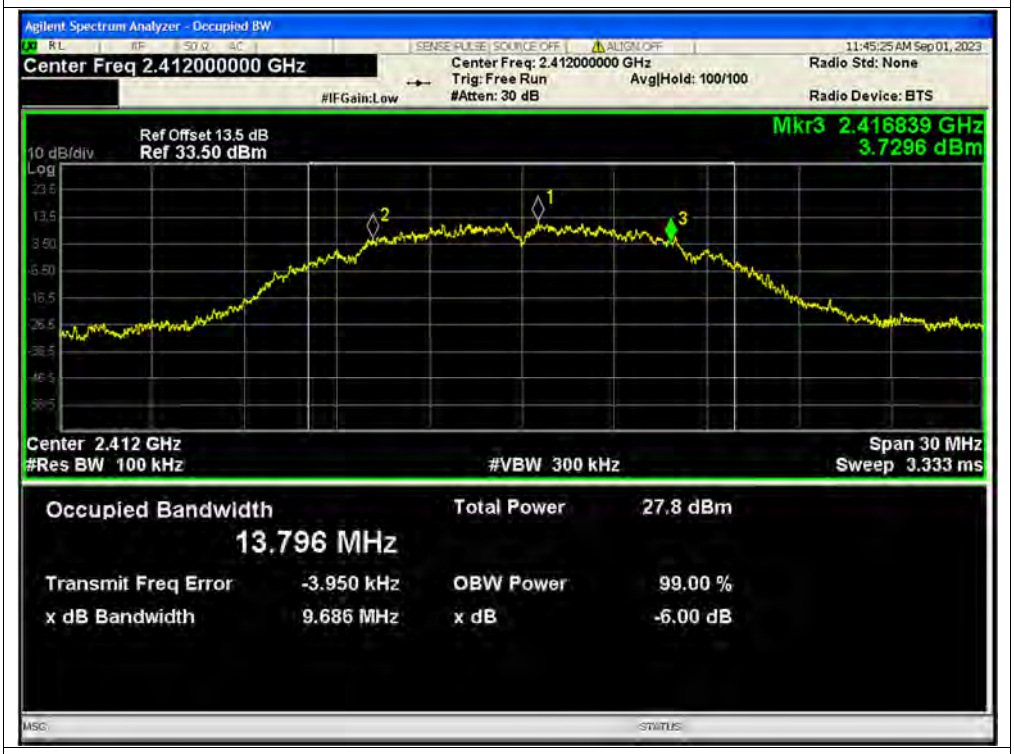


A.4. 6 dB Bandwidth and 99% OBW

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	b	2412	Ant1	9.686	0.5	Pass
NVNT	b	2442	Ant1	9.581	0.5	Pass
NVNT	b	2472	Ant1	9.056	0.5	Pass
NVNT	g	2412	Ant1	15.743	0.5	Pass
NVNT	g	2442	Ant1	15.414	0.5	Pass
NVNT	g	2472	Ant1	16.296	0.5	Pass
NVNT	n20	2412	Ant1	16.895	0.5	Pass
NVNT	n20	2442	Ant1	17.126	0.5	Pass
NVNT	n20	2472	Ant1	15.621	0.5	Pass
NVNT	n40	2422	Ant1	33.775	0.5	Pass
NVNT	n40	2442	Ant1	33.584	0.5	Pass
NVNT	n40	2462	Ant1	31.913	0.5	Pass

Test Graphs

-6dB Bandwidth NVNT b 2412MHz Ant1

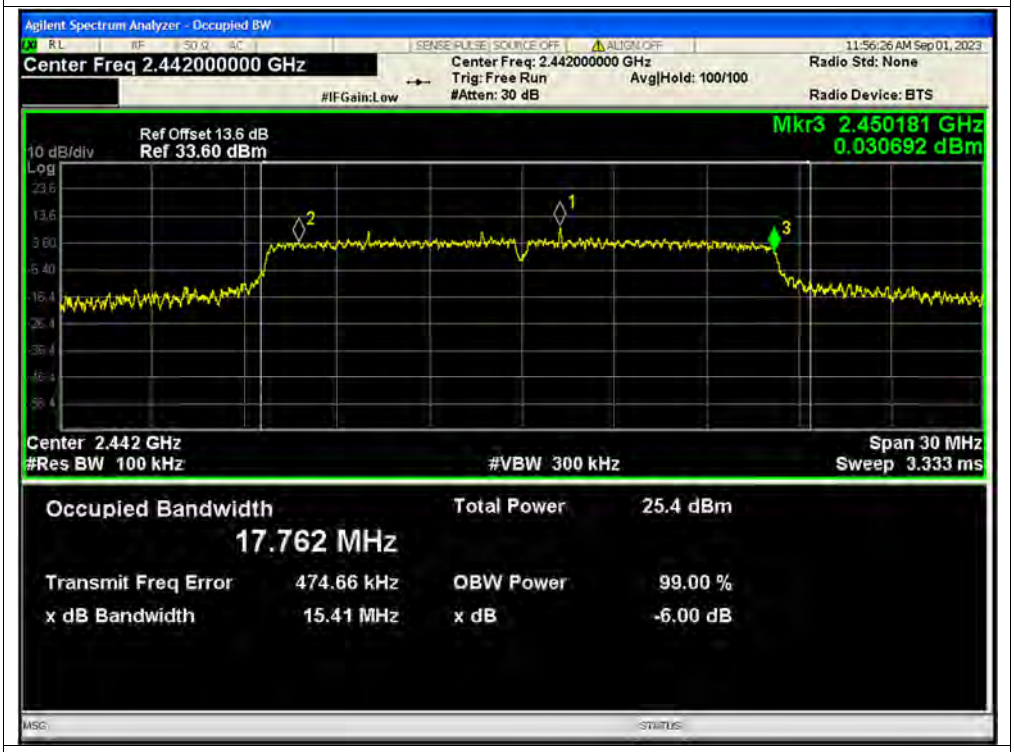


-6dB Bandwidth NVNT b 2442MHz Ant1

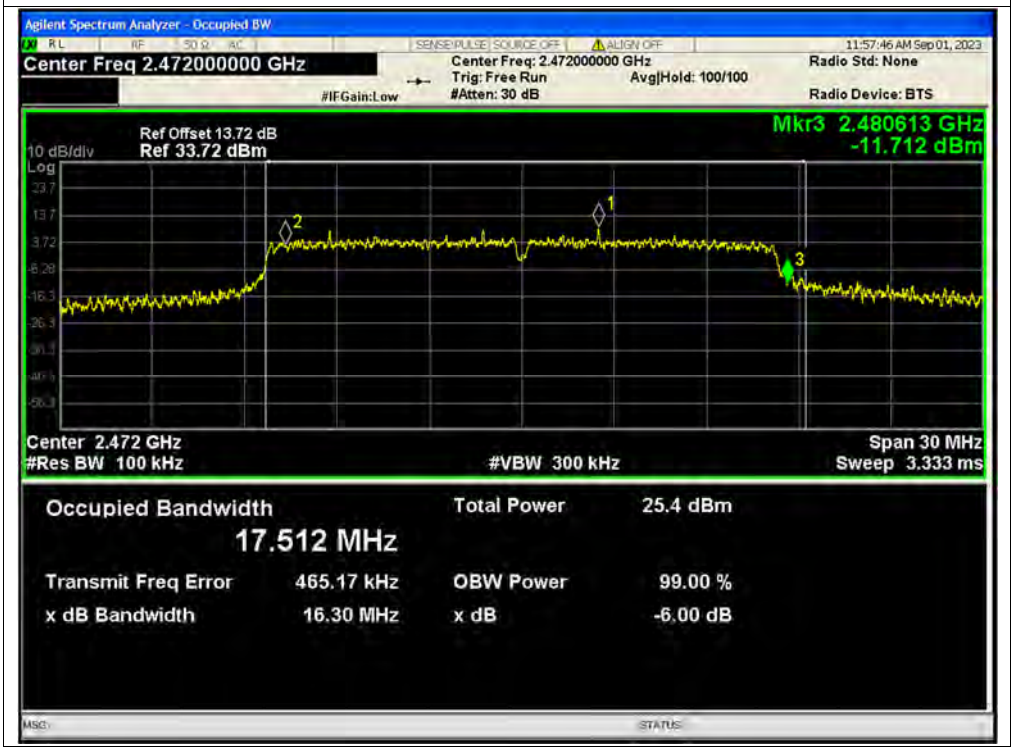
-6dB Bandwidth NVNT b 2472MHz Ant1

-6dB Bandwidth NVNT g 2412MHz Ant1

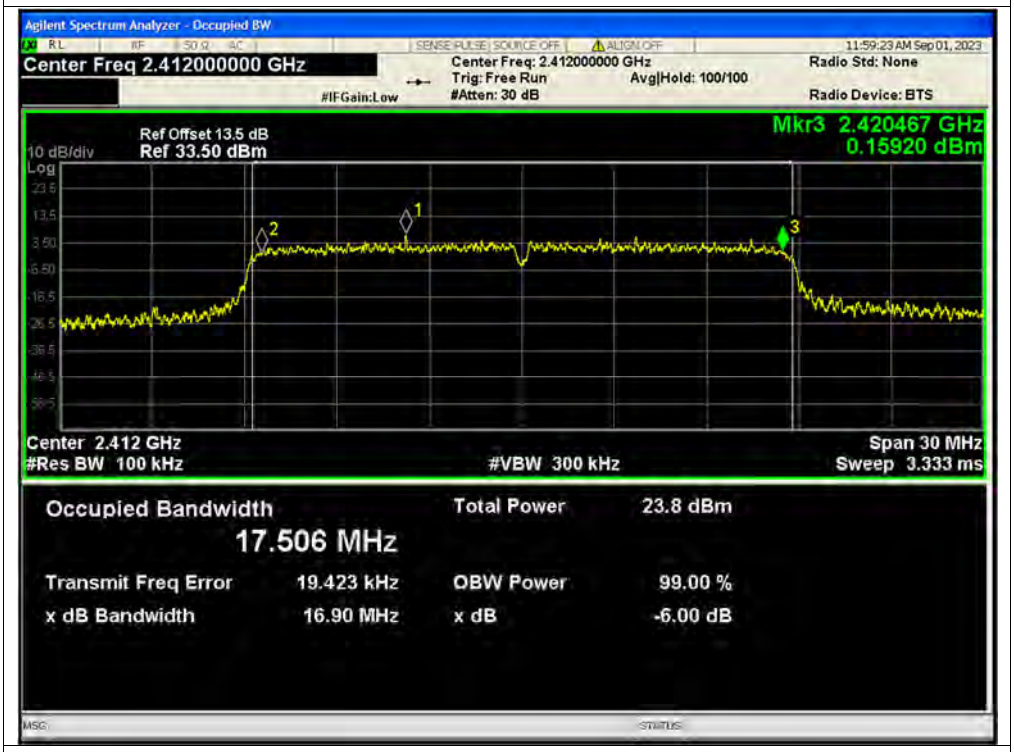
-6dB Bandwidth NVNT g 2442MHz Ant1



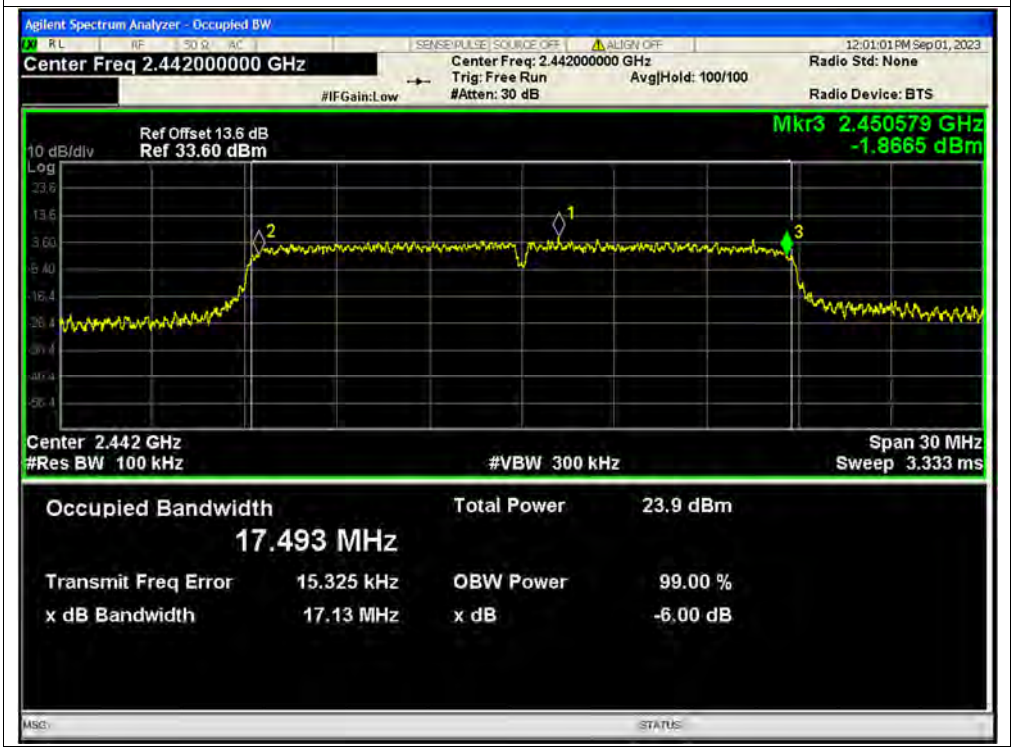
-6dB Bandwidth NVNT g 2472MHz Ant1



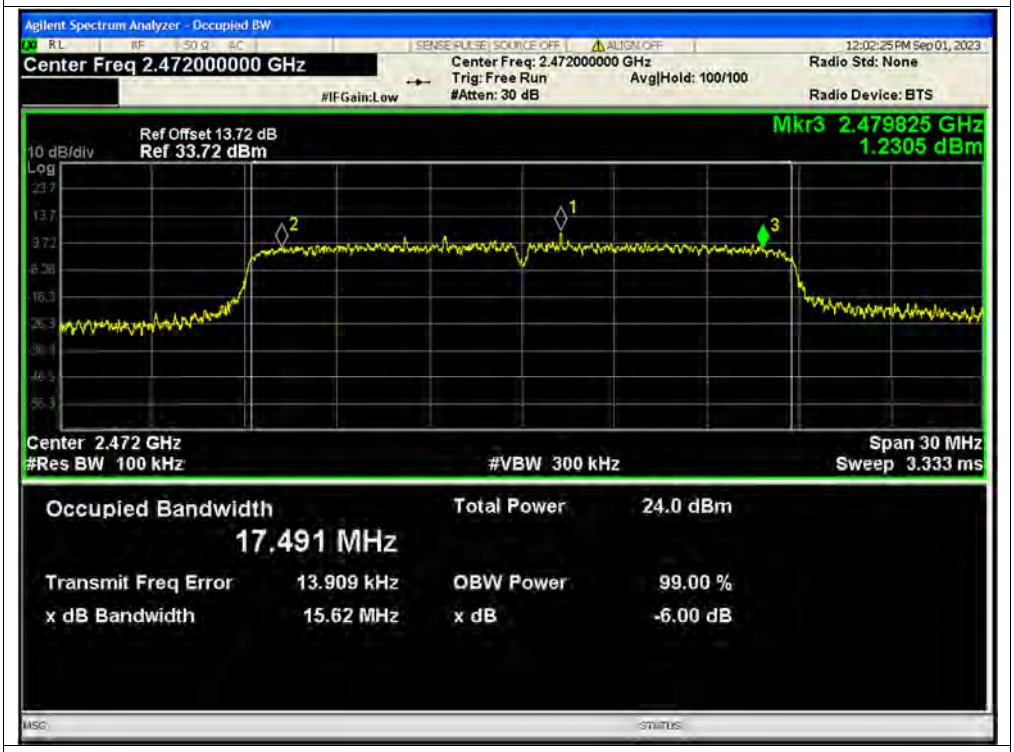
-6dB Bandwidth NVNT n20 2412MHz Ant1



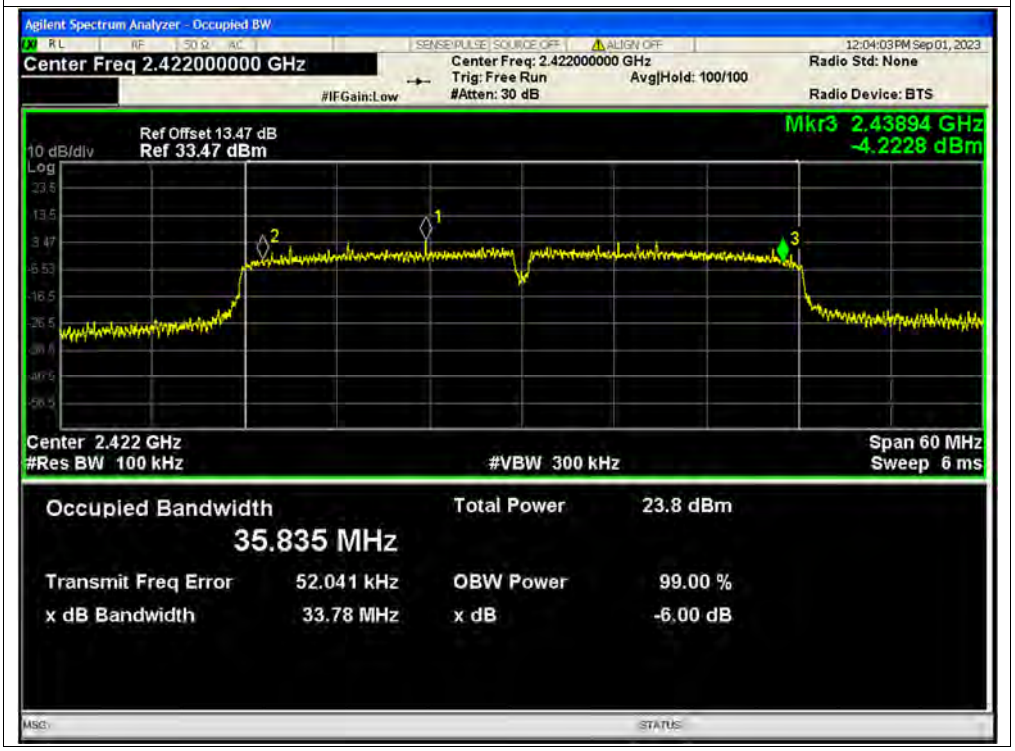
-6dB Bandwidth NVNT n20 2442MHz Ant1



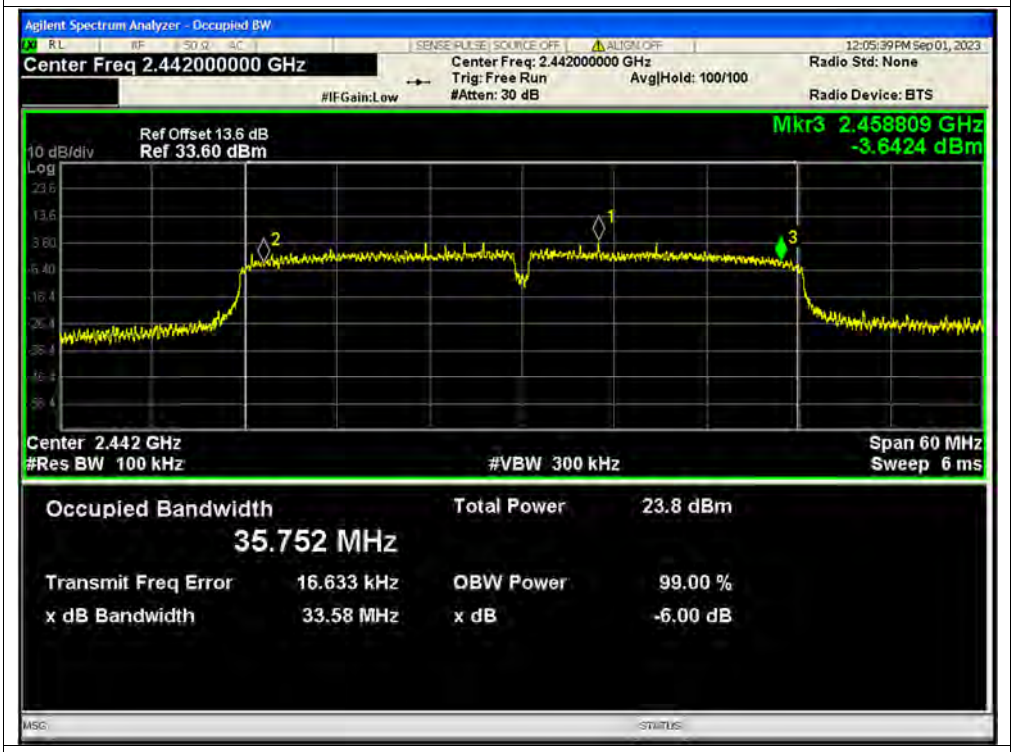
-6dB Bandwidth NVNT n20 2472MHz Ant1



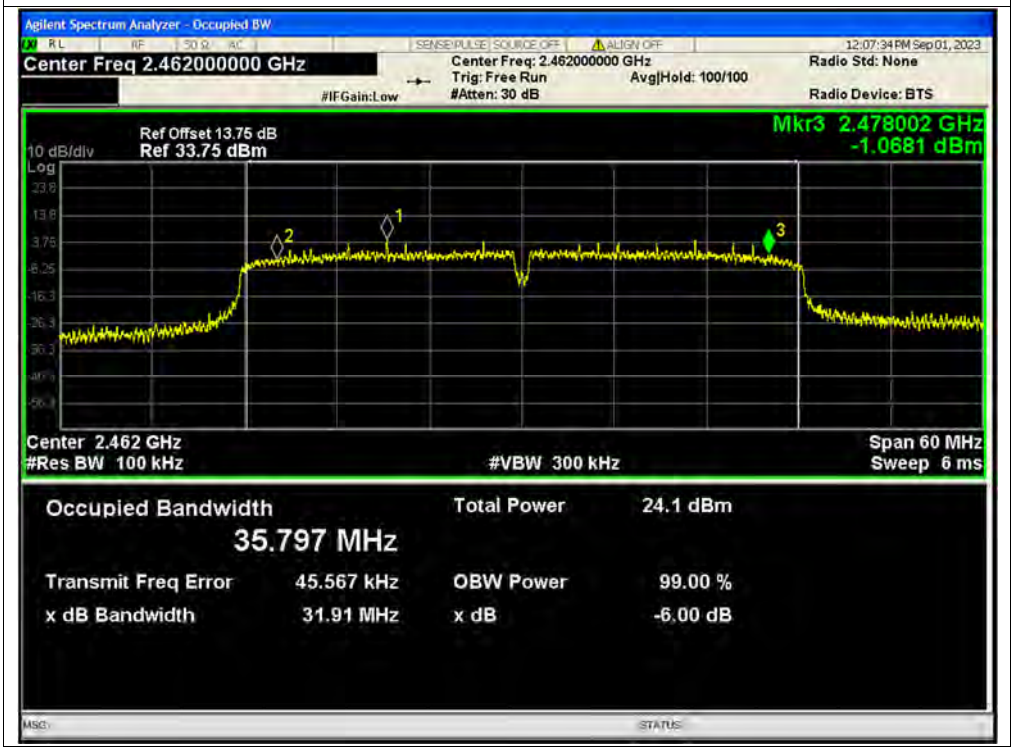
-6dB Bandwidth NVNT n40 2422MHz Ant1



-6dB Bandwidth NVNT n40 2442MHz Ant1



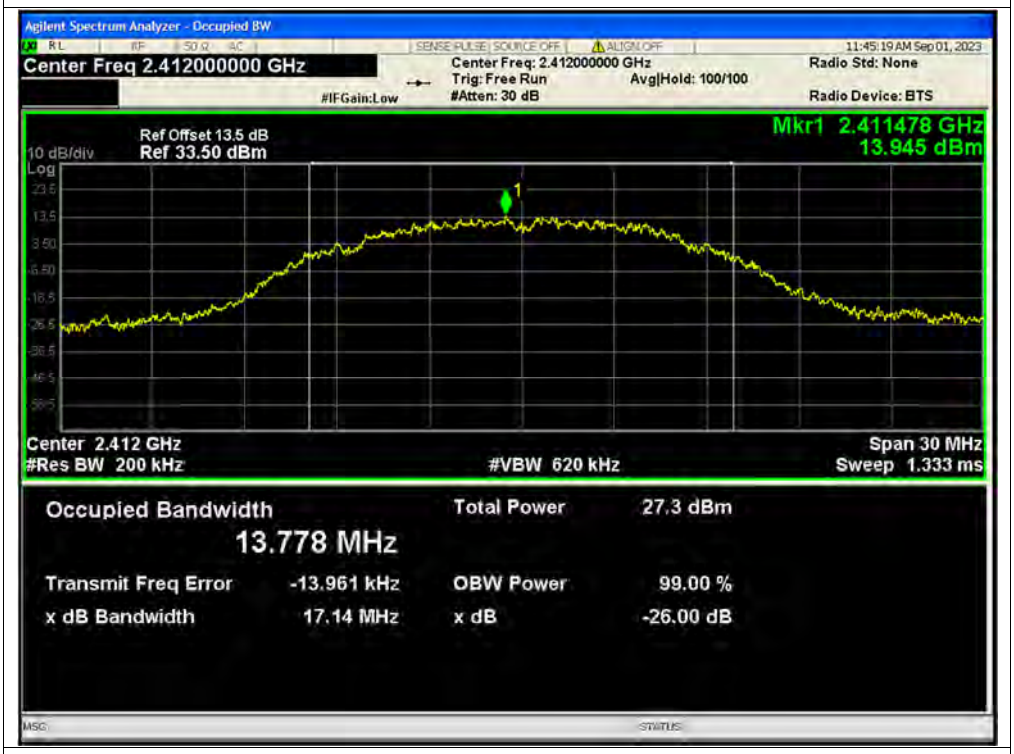
-6dB Bandwidth NVNT n40 2462MHz Ant1



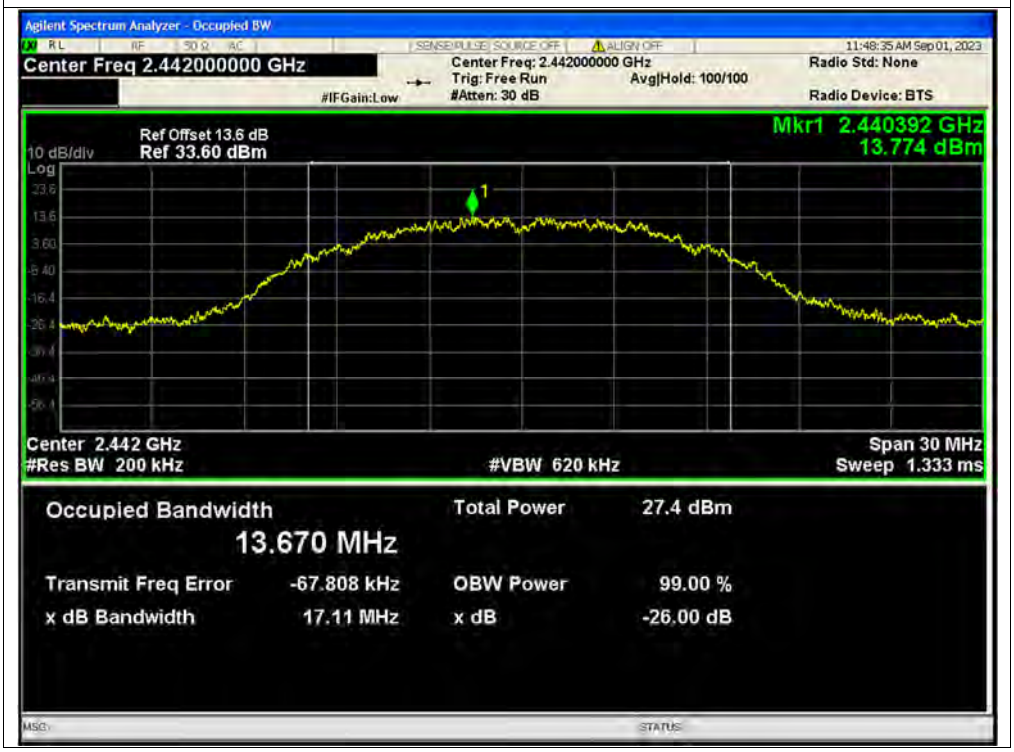
Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	b	2412	Ant1	13.7778
NVNT	b	2442	Ant1	13.6701
NVNT	b	2472	Ant1	13.5191
NVNT	g	2412	Ant1	19.4414
NVNT	g	2442	Ant1	17.9631
NVNT	g	2472	Ant1	17.7801
NVNT	n20	2412	Ant1	17.5177
NVNT	n20	2442	Ant1	17.4936
NVNT	n20	2472	Ant1	17.5046
NVNT	n40	2422	Ant1	35.8564
NVNT	n40	2442	Ant1	35.8142
NVNT	n40	2462	Ant1	35.881

Test Graphs

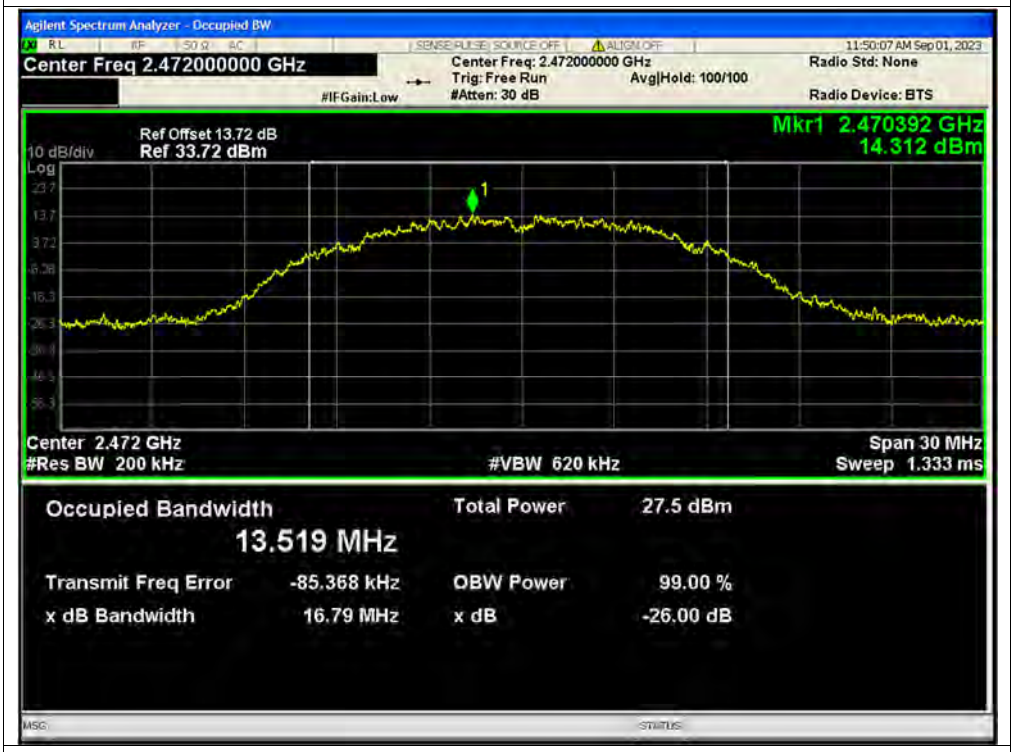
OBW NVNT b 2412MHz Ant1



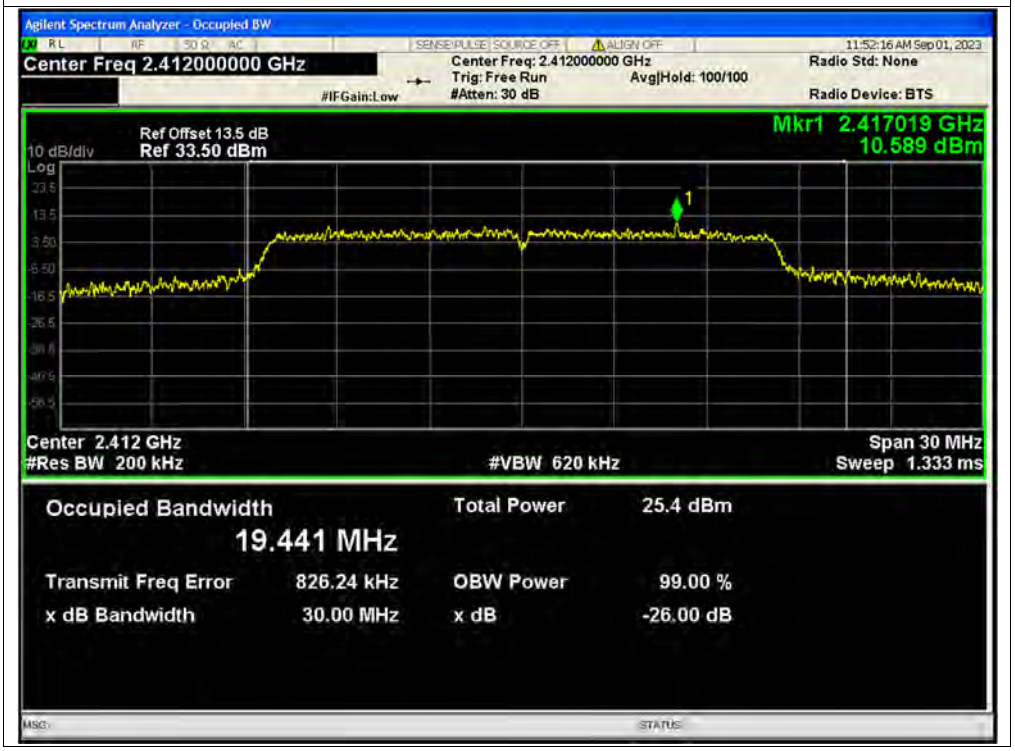
OBW NVNT b 2442MHz Ant1



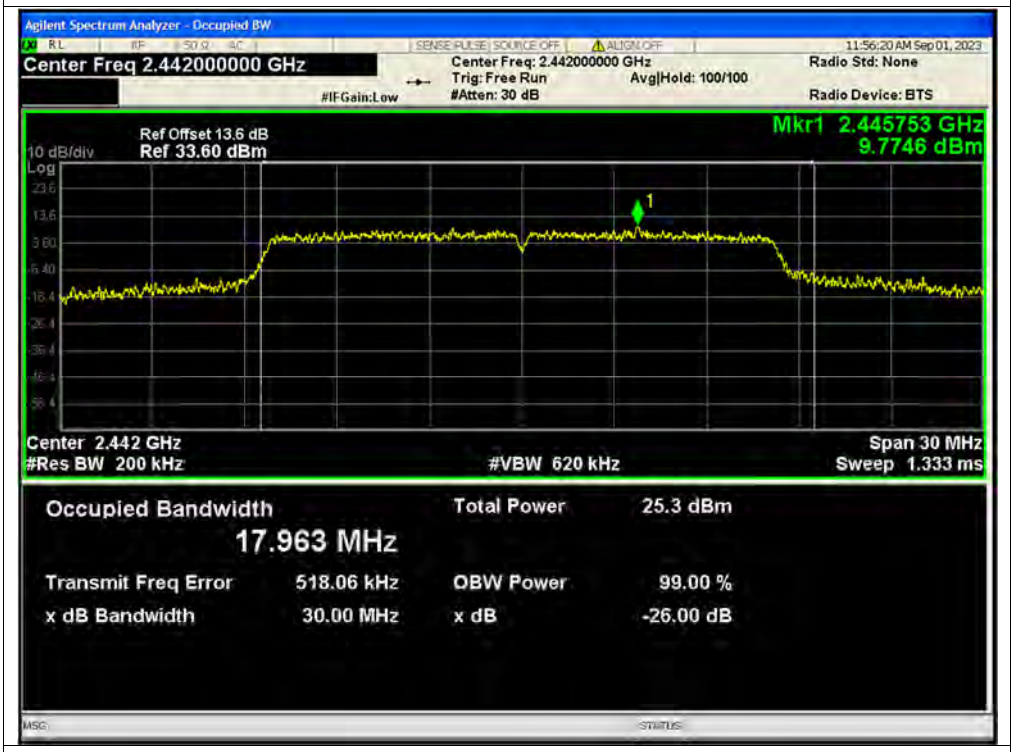
OBW NVNT b 2472MHz Ant1



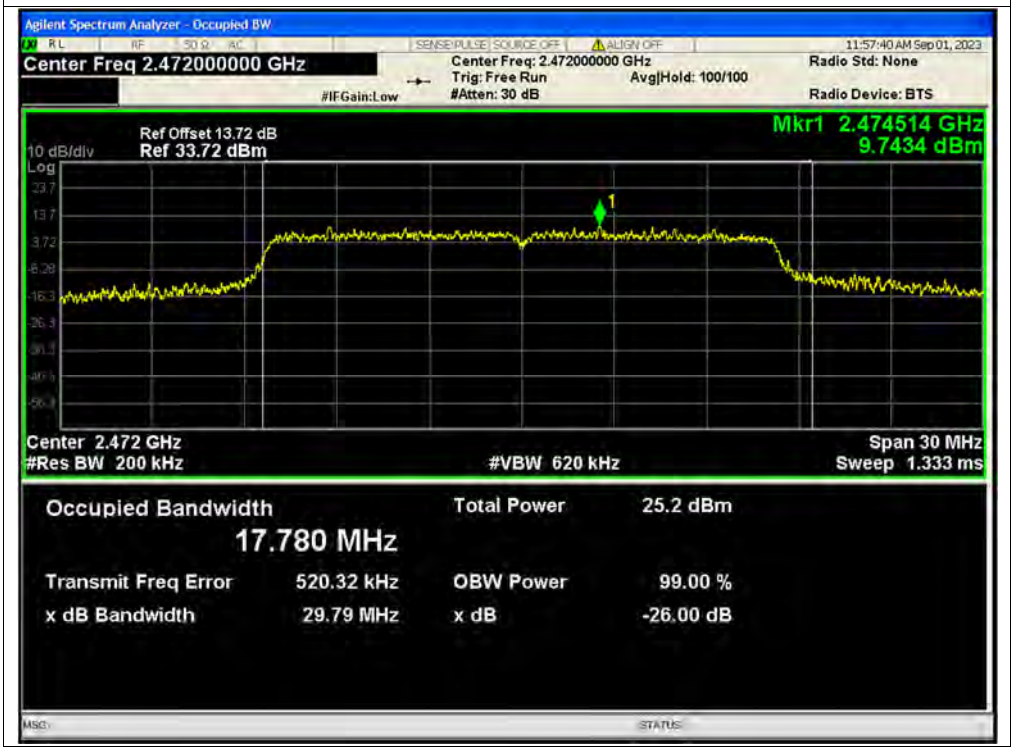
OBW NVNT g 2412MHz Ant1



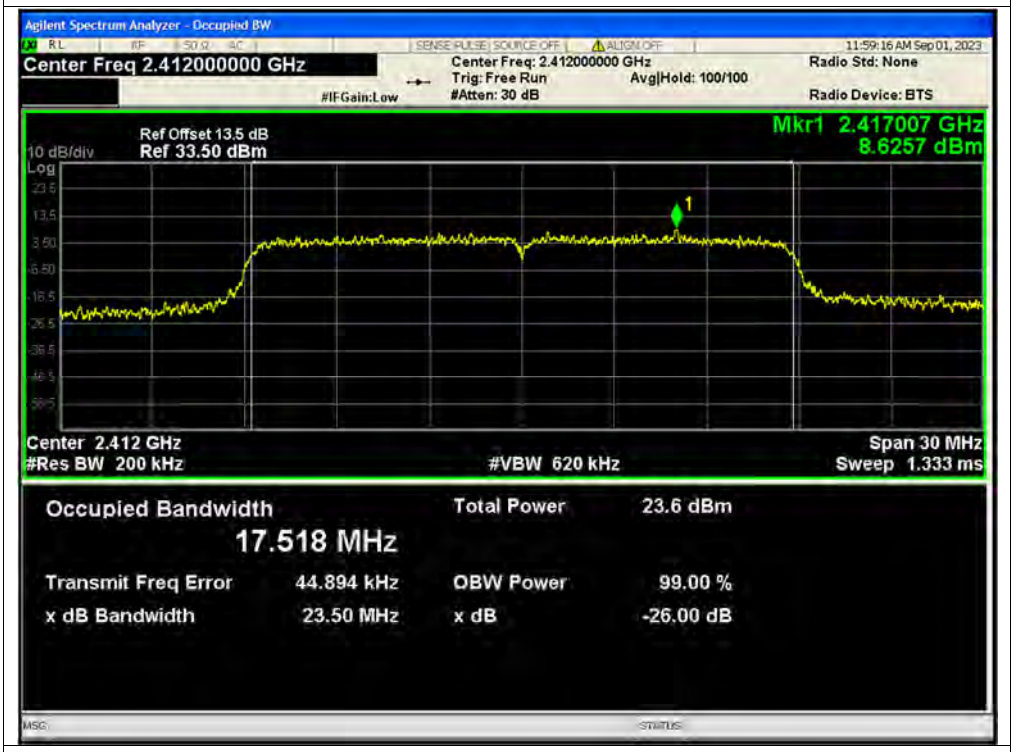
OBW NVNT g 2442MHz Ant1



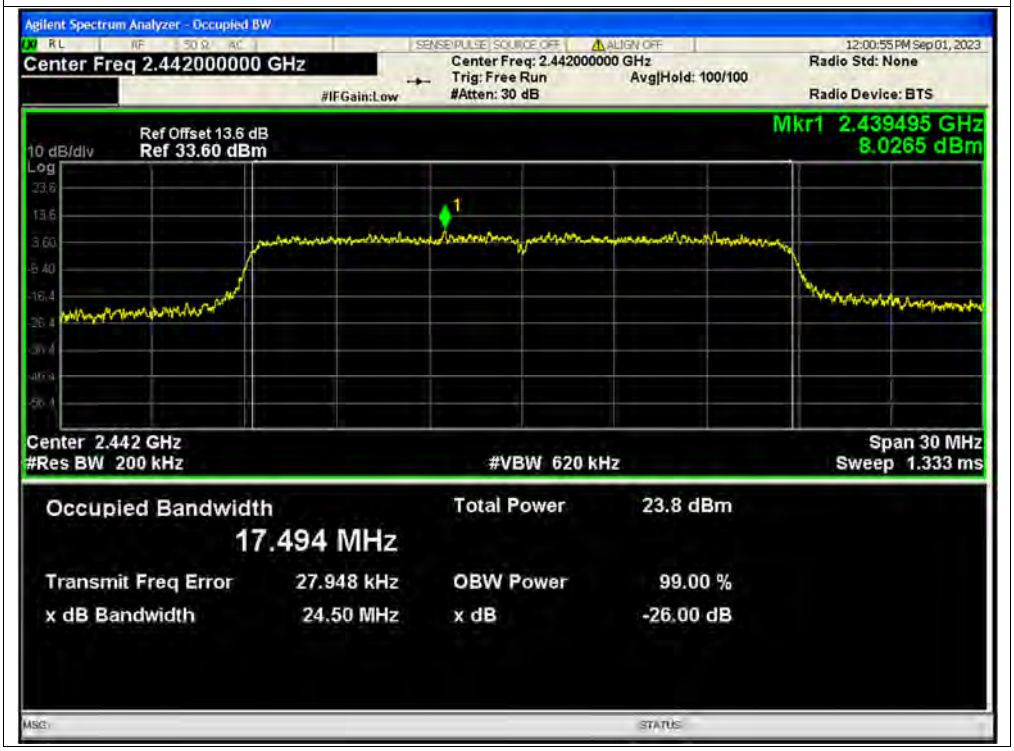
OBW NVNT g 2472MHz Ant1



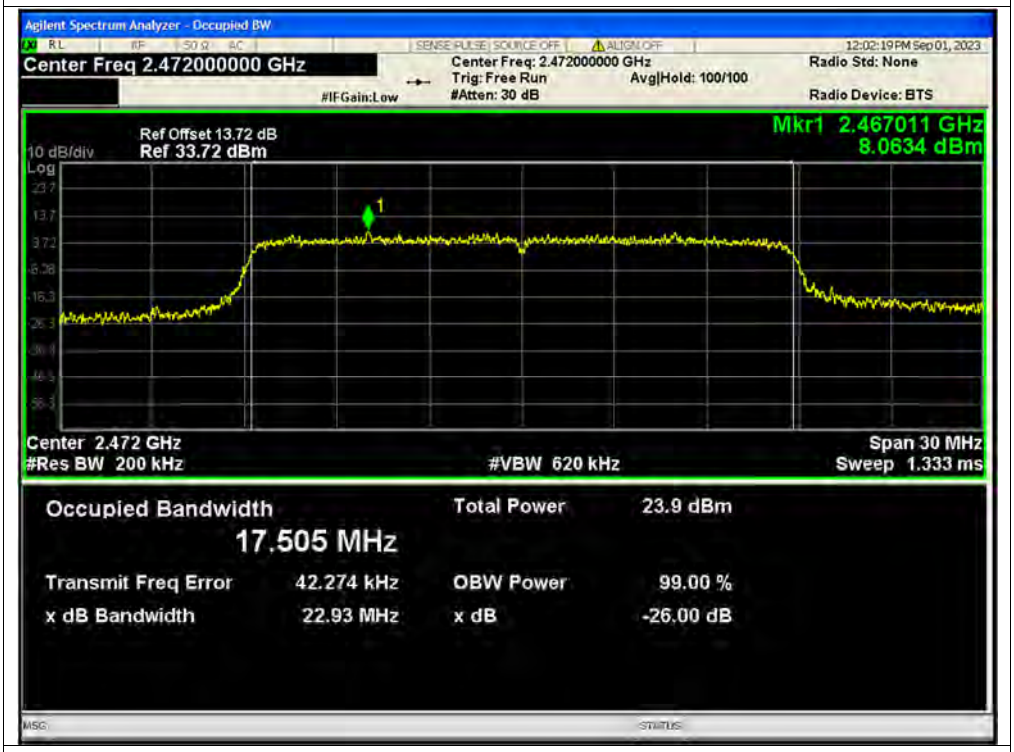
OBW NVNT n20 2412MHz Ant1



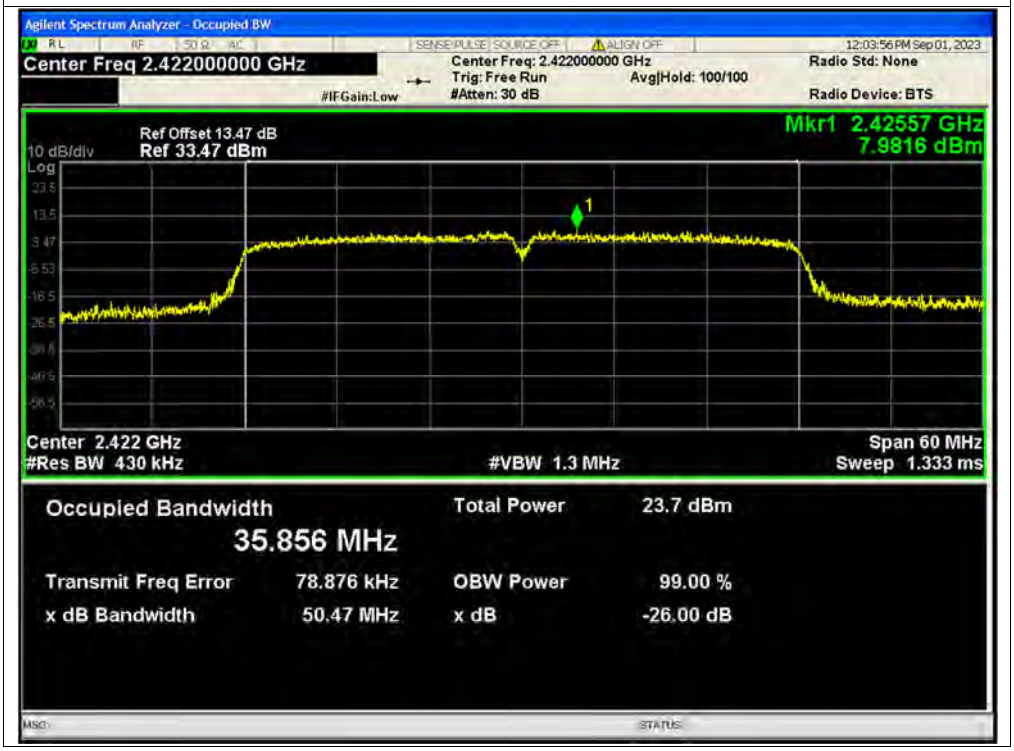
OBW NVNT n20 2442MHz Ant1



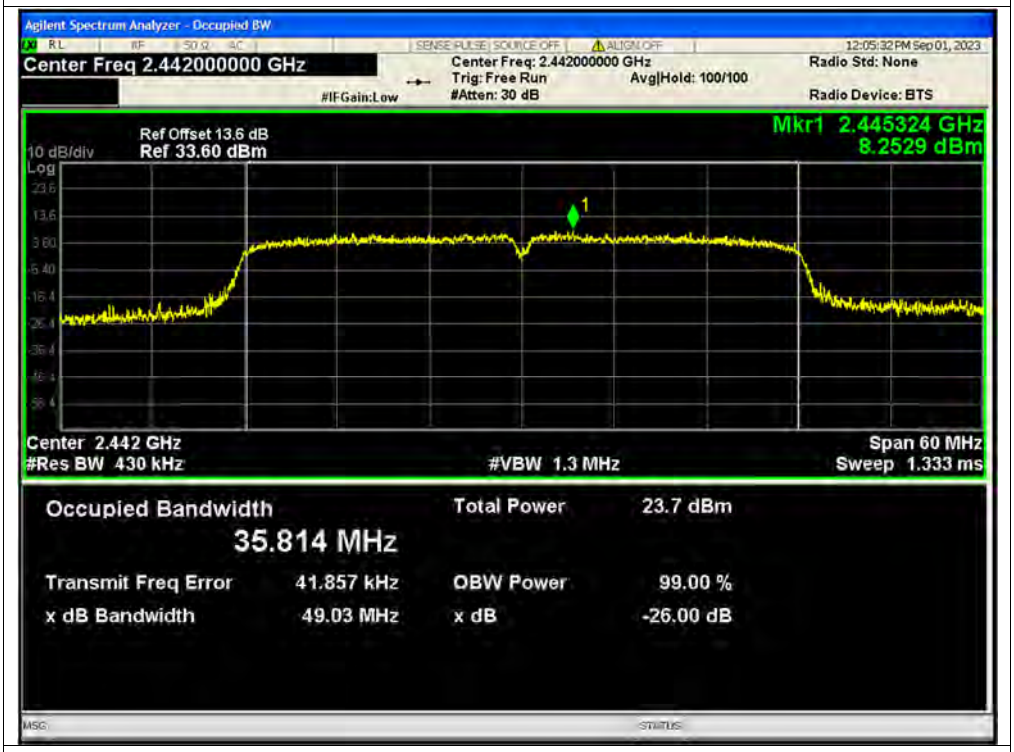
OBW NVNT n20 2472MHz Ant1



OBW NVNT n40 2422MHz Ant1



OBW NVNT n40 2442MHz Ant1



OBW NVNT n40 2462MHz Ant1

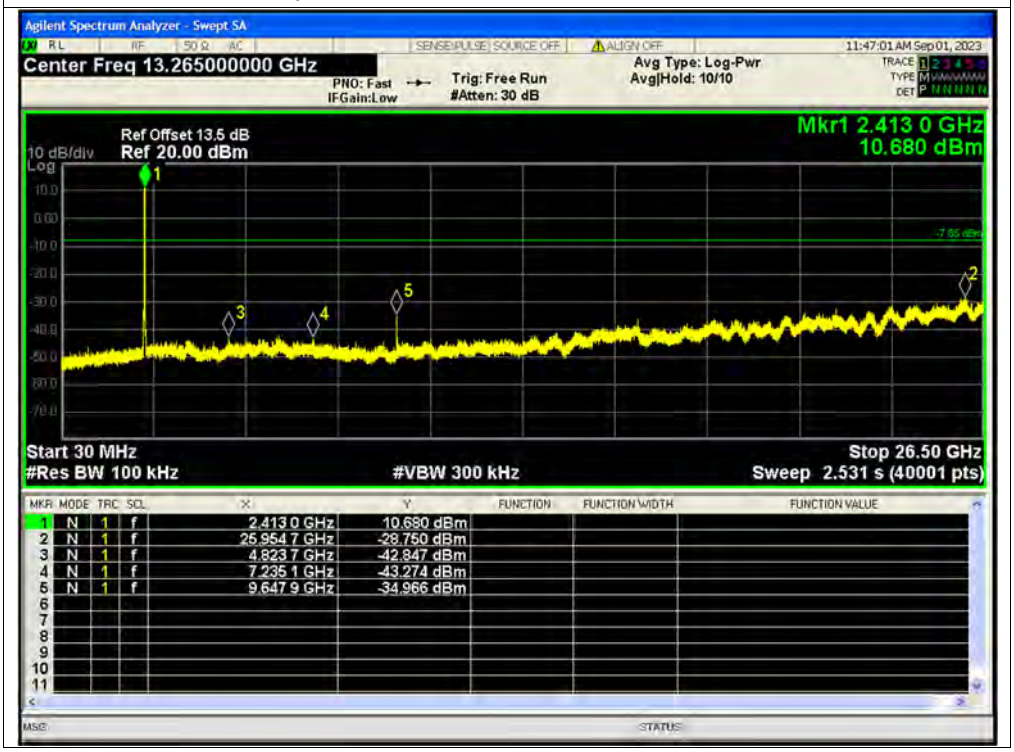
A.5. Conducted Spurious Emissions

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-40.89	-20	Pass
NVNT	b	2442	Ant1	-40.29	-20	Pass
NVNT	b	2472	Ant1	-40.37	-20	Pass
NVNT	g	2412	Ant1	-35.81	-20	Pass
NVNT	g	2442	Ant1	-36.42	-20	Pass
NVNT	g	2472	Ant1	-36.85	-20	Pass
NVNT	n20	2412	Ant1	-34.16	-20	Pass
NVNT	n20	2442	Ant1	-35.89	-20	Pass
NVNT	n20	2472	Ant1	-35.35	-20	Pass
NVNT	n40	2422	Ant1	-32.28	-20	Pass
NVNT	n40	2442	Ant1	-32.76	-20	Pass
NVNT	n40	2462	Ant1	-32.03	-20	Pass

Test Graphs

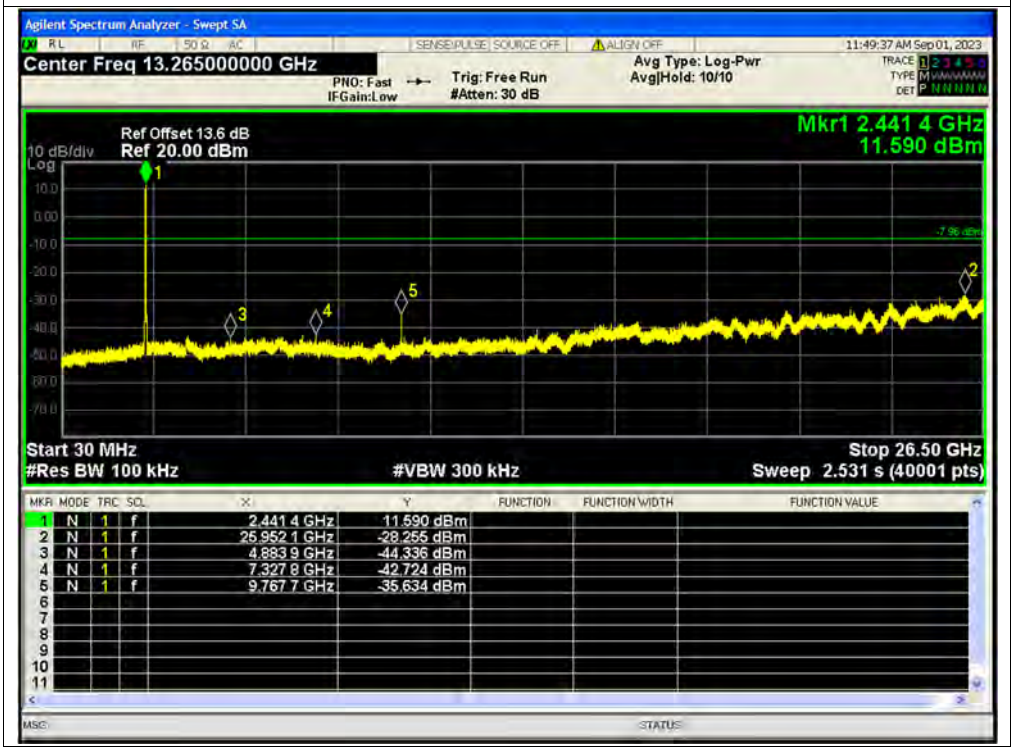
Tx. Spurious NVNT b 2412MHz Ant1 Ref

Tx. Spurious NVNT b 2412MHz Ant1 Emission



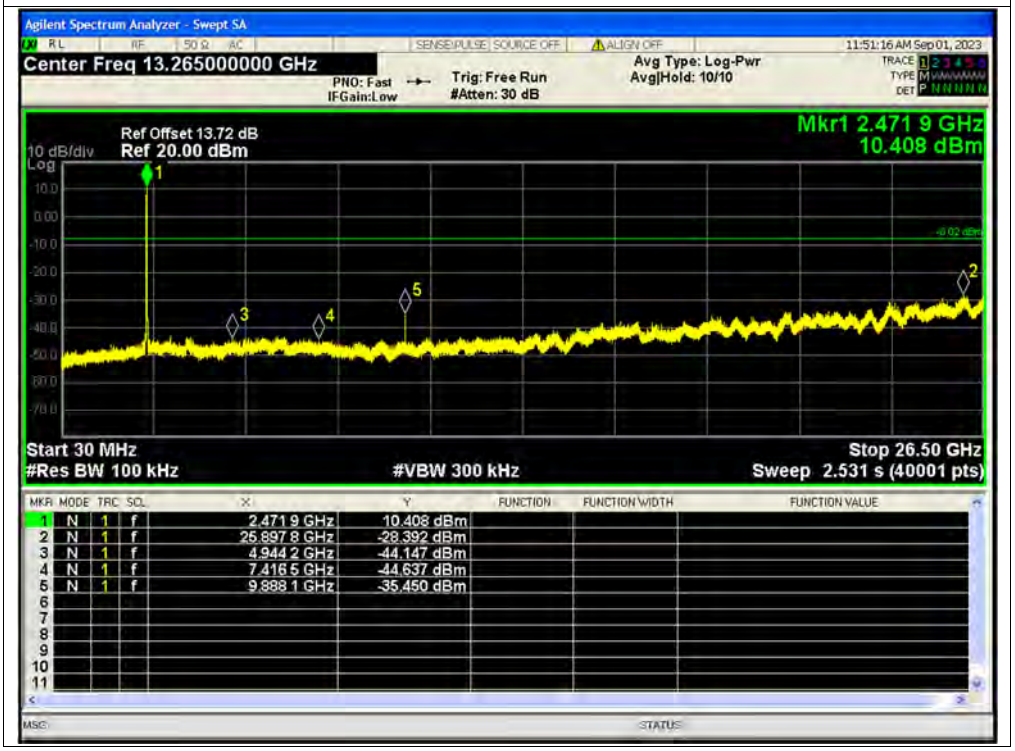
Tx. Spurious NVNT b 2442MHz Ant1 Ref

Tx. Spurious NVNT b 2442MHz Ant1 Emission



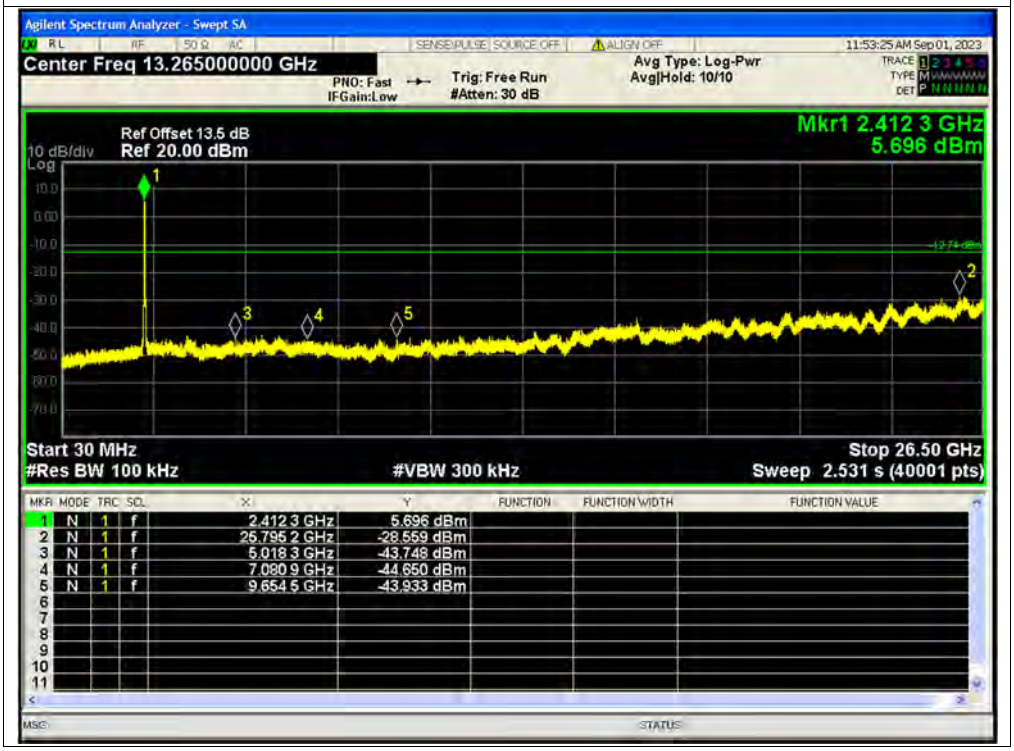
Tx. Spurious NVNT b 2472MHz Ant1 Ref

Tx. Spurious NVNT b 2472MHz Ant1 Emission

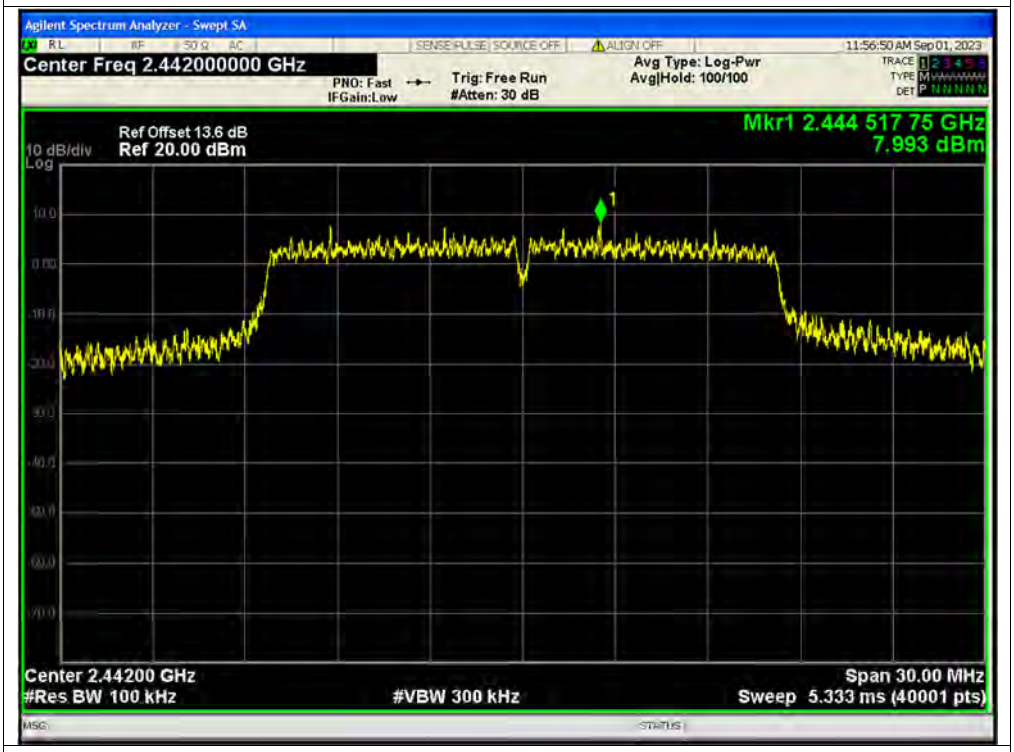


Tx. Spurious NVNT g 2412MHz Ant1 Ref

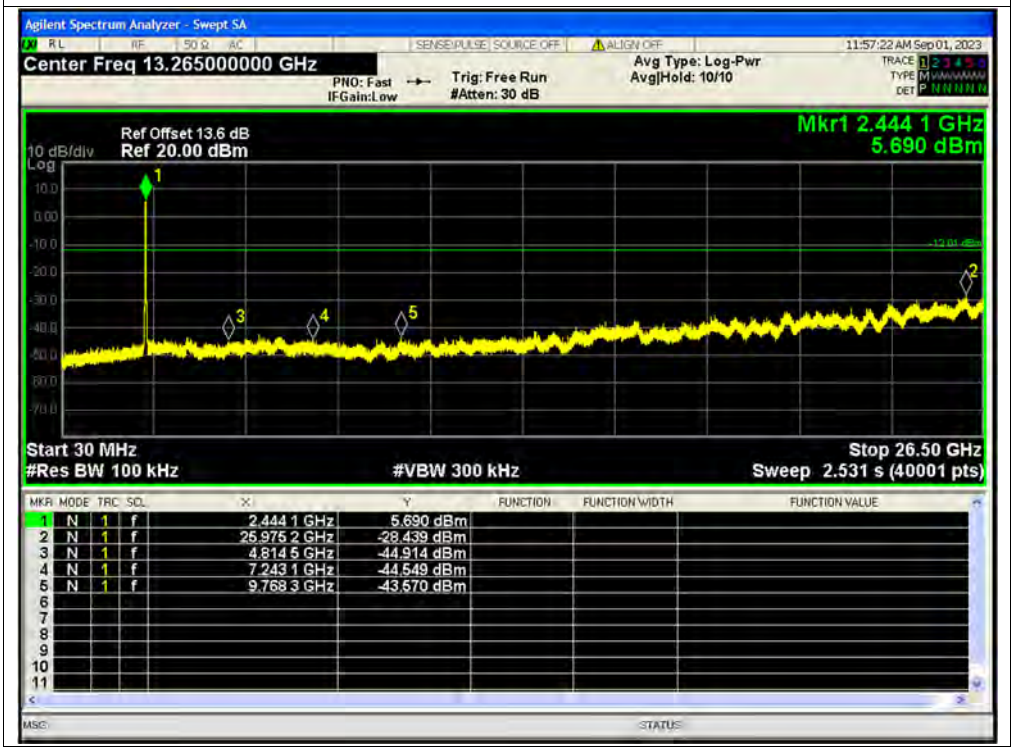
Tx. Spurious NVNT g 2412MHz Ant1 Emission



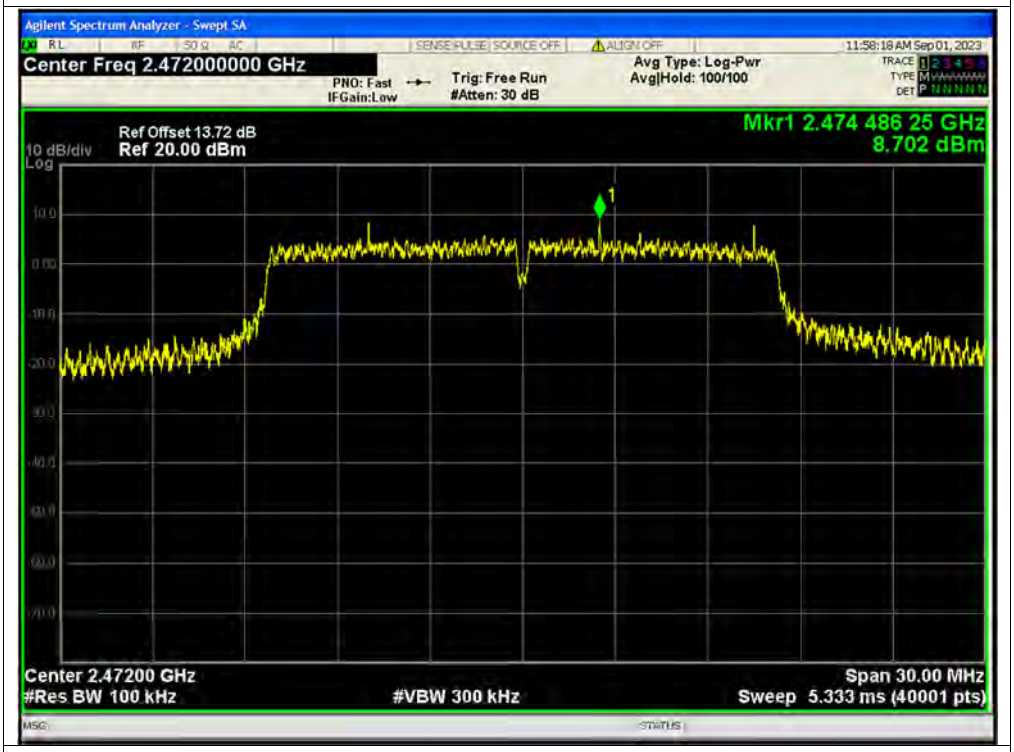
Tx. Spurious NVNT g 2442MHz Ant1 Ref



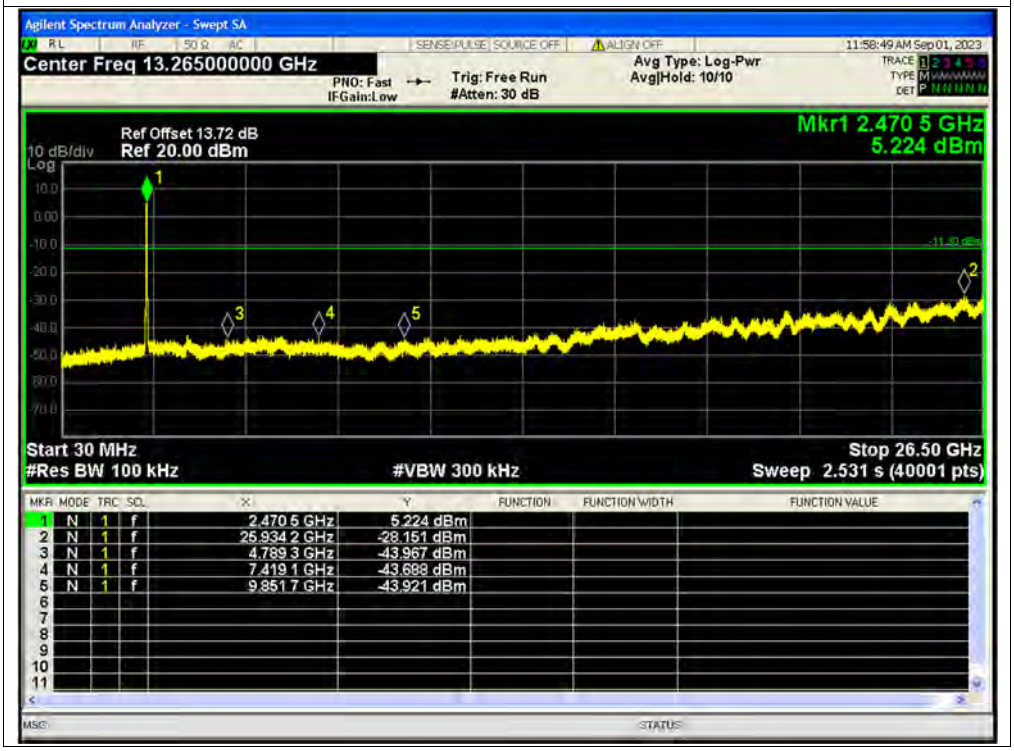
Tx. Spurious NVNT g 2442MHz Ant1 Emission



Tx. Spurious NVNT g 2472MHz Ant1 Ref

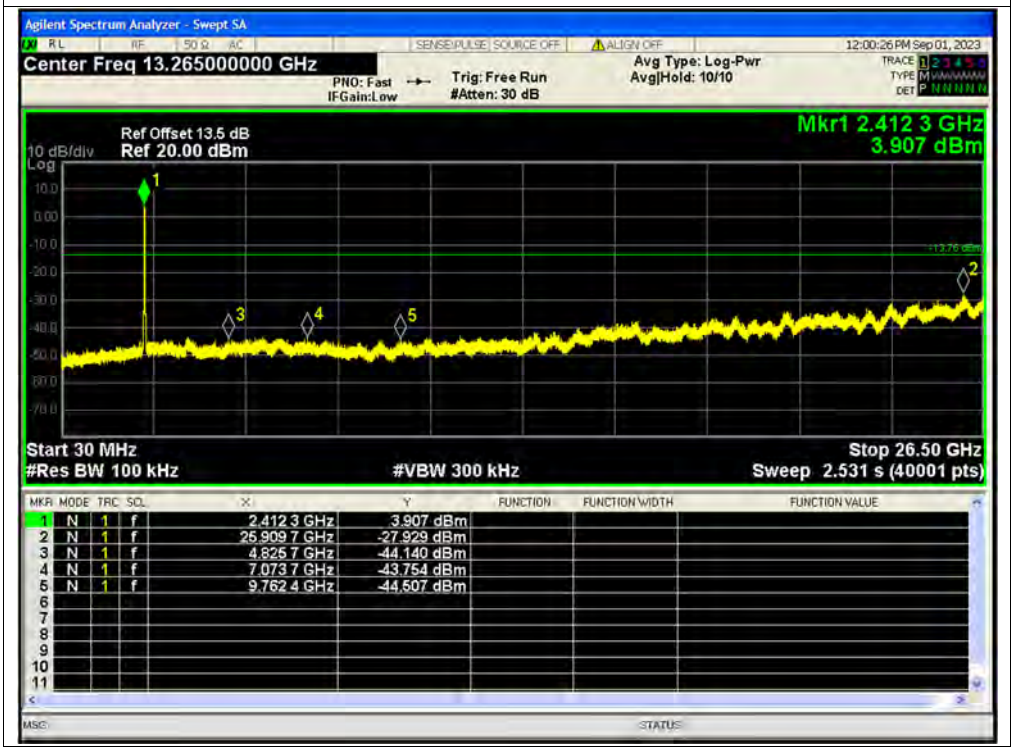


Tx. Spurious NVNT g 2472MHz Ant1 Emission



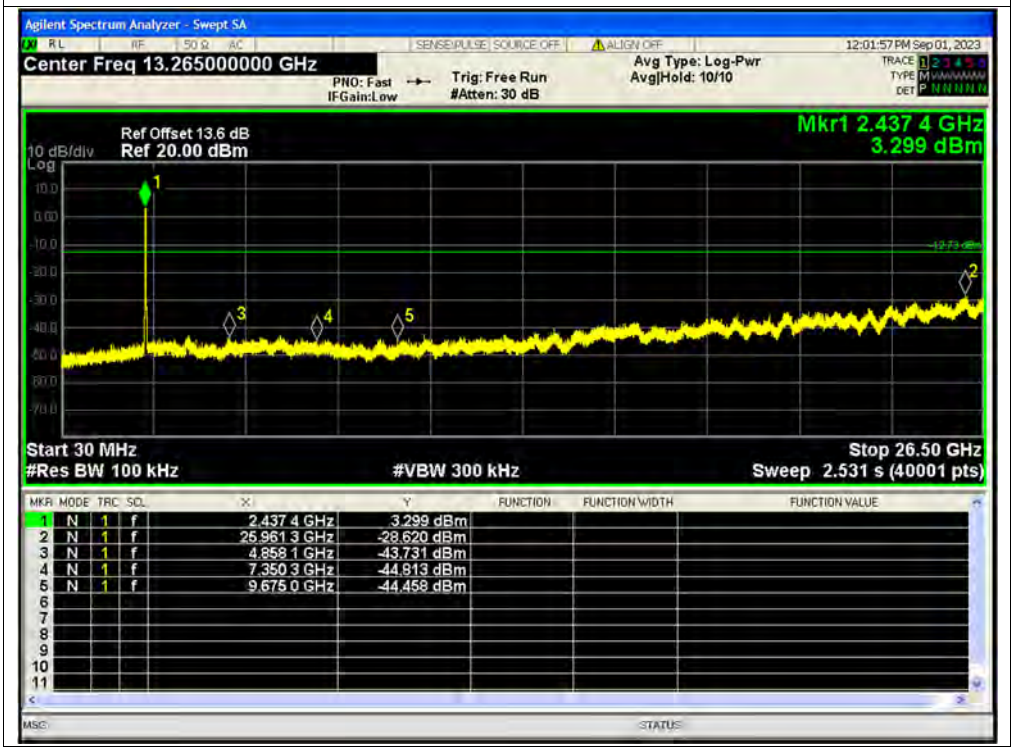
Tx. Spurious NVNT n20 2412MHz Ant1 Ref

Tx. Spurious NVNT n20 2412MHz Ant1 Emission

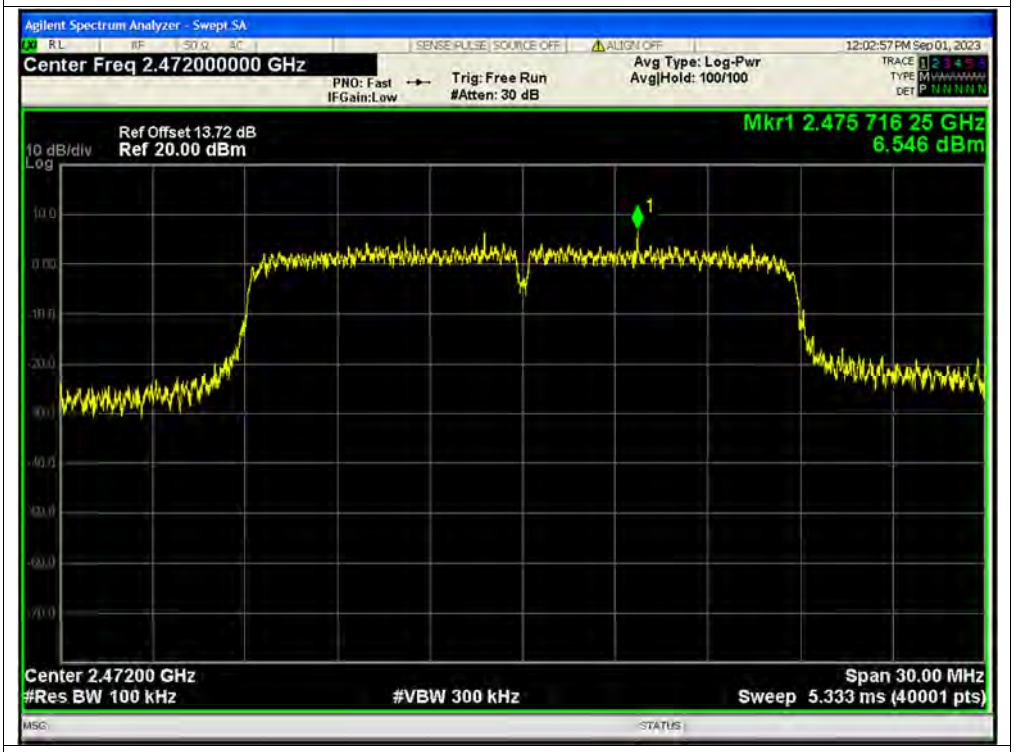


Tx. Spurious NVNT n20 2442MHz Ant1 Ref

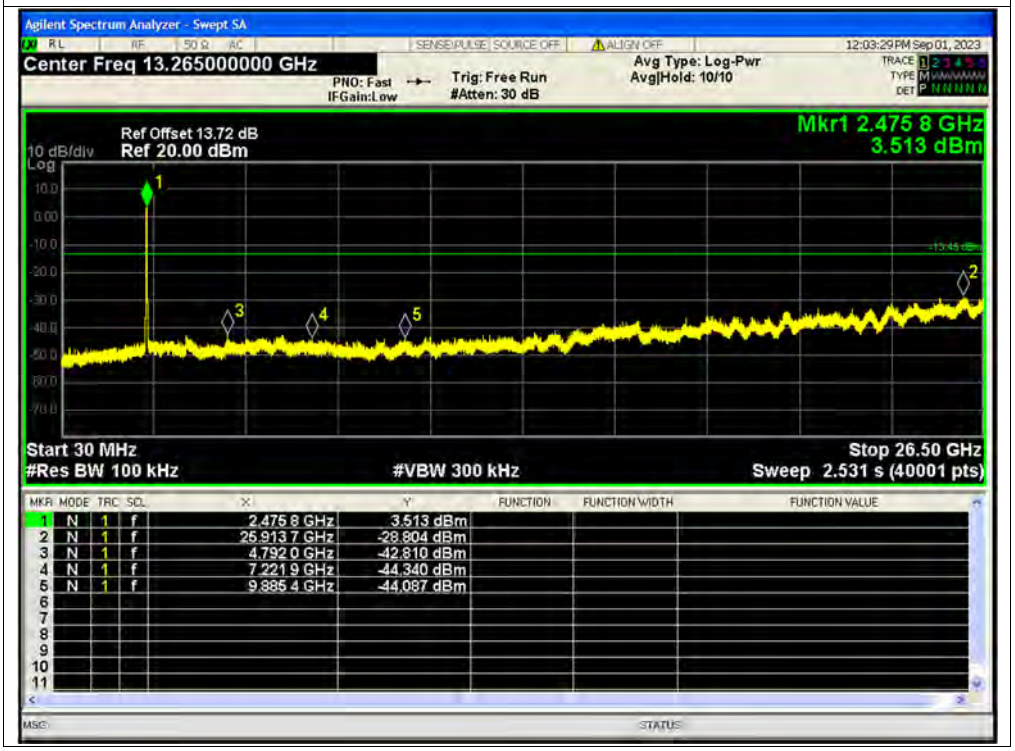
Tx. Spurious NVNT n20 2442MHz Ant1 Emission



Tx. Spurious NVNT n20 2472MHz Ant1 Ref

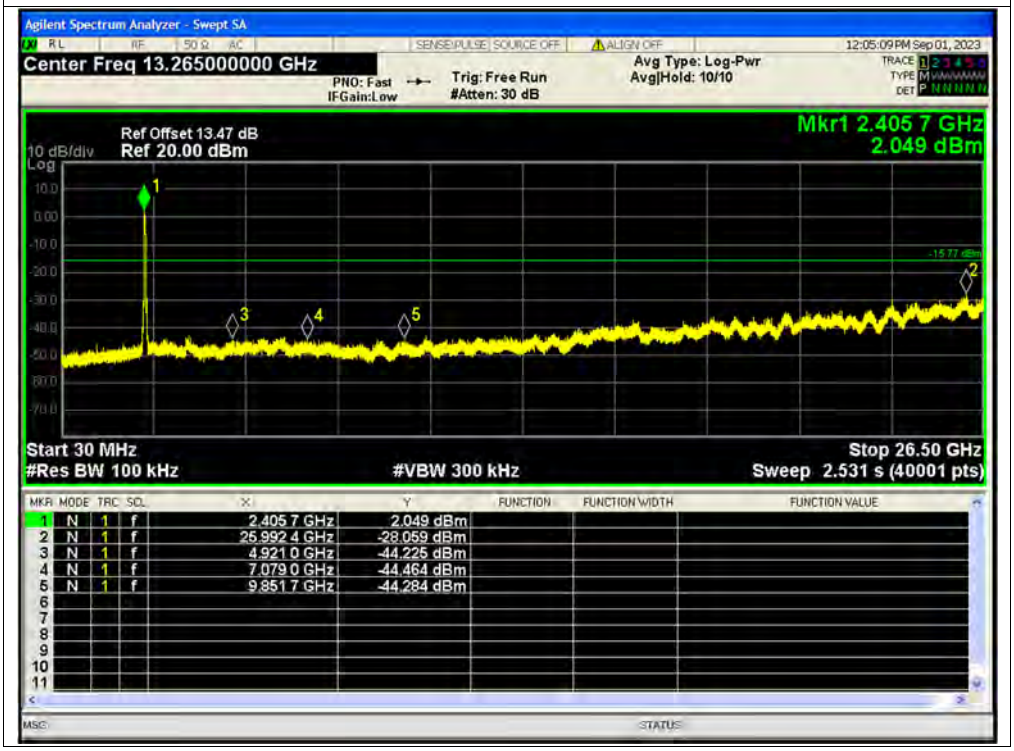


Tx. Spurious NVNT n20 2472MHz Ant1 Emission



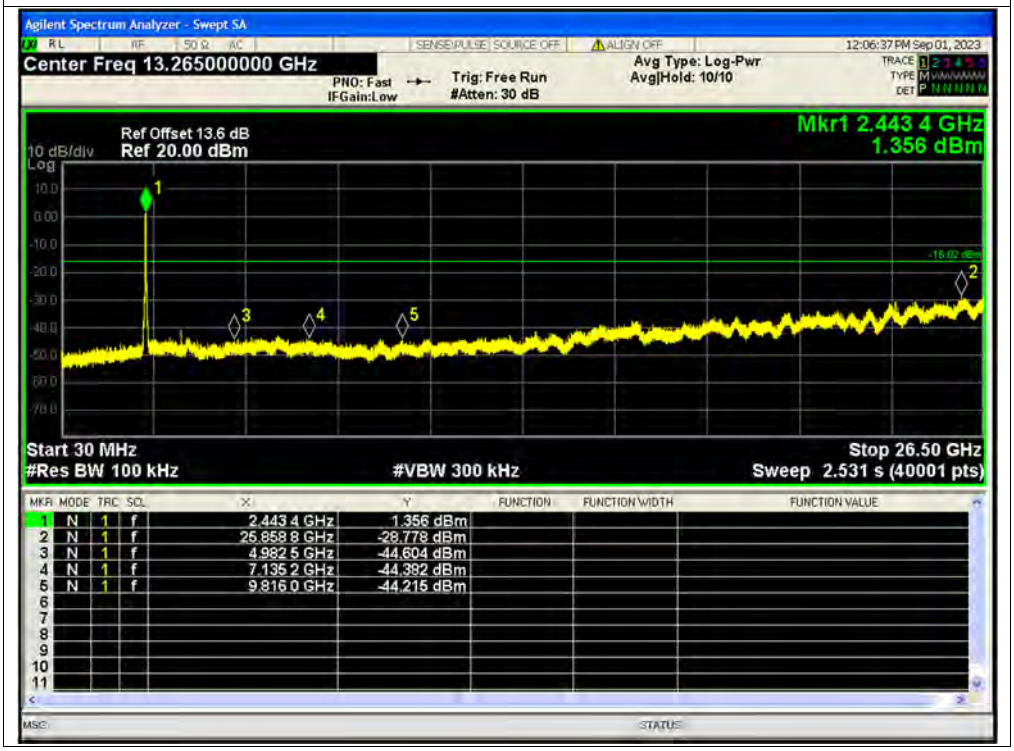
Tx. Spurious NVNT n40 2422MHz Ant1 Ref

Tx. Spurious NVNT n40 2422MHz Ant1 Emission



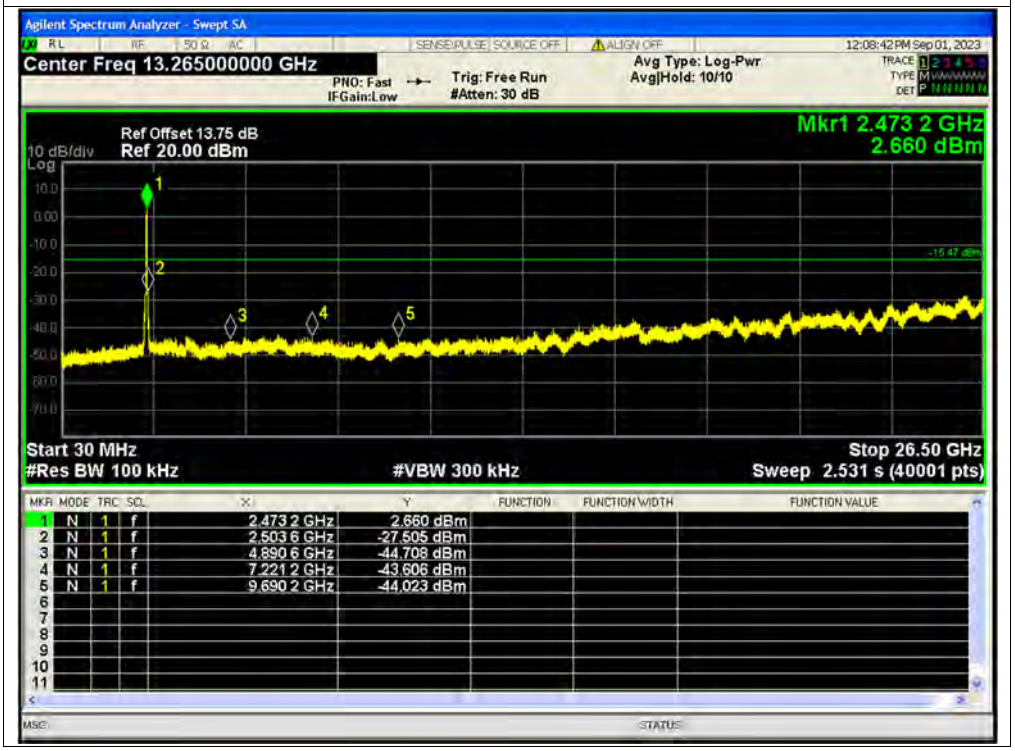
Tx. Spurious NVNT n40 2442MHz Ant1 Ref

Tx. Spurious NVNT n40 2442MHz Ant1 Emission



Tx. Spurious NVNT n40 2462MHz Ant1 Ref

Tx. Spurious NVNT n40 2462MHz Ant1 Emission



A.6. Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-36.69	-20	Pass
NVNT	b	2472	Ant1	-34.69	-20	Pass
NVNT	g	2412	Ant1	-23.06	-20	Pass
NVNT	g	2472	Ant1	-21.25	-20	Pass
NVNT	n20	2412	Ant1	-29.38	-20	Pass
NVNT	n20	2472	Ant1	-25.51	-20	Pass
NVNT	n40	2422	Ant1	-27.64	-20	Pass
NVNT	n40	2462	Ant1	-26.21	-20	Pass

Test Graphs

Band Edge NVNT b 2412MHz Ant1 Ref

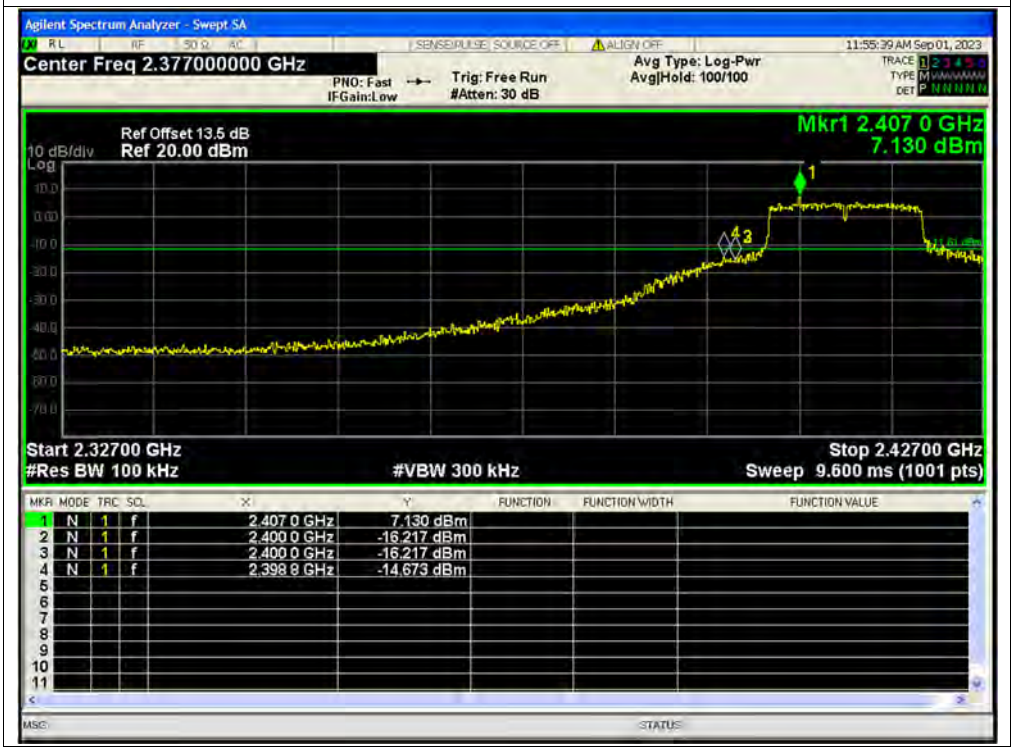
Band Edge NVNT b 2412MHz Ant1 Emission

Band Edge NVNT b 2472MHz Ant1 Ref

Band Edge NVNT b 2472MHz Ant1 Emission

Band Edge NVNT g 2412MHz Ant1 Ref

Band Edge NVNT g 2412MHz Ant1 Emission



Band Edge NVNT g 2472MHz Ant1 Ref

Band Edge NVNT g 2472MHz Ant1 Emission

Band Edge NVNT n20 2412MHz Ant1 Ref

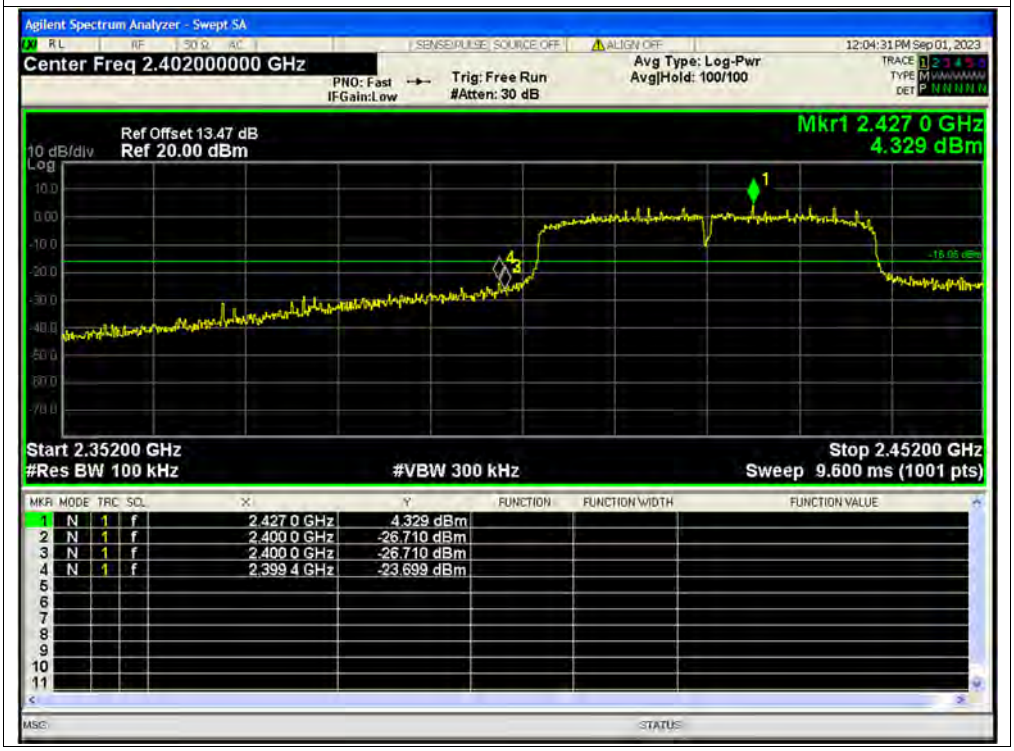
Band Edge NVNT n20 2412MHz Ant1 Emission

Band Edge NVNT n20 2472MHz Ant1 Ref

Band Edge NVNT n20 2472MHz Ant1 Emission

Band Edge NVNT n40 2422MHz Ant1 Ref

Band Edge NVNT n40 2422MHz Ant1 Emission



Band Edge NVNT n40 2462MHz Ant1 Ref

Band Edge NVNT n40 2462MHz Ant1 Emission

A.7. Power Spectral Density

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Duty Factor (dB)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	b	2412	Ant1	-1.19	0	-1.19	8	Pass
NVNT	b	2442	Ant1	-1.76	0	-1.76	8	Pass
NVNT	b	2472	Ant1	-1.53	0	-1.53	8	Pass
NVNT	g	2412	Ant1	-6.2	0	-6.2	8	Pass
NVNT	g	2442	Ant1	-5.97	0	-5.97	8	Pass
NVNT	g	2472	Ant1	-5.93	0	-5.93	8	Pass
NVNT	n20	2412	Ant1	-7.5	0	-7.5	8	Pass
NVNT	n20	2442	Ant1	-7.95	0	-7.95	8	Pass
NVNT	n20	2472	Ant1	-7.76	0	-7.76	8	Pass
NVNT	n40	2422	Ant1	-10.55	0	-10.55	8	Pass
NVNT	n40	2442	Ant1	-10.42	0	-10.42	8	Pass
NVNT	n40	2462	Ant1	-10.03	0	-10.03	8	Pass

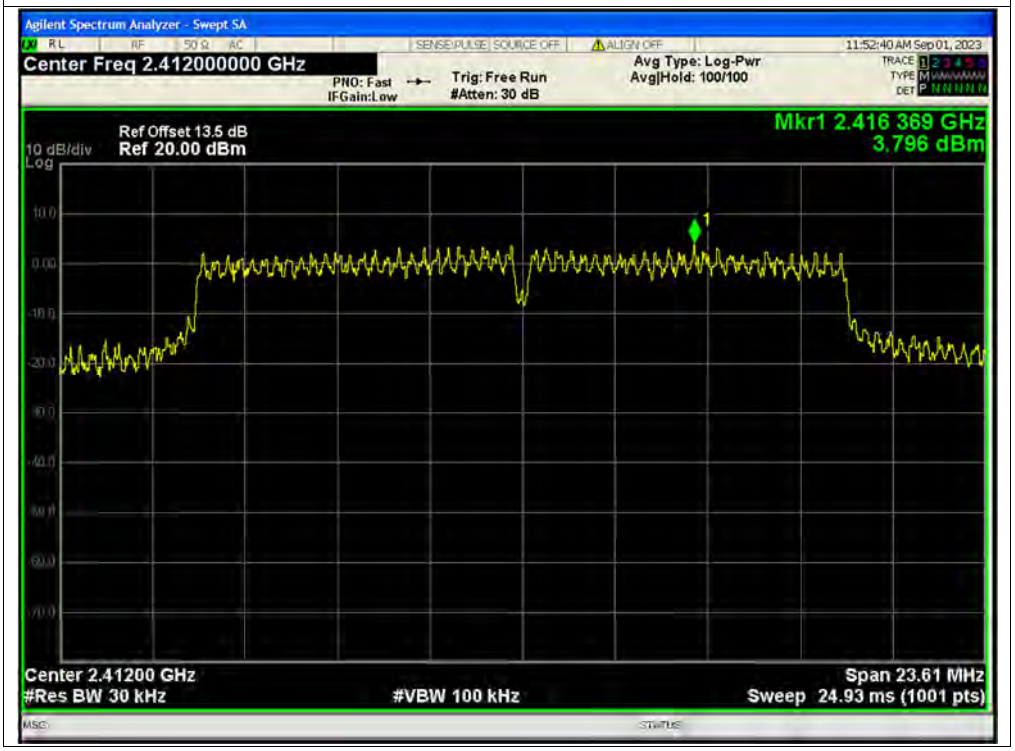
Test Graphs

PSD NVNT b 2412MHz Ant1

PSD NVNT b 2442MHz Ant1

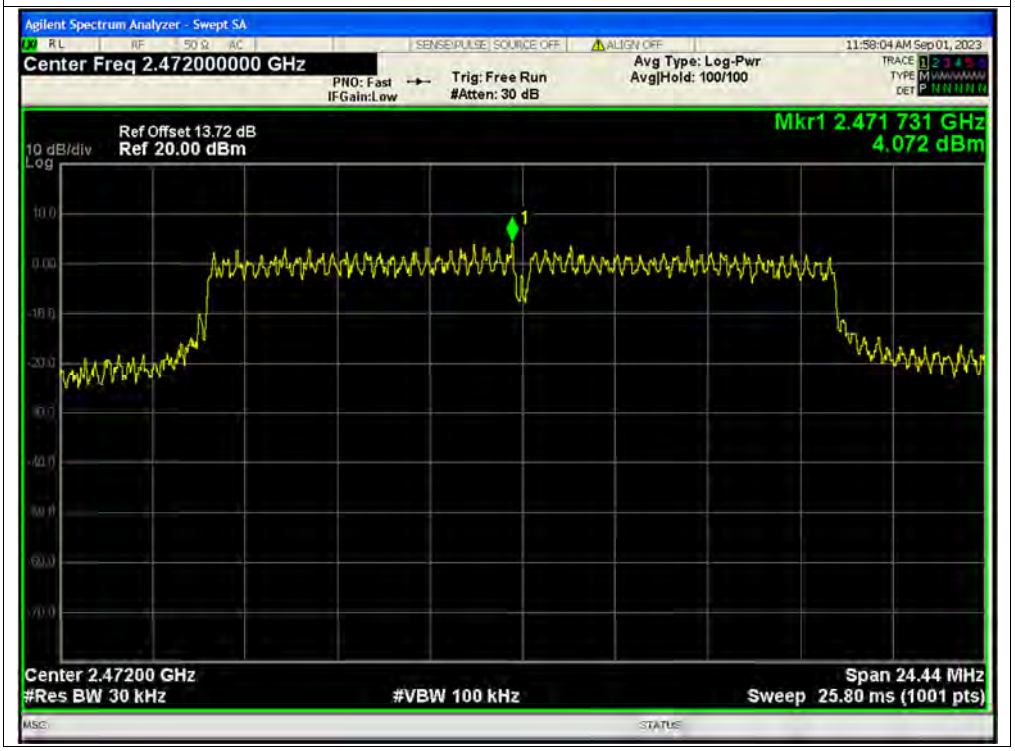
PSD NVNT b 2472MHz Ant1

PSD NVNT g 2412MHz Ant1



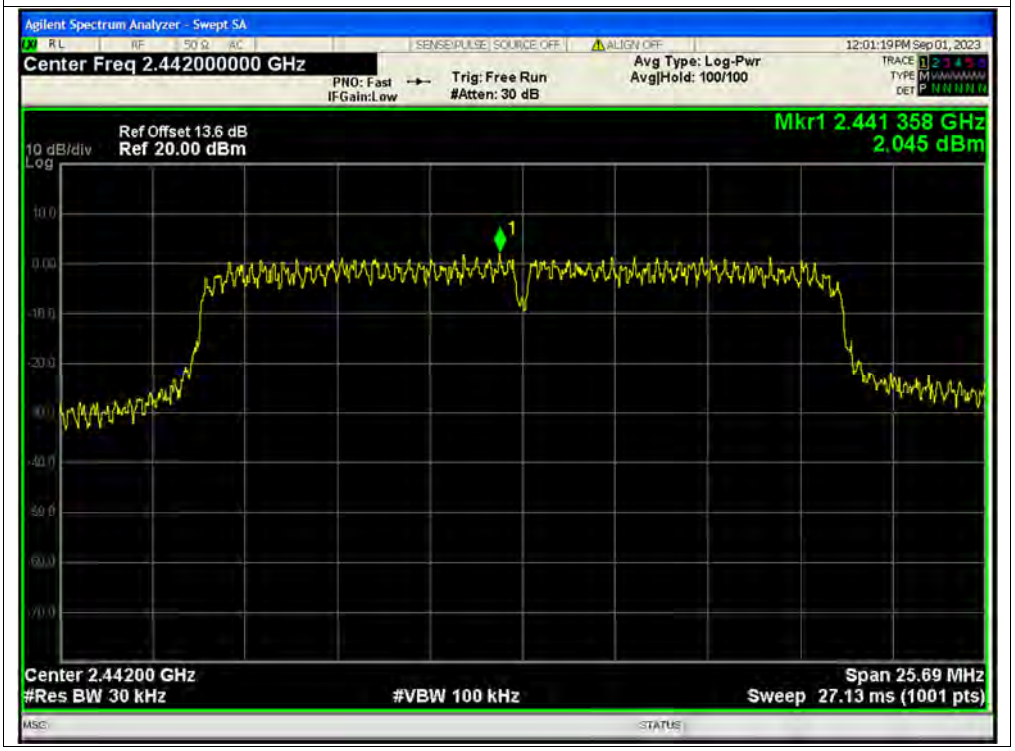
PSD NVNT g 2442MHz Ant1

PSD NVNT g 2472MHz Ant1

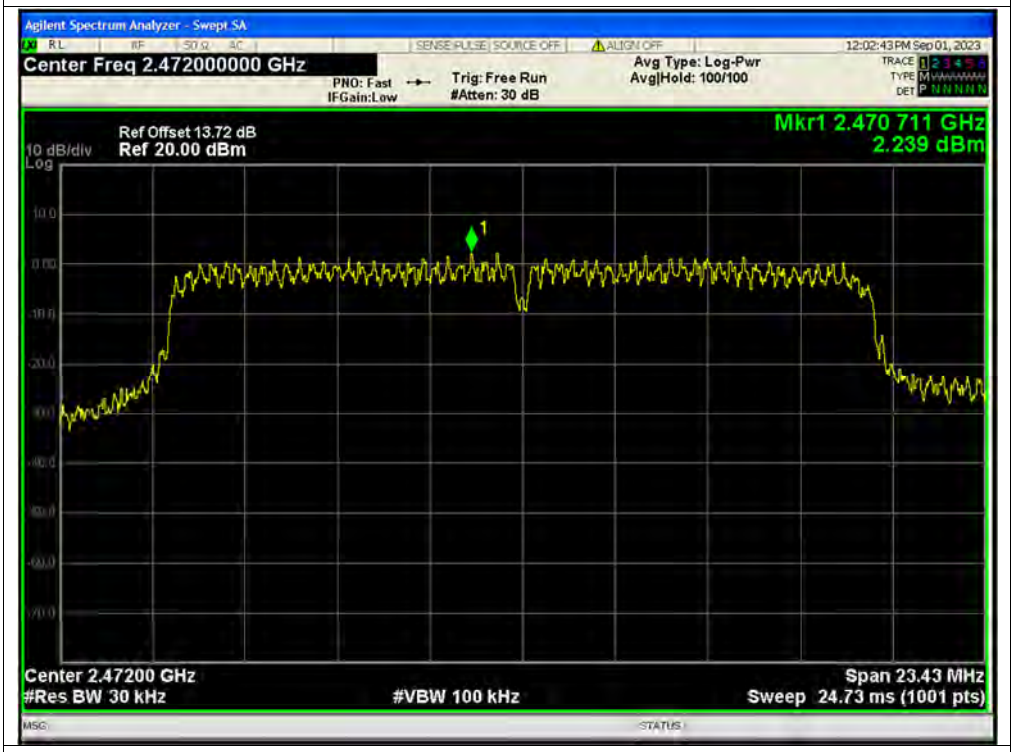


PSD NVNT n20 2412MHz Ant1

PSD NVNT n20 2442MHz Ant1

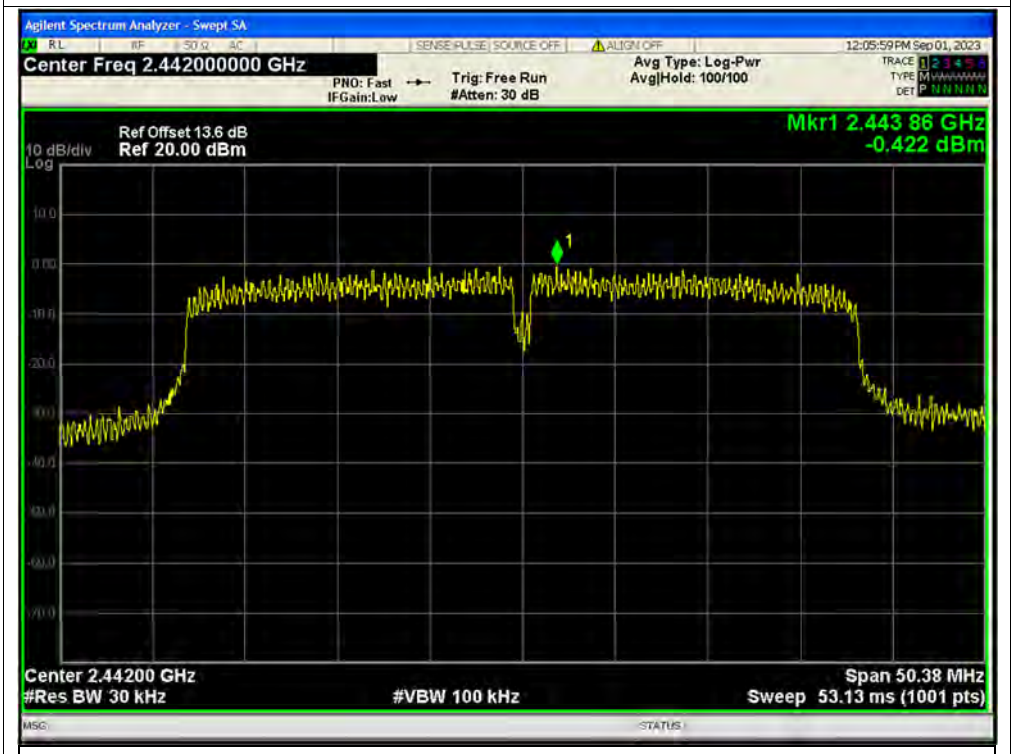


PSD NVNT n20 2472MHz Ant1

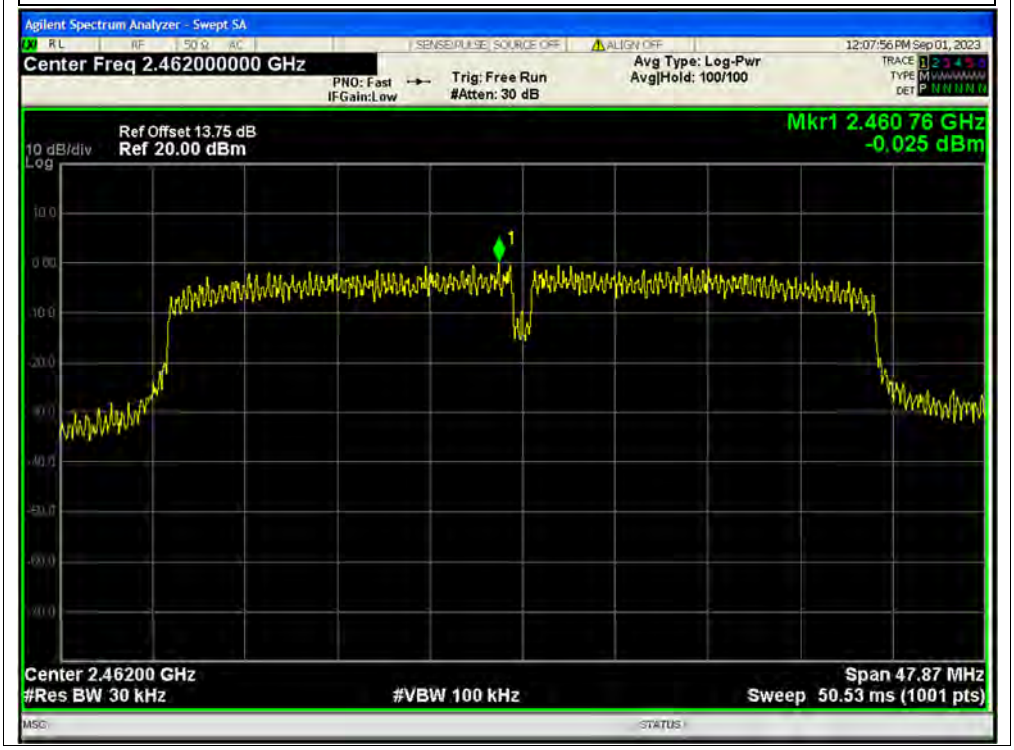


PSD NVNT n40 2422MHz Ant1

PSD NVNT n40 2442MHz Ant1



PSD NVNT n40 246MHz Ant1



A.8. Conducted Emission

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Set RBW=9kHz, VBW=30kHz. Refer to recorded points and plots below.

Note: Both of the test voltage AC 120V/60Hz and AC 230V/50Hz were considered and tested respectively, only the results of the worst case AC 120V/60Hz were recorded in this report.

A. Test Setup:

Test Mode: EUT +Notebook+Notebook Adapter +WIFI TX

Test voltage: AC 120V/60Hz

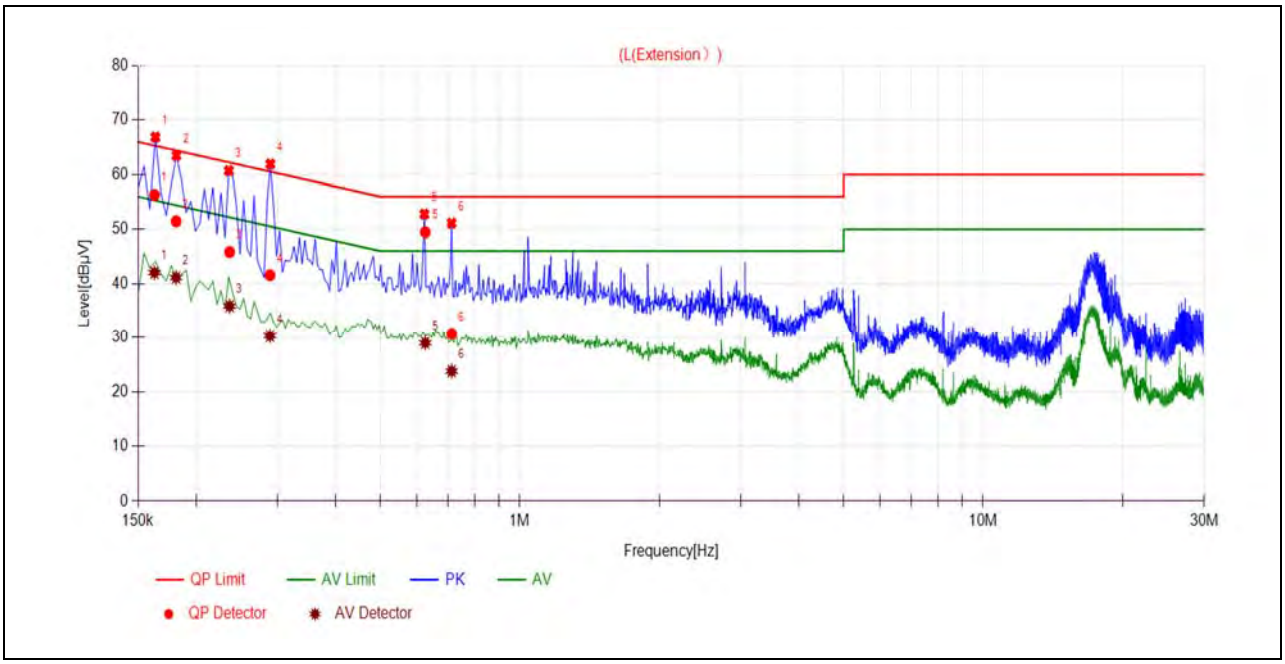
The measurement results are obtained as below:

E [dBμV] $=U_R + L_{Cable\ loss}$ [dB] + A_{Factor}

U_R: Receiver Reading

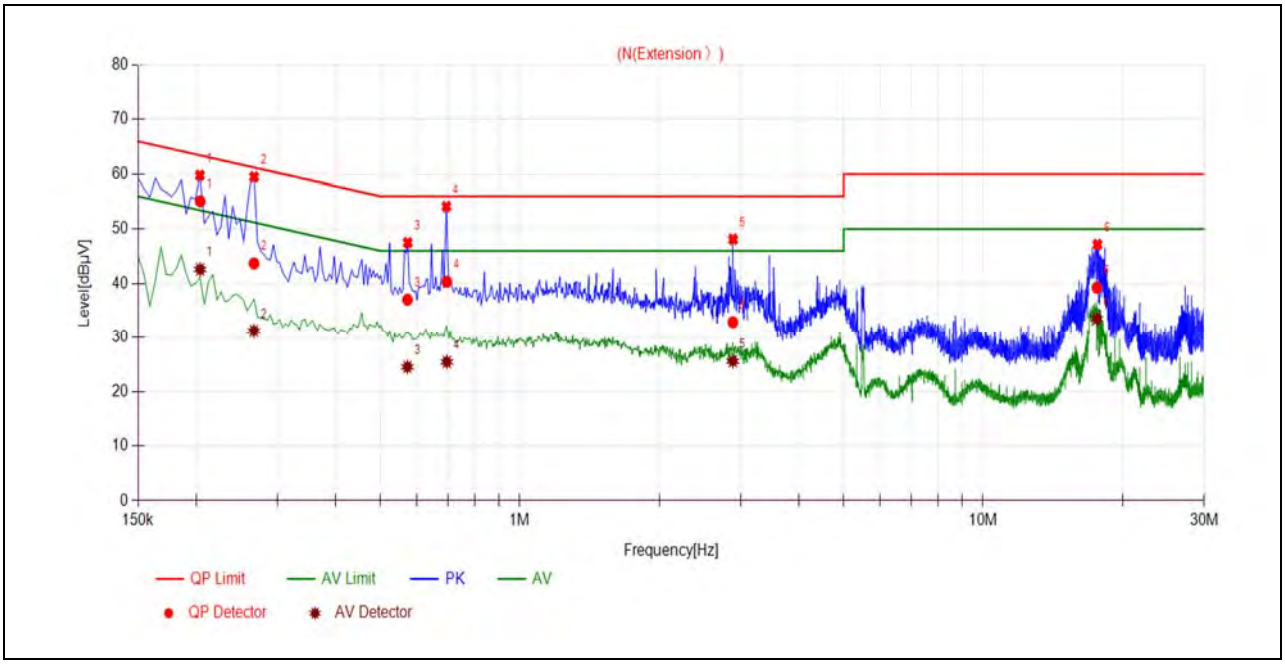
A_{Factor}: Voltage division factor of LISN

B. Test Plot:



(L Phase)

No.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1627	56.32	42.04	65.32	55.32	Line	PASS
2	0.1812	51.49	41.14	64.43	54.43		PASS
3	0.2364	45.84	35.87	62.22	52.22		PASS
4	0.2889	41.58	30.29	60.56	50.56		PASS
5	0.6251	49.49	28.98	56.00	46.00		PASS
6	0.7128	30.68	23.76	56.00	46.00		PASS



(N Phase)

No.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.2042	55.10	42.61	63.44	53.44	Neutral	PASS
2	0.2668	43.71	31.26	61.22	51.22		PASS
3	0.5721	37.04	24.52	56.00	46.00		PASS
4	0.6958	40.35	25.45	56.00	46.00		PASS
5	2.8835	32.89	25.59	56.00	46.00		PASS
6	17.6005	39.27	33.51	60.00	50.00		PASS

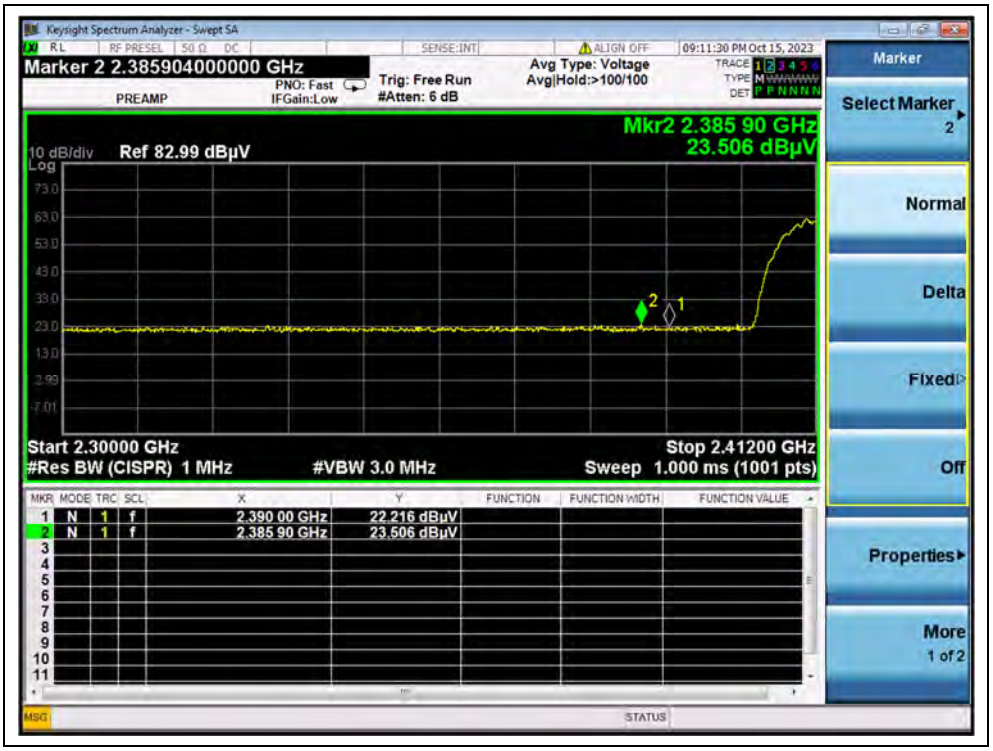
A.9. Restricted Frequency Bands

The lowest and highest channels are tested to verify the Restricted Frequency Bands.
The measurement results are obtained as below:
E [dBμV/m] $=U_R + A_T + A_{Factor}$ [dB]; $A_T = L_{Cable\ loss}$ [dB]-G_{preamp} [dB]
A_T: Total correction Factor except Antenna
U_R: Receiver Reading
G_{preamp}: Preamplifier Gain
A_{Factor}: Antenna Factor at 3m

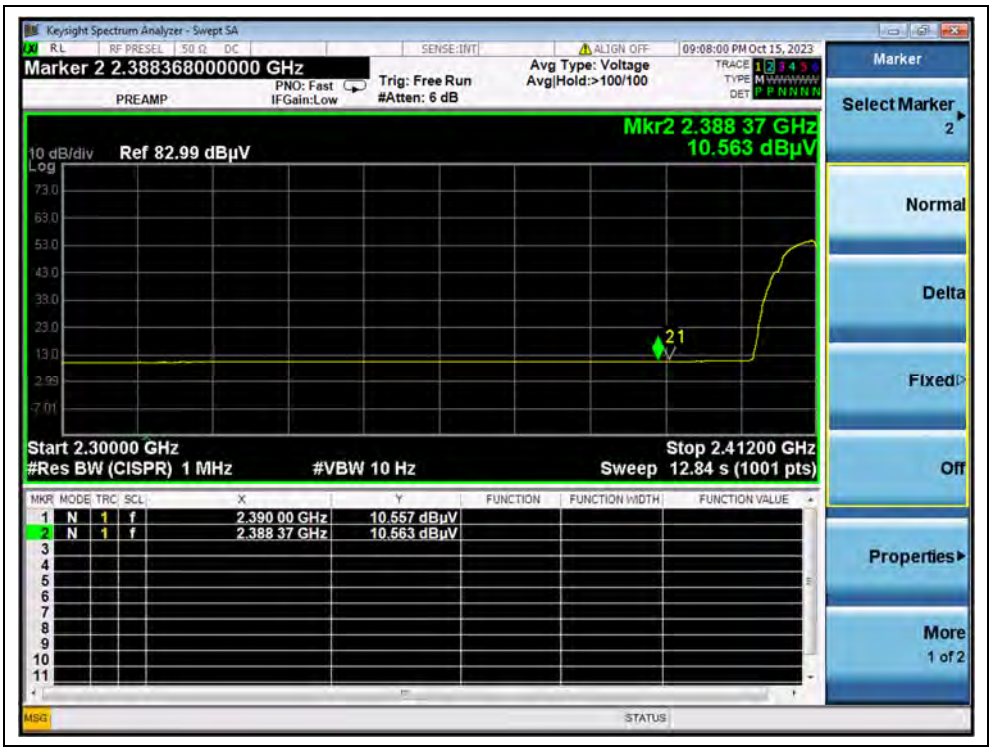
Note: Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.

802.11b Mode

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBμV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
1	2385.90	PK	23.51	6.74	27.20	57.45	74	PASS
1	2388.37	AV	10.56	6.74	27.20	44.50	54	PASS
13	2490.20	PK	23.73	6.74	27.20	57.67	74	PASS
13	2483.50	AV	10.44	6.74	27.20	44.38	54	PASS

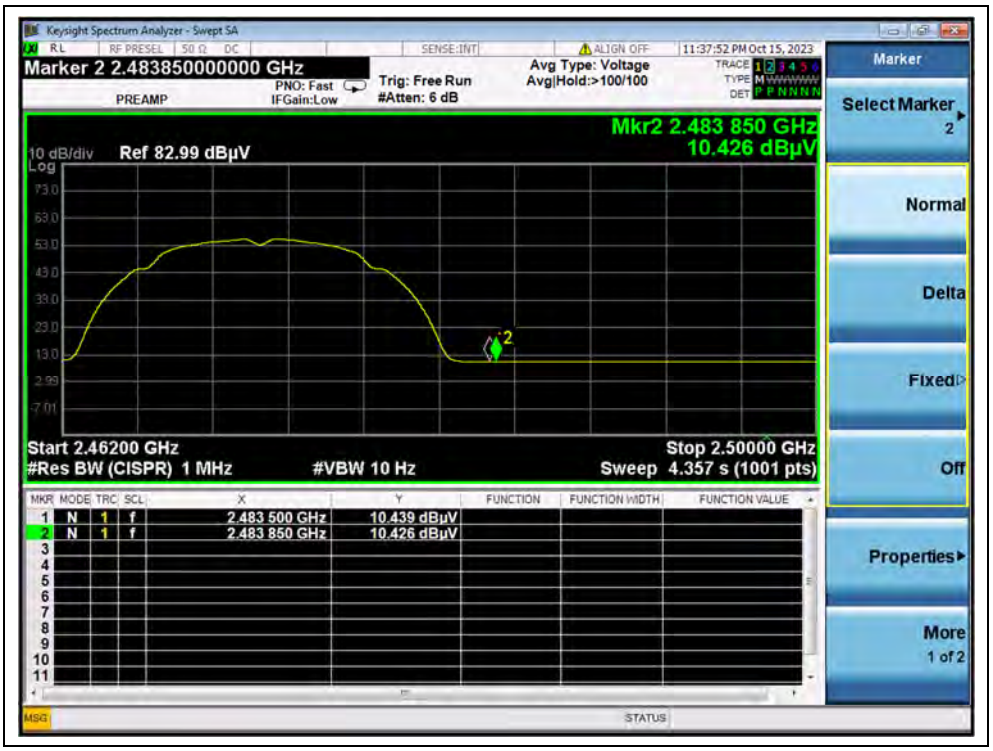


(PEAK, Channel 1, 802.11b)



(AVERAGE, Channel 1, 802.11b)

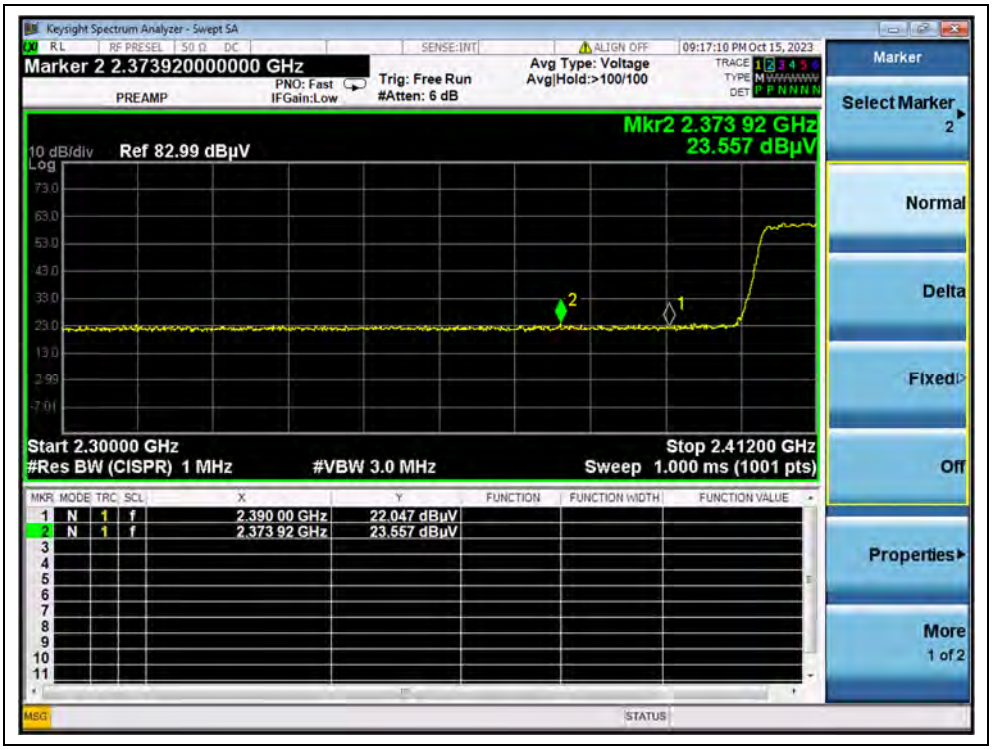
(PEAK, Channel 13, 802.11b)



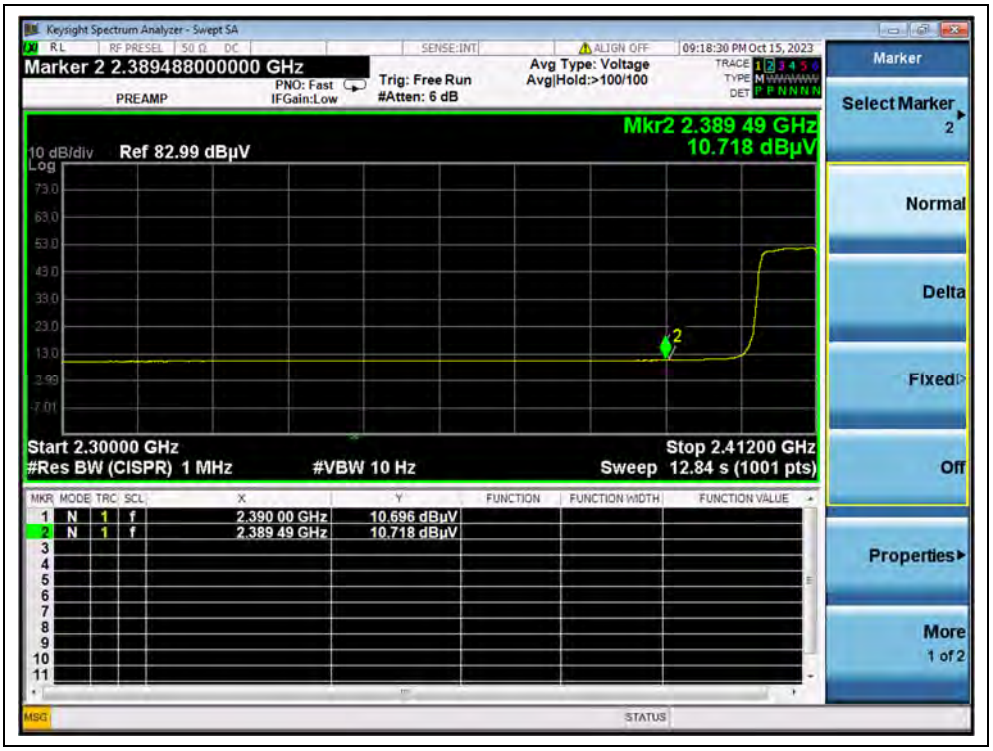
(AVERAGE, Channel 13, 802.11b)

802.11g Mode

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBμV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
1	2373.92	PK	23.56	6.74	27.20	57.50	74	PASS
1	2389.49	AV	10.72	6.74	27.20	44.66	54	PASS
13	2486.85	PK	26.86	6.74	27.20	60.80	74	PASS
13	2483.50	AV	12.62	6.74	27.20	46.56	54	PASS

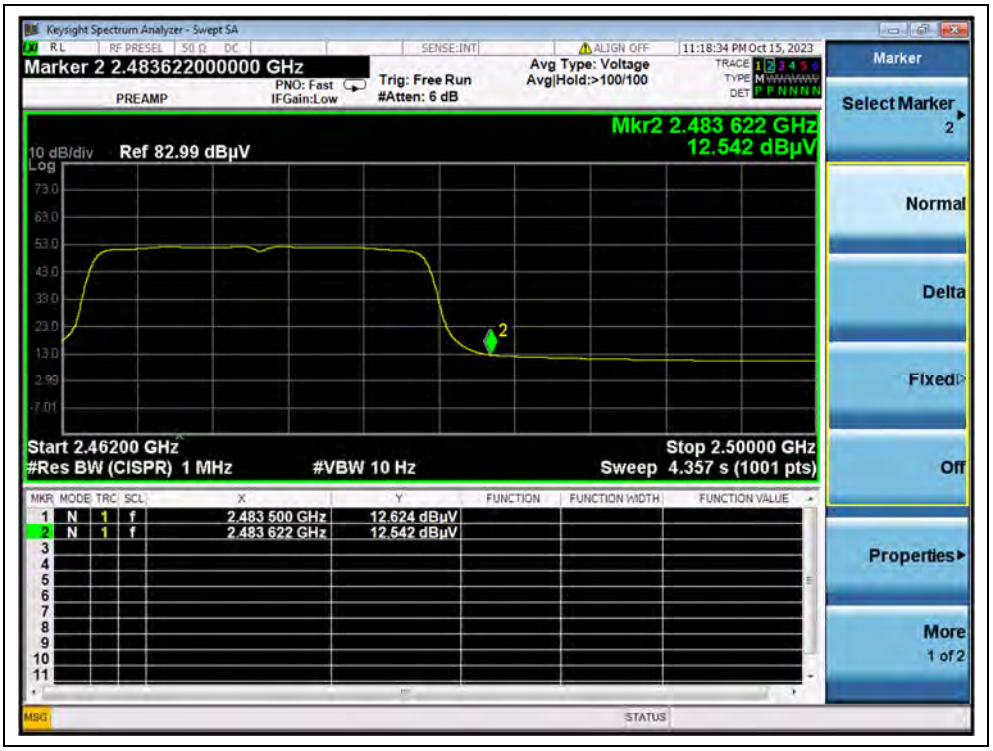


(PEAK, Channel 1, 802.11g)



(AVERAGE, Channel 1, 802.11g)

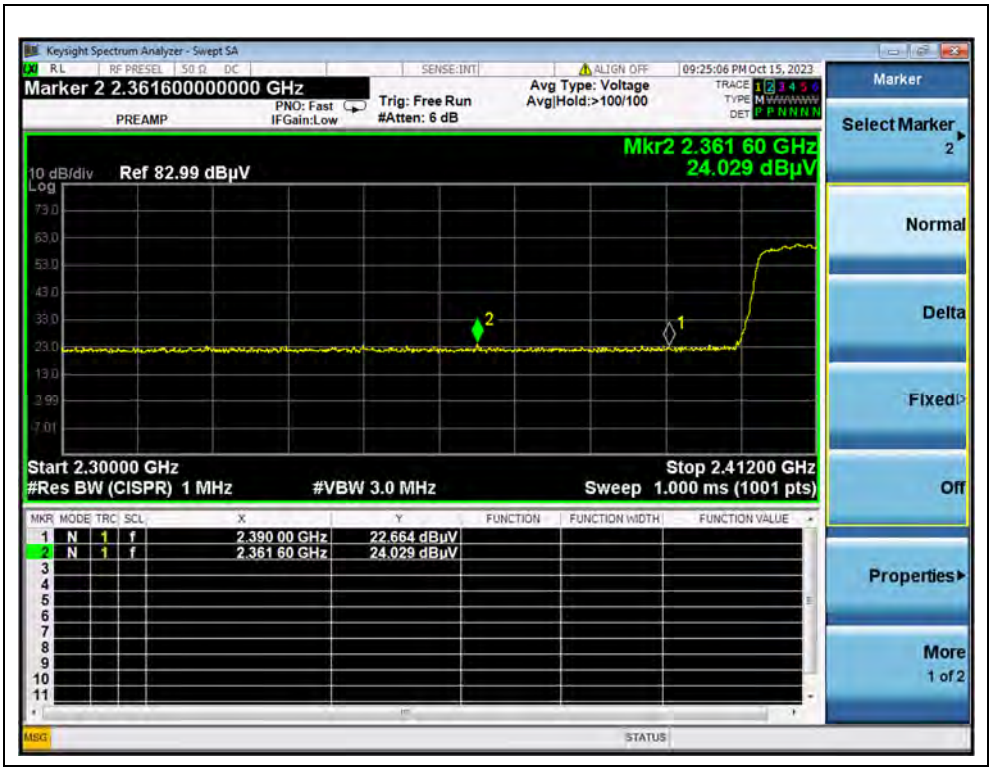
(PEAK, Channel 13, 802.11g)



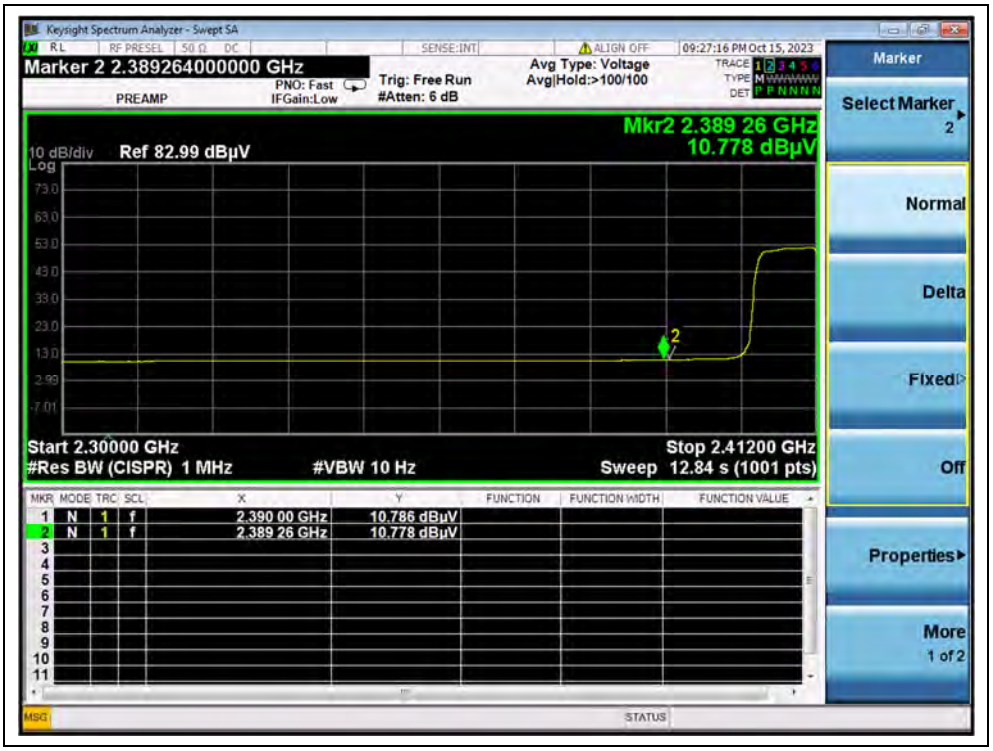
(AVERAGE, Channel 13, 802.11g)

802.11n (HT20) Mode

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBμV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
1	2361.60	PK	24.03	6.74	27.20	57.97	74	PASS
1	2390.00	AV	10.79	6.74	27.20	44.73	54	PASS
13	2483.50	PK	25.42	6.74	27.20	59.36	74	PASS
13	2483.50	AV	12.80	6.74	27.20	46.74	54	PASS

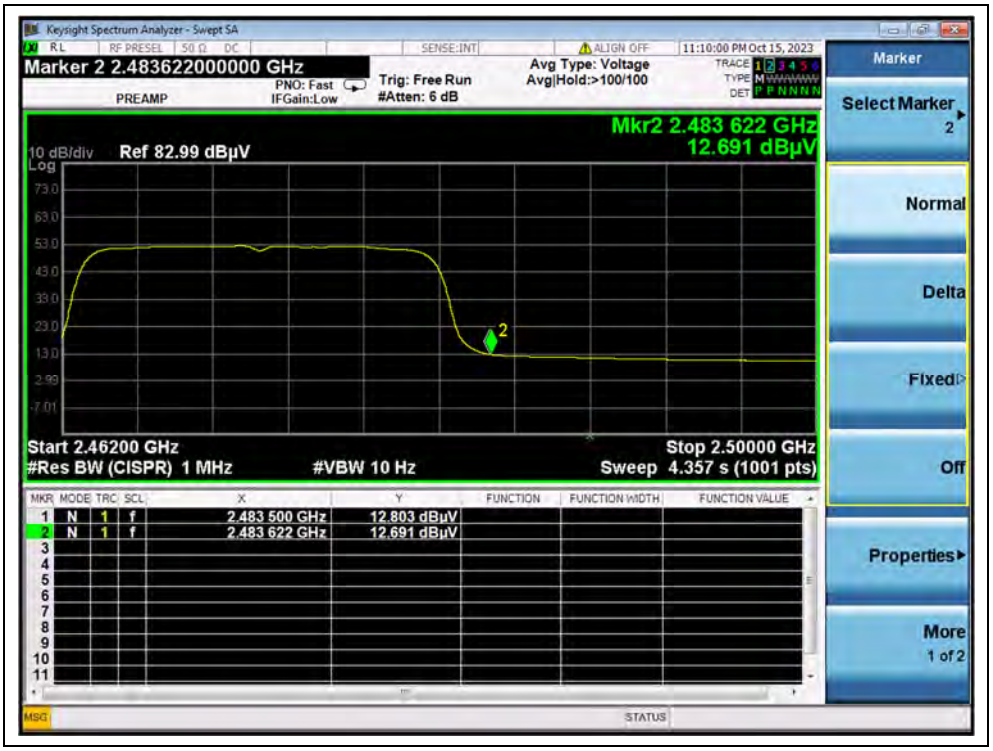


(PEAK, Channel 1, 802.11n (HT20))



(AVERAGE, Channel 1, 802.11n (HT20))

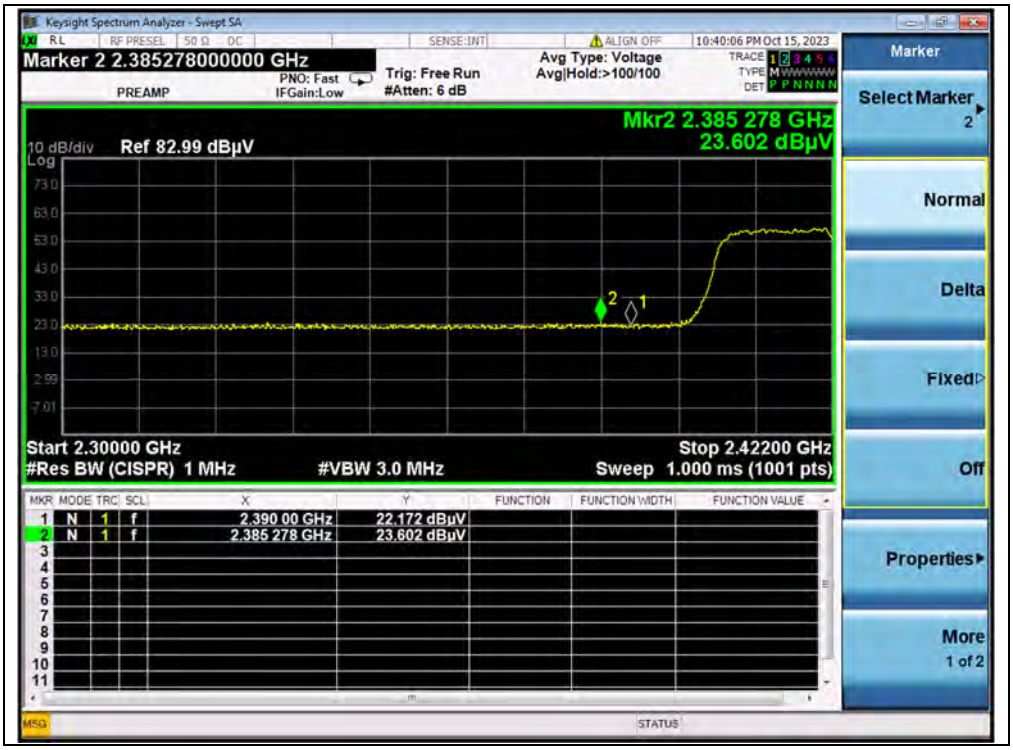
(PEAK, Channel 13, 802.11n (HT20))



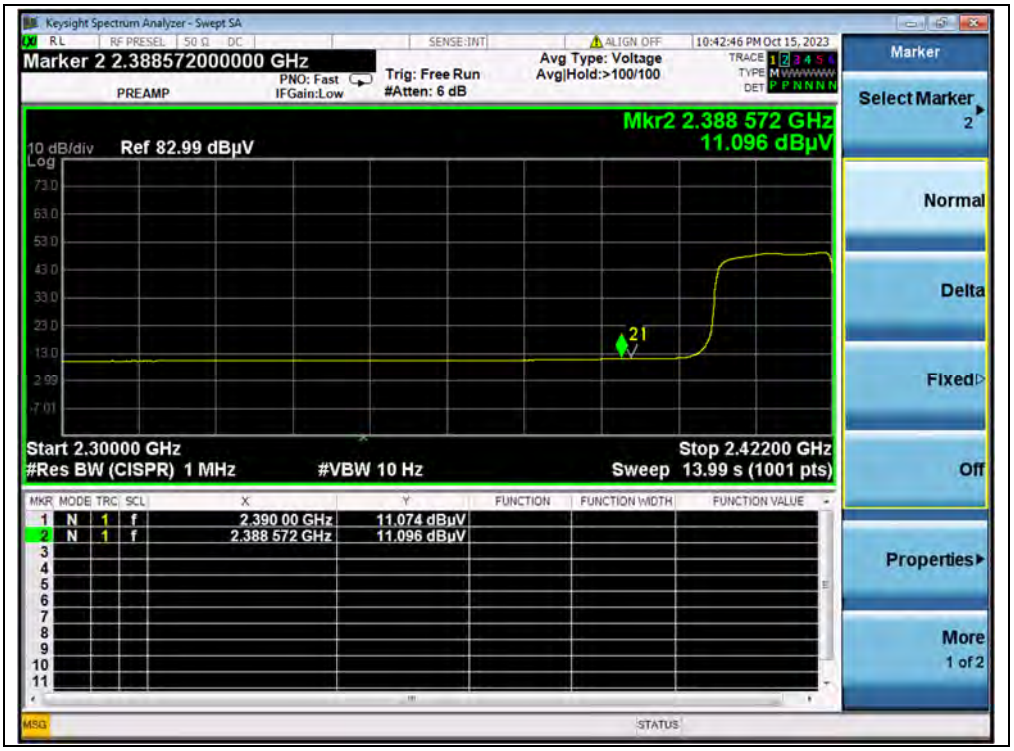
(AVERAGE, Channel 13, 802.11n (HT20))

802.11n (HT40) Mode

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBμV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
3	2385.28	PK	23.60	6.74	27.20	57.54	74	PASS
3	2388.57	AV	11.10	6.74	27.20	45.04	54	PASS
11	2483.50	PK	28.73	6.74	27.20	62.67	74	PASS
11	2483.50	AV	12.77	6.74	27.20	46.71	54	PASS

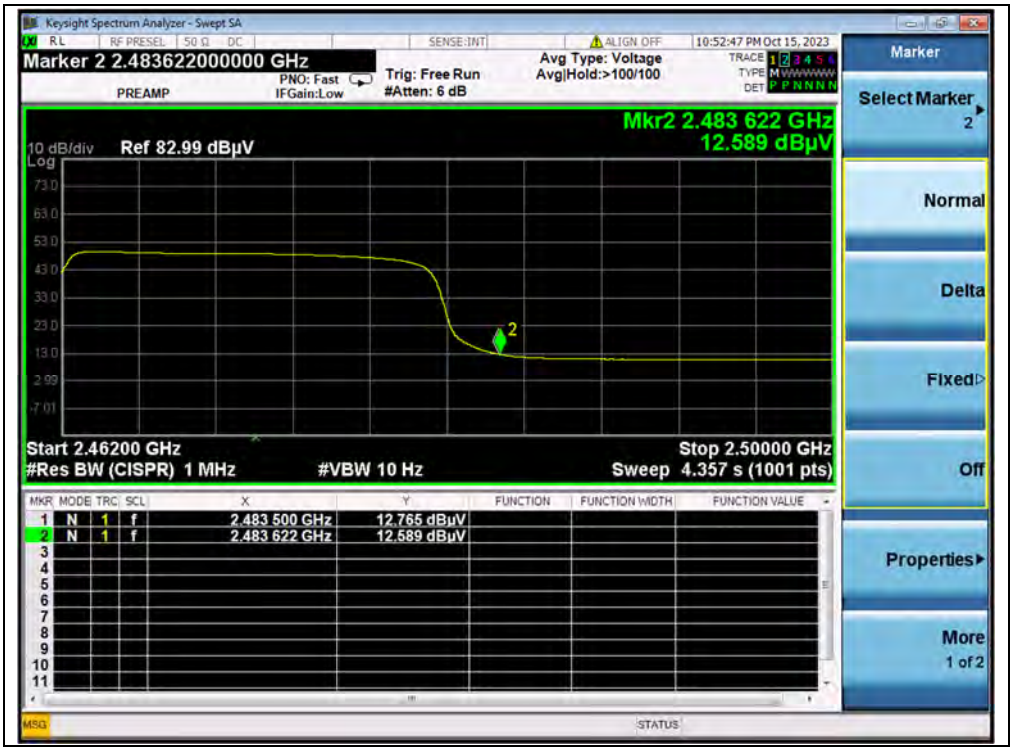


(PEAK, Channel 3, 802.11n (HT40))



(AVERAGE, Channel 3, 802.11n (HT40))

(PEAK, Channel 11, 802.11n (HT40))



(AVERAGE, Channel 11, 802.11n (HT40))

A.10. Radiated Emission

According to ANSI C63.10, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak (or average) detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with the quasi-peak (or average) limit, it is unnecessary to perform an quasi-peak measurement (or average).

The measurement results are obtained as below:

E [dBμV/m] $=U_R + A_T + A_{Factor}$ [dB]; $A_T = L_{Cable\ loss}$ [dB]$-G_{preamp}$ [dB]

A_T: Total correction Factor except Antenna

U_R: Receiver Reading

G_{preamp}: Preamplifier Gain

A_{Factor}: Antenna Factor at 3m

During the test, the total correction Factor A_T and A_{Factor} were built in test software.

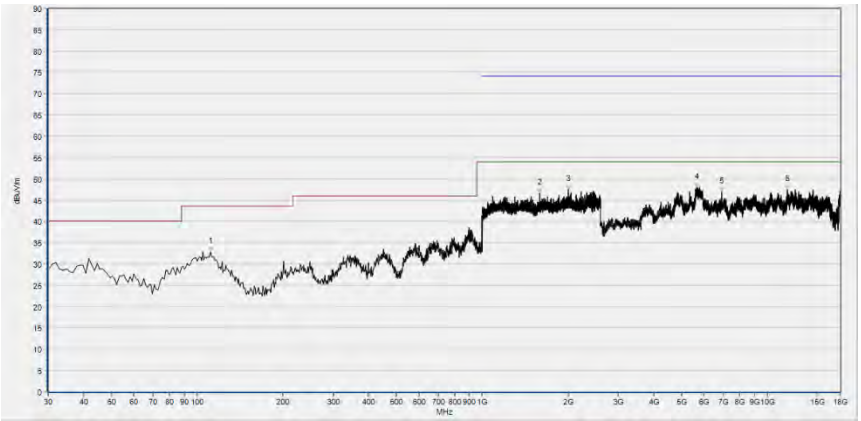
Note1: All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Note2: For the frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

Note3: For the frequency, which started from 18GHz to 10th harmonic of the highest frequency, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

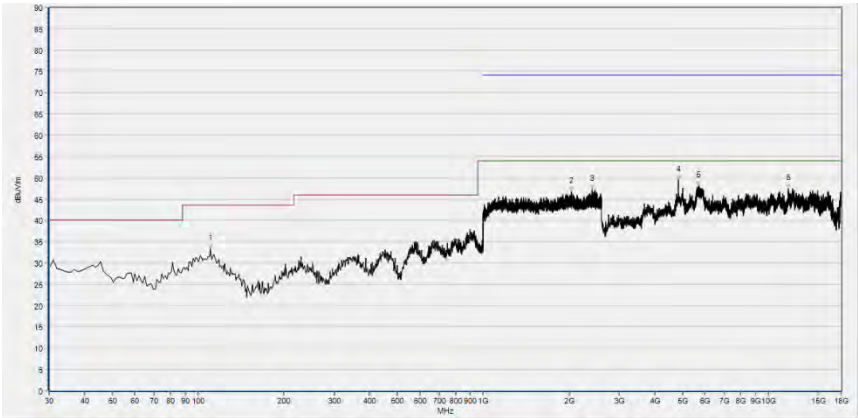
802.11b Mode

Plot for Channel 1



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
111.480	32.81	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1589.867	46.62	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2001.067	47.50	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5649.200	47.96	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
6902.760	46.87	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
11744.520	47.35	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

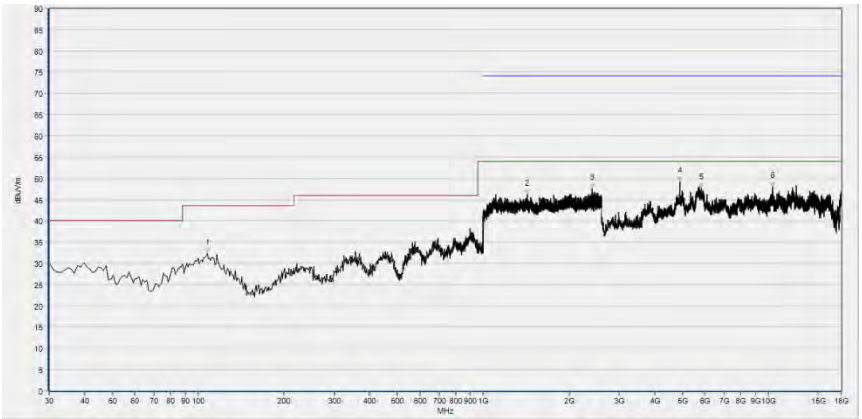
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
110.510	33.35	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2042.133	46.69	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2412.267	47.19	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4823.760	49.46	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5683.080	48.16	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11750.680	47.50	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

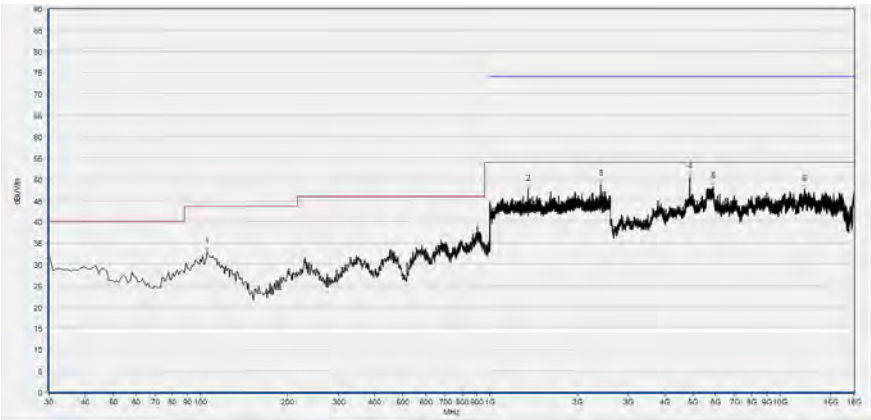
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 7



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
107.600	32.42	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1429.333	46.29	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2409.600	47.64	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4882.280	49.28	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5815.520	47.70	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10349.280	48.07	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
105.660	32.78	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1349.867	47.58	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2411.733	48.75	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4882.280	50.52	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5883.280	48.21	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12141.840	47.63	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 13

Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
102.750	32.92	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1420.267	45.90	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2459.200	47.81	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4943.880	46.94	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5707.720	48.34	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12129.520	47.25	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

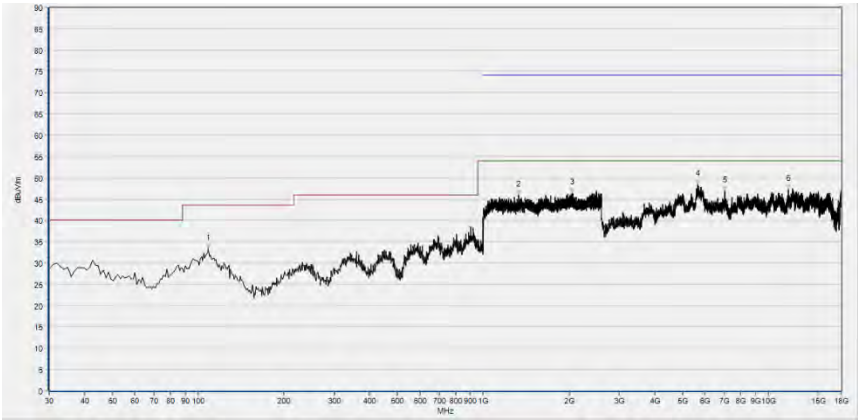
(Antenna Horizontal, 30MHz to 18GHz)

Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
108.570	33.00	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2040.000	46.93	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2406.933	47.75	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4943.880	49.73	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5618.400	48.01	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12129.520	48.01	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

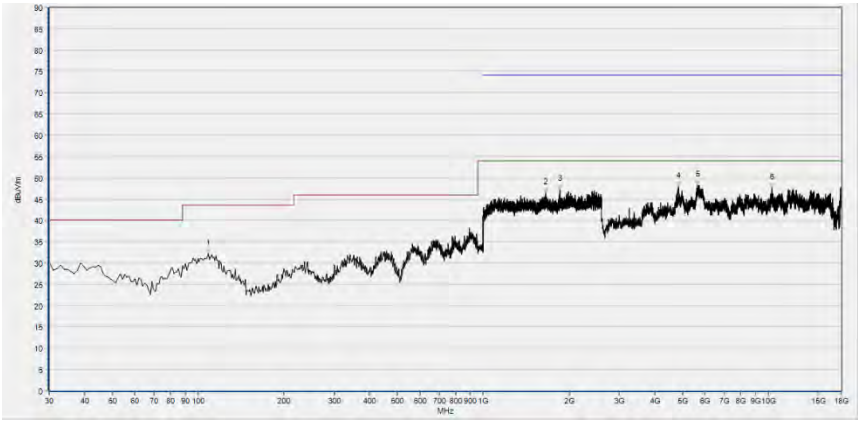
802.11g Mode

Plot for Channel 1



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
108.570	33.27	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1332.800	45.86	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2049.600	46.45	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5649.200	48.50	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7032.120	46.89	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
11747.600	47.34	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
108.570	32.22	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1651.733	46.39	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1856.533	47.26	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4829.920	48.00	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5652.280	48.20	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10266.120	47.54	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 7

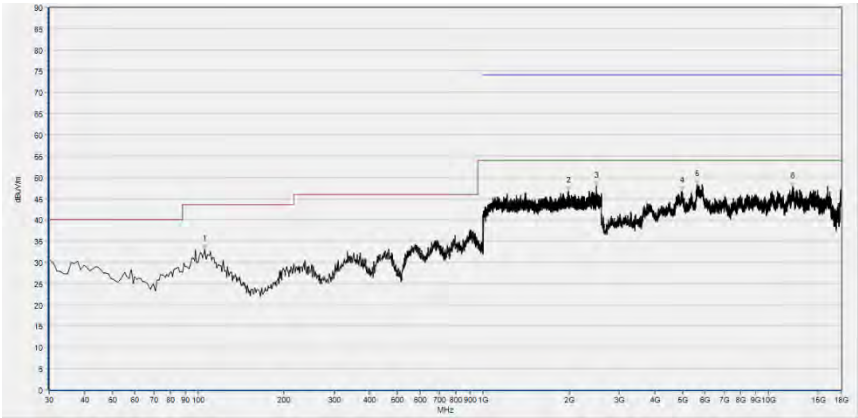
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
107.600	33.52	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1204.267	45.40	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2362.133	46.90	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4885.360	48.00	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5747.760	48.47	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12129.520	47.96	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
108.570	32.49	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1252.267	45.78	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2414.400	47.36	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4879.200	49.59	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5867.880	49.16	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12148.000	47.15	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

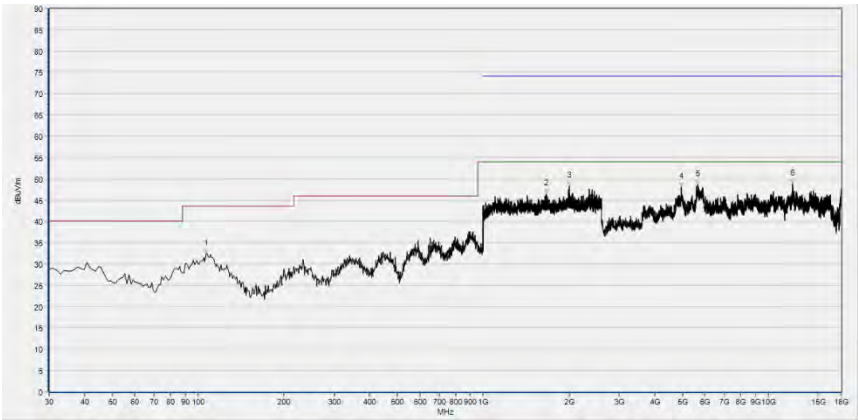
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 13



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
105.660	33.04	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1994.667	46.77	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2496.533	47.97	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4980.840	46.77	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5627.640	48.28	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12148.000	47.74	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

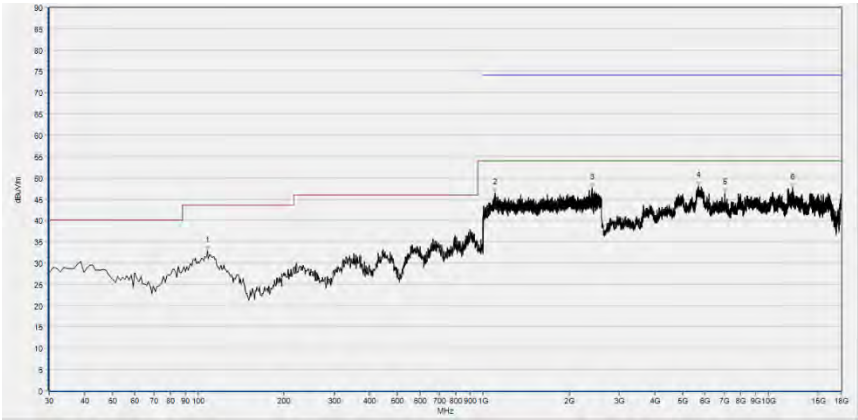


Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
106.630	32.30	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1664.000	46.46	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1998.400	48.19	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4943.880	48.06	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5652.280	48.58	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12154.160	48.77	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

802.11n (HT20) Mode

Plot for Channel 1



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
107.600	32.91	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1098.667	46.40	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2413.867	47.67	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5673.840	48.08	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7050.600	46.48	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12184.960	47.53	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

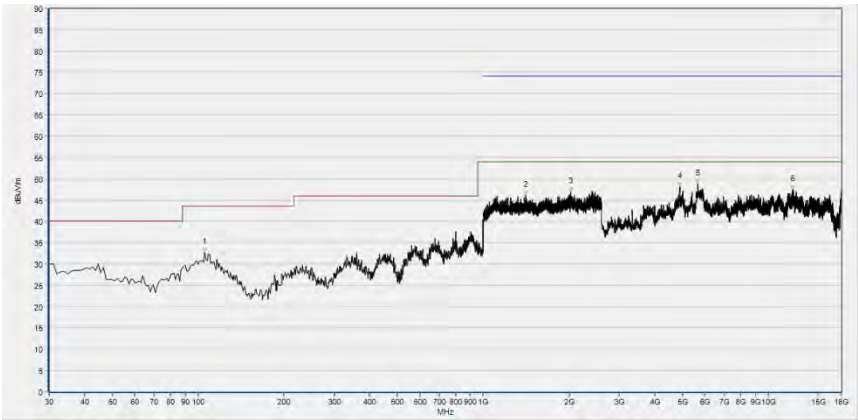
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
112.450	32.13	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1661.867	46.30	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1994.133	47.12	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5846.320	48.73	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10854.400	47.31	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12209.600	48.24	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 7

Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
108.570	32.05	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1358.933	45.83	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
1963.733	47.08	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4882.280	46.99	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5661.520	48.48	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
14402.560	47.60	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)



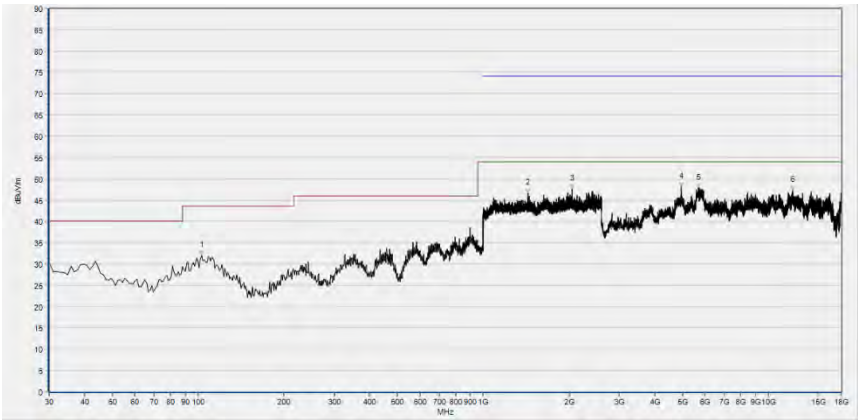
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
105.660	32.67	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1408.533	46.14	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2024.533	46.87	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4882.280	48.10	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5667.680	48.78	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12175.720	47.40	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 13

Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
106.630	33.07	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2004.800	46.74	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2413.333	48.00	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5726.200	47.77	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8393.480	47.13	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12114.120	47.37	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

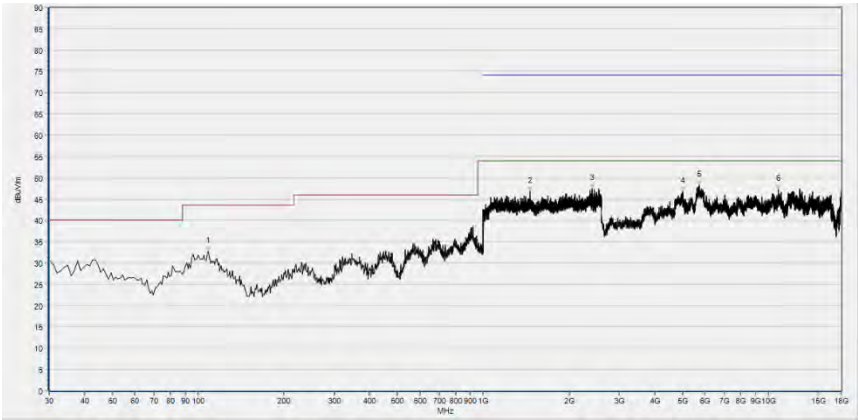


Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
102.750	31.96	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1436.800	46.67	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2048.533	47.63	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4943.880	48.14	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5689.240	47.76	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12172.640	47.34	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

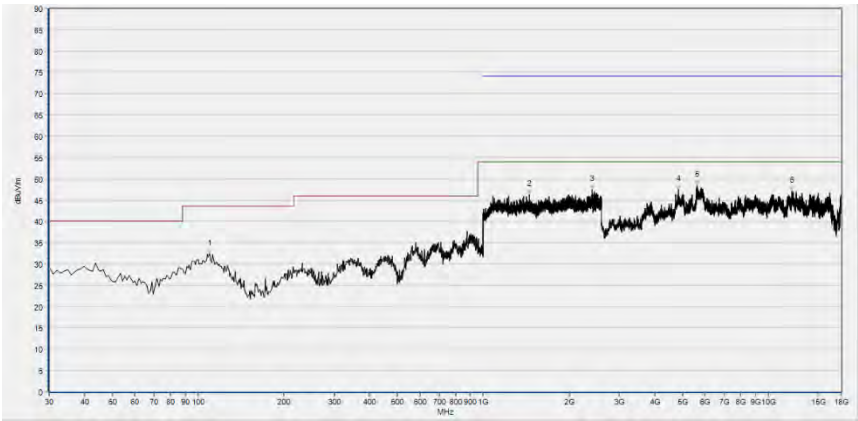
802.11n (HT40) Mode

Plot for Channel 3



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
108.570	32.70	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1458.133	46.69	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2413.867	47.40	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5008.560	46.74	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5720.040	48.33	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10854.400	47.18	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
109.540	32.31	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1453.867	46.17	N/A	-40.80	74.00	N/A	54.00	Vertical	PASS
2405.333	47.46	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4839.160	47.47	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5612.240	48.41	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12111.040	47.11	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 7

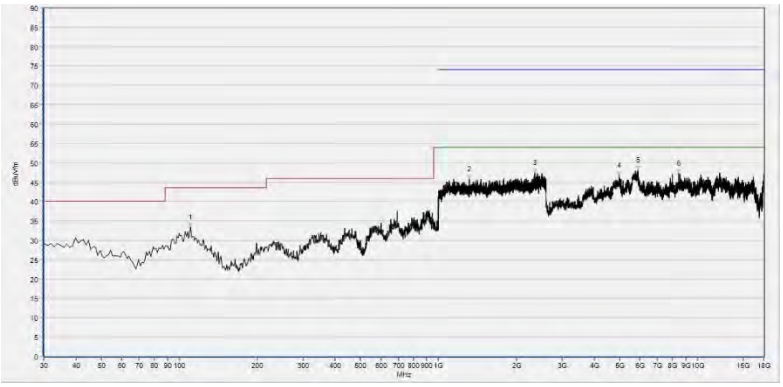
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
109.540	31.99	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1650.667	46.66	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2046.933	46.96	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5778.560	48.10	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7977.680	46.67	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10309.240	47.55	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
107.600	32.36	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1879.467	46.30	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2451.733	47.62	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4876.120	47.30	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5655.360	47.54	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11726.040	47.00	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

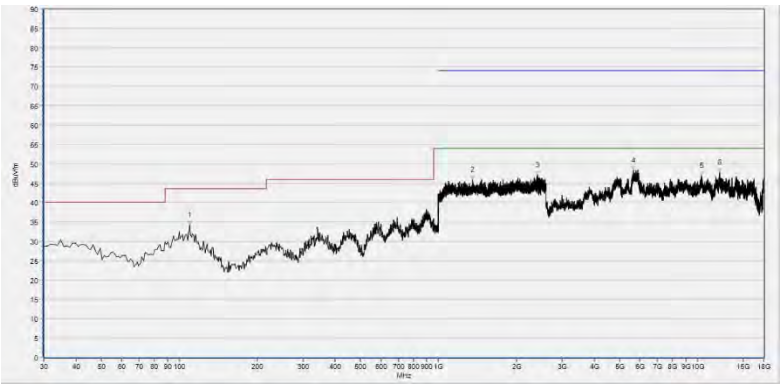
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 11



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
110.510	33.36	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1314.133	45.78	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2359.467	47.39	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4987.000	46.72	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5867.880	48.02	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8448.920	47.28	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
109.540	34.22	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1352.533	45.95	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2409.600	47.17	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5658.440	48.27	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10361.600	47.00	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12184.960	47.70	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

END OF REPORT