



TEST REPORT

APPLICANT : SHENZHEN XFANIC
: TECHNOLOGY CO.,LTD
PRODUCT NAME : 2.4GHz Lavalier digital Wireless
: Microphone
MODEL NAME : XF-A3003B, XF-A3003A, 44695,
: SF-MP012
BRAND NAME : DarkMatter, XFANIC, SOOMFON
FCC ID : 2ASRI-A3003B
STANDARD(S) : 47 CFR Part 15 Subpart C
RECEIPT DATE : 2023-09-18
TEST DATE : 2023-09-26 to 2023-11-03
ISSUE DATE : 2023-11-17



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Change History		
Version	Date	Reason for change
1.0	2023-11-17	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	15.247(a) 15.247(h)	Hopping Mechanism	N/A	N/A	PASS	No deviation
3	15.247(a)	Number of Hopping Frequency	Oct. 28, 2023	Zhong Yanshan	PASS	No deviation
4	ANSI C63.10	Duty Cycle	Oct. 19, 2023	Zhong Yanshan	PASS	No deviation
5	15.247(b)	Maximum Peak Conducted Output Power	Oct. 19, 2023	Zhong Yanshan	PASS	No deviation
6	15.247(b)	Maximum Average Conducted Output Power	Oct. 19, 2023	Zhong Yanshan	PASS	No deviation
7	15.247(a)	20dB Bandwidth	Oct. 19, 2023	Zhong Yanshan	PASS	No deviation
8	15.247(a)	Carrier Frequency Separation	Oct. 28, 2023	Zhong Yanshan	PASS	No deviation
9	15.247(a)	Time of Occupancy (Dwell time)	Oct. 28, 2023	Zhong Yanshan	PASS	No deviation
10	15.247(d)	Conducted Spurious Emission	Oct. 28, 2023	Zhong Yanshan	PASS	No deviation
11	15.207	Conducted Emission	Sep. 26, 2023	Wang Deyong	PASS	No deviation
12	15.247(d)	Restricted Frequency Bands	Nov. 03, 2023	Lin Jiayong	PASS	No deviation
13	15.209,	Radiated	Nov. 01, 2023	Lin Jiayong	PASS	No deviation



	15.247(d)	Emission				
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Note 1: The tests were performed according to the method of measurements prescribed in ANSI C63.10-2013, KDB558074 D01 v05r02 and DA 00-075.

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 Analyzer	MY53470836	N9010A	Agilent	2023.02.27	2024.02.26
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
TS+ -[JS36-RSE]	Tonscend	2.0.1.3
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	S10M100L38 02	LUCIX CORP.	2023.06.27	2024.06.26
Preamplifier (2GHz-18GHz)	61171/61172	S020180L32 03	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-K K-0.5	Qualwave	2023.07.04	2024.07.03
RF Coaxial Cable (DC-40GHz)	22290046	QA360-40-K KF-2	Qualwave	2023.07.04	2024.07.03
RF Coaxial Cable (DC-18GHz)	22120181	QA500-18-N N-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
Number of Hopping Frequency	±5%	Confidence levels of 95%
Peak Output Power	±2.22dB	Confidence levels of 95%
Bandwidth	±5%	Confidence levels of 95%
Carrier Frequency Separation	±5%	Confidence levels of 95%
Time of Occupancy (Dwell time)	±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	SHENZHEN XFANIC TECHNOLOGY CO.,LTD
Applicant Address	1-4/F,Block 2, Longcheng Industrial Area, Dalang Subdistrict, Longhua District, Shenzhen, Guangdong, China
Manufacturer	SHENZHEN XFANIC TECHNOLOGY CO.,LTD
Manufacturer Address	1-4/F,Block 2, Longcheng Industrial Area, Dalang Subdistrict, Longhua District, Shenzhen, Guangdong, China

2.2. Information of EUT

Product Name:	2.4GHz Lavalier digital Wireless Microphone	
Sample No.:	1#, 2#	
Hardware Version:	A2	
Software Version:	V1.2.15	
Equipment Type:	Bluetooth classic	
Modulation Type:	FHSS (GFSK(1Mbps), $\pi/4$ -DQPSK(EDR 2Mbps), 8-DPSK(EDR 3Mbps))	
Operating Frequency Range:	2402MHz-2480MHz	
Antenna Type:	Chip Antenna	
Antenna Gain:	3.09dBi	
Accessory Information:	Battery	
	Brand Name:	N/A
	Model No.:	502025
	Serial No.:	N/A
	Capacity:	180mAh
	Rated Voltage:	3.7V
	Charge Limit:	4.2V
	Manufacturer:	dongguan golden cel battery Co.,ltd



Note 1: According to the certificate holder, they declared that for Product Name: 2.4GHz Lavalier digital Wireless Microphone, have many models. These models have the same hardware and software, only different for model name, all RF parameters remain the same. And these models have their own brands, details as follows:

Brand Name: SOOMFON Model name: SF-MP012

Brand Name: XFANIC Model Name: XF-A3003B, XF-A3003A

Brand Name: DarkMatter Model name: 44695

The main measuring model is XF-A3003B, only the results for XF-A3003B were recorded in this report.

Note 2: We use the dedicated software to control the EUT continuous transmission.

Note 3: 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

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

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

2.4. Test Configuration of EUT

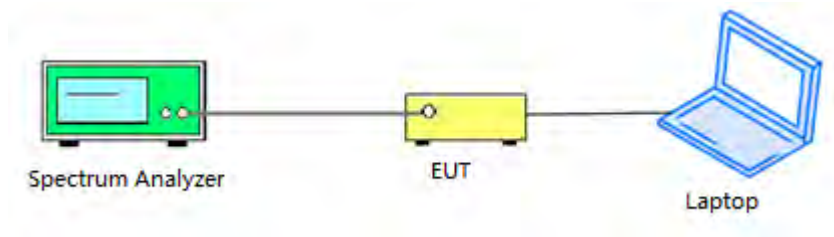
Test mode is used to control the EUT under the maximum power level during test.

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

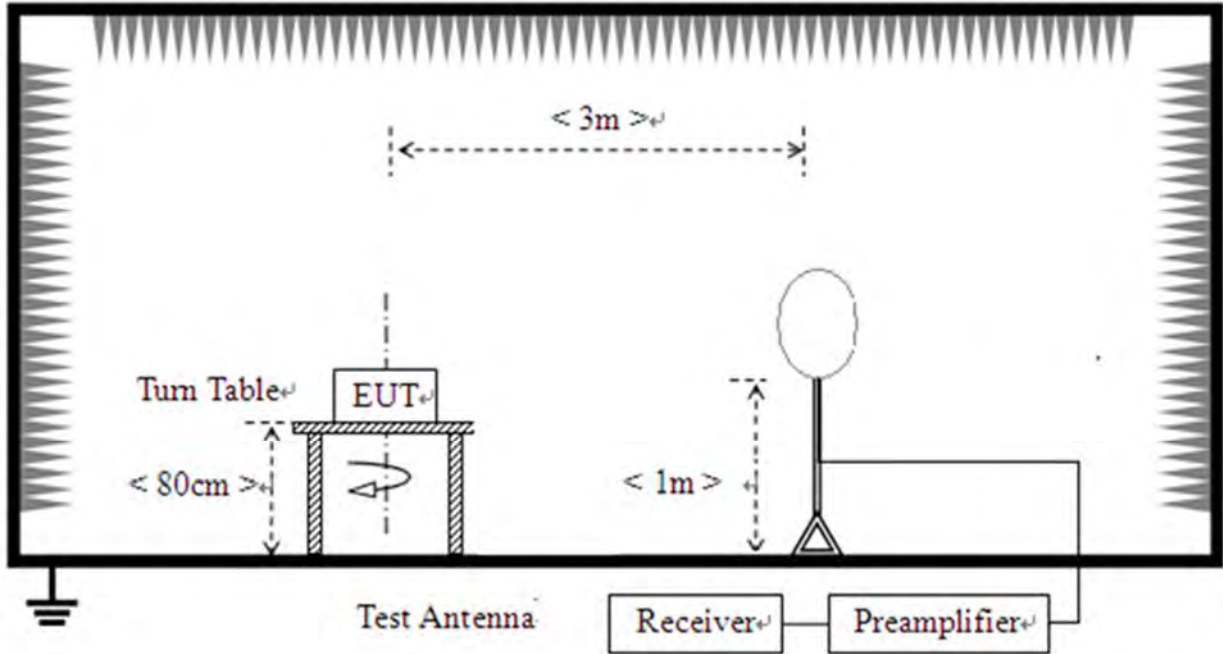


2.6.2. Conducted Emission Measurement

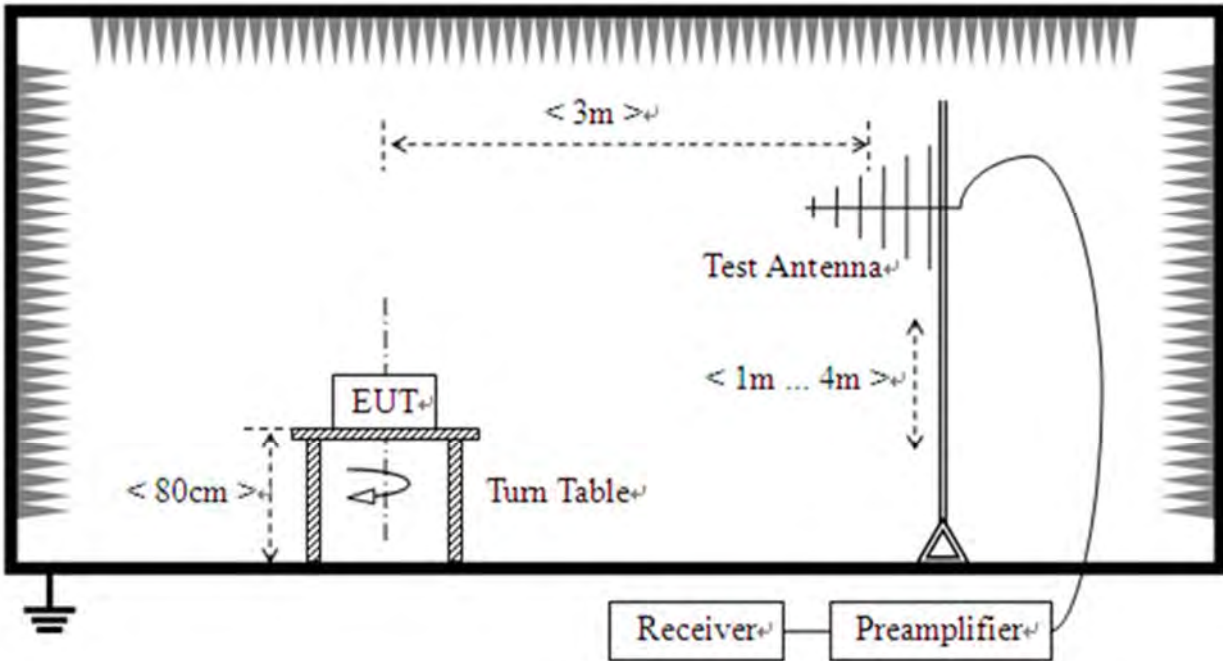


2.6.3.Radiation Measurement

1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to 1GHz



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. Hopping Mechanism

3.2.1. Requirement

According to FCC section 15.247(a)(1), a frequency hopping spread spectrum system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

According to FCC section 15.247(h), the incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hop sets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

3.2.2. Test Result

The hopping mechanism of the EUT is in compliance with the document "**Bluetooth core specification v5.1**".



3.3. Number of Hopping Frequency

3.3.1. Requirement

According to FCC section 15.247(a)(1)(iii), frequency hopping systems operating in the 2400MHz to 2483.5MHz bands shall use at least 15 hopping frequencies.

3.3.2. Test Procedures

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = the frequency band of operation

RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.

VBW \geq RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize

3.3.3. Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.3.4. Test Result

Refer to Annex A.1 in this report.



3.4. Duty Cycle of Test Signal

3.4.1. 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 $\pm 2\%$; otherwise, the duty cycle is considered to be non constant.

3.4.2. Test Result

Refer to Annex A.2 in this report.



3.5. Maximum Peak Conducted Output Power

3.5.1. Requirement

According to FCC section 15.247(b)(1), for frequency hopping systems that operates in the 2400MHz to 2483.5MHz band employing at least 75 hopping channels, the maximum peak output power of the intentional radiator shall not exceed 1Watt. For all other frequency hopping systems in the 2400MHz to 2483.5MHz band, it is 0.125Watts.

3.5.2. Test Procedures

KDB 558074 Section 8.3.1 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.3 in this report.



3.6. Maximum Average Conducted Output Power

3.6.1. Requirement

According to FCC section 15.247(b)(1), for frequency hopping systems that operates in the 2400MHz to 2483.5MHz band employing at least 75 hopping channels, the maximum peak output power of the intentional radiator shall not exceed 1Watt. For all other frequency hopping systems in the 2400MHz to 2483.5MHz band, it is 0.125Watts.

3.6.2. Test Procedures

KDB 558074 Section 8.3.2 was used in order to prove compliance.

3.6.3. Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.6.4. Test Result

Refer to Annex A.4 in this report.



3.7.20 dB Bandwidth

3.7.1.Requirement

According to FCC section 15.247(a)(1), the 20 dB bandwidth is known as the 99% emission bandwidth, or 20 dB bandwidth ($10 \cdot \log 1\% = 20 \text{ dB}$) taking the total RF output power.

3.7.1.Test Procedures

Use the following spectrum analyzer settings:

Span = between 2 to 5 times the OBW, centered on the test channel

RBW= 1% to 5% of the OBW

VBW $\geq 3 \times$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

3.7.2.Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.7.3.Test Result

Refer to Annex A.5 in this report.



3.8. Carried Frequency Separation

3.8.1. Requirement

According to FCC section 15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.

3.8.2. Test Procedures

The EUT must have its hopping function enabled. According to DA 00-705, use the following spectrum analyzer settings:

Span = wide enough to capture the peaks of two adjacent channels

Resolution (or IF) Bandwidth (RBW) \geq 1% of the span

Video (or Average) Bandwidth (VBW) \geq RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

3.8.3. Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.8.4. Test Result

Refer to Annex A.6 in this report.



3.9. Time of Occupancy (Dwell time)

3.9.1. Requirement

According to FCC section 15.247(a) (1) (iii), frequency hopping systems in the 2400 - 2483.5MHz band shall use at least 15 non-overlapping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

3.9.2. Test Procedures

Normal Mode:

DH1: Dwell time equal to Pulse time (ms) * (1600 / 2 / 79) * 31.6 Millisecond
DH3: Dwell time equal to Pulse time (ms) * (1600 / 4 / 79) * 31.6 Millisecond
DH5: Dwell time equal to Pulse Time (ms) * (1600 / 6 / 79) * 31.6 Millisecond

AFH Mode:

DH1: Dwell time equal to Pulse time (ms) * (800 / 2 / 20) * (0.4 * 20) Millisecond
DH3: Dwell time equal to Pulse time (ms) * (800 / 4 / 20) * (0.4 * 20) Millisecond
DH5: Dwell time equal to Pulse Time (ms) * (800 / 6 / 20) * (0.4 * 20) Millisecond.

3.9.3. Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.9.4. Test Result

Refer to Annex A.7 in this report.



3.10. Conducted Spurious Emissions and Band Edge

3.10.1.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.

3.10.2.Test Procedures

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.

RBW = 100 kHz

VBW \geq RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize.

3.10.3.Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.10.4.Test Result

Refer to Annex A.8 and A.9 in this report.



3.11. Conducted Emission

3.11.1.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 50 μ H/50 Ω line impedance stabilization network (LISN).

Frequency Range (MHz)	Conducted Limit (dB μ V)	
	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.

3.11.2.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.

3.11.3.Test Setup Layout

Refer to chapter 2.6.2 in this report.

3.11.4.Test Result

Refer to Annex A.10 in this report.



3.12. Restricted Frequency Bands

3.12.1.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).

3.12.2.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 $f \geq 1\text{GHz}$, 100 kHz for $f < 1\text{GHz}$

VBW = 3 MHz

Sweep = auto

Detector function = peak/average

Trace = max hold

Allow the trace to stabilize

3.12.3.Test Setup Layout

Refer to chapter 2.6.3 in this report.

3.12.4.Test Result

Refer to Annex A.11 in this report.



3.13. Radiated Emission

3.13.1.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 ($\mu\text{V}/\text{m}$)	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).



3.13.2. 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 3 meters. 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.

3.13.3. Test Setup Layout

Refer to chapter 2.6.3 in this report.

3.13.4. Test Result

Refer to Annex A.12 in this report.



Annex A Test Data and Result

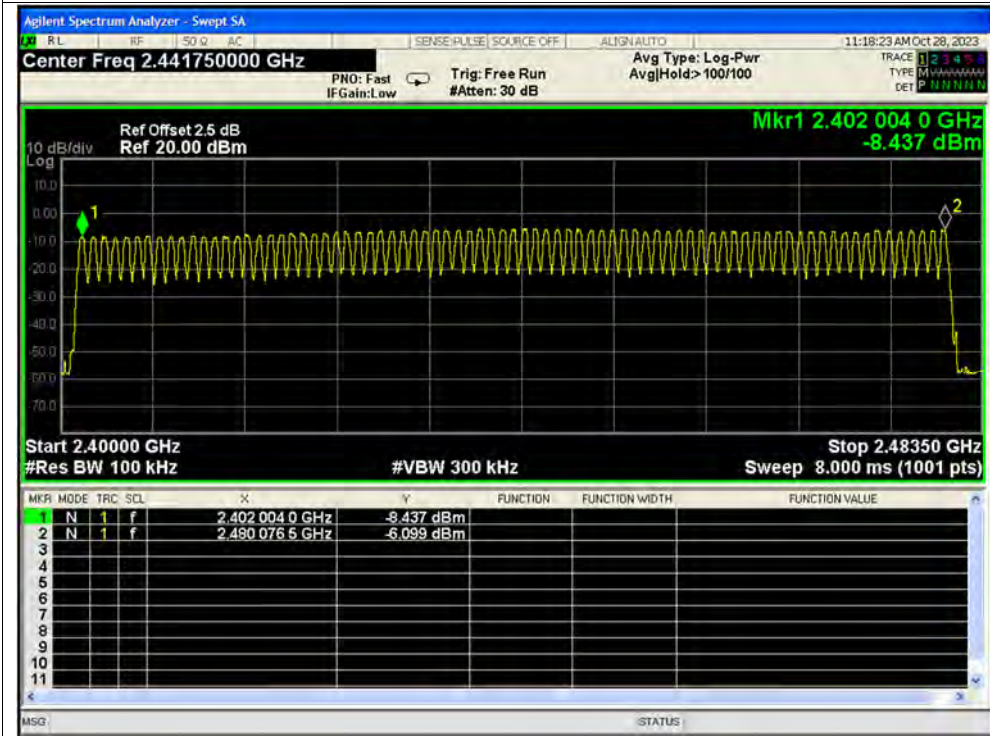
A.1. Number of Hopping Frequency

Condition	Mode	Antenna	Hopping Number	Limit	Verdict
NVNT	1-DH5	Ant1	79	15	Pass
NVNT	2-DH5	Ant1	79	15	Pass
NVNT	3-DH5	Ant1	79	15	Pass

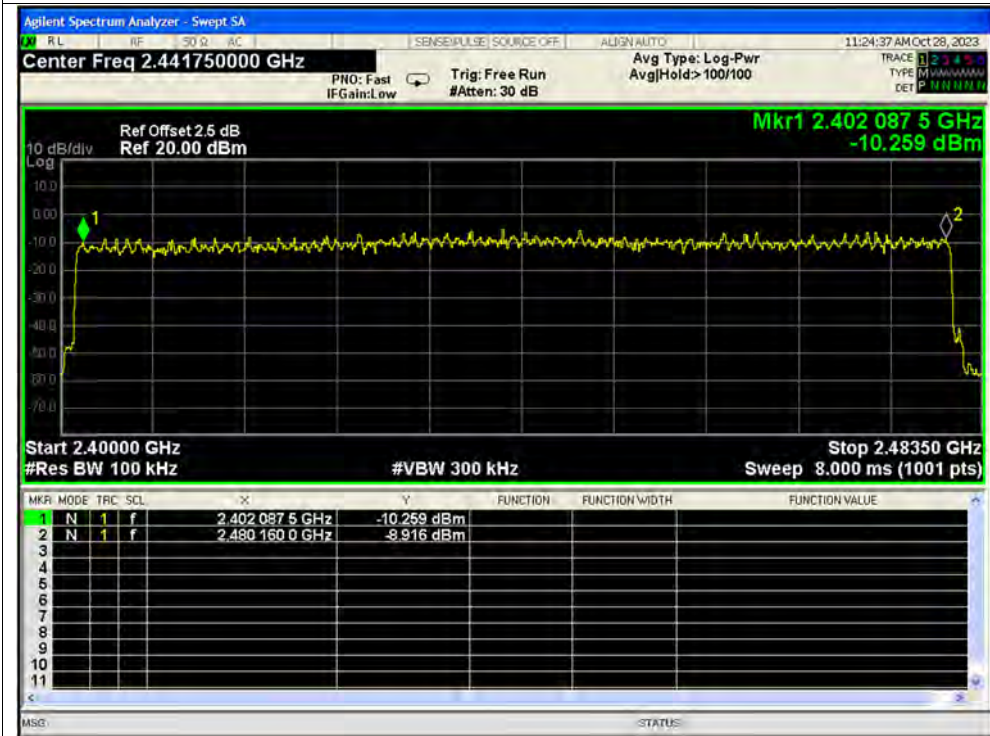


Test Graphs

Hopping No. NVNT 1-DH5 2402MHz Ant1

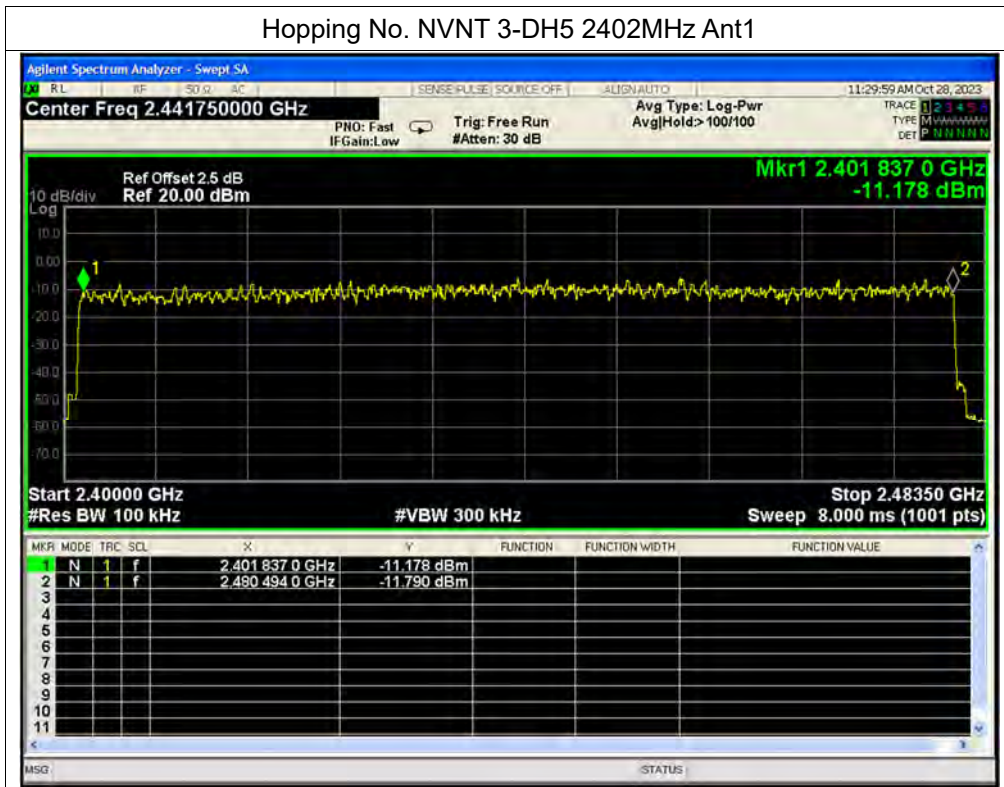


Hopping No. NVNT 2-DH5 2402MHz Ant1





Hopping No. NVNT 3-DH5 2402MHz Ant1



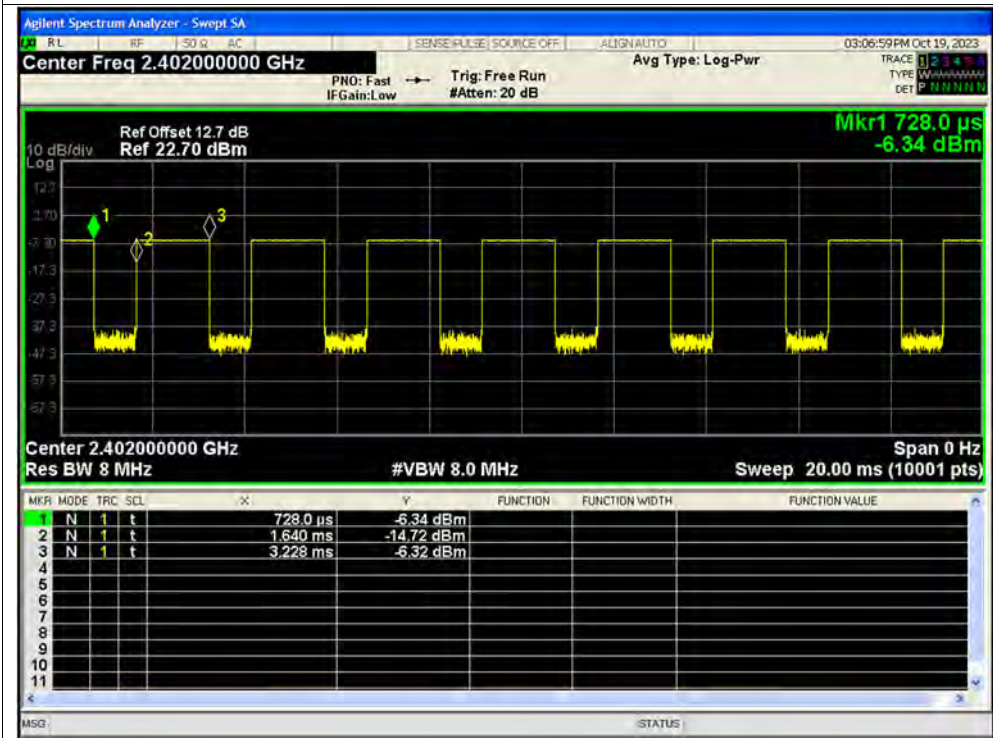
**A.2. Duty Cycle of Test Signal**

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	1-DH5	2402	Ant1	63.52	1.97	0.63
NVNT	1-DH5	2441	Ant1	63.52	1.97	0.63
NVNT	1-DH5	2480	Ant1	63.52	1.97	0.63
NVNT	2-DH5	2402	Ant1	63.92	1.94	0.63
NVNT	2-DH5	2441	Ant1	63.92	1.94	0.63
NVNT	2-DH5	2480	Ant1	63.92	1.94	0.63
NVNT	3-DH5	2402	Ant1	63.76	1.95	0.63
NVNT	3-DH5	2441	Ant1	63.84	1.95	0.63
NVNT	3-DH5	2480	Ant1	63.84	1.95	0.63

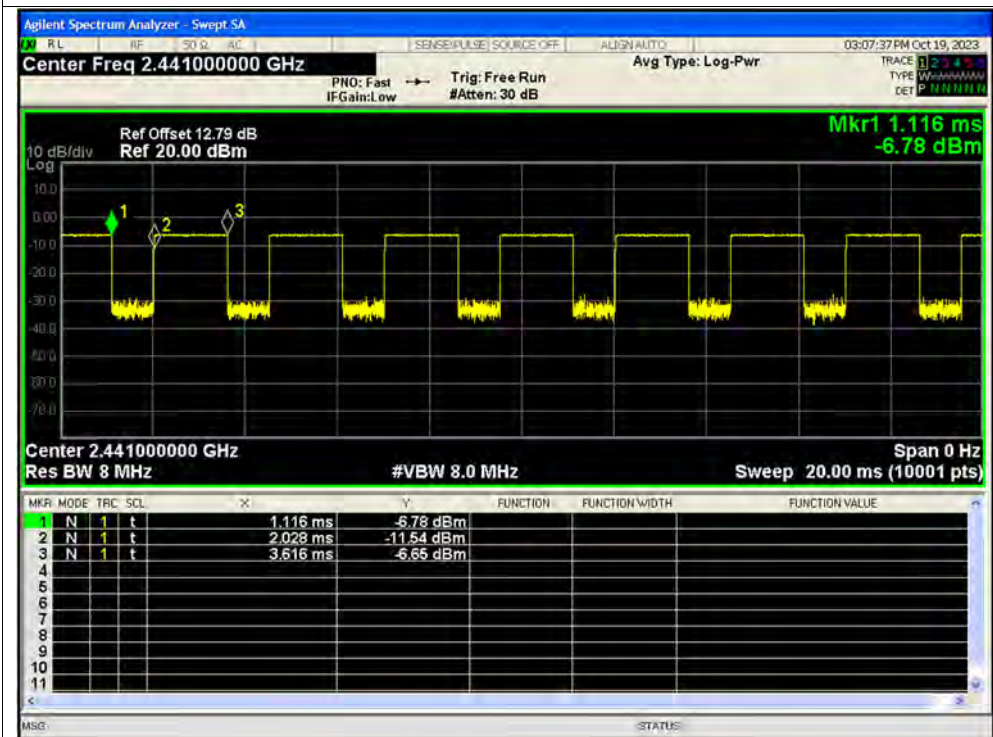


Test Graphs

Duty Cycle NVNT 1-DH5 2402MHz Ant1

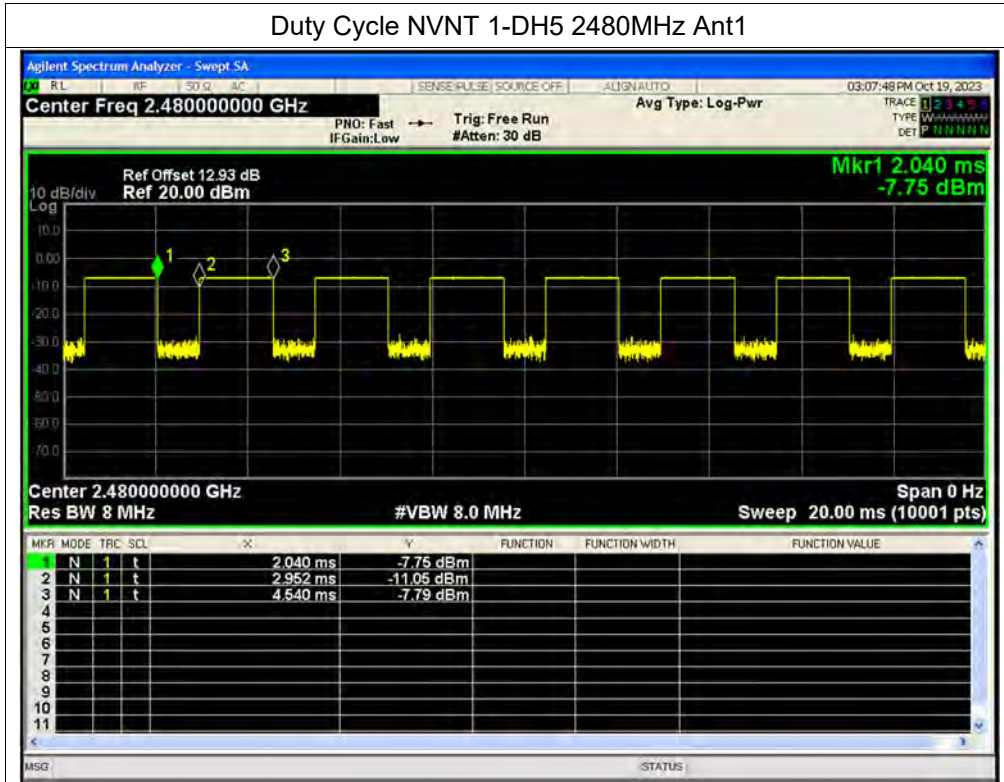


Duty Cycle NVNT 1-DH5 2441MHz Ant1

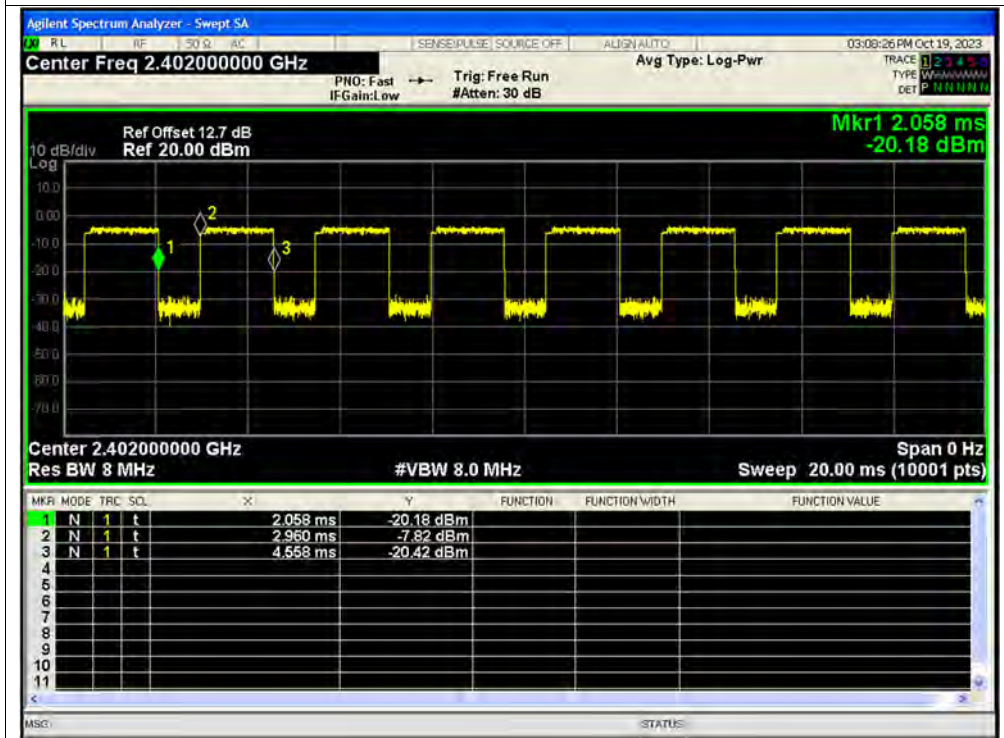




Duty Cycle NVNT 1-DH5 2480MHz Ant1

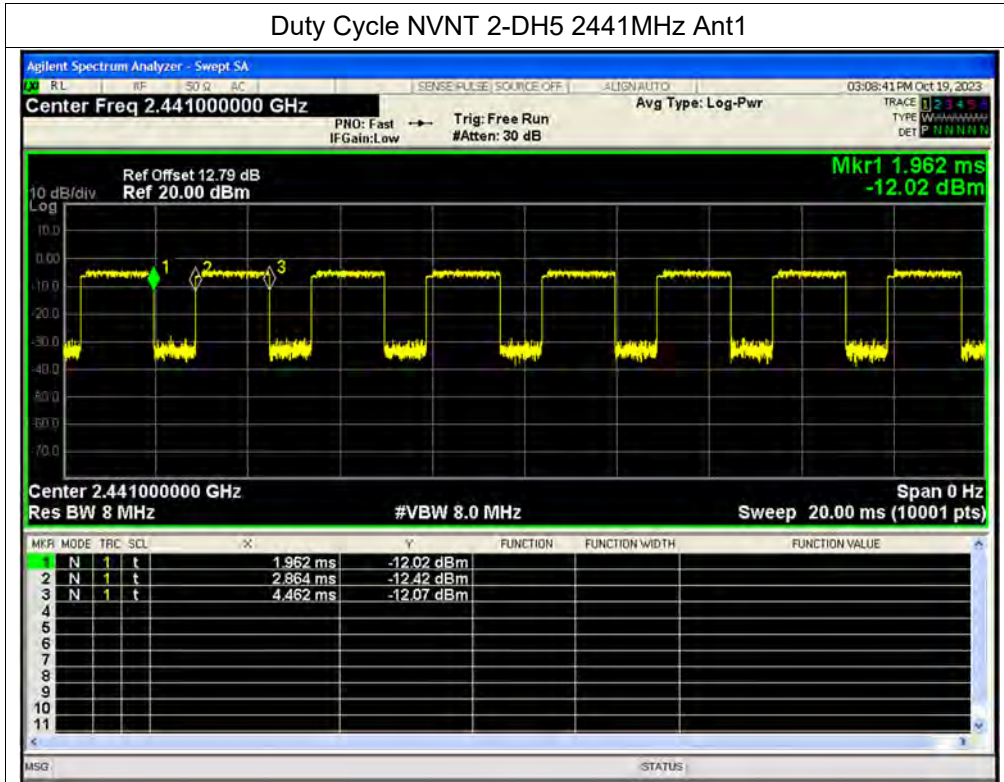


Duty Cycle NVNT 2-DH5 2402MHz Ant1

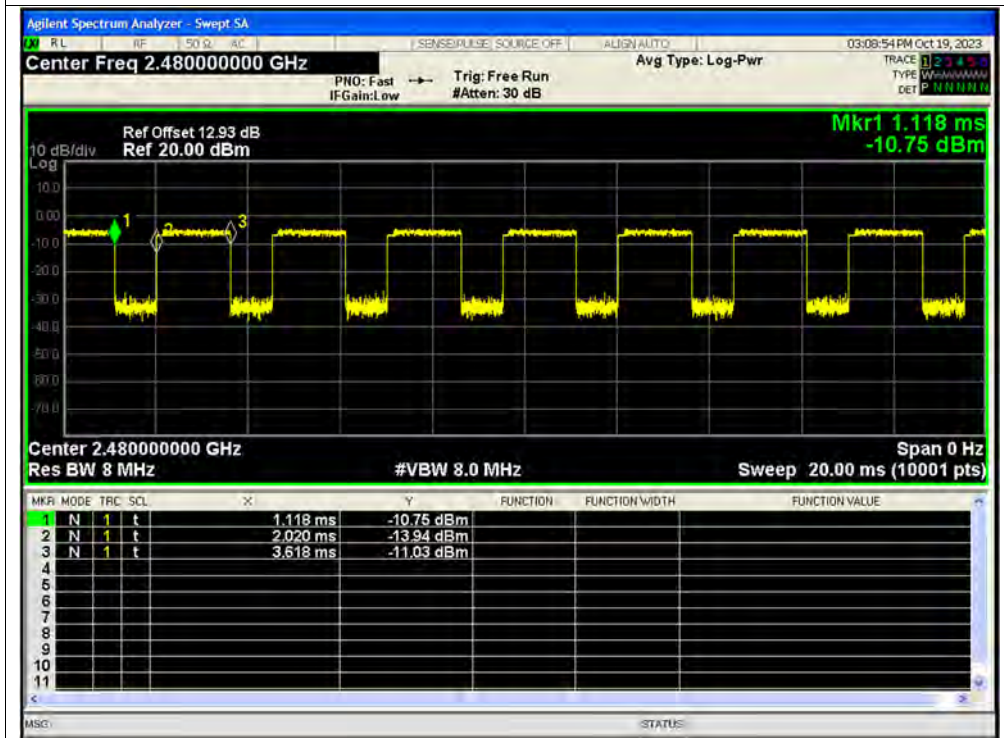




Duty Cycle NVNT 2-DH5 2441MHz Ant1

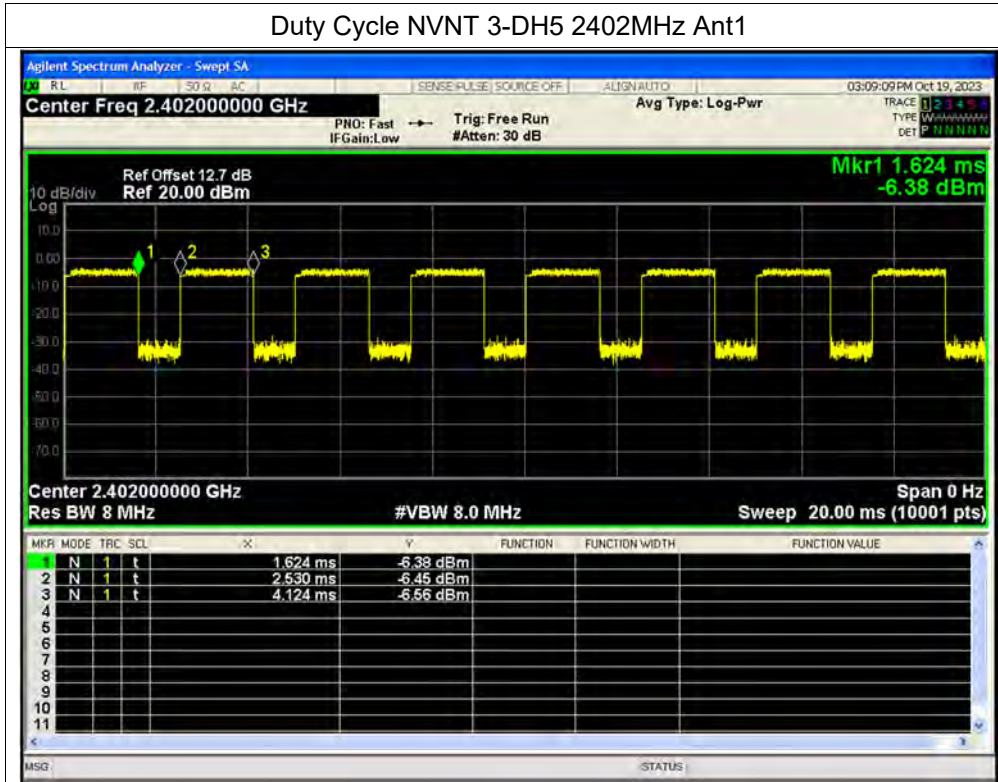


Duty Cycle NVNT 2-DH5 2480MHz Ant1

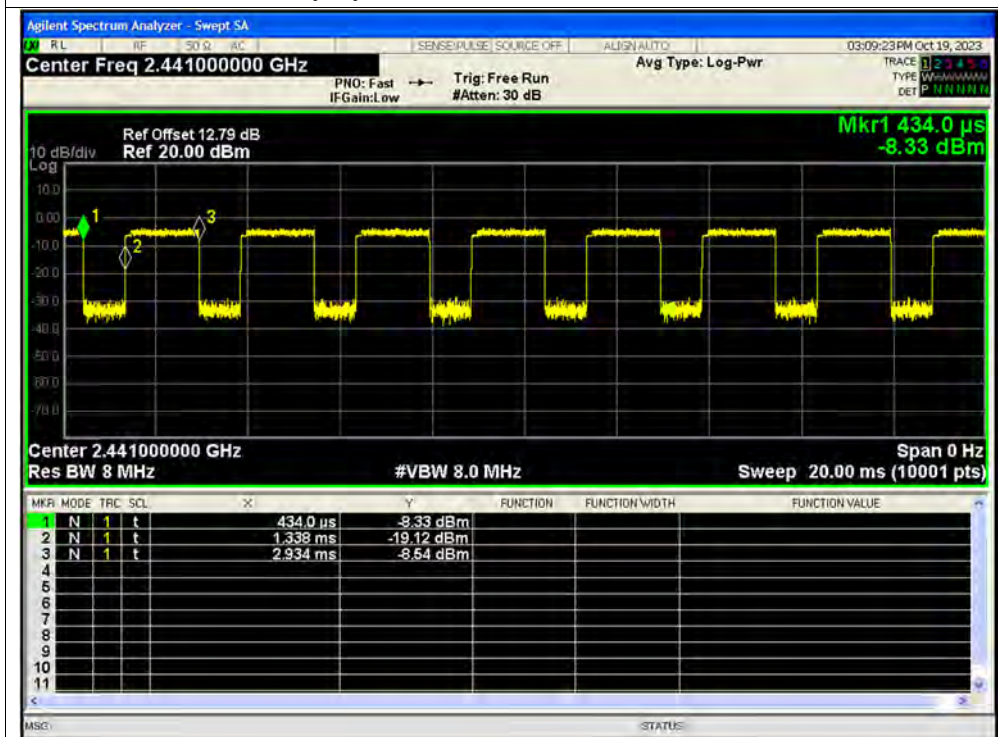




Duty Cycle NVNT 3-DH5 2402MHz Ant1

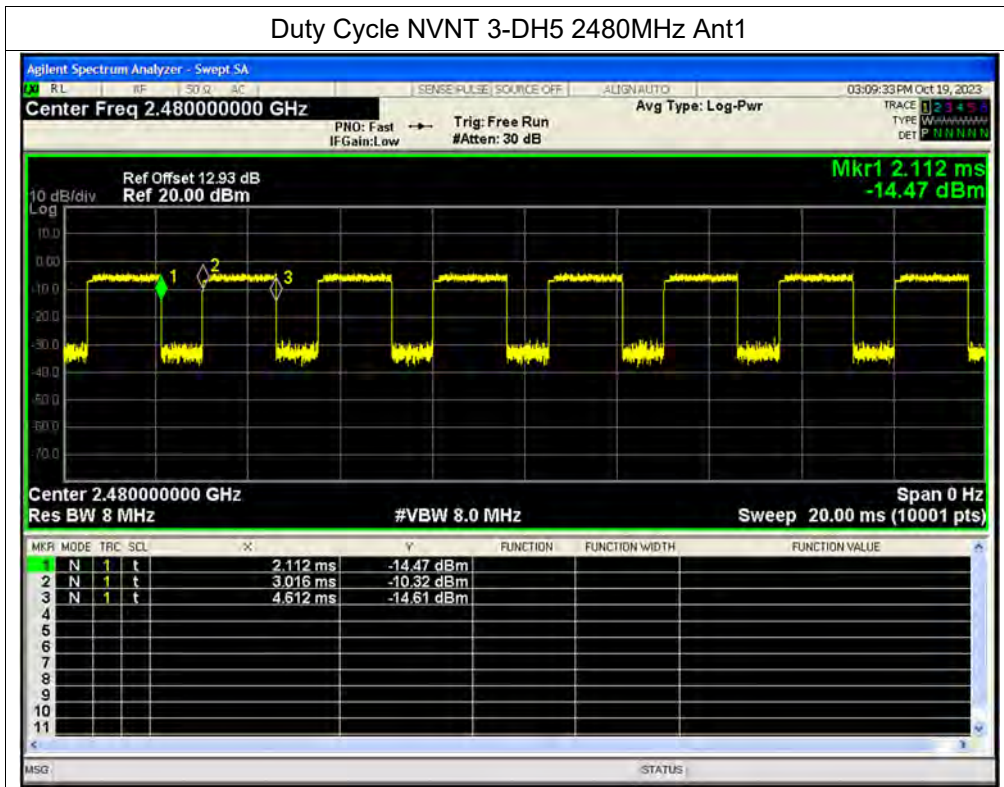


Duty Cycle NVNT 3-DH5 2441MHz Ant1





Duty Cycle NVNT 3-DH5 2480MHz Ant1



**A.3. Maximum Peak Conducted Output Power**

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Conducted Power (dBm)	Total Conducted Power (W)	Limit Conducted (dBm)	Verdict
NVNT	1-DH5	2402	Ant1	-6.01	0	-6.01	0.00025	30	Pass
NVNT	1-DH5	2441	Ant1	-6.31	0	-6.31	0.00023	30	Pass
NVNT	1-DH5	2480	Ant1	-6.88	0	-6.88	0.00021	30	Pass
NVNT	2-DH5	2402	Ant1	-4.26	0	-4.26	0.00037	30	Pass
NVNT	2-DH5	2441	Ant1	-4.35	0	-4.35	0.00037	30	Pass
NVNT	2-DH5	2480	Ant1	-4.97	0	-4.97	0.00032	30	Pass
NVNT	3-DH5	2402	Ant1	-3.63	0	-3.63	0.00043	30	Pass
NVNT	3-DH5	2441	Ant1	-3.84	0	-3.84	0.00041	30	Pass
NVNT	3-DH5	2480	Ant1	-4.56	0	-4.56	0.00035	30	Pass



Test Graphs

Peak Power NVNT 1-DH5 2402MHz Ant1



Peak Power NVNT 1-DH5 2441MHz Ant1



Peak Power NVNT 1-DH5 2480MHz Ant1

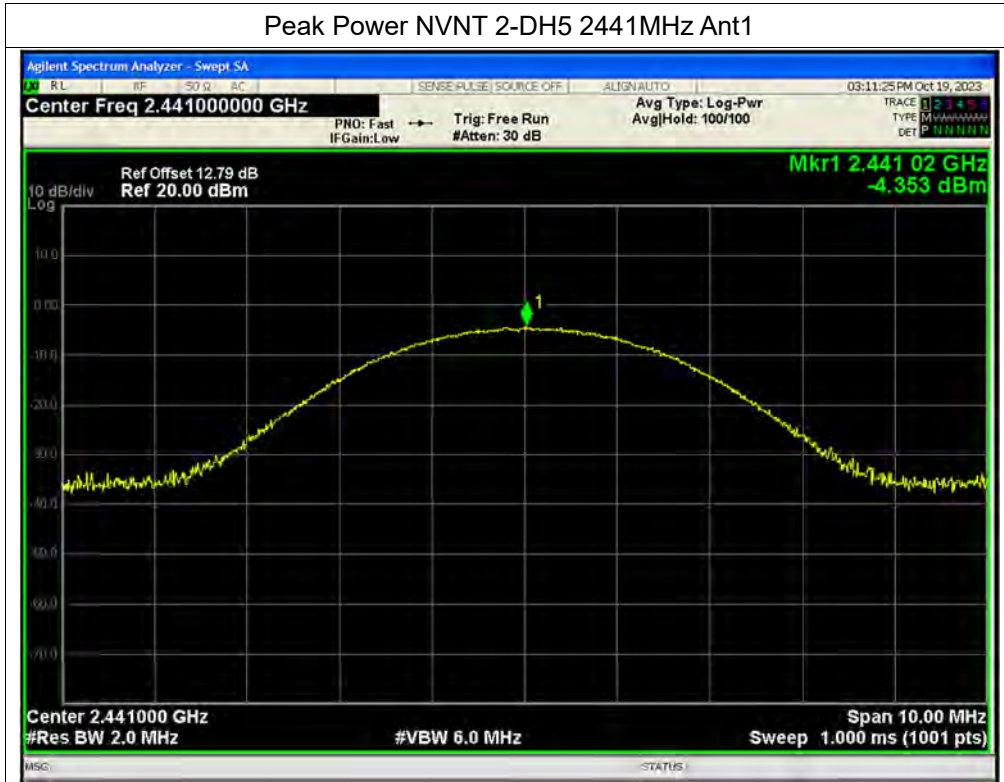


Peak Power NVNT 2-DH5 2402MHz Ant1

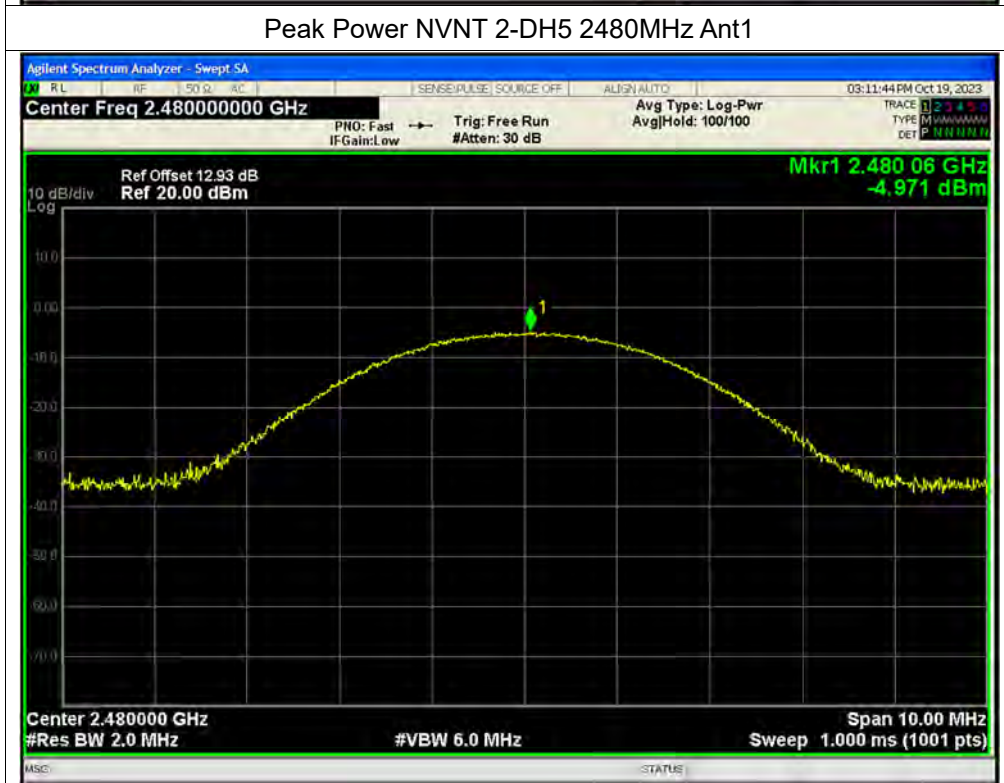




Peak Power NVNT 2-DH5 2441MHz Ant1



Peak Power NVNT 2-DH5 2480MHz Ant1





Peak Power NVNT 3-DH5 2402MHz Ant1



Peak Power NVNT 3-DH5 2441MHz Ant1





Peak Power NVNT 3-DH5 2480MHz Ant1



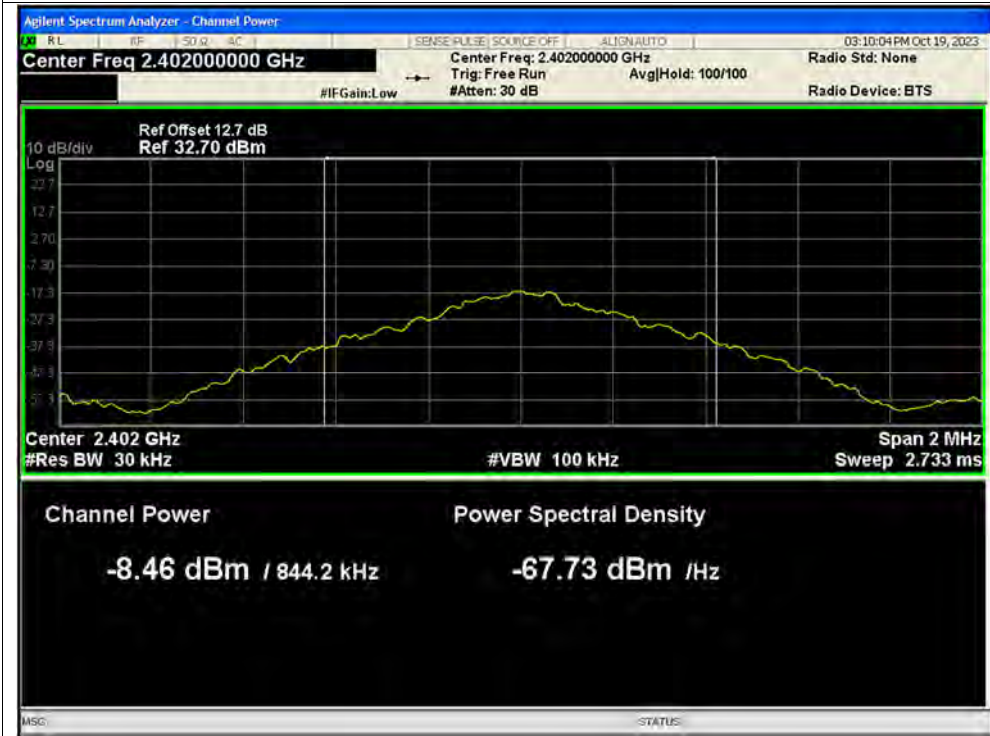
**A.4. Maximum Average Conducted Output Power**

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Conducted Power (dBm)	Total Conducted Power (W)	Limit Conducted (dBm)	Verdict
NVNT	1-DH5	2402	Ant1	-8.46	1.97	-6.49	0.00022	30	Pass
NVNT	1-DH5	2441	Ant1	-9.24	1.97	-7.27	0.00019	30	Pass
NVNT	1-DH5	2480	Ant1	-9.69	1.97	-7.72	0.00017	30	Pass
NVNT	2-DH5	2402	Ant1	-9.27	1.94	-7.33	0.00018	30	Pass
NVNT	2-DH5	2441	Ant1	-10.2	1.94	-8.26	0.00015	30	Pass
NVNT	2-DH5	2480	Ant1	-10.51	1.94	-8.57	0.00014	30	Pass
NVNT	3-DH5	2402	Ant1	-9.54	1.95	-7.59	0.00017	30	Pass
NVNT	3-DH5	2441	Ant1	-9.59	1.95	-7.64	0.00017	30	Pass
NVNT	3-DH5	2480	Ant1	-10.33	1.95	-8.38	0.00015	30	Pass



Test Graphs

Average Power NVNT 1-DH5 2402MHz Ant1

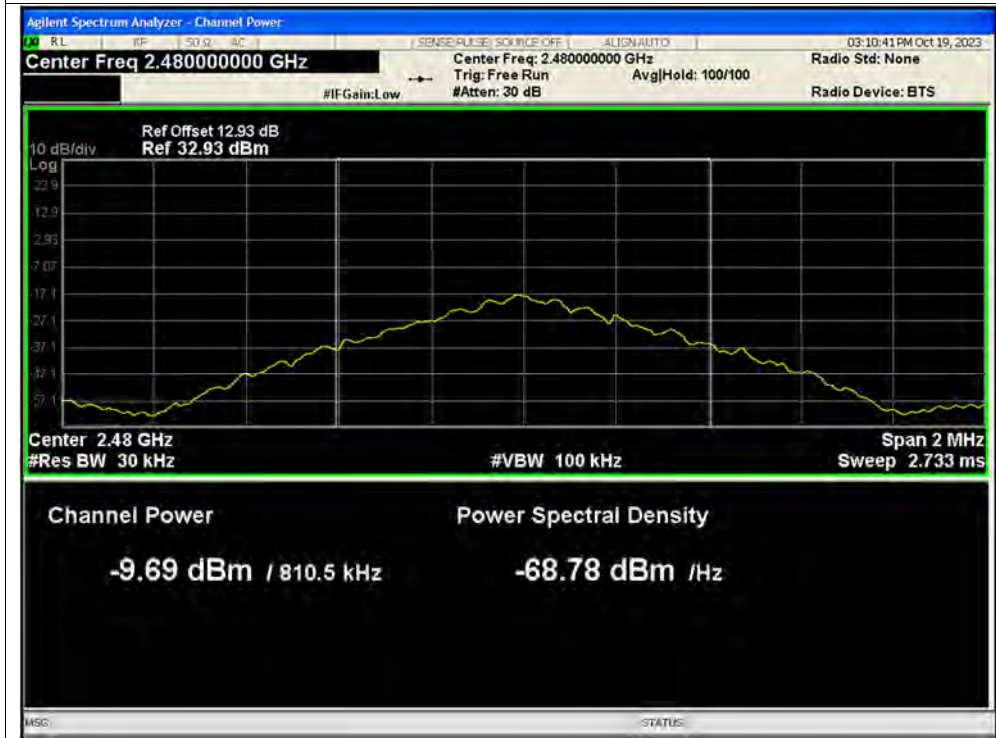


Average Power NVNT 1-DH5 2441MHz Ant1

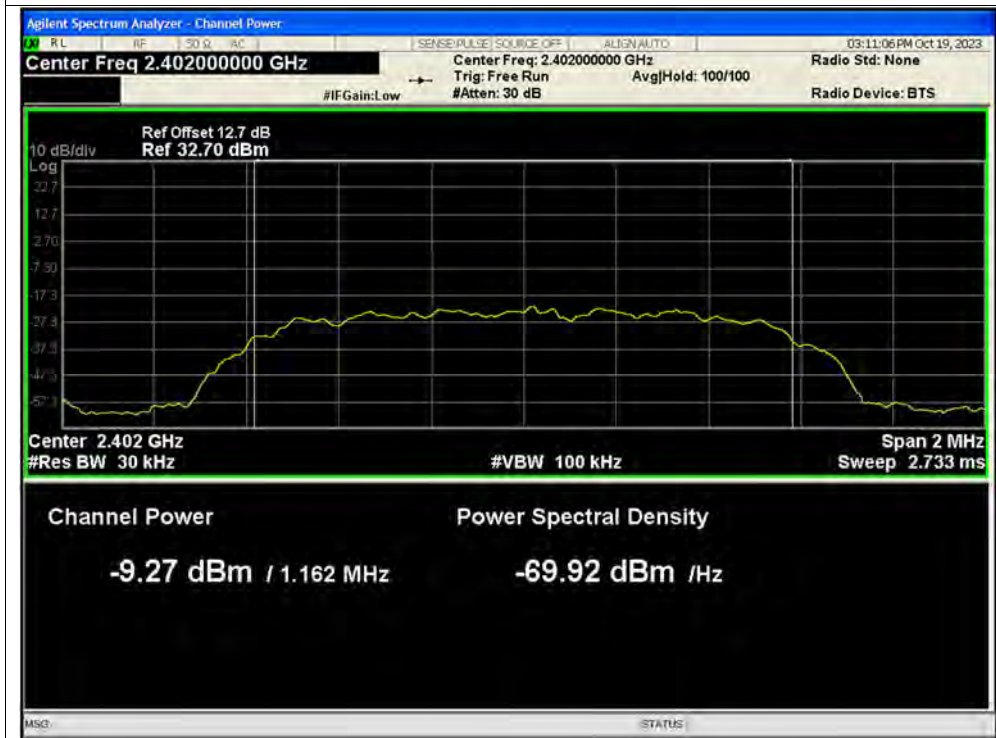




Average Power NVNT 1-DH5 2480MHz Ant1

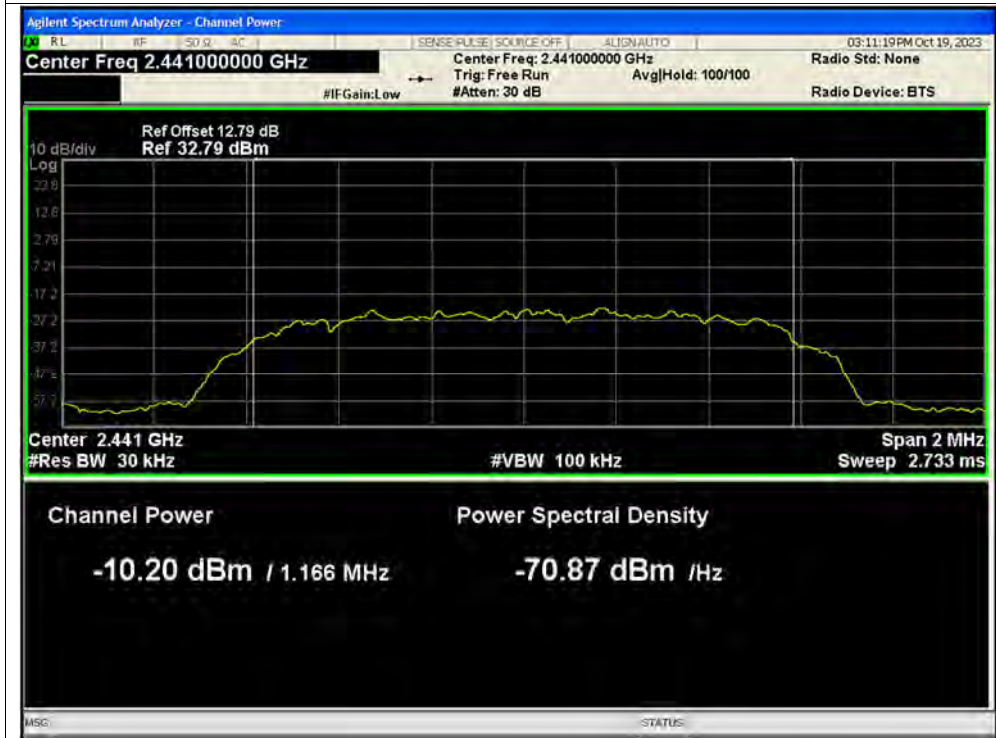


Average Power NVNT 2-DH5 2402MHz Ant1

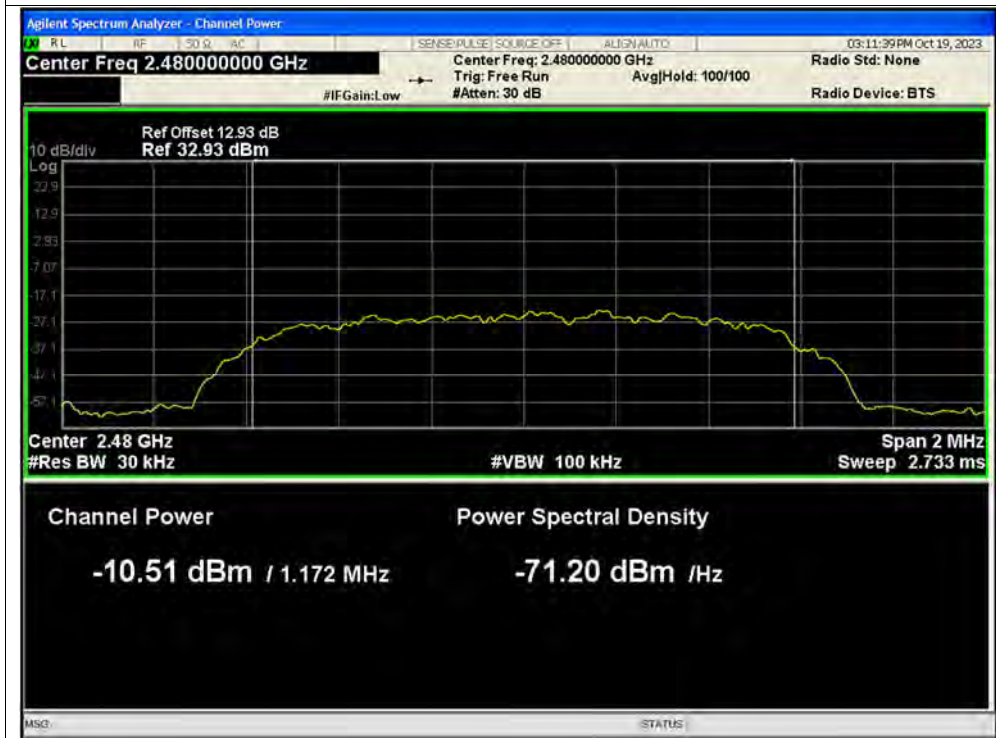




Average Power NVNT 2-DH5 2441MHz Ant1

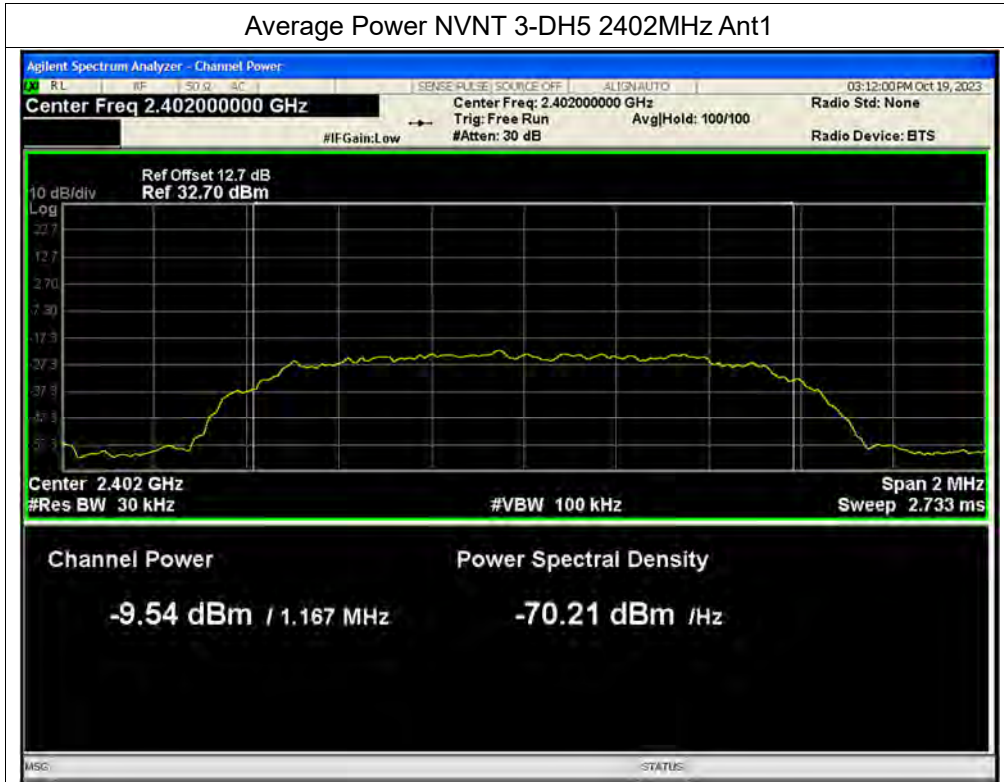


Average Power NVNT 2-DH5 2480MHz Ant1

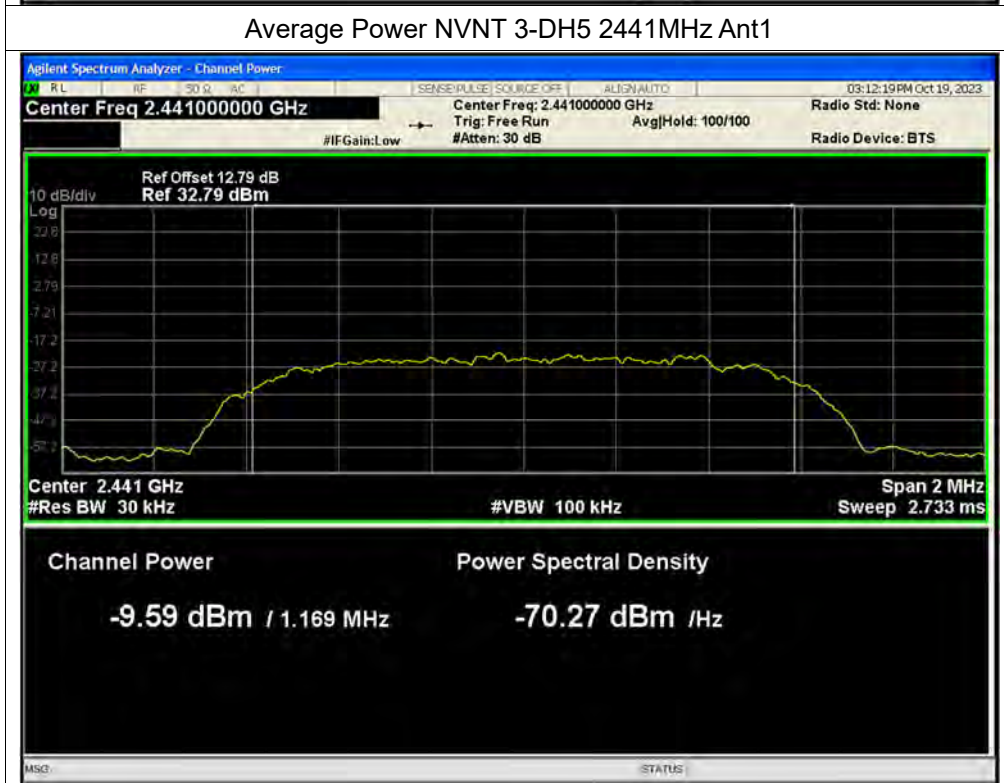


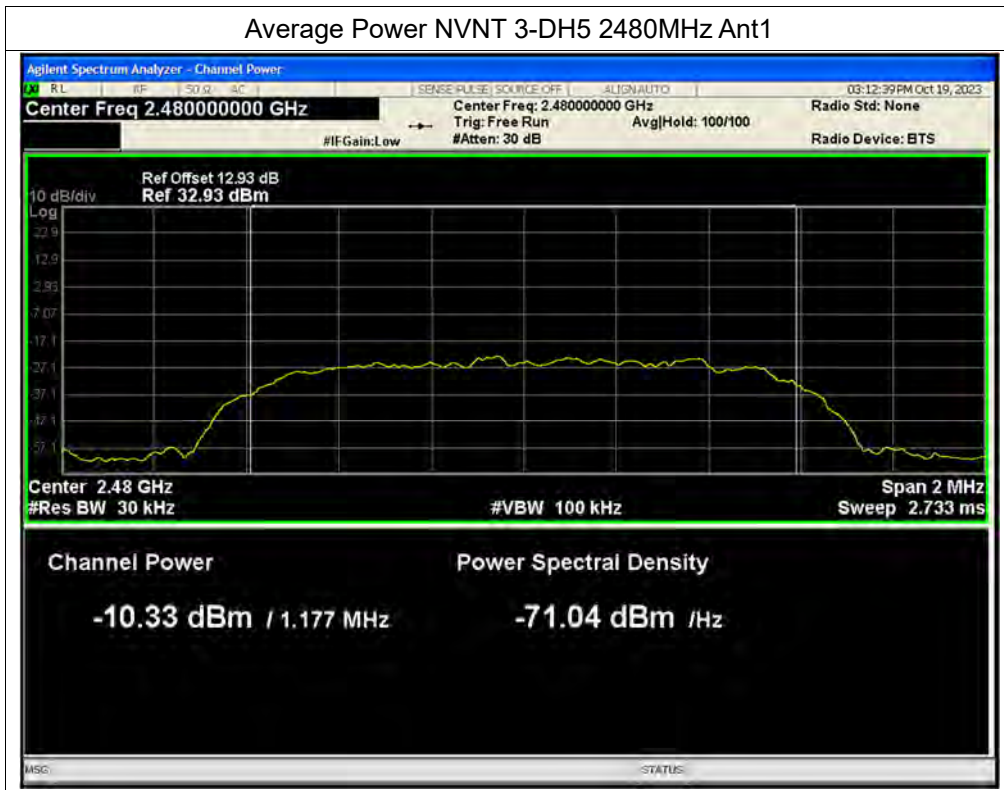


Average Power NVNT 3-DH5 2402MHz Ant1



Average Power NVNT 3-DH5 2441MHz Ant1





**A.5. 20 dB Bandwidth**

Condition	Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)
NVNT	1-DH5	2402	Ant1	0.945
NVNT	1-DH5	2441	Ant1	0.944
NVNT	1-DH5	2480	Ant1	0.943
NVNT	2-DH5	2402	Ant1	1.277
NVNT	2-DH5	2441	Ant1	1.284
NVNT	2-DH5	2480	Ant1	1.319
NVNT	3-DH5	2402	Ant1	1.287
NVNT	3-DH5	2441	Ant1	1.302
NVNT	3-DH5	2480	Ant1	1.298



Test Graphs

-20dB Bandwidth NVNT 1-DH5 2402MHz Ant1



-20dB Bandwidth NVNT 1-DH5 2441MHz Ant1

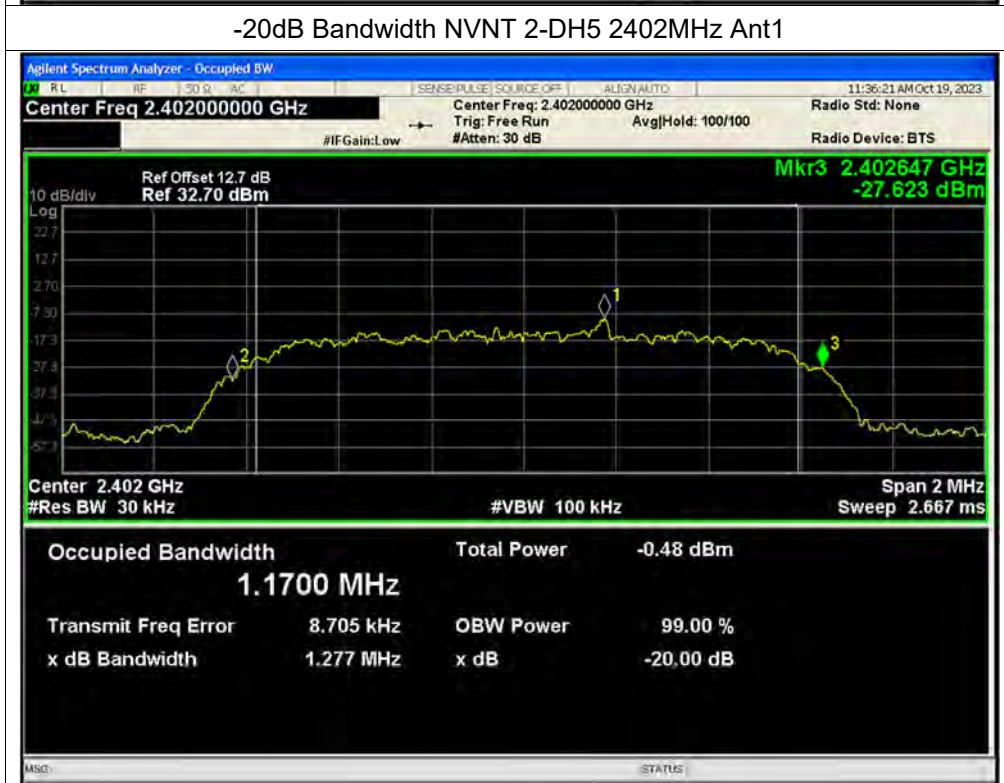




-20dB Bandwidth NVNT 1-DH5 2480MHz Ant1

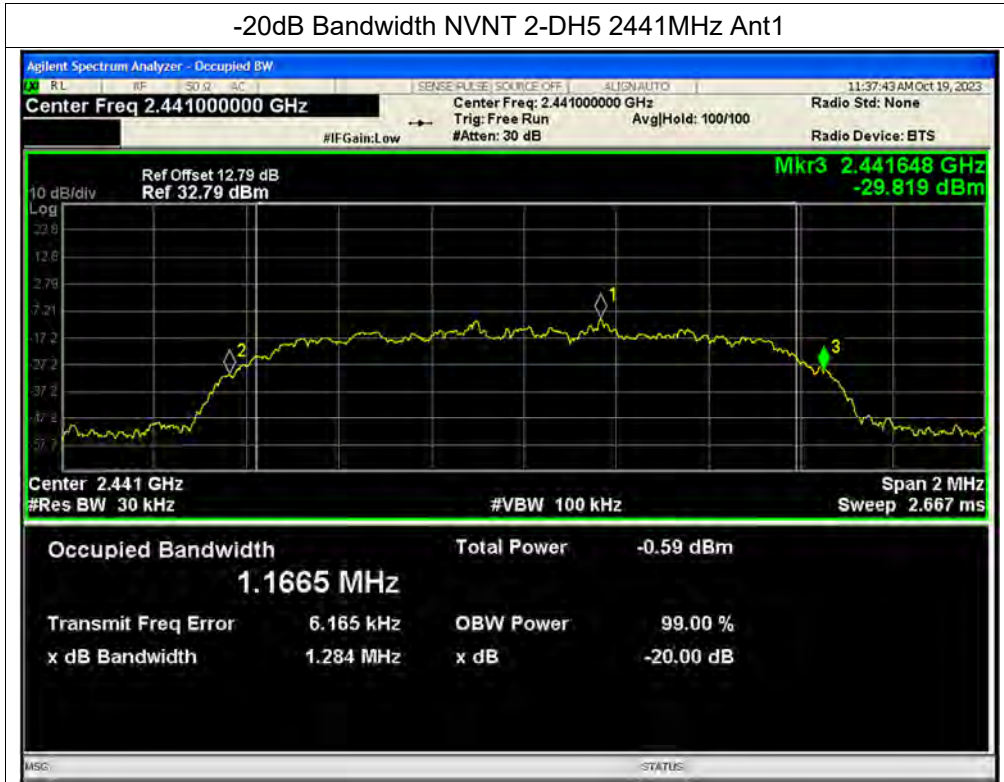


-20dB Bandwidth NVNT 2-DH5 2402MHz Ant1

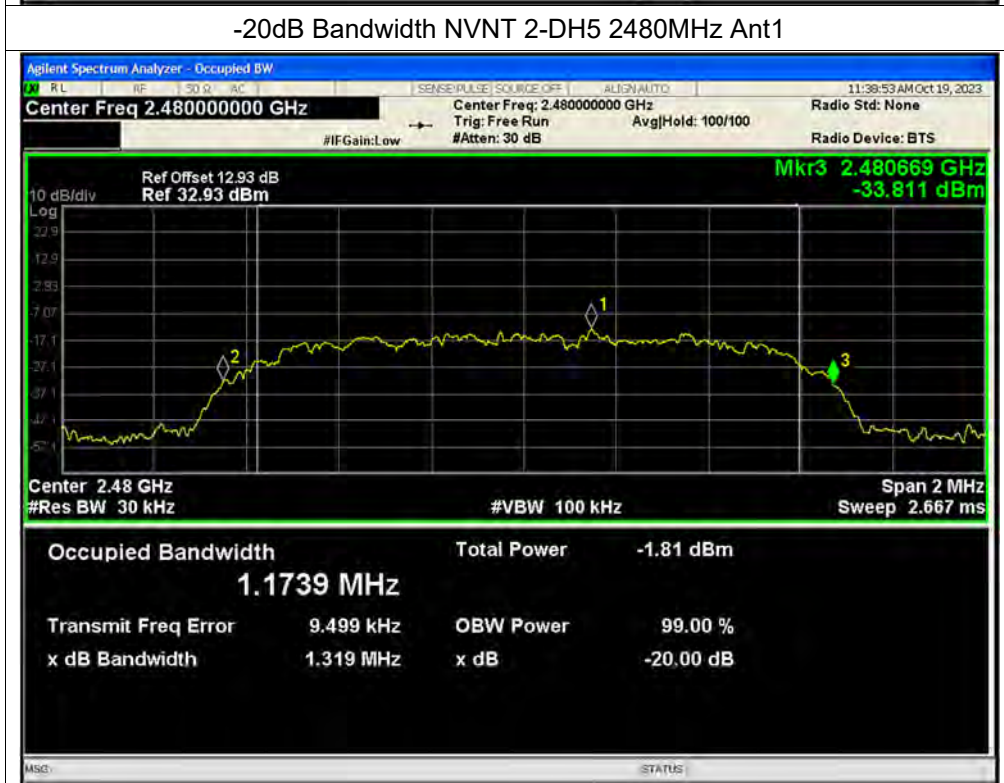




-20dB Bandwidth NVNT 2-DH5 2441MHz Ant1

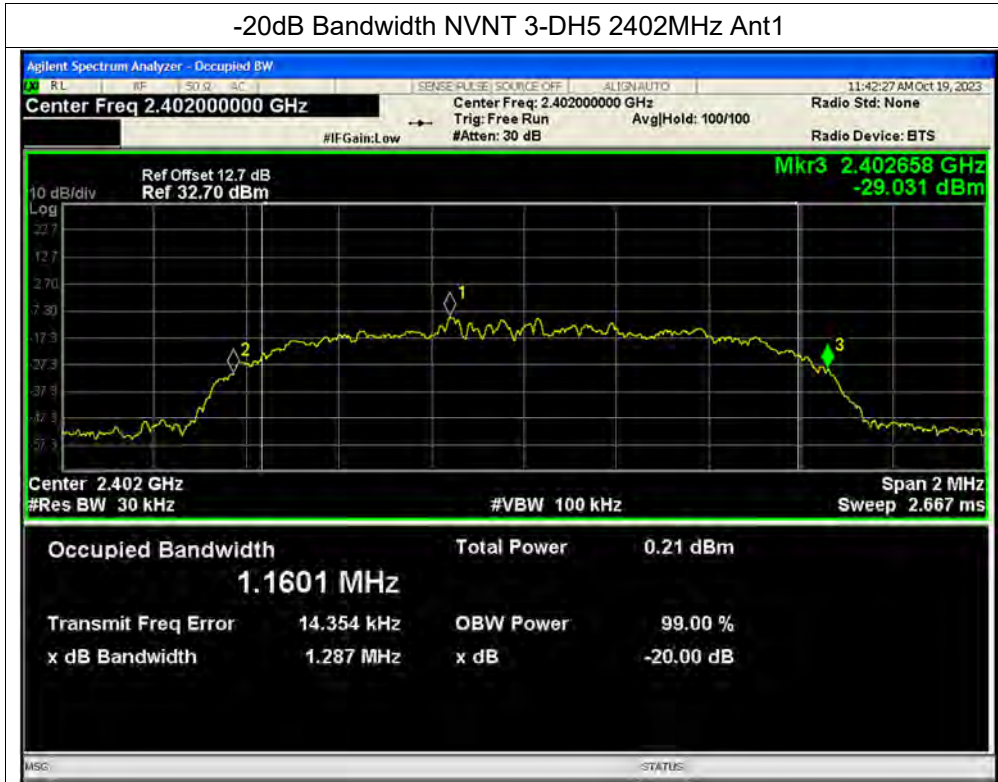


-20dB Bandwidth NVNT 2-DH5 2480MHz Ant1

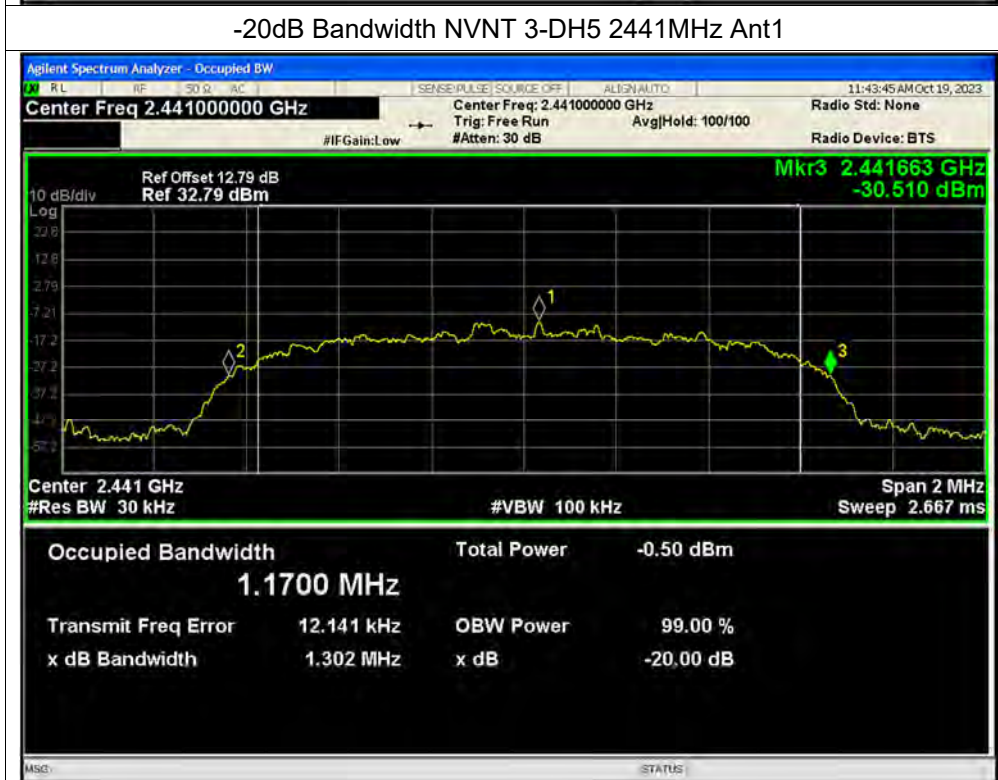


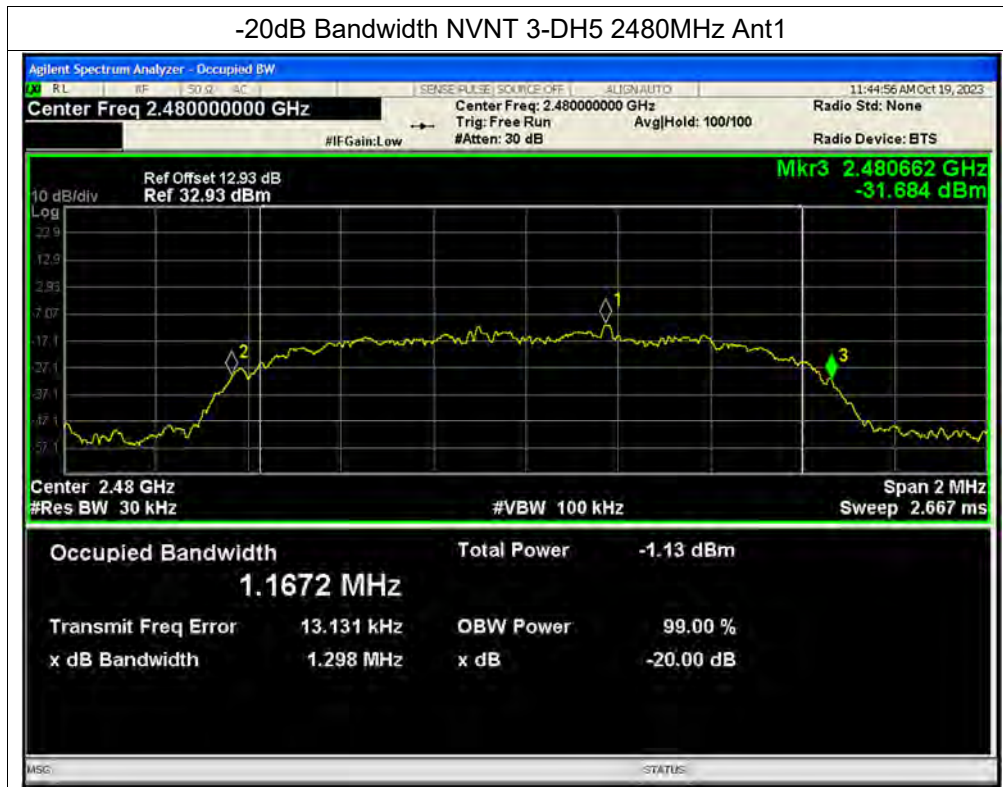


-20dB Bandwidth NVNT 3-DH5 2402MHz Ant1



-20dB Bandwidth NVNT 3-DH5 2441MHz Ant1







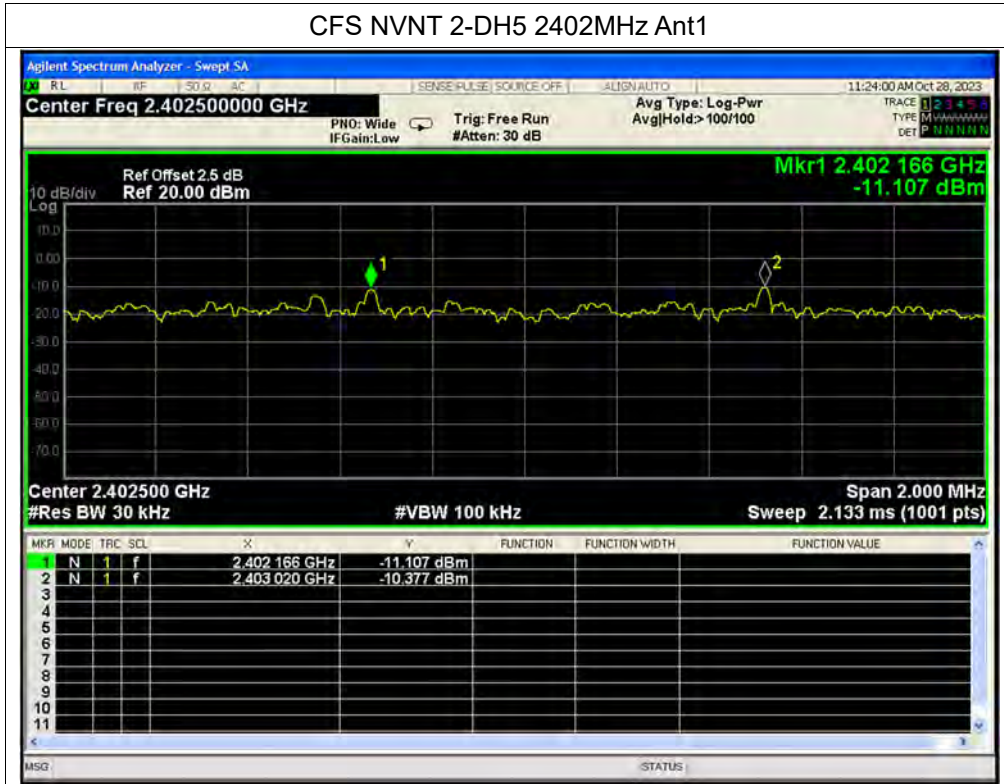
A.6. Carried Frequency Separation

Condition	Mode	Antenna	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH5	Ant1	2402.054	2402.986	0.932	0.63	Pass
NVNT	2-DH5	Ant1	2402.166	2403.02	0.854	0.851	Pass
NVNT	3-DH5	Ant1	2401.842	2403.118	1.276	0.858	Pass

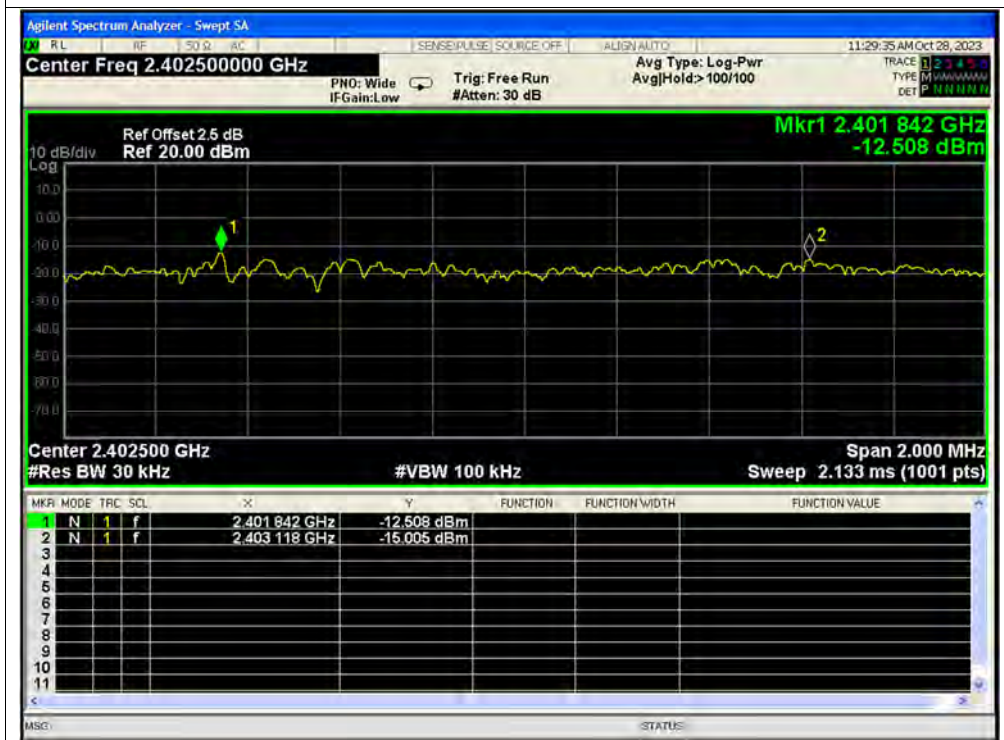




CFS NVNT 2-DH5 2402MHz Ant1



CFS NVNT 3-DH5 2402MHz Ant1



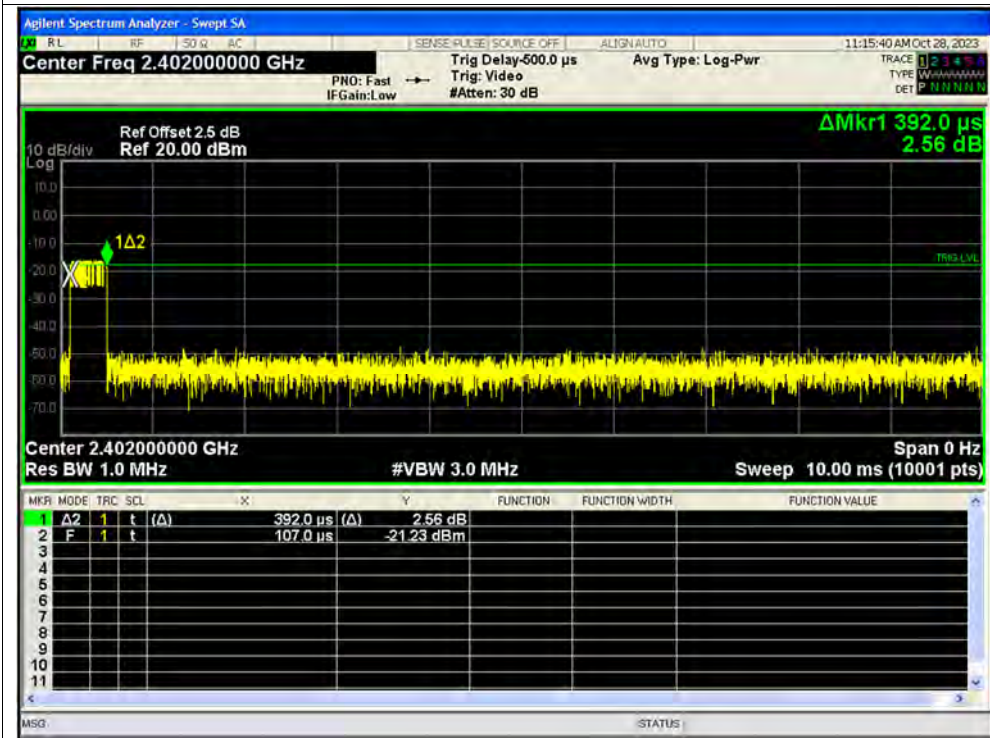
**A.7. Time of Occupancy (Dwell time)**

Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH1	2402	Ant1	0.392	125.048	319	31600	400	Pass
NVNT	1-DH3	2402	Ant1	0.499	85.329	171	31600	400	Pass
NVNT	1-DH5	2402	Ant1	0.499	57.385	115	31600	400	Pass
NVNT	2-DH1	2402	Ant1	0.384	121.344	316	31600	400	Pass
NVNT	2-DH3	2402	Ant1	1.636	271.576	166	31600	400	Pass
NVNT	2-DH5	2402	Ant1	2.884	299.936	104	31600	400	Pass
NVNT	3-DH1	2402	Ant1	0.382	120.712	316	31600	400	Pass
NVNT	3-DH3	2402	Ant1	1.632	257.856	158	31600	400	Pass
NVNT	3-DH5	2402	Ant1	2.883	343.077	119	31600	400	Pass

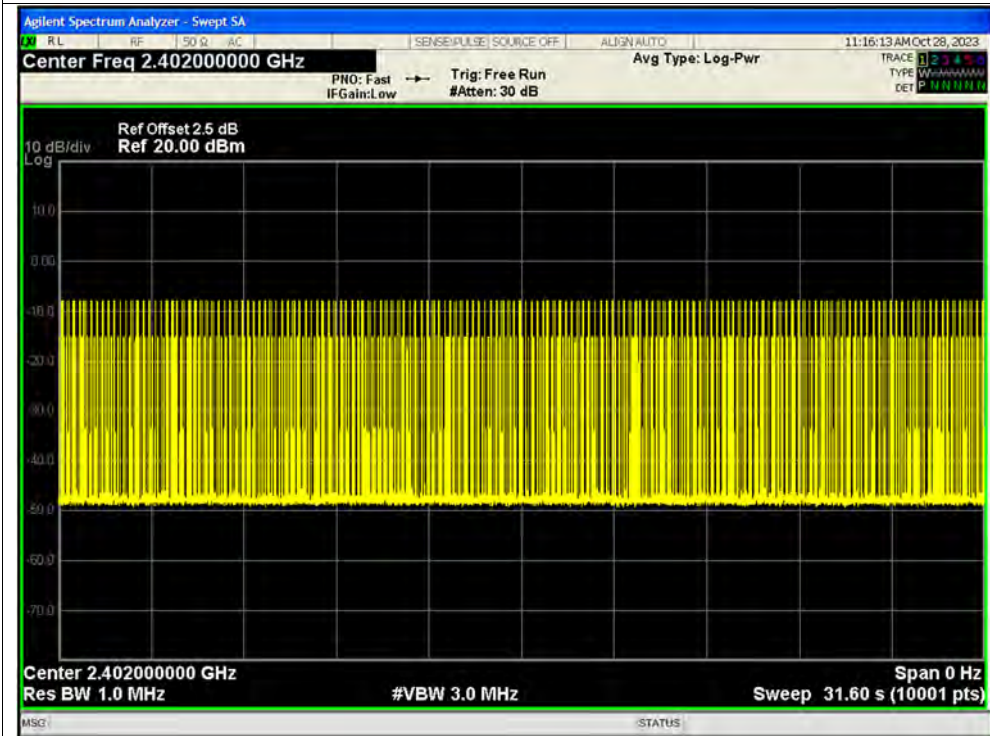


Test Graphs

Dwell NVLT 1-DH1 2402MHz Ant1 One Burst

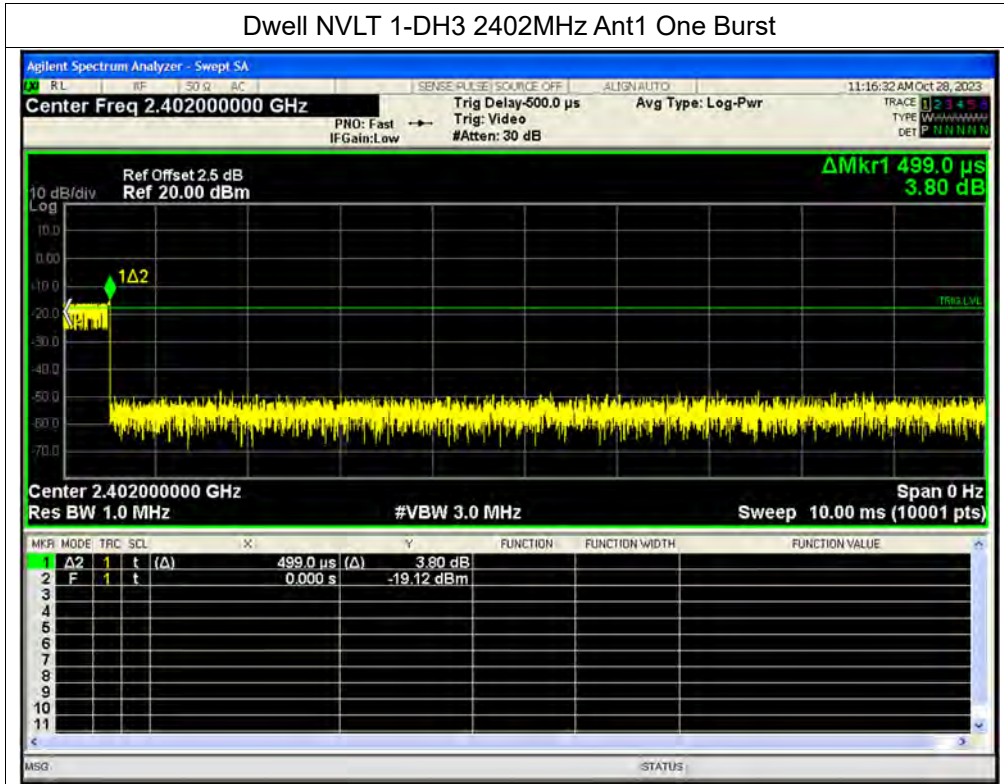


Dwell NVLT 1-DH1 2402MHz Ant1 Accumulated

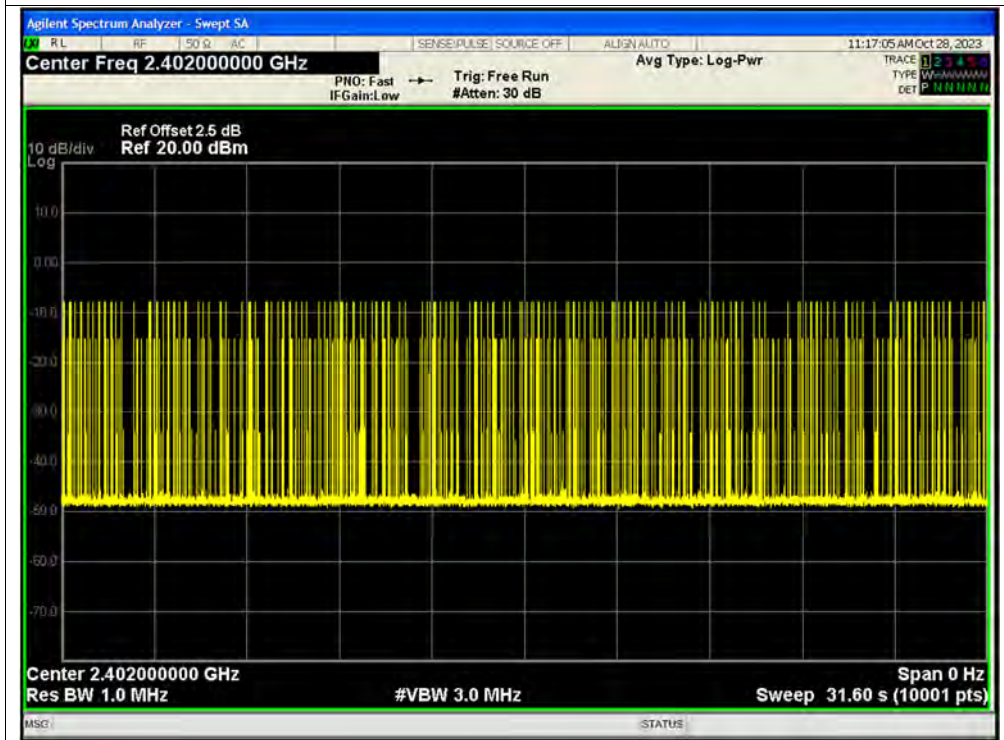




Dwell NVLT 1-DH3 2402MHz Ant1 One Burst

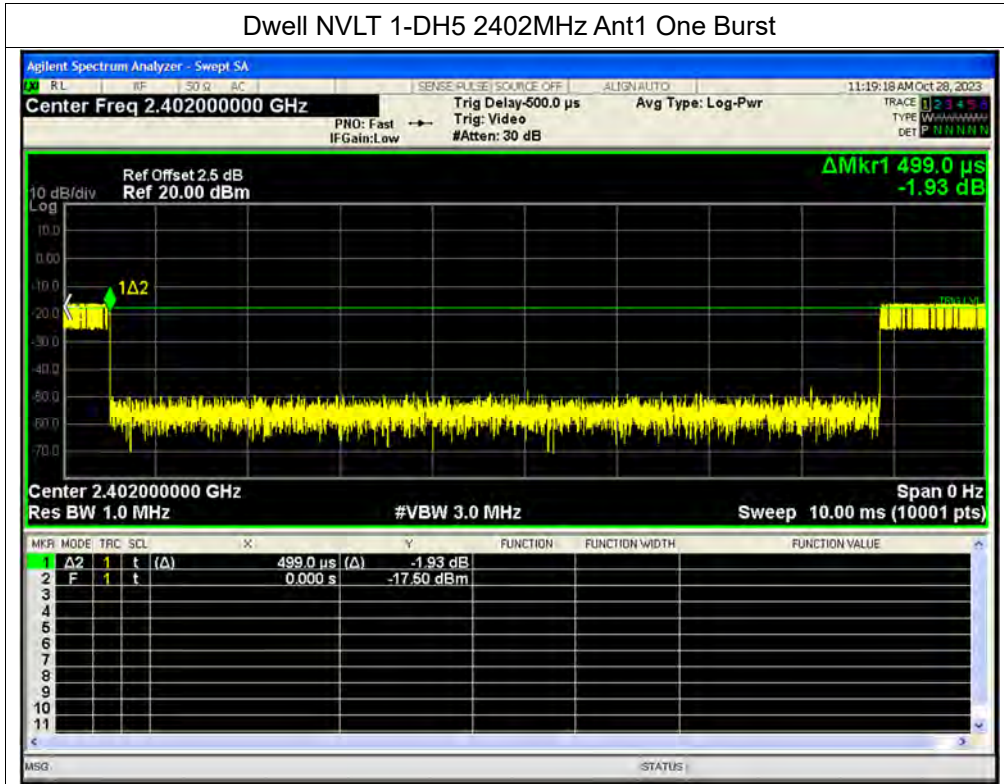


Dwell NVLT 1-DH3 2402MHz Ant1 Accumulated





Dwell NVLT 1-DH5 2402MHz Ant1 One Burst

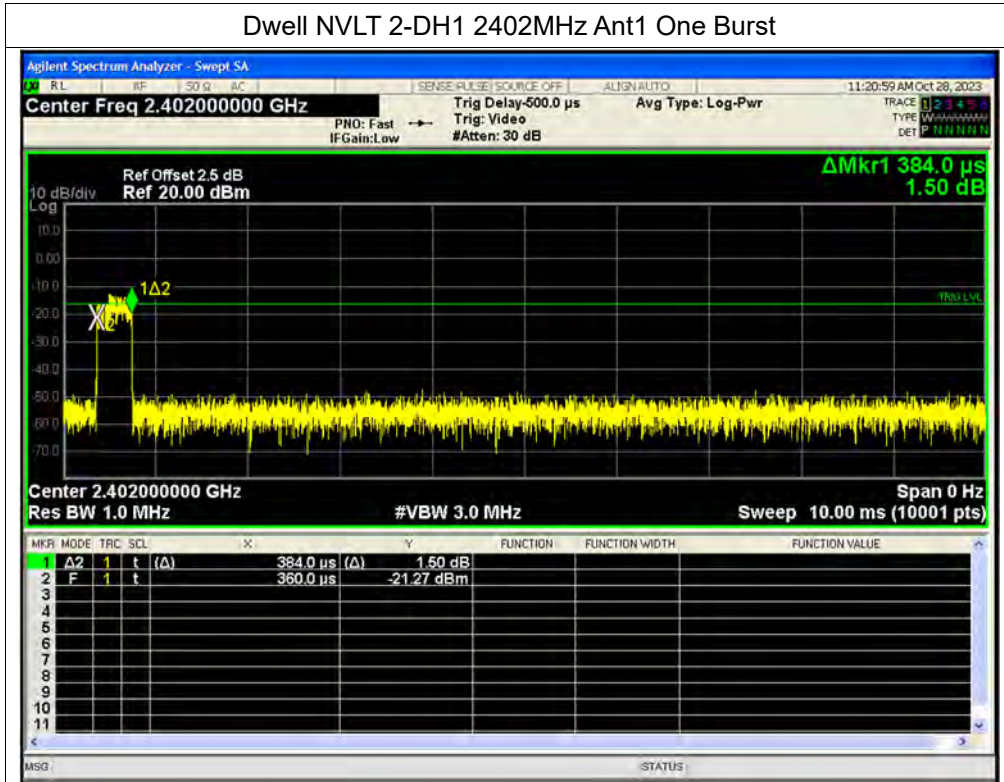


Dwell NVLT 1-DH5 2402MHz Ant1 Accumulated

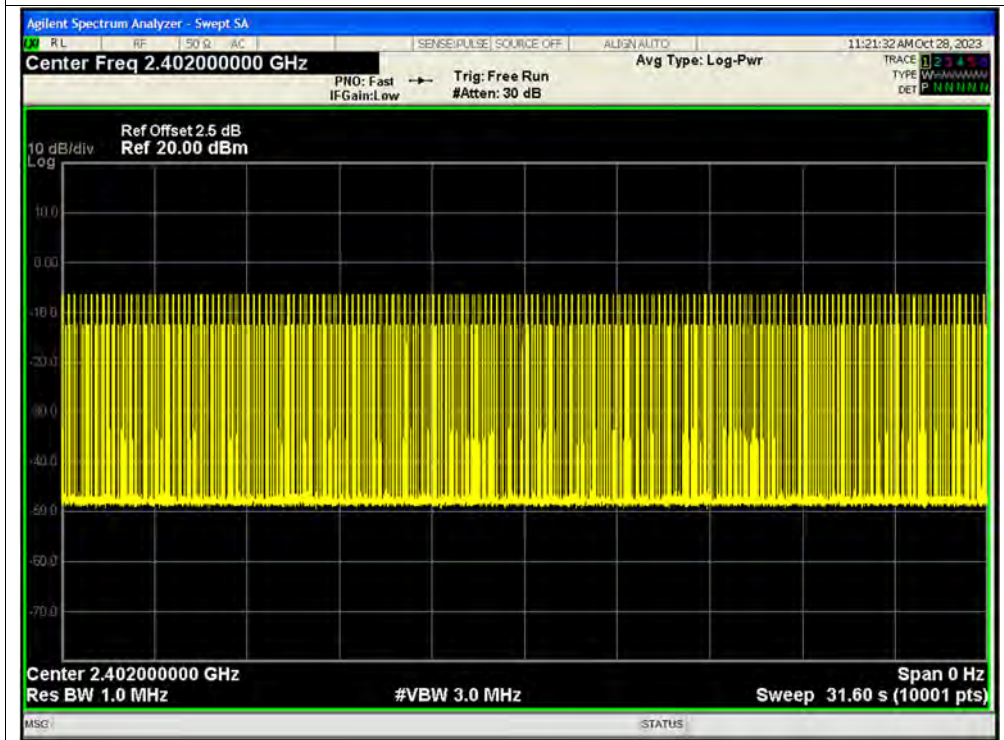




Dwell NVLT 2-DH1 2402MHz Ant1 One Burst

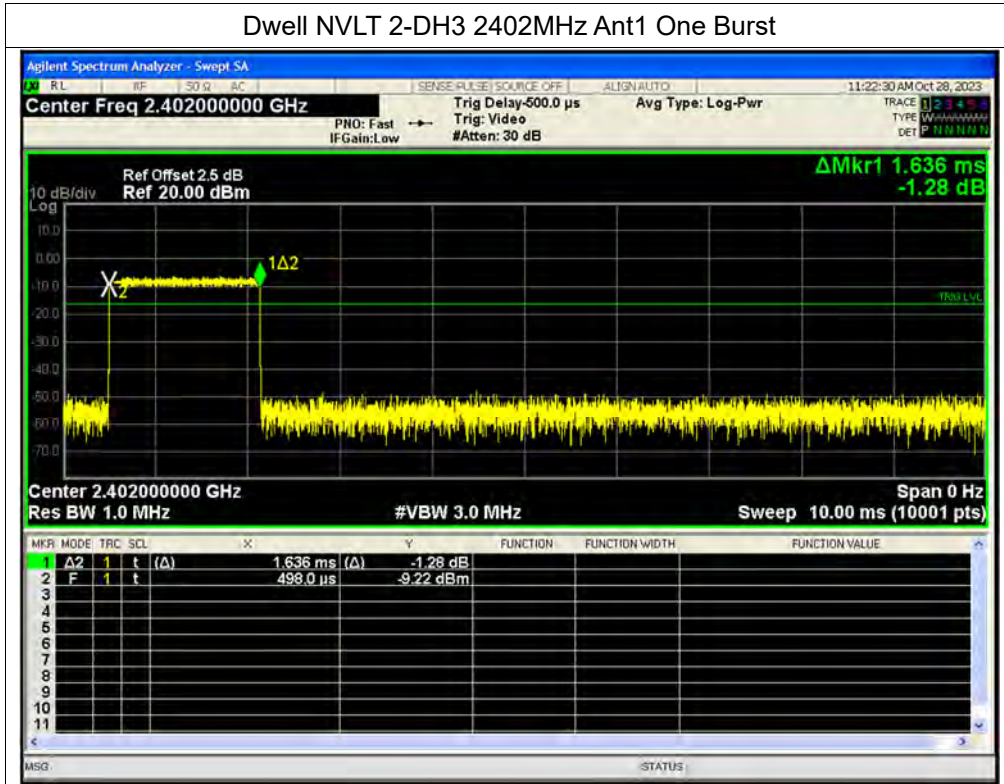


Dwell NVLT 2-DH1 2402MHz Ant1 Accumulated

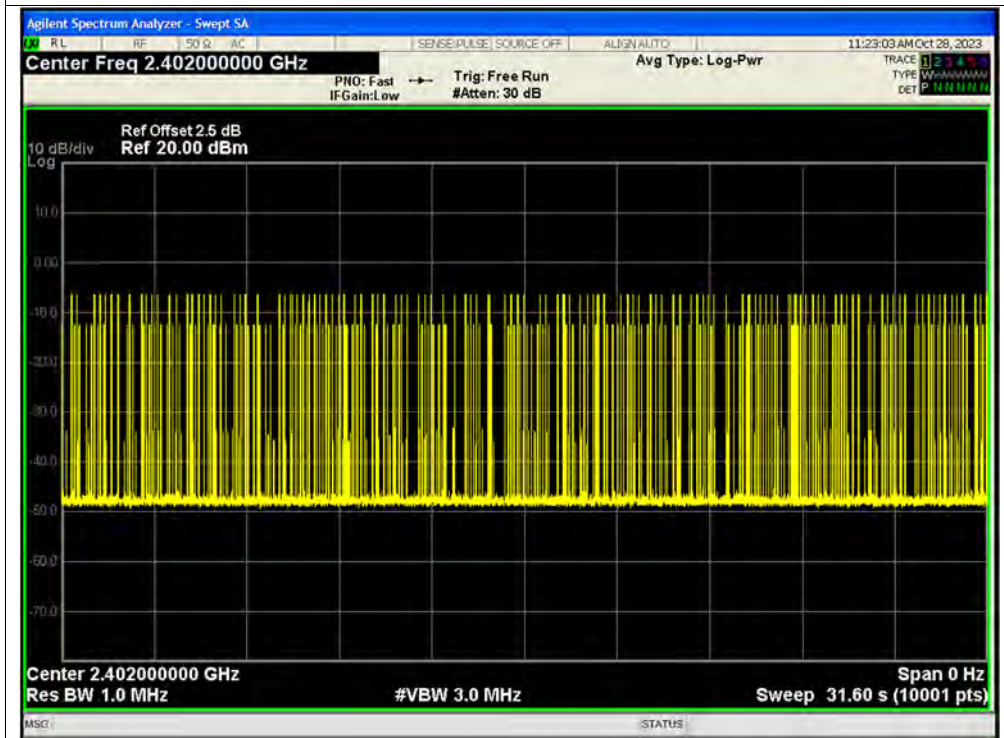




Dwell NVLT 2-DH3 2402MHz Ant1 One Burst

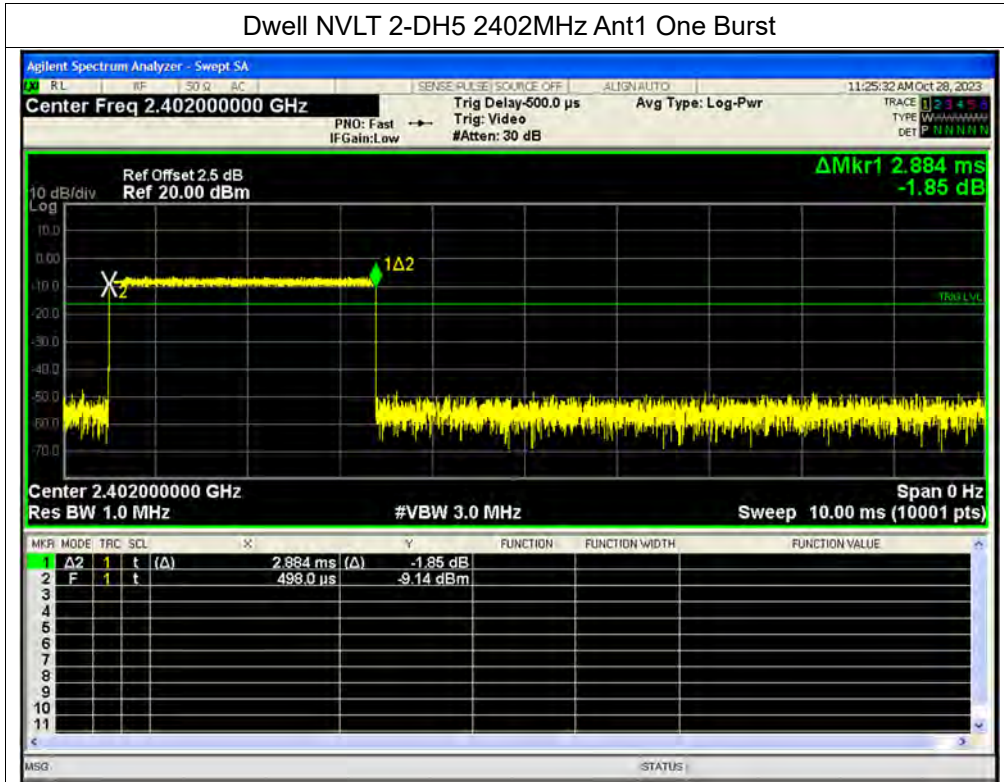


Dwell NVLT 2-DH3 2402MHz Ant1 Accumulated

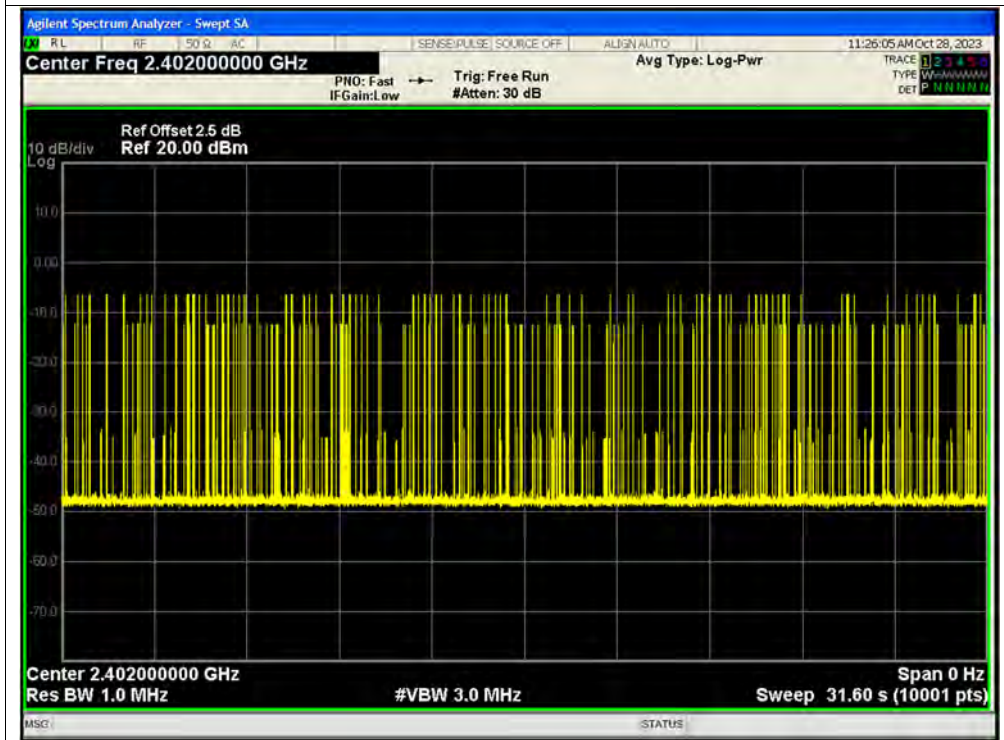




Dwell NVLT 2-DH5 2402MHz Ant1 One Burst

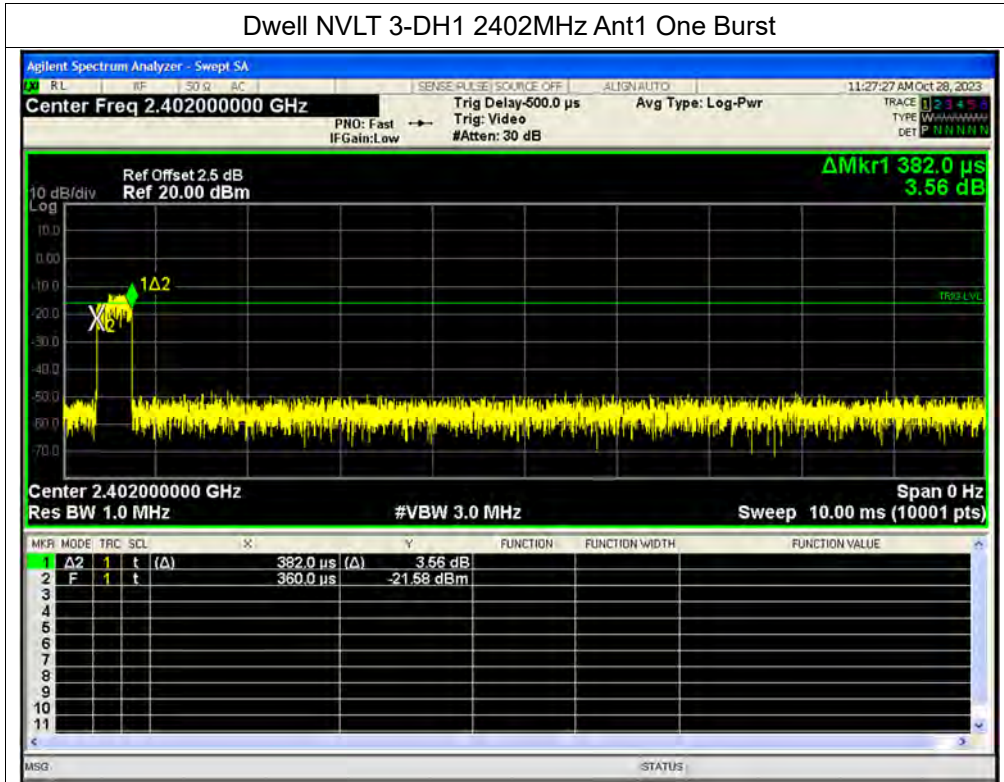


Dwell NVLT 2-DH5 2402MHz Ant1 Accumulated

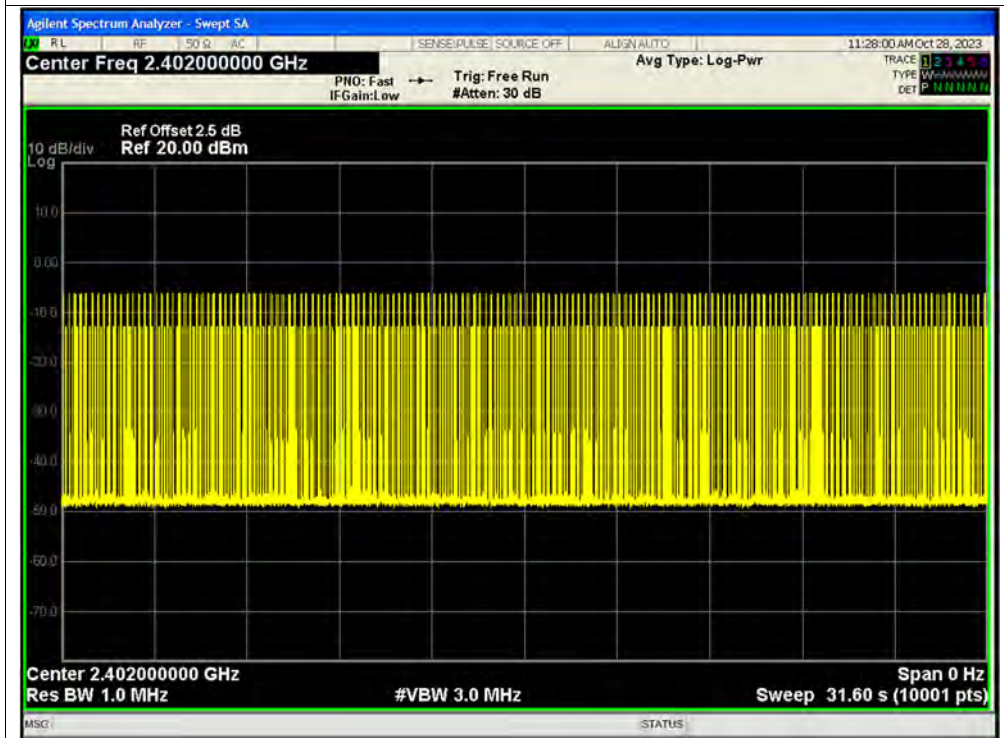




Dwell NVLT 3-DH1 2402MHz Ant1 One Burst

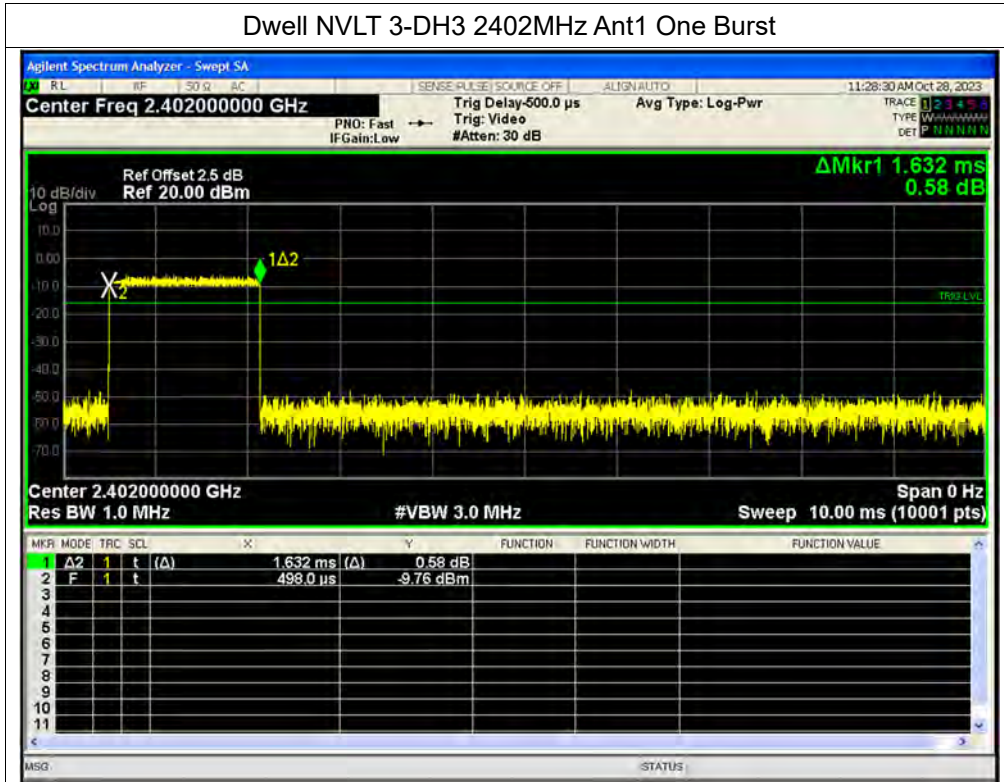


Dwell NVLT 3-DH1 2402MHz Ant1 Accumulated

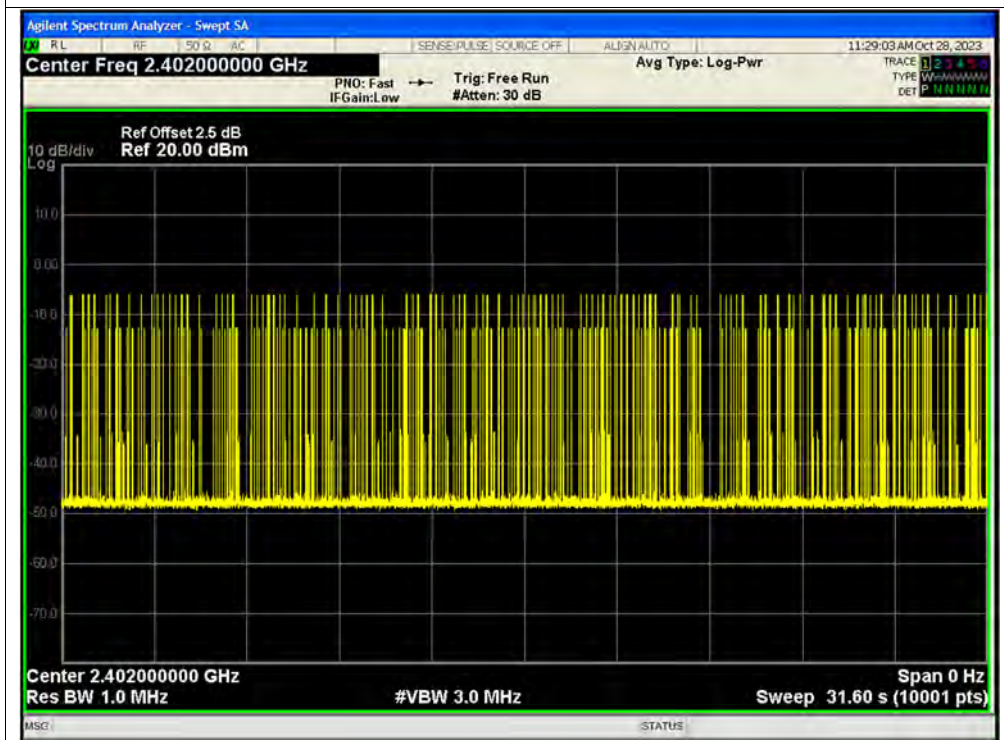




Dwell NVLT 3-DH3 2402MHz Ant1 One Burst

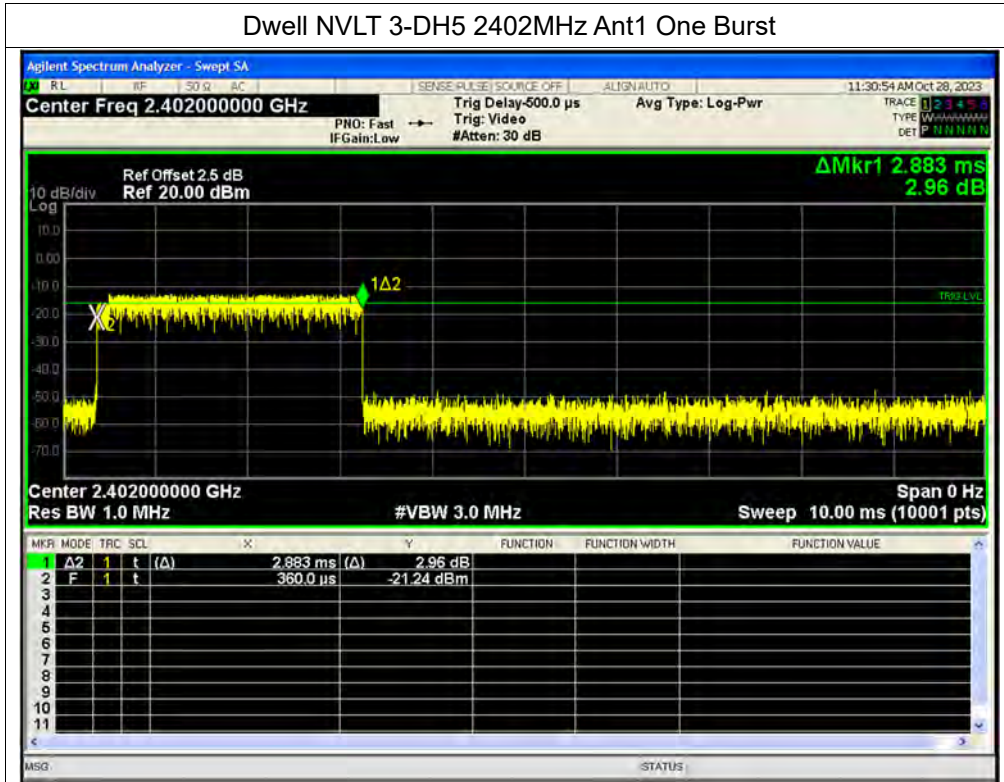


Dwell NVLT 3-DH3 2402MHz Ant1 Accumulated

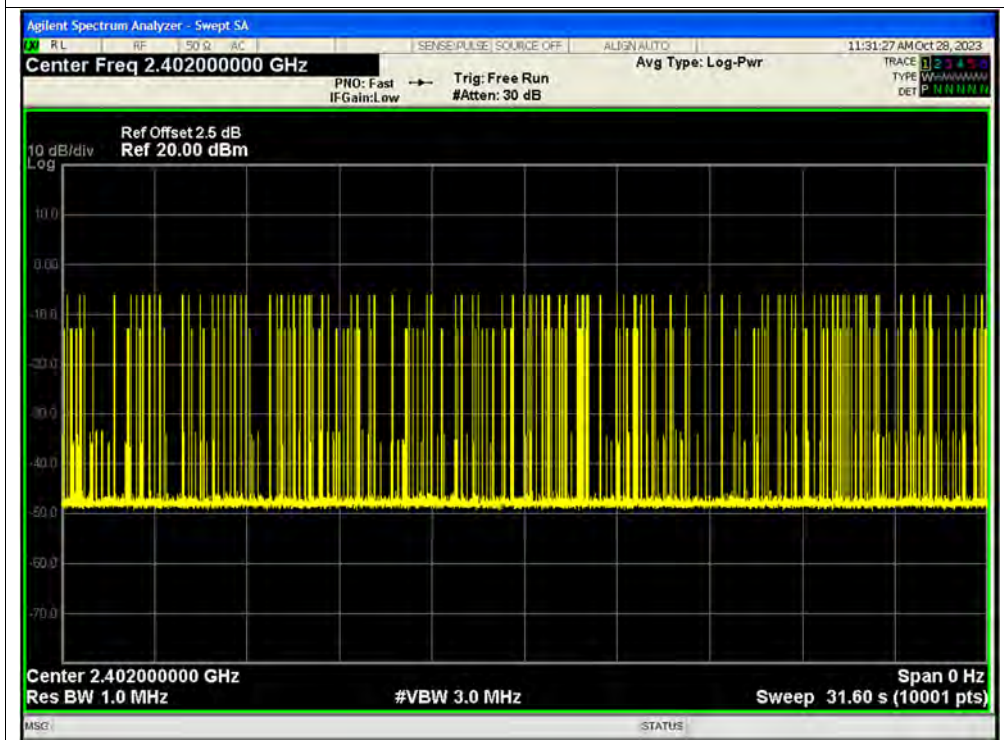




Dwell NVLT 3-DH5 2402MHz Ant1 One Burst



Dwell NVLT 3-DH5 2402MHz Ant1 Accumulated





A.8. Conducted Spurious Emissions

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	-32.5	-20	Pass
NVNT	1-DH5	2441	Ant1	-31.16	-20	Pass
NVNT	1-DH5	2480	Ant1	-31.06	-20	Pass
NVNT	2-DH5	2402	Ant1	-33.17	-20	Pass
NVNT	2-DH5	2441	Ant1	-32.35	-20	Pass
NVNT	2-DH5	2480	Ant1	-31.93	-20	Pass
NVNT	3-DH5	2402	Ant1	-32.91	-20	Pass
NVNT	3-DH5	2441	Ant1	-32.8	-20	Pass
NVNT	3-DH5	2480	Ant1	-31.21	-20	Pass

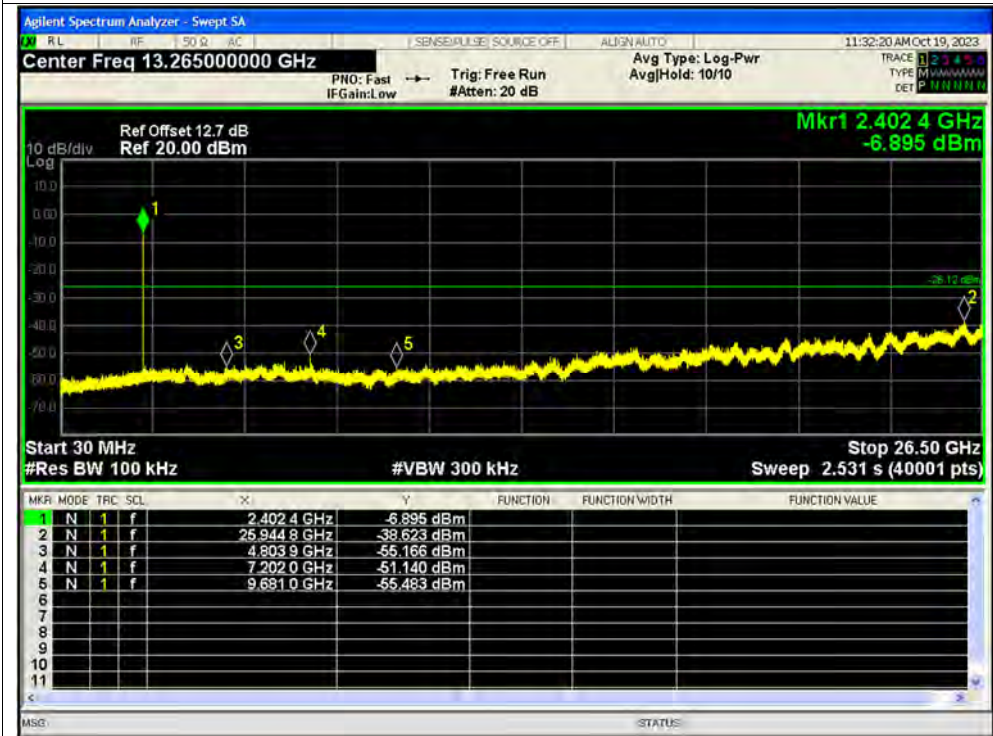


Test Graphs

Tx. Spurious NVLT 1-DH5 2402MHz Ant1 Ref



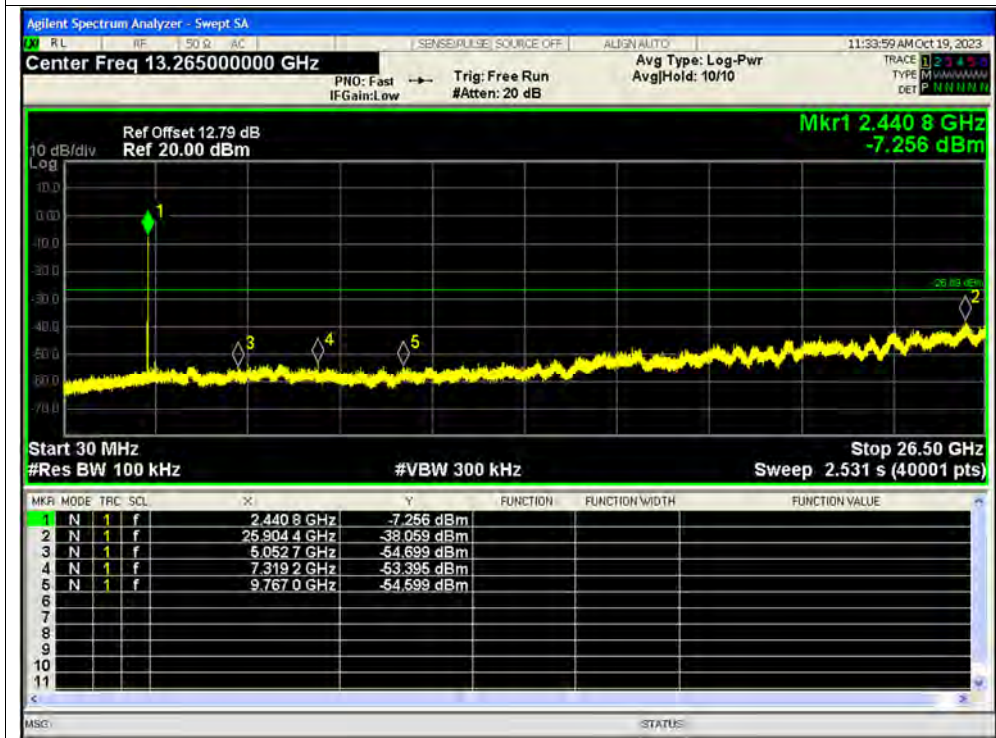
Tx. Spurious NVLT 1-DH5 2402MHz Ant1 Emission



Tx. Spurious NVLT 1-DH5 2441MHz Ant1 Ref



Tx. Spurious NVLT 1-DH5 2441MHz Ant1 Emission

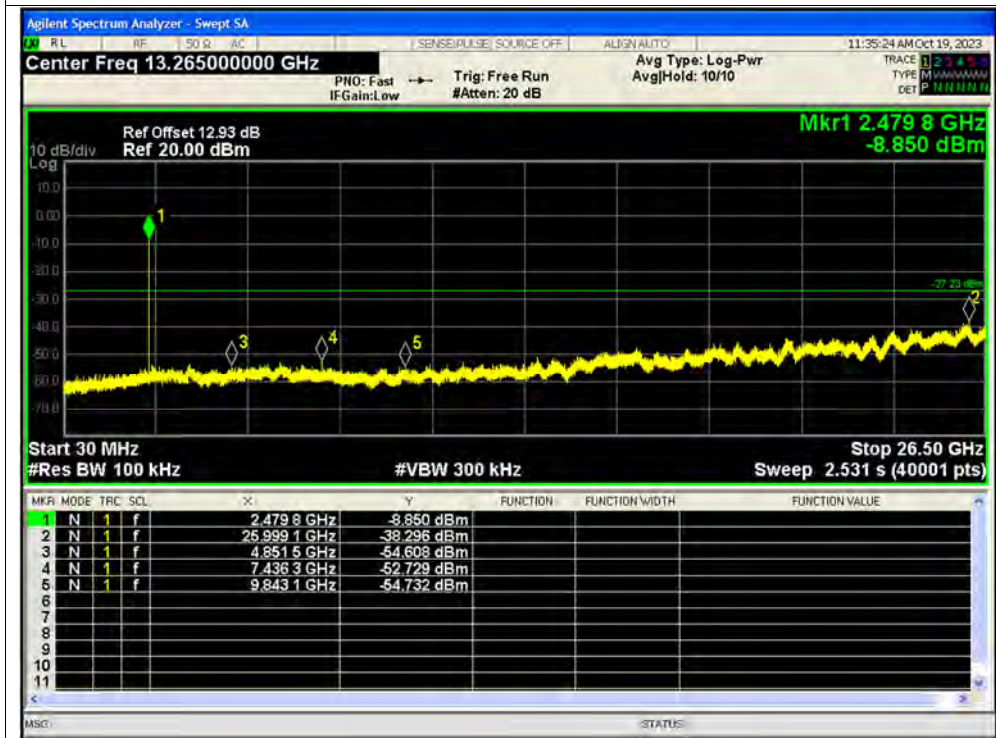




Tx. Spurious NVLT 1-DH5 2480MHz Ant1 Ref



Tx. Spurious NVLT 1-DH5 2480MHz Ant1 Emission

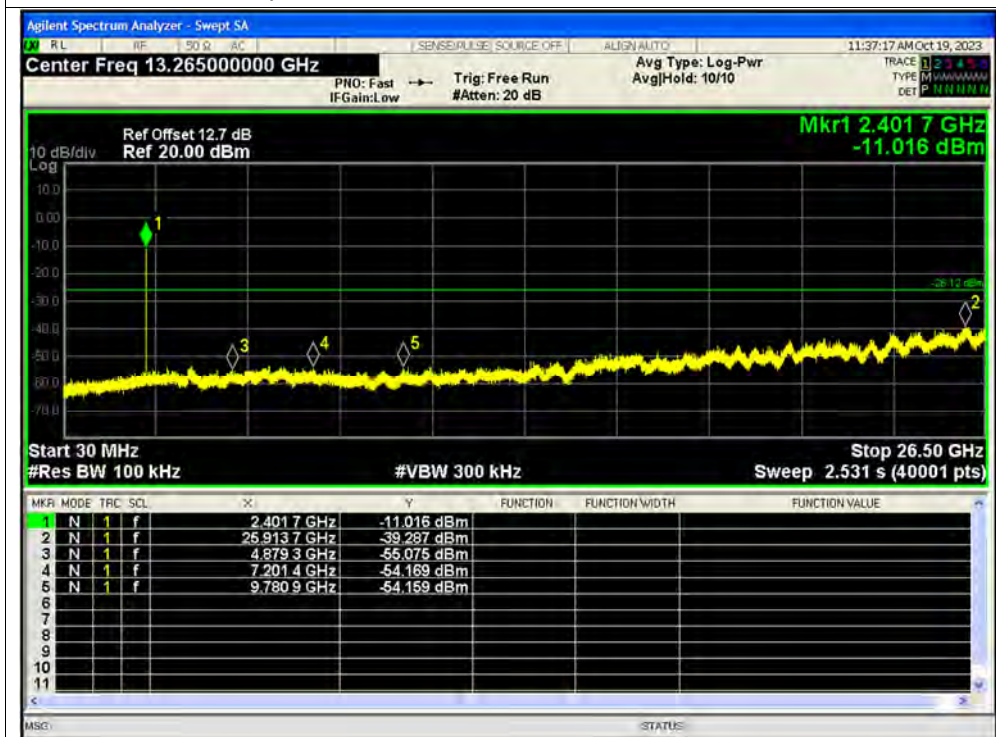




Tx. Spurious NVLT 2-DH5 2402MHz Ant1 Ref

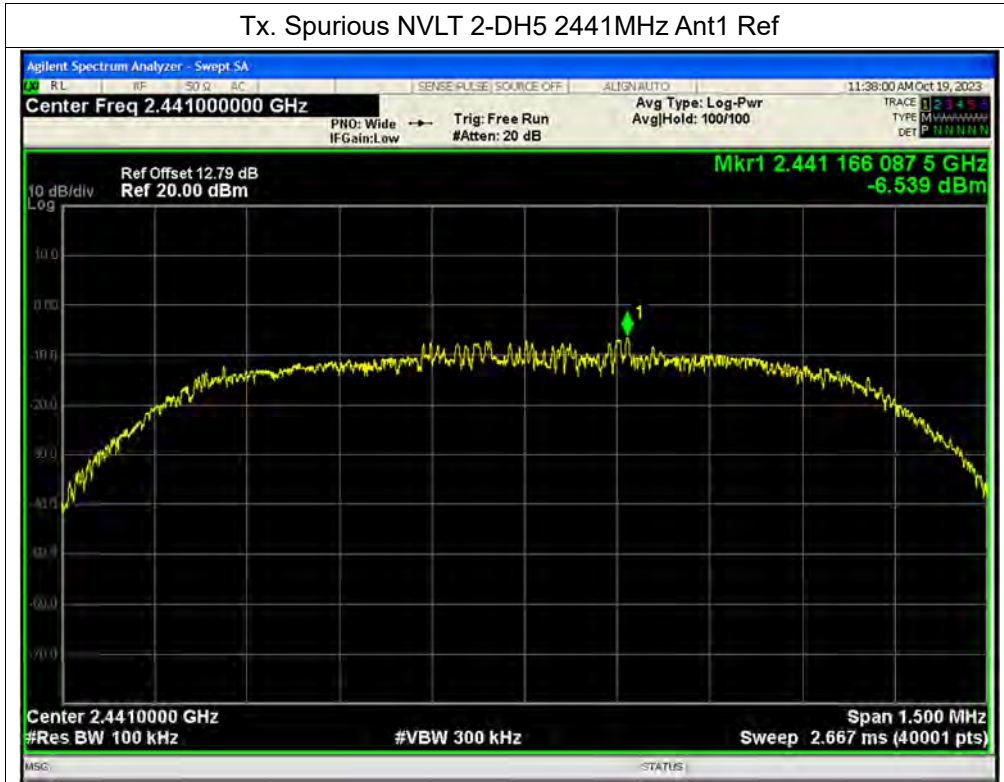


Tx. Spurious NVLT 2-DH5 2402MHz Ant1 Emission

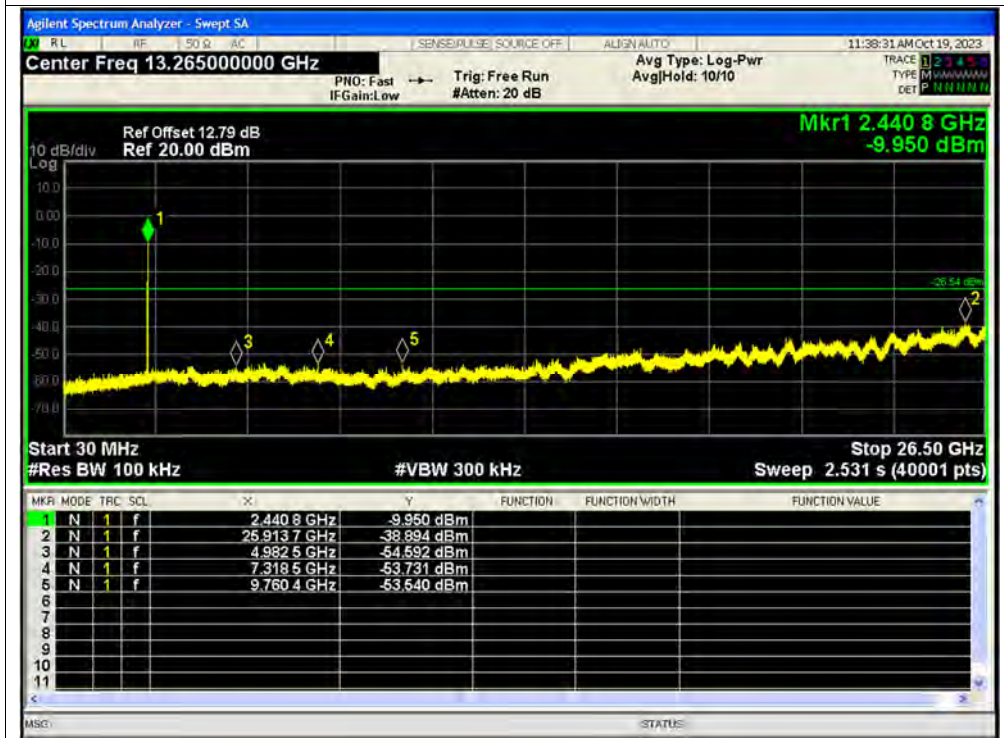




Tx. Spurious NVLT 2-DH5 2441MHz Ant1 Ref

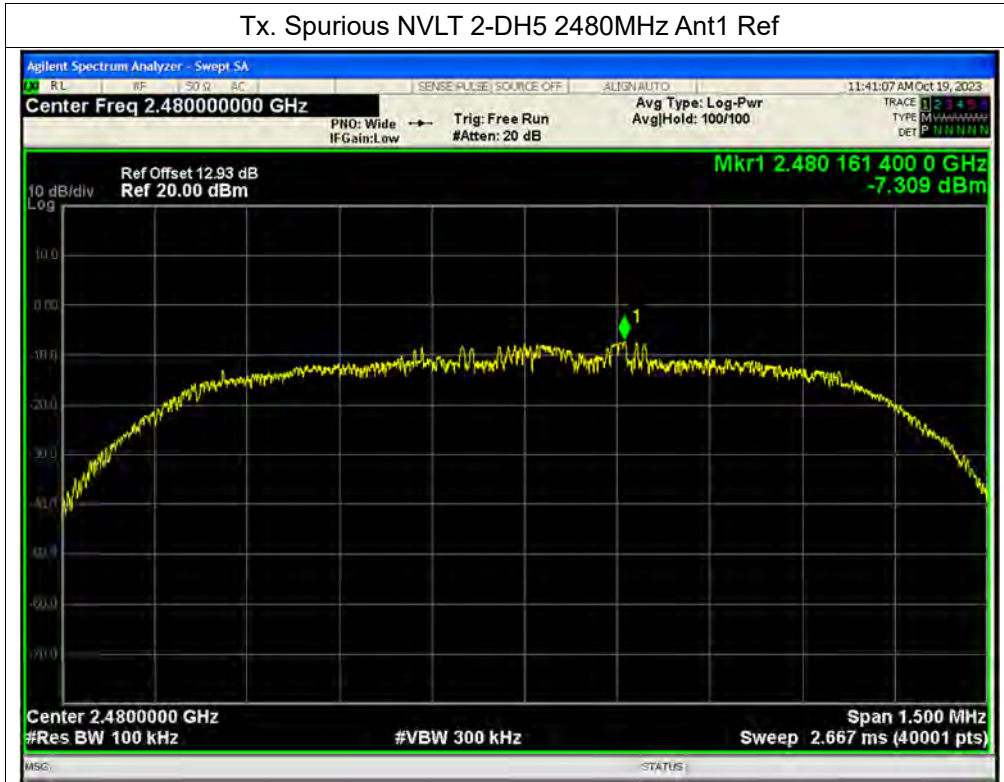


Tx. Spurious NVLT 2-DH5 2441MHz Ant1 Emission

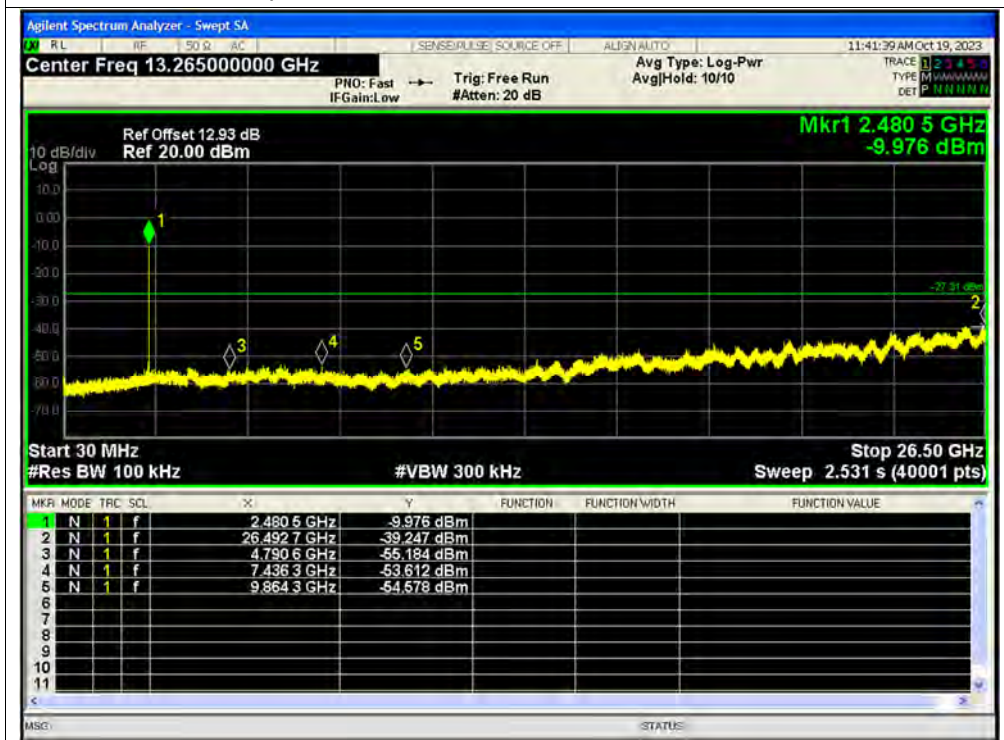




Tx. Spurious NVLT 2-DH5 2480MHz Ant1 Ref



Tx. Spurious NVLT 2-DH5 2480MHz Ant1 Emission

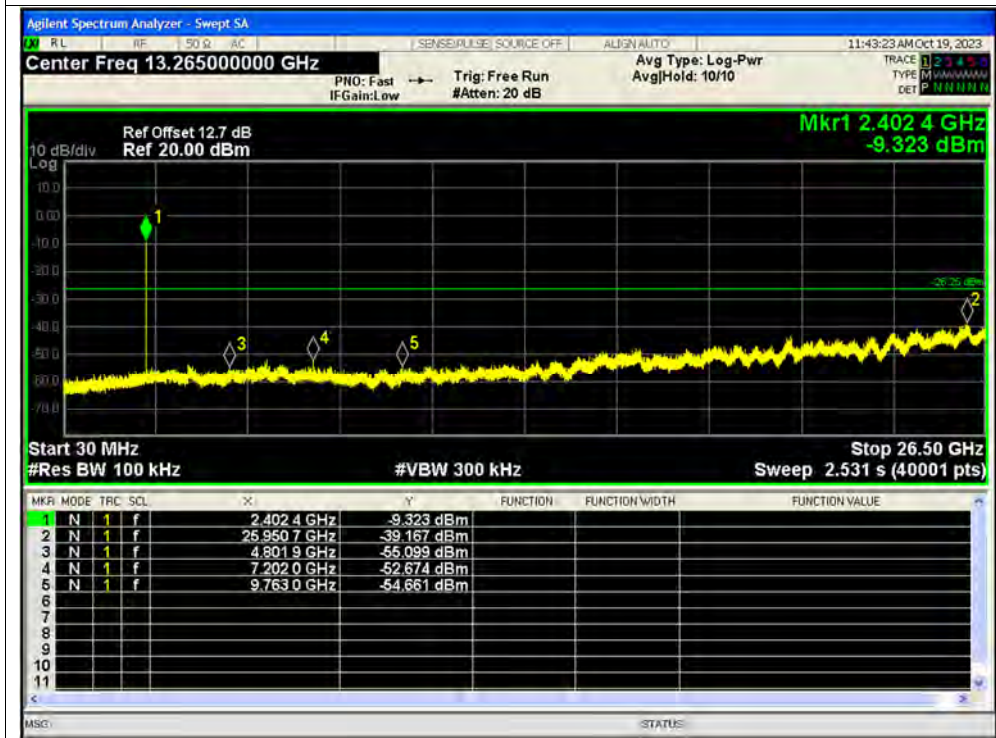




Tx. Spurious NVLT 3-DH5 2402MHz Ant1 Ref



Tx. Spurious NVLT 3-DH5 2402MHz Ant1 Emission

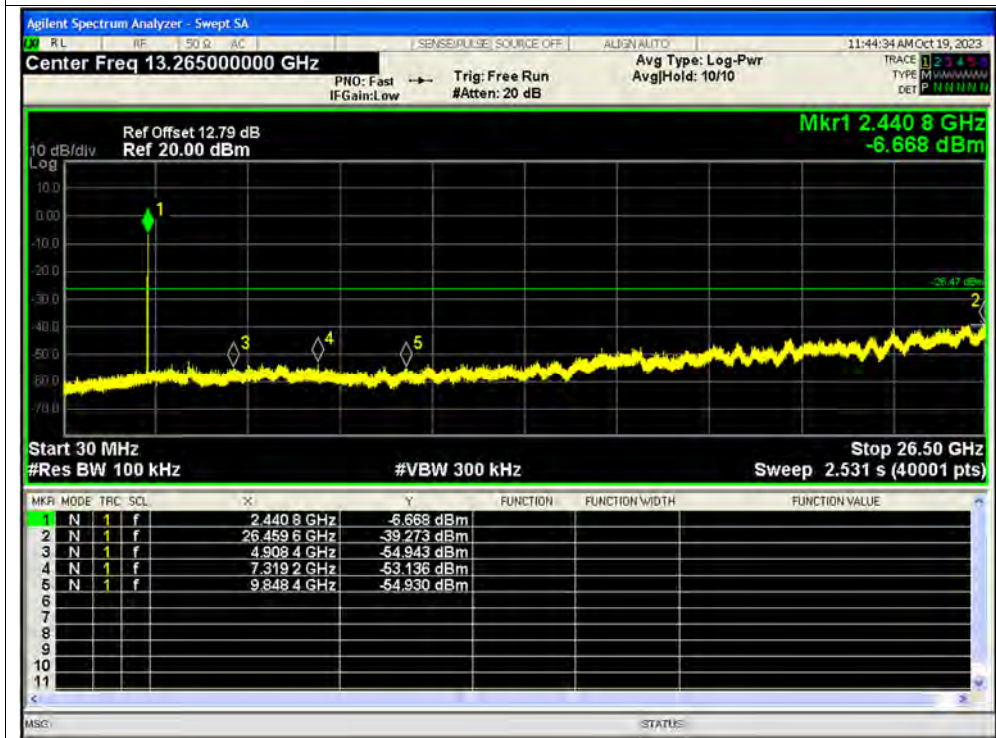




Tx. Spurious NVLT 3-DH5 2441MHz Ant1 Ref

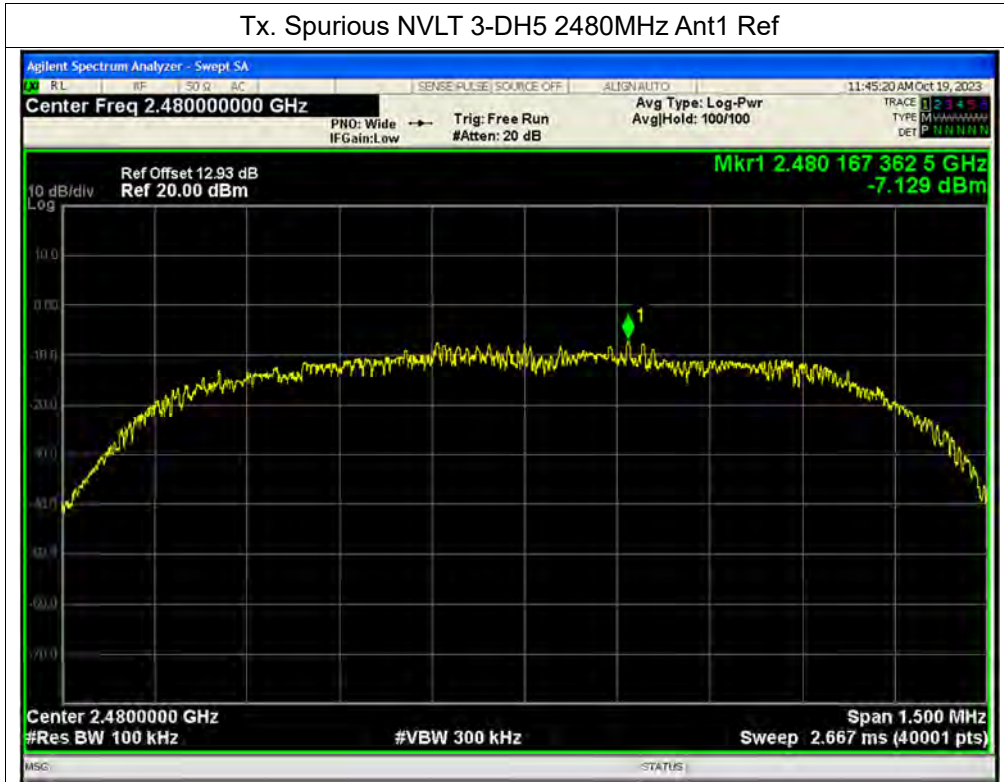


Tx. Spurious NVLT 3-DH5 2441MHz Ant1 Emission

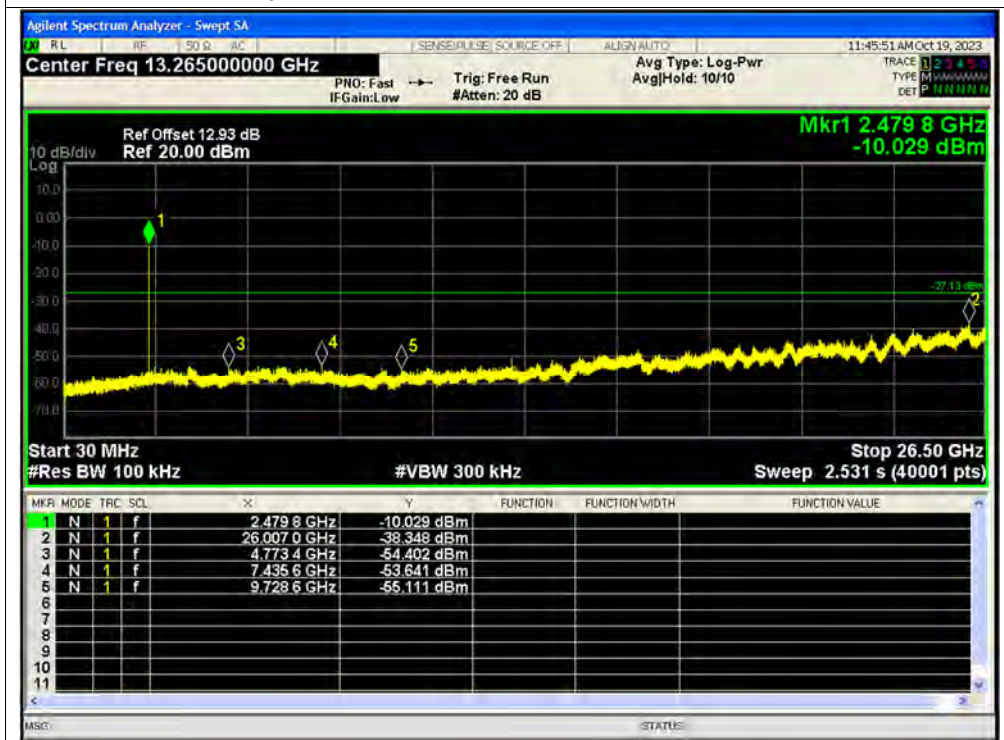




Tx. Spurious NVLT 3-DH5 2480MHz Ant1 Ref



Tx. Spurious NVLT 3-DH5 2480MHz Ant1 Emission



**A.9. Band Edge**

Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	No-Hopping	-37	-20	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	-38.37	-20	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	-37.53	-20	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	-36.32	-20	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	-37.23	-20	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	-37.48	-20	Pass
NVNT	1-DH5	2402	Ant1	Hopping	-47.21	-20	Pass
NVNT	1-DH5	2480	Ant1	Hopping	-49.94	-20	Pass
NVNT	2-DH5	2402	Ant1	Hopping	-45.26	-20	Pass
NVNT	2-DH5	2480	Ant1	Hopping	-49.25	-20	Pass
NVNT	3-DH5	2402	Ant1	Hopping	-45.79	-20	Pass
NVNT	3-DH5	2480	Ant1	Hopping	-49.36	-20	Pass

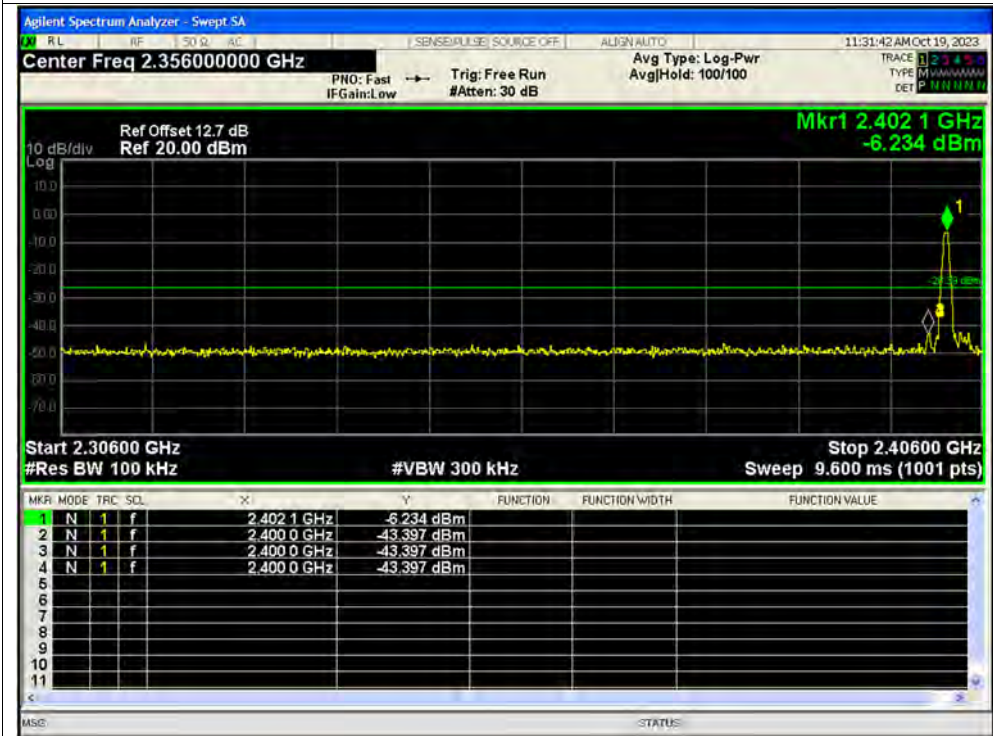


Test Graphs

Band Edge NVLT 1-DH5 2402MHz Ant1 No-Hopping Ref



Band Edge NVLT 1-DH5 2402MHz Ant1 No-Hopping Emission

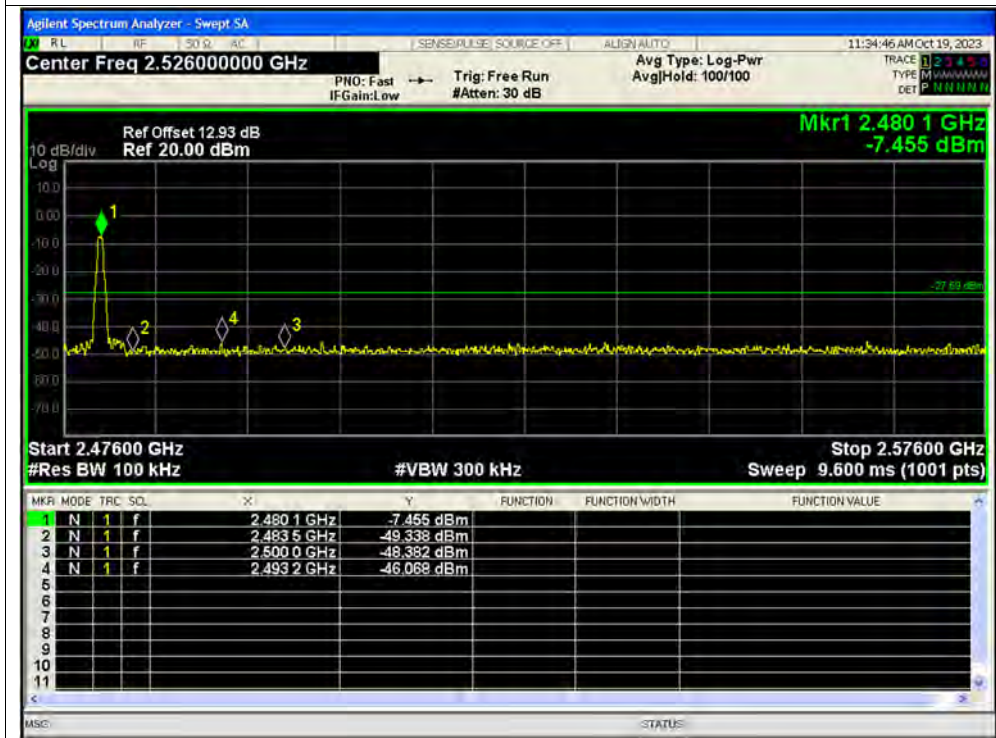




Band Edge NVLT 1-DH5 2480MHz Ant1 No-Hopping Ref

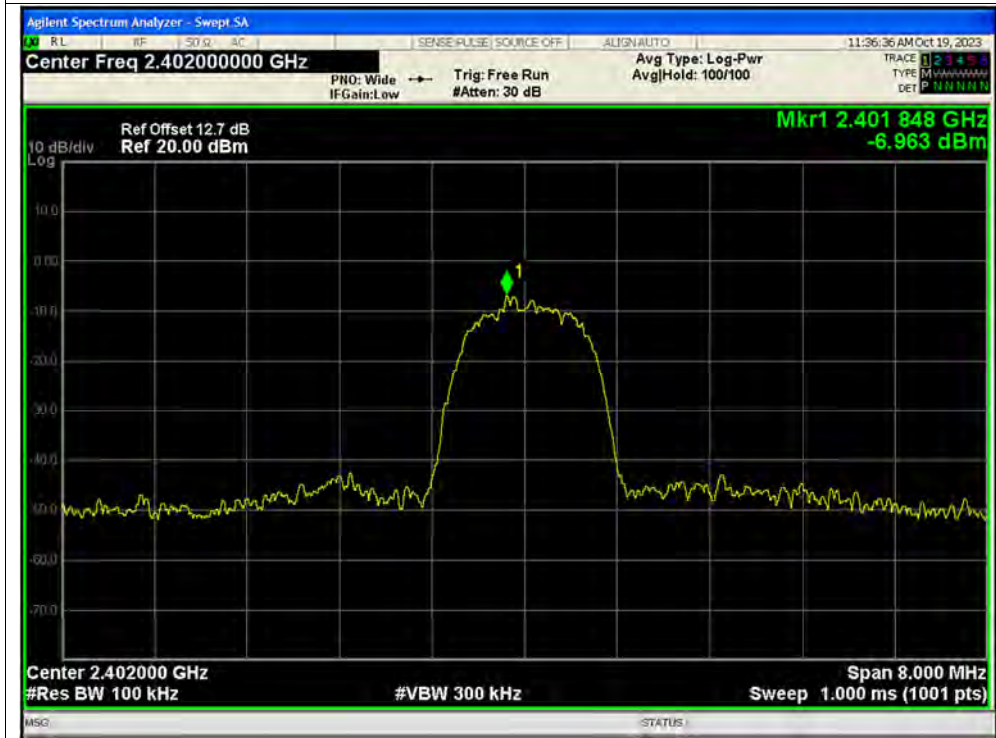


Band Edge NVLT 1-DH5 2480MHz Ant1 No-Hopping Emission

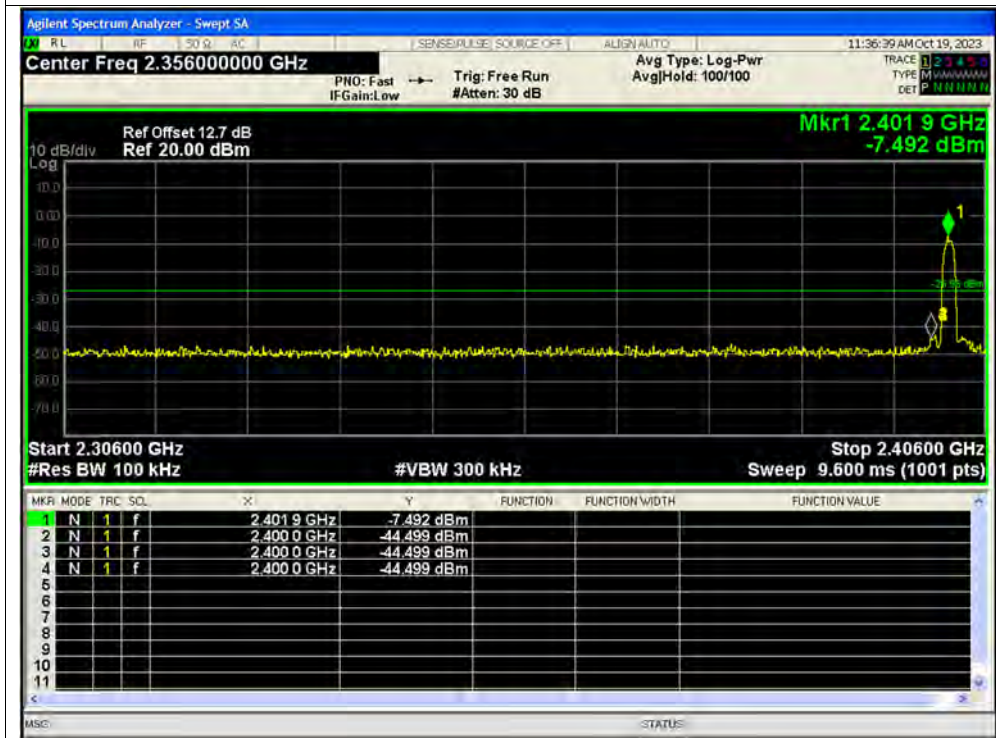




Band Edge NVLT 2-DH5 2402MHz Ant1 No-Hopping Ref

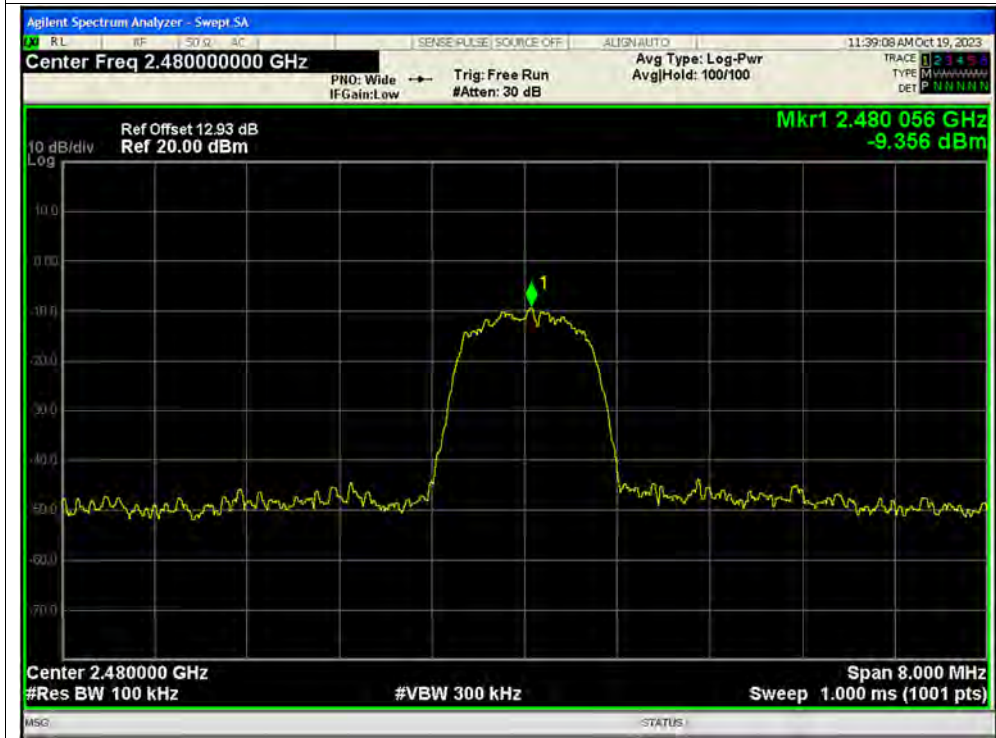


Band Edge NVLT 2-DH5 2402MHz Ant1 No-Hopping Emission

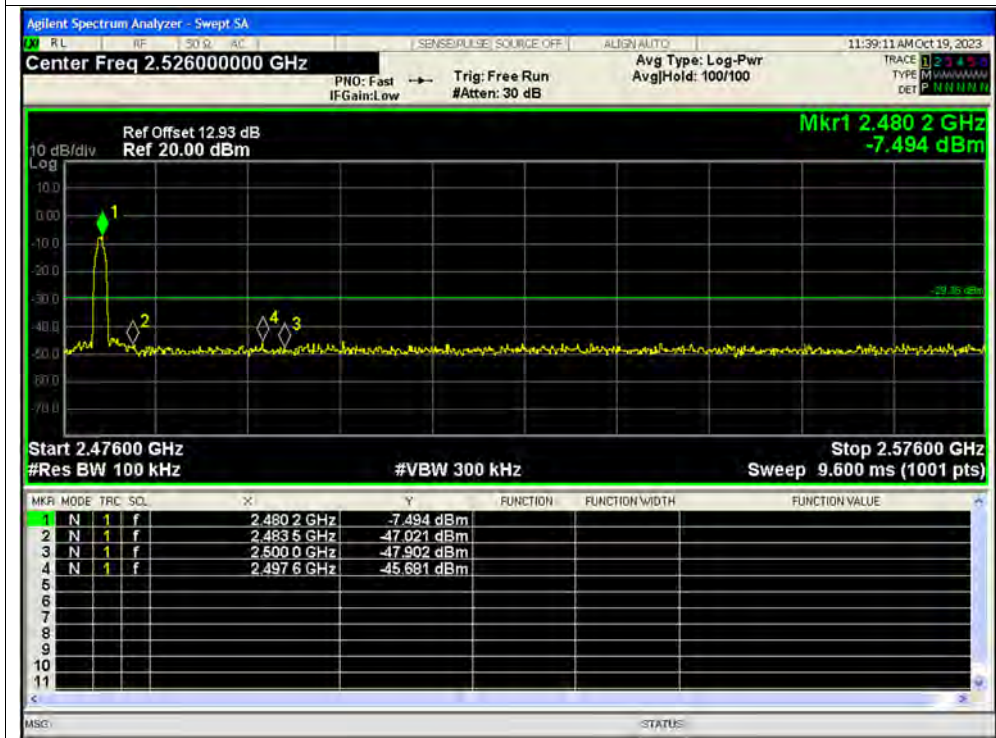




Band Edge NVLT 2-DH5 2480MHz Ant1 No-Hopping Ref

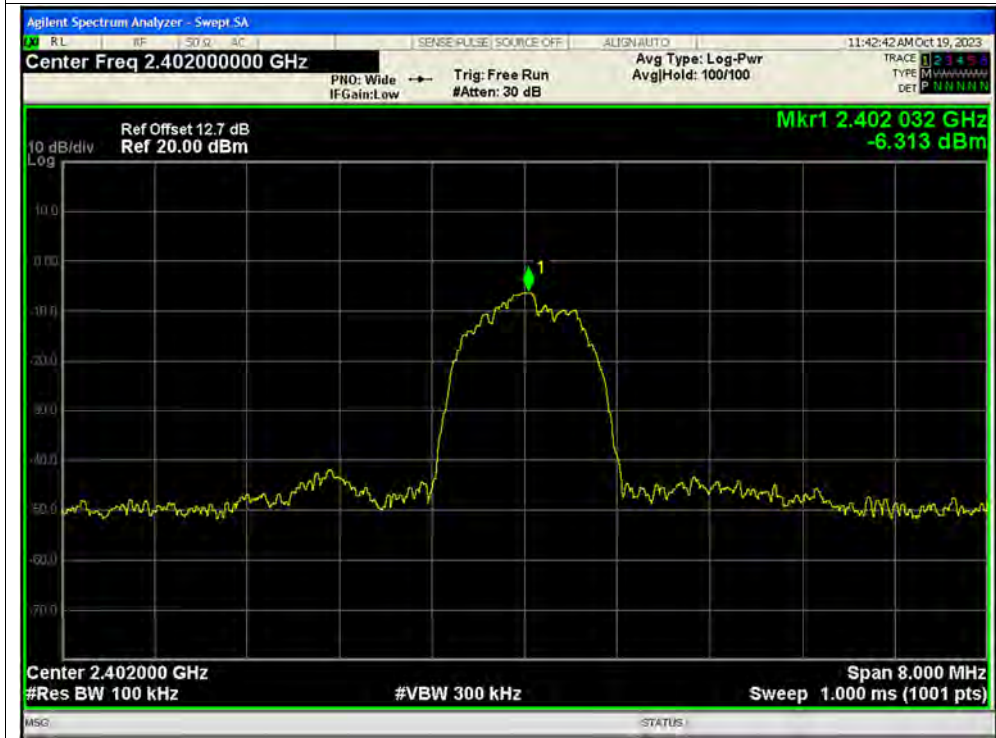


Band Edge NVLT 2-DH5 2480MHz Ant1 No-Hopping Emission

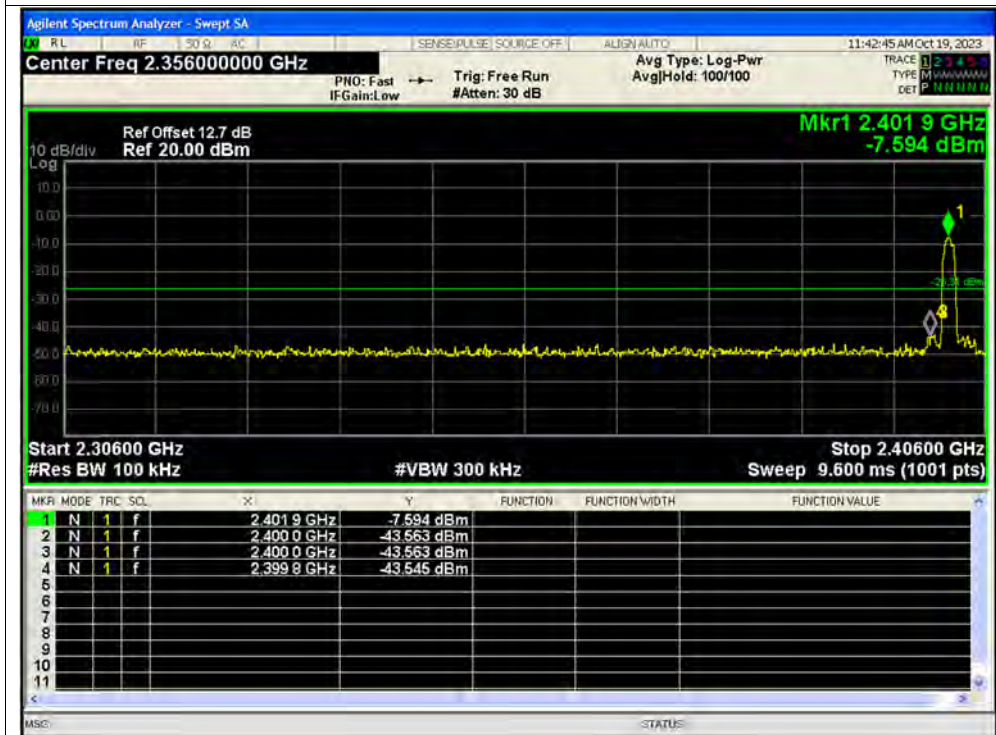




Band Edge NVLT 3-DH5 2402MHz Ant1 No-Hopping Ref

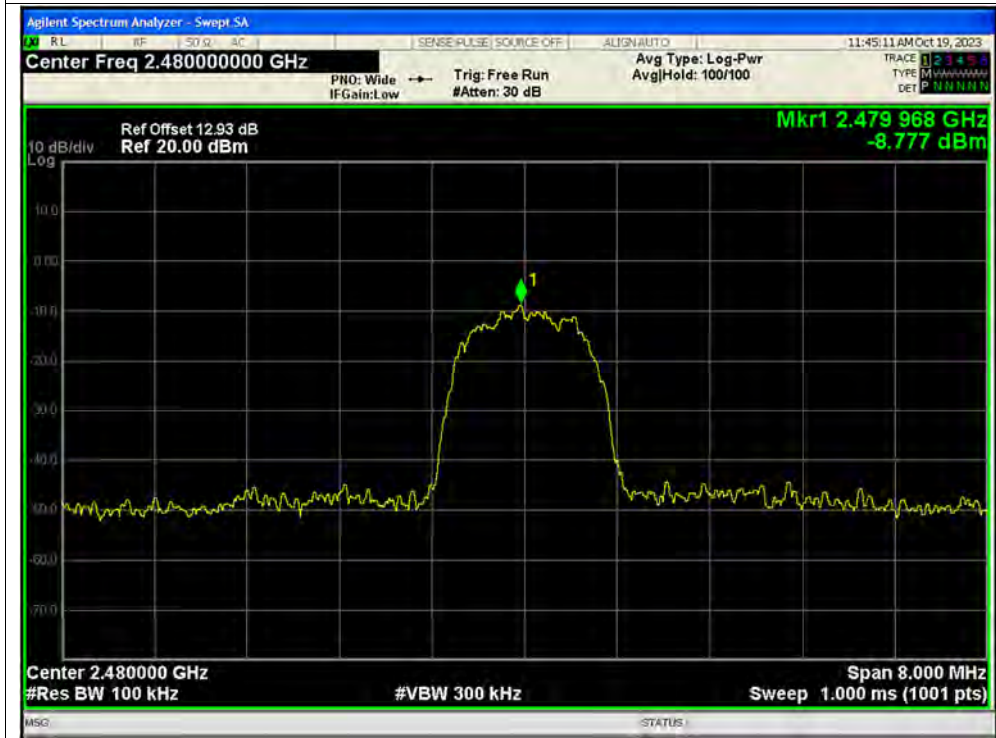


Band Edge NVLT 3-DH5 2402MHz Ant1 No-Hopping Emission

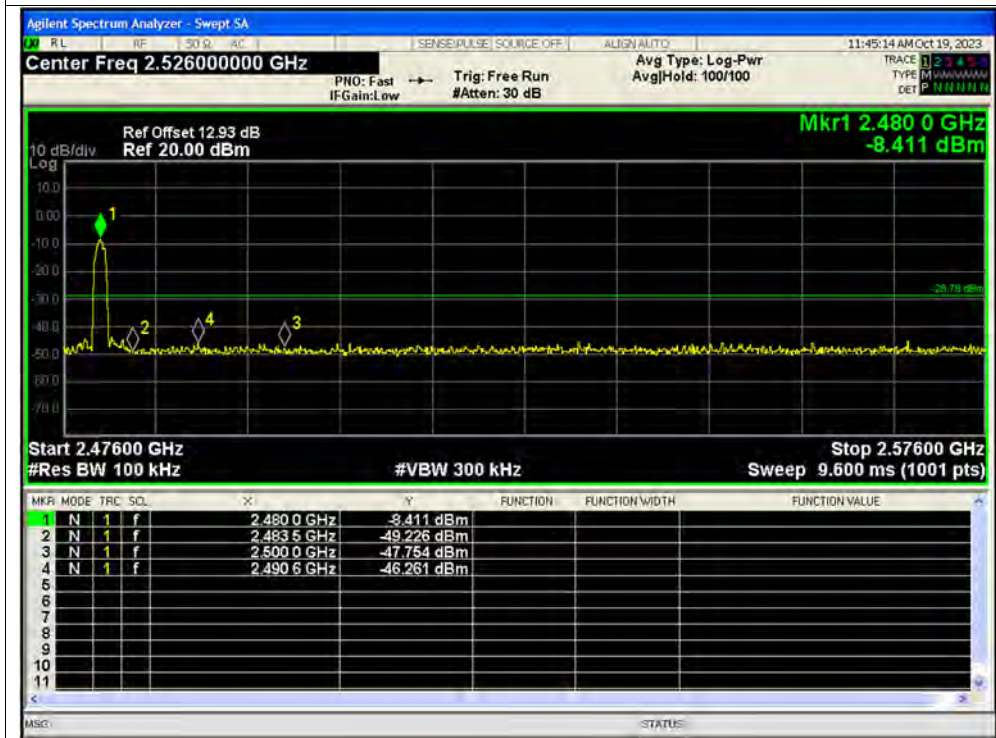




Band Edge NVLT 3-DH5 2480MHz Ant1 No-Hopping Ref



Band Edge NVLT 3-DH5 2480MHz Ant1 No-Hopping Emission



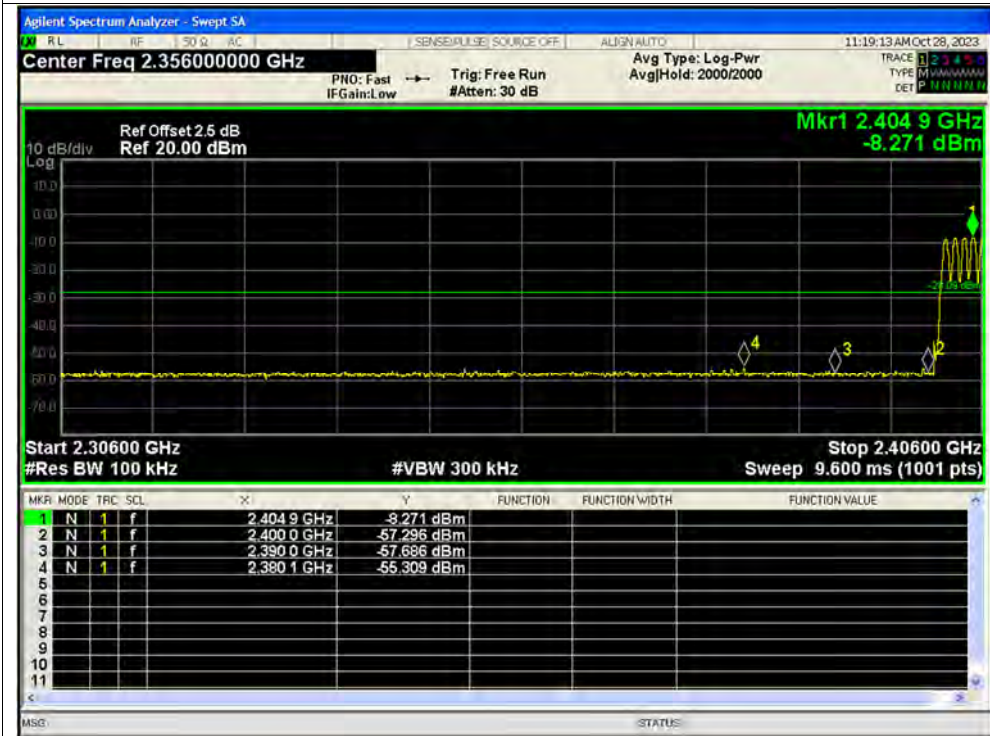


Test Graphs

Band Edge(Hopping) NVLT 1-DH5 2402MHz Ant1 Hopping Ref



Band Edge(Hopping) NVLT 1-DH5 2402MHz Ant1 Hopping Emission

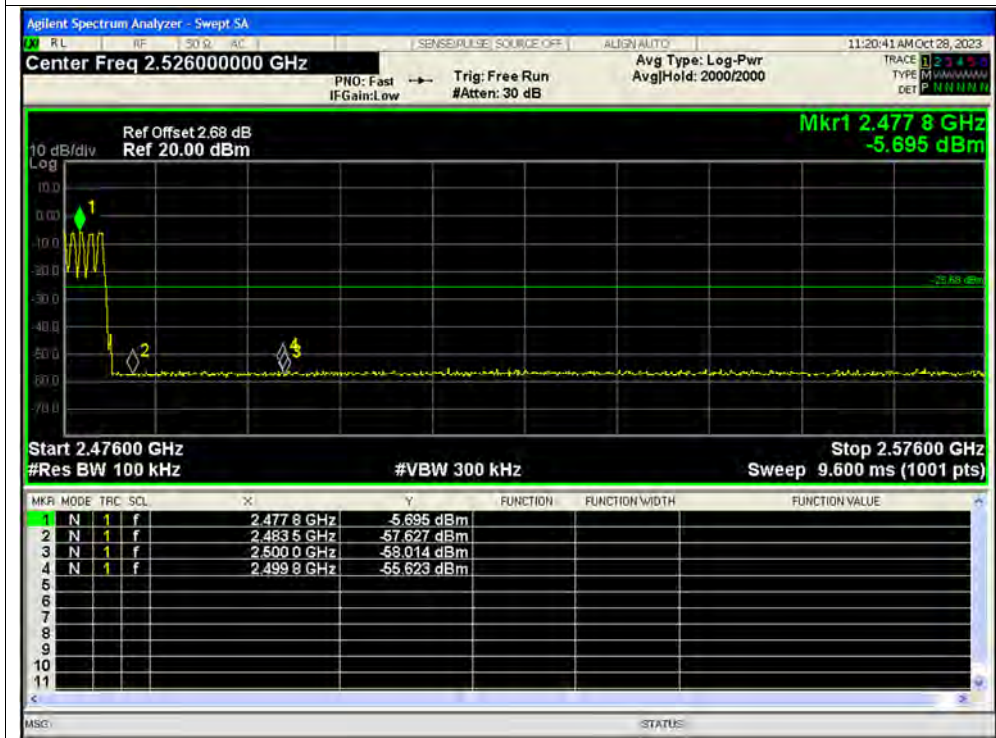




Band Edge(Hopping) NVLT 1-DH5 2480MHz Ant1 Hopping Ref



Band Edge(Hopping) NVLT 1-DH5 2480MHz Ant1 Hopping Emission

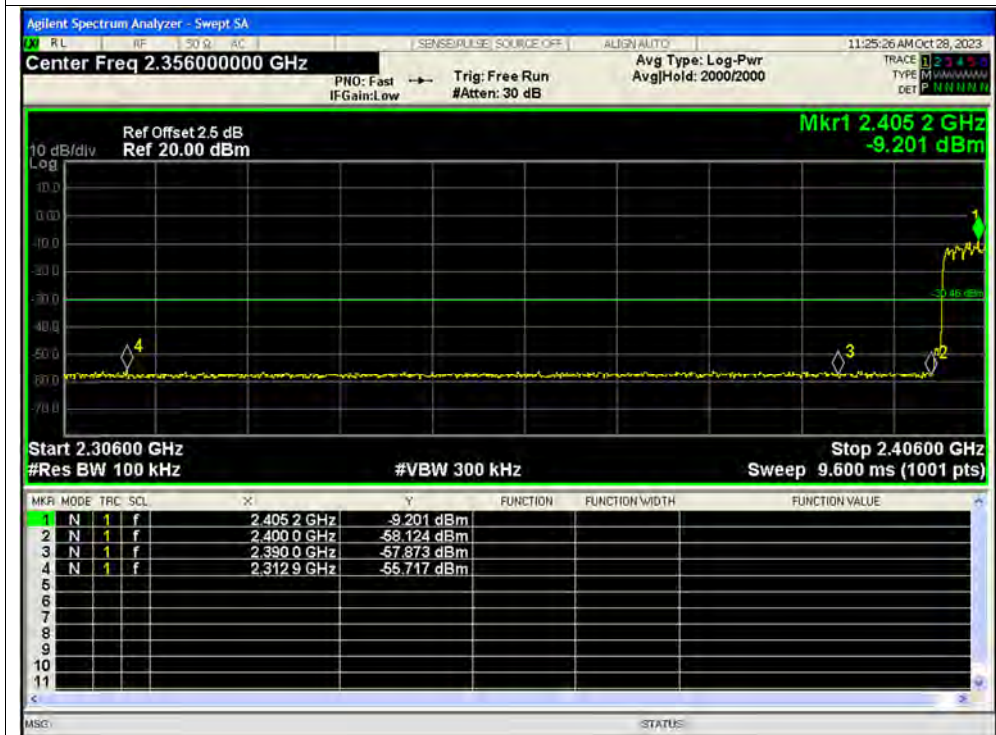




Band Edge(Hopping) NVLT 2-DH5 2402MHz Ant1 Hopping Ref



Band Edge(Hopping) NVLT 2-DH5 2402MHz Ant1 Hopping Emission

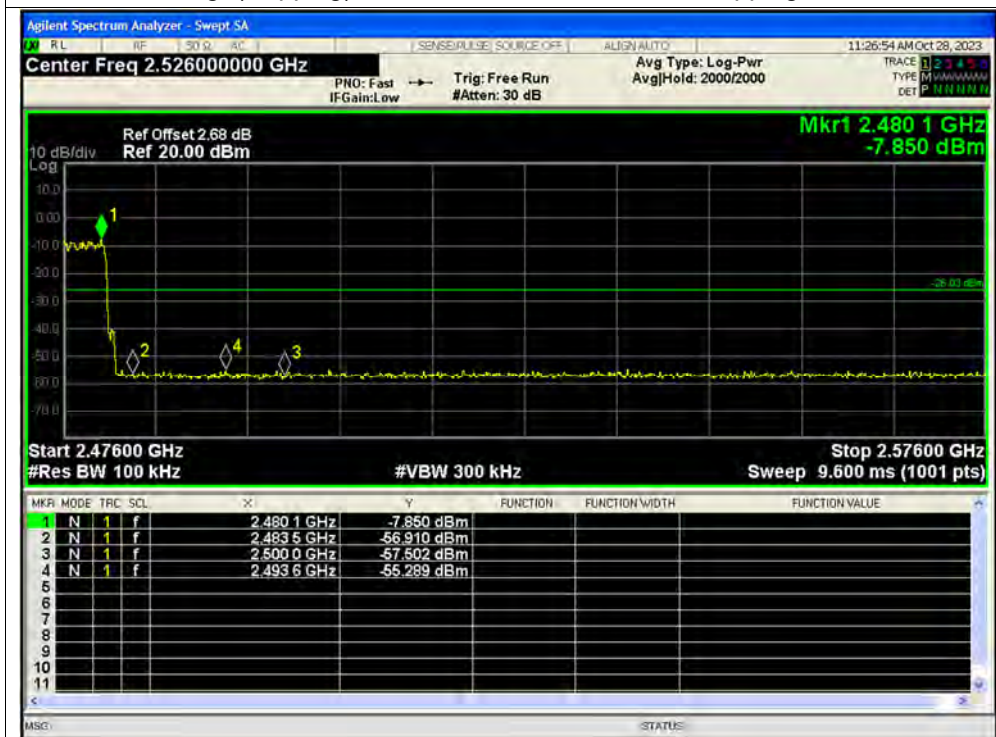




Band Edge(Hopping) NVLT 2-DH5 2480MHz Ant1 Hopping Ref



Band Edge(Hopping) NVLT 2-DH5 2480MHz Ant1 Hopping Emission

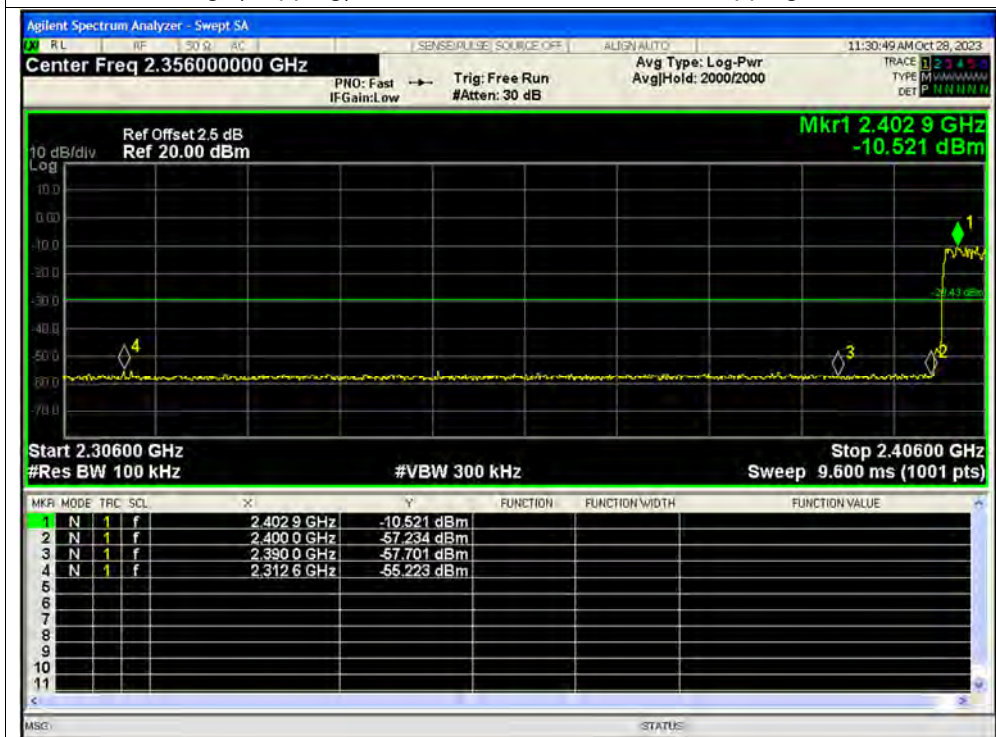




Band Edge(Hopping) NVLT 3-DH5 2402MHz Ant1 Hopping Ref



Band Edge(Hopping) NVLT 3-DH5 2402MHz Ant1 Hopping Emission

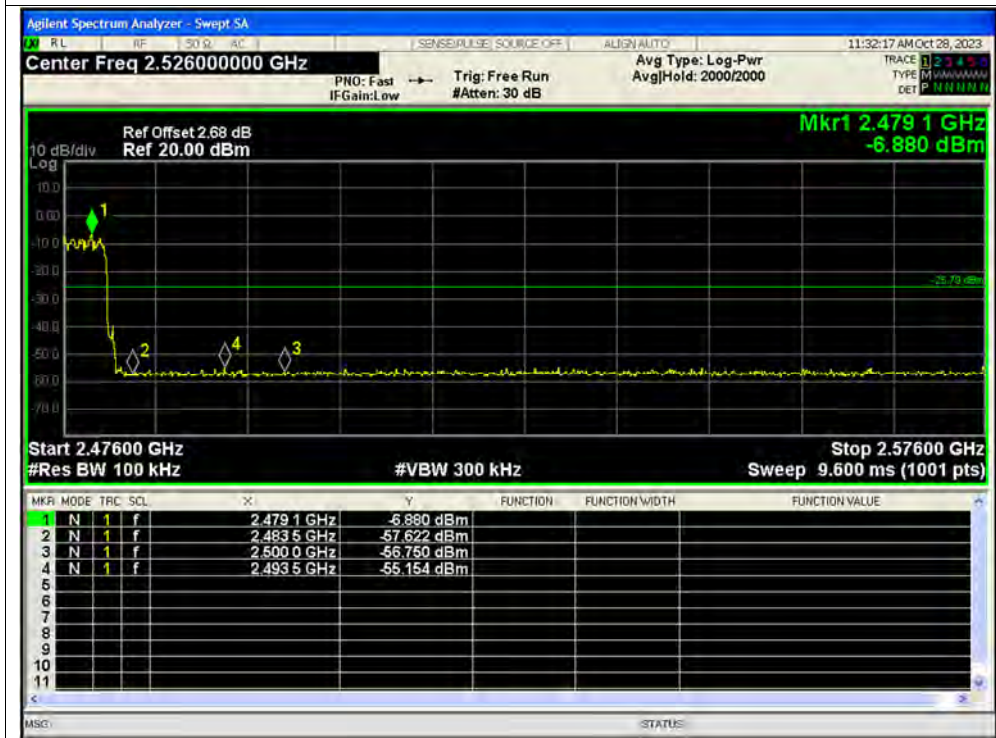




Band Edge(Hopping) NVLT 3-DH5 2480MHz Ant1 Hopping Ref



Band Edge(Hopping) NVLT 3-DH5 2480MHz Ant1 Hopping Emission





A.10. 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 + Adapter + PC + BT TX

Test voltage: AC 120V/60Hz

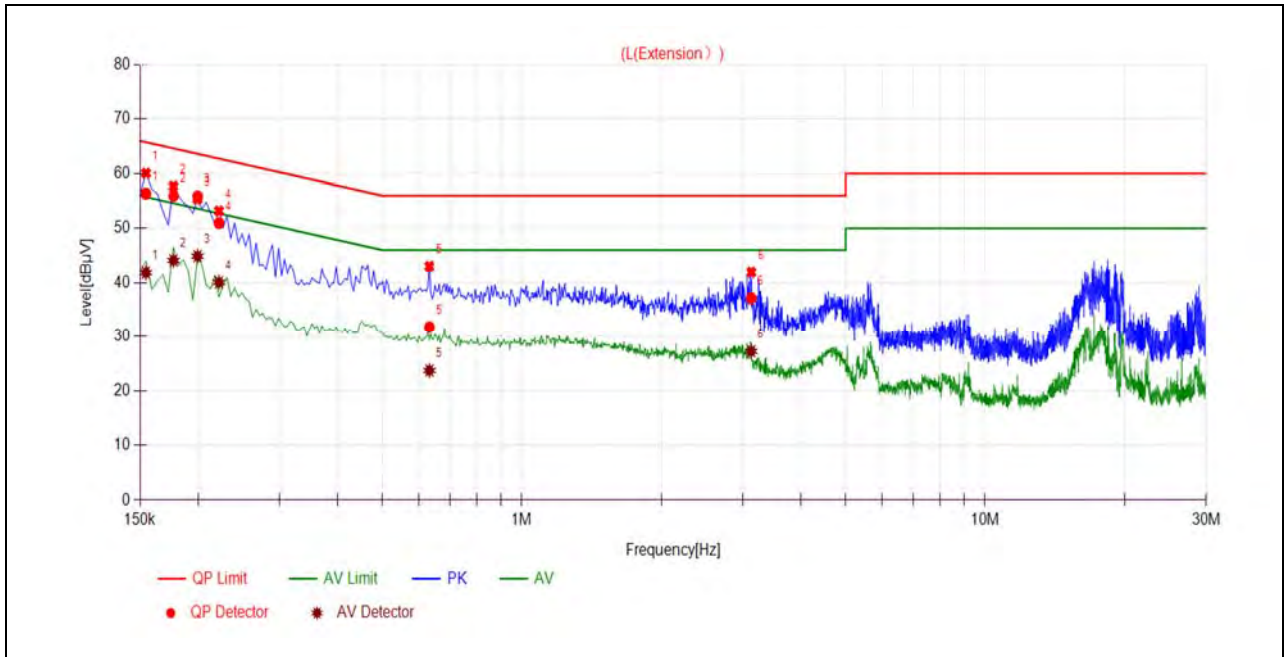
The measurement results are obtained as below:

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

U_R : Receiver Reading

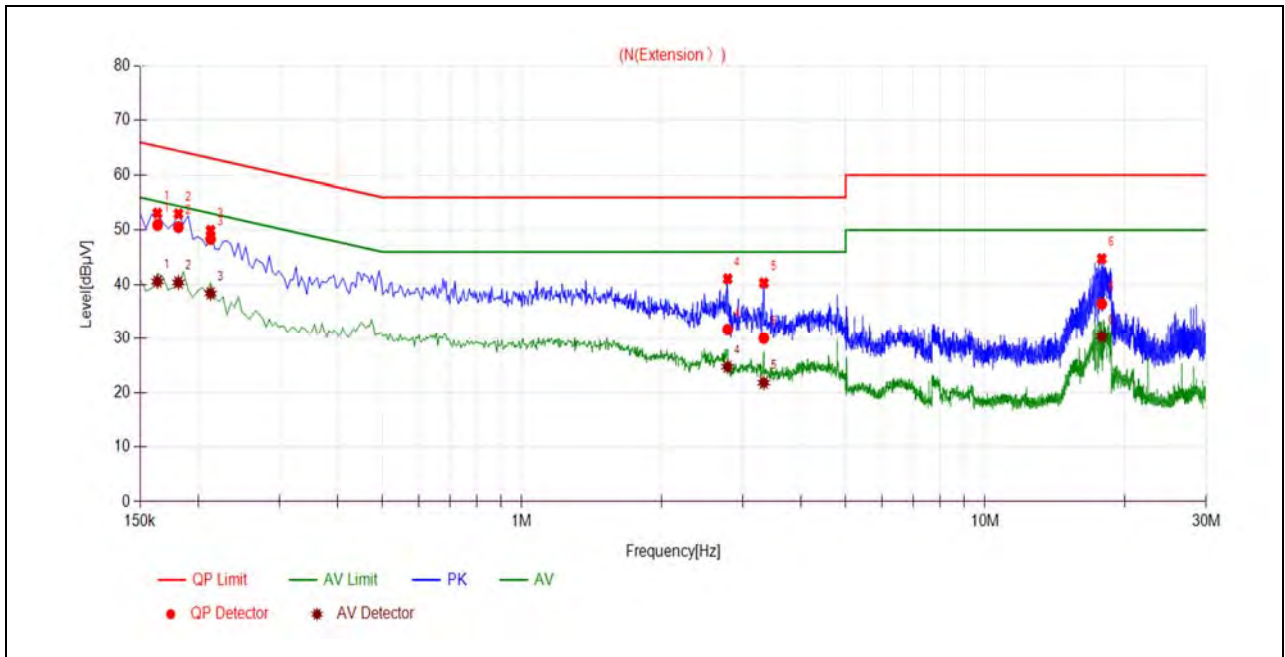
A_{Factor} : Voltage division factor of LISN

B. Test Plot:



(L Phase)

No.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1544	56.39	41.86	65.76	55.76	Line	PASS
2	0.1771	56.00	44.09	64.62	54.62		PASS
3	0.1996	55.87	44.89	63.63	53.63		PASS
4	0.2220	50.98	40.08	62.75	52.75		PASS
5	0.6319	31.77	23.69	56.00	46.00		PASS
6	3.1278	37.18	27.23	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	0.1636	50.96	40.58	65.28	55.28	Neutral	PASS
2	0.1815	50.56	40.40	64.41	54.41		PASS
3	0.2129	48.37	38.38	63.09	53.09		PASS
4	2.7805	31.69	24.74	56.00	46.00		PASS
5	3.3290	30.04	21.80	56.00	46.00		PASS
6	17.8526	36.47	30.35	60.00	50.00		PASS

**A.11. Restricted Frequency Bands**

The lowest and highest channels are tested to verify the Restricted Frequency Bands.

The measurement results are obtained as below:

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

A_T : Total correction Factor except Antenna

U_R : Receiver Reading

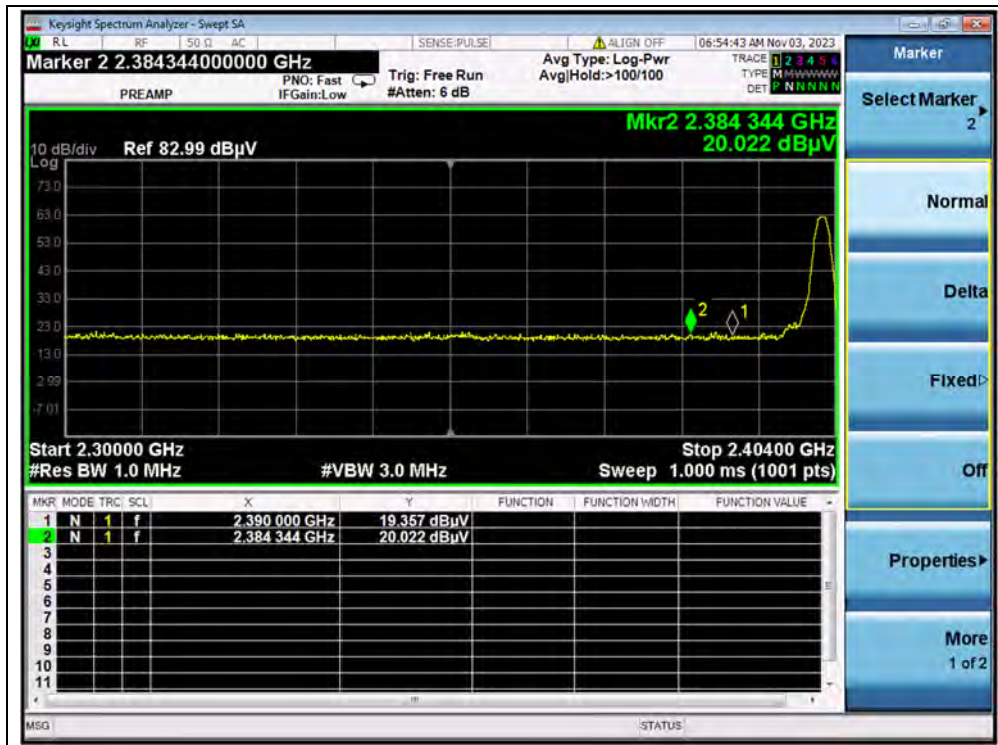
G_{preamp} : Preamplifier Gain

A_{Factor} : Antenna Factor at 3m

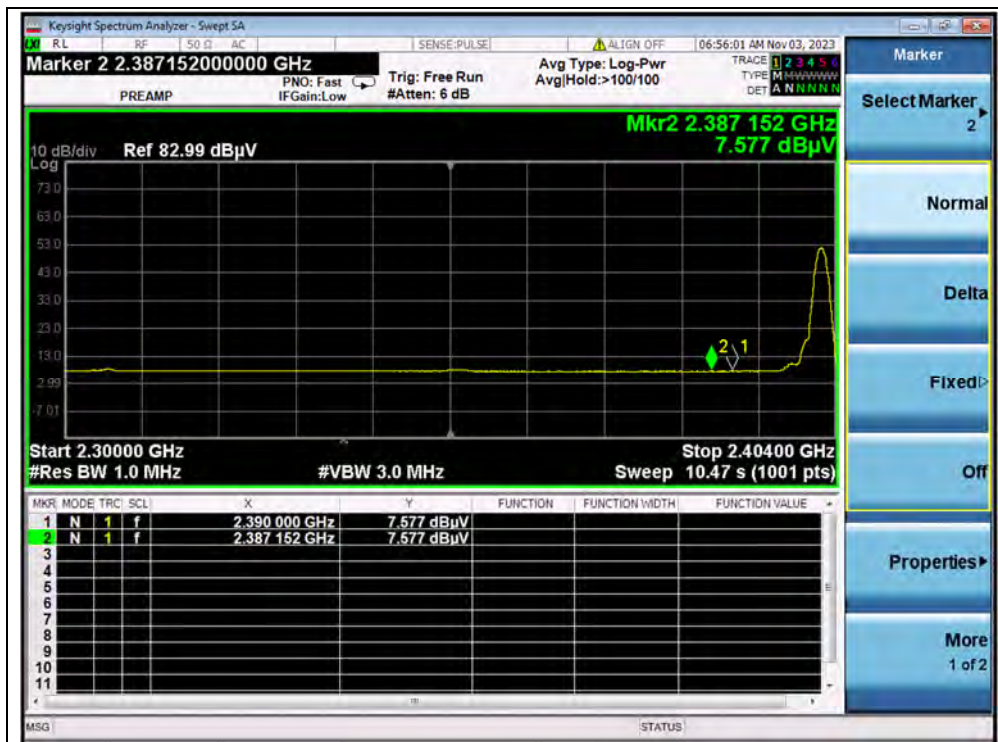
Note: Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.

GFSK Mode

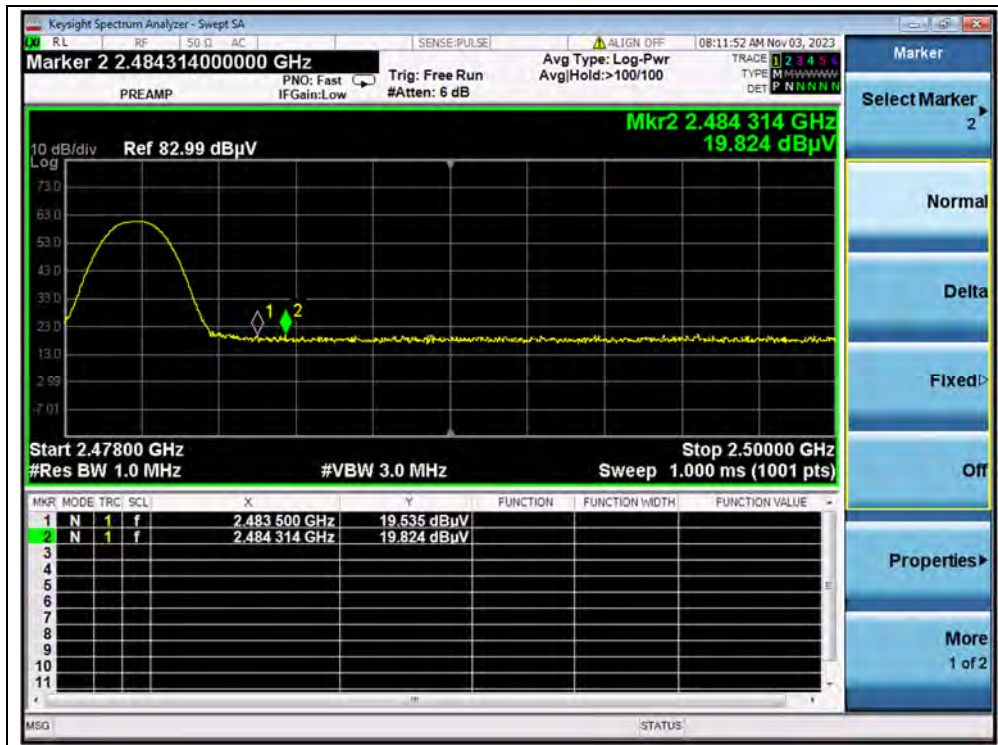
Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dB μ V)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dB μ V/m)	Limit (dB μ V/m)	Verdict
		PK/ AV						
0	2384.34	PK	20.02	6.74	27.20	53.96	74	PASS
0	2390.00	AV	7.58	6.74	27.20	41.52	54	PASS
78	2484.31	PK	19.82	6.74	27.20	53.76	74	PASS
78	2483.76	AV	7.55	6.74	27.20	41.49	54	PASS



(PEAK, Channel 0, GFSK)



(AVERAGE, Channel 0, GFSK)



(PEAK, Channel 78, GFSK)

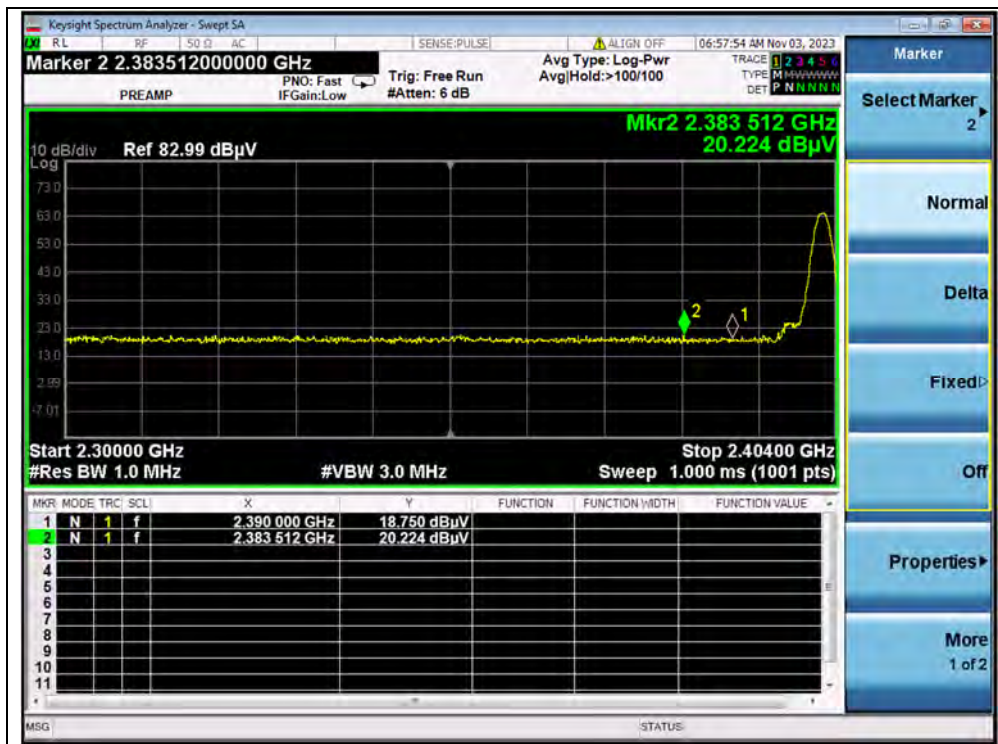


(AVERAGE, Channel 78, GFSK)

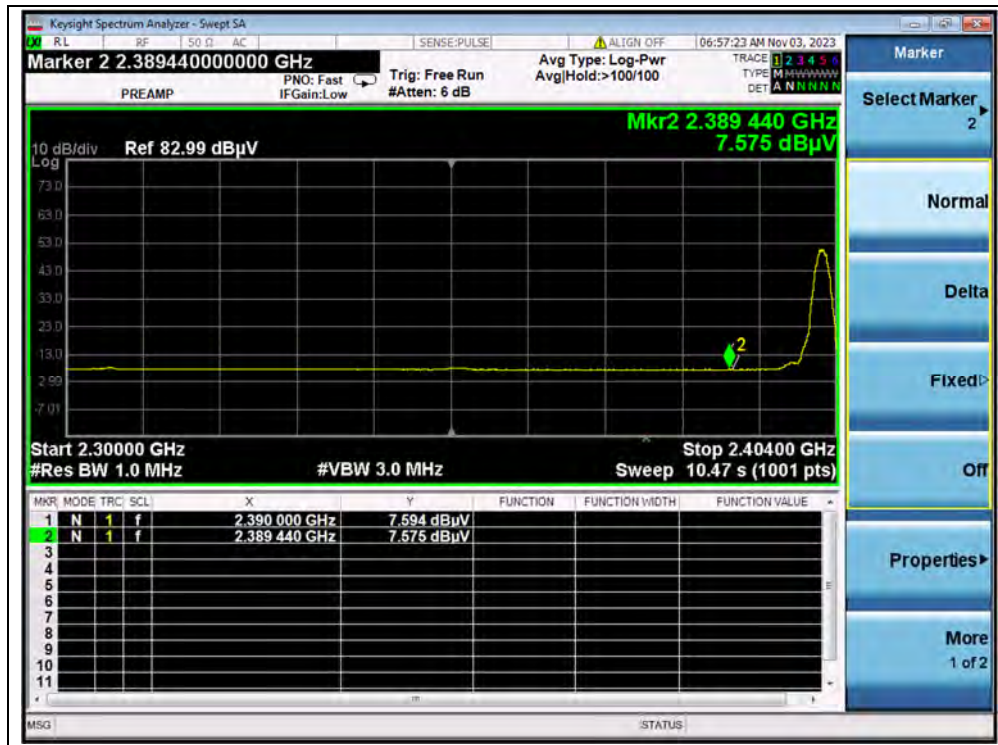


$\pi/4$ -DQPSK Mode

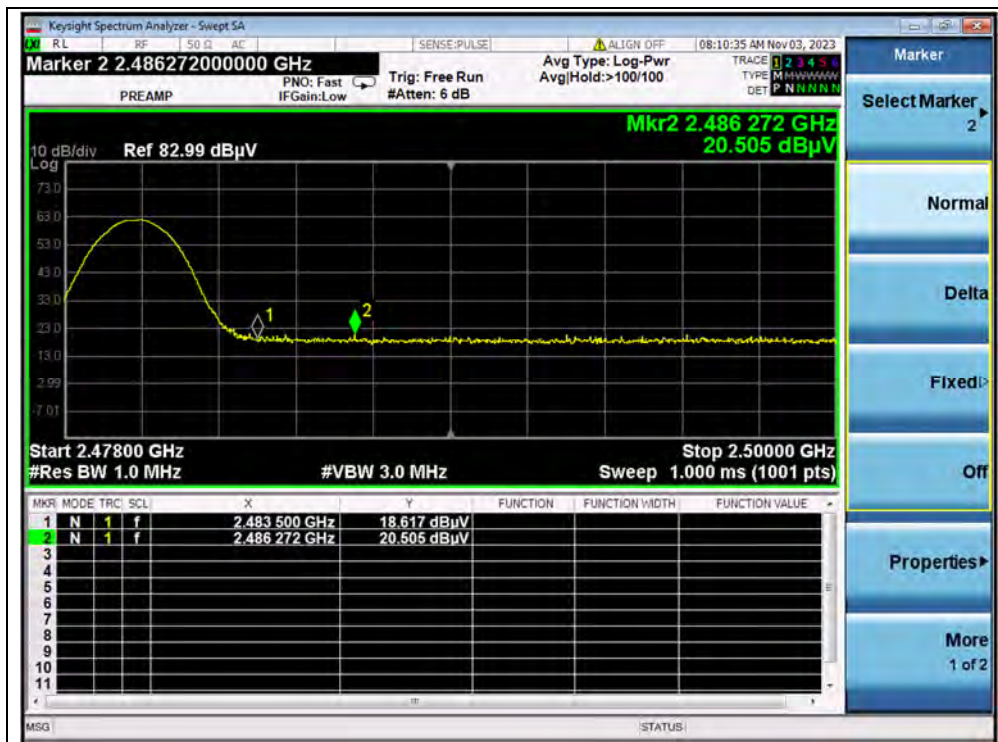
Channel	Frequency (MHz)	Detector	Receiver Reading	A _T (dB)	A _{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV	U _R (dBμV)					
0	2383.51	PK	20.22	6.74	27.20	54.16	74	PASS
0	2390.00	AV	7.59	6.74	27.20	41.53	54	PASS
78	2486.27	PK	20.51	6.74	27.20	54.45	74	PASS
78	2483.50	AV	7.58	6.74	27.20	41.52	54	PASS



(PEAK, Channel 0, $\pi/4$ -DQPSK)



(AVERAGE, Channel 0, $\pi/4$ -DQPSK)



(PEAK, Channel 78, $\pi/4$ -DQPSK)

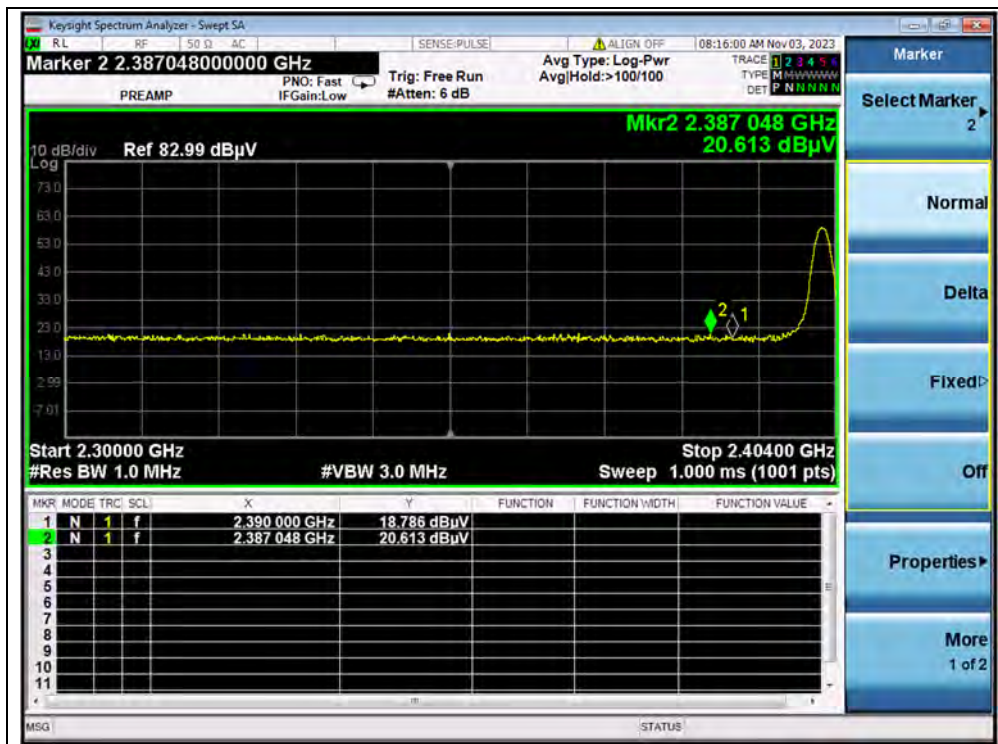


(AVERAGE, Channel 78, $\pi/4$ -DQPSK)

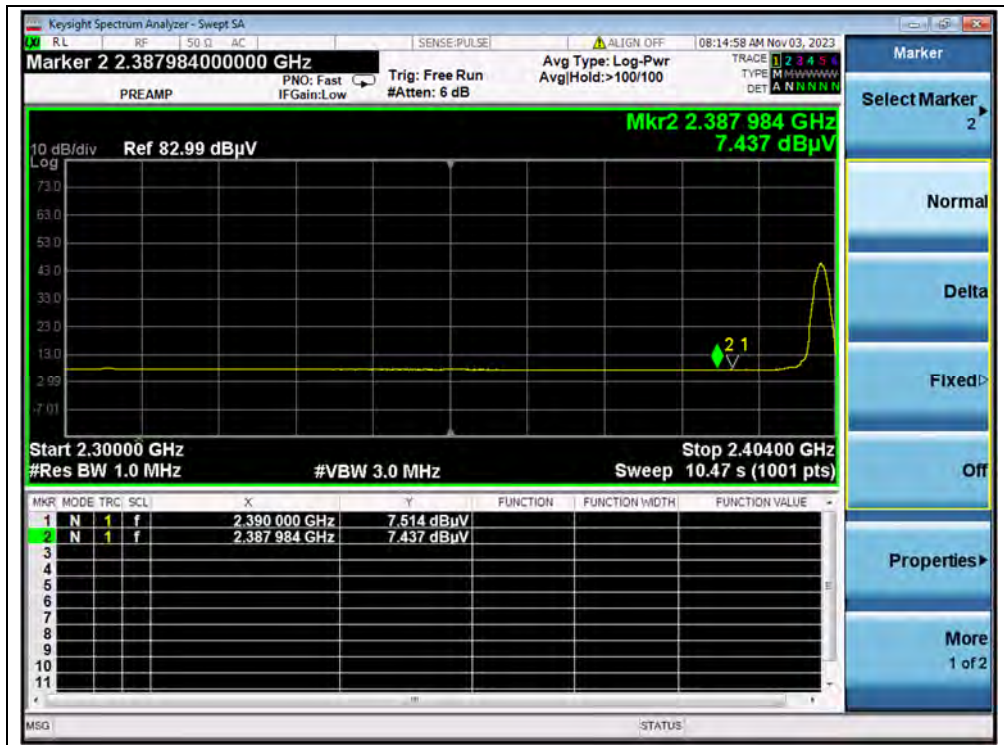


8-DPSK Mode

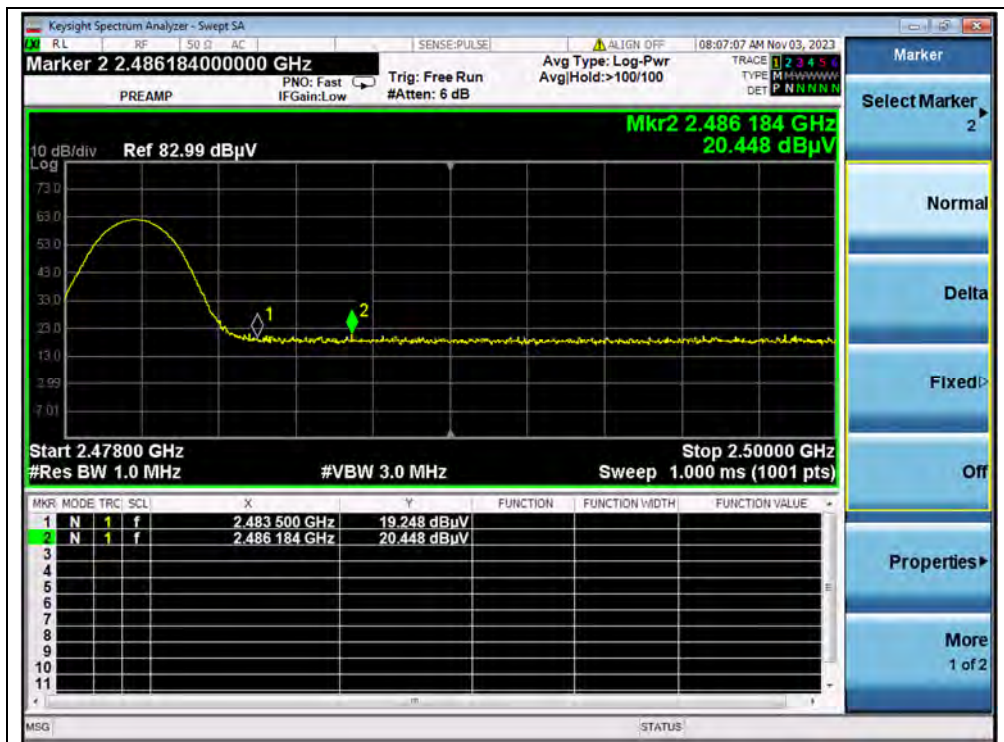
Channel	Frequency (MHz)	Detector	Receiver Reading	A _T (dB)	A _{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV	U _R (dBμV)					
0	2387.05	PK	20.61	6.74	27.20	54.55	74	PASS
0	2390.00	AV	7.51	6.74	27.20	41.45	54	PASS
78	2486.18	PK	20.45	6.74	27.20	54.39	74	PASS
78	2483.50	AV	7.65	6.74	27.20	41.59	54	PASS



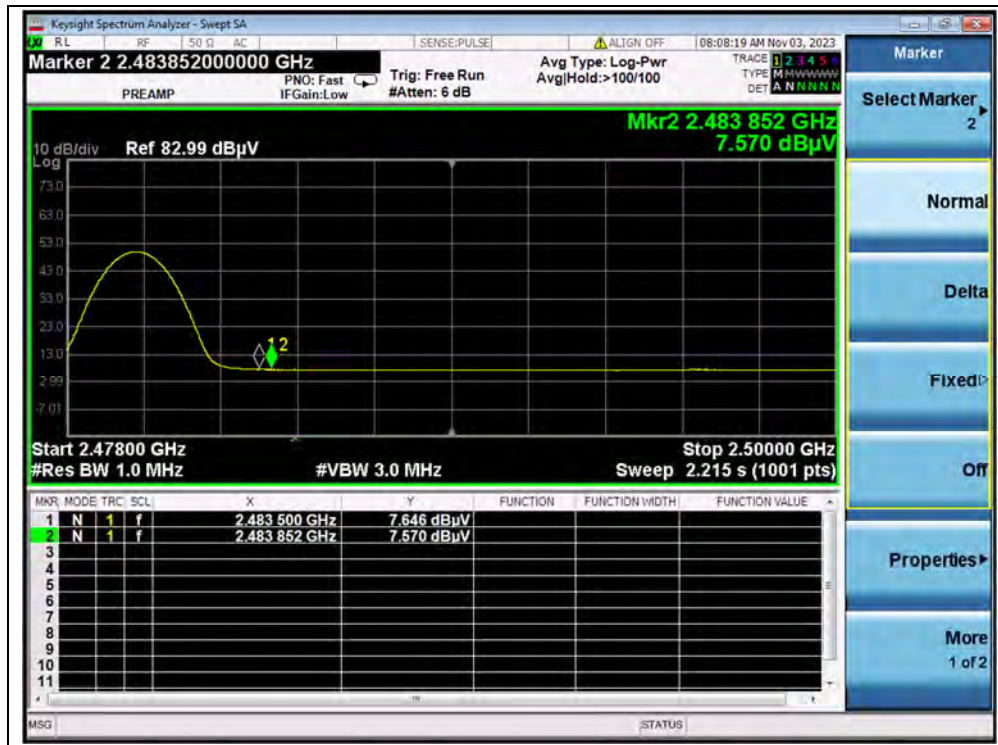
(PEAK, Channel 0, 8-DPSK)



(AVERAGE, Channel 0, 8-DPSK)



(PEAK, Channel 78, 8-DPSK)



(AVERAGE, Channel 78, 8-DPSK)



A.12. 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:

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

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.

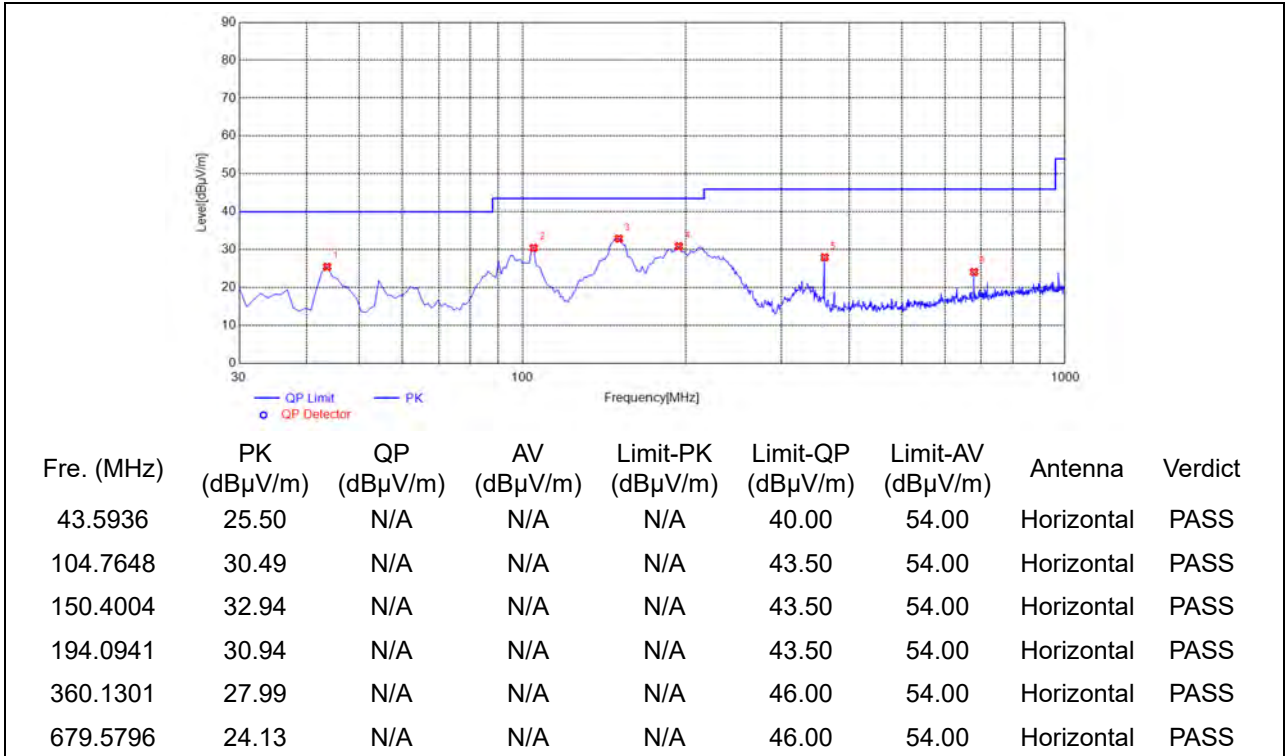
Note2: For the frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

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.

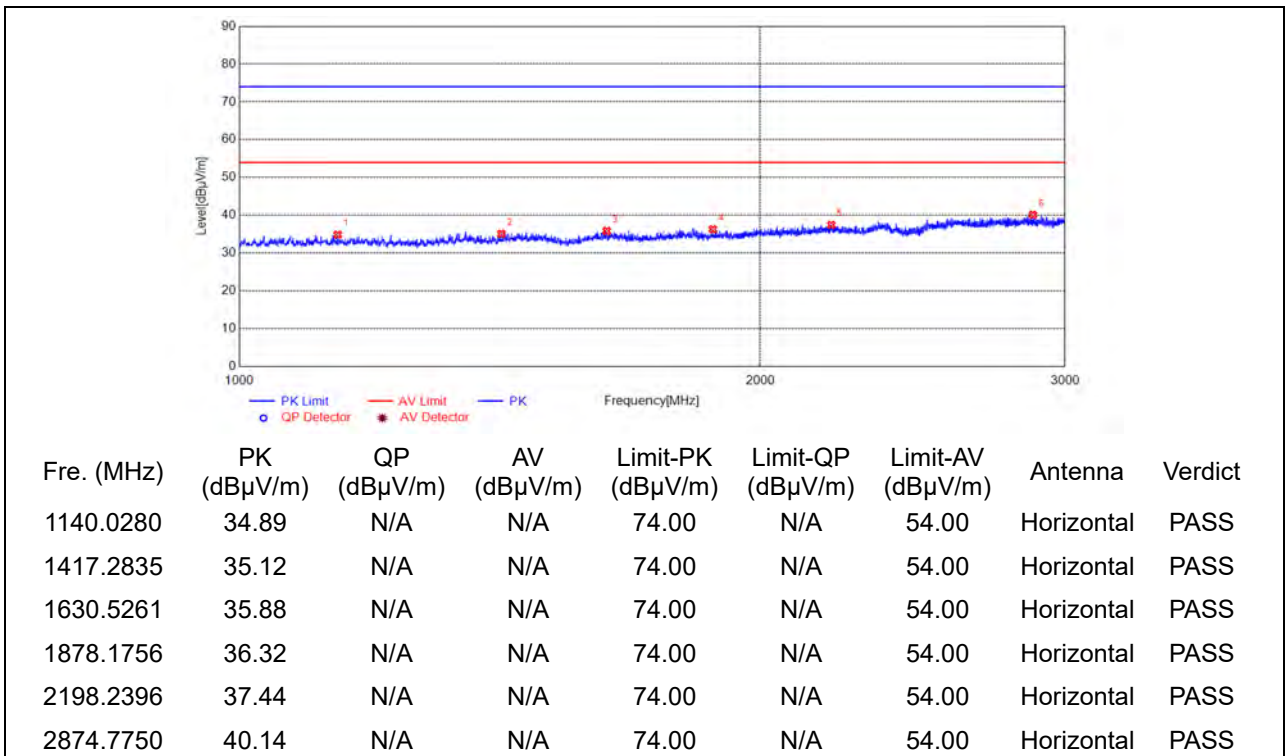


GFSK Mode

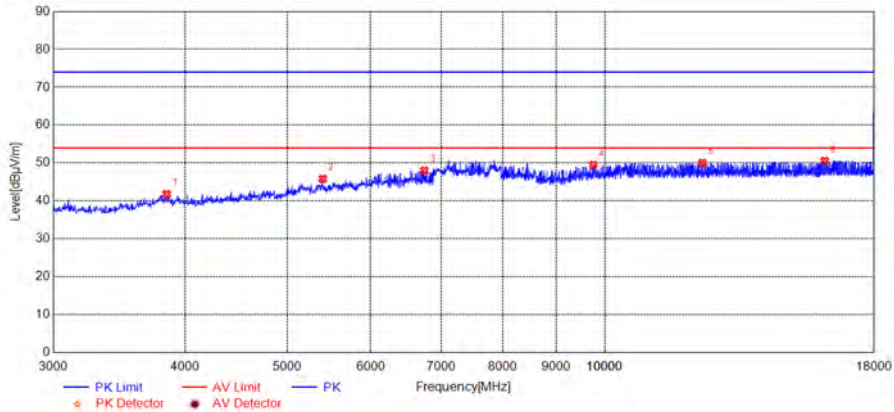
Plots for Channel 0



(Antenna Horizontal, 30MHz to 1GHz)

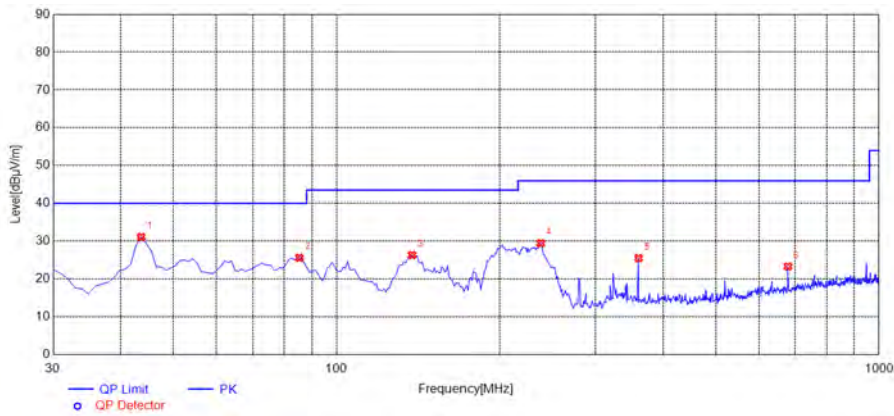


(Antenna Horizontal, 1GHz to 3GHz)



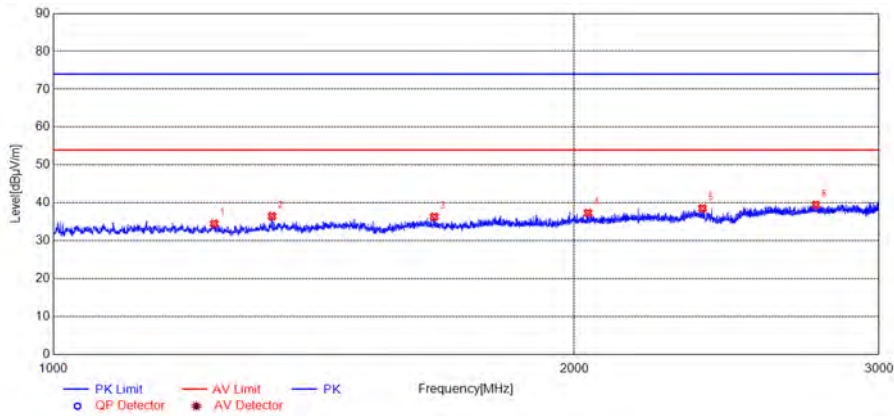
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
3843.1686	41.84	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5403.4807	45.82	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
6744.7490	48.04	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9754.3509	49.52	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12373.8748	50.02	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
16163.6327	50.56	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 3GHz to 18GHz)



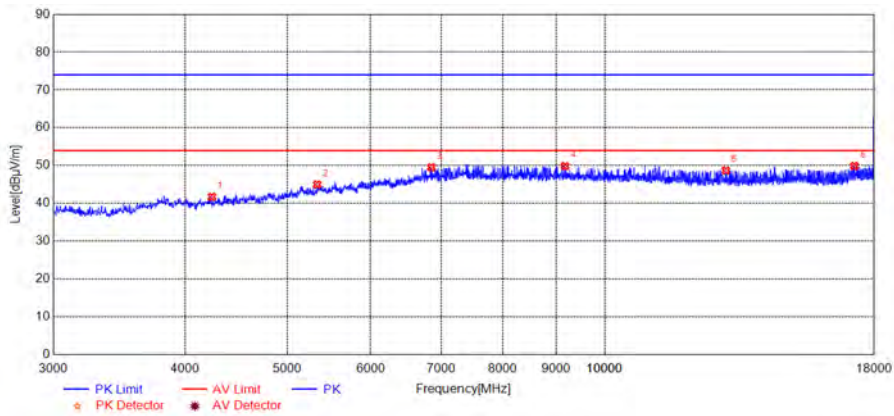
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
43.5936	31.12	N/A	N/A	N/A	40.00	54.00	Vertical	PASS
85.3453	25.62	N/A	N/A	N/A	40.00	54.00	Vertical	PASS
137.7778	26.35	N/A	N/A	N/A	43.50	54.00	Vertical	PASS
237.7878	29.46	N/A	N/A	N/A	46.00	54.00	Vertical	PASS
360.1301	25.54	N/A	N/A	N/A	46.00	54.00	Vertical	PASS
679.5796	23.30	N/A	N/A	N/A	46.00	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 1GHz)



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
1238.8478	34.53	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1338.0676	36.49	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1660.1320	36.37	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2037.0074	37.35	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2371.8744	38.57	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2758.3517	39.51	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 1GHz to 3GHz)

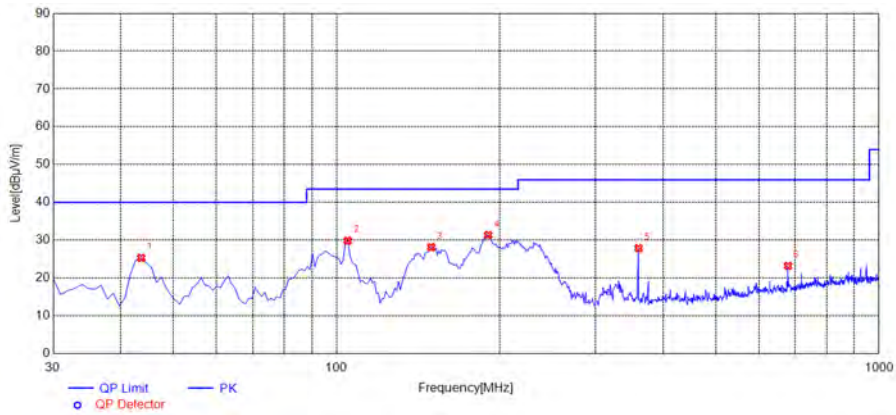


Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
4242.2485	41.74	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5337.4675	45.00	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
6849.7700	49.53	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9172.2344	49.88	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
13025.0050	48.70	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
17246.8494	49.92	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 3GHz to 18GHz)

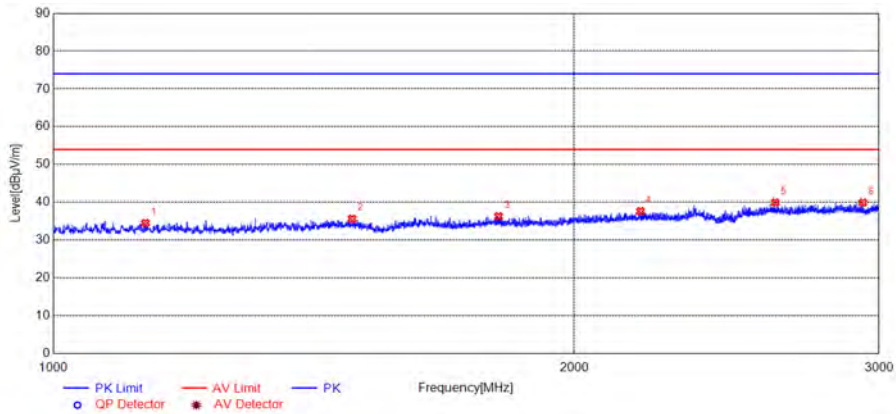


Plot for Channel 39



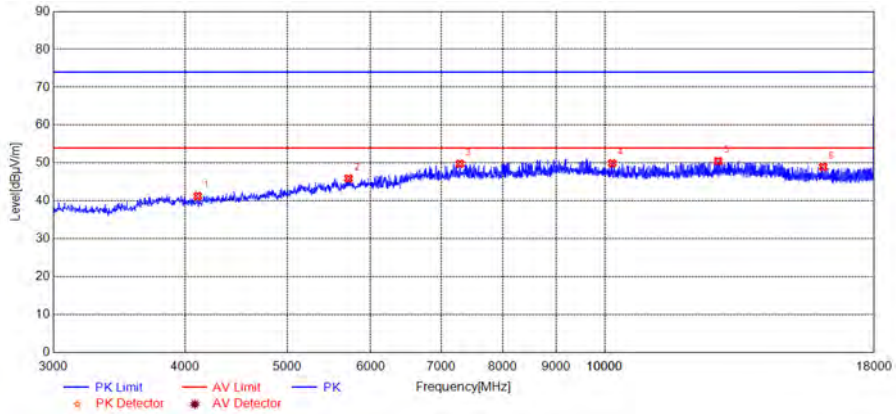
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
43.5936	25.32	N/A	N/A	N/A	40.00	54.00	Horizontal	PASS
104.7648	29.88	N/A	N/A	N/A	43.50	54.00	Horizontal	PASS
149.4294	28.16	N/A	N/A	N/A	43.50	54.00	Horizontal	PASS
190.2102	31.37	N/A	N/A	N/A	43.50	54.00	Horizontal	PASS
360.1301	27.89	N/A	N/A	N/A	46.00	54.00	Horizontal	PASS
679.5796	23.22	N/A	N/A	N/A	46.00	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 1GHz)



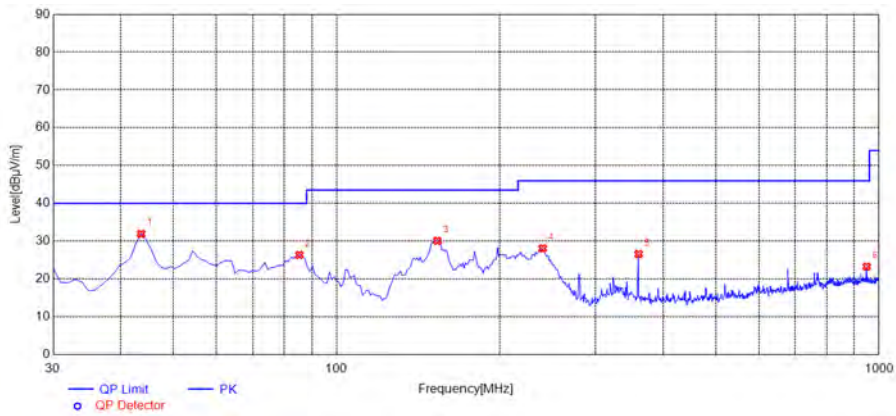
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
1130.8262	34.53	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
1488.4977	35.64	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
1808.5617	36.31	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2184.2368	37.66	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2613.5227	39.96	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2935.9872	39.95	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 1GHz to 3GHz)



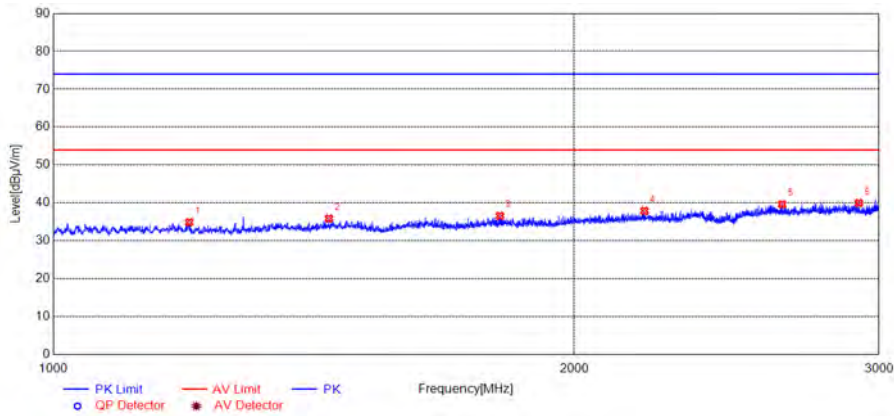
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
4113.2226	41.31	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5715.5431	45.96	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7290.8582	49.80	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10165.4331	49.96	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12811.9624	50.51	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
16109.6219	48.97	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 3GHz to 18GHz)



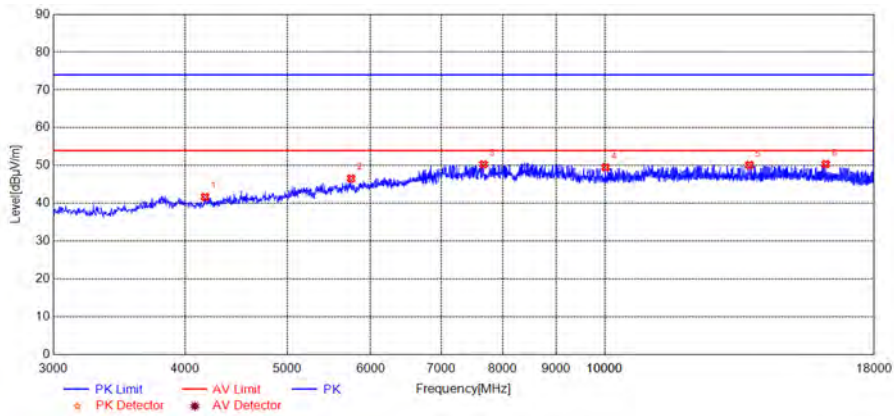
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
43.5936	31.95	N/A	N/A	N/A	40.00	54.00	Vertical	PASS
85.3453	26.37	N/A	N/A	N/A	40.00	54.00	Vertical	PASS
153.3133	30.12	N/A	N/A	N/A	43.50	54.00	Vertical	PASS
239.7297	28.12	N/A	N/A	N/A	46.00	54.00	Vertical	PASS
360.1301	26.59	N/A	N/A	N/A	46.00	54.00	Vertical	PASS
948.5385	23.28	N/A	N/A	N/A	46.00	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 1GHz)



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
1198.4397	34.90	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1443.2887	35.90	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1811.7624	36.61	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2195.8392	37.91	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2637.1274	39.62	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2920.7842	39.99	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

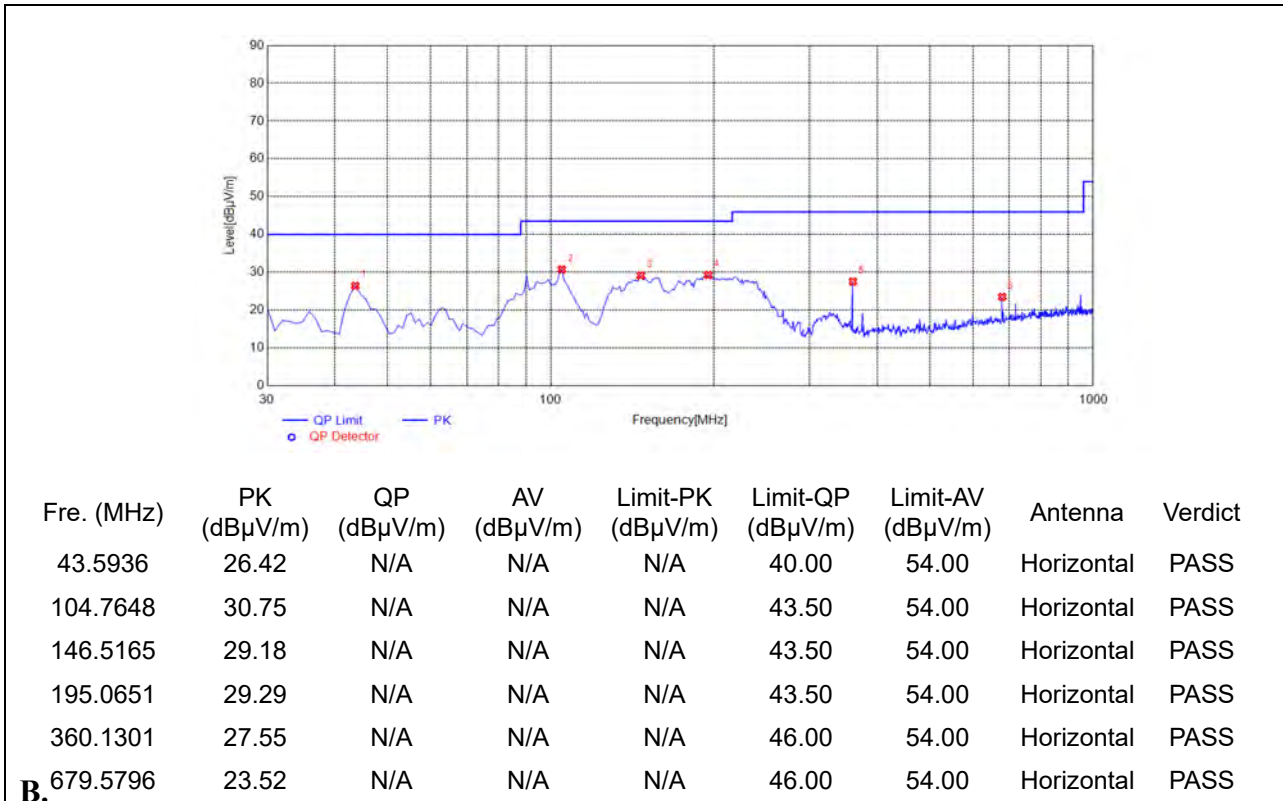
(Antenna Vertical, 1GHz to 3GHz)



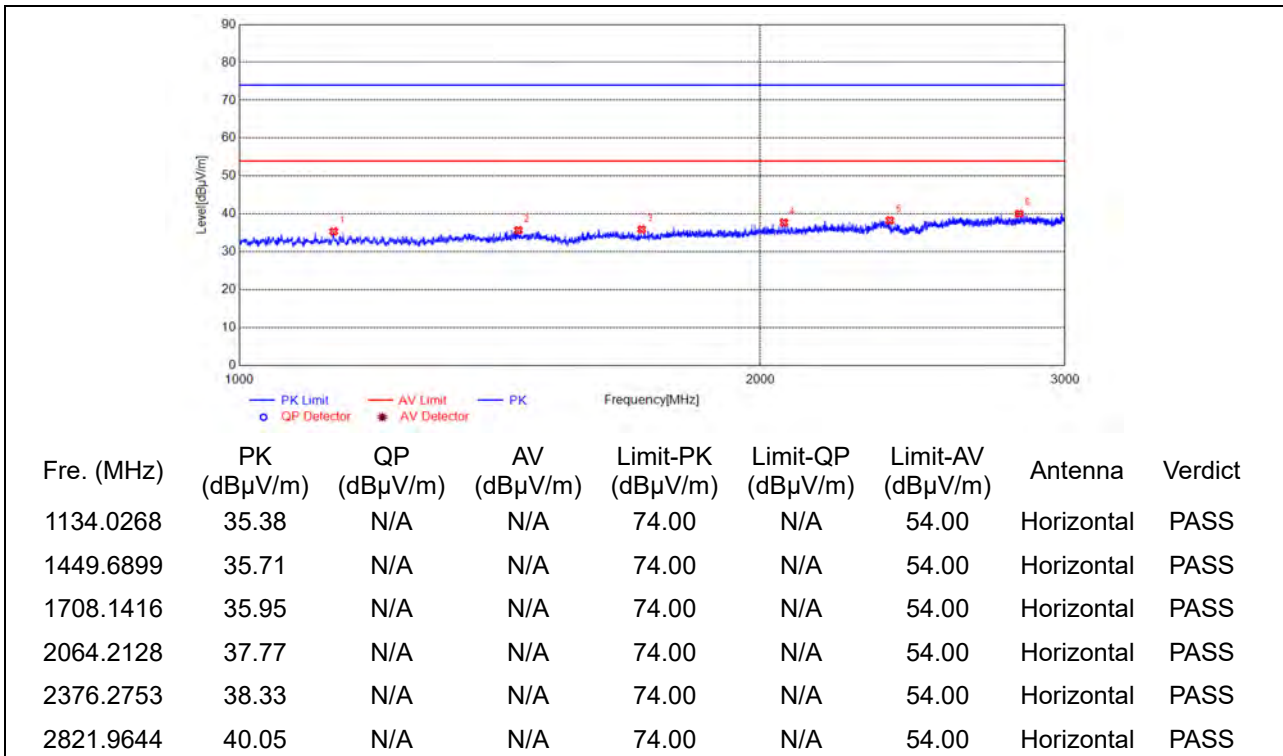
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
4179.2358	41.73	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5748.5497	46.63	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7674.9350	50.32	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10018.4037	49.52	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
13715.1430	50.14	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
16199.6399	50.41	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 3GHz to 18GHz)

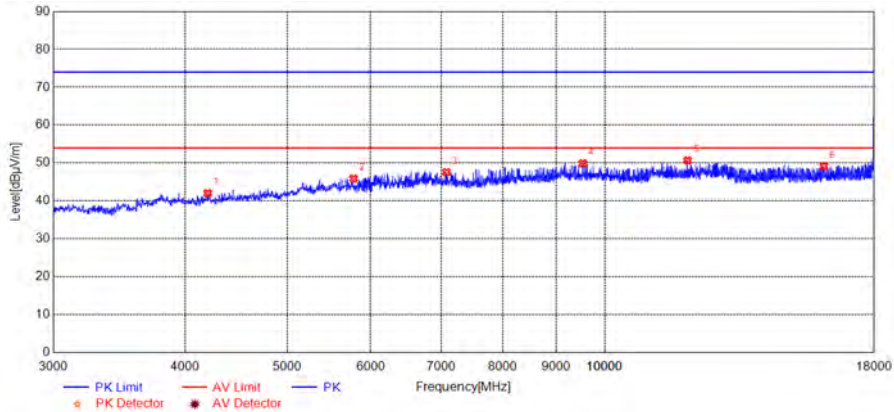
Plot for Channel 78



(Antenna Horizontal, 30MHz to 1GHz)

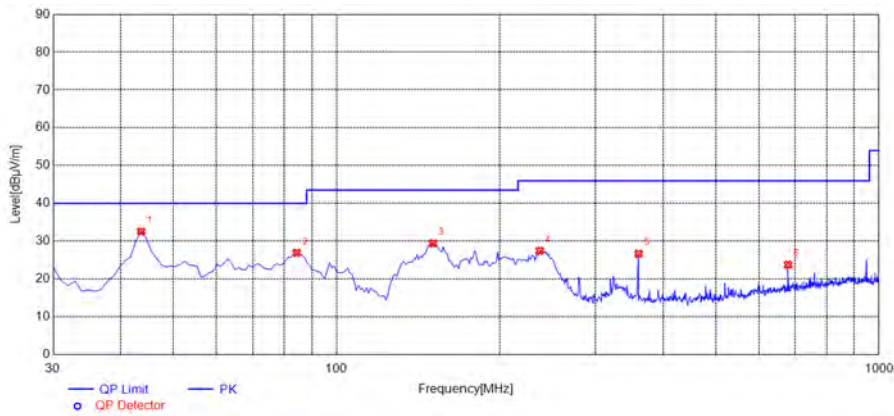


(Antenna Horizontal, 1GHz to 3GHz)



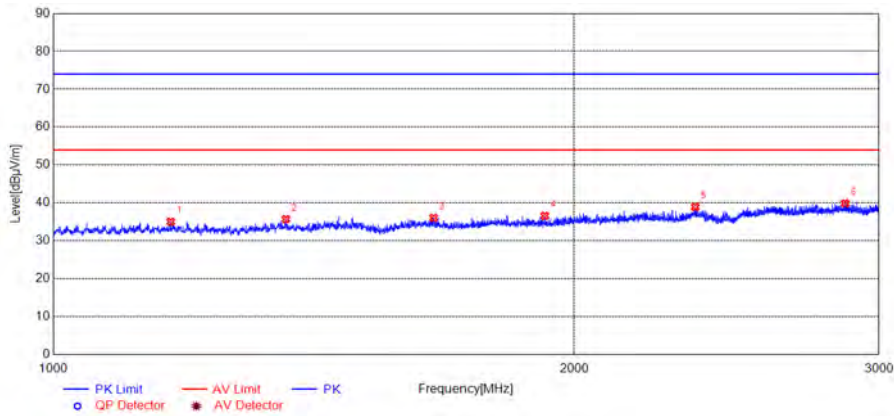
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
4203.2406	42.04	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5778.5557	45.92	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7077.8156	47.59	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9535.3071	49.94	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
11983.7968	50.70	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
16133.6267	49.16	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 3GHz to 18GHz)



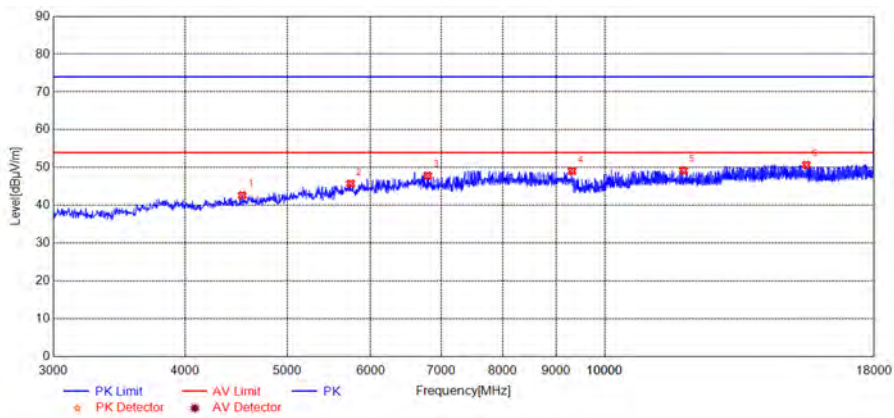
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
43.5936	32.58	N/A	N/A	N/A	40.00	54.00	Vertical	PASS
84.3744	26.94	N/A	N/A	N/A	40.00	54.00	Vertical	PASS
150.4004	29.44	N/A	N/A	N/A	43.50	54.00	Vertical	PASS
236.8168	27.48	N/A	N/A	N/A	46.00	54.00	Vertical	PASS
360.1301	26.68	N/A	N/A	N/A	46.00	54.00	Vertical	PASS
679.5796	23.80	N/A	N/A	N/A	46.00	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 1GHz)



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
1169.2338	35.06	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1362.8726	35.76	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1658.9318	36.07	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1923.3847	36.61	N/A	N/A <td 74.00	N/A	54.00	Vertical	PASS	
2349.4699	38.93	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2867.9736	39.92	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 1GHz to 3GHz)



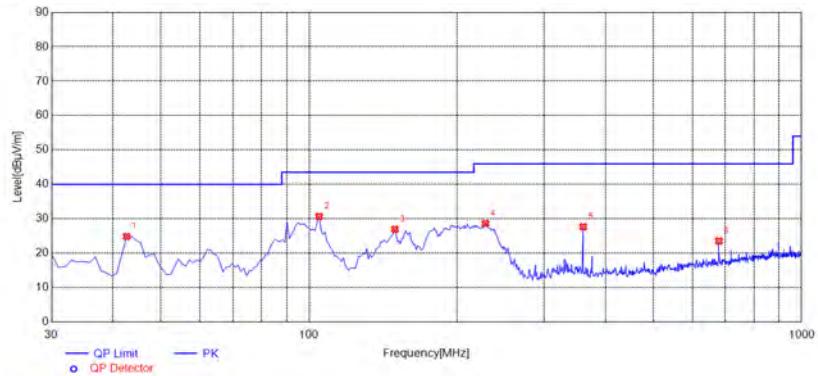
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
4533.3067	42.69	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5742.5485	45.76	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
6795.7592	47.88	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9310.2621	49.06	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11875.7752	49.25	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
15527.5055	50.73	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 3GHz to 18GHz)



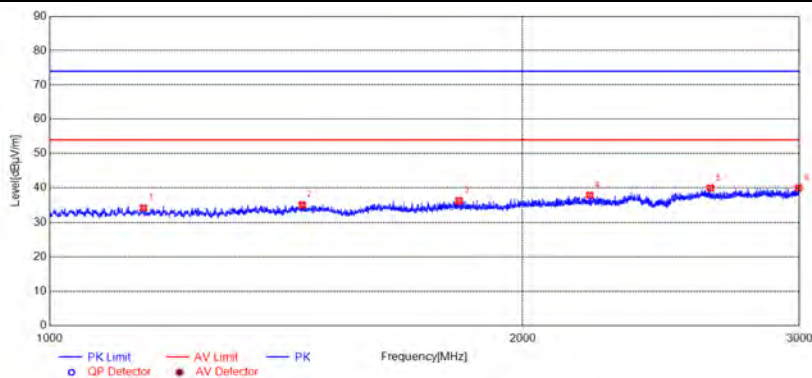
$\pi/4$ -DQPSK Mode

Plots for Channel 0



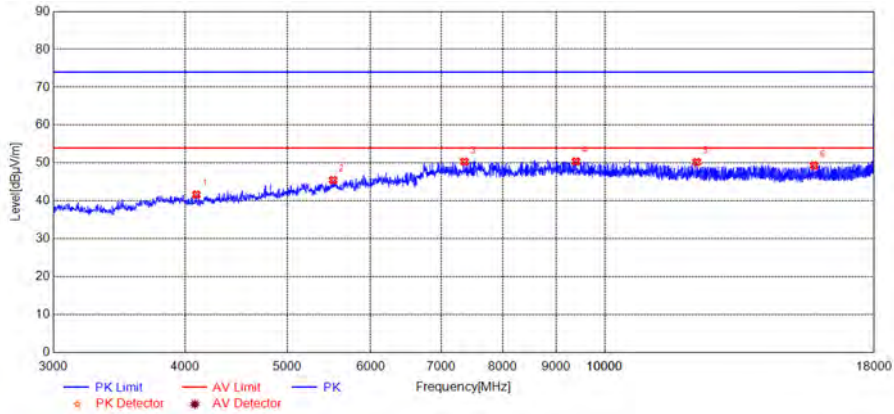
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
42.6226	24.85	N/A	N/A	N/A	40.00	54.00	Horizontal	PASS
104.7648	30.67	N/A	N/A	N/A	43.50	54.00	Horizontal	PASS
149.4294	26.93	N/A	N/A	N/A	43.50	54.00	Horizontal	PASS
228.0781	28.66	N/A	N/A	N/A	46.00	54.00	Horizontal	PASS
360.1301	27.69	N/A	N/A	N/A	46.00	54.00	Horizontal	PASS
679.5796	23.55	N/A	N/A	N/A	46.00	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 1GHz)



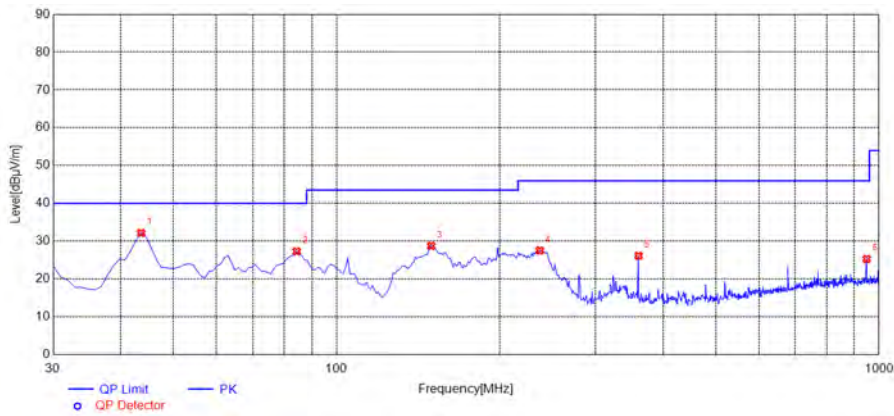
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
1147.6295	34.33	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
1448.0896	35.07	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
1821.7644	36.29	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2206.6413	37.83	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2633.1266	39.96	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2997.1994	39.98	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 1GHz to 3GHz)



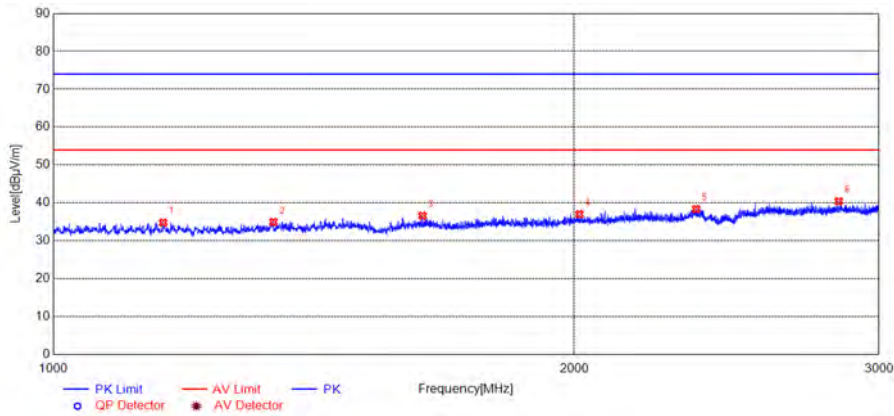
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
4101.2202	41.67	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5526.5053	45.50	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7365.8732	50.36	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9391.2783	50.42	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12223.8448	50.28	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
15794.5589	49.38	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 3GHz to 18GHz)



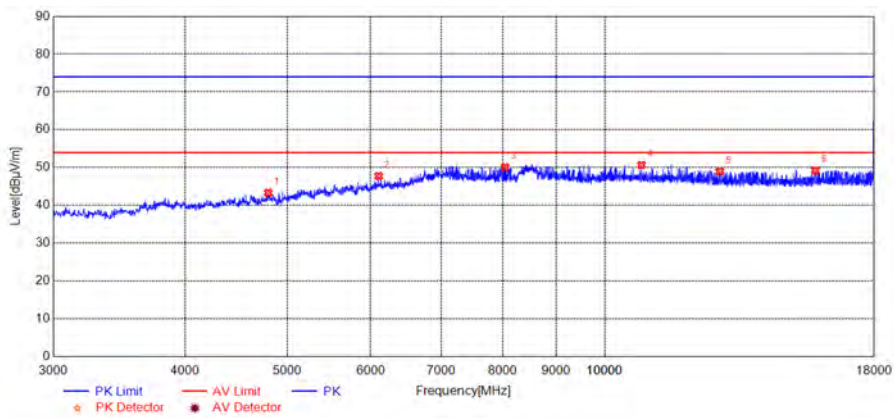
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
43.5936	32.18	N/A	N/A	N/A	40.00	54.00	Vertical	PASS
84.3744	27.31	N/A	N/A	N/A	40.00	54.00	Vertical	PASS
149.4294	28.76	N/A	N/A	N/A	43.50	54.00	Vertical	PASS
236.8168	27.56	N/A	N/A	N/A	46.00	54.00	Vertical	PASS
360.1301	26.15	N/A	N/A	N/A	46.00	54.00	Vertical	PASS
948.5385	25.31	N/A	N/A	N/A	46.00	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 1GHz)



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
1157.6315	34.81	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1340.4681	34.97	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1634.5269	36.64	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2013.8028	37.04	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2351.8704	38.42	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2843.5687	40.43	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

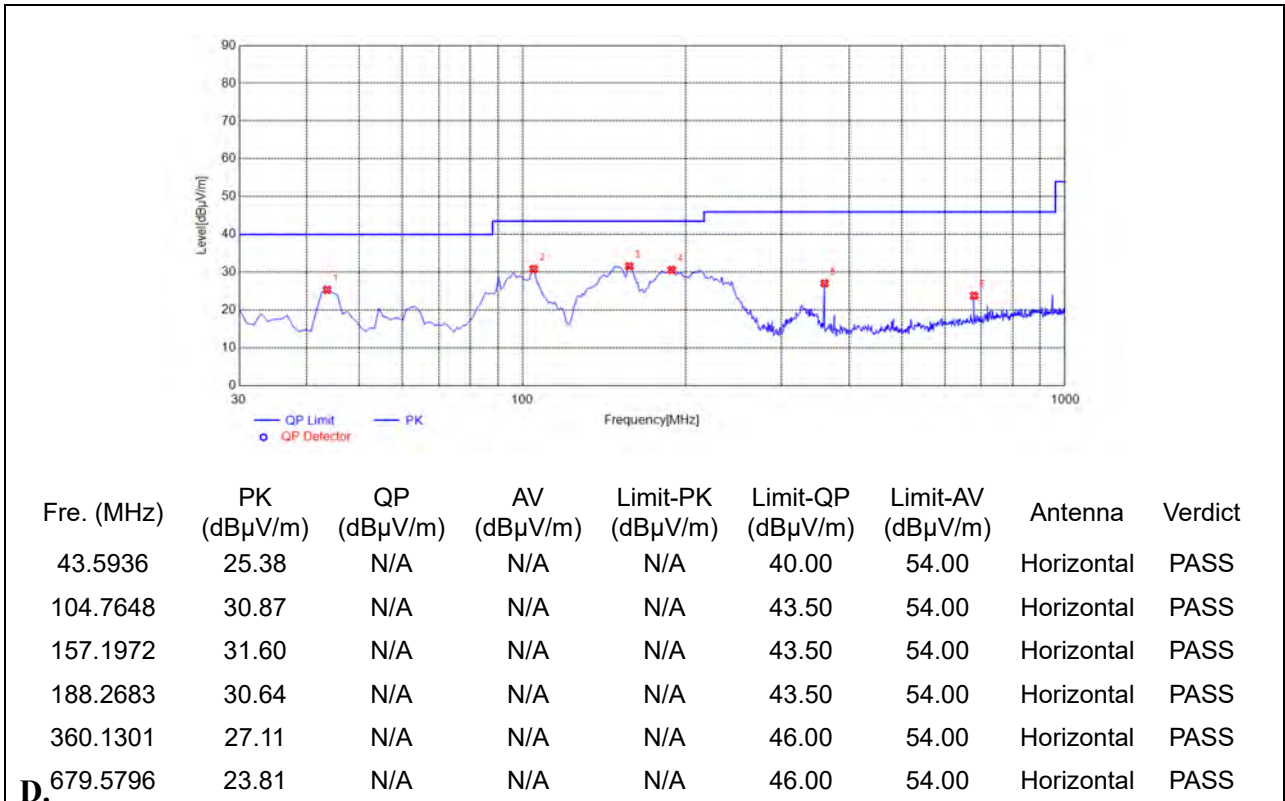
(Antenna Vertical, 1GHz to 3GHz)



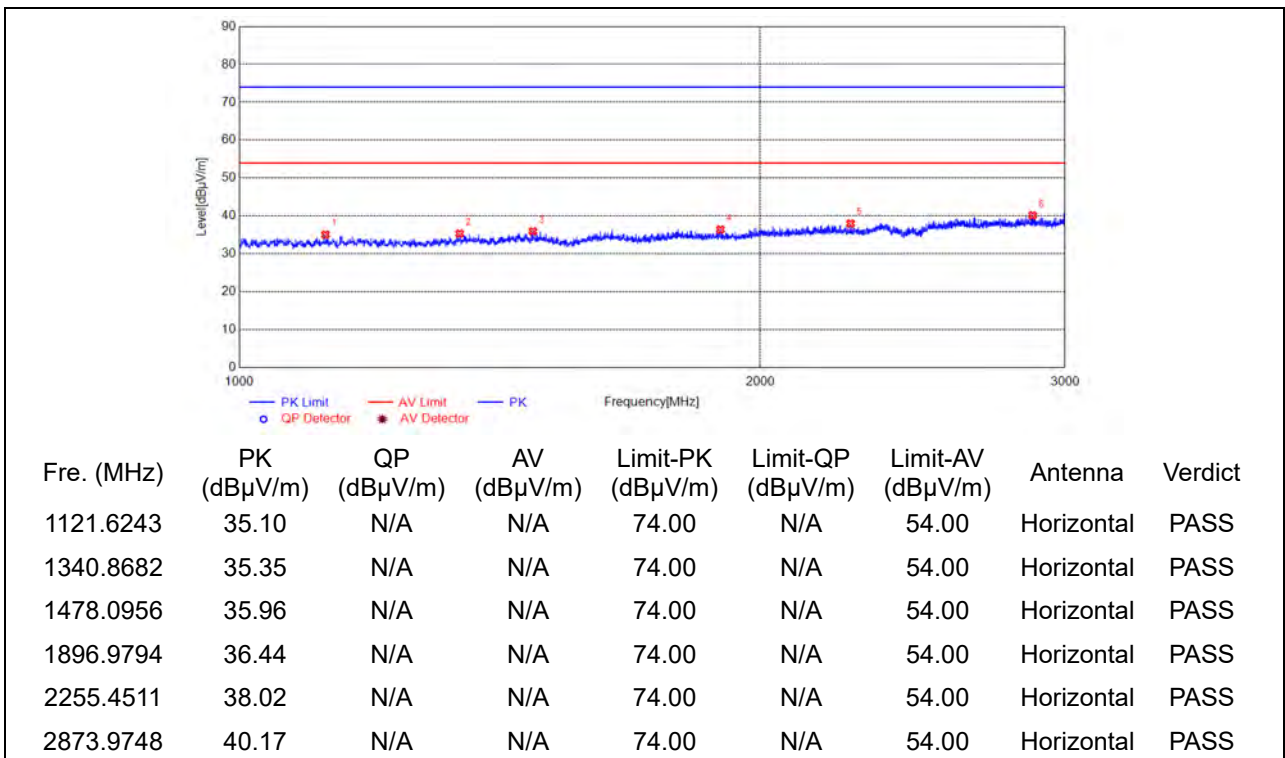
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
4797.3595	43.33	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
6105.6211	47.76	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8047.0094	50.09	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10837.5675	50.67	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12856.9714	48.96	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
15839.5679	49.24	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 3GHz to 18GHz)

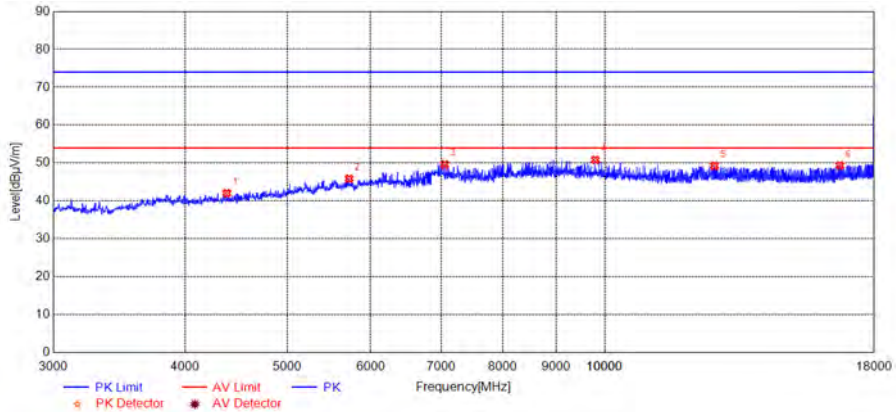
Plot for Channel 39



(Antenna Horizontal, 30MHz to 1GHz)

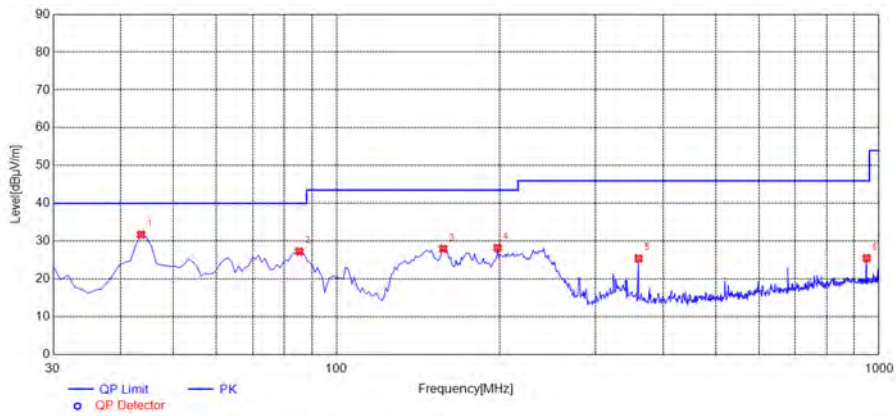


(Antenna Horizontal, 1GHz to 3GHz)



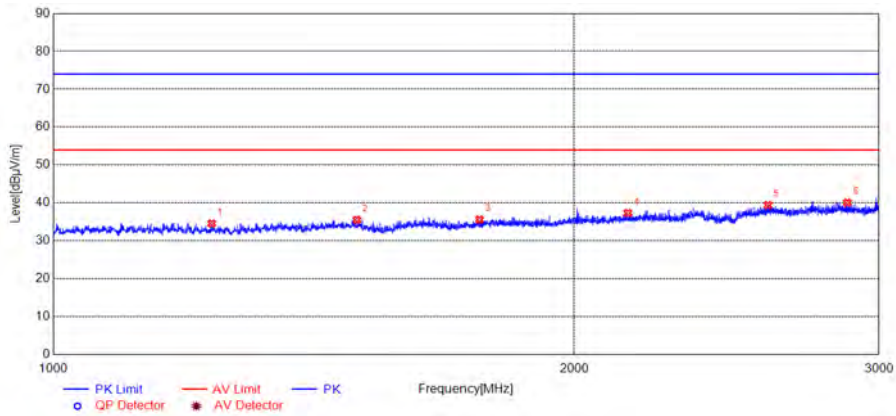
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
4383.2767	42.05	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5724.5449	45.90	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7053.8108	49.63	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9799.3599	50.84	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12706.9414	49.32	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
16706.7413	49.39	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 3GHz to 18GHz)



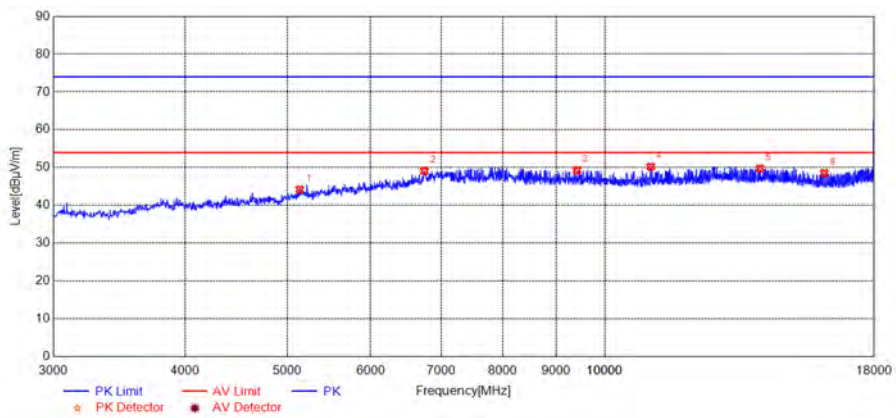
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
43.5936	31.75	N/A	N/A	N/A	40.00	54.00	Vertical	PASS
85.3453	27.26	N/A	N/A	N/A	40.00	54.00	Vertical	PASS
157.1972	27.98	N/A	N/A	N/A	43.50	54.00	Vertical	PASS
197.9780	28.23	N/A	N/A	N/A	43.50	54.00	Vertical	PASS
360.1301	25.44	N/A	N/A	N/A	46.00	54.00	Vertical	PASS
948.5385	25.54	N/A	N/A	N/A	46.00	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 1GHz)



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
1234.8470	34.57	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1498.0996	35.50	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1763.3527	35.63	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2147.8296	37.34	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2587.9176	39.42	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2875.9752	40.08	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

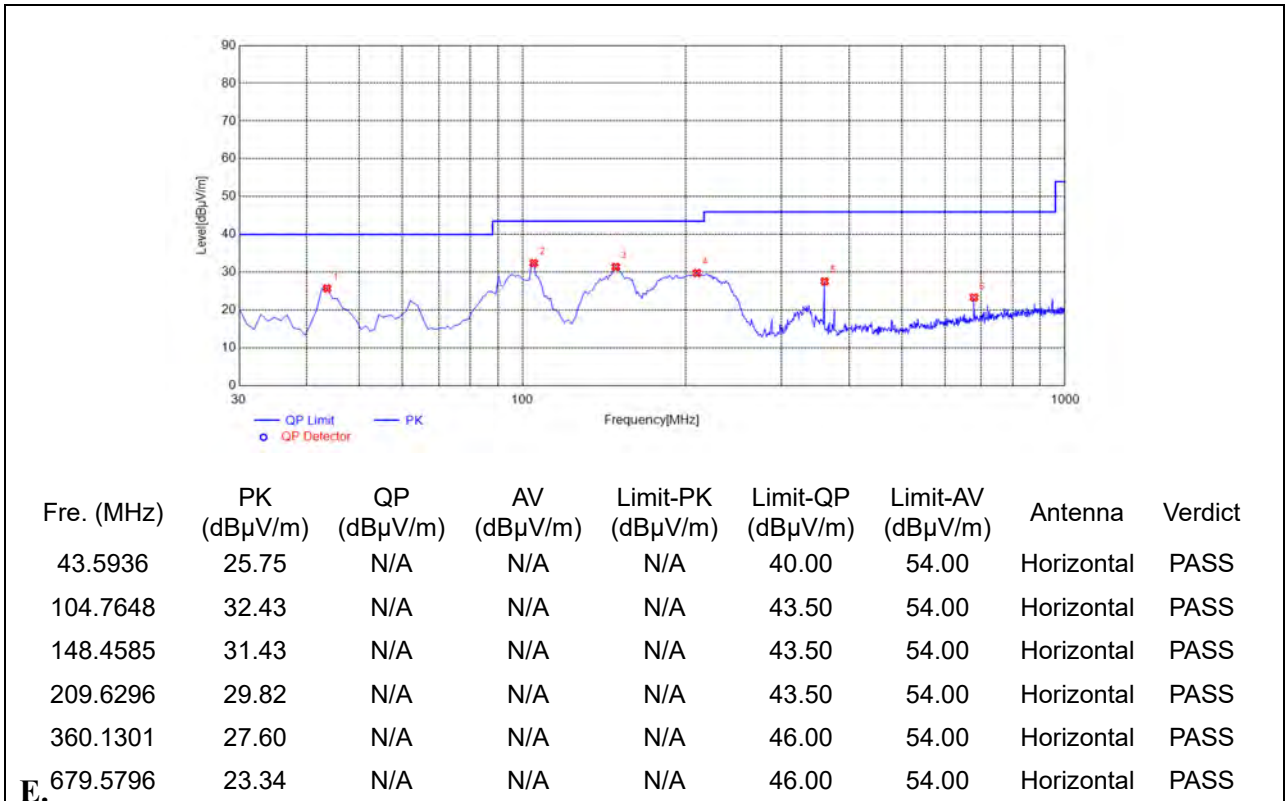
(Antenna Vertical, 1GHz to 3GHz)



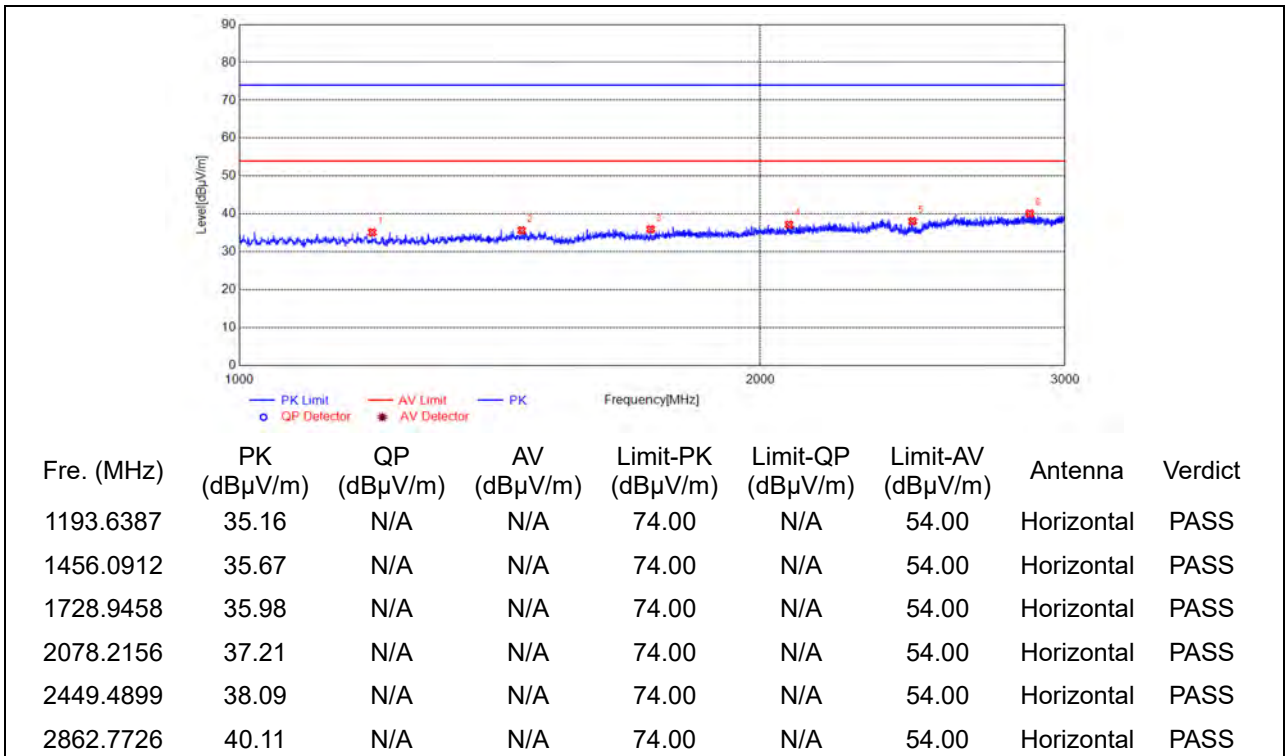
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
5139.4279	44.21	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
6744.7490	49.11	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9412.2825	49.31	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11056.6113	50.24	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
14036.2072	49.77	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
16151.6303	48.57	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 3GHz to 18GHz)

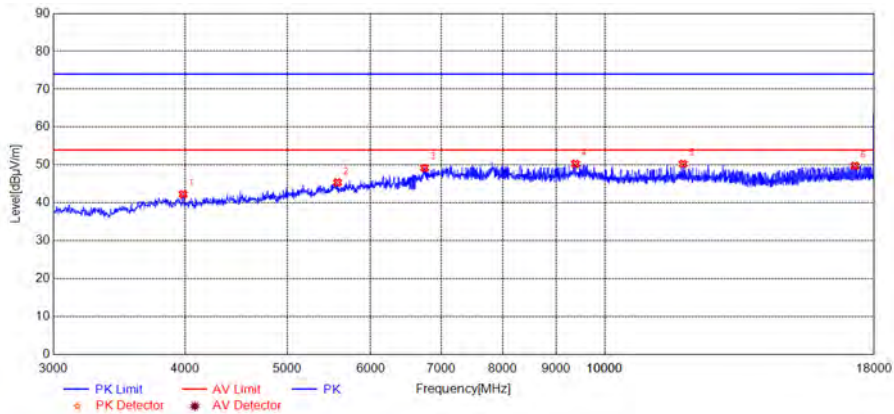
Plot for Channel 78



(Antenna Horizontal, 30MHz to 1GHz)

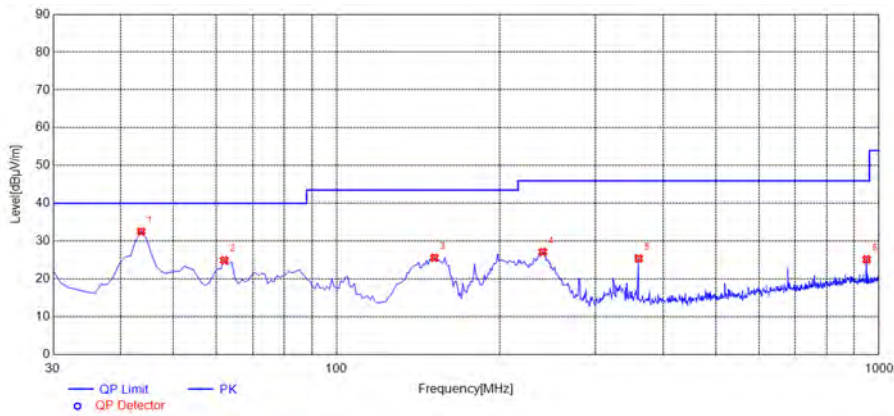


(Antenna Horizontal, 1GHz to 3GHz)



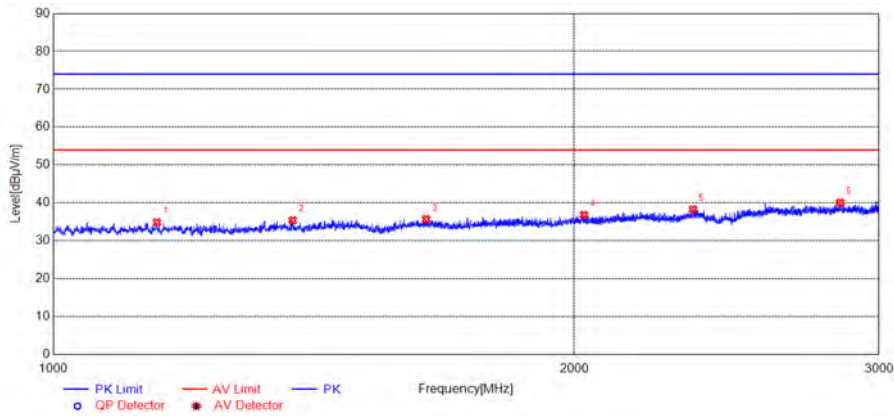
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
3984.1968	42.30	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5580.5161	45.40	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
6747.7496	49.24	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9382.2765	50.32	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
11866.7734	50.31	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
17264.8530	49.78	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 3GHz to 18GHz)



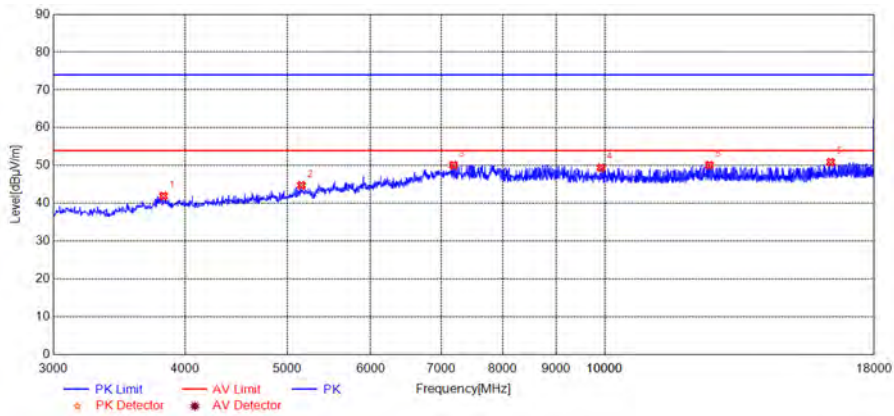
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
43.5936	32.58	N/A	N/A	N/A	40.00	54.00	Vertical	PASS
62.0420	24.99	N/A	N/A	N/A	40.00	54.00	Vertical	PASS
151.3714	25.64	N/A	N/A	N/A	43.50	54.00	Vertical	PASS
239.7297	27.18	N/A	N/A	N/A	46.00	54.00	Vertical	PASS
360.1301	25.44	N/A	N/A	N/A	46.00	54.00	Vertical	PASS
948.5385	25.21	N/A	N/A	N/A	46.00	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 1GHz)



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
1148.0296	34.86	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1375.2751	35.41	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1642.5285	35.73	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2026.2052	36.83	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2342.6685	38.28	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2849.1698	40.11	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 1GHz to 3GHz)



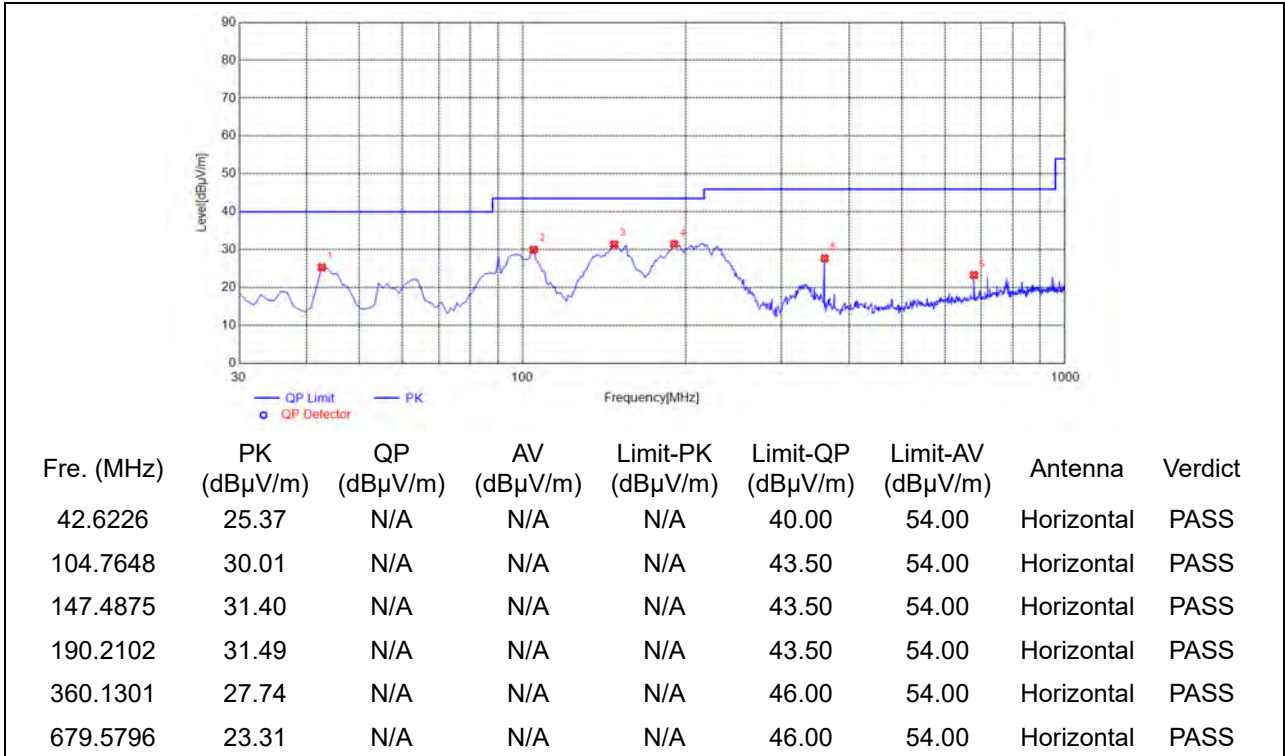
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
3816.1632	41.97	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5157.4315	44.80	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7188.8378	50.12	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9919.3839	49.44	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12565.9132	50.14	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
16370.6741	50.92	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 3GHz to 18GHz)

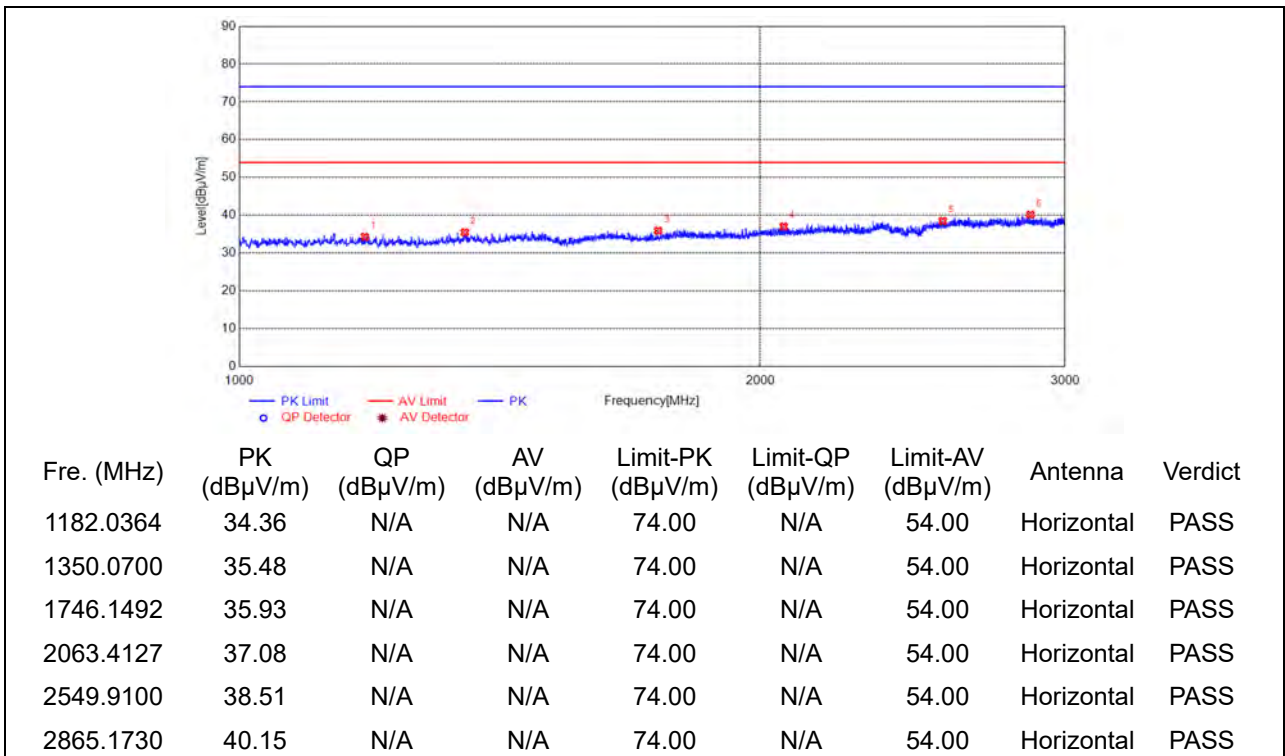


8-DPSK Mode

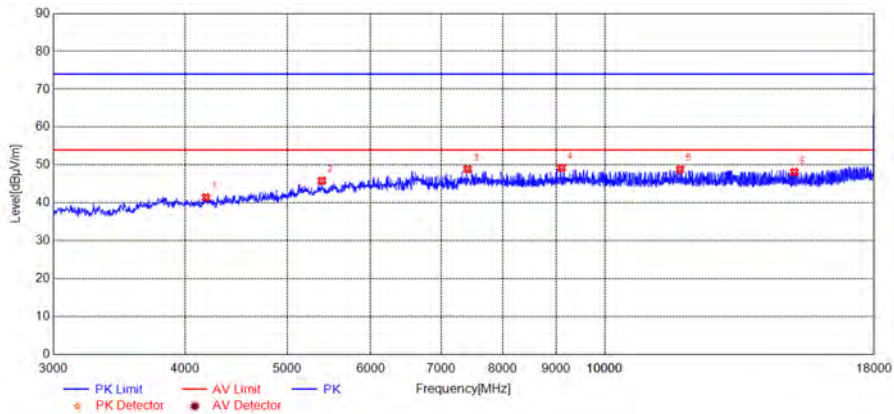
Plots for Channel 0



(Antenna Horizontal, 30MHz to 1GHz)

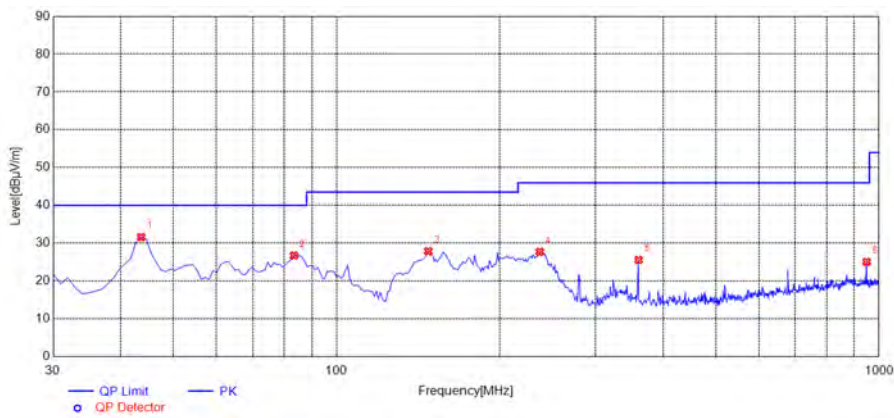


(Antenna Horizontal, 1GHz to 3GHz)



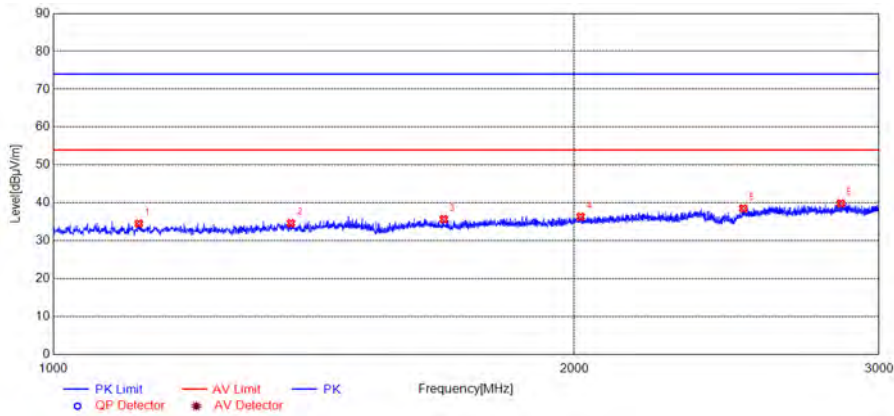
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
4188.2376	41.48	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5394.4789	45.84	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7410.8822	48.90	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9100.2200	49.28	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
11788.7578	48.84	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
15125.4251	48.15	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 3GHz to 18GHz)



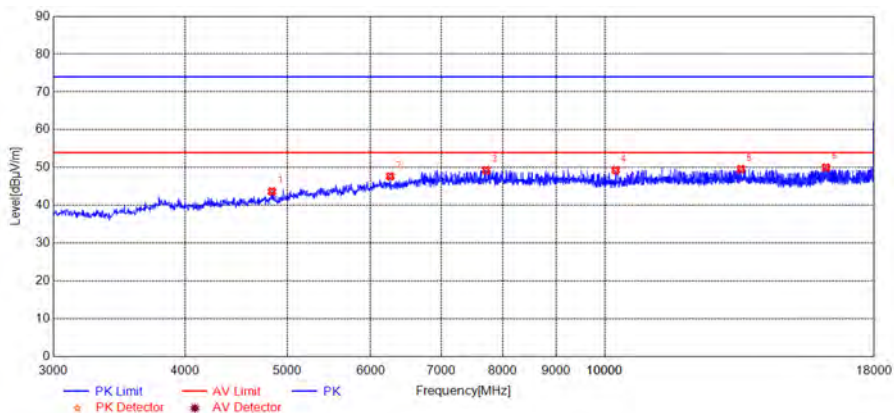
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
43.5936	31.61	N/A	N/A	N/A	40.00	54.00	Vertical	PASS
83.4034	26.73	N/A	N/A	N/A	40.00	54.00	Vertical	PASS
147.4875	27.88	N/A	N/A	N/A	43.50	54.00	Vertical	PASS
236.8168	27.74	N/A	N/A	N/A	46.00	54.00	Vertical	PASS
360.1301	25.60	N/A	N/A	N/A	46.00	54.00	Vertical	PASS
948.5385	25.08	N/A	N/A	N/A	46.00	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 1GHz)



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
1120.8242	34.56	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1372.0744	34.67	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1681.3363	35.76	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2017.4035	36.39	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2504.3009	38.56	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2851.1702	39.90	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 1GHz to 3GHz)

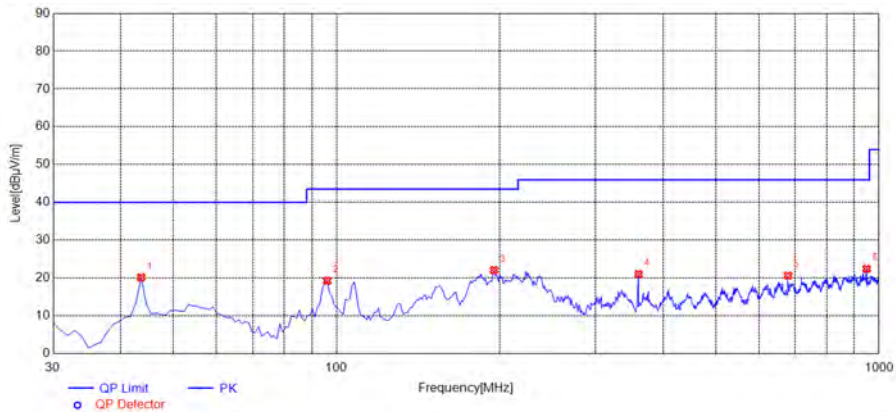


Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
4836.3673	43.69	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
6261.6523	47.69	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7719.9440	49.35	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10243.4487	49.34	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
13460.0920	49.61	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
16205.6411	50.04	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 3GHz to 18GHz)

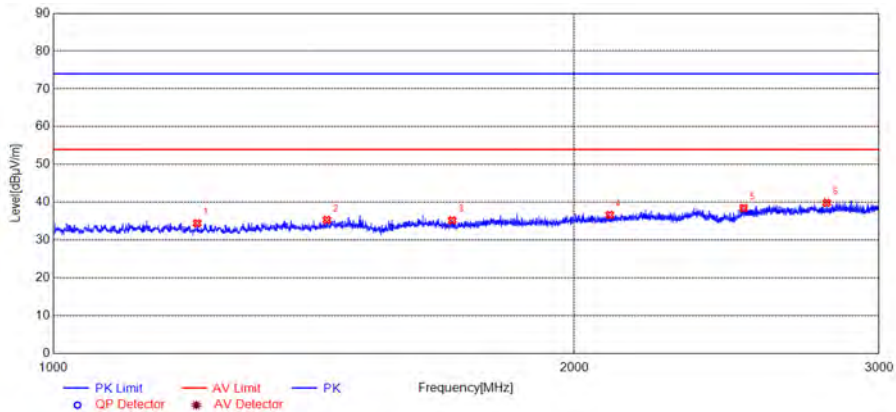


Plot for Channel 39



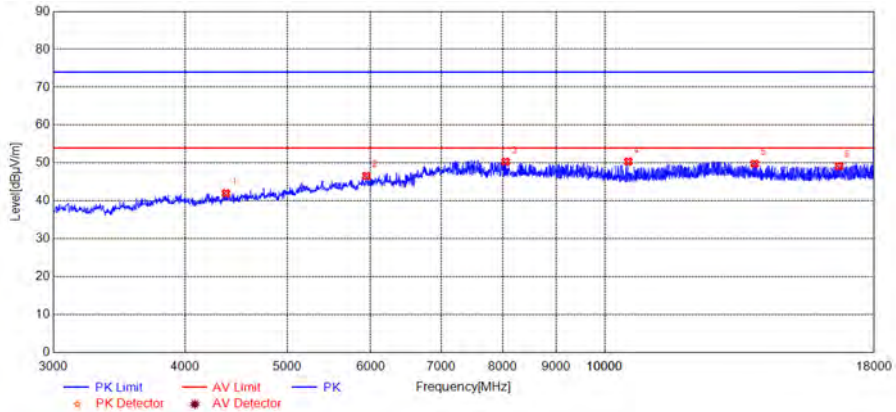
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
43.5936	20.18	N/A	N/A	N/A	40.00	54.00	Horizontal	PASS
96.0260	19.28	N/A	N/A	N/A	43.50	54.00	Horizontal	PASS
195.0651	22.11	N/A	N/A	N/A	43.50	54.00	Horizontal	PASS
360.1301	21.04	N/A	N/A	N/A	46.00	54.00	Horizontal	PASS
679.5796	20.66	N/A	N/A	N/A	46.00	54.00	Horizontal	PASS
948.5385	22.42	N/A	N/A	N/A	46.00	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 1GHz)



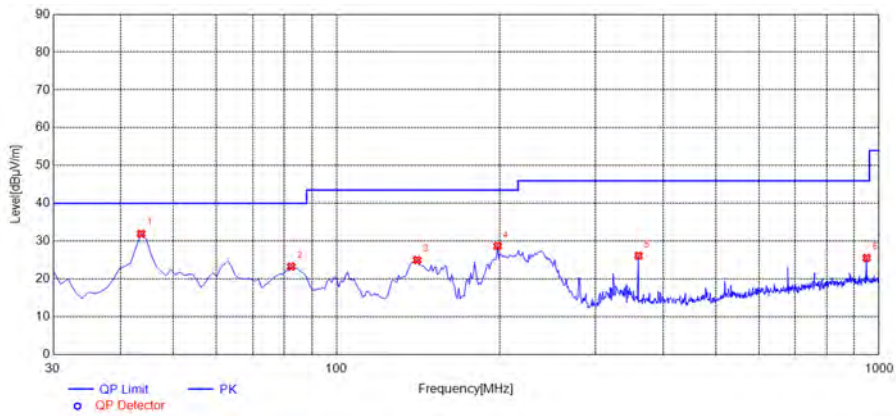
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
1211.2422	34.48	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
1439.2879	35.34	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
1700.5401	35.24	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2096.6193	36.68	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2505.1010	38.48	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2798.3597	39.91	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 1GHz to 3GHz)



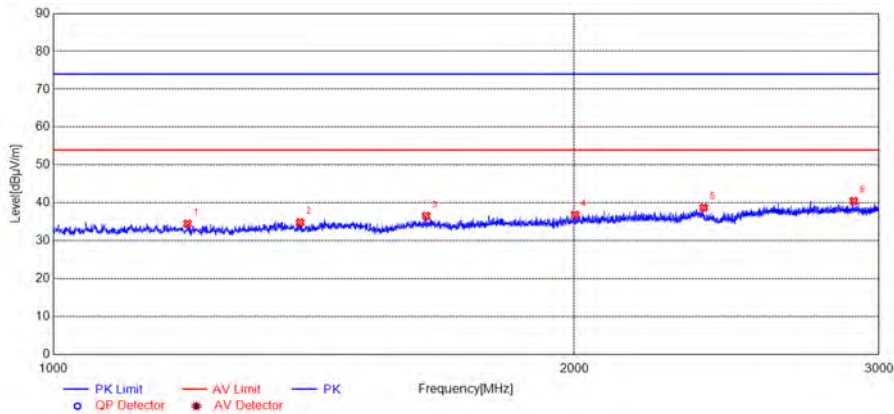
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
4374.2749	42.03	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5943.5887	46.62	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8056.0112	50.37	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10528.5057	50.39	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
13874.1748	49.82	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
16682.7365	49.22	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 3GHz to 18GHz)



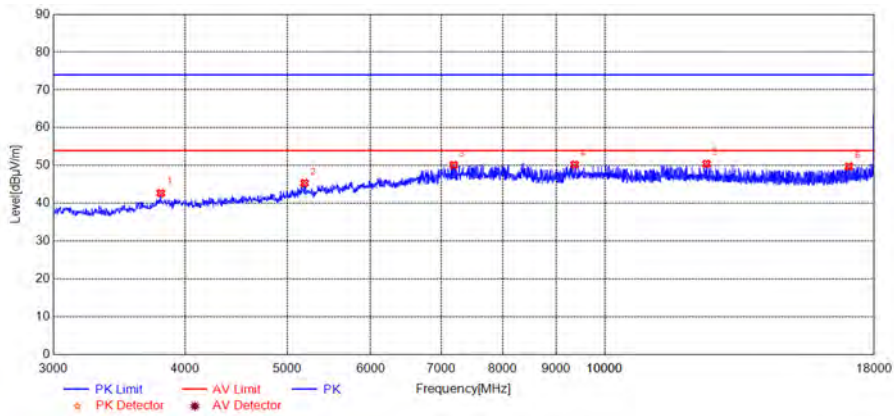
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
43.5936	31.97	N/A	N/A	N/A	40.00	54.00	Vertical	PASS
82.4324	23.30	N/A	N/A	N/A	40.00	54.00	Vertical	PASS
140.6907	25.02	N/A	N/A	N/A	43.50	54.00	Vertical	PASS
197.9780	28.76	N/A	N/A	N/A	43.50	54.00	Vertical	PASS
360.1301	26.16	N/A	N/A	N/A	46.00	54.00	Vertical	PASS
948.5385	25.60	N/A	N/A	N/A	46.00	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 1GHz)



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
1195.6391	34.54	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1388.8778	34.85	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1642.5285	36.57	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2002.6005	36.87	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2375.8752	38.73	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2900.7802	40.53	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 1GHz to 3GHz)

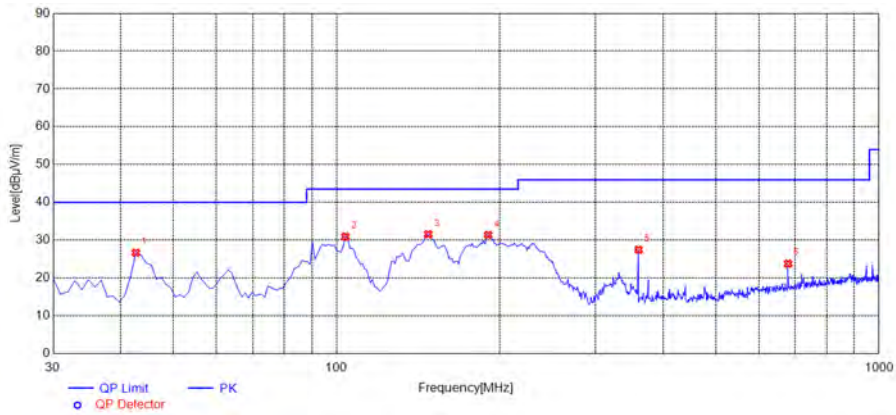


Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
3795.1590	42.71	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5193.4387	45.39	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7191.8384	50.17	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9367.2735	50.27	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12487.8976	50.47	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
17039.8080	49.76	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 3GHz to 18GHz)

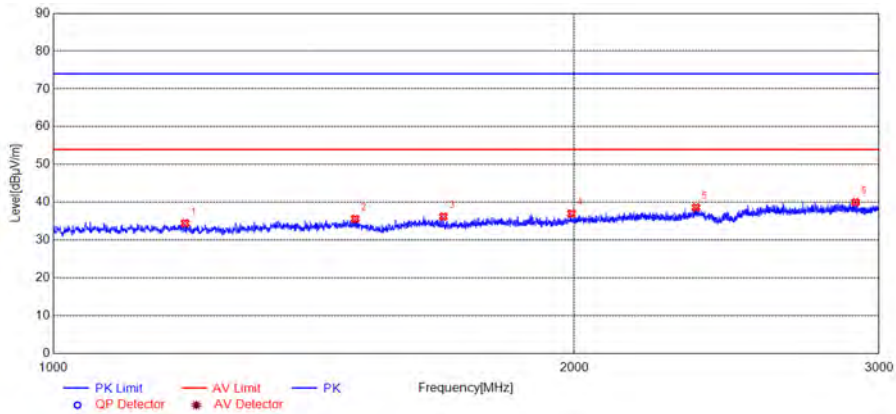


Plot for Channel 78



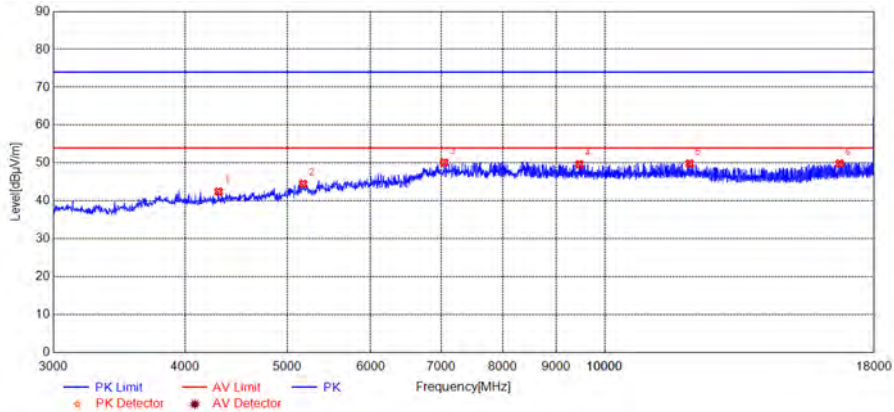
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
42.6226	26.70	N/A	N/A	N/A	40.00	54.00	Horizontal	PASS
103.7938	30.97	N/A	N/A	N/A	43.50	54.00	Horizontal	PASS
147.4875	31.58	N/A	N/A	N/A	43.50	54.00	Horizontal	PASS
190.2102	31.39	N/A	N/A	N/A	43.50	54.00	Horizontal	PASS
360.1301	27.49	N/A	N/A	N/A	46.00	54.00	Horizontal	PASS
679.5796	23.82	N/A	N/A	N/A	46.00	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 1GHz)



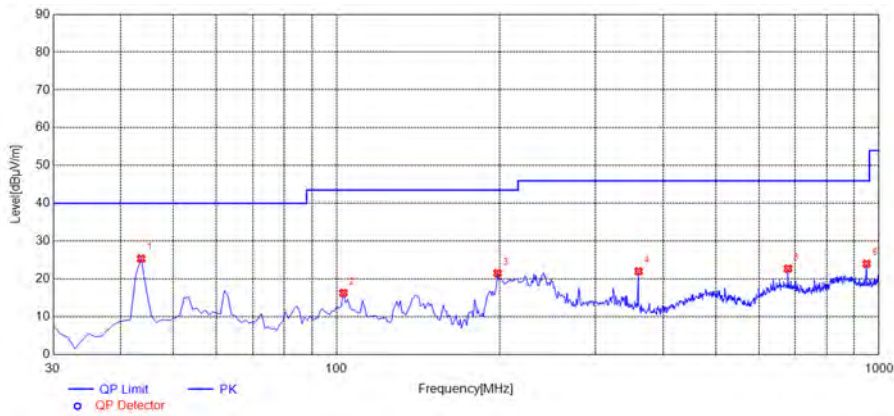
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
1192.0384	34.49	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
1494.4989	35.65	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
1680.5361	36.26	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
1992.5985	37.05	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2351.8704	38.68	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2907.9816	40.03	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 1GHz to 3GHz)



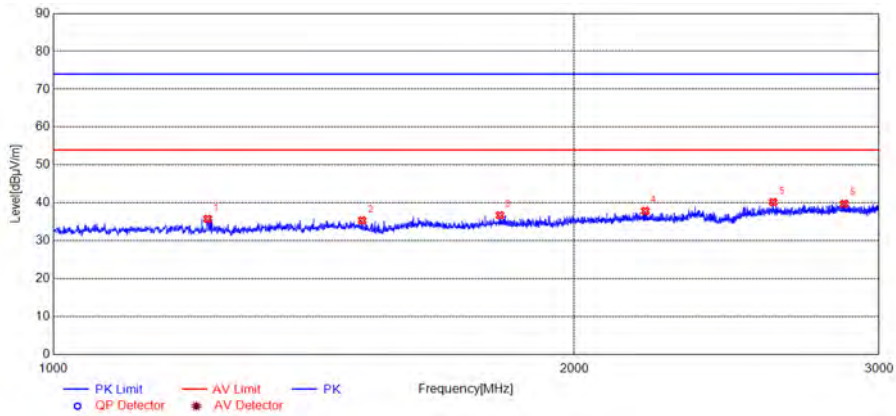
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
4305.2611	42.49	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5178.4357	44.56	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7044.8090	50.15	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9463.2927	49.68	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12034.8070	49.87	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
16697.7395	49.91	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 3GHz to 18GHz)



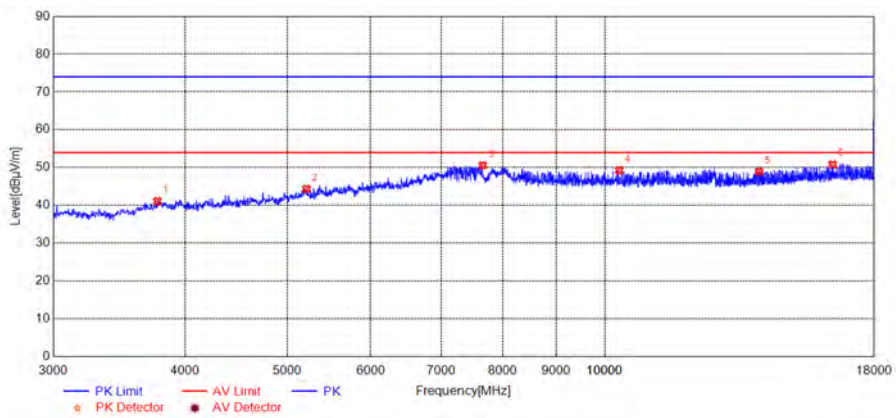
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
43.5936	25.39	N/A	N/A	N/A	40.00	54.00	Vertical	PASS
102.8228	16.32	N/A	N/A	N/A	43.50	54.00	Vertical	PASS
197.9780	21.56	N/A	N/A	N/A	43.50	54.00	Vertical	PASS
360.1301	22.05	N/A	N/A	N/A	46.00	54.00	Vertical	PASS
679.5796	22.75	N/A	N/A	N/A	46.00	54.00	Vertical	PASS
948.5385	24.03	N/A	N/A	N/A	46.00	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 1GHz)



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
1228.0456	35.80	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1508.5017	35.37	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
1811.7624	36.75	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2198.2396	37.88	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2606.3213	40.20	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2864.3729	39.82	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 1GHz to 3GHz)



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
3768.1536	41.14	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5214.4429	44.38	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7662.9326	50.61	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10321.4643	49.29	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
14006.2012	48.94	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
16448.6897	50.82	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 3GHz to 18GHz)

END OF REPORT