



# TEST REPORT

**APPLICANT** : OnePlus Technology (Shenzhen) Co., Ltd.

**PRODUCT NAME** : Wireless Earbuds

**MODEL NAME** : E512A

**BRAND NAME** : ONEPLUS

**FCC ID** : 2ABZ2-E512A

**STANDARD(S)** : 47 CFR Part 15 Subpart C

**RECEIPT DATE** : 2024-03-06

**TEST DATE** : 2024-03-15 to 2024-04-12

**ISSUE DATE** : 2024-08-15



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Change History		
Version	Date	Reason for change
1.0	2024-08-15	First edition



# 1. Summary of Test Result

No.	Section	Description	Test Date	Test Engineer	Result	Method Determination /Remark
1	15.203	Antenna Requirement	N/A	N/A	PASS	No deviation
2	N/A	Duty Cycle of Test Signal	Mar. 15, 2024	Zhong Yanshan	PASS	No deviation
3	15.247(b)	Maximum Peak Conducted Output Power	Mar. 15, 2024	Zhong Yanshan	PASS	No deviation
4	15.247(b)	Maximum Average Conducted Output Power	Mar. 15, 2024	Zhong Yanshan	PASS	No deviation
5	15.247(a)	Bandwidth	Mar. 15, 2024	Zhong Yanshan	PASS	No deviation
6	15.247(d)	Conducted Spurious Emission and Band Edge	Mar. 15, 2024	Zhong Yanshan	PASS	No deviation
7	15.247(e)	Power Spectral Density	Mar. 15, 2024	Zhong Yanshan	PASS	No deviation
8	15.207	Conducted Emission	Mar. 27, 2024	Wang Deyong	PASS	No deviation
9	15.247(d)	Restricted Frequency Bands	Apr. 12, 2024	Yang Lian	PASS	No deviation
10	15.209, 15.247(d)	Radiated Emission	Apr. 12, 2024	Yang Lian	PASS	No deviation

**Note 1:** The tests were performed according to the method of measurements prescribed in ANSI C63.10-2013 and KDB 558074 D01 v05r02.

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

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



## 1.1. Testing Applied Standards

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

- 47 CFR Part 15 Subpart C Radio Frequency Devices



## 1.2. Test Equipment List

### 1.2.1 Conducted Test Equipment

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
EXA Signal Analyzer	MY53470836	N9010A	Agilent	2024.02.19	2025.02.18
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 Equipment

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Receiver	MY56400093	N9038A	KEYSIGHT	2024.01.25	2025.01.24
LISN	8127449	NSLK 8127	Schwarzbeck	2024.02.02	2025.02.01
Pulse Limiter (10dB)	VTSD 9561 F-B #206	VTSD 9561-F	Schwarzbeck	2023.06.27	2024.06.26
RF Coaxial Cable (DC-100MHz)	BNC	MRE04	Qualwave	N/A	N/A

### 1.2.3 List of Software Used

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

**1.2.4 Radiated Test Equipment**

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	2023.07.01	2024.06.30
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2023.06.26	2024.06.25
Test Antenna – Horn	01774	BBHA 9120D	Schwarzbeck	2023.07.01	2024.06.30
Test Antenna – Horn	BBHA9170 #773	BBHA9170	Schwarzbeck	2023.07.01	2024.06.30
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
Peak Output Power	±2.22dB	Confidence levels of 95%
Power Spectral Density	±2.22dB	Confidence levels of 95%
Bandwidth	±5%	Confidence levels of 95%
Conducted Spurious Emission	±2.77dB	Confidence levels of 95%
Restricted Frequency Bands	±5%	Confidence levels of 95%
Radiated Emission	±2.95dB	Confidence levels of 95%
Conducted Emission	±2.44dB	Confidence levels of 95%

### 1.4. Testing Laboratory

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





## 2. General Description

### 2.1. Information of Applicant and Manufacturer

<b>Applicant</b>	OnePlus Technology (Shenzhen) Co., Ltd.
<b>Applicant Address</b>	18C02, 18C03, 18C04, and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, Guangdong, P.R. China
<b>Manufacturer</b>	OnePlus Technology (Shenzhen) Co., Ltd.
<b>Manufacturer Address</b>	18C02, 18C03, 18C04, and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, Guangdong, P.R. China

### 2.2. Information of EUT

<b>Product Name:</b>	Wireless Earbuds	
<b>Sample No.:</b>	1#, 2#	
<b>Hardware Version:</b>	X23E3_06	
<b>Software Version:</b>	V.2.6	
<b>Equipment Type:</b>	Bluetooth LE	
<b>Bluetooth Version:</b>	5.3	
<b>Modulation Type:</b>	GFSK	
<b>Data Rate:</b>	1Mbps, 2Mbps	
<b>Operating Frequency Range:</b>	2402MHz-2480MHz	
<b>Antenna Type:</b>	LDS Antenna	
<b>Antenna Gain:</b>	Left: -3.40dBi; Right: -3.20dBi	
<b>Accessory Information:</b>	Battery (Earphone)	
	<b>Brand Name:</b>	N/A
	<b>Model No.:</b>	112570
	<b>Serial No.:</b>	N/A
	<b>Capacity:</b>	58mAh
	<b>Rated Voltage:</b>	3.85V
	<b>Charge Limit:</b>	4.40V
	<b>Manufacturer:</b>	XINYU GANFENG ELECTRONICS CO., LTD.

<b>Accessory Information:</b>	Battery (Charging case)	
	Brand Name:	N/A
	Model No.:	SZS601826-2P
	Serial No.:	N/A
	Capacity:	566mAh
	Rated Voltage:	3.85V
	Charge Limit:	4.40V
	Manufacturer:	Chongqing VDL Electronics Co., Ltd.

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

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

### 2.3. Channel List of EUT

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
<b>0</b>	<b>2402</b>	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	<b>19</b>	<b>2440</b>	29	2460	<b>39</b>	<b>2480</b>

**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

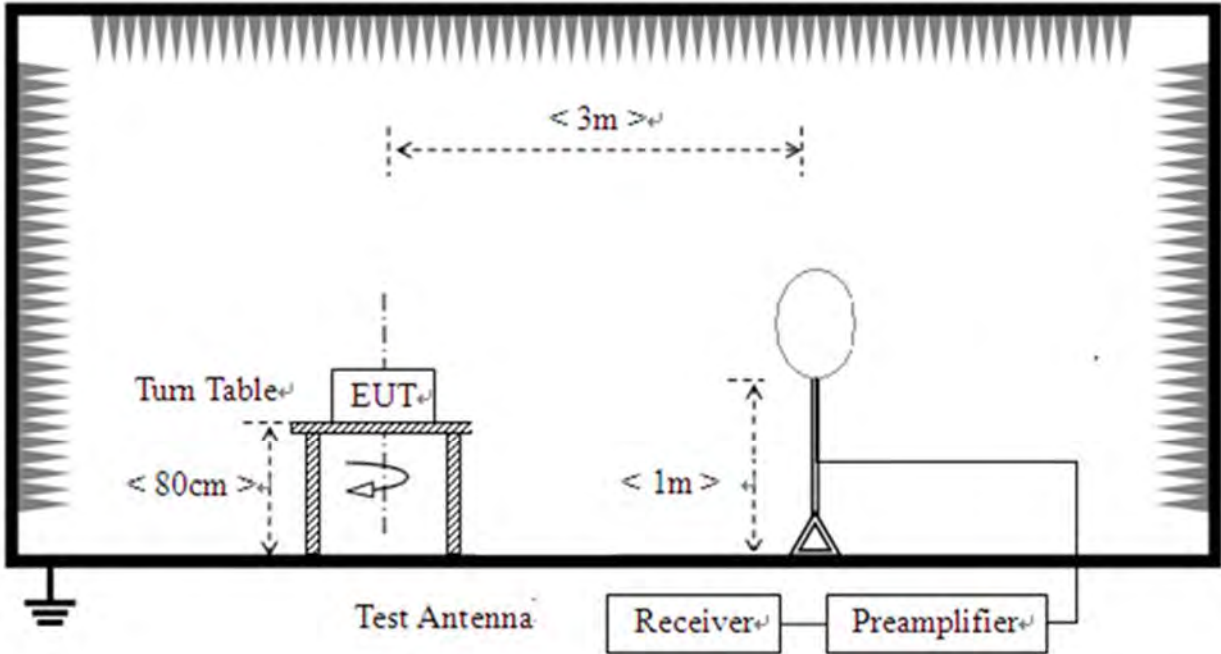


### 2.6.2. Conducted Emission Measurement

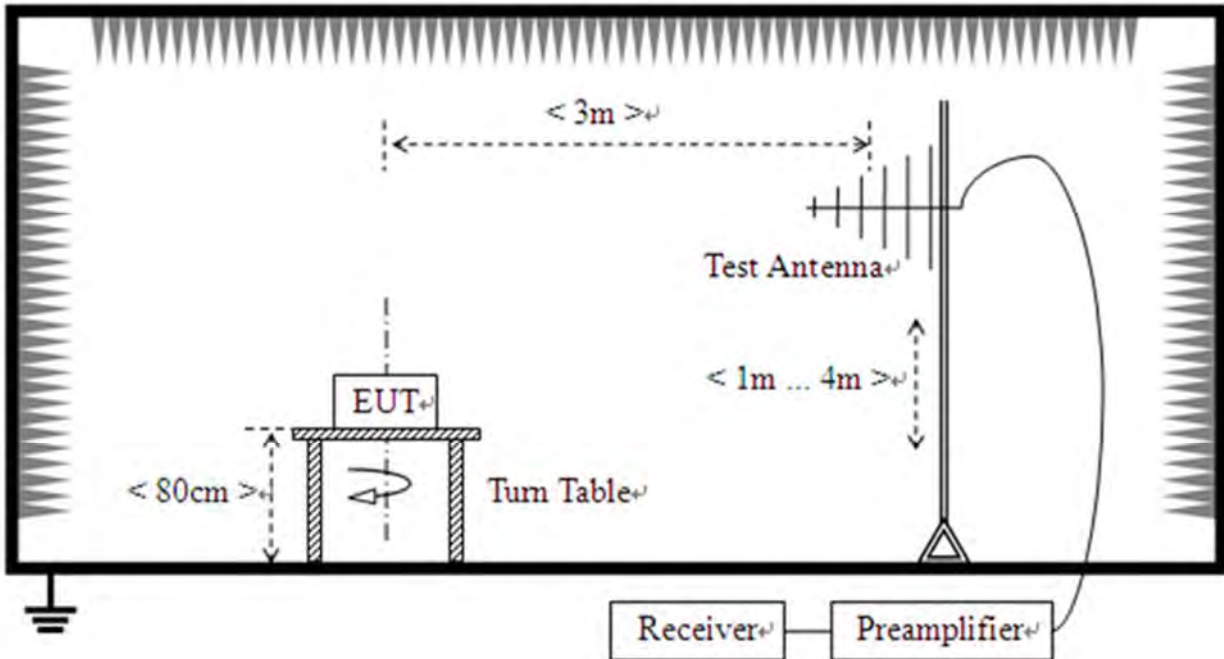


**2.6.3.Radiation Measurement**

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. Duty Cycle of Test Signal

### 3.2.1. Requirement

Preferably, all measurements of maximum conducted (average) output power will be performed with the EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%). When continuous operation cannot be realized, then the use of sweep triggering/signal gating techniques can be used to ensure that measurements are made only during transmissions at the maximum power control level. Such sweep triggering/signal gating techniques will require knowledge of the minimum transmission duration (T) over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. Sweep triggering/signal gating techniques can then be used if the measurement/sweep time of the analyzer can be set such that it does not exceed T at any time that data are being acquired (i.e., no transmitter OFF-time is to be considered).

When continuous transmission cannot be achieved and sweep triggering/signal gating cannot be implemented, alternative procedures are provided that can be used to measure the average power; however, they will require an additional measurement of the transmitter duty cycle (D). Within this sub clause, the duty cycle refers to the fraction of time over which the transmitter is ON and is transmitting at its maximum power control level. The duty cycle is considered to be constant if variations are less than  $\pm 2\%$ ; otherwise, the duty cycle is considered to be non constant.

### 3.2.2. Test Result

Refer to Annex A.1 in this report.



## **3.3. Maximum Peak Conducted Output Power**

### **3.3.1. Requirement**

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

### **3.3.2. Test Procedures**

KDB 558074 Section 8.3.1 was used in order to prove compliance.

### **3.3.3. Test Setup Layout**

Refer to chapter 2.6.1 in this report.

### **3.3.4. Test Result**

Refer to Annex A.2 in this report.





## **3.4. Maximum Average Conducted Output Power**

### **3.4.1. Requirement**

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

### **3.4.2. Test Procedures**

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

### **3.4.3. Test Setup Layout**

Refer to chapter 2.6.1 in this report.

### **3.4.4. Test Result**

Refer to Annex A.3 in this report.



## 3.5.6 dB Bandwidth

### 3.5.1.Requirement

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

### 3.5.1.Test Procedures

The steps for the first option are as follows:

- a) Set analyzer center frequency to channel center frequency
- b) Set RBW to 100kHz
- c) Set VBW to 300kHz
- d) Detector = peak.
- e) Trace mode = max hold
- f) Sweep time = auto couple
- g) Allow the trace to fully stabilize
- h) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described in 11.8.1 (i.e., RBW = 100 kHz, VBW  $\geq 3 \times$  RBW, and peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be  $\geq 6$  dB.

### 3.5.2.Test Setup Layout

Refer to chapter 2.6.1 in this report.

### 3.5.3.Test Result

Refer to Annex A.4 in this report.



## **3.6. Conducted Spurious Emissions and Band Edge**

### **3.6.1. 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.

### **3.6.2. Test Procedures**

KDB 558074 Section 8.5 and 8.7 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.5 and A.6 in this report.



## 3.7. Power Spectral Density

### 3.7.1. Requirement

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

### 3.7.2. Test Procedures

The measured power spectral density was calculated by the reading of the spectrum analyzer and calibration. Following is the test procedure for PSD test:

- a) Set analyzer center frequency to channel center frequency
- b) Set span to 1.5 times DTS
- c) Set RBW to 3kHz
- d) Set VBW to 10kHz
- e) Detector = peak
- f) Sweep time = auto couple
- g) Trace mode = max hold
- h) Allow trace to fully stabilize
- i) Use the peak marker function to determine the maximum amplitude level within the RBW

### 3.7.3. Test Setup Layout

Refer to chapter 2.6.1 in this report.

### 3.7.4. Test Result

Refer to Annex A.7 in this report.



### 3.8. Conducted Emission

#### 3.8.1. Requirement

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

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

Note:

- (a) The lower limit shall apply at the band edges.
- (b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

#### 3.8.2. 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.

#### 3.8.3. Test Setup Layout

Refer to chapter 2.6.2 in this report.

#### 3.8.4. Test Result

Refer to Annex A.8 in this report.



## 3.9. Restricted Frequency Bands

### 3.9.1. 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).

### 3.9.2. 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

### 3.9.3. Test Setup Layout

Refer to chapter 2.6.3 in this report.

### 3.9.4. Test Result

Refer to Annex A.9 in this report.



## 3.10. Radiated Emission

### 3.10.1. 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).



### 3.10.2. 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.

### 3.10.3. Test Setup Layout

Refer to chapter 2.6.3 in this report.

### 3.10.4. Test Result

Refer to Annex A.10 in this report.





## Annex A Test Data and Result

### A.1. Duty Cycle of Test Signal

Left:

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1M SISO	2402	Ant1	65.08	1.87	2.44
NVNT	BLE 1M SISO	2440	Ant1	66.13	1.80	2.44
NVNT	BLE 1M SISO	2480	Ant1	66.13	1.80	2.44
NVNT	BLE 2M SISO	2404	Ant1	37.10	4.31	4.35
NVNT	BLE 2M SISO	2440	Ant1	36.51	4.38	4.35
NVNT	BLE 2M SISO	2478	Ant1	36.51	4.38	4.35

Right:

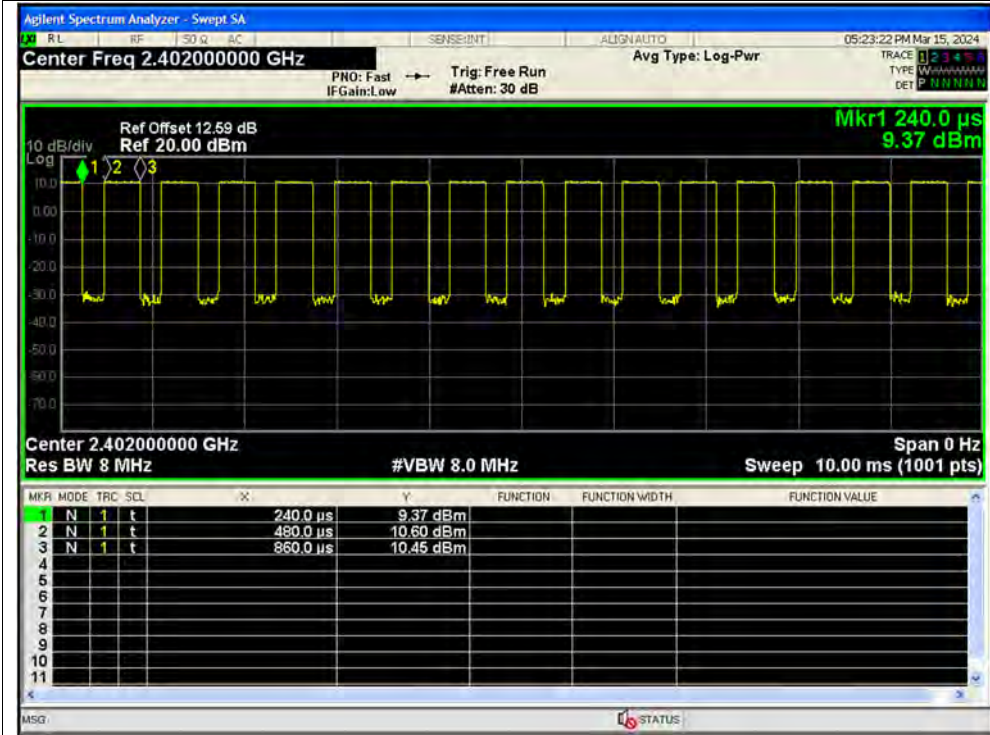
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1M SISO	2402	Ant1	62.9	2.01	2.56
NVNT	BLE 1M SISO	2440	Ant1	61.29	2.13	2.63
NVNT	BLE 1M SISO	2480	Ant1	61.29	2.13	2.63
NVNT	BLE 2M SISO	2404	Ant1	32.26	4.91	5
NVNT	BLE 2M SISO	2440	Ant1	32.26	4.91	5
NVNT	BLE 2M SISO	2478	Ant1	33.33	4.77	4.76



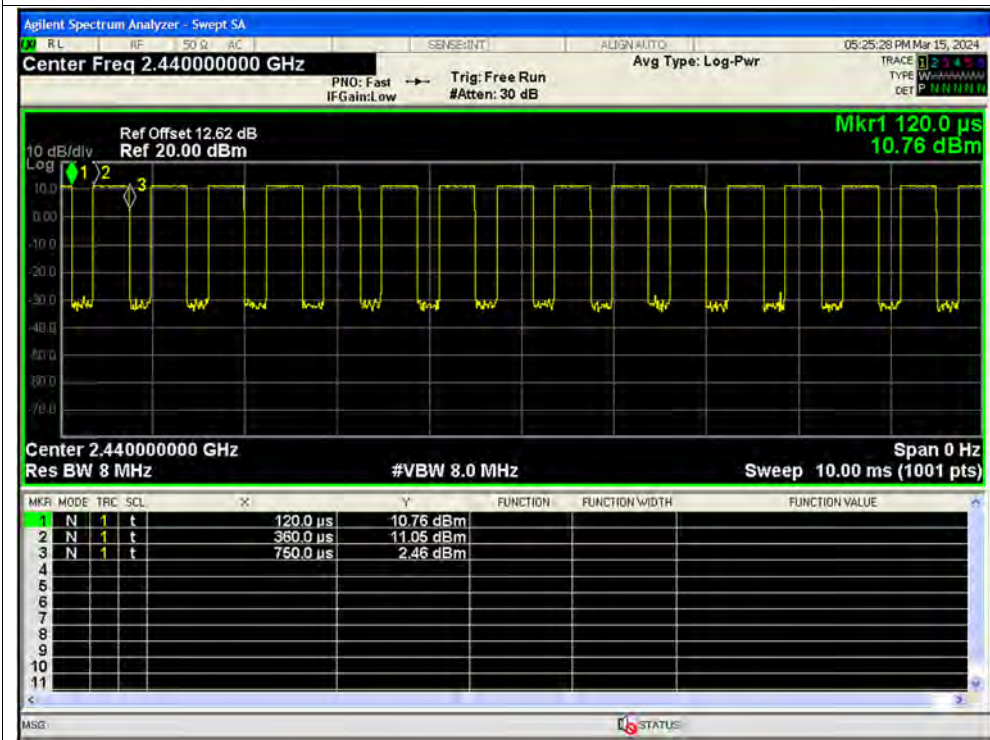
Left

Test Graphs

Duty Cycle NVNT BLE 1M 2402MHz Ant1 SISO

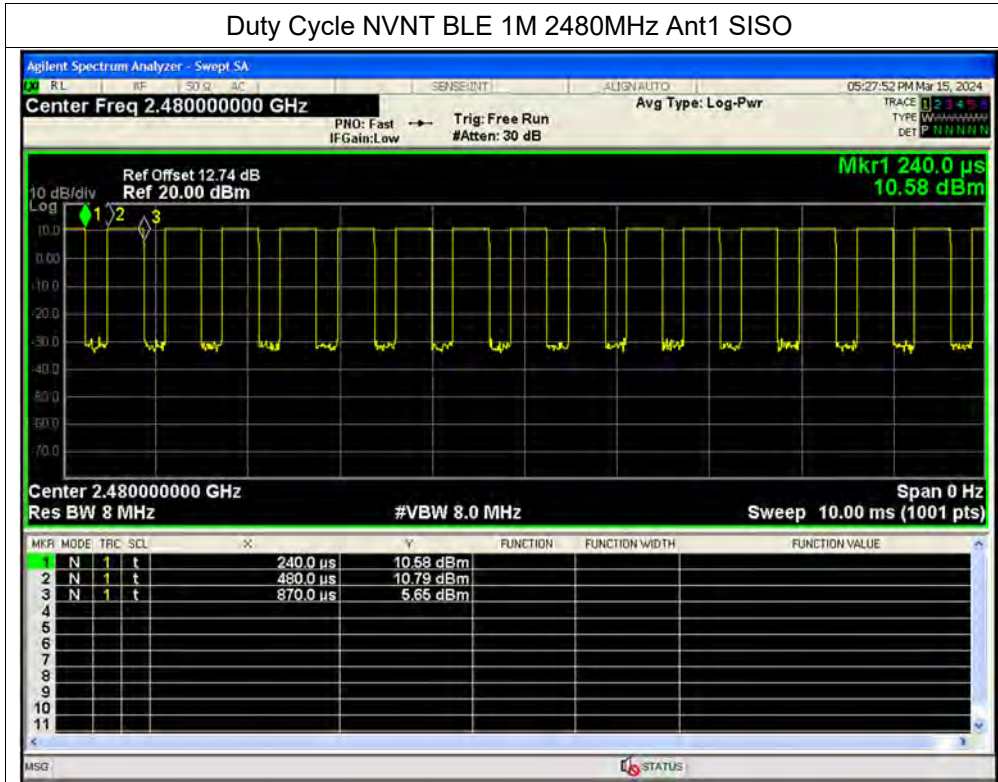


Duty Cycle NVNT BLE 1M 2440MHz Ant1 SISO

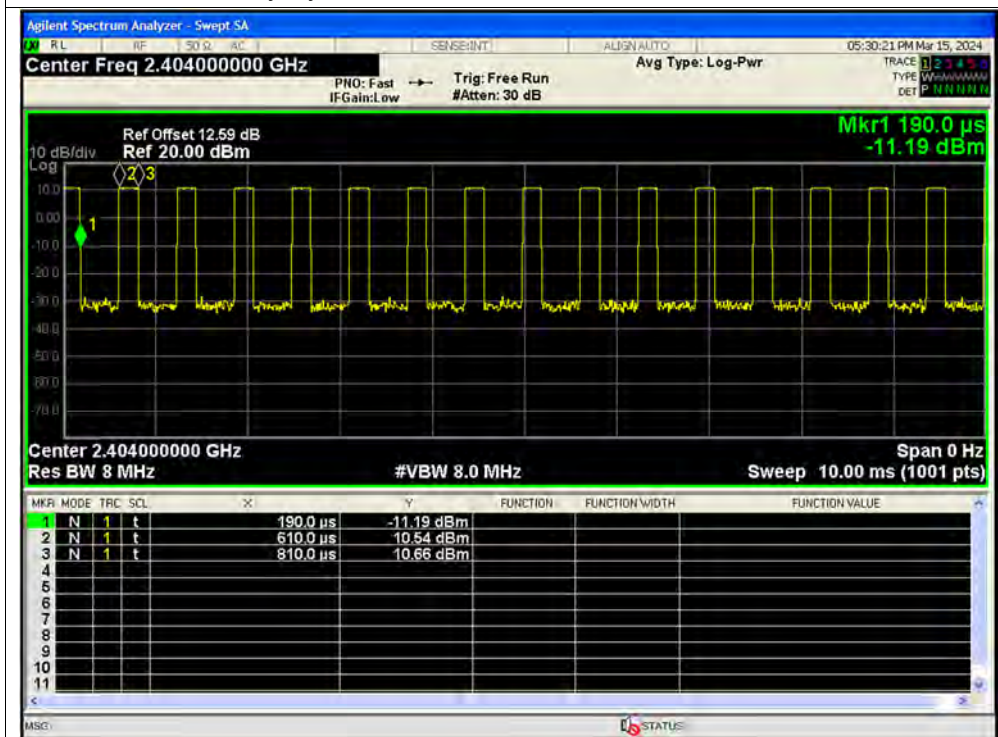




Duty Cycle NVNT BLE 1M 2480MHz Ant1 SISO

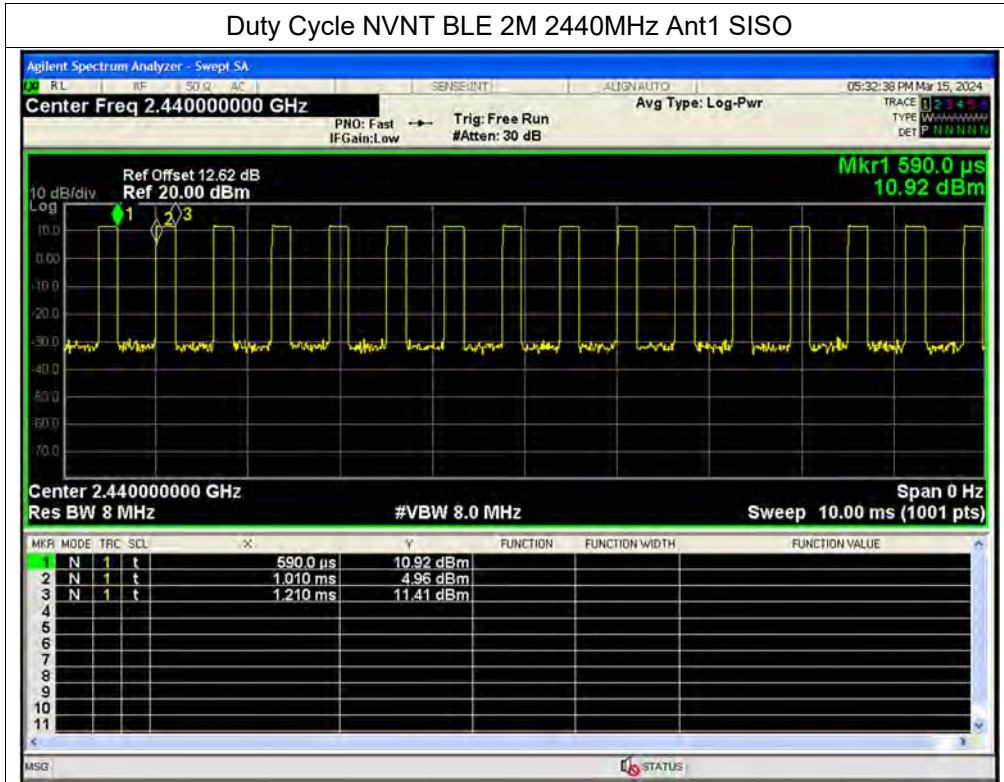


Duty Cycle NVNT BLE 2M 2404MHz Ant1 SISO

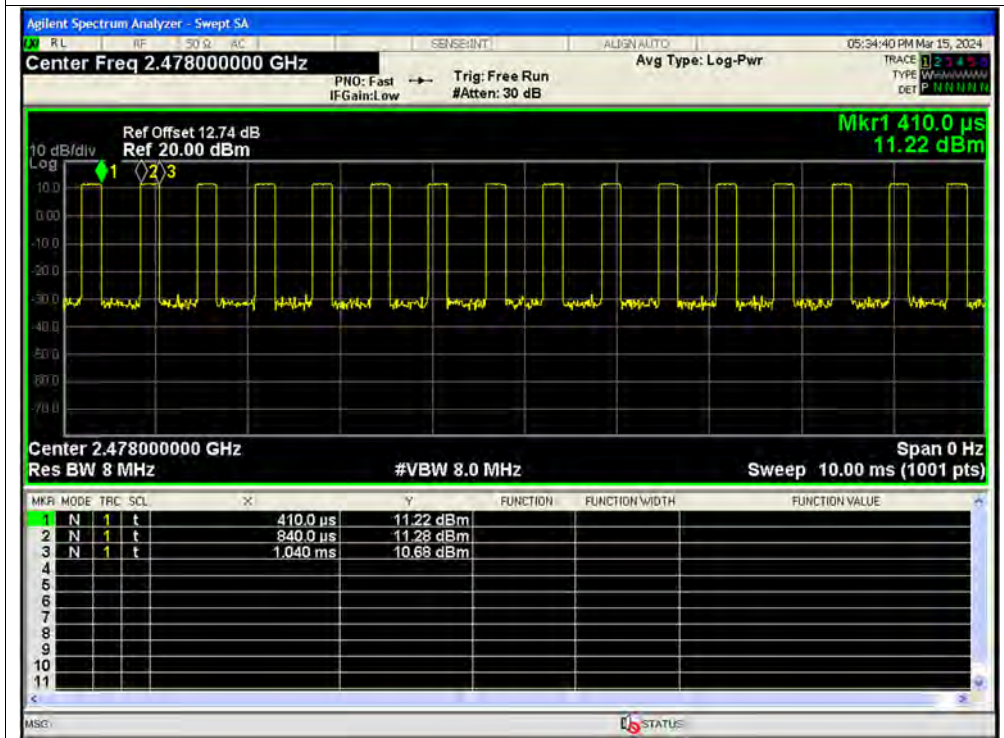




Duty Cycle NVNT BLE 2M 2440MHz Ant1 SISO



Duty Cycle NVNT BLE 2M 2478MHz Ant1 SISO

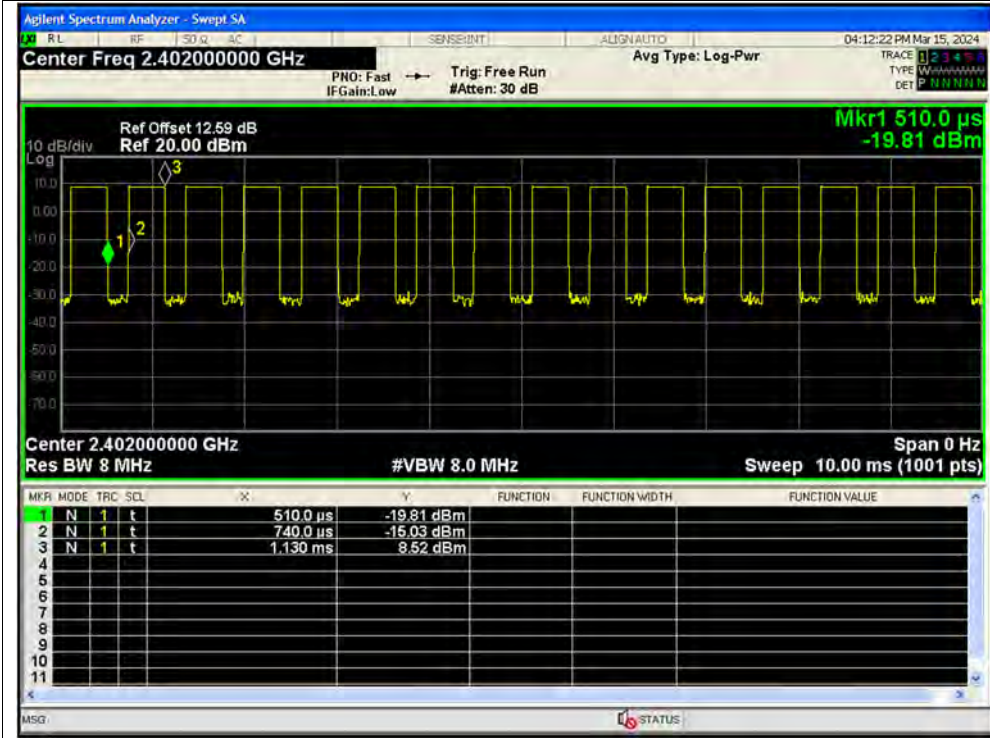




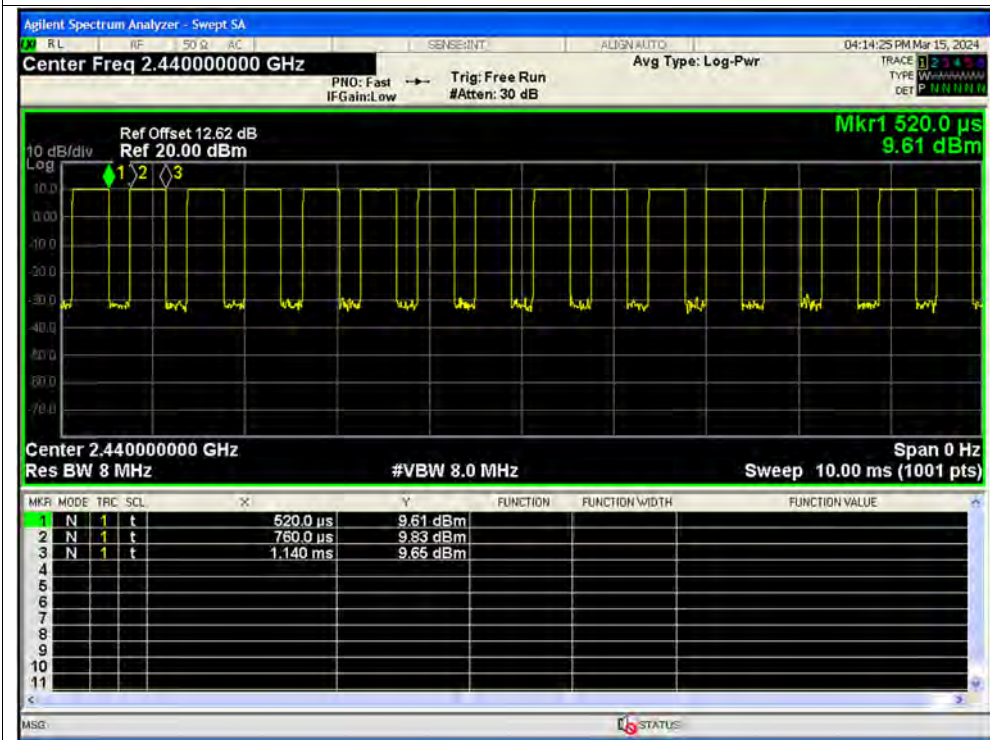
Right

Test Graphs

Duty Cycle NVNT BLE 1M 2402MHz Ant1 SISO

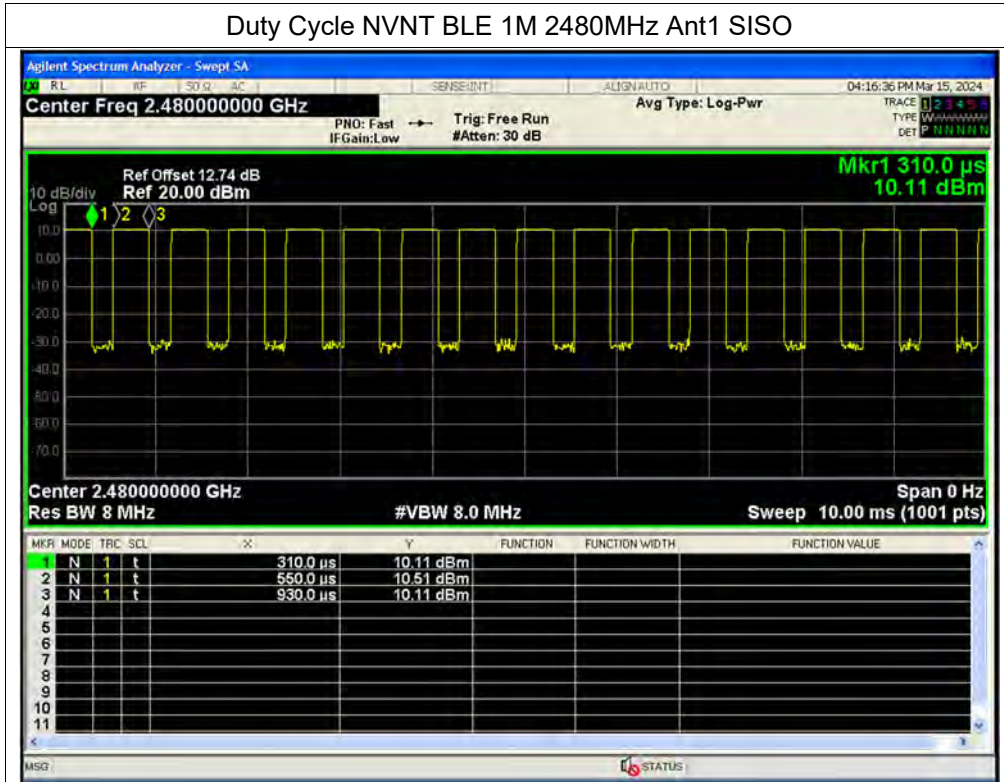


Duty Cycle NVNT BLE 1M 2440MHz Ant1 SISO

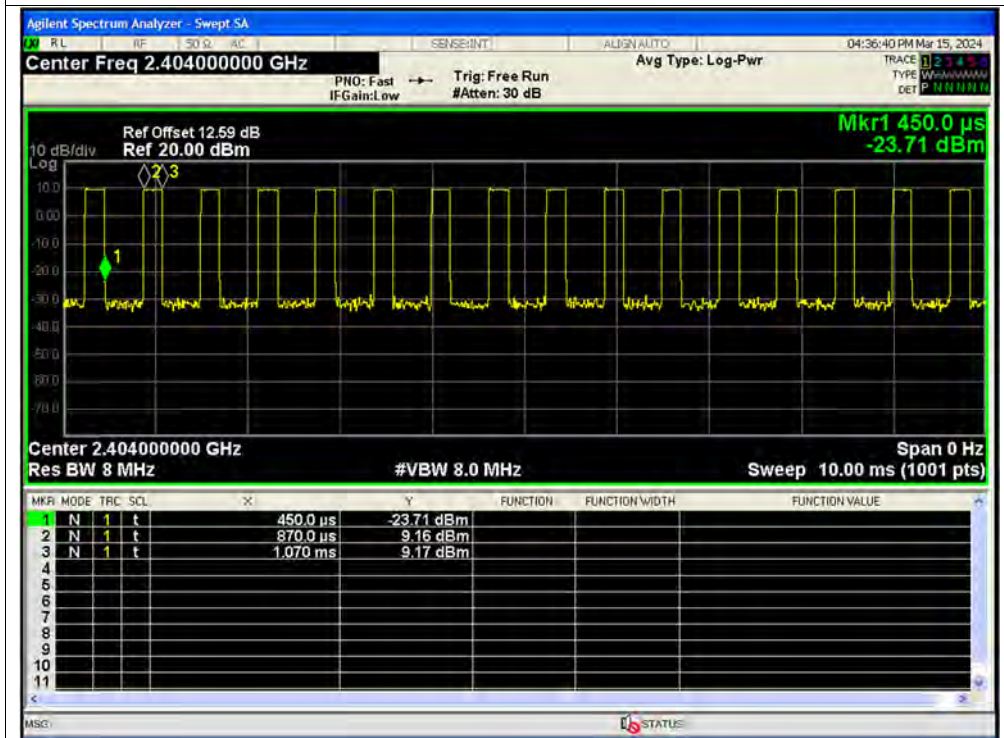




Duty Cycle NVNT BLE 1M 2480MHz Ant1 SISO

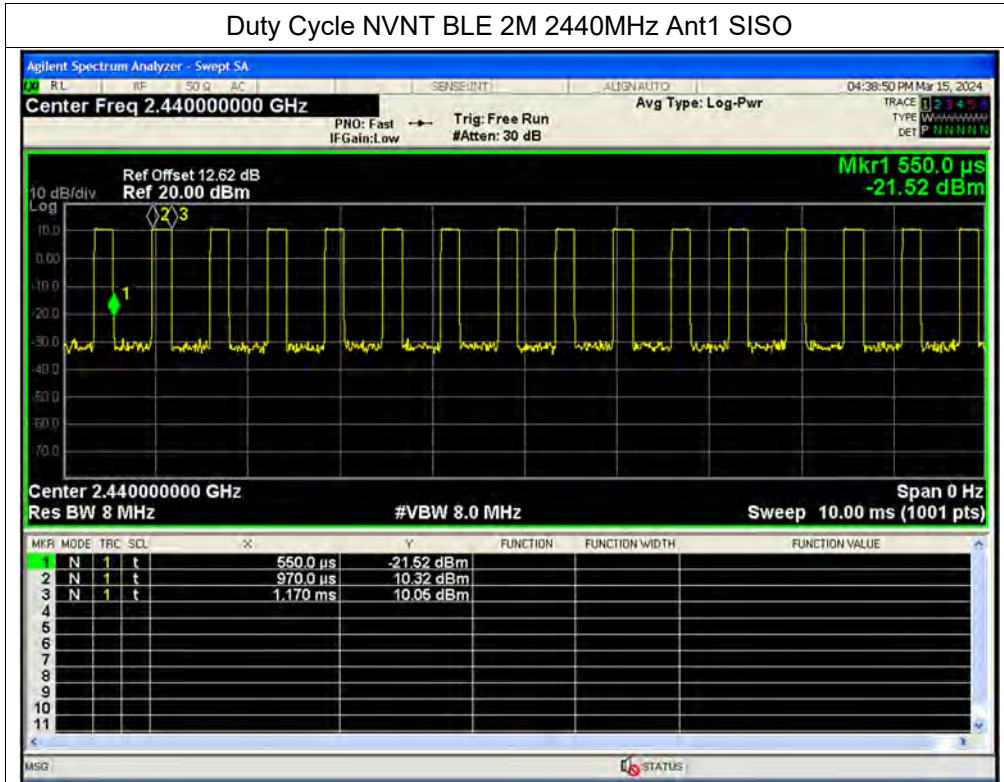


Duty Cycle NVNT BLE 2M 2404MHz Ant1 SISO

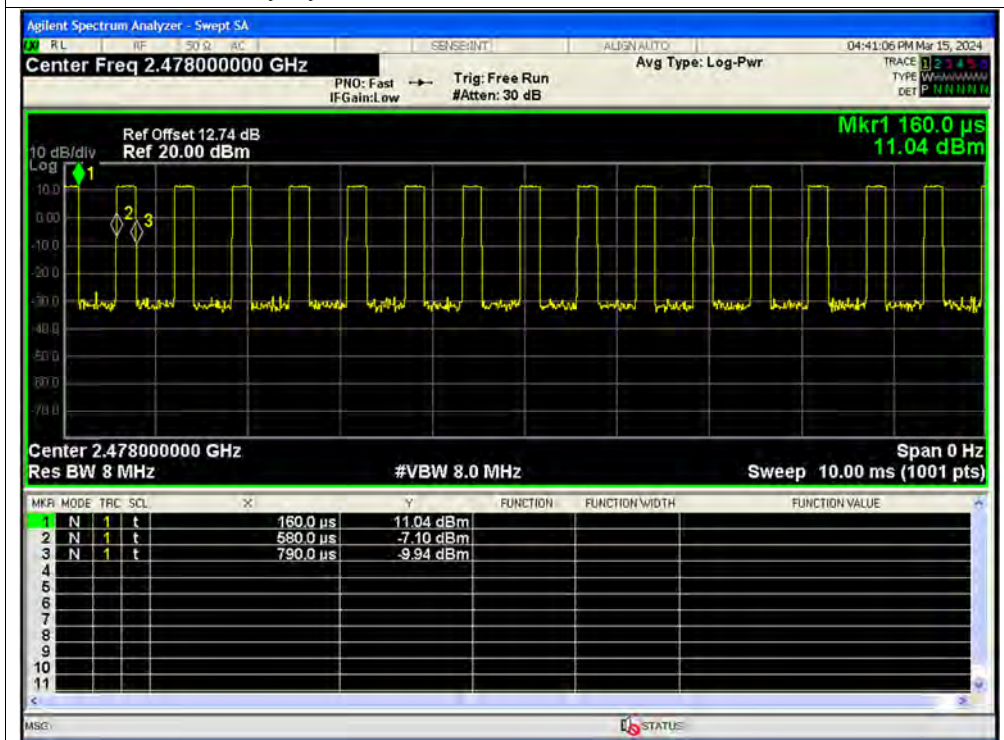




Duty Cycle NVNT BLE 2M 2440MHz Ant1 SISO



Duty Cycle NVNT BLE 2M 2478MHz Ant1 SISO



**A.2. Maximum Peak Conducted Output Power**

Left:

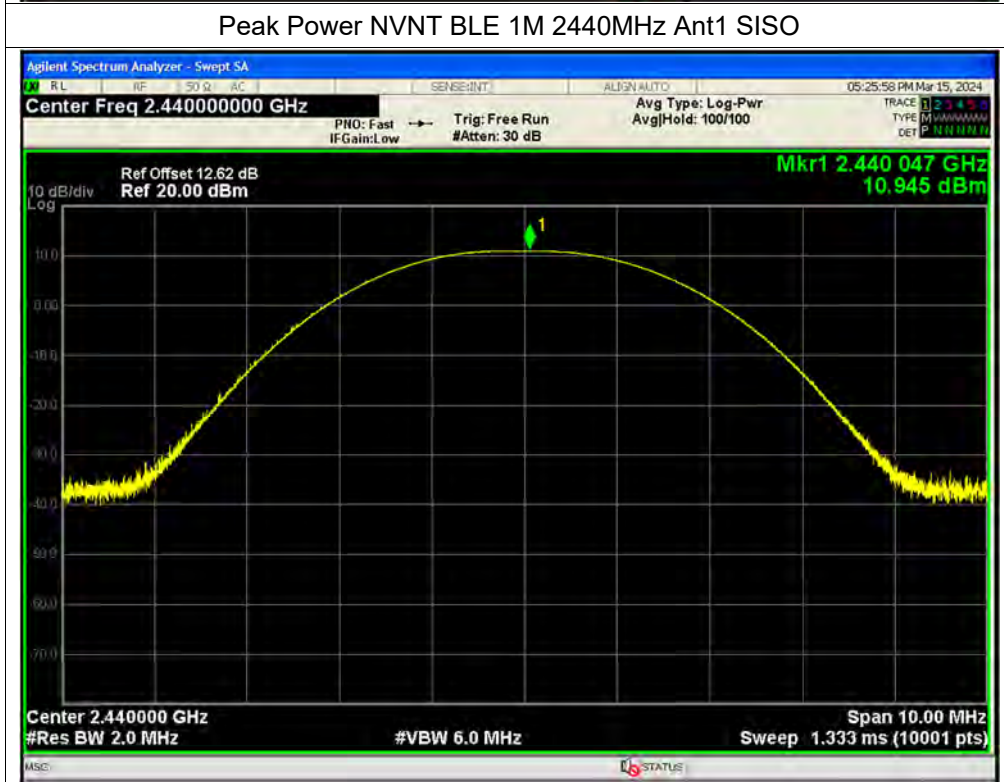
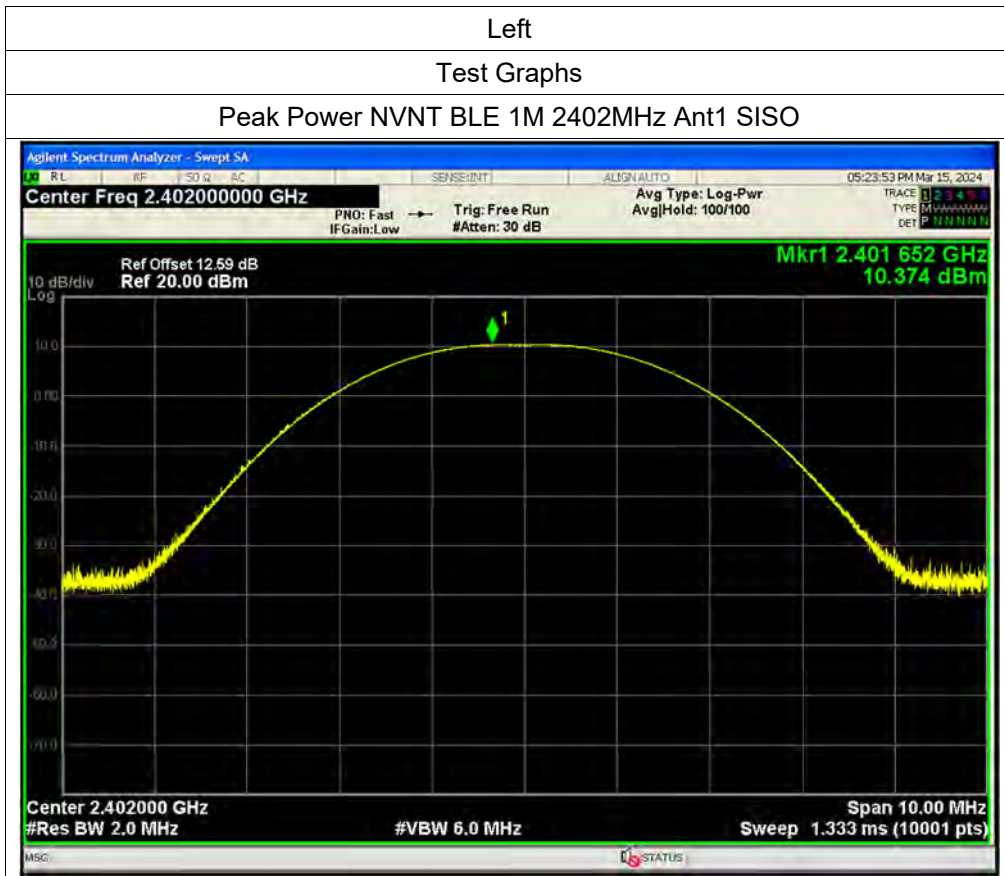
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Conducted Power (dBm)	Total Conducted Power (W)	Limit Conducted (dBm)	Verdict
NVNT	BLE 1M SISO	2402	Ant1	10.37	0	10.37	0.01089	30	Pass
NVNT	BLE 1M SISO	2440	Ant1	10.95	0	10.95	0.01245	30	Pass
NVNT	BLE 1M SISO	2480	Ant1	10.75	0	10.75	0.01189	30	Pass
NVNT	BLE 2M SISO	2404	Ant1	10.48	0	10.48	0.01117	30	Pass
NVNT	BLE 2M SISO	2440	Ant1	11.22	0	11.22	0.01324	30	Pass
NVNT	BLE 2M SISO	2478	Ant1	11.06	0	11.06	0.01276	30	Pass





Right:

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Conducted Power (dBm)	Total Conducted Power (W)	Limit Conducted (dBm)	Verdict
NVNT	BLE 1M SISO	2402	Ant1	8.64	0	8.64	0.00731	30	Pass
NVNT	BLE 1M SISO	2440	Ant1	9.81	0	9.81	0.00957	30	Pass
NVNT	BLE 1M SISO	2480	Ant1	10.34	0	10.34	0.01081	30	Pass
NVNT	BLE 2M SISO	2404	Ant1	9.08	0	9.08	0.00809	30	Pass
NVNT	BLE 2M SISO	2440	Ant1	10.17	0	10.17	0.0104	30	Pass
NVNT	BLE 2M SISO	2478	Ant1	11.02	0	11.02	0.01265	30	Pass

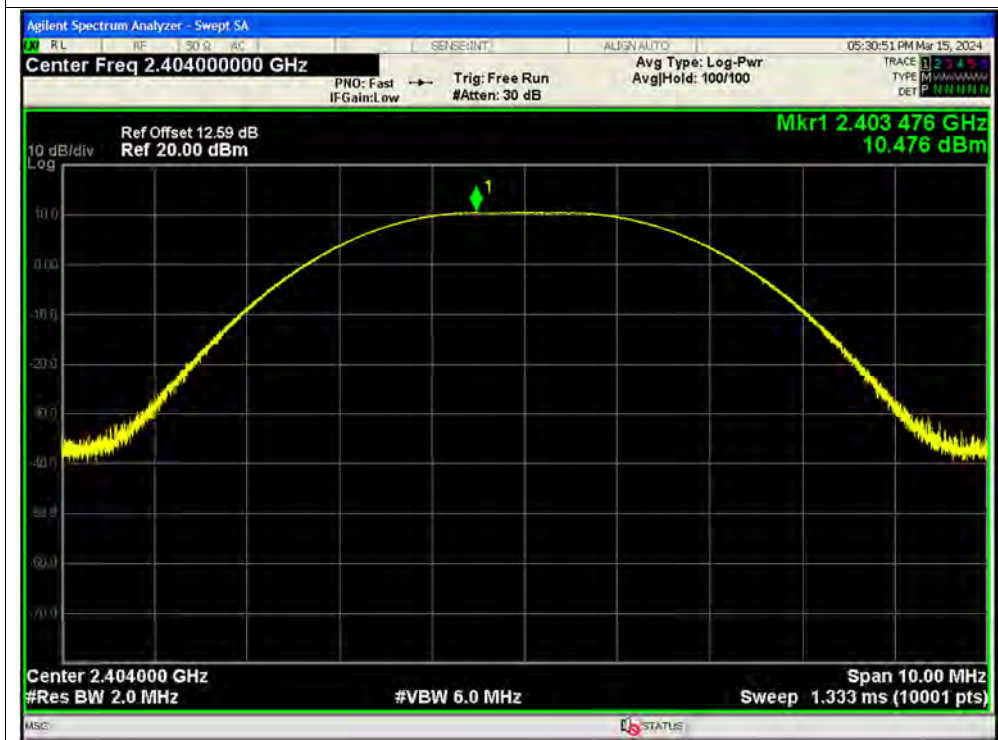




Peak Power NVNT BLE 1M 2480MHz Ant1 SISO

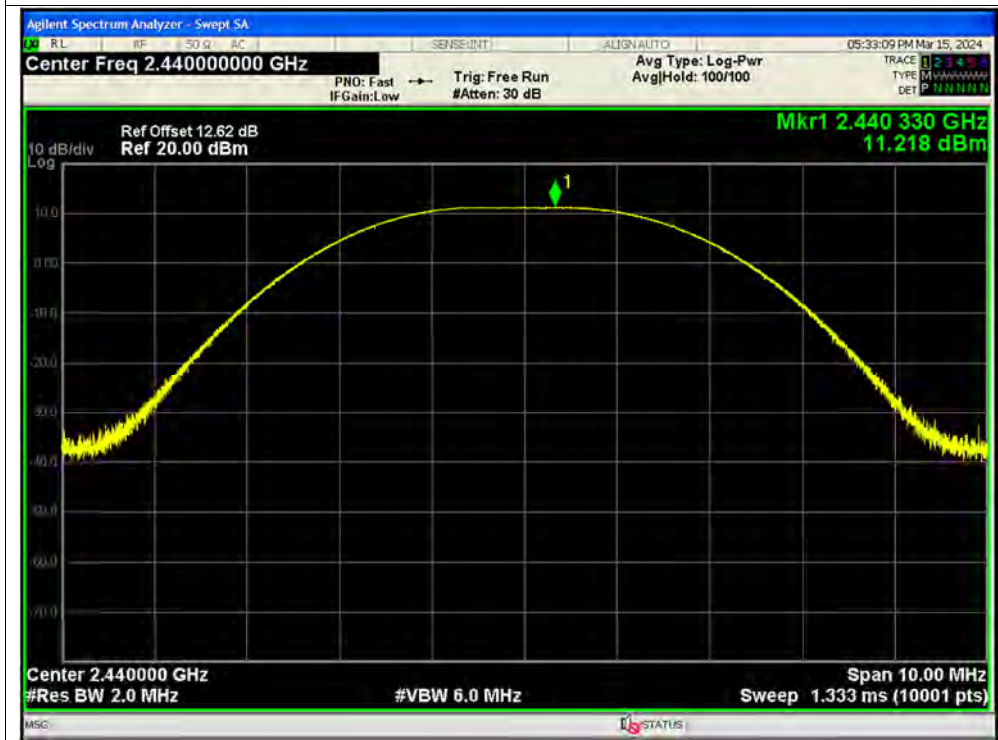


Peak Power NVNT BLE 2M 2404MHz Ant1 SISO



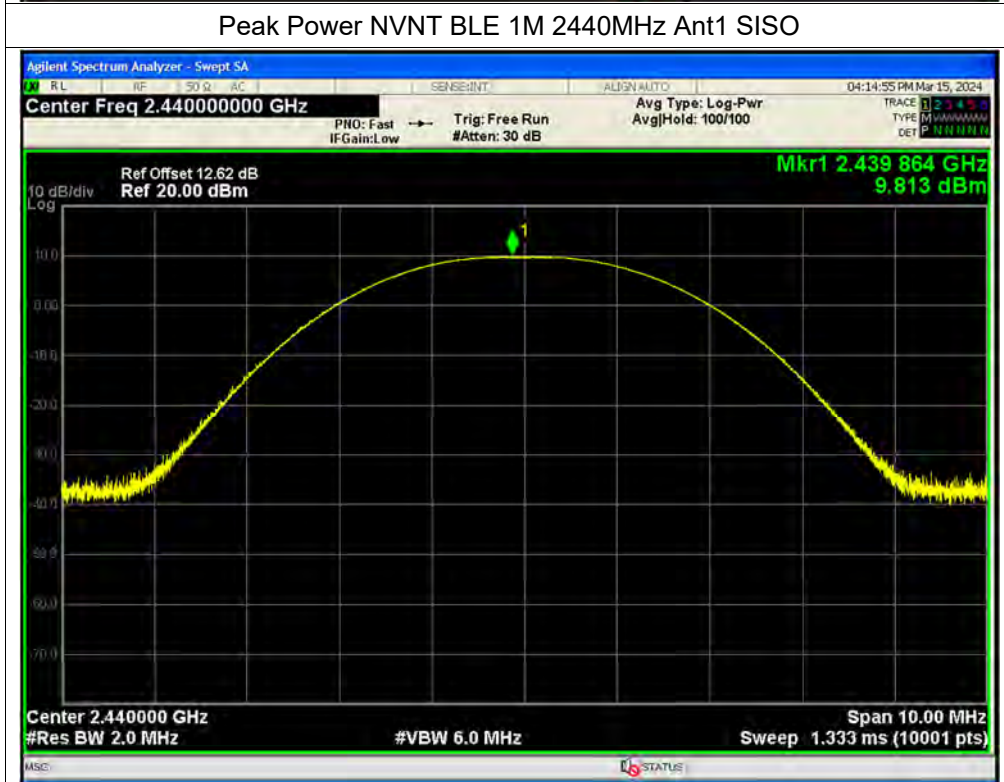
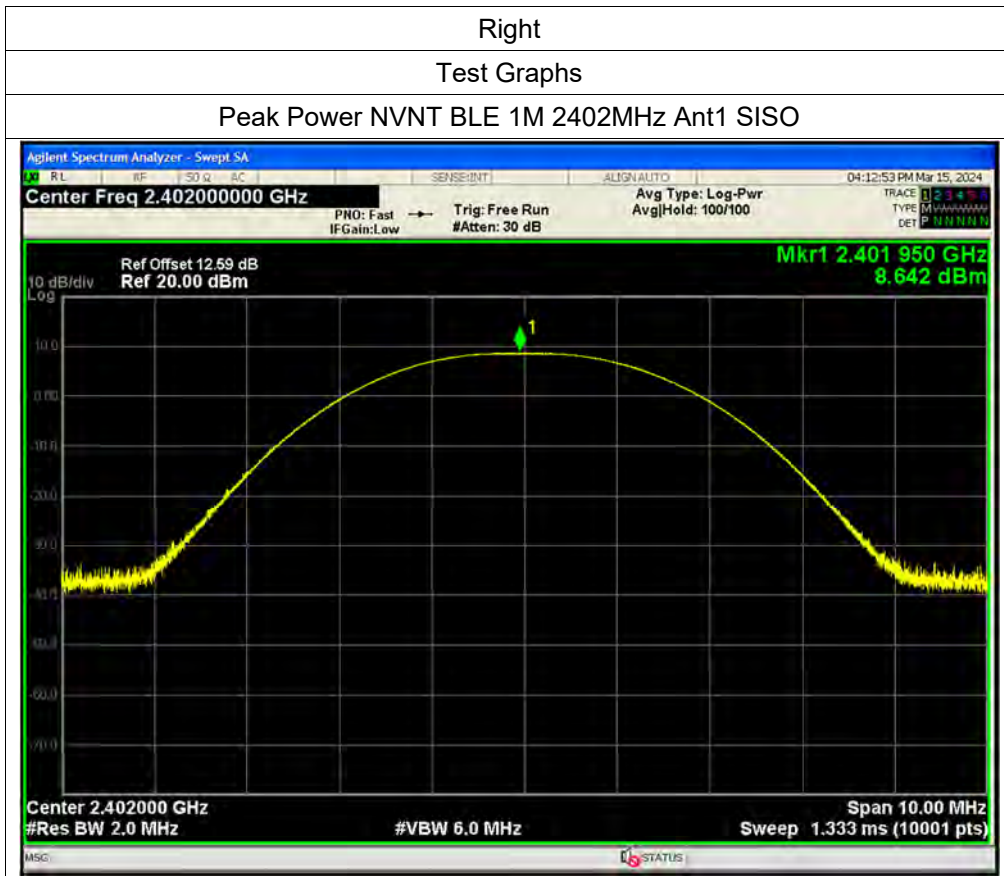


Peak Power NVNT BLE 2M 2440MHz Ant1 SISO



Peak Power NVNT BLE 2M 2478MHz Ant1 SISO



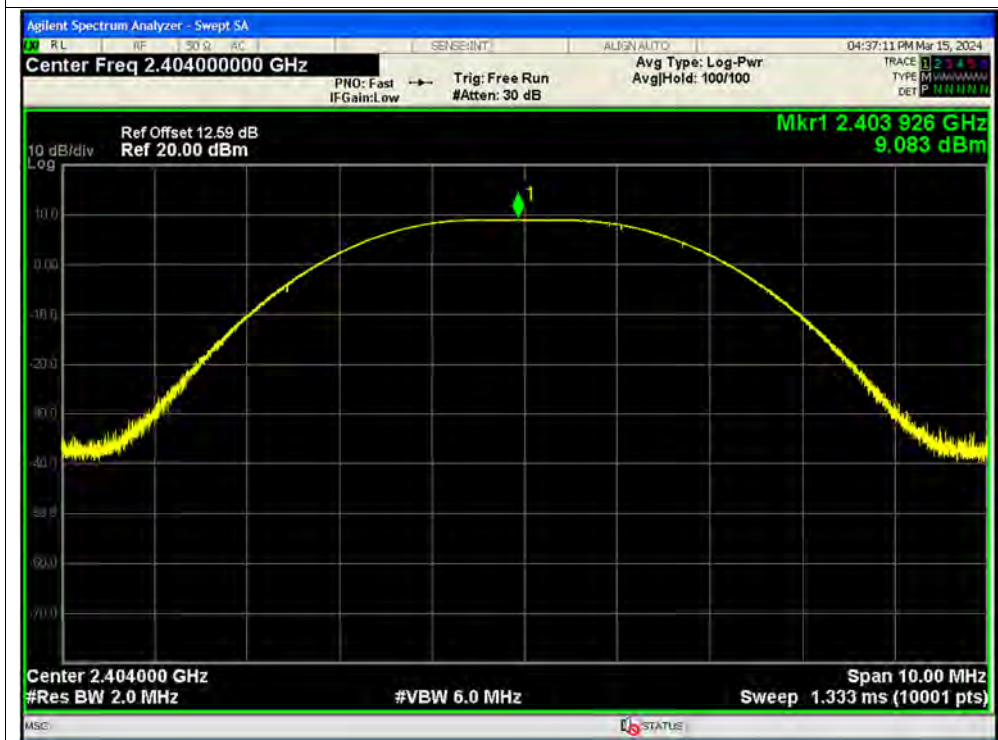




Peak Power NVNT BLE 1M 2480MHz Ant1 SISO

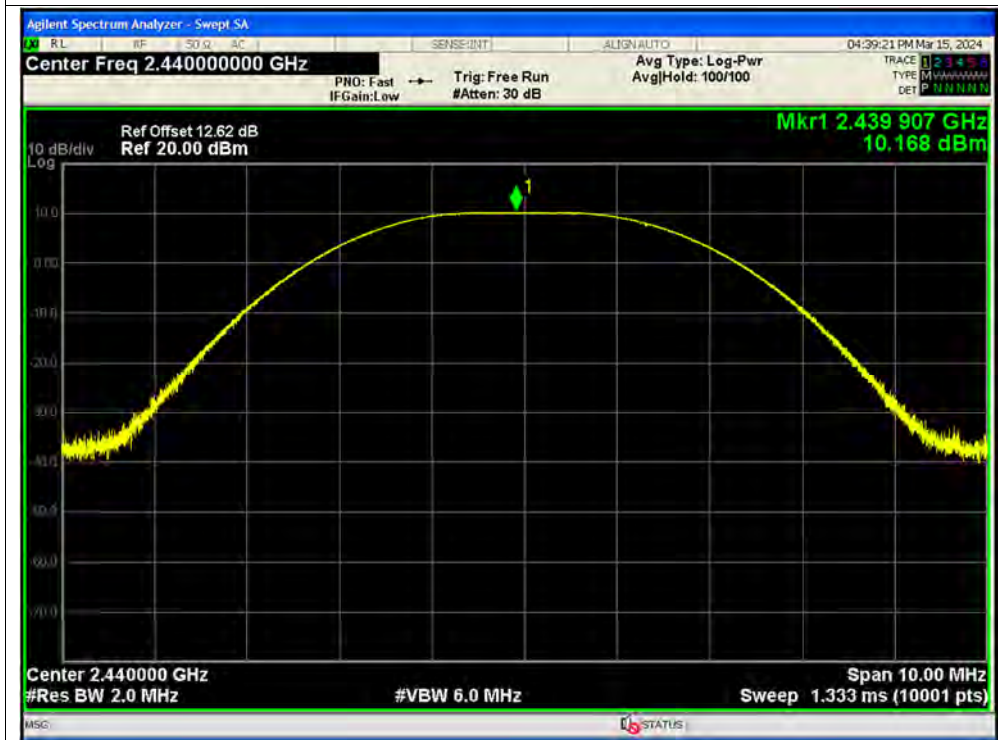


Peak Power NVNT BLE 2M 2404MHz Ant1 SISO





Peak Power NVNT BLE 2M 2440MHz Ant1 SISO



Peak Power NVNT BLE 2M 2478MHz Ant1 SISO



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

Left:

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Conducted Power (dBm)	Total Conducted Power (W)	Limit Conducted (dBm)	Verdict
NVNT	BLE 1M SISO	2402	Ant1	7.93	2.13	10.06	0.01014	30	Pass
NVNT	BLE 1M SISO	2440	Ant1	8.51	2.08	10.59	0.01146	30	Pass
NVNT	BLE 1M SISO	2480	Ant1	8.27	2.08	10.35	0.01084	30	Pass
NVNT	BLE 2M SISO	2404	Ant1	5.11	4.91	10.02	0.01005	30	Pass
NVNT	BLE 2M SISO	2440	Ant1	5.88	4.91	10.79	0.01199	30	Pass
NVNT	BLE 2M SISO	2478	Ant1	5.72	4.98	10.7	0.01175	30	Pass





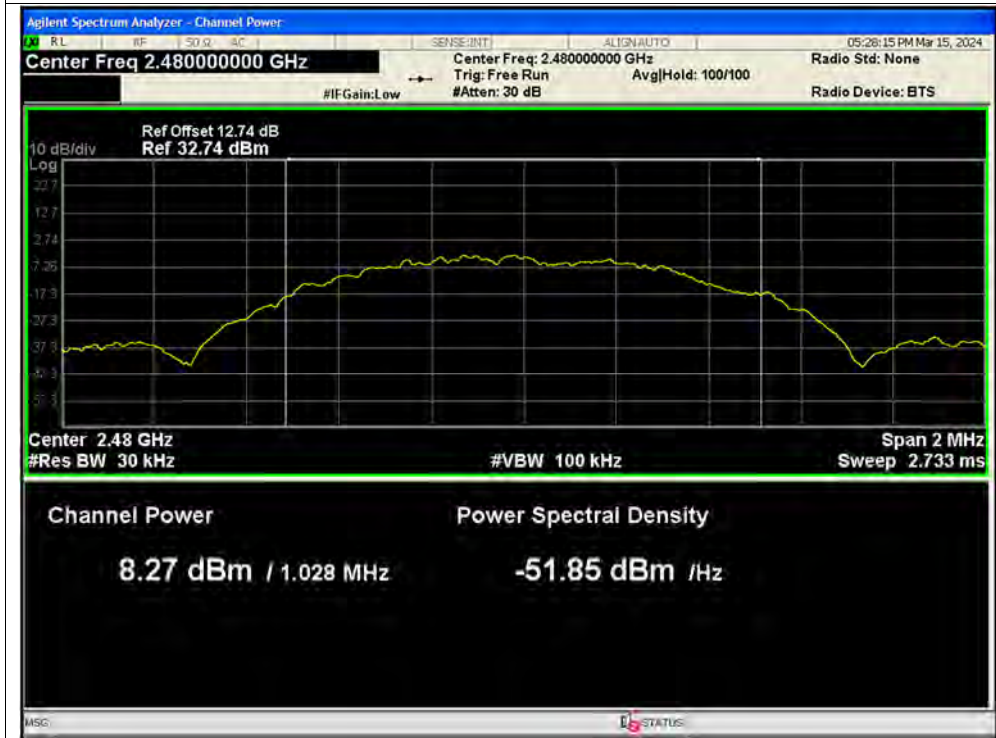
Right:

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Conducted Power (dBm)	Total Conducted Power (W)	Limit Conducted (dBm)	Verdict
NVNT	BLE 1M SISO	2402	Ant1	6.2	2.01	8.21	0.00662	30	Pass
NVNT	BLE 1M SISO	2440	Ant1	7.2	2.13	9.33	0.00857	30	Pass
NVNT	BLE 1M SISO	2480	Ant1	7.9	2.13	10.03	0.01007	30	Pass
NVNT	BLE 2M SISO	2404	Ant1	3.8	4.91	8.71	0.00743	30	Pass
NVNT	BLE 2M SISO	2440	Ant1	4.88	4.91	9.79	0.00953	30	Pass
NVNT	BLE 2M SISO	2478	Ant1	5.6	4.77	10.37	0.01089	30	Pass





### Average Power NVNT BLE 1M 2480MHz Ant1 SISO

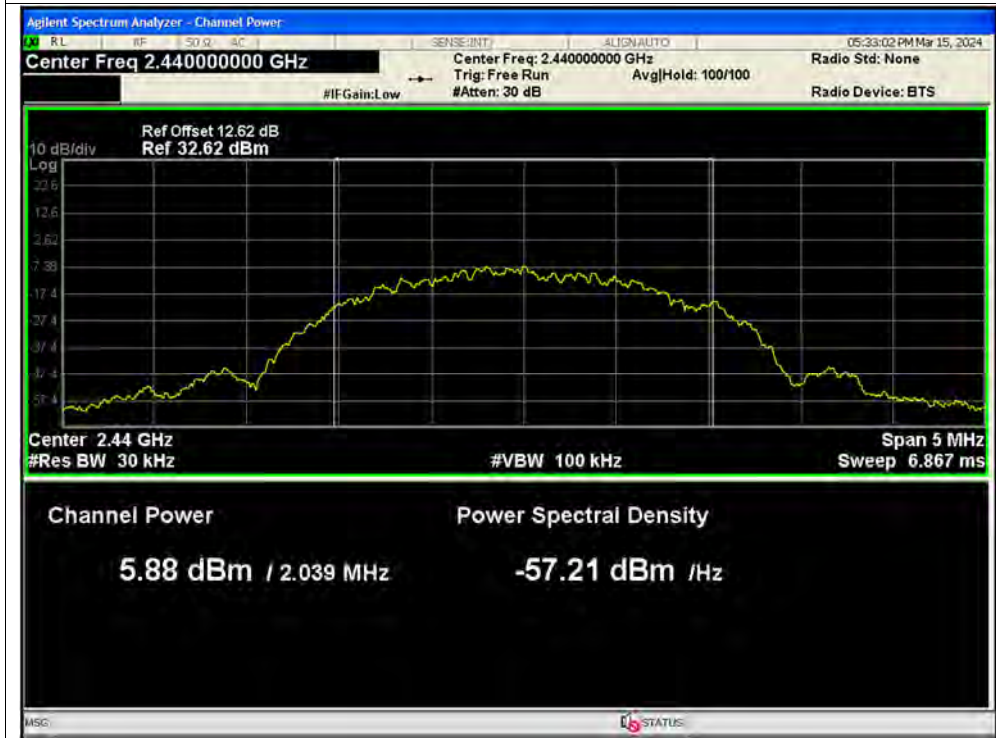


### Average Power NVNT BLE 2M 2404MHz Ant1 SISO





Average Power NVNT BLE 2M 2440MHz Ant1 SISO



Average Power NVNT BLE 2M 2478MHz Ant1 SISO





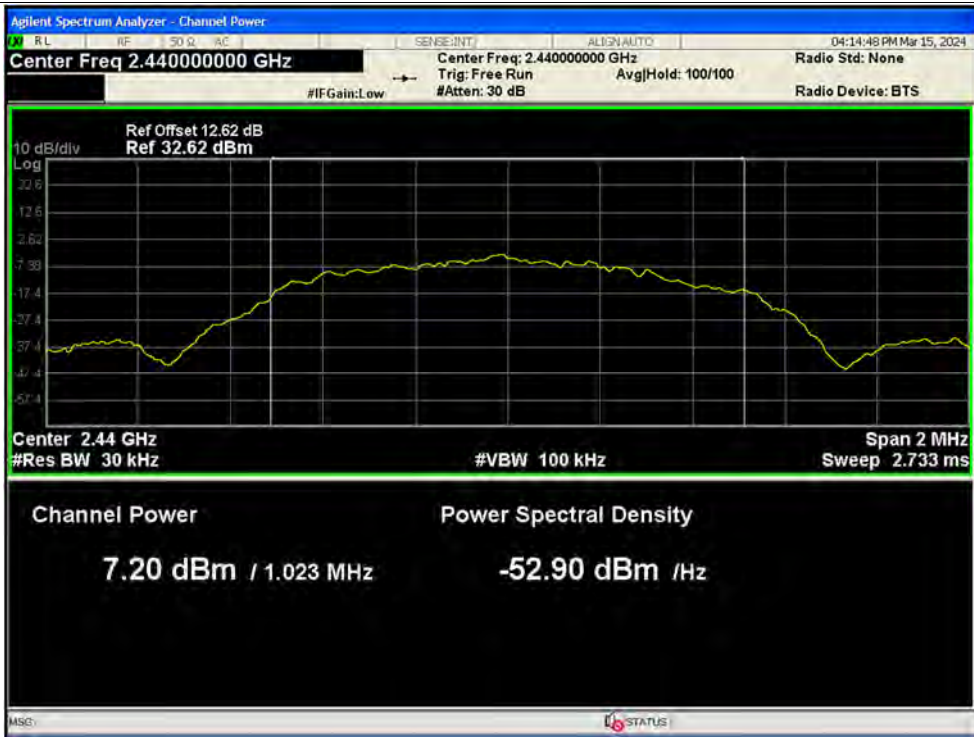
Right

Test Graphs

Average Power NVNT BLE 1M 2402MHz Ant1 SISO

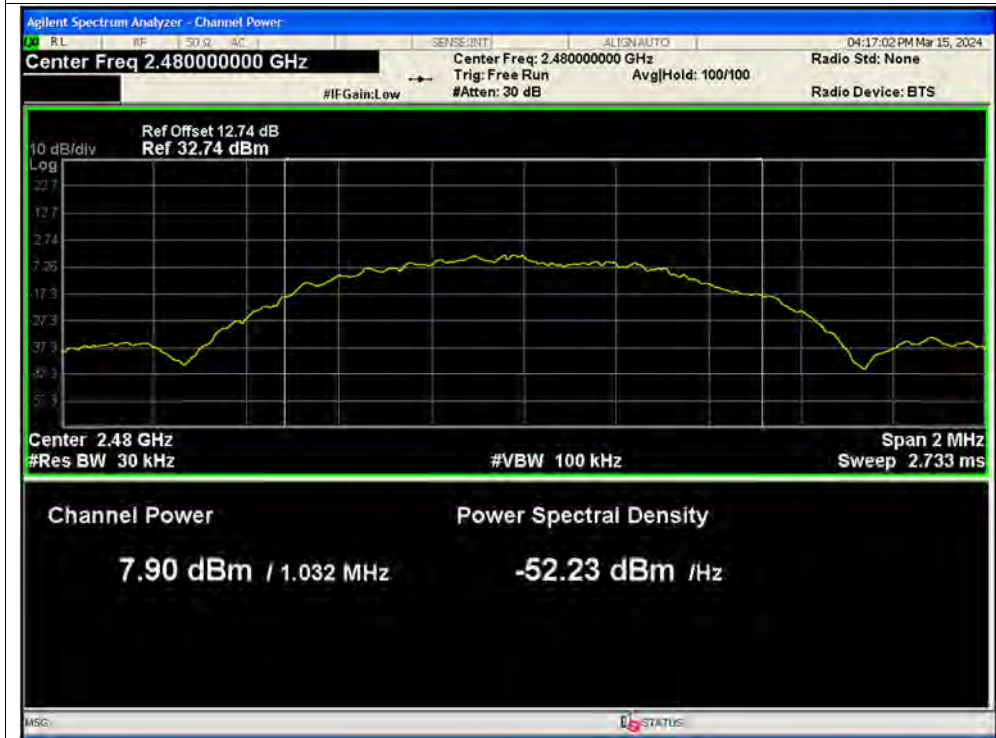


Average Power NVNT BLE 1M 2440MHz Ant1 SISO





Average Power NVNT BLE 1M 2480MHz Ant1 SISO



Average Power NVNT BLE 2M 2404MHz Ant1 SISO





Average Power NVNT BLE 2M 2440MHz Ant1 SISO



Average Power NVNT BLE 2M 2478MHz Ant1 SISO



**A.4. 6 dB Bandwidth****Left:**

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	Ant1	0.666	0.5	Pass
NVNT	BLE 1M	2440	Ant1	0.672	0.5	Pass
NVNT	BLE 1M	2480	Ant1	0.667	0.5	Pass
NVNT	BLE 2M	2402	Ant1	1.143	0.5	Pass
NVNT	BLE 2M	2440	Ant1	1.134	0.5	Pass
NVNT	BLE 2M	2480	Ant1	1.168	0.5	Pass

**Right:**

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	Ant1	0.666	0.5	Pass
NVNT	BLE 1M	2440	Ant1	0.671	0.5	Pass
NVNT	BLE 1M	2480	Ant1	0.679	0.5	Pass
NVNT	BLE 2M	2402	Ant1	1.123	0.5	Pass
NVNT	BLE 2M	2440	Ant1	1.18	0.5	Pass
NVNT	BLE 2M	2480	Ant1	1.171	0.5	Pass

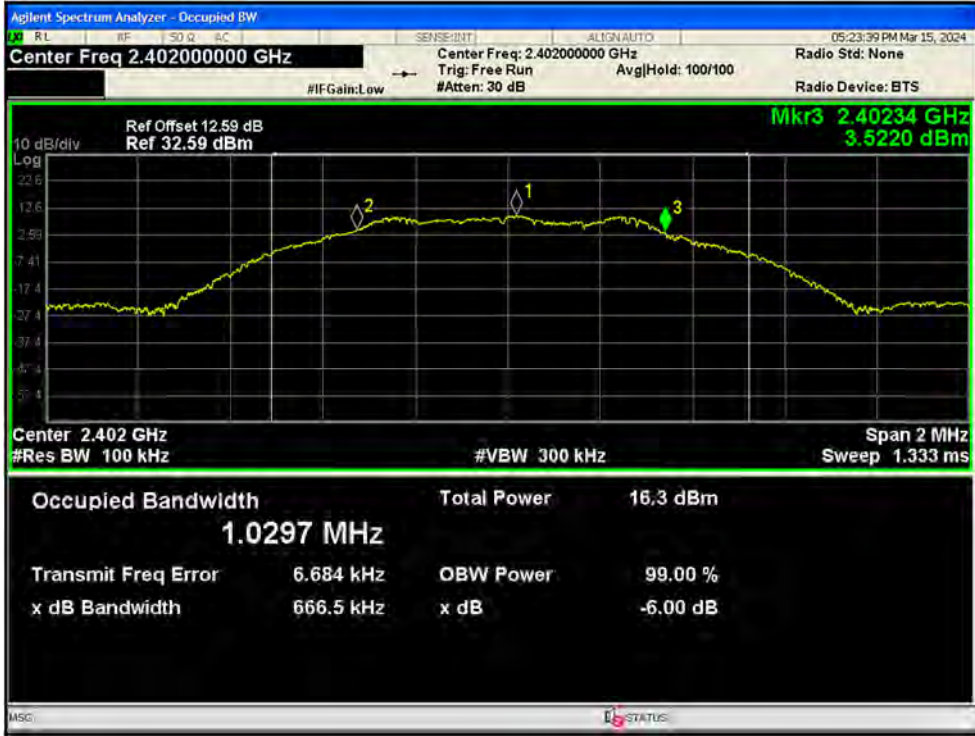




Left

Test Graphs

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1 SISO



-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1 SISO





-6dB Bandwidth NVNT BLE 1M 2480MHz Ant1 SISO



-6dB Bandwidth NVNT BLE 2M 2404MHz Ant1 SISO





-6dB Bandwidth NVNT BLE 2M 2440MHz Ant1 SISO



-6dB Bandwidth NVNT BLE 2M 2478MHz Ant1 SISO





Right

Test Graphs

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1 SISO



-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1 SISO





-6dB Bandwidth NVNT BLE 1M 2480MHz Ant1 SISO



-6dB Bandwidth NVNT BLE 2M 2404MHz Ant1 SISO





-6dB Bandwidth NVNT BLE 2M 2440MHz Ant1 SISO



-6dB Bandwidth NVNT BLE 2M 2478MHz Ant1 SISO

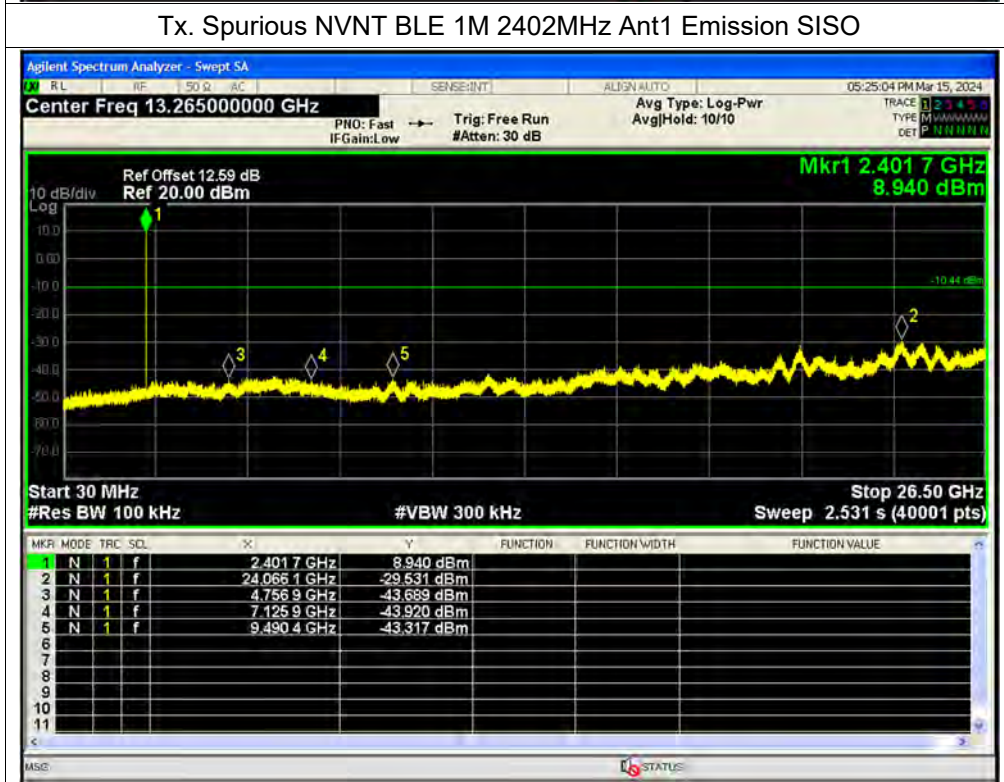


**A.5. Conducted Spurious Emissions****Left:**

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-39.09	-20	Pass
NVNT	BLE 1M	2440	Ant1	-38.88	-20	Pass
NVNT	BLE 1M	2480	Ant1	-39.1	-20	Pass
NVNT	BLE 2M	2402	Ant1	-39.7	-20	Pass
NVNT	BLE 2M	2440	Ant1	-39.71	-20	Pass
NVNT	BLE 2M	2480	Ant1	-39.66	-20	Pass

**Right:**

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-36.64	-20	Pass
NVNT	BLE 1M	2440	Ant1	-38.68	-20	Pass
NVNT	BLE 1M	2480	Ant1	-39.34	-20	Pass
NVNT	BLE 2M	2402	Ant1	-37.36	-20	Pass
NVNT	BLE 2M	2440	Ant1	-38.55	-20	Pass
NVNT	BLE 2M	2480	Ant1	-39.63	-20	Pass



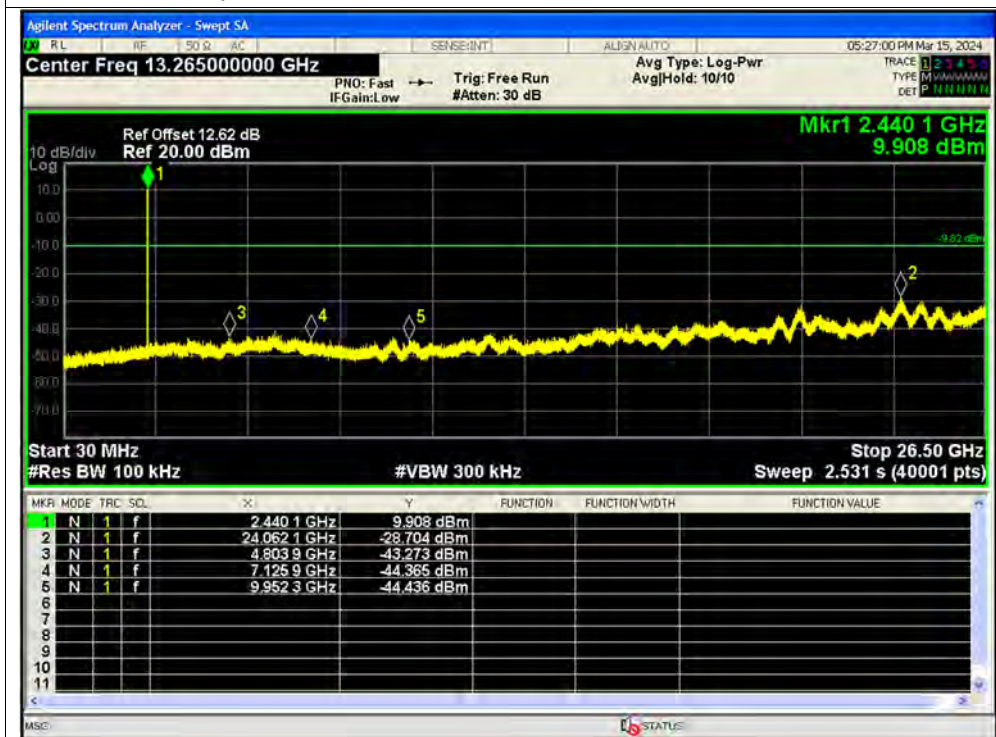




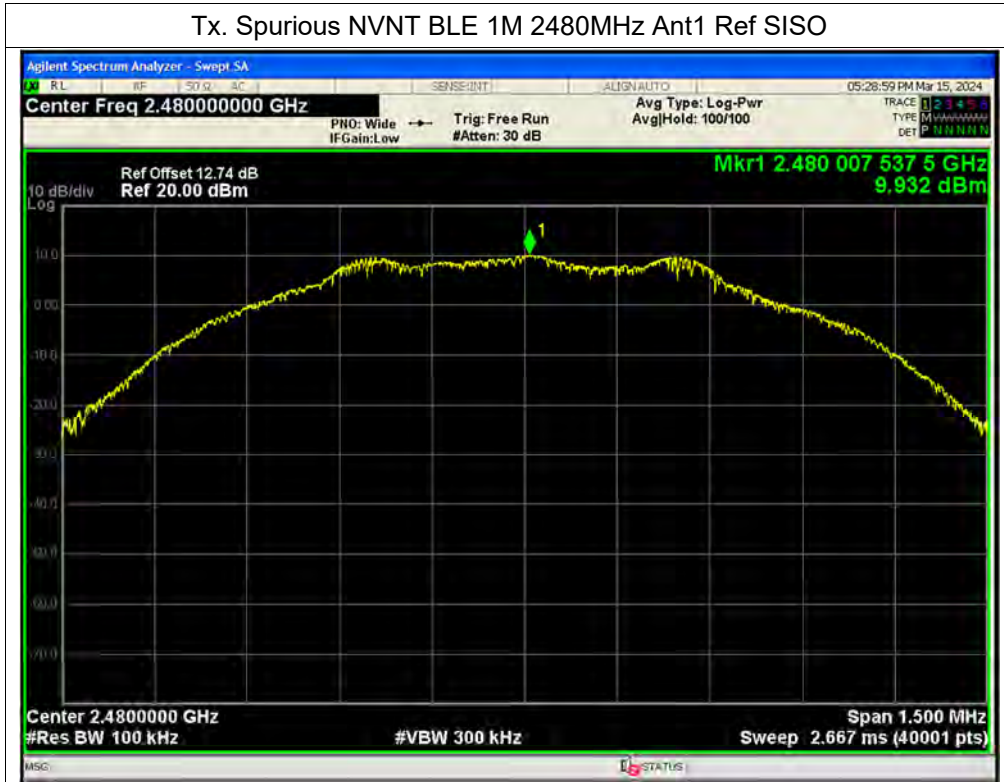
Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref SISO



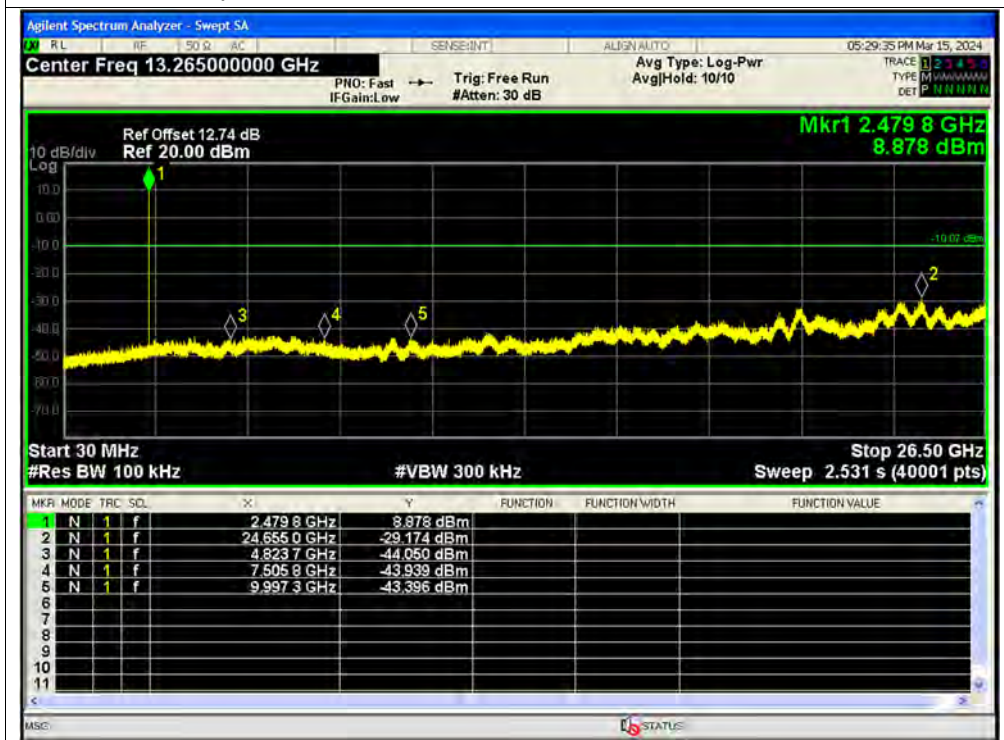
Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission SISO



Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref SISO



Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission SISO

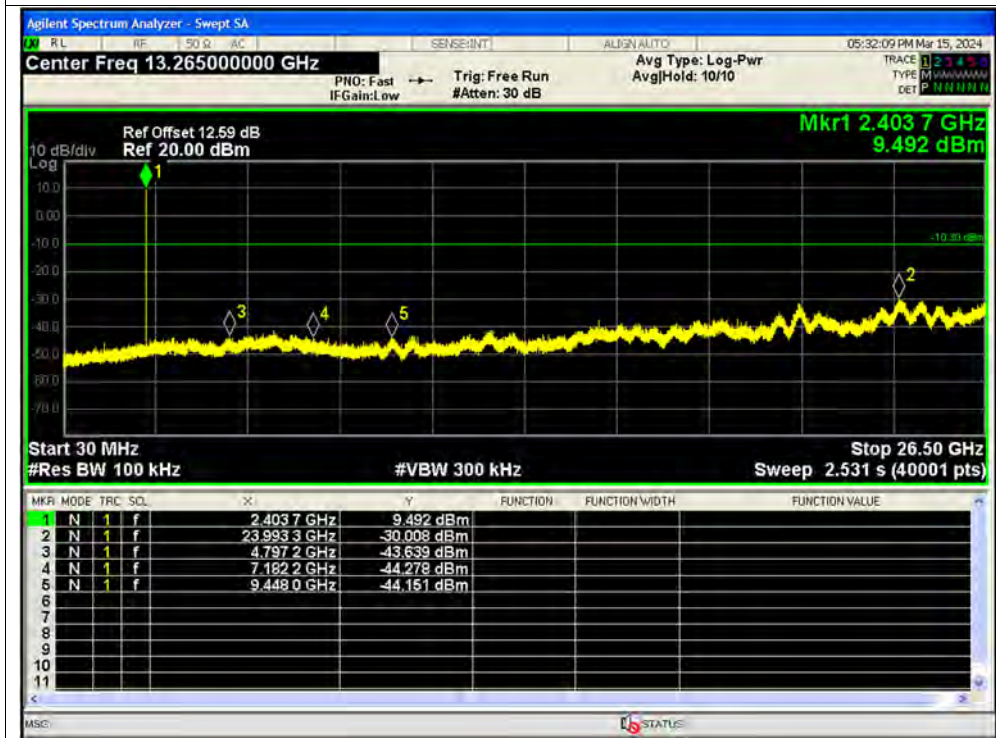




Tx. Spurious NVNT BLE 2M 2404MHz Ant1 Ref SISO



Tx. Spurious NVNT BLE 2M 2404MHz Ant1 Emission SISO

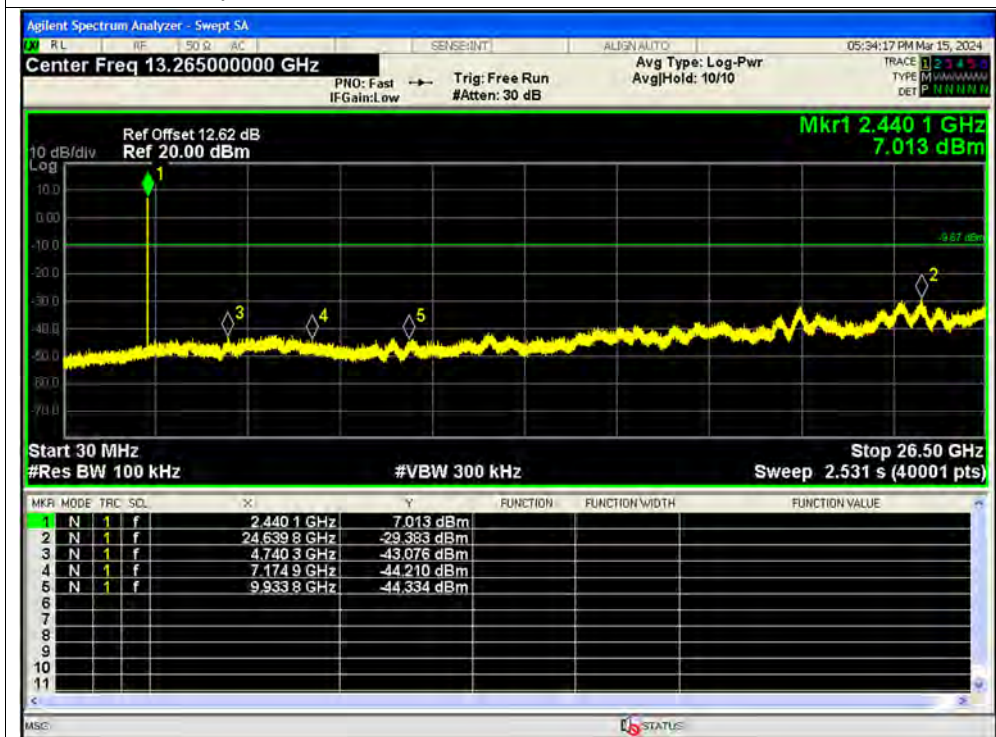




Tx. Spurious NVNT BLE 2M 2440MHz Ant1 Ref SISO



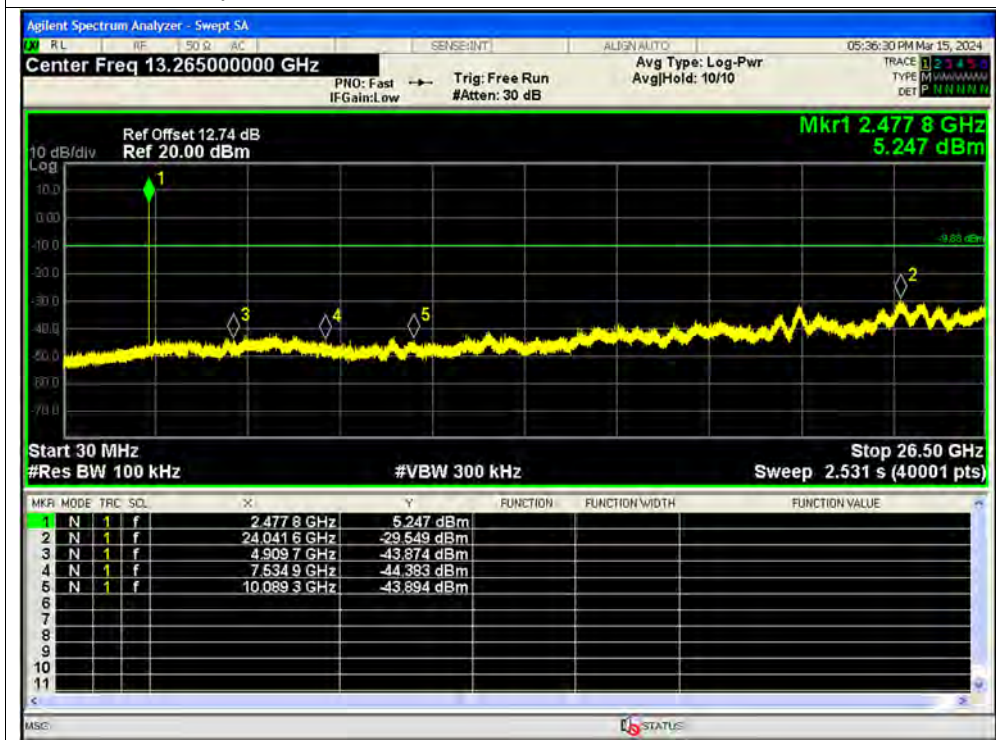
Tx. Spurious NVNT BLE 2M 2440MHz Ant1 Emission SISO

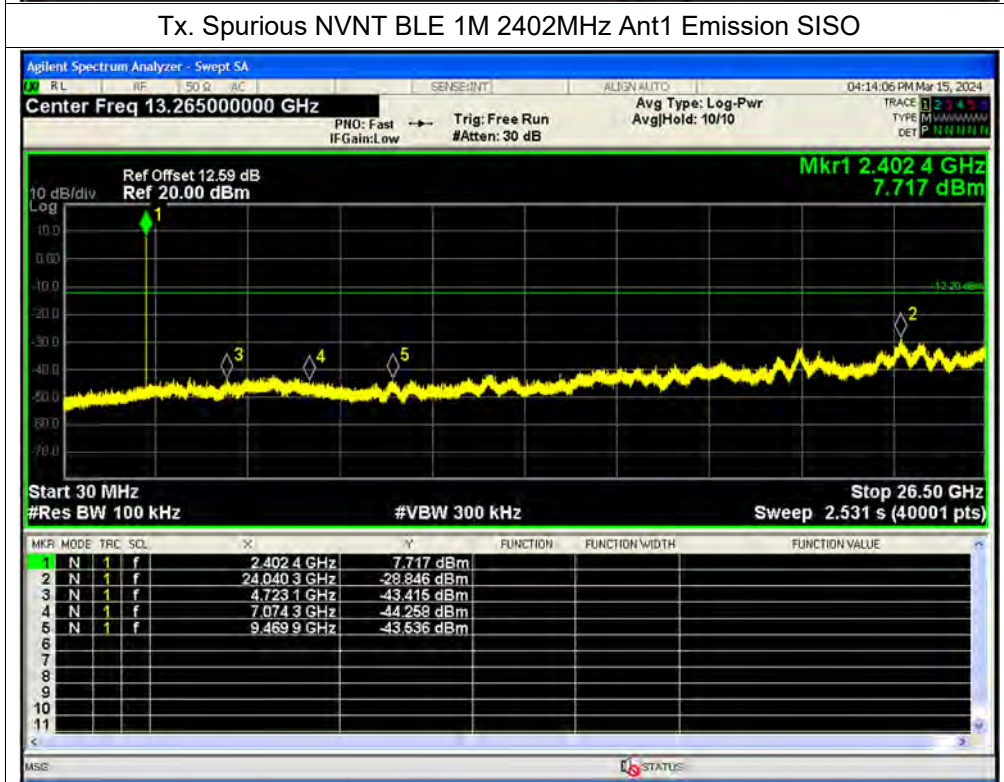


Tx. Spurious NVNT BLE 2M 2478MHz Ant1 Ref SISO



Tx. Spurious NVNT BLE 2M 2478MHz Ant1 Emission SISO



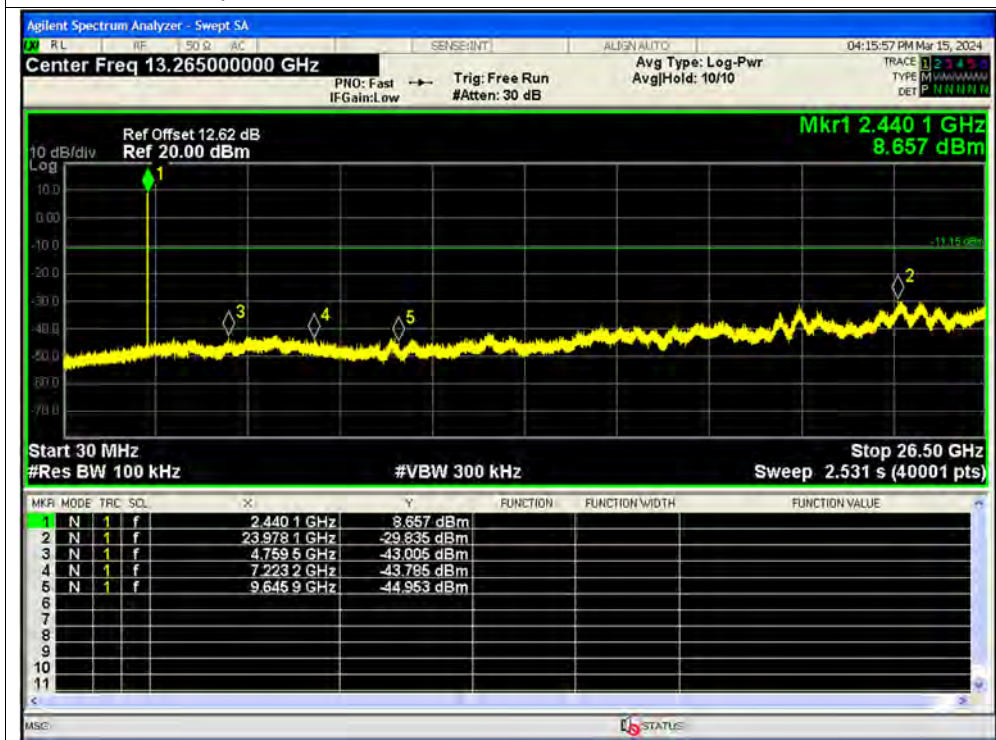




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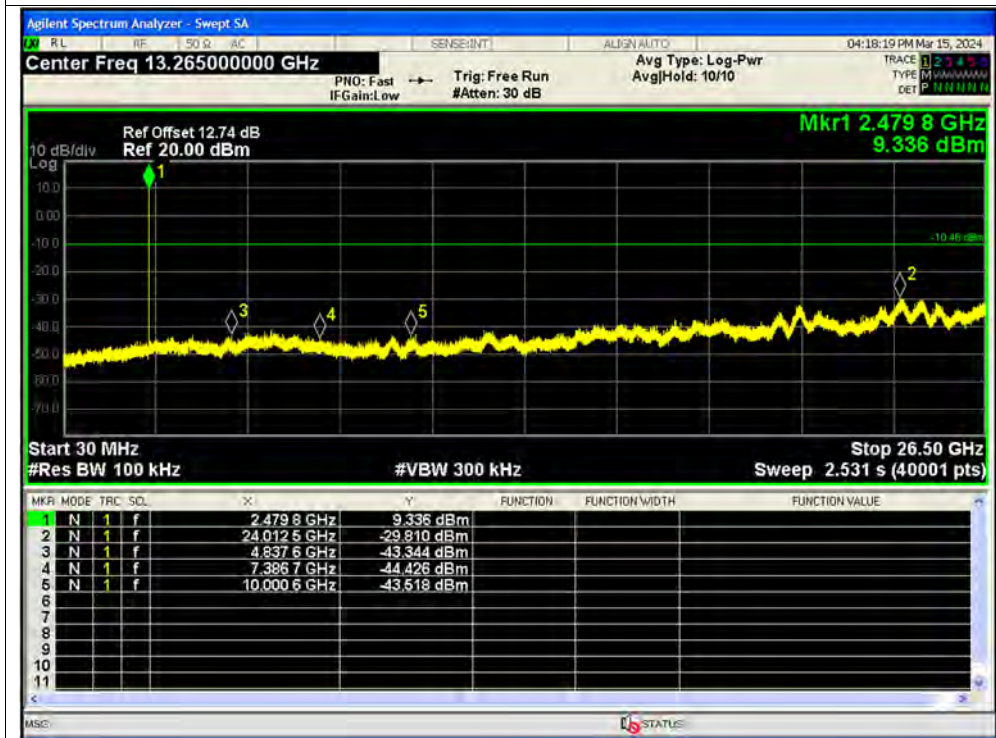
Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission SISO



Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref SISO



Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission SISO



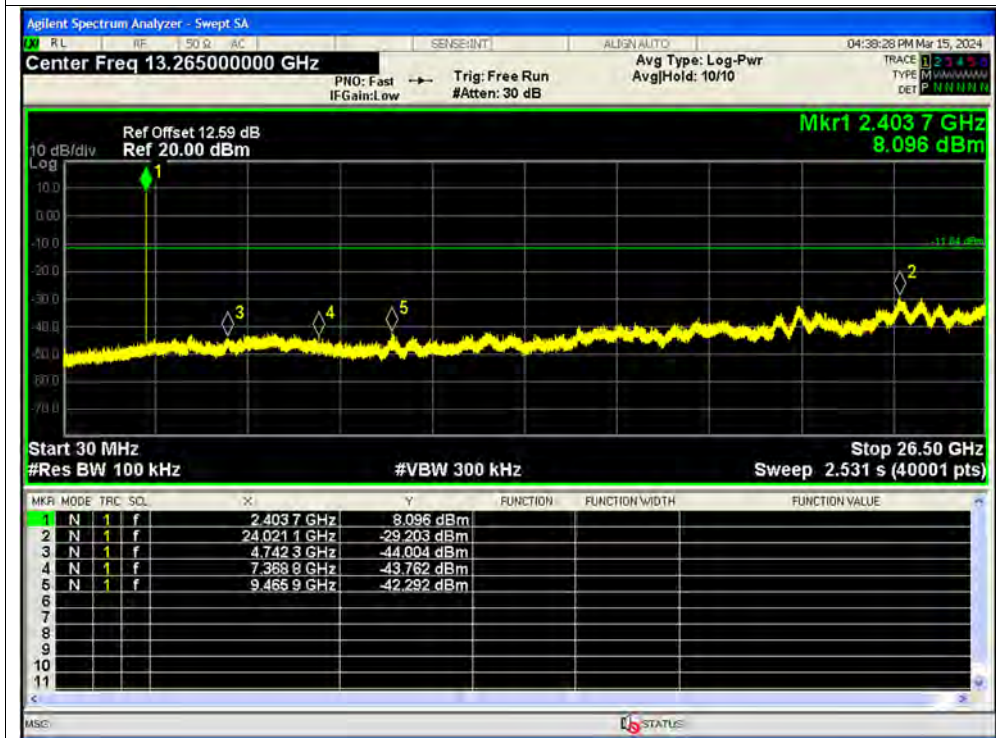




Tx. Spurious NVNT BLE 2M 2404MHz Ant1 Ref SISO



Tx. Spurious NVNT BLE 2M 2404MHz Ant1 Emission SISO

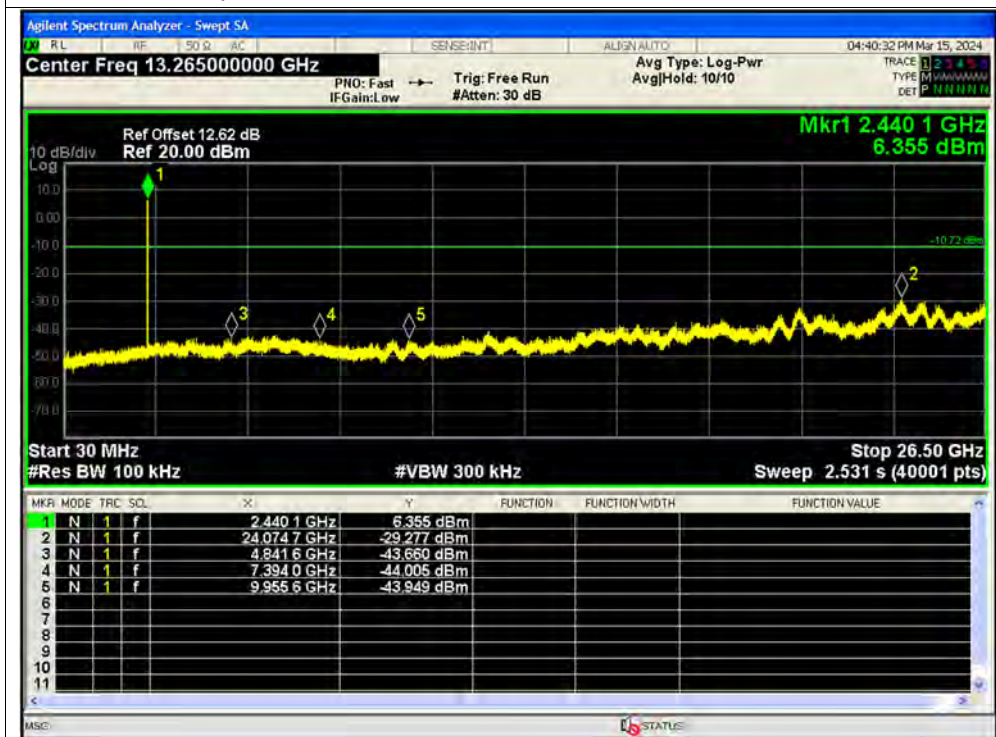




Tx. Spurious NVNT BLE 2M 2440MHz Ant1 Ref SISO



Tx. Spurious NVNT BLE 2M 2440MHz Ant1 Emission SISO

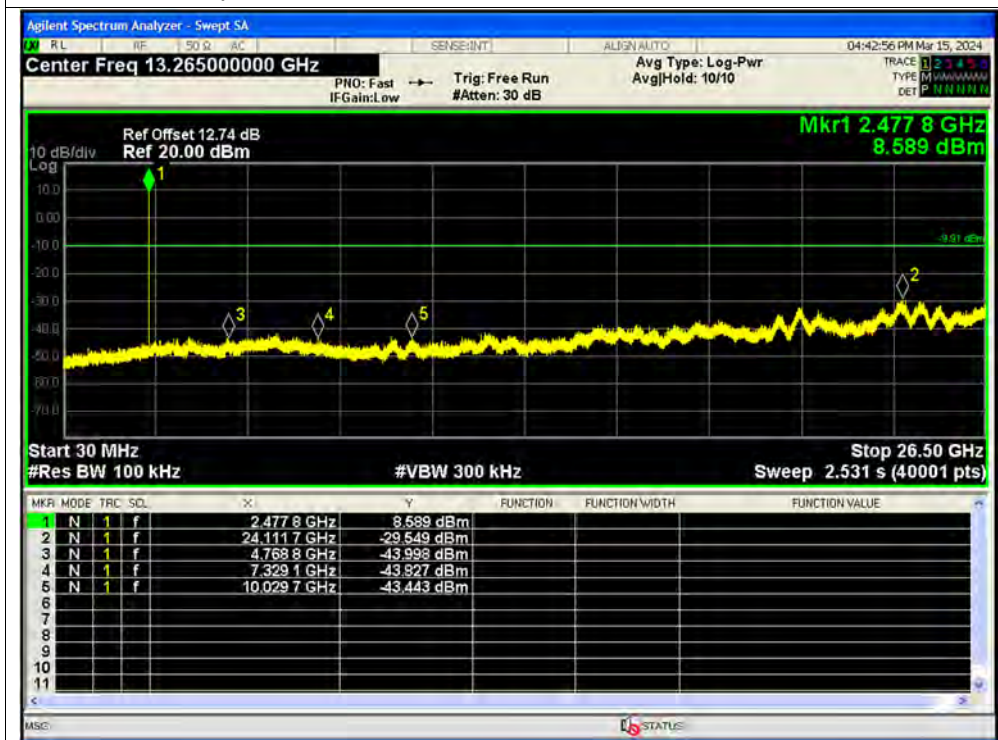




Tx. Spurious NVNT BLE 2M 2478MHz Ant1 Ref SISO



Tx. Spurious NVNT BLE 2M 2478MHz Ant1 Emission SISO

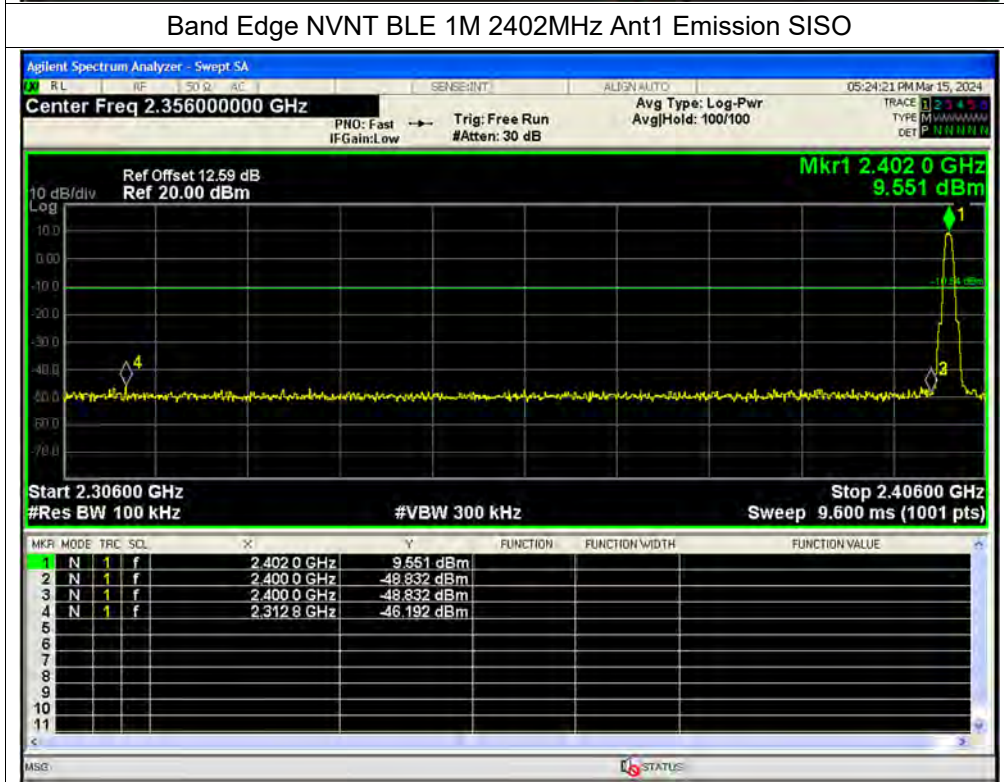
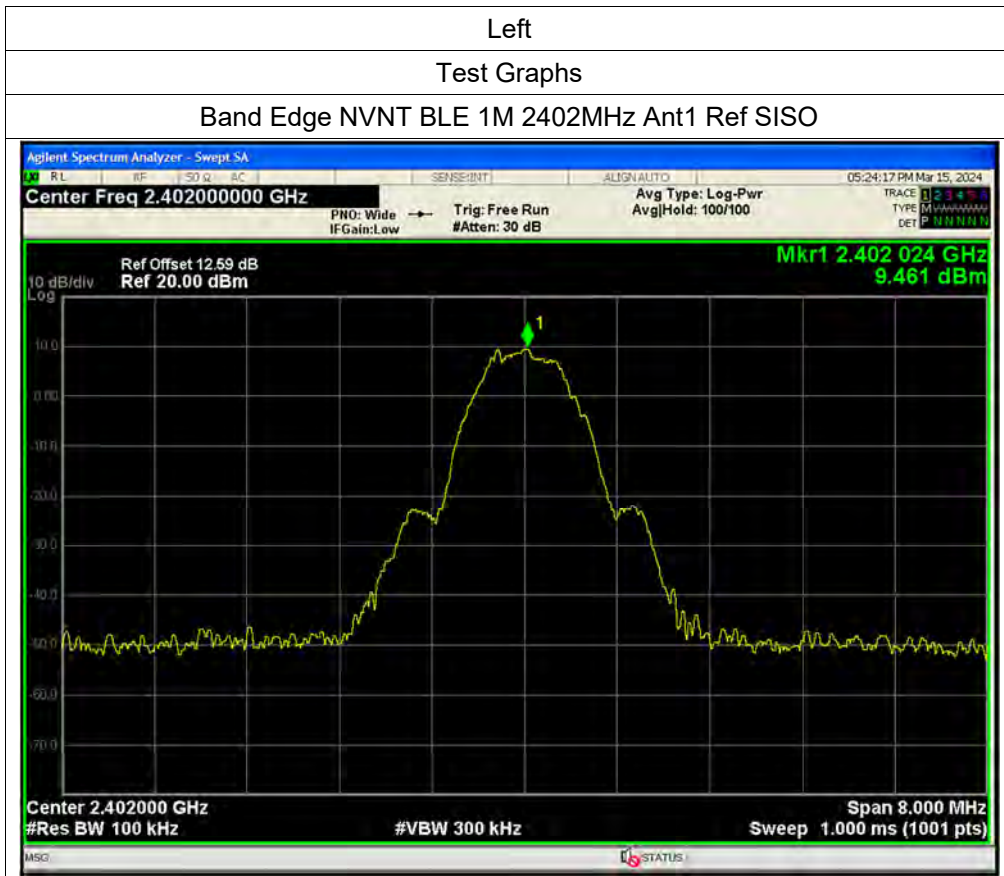


**A.6. Band Edge****Left:**

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-55.65	-20	Pass
NVNT	BLE 1M	2480	Ant1	-55.51	-20	Pass
NVNT	BLE 2M	2402	Ant1	-55.25	-20	Pass
NVNT	BLE 2M	2480	Ant1	-55.23	-20	Pass

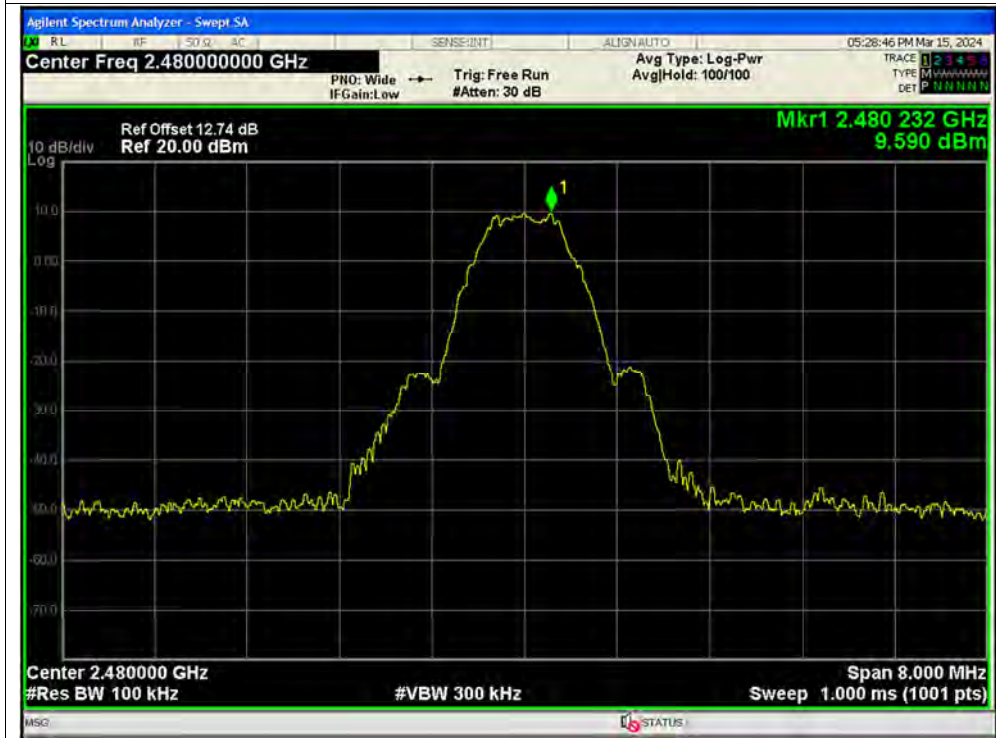
**Right:**

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-54.35	-20	Pass
NVNT	BLE 1M	2480	Ant1	-55.99	-20	Pass
NVNT	BLE 2M	2402	Ant1	-54.42	-20	Pass
NVNT	BLE 2M	2480	Ant1	-54.32	-20	Pass

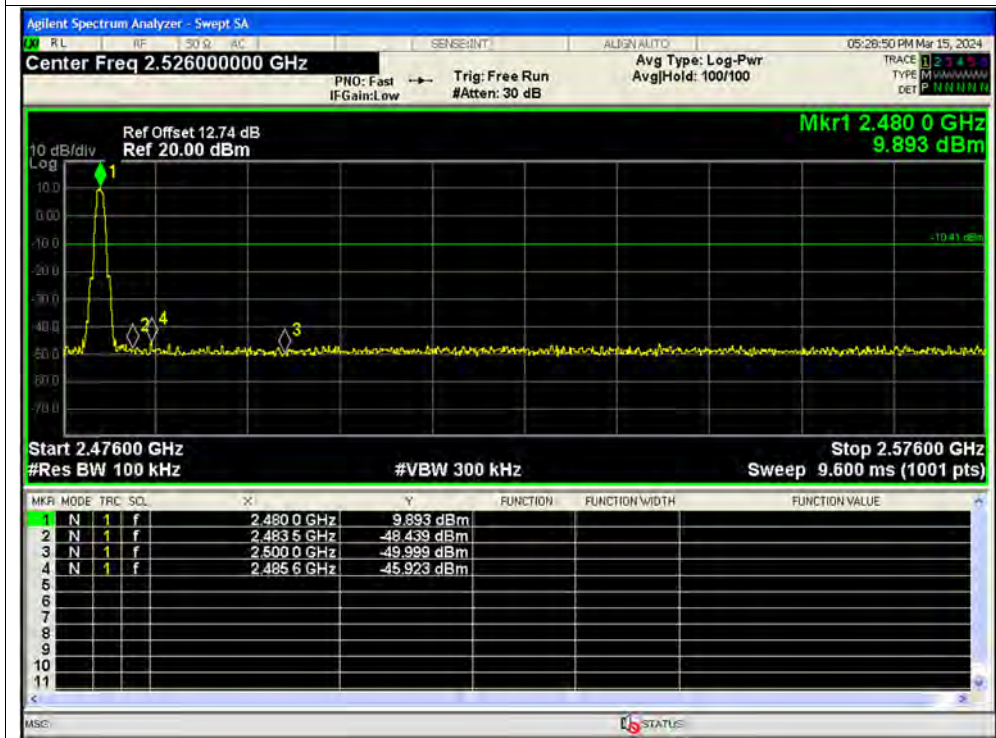




Band Edge NVNT BLE 1M 2480MHz Ant1 Ref SISO



Band Edge NVNT BLE 1M 2480MHz Ant1 Emission SISO

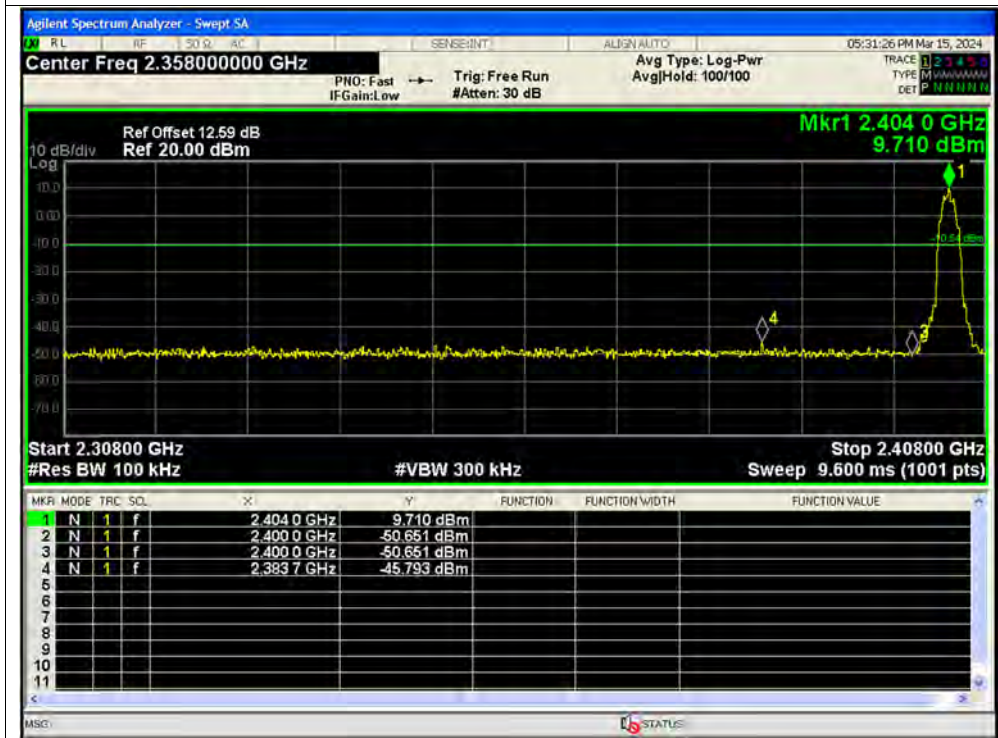




Band Edge NVNT BLE 2M 2404MHz Ant1 Ref SISO



Band Edge NVNT BLE 2M 2404MHz Ant1 Emission SISO

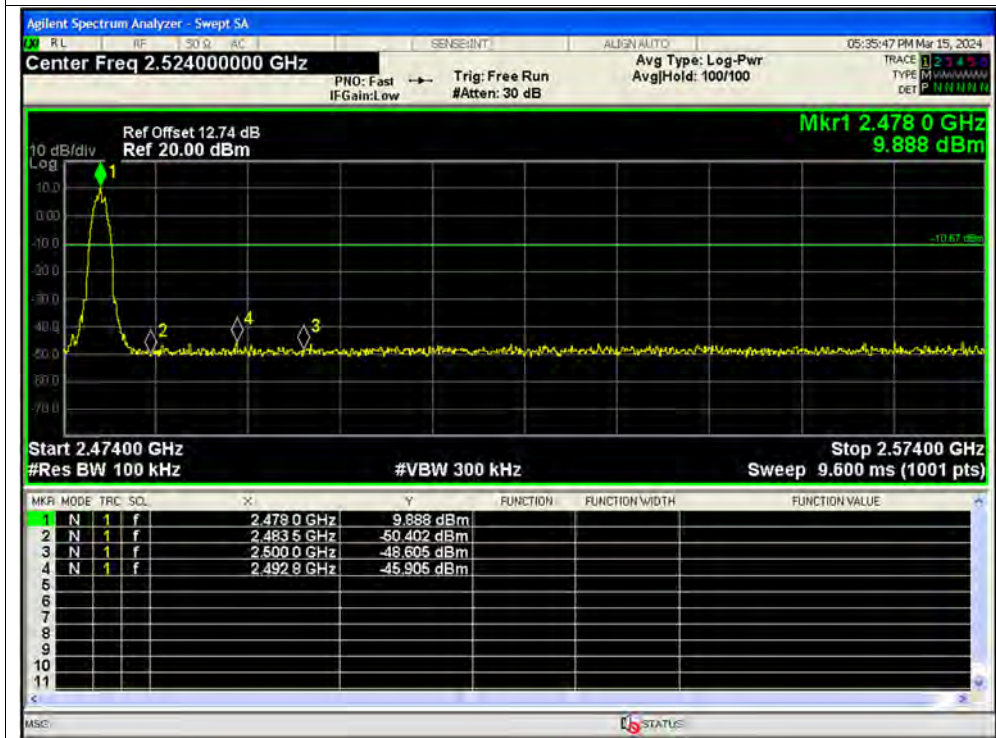




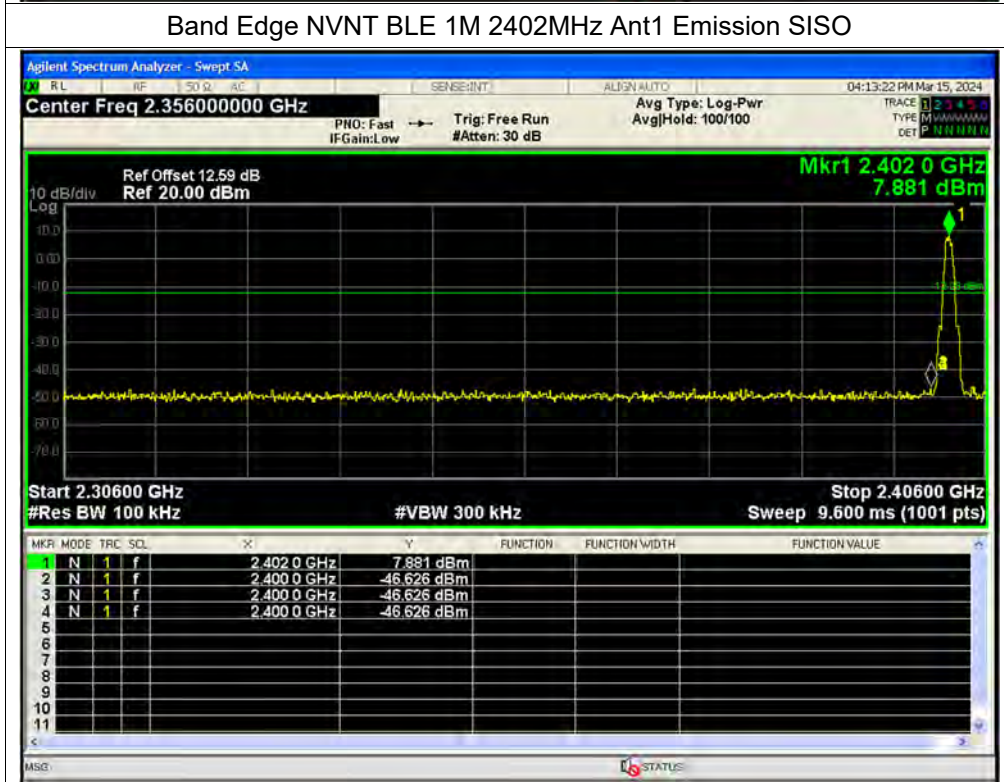
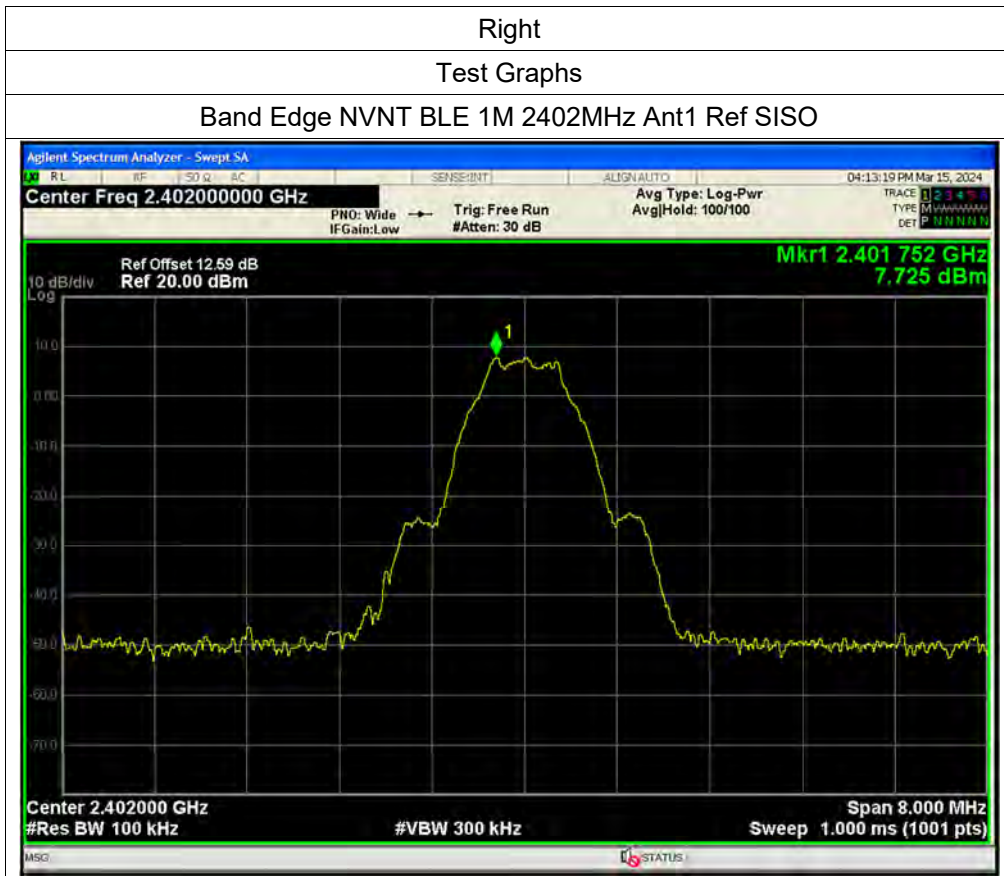
Band Edge NVNT BLE 2M 2478MHz Ant1 Ref SISO



Band Edge NVNT BLE 2M 2478MHz Ant1 Emission SISO





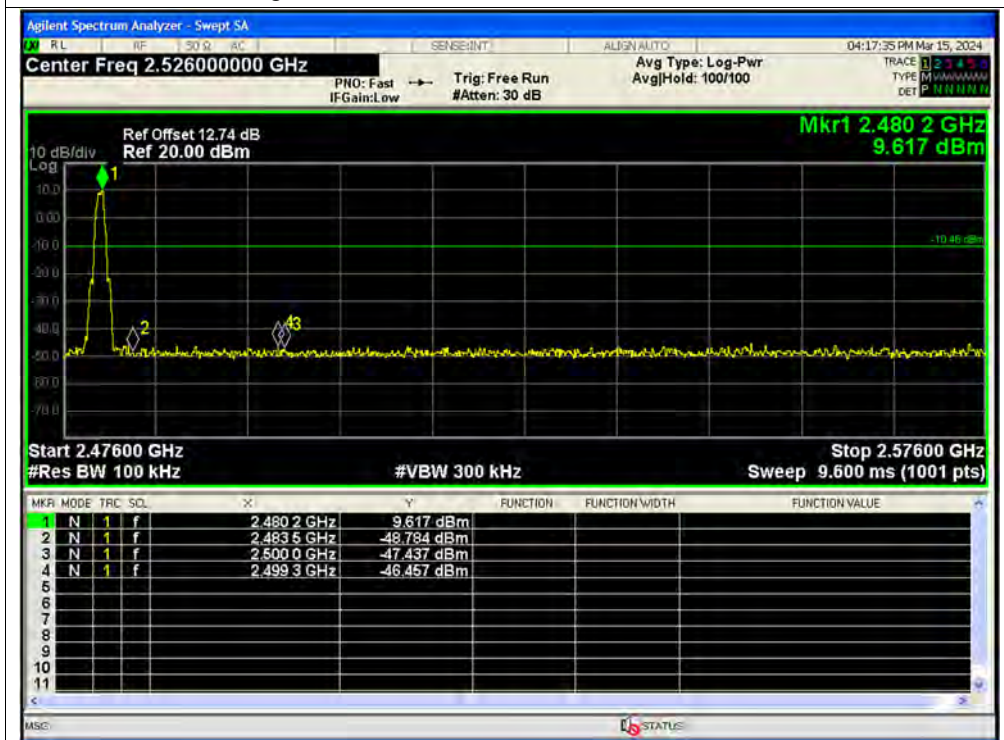




Band Edge NVNT BLE 1M 2480MHz Ant1 Ref SISO



Band Edge NVNT BLE 1M 2480MHz Ant1 Emission SISO

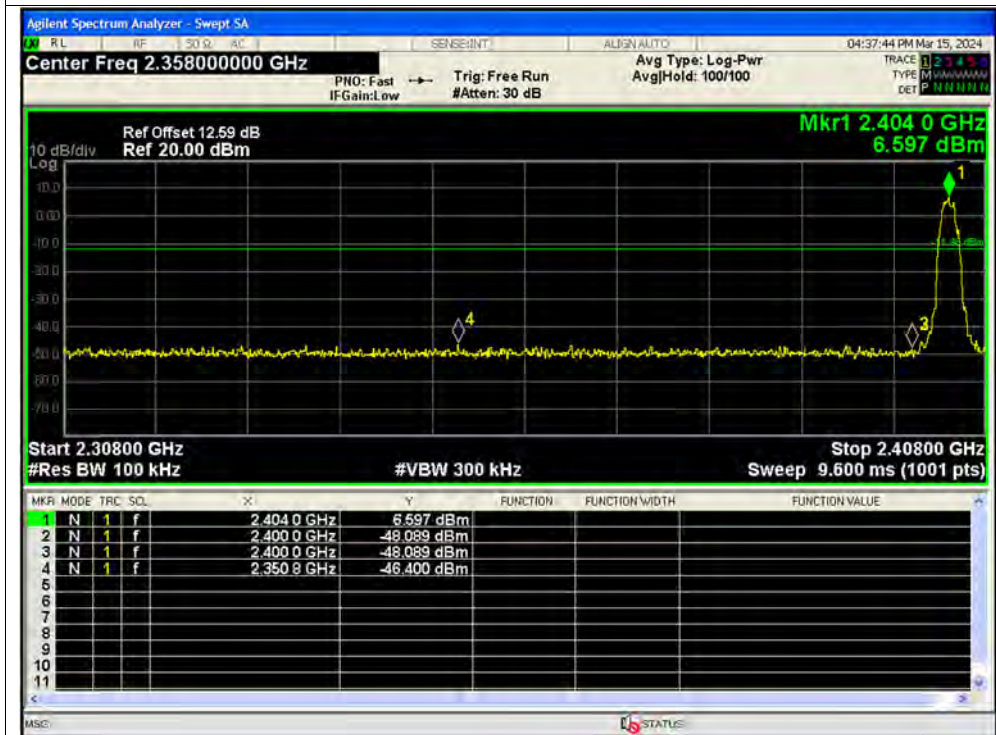




Band Edge NVNT BLE 2M 2404MHz Ant1 Ref SISO



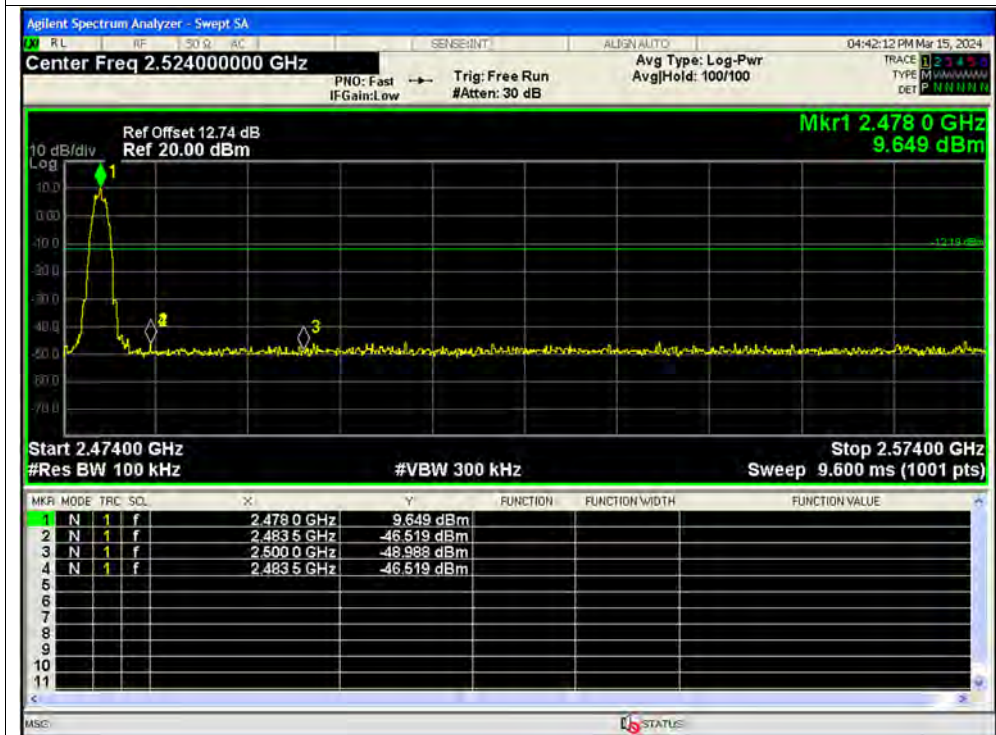
Band Edge NVNT BLE 2M 2404MHz Ant1 Emission SISO



Band Edge NVNT BLE 2M 2478MHz Ant1 Ref SISO



Band Edge NVNT BLE 2M 2478MHz Ant1 Emission SISO



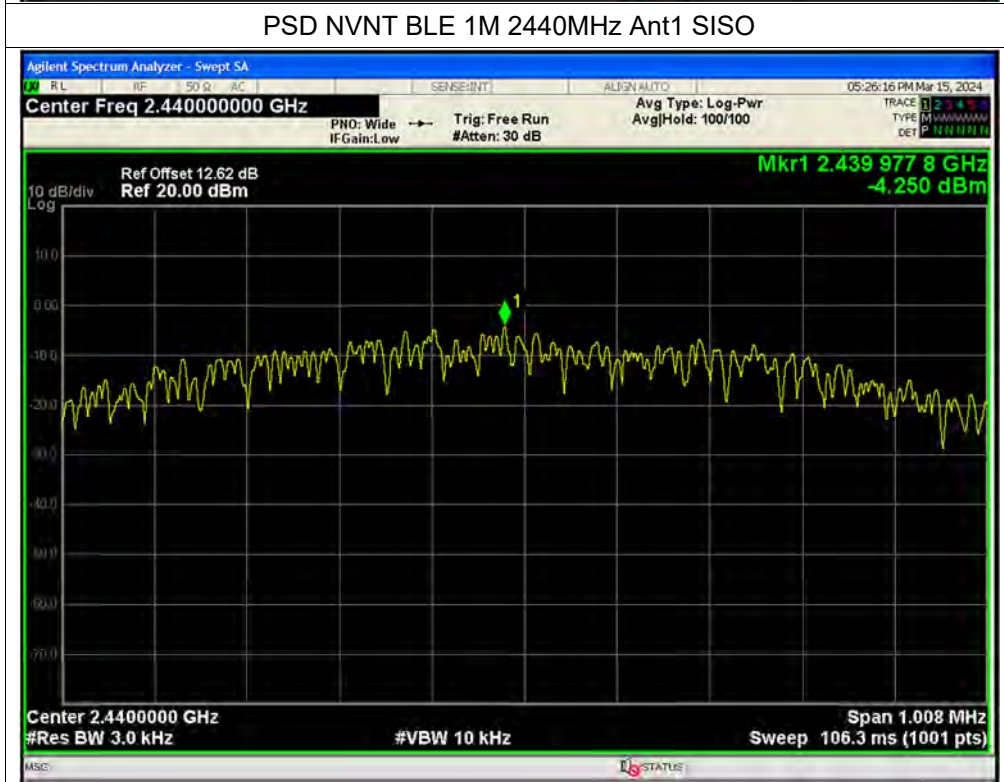
**A.7. Power Spectral Density**

Left:

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Duty Factor (dB)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1M SISO	2402	Ant1	-4.68	0	-4.68	8	Pass
NVNT	BLE 1M SISO	2440	Ant1	-4.25	0	-4.25	8	Pass
NVNT	BLE 1M SISO	2480	Ant1	-4.57	0	-4.57	8	Pass
NVNT	BLE 2M SISO	2404	Ant1	-7.6	0	-7.6	8	Pass
NVNT	BLE 2M SISO	2440	Ant1	-6.92	0	-6.92	8	Pass
NVNT	BLE 2M SISO	2478	Ant1	-7.17	0	-7.17	8	Pass

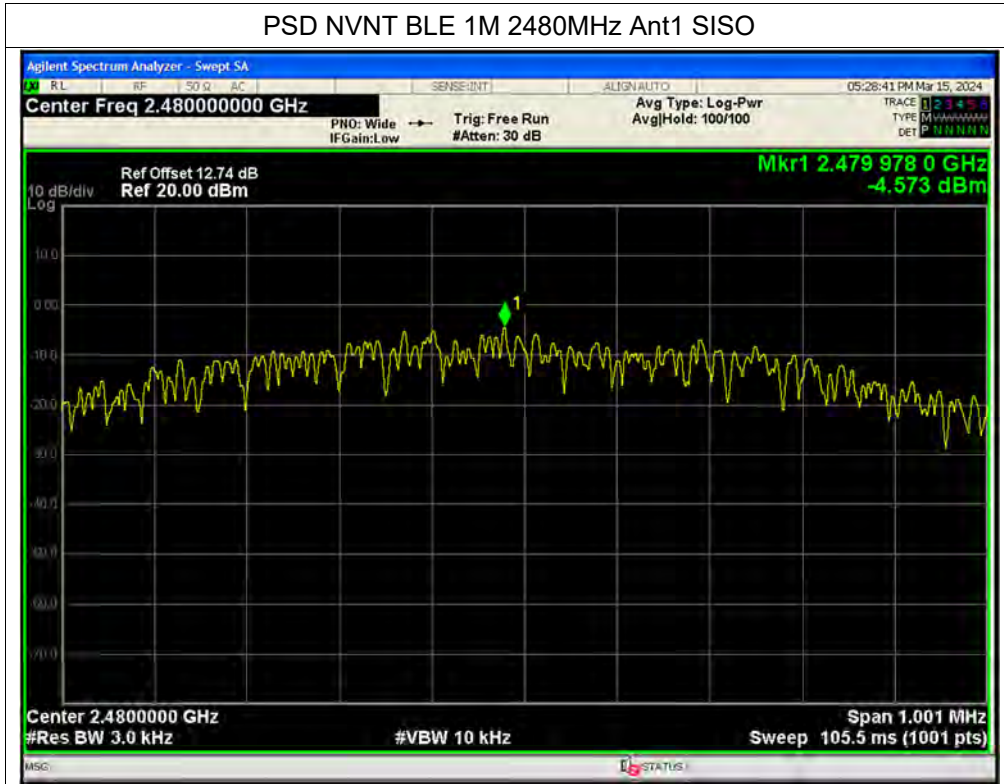
Right:

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Duty Factor (dB)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1M SISO	2402	Ant1	-6.64	0	-6.64	8	Pass
NVNT	BLE 1M SISO	2440	Ant1	-5.57	0	-5.57	8	Pass
NVNT	BLE 1M SISO	2480	Ant1	-4.84	0	-4.84	8	Pass
NVNT	BLE 2M SISO	2404	Ant1	-8.55	0	-8.55	8	Pass
NVNT	BLE 2M SISO	2440	Ant1	-7.89	0	-7.89	8	Pass
NVNT	BLE 2M SISO	2478	Ant1	-7.34	0	-7.34	8	Pass

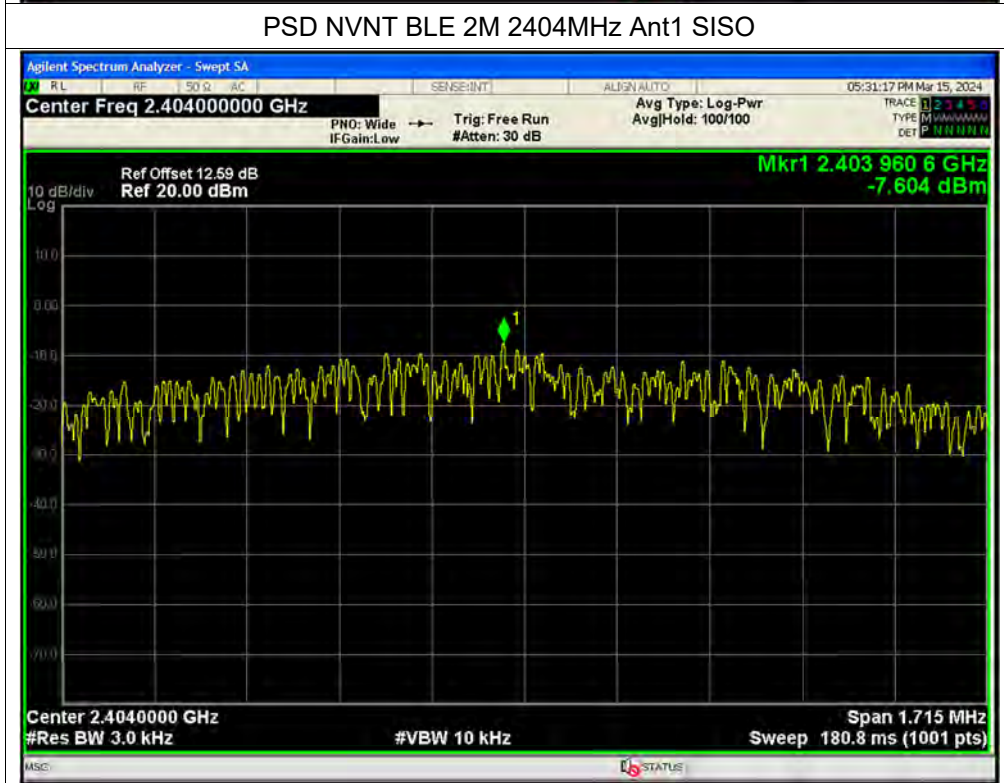




PSD NVNT BLE 1M 2480MHz Ant1 SISO

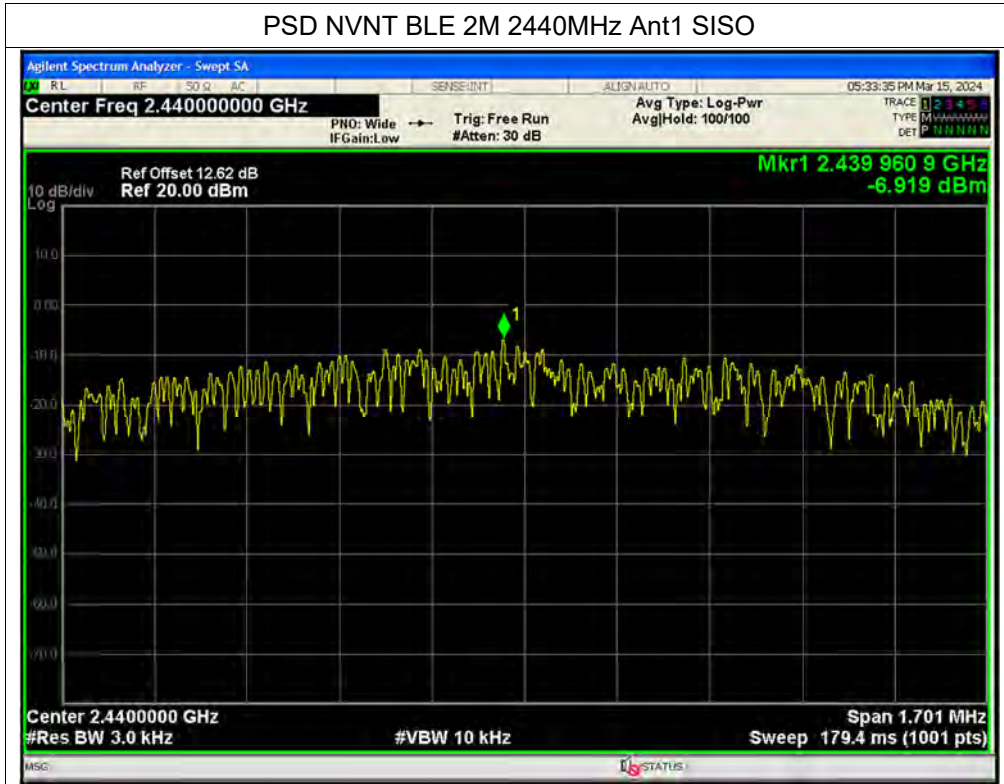


PSD NVNT BLE 2M 2404MHz Ant1 SISO

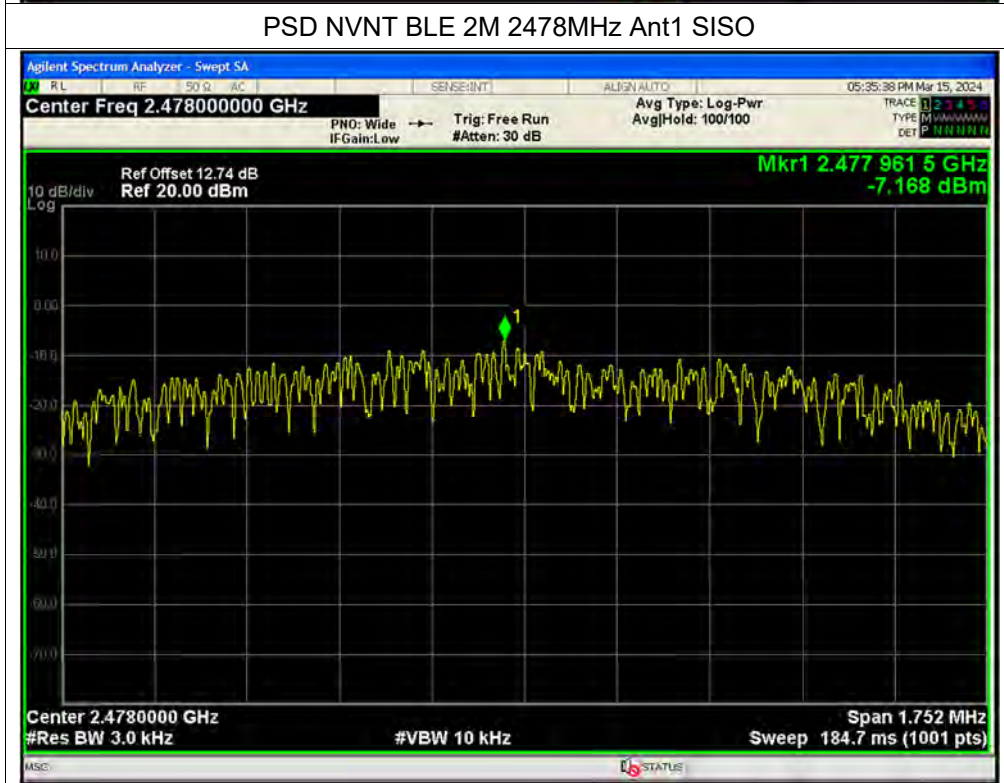




PSD NVNT BLE 2M 2440MHz Ant1 SISO



PSD NVNT BLE 2M 2478MHz Ant1 SISO

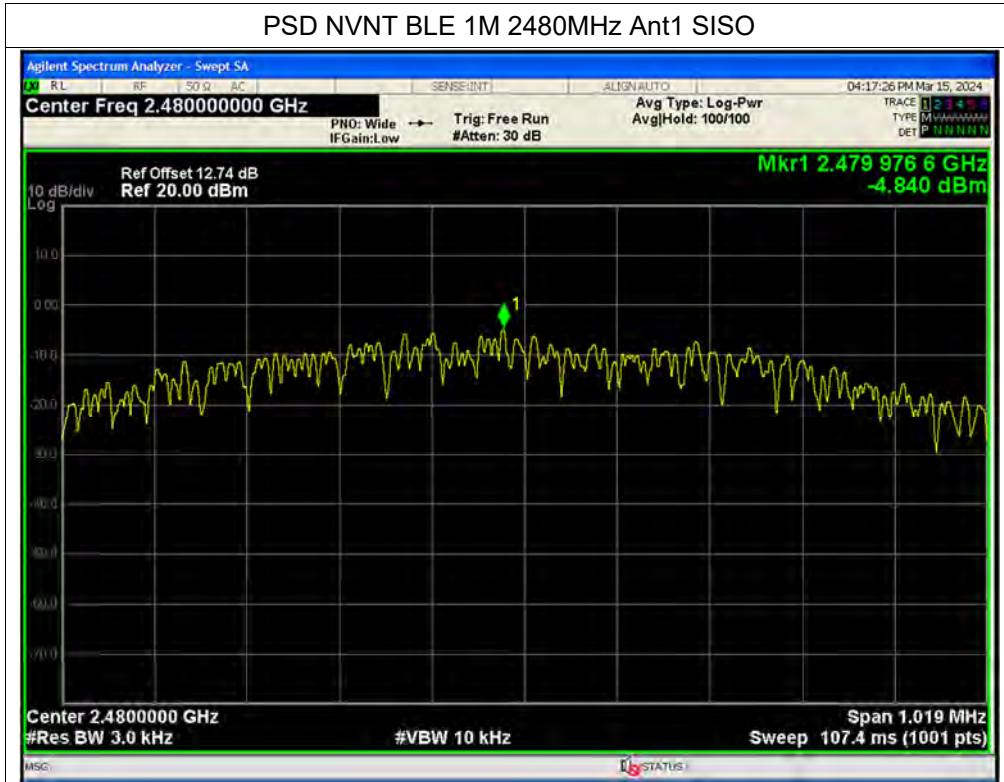




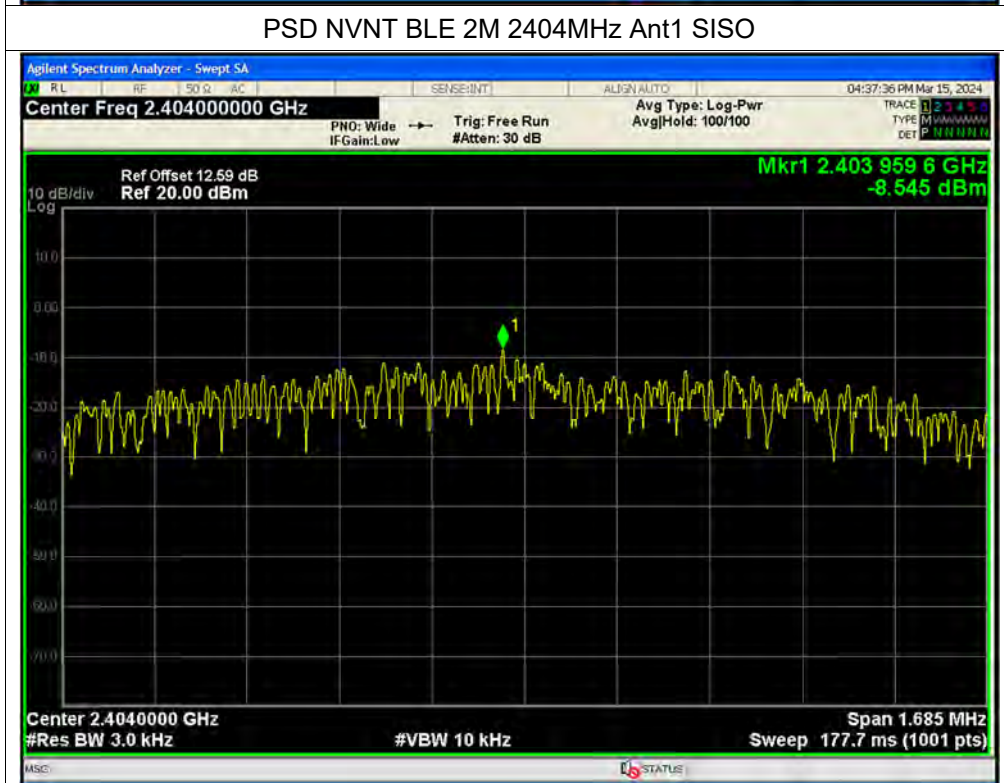




PSD NVNT BLE 1M 2480MHz Ant1 SISO

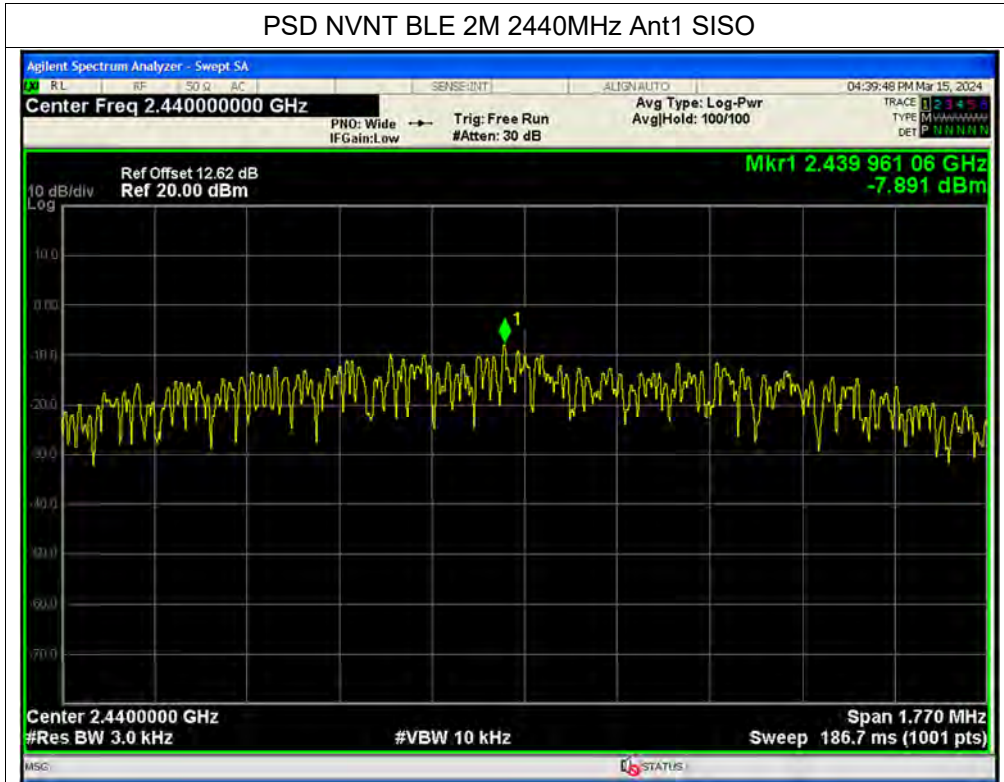


PSD NVNT BLE 2M 2404MHz Ant1 SISO

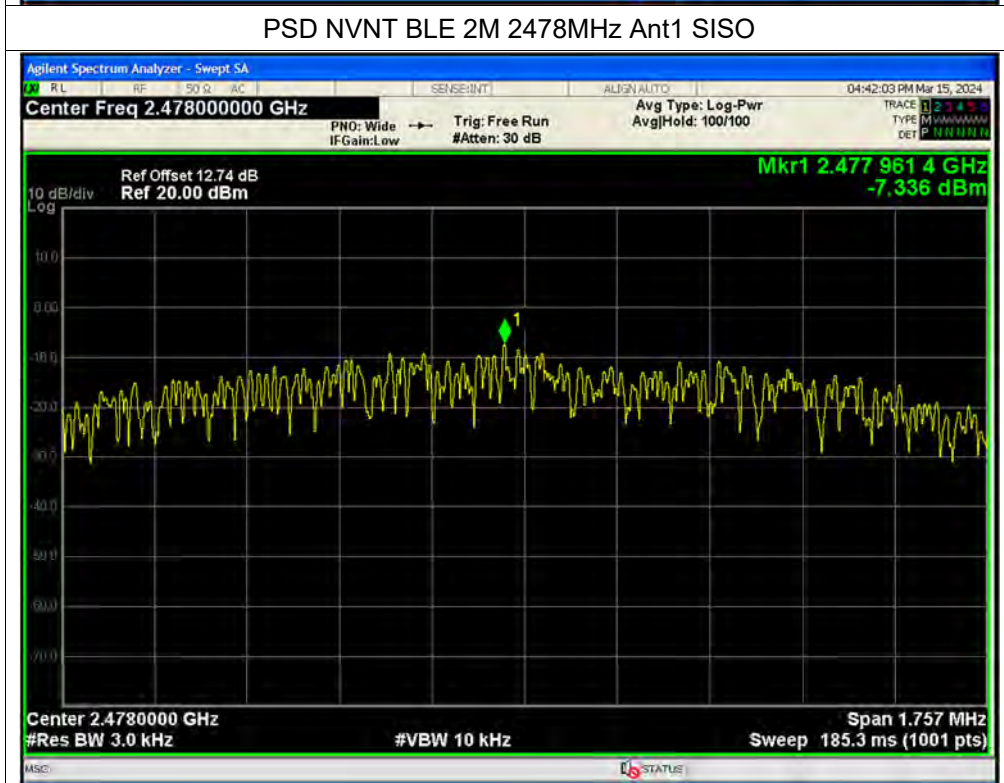




PSD NVNT BLE 2M 2440MHz Ant1 SISO



PSD NVNT BLE 2M 2478MHz Ant1 SISO





## A.8. Conducted Emission

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

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

### A. Test Setup:

Test Mode: EUT + PC + PC Adapter + BT TX

Test voltage: AC 120V/60Hz

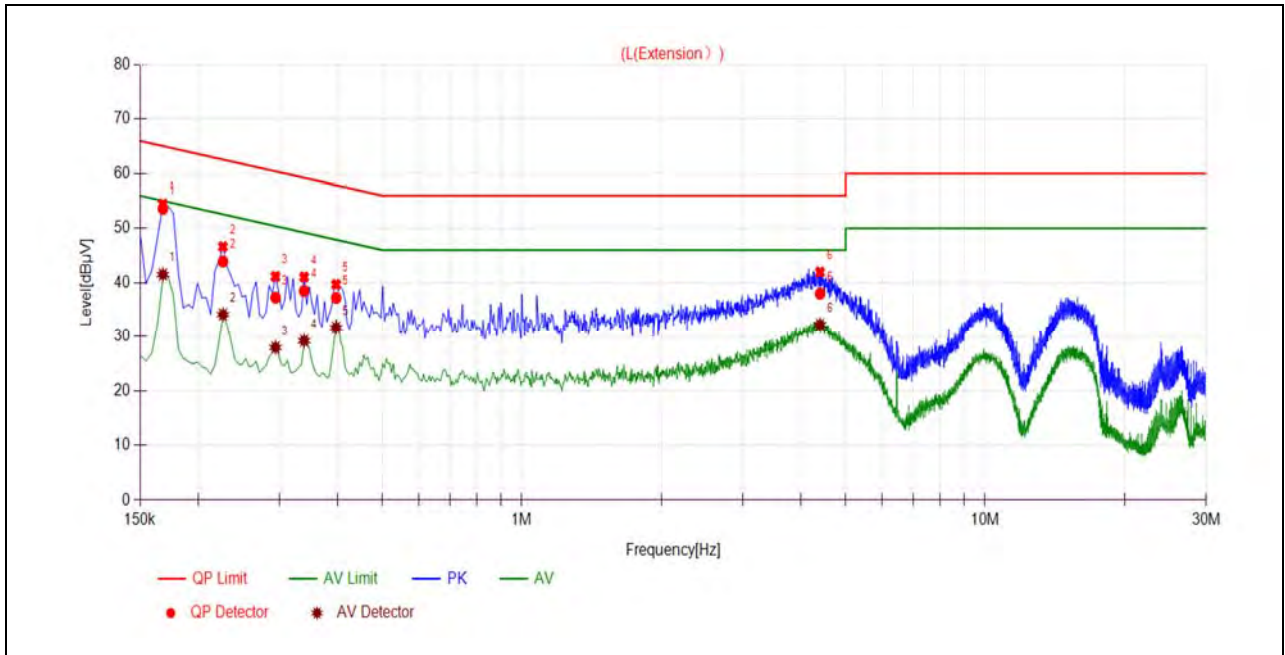
The measurement results are obtained as below:

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

$U_R$ : Receiver Reading

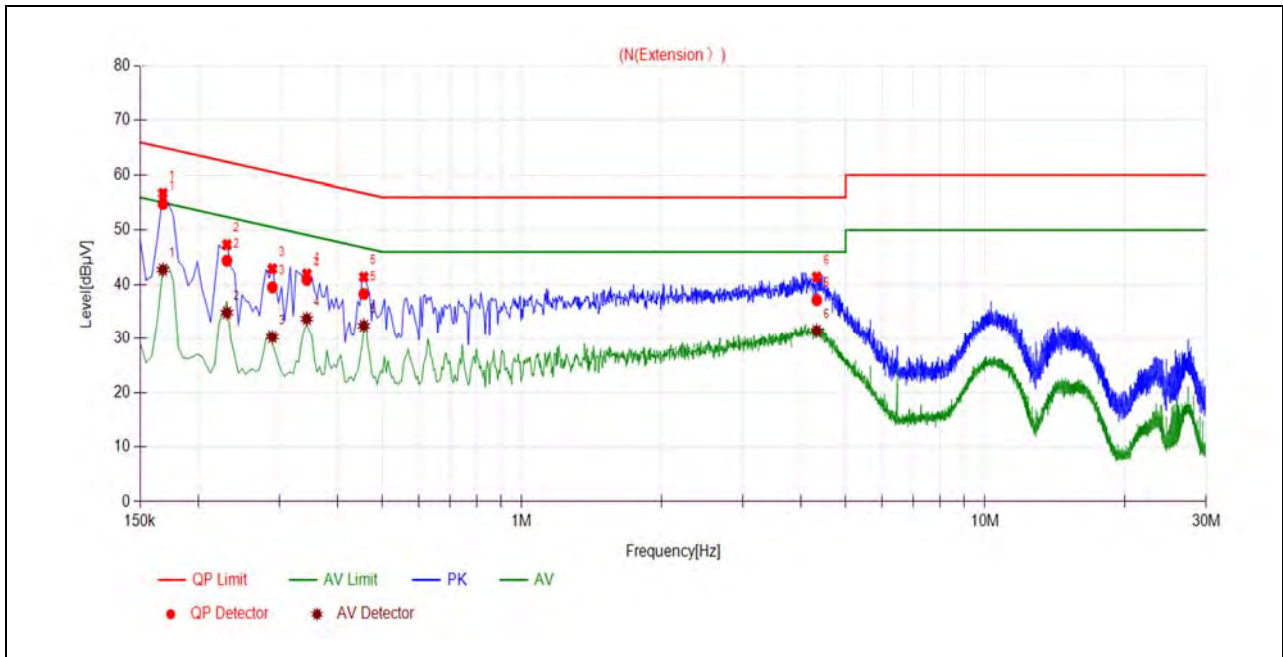
$A_{\text{Factor}}$ : Voltage division factor of LISN

**B. Test Plot:**



(L Phase)

No.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1680	53.61	41.50	65.06	55.06	Line	PASS
2	0.2265	43.90	34.12	62.58	52.58		PASS
3	0.2940	37.25	27.94	60.41	50.41		PASS
4	0.3390	38.48	29.18	59.23	49.23		PASS
5	0.3975	37.21	31.68	57.91	47.91		PASS
6	4.4021	37.98	32.22	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	0.1680	54.81	42.74	65.06	55.06	Neutral	PASS
2	0.2310	44.39	34.84	62.41	52.41		PASS
3	0.2895	39.52	30.27	60.54	50.54		PASS
4	0.3435	40.88	33.71	59.12	49.12		PASS
5	0.4560	38.29	32.41	56.76	46.76		PASS
6	4.3307	37.16	31.48	56.00	46.00		PASS



**A.9. Restricted Frequency Bands**

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

The measurement results are obtained as below:

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

$A_T$ : Total correction Factor except Antenna

$U_R$ : Receiver Reading

$G_{\text{preamp}}$ : Preamplifier Gain

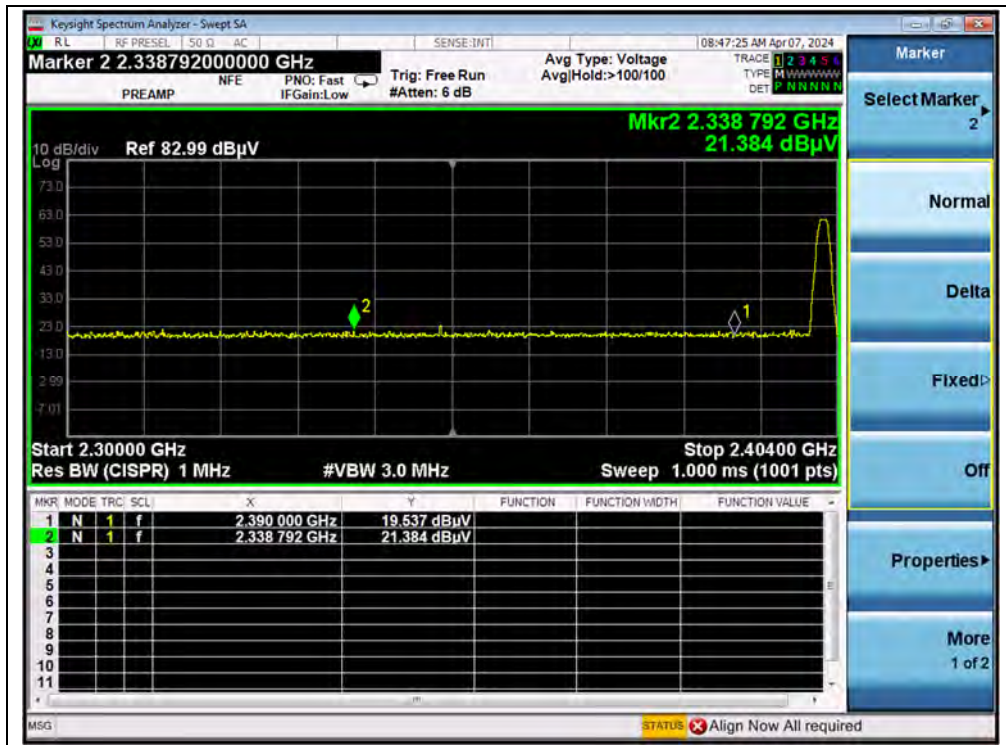
$A_{\text{Factor}}$ : Antenna Factor at 3m

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.

**Left:**

**1Mbps**

Channel	Frequency (MHz)	Detector	Receiver Reading	$A_T$ (dB)	$A_{\text{Factor}}$ (dB@3m)	Max. Emission E (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Verdict
		PK/ AV	$U_R$ (dB $\mu$ V)					
0	2338.79	PK	21.38	6.74	27.20	55.32	74	PASS
0	2390.00	AV	-0.01	6.74	27.20	33.93	54	PASS
39	2484.18	PK	22.29	6.74	27.20	56.23	74	PASS
39	2483.72	AV	-1.52	6.74	27.20	32.42	54	PASS

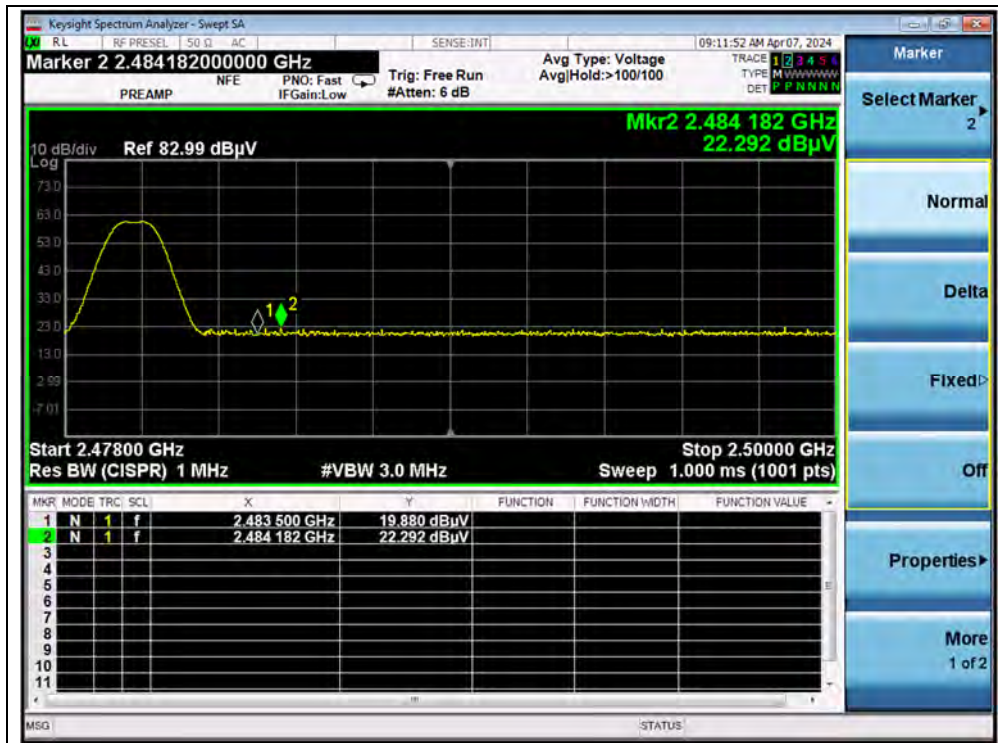


(PEAK, Channel 0)



(AVERAGE, Channel 0)





(PEAK, Channel 39)

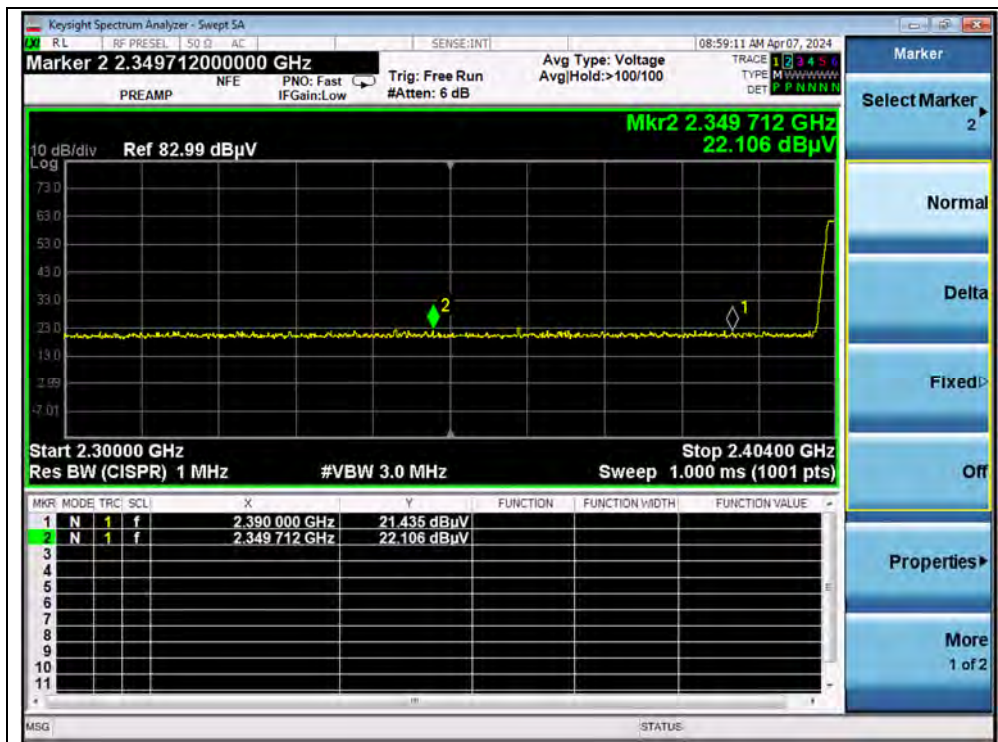


(AVERAGE, Channel 39)

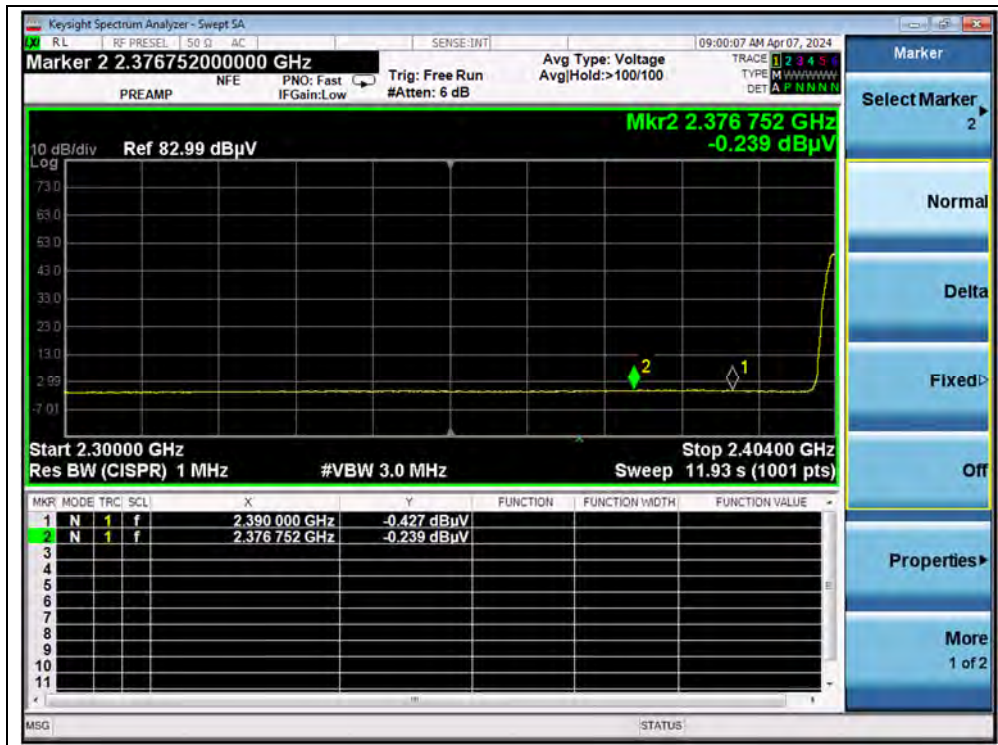


2Mbps

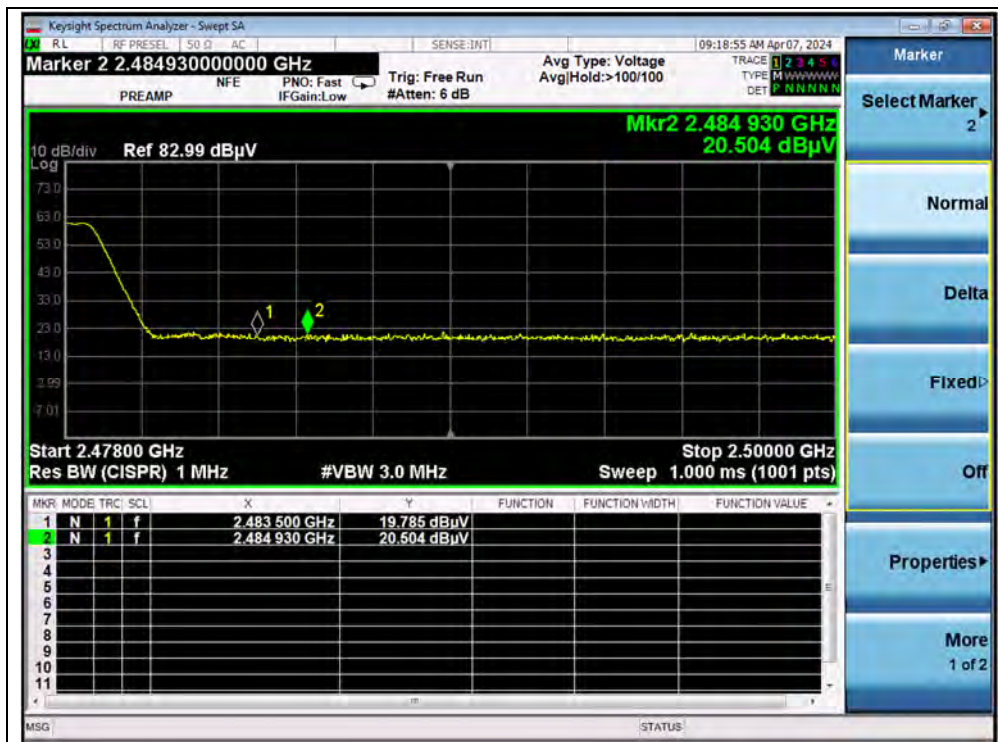
Channel	Frequency (MHz)	Detector	Receiver Reading	A <sub>T</sub> (dB)	A <sub>Factor</sub> (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV	U <sub>R</sub> (dBμV)					
1	2349.71	PK	22.10	6.74	27.20	56.04	74	PASS
1	2376.75	AV	-0.24	6.74	27.20	33.70	54	PASS
38	2484.93	PK	20.50	6.74	27.20	54.44	74	PASS
38	2484.01	AV	-1.63	6.74	27.20	32.31	54	PASS



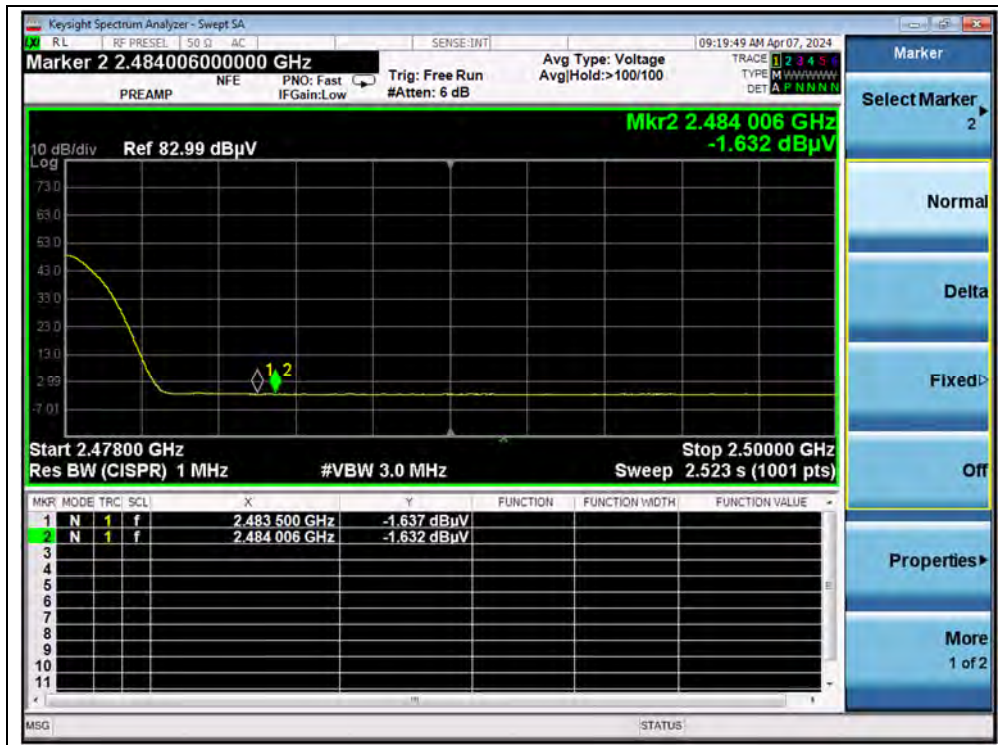
(PEAK, Channel 1)



(AVERAGE, Channel 1)



(PEAK, Channel 38)

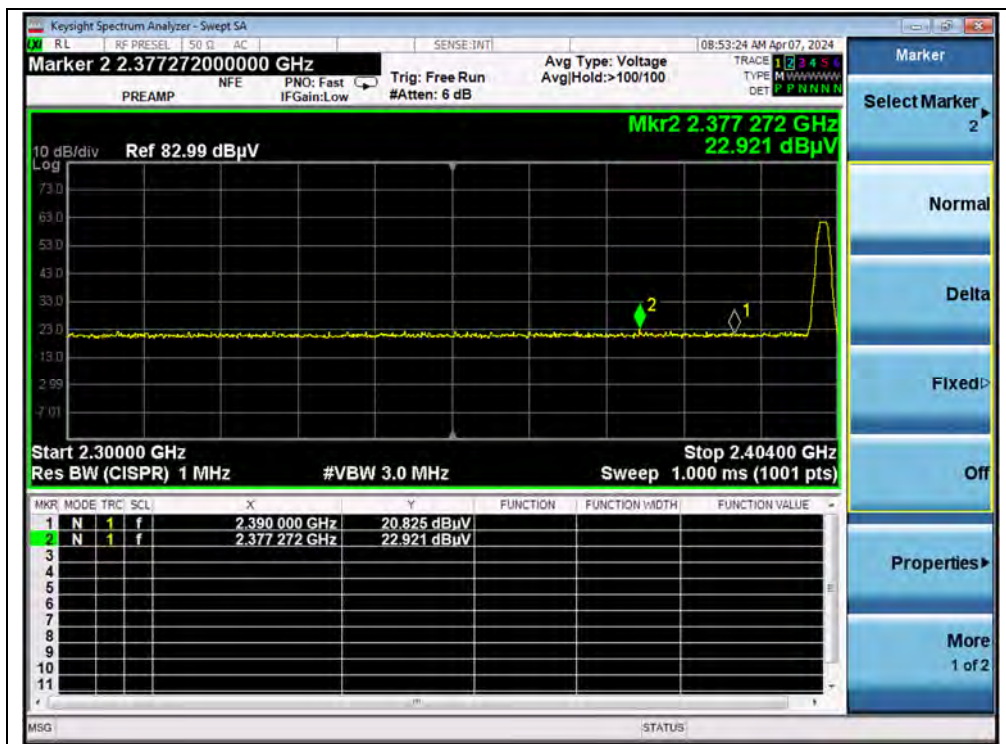


(AVERAGE, Channel 38)

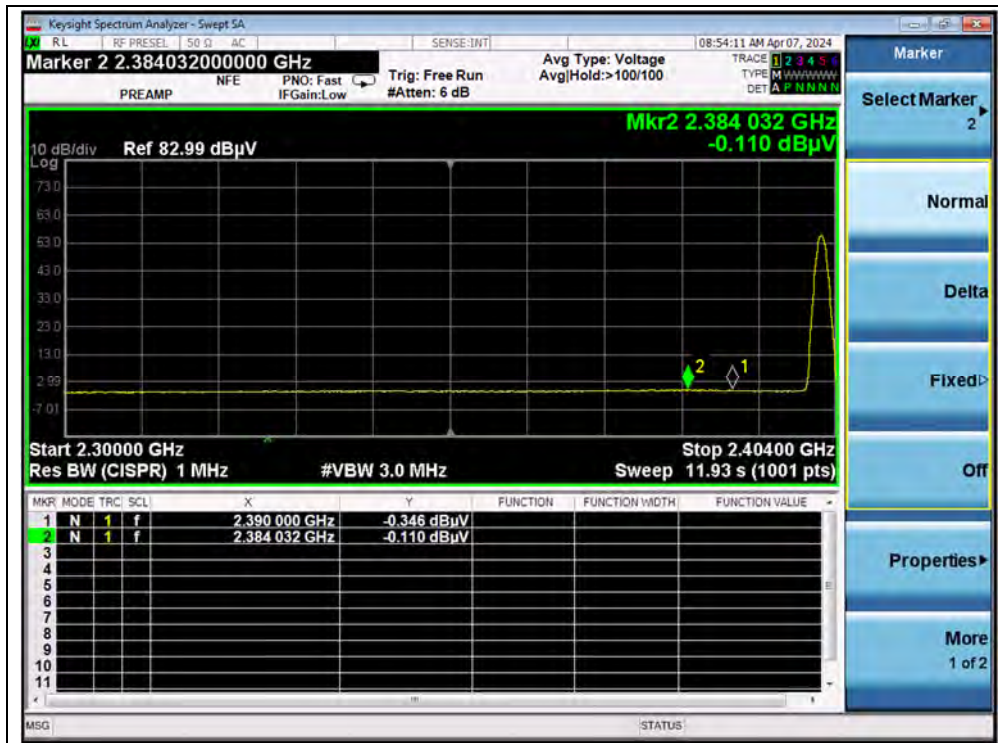


Right:  
1Mbps

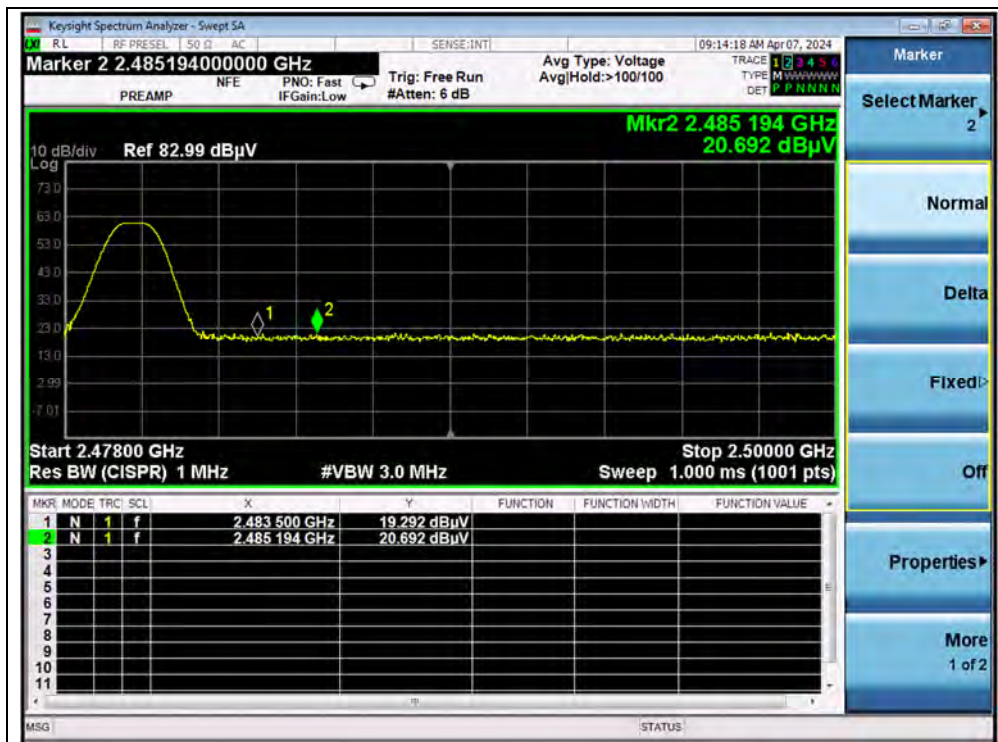
Channel	Frequency (MHz)	Detector	Receiver Reading	A <sub>T</sub> (dB)	A <sub>Factor</sub> (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV	U <sub>R</sub> (dBμV)					
0	2377.27	PK	22.92	6.74	27.20	56.86	74	PASS
0	2384.03	AV	-0.11	6.74	27.20	33.83	54	PASS
39	2485.19	PK	20.69	6.74	27.20	54.63	74	PASS
39	2484.03	AV	-1.50	6.74	27.20	32.44	54	PASS



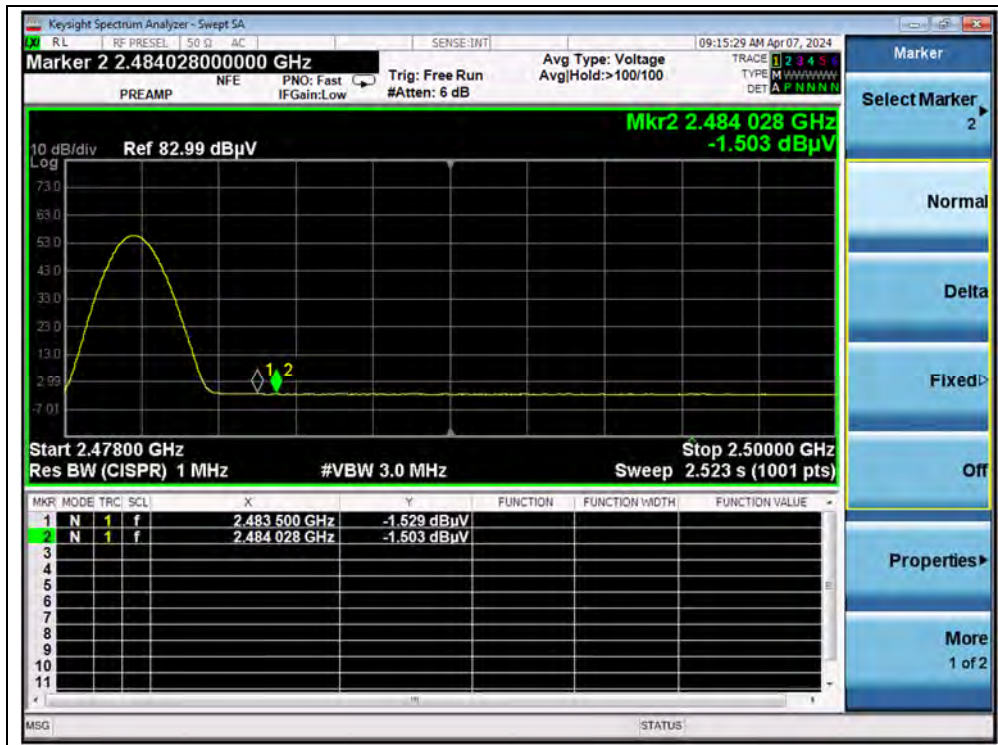
(PEAK, Channel 0)



(AVERAGE, Channel 0)



(PEAK, Channel 39)

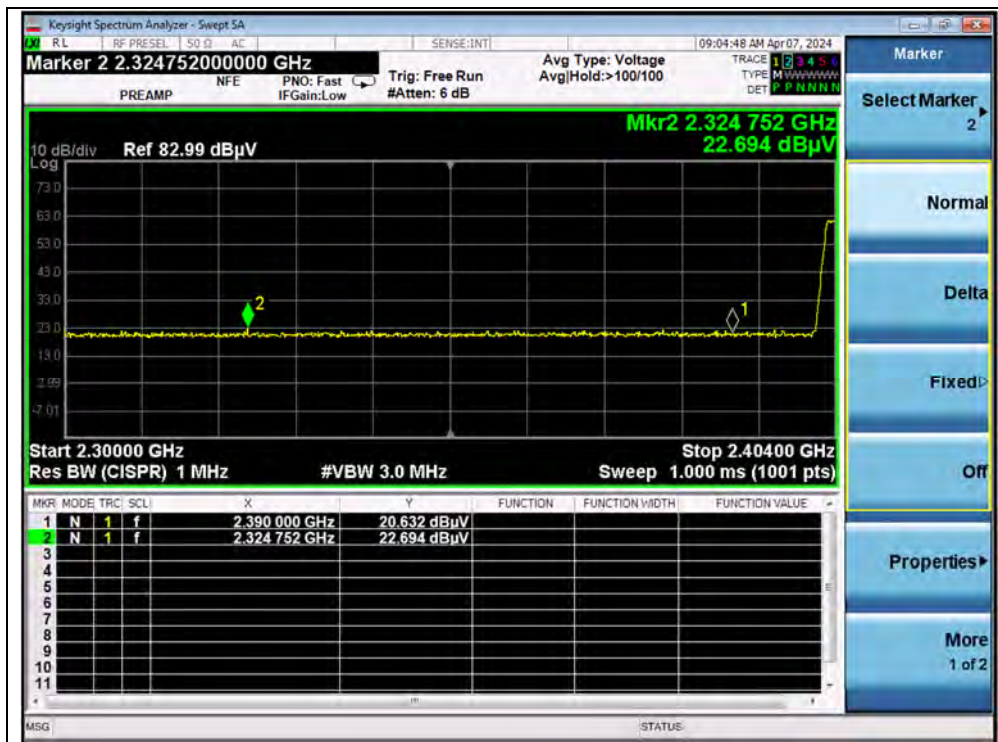


(AVERAGE, Channel 39)



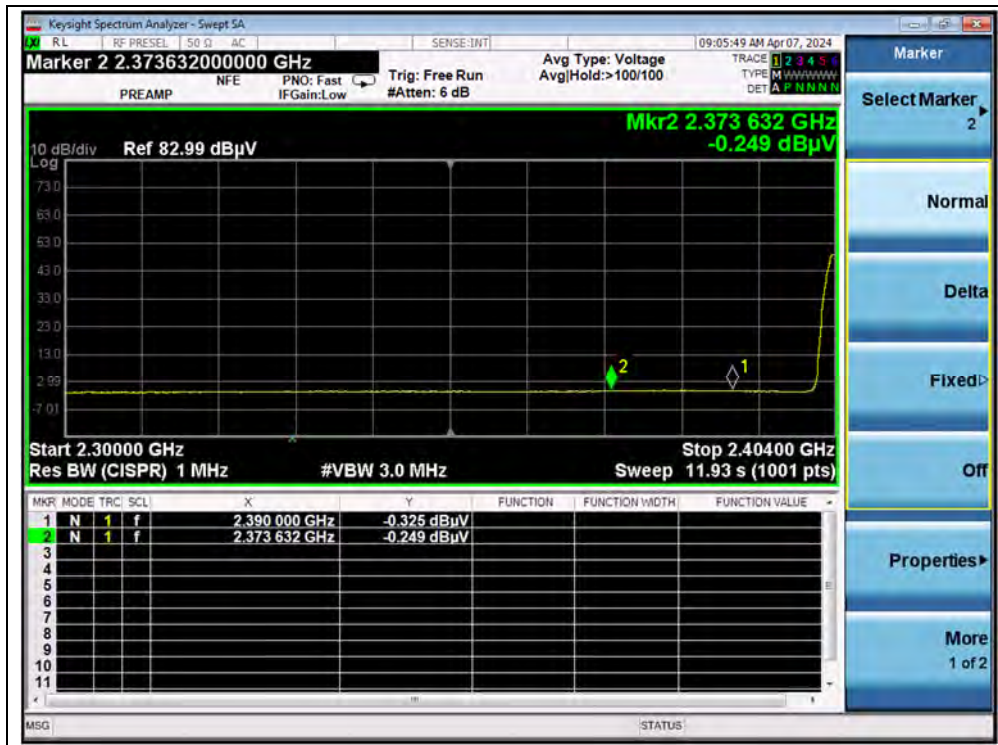
2Mbps

Channel	Frequency (MHz)	Detector	Receiver Reading	A <sub>T</sub> (dB)	A <sub>Factor</sub> (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV	U <sub>R</sub> (dBμV)					
1	2324.75	PK	22.69	6.74	27.20	56.63	74	PASS
1	2373.63	AV	-0.25	6.74	27.20	33.69	54	PASS
38	2489.53	PK	21.80	6.74	27.20	55.74	74	PASS
38	2485.35	AV	-1.51	6.74	27.20	32.43	54	PASS

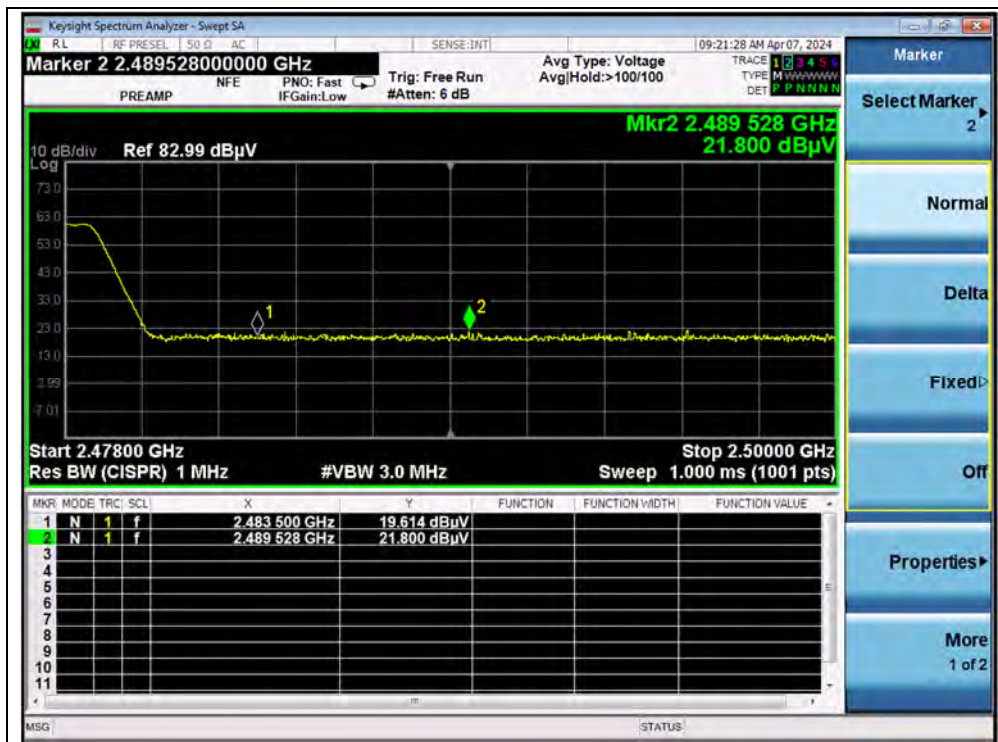


(PEAK, Channel 1)

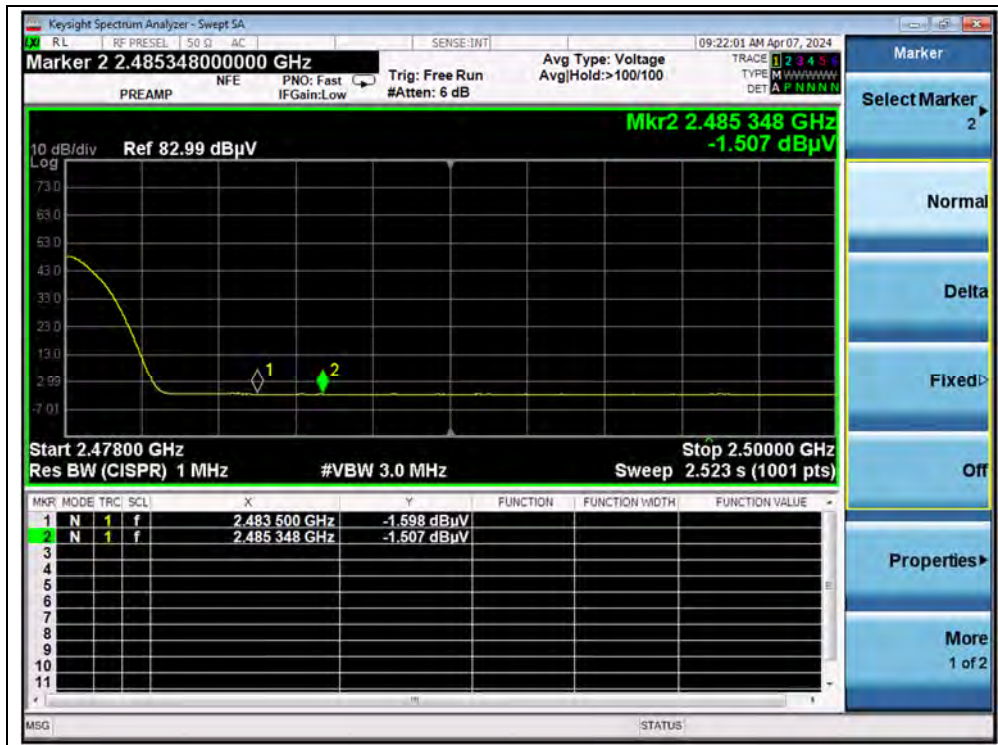




(AVERAGE, Channel 1)



(PEAK, Channel 38)



(AVERAGE, Channel 38)



## A.10. Radiated Emission

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

The measurement results are obtained as below:

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

$A_T$ : Total correction Factor except Antenna

$U_R$ : Receiver Reading

$G_{\text{preamp}}$ : Preamplifier Gain

$A_{\text{Factor}}$ : Antenna Factor at 3m

During the test, the total correction Factor  $A_T$  and  $A_{\text{Factor}}$  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.

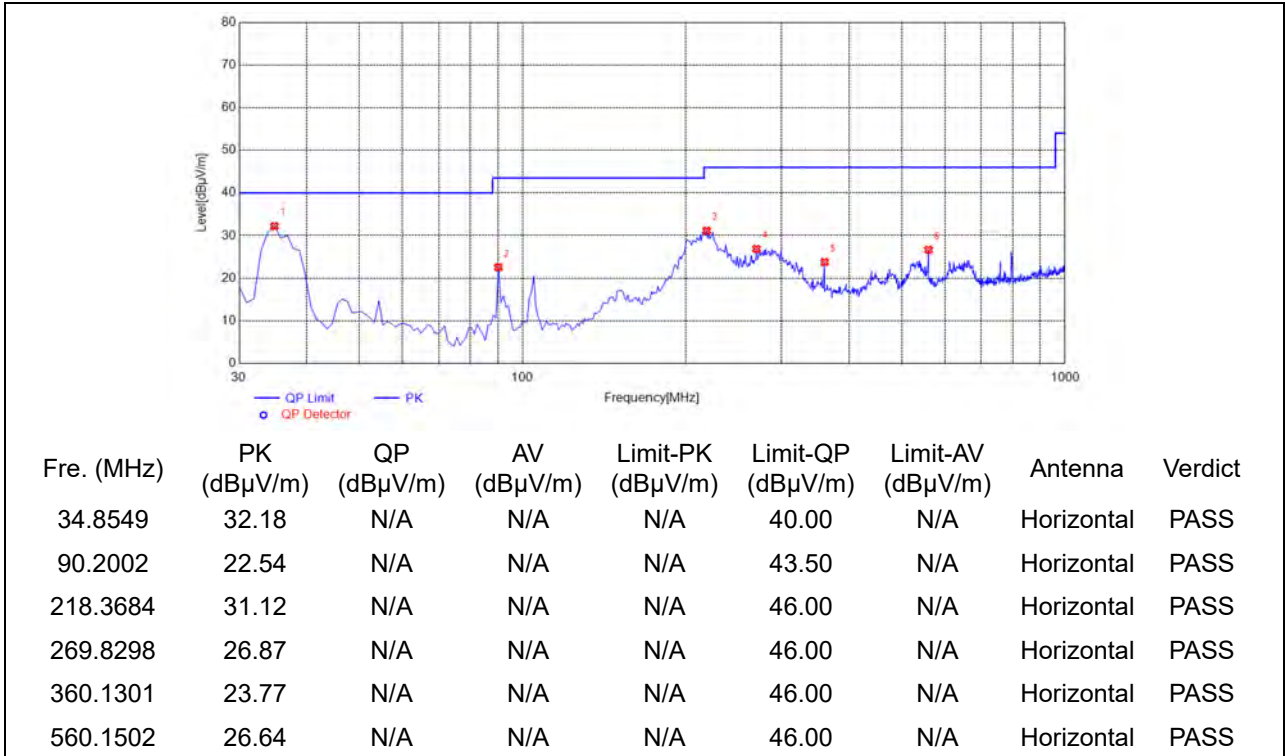
**Note2:** For the frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

**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.

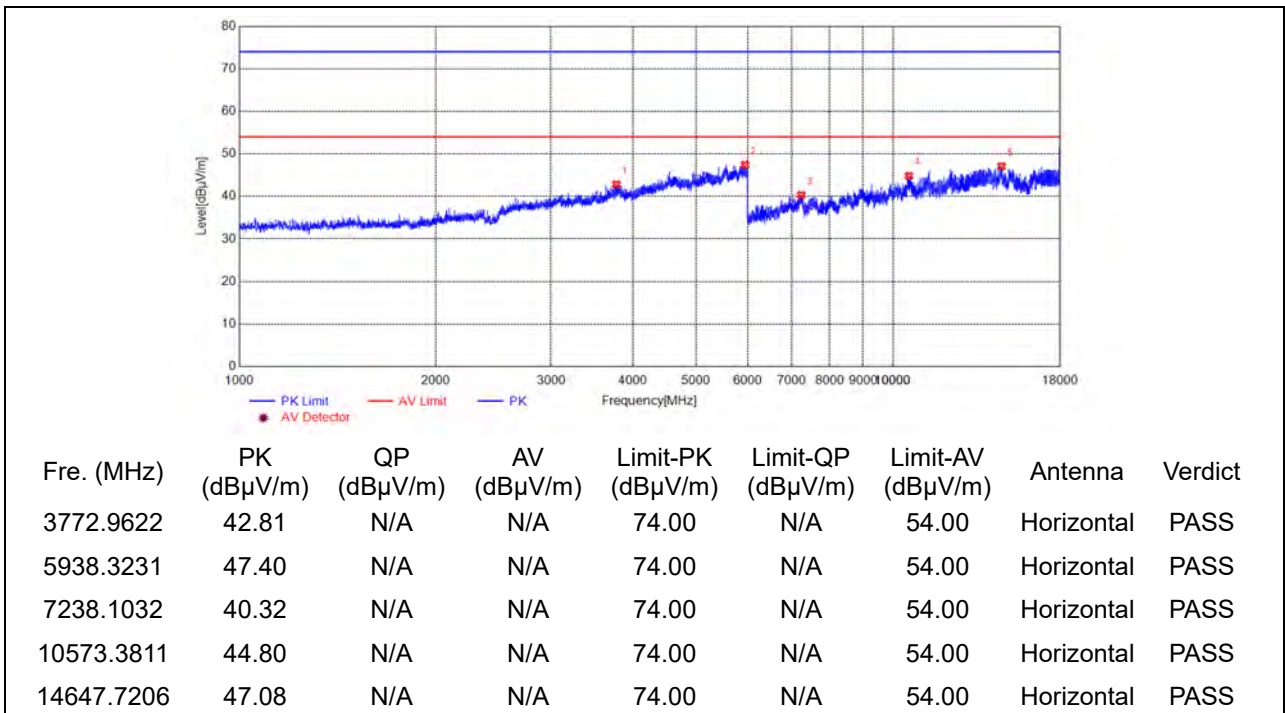


Left, 1Mbps

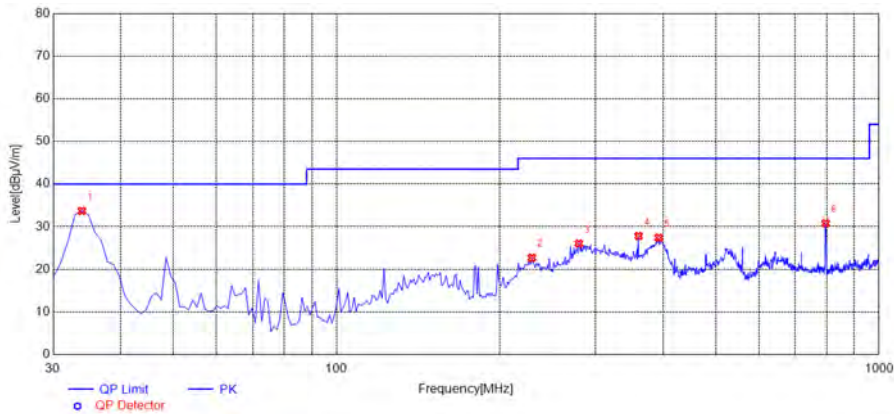
Plot for Channel 0



(Antenna Horizontal, 30MHz to 1GHz)

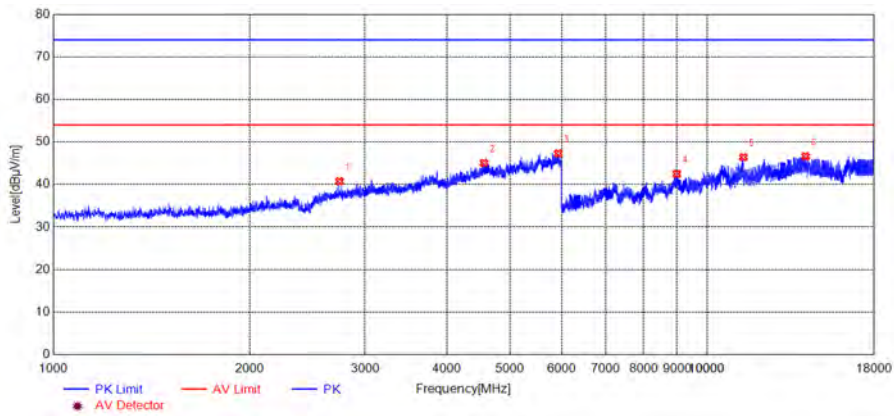


(Antenna Horizontal, 1GHz to 18GHz)



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
33.8839	33.69	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
229.0490	22.73	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
279.5395	26.04	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
360.1301	27.81	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
392.1722	27.41	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
797.0671	30.79	N/A	N/A	N/A	46.00	N/A	Vertical	PASS

(Antenna Vertical, 30MHz to 1GHz)

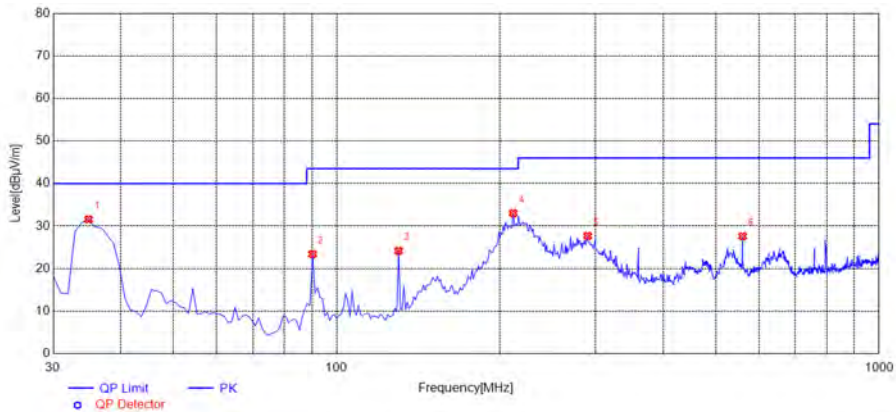


Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
2741.1235	40.77	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4559.7600	45.07	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5921.6536	47.32	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8987.2489	42.50	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11359.4466	46.42	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
14150.6792	46.62	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 1GHz to 18GHz)

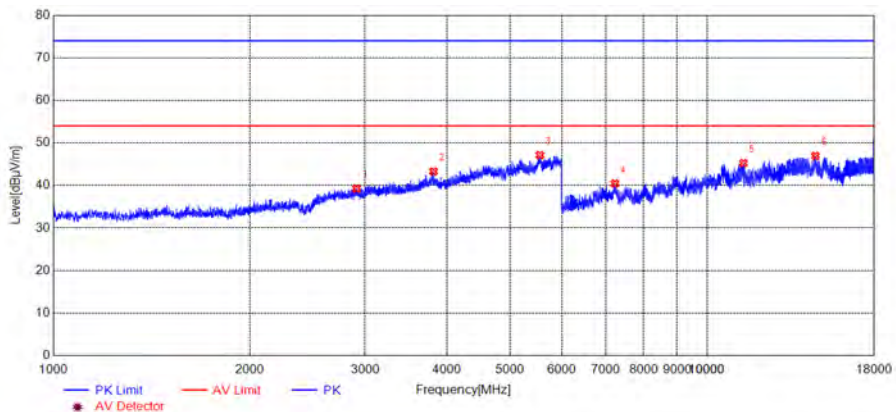


Plot for Channel 19



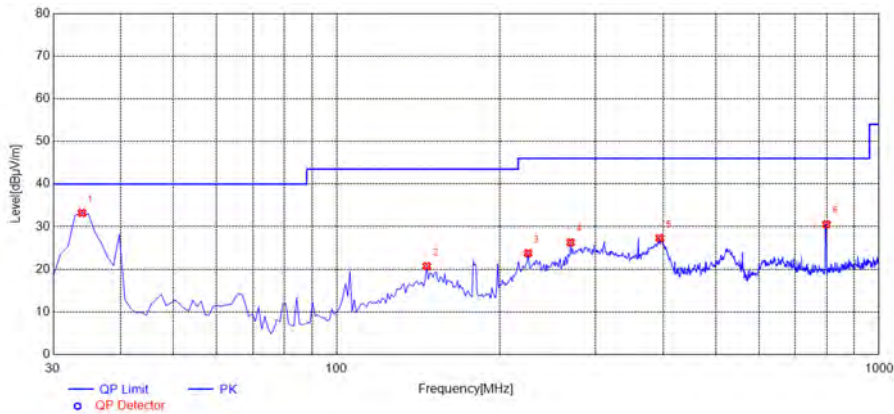
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
34.8549	31.58	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.2002	23.40	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
130.0100	24.17	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
211.5716	33.04	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
290.2202	27.70	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
560.1502	27.60	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 1GHz)



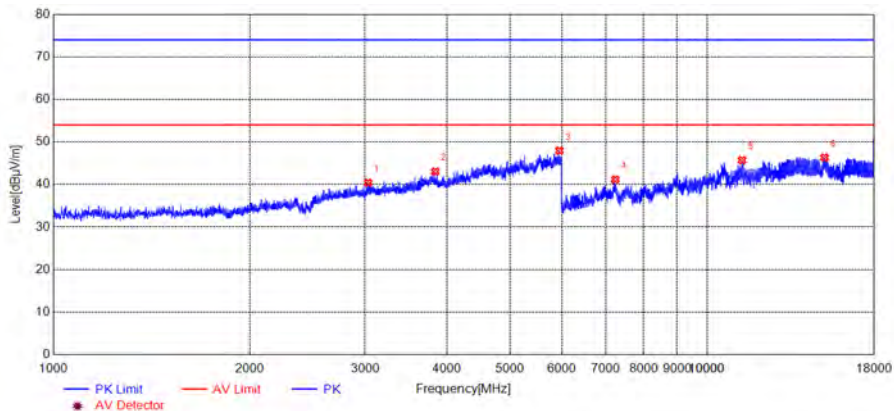
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
2909.4849	39.28	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3815.4692	43.28	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5549.9250	47.12	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7227.1023	40.46	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
11361.4468	45.24	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
14637.7198	46.97	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 1GHz 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
33.8839	33.21	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
146.5165	20.74	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
225.1652	23.74	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
269.8298	26.31	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
394.1141	27.31	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
799.9800	30.56	N/A	N/A	N/A	46.00	N/A	Vertical	PASS

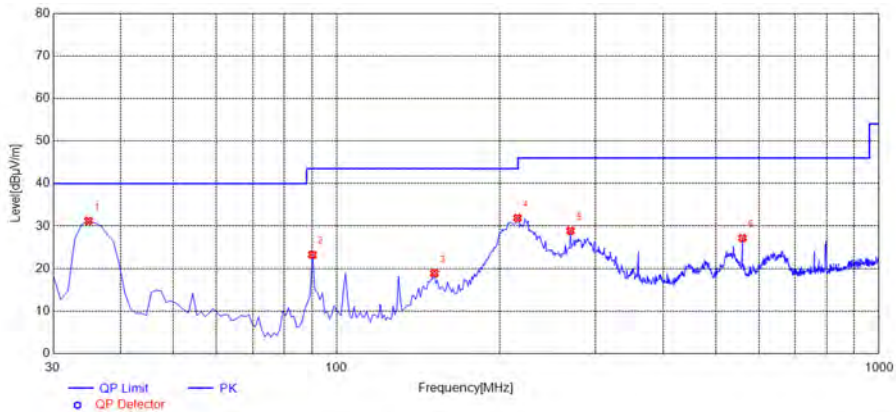
(Antenna Vertical, 30MHz to 1GHz)



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
3031.1719	40.41	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3839.6399	43.04	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5944.9908	47.96	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7235.1029	41.16	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11308.4424	45.72	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
15116.7597	46.35	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

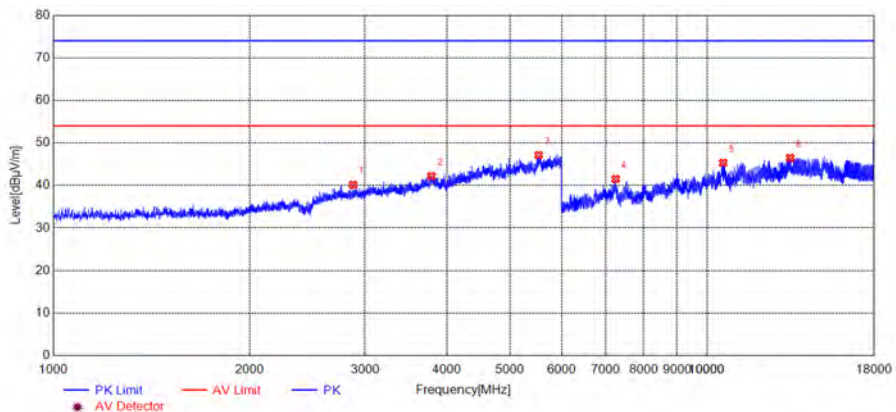
(Antenna Vertical, 1GHz to 18GHz)

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
34.8549	31.21	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.2002	23.27	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
151.3714	18.90	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
215.4555	31.91	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
269.8298	28.89	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
560.1502	27.19	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS

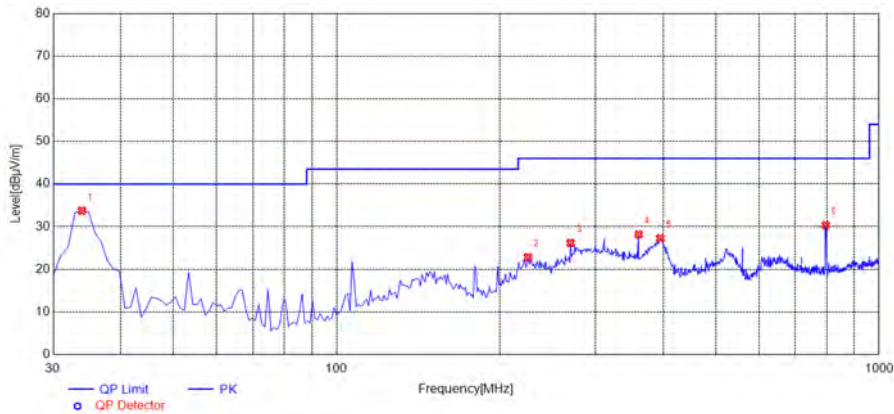
(Antenna Horizontal, 30MHz to 1GHz)



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
2874.4791	40.17	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3789.6316	42.20	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5525.7543	47.13	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7248.1040	41.52	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10579.3816	45.32	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
13403.6170	46.49	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

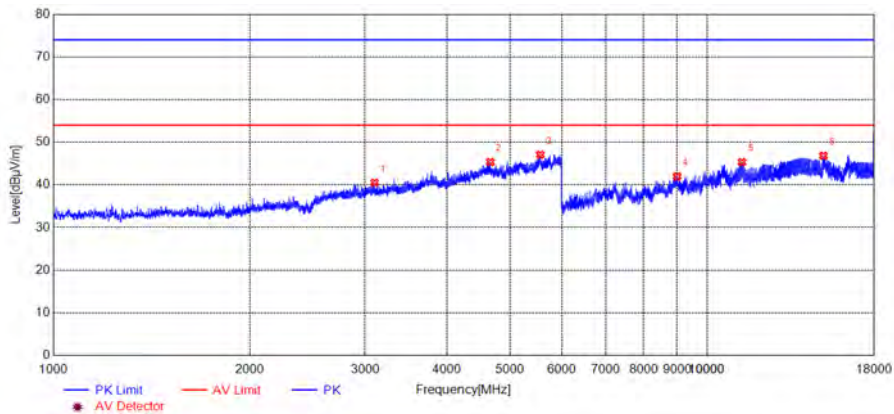
(Antenna Horizontal, 1GHz to 18GHz)





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
33.8839	33.74	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
225.1652	22.83	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
269.8298	26.18	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
360.1301	28.20	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
395.0851	27.30	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
797.0671	30.35	N/A	N/A	N/A	46.00	N/A	Vertical	PASS

(Antenna Vertical, 30MHz to 1GHz)



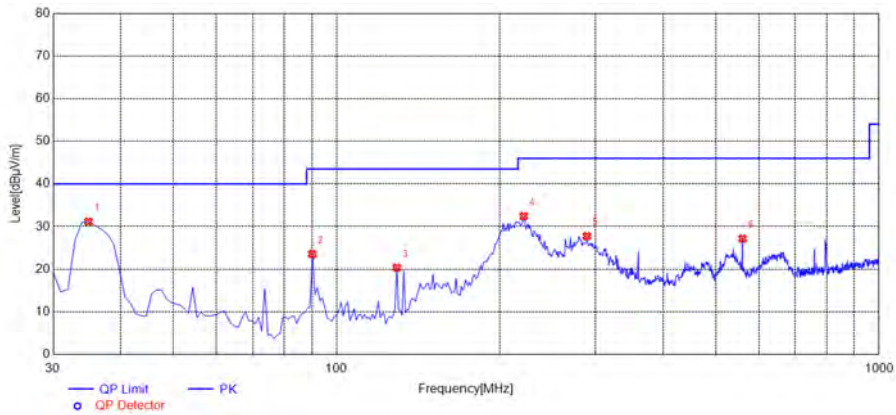
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
3100.3501	40.51	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4661.4436	45.34	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5556.5928	47.07	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8997.2498	42.01	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11306.4422	45.34	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
15059.7550	46.84	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 1GHz to 18GHz)



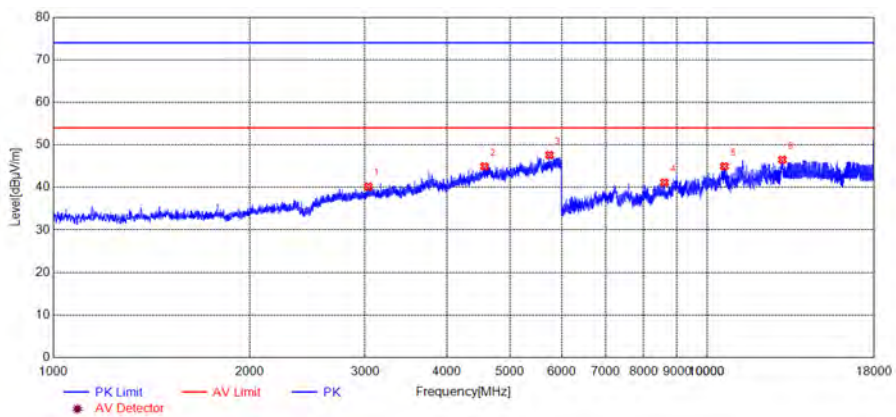
2Mbps

Plot for Channel 1



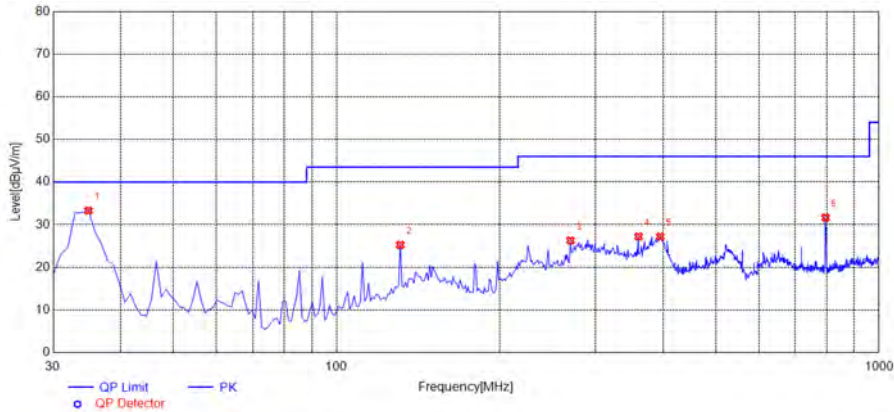
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
34.8549	31.15	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.2002	23.54	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
129.0390	20.35	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
221.2813	32.43	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
289.2492	27.75	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
560.1502	27.18	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 1GHz)



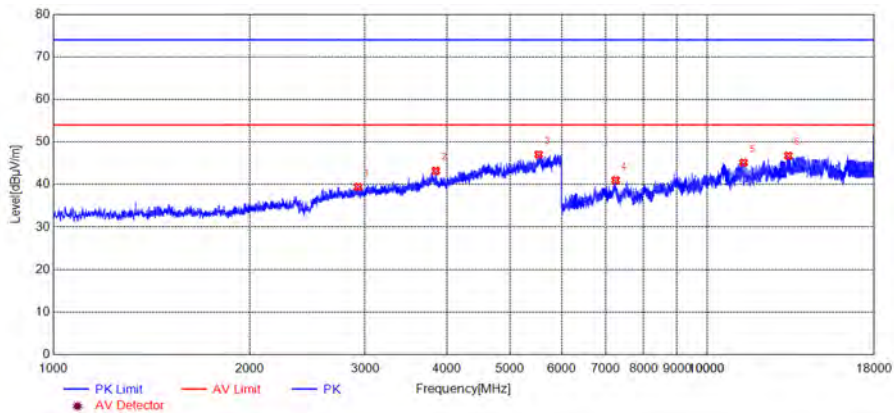
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
3033.6723	40.21	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4566.4277	44.95	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5741.6236	47.61	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8608.2174	41.14	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10627.3856	44.97	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
13041.5868	46.51	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 1GHz 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
34.8549	33.30	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
130.9810	25.25	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
269.8298	26.27	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
360.1301	27.23	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
395.0851	27.22	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
797.0671	31.64	N/A	N/A	N/A	46.00	N/A	Vertical	PASS

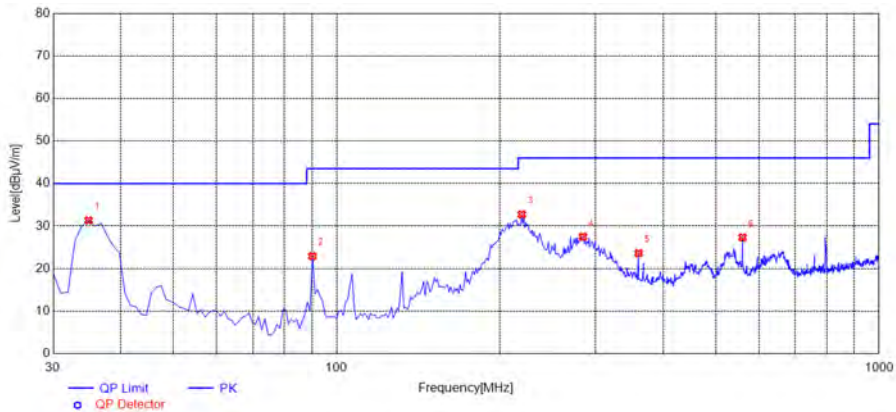
(Antenna Vertical, 30MHz to 1GHz)



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
2926.1544	39.44	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3846.3077	43.23	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5527.4212	47.07	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7247.1039	41.02	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11366.4472	45.15	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
13315.6096	46.77	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

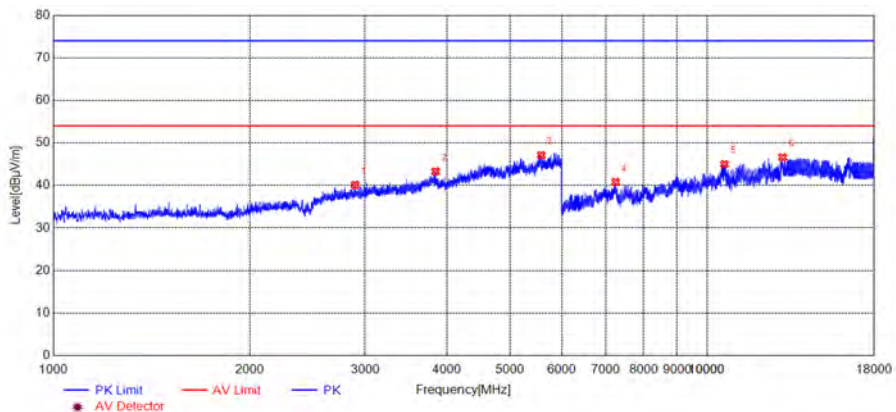
(Antenna Vertical, 1GHz to 18GHz)

Plot for Channel 19



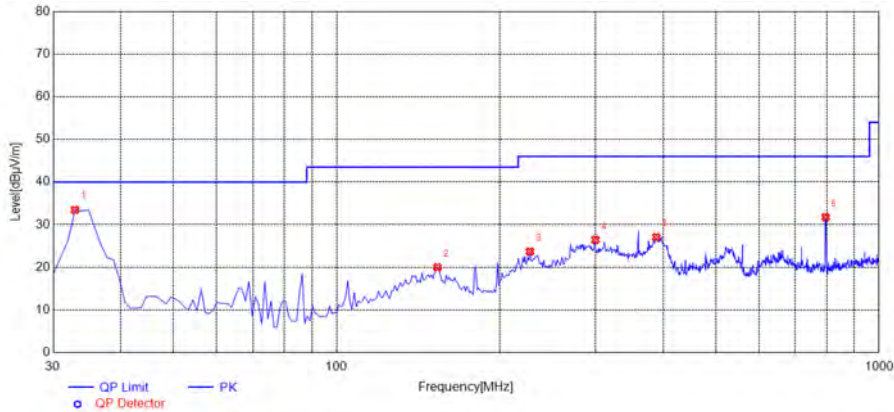
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
34.8549	31.34	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.2002	22.93	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
219.3393	32.74	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
284.3944	27.53	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
360.1301	23.63	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
560.1502	27.34	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 1GHz)



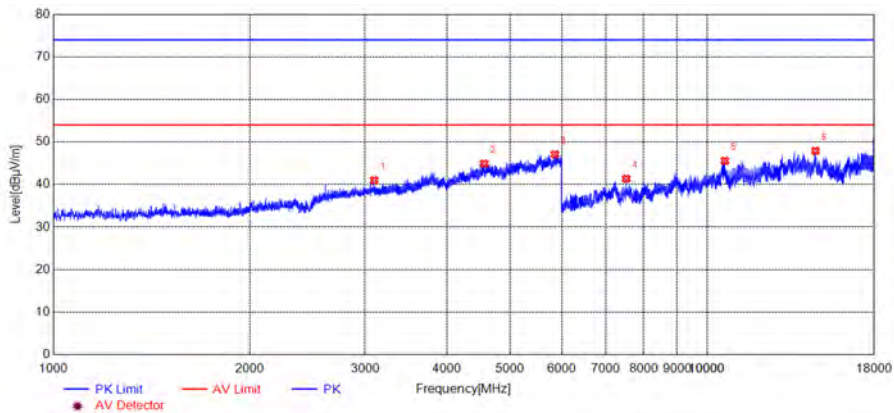
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
2895.3159	40.13	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3842.9738	43.29	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5576.5961	47.12	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7246.1038	40.81	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10628.3857	44.99	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
13047.5873	46.59	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 1GHz 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
32.9129	33.45	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
153.3133	20.01	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
227.1071	23.69	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
299.9299	26.44	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
388.2883	27.08	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
797.0671	31.76	N/A	N/A	N/A	46.00	N/A	Vertical	PASS

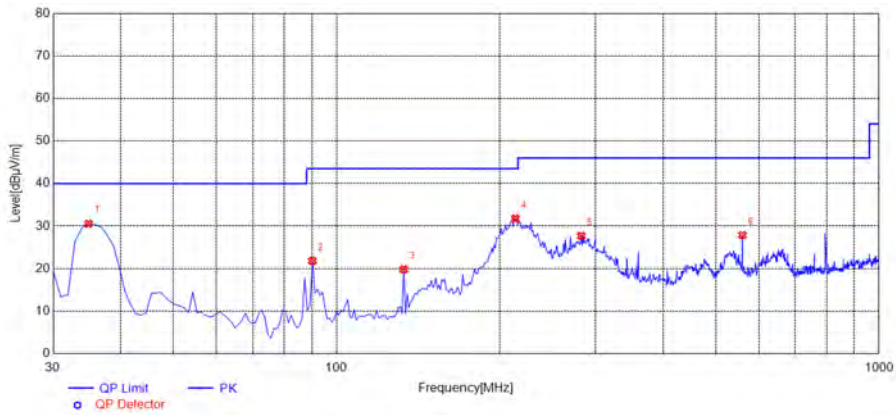
(Antenna Vertical, 30MHz to 1GHz)



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
3095.3492	41.01	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4560.5934	44.90	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5851.6419	47.08	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7522.1268	41.39	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10641.3868	45.56	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
14644.7204	47.91	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

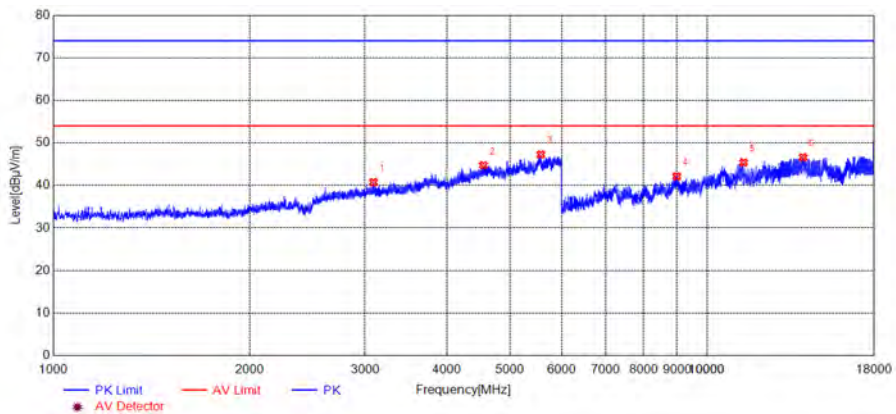
(Antenna Vertical, 1GHz to 18GHz)

Plot for Channel 38



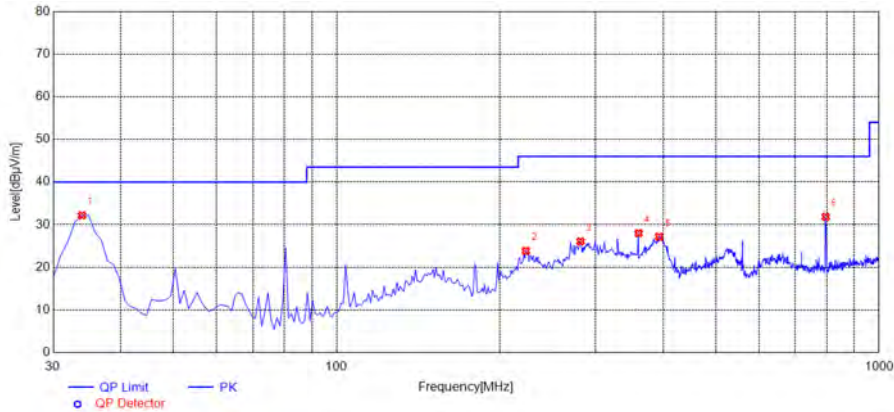
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
34.8549	30.56	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.2002	21.80	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
132.9229	19.81	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
213.5135	31.79	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
282.4525	27.70	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
560.1502	27.86	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 1GHz)



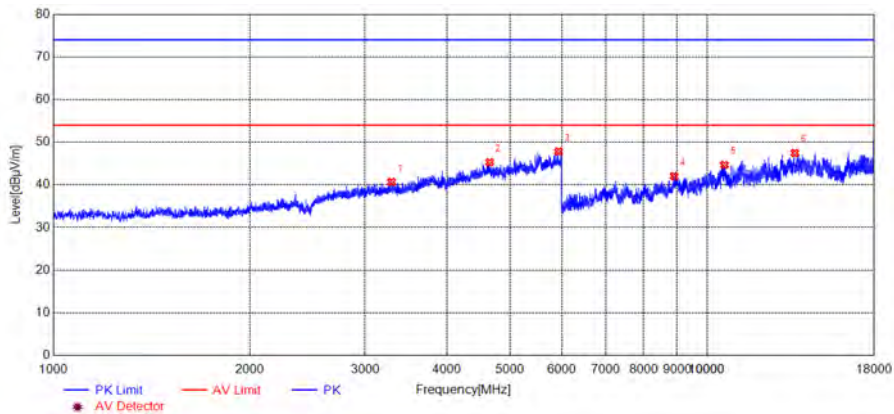
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
3088.6814	40.77	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4548.9248	44.73	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5568.2614	47.29	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8988.2490	42.14	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
11367.4473	45.40	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
14027.6690	46.61	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 1GHz 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
33.8839	32.17	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
223.2232	23.84	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
281.4815	26.06	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
360.1301	27.99	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
393.1431	27.17	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
797.0671	31.84	N/A	N/A	N/A	46.00	N/A	Vertical	PASS

(Antenna Vertical, 30MHz to 1GHz)



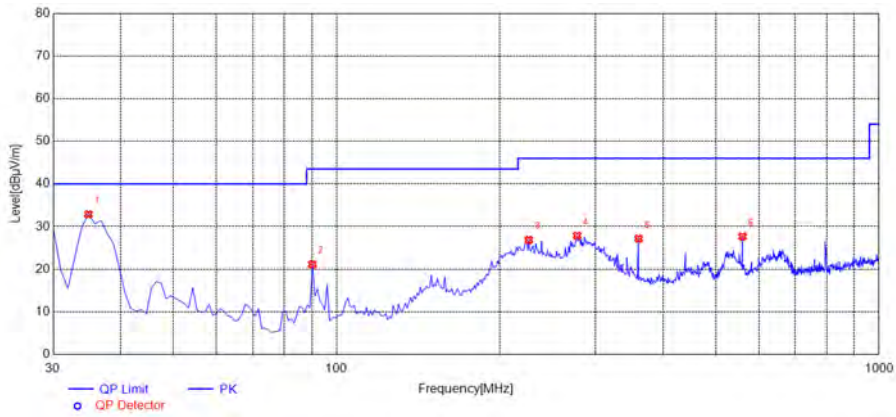
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
3292.0487	40.69	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4648.9415	45.27	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5924.1540	47.82	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8902.2419	42.04	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10626.3855	44.67	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
13615.6346	47.47	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 1GHz to 18GHz)



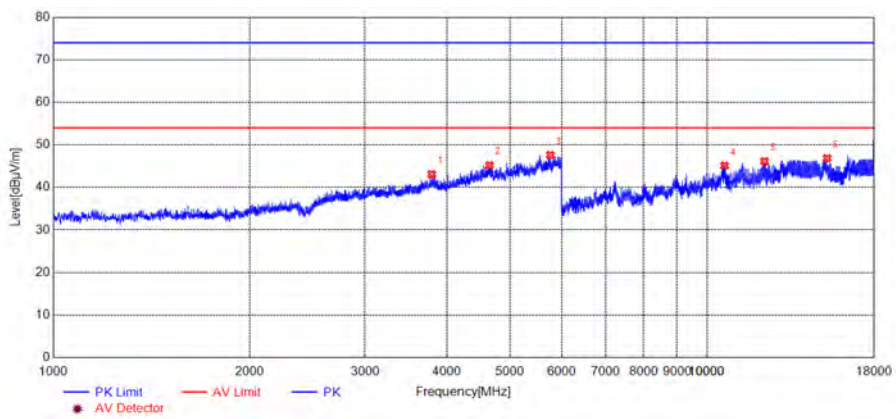
Right, 1Mbps

Plot 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
34.8549	32.86	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.2002	21.13	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
226.1361	26.85	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
277.5976	27.84	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
360.1301	27.14	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
560.1502	27.65	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS

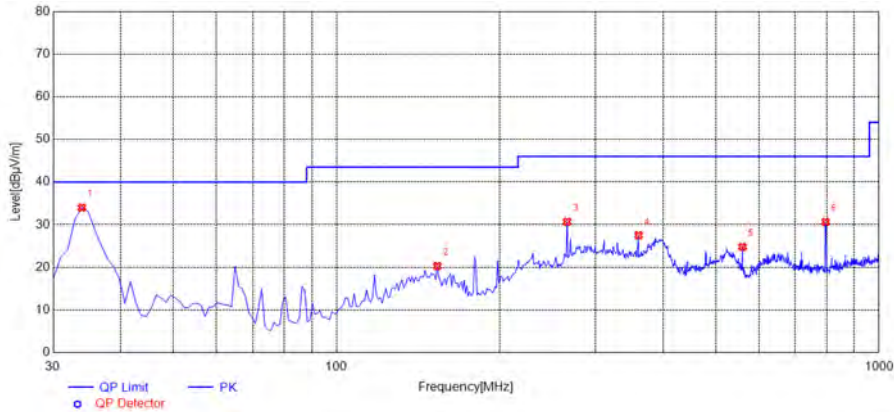
(Antenna Horizontal, 30MHz to 1GHz)



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
3793.7990	43.07	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4648.1080	45.18	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5757.4596	47.60	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10633.3861	45.11	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12238.5199	46.13	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
15257.7715	46.84	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

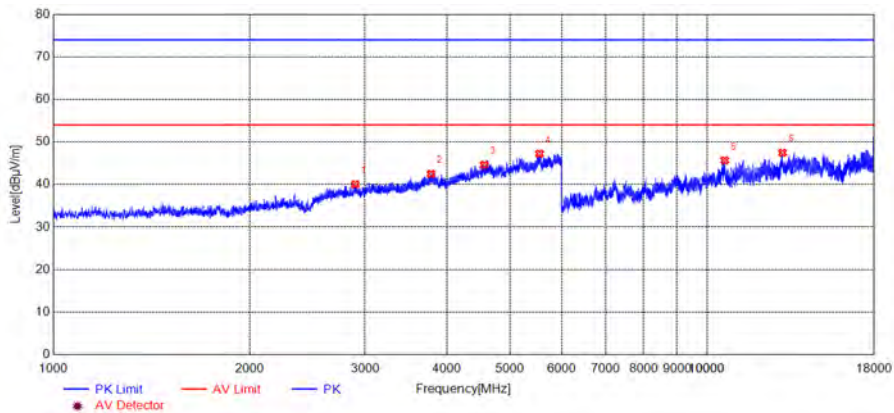
(Antenna Horizontal, 1GHz to 18GHz)





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
33.8839	33.98	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
153.3133	20.28	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
265.9459	30.69	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
360.1301	27.52	N/A	N/A <td N/A	46.00	N/A	Vertical	PASS	
560.1502	24.79	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
797.0671	30.64	N/A	N/A	N/A	46.00	N/A	Vertical	PASS

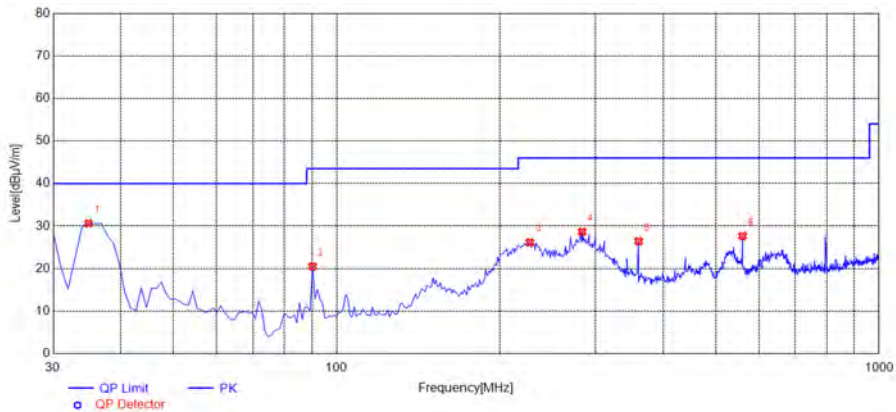
(Antenna Vertical, 30MHz to 1GHz)



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
2896.9828	40.02	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3784.6308	42.49	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4562.2604	44.62	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5544.0907	47.25	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10638.3865	45.68	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
13044.5870	47.47	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

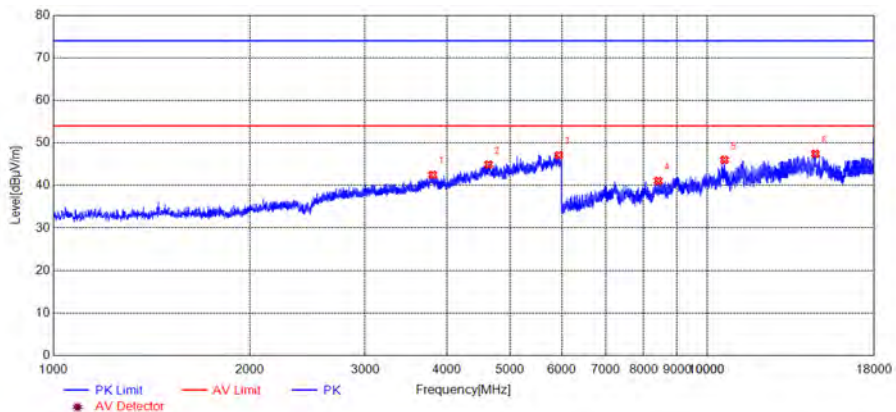
(Antenna Vertical, 1GHz to 18GHz)

Plot for Channel 19



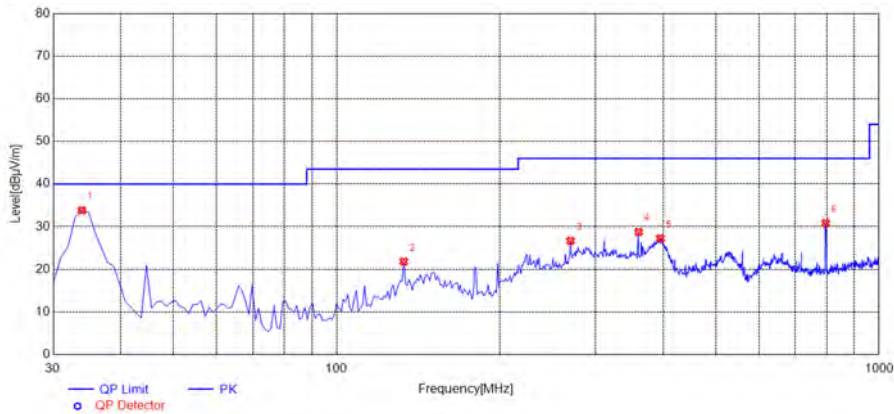
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
34.8549	30.65	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.2002	20.51	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
227.1071	26.14	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
283.4234	28.67	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
360.1301	26.43	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
560.1502	27.64	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 1GHz)



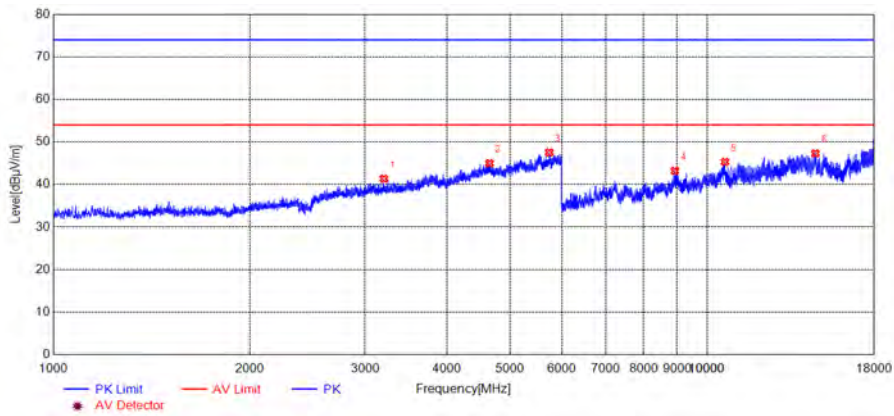
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
3805.4676	42.50	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4632.2720	44.93	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5931.6553	47.11	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8418.2015	41.07	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10627.3856	46.03	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
14638.7199	47.46	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 1GHz 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
33.8839	33.83	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
132.9229	21.81	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
269.8298	26.66	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
360.1301	28.78	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
395.0851	27.27	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
797.0671	30.83	N/A	N/A	N/A	46.00	N/A	Vertical	PASS

(Antenna Vertical, 30MHz to 1GHz)

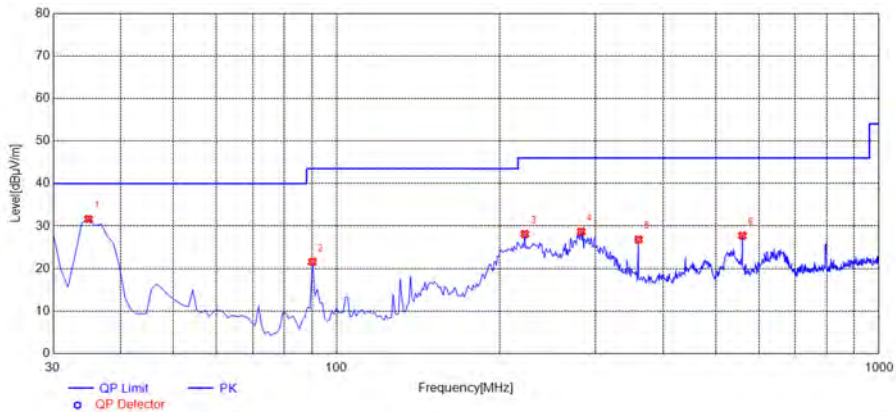


Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
3203.7006	41.39	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4646.4411	45.02	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5737.4562	47.53	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8926.2439	43.23	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10647.3873	45.32	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
14639.7200	47.32	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 1GHz to 18GHz)

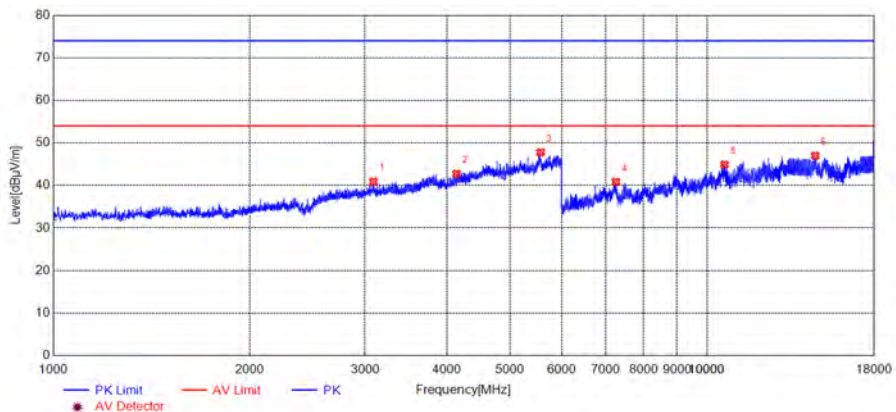


Plot for Channel 39



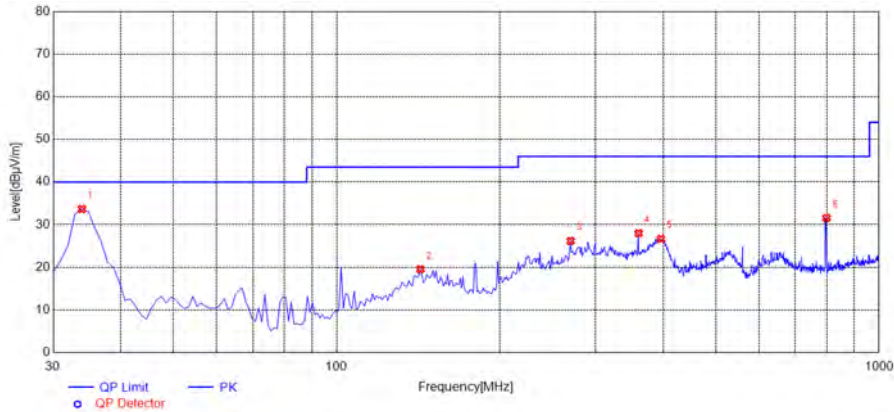
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
34.8549	31.64	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.2002	21.57	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
222.2523	28.15	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
282.4525	28.69	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
360.1301	26.83	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
560.1502	27.77	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 1GHz)



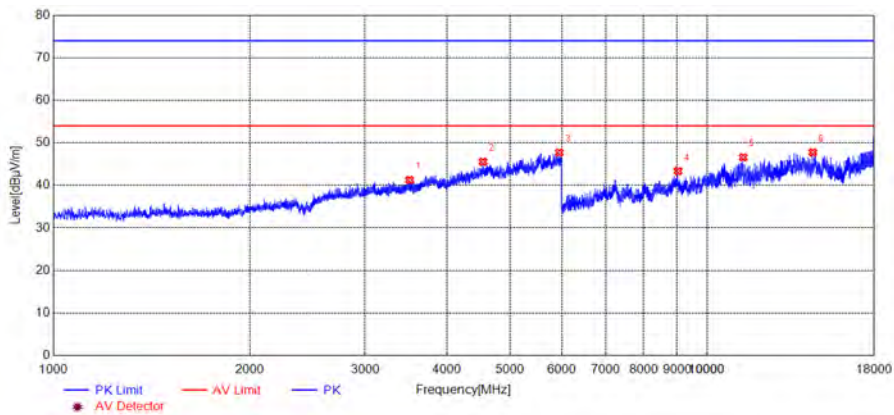
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
3087.8480	40.89	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4138.0230	42.76	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5564.0940	47.77	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7255.1046	40.86	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10631.3859	44.91	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
14630.7192	47.00	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 1GHz 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
33.8839	33.66	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
142.6326	19.52	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
269.8298	26.17	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
360.1301	27.99	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
396.0561	26.65	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
799.9800	31.55	N/A	N/A	N/A	46.00	N/A	Vertical	PASS

(Antenna Vertical, 30MHz to 1GHz)



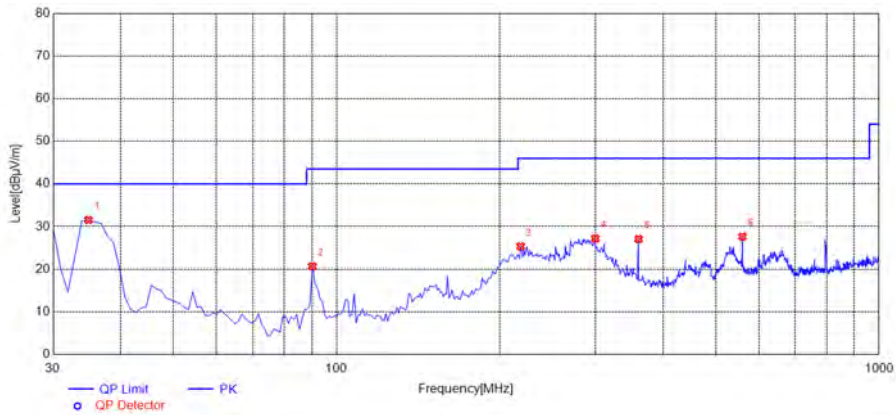
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
3507.9180	41.27	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4541.4236	45.55	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5943.3239	47.71	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9029.2524	43.36	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11352.4460	46.59	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
14504.7087	47.75	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 1GHz to 18GHz)



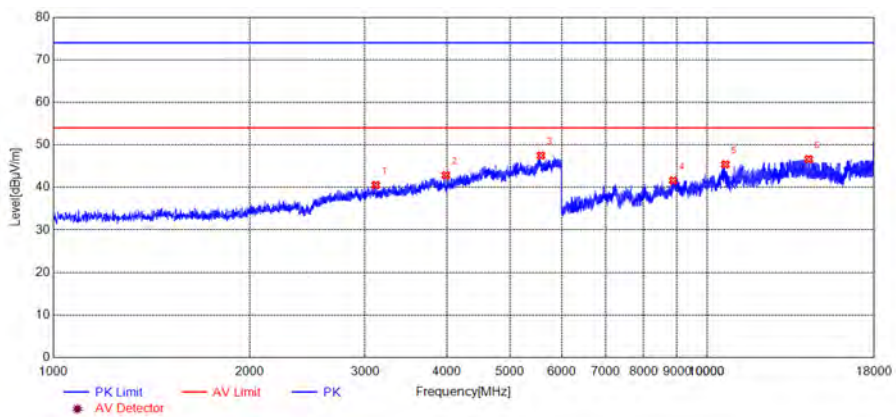
2Mbps

Plot for Channel 1



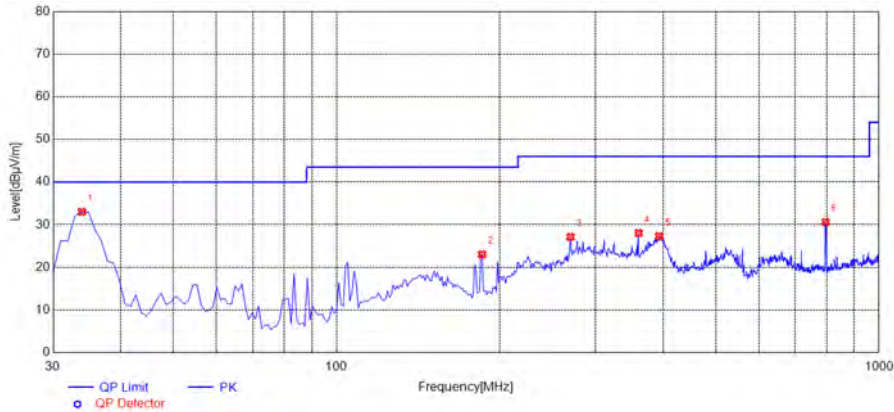
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
34.8549	31.53	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.2002	20.67	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
218.3684	25.34	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
299.9299	27.19	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
360.1301	27.07	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
560.1502	27.62	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 1GHz)



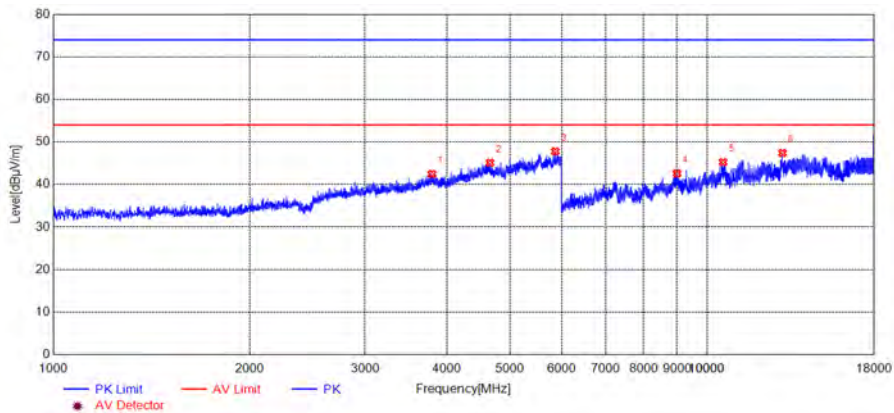
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
3113.6856	40.55	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3984.6641	42.86	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5569.9283	47.50	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8876.2397	41.60	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10662.3885	45.39	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
14305.6921	46.64	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 1GHz 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
33.8839	33.02	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
185.3554	23.04	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
269.8298	27.13	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
360.1301	28.05	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
393.1431	27.27	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
797.0671	30.63	N/A	N/A	N/A	46.00	N/A	Vertical	PASS

(Antenna Vertical, 30MHz to 1GHz)

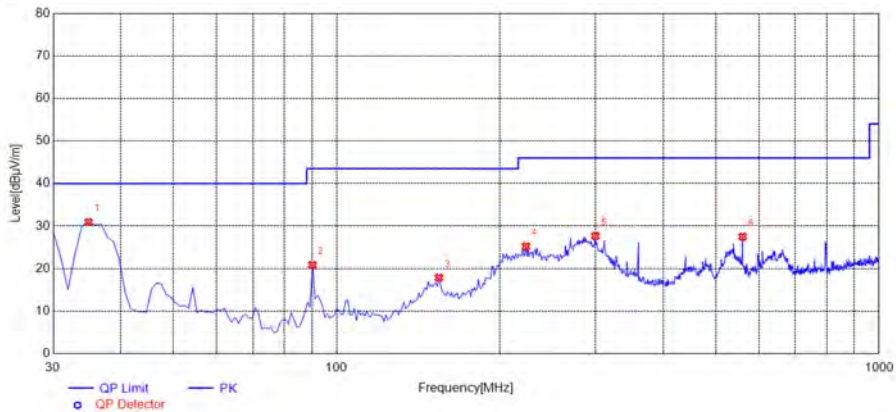


Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
3795.4659	42.47	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4656.4427	45.13	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5860.8101	47.80	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8993.2494	42.61	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10576.3814	45.24	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
13041.5868	47.42	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 1GHz to 18GHz)

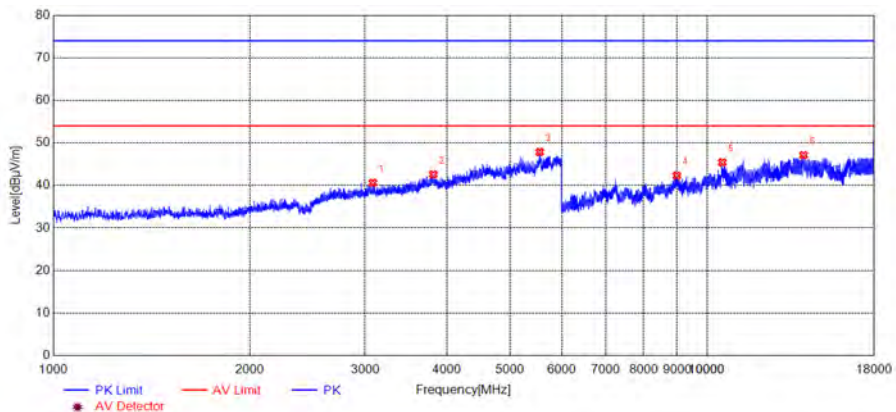


Plot for Channel 19



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
34.8549	30.93	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.2002	20.84	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
154.2843	17.89	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
223.2232	25.22	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
299.9299	27.68	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
560.1502	27.51	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS

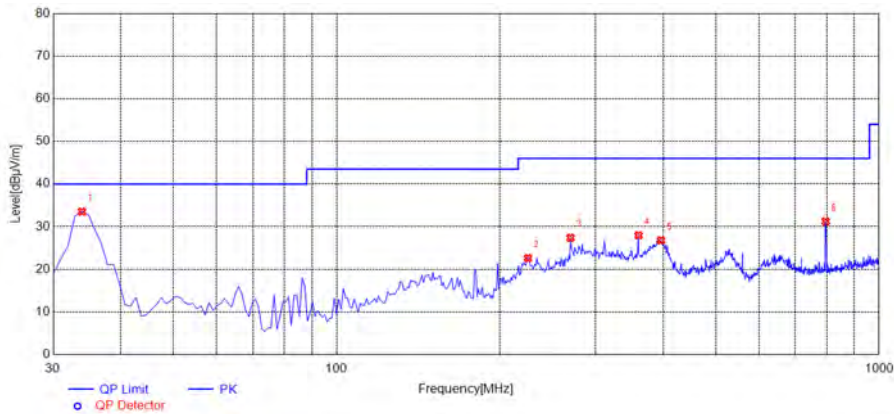
(Antenna Horizontal, 30MHz to 1GHz)



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
3082.0137	40.62	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3811.3019	42.62	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5545.7576	47.86	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8986.2489	42.31	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10547.3789	45.42	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
14040.6701	47.12	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

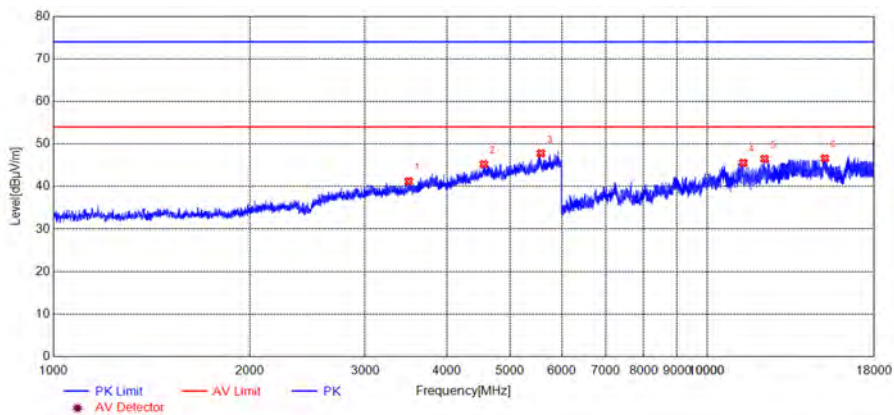
(Antenna Horizontal, 1GHz to 18GHz)





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
33.8839	33.51	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
225.1652	22.63	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
269.8298	27.38	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
360.1301	27.98	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
396.0561	26.79	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
797.0671	31.24	N/A	N/A	N/A	46.00	N/A	Vertical	PASS

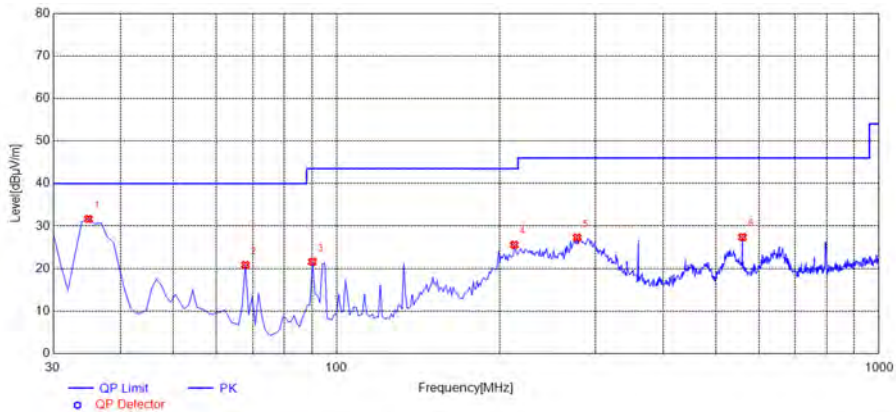
(Antenna Vertical, 30MHz to 1GHz)



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
3497.0828	41.24	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4555.5926	45.25	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5568.2614	47.80	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11354.4462	45.56	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12244.5204	46.52	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
15134.7612	46.60	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

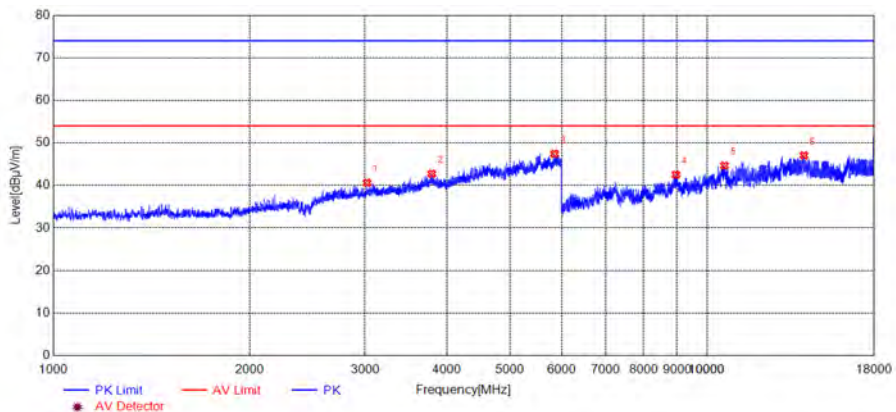
(Antenna Vertical, 1GHz to 18GHz)

Plot for Channel 38



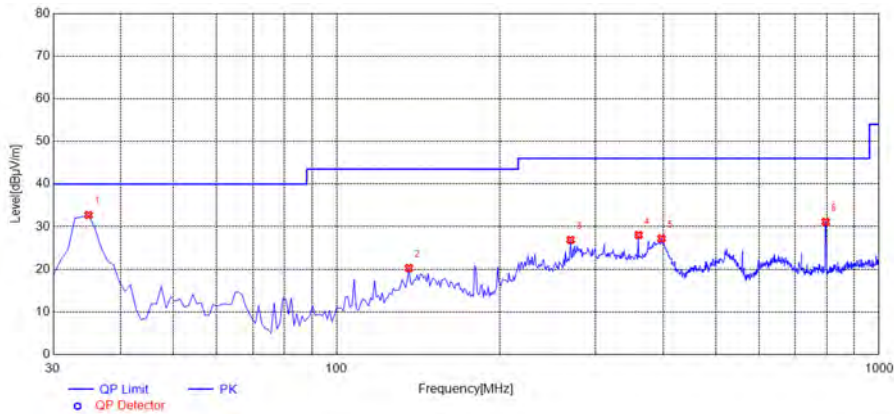
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
34.8549	31.66	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
67.8679	20.88	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.2002	21.58	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
212.5425	25.60	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
277.5976	27.30	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
560.1502	27.41	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 1GHz)



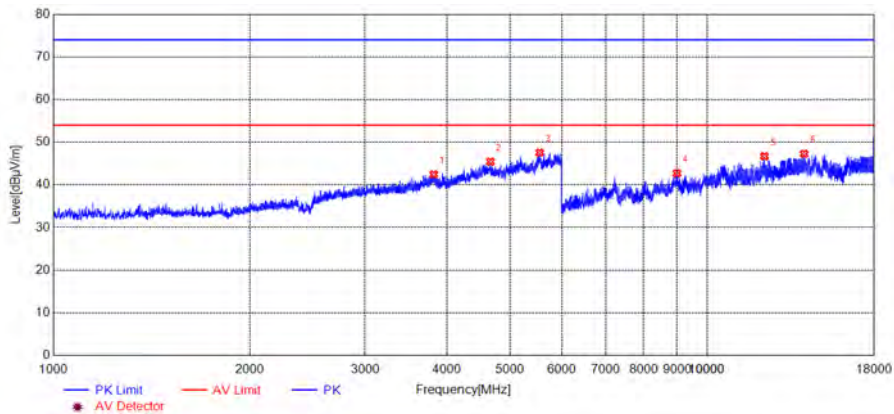
Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
3020.3367	40.63	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3792.9655	42.76	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5844.9742	47.45	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8960.2467	42.54	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10629.3858	44.67	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
14067.6723	47.06	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 1GHz 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
34.8549	32.71	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
135.8358	20.30	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
269.8298	26.91	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
360.1301	28.04	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
397.0270	27.22	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
797.0671	31.10	N/A	N/A	N/A	46.00	N/A	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
3819.6366	42.48	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4663.1105	45.43	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5546.5911	47.56	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8992.2494	42.72	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12231.5193	46.71	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
14072.6727	47.29	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 1GHz to 18GHz)

————— END OF REPORT —————