TEST REPORT

APPLICANT	:	BLU Products, Inc.
PRODUCT NAME	:	Smart Phone
MODEL NAME	:	N4
BRAND NAME	:	BOLD
FCC ID	:	YHLBLU4NC
STANDARD(S)	:	47 CFR Part 15 Subpart C
RECEIPT DATE	:	2025-07-08
TEST DATE	:	2025-07-11 to 2025-08-05
ISSUE DATE	:	2025-08-18

Edited by: Zeng Xiaoying (Rapporteur)

Approved by: Shen Junsheng (Supervisor)

DIRECTORY

Change History		
Version	**Date**	**Reason for change**
1.0	2025-08-18	First edition

1. Summary of Test Result

No.	Section	Description	Test Date	Test Engineer	Result	Remark
1	15.203	Antenna Requirement	N/A	N/A	PASS	/
2	N/A	Duty Cycle of Test Signal	Jul. 14, 2025	Li Xinpeng	PASS	/
3	15.247(b)	Maximum Peak Conducted Output Power	Jul. 14, 2025	Li Xinpeng	PASS	/
4	15.247(b)	Maximum Average Conducted Output Power	Jul. 14, 2025	Li Xinpeng	PASS	/
5	15.247(a)	Bandwidth	Jul. 14, 2025	Li Xinpeng	PASS	/
6	15.247(d)	Conducted Spurious Emission and Band Edge	Jul. 14, 2025	Li Xinpeng	PASS	/
7	15.247(e)	Power Spectral Density	Jul. 14, 2025	Li Xinpeng	PASS	/
8	15.207	Conducted Emission	Jul. 29, 2025	Wang Yapeng	PASS	/
9	15.247(d)	Restricted Frequency Bands	Jul. 13, 2025	Wang Deyong	PASS	/
10	15.209, 15.247(d)	Radiated Emission	Jul. 15, 2025	Wang Deyong	PASS	/

Note 1: The tests were performed according to the method of measurements prescribed in ANSI C63.10-2020 and KDB 558074 D01 v05r02.

Note 2: Any additions, deviation, or exclusions from the method shall be noted in the “Remark”.

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	Serial No.	Type	Manufacturer	Cal. Date	Due Date
EXA Signal Analzyer	MY53470836	N9010A	Agilent	2025.01.15	2026.01.14
RF Cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
SMA Connector	CN01	RF03	HUBER-SUHNER	N/A	N/A

1.2.2 Conducted Emission Test Equipment

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Receiver	101052	ESPI	R&S	2025.05.15	2026.05.14
LISN	103131	ENV 216	R&S	2025.03.20	2026.03.19
RF Coaxial Cable (DC-100MHz)	EMC-CE-00514	N/A	N/A	2025.05.06	2026.05.05

1.2.3 List of Software Used

Description	Manufacturer	Software Version
Test System	MaiWei	2.0.0.0
JS32-RE	Tonscend	5.0.0
TS+ -[JS32-CE]	Tonscend	2.5.0.0

1.2.4 Radiated Test Equipment

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Signal Analyzer	MY56060145	N9020A	Agilent	2025.05.13	2026.05.12
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2025.06.22	2026.06.21
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2025.05.16	2026.05.15
Test Antenna – Horn	01774	BBHA 9120D	Schwarzbeck	2025.06.20	2026.06.19
Test Antenna – Horn	BBHA9170 #773	BBHA9170	Schwarzbeck	2025.06.20	2026.06.19
Preamplifier (10MHz-6GHz)	46732	S10M100L3802	LUCIX CORP.	2025.05.13	2026.05.12
Preamplifier (2GHz-18GHz)	61171/61172	S020180L3203	LUCIX CORP.	2025.05.13	2026.05.12
Preamplifier (18GHz-40GHz)	DS77209	DCLNA0118-40C-S	Decentest	2025.05.13	2026.05.12
RF Coaxial Cable (DC-18GHz)	MRE001	PE330	Pasternack	2025.05.13	2026.05.12
RF Coaxial Cable (DC-18GHz)	MRE002	CLU18	Pasternack	2025.05.13	2026.05.12
RF Coaxial Cable (DC-18GHz)	MRE003	CLU18	Pasternack	2025.05.13	2026.05.12
RF Coaxial Cable (DC-40GHz)	22290045	QA360-40-KK-0.5	Qualwave	2024.09.11	2025.09.10
RF Coaxial Cable (DC-40GHz)	22290046	QA360-40-KKF-2	Qualwave	2024.09.11	2025.09.10
RF Coaxial Cable (DC-18GHz)	22120181	QA500-18-NN-5	Qualwave	2024.09.11	2025.09.10
Notch Filter	N/A	WRCG-2400-2483.5-60SS	Wainwright	N/A	N/A
Anechoic Chamber	N/A	9m*6m*6m	CRT	2025.06.21	2028.06.20
Anechoic Chamber	N/A	9m*6m*6m	CRT	2022.11.30	2025.11.29

1.3. Measurement Uncertainty

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

1.4. Testing Laboratory

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

2. General Description

2.1. Information of Applicant and Manufacturer

Applicant:	BLU Products, Inc.
Applicant Address:	8600 NW 36th Street, Suite #300 | Miami, FL 33166 USA
Manufacturer:	BLU Products, Inc.
Manufacturer Address:	8600 NW 36th Street, Suite #300 | Miami, FL 33166 USA

2.2. Information of EUT

Product Name:	Smart Phone	
Sample No.:	1#, 8#	
Hardware Version:	KX10GF_06	
Software Version:	BOLD_N0090_V15.0.03.00_GENERIC 01-08-2025 21:45	
Equipment Type:	Bluetooth LE	
Bluetooth Version:	5.4	
Modulation Type:	GFSK	
Data Rate:	1Mbps, 2Mbps	
Operating Frequency Range:	2402MHz-2480MHz	
Antenna Type:	PCB Antenna	
Antenna Gain:	-1.30dBi	
Accessory Information:	Battery	
	Brand Name:	BOLD
	Model No.:	C865255500P
	Serial No.:	N/A
	Capacity:	4900mAh
	Rated Voltage:	3.87V
	Charge Limit:	4.45V
	Manufacturer:	Guangdong Highpower New Energy Technology Co. , Ltd.
	AC Adapter	
	Brand Name:	BOLD
	Model No.:	US-BJ-6625Q
	Serial No.:	N/A
	Rated Output:	5.0V⎓3000mA, 9.0V⎓3000mA, 12.0V⎓3000mA, 15.0V⎓3000mA, 20.0V⎓3250mA,

		5.0-11.0V⎓6000mA, 5.0-20.0V⎓3250mA
	Rated Input:	100-240V～50/60Hz, 1.6A
	Manufacturer:	ShenZhen BaiJunDa Electronics Co., Ltd

Note 1: The EUT description presented in the report are provided by applicant and/or manufacturer, and the test laboratory is not responsible for the accuracy of the information. 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**	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	**19**	**2440**	29	2460	**39**	**2480**

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

2.4. Test Configuration of EUT

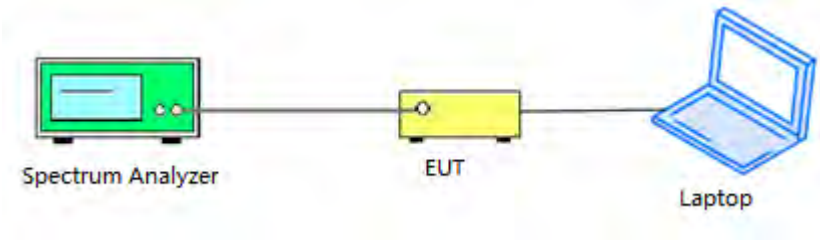
The EUT is controlled by dedicated software to transmit at the default maximum power level.

2.5. Test Conditions

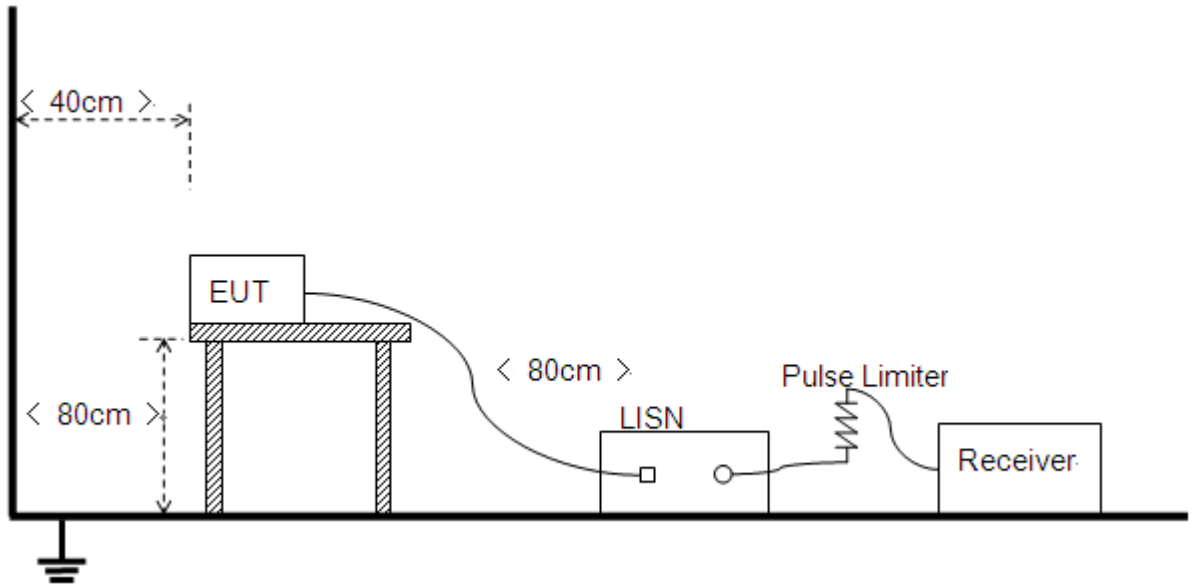
Temperature (°C):	15-35
Relative Humidity (%):	30-60
Atmospheric Pressure (kPa):	86-106

2.6. Test Setup Layout Diagram

2.6.1.Conducted Measurement

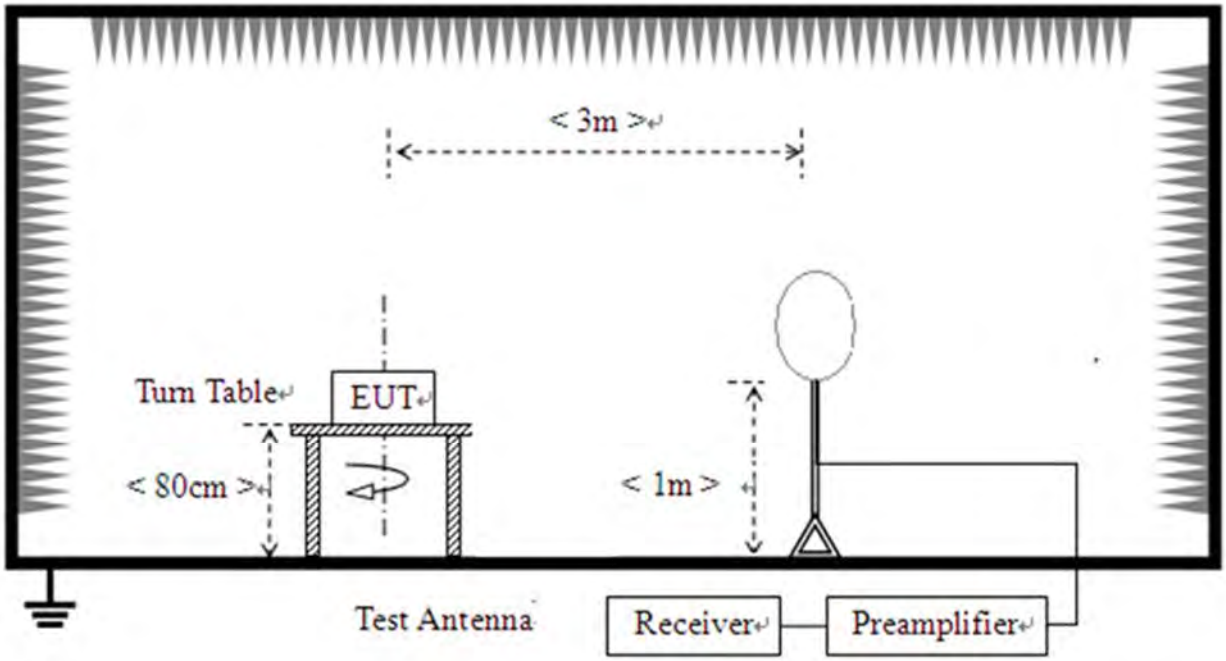


2.6.2.Conducted Emission Measurement

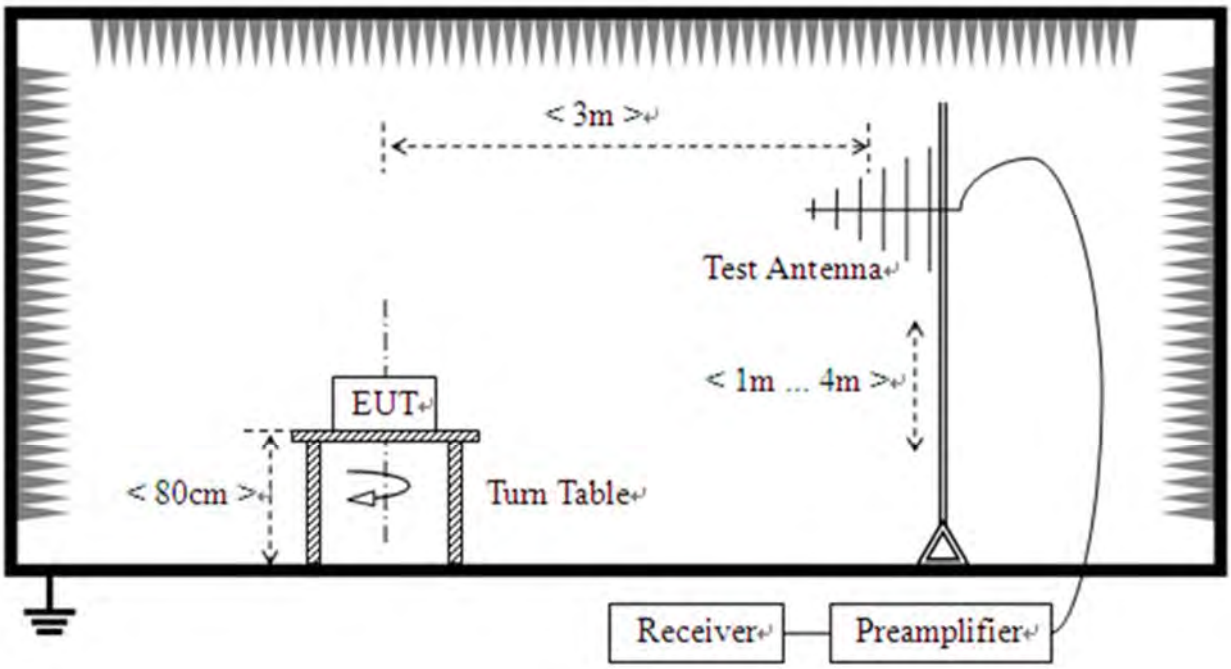


2.6.3.Radiation Measurement

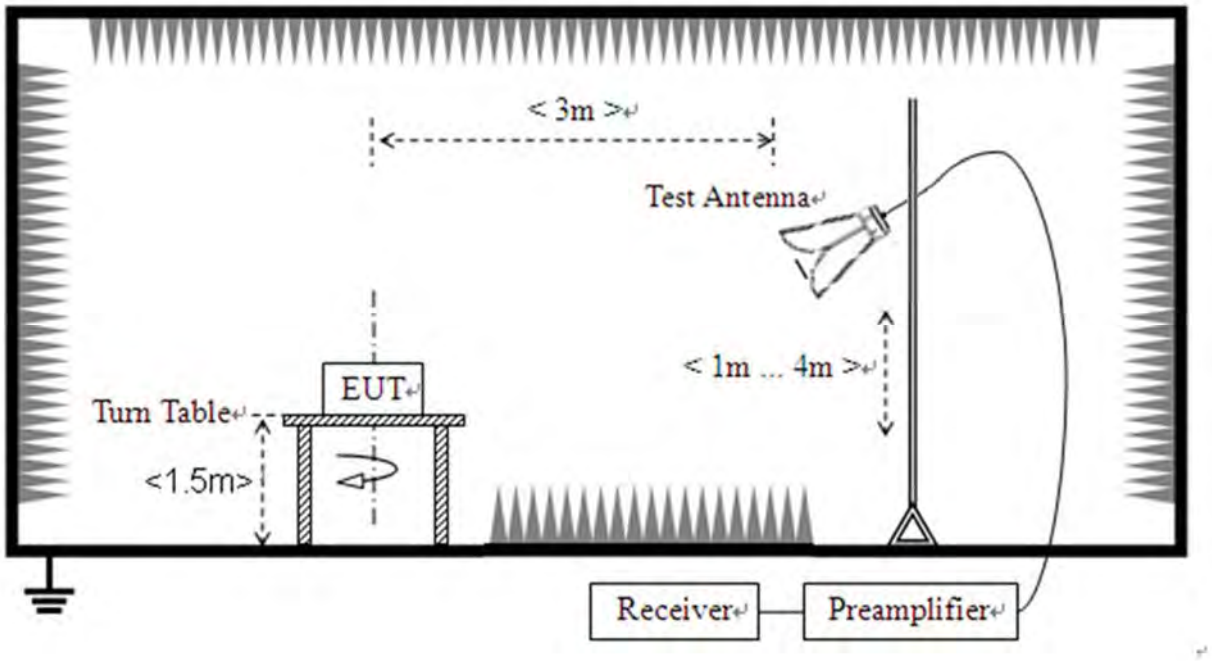
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



3) For radiated emissions above 1GHz



3. Test Results

3.1. Antenna Requirement

3.1.1.Requirement

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

3.1.2.Test Result

Antenna location	Antenna Type	Coupling Method
☒Internal ☐External	☐FPC Antenna ☐Spring Antenna ☐Ceramic Antenna ☐Integrated Antenna ☐Dipole Antenna ☐PCB Antenna ☒PIFA Antenna ☐Inverted F Antenna	☐I-PEX Connector ☐SMA Connector ☐RP-SMA Connector ☒Metal Shrapnel ☐Layout

3.2. Duty Cycle of Test Signal

3.2.1.Requirement

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

3.2.2.Test Result

Refer to Annex A.1 in this report.

3.3. Maximum Peak 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 to100kHz
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 by6 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 ≥ 3 ×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 ≥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 to1.5 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.

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 ≥ 1GHz, 100 kHz for f < 1GHz
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 (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

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

3.10.2.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 3meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

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

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

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

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

3.10.3.Test Setup Layout

Refer to chapter 2.6.3 in this report.

3.10.4.Test Result

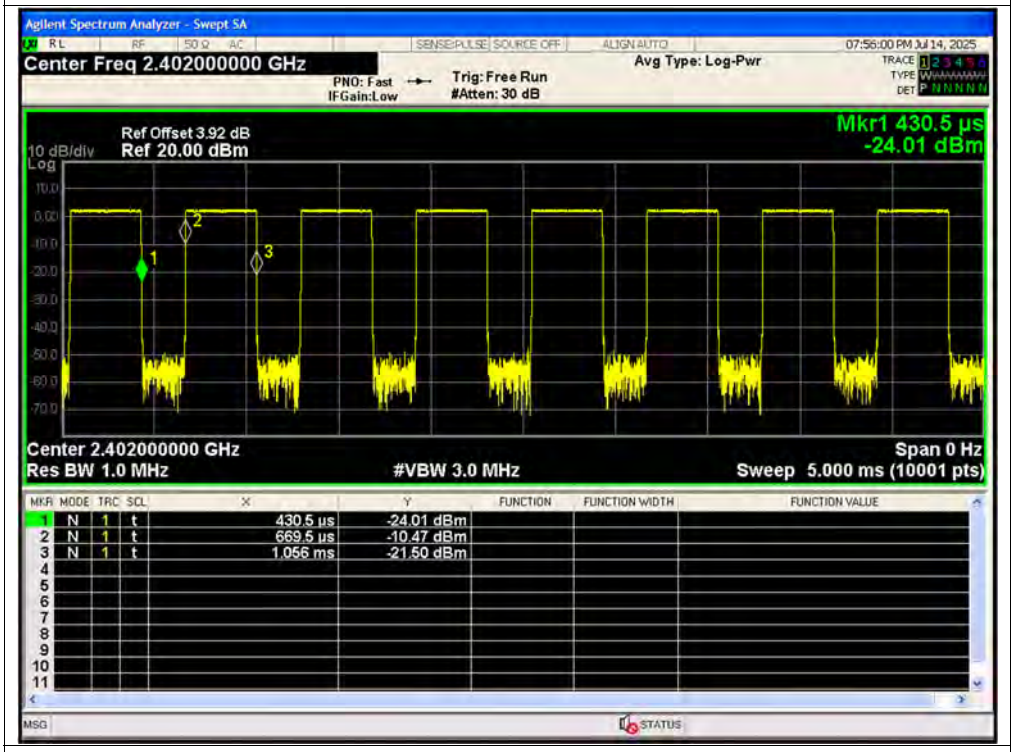
Refer to Annex A.10 in this report.

Annex A Test Data and Result

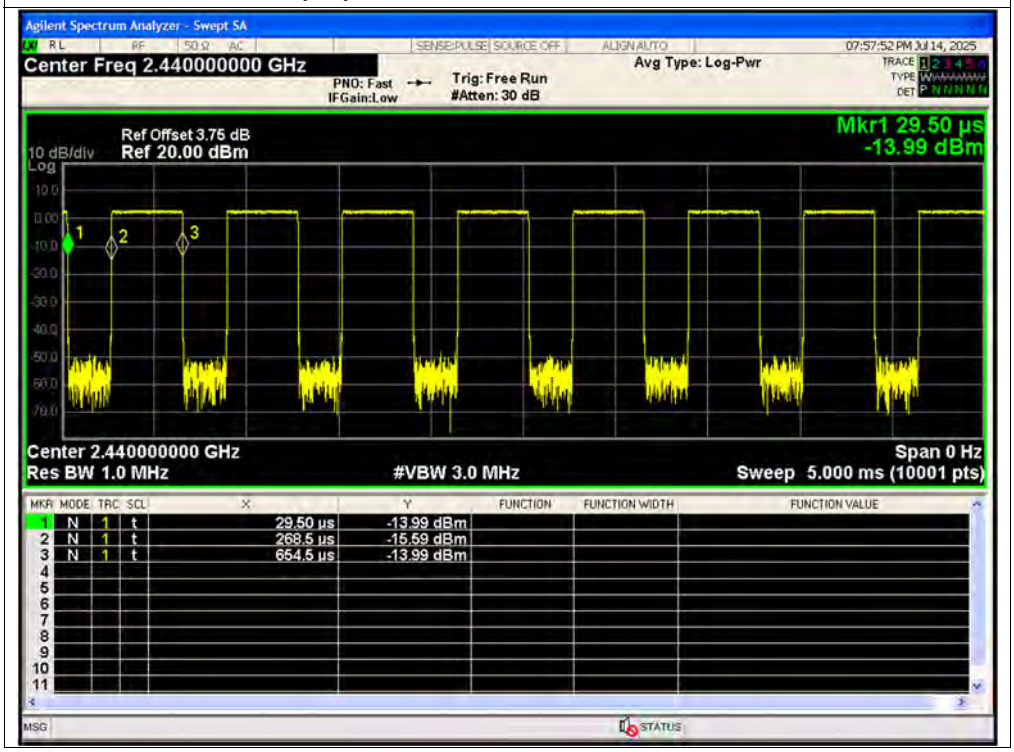
A.1. Duty Cycle of Test Signal

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1M	2402	Ant1	61.76	2.09	2.59
NVNT	BLE 1M	2440	Ant1	61.76	2.09	2.59
NVNT	BLE 1M	2480	Ant1	61.76	2.09	2.59
NVNT	BLE 2M	2404	Ant1	32.32	4.91	4.95
NVNT	BLE 2M	2440	Ant1	32.32	4.91	4.95
NVNT	BLE 2M	2478	Ant1	32.32	4.91	4.95

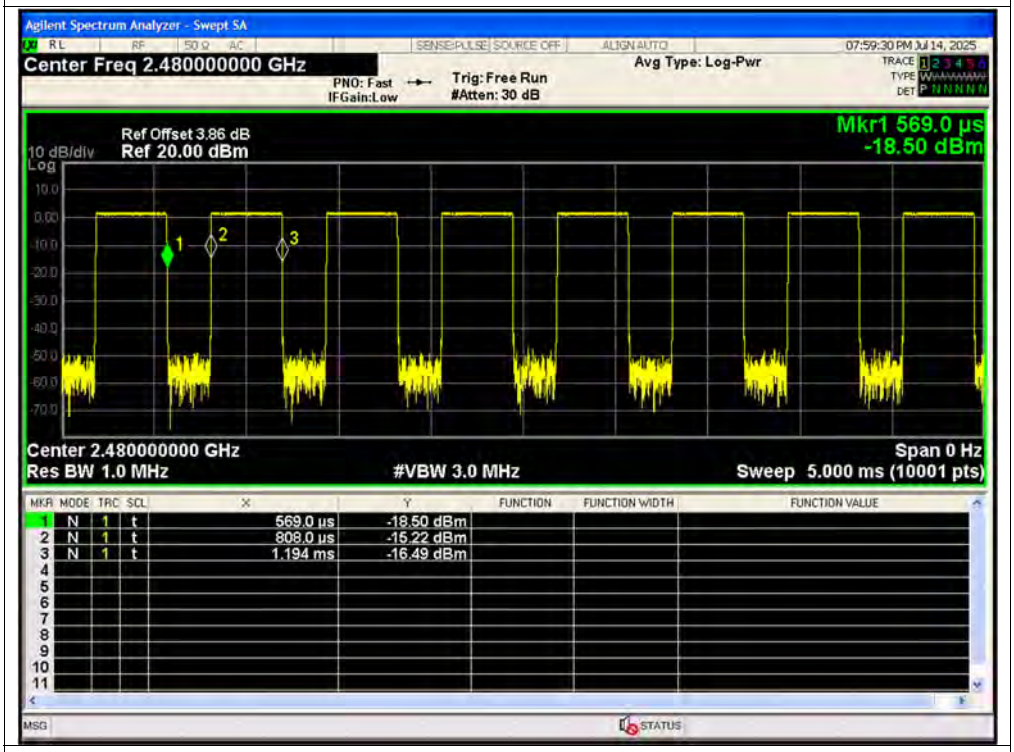
Test Graphs
Duty Cycle NVNT BLE 1M 2402MHz Ant1



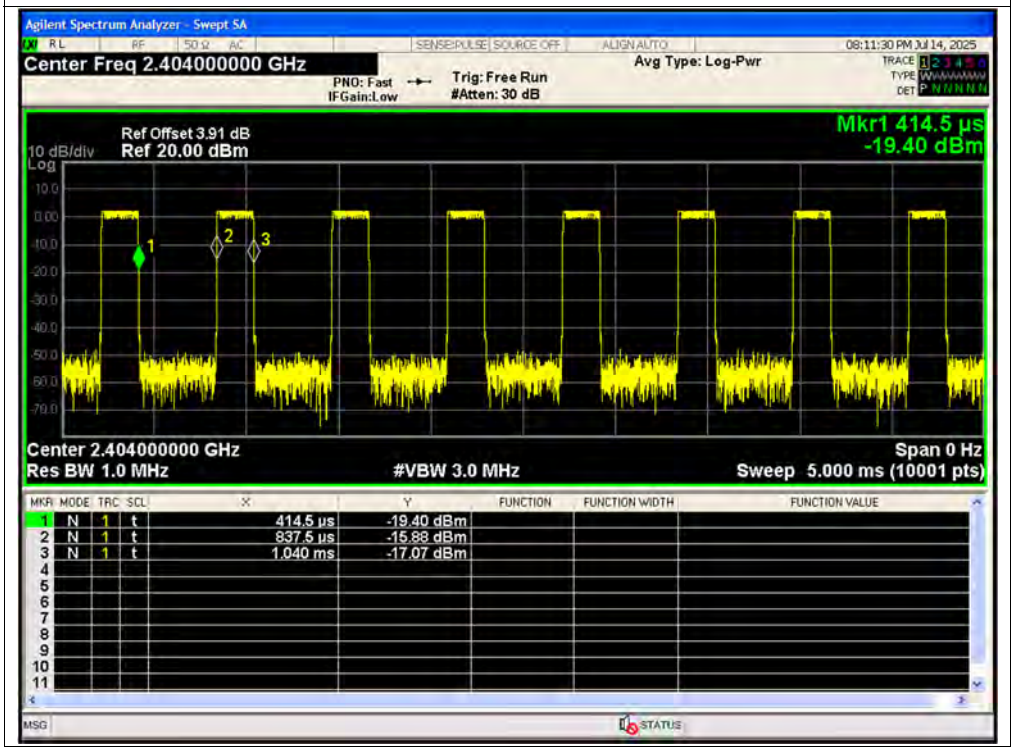
Duty Cycle NVNT BLE 1M 2440MHz Ant1



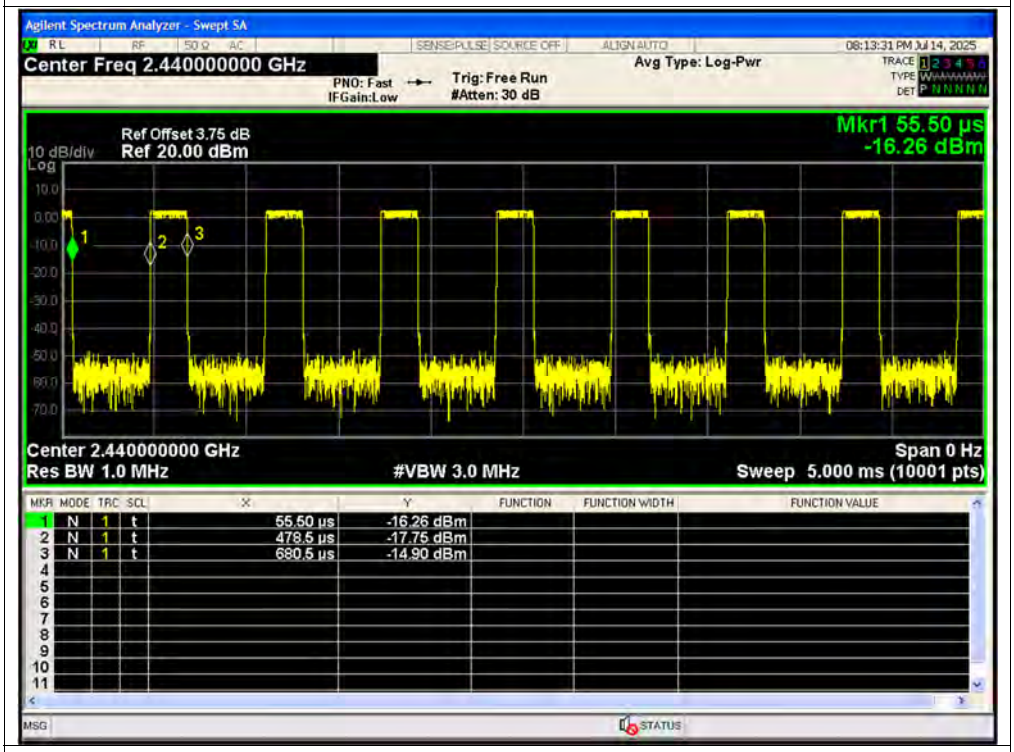
Duty Cycle NVNT BLE 1M 2480MHz Ant1



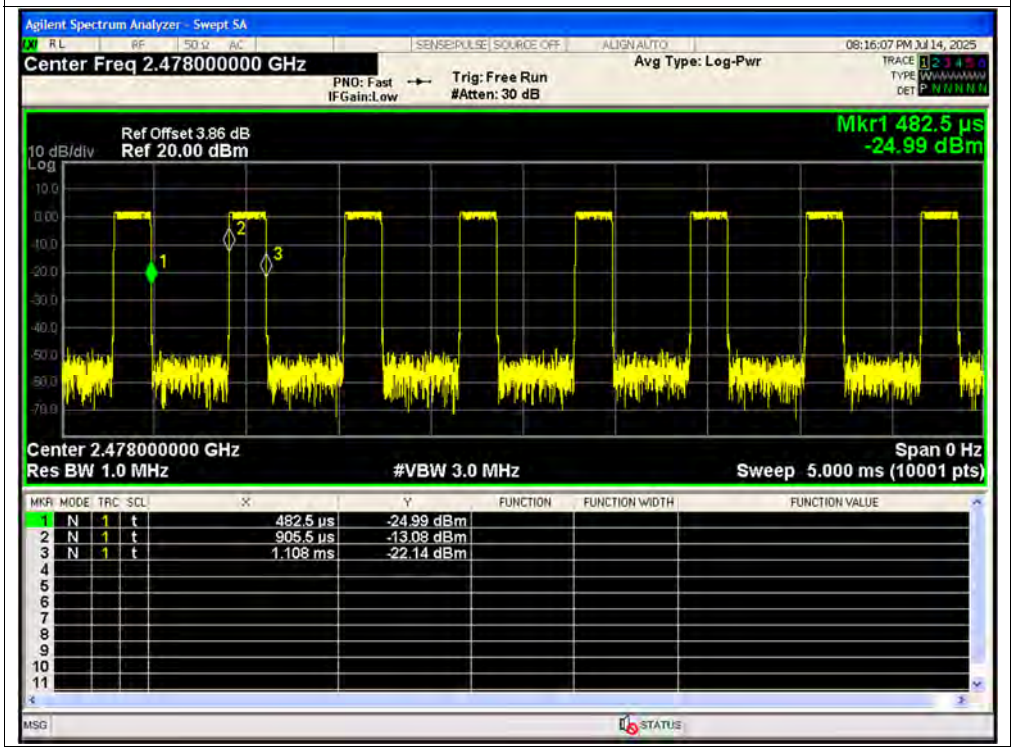
Duty Cycle NVNT BLE 2M 2404MHz Ant1



Duty Cycle NVNT BLE 2M 2440MHz Ant1



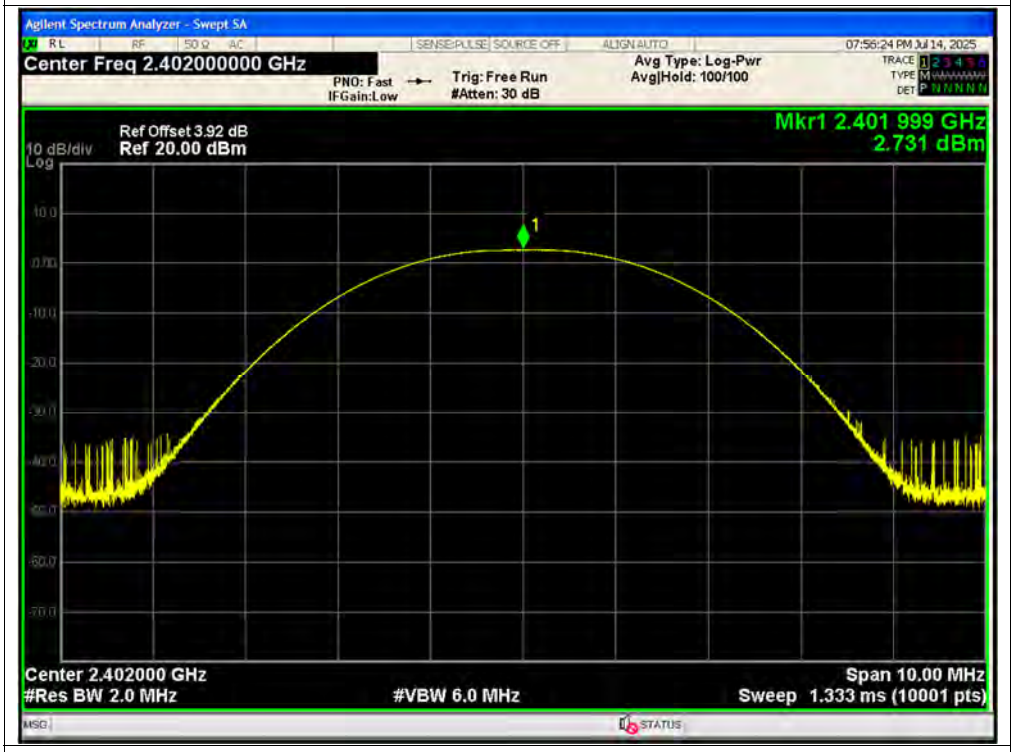
Duty Cycle NVNT BLE 2M 2478MHz Ant1



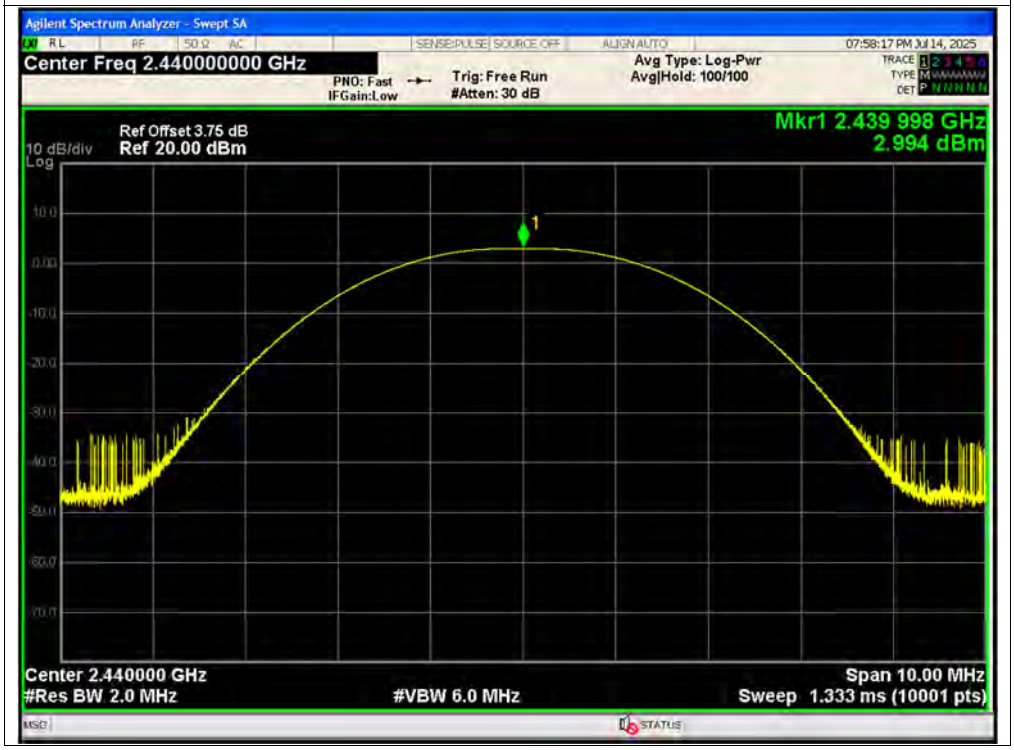
A.2. Maximum Peak Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Conducted Power (dBm)	Total Conducted Power (W)	Limit Conducted (dBm)	Verdict
NVNT	BLE 1M	2402	Ant1	2.73	0	2.73	0.00187	30	Pass
NVNT	BLE 1M	2440	Ant1	2.99	0	2.99	0.00199	30	Pass
NVNT	BLE 1M	2480	Ant1	2.19	0	2.19	0.00166	30	Pass
NVNT	BLE 2M	2404	Ant1	2.77	0	2.77	0.00189	30	Pass
NVNT	BLE 2M	2440	Ant1	3.02	0	3.02	0.002	30	Pass
NVNT	BLE 2M	2478	Ant1	2.67	0	2.67	0.00185	30	Pass

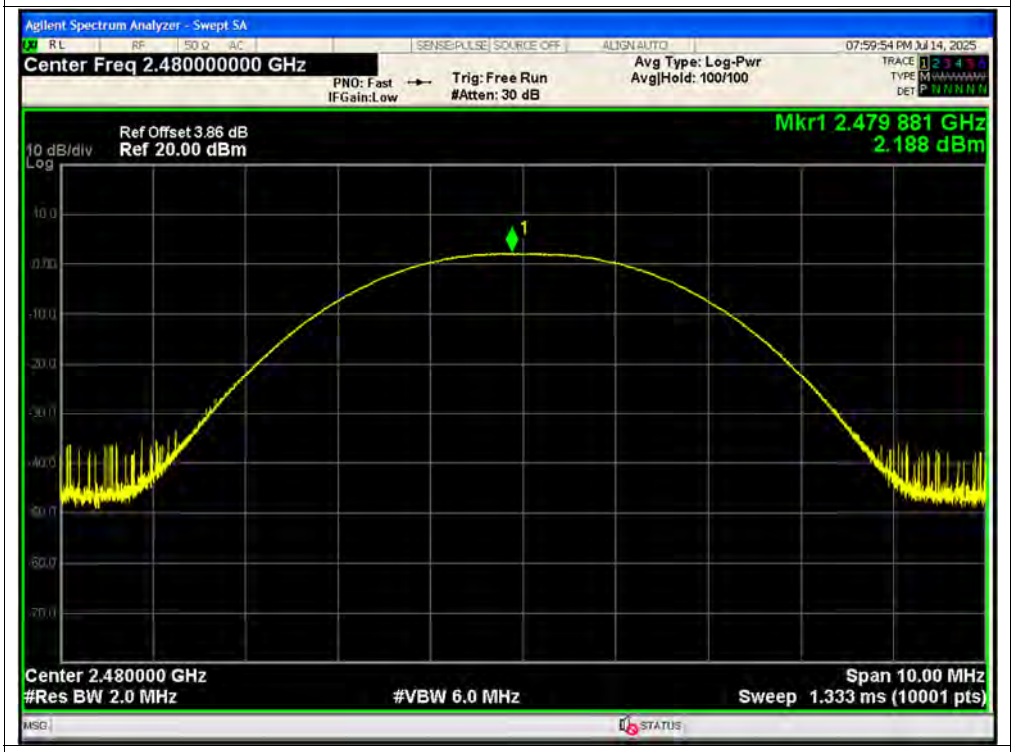
Test Graphs
Peak Power NVNT BLE 1M 2402MHz Ant1



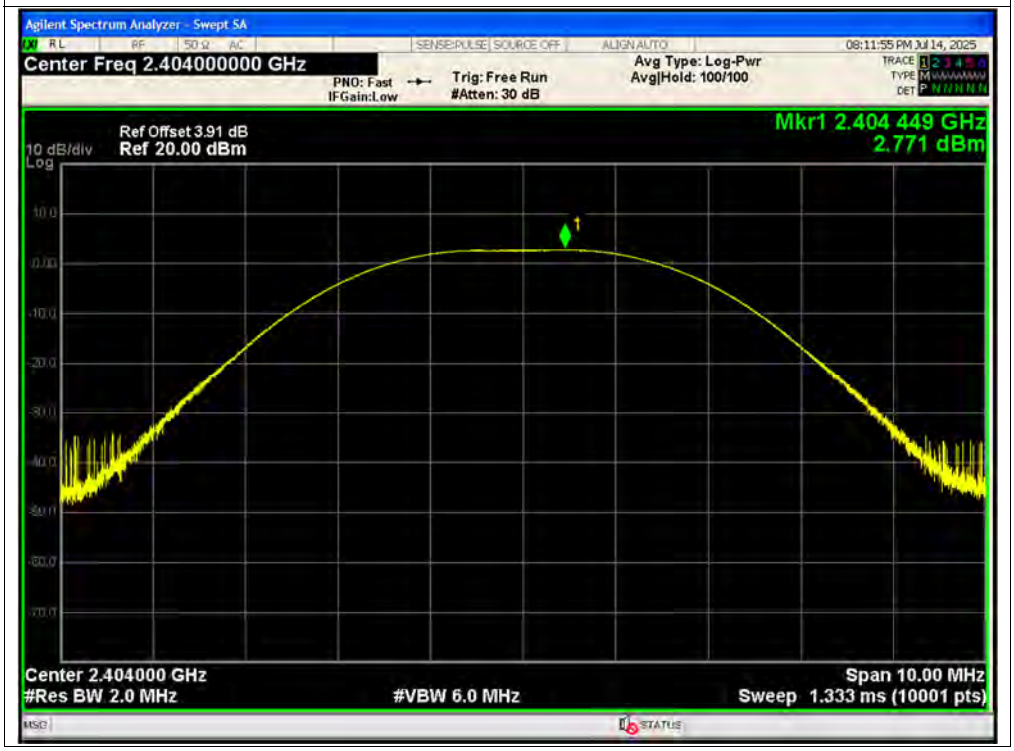
Peak Power NVNT BLE 1M 2440MHz Ant1



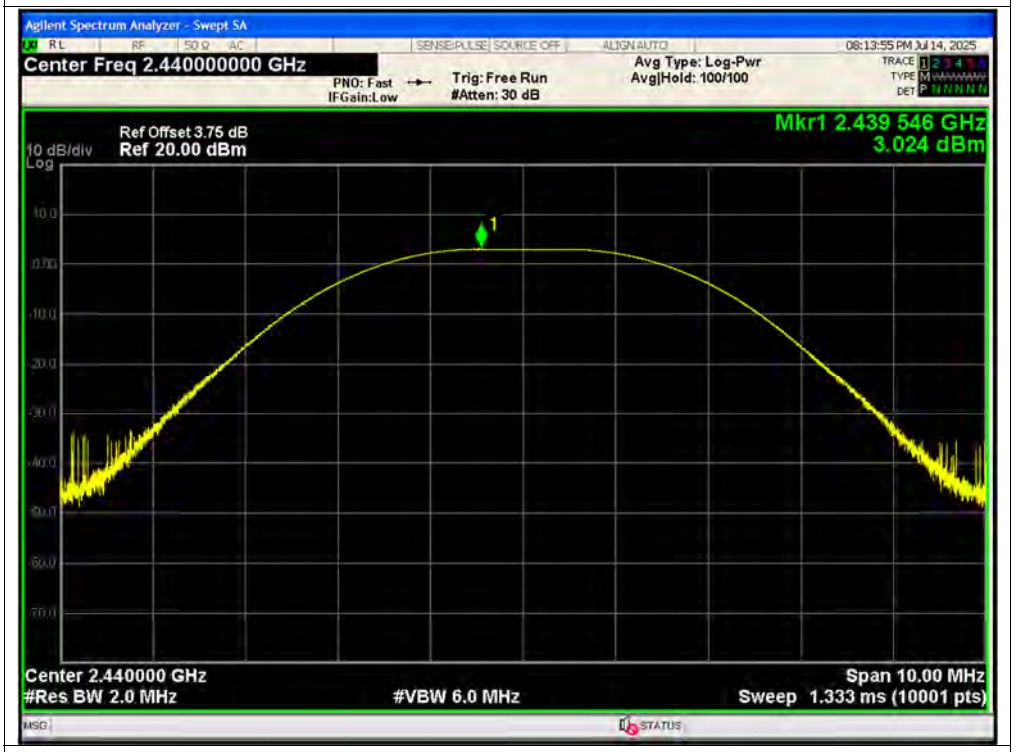
Peak Power NVNT BLE 1M 2480MHz Ant1



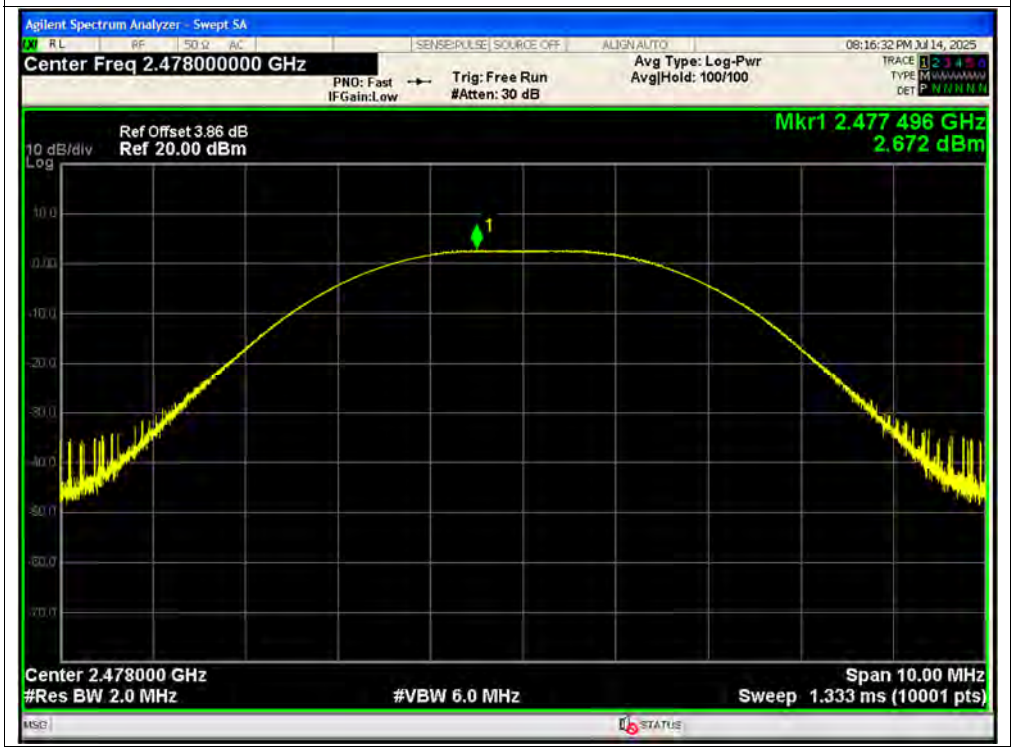
Peak Power NVNT BLE 2M 2404MHz Ant1



Peak Power NVNT BLE 2M 2440MHz Ant1



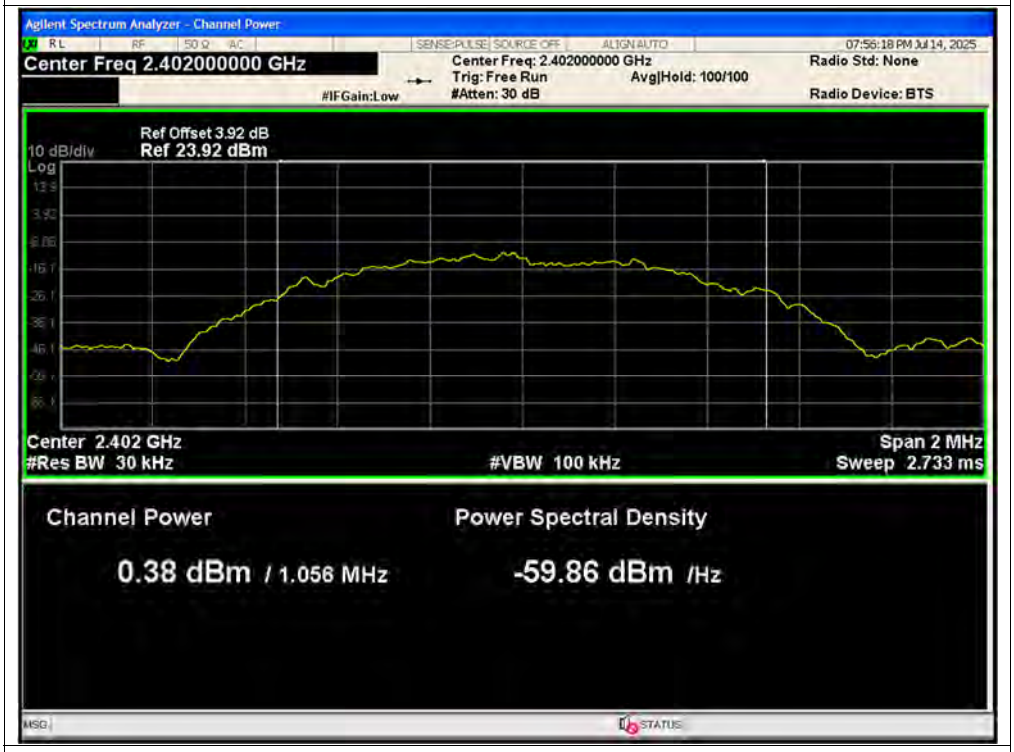
Peak Power NVNT BLE 2M 2478MHz Ant1



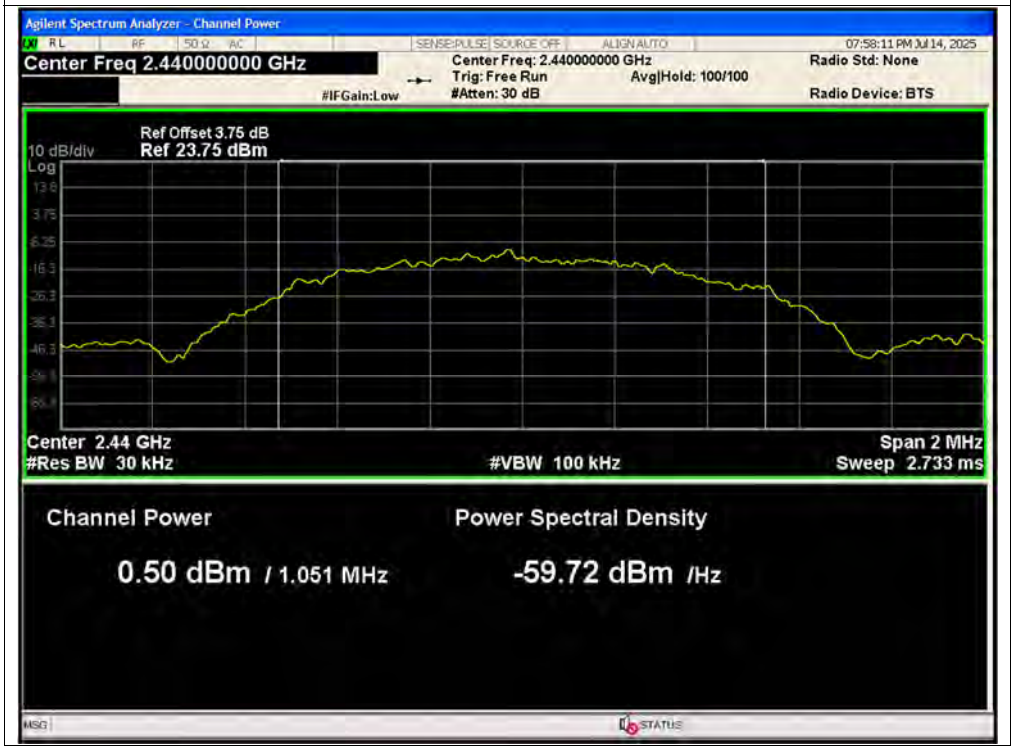
A.3. Maximum Average Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Conducted Power (dBm)	Total Conducted Power (W)	Limit Conducted (dBm)	Verdict
NVNT	BLE 1M	2402	Ant1	0.38	2.09	2.47	0.00177	30	Pass
NVNT	BLE 1M	2440	Ant1	0.5	2.09	2.59	0.00182	30	Pass
NVNT	BLE 1M	2480	Ant1	-0.69	2.09	1.4	0.00138	30	Pass
NVNT	BLE 2M	2404	Ant1	-2.38	4.91	2.53	0.00179	30	Pass
NVNT	BLE 2M	2440	Ant1	-2.09	4.91	2.82	0.00191	30	Pass
NVNT	BLE 2M	2478	Ant1	-2.73	4.91	2.18	0.00165	30	Pass

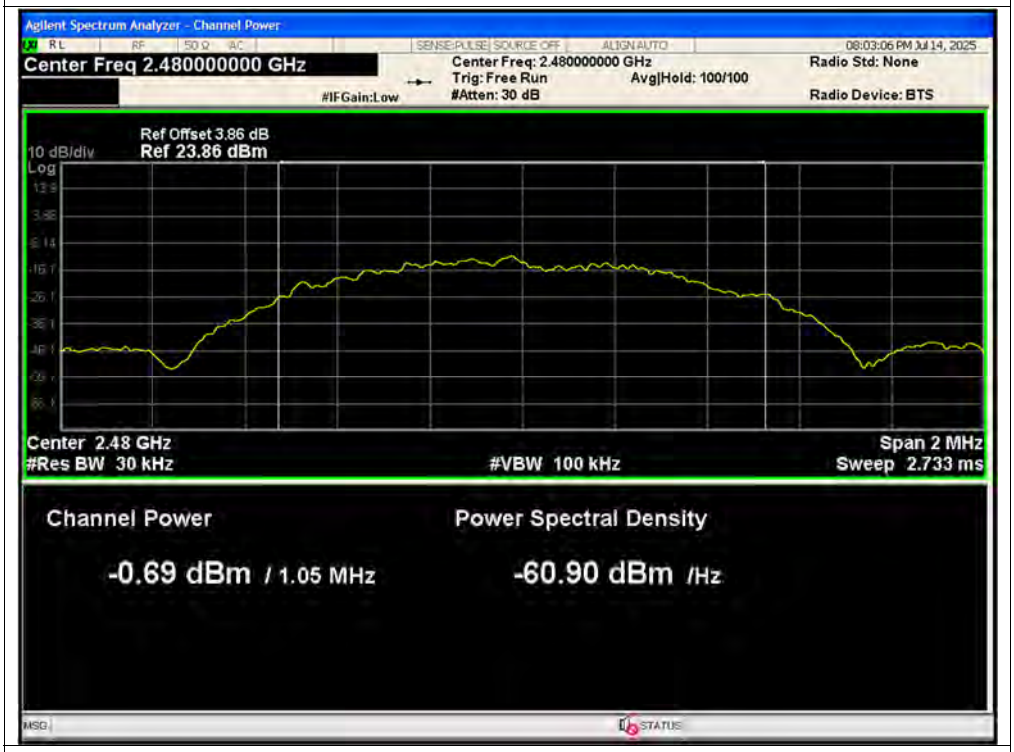
Test Graphs
Average Power NVNT BLE 1M 2402MHz Ant1



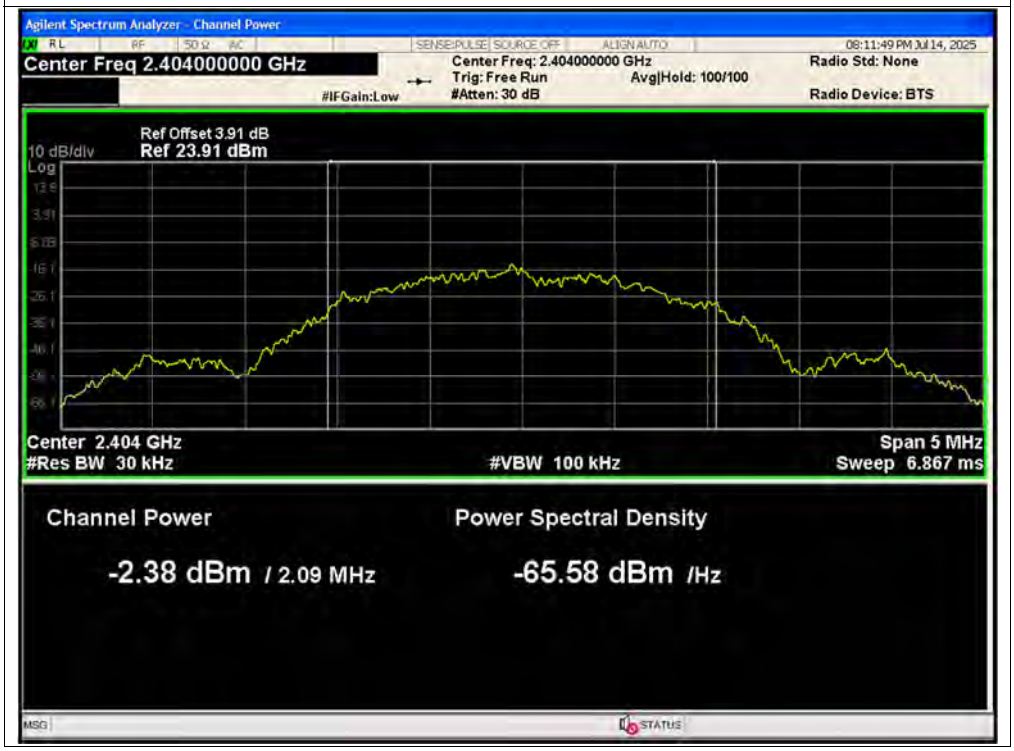
Average Power NVNT BLE 1M 2440MHz Ant1



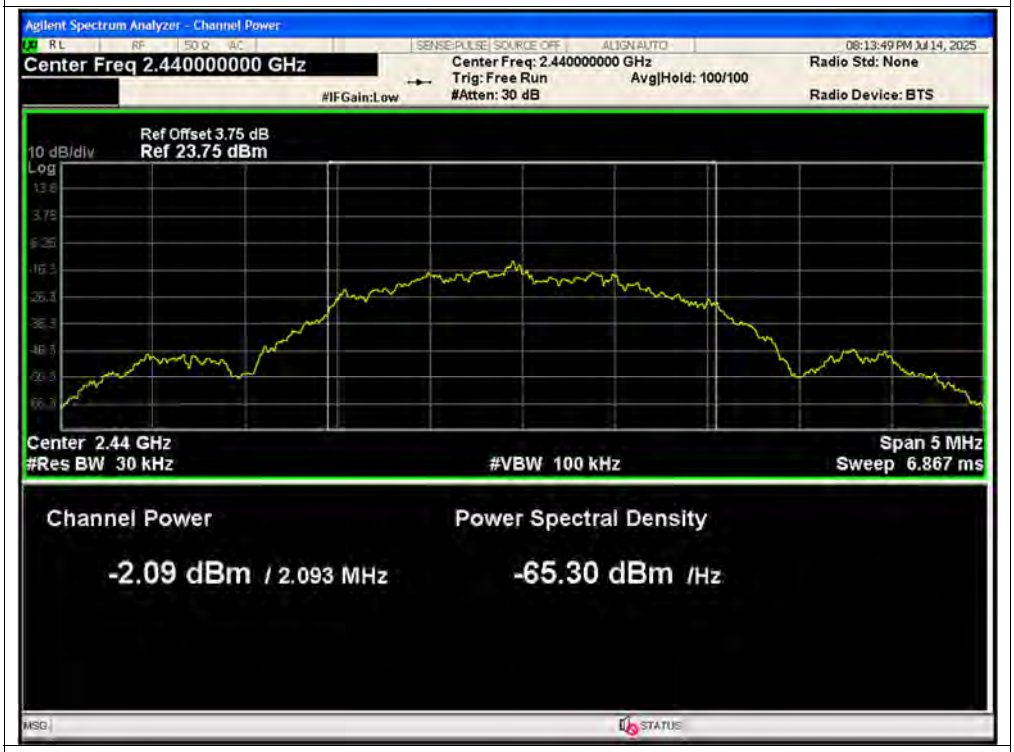
Average Power NVNT BLE 1M 2480MHz Ant1



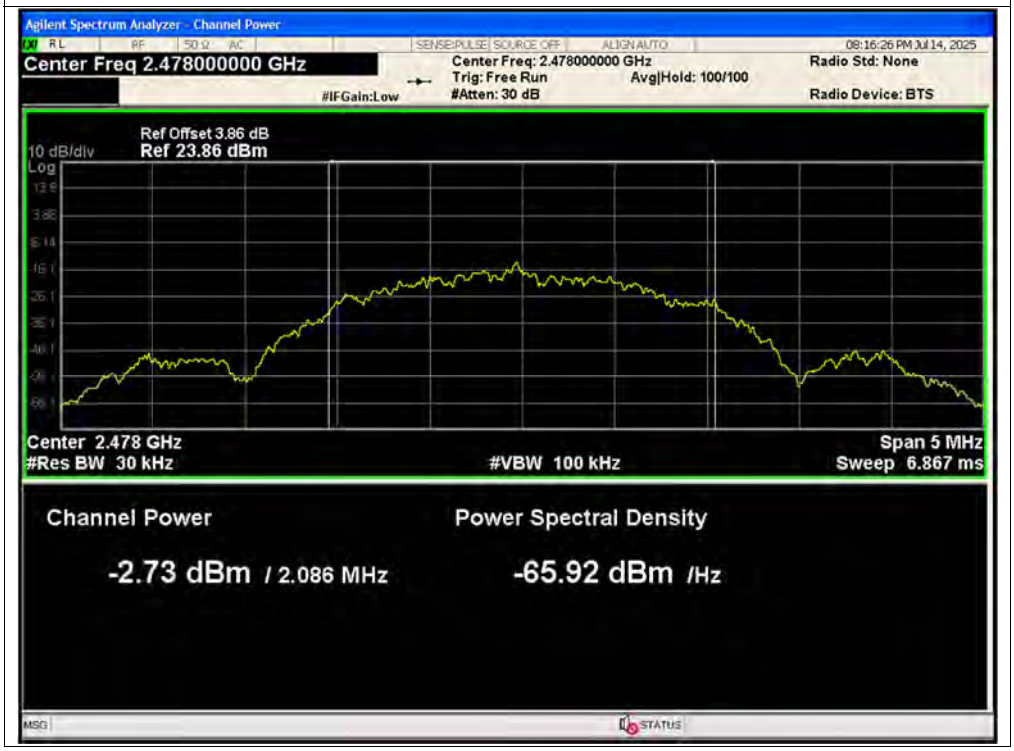
Average Power NVNT BLE 2M 2404MHz Ant1



Average Power NVNT BLE 2M 2440MHz Ant1



Average Power NVNT BLE 2M 2478MHz Ant1



A.4. 6 dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	Ant1	0.6921	0.5	Pass
NVNT	BLE 1M	2440	Ant1	0.7044	0.5	Pass
NVNT	BLE 1M	2480	Ant1	0.6922	0.5	Pass
NVNT	BLE 2M	2404	Ant1	1.166	0.5	Pass
NVNT	BLE 2M	2440	Ant1	1.18	0.5	Pass
NVNT	BLE 2M	2478	Ant1	1.155	0.5	Pass

Test Graphs
-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1

-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1

-6dB Bandwidth NVNT BLE 1M 2480MHz Ant1

-6dB Bandwidth NVNT BLE 2M 2404MHz Ant1

-6dB Bandwidth NVNT BLE 2M 2440MHz Ant1

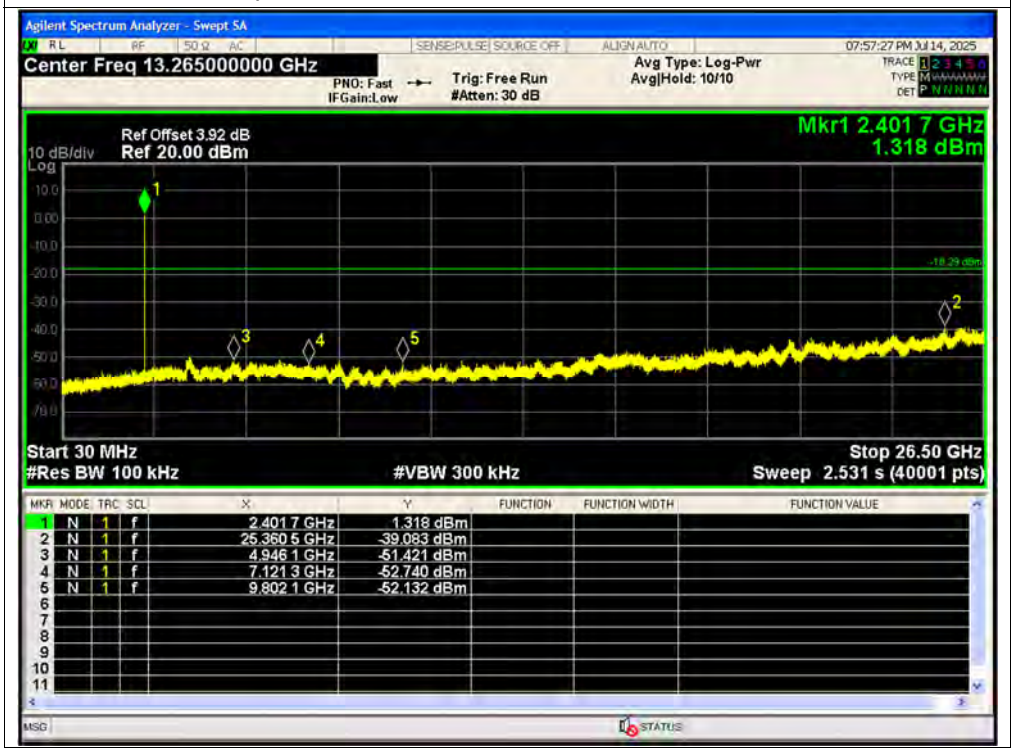
-6dB Bandwidth NVNT BLE 2M 2478MHz Ant1

A.5. Conducted Spurious Emissions

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-40.79	-20	Pass
NVNT	BLE 1M	2440	Ant1	-41.42	-20	Pass
NVNT	BLE 1M	2480	Ant1	-39.98	-20	Pass
NVNT	BLE 2M	2404	Ant1	-40.63	-20	Pass
NVNT	BLE 2M	2440	Ant1	-41.01	-20	Pass
NVNT	BLE 2M	2478	Ant1	-40.66	-20	Pass

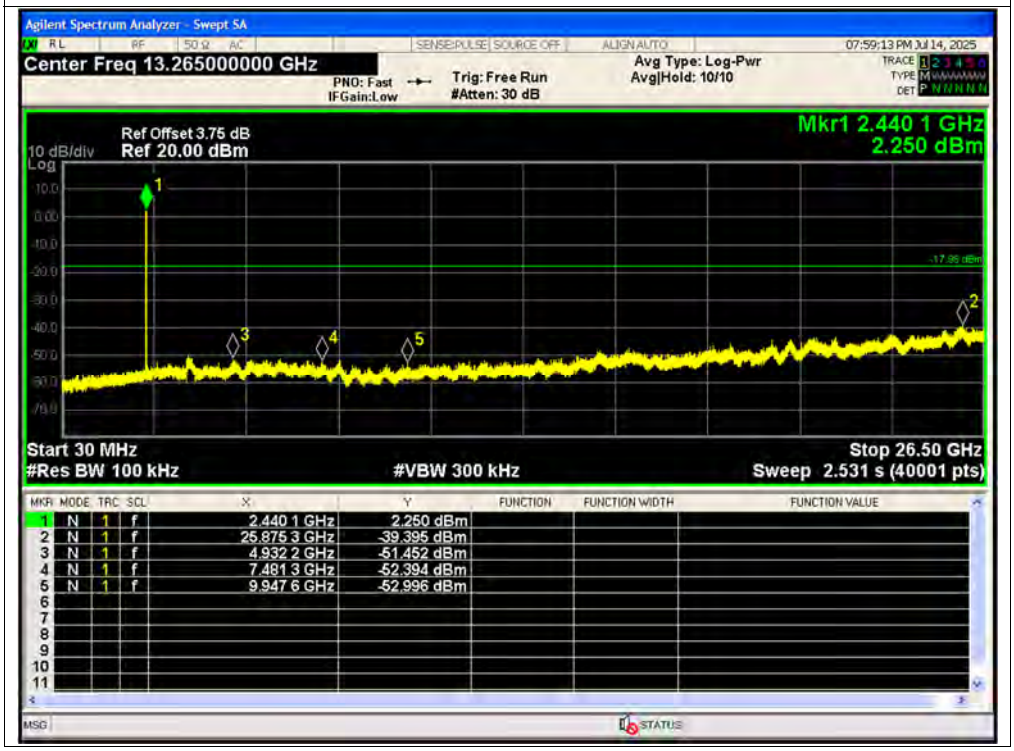
Test Graphs
Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Ref

Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission



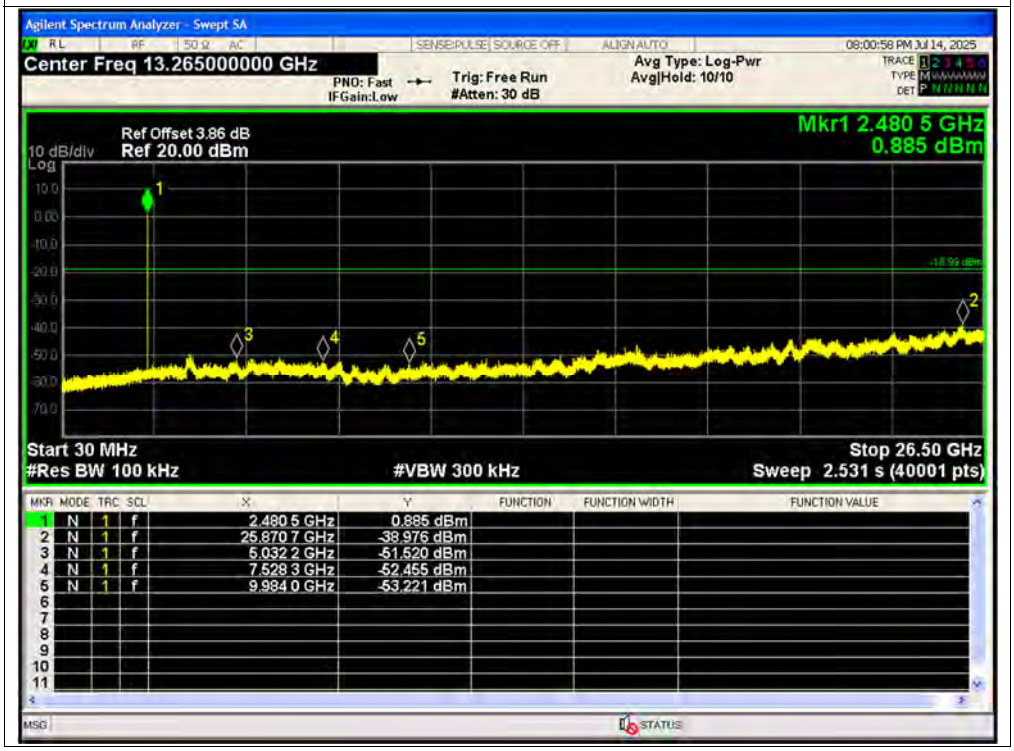
Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref

Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission



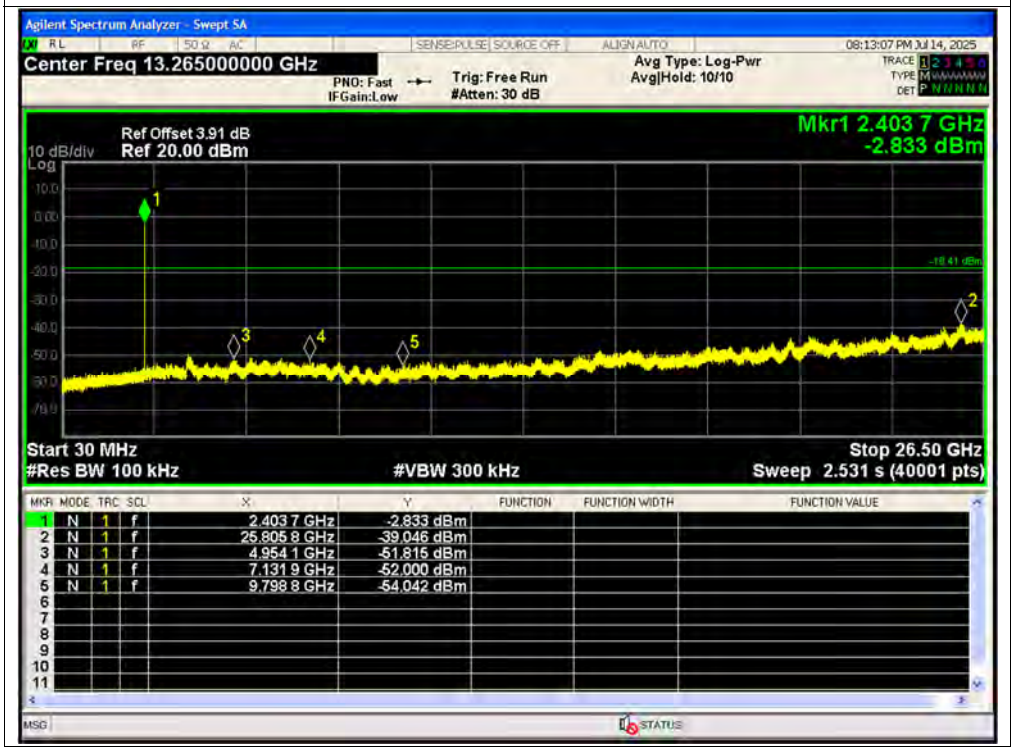
Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref

Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission



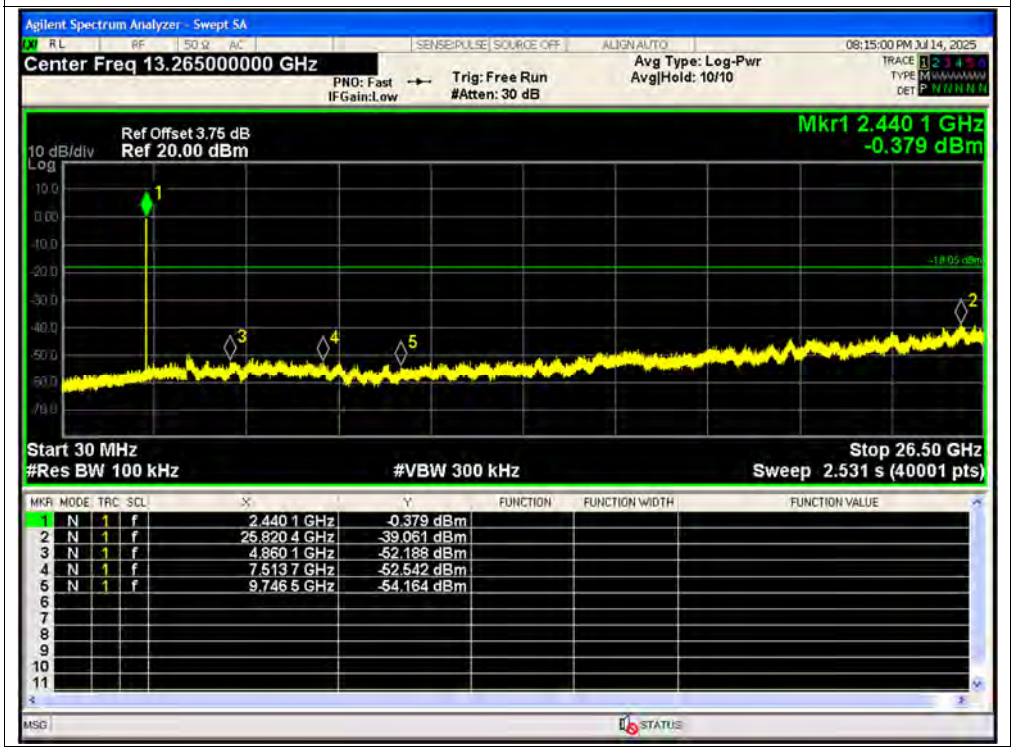
Tx. Spurious NVNT BLE 2M 2404MHz Ant1 Ref

Tx. Spurious NVNT BLE 2M 2404MHz Ant1 Emission



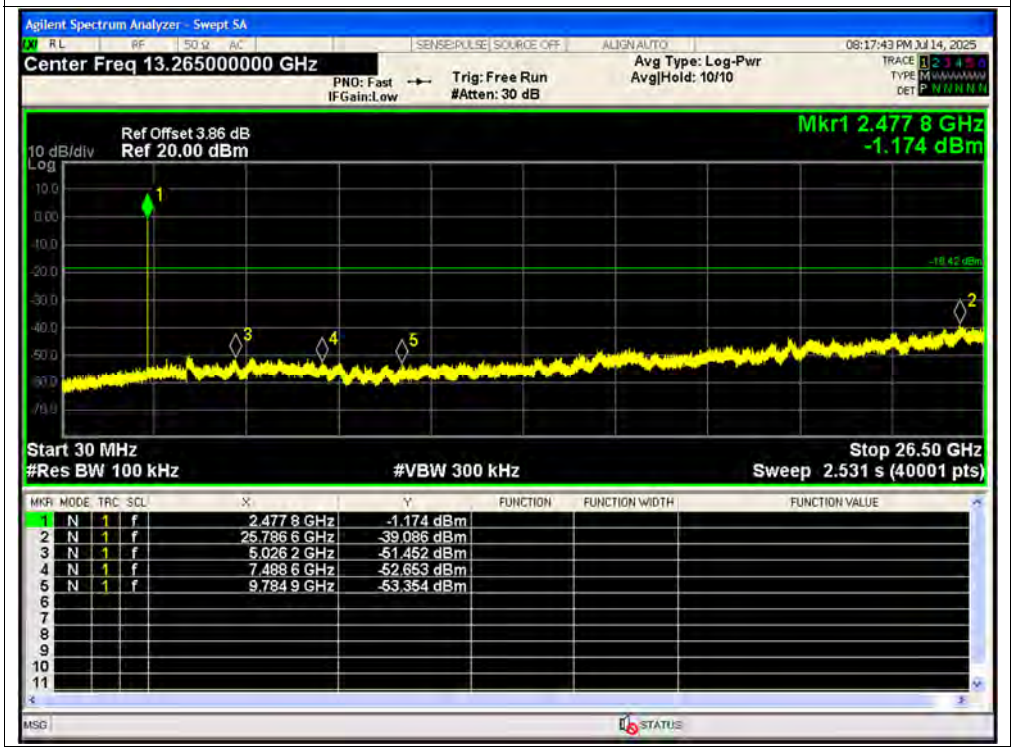
Tx. Spurious NVNT BLE 2M 2440MHz Ant1 Ref

Tx. Spurious NVNT BLE 2M 2440MHz Ant1 Emission



Tx. Spurious NVNT BLE 2M 2478MHz Ant1 Ref

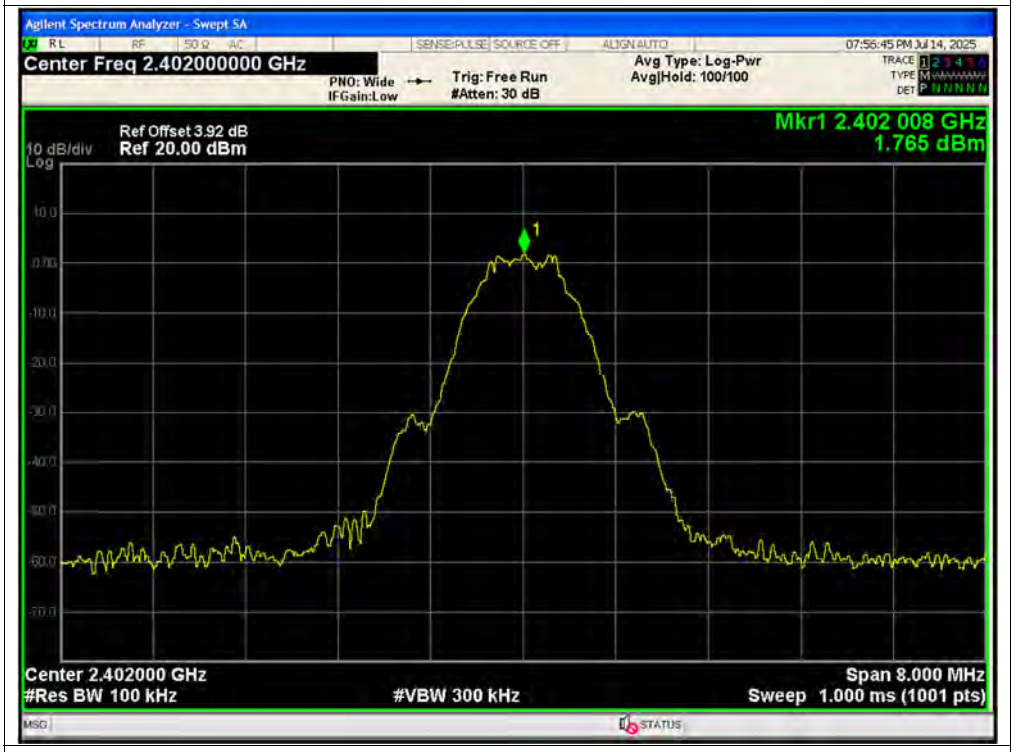
Tx. Spurious NVNT BLE 2M 2478MHz Ant1 Emission



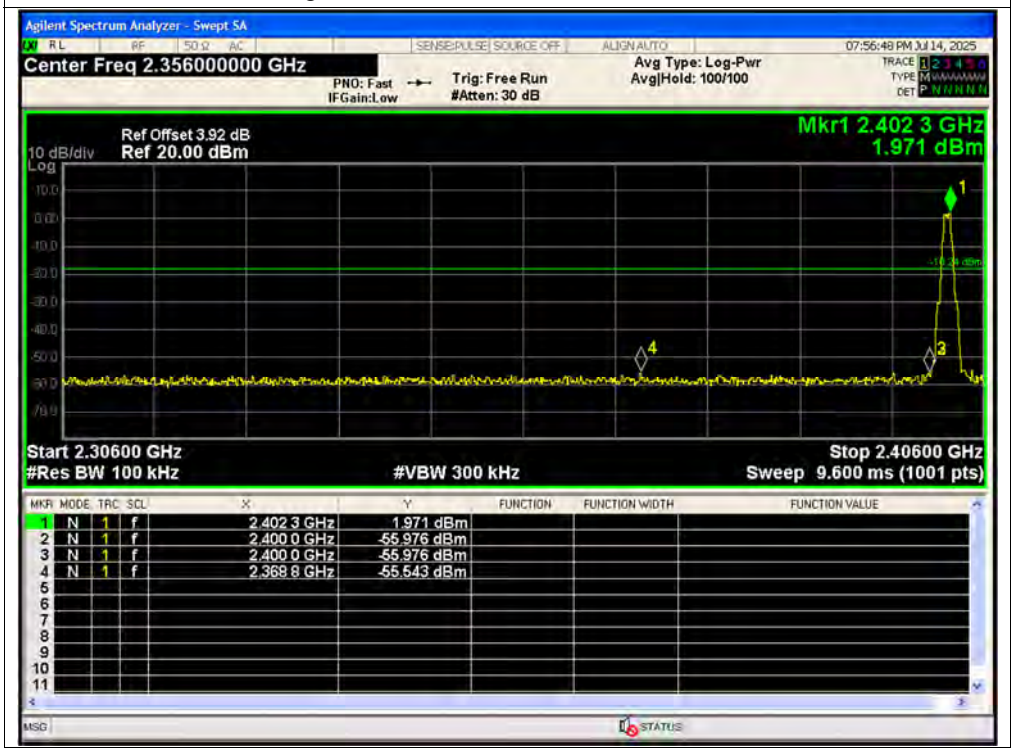
A.6. Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-57.31	-20	Pass
NVNT	BLE 1M	2480	Ant1	-56.78	-20	Pass
NVNT	BLE 2M	2404	Ant1	-57.74	-20	Pass
NVNT	BLE 2M	2478	Ant1	-56.45	-20	Pass

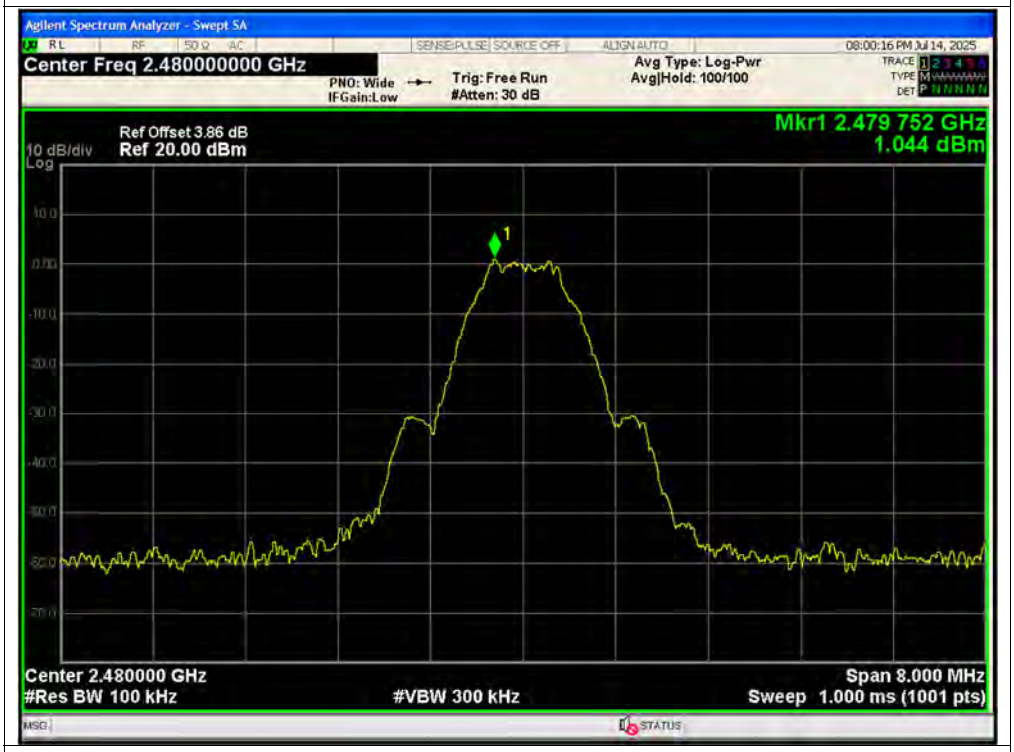
Test Graphs
Band Edge NVNT BLE 1M 2402MHz Ant1 Ref



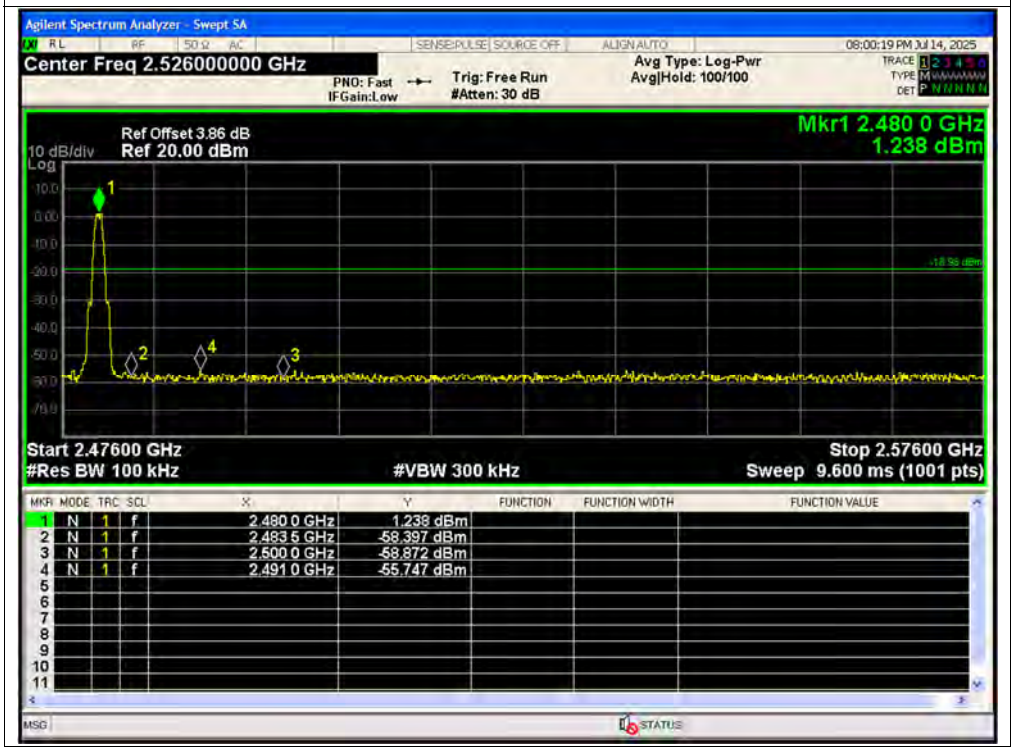
Band Edge NVNT BLE 1M 2402MHz Ant1 Emission



Band Edge NVNT BLE 1M 2480MHz Ant1 Ref

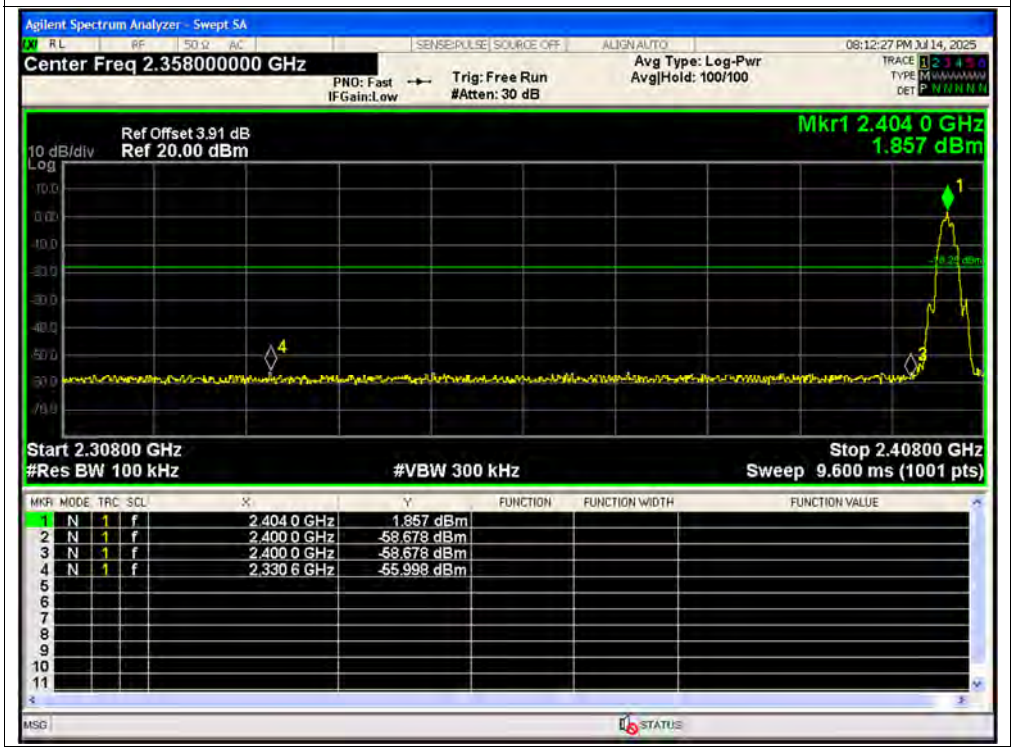


Band Edge NVNT BLE 1M 2480MHz Ant1 Emission



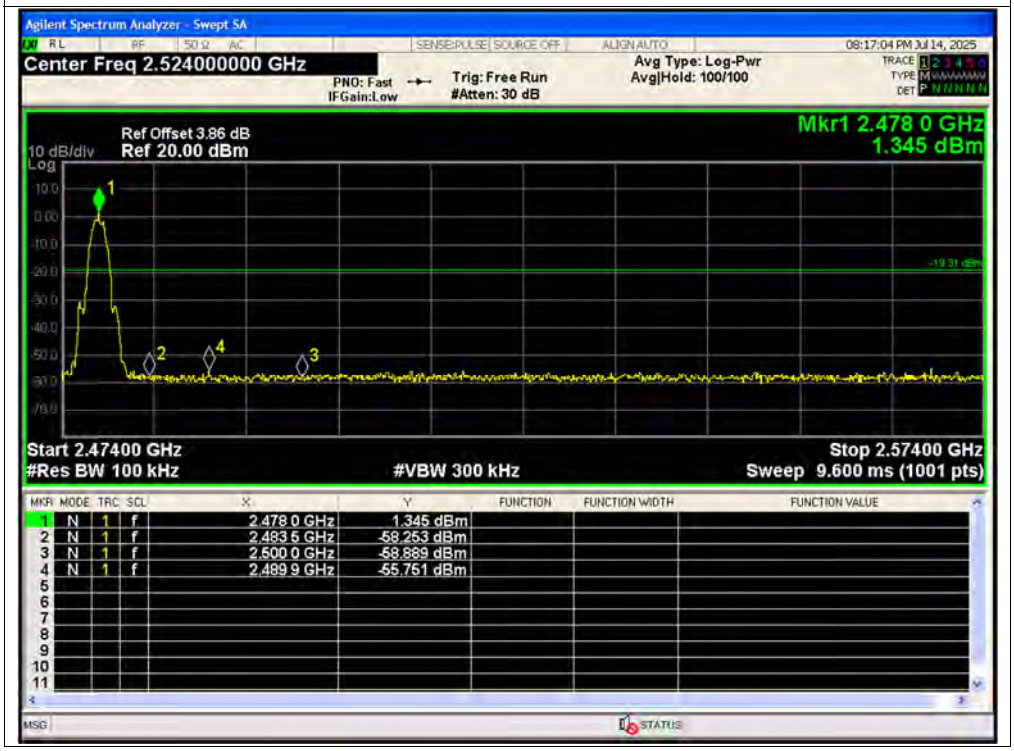
Band Edge NVNT BLE 2M 2404MHz Ant1 Ref

Band Edge NVNT BLE 2M 2404MHz Ant1 Emission



Band Edge NVNT BLE 2M 2478MHz Ant1 Ref

Band Edge NVNT BLE 2M 2478MHz Ant1 Emission

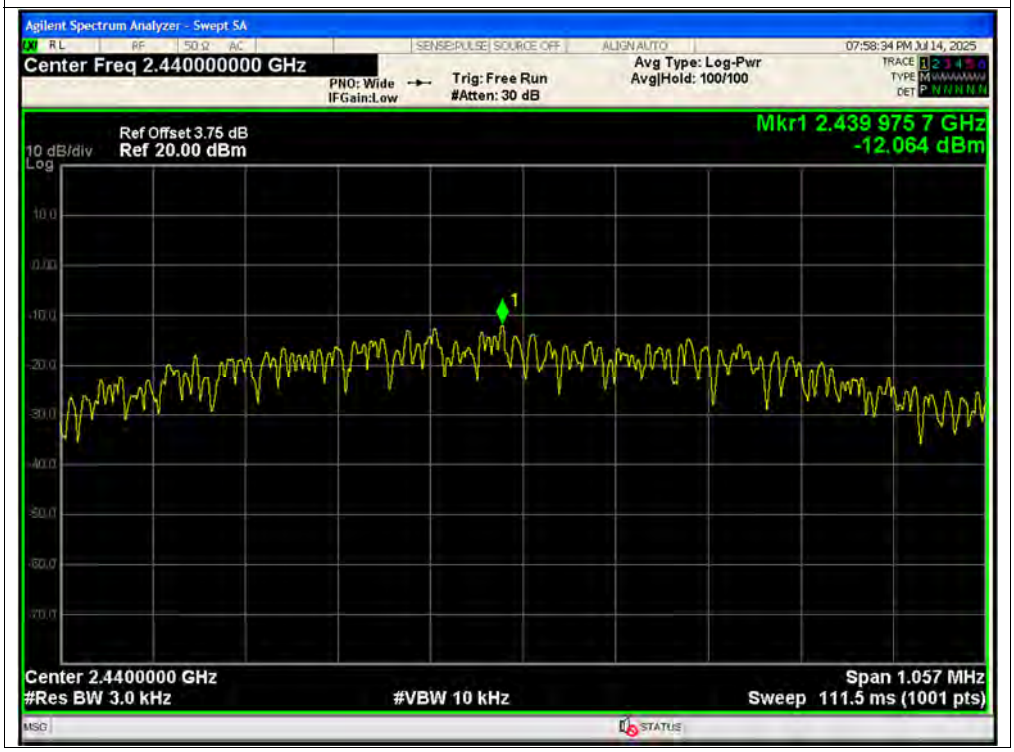


A.7. Power Spectral Density

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Duty Factor (dB)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1M	2402	Ant1	-12.37	0	-12.37	8	Pass
NVNT	BLE 1M	2440	Ant1	-12.06	0	-12.06	8	Pass
NVNT	BLE 1M	2480	Ant1	-12.8	0	-12.8	8	Pass
NVNT	BLE 2M	2404	Ant1	-14.44	0	-14.44	8	Pass
NVNT	BLE 2M	2440	Ant1	-14.06	0	-14.06	8	Pass
NVNT	BLE 2M	2478	Ant1	-14.64	0	-14.64	8	Pass

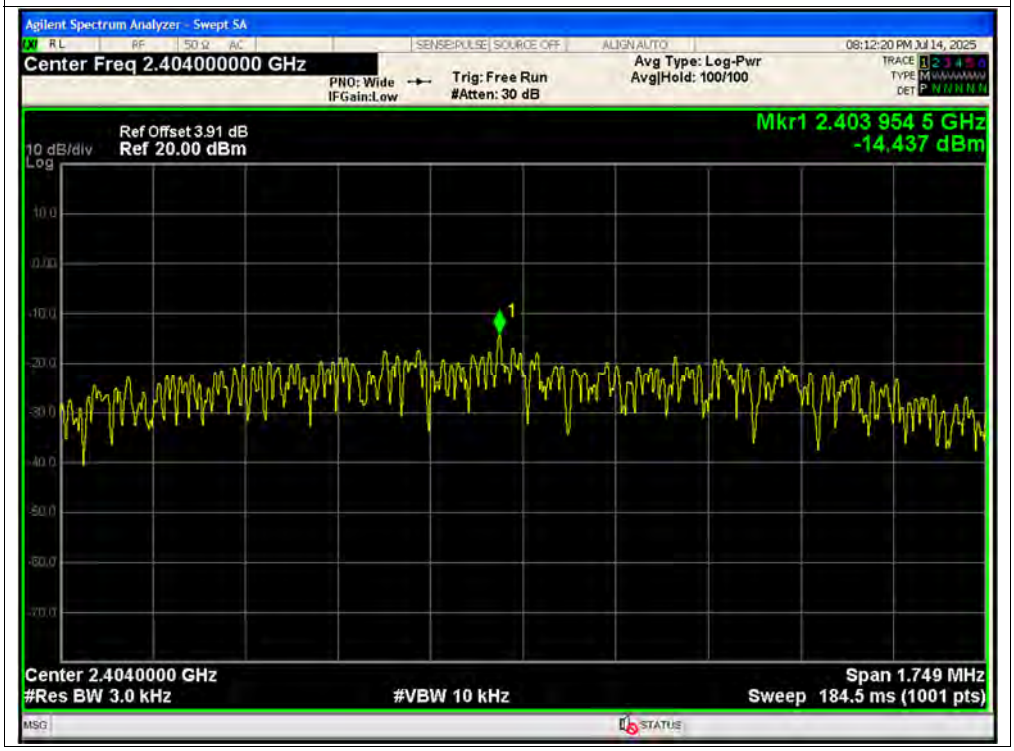
Test Graphs
PSD NVNT BLE 1M 2402MHz Ant1

PSD NVNT BLE 1M 2440MHz Ant1



PSD NVNT BLE 1M 2480MHz Ant1

PSD NVNT BLE 2M 2404MHz Ant1



PSD NVNT BLE 2M 2440MHz Ant1

PSD NVNT BLE 2M 2478MHz Ant1

A.8. Conducted Emission

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

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

A. Test Setup:

Test Mode: EUT+Adapter+Data cable+BLE TX

Test voltage: AC 120V/60Hz

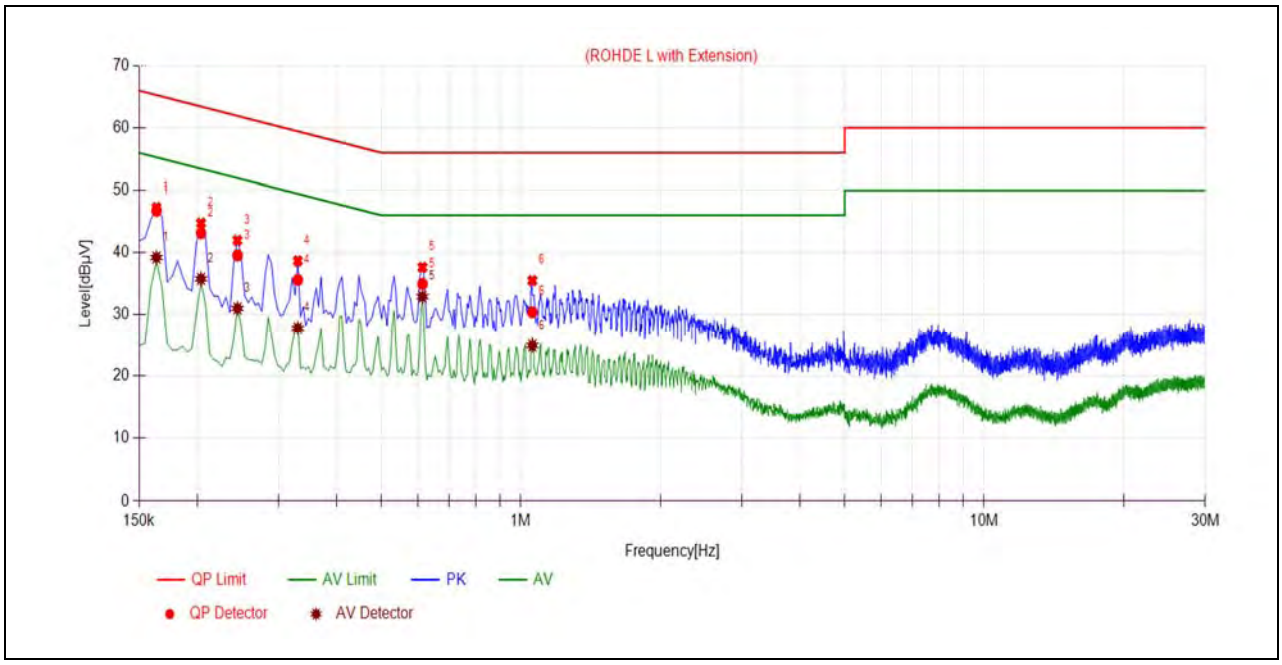
The measurement results are obtained as below:

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

U_R: Receiver Reading

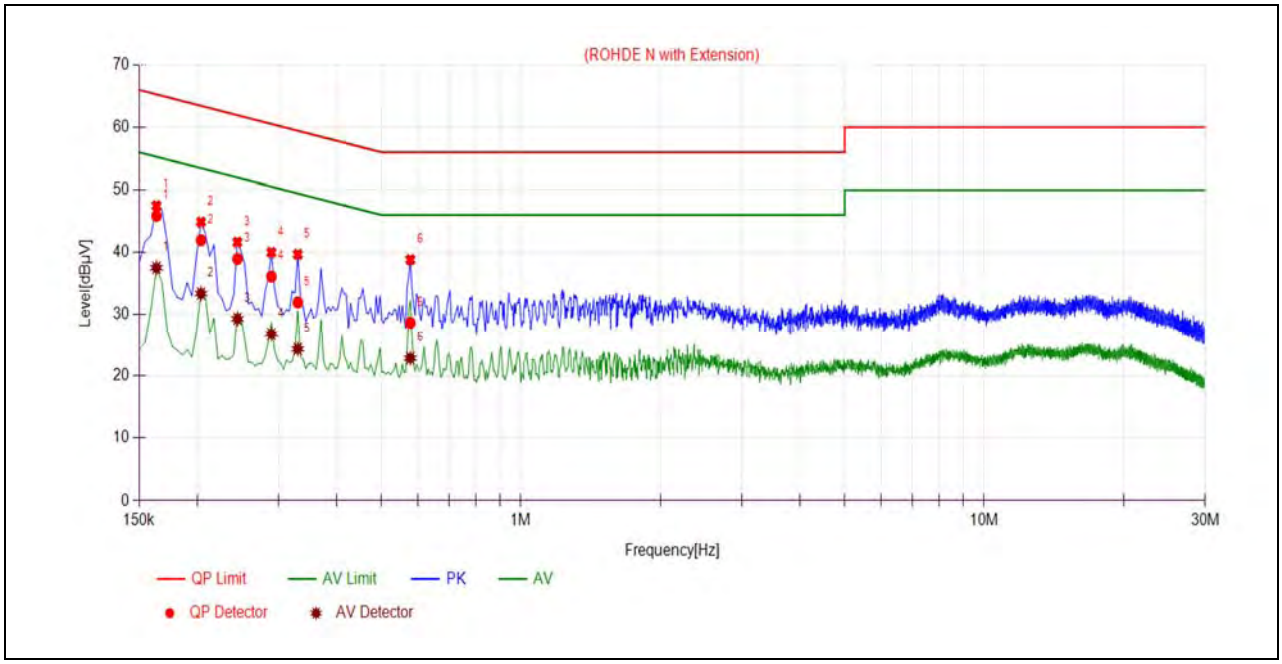
A_{Factor}: Voltage division factor of LISN

B. Test Plot:



(L Phase)

No.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1635	46.73	39.22	65.28	55.28	Line	PASS
2	0.2040	43.15	35.78	63.45	53.45		PASS
3	0.2445	39.56	31.03	61.94	51.94		PASS
4	0.3300	35.63	27.79	59.45	49.45		PASS
5	0.6134	34.98	32.93	56.00	46.00		PASS
6	1.0590	30.41	24.93	56.00	46.00		PASS



(N Phase)

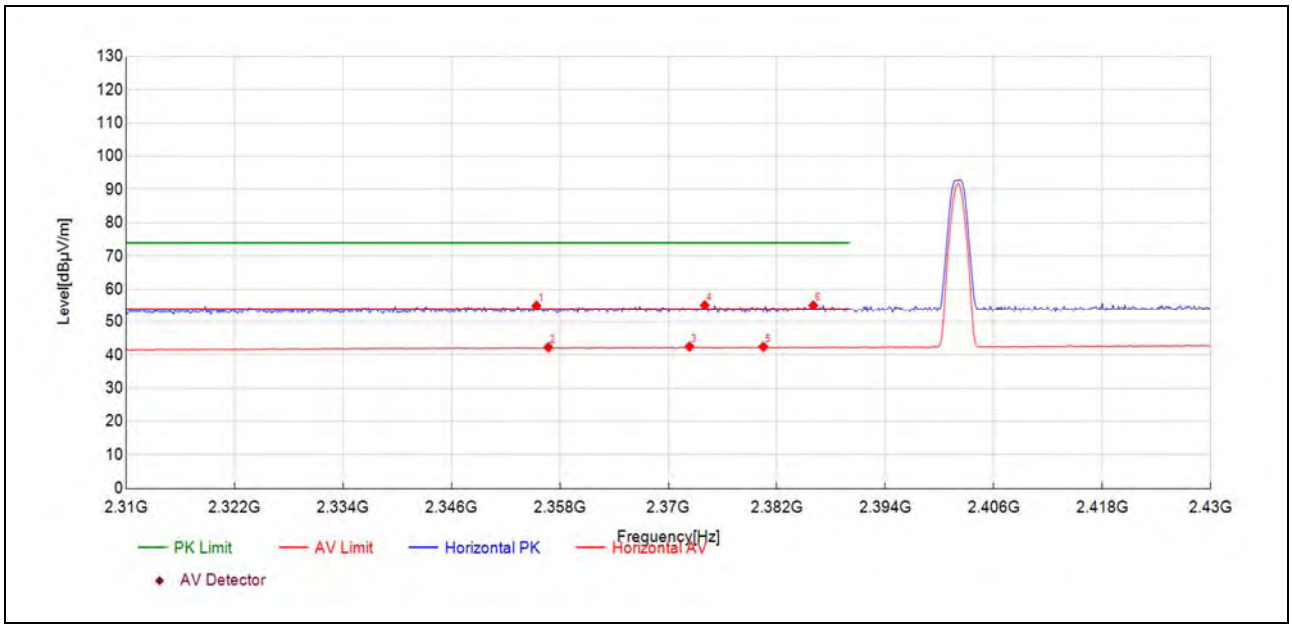
No.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1635	45.88	37.54	65.28	55.28	Neutral	PASS
2	0.2040	41.97	33.41	63.45	53.45		PASS
3	0.2445	38.96	29.33	61.94	51.94		PASS
4	0.2895	36.13	26.82	60.54	50.54		PASS
5	0.3300	31.97	24.36	59.45	49.45		PASS
6	0.5775	28.67	22.88	56.00	46.00		PASS

A.9. Restricted Frequency Bands

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

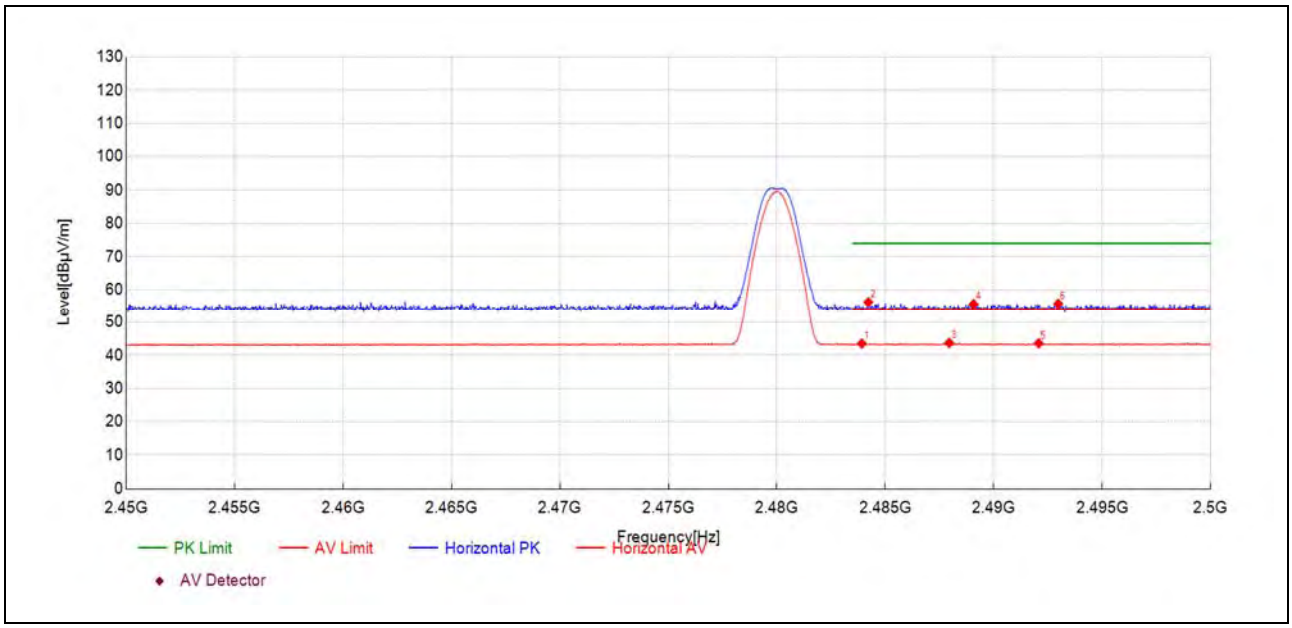
1Mbps

Plot for Channel 0



Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
2355.41	22.6	55.05	32.420	74.00	18.95	150	63	PK	PASS
2356.73	9.9	42.28	32.420	54.00	11.72	150	40	AV	PASS
2372.34	10.0	42.50	32.480	54.00	11.50	150	55	AV	PASS
2374.02	22.7	55.18	32.490	74.00	18.82	150	357	PK	PASS
2380.51	9.9	42.43	32.510	54.00	11.57	150	40	AV	PASS
2386.04	22.6	55.13	32.530	74.00	18.87	150	149	PK	PASS

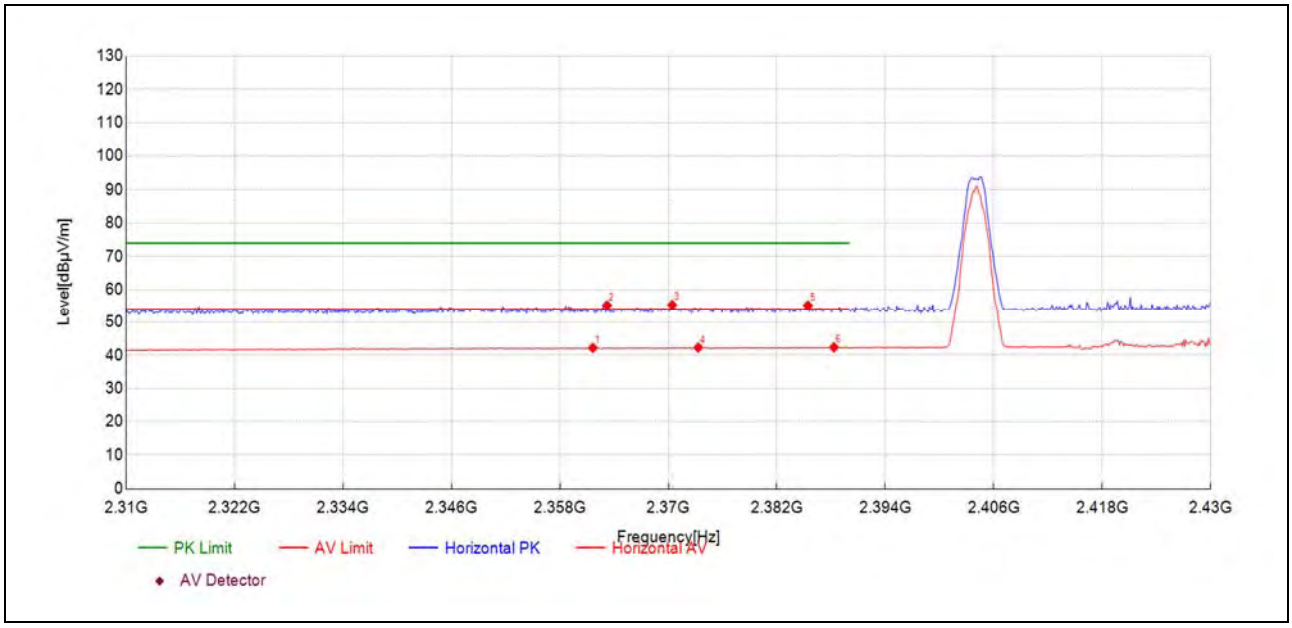
Plot for Channel 39



Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
2483.92	10.5	43.52	33.030	54.00	10.48	150	349	AV	PASS
2484.22	23.2	56.21	33.030	74.00	17.79	150	144	PK	PASS
2487.94	10.7	43.70	33.020	54.00	10.30	150	212	AV	PASS
2489.07	22.6	55.61	33.020	74.00	18.39	150	196	PK	PASS
2492.07	10.6	43.59	33.020	54.00	10.41	150	128	AV	PASS
2492.97	22.7	55.75	33.010	74.00	18.25	150	297	PK	PASS

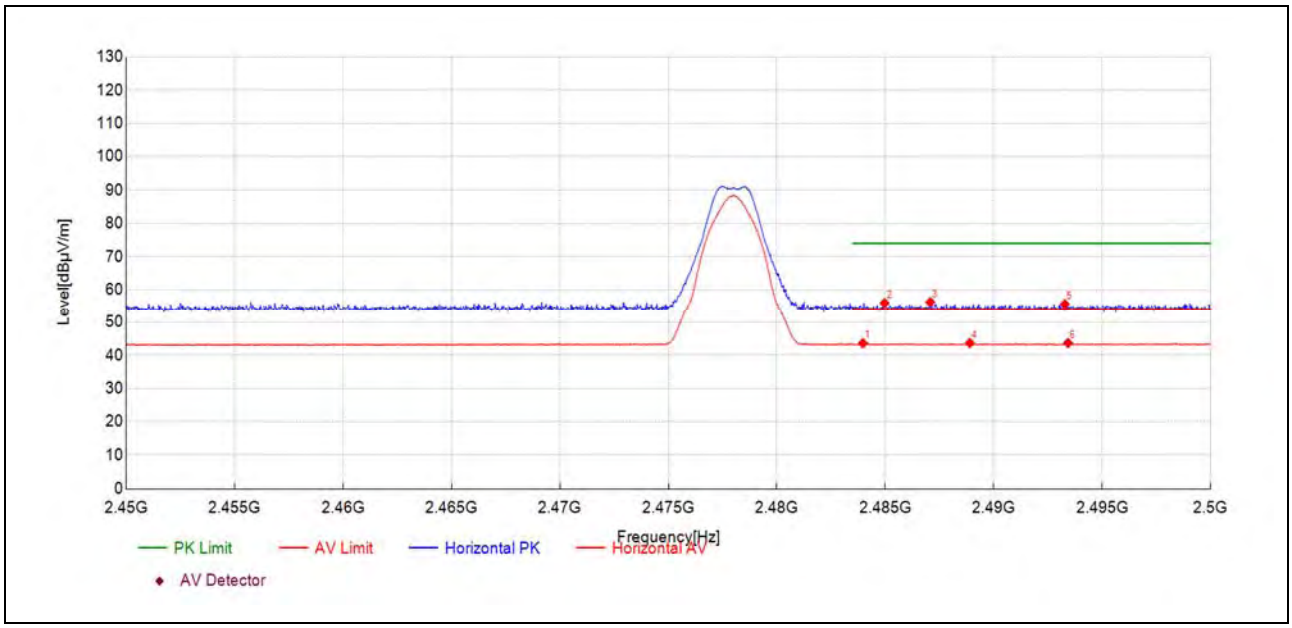
2Mbps

Plot for Channel 1



Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
2361.65	9.8	42.19	32.440	54.00	11.81	150	243	AV	PASS
2363.21	22.8	55.21	32.450	74.00	18.79	150	238	PK	PASS
2370.42	22.9	55.34	32.470	74.00	18.66	150	127	PK	PASS
2373.30	9.8	42.27	32.490	54.00	11.73	150	222	AV	PASS
2385.44	22.6	55.17	32.530	74.00	18.83	150	295	PK	PASS
2388.32	9.8	42.35	32.540	54.00	11.65	150	208	AV	PASS

Plot for Channel 38



Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
2483.97	10.6	43.62	33.030	54.00	10.38	150	89	AV	PASS
2484.97	22.9	55.92	33.030	74.00	18.08	150	349	PK	PASS
2487.07	23.2	56.21	33.030	74.00	17.79	150	349	PK	PASS
2488.89	10.7	43.68	33.020	54.00	10.32	150	172	AV	PASS
2493.27	22.6	55.59	33.010	74.00	18.41	150	1	PK	PASS
2493.42	10.7	43.66	33.010	54.00	10.34	150	165	AV	PASS

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:

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

A_T: Total correction Factor except Antenna

U_R: Receiver Reading

G_{preamp}: Preamplifier Gain

A_{Factor}: Antenna Factor at 3m

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

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

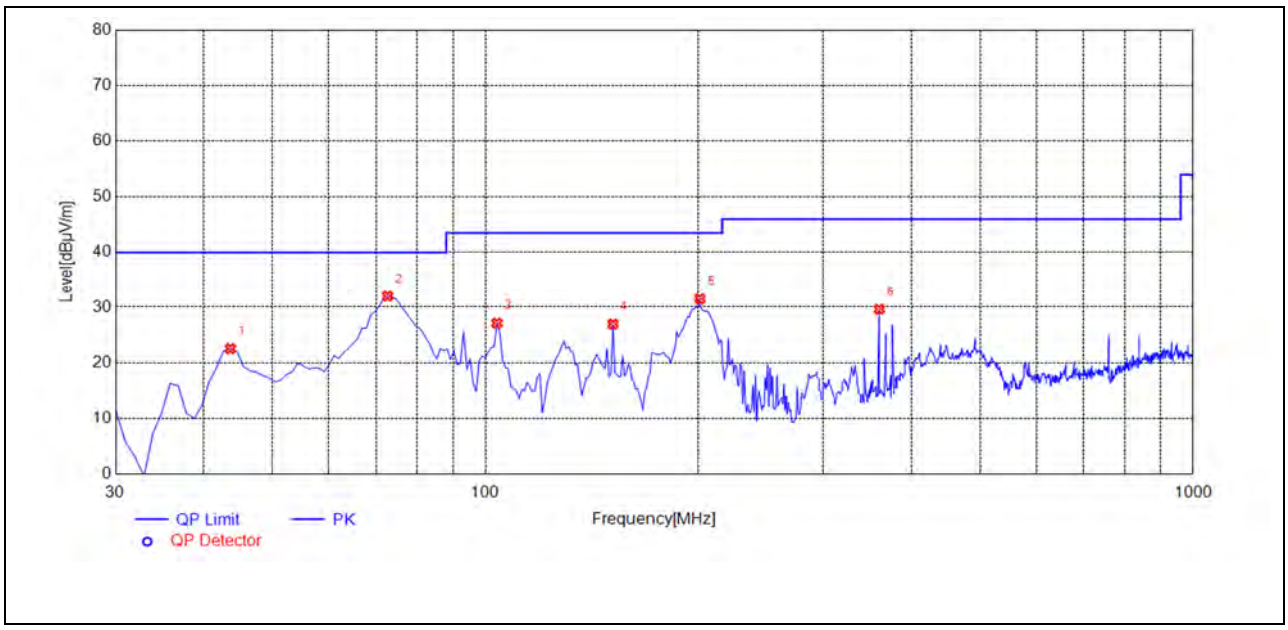
Note2: For the frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

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

Note 4: All test modes were considered and evaluated respectively by performing full test, only the worst data were recorded.

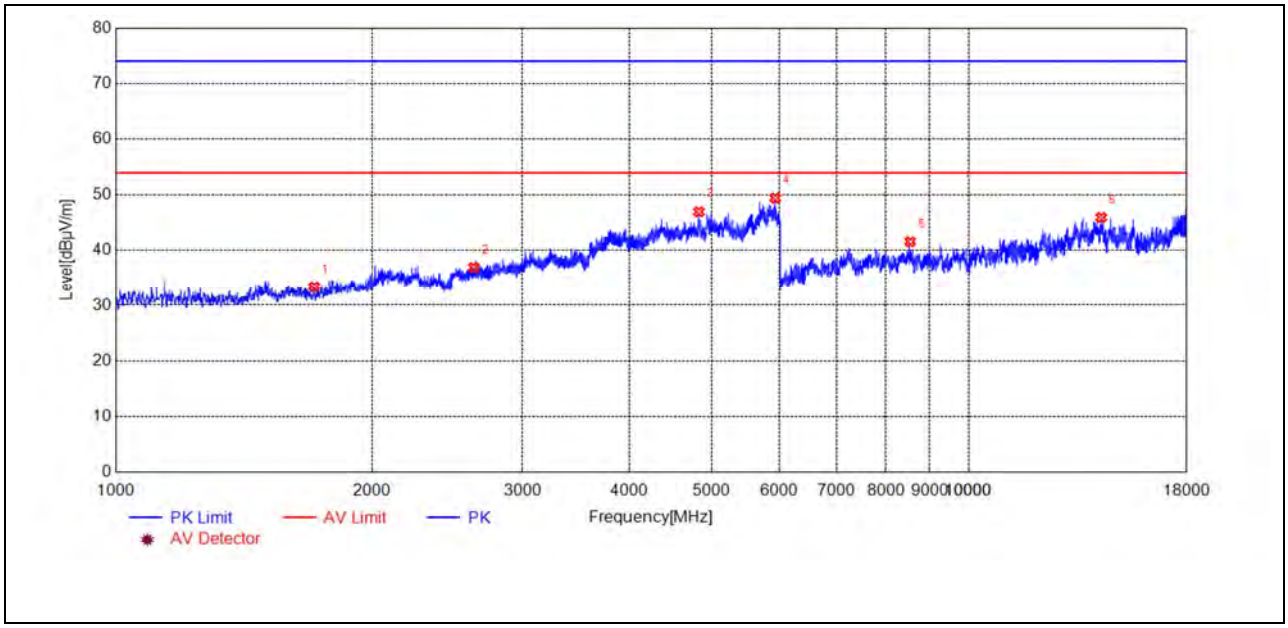
1Mbps

Plot for Channel 0



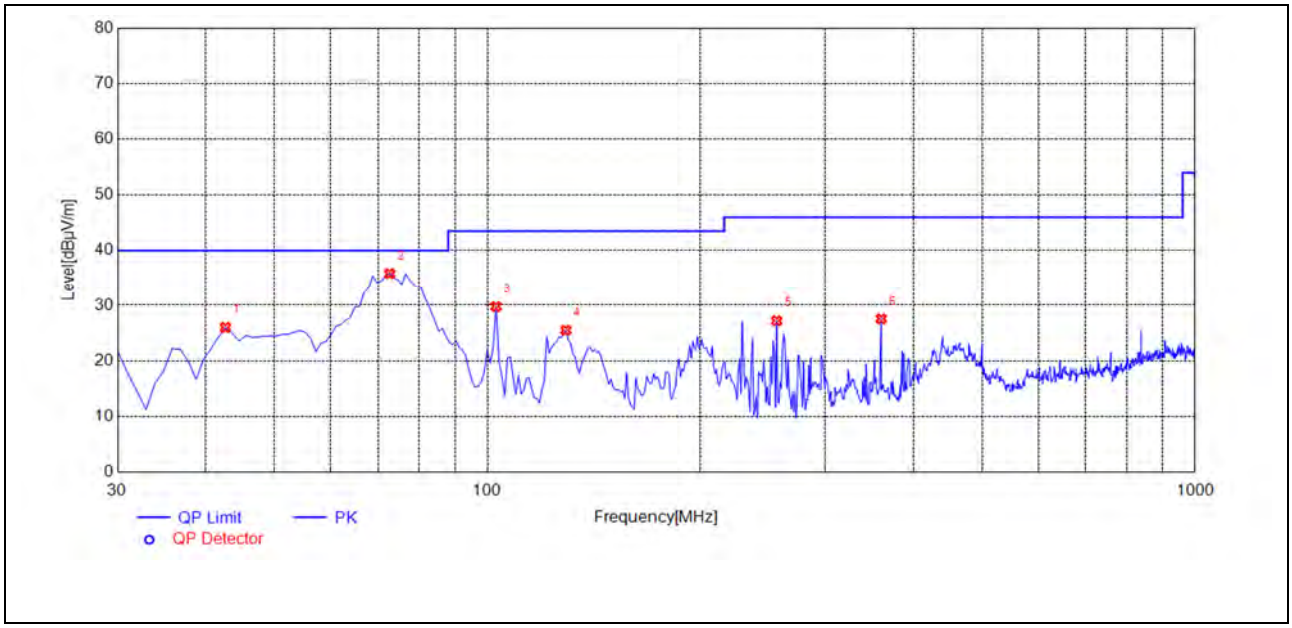
(Antenna Horizontal, 30MHz to 1GHz)

Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
43.5936	22.51	-30.05	40.00	17.49	150	91	Horizontal	PASS
72.7227	31.96	-32.73	40.00	8.04	150	40	Horizontal	PASS
103.7938	27.09	-30.69	43.50	16.41	150	186	Horizontal	PASS
151.3714	26.92	-34.36	43.50	16.58	150	271	Horizontal	PASS
200.8909	31.48	-32.43	43.50	12.02	150	91	Horizontal	PASS
360.1301	29.59	-26.34	46.00	16.41	150	305	Horizontal	PASS



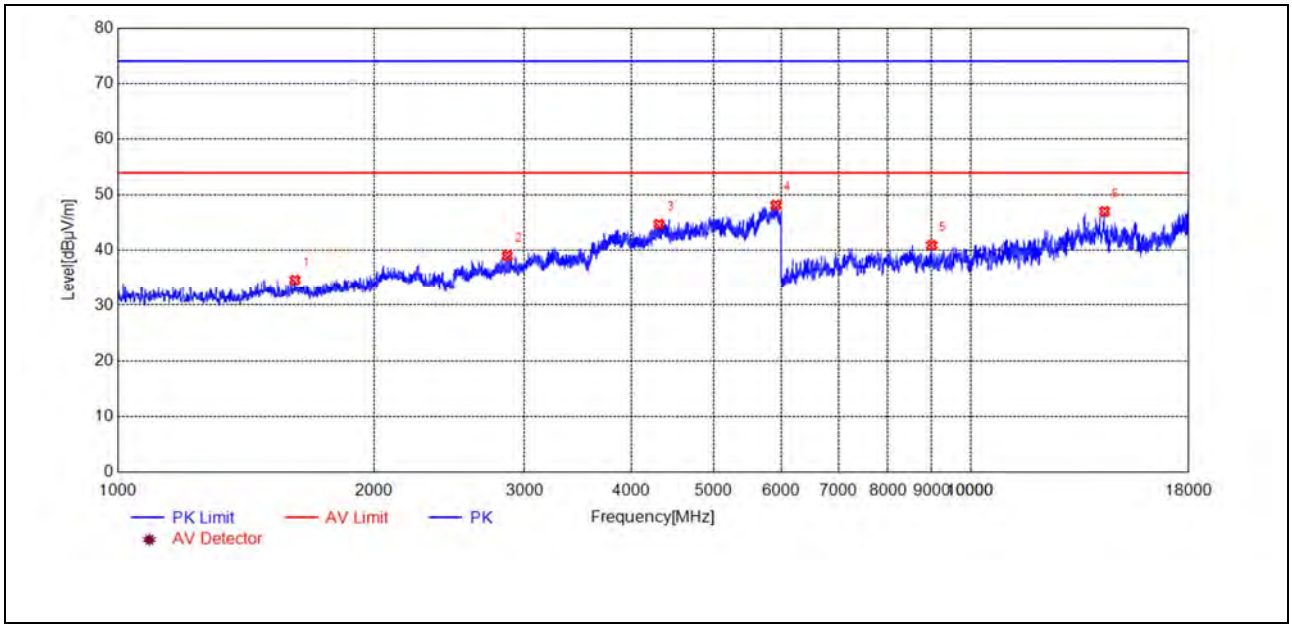
(Antenna Horizontal, 1GHz to 18GHz)

Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1709.1418	33.38	-23.89	74.00	40.62	150	243	Horizontal	PASS
2630.3261	36.93	-19.56	74.00	37.07	150	182	Horizontal	PASS
4827.7656	46.97	-10.29	74.00	27.03	150	222	Horizontal	PASS
5931.9864	49.45	-6.55	74.00	24.55	150	62	Horizontal	PASS
8537.3075	41.59	-1.37	74.00	32.41	150	320	Horizontal	PASS
14296.0592	45.96	7.59	74.00	28.04	150	280	Horizontal	PASS



(Antenna Vertical, 30MHz to 1GHz)

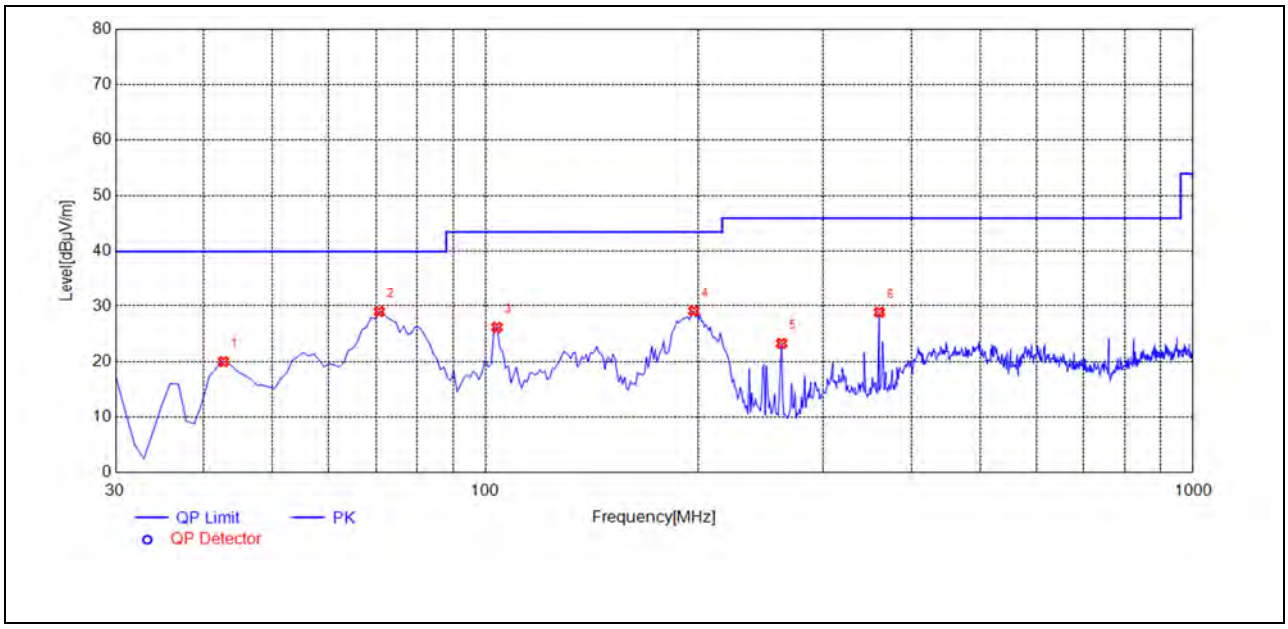
Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
42.6226	25.98	-29.77	40.00	14.02	150	218	Vertical	PASS
72.7227	35.82	-32.73	40.00	4.18	150	20	Vertical	PASS
102.8228	29.75	-30.97	43.50	13.75	150	64	Vertical	PASS
129.0390	25.48	-32.25	43.50	18.02	150	46	Vertical	PASS
256.2362	27.20	-30.26	46.00	18.80	150	269	Vertical	PASS
360.1301	27.52	-26.34	46.00	18.48	150	158	Vertical	PASS



(Antenna Vertical, 1GHz to 18GHz)

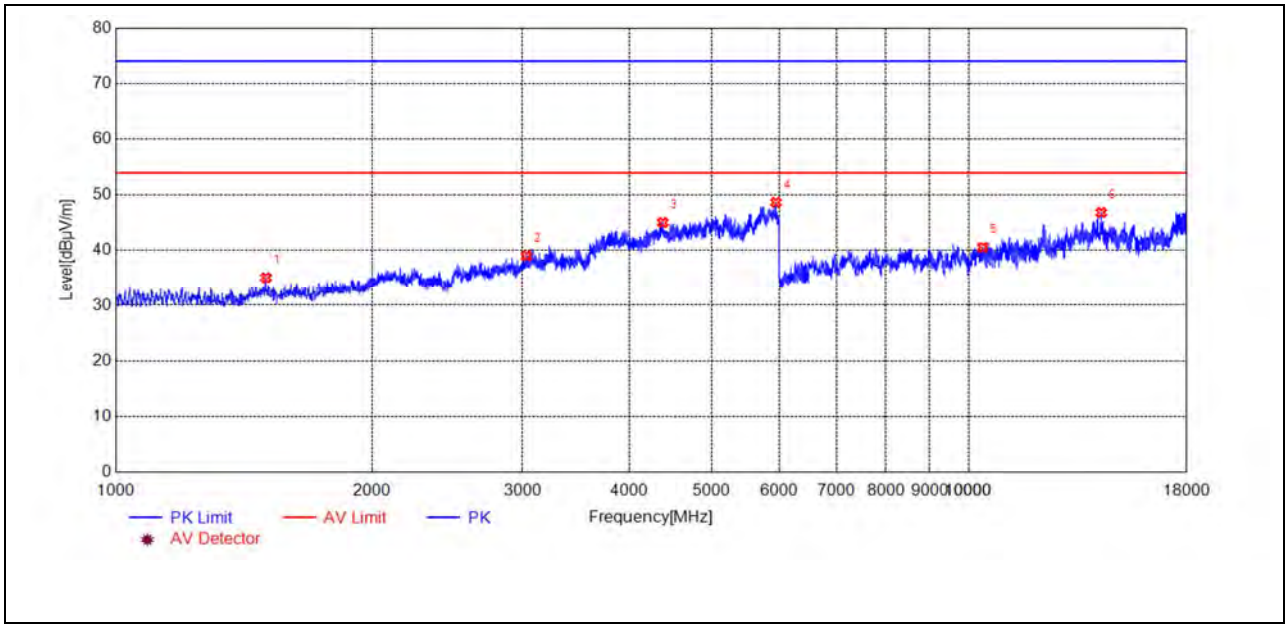
Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1614.1228	34.63	-23.15	74.00	39.37	150	132	Vertical	PASS
2862.3725	39.07	-18.47	74.00	34.93	150	163	Vertical	PASS
4311.6623	44.73	-12.72	74.00	29.27	150	72	Vertical	PASS
5910.9822	48.18	-6.86	74.00	25.82	150	0	Vertical	PASS
9000.6001	40.95	-0.71	74.00	33.05	150	299	Vertical	PASS
14344.0688	47.04	7.53	74.00	26.96	150	299	Vertical	PASS

Plot for Channel 19



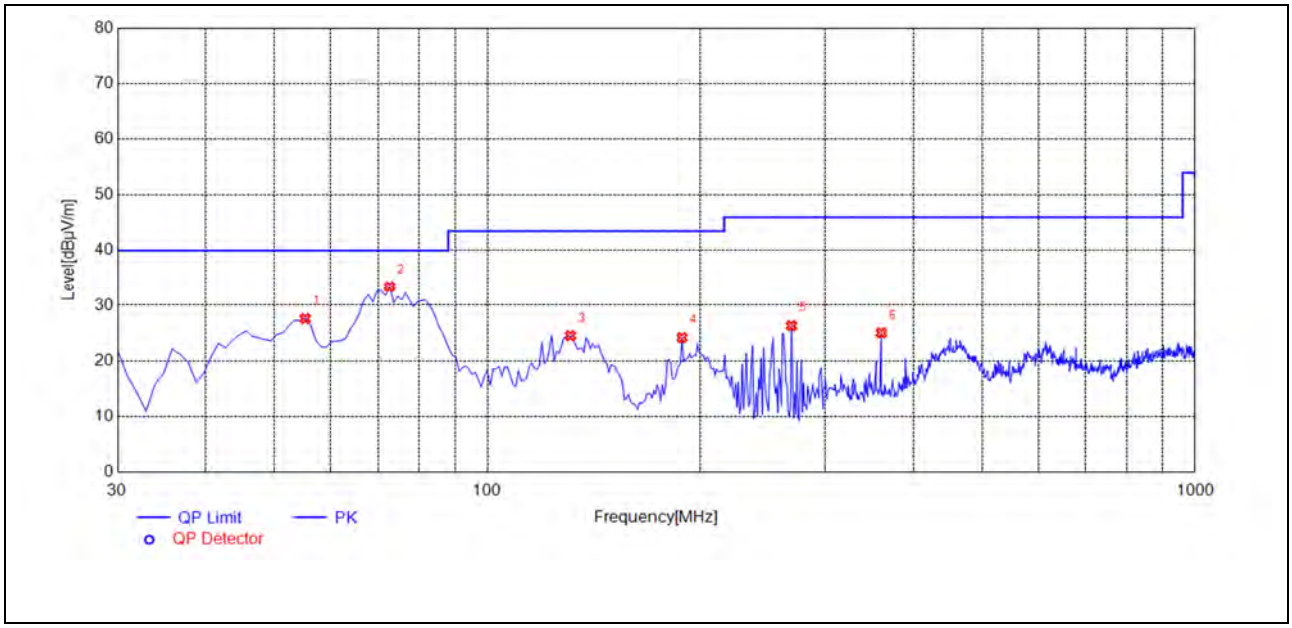
(Antenna Horizontal, 30MHz to 1GHz)

Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
42.6226	19.99	-29.77	40.00	20.01	150	218	Horizontal	PASS
70.7808	28.99	-32.25	40.00	11.01	150	46	Horizontal	PASS
103.7938	26.15	-30.69	43.50	17.35	150	329	Horizontal	PASS
197.0070	29.10	-32.27	43.50	14.40	150	115	Horizontal	PASS
262.0621	23.26	-30.21	46.00	22.74	150	277	Horizontal	PASS
360.1301	28.88	-26.34	46.00	17.12	150	311	Horizontal	PASS



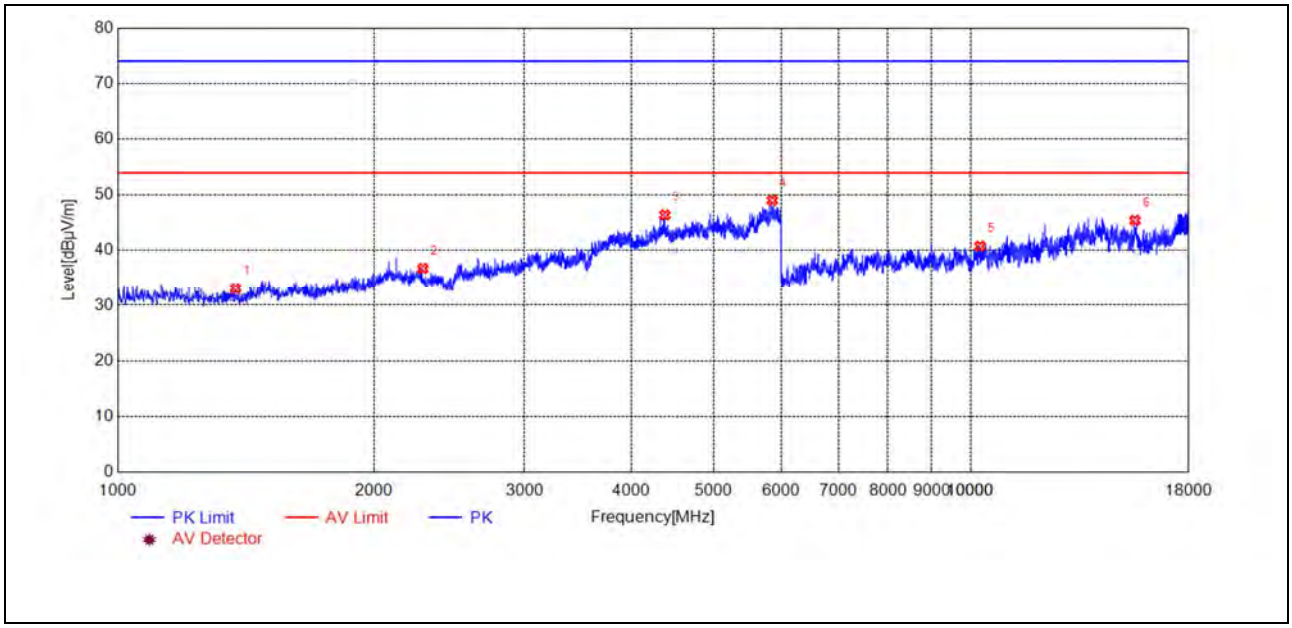
(Antenna Horizontal, 1GHz to 18GHz)

Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1501.1002	35.07	-22.99	74.00	38.93	150	232	Horizontal	PASS
3031.4063	39.03	-17.52	74.00	34.97	150	133	Horizontal	PASS
4378.6757	45.03	-12.00	74.00	28.97	150	103	Horizontal	PASS
5942.9886	48.68	-6.39	74.00	25.32	150	313	Horizontal	PASS
10383.2767	40.57	1.98	74.00	33.43	150	329	Horizontal	PASS
14298.4597	46.86	7.71	74.00	27.14	150	209	Horizontal	PASS



(Antenna Vertical, 30MHz to 1GHz)

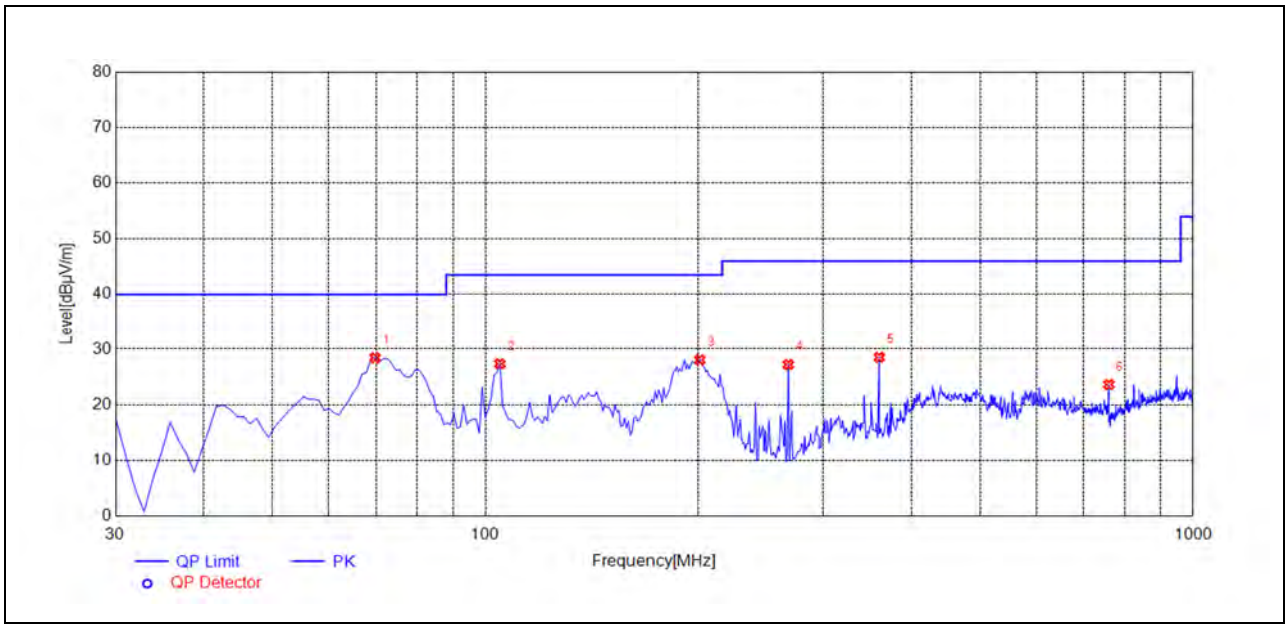
Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
55.2452	27.57	-28.97	40.00	12.43	150	100	Vertical	PASS
72.7227	33.39	-32.73	40.00	6.61	150	49	Vertical	PASS
130.9810	24.50	-32.82	43.50	19.00	150	340	Vertical	PASS
188.2683	24.16	-32.87	43.50	19.34	150	279	Vertical	PASS
268.8589	26.29	-30.20	46.00	19.71	150	237	Vertical	PASS
360.1301	25.01	-26.34	46.00	20.99	150	0	Vertical	PASS



(Antenna Vertical, 1GHz to 18GHz)

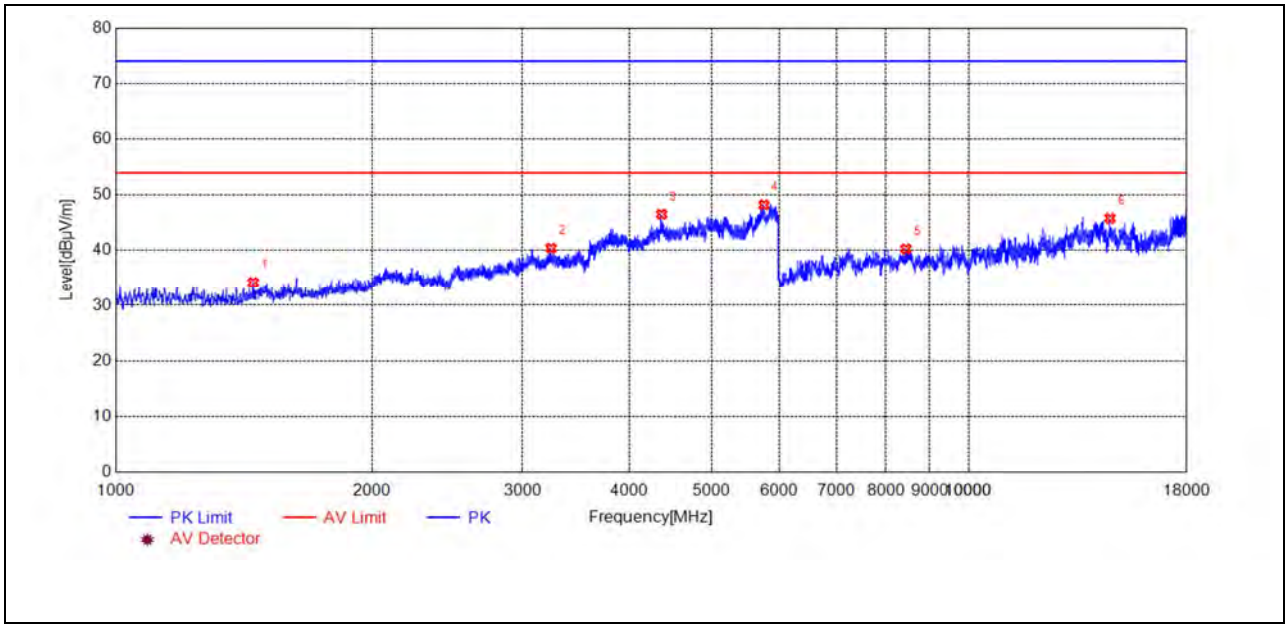
Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1375.0750	33.06	-24.66	74.00	40.94	150	151	Vertical	PASS
2279.2559	36.73	-20.89	74.00	37.27	150	262	Vertical	PASS
4379.6759	46.41	-12.00	74.00	27.59	150	343	Vertical	PASS
5852.9706	49.03	-6.93	74.00	24.97	150	332	Vertical	PASS
10251.2503	40.79	2.26	74.00	33.21	150	198	Vertical	PASS
15575.5151	45.44	6.17	74.00	28.56	150	38	Vertical	PASS

Plot for Channel 39



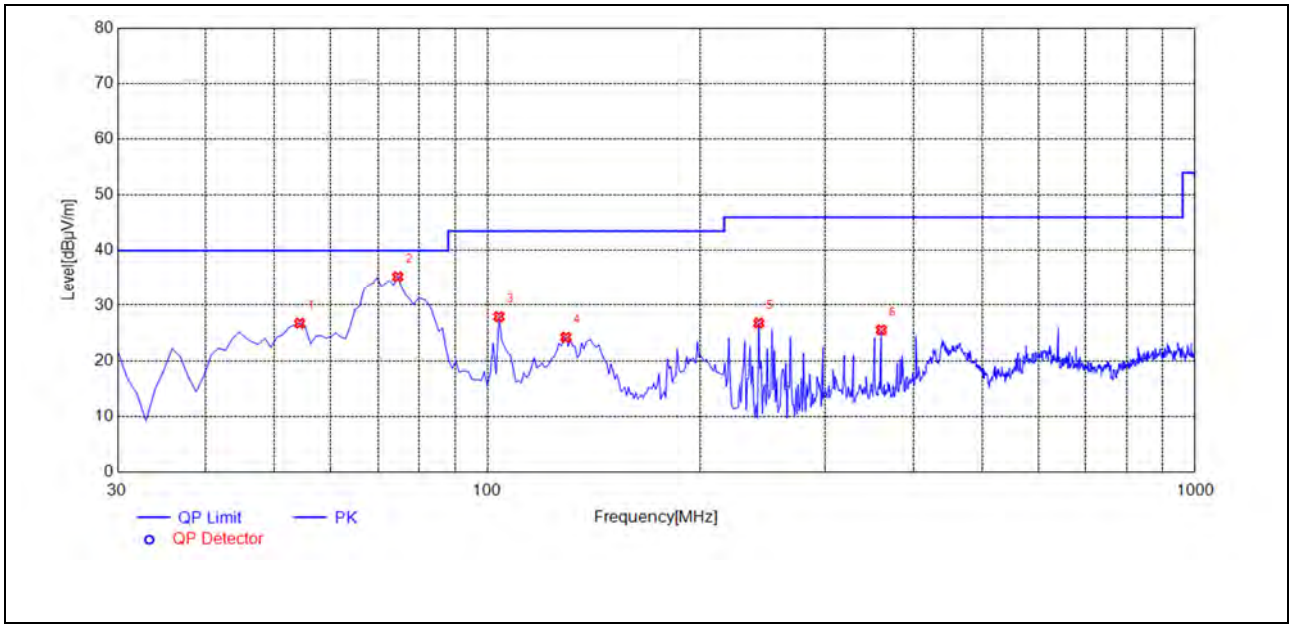
(Antenna Horizontal, 30MHz to 1GHz)

Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
69.8098	28.42	-32.28	40.00	11.58	150	58	Horizontal	PASS
104.7648	27.34	-30.84	43.50	16.16	150	7	Horizontal	PASS
200.8909	28.06	-32.43	43.50	15.44	150	101	Horizontal	PASS
267.8879	27.21	-30.31	46.00	18.79	150	281	Horizontal	PASS
360.1301	28.50	-26.34	46.00	17.50	150	289	Horizontal	PASS
760.1702	23.59	-22.02	46.00	22.41	150	340	Horizontal	PASS



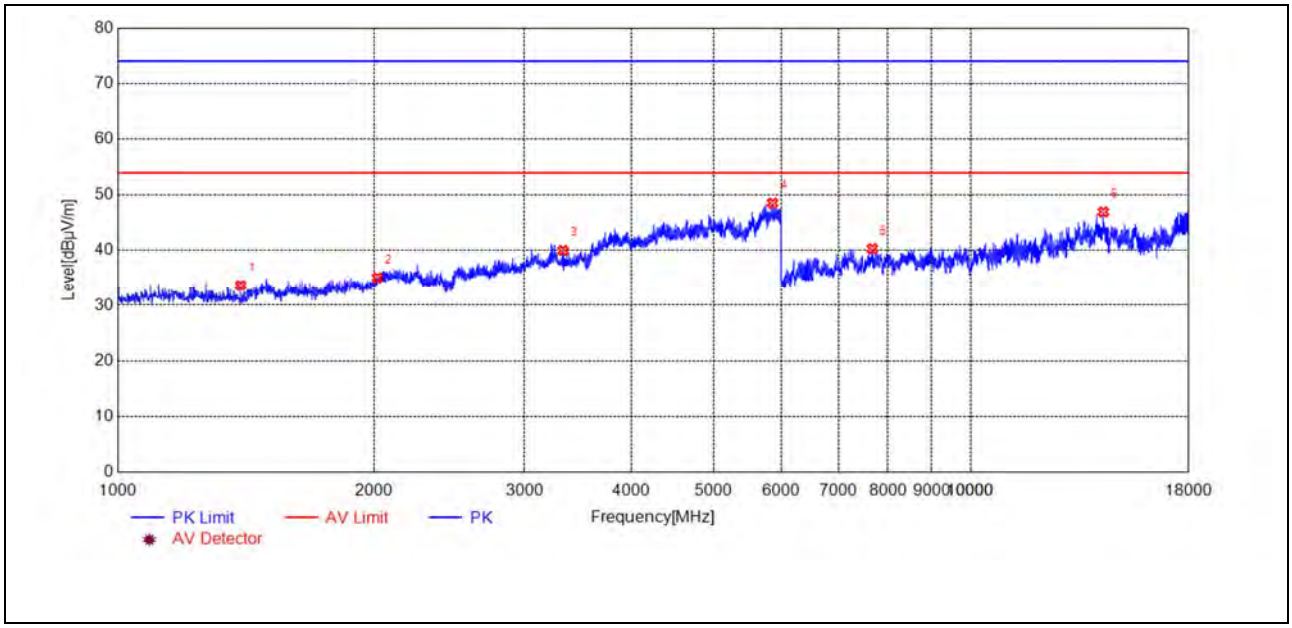
(Antenna Horizontal, 1GHz to 18GHz)

Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1450.0900	34.17	-23.80	74.00	39.83	150	312	Horizontal	PASS
3239.4479	40.42	-16.68	74.00	33.58	150	332	Horizontal	PASS
4364.6729	46.54	-11.98	74.00	27.46	150	231	Horizontal	PASS
5753.9508	48.23	-6.86	74.00	25.77	150	281	Horizontal	PASS
8441.2883	40.26	-2.38	74.00	33.74	150	339	Horizontal	PASS
14639.3279	45.79	7.23	74.00	28.21	150	239	Horizontal	PASS



(Antenna Vertical, 30MHz to 1GHz)

Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
54.2743	26.73	-29.08	40.00	13.27	150	208	Vertical	PASS
74.6647	35.26	-33.20	40.00	4.74	150	46	Vertical	PASS
103.7938	27.92	-30.69	43.50	15.58	150	148	Vertical	PASS
129.0390	24.22	-32.25	43.50	19.28	150	353	Vertical	PASS
241.6717	26.76	-30.86	46.00	19.24	150	353	Vertical	PASS
360.1301	25.55	-26.34	46.00	20.45	150	208	Vertical	PASS



(Antenna Vertical, 1GHz to 18GHz)

Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1394.0788	33.62	-24.80	74.00	40.38	150	343	Vertical	PASS
2016.2032	35.06	-21.44	74.00	38.94	150	222	Vertical	PASS
3327.4655	40.01	-16.91	74.00	33.99	150	211	Vertical	PASS
5857.9716	48.55	-6.94	74.00	25.45	150	22	Vertical	PASS
7665.9332	40.33	-2.55	74.00	33.67	150	189	Vertical	PASS
14303.2607	46.96	7.77	74.00	27.04	150	269	Vertical	PASS

END OF REPORT