



REPORT No. : XM19020007W01

TEST REPORT

APPLICANT : Hot Pepper, Inc.

PRODUCT NAME : 4G Smart Phone

MODEL NAME : HPP-GS1

BRAND NAME : Hot Pepper

FCC ID : 2APD4-A81C

STANDARD(S) : 47 CFR Part 15 Subpart C

TEST DATE : 2019-04-08 to 2019-04-22

ISSUE DATE : 2019-05-23

Prepared by: Lion Xiao
Lion Xiao (Project Engineer)

Approved by: Anne Liu
Anne Liu(Supervisor)

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DIRECTORY

1. Technical Information	3
1.1. Applicant and Manufacturer Information.....	3
1.2. Equipment Under Test (EUT) Description.....	3
1.3. Test Standards and Results	5
1.4. Environmental Conditions	5
2. 47 CFR Part 15C Requirements.....	6
2.1. Antenna requirement.....	6
2.2. Number of Hopping Frequency.....	7
2.3. Peak Output Power	10
2.4. 20dB Bandwidth	17
2.5. Carried Frequency Separation.....	24
2.6. Time of Occupancy (Dwell time)	30
2.7. Conducted Spurious Emissions and Band Edge	46
2.8. Restricted Frequency Bands	58
2.9. Conducted Emission	72
2.10. Radiated Emission	76
Annex A Test Uncertainty	134
Annex B Testing Laboratory Information.....	135

Change History		
Version	Date	Reason for change
1.0	2019-05-23	First edition



1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Hot Pepper, Inc.
Applicant Address:	5151 California Ave., Suite 100, Irvine 92617, USA
Manufacturer:	Hot Pepper, Inc.
Manufacturer Address:	5151 California Ave., Suite 100, Irvine 92617, USA

1.2. Equipment Under Test (EUT) Description

Product Name:	4G Smart Phone	
Serial No:	(N/A, marked #1 by test site)	
Hardware Version:	A81C_MAINBOARD_P1	
Software Version:	HPP- GS1-V1.0.4-190121	
Modulation Type:	Bluetooth: FHSS GFSK(1Mbps), $\pi/4$ -DQPSK(EDR 2Mbps), 8-DPSK(EDR 3Mbps)	
Operating Frequency Range:	The frequency range used is 2402MHz – 2480MHz (79 channels, at intervals of 1MHz);	
Bluetooth Version:	Bluetooth classic	
Antenna Type:	PIFA Antenna	
Antenna Gain:	0.2dBi	
Ancillary Equipment:	AC Adapter	
	Manufacturer:	Shenzhen Tianyin Electronics Co.,Ltd.
	Model No.:	TPA-23A050200UU01
	Rated Input:	100-240V~ 50/60Hz, 0.3A
	Rated Output:	5V=2.0A
	Battery	
	Manufacturer:	SHENZHEN HUATIAN TONG TECHNOLOGY CO., LTD
	Model Name:	H2019GS1
	Manufacturer:	Shenzhen Nine Liyuan Electronic Technology Co., Ltd



	Model Name:	H2019GS1A
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Note 1: The EUT contains Bluetooth Module operating at 2.4GHz ISM band; the frequencies is $F(\text{MHz})=2402+1*n$ ($0 \leq n \leq 78$). The lowest, middle, highest channel numbers of the Bluetooth Module used and tested in this report are separately 0 (2402MHz), 39 (2441MHz) and 78 (2480MHz).

Note 2: The EUT connected to the serial port of the computer with a serial communication cable, we use the dedicated software to control the EUT into the test mode.

Note 3: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.3. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C for the EUT FCC ID Certification:

No	Identity	Document Title
1	47 CFR Part 15	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section in CFR 47	Description	Test Date	Test Engineer	Result
1	15.203	Antenna Requirement	N/A	N/A	PASS
2	15.247(a)	Number of Hopping Frequency	Apr 08, 2019 Apr 22, 2019	Lion Xiao	<u>PASS</u>
3	15.247(b)	Peak Output Power	Apr 08, 2019 Apr 22, 2019	Lion Xiao	<u>PASS</u>
4	15.247(a)	20dB Bandwidth	Apr 08, 2019 Apr 22, 2019	Lion Xiao	<u>PASS</u>
5	15.247(a)	Carrier Frequency Separation	Apr 08, 2019 Apr 22, 2019	Lion Xiao	<u>PASS</u>
6	15.247(a)	Time of Occupancy (Dwell time)	Apr 08, 2019 Apr 22, 2019	Lion Xiao	<u>PASS</u>
7	15.247(d)	Conducted Spurious Emission and Band Edge	Apr 08, 2019 Apr 22, 2019	Lion Xiao	<u>PASS</u>
8	15.247(d)	Restricted Frequency Bands	Apr 09, 2019	Jiefeng Zhang	<u>PASS</u>
9	15.209, 15.247(d)	Radiated Emission	Apr 10, 2019 Apr 18, 2019	Jiefeng Zhang	<u>PASS</u>
10	15.207	Conducted Emission	Apr 08, 2019	Jiefeng Zhang	<u>PASS</u>

Note 1: The tests were performed according to the method of measurements prescribed in ANSI C63.10-2013.

1.4. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

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



2. 47 CFR Part 15C Requirements

2.1. Antenna requirement

2.1.1. Applicable Standard

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.

2.1.2. Result: Compliant

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

2.2. Number of Hopping Frequency

2.2.1. Requirement

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

2.2.2. Test Description

A. Test Setup:



The EUT (Equipment under the test) is coupled to the Spectrum analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading, all test result in Spectrum analyzer.

2.2.3. Test Procedure

- Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
- Set the SA on View mode and then plot the result on SA screen.
- Repeat above procedures until all frequencies measured were complete.

B. Equipments List:

Please reference ANNEX B(4).

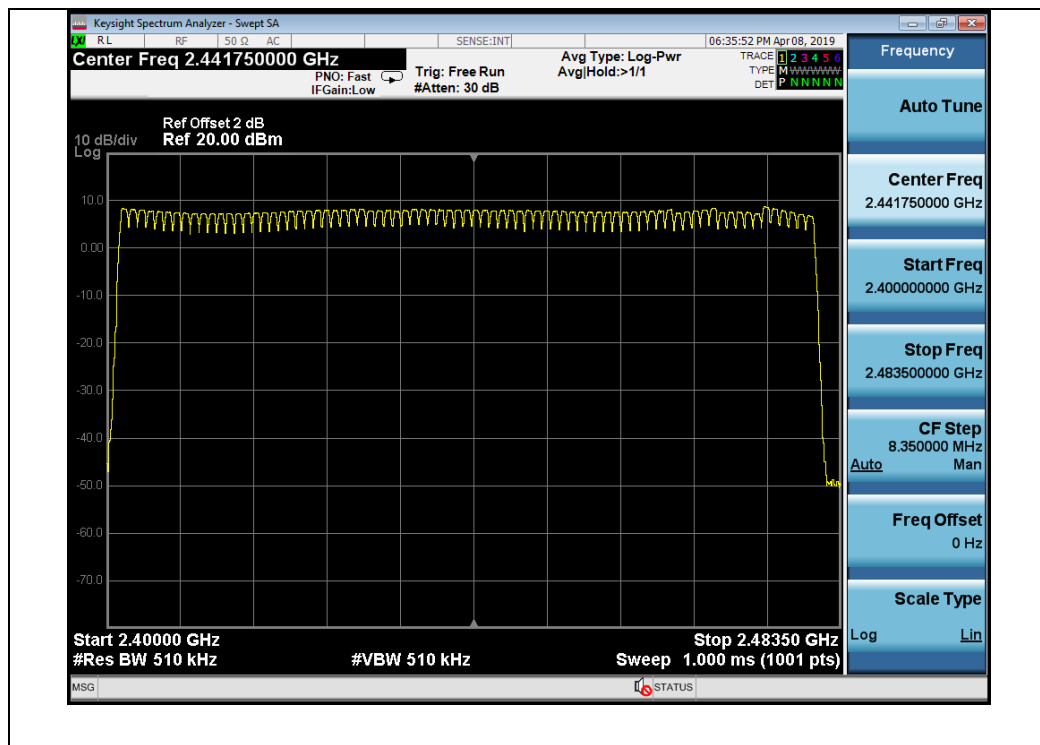
2.2.4. Test Result

The Bluetooth Module operates at hopping-on test mode; the frequencies number employed is counted to verify the Module's using the number of hopping frequency.

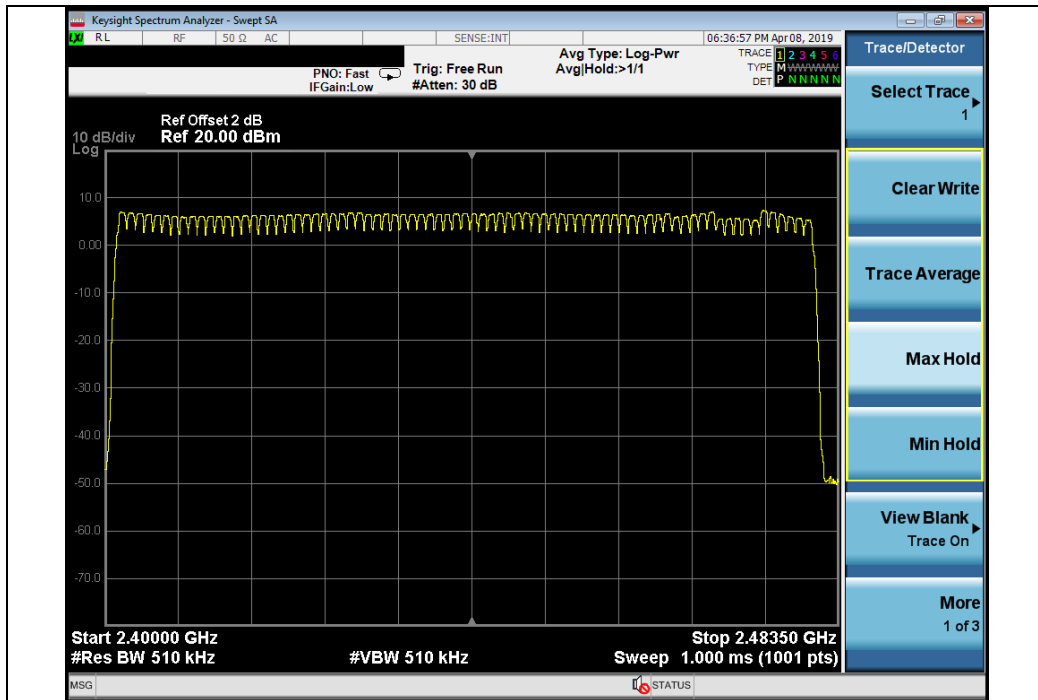
A. Test Verdict:

Test Mode	Frequency Block (MHz)	Measured Channel Numbers	Min. Limit	Verdict
GFSK	2400 - 2483.5	79	15	PASS
$\pi/4$ -DQPSK	2400 - 2483.5	79	15	PASS
8-DPSK	2400 - 2483.5	79	15	PASS

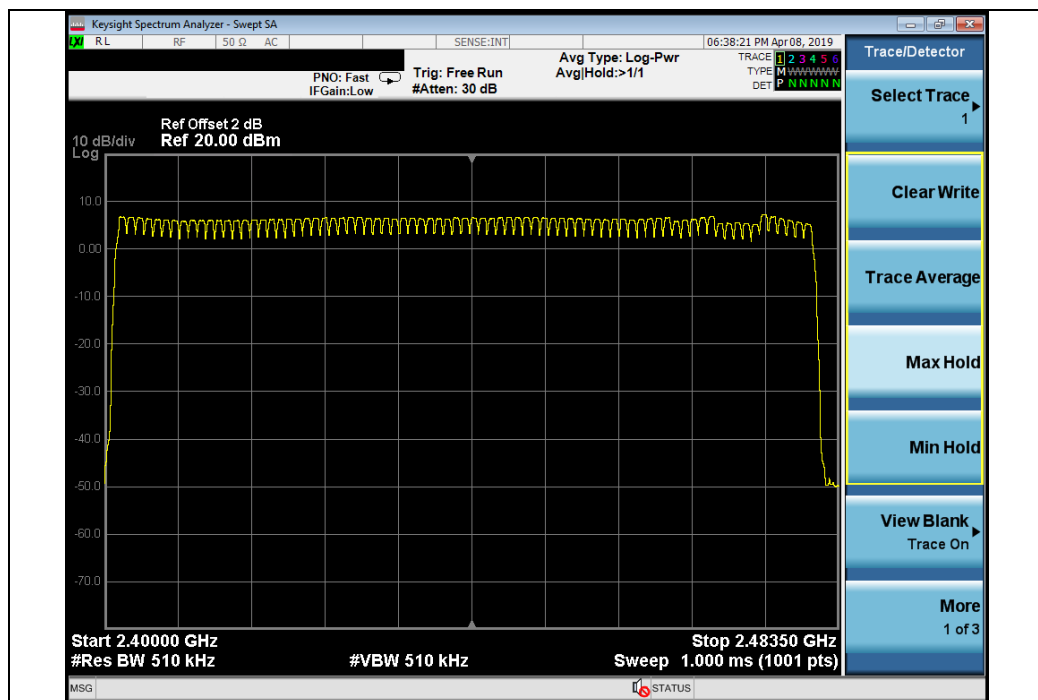
B. Test Plots:



(GFSK)



($\pi/4$ -DQPSK)



(8- DPSK)

2.3. Peak Output Power

2.3.1. Requirement

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

2.3.2. Test Description

A. Test Setup:



The EUT (Equipment under the test) is coupled to the Spectrum analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading, all test result in Spectrum analyzer.

B. Equipments List:

Please refer ANNEX B(4).

2.3.3. Test procedure

The measured output power was calculated by the reading of the spectrum analyzer and calibration. Following is the test procedure for Peak Output Power test on the spectrum analyzer:

- Set analyzer center frequency to channel center frequency.
 - Set the RBW to 3MHz
 - Set VBW to 8MHz
 - Set span to 6MHz
 - Sweep time to auto couple.
 - Detector=peak.
 - Trace mode=max hold.
 - Allow trace to fully stabilize.
- Use peak marker function to determine the peak amplitude level.



2.3.4. Test Result

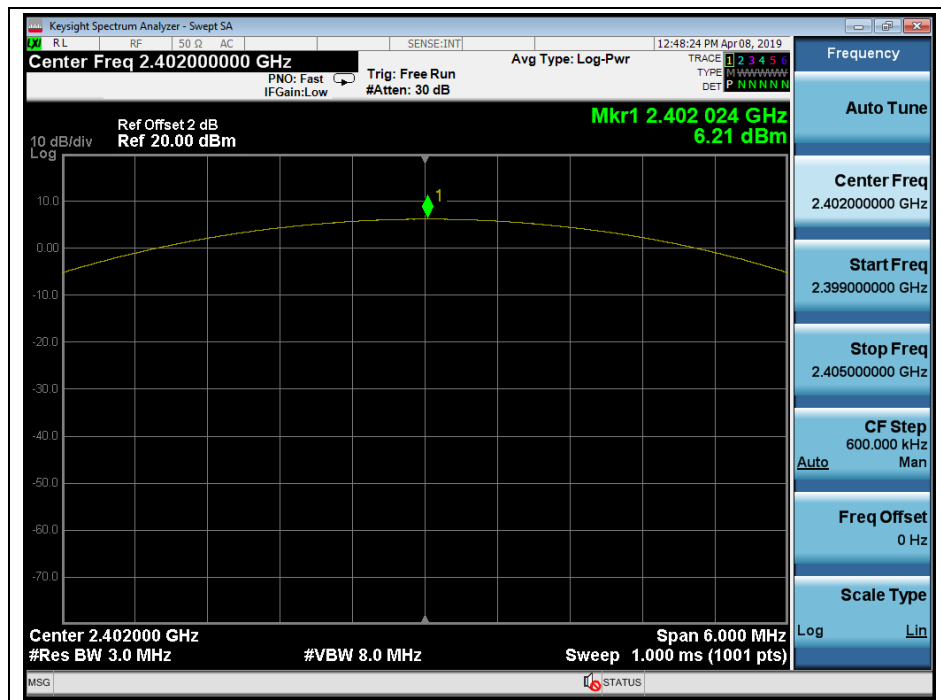
The Bluetooth Module operates at hopping-off test mode. The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the module.

GFSK Mode

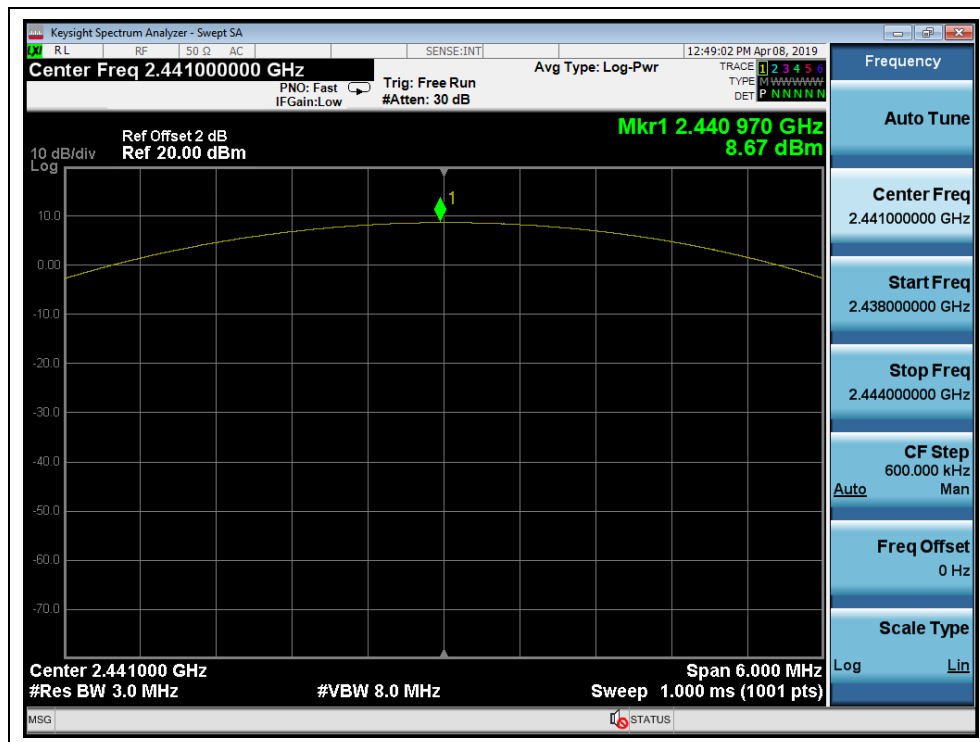
A. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
0	2402	6.21	0.004	21	0.125	PASS
39	2441	8.67	0.007			PASS
78	2480	8.20	0.007			PASS

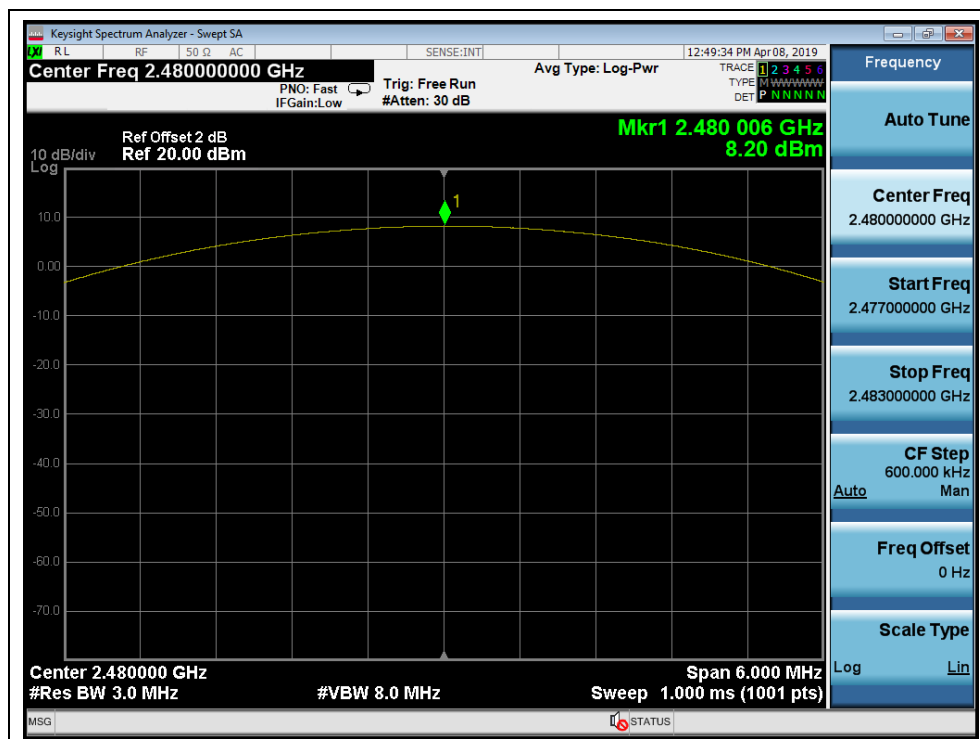
B. Test Plots:



(GFSK, Channel 0, 2402MHz)



(GFSK, Channel 39, 2441MHz)



(GFSK, Channel 78, 2480MHz)

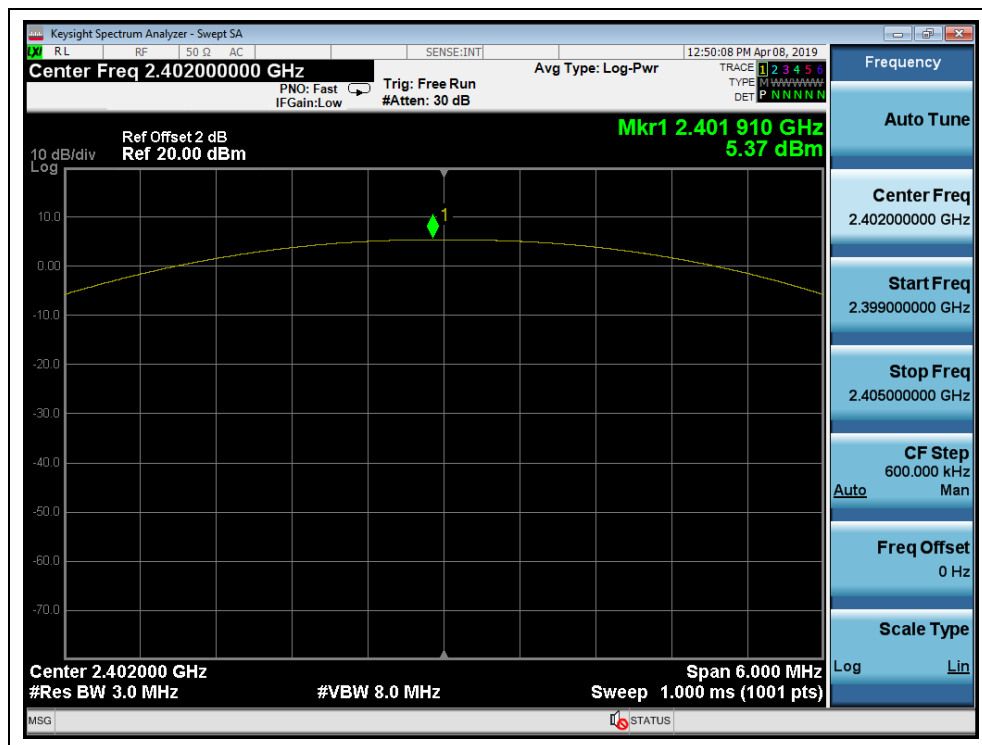


$\pi/4$ -DQPSK Mode

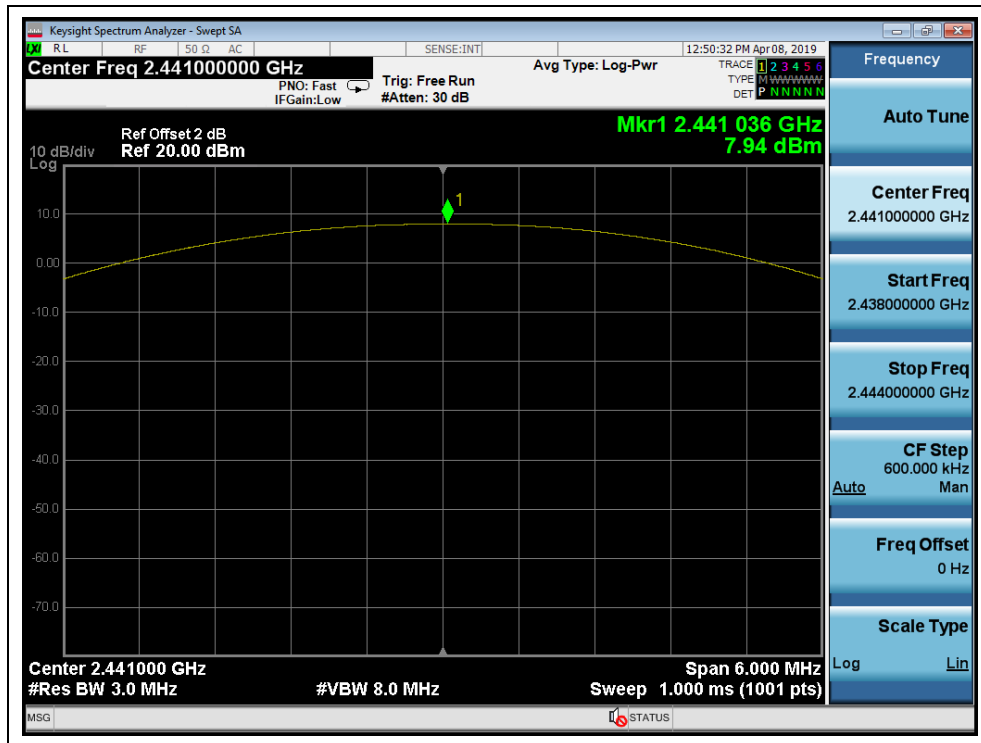
A. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
0	2402	5.37	0.003	21	0.125	PASS
39	2441	7.94	0.006			PASS
78	2480	7.46	0.006			PASS

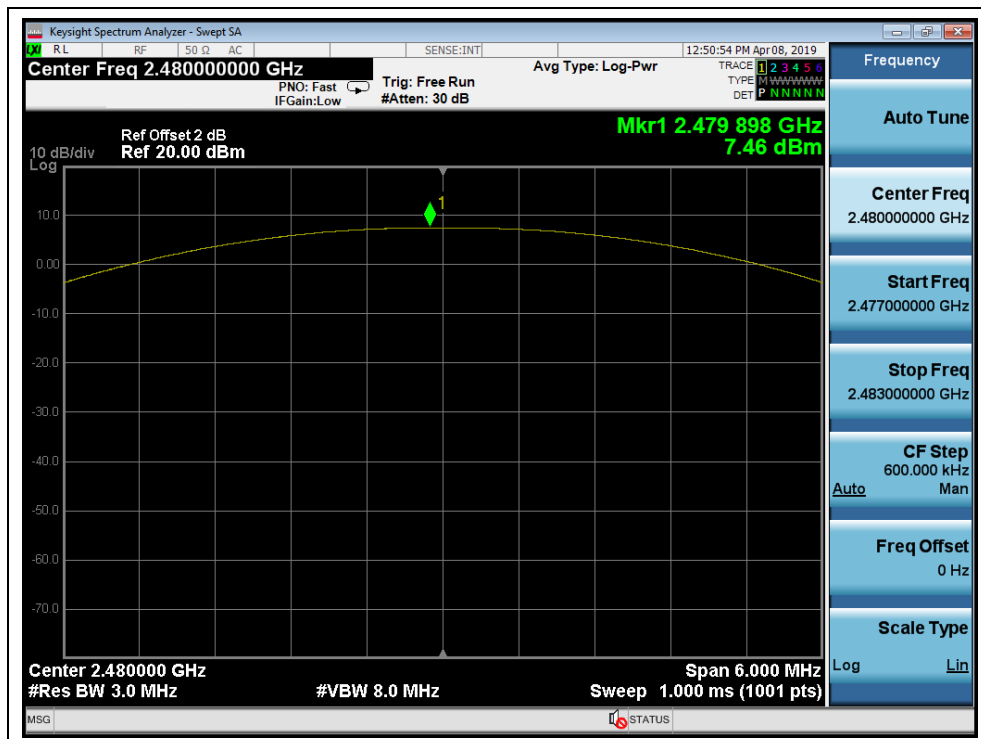
B. Test Plots:



($\pi/4$ -DQPSK, Channel 0, 2402MHz)



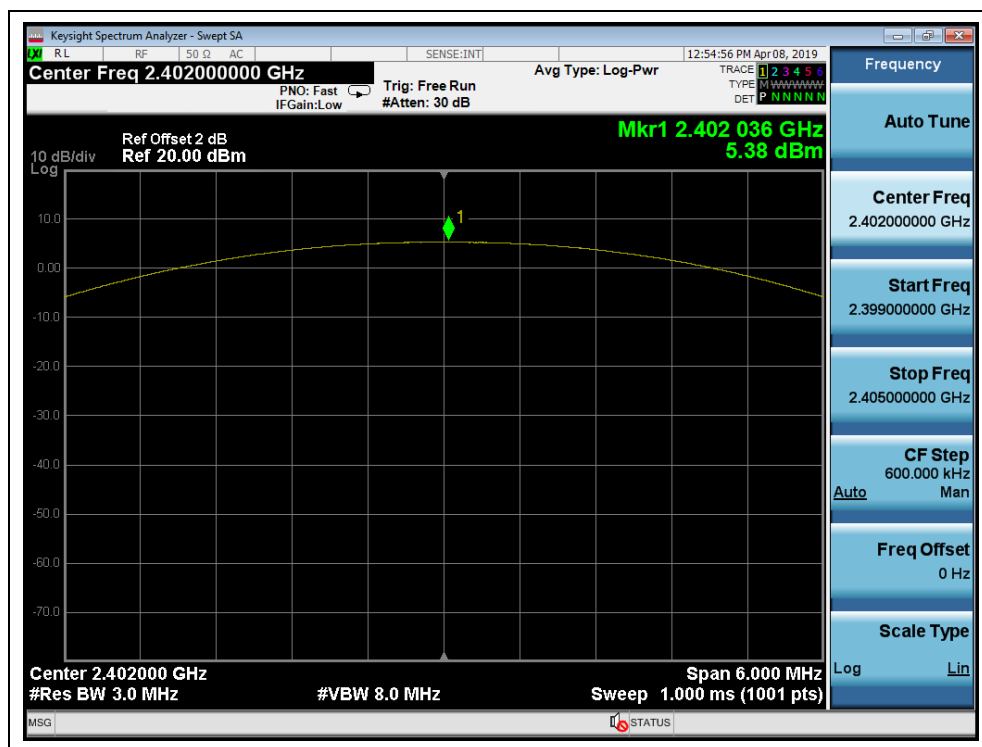
(π/4-DQPSK, Channel 39, 2441MHz)



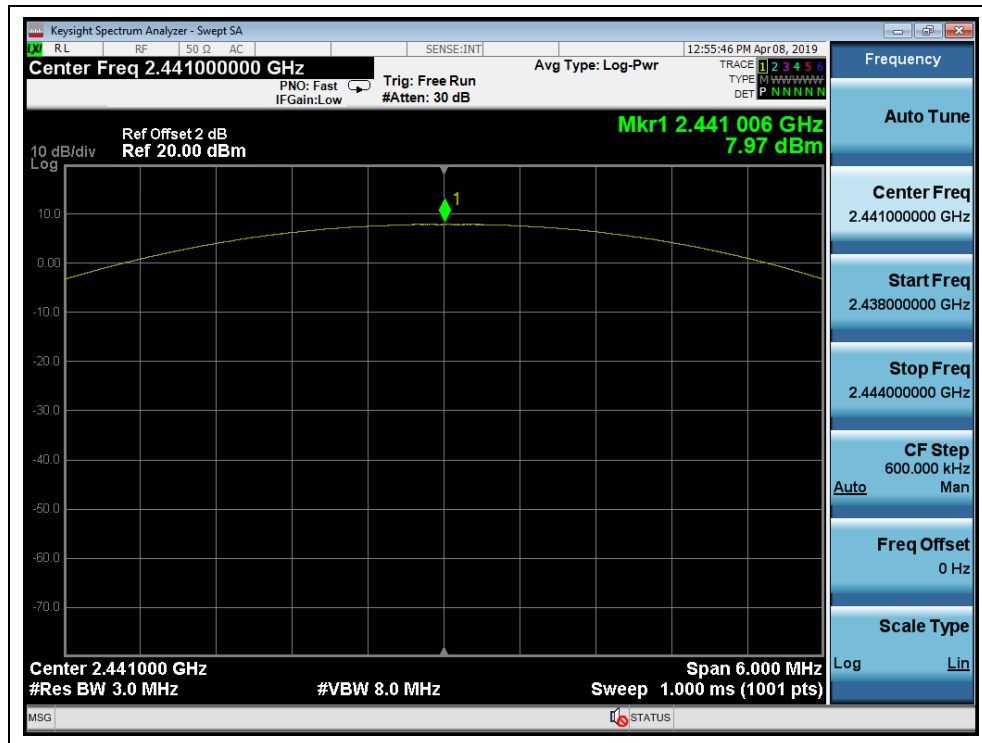
(π/4-DQPSK, Channel 78, 2480MHz)

**8-DPSK Mode****A. Test Verdict:**

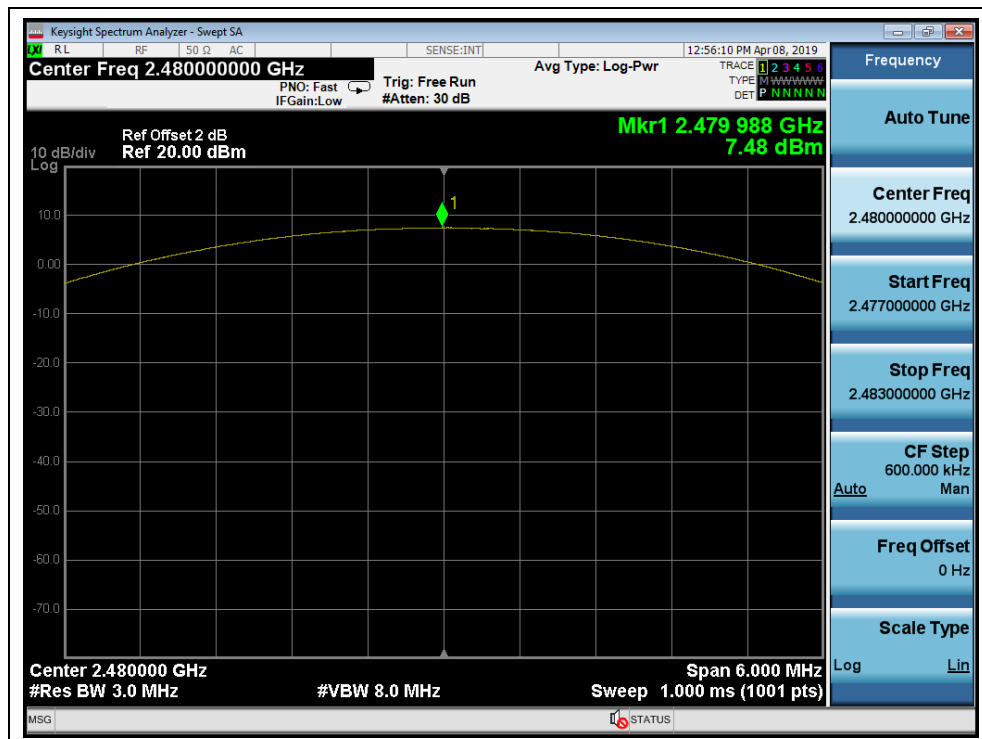
Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
0	2402	5.38	0.003	21	0.125	PASS
39	2441	7.97	0.006			PASS
78	2480	7.48	0.006			PASS

B. Test Plots:

(8-DPSK, Channel 0, 2402MHz)



(8-DPSK, Channel 39, 2441MHz)



(8-DPSK, Channel 78, 2480MHz)

2.4. 20dB Bandwidth

2.4.1. Definition

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

2.4.2. Test Description

A. Test Setup:



The EUT (Equipment under the test) is coupled to the Spectrum analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading, all test result in Spectrum analyzer.

B. Equipments List:

Please refer ANNEX B(4).

2.4.3. Test procedure

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- Repeat above procedures until all frequencies measured were complete.



2.4.4. Test Result

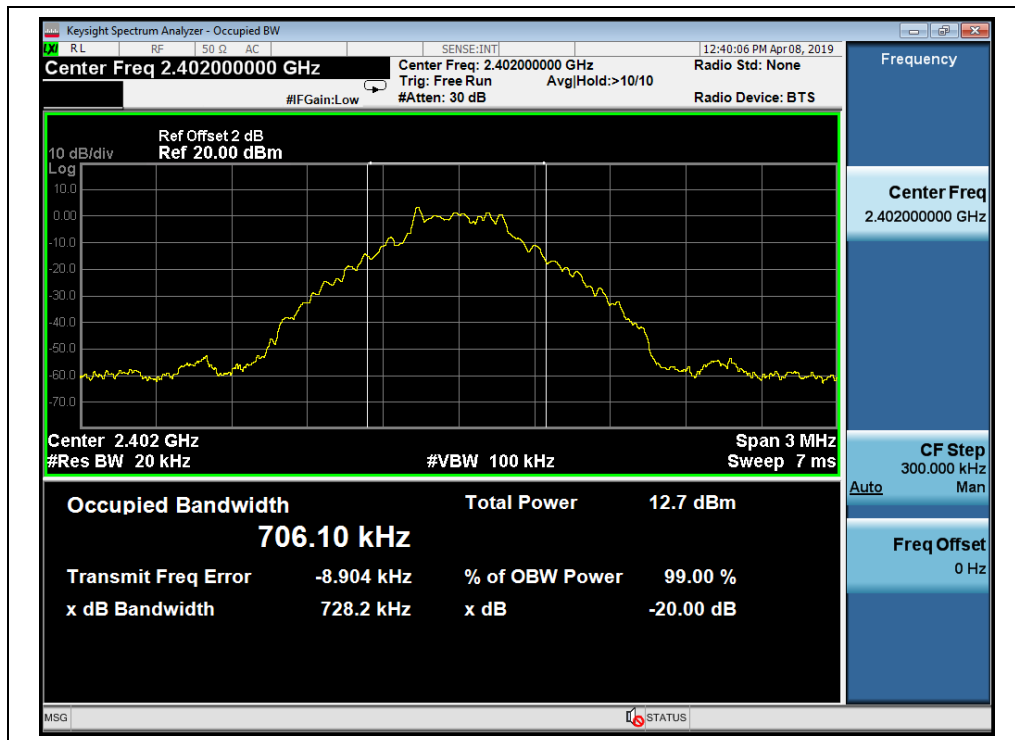
The Bluetooth Module operates at hopping-off test mode. The lowest, middle and highest channels are selected to perform testing to record the 20dB bandwidth of the Module.

GFSK Mode

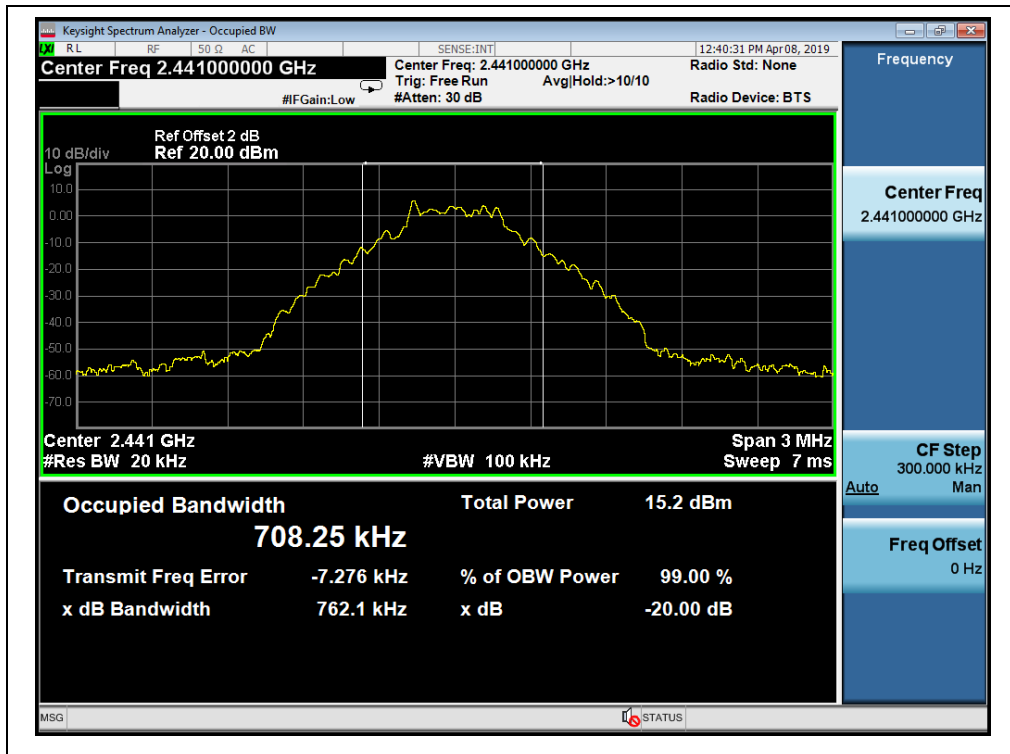
A. Test Verdict:

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Result
0	2402	0.782	PASS
39	2441	0.762	PASS
78	2480	0.728	PASS

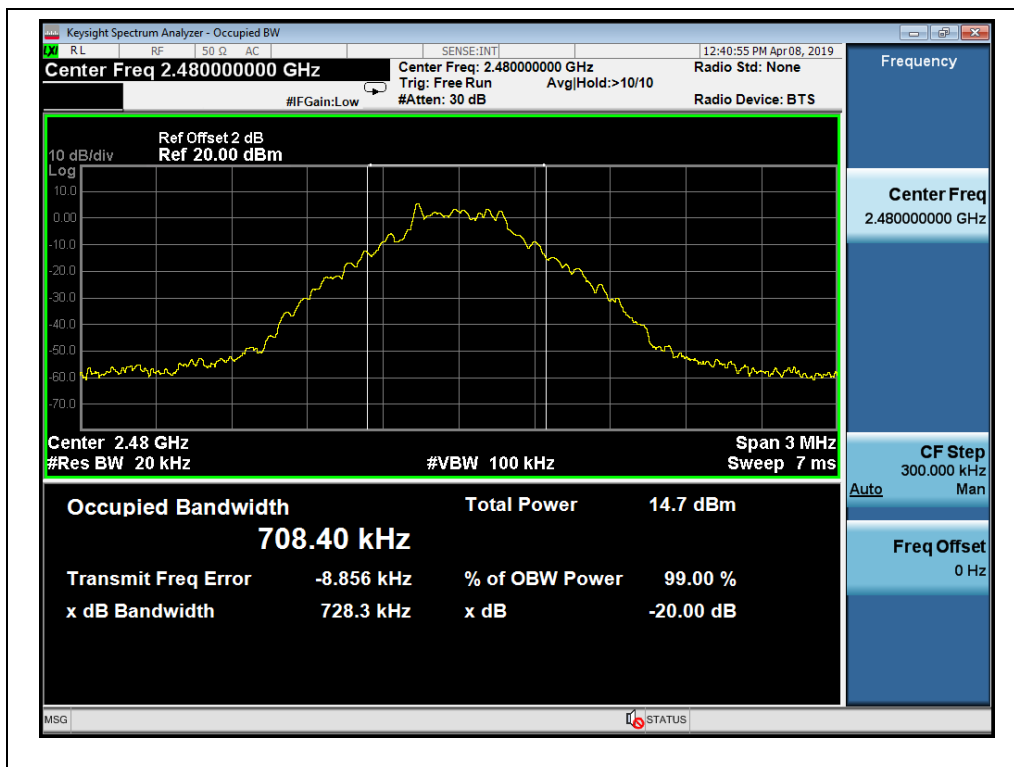
B. Test Plots:



(GFSK, Channel 0, 2402MHz)



(GFSK, Channel 39, 2441MHz)



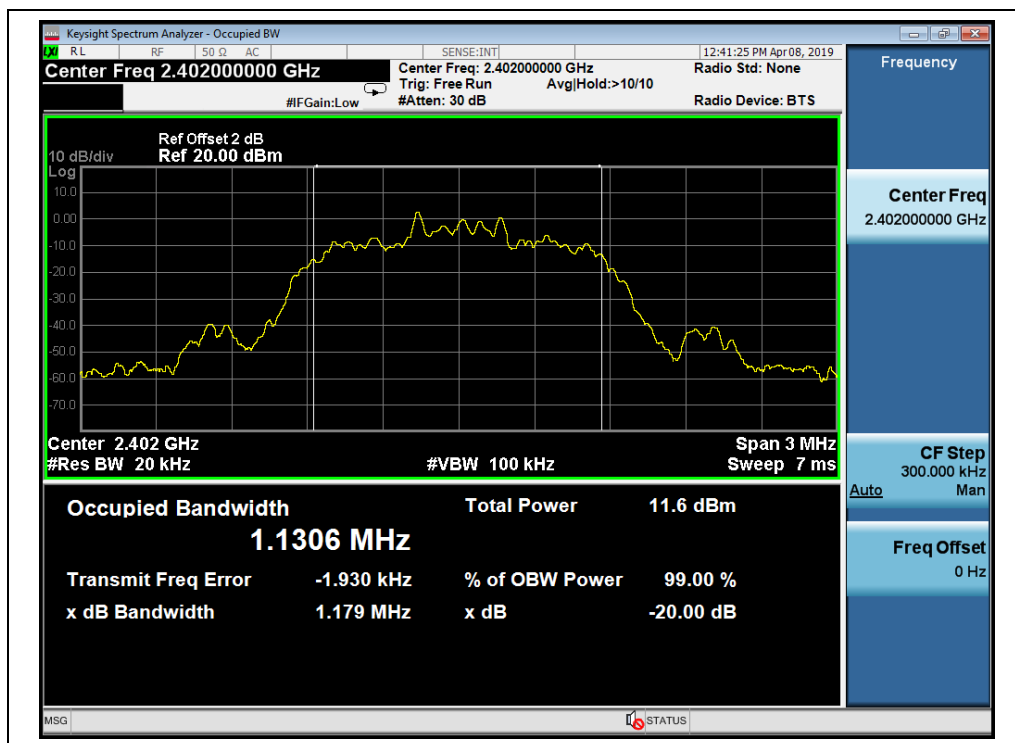
(GFSK, Channel 78, 2480MHz)

 $\pi/4$ -DQPSK Mode

A. Test Verdict:

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Result
0	2402	1.179	PASS
39	2441	1.181	PASS
78	2480	1.181	PASS

B. Test Plots:

 $\pi/4$ -DQPSK, Channel 0, 2402MHz)



($\pi/4$ -DQPSK, Channel 39, 2441MHz)



($\pi/4$ -DQPSK, Channel 78, 2480MHz)



8-DPSK Mode

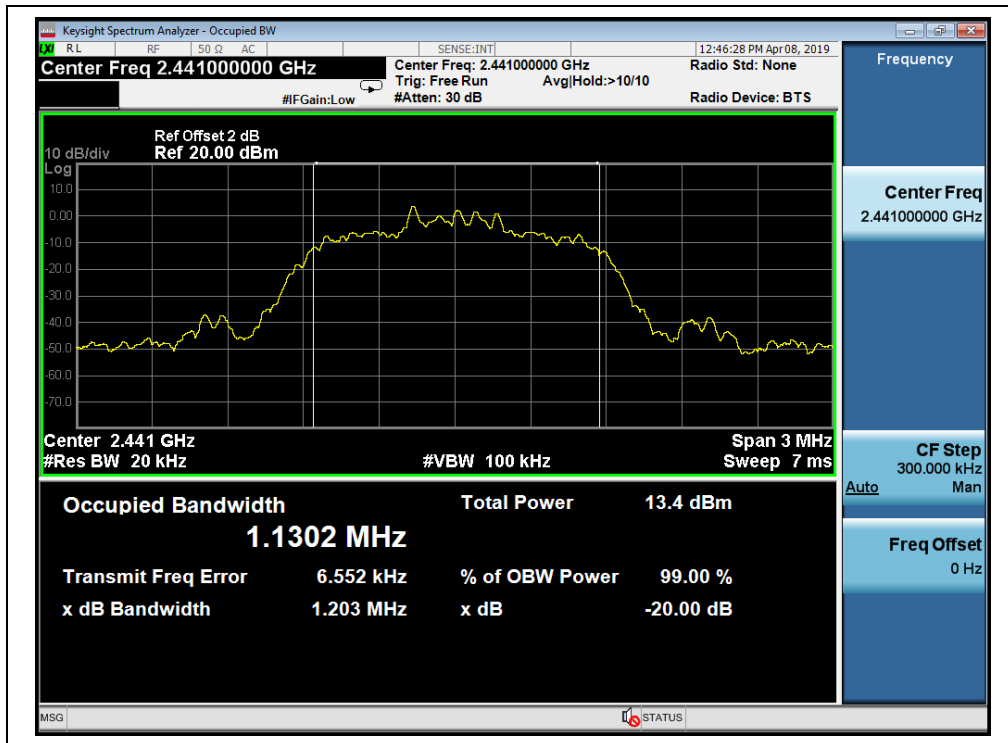
A. Test Verdict:

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Result
0	2402	1.202	PASS
39	2441	1.203	PASS
78	2480	1.203	PASS

B. Test Plots:



(8-DPSK, Channel 0, 2402MHz)



(8-DPSK, Channel 39, 2441MHz)



(8-DPSK, Channel 78, 2480MHz)

2.5. Carried Frequency Separation

2.5.1. Definition

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

2.5.2. Test Description

A. Test Setup:



The EUT (Equipment under the test) is coupled to the Spectrum analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading, all test result in Spectrum analyzer.

B. Equipments List:

Please refer ANNEX B(4).

2.5.3. Test Procedure

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
- By using the MaxHold function record the separation of two adjacent channels.
- Measure the frequency difference of these two adjacent channels by SA mark function. And then plot the result on SA screen.
- Repeat above procedures until all frequencies measured were complete.

2.5.4. Test Result

The Bluetooth Module operates at hopping-on test mode. For any adjacent channels (e.g. the channel 39 and 40 as showed below), the Module does have hopping channel carrier frequencies separated by a minimum of 25kHz or two-thirds of the 20dB bandwidth of the hopping channel (refer to section 2.4.4), whichever is greater. So, the verdict is PASS.

Test Mode	Measured Channel Numbers	Carried Frequency Separation (MHz)	20dB bandwidth (MHz)	Min. Limit ^{Note1} (MHz)	Verdict
GFSK	0 and 1	0.999	0.782	0.521	PASS
	39 and 40	0.999	0.762	0.508	PASS
	77 and 78	0.999	0.728	0.485	PASS
$\pi/4$ -DQPSK	0 and 1	1.001	1.179	0.786	PASS
	39 and 40	0.999	1.181	0.787	PASS
	77 and 78	0.999	1.181	0.787	PASS
8-DPSK	0 and 1	0.999	1.202	0.801	PASS
	39 and 40	0.999	1.203	0.802	PASS
	77 and 78	0.999	1.203	0.802	PASS

Note 1:Min. Limit is equal to the two-thirds of the 20dB bandwidth

Test Plots



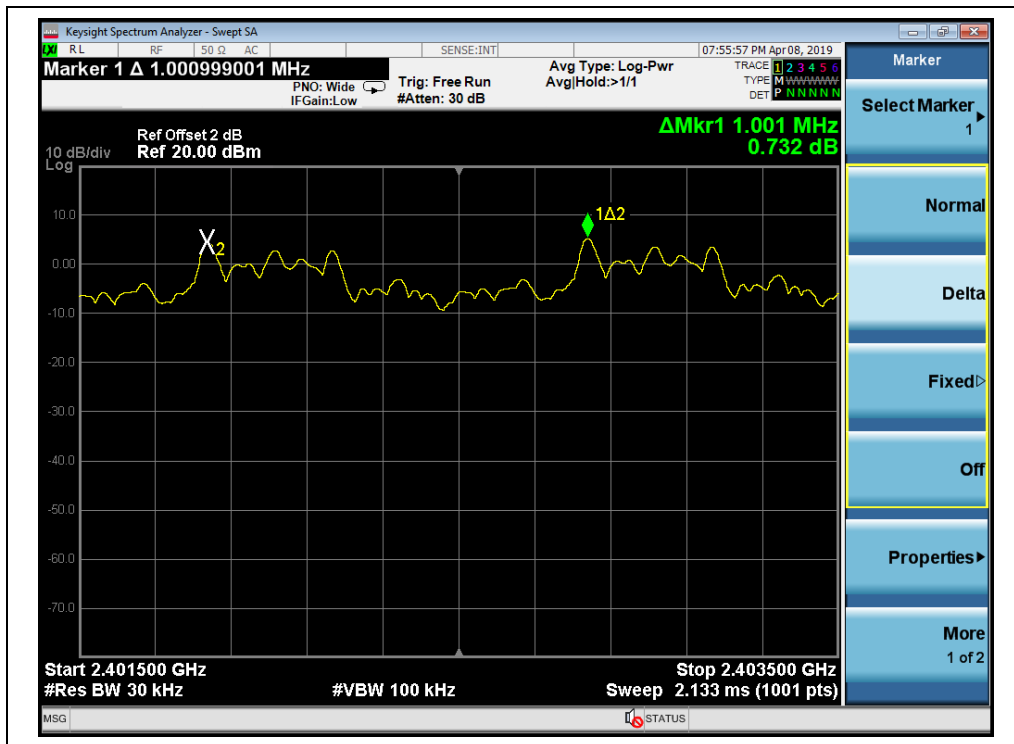
(GFSK, Channel 0 and 1, 2402MHz)



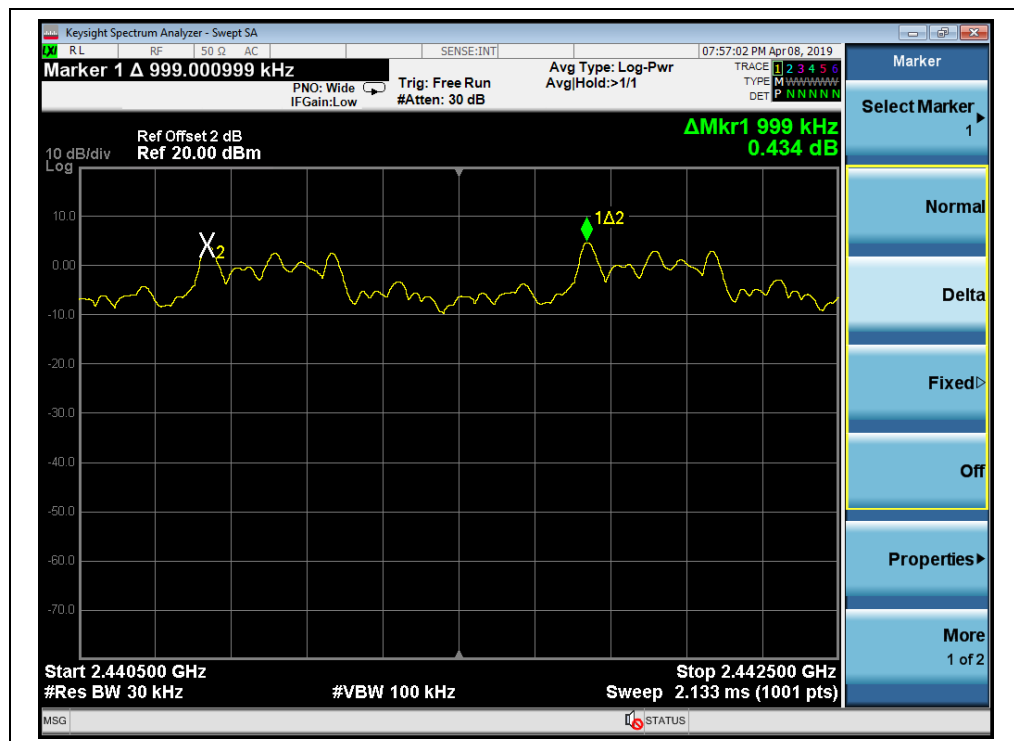
(GFSK, Channel 39 and 40, 2441MHz)



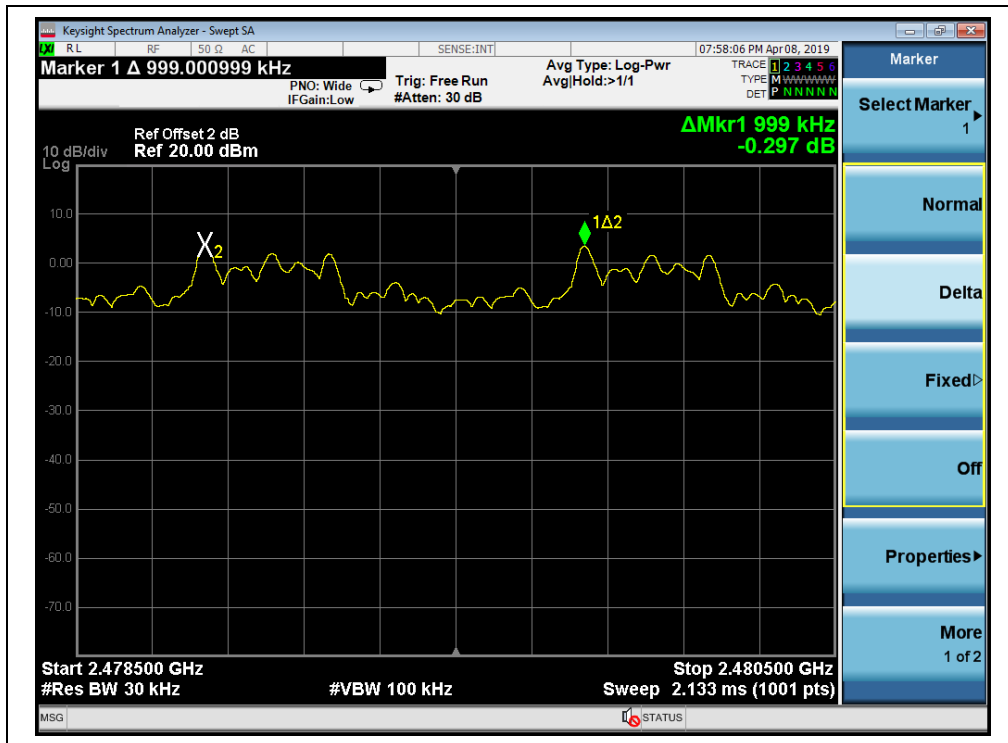
(GFSK, Channel 77 and 78, 2480MHz)



($\pi/4$ -DQPSK, Channel 0 and 1, 2402MHz)



($\pi/4$ -DQPSK, Channel 39 and 40, 2441MHz)



($\pi/4$ -DQPSK, Channel 77 and 78, 2480MHz)



(8-DPSK, Channel 0 and 1, 2402MHz)



(8-DPSK, Channel 39 and 40, 2441MHz)



(8-DPSK, Channel 77 and 78, 2480MHz)

2.6. Time of Occupancy (Dwell time)

2.6.1. Requirement

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

2.6.2. Test Description

A. Test Setup:



The EUT (Equipment under the test) is coupled to the Spectrum analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading, all test result in Spectrum analyzer.

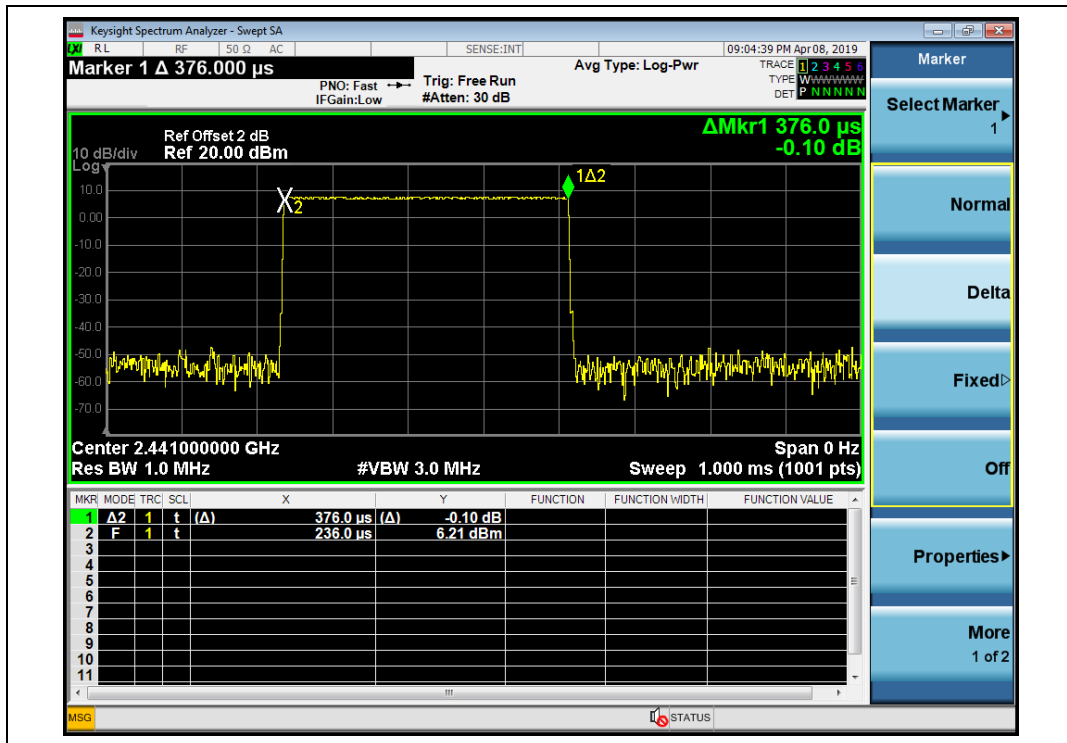
The EUT was working in channel hopping; Spectrum SPAN was set as 0. Sweep was set as 0.4 * channel no.(s), the quantity of pulse was get from single sweep. In addition, the time of single pulses was tested.

Dwell time = time slot length * hop rate / number of hopping channels * 31.6s

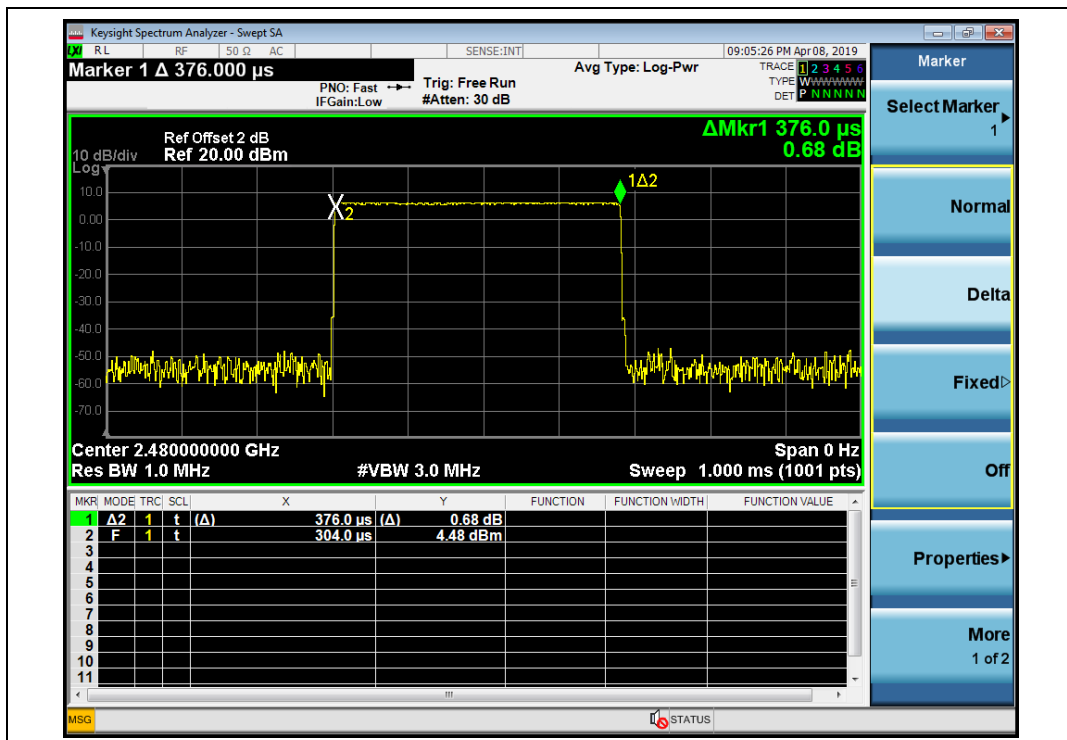
Hop rate = 1600/s

B. Equipments List:

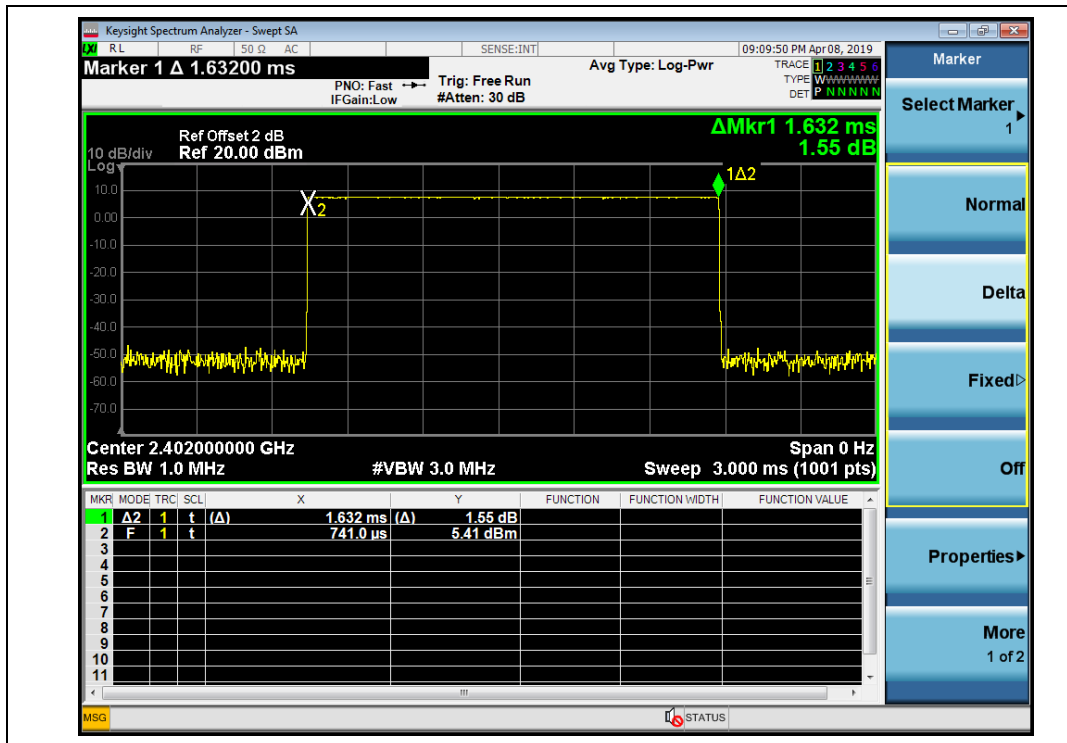
Please refer ANNEX B(4).



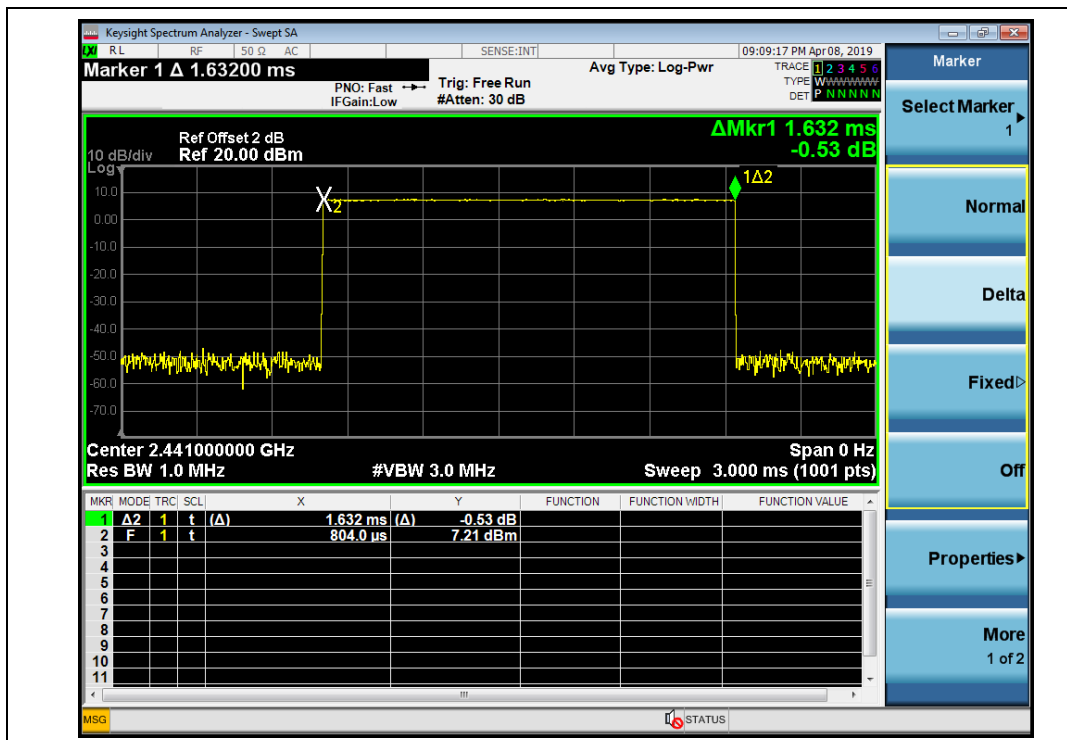
(DH1_2441M, GFSK)



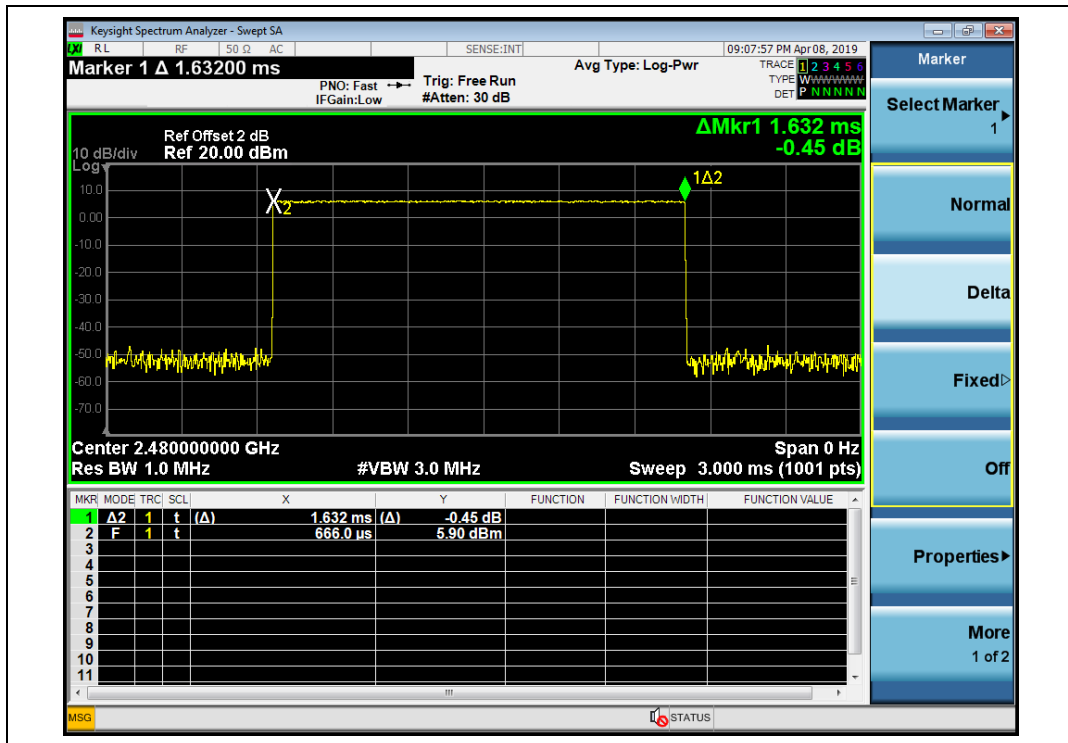
(DH1_2480M, GFSK)



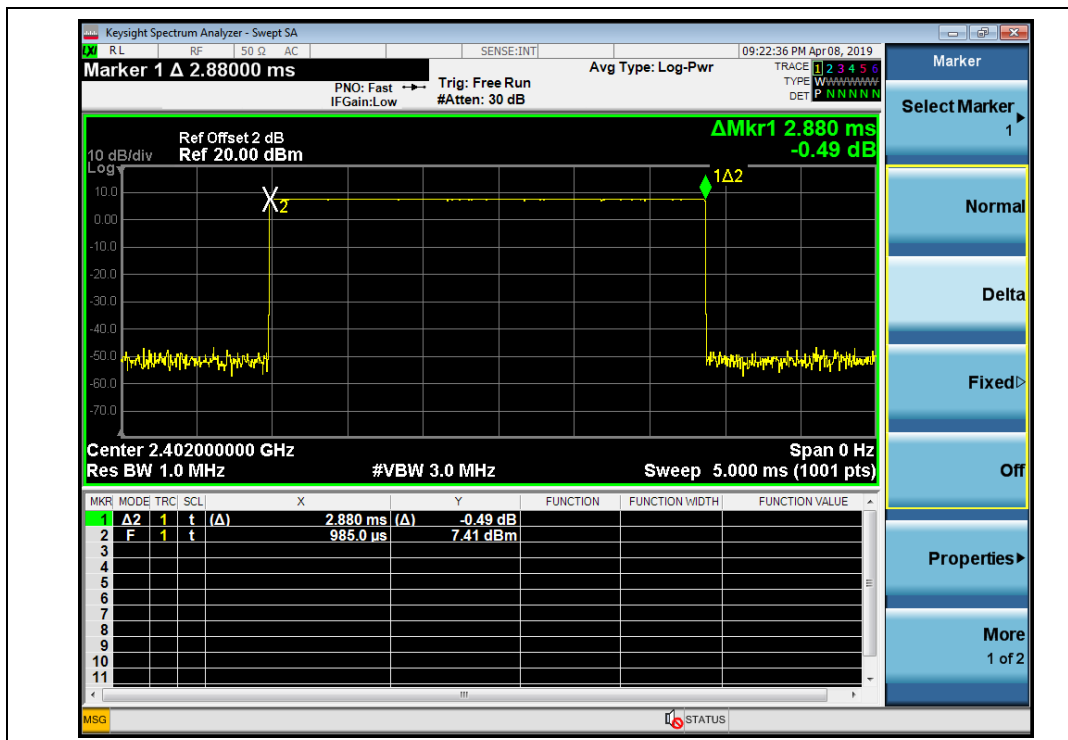
(DH3_2402M, GFSK)



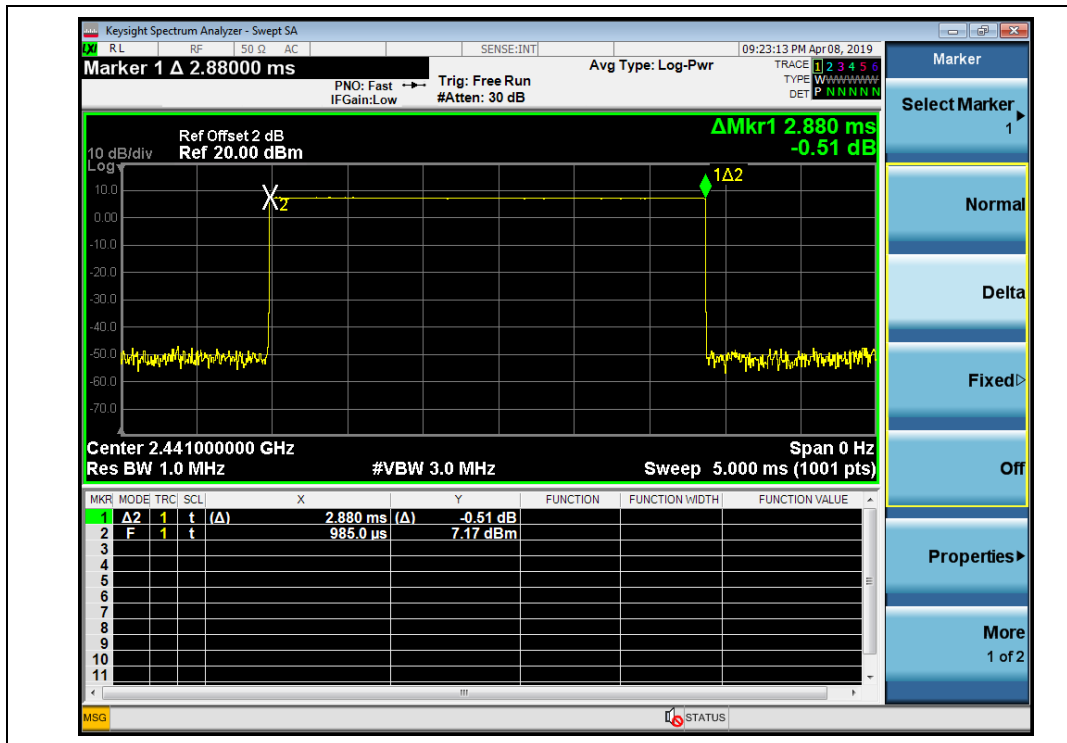
(DH3_2441M, GFSK)



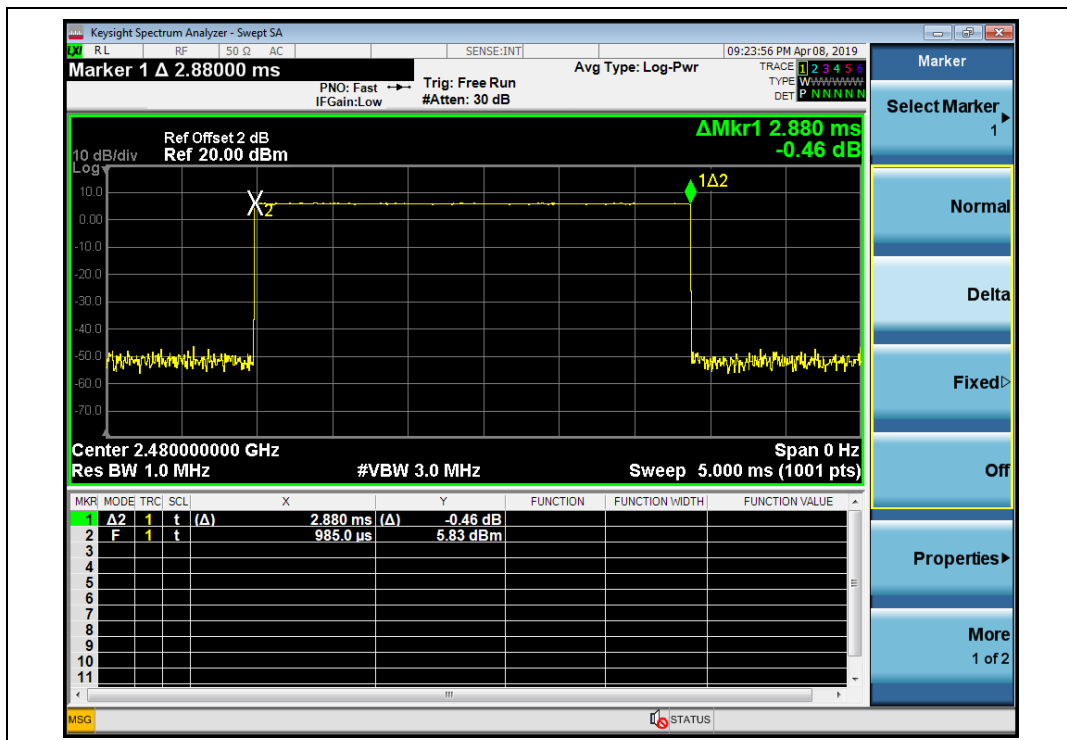
(DH3_2480M, GFSK)



(DH5_2402M, GFSK)



(DH5_2441M, GFSK)



(DH5_2480M, GFSK)

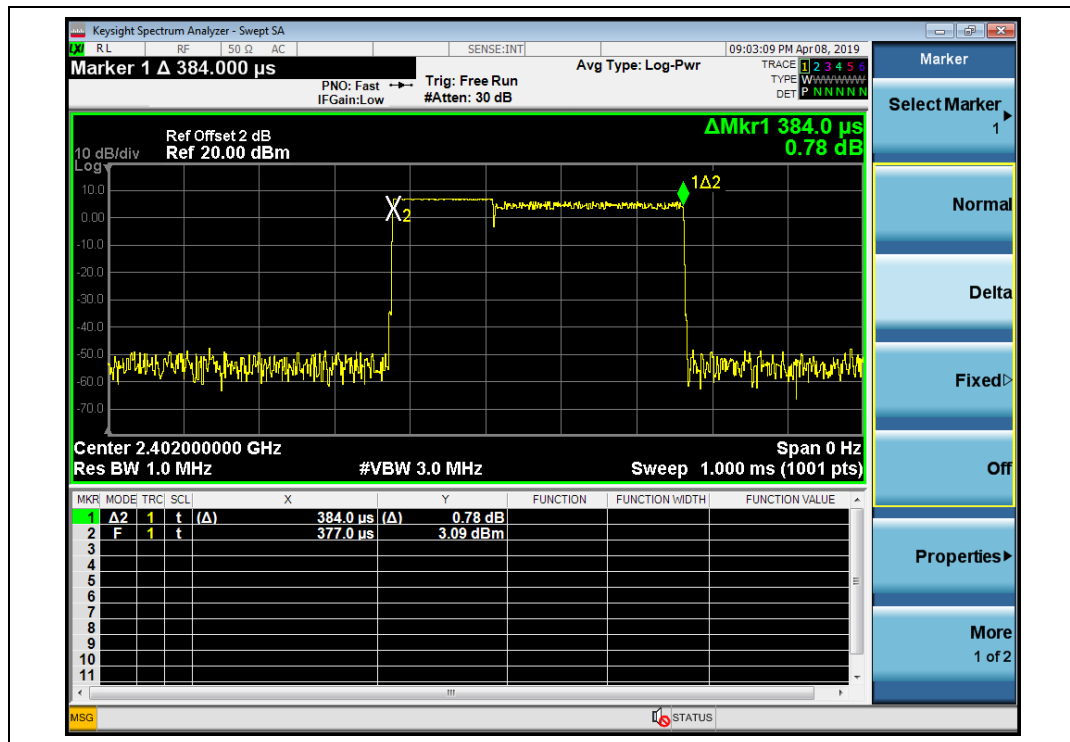


$\pi/4$ -DQPSK Mode

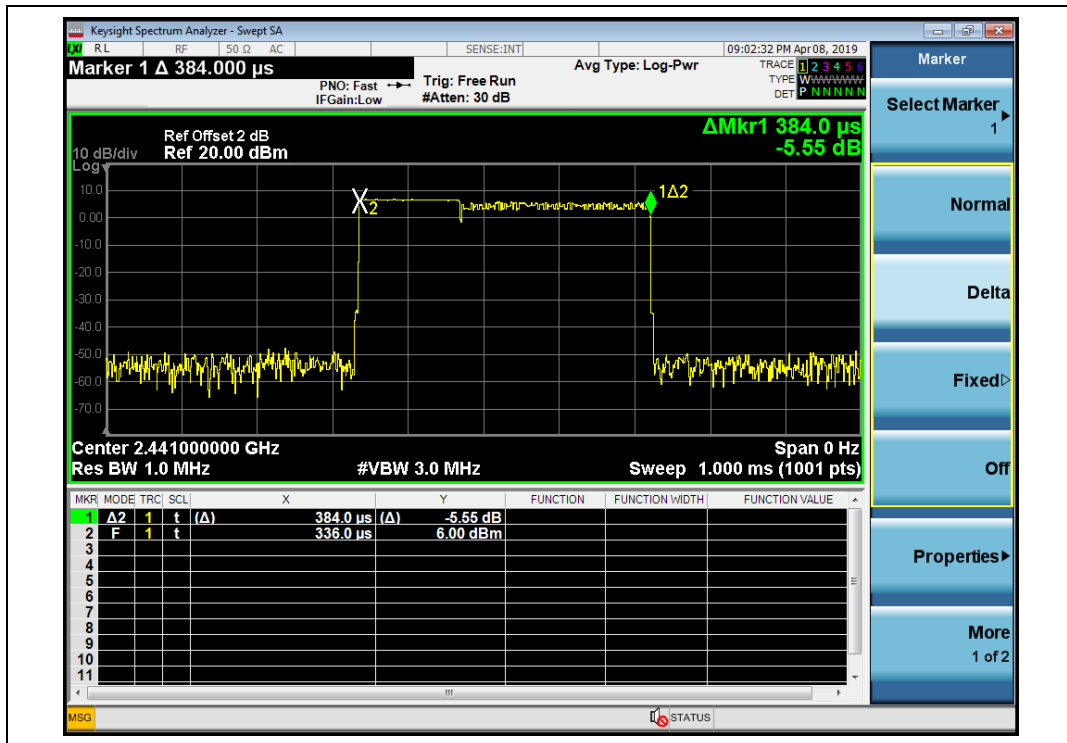
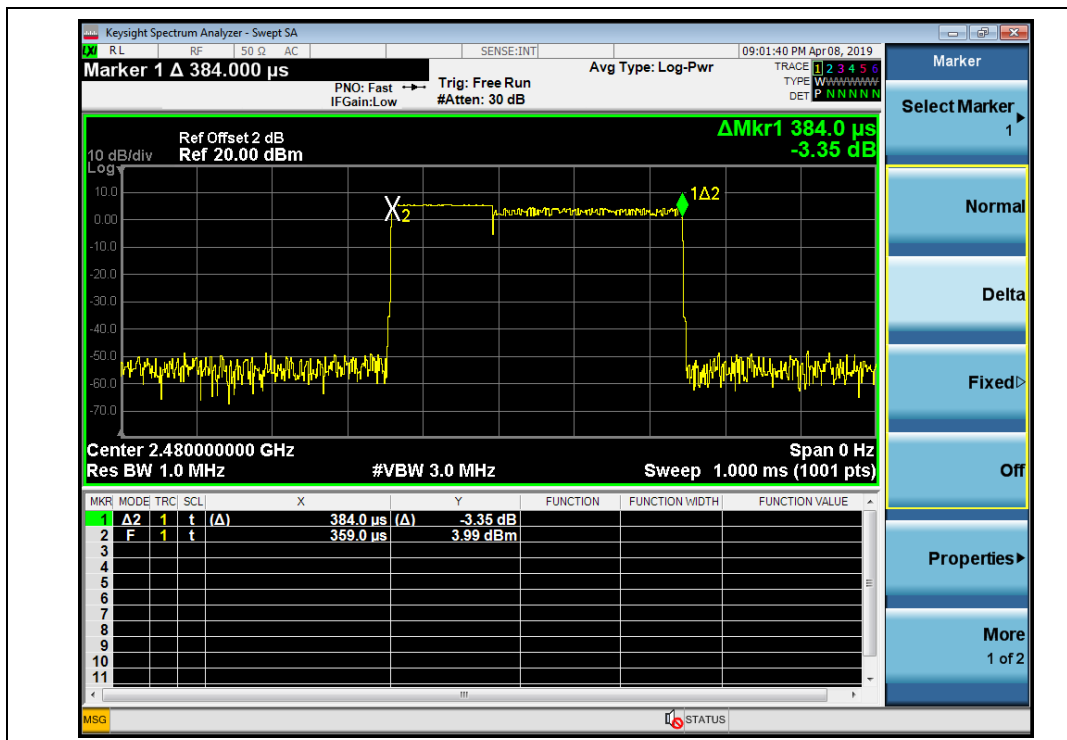
A. Test Verdict:

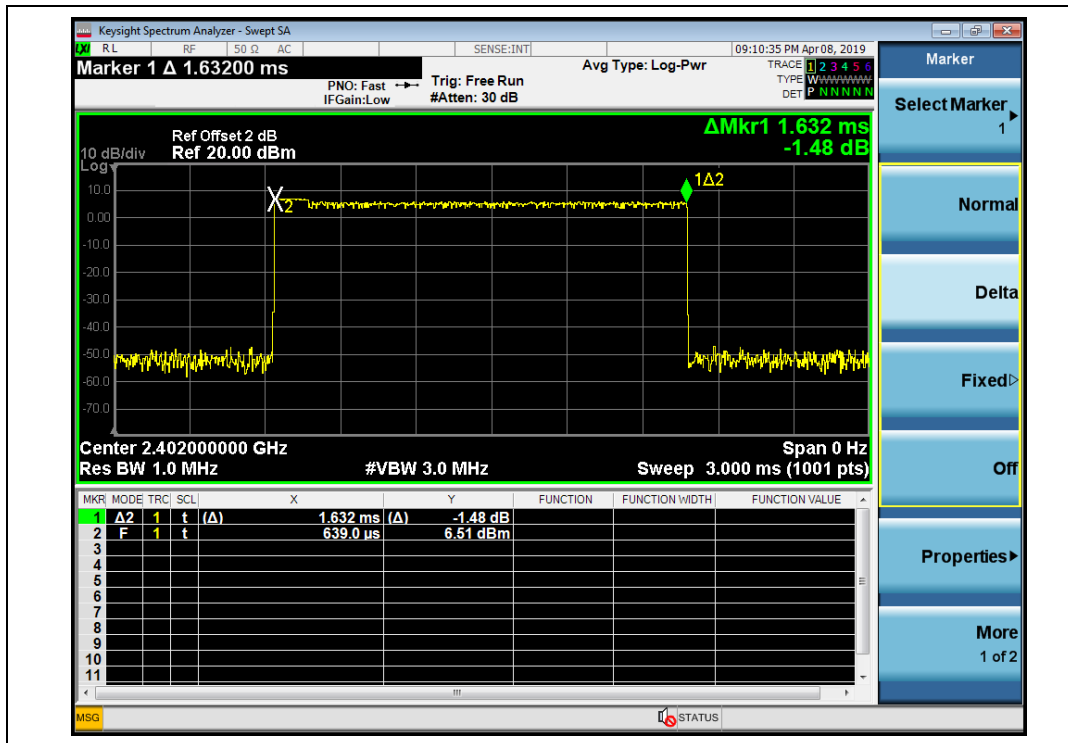
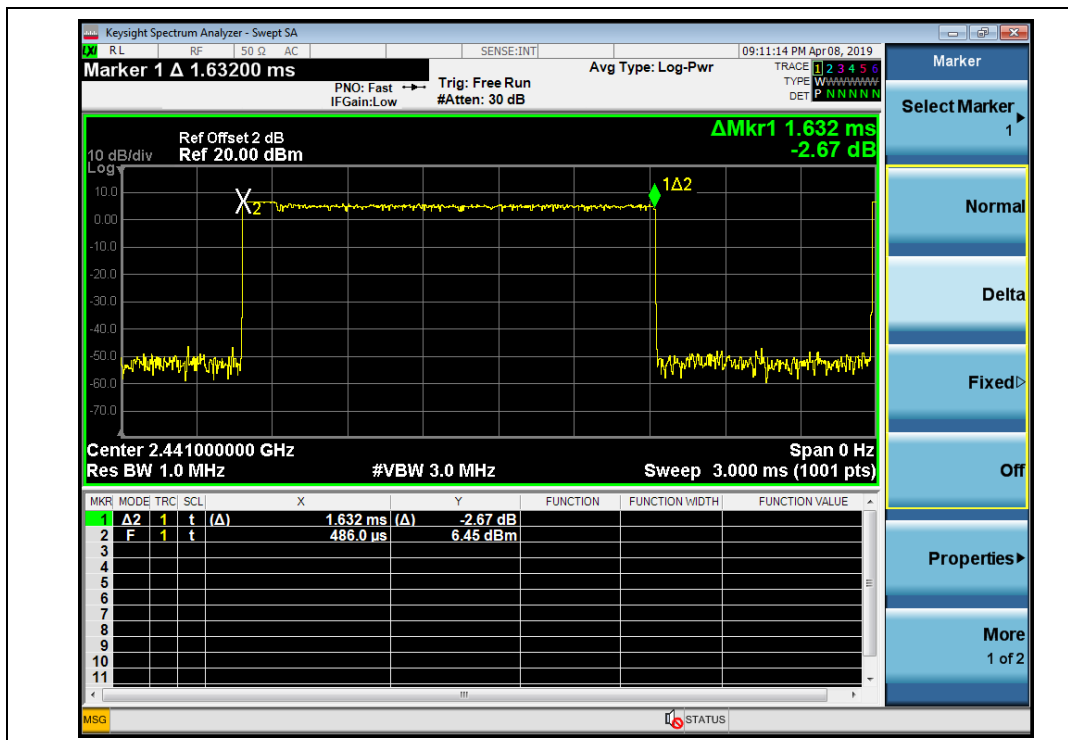
Mode	Frequency (MHz)	Pulse Width (ms)	Dwell Time (ms)	Limit (sec)	Verdict
2DH1	2402	0.384	122.880	0.4	PASS
	2441	0.384	122.880		PASS
	2480	0.384	122.880		PASS
2DH3	2402	1.632	261.120		PASS
	2441	1.632	261.120		PASS
	2480	1.632	261.120		PASS
2DH5	2402	2.880	307.200		PASS
	2441	2.880	307.200		PASS
	2480	2.880	307.200		PASS

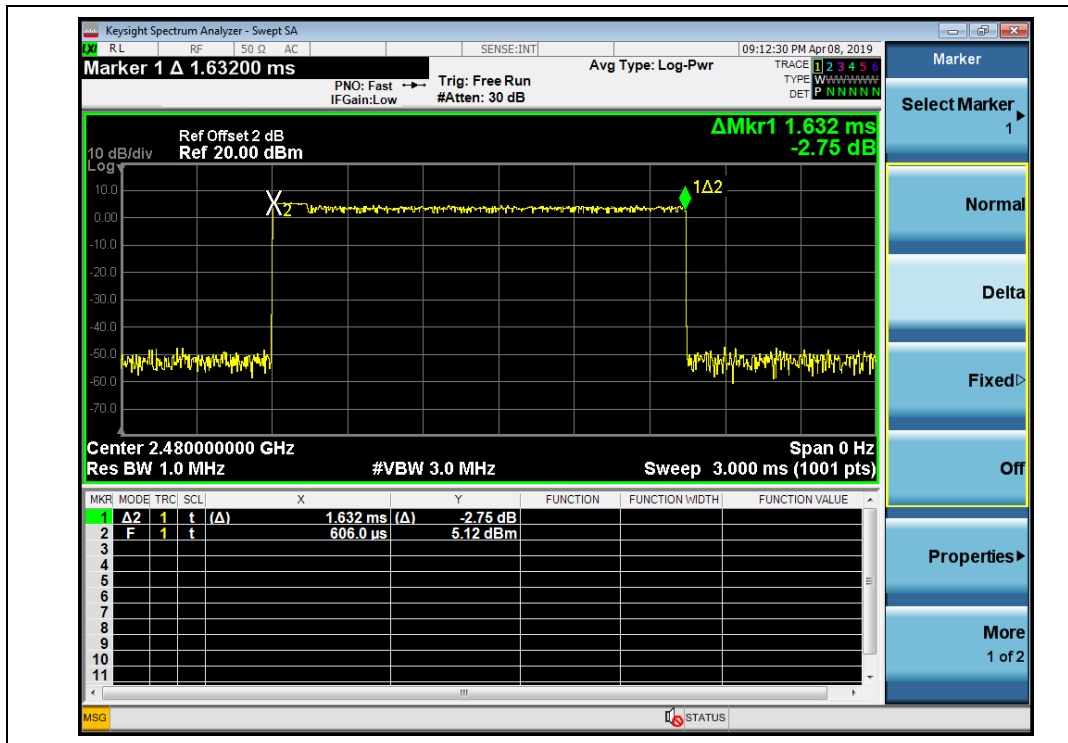
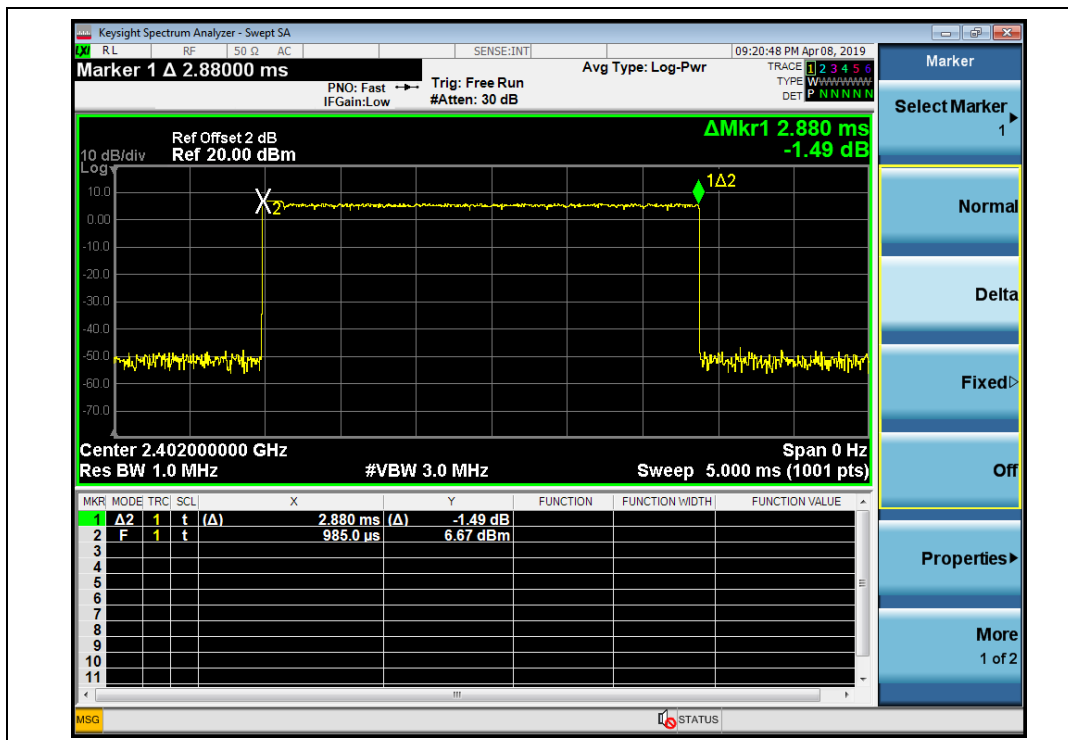
B. Test Plots:

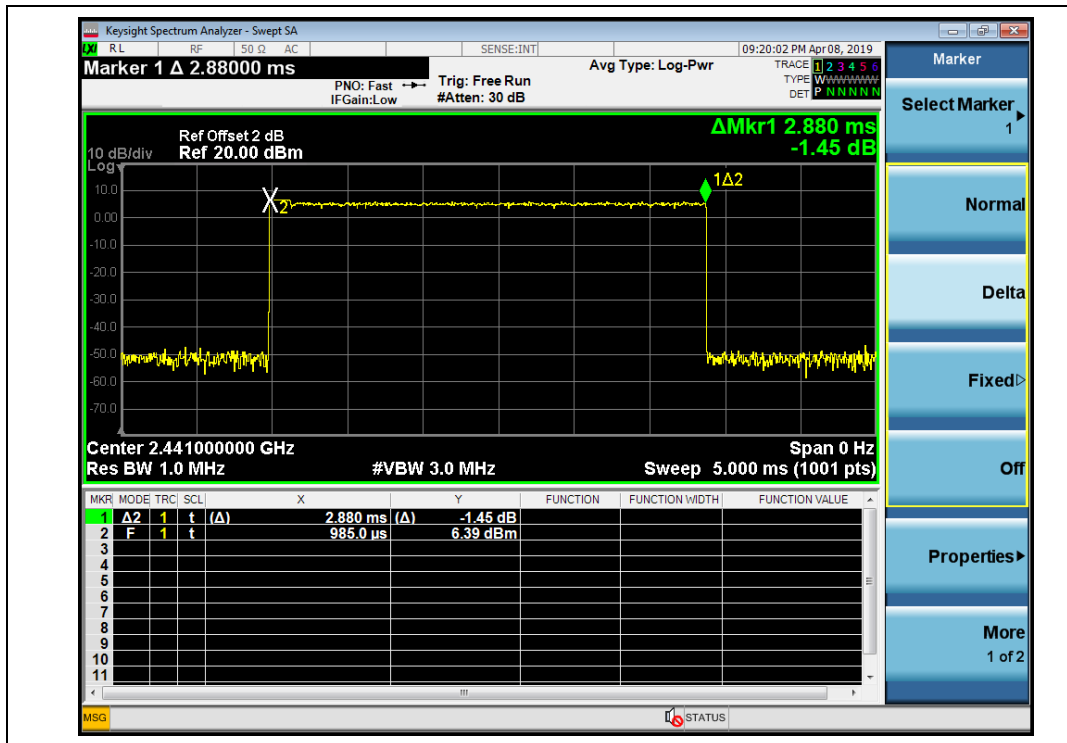
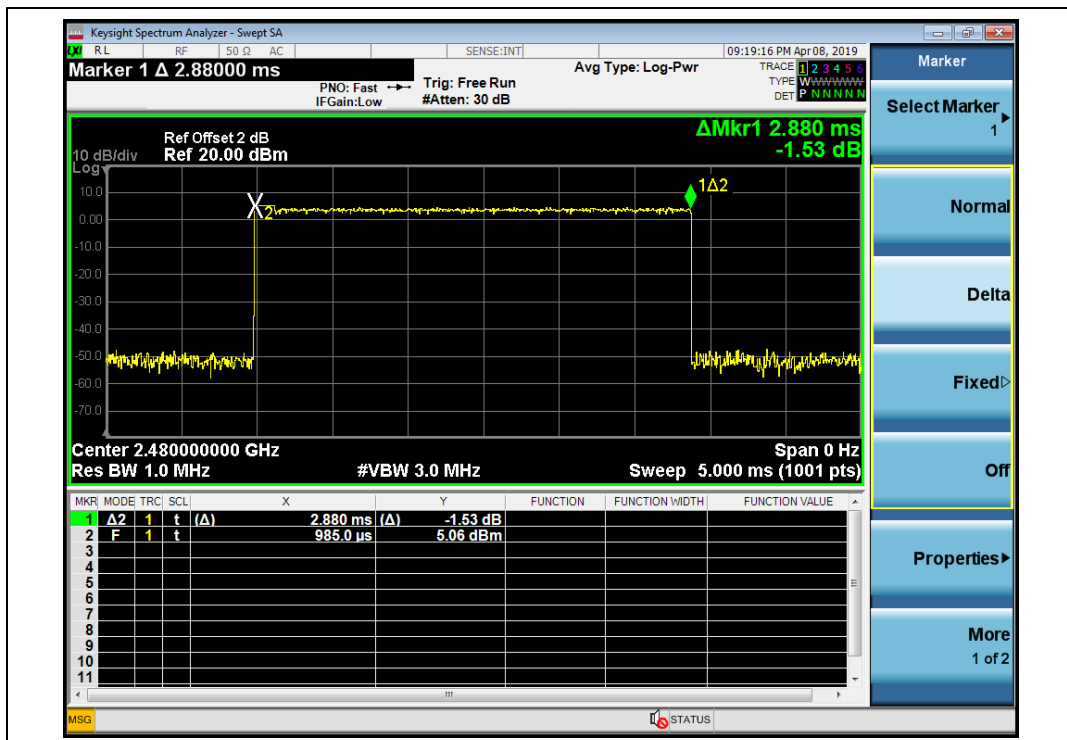


(2DH1_2402M, $\pi/4$ -DQPSK)

(2DH1_2441M, $\pi/4$ -DQPSK)(2DH1_2480M, $\pi/4$ -DQPSK)


(2DH3_2402M, $\pi/4$ -DQPSK)

(2DH3_2441M, $\pi/4$ -DQPSK)


(2DH3_2480M, $\pi/4$ -DQPSK)

(2DH5_2402M, $\pi/4$ -DQPSK)

(2DH5_2441M, $\pi/4$ -DQPSK)(2DH5_2480M, $\pi/4$ -DQPSK)

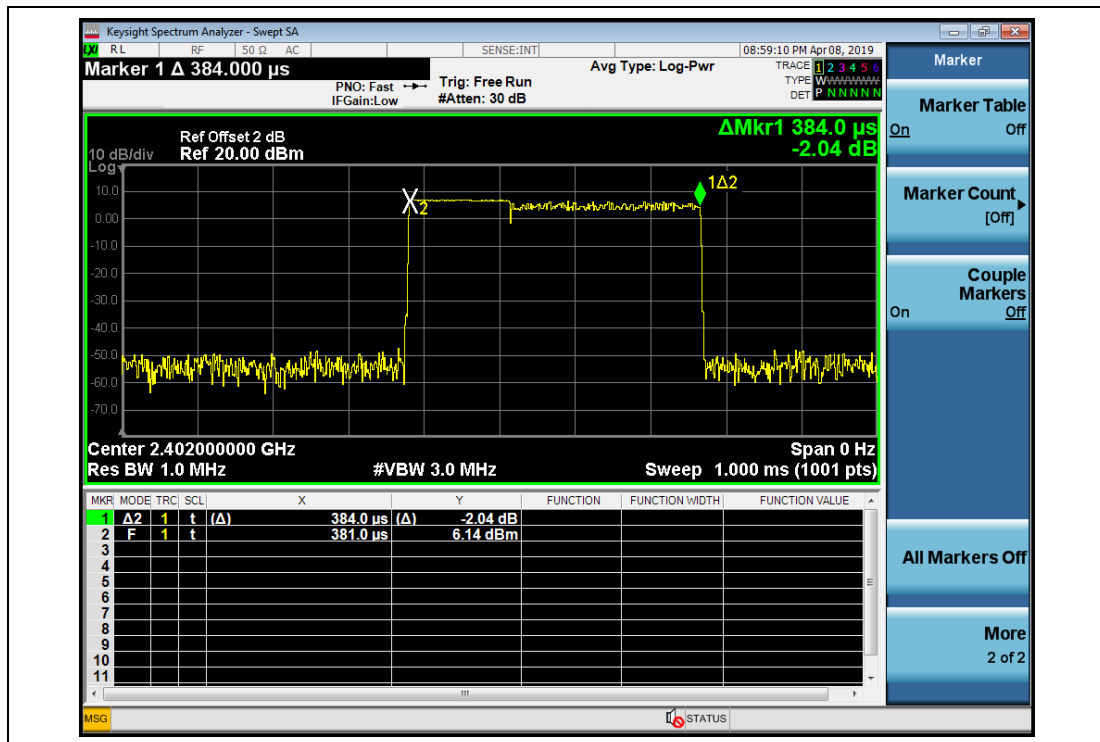


8-DPSK mode

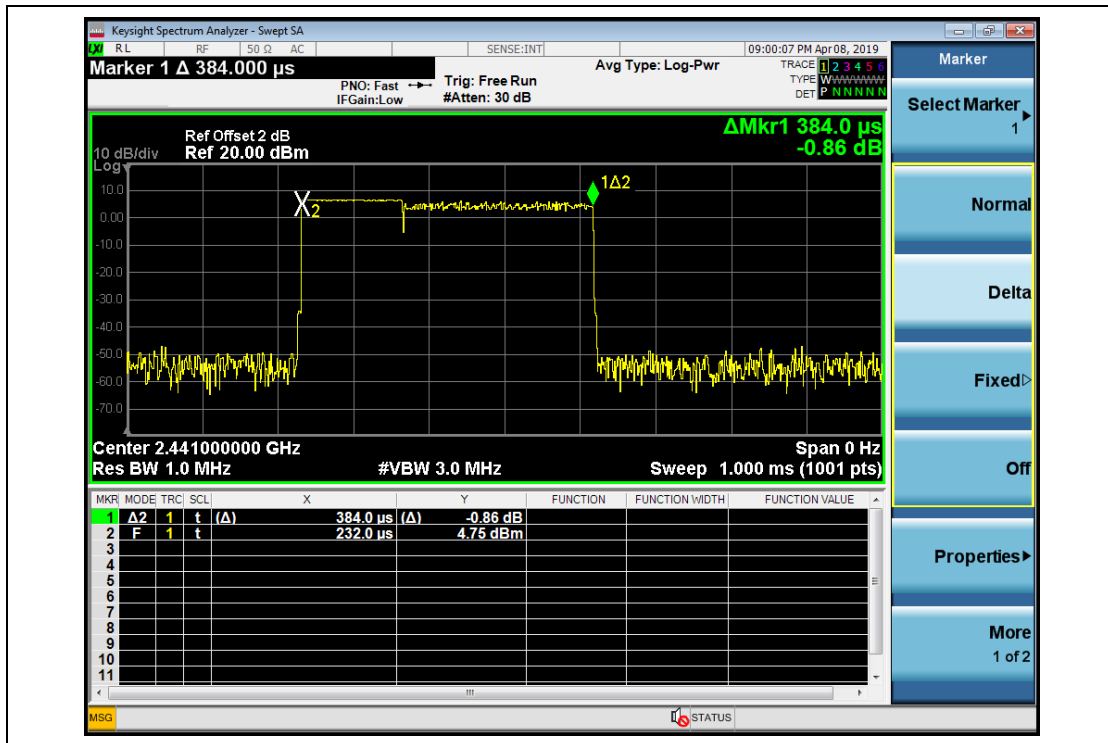
A. Test Verdict:

Mode	Frequency (MHz)	Pulse Width (ms)	Dwell Time (ms)	Limit (sec)	Verdict
3DH1	2402	0.384	122.880	0.4	PASS
	2441	0.384	122.880		PASS
	2480	0.384	122.880		PASS
3DH3	2402	1.632	261.120		PASS
	2441	1.632	261.120		PASS
	2480	1.632	261.120		PASS
3DH5	2402	2.880	307.200		PASS
	2441	2.880	307.200		PASS
	2480	2.880	307.200		PASS

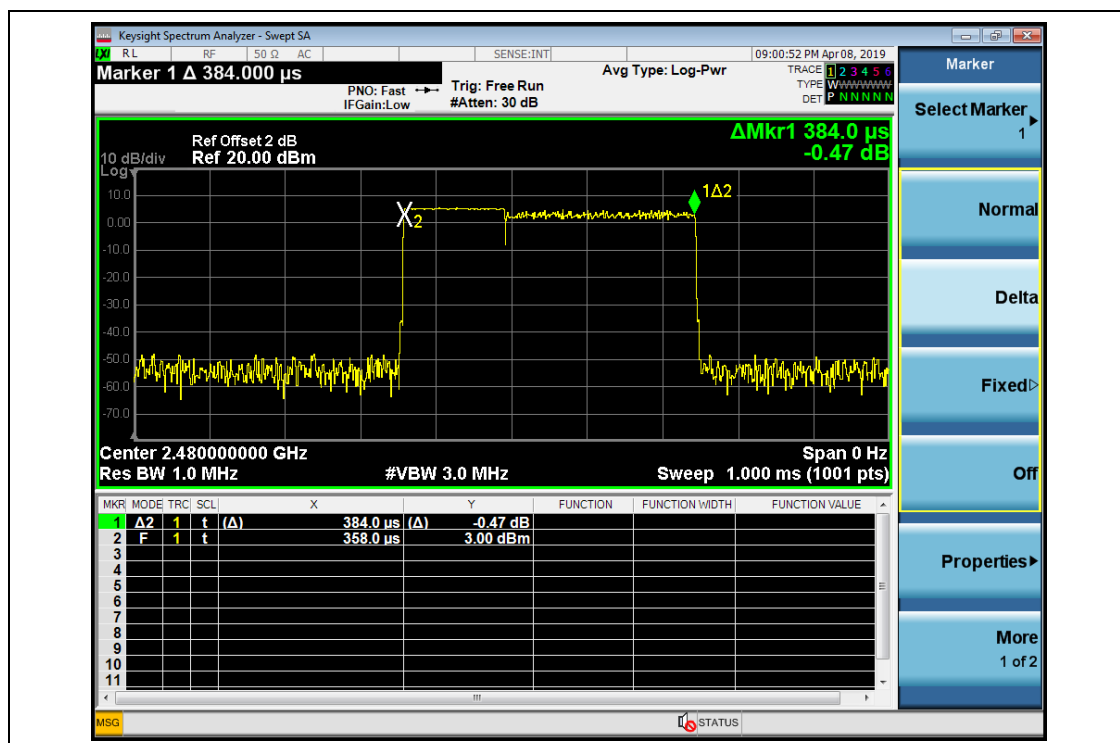
B. Test Plots:



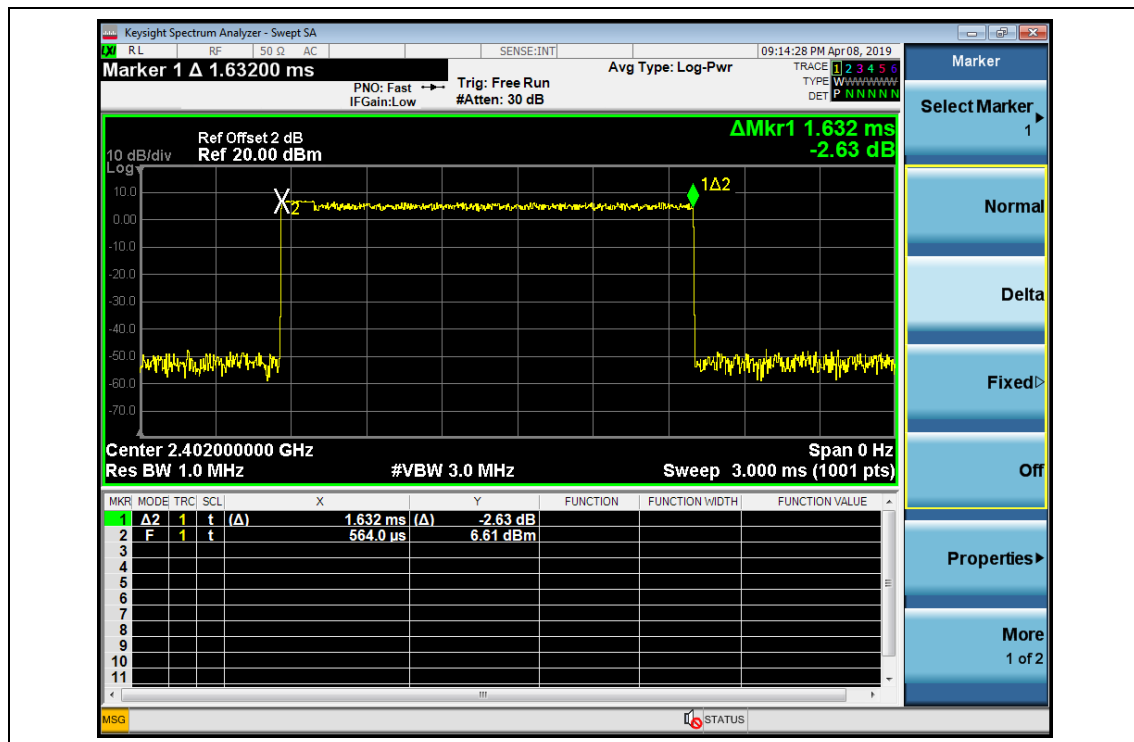
(3DH1_2402M, 8-DQPSK)



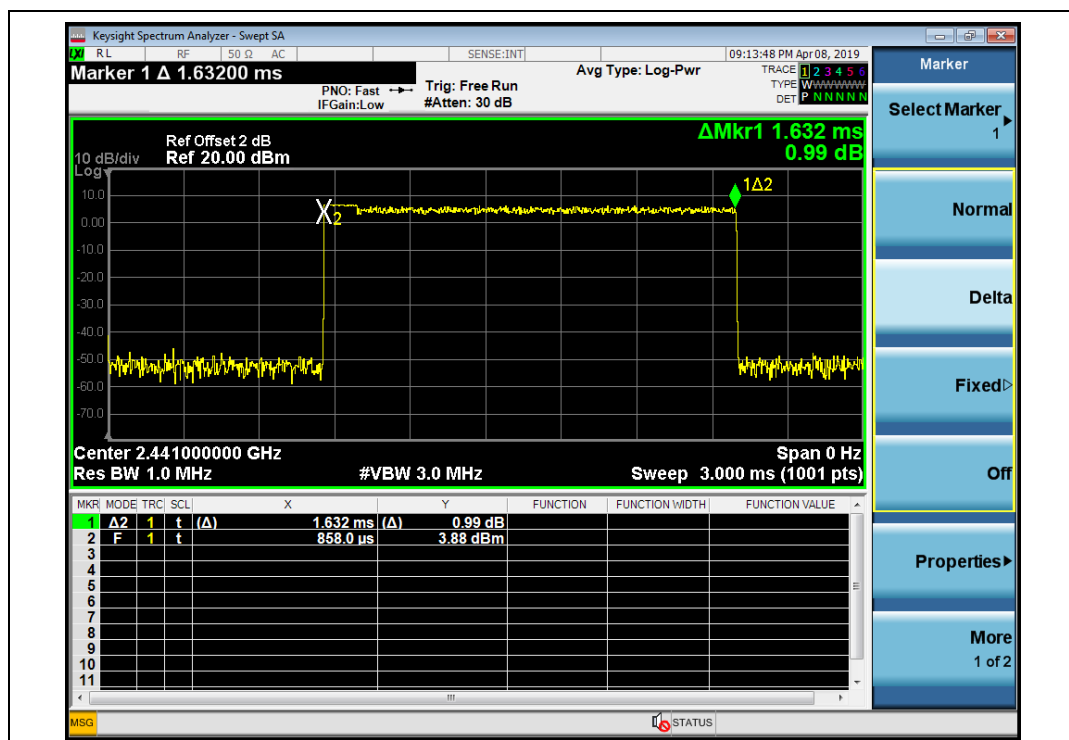
(3DH1_2441M, 8-DQPSK)



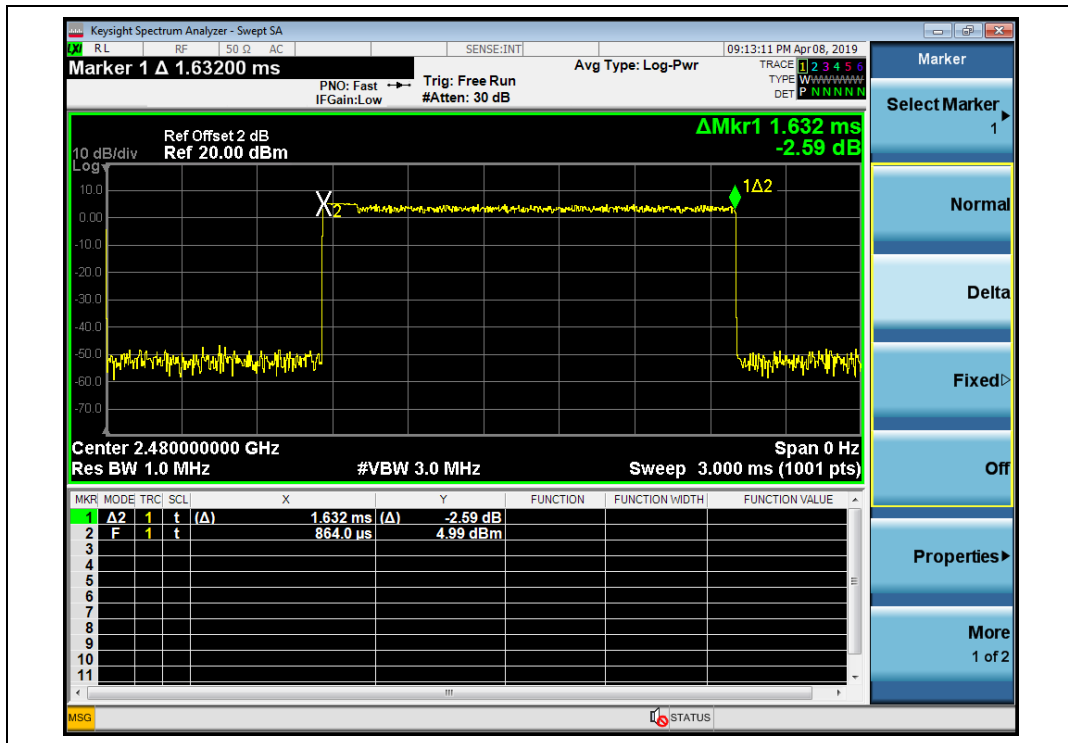
(3DH1_2480M, 8-DQPSK)



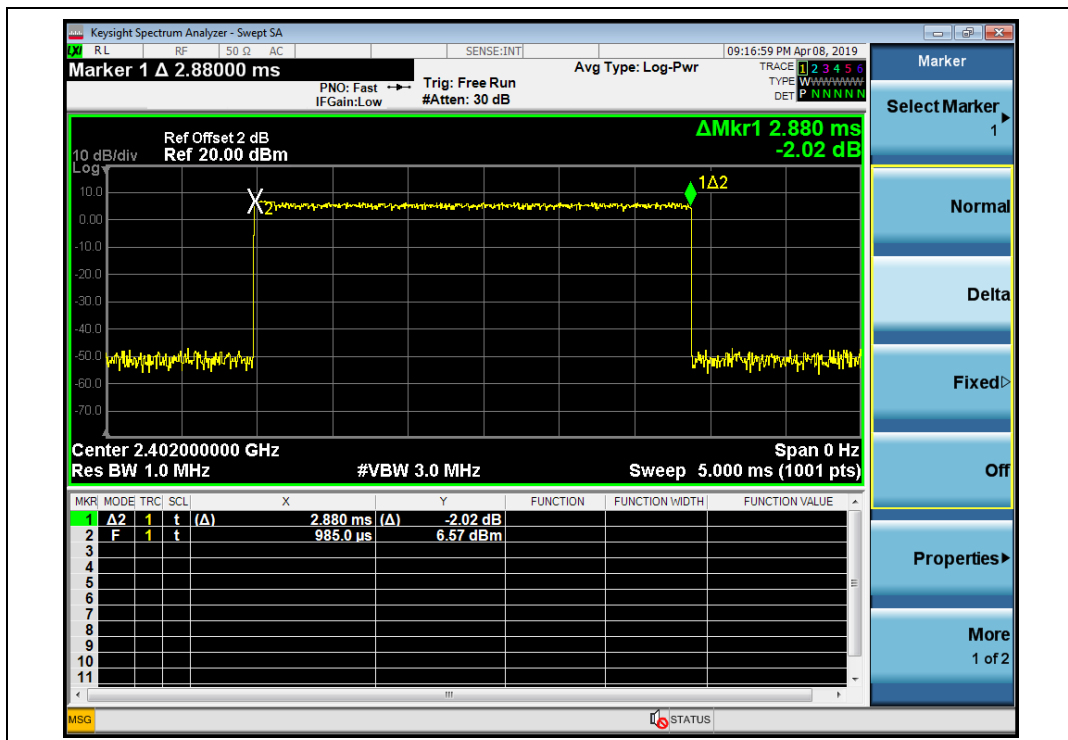
(3DH3_2402M, 8-DQPSK)



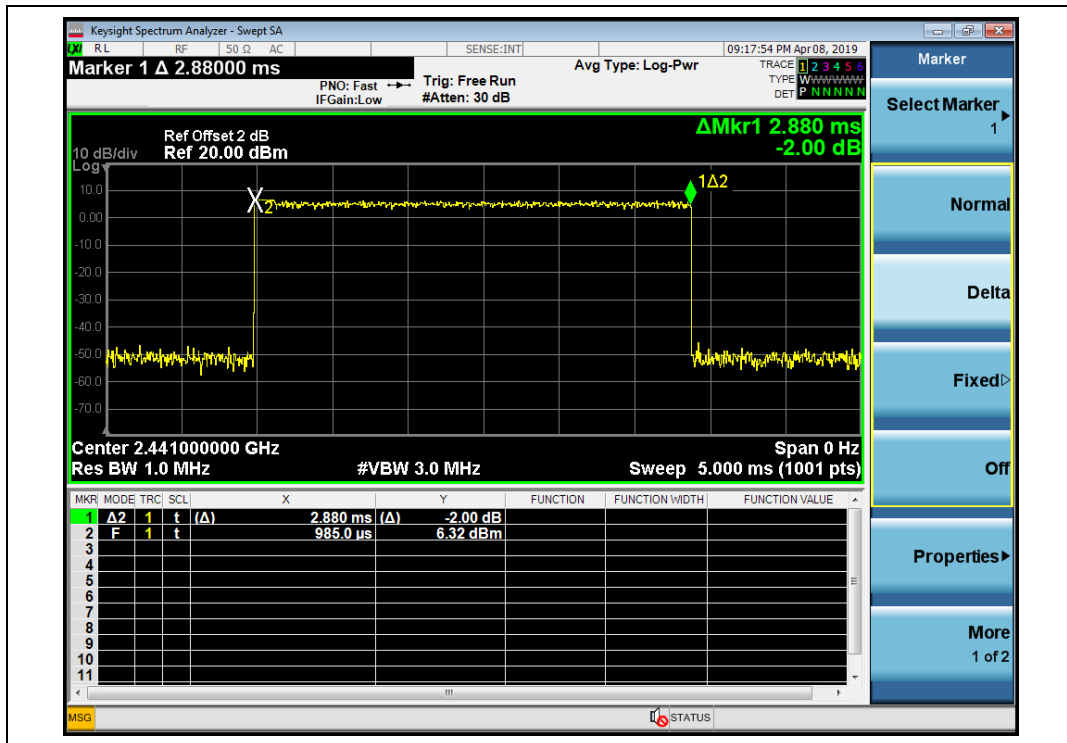
(3DH3_2441M, 8-DQPSK)



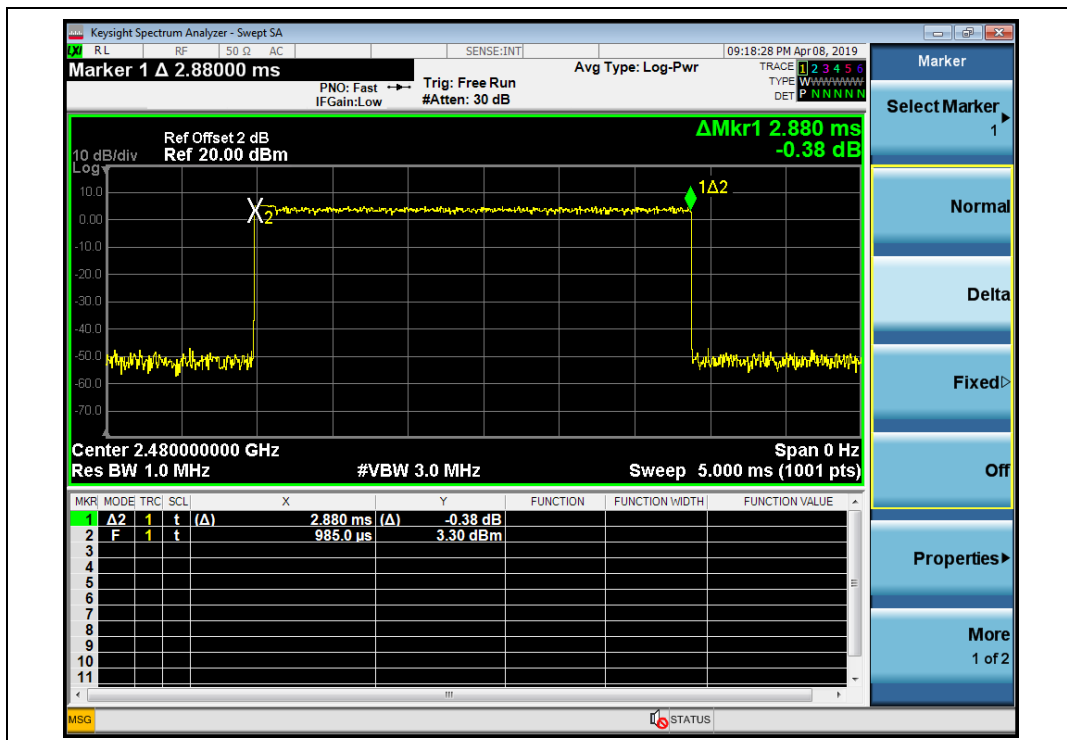
(3DH3_2480M, 8-DQPSK)



(3DH5_2402M, 8-DQPSK)



(3DH5_2441M, 8-DQPSK)



(3DH5_2480M, 8-DQPSK)

2.7. Conducted Spurious Emissions and Band Edge

2.7.1. Requirement

According to FCC §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.

2.7.2. Test Description

A. Test Setup:



The EUT (Equipment under the test) is coupled to the Spectrum analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading, all test result in Spectrum analyzer.

B. Equipments List:

Please refer ANNEX B(4).

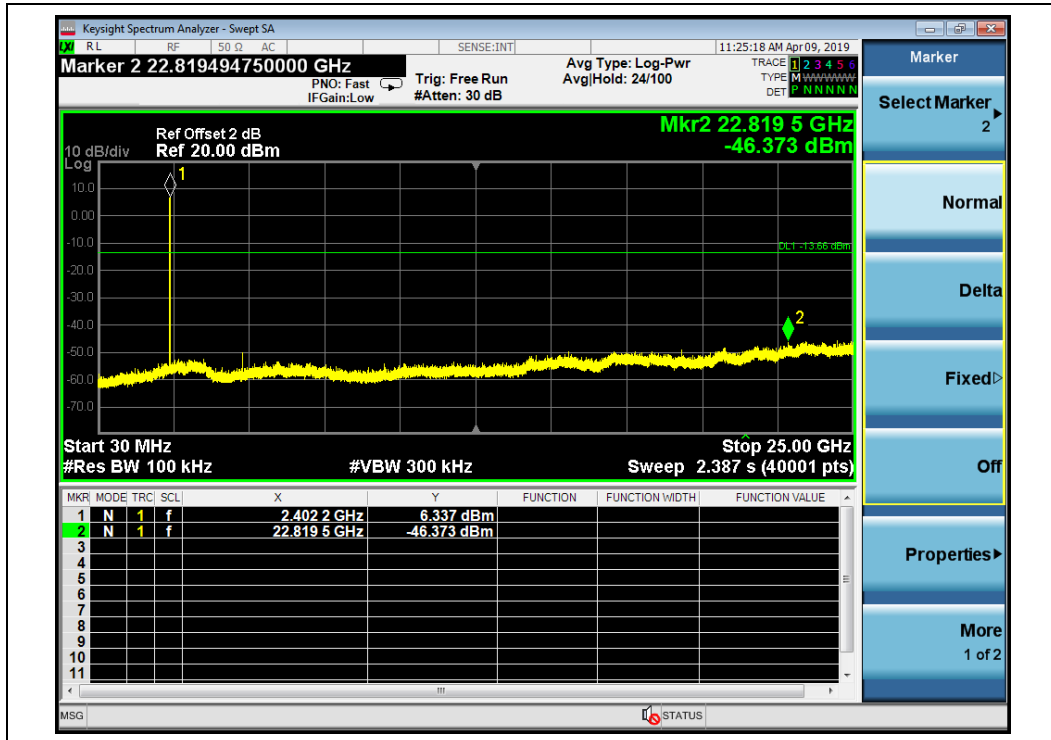
2.7.3. Test Procedure

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100kHz and 300kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

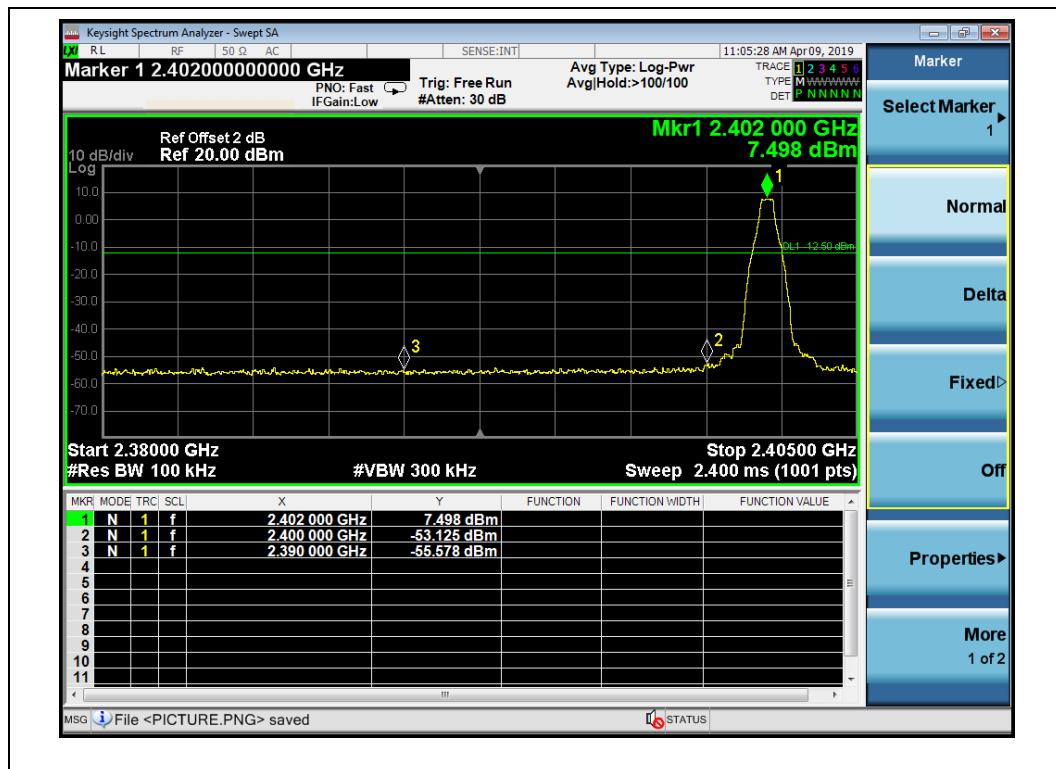
2.7.4. Test Result

The Bluetooth Module operates at hopping-off test mode. The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions.

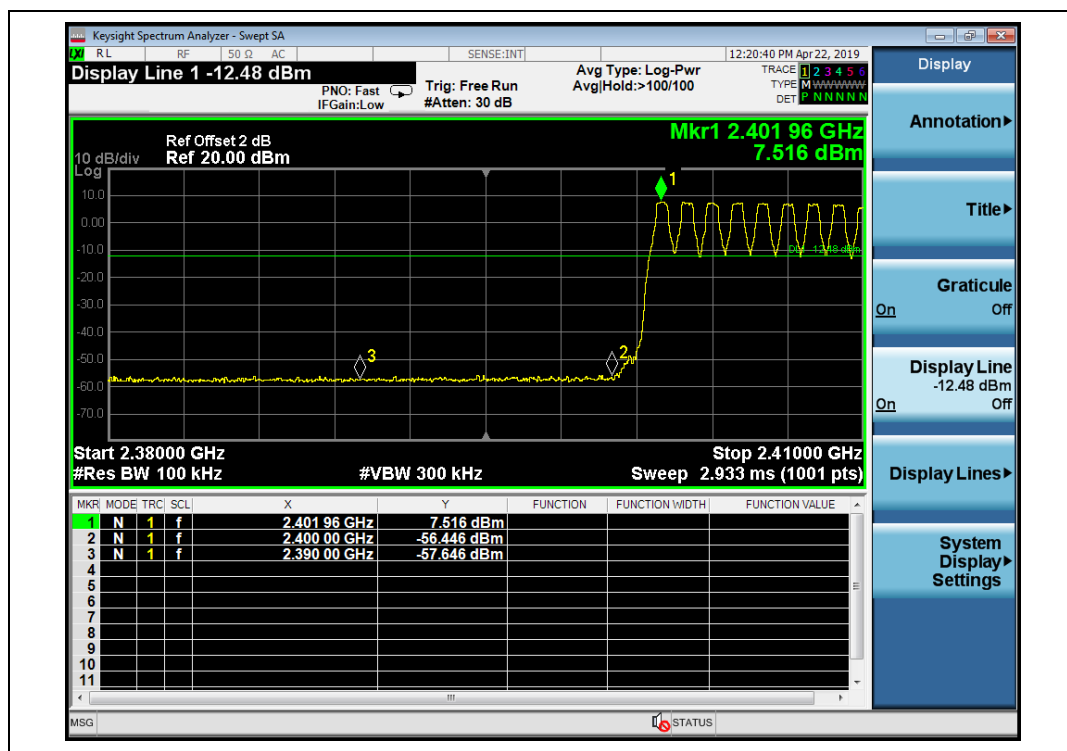
GFSK Mode



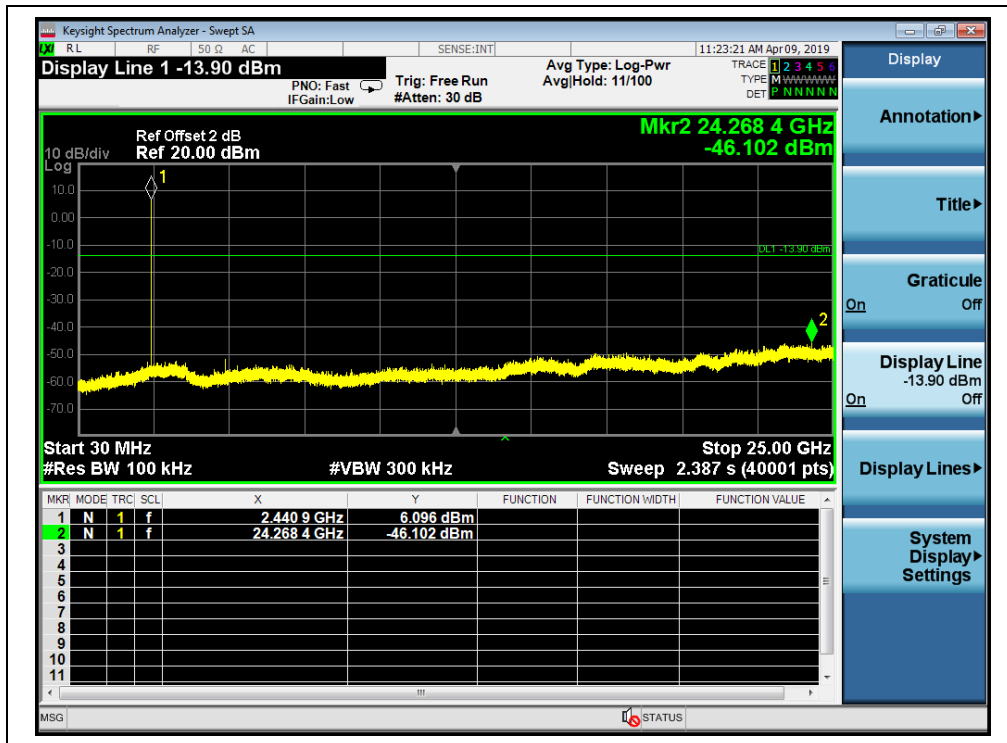
(Channel = 0, 30MHz to 25GHz, GFSK Mode)



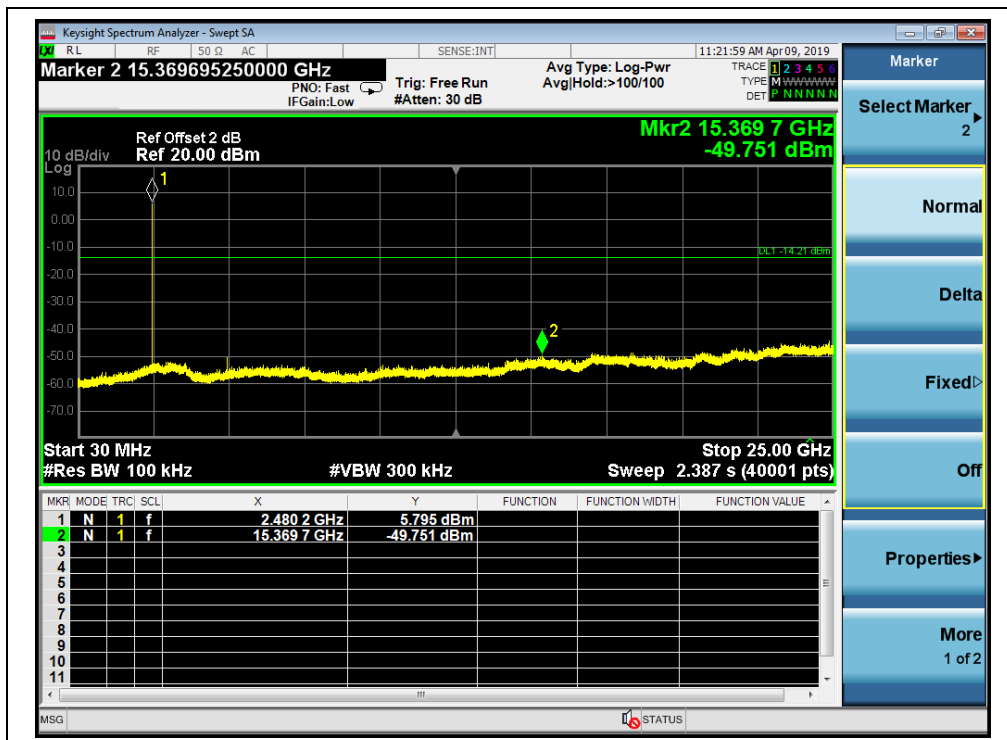
(Channel = 0, Band edge,GFSK Mode)



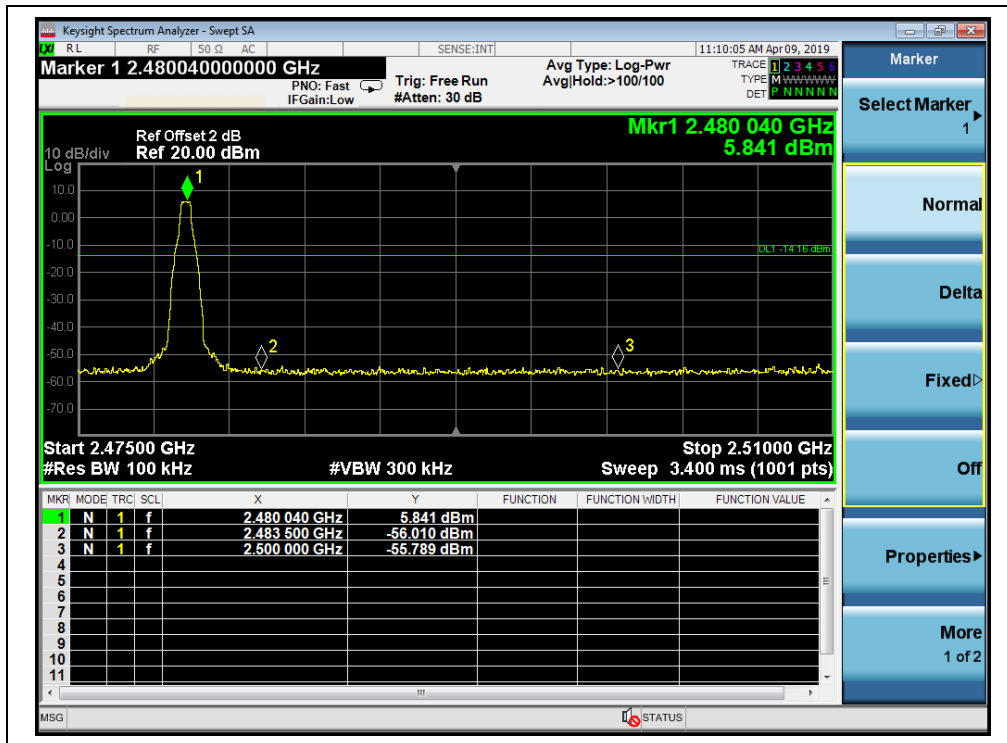
(Channel = 0, Band edge with hopping on, GFSK Mode)



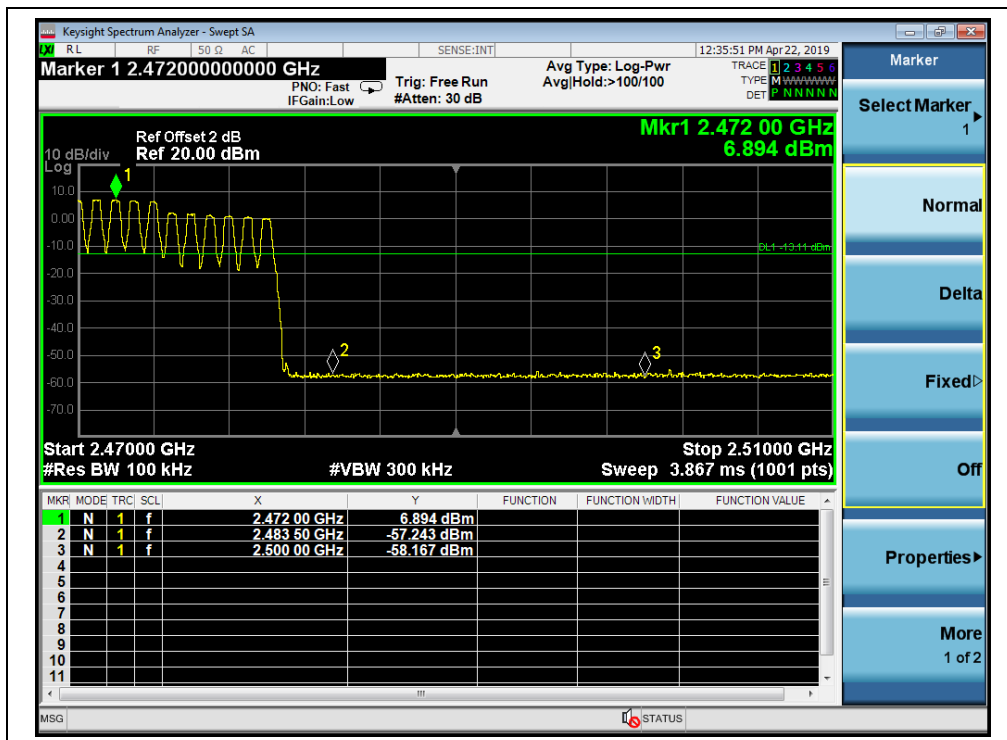
(Channel = 39, 30MHz to 25GHz, GFSK Mode)



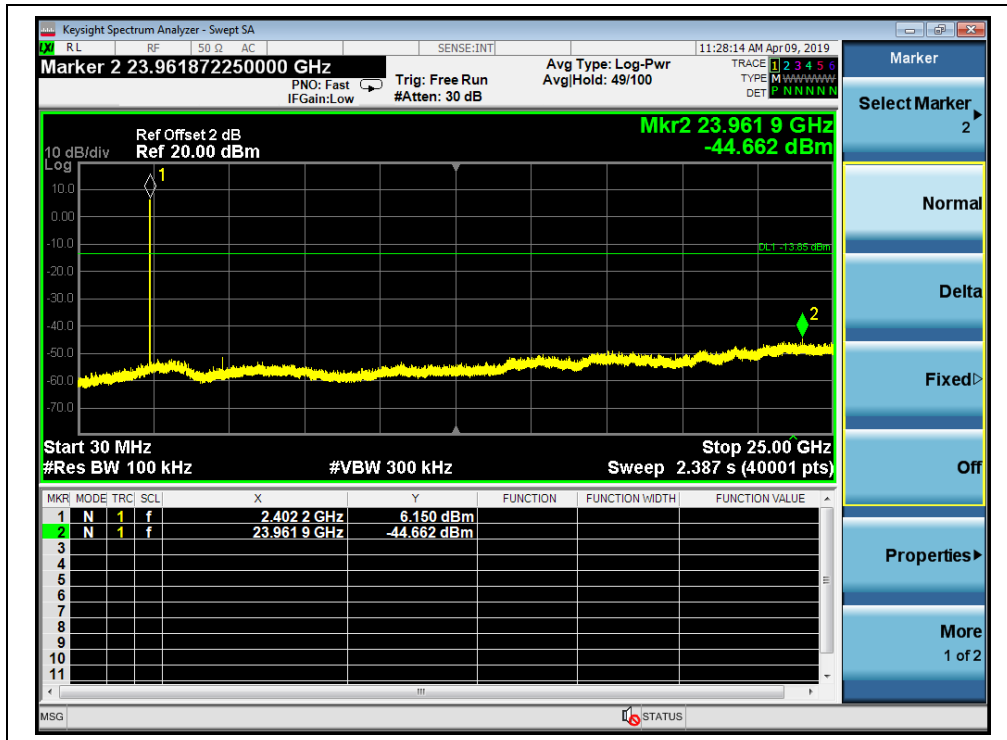
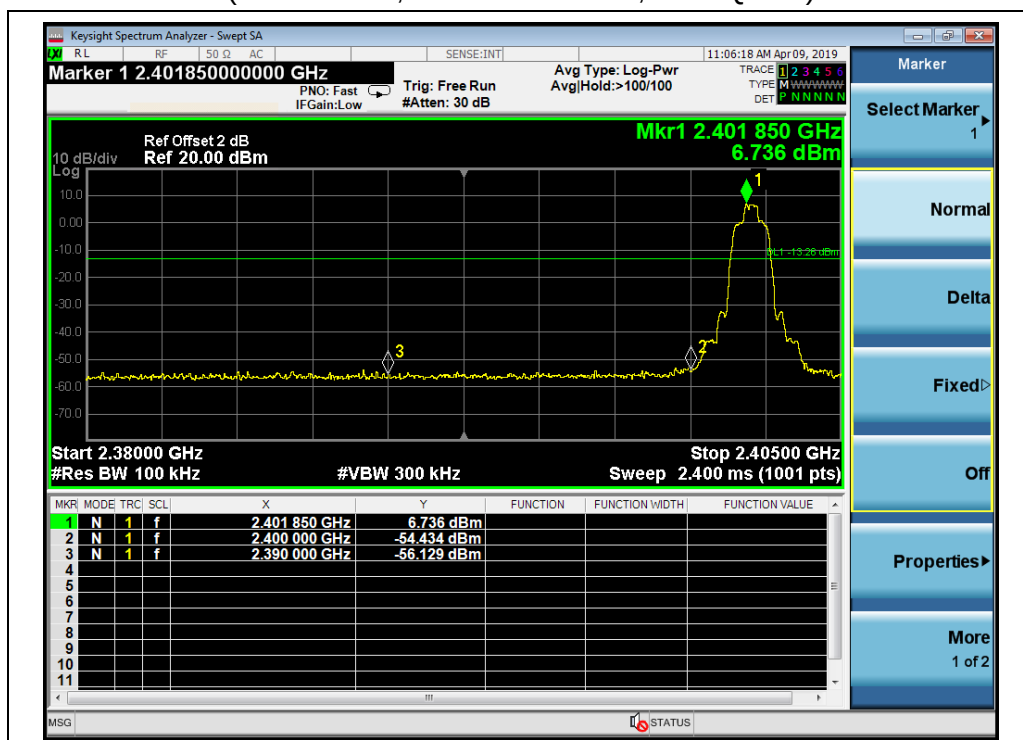
(Channel = 78, 30MHz to 25GHz, GFSK Mode)

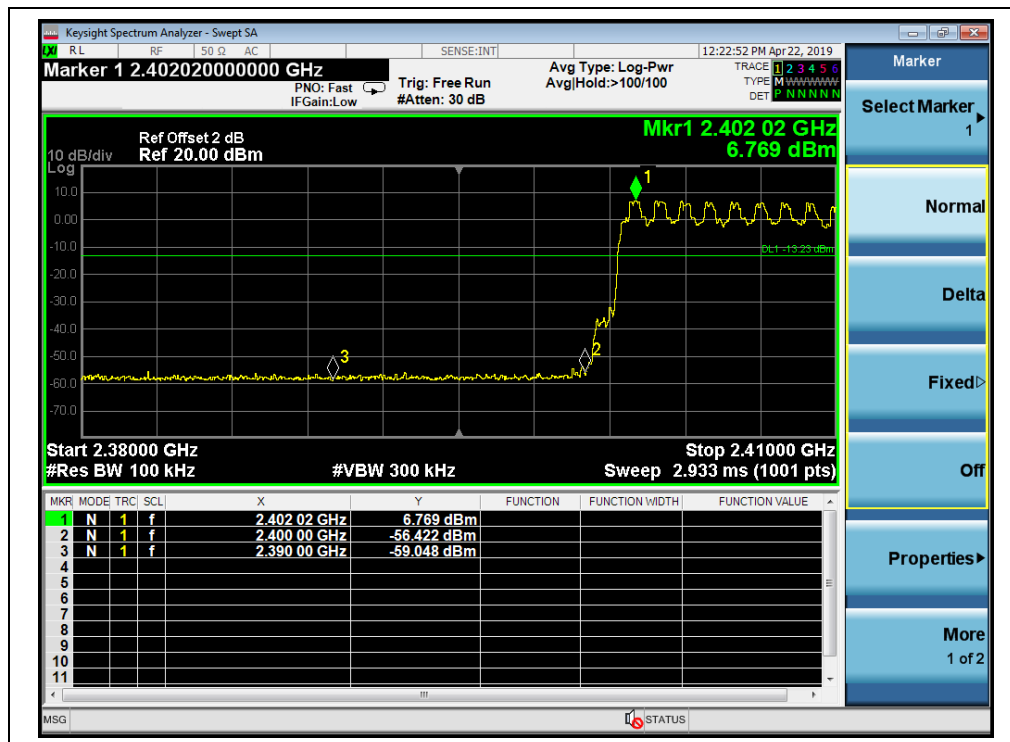
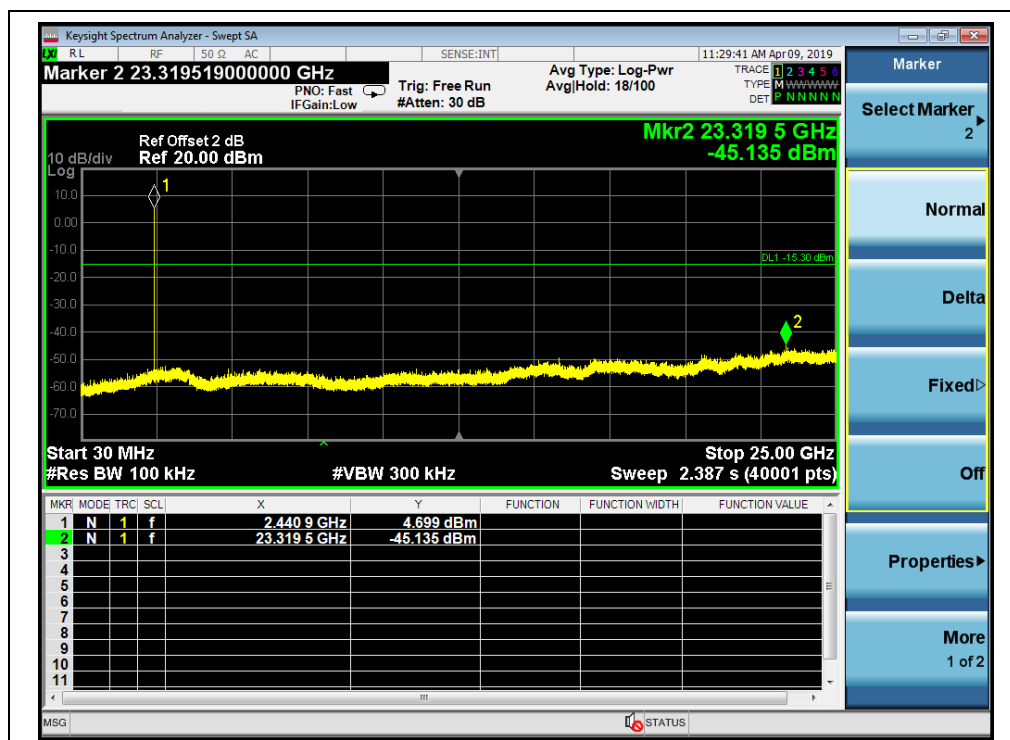


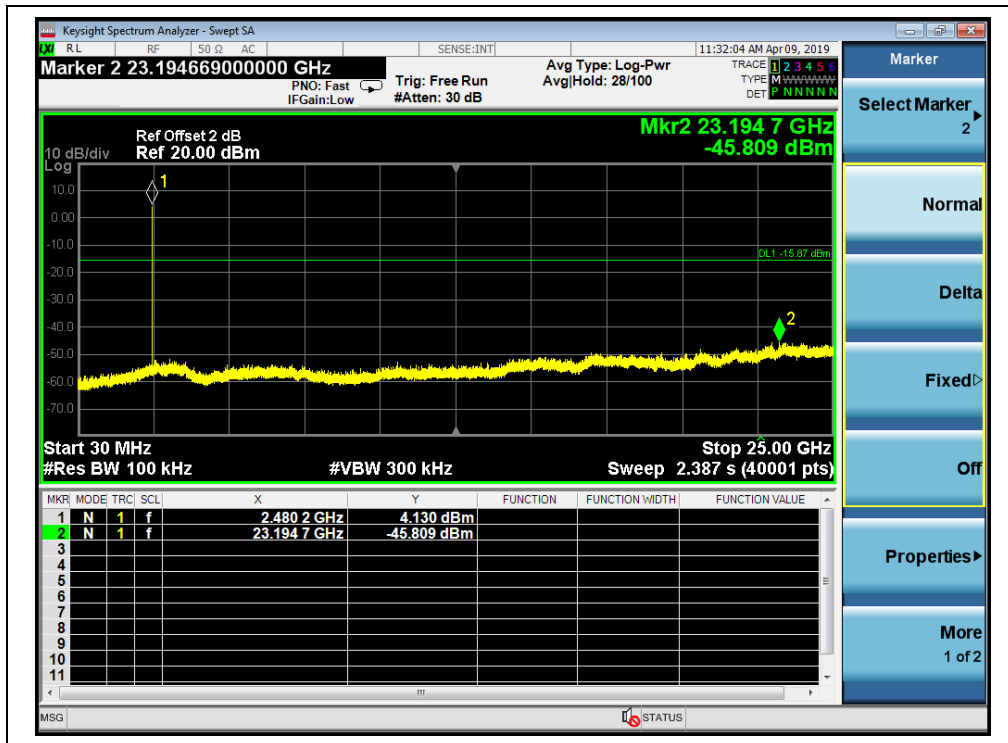
(Channel = 78, Band edge, GFSK Mode)



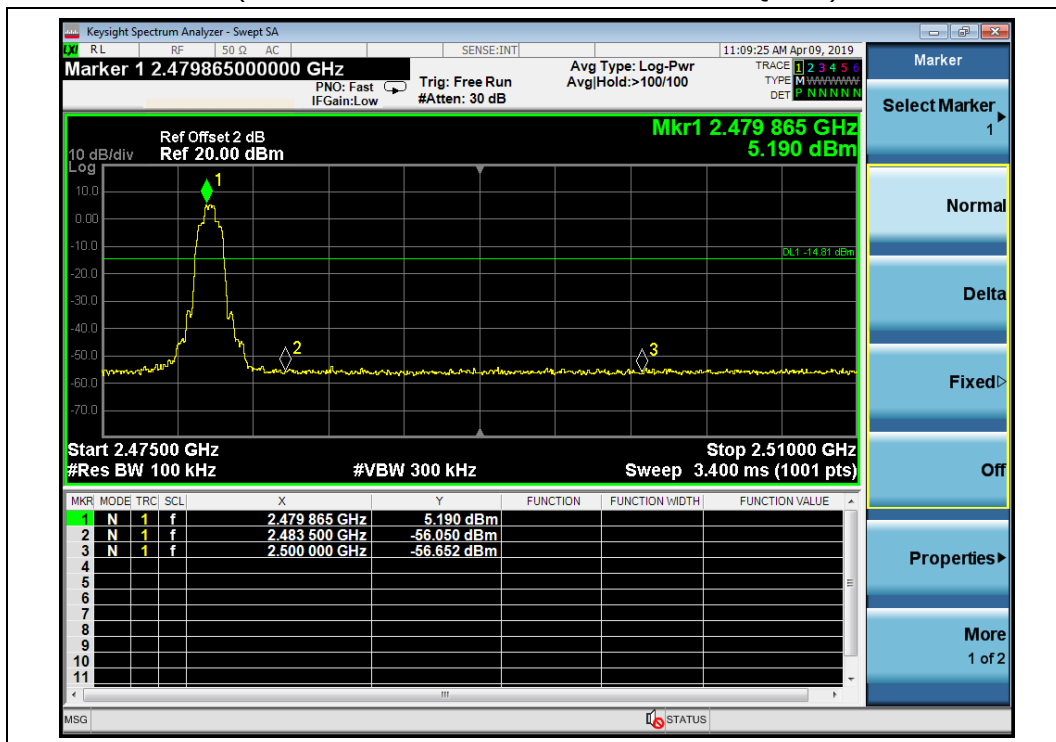
(Channel = 78, Band edge with hopping on, GFSK Mode)

 $\pi/4$ -DQPSK Mode(Channel = 0, 30MHz to 25GHz, $\pi/4$ -DQPSK)(Channel = 0, Band edge, $\pi/4$ -DQPSK)

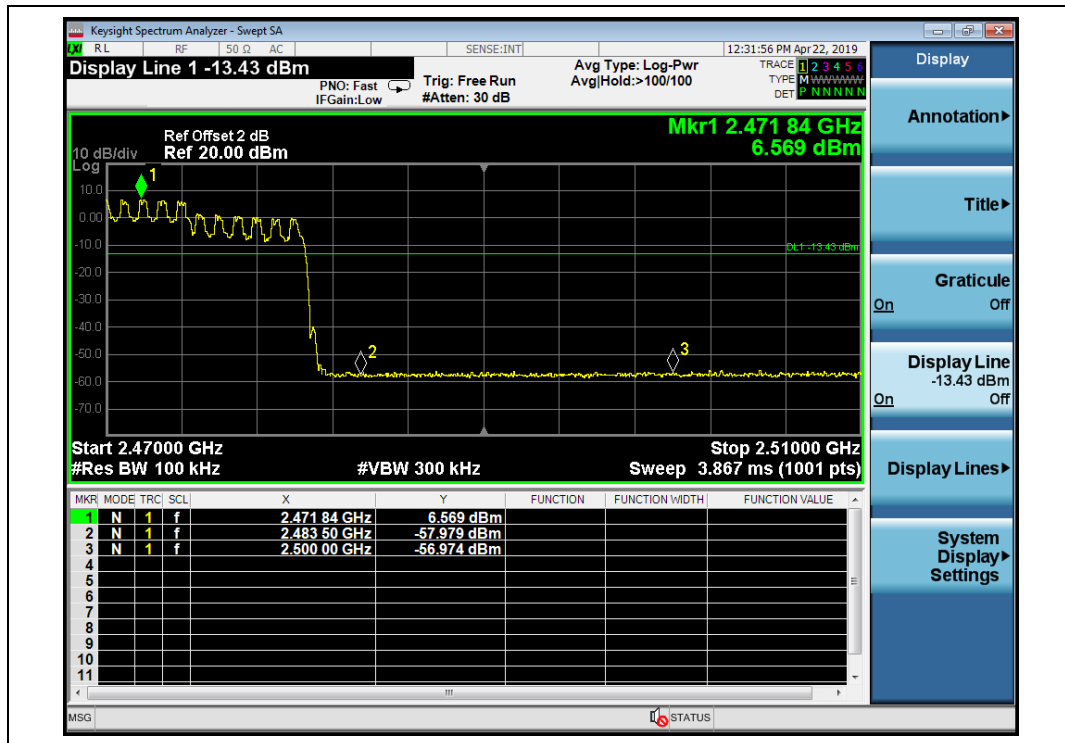
(Channel = 0, Band edge with hopping on, $\pi/4$ -DQPSK)(Channel = 39, 30MHz to 25GHz, $\pi/4$ -DQPSK)



(Channel = 78, 30MHz to 25GHz, $\pi/4$ -DQPSK)

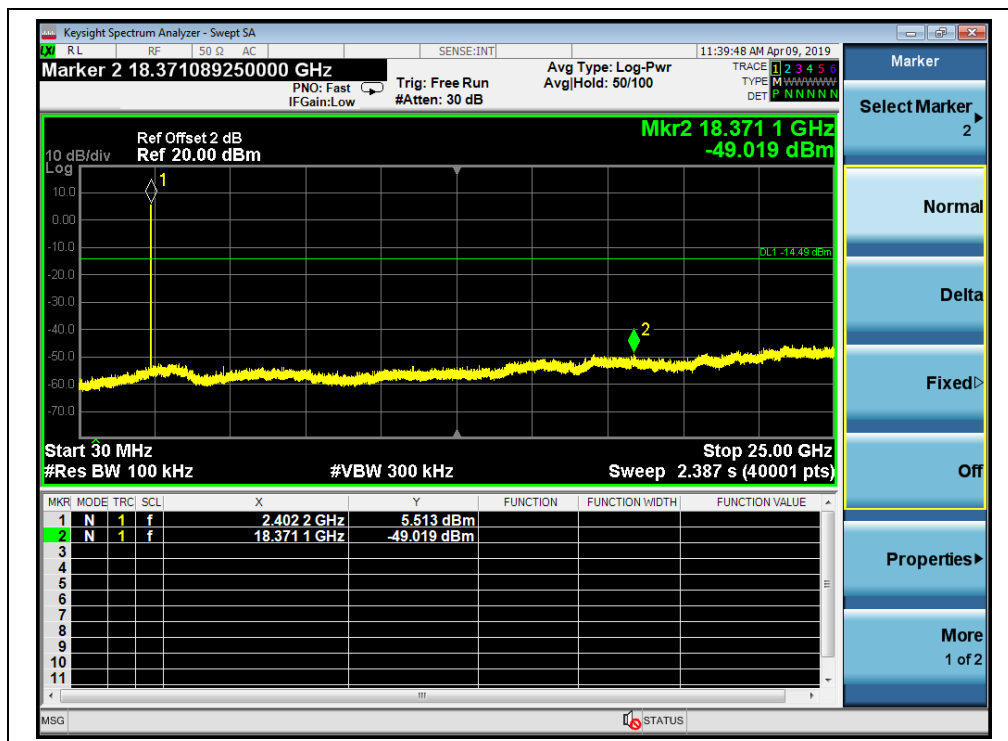


(Channel = 78, Band edge, $\pi/4$ -DQPSK)

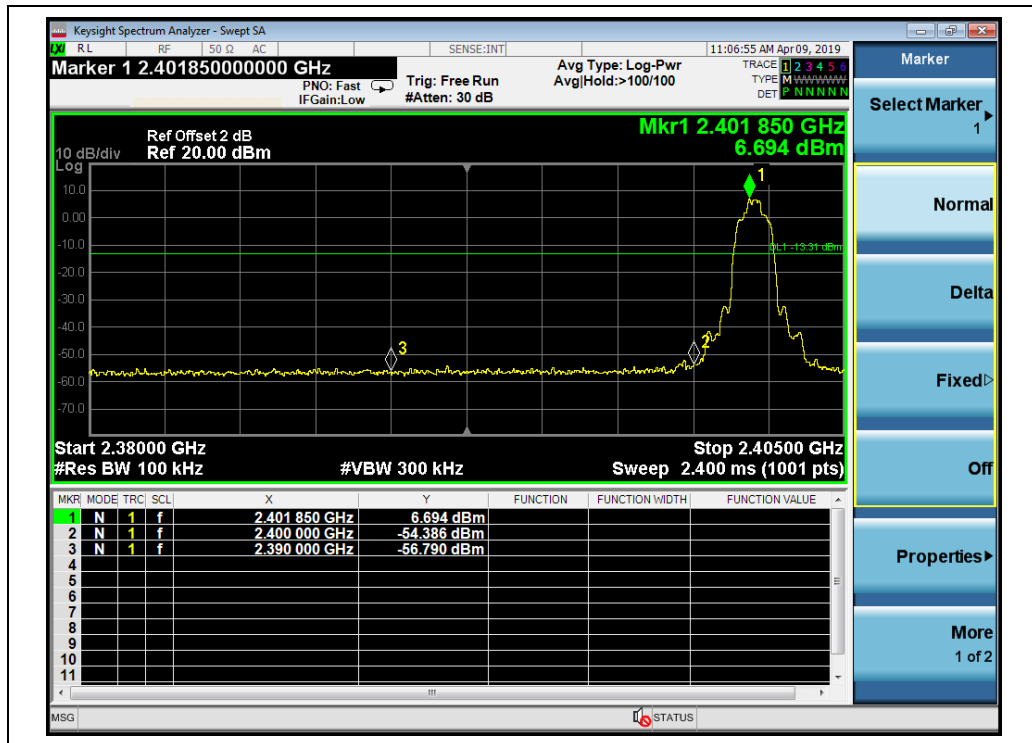


(Channel = 78, Band edge with hopping on, $\pi/4$ -DQPSK)

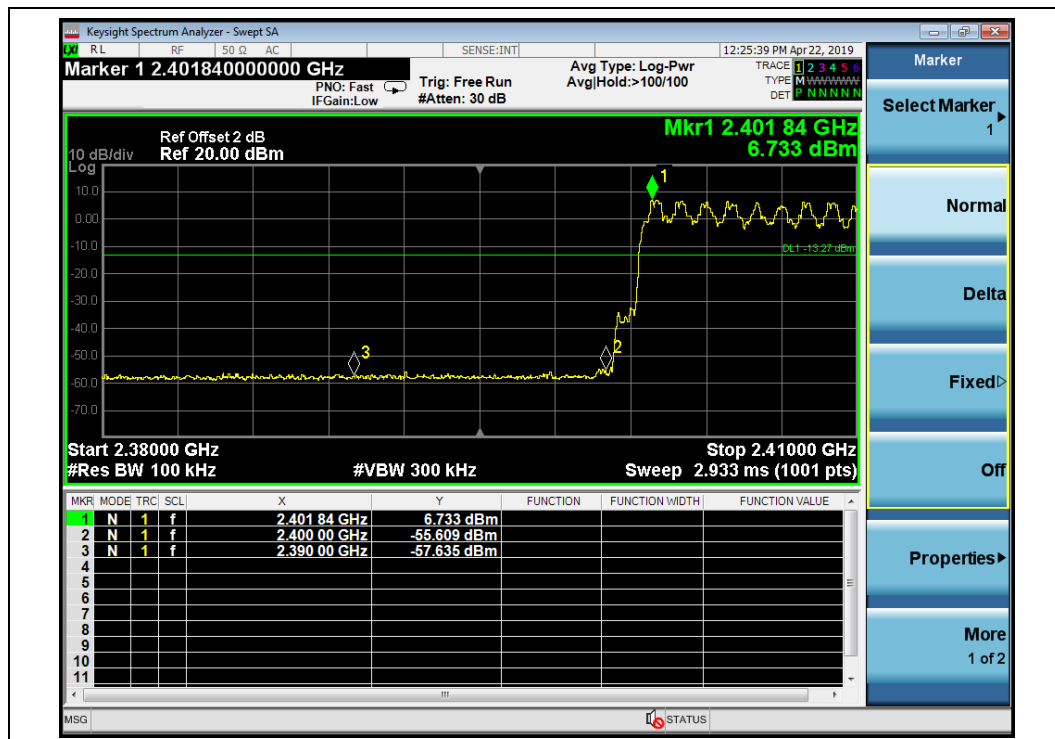
8-DPSK Mode



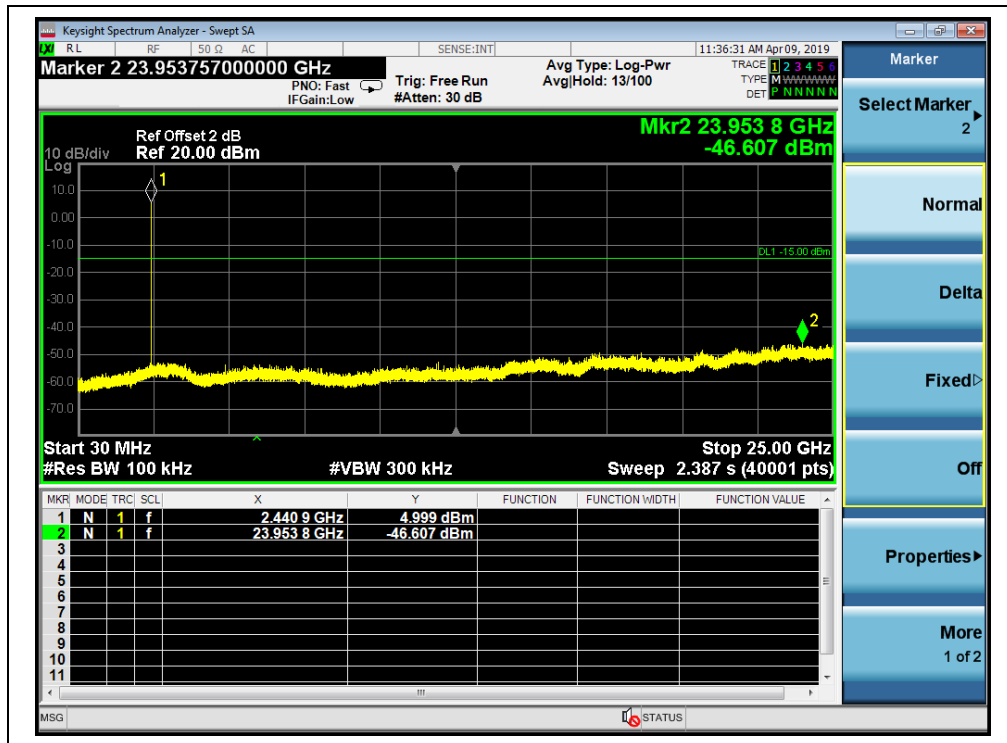
(Channel = 0, 30MHz to 25GHz, 8-DPSK)



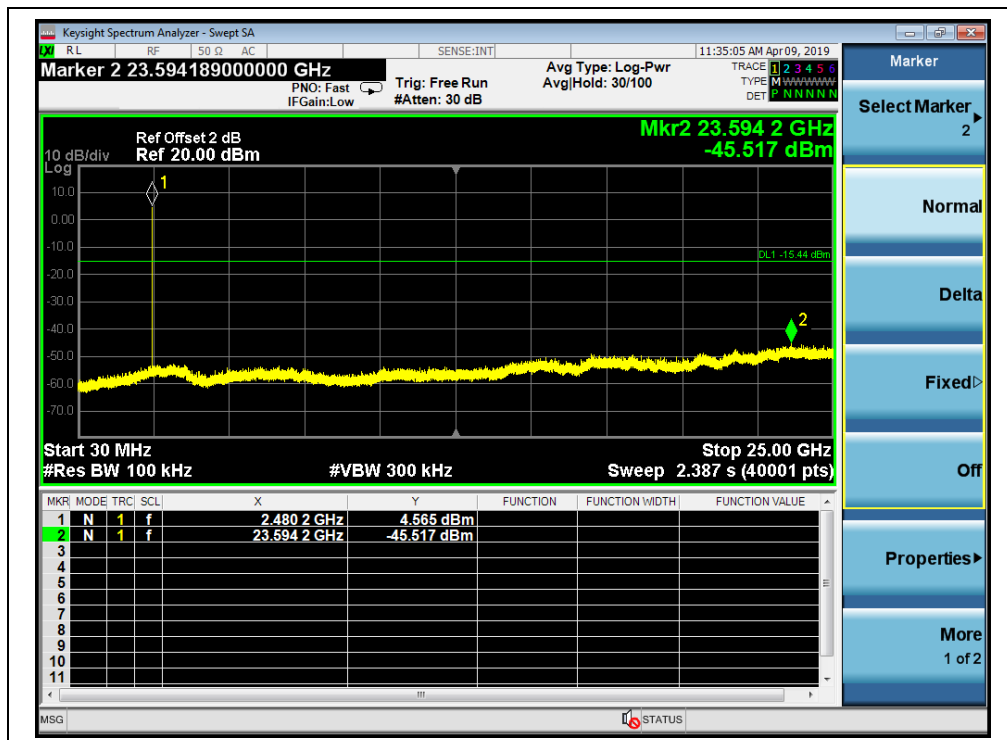
(Channel = 0, Band edge, 8-DPSK)



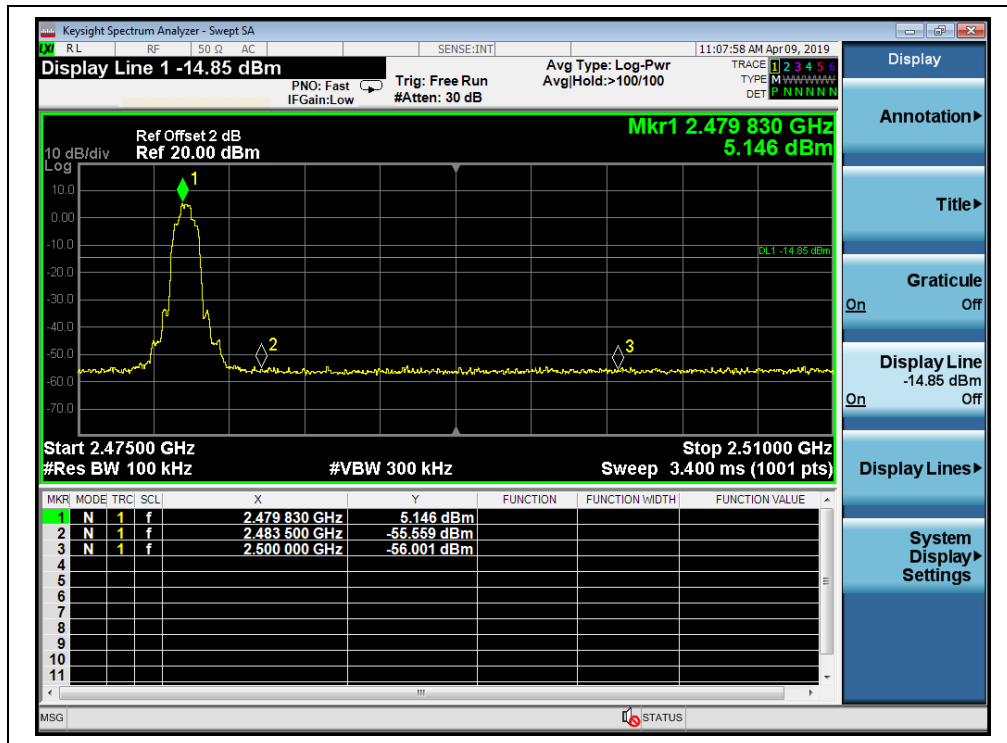
(Channel = 0, Band edge with hopping on, 8-DPSK)



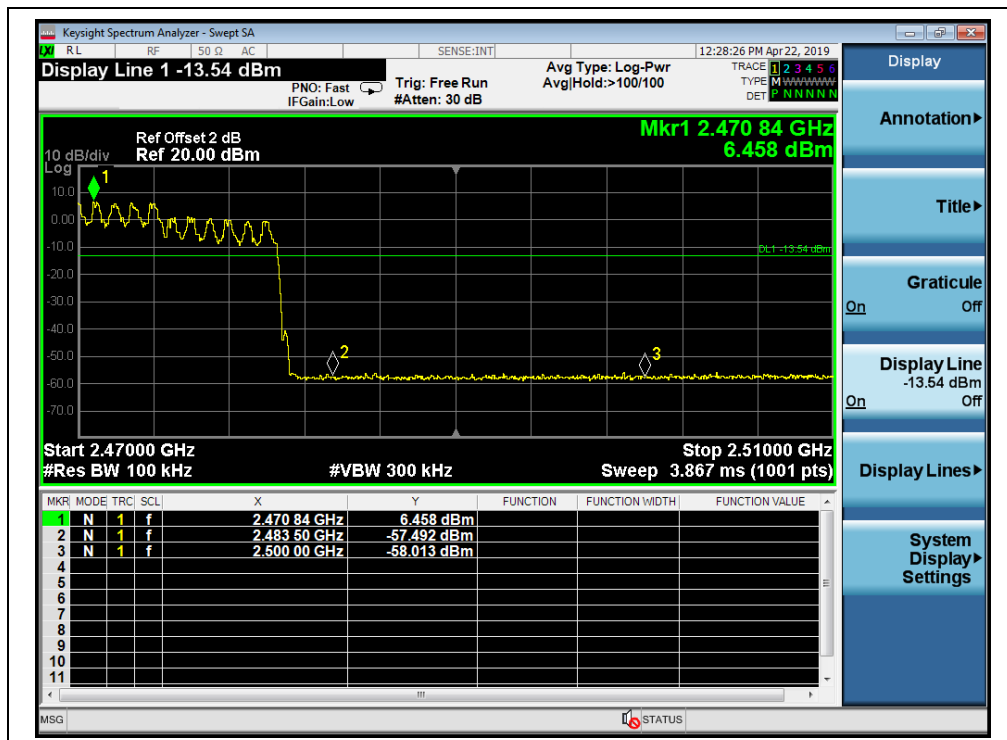
(Channel = 39, 30MHz to 25GHz, 8-DPSK)



(Channel = 78, 30MHz to 25GH, 8-DPSK)



(Channel = 78, Band edge, 8-DPSK)



(Channel = 78, Band edge with hopping on, 8-DPSK)

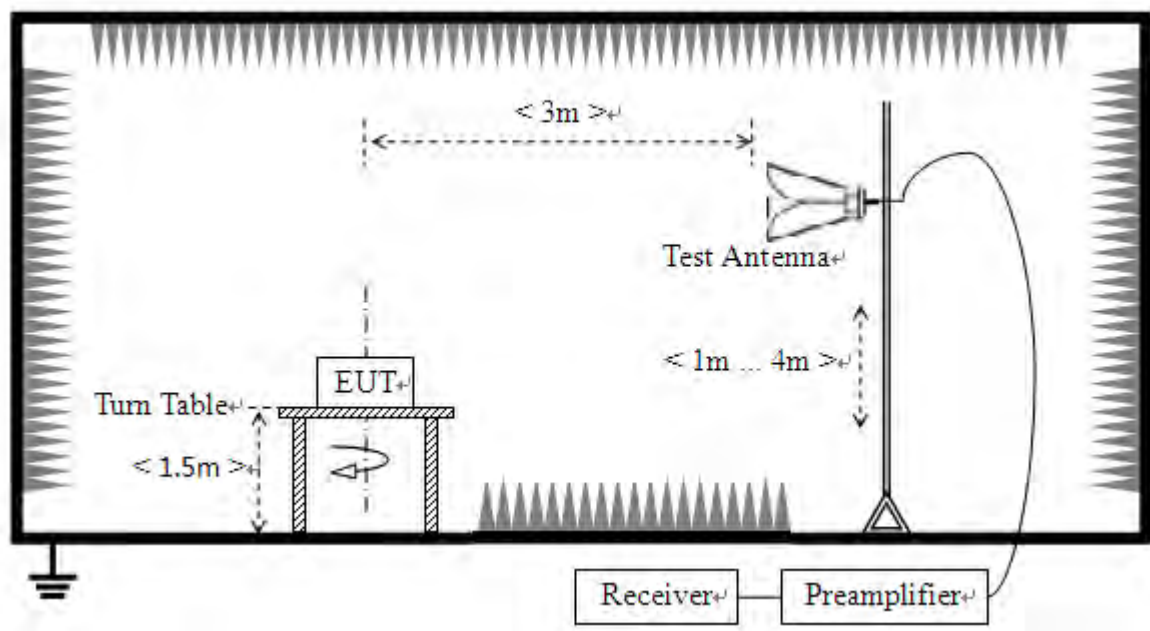
2.8. Restricted Frequency Bands

2.8.1. Requirement

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

2.8.2. Test Description

A. Test Setup:



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. During the measurement, the Bluetooth Module of the EUT is activated and controlled by the Bluetooth Service Supplier (SS) via a Common Antenna, and is set to operate under non hopping-on test mode transmitting 339 bytes DH5, 679 bytes 2DH5 and 1021 bytes 3DH5 packages at maximum power.

For the Test Antenna:

Horn 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.



For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasipeak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

B. Equipments List:

Please refer ANNEX B(4).

2.8.3. Test Result

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

The measurement results are obtained as below:

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

AT: Total correction Factor except Antenna

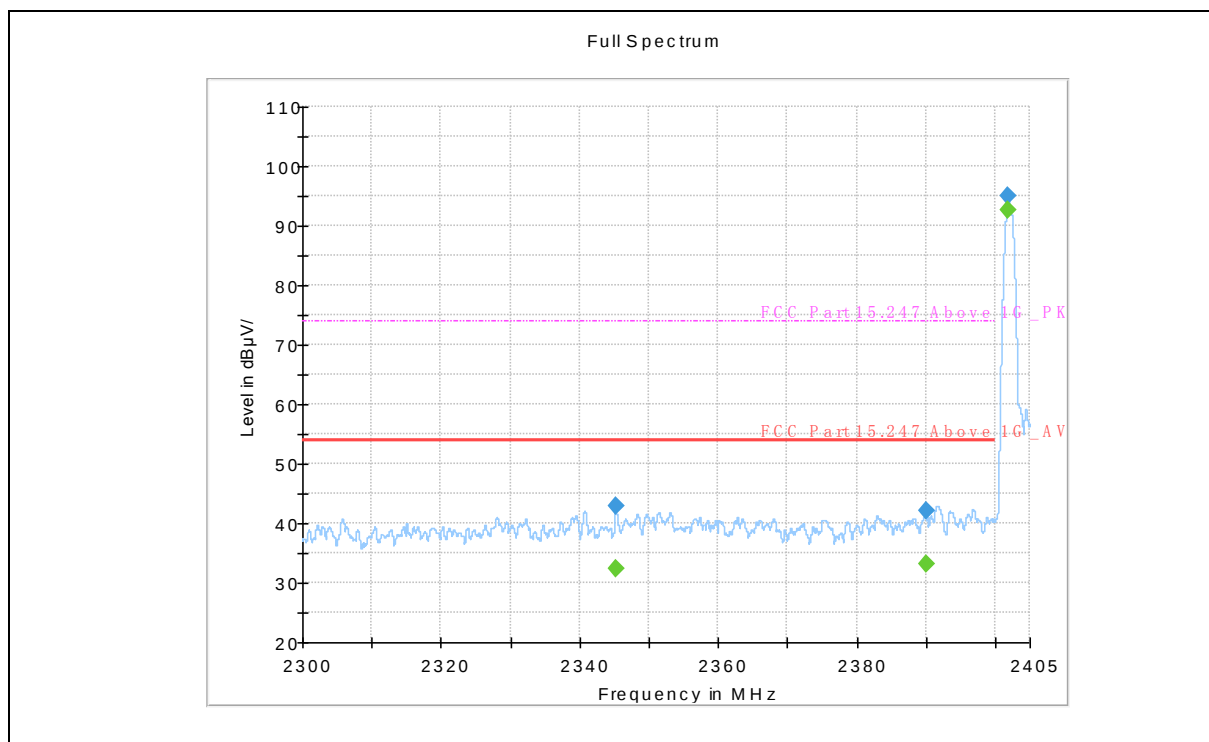
UR: Receiver Reading

Gpreamp: Preamplifier Gain

AFactor: Antenna Factor at 3m

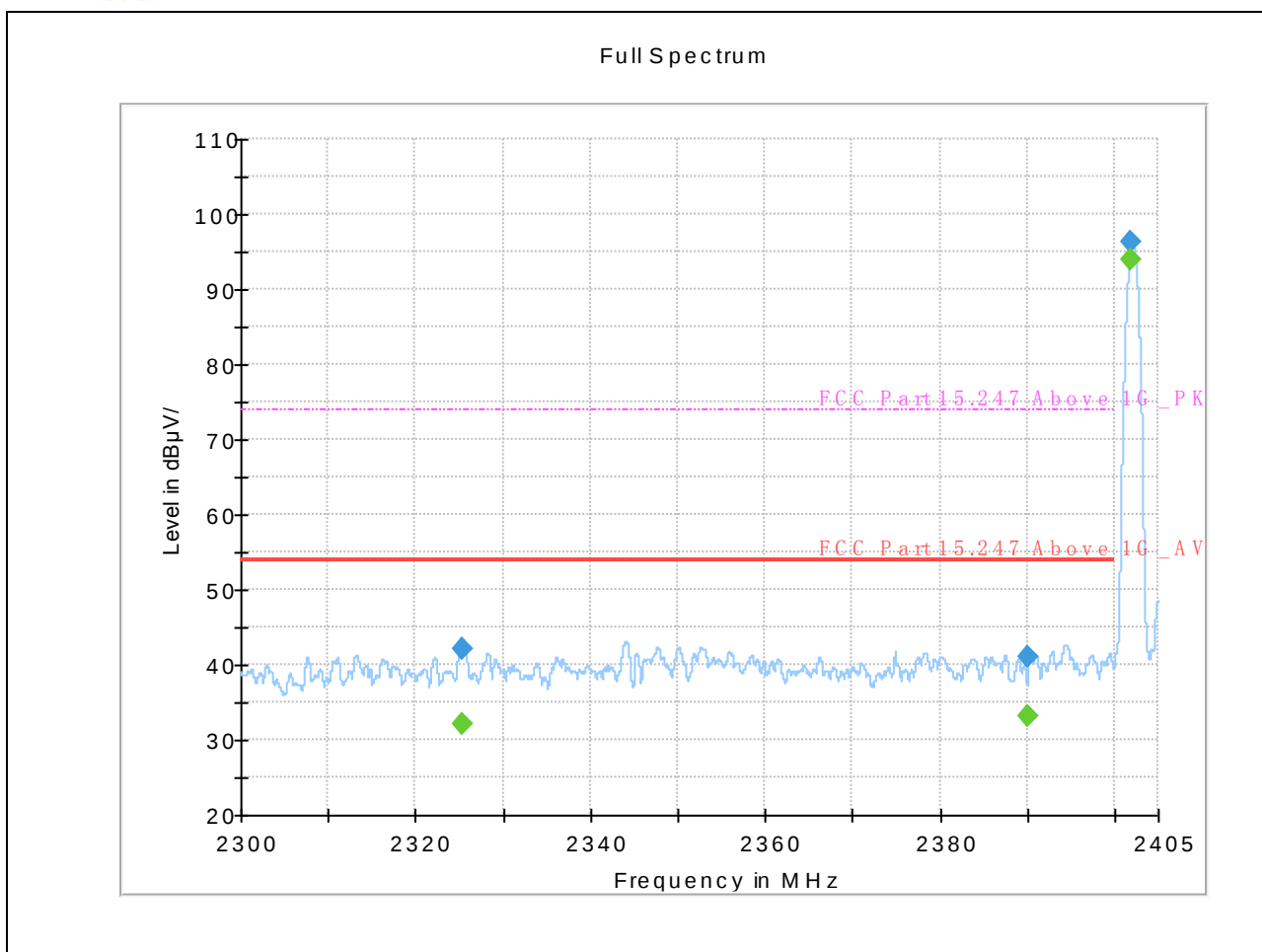
Corr. is the [AT + AFactor].

GFSK Test mode

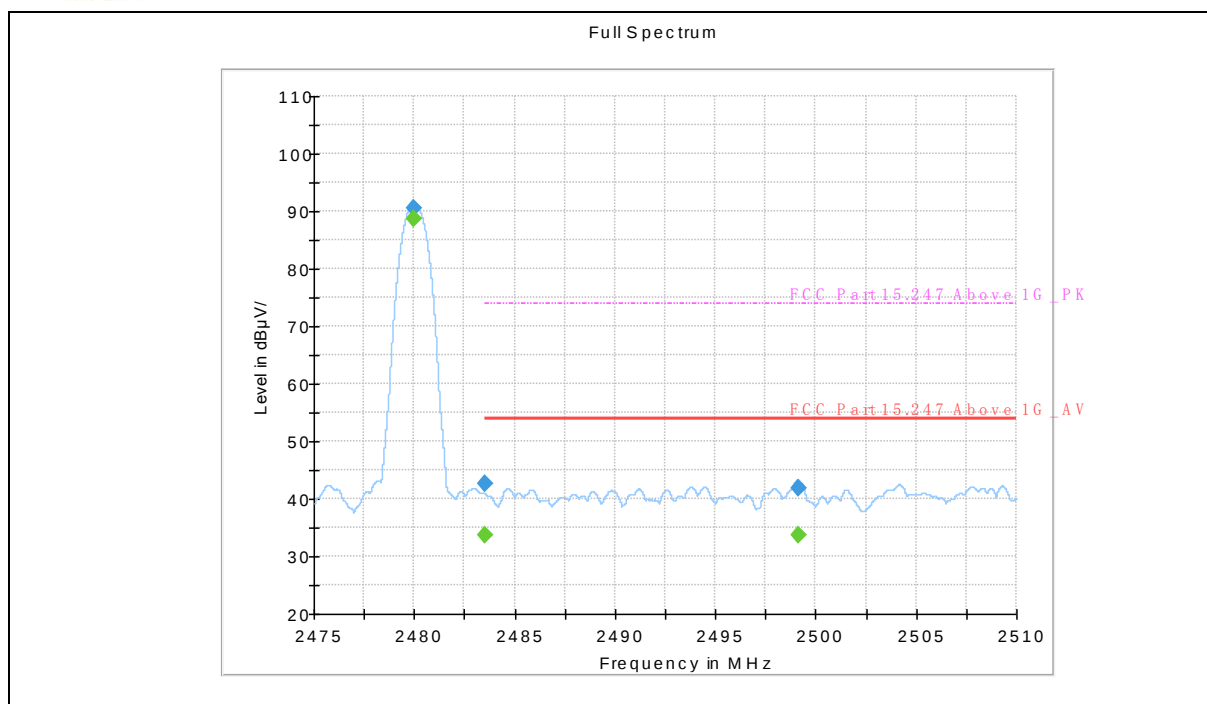


(GFSK _2402MHz, Antenna Horizontal)

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2345.202500	---	32.25	74.00	41.75	H	7.7
2345.202500	42.89	---	54.00	11.11	H	7.7
2390.008333	42.13	---	54.00	11.87	H	8.0
2390.008333	---	33.19	74.00	40.81	H	8.0
2401.902500	94.90	---	---	---	H	8.7
2401.902500	---	92.74	---	---	H	8.7

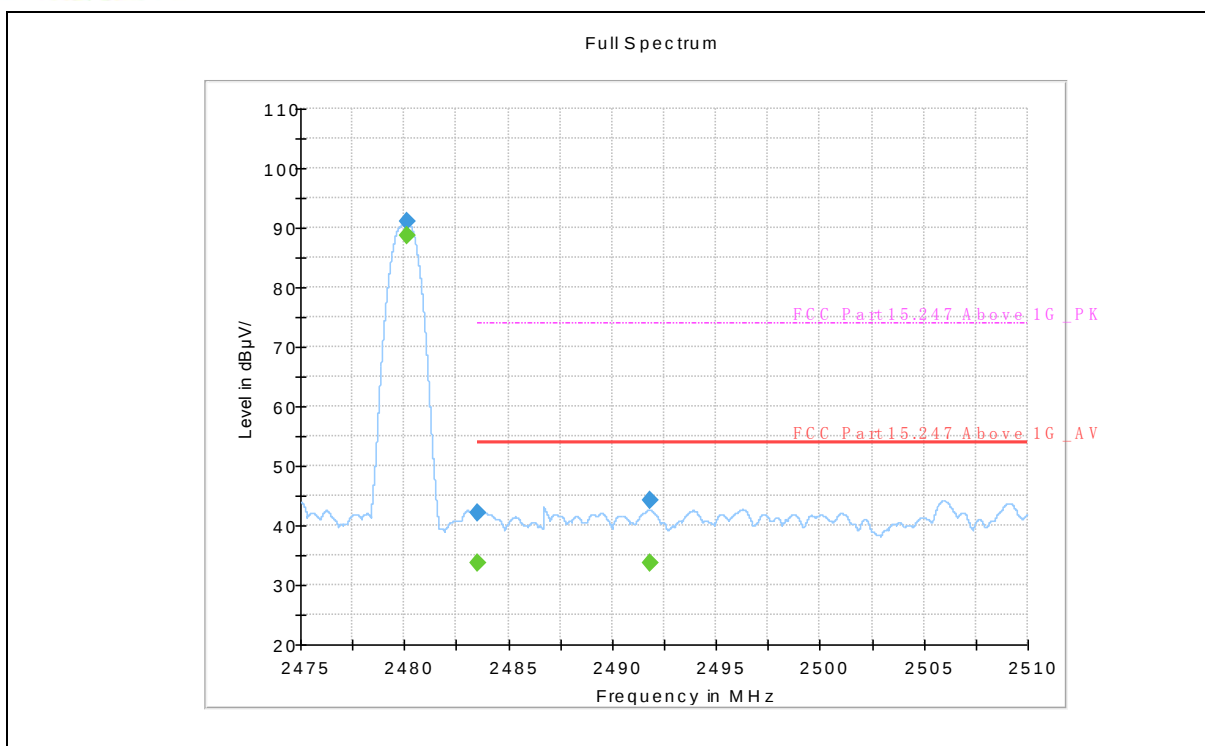


Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
2325.310833	---	32.04	74.00	41.96	V	7.3
2325.310833	42.04	---	54.00	11.96	V	7.3
2390.002500	---	33.14	74.00	40.86	V	8.0
2390.002500	41.18	---	54.00	12.82	V	8.0
2401.914167	---	94.02	---	---	V	8.7
2401.914167	96.20	---	---	---	V	8.7



(GFSK_2480MHz, Antenna Horizontal)

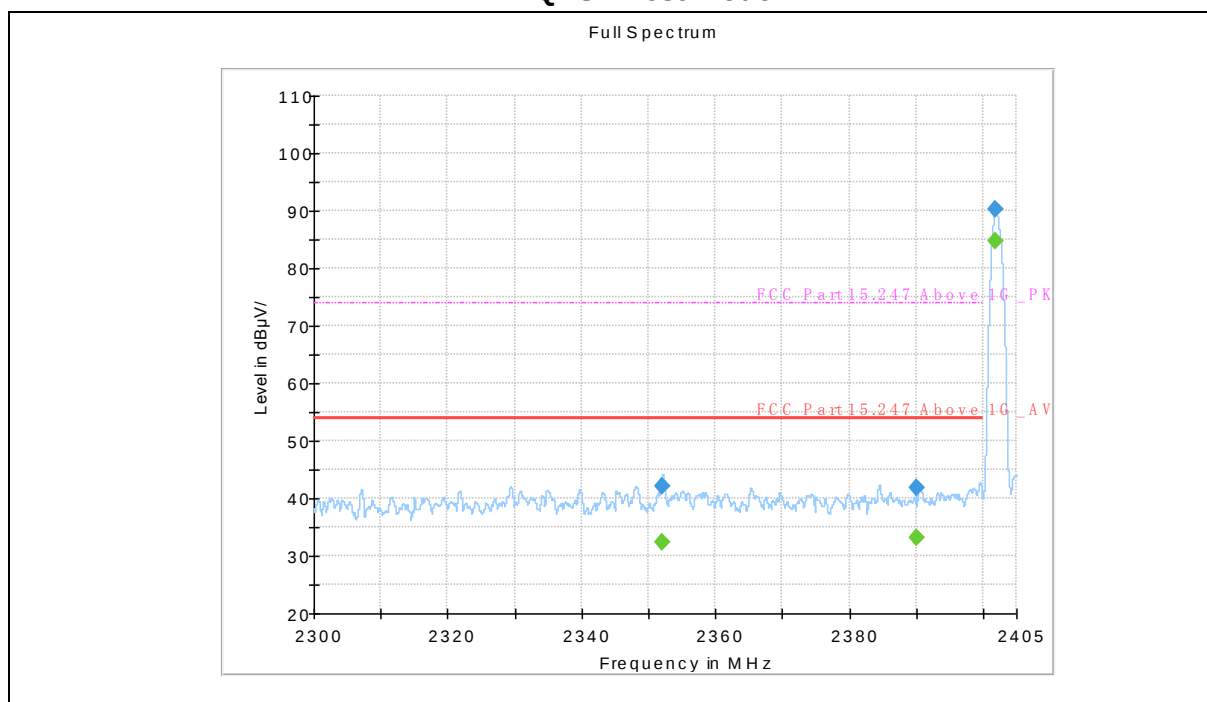
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
2480.001111	---	88.59	---	---	H	8.2
2480.001111	90.55	---	---	---	H	8.2
2483.505000	42.68	---	54.00	11.32	H	8.3
2483.505000	---	33.77	74.00	40.23	H	8.3
2499.111111	41.75	---	54.00	12.25	H	8.4
2499.111111	---	33.70	74.00	40.30	H	8.4



(GFSK _2480MHz, Antenna Vertical)

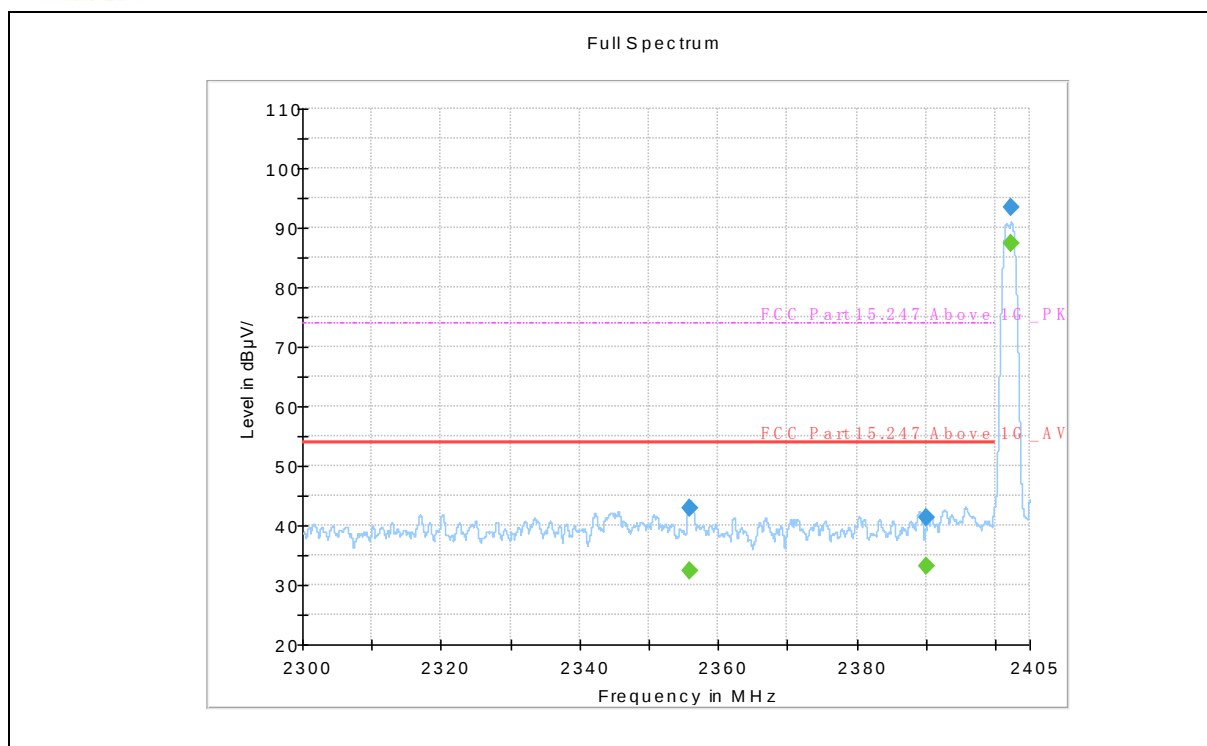
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
2480.162500	---	88.61	---	---	V	8.2
2480.162500	91.06	---	---	---	V	8.2
2483.501111	42.23	---	54.00	11.77	V	8.3
2483.501111	---	33.71	74.00	40.29	V	8.3
2491.800000	44.25	---	54.00	9.75	V	8.4
2491.800000	---	33.71	74.00	40.29	V	8.4

$\pi/4$ -DQPSK Test mode

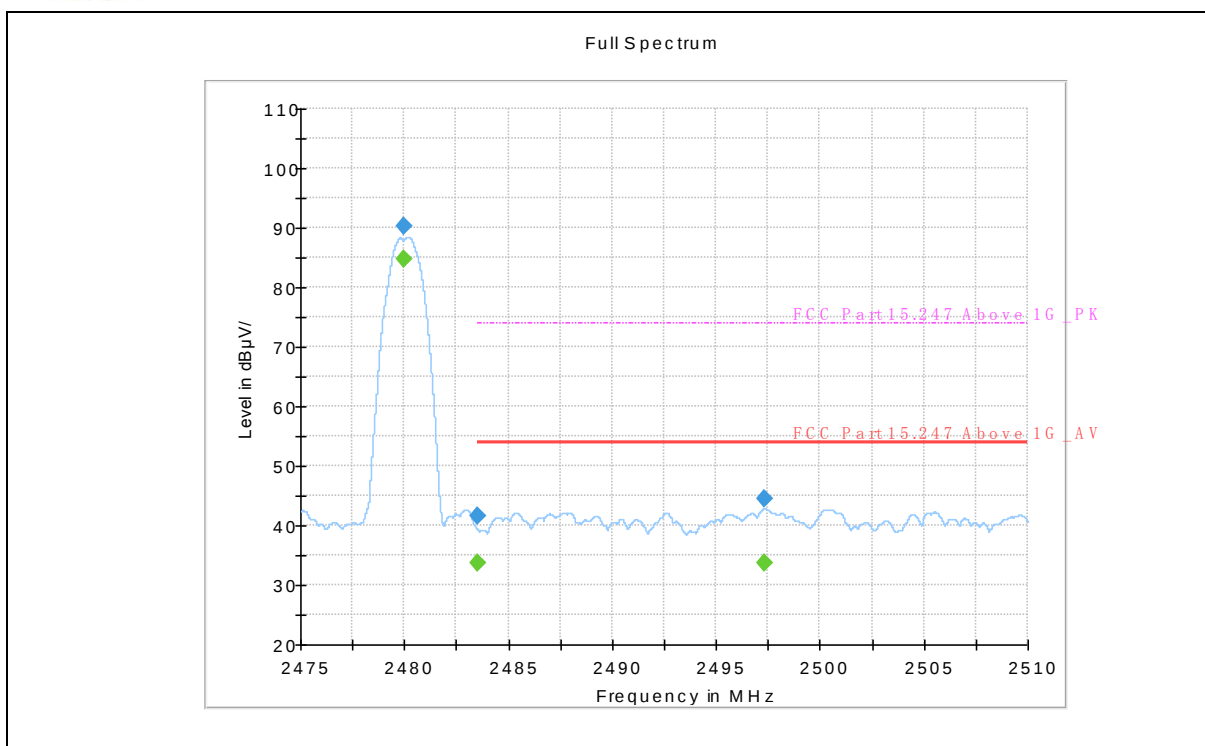


($\pi/4$ -DQPSK _2402MHz, Antenna Horizontal)

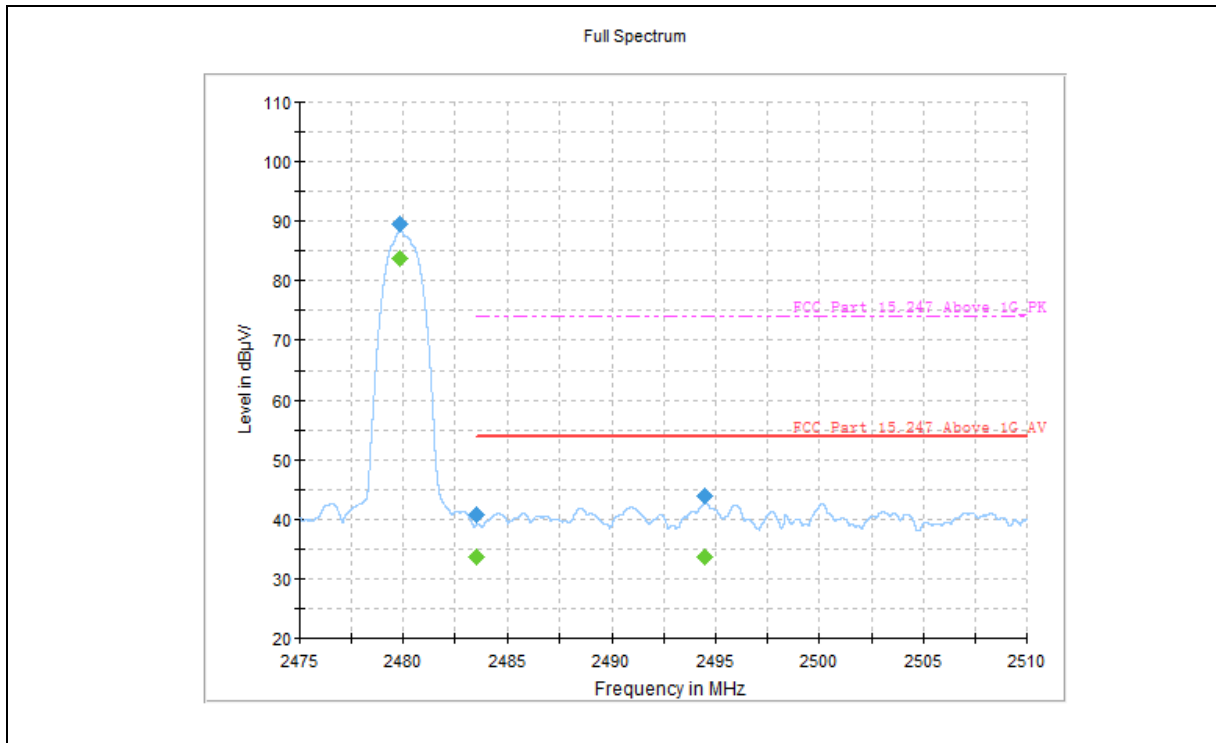
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
2352.138333	---	32.34	74.00	41.66	H	7.7
2352.138333	42.21	---	54.00	11.79	H	7.7
2390.002500	---	33.15	74.00	40.85	H	8.0
2390.002500	41.74	---	54.00	12.26	H	8.0
2401.902500	---	84.69	---	---	H	8.7
2401.902500	90.27	---	---	---	H	8.7



Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
2355.988333	---	32.25	74.00	41.75	V	7.6
2355.988333	42.90	---	54.00	11.10	V	7.6
2390.002500	---	33.14	74.00	40.86	V	8.0
2390.002500	41.34	---	54.00	12.66	V	8.0
2402.281667	---	87.47	---	---	V	8.7
2402.281667	93.39	---	---	---	V	8.7



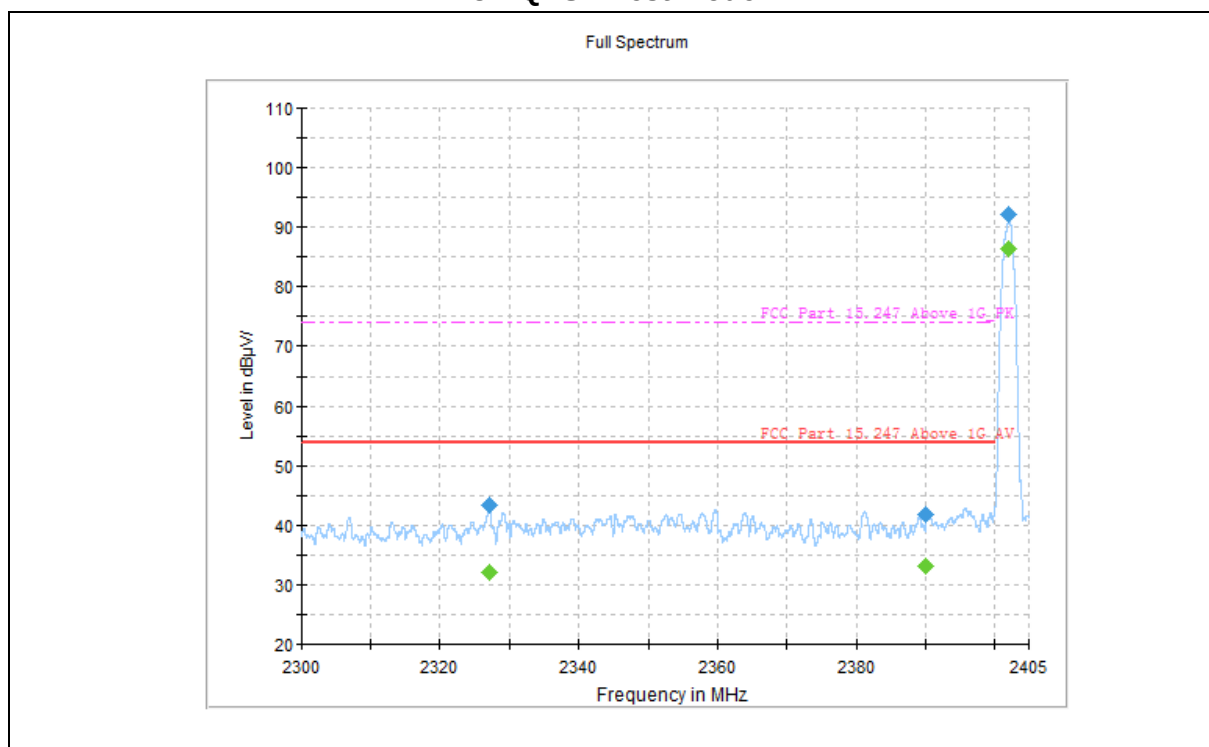
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
2480.005000	90.24	---	---	---	H	8.2
2480.005000	---	84.69	---	---	H	8.2
2483.503056	---	33.78	74.00	40.22	H	8.3
2483.503056	41.59	---	54.00	12.41	H	8.3
2497.324167	44.35	---	54.00	9.65	H	8.4
2497.324167	---	33.73	74.00	40.27	H	8.4



($\pi/4$ -DQPSK _2480MHz, Antenna Vertical)

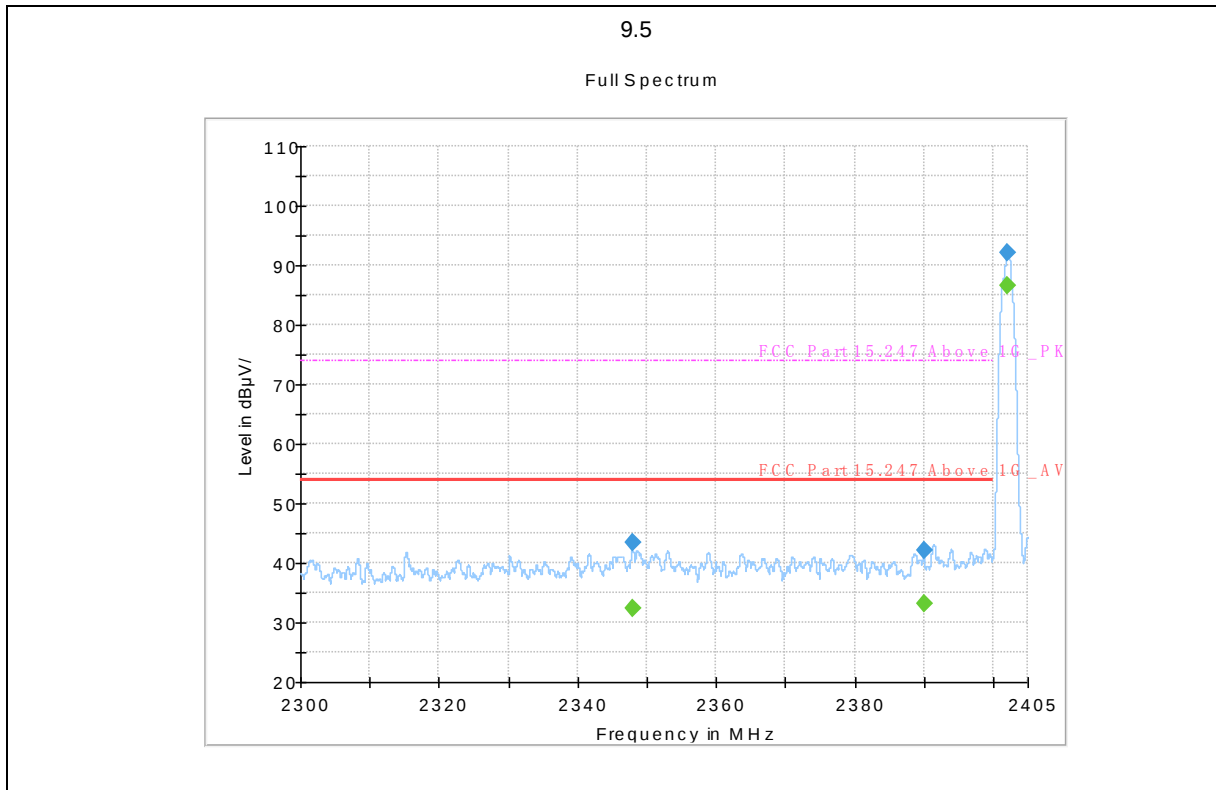
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
2479.816389	---	83.63	---	---	V	8.2
2479.816389	89.51	---	---	---	V	8.2
2483.505000	---	33.70	74.00	40.30	V	8.3
2483.505000	40.84	---	54.00	13.16	V	8.3
2494.489167	---	33.71	74.00	40.29	V	8.4
2494.489167	44.06	---	54.00	9.94	V	8.4

8-DQPSK Test mode

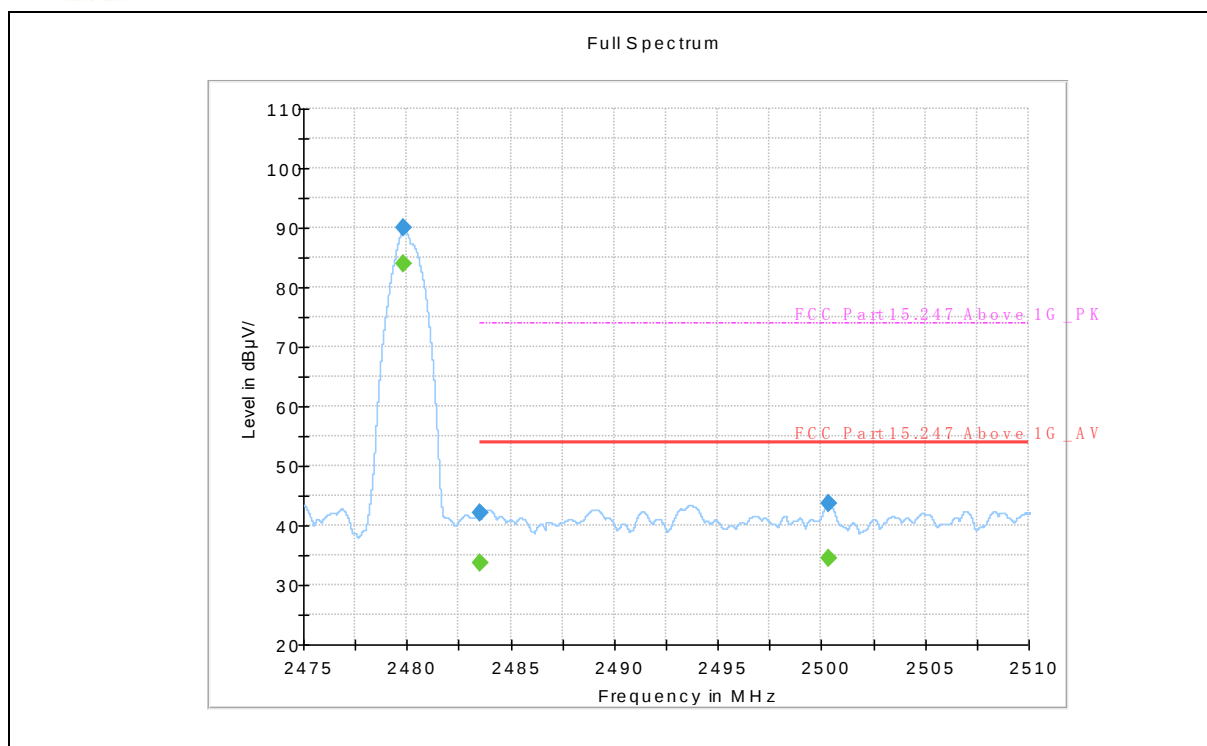


(8-DQPSK _2402MHz, Antenna Horizontal)

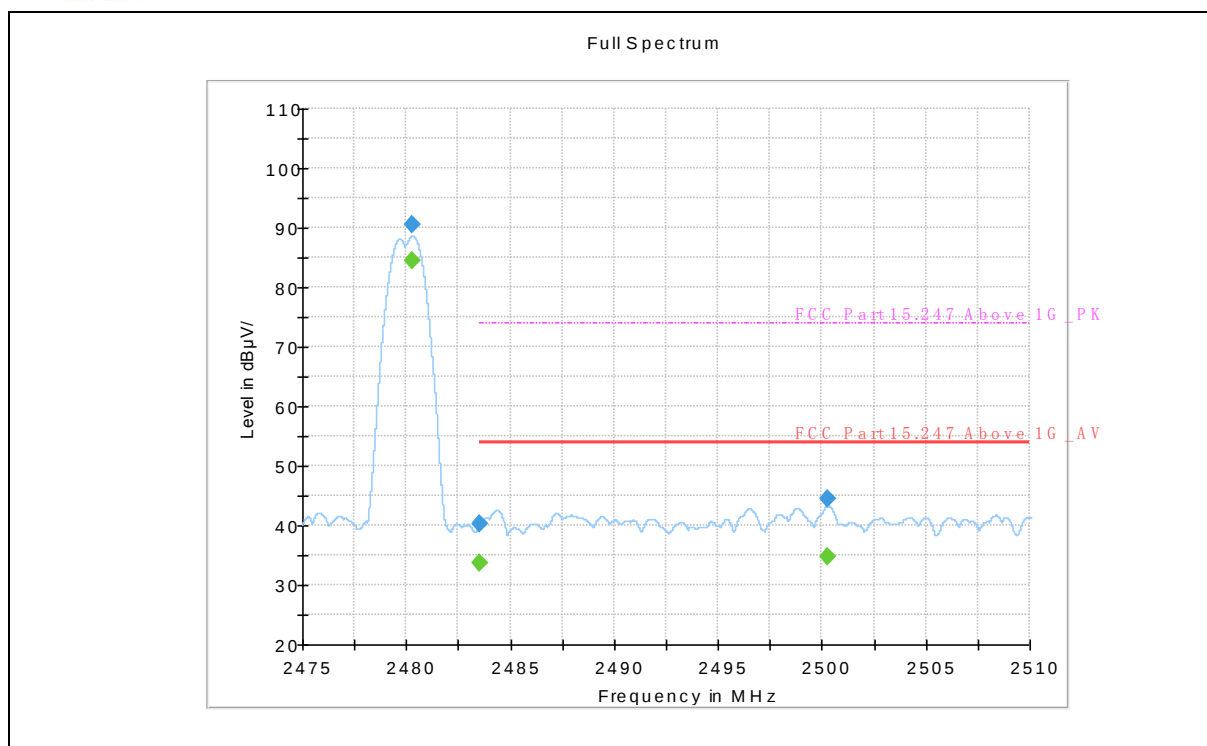
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
2327.095833	---	32.17	74.00	41.83	H	7.3
2327.095833	43.42	---	54.00	10.58	H	7.3
2390.002500	---	33.16	74.00	40.84	H	8.0
2390.002500	41.93	---	54.00	12.07	H	8.0
2402.100833	---	86.25	---	---	H	8.7
2402.100833	91.98	---	---	---	H	8.7



Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
2347.926667	---	32.39	74.00	41.61	V	7.7
2347.926667	43.37	---	54.00	10.63	V	7.7
2390.002500	---	33.16	74.00	40.84	V	8.0
2390.002500	42.23	---	54.00	11.77	V	8.0
2402.124167	---	86.49	---	---	V	8.7
2402.124167	92.17	---	---	---	V	8.7



Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
2479.826111	---	84.07	---	---	H	8.2
2479.826111	89.99	---	---	---	H	8.2
2483.505000	42.21	---	54.00	11.79	H	8.3
2483.505000	---	33.74	74.00	40.26	H	8.3
2500.330278	43.77	---	54.00	10.23	H	8.4
2500.330278	---	34.37	74.00	39.63	H	8.4



Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
2480.265556	---	84.37	---	---	V	8.2
2480.265556	90.56	---	---	---	V	8.2
2483.501111	40.35	---	54.00	13.65	V	8.3
2483.501111	---	33.72	74.00	40.28	V	8.3
2500.287500	44.55	---	54.00	9.45	V	8.4
2500.287500	---	34.67	74.00	39.33	V	8.4

2.9. Conducted Emission

2.9.1. Requirement

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

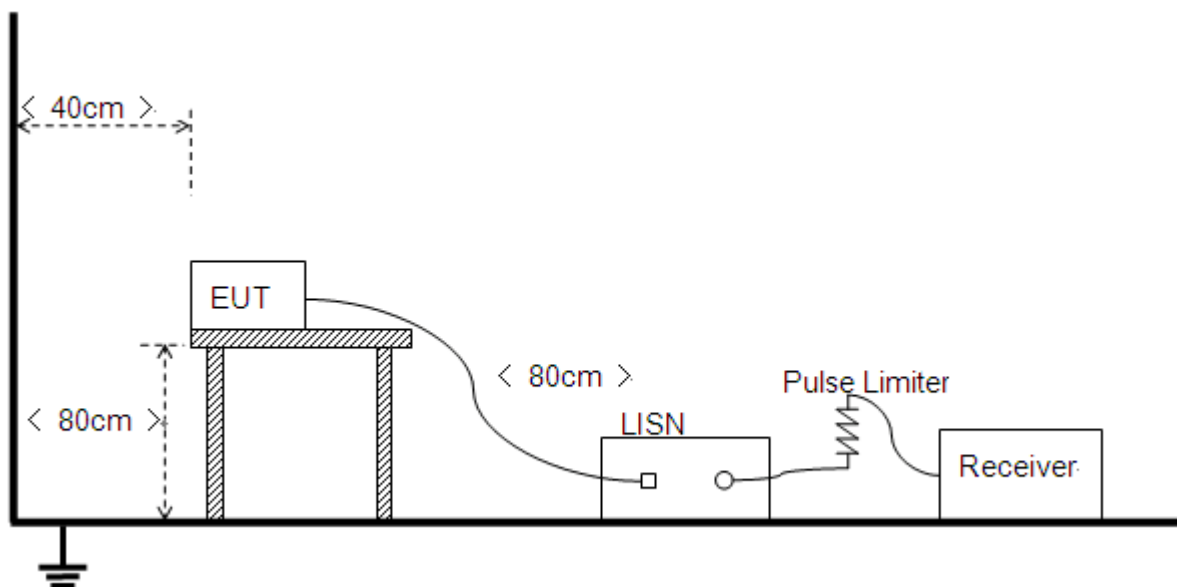
Frequency range (MHz)	Conducted Limit (dB μ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5- 30	60	50

NOTE:

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

2.9.2. Test Description

A. Test Setup:



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.



The factors of the site are calibrated to correct the reading. During the measurement, the Bluetooth EUT is activated and controlled by the Bluetooth Service Supplier (SS) via a Common Antenna, and is set to operate under hopping-on test mode transmitting 339 bytes DH5 packages at maximum power.

B. Equipments List:

Please refer ANNEX B(4).

2.9.3. Test Result

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. Refer to recorded points and plots below.

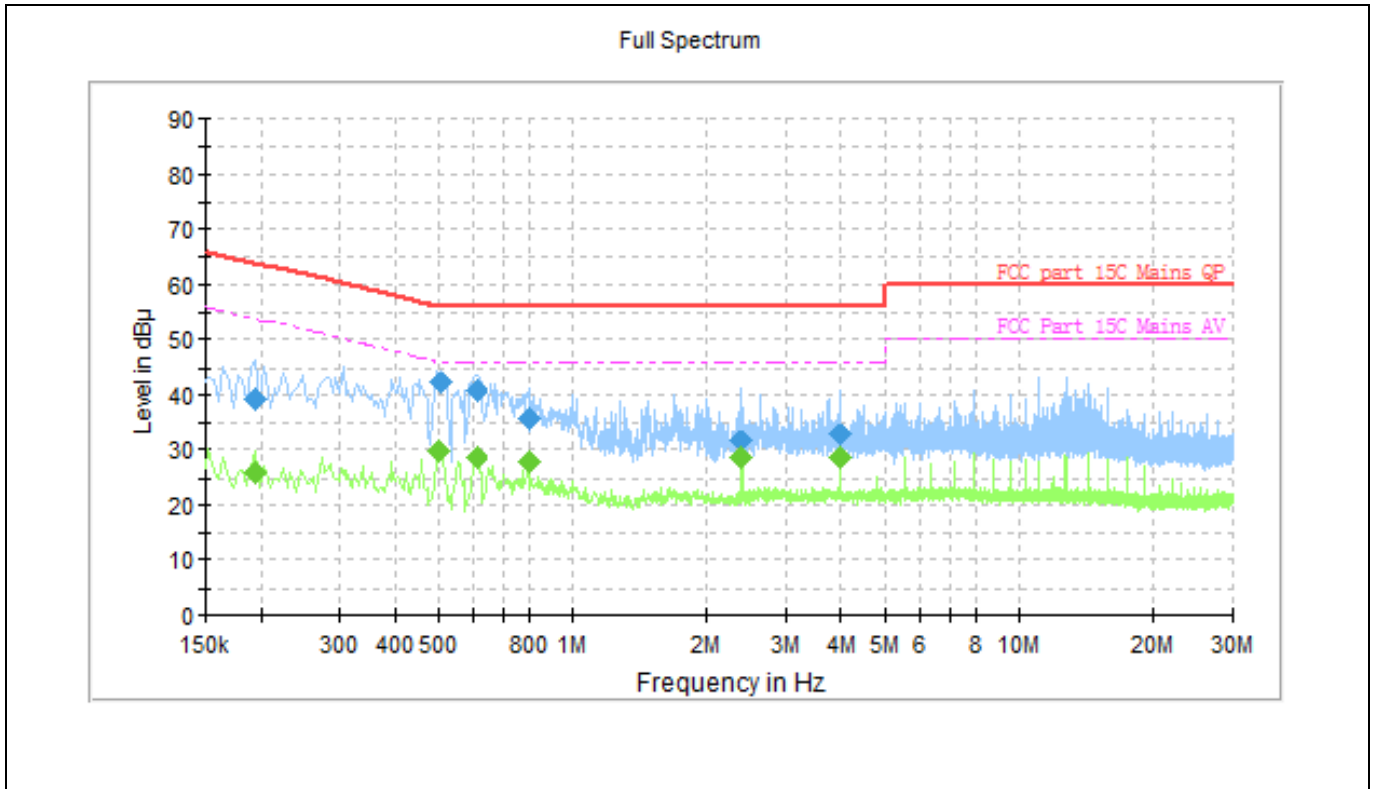
Note: Both of the test voltage AC 120V/60Hz and AC 230V/50Hz were considered and tested respectively, only the results of the worst case AC 120V/60Hz were recorded in this report.

A. Test setup:

The EUT configuration of the emission tests is Charging + BT Link.

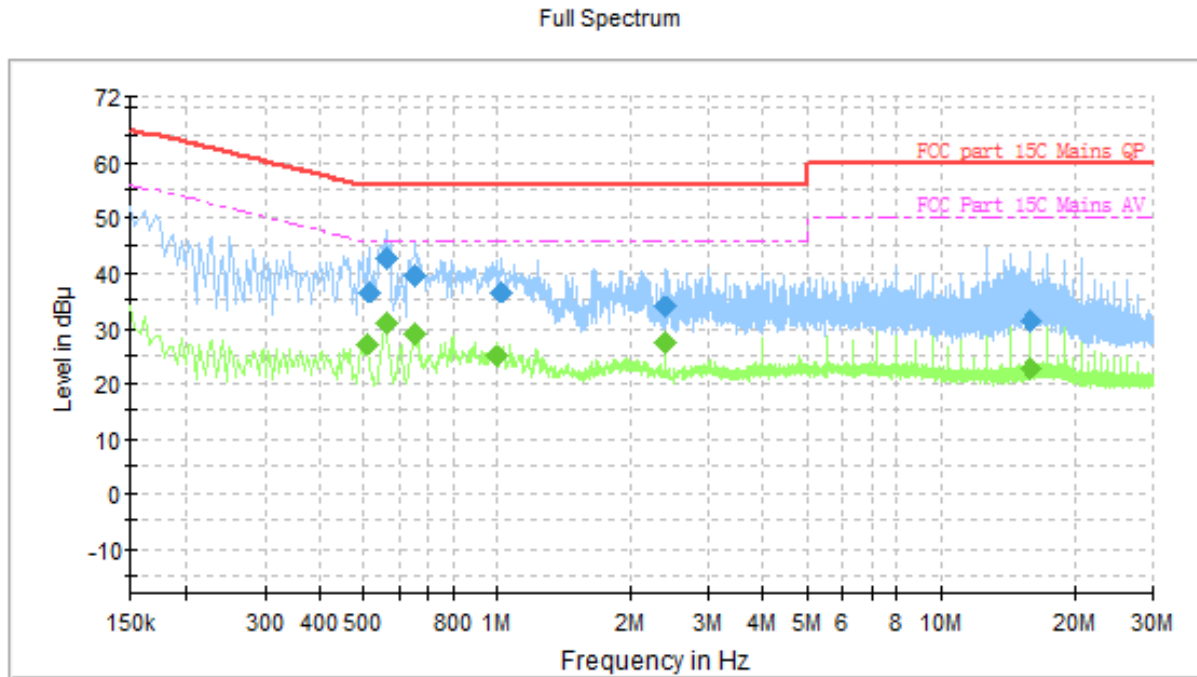
Note: The test voltage is AC 120V/60Hz.

B. Test Plots:



(Plot A: L Phase)

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.194000	---	26.07	53.86	27.80	L	10.2
0.194000	39.30	---	63.86	24.56	L	10.2
0.502000	---	29.56	46.00	16.44	L	10.2
0.510000	42.32	---	56.00	13.68	L	10.2
0.610000	---	28.81	46.00	17.19	L	10.2
0.610000	40.76	---	56.00	15.24	L	10.2
0.798000	35.63	---	56.00	20.37	L	10.2
0.798000	---	27.70	46.00	18.30	L	10.2
2.382000	31.71	---	56.00	24.29	L	10.3
2.386000	---	28.58	46.00	17.42	L	10.3
3.974000	---	28.47	46.00	17.53	L	10.4
3.974000	32.88	---	56.00	23.12	L	10.4



(Plot A: N Phase)

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.510000	---	27.37	46.00	18.63	N	10.2
0.518000	36.47	---	56.00	19.53	N	10.2
0.562000	---	30.86	46.00	15.14	N	10.2
0.562000	42.46	---	56.00	13.54	N	10.2
0.658000	---	28.98	46.00	17.02	N	10.2
0.658000	39.73	---	56.00	16.27	N	10.2
1.006000	---	24.86	46.00	21.14	N	10.3
1.022000	36.52	---	56.00	19.48	N	10.3
2.390000	33.90	---	56.00	22.10	N	10.3
2.390000	---	27.63	46.00	18.37	N	10.3
15.930000	---	22.48	50.00	27.52	N	10.7
15.930000	31.29	---	60.00	28.71	N	10.7

2.10. Radiated Emission

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

Note:

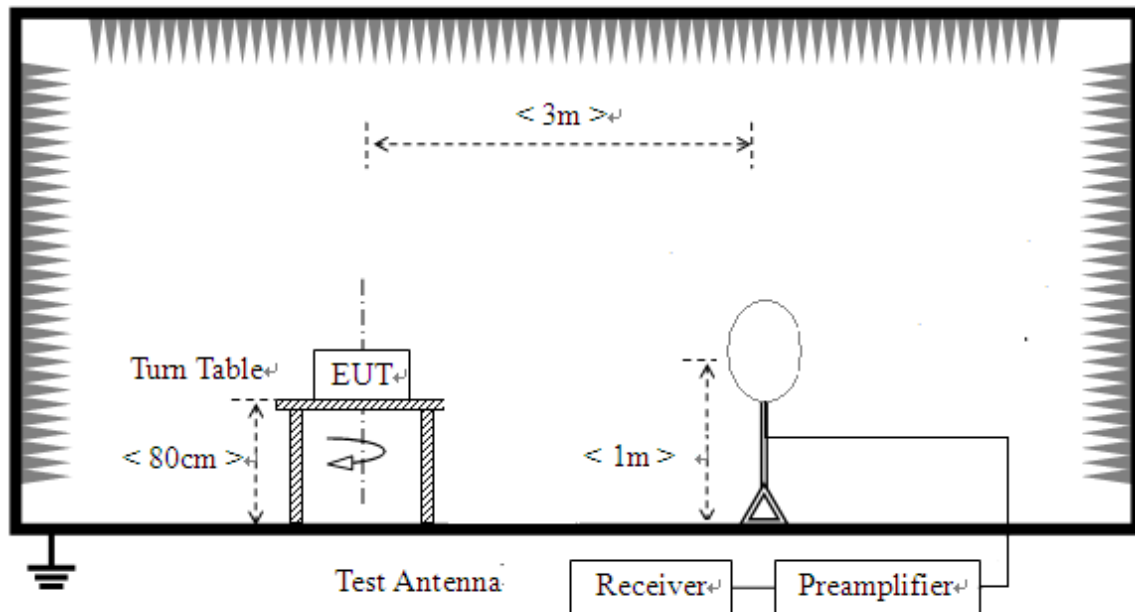
1. For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
2. For above 1000MHz, limit field strength 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)

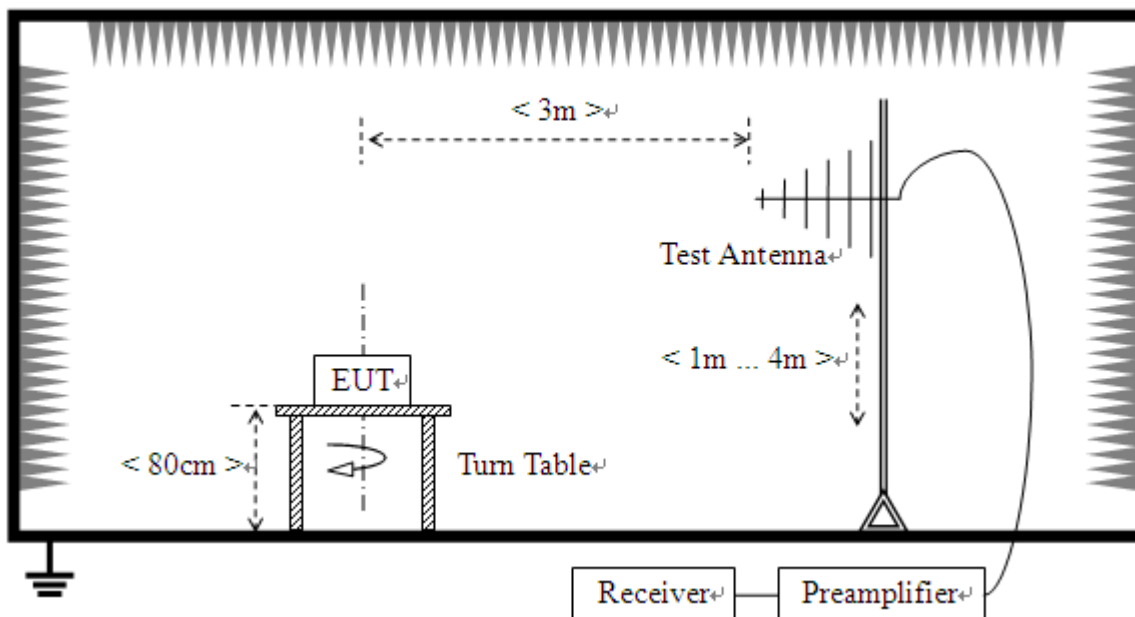
2.10.2. Test Description

A. Test Setup:

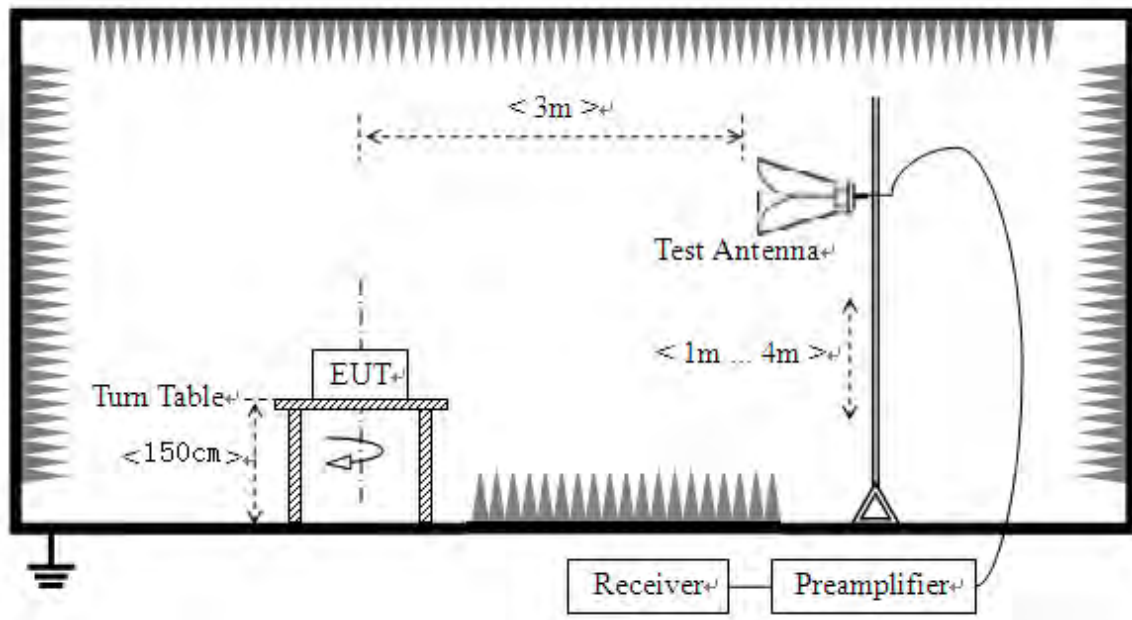
- 1) For radiated emissions from 9kHz to 30MHz



- 2) For radiated emissions from 30MHz to 1GHz



3) For radiated emissions above 1GHz



The RF absorbing material used on the reference ground plane and on the turntable have a maximum height (thickness) of 30 cm (12 in) and have a minimum-rated attenuation of 20 dB at all frequencies from 1 GHz to 18 GHz.

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.10 (2013). For radiated emissions below or equal to 1GHz, the EUT was set-up on insulator 80cm above the Ground Plane, For radiated emissions above 1GHz, The EUT was set-up on insulator 150cm above the Ground Plane. The set-up and test methods were according to ANSI C63.10.

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 Radiated emission below 30MHz

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.



- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasipeak detection (QP) at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
- 3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
- 4. All modes of operation were investigated and the worst-case emissions are reported.

B. Equipments List:

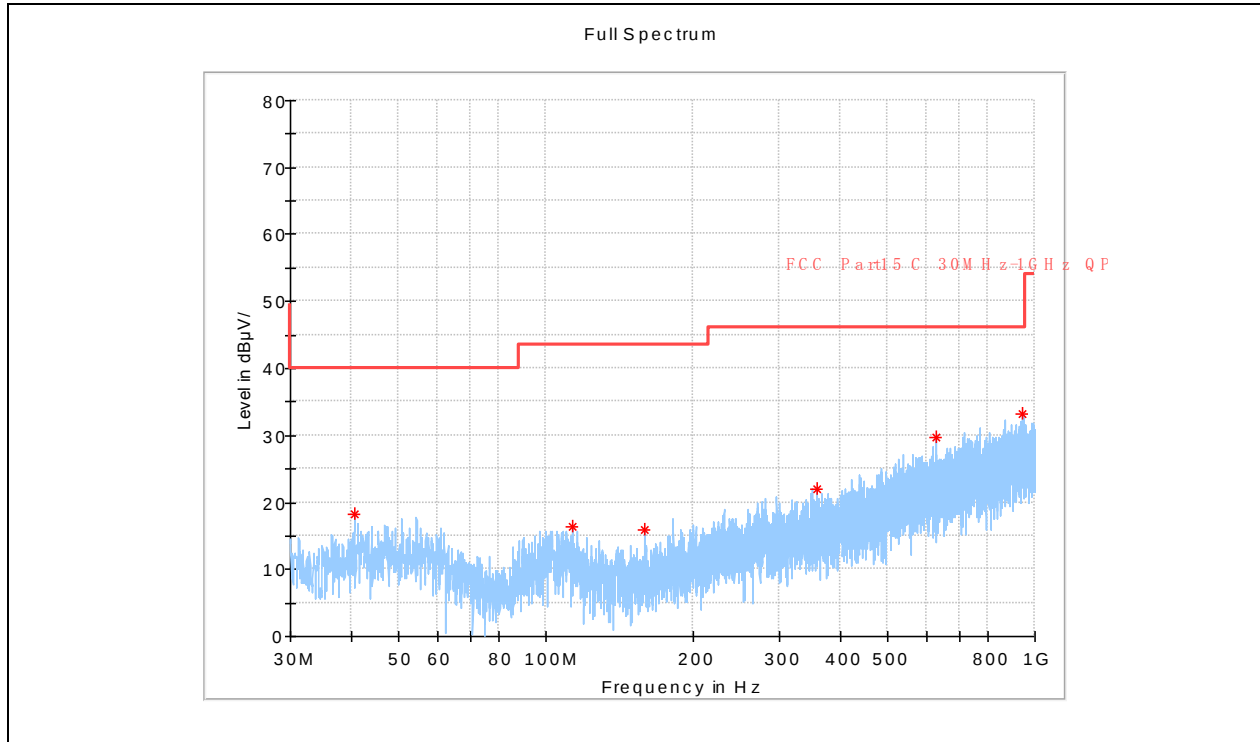
Please refer ANNEX B(4).

2.10.3. Test Result

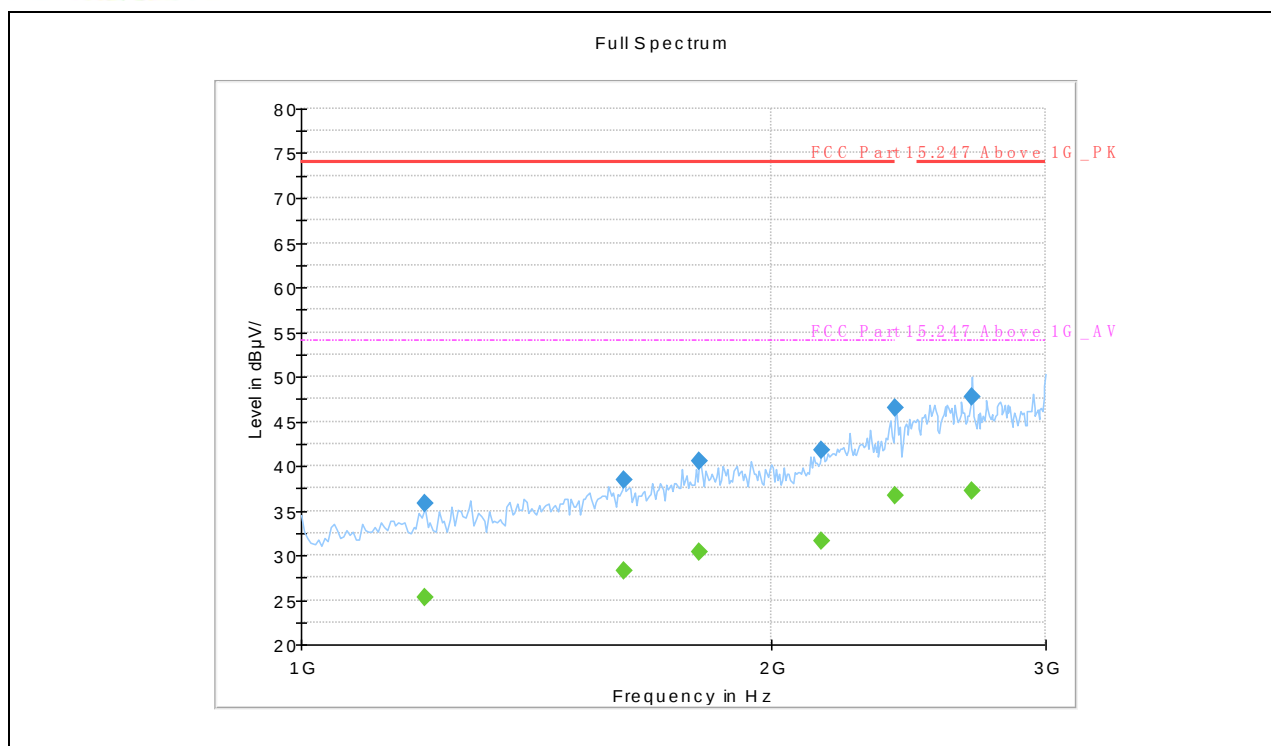
Note1: For the frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

Note2: For the frequency, which started from 25GHz to 40GHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

GFSK Test mode

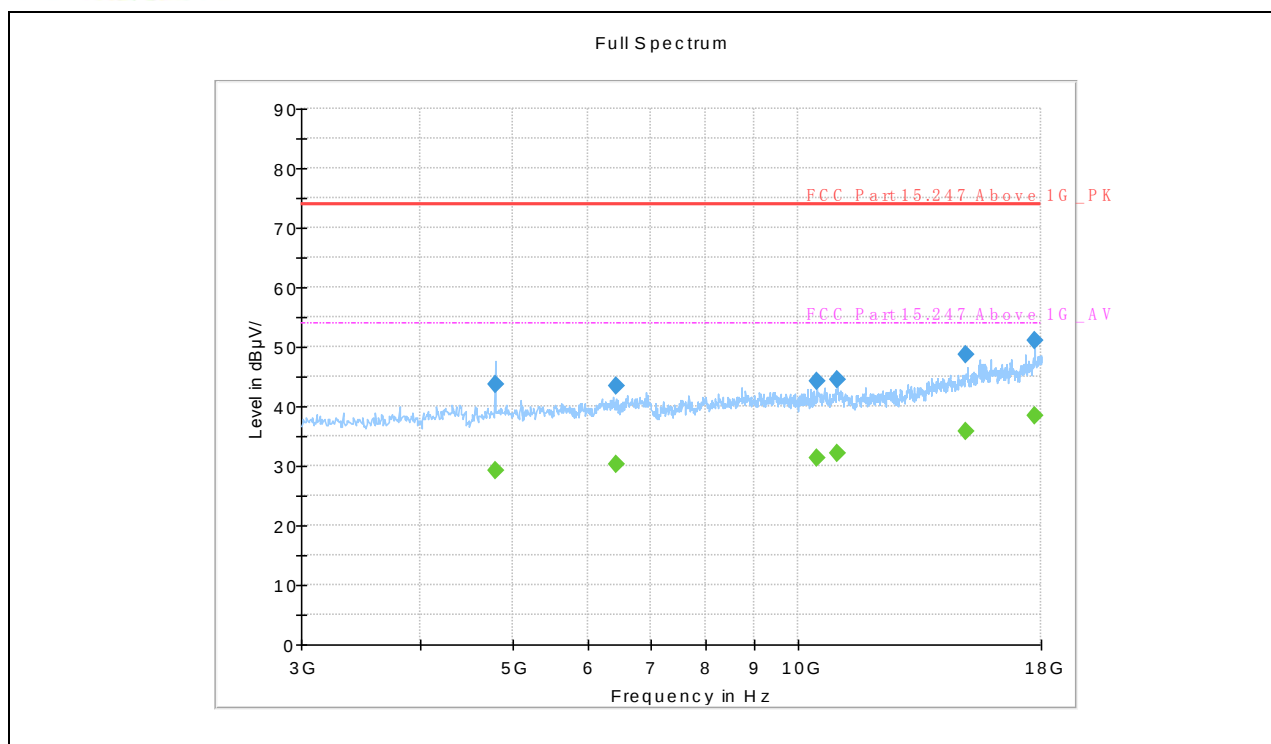


Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
40.589167	18.15	---	40.00	21.85	H	15.2
112.975417	16.35	---	43.50	27.15	H	13.9
159.212083	15.80	---	43.50	27.70	H	12.0
359.274583	22.08	---	46.00	23.92	H	18.5
626.711667	29.64	---	46.00	16.36	H	23.8
942.608333	33.32	---	46.00	12.68	H	28.4



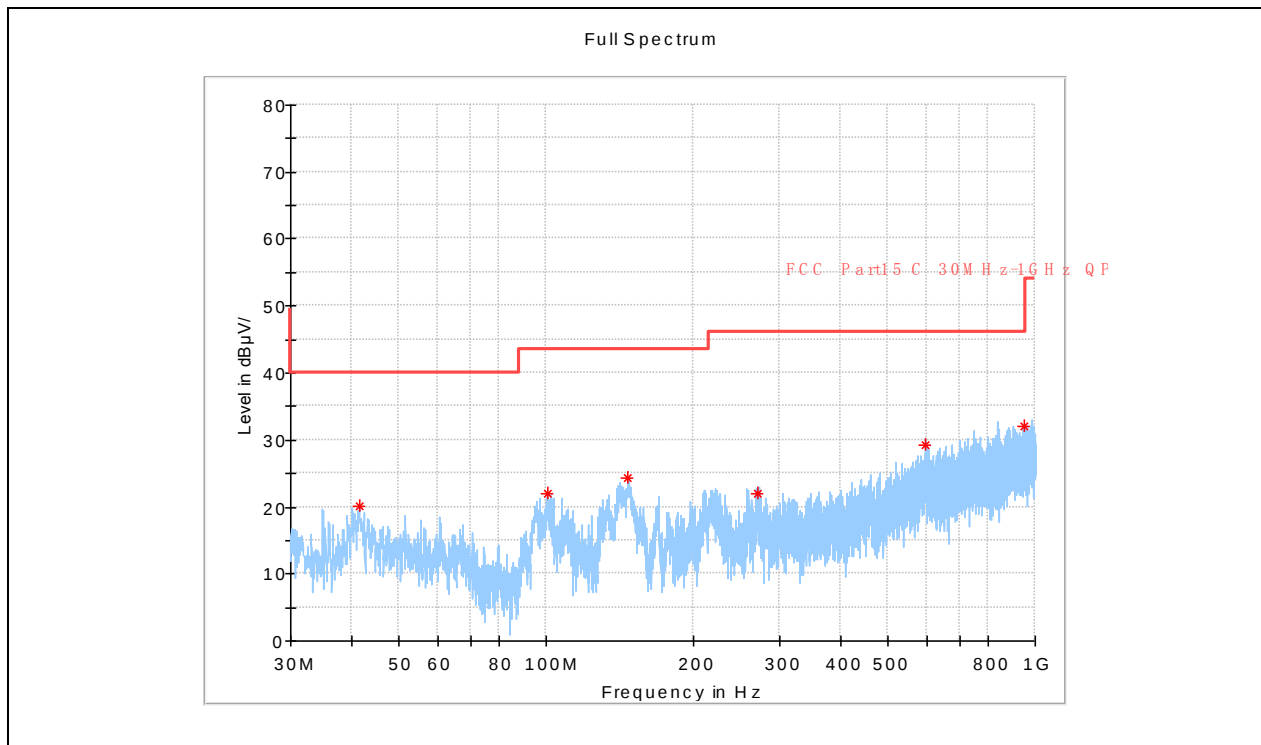
(GFSK _2402MHz, Antenna Horizontal, 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1200.000000	---	25.20	54.00	28.80	H	-0.4
1200.000000	35.82	---	74.00	38.18	H	-0.4
1610.000000	38.36	---	74.00	35.64	H	3.6
1610.000000	---	28.22	54.00	25.78	H	3.6
1800.000000	40.52	---	74.00	33.48	H	6.7
1800.000000	---	30.43	54.00	23.57	H	6.7
2155.000000	---	31.64	54.00	22.36	H	8.3
2155.000000	41.77	---	74.00	32.23	H	8.3
2400.000000	46.43	---	74.00	27.57	H	13.5
2400.000000	---	36.60	54.00	17.40	H	13.5
2690.000000	47.79	---	74.00	26.21	H	14.8
2690.000000	---	37.15	54.00	16.85	H	14.8



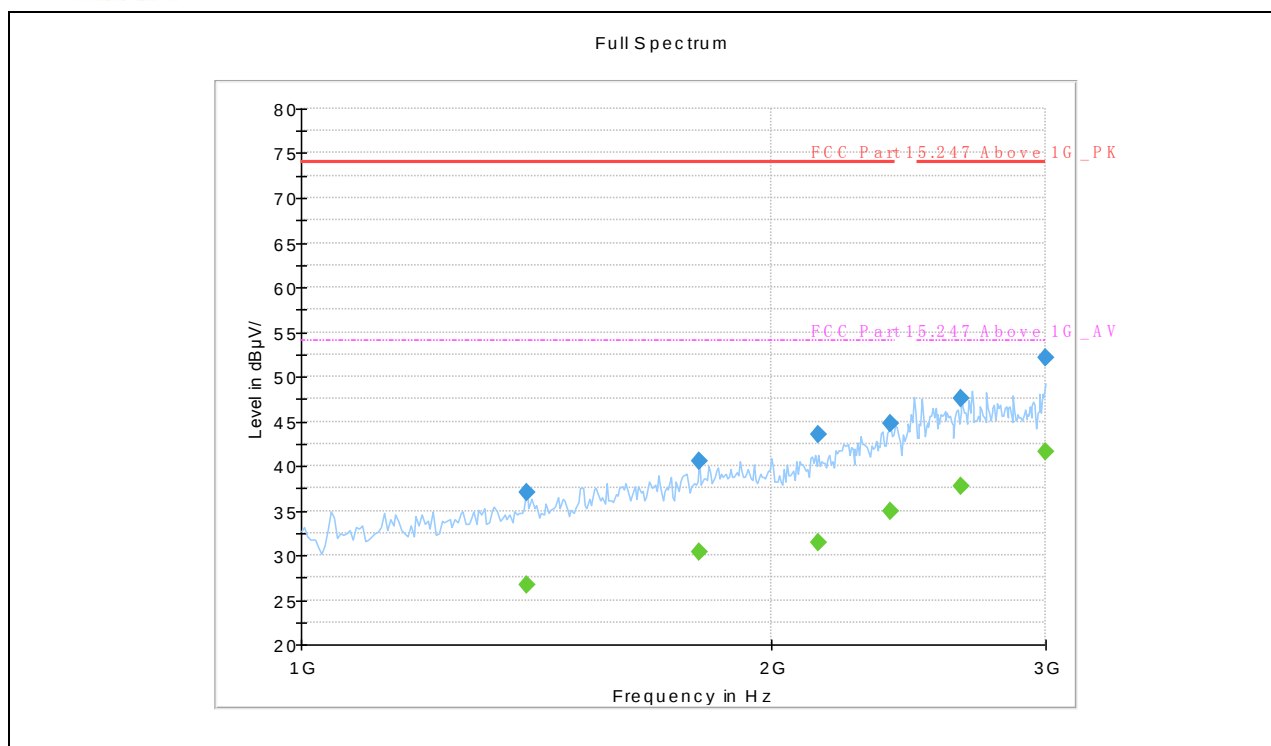
(GFSK _2402MHz, Antenna Horizontal, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
4800.000000	---	29.18	54.00	24.82	H	-3.4
4800.000000	43.66	---	74.00	30.34	H	-3.4
6427.500000	---	30.31	54.00	23.69	H	-1.8
6427.500000	43.33	---	74.00	30.67	H	-1.8
10455.000000	---	31.37	54.00	22.63	H	2.7
10455.000000	44.25	---	74.00	29.75	H	2.7
11002.500000	---	31.98	54.00	22.02	H	3.4
11002.500000	44.43	---	74.00	29.57	H	3.4
15022.500000	48.64	---	74.00	25.36	H	10.8
15022.500000	---	35.82	54.00	18.18	H	10.8
17730.000000	51.18	---	74.00	22.82	H	14.9
17730.000000	---	38.48	54.00	15.52	H	14.9



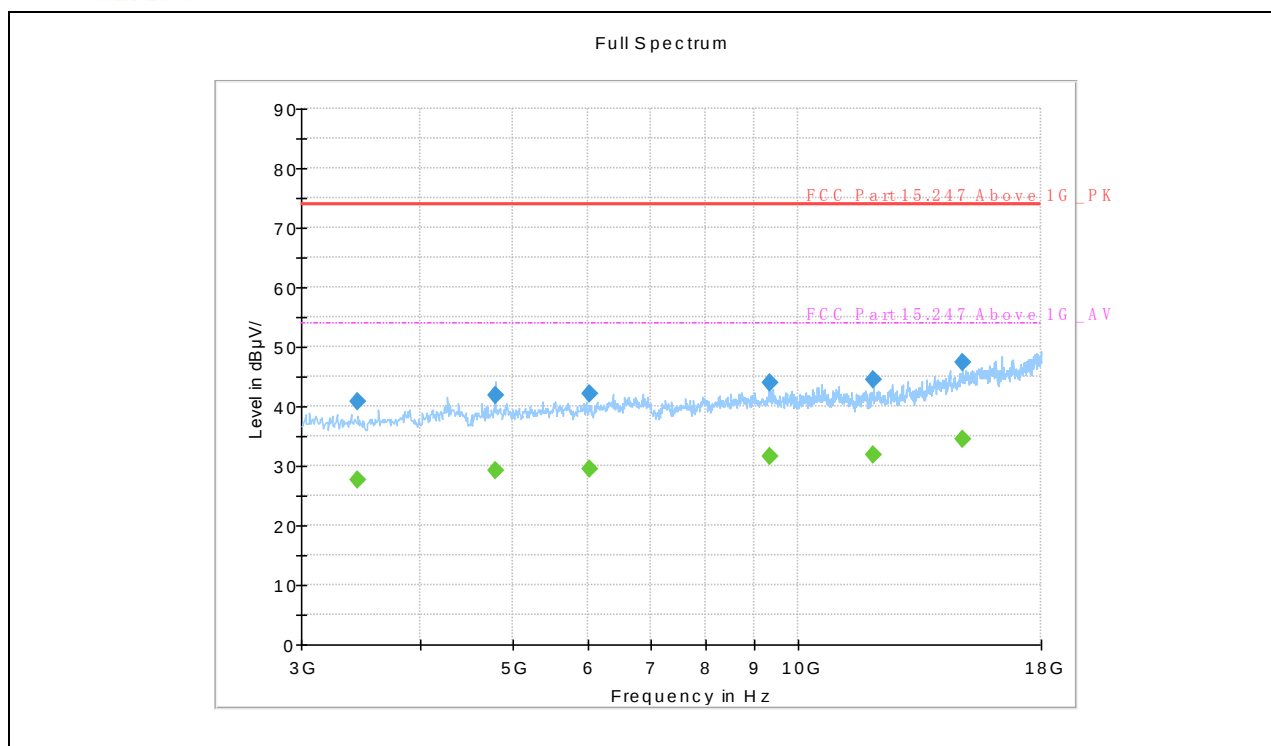
(GFSK _2402MHz, Antenna Vertical, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
41.478333	20.15	---	40.00	19.85	V	14.9
100.325000	21.96	---	43.50	21.54	V	15.1
146.561667	24.37	---	43.50	19.13	V	10.8
270.762083	21.95	---	46.00	24.05	V	15.3
594.863333	29.18	---	46.00	16.82	V	23.6
951.702083	32.09	---	46.00	13.91	V	28.3



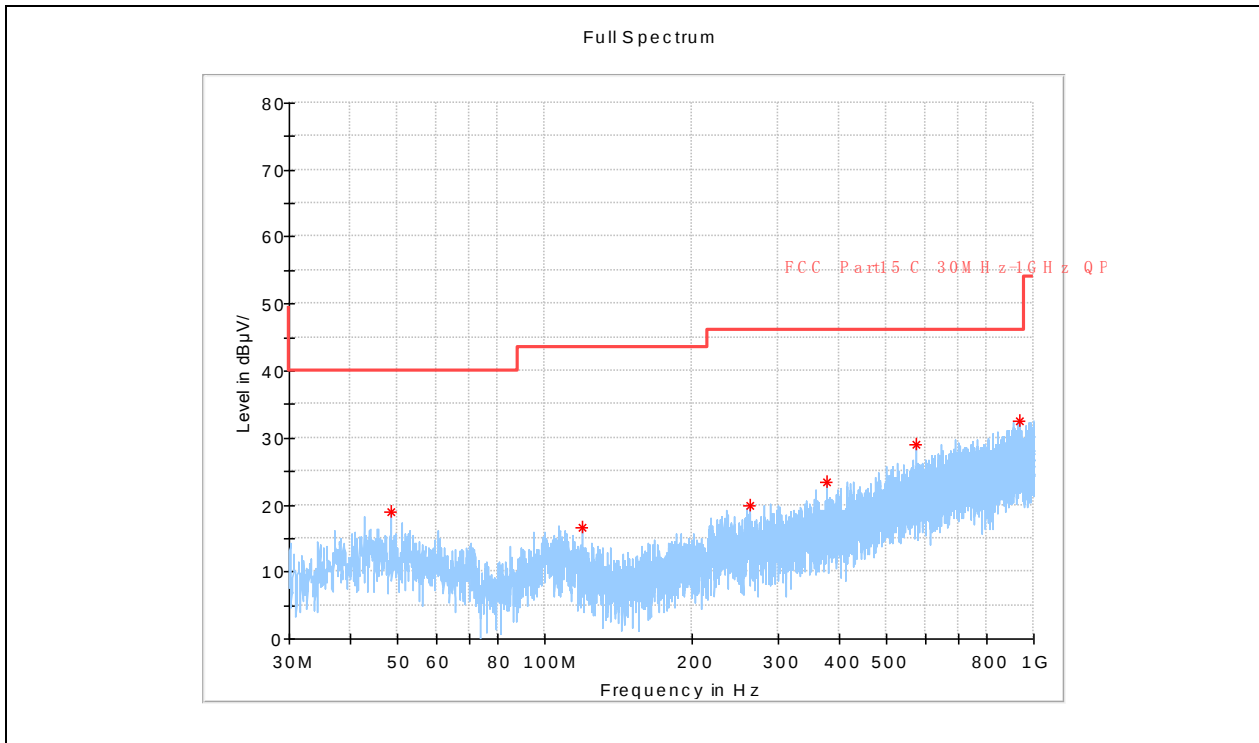
(GFSK _2402MHz, Antenna Vertical , 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1395.000000	---	26.65	54.00	27.35	V	1.5
1395.000000	36.94	---	74.00	37.06	V	1.5
1800.000000	40.56	---	74.00	33.44	V	6.7
1800.000000	---	30.43	54.00	23.57	V	6.7
2145.000000	43.50	---	74.00	30.50	V	8.2
2145.000000	---	31.38	54.00	22.62	V	8.2
2385.000000	---	34.96	54.00	19.04	V	12.3
2385.000000	44.80	---	74.00	29.20	V	12.3
2650.000000	47.50	---	74.00	26.50	V	15.6
2650.000000	---	37.69	54.00	16.31	V	15.6
3000.000000	52.07	---	74.00	21.93	V	18.4
3000.000000	---	41.50	54.00	12.50	V	18.4



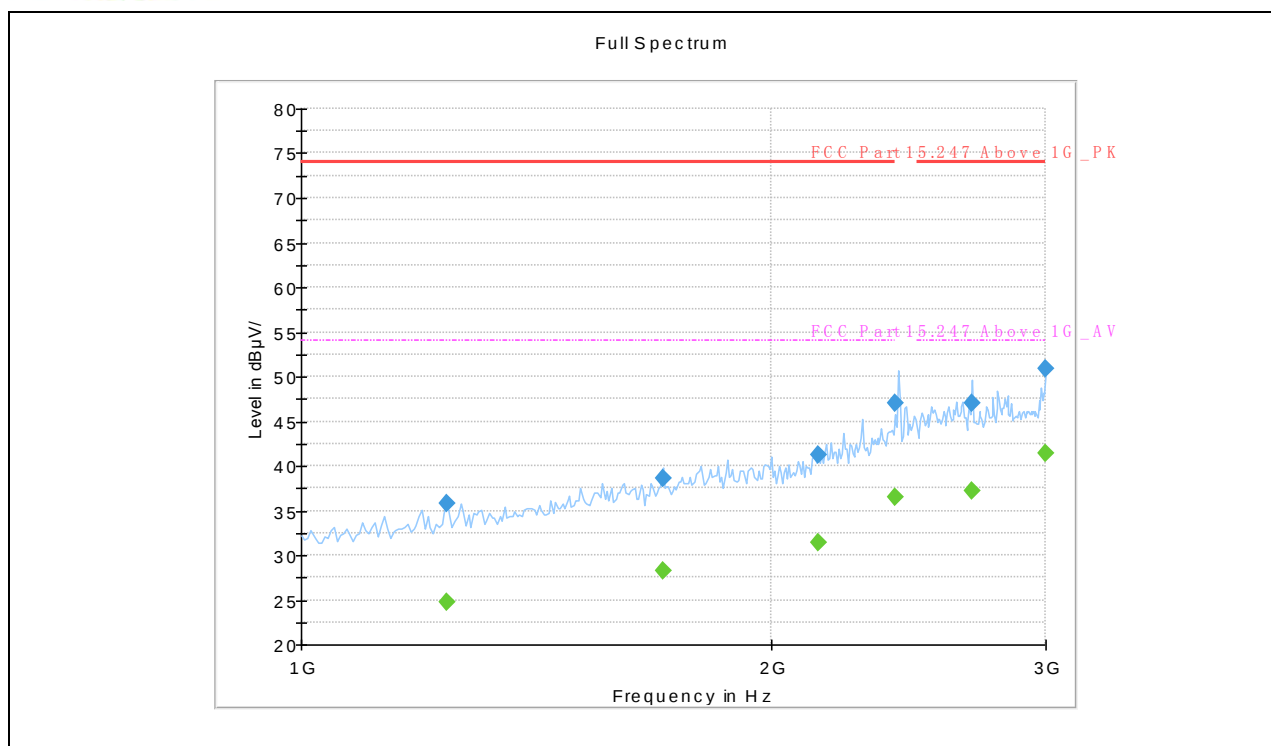
(GFSK _2402MHz, Antenna Vertical, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
3442.500000	40.84	---	74.00	33.16	V	-5.8
3442.500000	---	27.69	54.00	26.31	V	-5.8
4800.000000	---	29.18	54.00	24.82	V	-3.4
4800.000000	41.80	---	74.00	32.20	V	-3.4
6022.500000	---	29.39	54.00	24.61	V	-2.5
6022.500000	42.14	---	74.00	31.86	V	-2.5
9345.000000	43.89	---	74.00	30.11	V	1.8
9345.000000	---	31.61	54.00	22.39	V	1.8
12000.000000	---	31.77	54.00	22.23	V	3.8
12000.000000	44.58	---	74.00	29.42	V	3.8
14865.000000	---	34.51	54.00	19.49	V	9.1
14865.000000	47.24	---	74.00	26.76	V	9.1



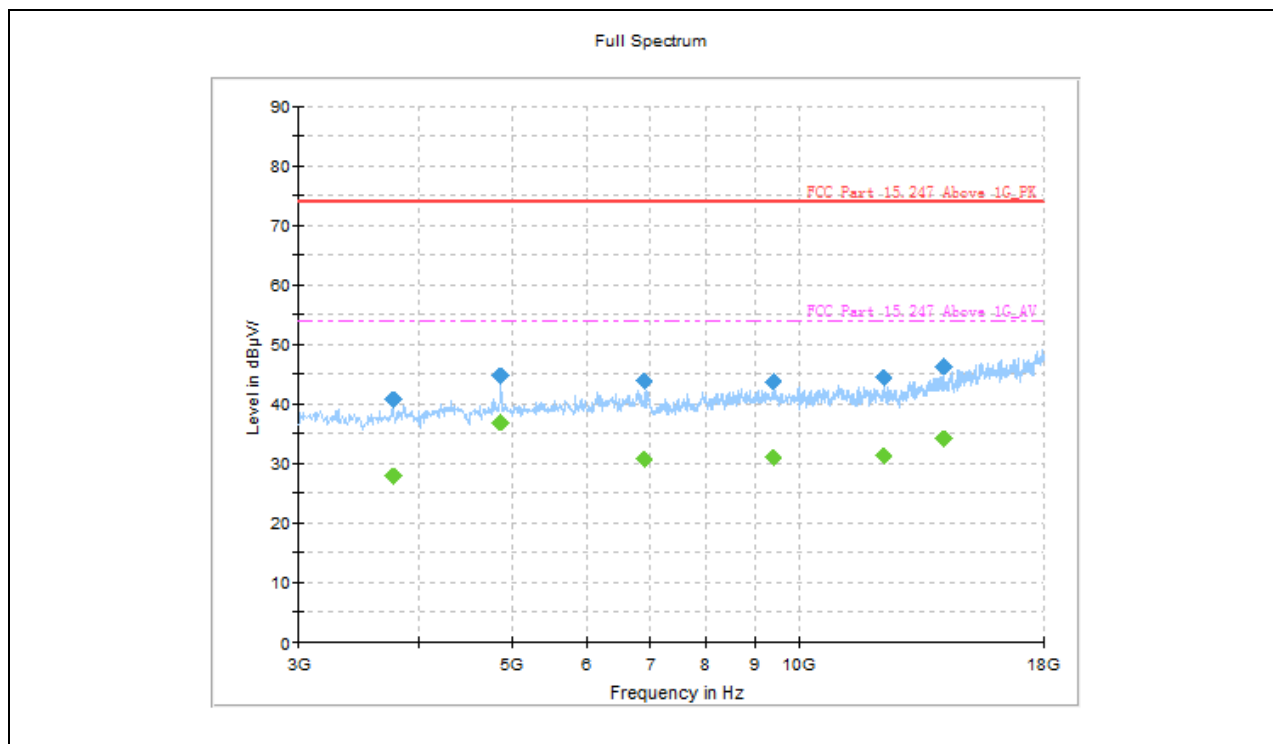
(GFSK_2441MHz, Antenna Horizontal, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
48.389583	18.87	---	40.00	21.13	H	15.5
119.078333	16.71	---	43.50	26.79	H	13.1
261.951250	19.78	---	46.00	26.22	H	15.7
378.593750	23.39	---	46.00	22.61	H	19.0
576.029167	29.07	---	46.00	16.93	H	23.0
934.242083	32.56	---	46.00	13.44	H	28.2



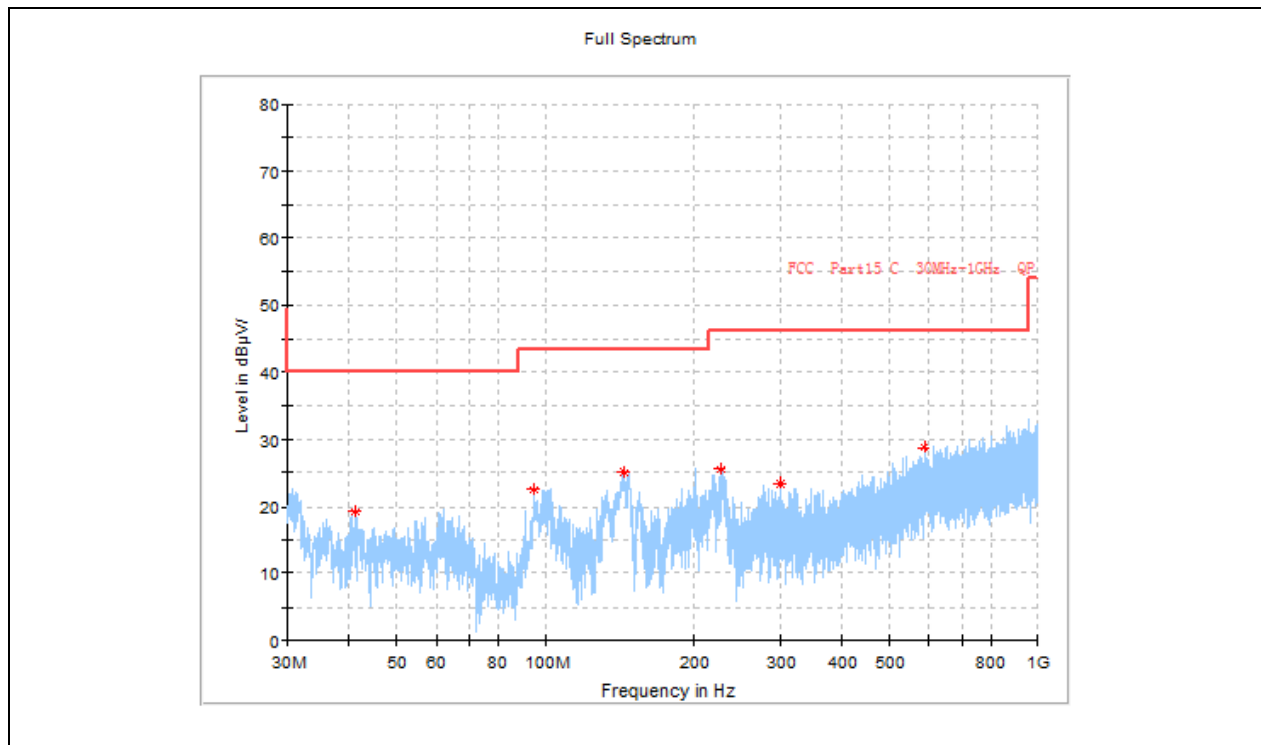
(GFSK_2441MHz, Antenna Horizontal, 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1240.000000	35.78	---	74.00	38.22	H	-0.9
1240.000000	---	24.69	54.00	29.31	H	-0.9
1705.000000	38.54	---	74.00	35.46	H	4.0
1705.000000	---	28.24	54.00	25.76	H	4.0
2145.000000	41.21	---	74.00	32.79	H	8.2
2145.000000	---	31.38	54.00	22.62	H	8.2
2400.000000	---	36.55	54.00	17.45	H	13.5
2400.000000	47.00	---	74.00	27.00	H	13.5
2690.000000	---	37.13	54.00	16.87	H	14.8
2690.000000	46.95	---	74.00	27.05	H	14.8
3000.000000	50.95	---	74.00	23.05	H	18.4
3000.000000	---	41.32	54.00	12.68	H	18.4



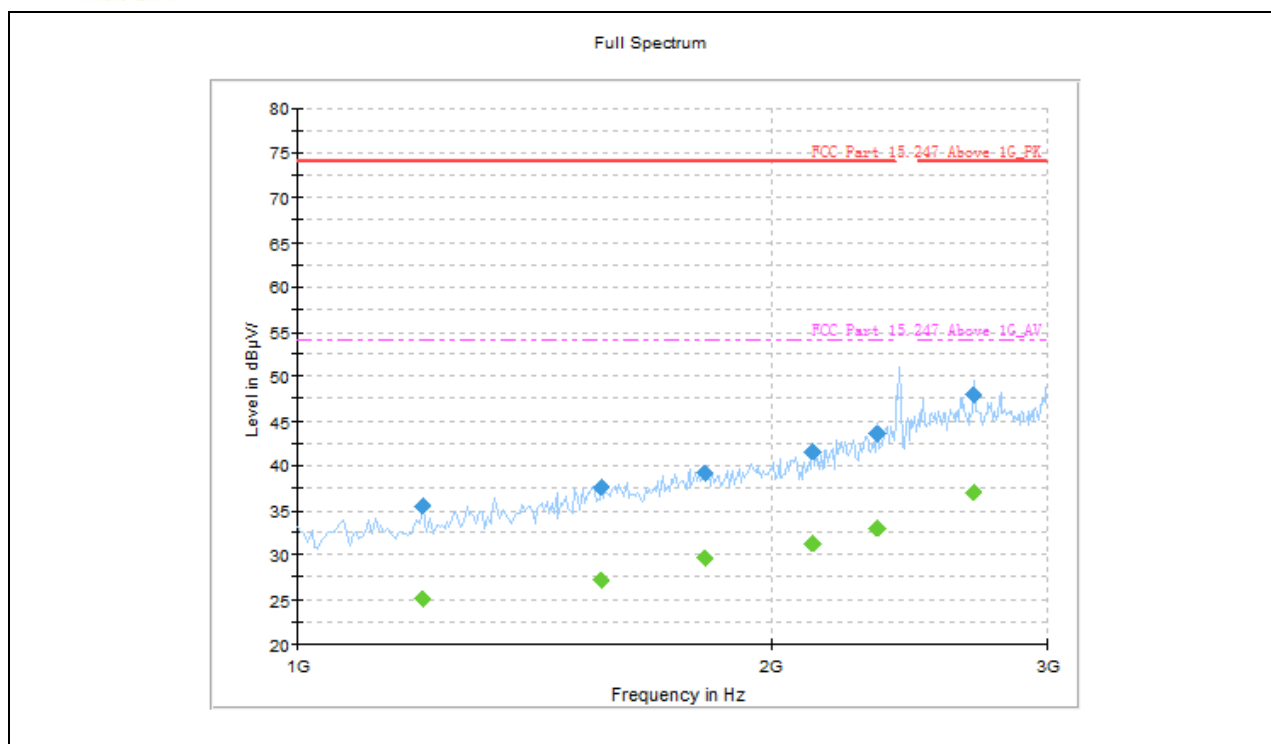
(GFSK _2441MHz, Antenna Horizontal, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
3765.000000	40.88	---	74.00	33.12	H	-5.0
3765.000000	---	27.95	54.00	26.05	H	-5.0
4882.500000	44.76	---	74.00	29.24	H	-2.8
4882.500000	---	36.74	54.00	17.26	H	-2.8
6900.000000	44.04	---	74.00	29.96	H	-1.0
6900.000000	---	30.66	54.00	23.34	H	-1.0
9420.000000	---	31.17	54.00	22.83	H	2.0
9420.000000	43.69	---	74.00	30.31	H	2.0
12262.50000	---	31.44	54.00	22.56	H	4.0
12262.50000	44.36	---	74.00	29.64	H	4.0
14190.00000	46.31	---	74.00	27.69	H	8.1
14190.00000	---	34.10	54.00	19.90	H	8.1



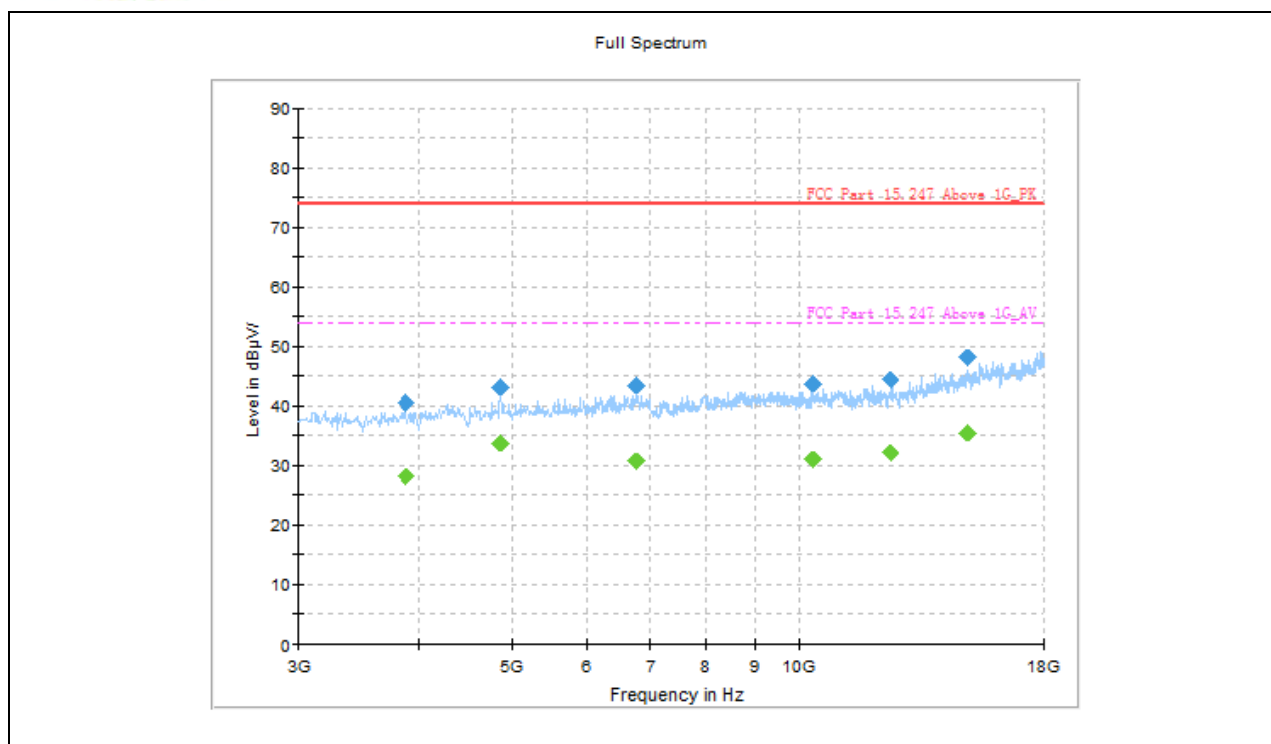
(GFSK _2441MHz, Antenna Vertical, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
41.357083	19.12	---	40.00	20.88	V	14.9
95.030417	22.44	---	43.50	21.06	V	13.1
144.055833	24.95	---	43.50	18.55	V	10.6
227.395000	25.45	---	46.00	20.55	V	14.2
300.266250	23.49	---	46.00	22.51	V	17.4
588.598750	28.72	---	46.00	17.28	V	23.2



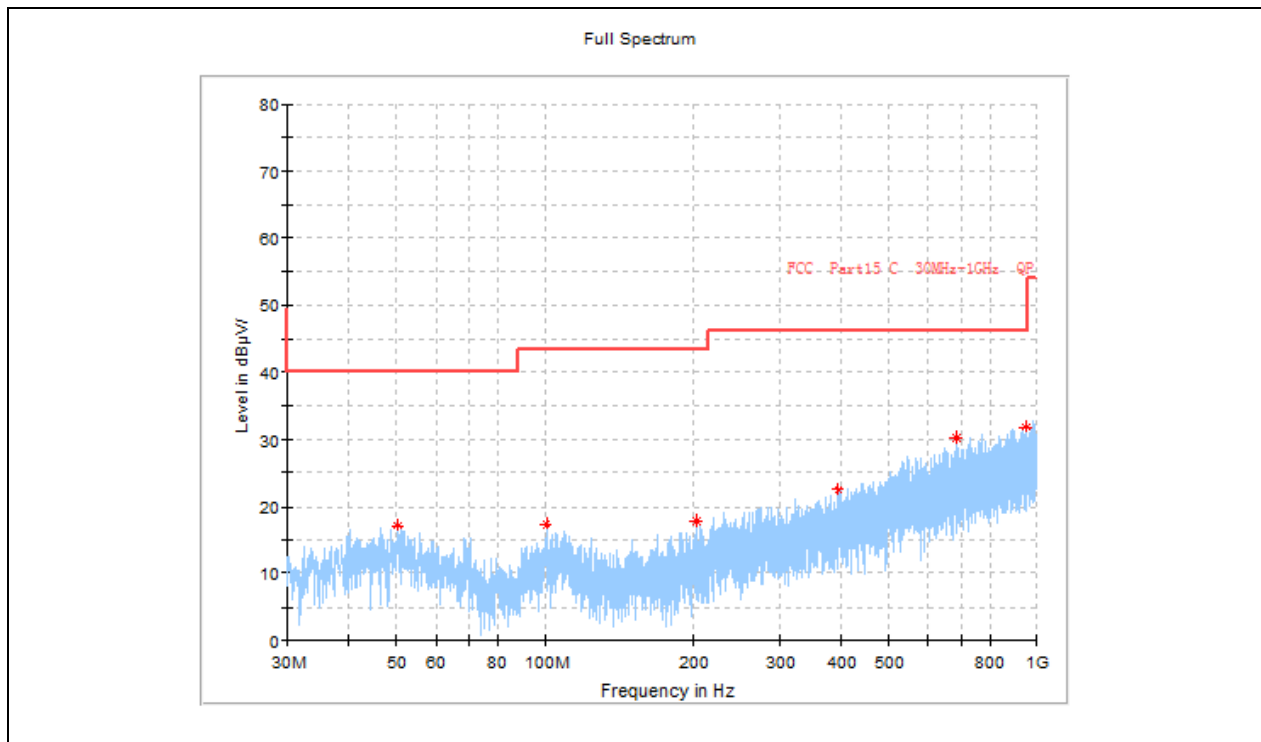
(GFSK _2441MHz, Antenna Vertical , 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1200.000000	---	25.09	54.00	28.91	V	-0.4
1200.000000	35.44	---	74.00	38.56	V	-0.4
1560.000000	---	27.27	54.00	26.73	V	2.9
1560.000000	37.46	---	74.00	36.54	V	2.9
1815.000000	---	29.66	54.00	24.34	V	5.7
1815.000000	39.21	---	74.00	34.79	V	5.7
2125.000000	41.51	---	74.00	32.49	V	8.2
2125.000000	---	31.23	54.00	22.77	V	8.2
2335.000000	43.49	---	74.00	30.51	V	11.2
2335.000000	---	33.04	54.00	20.96	V	11.2
2690.000000	---	37.10	54.00	16.90	V	14.8
2690.000000	47.88	---	74.00	26.12	V	14.8



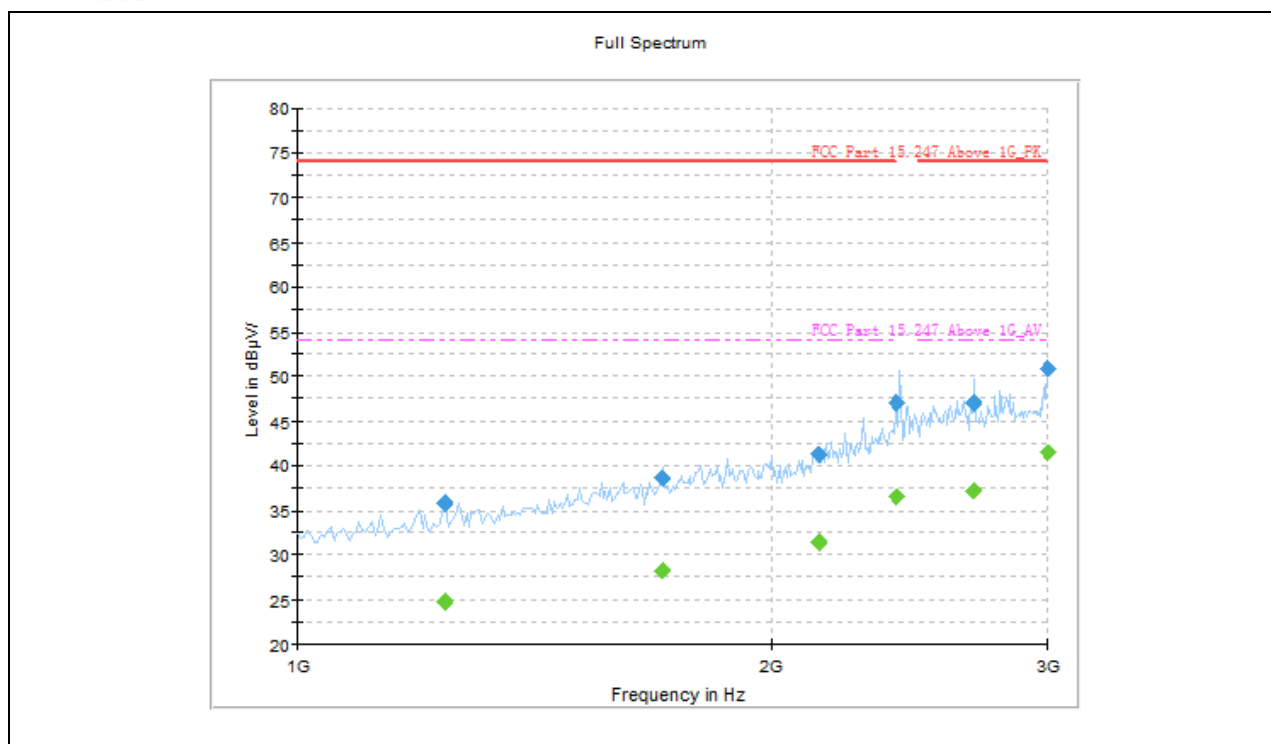
(GFSK _2441MHz, Antenna Vertical, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
3877.500000	40.52	---	74.00	33.48	V	-4.6
3877.500000	---	28.26	54.00	25.74	V	-4.6
4882.500000	43.17	---	74.00	30.83	V	-2.8
4882.500000	---	33.56	54.00	20.44	V	-2.8
6772.500000	---	30.66	54.00	23.34	V	-1.2
6772.500000	43.55	---	74.00	30.45	V	-1.2
10335.000000	---	31.13	54.00	22.87	V	2.1
10335.000000	43.72	---	74.00	30.28	V	2.1
12465.000000	44.49	---	74.00	29.51	V	4.8
12465.000000	---	32.22	54.00	21.78	V	4.8
14977.500000	48.05	---	74.00	25.95	V	10.1
14977.500000	---	35.53	54.00	18.47	V	10.1



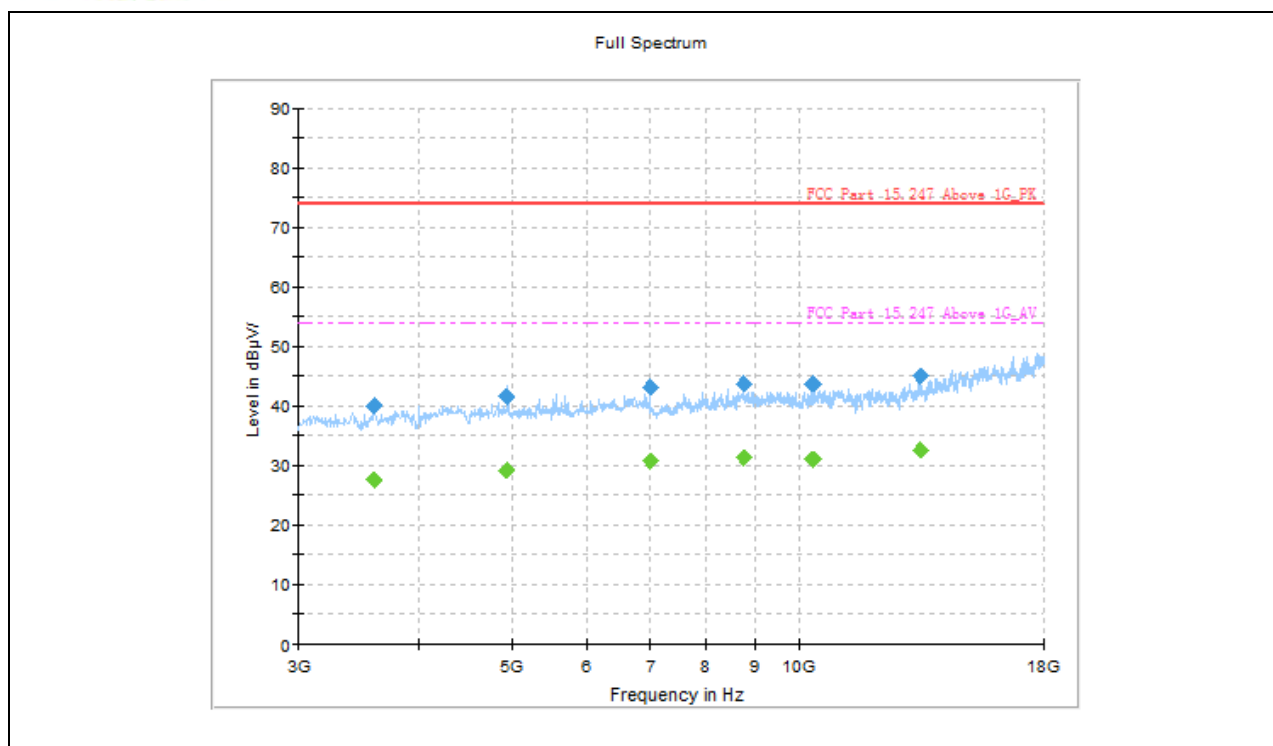
(GFSK_2480MHz, Antenna Horizontal, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
50.167917	17.16	---	40.00	22.84	H	16.2
100.365417	17.31	---	43.50	26.19	H	15.1
203.064167	17.73	---	43.50	25.77	H	13.8
395.892083	22.45	---	46.00	23.55	H	19.1
687.619583	30.08	---	46.00	15.92	H	24.7
952.510417	31.87	---	46.00	14.13	H	28.3



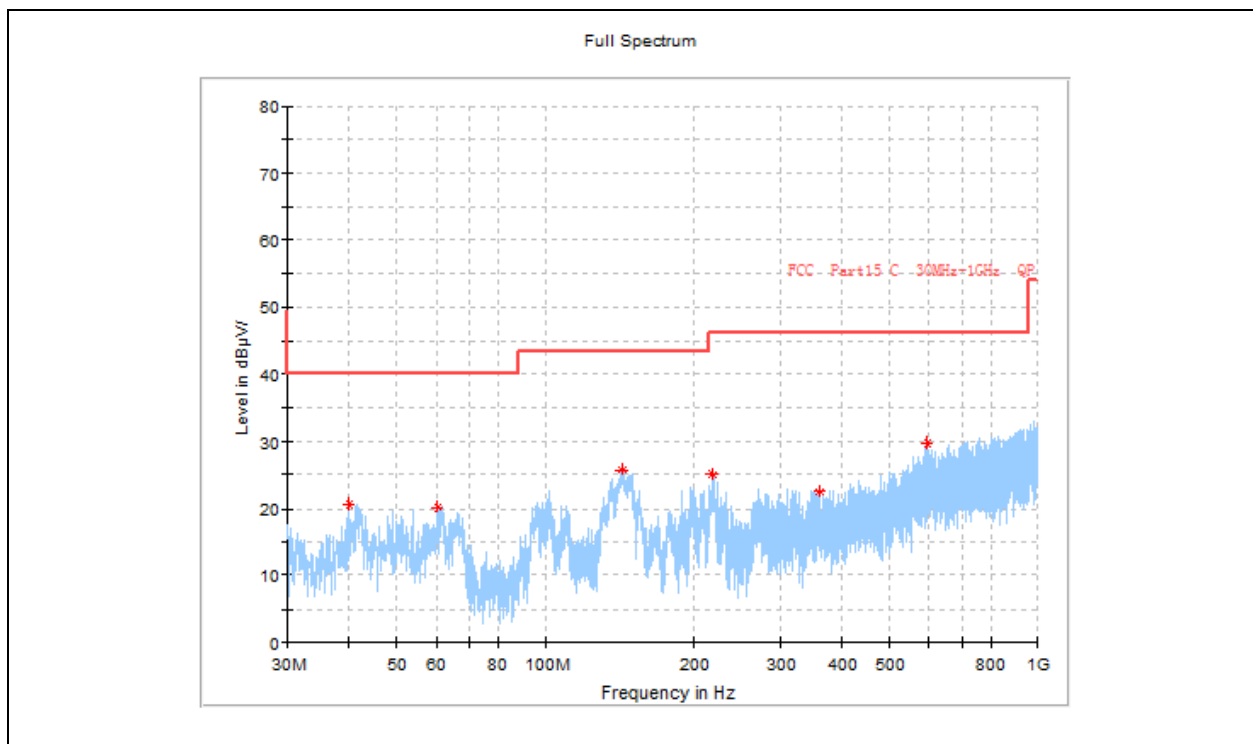
(GFSK_2480MHz, Antenna Horizontal, 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1240.000000	35.78	---	74.00	38.22	H	-0.9
1240.000000	---	24.69	54.00	29.31	H	-0.9
1705.000000	38.54	---	74.00	35.46	H	4.0
1705.000000	---	28.24	54.00	25.76	H	4.0
2145.000000	41.21	---	74.00	32.79	H	8.2
2145.000000	---	31.38	54.00	22.62	H	8.2
2400.000000	---	36.55	54.00	17.45	H	13.5
2400.000000	47.00	---	74.00	27.00	H	13.5
2690.000000	---	37.13	54.00	16.87	H	14.8
2690.000000	46.95	---	74.00	27.05	H	14.8
3000.000000	50.95	---	74.00	23.05	H	18.4
3000.000000	---	41.32	54.00	12.68	H	18.4



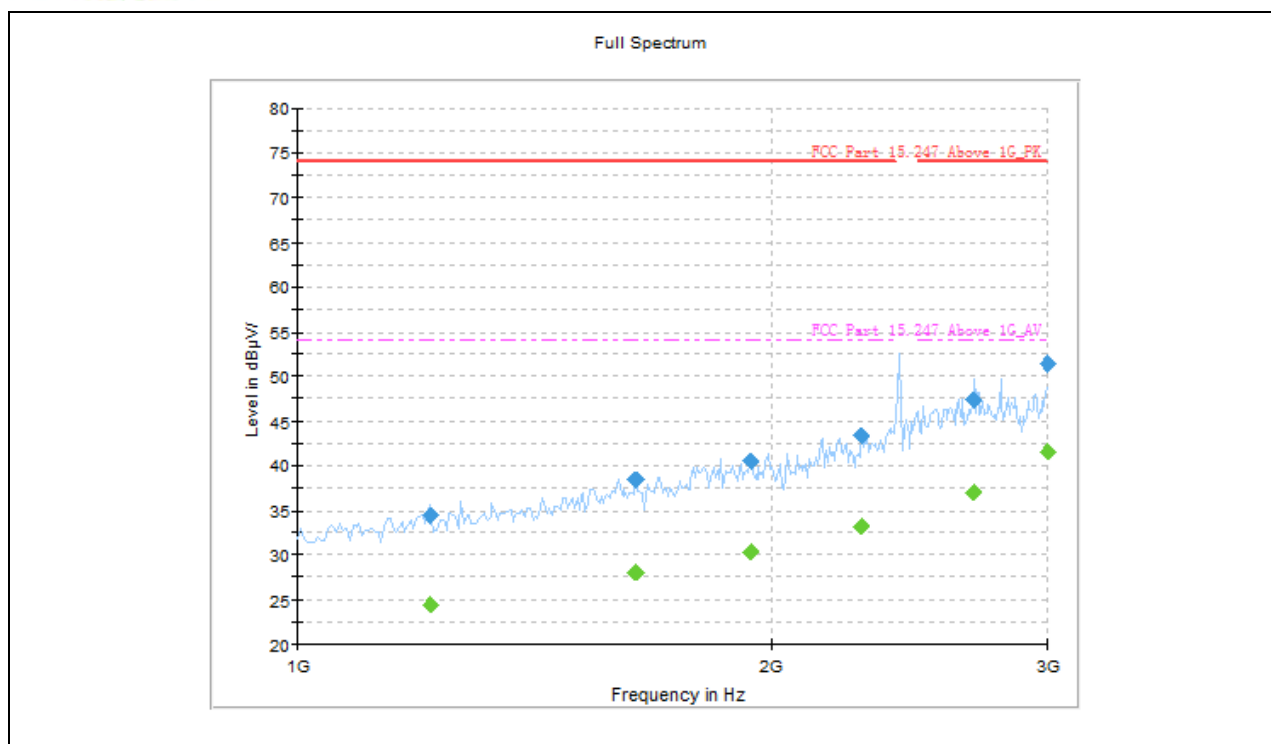
(GFSK _2480MHz, Antenna Horizontal, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
3600.000000	40.09	---	74.00	33.91	H	-5.8
3600.000000	---	27.53	54.00	26.47	H	-5.8
4957.500000	41.61	---	74.00	32.39	H	-3.0
4957.500000	---	29.11	54.00	24.89	H	-3.0
6990.000000	---	30.71	54.00	23.29	H	-0.8
6990.000000	43.07	---	74.00	30.93	H	-0.8
8752.500000	43.67	---	74.00	30.33	H	1.4
8752.500000	---	31.21	54.00	22.79	H	1.4
10357.500000	43.65	---	74.00	30.35	H	2.3
10357.500000	---	31.15	54.00	22.85	H	2.3
13365.000000	---	32.53	54.00	21.47	H	6.5
13365.000000	44.90	---	74.00	29.10	H	6.5



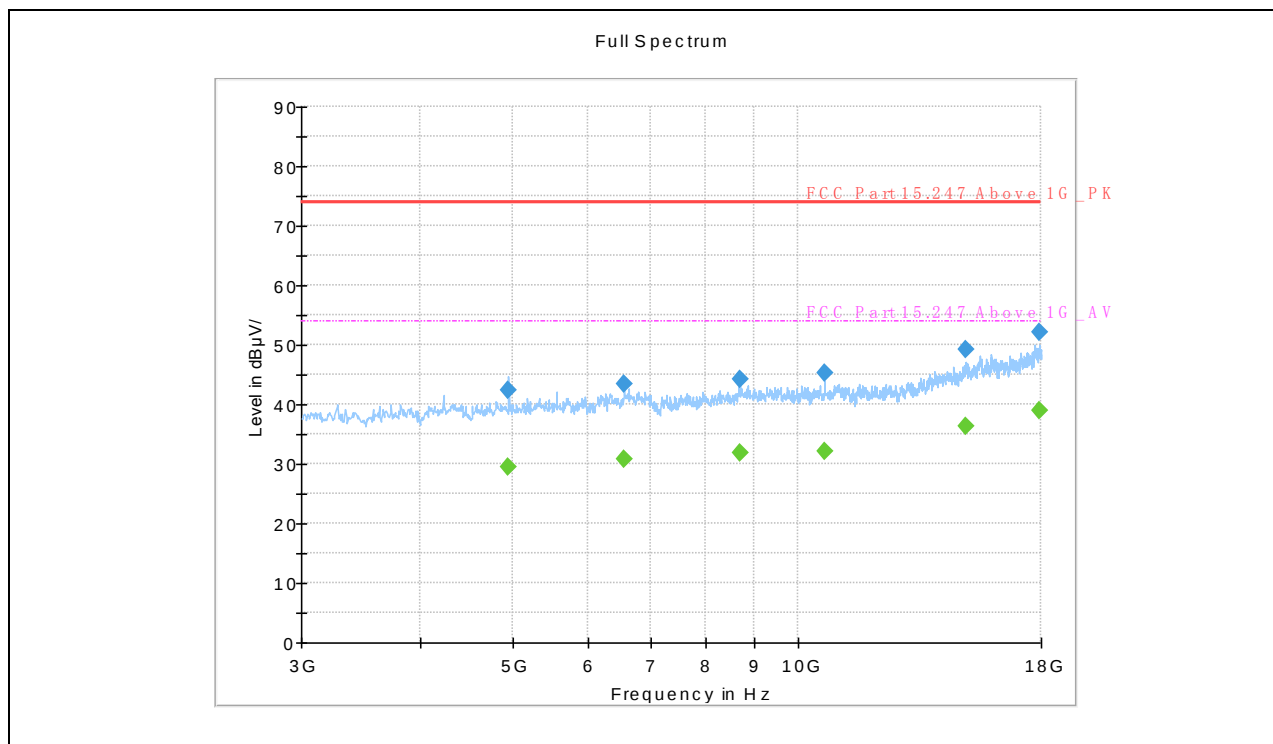
(GFSK _2480MHz, Antenna Vertical, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
39.982917	20.60	---	40.00	19.40	V	15.7
60.635833	20.10	---	40.00	19.90	V	14.5
144.015417	25.81	---	43.50	17.69	V	10.6
219.311667	25.07	---	46.00	20.93	V	14.6
360.163750	22.49	---	46.00	23.51	V	18.6
595.105833	29.65	---	46.00	16.35	V	23.6



(GFSK _2480MHz, Antenna Vertical , 1GHz to 3GHz)

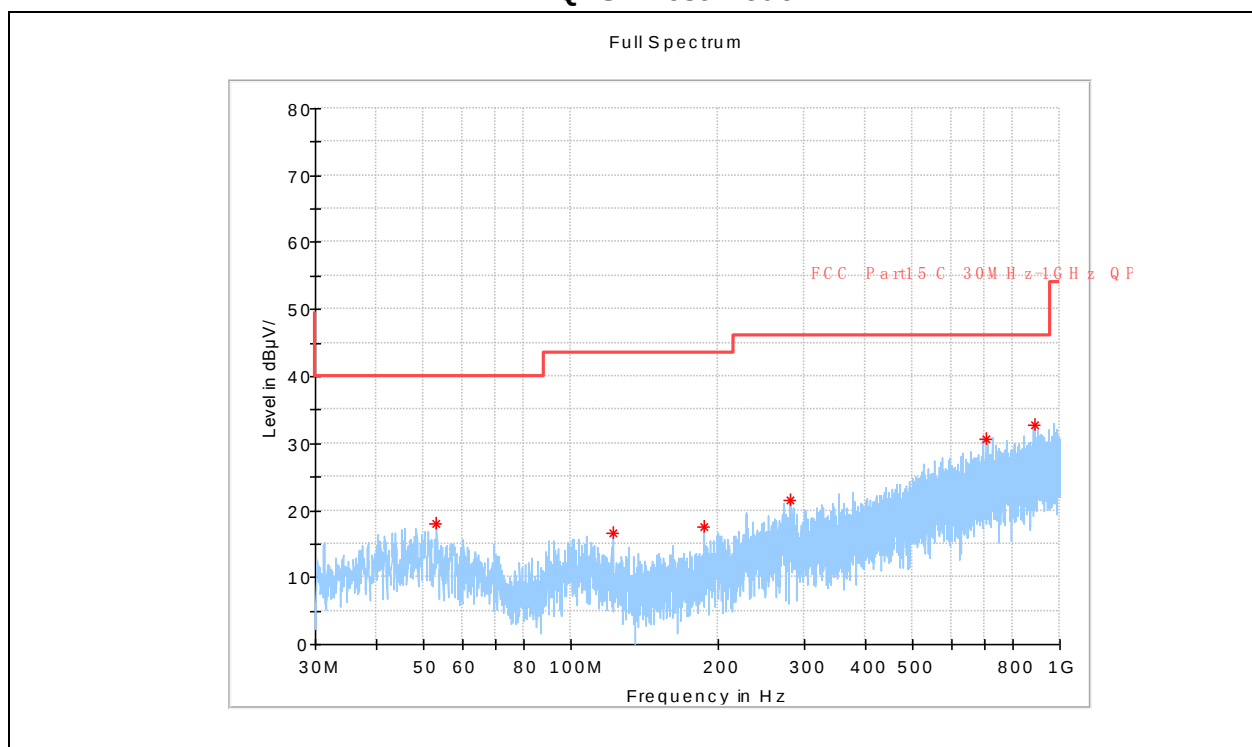
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1215.000000	---	24.39	54.00	29.61	V	-1.4
1215.000000	34.45	---	74.00	39.55	V	-1.4
1640.000000	---	28.03	54.00	25.97	V	3.4
1640.000000	38.49	---	74.00	35.51	V	3.4
1940.000000	---	30.40	54.00	23.60	V	6.6
1940.000000	40.48	---	74.00	33.52	V	6.6
2285.000000	---	33.20	54.00	20.80	V	10.2
2285.000000	43.33	---	74.00	30.67	V	10.2
2690.000000	47.39	---	74.00	26.61	V	14.8
2690.000000	---	37.09	54.00	16.91	V	14.8
3000.000000	51.36	---	74.00	22.64	V	18.4
3000.000000	---	41.54	54.00	12.46	V	18.4



(GFSK _2480MHz, Antenna Vertical, 3GHz to 18GHz)

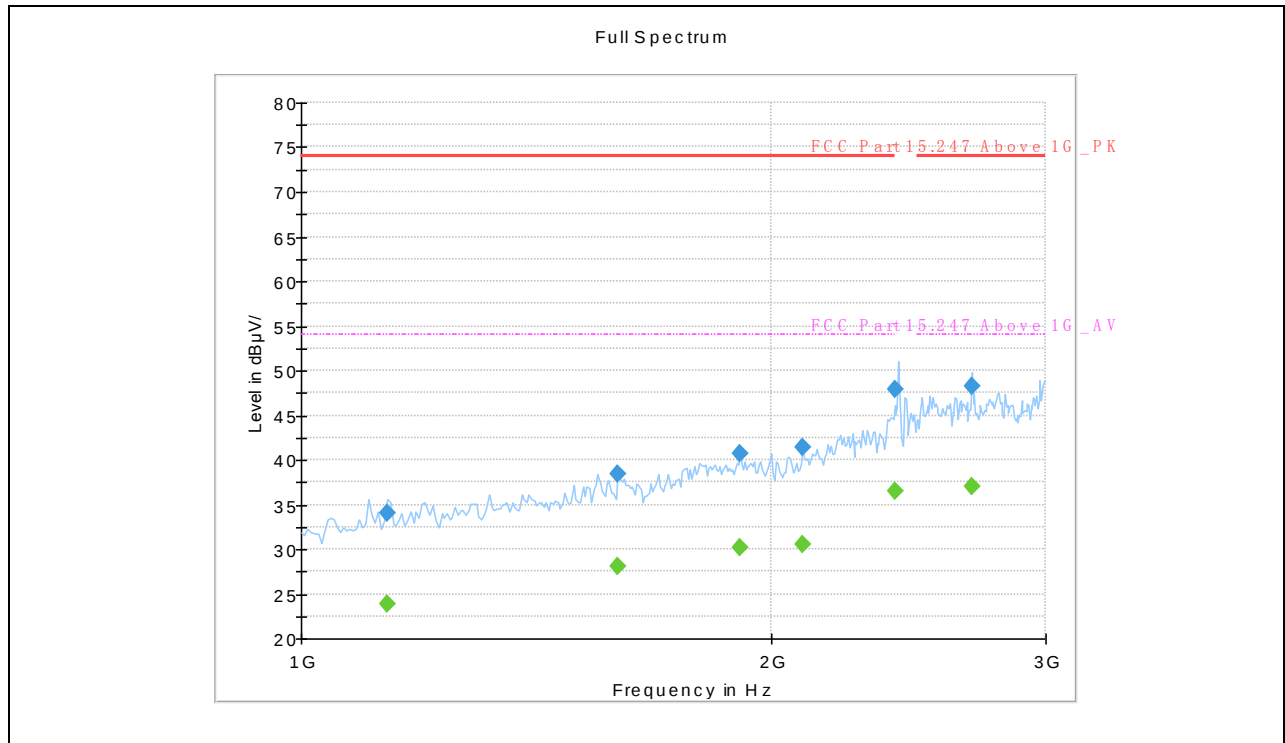
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
4957.500000	42.24	---	74.00	31.76	V	-3.0
4957.500000	---	29.57	54.00	24.43	V	-3.0
6555.000000	---	30.72	54.00	23.28	V	-1.3
6555.000000	43.54	---	74.00	30.46	V	-1.3
8685.000000	---	31.95	54.00	22.05	V	1.3
8685.000000	44.27	---	74.00	29.73	V	1.3
10657.50000	45.17	---	74.00	28.83	V	2.6
10657.50000	---	32.12	54.00	21.88	V	2.6
14992.50000	---	36.40	54.00	17.60	V	10.4
14992.50000	49.16	---	74.00	24.84	V	10.4
17955.00000	---	38.98	54.00	15.02	V	14.6
17955.00000	52.17	---	74.00	21.83	V	14.6

$\pi/4$ -DQPSK Test mode



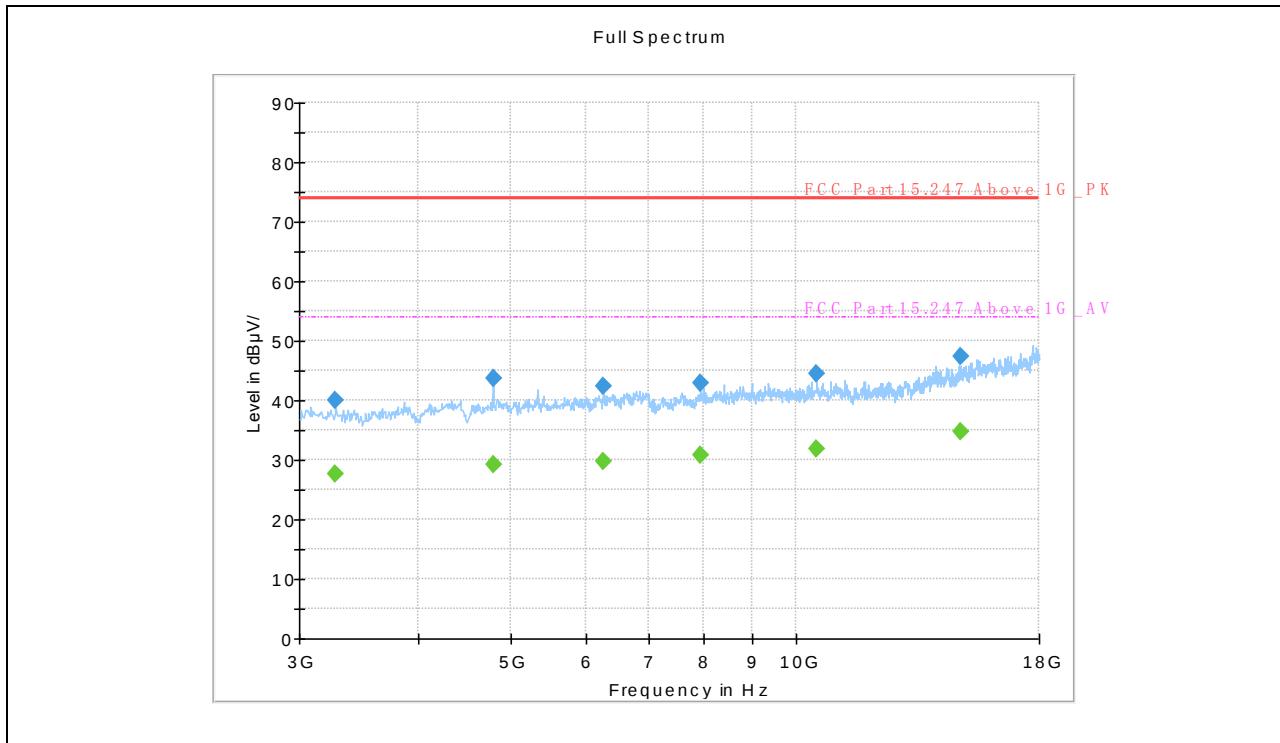
($\pi/4$ -DQPSK _2402MHz, Antenna Horizontal, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
53.158750	18.00	---	40.00	22.00	H	15.4
122.028750	16.59	---	43.50	26.91	H	12.3
187.584583	17.59	---	43.50	25.91	H	12.9
280.017500	21.59	---	46.00	24.41	H	16.8
704.635000	30.57	---	46.00	15.43	H	24.9
889.541250	32.74	---	46.00	13.26	H	27.8



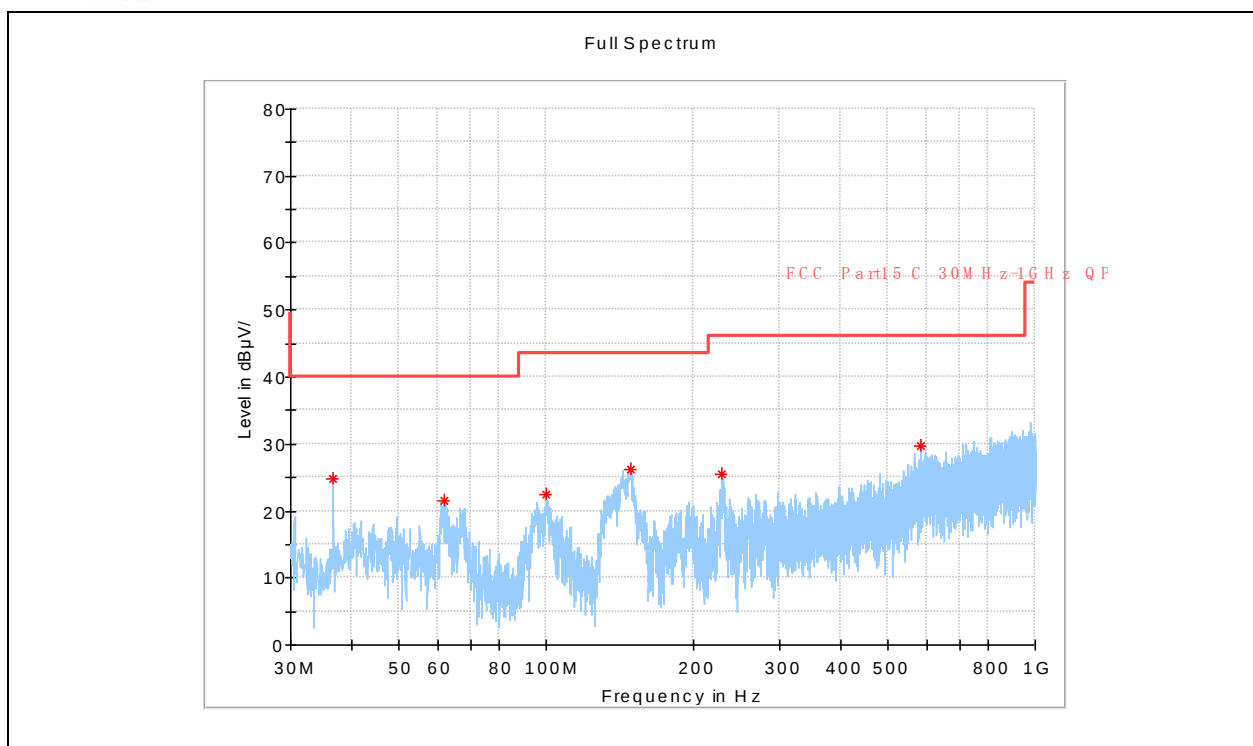
($\pi/4$ -DQPSK _2402MHz, Antenna Horizontal, 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1135.000000	---	23.94	54.00	30.06	H	-1.9
1135.000000	34.06	---	74.00	39.94	H	-1.9
1595.000000	---	28.07	54.00	25.93	H	3.5
1595.000000	38.48	---	74.00	35.52	H	3.5
1910.000000	40.78	---	74.00	33.22	H	6.2
1910.000000	---	30.16	54.00	23.84	H	6.2
2095.000000	---	30.55	54.00	23.45	H	7.6
2095.000000	41.43	---	74.00	32.57	H	7.6
2400.000000	47.85	---	74.00	26.15	H	13.5
2400.000000	---	36.54	54.00	17.46	H	13.5
2690.000000	---	37.09	54.00	16.91	H	14.8
2690.000000	48.17	---	74.00	25.83	H	14.8

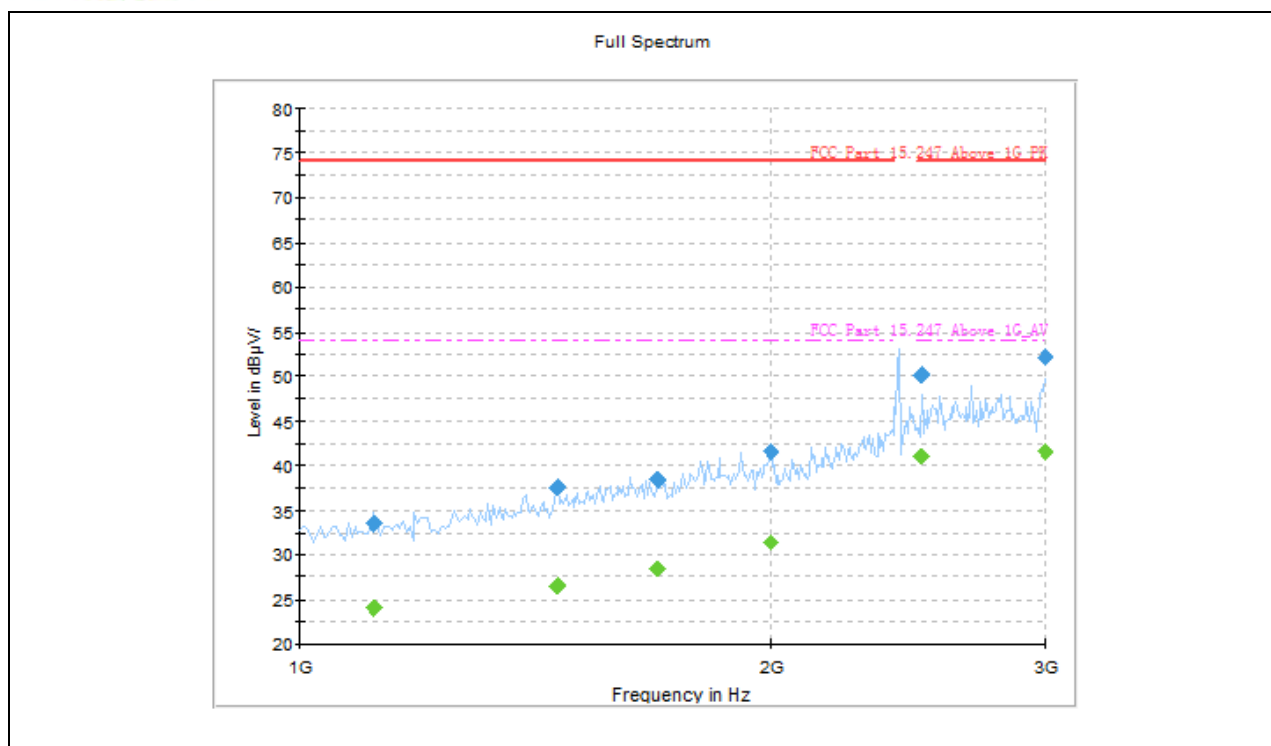


($\pi/4$ -DQPSK _2402MHz, Antenna Horizontal, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
3277.500000	40.04	---	74.00	33.96	H	-5.9
3277.500000	---	27.56	54.00	26.44	H	-5.9
4800.000000	43.62	---	74.00	30.38	H	-3.4
4800.000000	---	29.17	54.00	24.83	H	-3.4
6255.000000	---	29.83	54.00	24.17	H	-1.6
6255.000000	42.37	---	74.00	31.63	H	-1.6
7935.000000	42.78	---	74.00	31.22	H	1.0
7935.000000	---	30.72	54.00	23.28	H	1.0
10492.50000	---	31.88	54.00	22.12	H	2.7
10492.50000	44.47	---	74.00	29.53	H	2.7
14880.00000	47.24	---	74.00	26.76	H	9.1
14880.00000	---	34.66	54.00	19.34	H	9.1

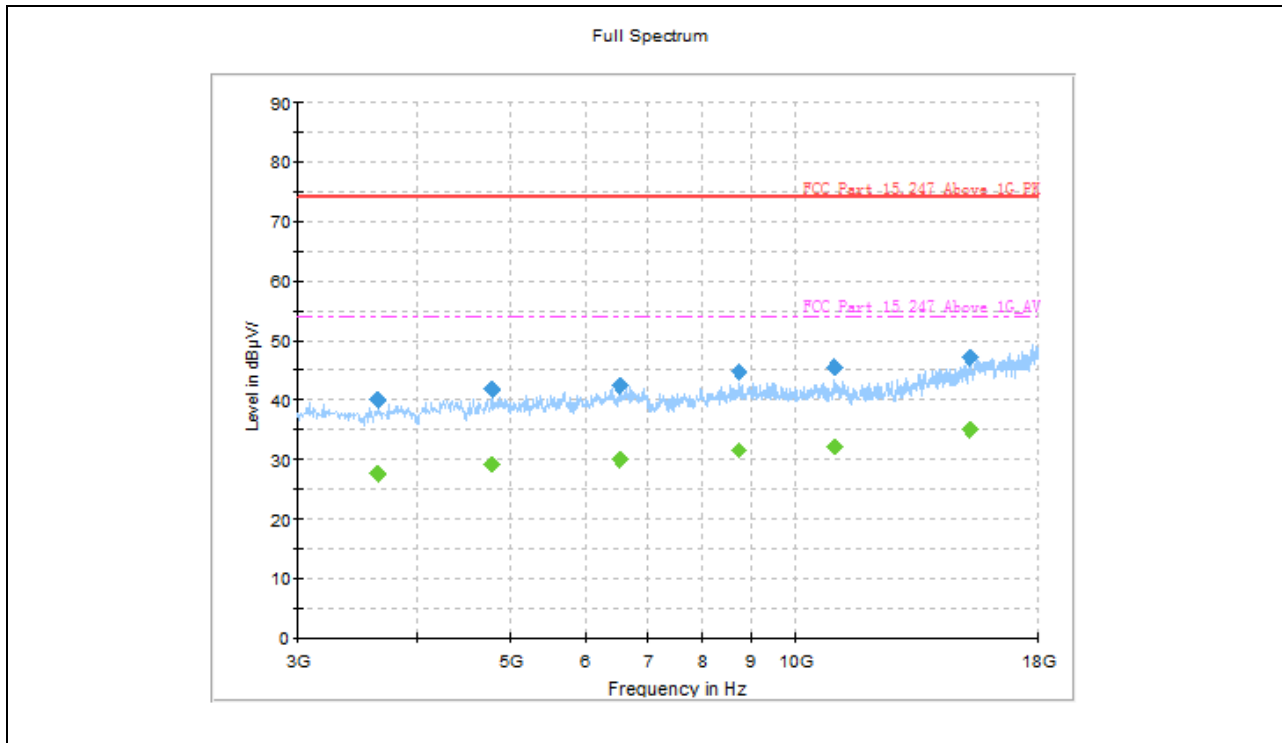


Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
36.668750	24.91	---	40.00	15.09	V	13.4
62.010000	21.51	---	40.00	18.49	V	13.6
99.840000	22.47	---	43.50	21.03	V	15.1
149.390833	26.27	---	43.50	17.23	V	11.5
228.567083	25.44	---	46.00	20.56	V	14.3
584.961250	29.71	---	46.00	16.29	V	23.1



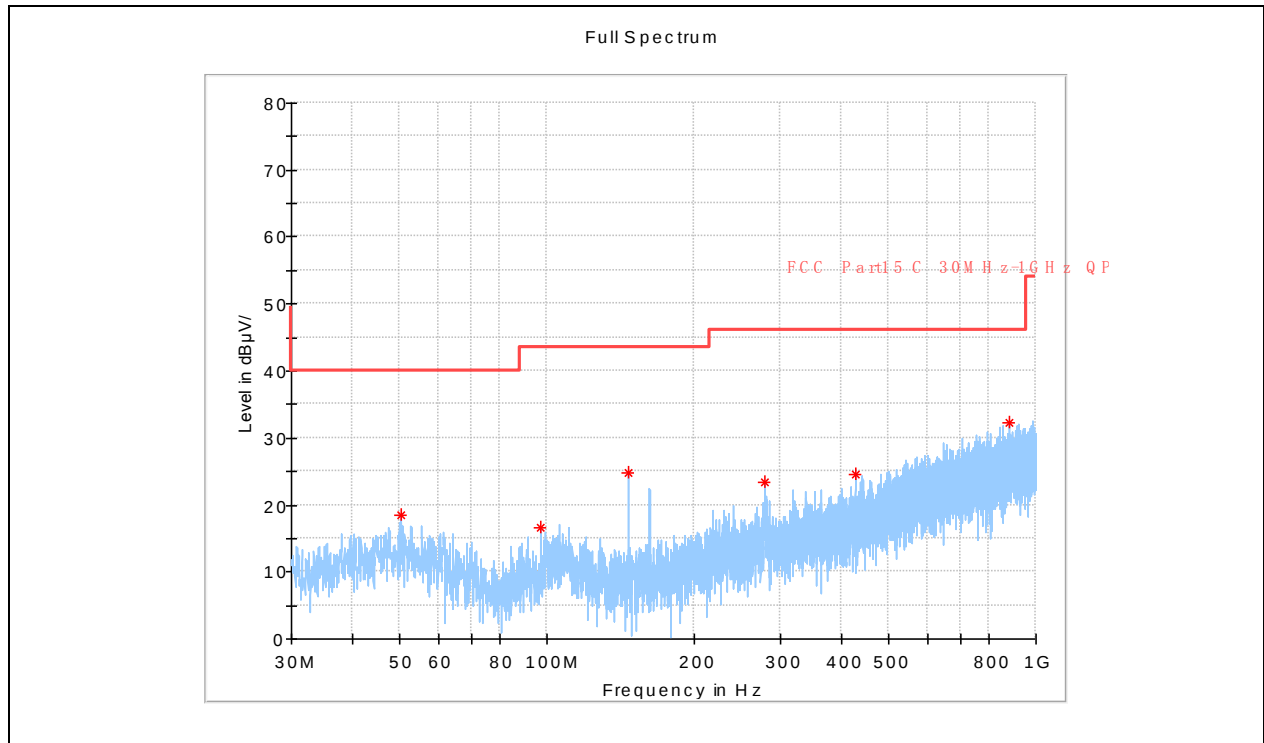
($\pi/4$ -DQPSK_2402MHz, Antenna Vertical , 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1115.000000	33.48	---	74.00	40.52	V	-2.0
1115.000000	---	24.01	54.00	29.99	V	-2.0
1460.000000	---	26.50	54.00	27.50	V	1.6
1460.000000	37.47	---	74.00	36.53	V	1.6
1695.000000	38.48	---	74.00	35.52	V	3.8
1695.000000	---	28.47	54.00	25.53	V	3.8
2000.000000	41.52	---	74.00	32.48	V	7.5
2000.000000	---	31.39	54.00	22.61	V	7.5
2500.000000	---	41.06	54.00	12.94	V	13.2
2500.000000	50.11	---	74.00	23.89	V	13.2
3000.000000	52.04	---	74.00	21.96	V	18.4
3000.000000	---	41.53	54.00	12.47	V	18.4



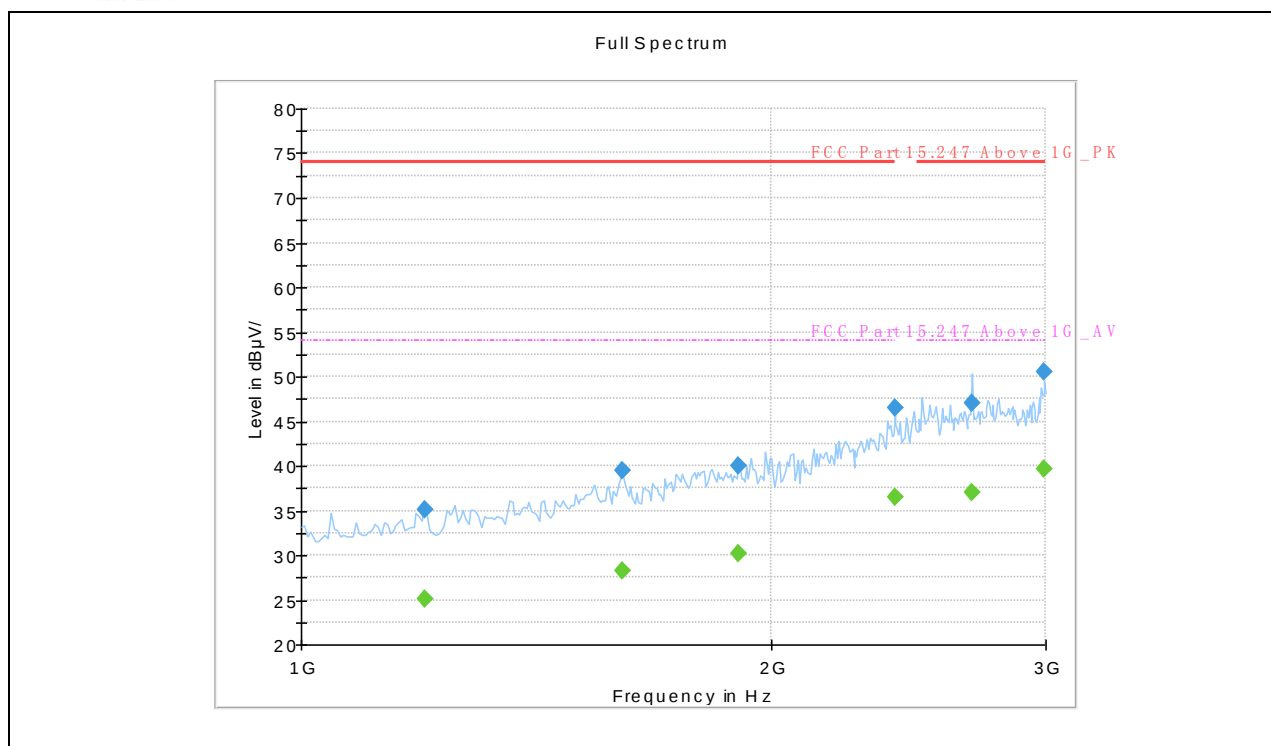
($\pi/4$ -DQPSK _2402MHz, Antenna Vertical, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
3645.000000	39.88	---	74.00	34.12	V	-5.7
3645.000000	---	27.53	54.00	26.47	V	-5.7
4800.000000	41.76	---	74.00	32.24	V	-3.4
4800.000000	---	29.16	54.00	24.84	V	-3.4
6540.000000	42.40	---	74.00	31.60	V	-1.3
6540.000000	---	29.91	54.00	24.09	V	-1.3
8707.500000	44.79	---	74.00	29.21	V	1.3
8707.500000	---	31.57	54.00	22.43	V	1.3
10972.500000	---	31.99	54.00	22.01	V	3.3
10972.500000	45.41	---	74.00	28.59	V	3.3
15240.000000	---	34.92	54.00	19.08	V	9.8
15240.000000	47.05	---	74.00	26.95	V	9.8



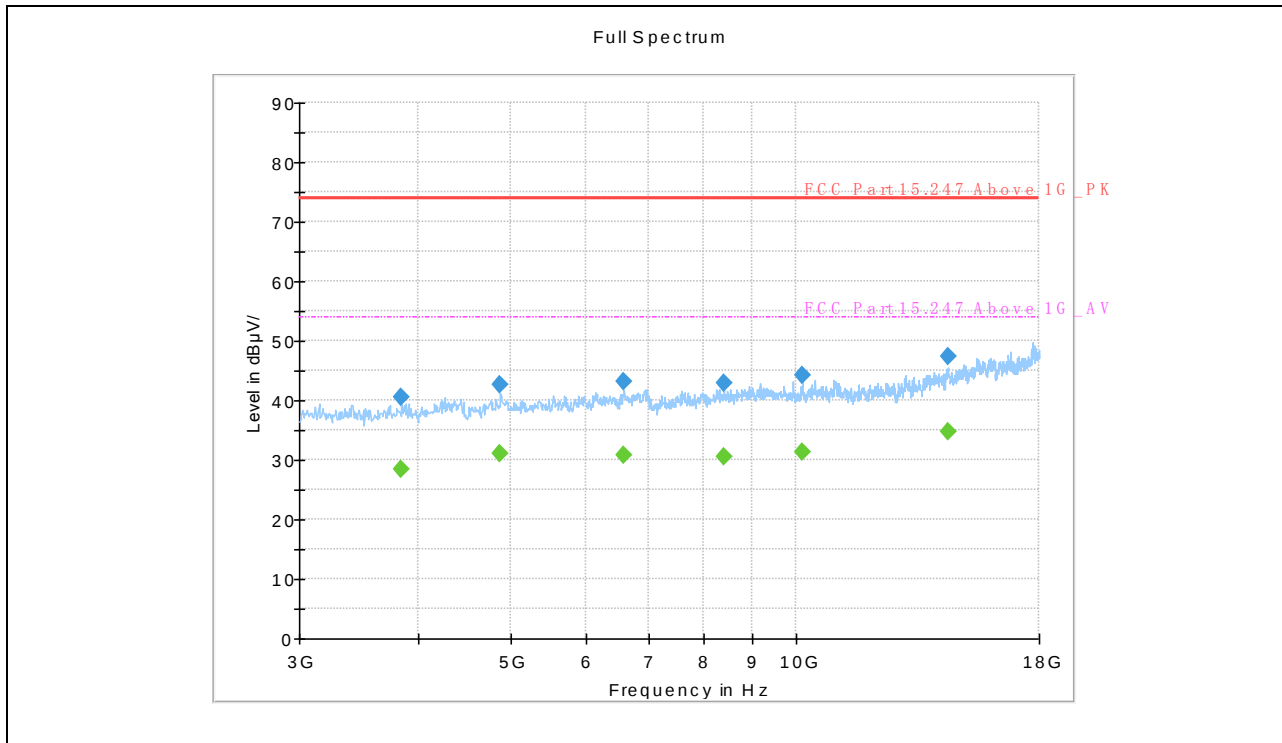
($\pi/4$ -DQPSK _2441MHz, Antenna Horizontal, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
50.289167	18.55	---	40.00	21.45	H	16.1
96.808750	16.68	---	43.50	26.82	H	13.4
146.682917	24.84	---	43.50	18.66	H	10.8
278.764583	23.50	---	46.00	22.50	H	16.4
426.325833	24.67	---	46.00	21.33	H	19.5
879.679583	32.23	---	46.00	13.77	H	27.6



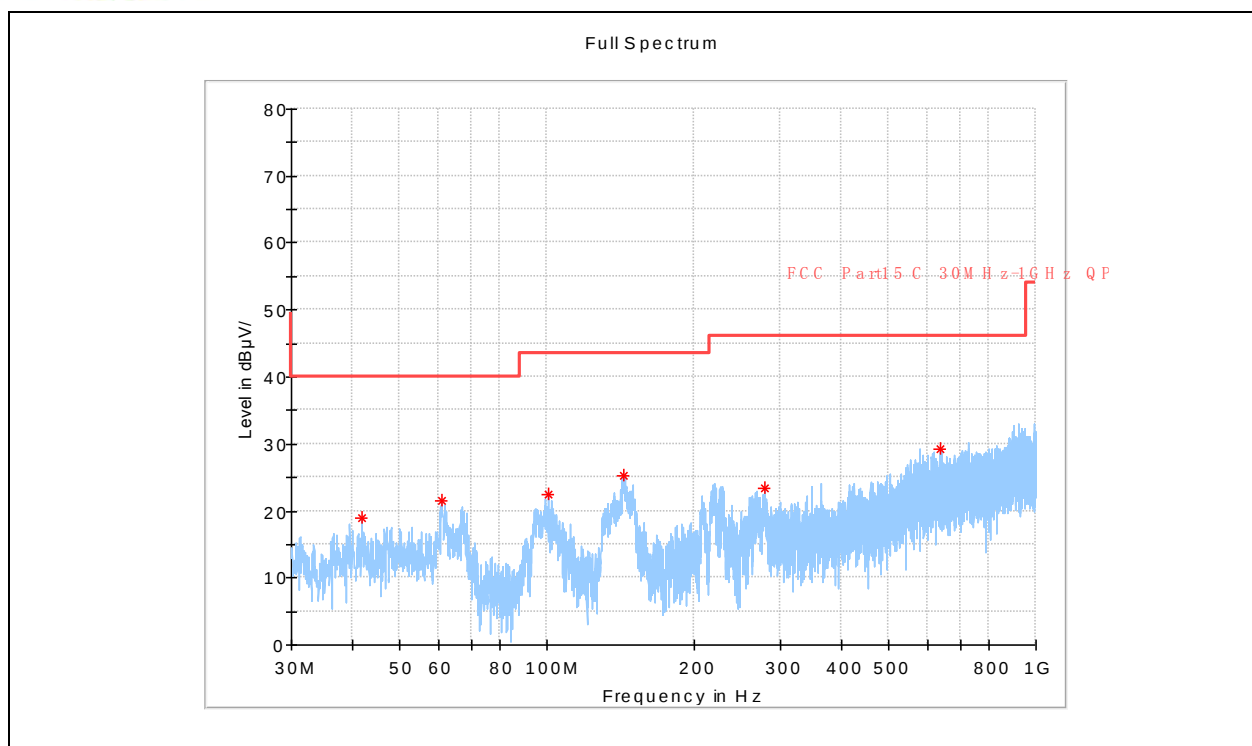
($\pi/4$ -DQPSK _2441MHz, Antenna Horizontal, 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1200.000000	---	25.04	54.00	28.96	H	-0.4
1200.000000	35.17	---	74.00	38.83	H	-0.4
1605.000000	39.41	---	74.00	34.59	H	3.6
1605.000000	---	28.33	54.00	25.67	H	3.6
1905.000000	39.97	---	74.00	34.03	H	6.2
1905.000000	---	30.10	54.00	23.90	H	6.2
2400.000000	---	36.54	54.00	17.46	H	13.5
2400.000000	46.56	---	74.00	27.44	H	13.5
2690.000000	47.02	---	74.00	26.98	H	14.8
2690.000000	---	37.09	54.00	16.91	H	14.8
2995.000000	50.57	---	74.00	23.43	H	17.9
2995.000000	---	39.63	54.00	14.37	H	17.9



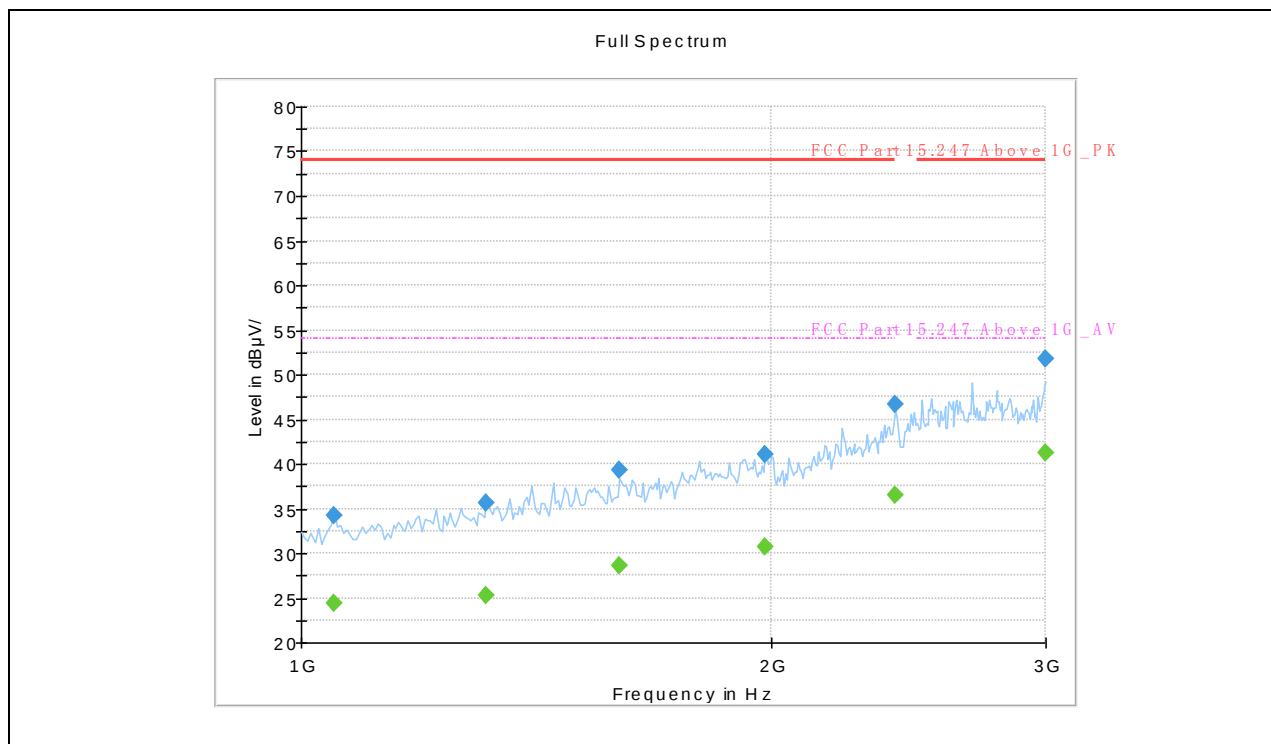
($\pi/4$ -DQPSK _2441MHz, Antenna Horizontal, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
3840.000000	40.45	---	74.00	33.55	H	-4.8
3840.000000	---	28.40	54.00	25.60	H	-4.8
4882.500000	---	30.99	54.00	23.01	H	-2.8
4882.500000	42.63	---	74.00	31.37	H	-2.8
6592.500000	43.12	---	74.00	30.88	H	-1.2
6592.500000	---	30.81	54.00	23.19	H	-1.2
8400.000000	42.80	---	74.00	31.20	H	0.9
8400.000000	---	30.63	54.00	23.37	H	0.9
10147.50000	44.09	---	74.00	29.91	H	2.1
10147.50000	---	31.44	54.00	22.56	H	2.1
14422.50000	---	34.84	54.00	19.16	H	9.3
14422.50000	47.44	---	74.00	26.56	H	9.3



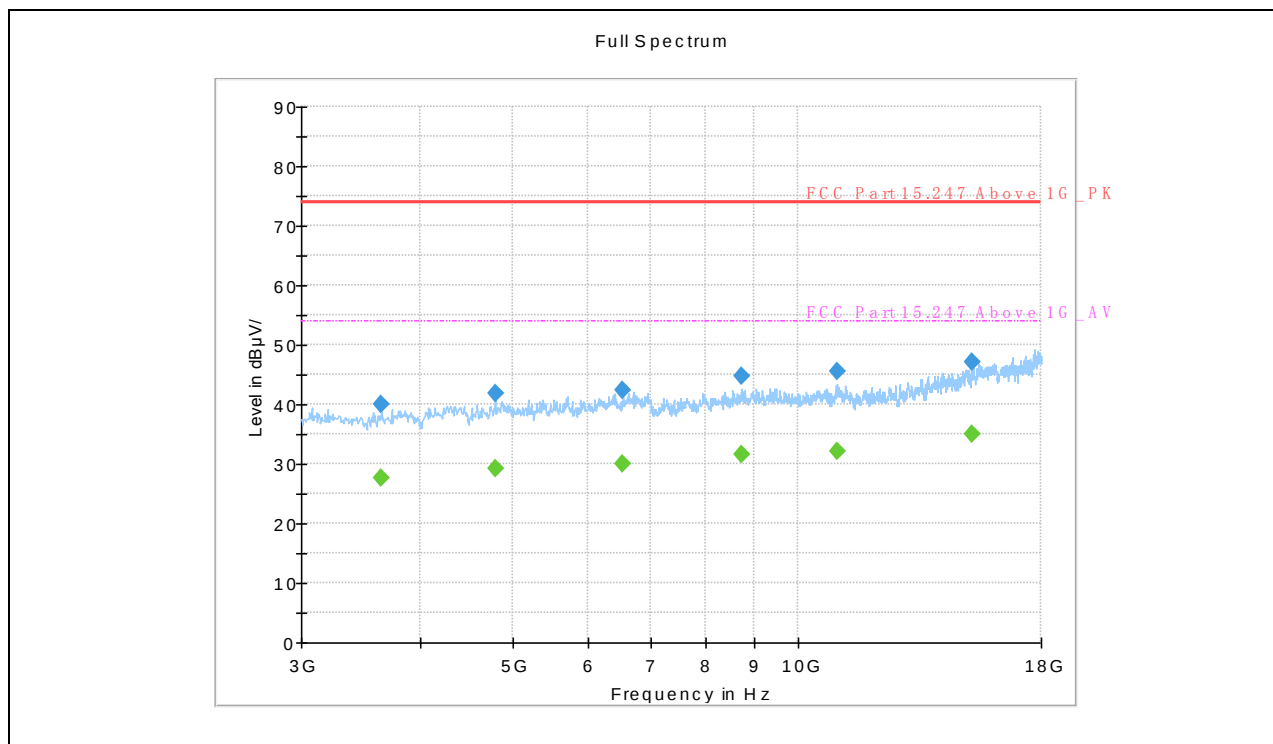
(π/4-DQPSK _2441MHz, Antenna Vertical, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
41.720833	19.05	---	40.00	20.95	V	15.0
60.918750	21.45	---	40.00	18.55	V	14.3
100.729167	22.41	---	43.50	21.09	V	15.1
143.328333	25.37	---	43.50	18.13	V	10.8
278.239167	23.45	---	46.00	22.55	V	16.3
637.664583	29.27	---	46.00	16.73	V	24.0



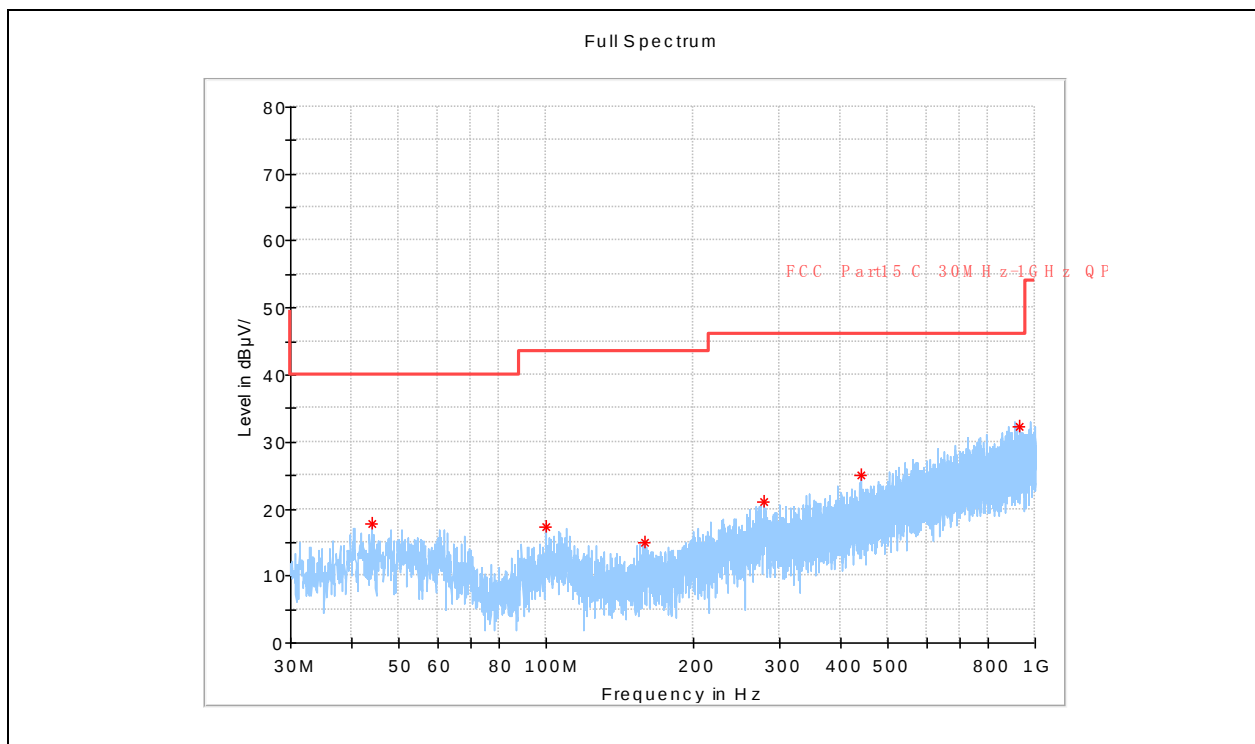
($\pi/4$ -DQPSK_2441MHz, Antenna Vertical , 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1050.000000	34.17	---	74.00	39.83	V	-1.9
1050.000000	---	24.35	54.00	29.65	V	-1.9
1315.000000	35.63	---	74.00	38.37	V	0.0
1315.000000	---	25.31	54.00	28.69	V	0.0
1600.000000	39.26	---	74.00	34.74	V	3.8
1600.000000	---	28.52	54.00	25.48	V	3.8
1985.000000	---	30.79	54.00	23.21	V	7.1
1985.000000	41.09	---	74.00	32.91	V	7.1
2400.000000	---	36.58	54.00	17.42	V	13.5
2400.000000	46.75	---	74.00	27.25	V	13.5
3000.000000	51.69	---	74.00	22.31	V	18.4
3000.000000	---	41.27	54.00	12.73	V	18.4



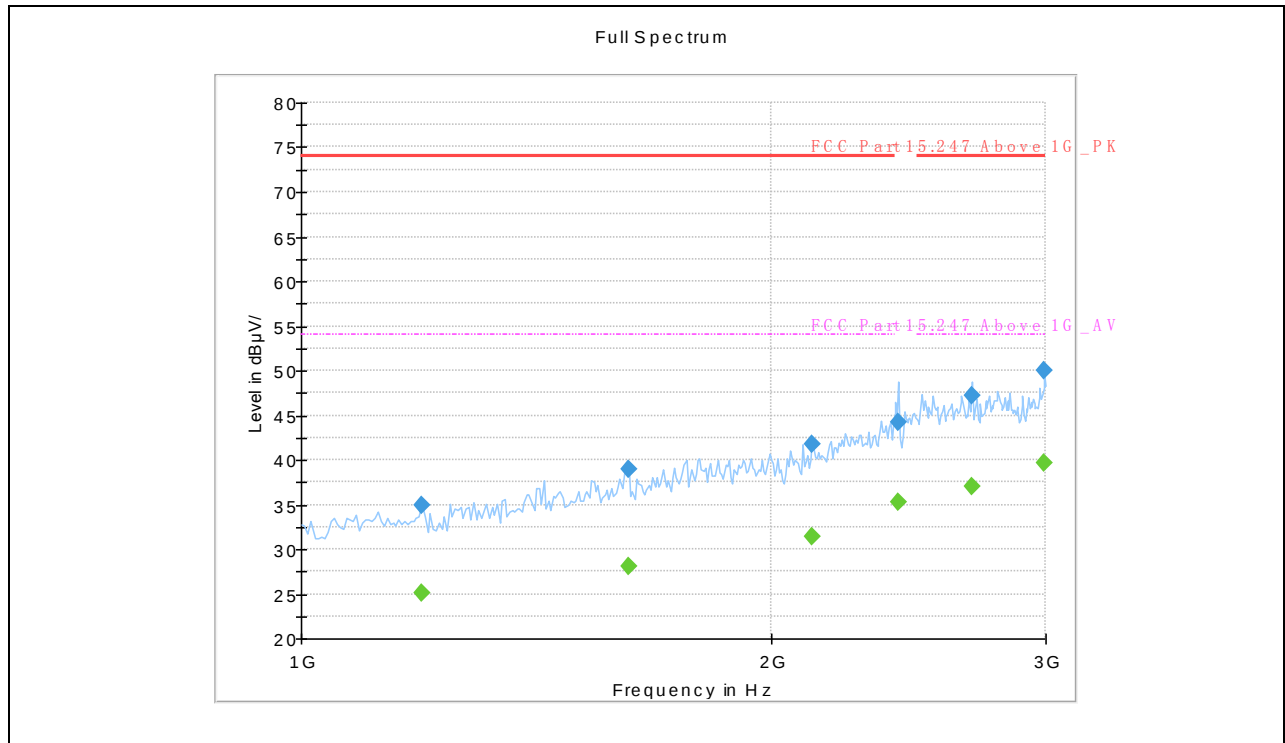
($\pi/4$ -DQPSK _2441MHz, Antenna Vertical, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
3645.000000	39.88	---	74.00	34.12	V	-5.7
3645.000000	---	27.53	54.00	26.47	V	-5.7
4800.000000	41.76	---	74.00	32.24	V	-3.4
4800.000000	---	29.16	54.00	24.84	V	-3.4
6540.000000	42.40	---	74.00	31.60	V	-1.3
6540.000000	---	29.91	54.00	24.09	V	-1.3
8707.500000	44.79	---	74.00	29.21	V	1.3
8707.500000	---	31.57	54.00	22.43	V	1.3
10972.50000	---	31.99	54.00	22.01	V	3.3
10972.50000	45.41	---	74.00	28.59	V	3.3
15240.00000	---	34.92	54.00	19.08	V	9.8
15240.00000	47.05	---	74.00	26.95	V	9.8



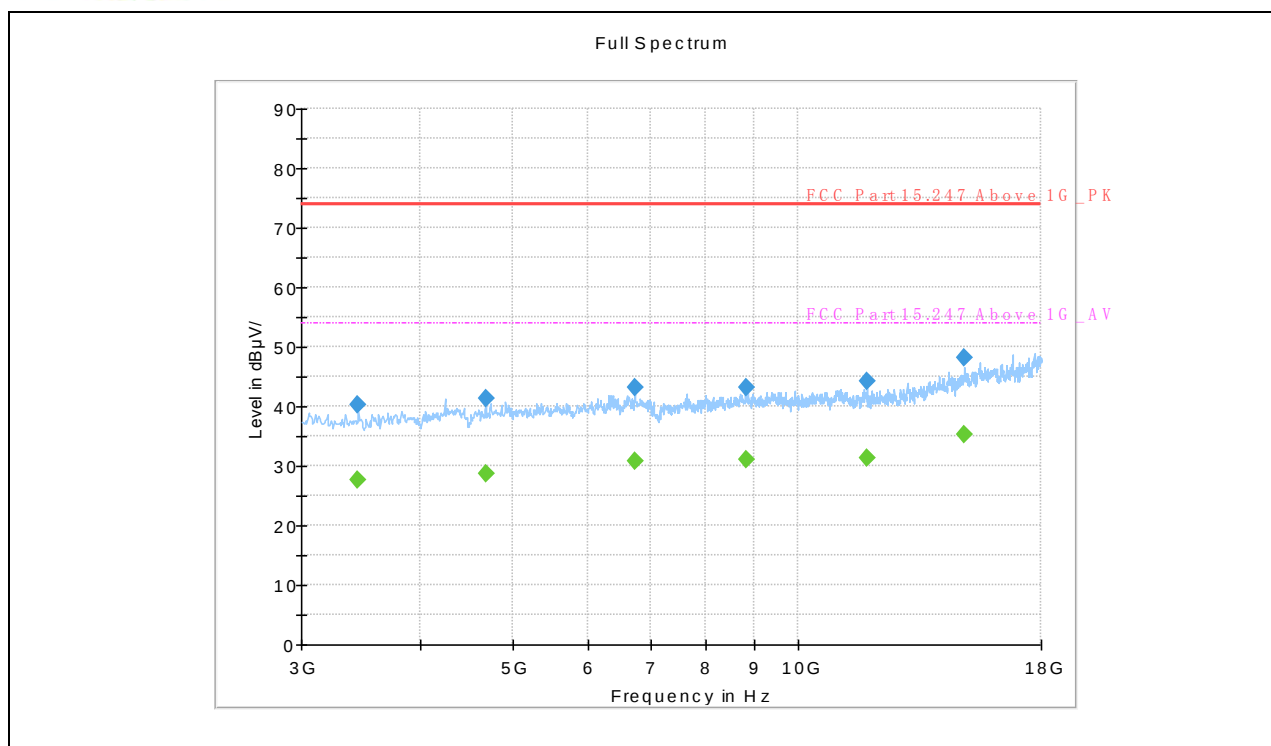
($\pi/4$ -DQPSK _2480MHz, Antenna Horizontal, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
43.943750	17.88	---	40.00	22.12	H	15.3
100.203750	17.28	---	43.50	26.22	H	15.2
158.565417	15.03	---	43.50	28.47	H	11.8
279.532500	21.01	---	46.00	24.99	H	16.6
441.684167	25.02	---	46.00	20.98	H	20.4
927.290417	32.39	---	46.00	13.61	H	28.0



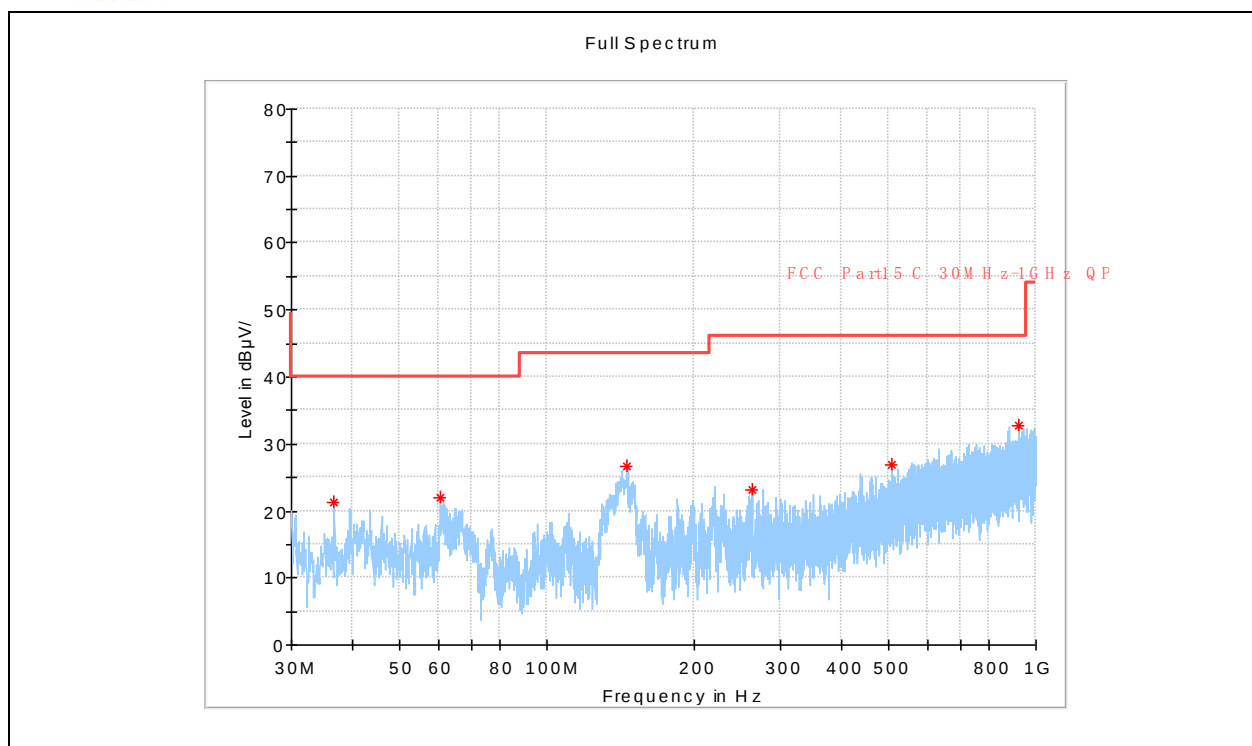
($\pi/4$ -DQPSK _2480MHz, Antenna Horizontal, 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1195.000000	---	25.02	54.00	28.98	H	-0.6
1195.000000	34.88	---	74.00	39.12	H	-0.6
1620.000000	---	28.02	54.00	25.98	H	3.3
1620.000000	39.00	---	74.00	35.00	H	3.3
2125.000000	---	31.32	54.00	22.68	H	8.2
2125.000000	41.73	---	74.00	32.27	H	8.2
2415.000000	44.26	---	74.00	29.74	H	12.7
2415.000000	---	35.25	54.00	18.75	H	12.7
2690.000000	---	37.09	54.00	16.91	H	14.8
2690.000000	47.21	---	74.00	26.79	H	14.8
2995.000000	49.94	---	74.00	24.06	H	17.9
2995.000000	---	39.63	54.00	14.37	H	17.9



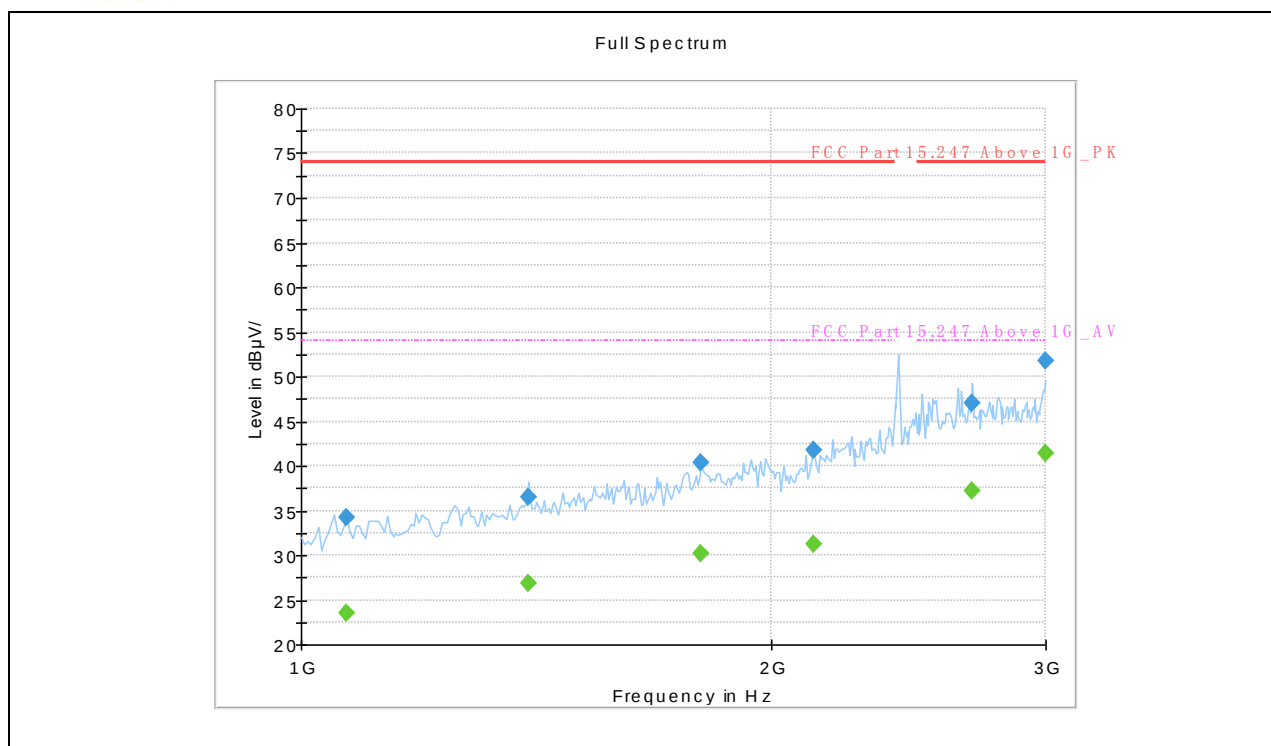
($\pi/4$ -DQPSK _2480MHz, Antenna Horizontal, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
3442.500000	---	27.70	54.00	26.30	H	-5.8
3442.500000	40.22	---	74.00	33.78	H	-5.8
4687.500000	---	28.77	54.00	25.23	H	-3.6
4687.500000	41.22	---	74.00	32.78	H	-3.6
6727.500000	43.16	---	74.00	30.84	H	-1.1
6727.500000	---	30.68	54.00	23.32	H	-1.1
8812.500000	---	31.03	54.00	22.97	H	1.5
8812.500000	43.18	---	74.00	30.82	H	1.5
11797.500000	44.21	---	74.00	29.79	H	3.4
11797.500000	---	31.25	54.00	22.75	H	3.4
14955.000000	---	35.39	54.00	18.61	H	9.7
14955.000000	48.10	---	74.00	25.90	H	9.7



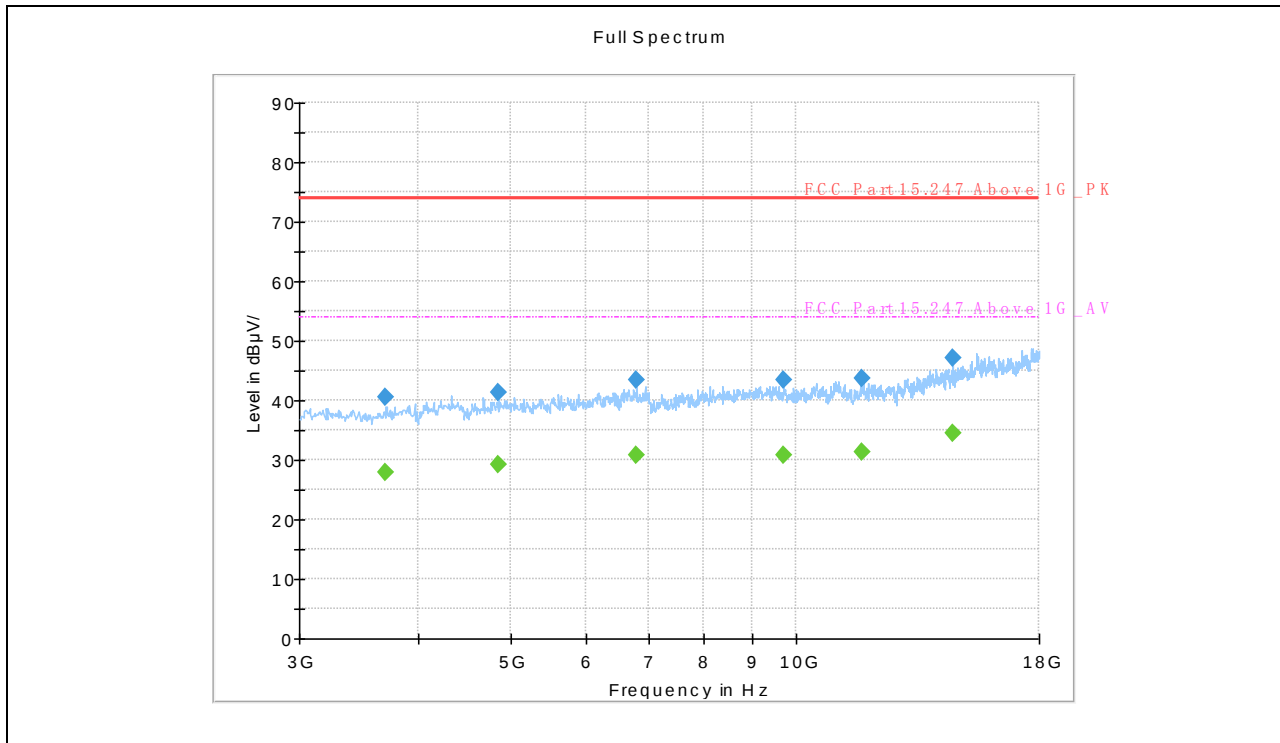
($\pi/4$ -DQPSK _2480MHz, Antenna Vertical, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
36.709167	21.20	---	40.00	18.80	V	13.5
60.352917	21.98	---	40.00	18.02	V	14.6
146.157500	26.66	---	43.50	16.84	V	10.7
261.951250	23.26	---	46.00	22.74	V	15.7
508.816250	26.91	---	46.00	19.09	V	22.0
924.542083	32.73	---	46.00	13.27	V	28.0



($\pi/4$ -DQPSK_2480MHz, Antenna Vertical , 1GHz to 3GHz)

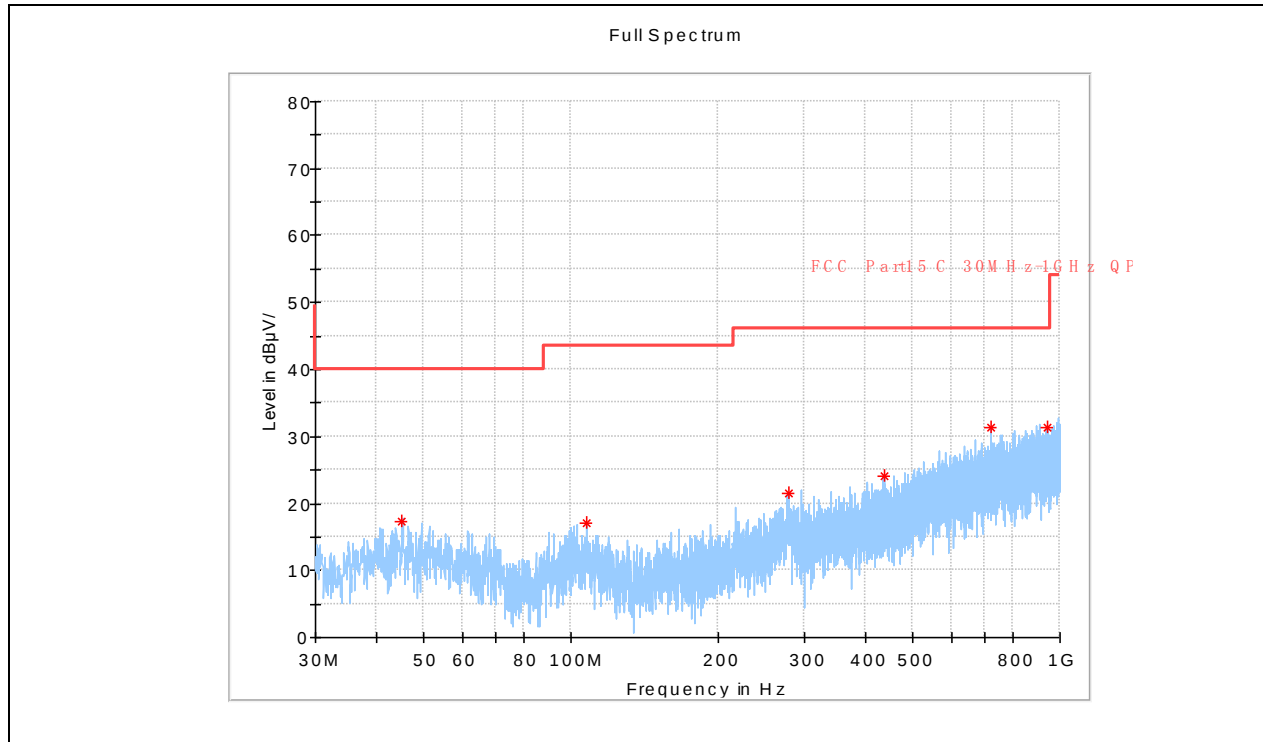
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1070.000000	34.20	---	74.00	39.80	V	-2.6
1070.000000	---	23.55	54.00	30.45	V	-2.6
1400.000000	36.49	---	74.00	37.51	V	1.7
1400.000000	---	26.79	54.00	27.21	V	1.7
1805.000000	---	30.22	54.00	23.78	V	6.4
1805.000000	40.39	---	74.00	33.61	V	6.4
2130.000000	---	31.28	54.00	22.72	V	8.2
2130.000000	41.83	---	74.00	32.17	V	8.2
2690.000000	---	37.12	54.00	16.88	V	14.8
2690.000000	46.95	---	74.00	27.05	V	14.8
3000.000000	---	41.35	54.00	12.65	V	18.4
3000.000000	51.70	---	74.00	22.30	V	18.4



($\pi/4$ -DQPSK _2480MHz, Antenna Vertical, 3GHz to 18GHz)

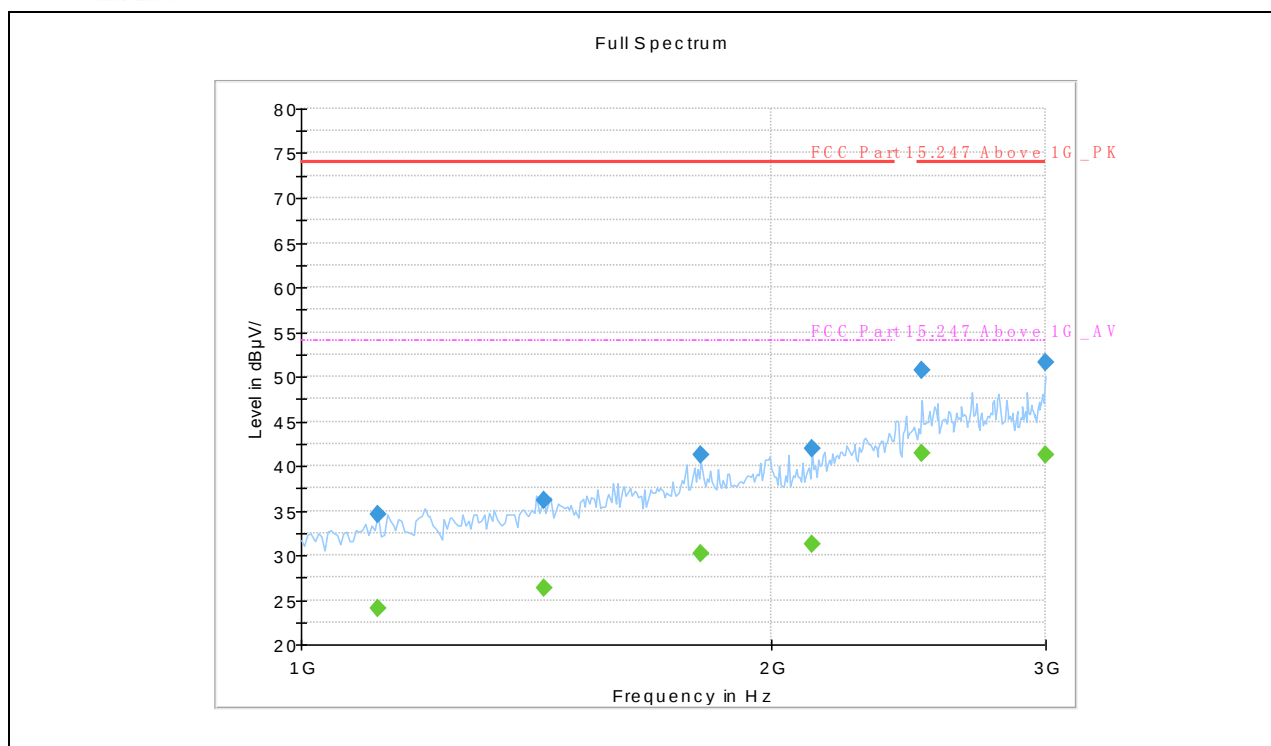
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
3697.500000	40.65	---	74.00	33.35	V	-5.3
3697.500000	---	27.87	54.00	26.13	V	-5.3
4860.000000	---	29.33	54.00	24.67	V	-3.0
4860.000000	41.25	---	74.00	32.75	V	-3.0
6795.000000	43.42	---	74.00	30.58	V	-1.1
6795.000000	---	30.82	54.00	23.18	V	-1.1
9697.500000	43.30	---	74.00	30.70	V	1.8
9697.500000	---	30.91	54.00	23.09	V	1.8
11730.000000	---	31.23	54.00	22.77	V	3.9
11730.000000	43.63	---	74.00	30.37	V	3.9
14595.000000	47.06	---	74.00	26.94	V	8.6
14595.000000	---	34.50	54.00	19.50	V	8.6

8-DPSK Test mode



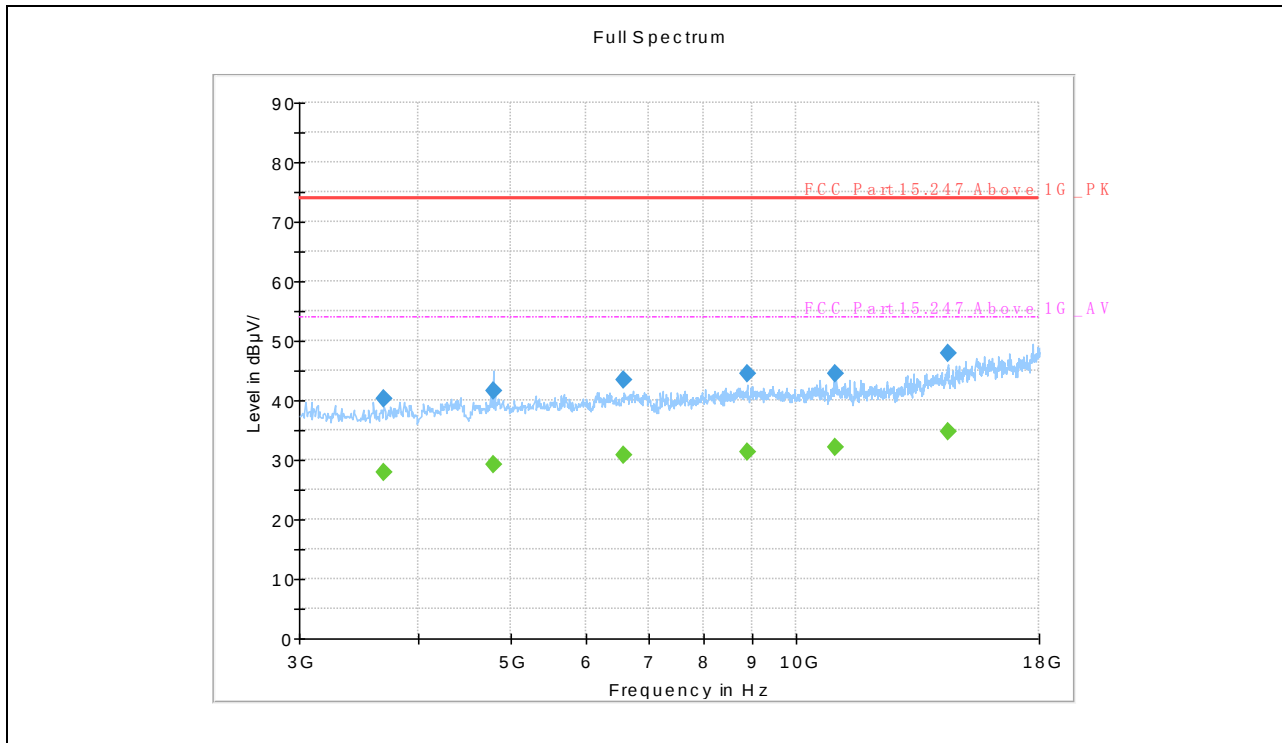
(8-DPSK _2402MHz, Antenna Horizontal, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
45.156250	17.38	---	40.00	22.62	H	15.4
107.478750	16.99	---	43.50	26.51	H	14.5
278.845417	21.50	---	46.00	24.50	H	16.4
437.682917	24.08	---	46.00	21.92	H	20.2
721.569583	31.32	---	46.00	14.68	H	25.1
942.689167	31.24	---	46.00	14.76	H	28.4



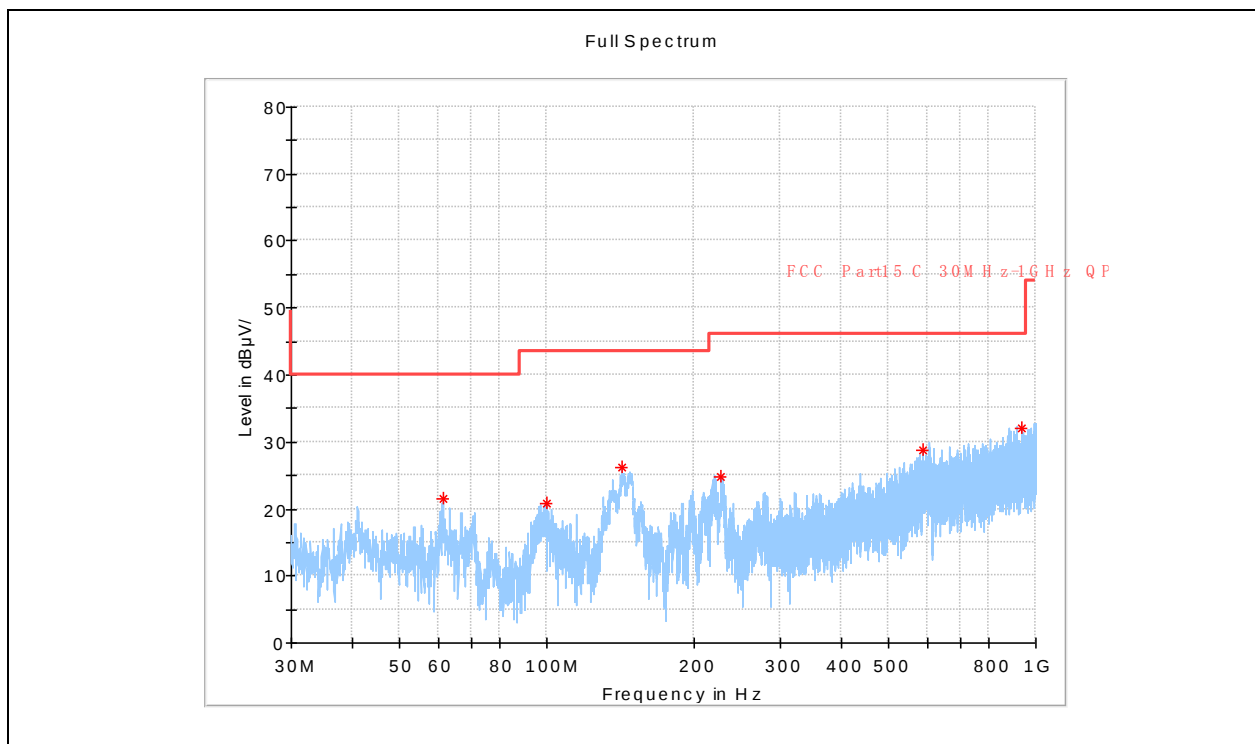
(8-DPSK _2402MHz, Antenna Horizontal, 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1120.000000	---	24.10	54.00	29.90	H	-2.0
1120.000000	34.63	---	74.00	39.37	H	-2.0
1430.000000	36.18	---	74.00	37.82	H	1.4
1430.000000	---	26.34	54.00	27.66	H	1.4
1805.000000	41.21	---	74.00	32.79	H	6.4
1805.000000	---	30.20	54.00	23.80	H	6.4
2125.000000	---	31.26	54.00	22.74	H	8.2
2125.000000	41.99	---	74.00	32.01	H	8.2
2500.000000	---	41.36	54.00	12.64	H	13.2
2500.000000	50.68	---	74.00	23.32	H	13.2
3000.000000	---	41.17	54.00	12.83	H	18.4
3000.000000	51.67	---	74.00	22.33	H	18.4



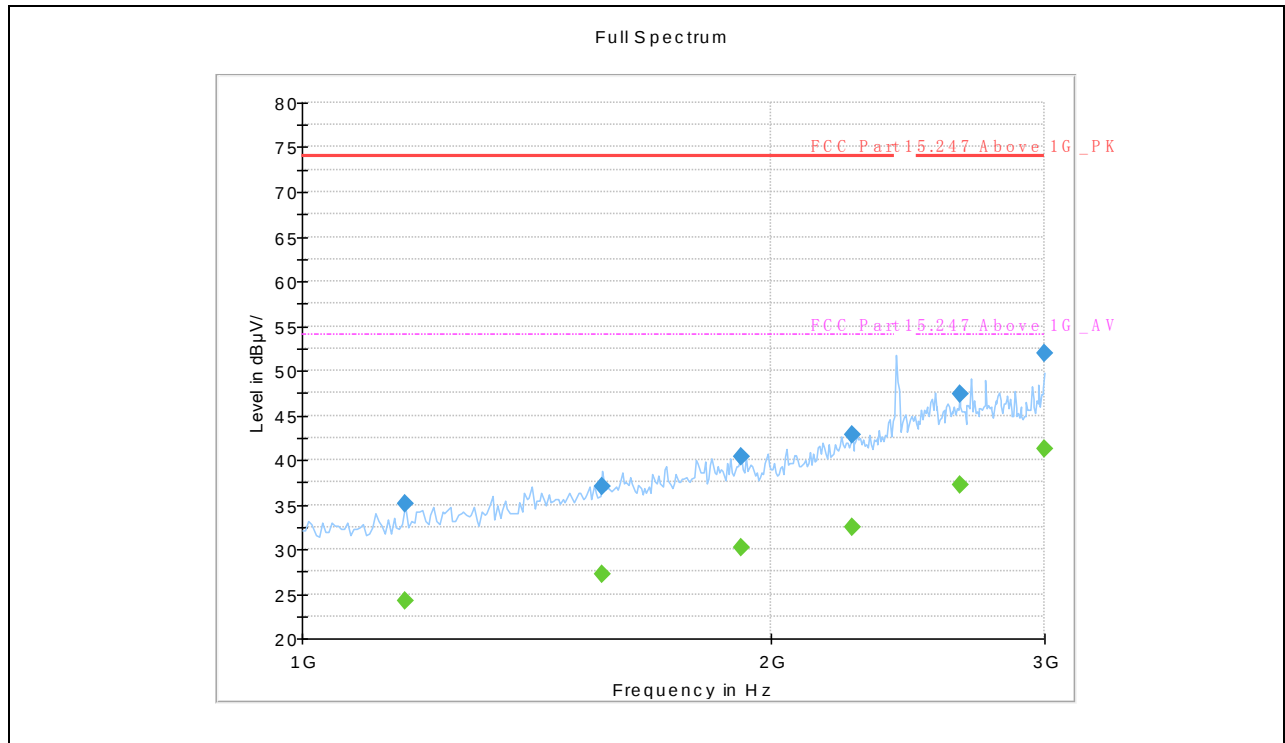
(8-DPSK _2402MHz, Antenna Horizontal, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
3682.500000	---	27.95	54.00	26.05	H	-5.3
3682.500000	40.18	---	74.00	33.82	H	-5.3
4800.000000	41.60	---	74.00	32.40	H	-3.4
4800.000000	---	29.19	54.00	24.81	H	-3.4
6592.500000	---	30.81	54.00	23.19	H	-1.2
6592.500000	43.34	---	74.00	30.66	H	-1.2
8872.500000	---	31.21	54.00	22.79	H	1.4
8872.500000	44.38	---	74.00	29.62	H	1.4
11002.50000	44.39	---	74.00	29.61	H	3.4
11002.50000	---	32.17	54.00	21.83	H	3.4
14422.50000	---	34.85	54.00	19.15	H	9.3
14422.50000	47.97	---	74.00	26.03	H	9.3



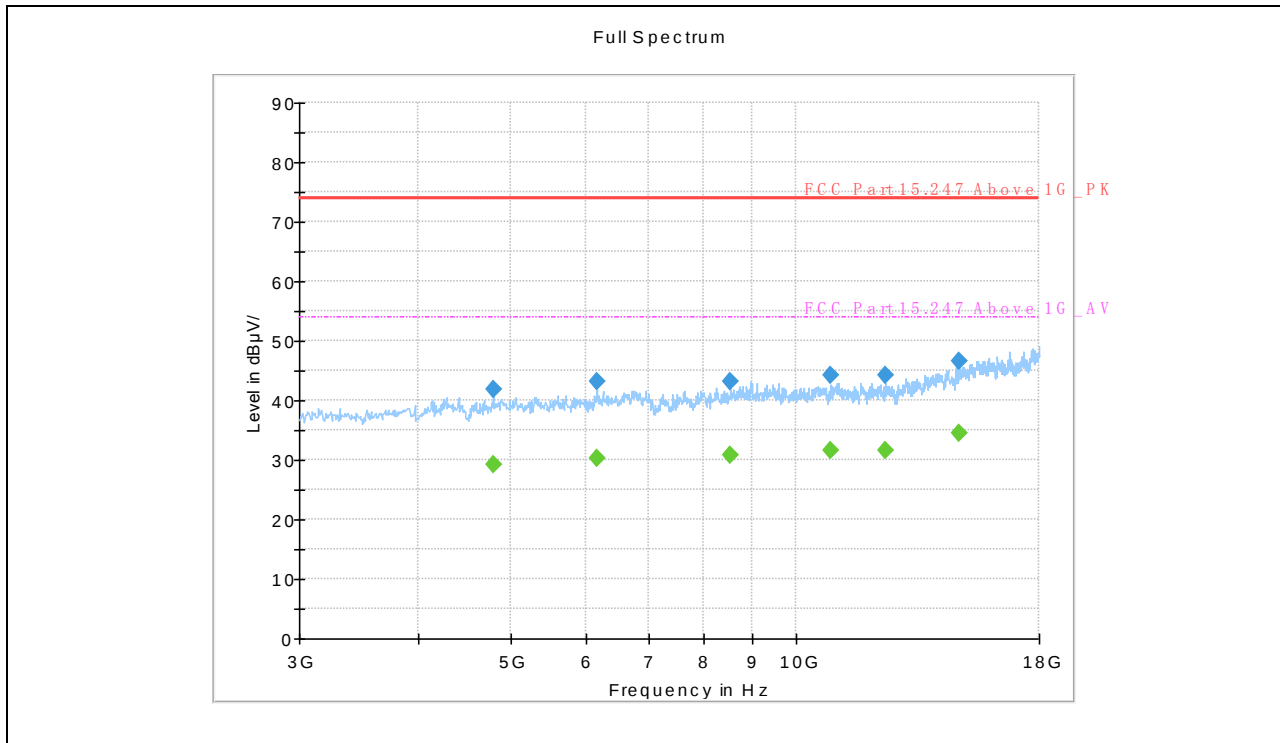
(8-DPSK _2402MHz, Antenna Vertical, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
61.363333	21.54	---	40.00	18.46	V	14.0
99.637917	20.82	---	43.50	22.68	V	14.9
142.681667	26.30	---	43.50	17.20	V	11.2
227.516250	24.90	---	46.00	21.10	V	14.2
589.124167	28.74	---	46.00	17.26	V	23.2
933.595417	31.94	---	46.00	14.06	V	28.2



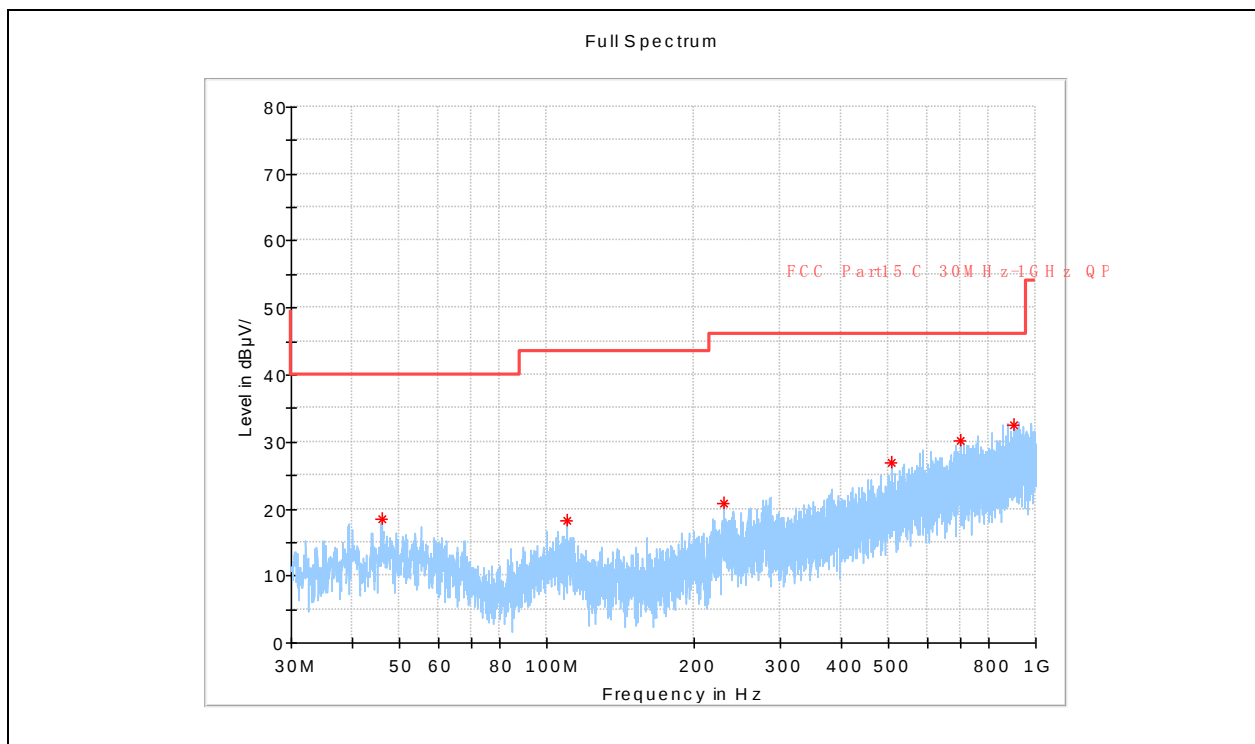
(8-DPSK _2402MHz, Antenna Vertical , 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1165.000000	35.07	---	74.00	38.93	V	-1.8
1165.000000	---	24.17	54.00	29.83	V	-1.8
1560.000000	37.04	---	74.00	36.96	V	2.9
1560.000000	---	27.24	54.00	26.76	V	2.9
1915.000000	---	30.20	54.00	23.80	V	6.2
1915.000000	40.42	---	74.00	33.58	V	6.2
2255.000000	42.85	---	74.00	31.15	V	9.9
2255.000000	---	32.52	54.00	21.48	V	9.9
2645.000000	47.42	---	74.00	26.58	V	15.5
2645.000000	---	37.21	54.00	16.79	V	15.5
3000.000000	---	41.28	54.00	12.72	V	18.4
3000.000000	51.88	---	74.00	22.12	V	18.4

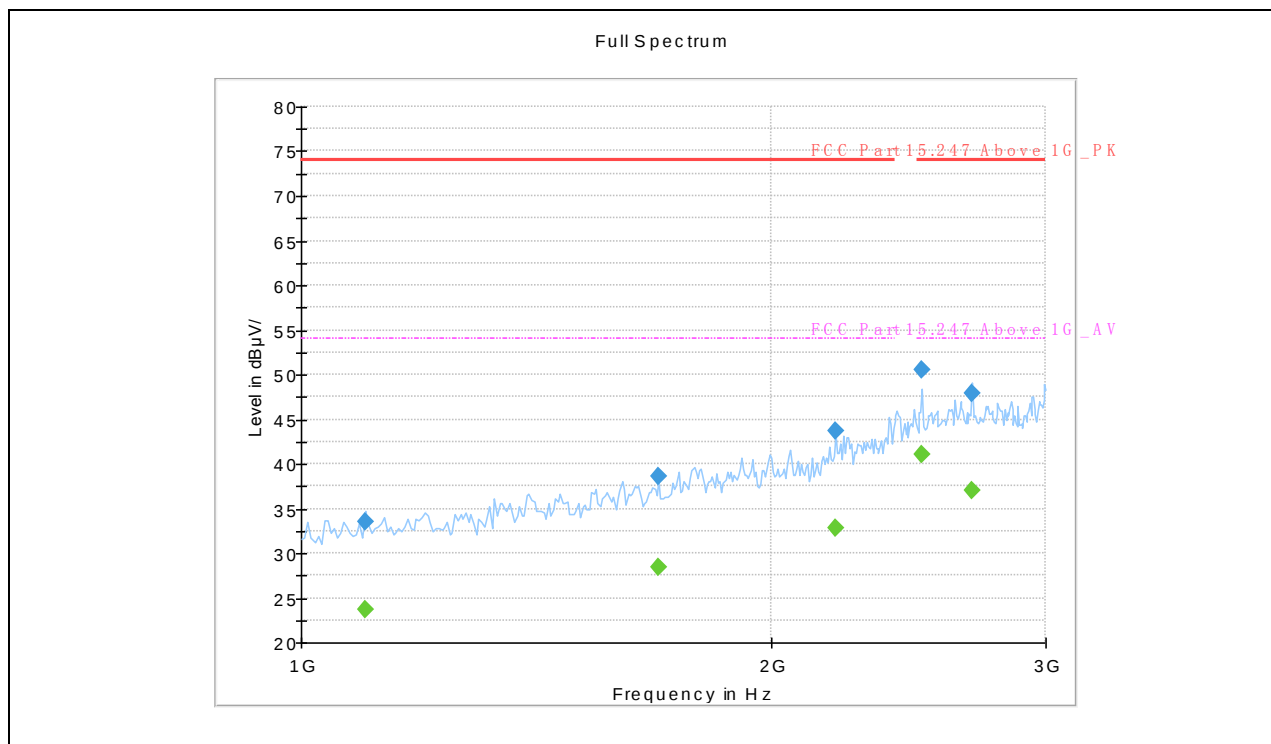


(8-DPSK _2402MHz, Antenna Vertical, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
4800.000000	---	29.18	54.00	24.82	V	-3.4
4800.000000	41.77	---	74.00	32.23	V	-3.4
6165.000000	---	30.35	54.00	23.65	V	-1.7
6165.000000	43.03	---	74.00	30.97	V	-1.7
8527.500000	43.21	---	74.00	30.79	V	0.9
8527.500000	---	30.75	54.00	23.25	V	0.9
10860.000000	44.15	---	74.00	29.85	V	2.9
10860.000000	---	31.62	54.00	22.38	V	2.9
12412.500000	44.17	---	74.00	29.83	V	4.4
12412.500000	---	31.63	54.00	22.37	V	4.4
14820.000000	46.55	---	74.00	27.45	V	8.8
14820.000000	---	34.41	54.00	19.59	V	8.8

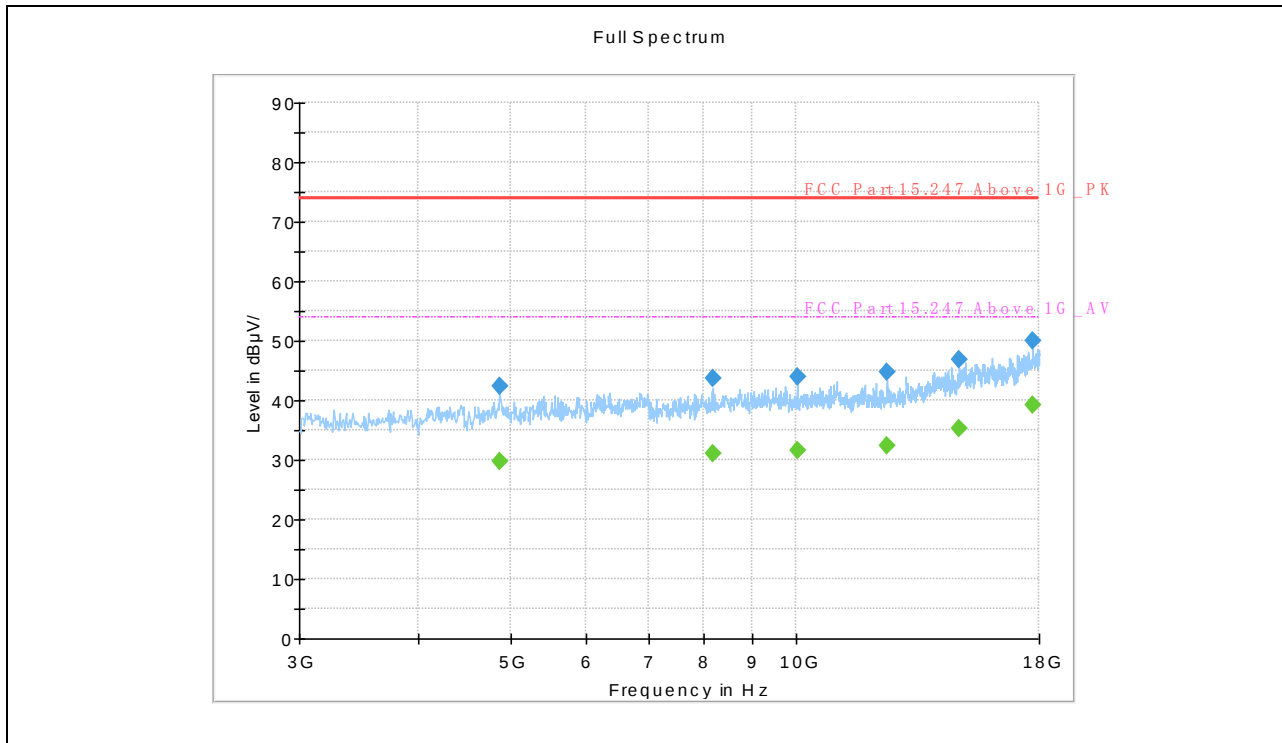


Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
46.045417	18.50	---	40.00	21.50	H	15.5
110.105833	18.19	---	43.50	25.31	H	14.9
229.537083	20.72	---	46.00	25.28	H	14.4
506.593333	26.83	---	46.00	19.17	H	22.0
700.714583	30.12	---	46.00	15.88	H	24.9
898.877500	32.62	---	46.00	13.38	H	28.0



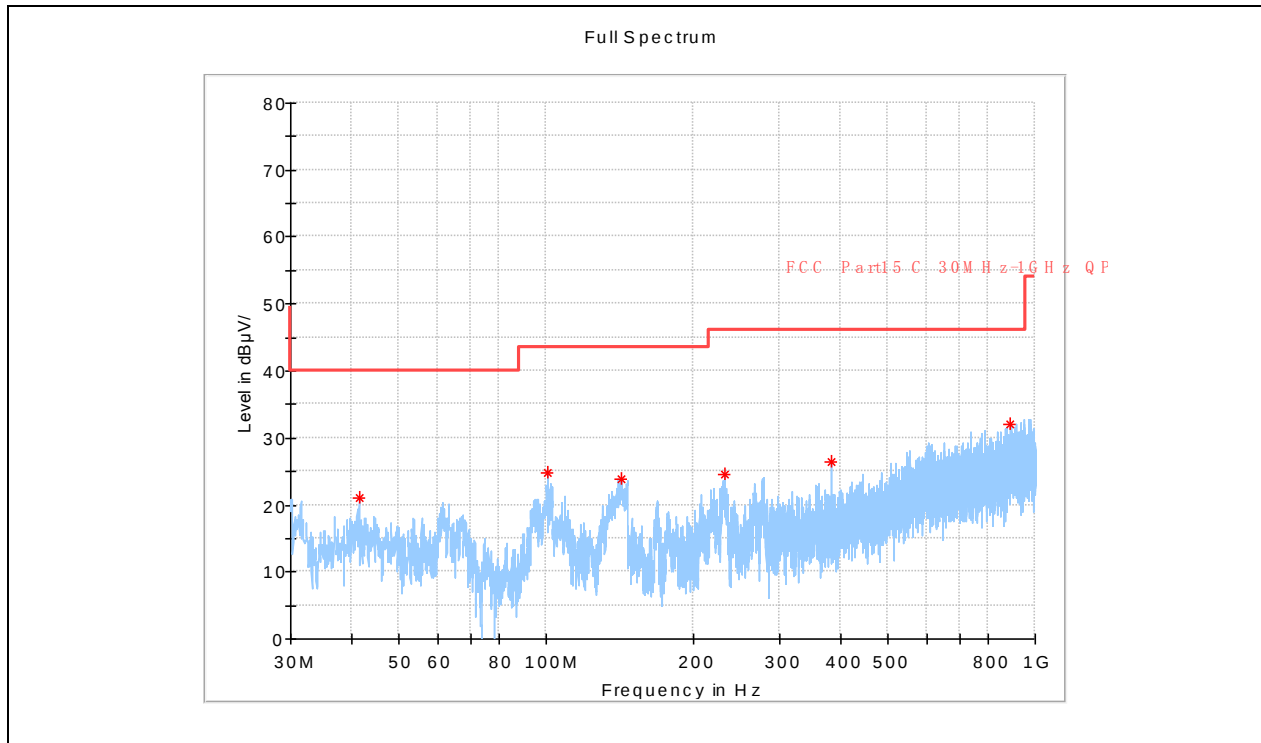
(8-DPSK _2441MHz, Antenna Horizontal, 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1100.000000	33.56	---	74.00	40.44	H	-2.2
1100.000000	---	23.73	54.00	30.27	H	-2.2
1695.000000	38.68	---	74.00	35.32	H	3.8
1695.000000	---	28.44	54.00	25.56	H	3.8
2200.000000	43.60	---	74.00	30.40	H	9.3
2200.000000	---	32.72	54.00	21.28	H	9.3
2500.000000	---	41.13	54.00	12.87	H	13.2
2500.000000	50.48	---	74.00	23.52	H	13.2
2690.000000	47.89	---	74.00	26.11	H	14.8
2690.000000	---	37.10	54.00	16.90	H	14.8
1100.000000	33.56	---	74.00	40.44	H	-2.2
1100.000000	---	23.73	54.00	30.27	H	-2.2



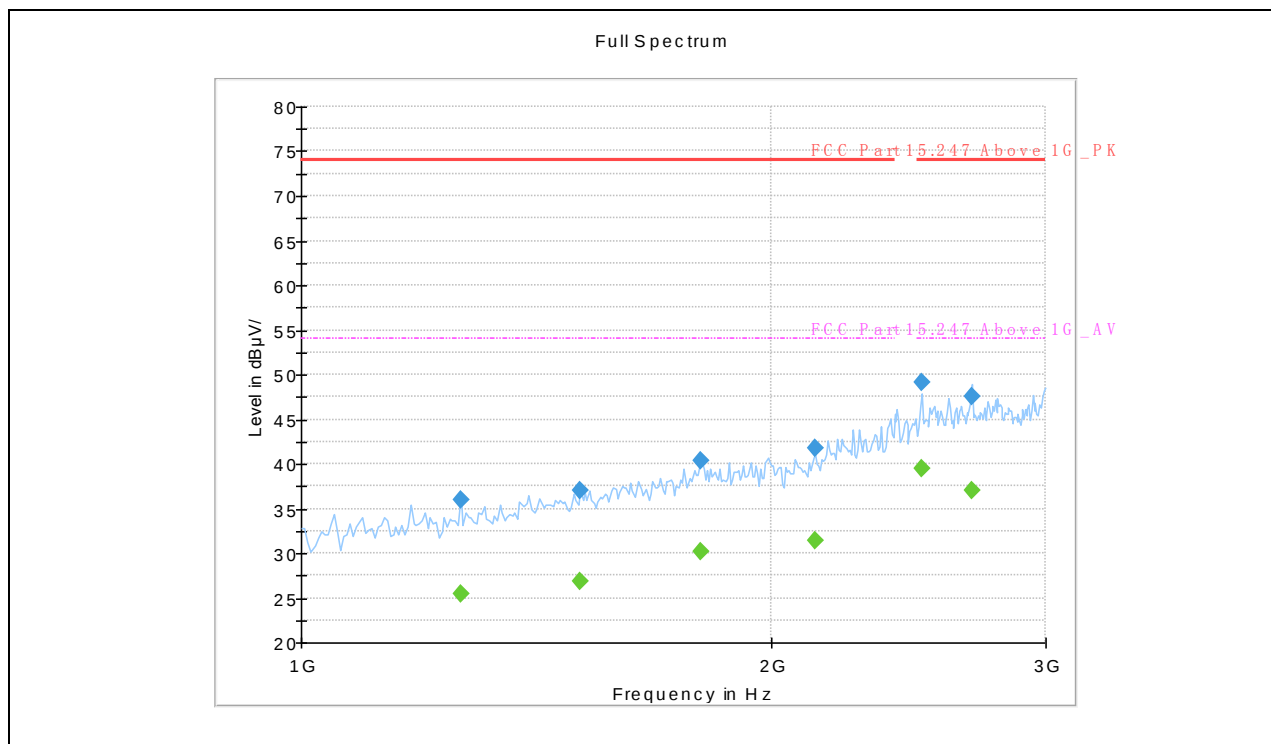
(8-DPSK _2441MHz, Antenna Horizontal, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
4875.000000	42.43	---	74.00	31.57	H	-2.8
4875.000000	---	29.77	54.00	24.23	H	-2.8
8160.000000	---	31.17	54.00	22.83	H	-1.2
8160.000000	43.56	---	74.00	30.44	H	-1.2
10020.000000	44.03	---	74.00	29.97	H	1.0
10020.000000	---	31.57	54.00	22.43	H	1.0
12450.000000	---	32.34	54.00	21.66	H	3.2
12450.000000	44.67	---	74.00	29.33	H	3.2
14820.000000	46.72	---	74.00	27.28	H	10.8
14820.000000	---	35.24	54.00	18.76	H	10.8
17722.500000	50.08	---	74.00	23.92	H	14.9
17722.500000	---	39.20	54.00	14.80	H	14.9



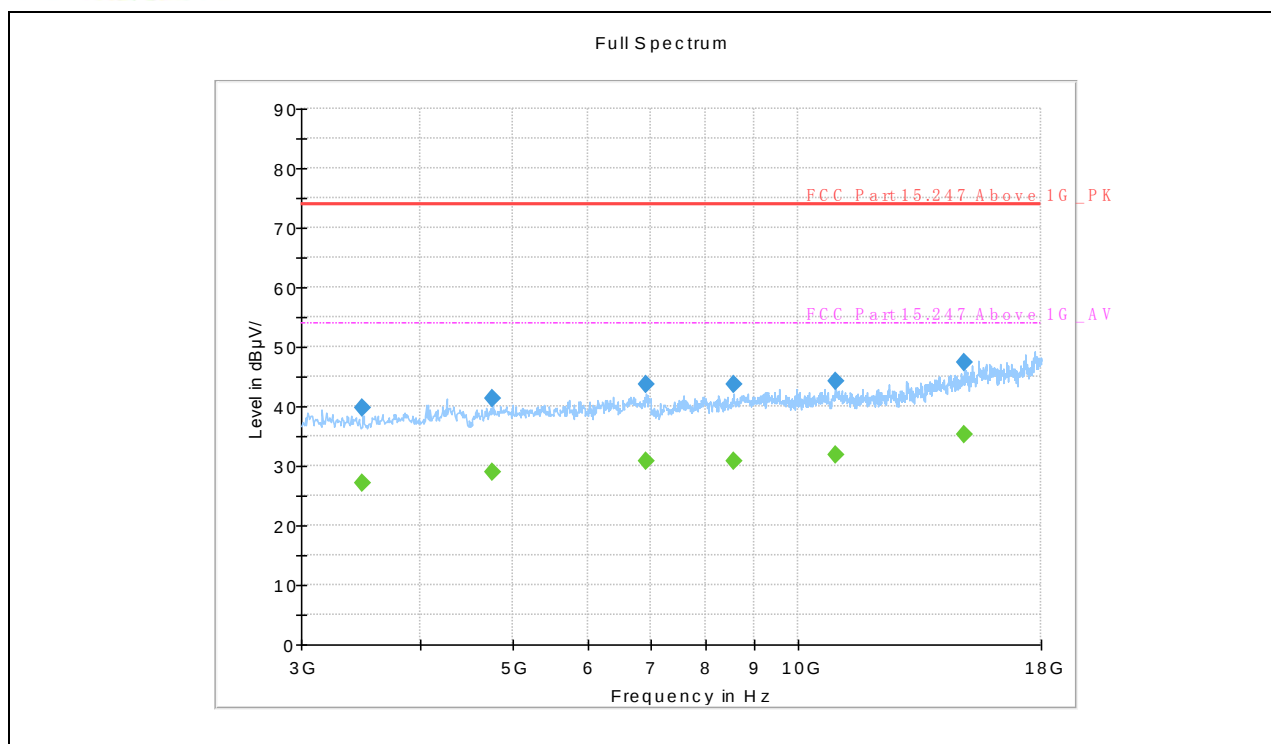
(8-DPSK _2441MHz, Antenna Vertical, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)
41.437917	21.08	---	40.00	18.92	V	14.9
100.810000	24.77	---	43.50	18.73	V	15.1
142.600833	23.91	---	43.50	19.59	V	11.2
231.234583	24.51	---	46.00	21.49	V	14.4
384.009583	26.38	---	46.00	19.62	V	18.7
891.845000	32.05	---	46.00	13.95	V	27.9



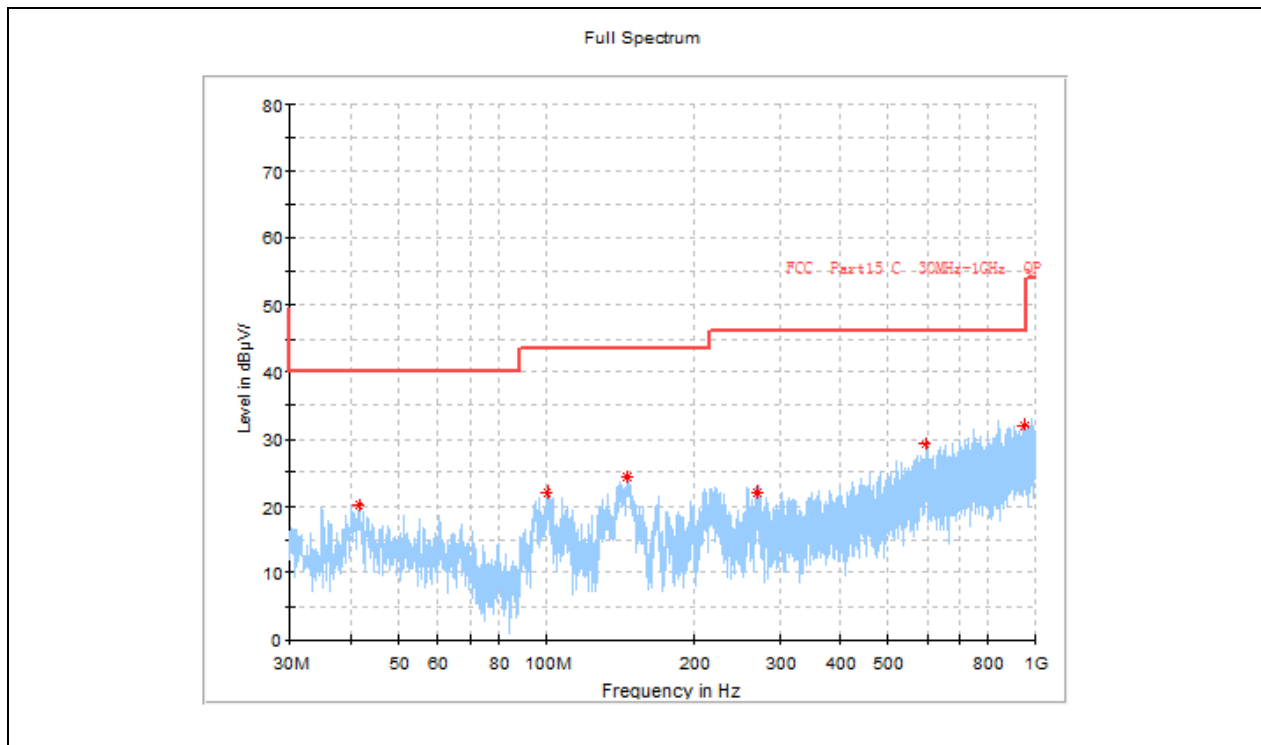
(8-DPSK _2441MHz, Antenna Vertical , 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1265.000000	36.04	---	74.00	37.96	V	-0.1
1265.000000	---	25.35	54.00	28.65	V	-0.1
1510.000000	---	26.78	54.00	27.22	V	2.1
1510.000000	37.05	---	74.00	36.95	V	2.1
1805.000000	---	30.21	54.00	23.79	V	6.4
1805.000000	40.41	---	74.00	33.59	V	6.4
2135.000000	---	31.35	54.00	22.65	V	8.2
2135.000000	41.81	---	74.00	32.19	V	8.2
2500.000000	---	39.47	54.00	14.53	V	13.2
2500.000000	49.17	---	74.00	24.83	V	13.2
2690.000000	47.62	---	74.00	26.38	V	14.8
2690.000000	---	37.06	54.00	16.94	V	14.8



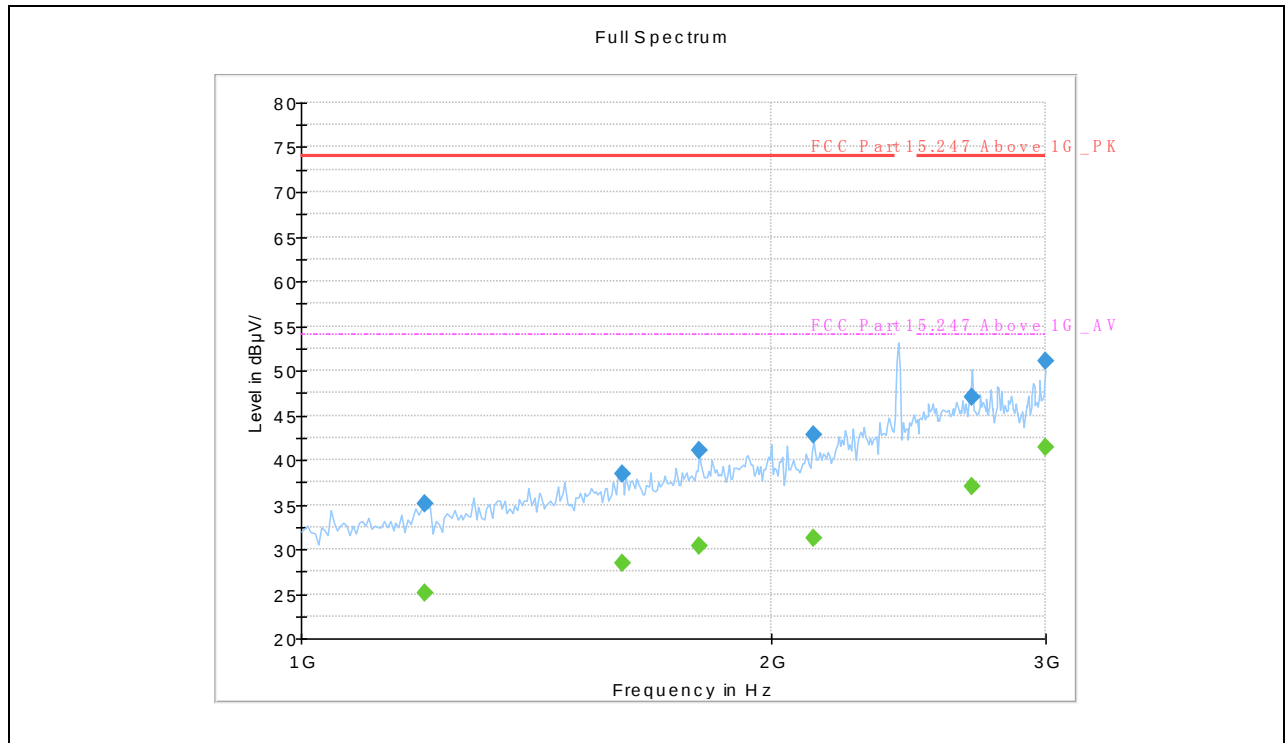
(8-DPSK _2441MHz, Antenna Vertical, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
3480.000000	---	27.03	54.00	26.97	V	-6.6
3480.000000	39.68	---	74.00	34.32	V	-6.6
4770.000000	41.37	---	74.00	32.63	V	-3.4
4770.000000	---	29.02	54.00	24.98	V	-3.4
6915.000000	---	30.91	54.00	23.09	V	-0.8
6915.000000	43.62	---	74.00	30.38	V	-0.8
8557.500000	43.72	---	74.00	30.28	V	1.1
8557.500000	---	30.74	54.00	23.26	V	1.1
10927.50000	---	31.84	54.00	22.16	V	3.3
10927.50000	44.24	---	74.00	29.76	V	3.3
14962.50000	---	35.36	54.00	18.64	V	9.8
14962.50000	47.48	---	74.00	26.52	V	9.8



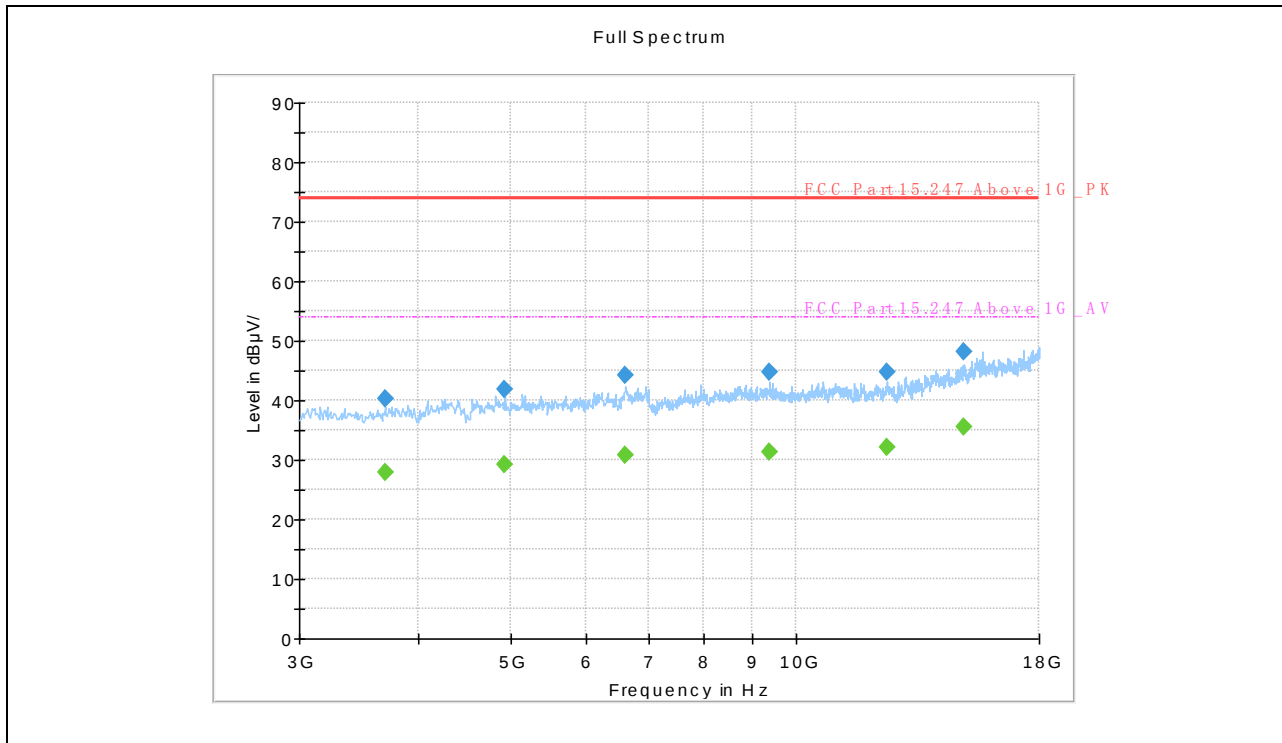
(8-DPSK _2480MHz, Antenna Horizontal, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
41.478333	20.15	---	40.00	19.85	H	14.9
100.325000	21.96	---	43.50	21.54	H	15.1
146.561667	24.37	---	43.50	19.13	H	10.8
270.762083	21.95	---	46.00	24.05	H	15.3
594.863333	29.18	---	46.00	16.82	H	23.6
951.702083	32.09	---	46.00	13.91	H	28.3



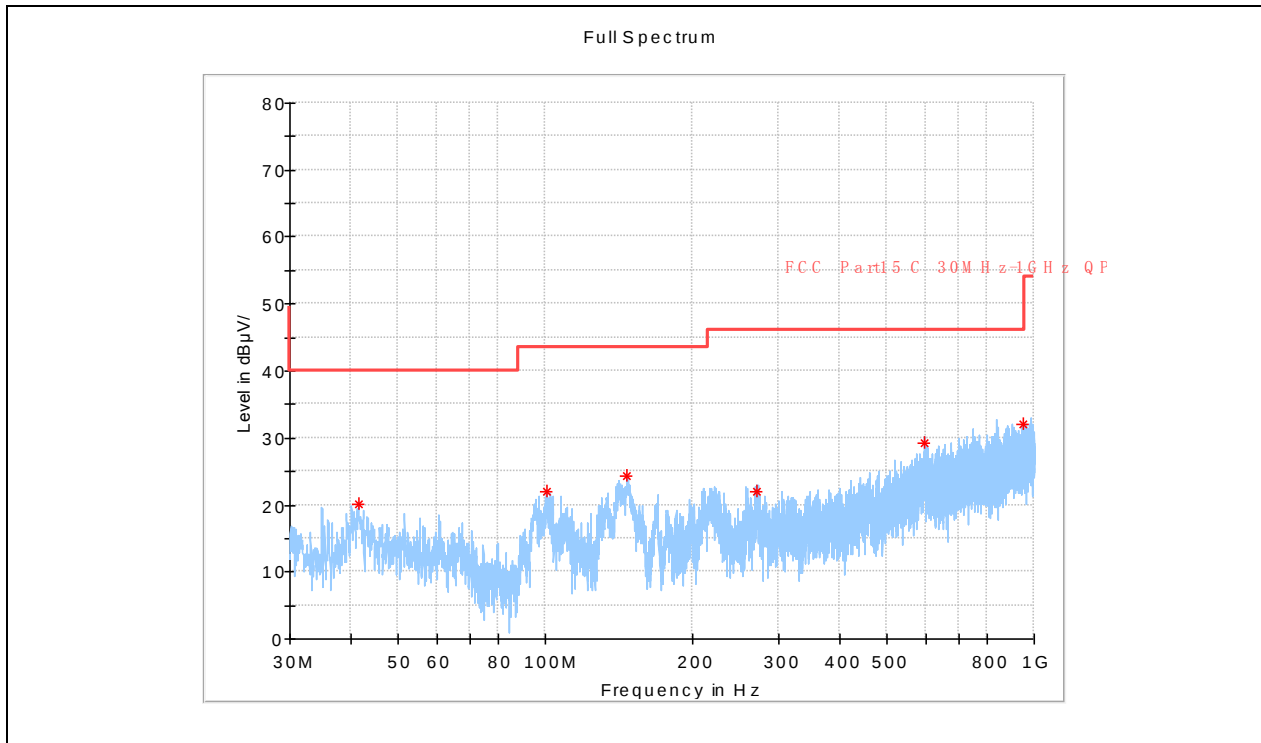
(8-DPSK _2480MHz, Antenna Horizontal, 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1200.000000	---	25.06	54.00	28.94	H	-0.4
1200.000000	35.02	---	74.00	38.98	H	-0.4
1605.000000	---	28.34	54.00	25.66	H	3.6
1605.000000	38.43	---	74.00	35.57	H	3.6
1800.000000	---	30.43	54.00	23.57	H	6.7
1800.000000	41.01	---	74.00	32.99	H	6.7
2130.000000	---	31.26	54.00	22.74	H	8.2
2130.000000	42.85	---	74.00	31.15	H	8.2
2690.000000	---	37.08	54.00	16.92	H	14.8
2690.000000	47.08	---	74.00	26.92	H	14.8
3000.000000	---	41.39	54.00	12.61	H	18.4
3000.000000	51.11	---	74.00	22.89	H	18.4



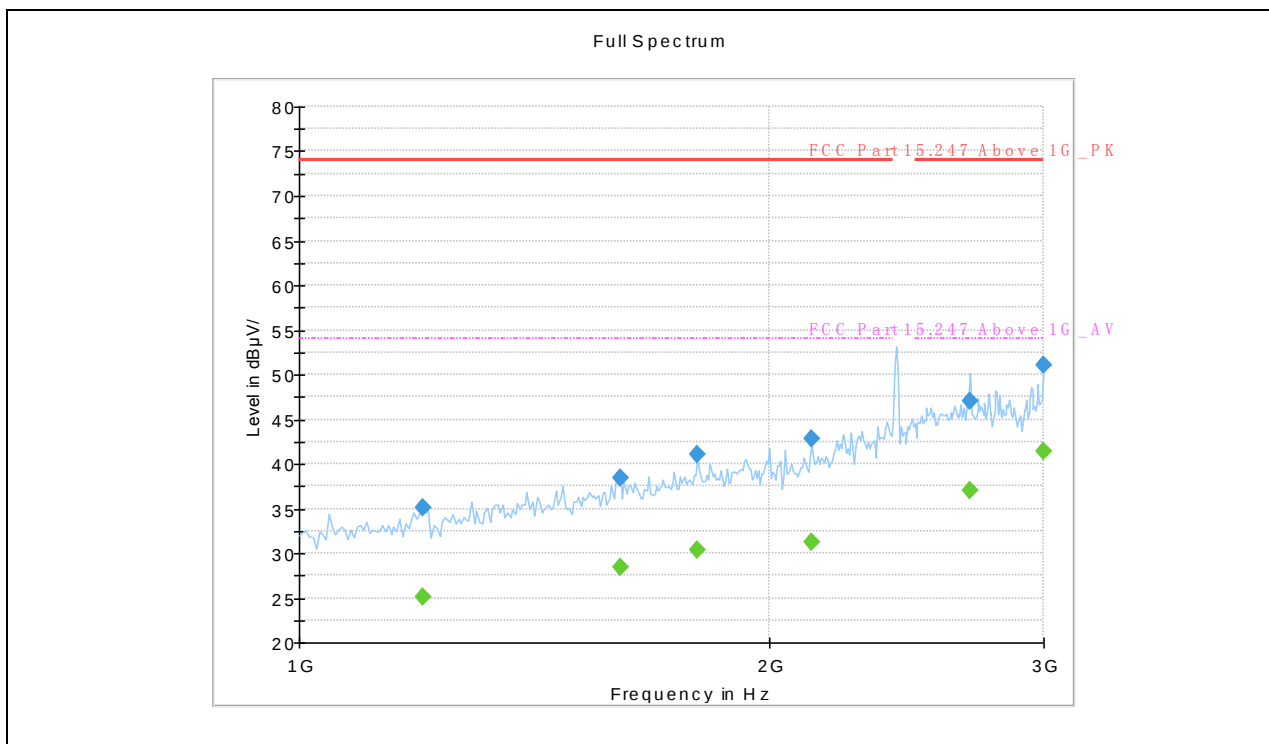
(8-DPSK _2480MHz, Antenna Horizontal, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
3690.000000	---	27.80	54.00	26.20	H	-5.3
3690.000000	40.15	---	74.00	33.85	H	-5.3
4935.000000	---	29.32	54.00	24.68	H	-2.9
4935.000000	41.78	---	74.00	32.22	H	-2.9
6615.000000	---	30.90	54.00	23.10	H	-0.8
6615.000000	44.25	---	74.00	29.75	H	-0.8
9382.500000	44.62	---	74.00	29.38	H	2.0
9382.500000	---	31.29	54.00	22.71	H	2.0
12457.500000	---	32.09	54.00	21.91	H	4.8
12457.500000	44.85	---	74.00	29.15	H	4.8
15030.000000	48.24	---	74.00	25.76	H	10.6
15030.000000	---	35.54	54.00	18.46	H	10.6



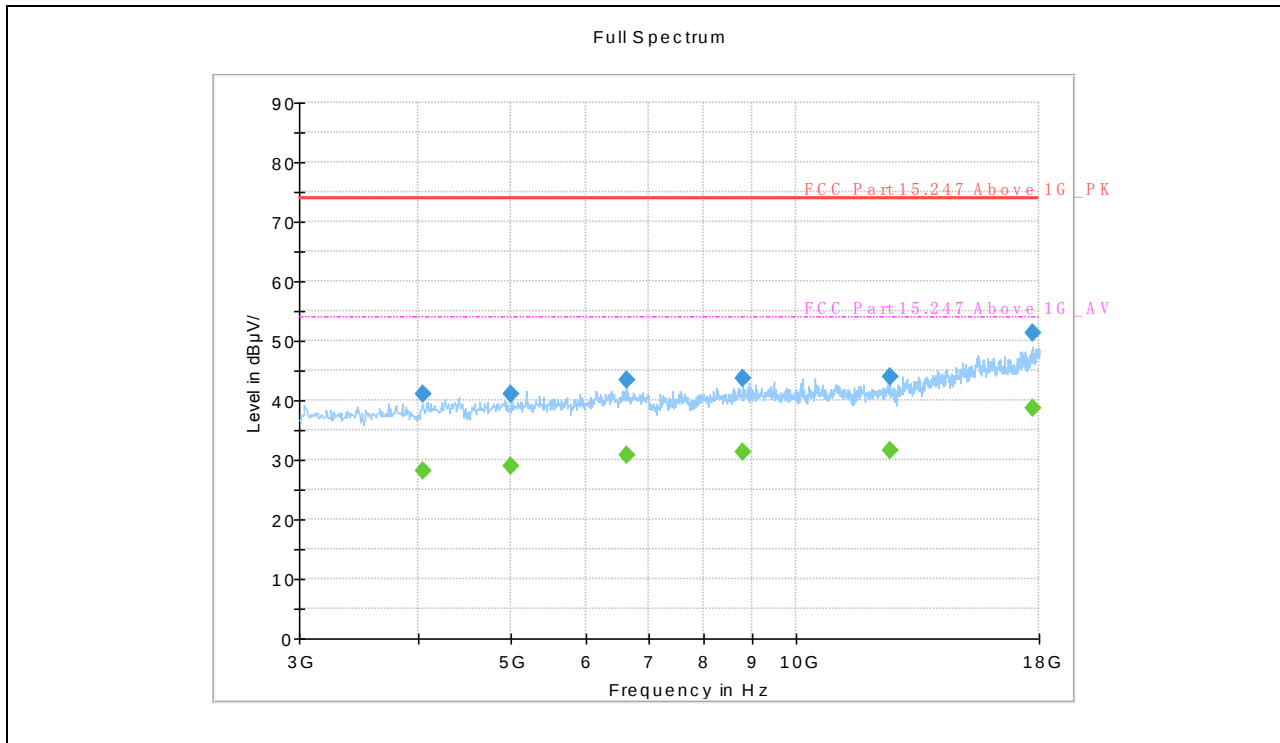
(8-DPSK _2480MHz, Antenna Vertical, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
41.478333	20.15	---	40.00	19.85	V	14.9
100.325000	21.96	---	43.50	21.54	V	15.1
146.561667	24.37	---	43.50	19.13	V	10.8
270.762083	21.95	---	46.00	24.05	V	15.3
594.863333	29.18	---	46.00	16.82	V	23.6
951.702083	32.09	---	46.00	13.91	V	28.3



(8-DPSK _2480MHz, Antenna Vertical , 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
1200.000000	---	25.06	54.00	28.94	V	-0.4
1200.000000	35.02	---	74.00	38.98	V	-0.4
1605.000000	---	28.34	54.00	25.66	V	3.6
1605.000000	38.43	---	74.00	35.57	V	3.6
1800.000000	---	30.43	54.00	23.57	V	6.7
1800.000000	41.01	---	74.00	32.99	V	6.7
2130.000000	---	31.26	54.00	22.74	V	8.2
2130.000000	42.85	---	74.00	31.15	V	8.2
2690.000000	---	37.08	54.00	16.92	V	14.8
2690.000000	47.08	---	74.00	26.92	V	14.8
3000.000000	---	41.39	54.00	12.61	V	18.4
3000.000000	51.11	---	74.00	22.89	V	18.4



(8-DPSK _2480MHz, Antenna Vertical, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
4042.500000	---	28.20	54.00	25.80	V	-4.7
4042.500000	40.94	---	74.00	33.06	V	-4.7
5017.500000	41.17	---	74.00	32.83	V	-3.3
5017.500000	---	28.82	54.00	25.18	V	-3.3
6630.000000	---	30.91	54.00	23.09	V	-0.6
6630.000000	43.35	---	74.00	30.65	V	-0.6
8782.500000	43.65	---	74.00	30.35	V	1.5
8782.500000	---	31.27	54.00	22.73	V	1.5
12540.000000	43.95	---	74.00	30.05	V	4.6
12540.000000	---	31.60	54.00	22.40	V	4.6
17715.000000	51.19	---	74.00	22.81	V	14.6
17715.000000	---	38.62	54.00	15.38	V	14.6

Annex A Test Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

Test items	Uncertainty
Peak Output Power	$\pm 2.22\text{dB}$
Power spectral density (PSD)	$\pm 2.22\text{dB}$
Bandwidth	$\pm 5\%$
Conducted Spurious Emission	$\pm 2.77\text{ dB}$
Restricted Frequency Bands	$\pm 5\%$
Radiated Emission	$\pm 3.1\text{dB}$
Conducted Emission	$\pm 1.8\text{dB}$

This uncertainty represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$



Annex B Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Company Name:	Kehu-Morlab Test Laboratory
Address:	Unit 101, No.1732 Gangzhong Road, Xiamen Area, Pilot Free Trade Zone (Fujian), P.R. China
Responsible Test Lab Manager:	Mr. Di Dehai
Telephone:	+86-592-5612050
Facsimile:	+86-592-5612095

2. Identification of the Responsible Testing Location

Name:	Kehu-Morlab Test Laboratory
Address:	Unit 101, No.1732 Gangzhong Road, Xiamen Area, Pilot Free Trade Zone (Fujian), P.R. China

3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at Unit 101, No.1732 Gangzhong Road, Xiamen Area, Pilot Free Trade Zone (Fujian), P.R. China.

The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC designation number is CN1249.

4. Test Equipments Utilized

4.1 Conducted Test Equipments

No.	Equipment Name	Serial No.	Model No.	Manufacturer	Cal.Date	Cal.Due Date
1	MXA Signal Analyzer	MY53421845	N9020A	Keysight	2019.01.05	2020.01.04
2	RF cable (30MHz-26.5GHz)	RF01	N/A	Morlab	2019.01.05	2020.01.04
3	Coaxial cable	RF02	N/A	Morlab	2019.01.05	2020.01.04
4	SMA connector	RF03	N/A	Xingbo	2019.01.05	2020.01.04
Software Version: Eagle 2.0						

**4.2 Conducted Emission Test Equipments**

No.	Equipment Name	Serial No.	Model No.	Manufacturer	Cal.Date	Cal.Due Date
1	EMI Receiver	102174	ESR3	ESR3	2019.01.08	2020.01.07
2	LISN	101338	ENV432	ENV432	2019.01.14	2020.01.13
3	Pulse Limiter (10dB)	317	VTSD 9561 F	VTSD 9561 F	2019.01.14	2020.01.13
4	Coaxial cable(BNC) (30MHz-3GHz)	EMC01	N/A	Morlab	2019.01.14	2020.01.13

4.3 List of Software Used

No.	Model	Version Number	Producer	Test Item
1	EMC32	V10.00.00	Rode&Schwarz	RE
2	EMC32	V10.20.01	Rode&Schwarz	CE

4.4 Radiated Test Equipments

RSE Test System						
No.	Equipment Name	Serial No.	Model No.	Manufacturer	Cal. Date	Cal.Due Date
1	Anechoic Chamber	N/A	9m*6m*6m	ETS-Lindgren	2017.07.21	2020.07.20
2	Signal Analyzer	101294	FSV40	R&S	2019.01.04	2020.01.03
3	Active Ring Antenna	FMZB 1513 #269	FMZB 1513	Schwarzbeck	2019.01.12	2020.01.11
4	Linear Log Periodic Broad Band Antenna	949	VULB 9163	Schwarzbeck	2018.09.25	2019.09.24
5	Ultra-Wideband Horn Antenna	102615	HF907	R&S	2019.01.19	2020.01.18
6	Steatite Antennas	17868	QSH-SL-1 8-26-S-20	Seibersdorf	2019.01.12	2020.01.11
7	RF Switch and Control Platform	N/A	RSC	CDSI	N/A	N/A
8	Coaxial cable (N male) (9kHz -3GHz)	EMC02	N/A	Morlab	2019.01.04	2020.01.03
9	Coaxial cable (N male)	EMC03	N/A	Morlab	2019.01.04	2020.01.03



	(9kHz -3GHz)					
10	Coaxial cable (N male) (1GHz-26.5GHz)	EMC04	N/A	Morlab	2019.01.04	2020.01.03
11	Coaxial cable (N male) (1GHz-26.5GHz)	EMC05	N/A	Morlab	2019.01.04	2020.01.03
12	Pre-amplifier (1GHz-18GHz)	8810011	PAP-1G18	CDSI	2019.01.04	2020.01.03
13	Pre-amplifier (18GHz-40GHz)	17021-17024	PAP-1840	CDSI	2018.07.05	2019.07.04
14	Band stop Filter	EMC19	BJF2400/2 485-60	CDSI	2019.01.04	2020.01.03
15	High Pass Filter	EMC22	HFP-3.0/1 8G-60	CDSI	2019.01.04	2020.01.03

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