



Report No.:SZ12100121W03



FCC/IC RADIO TEST REPORT

Issued to

Coby Communications Ltd.

For

Mobile Internet Device

Model Name : MID8060/MID8065
 Trade Name : COBY
 Brand Name : COBY
 FCC ID : S7IMID8065-8060
 IC Number : 5824A-8060MID8065
 Standard : 47 CFR Part 15 Subpart C
 RSS-GEN
 RSS-210
 Test date : 2012-11-01 to 2012-11-15
 Issue date : 2012-11-15

Shenzhen MORLAB Communication Technology Co., Ltd.



Tested by Nie Quan
 Nie Quan
 Date 2012.11.15

Approved by Wu Xuewei
 Wu Xuewei
 Date

Review by Peng Huarui
 Peng Huarui
 Date 2012.11.15



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Change History		
Issue	Date	Reason for change
1.0	November 15, 2012	First edition

1. General Information

1.1. EUT Description

EUT Type: Mobile Internet Device
Serial No.....: (n.a, marked #1 by test site)
Hardware Version.....: EM_MID8060/MID8065_V3.0
Software Version: 4.0.4
Applicant: Coby Communications Ltd.
Unit C-E, 8/F, PO Shau Centre,115 How Ming Street , Kwun Tong
Kowloon ,Hong Kong
Manufacturer: ShenZhen COBY Communications Ltd
Block 2~3, TaoXia 2nd Industrial Zone,LongHua Town, BaoAn
District, ShenZhen City GuangDong Province P.R. China
Frequency Range.....: The frequency range used is 2402MHz - 2480MHz (79 channels, at
intervals of 1MHz);
The frequency block is 2400MHz to 2483.5MHz.
Modulation Type: Bluetooth: FHSS (GFSK(1Mbps), $\pi/4$ -DQPSK(EDR 2Mbps),
8-DPSK(EDR 3Mbps)
Antenna: PIFA Antenna, gain: 0.92dBi

Note 1: The EUT is Mobile Internet Device, it contains Bluetooth Module operating at 2.4GHz ISM band; the frequencies allocated for the Bluetooth Module 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: For the purposes of the present report, following the abbreviations are apply:

N.A Not Application
-- Not done this test
EUT Equipment under the test

Note 3: For the radiated emission test, according to the FCC Part 15 Paragraph 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 to the intentional radiator shall be considered sufficient to comply with the provisions of this section. This product has a permanent antenna, fulfill the requirement of this section.

Note 4: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

Note 5: Bluetooth signal has 9 packages DH1, DH3, DH5, 3DH1, 3DH3, 3DH5, 5DH1, 5DH3, 5DH5, DH5 package is largest, we are testing DH5 in the document.

Note 6: The antenna connector of EUT is designed with permanent attachment and no consideration of replacement.

1.2. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C and RSS-210 (Bluetooth, 2.4GHz ISM band radiators) for the EUT FCC/IC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15 (10-1-09 Edition)	Radio Frequency Devices
2	RSS-GEN:Issue 3, December 2010	General Requirements and Information for the Certification of Radio Apparatus
3	RSS-210: Issue 8, December 2010	Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

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

No	Section in CFR 47	Section in RSS-GEN, RSS-210	Description	Result
1	15.247(a)	A8.1 (d)	Number of Hopping Frequency	PASS
2	15.247(b)	A8.4 (2)	Peak Output Power	PASS
3	15.247(a)	A8.1 (a)	20dB Bandwidth	PASS
4	15.247(a)	A8.1 (b)	Carrier Frequency Separation	PASS
5	15.247(a)	A8.1 (d)	Time of Occupancy (Dwell time)	PASS
6	15.247(d)	A8.5	Conducted Spurious Emission	PASS
7	15.247(d)	A8.5	Band Edge	PASS
8	15.207	7.2.2	Conducted Emission	PASS
9	15.209 15.247(c)	A8.5	Radiated Emission	PASS

NOTE:

The tests were performed according to the method of measurements prescribed in DA-00-705.

1.3. Facilities and Accreditations

1.3.1. Facilities

Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L3572.

All measurement facilities used to collect the measurement data are located at FL.3, Building a, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22; the FCC registration number is 741109.

IC registration number is 7183A.

1.3.2. Test Environment 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 and RSS-210 Requirements

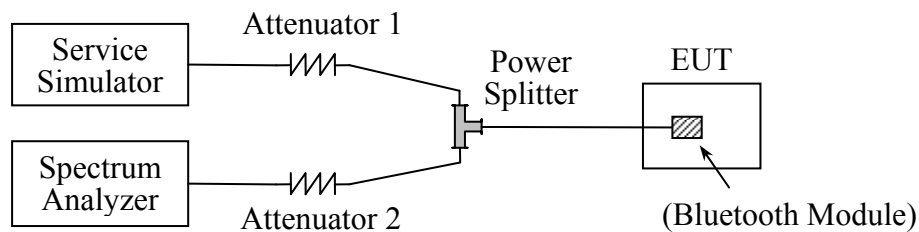
2.1. Number of Hopping Frequency

2.1.1. Requirement

According to FCC §15.247(a)(1)(iii) and RSS-210 A8.1 (d), frequency hopping systems operating in the 2400MHz to 2483.5MHz bands shall use at least 75 hopping frequencies.

2.1.2. Test Description

A. Test Setup:



The Bluetooth Module of the EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the Bluetooth Service Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. During the measurement, the Bluetooth Module of the EUT is activated and controlled by the SS, and is set to operate under test mode transmitting 339 bytes DH5 packages at maximum power.

B. Equipments List:

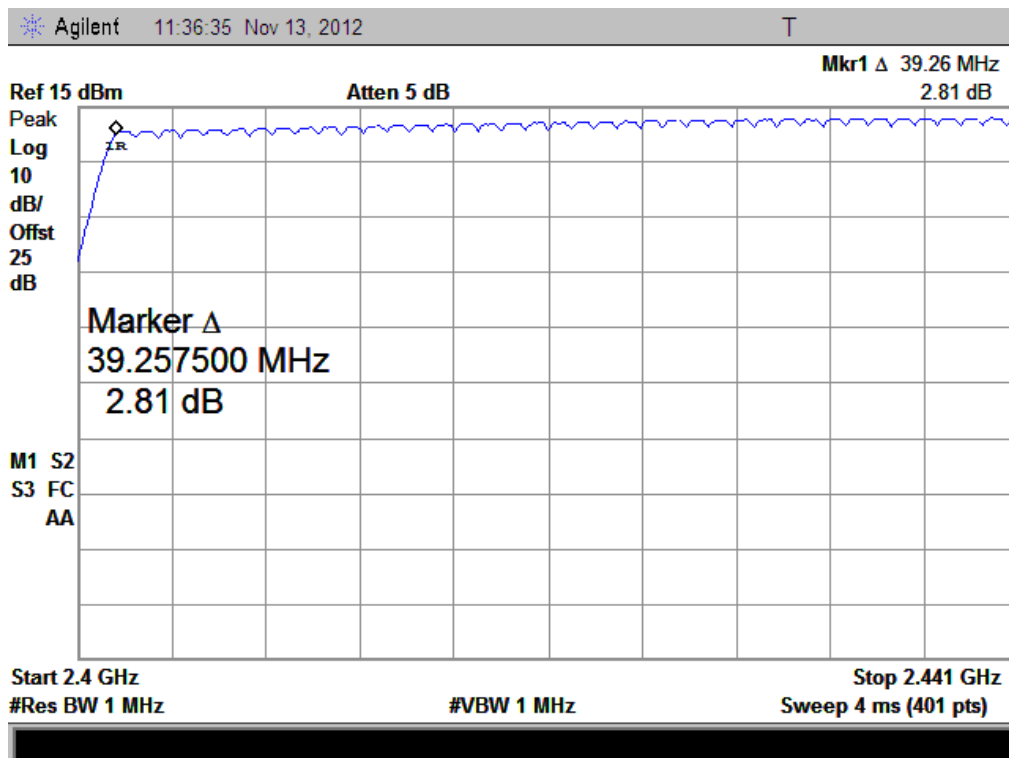
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	R&S	CMU200	100448	2012.05	2013.05
Spectrum Analyzer	Agilent	E7405A	US44210471	2012.05	2013.05
Power Splitter	Weinschel	1506A	NW521	2012.05	2013.05
Attenuator 1	Resnet	20dB	(n.a.)	2012.05	2013.05
Attenuator 2	Resnet	3dB	(n.a.)	2012.05	2013.05

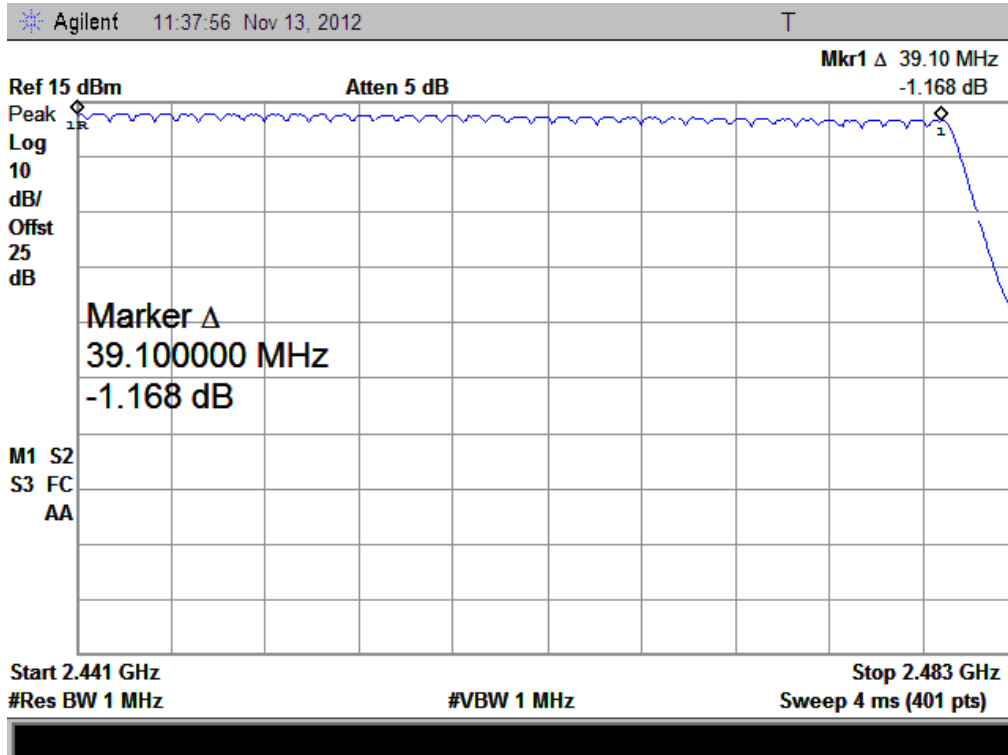
2.1.3. Test Result

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.

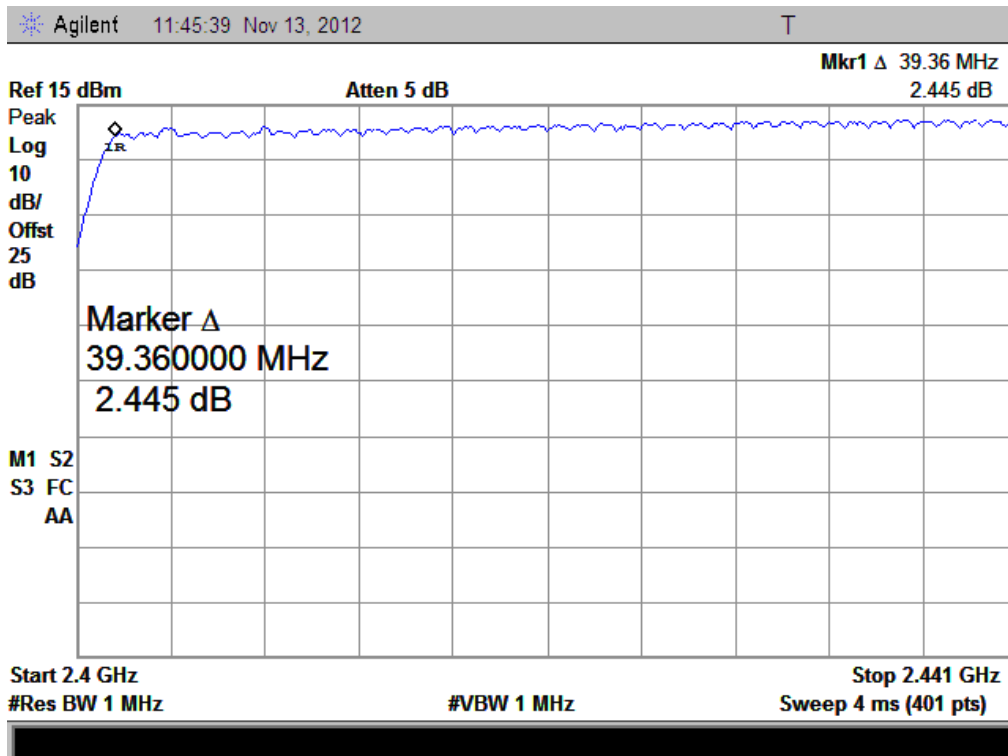
A. Test Verdict:

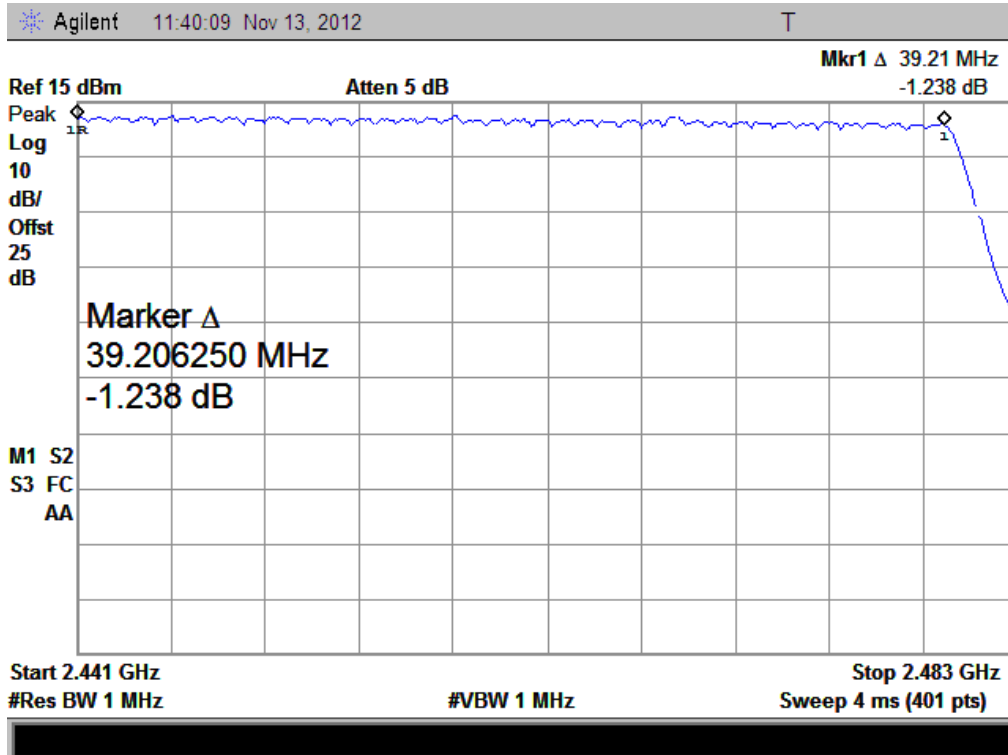
Test Mode	Frequency Block (MHz)	Measured Channel Numbers	Min. Limit	Refer to Plot	Verdict
GFSK	2400 - 2483.5	79	75	Plot A	PASS
$\pi/4$ -DQPSK	2400 - 2483.5	79	75	Plot B	PASS
8-DPSK	2400 - 2483.5	79	75	Plot C	PASS

B. Test Plots:


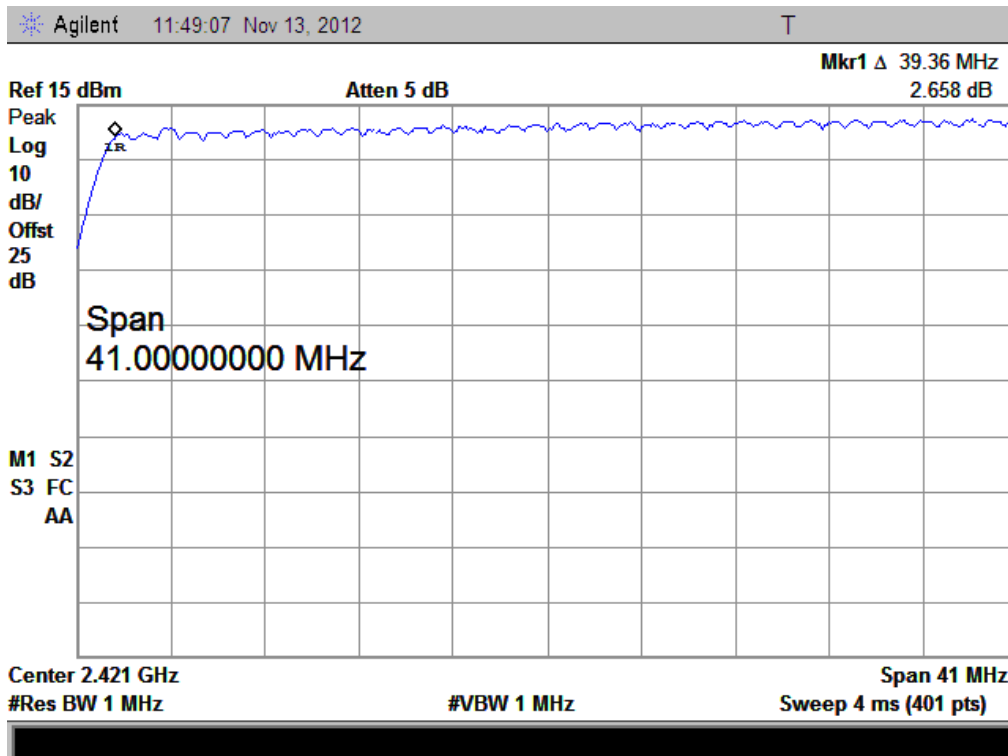


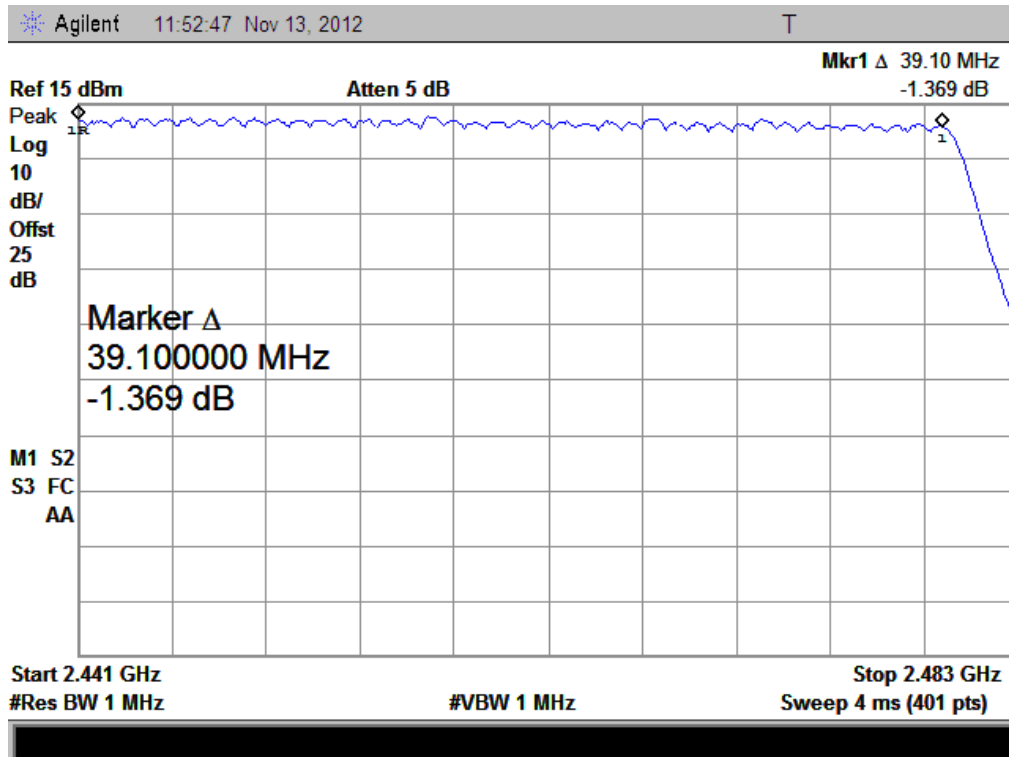
(Plot A: GFSK)





(Plot B: $\Pi/4$ -DQPSK)





(Plot C: 8- DPSK)

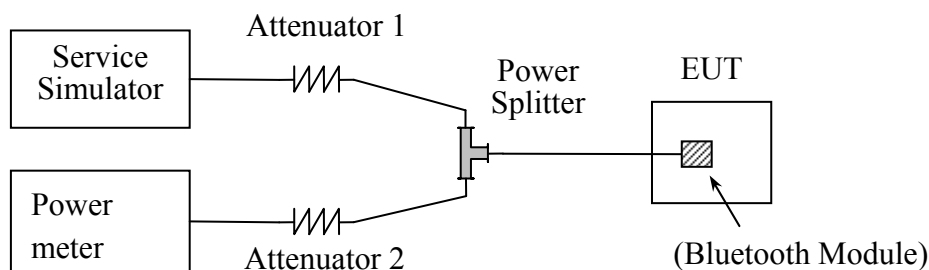
2.2. Peak Output Power

2.2.1. Requirement

According to FCC §15.247(b)(1) and RSS-210 A8.4 (2), 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.

2.2.2. Test Description

A. Test Setup:



The Bluetooth Module of the EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the Bluetooth Service Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. During the measurement, the Bluetooth Module of the EUT is activated and controlled by the SS, and is set to operate under test mode transmitting 339 bytes DH5 packages at maximum power.

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	R&S	CMU200	100448	2012.05	2013.05
Power meter	Agilent	E4418B	GB44318055	2012.05	2013.05
Power Splitter	Weinschel	1506A	NW521	2012.05	2013.05
Power Sensor	Agilent	8482A	MY41091706	2012.05	2013.05
Attenuator 1	Resnet	20dB	(n.a.)	2012.05	2013.05
Attenuator 2	Resnet	3dB	(n.a.)	2012.05	2013.05

2.2.3. 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. The lowest, middle and highest channel were tested by Power meter.

2.2.3.1. GFSK Mode

A. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
0	2402	11.38	0.013740	20.96	0.125	PASS
39	2441	12.65	0.018408			PASS
78	2480	9.987	0.009970			PASS

2.2.3.2. $\pi/4$ -DQPSK Mode

A. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
0	2402	11.01	0.012618	20.96	0.125	PASS
39	2441	11.88	0.015417			PASS
78	2480	11.57	0.014355			PASS

2.2.3.3. 8-DPSK Mode

A. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
0	2402	10.56	0.011376	20.96	0.125	PASS
39	2441	12.85	0.019275			PASS
78	2480	11.85	0.015311			PASS

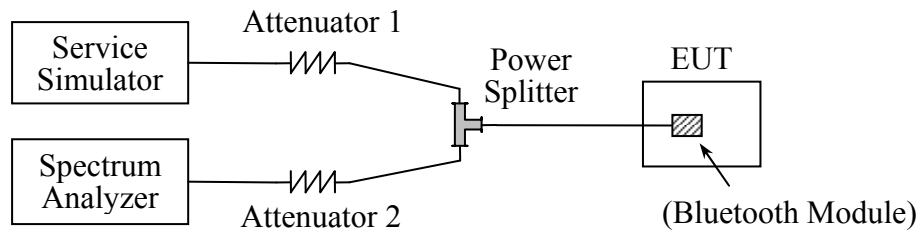
2.3. 20dB Bandwidth

2.3.1. Definition

According to FCC §15.247(a)(1) and RSS-210 A8.1(a), 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.

2.3.2. Test Description

A. Test Setup:



The Bluetooth Module of the EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the Bluetooth Service Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. During the measurement, the Bluetooth Module of the EUT is activated and controlled by the SS, and is set to operate under test mode transmitting 339 bytes DH5 packages at maximum power.

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	R&S	CMU200	100448	2012.05	2013.05
Spectrum Analyzer	Agilent	E7405A	US44210471	2012.05	2013.05
Power Splitter	Weinschel	1506A	NW521	2012.05	2013.05
Attenuator 1	Resnet	20dB	(n.a.)	2012.05	2013.05
Attenuator 2	Resnet	3dB	(n.a.)	2012.05	2013.05

2.3.3. 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.

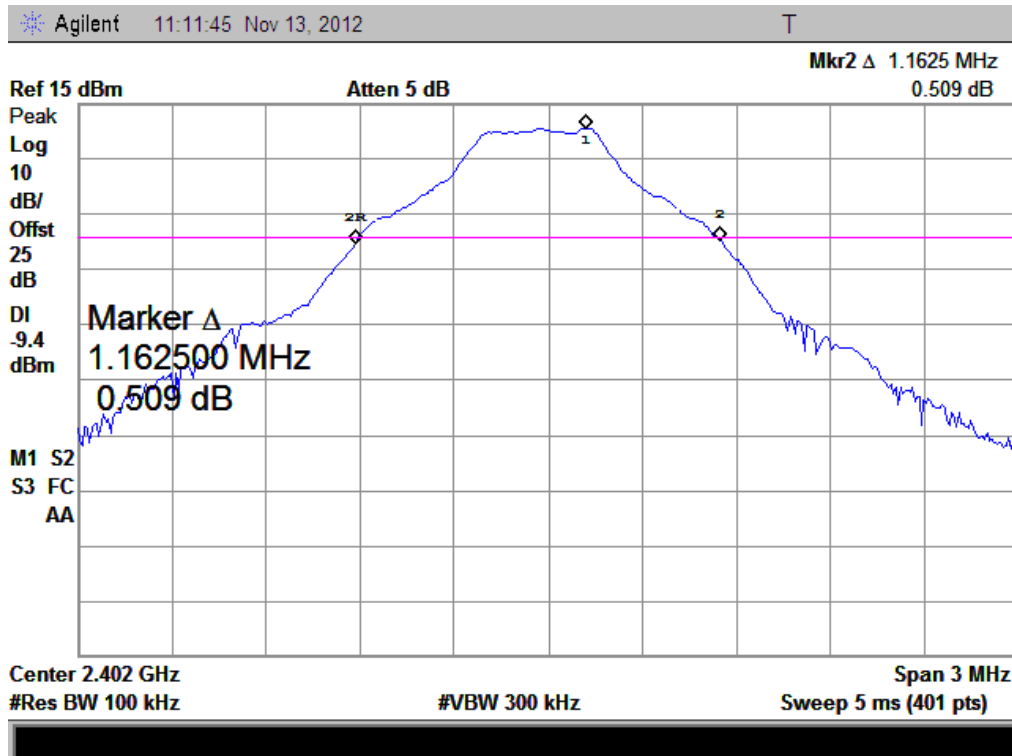
2.3.3.1. GFSK Mode

A. Test Verdict:

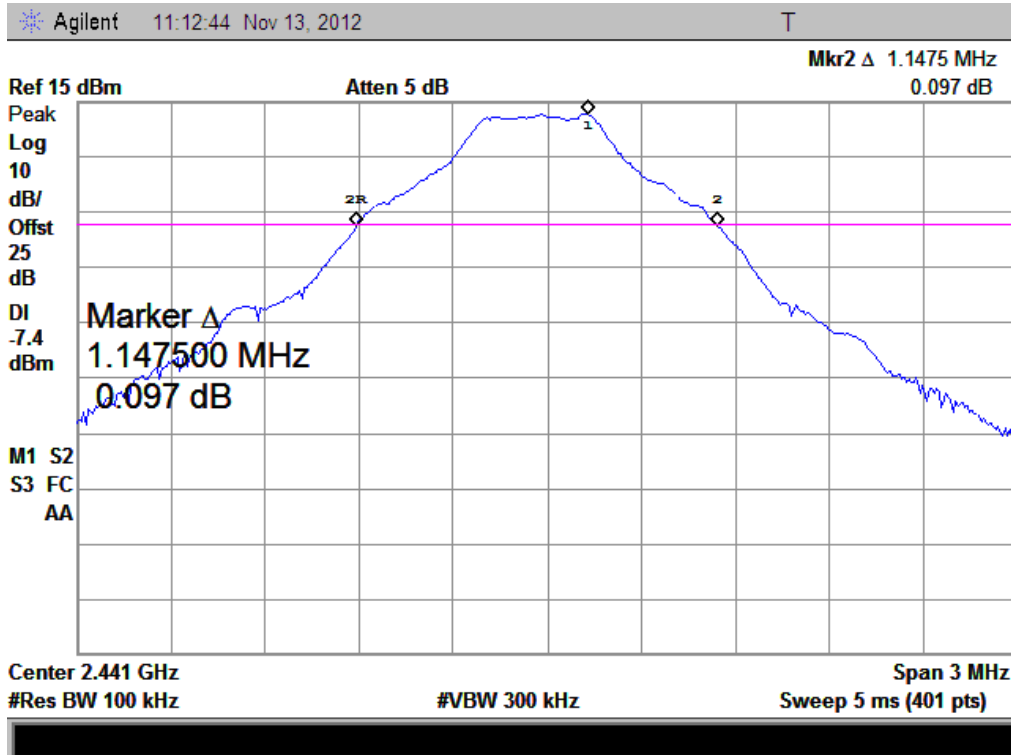
The maximum 20dB bandwidth measured is 1.1775MHz according to the table below.

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Refer to Plot
0	2402	1.1625	Plot A
39	2441	1.1475	Plot B
78	2480	1.1775	Plot C

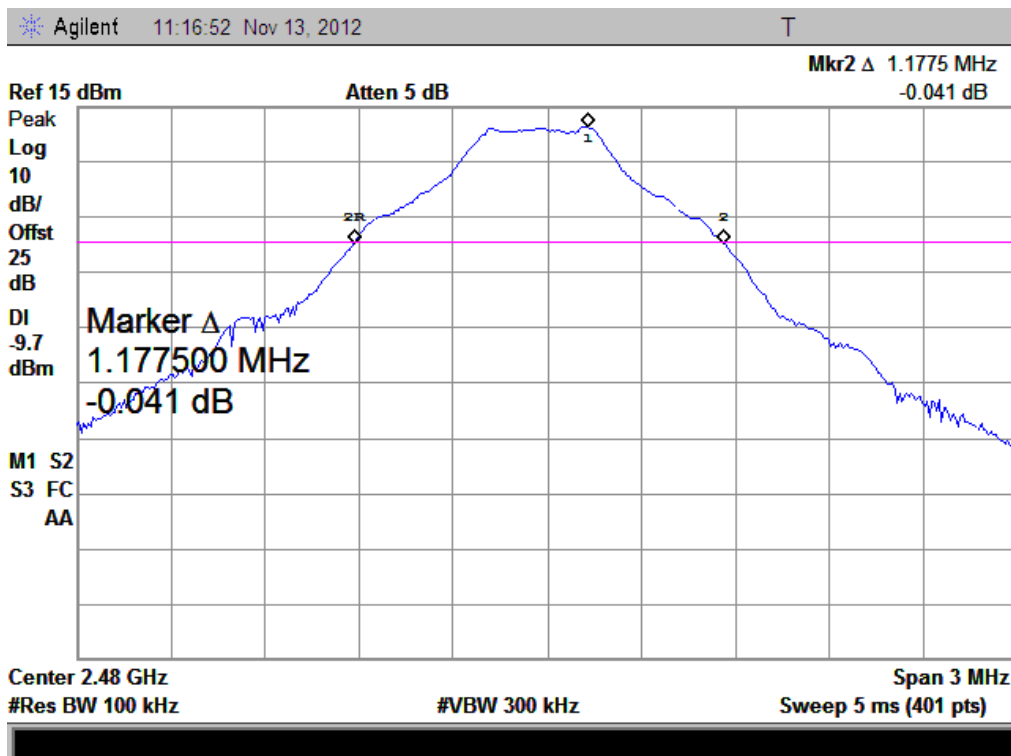
B. Test Plots:



(Plot A: Channel = 2402)



(Plot B: Channel = 2441)

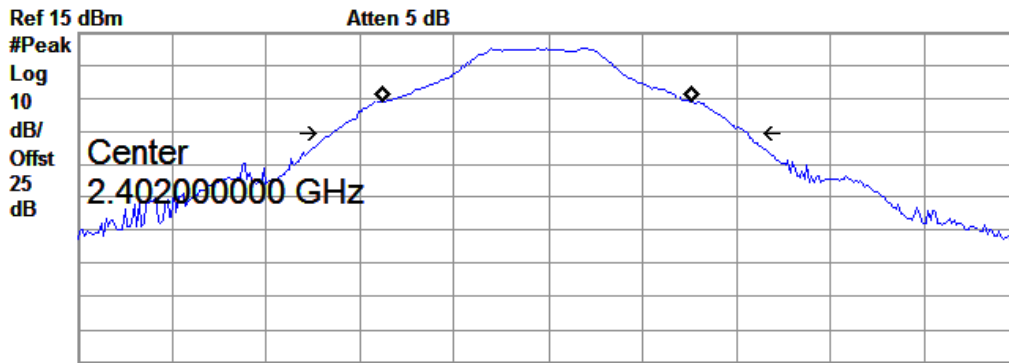


(Plot C: Channel = 2480)

99% Bandwidth

Channel	Frequency (MHz)	99% Bandwidth (MHz)	Refer to Plot
0	2402	0.981	Plot A1
39	2441	0.972	Plot B1
78	2480	0.973	Plot C1

Agilent 12:04:25 Nov 13, 2012 T S



Center 2.402 GHz Span 3 MHz
#Res BW 100 kHz #VBW 300 kHz Sweep 5 ms (401 pts)

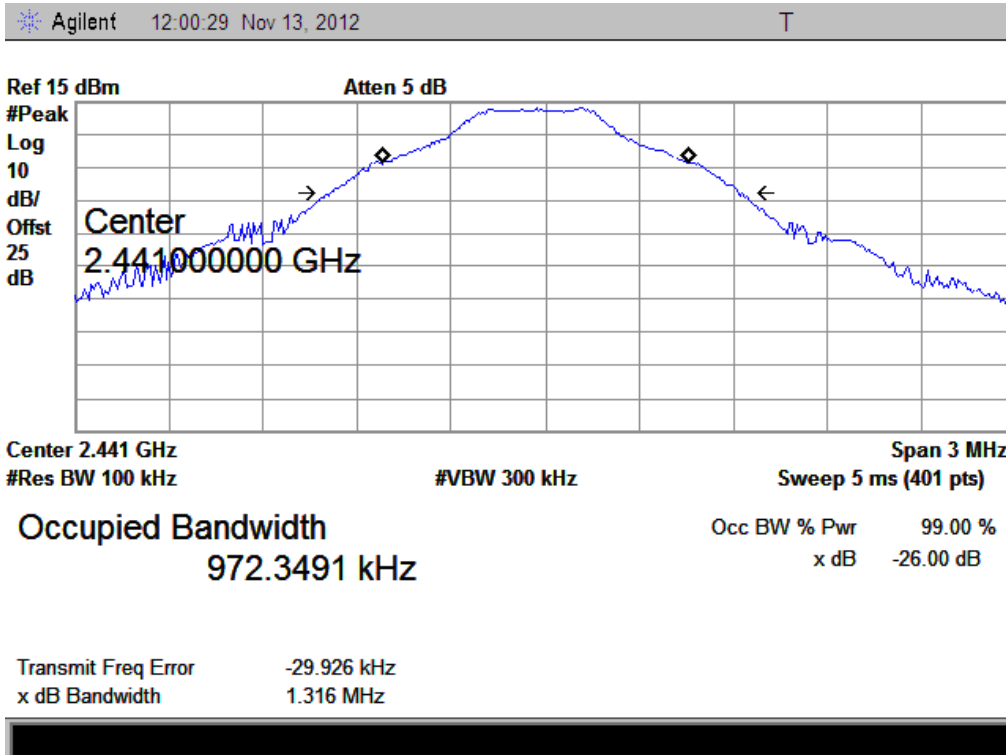
Occupied Bandwidth
980.6346 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

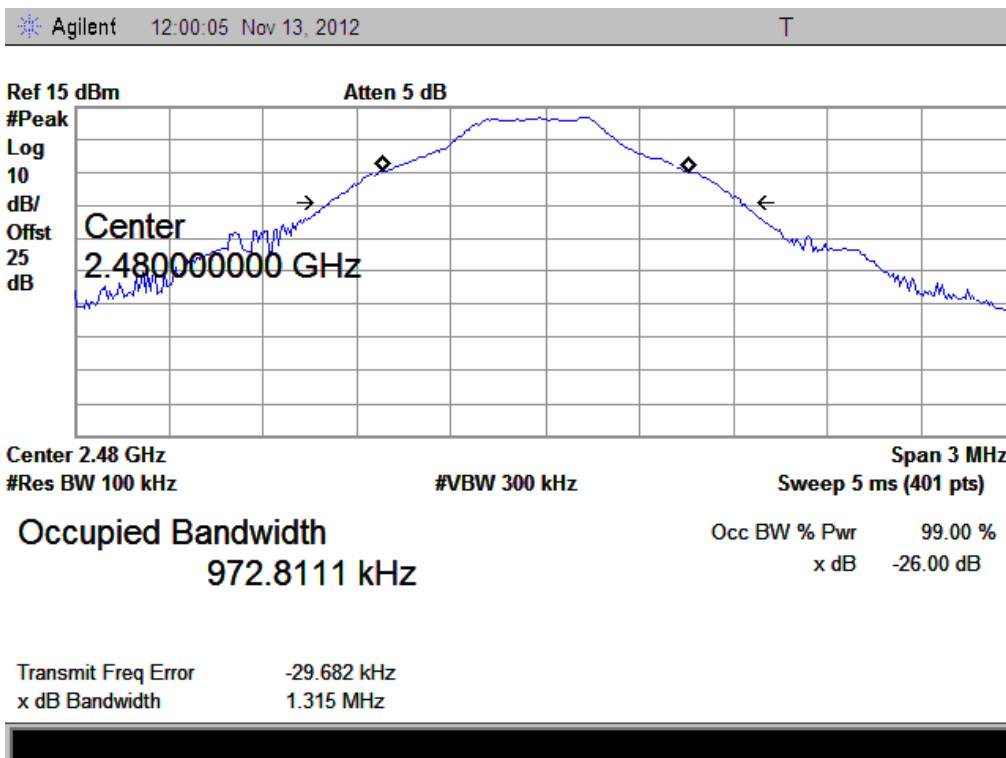
Transmit Freq Error -32.662 kHz
x dB Bandwidth 1.327 MHz

Undefined header

(Plot A1:Channel = 2402)



(Plot B1:Channel = 2441)



(Plot C1:Channel = 2480)

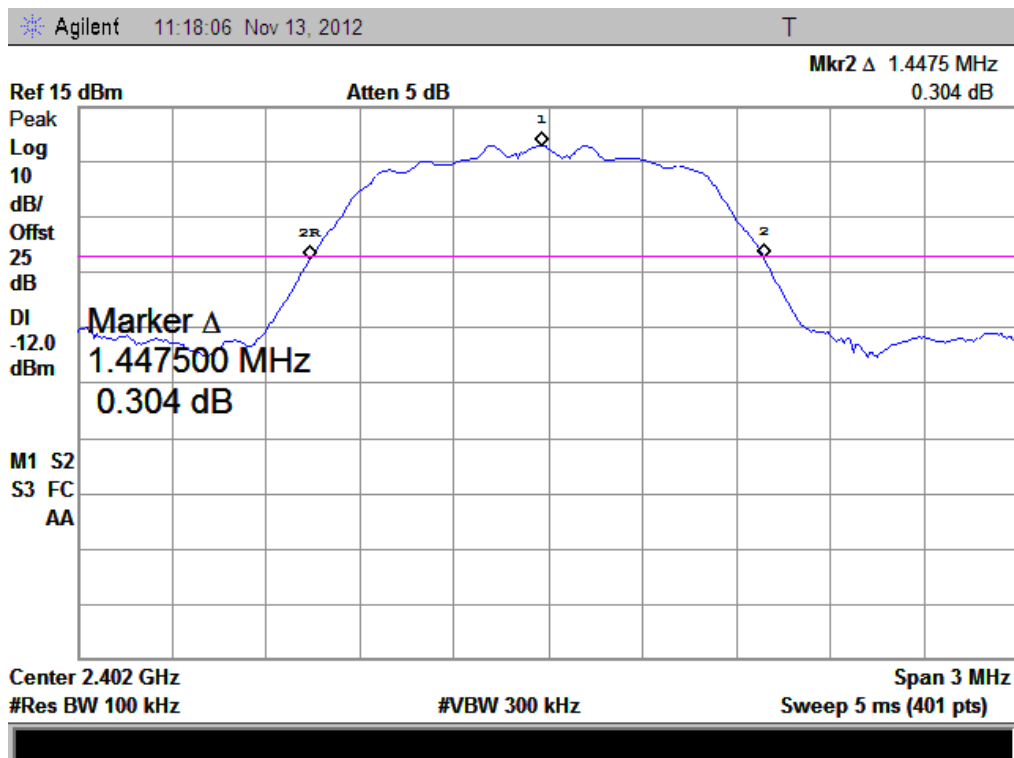
2.3.3.2. $\pi/4$ -DQPSK Mode

A. Test Verdict:

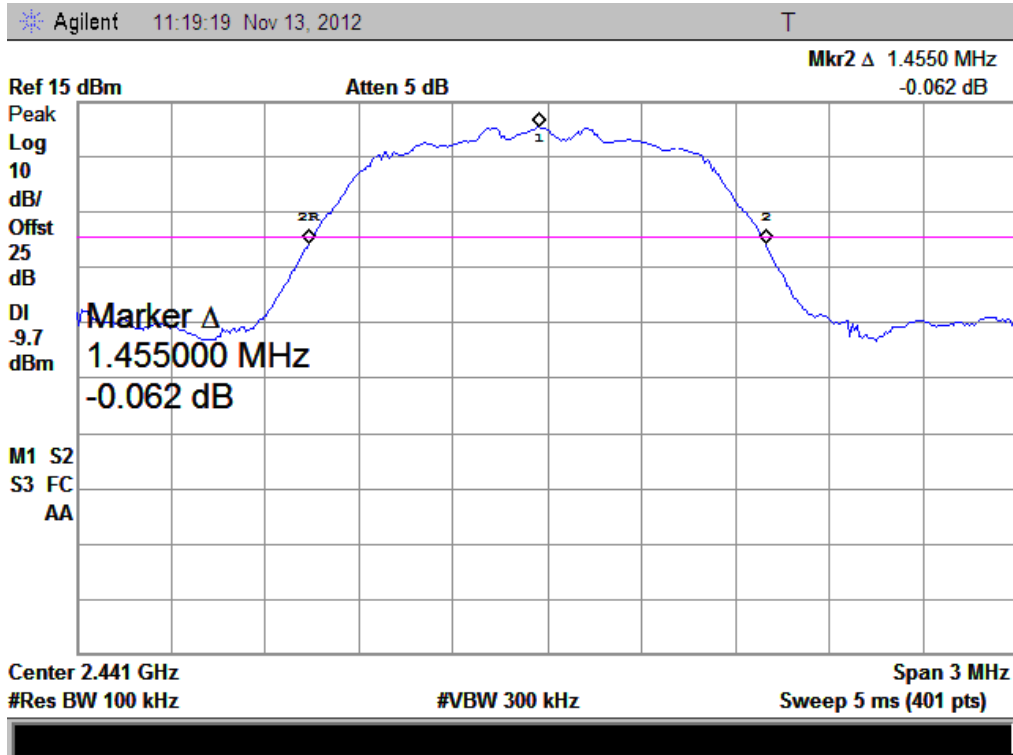
The maximum 20dB bandwidth measured is 1.4550MHz according to the table below.

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Refer to Plot
0	2402	1.4475	Plot D
39	2441	1.4550	Plot E
78	2480	1.4550	Plot F

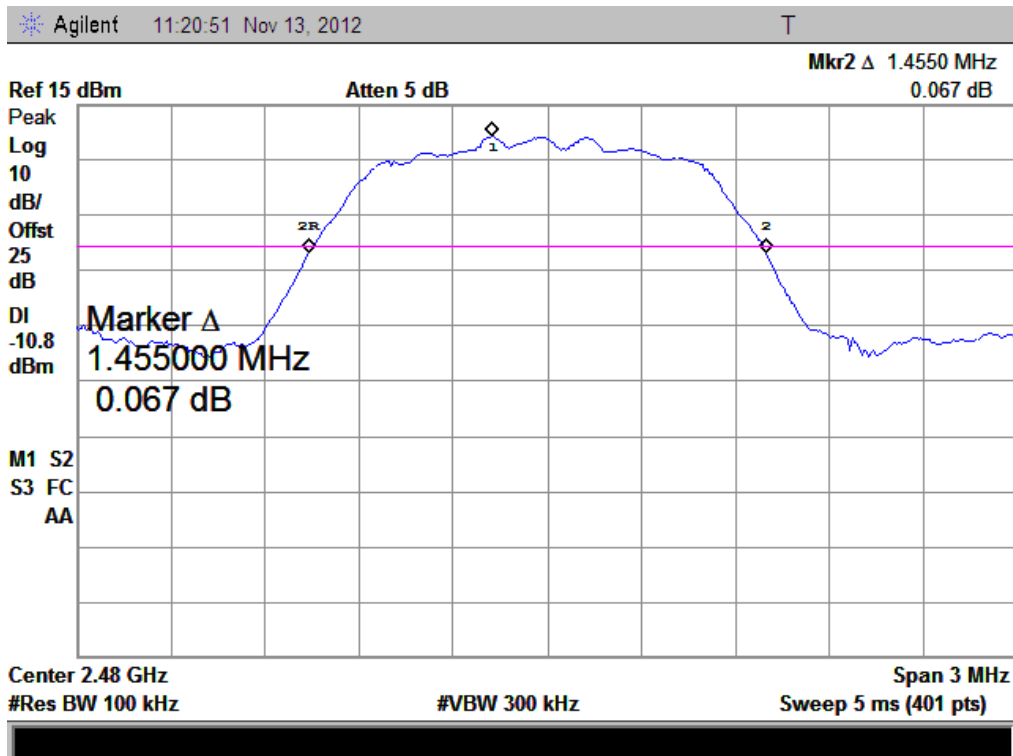
B. Test Plots:



(Plot D: Channel = 2402)



(Plot E: Channel = 2441)

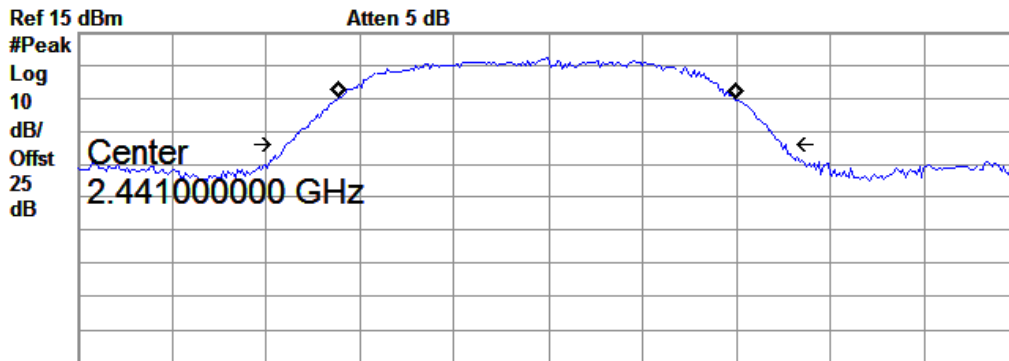


(Plot F: Channel = 2480)

99% Bandwidth

Channel	Frequency (MHz)	99% Bandwidth (MHz)	Refer to Plot
0	2402	1.2635	Plot D1
39	2441	1.2449	Plot E1
78	2480	1.2494	Plot F1

Agilent 11:58:51 Nov 13, 2012 T



Center 2.402 GHz Span 3 MHz
 #Res BW 100 kHz #VBW 300 kHz Sweep 5 ms (401 pts)

Occupied Bandwidth

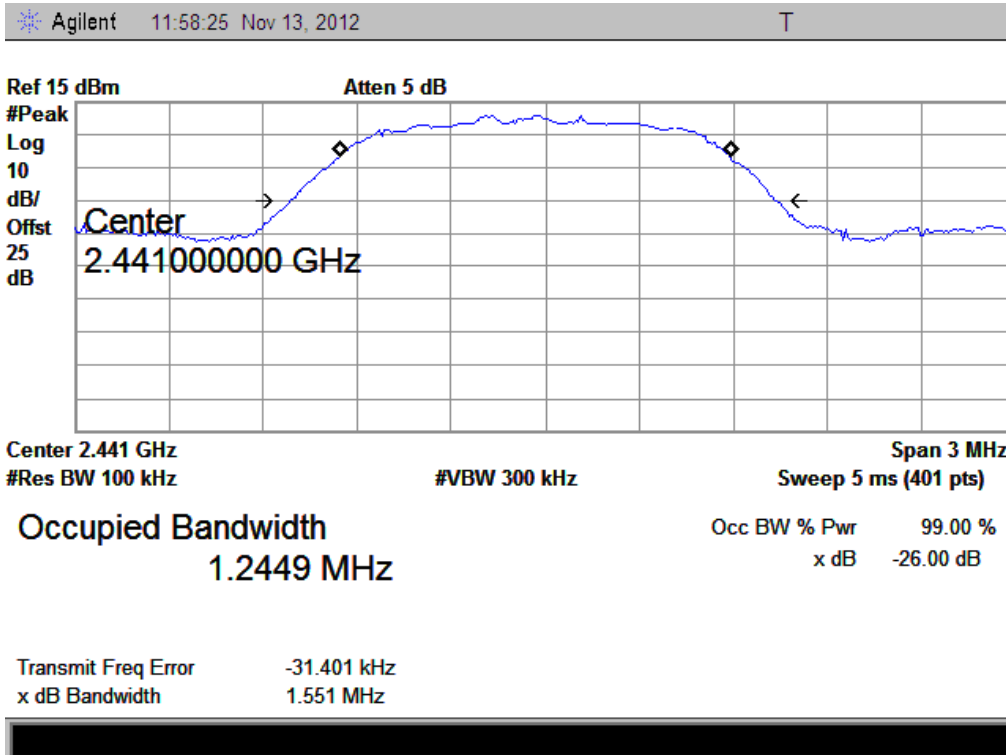
1.2635 MHz

Occ BW % Pwr 99.00 %
 x dB -26.00 dB

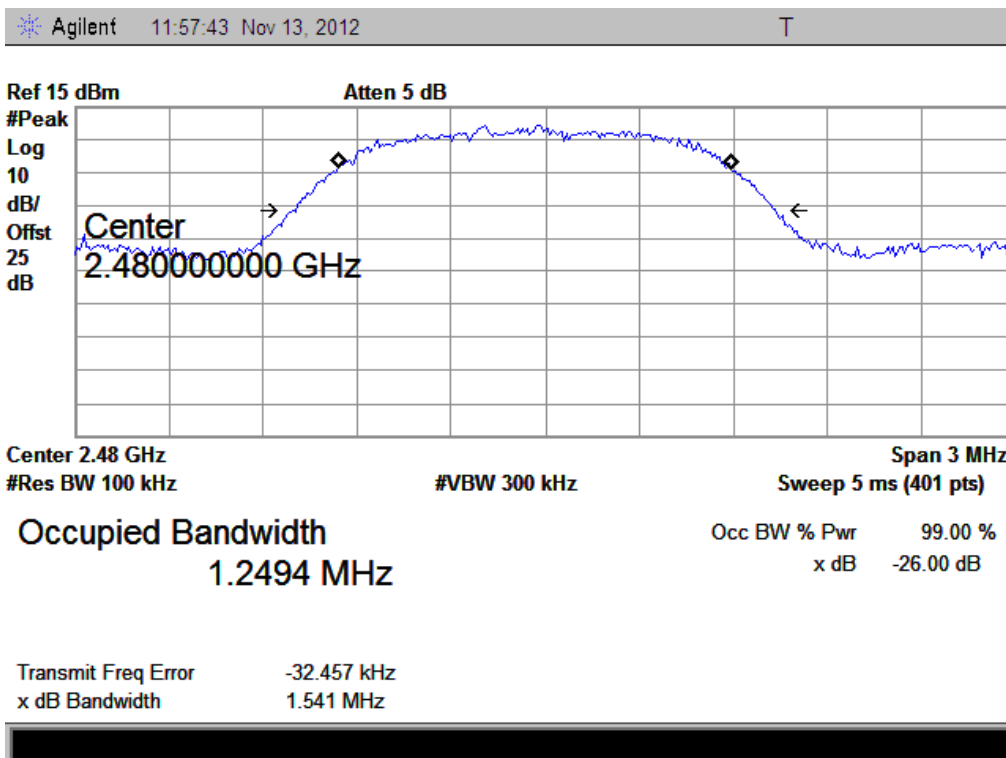
Transmit Freq Error -33.970 kHz
 x dB Bandwidth 1.575 MHz



(Plot D1:Channel = 2402)



(Plot E1:Channel = 2441)



(Plot F1:Channel = 2480)

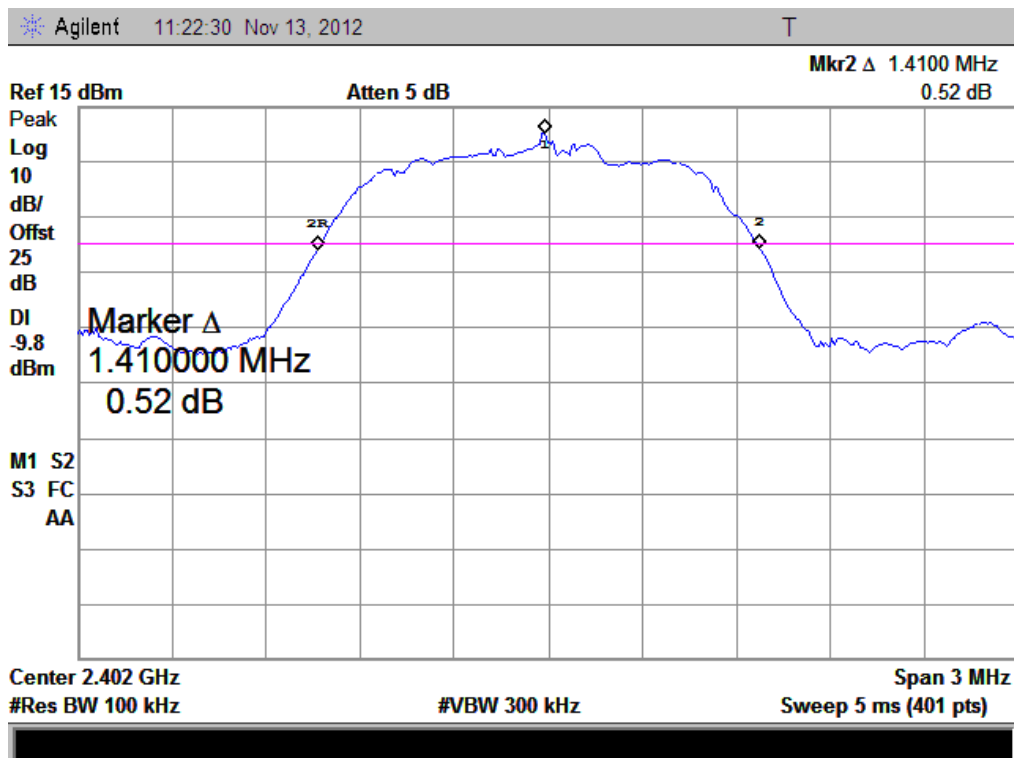
2.3.3.3. 8-DPSK Mode

A. Test Verdict:

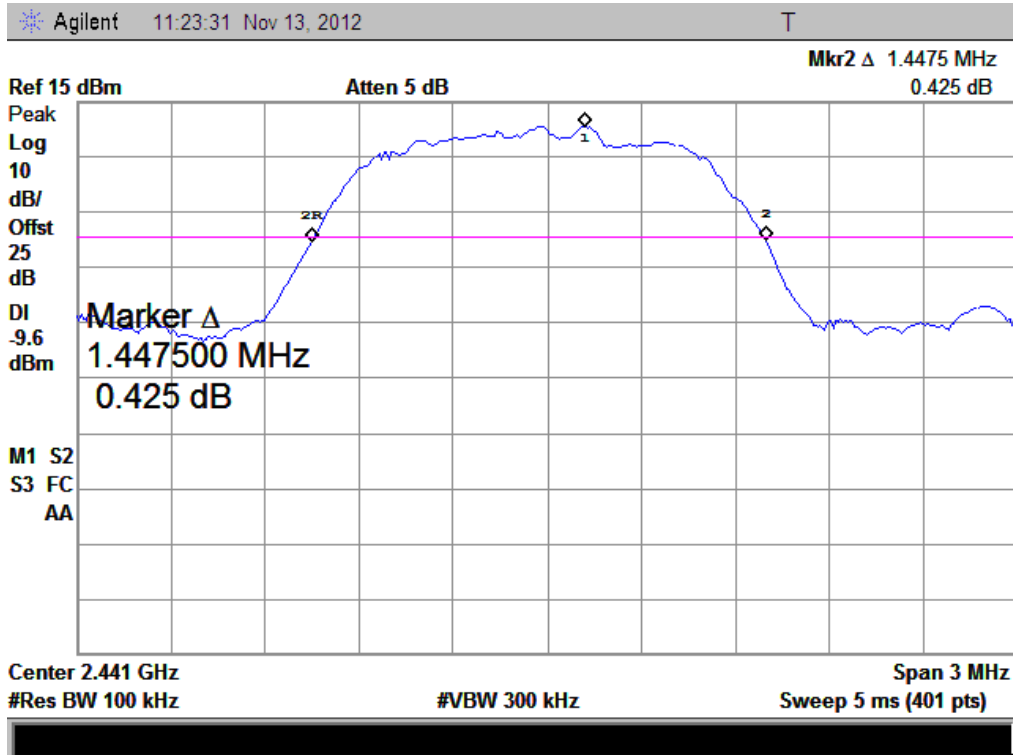
The maximum 20dB bandwidth measured is 1.4475MHz according to the table below.

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Refer to Plot
0	2402	1.4100	Plot G
39	2441	1.4475	Plot H
78	2480	1.4400	Plot I

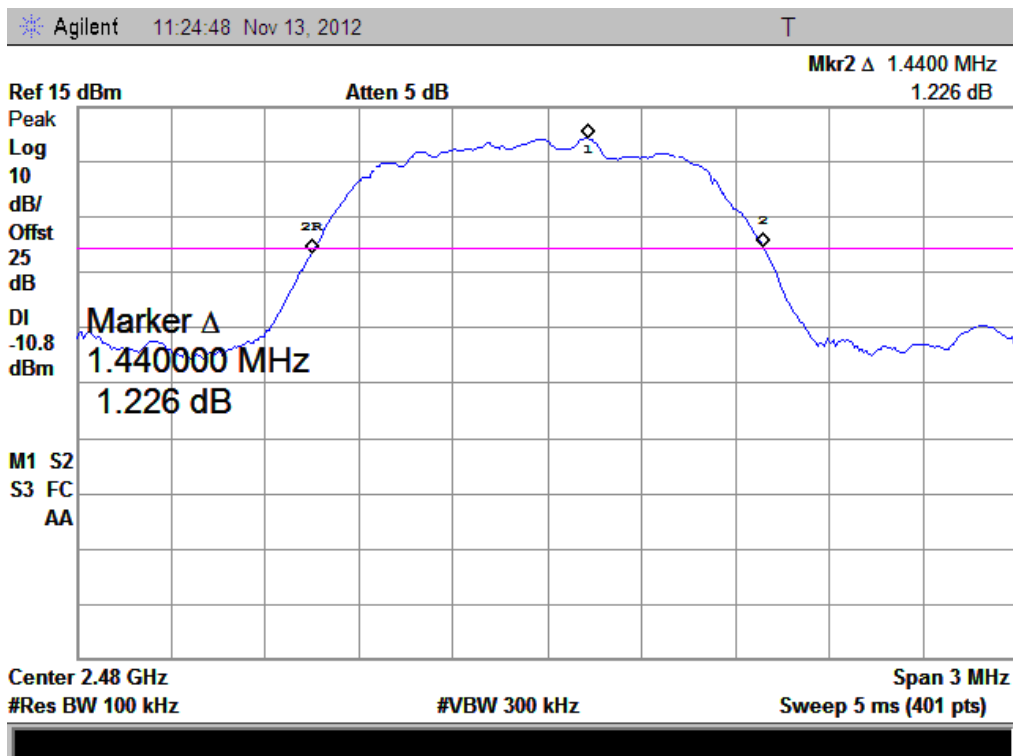
B. Test Plots:



(Plot G: Channel = 2402)



(Plot H: Channel = 2441)

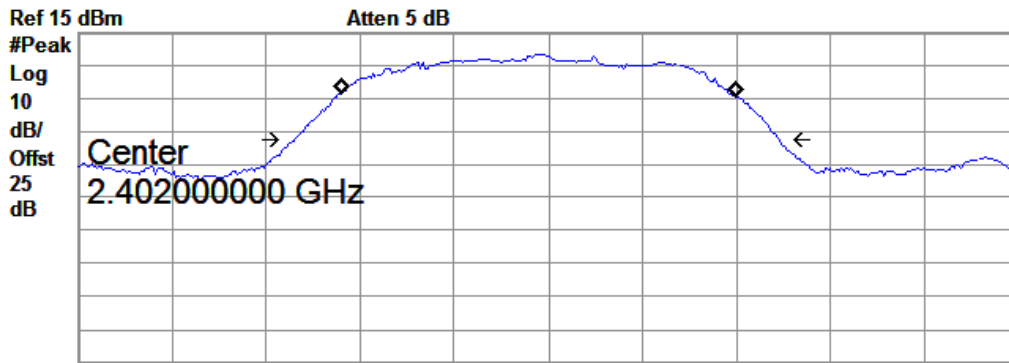


(Plot I: Channel = 2480)

99% Bandwidth

Channel	Frequency (MHz)	99% Bandwidth (MHz)	Refer to Plot
0	2402	1.2613	Plot G1
39	2441	1.2567	Plot H1
78	2480	1.2568	Plot I1

Agilent 11:56:23 Nov 13, 2012 T



Center 2.402 GHz Span 3 MHz
 #Res BW 100 kHz #VBW 300 kHz Sweep 5 ms (401 pts)

Occupied Bandwidth

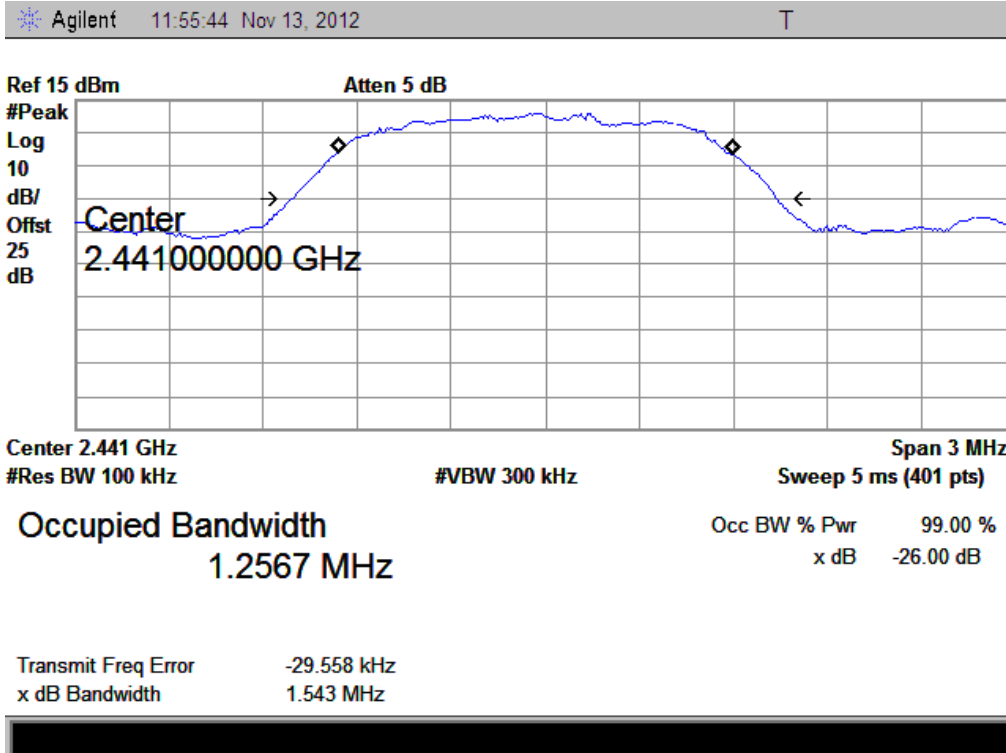
1.2613 MHz

Occ BW % Pwr 99.00 %
 x dB -26.00 dB

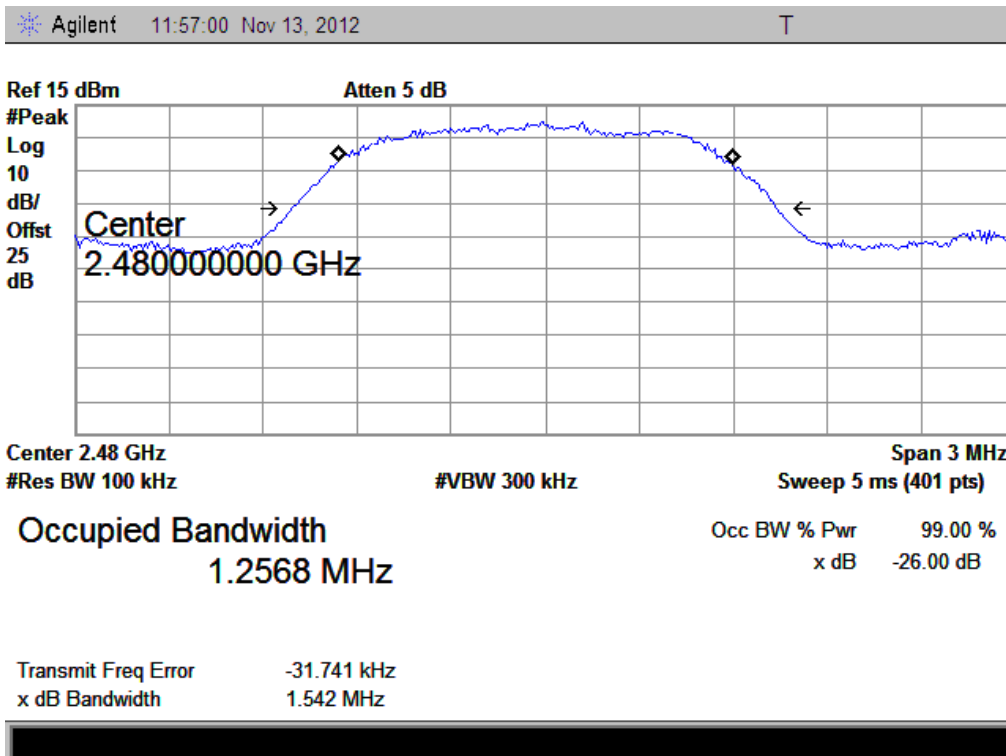
Transmit Freq Error -31.732 kHz
 x dB Bandwidth 1.546 MHz



(Plot G1:Channel = 2402)



(Plot H1:Channel = 2441)



(Plot I1:Channel = 2480)

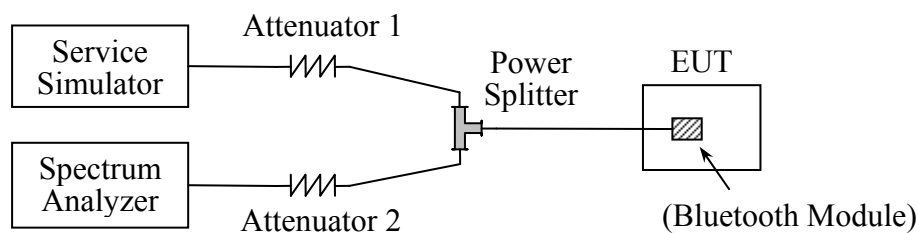
2.4. Carried Frequency Separation

2.4.1. Definition

According to FCC §15.247(a)(1) RSS-210 A8.1 (b), 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.

2.4.2. Test Description

A. Test Setup:



The Bluetooth Module of the EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the Bluetooth Service Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. During the measurement, the Bluetooth Module of the EUT is activated and controlled by the SS, and is set to operate under test mode transmitting 339 bytes DH5 packages at maximum power.

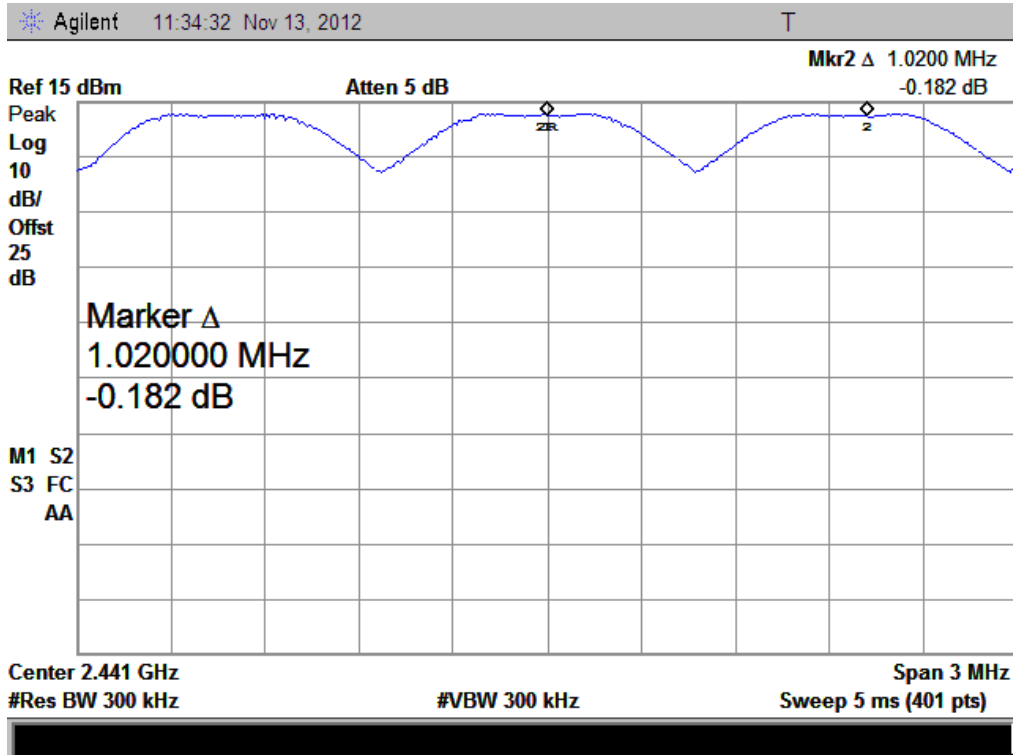
B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	R&S	CMU200	100448	2012.05	2013.05
Spectrum Analyzer	Agilent	E7405A	US44210471	2012.05	2013.05
Power Splitter	Weinschel	1506A	NW521	2012.05	2013.05
Attenuator 1	Resnet	20dB	(n.a.)	2012.05	2013.05
Attenuator 2	Resnet	3dB	(n.a.)	2012.05	2013.05

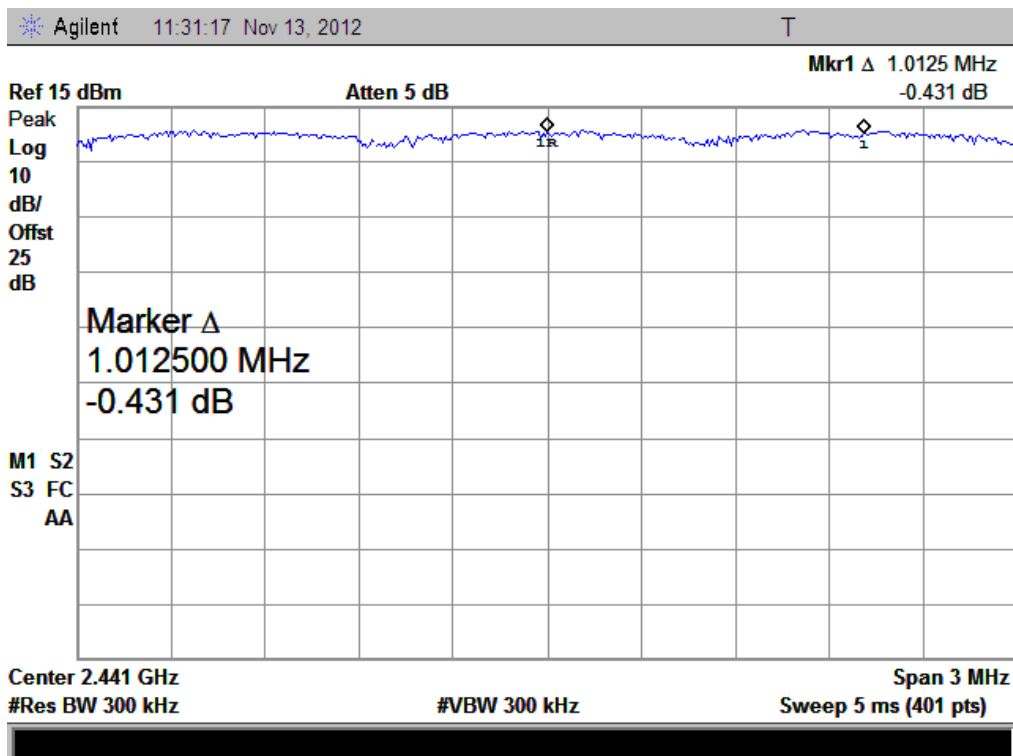
2.4.3. Test Result

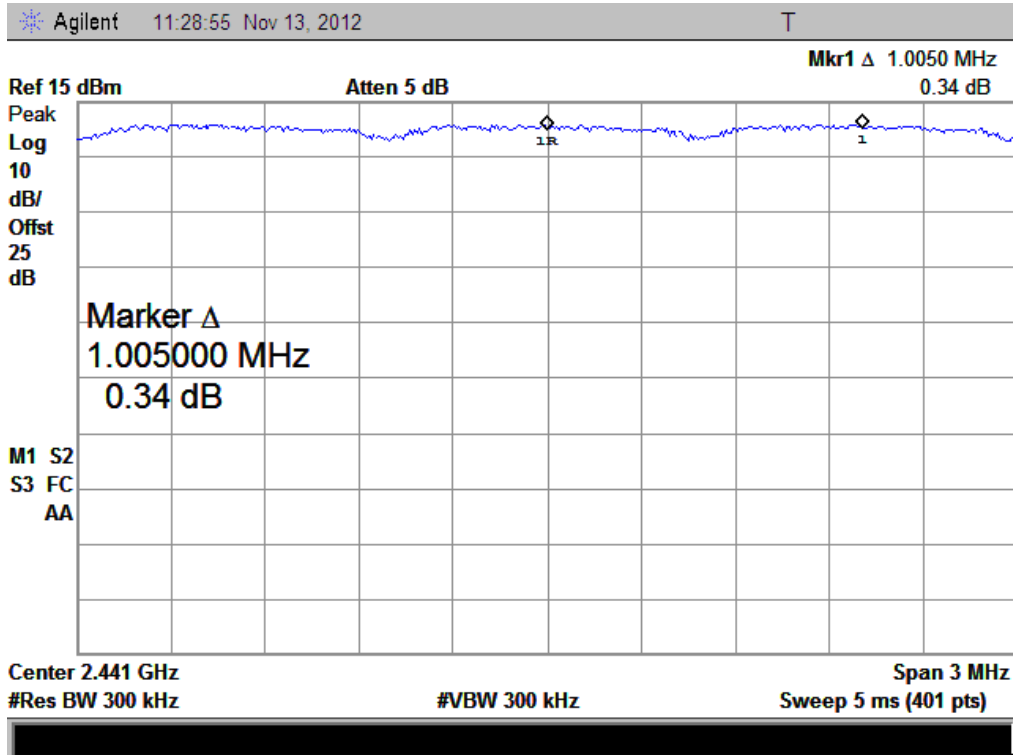
The Bluetooth Module operates at hopping-on test mode.

For any adjacent channels (e.g. the channel 39 and 40 as showed in the Plot A), 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 (1.1775MHz for GFSK mode, 1.4550MHz for $\pi/4$ -DQPSK mode and 1.4475MHz for 8-DPSK mode, refer to section 2.3.3), whichever is greater. So, the verdict is PASSING.



(Plot A: GFSK)


 (Plot B: $\pi/4$ -DQPSK)



(Plot C: 8-DPSK)

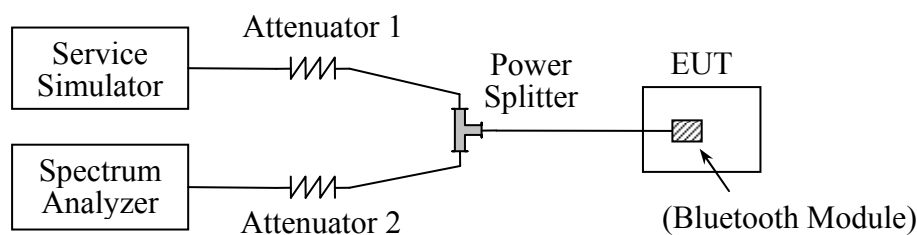
2.5. Time of Occupancy (Dwell time)

2.5.1. Requirement

According to FCC §15.247(a)(1)(iii) and RSS-210 A8.1 (d), 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.

2.5.2. Test Description

A. Test Setup:



The Bluetooth Module of the EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the Bluetooth Service Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. During the measurement, the Bluetooth Module of the EUT is activated and controlled by the SS, and is set to operate under test mode transmitting 339 bytes DH5 packages at maximum power.

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	R&S	CMU200	100448	2012.05	2013.05
Spectrum Analyzer	Agilent	E7405A	US44210471	2012.05	2013.05
Power Splitter	Weinschel	1506A	NW521	2012.05	2013.05
Attenuator 1	Resnet	20dB	(n.a.)	2012.05	2013.05
Attenuator 2	Resnet	3dB	(n.a.)	2012.05	2013.05

2.5.3. Test Result

The average time of occupancy on any channel within the Period can be calculated with formulas (for DH5 package type):

$$\begin{aligned} \{\text{Total of Dwell}\} &= \{\text{Pulse Time}\} * (1600 / 6) / \{\text{Number of Hopping Frequency}\} * \{\text{Period}\} \\ \{\text{Period}\} &= 0.4s * \{\text{Number of Hopping Frequency}\} \end{aligned}$$

The lowest, middle and highest channels are selected to perform testing to record the dwell time of each occupation measured in this channel, which is called Pulse Time here.

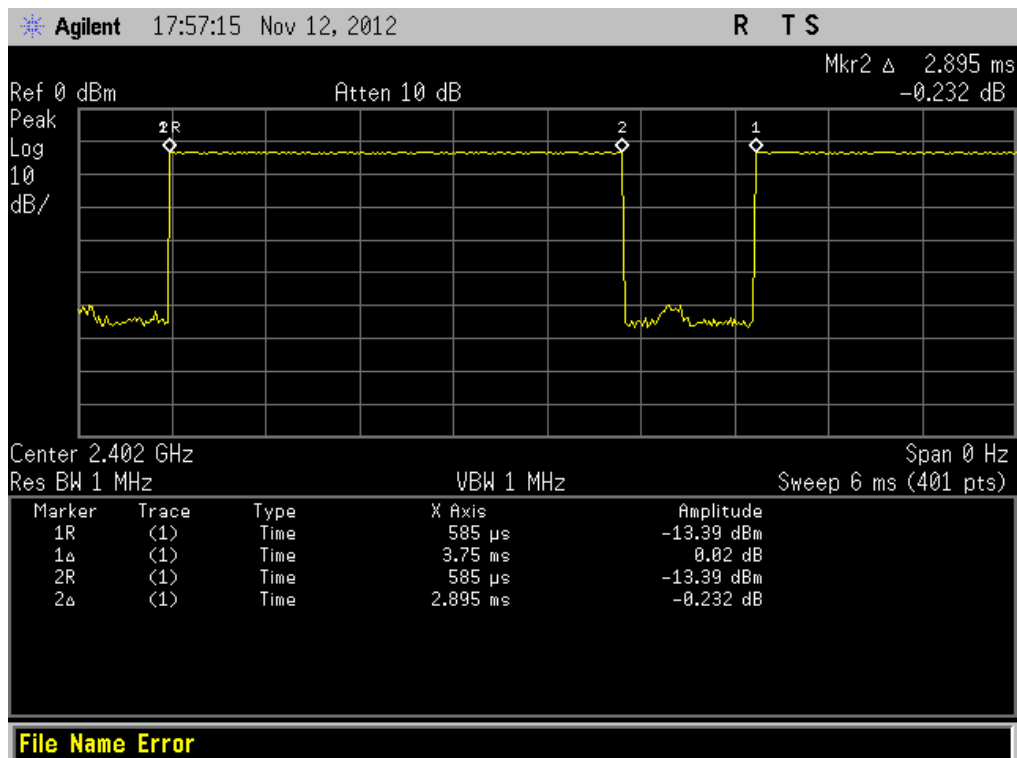
2.5.3.1. GFSK Mode

A. Test Verdict:

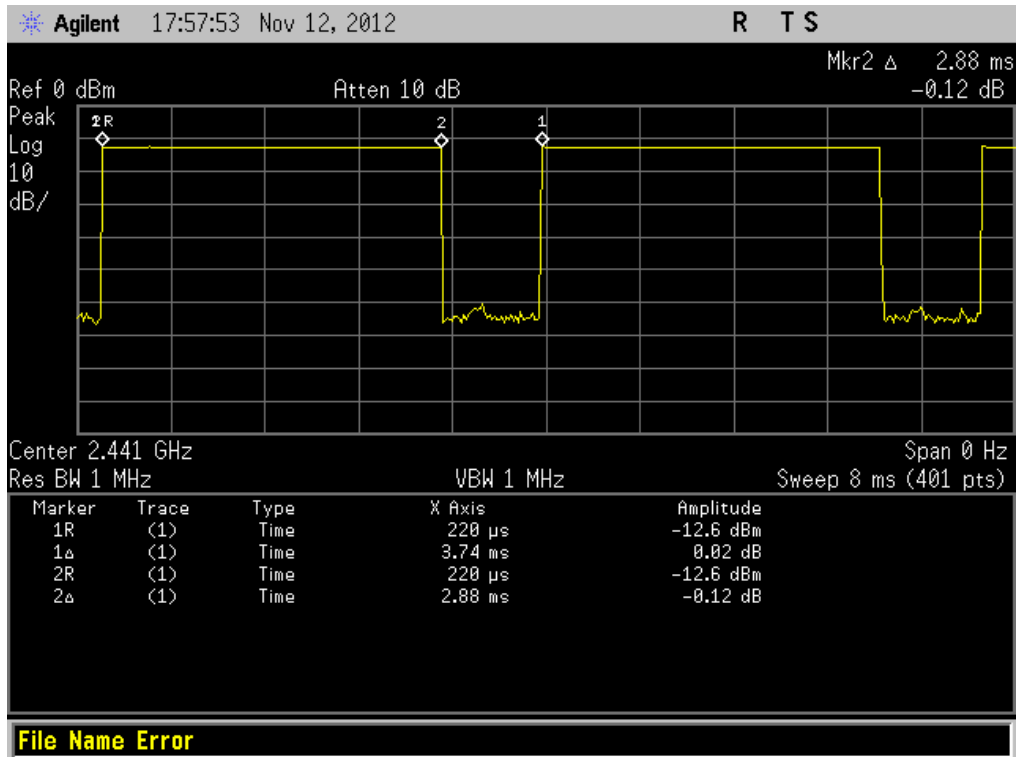
Channel	Frequency (MHz)	Pulse Time		Total of Dwell (ms)	Limit (ms)	Verdict
		ms	Refer to Plot			
0	2402	2.895	Plot A	308.800	400	PASS
39	2441	2.880	Plot B	307.200		PASS
78	2480	2.890	Plot C	308.27		PASS

B. Test Plots:

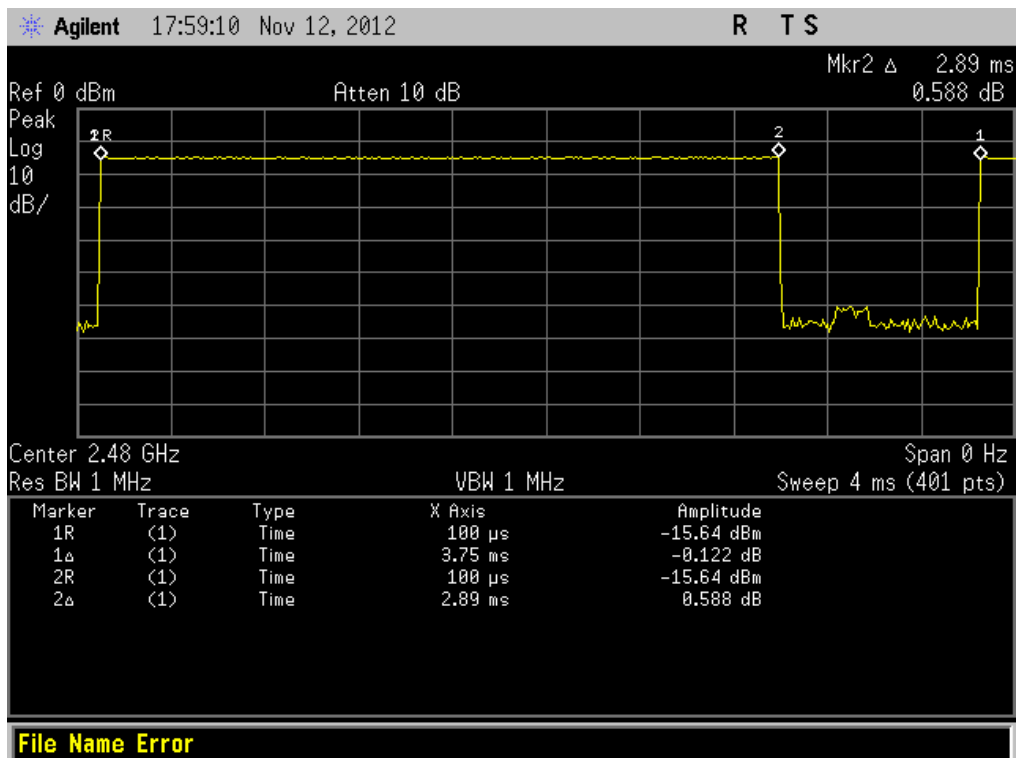
Note: the following plots record the Pulse Time of the Module carrier.



(Plot A: Channel = 2402)



(Plot B: Channel = 2441)



(Plot C: Channel = 2480)

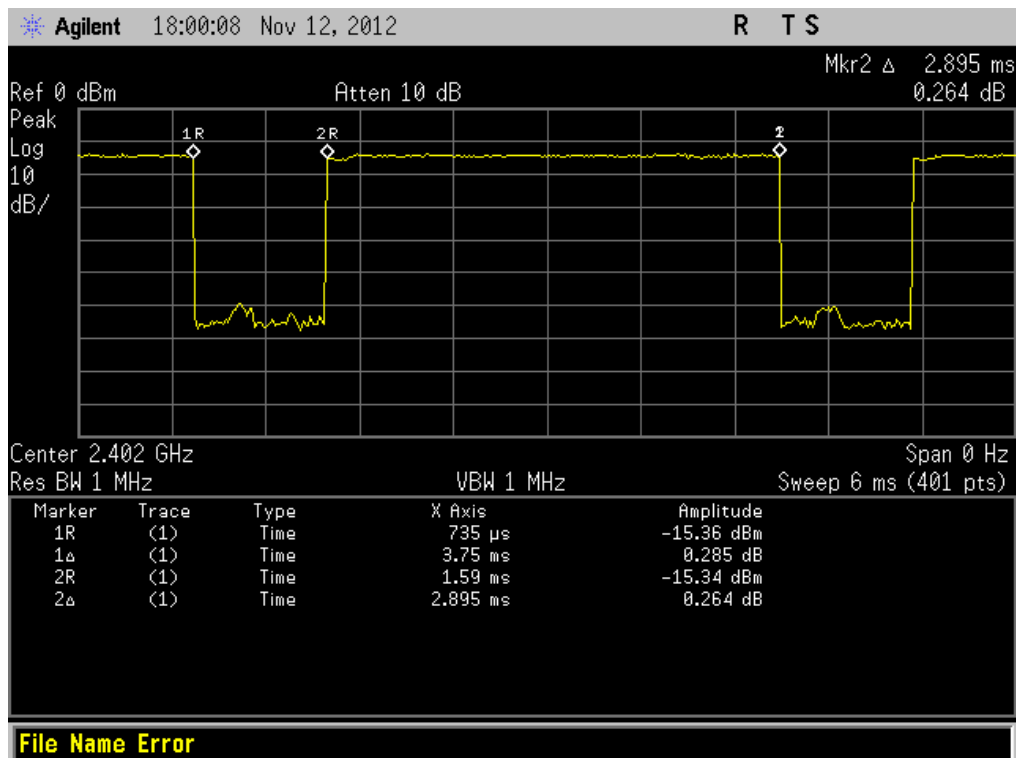
2.5.3.2. $\pi/4$ -DQPSK Mode

A. Test Verdict:

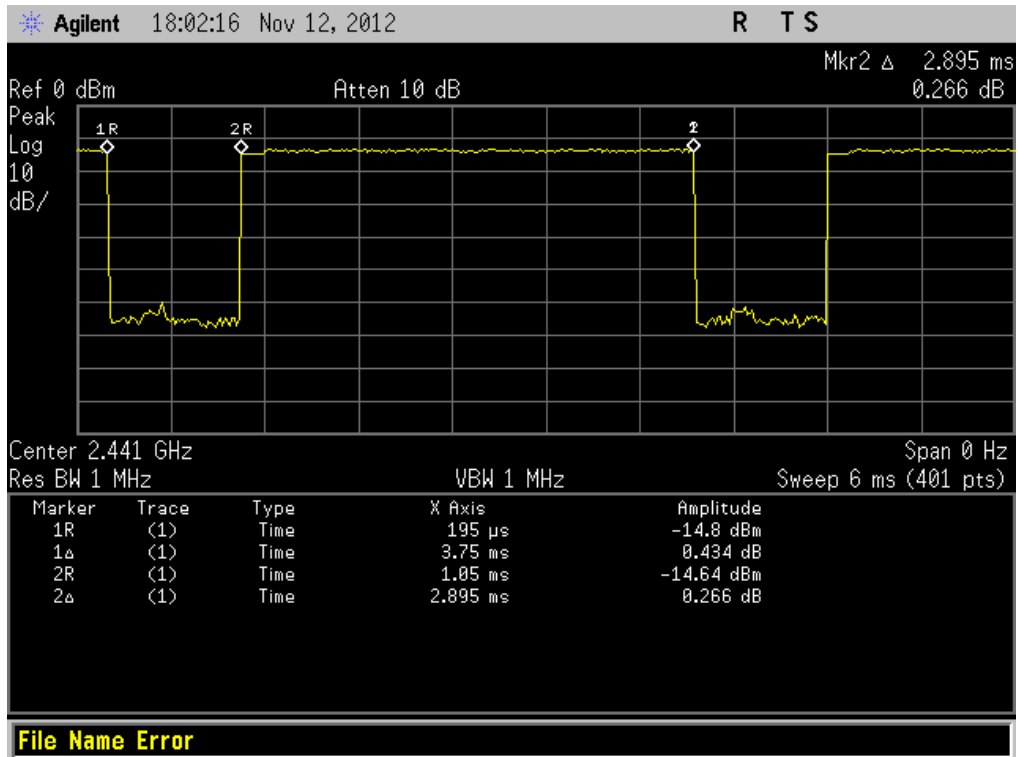
Channel	Frequency (MHz)	Pulse Time		Total of Dwell (ms)	Limit (ms)	Verdict
		ms	Refer to Plot			
0	2402	2.895	Plot D	308.800	400	PASS
39	2441	2.895	Plot E	308.800		PASS
78	2480	2.895	Plot F	308.800		PASS

B. Test Plots:

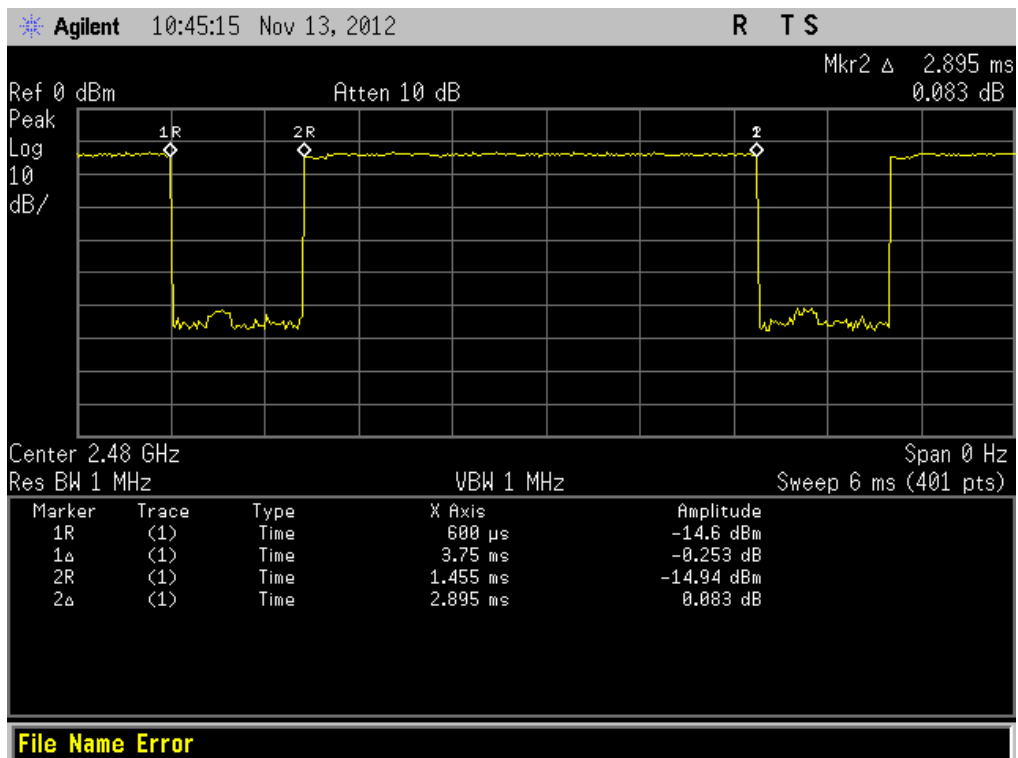
Note: the following plots record the Pulse Time of the Module carrier.



(Plot D: Channel = 2402)



(Plot E: Channel = 2441)



(Plot F: Channel = 2480)

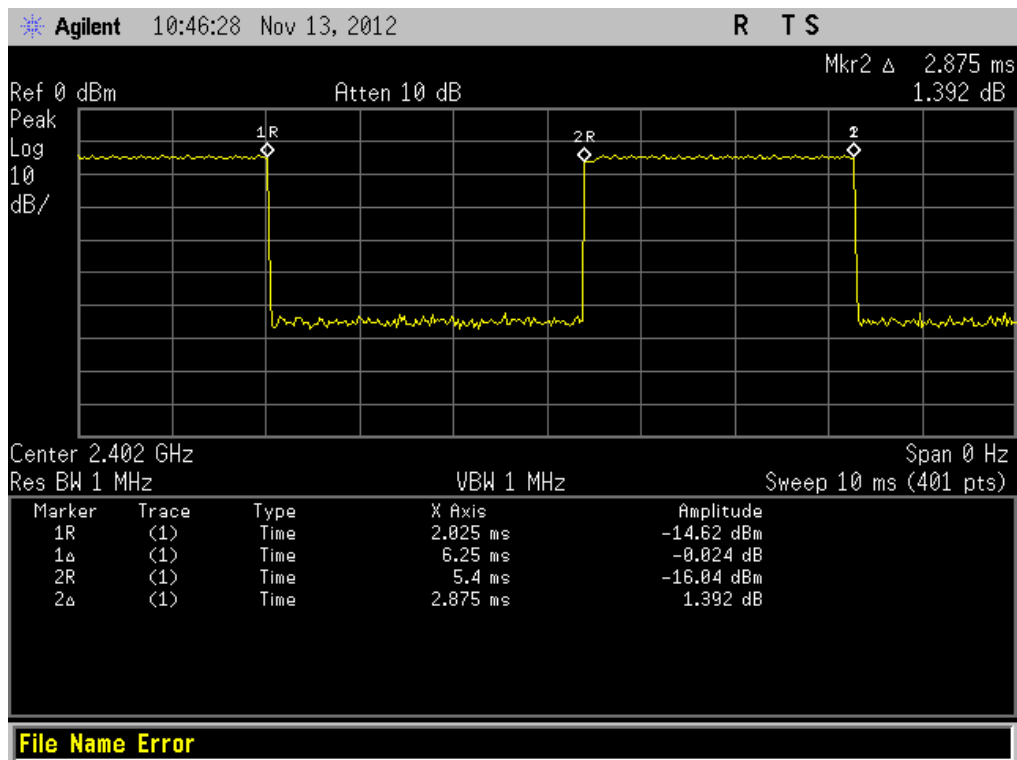
2.5.3.3. 8-DPSK Mode

A. Test Verdict:

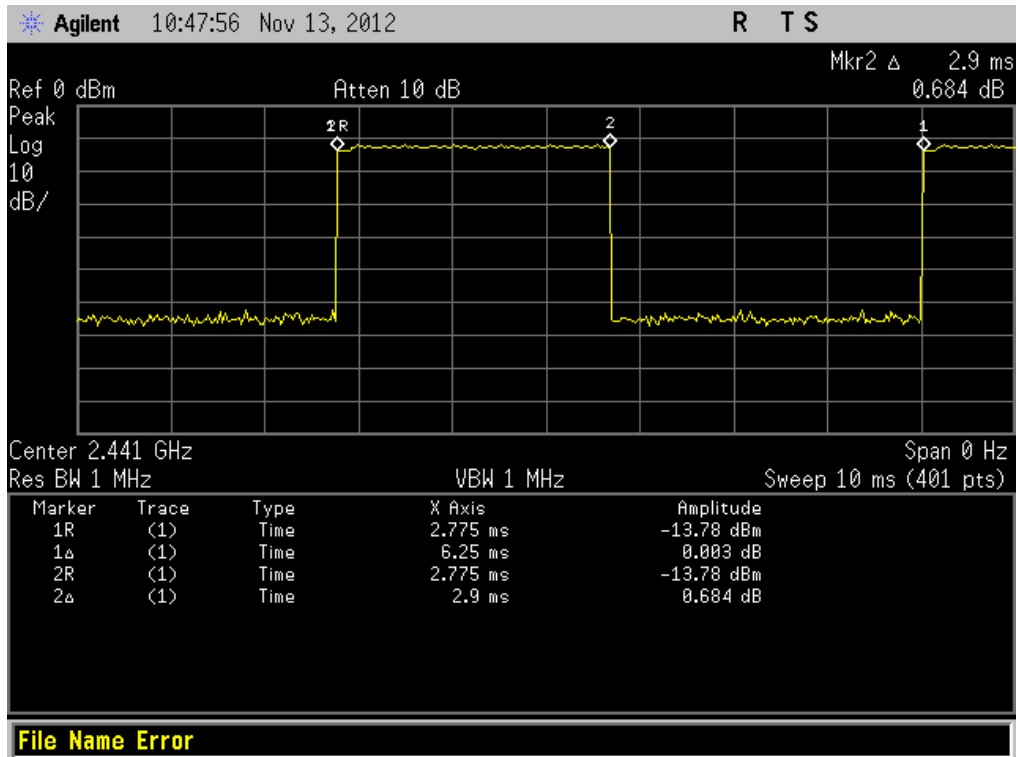
Channel	Frequency (MHz)	Pulse Time		Total of Dwell (ms)	Limit (ms)	Verdict
		ms	Refer to Plot			
0	2402	2.875	Plot G	306.667	400	PASS
39	2441	2.900	Plot H	309.333		PASS
78	2480	2.900	Plot I	309.333		PASS

B. Test Plots:

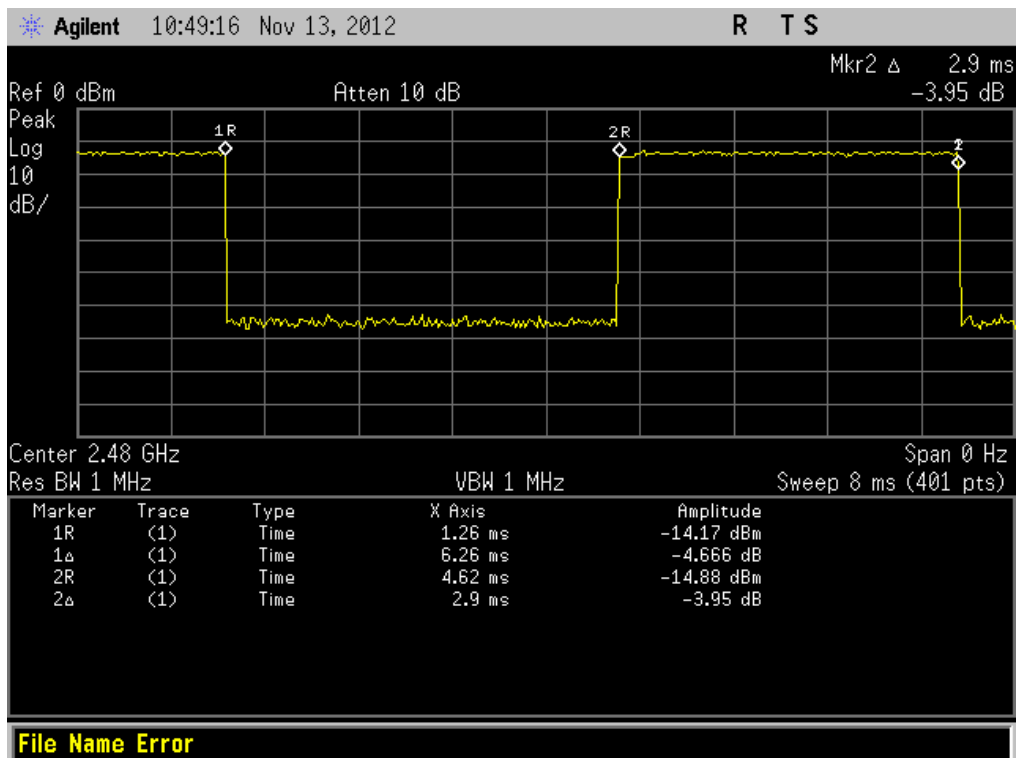
Note: the following plots record the Pulse Time of the Module carrier.



(Plot G: Channel = 2402)



(Plot H: Channel = 2441)



(Plot I: Channel = 2480)

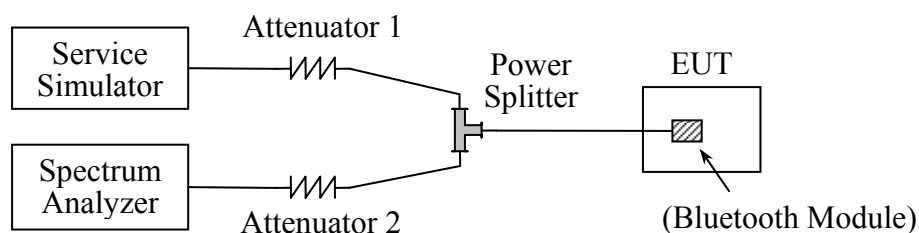
2.6. Conducted Spurious Emissions

2.6.1. Requirement

According to FCC §15.247(d) and RSS-A8.5, 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.

2.6.2. Test Description

A. Test Setup:



The Bluetooth Module of the EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the Bluetooth Service Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. During the measurement, the Bluetooth Module of the EUT is activated and controlled by the SS, and is set to operate under test mode transmitting 339 bytes DH5 packages at maximum power.

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	R&S	CMU200	100448	2012.05	2013.05
Spectrum Analyzer	Agilent	E7405A	US44210471	2012.05	2013.05
Power Splitter	Weinschel	1506A	NW521	2012.05	2013.05
Attenuator 1	Resnet	20dB	(n.a.)	2012.05	2013.05
Attenuator 2	Resnet	3dB	(n.a.)	2012.05	2013.05

2.6.3. 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.

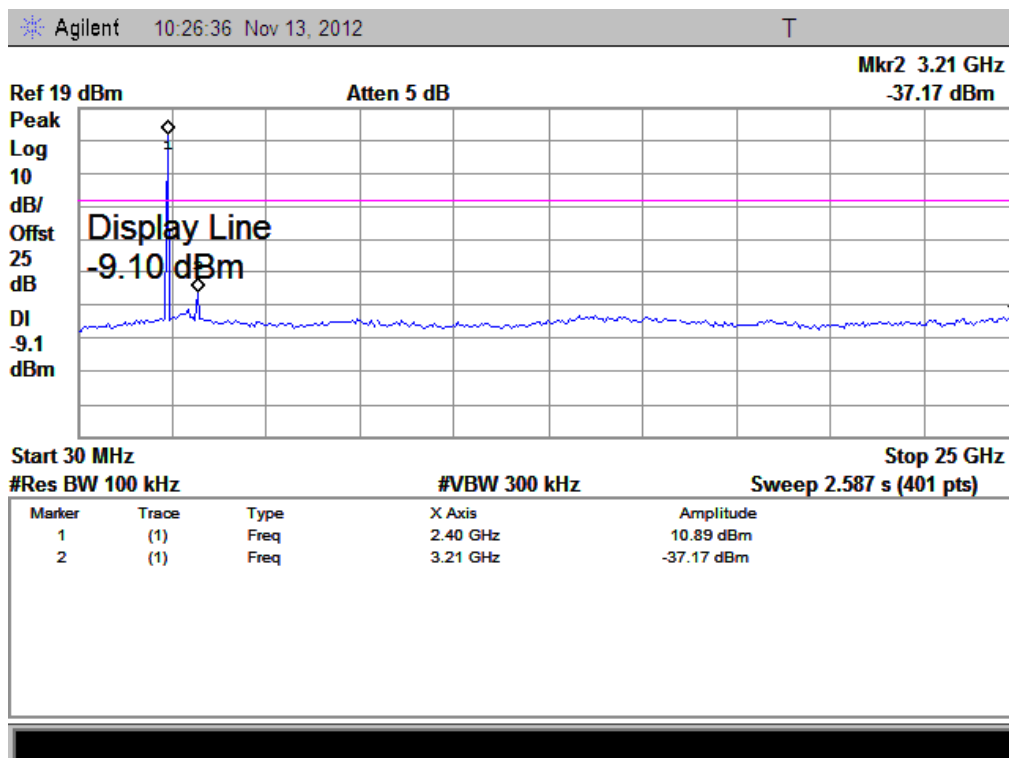
2.6.3.1. GFSK Mode

A. Test Verdict:

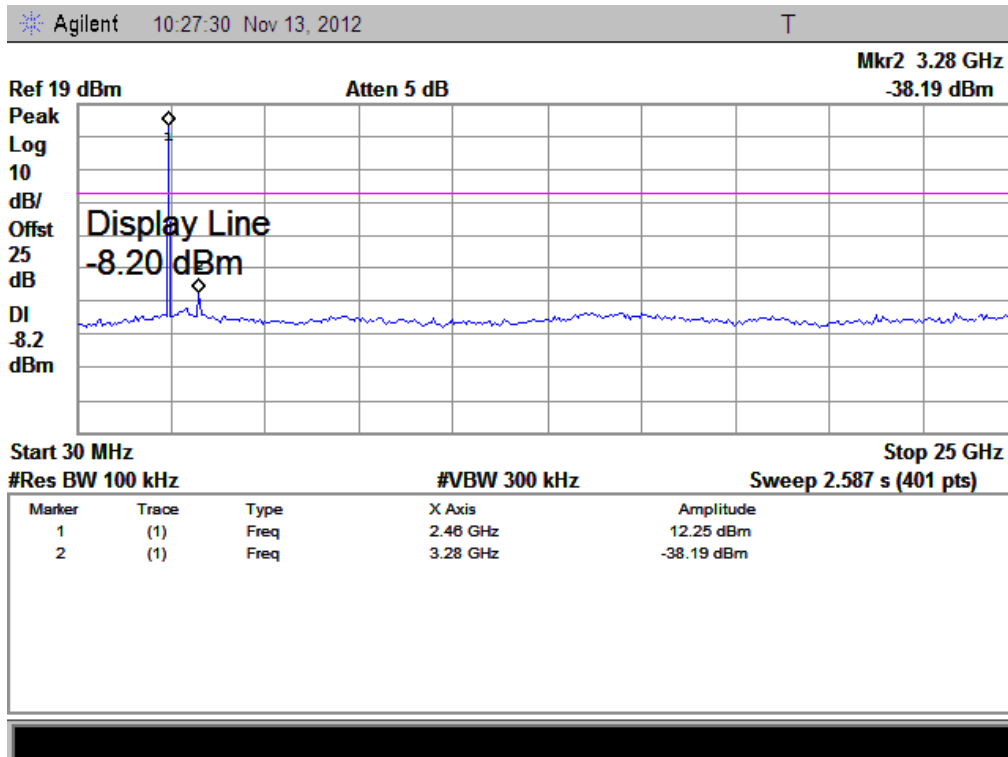
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Refer to Plot	Limit (dBm)		Verdict
				Carrier Level	Calculated -20dBc Limit	
0	2402	-37.17	Plot A.1	10.89	-9.1	PASS
39	2441	-38.19	Plot B.1	12.25	-8.2	PASS
78	2480	-40.06	Plot C.1	11.31	-8.7	PASS

B. Test Plots:

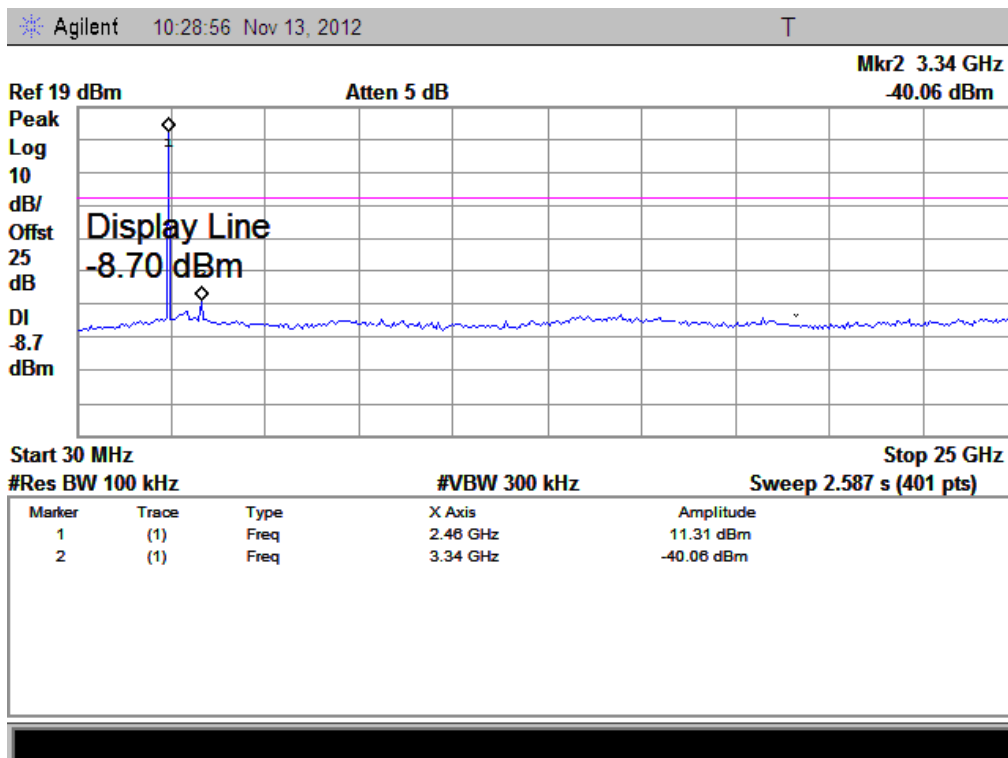
Note: the power of the Module transmitting frequency should be ignored.



(Plot A.1: Channel = 0, 30MHz to 25GHz)



(Plot B.1: Channel = 39, 30MHz to 25GHz)



(Plot C.1: Channel = 78, 30MHz to 25GHz)

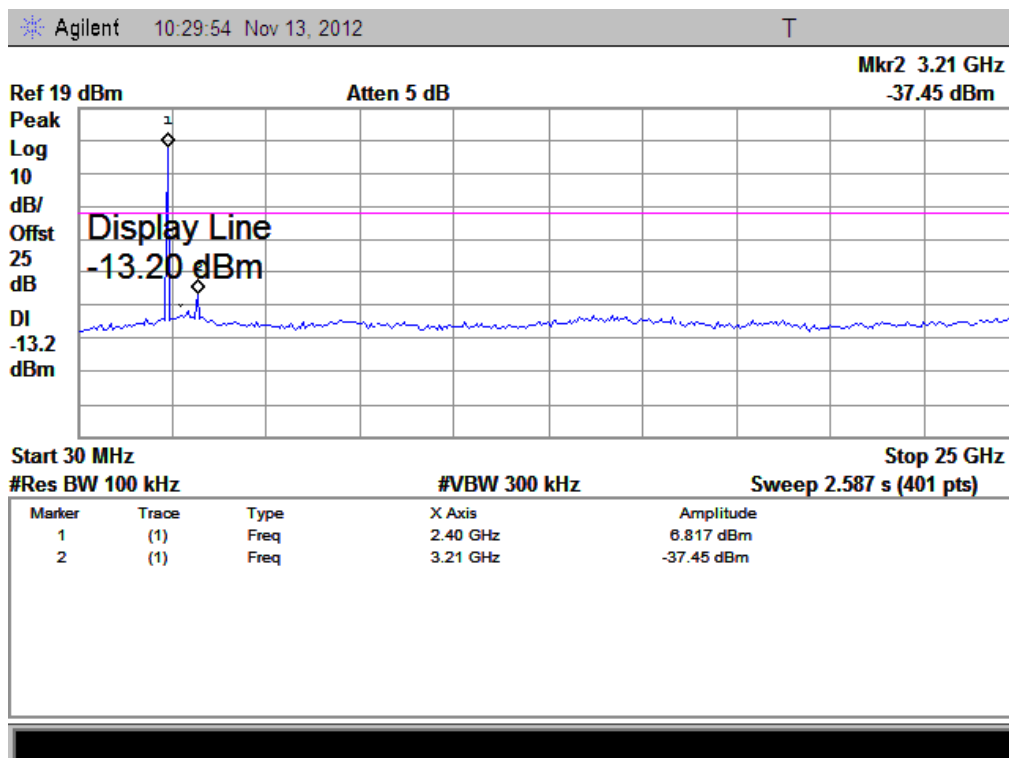
2.6.3.2. $\pi/4$ -DQPSK Mode

A. Test Verdict:

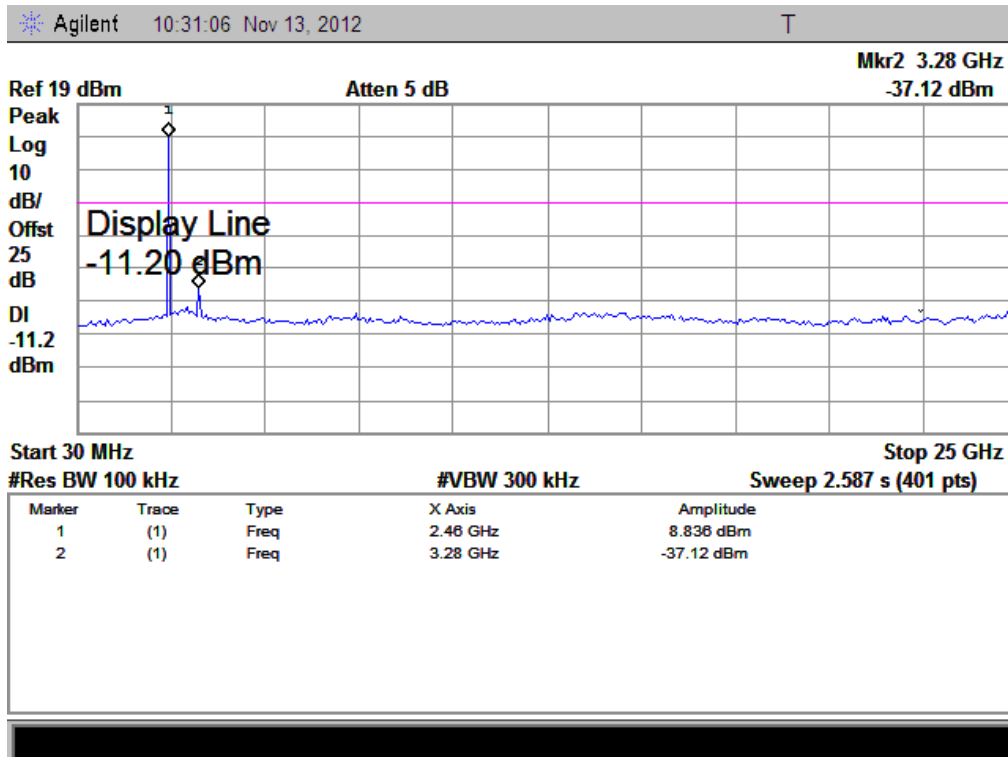
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Refer to Plot	Limit (dBm)		Verdict
				Carrier Level	Calculated -20dBc Limit	
0	2402	-37.45	Plot D.1	6.817	-13.2	PASS
39	2441	-37.12	Plot E.1	8.836	-11.2	PASS
78	2480	-38.92	Plot F.1	7.653	-12.3	PASS

B. Test Plots:

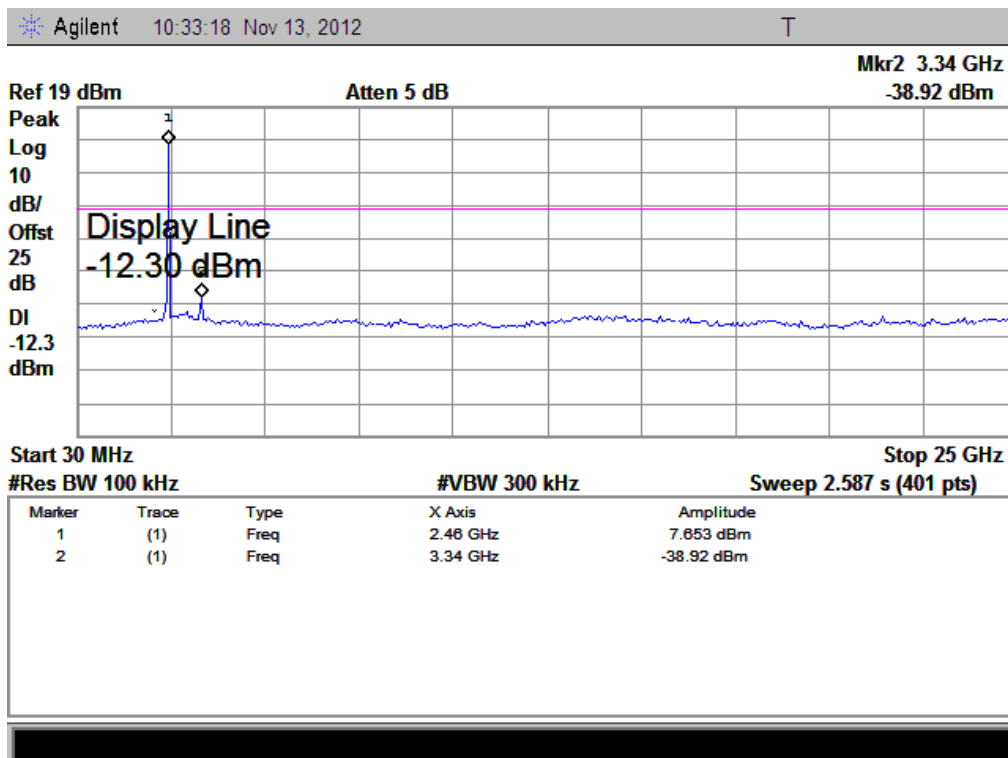
Note: the power of the Module transmitting frequency should be ignored.



(Plot D.1: Channel = 0, 30MHz to 25GHz)



(Plot E.1: Channel = 39, 30MHz to 25GHz)



(Plot F.1: Channel = 78, 30MHz to 25GHz)

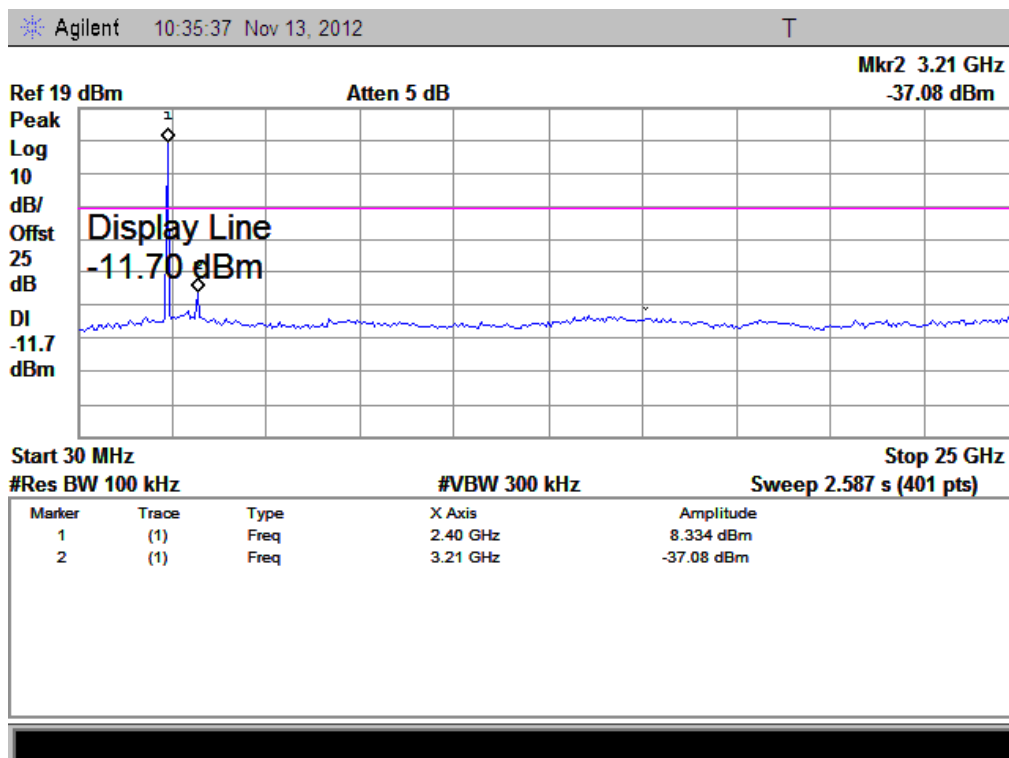
2.6.3.3. 8-DPSK Mode

A. Test Verdict:

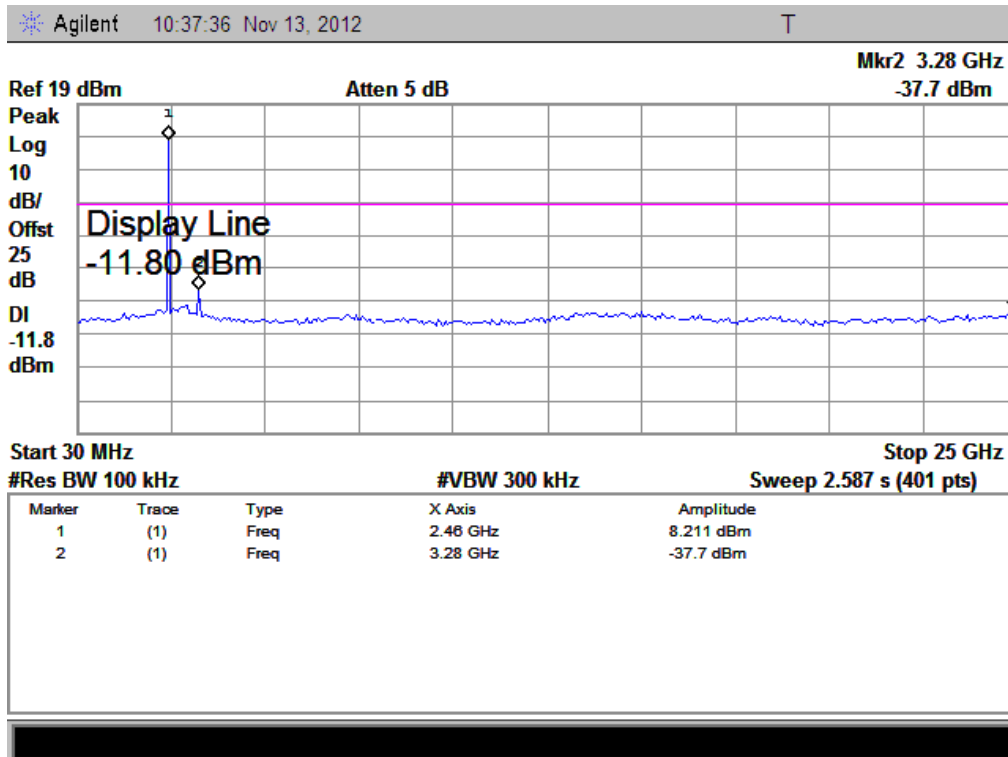
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Refer to Plot	Limit (dBm)		Verdict
				Carrier Level	Calculated -20dBc Limit	
0	2402	-37.08	Plot G.1	8.334	-11.7	PASS
39	2441	-37.70	Plot H.1	8.211	-11.8	PASS
78	2480	-38.53	Plot I.1	8.153	-11.8	PASS

B. Test Plots:

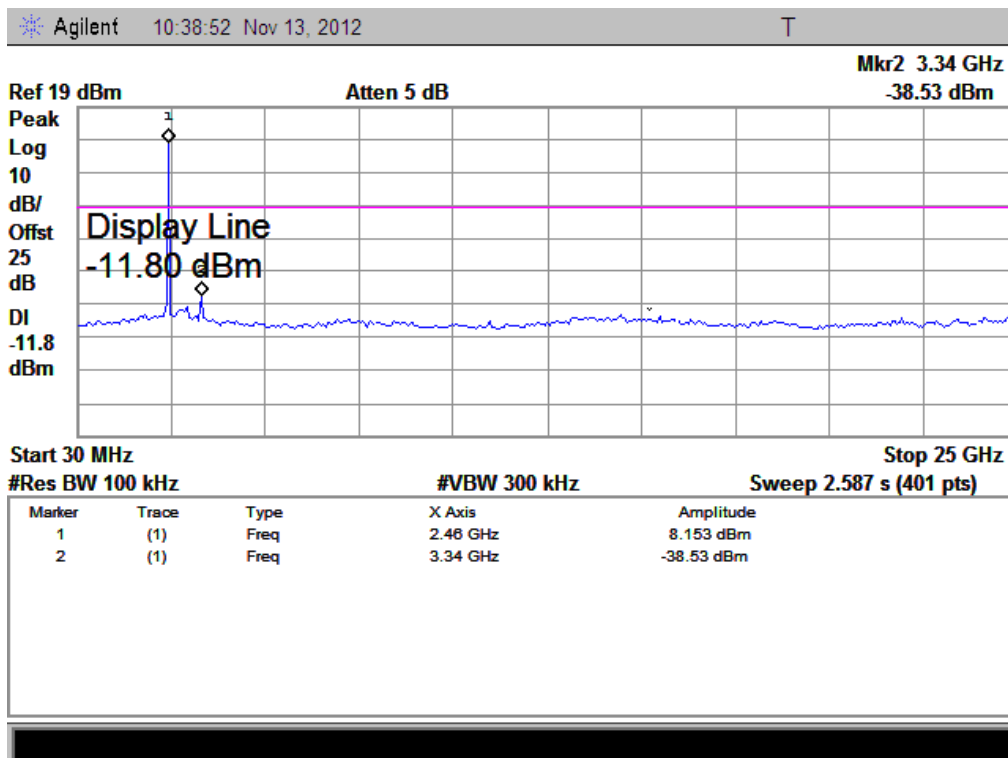
Note: the power of the Module transmitting frequency should be ignored.



(Plot G.1: Channel = 0, 30MHz to 25GHz)



(Plot H.1: Channel = 39, 30MHz to 25GHz)



(Plot I.1: Channel = 78, 30MHz to 25GHz)

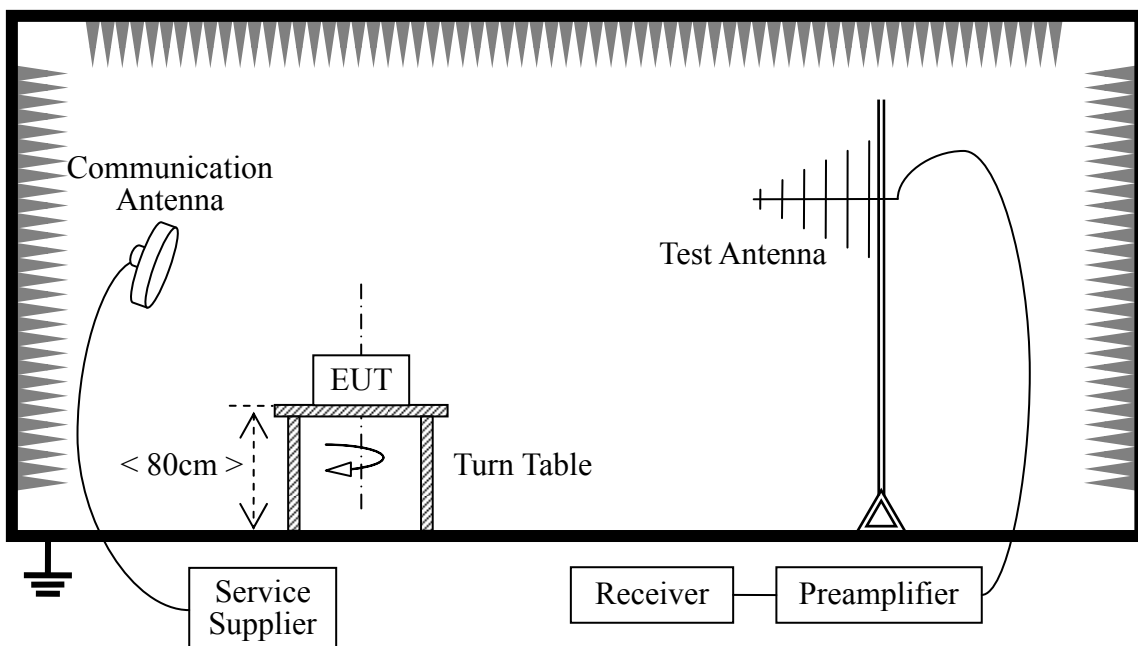
2.7. Band Edge

2.7.1. Requirement

According to FCC section 15.247(d) and RSS- A8.5, 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 Bluetooth Module of the EUT is powered by the Battery. The Module 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 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.

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.

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	R&S	CMU200	100448	2012.05	2013.05
Receiver	Agilent	E7405A	US44210471	2012.05	2013.05
Full-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2012.05	2014.05

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Test Antenna - Horn	Schwarzbeck	BBHA 9120C	9120C-384	2012.05	2013.05

2.7.3. Test Result

The lowest and highest channels are tested to verify the band edge emissions.

The measurement results are obtained as below:

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

A_T : Total correction Factor except Antenna

U_R : Receiver Reading

G_{preamp} : Preamplifier Gain

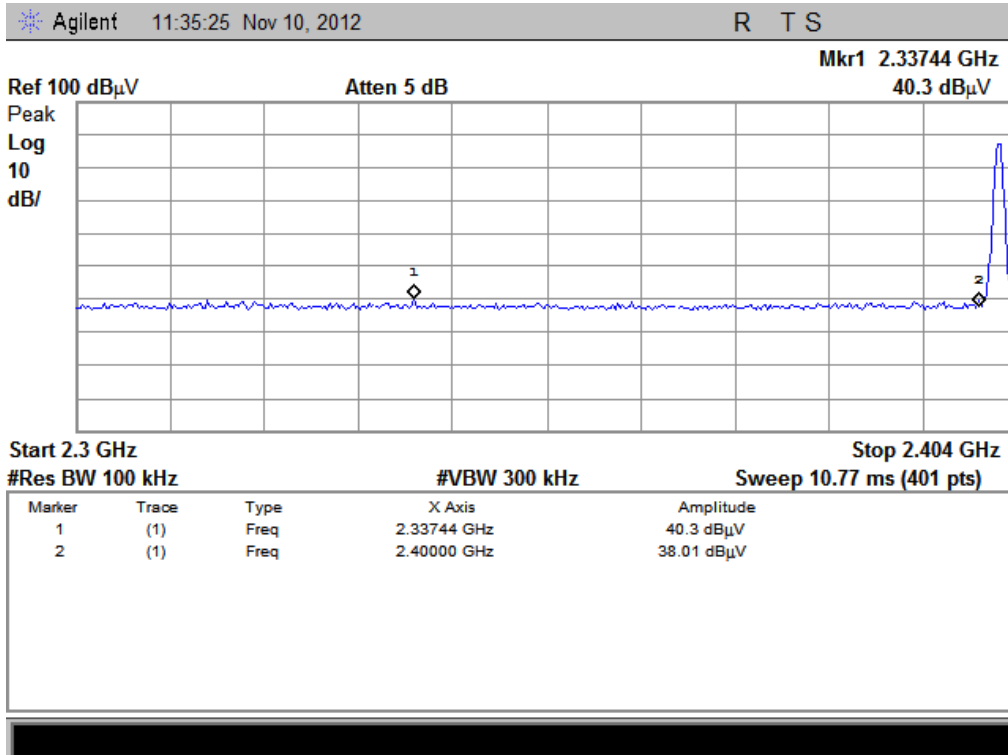
A_{Factor} : Antenna Factor at 3m

2.7.3.1. GFSK Mode

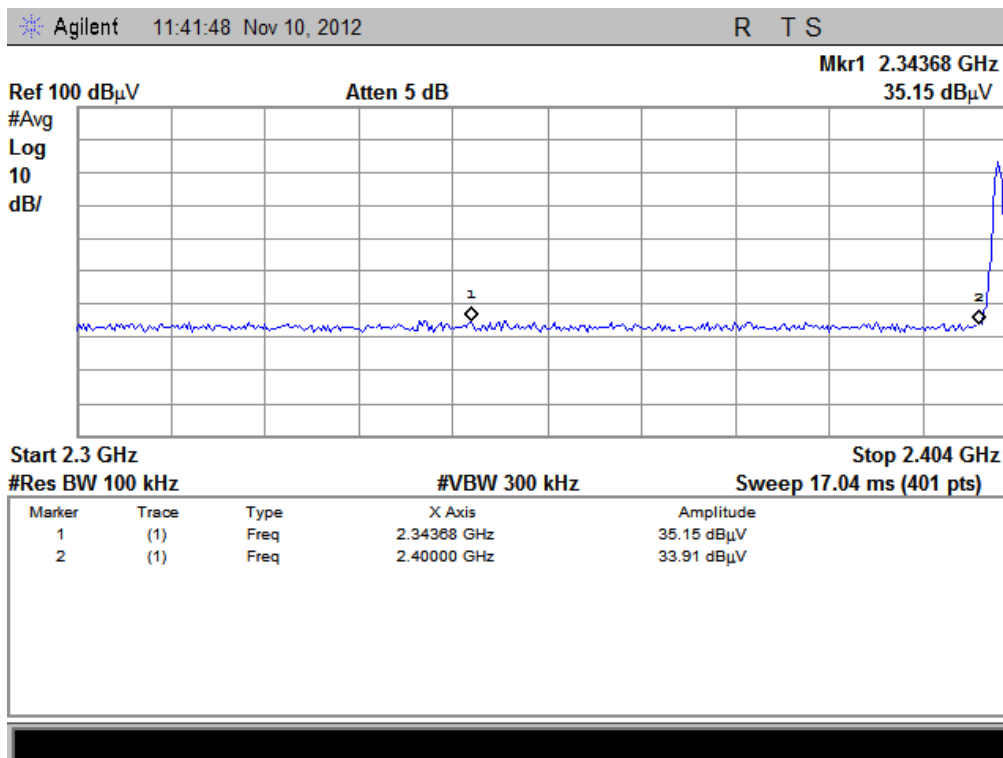
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading UR (dBuV)	AT (dB)	AFactor (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
0	2337.44	PK	38.01	-30.93	39.64	41.38	74	Pass
0	2343.68	AV	35.15	-30.93	32.56	36.78	54	Pass
78	2489.99	PK	39.22	-29.05	32.50	42.67	74	Pass
78	2494.28	AV	37.45	-29.05	32.50	40.90	54	Pass

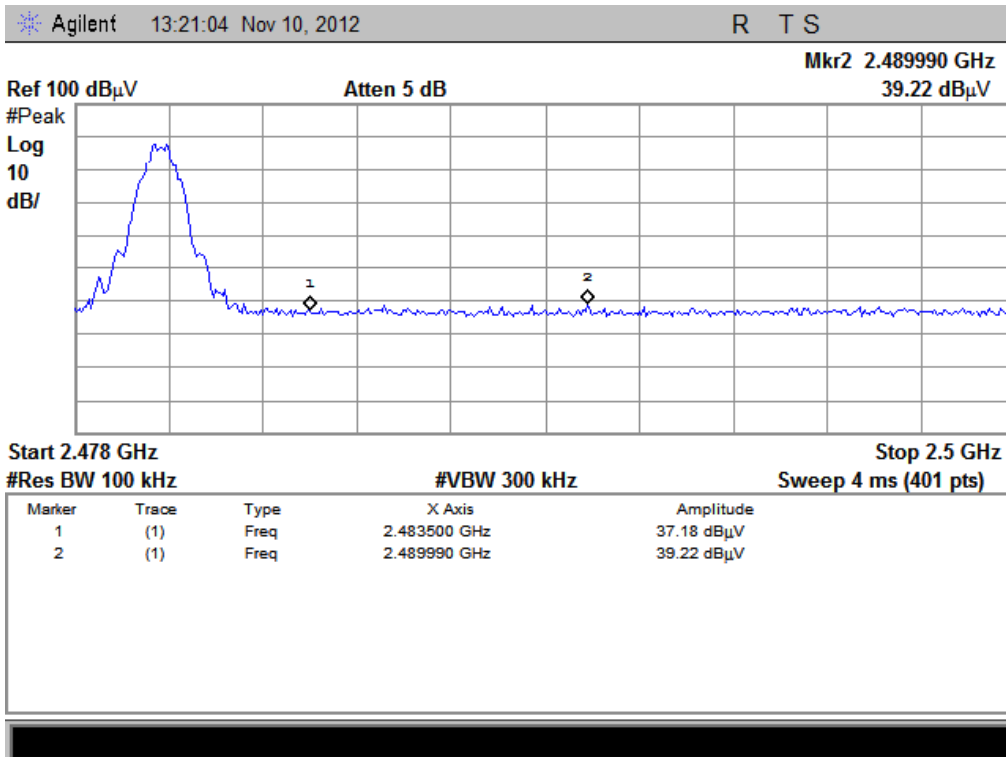
B. Test Plots:



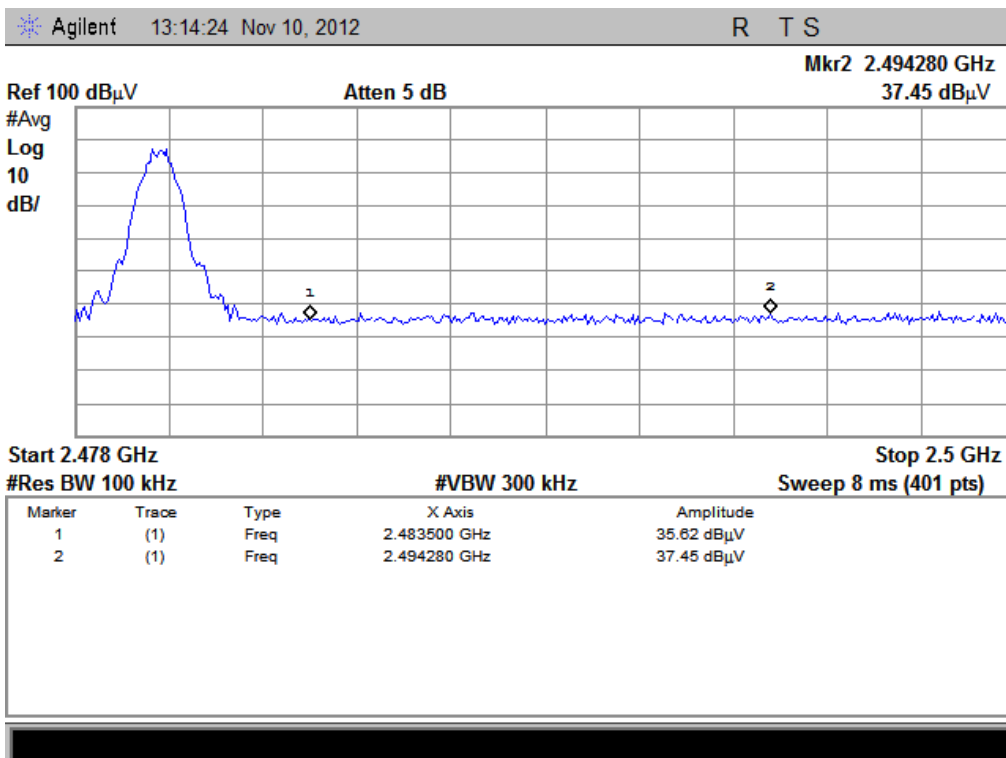
(Plot A1: Channel = 0 PEAK)



(Plot A2: Channel = 0 AVERAGE)



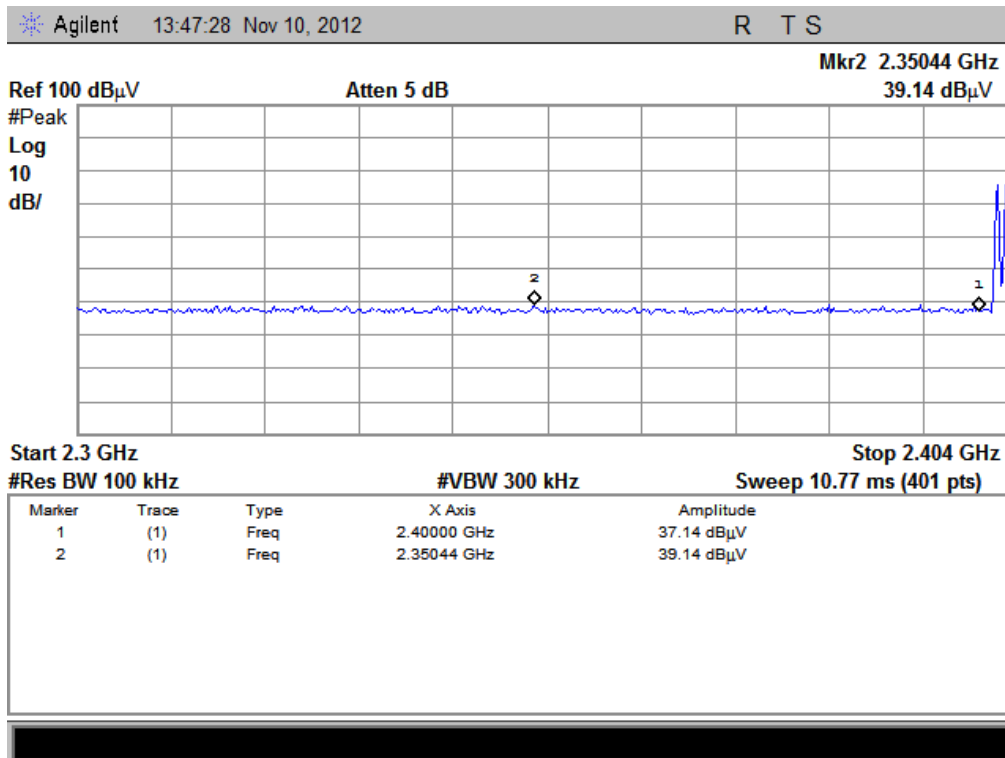
(Plot B1: Channel = 78 PEAK)



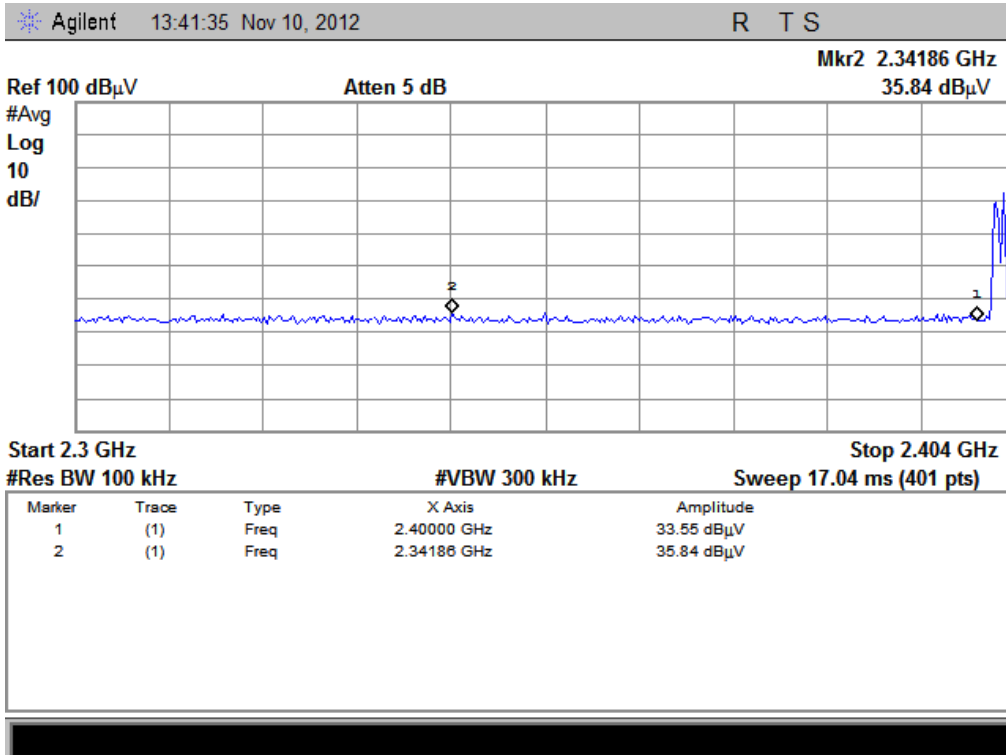
(Plot B2: Channel = 78 AVERAGE)

(hopping)

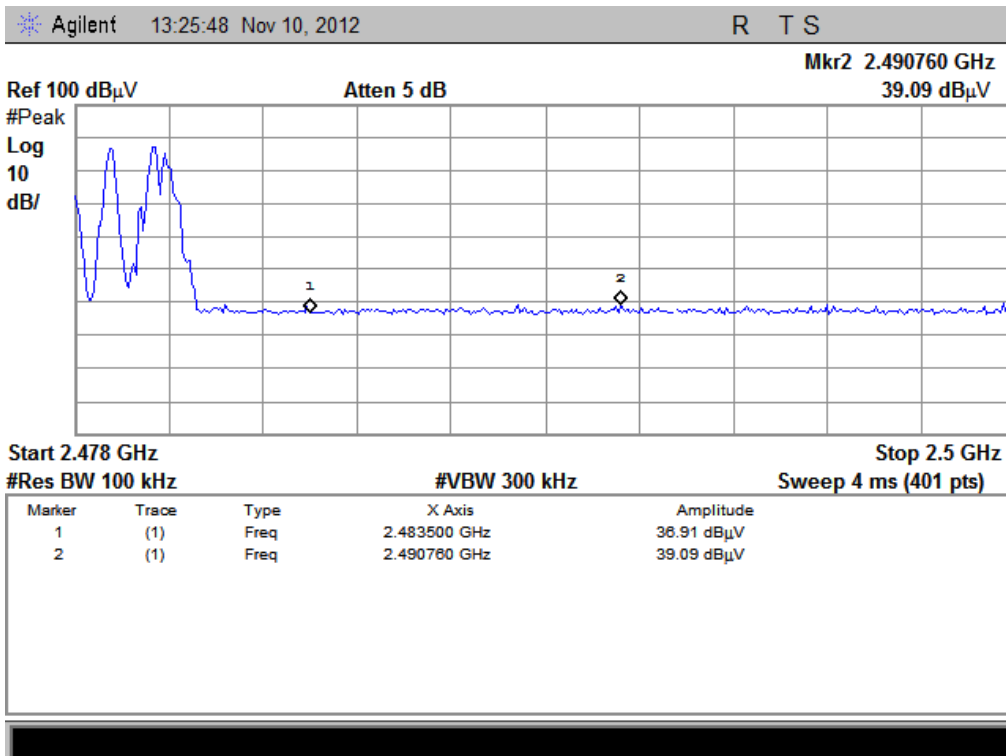
Channel	Frequency (MHz)	Detector	Receiver Reading UR (dBuV)	AT (dB)	AFactor (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
0	2350.44	PK	39.14	-30.93	32.56	40.77	74	Pass
0	2341.86	AV	35.84	-30.93	32.56	37.47	54	Pass
78	2490.76	PK	39.09	-29.05	32.50	42.54	74	Pass
78	2499.07	AV	38.07	-29.05	32.50	41.52	54	Pass



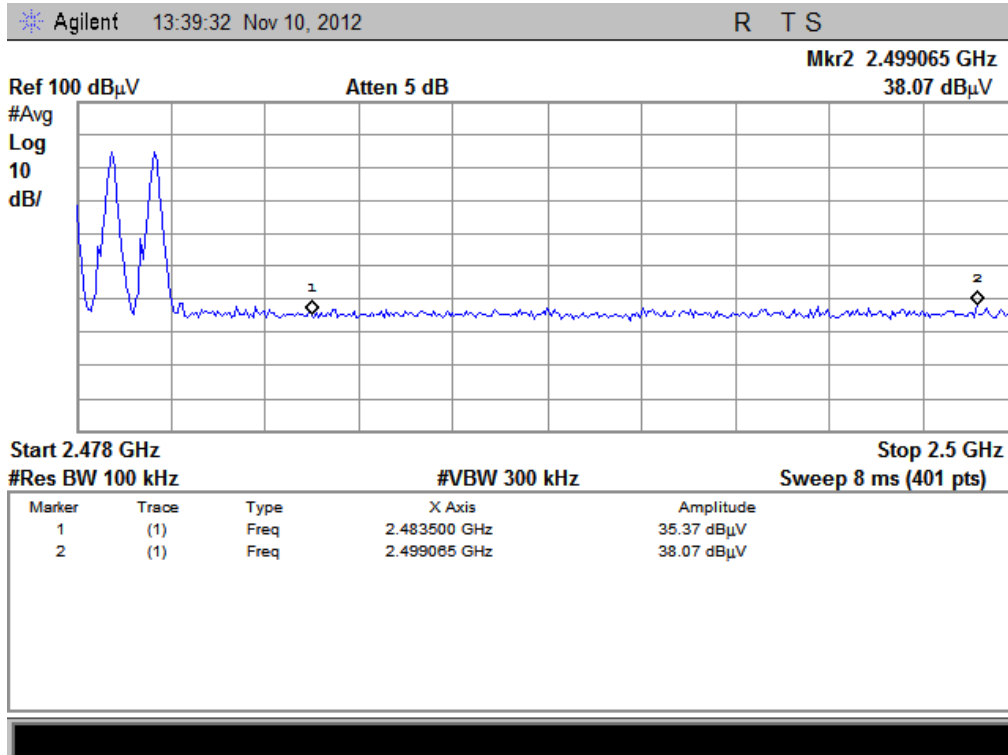
(Plot A1-1: Channel = 0 PEAK)



(Plot A2-1: Channel = 0 AVERAGE)



(Plot B1-1: Channel = 78 PEAK)



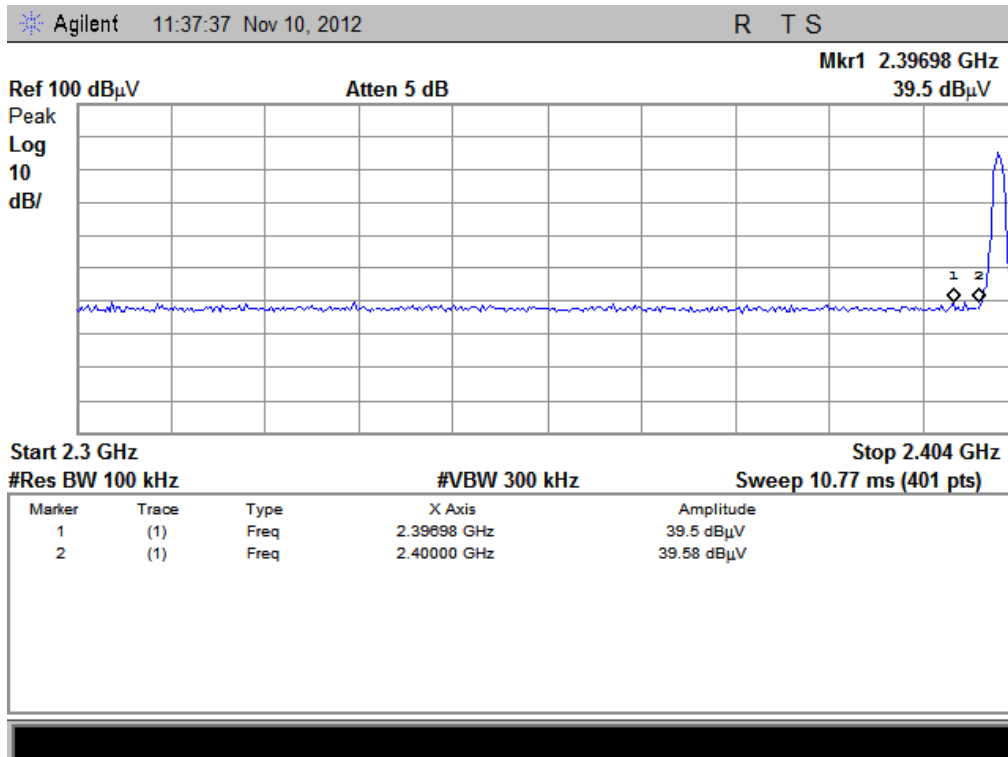
(Plot B2-1: Channel = 78 AVERAGE)

2.7.3.2. $\Pi/4$ -DQPSK Mode

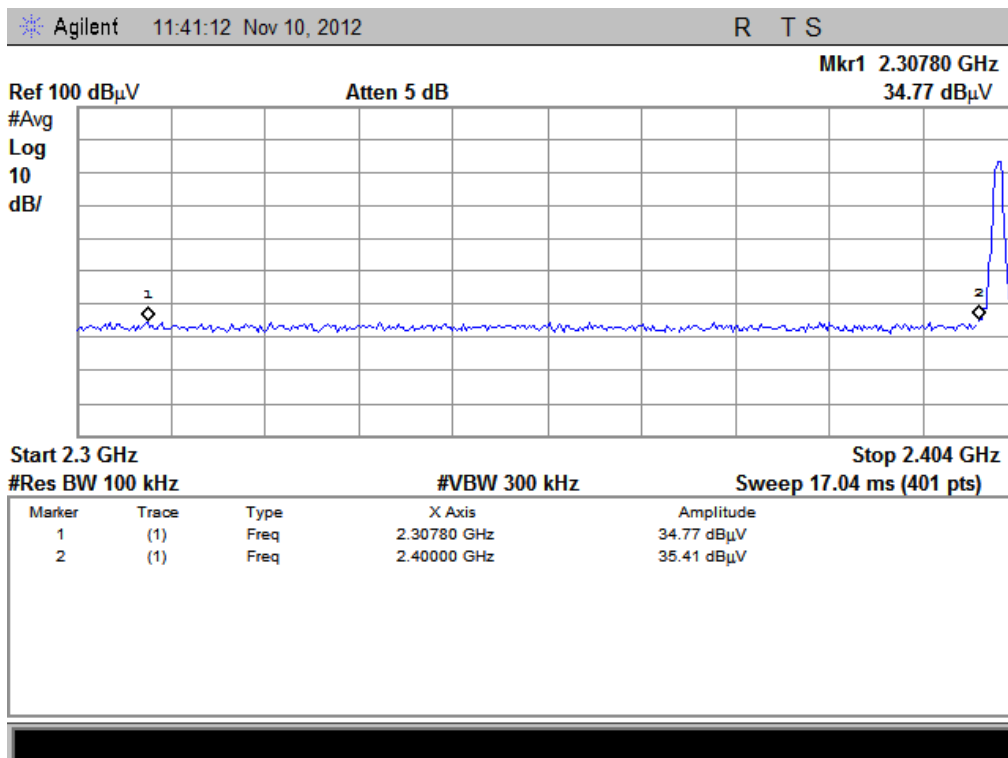
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading UR (dB μ V)	AT (dB)	AFactor (dB@3m)	Max. Emission E (dB μ V/m)	Limit (dB μ V/m)	Verdict
		PK/ AV						
0	2396.98	PK	39.50	-30.93	32.56	40.68	74	Pass
0	2307.80	AV	34.77	-30.93	32.56	36.40	54	Pass
78	2491.81	PK	38.60	-29.05	32.50	42.05	74	Pass
78	2495.11	AV	36.91	-29.05	32.50	40.36	54	Pass

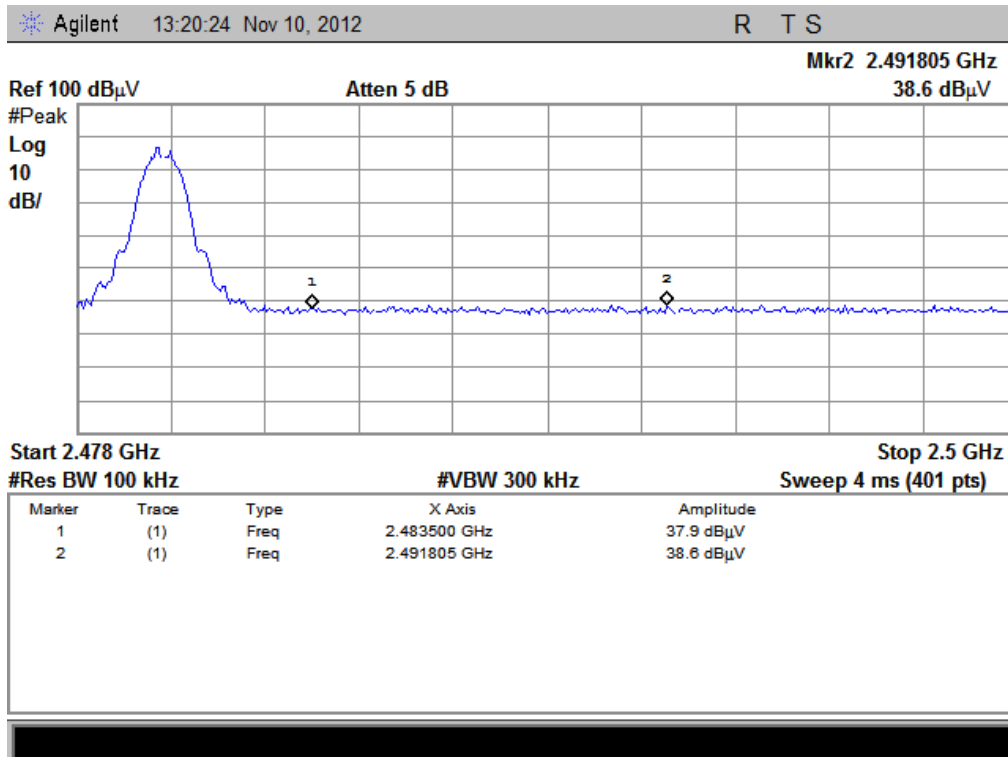
B. Test Plots:



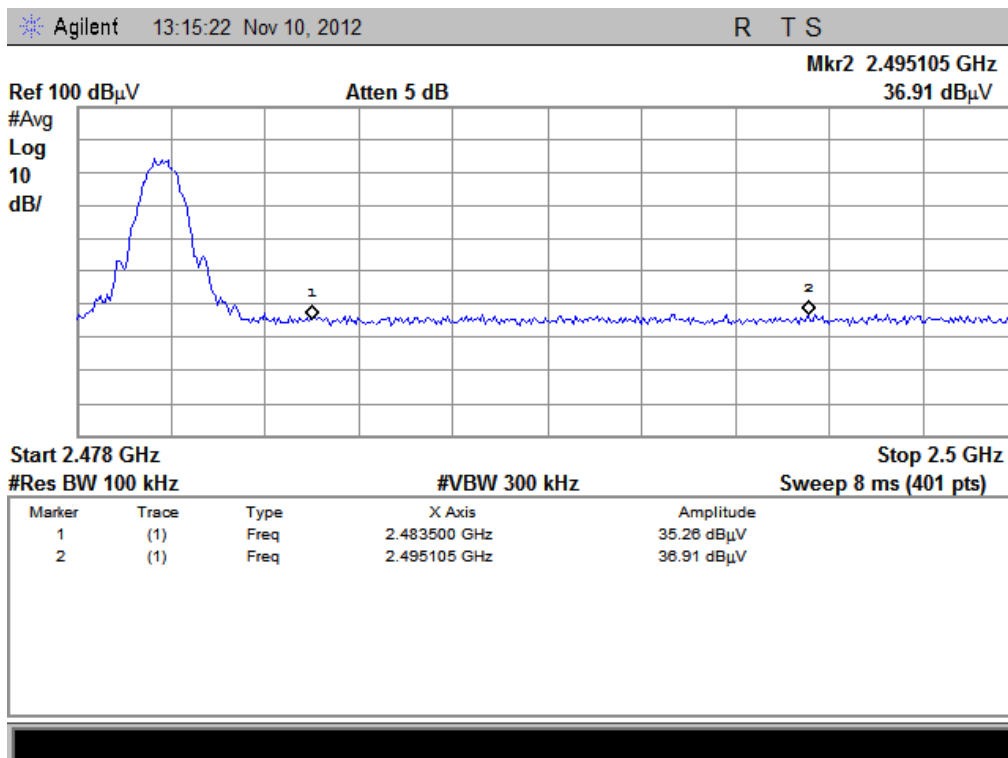
(Plot A1: Channel = 0 PEAK)



(Plot A2: Channel = 0 AVERAGE)



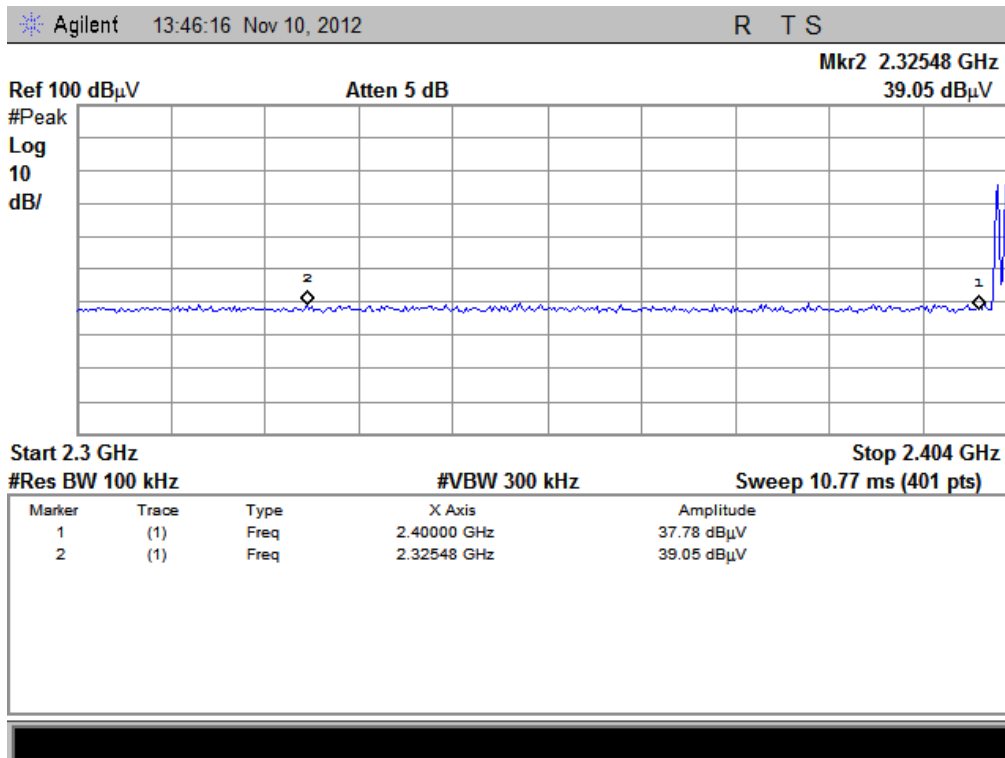
(Plot B1: Channel = 78 PEAK)



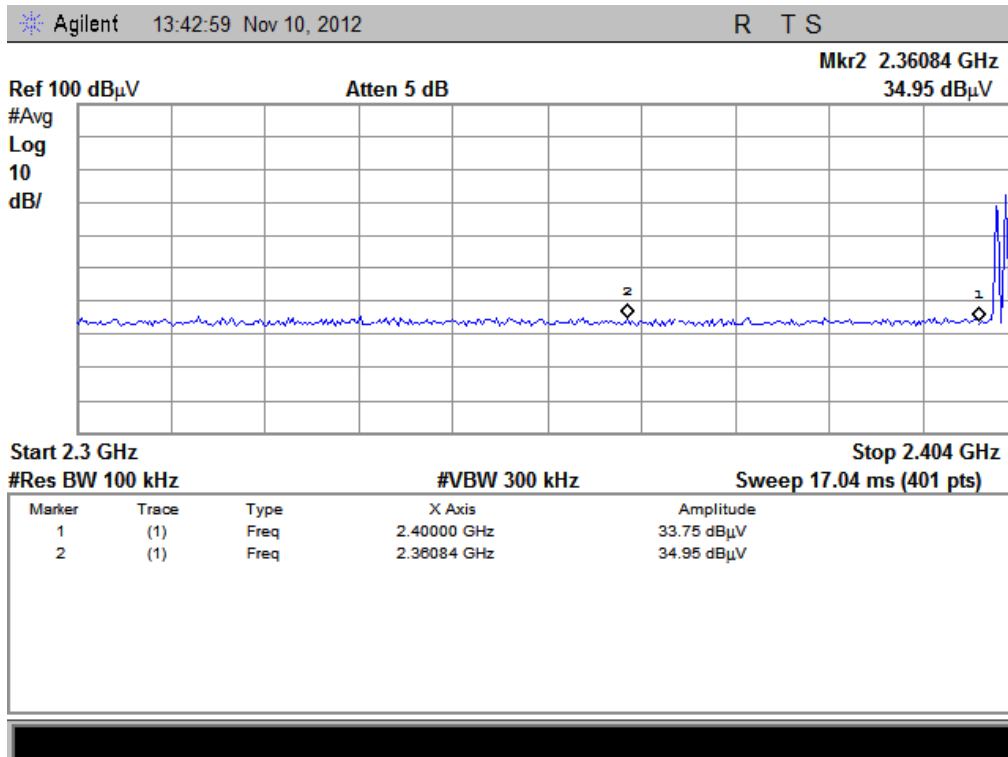
(Plot B2: Channel = 78 AVERAGE)

(hopping)

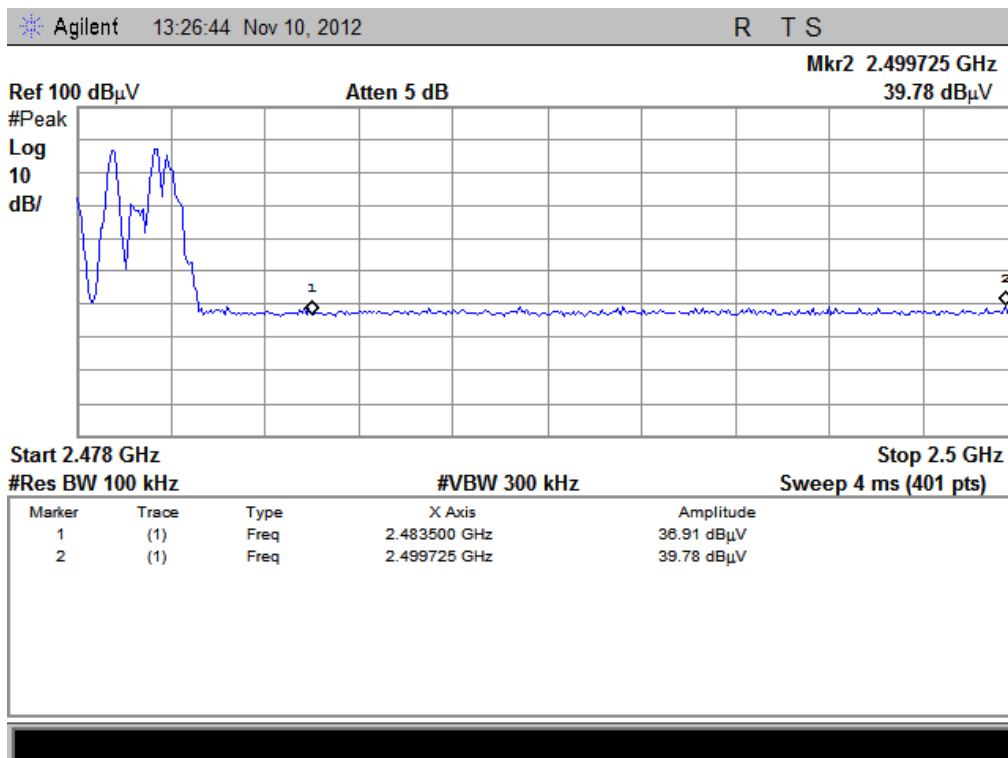
Channel	Frequency (MHz)	Detector	Receiver Reading UR (dBuV)	AT (dB)	AFactor (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
0	2325.48	PK	39.05	-30.93	32.56	40.68	74	Pass
0	2360.84	AV	34.95	-30.93	32.56	36.58	54	Pass
78	2499.73	PK	39.78	-29.05	32.50	43.23	74	Pass
78	2487.68	AV	37.73	-29.05	32.50	41.18	54	Pass



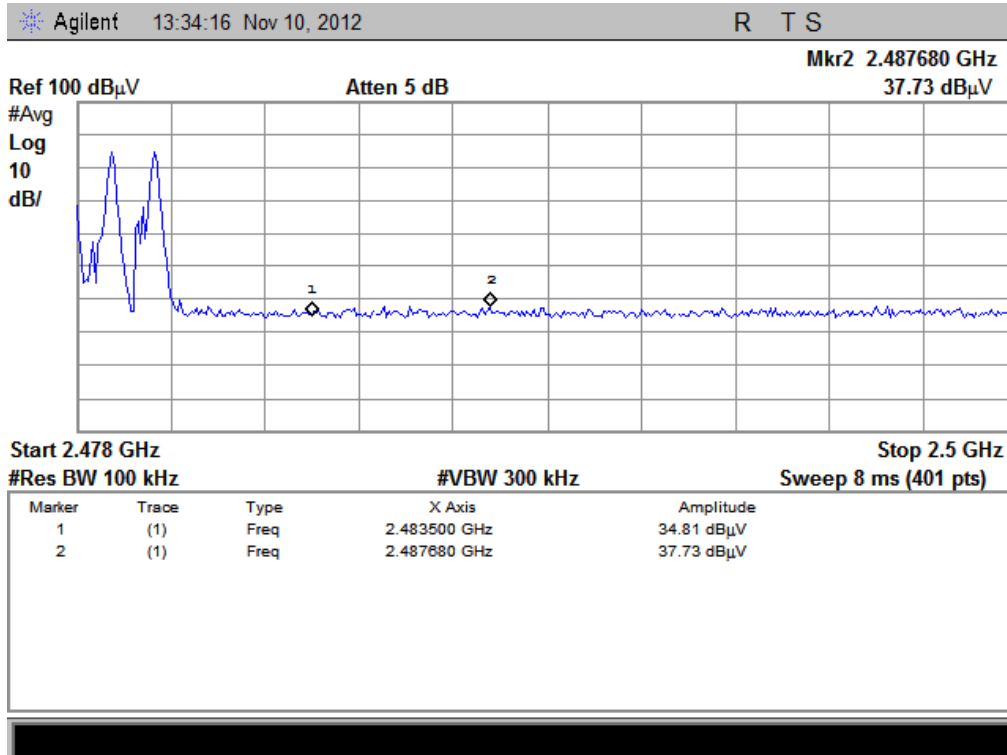
(Plot A1-1: Channel = 0 PEAK)



(Plot A2-1: Channel = 0 AVERAGE)



(Plot B1-1: Channel = 78 PEAK)



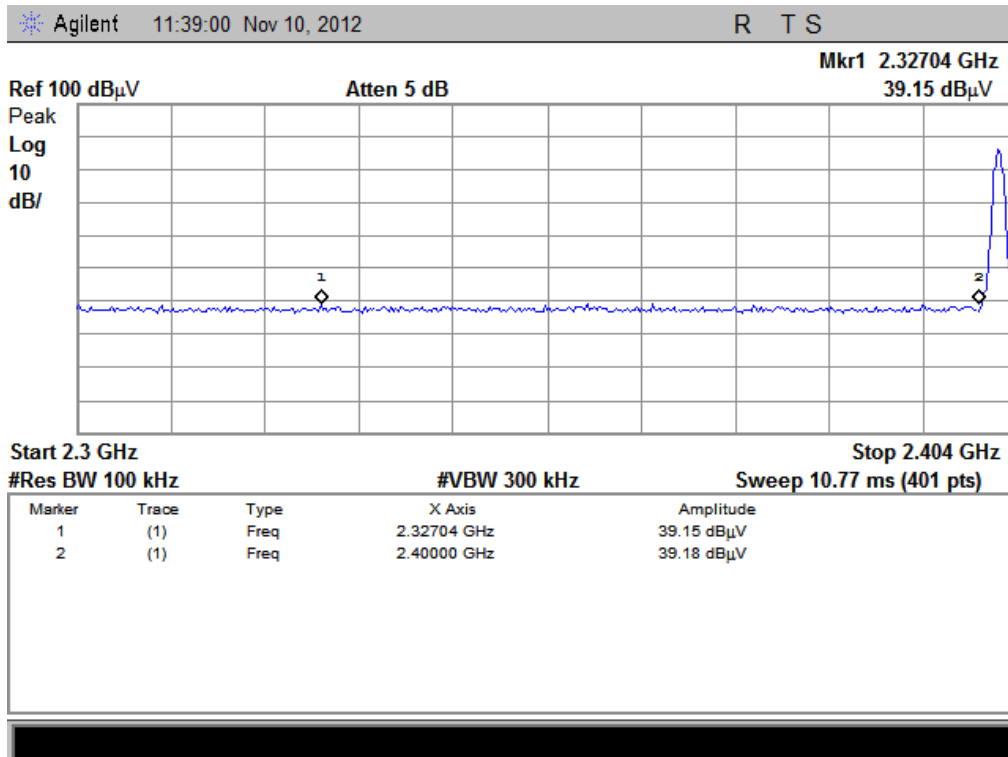
(Plot B2-1: Channel = 78 AVERAGE)

2.7.3.3. 8-DPSK Mode

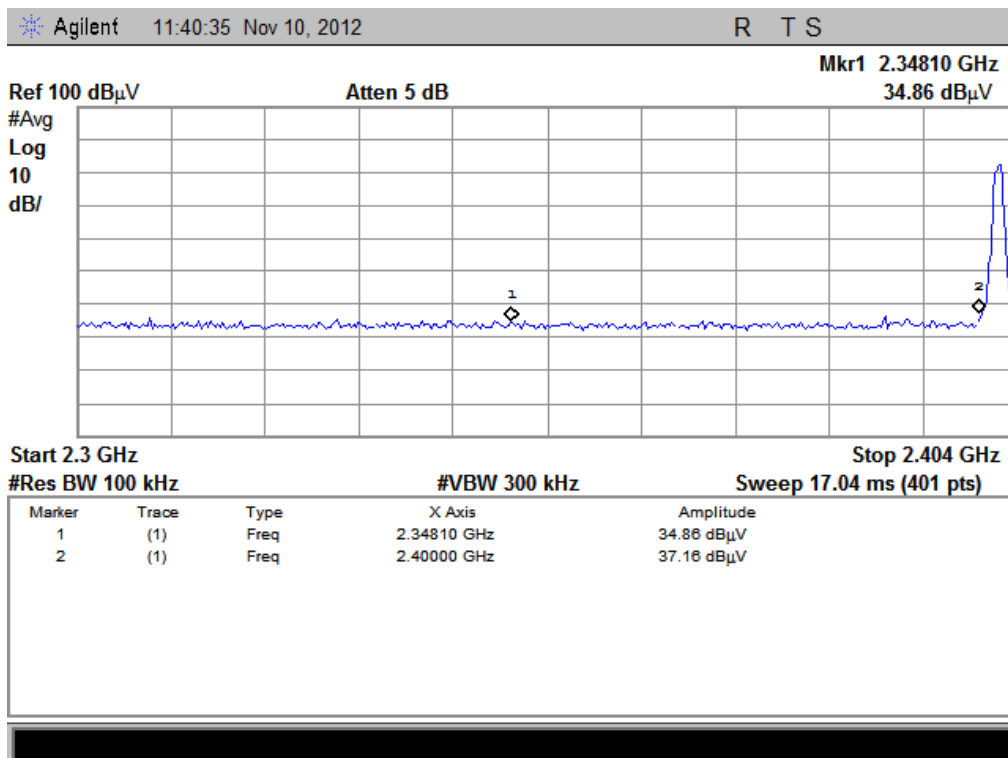
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading UR (dB μ V)	AT (dB)	AFactor (dB@3m)	Max. Emission E (dB μ V/m)	Limit (dB μ V/m)	Verdict
		PK/ AV						
0	2327.04	PK	39.15	-30.93	32.56	40.78	74	Pass
0	2348.10	AV	34.86	-30.93	32.56	36.49	54	Pass
78	2491.59	PK	39.09	-29.05	32.50	42.57	74	Pass
78	2487.02	AV	36.74	-29.05	32.50	40.19	54	Pass

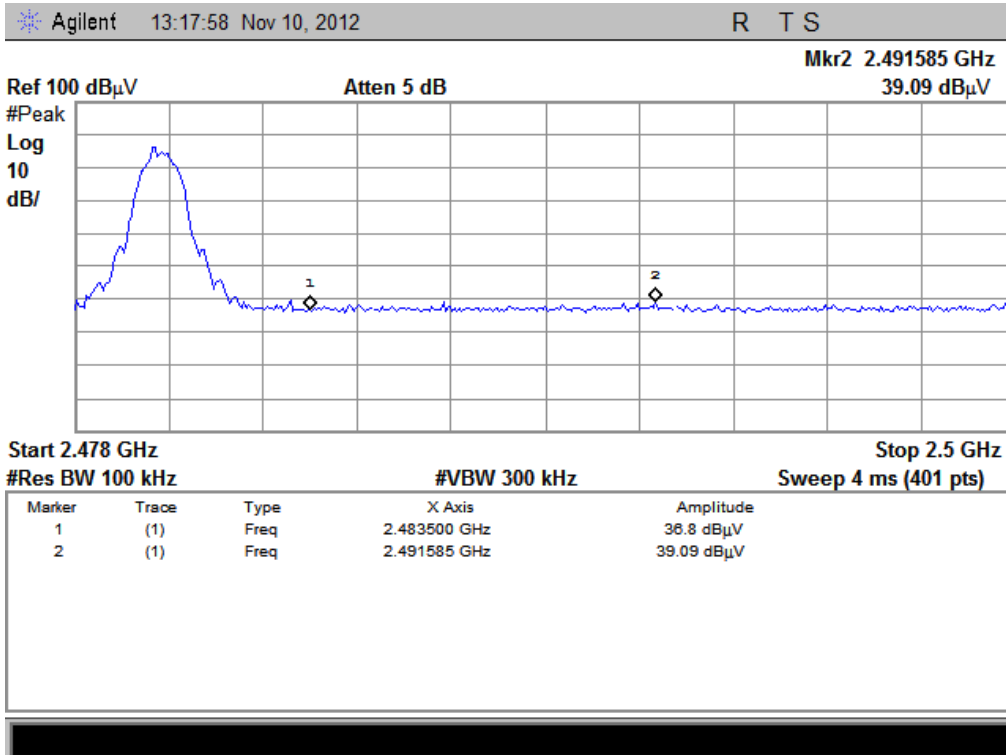
B. Test Plots:



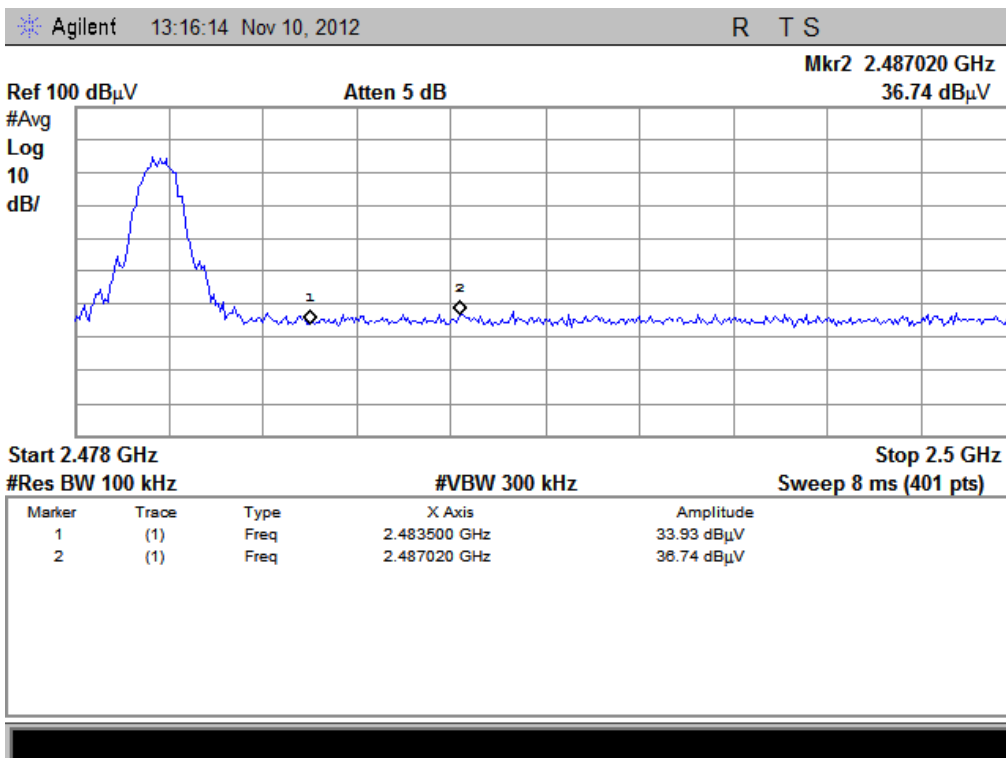
(Plot A1: Channel = 0 PEAK)



(Plot A2: Channel = 0 AVERAGE)



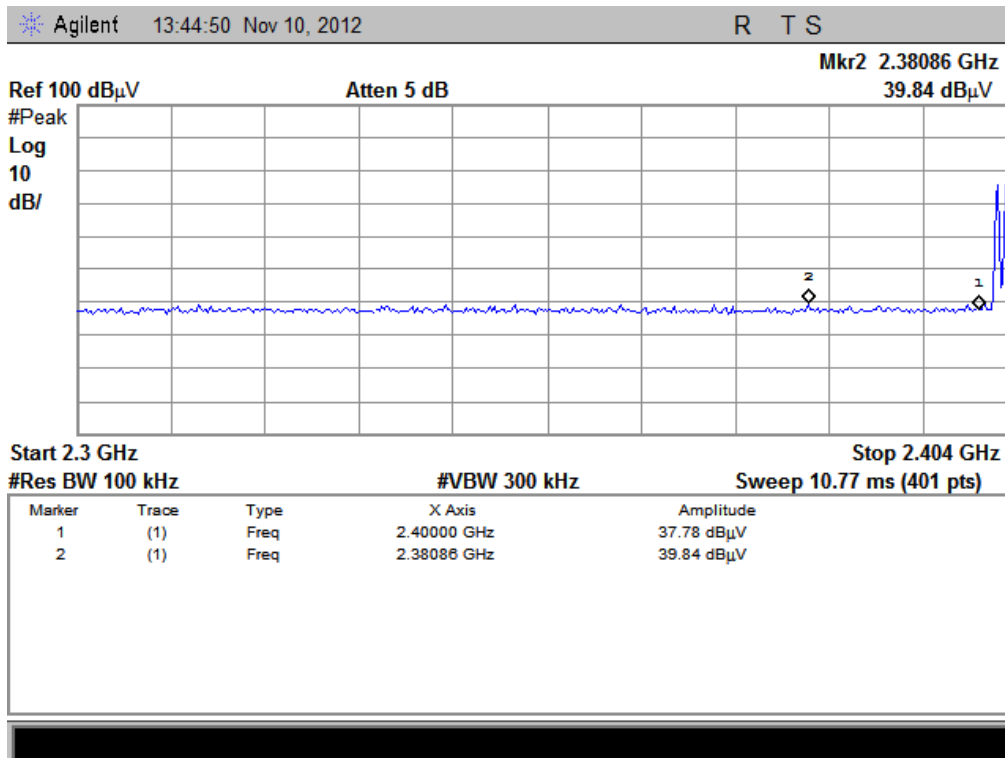
(Plot B1: Channel = 78 PEAK)



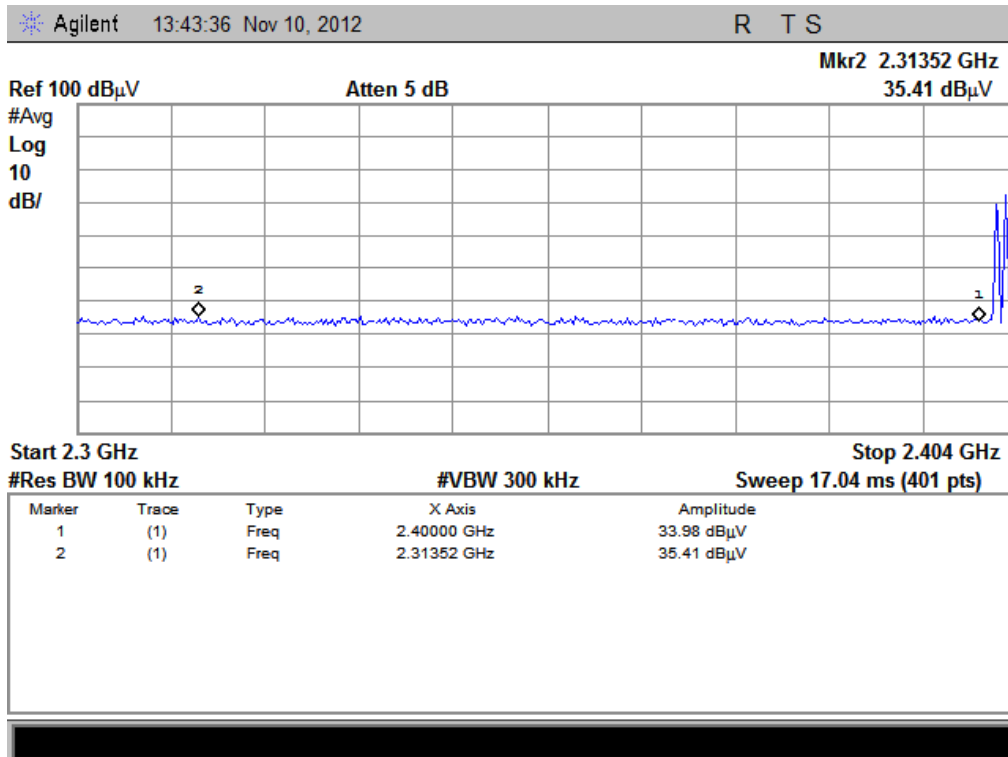
(Plot B2: Channel = 78 AVERAGE)

(hopping)

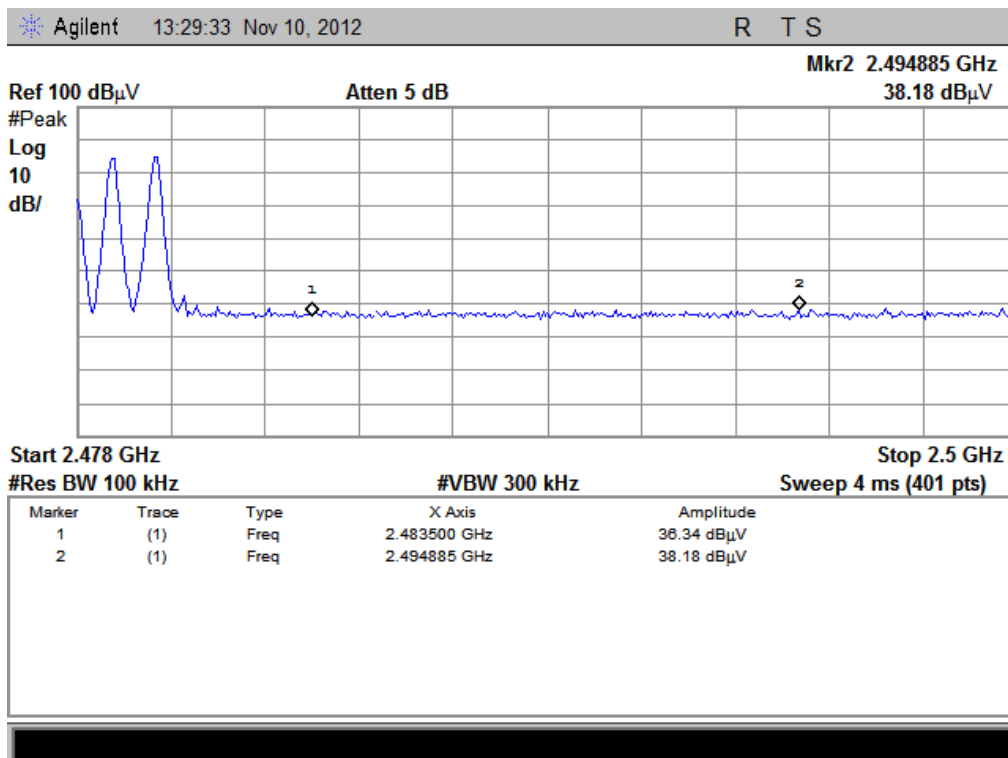
Channel	Frequency (MHz)	Detector	Receiver Reading UR (dBuV)	AT (dB)	AFactor (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
0	2380.86	PK	39.84	-30.93	41.47	48.74	74	Pass
0	2313.52	AV	35.41	-30.93	37.04	44.68	54	Pass
78	2494.49	PK	38.18	-29.05	41.63	49.39	74	Pass
78	2491.42	AV	37.90	-29.05	41.35	48.89	54	Pass



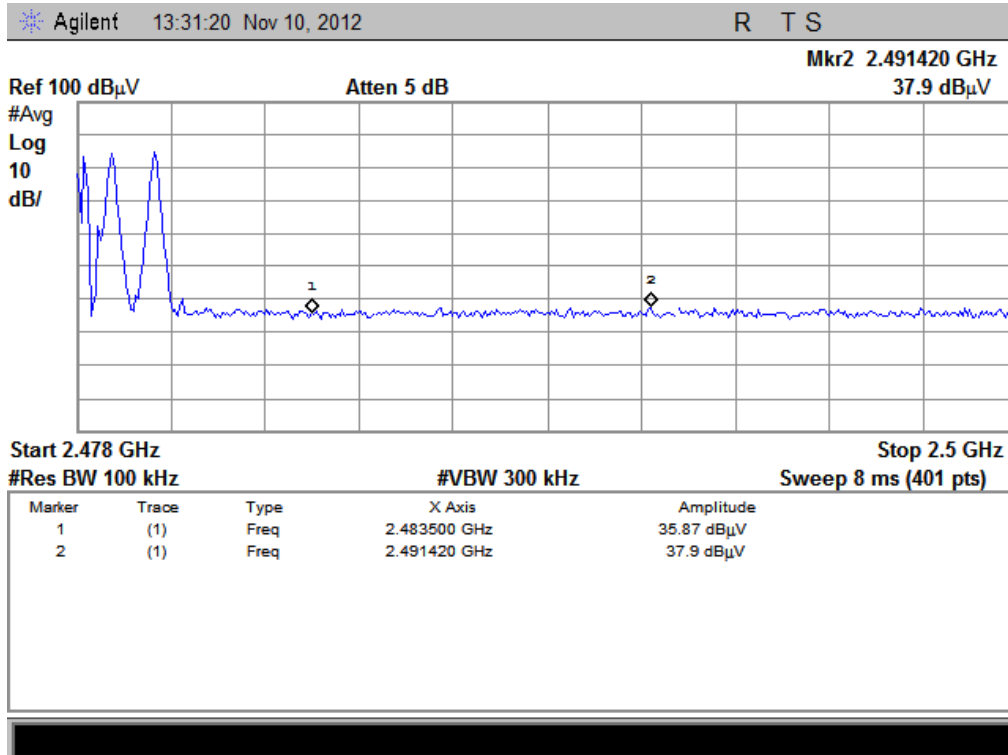
(Plot A1-1: Channel = 0 PEAK)



(Plot A2-1: Channel = 0 AVERAGE)



(Plot B1-1: Channel = 78 PEAK)



(Plot B2-1: Channel = 78 AVERAGE)

2.8. Conducted Emission

2.8.1. Requirement

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

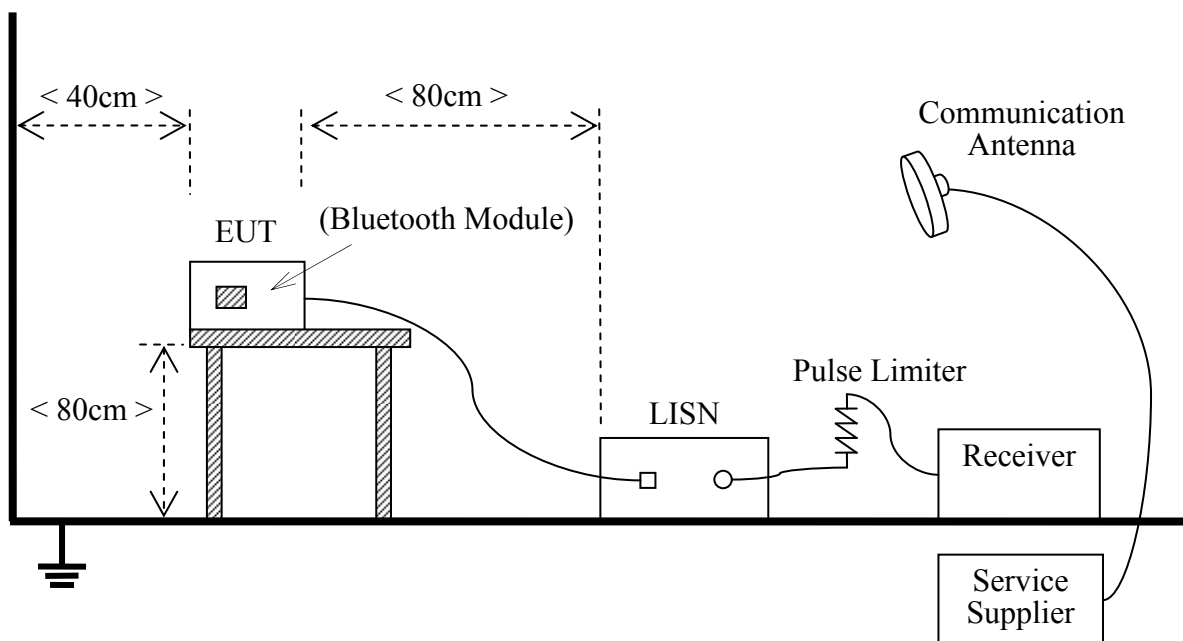
Frequency range (MHz)	Conducted Limit (dB μ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

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.

2.8.2. 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 C63.4:2009

The Bluetooth Module of the EUT is powered by the Battery charged with the AC Adapter which is powered by 120V, 60Hz AC mains supply. The factors of the site are calibrated to correct the reading. During the measurement, the Bluetooth Module 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

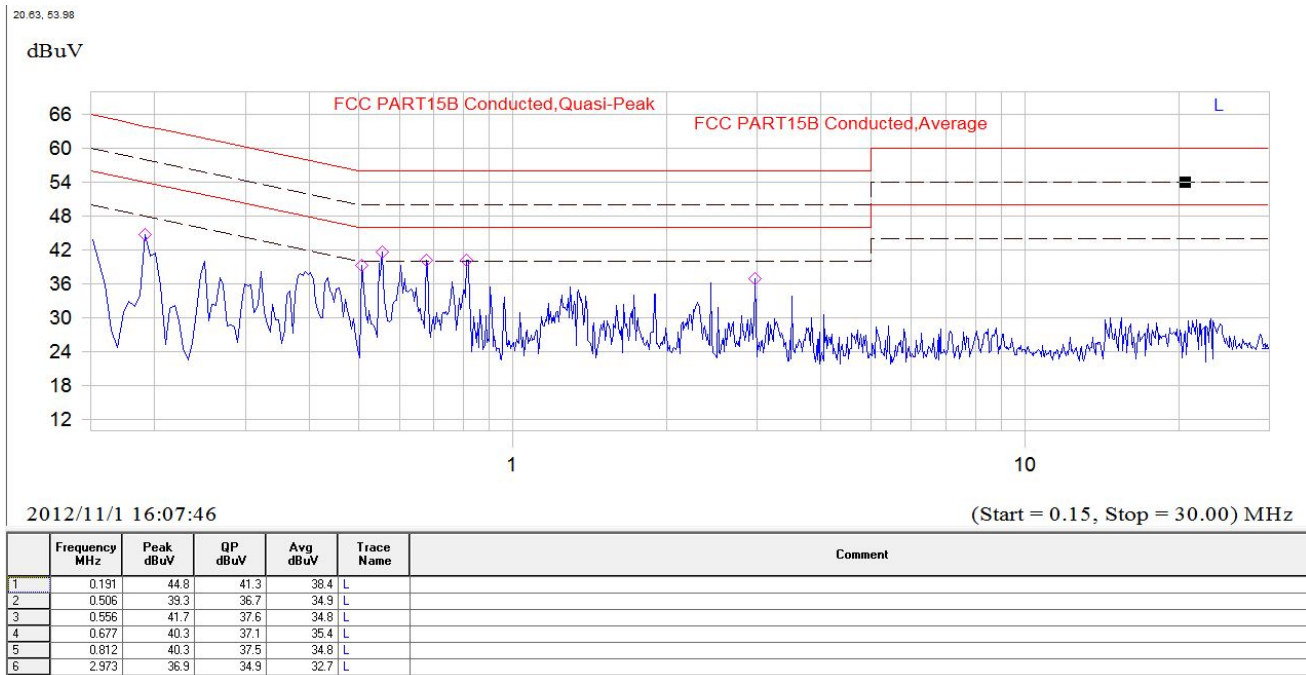
339 bytes DH5 packages at maximum power.

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Receiver	Agilent	E7405A	US44210471	2012.05	2013.05
LISN	Schwarzbeck	NSLK 8127	812744	2012.05	2013.05
Service Supplier	R&S	CMU200	100448	2012.05	2013.05
Pulse Limiter (20dB)	Schwarzbeck	VTSD 9561-D	9391	2012.05	2013.05

2.8.3. Test Result

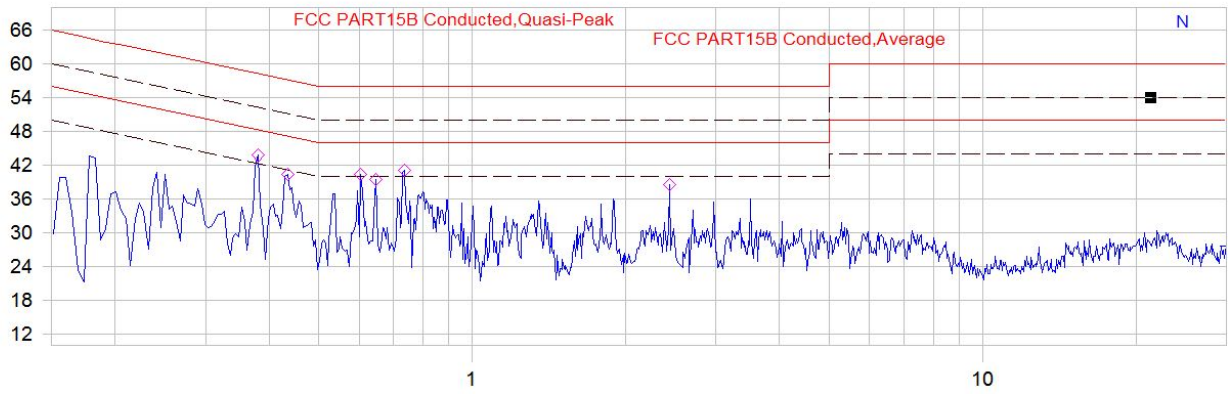
The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT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



(Plot A: L Phase)

21.39, 53.98

dBuV



2012/11/1 16:11:33

(Start = 0.15, Stop = 30.00) MHz

	Frequency MHz	Peak dBuV	QP dBuV	Avg dBuV	Trace Name	Comment
1	0.380	43.8	40.1	39.4	N	
2	0.434	40.4	38.7	34.8	N	
3	0.605	40.4	38.2	33.7	N	
4	0.646	39.5	37.3	34.8	N	
5	0.736	41.2	37.6	33.7	N	
6	2.433	38.6	36.8	34.3	N	

(Plot B: N Phase)

2.9. Radiated Emission

2.9.1. Requirement

According to FCC section 15.247(c) and RSS-A8.5, 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 RSS- Gen section 7.2.3. Those emissions generated in a receiver and radiated from the receiver either via the antenna path or via the control, power, and audio cables that may be used with the receiver. All spurious emissions shall comply with the limits of next table:

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
960 - 1000	500	3
Above 1000	500	3

Note:

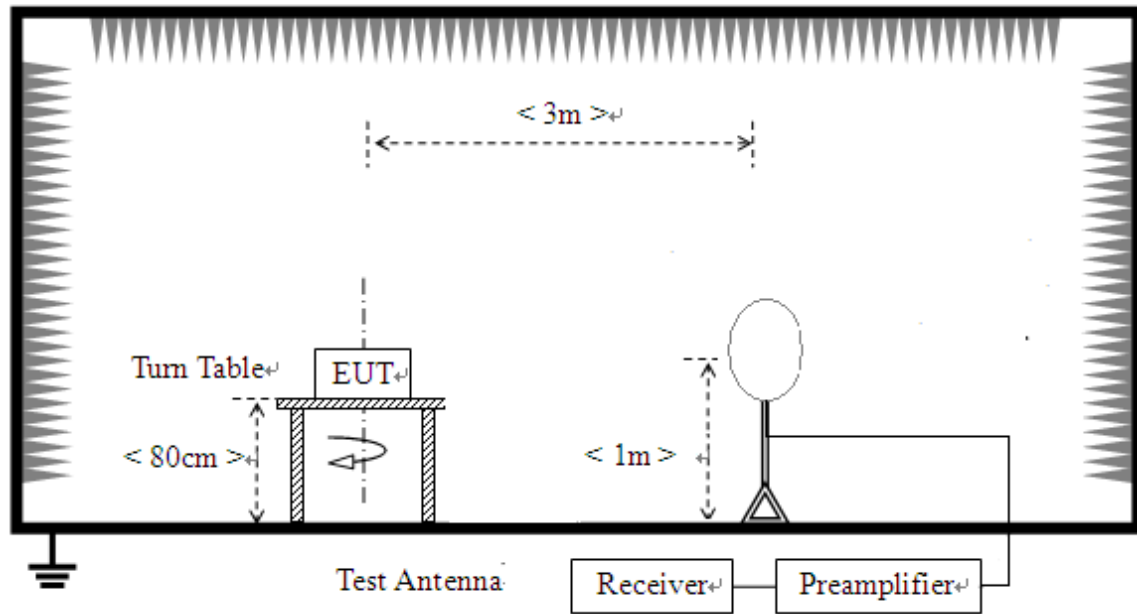
1. For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
2. For above 1000MHz, limit field strength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

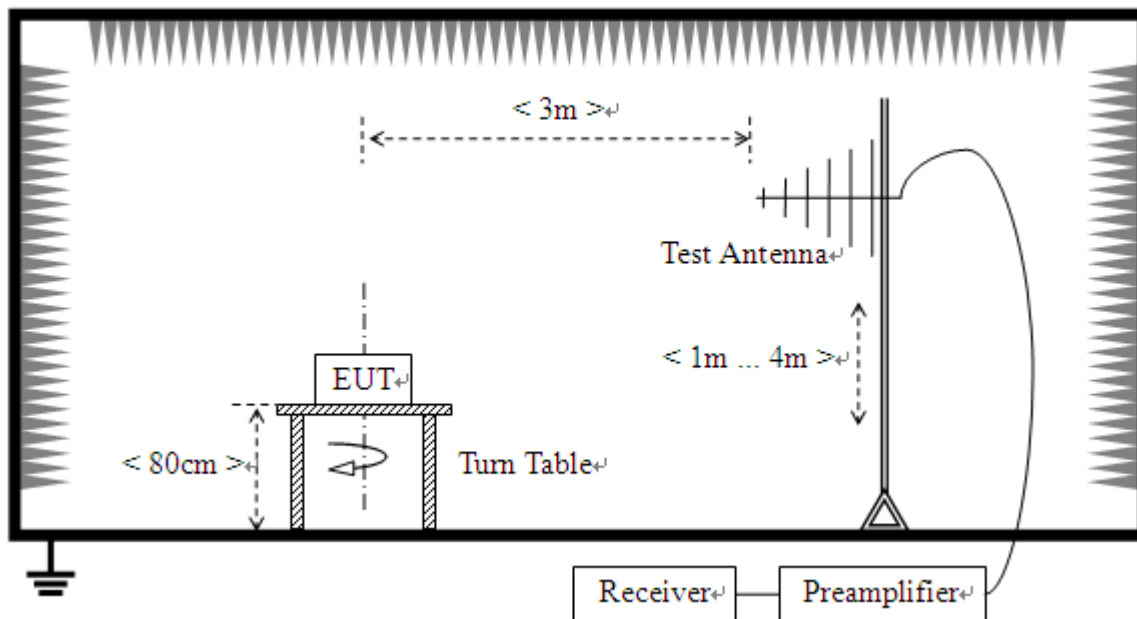
2.9.2. Test Description

A. Test Setup:

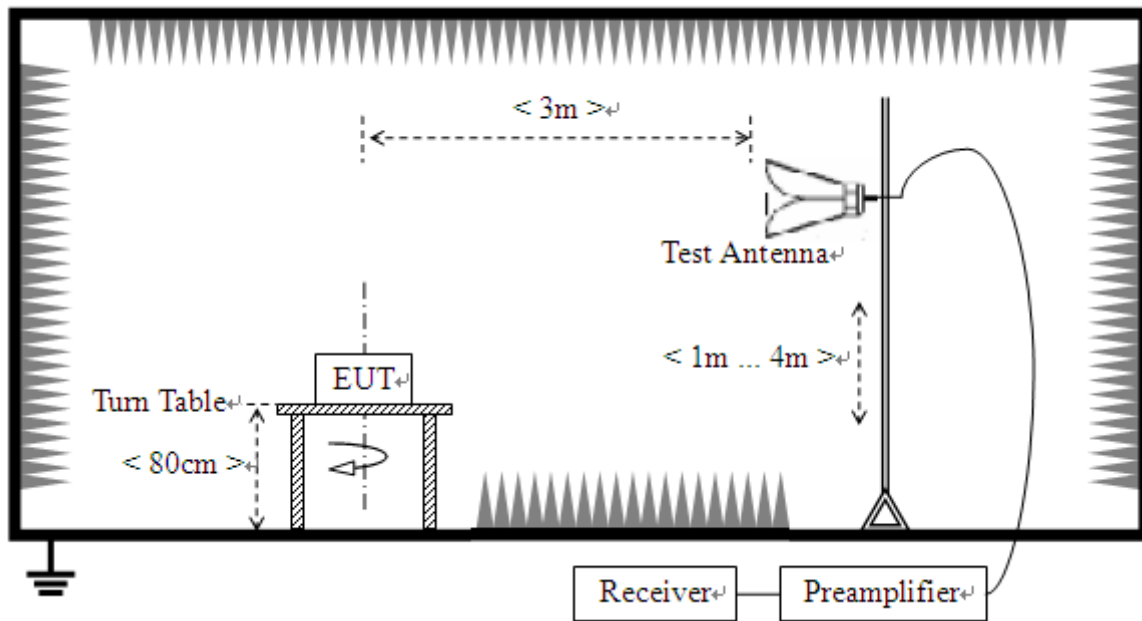
- 1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to 1GHz



3) For radiated emissions above 1GHz



The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4 (2009). The EUT was set-up on insulator 80cm above the Ground Plane. The set-up and test methods were according to ANSI C63.4.

The Bluetooth Module of the EUT is powered by the Battery. The Module 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 is activated and controlled by the Bluetooth Service Supplier (SS) via a Common Antenna, and is set to operate under hopping-off test mode transmitting 339 bytes DH5 packages at maximum power.

For the Test Antenna:

(a) In the frequency range of 9kHz to 30MHz, magnetic field is measured with Loop Test Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.

(b) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. 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. The emission levels at both horizontal and vertical polarizations should be tested.

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	R&S	CMU200	100448	2012.05	2013.05
Receiver	Agilent	E7405A	US44210471	2012.05	2013.05
Full-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2012.05	2014.05
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2012.05	2013.05
Test Antenna - Horn	Schwarzbeck	BBHA 9120C	9120C-384	2012.05	2013.05

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Test Antenna - Horn	R&S	HL050S7	71688	2012.05	2013.05
Test Antenna - Loop	Schwarzbeck	FMZB 1519	1519-022	2012.05	2013.05

2.9.3. Test Result

According to ANSI C63.4 selection 4.2.2, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak (or average) detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with the quasi-peak limit, it is unnecessary to perform an quasi-peak measurement.

The measurement results are obtained as below:

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

A_T : Total correction Factor except Antenna

U_R : Receiver Reading

G_{preamp} : Preamplifier Gain

A_{Factor} : Antenna Factor at 3m

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

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

2.9.3.1. GFSK Mode:

A. Test Verdict for Harmonics:

The Fundamental Emissions

The field strength of {Fundamental Emission} listed below is recorded, and used in the next table.

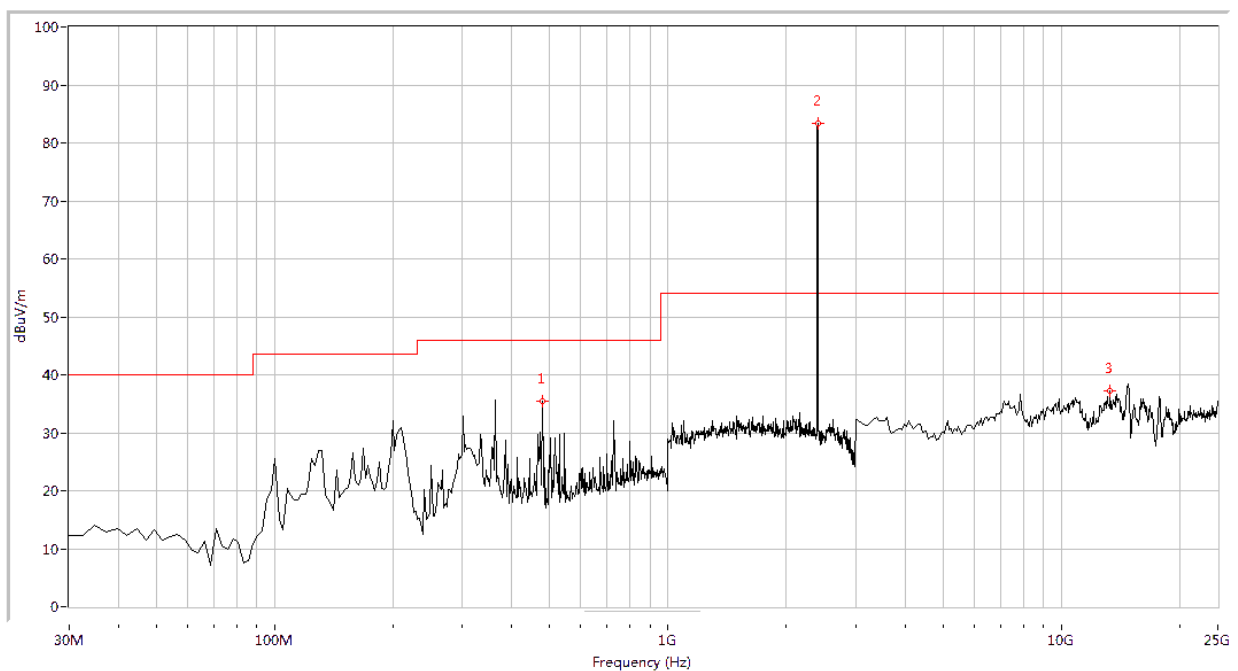
Channe l	Frequency (MHz)	Fundamental Emission (dB μ V/m)		Antenna Polarization	Refer to Plot
		PK	AV		
0	2402	83.36	N/A	Horizontal	Plot A.1
		83.70	N/A	Vertical	Plot A.2
39	2441	86.22	N/A	Horizontal	Plot B.1
		85.44	N/A	Vertical	Plot B.2
78	2480	85.04	N/A	Horizontal	Plot C.1
		85.97	N/A	Vertical	Plot C.2

B. Test Plots for the Whole Measurement Frequency Range:

Plots for Channel = 0

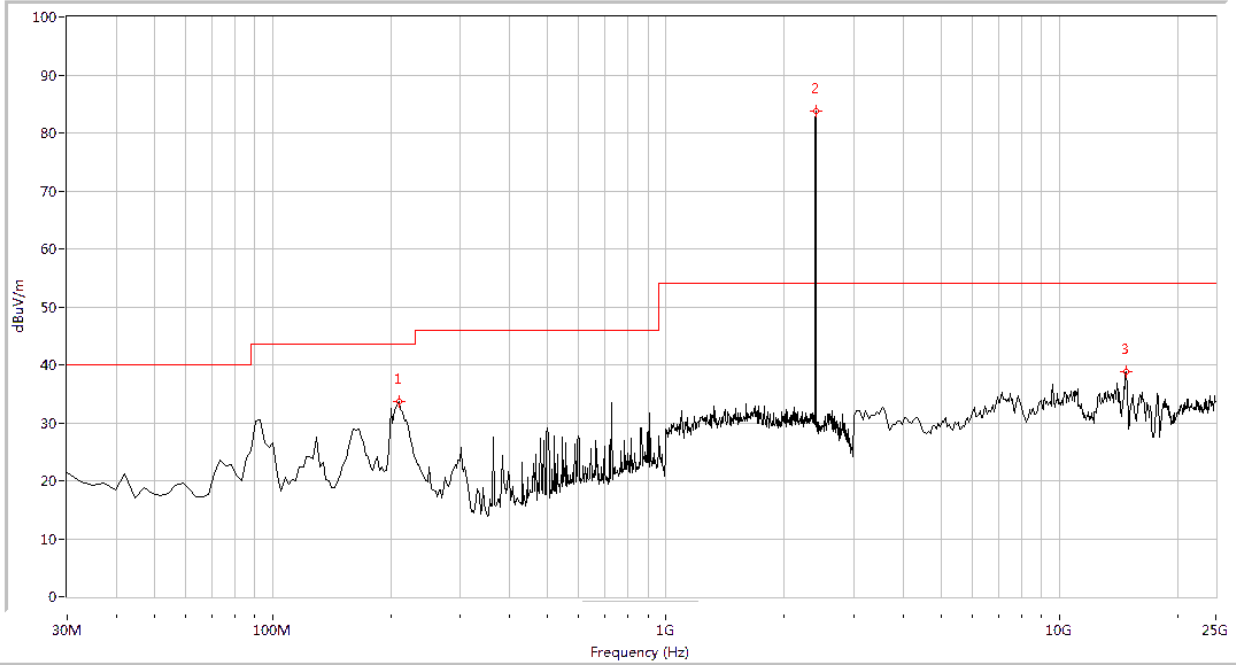


(Plot A.0: 9kHz to 30MHz @ GFSK, channel 0)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
479.925	35.44	N.A	N.A	N.A	46.0	N.A	218.1	Horizontal	PASS
2402.000	83.36	N.A	N.A	74.0	N.A	54.0	107.3	Horizontal	N/A
13314.214	37.17	N.A	N.A	74.0	N.A	54.0	89.1	Horizontal	PASS

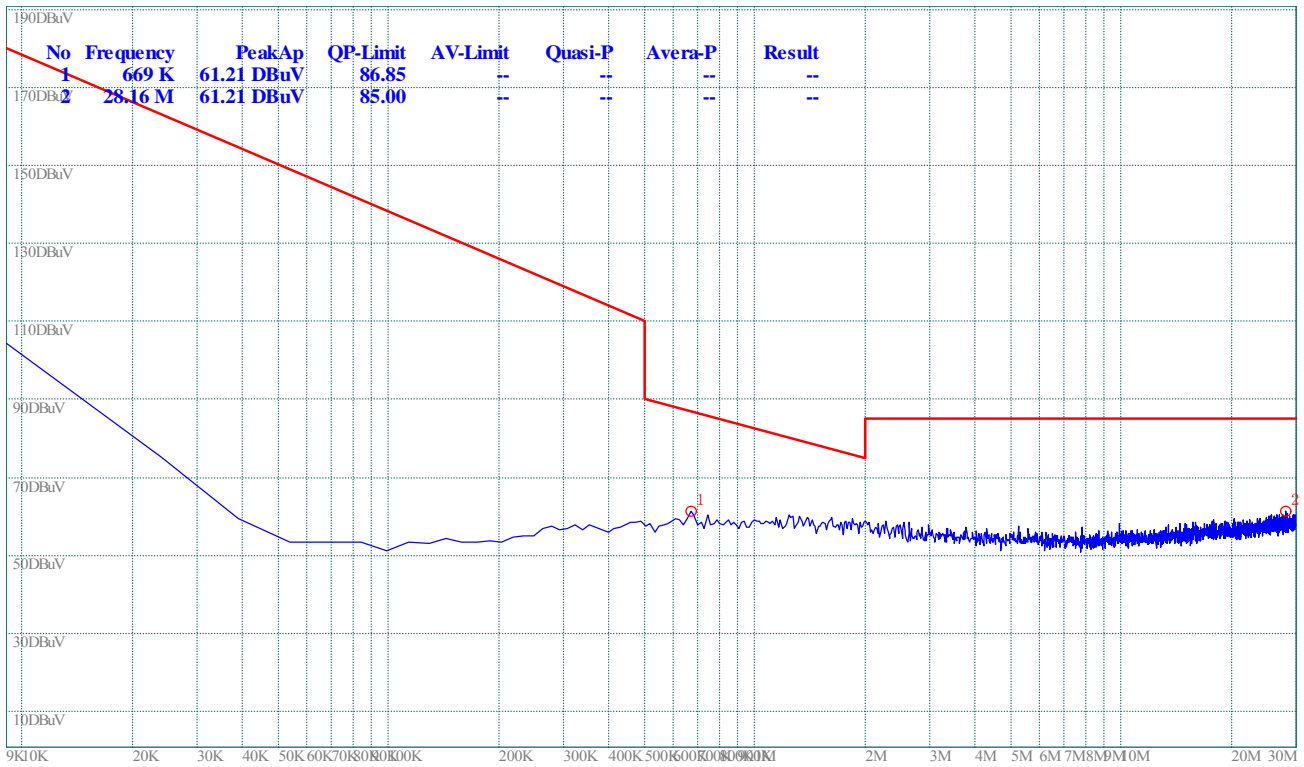
(Plot A.1: 30MHz to 25GHz, Antenna Horizontal @ GFSK, channel 0)



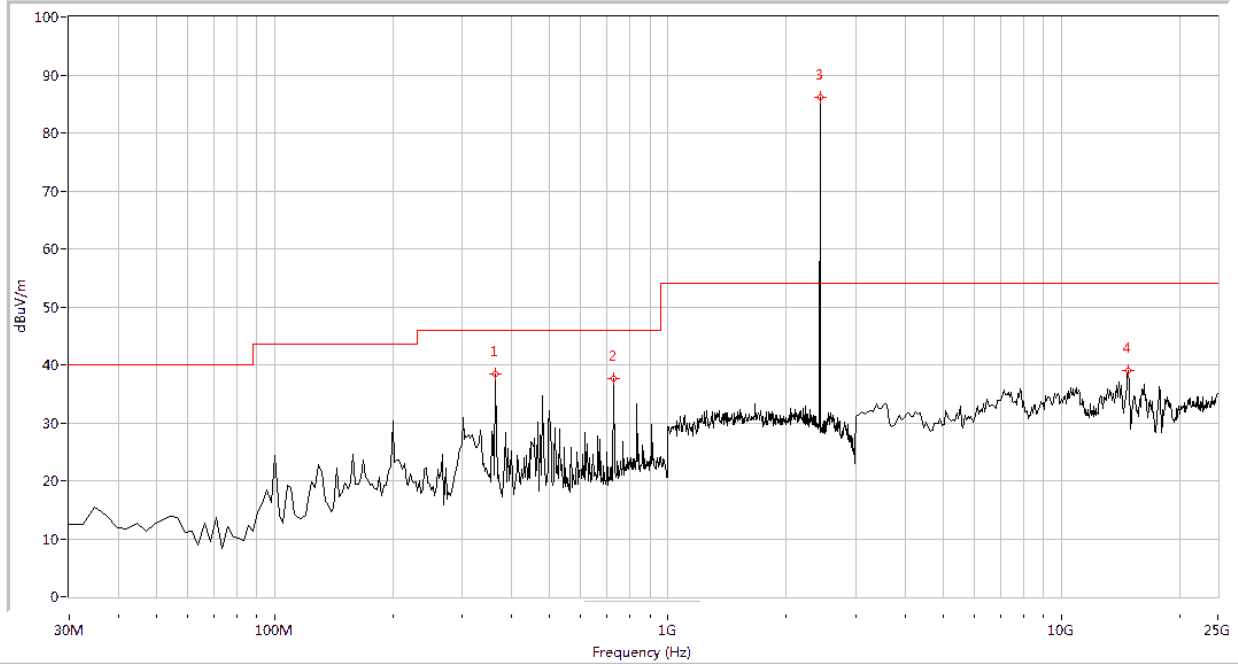
Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
209.002	33.67	N.A	N.A	N.A	43.5	N.A	105.3	Vertical	PASS
2402.000	83.70	N.A	N.A	74.0	N.A	54.0	317.1	Vertical	N/A
14795.511	38.84	N.A	N.A	74.0	N.A	54.0	95.3	Vertical	PASS

(Plot A.2: 30MHz to 25GHz, Antenna Vertical @ GFSK, channel 0)

Plot for Channel = 39

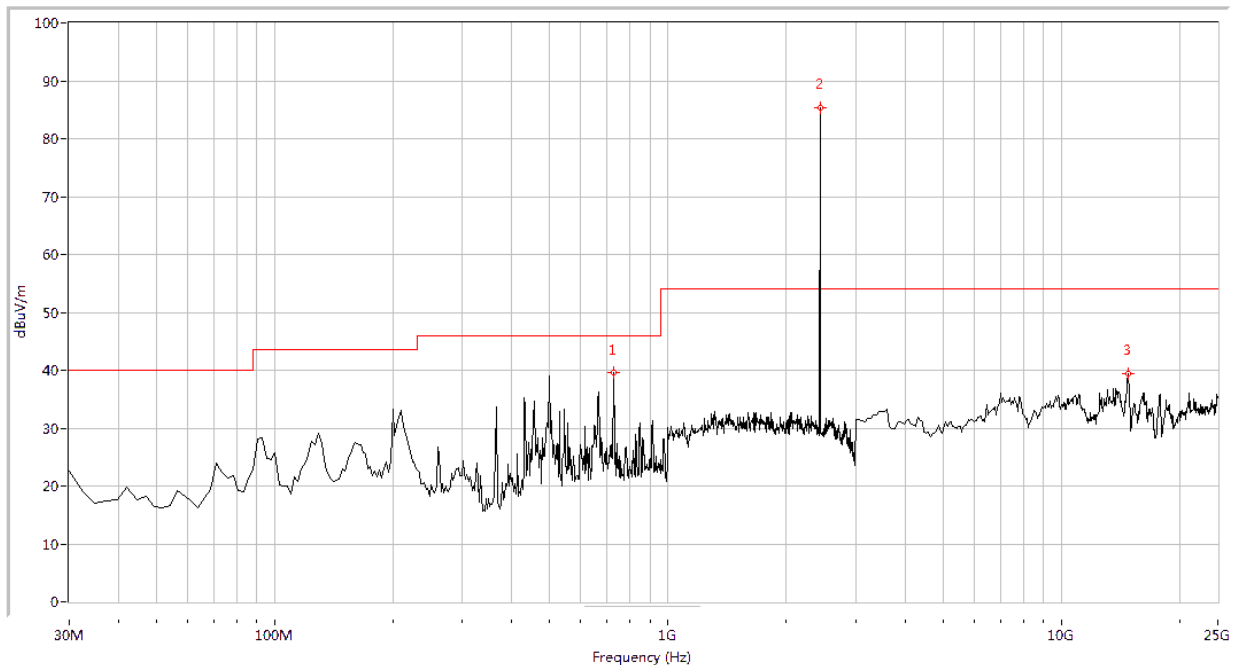


(Plot B.0: 9kHz to 30MHz @ GFSK, channel 39)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
363.815	38.50	N.A	N.A	N.A	46.0	N.A	172.6	Horizontal	PASS
729.077	37.69	N.A	N.A	N.A	46.0	N.A	85.3	Horizontal	PASS
2441.000	86.22	N.A	N.A	74.0	N.A	54.0	295.3	Horizontal	N/A
14795.511	39.02	N.A	N.A	74.0	N.A	54.0	192.1	Horizontal	PASS

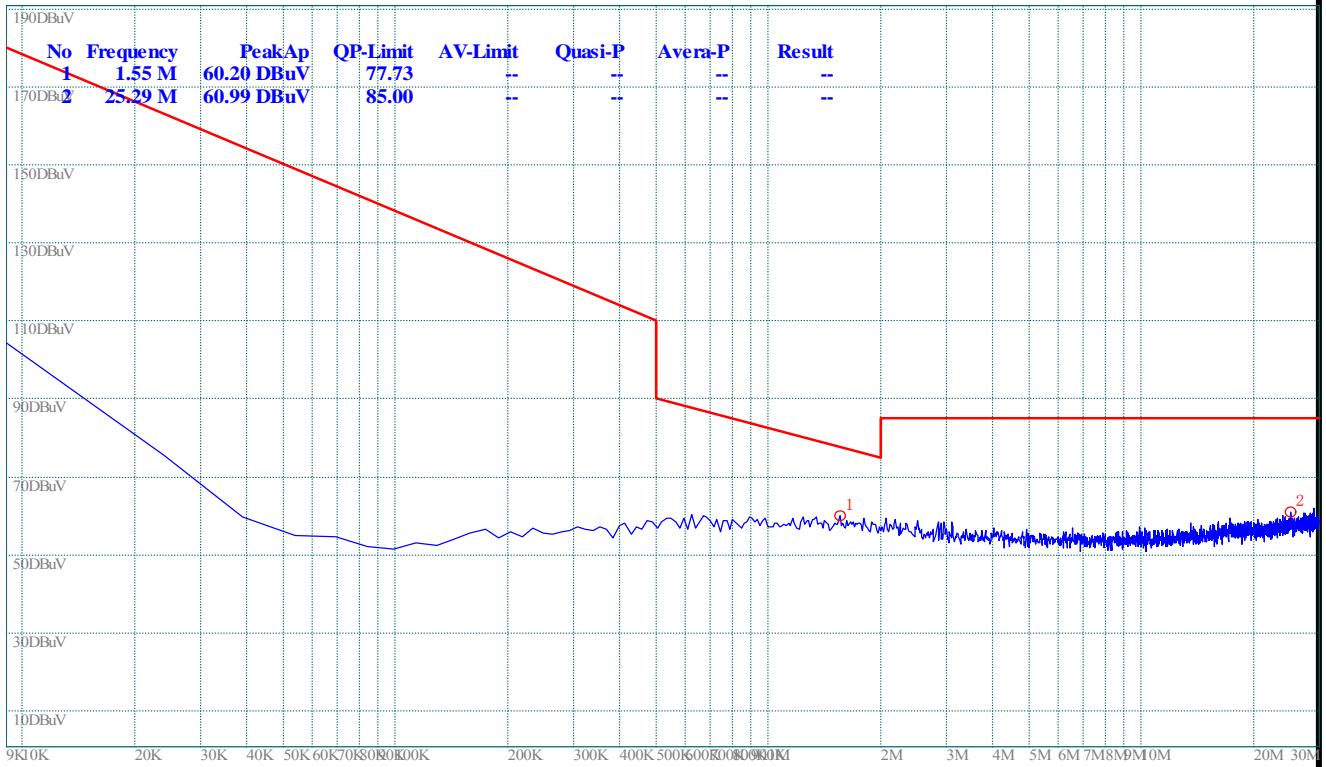
(Plot B.1: 30MHz to 25GHz, Antenna Horizontal @ GFSK, channel 39)



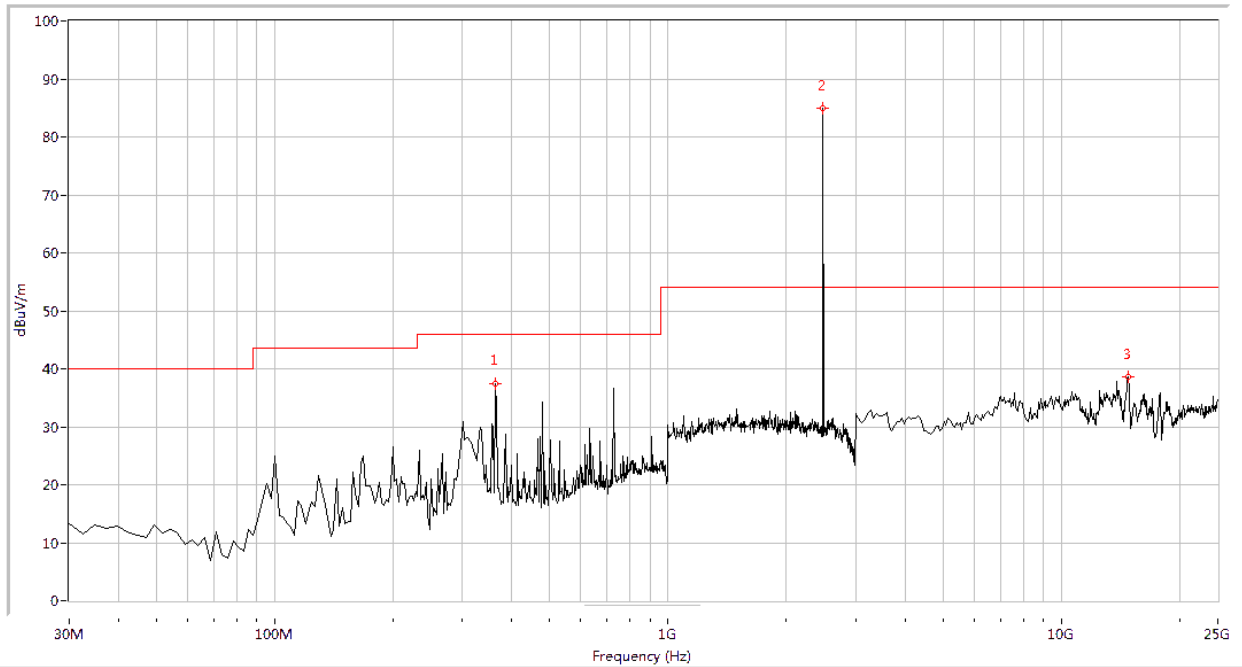
Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
729.077	39.63	N.A	N.A	N.A	46.0	N.A	182.7	Vertical	PASS
2441.000	85.44	N.A	N.A	74.0	N.A	54.0	55.3	Vertical	N/A
14795.511	39.44	N.A	N.A	74.0	N.A	54.0	224.7	Vertical	PASS

(Plot B.2: 30MHz to 25GHz, Antenna Vertical @ GFSK, channel 39)

Plot for Channel = 78

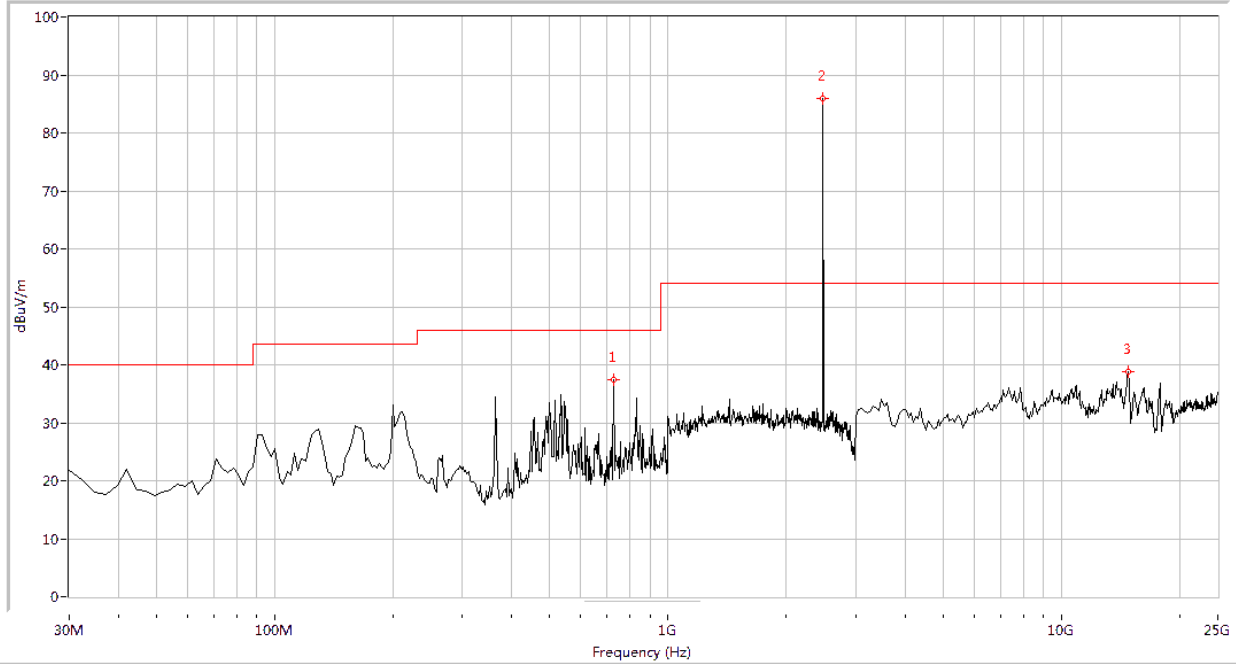


(Plot C.0: 9kHz to 30MHz @ GFSK, channel 78)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
363.815	37.46	N.A	N.A	N.A	46.0	N.A	315.2	Horizontal	PASS
2480.000	85.04	N.A	N.A	74.0	N.A	54.0	95.1	Horizontal	N/A
14795.511	38.52	N.A	N.A	74.0	N.A	54.0	157.2	Horizontal	PASS

(Plot C.1: 30MHz to 25GHz, Antenna Horizontal @ GFSK, channel 78)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
729.077	37.37	N.A	N.A	N.A	46.0	N.A	157.3	Vertical	PASS
2480.000	85.97	N.A	N.A	74.0	N.A	54.0	293.8	Vertical	N/A
14795.511	38.87	N.A	N.A	74.0	N.A	54.0	163.7	Vertical	PASS

(Plot C.2: 30MHz to 25GHz, Antenna Vertical @ GFSK, channel 78)

2.9.3.2. $\pi/4$ -DQPSK Mode:

A. Test Verdict for Harmonics:

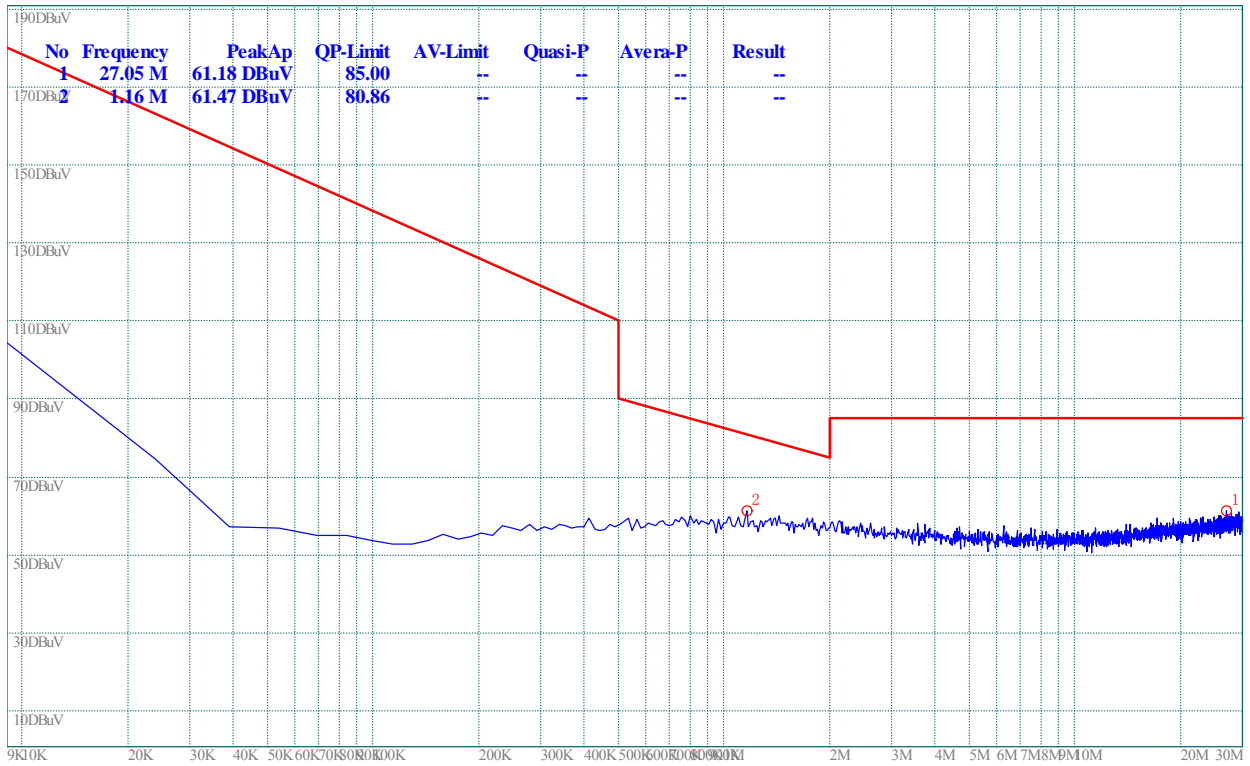
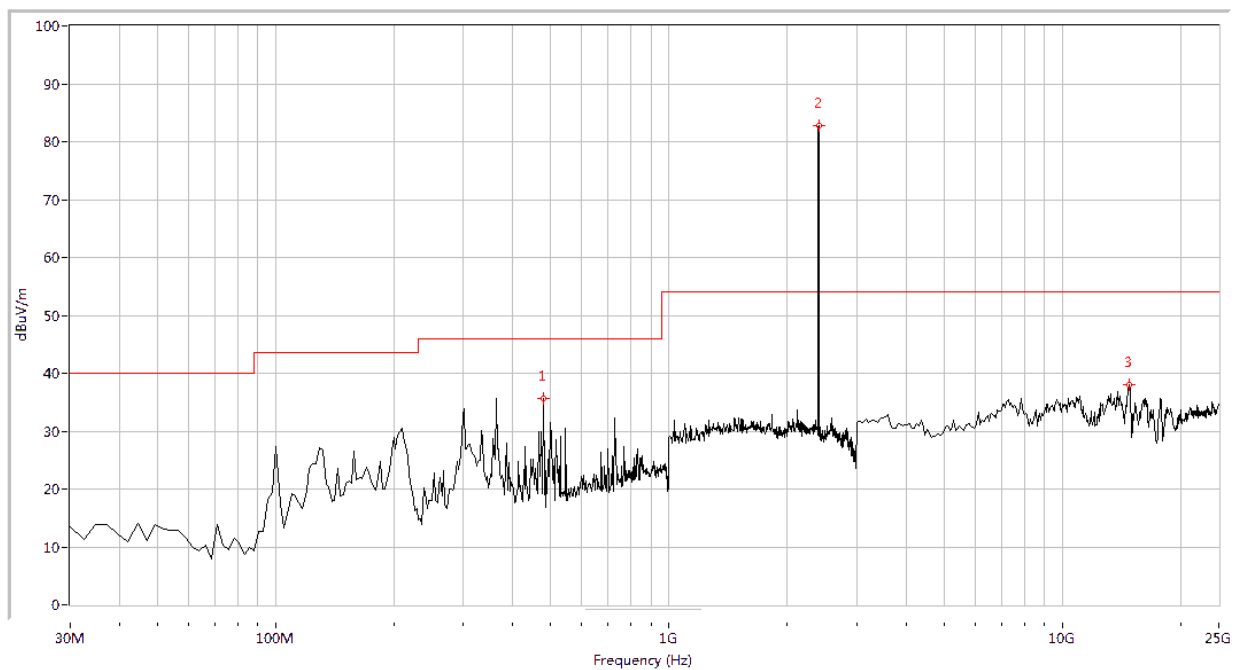
The Fundamental Emissions

The field strength of {Fundamental Emission} listed below is recorded, and used in the next table.

Channe l	Frequency (MHz)	Fundamental Emission (dB μ V/m)		Antenna Polarization	Refer to Plot
		PK	AV		
0	2402	82.80	N/A	Horizontal	Plot A.1
		82.78	N/A	Vertical	Plot A.2
39	2441	85.64	N/A	Horizontal	Plot B.1
		85.17	N/A	Vertical	Plot B.2
78	2480	85.82	N/A	Horizontal	Plot C.1
		85.10	N/A	Vertical	Plot C.2

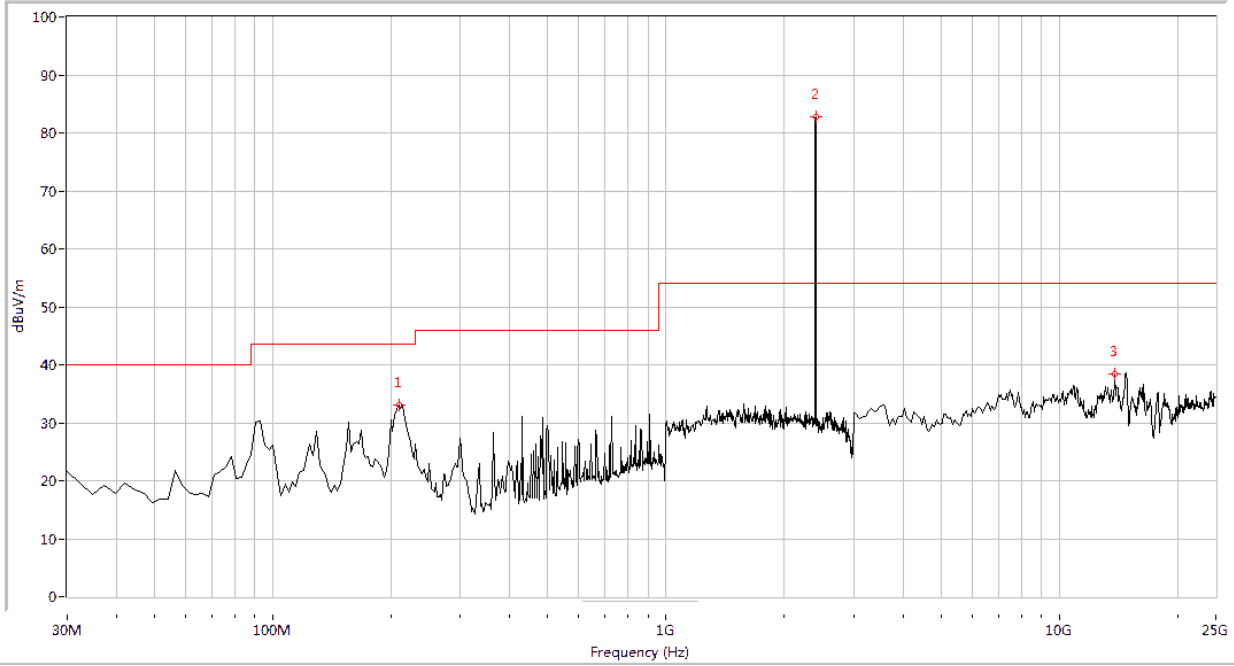
B. Test Plots for the Whole Measurement Frequency Range:

Plots for Channel = 0


 (Plot A.0: 9kHz to 30MHz $\pi/4$ -DQPSK, channel 0)


Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
479.925	35.60	N.A	N.A	N.A	46.0	N.A	167.5	Horizontal	PASS
2402.000	82.80	N.A	N.A	54.0	N.A	54.0	283.1	Horizontal	N/A
14795.511	38.02	N.A	N.A	54.0	N.A	54.0	241.3	Horizontal	PASS

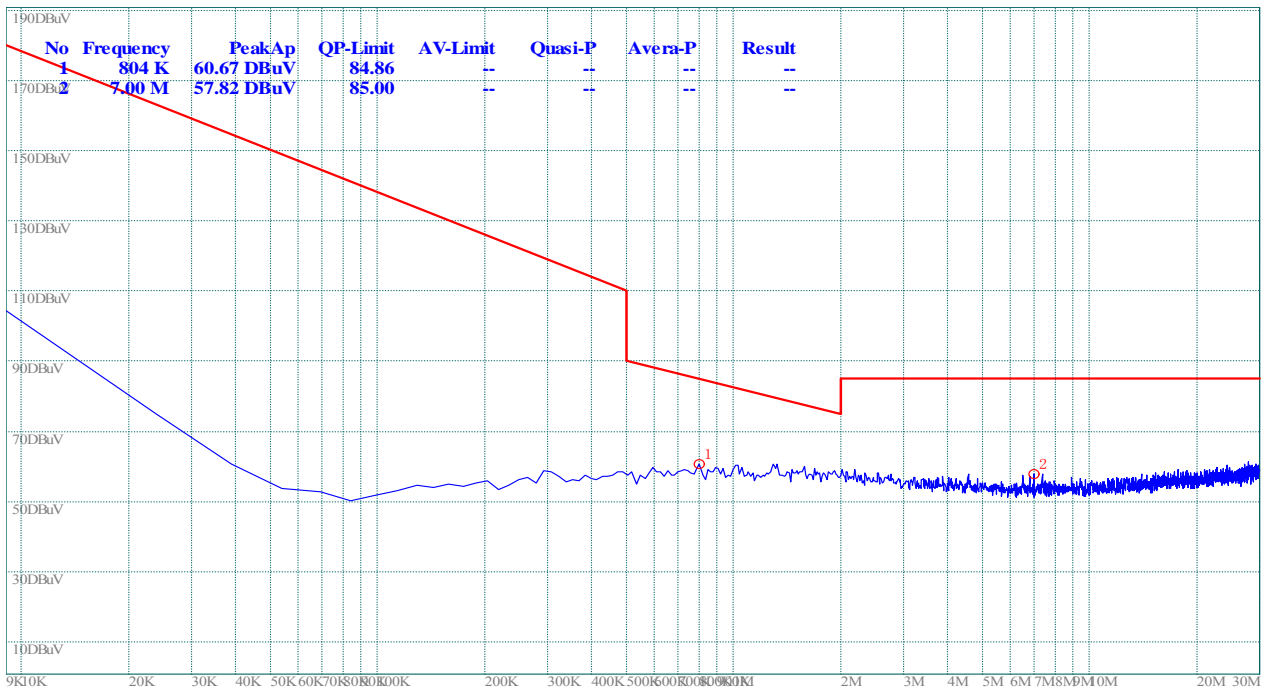
 (Plot A.1: 30MHz to 25GHz, Antenna Horizontal $\pi/4$ -DQPSK, channel 0)



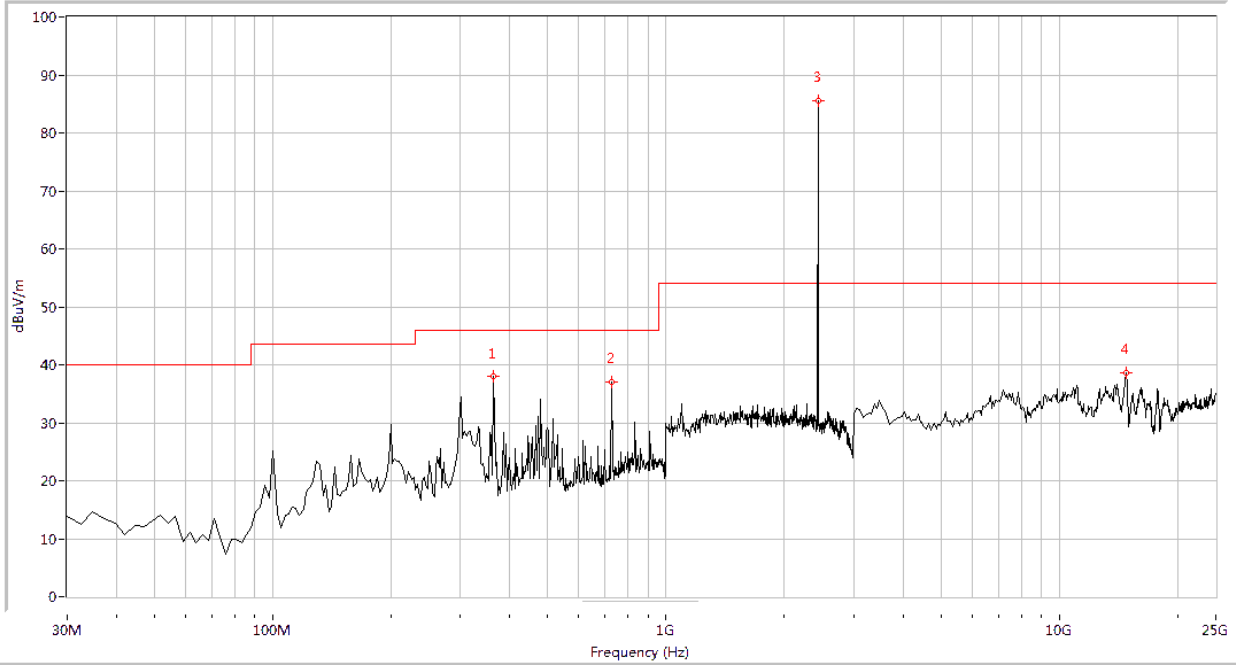
Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
209.002	33.07	N.A	N.A	N.A	43.5	N.A	103.2	Vertical	PASS
2402.000	82.78	N.A	N.A	74.0	N.A	54.0	93.2	Vertical	N/A
13862.843	38.35	N.A	N.A	74.0	N.A	54.0	182.6	Vertical	PASS

(Plot A.2: 30MHz to 25GHz, Antenna Vertical $\pi/4$ -DQPSK, channel 0)

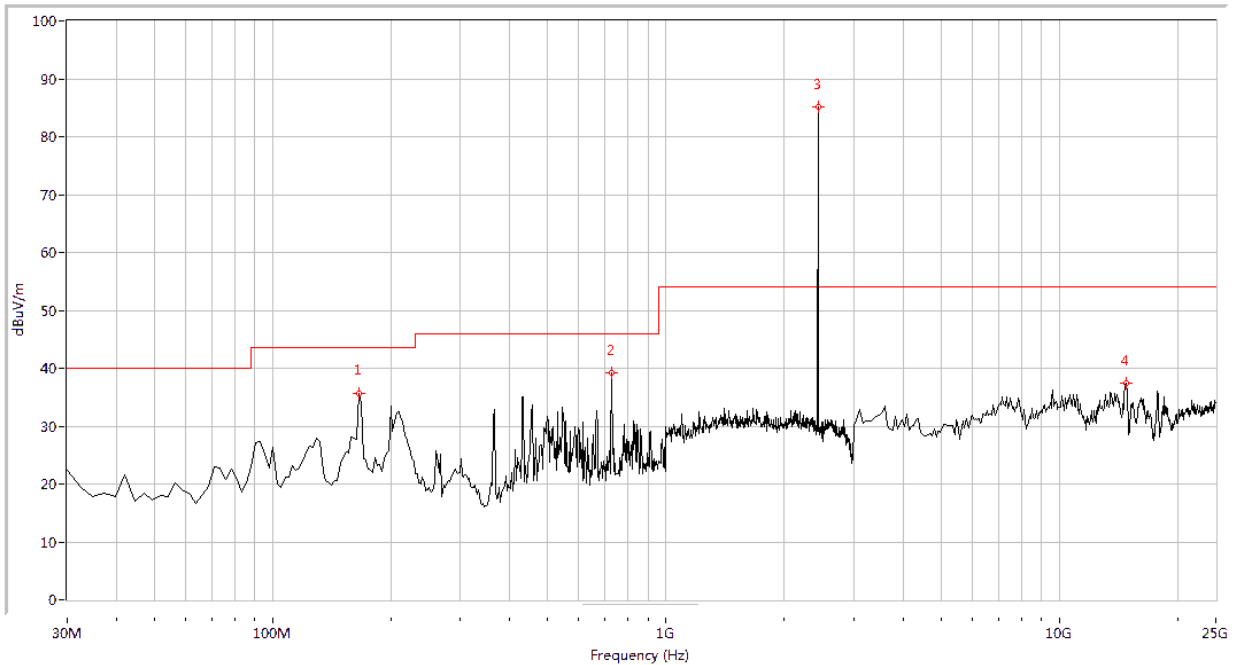
Plot for Channel = 39



(Plot B.0: 9kHz to 30MHz $\pi/4$ -DQPSK, channel 39)



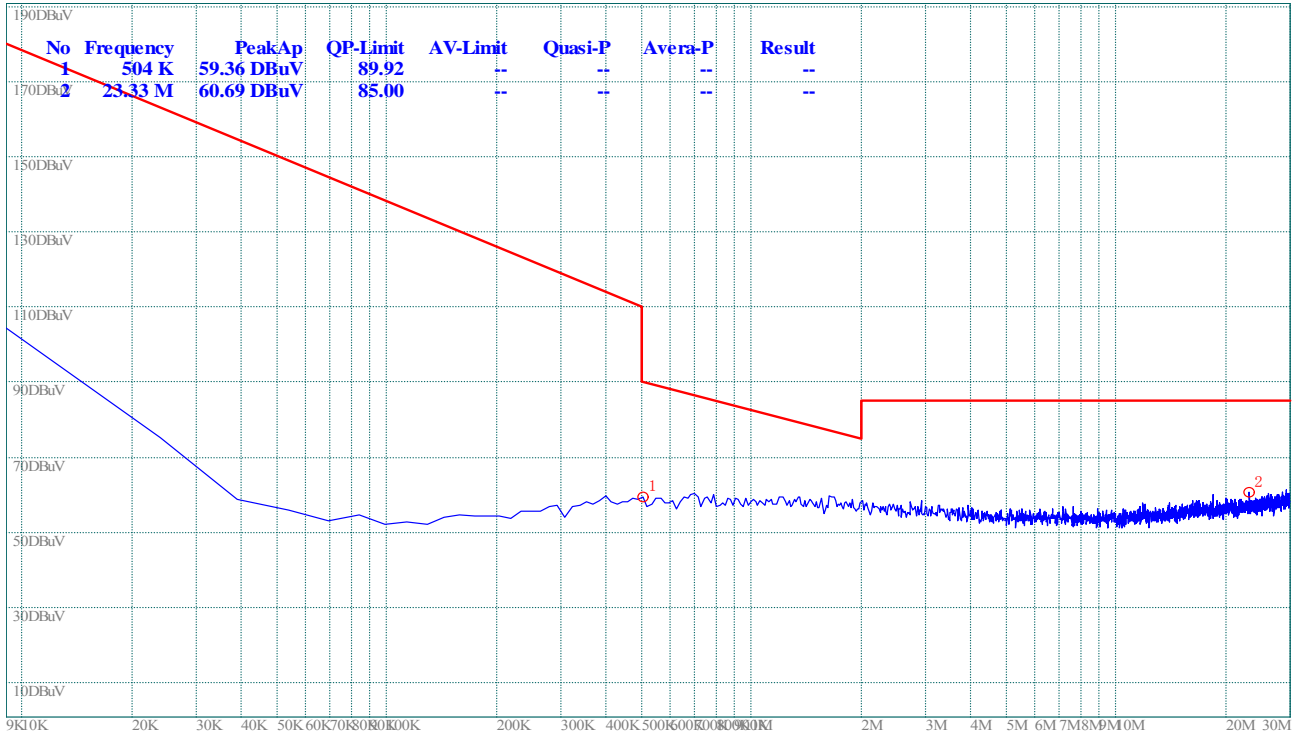
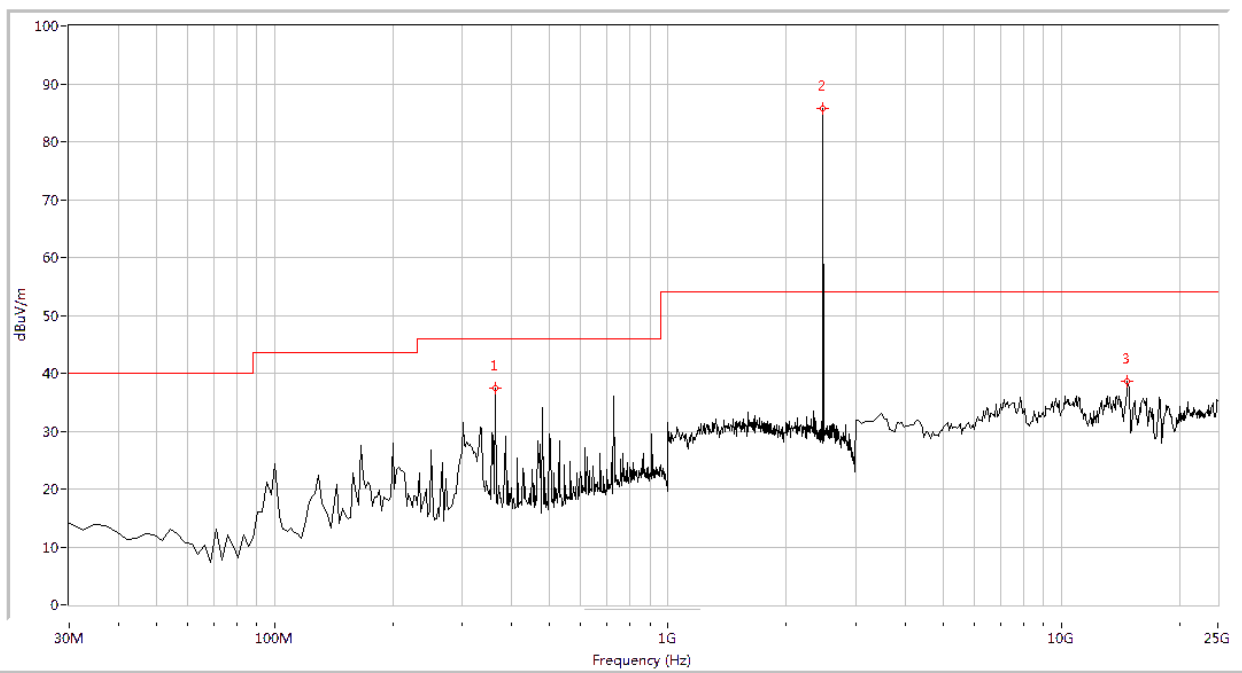
Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
363.815	38.09	N.A	N.A	N.A	46.0	N.A	83.6	Horizontal	PASS
726.658	36.97	N.A	N.A	N.A	46.0	N.A	102.3	Horizontal	PASS
2441.000	85.64	N.A	N.A	74.0	N.A	54.0	325.2	Horizontal	N/A
14795.511	38.55	N.A	N.A	74.0	N.A	54.0	111.2	Horizontal	PASS

 (Plot B.1: 30MHz to 25GHz, Antenna Horizontal $\pi/4$ -DQPSK, channel 39)


Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
726.658	39.14	N.A	N.A	N.A	46.0	N.A	153.2	Vertical	PASS
2441.000	85.17	N.A	N.A	74.0	N.A	54.0	86.7	Vertical	N/A
14795.511	37.45	N.A	N.A	74.0	N.A	54.0	105.3	Vertical	PASS

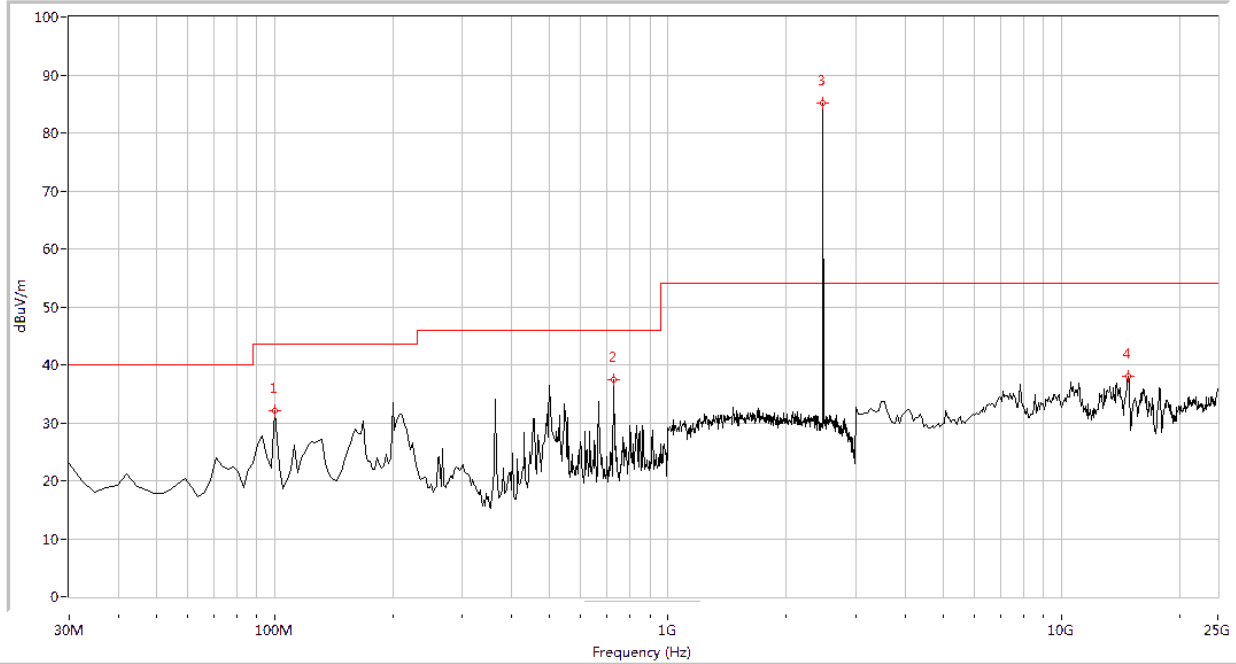
 (Plot B.2: 30MHz to 25GHz, Antenna Vertical $\pi/4$ -DQPSK, channel 39)

Plot for Channel = 78


 (Plot C.0: 9kHz to 30MHz $\pi/4$ -DQPSK, channel 78)


Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
363.815	37.43	N.A	N.A	N.A	46.0	N.A	142.3	Horizontal	PASS
2480.000	85.82	N.A	N.A	74.0	N.A	54.0	287.5	Horizontal	N/A
14740.648	38.54	N.A	N.A	74.0	N.A	54.0	182.6	Horizontal	PASS

 (Plot C.1: 30MHz to 25GHz, Antenna Horizontal $\pi/4$ -DQPSK, channel 78)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
100.150	32.00	N.A	N.A	N.A	43.5	N.A	128.3	Vertical	PASS
729.077	37.37	N.A	N.A	N.A	46.0	N.A	85.6	Vertical	PASS
2480.000	85.10	N.A	N.A	74.0	N.A	54.0	211.6	Vertical	N/A
14795.511	38.01	N.A	N.A	74.0	N.A	54.0	217.0	Vertical	PASS

(Plot C.2: 30MHz to 25GHz, Antenna Vertical $\pi/4$ -DQPSK, channel 78)

2.9.3.3. 8-DPSK Mode:

A. Test Verdict for Harmonics:

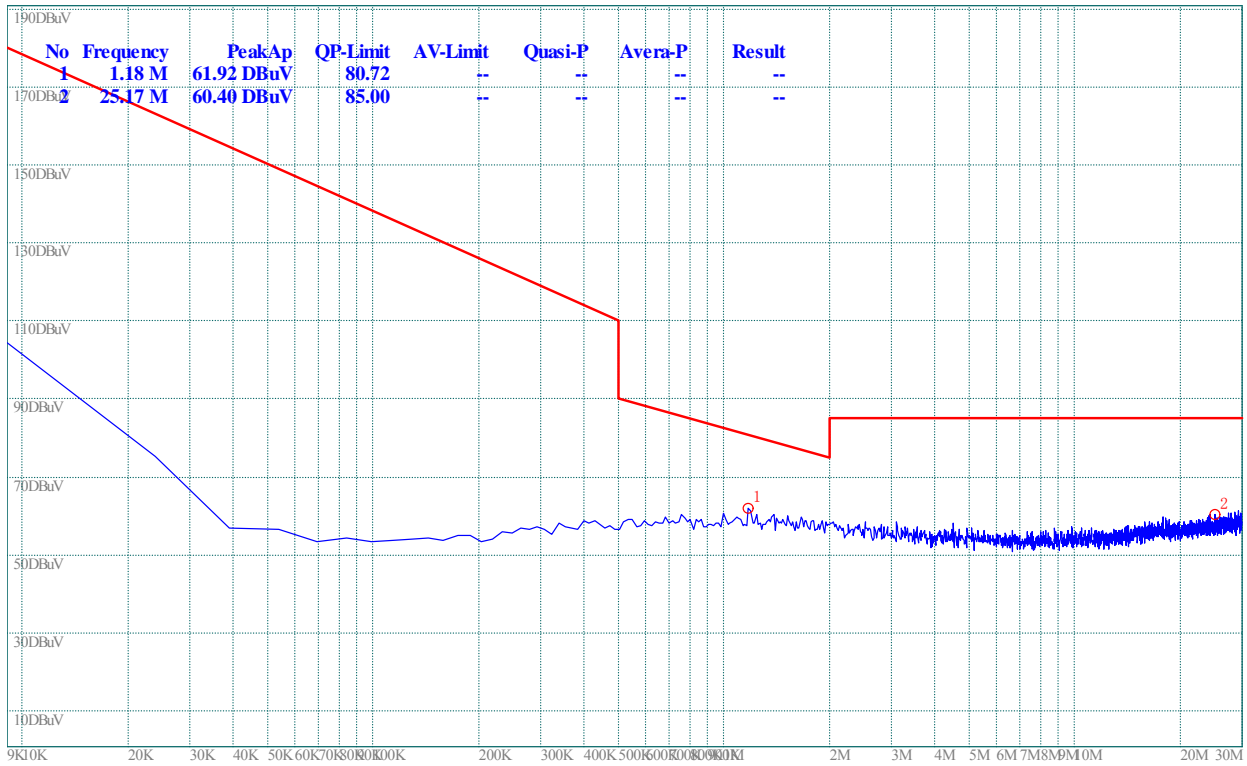
The Fundamental Emissions

The field strength of {Fundamental Emission} listed below is recorded, and used in the next table.

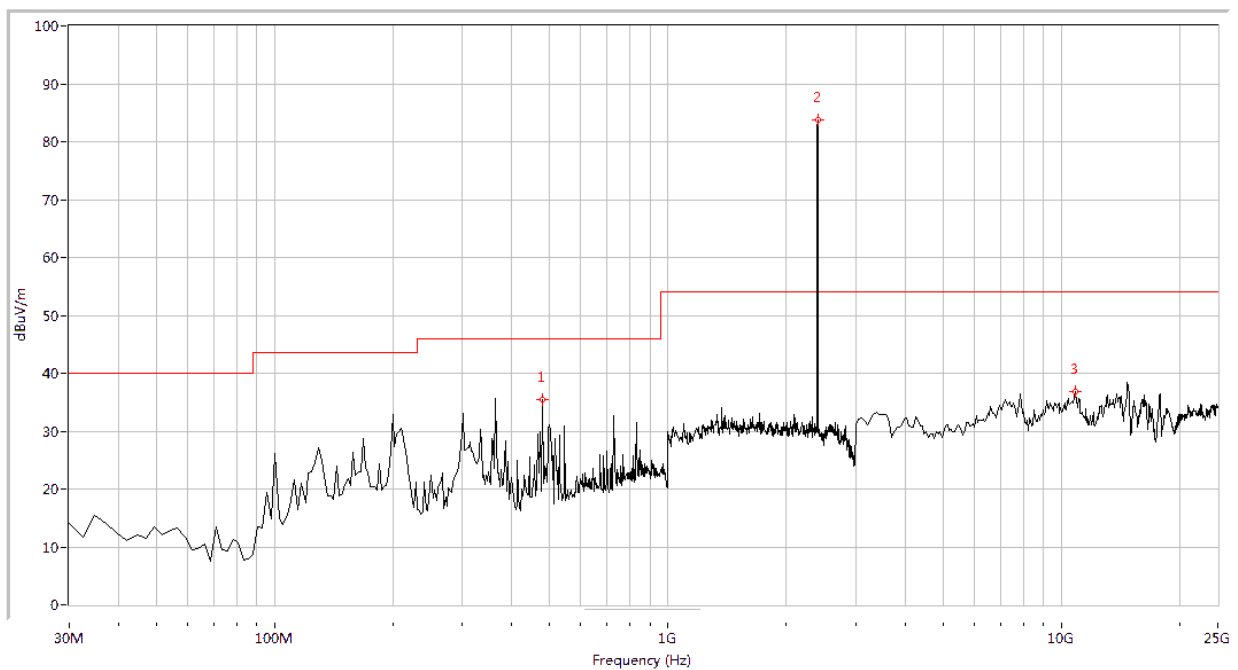
Channe l	Frequency (MHz)	Fundamental Emission (dB μ V/m)		Antenna Polarization	Refer to Plot
		PK	AV		
0	2402	83.68	N/A	Horizontal	Plot A.1
		83.87	N/A	Vertical	Plot A.2
39	2441	85.67	N/A	Horizontal	Plot B.1
		85.28	N/A	Vertical	Plot B.2
78	2480	85.08	N/A	Horizontal	Plot C.1
		85.17	N/A	Vertical	Plot C.2

B. Test Plots for the Whole Measurement Frequency Range:

Plots for Channel = 0

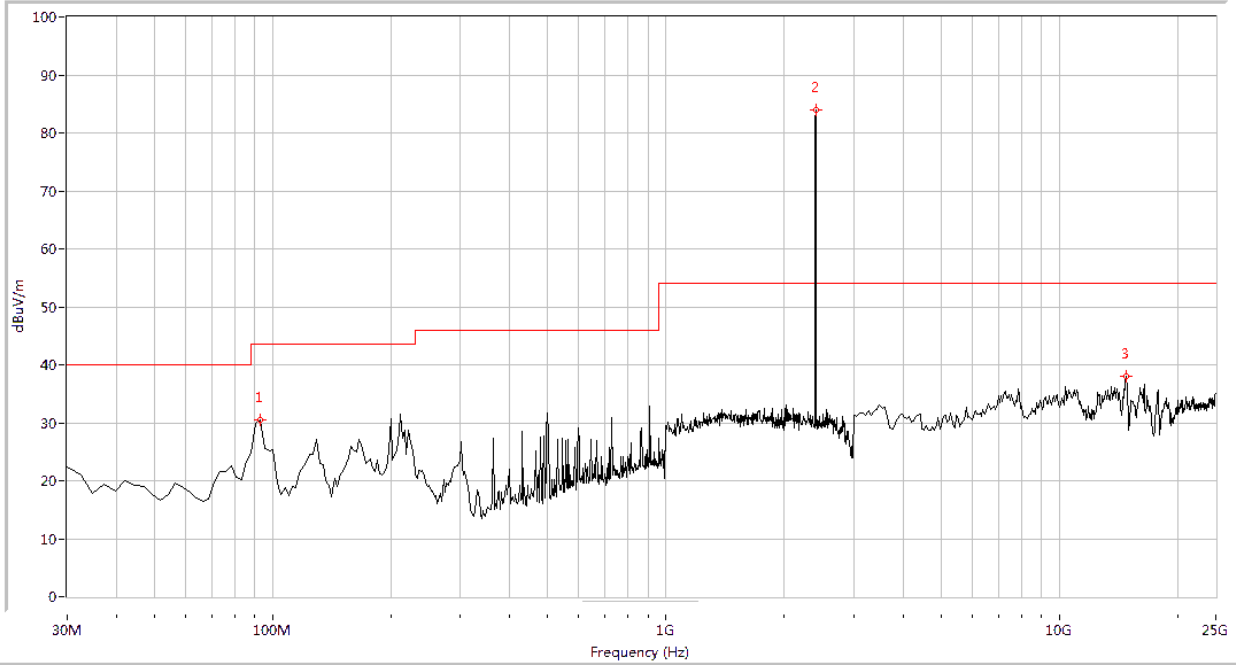


(Plot A.0: 9kHz to 30MHz 8-DPSK, channel 0)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
479.925	35.43	N.A	N.A	N.A	46.0	N.A	36.1	Horizontal	PASS
2402.000	83.68	N.A	N.A	74.0	N.A	54.0	151.9	Horizontal	N/A
10845.387	36.82	N.A	N.A	74.0	N.A	54.0	296.4	Horizontal	PASS

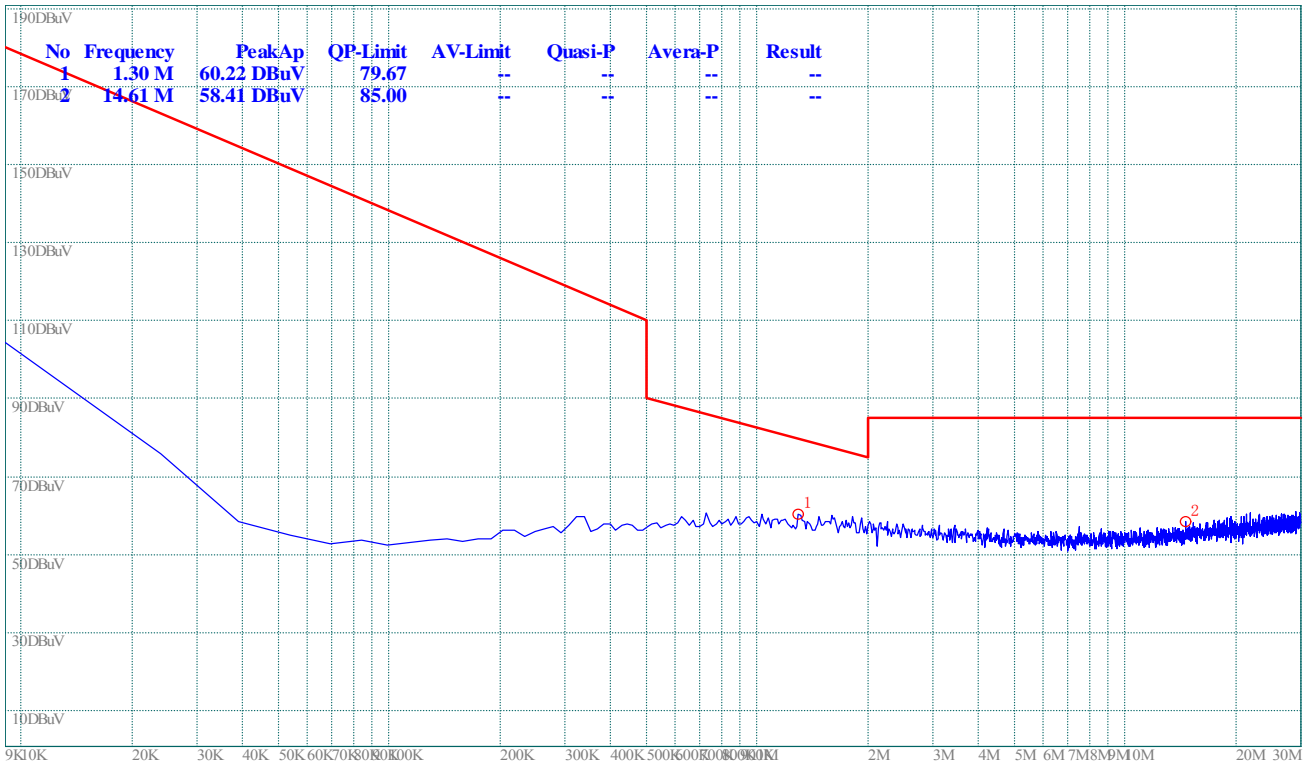
(Plot A.1: 30MHz to 25GHz, Antenna Horizontal 8-DPSK, channel 0)



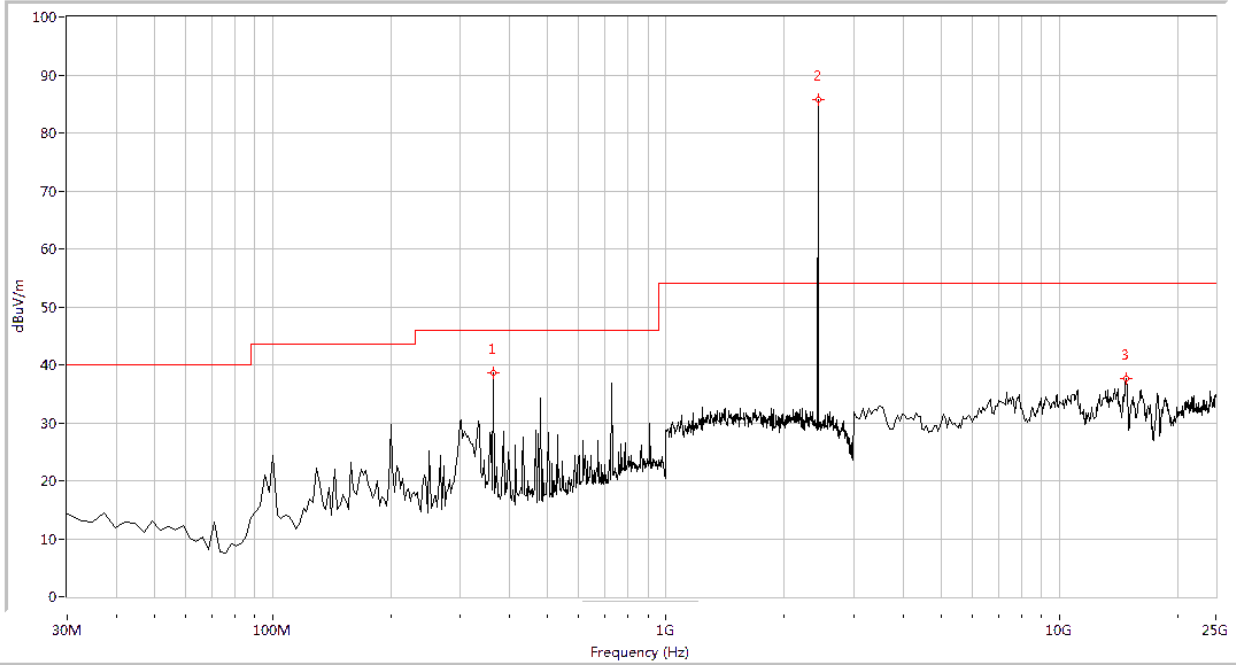
Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
92.893	30.48	N.A	N.A	N.A	43.5	N.A	172.3	Vertical	PASS
2402.000	83.87	N.A	N.A	74.0	N.A	54.0	329.2	Vertical	N/A
14795.511	37.96	N.A	N.A	74.0	N.A	54.0	83.6	Vertical	PASS

(Plot A.2: 30MHz to 25GHz, Antenna Vertical 8-DPSK, channel 0)

Plot for Channel = 39

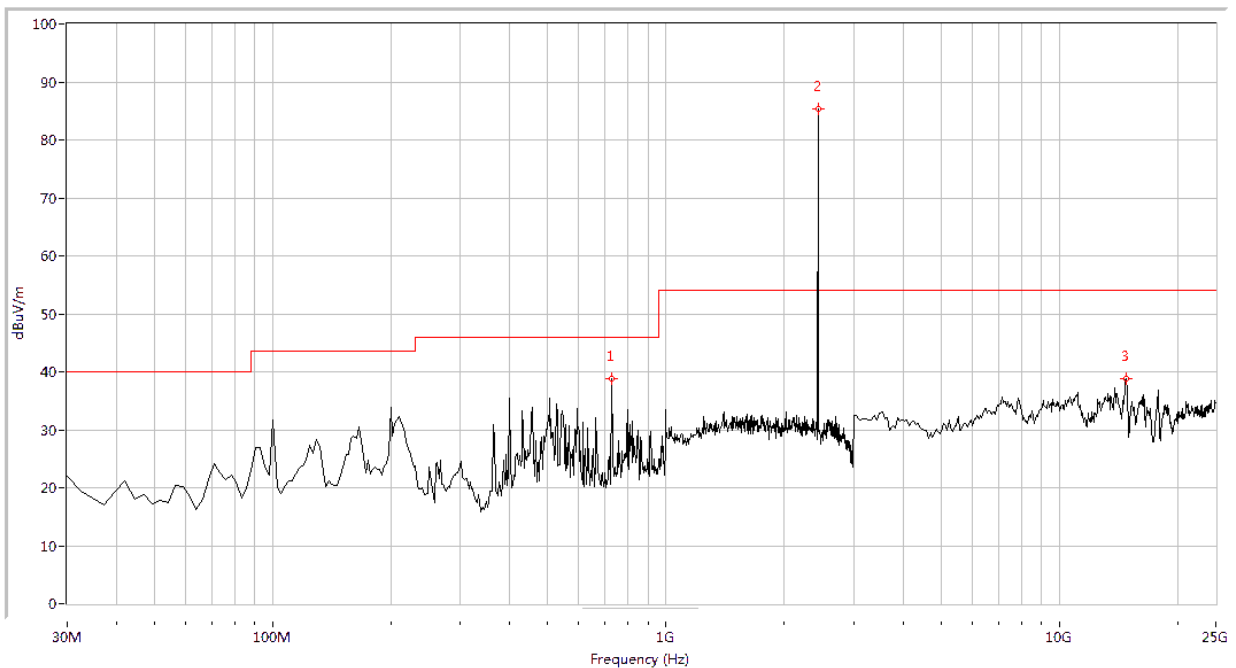


(Plot B.0: 9kHz to 30MHz 8-DPSK, channel 39)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
363.815	38.66	N.A	N.A	N.A	46.0	N.A	181.1	Horizontal	PASS
2441.000	85.67	N.A	N.A	74.0	N.A	54.0	22.6	Horizontal	N/A
14795.511	37.54	N.A	N.A	74.0	N.A	54.0	101.5	Horizontal	PASS

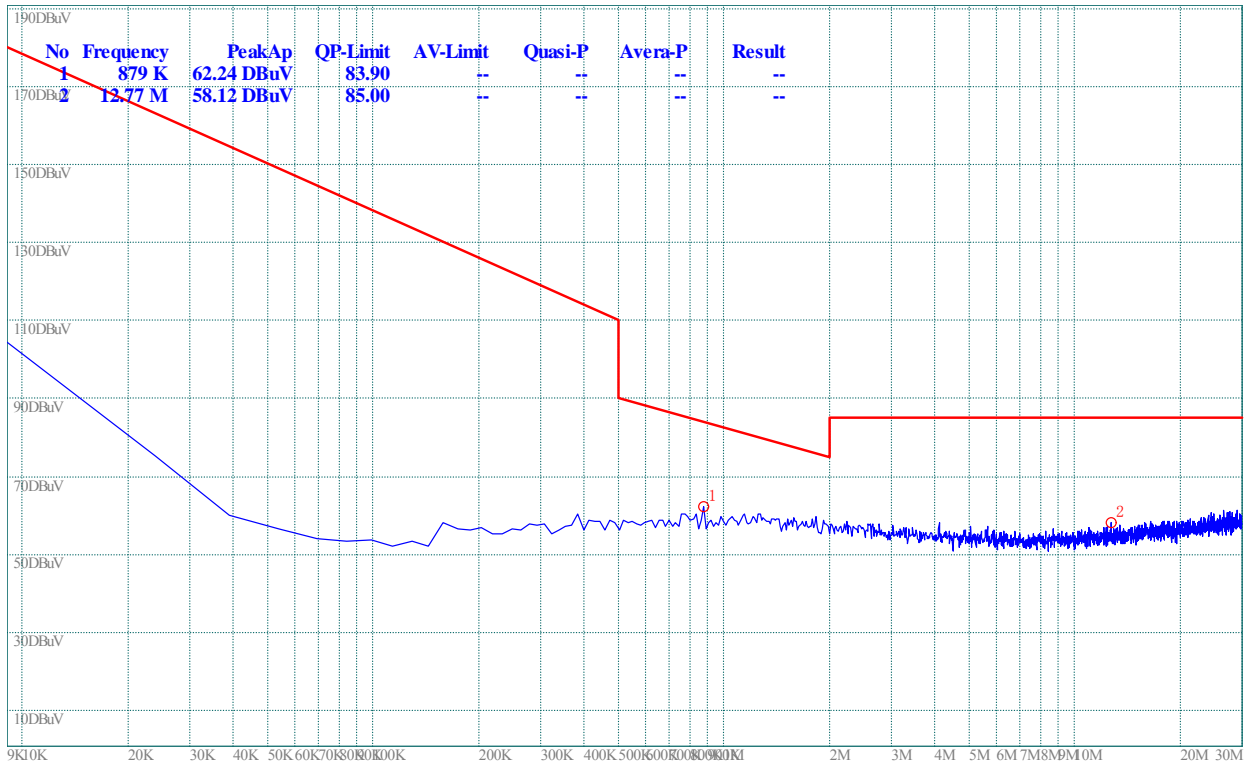
(Plot B.1: 30MHz to 25GHz, Antenna Horizontal 8-DPSK, channel 39)



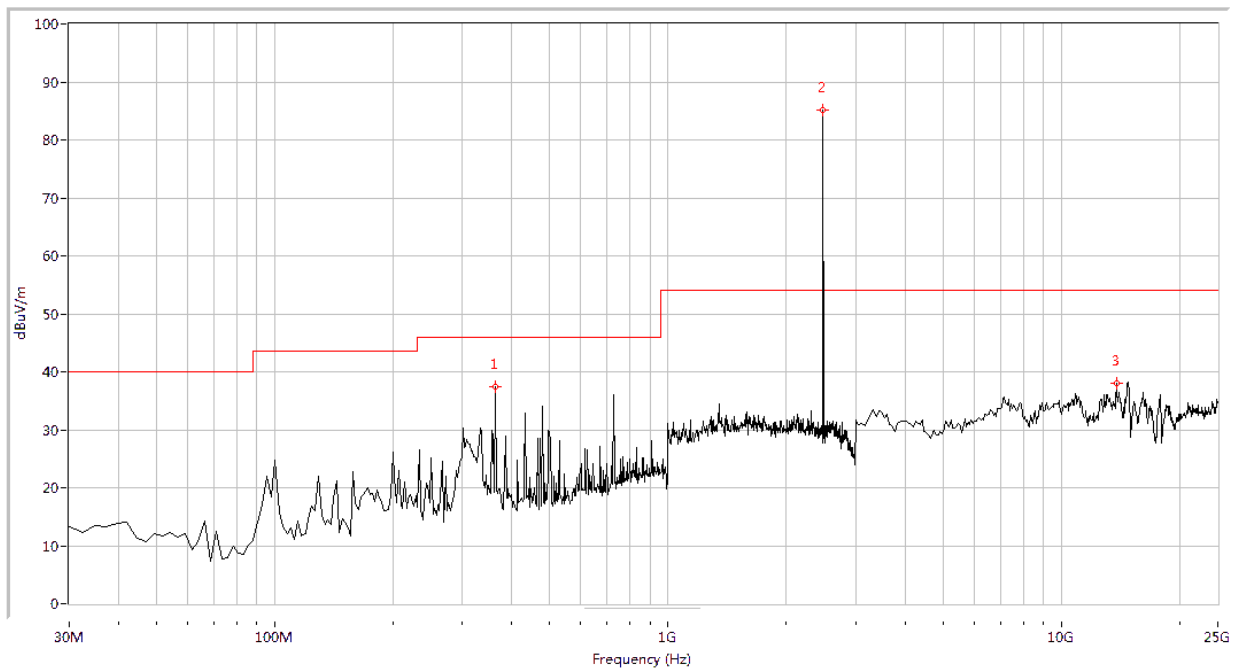
Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
729.077	38.84	N.A	N.A	N.A	46.0	N.A	185.3	Vertical	PASS
2441.000	85.28	N.A	N.A	74.0	N.A	54.0	261.5	Vertical	N/A
14795.511	38.82	N.A	N.A	74.0	N.A	54.0	84.3	Vertical	PASS

(Plot B.2: 30MHz to 25GHz, Antenna Vertical 8-DPSK, channel 39)

Plot for Channel = 78

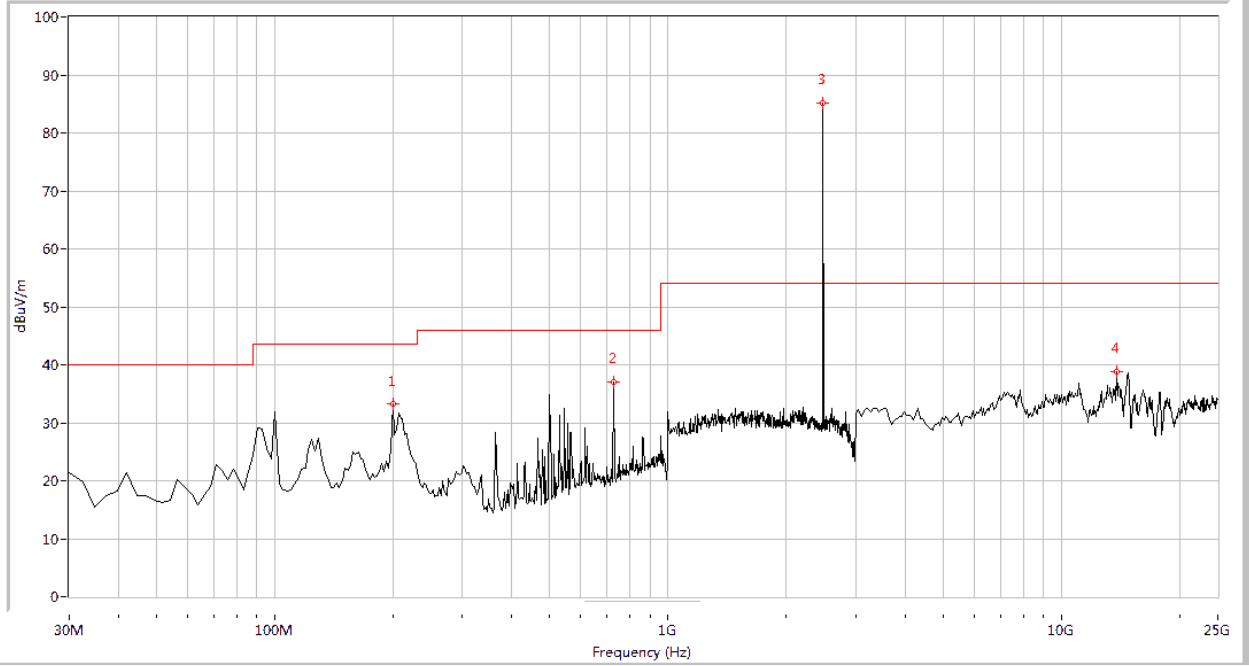


(Plot C.0: 9kHz to 30MHz 8-DPSK, channel 78)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
363.815	37.50	N.A	N.A	N.A	46.0	N.A	163.3	Horizontal	PASS
2480.000	85.08	N.A	N.A	74.0	N.A	54.0	206.1	Horizontal	N/A
13807.980	38.03	N.A	N.A	74.0	N.A	54.0	55.6	Horizontal	PASS

(Plot C.1: 30MHz to 25GHz, Antenna Horizontal 8-DPSK, channel 78)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Degree	Antenna	Verdict
729.077	37.12	N.A	N.A	N.A	46.0	N.A	101.4	Vertical	PASS
2480.000	85.17	N.A	N.A	74.0	N.A	54.0	95.3	Vertical	N/A
13862.843	38.86	N.A	N.A	74.0	N.A	54.0	157.2	Vertical	PASS

(Plot C.2: 30MHz to 25GHz, Antenna Vertical 8-DPSK, channel 78)

* END OF REPORT *