REPORT No. : SZ14120182W05

FCC RF TEST REPORT

APPLICANT	:	Hisense International Co.,Ltd
PRODUCT NAME	:	WCDMA Handset
MODEL NAME	:	HS-U688
TRADE NAME	:	Hisense
BRAND NAME	:	Hisense
FCC ID	:	2ADOBU688
STANDARD(S)	:	47 CFR Part 15 Subpart C
ISSUE DATE	:	2015-01-28

SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.

MORLAB GROUP
FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China
Tel: 86-755-36698555 Fax: 86-755-36698525
Http://www.morlab.com E-mail: service@morlab.cn

DIRECTORY

Change History		
Issue	Date	Reason for change
1.0	2015-01-28	First edition

Test Report Declaration

Applicant	Hisense International Co.,Ltd
Applicant Address	Floor 22, Hisense Tower, 17 Donghai Xi Road, Qingdao, 266071, China
Manufacturer	Hisense Communications Co.,Ltd
Manufacturer Address	218,Qianwangang Road,Qingdao Economic&Technological Development Zone,Qingdao
Product Name	WCDMA Handset
Model Name	HS-U688
Brand Name	Hisense
HW Version	V2.00
SW Version	W1001.4.01.03.US00
Test Standards	47 CFR Part 15 Subpart C
Test Date	2015-01-08 to 2015-01-23
Test Result	PASS

Tested by : Shen Senping
Shen Senping

Reviewed by : Qiu Xiaojun
Qiu Xiaojun

Approved by : Zeng Dexin
Zeng Dexin

1. Technical Information

Note： Provide by applicant.

1.1. Equipment under Test (EUT) Description

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), ∏/4-DQPSK(EDR 2Mbps), 8-DPSK(EDR 3Mbps))
Bluetooth Version:	2.1+EDR
Antenna Type:	PIFA Antenna
Antenna Gain:	-0.5dBi

NOTE:

The EUT is a WCDMA Handset, it contains Bluetooth Module operating at 2.4GHz ISM band; the frequencies allocated for the Bluetooth Module is F(MHz)=2402+1*n (0<=n<=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).

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

1.2. Test Standards and Results

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

No.	Identity	Document Title
1	47 CFR Part 15 (10-1-13 Edition)	Radio Frequency Devices

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

No.	Section in CFR 47	Description	Result
1	15.203	Antenna Requirement	**PASS**
2	15.247(a)	Number of Hopping Frequency	**PASS**
3	15.247(b)	Peak Output Power	**PASS**
4	15.247(a)	20dB Bandwidth	**PASS**
5	15.247(a)	Carrier Frequency Separation	**PASS**
6	15.247(a)	Time of Occupancy (Dwell time)	**PASS**
7	15.247(d)	Conducted Spurious Emission	**PASS**
8	15.247(d)	Restricted Frequency Bands	**PASS**
9	15.207	Conducted Emission	**PASS**
10	15.209 15.247(d)	Radiated Emission	**PASS**
11	15.247(i),1.1307& 2.1093	RF exposure evaluation	**PASS**

NOTE: The tests were performed according to the method of measurements prescribed in DA-00-705, ANSI C63.4-2003 and ANSI C63.10-2009.

1.2.1. 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 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.

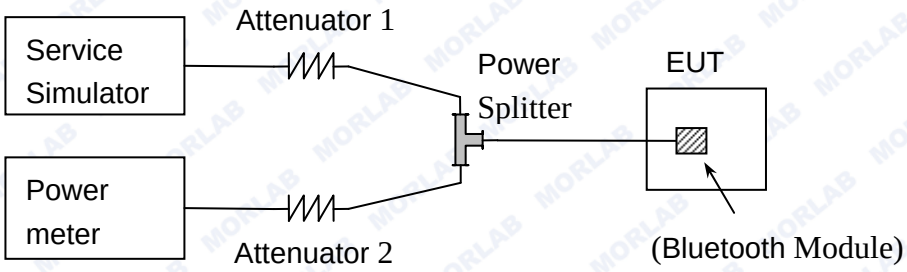
2.2. Number of Hopping Frequency

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 Bluetooth Module of the EUT 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:

Please reference ANNEX A(1.4).

2.2.3. Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Span = the frequency band of operation
RBW ≥ 1% of the span
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize

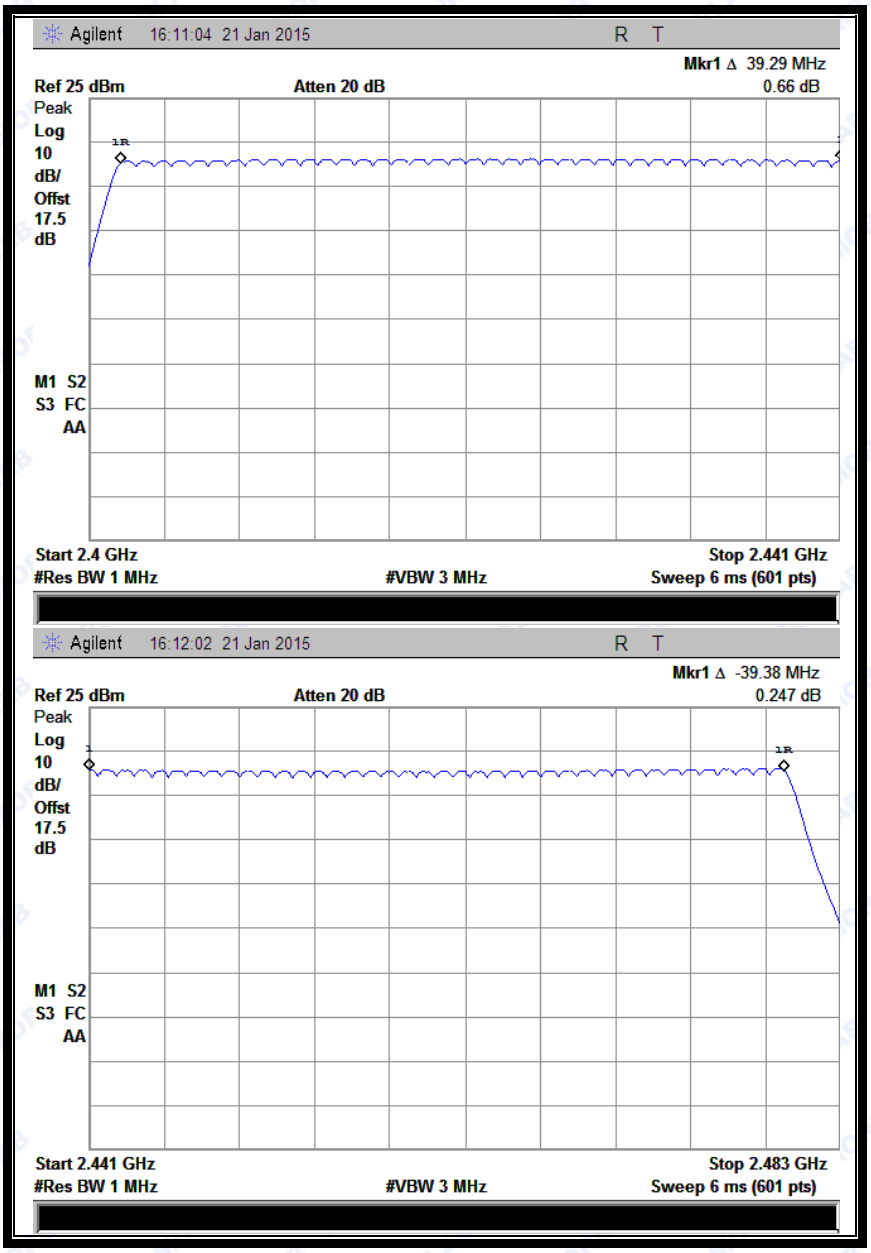
2.2.4. Test Result

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.

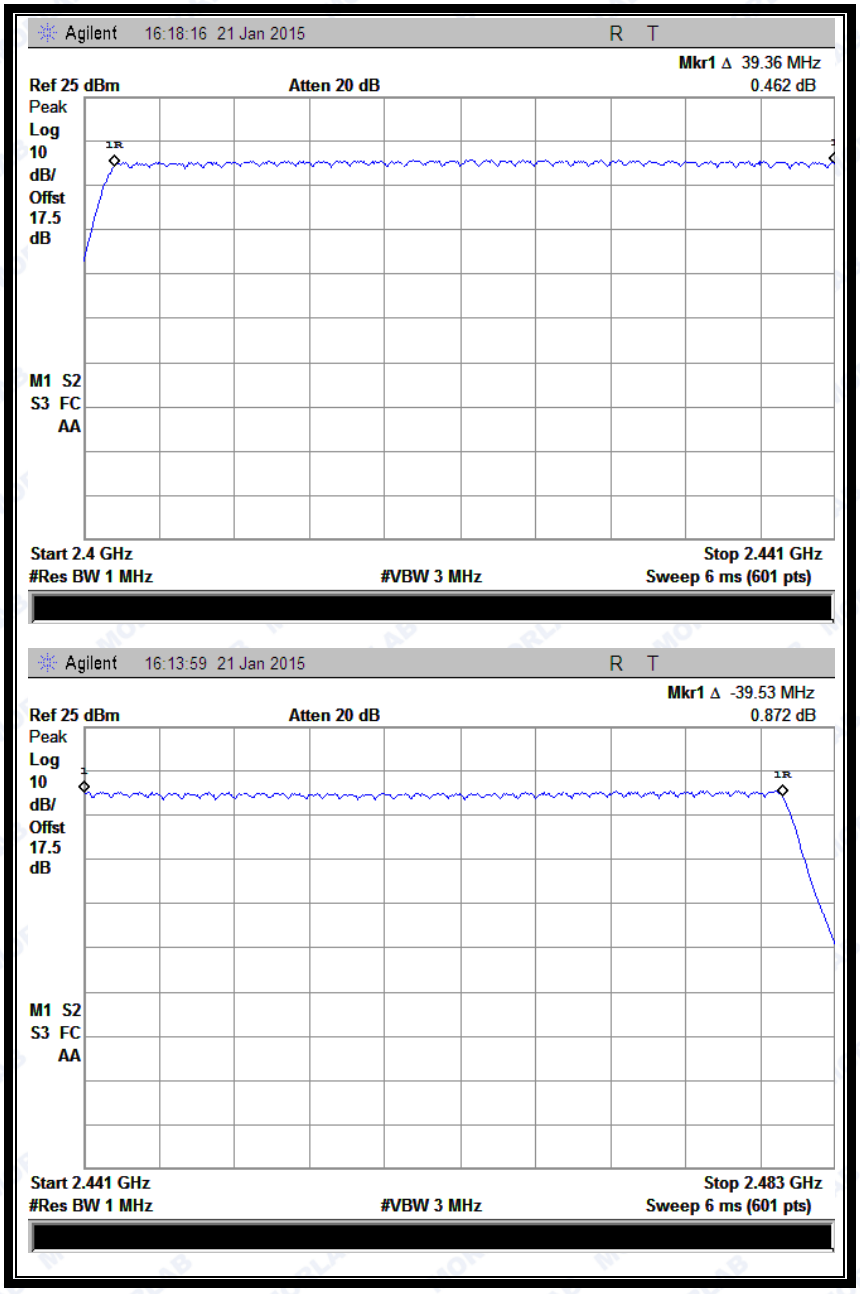
A. Test Verdict:

Test Mode	Frequency Block (MHz)	Measured Channel Numbers	Min. Limit	Refer to Plot	Verdict
GFSK	2400 - 2483.5	79	15	Plot A	PASS
∏/4-DQPSK	2400 - 2483.5	79	15	Plot B	PASS
8-DPSK	2400 - 2483.5	79	15	Plot C	PASS

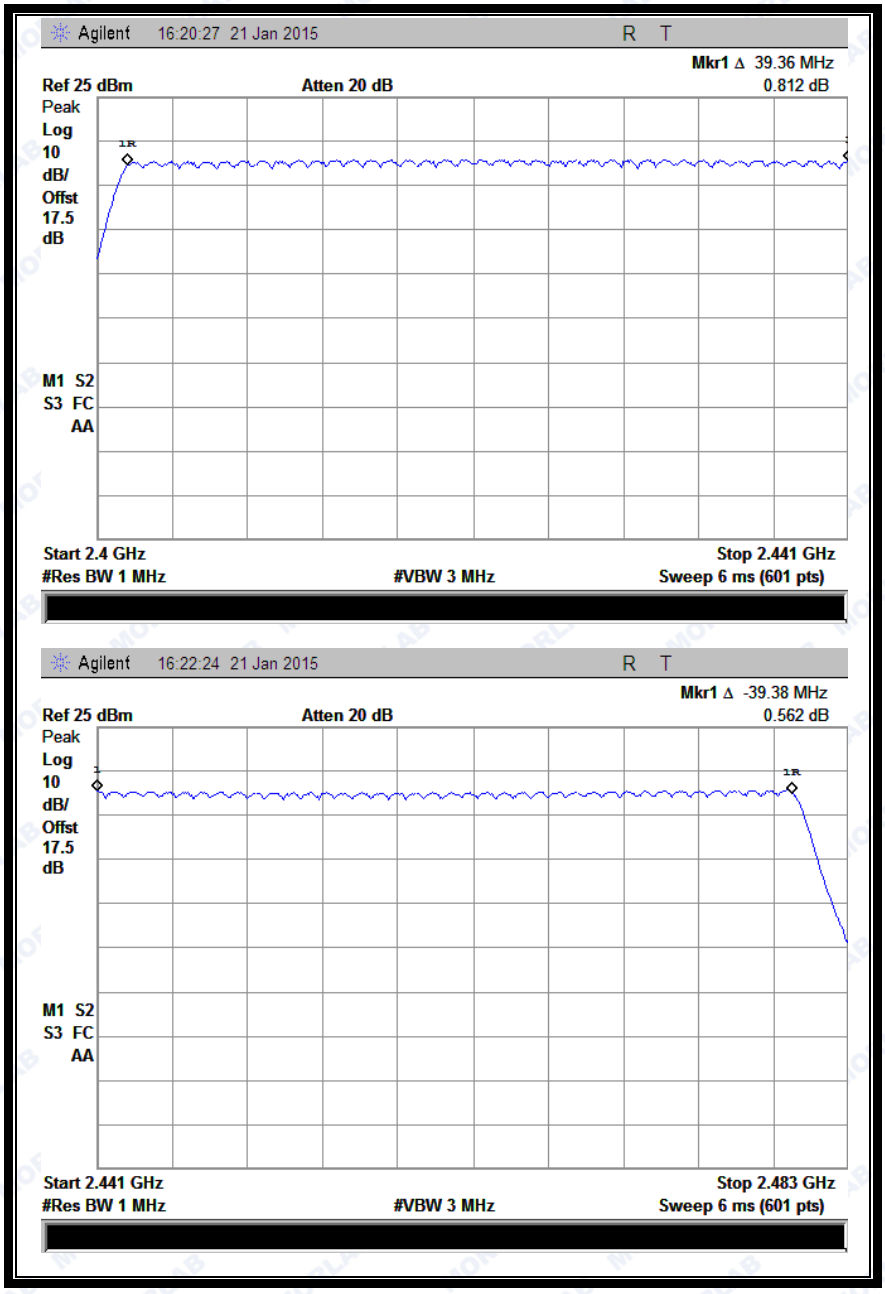
B. Test Plots:



(Plot A: GFSK)



(Plot B: ∏/4-DQPSK)


Agilent 16:20:27 21 Jan 2015
R T
Mkr1 Δ 39.36 MHz
0.812 dB
Ref 25 dBm
Atten 20 dB
Peak
Log
10
dB/
Offst
17.5
dB
M1 S2
S3 FC
AA
Start 2.4 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 2.441 GHz
Sweep 6 ms (601 pts)
Agilent 16:22:24 21 Jan 2015
R T
Mkr1 Δ -39.38 MHz
0.562 dB
Ref 25 dBm
Atten 20 dB
Peak
Log
10
dB/
Offst
17.5
dB
M1 S2
S3 FC
AA
Start 2.441 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 2.483 GHz
Sweep 6 ms (601 pts)

(Plot C: 8- DPSK)

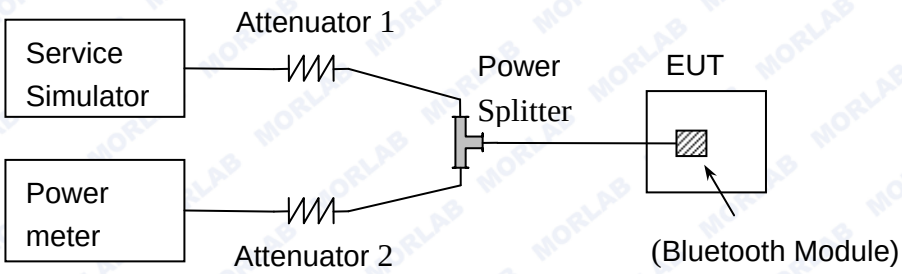
2.3. Peak Output Power

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 Bluetooth Module of the EUT is coupled to the Power meter 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:

Please reference ANNEX A(1.4).

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 verify the conducted RF output peak power of the Module.The lowest, middle and highest channel were tested by Power meter.

2.3.3.1. GFSK Mode

A. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
0	2402	10.80	0.012023	20.97	0.125	PASS
39	2441	10.82	0.012078			PASS
78	2480	11.15	0.013030			PASS

2.3.3.2. ∏/4-DQPSK Mode

A. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
0	2402	10.43	0.011041	20.97	0.125	PASS
39	2441	10.42	0.011015			PASS
78	2480	10.78	0.011967			PASS

2.3.3.3. 8-DPSK Mode

A. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
0	2402	10.43	0.011041	20.97	0.125	PASS
39	2441	10.43	0.011041			PASS
78	2480	10.73	0.011830			PASS

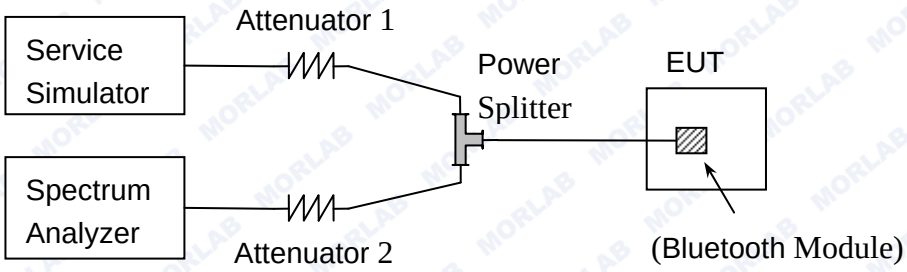
2.4. 20dB Bandwidth

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*log1% = 20dB) taking the total RF output power.

2.4.2. Test Description

A. Test Setup:



The Bluetooth Module of the EUT 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:

Please reference ANNEX A(1.4).

2.4.3. Test Procedure

Use the following spectrum analyzer settings:
Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
RBW ≥ 1% of the 20 dB bandwidth

VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold

2.4.4. Test Result

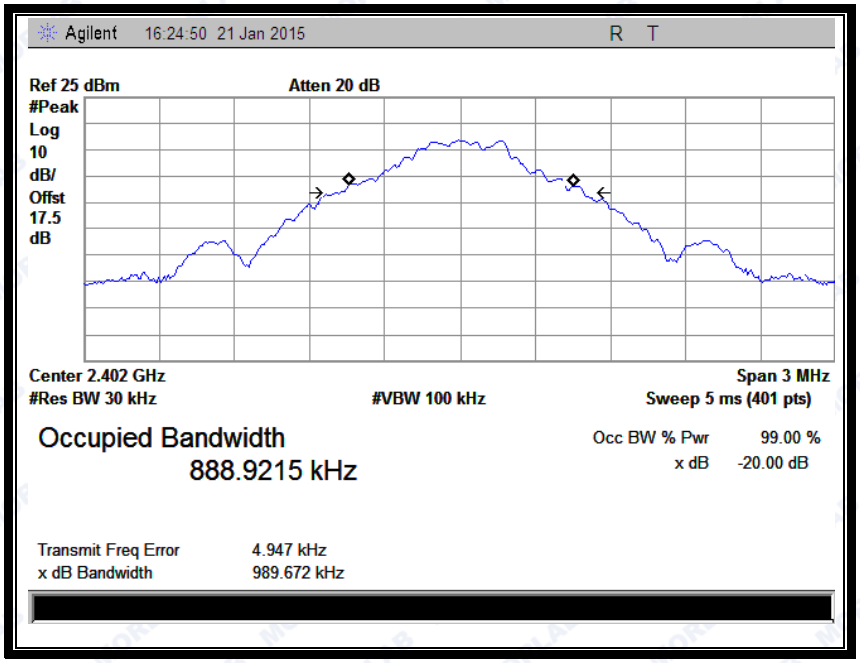
The Bluetooth Module operates at hopping-off test mode. The lowest, middle and highest channels are selected to perform testing to record the 20dB bandwidth of the Module.

2.4.4.1. GFSK Mode

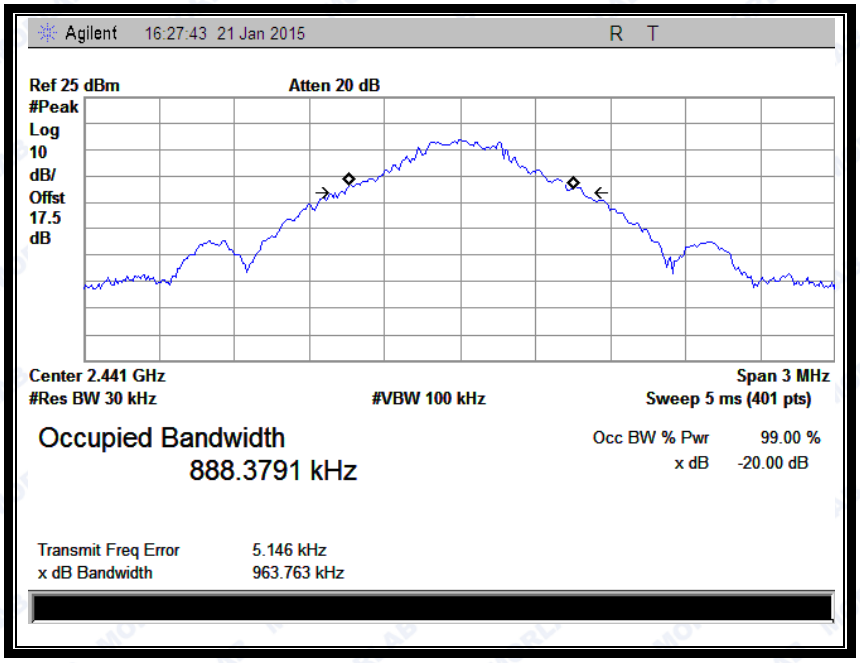
A. Test Verdict:

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Refer to Plot
0	2402	0.990	Plot A
39	2441	0.964	Plot B
78	2480	0.954	Plot C

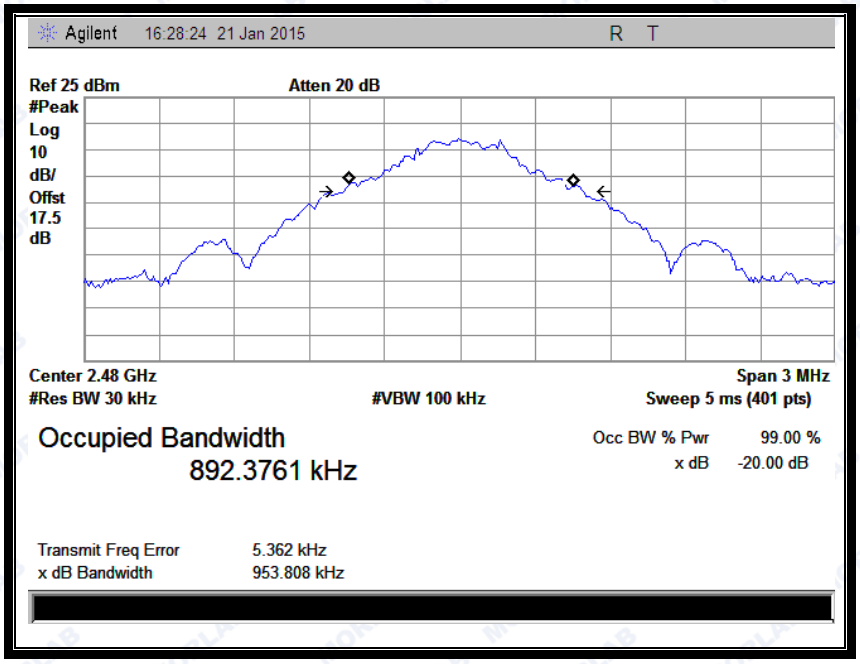
B. Test Plots:



(Plot A: Channel = 2402 @ GFSK)



(Plot B: Channel = 2441 @ GFSK)



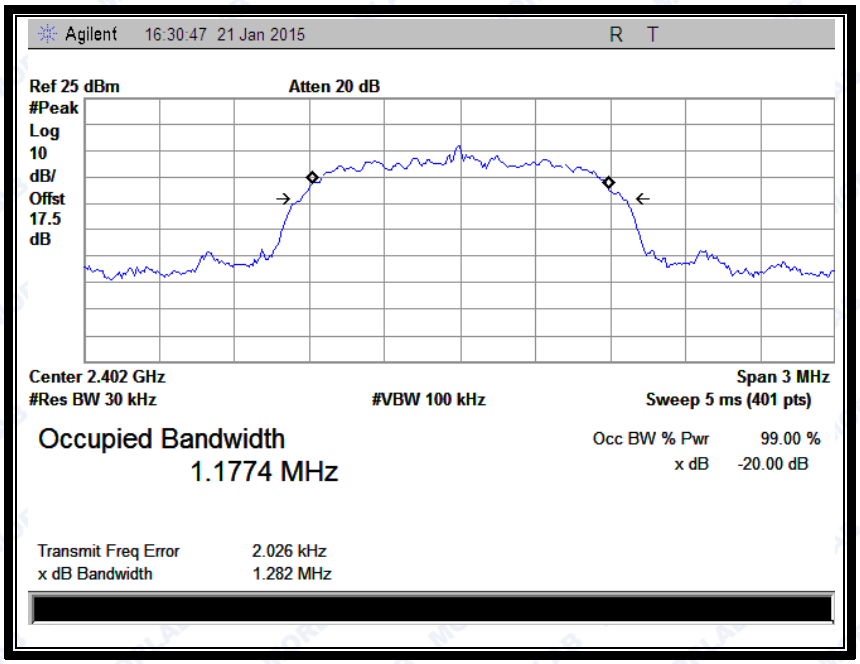
(Plot C: Channel = 2480 @ GFSK)

2.4.4.2. ∏/4-DQPSK Mode

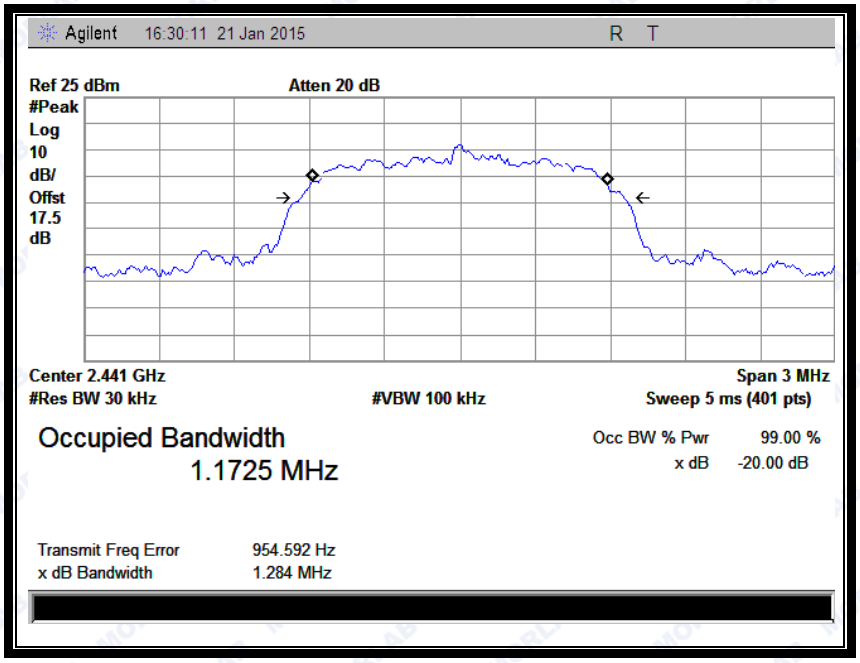
A. Test Verdict:

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Refer to Plot
0	2402	1.282	Plot D
39	2441	1.284	Plot E
78	2480	1.282	Plot F

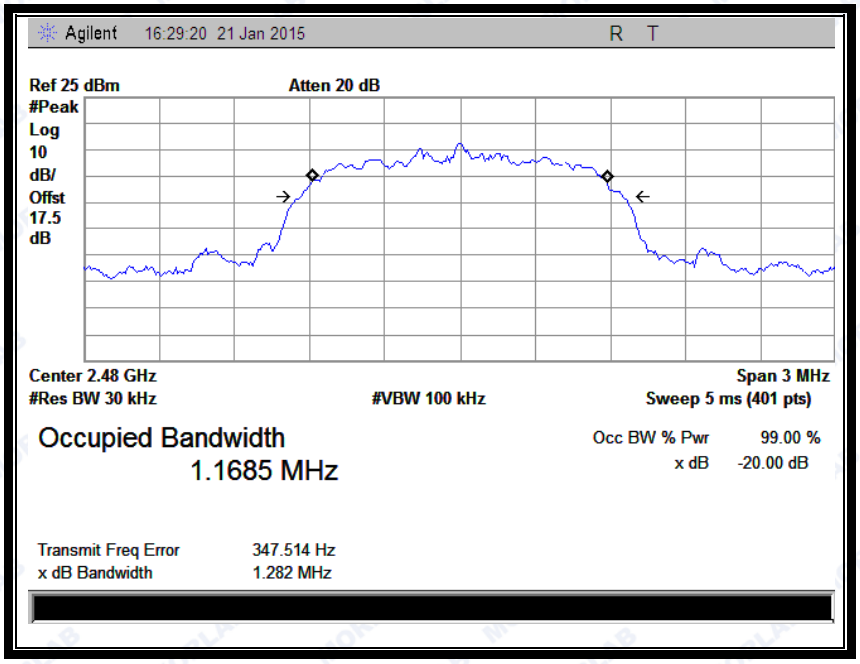
B. Test Plots:



(Plot D: Channel = 2402 @ ∏/4-DQPSK)



(Plot E: Channel = 2441 @ ∏/4-DQPSK)



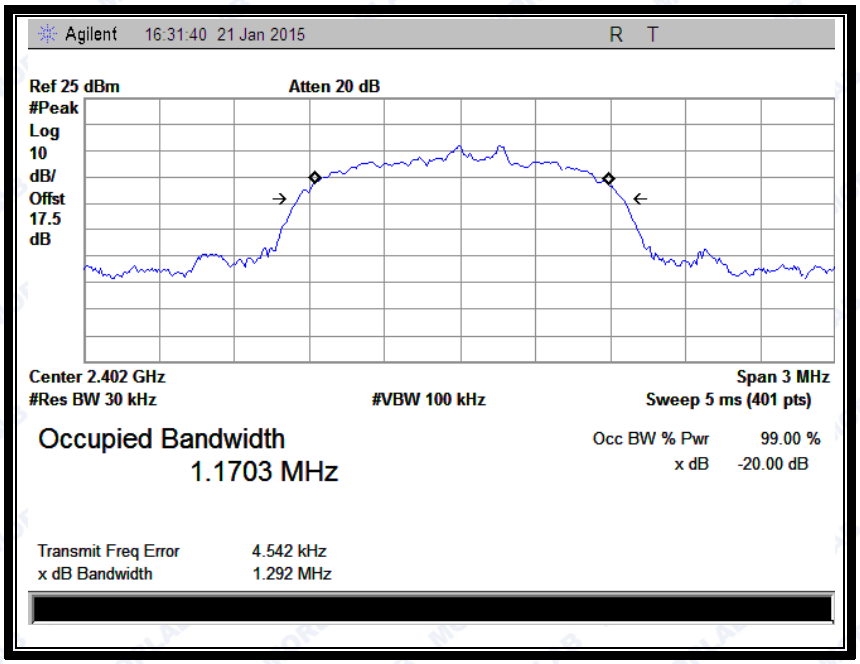
(Plot F: Channel = 2480 @ ∏/4-DQPSK)

2.4.4.3. 8-DPSK Mode

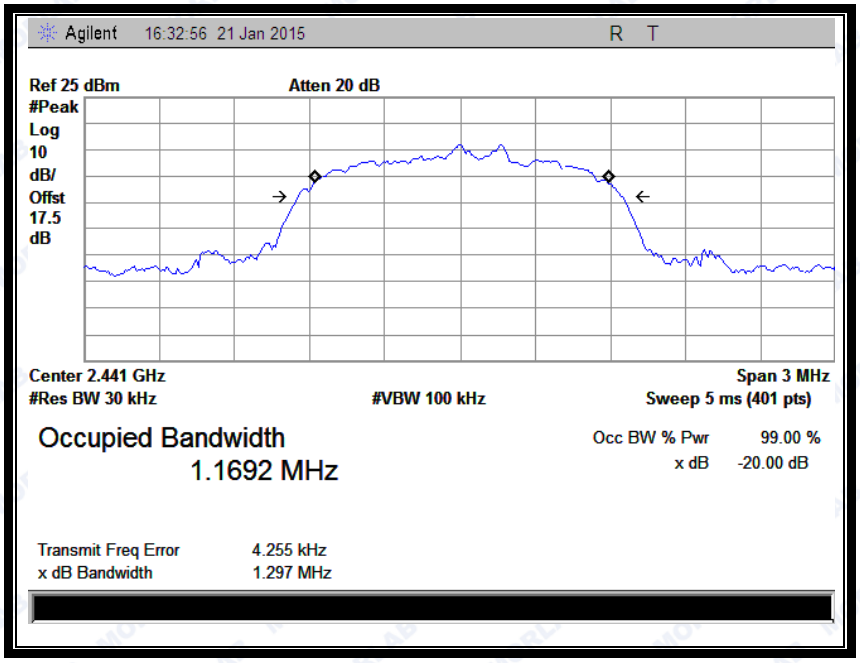
A. Test Verdict:

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Refer to Plot
0	2402	1.292	Plot G
39	2441	1.297	Plot H
78	2480	1.298	Plot I

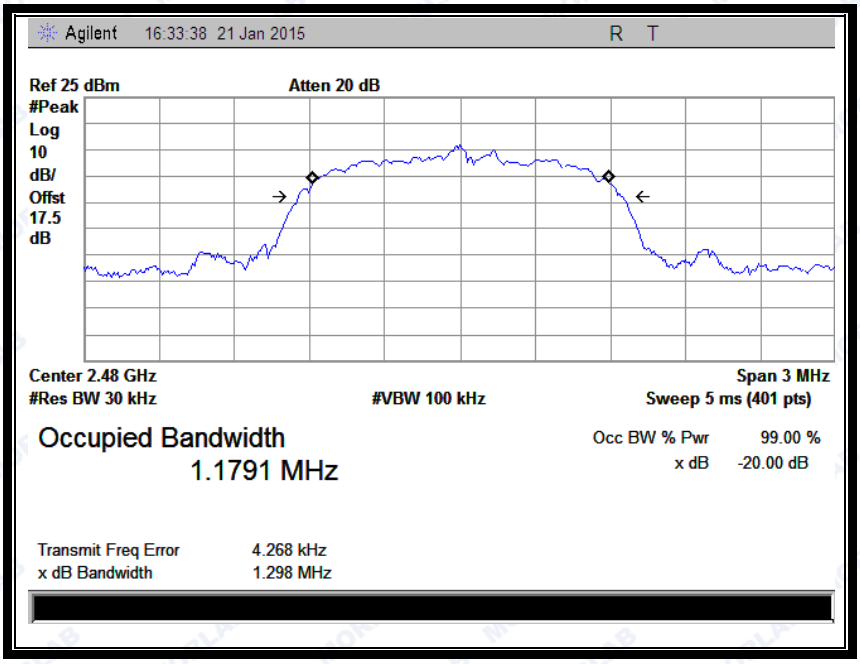
B. Test Plots:



(Plot G: Channel = 2402 @ 8-DPSK)



(Plot H: Channel = 2441 @ 8-DPSK)



(Plot I: Channel = 2480 @ 8-DPSK)

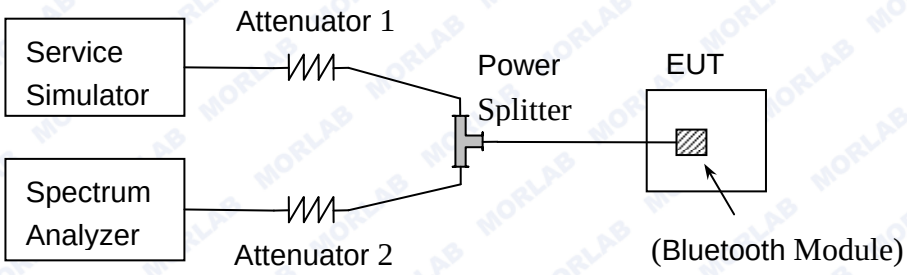
2.5. Carried Frequency Separation

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 Bluetooth Module of the EUT 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:

Please reference ANNEX A(1.4).

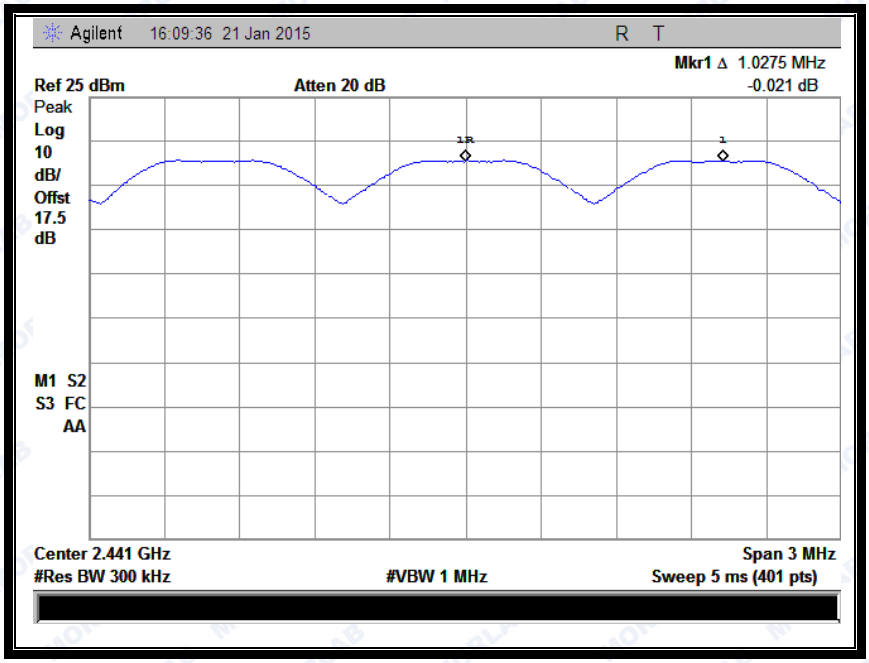
2.5.3. Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Span = wide enough to capture the peaks of two adjacent channels
Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span
Video (or Average) Bandwidth (VBW) ≥ RBW

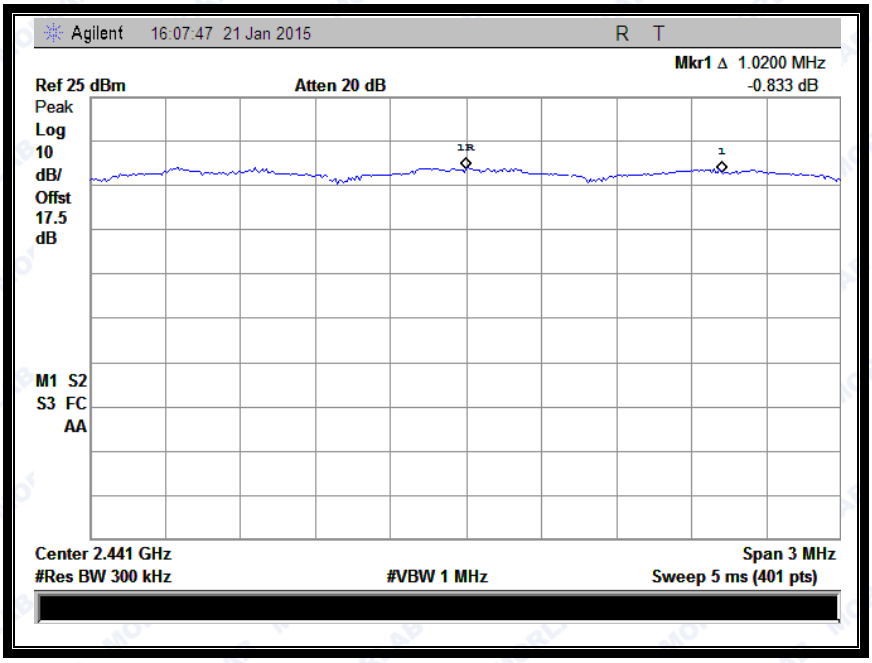
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

2.5.4. Test Result

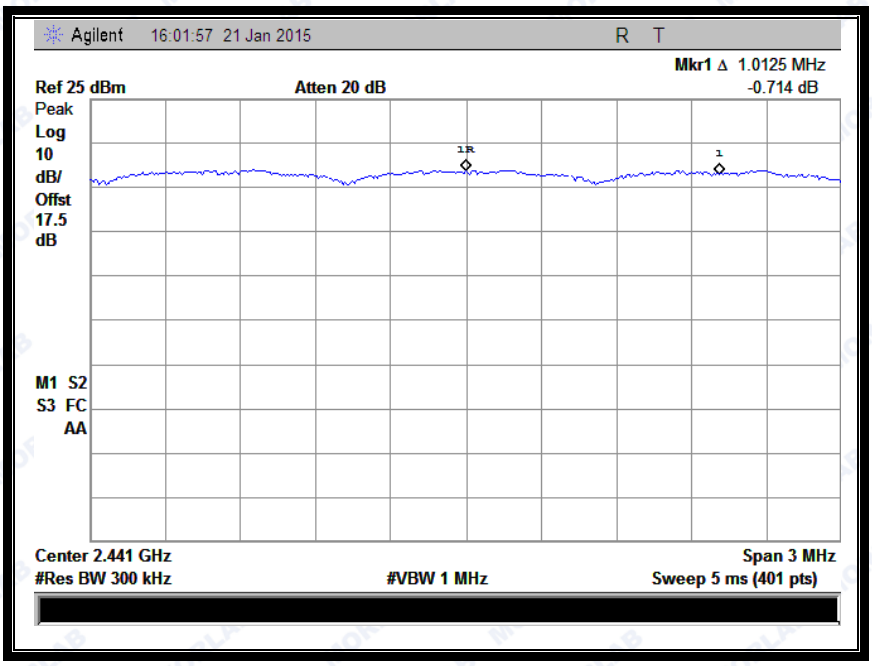
The Bluetooth Module operates at hopping-on test mode.
For any adjacent channels (e.g. the channel 39 and 40 as showed in the Plot A), the Module does have hopping channel carrier frequencies separated by a minimum of 25kHz or two-thirds of the 20dB bandwidth of the hopping channel (refer to section 0), whichever is greater. So, the verdict is PASSING



(Plot A: GFSK)



(Plot B: ∏/4-DQPSK)



(Plot C: 8-DPSK)

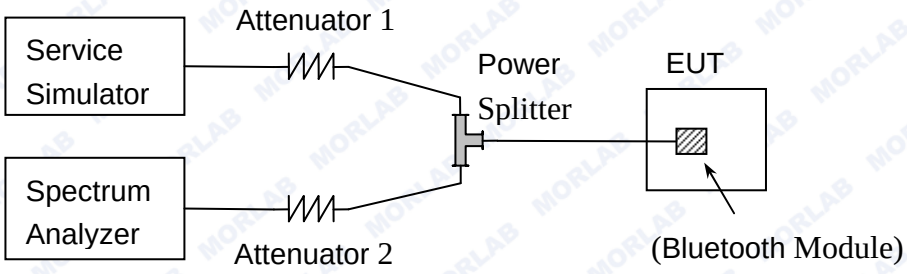
2.6. Time of Occupancy (Dwell time)

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:



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B. Equipments List:

Please reference ANNEX A(1.4).

2.6.3. Test Procedure

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The

number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 31.6 second period (79 channel * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

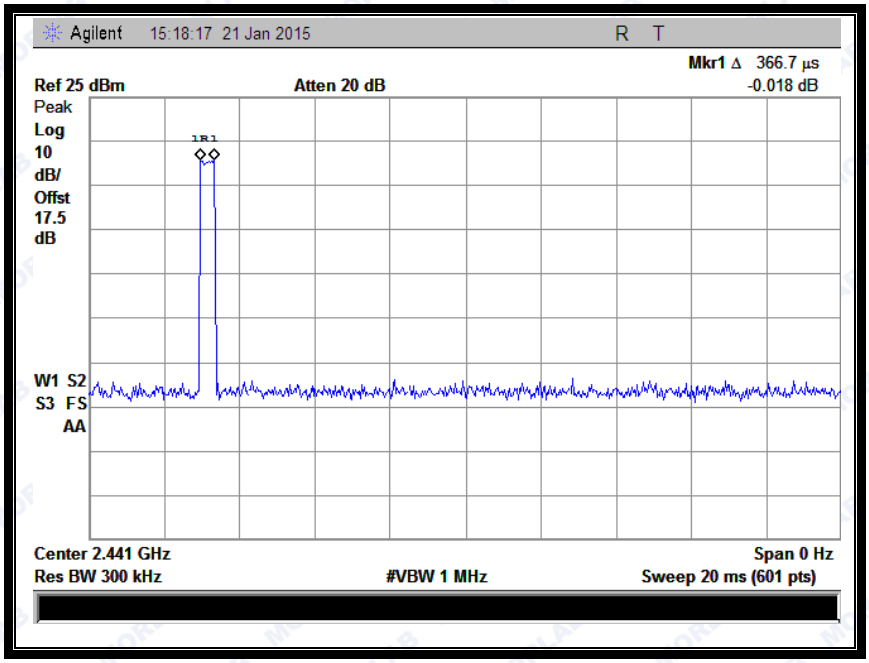
2.6.4. Test Result

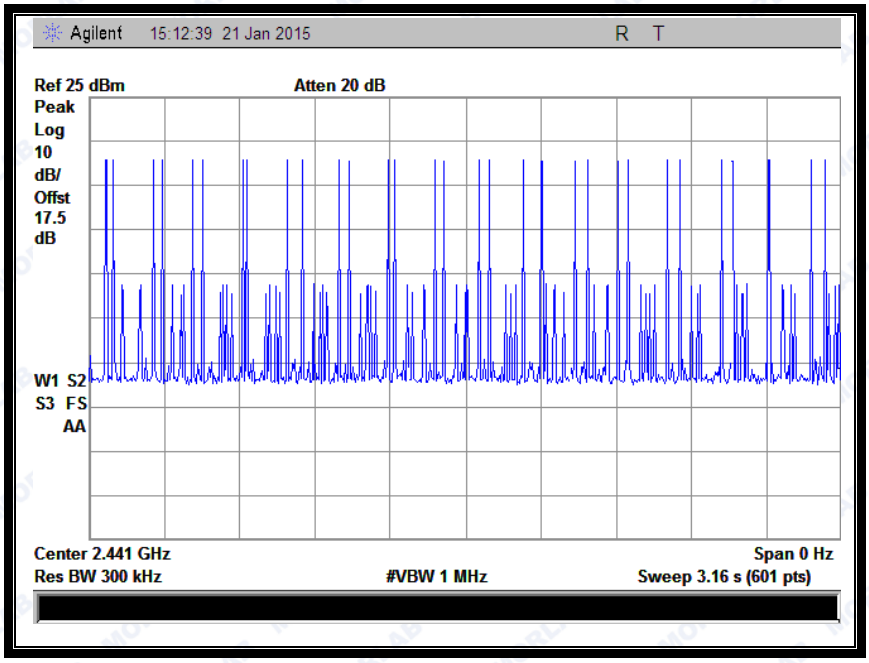
2.6.4.1. GFSK Mode

A. Test Verdict:

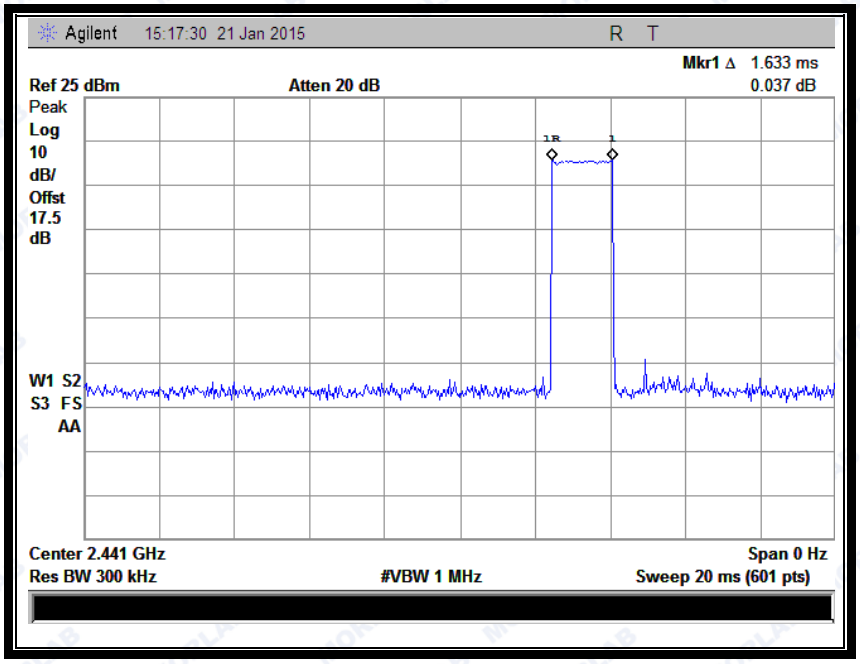
DH Packet	Pulse Width (msec)	Number of pulse in 3.16 seconds	Refer to Plot	Average Time of Occupancy (sec)	Limit (sec)	Verdict
DH1	0.367	31	Plot A	0.114	0.4	PASS
DH3	1.633	16	Plot B	0.261		PASS
DH5	2.900	11	Plot C	0.319		PASS

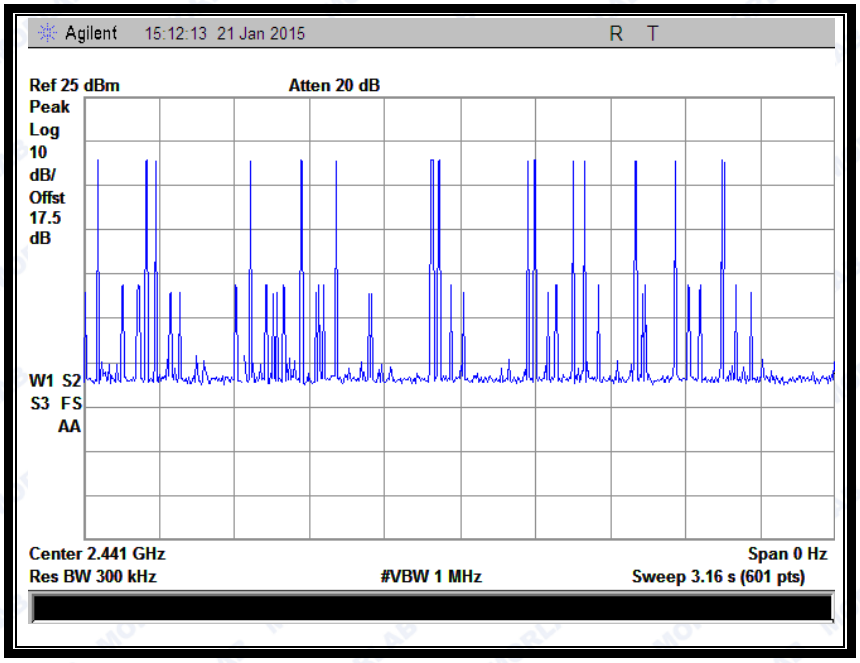
B. Test Plots:



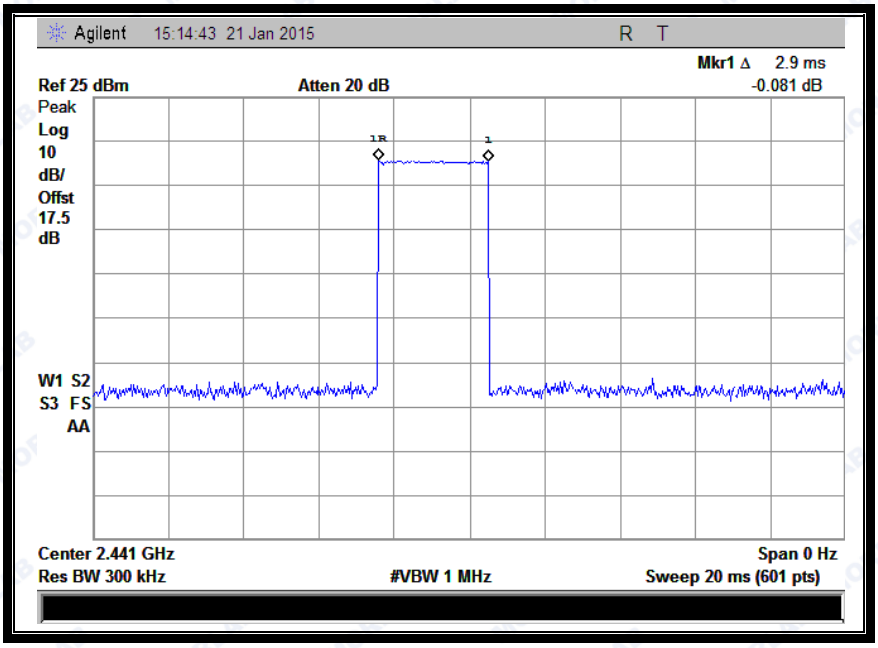


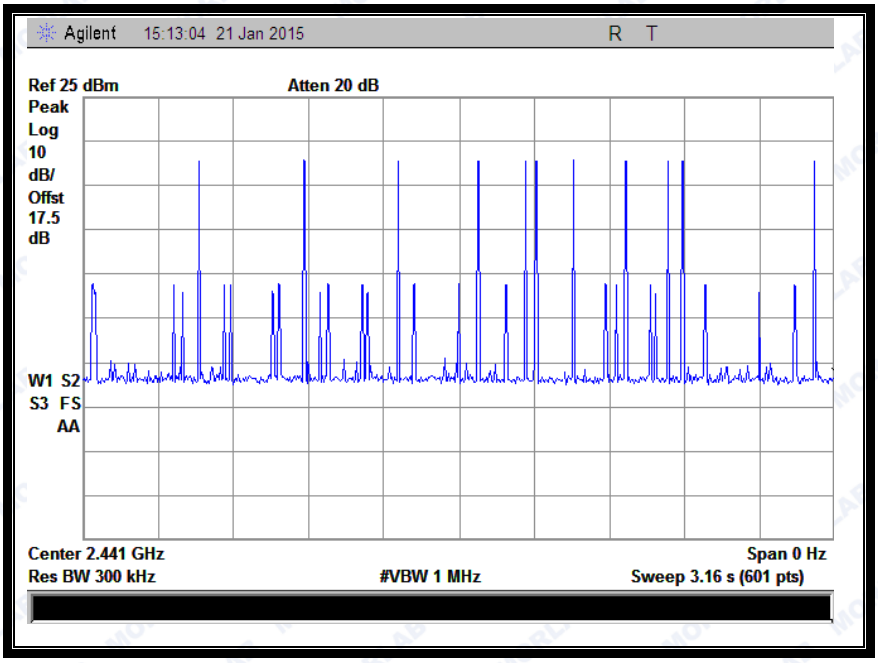
(Plot A: DH1 @ GFSK)





(Plot B: DH3 @ GFSK)





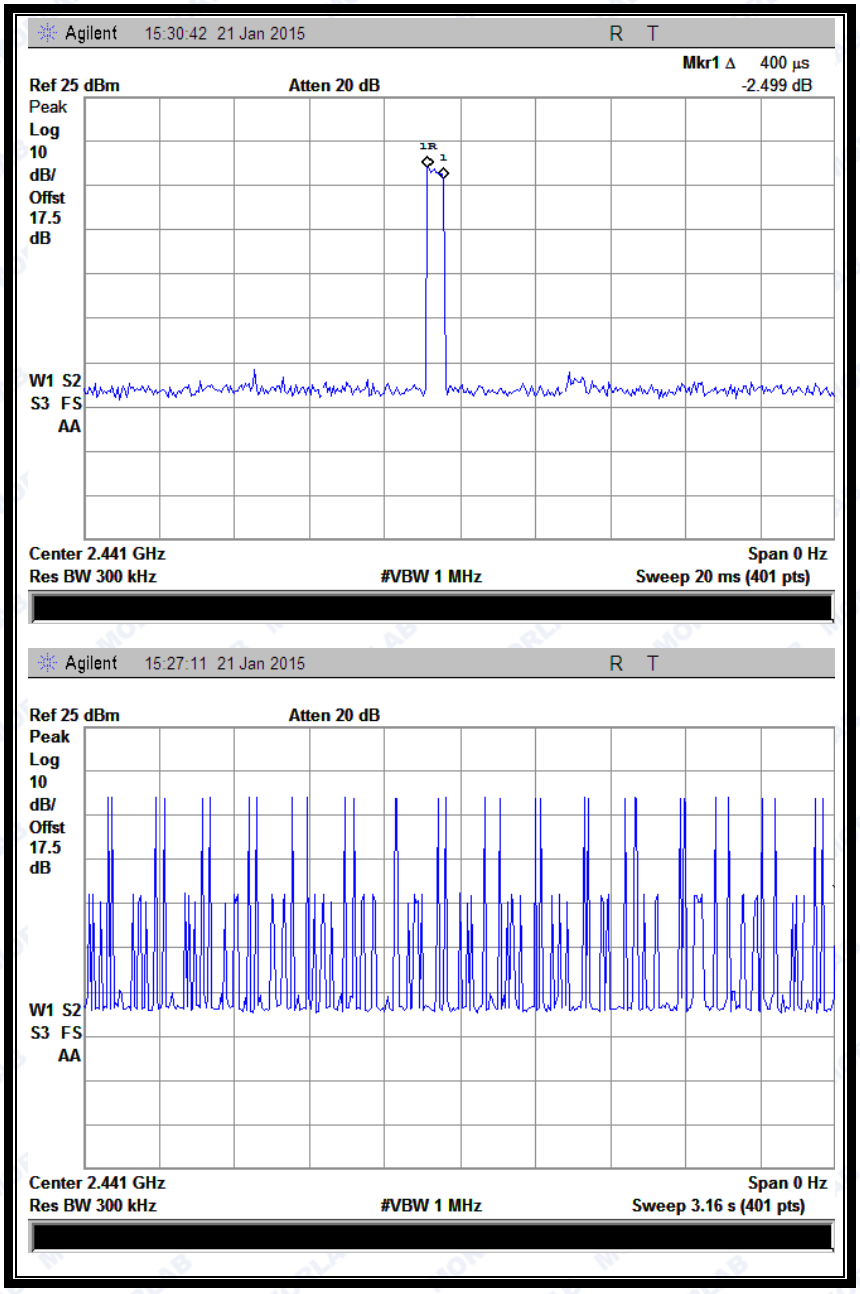
(Plot C: DH5 @ GFSK)

2.6.4.2. ∏/4-DQPSK Mode

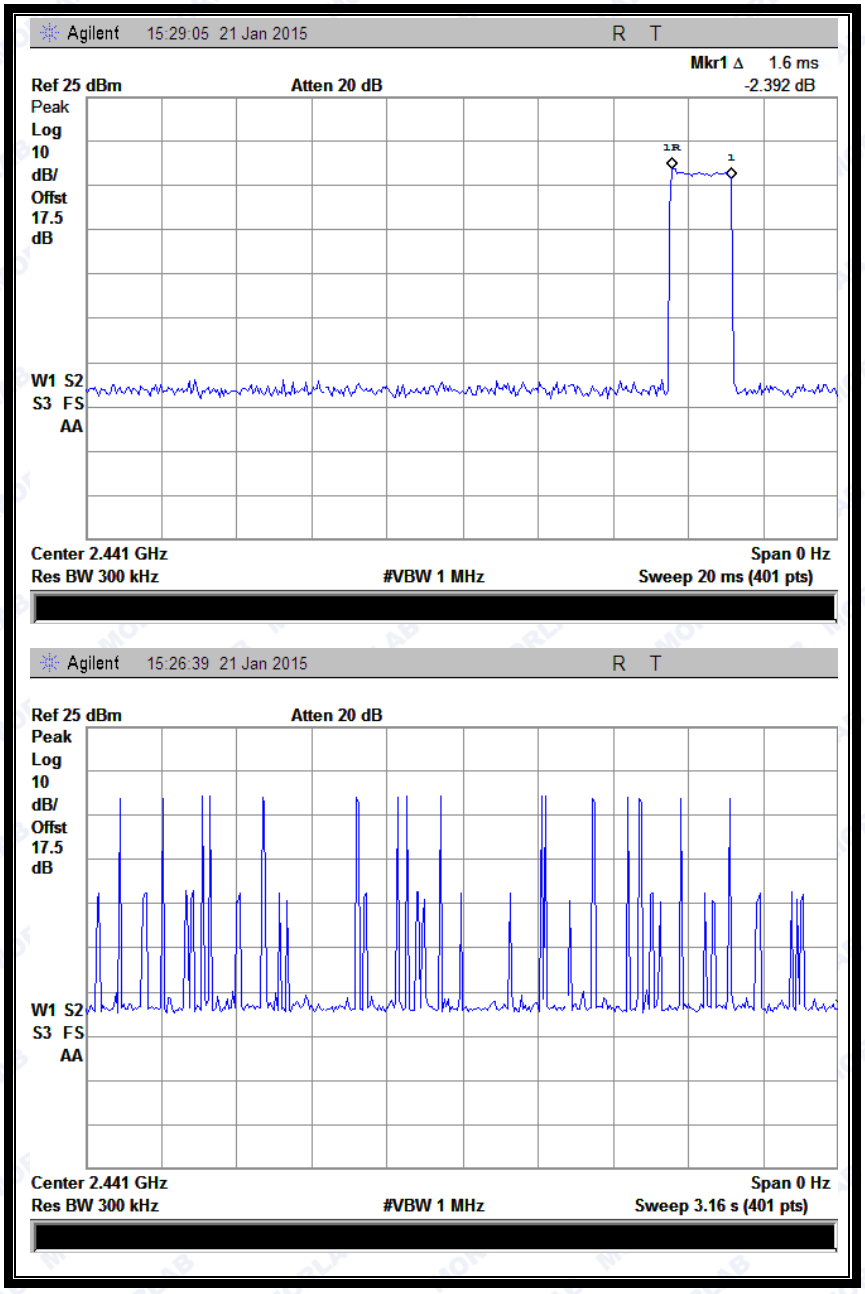
A. Test Verdict:

DH Packet	Pulse Width (msec)	Number of pulse in 3.16 seconds	Refer to Plot	Average Time of Occupancy (sec)	Limit (sec)	Verdict
DH1	0.400	31	Plot A	0.124	0.4	PASS
DH3	1.600	16	Plot B	0.256		PASS
DH5	2.850	12	Plot C	0.342		PASS

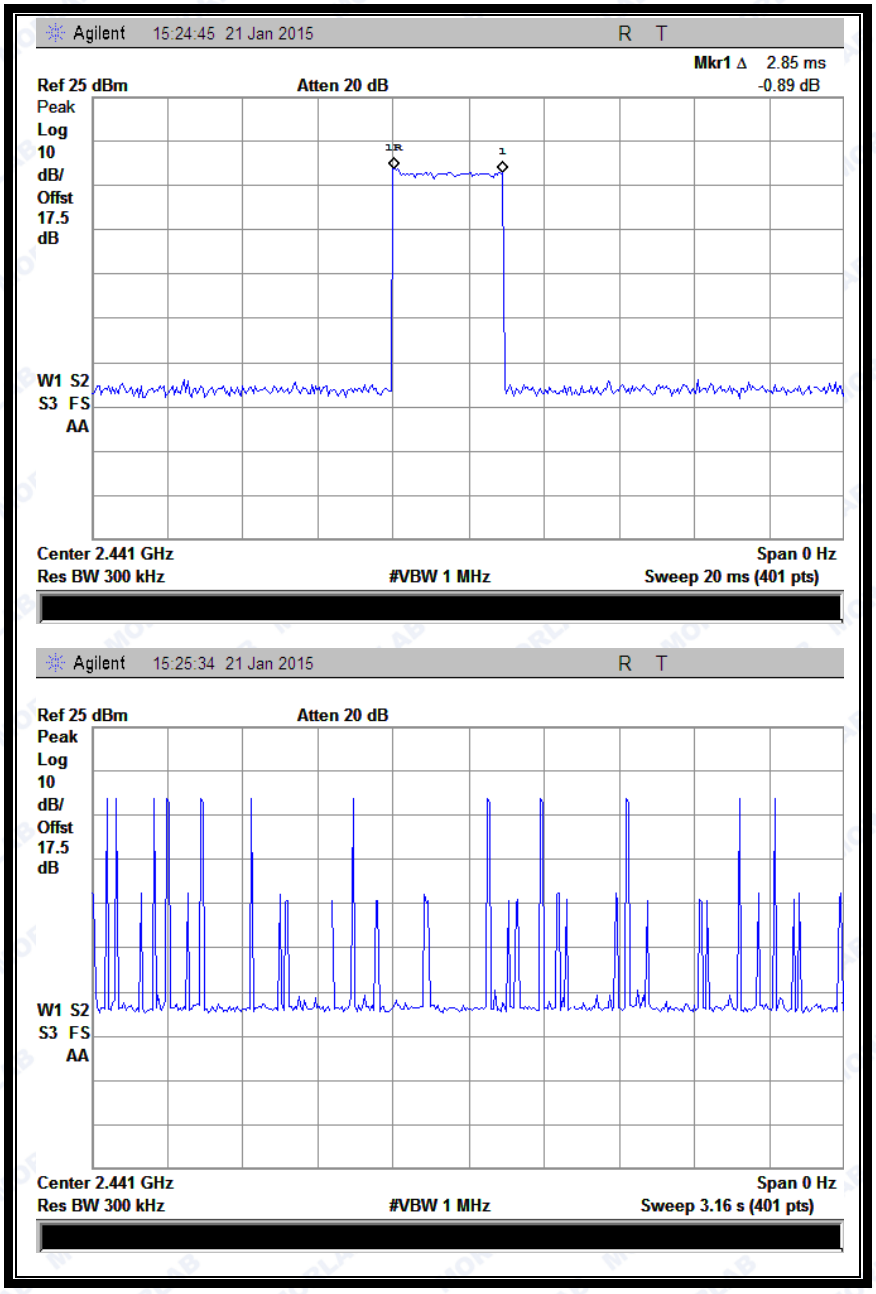
B. Test Plots:



(Plot D: DH1 @ ∏/4-DQPSK)



(Plot E: DH3 @ ∏/4-DQPSK)



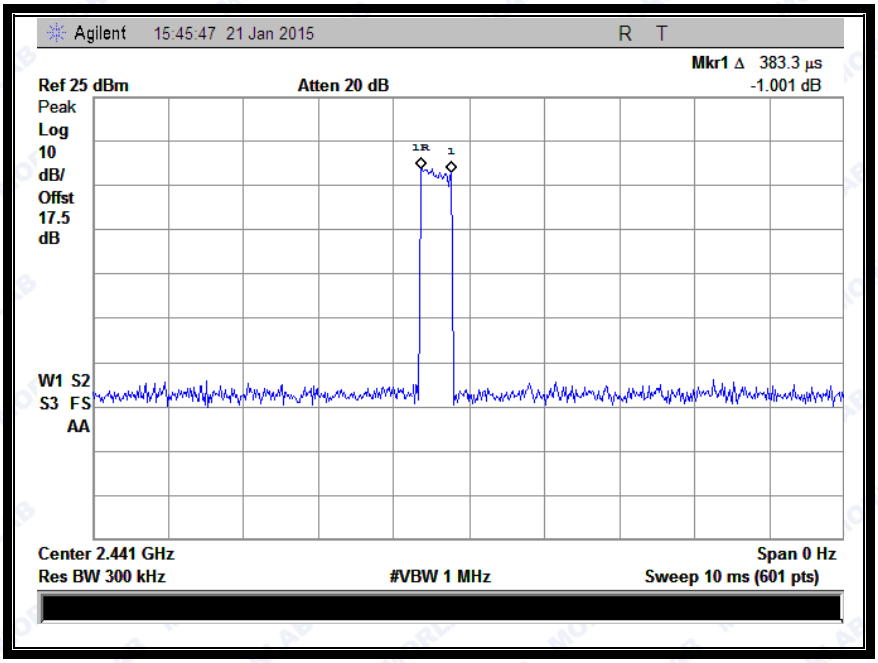
(Plot F: DH5 @ ∏/4-DQPSK)

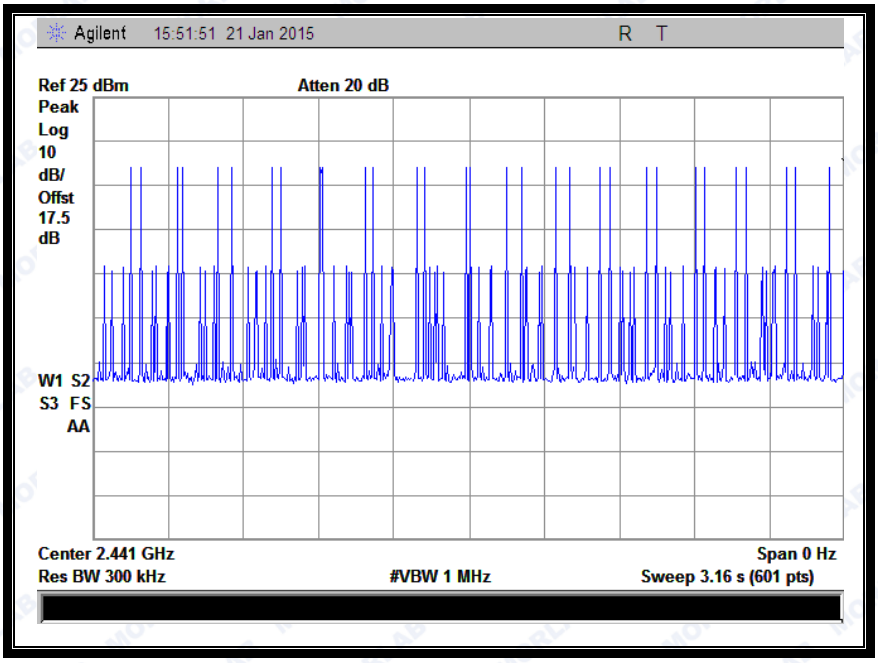
2.6.4.3. 8-DPSK mode

A. Test Verdict:

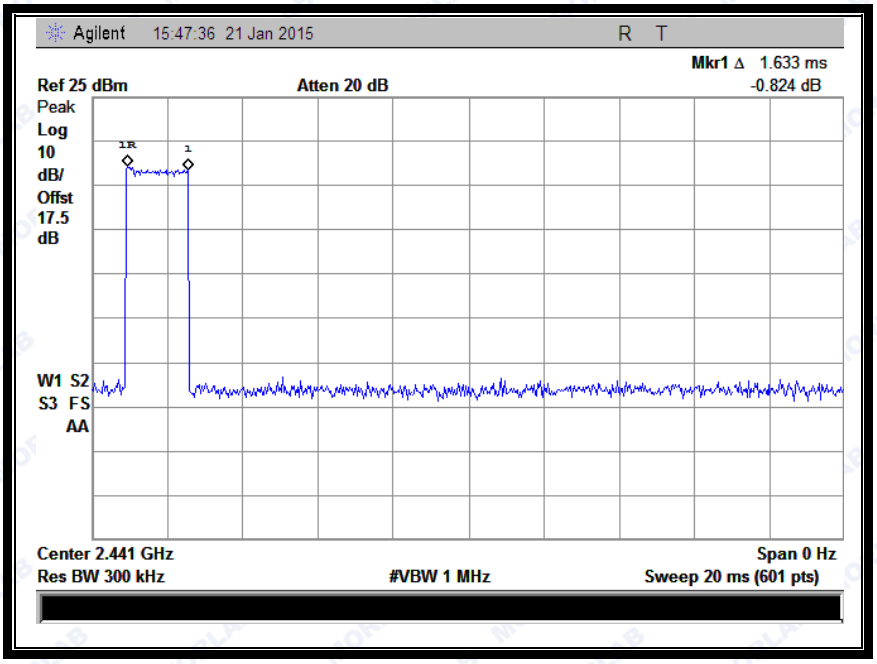
DH Packet	Pulse Width (msec)	Number of pulse in 3.16 seconds	Refer to Plot	Average Time of Occupancy (sec)	Limit (sec)	Verdict
DH1	0.383	31	Plot A	0.119	0.4	PASS
DH3	1.633	16	Plot B	0.261		PASS
DH5	2.900	12	Plot C	0.348		PASS

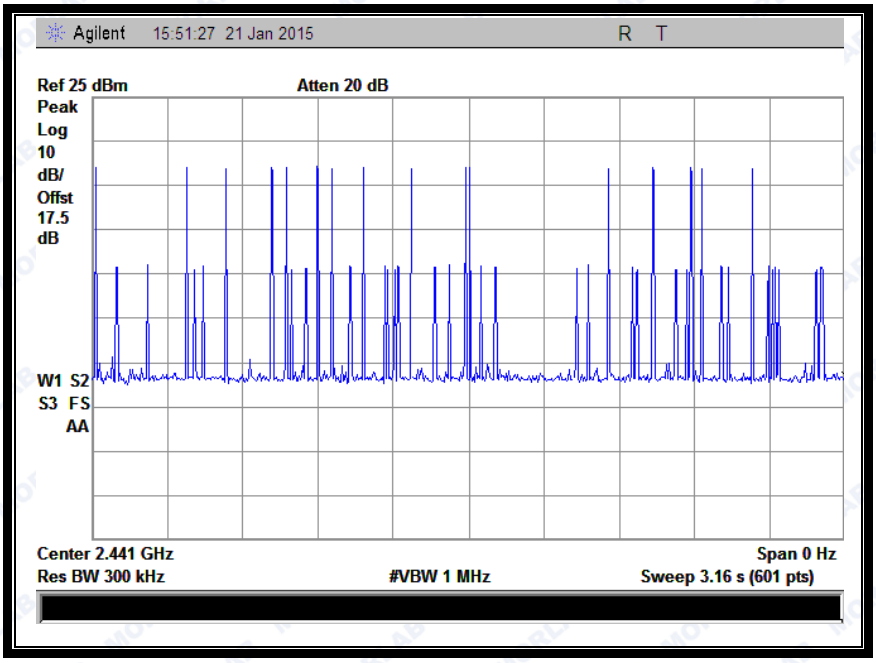
B. Test Plots:



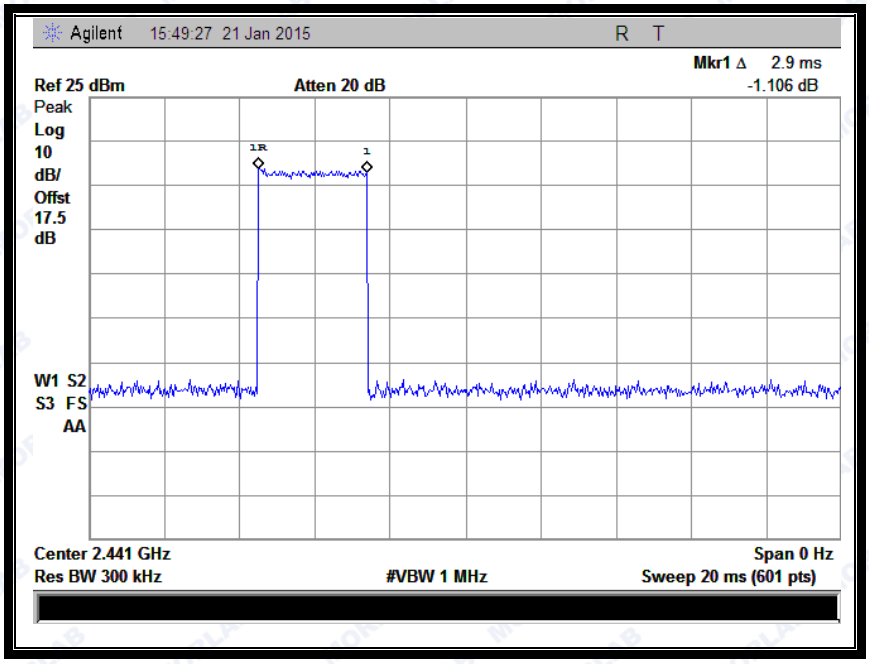


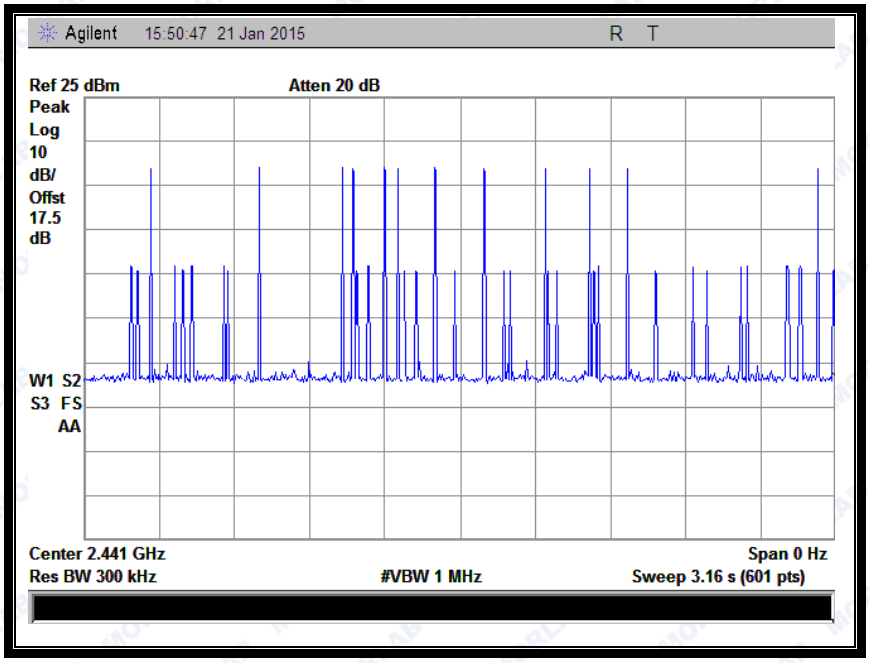
(Plot G: DH1 @ 8-DPSK)





(Plot H: DH3 @ 8-DPSK)





(Plot I: DH5 @ 8-DPSK)

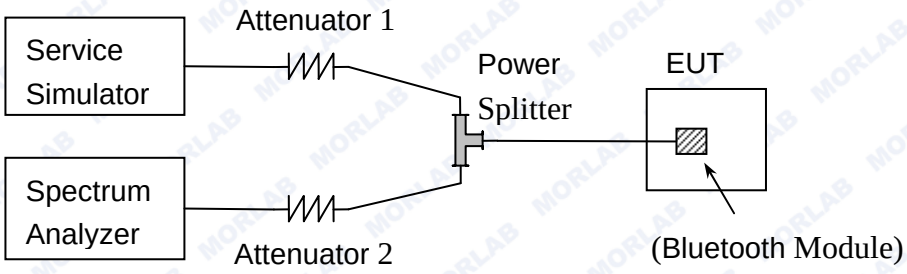
2.7. Conducted Spurious Emissions

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 Bluetooth Module of the EUT 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:

Please reference ANNEX A(1.4).

2.7.3. Test Procedure

Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious emissions

(e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
RBW = 100 kHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize.

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.

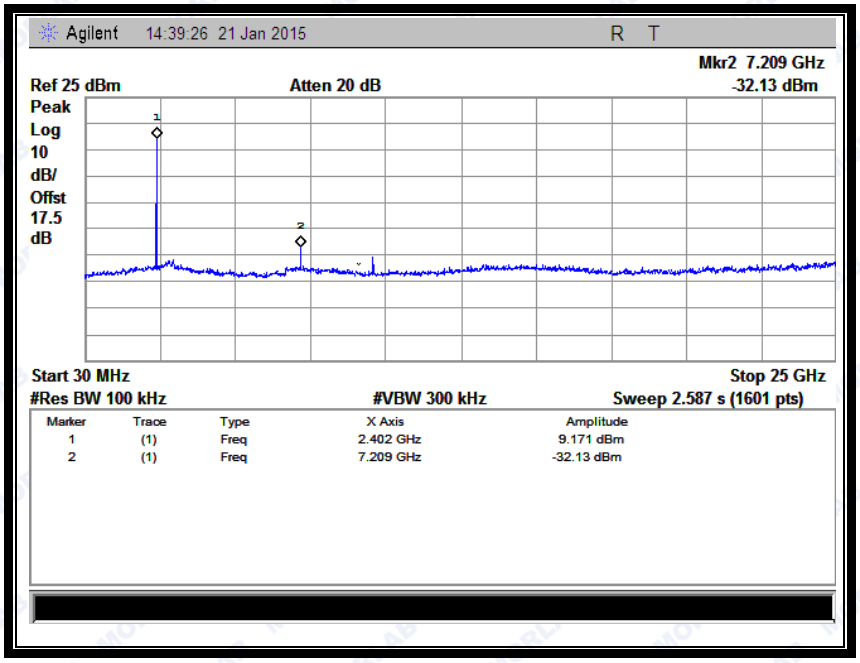
2.7.4.1. GFSK Mode

A. Test Verdict:

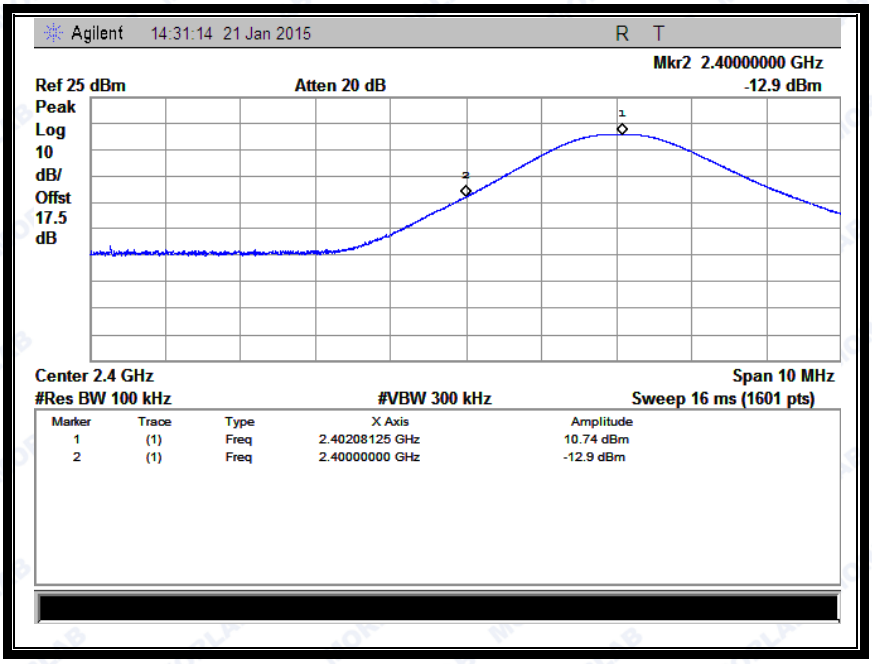
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Refer to Plot	Limit (dBm)		Verdict
				Carrier Level	Calculated -20dBc Limit	
0	2402	-32.13	Plot A.1	9.171	-10.829	PASS
39	2441	-31.73	Plot B.1	9.640	-10.360	PASS
78	2480	-31.40	Plot C.1	10.130	-9.870	PASS

B. Test Plots:

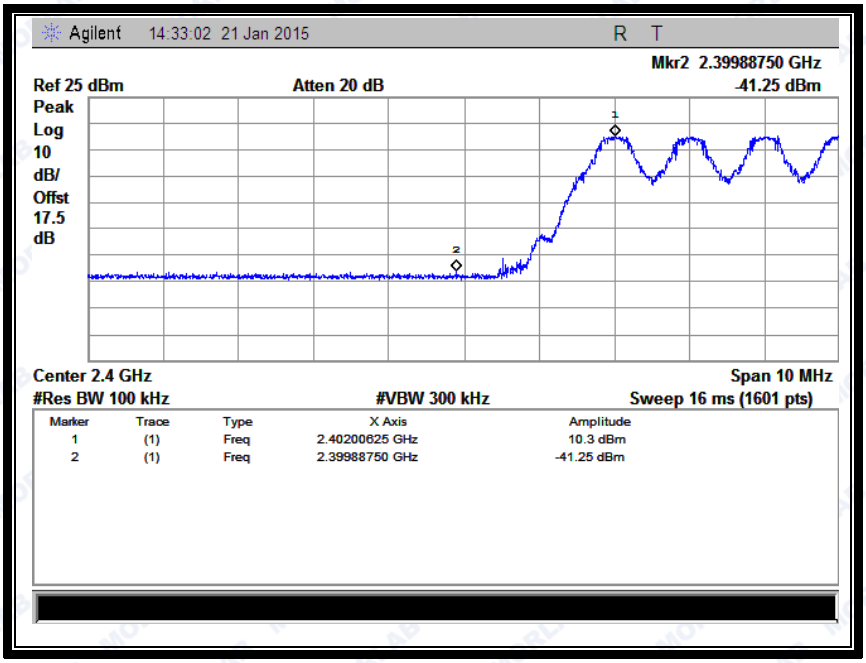
Note: the power of the Module transmitting frequency should be ignored.



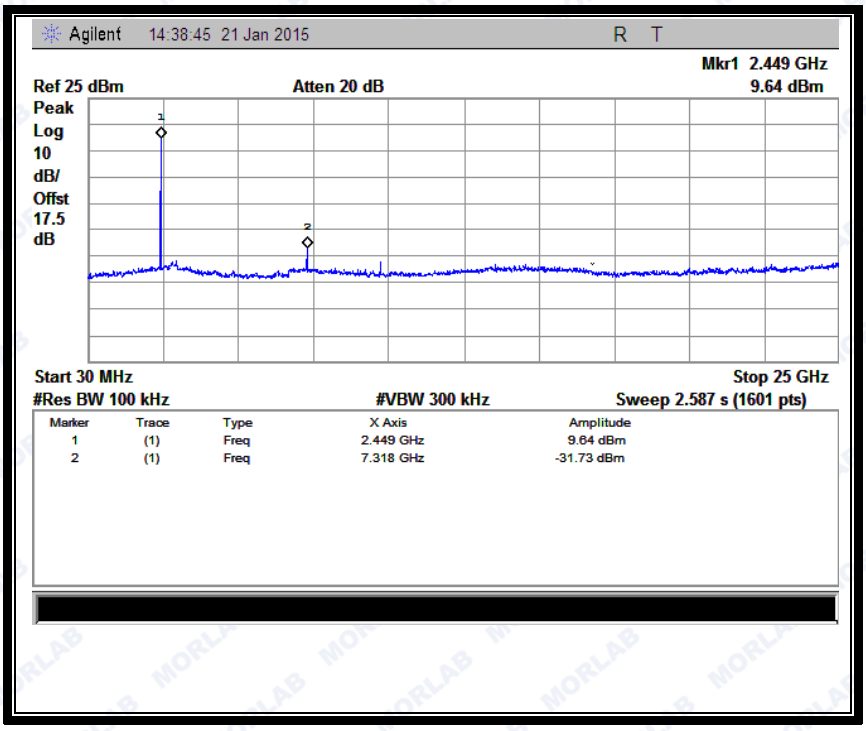
(Plot A.1: Channel = 0, 30MHz to 25GHz @ GFSK Mode)



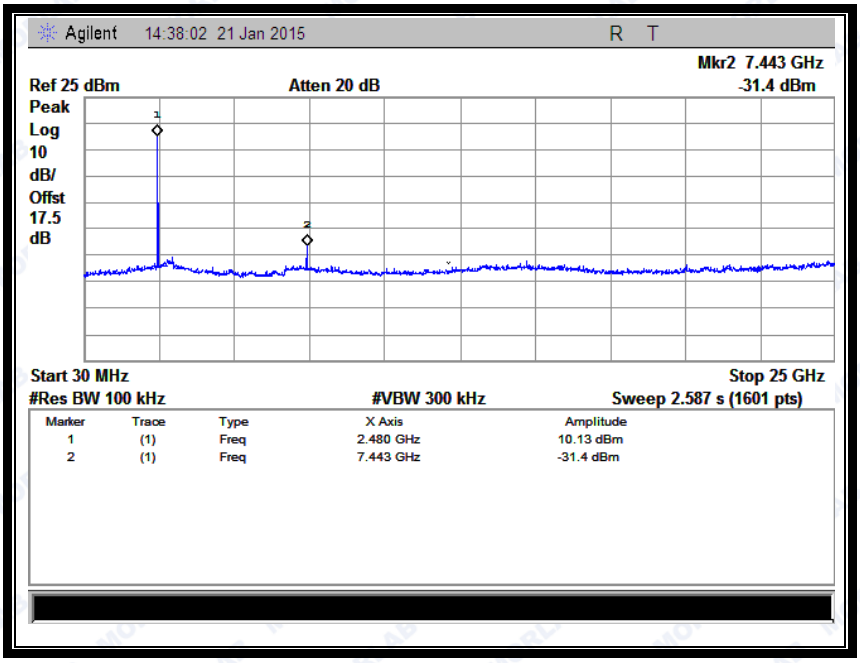
(Channel = 0, Band edge @ GFSK Mode)



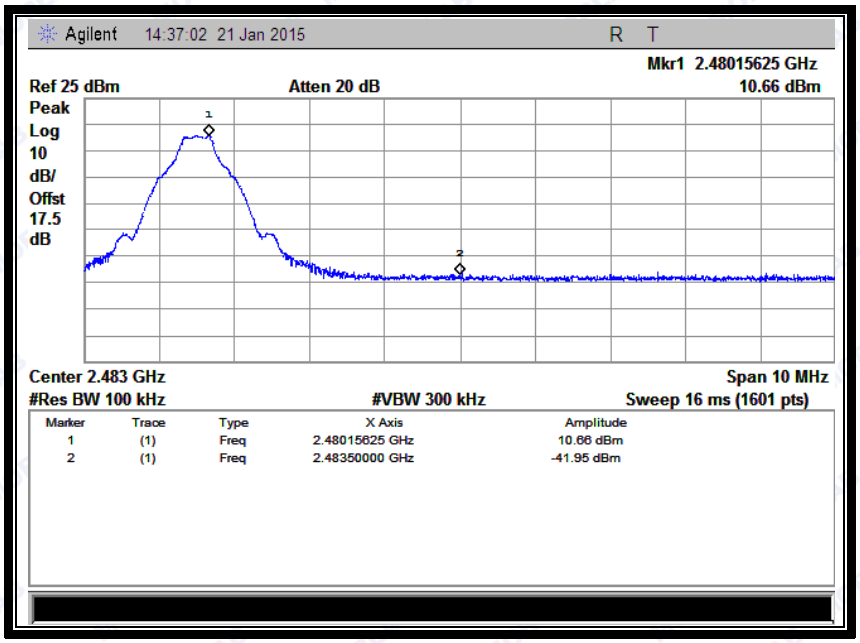
(Channel = 0, Band edge with hopping on @ GFSK Mode)



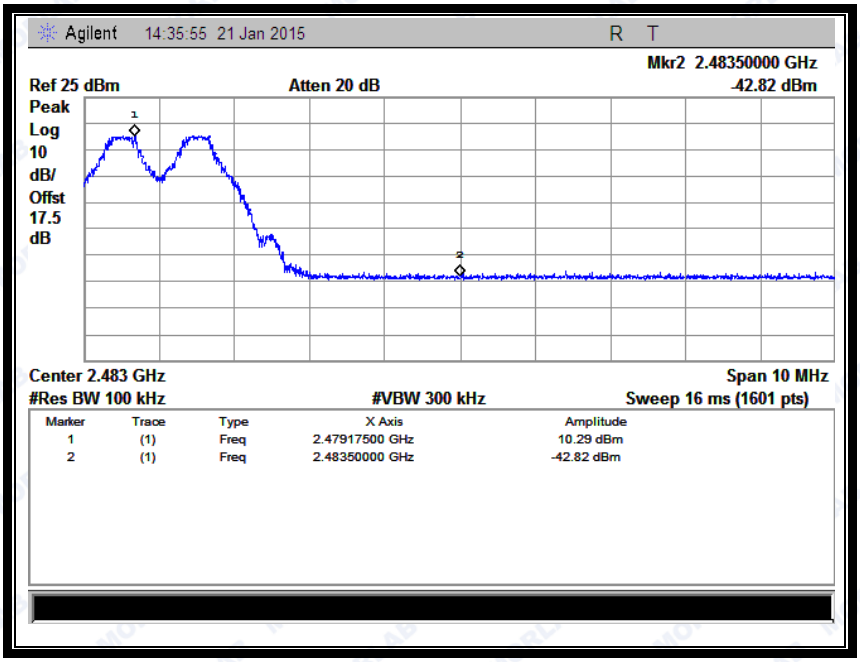
(Plot B.1: Channel = 39, 30MHz to 25GHz @ GFSK Mode)



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



(Channel = 78, Band edge @ GFSK Mode)



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

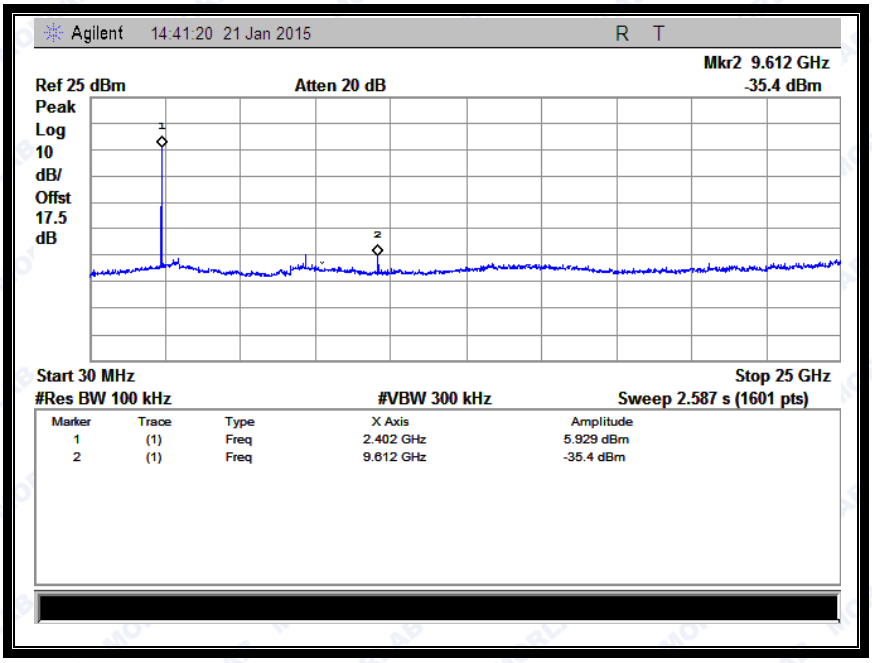
2.7.4.2. ∏/4-DQPSK Mode

A. Test Verdict:

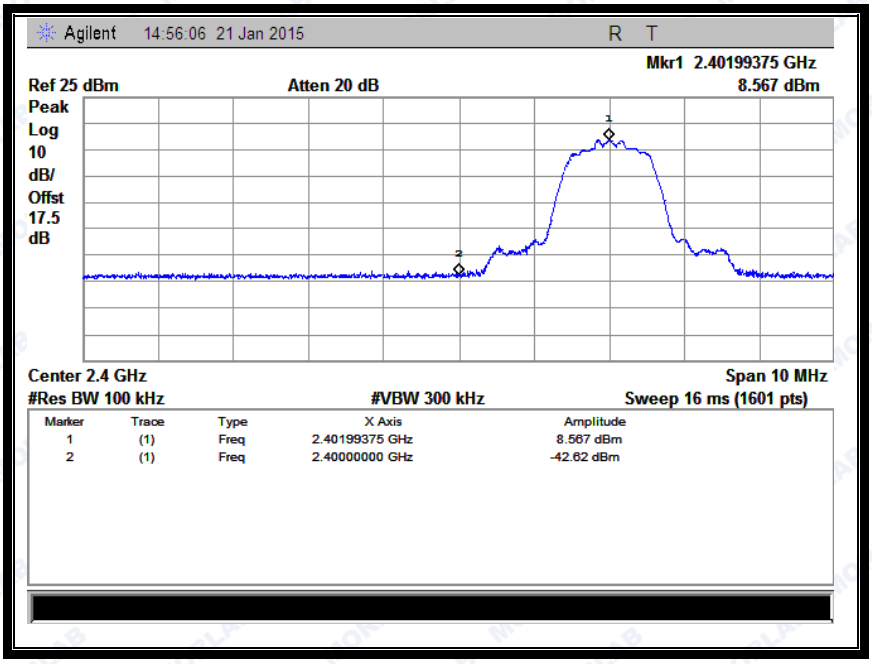
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Refer to Plot	Limit (dBm)		Verdict
				Carrier Level	Calculated -20dBc Limit	
0	2402	-35.40	Plot D.1	5.929	-14.071	PASS
39	2441	-35.75	Plot E.1	8.586	-11.414	PASS
78	2480	-35.41	Plot F.1	7.352	-12.648	PASS

B. Test Plots:

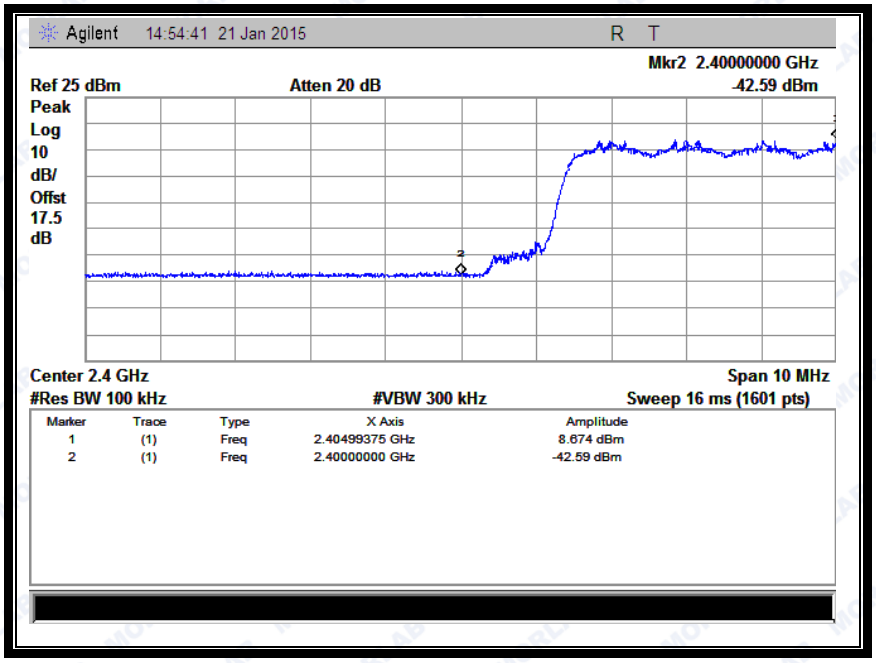
Note: the power of the Module transmitting frequency should be ignored.



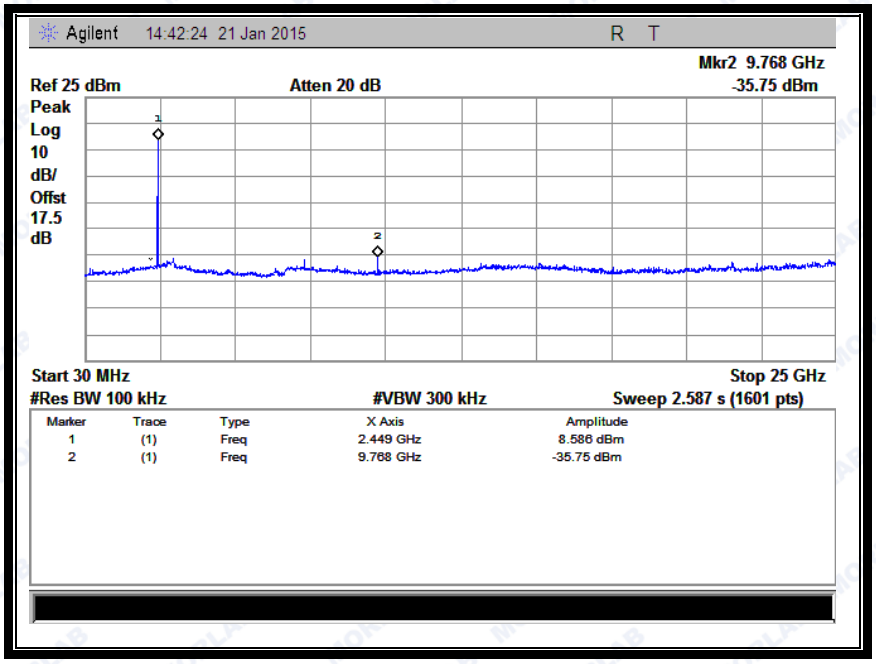
(Plot D.1: Channel = 0, 30MHz to 25GHz @ ∏/4-DQPSK)



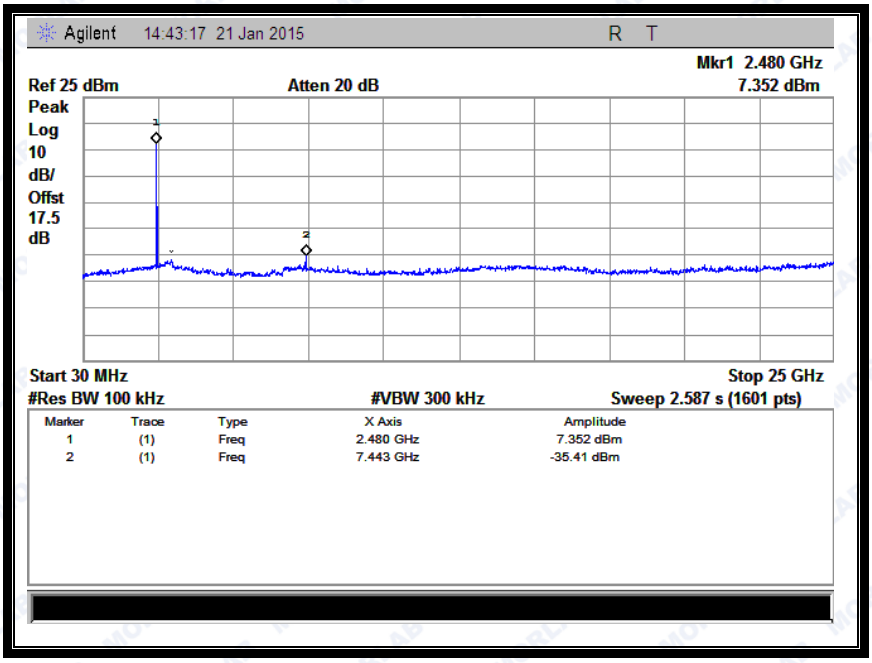
(Channel = 0, Band edge @ ∏/4-DQPSK)



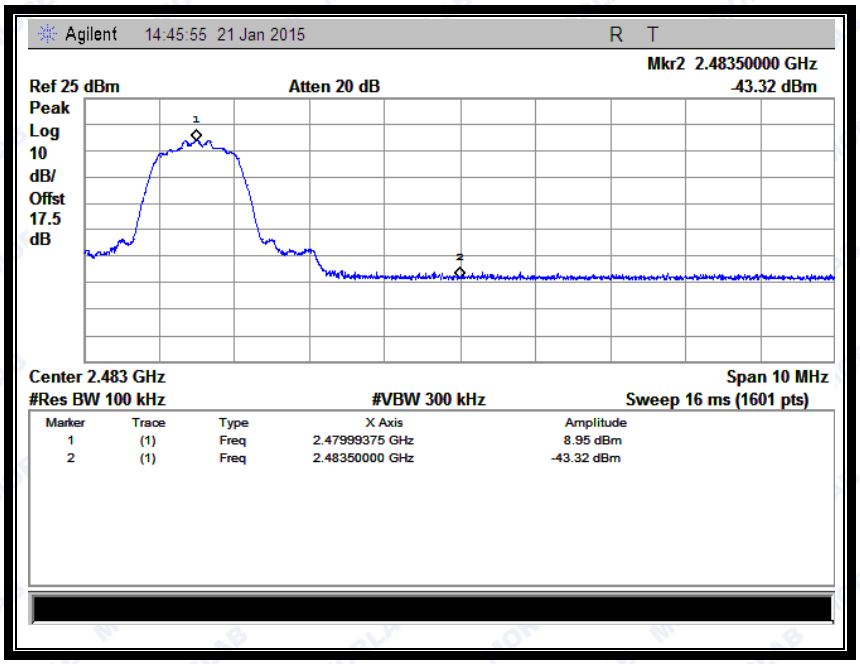
(Channel = 0, Band edge with hopping on @ ∏/4-DQPSK)



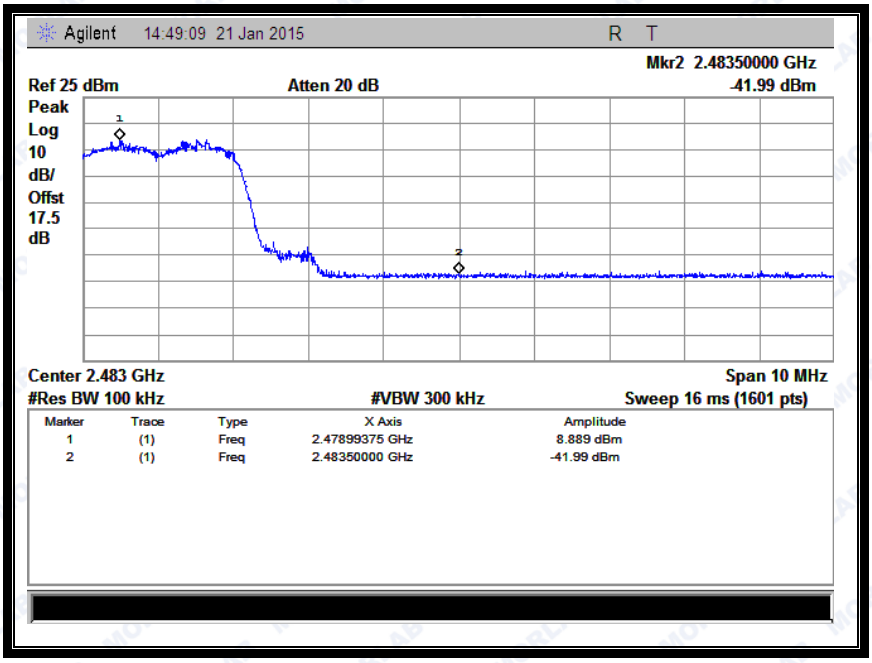
(Plot E.1: Channel = 39, 30MHz to 25GHz @ ∏/4-DQPSK)



(Plot F.1: Channel = 78, 30MHz to 25GHz @ ∏/4-DQPSK)



(Channel = 78, Band edge @ ∏/4-DQPSK)



(Channel = 78, Band edge with hopping on @ ∏/4-DQPSK)

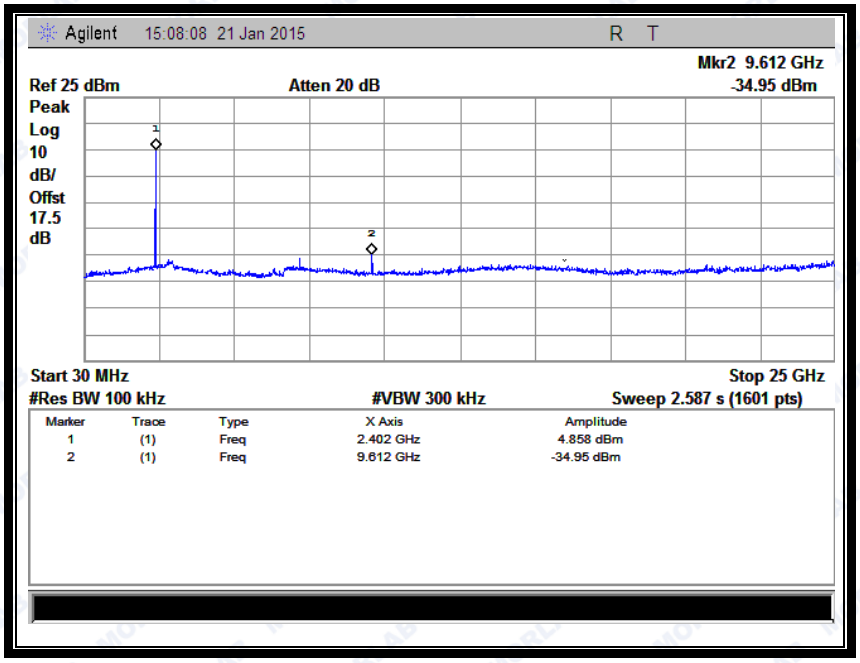
2.7.4.3. 8-DPSK Mode

A. Test Verdict:

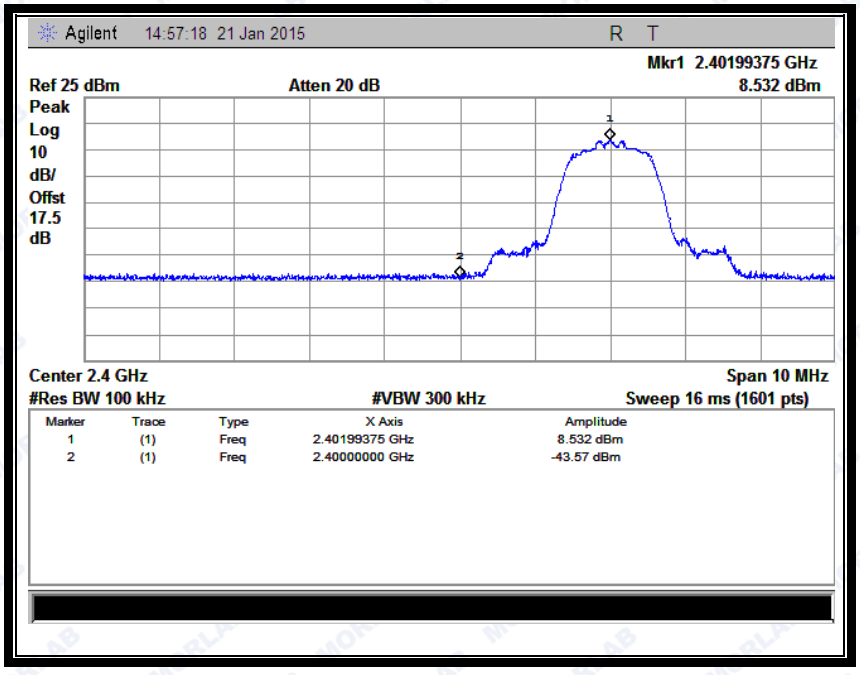
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Refer to Plot	Limit (dBm)		Verdict
				Carrier Level	Calculated -20dBc Limit	
0	2402	-34.95	Plot G.1	4.858	-15.142	PASS
39	2441	-36.47	Plot H.1	4.804	-15.196	PASS
78	2480	-32.98	Plot I.1	5.620	-14.380	PASS

B. Test Plots:

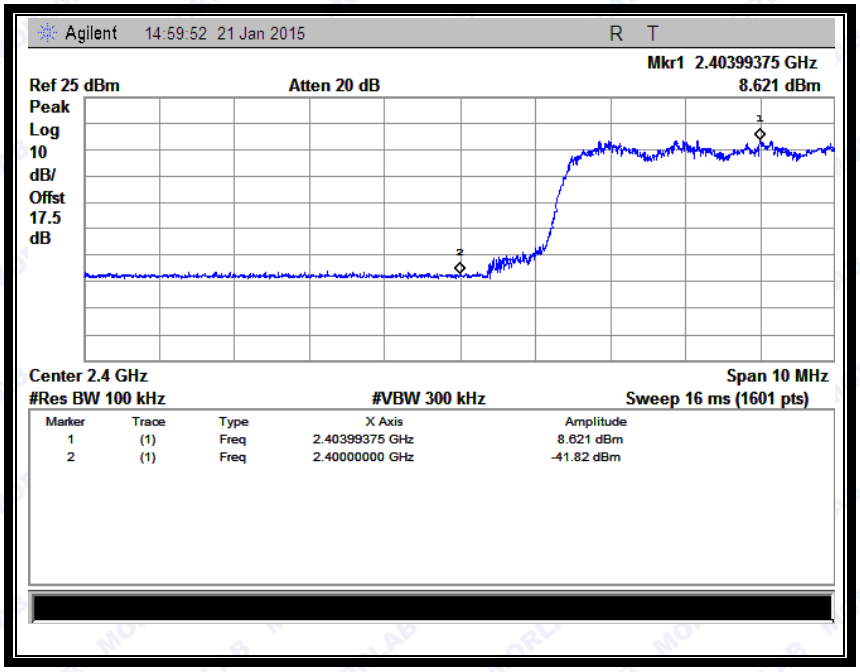
Note: the power of the Module transmitting frequency should be ignored.



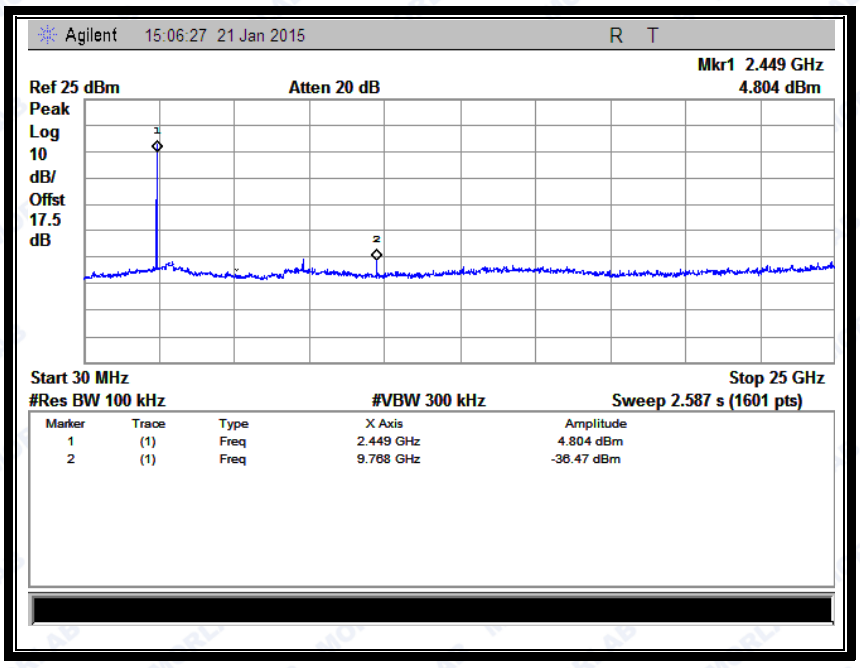
(Plot G.1: Channel = 0, 30MHz to 25GHz @ 8-DPSK)



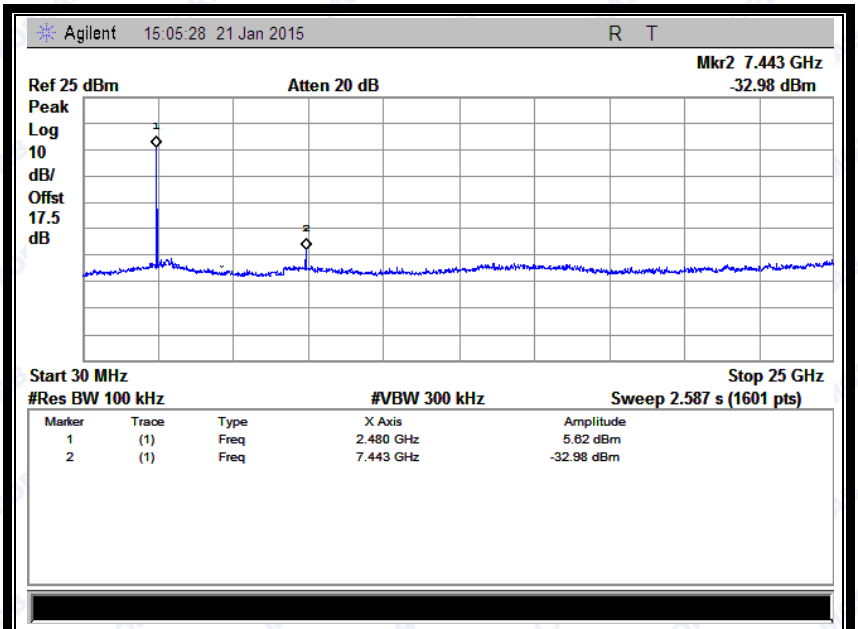
(Channel = 0, Band edge @ 8-DPSK)



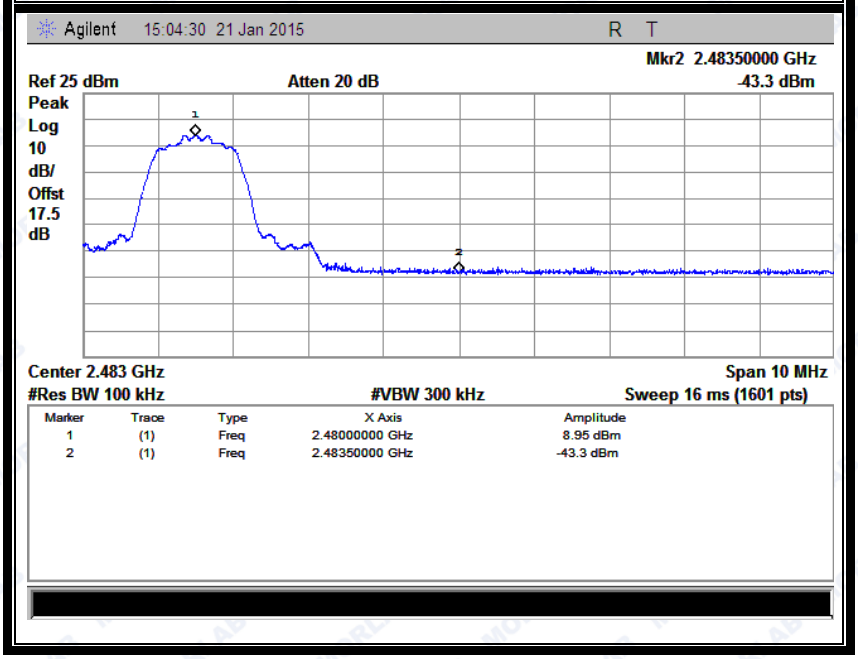
(Channel = 0, Band edge with hopping on @ 8-DPSK)



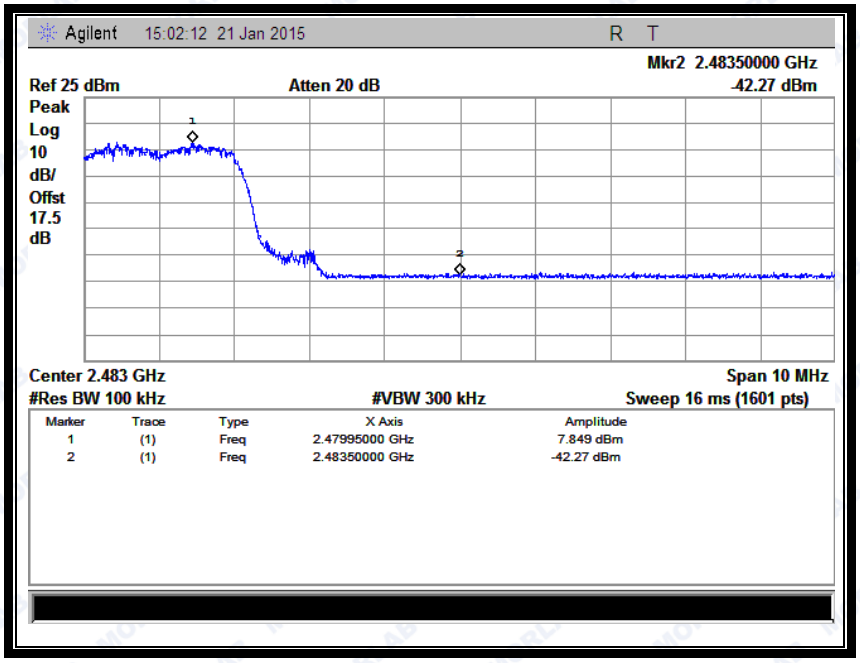
(Plot H.1: Channel = 39, 30MHz to 25GHz @ 8-DPSK)



(Plot I.1: Channel = 78, 30MHz to 25GHz @ 8-DPSK)



(Plot I.1: Channel = 78, Band edge @ 8-DPSK)



(Plot I.1: Channel = 78, Band edge with hopping on @ 8-DPSK)

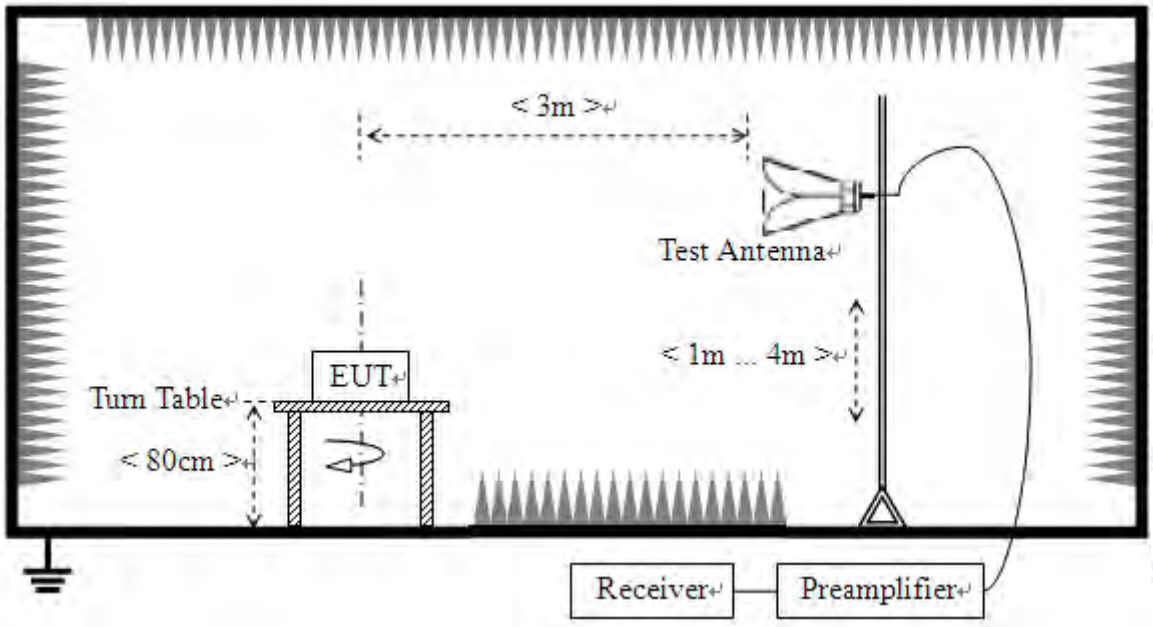
2.8. Restricted Frequency Bands

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 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:

Please reference ANNEX A(1.4).

2.8.3. Test Procedure

Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1GHz, 100 KHz for f < 1GHz
VBW = 3 MHz for peak and 10Hz for average
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize.

2.8.4. Test Result

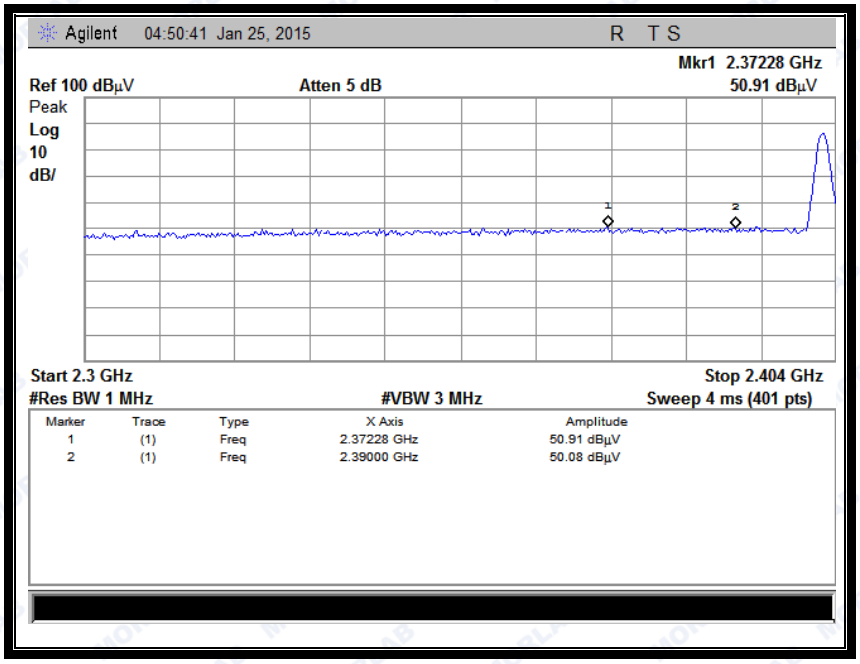
The lowest and highest channels are tested to verify Restricted Frequency Bands.
The measurement results are obtained as below:
E [dBμV/m] =UR + AT + AFactor [dB]; AT =LCable loss [dB]-Gpreamp [dB]
AT: Total correction Factor except Antenna
UR: Receiver Reading
Gpreamp: Preamplifier Gain
AFactor: Antenna Factor at 3m
Note: Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.

2.8.4.1. GFSK Mode

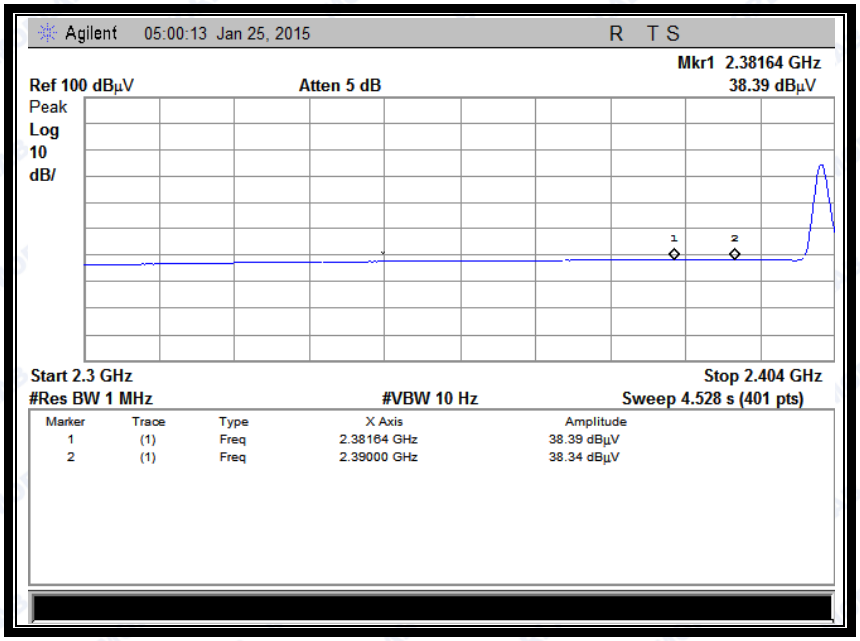
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading UR (dBuV)	AT (dB)	AFactor (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
0	2372.28	PK	50.91	-24.63	32.56	58.84	74	Pass
0	2381.64	AV	38.39	-24.63	32.56	46.32	54	Pass
78	2491.65	PK	52.06	-24.18	32.5	60.38	74	Pass
78	2483.50	AV	38.63	-24.18	32.5	46.95	54	Pass

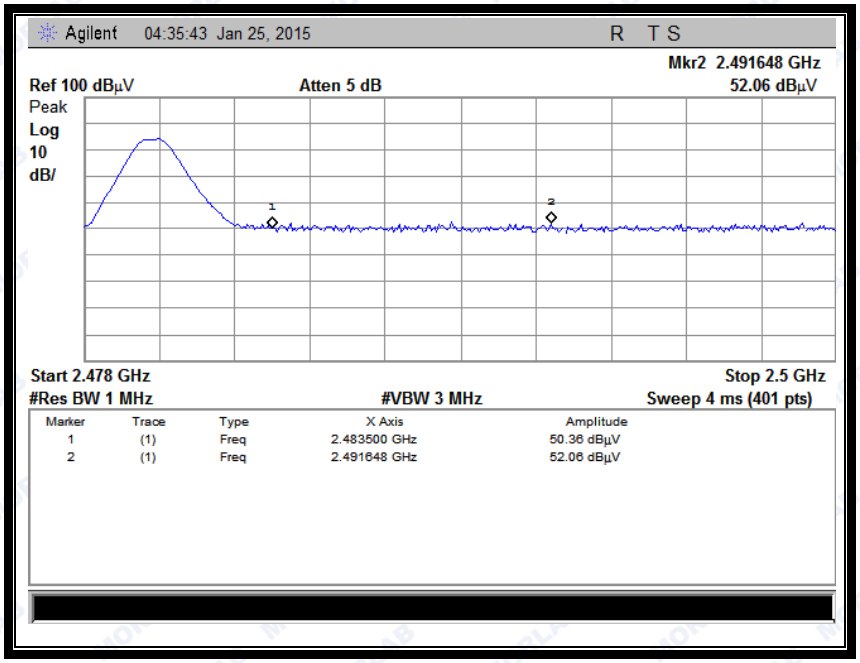
B. Test Plots:



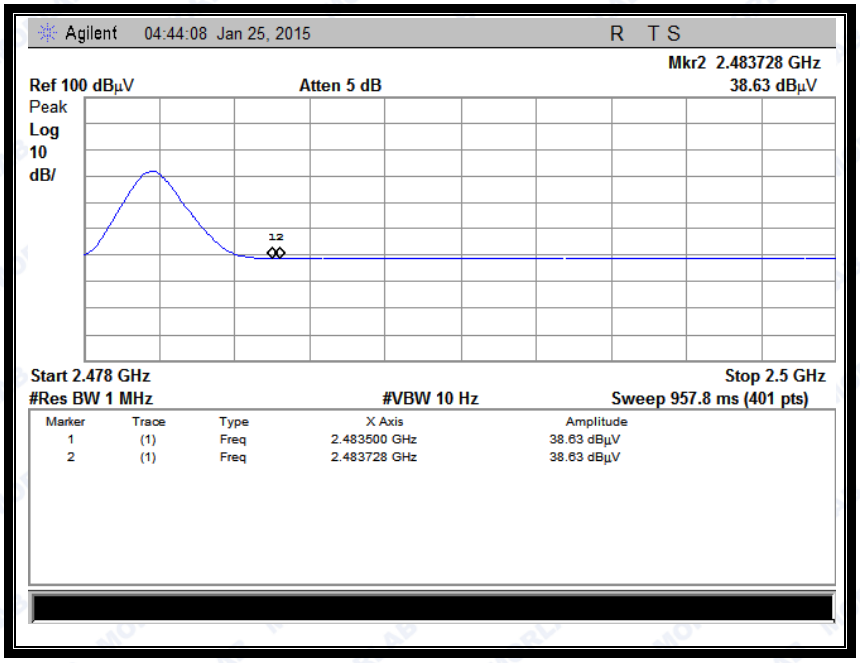
(Plot A1:Channel = 0 PEAK @ GFSK)



(Plot A2:Channel = 0 AVERAGE @ GFSK)



(Plot B1:Channel = 78 PEAK @ GFSK)



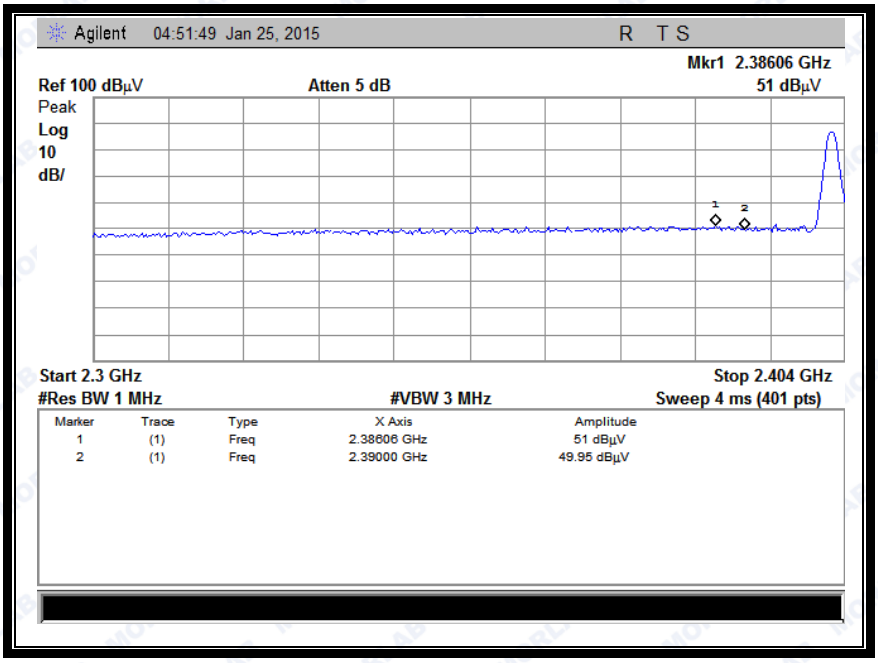
(Plot B2: Channel = 78 AVERAGE @ GFSK)

2.8.4.2. ∏/4-DQPSK Mode

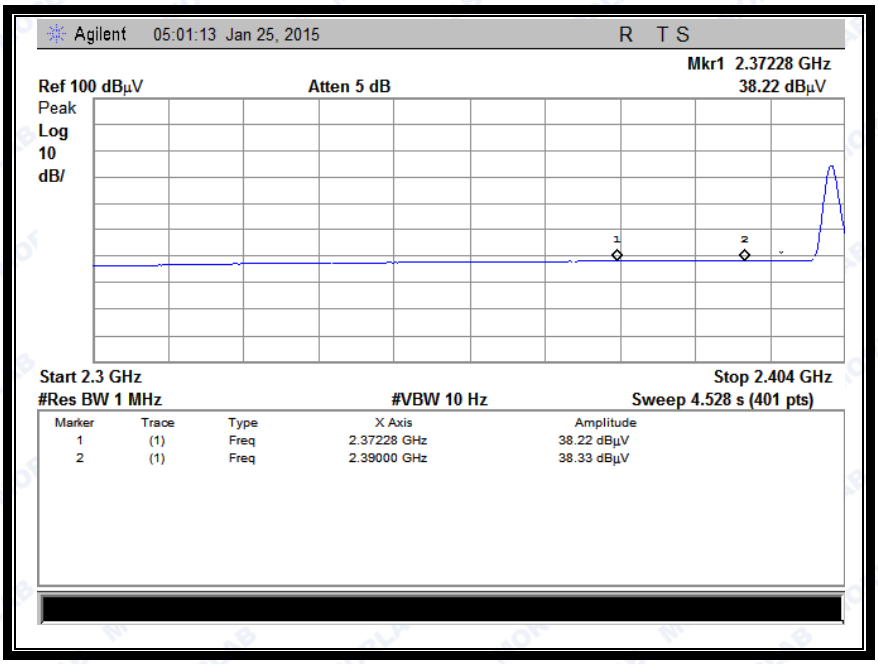
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading UR (dBuV)	AT (dB)	AFactor (dB@3m)	Max. Emission E (dBµV/m)	Limit (dBµV/m)	Verdict
0	2386.06	PK	51.00	-24.63	32.56	58.93	74	Pass
0	2390.00	AV	38.33	-24.63	32.56	46.26	54	Pass
78	2490.38	PK	51.58	-24.18	32.5	59.9	74	Pass
78	2488.73	AV	38.71	-24.18	32.5	47.03	54	Pass

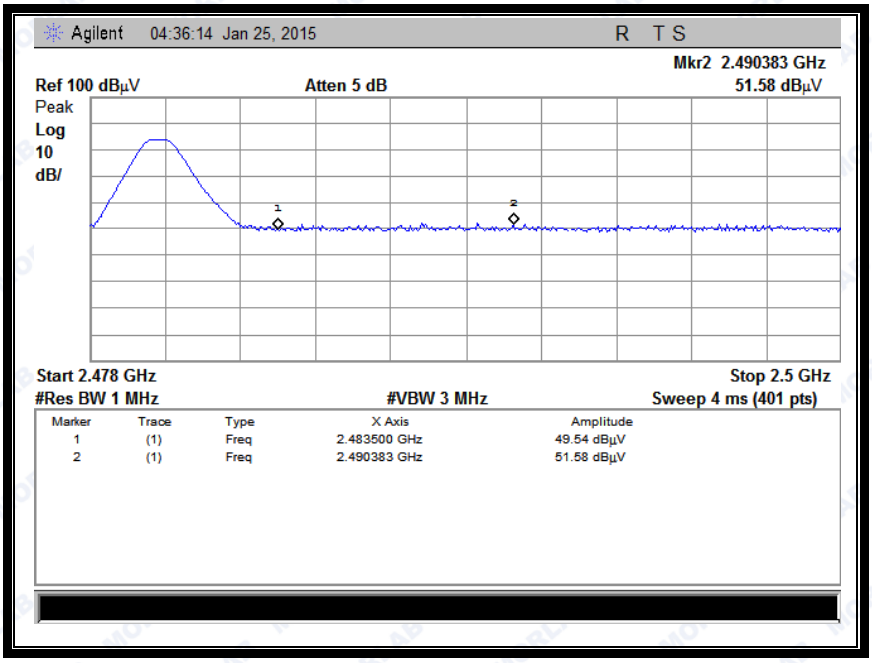
B. Test Plots:



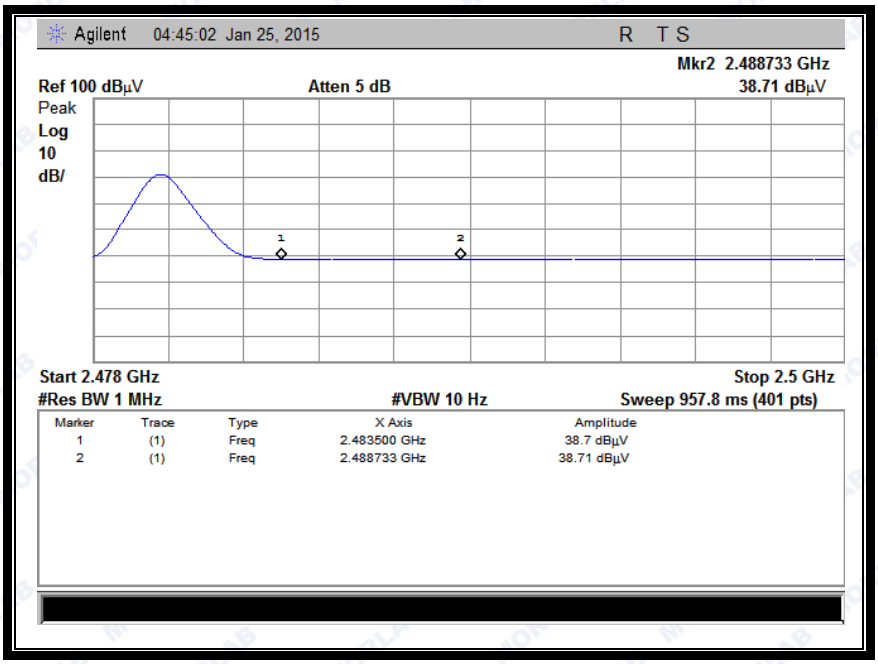
(Plot C1: Channel = 0 PEAK @ ∏/4-DQPSK)



(Plot C2: Channel = 0 AVERAGE @ ∏/4-DQPSK)



(Plot D1: Channel = 78 PEAK @ ∏/4-DQPSK)



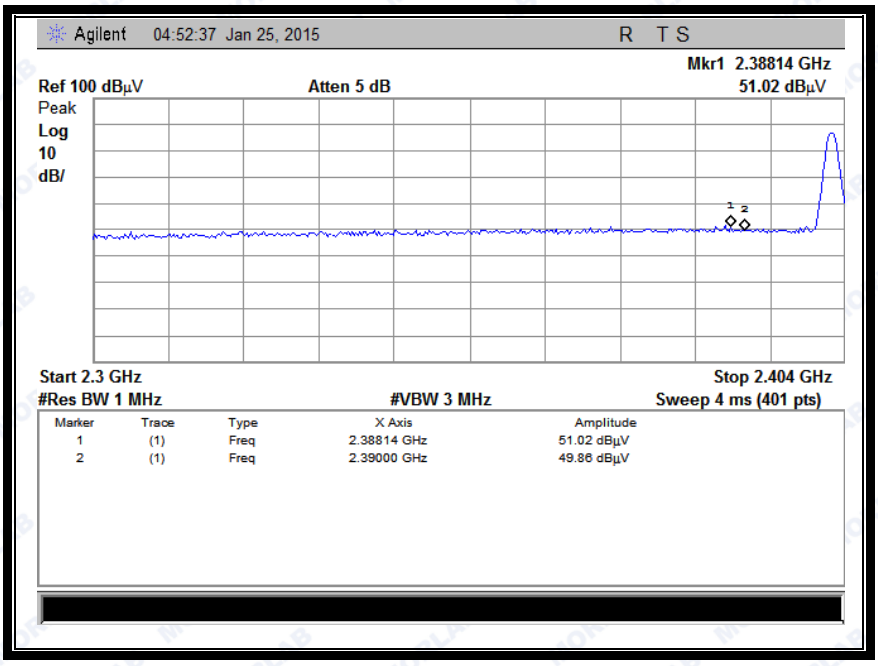
(Plot D2: Channel = 78 AVERAGE@ ∏/4-DQPSK)

2.8.4.3. 8-DPSK Mode

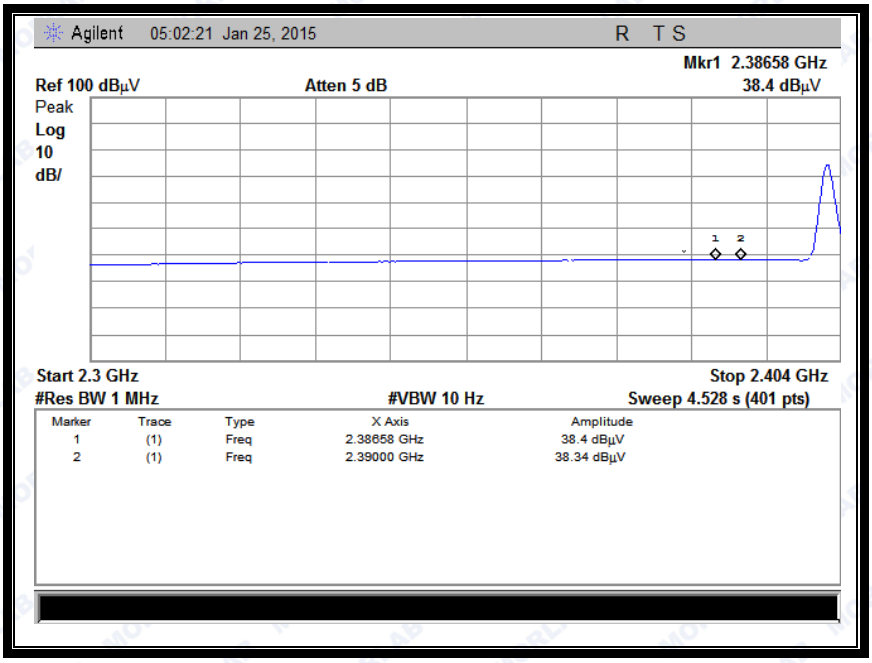
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading UR (dBuV)	AT (dB)	AFactor (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
0	2388.14	PK	51.02	-24.63	32.56	58.95	74	Pass
0	2386.58	AV	38.40	-24.63	32.56	46.33	54	Pass
78	2489.39	PK	51.76	-24.18	32.5	60.08	74	Pass
78	2483.50	AV	38.74	-24.18	32.5	47.06	54	Pass

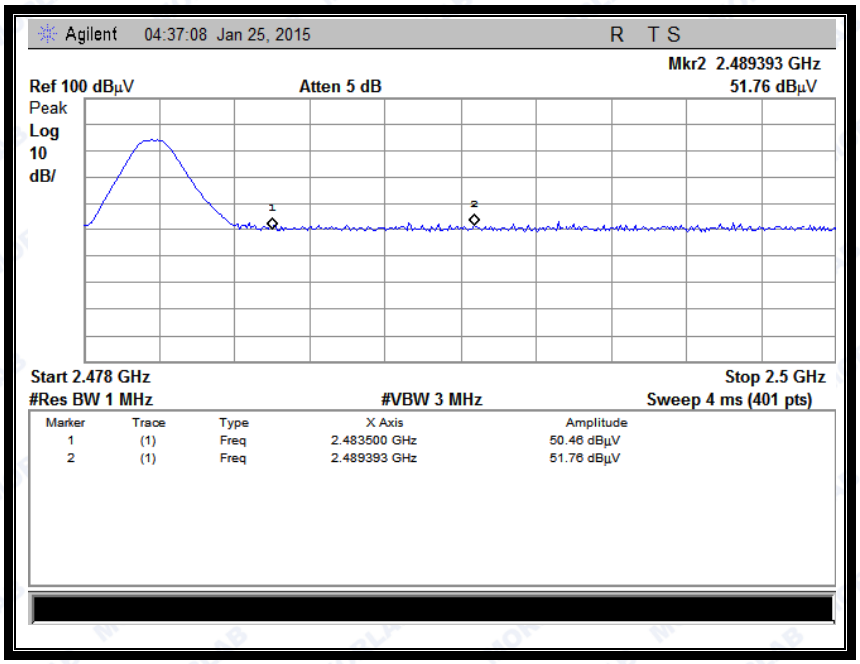
B. Test Plots:



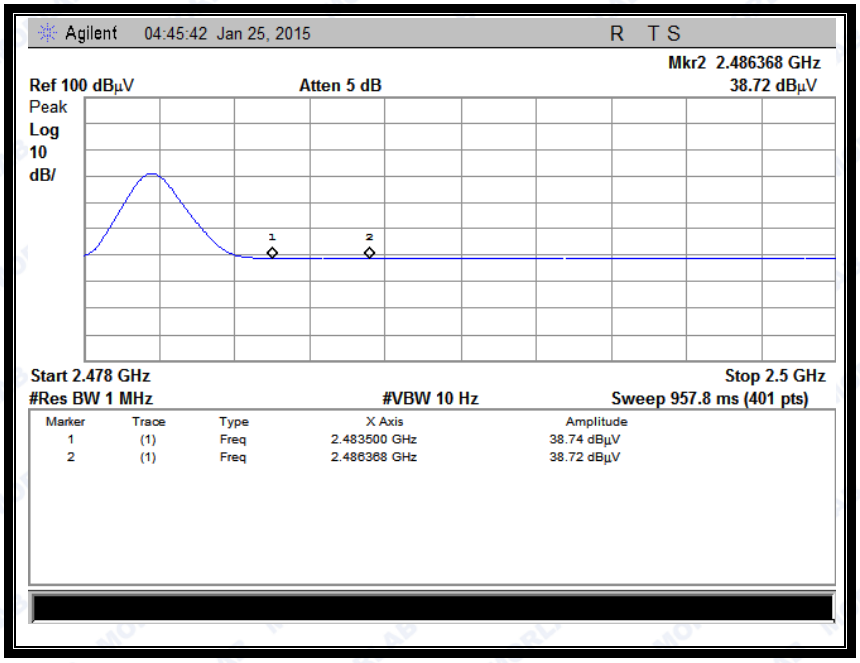
(Plot E1: Channel = 0 PEAK @ 8-DPSK Mode)



(Plot E2: Channel = 0 AVERAGE @ 8-DPSK Mode)



(Plot F1:Channel = 78 PEAK @ 8-DPSK Mode)



(Plot F2:Channel = 78 AVERAGE @ 8-DPSK Mode)

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 50μH/50Ω line impedance stabilization network (LISN).

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

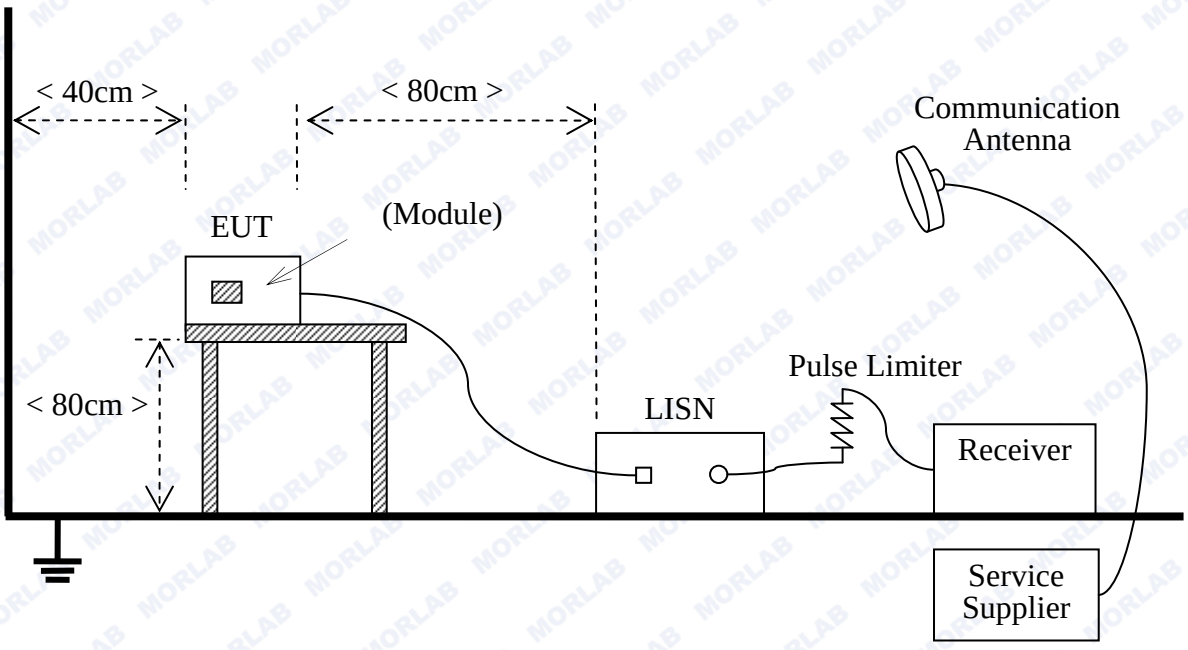
NOTE:

(a) The lower limit shall apply at the band edges.

(b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

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 C63.4:2009

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:

Please reference ANNEX A(1.4).

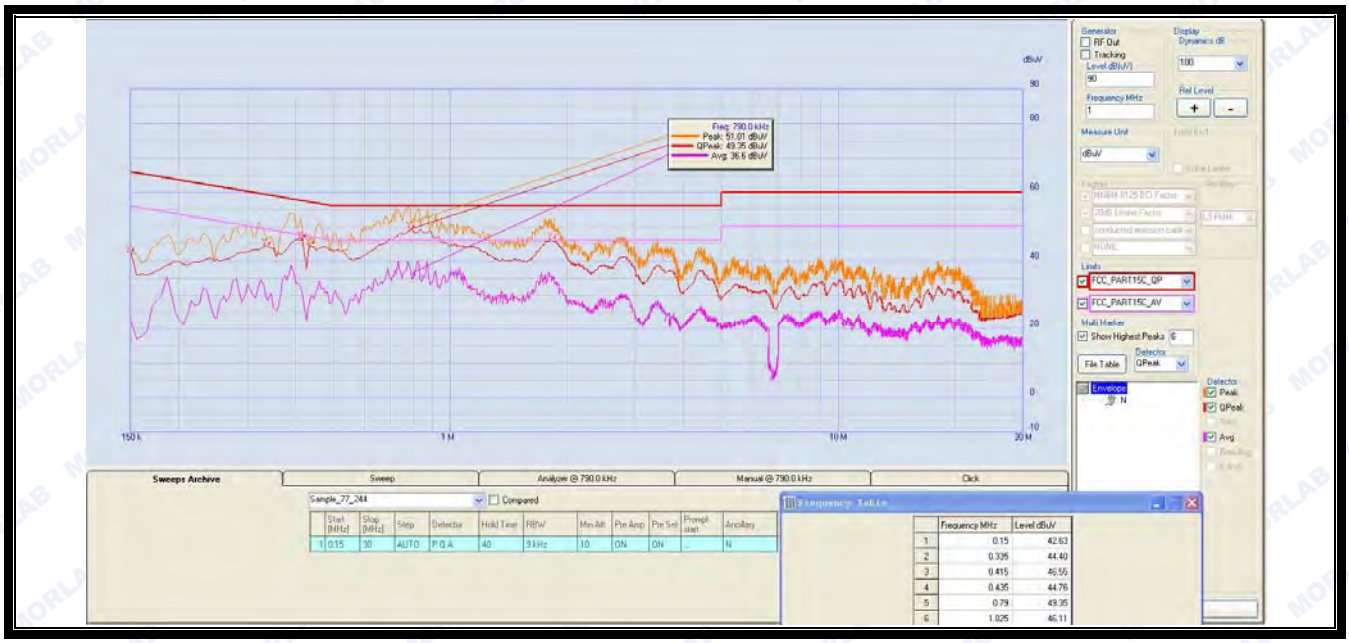
2.9.3. Test Result

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.

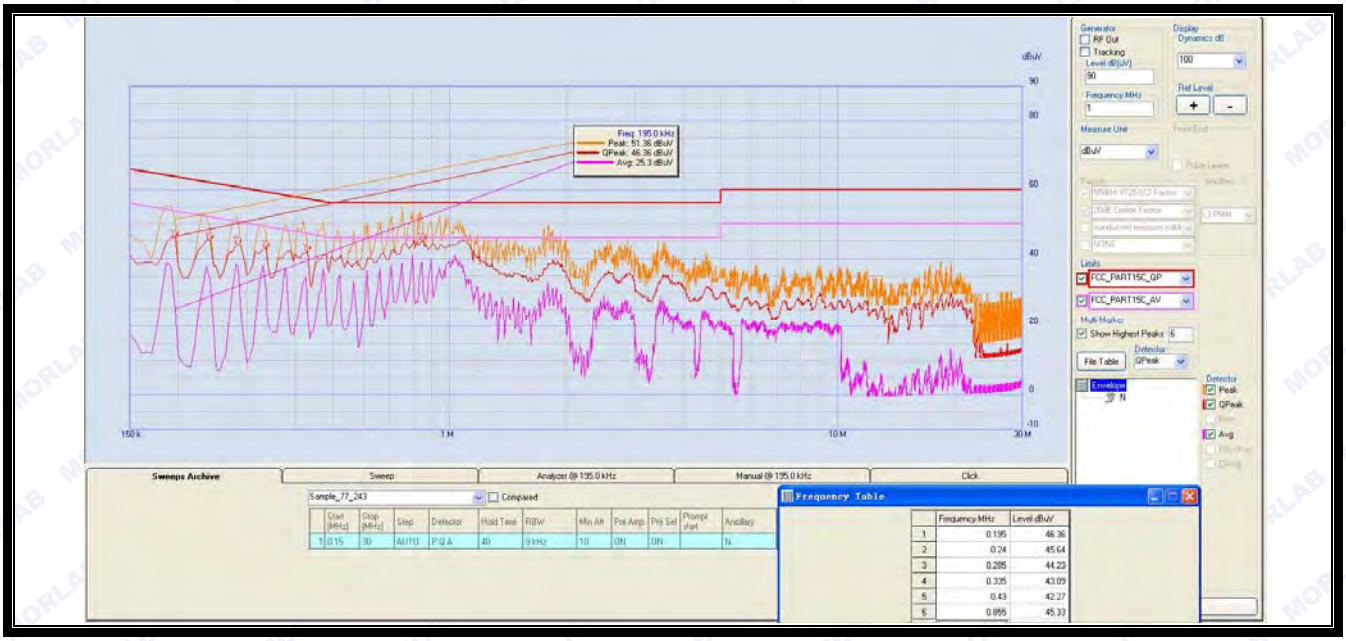
A. Test setup:

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

B. Test Plots:



(Plot A: L Phase)



(Plot B: N Phase)

2.10. Radiated Emission

2.10.1. Requirement

According to FCC section 15.247(d) 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 FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Note:

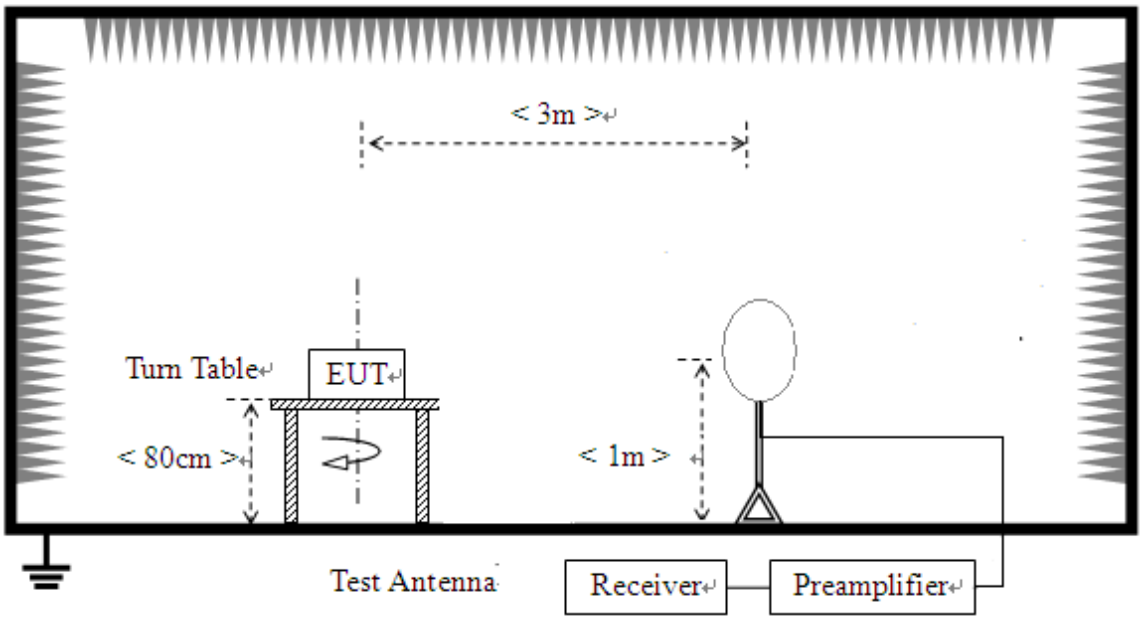
1. For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
2. For above 1000MHz, limit field strength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

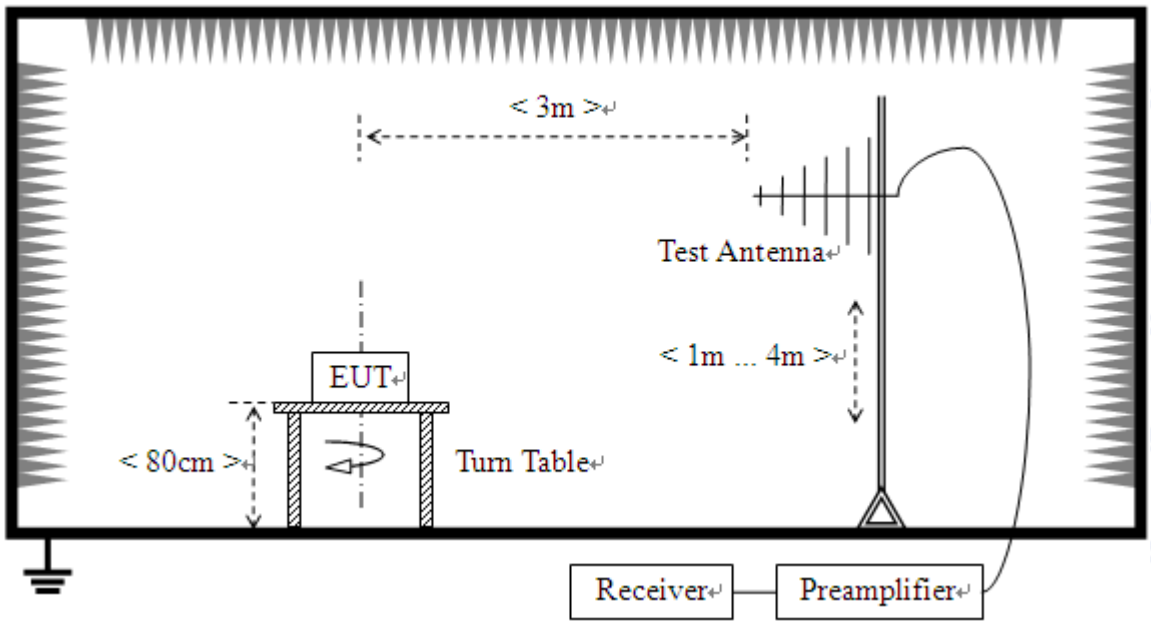
2.10.2. Test Description

A. Test Setup:

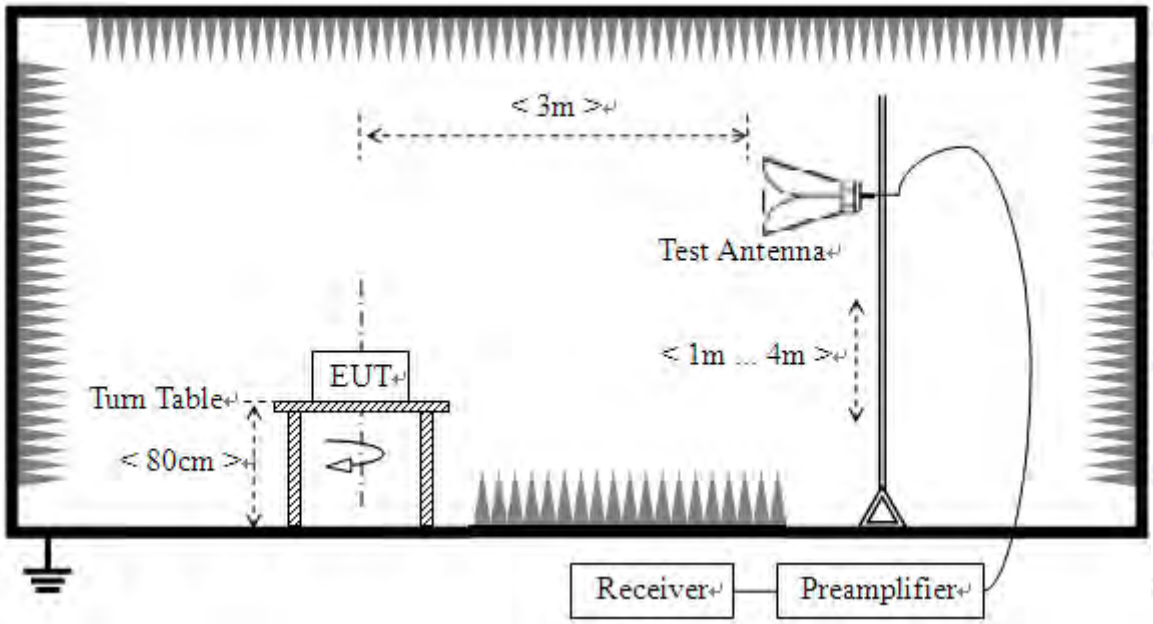
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



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 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 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:

(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:

Please reference ANNEX A(1.4).

2.10.3. Test Procedure

Use the following spectrum analyzer settings:
Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold

2.10.4. 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:

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

A_T: Total correction Factor except Antenna

U_R: Receiver Reading

G_{preamp}: Preamplifier Gain

A_{Factor}: Antenna Factor at 3m

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

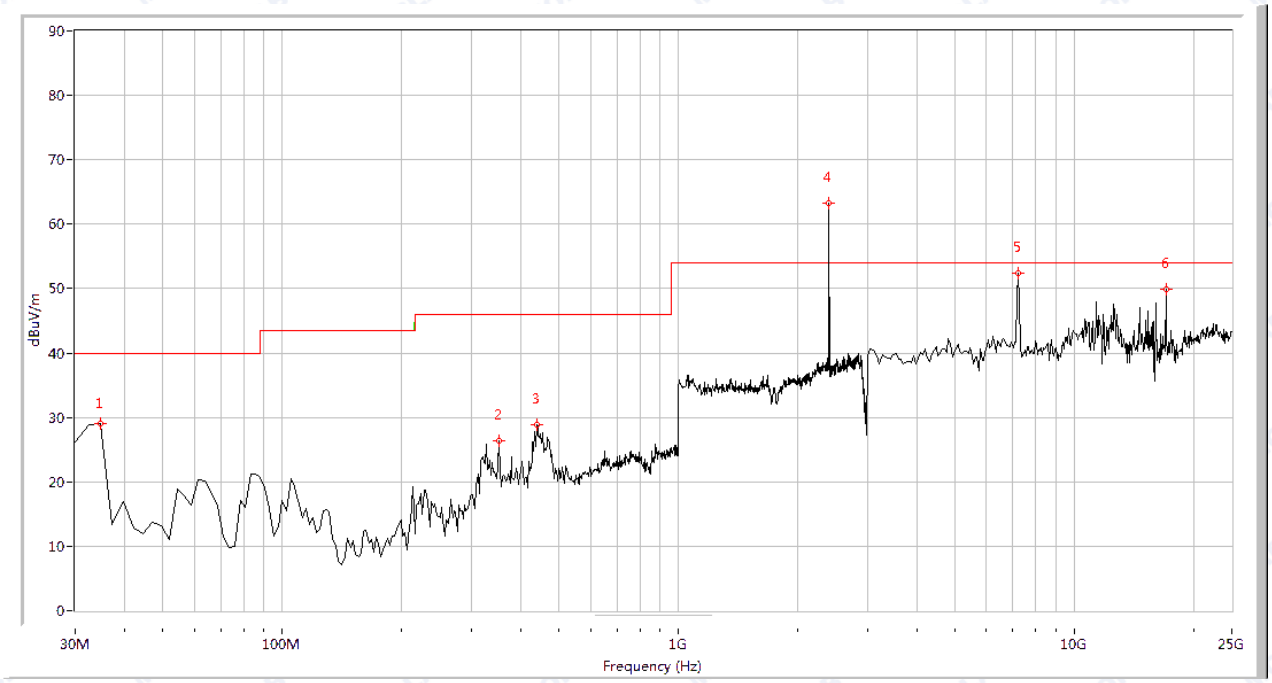
Note: All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

The low frequency, which started from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

2.10.4.1. GFSK Mode:

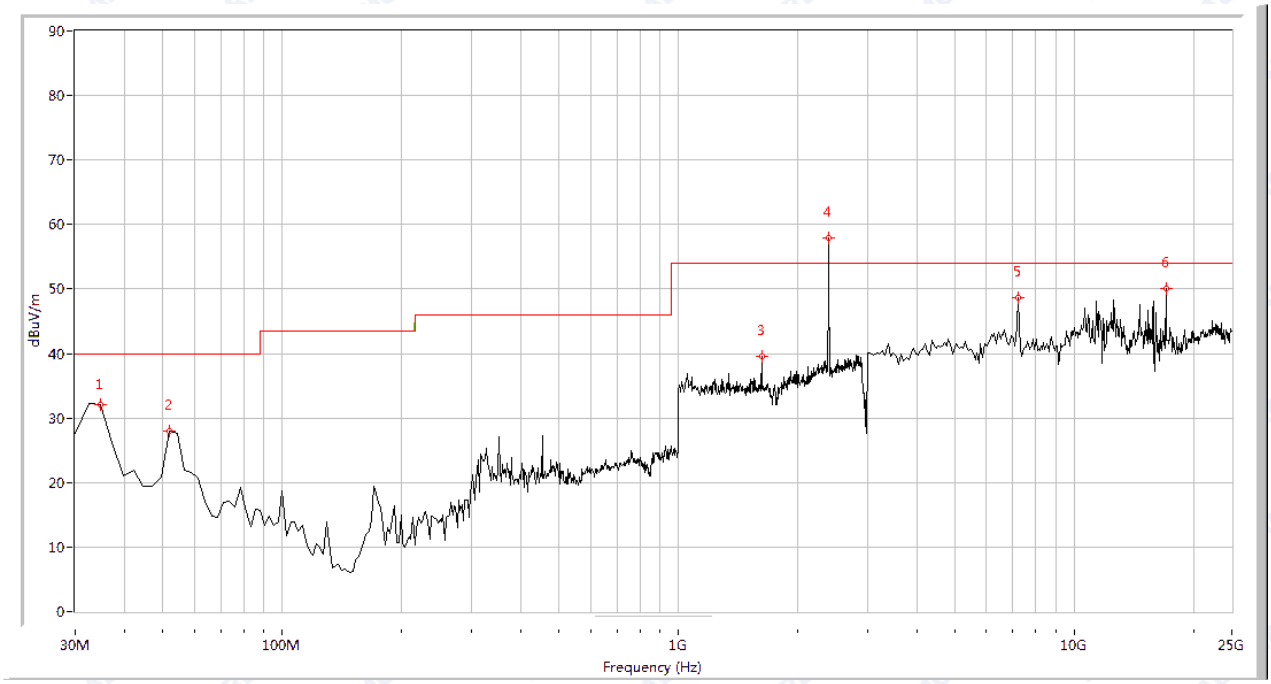
A. Test Plots for the Whole Measurement Frequency Range:

Plots for Channel = 0



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
34.838	29.07	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
351.721	26.33	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
438.803	28.82	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2402.000	63.31	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
7224.439	52.31	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
17044.888	49.93	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

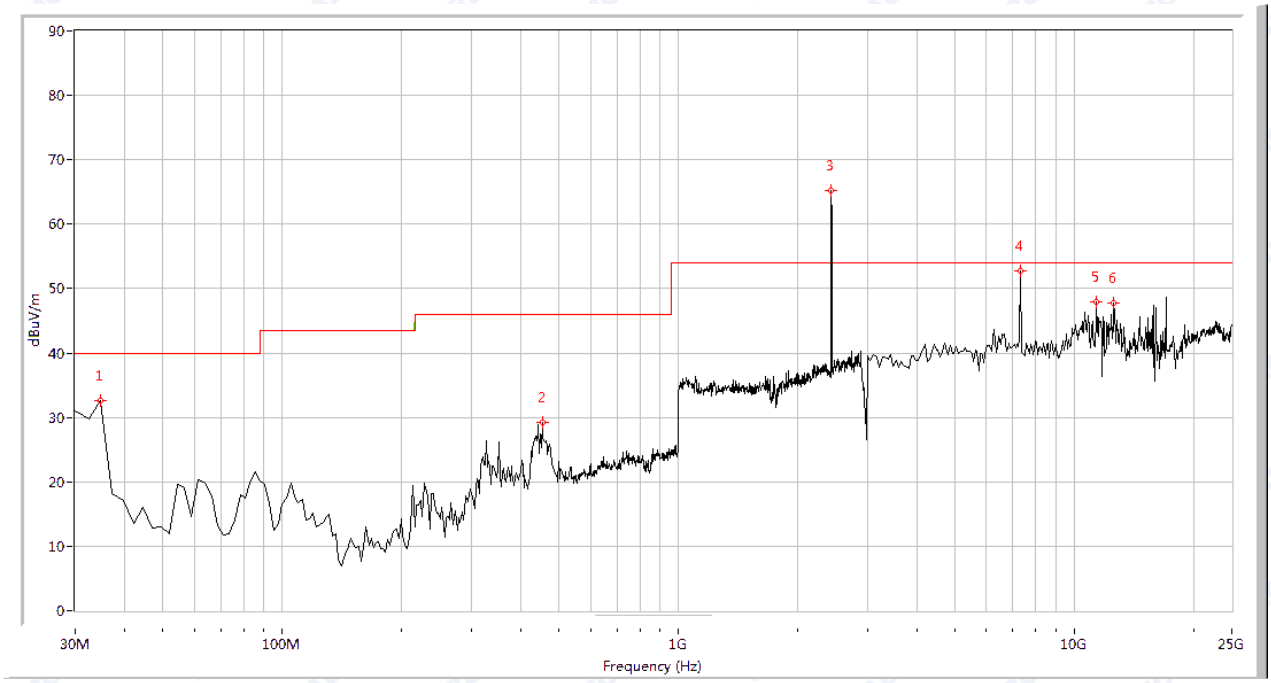
(30MHz to 25GHz, Antenna Horizontal @ GFSK, channel 0)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
34.838	32.00	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
51.771	28.00	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
1623.441	39.51	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
2402.000	57.98	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
7224.439	48.61	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
17044.888	50.04	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

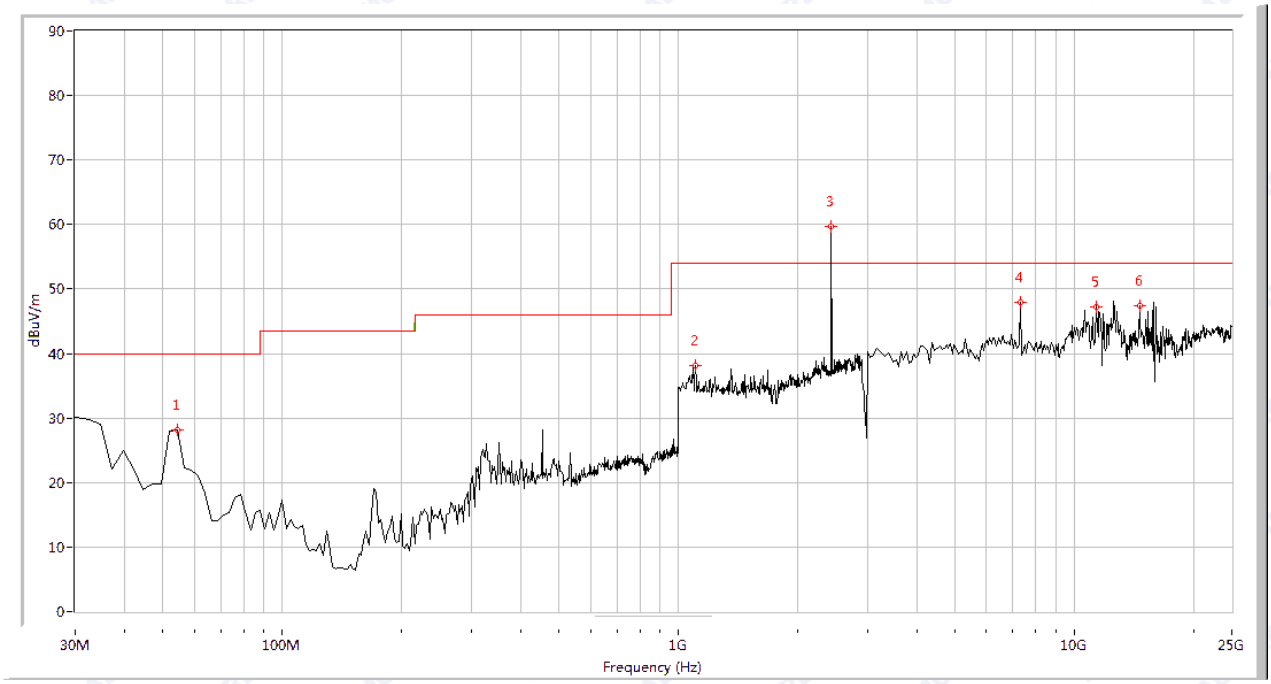
(30MHz to 25GHz, Antenna Vertical @ GFSK, channel 0)

Plot for Channel = 39



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
34.838	32.65	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
453.317	29.20	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2441.000	65.20	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
7334.165	52.72	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
11394.015	48.00	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
12600.998	47.72	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

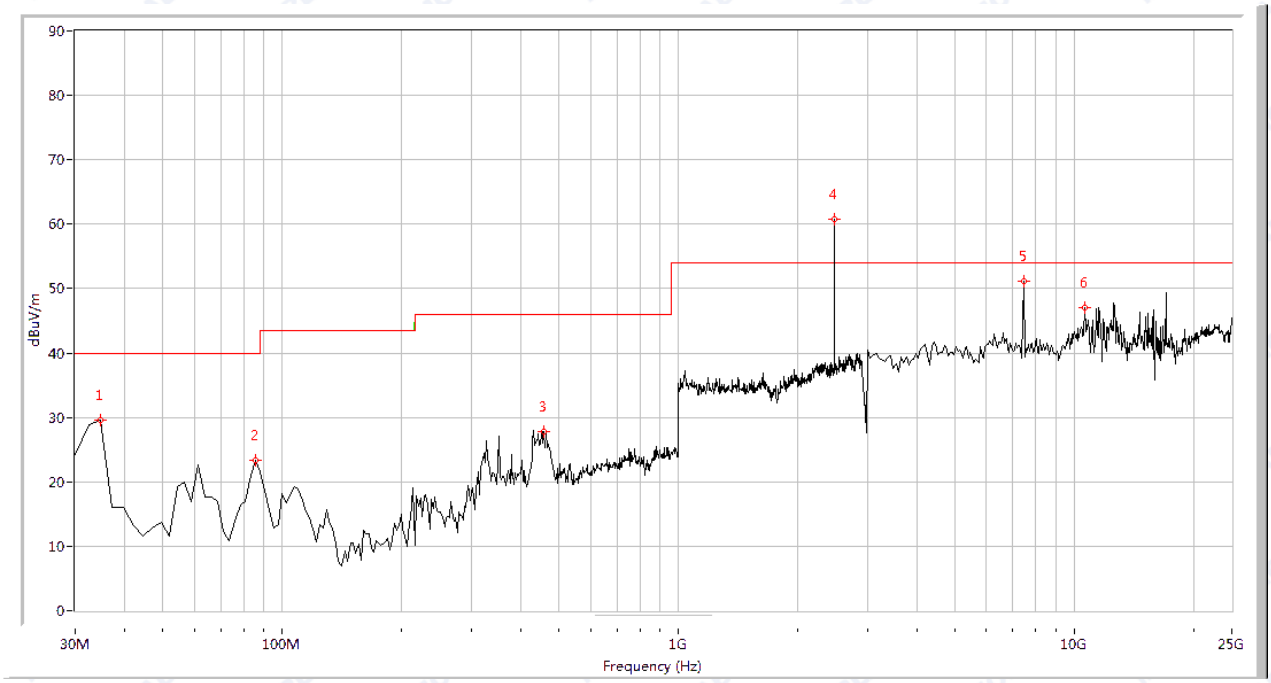
(30MHz to 25GHz, Antenna Horizontal @ GFSK, channel 39)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
54.190	28.16	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
1104.738	38.16	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
2441.000	59.66	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
7334.165	47.99	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
11394.015	47.20	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
14630.923	47.42	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

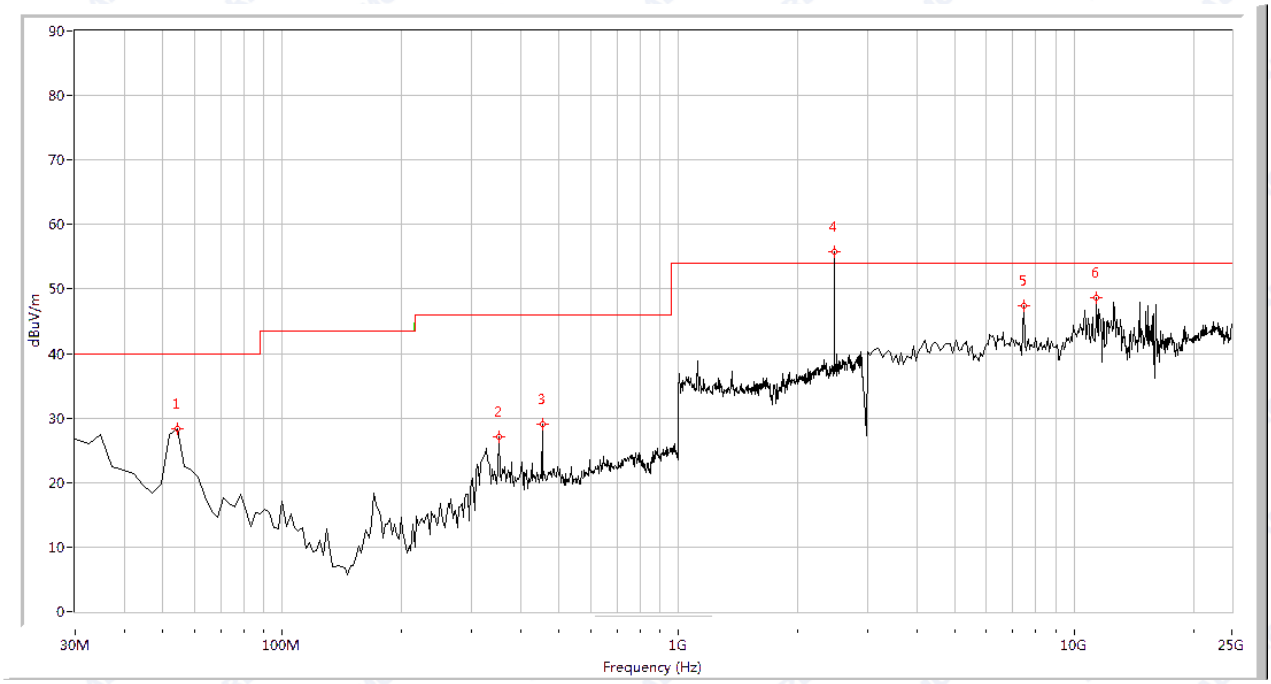
(30MHz to 25GHz, Antenna Vertical @ GFSK, channel 39)

Plot for Channel = 78



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
34.838	29.59	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
85.636	23.36	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
458.155	27.86	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2480.000	60.75	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
7443.890	51.14	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
10625.935	46.97	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

(30MHz to 25GHz, Antenna Horizontal @ GFSK, channel 78)



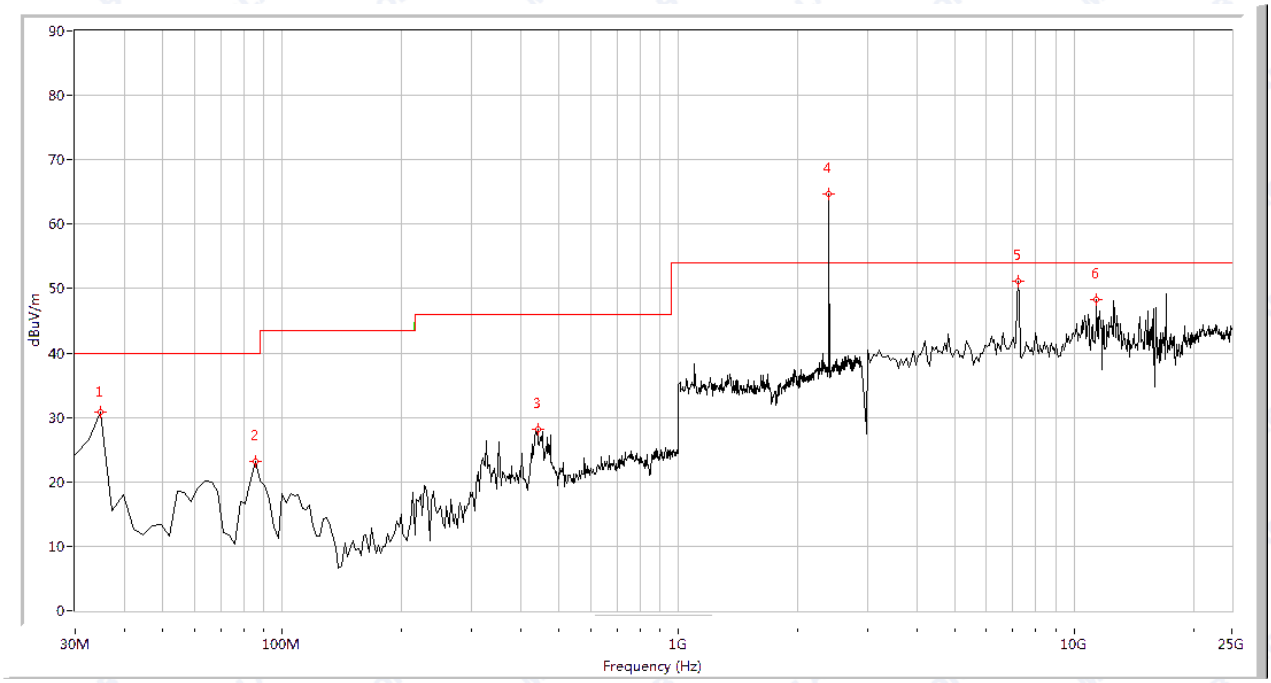
Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
54.190	28.32	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
351.721	27.04	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
453.317	29.11	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
2480.000	55.78	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
7443.890	47.44	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
11394.015	48.61	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

(30MHz to 25GHz, Antenna Vertical @ GFSK, channel 78)

2.10.4.2. ∏/4-DQPSK Mode：

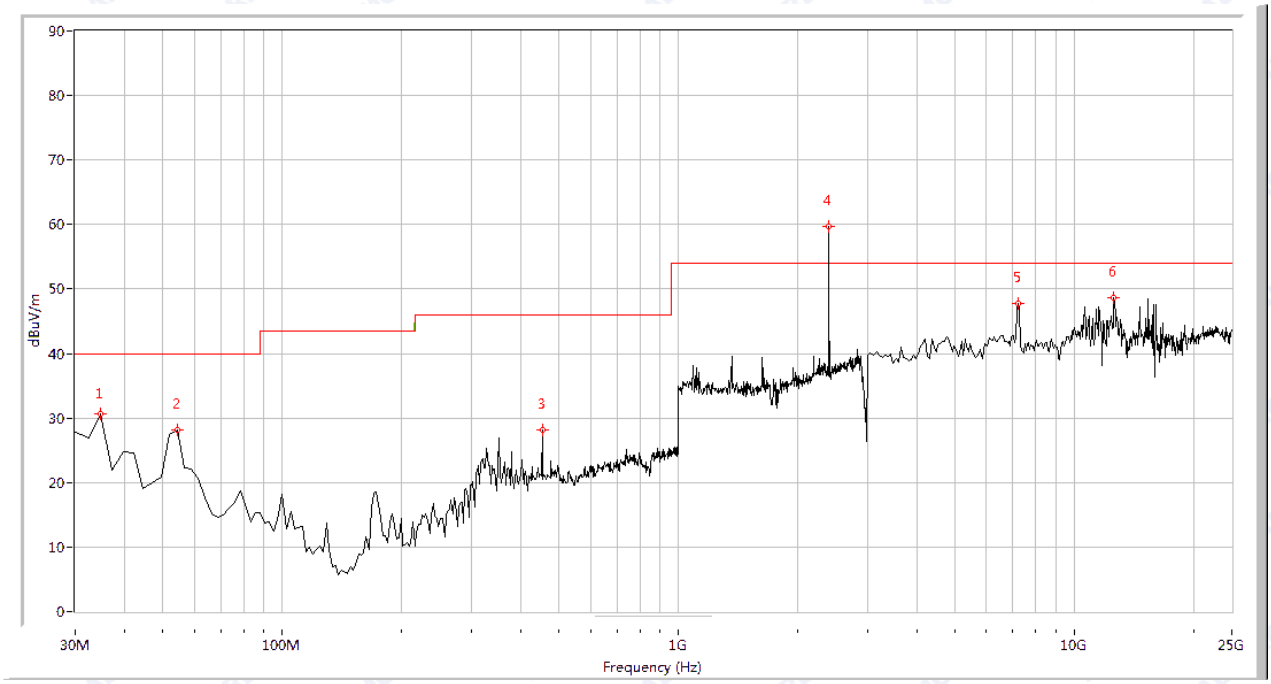
A. Test Plots for the Whole Measurement Frequency Range:

Plots for Channel = 0



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
34.838	30.90	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
85.636	23.09	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
441.222	28.22	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2402.000	64.61	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
7224.439	51.22	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
11394.015	48.27	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

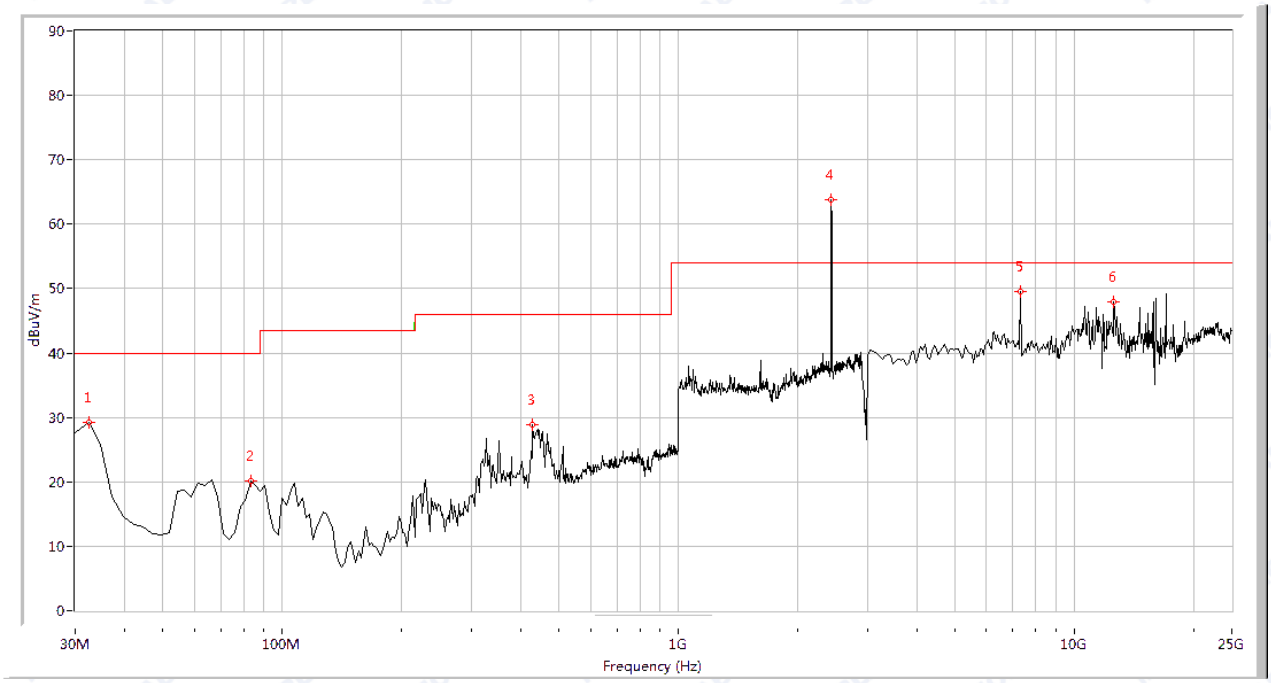
(30MHz to 25GHz, Antenna Horizontal @ ∏/4-DQPSK, channel 0)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
34.838	30.68	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
54.190	28.24	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
453.317	28.08	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
2402.000	59.68	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
7224.439	47.75	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
12600.998	48.69	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

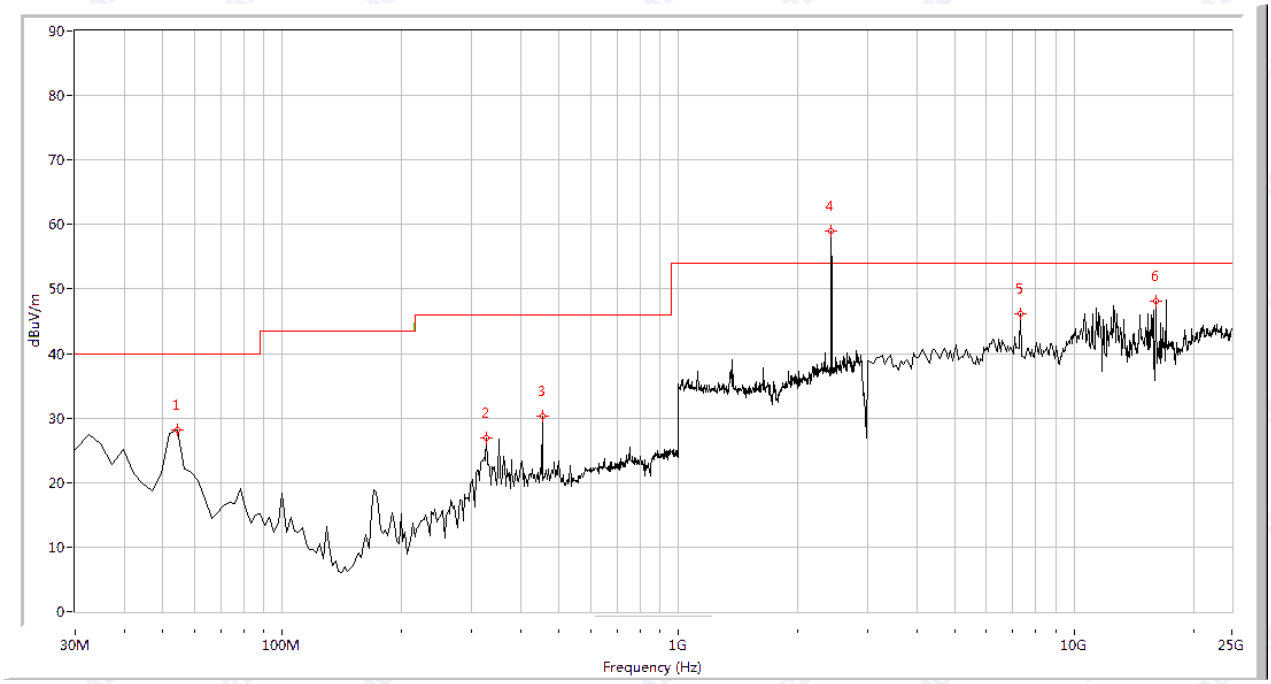
(30MHz to 25GHz, Antenna Vertical @ ∏/4-DQPSK, channel 0)

Plot for Channel = 39



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.419	29.18	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
83.217	20.21	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
429.127	28.95	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2441.000	63.77	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
7334.165	49.59	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
12600.998	47.91	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

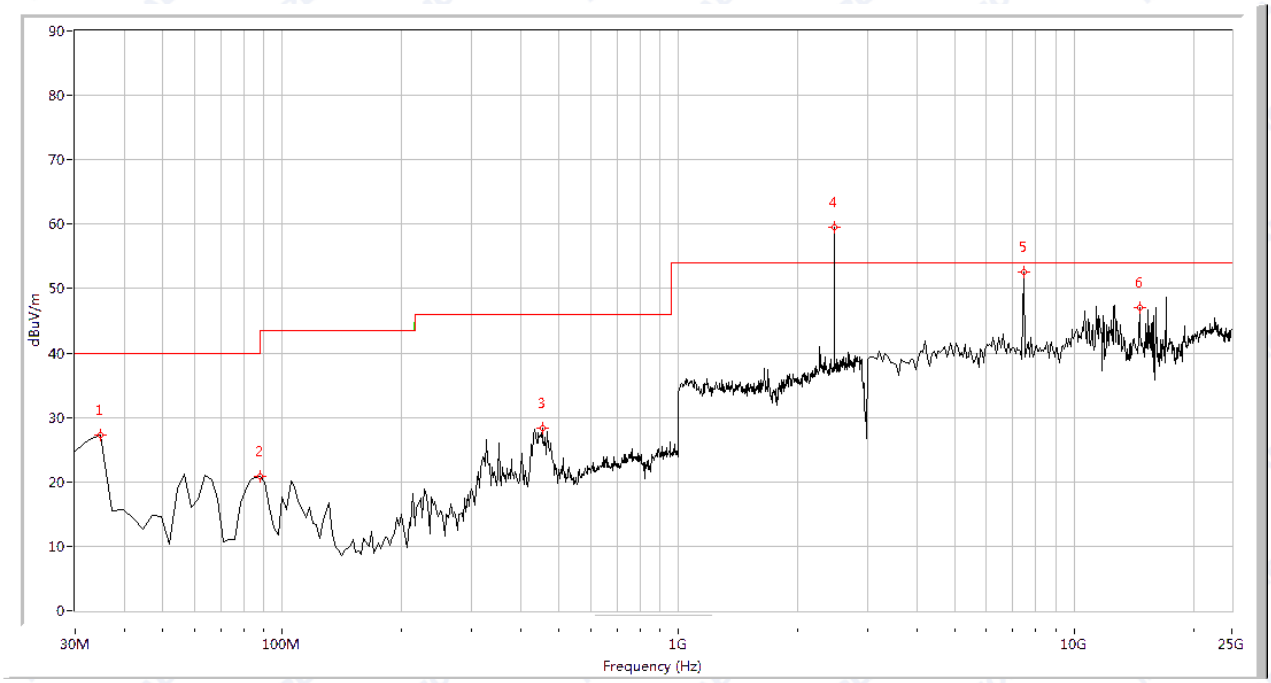
(30MHz to 25GHz, Antenna Horizontal @ ∏/4-DQPSK, channel 39)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
54.190	28.11	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
327.531	26.94	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
453.317	30.26	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
2441.000	58.90	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
7334.165	46.22	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
16057.357	48.15	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

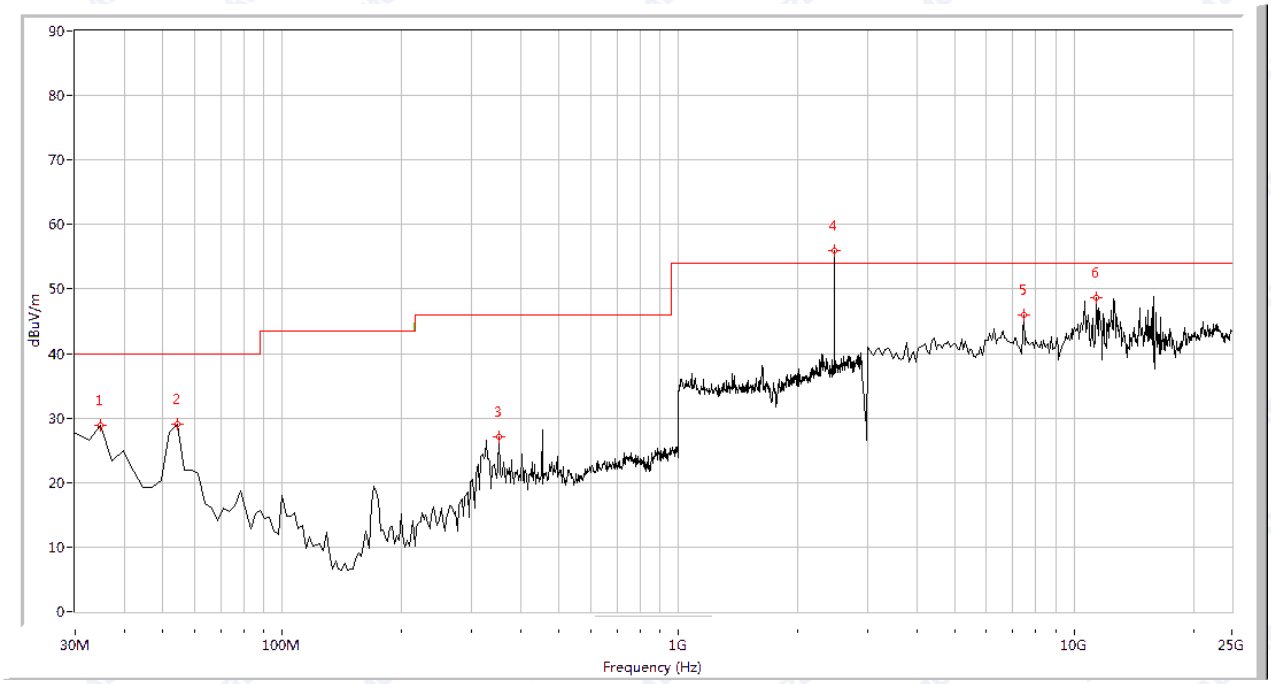
(30MHz to 25GHz, Antenna Vertical @ ∏/4-DQPSK, channel 39)

Plot for Channel = 78



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
34.838	27.18	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
88.055	20.85	N.A	N.A	N.A	43.5	N.A	Horizontal	PASS
453.317	28.29	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2480.000	59.57	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
7443.890	52.51	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
14630.923	47.06	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

(30MHz to 25GHz, Antenna Horizontal @ ∏/4-DQPSK, channel 78)



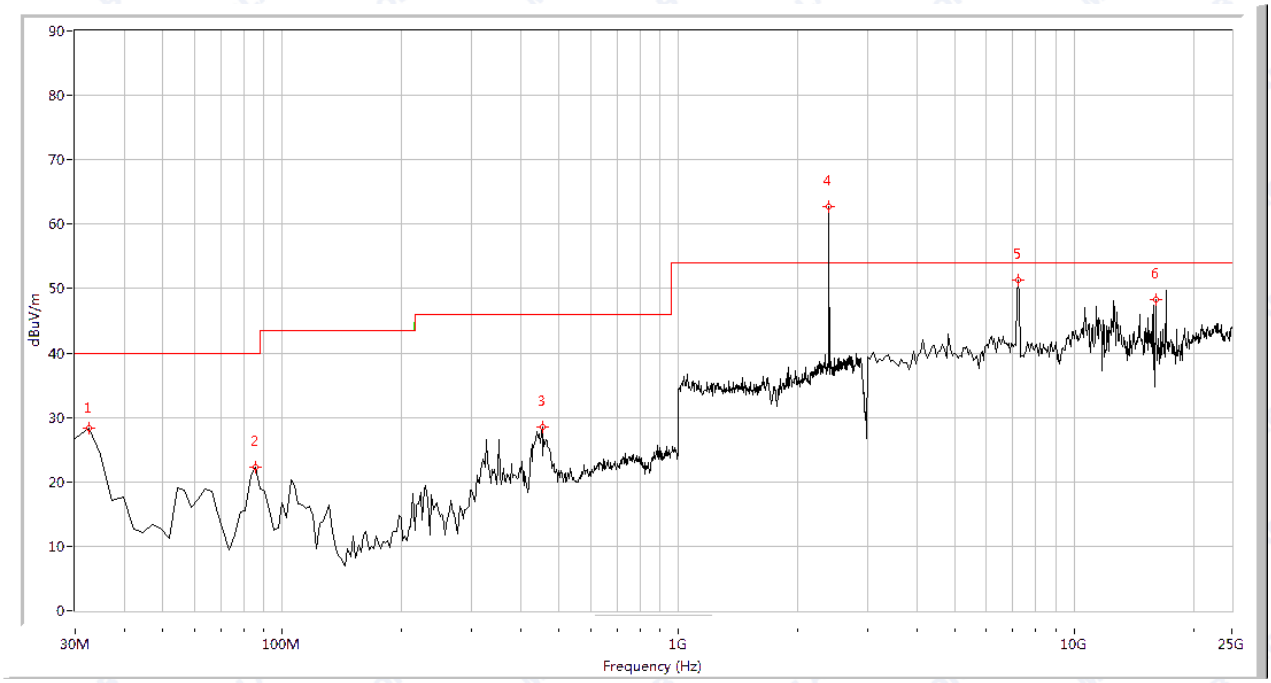
Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
34.838	28.91	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
54.190	29.09	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
351.721	27.03	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
2480.000	55.93	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
7443.890	45.91	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
11394.015	48.64	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

(30MHz to 25GHz, Antenna Vertical @ ∏/4-DQPSK, channel 78)

2.10.4.3. 8-DPSK Mode：

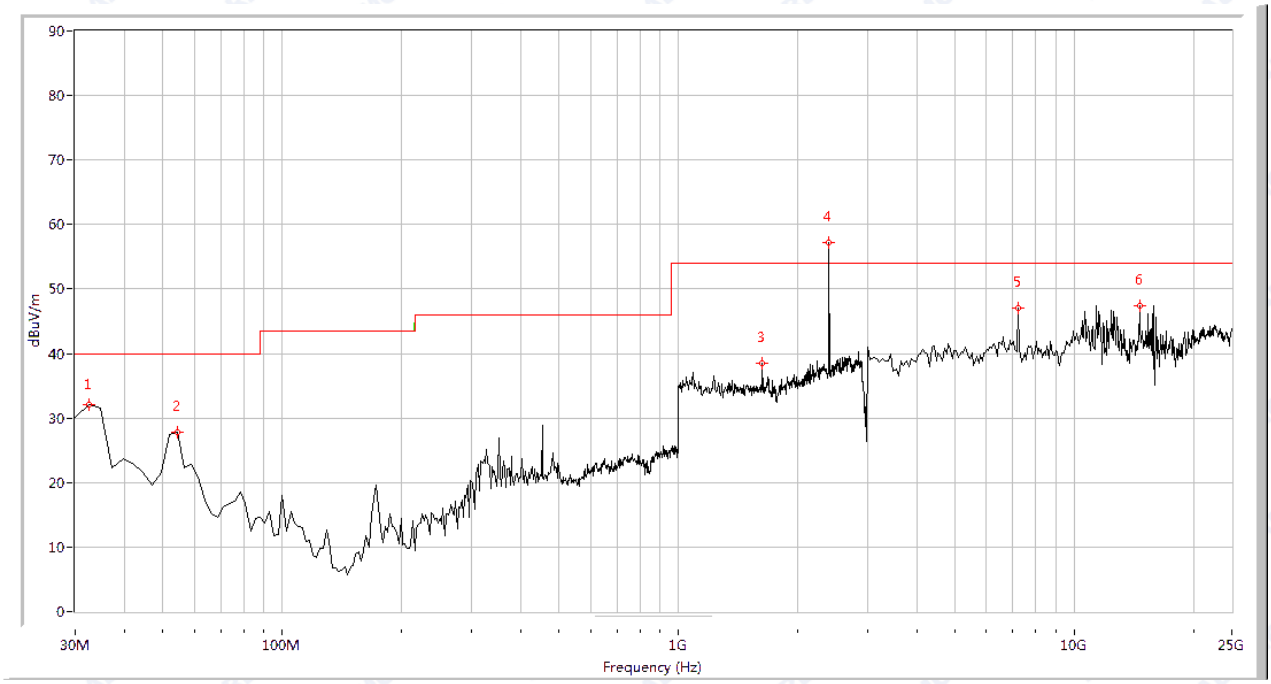
A. Test Plots for the Whole Measurement Frequency Range:

Plots for Channel = 0



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.419	28.29	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
85.636	22.25	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
453.317	28.47	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2402.000	62.72	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
7224.439	51.32	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
16057.357	48.33	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

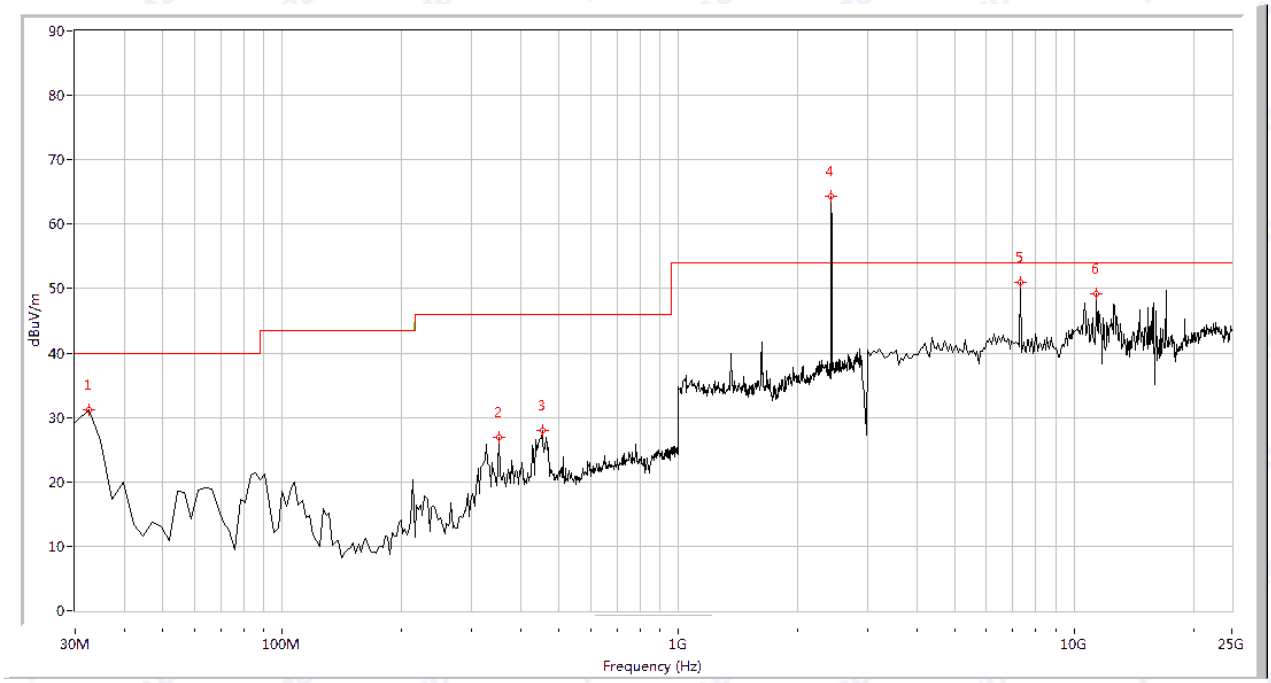
(30MHz to 25GHz, Antenna Horizontal @8-DPSK, channel 0)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.419	32.13	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
54.190	27.87	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
1628.429	38.53	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
2402.000	57.14	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
7224.439	47.02	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
14630.923	47.39	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

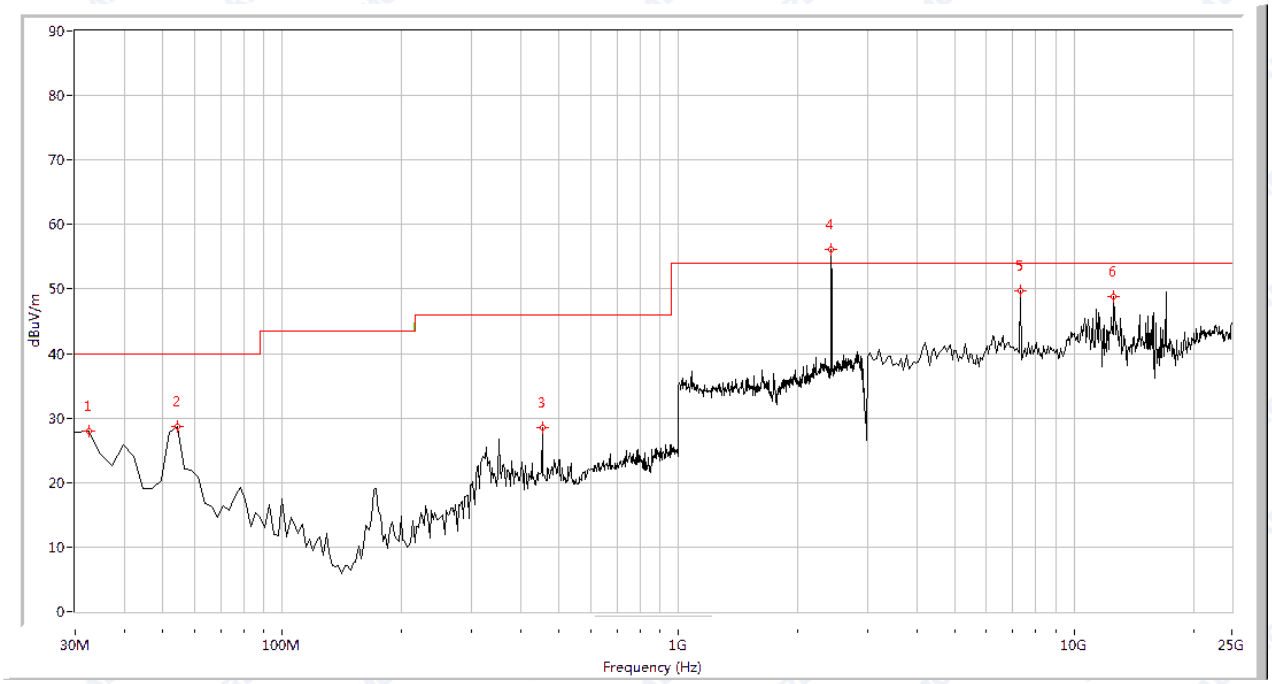
(30MHz to 25GHz, Antenna Vertical @8-DPSK, channel 0)

Plot for Channel = 39



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.419	31.20	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
351.721	26.96	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
453.317	28.06	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2441.000	64.28	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
7334.165	50.91	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
11394.015	49.12	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

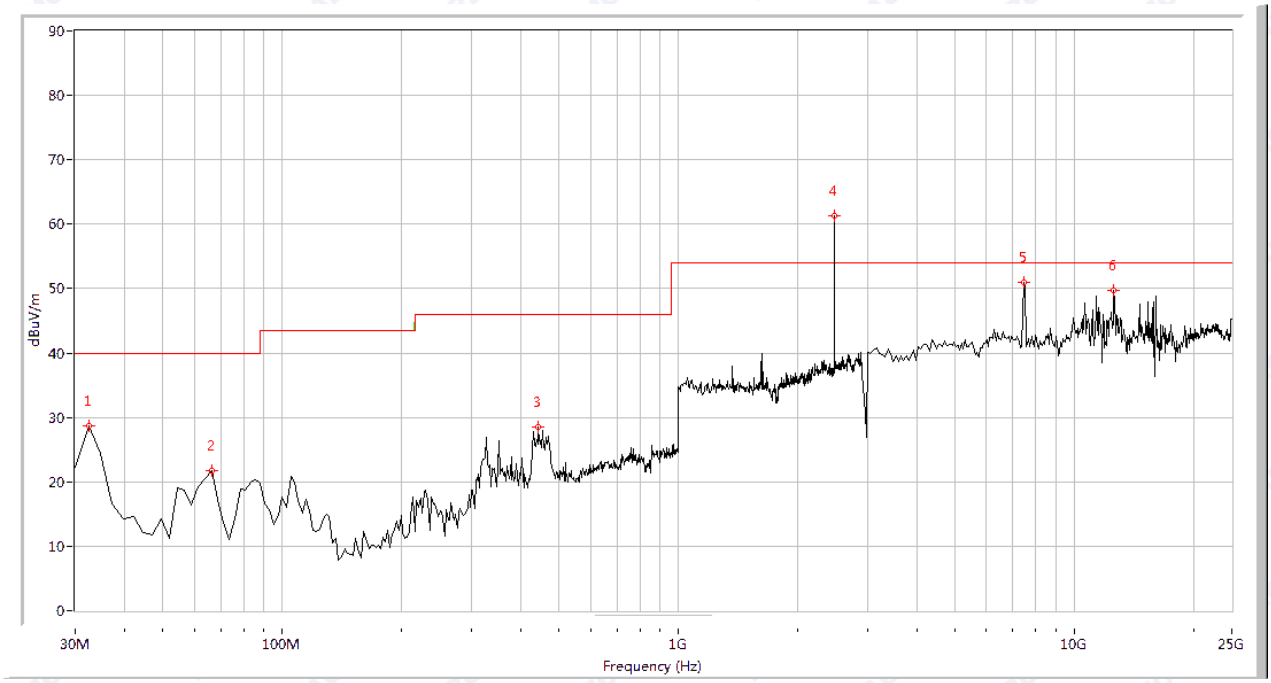
(30MHz to 25GHz, Antenna Horizontal @8-DPSK, channel 39)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.419	28.03	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
54.190	28.64	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
453.317	28.46	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
2441.000	56.20	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
7334.165	49.78	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
12600.998	48.87	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

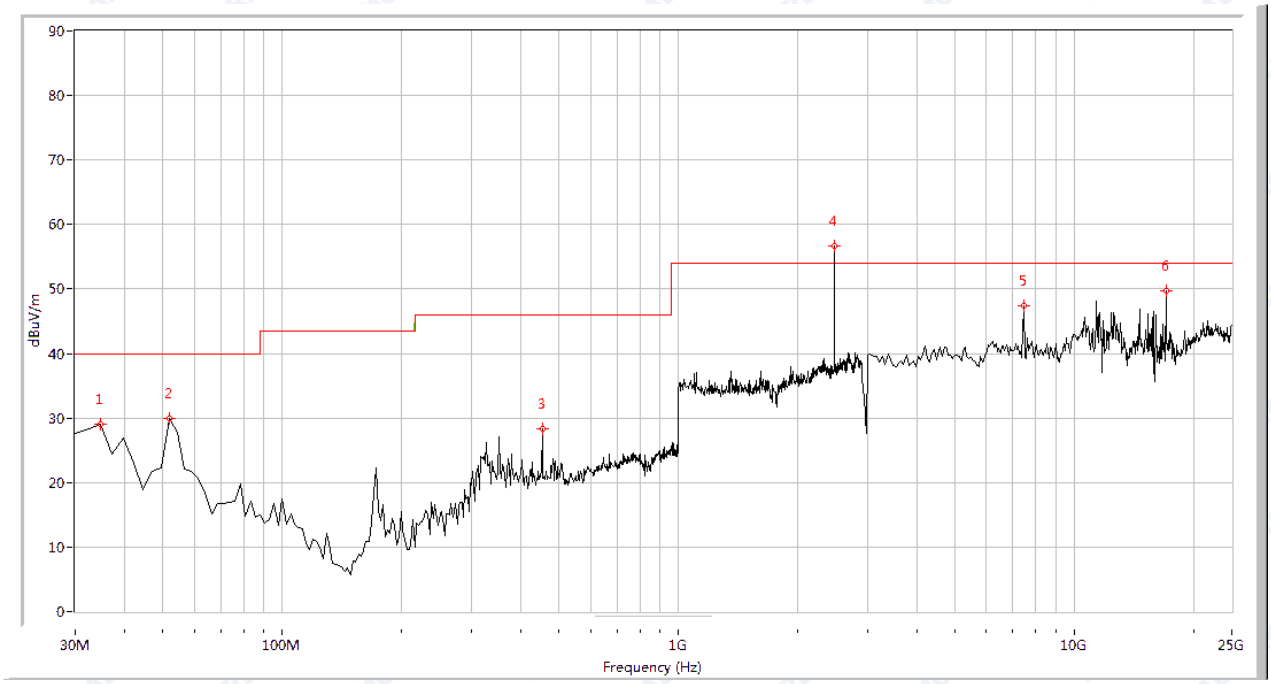
(30MHz to 25GHz, Antenna Vertical @8-DPSK, channel 39)

Plot for Channel = 78



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.419	28.67	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
66.284	21.81	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
443.641	28.56	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2480.000	61.23	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
7443.890	51.01	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
12600.998	49.78	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

(30MHz to 25GHz, Antenna Horizontal @8-DPSK, channel 78)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
34.838	29.12	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
51.771	29.99	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
453.317	28.37	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
2480.000	56.59	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
7443.890	47.46	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
17044.888	49.74	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

(30MHz to 25GHz, Antenna Vertical @8-DPSK, channel 78)

2.11. RF exposure evaluation

2.11.1. Requirement

According to § 1.1307(b)(1), systems operating under the provisions of this section shall be opera ted in a manner that ensure that the public is not exposed to radio frequency energy lever in exce ss of Commission's guideline.

2.11.2. Result

Please refer to SAR report.

3. General Information

1.1 Identification of the Responsible Testing Laboratory

Company Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Department:	Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Responsible Test Lab Manager:	Mr. Su Feng
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

1.2 Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

1.3 Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.1, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10 2009, ANSI C63.4 2009 and CISPR Publication 22; the FCC registration number is 695796.

The IC registration number is 7183A-2.

1.4 Test Equipments Utilized

1.4.1Conducted Test Equipments

Conducted Test Equipment						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal. Date**	**Cal. Due**
1	System Simulator	6K00006210	MT8852B	Anritsu	2014.02.26	2015.02.25
2	Spectrum Analyzer	MY45101810	E4407B	Agilent	2014.02.26	2015.02.25
3	Power Splitter	NW521	1506A	Weinschel	2014.02.26	2015.02.25
4	Attenuator 1	(n.a.)	10dB	Resnet	2014.02.26	2015.02.25
5	Attenuator 2	(n.a.)	3dB	Resnet	2014.02.26	2015.02.25
6	EXA Signal Analzyer	MY51440152	N9010A	Agilent	2014.02.26	2015.02.25
7	RF cable	CB01	RF01	Morlab	N/A	N/A
8	Coaxial cable	CB02	RF02	Morlab	N/A	N/A
9	SMA connector	CN01	RF03	HUBER-SUHNER	N/A	N/A

1.4.2Conducted Emission Test Equipments

Conducted Emission Test Equipments						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal. Date**	**Cal. Due**
1	Receiver	US44210471	E7405A	Agilent	2014.02.26	2015.02.25
2	LISN	812744	NSLK 8127	Schwarzbeck	2014.02.26	2015.02.25
3	Service Supplier	100448	CMU200	R&S	2014.02.26	2015.02.25
4	Pulse Limiter (20dB)	9391	VTSD 9561-D	Schwarzbeck	2014.02.26	2015.02.25
5	Coaxial cable(BNC)	CB01	EMC01	Morlab	N/A	N/A

1.4.3Radiated Test Equipments

Radiated Test Equipments						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal. Date**	**Cal.Due Date**
1	System Simulator	100448	CMU200	R&S	2014.02.26	2015.02.25
2	Receiver	US44210471	E7405A	Agilent	2014.02.26	2015.02.25
3	Test Antenna - Bi-Log	9163-274	9m*6m*6m	Albatross	2014.02.26	2015.02.25
4	Test Antenna - Horn	9120D-963	VULB 9163	Schwarzbeck	2014.02.26	2015.02.25
5	Test Antenna - Horn	71688	BBHA 9120D	Schwarzbeck	2014.02.26	2015.02.25
6	Test Antenna - Loop	1519-022	HL050S7	R&S	2014.02.26	2015.02.25
7	Reject Filter	(n.a.)	BRM50702	Micro-Tronics	2014.02.26	2015.02.25
8	Coaxial cable (N male)	CB02	EMC02	Morlab	N/A	N/A
9	Coaxial cable (N male)	CB03	EMC03	Morlab	N/A	N/A

1.4.4Climate Chamber

Climate Chamber						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal.Date**	**Cal.Due Date**
1	Climate Chamber	2004012	HL4003T	Yinhe	2014.02.26	2015.02.25

1.4.5Vibration Table

Vibration Table						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal.Date**	**Cal.Due Date**
1	Vibration Table	N/A	ACT2000-S015L	CMI-COM	2014.02.26	2015.02.25

1.4.6Anechoic Chamber

Anechoic Chamber						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal.Date**	**Cal.Due Date**
1	Anechoic Chamber	N/A	9m*6m*6m	Albatross	2014.02.26	2015.02.25

***** END OF REPORT *****