REPORT No.: SZ15020015W02

FCC RF TEST REPORT

APPLICANT	:	ZTE Corporation
PRODUCT NAME	:	CDMA2000 Mobile Phone Handset
MODEL NAME	:	ZTE R144C
TRADE NAME	:	ZTE
BRAND NAME	:	ZTE
FCC ID	:	SRQ-R144C
STANDARD(S)	:	47 CFR Part 15 Subpart C
ISSUE DATE	:	2015-3-4

SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.

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DIRECTORY

TEST REPORT DECLARATION 4

1. TECHNICAL INFORMATION 5

1.1 APPLICANT INFORMATION 5
1.2 EQUIPMENT UNDER TEST (EUT) DESCRIPTION 5
1.2.1 IDENTIFICATION OF ALL USED EUTS 5
1.3 TEST STANDARDS AND RESULTS 6
1.3.1 TEST ENVIRONMENT CONDITIONS 6

2. 47 CFR PART 15C REQUIREMENTS 7

2.1 ANTENNA REQUIREMENT 7
2.1.1 APPLICABLE STANDARD 7
2.1.2 RESULT: COMPLIANT 7
2.2 NUMBER OF HOPPING FREQUENCY 7
2.2.1 REQUIREMENT 7
2.2.2 TEST DESCRIPTION 7
2.2.3 TEST PROCEDURE 8
2.2.4 TEST RESULT 8
2.3 PEAK OUTPUT POWER 12
2.3.1 REQUIREMENT 12
2.3.2 TEST DESCRIPTION 12
2.3.3 TEST RESULT 12
2.4 20DB BANDWIDTH 14
2.4.1 DEFINITION 14
2.4.2 TEST DESCRIPTION 14
2.4.3 TEST PROCEDURE 14
2.4.4 TEST RESULT 14
2.5 CARRIED FREQUENCY SEPARATION 21
2.5.1 DEFINITION 21
2.5.2 TEST DESCRIPTION 21
2.5.3 TEST PROCEDURE 21
2.5.4 TEST RESULT 22
2.6 TIME OF OCCUPANCY (DWELL TIME) 24

2.6.1 REQUIREMENT 24
2.6.2 TEST DESCRIPTION 24
2.6.3 TEST PROCEDURE 24
2.6.4 TEST RESULT 25
2.7 CONDUCTED SPURIOUS EMISSIONS 36
2.7.1 REQUIREMENT 36
2.7.2 TEST DESCRIPTION 36
2.7.3 TEST PROCEDURE 36
2.7.4 TEST RESULT 37
2.8 RESTRICTED FREQUENCY BANDS 49
2.8.1 REQUIREMENT 49
2.8.2 TEST DESCRIPTION 49
2.8.3 TEST PROCEDURE 50
2.8.4 TEST RESULT 50
2.9 CONDUCTED EMISSION 59
2.9.1 REQUIREMENT 59
2.9.2 TEST DESCRIPTION 59
2.9.3 TEST RESULT 60
2.10 RADIATED EMISSION 62
2.10.1 REQUIREMENT 62
2.10.2 TEST DESCRIPTION 63
2.10.3 TEST PROCEDURE 65
2.10.4 TEST RESULT 65
2.11 RF EXPOSURE EVALUATION 75
2.11.1 REQUIREMENT 75
2.11.2 RESULT 75

ANNEX A GENERAL INFORMATION 76

Change History		
Issue	Date	Reason for change
1.0	2015-3-4	First edition

TEST REPORT DECLARATION

Applicant	ZTE Corporation
Applicant Address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R.China
Manufacturer	ZTE Corporation
Manufacturer Address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R.China
Product Name	CDMA2000 Mobile Phone Handset
Model Name	ZTE R144C
Brand Name	ZTE
HW Version	R144C_V1AMB_B
SW Version	R144C_S_MH8J3001
Test Standards	47 CFR Part 15 Subpart C
Test Date	2015-2-4 to 2015-2-17
Test Result	PASS

Tested by : Zou Jian

Zou Jian

Reviewed by : Qiu Xiaojun

Qiu Xiaojun

Approved by : Zeng Dexin

Zeng Dexin

1. TECHNICAL INFORMATION

Note: Provide by applicant.

1.1 Applicant Information

Company:	ZTE Corporation
Address:	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R.China

1.2 Equipment under Test (EUT) Description

Brand Name:	ZTE
Trade Name:	ZTE
Model Name:	ZTE R144C
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), π/4-DQPSK(EDR 2Mbps), 8-DPSK(EDR 3Mbps))
Bluetooth Version:	2.1+EDR
Antenna Type:	PIFA Antenna
Antenna Gain:	-1.5dBi

NOTE:

The EUT is a CDMA2000 Mobile Phone 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.

1.2.1 Identification of all used EUTs

The EUT identity consists of numerical and letter characters, the letter character indicates the test sample, and the following two numerical characters indicate the software version of the test sample.

EUT Identity	Hardware Version	Software Version
A01	R144C_V1AMB_B	R144C_S_MH8J3001

1.3 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.

1.3.1 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.

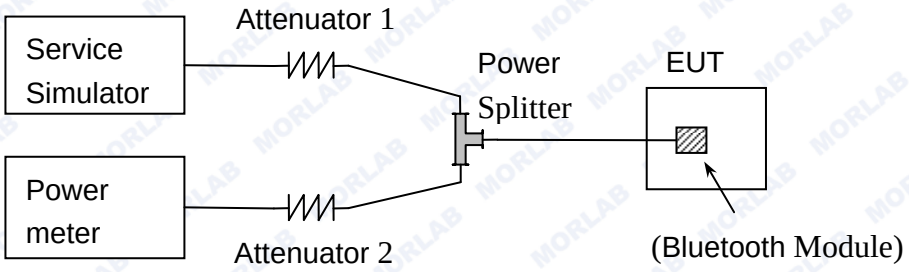
2.2 Number of Hopping Frequency

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.

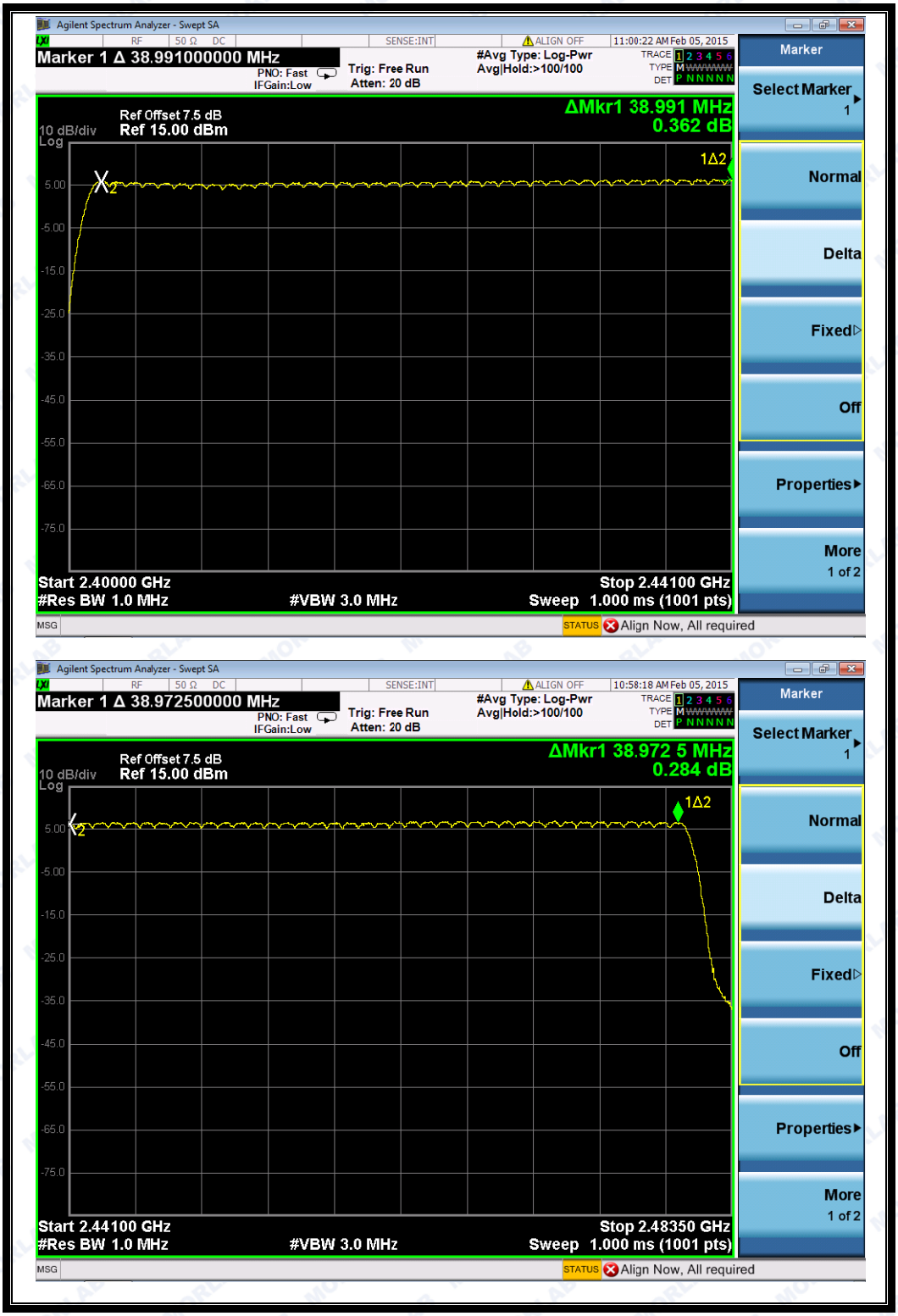
A. Test Verdict:

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

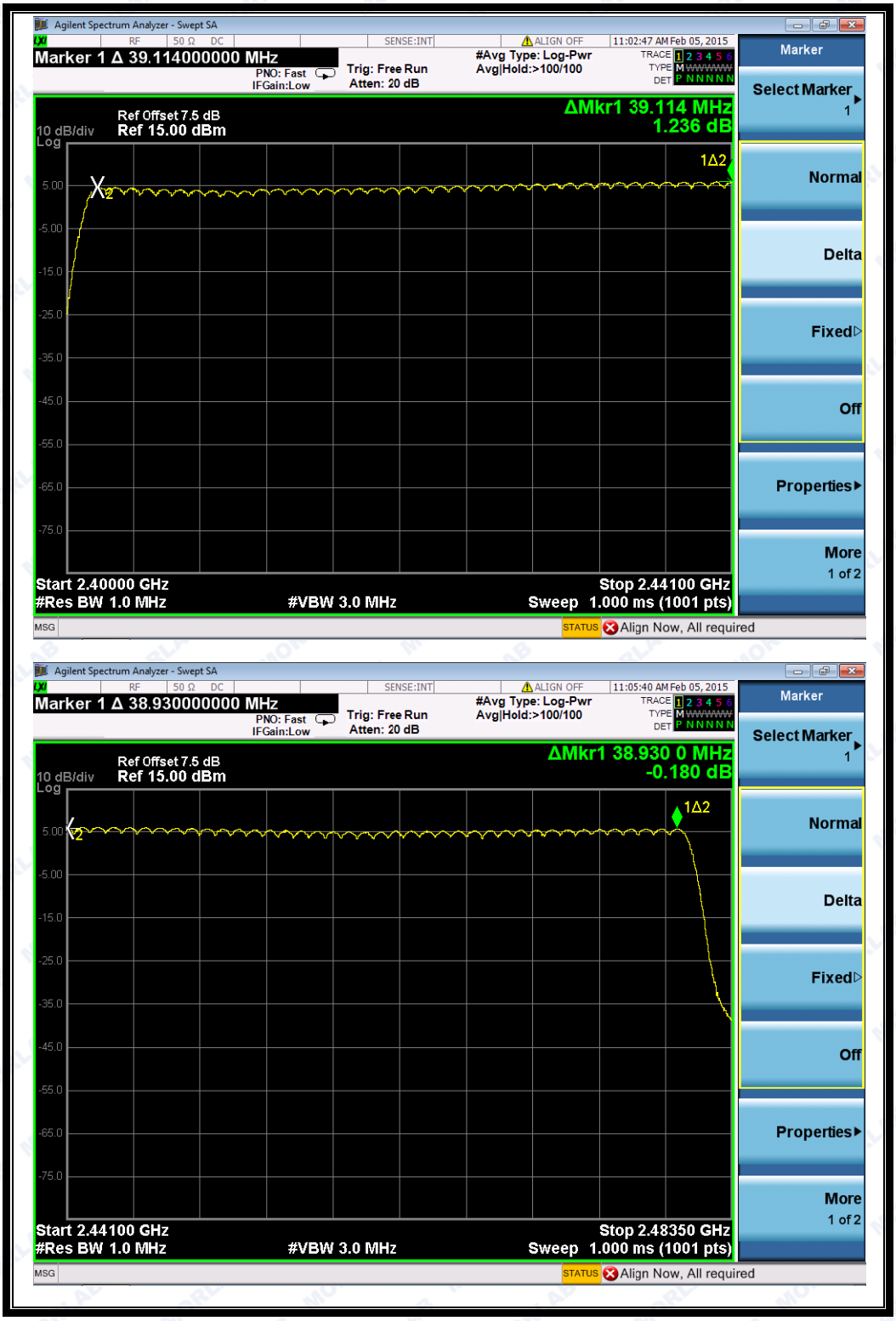
B. Test Plots:

Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 38.888500000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
#Avg Type: Log-Pwr
Avg|Hold:>100/100
10:54:50 AM Feb 05, 2015
Ref Offset 7.5 dB
10 dB/div
Ref 15.00 dBm
ΔMkr1 38.889 MHz
0.251 dB
Start 2.40000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 2.44100 GHz
Sweep 1.067 ms (2001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2
Align Now, All required
Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 39.036250000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
#Avg Type: Log-Pwr
Avg|Hold:>100/100
10:55:59 AM Feb 05, 2015
Ref Offset 7.5 dB
10 dB/div
Ref 15.00 dBm
ΔMkr1 39.036 MHz
0.343 dB
Start 2.44100 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 2.48350 GHz
Sweep 1.067 ms (2001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2
Align Now, All required

(Plot A: GFSK)



(Plot B: π/4-DQPSK)


Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 39.114000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
#Avg Type: Log-Pwr
Avg|Hold:>100/100
11:02:47 AM Feb 05, 2015
Ref Offset 7.5 dB
10 dB/div
Ref 15.00 dBm
ΔMkr1 39.114 MHz
1.236 dB
Start 2.40000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 2.44100 GHz
Sweep 1.000 ms (1001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2
Align Now, All required
Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 38.930000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
#Avg Type: Log-Pwr
Avg|Hold:>100/100
11:05:40 AM Feb 05, 2015
Ref Offset 7.5 dB
10 dB/div
Ref 15.00 dBm
ΔMkr1 38.930 0 MHz
-0.180 dB
Start 2.44100 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 2.48350 GHz
Sweep 1.000 ms (1001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2
Align Now, All required

(Plot C: 8- DPSK)

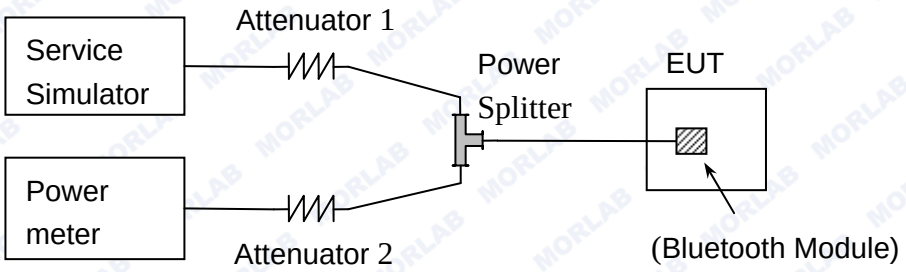
2.3 Peak Output Power

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	6.627	0.004599	20.97	0.125	PASS
39	2441	7.447	0.005555			PASS
78	2480	7.339	0.005419			PASS

2.3.3.2 π/4-DQPSK Mode

B. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
0	2402	6.002	0.003983	20.97	0.125	PASS
39	2441	7.001	0.005013			PASS
78	2480	6.643	0.004616			PASS

2.3.3.3 8-DPSK Mode

C. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
0	2402	4.957	0.003131	20.97	0.125	PASS
39	2441	6.003	0.003984			PASS
78	2480	5.825	0.003824			PASS

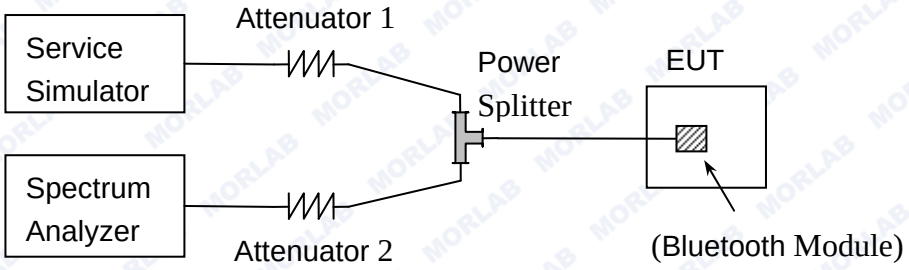
2.4 20dB Bandwidth

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.

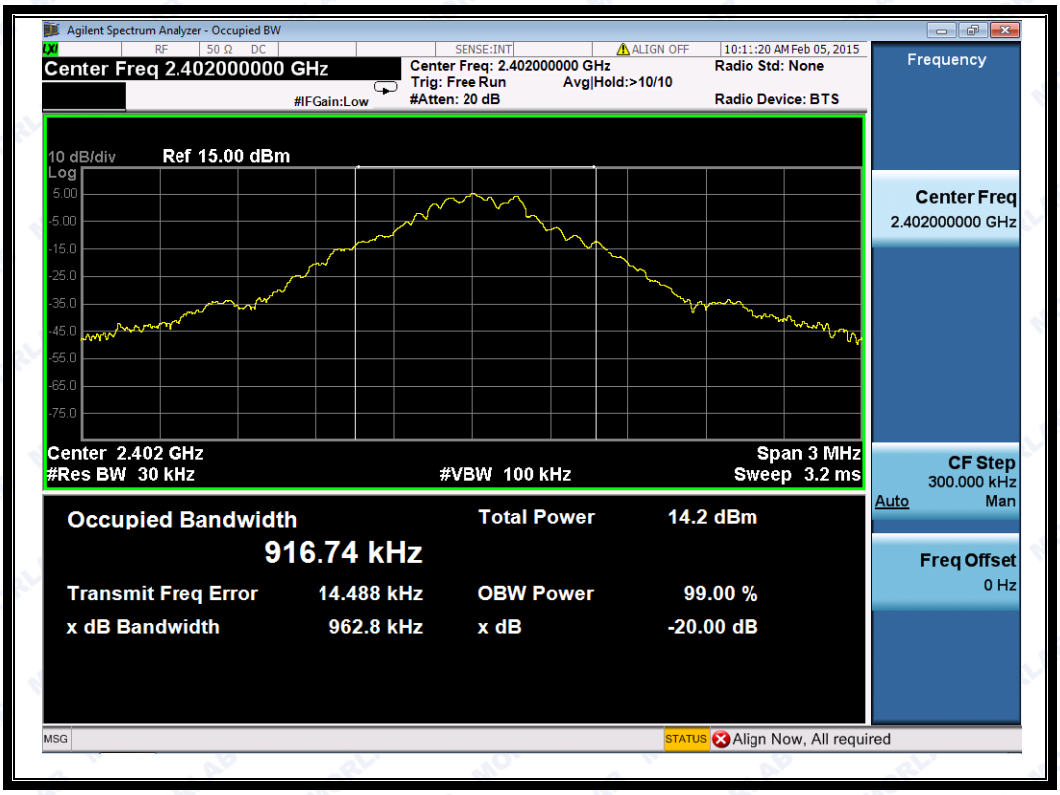
2.4.4.1 GFSK Mode

A. Test Verdict:

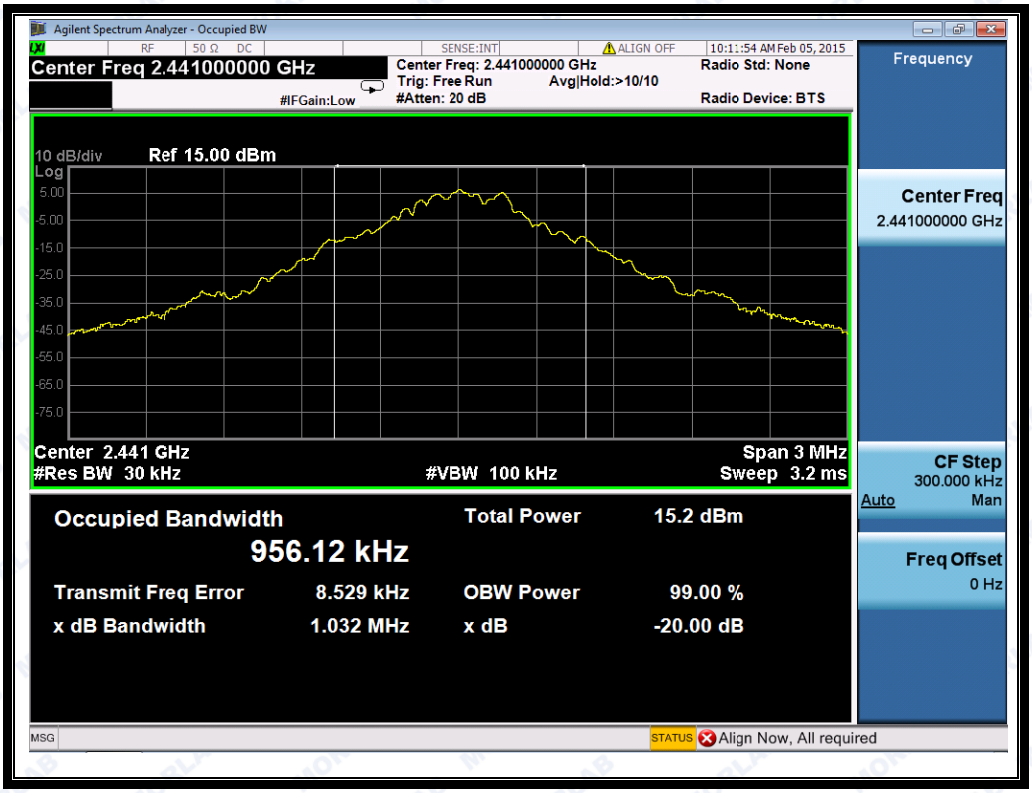
The maximum 20dB bandwidth measured is 1.032MHz according to the table below.

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Refer to Plot
0	2402	0.9628	Plot A
39	2441	1.032	Plot B
78	2480	1.023	Plot C

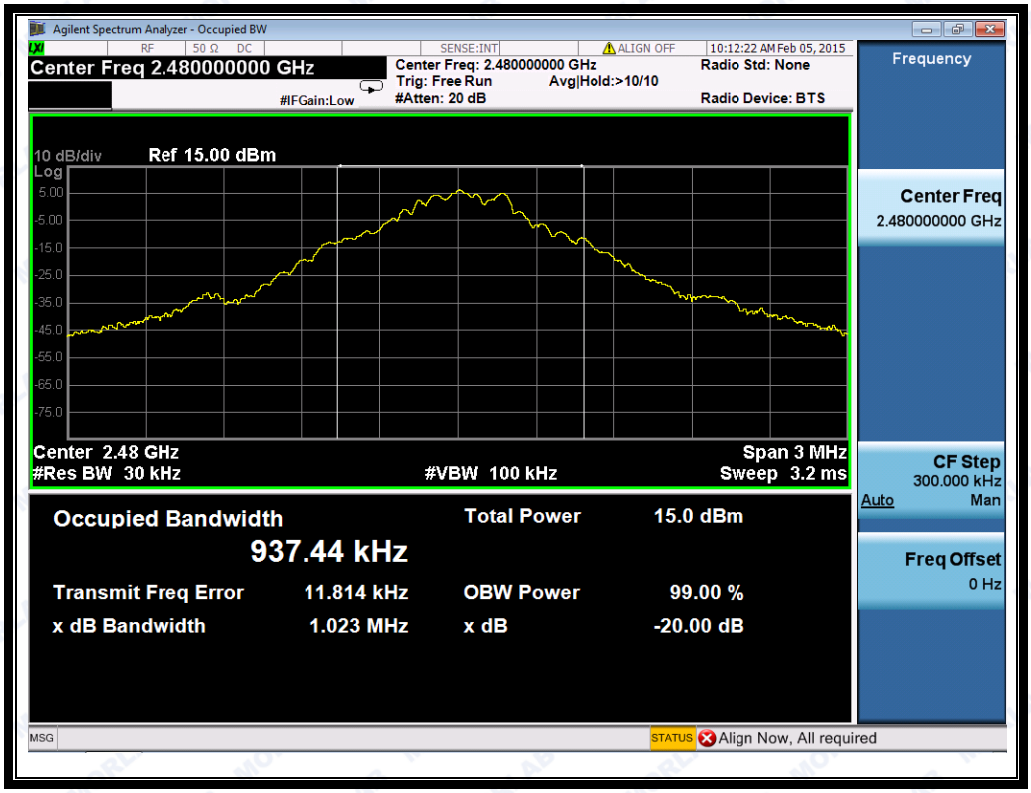
B. Test Plots:



(Plot A: Channel = 2402 @ GFSK)



(Plot B: Channel = 2441 @ GFSK)



(Plot C: Channel = 2480 @ GFSK)

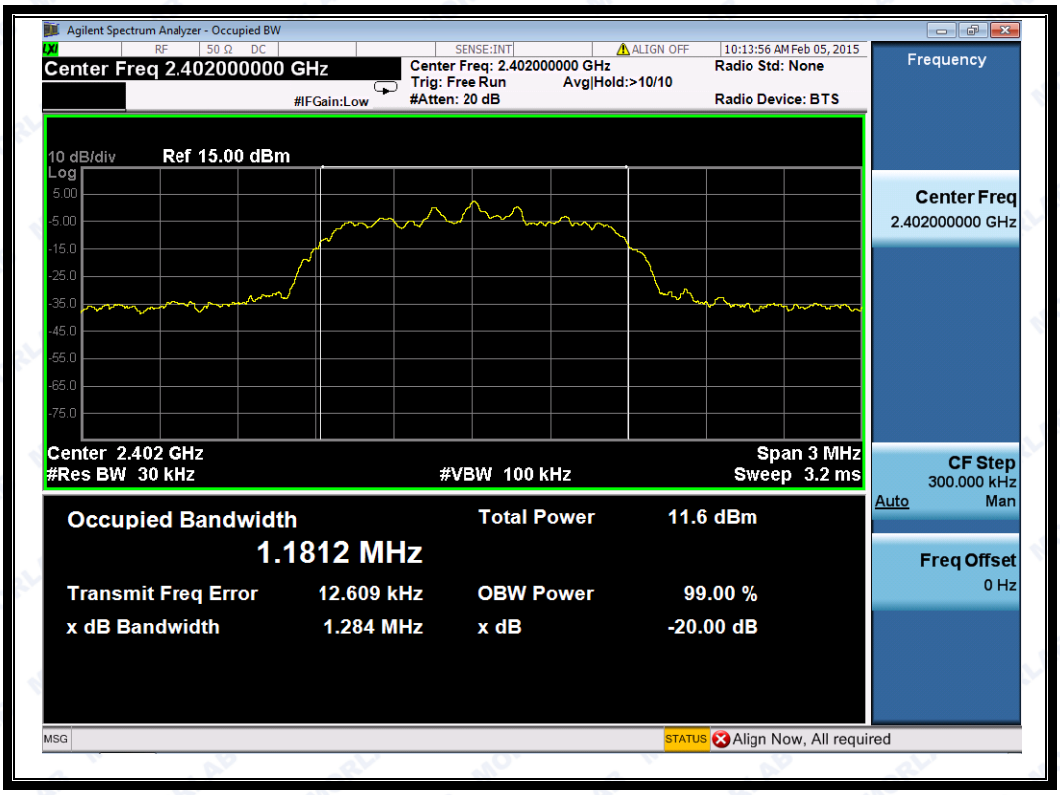
2.4.4.2 π /4-DQPSK Mode

A. Test Verdict:

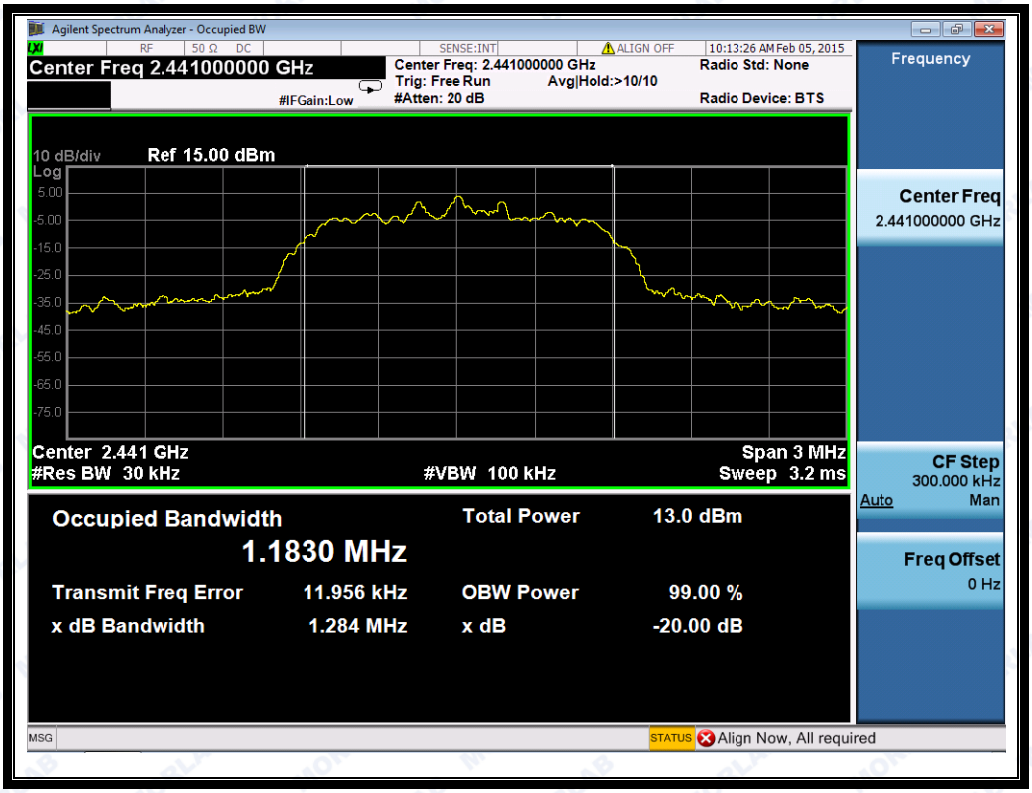
The maximum 20dB bandwidth measured is 1.287MHz according to the table below.

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Refer to Plot
0	2402	1.284	Plot D
39	2441	1.284	Plot E
78	2480	1.287	Plot F

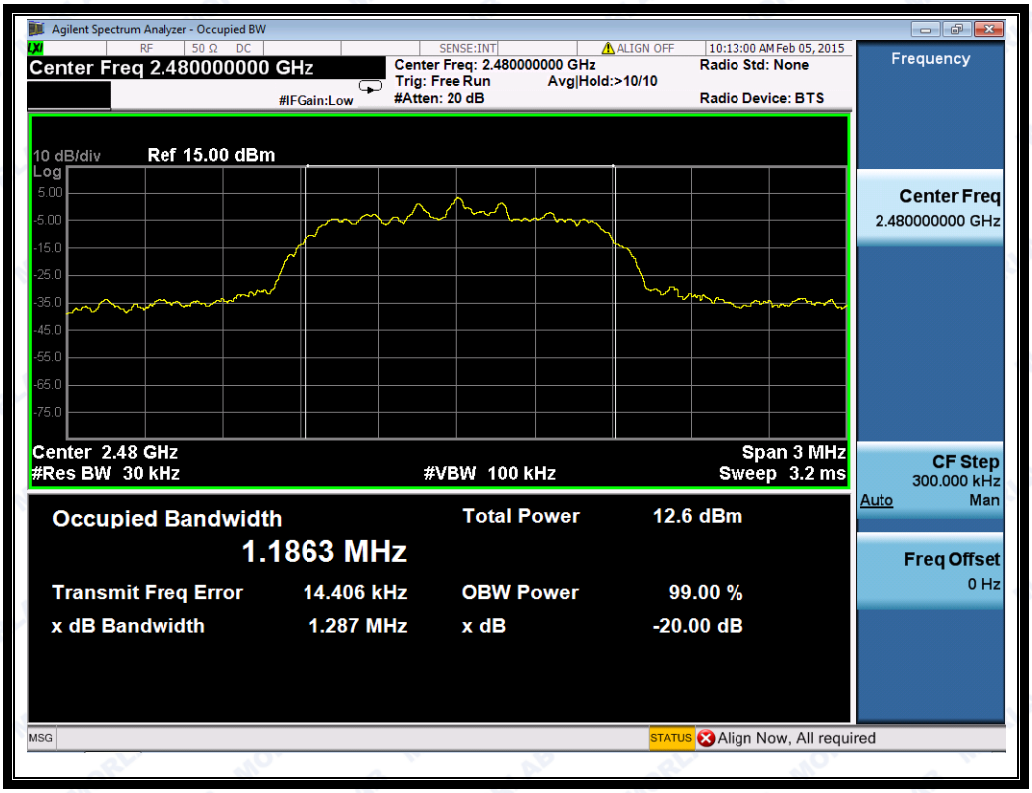
B. Test Plots:



(Plot D: Channel = 2402 @ π/4-DQPSK)



(Plot E: Channel = 2441 @ π/4-DQPSK)



(Plot F: Channel = 2480 @ π/4-DQPSK)

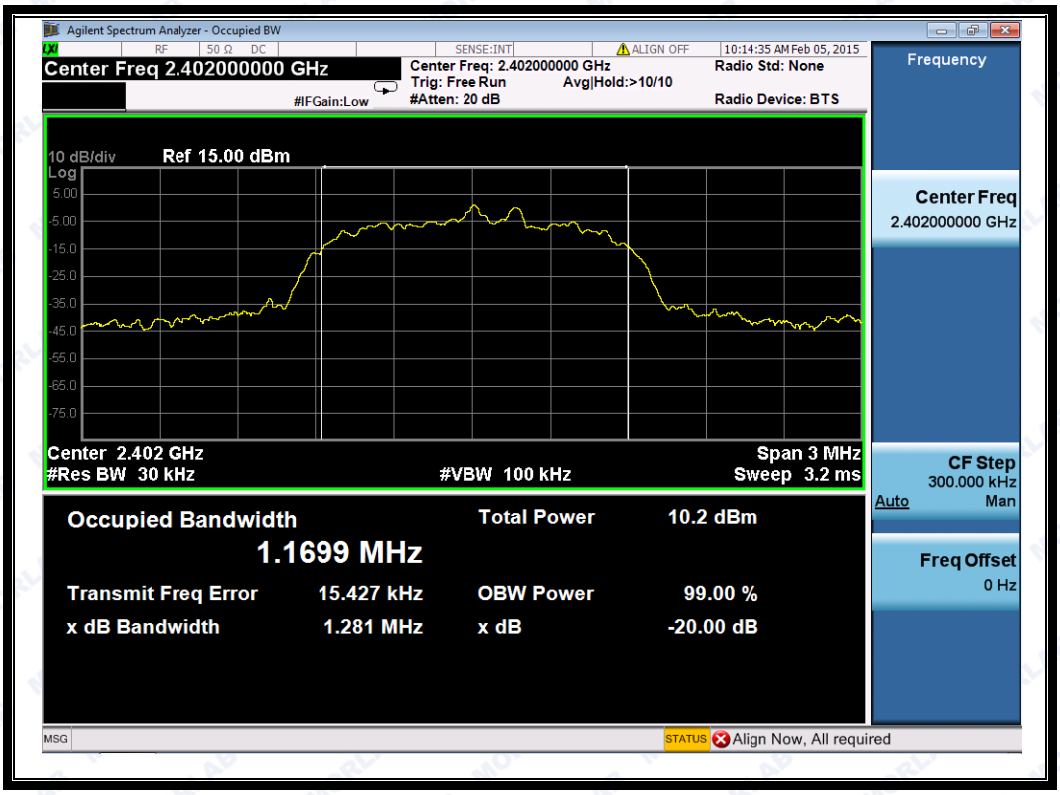
2.4.4.3 8-DPSK Mode

A. Test Verdict:

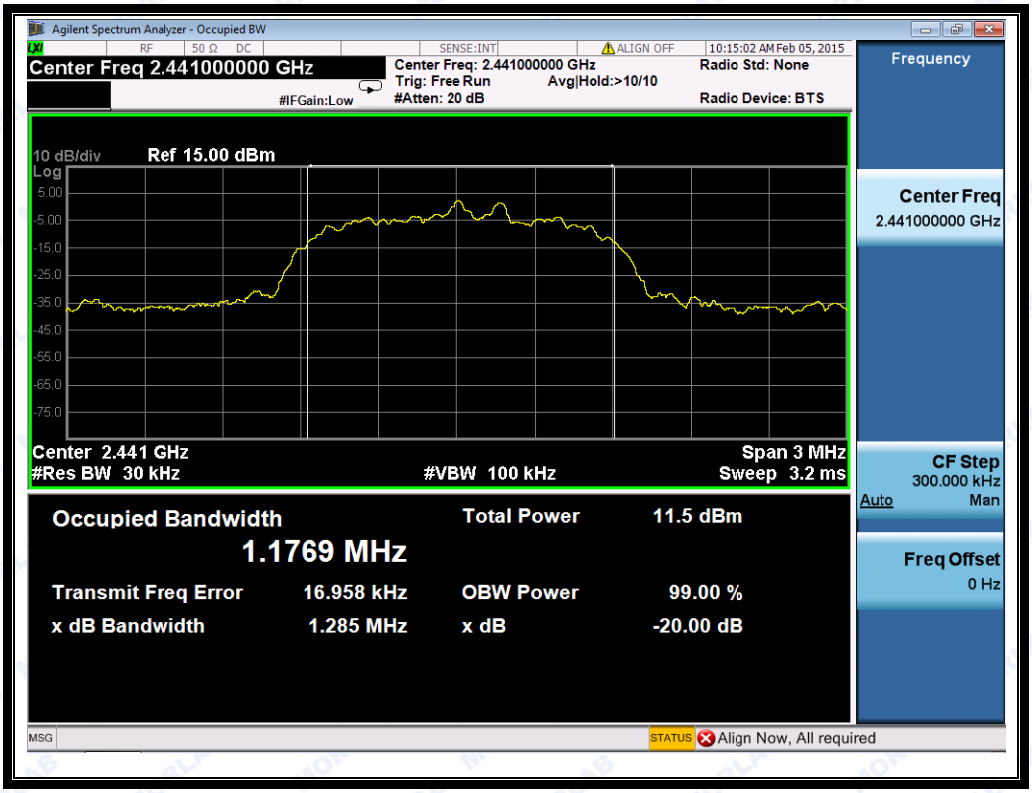
The maximum 20dB bandwidth measured is 1.285MHz according to the table below.

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Refer to Plot
0	2402	1.281	Plot G
39	2441	1285	Plot H
78	2480	1.285	Plot I

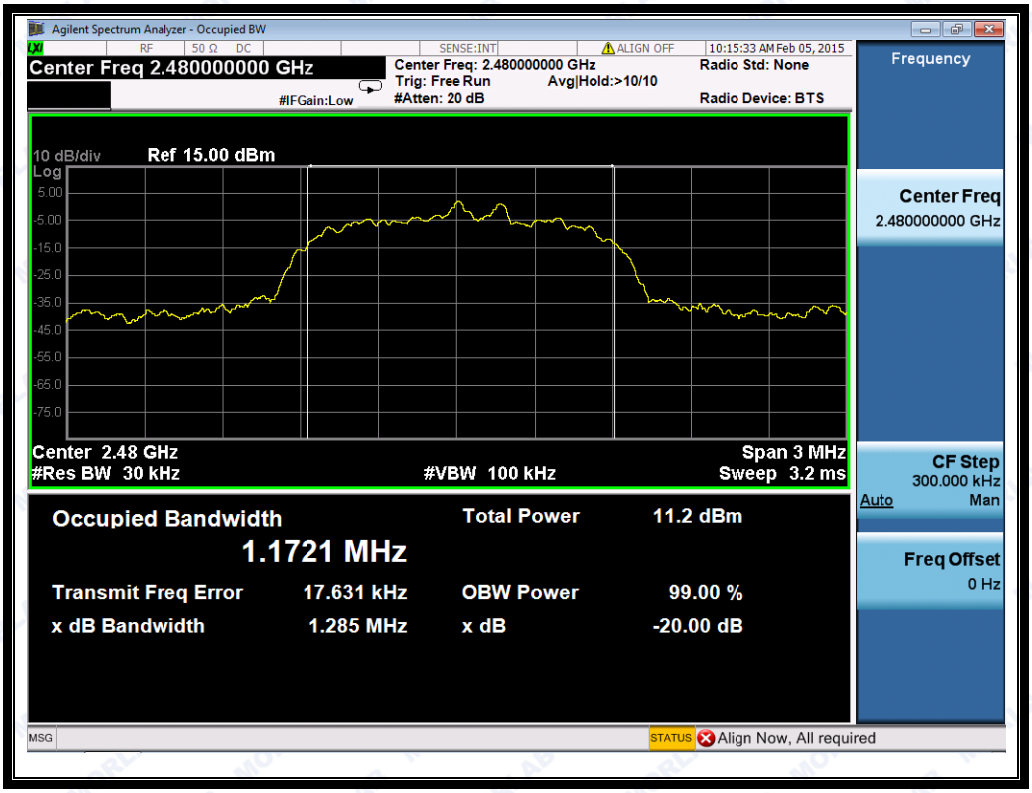
B. Test Plots:



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



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



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

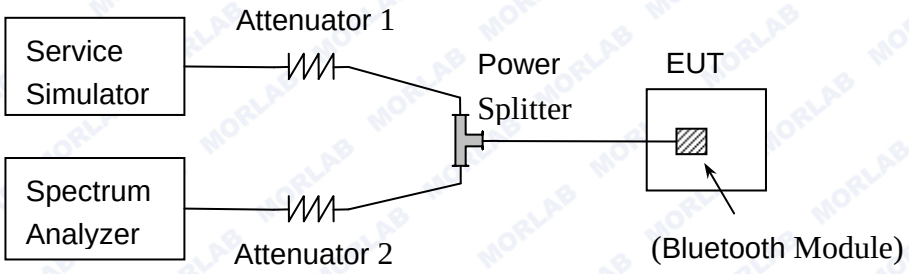
2.5 Carried Frequency Separation

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

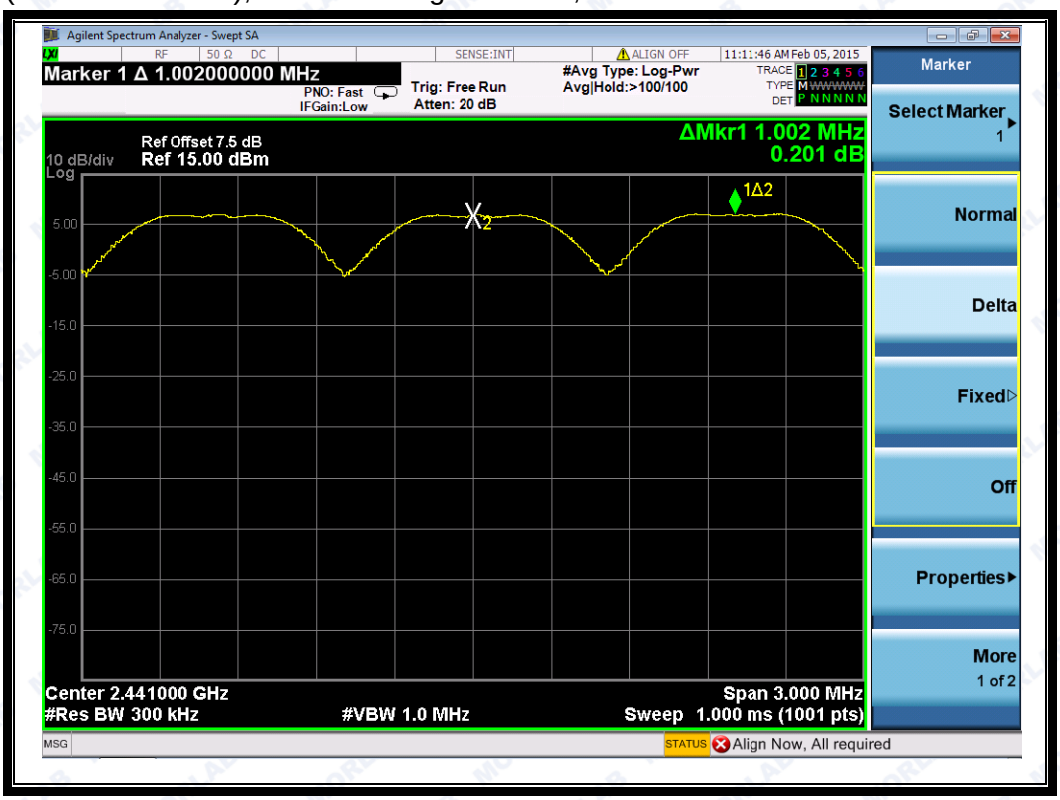
Detector function = peak

Trace = max hold

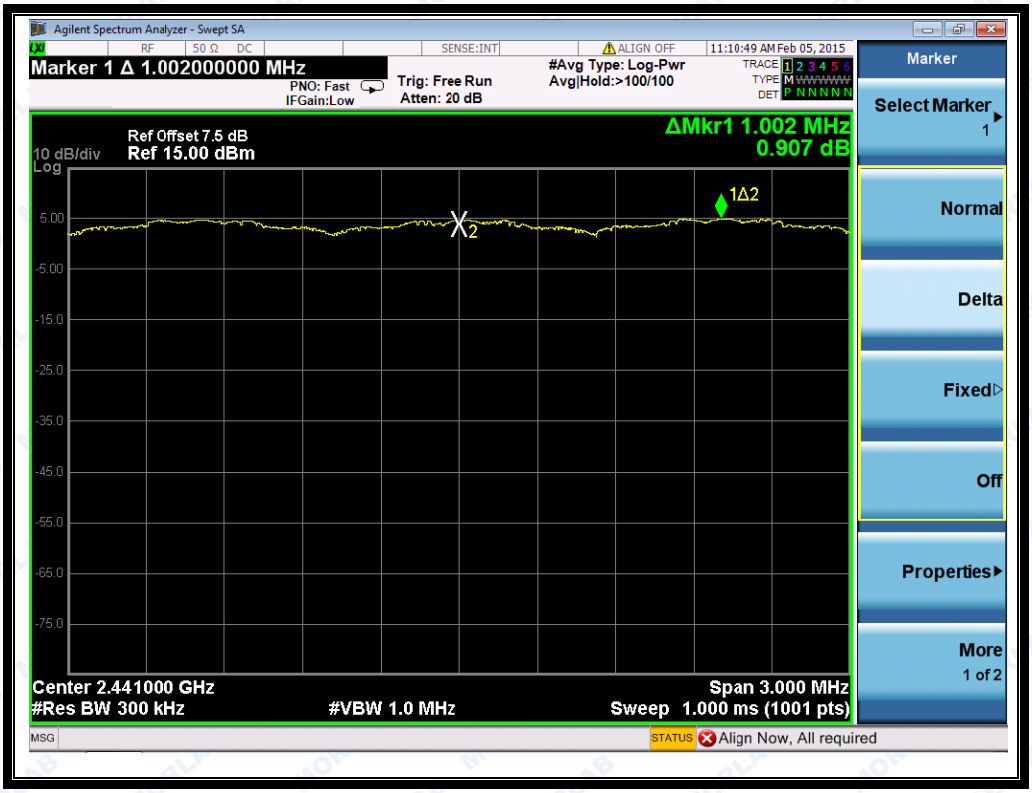
Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

2.5.4 Test Result

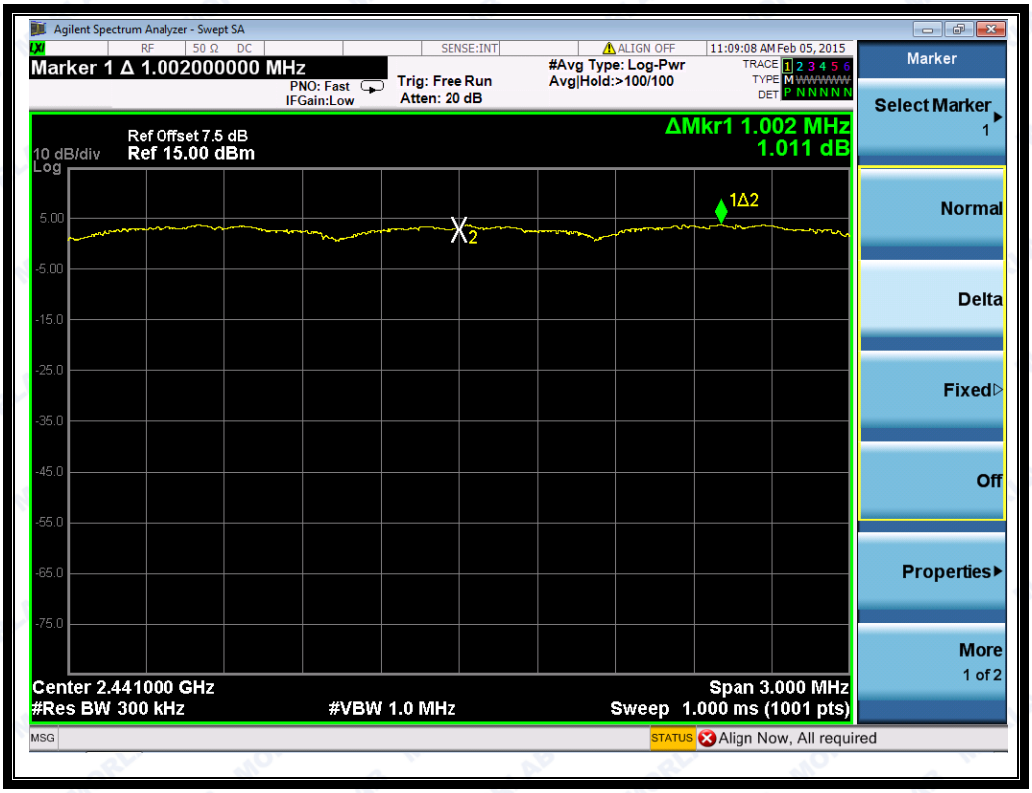
The Bluetooth Module operates at hopping-on test mode. For any adjacent channels (e.g. the channel 39 and 40 as showed in the Plot A), the Module does have hopping channel carrier frequencies separated by a minimum of 25kHz or two-thirds of the 20dB bandwidth of the hopping channel (refer to section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



(Plot A: GFSK)



(Plot B: π/4-DQPSK)



(Plot C: 8-DPSK)

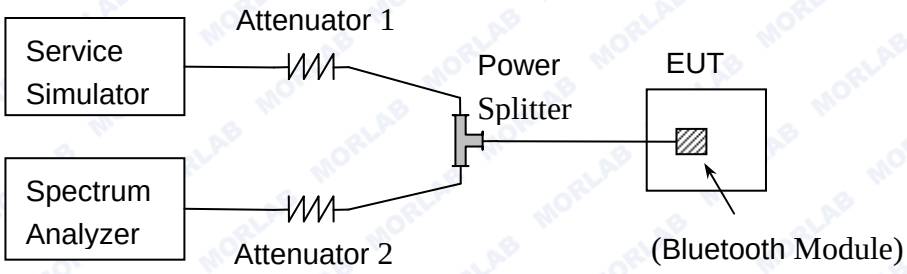
2.6 Time of Occupancy (Dwell time)

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:



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).

2.6.3 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.

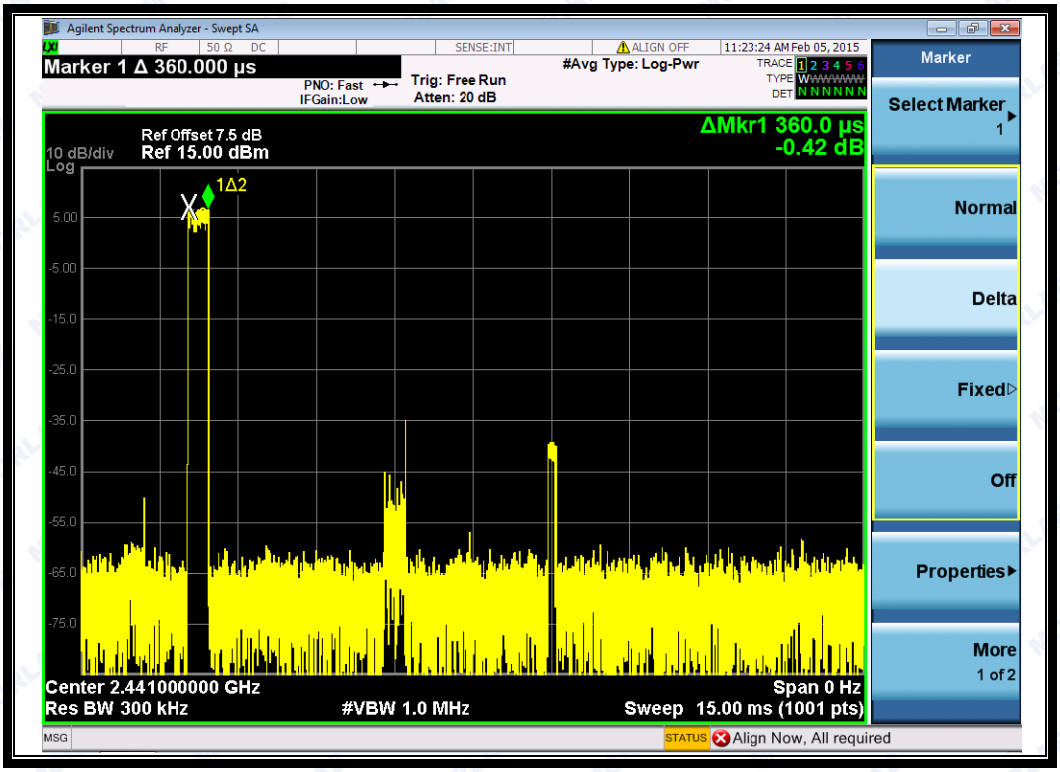
2.6.4 Test Result

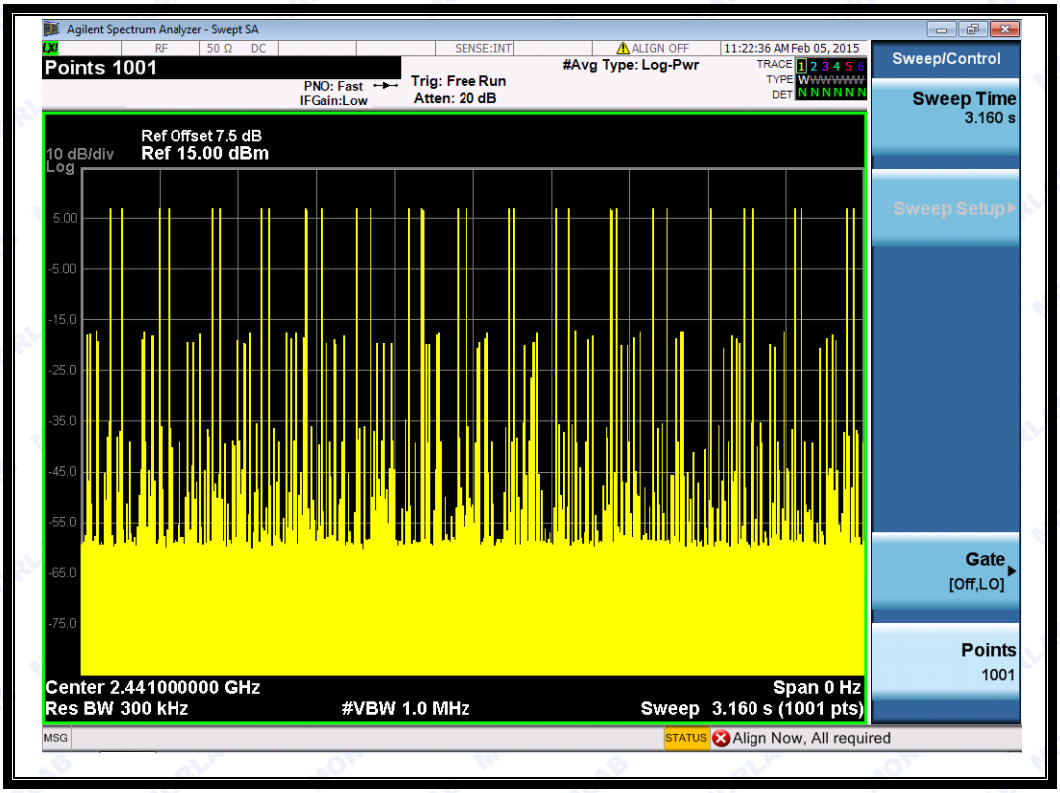
2.6.4.1 GFSK Mode

A. Test Verdict:

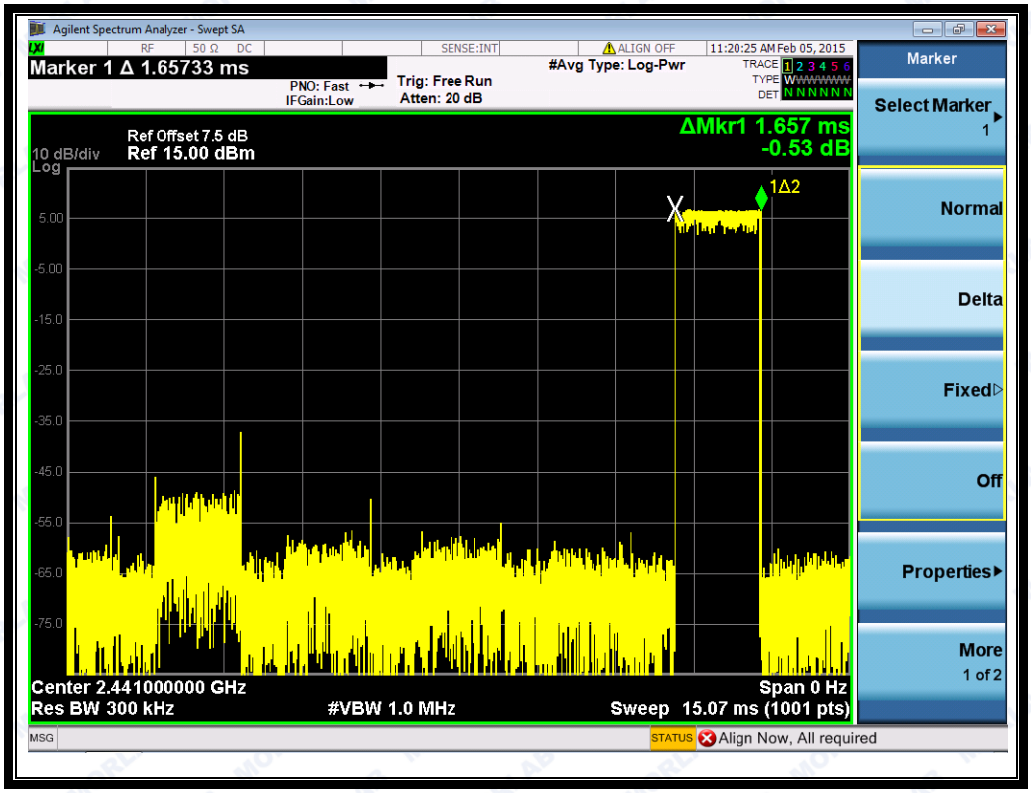
DH Packet	Pulse Width (msec)	Number of pulse in 3.16 seconds	Refer to Plot	Average Time of Occupancy (sec)	Limit (sec)	Verdict
DH1	0.360	31	Plot A	0.01116	0.4	PASS
DH3	1.657	18	Plot B	0.029826		PASS
DH5	2.910	11	Plot C	0.03201		PASS

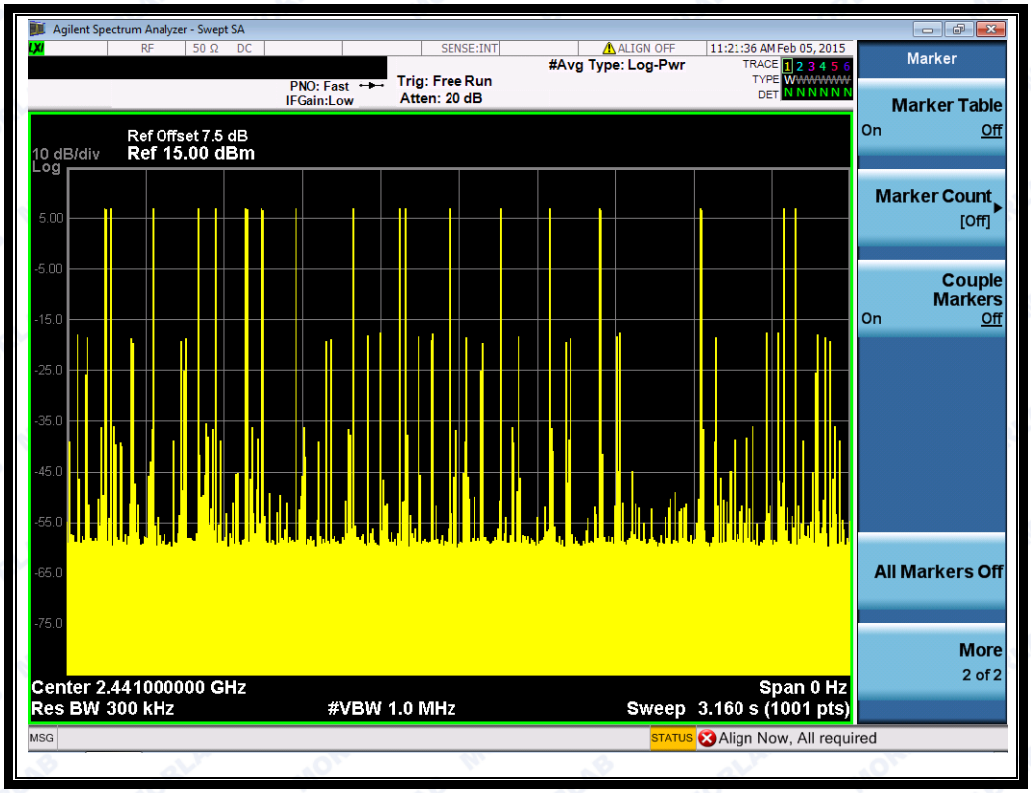
B. Test Plots:



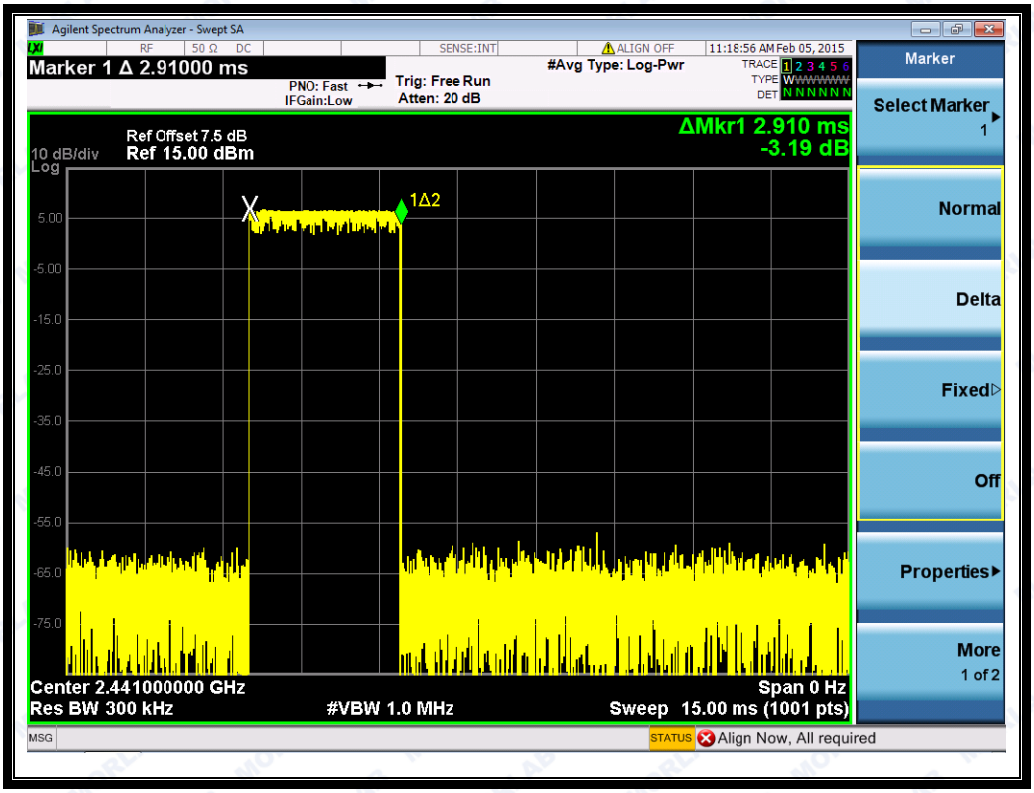


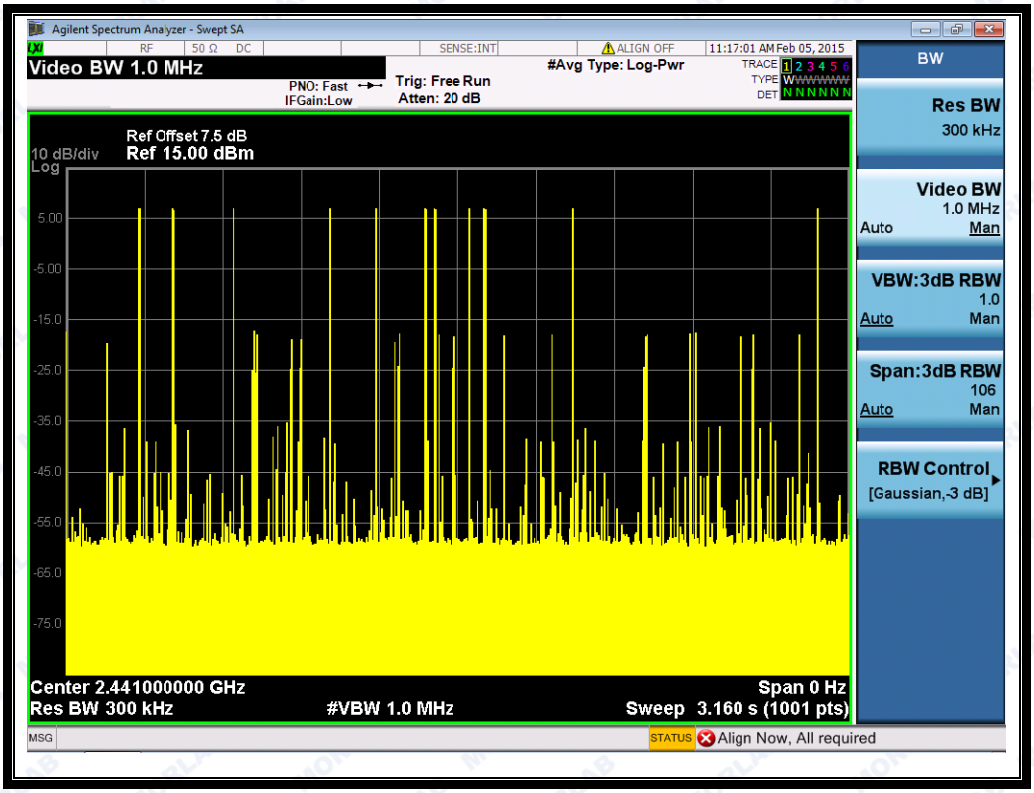
(Plot A: DH1 @ GFSK)





(Plot B: DH3 @ GFSK)





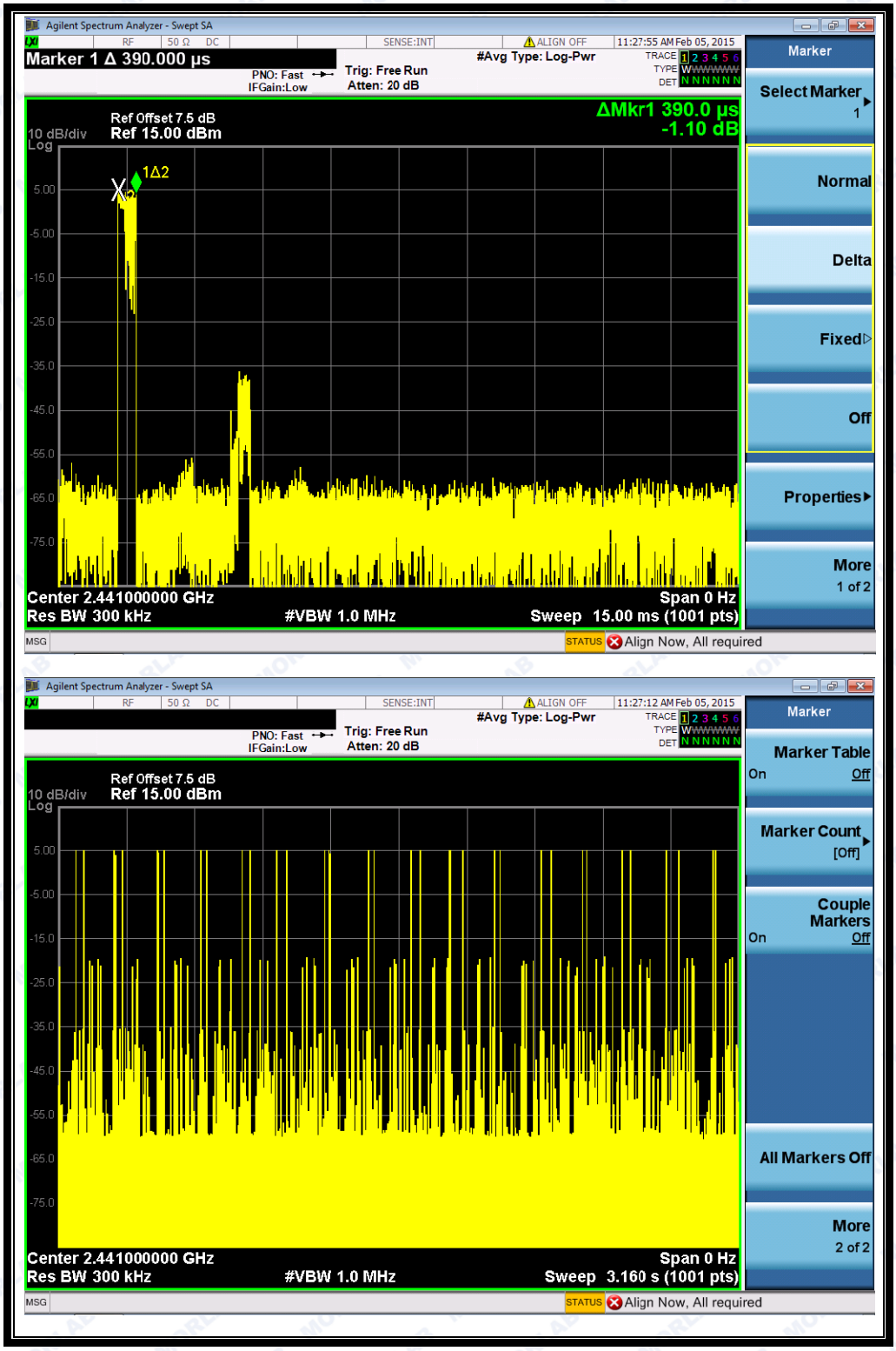
(Plot C: DH5 @ GFSK)

2.6.4.2 π/4-DQPSK Mode

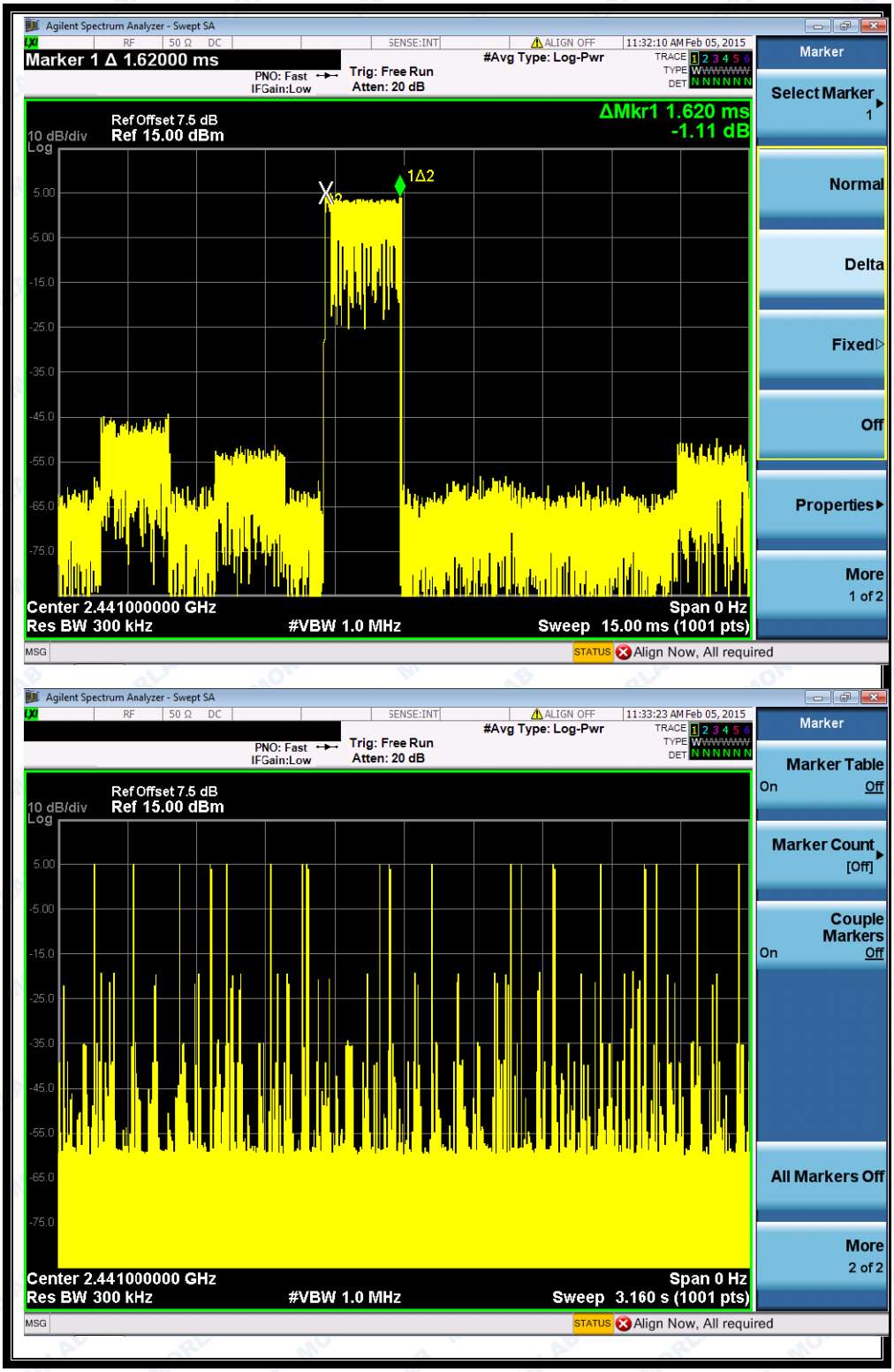
A. Test Verdict:

DH Packet	Pulse Width (msec)	Number of pulse in 3.16 seconds	Refer to Plot	Average Time of Occupancy (sec)	Limit (sec)	Verdict
DH1	0.390	31	Plot A	0.01209	0.4	PASS
DH3	1.620	19	Plot B	0.03078		PASS
DH5	2.850	12	Plot C	0.0342		PASS

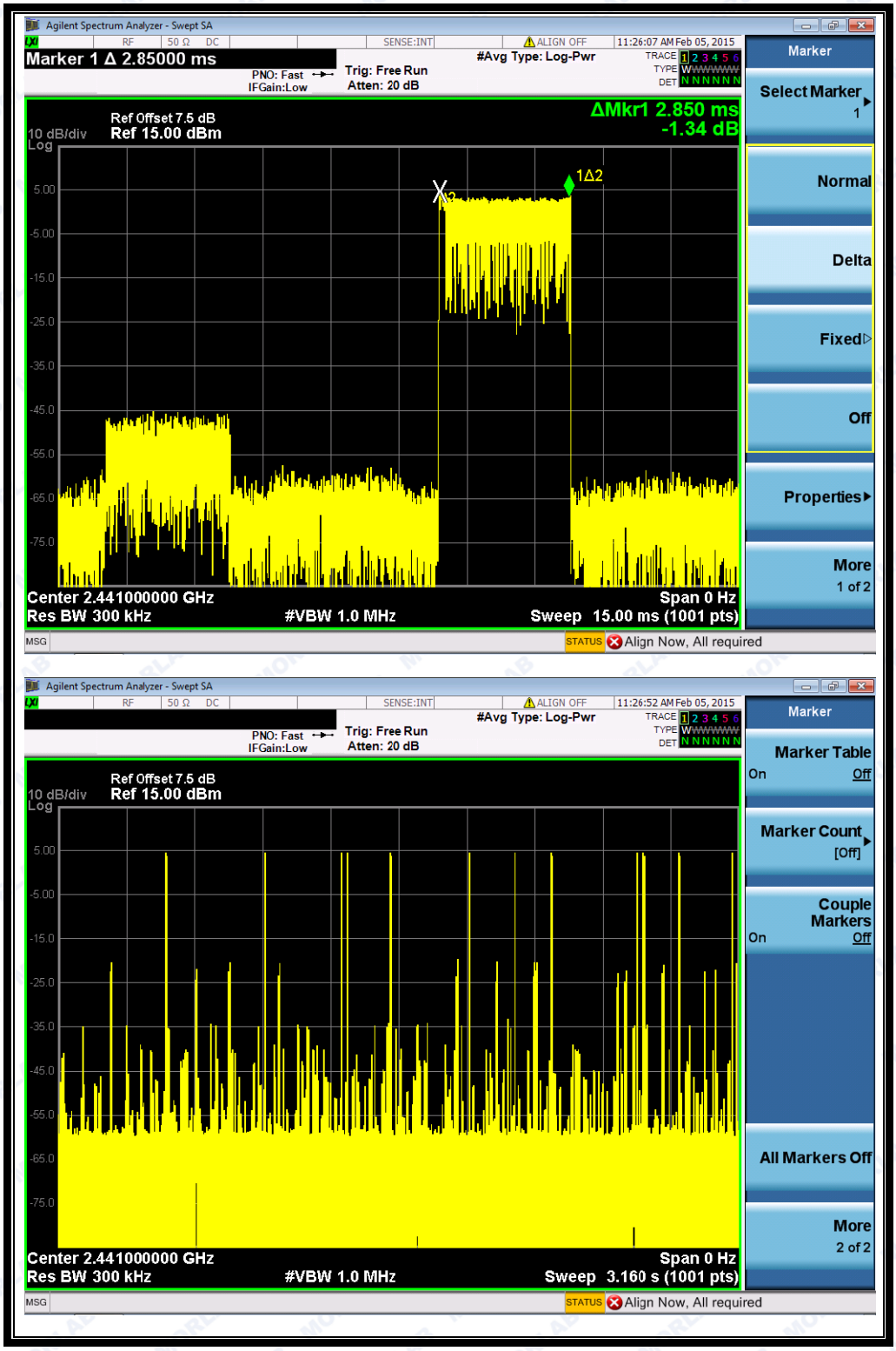
B. Test Plots:



(Plot D: DH1 @ π/4-DQPSK)



(Plot E: DH3 @ π/4-DQPSK)



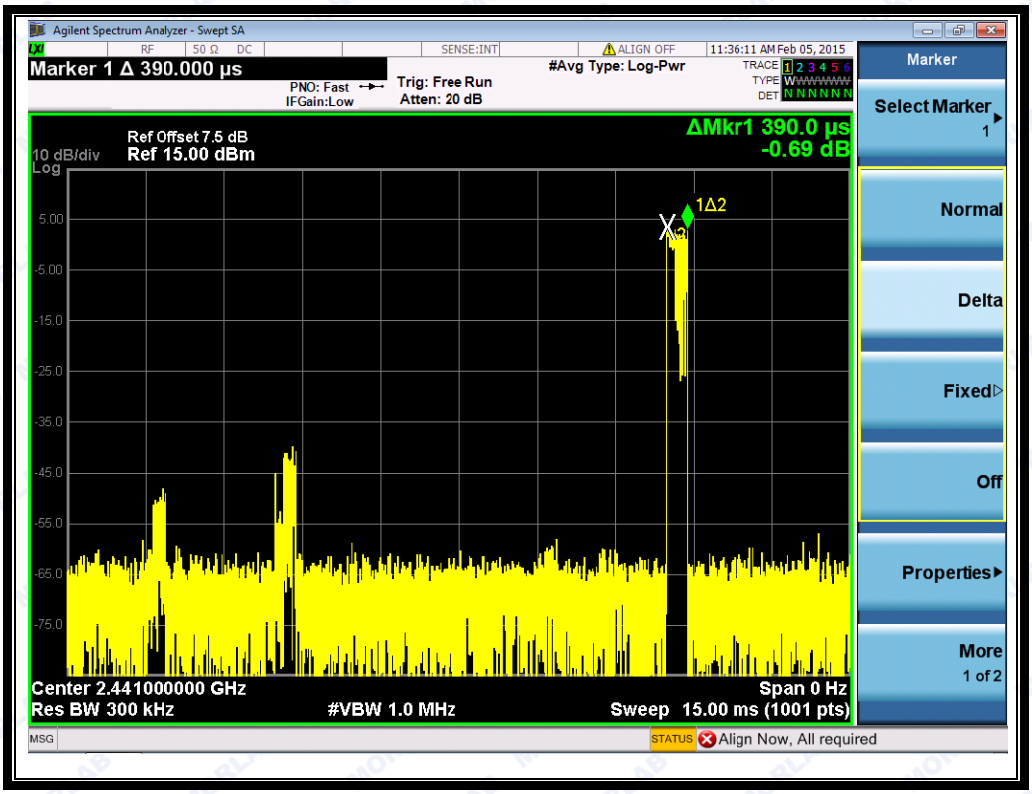
(Plot F: DH5 @ π/4-DQPSK)

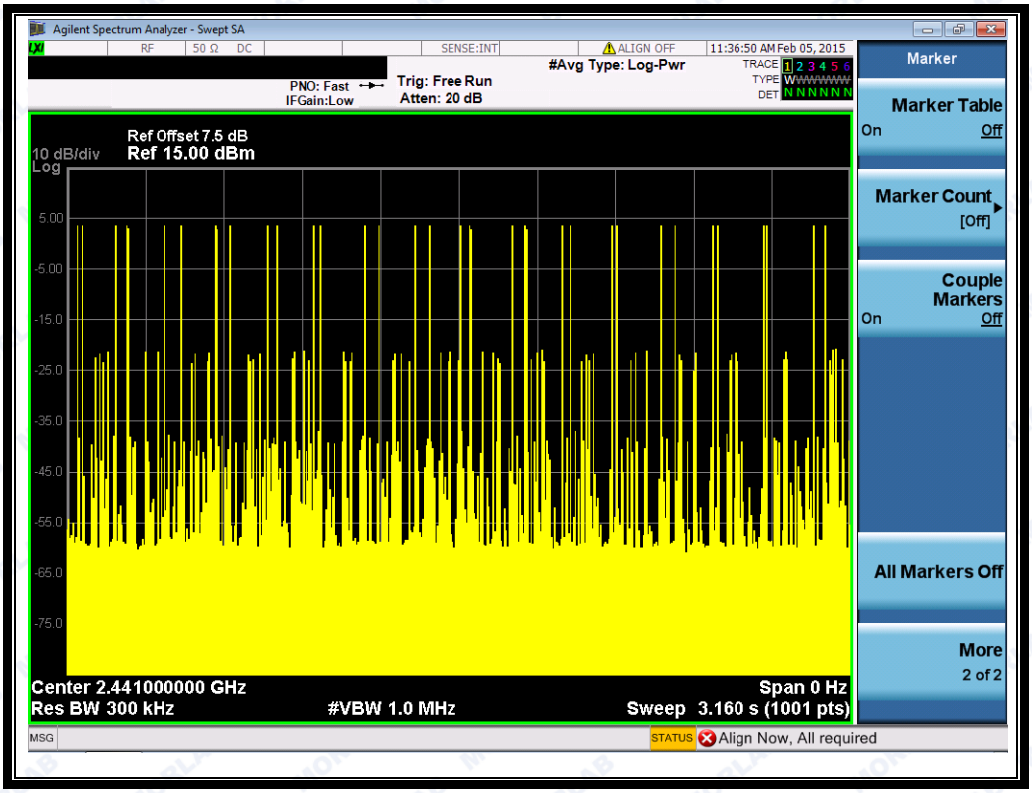
2.6.4.3 8-DPSK mode

A. Test Verdict:

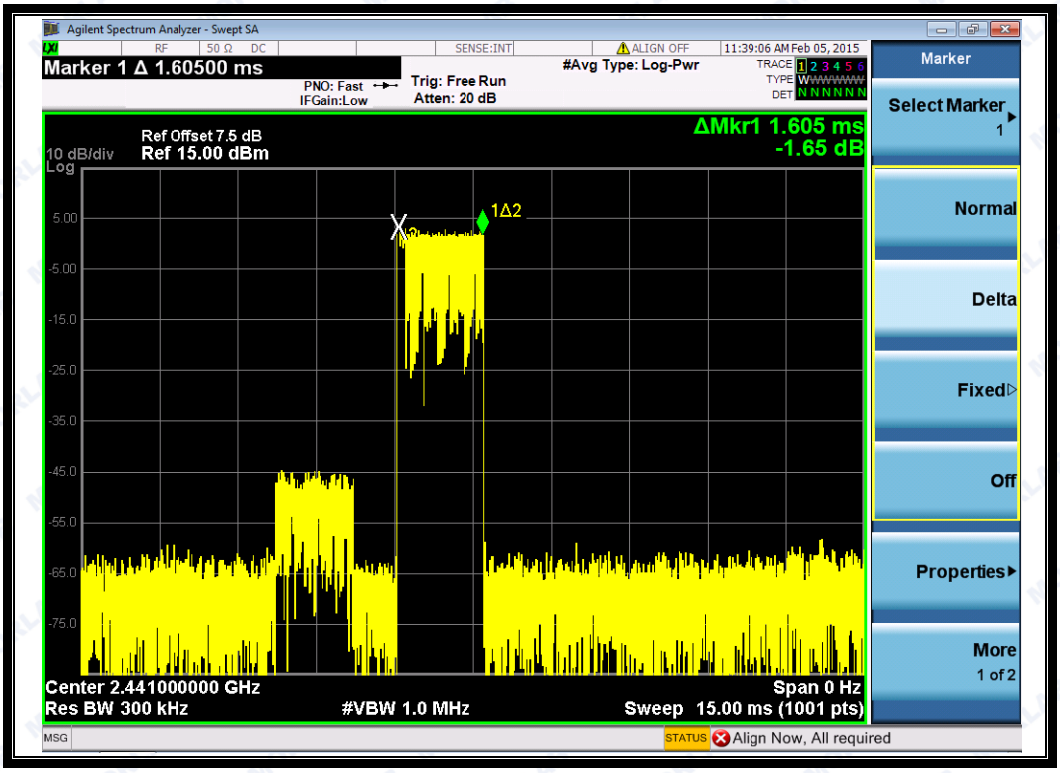
DH Packet	Pulse Width (msec)	Number of pulse in 3.16 seconds	Refer to Plot	Average Time of Occupancy (sec)	Limit (sec)	Verdict
DH1	0.390	32	Plot A	0.01248	0.4	PASS
DH3	1.605	19	Plot B	0.030495		PASS
DH5	2.910	13	Plot C	0.03783		PASS

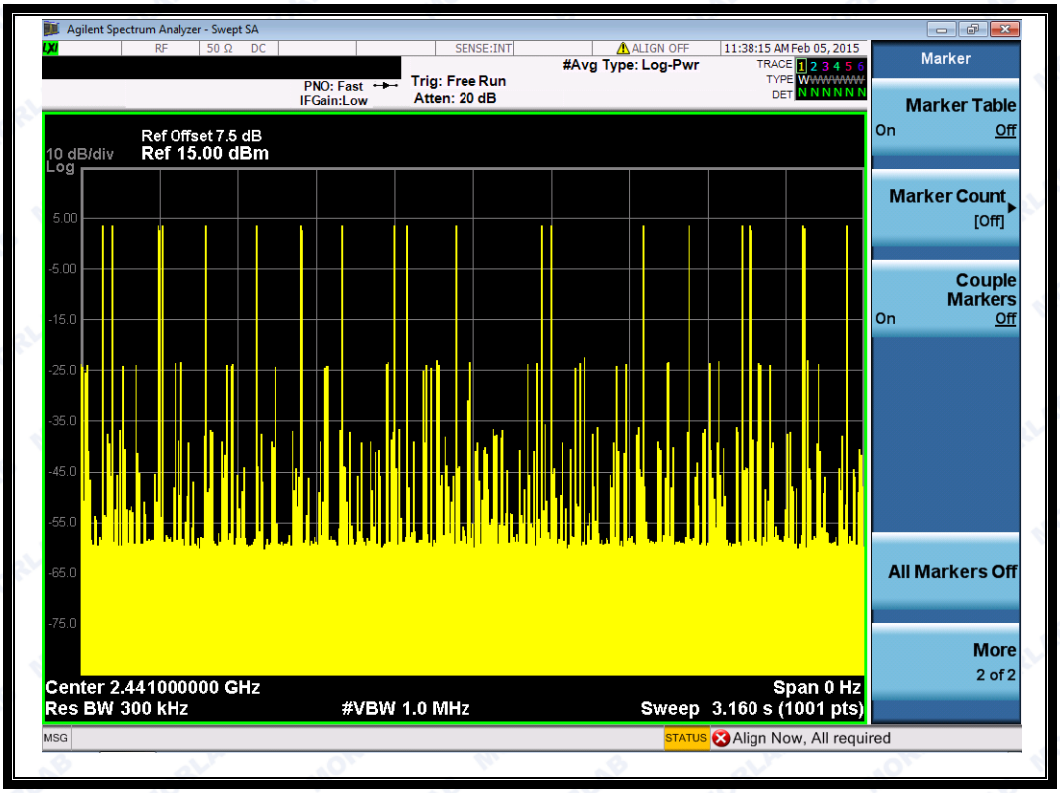
B. Test Plots:



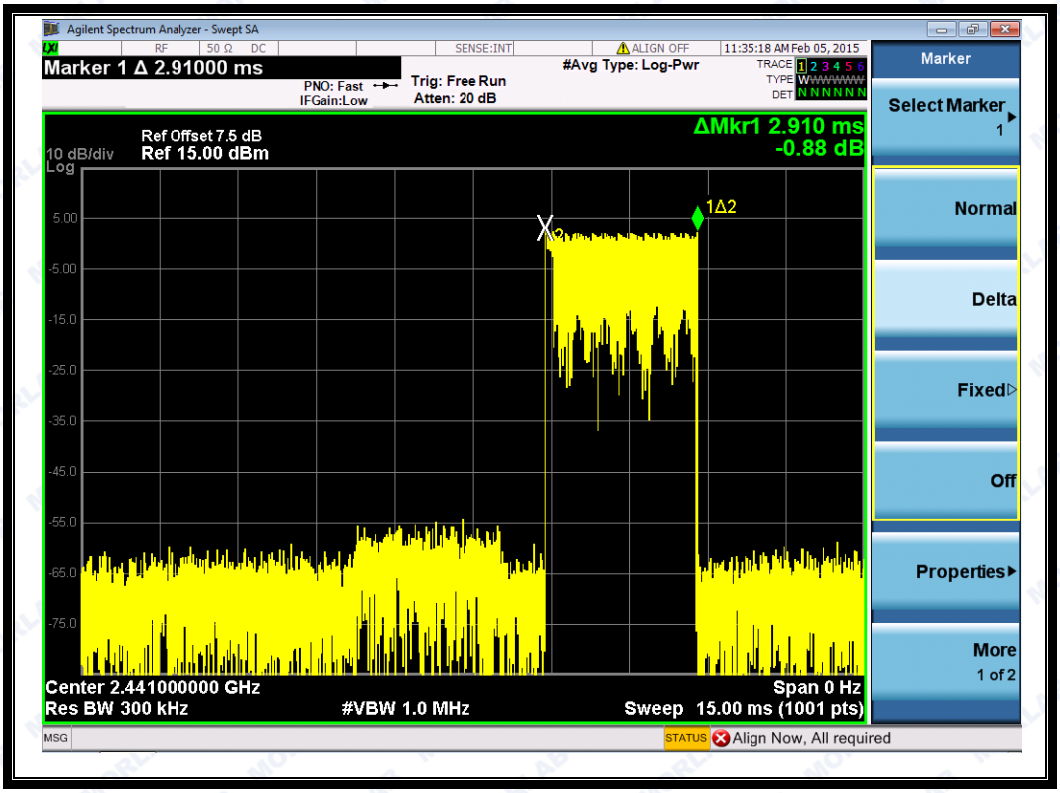


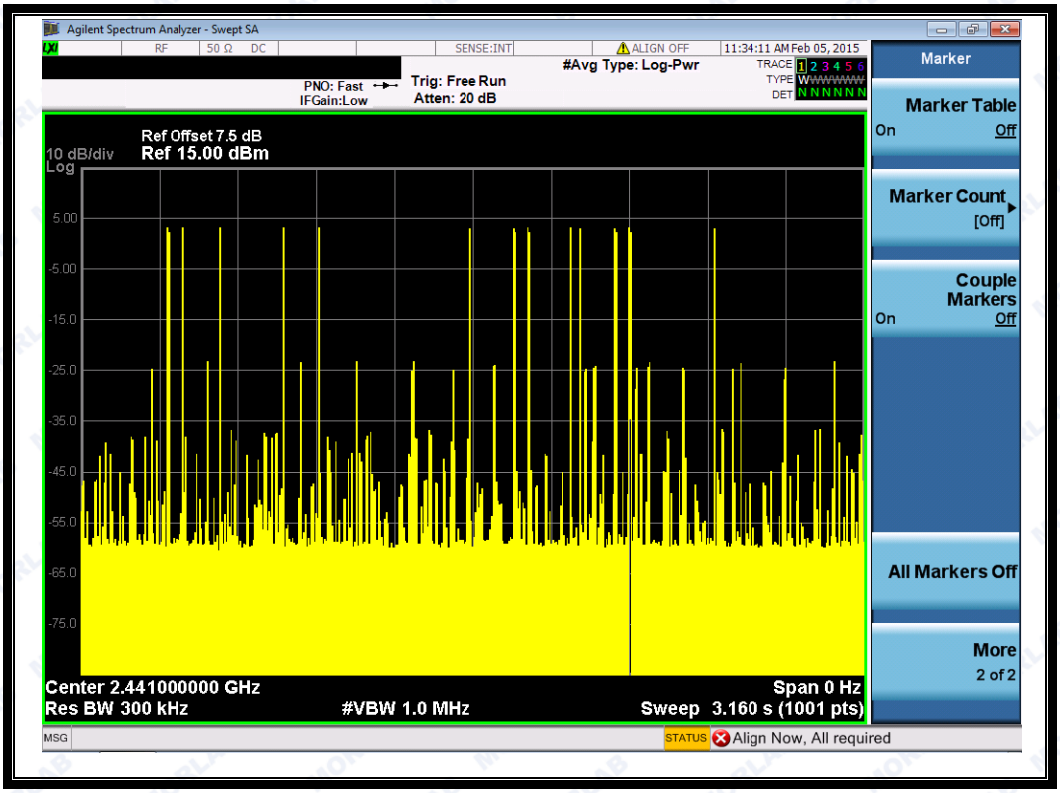
(Plot G: DH1 @ 8-DPSK)





(Plot H: DH3 @ 8-DPSK)





(Plot I: DH5 @ 8-DPSK)

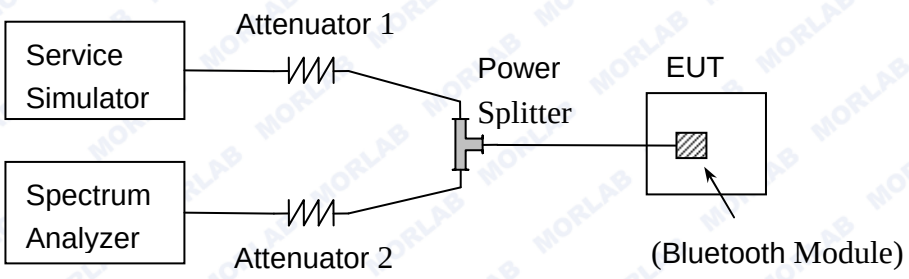
2.7 Conducted Spurious Emissions

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.

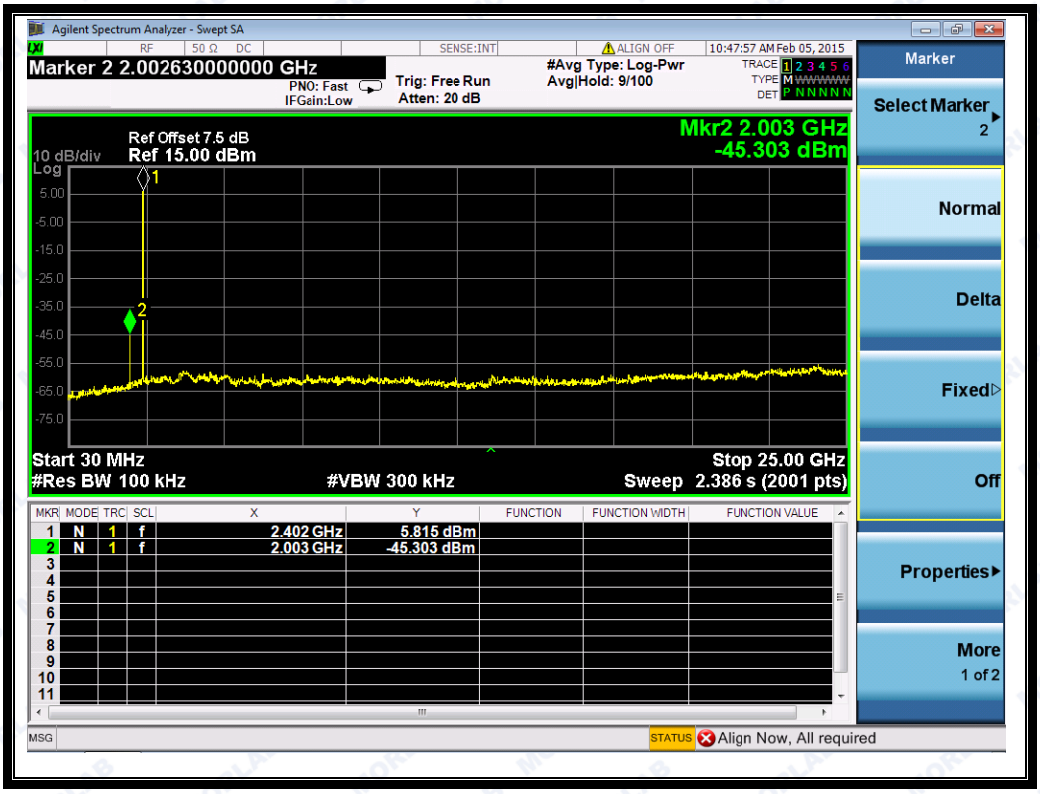
2.7.4.1 GFSK Mode

A. Test Verdict:

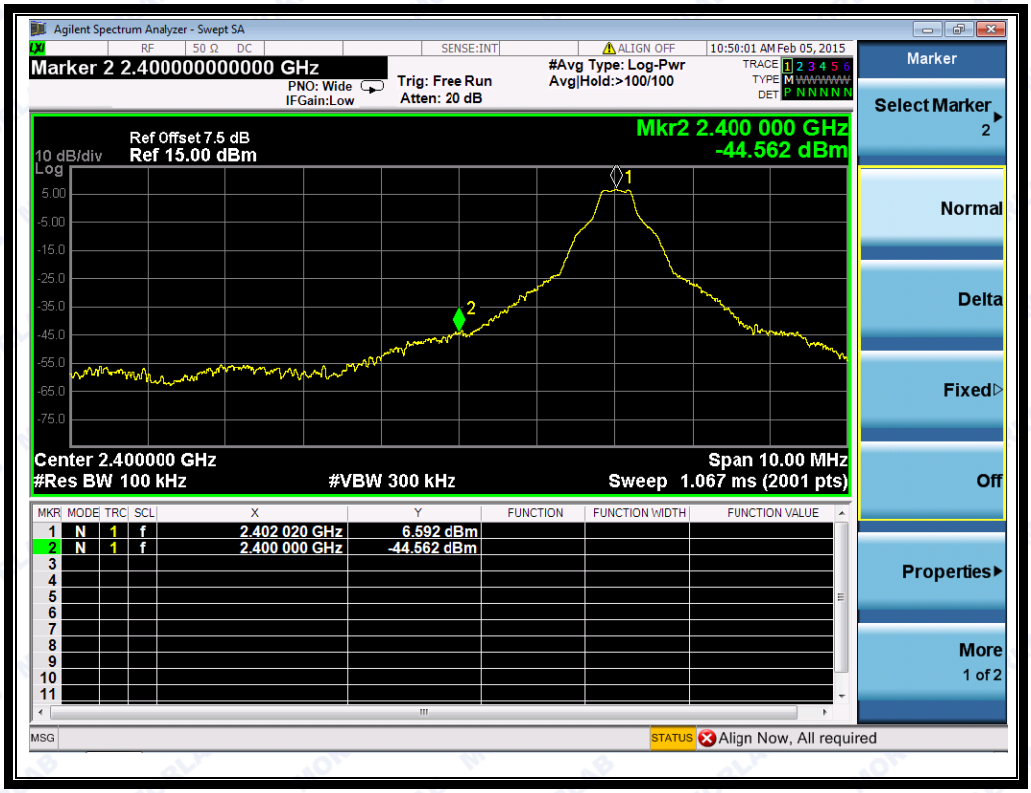
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Refer to Plot	Limit (dBm)		Verdict
				Carrier Level	Calculated -20dBc Limit	
0	2402	-45.303	Plot A.1	5.815	-14.185	PASS
39	2441	-44.429	Plot B.1	6.543	-13.457	PASS
78	2480	-43.547	Plot C.1	5.573	-14.427	PASS

B. Test Plots:

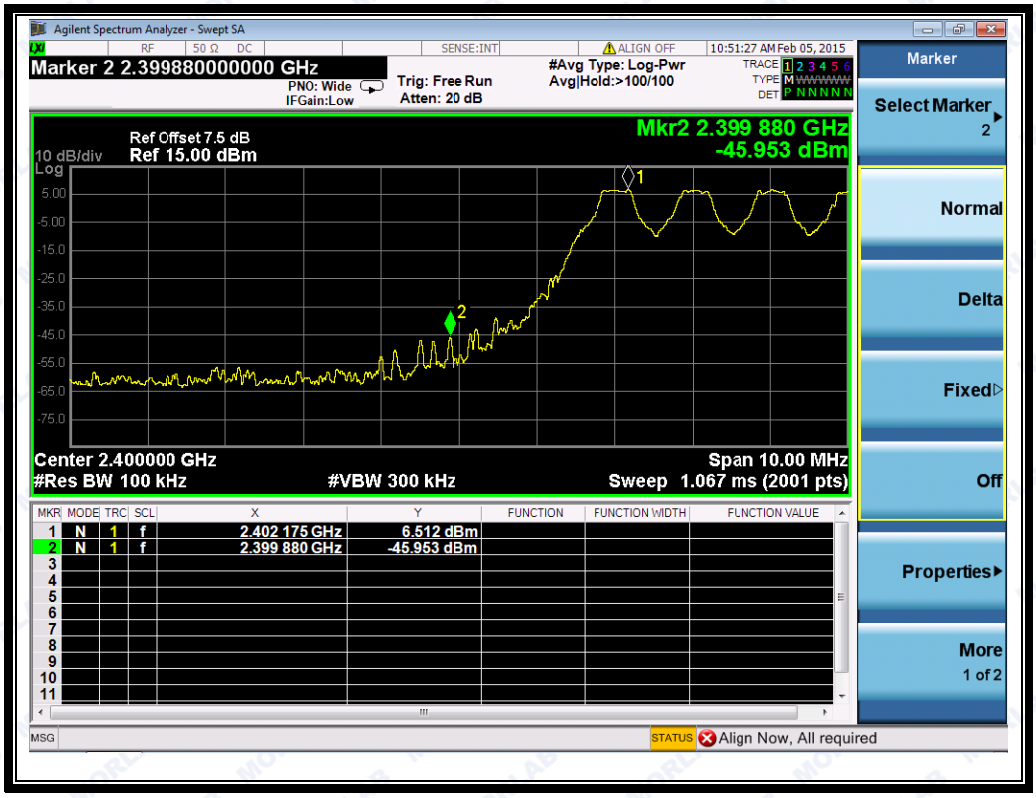
Note: the power of the Module transmitting frequency should be ignored.



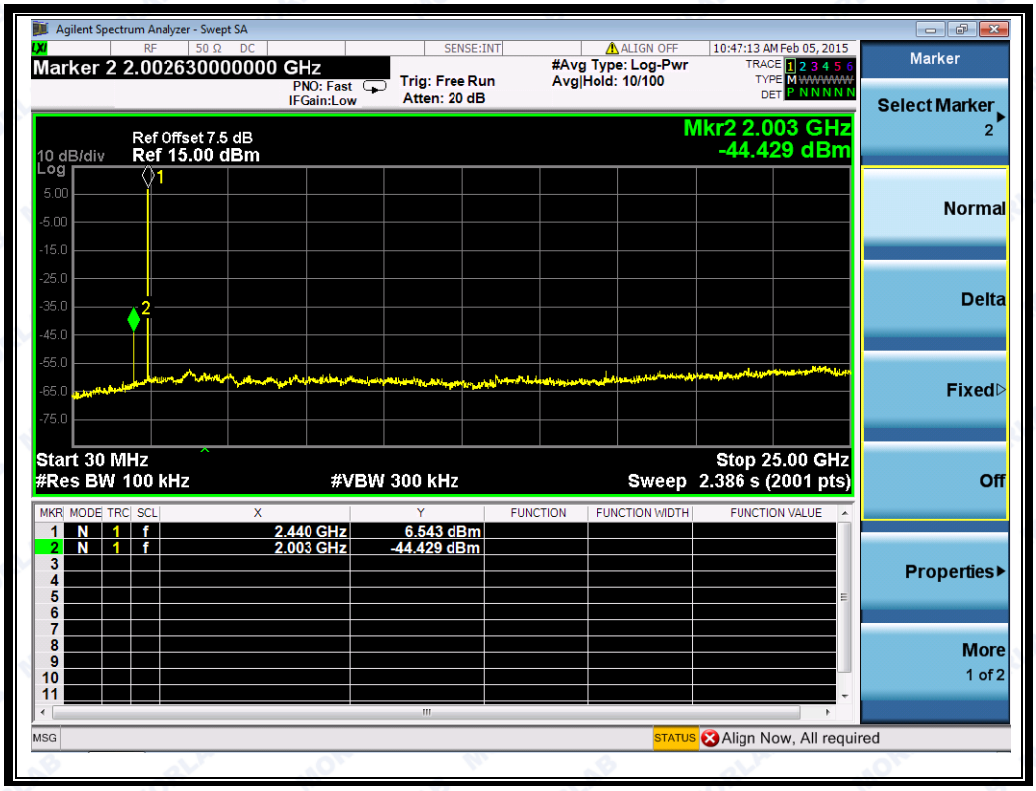
(Plot A.1: Channel = 0, 30MHz to 25GHz @ GFSK Mode)



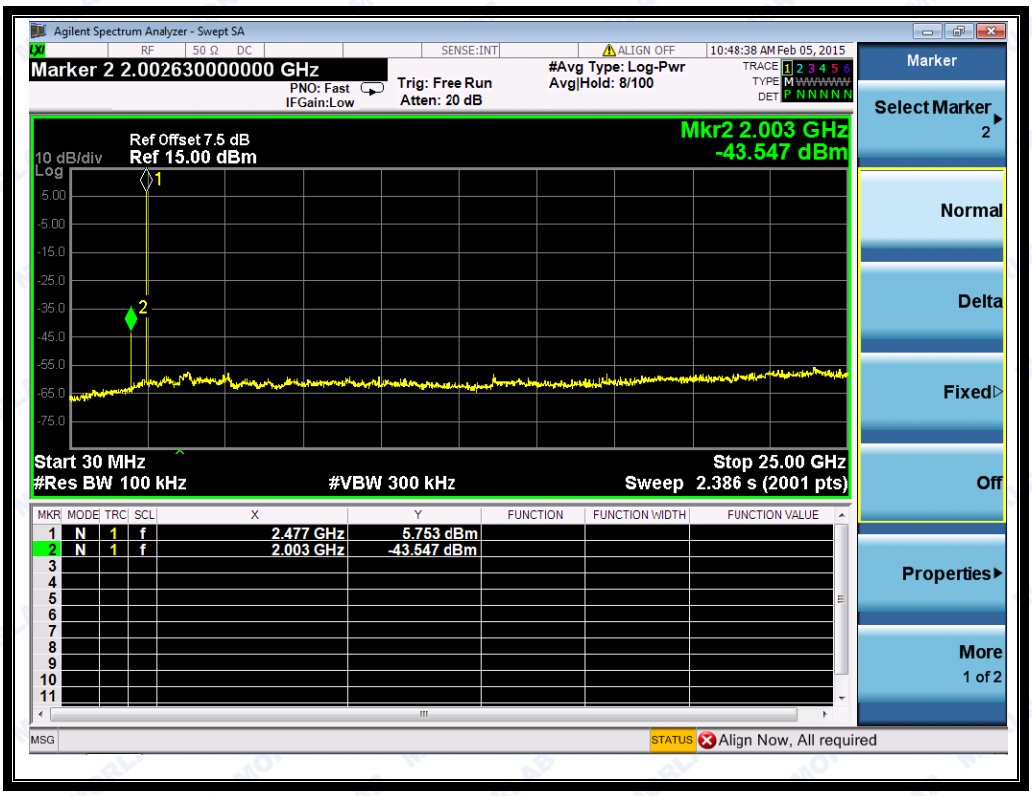
(Channel = 0, Band edge @ GFSK Mode)



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

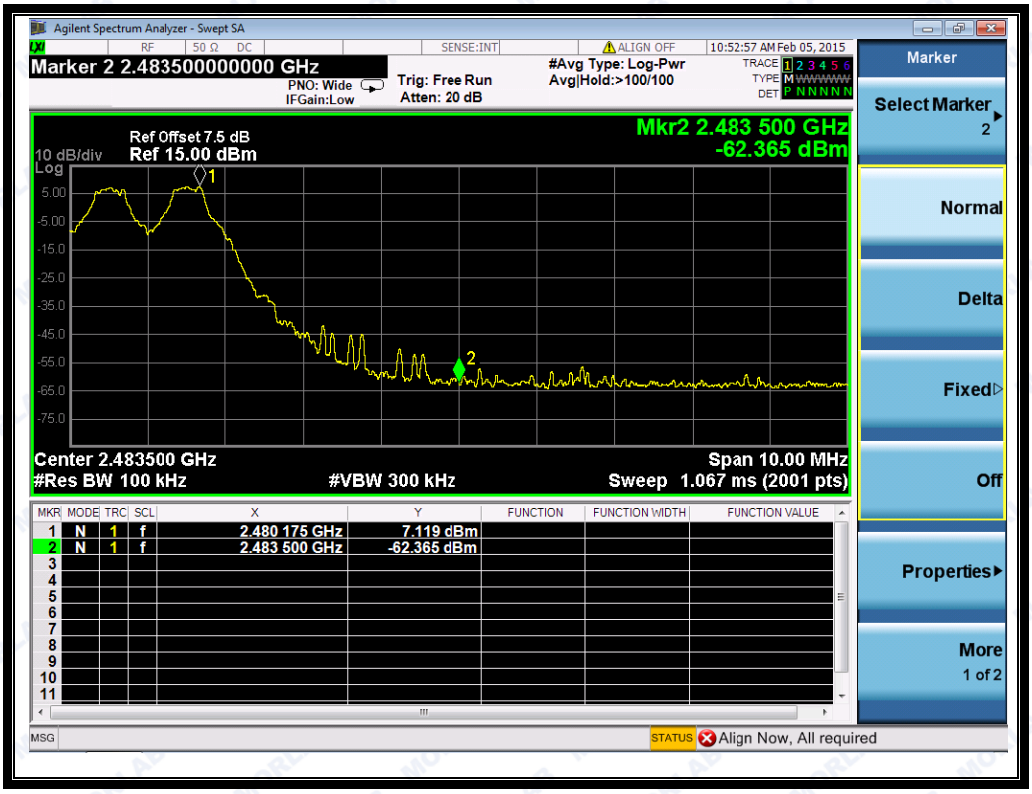


(Plot B.1: Channel = 39, 30MHz to 25GHz @ GFSK Mode)



(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)

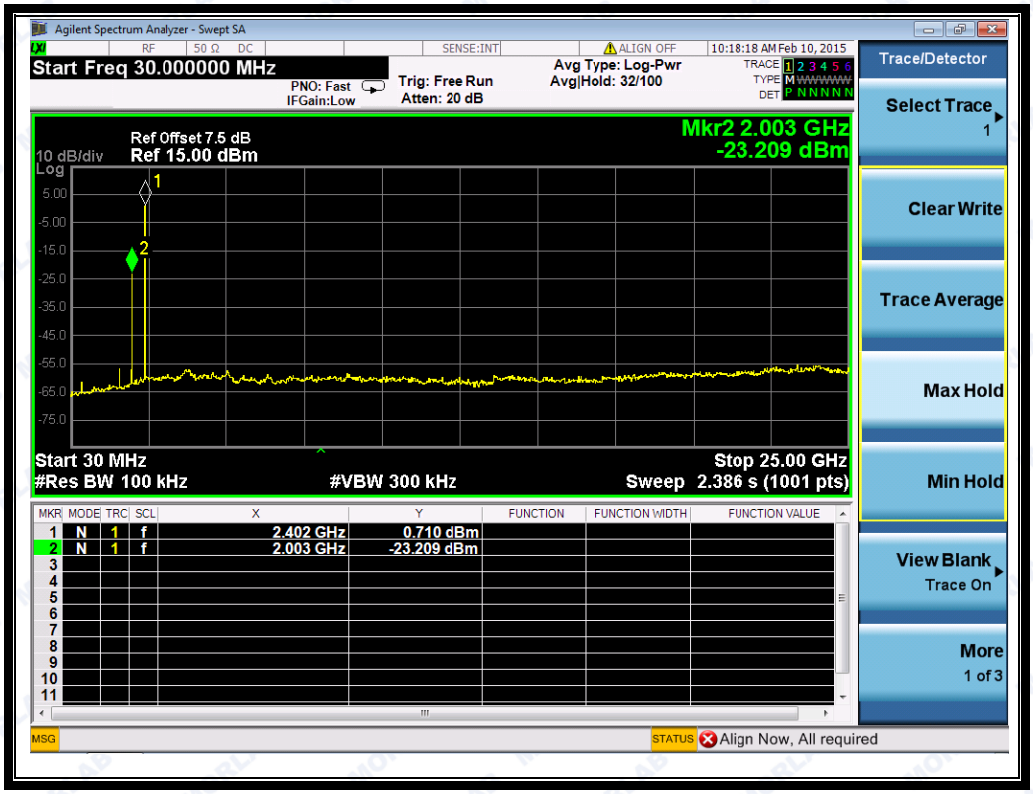
2.7.4.2 π/4-DQPSK Mode

A. Test Verdict:

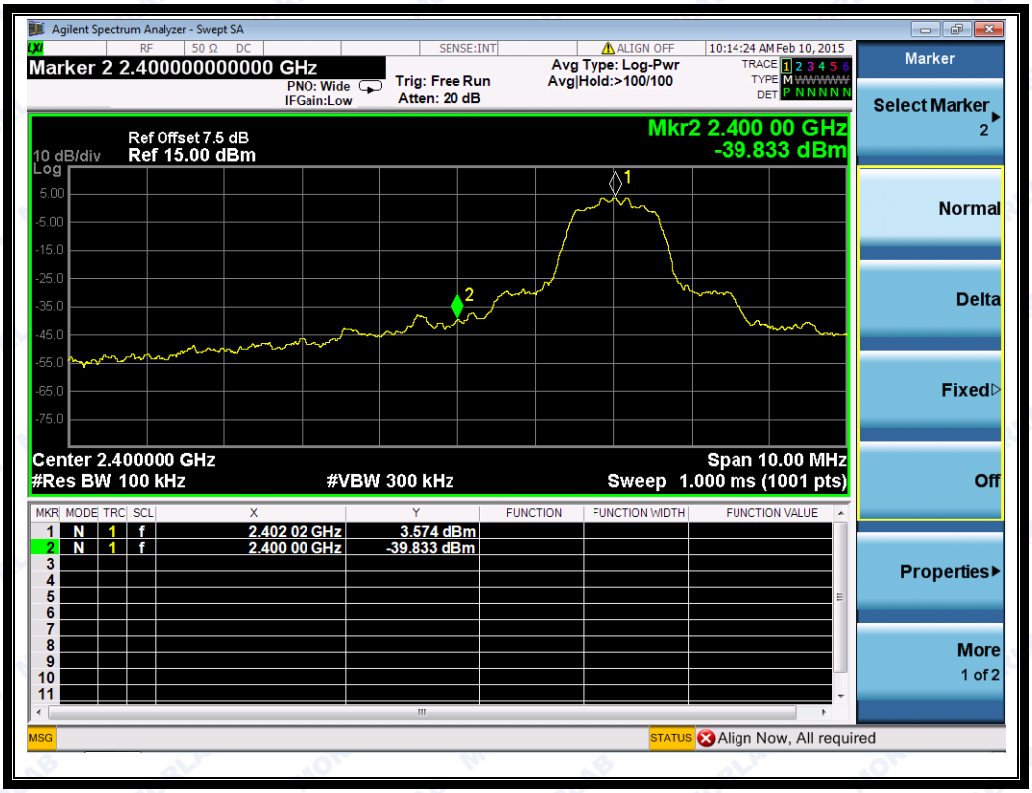
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Refer to Plot	Limit (dBm)		Verdict
				Carrier Level	Calculated -20dBc Limit	
0	2402	-23.209	Plot D.1	0.710	-19.29	PASS
39	2441	-29.562	Plot E.1	4.067	-15.933	PASS
78	2480	-26.470	Plot F.1	3.776	-16.224	PASS

B. Test Plots:

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

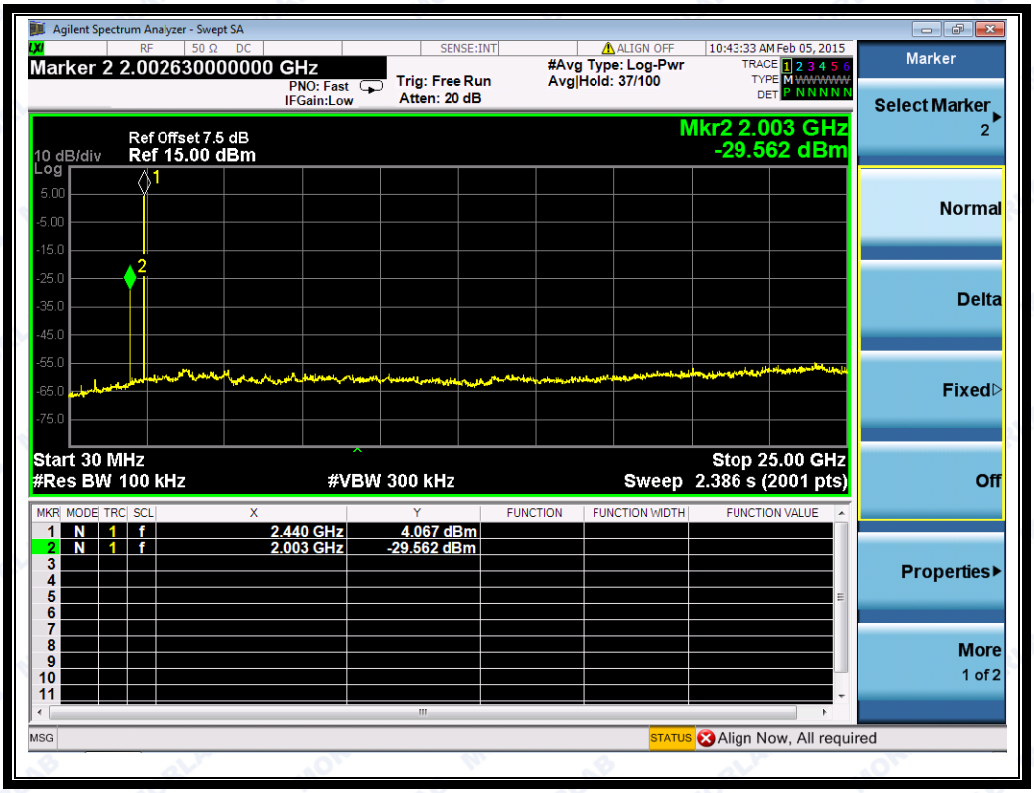


(Plot D.1: Channel = 0, 30MHz to 25GHz @π/4-DQPSK)

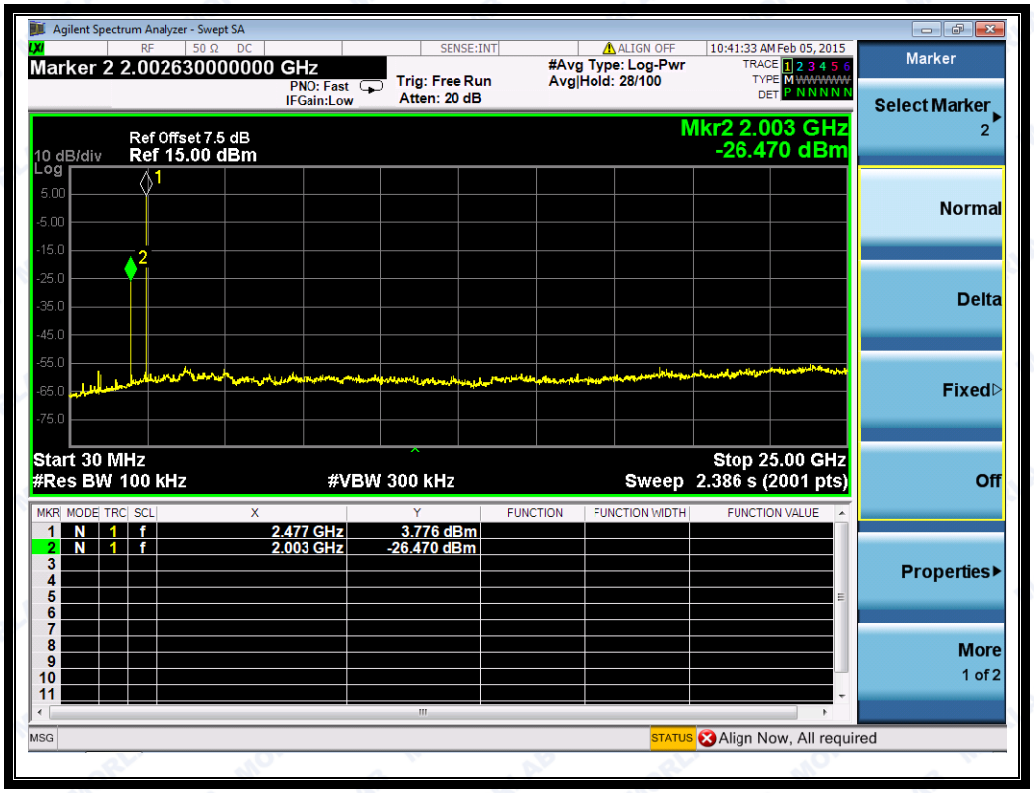


(Channel = 0, Band edge @π/4-DQPSK)

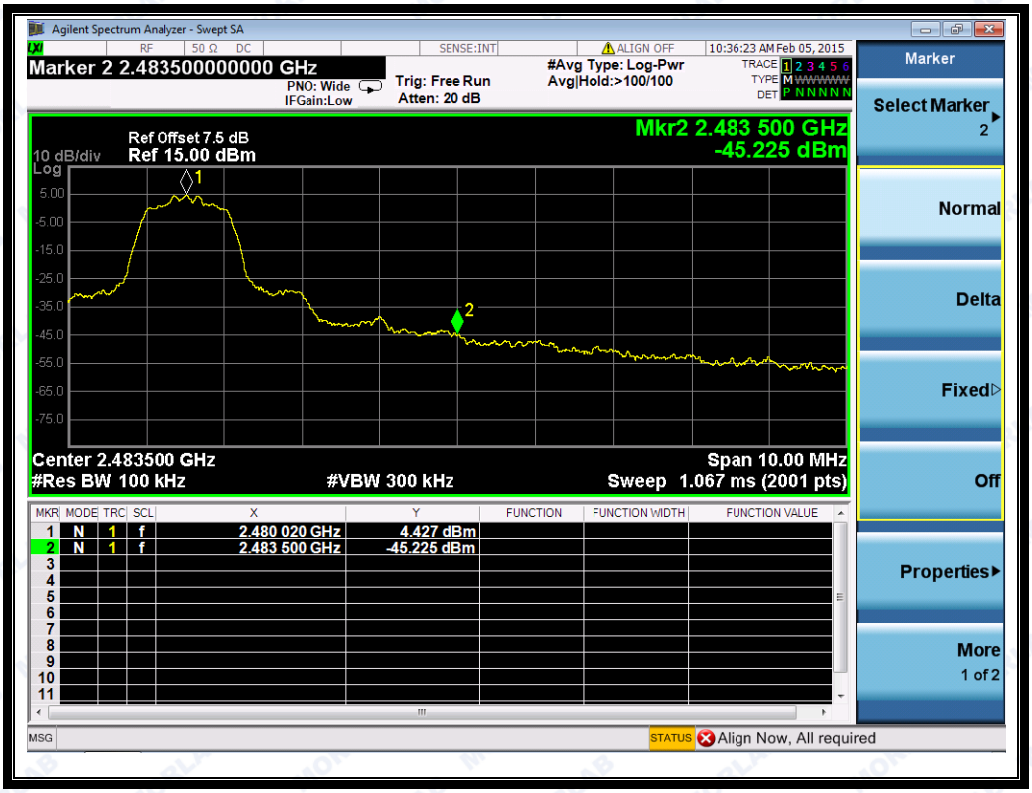
(Channel = 0, Band edge with hopping on @π/4-DQPSK)



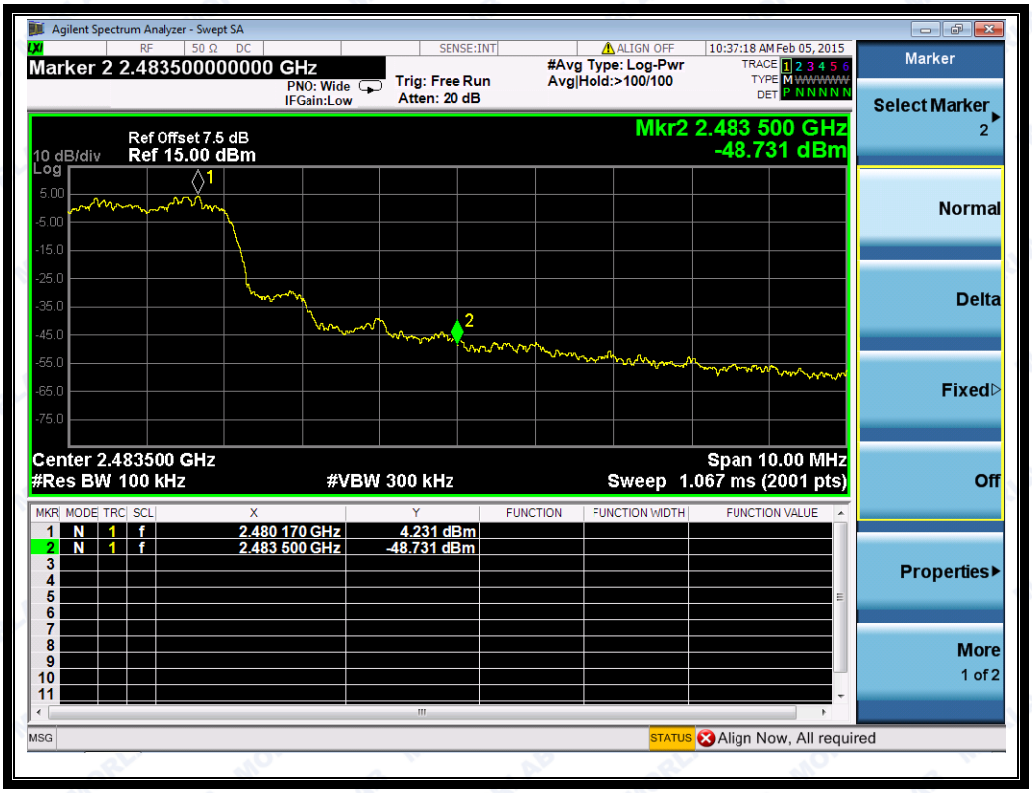
(Plot E.1: Channel = 39, 30MHz to 25GHz @ π/4-DQPSK)



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



(Channel = 78, Band edge @π/4-DQPSK)



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

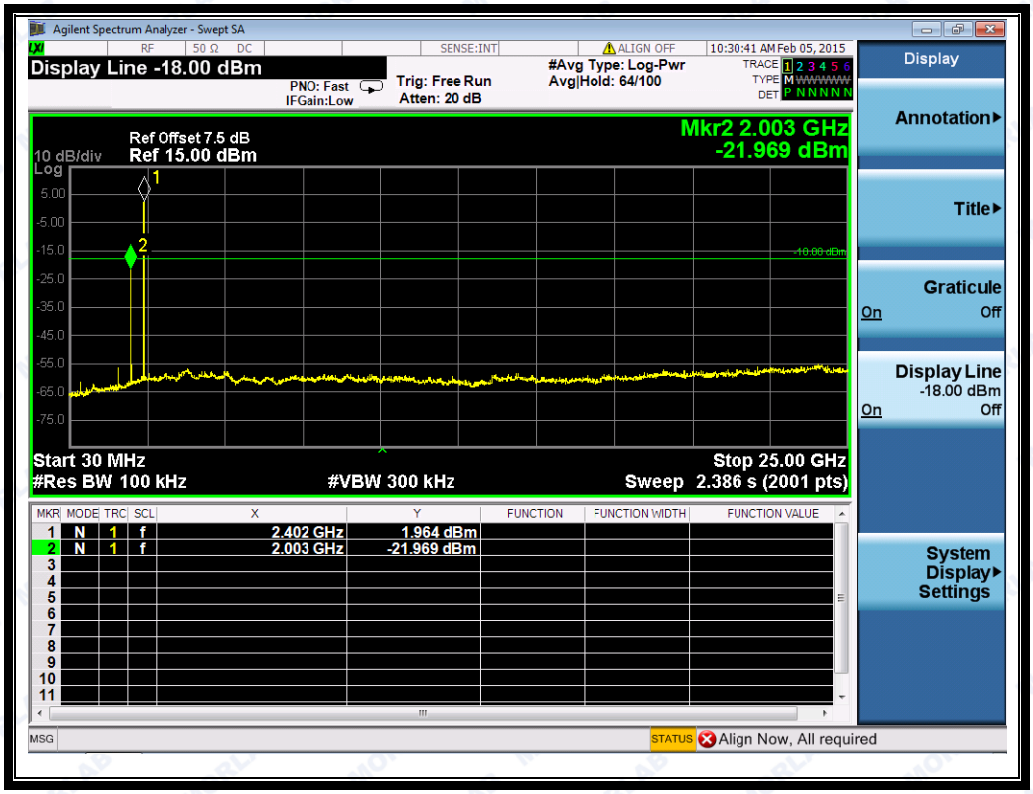
2.7.4.3 8-DPSK Mode

A. Test Verdict:

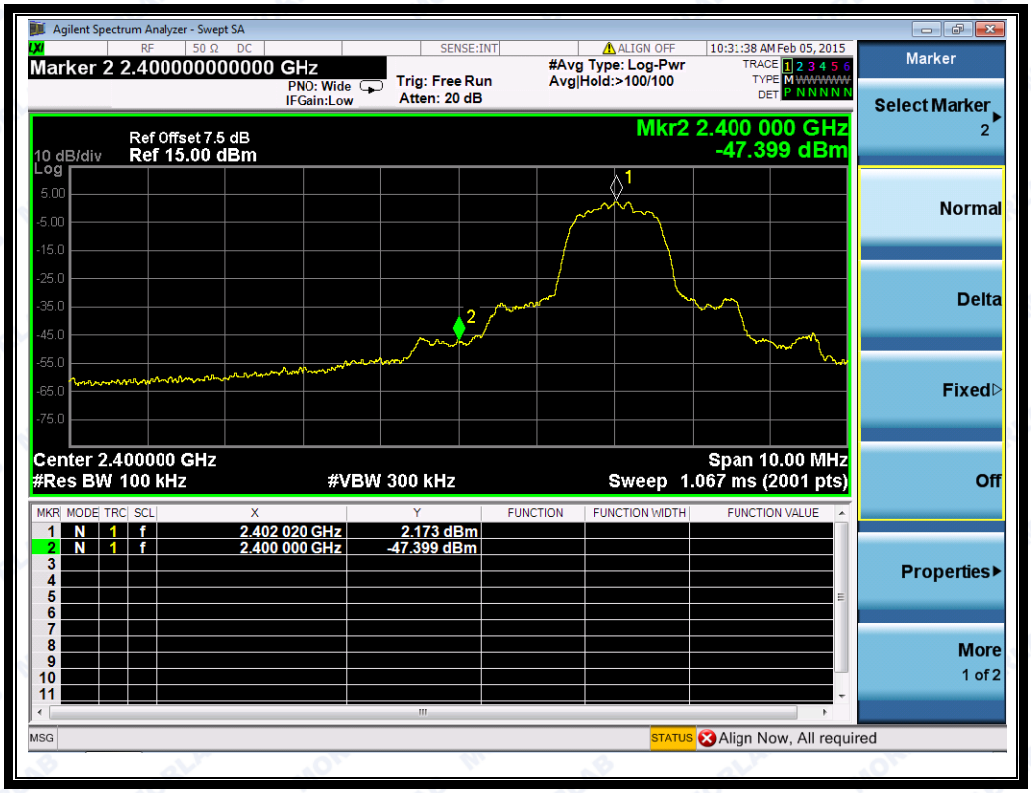
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Refer to Plot	Limit (dBm)		Verdict
				Carrier Level	Calculated -20dBc Limit	
0	2402	-21.969	Plot G.1	1.964	-18.036	PASS
39	2441	-22.683	Plot H.1	3.315	-16.685	PASS
78	2480	-22.786	Plot I.1	3.077	-16.923	PASS

B. Test Plots:

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

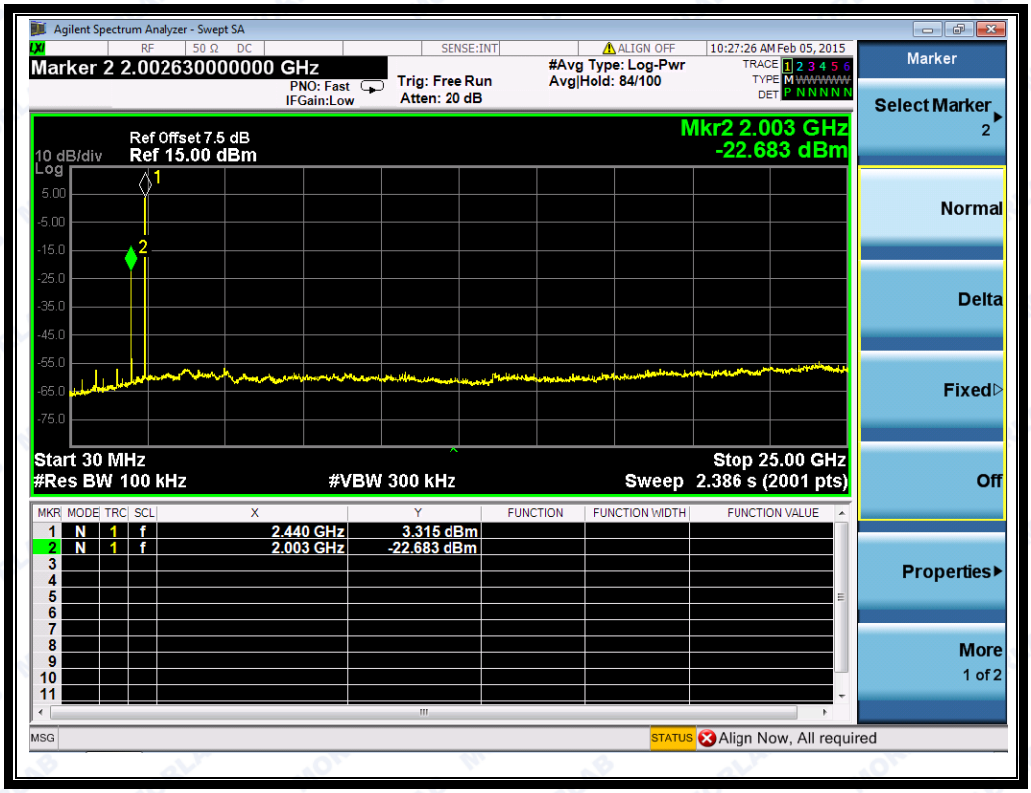


(Plot G.1: Channel = 0, 30MHz to 25GHz @ 8-DPSK)

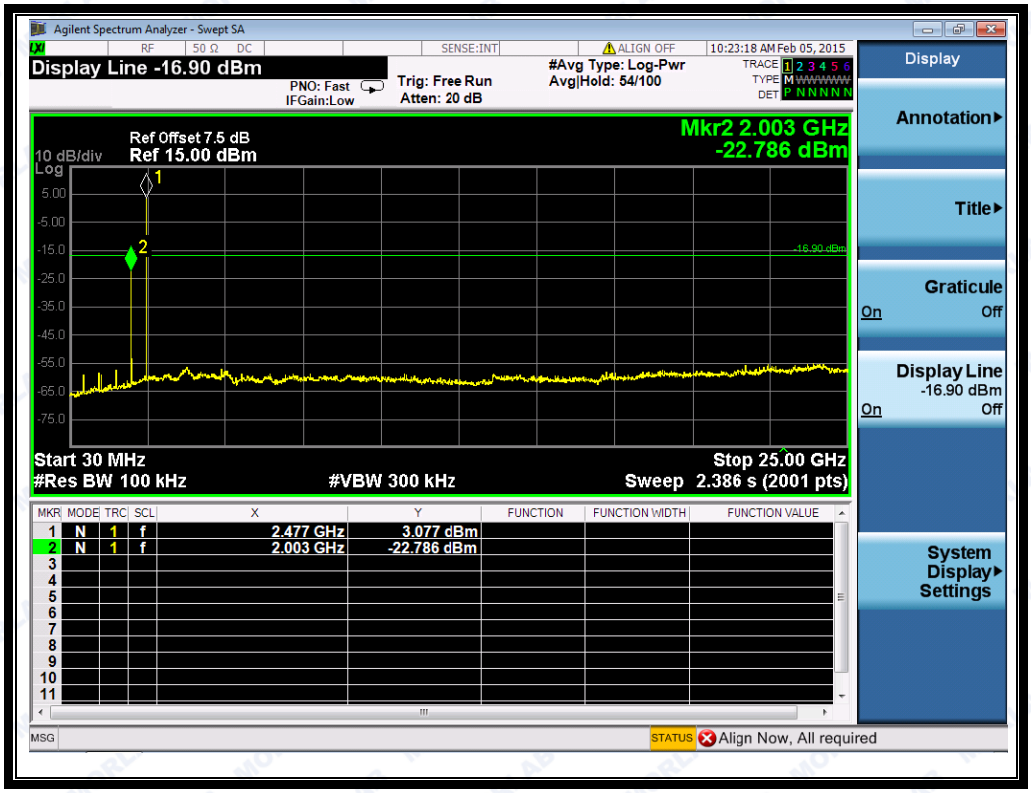


(Channel = 0, Band edge @ 8-DPSK)

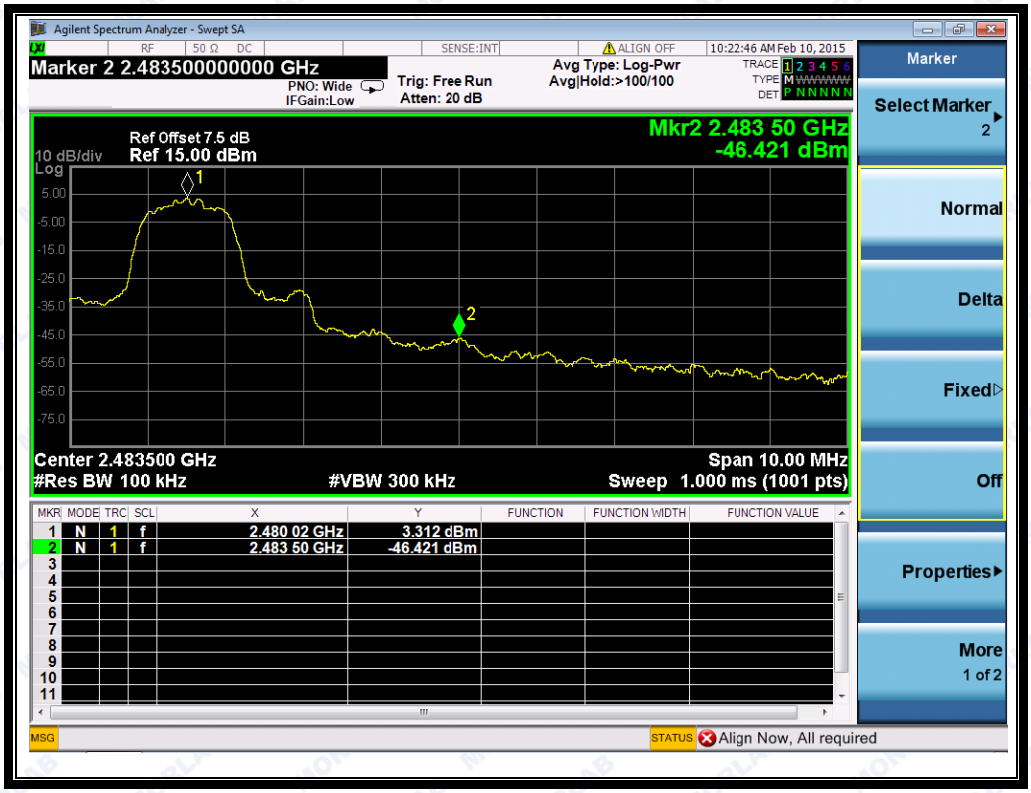
(Channel = 0, Band edge with hopping on @ 8-DPSK)



(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)

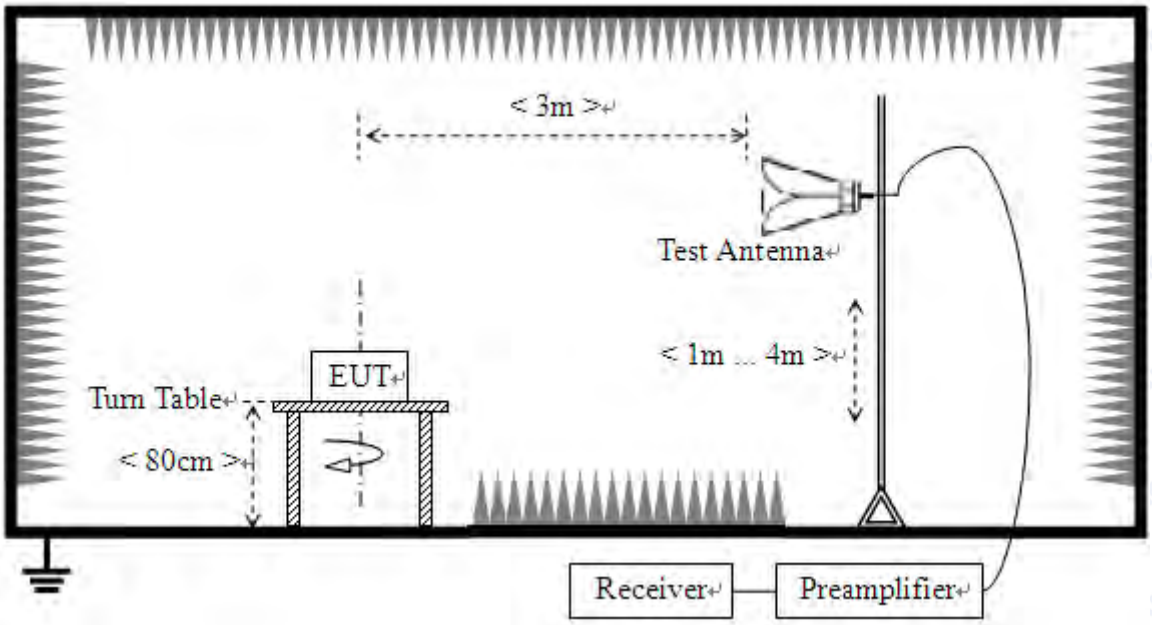
2.8 Restricted Frequency Bands

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

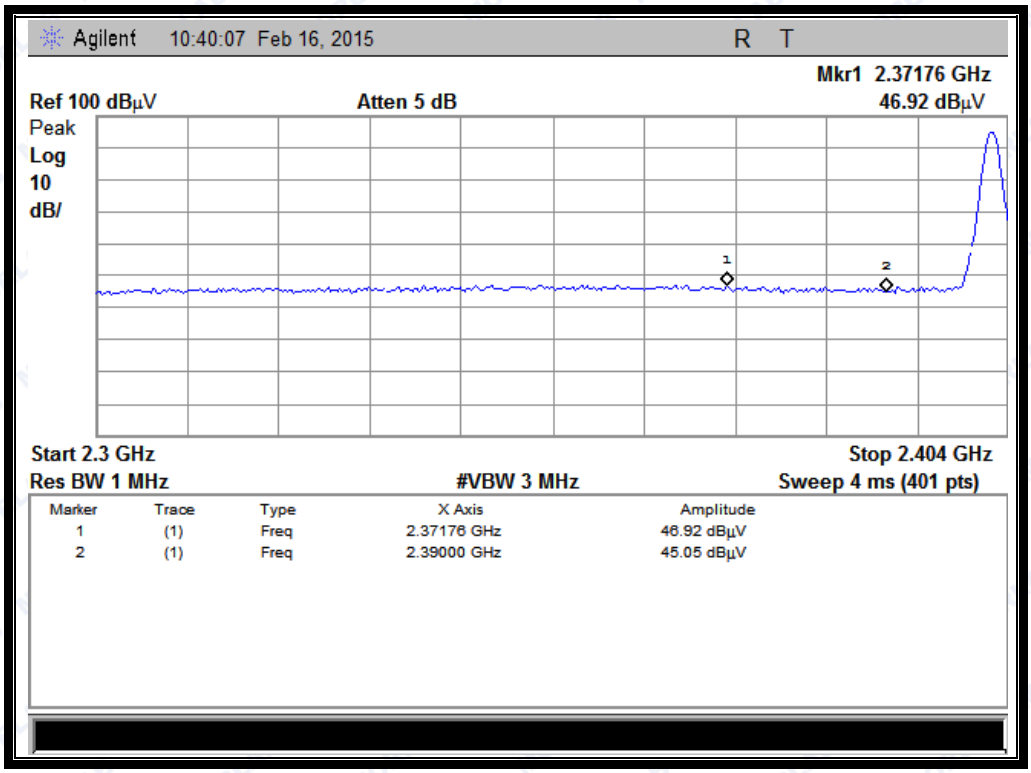
The lowest and highest channels are tested to verify Restricted Frequency Bands.
The measurement results are obtained as below:
E [dBμV/m] $=U_R + A_T + A_{Factor}$ [dB]; AT $=L_{Cable\ loss}$ [dB]-G_{preamp} [dB]
AT: Total correction Factor except Antenna
UR: Receiver Reading
Gpreamp: Preamplifier Gain
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

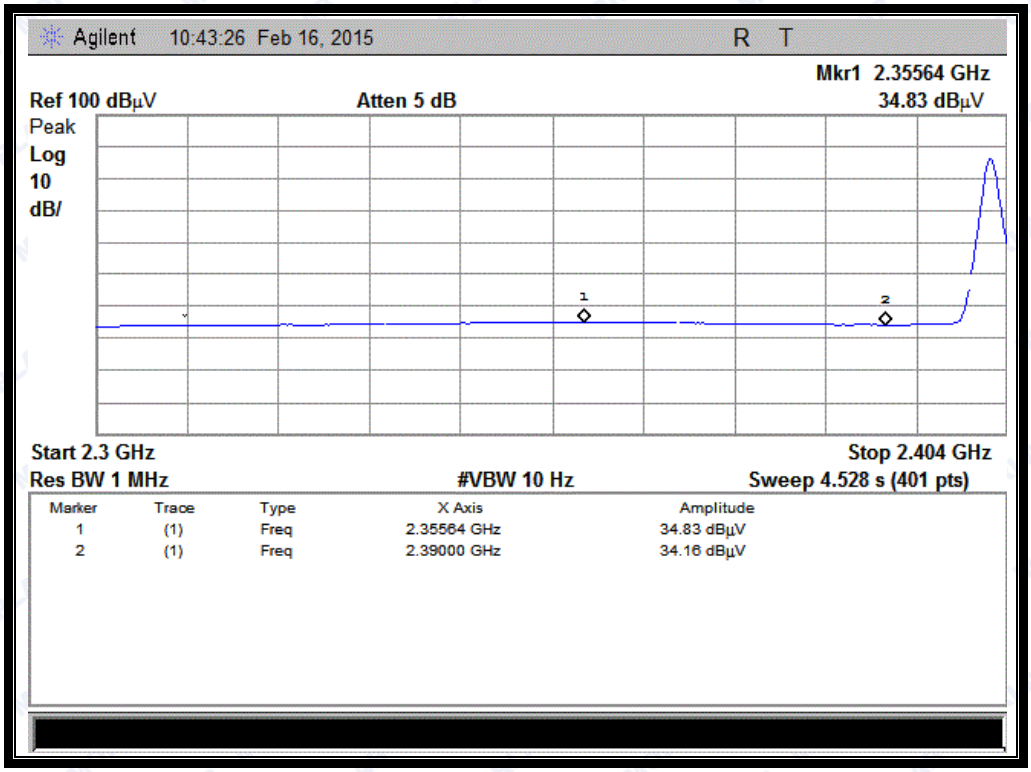
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
0	2371.76	PK	46.92	-33.63	32.56	45.85	74	Pass
0	2355.64	AV	34.83	-33.63	32.56	33.76	54	Pass
78	2483.61	PK	49.54	-33.18	32.5	48.86	74	Pass
78	2483.61	AV	42.19	-33.18	32.5	41.51	54	Pass

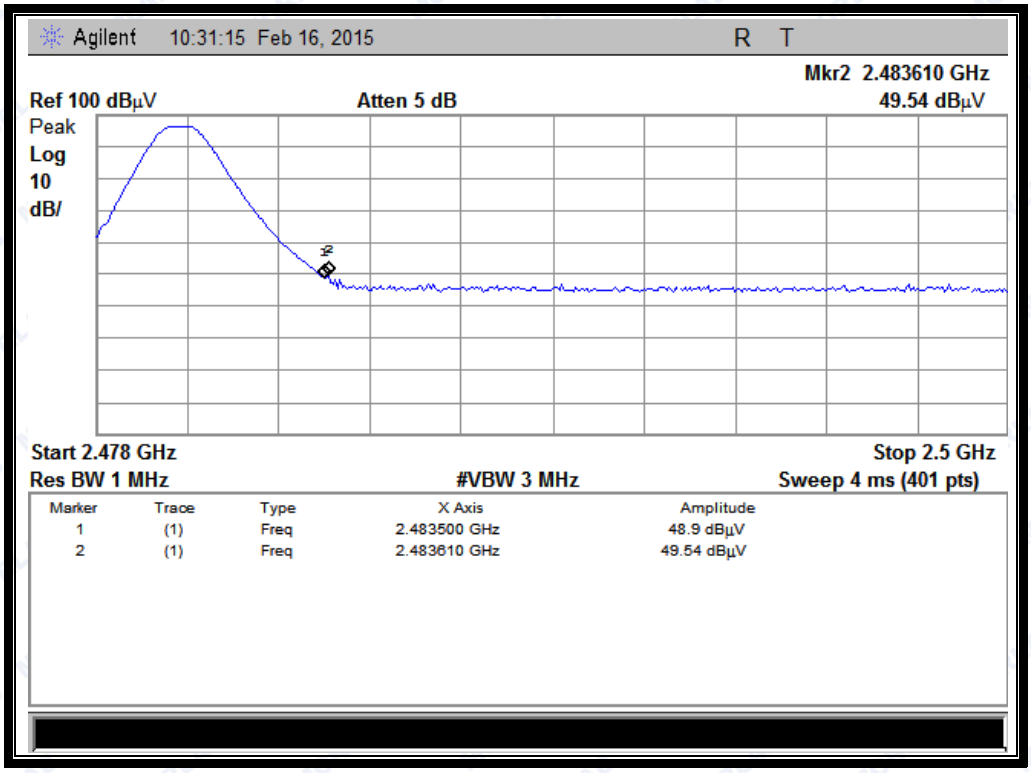
B. Test Plots:



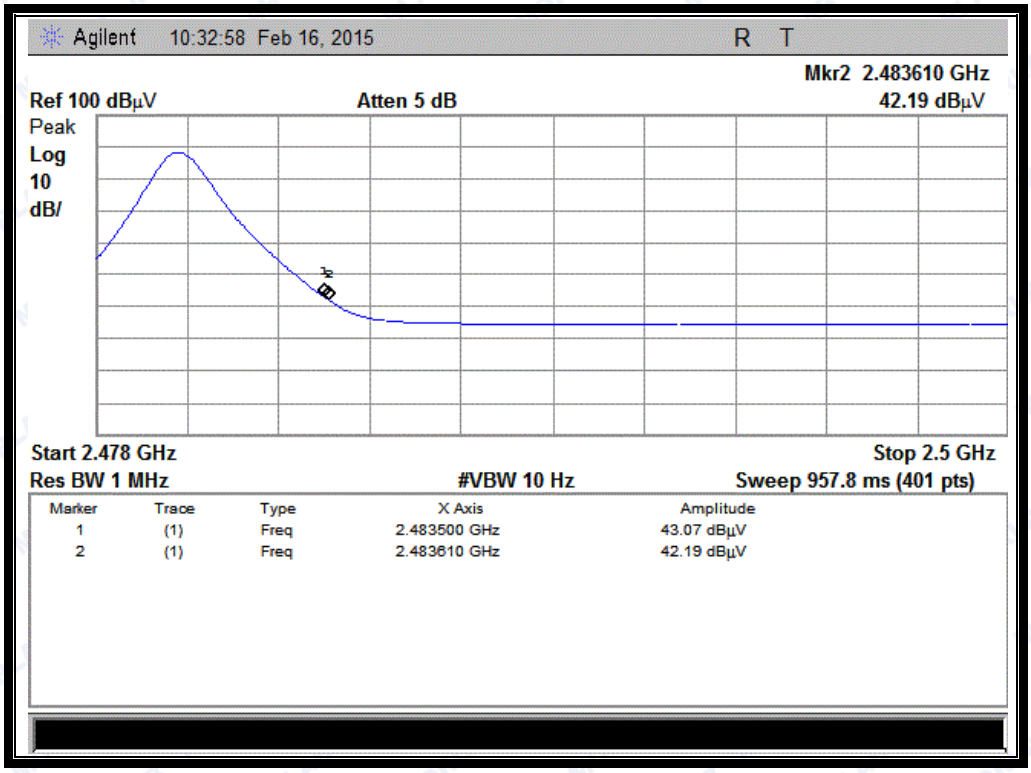
(Plot A1:Channel = 0 PEAK @ GFSK)



(Plot A2:Channel = 0 AVERAGE @ GFSK)



(Plot B1: Channel = 78 PEAK @ GFSK)



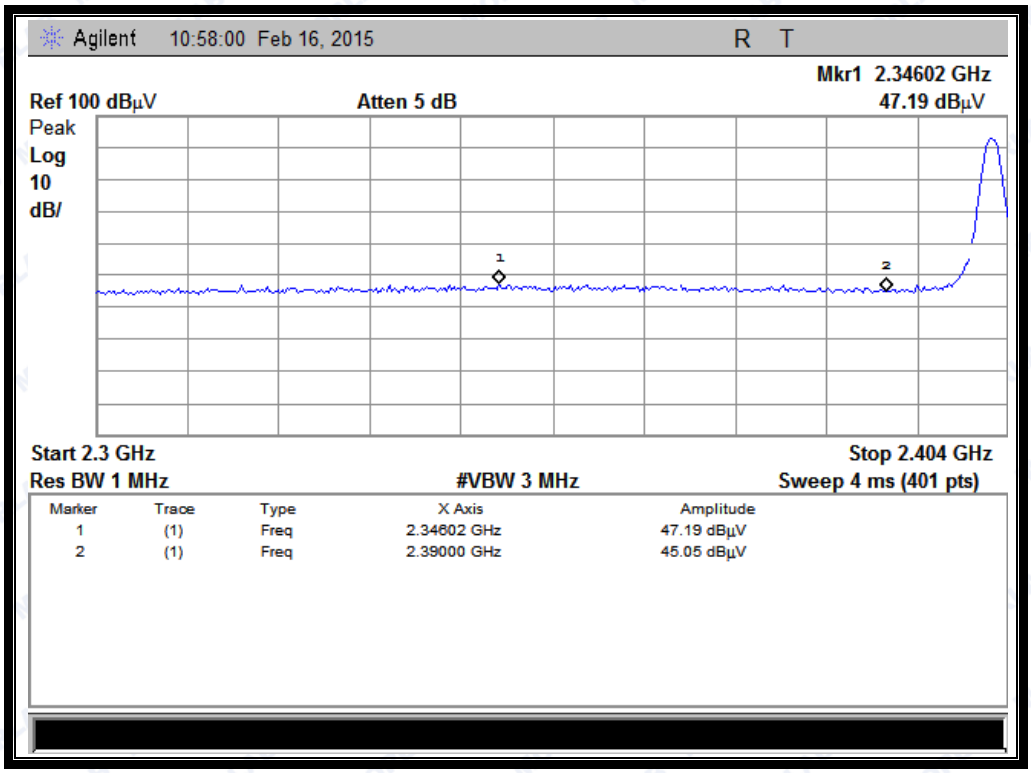
(Plot B2: Channel = 78 AVERAGE @ GFSK)

2.8.4.2 π/4-DQPSK Mode

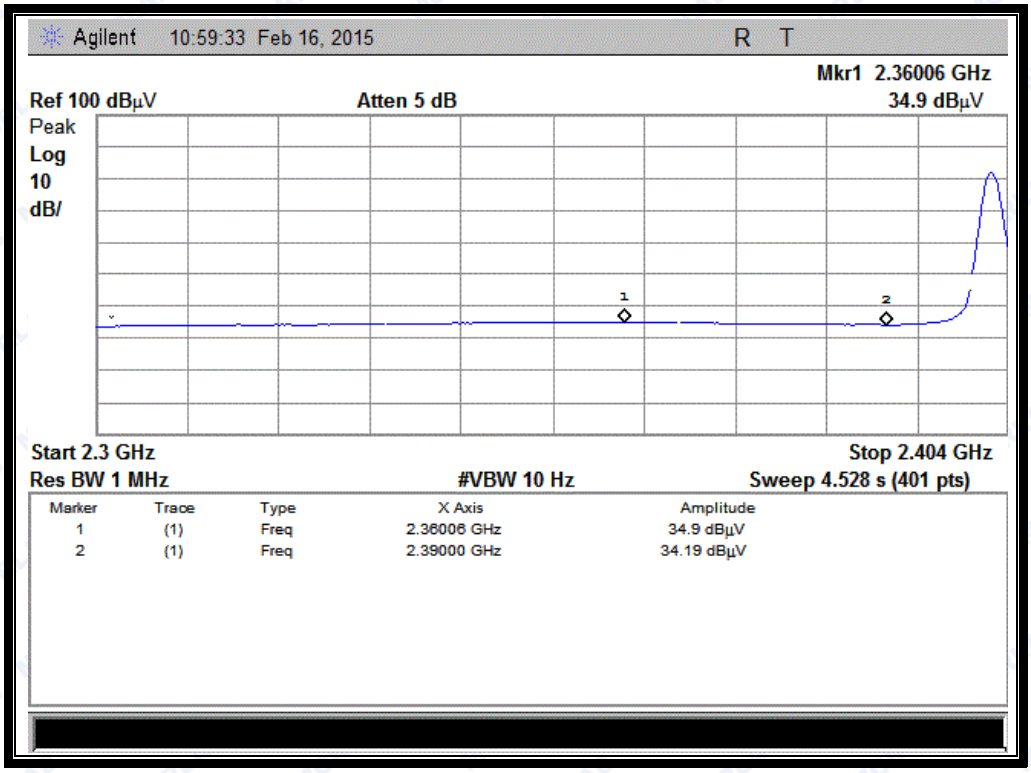
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
0	2346.02	PK	47.19	-33.63	32.56	46.12	74	Pass
0	2360.06	AV	34.90	-33.63	32.56	33.83	54	Pass
78	2483.72	PK	51.30	-33.18	32.5	50.62	74	Pass
78	2483.61	AV	39.85	-33.18	32.5	39.17	54	Pass

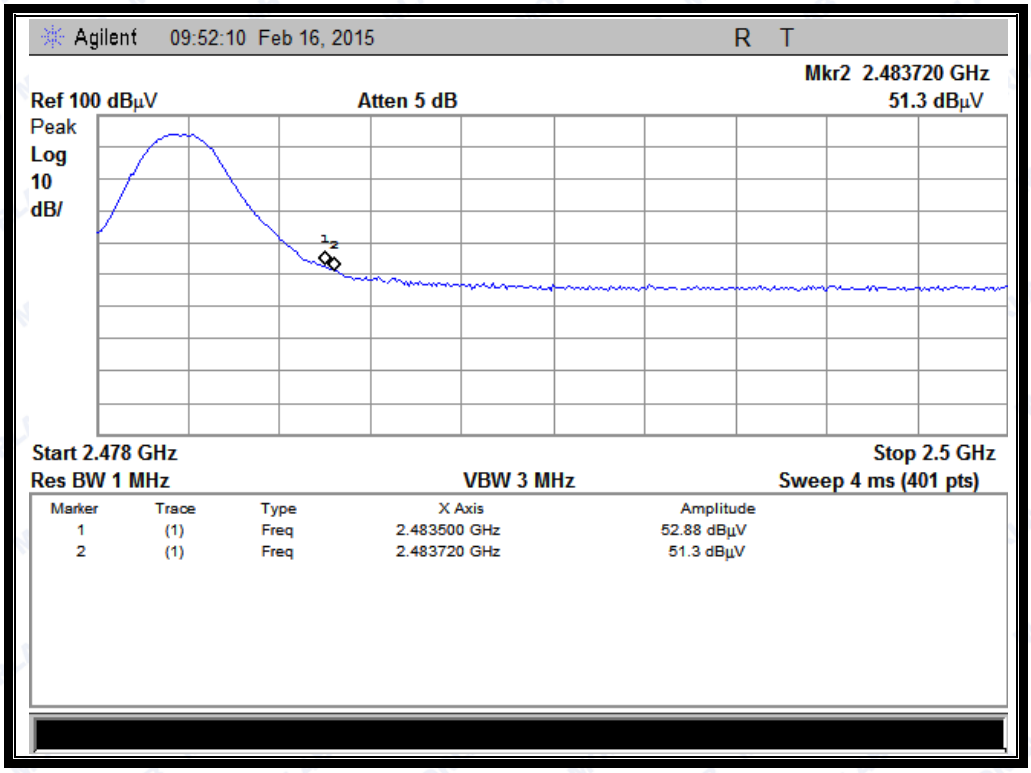
B. Test Plots:



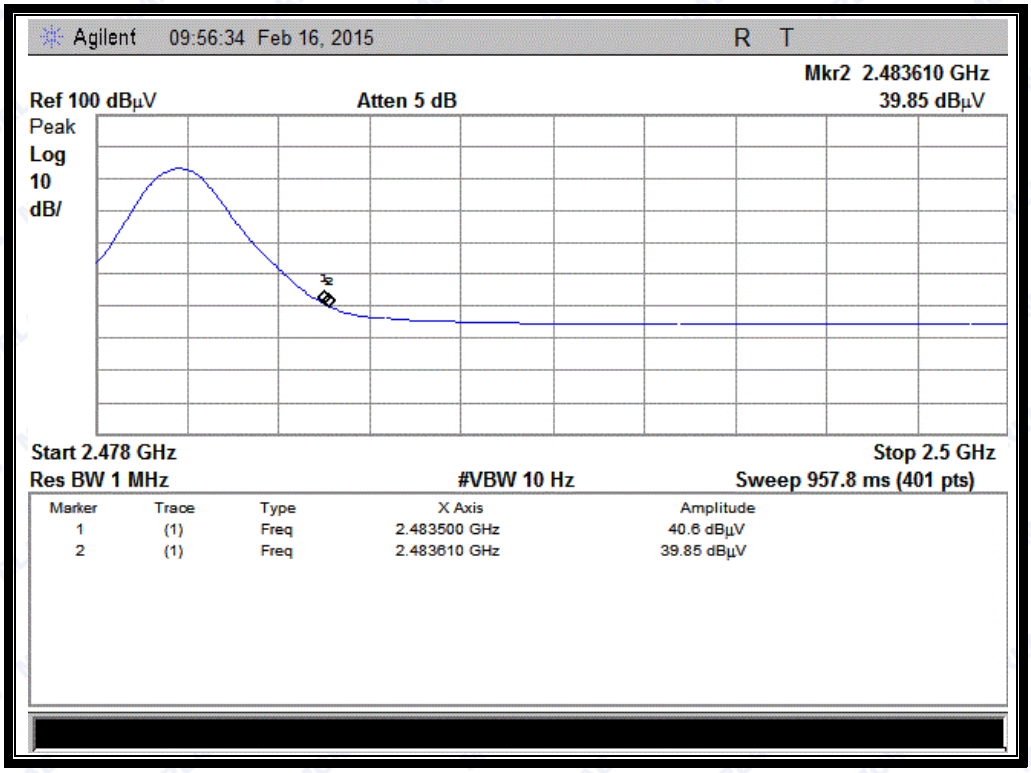
(Plot C1: Channel = 0 PEAK @ π/4-DQPSK)



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



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



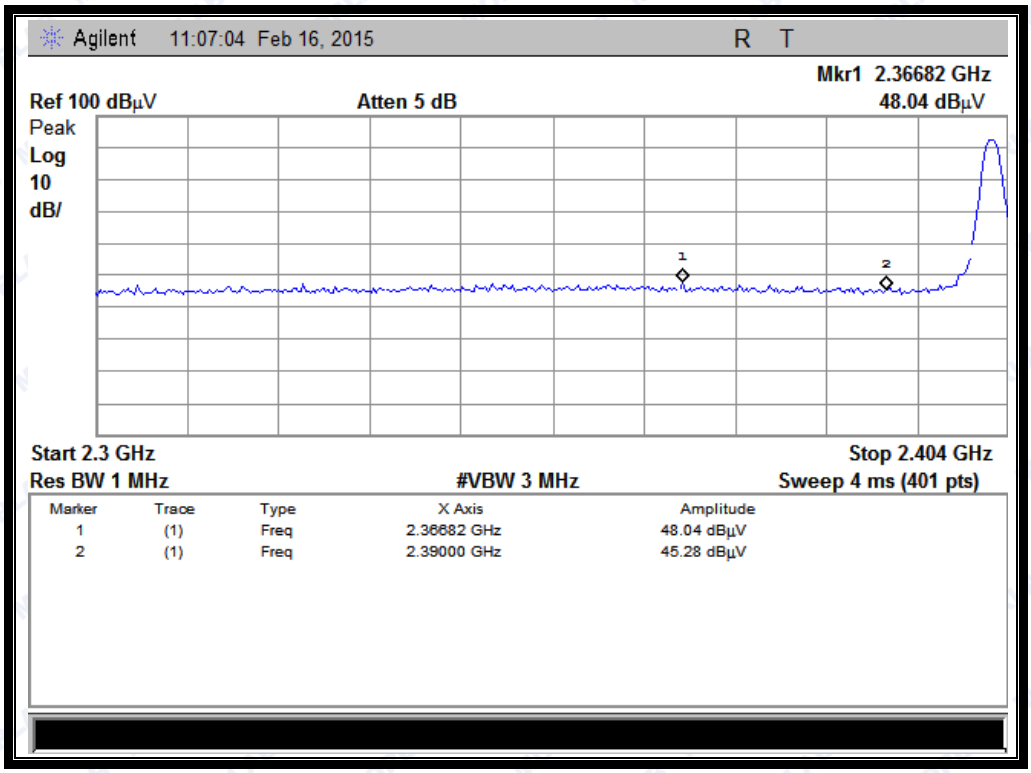
(Plot D2: Channel = 78 AVERAGE@ π/4-DQPSK)

2.8.4.3 8-DPSK Mode

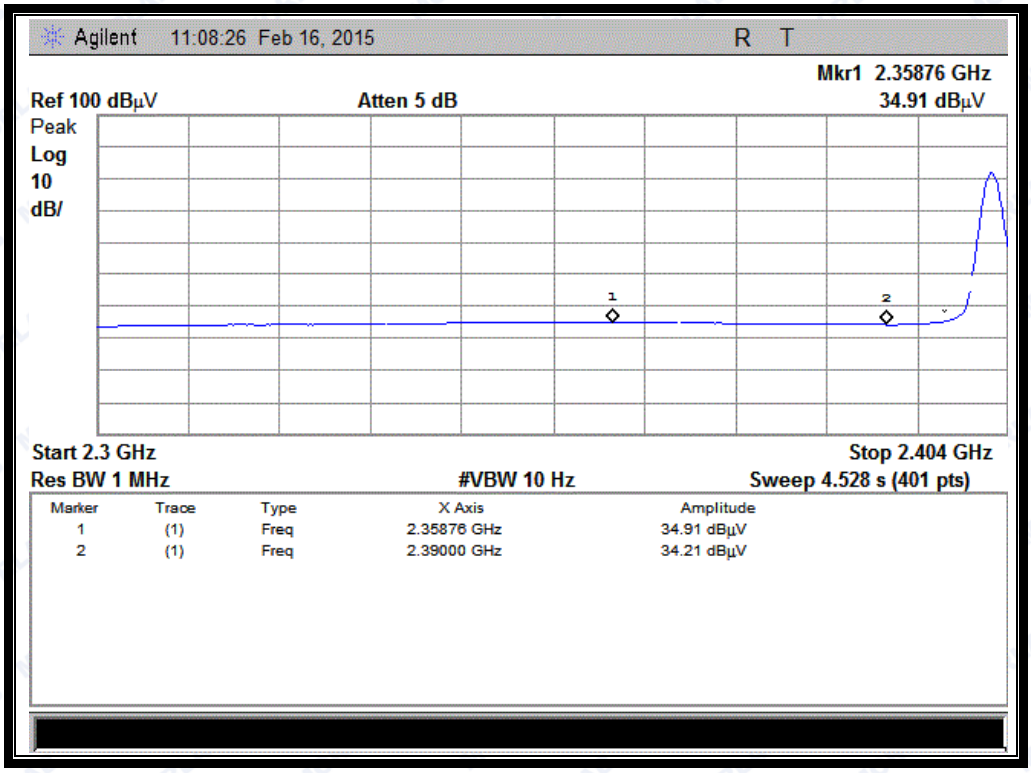
A. Test Verdict:

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	2366.82	PK	48.04	-33.63	32.56	46.97	74	Pass
0	2358.76	AV	34.91	-33.63	32.56	33.84	54	Pass
78	2483.89	PK	49.3	-33.18	32.5	48.62	74	Pass
78	2483.67	AV	39.95	-33.18	32.5	39.27	54	Pass

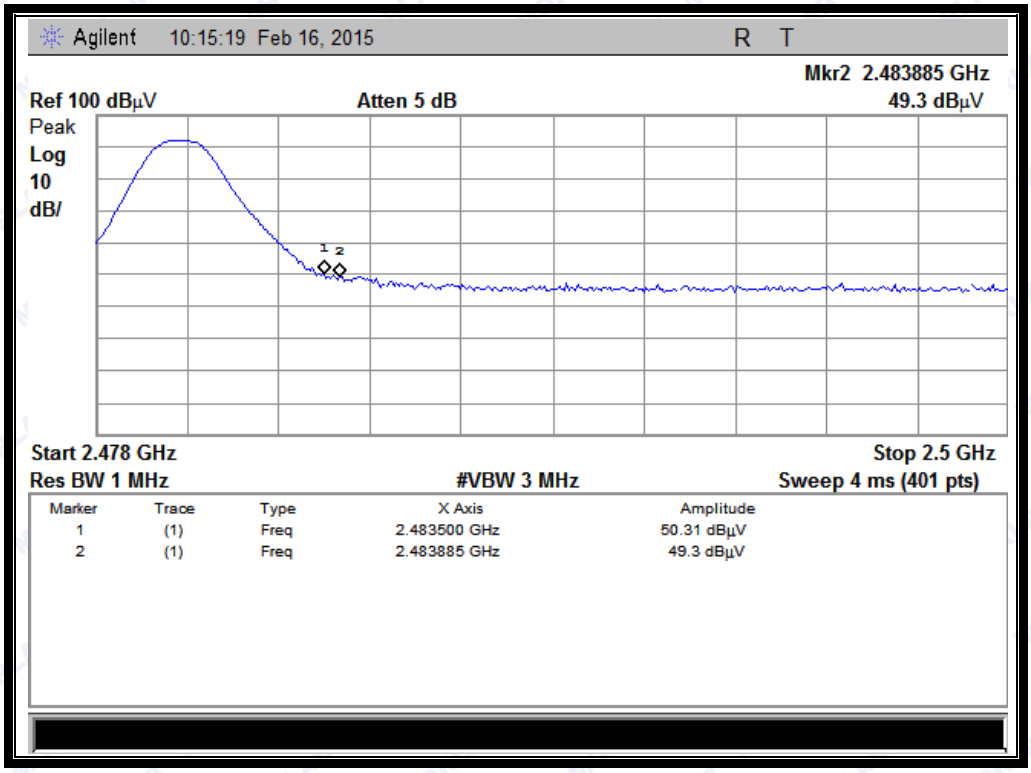
B. Test Plots:



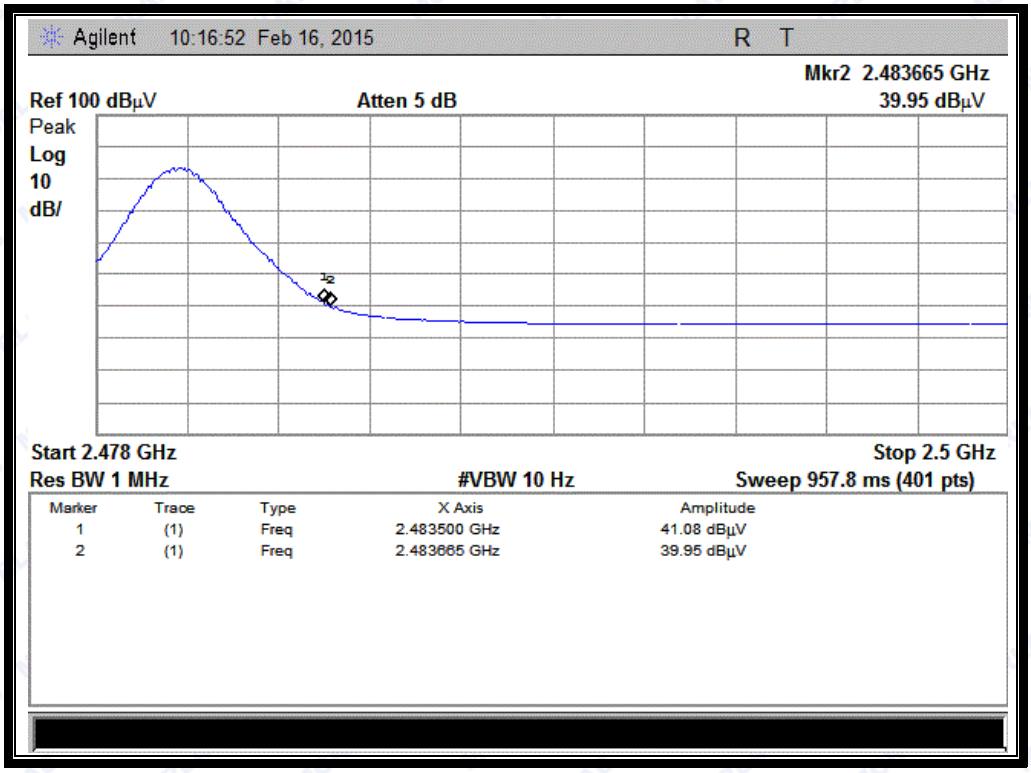
(Plot E1: Channel = 0 PEAK @ 8-DPSK Mode)



(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

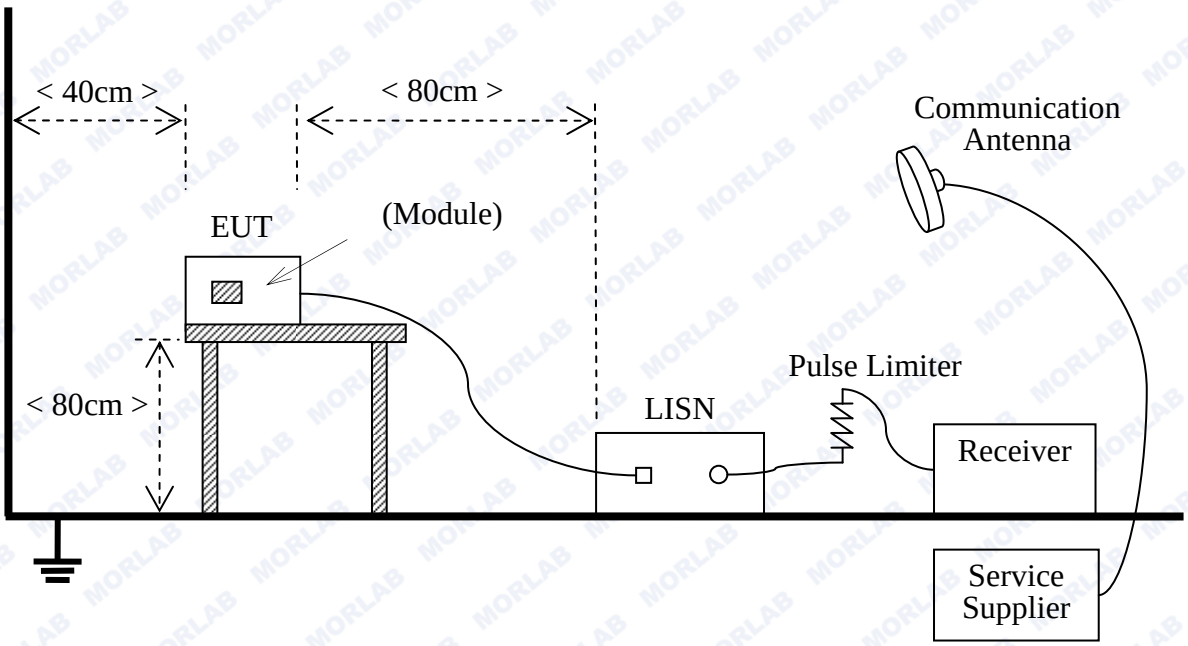
NOTE:

(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).

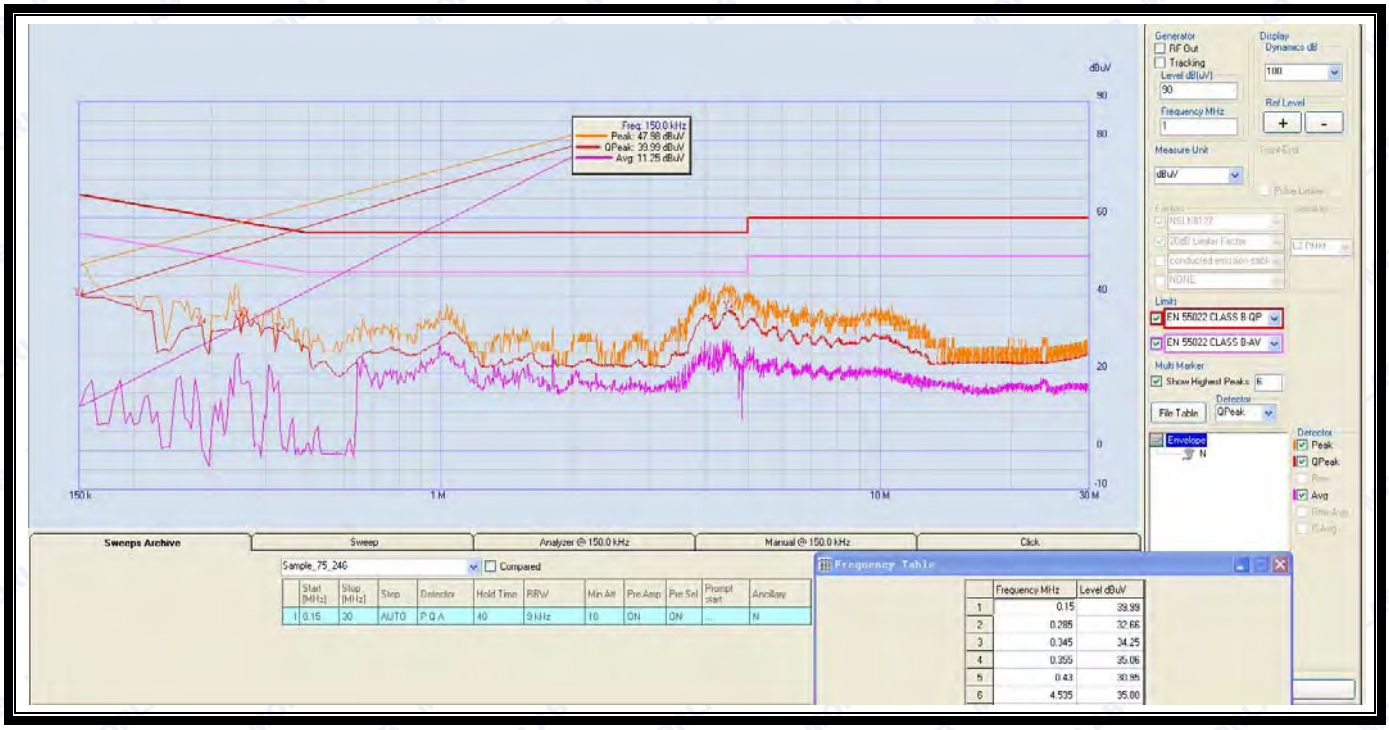
2.9.3 Test Result

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.

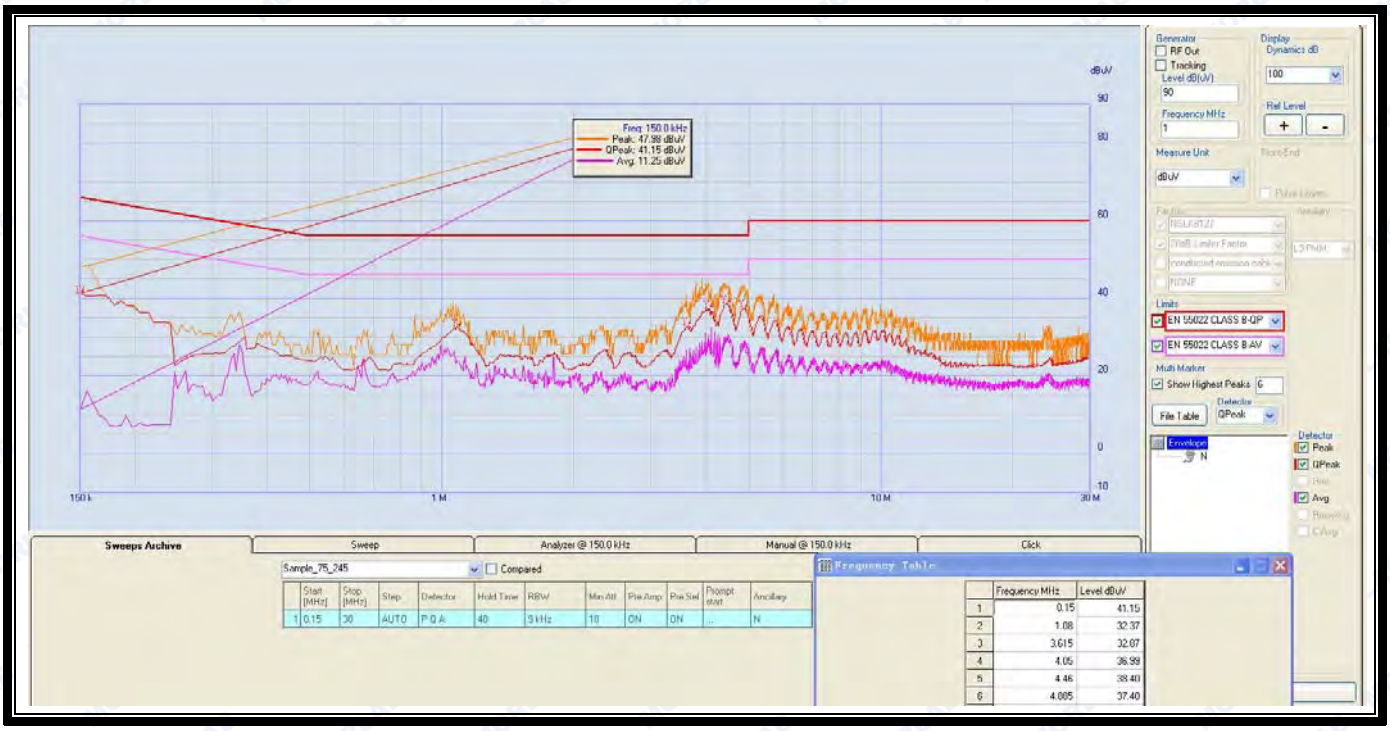
A. Test setup:

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:

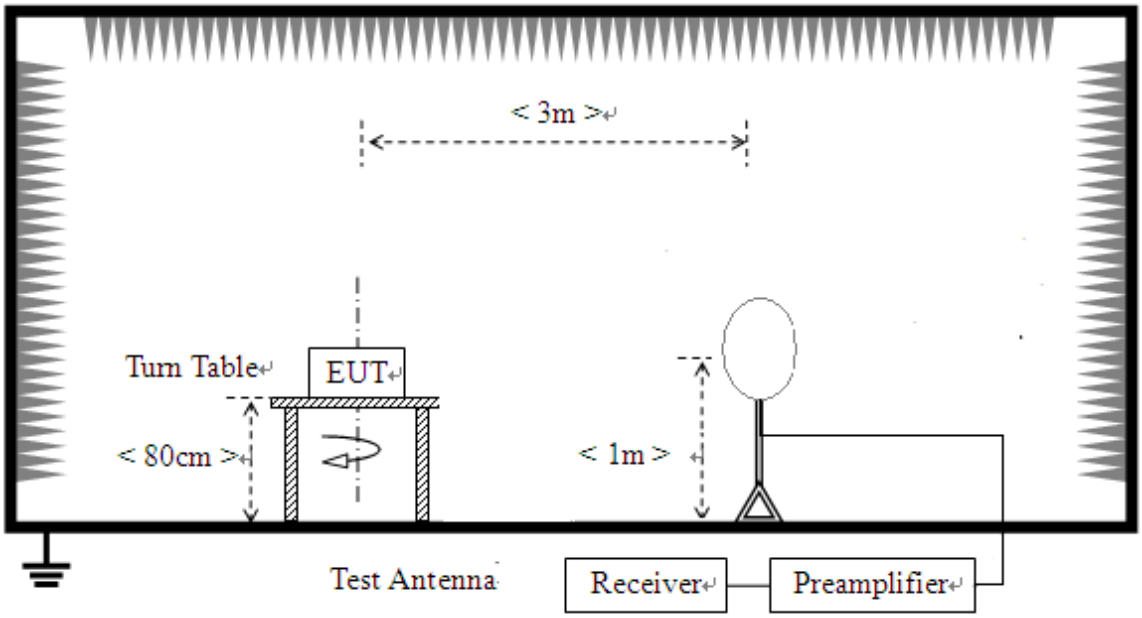
1. For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
2. For above 1000MHz, limit field strength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

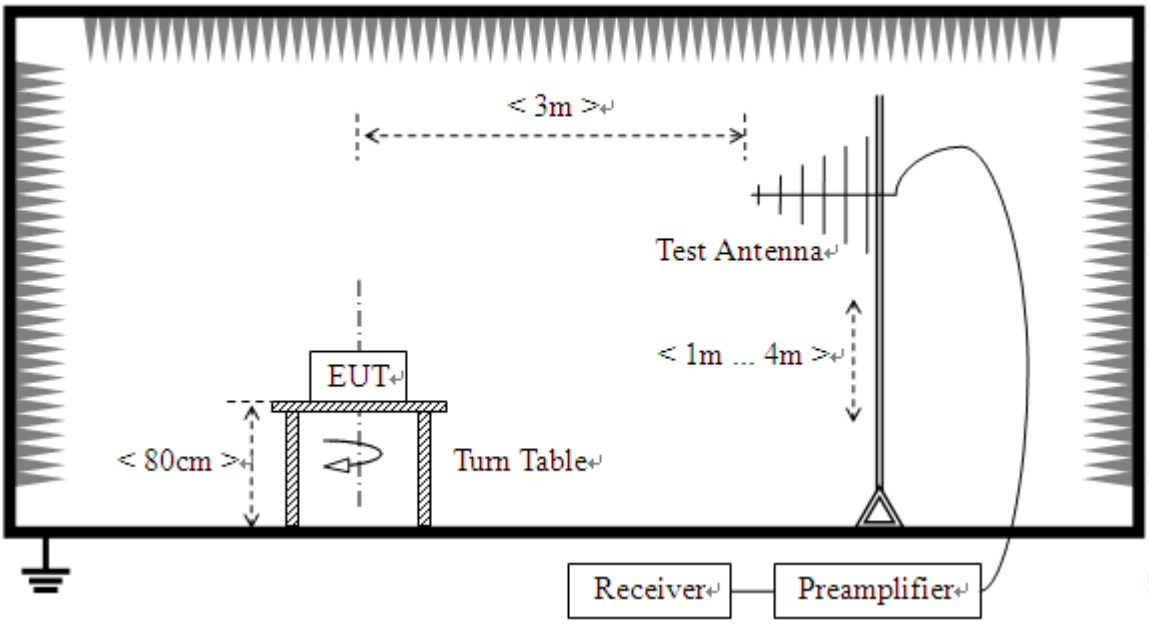
2.10.2 Test Description

A. Test Setup:

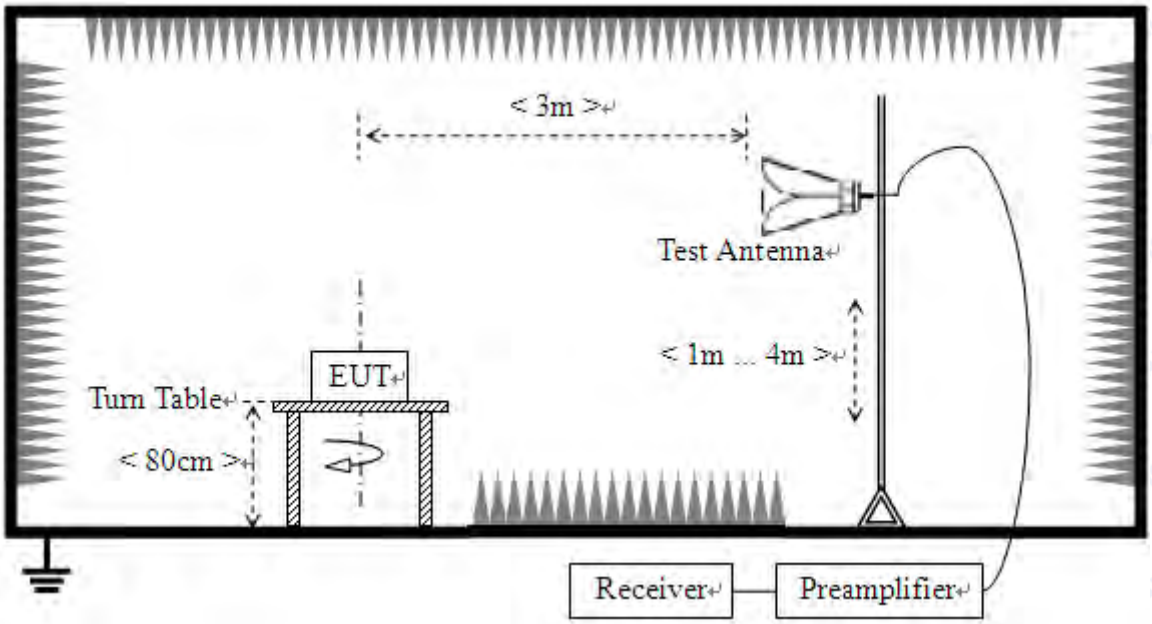
1) For radiated emissions from 9kHz to 30MHz



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.

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 [dBμV/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.

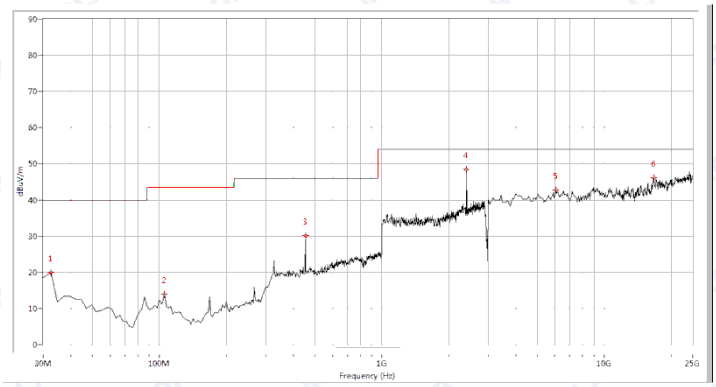
Note: All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

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:

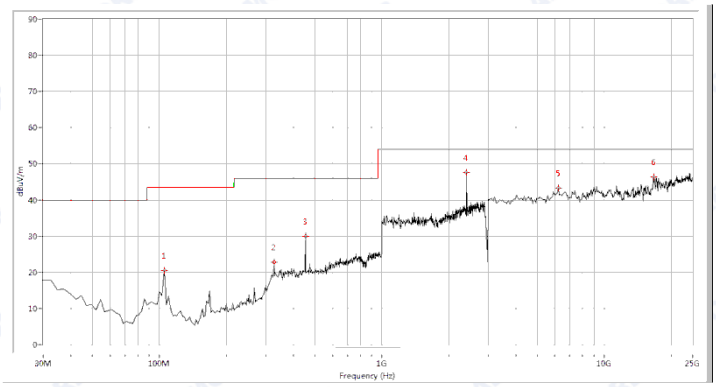
A. Test Plots for the Whole Measurement Frequency Range:

Plots for Channel = 0



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.419	19.88	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
104.988	13.93	N.A	N.A	N.A	43.5	N.A	Horizontal	PASS
453.317	30.11	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2402.000	48.54	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
6072.319	42.72	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
16715.711	46.11	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

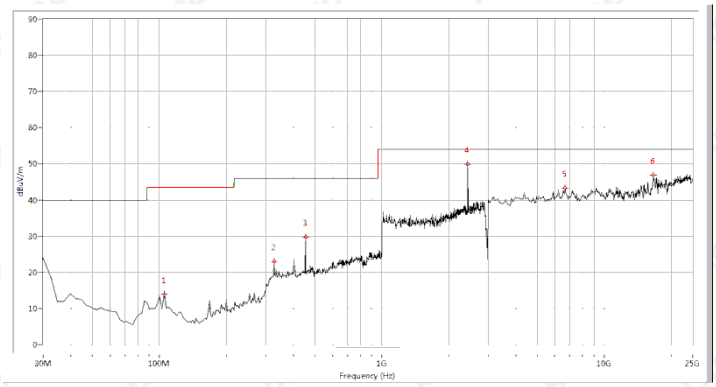
(30MHz to 25GHz, Antenna Horizontal @ GFSK, channel 0)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
104.988	20.58	N.A	N.A	N.A	43.5	N.A	Vertical	PASS
327.531	22.75	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
453.317	29.97	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
2402.000	47.53	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
6236.908	43.38	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
16715.711	46.38	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

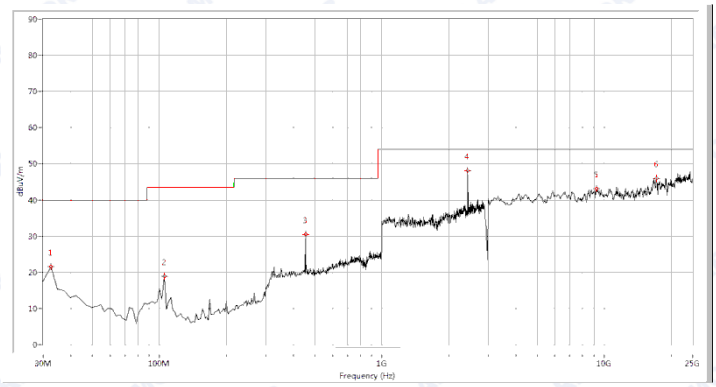
(30MHz to 25GHz, Antenna Vertical @ GFSK, channel 0)

Plot for Channel = 39



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
104.988	13.95	N.A	N.A	N.A	43.5	N.A	Horizontal	PASS
327.531	22.96	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
453.317	29.82	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2441.000	49.94	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
6675.810	43.33	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
16660.848	46.81	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

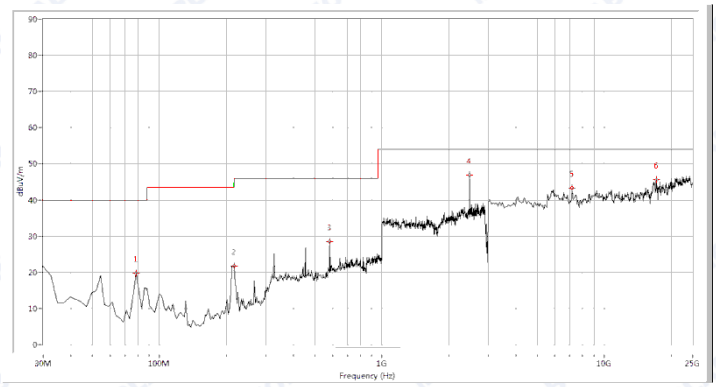
(30MHz to 25GHz, Antenna Horizontal @ GFSK, channel 39)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.419	21.53	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
104.988	18.90	N.A	N.A	N.A	43.5	N.A	Vertical	PASS
453.317	30.40	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
2441.000	48.19	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
9254.364	43.18	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
17154.613	46.04	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

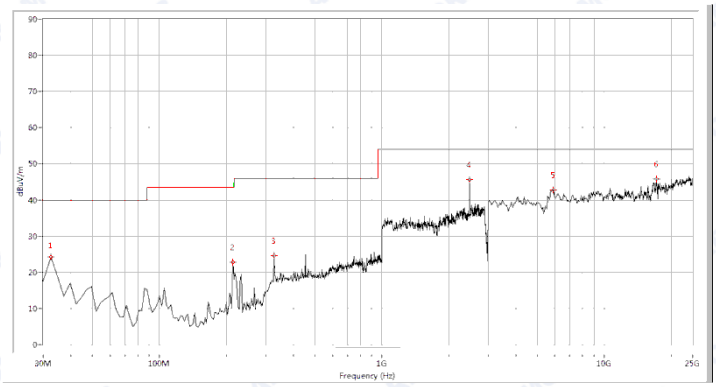
(30MHz to 25GHz, Antenna Vertical @ GFSK, channel 39)

Plot for Channel = 78



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
78.379	19.86	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
216.259	21.73	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
583.940	28.47	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2480.000	46.81	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
7169.576	43.39	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
17154.613	45.64	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

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



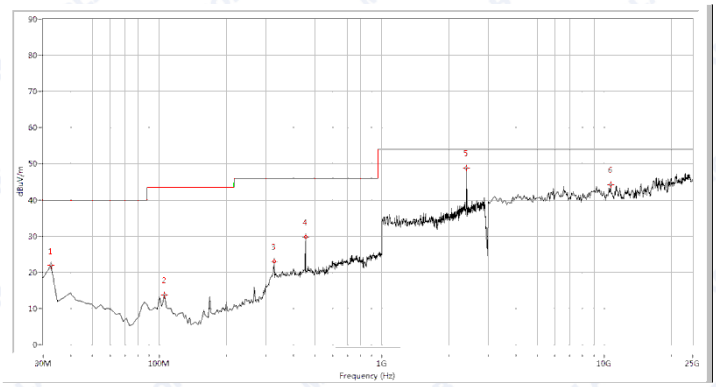
Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.419	24.24	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
213.840	22.87	N.A	N.A	N.A	43.5	N.A	Vertical	PASS
327.531	24.57	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
2480.000	45.69	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
5907.731	42.70	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
17154.613	45.80	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

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

2.10.4.2 π/4-DQPSK Mode:

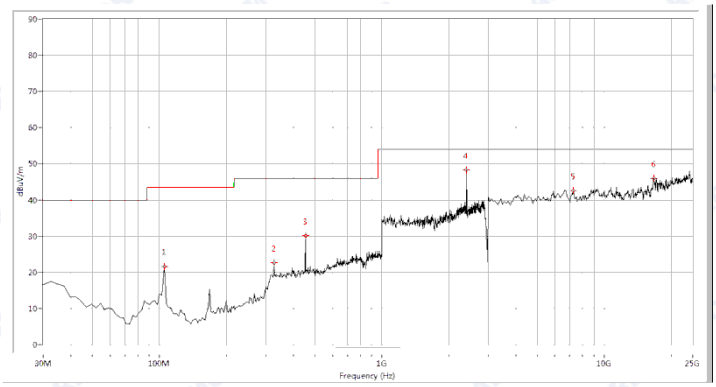
B. Test Plots for the Whole Measurement Frequency Range:

Plots for Channel = 0



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.419	21.86	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
104.988	13.81	N.A	N.A	N.A	43.5	N.A	Horizontal	PASS
327.531	22.98	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
453.317	29.75	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2402.000	48.89	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
10680.798	44.19	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

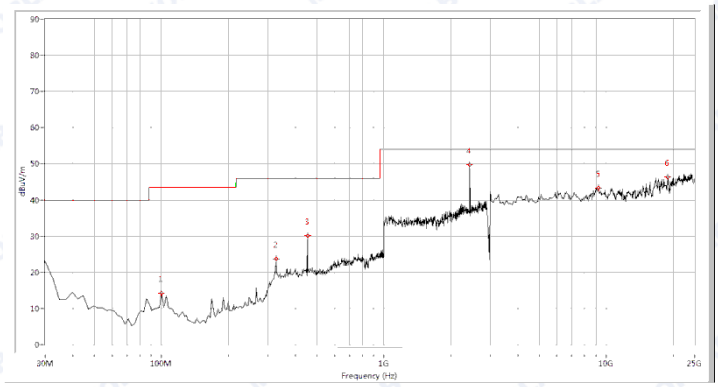
(30MHz to 25GHz, Antenna Horizontal @ π/4-DQPSK, channel 0)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
104.988	21.49	N.A	N.A	N.A	43.5	N.A	Vertical	PASS
327.531	22.55	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
453.317	30.16	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
2402.000	47.24	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
7279.302	42.57	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
16715.711	45.95	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

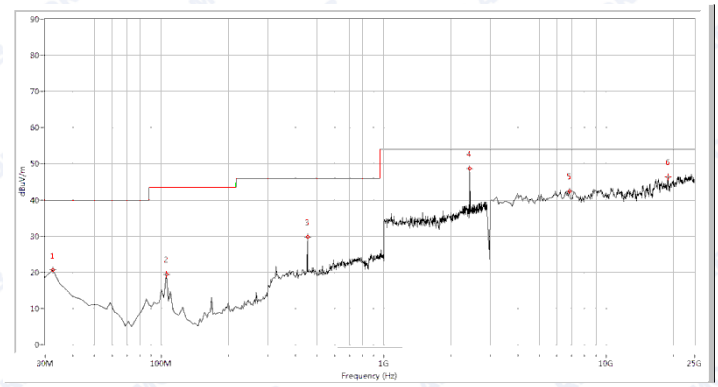
(30MHz to 25GHz, Antenna Vertical @ π/4-DQPSK, channel 0)

Plot for Channel = 39



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
100.150	14.27	N.A	N.A	N.A	43.5	N.A	Horizontal	PASS
327.531	23.67	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
453.317	30.07	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2441.000	49.65	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
9254.364	43.23	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
18910.224	46.40	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

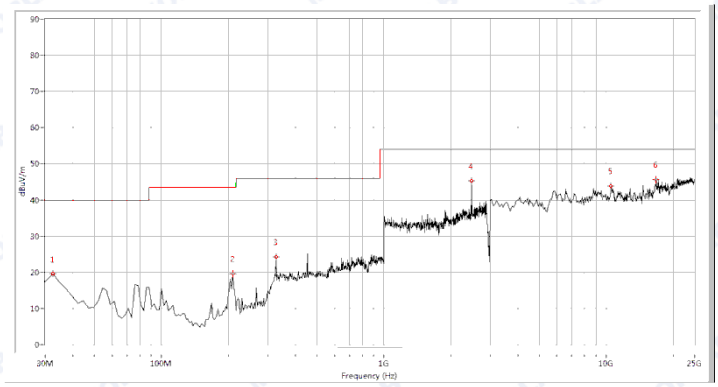
(30MHz to 25GHz, Antenna Horizontal @ π/4-DQPSK, channel 39)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.419	20.66	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
104.988	19.40	N.A	N.A	N.A	43.5	N.A	Vertical	PASS
453.317	29.76	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
2441.000	48.66	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
6840.399	42.44	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
18965.087	46.28	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

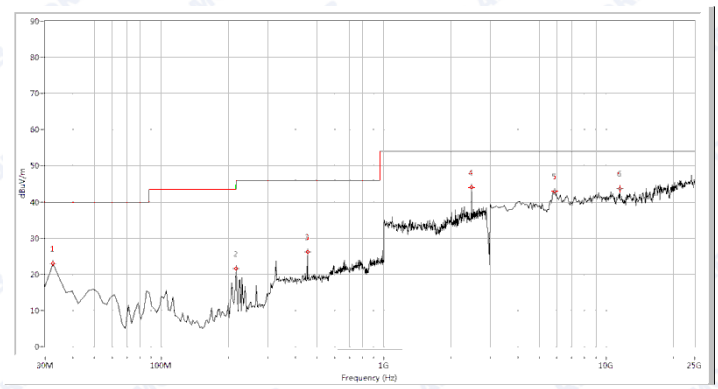
(30MHz to 25GHz, Antenna Vertical @ π/4-DQPSK, channel 39)

Plot for Channel = 78



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.419	19.56	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
209.002	19.66	N.A	N.A	N.A	43.5	N.A	Horizontal	PASS
327.531	24.16	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2480.000	45.30	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
10516.209	43.89	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
16770.574	45.54	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

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



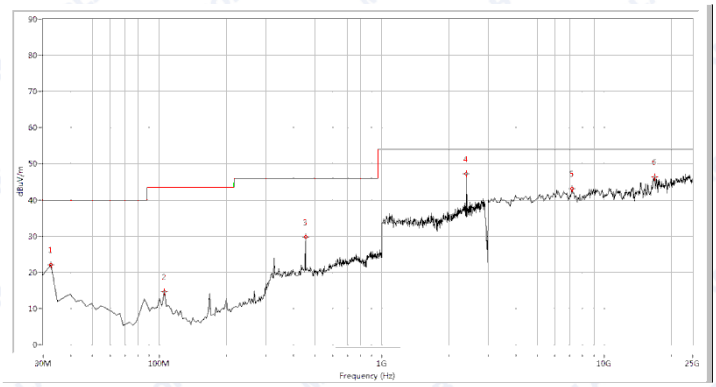
Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.419	23.07	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
216.259	21.52	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
453.317	26.27	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
2480.000	43.97	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
5852.868	43.00	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
11503.741	43.75	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

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

2.10.4.3 8-DPSK Mode：

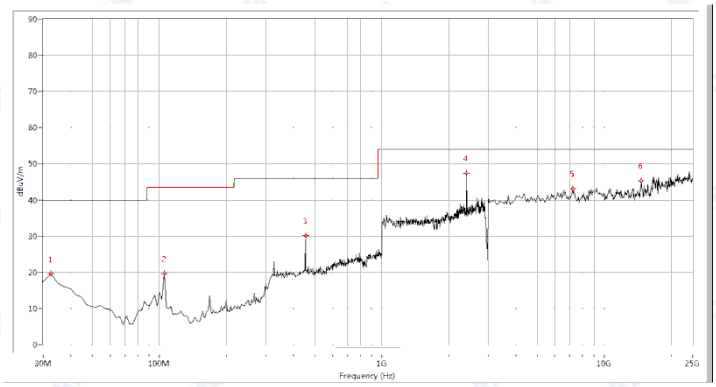
C. Test Plots for the Whole Measurement Frequency Range:

Plots for Channel = 0



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.419	22.07	N.A	N.A	N.A	40.0	N.A	Horizontal	PASS
104.988	14.53	N.A	N.A	N.A	43.5	N.A	Horizontal	PASS
453.317	29.70	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2402.000	47.27	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
7169.576	43.12	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
16825.436	46.37	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

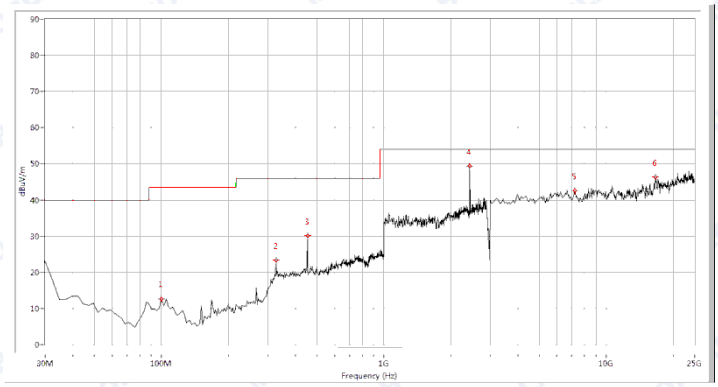
(30MHz to 25GHz, Antenna Horizontal @8-DPSK, channel 0)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.419	19.53	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
104.988	19.63	N.A	N.A	N.A	43.5	N.A	Vertical	PASS
453.317	30.12	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
2402.000	47.45	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
7224.439	43.20	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
14685.786	45.23	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

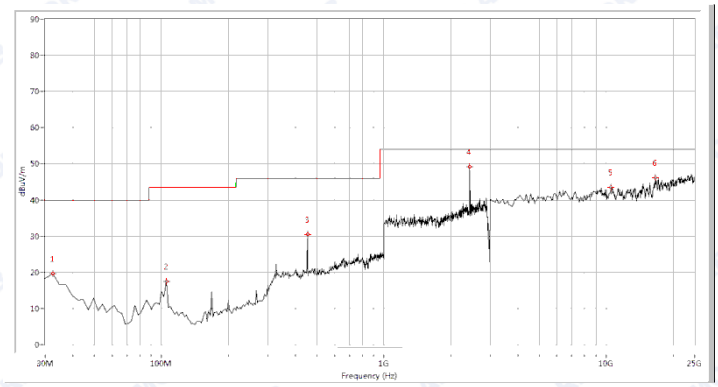
(30MHz to 25GHz, Antenna Vertical @8-DPSK, channel 0)

Plot for Channel = 39



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
100.150	12.64	N.A	N.A	N.A	43.5	N.A	Horizontal	PASS
327.531	23.36	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
453.317	30.15	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2441.000	49.35	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
7224.439	42.54	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
16660.848	46.36	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

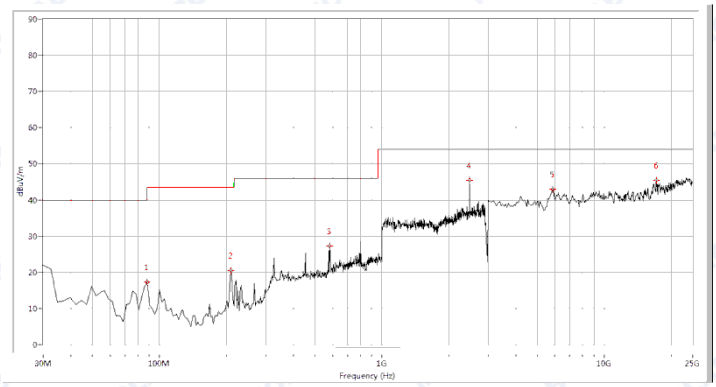
(30MHz to 25GHz, Antenna Horizontal @8-DPSK, channel 39)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.419	19.64	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
104.988	17.48	N.A	N.A	N.A	43.5	N.A	Vertical	PASS
453.317	30.46	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
2441.000	49.21	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
10516.209	43.44	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
16605.985	46.10	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

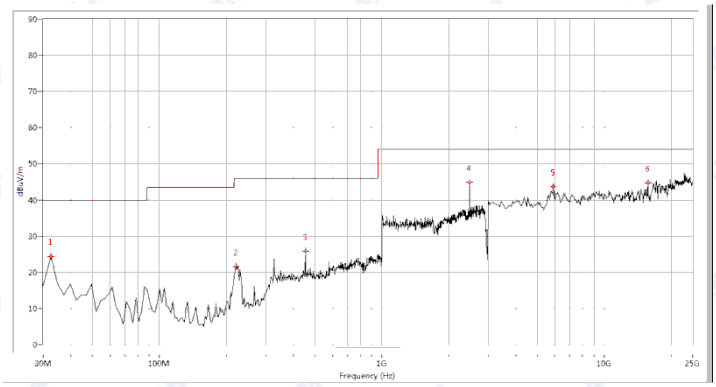
(30MHz to 25GHz, Antenna Vertical @8-DPSK, channel 39)

Plot for Channel = 78



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
88.055	17.21	N.A	N.A	N.A	43.5	N.A	Horizontal	PASS
209.002	20.54	N.A	N.A	N.A	43.5	N.A	Horizontal	PASS
583.940	27.29	N.A	N.A	N.A	46.0	N.A	Horizontal	PASS
2480.000	45.46	N.A	N.A	N.A	N.A	N.A	Horizontal	N.A
5852.868	42.92	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
17154.613	45.39	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
32.419	24.39	N.A	N.A	N.A	40.0	N.A	Vertical	PASS
221.097	21.54	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
453.317	25.77	N.A	N.A	N.A	46.0	N.A	Vertical	PASS
2480.000	44.82	N.A	N.A	N.A	N.A	N.A	Vertical	N.A
5907.731	43.69	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
15728.180	44.65	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 operated in a manner that ensure that the public is not exposed to radio frequency energy lever in excess of Commission's guideline.

2.11.2 Result

Please refer to SAR report.

ANNEX A 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.

1.4 Test Equipments Utilized

1.4.1 Conducted 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

1.4.2 Conducted 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

1.4.3 Radiated 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

1.4.4 Climate 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

1.4.5 Vibration 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

1.4.6 Anechoic 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 *****