FCC TEST REPORT

for

47 CFR Part 15 Subpart C

Equipment : Bluetooth USB Adapter

Model No. : MBD-C2.1-1

FCC ID. : SI4-MBDC211

Filing Type : Certification

Applicant : Mavin Technology Inc.
Room 305, Bldg. 52, No. 195-28, Sec. 4 Chung Hsin Rd., Chutung, Hsinchu, Taiwan, 310, R.O.C.

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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History of this test report

Original Report Issue Date: Oct. 11, 2004

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

CERTIFICATE OF COMPLIANCE

for

47 CFR Part 15 Subpart C

Equipment	:	**Bluetooth USB Adapter**
Model No.	:	**MBD-C2.1-1**
FCC ID.	:	**SI4-MBDC211**
Filing Type	:	**Certification**
Applicant	:	**Mavin Technology Inc.** Room 305, Bldg. 52, No. 195-28, Sec. 4 Chung Hsin Rd., Chutung, Hsinchu, Taiwan, 310, R.O.C.

I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 - 2003** and the equipment under test was ***passed*** all test items required in FCC Part 15 subpart C, relative to the equipment under test. Testing was carried out on Oct. 04, 2004 at **SPORTON International Inc.** LAB.

Daniel Lee 10/12/2004

Daniel Lee
Manager

1. General Description of Equipment under Test

1.1. Applicant

Mavin Technology Inc.
Room 305, Bldg. 52, No. 195-28, Sec. 4, Chung Hsin Rd., Chutung, Hsinchu, Taiwan, 310, R.O.C.

1.2. Manufacturer

Mavin Technology Inc.
Room 305, Bldg. 52, No. 195-28, Sec. 4, Chung Hsin Rd., Chutung, Hsinchu, Taiwan, 310, R.O.C.

1.3. Basic Description of Equipment under Test

Equipment	: Bluetooth USB Adapter
Model No.	: MBD-C2.1-1
FCC ID	: SI4-MDBC211
Trade Name	: Mavin
Power Supply Type	: From System

1.4. Feature of Equipment under Test

Product Feature & Specification				
1. Type of Modulation	GFSK			
2. Frequency Band	2.400GHz ~ 2.4835GHz			
3. Carrier Frequency of each channel	2402+K MHz ; K=0 ~ 78			
4. Bandwidth of each channel	1MHz			
5. Maximum Output Power to Antenna	9.52 dBm			
6. Type of Antenna Connector	N/A			
7. Antenna Type	PCB Antenna			
8. Antenna Gain	0 dBi			
9. Function Type	Transmitter		Transceiver	V
10. Power Rating (DC/AC , Voltage)	DC 3.3V			
11. Temperature Range (Operating)	-40°C to + 105°C			

2. Test Configuration of Equipment under Test

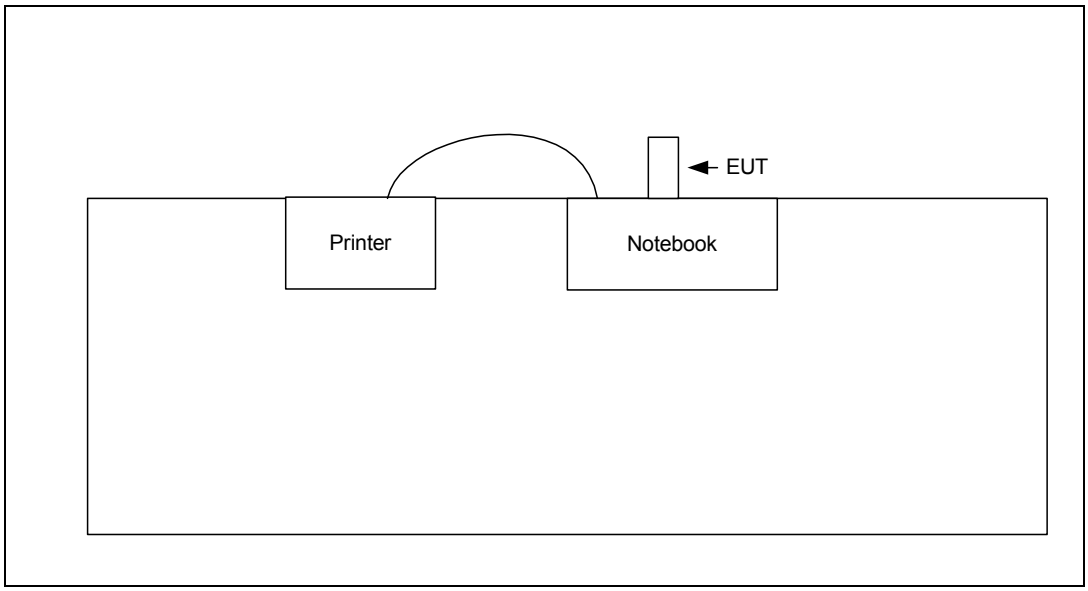
2.1. Test Manner

a. The EUT has been associated with peripherals pursuant to ANSI C63.4- 2003 and configuration operated in a manner, which tended to maximize its emission characteristics in a typical application.
b. The complete test system included DELL Notebook, EPSON Printer and EUT for EMI test.
c. The following test modes were tested for conduction test:
   Mode 1: Link Mode
d. The following test modes were tested for radiation test:
   Mode 1: TX CH00 2402MHz
   Mode 2: TX CH39 2441MHz
   Mode 3: TX CH78 2480MHz
e. Frequency range investigated: conduction 150 kHz to 30 MHz, radiation 30 MHz to 25000MHz.

2.2. Description of Test System

Item	Asset	Model Name	Power Cord
1.	Notebook (DELL)	PP05L	N/A
2.	Printer (EPSON)	LQ-300	N/A

2.3. Connection Diagram of Test System



3. Operation of Equipment under Test

During the test, the following programs on WIN XP were executed :
Execute “Blue test.exe” to implement continuous transmitting.

4. General Information of Test

Test Site Location	:	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiag, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
Test Site No	:	CO01-HY, 03CH06-HY

4.1. Test Voltage

110V/60Hz or DC 3.7V

4.2. Standard for Methods of Measurement

ANSI C63.4-2003

4.3. Test in Compliance with

47 CFR Part 15 Subpart C

4.4. Frequency Range Investigated

Conduction: from 150 kHz to 30 MHz
Radiation: from 30 MHz to 25000MHz

4.5. Test Distance

The test distance of radiated emission from antenna to EUT is 3 m.

5. Report of Measurements and Examinations

5.1. List of Measurements and Examinations

FCC Rule	Description of Test	Result
15.247(a)(1)	Hopping Channel Bandwidth	Pass
15.247(a)(1)	Hopping Channel Separation	Pass
15.247(a)(1)(iii)	Number of Hopping Frequency Used	Pass
15.247(a)(1)(iii)	Dwell Time of Each Frequency within a 30 Second Period	Pass
15.247(b)(1)	Output Power	Pass
15.247(c)	100kHz Bandwidth of Frequency Band Edges	Pass
15.207	Conducted Emission	Pass
15.209	Radiated Emission	Pass
15.203	Antenna Requirement	Pass

5.2. Hopping Channel Separation

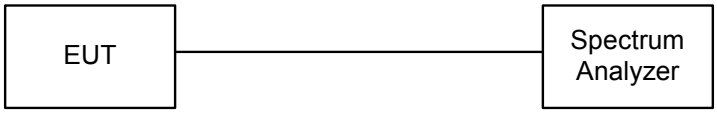
5.2.1. Measuring Instruments：

As described in chapter 7 of this test report.

5.2.2. Test Procedure：

1. The transmitter output was connected to the spectrum analyze directly.
2. Set RBW of spectrum analyzer to 30kHz and VBW to 100kHz.
3. The Hopping Channel Separation is defined as the channel is separated with the next channel.

5.2.3. Test Setup Layout：



5.2.4. Test Result：The spectrum analyzer plots are attached as below

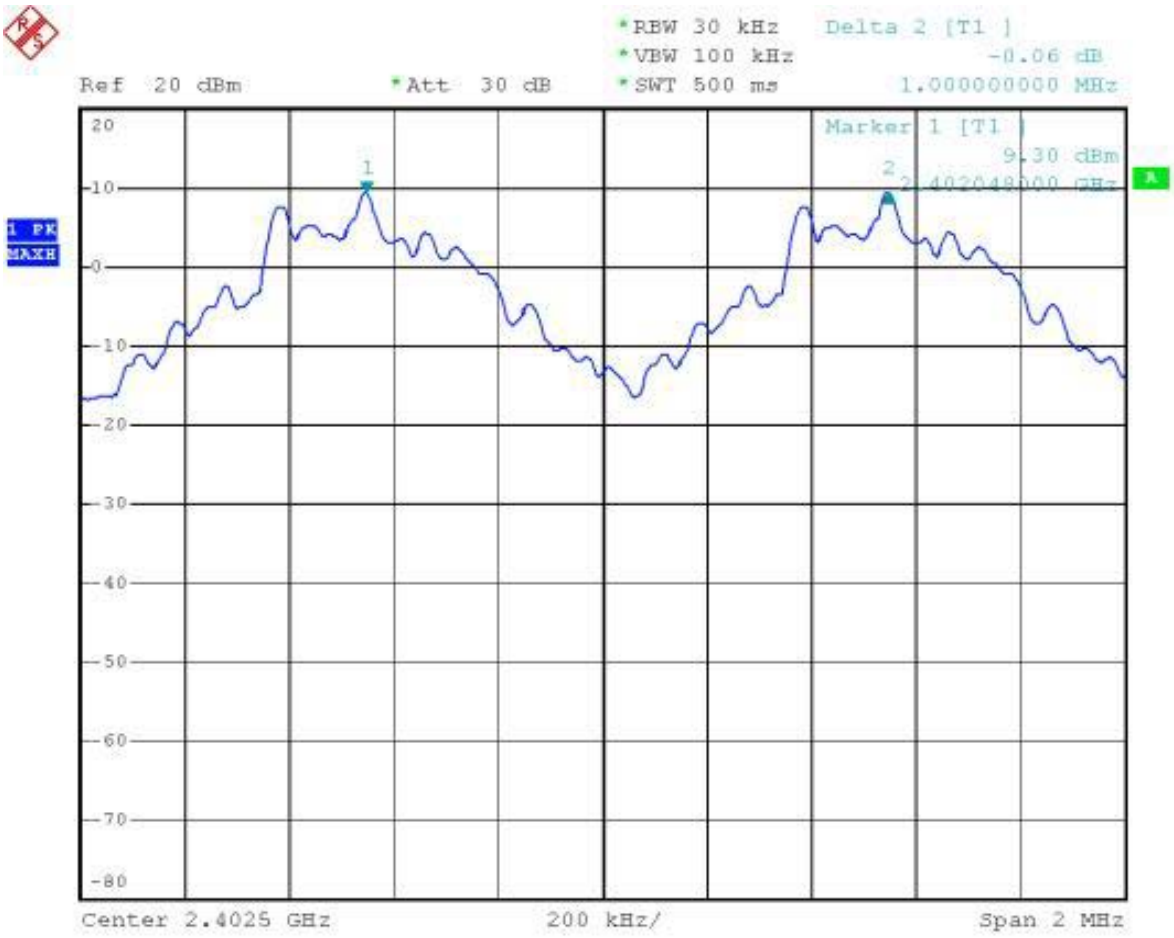
- Test Mode: Mode 1~Mode 3
- Temperature: 26°C
- Relative Humidity: 58 %

Channel	Frequency (MHz)	Hopping Channel Separation (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	1.0	0.760	Mode 1
39	2441	1.0	0.760	Mode 2
78	2480	1.0	0.764	Mode 3

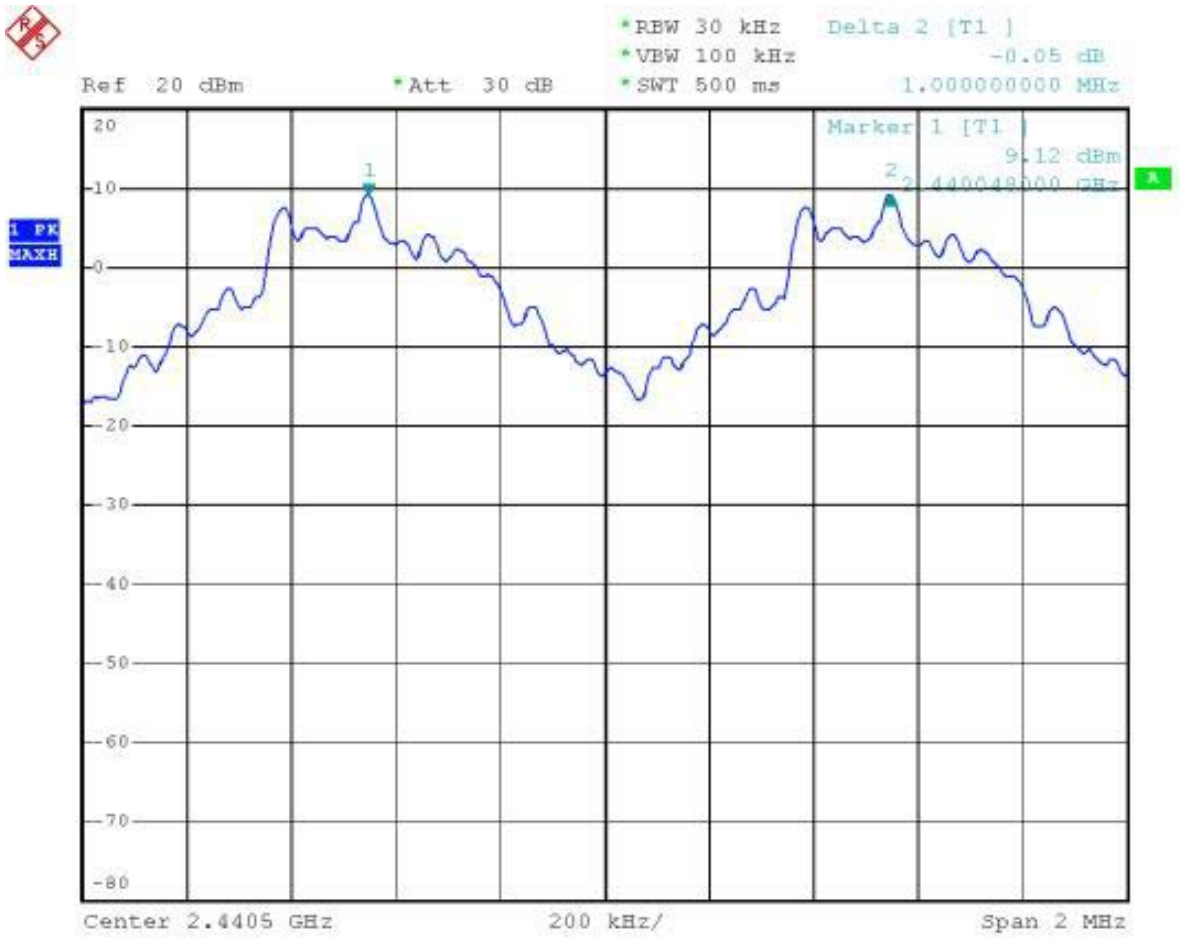
Remark: Limit is the greater one of 25kHz or the 20dB bandwidth of the hopping channel.

5.2.5 Hopping Channel Separation

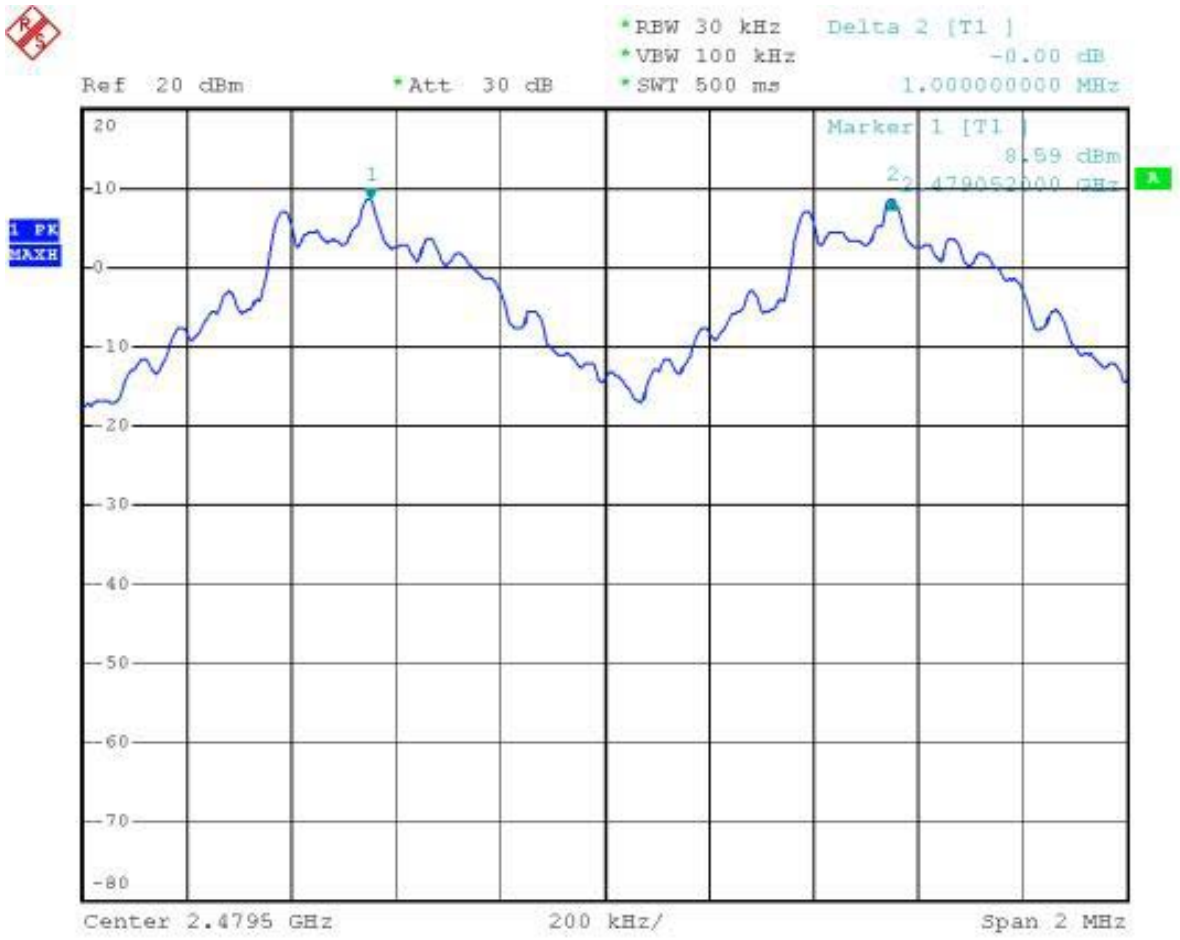
Mode 1: CH00 (2402MHz)



Mode 2: CH39 (2441MHz)



Mode 3: CH78 (2480MHz)



5.3. Number of Hopping Frequency

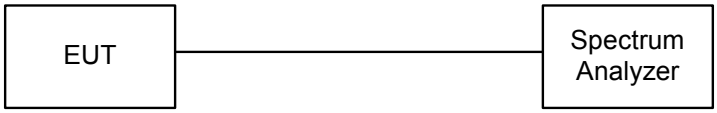
5.3.1. Measuring Instruments：

As described in chapter 7 of this test report.

5.3.2. Test Procedure：

1. The transmitter output was connected to the spectrum analyze directly.
2. Set RBW of spectrum analyzer to 100kHz and VBW to 100kHz.
3. The number of hopping frequency used is defined as the device has the numbers of total channel.

5.3.3. Test Setup Layout：

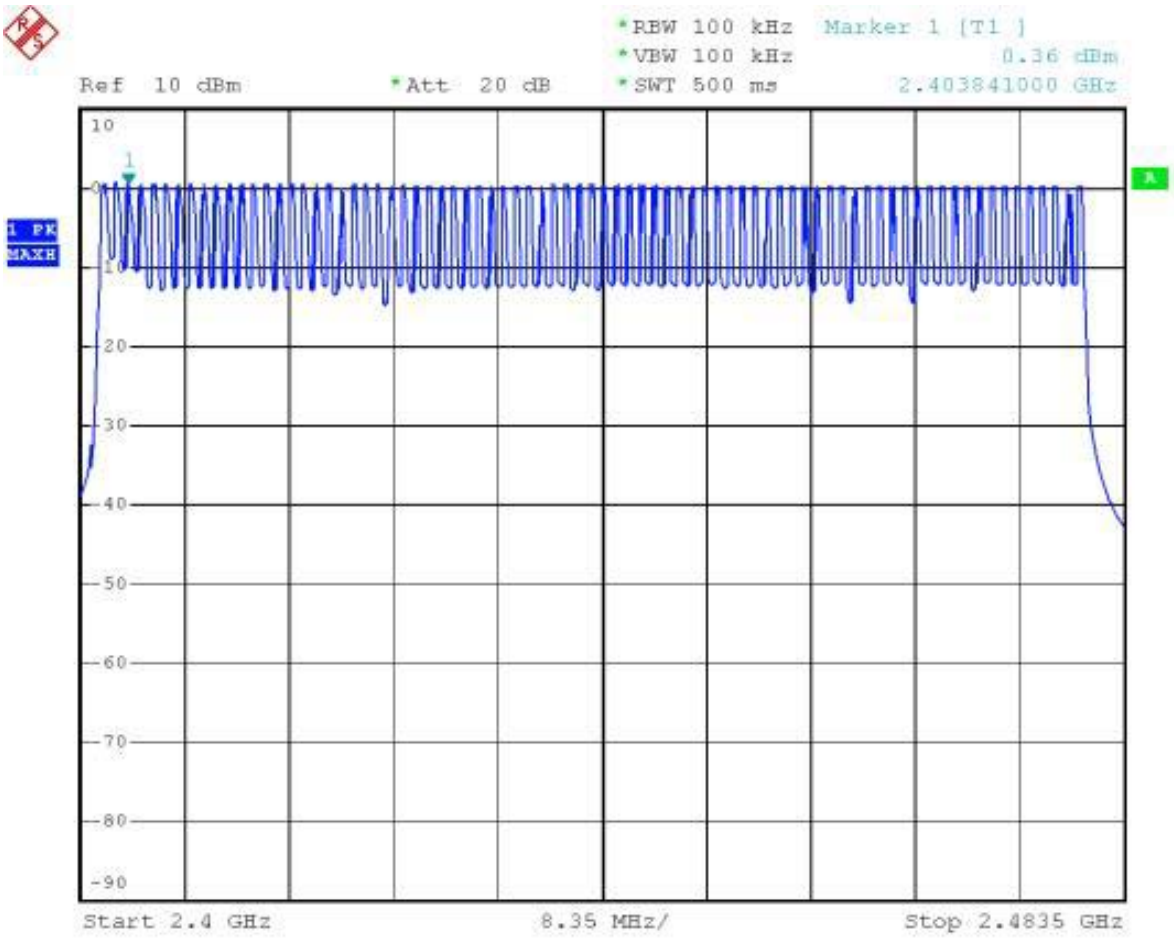


5.3.4. Test Result：See spectrum analyzer plots below

- Temperature: 26°C
- Relative Humidity: 58 %

Number of Hopping Frequency (Channel)	Limits (Channel)
79	75

5.3.5 Number of Hopping Frequency



5.4 Hopping Channel Bandwidth

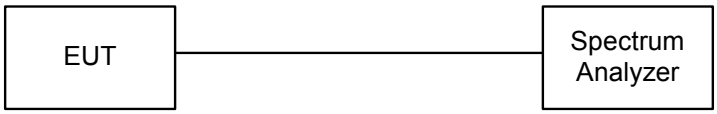
5.4.1 Measuring Instruments：

As described in chapter 7 of this test report.

5.4.2 Test Procedure：

1. The transmitter output was connected to the spectrum analyzer directly.
2. Set RBW of spectrum analyzer to 30kHz and VBW to 300kHz.
3. The Hopping Channel bandwidth is defined as the frequency range where the power is higher than peak power minus 20dB.

5.4.3 Test Setup Layout：



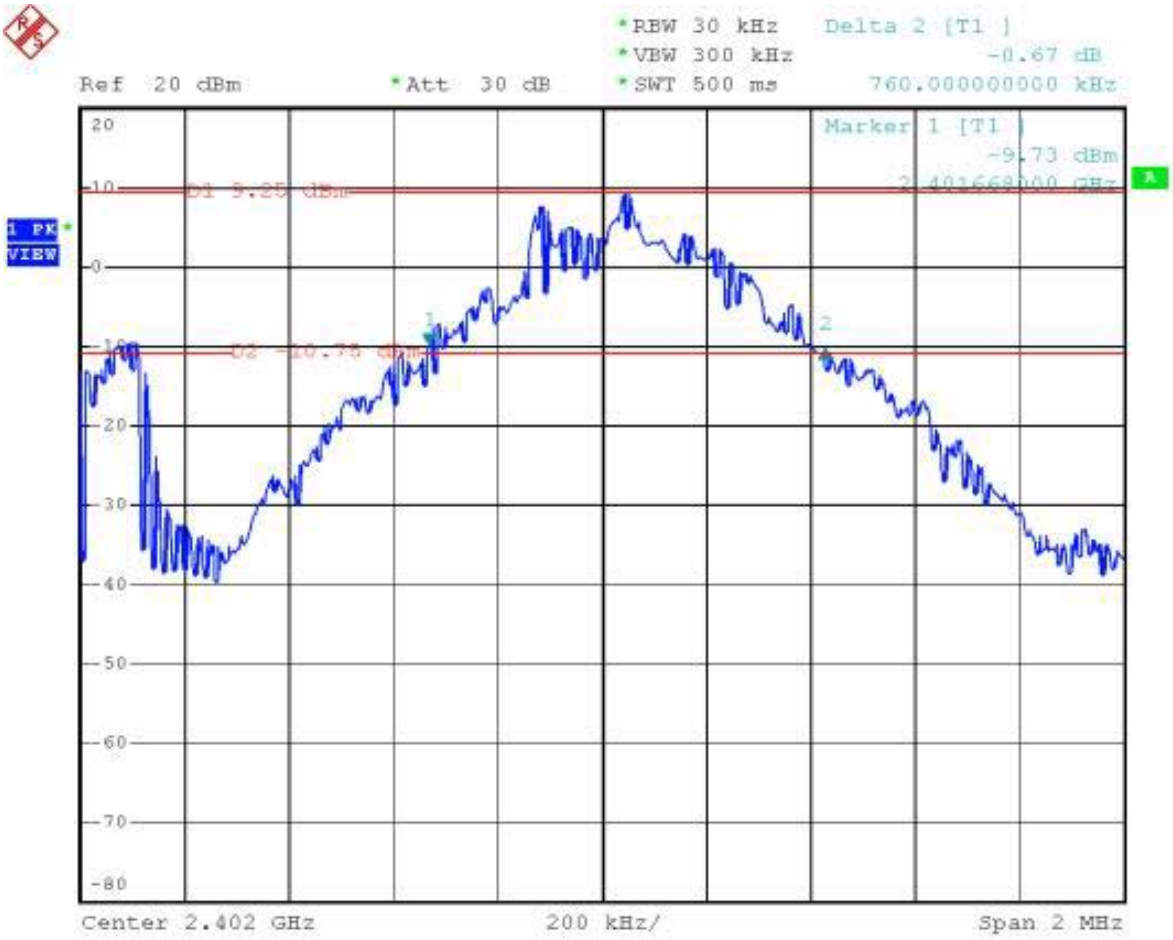
5.4.4 Test Result：See spectrum analyzer plots below

- Test Mode: Mode 1~Mode 3
- Temperature: 26°C
- Relative Humidity: 58 %

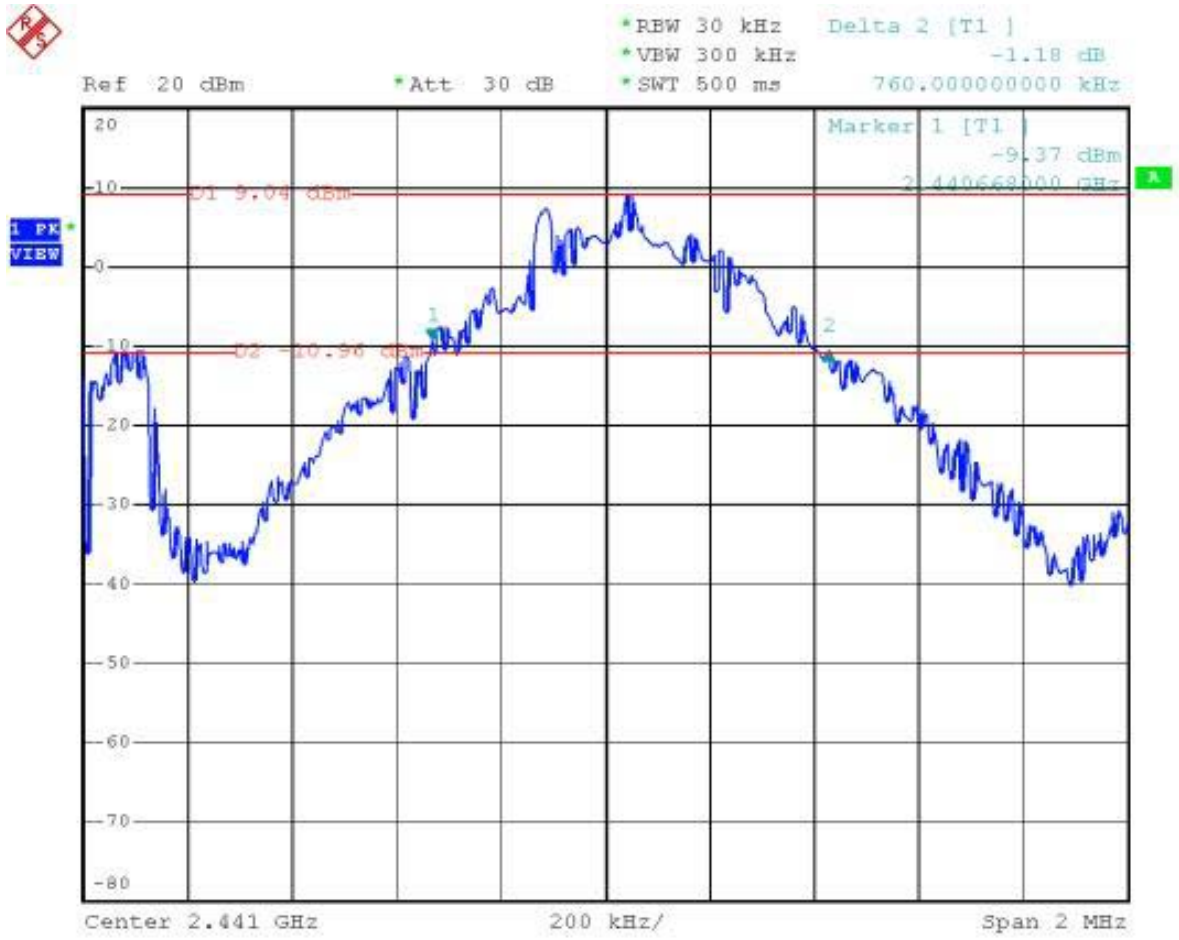
Channel	Frequency (MHz)	Hopping Channel Bandwidth (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	0.760	1.0	Mode 1
39	2441	0.760	1.0	Mode 2
78	2480	0.764	1.0	Mode 3

5.4.5 Hopping Channel Bandwidth

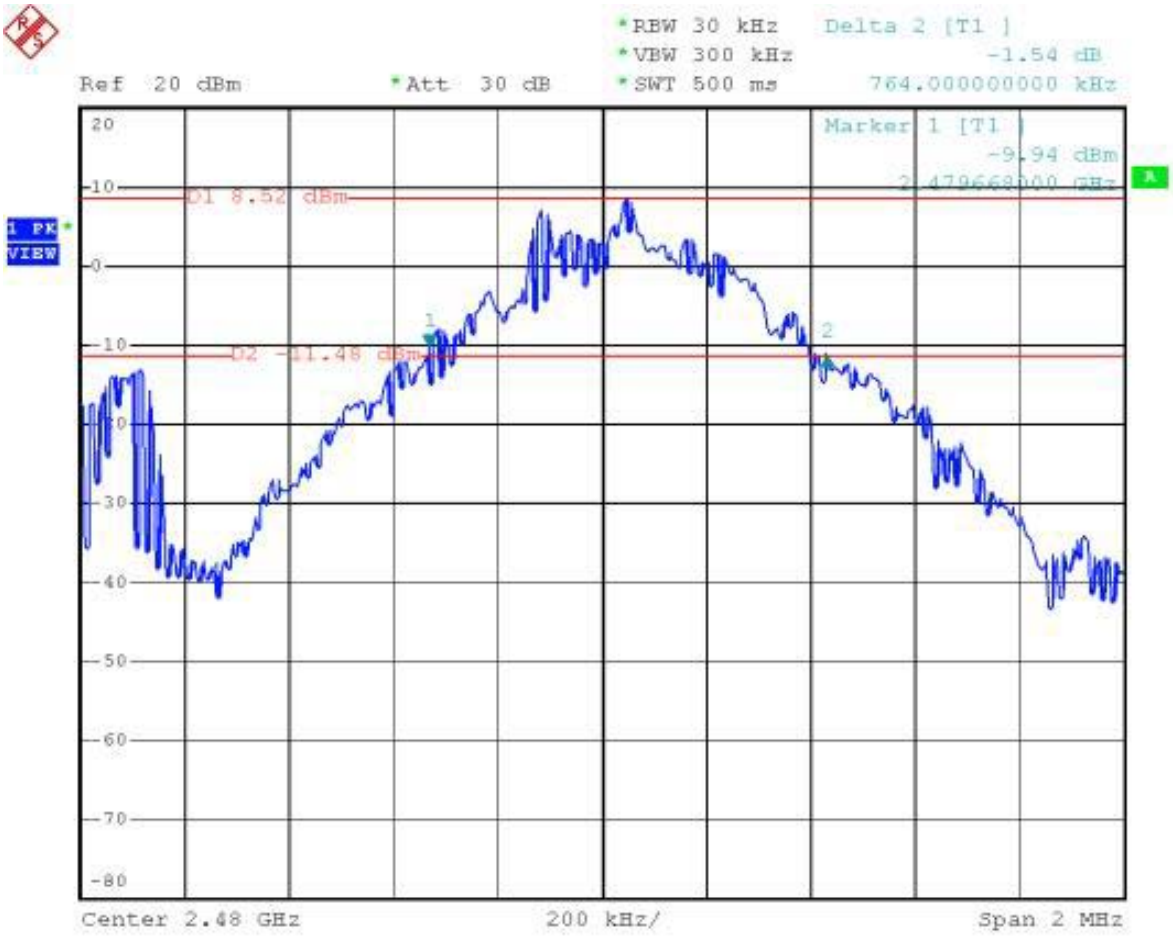
Mode 1: CH00 (2402MHz)



Mode 2: CH39 (2441MHz)



Mode 3: CH78 (2480MHz)



5.5 Dwell Time of Each Frequency within a 30 Seconds Period

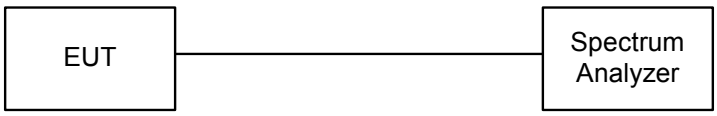
5.5.1 Measuring Instruments：

As described in chapter 7 of this test report.

5.5.2 Test Procedure：

1. The transmitter output was connected to the spectrum analyzer directly.
2. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
3. Set the center frequency on any frequency would be measured and set the frequency span to zero span.
4. The equation = 30*(1600/79)*t (t = the time duration of one single pulse)

5.5.3 Test Setup Layout：



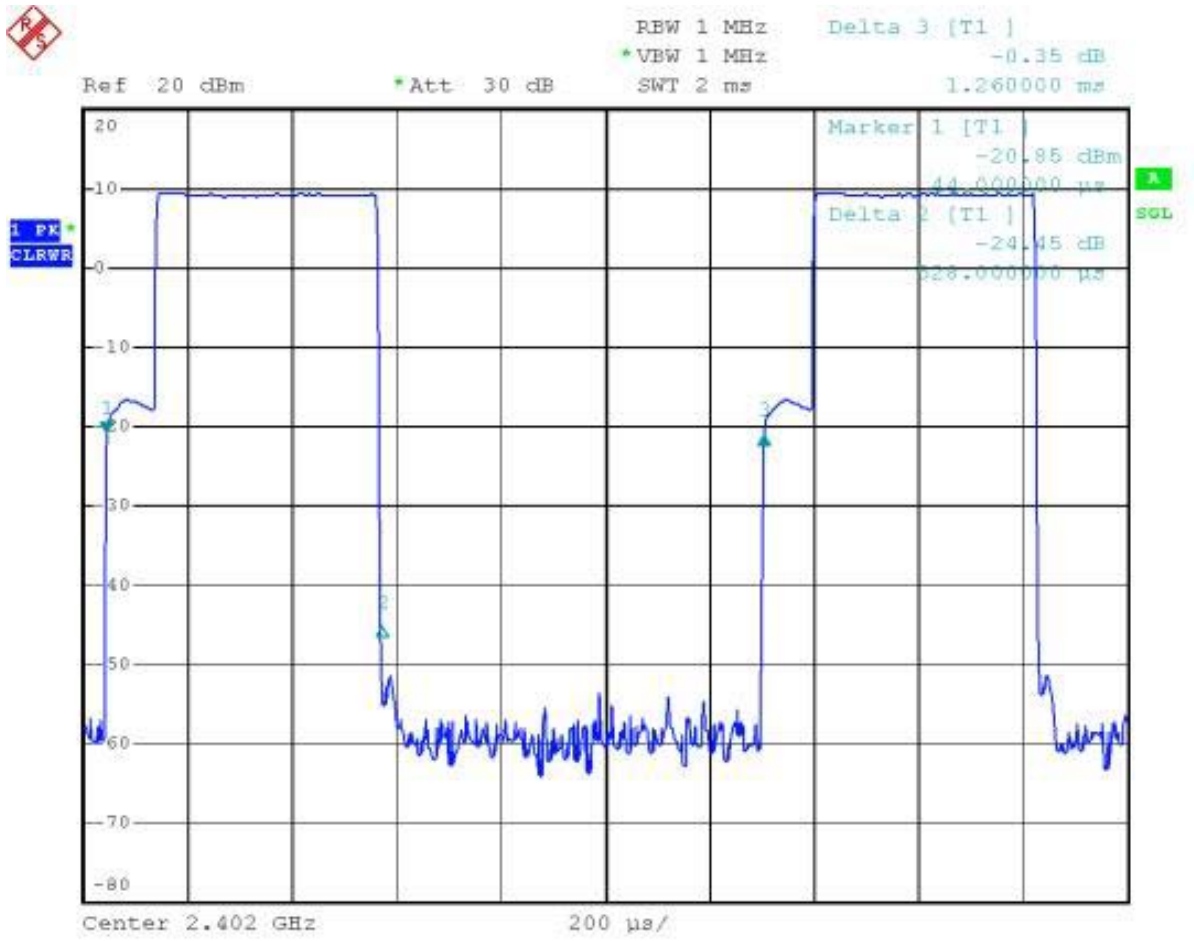
5.5.4 Test Result：See spectrum analyzer plots below

- Test Mode: Mode 1~Mode 3
- Temperature: 26°C
- Relative Humidity: 58 %

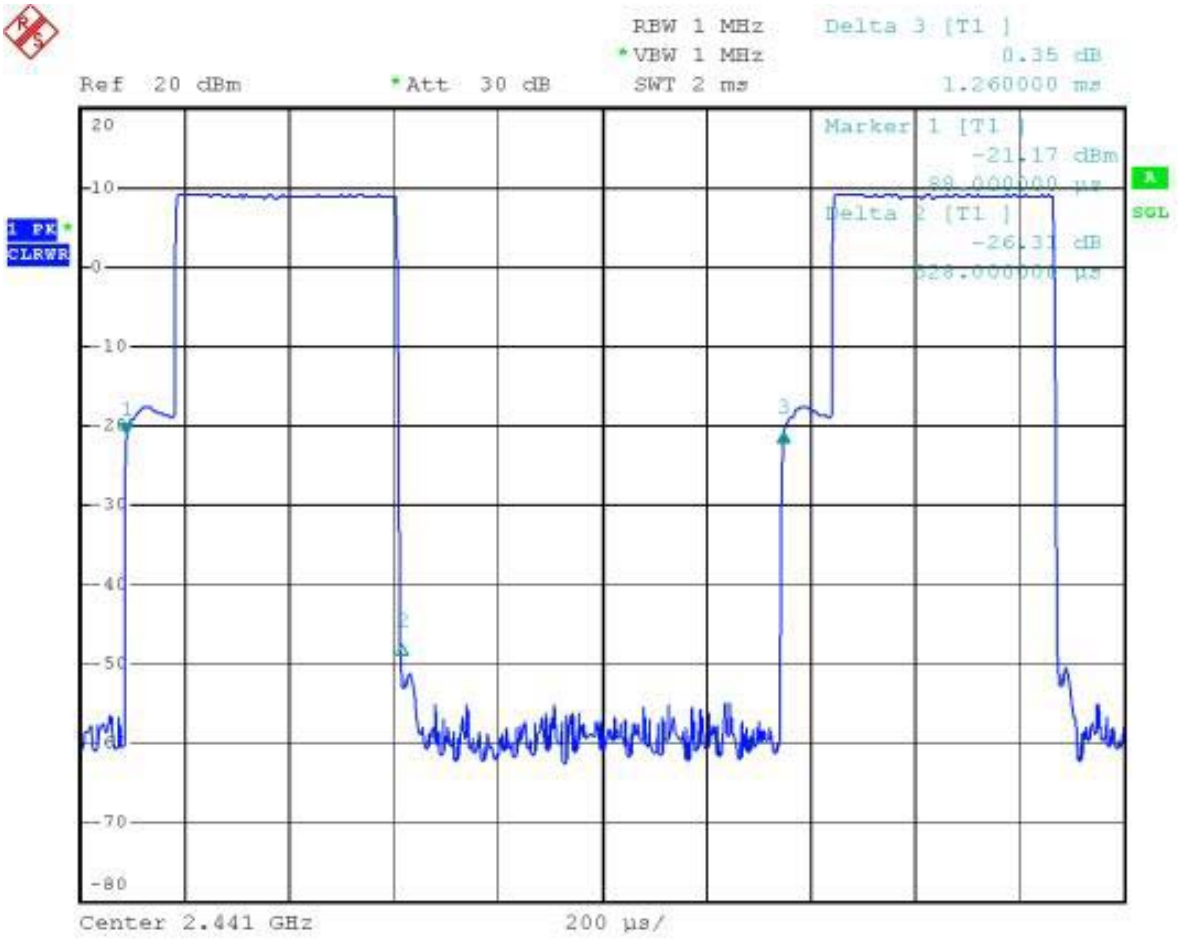
Channel	Frequency (MHz)	Dwell Time (s)	Limits (s)	Plot Ref. No.
00	2402	0.32	0.4	Mode 1
39	2441	0.32	0.4	Mode 2
78	2480	0.32	0.4	Mode 3

5.5.5 Dwell Time of Each Frequency

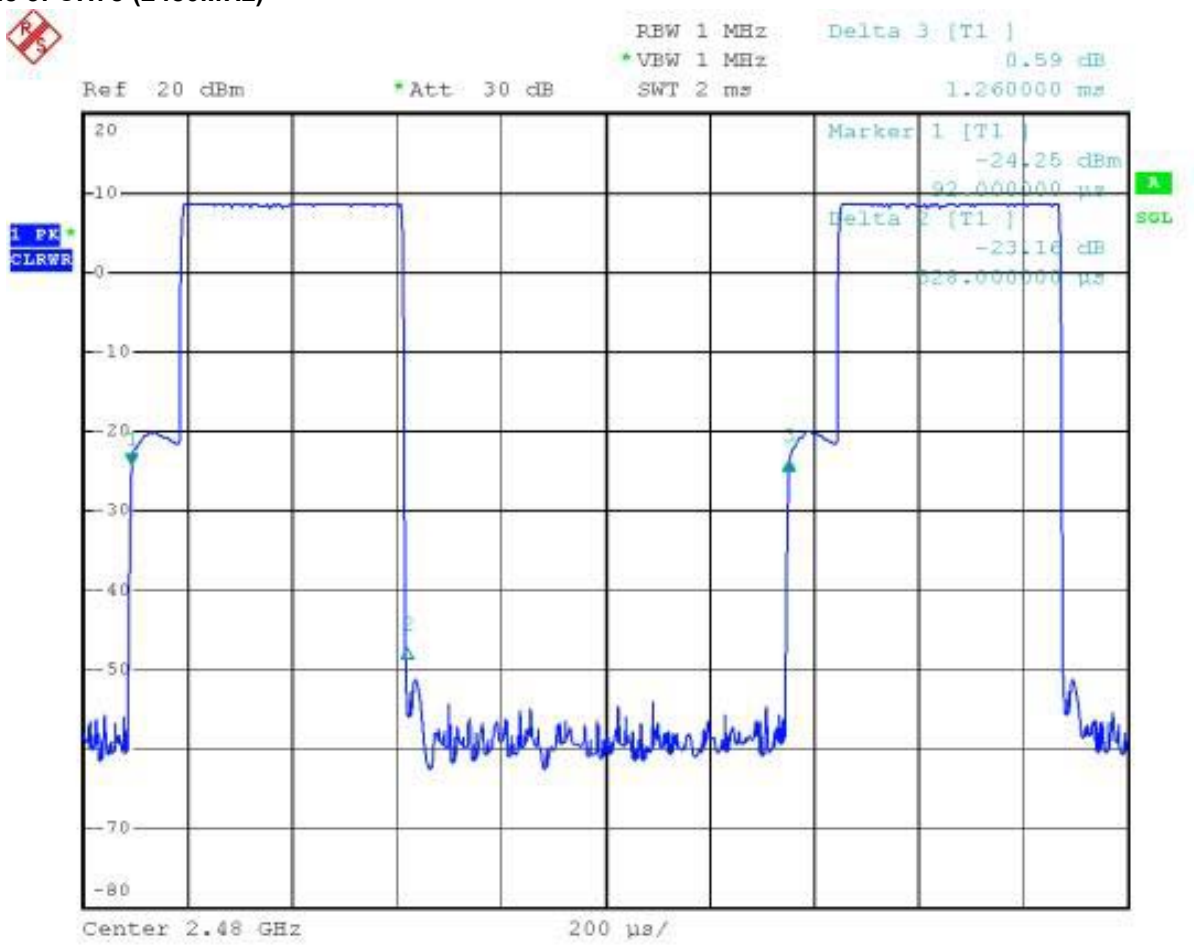
Mode 1: CH00 (2402MHz)



Mode 2: CH39 (2441MHz)



Mode 3: CH78 (2480MHz)



5.6 Output Power

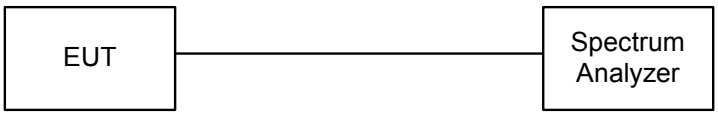
5.6.1 Measuring Instruments：

As described in chapter 7 of this test report.

5.6.2 Test Procedure：

1. The transmitter output was connected to the spectrum analyzer directly.
2. The center frequency of the spectrum analyzer was set to the fundamental frequency and set RBW to 3MHz and VBW to 3MHz.

5.6.3 Test Setup Layout：



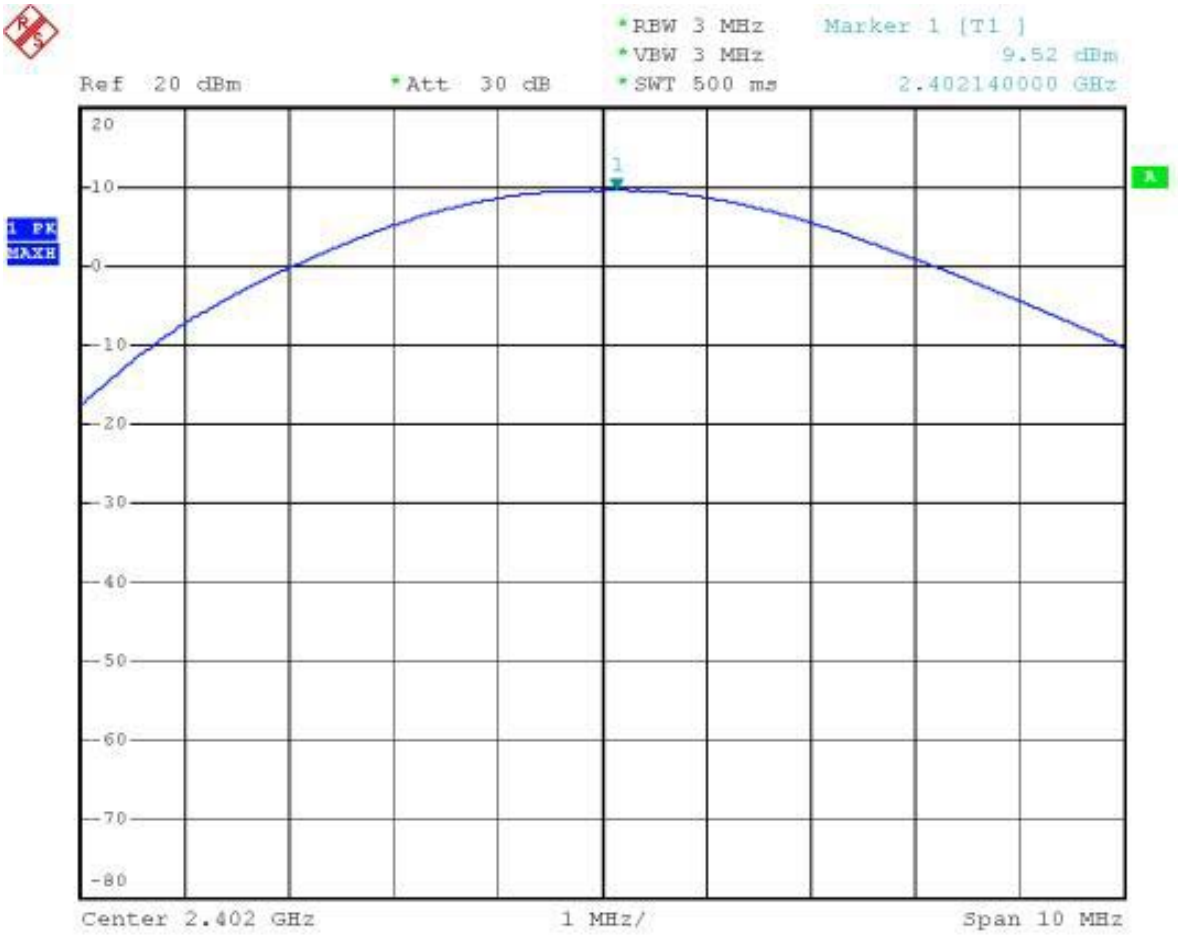
5.6.4 Test Result：See spectrum analyzer plots below

- Test Mode: Mode 1~Mode 3
- Temperature: 26°C
- Relative Humidity: 58 %

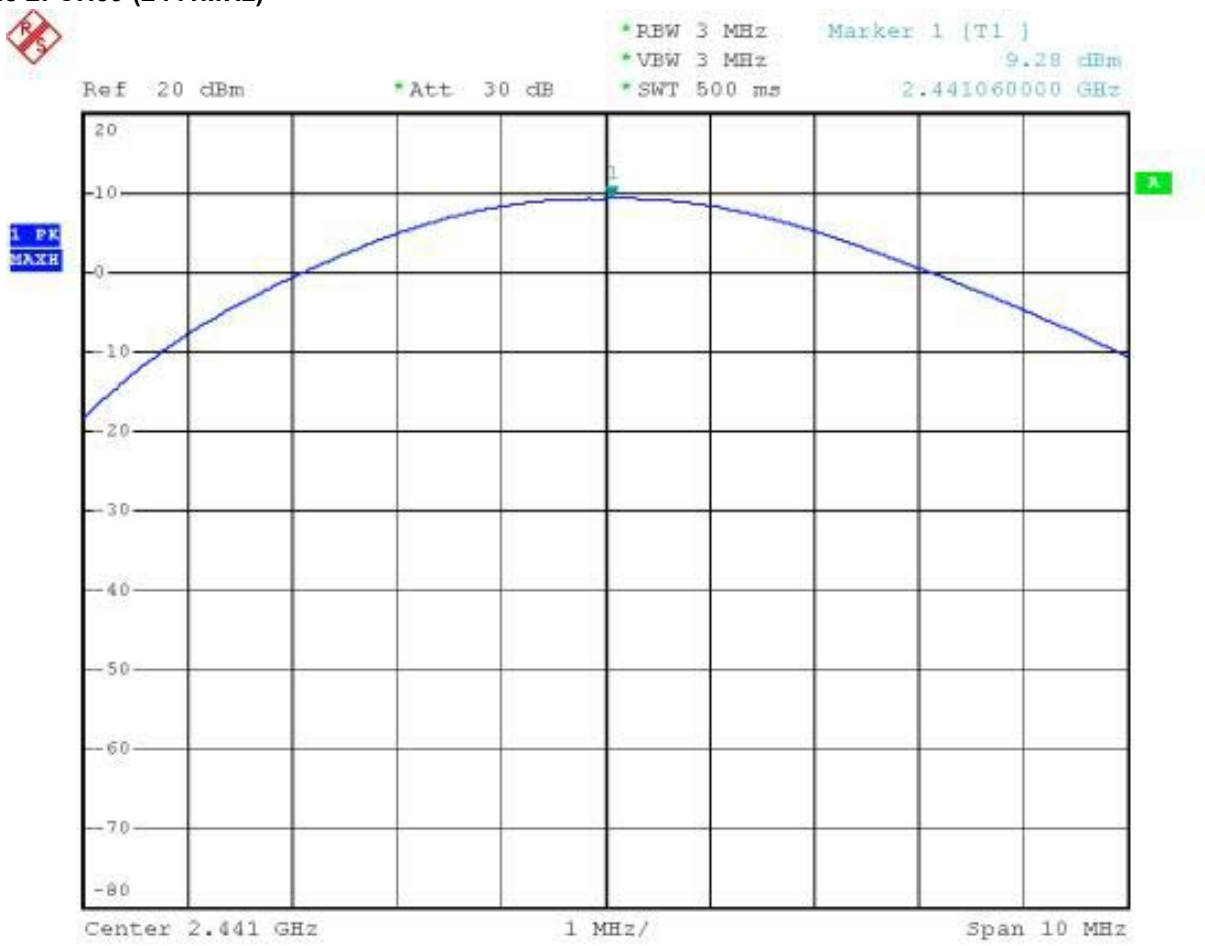
Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (Watt/dBm)	Plot Ref. No.
00	2402	9.52	1W/30 dBm	Mode 1
39	2441	9.28	1W/30 dBm	Mode 2
78	2480	8.81	1W/30 dBm	Mode 3

5.6.5 Output Power

Mode 1: CH00 (2402MHz)



Mode 2: CH39 (2441MHz)



Mode 3: CH78 (2480MHz)

5.7 100kHz Bandwidth of Frequency Band Edges

5.7.1 Measuring Instruments：

As described in chapter 7 of this test report.

5.7.2 Test Procedure：

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

5.7.3 Test Result：

- Test Mode: Mode 1 and Mode 3
- Temperature: 26°C
- Relative Humidity: 58 %

Test Result in lower band (Channel 00)： PASS

Test Result in higher band(Channel 78)： PASS

5.7.4 Note on Band edge Emission

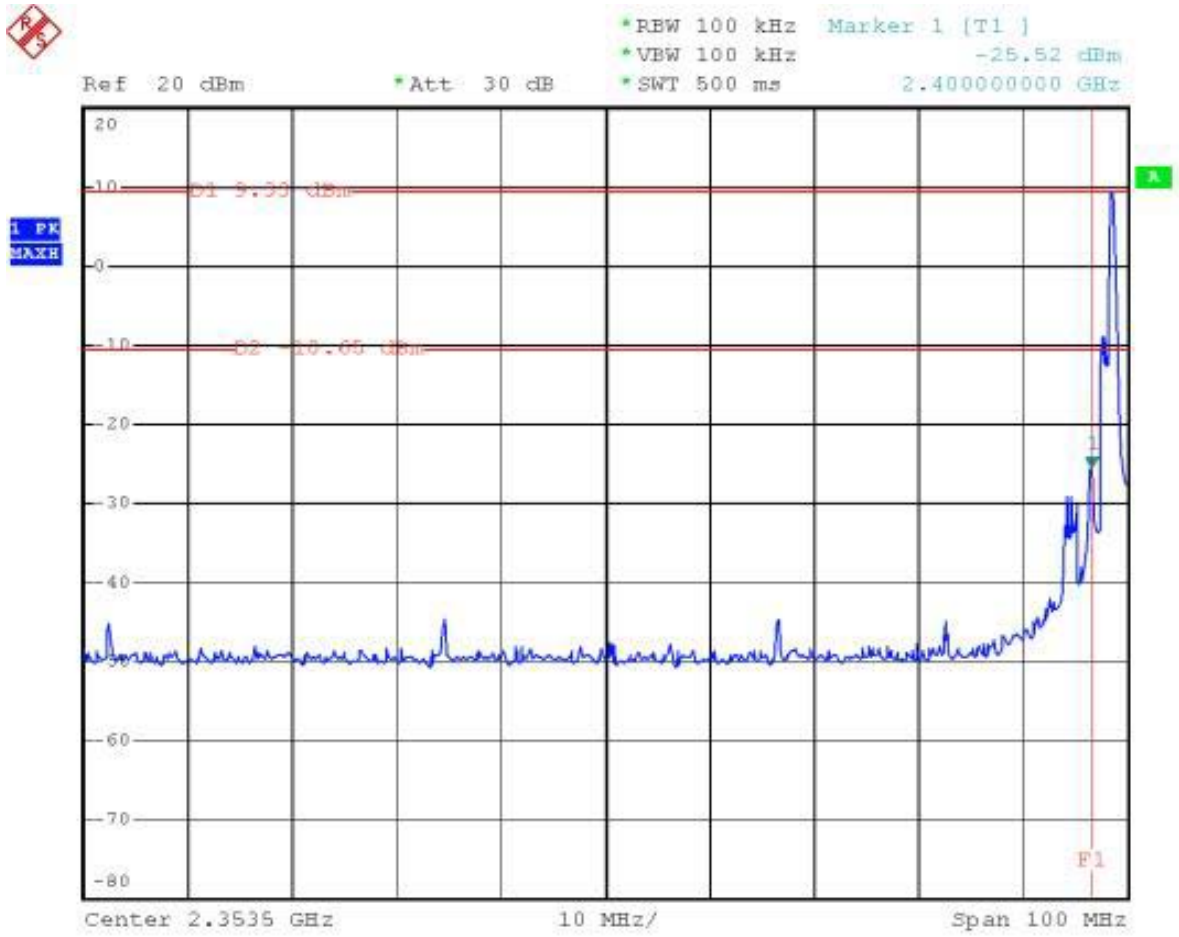
The delta between fundamental and peak spurious emission (2400MHz) for CH00 is 34.85 dB.
The delta between fundamental and peak spurious emission (2484.9MHz) for CH78 is 46.27 dB.

Channel	Polarity	The emission of carrier power strength	Frequency	The maximum field strength in band edge	Limit	Margin	Remark	Result
		(dB μ V/m)	(GHz)	(dB μ V/m)	(dB μ V/m)	(dB)		
00	H	99.19	2.400	64.34	74.00	-9.66	Peak	Pass
	H	75.74	2.400	40.89	54.00	-13.11	Average	Pass
	V	100.54	2.400	65.69	74.00	-8.31	Peak	Pass
	V	76.42	2.400	41.57	54.00	-12.43	Average	Pass
78	H	96.89	2.4849	50.62	74.00	-23.38	Peak	Pass
	H	75.09	2.4849	28.82	54.00	-25.18	Average	Pass
	V	98.19	2.4849	51.92	74.00	-22.08	Peak	Pass
	V	75.87	2.4849	29.60	54.00	-24.40	Average	Pass

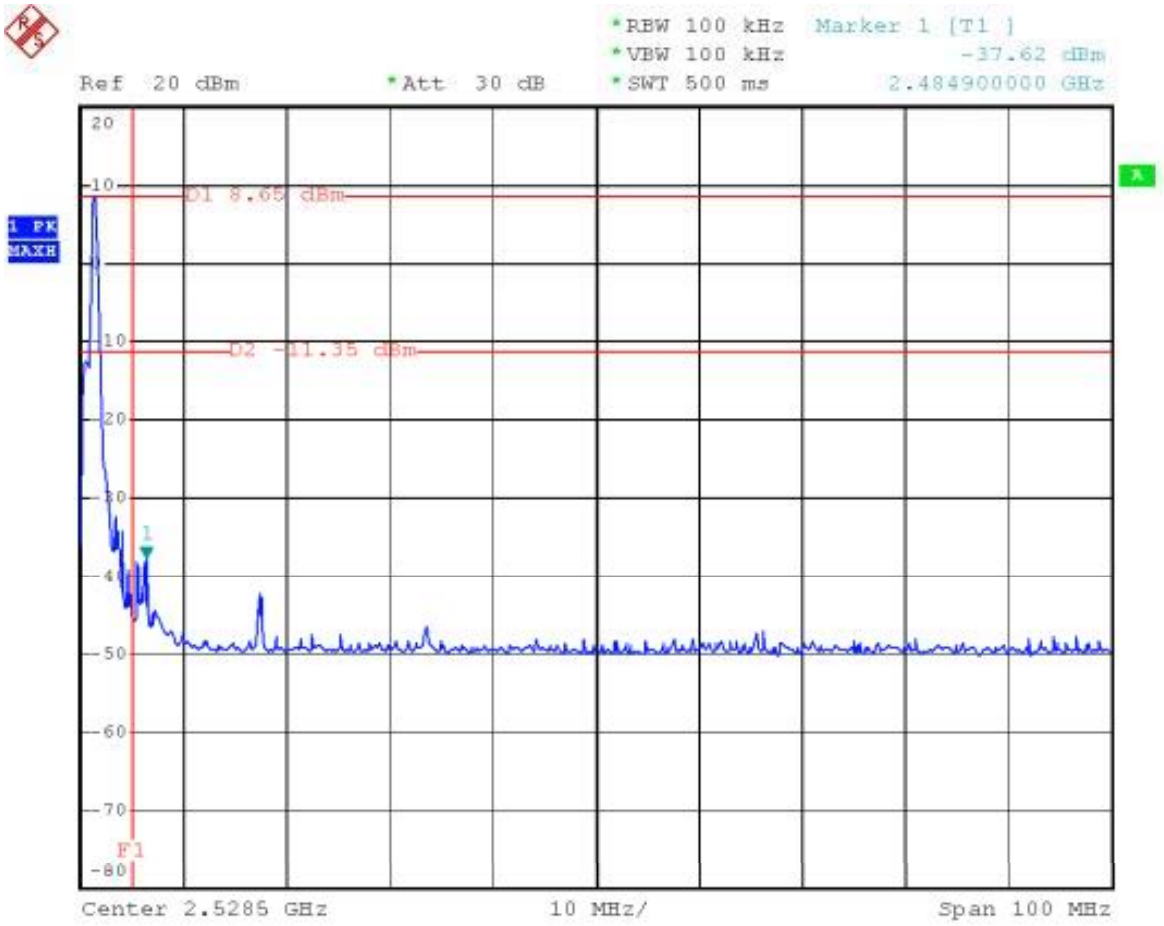
＊Remark: The data above can refer to radiated emission in section 5.9.

5.7.5 Frequency Band Edge

Mode 1: CH00 (2402 MHz)



Mode 3: CH78 (2480 MHz)



5.8 Test of Conducted Emission

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 kHz and return leads of the EUT according to the methods defined in ANSI C63.4-2003 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

5.8.1 Major Measuring Instruments：

● Test Receiver	(R&S ESCS 30)
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

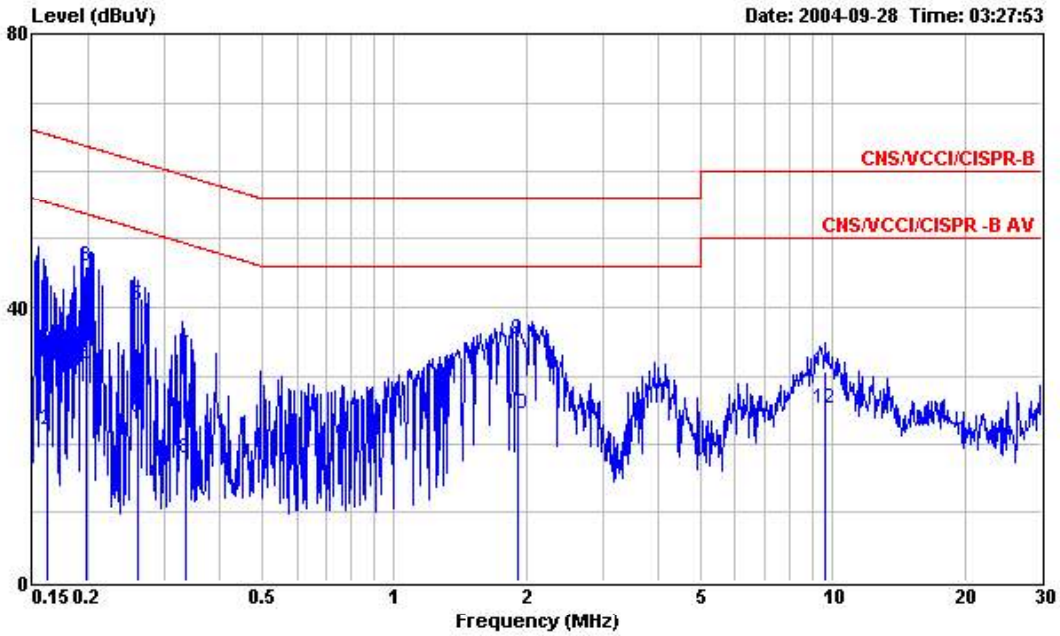
5.8.2 Test Procedures：

a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
b. Connect EUT to the power port of a line impedance stabilization network (LISN).
c. All the support units are connected to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

5.8.3 Test Result of Conducted Emission：

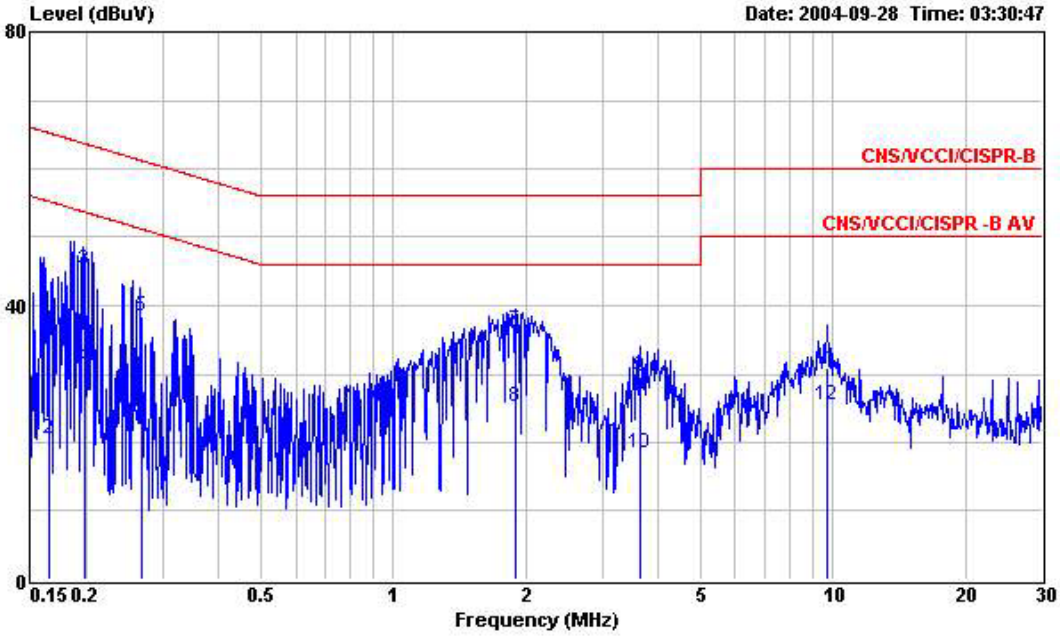
- Test Mode: Mode 1
- Frequency Range of Test: from 150kHz to 30 MHz
- Temperature: 26°C
- Relative Humidity: 58 %

■ The test that passed at the minimum margin was marked by a frame in the following data



Site : CO01-HY
Condition : CNS/VCCI/CISPR-B 2003 2001/008 LINE
EUT : Bluetooth USB dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : Link Mode

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.162	36.02	-29.36	65.38	35.88	0.10	0.04	QP
2	0.162	22.06	-33.32	55.38	21.92	0.10	0.04	Average
3	0.198	45.96	-17.72	63.68	45.82	0.10	0.04	QP
4	0.198	31.23	-22.45	53.68	31.09	0.10	0.04	Average
5	0.260	40.25	-21.17	61.42	40.10	0.10	0.05	QP
6	0.260	23.97	-27.45	51.42	23.82	0.10	0.05	Average
7	0.336	33.06	-26.24	59.30	32.90	0.10	0.06	QP
8	0.336	17.90	-31.40	49.30	17.74	0.10	0.06	Average
9	1.910	35.38	-20.62	56.00	35.18	0.10	0.10	QP
10	1.910	24.34	-21.66	46.00	24.14	0.10	0.10	Average
11	9.650	30.62	-29.38	60.00	30.26	0.20	0.16	QP
12	9.650	25.16	-24.84	50.00	24.80	0.20	0.16	Average



Site : CO01-HV
Condition : CNS/VCCI/CISPR-B 2003 2001/008 NEUTRAL
EUT : Bluetooth USB dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : Link Mode

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.164	35.40	-29.84	65.24	35.26	0.10	0.04	QP
2	0.164	20.64	-34.60	55.24	20.50	0.10	0.04	Average
3	0.198	45.21	-18.49	63.70	45.07	0.10	0.04	QP
4	0.198	30.91	-22.79	53.70	30.77	0.10	0.04	Average
5	0.266	38.48	-22.75	61.23	38.33	0.10	0.05	QP
6	0.266	22.02	-29.21	51.23	21.87	0.10	0.05	Average
7	1.900	36.40	-19.60	56.00	36.20	0.10	0.10	QP
8	1.900	25.20	-20.80	46.00	25.00	0.10	0.10	Average
9	3.640	29.73	-26.27	56.00	29.44	0.19	0.10	QP
10	3.640	18.40	-27.60	46.00	18.11	0.19	0.10	Average
11	9.710	30.91	-29.09	60.00	30.55	0.20	0.16	QP
12	9.710	25.55	-24.45	50.00	25.19	0.20	0.16	Average

Test Engineer: Jim

5.9 Test of Radiated Emission

Radiated emissions from 30 MHz to 26.5 GHz were measured according to the methods defined in ANSI C63.4-2003. The EUT was placed on a nonmetallic stand, 0.8 meter above the ground plane, as shown in section 5.9.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions

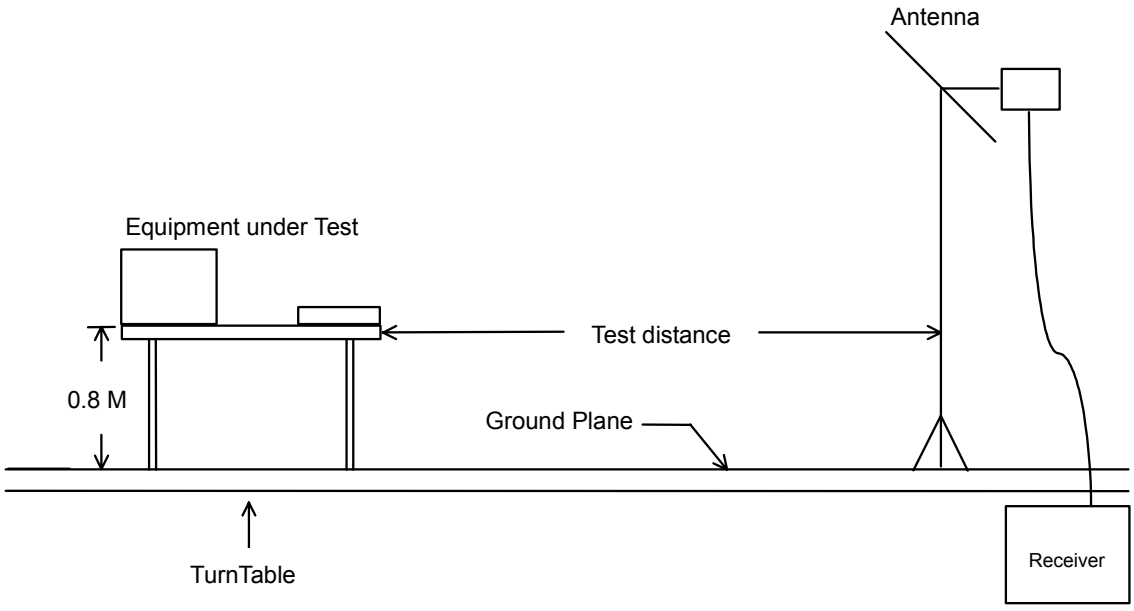
5.9.1 Major Measuring Instruments

● Amplifier	(MITEQ AFS44)
RF Gain	40 dB
Signal Input	100 MHz to 26.5 GHz
● Amplifier	(PA-103)
RF Gain	30 dB
Signal Input	100 MHz to 1 GHz
● Spectrum analyzer	(R&S FSP40)
Attenuation	10 dB
Start Frequency	1 GHz
Stop Frequency	24 GHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	9 kHz to 40 GHz

5.9.2 Test Procedures

1. The EUT was placed on a rotatable table top 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the quasi-peak method and reported.

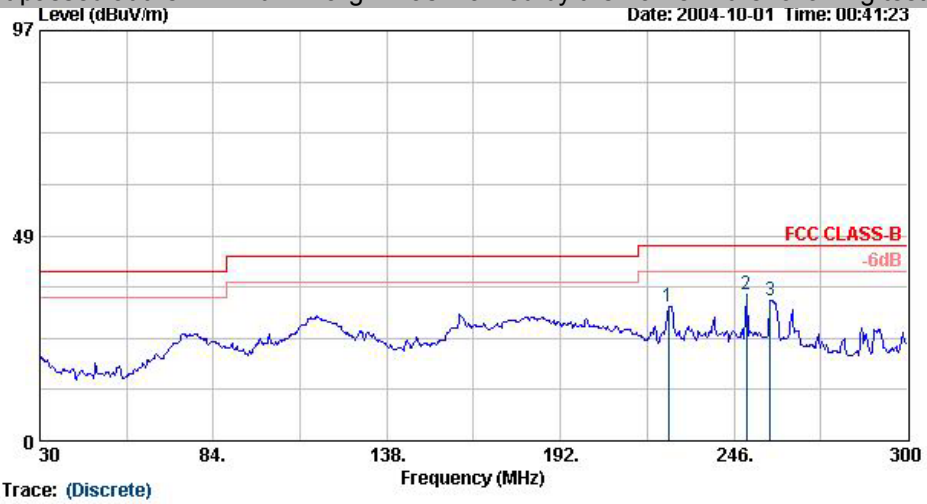
5.9.3 Typical Test Setup Layout of Radiated Emission



5.9.4 Test Result of Radiated Emission

- Test Mode: Mode 1
- Test Distance: 3 m
- Temperature: 24°C
- Relative Humidity: 61 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

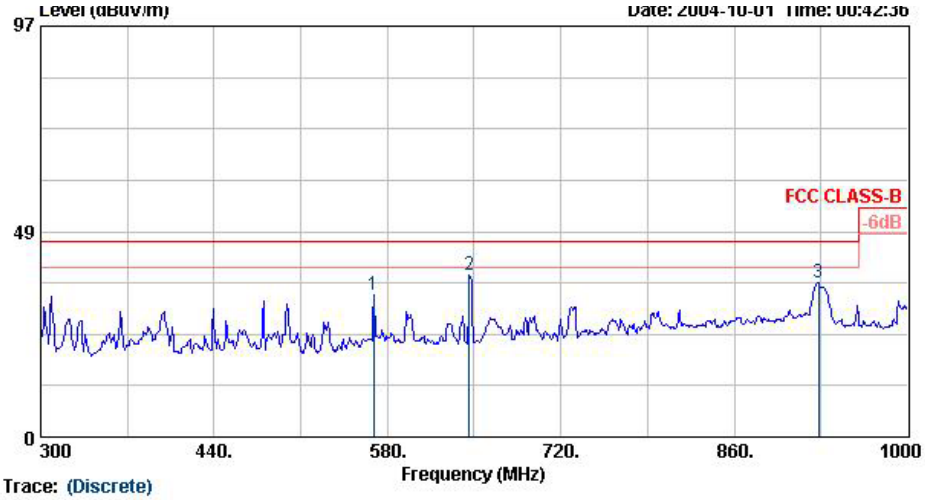
■ The test that passed at the minimum margin was marked by the frame in the following test record



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m BI LOG 2004 0629 HORIZONTAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH00;2402MHz

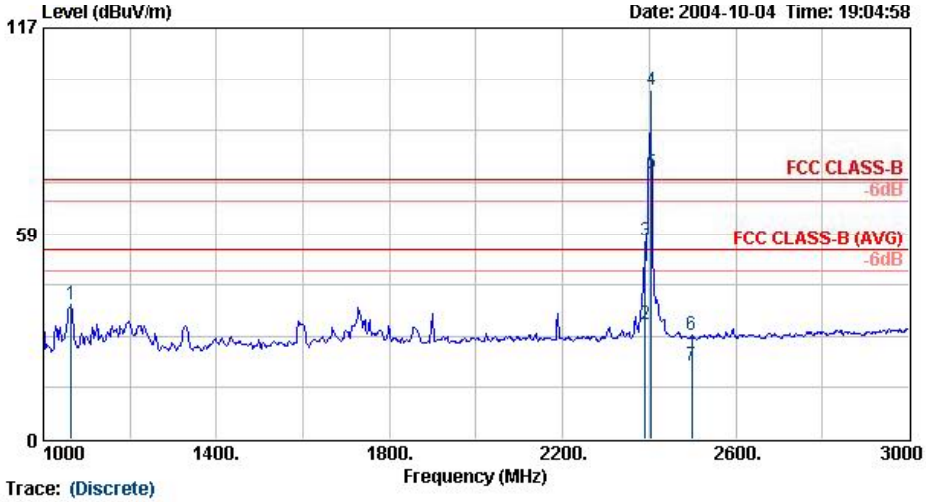
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	225.48	31.83	-14.17	46.00	53.15	9.16	31.80	1.32	Peak	---	---
2 @	249.78	34.64	-11.36	46.00	53.18	11.89	31.83	1.40	Peak	---	---
3	257.34	33.28	-12.72	46.00	51.10	12.63	31.87	1.41	Peak	---	---



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m BI LOG 2004 0629 HORIZONTAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH00;2402MHz

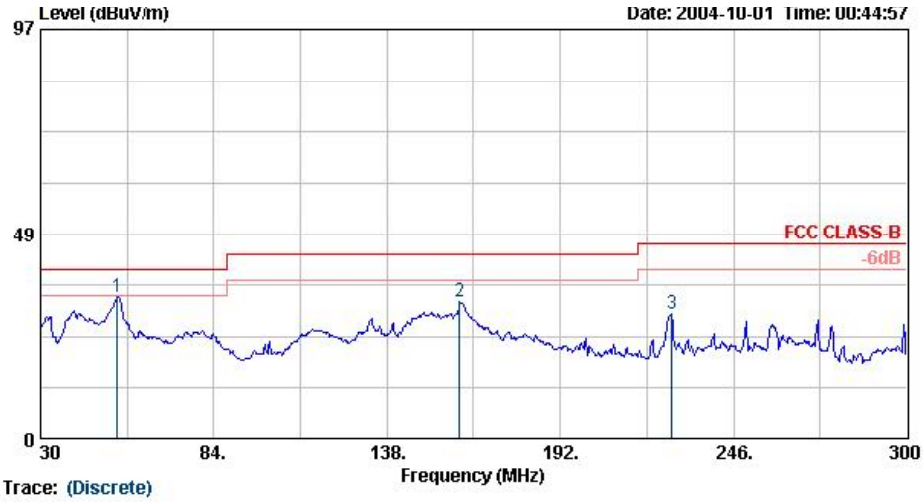
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	568.80	33.49	-12.51	46.00	43.91	18.69	31.35	2.23	Peak	---	---
2 @	645.80	38.16	-7.84	46.00	48.39	18.84	31.51	2.44	Peak	---	---
3 @	927.90	36.50	-9.50	46.00	43.82	20.73	31.10	3.05	Peak	---	---



Site : 03CH06-HY
Condition : FCC CLASS-B 3m HF-HORN AH-118 HORIZONTAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH00;2402MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	1064.00	38.25	-35.75	74.00	60.13	24.21	48.26	2.17	Peak	---	---
2 @	2390.00	32.71	-21.29	54.00	50.54	28.40	49.55	3.32	Average	---	---
3 @	2390.00	56.59	-17.41	74.00	74.42	28.40	49.55	3.32	Peak	---	---
4 @	2404.00	99.19			117.00	28.41	49.55	3.32	Peak	---	---
5 @	2404.00	75.74			93.55	28.41	49.55	3.32	Average	---	---
6 @	2498.00	29.76	-44.24	74.00	47.44	28.50	49.57	3.39	Peak	---	---
7 @	2498.00	20.79	-33.21	54.00	38.47	28.50	49.57	3.39	Average	---	---

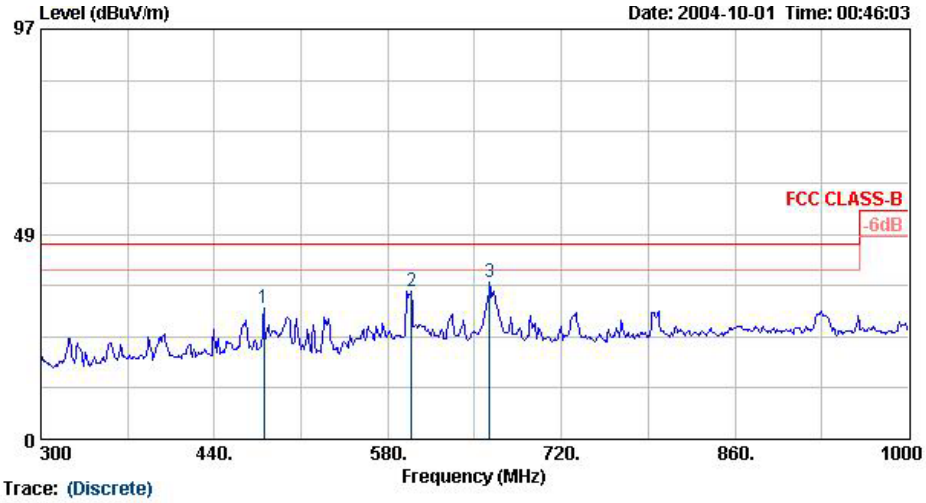
Remark: #4 and #5 Fundamental Signal



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m BI LOG 2004 0629 VERTICAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH00;2402MHz

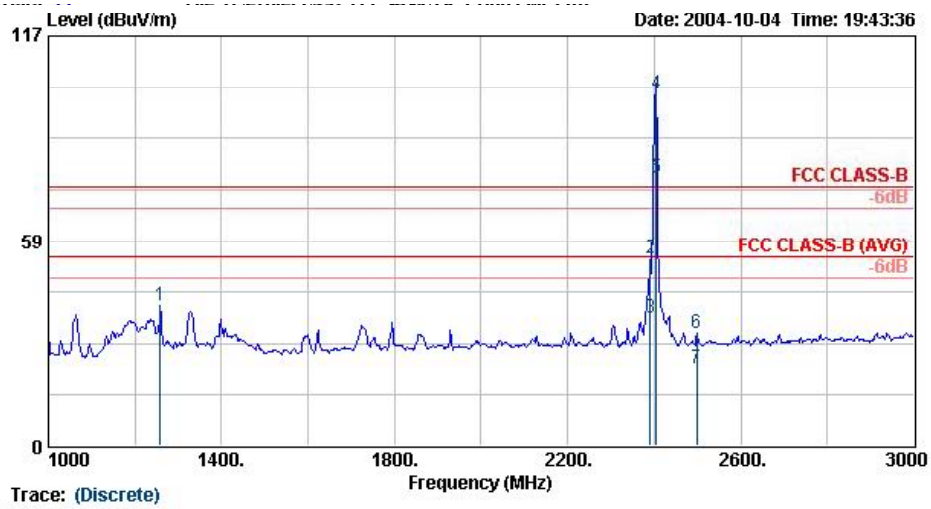
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	54.03	33.60	-6.40	40.00	56.96	8.47	32.45	0.62	Peak	---	---
2 @	160.68	32.30	-11.20	43.50	53.90	9.45	32.15	1.09	Peak	---	---
3	226.83	29.69	-16.31	46.00	50.89	9.27	31.80	1.32	Peak	---	---



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m BI LOG 2004 0629 VERTICAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH00;2402MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	479.90	31.10	-14.90	46.00	43.83	17.09	31.84	2.02	Peak	---	---
2 @	598.90	35.16	-10.84	46.00	45.45	18.70	31.28	2.29	Peak	---	---
3 @	661.90	37.01	-8.99	46.00	47.26	18.91	31.63	2.48	Peak	---	---



Site : 03CH06-HY
Condition : FCC CLASS-B 3m HF-HORN AH-118 VERTICAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH00;2402MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	1258.00	40.06	-33.94	74.00	61.42	24.78	48.49	2.36	Peak	---	---
2 @	2390.00	53.71	-20.29	74.00	71.54	28.40	49.55	3.32	Peak	---	---
3 @	2390.00	36.62	-17.38	54.00	54.45	28.40	49.55	3.32	Average	---	---
4 @	2404.00	100.54			118.35	28.41	49.55	3.32	Peak	---	---
5 @	2404.00	76.42			94.23	28.41	49.55	3.32	Average	---	---
6 @	2498.00	32.05	-41.95	74.00	49.73	28.50	49.57	3.39	Peak	---	---
7 @	2498.00	22.22	-31.78	54.00	39.90	28.50	49.57	3.39	Average	---	---

Remark: #4 and #5 Fundamental Signal

- For 3GHz ~ 25GHz
  Remark: Frequency from 3000MHz to 25000MHz, the emission emitted by the EUT is too low to be measured

■ Field strength of fundamental and harmonics

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Preamp Factor (dB)	Limits (dBuV/m)	Emission (dBuV/m)	Margin (dB)	Detect Mode
2404.000	H	28.41	3.32	67.46	49.55	-	99.19	-	Peak
2404.000	H	28.41	3.32	44.01	49.55	-	75.74	-	A.V.
2404.000	V	28.41	3.32	68.81	49.55	-	100.54	-	Peak
2404.000	V	28.41	3.32	44.69	49.55	-	76.42	-	A.V.
4804.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
7206.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
9608.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
12010.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
14412.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
16814.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
19216.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
21618.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
24020.000	V/H	-	-	-	-	-	-	-	Peak, A.V.

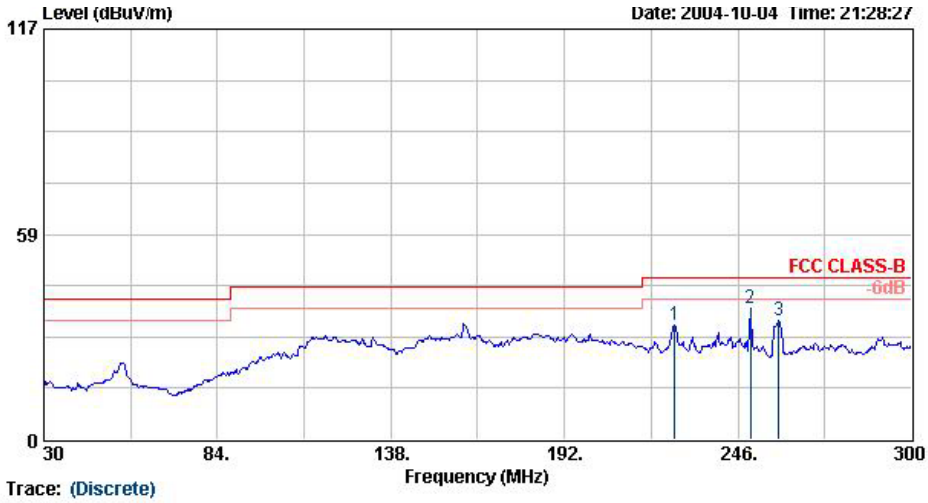
Remark: The emission emitted by the EUT is too low to be measured except the emission listed above

Test Engineer: 

Jim

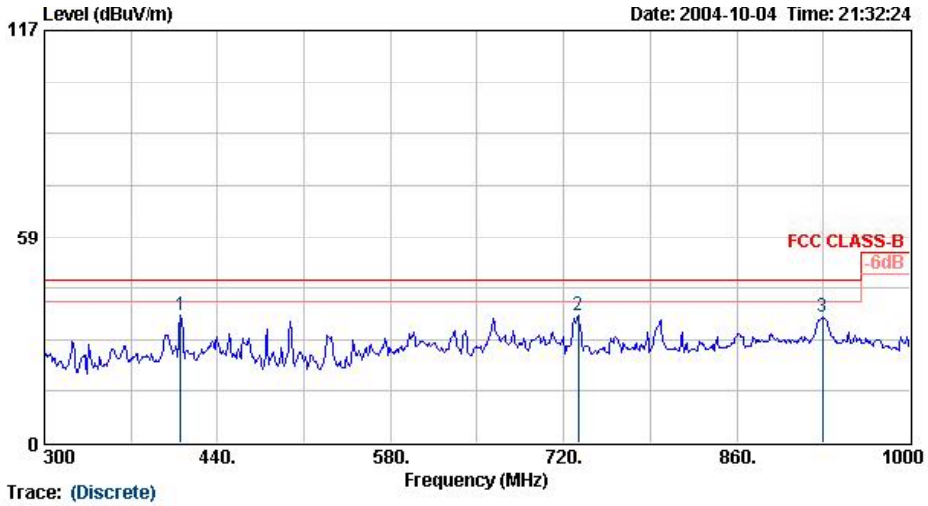
- Test Mode: Mode 2
- Test Distance: 3 M
- Temperature: 24 °C
- Relative Humidity: 61 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

■ The test that passed at the minimum margin was marked by the frame in the following test record



Site : 03CH06-HY
Condition : FCC CLASS-B 3m BI LOG 2004 0629 HORIZONTAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH39;2441MHz

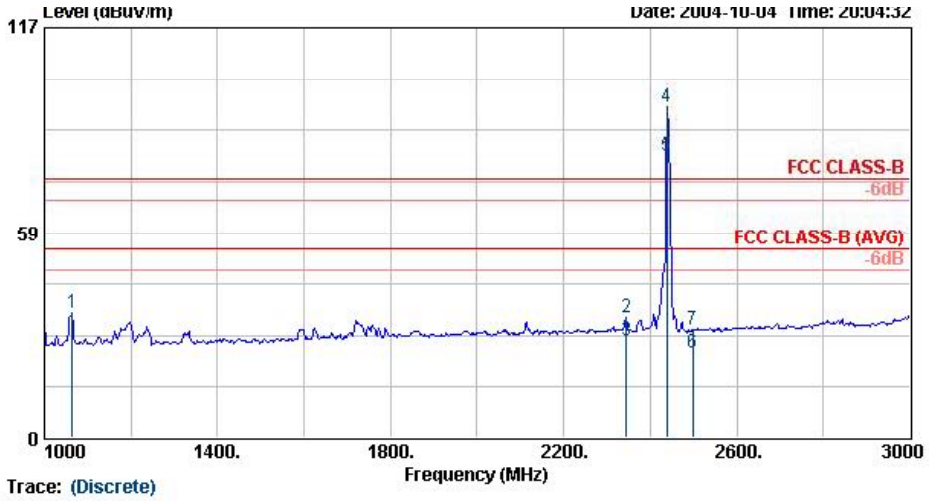
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	226.29	32.52	-13.48	46.00	53.84	9.16	31.80	1.32	Peak	---	---
2 @	249.78	37.20	-8.80	46.00	55.74	11.89	31.83	1.40	Peak	---	---
3 @	258.69	33.79	-12.21	46.00	51.44	12.81	31.88	1.42	Peak	---	---



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m BI LOG 2004 0629 HORIZONTAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH39;2441MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	409.90	36.18	-9.82	46.00	49.90	16.35	31.92	1.85	Peak	---	---
2 @	731.90	36.04	-9.96	46.00	45.29	19.57	31.41	2.60	Peak	---	---
3 @	929.30	35.66	-10.34	46.00	42.95	20.74	31.10	3.06	Peak	---	---

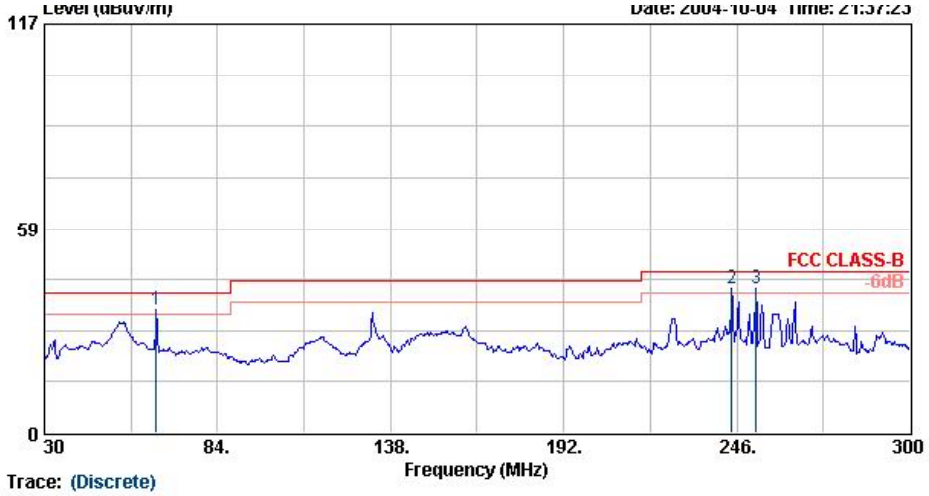


Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m HF-HORN AH-118 HORIZONTAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH39;2441MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	1064.00	35.77	-38.23	74.00	57.65	24.21	48.26	2.17	Peak	---	---
2	2344.00	34.51	-39.49	74.00	52.42	28.34	49.54	3.29	Peak	---	---
3	2344.00	27.98	-26.02	54.00	45.88	28.34	49.54	3.29	Average	---	---
4 @	2438.00	94.47			112.23	28.45	49.55	3.34	Peak	---	---
5 @	2438.00	80.26			98.02	28.45	49.55	3.34	Average	---	---
6	2498.00	24.27	-29.73	54.00	41.95	28.50	49.57	3.39	Average	---	---
7	2498.00	31.05	-42.95	74.00	48.72	28.50	49.57	3.39	Peak	---	---

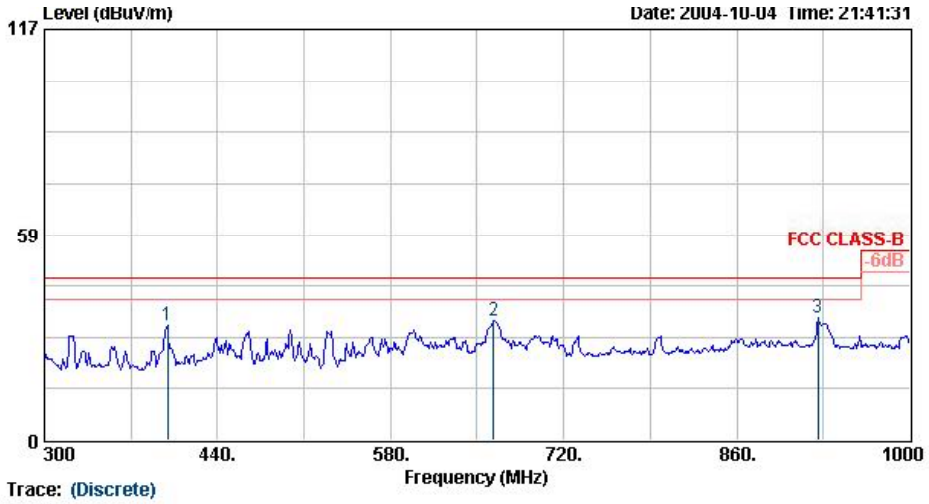
Remark: #4 and #5 Fundamental Signal



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m BI LOG 2004 0629 VERTICAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH39;2441MHz

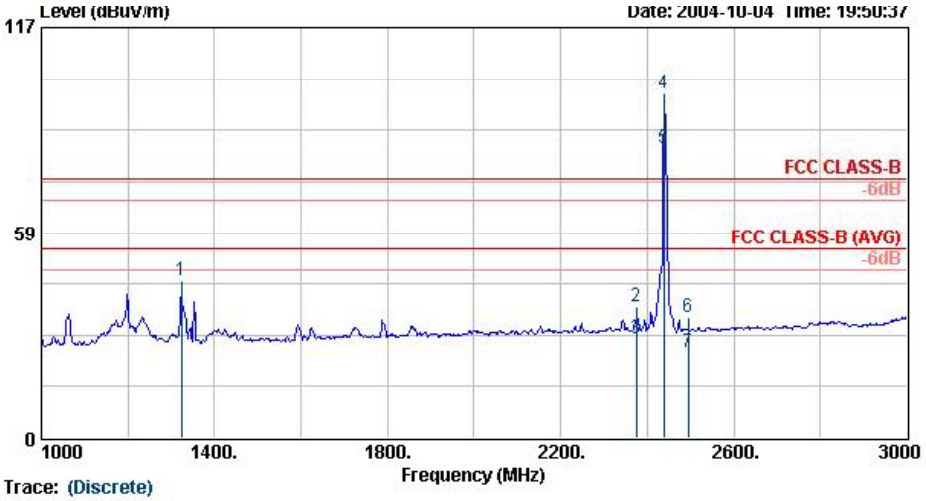
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	64.83	35.10	-4.90	40.00	61.66	5.13	32.39	0.69	Peak	---	---
2 @	244.38	41.23	-4.77	46.00	60.30	11.35	31.79	1.38	Peak	---	---
3 @	251.94	41.37	-4.63	46.00	59.62	12.18	31.84	1.40	Peak	---	---



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m BI LOG 2004 0629 VERTICAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH39;2441MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	399.40	32.60	-13.40	46.00	46.43	15.85	31.50	1.83	Peak	---	---
2 @	663.30	34.02	-11.98	46.00	44.23	18.91	31.61	2.48	Peak	---	---
3 @	925.80	34.74	-11.26	46.00	42.09	20.72	31.12	3.05	Peak	---	---



Site : 03CH06-HY
Condition : FCC CLASS-B 3m HF-HORN AH-118 VERTICAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH39;2441MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	1324.00	44.72	-29.28	74.00	65.89	24.98	48.59	2.44	Peak	---	---
2	2374.00	37.36	-36.64	74.00	55.22	28.38	49.54	3.31	Peak	---	---
3	2374.00	28.27	-25.73	54.00	46.13	28.38	49.54	3.31	Average	---	---
4 @	2438.00	98.31			116.07	28.45	49.55	3.34	Peak	---	---
5 @	2438.00	82.65			100.41	28.45	49.55	3.34	Average	---	---
6	2494.00	34.54	-39.46	74.00	52.22	28.50	49.57	3.39	Peak	---	---
7	2494.00	24.20	-29.80	54.00	41.88	28.50	49.57	3.39	Average	---	---

Remark: #4 and #5 Fundamental Signal

- For 3GHz ~ 25GHz
  Remark: Frequency from 3000MHz to 25000MHz, the emission emitted by the EUT is too low to be measured

■ Field strength of fundamental and harmonics

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Preamp Factor (dB)	Limits (dBuV/m)	Emission (dBuV/m)	Margin (dB)	Detect Mode
2438.000	H	28.45	3.34	62.68	49.55	-	94.47	-	Peak
2438.000	H	28.45	3.34	48.47	49.55	-	80.26	-	A.V.
2438.000	V	28.45	3.34	66.52	49.55	-	98.31	-	Peak
2438.000	V	28.45	3.34	50.86	49.55	-	82.65	-	A.V.
4882.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
7323.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
9764.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
12205.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
14646.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
17087.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
19528.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
21969.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
24410.000	V/H	-	-	-	-	-	-	-	Peak, A.V.

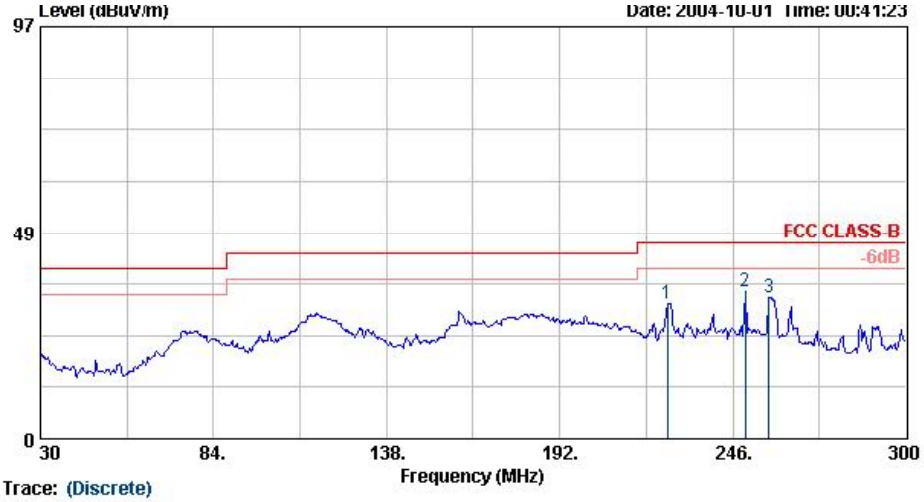
Remark: The emission emitted by the EUT is too low to be measured except the emission listed above

Test Engineer: 

Jim

- Test Mode: Mode 3
- Test Distance: 3 M
- Temperature: 24 °C
- Relative Humidity: 61 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

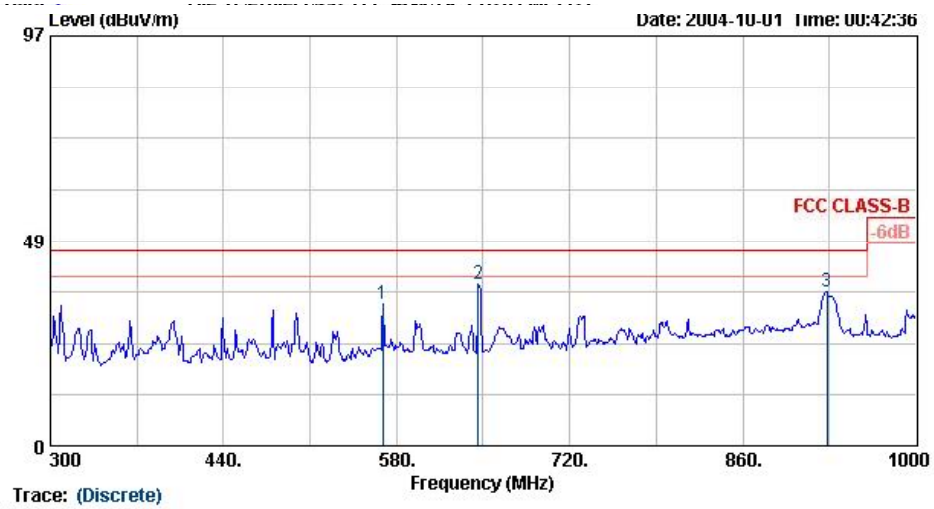
The test that passed at the minimum margin was marked by the frame in the following test record



Trace: (Discrete)

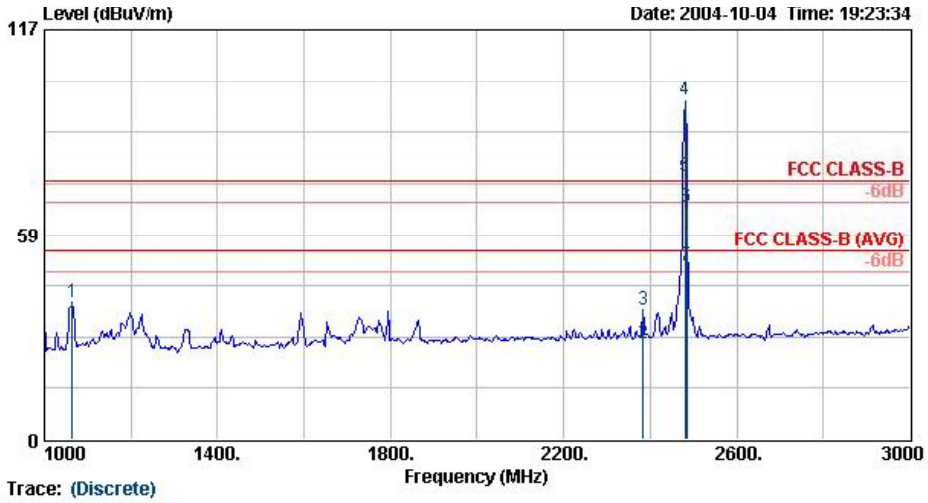
Site : 03CH06-HY
Condition : FCC CLASS-B 3m BI LOG 2004 0629 HORIZONTAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH78;2480MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	225.48	31.83	-14.17	46.00	53.15	9.16	31.80	1.32	Peak	---	---
2 @	249.78	34.64	-11.36	46.00	53.18	11.89	31.83	1.40	Peak	---	---
3	257.34	33.28	-12.72	46.00	51.10	12.63	31.87	1.41	Peak	---	---



Site : 03CH06-HY
Condition : FCC CLASS-B 3m BI LOG 2004 0629 HORIZONTAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH78;2480MHz

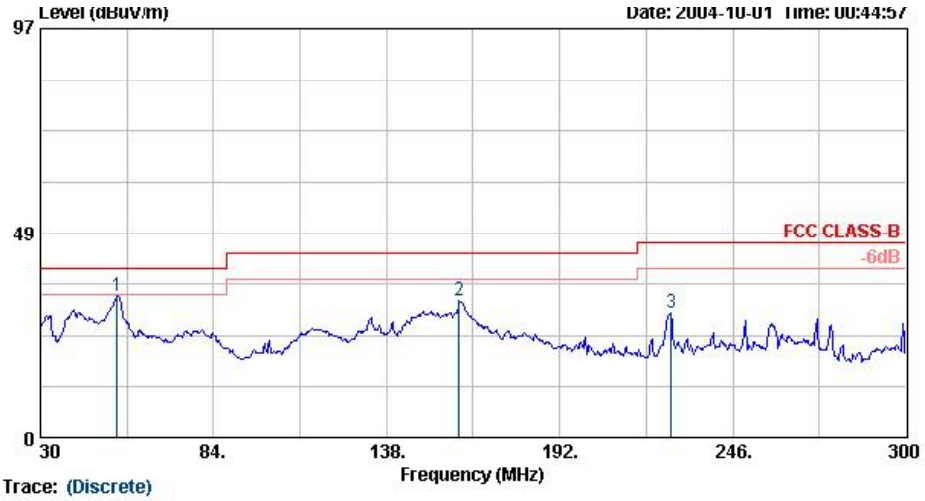
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	568.80	33.49	-12.51	46.00	43.91	18.69	31.35	2.23	Peak	---	---
2 @	645.80	38.16	-7.84	46.00	48.39	18.84	31.51	2.44	Peak	---	---
3 @	927.90	36.50	-9.50	46.00	43.82	20.73	31.10	3.05	Peak	---	---



Site : 03CH06-HY
Condition : FCC CLASS-B 3m HF-HORN AH-118 HORIZONTAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH78;2480MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	1064.00	39.04	-34.96	74.00	60.93	24.21	48.26	2.17	Peak	---	---
2	2384.00	27.48	-26.52	54.00	45.34	28.38	49.54	3.31	Average	---	---
3	2384.00	37.01	-36.99	74.00	54.87	28.38	49.54	3.31	Peak	---	---
4 @	2480.00	96.89			114.60	28.48	49.56	3.38	Peak	---	---
5 X	2480.00	75.09			92.80	28.48	49.56	3.38	Average	---	---
6	2483.50	66.44	-7.56	74.00	84.15	28.48	49.56	3.38	Peak	---	---
7 !	2483.50	49.68	-4.32	54.00	67.39	28.48	49.56	3.38	Average	---	---

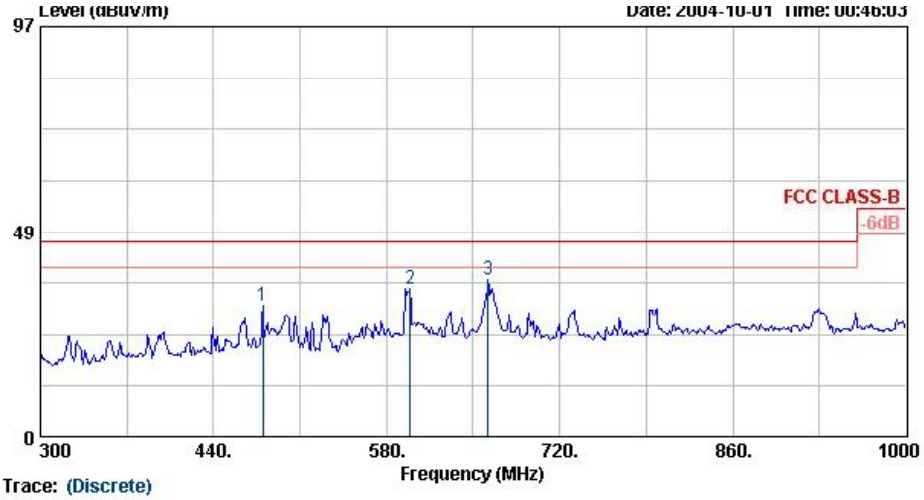
Remark: #4 and #5 Fundamental Signal



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m BI LOG 2004 0629 VERTICAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH78;2480MHz

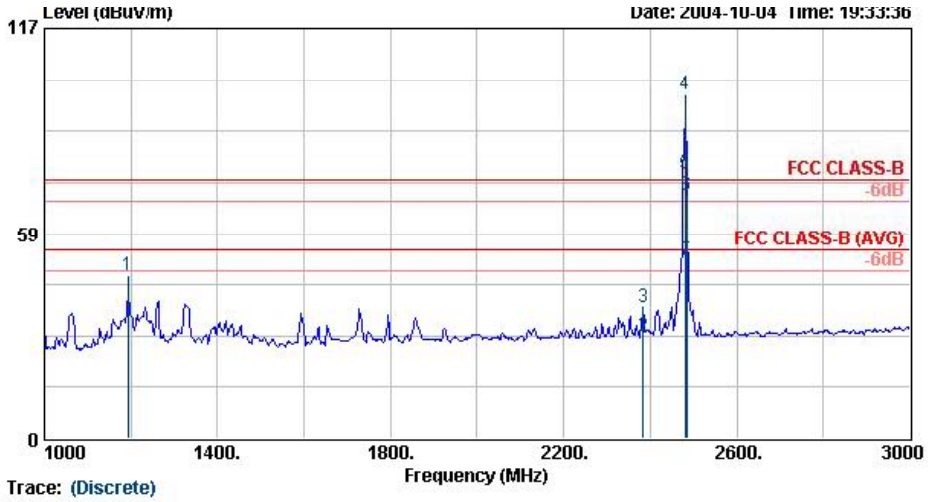
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	54.03	33.60	-6.40	40.00	56.96	8.47	32.45	0.62	Peak	---	---
2 @	160.68	32.30	-11.20	43.50	53.90	9.45	32.15	1.09	Peak	---	---
3	226.83	29.69	-16.31	46.00	50.89	9.27	31.80	1.32	Peak	---	---



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m BI LOG 2004 0629 VERTICAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH78;2480MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	479.90	31.10	-14.90	46.00	43.83	17.09	31.84	2.02	Peak	---	---
2 @	598.90	35.16	-10.84	46.00	45.45	18.70	31.28	2.29	Peak	---	---
3 @	661.90	37.01	-8.99	46.00	47.26	18.91	31.63	2.48	Peak	---	---



Site : 03CH06-HY
Condition : FCC CLASS-B 3m HF-HORN AH-118 VERTICAL
EUT : Bluetooth USB Dongle
Power : 120Vac/60Hz
Model : MBD-C2.1-1
Memo : TX_CH78;2480MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	1194.00	46.59	-27.41	74.00	52.82	24.57	33.11	2.30	Peak	---	---
2	2384.00	29.14	-24.86	54.00	47.00	28.38	49.54	3.31	Average	---	---
3	2384.00	37.55	-36.45	74.00	55.41	28.38	49.54	3.31	Peak	---	---
4 @	2480.00	98.19			115.90	28.48	49.56	3.38	Peak	---	---
5 X	2480.00	75.87			93.58	28.48	49.56	3.38	Average	---	---
6 !	2483.50	69.44	-4.56	74.00	87.15	28.48	49.56	3.38	Peak	---	---
7 !	2483.50	50.84	-3.16	54.00	68.55	28.48	49.56	3.38	Average	---	---

Remark: #4 and #5 Fundamental Signal

- For 3GHz ~ 25GHz

  Remark: Frequency from 3000MHz to 25000MHz, the emission emitted by the EUT is too low to be measured

■ Field strength of fundamental and harmonics

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Preamp Factor (dB)	Limits (dBuV/m)	Emission (dBuV/m)	Margin (dB)	Detect Mode
2478.000	H	28.48	3.38	65.03	49.56	-	96.89	-	Peak
2478.000	H	28.48	3.38	43.23	49.56	-	75.09	-	A.V.
2478.000	V	28.48	3.38	66.33	49.56	-	98.19	-	Peak
2478.000	V	28.48	3.38	44.01	49.56	-	75.87	-	A.V.
4960.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
7440.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
9920.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
12400.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
14880.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
17360.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
19840.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
22320.000	V/H	-	-	-	-	-	-	-	Peak, A.V.
24800.000	V/H	-	-	-	-	-	-	-	Peak, A.V.

Remark: The emission emitted by the EUT is too low to be measured except the emission listed above

Test Engineer: 

Jim

6. Antenna Requirements

The EUT use a PCB Antenna without connector. It is considered to meet antenna requirement of FCC.

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that assembled by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if directional gain of transmitting antennas greater than 6dBi are used, the power shall be reduced by the same amount in unit dB comparing to the directional gain of the antenna minus 6dBi.

Antenna Connected Construction

The antenna used in this product is PCB Antenna without connector.

7. List of Measuring Equipments Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
EMC Receiver	R&S	ESCS 30	100132	9 KHz – 2.75 GHz	Jun. 23, 2004	Jun. 23, 2005	Conduction (CO01-HY)
LISN	MessTec	NNB-2/16Z	2001/008	9 KHz – 30 MHz	May 03, 2004	May 03, 2005	Conduction (CO01-HY)
LISN (Support Unit)	MessTec	NNB-2/16Z	2001/009	9 KHz – 30 MHz	Apr. 19, 2004	Apr. 19, 2005	Conduction (CO01-HY)
EMI Filter	LINDGREN	LRE-2060	1004	< 450 Hz	N/A	N/A	Conduction (CO01-HY)
EMI Filter	LINDGREN	N6006	201052	0 ~ 60 Hz	N/A	N/A	Conduction (CO01-HY)
RF Cable-CON	Suhner Switzerland	RG223/U	CB029	9KHz~30MHz	Dec. 24, 2003	Dec. 24, 2004	Conduction (CO01-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Spectrum analyzer	R&S	FSP40	100057	9KHz-40GHz	Feb. 26, 2004	Feb. 26, 2005	Radiation (03CH06-HY)
Controller	CT	SC100	N/A	N/A	N/A	N/A	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Dec. 18, 2003	Dec. 18, 2004	Radiation (03CH06-HY)
Horn Antenna	Com-Power	AH118	071025	1G-18G	Feb. 11, 2004	Feb. 11, 2005	Radiation (03CH06-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	9170-249	14G - 40G	Jun. 22, 2004	Jun. 22, 2005	Radiation (03CH06-HY)
PreAmplifier	Com-Power	PA-103	161055	1MHz - 1000MHz	Apr. 26, 2004	Apr. 26, 2005	Radiation (03CH06-HY)
HF Amplifier	MITEQ	AFS44	973248	0.1G - 26.5G	May. 20, 2004	May. 20, 2005	Radiation (03CH06-HY)
Amplifier	MITEQ	AMF-6F	997165	26G - 40G	Jun. 24, 2004	Jun. 24, 2005	Radiation (03CH06-HY)
Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	N/A	Radiation (03CH06-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	N/A	Radiation (03CH06-HY)
Wireless Communications Test Set	Agilent	8960	E5515C	Qual-band	N/A	N/A	Radiation (03CH06-HY)

8. Uncertainty of Test Site

Uncertainty of Conducted Emission Measurement (30MHz ~ 1000MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.10	Normal(k=2)	0.05
Cable loss	0.10	Normal(k=2)	0.05
AMN insertion loss	2.50	Rectangular	0.63
Receiver Spec	1.50	Rectangular	0.43
Site imperfection	1.39	Rectangular	0.80
Mismatch Receiver VSWR Γ1= LISN VSWR Γ2= Uncertainty=20log(1-Γ1*Γ2)	+0.34/-0.35	U-shape	0.24
combined standard uncertainty Uc(y)	**1.13**		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	**2.26**		

Uncertainty of Radiated Emission Measurement (150kHz ~ 30MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.41	Normal(k=2)	0.21
Antenna factor calibration	0.83	Normal(k=2)	0.42
Cable loss calibration	0.25	Normal(k=2)	0.13
Pre Amplifier Gain calibration	0.27	Normal(k=2)	0.14
RCV/SPA specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site imperfection	1.43	Rectangular	0.83
Mismatch Receiver VSWR Γ1= 0.20 Antenna VSWR Γ2= 0.23 Uncertainty=20log(1-Γ1*Γ2)	+0.39/-0.41	U-shaped	0.28
combined standard uncertainty Uc(y)	**1.27**		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	**2.54**		

U=√{(1/2)²+(0.3/2)²+(2²+0.5²+2²+0.25²+2²)/3+(0.54)²/2}=2.2 for 10m test distance
U=√{(1/2)²+(0.3/2)²+(2²+3²+2²+0.25²+2²)/3+(0.54)²/2}=2.7 for 3m test distance

Uncertainty of Conducted Emission Measurement (1GHz ~ 40GHz)

Contribution	Uncertainty of x_i		$u(x_i)$	Ci	$Ci*u($
	dB	Probability Distribution			
Receiver reading	±0.10	Normal(k=1)	0.10	1	0.10
Antenna factor calibration	±1.70	Normal(k=2)	0.85	1	0.85
Cable loss calibration	±0.50	Normal(k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR Γ1= 0.197 Antenna VSWR Γ2= 0.194 Uncertainty=20log(1-Γ1*Γ2*Γ3)	+0.34/-0.35	U-shaped	0.244	1	0.244
Combined standard uncertainty Uc(y)	**2.36**				
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	**4.72**				

U=√{(0.3/2)² +(2²+1.5²+0.2²)/3+(0.2)²/2}=1.66