FCC TEST REPORT

for

47 CFR Part 15 Subpart C

Equipment	:	**USB DONGLE**
Trade Name	:	**EPoX**
Model No.	:	**BT-DG05A**
FCC ID.	:	**QLHCAO0404**
Filing Type	:	**Certification**
Applicant	:	**EPoX COMPUTER CO., LTD.** 10F, 346, Chung San., Sec. 2, Cheng Ho City, Taipei Hsien 236, Taiwan R.O.C.

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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: July 12, 2004

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

Certificate No. :F443036

CERTIFICATE OF COMPLIANCE

for

47 CFR Part 15 Subpart C

Equipment : **USB DONGLE**

Trade Name : **EPoX**

Model No. : **BT-DG05A**

FCC ID. : **QLHCAO0404**

Filing Type : **Certification**

Applicant : **EPoX COMPUTER CO., LTD.**
10F, 346, Chung San., Sec. 2, Cheng Ho City, Taipei Hsien 236, Taiwan 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 - 2001** 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 July 09, 2004 at **SPORTON International Inc.** LAB.

Daniel Lee 7/14/2004
Daniel Lee
Manager

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

1. General Description of Equipment under Test

1.1. Applicant

EPoX COMPUTER CO., LTD.
10F, 346, Chung San., Sec. 2, Cheng Ho City, Taipei Hsien 236, Taiwan R.O.C.

1.2. Manufacturer

Flextronics-Dong Guan
Sh Da Road, Da Ling Shan, Dongguan, Guangdong, China.

1.3. Basic Description of Equipment under Test

Equipment	: USB DONGLE
Model No.	: BT-DG05A
FCC ID	: QLHCAO0404
Trade Name	: EPoX
Power Supply Type	: DC 3.5V

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	0.32 dBm			
6. Type of Antenna Connector	N/A			
7. Antenna Type	Printed antenna			
8. Antenna Gain	0 dBi			
9. Function Type	Transmitter		Transceiver	V
10. Power Rating (DC/AC , Voltage)	DC 5.5V~6V			
11. Temperature Range (Operating)	0°C to + 40°C			

2. Test Configuration of Equipment under Test

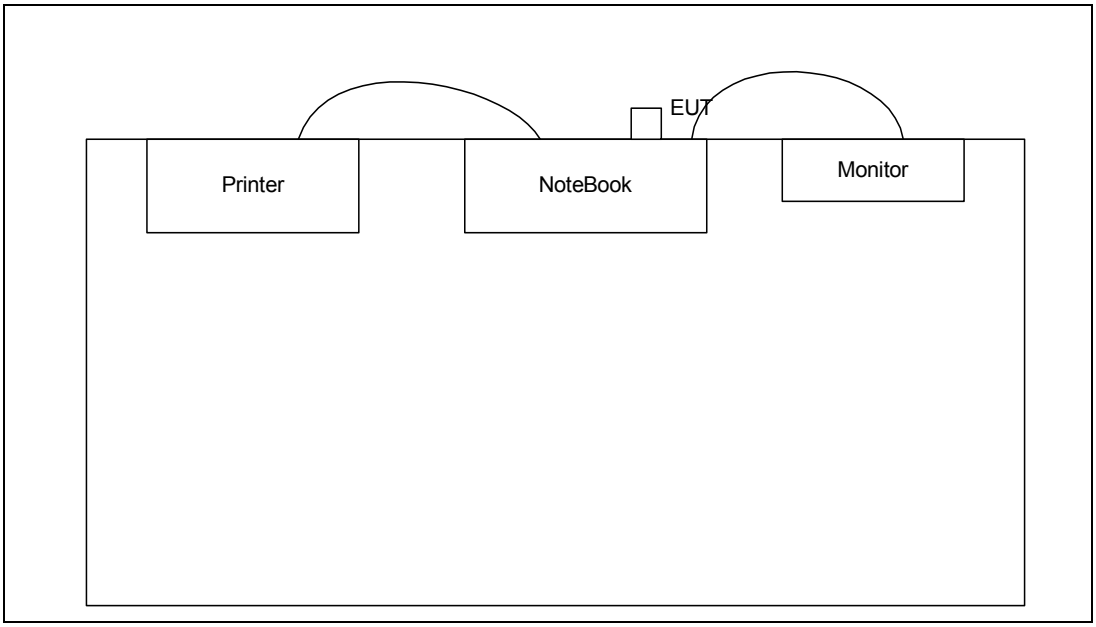
2.1. Test Manner

a. The EUT has been associated with peripherals pursuant to ANSI C63.4-2001 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, VIEWSONIC Monitor, EPSON Printer and EUT for EMI test.
c. The following test modes were tested for conduction test:
   Mode 1: Operating
d. The following test modes were tested for radiation test:
   Mode 1: CH00 Tx（2402MHz）
   Mode 2: CH39 Tx（2441MHz）
   Mode 3: CH78 Tx（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	S/N
1.	Notebook (DELL)	PP05L	N/A	SP0005
2.	Monitor (VIEWSONIC)	VCDTS21553-3P	Shielded, 1.7m	SP0007
3.	Printer (EPSON)	STYLUS COLRO 680	Shielded, 1.35m	SP0017

2.3. Connection Diagram of Test System



3. Operation of Equipment under Test

An executive program, EMITEST.EXE and Activesync.exe on WIN XP continuously generating a complete line of " H " pattern was used as the test software.

The program was executed as follows:

a. Turn on the power of all equipment.
b. The PC reads the test program from the hard disk drive and runs it.
c. The PC sends " H" messages to the monitor, and the monitor displays " H " patterns on the screen.
d. The PC sends " H " messages to the printer, then the printer prints them on the paper.
e. The PC sends " H " messages to the modem.
f. The PC sends " H " messages to the internal hard disk, and the hard disk reads and writes the message.
g. Repeat the steps from c to f.

At the same time, the following program was executed:

"Bluetest.exe" sends continuous Tx.

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	:	CO04-HY, 03CH03-HY

4.1. Test Voltage

110V/60Hz

4.2. Standard for Methods of Measurement

ANSI C63.4-2001

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 15.247(b)(5)	Antenna Requirement	Pass
1307 2.1091	RF Exposure	Pass

5.2. Hopping Channel Separation

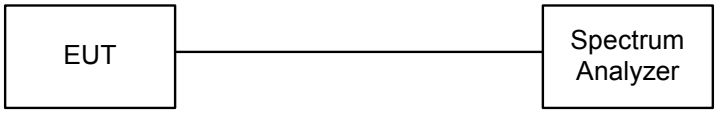
5.2.1. Measuring Instruments：

As described in chapter 8 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

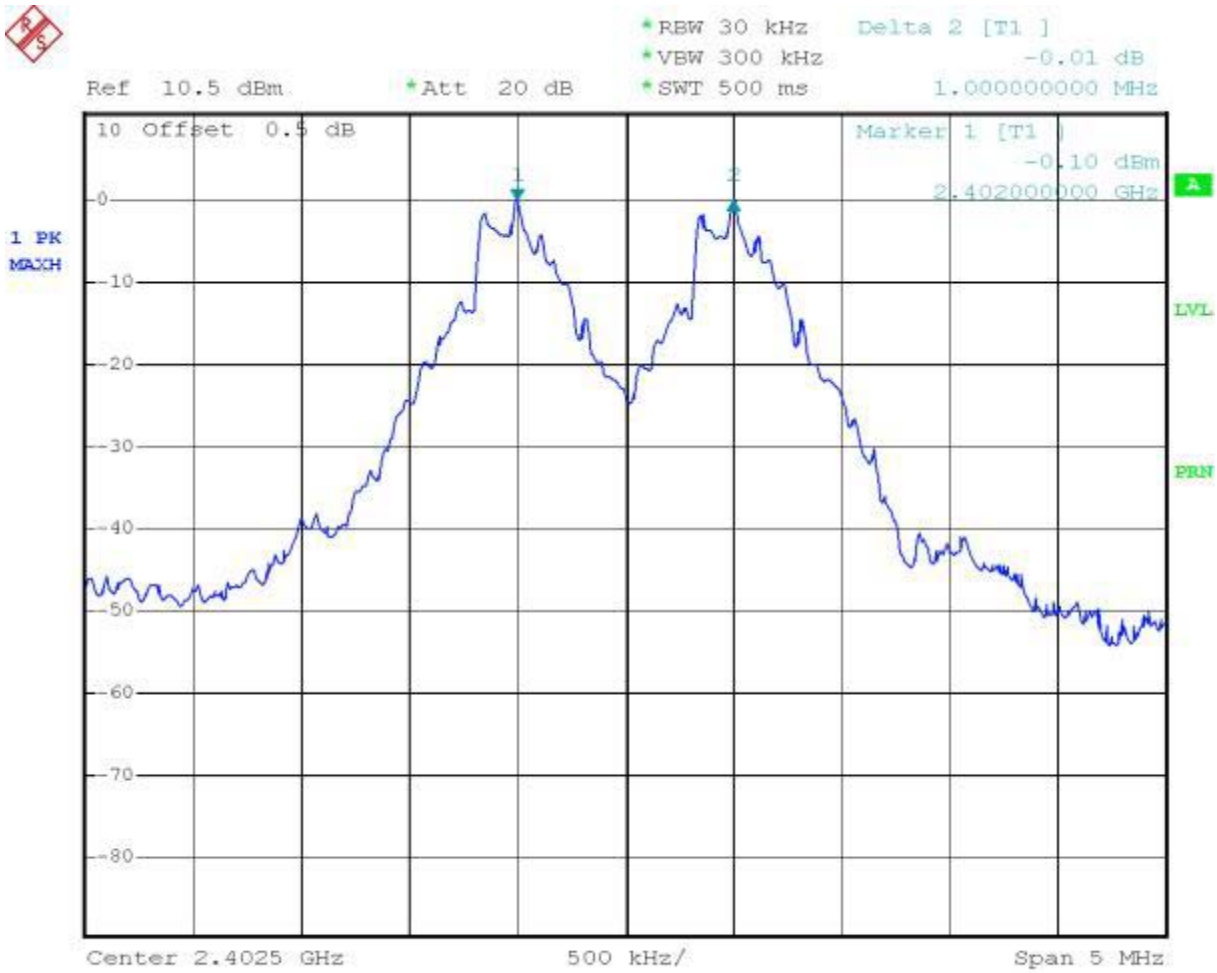
- Test Mode: Mode 1~Mode 3
- Temperature: 26°C
- Relative Humidity: 53 %

Channel	Frequency (MHz)	Hopping Channel Separation (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	1.0	0.744	Mode 1
39	2441	1.0	0.788	Mode 2
78	2480	1.0	0.772	Mode 3

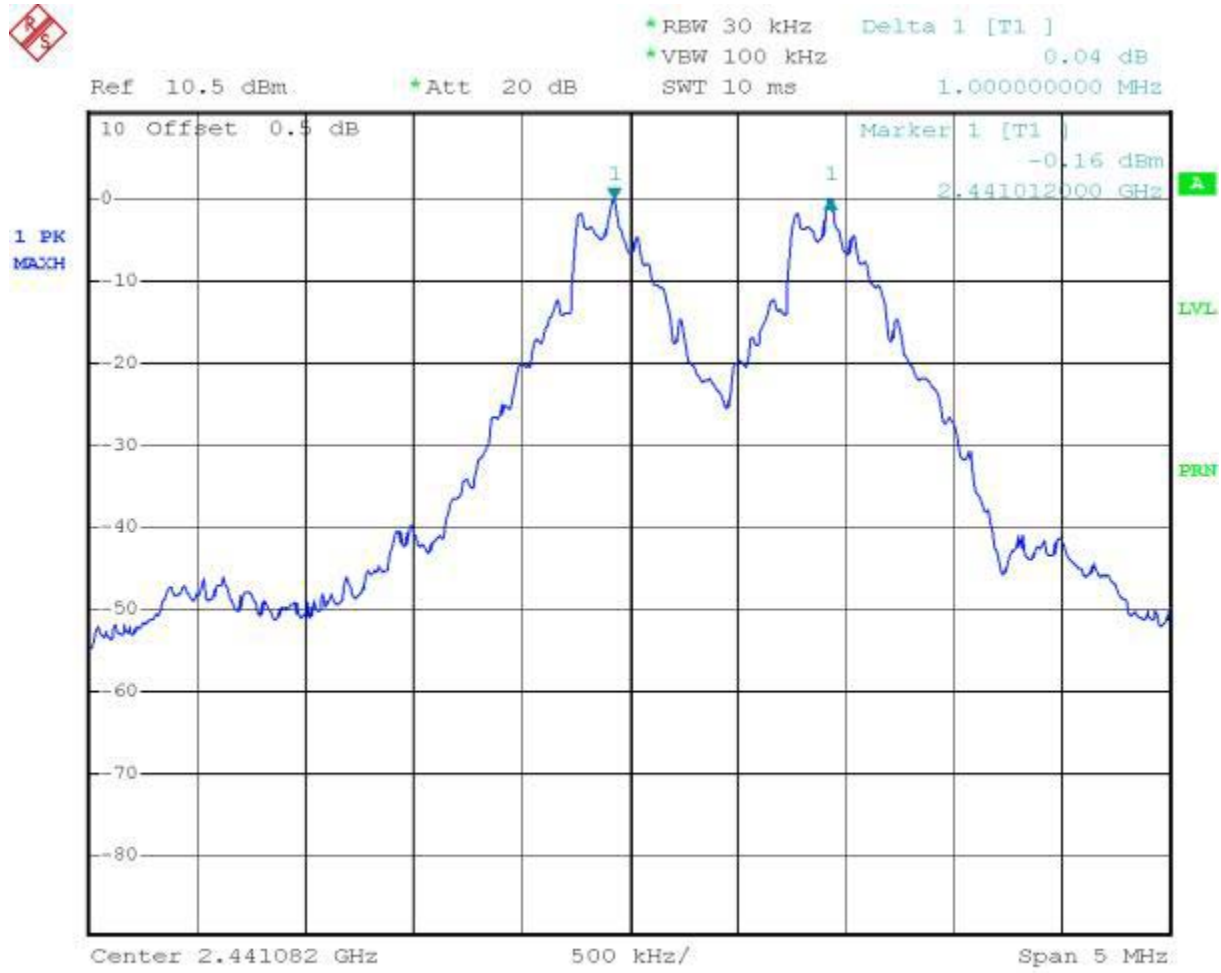
Remark: Limit is the greater one of 25kHz or the 20dB bandwidth of the hopping channel.

5.2.5 Hopping Channel Separation

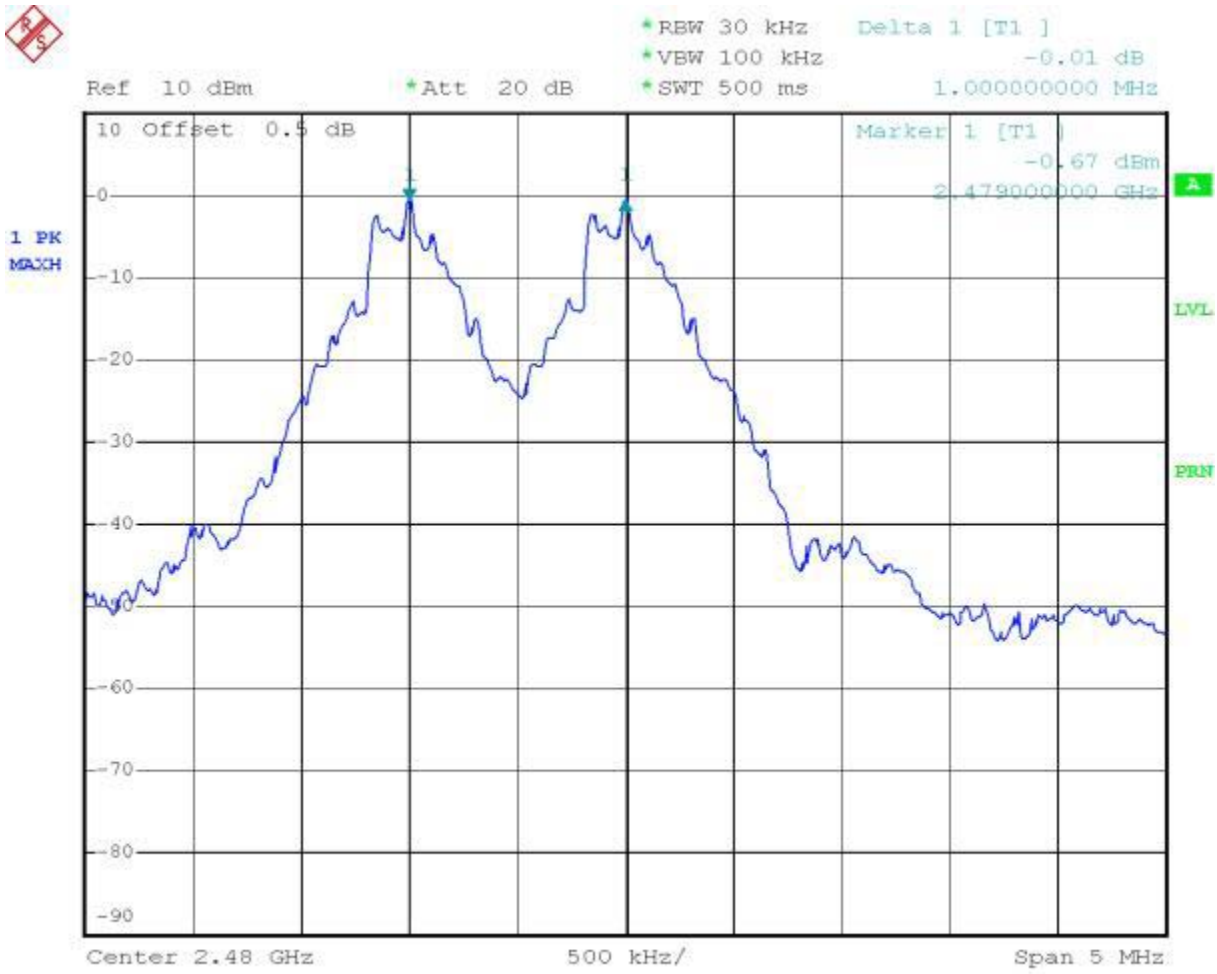
Mode 1: CH00 (2402MHz)



Mode 2: CH39 (2441MHz)



Mode 3: CH78 (2480MHz)



5.3. Number of Hopping Frequency

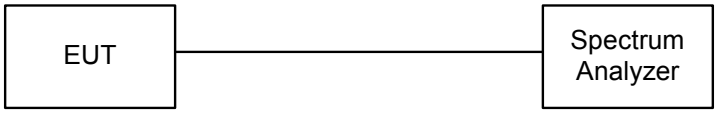
5.3.1. Measuring Instruments：

As described in chapter 8 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：

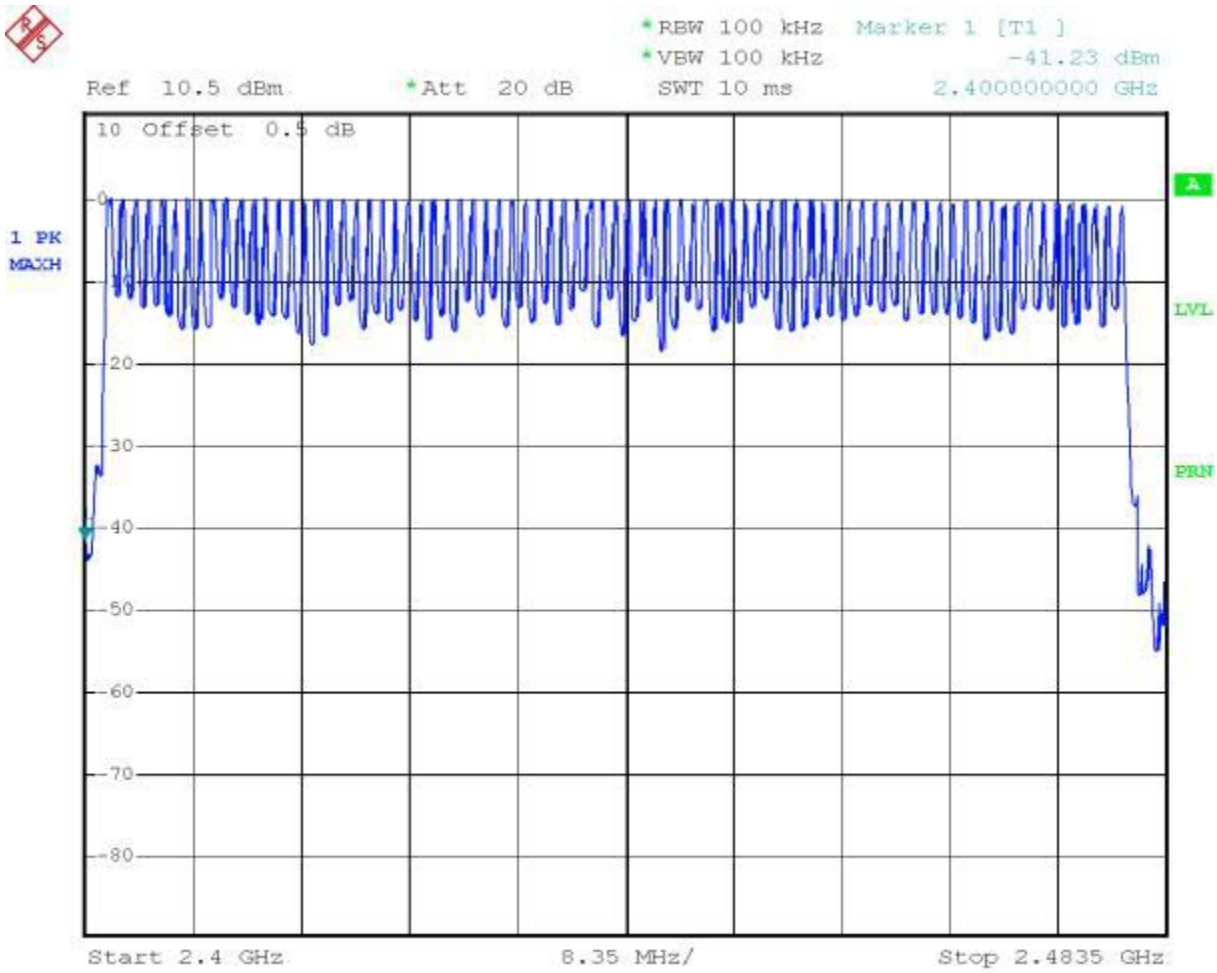


5.3.4. Test Result：See spectrum analyzer plots below

- Temperature: 26°C
- Relative Humidity: 53 %

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

5.3.5 Number of Hopping Frequency



5.4 Hopping Channel Bandwidth

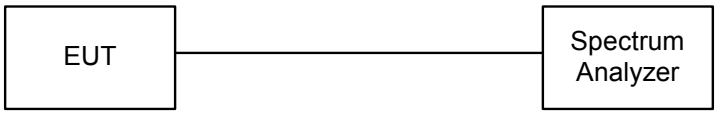
5.4.1 Measuring Instruments：

As described in chapter 8 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：



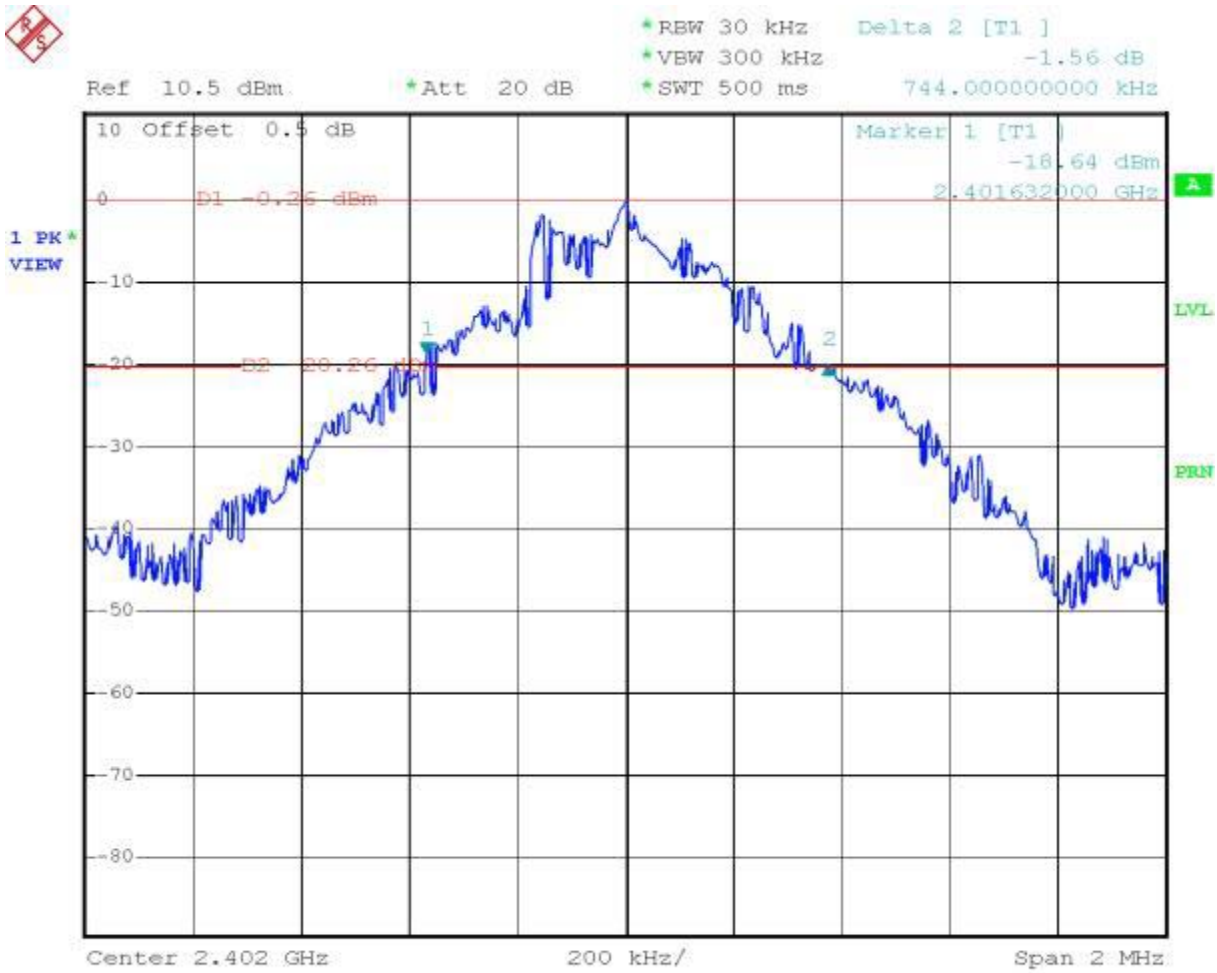
5.4.4 Test Result：See spectrum analyzer plots below

- Test Mode: Mode 1~Mode 3
- Temperature: 26°C
- Relative Humidity: 53 %

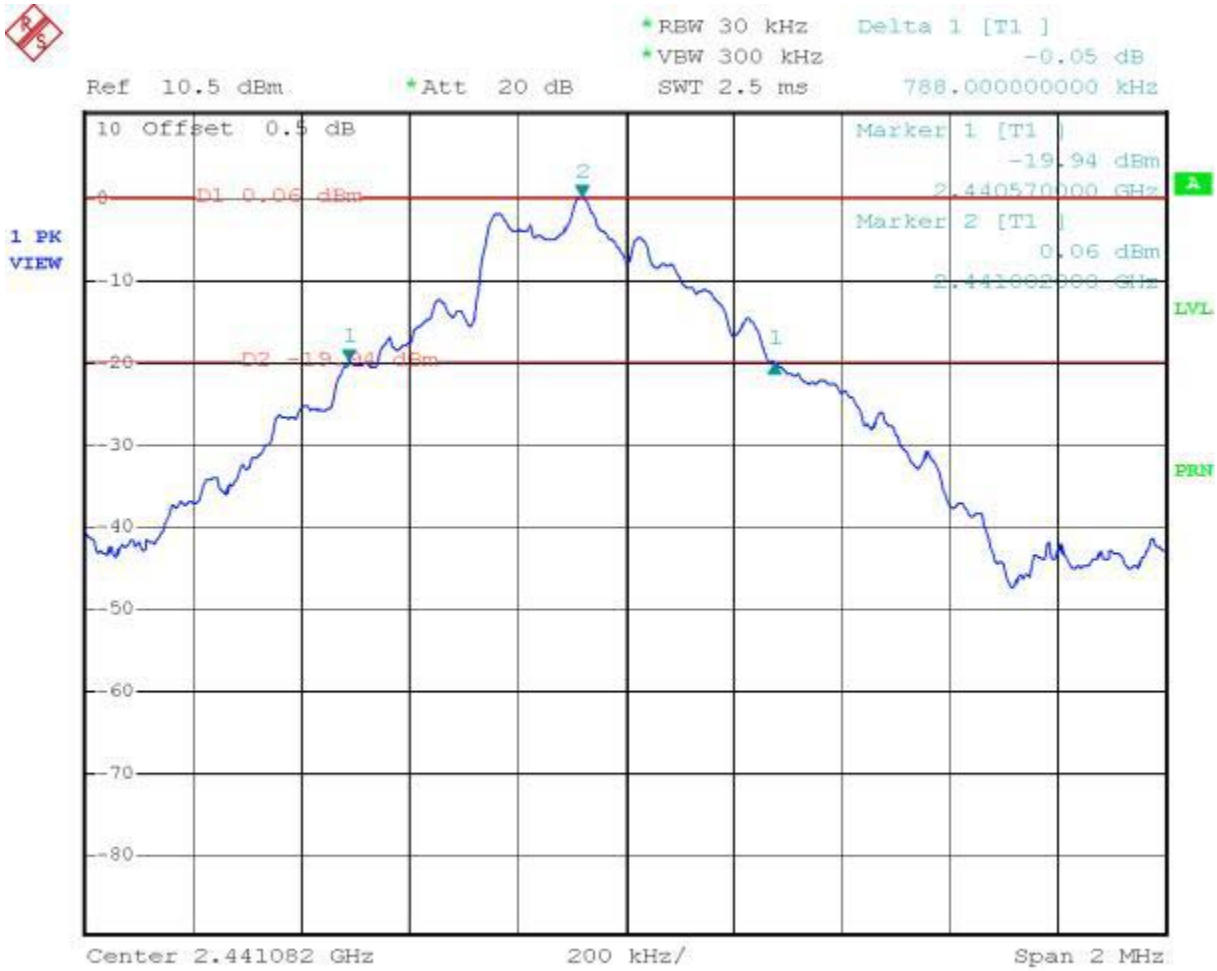
Channel	Frequency (MHz)	Hopping Channel Bandwidth (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	0.744	1.0	Mode 1
39	2441	0.788	1.0	Mode 2
78	2480	0.772	1.0	Mode 3

5.4.5 Hopping Channel Bandwidth

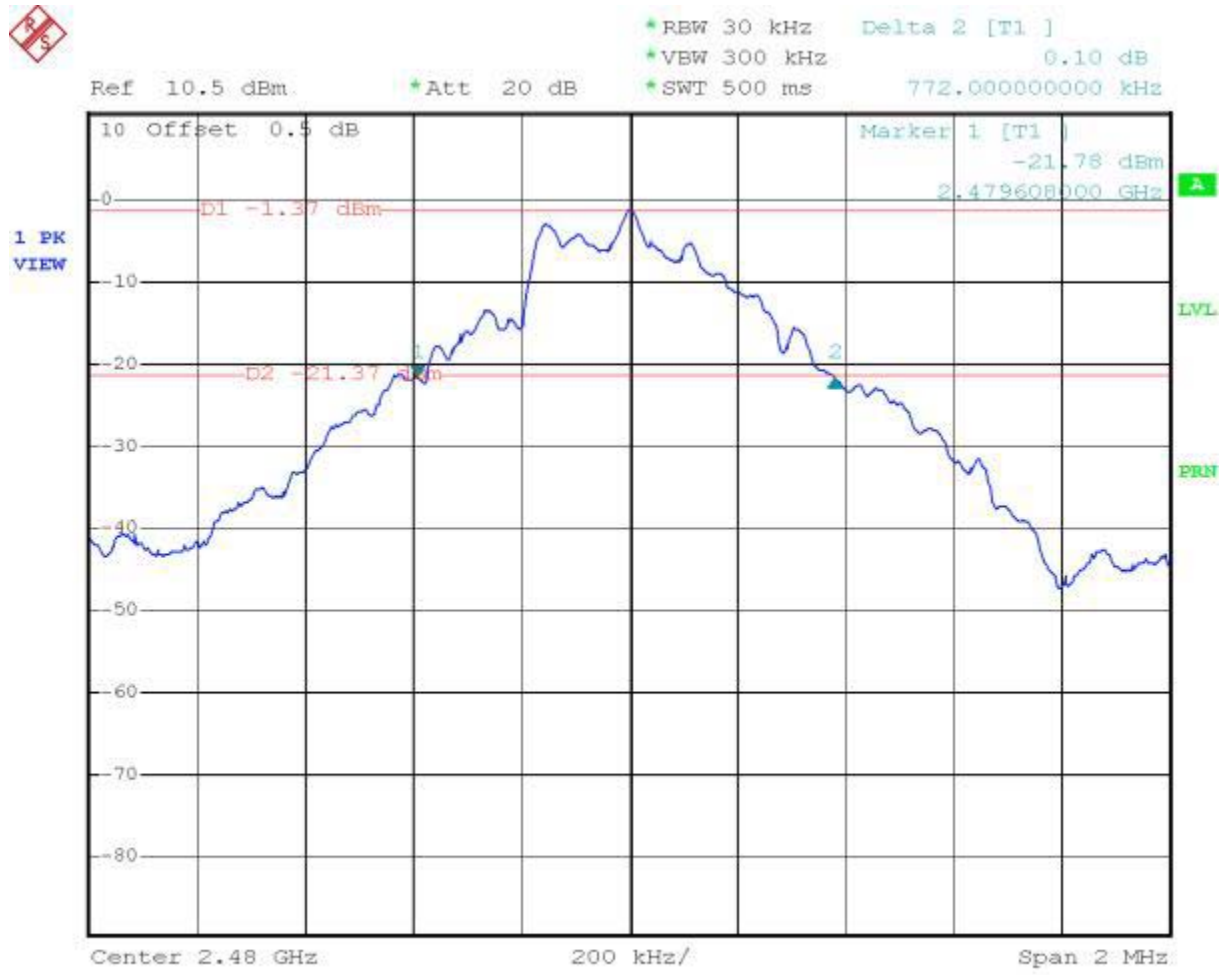
Mode 1: CH00 (2402MHz)



Mode 2: CH39 (2441MHz)



Mode 3: CH78 (2480MHz)



5.5 Dwell Time of Each Frequency within a 30 Seconds Period

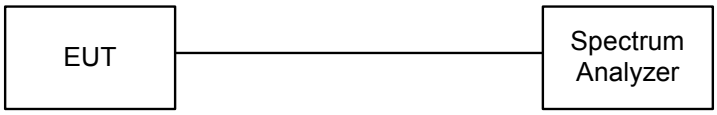
5.5.1 Measuring Instruments：

As described in chapter 8 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：



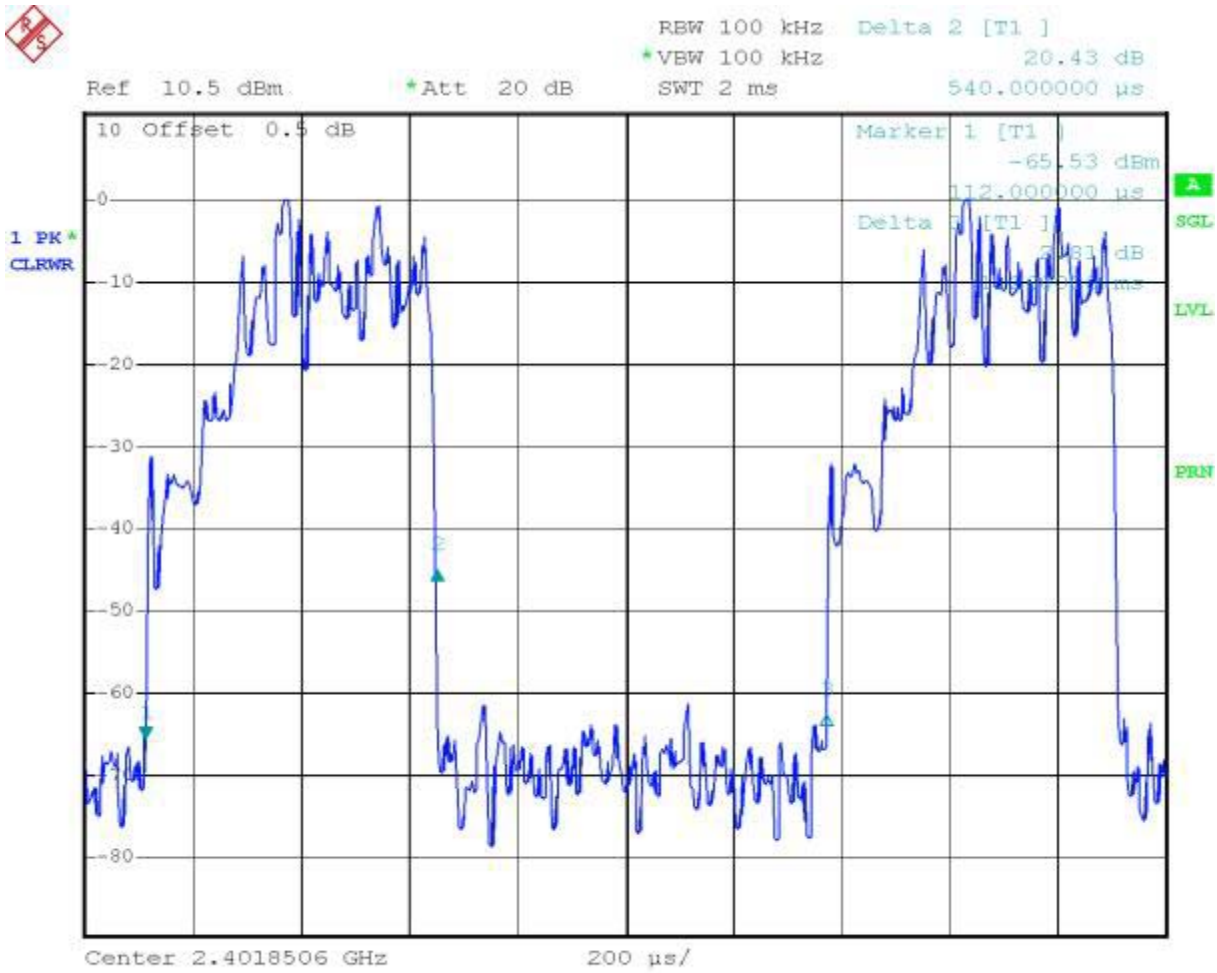
5.5.4 Test Result：See spectrum analyzer plots below

- Test Mode: Mode 1~Mode 3
- Temperature: 26°C
- Relative Humidity: 53 %

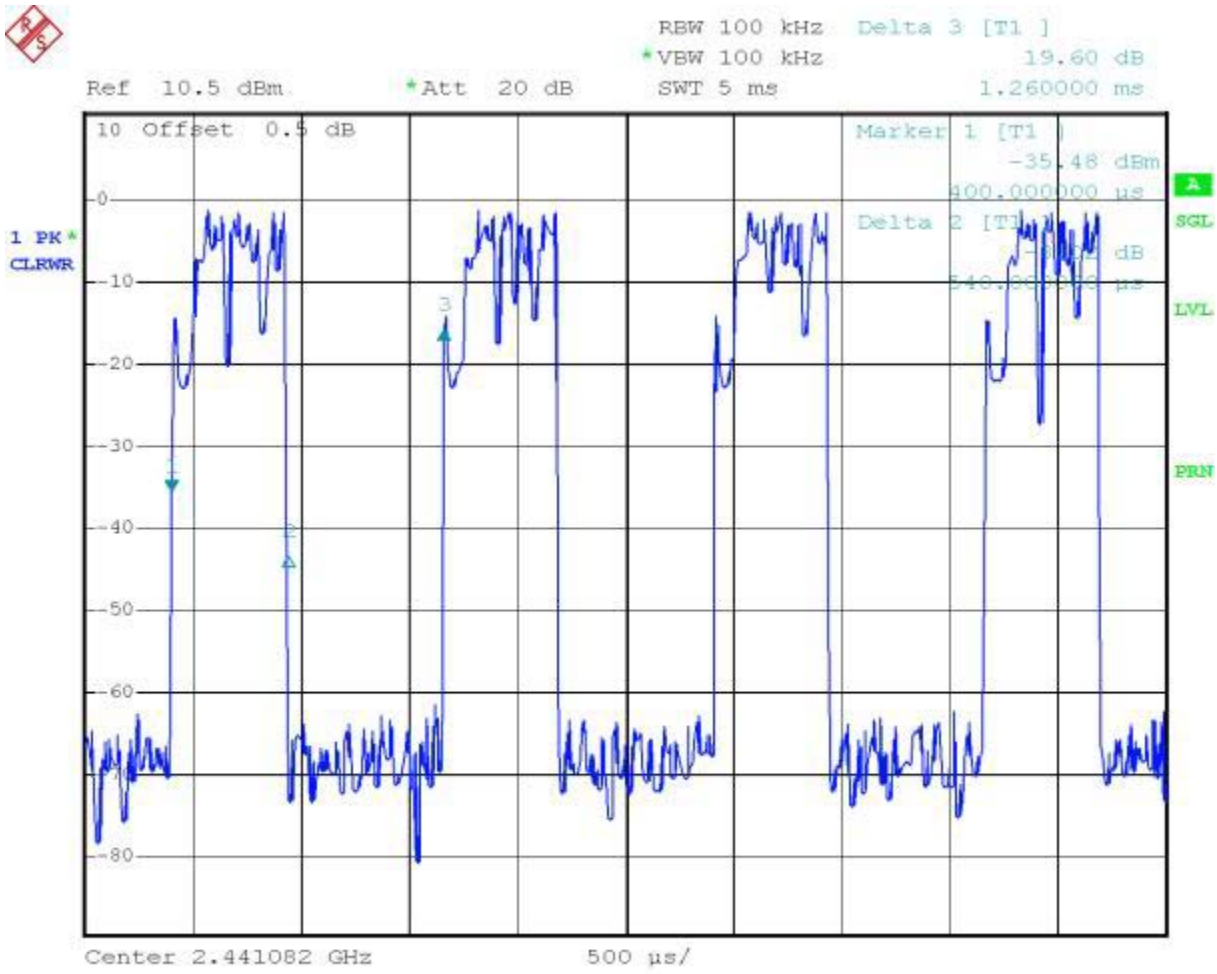
Channel	Frequency (MHz)	Dwell Time (s)	Limits (s)	Plot Ref. No.
00	2402	0.328	0.4	Mode 1
39	2441	0.328	0.4	Mode 2
78	2480	0.328	0.4	Mode 3

5.5.5 Dwell Time of Each Frequency

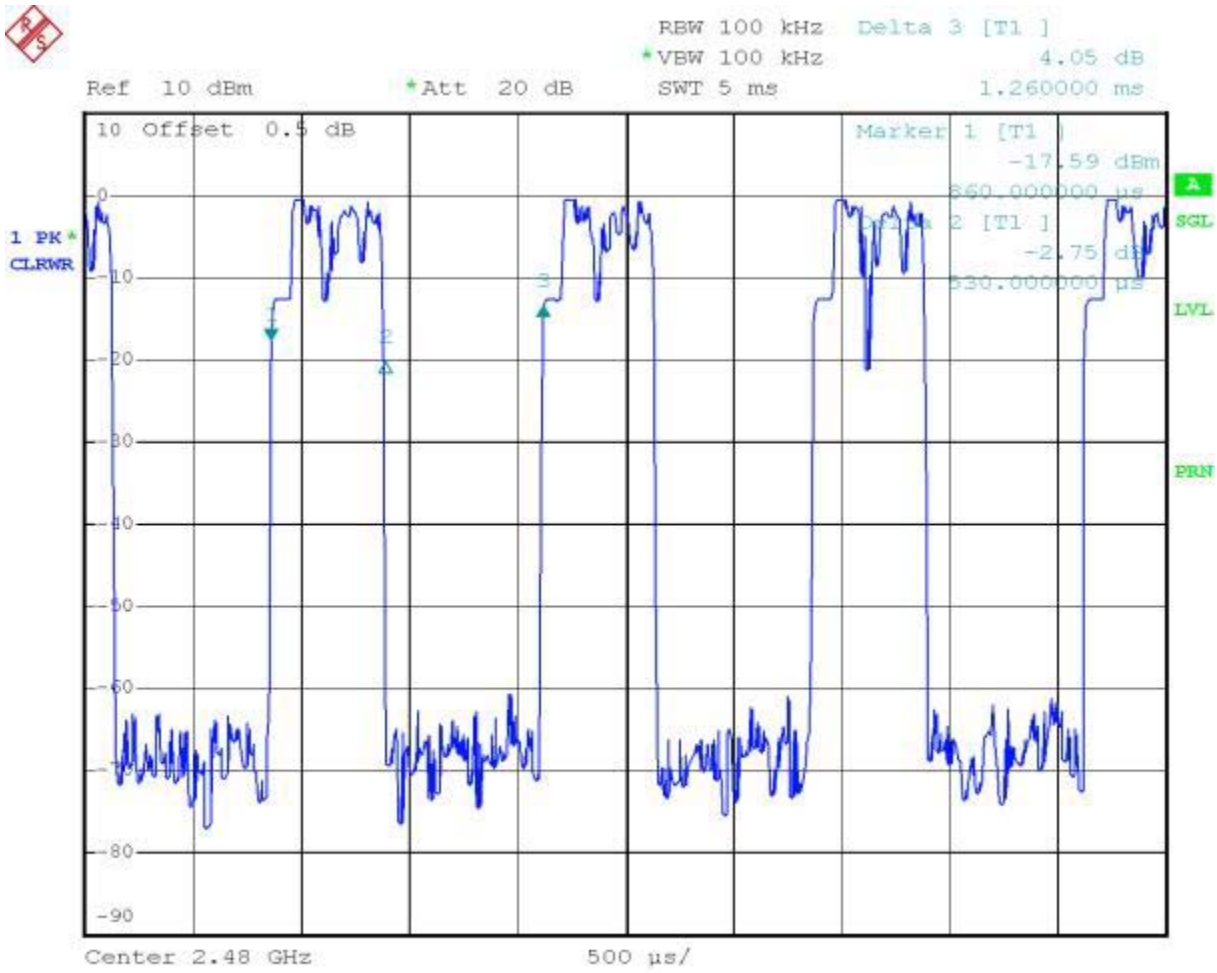
Mode 1: CH00 (2402MHz)



Mode 2: CH39 (2441MHz)



Mode 3: CH78 (2480MHz)



5.6 Output Power

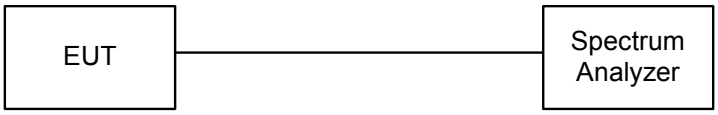
5.6.1 Measuring Instruments：

As described in chapter 8 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：



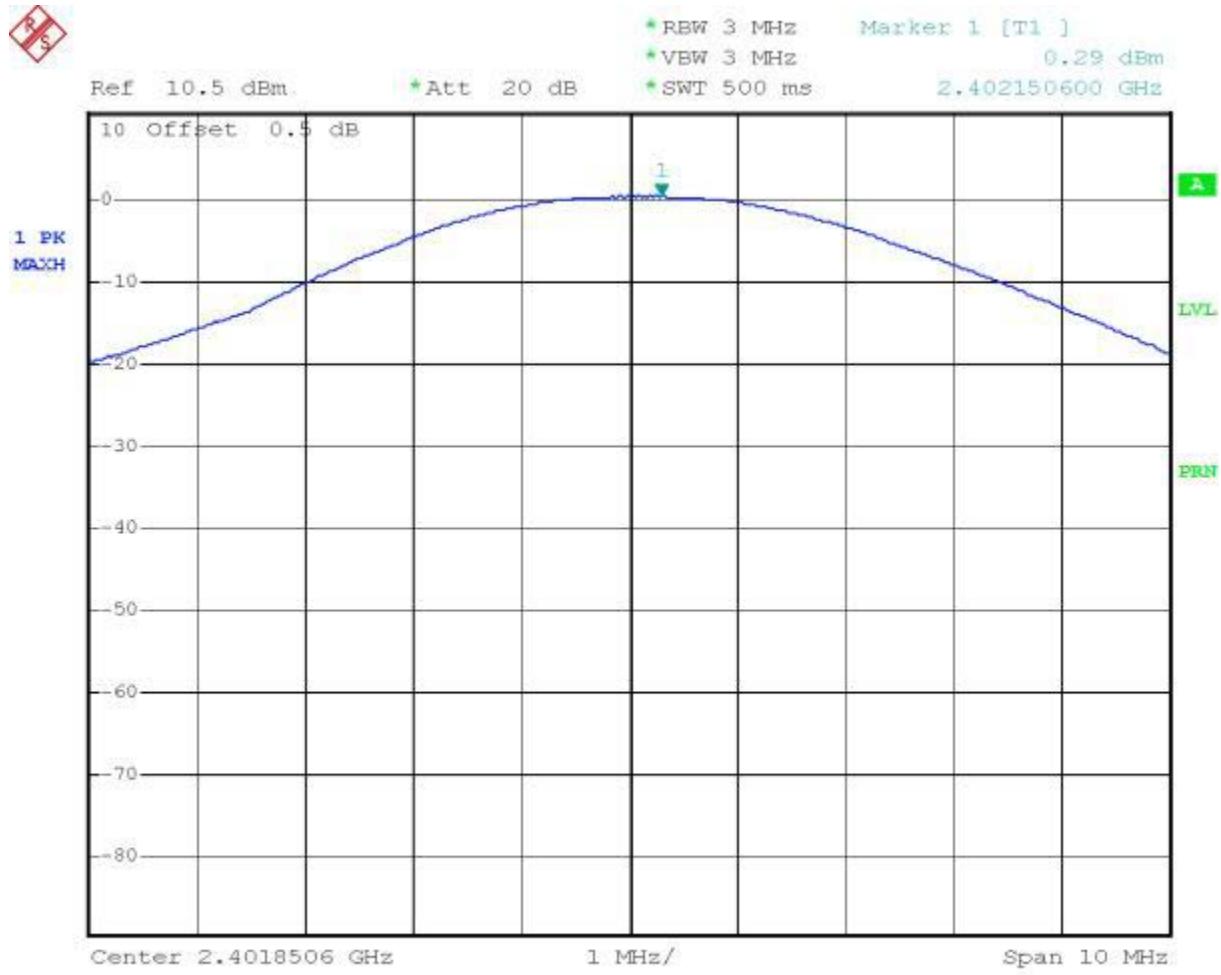
5.6.4 Test Result：See spectrum analyzer plots below

- Test Mode: Mode 1~Mode 3
- Temperature: 26°C
- Relative Humidity: 53 %

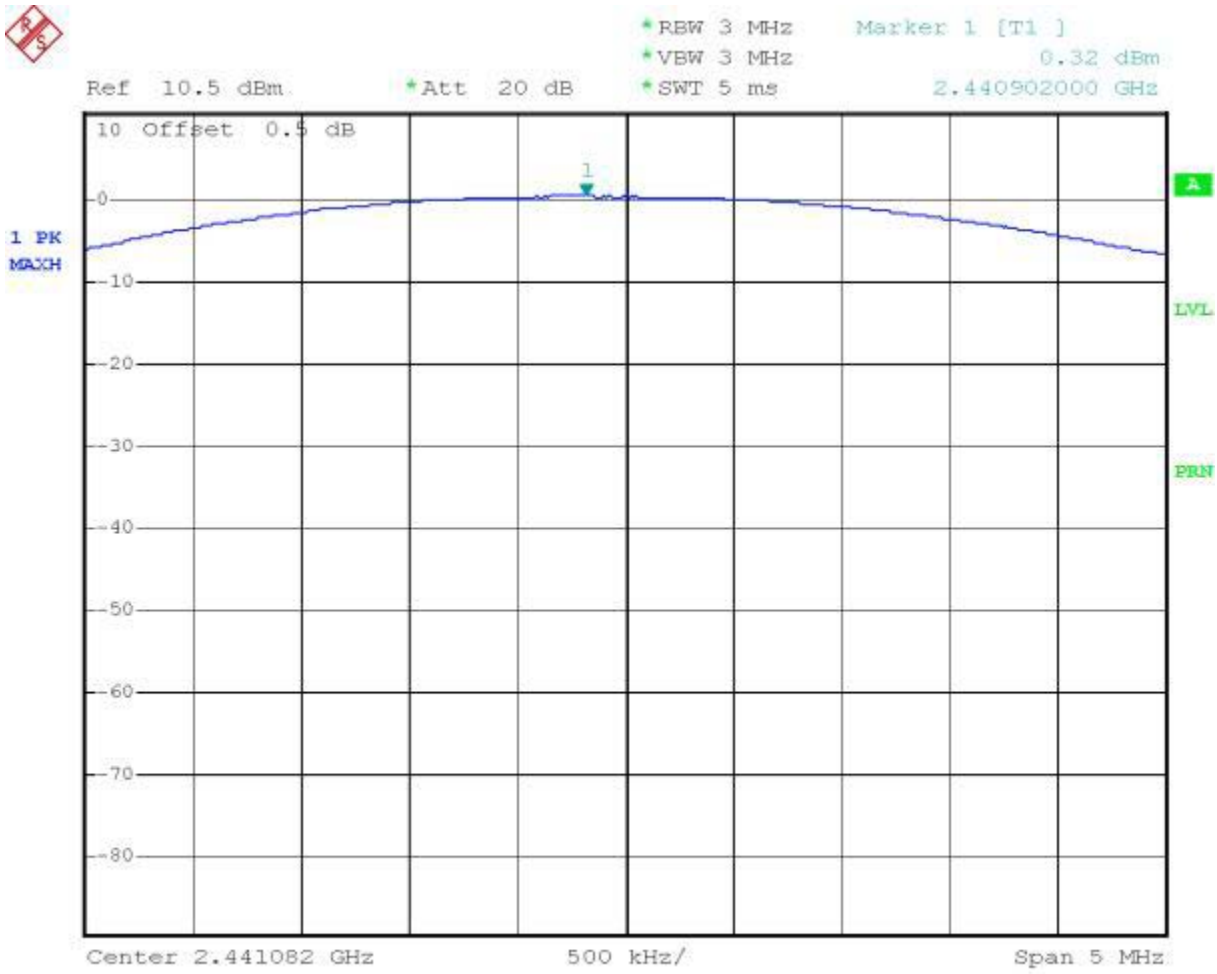
Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (Watt/dBm)	Plot Ref. No.
00	2402	0.29	1W/30 dBm	Mode 1
39	2441	0.32	1W/30 dBm	Mode 2
78	2480	0.01	1W/30 dBm	Mode 3

5.6.5 Output Power

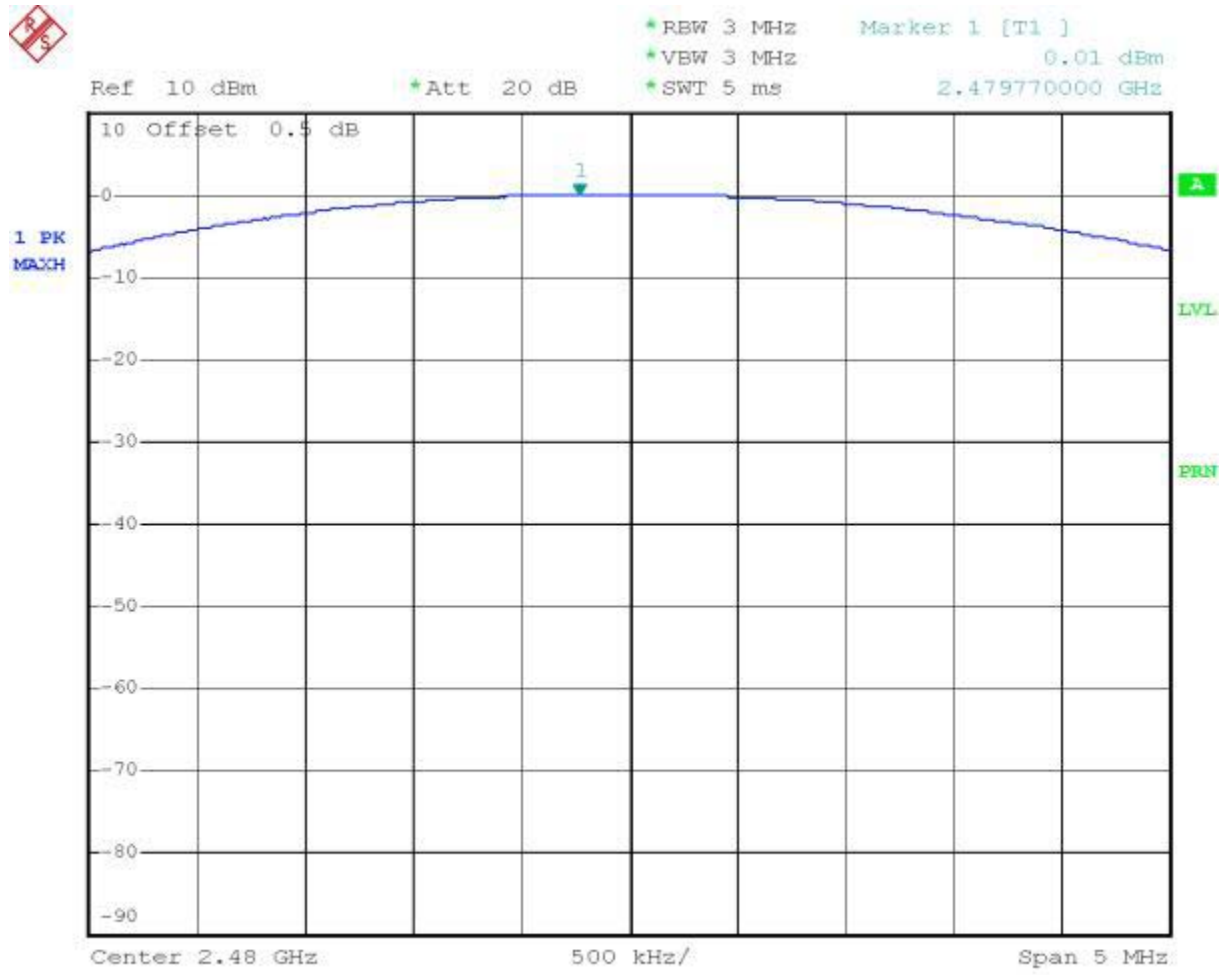
Mode 1: CH00 (2402MHz)



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 8 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: 53 %

Test Result in lower band (Channel 00)： PASS

Test Result in higher band(Channel 78)： PASS

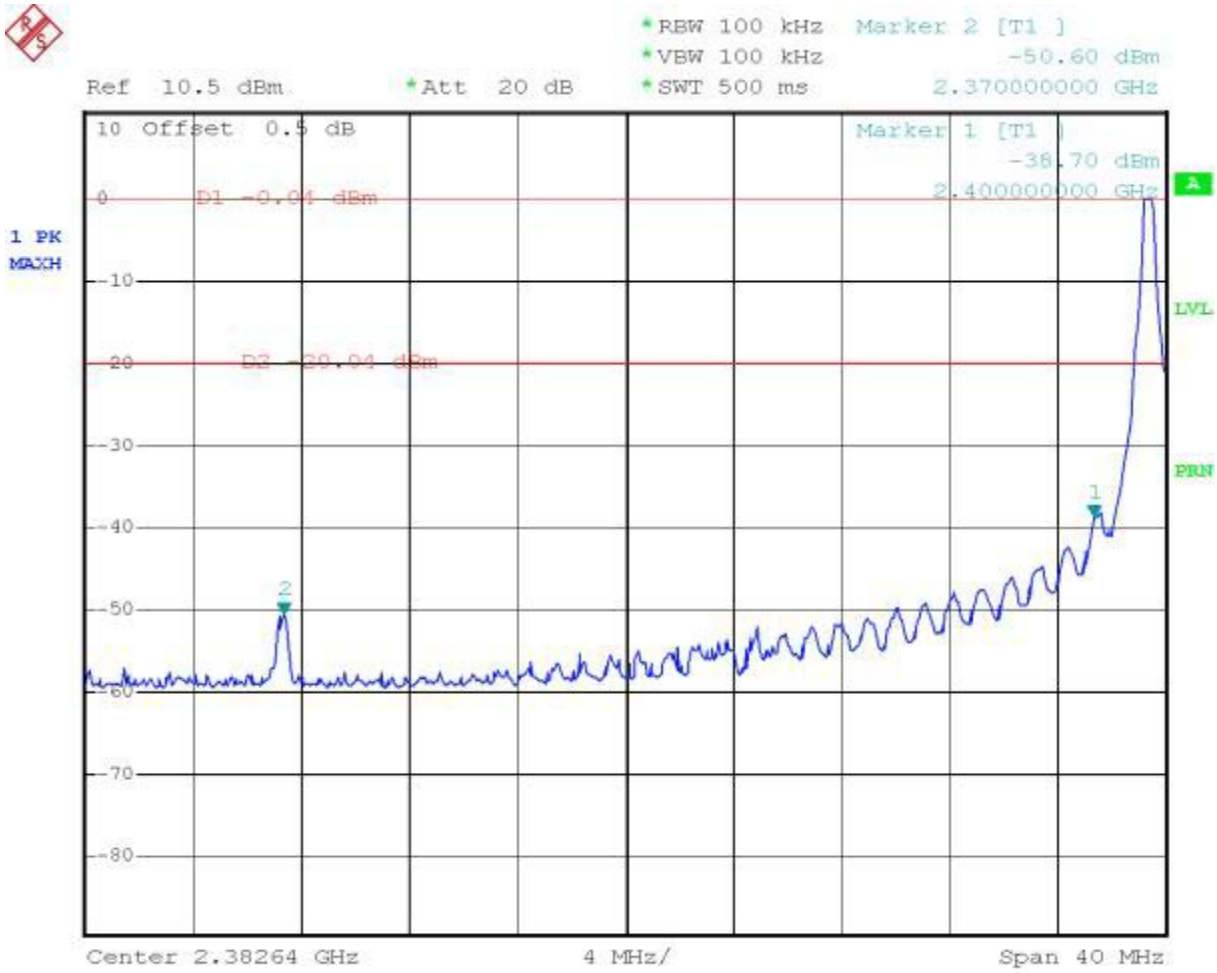
5.7.4 Note on Band edge Emission

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	89.78	2.400	51.27	74	-22.73	Peak	Pass
	H	67.37	2.400	28.86	54	-25.14	Average	Pass
	V	89.78	2.400	51.27	74	-22.73	Peak	Pass
	V	69.35	2.400	30.84	54	-23.16	Average	Pass
78	H	89.98	2.48428	42.71	74	-31.29	Peak	Pass
	H	68.1	2.48428	20.83	54	-33.17	Average	Pass
	V	89.98	2.48428	42.71	74	-31.29	Peak	Pass
	V	68.73	2.48428	21.46	54	-32.54	Average	Pass

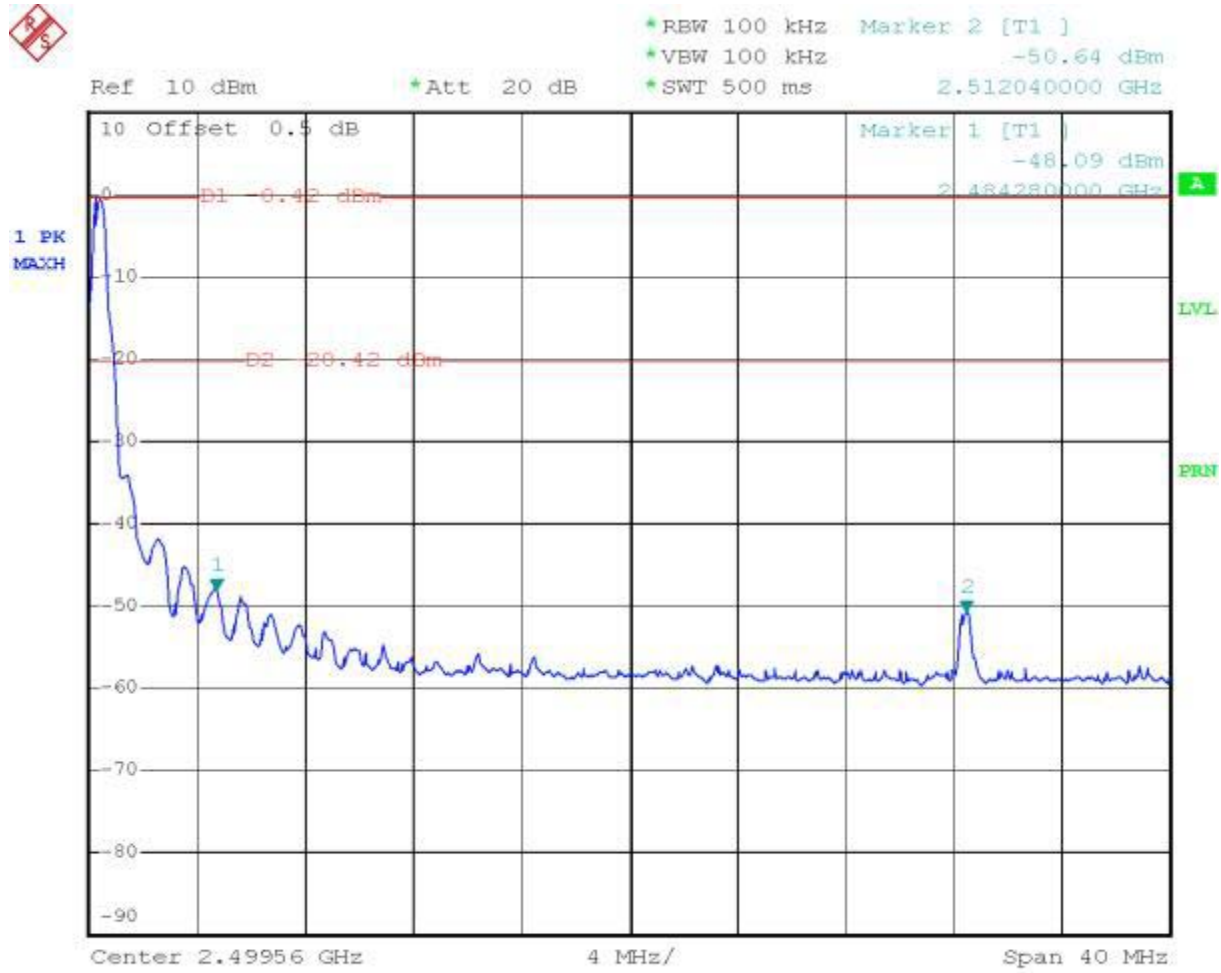
＊Remark: The data above can refer to radiated emission in section 5.9.

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 C63.4-2001 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

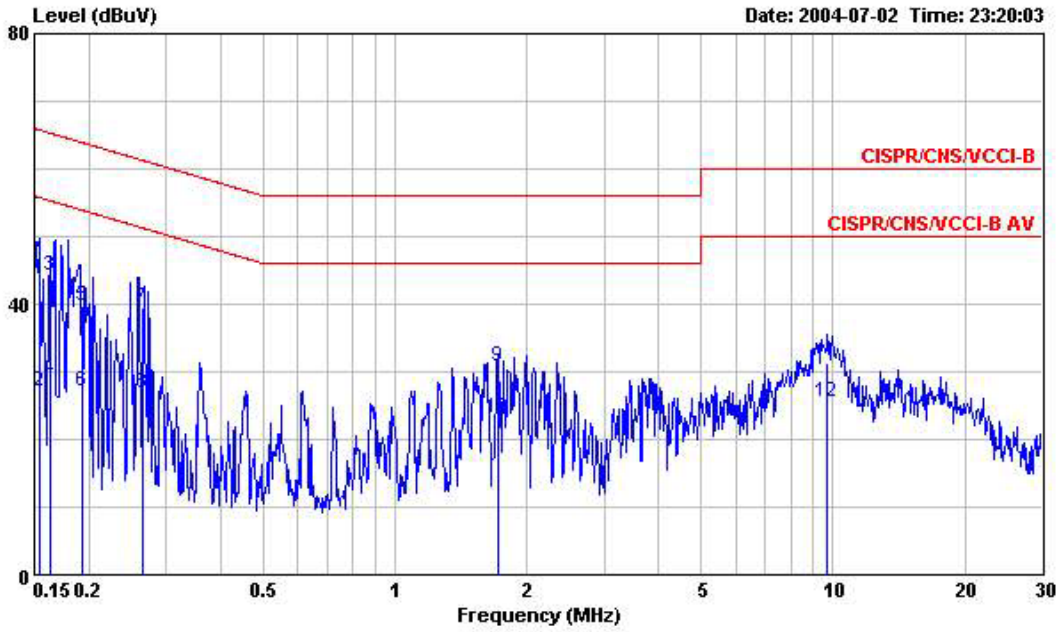
5.8.2 Test Procedures：

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：

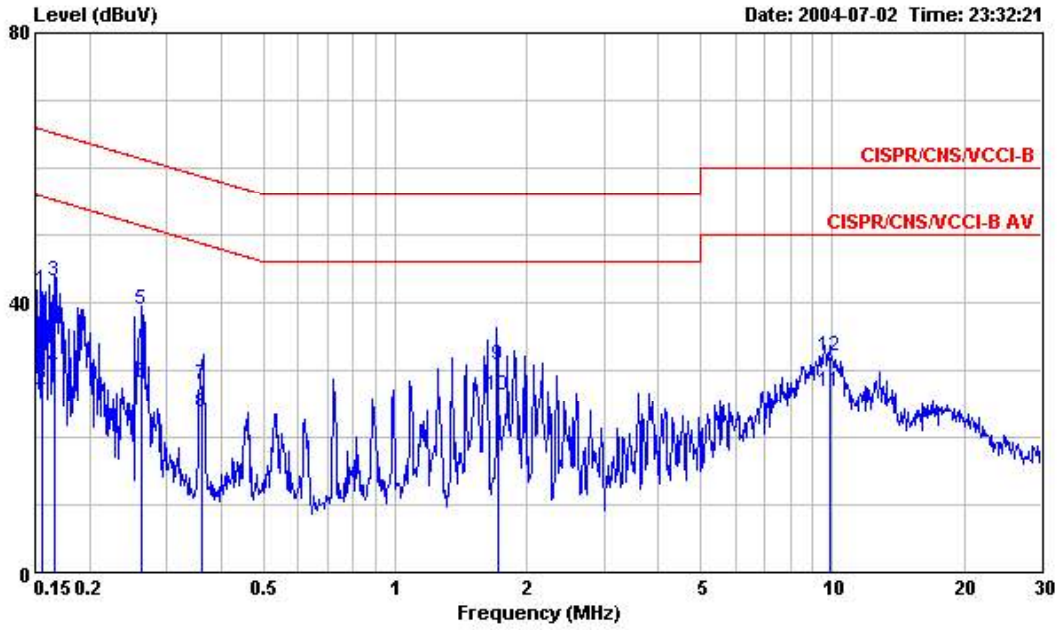
- Test Mode: Mode 1
- Frequency Range of Test: from 150KHz to 30 MHz
- Temperature: 26°C
- Relative Humidity: 53 %
- Test Date: July 02, 2004

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



Site : CO04-HY
Condition : CISPR/CNS/VCCI-B 2004 2001/004 LINE
EUT : Dongle
POWER: 120Vac/60Hz
MODEL : BT-DG05A
MEMO : Bluetooth CH39_2441MHz

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1543970	43.64	-22.12	65.76	43.53	0.10	0.01	QP
2	0.1543970	27.23	-28.53	55.76	27.12	0.10	0.01	Average
3	@0.1632990	44.25	-21.04	65.29	44.14	0.10	0.01	QP
4	0.1632990	28.91	-26.38	55.29	28.80	0.10	0.01	Average
5	0.1932570	39.74	-24.16	63.90	39.63	0.10	0.01	QP
6	0.1932570	27.08	-26.82	53.90	26.97	0.10	0.01	Average
7	0.2651450	39.37	-21.90	61.27	39.26	0.10	0.01	QP
8	0.2651450	26.75	-24.52	51.27	26.64	0.10	0.01	Average
9	1.716	30.67	-25.33	56.00	30.55	0.10	0.02	QP
10	1.716	23.25	-22.75	46.00	23.13	0.10	0.02	Average
11	9.709	31.39	-28.61	60.00	31.08	0.20	0.11	QP
12	9.709	25.63	-24.37	50.00	25.32	0.20	0.11	Average



Site : CO04-HY
Condition : CISPR/CNS/VCCI-B 2004 2001/004 NEUTRAL
EUT : Do
POWER: 120Vac/60Hz
MODEL : BT-DG05A
MEMO : Bluetooth CH39_2441MHz

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1560660	41.73	-23.94	65.67	41.62	0.10	0.01	QP
2	0.1560660	27.08	-28.59	55.67	26.97	0.10	0.01	Average
3	0.1656960	43.17	-22.00	65.17	43.06	0.10	0.01	QP
4	0.1656960	30.18	-24.99	55.17	30.07	0.10	0.01	Average
5	0.2636170	39.03	-22.29	61.32	38.92	0.10	0.01	QP
6	0.2636170	28.13	-23.19	51.32	28.02	0.10	0.01	Average
7	0.3594120	27.82	-30.92	58.74	27.70	0.10	0.02	QP
8	0.3594120	23.73	-25.01	48.74	23.61	0.10	0.02	Average
9	1.713	30.75	-25.25	56.00	30.63	0.10	0.02	QP
10 @	1.713	26.34	-19.66	46.00	26.22	0.10	0.02	Average
11	9.865	26.72	-23.28	50.00	26.41	0.20	0.11	Average
12	9.865	32.09	-27.91	60.00	31.78	0.20	0.11	QP

Test Engineer: Jay

Jay