



Spectrum Research &  
Testing Lab., Inc.  
No. 101-10, Ling 8,  
Shan-Tong Li, Chung-Li  
City, Taoyuan, Taiwan

## TEST REPORT

Reference No.: A08031306  
Report No.: FCCA08031306  
FCC ID: V83BLUEW-2310  
Page: 1 of 101  
Date: Apr. 22, 2008

Product Name: Wi-Fi and Bluetooth PCI Card  
Model No.: BLUEW\_2310  
Applicant: SYNTEKSMEICONDUCTOR CO., LTD.  
10F, No. 1, Alley 30, Lane 358, Rui-Guang Road, Neihu,  
Taipei, Taiwan. R.O.C.  
Date of Receipt: Mar. 13, 2008  
Finished date of Test: Apr. 18, 2008  
Applicable Standards: 47 CFR Part 15, Subpart C  
47 CFR Part 15, Subpart B  
ANSI C63.4: 2003

We, **Spectrum Research & Testing Laboratory Inc.**, hereby certify that one sample of the above was tested in our laboratory with positive results according to the above-mentioned standards. The records in the report are an accurate account of the results. Details of the results are given in the subsequent pages of this report.

Tested By : Shunm Wang , Date: Apr. 22, 2008  
(Shunm Wang)

Approved By : JH , Date: Apr 22 / 2008  
( Johnson Ho, Director )

NVLAQ®

Lab Code: 200099-0  
FMNG-059.10 REPORT



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### **1. DOCUMENT POLICY AND TEST STATEMENT**

#### **1.1 DOCUMENT POLICY**

- The report shall not be reproduced except in full, without the written approval of SRT Lab, Inc.
- The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

#### **1.2 TEST STATEMENT**

- The test results in the report apply only to the unit tested by SRT Lab.
- There was no deviation from the requirements of test standards during the test.
- AC power source, 120 Vac/60 Hz, was used during the test.

#### **1.3 EUT MODIFICATION**

- No modification in SRT Lab.



## 2. DESCRIPTION OF EUT AND TEST MODE

### 2.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Wi-Fi and Bluetooth PCI Card
<b>MODEL NO.</b>	Bluew_2310
<b>POWER SUPPLY</b>	3.3V DC form PCI interface
<b>CABLE</b>	N/A
<b>I/O PORT</b>	PCI 32 bits interface
<b>FREQUENCY BAND</b>	Wi-Fi 2412 ~ 2462MHz , Bluetooth 2402 ~ 2480MHz
<b>CARRIER FREQUENCY</b>	Wi-Fi 2412 ~ 2462MHz , Bluetooth 2402 ~ 2480 MHz
<b>NUMBER OF CHANNEL</b>	Wi-Fi 11 , Bluetooth 79
<b>CHANNEL SPACING</b>	Wi-Fi 5MHz , Bluetooth 1MHz
<b>RATED RF OUTPUT POWER</b>	WiFi DSSS 58mW / OFDM 26mW Bluetooth 1mW
<b>I.F. &amp; L.O.</b>	Wi-Fi I.F. 0MHz , L.O. 2412 ~ 2462MHz Bluetooth I.F. 0MHz , L.O. 2402 ~ 2480MHz
<b>MODULATION TYPE</b>	Wi-Fi DSSS, OFDM Bluetooth DQPSK, 8DPSK, GFSK
<b>BIT RATE OF TRANSMISSION</b>	Wi-Fi 6,9,12,18,24,36,48,54Mbit/s(802.11g), 1,2,5.5,11Mbit/s(802.11b) Bluetooth 1Mbit/s 2Mbit/s 3Mbit/s
<b>ANTENNA TYPE</b>	Reverse SAM Antenna
<b>ANTENNA GAIN</b>	2.0 ± 0.5 dBi

#### NOTE :

For more detailed information, please refer to the EUT's specification or user's manual provided by manufacturer.

### 2.2 DESCRIPTION OF EUT INTERNAL DEVICE

DEVICE	BRAND / MAKER	MODEL	FCC ID/DOC	REMARK
N/A				



## 2.3 DESCRIPTION OF TEST MODE

Bluetooth:

79 channels are provided by EUT of Bluetooth. The 3 channels of them were chosen for test.

Channel	Frequency (MHz)	Final Test
0	2402	V
39	2441	V
78	2480	V

Wi-Fi:

11 channels are provided by EUT of wireless. The 3 channels of lower, medium and higher were chosen for test.

There are test modes for each test configuration as below:

Mode	Modulation Type	Channel	Frequency (MHz)	
1	IEEE 802.11g	OFDM	CH1	2412
2			CH6	2437
3			CH11	2462
4	IEEE 802.11b	DSSS	CH1	2412
5			CH6	2437
6			CH11	2462

### NOTE :

1. Below 1 GHz, the channel 1, 6 and 11 were pre-tested in chamber. The channel 11, worst case one, was chosen for conducted and radiated emission test.
2. Above 1 GHz, the channel 1, 6 and 11 were tested individually



## 2.4 DESCRIPTION OF SUPPORT UNIT

The EUT was configured by the requirement of ANSI C63.4:2003. All interface ports were connected to the appropriate support units via specific cables. The support units and cables are listed below.

NO	DEVICE	BRAND	MODEL	FCC ID/DOC	CABLE
1	PC	ACER	Aspire SA85	DOC	1.8m unshielded power cord
2	Monitor	SAMSUNG	PG17IS	DOC	1.8m unshielded power cord 1.5m shielded data cord
3	Print	EPSON	STYLUS C20SX	NA	1.5m unshielded power cord 1.2m shielded data cord
4	Modem	ACEEX	DM-1414	DOC	1.5m unshielded power cord 1.2m shielded data cord
5	Keyboard	ACER	6312-TA4C/6	NA	1.5m shielded data cord
6	Mouse	IntelliMouse	ITE 78CJ	DOC	1.5m shielded data cord
7	Wireless router	D-Link	DI-624	DOC	1.8m unshielded power cord
8	Wireless access point	D-Link	DWL-700AP	DOC	1.8m unshielded power cord
9	Headset	Son Ericsson	HBH-610a	DOC	N/A

**NOTE :** For the actual test configuration, please refer to the photos of testing.

## 3. DESCRIPTION OF APPLIED STANDARDS

The EUT is a kind of wireless product. According to the specifications provided by the applicant, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C

47 CFR Part 15, Subpart B

ANSI C63.4: 2003

All tests have been performed and recorded as the above standards.





# TEST REPORT

## 4. TECHNICAL CHARACTERISTICS TEST

### 4.1 CONDUCTED EMISSION TEST

#### 4.1.1 LIMIT

Frequency (MHz)	Class A (dB $\mu$ V)		Class B (dB $\mu$ V)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

#### NOTE :

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

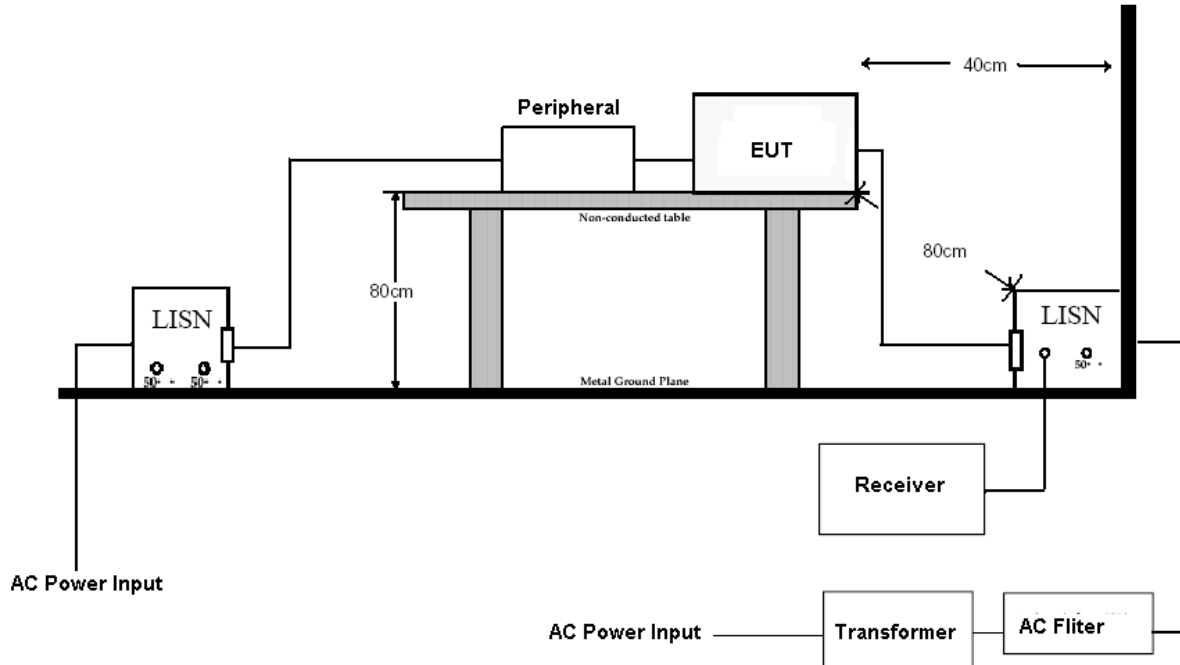
#### 4.1.2 TEST EQUIPMENT

The following test equipment was used for the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER	9 kHz TO 30 MHz	ROHDE & SCHWARZ	ESHS30 / 826003/008	SEP. 2008 ETC
LISN	50 $\mu$ H, 50 ohm	FCC	FCC-LISN-50-25-2 / 01017	OCT. 2008 ETC
LISN	50 $\mu$ H, 50 ohm	FCC	9252-50-R24-BNC / 951315	JUN. 2008 ETC
50 OHM TERMINATOR	50 ohm	HP	11593A / #2	OCT. 2008 ETC
COAXIAL CABLE	5M	TIMES	EQM-0159 / #5-5m	AUG. 2008 SRT
FILTER	2 LINE, 30A	FIL.COIL	FC-943 / 771	NCR
GROUND PLANE	2.3M (H) x 2.4M (W)	SRT	N/A	NCR
GROUND PLANE	2.4M (H) x 2.4M (W)	SRT	N/A	NCR

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

## 4.1.3 TEST SETUP



### NOTE :

1. The EUT was put on a wooden table with 0.8m heights above ground plane, and 0.4m away from reference ground plane (> 2mx2m).
2. For the actual test configuration, please refer to the photos of testing.
3. The serial no. of the LISN connected to EUT is 01017.
4. The serial no. of the LISN connected to support units is 01018.

## 4.1.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4:2003 and CISPR22:2003. The frequency spectrum from 0.15 MHz to 30 MHz was investigated. The LISN used was 50 ohm/50 $\mu$ H as specified. All readings were quasi-peak and average values with 10 kHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. Both lines of the power mains of EUT were measured and the cables connected to EUT and support units were moved to find the maximum emission levels for each frequency. First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.



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### **4.1.5 EUT OPERATING CONDITION**

1. Under Windows XP ran "EMI TEST", "BlueSoleli" and "CDM" program and PC sent "H" pattern or accessed the following peripherals directly or via EUT:

- Monitor
- Print
- Modem
- Keyboard
- Mouse
- Wireless router
- Wireless access point
- Headset



## 4.1.6 TEST RESULT

Temperature:	22 °C	Humidity:	53 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Link
Receiver Detector:	Q.P. and AV.	Modulation Type:	N/A
Tested By:	Shunm Wang	Tested Channel:	N/A
Antenna Type:	SMA Antenna	Tested Date:	Mar. 25, 2007

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.207	0.28	39.36	31.69	39.64	31.97	63.31	53.31	-23.66	-21.33
0.210	0.28	38.52	30.96	38.80	31.24	63.19	53.19	-24.38	-21.94
0.831	0.19	30.58	20.99	30.77	21.18	56.00	46.00	-25.23	-24.82
14.845	0.25	29.58	27.62	29.83	27.87	60.00	50.00	-30.17	-22.13
14.957	0.25	27.70	16.39	27.95	16.64	60.00	50.00	-32.05	-33.36
22.441	0.39	33.52	26.27	33.91	26.66	60.00	50.00	-26.09	-23.34

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	40.38	30.99	40.68	31.29	66.00	56.00	-25.32	-24.71
0.207	0.28	39.18	32.08	39.46	32.36	63.31	53.31	-23.84	-20.94
0.831	0.19	29.68	20.52	29.87	20.71	56.00	46.00	-26.13	-25.29
12.369	0.24	27.86	25.86	28.10	26.10	60.00	50.00	-31.90	-23.90
14.845	0.25	29.14	26.84	29.39	27.09	60.00	50.00	-30.61	-22.91
22.165	0.29	33.64	25.39	33.93	25.68	60.00	50.00	-26.07	-24.32

### NOTE :

1. Measurement uncertainty is +/-1.32dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



# TEST REPORT

Temperature:	22 °C	Humidity:	53 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Standby
Receiver Detector:	Q.P. and AV.	Modulation Type:	N/A
Tested By:	Shunm Wang	Tested Channel:	N/A
Antenna Type:	SMA Antenna	Tested Date:	Mar. 25, 2007

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	40.50	30.99	40.80	31.29	66.00	56.00	-25.20	-24.71
0.210	0.28	38.28	31.04	38.56	31.32	63.19	53.19	-24.62	-21.86
0.831	0.19	31.04	21.10	31.23	21.29	56.00	46.00	-24.77	-24.71
14.622	0.25	26.84	20.70	27.09	20.95	60.00	50.00	-32.91	-29.05
14.896	0.25	30.28	20.46	30.53	20.71	60.00	50.00	-29.47	-29.29
22.934	0.39	34.22	25.86	34.61	26.25	60.00	50.00	-25.39	-23.75

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.207	0.28	39.50	32.50	39.78	32.78	63.31	53.31	-23.52	-20.52
0.210	0.28	38.82	31.67	39.10	31.95	63.19	53.19	-24.08	-21.23
0.831	0.19	29.76	20.40	29.95	20.59	56.00	46.00	-26.05	-25.41
14.845	0.25	28.74	25.29	28.99	25.54	60.00	50.00	-31.01	-24.46
14.896	0.25	26.88	19.84	27.13	20.09	60.00	50.00	-32.87	-29.91
22.236	0.29	33.64	25.68	33.93	25.97	60.00	50.00	-26.07	-24.03

**NOTE :**

1. Measurement uncertainty is +/-1.32dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



# TEST REPORT

Temperature:	22 °C	Humidity:	53 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Bluetooth
Receiver Detector:	Q.P. and AV.	Modulation Type:	N/A
Tested By:	Shunm Wang	Tested Channel:	CH0: 2402MHz
Antenna Type:	SMA Antenna	Tested Date:	Mar. 25, 2007

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	39.58	30.90	39.88	31.20	66.00	56.00	-26.12	-24.80
0.204	0.28	36.72	28.95	37.00	29.23	63.43	53.43	-26.43	-24.20
0.831	0.19	31.10	21.18	31.29	21.37	56.00	46.00	-24.71	-24.63
14.845	0.25	26.28	22.09	26.53	22.34	60.00	50.00	-33.47	-27.66
14.886	0.25	24.42	13.05	24.67	13.30	60.00	50.00	-35.33	-36.70
23.139	0.39	34.16	26.17	34.55	26.56	60.00	50.00	-25.45	-23.44

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	40.50	31.09	40.80	31.39	66.00	56.00	-25.20	-24.61
0.207	0.28	39.38	32.21	39.66	32.49	63.31	53.31	-23.64	-20.81
0.831	0.19	31.38	19.64	31.57	19.83	56.00	46.00	-24.43	-26.17
14.845	0.25	27.94	22.79	28.19	23.04	60.00	50.00	-31.81	-26.96
14.967	0.25	28.26	19.92	28.51	20.17	60.00	50.00	-31.49	-29.83
22.934	0.29	33.20	25.16	33.49	25.45	60.00	50.00	-26.51	-24.55

**NOTE :**

1. Measurement uncertainty is +/-1.32dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



# TEST REPORT

Temperature:	22 °C	Humidity:	53 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Bluetooth
Receiver Detector:	Q.P. and AV.	Modulation Type:	N/A
Tested By:	Shunm Wang	Tested Channel:	CH39: 2441MHz
Antenna Type:	SMA Antenna	Tested Date:	Mar. 25, 2007

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	40.48	30.72	40.78	31.02	66.00	56.00	-25.22	-24.98
0.207	0.28	38.96	31.29	39.24	31.57	63.31	53.31	-24.06	-21.73
0.831	0.19	31.22	21.14	31.41	21.33	56.00	46.00	-24.59	-24.67
14.622	0.25	28.90	21.13	29.15	21.38	60.00	50.00	-30.85	-28.62
14.845	0.25	26.24	20.81	26.49	21.06	60.00	50.00	-33.51	-28.94
22.657	0.39	33.92	26.20	34.31	26.59	60.00	50.00	-25.69	-23.41

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	41.34	31.35	41.64	31.65	66.00	56.00	-24.36	-24.35
0.207	0.28	39.54	32.02	39.82	32.30	63.31	53.31	-23.48	-21.00
0.831	0.19	31.42	19.64	31.61	19.83	56.00	46.00	-24.39	-26.17
14.845	0.25	26.82	22.65	27.07	22.90	60.00	50.00	-32.93	-27.10
14.896	0.25	27.00	20.09	27.25	20.34	60.00	50.00	-32.75	-29.66
21.826	0.29	34.48	26.76	34.77	27.05	60.00	50.00	-25.23	-22.95

**NOTE :**

1. Measurement uncertainty is +/-1.32dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



# TEST REPORT

Temperature:	22 °C	Humidity:	53 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Bluetooth
Receiver Detector:	Q.P. and AV.	Modulation Type:	N/A
Tested By:	Shunm Wang	Tested Channel:	CH78: 2480MHz
Antenna Type:	SMA Antenna	Tested Date:	Mar. 25, 2007

## Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	40.62	31.14	40.92	31.44	66.00	56.00	-25.08	-24.56
0.153	0.30	36.84	27.34	37.14	27.64	65.82	55.82	-28.68	-28.18
0.831	0.19	31.18	21.14	31.37	21.33	56.00	46.00	-24.63	-24.67
12.379	0.24	27.34	24.35	27.58	24.59	60.00	50.00	-32.42	-25.41
14.856	0.25	26.24	20.98	26.49	21.23	60.00	50.00	-33.51	-28.77
21.826	0.39	33.28	25.82	33.67	26.21	60.00	50.00	-26.33	-23.79

## Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	40.68	31.06	40.98	31.36	66.00	56.00	-25.02	-24.64
0.207	0.28	39.54	32.04	39.82	32.32	63.31	53.31	-23.48	-20.98
0.831	0.19	31.36	20.07	31.55	20.26	56.00	46.00	-24.45	-25.74
12.379	0.24	29.58	27.40	29.82	27.64	60.00	50.00	-30.18	-22.36
14.622	0.25	26.02	20.37	26.27	20.62	60.00	50.00	-33.73	-29.38
22.247	0.29	33.24	24.57	33.53	24.86	60.00	50.00	-26.47	-25.14

### NOTE :

1. Measurement uncertainty is +/-1.32dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.





# TEST REPORT

Temperature:	22 °C	Humidity:	53 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	IEEE 802.11g
Receiver Detector:	Q.P. and AV.	Modulation Type:	OFDM
Tested By:	Shunm Wang	Tested Channel:	CH1: 2412MHz
Antenna Type:	SMA Antenna	Tested Date:	Mar. 25, 2007

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	39.82	30.26	40.12	30.56	66.00	56.00	-25.88	-25.44
0.210	0.28	38.76	31.24	39.04	31.52	63.19	53.19	-24.14	-21.66
0.831	0.19	31.42	21.20	31.61	21.39	56.00	46.00	-24.39	-24.61
14.693	0.25	28.74	18.00	28.99	18.25	60.00	50.00	-31.01	-31.75
14.896	0.25	29.46	19.43	29.71	19.68	60.00	50.00	-30.29	-30.32
23.077	0.39	34.28	26.23	34.67	26.62	60.00	50.00	-25.33	-23.38

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	40.72	30.64	41.02	30.94	66.00	56.00	-24.98	-25.06
0.207	0.28	39.40	32.54	39.68	32.82	63.31	53.31	-23.62	-20.48
0.831	0.19	31.78	19.36	31.97	19.55	56.00	46.00	-24.03	-26.45
12.379	0.24	29.48	26.79	29.72	27.03	60.00	50.00	-30.28	-22.97
14.896	0.25	26.62	19.90	26.87	20.15	60.00	50.00	-33.13	-29.85
22.103	0.29	33.54	25.16	33.83	25.45	60.00	50.00	-26.17	-24.55

**NOTE :**

1. Measurement uncertainty is +/-1.32dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



# TEST REPORT

Temperature:	22 °C	Humidity:	53 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	IEEE 802.11g
Receiver Detector:	Q.P. and AV.	Modulation Type:	OFDM
Tested By:	Shunm Wang	Tested Channel:	CH6: 2437MHz
Antenna Type:	SMA Antenna	Tested Date:	Mar. 25, 2007

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	39.94	30.75	40.24	31.05	66.00	56.00	-25.76	-24.95
0.207	0.28	39.12	31.71	39.40	31.99	63.31	53.31	-23.90	-21.31
0.831	0.19	31.14	21.23	31.33	21.42	56.00	46.00	-24.67	-24.58
14.693	0.25	29.12	18.11	29.37	18.36	60.00	50.00	-30.63	-31.64
14.835	0.25	27.34	15.67	27.59	15.92	60.00	50.00	-32.41	-34.08
23.149	0.39	33.70	25.16	34.09	25.55	60.00	50.00	-25.91	-24.45

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	39.62	30.50	39.92	30.80	66.00	56.00	-26.08	-25.20
0.207	0.28	39.38	32.32	39.66	32.60	63.31	53.31	-23.64	-20.70
0.831	0.19	31.58	19.45	31.77	19.64	56.00	46.00	-24.23	-26.36
12.379	0.24	29.50	26.73	29.74	26.97	60.00	50.00	-30.26	-23.03
14.622	0.25	26.90	21.44	27.15	21.69	60.00	50.00	-32.85	-28.31
23.005	0.29	31.88	24.27	32.17	24.56	60.00	50.00	-27.83	-25.44

**NOTE :**

1. Measurement uncertainty is +/-1.32dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



# TEST REPORT

Temperature:	22 °C	Humidity:	53 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	IEEE 802.11g
Receiver Detector:	Q.P. and AV.	Modulation Type:	OFDM
Tested By:	Shunm Wang	Tested Channel:	CH11: 2462MHz
Antenna Type:	SMA Antenna	Tested Date:	Mar. 25, 2007

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	40.34	30.72	40.64	31.02	66.00	56.00	-25.36	-24.98
0.210	0.28	38.32	31.12	38.60	31.40	63.19	53.19	-24.58	-21.78
0.831	0.19	31.24	21.28	31.43	21.47	56.00	46.00	-24.57	-24.53
14.693	0.25	29.22	17.94	29.47	18.19	60.00	50.00	-30.53	-31.81
14.856	0.25	25.58	23.54	25.83	23.79	60.00	50.00	-34.17	-26.21
22.729	0.39	34.60	27.05	34.99	27.44	60.00	50.00	-25.01	-22.56

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	41.26	31.64	41.56	31.94	66.00	56.00	-24.44	-24.06
0.210	0.28	38.64	31.68	38.92	31.96	63.19	53.19	-24.26	-21.22
0.831	0.19	31.72	19.55	31.91	19.74	56.00	46.00	-24.09	-26.26
12.379	0.24	29.78	27.80	30.02	28.04	60.00	50.00	-29.98	-21.96
14.856	0.25	27.40	24.89	27.65	25.14	60.00	50.00	-32.35	-24.86
22.319	0.29	32.92	23.15	33.21	23.44	60.00	50.00	-26.79	-26.56

**NOTE :**

1. Measurement uncertainty is +/-1.32dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



# TEST REPORT

Temperature:	22 °C	Humidity:	53 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	IEEE 802.11b
Receiver Detector:	Q.P. and AV.	Modulation Type:	DSSS
Tested By:	Shunm Wang	Tested Channel:	CH1: 2412MHz
Antenna Type:	SMA Antenna	Tested Date:	Mar. 25, 2007

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	40.14	30.39	40.44	30.69	66.00	56.00	-25.56	-25.31
0.207	0.28	39.24	31.81	39.52	32.09	63.31	53.31	-23.78	-21.21
0.831	0.19	30.88	21.14	31.07	21.33	56.00	46.00	-24.93	-24.67
14.852	0.25	22.86	14.04	23.11	14.29	60.00	50.00	-36.89	-35.71
14.967	0.25	27.32	16.28	27.57	16.53	60.00	50.00	-32.43	-33.47
22.729	0.39	33.12	26.27	33.51	26.66	60.00	50.00	-26.49	-23.34

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	41.16	31.21	41.46	31.51	66.00	56.00	-24.54	-24.49
0.153	0.30	37.70	27.77	38.00	28.07	65.82	55.82	-27.82	-27.75
0.831	0.19	31.54	19.47	31.73	19.66	56.00	46.00	-24.27	-26.34
12.379	0.24	29.88	28.14	30.12	28.38	60.00	50.00	-29.88	-21.62
14.856	0.25	27.80	24.54	28.05	24.79	60.00	50.00	-31.95	-25.21
21.826	0.29	31.62	24.02	31.91	24.31	60.00	50.00	-28.09	-25.69

**NOTE :**

1. Measurement uncertainty is +/-1.32dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



# TEST REPORT

Temperature:	22 °C	Humidity:	53 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	IEEE 802.11b
Receiver Detector:	Q.P. and AV.	Modulation Type:	DSSS
Tested By:	Shunm Wang	Tested Channel:	CH6: 2437MHz
Antenna Type:	SMA Antenna	Tested Date:	Mar. 25, 2007

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	39.66	30.32	39.96	30.62	66.00	56.00	-26.04	-25.38
0.207	0.28	39.46	31.91	39.74	32.19	63.31	53.31	-23.56	-21.11
0.831	0.19	31.00	21.23	31.19	21.42	56.00	46.00	-24.81	-24.58
12.379	0.24	29.82	27.80	30.06	28.04	60.00	50.00	-29.94	-21.96
14.856	0.25	28.86	26.87	29.11	27.12	60.00	50.00	-30.89	-22.88
21.622	0.39	32.62	24.49	33.01	24.88	60.00	50.00	-26.99	-25.12

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	40.52	31.12	40.82	31.42	66.00	56.00	-25.18	-24.58
0.210	0.28	39.18	31.91	39.46	32.19	63.19	53.19	-23.72	-20.99
0.831	0.19	31.40	19.36	31.59	19.55	56.00	46.00	-24.41	-26.45
12.379	0.24	31.24	29.13	31.48	29.37	60.00	50.00	-28.52	-20.63
14.856	0.25	28.04	25.94	28.29	26.19	60.00	50.00	-31.71	-23.81
16.425	0.27	32.84	26.82	33.11	27.09	60.00	50.00	-26.89	-22.91

**NOTE :**

1. Measurement uncertainty is +/-1.32dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



# TEST REPORT

Temperature:	22 °C	Humidity:	53 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	IEEE 802.11b
Receiver Detector:	Q.P. and AV.	Modulation Type:	DSSS
Tested By:	Shunm Wang	Tested Channel:	CH11: 2462MHz
Antenna Type:	SMA Antenna	Tested Date:	Mar. 25, 2007

## Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	38.92	29.62	39.22	29.92	66.00	56.00	-26.78	-26.08
0.210	0.28	38.88	31.37	39.16	31.65	63.19	53.19	-24.02	-21.53
0.831	0.19	31.10	21.22	31.29	21.41	56.00	46.00	-24.71	-24.59
12.379	0.24	29.72	27.39	29.96	27.63	60.00	50.00	-30.04	-22.37
14.856	0.25	28.42	25.91	28.67	26.16	60.00	50.00	-31.33	-23.84
22.800	0.39	34.22	26.36	34.61	26.75	60.00	50.00	-25.39	-23.25

## Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB $\mu$ V)		Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.150	0.30	40.48	31.04	40.78	31.34	66.00	56.00	-25.22	-24.66
0.204	0.28	37.04	29.53	37.32	29.81	63.43	53.43	-26.11	-23.62
0.831	0.19	31.58	19.53	31.77	19.72	56.00	46.00	-24.23	-26.28
12.379	0.24	31.26	29.07	31.50	29.31	60.00	50.00	-28.50	-20.69
14.856	0.25	28.04	23.43	28.29	23.68	60.00	50.00	-31.71	-26.32
16.425	0.27	33.26	27.33	33.53	27.60	60.00	50.00	-26.47	-22.40

### NOTE :

1. Measurement uncertainty is +/-1.32dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



# TEST REPORT

## 4.2 RADIATED EMISSION TEST

### 4.2.1 LIMIT

FCC Part 15, Subpart C Section 15.209 limit of radiated emission for frequency below 1000 MHz. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (dB $\mu$ V/m)
30 - 88	3	40.0
88 - 216	3	43.5
216 - 960	3	46.0
Above 960	3	54.0

**NOTE :**

1. In the emission tables above, the tighter limit applies at the band edges.
2. Distance refers to the distance between measuring instrument, antenna, and the closest point of any part of the device or system.

FCC Part 15, Section 15.35(b) limit of radiated emission for frequency above 1000 MHz

FREQUENCY (MHz)	Class A (dB $\mu$ V/m) (at 3m)		Class B (dB $\mu$ V/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80.0	60.0	74.0	54.0



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## TEST REPORT

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### 4.2.2 TEST EQUIPMENT

The following test equipment was used during the radiated emission test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER	9kHz TO 2.75 GHz	ROHDE & SCHWARZ	ESCS30/ 830245/012	OCT. 2008 ETC
SPECTRUM ANALYZER	PK-40GHz	ROHDE & SCHWARZ	FSP40/ 100093	SEP 2008 ETC
BI-LOG ANTENNA	25 MHz TO 2 GHz	EMCO	3142B/ 0005-1534	NOV. 2008 ETC
PRE-AMPLIFIER	1 GHz TO 26.5 GHz	HP	8449B/ 3008A01995	SEP. 2008 ETC
HORN ANTENNA	1 GHz TO 18 GHz	EMCO	3115/ 9602-4681	JAN. 2009 ETC
OATS	3 – 10 M MEASUREMENT	SRT	SRT-1	NOV. 2008 SRT
COAXIAL CABLE	25M	TIMES	J400/ #25M	AUG. 2008 ETC
FILTER	2 LINE, 30A	FIL.COIL	FC-943/ 869	NCR

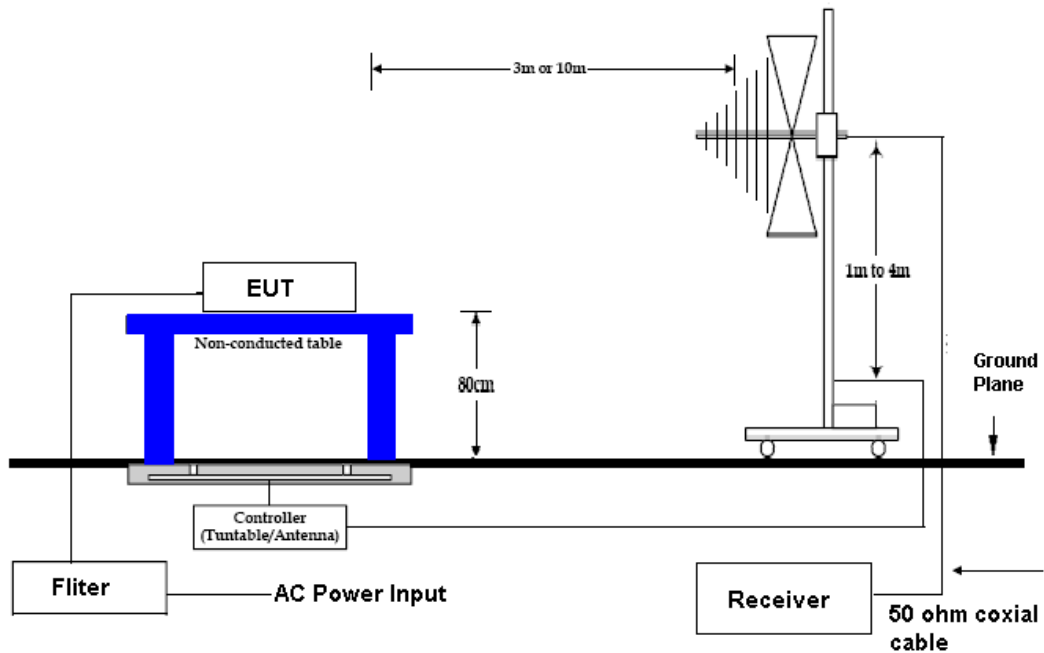
#### NOTE:

1. The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.
2. The Open Area Test Site (SRT-1) is registered by FCC with No. 90957 and VCCI with No. R-1081.
3. The Open Area Test Site (SRT-2) is registered by FCC with No. 98458 and VCCI with No. R-1168.





## 4.2.3 TEST SET-UP



### NOTE :

1. The EUT system was put on a wooden table with 0.8m heights above a ground plane.
2. For the actual test configuration, please refer to the photos of testing.



#### 4.2.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4:2003 and CISPR 22:2003. The measurements were made at an open area test site with 10 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 30 MHz. Under 1 GHz, all readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak or average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.

First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.

#### 4.2.5 EUT OPERATING CONDITION

Same as section 4.1.5 of this report.



# TEST REPORT

## 4.2.6 TEST RESULT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	Link
Tested By:	Shunm Wang	Tested Date:	Mar. 28, 2008

Antenna Polarization: Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
73.5213	1.19	6.48	22.1	29.8	40.0	-10.2	218	2.3
137.1402	1.74	11.54	15.9	29.2	43.5	-14.3	141	1.9
166.2694	1.91	8.53	22.5	32.9	43.5	-10.6	151	1.67
184.0030	1.69	9.32	22.2	33.2	43.5	-10.3	333	1.4
277.9150	2.49	12.90	17.3	32.7	46.0	-13.3	18	1.5
600.1030	3.72	19.20	15.0	37.9	46.0	-8.1	207	1.2

Antenna Polarization: Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
81.1223	1.26	7.55	24.9	33.7	40.0	-6.3	36	1
184.0040	1.69	9.32	28.0	39.0	43.5	-4.5	268	1.1
276.0250	2.44	12.85	23.1	38.4	46.0	-7.6	101	1
368.0256	3.23	15.53	18.8	37.6	46.0	-8.4	223	1
458.0316	3.04	16.95	15.3	35.3	46.0	-10.7	49	1.3
644.0051	4.65	20.08	14.8	39.5	46.0	-6.5	355	1.2

### NOTE :

1. Measurement uncertainty is +/-2dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	Standby
Tested By:	Shunm Wang	Tested Date:	Mar. 28, 2008

Antenna Polarization: Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
40.5880	0.95	9.50	20.0	30.5	40.0	-9.6	13.9	1.8
166.2693	1.91	8.53	23.2	33.6	43.5	-9.9	204.8	1.6
265.3516	2.33	12.28	14.0	28.6	46.0	-17.4	325.1	1.4
600.1020	3.72	19.20	15.9	38.8	46.0	-7.2	91.4	1.61
800.2560	5.23	21.40	11.1	37.7	46.0	-8.3	88.3	1.92
834.1136	4.77	22.35	10.0	37.1	46.0	-8.9	173.2	1.2

Antenna Polarization: Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
130.0214	1.48	9.75	20.9	32.1	43.5	-11.4	55.9	1.2
170.7964	2.05	8.75	23.5	34.3	43.5	-9.2	301.8	1.3
266.7513	2.29	12.33	16.7	31.3	46.0	-14.7	43.5	1.5
533.2270	3.62	18.06	14.2	35.9	46.0	-10.1	225.1	1
838.6420	4.71	22.46	10.1	37.3	46.0	-8.7	53.1	1
938.0130	4.87	23.17	9.5	37.5	46.0	-8.5	97.5	1.1

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	Bluetooth CH0
Tested By:	Shunm Wang	Tested Date:	Mar. 28, 2008

Antenna Polarization: Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
159.9988	1.68	8.41	28.7	38.8	43.5	-4.7	261	1.89
181.3320	1.52	9.31	20.9	31.7	43.5	-11.8	259	1.58
257.6210	2.52	11.86	26.0	40.4	46.0	-5.6	266	1.61
448.3105	2.96	16.82	21.4	41.2	46.0	-4.8	254	1.51
545.0540	3.65	18.27	20.1	42.0	46.0	-4.0	273	1.45
578.5780	3.70	18.83	18.6	41.1	46.0	-4.9	269	1.39

Antenna Polarization: Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
30.6197	0.31	13.60	21.6	35.5	40.0	-4.5	32	1.26
159.9991	1.68	8.41	17.0	27.1	43.5	-16.4	351	1.88
351.2567	3.29	15.17	22.2	40.7	46.0	-5.3	265	1.76
471.4560	3.19	17.12	18.7	39.0	46.0	-7.0	246	1.51
490.3690	3.40	17.37	19.9	40.7	46.0	-5.3	254	1.34
503.5510	3.52	17.55	19.2	40.3	46.0	-5.7	275	1.28

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	Bluetooth CH39
Tested By:	Shunm Wang	Tested Date:	Mar. 28, 2008

Antenna Polarization:Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
159.9988	1.68	8.41	28.6	38.7	43.5	-4.8	263	1.88
181.3320	1.52	9.31	21.0	31.8	43.5	-11.7	257	1.59
257.6210	2.52	11.86	25.9	40.3	46.0	-5.7	268	1.6
448.3105	2.96	16.82	21.3	41.1	46.0	-4.9	251	1.52
545.0540	3.65	18.27	20.2	42.1	46.0	-3.9	275	1.43
578.5780	3.70	18.83	18.5	41.0	46.0	-5.0	266	1.38

Antenna Polarization:Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
30.6197	0.31	13.60	21.5	35.4	40.0	-4.6	30	1.27
159.9991	1.68	8.41	17.1	27.2	43.5	-16.3	349	1.87
351.2567	3.29	15.17	22.3	40.8	46.0	-5.2	268	1.75
471.4560	3.19	17.12	18.5	38.8	46.0	-7.2	244	1.52
490.3690	3.40	17.37	19.7	40.5	46.0	-5.5	255	1.34
503.5510	3.52	17.55	19.1	40.2	46.0	-5.8	271	1.27

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	Bluetooth CH78
Tested By:	Shunm Wang	Tested Date:	Mar. 28, 2008

Antenna Polarization: Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
159.9987	1.68	8.41	28.8	38.9	43.5	-4.6	260	1.9
181.3326	1.52	9.31	20.8	31.6	43.5	-11.9	258	1.59
257.6215	2.52	11.86	25.9	40.3	46.0	-5.7	264	1.52
448.3105	2.96	16.82	21.5	41.3	46.0	-4.7	255	1.5
545.0540	3.65	18.27	20.2	42.1	46.0	-3.9	271	1.46
578.5782	3.70	18.83	18.8	41.3	46.0	-4.7	271	1.38

Antenna Polarization: Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
30.6197	0.31	13.60	21.5	35.4	40.0	-4.6	30	1.25
159.9991	1.68	8.41	17.2	27.3	43.5	-16.2	353	1.87
351.2567	3.29	15.17	20.0	38.5	46.0	-7.5	261	1.75
471.4563	3.19	17.12	18.6	38.9	46.0	-7.1	248	1.5
490.3699	3.40	17.37	20.0	40.8	46.0	-5.2	255	1.35
503.5511	3.52	17.55	19.3	40.4	46.0	-5.6	274	1.29

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	IEEE802.11g CH01
Tested By:	Shunm Wang	Tested Date:	Mar. 28, 2008

Antenna Polarization: Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
77.6610	1.23	7.12	21.5	29.9	40.0	-10.2	225	2.2
137.1450	1.74	11.54	15.6	28.9	43.5	-14.6	153	1.91
166.2690	1.91	8.53	22.7	33.1	43.5	-10.4	164	1.62
183.9968	1.63	9.32	23.0	33.9	43.5	-9.6	345	1.46
600.1100	3.72	19.20	15.9	38.8	46.0	-7.2	25	1.51
800.1820	5.23	21.40	10.6	37.2	46.0	-8.8	213	1.19

Antenna Polarization: Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
35.7860	0.63	11.55	23.1	35.3	40.0	-4.7	49	1
81.1260	1.26	7.55	23.9	32.7	40.0	-7.3	254	1
183.9821	1.63	9.32	26.1	37.0	43.5	-6.5	114	1
276.0020	2.44	12.85	22.4	37.7	46.0	-8.3	239	1
368.0100	3.23	15.53	17.2	36.0	46.0	-10.0	53	1.28
600.0890	3.72	19.20	15.4	38.3	46.0	-7.7	359	1.31

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.





# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	IEEE802.11g CH06
Tested By:	Shunm Wang	Tested Date:	Mar. 28, 2008

Antenna Polarization: Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
77.6616	1.23	7.12	21.7	30.1	40.0	-10.0	221	2.21
137.1451	1.74	11.54	15.4	28.7	43.5	-14.8	156	1.89
166.2697	1.91	8.53	22.8	33.2	43.5	-10.3	160	1.61
183.9962	1.63	9.32	22.8	33.7	43.5	-9.8	348	1.44
600.1190	3.72	19.20	16.1	39.0	46.0	-7.0	27	1.5
800.1824	5.23	21.40	10.5	37.1	46.0	-8.9	217	1.2

Antenna Polarization: Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
35.7865	0.63	11.55	22.9	35.1	40.0	-4.9	44	1
81.1267	1.26	7.55	23.8	32.6	40.0	-7.4	256	1
183.9828	1.63	9.32	26.3	37.2	43.5	-6.3	111	1.1
276.0023	2.44	12.85	22.5	37.8	46.0	-8.2	242	1
368.0160	3.23	15.53	17.4	36.2	46.0	-9.8	48	1.26
600.0896	3.72	19.20	15.3	38.2	46.0	-7.8	355	1.29

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	IEEE802.11g CH11
Tested By:	Shunm Wang	Tested Date:	Mar. 28, 2008

Antenna Polarization: Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
77.6620	1.23	7.12	21.7	30.1	40.0	-10.0	219	1.99
137.1460	1.74	11.54	15.8	29.1	43.5	-14.4	150	1.92
166.2687	1.91	8.53	22.4	32.8	43.5	-10.7	161	1.63
183.9971	1.63	9.32	23.1	34.0	43.5	-9.5	341	1.45
600.1123	3.72	19.20	15.7	38.6	46.0	-7.4	22	1.52
800.1831	5.23	21.40	10.5	37.1	46.0	-8.9	216	1.22

Antenna Polarization: Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
35.7858	0.63	11.55	23.0	35.2	40.0	-4.8	42	1
81.1269	1.26	7.55	23.7	32.5	40.0	-7.5	251	1.1
183.9817	1.63	9.32	26.2	37.1	43.5	-6.4	119	1
276.0022	2.44	12.85	22.1	37.4	46.0	-8.6	234	1
368.0134	3.23	15.53	17.6	36.4	46.0	-9.6	50	1.31
600.0899	3.72	19.20	15.7	38.6	46.0	-7.4	352	1.29

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	IEEE802.11b CH01
Tested By:	Shunm Wang	Tested Date:	Mar. 28, 2008

Antenna Polarization: Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
77.6610	1.23	7.12	21.4	29.8	40.0	-10.3	223	2.1
137.1450	1.74	11.54	15.5	28.8	43.5	-14.7	154	1.92
166.2690	1.91	8.53	22.6	33.0	43.5	-10.5	165	1.61
183.9968	1.63	9.32	23.1	34.0	43.5	-9.5	347	1.45
600.1100	3.72	19.20	15.8	38.7	46.0	-7.3	28	1.5
800.1820	5.23	21.40	10.5	37.1	46.0	-8.9	215	1.18

Antenna Polarization: Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
35.7860	0.63	11.55	23.2	35.4	40.0	-4.6	47	1
81.1260	1.26	7.55	23.8	32.6	40.0	-7.4	253	1
183.9821	1.63	9.32	26.0	36.9	43.5	-6.6	112	1.1
276.0020	2.44	12.85	22.3	37.6	46.0	-8.4	234	1
368.0100	3.23	15.53	17.3	36.1	46.0	-9.9	56	1.29
600.0890	3.72	19.20	15.3	38.2	46.0	-7.8	1	1.3

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	IEEE802.11b CH06
Tested By:	Shunm Wang	Tested Date:	Mar. 28, 2008

Antenna Polarization: Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
77.6616	1.23	7.12	21.8	30.2	40.0	-9.9	218	2.18
137.1451	1.74	11.54	15.3	28.6	43.5	-14.9	151	1.91
166.2697	1.91	8.53	22.9	33.3	43.5	-10.2	153	1.63
183.9962	1.63	9.32	22.7	33.6	43.5	-9.9	341	1.42
600.1190	3.72	19.20	16.2	39.1	46.0	-6.9	25	1.53
800.1824	5.23	21.40	10.6	37.2	46.0	-8.8	219	1.22

Antenna Polarization: Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
35.7865	0.63	11.55	22.8	35.0	40.0	-5.0	46	1.1
81.1267	1.26	7.55	23.9	32.7	40.0	-7.3	251	1
183.9828	1.63	9.32	26.4	37.3	43.5	-6.2	119	1.1
276.0023	2.44	12.85	22.6	37.9	46.0	-8.1	246	1
368.0160	3.23	15.53	17.3	36.1	46.0	-9.9	53	1.25
600.0896	3.72	19.20	15.4	38.3	46.0	-7.7	352	1.28

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	IEEE802.11b CH11
Tested By:	Shunm Wang	Tested Date:	Mar. 28, 2008

Antenna Polarization: Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
77.6620	1.23	7.12	21.8	30.2	40.0	-9.9	222	2
137.1460	1.74	11.54	15.7	29.0	43.5	-14.5	156	1.93
166.2687	1.91	8.53	22.6	33.0	43.5	-10.5	163	1.61
183.9971	1.63	9.32	23.2	34.1	43.5	-9.4	338	1.4
600.1123	3.72	19.20	15.8	38.7	46.0	-7.3	25	1.55
800.1831	5.23	21.40	10.6	37.2	46.0	-8.8	217	1.23

Antenna Polarization: Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
35.7858	0.63	11.55	23.1	35.3	40.0	-4.7	45	1
81.1269	1.26	7.55	23.6	32.4	40.0	-7.6	255	1.1
183.9817	1.63	9.32	26.4	37.3	43.5	-6.2	116	1
276.0022	2.44	12.85	22.2	37.5	46.0	-8.5	231	1.1
368.0134	3.23	15.53	17.7	36.5	46.0	-9.5	48	1.3
600.0899	3.72	19.20	15.8	38.7	46.0	-7.3	359	1.25

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	1 – 25 GHz	Measured Distance:	3m
Receiver Detector:	PK. or AV.	Tested Mode:	Bluetooth
Tested By:	Shunm Wang	Tested Channel:	CH0 : 2402MHz
Tested Date:	Mar. 28, 2008	Modulation Type:	N/A

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2401.99	-32.16	28.54	90.2	81.3	86.6	77.7	74.0	54.0	NA	NA	251	1.51
4803.98	-30.47	33.64	52.5	45.0	55.7	48.2	74.0	54.0	-18.3	-5.8	266	1.27
1490.51	-30.68	25.28	33.6	*	28.2	*	74.0	54.0	-45.8	*	47	1.33
1606.03	-32.91	25.70	44.9	*	37.7	*	74.0	54.0	-36.3	*	103	1.46
1680.49	-32.85	25.98	*	*	*	*	74.0	54.0	*	*	351	1.20
1830.51	-33.05	26.55	48.8	*	42.3	*	74.0	54.0	-31.7	*	110	1.15

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2401.99	-32.16	28.00	92.5	83.5	88.3	79.3	74.0	54.0	NA	NA	255	1.61
4803.98	-30.47	33.64	53.5	42.7	56.7	45.9	74.0	54.0	-17.3	-8.1	260	1.35
1333.05	-33.13	24.93	37.5	*	29.3	*	74.0	54.0	-44.7	*	137	1.19
1463.49	-30.01	25.22	46.8	*	42.0	*	74.0	54.0	-32.0	*	204	1.38
1606.03	-32.91	25.70	47.3	39.9	40.1	32.7	74.0	54.0	-33.9	-21.3	211	1.27
1910.55	-32.61	26.86	45.9	37.8	40.1	32.0	74.0	54.0	-33.9	-22.0	158	1.00

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "\*\*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	1 – 25 GHz	Measured Distance:	3m
Receiver Detector:	PK. or AV.	Tested Mode:	Bluetooth
Tested By:	Shunm Wang	Tested Channel:	CH39 : 2441MHz
Tested Date:	Mar. 28, 2008	Modulation Type:	N/A

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2441.00	-32.23	28.62	90.8	81.9	87.2	78.3	74.0	54.0	NA	NA	252	1.25
4882.01	-30.26	33.71	53.0	45.7	56.4	49.1	74.0	54.0	-17.6	-4.9	263	1.30
1490.51	-30.68	25.28	33.6	*	28.2	*	74.0	54.0	-45.8	*	47	1.33
1606.03	-32.91	25.70	44.9	*	37.7	*	74.0	54.0	-36.3	*	103	1.46
1680.49	-32.85	25.98	*	*	*	*	74.0	54.0	*	*	351	1.20
1830.51	-33.05	26.55	48.8	*	42.3	*	74.0	54.0	-31.7	*	110	1.15

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2441.00	-32.23	28.08	92.9	83.8	88.8	79.7	74.0	54.0	NA	NA	250	1.59
4882.01	-30.26	33.71	53.9	43.2	57.3	46.6	74.0	54.0	-16.7	-7.4	258	1.37
1333.05	-33.13	24.93	37.5	*	29.3	*	74.0	54.0	-44.7	*	137	1.19
1463.49	-30.01	25.22	46.8	*	42.0	*	74.0	54.0	-32.0	*	204	1.38
1606.03	-32.91	25.70	47.3	39.9	40.1	32.7	74.0	54.0	-33.9	-21.3	211	1.27
1910.55	-32.61	26.86	45.9	37.8	40.1	32.0	74.0	54.0	-33.9	-22.0	158	1.00

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "\*\*\*\*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	1 – 25 GHz	Measured Distance:	3m
Receiver Detector:	PK. or AV.	Tested Mode:	Bluetooth
Tested By:	Shunm Wang	Tested Channel:	CH78 : 2480MHz
Tested Date:	Mar. 28, 2008	Modulation Type:	N/A

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2479.99	-32.19	28.73	90.7	81.6	87.2	78.1	74.0	54.0	NA	NA	256	1.27
4959.98	-30.26	33.77	52.9	45.4	56.4	48.9	74.0	54.0	-17.6	-5.1	261	1.33
1490.51	-30.68	25.28	33.6	*	28.2	*	74.0	54.0	-45.8	*	47	1.33
1606.03	-32.91	25.70	44.9	*	37.7	*	74.0	54.0	-36.3	*	103	1.46
1680.49	-32.85	25.98	*	*	*	*	74.0	54.0	*	*	351	1.20
1830.51	-33.05	26.55	48.8	*	42.3	*	74.0	54.0	-31.7	*	110	1.15

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2479.99	-32.19	28.16	92.7	83.5	88.7	79.5	74.0	54.0	NA	NA	254	1.60
4959.98	-30.26	33.77	53.6	42.9	57.1	46.4	74.0	54.0	-16.9	-7.6	262	1.38
1333.05	-33.13	24.93	37.5	*	29.3	*	74.0	54.0	-44.7	*	137	1.19
1463.49	-30.01	25.22	46.8	*	42.0	*	74.0	54.0	-32.0	*	204	1.38
1606.03	-32.91	25.70	47.3	39.9	40.1	32.7	74.0	54.0	-33.9	-21.3	211	1.27
1910.55	-32.61	26.86	45.9	37.8	40.1	32.0	74.0	54.0	-33.9	-22.0	158	1.00

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "\*\*\*\*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.





# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	1 – 25 GHz	Measured Distance:	3m
Receiver Detector:	PK. or AV.	Tested Mode:	IEEE 802.11g
Tested By:	Shunm Wang	Tested Channel:	CH 1 : 2412MHz
Tested Date:	Mar. 28, 2008	Modulation Type:	OFDM

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2411.96	-32.18	28.56	110.3	101.5	106.7	97.9	74.0	54.0	NA	NA	206	1.59
4822.03	-30.42	33.66	61.2	45.6	64.4	48.8	74.0	54.0	-9.6	-5.2	133	1.53
9648.10	-28.65	37.86	42.5	*	51.7	*	74.0	54.0	-22.3	*	28.4	1.35
1070.53	-34.61	24.35	42.9	*	32.6	*	74.0	54.0	-41.4	*	75.7	1.42
1205.43	-33.86	24.65	46.5	*	37.3	*	74.0	54.0	-36.7	*	136	1.29
1471.02	-30.21	25.24	40.8	*	35.8	*	74.0	54.0	-38.2	*	151	1.42

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2411.96	-32.18	28.02	112.8	104.9	108.6	100.7	74.0	54.0	NA	NA	206	1.20
4822.03	-30.42	33.66	56.2	46.1	59.4	49.3	74.0	54.0	-14.6	-4.7	133	1.22
9648.10	-28.65	37.86	41.2	*	50.4	*	74.0	54.0	-23.6	*	33.6	1.31
1138.23	-34.62	24.50	51.6	42.0	41.5	31.9	74.0	54.0	-32.5	-22.1	68.9	1.15
1408.61	-31.38	25.10	49.5	40.6	43.2	34.3	74.0	54.0	-30.8	-19.7	72.4	1.38
1663.14	-32.78	25.92	56.4	46.5	49.5	39.6	74.0	54.0	-24.5	-14.4	290	1.16

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "\*\*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	1 – 25 GHz	Measured Distance:	3m
Receiver Detector:	PK. or AV.	Tested Mode:	IEEE 802.11g
Tested By:	Shunm Wang	Tested Channel:	CH 6 : 2437MHz
Tested Date:	Mar. 28, 2008	Modulation Type:	OFDM

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.01	-32.22	28.61	111.3	101.5	107.7	97.9	74.0	54.0	NA	NA	202	1.62
4874.00	-30.28	33.70	61.2	45.8	64.6	49.2	74.0	54.0	-9.4	-4.8	141	1.52
9747.99	-28.43	37.90	42.9	37.1	52.4	46.6	74.0	54.0	-21.6	-7.4	29.3	1.36
1070.53	-34.61	24.35	43.5	*	33.2	*	74.0	54.0	-40.8	*	71.2	1.44
1205.43	-33.86	24.65	45.7	*	36.5	*	74.0	54.0	-37.5	*	139	1.28
1471.02	-30.21	25.24	41.3	*	36.3	*	74.0	54.0	-37.7	*	145	1.43

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.01	-32.22	28.07	113.3	103.7	109.2	99.6	74.0	54.0	NA	NA	205	1.25
4874.00	-30.28	33.70	60.1	46.2	63.5	49.6	74.0	54.0	-10.5	-4.4	131	1.24
9747.99	-28.43	37.90	43.3	*	52.8	*	74.0	54.0	-21.2	*	31.7	1.32
1138.23	-34.62	24.50	51.2	43.5	41.1	33.4	74.0	54.0	-32.9	-20.6	62.8	1.21
1408.61	-31.38	25.10	49.1	41.6	42.8	35.3	74.0	54.0	-31.2	-18.7	75.6	1.34
1663.14	-32.78	25.92	55.3	46.2	48.4	39.3	74.0	54.0	-25.6	-14.7	301	1.22

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "\*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	1 – 25 GHz	Measured Distance:	3m
Receiver Detector:	PK. or AV.	Tested Mode:	IEEE 802.11g
Tested By:	Shunm Wang	Tested Channel:	CH 11 : 2462MHz
Tested Date:	Mar. 28, 2008	Modulation Type:	OFDM

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.01	-32.22	28.61	109.9	103.3	106.3	99.7	74.0	54.0	NA	NA	210	1.60
4874.00	-30.28	33.70	59.7	45.5	63.1	48.9	74.0	54.0	-10.9	-5.1	142	1.50
9747.99	-28.43	37.90	44.6	37.5	54.1	47.0	74.0	54.0	-19.9	-7.0	21.5	1.31
1070.53	-34.61	24.35	43.2	*	32.9	*	74.0	54.0	-41.1	*	80.1	1.49
1205.43	-33.86	24.65	45.8	*	36.6	*	74.0	54.0	-37.4	*	131	1.22
1471.02	-30.21	25.24	41.2	*	36.2	*	74.0	54.0	-37.8	*	152	1.45

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.01	-32.22	28.07	111.2	102.2	107.1	98.1	74.0	54.0	NA	NA	201	1.26
4874.00	-30.28	33.70	58.1	45.1	61.5	48.5	74.0	54.0	-12.5	-5.5	138	1.24
9747.99	-28.43	37.90	43.5	*	53.0	*	74.0	54.0	-21.0	*	31.8	1.35
1138.23	-34.62	24.50	50.9	42.8	40.8	32.7	74.0	54.0	-33.2	-21.3	66.9	1.22
1408.61	-31.38	25.10	49.9	41.6	43.6	35.3	74.0	54.0	-30.4	-18.7	70.4	1.31
1663.14	-32.78	25.92	55.1	45.9	48.2	39.0	74.0	54.0	-25.8	-15.0	296	1.20

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "\*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	1 – 25 GHz	Measured Distance:	3m
Receiver Detector:	PK. or AV.	Tested Mode:	IEEE 802.11b
Tested By:	Shunm Wang	Tested Channel:	CH 1 : 2412MHz
Tested Date:	Mar. 28, 2008	Modulation Type:	DSSS

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2411.96	-32.18	28.56	109.0	101.2	105.4	97.6	74.0	54.0	NA	NA	201	1.60
4822.03	-30.42	33.66	58.2	45.8	61.4	49.0	74.0	54.0	-12.6	-5.0	137	1.51
9648.10	-28.65	37.86	41.6	*	50.8	*	74.0	54.0	-23.2	*	25.1	1.37
1070.53	-34.61	24.35	42.2	*	31.9	*	74.0	54.0	-42.1	*	73.9	1.43
1205.43	-33.86	24.65	46.2	*	37.0	*	74.0	54.0	-37.0	*	133	1.28
1471.02	-30.21	25.24	40.3	*	35.3	*	74.0	54.0	-38.7	*	150	1.41

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2411.96	-32.18	28.02	113.1	105.3	108.9	101.1	74.0	54.0	NA	NA	204	1.00
4822.03	-30.42	33.66	55.9	46.2	59.1	49.4	74.0	54.0	-14.9	-4.6	132	1.20
9648.10	-28.65	37.86	40.8	*	50.0	*	74.0	54.0	-24.0	*	31.5	1.35
1138.23	-34.62	24.50	51.1	42.3	41.0	32.2	74.0	54.0	-33.0	-21.8	66.7	1.14
1408.61	-31.38	25.10	49.3	40.4	43.0	34.1	74.0	54.0	-31.0	-19.9	76.2	1.37
1663.14	-32.78	25.92	55.9	46.8	49.0	39.9	74.0	54.0	-25.0	-14.1	295	1.15

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	1 – 25 GHz	Measured Distance:	3m
Receiver Detector:	PK. or AV.	Tested Mode:	IEEE 802.11b
Tested By:	Shunm Wang	Tested Channel:	CH 6 : 2437MHz
Tested Date:	Mar. 28, 2008	Modulation Type:	DSSS

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.01	-32.22	28.61	110.2	102.4	106.6	98.8	74.0	54.0	NA	NA	205	1.61
4874.00	-30.28	33.70	60.1	46.1	63.5	49.5	74.0	54.0	-10.5	-4.5	139	1.53
9747.99	-28.43	37.90	43.5	36.2	53.0	45.7	74.0	54.0	-21.0	-8.3	26.7	1.35
1070.53	-34.61	24.35	42.8	*	32.5	*	74.0	54.0	-41.5	*	75.2	1.45
1205.43	-33.86	24.65	46.1	*	36.9	*	74.0	54.0	-37.1	*	136	1.29
1471.02	-30.21	25.24	40.5	*	35.5	*	74.0	54.0	-38.5	*	147	1.42

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.01	-32.22	28.07	112.5	104.9	108.4	100.8	74.0	54.0	NA	NA	206	1.20
4874.00	-30.28	33.70	59.8	46.5	63.2	49.9	74.0	54.0	-10.8	-4.1	134	1.25
9747.99	-28.43	37.90	42.5	*	52.0	*	74.0	54.0	-22.0	*	32.8	1.31
1138.23	-34.62	24.50	51.6	42.9	41.5	32.8	74.0	54.0	-32.5	-21.2	63.9	1.20
1408.61	-31.38	25.10	49.5	41.0	43.2	34.7	74.0	54.0	-30.8	-19.3	74.3	1.35
1663.14	-32.78	25.92	55.7	46.5	48.8	39.6	74.0	54.0	-25.2	-14.4	298	1.21

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



# TEST REPORT

Temperature:	23 °C	Humidity:	68 %RH
Frequency Range:	1 – 25 GHz	Measured Distance:	3m
Receiver Detector:	PK. or AV.	Tested Mode:	IEEE 802.11b
Tested By:	Shunm Wang	Tested Channel:	CH 11 : 2462MHz
Tested Date:	Mar. 28, 2008	Modulation Type:	DSSS

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBµV)		Emission Level (dBµV/m)		Limit (dBµV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2461.97	-32.22	28.69	108.9	99.9	105.4	96.4	74.0	54.0	NA	NA	208	1.62
4923.94	-30.23	33.74	58.7	45.5	62.2	49.0	74.0	54.0	-11.8	-5.0	133	1.51
9847.88	-28.94	37.94	44.6	*	53.6	*	74.0	54.0	-20.4	*	29.4	1.36
1070.53	-34.61	24.35	43.2	*	32.9	*	74.0	54.0	-41.1	*	71.9	1.44
1205.43	-33.86	24.65	45.7	*	36.5	*	74.0	54.0	-37.5	*	141	1.28
1471.02	-30.21	25.24	40.1	*	35.1	*	74.0	54.0	-38.9	*	141	1.43

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBµV)		Emission Level (dBµV/m)		Limit (dBµV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2461.97	-32.22	28.12	110.8	101.5	106.7	97.4	74.0	54.0	NA	NA	201	1.21
4923.94	-30.23	33.74	57.9	45.8	61.4	49.3	74.0	54.0	-12.6	-4.7	136	1.26
9847.88	-28.94	37.94	41.6	*	50.6	*	74.0	54.0	-23.4	*	35.3	1.30
1138.23	-34.62	24.50	52.4	42.8	42.3	32.7	74.0	54.0	-31.7	-21.3	67.2	1.21
1408.61	-31.38	25.10	49.2	41.2	42.9	34.9	74.0	54.0	-31.1	-19.1	79.8	1.34
1663.14	-32.78	25.92	55.4	46.1	48.5	39.2	74.0	54.0	-25.5	-14.8	292	1.22

**NOTE :**

1. Measurement uncertainty is +/-2dB.
2. "\*\*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



### 4.3 BANDWIDTH TEST

#### 4.3.1 LIMIT

Bluetooth:

Frequency Range (MHz)	Quantity of Hopping Channel	Limit(kHz)			
		50	25	15	75
902-928		<250	>250	NA	NA
2400-2483.5		NA	NA	>1000	<1000

Wi-Fi:

FCC Part15, Subpart C Section 15.247(2). The minimum 6dBm bandwidth shall be at least 500 kHz.

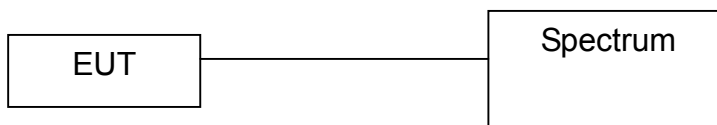
#### 4.3.2 TEST EQUIPMENT

The following test equipment was used during the test:

EQUIPMENT/FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM	9kHz-7GHz	ROHDE & SCHWARZ	FSP7/ 839511/010	APR. 2008 R&S

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

#### 4.3.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

#### 4.3.4 TEST PROCEDURE

The EUT was operated in hopping mode or any specific channel. Printed out the test result from the spectrum by hard copy function.

#### 4.3.5 EUT OPERATING CONDITION

Same as section 4.1.5 of this report.

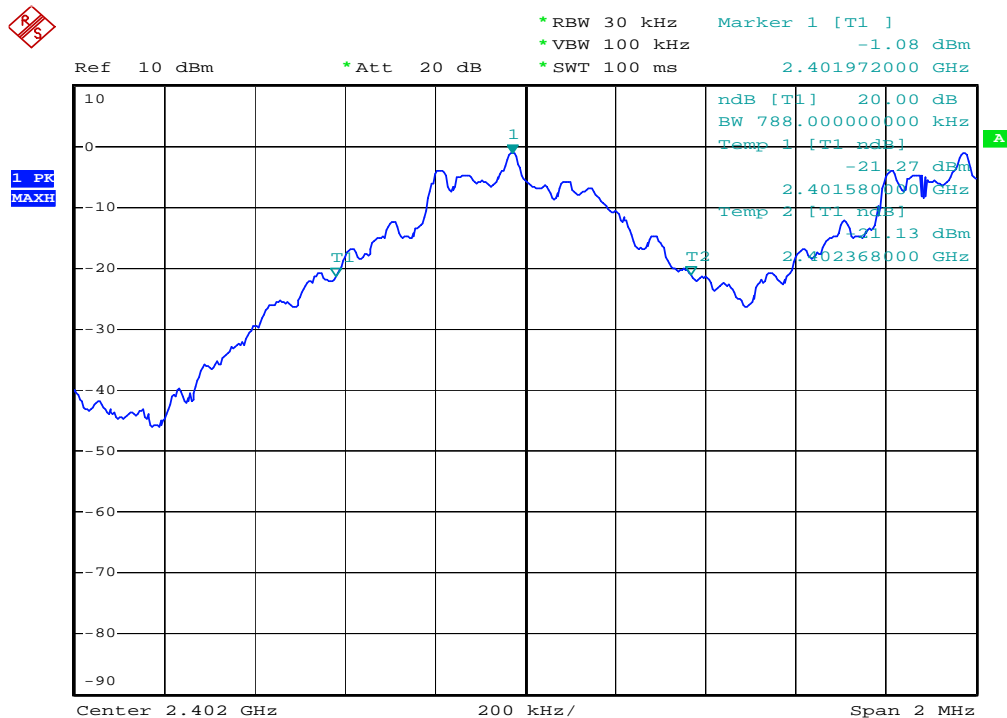


### 4.3.6 TEST RESULT

Temperature:	22°C	Humidity:	60%RH
Spectrum Detector:	PK	Tested by:	Shunm Wang
Test Result:	PASS	Tested Date:	Feb. 27, 2008
Test Mode:	Bluetooth		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	20dB Down Bandwidth (kHz)
0	2402	788
39	2441	792
78	2480	800

CH 0



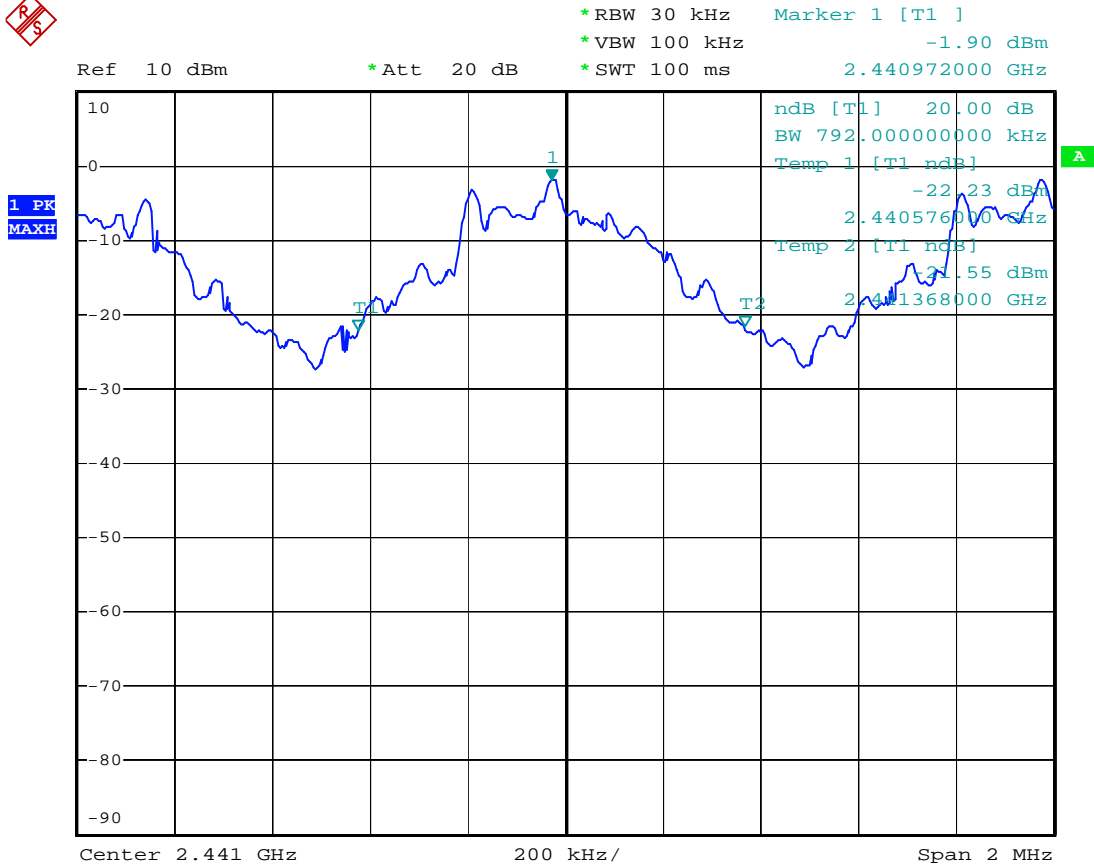
-20dB bw

Date: 27.FEB.2008 08:42:25





## Ch 39



-20dB bw

Date: 27.FEB.2008 08:45:40

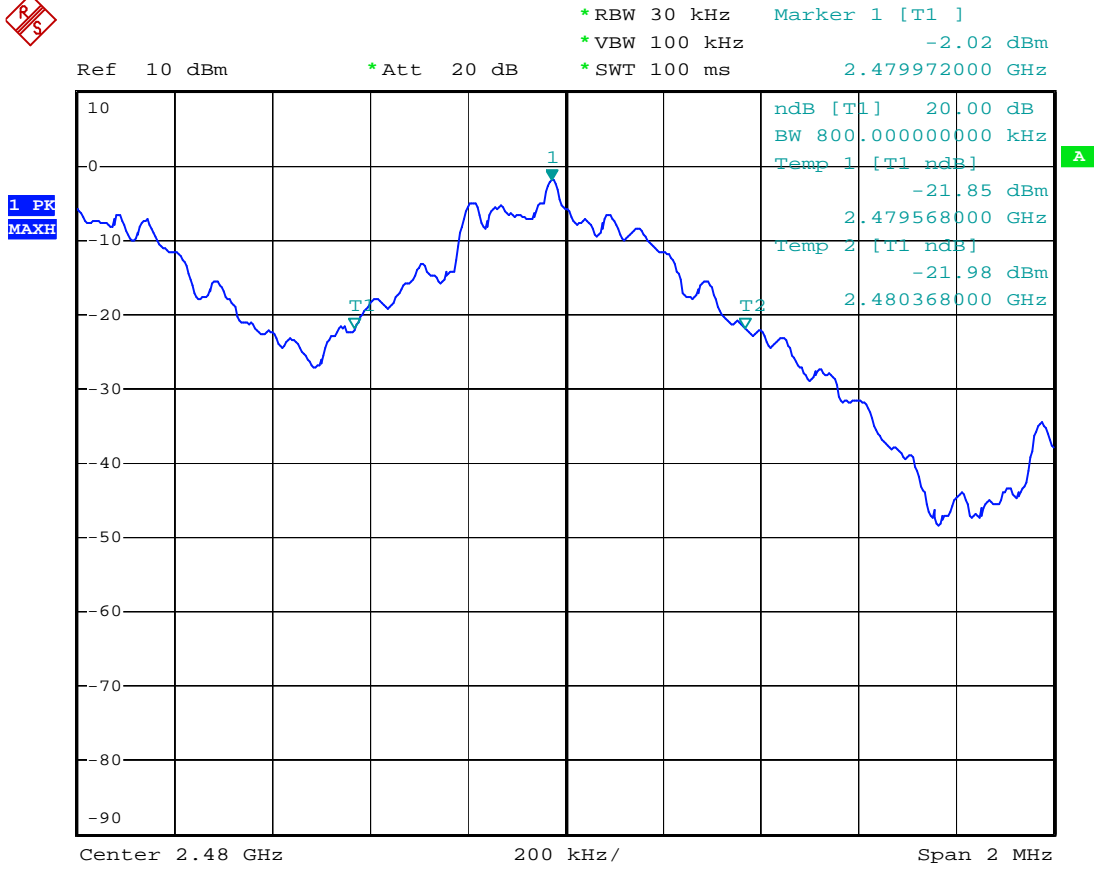


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 City, Taoyuan, Taiwan

# TEST REPORT

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Ch 78



-20dB bw

Date: 27.FEB.2008 08:52:23



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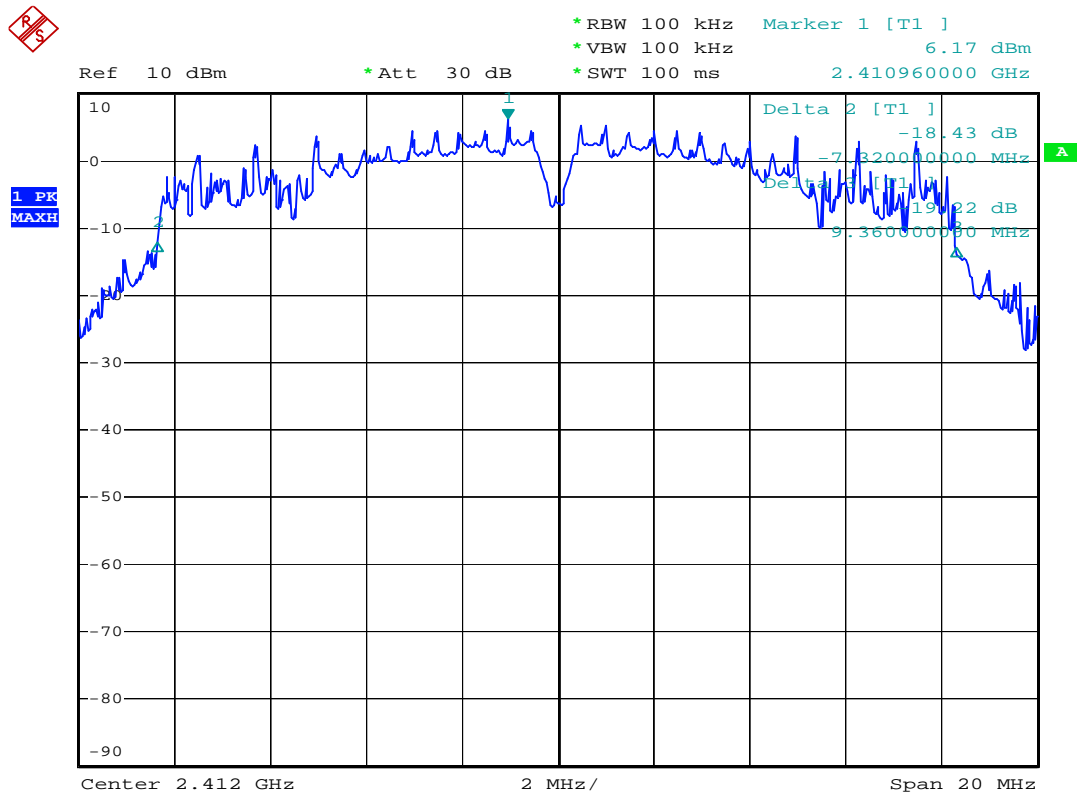
# TEST REPORT

Reference No.: A08031306  
 Report No.: FCCA08031306  
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 Date: Apr. 21, 2008

Temperature:	<u>22°C</u>	Humidity:	<u>60%RH</u>
Spectrum Detector:	<u>PK.</u>	Tested Mode:	<u>IEEE 802.11g</u>
Tested By:	<u>Shunm Wang</u>	Modulation Type:	<u>OFDM</u>
Tested Date:	<u>Mar. 27, 2008</u>		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	6dB DOWN BW (MHz)
1	2412	16.68
6	2437	16.64
11	2462	16.60

CH1:



-20dB bw

Date: 27.MAR.2008 09:54:46

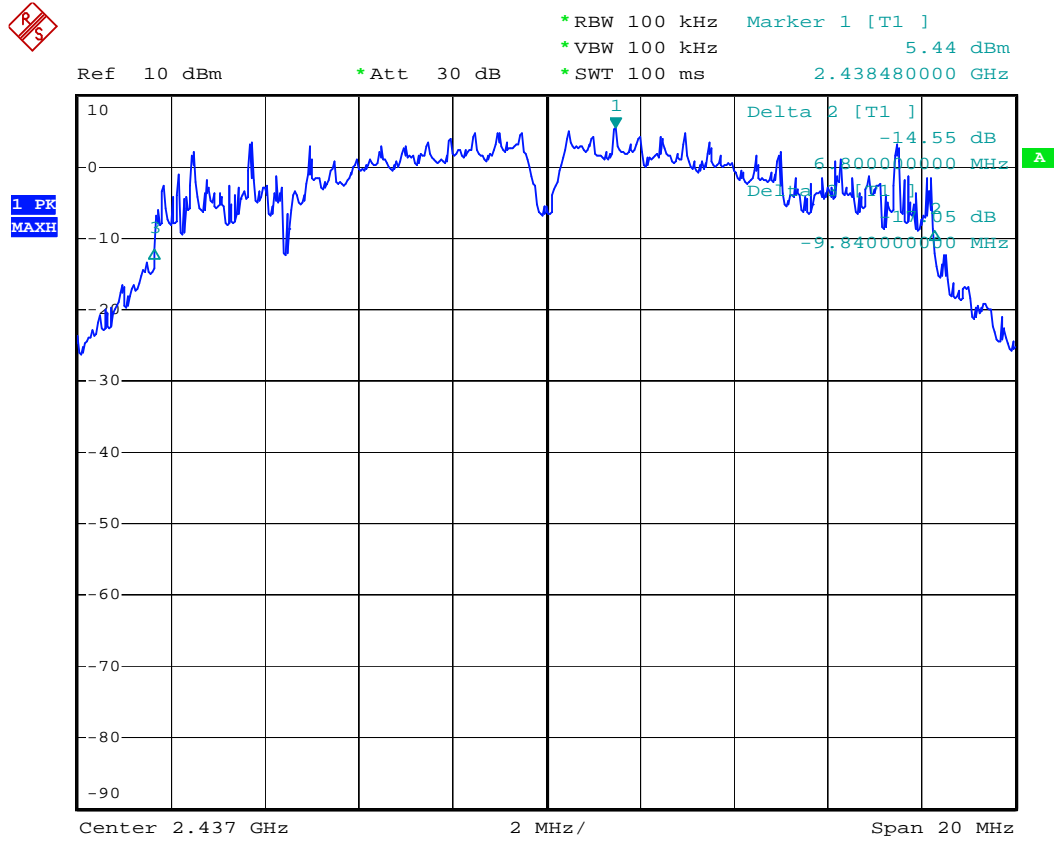


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# TEST REPORT

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 FCC ID: V83 BLUEW-2310  
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 Date: Apr. 21, 2008

CH 6:



-20dB bw

Date: 27.MAR.2008 10:17:49

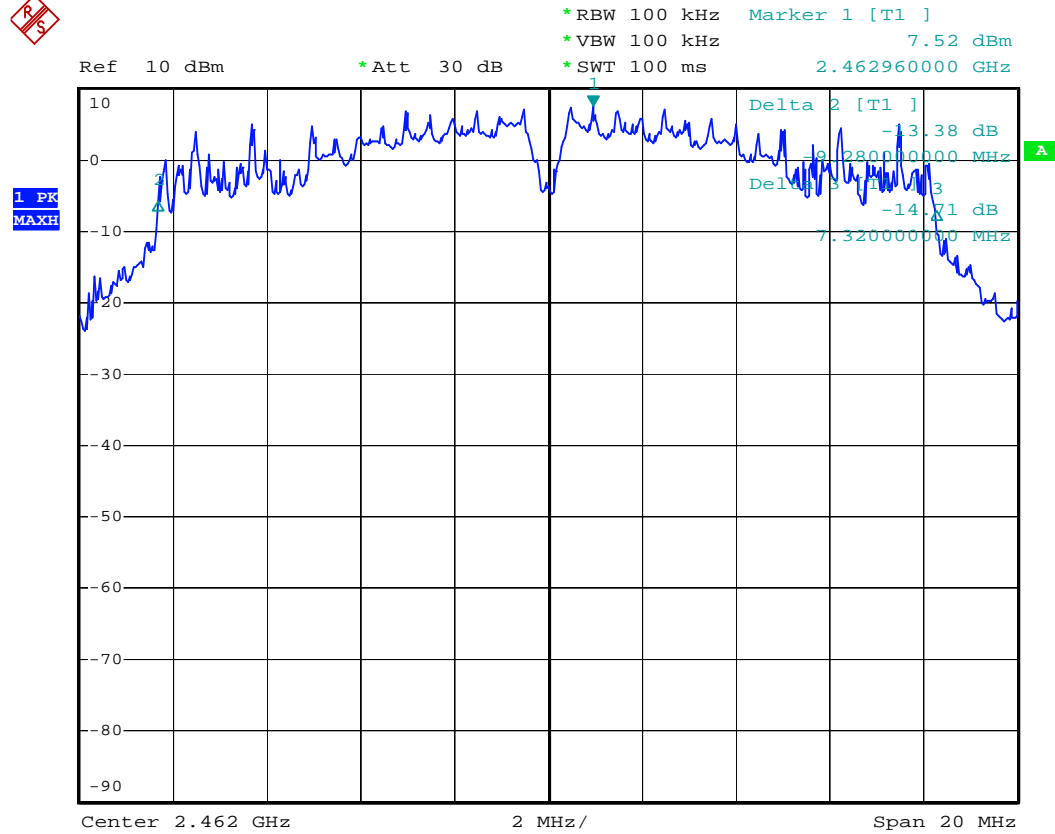


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# TEST REPORT

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CH 11:



-20dB bw

Date: 27.MAR.2008 10:51:45



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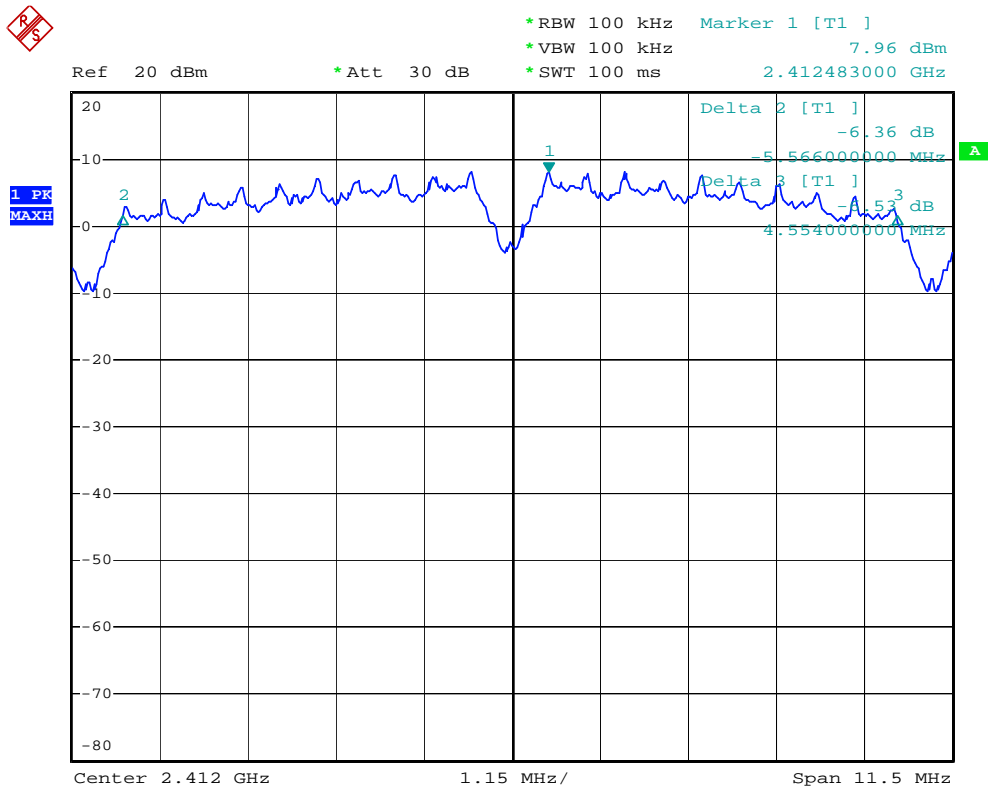
# TEST REPORT

Reference No.: A08031306  
 Report No.: FCCA08031306  
 FCC ID: V83 BLUEW-2310  
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Temperature:	<u>22°C</u>	Humidity:	<u>60%RH</u>
Spectrum Detector:	<u>PK.</u>	Tested Mode:	<u>IEEE 802.11b</u>
Tested By:	<u>Shunm Wang</u>	Modulation Type:	<u>DSSS</u>
Tested Date:	<u>Mar. 27, 2008</u>		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	6dB DOWN BW (MHz)
1	2412	10.11
6	2437	10.07
11	2462	10.12

CH1:



-20dB bw

Date: 20.MAY.2008 16:16:06

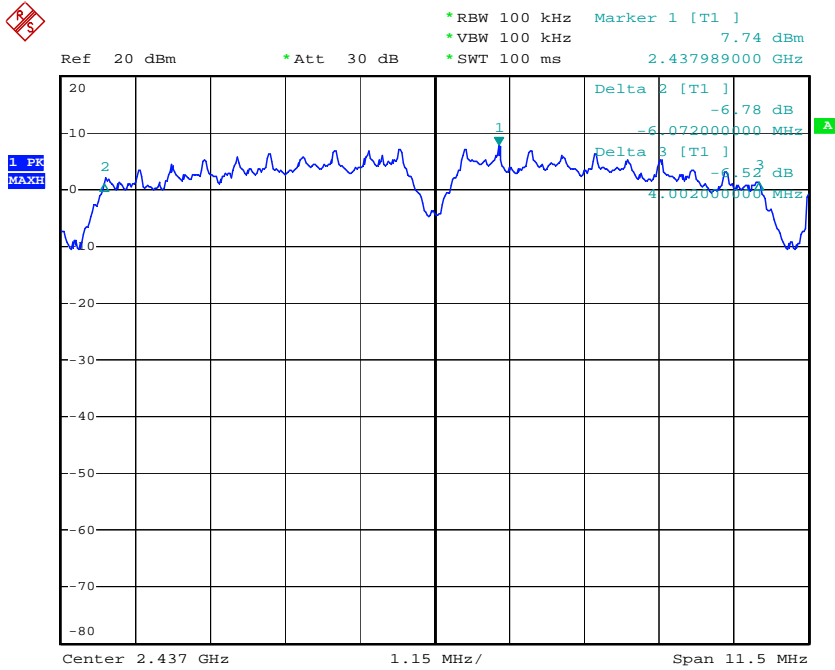


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# TEST REPORT

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CH6



-20dB bw

Date: 20.MAY.2008 16:30:21

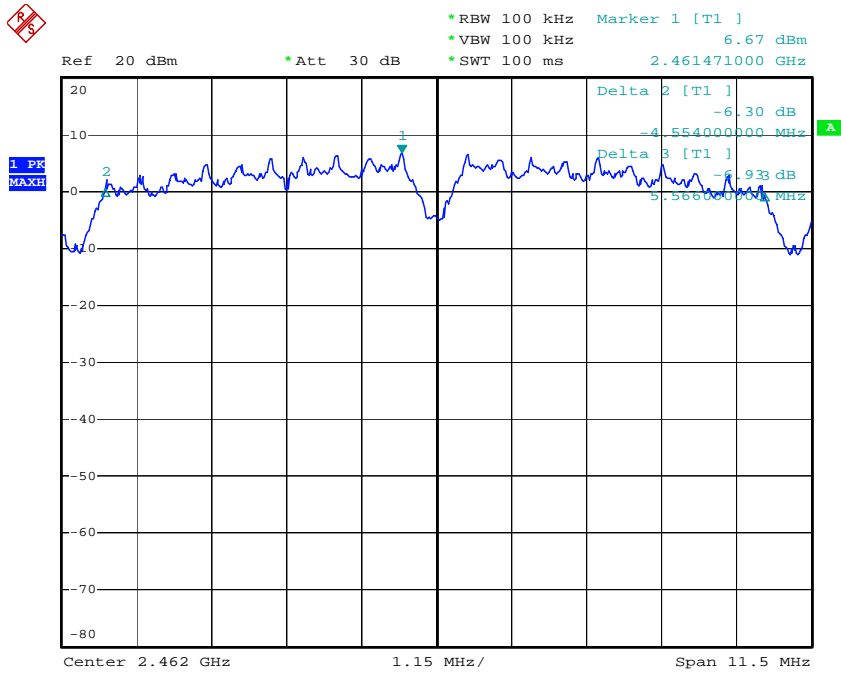
CH11



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-20dB bw

Date: 20.MAY.2008 16:49:08





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# TEST REPORT

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## 4.4 PEAK POWER TEST

### 4.4.1 LIMIT

FCC Part15, Subpart C Section 15.247.

Frequency Range (MHz)	Limit(w)				
	Quantity of Hopping Channel	50	25	15	75
902-928		1(30dBm)	0.125(21dBm)	NA	NA
2400-2483.5		NA	NA	0.125(21dBm)	1(30dBm)
5725-5850		NA	NA	NA	1(30dBm)

### 4.4.2 TEST EQUIPMENT

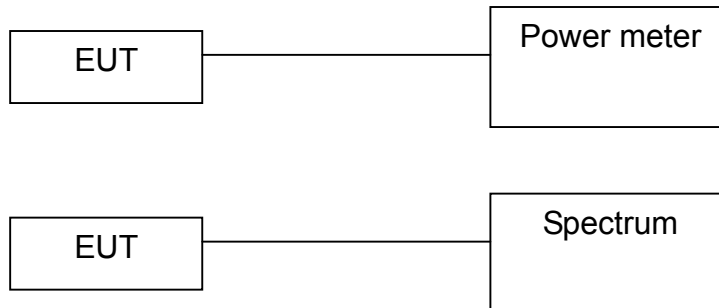
The following test equipment was used during the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM	9kHz-7GHz	ROHDE & SCHWARZ	FSP7/ 839511/010	MAR. 2009 ETC
POWER METER	N/A	BOONTON	4232A/ 29001	MAY 2008 ETC
POWER SENSOR	DC-8GHz 50 Ω	BOONTON	51011EMC/ 31181	JUN. 2008 ETC

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



#### 4.4.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

#### 4.4.4 TEST PROCEDURE

The EUT was operating in hopping mode or could control its channel.  
Printed out the test result from the spectrum by hard copy function.  
Recorded the read value of the power meter.

#### 4.4.5 EUT OPERATING CONDITION

Same as section 4.1.5 of this report.



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# TEST REPORT

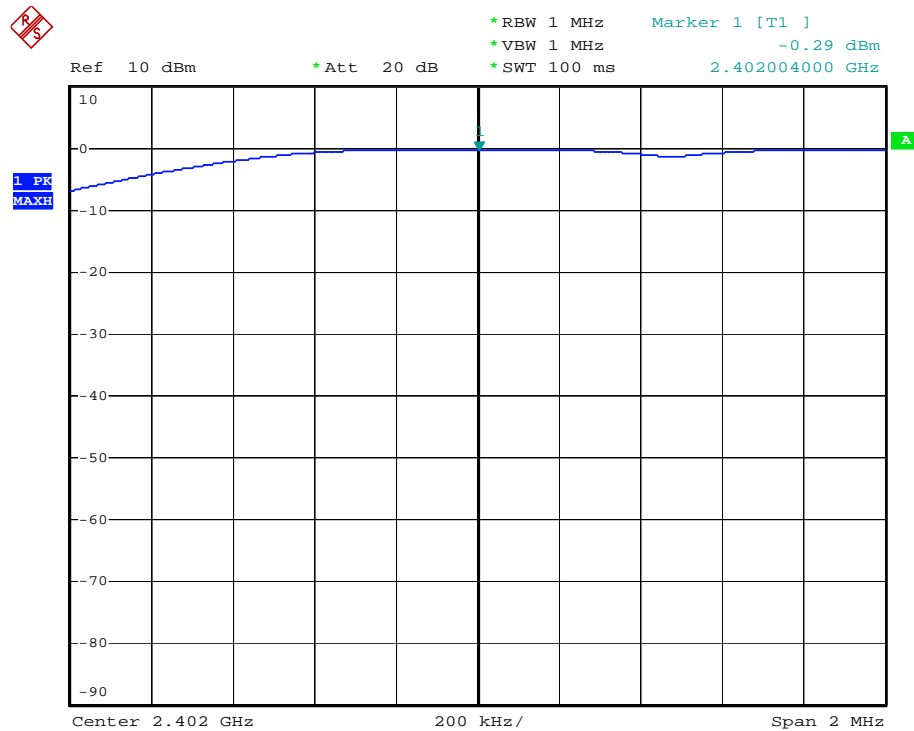
Reference No.: A08031306  
 Report No.: FCCA08031306  
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## 4.4.6 TEST RESULT

Temperature:	<u>23°C</u>	Humidity:	<u>60%RH</u>
Spectrum Detector:	<u>PK.</u>	Tested Mode:	<u>Bluetooth</u>
Tested By:	<u>Shunm Wang</u>	Modulation Type:	<u>N/A</u>
Tested Date:	<u>Feb. 27, 2007</u>		

Channel Number	Channel Frequency (MHz)	Peak Output Power (dBm)	Peak Power Limit (dBm)
0	2402.0000	-0.29	30
39	2441.0000	-1.05	30
78	2480.0000	-1.2	30

CH0



-20dB bw

Date: 27.FEB.2008 08:27:18



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CH39

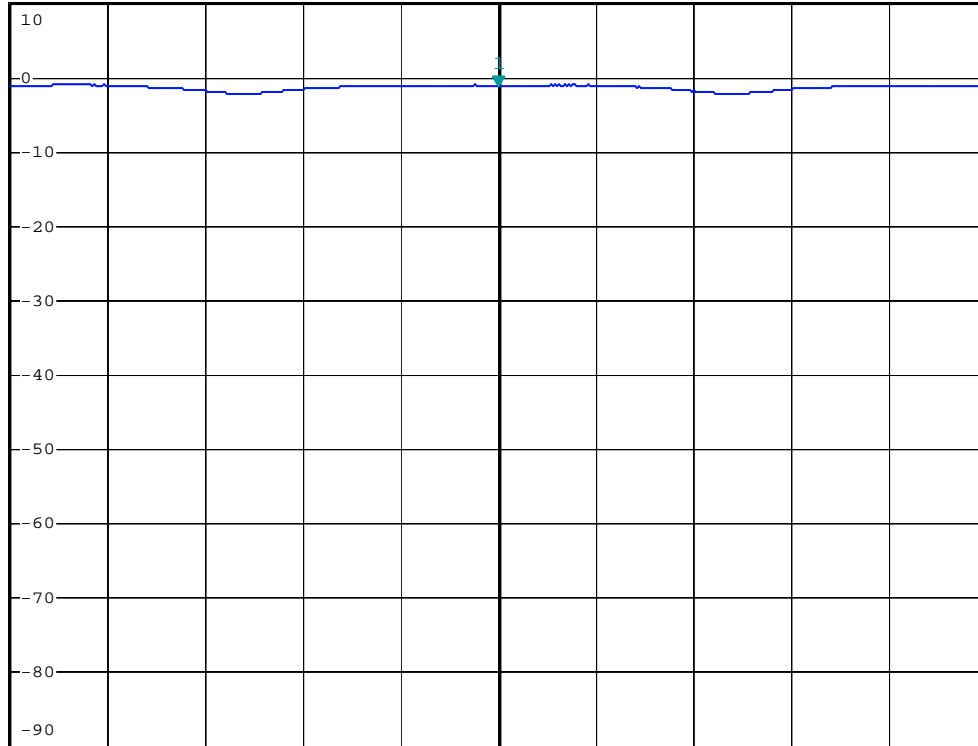


\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 1 MHz      -1.05 dBm  
\*SWT 100 ms      2.441000000 GHz

Ref 10 dBm

\*Att 20 dB

1. PK  
MAXH



Center 2.441 GHz

200 kHz/

Span 2 MHz

-20dB bw

Date: 27.FEB.2008 08:29:19



# TEST REPORT

CH78

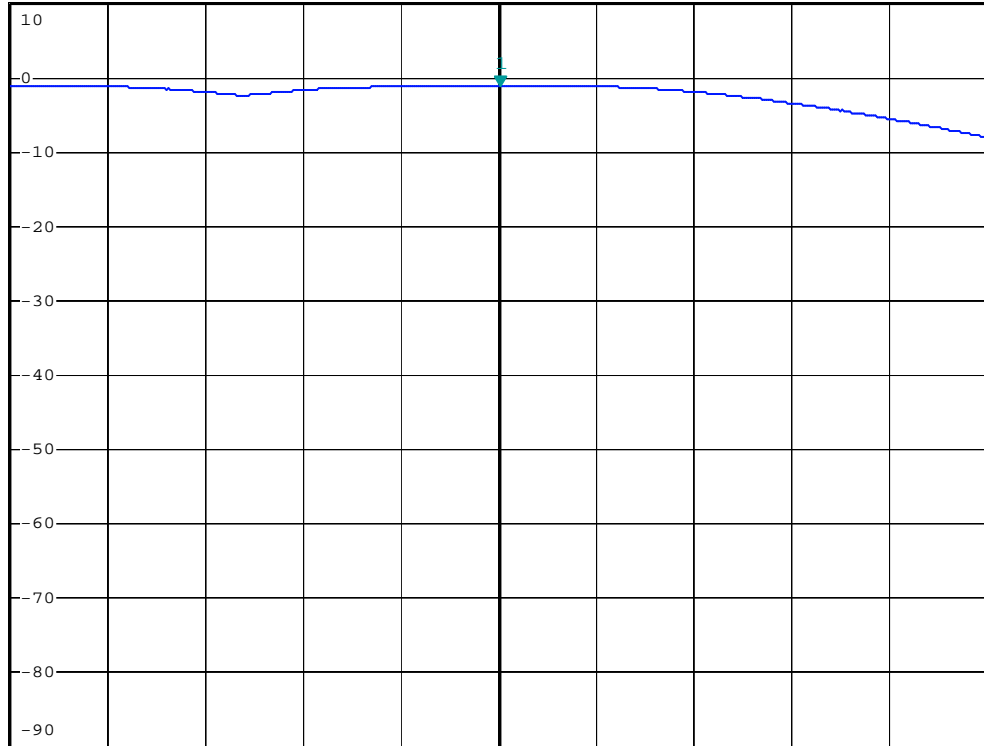


\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 1 MHz      -1.20 dBm  
\*SWT 100 ms      2.480004000 GHz

Ref 10 dBm

\*Att 20 dB

1 PK  
MAXH



Center 2.48 GHz

200 kHz/

Span 2 MHz

-20dB bw

Date: 27.FEB.2008 08:31:19



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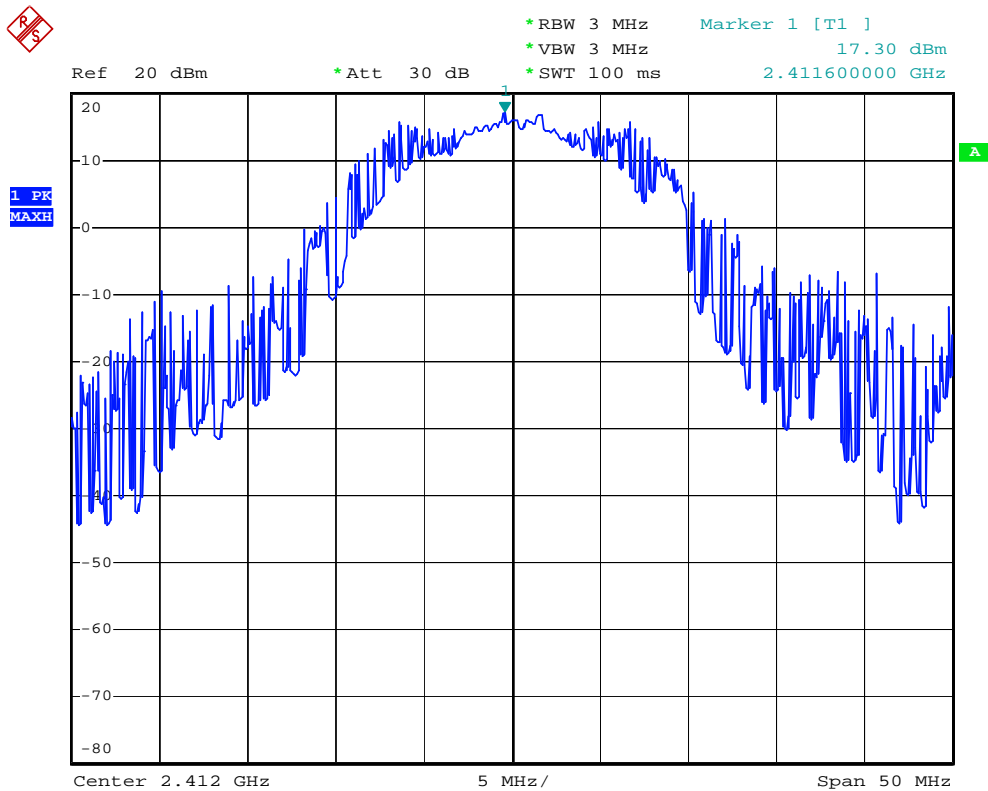
# TEST REPORT

Reference No.: A08031306  
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 Date: Apr. 21, 2008

Temperature:	<u>23°C</u>	Humidity:	<u>60%RH</u>
Spectrum Detector:	<u>PK.</u>	Tested Mode:	<u>IEEE 802.11g</u>
Tested By:	<u>Shunm Wang</u>	Modulation Type:	<u>OFDM</u>
Tested Date:	<u>Mar. 27, 2008</u>		

Channel Number	Channel Frequency (MHz)	Peak Output Power (dBm)	Peak Power Limit (dBm)
1	2411.6000	17.30	30
6	2437.0000	16.02	30
11	2462.0820	17.65	30

CH1:

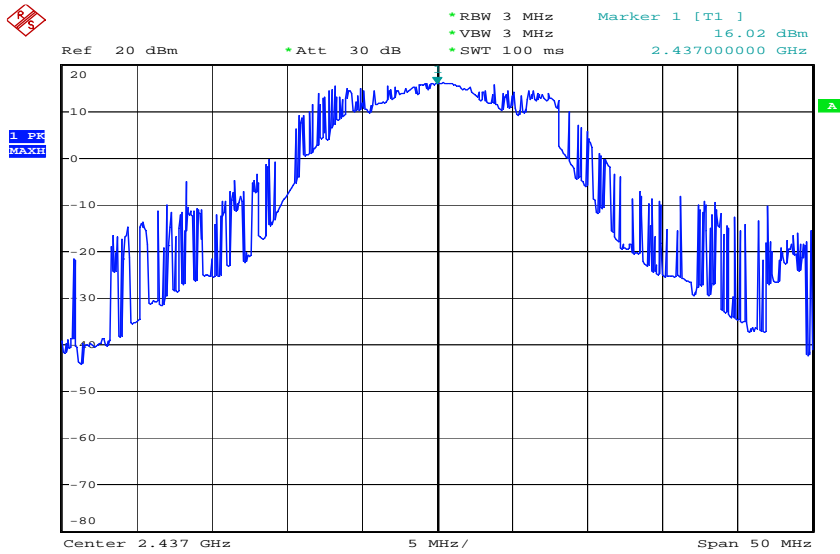


-20dB bw

Date: 27.MAR.2008 12:16:16

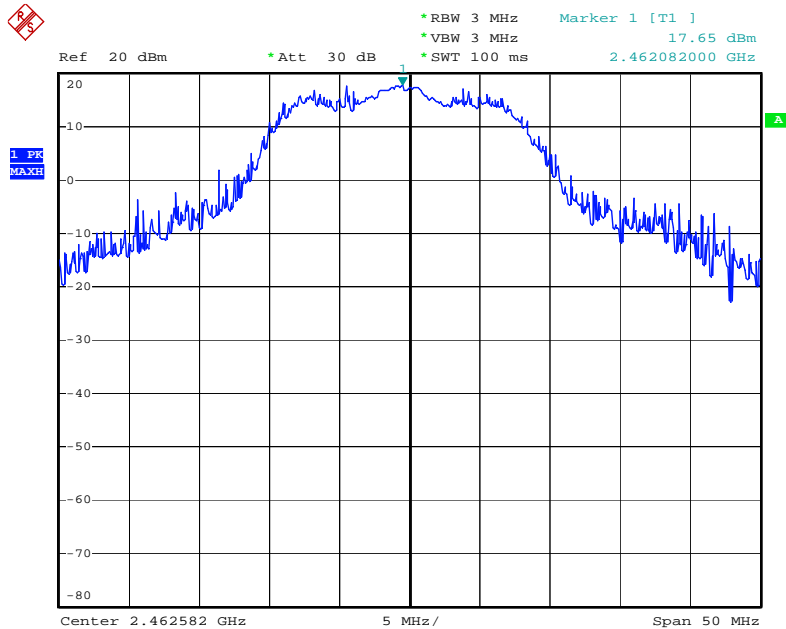


## CH6



-20dB bw  
Date: 27.MAR.2008 12:13:09

## CH11



-20dB bw  
Date: 27.MAR.2008 12:08:57



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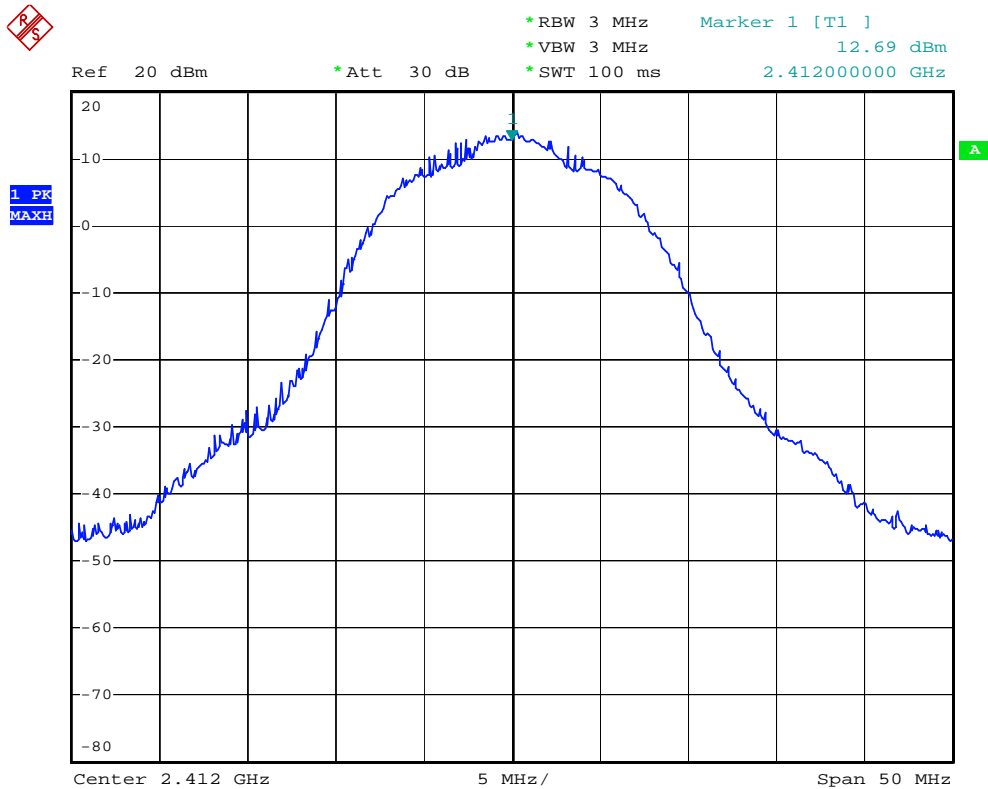
# TEST REPORT

Reference No.: A08031306  
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 FCC ID: V83 BLUEW-2310  
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Temperature:	<u>23°C</u>	Humidity:	<u>60%RH</u>
Spectrum Detector:	<u>PK.</u>	Tested Mode:	<u>IEEE 802.11b</u>
Tested By:	<u>Shunm Wang</u>	Modulation Type:	<u>DSSS</u>
Tested Date:	<u>Mar. 27, 2008</u>		

Channel Number	Channel Frequency (MHz)	Peak Output Power (dBm)	Peak Power Limit (dBm)
1	2412.0000	12.69	30
6	2437.0000	11.40	30
11	2462.1000	14.23	30

CH1:



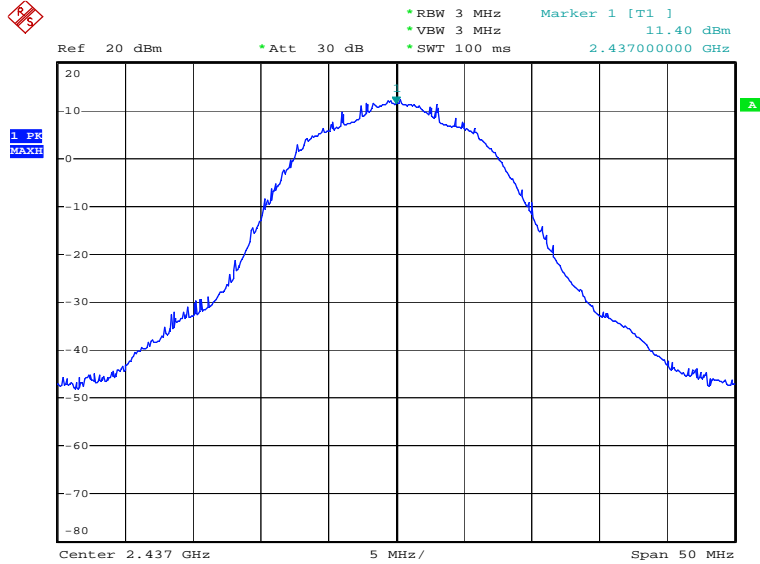
-20dB bw

Date: 27.MAR.2008 15:09:40



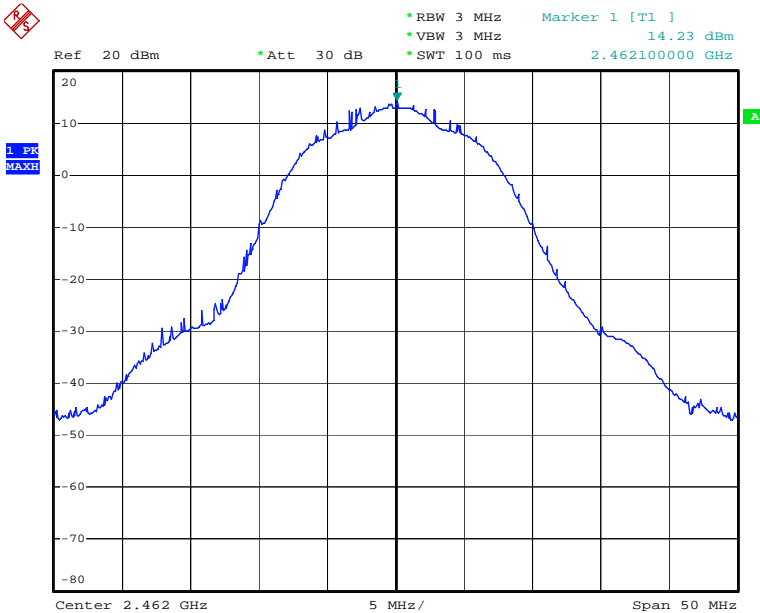


## CH6



-20dB bw  
Date: 27.MAR.2008 15:04:42

## CH11



-20dB bw  
Date: 27.MAR.2008 15:02:08



## 4.5 BAND EDGE TEST

### 4.5.1 LIMIT

Bluetooth: FCC Part15, Subpart C Section 15.249 (c), Emission radiated outside of the specified frequency bands, except for harmonics, shall attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Operating Frequency Range (MHz)	Limit (dB $\mu$ V/m)	
	Peak	Average
902-928	74	54
2400-2483.5		
5725-5850		

Wi-Fi:FCC Part15, Subpart C Section 15.247. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

OPERATING FREQUENCY RANGE (MHz)	SPURIOUS EMISSION FREQUENCY (MHz)	LIMIT	
		Peak power ration to emission(dBc)	Emission level(dBuV/m)
902 - 928	<902	>20	NA
	>928	>20	NA
	960-1240	NA	54
2400 - 2483.5	<2400	>20	NA
	>2483.5-2500	NA	54
5725 - 5850	<5350-5460	NA	54
	<5725	>20	NA
	>5850	>20	NA



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## TEST REPORT

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### 4.5.2 TEST EQUIPMENT

The following test equipment was used during the test:

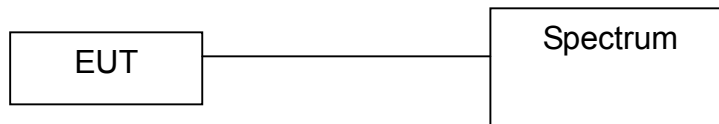
EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM	9kHz-7GHz	ROHDE & SCHWARZ	FSP7/ 839511/010	APR. 2009 R&S
EMI TEST RECEIVER	9 kHz TO 2750 MHz	ROHDE & SCHWARZ	ESCS30/ 830245/012	OCT. 2008 ETC
SPECTRUM	9KHz-26.5GHz	HP	8953E/ 3710A03220	MAY 2008 ETC
PRE-AMPLIFIER	1GHz-26.5GHz Gain:30dB	HP	8449B/ 3008A01019	NOV. 2008 ETC
BI-LOG ANTENNA	25 MHz TO 2 GHz	EMCO	3142/ 9701-1124	FEB. 2009 SRT
HORN ANTENNA	1GHz to 18GHz	EMCO	3115/ 9602-4681	DEC. 2008 ETC
OATS	3 - 10 M measurement	SRT	SRT-1	APR. 2009 SRT

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



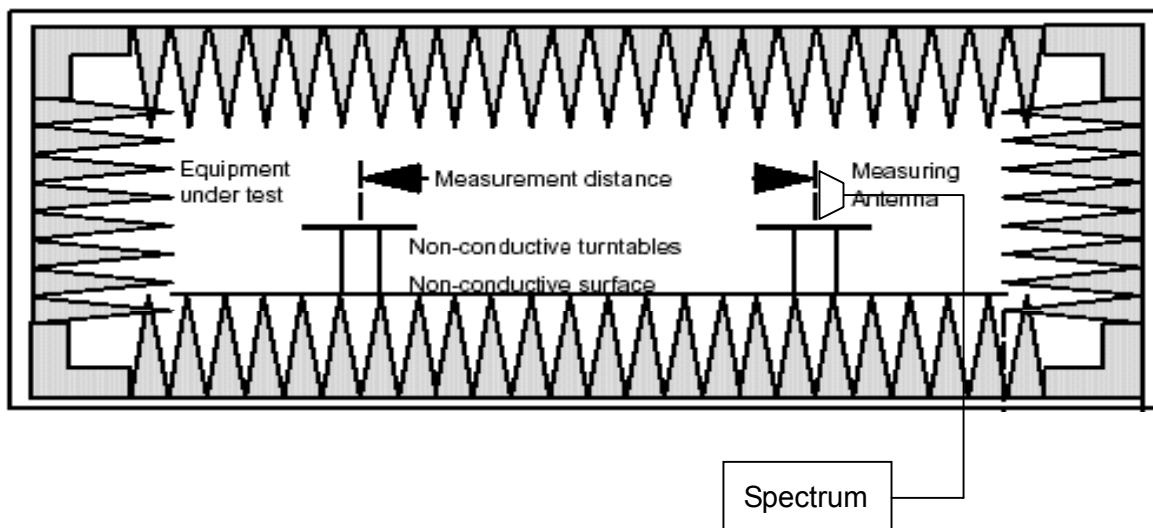
## 4.5.3 TEST SET-UP

### FOR RF CONDUCTED TEST (dBc)



The EUT was connected to a spectrum through a 50Ω RF cable.

### FOR RADIATED EMISSION TEST



**NOTE :**

3. The EUT system was put on a wooden table with 0.8m heights above a ground plane.
4. For the actual test configuration, please refer to the photos of testing.



#### 4.5.4 TEST PROCEDURE

1. The EUT was operating in hopping mode or could be controlled its channel.  
Printed out the test result from the spectrum by hard copy function.
2. The EUT was tested according to the requirement of ANSI C63.4 and CISPR 22.  
The measurements were made at an open area test site with 10 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 30 MHz. Under 1 GHz. All readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak and average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.

#### 4.5.5 EUT OPERATING CONDITION

Same as section 4.1.5 of this report.



**Spectrum Research & Testing Lab., Inc.**  
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 Shan-Tong Li, Chung-Li  
 City, Taoyuan, Taiwan

# TEST REPORT

Reference No.: A08031306  
 Report No.: FCCA08031306  
 FCC ID: V83 BLUEW-2310  
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## 4.5.6 TEST RESULT

Temperature:	<u>21°C</u>	Humidity:	<u>62%RH</u>
Spectrum Detector:	<u>PK. &amp; AV.</u>	Tested Mode:	<u>Bluetooth</u>
Tested By:	<u>Shunm Wang</u>	Modulation Type:	<u>N/A</u>
Tested Date:	<u>Feb. 27, 2008</u>		

### 1. Conducted emission test

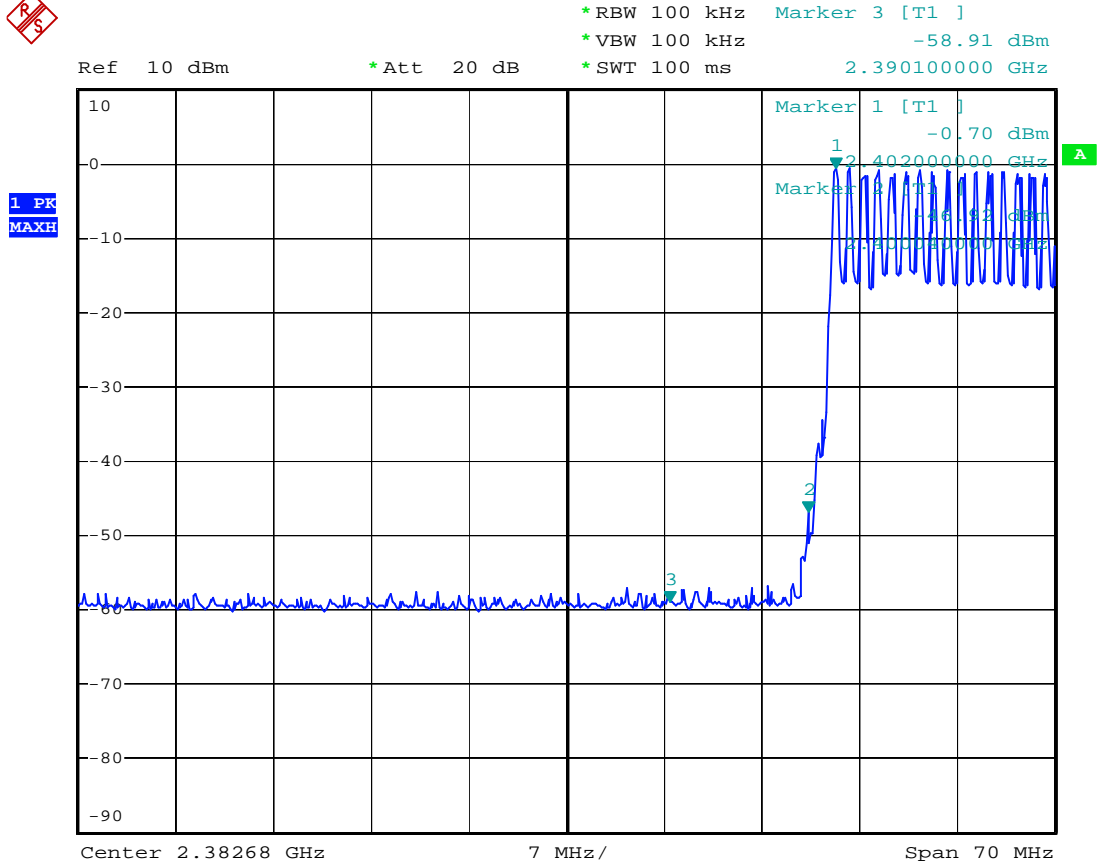
Frequency (MHz)	PEAK POWER OUTPUT (dBm)	Emission read Value (dBm)	Result of Band edge (dBc)	Band edge LIMIT (dBc)
<2400	-0.7	-46.92	46.22	>20dBc
>2483.5	-1.62	-56.16	54.54	>20dBc

### 2. Radiated emission test

Frequency (MHz)	Antenna polarization (H/V)	Reading (dBuV)	Emission (dBuV/m)	Band edge Limit (dBuV)
		Strength	Strength	Strength
<2400	H	48.3	44.1	54.0
>2483.5	V	37.9	33.9	54.0



## <2400 MHz(Conducted)



-20dB bw

Date: 27.FEB.2008 08:37:31



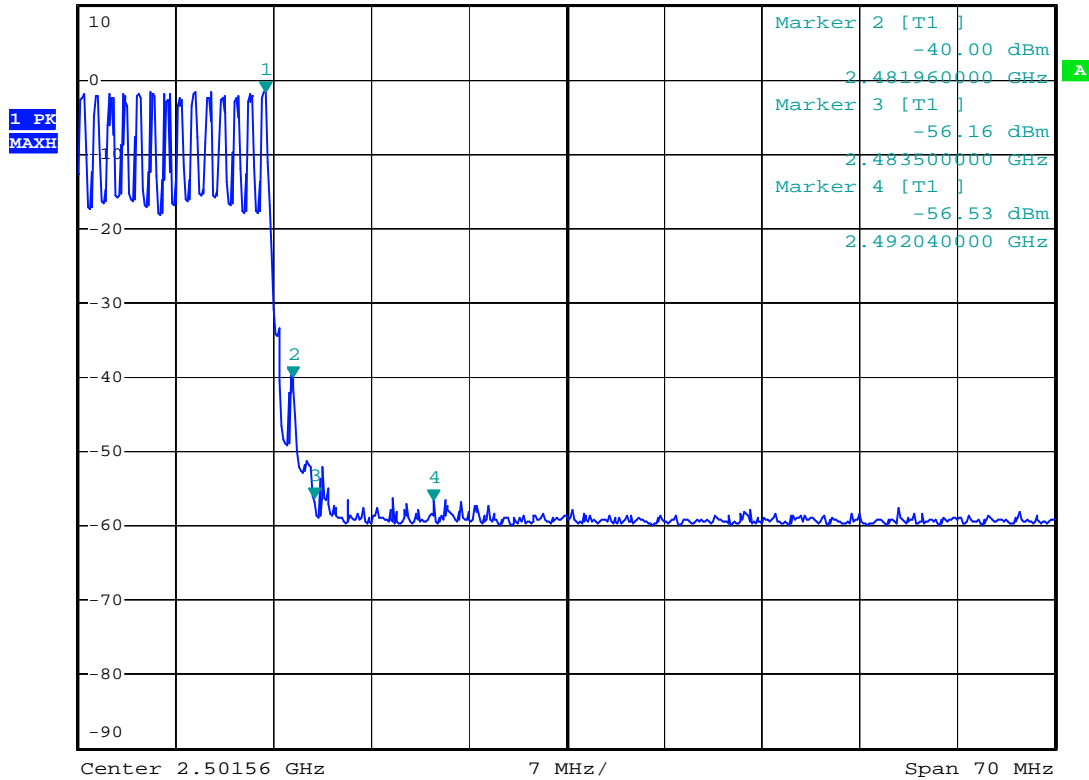
>2483.5 MHz(Conducted)



\*RBW 100 kHz    Marker 1 [T1 ]  
 \*VBW 100 kHz    -1.62 dBm  
 \*SWT 100 ms    2.480000000 GHz

Ref 10 dBm

\*Att 20 dB



-20dB bw

Date: 27.FEB.2008 08:34:57





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# TEST REPORT

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 FCC ID: V83 BLUEW-2310  
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Temperature:	<u>24°C</u>	Humidity:	<u>65%RH</u>
Spectrum Detector:	<u>PK. &amp; AV.</u>	Tested Mode:	<u>IEEE 802.11g</u>
Tested By:	<u>Shunm Wang</u>	Modulation Type:	<u>OFDM</u>
Tested Date:	<u>Mar. 27, 2008</u>		

## 1. Conducted test

Frequency (MHz)	PEAK POWER OUTPUT (dBm)	Emission read Value (dBm)	Result of Band edge (dBc)	Band edge LIMIT (dBc)
<2400	7.42	-29.29	36.71	>20dBc
>2483.5	5.2	-41.18	46.38	>20dBc

## 2. Radiated emission test

Frequency (MHz)	Antenna polarization (H/V)	Reading (dBuV)		Emission (dBuV/m)		Band edge Limit (dBuV/m)	
		PK	AV	PK	AV	PK	AV
<2400	V	64.7	45.5	60.5	41.3	74.0	54.0
>2483.5	V	62.2	44.4	58.2	40.4	74.0	54.0



CH1

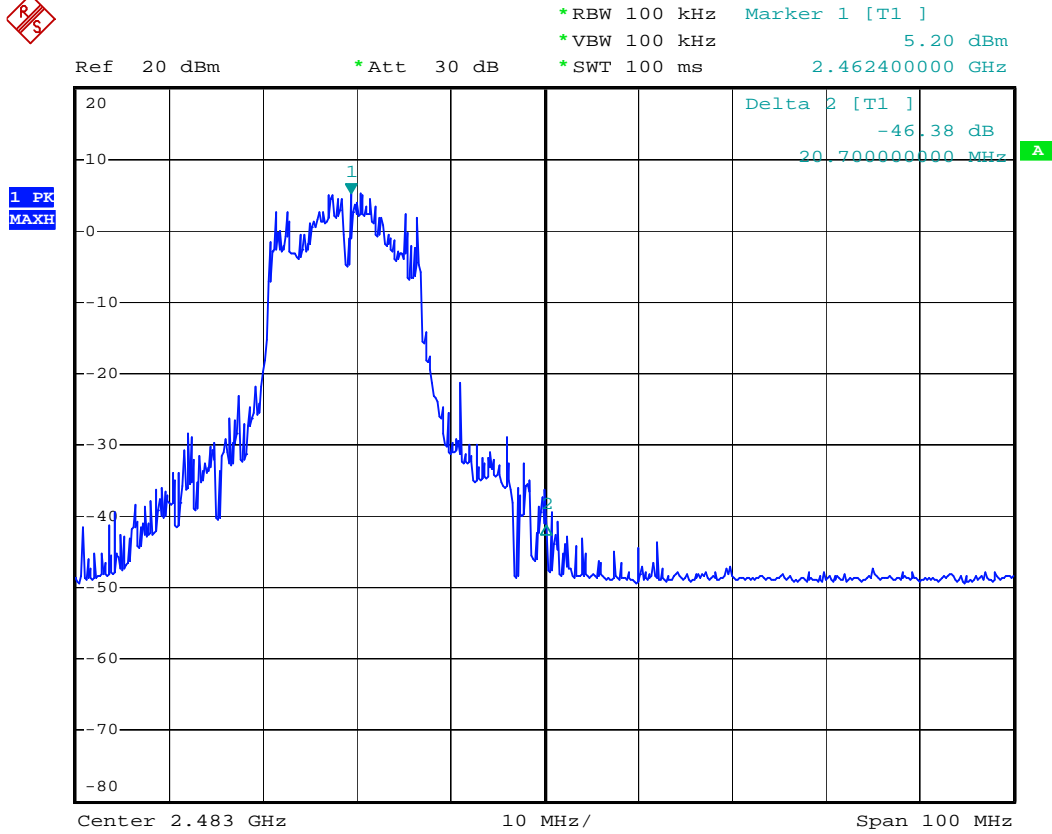


-20dB bw

Date: 27.MAR.2008 12:30:15



## CH11



-20dB bw

Date: 27.MAR.2008 12:45:43



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# TEST REPORT

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 FCC ID: V83 BLUEW-2310  
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Temperature:	<u>24°C</u>	Humidity:	<u>65%RH</u>
Spectrum Detector:	<u>PK. &amp; AV.</u>	Tested Mode:	<u>IEEE 802.11b</u>
Tested By:	<u>Shunm Wang</u>	Modulation Type:	<u>DSSS</u>
Tested Date:	<u>Mar. 27, 2008</u>		

## 1. Conducted test

Frequency (MHz)	PEAK POWER OUTPUT (dBm)	Emission read Value(dBm)	Result of Band edge (dBc)	Band edge LIMIT (dBc)
<2400	3.43	-34.03	37.46	>20dBc
>2483.5	3.07	-49.17	52.24	>20dBc

## 2. Radiated emission test

Frequency (MHz)	Antenna polarization (H/V)	Reading (dBuV)		Emission (dBuV/m)		Band edge Limit (dBuV/m)	
		PK	AV	PK	AV	PK	AV
<2400	V	63.5	45.6	59.3	41.4	74.0	54.0
>2483.5	V	66.1	46.9	62.1	42.9	74.0	54.0



CH1

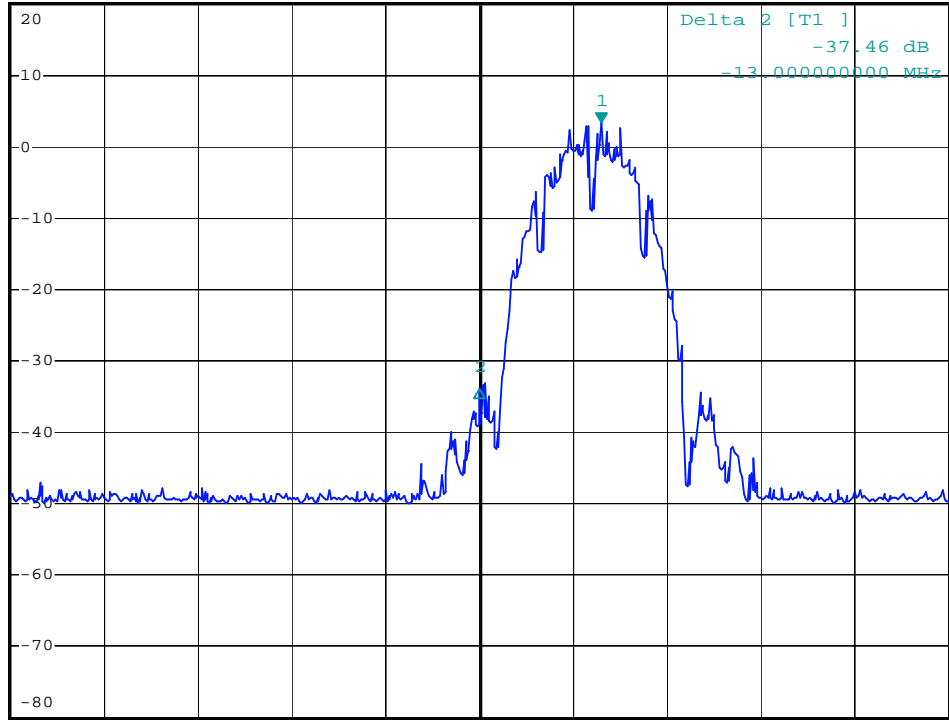


\*RBW 100 kHz    Marker 1 [T1 ]  
 \*VBW 100 kHz                    3.43 dBm  
 \*SWT 100 ms                    2.413000000 GHz

Ref 20 dBm

\*Att 30 dB

1 PK  
MAXH



Center 2.4 GHz

10 MHz/

Span 100 MHz

-20dB bw

Date: 27.MAR.2008 14:55:42

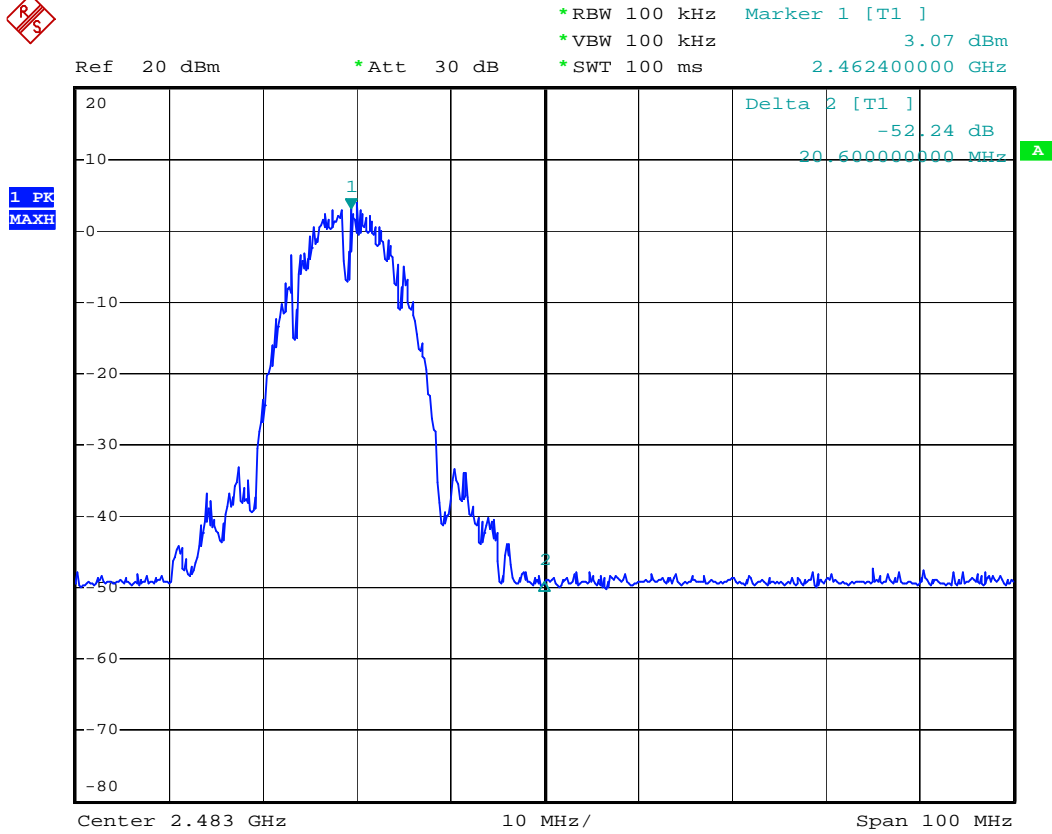


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# TEST REPORT

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CH11



-20dB bw

Date: 27.MAR.2008 14:59:22



## 4.6 POWER DENSITY TEST

### 4.6.1 LIMIT

FCC Part15, Subpart C Section 15.247

FREQUENCY RANGE (MHz)	Limit(dBm/kHz)
902-928	8dBm/3kHz
2400-2483.5	
5725-5850	

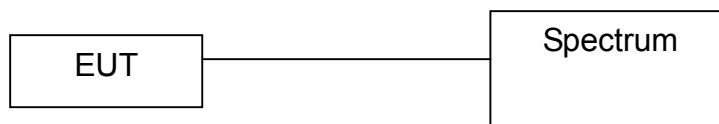
### 4.6.2 TEST EQUIPMENT

The following test equipment was used during the radiated emission test:

EQUIPMENT/FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM	9kHz-7GHz	ROHDE & SCHWARZ	FSP7/ 839511/010	APR. 2009 R&S

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.6.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

### 4.6.4 TEST PROCEDURE

The EUT was operating in transmitter mode and could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

### 4.6.5 EUT OPERATING CONDITION

Same as section 4.1.5 of this report.



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# TEST REPORT

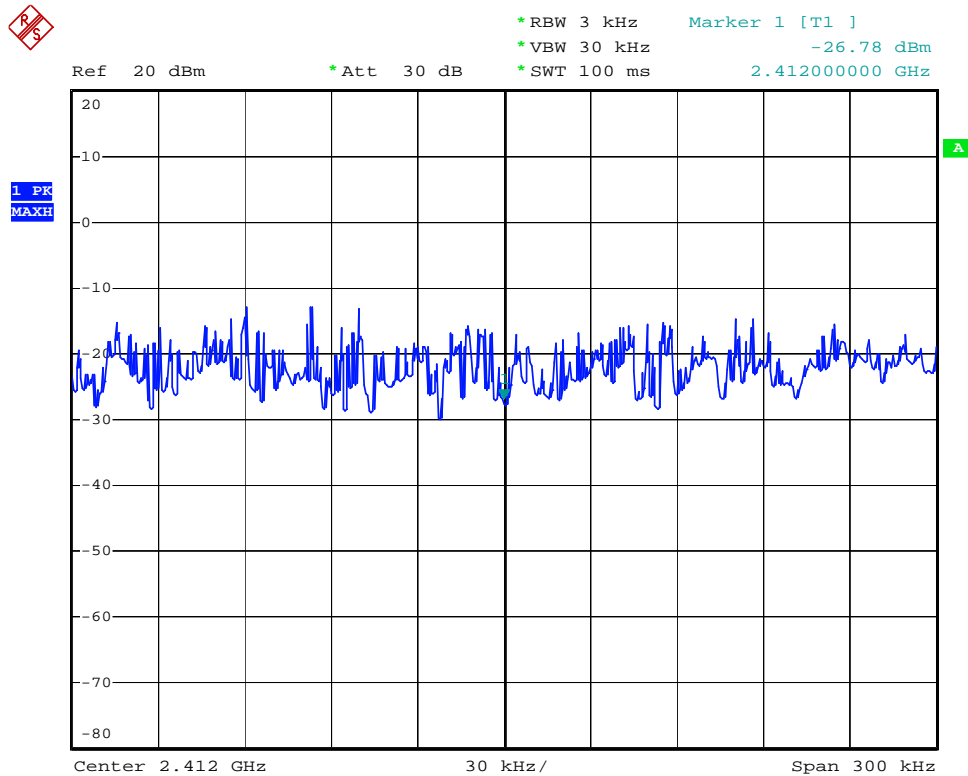
Reference No.: A08031306  
 Report No.: FCCA08031306  
 FCC ID: V83 BLUEW-2310  
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 Date: Apr. 21, 2008

## 4.6.6 TEST RESULT

Temperature:	23°C	Humidity:	60%RH
Spectrum Detector:	PK.	Tested Mode:	IEEE 802.11g
Tested By:	Shunm Wang	Modulation Type:	OFDM
Tested Date:	Mar. 27, 2008		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm/3kHz)	MAXIMUM LIMIT (dBm/3kHz)
1	2412.0000	-26.78	8
6	2437.0000	-29.50	8
11	2462.0000	-21.48	8

CH 1:



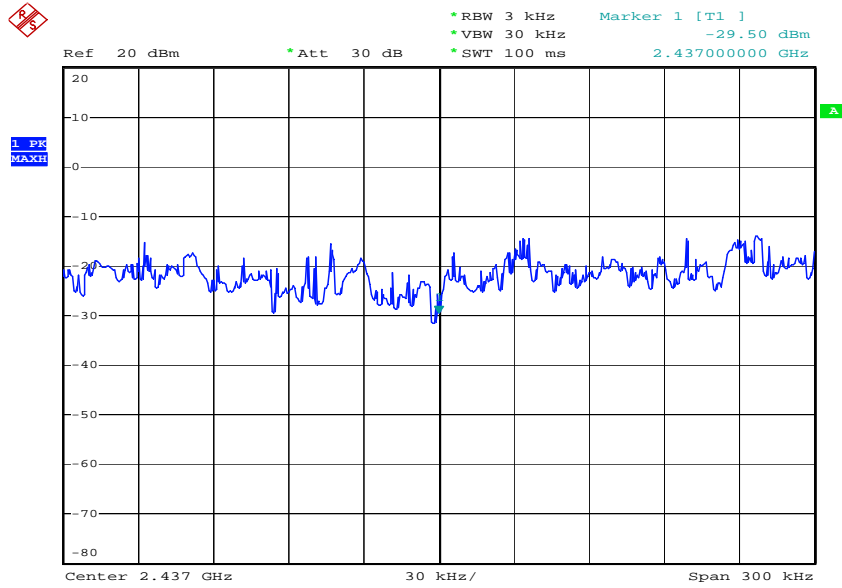
-20dB bw

Date: 27.MAR.2008 13:27:00





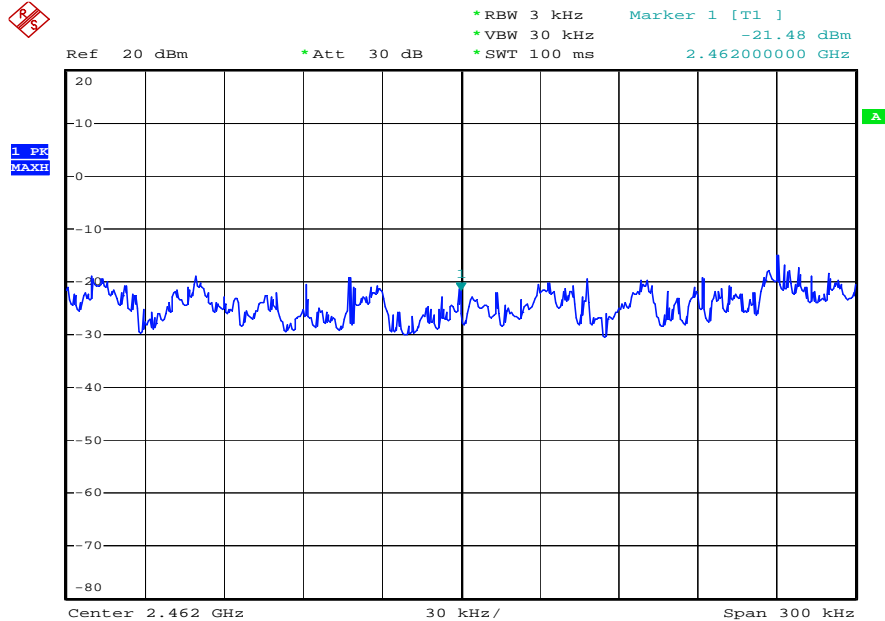
## CH 6:



-20dB bw

Date: 27.MAR.2008 13:15:39

## CH 11:



-20dB bw

Date: 27.MAR.2008 13:01:41



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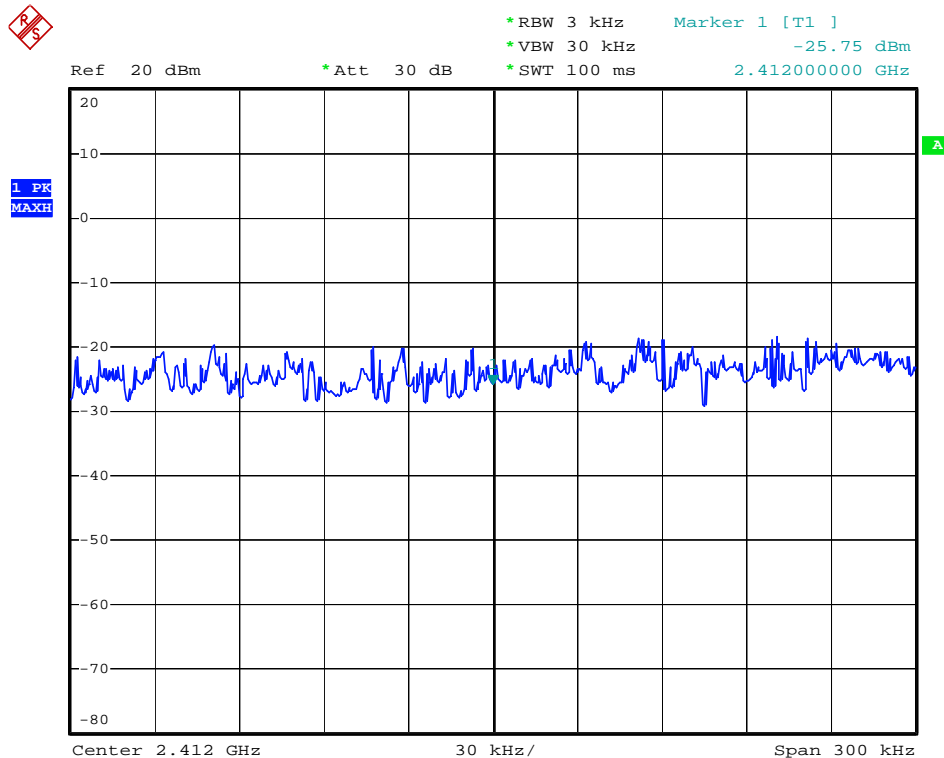
# TEST REPORT

Reference No.: A08031306  
 Report No.: FCCA08031306  
 FCC ID: V83 BLUEW-2310  
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 Date: Apr. 21, 2008

Temperature:	<u>23°C</u>	Humidity:	<u>60%RH</u>
Spectrum Detector:	<u>PK.</u>	Tested Mode:	<u>IEEE 802.11b</u>
Tested By:	<u>Shunm Wang</u>	Modulation Type:	<u>DSSS</u>
Tested Date:	<u>Mar. 27, 2008</u>		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm/3kHz)	MAXIMUM LIMIT (dBm/3kHz)
1	2412.0000	-25.75	8
6	2437.0000	-22.85	8
11	2462.0000	-24.27	8

CH 1:



-20dB bw

Date: 27.MAR.2008 13:55:38

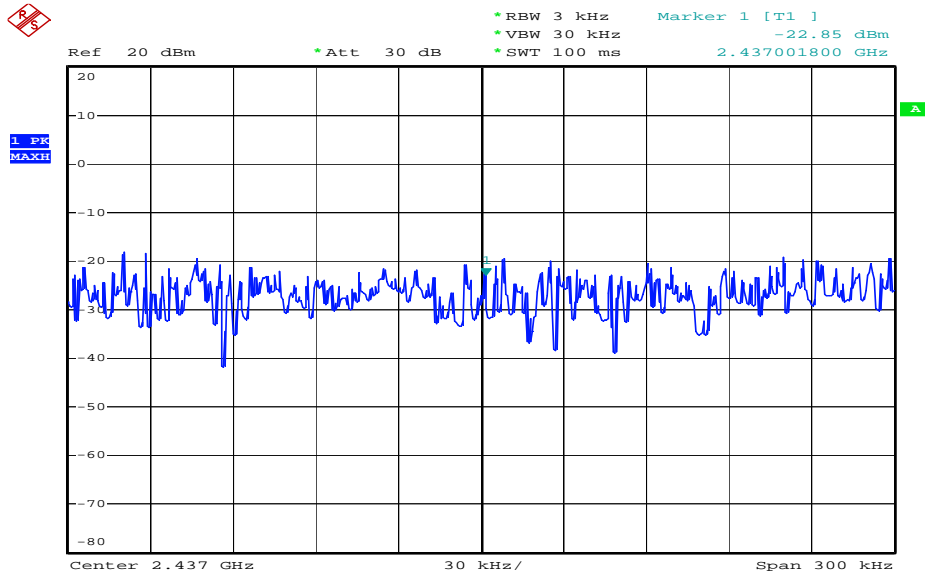


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# TEST REPORT

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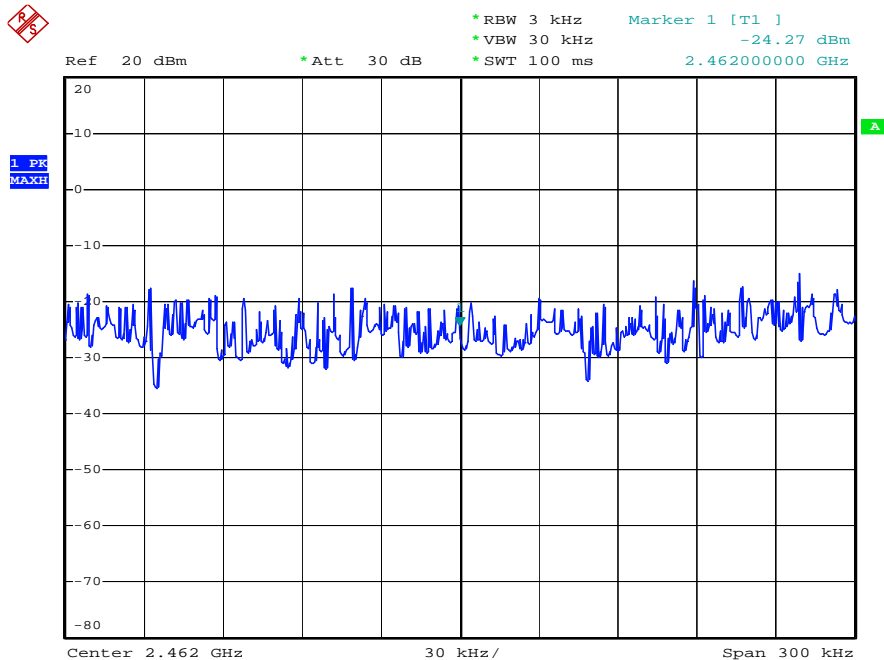
CH 6:



-20dB bw

Date: 27.MAR.2008 14:07:29

CH 11:



-20dB bw

Date: 27.MAR.2008 14:14:28



## 4.7 CHANNEL SEPARATION TEST

### 4.7.1 LIMIT

FCC Part 15, Subpart C Section 15.247(a)(1). Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Frequency Range (MHz)	Limit(kHz)
902-928	>25kHz
2400-2483.5	>25kHz
5725-5850	>25kHz

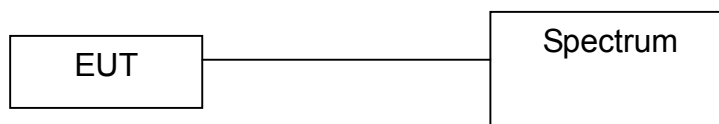
### 4.7.2 TEST EQUIPMENT

The following test equipment was used during the radiated emission test :

Equipment/ Facilities	Specifications	Manufacturer	Model#/ Serial#	Due Date of Cal. & Cal. Center
SPECTRUM	9kHz-7GHz	ROHDE & SCHWARZ	FSP7/ 839511/010	MAR. 2009 ETC

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.7.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

### 4.7.4 TEST PROCEDURE

The EUT was operating in hopping mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

### 4.7.5 EUT OPERATING CONDITION

Same as section 4.1.5 of this report.



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# TEST REPORT

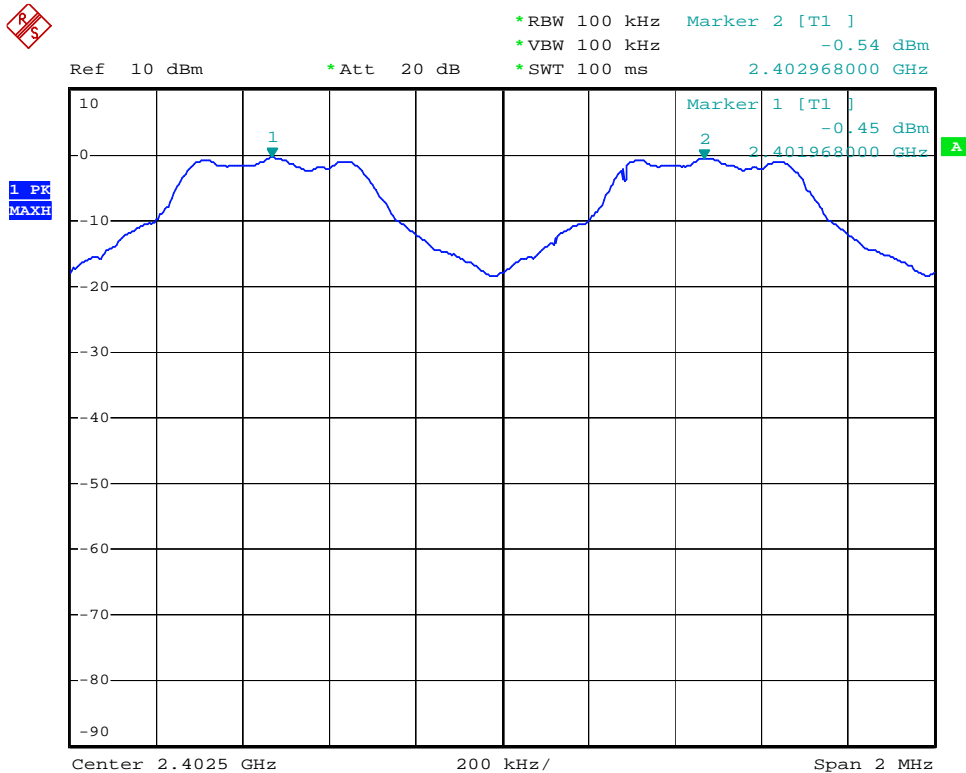
Reference No.: A08031306  
 Report No.: FCCA08031306  
 FCC ID: V83 BLUEW-2310  
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 Date: Apr. 21, 2008

## 4.7.6 TEST RESULT

Temperature:	<u>23°C</u>	Humidity:	<u>58%RH</u>
Spectrum Detector:	<u>PK</u>	Tested by:	<u>Shunm Wang</u>
Test Result:	<u>PASS</u>	Tested Date:	<u>Feb. 27, 2008</u>

Channel Number	Channel Frequency (MHz)	Separation Read Value (kHz)	Minimum Limit(20dB Bandwidth) (kHz)
0	2402	1000.000	25
39	2441	1004.000	25
78	2480	1008.000	25

CH0:

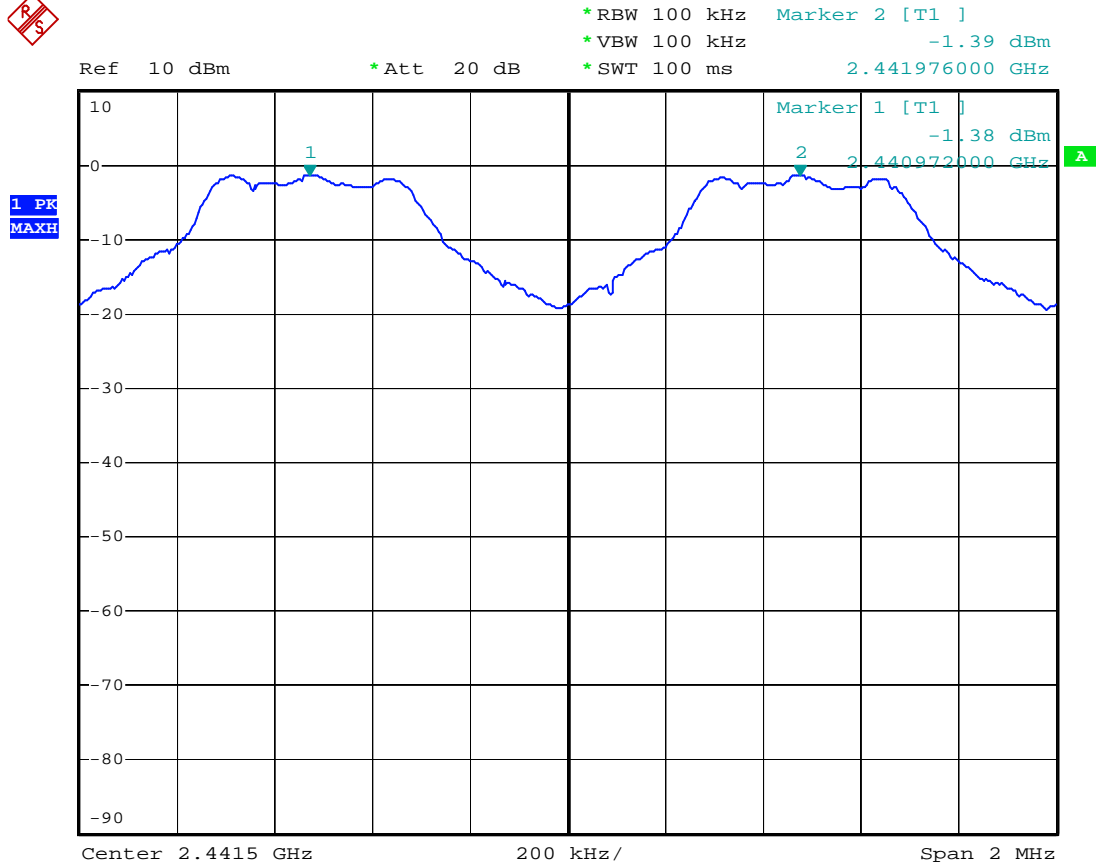


-20dB bw

Date: 27.FEB.2008 08:11:56



CH39:



-20dB bw

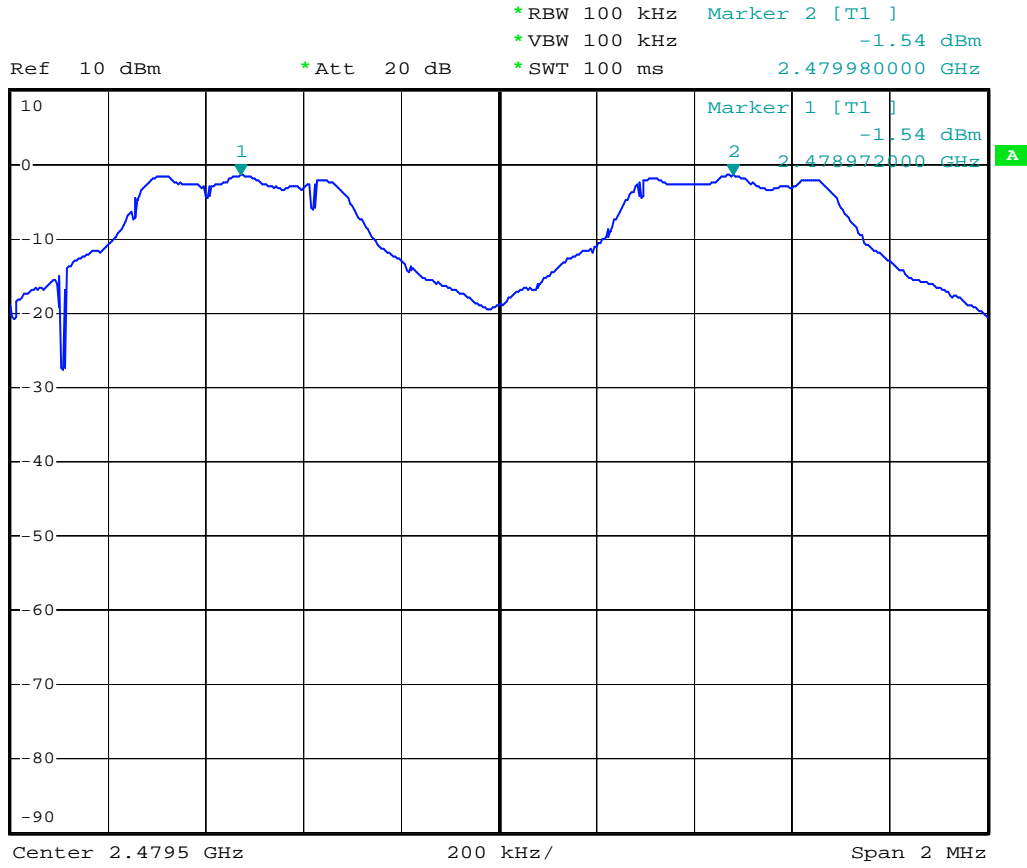
Date: 27.FEB.2008 08:14:51



CH78:



1 PK  
MAXH



-20dB bw

Date: 27.FEB.2008 08:20:00



## 4.8 QUANTITY OF HOPPING CHANNEL TEST

### 4.8.1 LIMIT

FCC Part15, Subpart C Section 15.247.

Frequency Range (MHz)	Limit (Quantity of Hopping Channel)			
	20dB Bandwidth <250kHz	20dB Bandwidth >250kHz	20dB Bandwidth <1MHz	20dB Bandwidth >1MHz
902-928	50	25	N/A	N/A
2400-2483.5	N/A	N/A	75	15
5725-5850	N/A	N/A	75	N/A

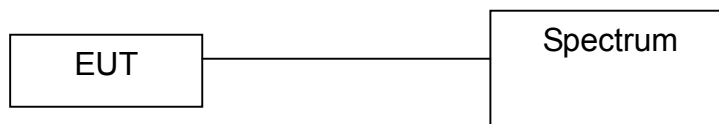
### 4.8.2 TEST EQUIPMENT

The following test equipment was used during the test:

Equipment/Facilities	Specifications	Manufacturer	Model#/Serial#	Due Date of Cal. & Cal. Center
SPECTRUM	9kHz-7GHz	ROHDE & SCHWARZ	FSP7/ 839511/010	MAR. 2009 ETC

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.8.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

### 4.8.4 TEST PROCEDURE

The EUT was operating in hopping mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

### 4.8.5 EUT OPERATING CONDITION

1. Set the EUT under frequency hopping transmission condition.
2. The EUT was set to the highest available power level.





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# TEST REPORT

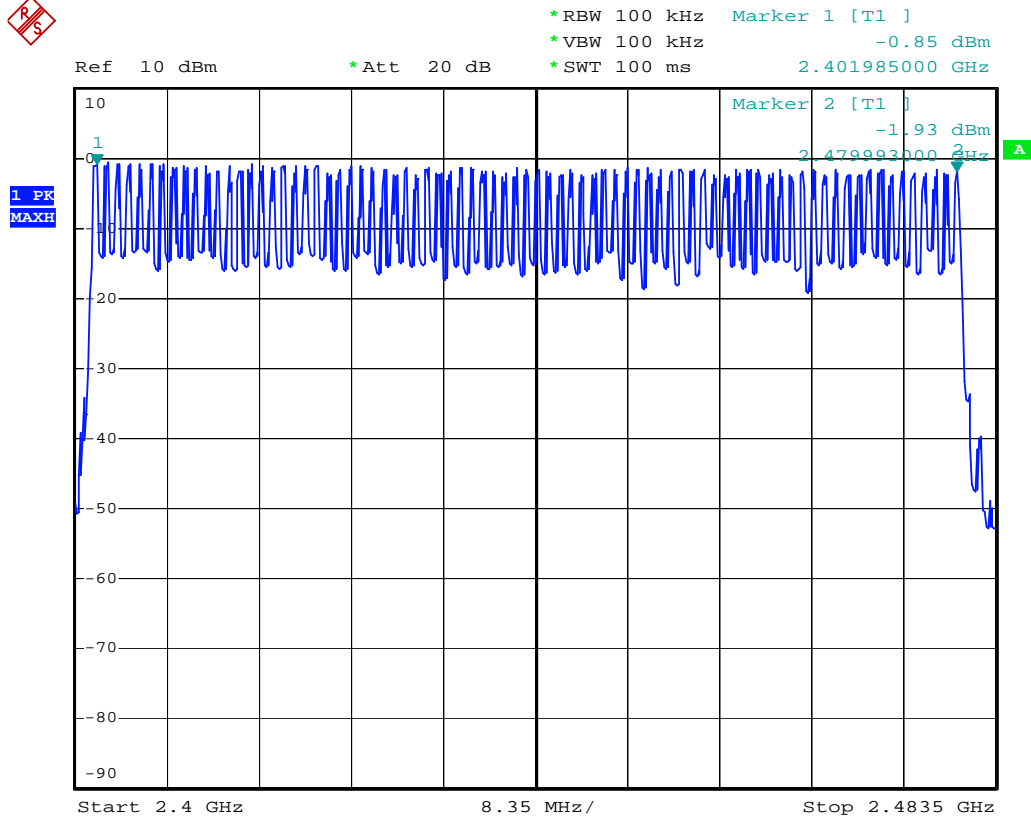
Reference No.: A08031306  
 Report No.: FCCA08031306  
 FCC ID: V83 BLUEW-2310  
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 Date: Apr. 21, 2008

## 4.8.6 TEST RESULT

Temperature:	<u>23°C</u>	Humidity:	<u>58%RH</u>
Spectrum Detector:	<u>PK</u>	Tested by:	<u>Shunm Wang</u>
Test Result:	<u>PASS</u>	Tested Mode:	<u>Bluetooth</u>
Tested Date:	<u>Feb.27,2008</u>		

Hopping Channel Frequency Range(MHz)	Quantity of Hopping Channel Read Value	Quantity of Hopping Channel Limit
2402~2480	79	75

CH0-CH78



-20dB bw

Date: 27.FEB.2008 08:22:37



## 4.9 TIME OF OCCUPANCY (Dwell Time)

### 4.9.1 LIMIT

FCC Part15, Subpart C Section 15.247.

Frequency Range (MHz)	Limit (ms)		
	20dB Bandwidth <250kHz(50Channel)	20dB Bandwidth >250kHz(25Channel)	20dB Bandwidth <1MHz(75Channel)
902-928	400(20s)	400(10s)	NA
2400-2483.5	NA	NA	400(30s)
5725-5850	NA	NA	400(30s)

**NOTE:** The “( )” is all channel’s average time of occupancy.

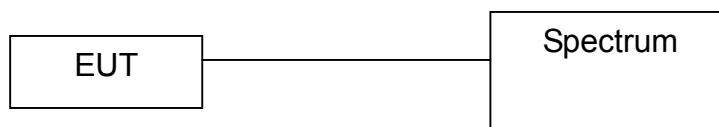
### 4.9.2 TEST EQUIPMENT

The following test equipment was used during the test:

Equipment/ Facilities	Specifications	Manufacturer	Model#/ Serial#	Due Date of Cal. & Cal. Center
SPECTRUM	9kHz-7GHz	ROHDE & SCHWARZ	FSP7/ 839511/010	MAR. 2009 ETC

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.9.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

### 4.9.4 TEST PROCEDURE

The EUT was operating in hopping mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

### 4.9.5 EUT OPERATING CONDITION

Same as section 4.1.5 of this report.



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# TEST REPORT

Reference No.: A08031306  
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## 4.9.6 TEST RESULT

Temperature: 23°C Humidity: 58%RH  
Spectrum Detector: PK Tested by: Shunm Wang  
Test Result: PASS Tested Mode: Bluetooth  
Tested Date: Feb.27,2008

Channel Number	Channel Frequency (MHz)	Pulse Time (µs)	Period Time (s)	Time of Occupancy (Dwell Time) (ms)	Average Time of Occupancy Limit (ms)
0	2402.00	404	31.6	127.664	400
39	2441.00	400	31.6	126.400	400
78	2480.00	404	31.6	127.664	400

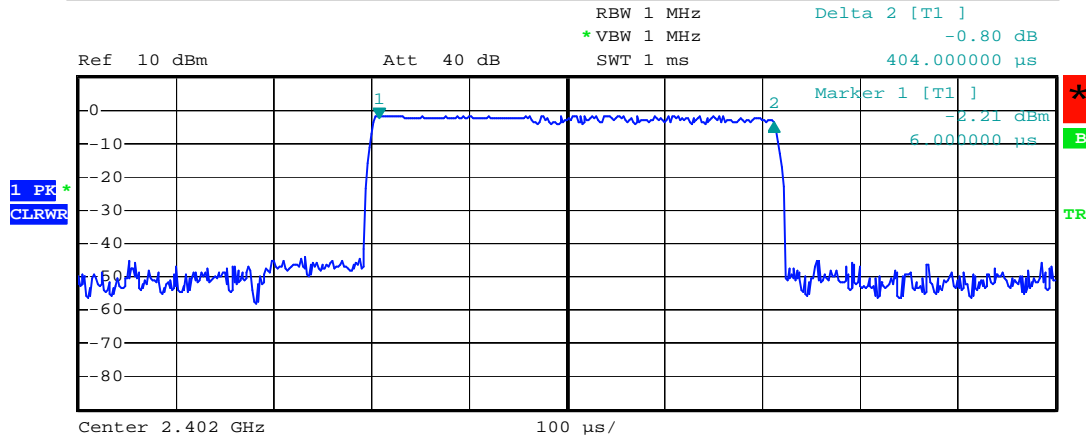
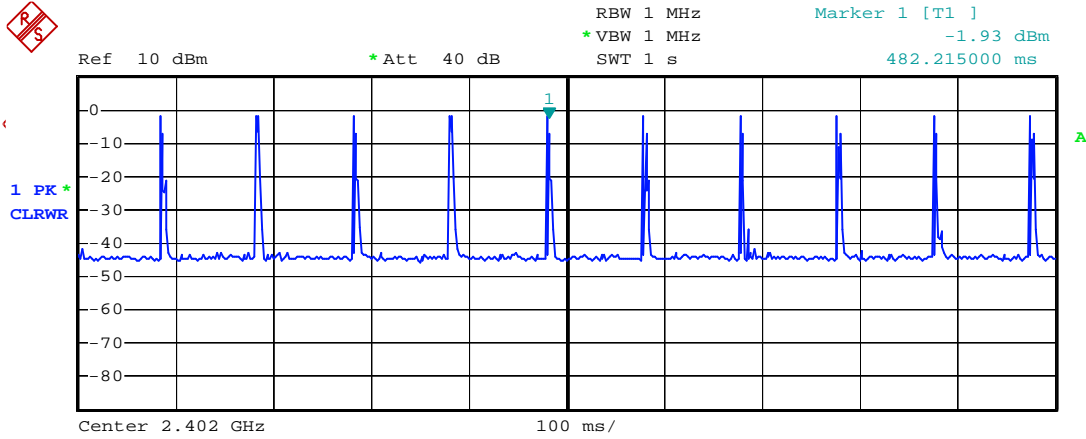


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# TEST REPORT

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CH0:

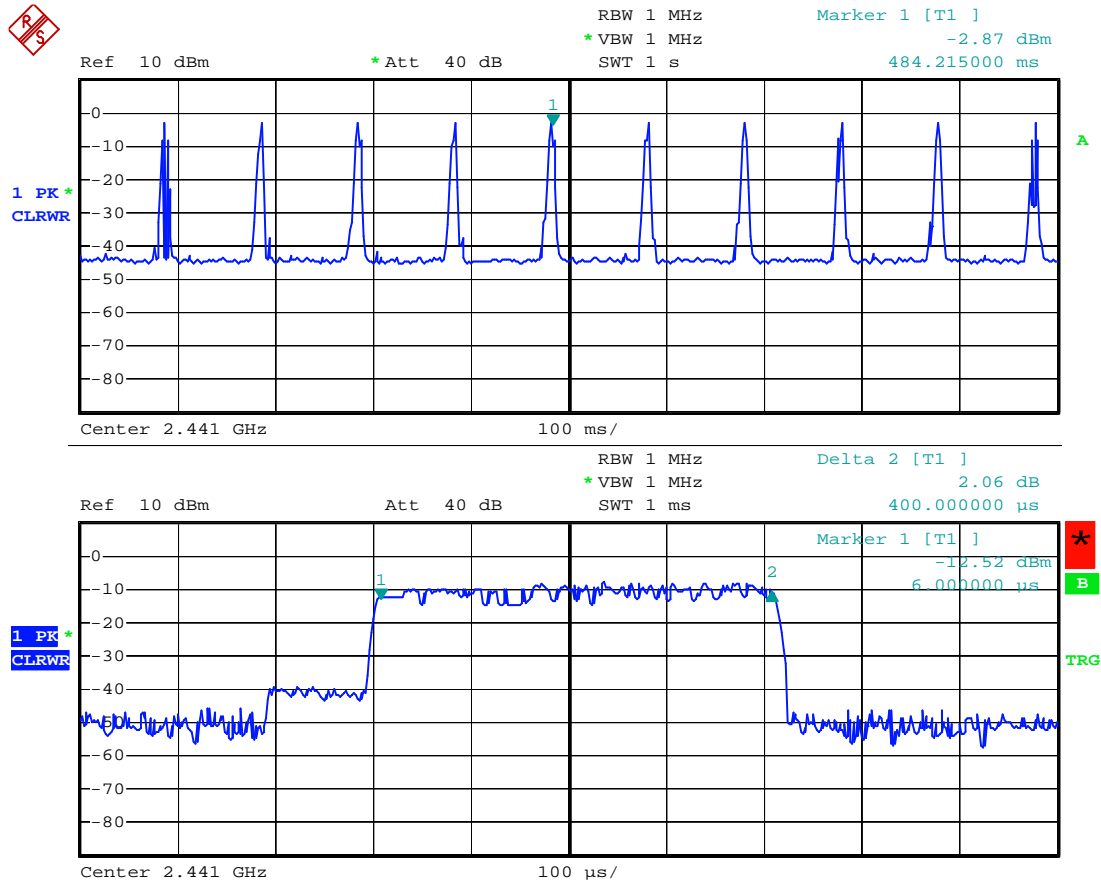


-20dB bw

Date: 27.FEB.2008 08:58:44



Ch39:



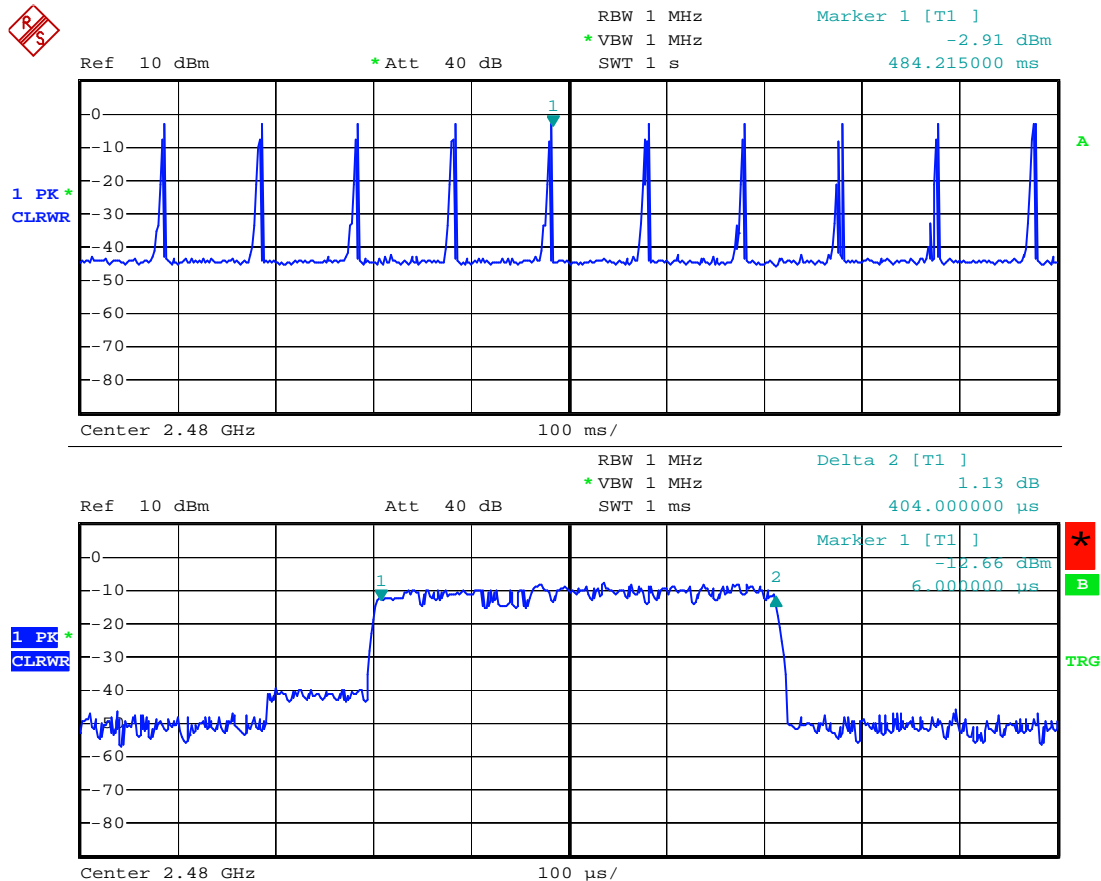
-20dB bw

Date: 27.FEB.2008 09:05:40

Date: 26.FEB.2008 14:45:00



CH78:



-20dB bw

Date: 27.FEB.2008 09:07:31



## 5. Antenna application

### 5.1 Antenna requirement

The EUT's antenna is met the requirement of FCC part15C section15.203 and 15.204.

FCC part15C section15.247 requirement:

Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

### 5.2 Result

The EUT's antenna used a Reverse SMA antenna. Gain of antenna types is  $2.0 \pm 0.5$  dBi that meet the requirement.



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### 7. TERMS OF ABBREVIATION

AV.	Average detection
AZ(°)	Turn table azimuth
Correct.	Correction
EL(m)	Antenna height (meter)
EUT	Equipment Under Test
Horiz.	Horizontal direction
LISN	Line Impedance Stabilization Network
NSA	Normalized Site Attenuation
Q.P.	Quasi-peak detection
SRT Lab	Spectrum Research & Testing Laboratory, Inc.
Vert.	Vertical direction