



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

TEST REPORT

Reference No.: A08011607
Report No.: FCCA08011607
FCC ID: SW8WM2210
Page: 1 of 32
Date: Jan. 23, 2008

Product Name: RF PRESENTER
Model No.: WM2210
Applicant: GOOD WAY ELECTRONIC (KUNSHAN) CO.,LTD.
57, No.366 Changjiang North Road KunShan City JiangSu
Province China
Date of Receipt: Jan. 16, 2008
Finished date of Test: Jan. 23, 2008
Applicable Standards: 47 CFR Part 15, Subpart C
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 Auth. , Date: Jan. 23, 2008
(Jeff Yu)

Approved By : [Signature] , Date: Jan. 23, 2008
(Johnson Ho, Director)

NVLAQ[®]

Lab Code: 200099-0
FMNG-059.10 REPORT



Table of Contents

1. DOCUMENT POLICY AND TEST STATEMENT	3
1.1 DOCUMENT POLICY	3
1.2 TEST STATEMENT	3
1.3 EUT MODIFICATION	3
2. DESCRIPTION OF EUT AND TEST MODE	4
2.1 GENERAL DESCRIPTION OF EUT	4
2.2 DESCRIPTION OF EUT INTERNAL DEVICE	4
2.3 DESCRIPTION OF TEST MODE	4
2.4 DESCRIPTION OF SUPPORT UNIT	5
3. DESCRIPTION OF APPLIED STANDARDS	5
4. RADIATED EMISSION TEST	6
4.1 LIMIT	6
4.2 TEST EQUIPMENT	7
4.3 TEST SET-UP	8
4.4 TEST PROCEDURE	9
4.5 EUT OPERATING CONDITION	9
4.6 TEST RESULT	10
5 BAND EDGE TEST	22
5.1 LIMIT	22
5.2 TEST EQUIPMENT	23
5.3 TEST SET-UP	24
5.4 TEST PROCEDURE	25
5.5 EUT OPERATING CONDITION	25
5.6 TEST RESULT	25
6. Antenna application	28
6.1 ANTENNA REQUIREMENT	28
6.2 RESULT	28
7 PHOTOS OF TESTING	29
8. TERMS OF ABBREVIATION	32



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

TEST REPORT

Reference No.: A08011607
Report No.: FCCA08011607
FCC ID: SW8WM2210
Page: 3 of 32
Date: Jan. 23, 2008

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.
- The NVLAP logo applies only to the applicable standards specified in this report.

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

PRODUCT	RF PRESENTER
MODEL NO.	WM2210
POWER SUPPLY	1.5V AAA Battery
FREQUENCY BAND	2.4 ~ 2.4835 GHz
NUMBER OF CHANNEL	3
RATED RF OUTPUT POWER	0 dBm
MODULATION TYPE	FSK
BIT RATE OF TRANSMISSION	1Mbps
ANTENNA TYPE	PCB printed
ANTENNA GAIN	1.26 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

3 channels are provided by EUT. 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	FSK	CH1	2402
2	FSK	CH2	2441
3	FSK	CH3	2480



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

TEST REPORT

Reference No.: A08011607
Report No.: FCCA08011607
FCC ID: SW8WM2210
Page: 5 of 32
Date: Jan. 23, 2008

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	NOTEBOOK	IBM	IBM R60i 7732-7LV	N/A	1.8m shielded power cord

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

ANSI C63.4: 2003

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



4. RADIATED EMISSION TEST

4.1 LIMIT

FCC Part15, Subpart C Section 15.209 limit of radiated emission for frequency below 1000MHz. 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 μ 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, Section15.35(b) limit of radiated emission for frequency above 1000 MHz

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80.0	60.0	74.0	54.0

FCC Part 15, Section15.249(a) limit of radiated emission

Fundamental Frequency (MHz)	Field Strength of Fundamental (mV/m)	Field Strength of Harmonics (uV/m)
902 ~ 928	50 or 94 (dBuV/m)	500 or 54 (dBuV/m)
2400 ~ 2483.5	50 or 94 (dBuV/m)	500 or 54 (dBuV/m)



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

TEST REPORT

Reference No.: A08011607
Report No.: FCCA08011607
FCC ID: SW8WM2210
Page: 7 of 32
Date: Jan. 23, 2008

4. 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	9 kHz TO 2750 MHz	ROHDE & SCHWARZ	ESCS30/ 830245/012	OCT. 2008 ETC
BI-LOG ANTENNA	26 MHz TO 2 GHz	EMCO	3142B / 0005-1534	NOV. 2008 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

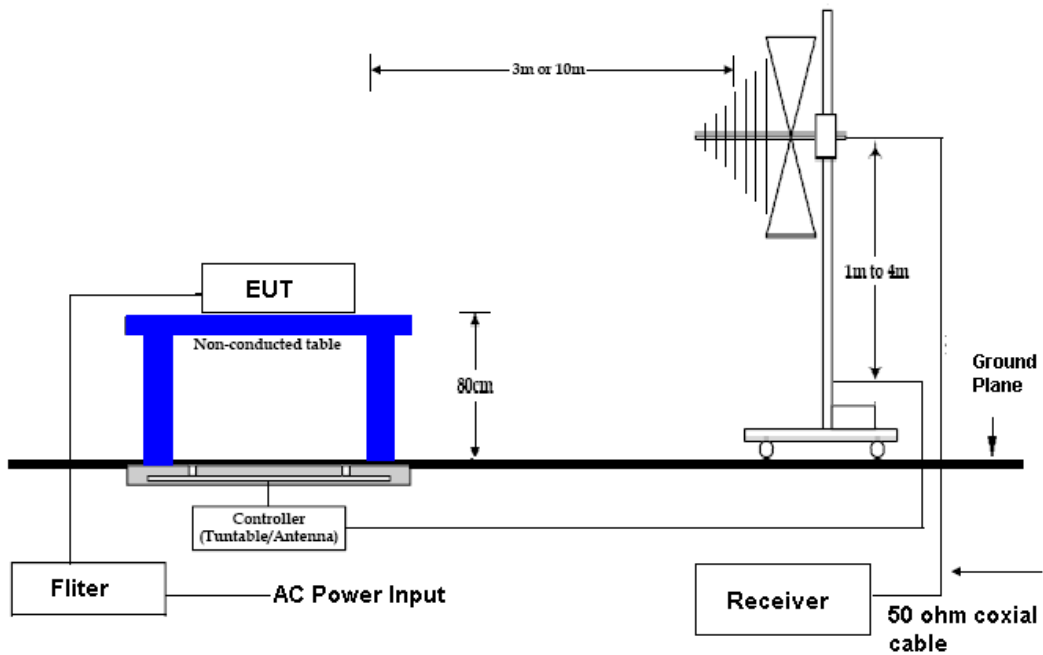
NOTE:

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.



4.3 TEST SET-UP

(30MHz - 1GHz)



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. 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 3 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.

4.5 EUT OPERATING CONDITION

Same as section 4.1.5 of this report.



TEST REPORT

4.6 TEST RESULT

Temperature:	24°C	Humidity:	61 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	TX
Tested By:	Jeff Yu	Tested Channel:	CH 1 : 2402MHz
Tested Date:	Jan. 21, 2008		

Antenna Polarization: Horizontal

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
80.339	-15.592	23.841	8.249	40.000	-31.751
132.615	-14.496	25.657	11.161	43.500	-32.339
339.780	-9.431	25.114	15.683	46.000	-30.317
461.756	-5.782	23.933	18.151	46.000	-27.849
636.008	-1.847	24.281	22.434	46.000	-23.566
854.790	2.140	24.408	26.548	46.000	-19.452

Antenna Polarization: Vertical

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
70.659	-17.236	24.557	7.321	40.000	-32.679
117.126	-13.635	25.948	12.313	43.500	-31.187
285.569	-11.428	24.699	13.271	46.000	-32.729
409.481	-7.390	21.838	14.448	46.000	-31.552
579.860	-3.073	23.683	20.610	46.000	-25.390
819.940	1.295	23.521	24.816	46.000	-21.184

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.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.



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

TEST REPORT

Reference No.: A08011607
 Report No.: FCCA08011607
 FCC ID: SW8WM2210
 Page: 11 of 32
 Date: Jan. 23, 2008

Temperature:	24°C	Humidity:	61 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	TX
Tested By:	Jeff Yu	Tested Channel:	CH 2 : 2441MHz
Tested Date:	Jan. 21, 2008		

Antenna Polarization: Horizontal

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
109.381	-14.085	24.626	10.541	43.500	-32.959
179.082	-14.710	23.733	9.023	43.500	-34.477
301.058	-10.890	23.980	13.089	46.000	-32.911
510.160	-4.656	25.774	21.118	46.000	-24.882
771.537	0.790	24.179	24.968	46.000	-21.032
901.258	3.036	24.338	27.374	46.000	-18.626

Antenna Polarization: Vertical

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
45.489	-13.631	23.867	10.236	40.000	-29.764
117.126	-13.635	25.948	12.313	43.500	-31.187
337.844	-9.592	24.126	14.533	46.000	-31.467
533.393	-4.130	24.309	20.179	46.000	-25.821
756.048	0.589	23.982	24.571	46.000	-21.429
891.577	2.882	23.561	26.442	46.000	-19.558

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.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.



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

TEST REPORT

Reference No.: A08011607
 Report No.: FCCA08011607
 FCC ID: SW8WM2210
 Page: 12 of 32
 Date: Jan. 23, 2008

Temperature:	24°C	Humidity:	61 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	TX
Tested By:	Jeff Yu	Tested Channel:	CH 3 : 2480MHz
Tested Date:	Jan. 21, 2008		

Antenna Polarization: Horizontal

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
72.595	-16.772	23.842	7.070	40.000	-32.930
117.126	-13.635	25.400	11.765	43.500	-31.735
510.160	-4.656	25.774	21.118	46.000	-24.882
680.539	-0.789	26.580	25.791	46.000	-20.209
854.790	2.140	24.408	26.548	46.000	-19.452
990.319	4.190	24.444	28.634	54.000	-25.366

Antenna Polarization: Vertical

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
35.808	-8.249	23.712	15.463	40.000	-24.537
132.615	-14.496	23.386	8.890	43.500	-34.610
208.124	-14.899	24.617	9.718	43.500	-33.782
514.032	-4.491	24.128	19.637	46.000	-26.363
651.497	-1.392	23.641	22.249	46.000	-23.751
945.788	3.493	23.763	27.256	46.000	-18.744

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.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.



TEST REPORT

Temperature:	24°C	Humidity:	61 %RH
Frequency Range:	1 – 18 GHz	Measured Distance:	3m
Receiver Detector:	PK & AV.	Tested Mode:	TX
Tested By:	Jeff Yu	Tested Channel:	CH 1 : 2402MHz
Tested Date:	Jan. 21, 2008		

Antenna Polarization:Horizontal

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4799.020	0.639	51.170	51.809	74.000	-22.191
7199.700	7.750	50.670	58.420	74.000	-15.580
9002.340	12.685	52.260	64.945	74.000	-9.055
4799.020	0.639	39.090	39.729	54.000	-14.271
7199.700	7.750	39.390	47.140	54.000	-6.860
9002.340	12.685	39.710	52.395	54.000	-1.605

Antenna Polarization:Vertical

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4781.350	0.613	52.360	52.973	74.000	-21.027
7326.500	8.265	52.340	60.605	74.000	-13.395
9959.360	16.602	52.030	68.631	74.000	-5.369
4781.350	0.613	37.580	38.193	54.000	-15.807
7326.500	8.265	39.840	48.105	54.000	-5.895
9959.360	16.602	35.050	51.651	54.000	-2.349

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.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.



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

TEST REPORT

Reference No.: A08011607
Report No.: FCCA08011607
FCC ID: SW8WM2210
Page: 14 of 32
Date: Jan. 23, 2008

Temperature:	24°C	Humidity:	61 %RH
Frequency Range:	1 – 18 GHz	Measured Distance:	3m
Receiver Detector:	PK & AV.	Tested Mode:	TX
Tested By:	Jeff Yu	Tested Channel:	CH 2 : 2441MHz
Tested Date:	Jan. 21, 2008		

Antenna Polarization: Horizontal

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4810.200	0.662	52.060	52.722	74.000	-21.278
7213.400	7.823	51.440	59.263	74.000	-14.737
9102.100	13.024	50.320	63.343	74.000	-10.657
4810.200	0.662	39.180	39.842	54.000	-14.158
7213.400	7.823	39.660	47.483	54.000	-6.517
9102.100	13.024	38.440	51.463	54.000	-2.537

Antenna Polarization: Vertical

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4805.260	0.651	51.390	52.041	74.000	-21.959
7206.950	7.796	51.440	59.236	74.000	-14.764
9112.300	13.066	50.760	63.825	74.000	-10.175
4805.260	0.651	38.240	38.891	54.000	-15.109
7206.950	7.796	39.470	47.266	54.000	-6.734
9112.300	13.066	39.870	52.935	54.000	-1.065

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.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.



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

TEST REPORT

Reference No.: A08011607
 Report No.: FCCA08011607
 FCC ID: SW8WM2210
 Page: 15 of 32
 Date: Jan. 23, 2008

Temperature:	24°C	Humidity:	61 %RH
Frequency Range:	1 – 18 GHz	Measured Distance:	3m
Receiver Detector:	PK & AV.	Tested Mode:	TX
Tested By:	Jeff Yu	Tested Channel:	CH 3 : 2480MHz
Tested Date:	Jan. 21, 2008		

Antenna Polarization: Horizontal

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4813.650	0.670	51.470	52.141	74.000	-21.859
7198.400	7.741	50.290	58.031	74.000	-15.969
9035.500	12.797	51.380	64.177	74.000	-9.823
4813.650	0.670	39.220	39.891	54.000	-14.109
7198.400	7.741	39.640	47.381	54.000	-6.619
9035.500	12.797	37.890	50.687	54.000	-3.313

Antenna Polarization: Vertical

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4813.650	0.670	51.470	52.141	74.000	-21.859
7198.400	7.741	50.290	58.031	74.000	-15.969
9423.500	15.112	51.380	66.492	74.000	-7.508
4813.650	0.670	38.480	39.151	54.000	-14.849
7198.400	7.741	39.070	46.811	54.000	-7.189
9423.500	15.112	37.690	52.802	54.000	-1.198

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.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.



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

TEST REPORT

Reference No.: A08011607
 Report No.: FCCA08011607
 FCC ID: SW8WM2210
 Page: 16 of 32
 Date: Jan. 23, 2008

Temperature:	24°C	Humidity:	61 %RH
Frequency Range:	18 – 26 GHz	Measured Distance:	3m
Receiver Detector:	PK & AV.	Tested Mode:	TX
Tested By:	Jeff Yu	Tested Channel:	CH 1 : 2402MHz
Tested Date:	Jan. 21, 2008		

Antenna Polarization: Horizontal

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
20053.600	24.744	42.110	66.854	74.000	-7.146
20053.600	24.744	24.660	49.404	54.000	-4.596

Antenna Polarization: Vertical

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
21008.640	26.473	44.160	70.634	74.000	-3.366
21008.640	26.473	26.180	52.654	54.000	-1.346

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.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.



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

TEST REPORT

Reference No.: A08011607
 Report No.: FCCA08011607
 FCC ID: SW8WM2210
 Page: 17 of 32
 Date: Jan. 23, 2008

Temperature:	24°C	Humidity:	61 %RH
Frequency Range:	18 – 26 GHz	Measured Distance:	3m
Receiver Detector:	PK & AV.	Tested Mode:	TX
Tested By:	Jeff Yu	Tested Channel:	CH 2 : 2441MHz
Tested Date:	Jan. 21, 2008		

Antenna Polarization: Horizontal

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
20478.600	25.490	41.002	66.493	74.000	-7.507
20478.600	25.490	26.160	51.651	54.000	-2.349

Antenna Polarization: Vertical

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
21068.600	26.600	43.100	69.700	74.000	-4.300
21068.600	26.600	26.118	52.718	54.000	-1.282

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.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.



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

TEST REPORT

Reference No.: A08011607
 Report No.: FCCA08011607
 FCC ID: SW8WM2210
 Page: 18 of 32
 Date: Jan. 23, 2008

Temperature:	<u>24°C</u>	Humidity:	<u>61 %RH</u>
Frequency Range:	<u>18 – 26 GHz</u>	Measured Distance:	<u>3m</u>
Receiver Detector:	<u>PK & AV.</u>	Tested Mode:	<u>TX</u>
Tested By:	<u>Jeff Yu</u>	Tested Channel:	<u>CH 3 : 2480MHz</u>
Tested Date:	<u>Jan. 21, 2008</u>		

Antenna Polarization: Horizontal

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
20447.900	25.445	42.110	67.556	74.000	-6.444
20447.900	25.445	25.390	50.836	54.000	-3.164

Antenna Polarization: Vertical

Frequency (MHz)	Correct Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
20336.800	25.248	41.220	66.468	74.000	-7.532
20336.800	25.248	23.760	49.008	54.000	-4.992

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.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.



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

TEST REPORT

Reference No.: A08011607
 Report No.: FCCA08011607
 FCC ID: SW8WM2210
 Page: 19 of 32
 Date: Jan. 23, 2008

Temperature: 24°C Humidity: 61 %RH
 Frequency Range: Above 1G Measured Distance: 3m
 Receiver Detector: PEAK Tested Mode: TX (Fundamental
 Tested Date: Mar. 22, 2008 Frequency)
 Tested By: Jeff Yu Tested Frequency: 2402 MHz

Fundamental frequency of transmitter

Frequency (MHz)	Antenna Polarization	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2402.01	H	-32.16	28.00	90.2	86.0	94.0	-8.0
2402.01	V	-32.16	28.00	92.5	88.3	94.0	-5.7

Receiver Detector: PEAK Tested Mode: TX (Harmonic)

Frequency (MHz)	Antenna Polarization	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4804.03	H	-30.47	33.64	43.9	47.1	54.0	-6.9
7206.06	V	-28.90	32.36	31.5	38.9	54.0	-15.1
4804.03	H	-30.47	33.64	44.2	47.4	54.0	-6.6
7206.06	V	-28.90	32.36	32.0	39.4	54.0	-14.6

NOTE :

1. Measurement uncertainty is less than +/- 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.
5. (F) : Fundamental frequency of transmitter.



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

TEST REPORT

Reference No.: A08011607
 Report No.: FCCA08011607
 FCC ID: SW8WM2210
 Page: 20 of 32
 Date: Jan. 23, 2008

Temperature:	<u>24°C</u>	Humidity:	<u>61 %RH</u>
Ferquency Range:	<u>Above 1G</u>	Measured Distance:	<u>3m</u>
Receiver Detector:	<u>PEAK</u>	Tested Mode:	<u>TX (Fundamental</u>
Tested Date:	<u>Mar. 22, 2008</u>		<u>Frequency)</u>
Tested By:	<u>Jeff Yu</u>	Tested Frequency:	<u>2441 MHz</u>

Fundamental frequency of transmitter

Frequency (MHz)	Antenna Polarization	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2440.99	H	-32.22	28.08	90.5	86.4	94.0	-7.6
2440.99	V	-32.22	28.08	92.1	88.0	94.0	-6.0

Receiver Detector: PEAK Tested Mode: TX (Harmonic)

Frequency (MHz)	Antenna Polarization	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4881.79	H	-30.27	33.70	43.1	46.5	54.0	-7.5
4881.79	V	-30.27	33.70	43.7	47.1	54.0	-6.9
7322.97	H	-29.04	36.36	31.8	39.3	54.0	-14.7
7322.97	V	-29.04	36.36	32.2	39.7	54.0	-14.3

NOTE :

1. Measurement uncertainty is less than +/- 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.
5. (F) : Fundamental frequency of transmitter.



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

TEST REPORT

Reference No.: A08011607
 Report No.: FCCA08011607
 FCC ID: SW8WM2210
 Page: 21 of 32
 Date: Jan. 23, 2008

Temperature:	<u>24°C</u>	Humidity:	<u>61 %RH</u>
Ferquency Range:	<u>Above 1G</u>	Measured Distance:	<u>3m</u>
Receiver Detector:	<u>PEAK</u>	Tested Mode:	<u>TX (Fundamental</u>
Tested Date:	<u>Mar. 22, 2008</u>		<u>Frequency)</u>
Tested By:	<u>Jeff Yu</u>	Tested Frequency:	<u>2480 MHz</u>

Fundamental frequency of transmitter

Frequency (MHz)	Antenna Polarization	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2480.02	H	-32.19	28.16	90.9	86.9	94.0	-7.1
2480.02	V	-32.19	28.16	92.4	88.4	94.0	-5.6

Receiver Detector: PEAK Tested Mode: TX (Harmonic)

Frequency (MHz)	Antenna Polarization	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4960.05	H	-30.26	33.77	42.8	46.3	54.0	-7.7
4960.05	V	-30.26	33.77	43.4	46.9	54.0	-7.1
7440.06	H	-28.95	36.45	31.6	39.1	54.0	-14.9
7440.06	V	-28.95	36.45	32.0	39.5	54.0	-14.5

NOTE :

1. Measurement uncertainty is less than +/- 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.
5. (F) : Fundamental frequency of transmitter.



5 BAND EDGE TEST

5.1 LIMIT

FCC Part15, Subpart C Section 15.249. 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



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

TEST REPORT

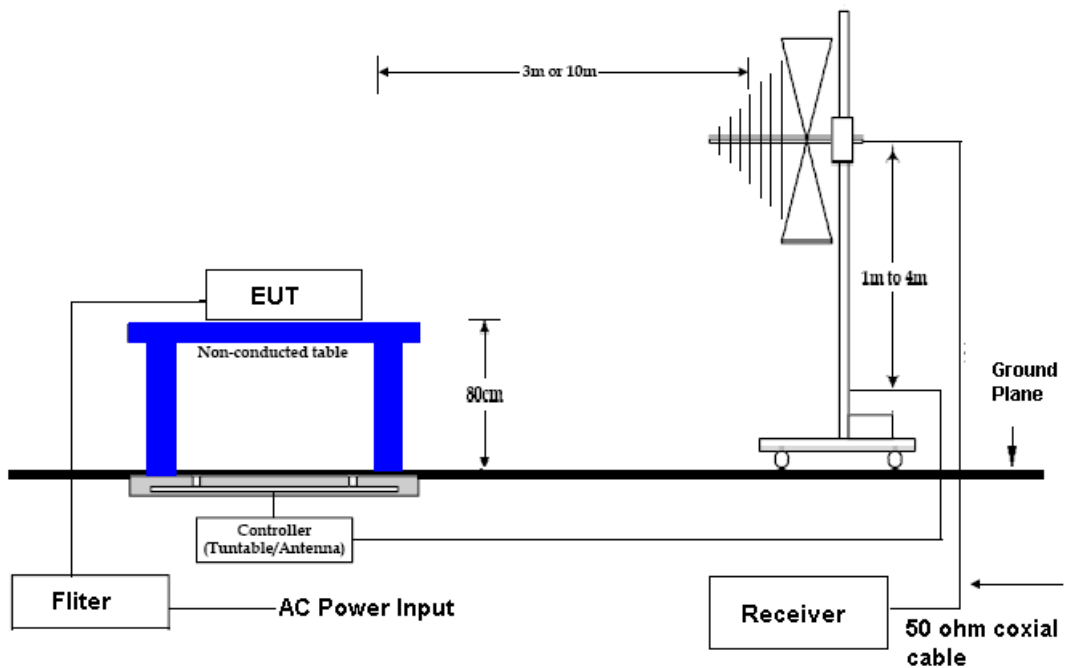
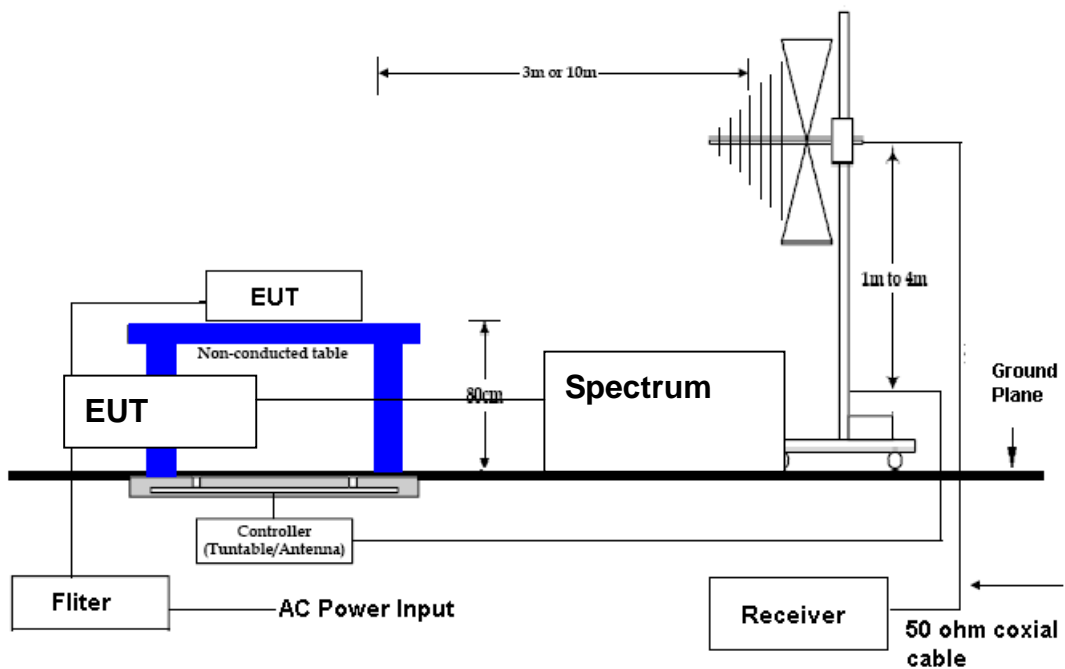
Reference No.: A08011607
Report No.: FCCA08011607
FCC ID: SW8WM2210
Page: 23 of 32
Date: Jan. 23, 2008

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. 2008 R&S
EMI TEST RECEIVER	9 kHz TO 2750 MHz	ROHDE & SCHWARZ	ESCS30/ 830245/012	AUG. 2008 R&S
SPECTRUM	9KHz-26.5GHz	HP	8593E/ 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. 2008 SRT
HORN ANTENNA	1GHz to 18GHz	EMCO	3115/ 9602-4681	DEC. 2008 ETC
OATS	3 - 10 M measurement	SRT	SRT-1	APR. 2008 SRT

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



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.



5.4 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.
- 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.

5.5 EUT OPERATING CONDITION

Same as section 4.1.5 of this report.

5.6 TEST RESULT

Temperature:	22°C	Humidity:	57%RH
Spectrum Detector:	PK & AV	Tested by:	Jeff Yu
Test Mode:	Link	Tested Date:	Jan. 23, 2008
Test Result:	PASS		

1. Conducted test

Frequency (MHz)	PEAK POWER OUTPUT (dBm)	Emission read Value(dBm)	Result of Band edge (dBc)	Band edge LIMIT (dBc)
<2400	-7.24	-31.32	-24.08	>20dBc
>2483.5	-9.08	-43.70	-34.62	>20dBc

2. Radiated emission test

Frequency (MHz)	Antenna polarization (H/V)	PEAK POWER OUTPUT (dBm)		Emission read Value(dBuV/m)		Band edge Limit (dBuV/m)	
		PK	AV	PK	AV	PK	AV
<2400	V	48.2	*	55.2	*	74.0	54.0
>2483.5	V	52.2	*	59.1	*	74.0	54.0

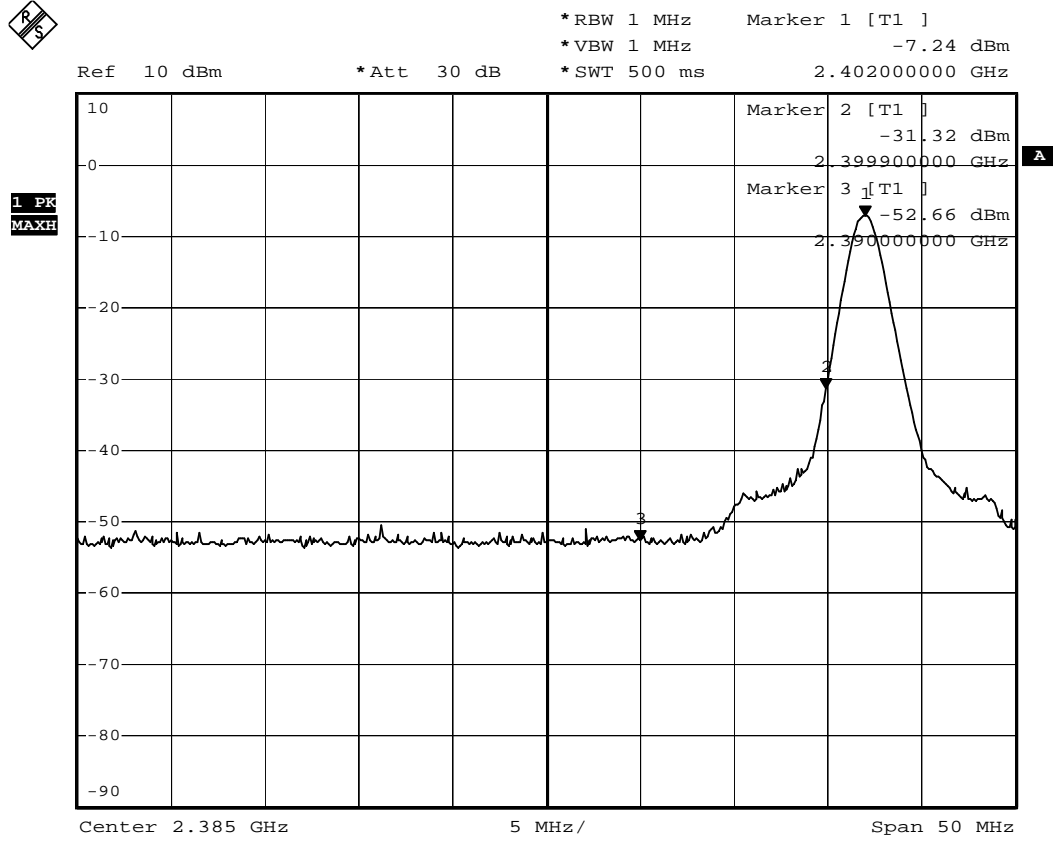


Spectrum Research & Testing Lab., Inc.
 No. 101-10, Ling 8,
 Shan-Tong Li, Chung-Li
 City, Taoyuan, Taiwan

TEST REPORT

Reference No.: A08011607
 Report No.: FCCA08011607
 FCC ID: SW8WM2210
 Page: 26 of 32
 Date: Jan. 23, 2008

<2400MHz:



-20dB bw

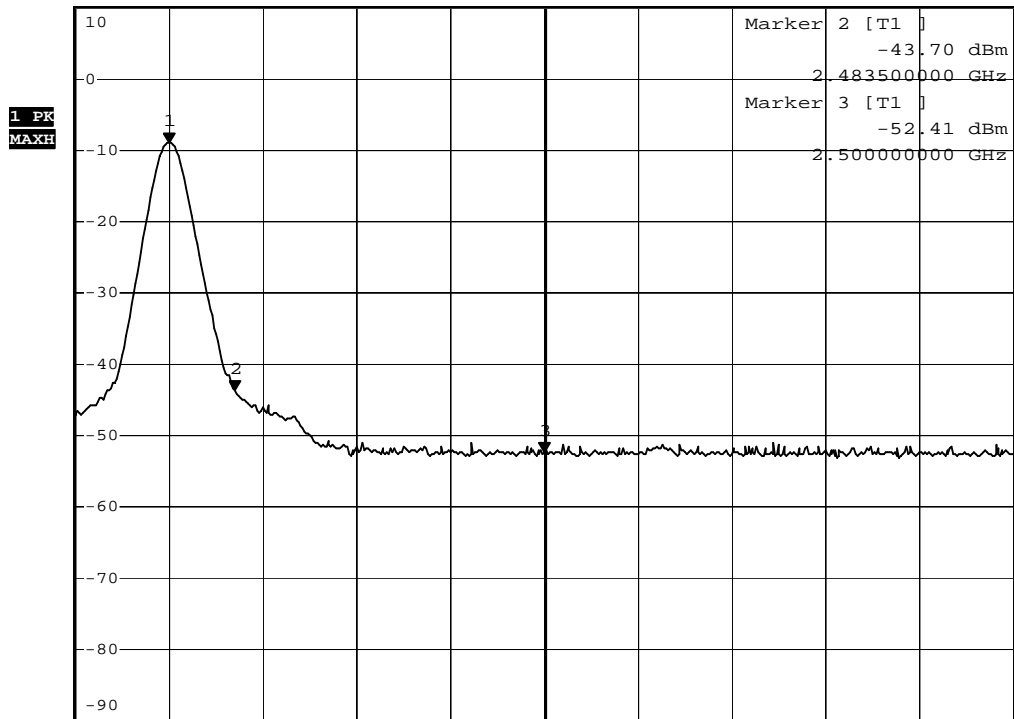
Date: 23.JAN.2008 13:16:04



>2483.5MHz



Ref 10 dBm *Att 30 dB *RBW 1 MHz Marker 1 [T1] -9.08 dBm
*VBW 1 MHz *SWT 500 ms 2.480000000 GHz



Center 2.5 GHz 5 MHz/ Span 50 MHz

-20dB bw

Date: 23.JAN.2008 13:14:30



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

TEST REPORT

Reference No.: A08011607
Report No.: FCCA08011607
FCC ID: SW8WM2210
Page: 28 of 32
Date: Jan. 23, 2008

6. Antenna application

6.1 Antenna requirement

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

FCC part15C section15.249 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.

6.2 Result

The EUT's antenna is printed on PCB. Gain of antenna types is 0dBi that meets the requirement.



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

TEST REPORT

Reference No.: A07103104
Report No.: FCCA07103104
FCC ID: UXNIV2120
Page: 32 of 32
Date: Dec. 04, 2007

8. 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



Lab Code: 200099-0
FMNG-059.10 REPORT