



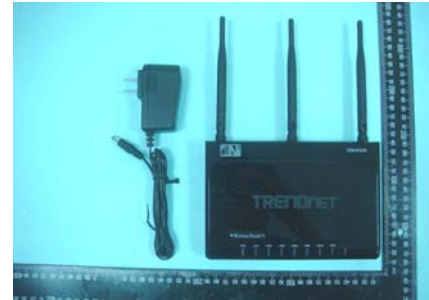
SPORTON International Inc.

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FCC RADIO TEST REPORT

Applicant's company	TRENDware International Inc.
Applicant Address	20675 Manhattan Place, Torrance, CA 90501 USA
FCC ID	S9ZTEW672GR
Manufacturer's company	TRENDware International Inc.
Manufacturer Address	20675 Manhattan Place, Torrance, CA 90501 USA

Product Name	Dual Band Wireless N Gigabit Router
Brand Name	TRENDnet
Model Name	TEW-672GR
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	May. 28, 2008
Final Test Date	Jun. 6, 2008
Submission Type	Original Equipment



Statement

Test result included is only for the 802.11b/g part and 802.11a (5725 ~ 5850MHz) of the product.

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.4-2003** and **47 CFR FCC Part 15 Subpart C**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.



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History of This Test Report

Original Issue Date: Jun. 11, 2008

Report No.: FR852817AC

- No additional attachment.
- Additional attachment were issued as following record:

Attachment No.	Issue Date	Description



1. CERTIFICATE OF COMPLIANCE

Product Name : Dual Band Wireless N Gigabit Router
Brand Name : TRENDnet
Model Name : TEW-672GR
Applicant : TRENDware International Inc.
Test Rule Part(s) : 47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on May. 28, 2008 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.


Wayne Hsu

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	Rule Section	Description of Test	Result	Under Limit
4.1	15.207	AC Power Line Conducted Emissions	Complies	2.31 dB
4.2	15.247(b)(3)	Maximum Peak Conducted Output Power	Complies	2.67 dB
4.3	15.247(e)	Power Spectral Density	Complies	18.59 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	0.25 dB
4.6	15.247(d)	Band Edge Emissions	Complies	0.32 dB
4.7	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Peak Conducted Output Power	±0.8dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
6dB Spectrum Bandwidth	±8.5×10 ⁻⁸	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7°C	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Power Type	WLAN (1TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	Power Adapter
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11a/g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	11b/g: 11 ; 11a: 5
Channel Band Width (99%)	11b: 15.00 MHz ; 11g: 16.48 MHz ; 11a: 16.52 MHz
Conducted Output Power	11b: 19.59 dBm ; 11g: 21.08 dBm ; 11a: 27.33 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

3.2. Accessories

Power	Brand	Model	Rating
Adapter	LEI	MT12-4120100-A1	Input: 120VAC, 50/60Hz, 0.3A Output: 12VDC, 1.0A

3.3. Table for Filed Antenna

For 2.4GHz Band

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
A	JOYMAX	TWF-152XMPXX-711	Dipole Antenna	Brass	2.22
B	JOYMAX	TWF-152XMPXX-711	Dipole Antenna	Brass	2.22
C	JOYMAX	TWF-152XMPXX-711	Dipole Antenna	Brass	2.22

Note:

(1) The EUT has three antennas .

(2) The EUT has three antenna ports, and the Port 1 have TX/RX function , Port 1, Part 2 and Port 3 have RX function.

Ant. A is transmitter antenna, only Ant. A were tested and recorded in the report.

Ant. A, Ant. B and Ant. C can both receive simultaneously.

Port 1: Ant. A

Port 2: Ant. B

Port 3: Ant. C

For 5GHz Band

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Remark
A	JOYMAX	TWF-152XMPXX-711	Dipole Antenna	Brass	3.00	TX / RX Ant.
B	JOYMAX	TWF-152XMPXX-711	Dipole Antenna	Brass	3.00	TX / RX Ant.
C	JOYMAX	TWF-152XMPXX-711	Dipole Antenna	Brass	3.00	TX / RX Ant.

Note:

(1) The EUT has three antennas .

(2) The EUT has three antenna ports, and the Port 1 have TX/RX function , Port 1, Part 2 and Port 3 have RX function.

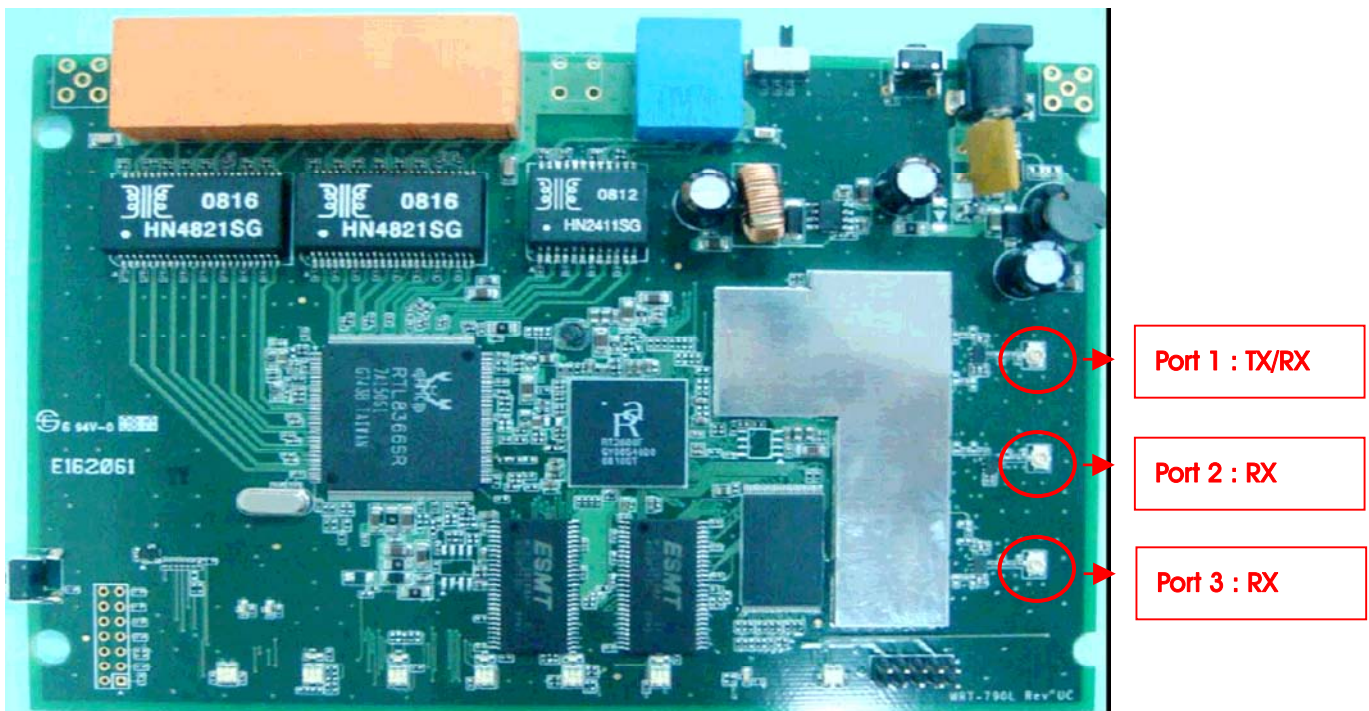
Ant. A is transmitter antenna, only Ant. A were tested and recorded in the report.

Ant. A, Ant. B and Ant. C can both receive simultaneously.

Port 1: Ant. A

Port 2: Ant. B

Port 3: Ant. C



3.4. Table for Carrier Frequencies

Frequency Allocation for 802.11b/g

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400~2483.5MHz	1	2412 MHz	7	2442 MHz
	2	2417 MHz	8	2447 MHz
	3	2422 MHz	9	2452 MHz
	4	2427 MHz	10	2457 MHz
	5	2432 MHz	11	2462 MHz
	6	2437 MHz		

Frequency Allocation for 802.11a

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5725~5850 MHz (USA/Canada/Taiwan)	149	5745 MHz		
	153	5765 MHz		
	157	5785 MHz		
	161	5805 MHz		
	165	5825 MHz		

3.5. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel	Antenna
AC Power Line Conducted Emissions	Normal Link	Auto	-	-
Max. Peak Conducted Output Power Power Spectral Density 6dB Spectrum Bandwidth	11b/CCK	11 Mbps	1/6/11	A
	11g/BPSK	6 Mbps	1/6/11	A
	11a/BPSK	6 Mbps	149/157/165	A
Radiated Emissions Below 1GHz	11g/BPSK	Auto	-	-
Radiated Emissions Above 1GHz	11b/CCK	11 Mbps	1/6/11	A
	11g/BPSK	6 Mbps	1/6/11	A
	11a/BPSK	6 Mbps	149/157/165	A
Band Edge Emissions	11b/CCK	11 Mbps	1/11	A
	11g/BPSK	6 Mbps	1/11	A
	11a/BPSK	6 Mbps	149/165	A

3.6. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
03CH03-HY	SAC	Hwa Ya	101377	IC 4088	-
CO04-HY	Conduction	Hwa Ya	101377	IC 4088	-
TH01-HY	OVEN Room	Hwa Ya	-	-	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC); Fully Anechoic Chamber (FAC).

Please refer section 6 for Test Site Address.

3.7. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	D520	E2KWM3945ABG
Notebook	DELL	D520	E2KWM3945ABG
Notebook	DELL	1200	E2K4965AGNM
Switch Hub	EtherHub-16	N/A	DOC

3.8. Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

For 2.4GHz Band

Power Parameters of IEEE 802.11b/g Ant. A

Test Software Version	QA		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	09	0A	0D
IEEE 802.11g	0E	0D	0D

For 5GHz Band

Power Parameters of IEEE 802.11a Ant. A

Test Software Version	QA		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	0D	0F	0F

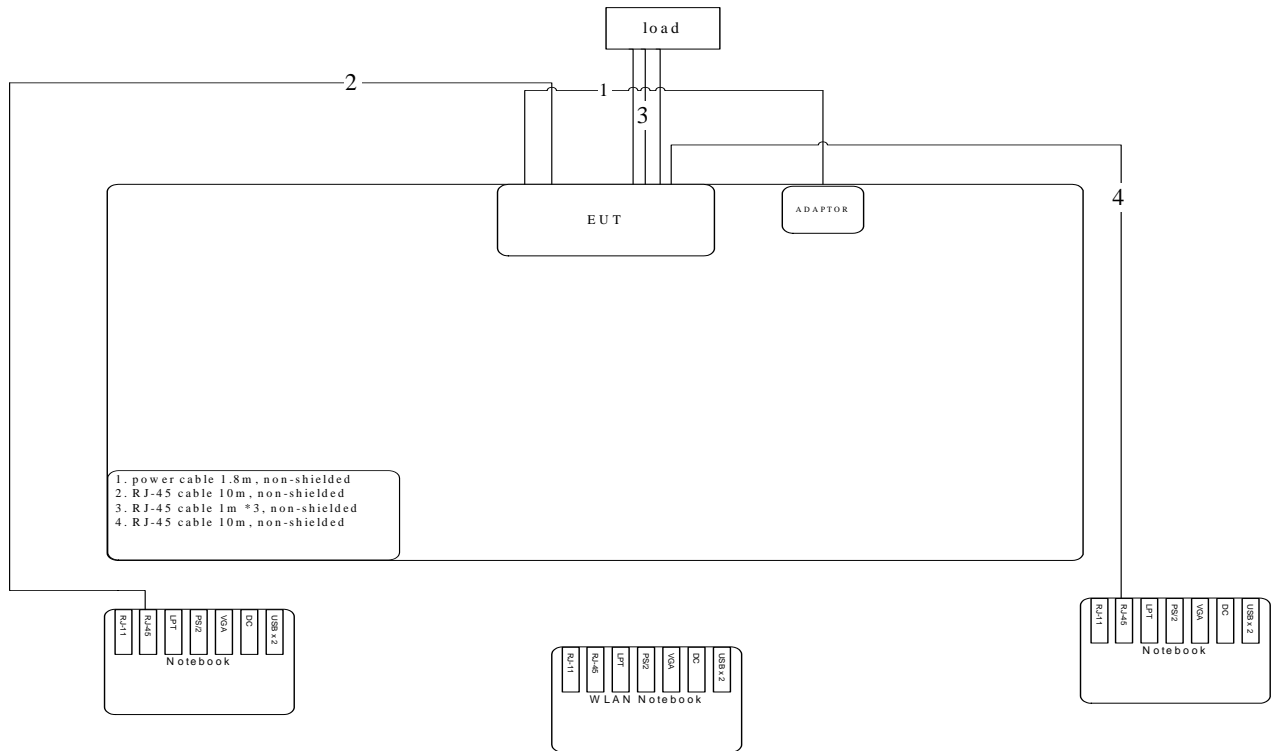
During the test, "Ping.exe" under WIN XP was executed to link with the remote workstation to receive and transmit signal by LAN and WLAN.

At the same time, "QA" was executed the test program to control the EUT continuously transmit RF signal.

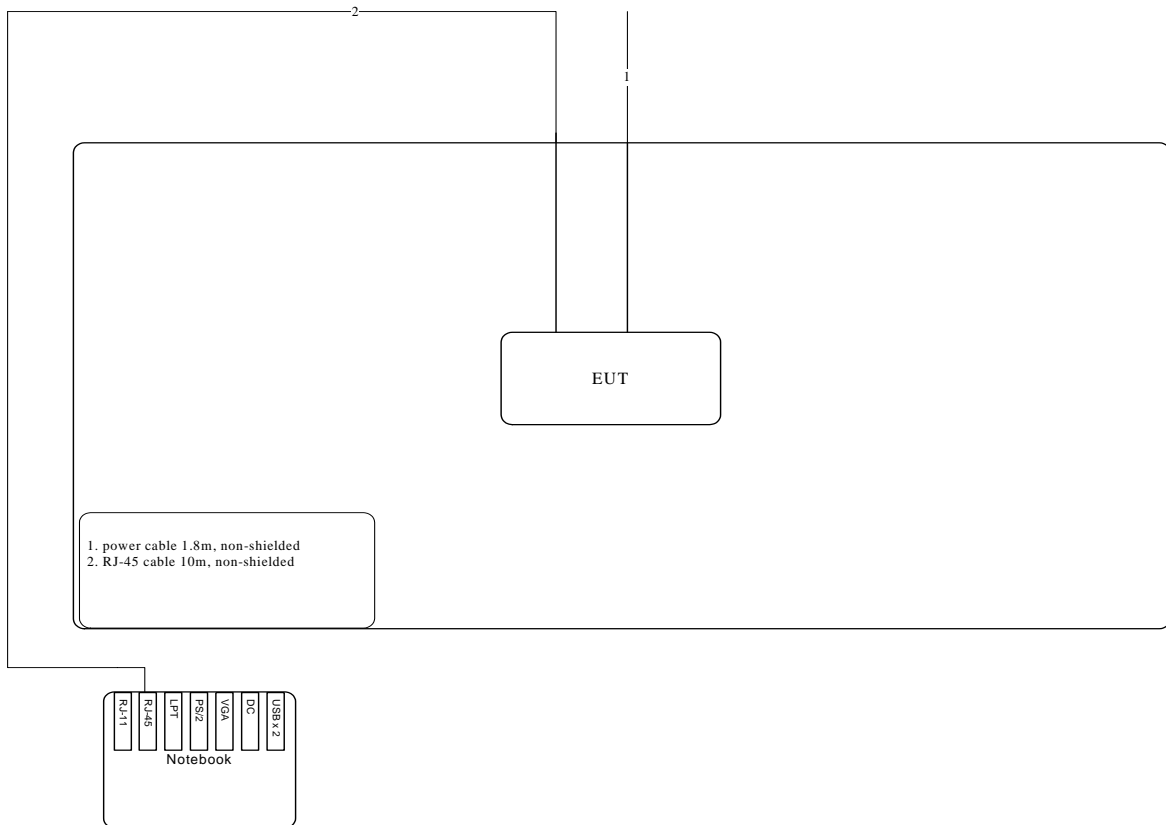
3.9. Test Configurations

3.9.1. Radiation Emissions Test Configuration

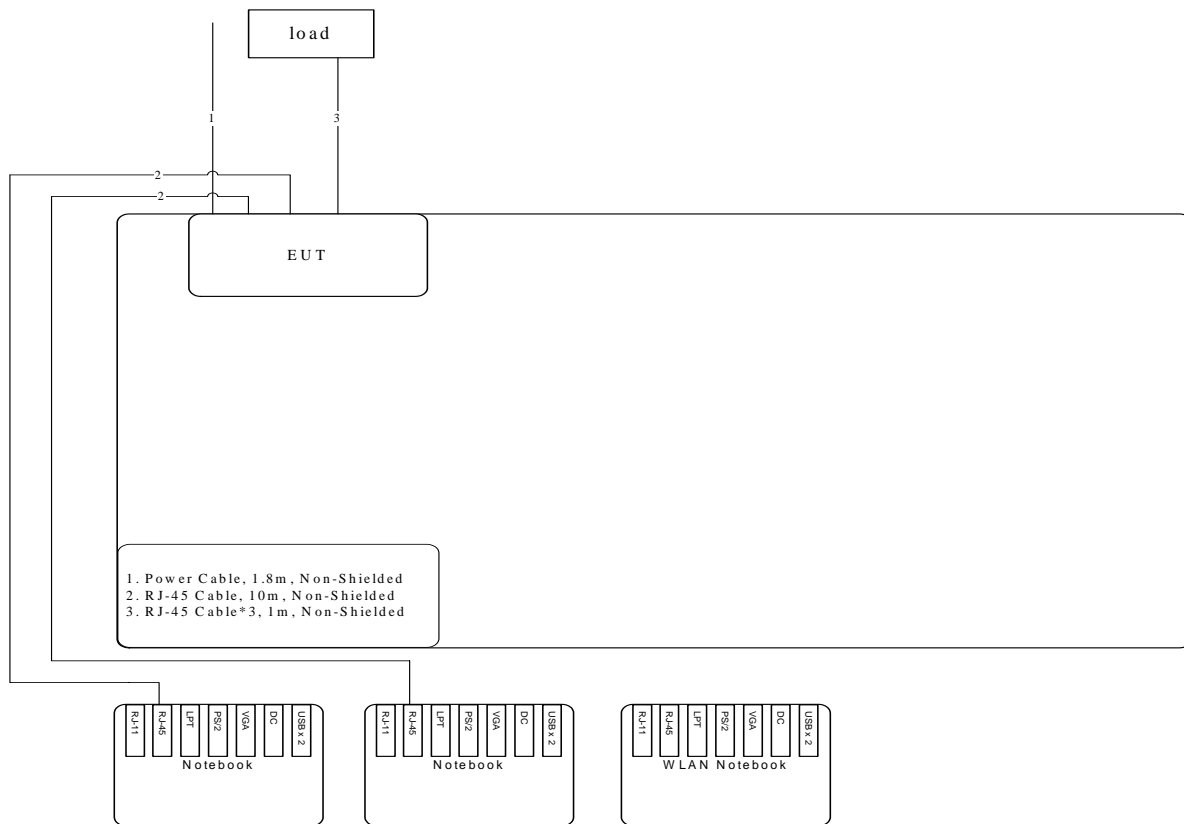
Test Configuration: 30KHz~1GHz / Ant. A



Test Configuration: above 1GHz / Ant. A



3.9.2. AC Power Line Conduction Emissions Test Configuration



4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

For this product which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

4.1.2. Measuring Instruments and Setting

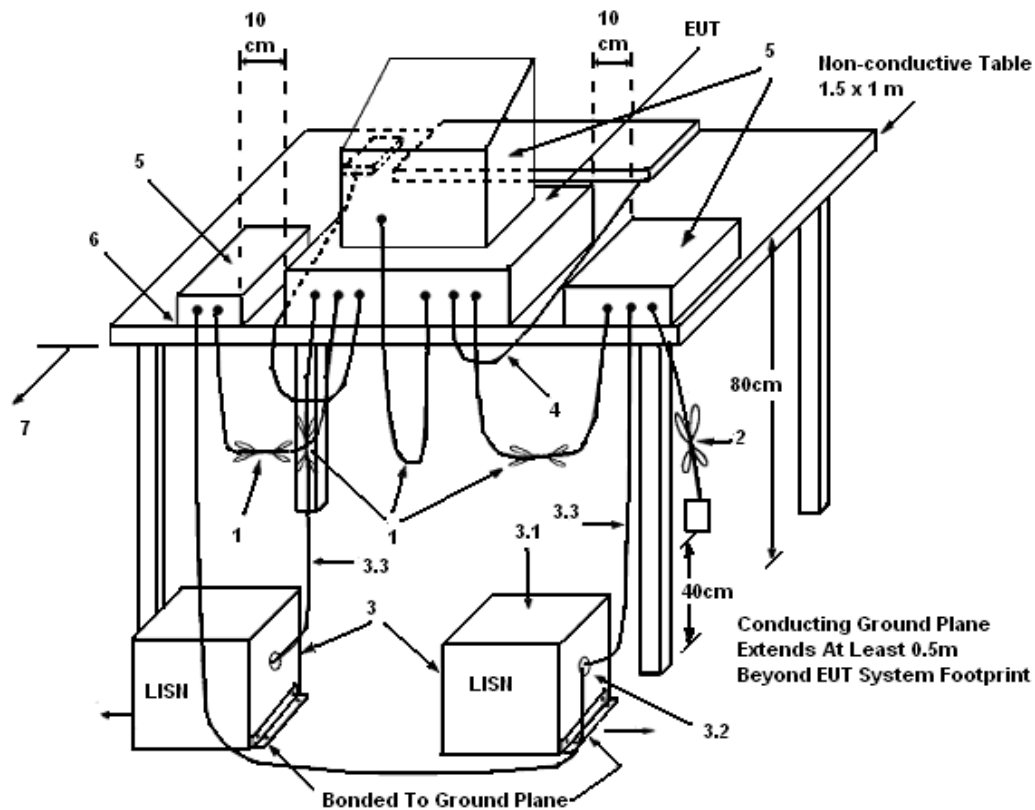
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 KHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

4.1.4. Test Setup Layout



LEGEND:

- (1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- (2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- (3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω . LISN can be placed on top of, or immediately beneath, reference ground plane.
 - (3.1) All other equipment powered from additional LISN(s).
 - (3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
 - (3.3) LISN at least 80 cm from nearest part of EUT chassis.
- (4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.
- (5) Non-EUT components of EUT system being tested.
- (6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.
- (7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

4.1.5. Test Deviation

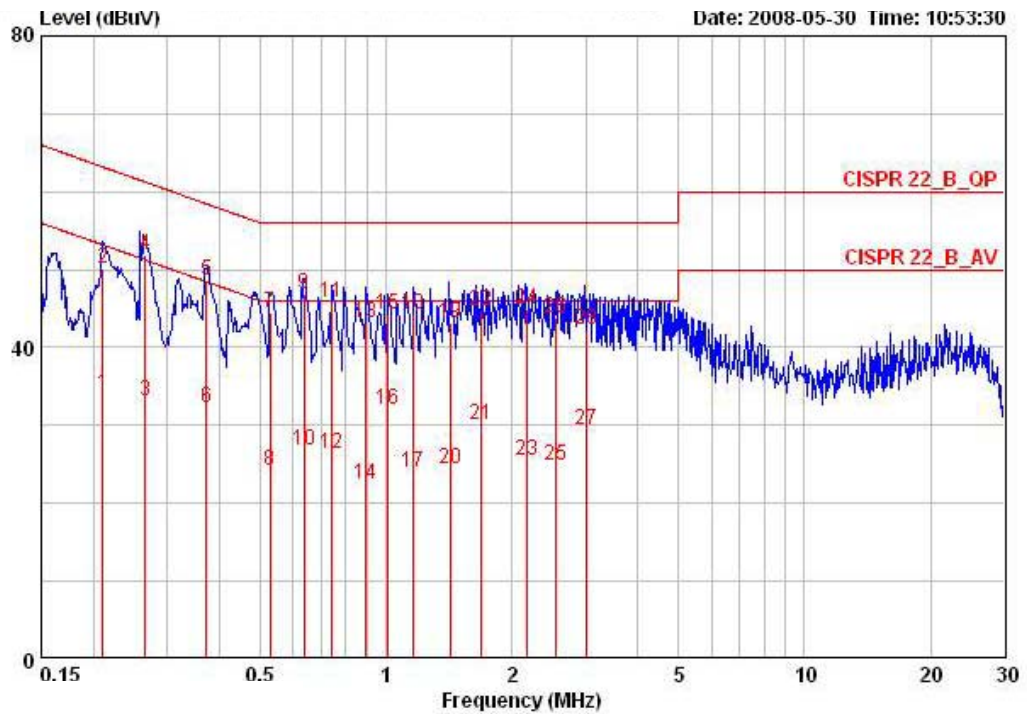
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was placed on the test table and programmed in normal function.

4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23°C	Humidity	54%
Test Engineer	Rex Chiu	Phase	Line
Configuration	Normal Link		

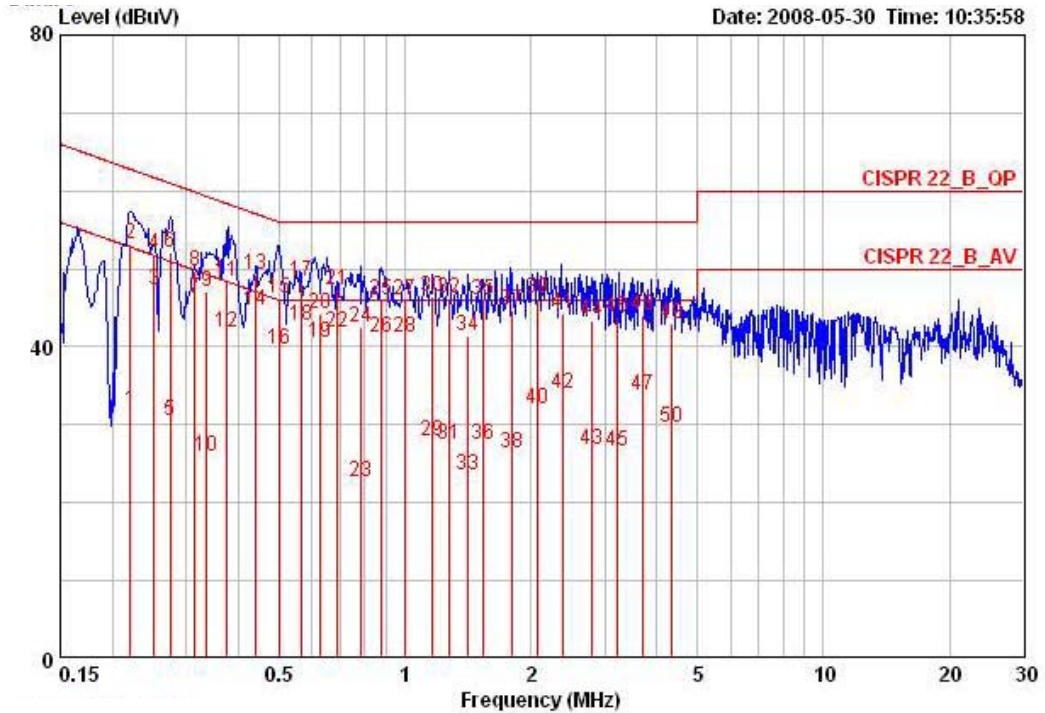


	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.21055	34.05	-19.13	53.18	33.75	0.10	0.20	AVERAGE
2	0.21055	50.03	-13.15	63.18	49.73	0.10	0.20	QP
3	0.26528	33.08	-18.18	51.26	32.78	0.10	0.20	AVERAGE
4	0.26528	51.87	-9.39	61.26	51.57	0.10	0.20	QP
5	0.37154	48.57	-9.90	58.47	48.27	0.10	0.20	QP
6	0.37154	32.35	-16.12	48.47	32.05	0.10	0.20	AVERAGE
7	0.52855	44.44	-11.57	56.00	44.16	0.08	0.20	QP
8	0.52855	24.22	-21.79	46.00	23.94	0.08	0.20	AVERAGE
9	0.63623	46.79	-9.21	56.00	46.53	0.06	0.20	QP
10	0.63623	26.72	-19.28	46.00	26.46	0.06	0.20	AVERAGE
11	0.74142	45.71	-10.29	56.00	45.47	0.04	0.20	QP
12	0.74142	26.39	-19.61	46.00	26.15	0.04	0.20	AVERAGE
13	0.89761	43.25	-12.76	56.00	43.03	0.02	0.20	QP
14	0.89761	22.54	-23.47	46.00	22.32	0.02	0.20	AVERAGE
15	1.007	44.24	-11.76	56.00	44.04	0.00	0.20	QP
16	1.007	32.10	-13.90	46.00	31.90	0.00	0.20	AVERAGE
17	1.163	24.00	-22.00	46.00	23.84	0.00	0.16	AVERAGE
18	1.163	44.21	-11.79	56.00	44.05	0.00	0.16	QP
19	1.429	43.09	-12.91	56.00	42.98	0.00	0.11	QP
20	1.429	24.40	-21.60	46.00	24.29	0.00	0.11	AVERAGE
21	1.693	30.14	-15.86	46.00	30.00	0.00	0.14	AVERAGE



	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
22	1.693	44.60	-11.40	56.00	44.46	0.00	0.14	QP
23	2.170	25.59	-20.41	46.00	25.39	0.00	0.20	AVERAGE
24	2.170	44.83	-11.17	56.00	44.63	0.00	0.20	QP
25	2.542	24.90	-21.10	46.00	24.70	0.00	0.20	AVERAGE
26	2.542	43.71	-12.29	56.00	43.51	0.00	0.20	QP
27	3.009	29.49	-16.51	46.00	29.29	0.00	0.20	AVERAGE
28	3.009	42.20	-13.80	56.00	42.00	0.00	0.20	QP

Temperature	23°C	Humidity	54%
Test Engineer	Rex Chiu	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.22083	31.82	-20.97	52.79	31.42	0.20	0.20	AVERAGE
2	0.22083	53.26	-9.53	62.79	52.86	0.20	0.20	QP
3	0.25083	47.37	-4.36	51.73	46.99	0.18	0.20	AVERAGE
4	0.25083	51.90	-9.83	61.73	51.52	0.18	0.20	QP
5	0.27442	30.42	-20.57	50.98	30.05	0.17	0.20	AVERAGE
6	0.27442	52.10	-8.89	60.98	51.73	0.17	0.20	QP
7	0.31403	46.16	-3.70	49.86	45.81	0.15	0.20	AVERAGE
8	0.31403	49.60	-10.26	59.86	49.25	0.15	0.20	QP
9	0.33562	47.10	-12.21	59.31	46.77	0.13	0.20	QP
10	0.33562	26.00	-23.31	49.31	25.67	0.13	0.20	AVERAGE
11	0.37643	48.29	-10.07	58.36	47.99	0.10	0.20	QP
12	0.37643	41.81	-6.55	48.36	41.51	0.10	0.20	AVERAGE
13	0.43803	49.32	-7.78	57.10	49.02	0.10	0.20	QP
14	0.43803	44.79	-2.31	47.10	44.49	0.10	0.20	AVERAGE
15	0.50233	46.28	-9.72	56.00	45.98	0.10	0.20	QP
16	0.50233	39.60	-6.40	46.00	39.30	0.10	0.20	AVERAGE
17	0.56433	48.45	-7.55	56.00	48.15	0.10	0.20	QP
18	0.56433	42.83	-3.17	46.00	42.53	0.10	0.20	AVERAGE
19	0.62723	40.54	-5.46	46.00	40.24	0.10	0.20	AVERAGE
20	0.62723	44.31	-11.69	56.00	44.01	0.10	0.20	QP
21	0.69003	47.39	-8.61	56.00	47.09	0.10	0.20	QP



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
22	0.69003	41.79	-4.21	46.00	41.49	0.10	0.20	AVERAGE
23	0.78345	22.57	-23.43	46.00	22.27	0.10	0.20	AVERAGE
24	0.78345	42.46	-13.54	56.00	42.16	0.10	0.20	QP
25	0.87871	45.93	-10.07	56.00	45.63	0.10	0.20	QP
26	0.87871	41.27	-4.73	46.00	40.97	0.10	0.20	AVERAGE
27	1.004	45.99	-10.01	56.00	45.69	0.10	0.20	QP
28	1.004	41.16	-4.84	46.00	40.86	0.10	0.20	AVERAGE
29	1.166	27.94	-18.06	46.00	27.68	0.10	0.16	AVERAGE
30	1.166	46.53	-9.47	56.00	46.27	0.10	0.16	QP
31	1.271	27.41	-18.59	46.00	27.17	0.10	0.14	AVERAGE
32	1.271	46.12	-9.88	56.00	45.88	0.10	0.14	QP
33	1.419	23.54	-22.46	46.00	23.33	0.10	0.11	AVERAGE
34	1.419	41.36	-14.64	56.00	41.15	0.10	0.11	QP
35	1.535	45.89	-10.11	56.00	45.68	0.10	0.11	QP
36	1.535	27.45	-18.55	46.00	27.24	0.10	0.11	AVERAGE
37	1.796	44.74	-11.26	56.00	44.48	0.10	0.16	QP
38	1.796	26.43	-19.57	46.00	26.17	0.10	0.16	AVERAGE
39	2.065	46.30	-9.70	56.00	46.00	0.10	0.20	QP
40	2.065	32.00	-14.00	46.00	31.70	0.10	0.20	AVERAGE
41	2.381	44.19	-11.81	56.00	43.89	0.10	0.20	QP
42	2.381	33.99	-12.01	46.00	33.69	0.10	0.20	AVERAGE
43	2.801	26.73	-19.27	46.00	26.43	0.10	0.20	AVERAGE
44	2.801	43.40	-12.60	56.00	43.10	0.10	0.20	QP
45	3.229	26.52	-19.48	46.00	26.17	0.10	0.25	AVERAGE
46	3.229	43.89	-12.11	56.00	43.54	0.10	0.25	QP
47	3.705	33.74	-12.26	46.00	33.34	0.10	0.30	AVERAGE
48	3.705	43.96	-12.04	56.00	43.56	0.10	0.30	QP
49	4.338	43.00	-13.00	56.00	42.60	0.10	0.30	QP
50	4.338	29.69	-16.31	46.00	29.29	0.10	0.30	AVERAGE

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. Maximum Conducted Output Power Measurement

4.2.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. The limited has to be reduced by the amount in dB that the gain of the antenna exceed 6dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi. Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

4.2.2. Measuring Instruments and Setting

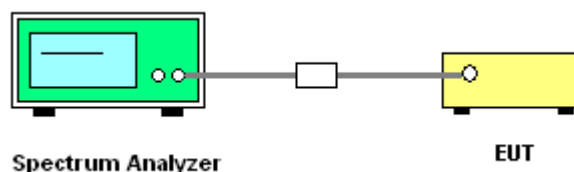
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1000 kHz
VB	3000 kHz
Detector	PEAK
Trace	MAX HOLD
Sweep Time	20ms

4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Test was performed in accordance with Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005.
3. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Maximum Conducted Output Power

Temperature	26°C	Humidity	62%
Test Engineer	Sam Chen	Configurations	802.11a/b/g

Configuration IEEE 802.11b / Ant. A

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	17.48	30.00	Complies
6	2437 MHz	18.33	30.00	Complies
11	2462 MHz	19.59	30.00	Complies

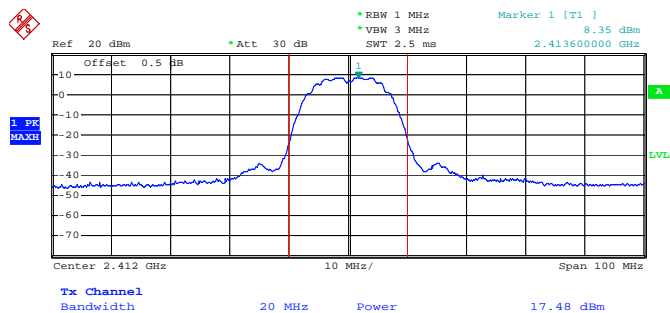
Configuration IEEE 802.11g / Ant. A

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	21.08	30.00	Complies
6	2437 MHz	20.72	30.00	Complies
11	2462 MHz	20.49	30.00	Complies

Configuration IEEE 802.11a / Ant. A

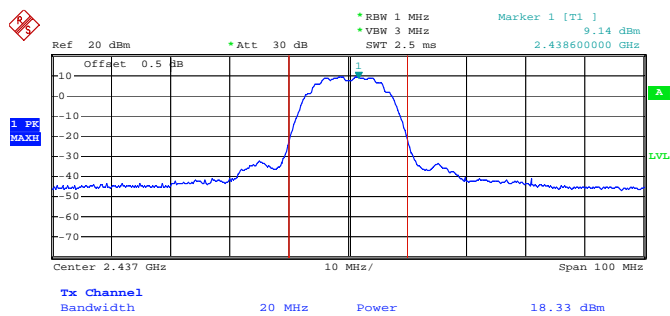
Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	26.53	30.00	Complies
157	5785 MHz	27.33	30.00	Complies
165	5825 MHz	26.73	30.00	Complies

Channel Output Power Plot on Configuration IEEE 802.11b / Ant. A / 2412 MHz



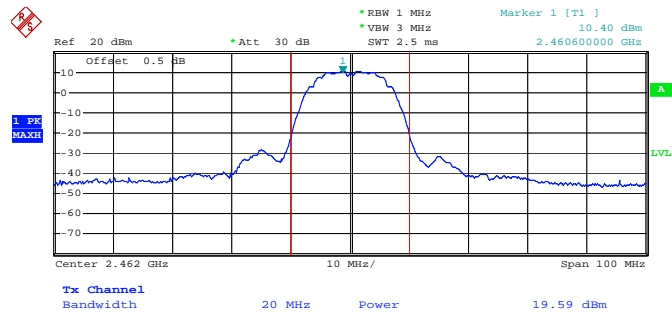
Date: 3.JUN.2008 18:06:14

Channel Output Power Plot on Configuration IEEE 802.11b / Ant. A / 2437 MHz



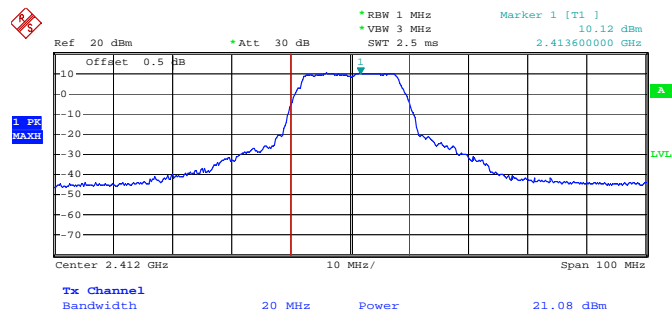
Date: 3.JUN.2008 18:07:15

Channel Output Power Plot on Configuration IEEE 802.11b / Ant. A / 2462 MHz



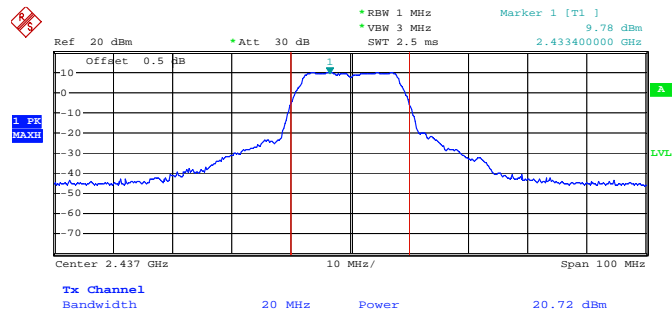
Date: 3.JUN.2008 18:07:55

Channel Output Power Plot on Configuration IEEE 802.11g / Ant. A / 2412 MHz



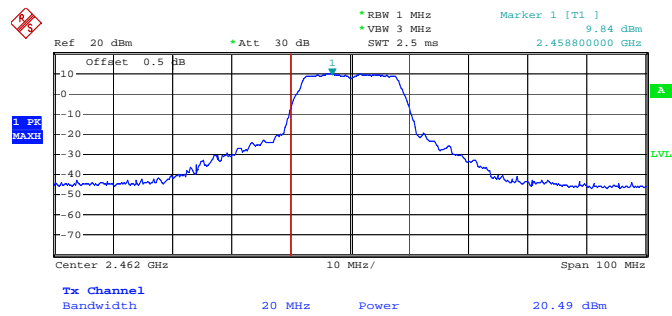
Date: 3.JUN.2008 18:09:15

Channel Output Power Plot on Configuration IEEE 802.11g / Ant. A / 2437 MHz



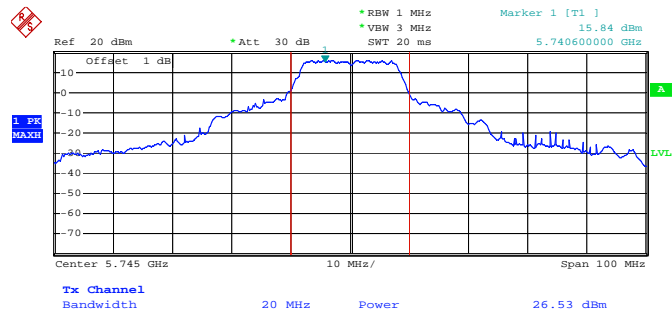
Date: 3.JUN.2008 18:09:59

Channel Output Power Plot on Configuration IEEE 802.11g / Ant. A / 2462 MHz



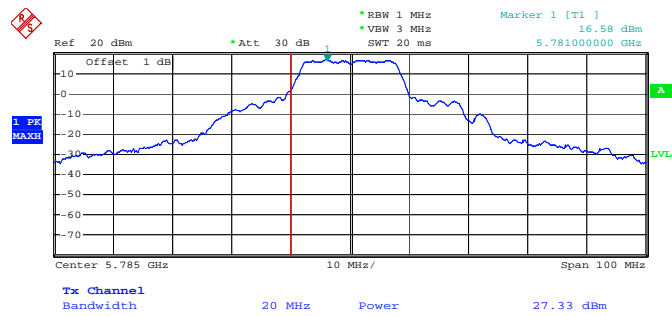
Date: 3.JUN.2008 18:10:31

Channel Output Power Plot on Configuration IEEE 802.11 a / Ant. A / 5745 MHz



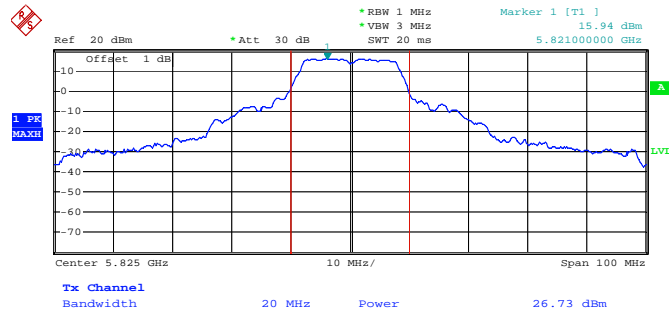
Date: 3.JUN.2008 20:29:50

Channel Output Power Plot on Configuration IEEE 802.11 a / Ant. A / 5785 MHz



Date: 3.JUN.2008 20:30:26

Channel Output Power Plot on Configuration IEEE 802.11a / Ant. A / 5825 MHz



Date: 3.JUN.2008 20:30:56

4.3. Power Spectral Density Measurement

4.3.1. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

4.3.2. Measuring Instruments and Setting

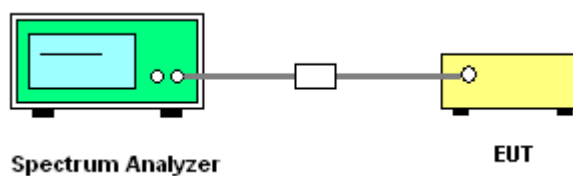
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	1.5MHz
RB	3 kHz
VB	30 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	500s

4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser.
2. Set RBW of spectrum analyzer to 3kHz and VBW to 30kHz. Set Detector to Peak, Trace to Max Hold.
3. Mark the frequency with maximum peak power as the center of the display of the spectrum.
4. Set the span to 1.5MHz and the sweep time to 500s and record the maximum peak value.
5. Measuring multiple antennas, the connector is required to link with spectrum analyser through a combiner.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Power Spectral Density

Temperature	26°C	Humidity	62%
Test Engineer	Sam Chen	Configurations	802.11a/b/g

Configuration IEEE 802.11b / Ant. A

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm)	Result
1	2412 MHz	-15.48	8.00	Complies
6	2437 MHz	-14.70	8.00	Complies
11	2462 MHz	-13.56	8.00	Complies

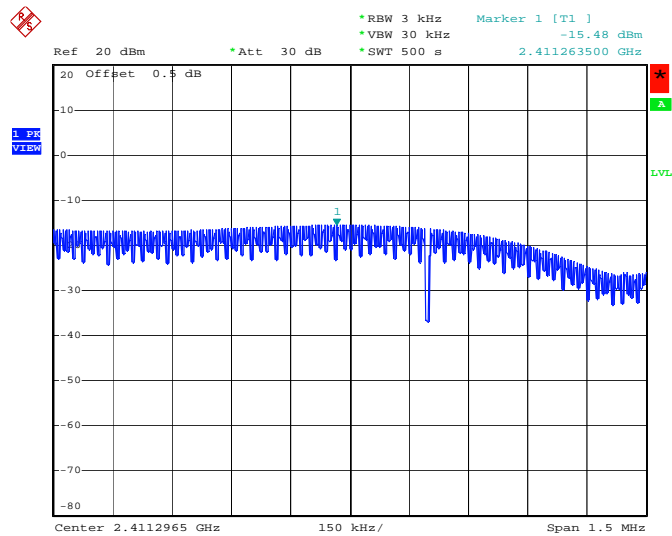
Configuration IEEE 802.11g / Ant. A

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm)	Result
1	2412 MHz	-16.14	8.00	Complies
6	2437 MHz	-15.92	8.00	Complies
11	2462 MHz	-16.07	8.00	Complies

Configuration IEEE 802.11a / Ant. A

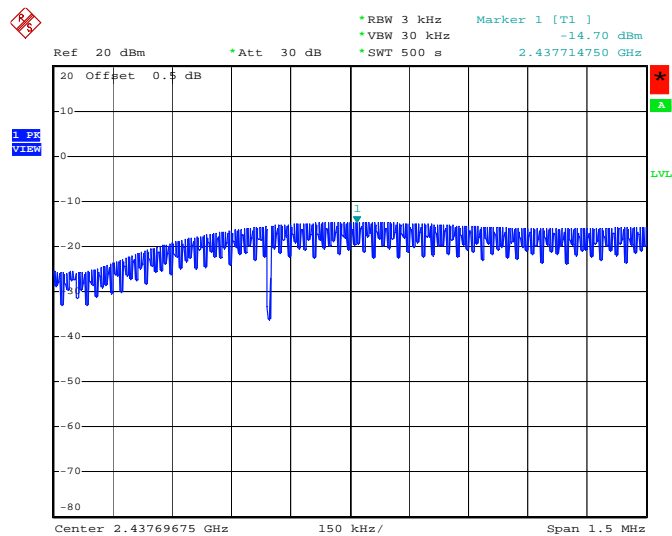
Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm)	Result
149	5745 MHz	-11.32	8.00	Complies
157	5785 MHz	-10.59	8.00	Complies
165	5825 MHz	-11.14	8.00	Complies

Power Density Plot on Configuration IEEE 802.11b / Ant. A / 2412 MHz



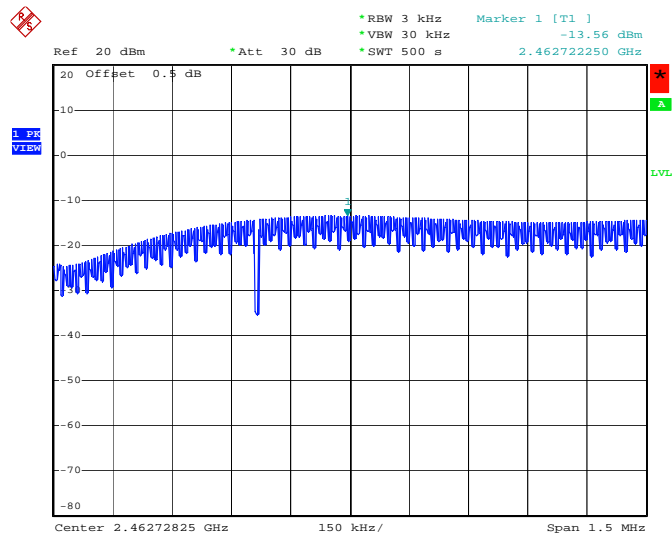
Date: 3.JUN.2008 20:39:26

Power Density Plot on Configuration IEEE 802.11b / Ant. A / 2437 MHz



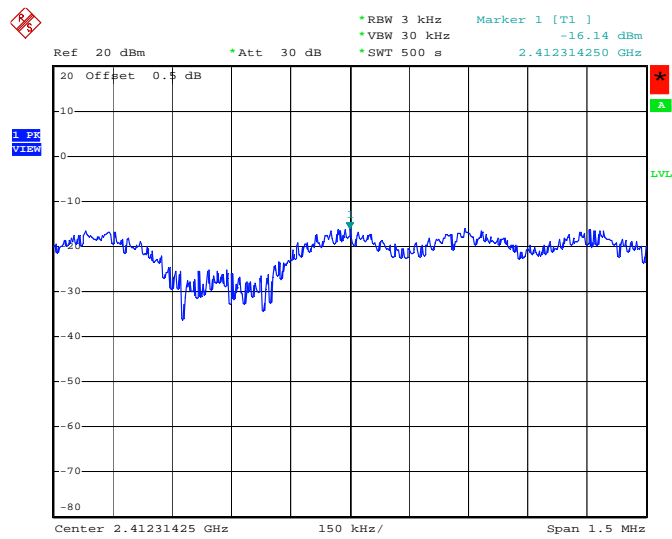
Date: 3.JUN.2008 20:40:30

Power Density Plot on Configuration IEEE 802.11b / Ant. A / 2462 MHz



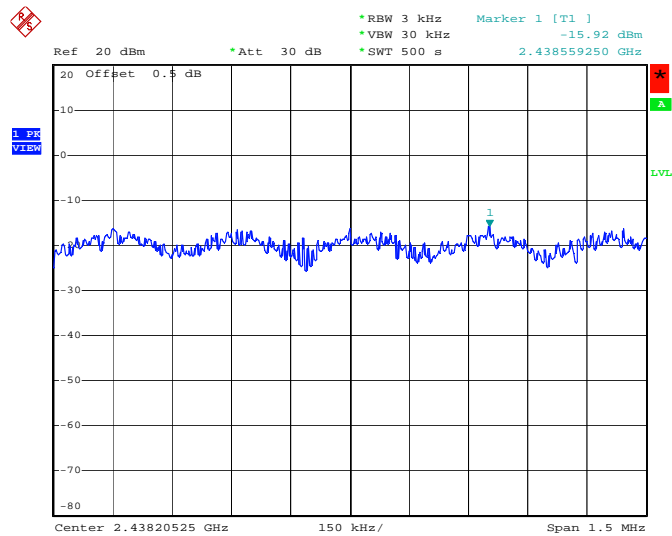
Date: 3.JUN.2008 20:41:25

Power Density Plot on Configuration IEEE 802.11g / Ant. A / 2412 MHz



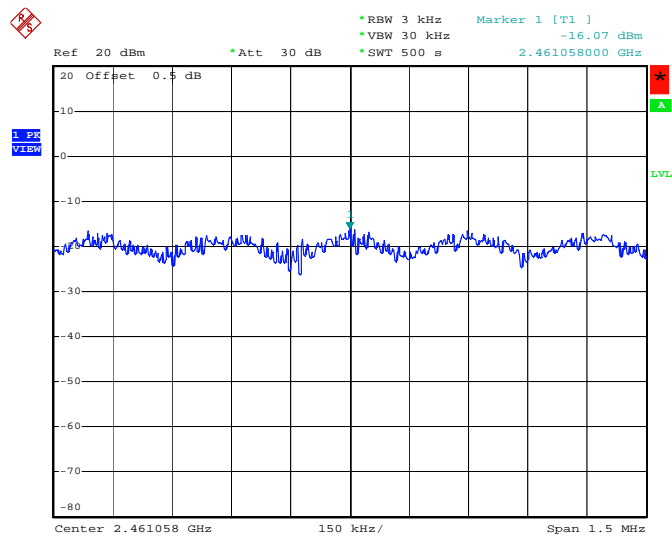
Date: 3.JUN.2008 20:38:04

Power Density Plot on Configuration IEEE 802.11g / Ant. A / 2437 MHz



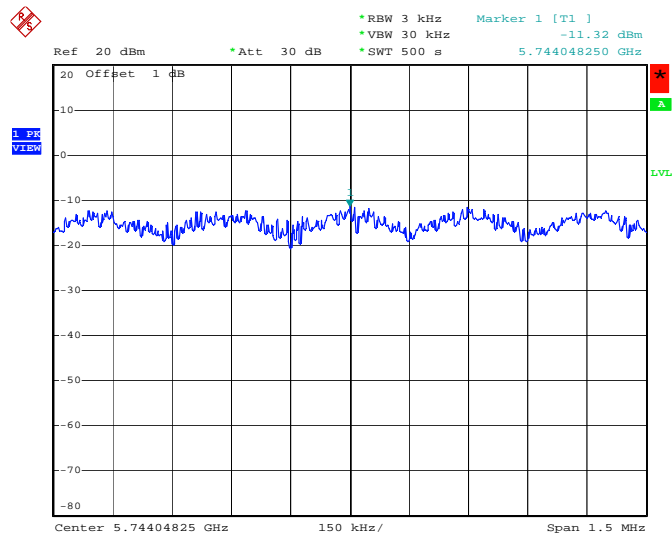
Date: 3.JUN.2008 20:37:03

Power Density Plot on Configuration IEEE 802.11g / Ant. A / 2462 MHz



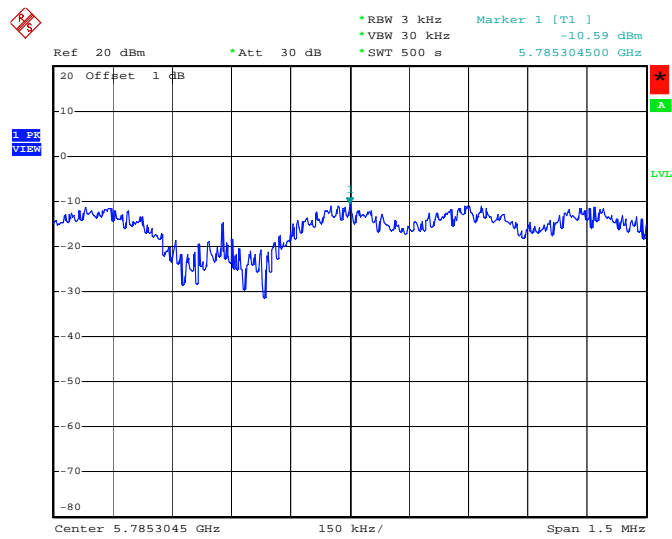
Date: 3.JUN.2008 20:36:08

Power Density Plot on Configuration IEEE 802.11a / Ant. A / 5745 MHz



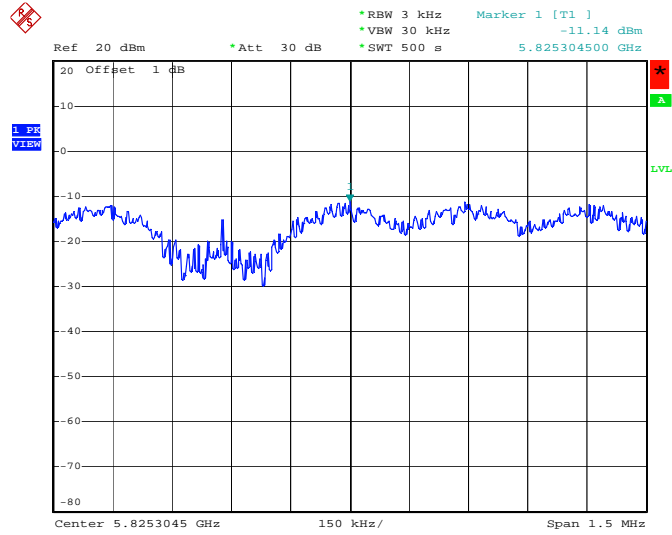
Date: 3.JUN.2008 21:11:10

Power Density Plot on Configuration IEEE 802.11a / Ant. A / 5785 MHz



Date: 3.JUN.2008 21:12:16

Power Density Plot on Configuration IEEE 802.11a / Ant. A / 5825 MHz



Date: 3.JUN.2008 21:13:14

4.4. 6dB Spectrum Bandwidth Measurement

4.4.1. Limit

For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz.

4.4.2. Measuring Instruments and Setting

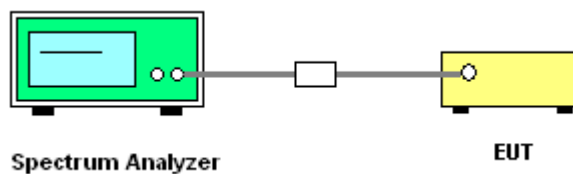
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RB	100 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. The resolution bandwidth of 100 kHz and the video bandwidth of 100 kHz were used.
3. Measured the spectrum width with power higher than 6dB below carrier.
4. Measuring multiple antennas, the connector is required to link with spectrum analyser through a combiner.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of 6dB Spectrum Bandwidth

Temperature	26°C	Humidity	62%
Test Engineer	Sam Chen	Configurations	802.11a/b/g

Configuration IEEE 802.11b / Ant. A

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	12.28	14.96	500	Complies
6	2437 MHz	12.24	14.96	500	Complies
11	2462 MHz	12.28	15.00	500	Complies

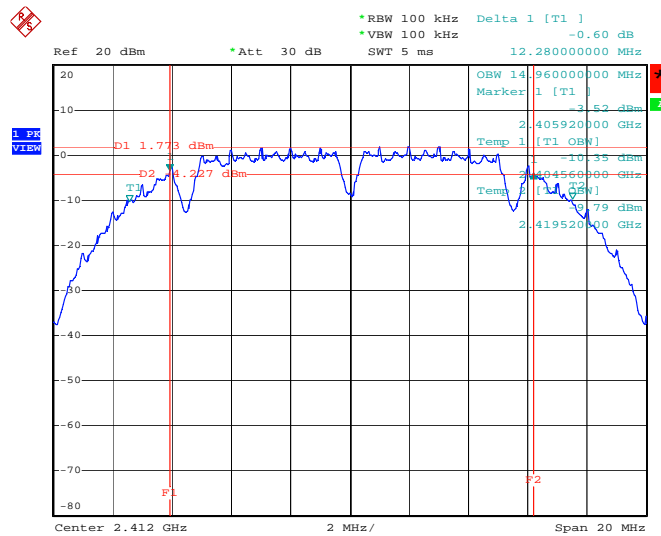
Configuration IEEE 802.11g / Ant. A

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.56	16.48	500	Complies
6	2437 MHz	16.56	16.48	500	Complies
11	2462 MHz	16.56	16.48	500	Complies

Configuration IEEE 802.11a / Ant. A

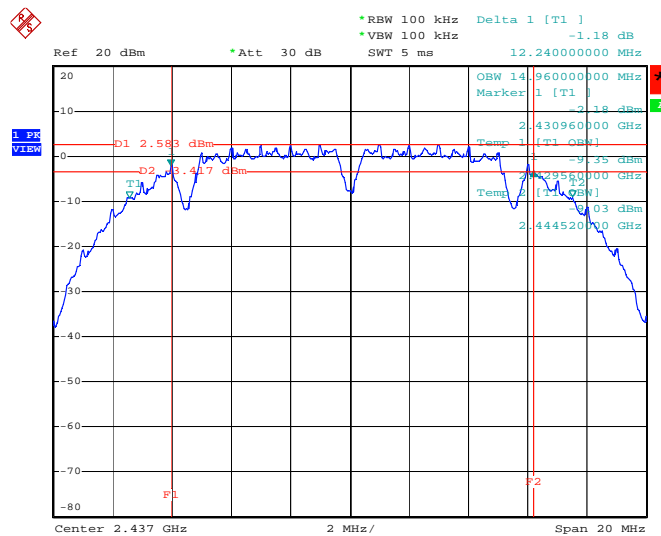
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.60	16.52	500	Complies
157	5785 MHz	16.60	16.52	500	Complies
165	5825 MHz	16.60	16.52	500	Complies

6 dB Bandwidth Plot on Configuration IEEE 802.11b / Ant. A / 2412 MHz



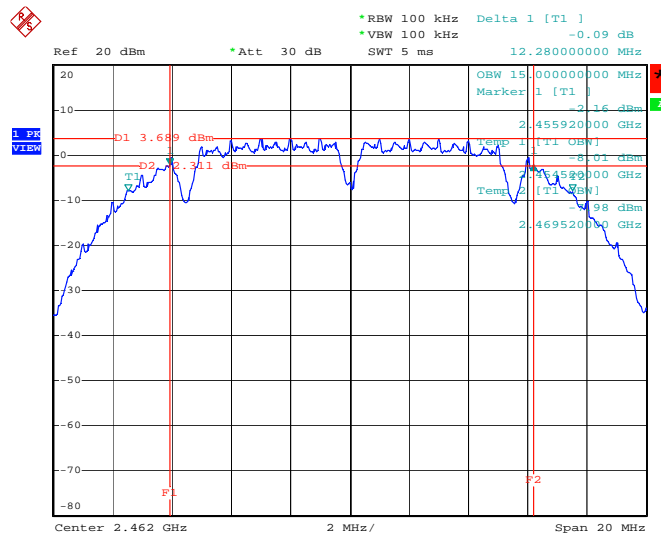
Date: 3.JUN.2008 20:39:01

6 dB Bandwidth Plot on Configuration IEEE 802.11b / Ant. A / 2437 MHz



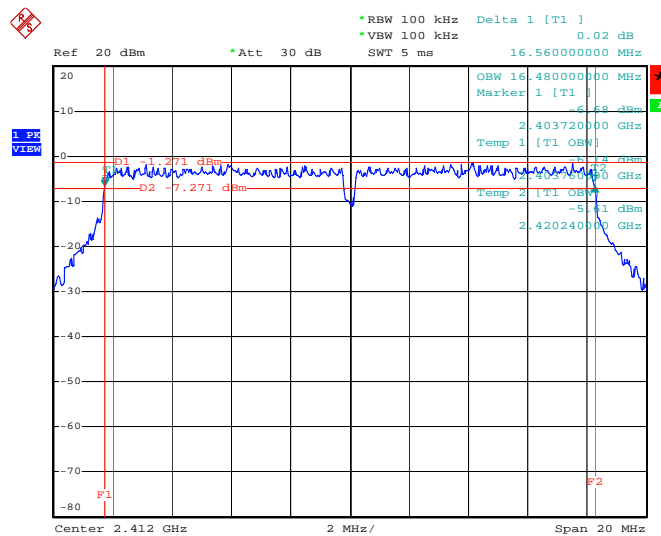
Date: 3.JUN.2008 20:40:14

6 dB Bandwidth Plot on Configuration IEEE 802.11b / Ant. A / 2462 MHz



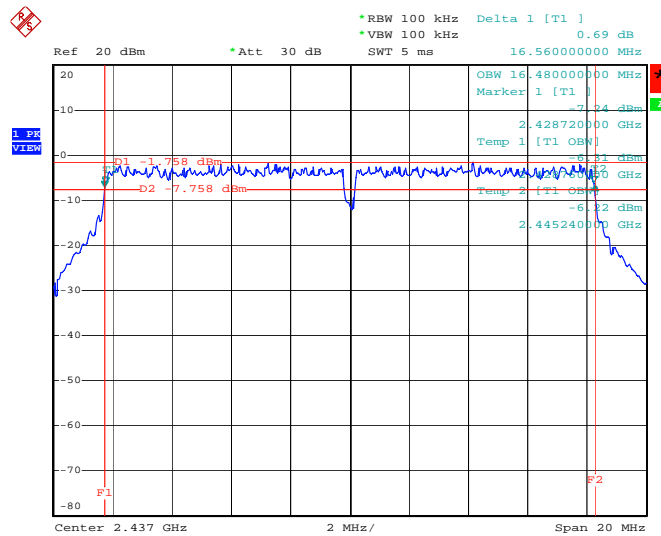
Date: 3.JUN.2008 20:41:09

6 dB Bandwidth Plot on Configuration IEEE 802.11g / Ant. A / 2412 MHz



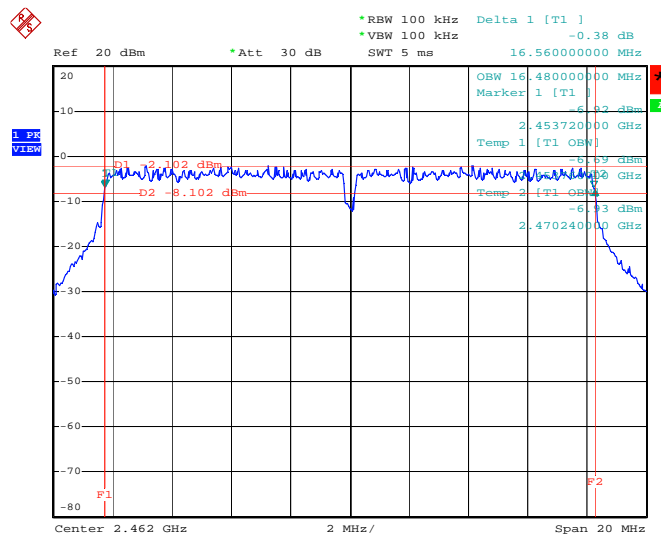
Date: 3.JUN.2008 20:37:39

6 dB Bandwidth Plot on Configuration IEEE 802.11g / Ant. A / 2437 MHz



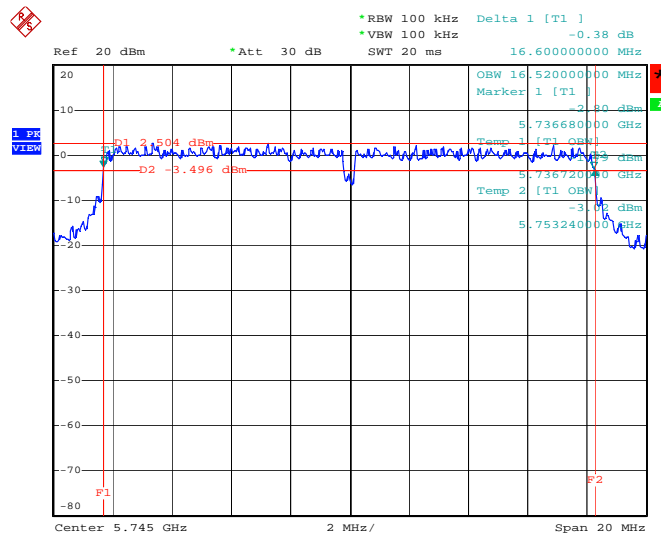
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6 dB Bandwidth Plot on Configuration IEEE 802.11g / Ant. A / 2462 MHz



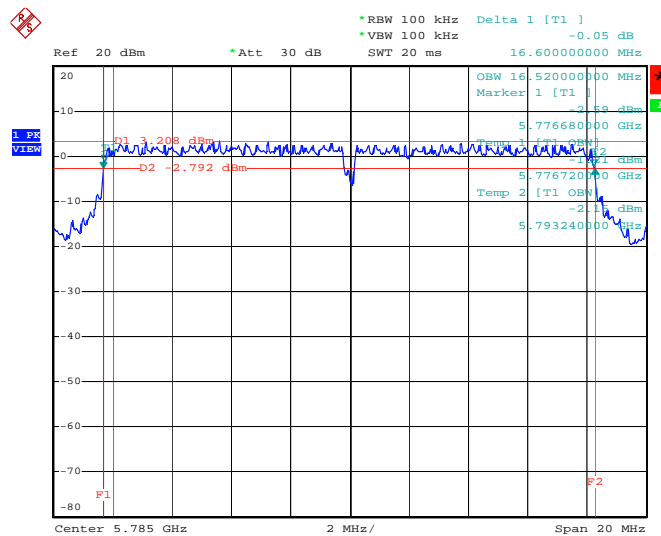
Date: 3.JUN.2008 20:35:53

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. A / 5745 MHz



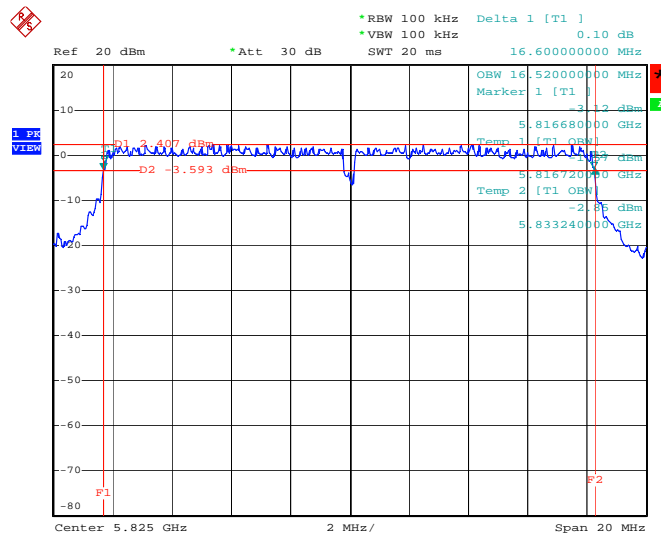
Date: 3.JUN.2008 21:10:45

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. A / 5785 MHz



Date: 3.JUN.2008 21:11:51

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. A / 5825 MHz



Date: 3.JUN.2008 21:12:49

4.5. Radiated Emissions Measurement

4.5.1. Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

4.5.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	100KHz / 100KHz for peak

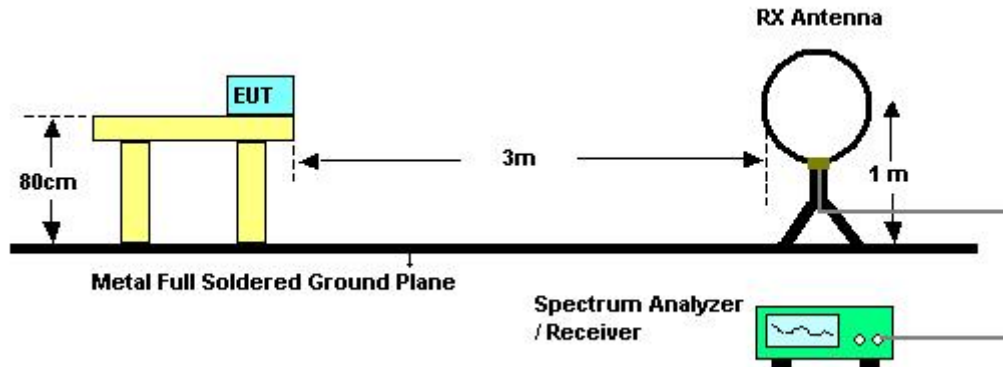
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~ 150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.5.3. Test Procedures

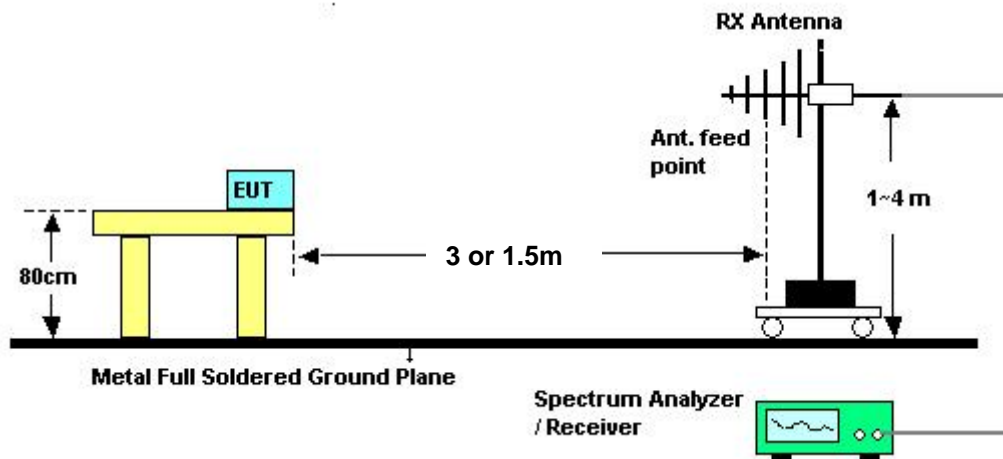
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.5.4. Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor = $20 \log (\text{specific distance [3m]} / \text{test distance [1.5m]})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.5.7. Results of Radiated Emissions (9kHz~30MHz)

Temperature	26°C	Humidity	62%
Test Engineer	Roy Huang		

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

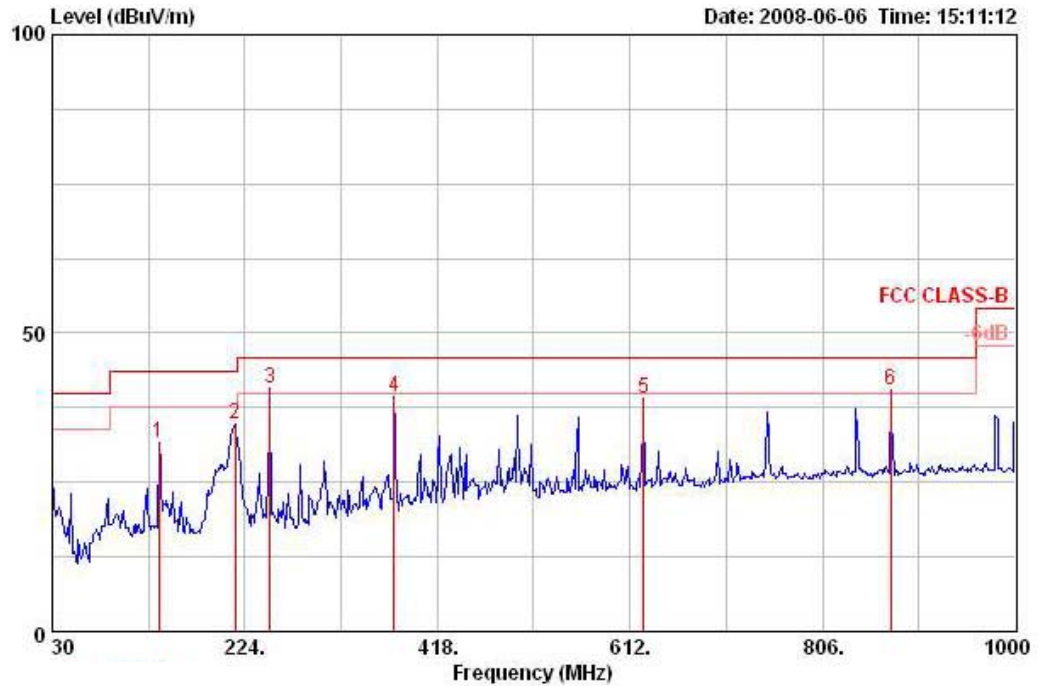
Distance extrapolation factor = $40 \log(\text{specific distance} / \text{test distance})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

4.5.8. Results of Radiated Emissions (30MHz~1GHz)

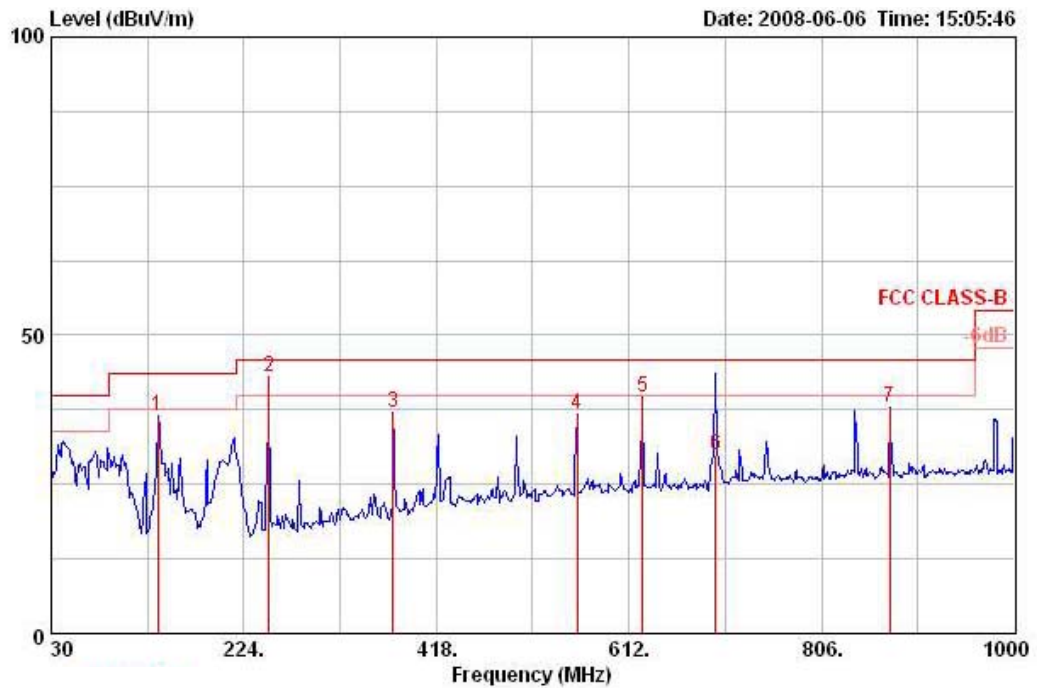
Temperature	26°C	Humidity	62%
Test Engineer	Roy Huang	Configurations	Normal Link / Ant. A

Horizontal



	Freq	Level	Over	Limit	Read	Antenna	Preamp	Cable	Table	Ant	
	MHz	dBuV/m	Limit	Line	Level	Factor	Factor	Loss	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	deg	cm	
1	137.670	31.68	-11.82	43.50	46.96	10.76	27.41	1.38	0	100	HORIZONTAL
2	214.300	34.74	-8.76	43.50	51.62	8.43	27.07	1.76	0	100	HORIZONTAL
3 !	249.220	40.69	-5.31	46.00	54.24	11.56	27.00	1.90	0	100	HORIZONTAL
4	374.350	39.44	-6.56	46.00	49.82	14.79	27.42	2.25	0	100	HORIZONTAL
5	625.580	38.92	-7.08	46.00	44.89	19.05	28.07	3.05	0	100	HORIZONTAL
6 !	874.870	40.35	-5.65	46.00	43.89	20.42	27.45	3.50	0	100	HORIZONTAL

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Table Pos	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		deg	cm	
1	137.670	36.51	-6.99	43.50	51.78	10.76	27.41	1.38	Peak	0	400	VERTICAL
2	249.220	42.90	-3.10	46.00	56.44	11.56	27.00	1.90	Peak	125	110	VERTICAL
3	374.350	37.17	-8.83	46.00	47.55	14.79	27.42	2.25	Peak	0	400	VERTICAL
4	559.620	36.82	-9.18	46.00	43.55	18.55	28.10	2.82	Peak	0	400	VERTICAL
5	625.580	39.73	-6.27	46.00	45.70	19.05	28.07	3.05	Peak	0	400	VERTICAL
6	699.300	29.81	-16.19	46.00	35.21	19.30	28.00	3.30	QP	256	100	VERTICAL
7	874.870	37.76	-8.24	46.00	41.29	20.42	27.45	3.50	Peak	0	400	VERTICAL

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

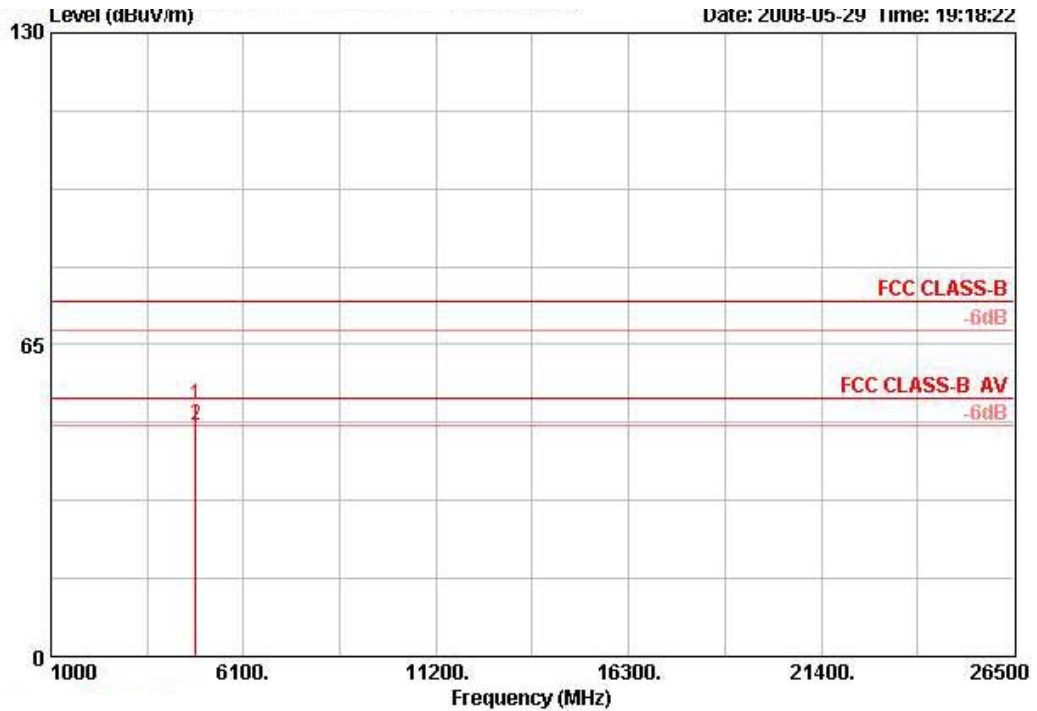
Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

4.5.9. Results for Radiated Emissions (1GHz~10th Harmonic)

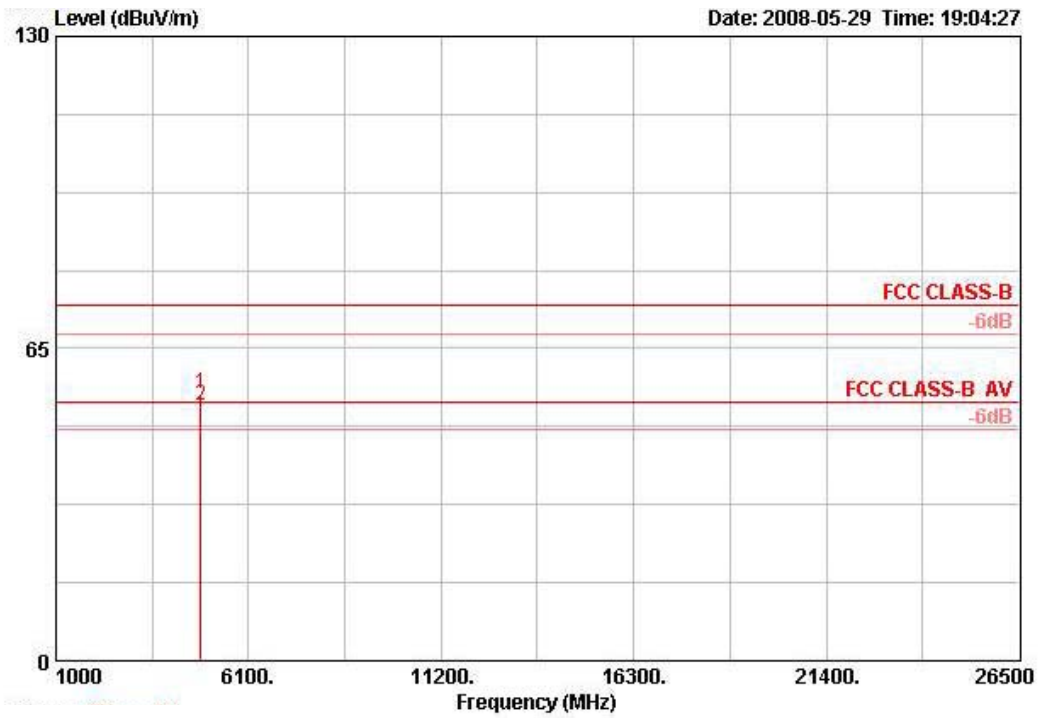
Temperature	26°C	Humidity	62%
Test Engineer	Roy Huang	Configurations	802.11b CH 1 / Ant. A

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1	4823.952	52.26	-21.74	74.00	50.75	33.39	3.37	35.25	PEAK	100	197	HORIZONTAL
2 !	4823.992	48.35	-5.65	54.00	46.84	33.39	3.37	35.25	AVERAGE	100	197	HORIZONTAL

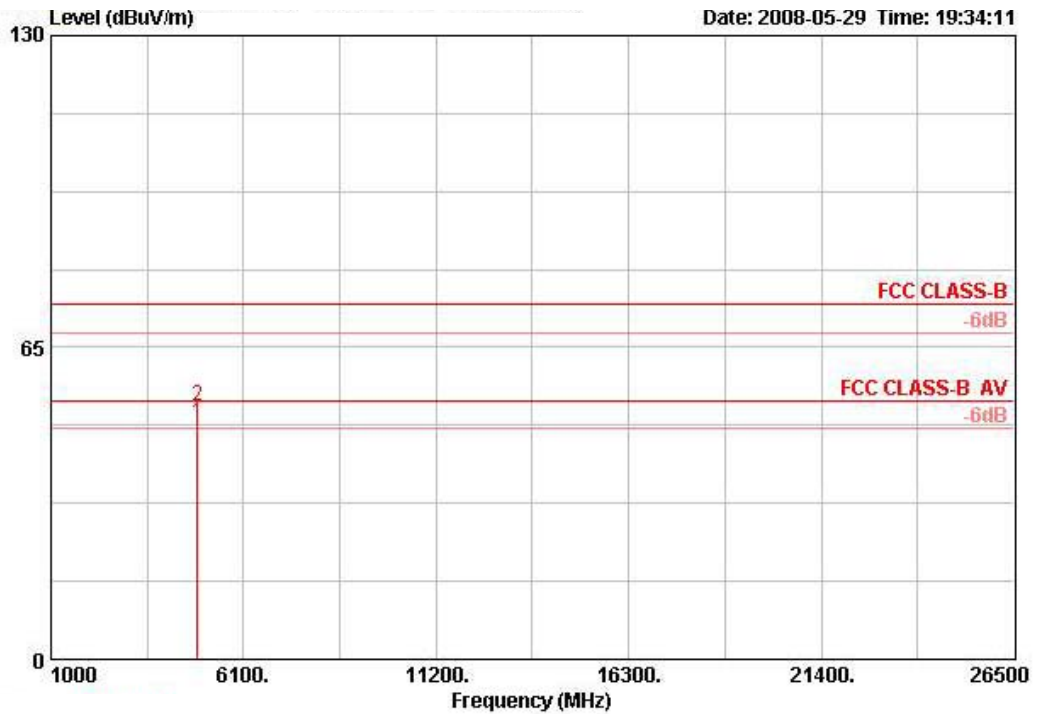
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1	4823.888	55.73	-18.27	74.00	54.22	33.39	3.37	35.25	PEAK	100	288	VERTICAL
2 @	4824.008	53.01	-0.99	54.00	51.50	33.39	3.37	35.25	AVERAGE	100	288	VERTICAL

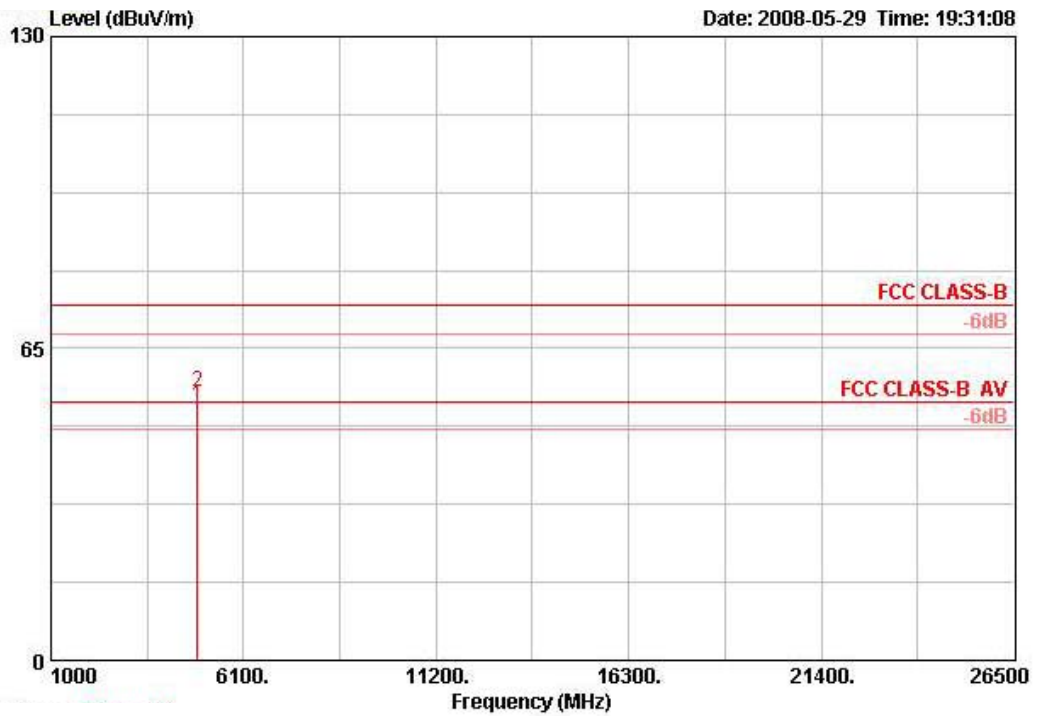
Temperature	26°C	Humidity	62%
Test Engineer	Roy Huang	Configurations	802.11b CH 6 / Ant. A

Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 !	4873.990	49.34	-4.66	54.00	47.72	33.48	3.38	35.25	AVERAGE	100	197	HORIZONTAL
2	4874.160	52.71	-21.29	74.00	51.09	33.48	3.38	35.25	PEAK	100	197	HORIZONTAL

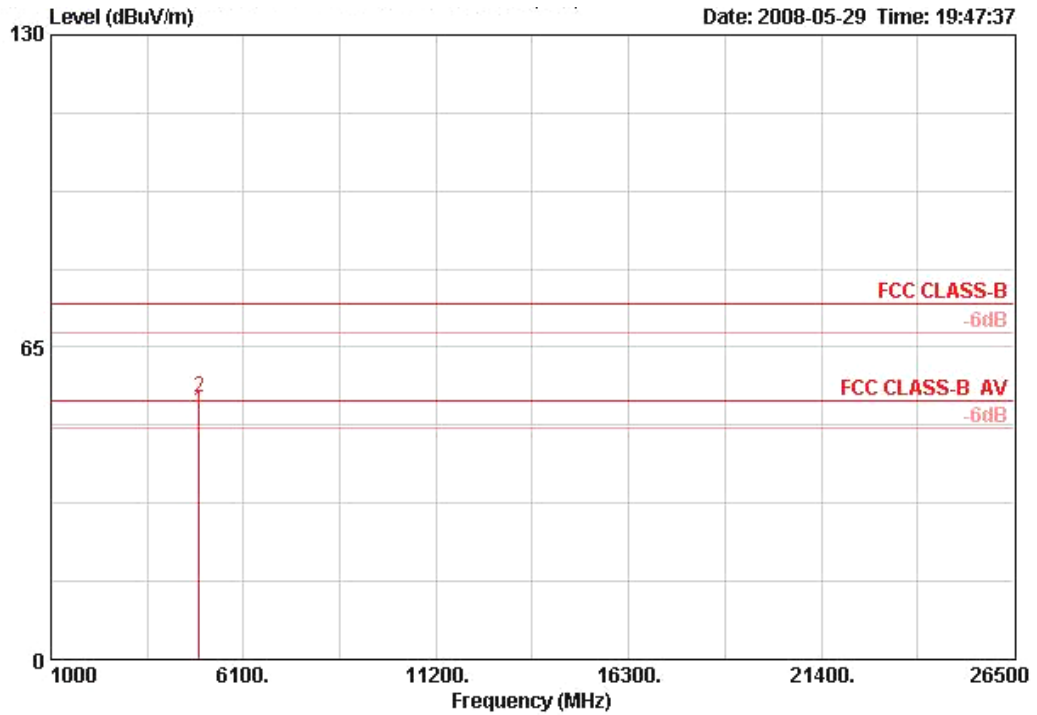
Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	4873.990	53.19	-0.81	54.00	51.57	33.48	3.38	35.25	AVERAGE	100	220	VERTICAL
2	4874.100	56.01	-17.99	74.00	54.39	33.48	3.38	35.25	PEAK	100	220	VERTICAL

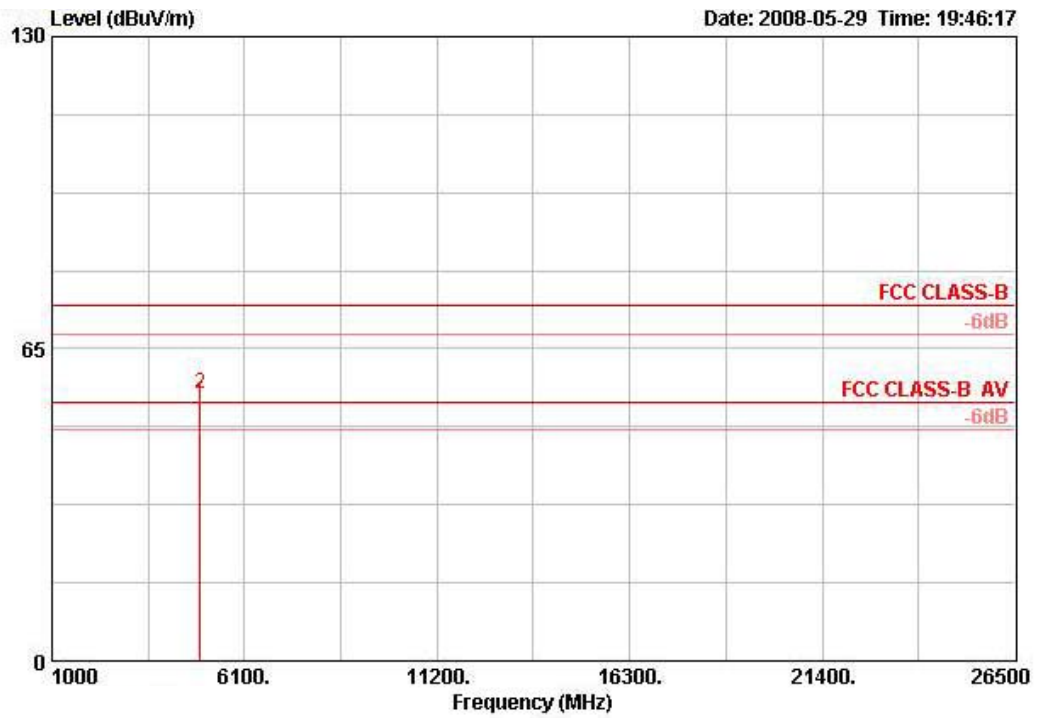
Temperature	26°C	Humidity	62%
Test Engineer	Roy Huang	Configurations	802.11b CH 11 / Ant. A

Horizontal



	Over	Limit	Read	Antenna	Cable	Preamp		Ant	Table			
	Freq	Level	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 !	4924.008	51.77	-2.23	54.00	50.04	33.58	3.40	35.24	AVERAGE	100	196	HORIZONTAL
2	4924.028	54.68	-19.32	74.00	52.95	33.58	3.40	35.24	PEAK	100	196	HORIZONTAL

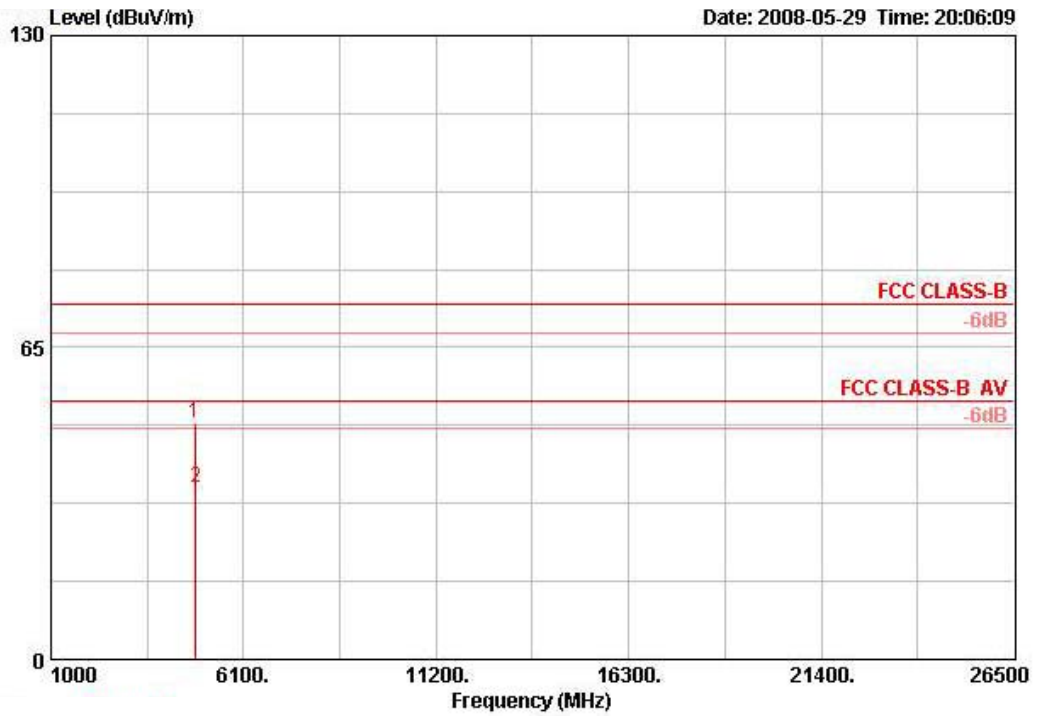
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	4923.948	53.75	-0.25	54.00	52.02	33.58	3.40	35.24	AVERAGE	100	220	VERTICAL
2	4923.948	55.60	-18.40	74.00	53.87	33.58	3.40	35.24	PEAK	100	220	VERTICAL

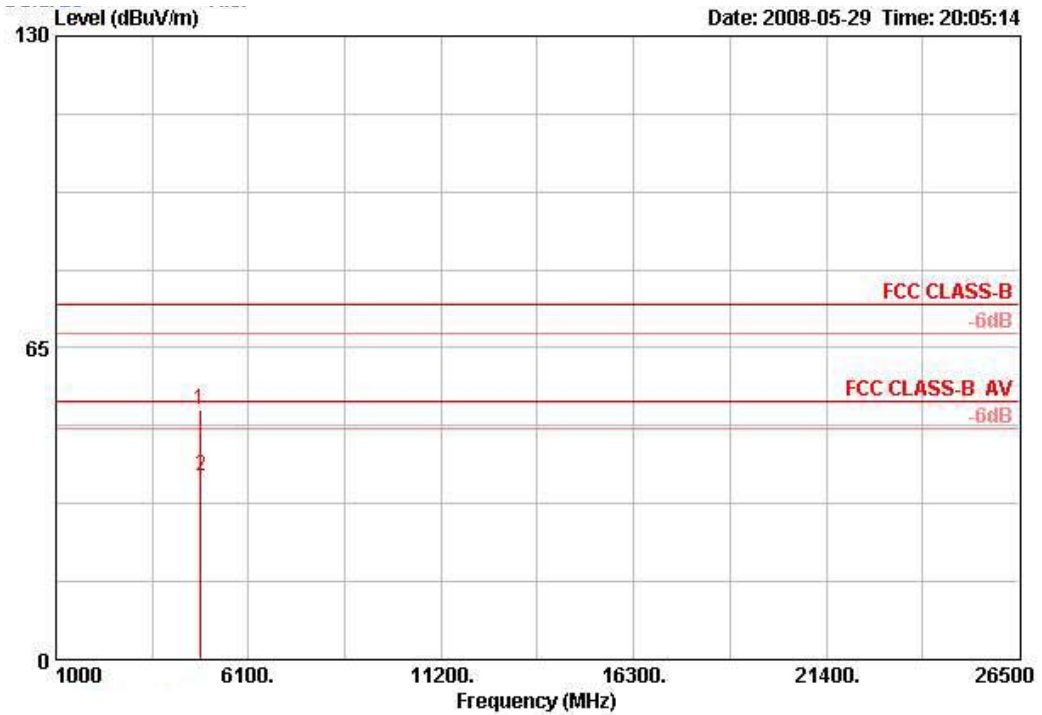
Temperature	26°C	Humidity	62%
Test Engineer	Roy Huang	Configurations	802.11g CH 1 / Ant. A

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1	4820.340	49.21	-24.79	74.00	47.70	33.39	3.37	35.25	PEAK	100	196	HORIZONTAL
2	4824.100	35.87	-18.13	54.00	34.36	33.39	3.37	35.25	AVERAGE	117	196	HORIZONTAL

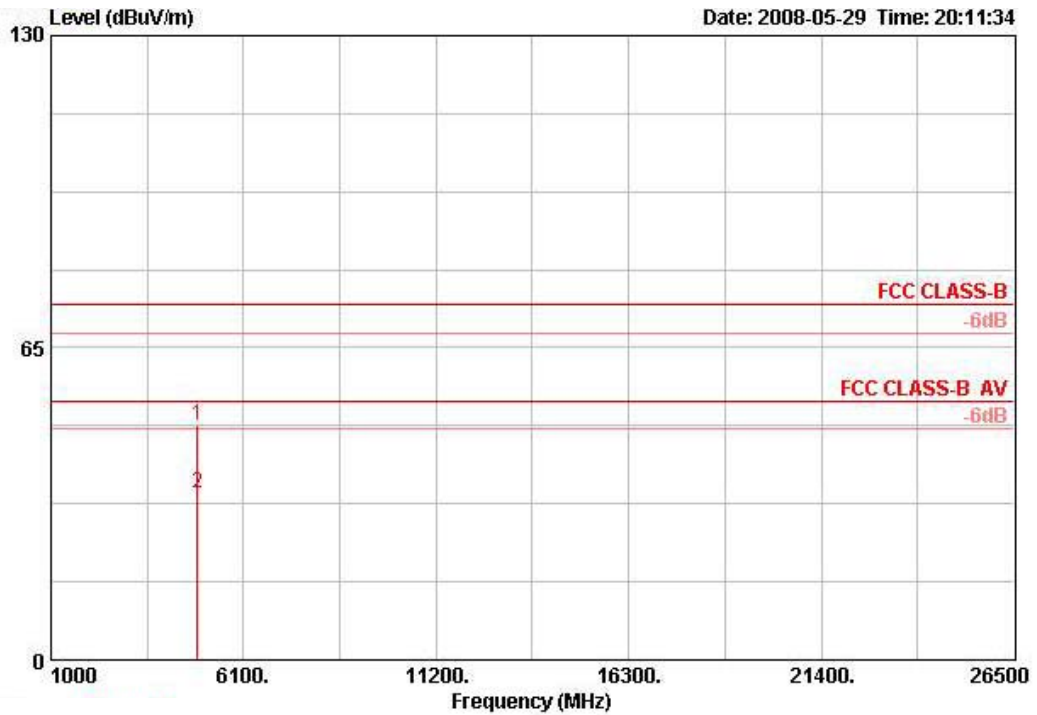
Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1	4820.220	52.15	-21.85	74.00	50.64	33.39	3.37	35.25	PEAK	100	288	VERTICAL
2	4824.020	38.42	-15.58	54.00	36.91	33.39	3.37	35.25	AVERAGE	100	288	VERTICAL

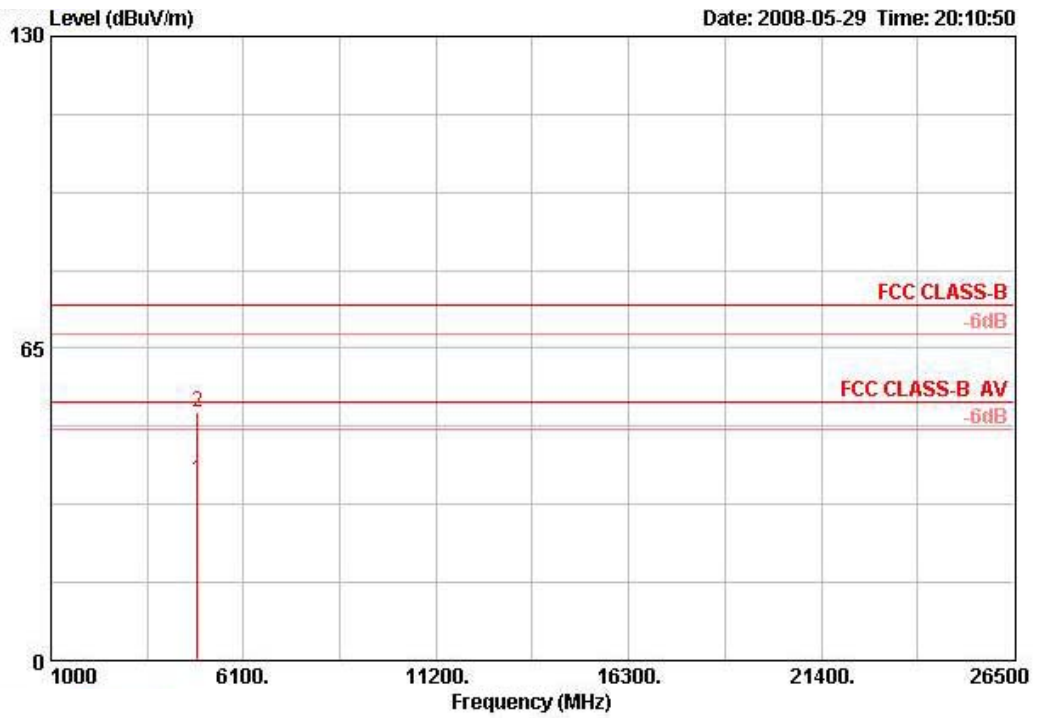
Temperature	26°C	Humidity	62%
Test Engineer	Roy Huang	Configurations	802.11g CH 6 / Ant. A

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1	4869.720	48.96	-25.04	74.00	47.34	33.48	3.38	35.25	PEAK	100	197	HORIZONTAL
2	4874.040	34.84	-19.16	54.00	33.22	33.48	3.38	35.25	AVERAGE	100	197	HORIZONTAL

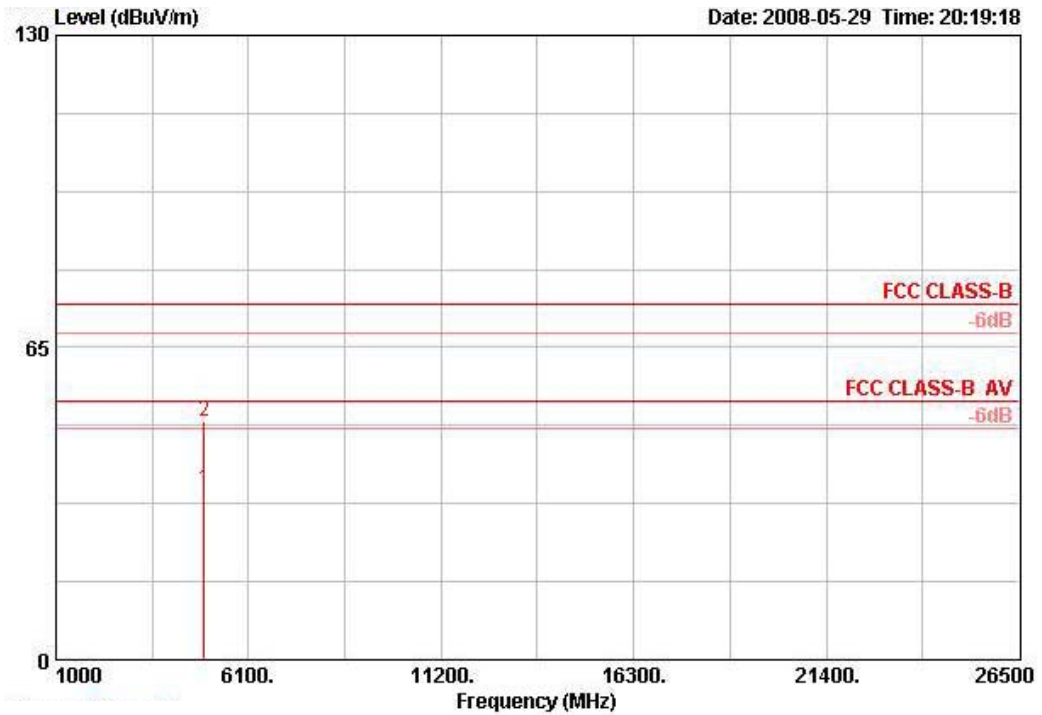
Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB		cm	deg	
1	4874.280	37.44	-16.56	54.00	35.82	33.48	3.38	35.25	AVERAGE	100	220	VERTICAL
2	4875.880	51.87	-22.13	74.00	50.25	33.48	3.38	35.25	PEAK	100	220	VERTICAL

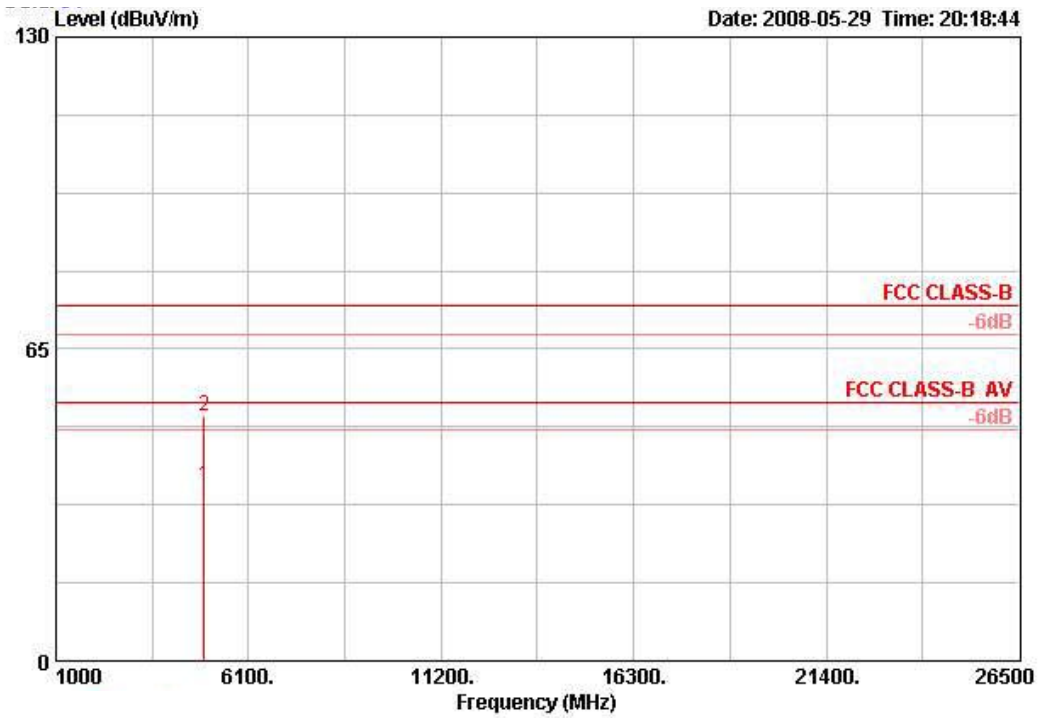
Temperature	26°C	Humidity	62%
Test Engineer	Roy Huang	Configurations	802.11g CH 11 / Ant. A

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1	4924.100	35.50	-18.50	54.00	33.77	33.58	3.40	35.24	AVERAGE	100	196	HORIZONTAL
2	4926.140	49.71	-24.29	74.00	47.98	33.58	3.40	35.24	PEAK	100	196	HORIZONTAL

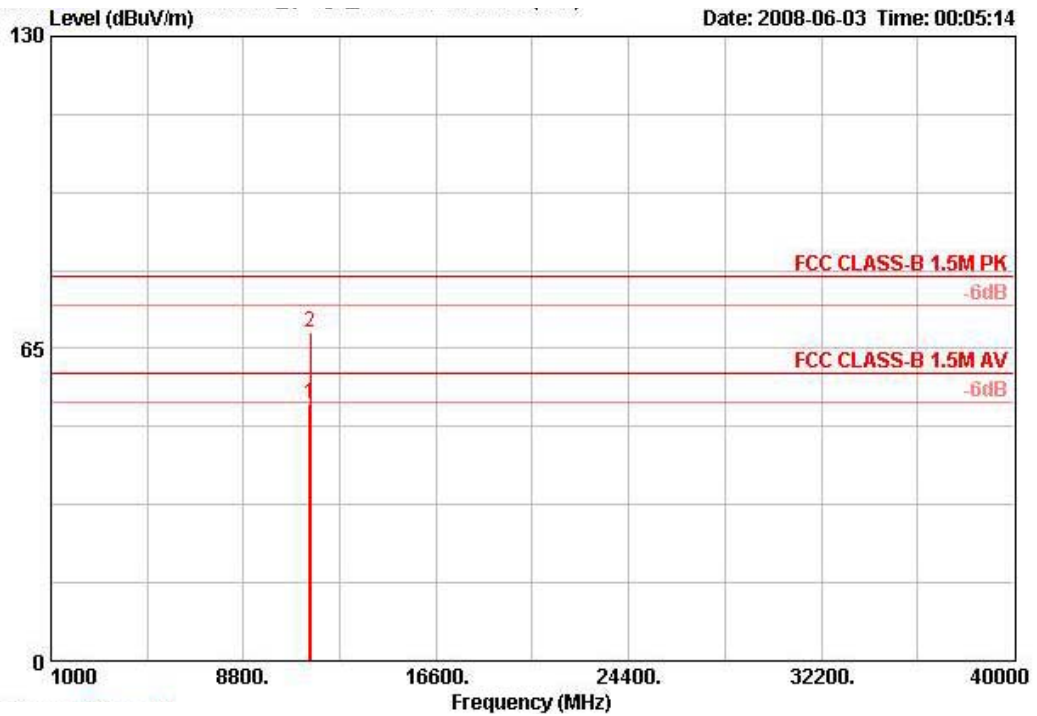
Vertical



	Over	Limit	Read	Antenna	Cable	Preamp		Ant	Table			
	Freq	Level	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1	4922.020	36.50	-17.50	54.00	34.76	33.58	3.40	35.24	AVERAGE	100	220	VERTICAL
2	4926.300	50.87	-23.13	74.00	49.14	33.58	3.40	35.24	PEAK	100	220	VERTICAL

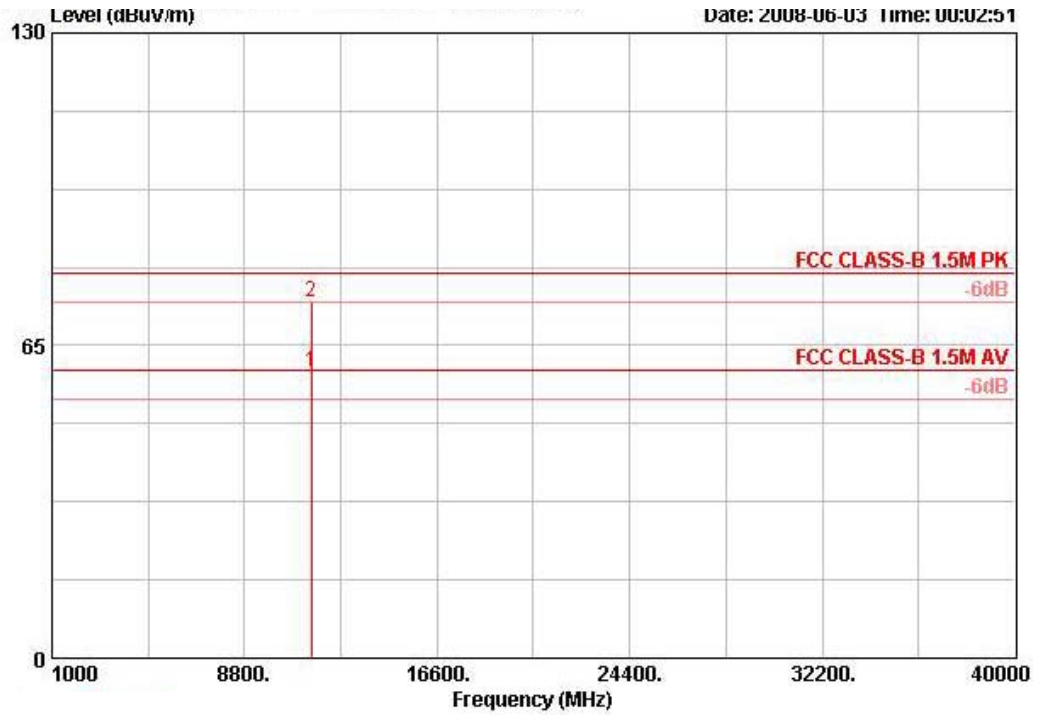
Temperature	26°C	Humidity	62%
Test Engineer	Roy Huang	Configurations	802.11a CH 149 / Ant. A

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB		cm	deg	
1	11488.240	53.44	-6.56	60.00	43.75	39.50	5.14	34.95	AVERAGE	117	266	HORIZONTAL
2	11492.200	68.20	-11.80	80.00	58.51	39.50	5.14	34.95	PEAK	117	266	HORIZONTAL

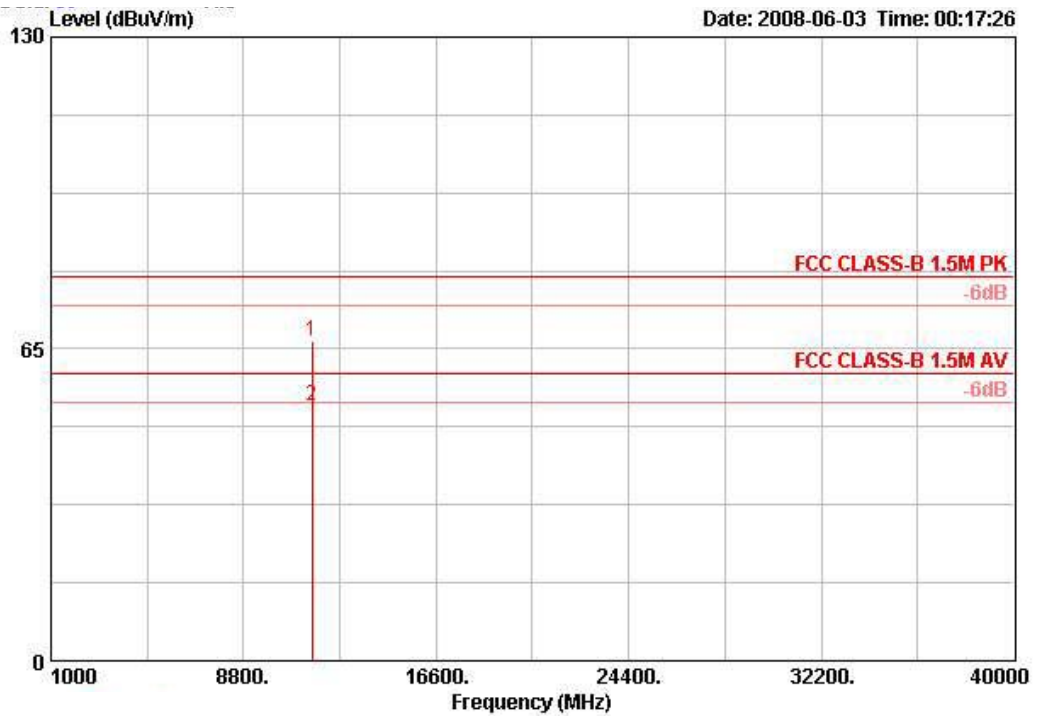
Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	11490.160	59.65	-0.35	60.00	49.97	39.50	5.14	34.95	AVERAGE	100	296	VERTICAL
2 !	11492.280	74.04	-5.96	80.00	64.35	39.50	5.14	34.95	PEAK	100	296	VERTICAL

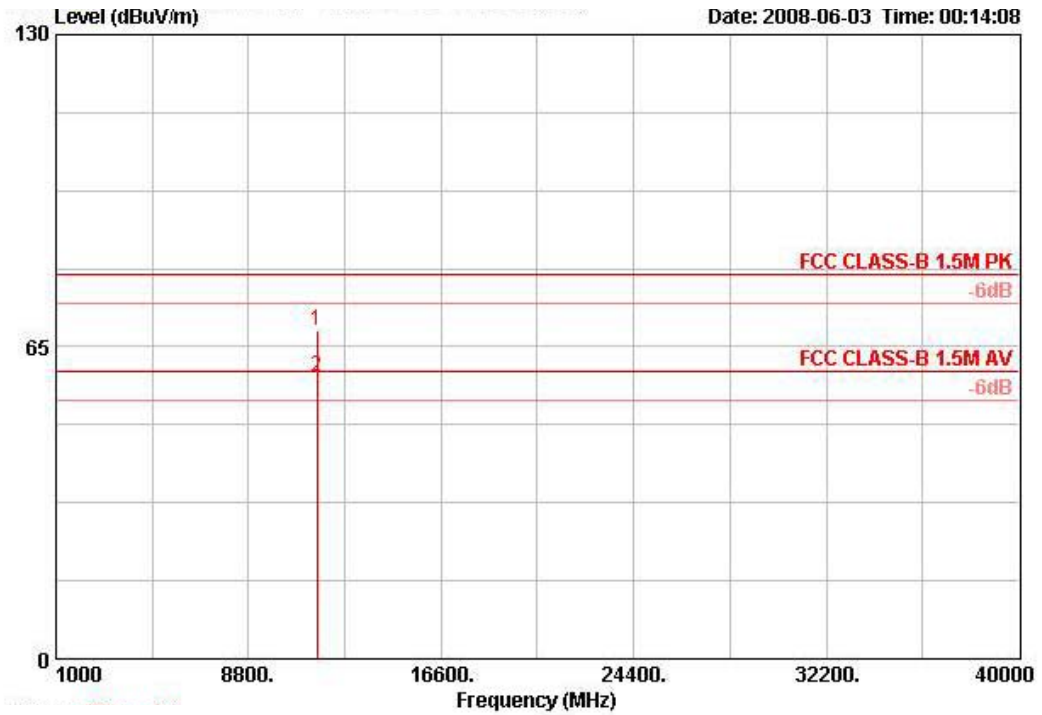
Temperature	26°C	Humidity	62%
Test Engineer	Roy Huang	Configurations	802.11a CH 157 / Ant. A

Horizontal



	Over	Limit	Read	Antenna	Cable	Preamp		Ant	Table			
	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos			
	dB	dBUV/m	dBuV	dB/m	dB	dB		cm	deg			
1	11566.200	66.77	-13.23	80.00	57.09	39.47	5.17	34.96	PEAK	122	277	HORIZONTAL
2	11570.120	53.11	-6.89	60.00	43.42	39.47	5.18	34.96	AVERAGE	122	277	HORIZONTAL

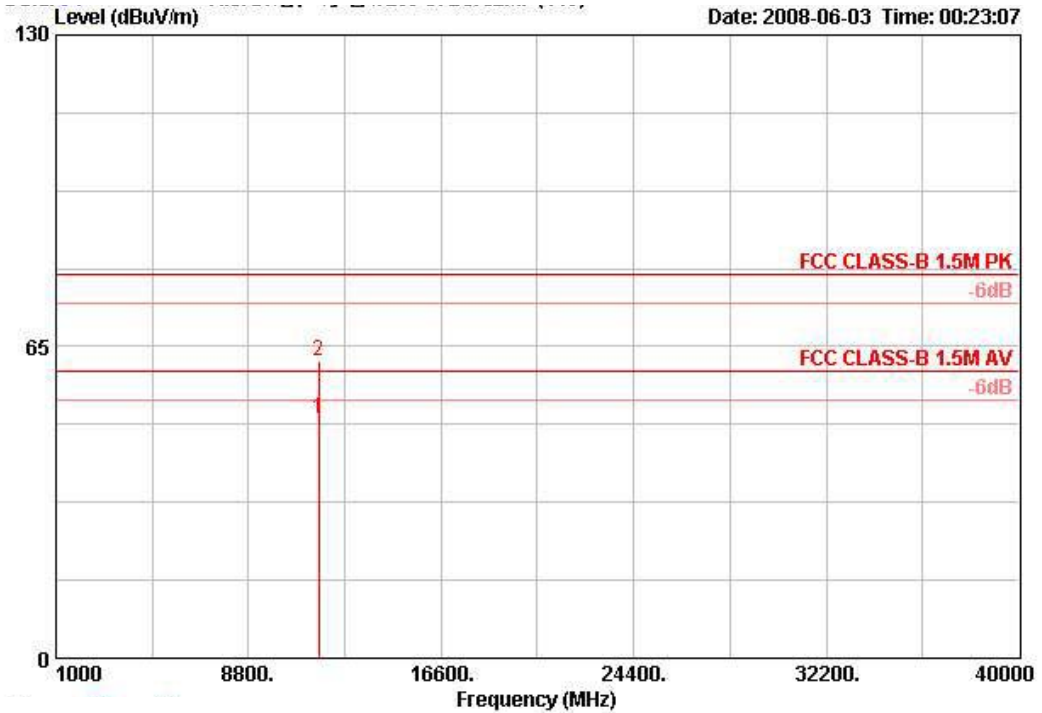
Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB		cm	deg	
1	11566.240	68.22	-11.78	80.00	58.55	39.47	5.17	34.96	PEAK	100	307	VERTICAL
2 @	11570.160	58.71	-1.29	60.00	49.02	39.47	5.18	34.96	AVERAGE	100	307	VERTICAL

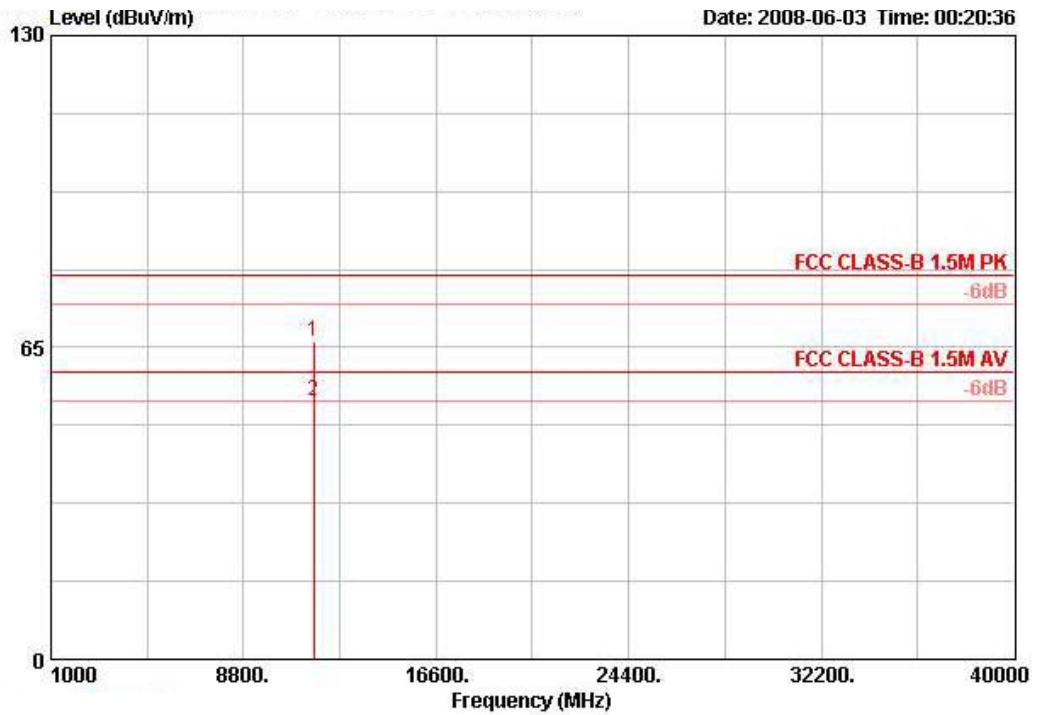
Temperature	26°C	Humidity	62%
Test Engineer	Roy Huang	Configurations	802.11a CH 165 / Ant. A

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1	11652.000	49.88	-10.12	60.00	40.20	39.44	5.20	34.97	AVERAGE	107	273	HORIZONTAL
2	11653.720	62.04	-17.96	80.00	52.36	39.44	5.20	34.97	PEAK	107	273	HORIZONTAL

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB		cm	deg	
1	11648.520	66.23	-13.77	80.00	56.54	39.44	5.20	34.97	PEAK	100	221	VERTICAL
2	11649.880	53.90	-6.10	60.00	44.22	39.44	5.20	34.97	AVERAGE	100	221	VERTICAL

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBUV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

4.6. Band Edge Emissions Measurement

4.6.1. Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micovolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

4.6.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RB / VB (Emission in restricted band)	1 MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	100 KHz /100 KHz for Peak

4.6.3. Test Procedures

1. The test procedure is the same as section 4.5.3, only the frequency range investigated is limited to 100MHz around bandedges.
2. In case the emission is fail due to the used RB/VB is too wide, marker-delta method of FCC Public Notice DA00-705 will be followed.

4.6.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.5.4.

4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

Temperature	26°C	Humidity	62%
Test Engineer	Roy Huang	Configurations	802.11b CH 1, 6, 11 / Ant. A
Test Date	May. 29, 2008		

Channel 1

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamplifier	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1	2390.000	60.73	-13.27	74.00	30.32	28.05	2.36	0.00	PEAK	100	200	VERTICAL
2 !	2390.000	50.47	-3.53	54.00	20.06	28.05	2.36	0.00	AVERAGE	100	200	VERTICAL
3 @	2409.200	107.01			76.55	28.09	2.36	0.00	AVERAGE	100	200	VERTICAL
4 @	2410.600	110.42			79.96	28.09	2.36	0.00	PEAK	100	200	VERTICAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamplifier	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	2434.400	108.43			77.92	28.13	2.38	0.00	AVERAGE	100	199	VERTICAL
2 @	2435.600	111.89			81.38	28.13	2.38	0.00	PEAK	100	199	VERTICAL

Item 1, 2 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamplifier	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	2459.400	109.08			78.46	28.22	2.40	0.00	AVERAGE	100	200	VERTICAL
2 @	2463.200	112.72			82.10	28.22	2.40	0.00	PEAK	100	200	VERTICAL
3 !	2483.500	50.79	-3.21	54.00	20.12	28.26	2.41	0.00	AVERAGE	100	200	VERTICAL
4	2484.300	60.78	-13.22	74.00	30.11	28.26	2.41	0.00	PEAK	100	200	VERTICAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	26°C	Humidity	62%
Test Engineer	Roy Huang	Configurations	802.11g CH 1, 6, 11 / Ant. A
Test Date	May. 29, 2008		

Channel 1

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 !	2389.960	69.14	-4.86	74.00	38.73	28.05	2.36	0.00	PEAK	100	201	VERTICAL
2 @	2390.000	53.68	-0.32	54.00	23.26	28.05	2.36	0.00	AVERAGE	100	201	VERTICAL
3 @	2408.200	111.99			81.53	28.09	2.36	0.00	PEAK	100	201	VERTICAL
4 @	2408.800	103.13			72.67	28.09	2.36	0.00	AVERAGE	100	201	VERTICAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	2435.000	111.93			81.41	28.13	2.38	0.00	PEAK	100	200	VERTICAL
2 @	2435.400	102.86			72.34	28.13	2.38	0.00	AVERAGE	100	200	VERTICAL

Item 1, 2 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	2455.200	111.54			80.93	28.22	2.40	0.00	PEAK	100	200	VERTICAL
2 @	2460.800	102.34			71.72	28.22	2.40	0.00	AVERAGE	100	200	VERTICAL
3	2483.500	64.63	-9.37	74.00	33.95	28.26	2.41	0.00	PEAK	100	200	VERTICAL
4 !	2483.500	51.11	-2.89	54.00	20.43	28.26	2.41	0.00	AVERAGE	100	200	VERTICAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	26°C	Humidity	62%
Test Engineer	Roy Huang	Configurations	802.11a CH 149, 157, 165 / Ant. A
Test Date	May. 29, 2008		

Channel 149

	Freq	Level	Over	Limit	ReadAntenna		Cable Preamp		Remark	Ant	Table	
			Limit	Line	Level	Factor	Loss	Factor		Pos	Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	5748.200	111.03			72.44	34.89	3.69	0.00	AVERAGE	100	190	VERTICAL
2 @	5748.400	120.57			81.99	34.89	3.69	0.00	PEAK	100	190	VERTICAL

Item 1, 2 are the fundamental frequency at 5745 MHz.

Channel 157

	Freq	Level	Over	Limit	ReadAntenna		Cable Preamp		Remark	Ant	Table	
			Limit	Line	Level	Factor	Loss	Factor		Pos	Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	5786.800	120.92			82.29	34.93	3.69	0.00	PEAK	128	190	VERTICAL
2 @	5788.800	111.53			72.90	34.93	3.69	0.00	AVERAGE	128	190	VERTICAL

Item 1, 2 are the fundamental frequency at 5785 MHz.

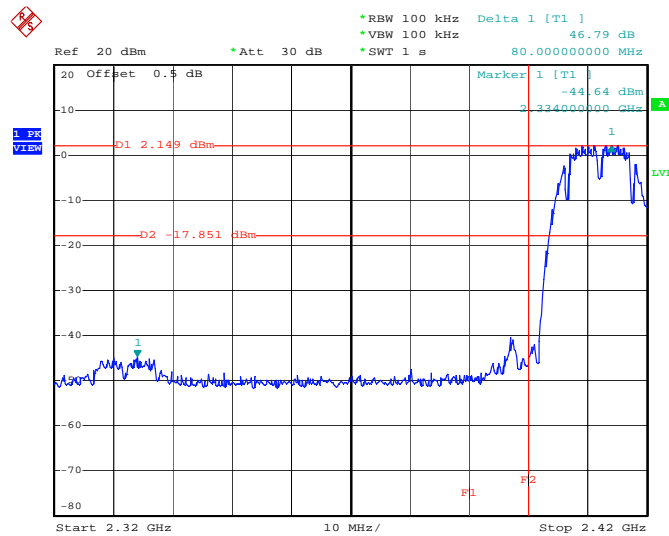
Channel 165

	Freq	Level	Over	Limit	ReadAntenna		Cable Preamp		Remark	Ant	Table	
			Limit	Line	Level	Factor	Loss	Factor		Pos	Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	5828.600	120.56			81.90	34.96	3.69	0.00	PEAK	131	188	VERTICAL
2 @	5829.000	111.30			72.65	34.96	3.69	0.00	AVERAGE	131	188	VERTICAL

Item 1, 2 are the fundamental frequency at 5825 MHz.

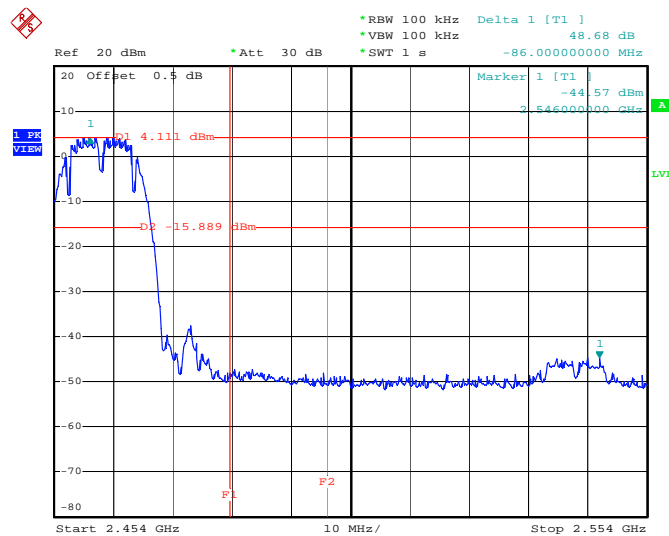
For Emission not in Restricted Band

Low Band Edge Plot on Configuration IEEE 802.11b / Ant. A / 2412 MHz



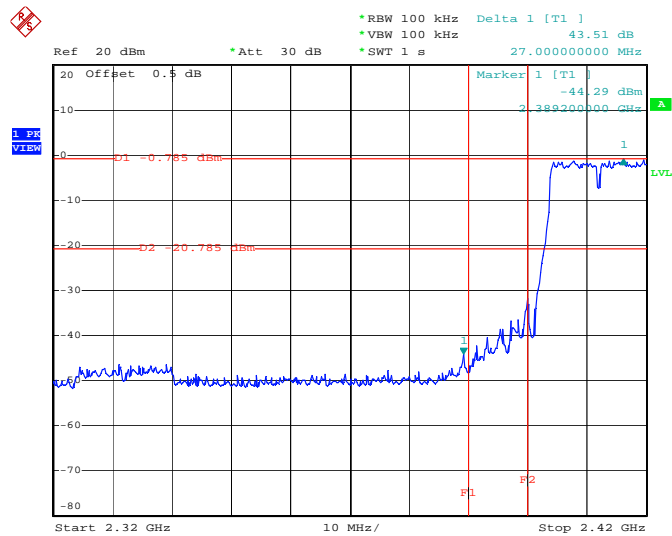
Date: 3.JUN.2008 20:39:35

High Band Edge Plot on Configuration IEEE 802.11b / Ant. A / 2462 MHz



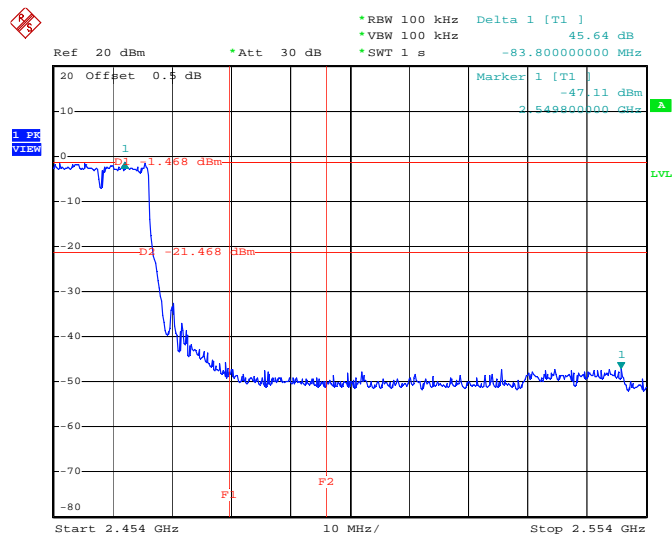
Date: 3.JUN.2008 20:41:33

Low Band Edge Plot on Configuration IEEE 802.11g / Ant. A / 2412 MHz



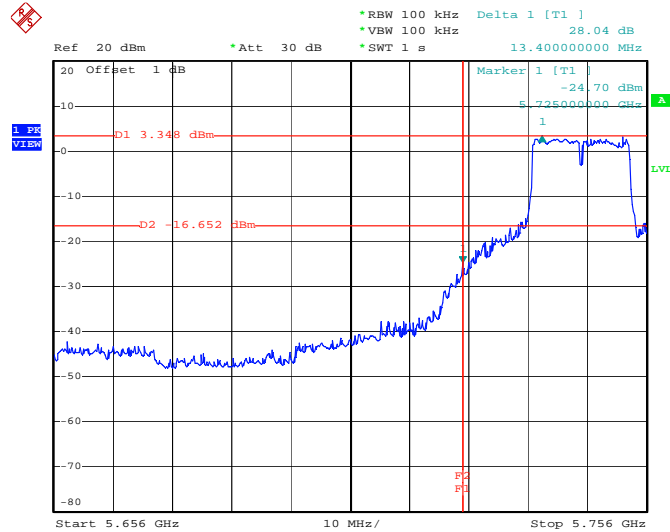
Date: 3.JUN.2008 20:38:13

High Band Edge Plot on Configuration IEEE 802.11g / Ant. A / 2462 MHz



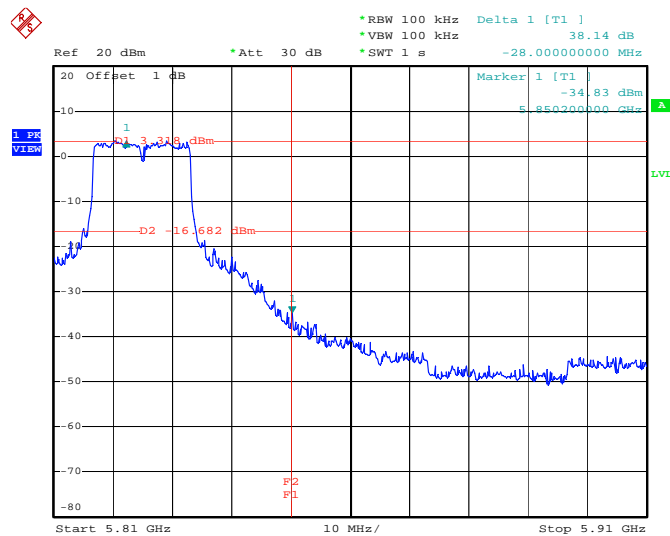
Date: 3.JUN.2008 20:36:16

Low Band Edge Plot on Configuration IEEE 802.11a / Ant. A / 5745 MHz



Date: 3.JUN.2008 21:11:18

High Band Edge Plot on Configuration IEEE 802.11a / Ant. A / 5825 MHz



Date: 3.JUN.2008 21:13:23

4.7. Antenna Requirements

4.7.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

4.7.2. Antenna Connector Construction

Please refer to section 3.3 in this test report; antenna connector complied with the requirements.

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	Mar. 03, 2008	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99079	9kHz – 30MHz	Mar. 31, 2008	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 22, 2008	Conduction (CO04-HY)
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9kHz – 30MHz	Apr. 20, 2008	Conduction (CO04-HY)
ISN	SCHAFFNER	ISN T400	21653	9kHz –30MHz	Mar. 27, 2008	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30 MHz - 1 GHz 3m	Jun. 14, 2007	Radiation (03CH03-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30 MHz - 1 GHz 3m	Jun. 14, 2007	Radiation (03CH03-HY)
Amplifier	SCHAFFNER	COA9231A	18667	9 kHz - 2 GHz	Jan. 14, 2008	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1 GHz - 26.5 GHz	Jun. 07, 2007	Radiation (03CH03-HY)
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5 GHz - 40 GHz	Jan. 22, 2007*	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP40	100305	9 kHz - 40 GHz	Sep. 27, 2007	Radiation (03CH03-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	May 23, 2006*	Radiation (03CH03-HY)
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30 MHz – 1 GHz	Jul. 21, 2007	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	Mar. 04, 2008	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15 GHz - 40 GHz	Jan.18, 2008	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30 MHz - 1 GHz	Dec. 03, 2007	Radiation (03CH03-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1 GHz - 40 GHz	Dec. 03, 2007	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 – 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	May 04, 2008	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15 GHz - 40 GHz	Jan. 18, 2008	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30 MHz - 1 GHz	Dec. 03, 2007	Radiation (03CH03-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1 GHz - 40 GHz	Dec. 03, 2007	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 – 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP30	100023	9kHz ~ 30GHz	Jan. 10, 2008	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100444	DC ~ 40GHz	Jun. 27, 2007	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100458	DC ~ 30GHz	Jun. 27, 2007	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jun. 27, 2007	Conducted (TH01-HY)
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	May 04, 2007*	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Mar. 13, 2008	Conducted (TH01-HY)
Temp. and Humidity Chamber	KSON	THS-C3L	612	N/A	Oct. 01, 2007	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 01, 2007	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 01, 2007	Conducted (TH01-HY)
Vector Signal Generator	R&S	SMU200A	102098	100kHz ~ 6GHz	Nov. 14, 2007	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Mar. 10, 2008	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jun. 27, 2007	Conducted (TH01-HY)
AC Power Source	HPC	HPB-500W	HPB-9100024	AC 0 ~ 300V	May 04, 2007*	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Mar. 03, 2008	Conducted (TH01-HY)
Temp. and Humidity Chamber	KSON	THS-C3L	612	N/A	Jan. 14, 2008	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Jan. 04, 2008	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Jan. 04, 2008	Conducted (TH01-HY)
Vector Signal Generator	R&S	SMU200A	102098	100kHz ~ 6GHz	Nov. 14, 2007	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Mar. 07, 2008	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is one year.

*Calibration Interval of instruments listed above is two year.

NCR means Non-Calibration required.

6. TEST LOCATION

SHIJR	ADD : 6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C. TEL : 886-2-2696-2468 FAX : 886-2-2696-2255
HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
LINKOU	ADD : No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C TEL : 886-2-2601-1640 FAX : 886-2-2601-1695
DUNGHU	ADD : No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C. TEL : 886-2-2631-4739 FAX : 886-2-2631-9740
JUNGHE	ADD : 7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C. TEL : 886-2-8227-2020 FAX : 886-2-8227-2626
NEIHU	ADD : 4Fl., No. 339, Hsin Hu 2 nd Rd., Taipei 114, Taiwan, R.O.C. TEL : 886-2-2794-8886 FAX : 886-2-2794-9777
JHUBEI	ADD : No.8, Lane 728, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

7. TAF CERTIFICATE OF ACCREDITATION



Certificate No. : L1190-070110

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien,
Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	: ISO/IEC 17025:2005
Accreditation Number	: 1190
Originally Accredited	: December 15, 2003
Effective Period	: January 10, 2007 to January 09, 2010
Accredited Scope	: Testing Field, see described in the Appendix
Specific Accreditation Program	: Accreditation Program for Designated Testing Laboratory for Commodities Inspection : Accreditation Program for Telecommunication Equipment Testing Laboratory



Jay-San Chen
President, Taiwan Accreditation Foundation
Date : January 10, 2007

PI, total 9 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when used without the Appendix.