SPORTON International Inc.
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FCC RADIO TEST REPORT

Applicant's company	**Belkin International, Inc.**
Applicant Address	501 West Walnut Street, Compton, CA 90220-5221, U.S.A.
FCC ID	**K7SF5D9231A**

Product Name	Belkin G+ MIMO Wireless Router
Brand Name	Belkin
Model Name	F5D9231-4 v1
Test Rule	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz
Received Date	Sep. 05, 2007
Final Test Date	Jun. 23, 2008
Submission Type	Original Equipment

Statement

Test result included in this report is for the Draft n and 802.11b/g part 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.

TAF
Testing Laboratory
1190

Table of Contents

History of This Test Report

Original Issue Date: Jul. 02, 2008

Report No.: FR790505-05

■ No additional attachment.

□ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

Certificate No.: CB9706135

1. CERTIFICATE OF COMPLIANCE

Product Name	:	Belkin G+ MIMO Wireless Router
Brand Name	:	Belkin
Model Name	:	F5D9231-4 v1
Applicant	:	Belkin 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 Sep. 05, 2007 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	1.24 dB
4.2	15.247(b)(3)	Maximum Conducted Output Power	Complies	8.26 dB
4.3	15.247(e)	Power Spectral Density	Complies	20.03 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	2.05 dB
4.6	15.247(d)	Band Edge Emissions	Complies	0.10 dB
4.7	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Conducted Output Power	±0.8dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
6dB Spectrum Bandwidth	$\pm 8.5\times10^{-8}$	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℃	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
Product Type	WLAN (1TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From Power Adapter
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11g
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
Channel Number	11
Channel Band Width (99%)	11b: 15.28 MHz ; 11g: 16.50 MHz
Conducted Output Power	11b: 19.82 dBm ; 11g: 21.74 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

3.2. Accessories

Power	Brand	Model	Rating
Adapter 1	DVE	DSA-12R-12 AUS 120120	Input: 100-120V, 50/60Hz, 0.3A Output: 12V, 1A
Adapter 2	LEADER	MT12-Y120100-A1	Input: 100-120V, 60Hz, 0.3A Output: 12V, 1.0A

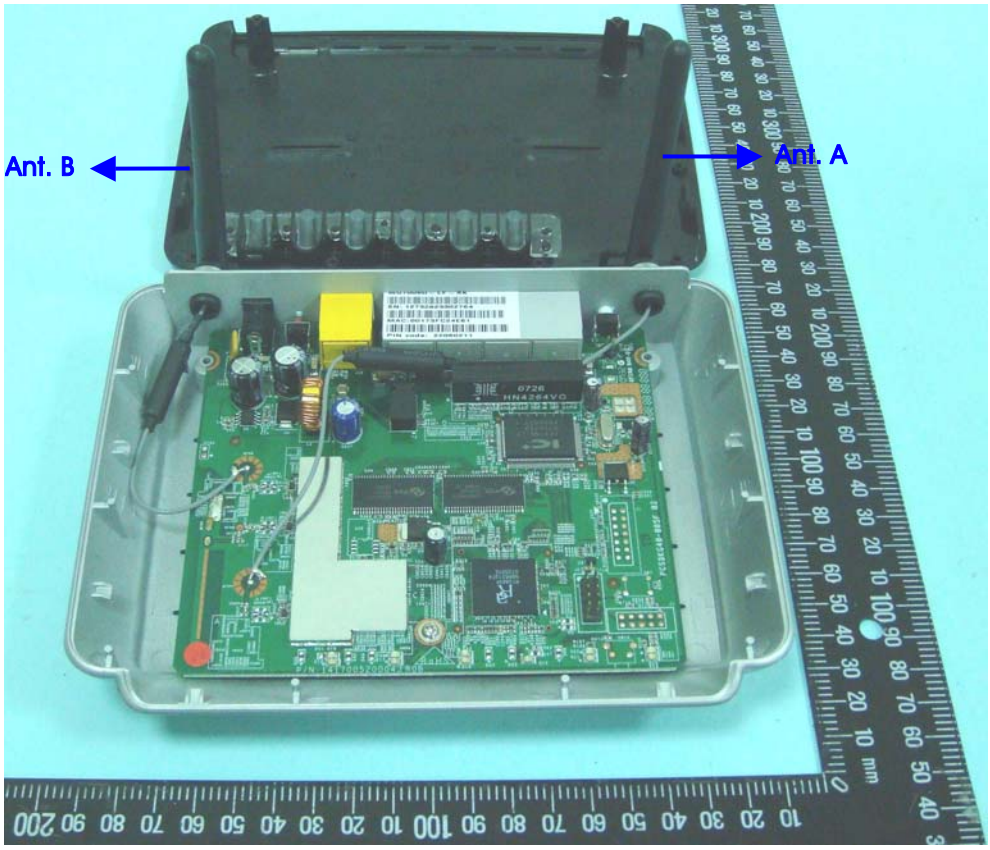
3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
A	Arcadyan	120300018500J	Dipole Antenna	N/A	2
B	Arcadyan	120300018400J	Dipole Antenna	N/A	2

Note: The EUT has two antennas.

Antenna A is used as the transmitting antenna.

Both antenna A and B can be used as receiving antenna.



3.4. Table for Carrier Frequencies

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		

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	-	-	-
Maximum Peak Conducted Output Power	11b/BPSK	1 Mbps	1/6/11	A
	11g/BPSK	6 Mbps	1/6/11	A
Power Spectral Density 6dB Spectrum Bandwidth	11b/BPSK	1 Mbps	1/6/11	A
	11g/BPSK	6 Mbps	1/6/11	A
Radiated Emissions 9kHz~1GHz	Normal Link	-	-	-
Radiated Emissions 1GHz~10th Harmonic	11b/BPSK	1 Mbps	1/6/11	A
	11g/BPSK	6 Mbps	1/6/11	A
Band Edge Emissions	11b/BPSK	1 Mbps	1/11	A
	11g/BPSK	6 Mbps	1/11	A

Note:

The following test modes were performed for all tests:

Mode 1: EUT + Adapter 1

Mode 2: EUT + Adapter 2

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	D400	E2K24GBRL
Notebook	DELL	D505	E2K24GBRL
Notebook	DELL	D400	E2K24GBRL
HUB	CNET	CSH-1600E	N/A

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.

Power Parameters of IEEE 802.11b/g

Test Software Version	ATE		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b Ant. C	14	13	12
IEEE 802.11g Ant. C	7	6	6

During the test, the following programs under WIN XP were executed:

Executed " ATE " to control the EUT continuously transmit RF signal.

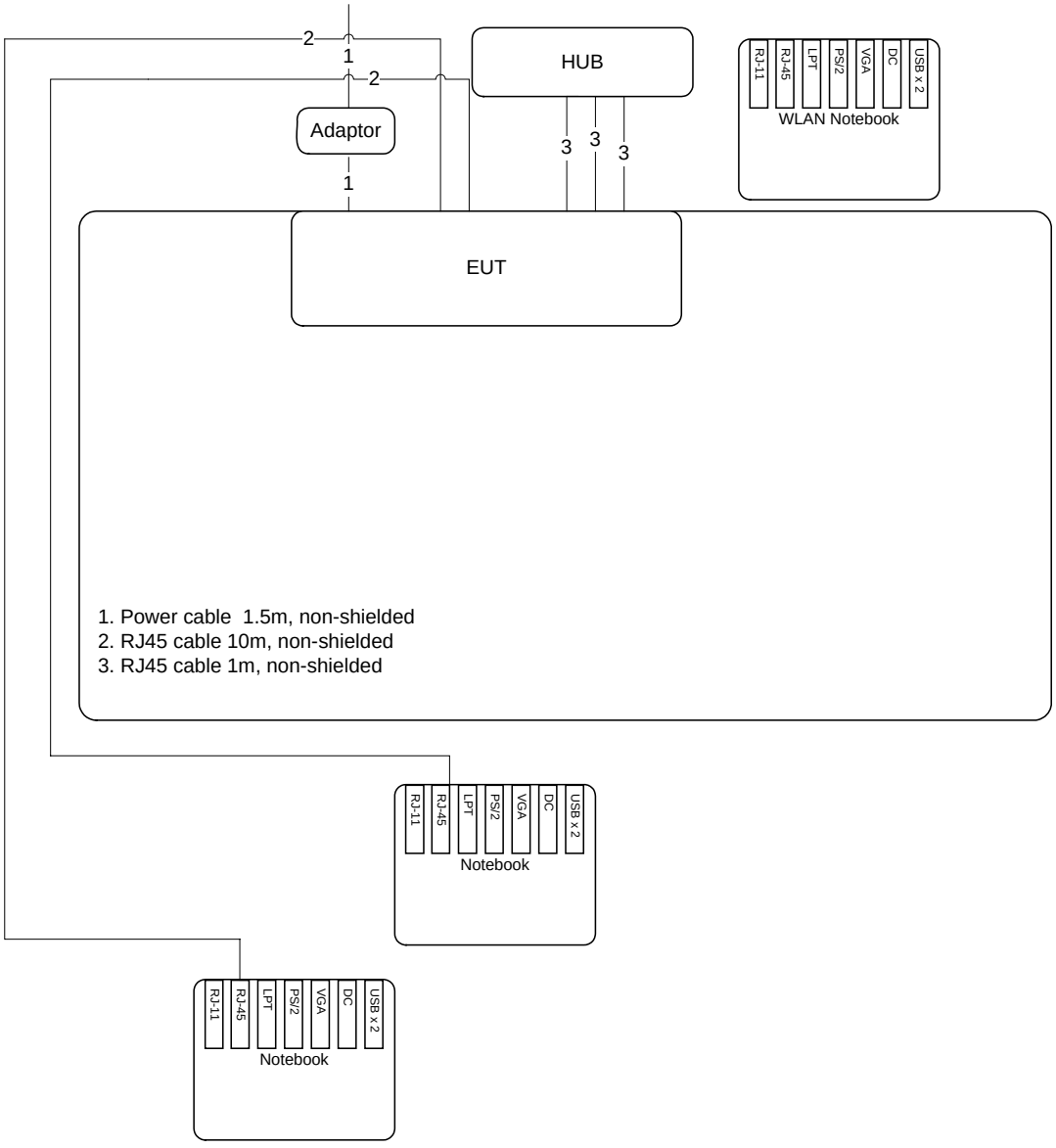
Executed " ping.exe " to link with the remote workstation to receive and transmit signal by LAN and WLAN.

3.9. Test Configurations

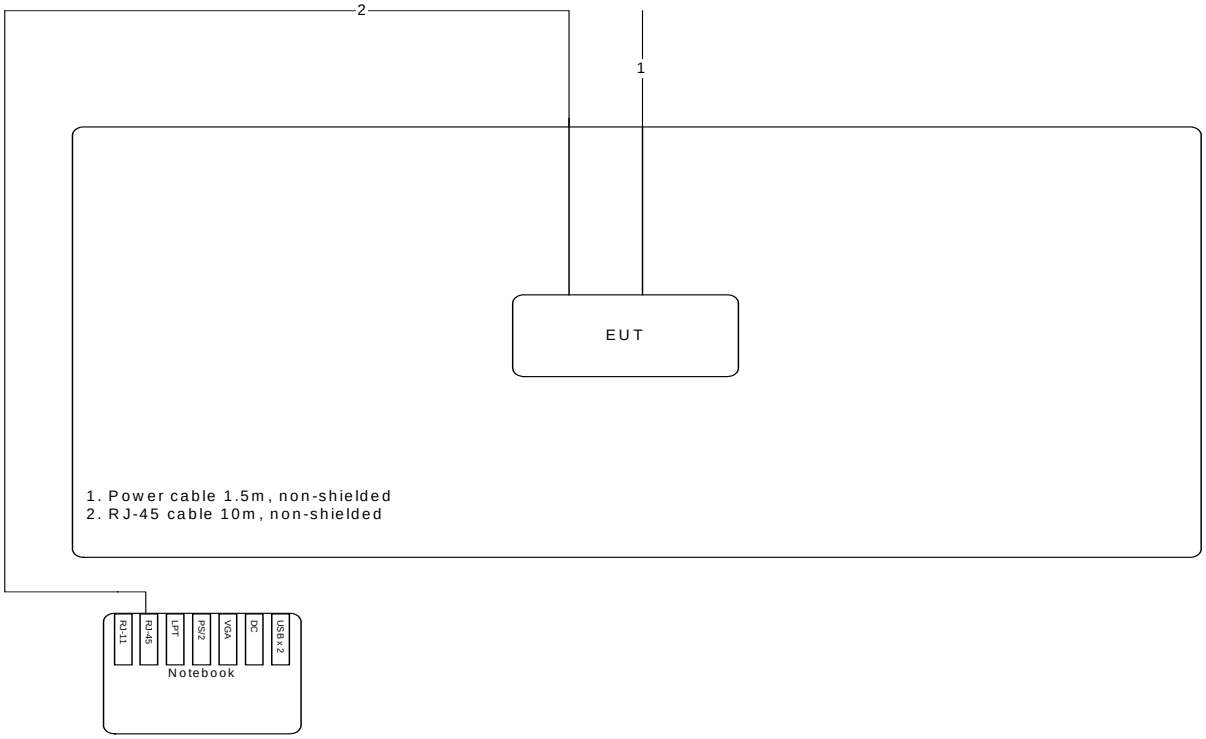
3.9.1. Radiation Emissions Test Configuration

Test Configuration: 30KHz~1GHz

Test Mode: Mode 1 / Mode 2

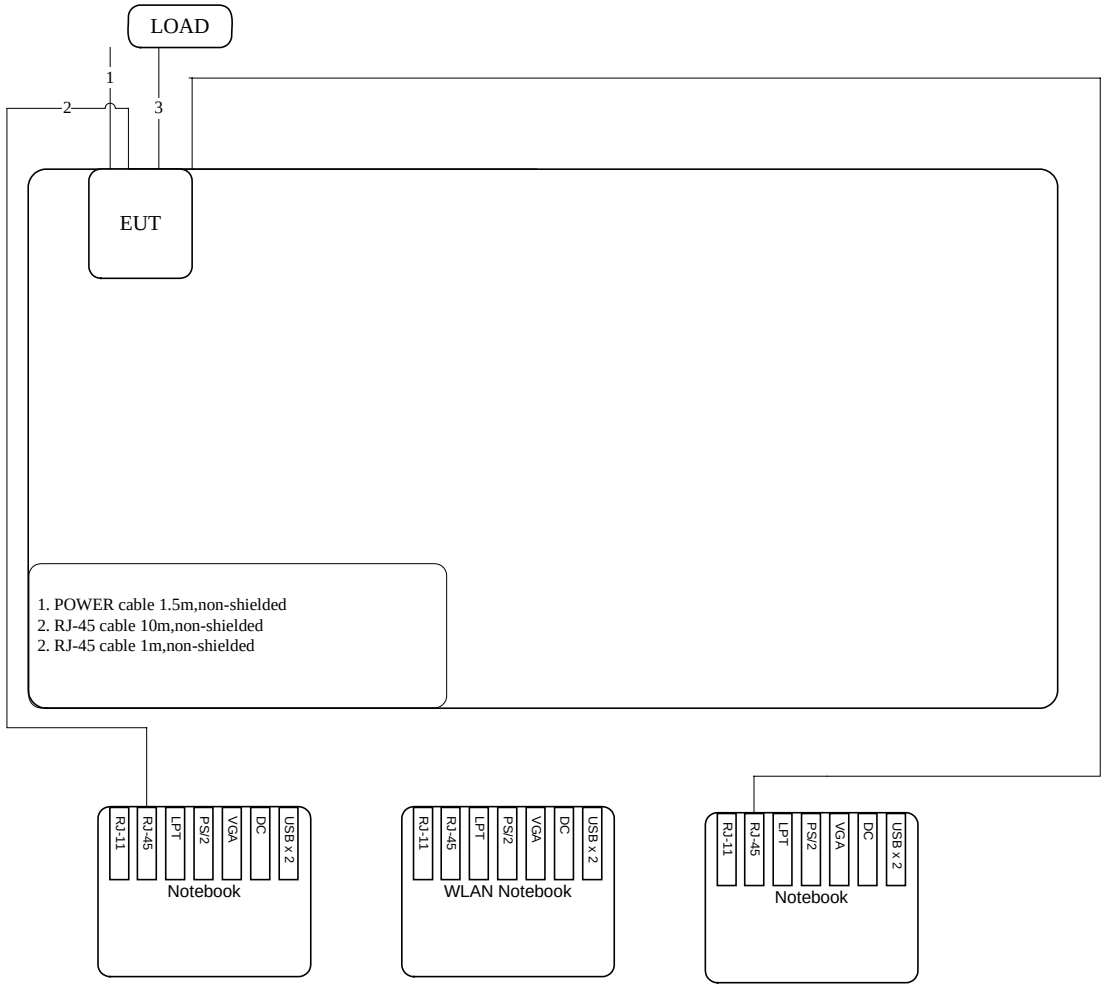


Test Configuration: above 1GHz



3.9.2. AC Power Line Conduction Emissions Test Configuration

Test Mode: Mode 1 / Mode 2



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

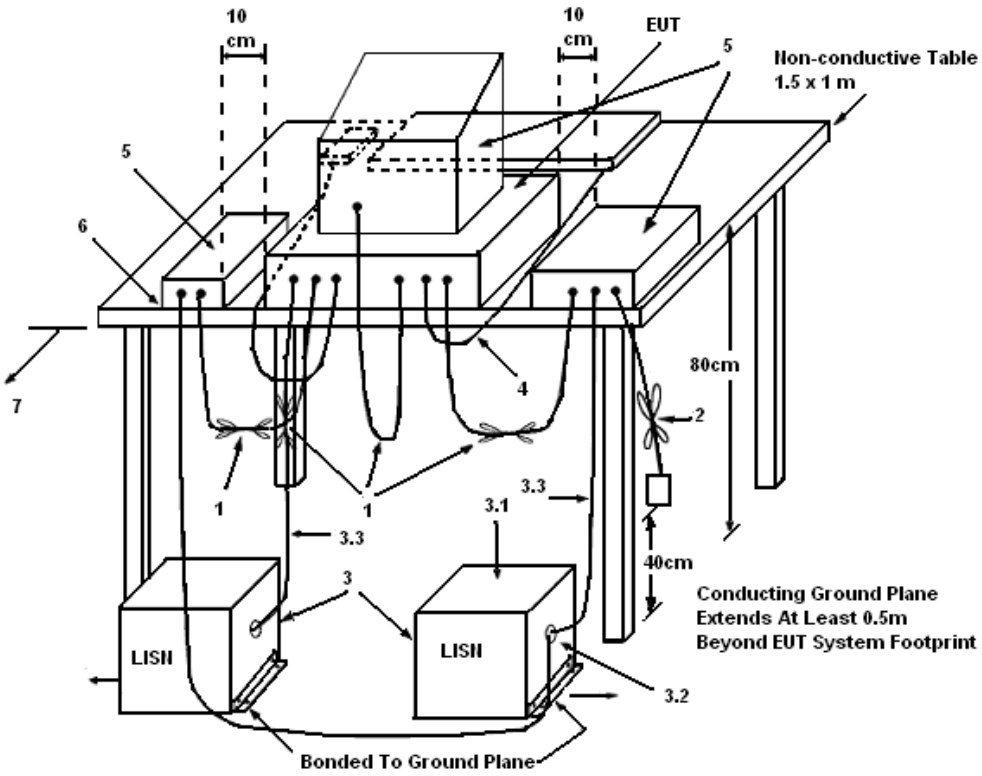
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

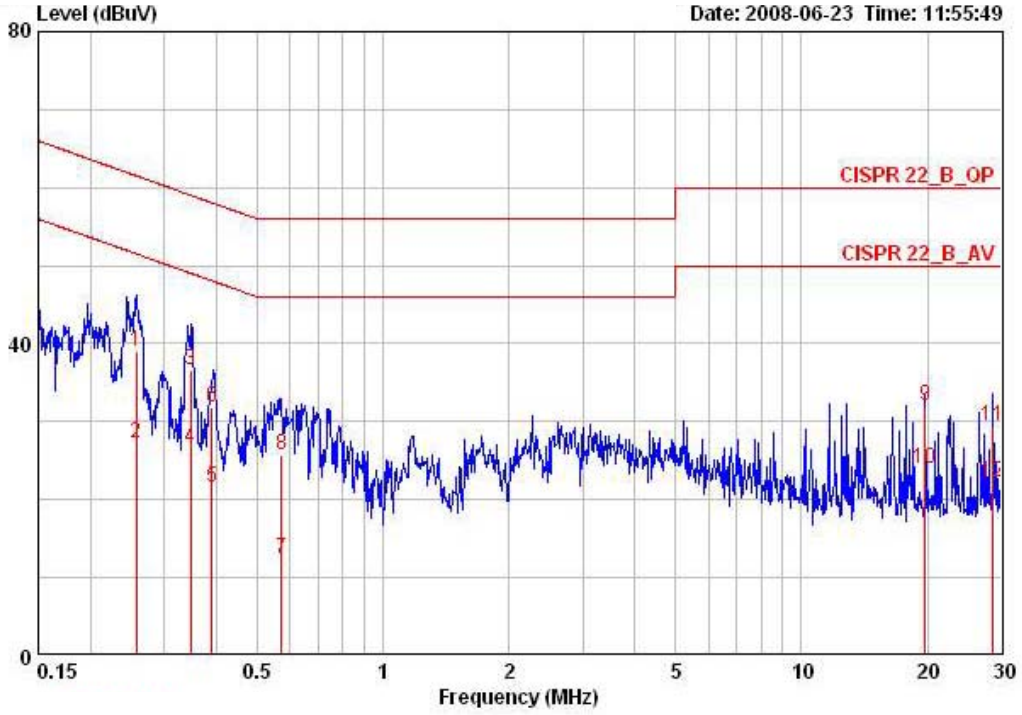
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

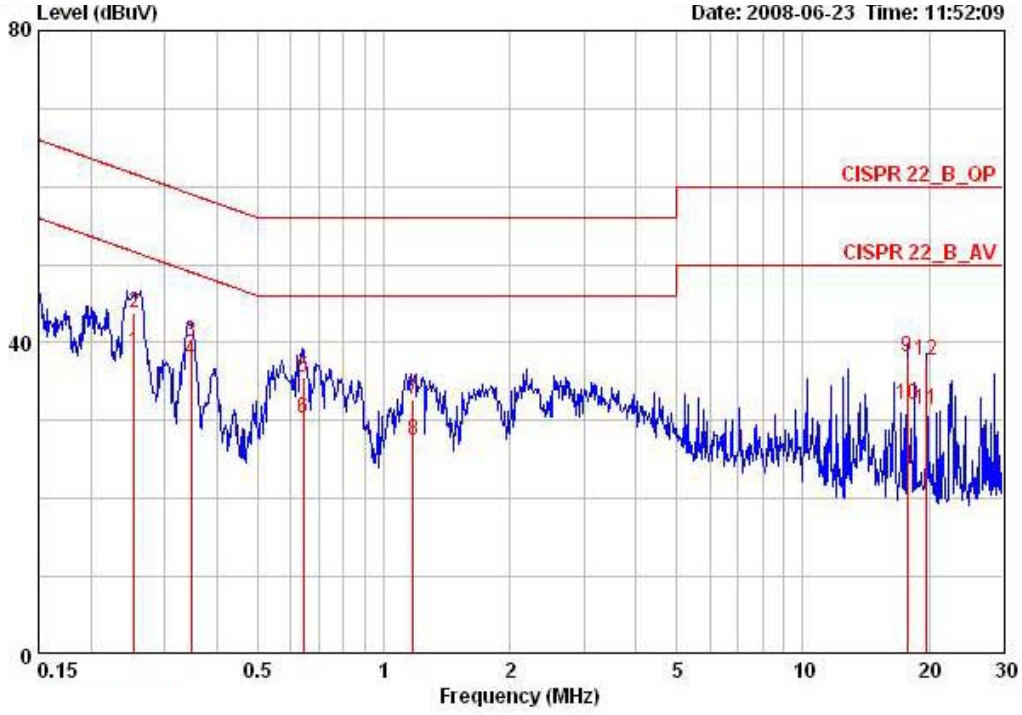
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23°C	Humidity	54%
Test Engineer	Rex Chiu	Phase	Line
Configuration	Normal Link / Mode 1		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.25751	39.07	-22.44	61.51	38.83	0.04	0.20	QP
2	0.25751	27.22	-24.29	51.51	26.98	0.04	0.20	AVERAGE
3	0.34646	36.63	-22.41	59.05	36.40	0.03	0.20	QP
4	0.34646	26.50	-22.54	49.05	26.27	0.03	0.20	AVERAGE
5	0.38976	21.51	-26.56	48.07	21.28	0.03	0.20	AVERAGE
6	0.38976	31.93	-26.14	58.07	31.70	0.03	0.20	QP
7	0.57313	12.32	-33.68	46.00	12.09	0.03	0.20	AVERAGE
8	0.57313	25.64	-30.36	56.00	25.41	0.03	0.20	QP
9	19.709	31.94	-28.06	60.00	30.63	0.81	0.50	QP
10	19.709	24.04	-25.96	50.00	22.73	0.81	0.50	AVERAGE
11	28.686	29.49	-30.51	60.00	27.53	1.36	0.60	QP
12	28.686	22.27	-27.73	50.00	20.31	1.36	0.60	AVERAGE

Temperature	23°C	Humidity	54%
Test Engineer	Rex Chiu	Phase	Neutral
Configuration	Mode 1		

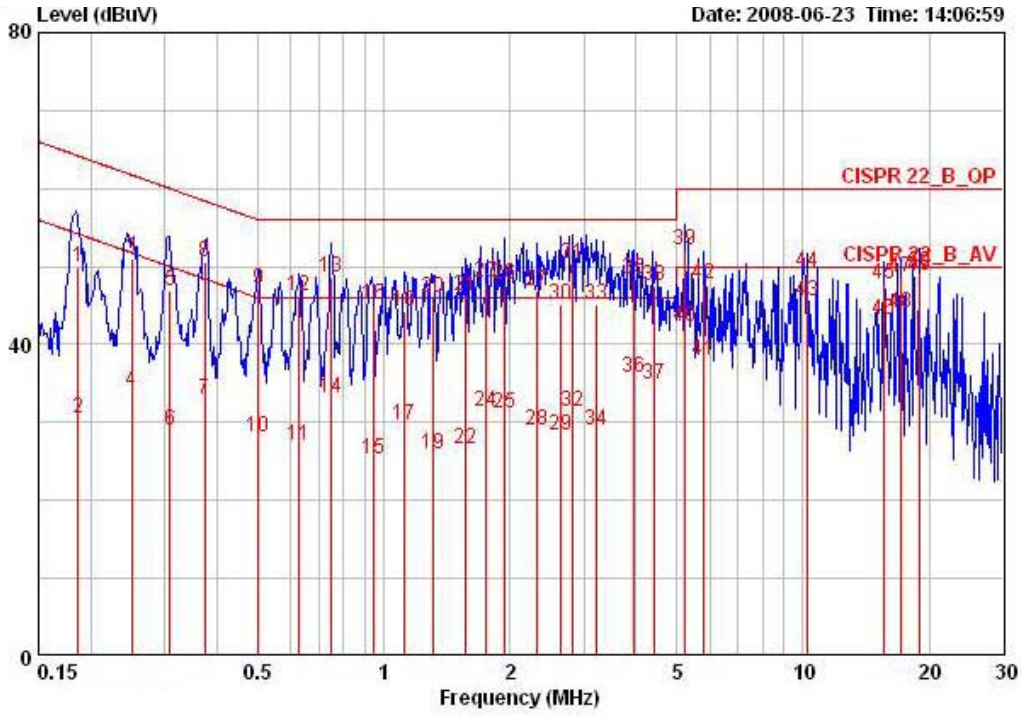


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.25393	38.75	-12.88	51.63	38.47	0.08	0.20	AVERAGE
2	0.25393	43.74	-17.89	61.63	43.46	0.08	0.20	QP
3	0.34641	40.18	-18.87	59.05	39.91	0.07	0.20	QP
4	0.34641	37.73	-11.32	49.05	37.46	0.07	0.20	AVERAGE
5	0.64298	35.47	-20.53	56.00	35.20	0.07	0.20	QP
6	0.64298	30.21	-15.79	46.00	29.94	0.07	0.20	AVERAGE
7	1.177	32.65	-23.35	56.00	32.42	0.07	0.16	QP
8	1.177	27.52	-18.48	46.00	27.29	0.07	0.16	AVERAGE
9	17.694	38.11	-21.89	60.00	36.91	0.70	0.50	QP
10	17.694	31.95	-18.05	50.00	30.75	0.70	0.50	AVERAGE
11	19.709	31.34	-18.66	50.00	30.05	0.79	0.50	AVERAGE
12	19.709	37.69	-22.31	60.00	36.40	0.79	0.50	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

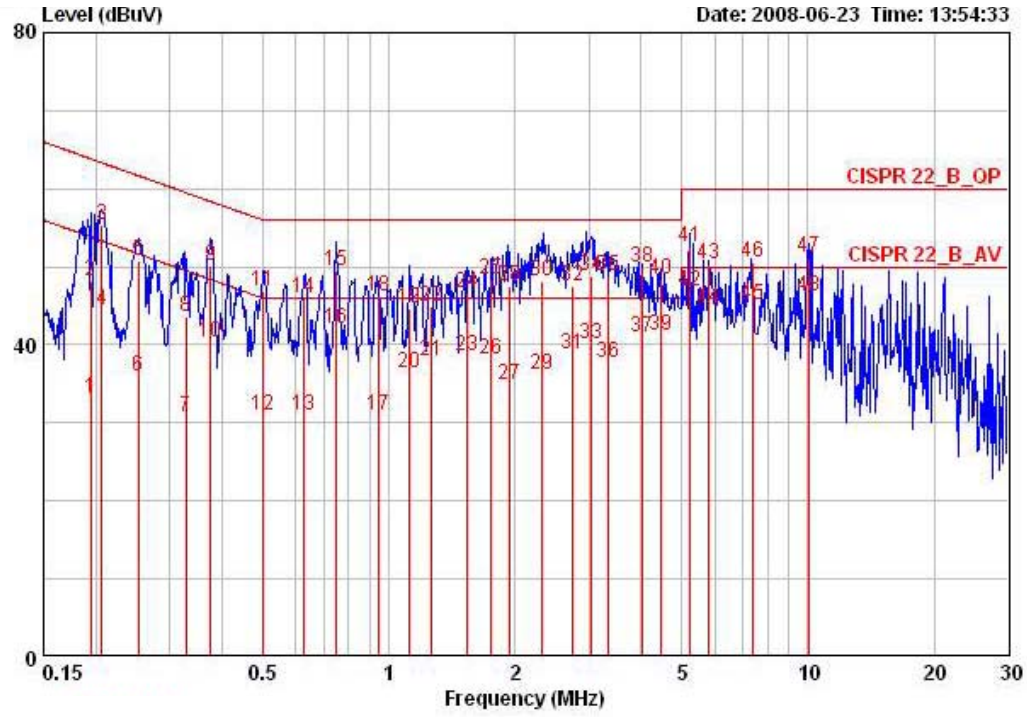
Temperature	23°C	Humidity	54%
Test Engineer	Rex Chiu	Phase	Line
Configuration	Mode 2		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.18666	49.95	-14.24	64.18	49.69	0.06	0.20	QP
2	0.18666	30.56	-23.63	54.18	30.30	0.06	0.20	AVERAGE
3	0.25066	51.09	-10.64	61.74	50.85	0.04	0.20	QP
4	0.25066	33.94	-17.79	51.74	33.70	0.04	0.20	AVERAGE
5	0.30911	46.86	-13.14	59.99	46.62	0.04	0.20	QP
6	0.30911	28.92	-21.08	49.99	28.68	0.04	0.20	AVERAGE
7	0.37471	32.86	-15.53	48.40	32.63	0.03	0.20	AVERAGE
8	0.37471	50.49	-7.90	58.40	50.26	0.03	0.20	QP
9	0.50123	47.11	-8.89	56.00	46.88	0.03	0.20	QP
10	0.50123	28.12	-17.88	46.00	27.89	0.03	0.20	AVERAGE
11	0.62595	27.05	-18.95	46.00	26.82	0.03	0.20	AVERAGE
12	0.62595	46.13	-9.87	56.00	45.90	0.03	0.20	QP
13	0.74897	48.63	-7.37	56.00	48.40	0.03	0.20	QP
14	0.74897	33.21	-12.79	46.00	32.98	0.03	0.20	AVERAGE
15	0.94154	25.29	-20.71	46.00	25.06	0.03	0.20	AVERAGE
16	0.94154	45.23	-10.77	56.00	45.00	0.03	0.20	QP
17	1.122	29.64	-16.36	46.00	29.44	0.03	0.17	AVERAGE
18	1.122	44.14	-11.86	56.00	43.94	0.03	0.17	QP
19	1.316	26.04	-19.96	46.00	25.87	0.04	0.13	AVERAGE
20	1.316	45.98	-10.02	56.00	45.81	0.04	0.13	QP

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
21	1.568	46.18	-9.82	56.00	46.02	0.04	0.11	QP
22	1.568	26.67	-19.33	46.00	26.51	0.04	0.11	AVERAGE
23	1.755	47.89	-8.11	56.00	47.69	0.05	0.15	QP
24	1.755	31.40	-14.60	46.00	31.20	0.05	0.15	AVERAGE
25	1.939	31.26	-14.74	46.00	31.02	0.05	0.19	AVERAGE
26	1.939	47.68	-8.32	56.00	47.44	0.05	0.19	QP
27	2.321	46.85	-9.15	56.00	46.59	0.06	0.20	QP
28	2.321	29.00	-17.00	46.00	28.74	0.06	0.20	AVERAGE
29	2.636	28.29	-17.71	46.00	28.02	0.07	0.20	AVERAGE
30	2.636	45.18	-10.82	56.00	44.91	0.07	0.20	QP
31	2.824	50.40	-5.61	56.00	50.12	0.08	0.20	QP
32	2.824	31.35	-14.66	46.00	31.07	0.08	0.20	AVERAGE
33	3.222	45.12	-10.88	56.00	44.79	0.08	0.25	QP
34	3.222	28.90	-17.10	46.00	28.57	0.08	0.25	AVERAGE
35	3.952	48.48	-7.52	56.00	48.08	0.10	0.30	QP
36	3.952	35.74	-10.26	46.00	35.34	0.10	0.30	AVERAGE
37	4.411	34.92	-11.08	46.00	34.49	0.13	0.30	AVERAGE
38	4.411	47.58	-8.42	56.00	47.15	0.13	0.30	QP
39	5.237	52.18	-7.82	60.00	51.71	0.17	0.30	QP
40	5.237	42.18	-7.82	50.00	41.71	0.17	0.30	AVERAGE
41	5.787	37.97	-12.03	50.00	37.47	0.20	0.30	AVERAGE
42	5.787	47.80	-12.20	60.00	47.30	0.20	0.30	QP
43	10.244	45.58	-4.42	50.00	44.87	0.36	0.34	AVERAGE
44	10.244	49.25	-10.75	60.00	48.54	0.36	0.34	QP
45	15.618	47.68	-12.32	60.00	46.69	0.59	0.40	QP
46	15.618	43.18	-6.82	50.00	42.19	0.59	0.40	AVERAGE
47	17.084	48.66	-11.34	60.00	47.48	0.68	0.50	QP
48	17.084	44.05	-5.95	50.00	42.87	0.68	0.50	AVERAGE
49 @	18.915	48.76	-1.24	50.00	47.49	0.77	0.50	AVERAGE
50	18.915	49.35	-10.65	60.00	48.08	0.77	0.50	QP

Temperature	23°C	Humidity	54%
Test Engineer	Rex Chiu	Phase	Neutral
Configuration	Normal Link / Mode 2		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.19447	33.23	-20.61	53.84	32.95	0.08	0.20	AVERAGE
2	0.19447	48.13	-15.71	63.84	47.85	0.08	0.20	QP
3	0.20694	55.46	-7.87	63.33	55.18	0.08	0.20	QP
4	0.20694	44.42	-8.91	53.33	44.14	0.08	0.20	AVERAGE
5	0.25251	50.85	-10.83	61.67	50.57	0.08	0.20	QP
6	0.25251	36.01	-15.67	51.67	35.73	0.08	0.20	AVERAGE
7	0.32832	30.76	-18.73	49.49	30.49	0.07	0.20	AVERAGE
8	0.32832	43.61	-15.88	59.49	43.34	0.07	0.20	QP
9	0.37592	50.05	-8.32	58.37	49.78	0.07	0.20	QP
10	0.37592	40.40	-7.97	48.37	40.13	0.07	0.20	AVERAGE
11	0.50243	46.97	-9.03	56.00	46.70	0.07	0.20	QP
12	0.50243	30.97	-15.03	46.00	30.70	0.07	0.20	AVERAGE
13	0.62928	30.87	-15.13	46.00	30.60	0.07	0.20	AVERAGE
14	0.62928	46.03	-9.97	56.00	45.76	0.07	0.20	QP
15	0.74697	49.59	-6.41	56.00	49.32	0.07	0.20	QP
16	0.74697	42.01	-3.99	46.00	41.74	0.07	0.20	AVERAGE
17	0.94234	30.88	-15.12	46.00	30.61	0.07	0.20	AVERAGE
18	0.94234	46.19	-9.81	56.00	45.92	0.07	0.20	QP
19	1.120	44.71	-11.29	56.00	44.46	0.07	0.17	QP
20	1.120	36.33	-9.67	46.00	36.08	0.07	0.17	AVERAGE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
21	1.266	37.92	-8.08	46.00	37.70	0.08	0.14	AVERAGE
22	1.266	44.90	-11.10	56.00	44.68	0.08	0.14	QP
23	1.542	38.49	-7.51	46.00	38.30	0.08	0.11	AVERAGE
24	1.542	46.69	-9.31	56.00	46.50	0.08	0.11	QP
25	1.758	48.43	-7.57	56.00	48.19	0.09	0.16	QP
26	1.758	38.07	-7.93	46.00	37.83	0.09	0.16	AVERAGE
27	1.948	34.98	-11.02	46.00	34.70	0.09	0.19	AVERAGE
28	1.948	47.60	-8.40	56.00	47.32	0.09	0.19	QP
29	2.329	36.21	-9.79	46.00	35.91	0.10	0.20	AVERAGE
30	2.329	48.17	-7.83	56.00	47.87	0.10	0.20	QP
31	2.734	38.73	-7.27	46.00	38.42	0.11	0.20	AVERAGE
32	2.734	47.43	-8.57	56.00	47.12	0.11	0.20	QP
33	3.038	40.00	-6.00	46.00	39.67	0.12	0.21	AVERAGE
34	3.038	48.89	-7.11	56.00	48.56	0.12	0.21	QP
35	3.347	48.75	-7.25	56.00	48.35	0.13	0.27	QP
36	3.347	37.70	-8.30	46.00	37.30	0.13	0.27	AVERAGE
37	4.015	40.93	-5.07	46.00	40.49	0.14	0.30	AVERAGE
38	4.015	50.02	-5.98	56.00	49.58	0.14	0.30	QP
39	4.474	41.10	-4.90	46.00	40.63	0.17	0.30	AVERAGE
40	4.474	48.45	-7.55	56.00	47.98	0.17	0.30	QP
41	5.236	52.50	-7.50	60.00	51.99	0.21	0.30	QP
42	5.236	46.79	-3.21	50.00	46.28	0.21	0.30	AVERAGE
43	5.785	50.46	-9.54	60.00	49.92	0.24	0.30	QP
44	5.785	44.71	-5.29	50.00	44.17	0.24	0.30	AVERAGE
45	7.373	45.21	-4.79	50.00	44.53	0.31	0.38	AVERAGE
46	7.373	50.47	-9.53	60.00	49.79	0.31	0.38	QP
47	10.060	51.30	-8.70	60.00	50.60	0.39	0.31	QP
48	10.060	46.11	-3.89	50.00	45.41	0.39	0.31	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.

4.2.2. Measuring Instruments and Setting

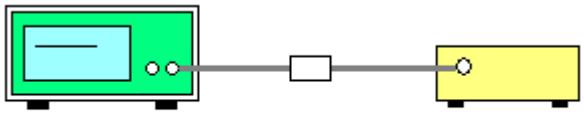
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1000 kHz
VB	3000 kHz
Detector	rms
Trace	Max Hold
Sweep Time	Auto

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	64%
Test Engineer	Aric Lee	Configurations	802.11b/g

Configuration IEEE 802.11b Ant. A

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	19.82	30.00	Complies
6	2437 MHz	19.79	30.00	Complies
11	2462 MHz	18.60	30.00	Complies

Configuration IEEE 802.11g Ant. A

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	21.74	30.00	Complies
6	2437 MHz	21.48	30.00	Complies
11	2462 MHz	21.29	30.00	Complies

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 8 dBm 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 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	64%
Test Engineer	Aric Lee	Configurations	802.11b/g

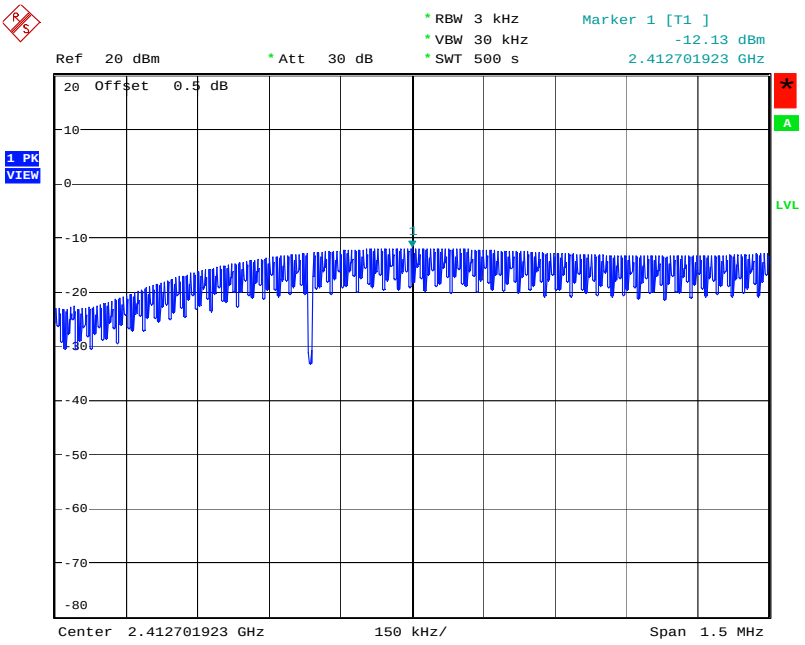
Configuration IEEE 802.11b Ant. A

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-12.13	8.00	Complies
6	2437 MHz	-12.09	8.00	Complies
11	2462 MHz	-12.03	8.00	Complies

Configuration IEEE 802.11g Ant. A

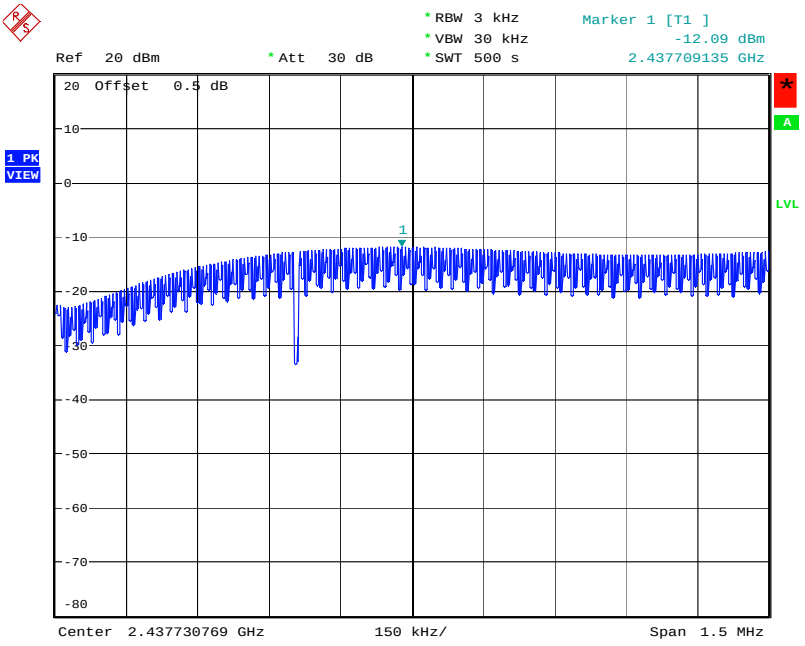
Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-14.94	8.00	Complies
6	2437 MHz	-14.11	8.00	Complies
11	2462 MHz	-14.39	8.00	Complies

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



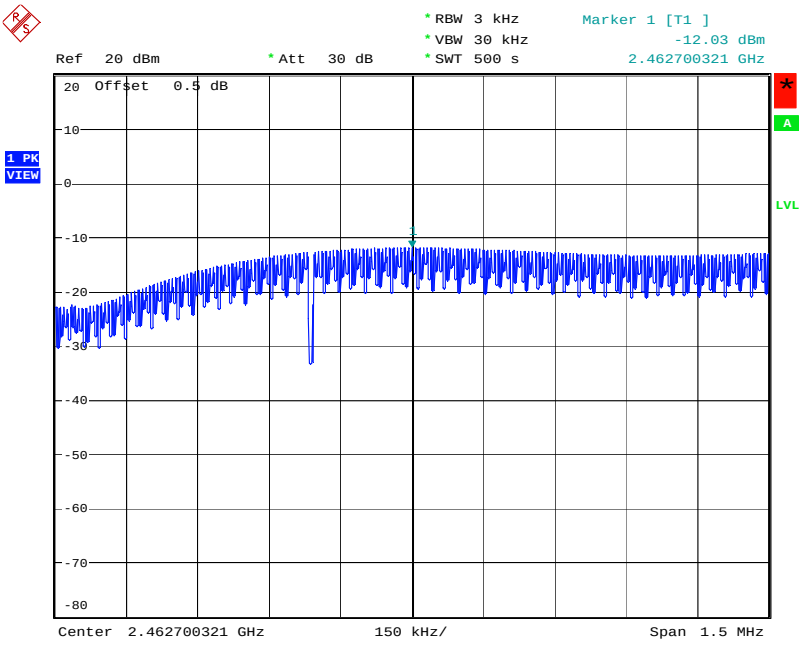
Date: 10.SEP.2007 16:28:03

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



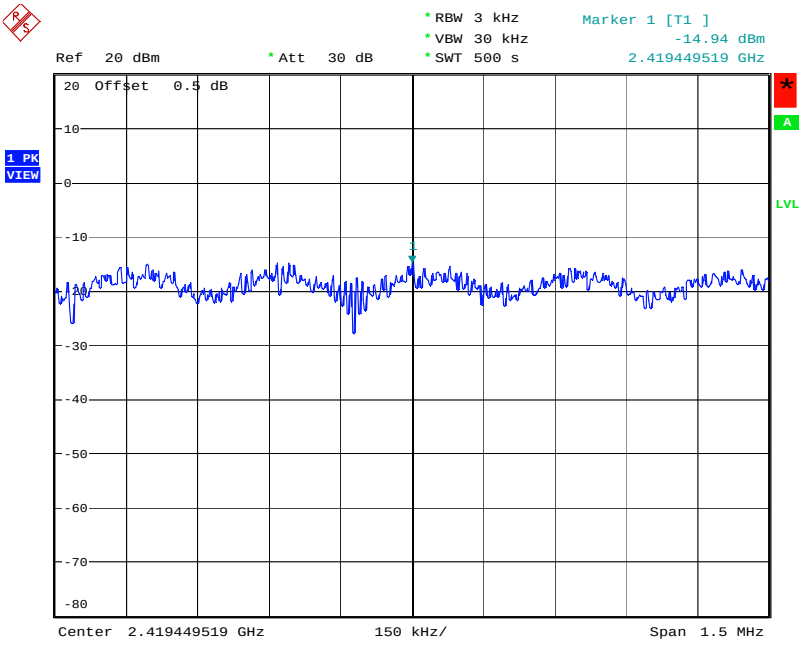
Date: 10.SEP.2007 16:33:53

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



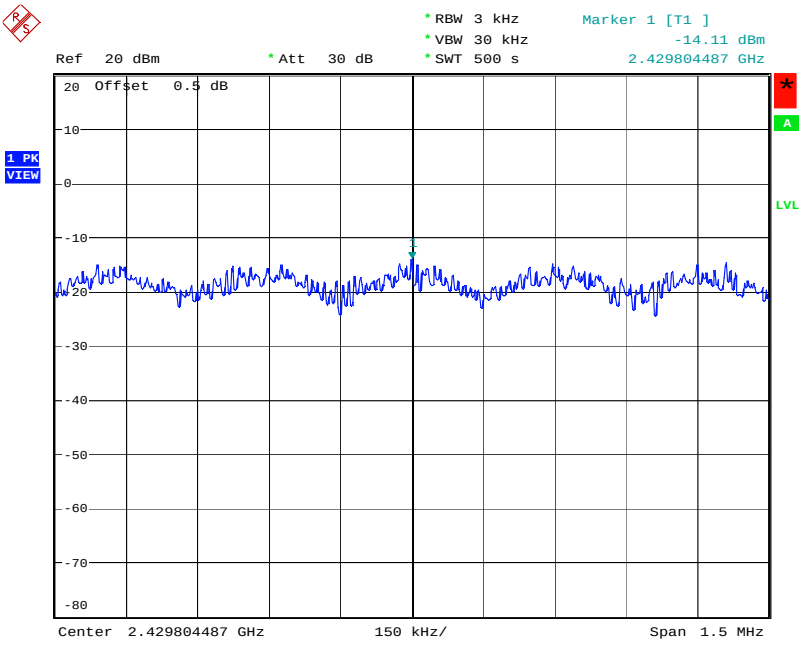
Date: 10.SEP.2007 16:36:05

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



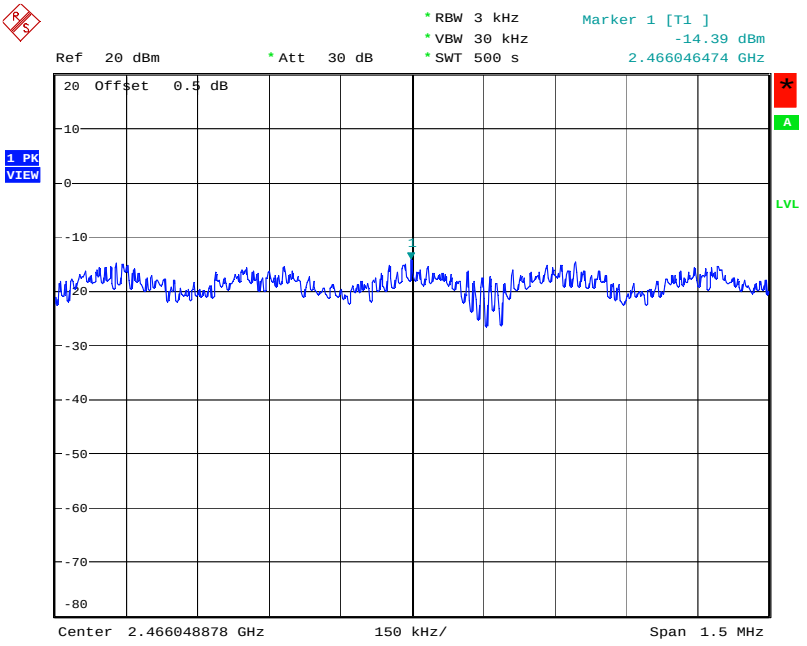
Date: 10.SEP.2007 16:37:43

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



Date: 10.SEP.2007 16:38:45

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



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4.4. 6dB Spectrum Bandwidth Measurement

4.4.1. Limit

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

4.4.2. Measuring Instruments and Setting

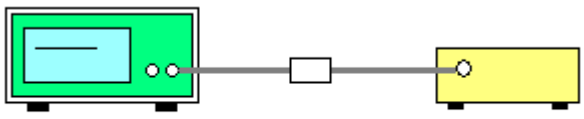
Please refer to section 5 of equipments list in this report. The following table is the setting of the Spectrum Analyzer.

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 analyzer 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	64%
Test Engineer	Aric Lee	Configurations	802.11b/g

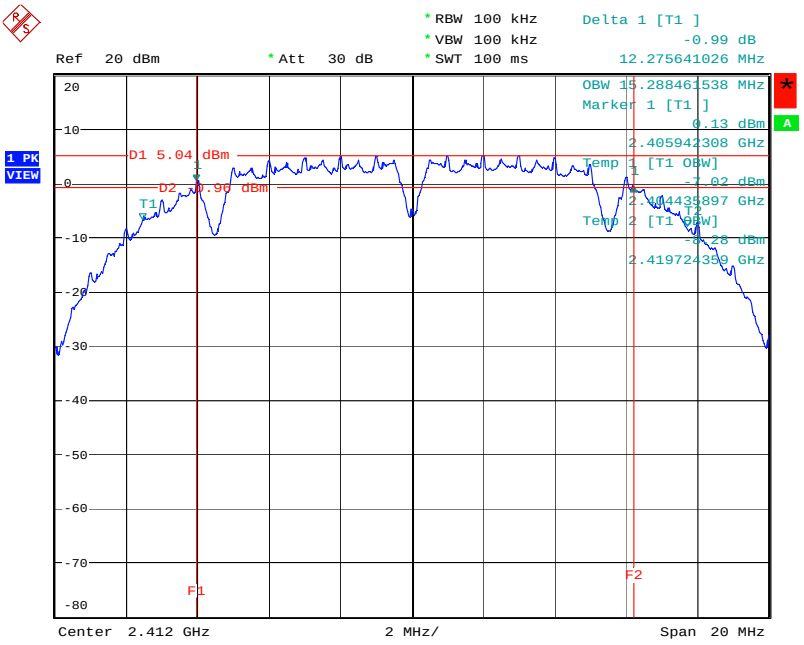
Configuration IEEE 802.11b Ant. A

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	12.27	15.28	500	Complies
6	2437 MHz	12.30	15.22	500	Complies
11	2462 MHz	12.40	15.22	500	Complies

Configuration IEEE 802.11g Ant. A

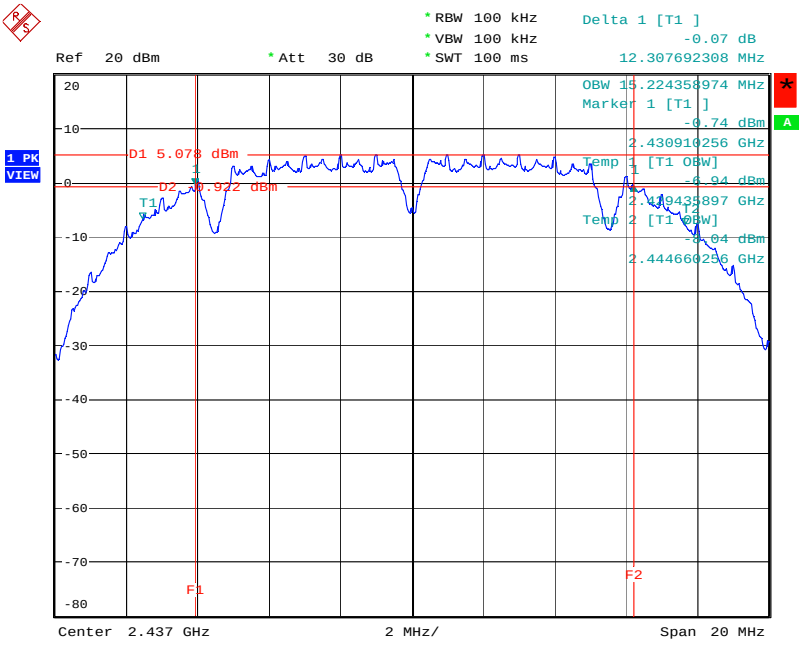
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.57	16.47	500	Complies
6	2437 MHz	16.57	16.50	500	Complies
11	2462 MHz	16.57	16.44	500	Complies

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



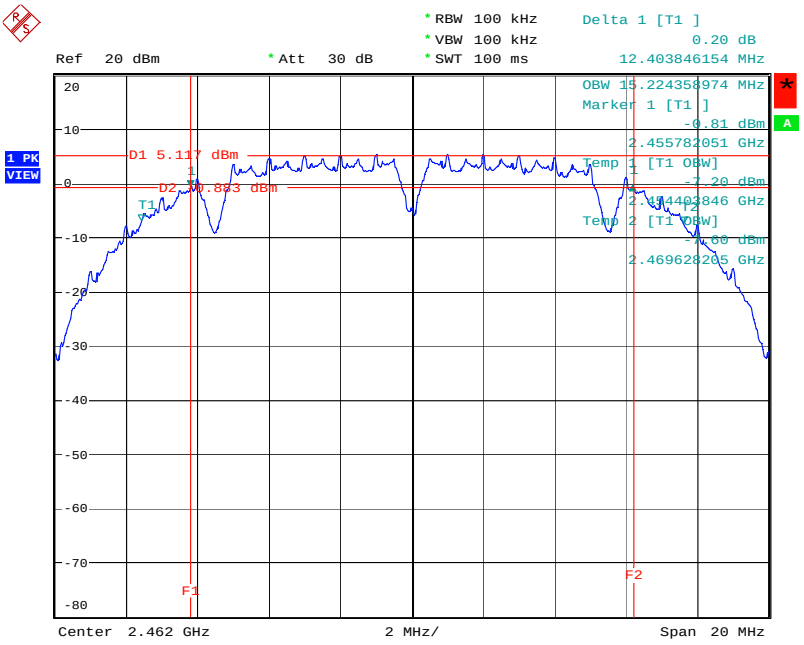
Date: 10.SEP.2007 16:27:37

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



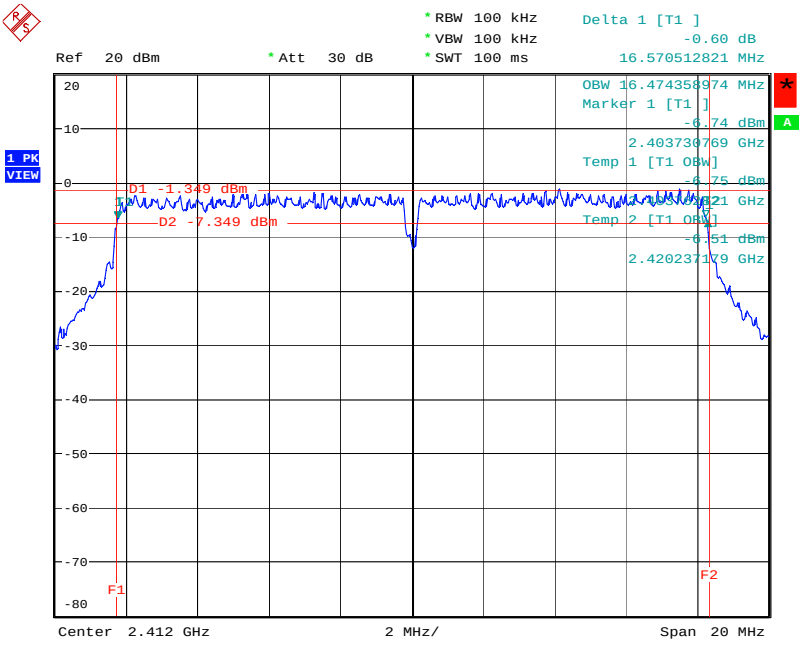
Date: 10.SEP.2007 16:33:36

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



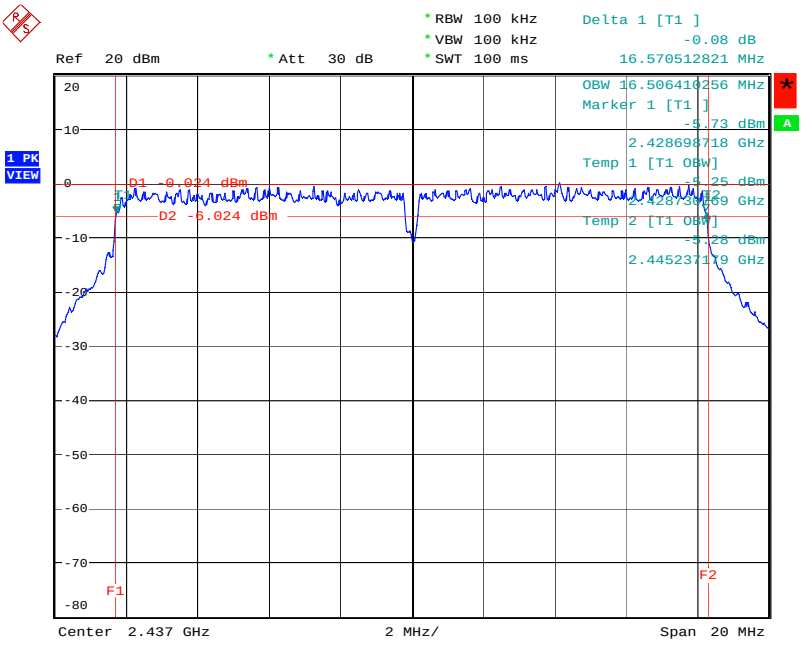
Date: 10.SEP.2007 16:35:50

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



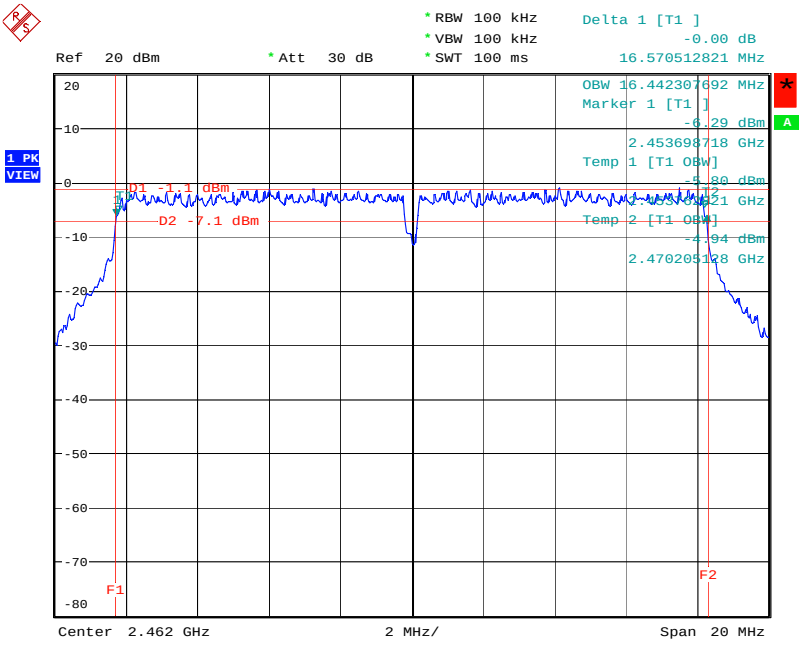
Date: 10.SEP.2007 16:37:17

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



Date: 10.SEP.2007 16:38:28

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



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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)	1000KHz / 1000KHz for peak

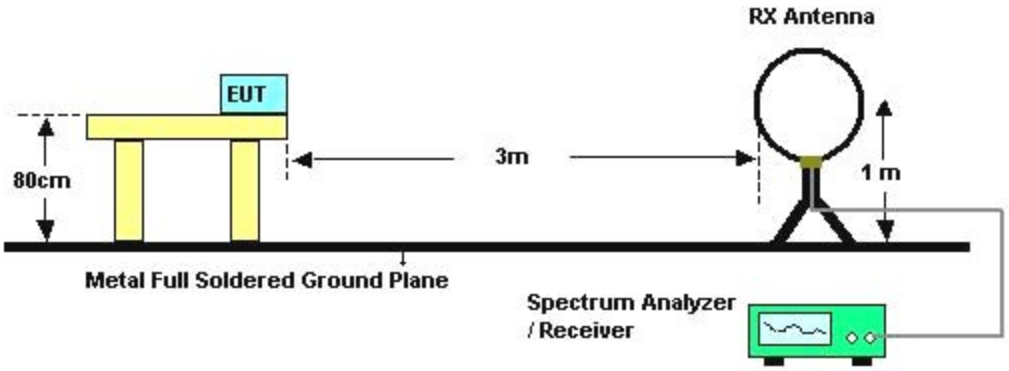
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.5.3. Test Procedures

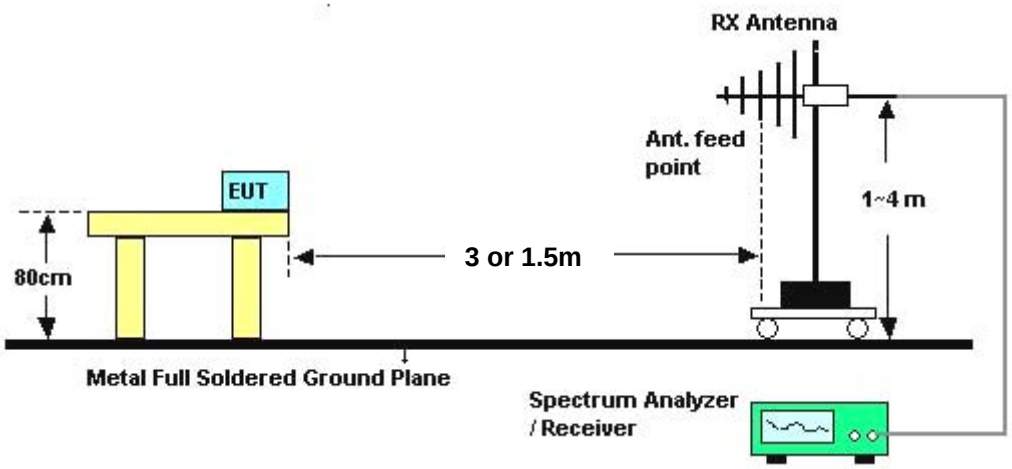
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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 form 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distanc [3m] / 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	24°C	Humidity	61%
Test Engineer	Aric Lee	Configurations	Normal Link

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

Note:

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

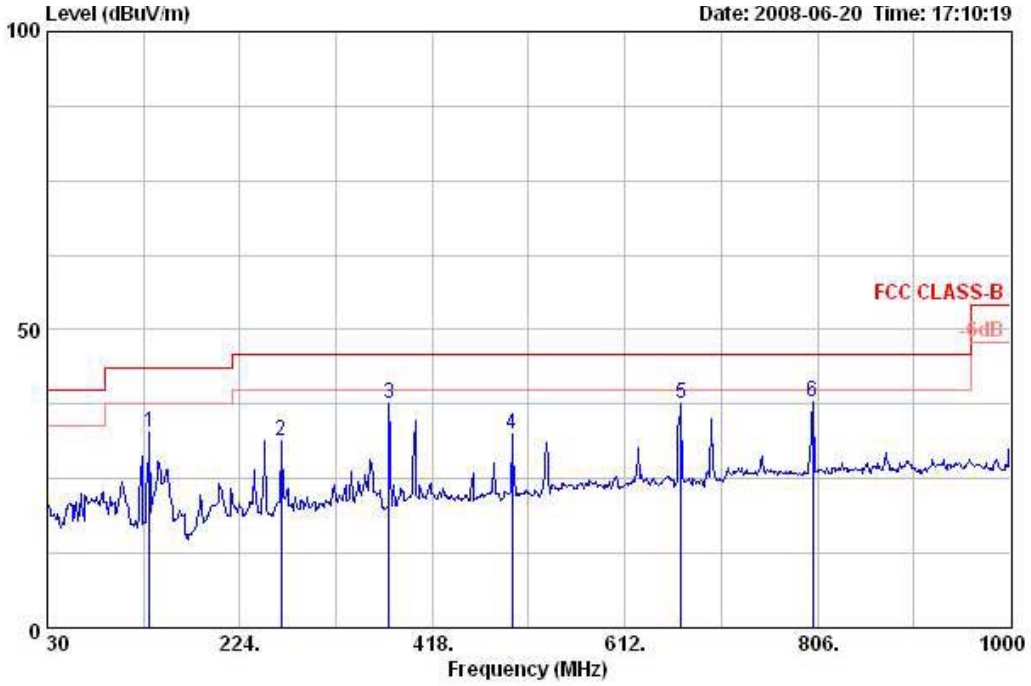
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

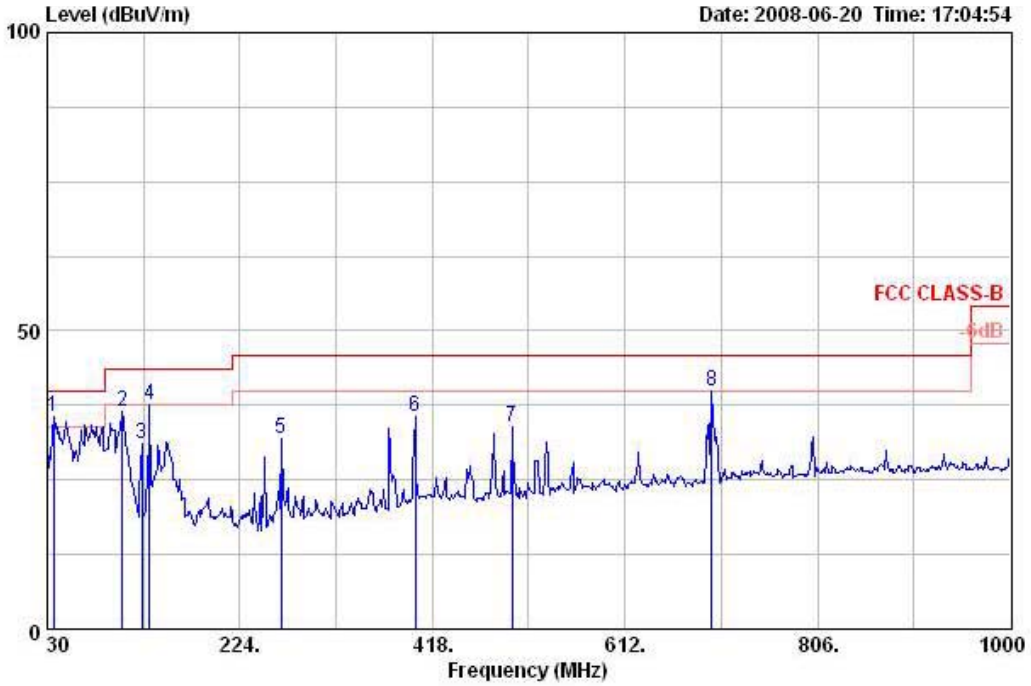
Temperature	24℃	Humidity	61%
Test Engineer	Aric Lee	Configurations	Mode 1

Horizontal



	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	132.820	32.63	-10.87	43.50	47.36	11.37	27.43	1.33	Peak	0	100	HORIZONTAL
2	265.710	31.43	-14.57	46.00	43.98	12.45	26.97	1.96	Peak	0	100	HORIZONTAL
3	374.350	37.53	-8.47	46.00	47.91	14.79	27.42	2.25	Peak	0	100	HORIZONTAL
4	498.510	32.34	-13.66	46.00	40.49	17.24	28.09	2.70	Peak	0	100	HORIZONTAL
5	668.260	37.56	-8.44	46.00	43.31	18.86	28.03	3.43	Peak	0	100	HORIZONTAL
6	801.150	38.02	-7.98	46.00	42.37	19.95	27.60	3.30	Peak	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 @	36.790	35.75	-4.25	40.00	49.37	13.60	27.80	0.58	Peak	21	100	VERTICAL
2 @	105.660	36.33	-7.17	43.50	51.76	10.94	27.57	1.20	Peak	0	400	VERTICAL
3	125.060	31.08	-12.42	43.50	45.56	11.75	27.48	1.25	Peak	0	400	VERTICAL
4 @	132.820	37.62	-5.88	43.50	52.35	11.37	27.43	1.33	Peak	10	100	VERTICAL
5	265.710	31.92	-14.08	46.00	44.48	12.45	26.97	1.96	Peak	0	400	VERTICAL
6	400.540	35.70	-10.30	46.00	45.06	15.95	27.61	2.31	Peak	0	400	VERTICAL
7	498.510	33.85	-12.15	46.00	42.00	17.24	28.09	2.70	Peak	0	400	VERTICAL
8 @	699.300	39.79	-6.21	46.00	45.18	19.30	28.00	3.30	Peak	0	400	VERTICAL

Note:

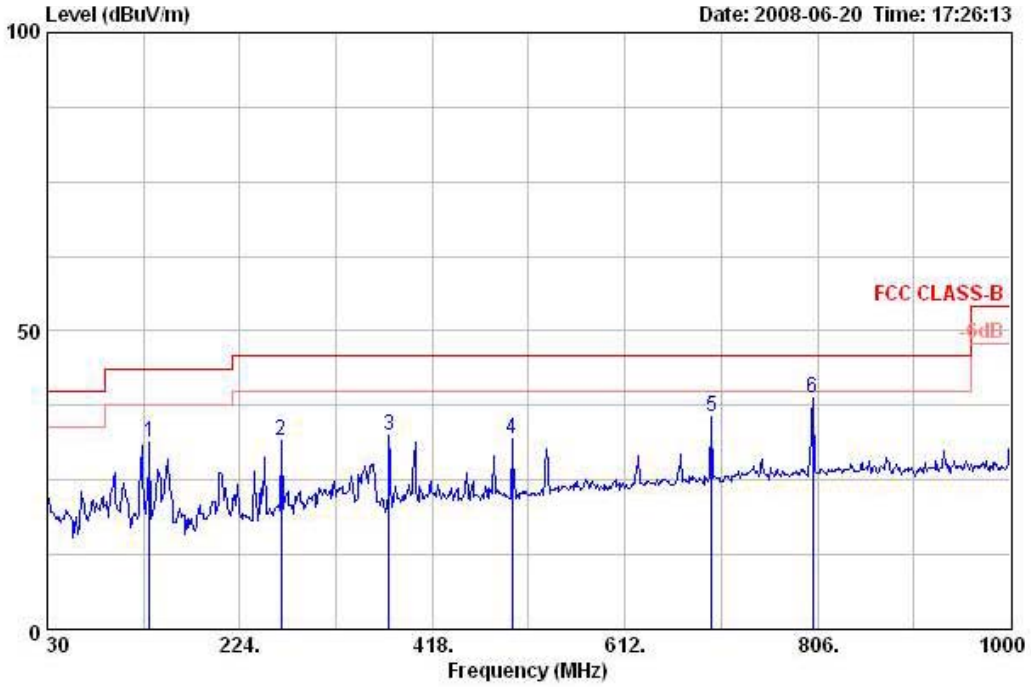
The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

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

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

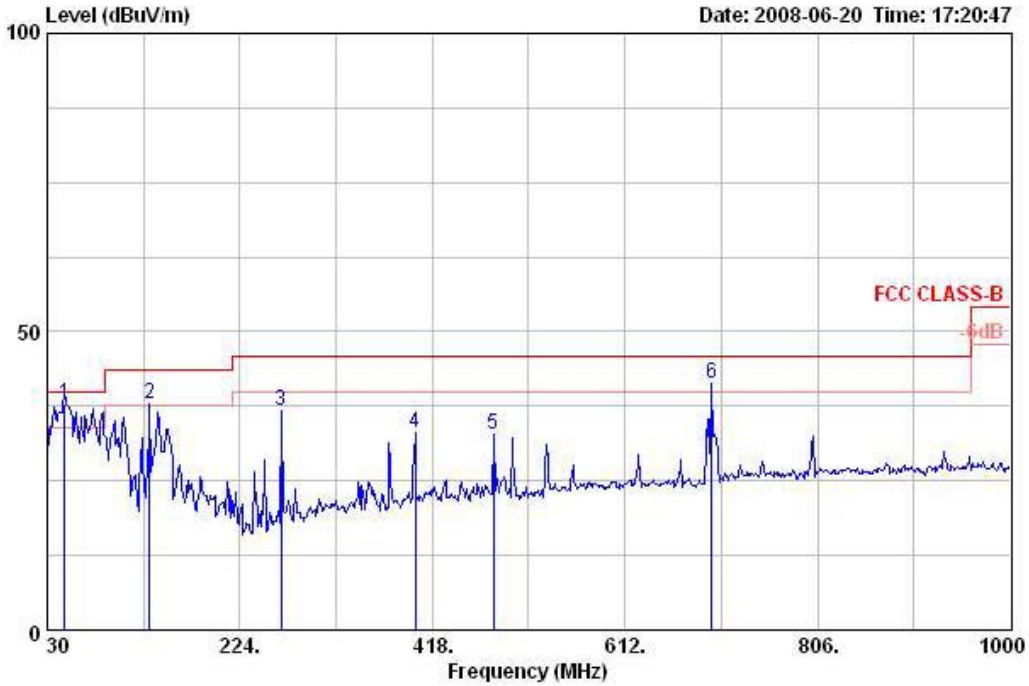
Temperature	24℃	Humidity	61%
Test Engineer	Aric Lee	Configurations	Mode 2

Horizontal



	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	132.820	31.21	-12.29	43.50	45.94	11.37	27.43	1.33	Peak	0	100	HORIZONTAL
2	265.710	31.48	-14.52	46.00	44.04	12.45	26.97	1.96	Peak	0	100	HORIZONTAL
3	374.350	32.58	-13.42	46.00	42.96	14.79	27.42	2.25	Peak	0	100	HORIZONTAL
4	498.510	31.79	-14.21	46.00	39.94	17.24	28.09	2.70	Peak	0	100	HORIZONTAL
5	699.300	35.58	-10.42	46.00	40.98	19.30	28.00	3.30	Peak	0	100	HORIZONTAL
6 @	801.150	38.63	-7.37	46.00	42.98	19.95	27.60	3.30	Peak	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 @	47.460	37.95	-2.05	40.00	56.07	8.98	27.80	0.70	QP	328	100	VERTICAL
2 @	132.820	37.80	-5.70	43.50	52.53	11.37	27.43	1.33	Peak	0	400	VERTICAL
3	265.710	36.71	-9.29	46.00	49.27	12.45	26.97	1.96	Peak	0	400	VERTICAL
4	400.540	32.98	-13.02	46.00	42.34	15.95	27.61	2.31	Peak	0	400	VERTICAL
5	479.110	32.79	-13.21	46.00	41.05	17.07	27.99	2.66	Peak	0	400	VERTICAL
6 @	699.300	41.22	-4.78	46.00	46.62	19.30	28.00	3.30	Peak	0	400	VERTICAL

Note:

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

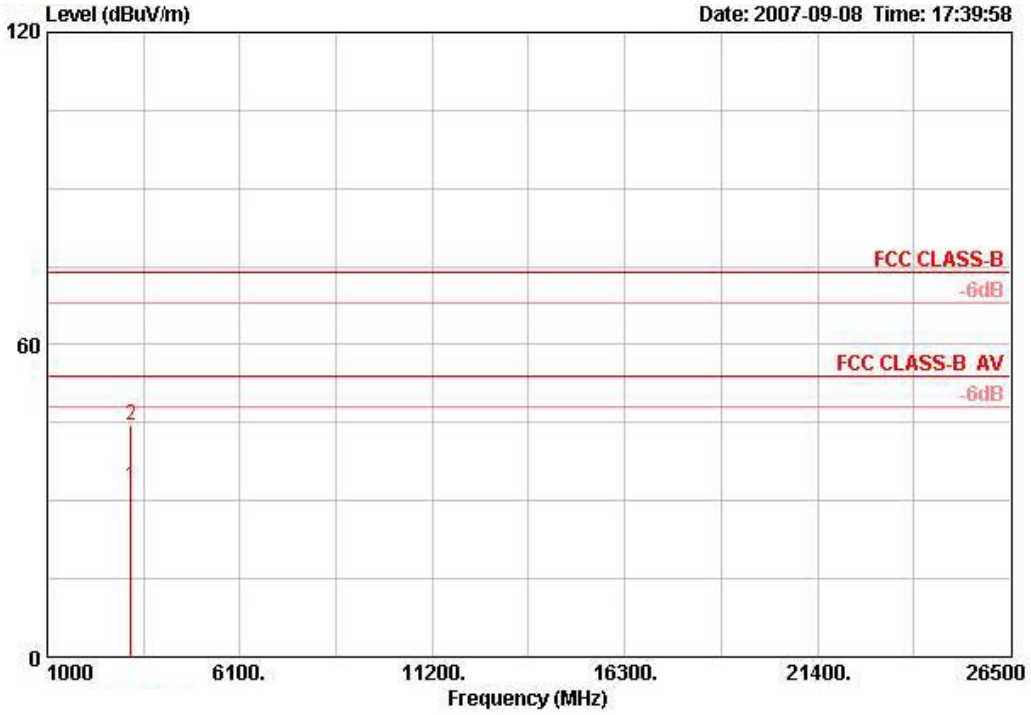
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

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

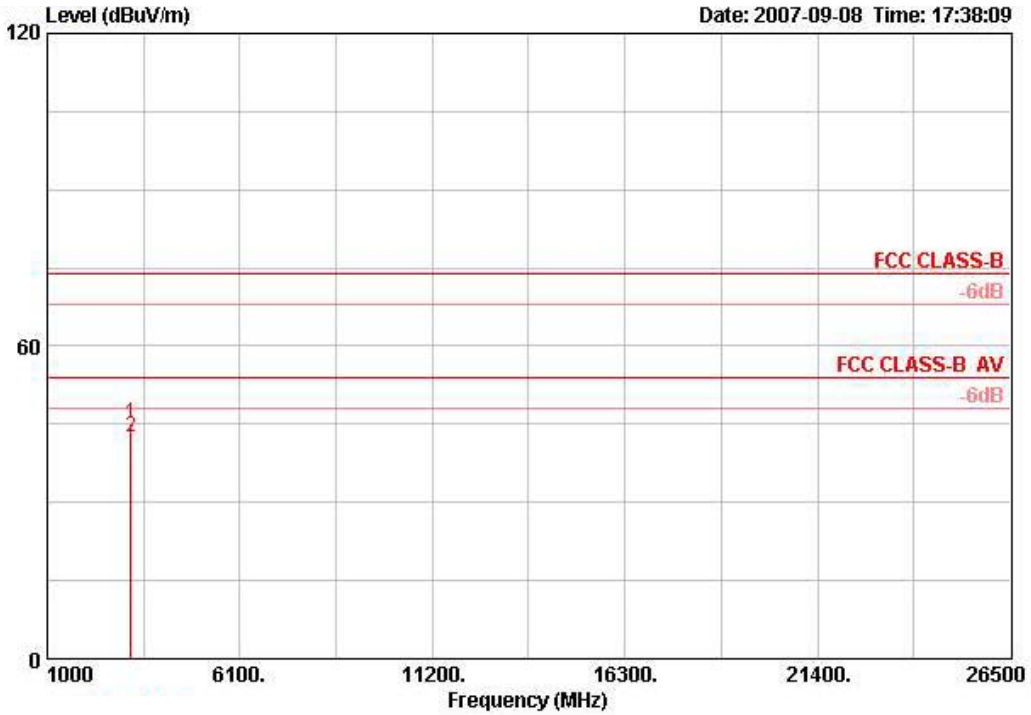
Temperature	24°C	Humidity	61%
Test Engineer	Aric Lee	Configurations	802.11b CH 1

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	
1	3215.960	32.85	-21.15	54.00	34.34	30.00	3.63	35.12	AVERAGE	100	HORIZONTAL
2	3216.400	44.44	-29.56	74.00	45.94	30.00	3.63	35.12	PEAK	100	HORIZONTAL

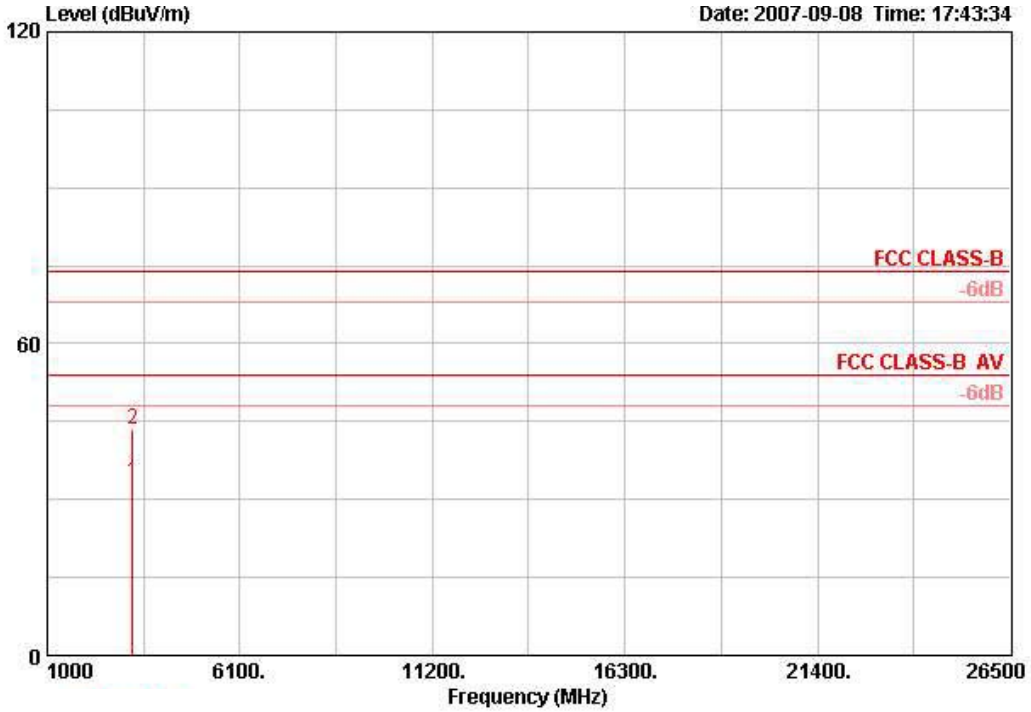
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	
1	3215.860	44.97	-29.03	74.00	46.46	30.00	3.63	35.12	PEAK	100	VERTICAL
2 @	3220.840	42.49	-11.51	54.00	43.98	30.00	3.63	35.12	AVERAGE	100	VERTICAL

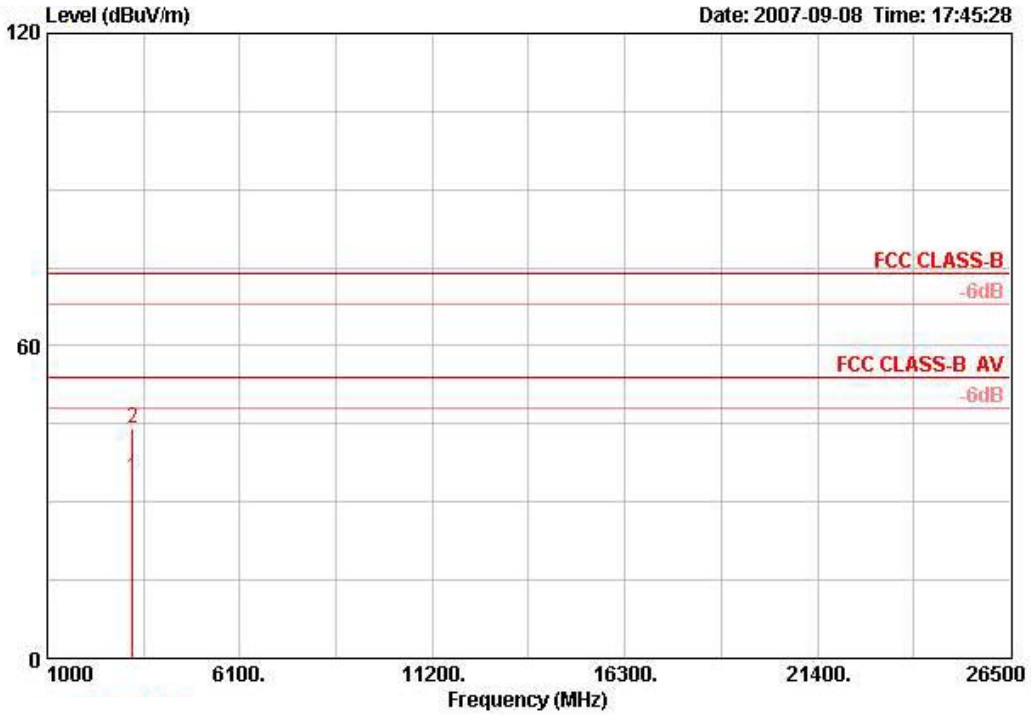
Temperature	24°C	Humidity	61%
Test Engineer	Aric Lee	Configurations	802.11b CH 6

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	
1	3249.280	33.40	-20.60	54.00	34.88	30.00	3.64	35.12	AVERAGE	100	HORIZONTAL
2	3249.380	43.46	-30.54	74.00	44.93	30.00	3.64	35.12	PEAK	100	HORIZONTAL

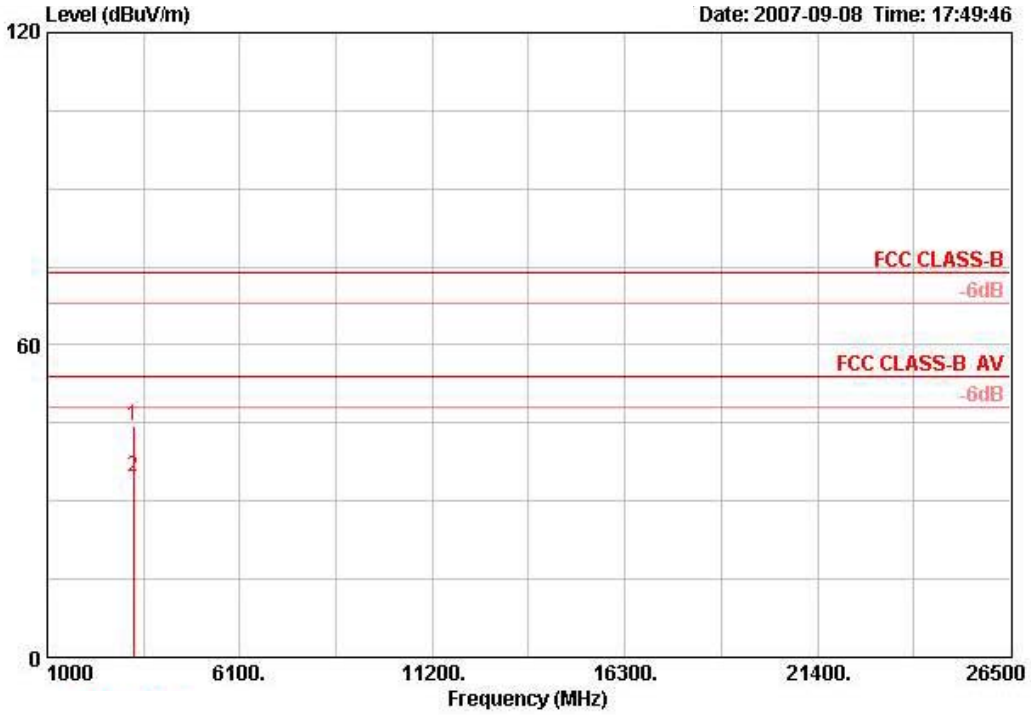
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	
1 @	3249.280	34.82	-19.18	54.00	36.30	30.00	3.64	35.12	AVERAGE	100	VERTICAL
2	3249.520	44.22	-29.78	74.00	45.70	30.00	3.64	35.12	PEAK	100	VERTICAL

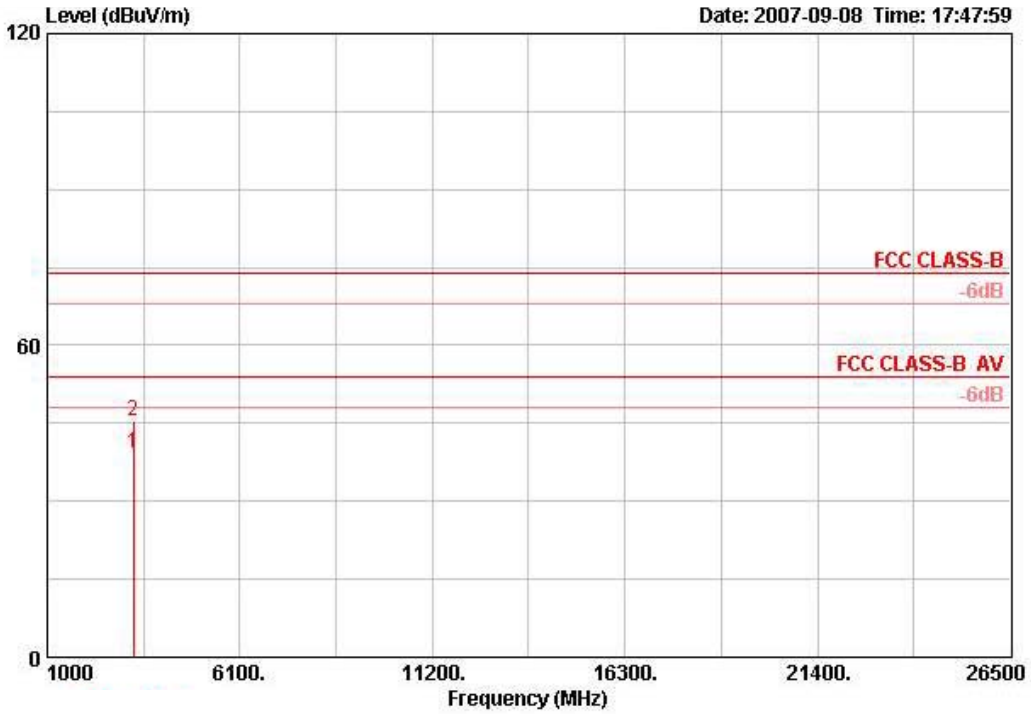
Temperature	24°C	Humidity	61%
Test Engineer	Aric Lee	Configurations	802.11b CH 11

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	
1	3282.600	44.57	-29.43	74.00	46.03	30.00	3.66	35.12	PEAK	100	HORIZONTAL
2	3282.640	34.66	-19.34	54.00	36.13	30.00	3.66	35.12	AVERAGE	100	HORIZONTAL

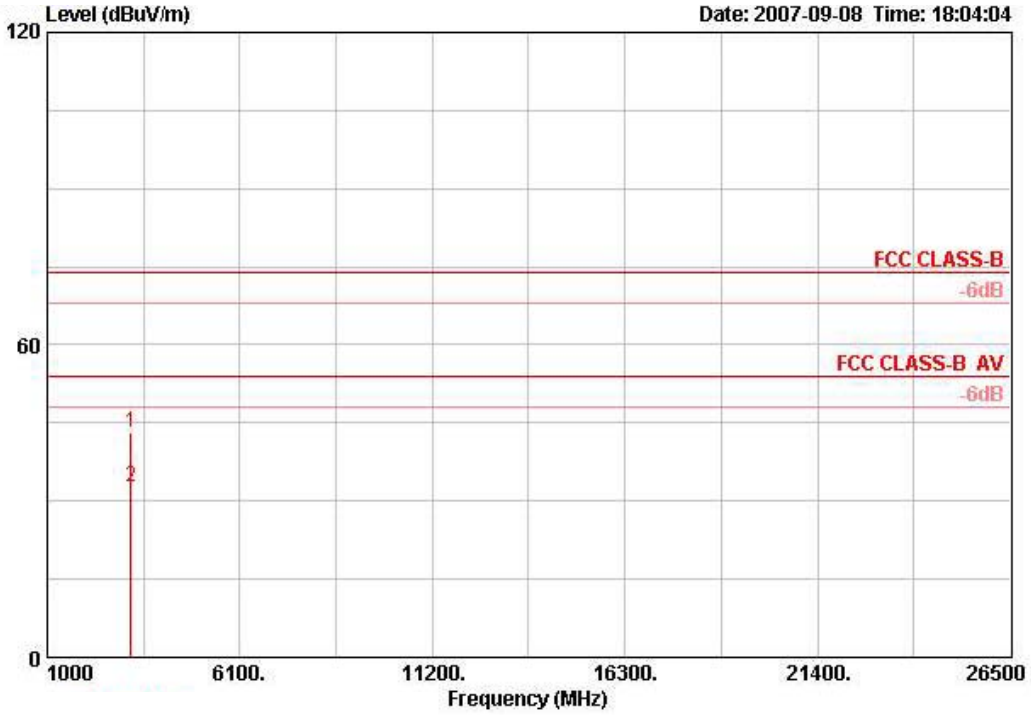
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	
1 @	3282.640	39.38	-14.62	54.00	40.84	30.00	3.66	35.12	AVERAGE	100	VERTICAL
2	3282.880	45.37	-28.63	74.00	46.84	30.00	3.66	35.12	PEAK	100	VERTICAL

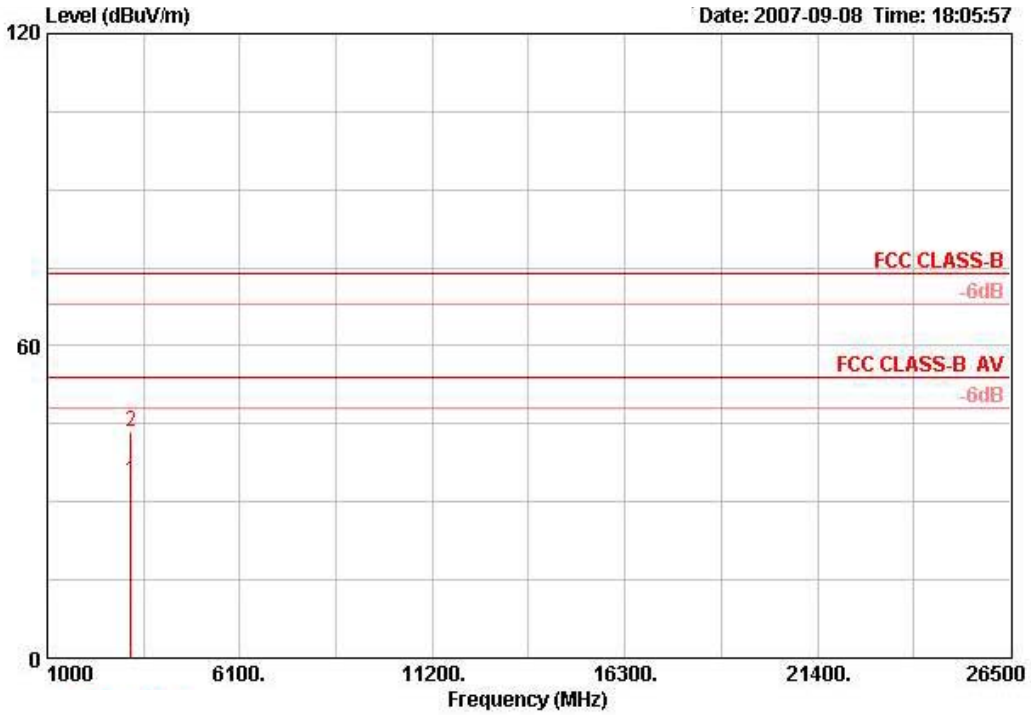
Temperature	24°C	Humidity	61%
Test Engineer	Aric Lee	Configurations	802.11g CH 1

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	
1	3215.860	43.31	-30.69	74.00	44.80	30.00	3.63	35.12	PEAK	100	HORIZONTAL
2	3216.000	32.62	-21.38	54.00	34.11	30.00	3.63	35.12	AVERAGE	100	HORIZONTAL

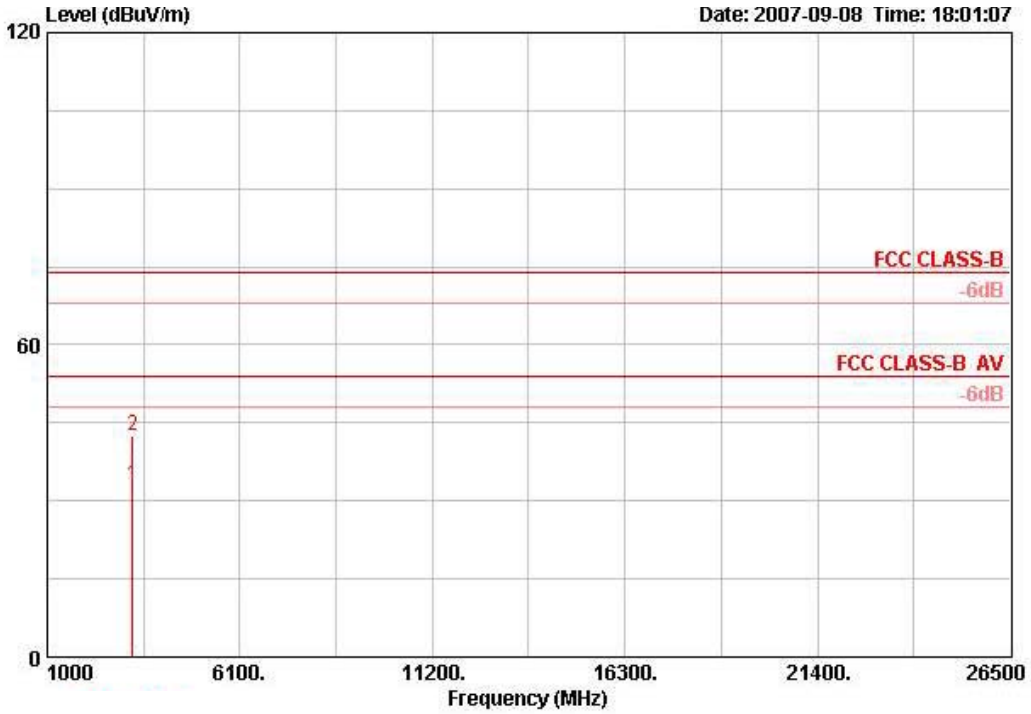
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	
1	3216.020	33.93	-20.07	54.00	35.42	30.00	3.63	35.12	AVERAGE	100	VERTICAL
2	3216.060	43.51	-30.49	74.00	45.00	30.00	3.63	35.12	PEAK	100	VERTICAL

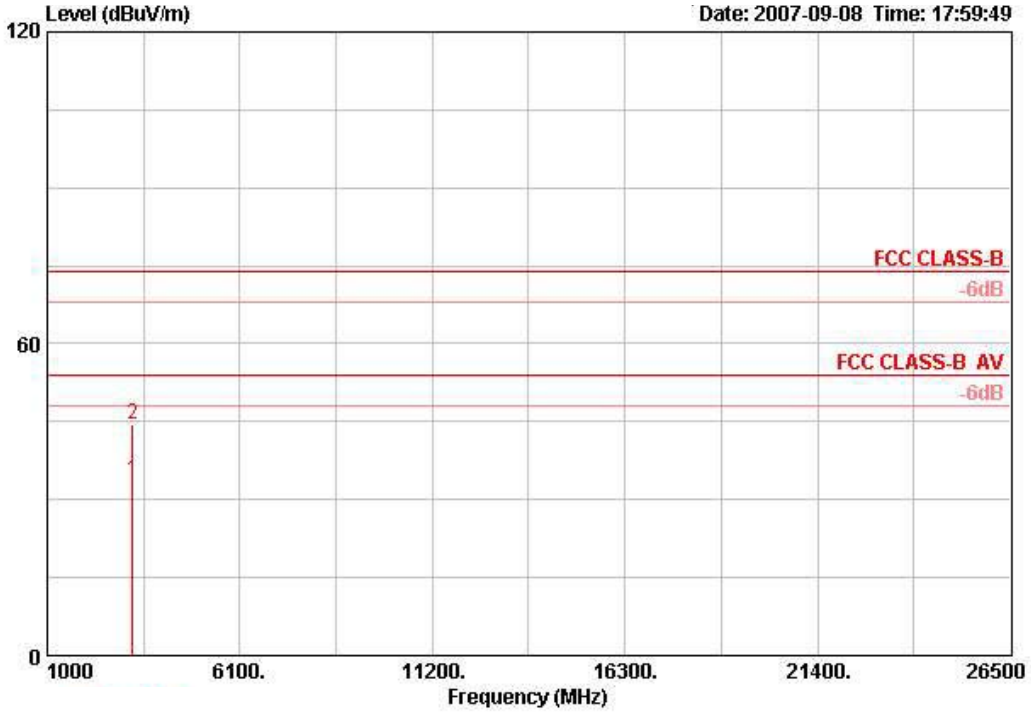
Temperature	24°C	Humidity	61%
Test Engineer	Aric Lee	Configurations	802.11g CH 6

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	
1	3249.240	33.09	-20.91	54.00	34.57	30.00	3.64	35.12	AVERAGE	100	HORIZONTAL
2	3249.560	42.35	-31.65	74.00	43.83	30.00	3.64	35.12	PEAK	100	HORIZONTAL

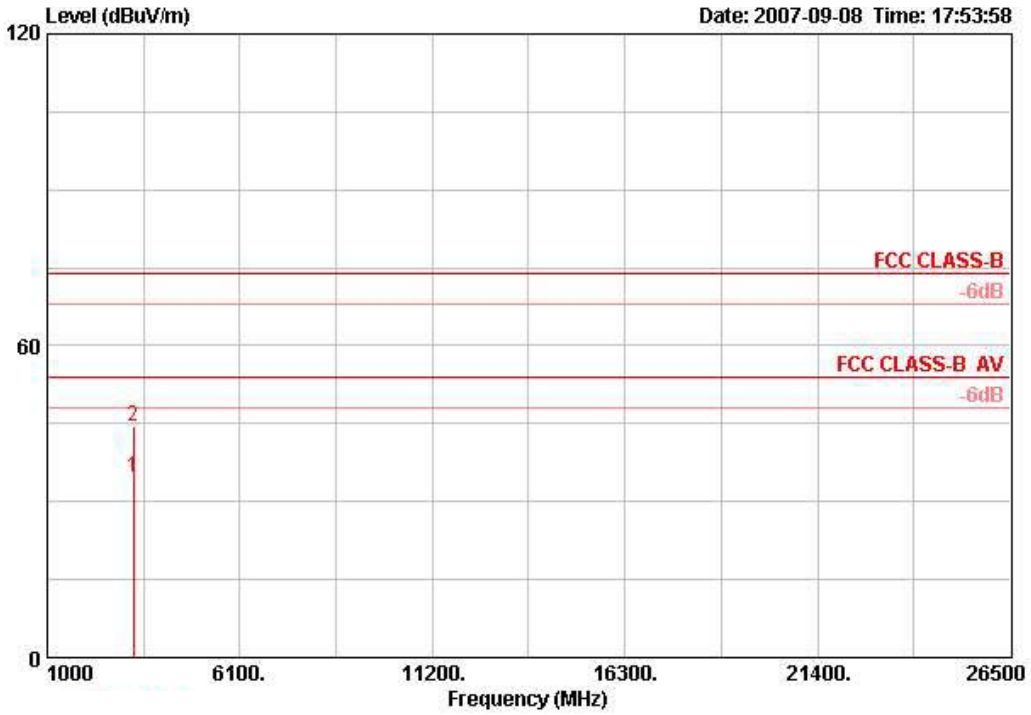
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	
1	3249.280	33.58	-20.42	54.00	35.06	30.00	3.64	35.12	AVERAGE	100	VERTICAL
2	3249.360	44.35	-29.65	74.00	45.82	30.00	3.64	35.12	PEAK	100	VERTICAL

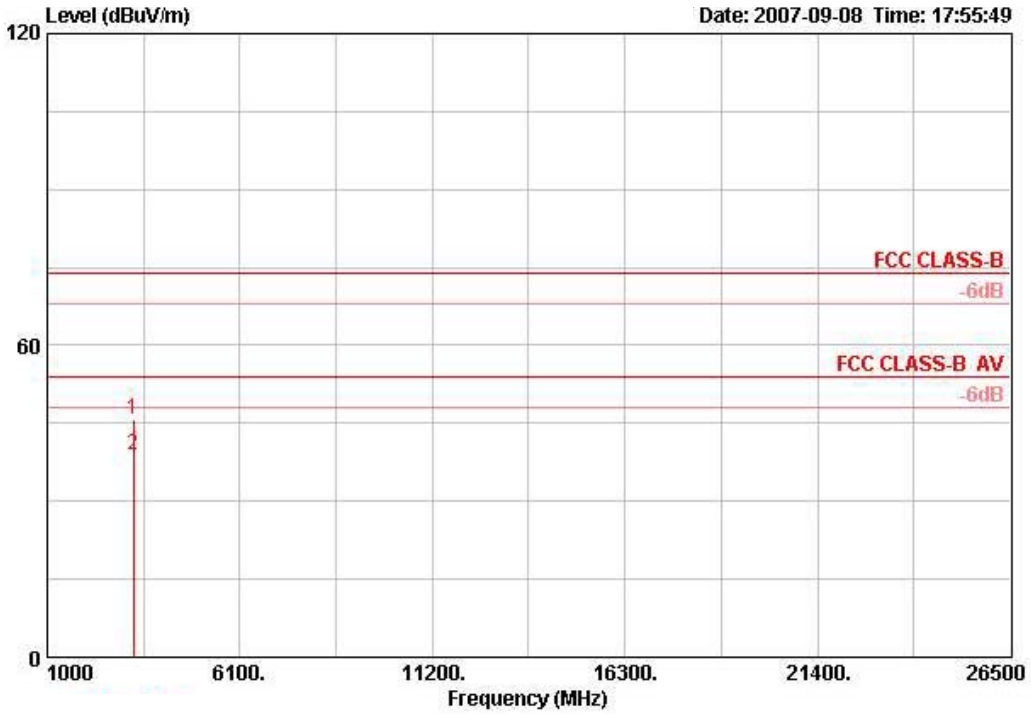
Temperature	24°C	Humidity	61%
Test Engineer	Aric Lee	Configurations	802.11g CH 11

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	
1	3282.640	34.69	-19.31	54.00	36.16	30.00	3.66	35.12	AVERAGE	100	HORIZONTAL
2	3282.840	44.35	-29.65	74.00	45.82	30.00	3.66	35.12	PEAK	100	HORIZONTAL

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	
1	3282.600	45.91	-28.09	74.00	47.37	30.00	3.66	35.12	PEAK	100	VERTICAL
2 @	3282.640	38.92	-15.08	54.00	40.39	30.00	3.66	35.12	AVERAGE	100	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 (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

4.6.2. 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)	1MHz / 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 freqeuncy 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.

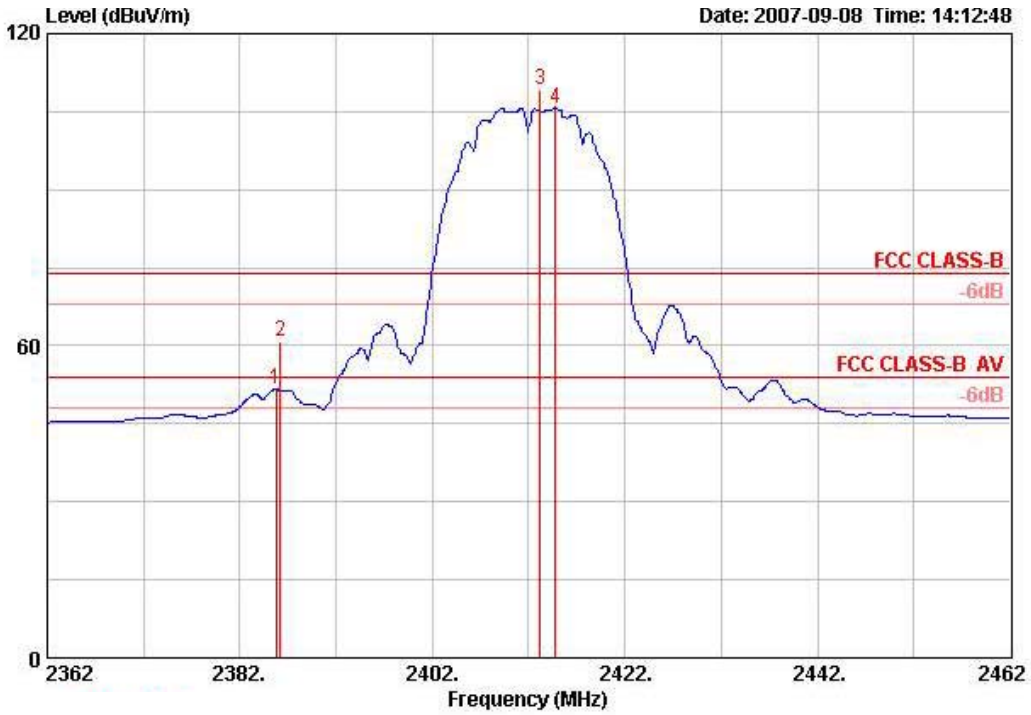
4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

Temperature	24°C	Humidity	61%
Test Engineer	Aric Lee	Configurations	802.11b CH 1, 11

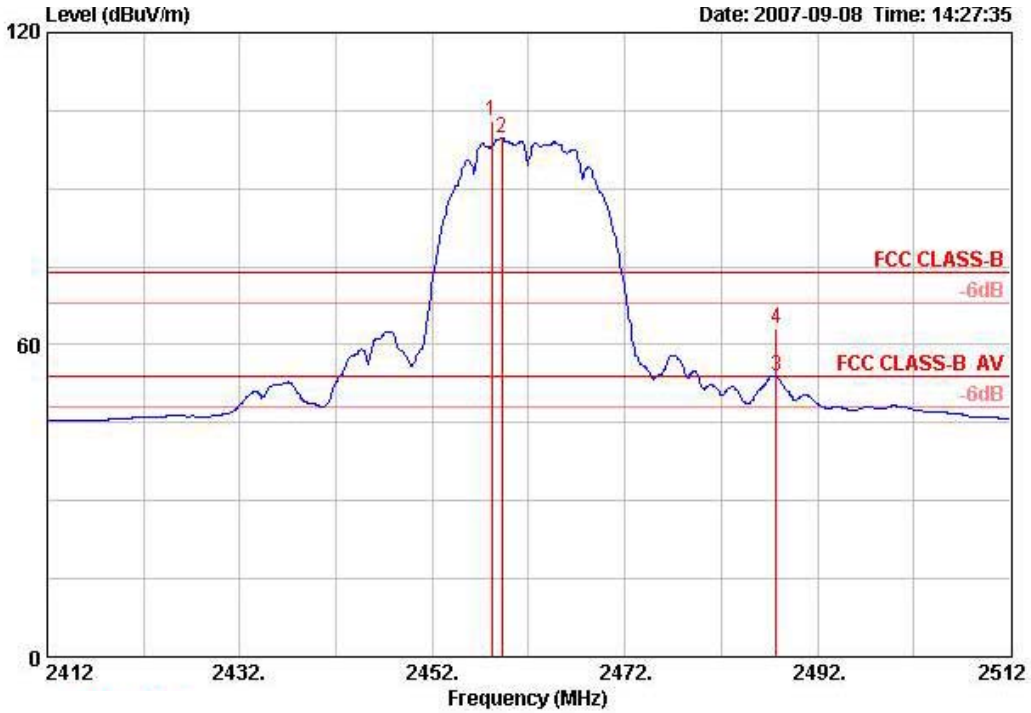
Channel 1



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	
1 @	2385.800	51.55	-2.45	54.00	20.15	28.17	3.23	0.00	AVERAGE	100	VERTICAL
2 @	2386.200	60.83	-13.17	74.00	29.43	28.17	3.23	0.00	PEAK	100	VERTICAL
3 @	2413.200	109.37			77.91	28.21	3.25	0.00	PEAK	100	VERTICAL
4 @	2414.800	105.76			74.30	28.21	3.25	0.00	AVERAGE	100	VERTICAL

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

Channel 11

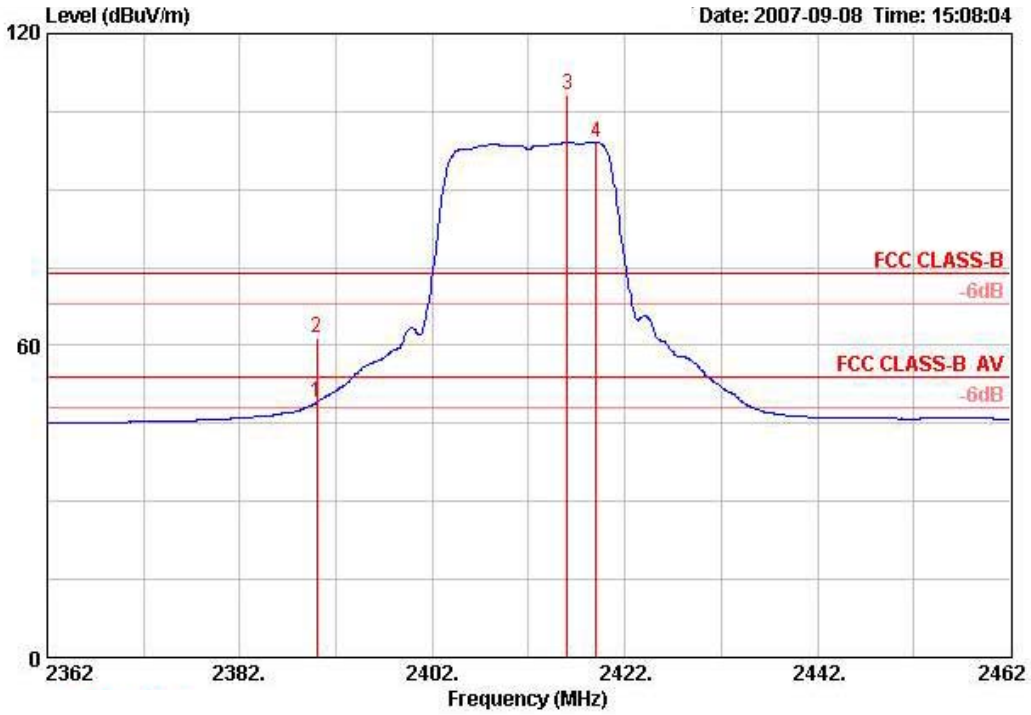


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	
1 @	2458.200	102.84			71.26	28.32	3.26	0.00	PEAK	100	VERTICAL
2 @	2459.200	99.62			68.04	28.32	3.26	0.00	AVERAGE	100	VERTICAL
3 @	2487.700	53.90	-0.10	54.00	22.23	28.40	3.28	0.00	AVERAGE	100	VERTICAL
4 @	2487.700	62.99	-11.01	74.00	31.32	28.40	3.28	0.00	PEAK	100	VERTICAL

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

Temperature	24°C	Humidity	61%
Test Engineer	Aric Lee	Configurations	802.11g CH 1, 11

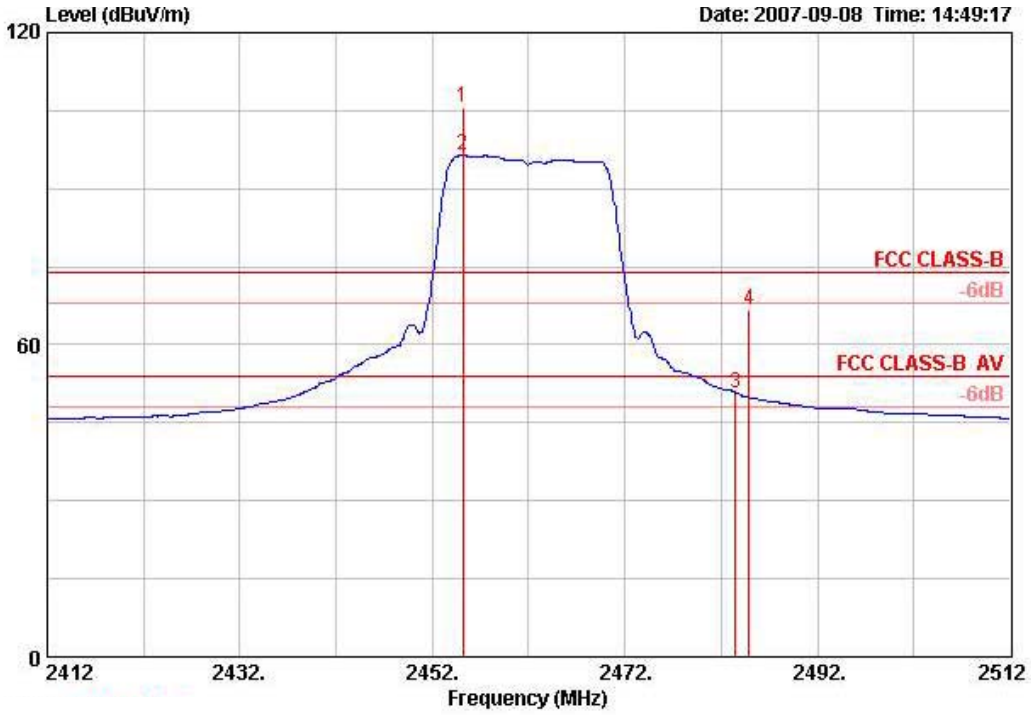
Channel 1



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	
1 @	2390.000	48.95	-5.05	54.00	17.54	28.17	3.24	0.00	AVERAGE	100	VERTICAL
2 @	2390.000	61.51	-12.49	74.00	30.09	28.17	3.24	0.00	PEAK	100	VERTICAL
3 @	2416.000	108.16			76.70	28.21	3.25	0.00	PEAK	100	VERTICAL
4 @	2419.000	99.10			67.64	28.21	3.25	0.00	AVERAGE	100	VERTICAL

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

Channel 11



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	
1 @	2455.200	105.57			73.99	28.32	3.26	0.00	PEAK	100	VERTICAL
2 @	2455.200	96.41			64.83	28.32	3.26	0.00	AVERAGE	100	VERTICAL
3 @	2483.500	50.77	-3.23	54.00	19.14	28.36	3.27	0.00	AVERAGE	100	VERTICAL
4 @	2484.900	66.79	-7.21	74.00	35.17	28.36	3.27	0.00	PEAK	100	VERTICAL

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

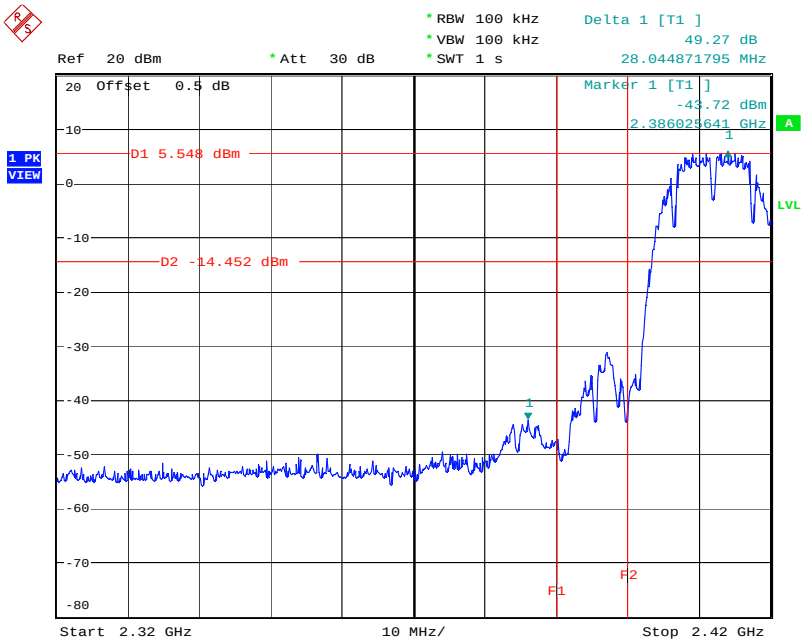
Note:

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

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

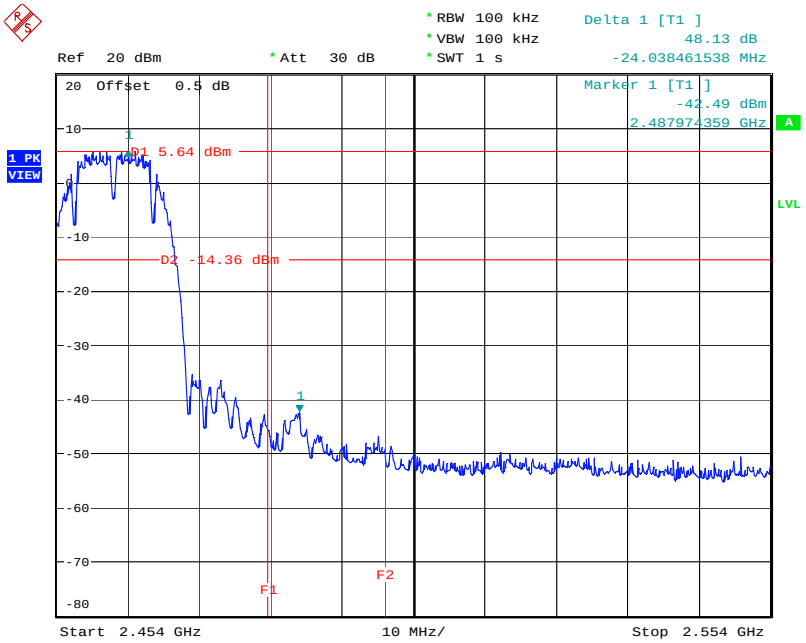
For Emission not in Restricted Band

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



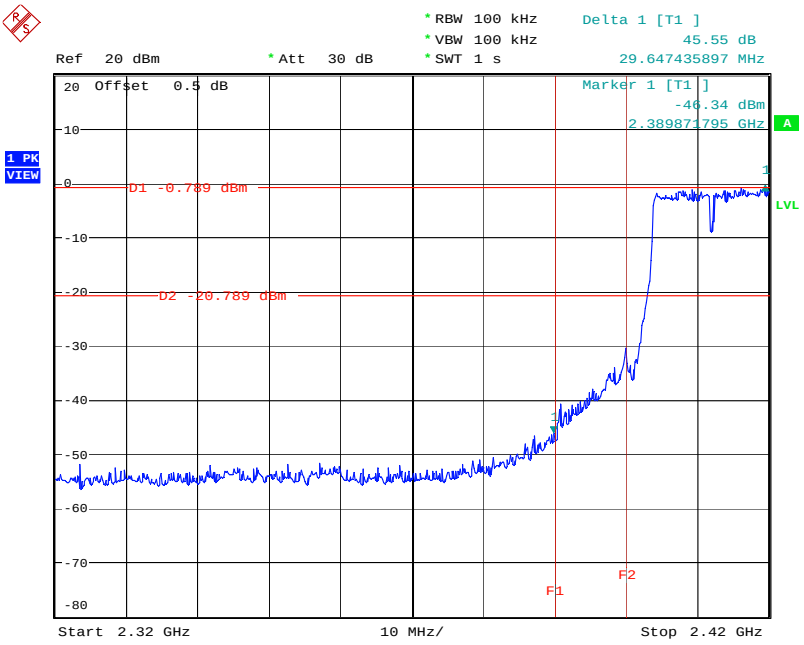
Date: 10.SEP.2007 16:28:11

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



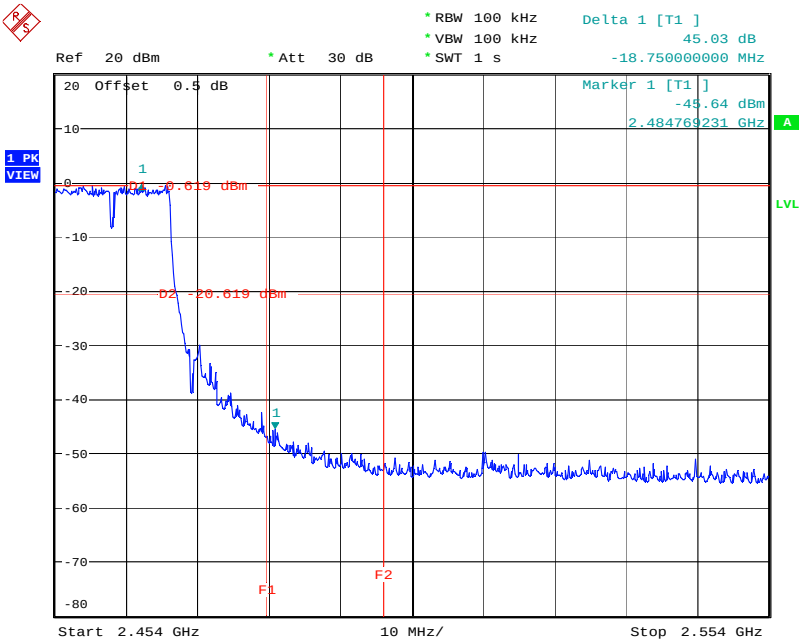
Date: 10.SEP.2007 16:36:14

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



Date: 10.SEP.2007 16:37:51

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



Date: 10.SEP.2007 16:49:15

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	100359	9kHz – 2.75GHz	Mar. 01, 2007	Conduction (CO04-HY)
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, 2007	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, 2007	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, 2007	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	May 09, 2007	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)
Isolation Transformer	Erika Fiedler OHG	D-65396 Walluf	58	45MHz-2.15GHz	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. 13, 2008	Radiation (03CH03-HY)
Amplifier	SCHAFFNER	CPA9231A	1886	9 kHz - 2 GHz	Jan. 22, 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	Agilent	8449B	3008A02120	1 GHz - 26.5 GHz	Jun. 06, 2008	Radiation (03CH03-HY)
Amplifier	MITEQ	AMF-6F-260400	923364	26.5 GHz - 40 GHz	Jan. 22, 2007*	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP40	100004/040	9 kHz - 40 GHz	Aug. 31, 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	May 04, 2007	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	May 04, 2007	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15 GHz - 40 GHz	NCR	Radiation (03CH03-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
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. 02, 2006	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. 02, 2006	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)

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

Note: *Calibration Interval of instruments listed above is two year.

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 2nd Rd., Taipei 114, Taiwan, R.O.C.
	TEL	:	886-2-2794-8886
	FAX	:	886-2-2794-9777
JHUBEI	ADD	:	No.8, Lane 724, 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

P1, total 9 pages

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