SPORTON International Inc.
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FCC RADIO TEST REPORT

Applicant's company	**Meru Networks Inc.**
Applicant Address	894 Ross Drive Sunnyvale, Ca. 94089 U.S.A.
FCC ID	**RE7-AP150R2**
Manufacturer's company	**Accton Technology Corporation**
Manufacturer Address	No. 1 Creation Rd., III, Science-based Industrial Park, Hsinchu 300, Taiwan, R.O.C.

Product Name	Dual Radio WLAN Access Point
Brand Name	Meru, Foundry
Model Name	AP150 Rev 2
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	Jul. 16, 2007
Final Test Date	Aug. 27, 2007
Submission Type	Original Equipment
Multiple Listing	Please refer to section 3.7

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.

Testing Laboratory
1190

Table of Contents

History of This Test Report

Original Issue Date: Jan. 28, 2008

Report No.: FR783104AB

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

1. CERTIFICATE OF COMPLIANCE

Product Name	:	Dual Radio WLAN Access Point
Brand Name	:	Meru, Foundry
Model Name	:	AP150 Rev 2
Applicant	:	Meru Networks 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 Jul. 16, 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	6.03 dB
4.2	15.247(b)(3)	Maximum Peak Conducted Output Power	Complies	6.22 dB
4.3	15.247(e)	Power Spectral Density	Complies	11.16 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	0.52 dB
4.6	15.247(d)	Band Edge Emissions	Complies	0.18 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	$\pm 8.5 \times 10^{-8}$	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℃	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	Power Adapter / POE
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 (6/9/12/18/24/36/48/54/108)
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	11b/g: 11 ; 11a: 7
Channel Band Width (99%)	11b: 15.56 MHz ; 11g: 32.88 MHz ; 11a: 16.92 MHz ; 11a Turbo: 32.96 MHz
Conducted Output Power	11b: 20.46 dBm ; 11g: 23.78 dBm ; 11a: 22.70 dBm ; 11a Turbo: 22.25dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

3.2. Accessories

Power	Brand	Model	Rating
Adapter 1	PHIHONG	PSA15R-050	Input: AC100-240V, 50-60 Hz, 0.5A Outlput: DC5.0V, 3.0A

3.3. Table for Filed Antenna

For 2.4 GHz

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1(A)	-	SAA04-220050	Dipole Antenna	Reversed-SMA	2.00
2(B)	-	SAA04-220050	Dipole Antenna	Reversed-SMA	2.00

For 5GHz

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1(A)	-	SAA04-220050	Dipole Antenna	Reversed-SMA	3.00
2(B)	-	SAA04-220050	Dipole Antenna	Reversed-SMA	3.00

Note: (1) Due to Ant. A & Ant. B are identical and the "Ant B" generated higher output power than "Ant. A". All the test were base on this setting and recorded in this report.
(2) The EUT supports the antenna with TX/RX diversity function.

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	Turbo 6	2437 MHz
	2	2417 MHz		
	3	2422 MHz		
	4	2427 MHz		
	5	2432 MHz		
	6	2437 MHz		
	7	2442 MHz		
	8	2447 MHz		
	9	2452 MHz		
	10	2457 MHz		
	11	2462 MHz		

Frequency Allocation for 802.11a

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5725~5850 MHz (Band 4)	149	5745 MHz	Turbo 152	5760 MHz
	153	5765 MHz	Turbo 160	5800 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	-	B
Max. Peak Conducted Output Power Power Spectral Density 6dB Spectrum Bandwidth	11b/BPSK	1 Mbps	1/6/11	NA
	11g/BPSK	6 Mbps	1/6/11	NA
	11g/BPSK Turbo	108 Mbps	6	NA
	11a/BPSK	6 Mbps	149/157/165	NA
	11a/BPSK Turbo	108 Mbps	152/160	NA
Radiated Emissions Below 1GHz	Normal Link	Auto	-	B
Radiated Emissions Above 1GHz Band Edge Emissions	11b/BPSK	1 Mbps	1/6/11	B
	11g/BPSK	6 Mbps	1/6/11	B
	11g/BPSK Turbo	108 Mbps	6	B
	11a/BPSK	6 Mbps	149/157/165	B
	11a/BPSK Turbo	108 Mbps	152/160	B
Band Edge Emissions	11b/BPSK	1 Mbps	1/11	B
	11g/BPSK	6 Mbps	1/11	B
	11g/BPSK Turbo	108 Mbps	6	B
	11a/BPSK	6 Mbps	149/165	B
	11a/BPSK Turbo	108 Mbps	152/160	B

Test mode:
Mode 1: Adapter mode
Mode 2: POE mode
< Conduction > :
Cause "mode 1"generated the worst test result, it was reported as final data.
< Radiation > :
Cause "mode 1" generated the worst test result, it was reported as final data.

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	-	-	-
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 Class II Change & Multiple List

The model listed below is series model to **AP150 Rev 2**.

The model is identical, the difference model for difference marketing strategy.

Product Name	Brand Name	Model Name	Applicant
Dual Radio WLAN Access Point	Foundry	AP150 Rev 2	Company: Foundry Networks Inc. Address: 1309 South Mary Avenue, Sunnyvale, CA 94087 U.S.A.

3.8. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	D400	E2K24GBRL
Notebook	DELL	D505	E2K24GBRL
POE	PHINONG	POE30U	-

3.9. 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	ART		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	19	20	20
IEEE 802.11g	15.5	20	15.5
IEEE 802.11g Turbo	-	19	-

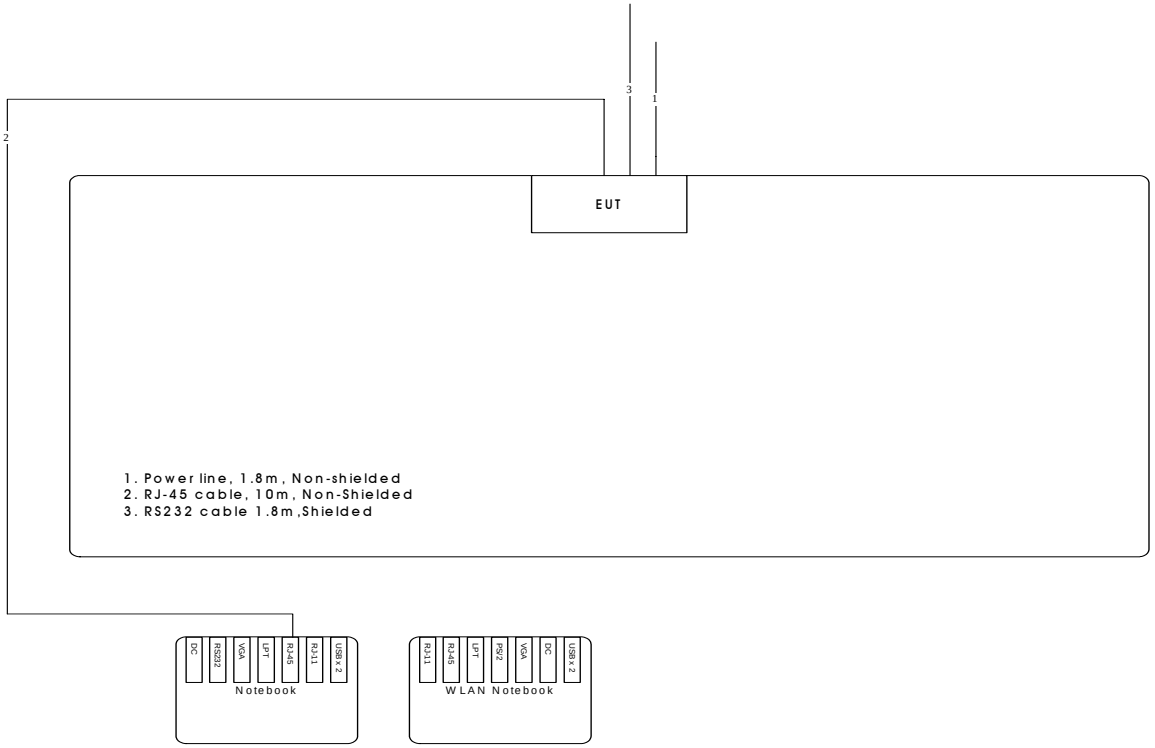
Power Parameters of IEEE 802.11a

Test Software Version	ART		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	22	22	21
Frequency	5760 MHz	5800 MHz	-
IEEE 802.11a Turbo	21	21	-

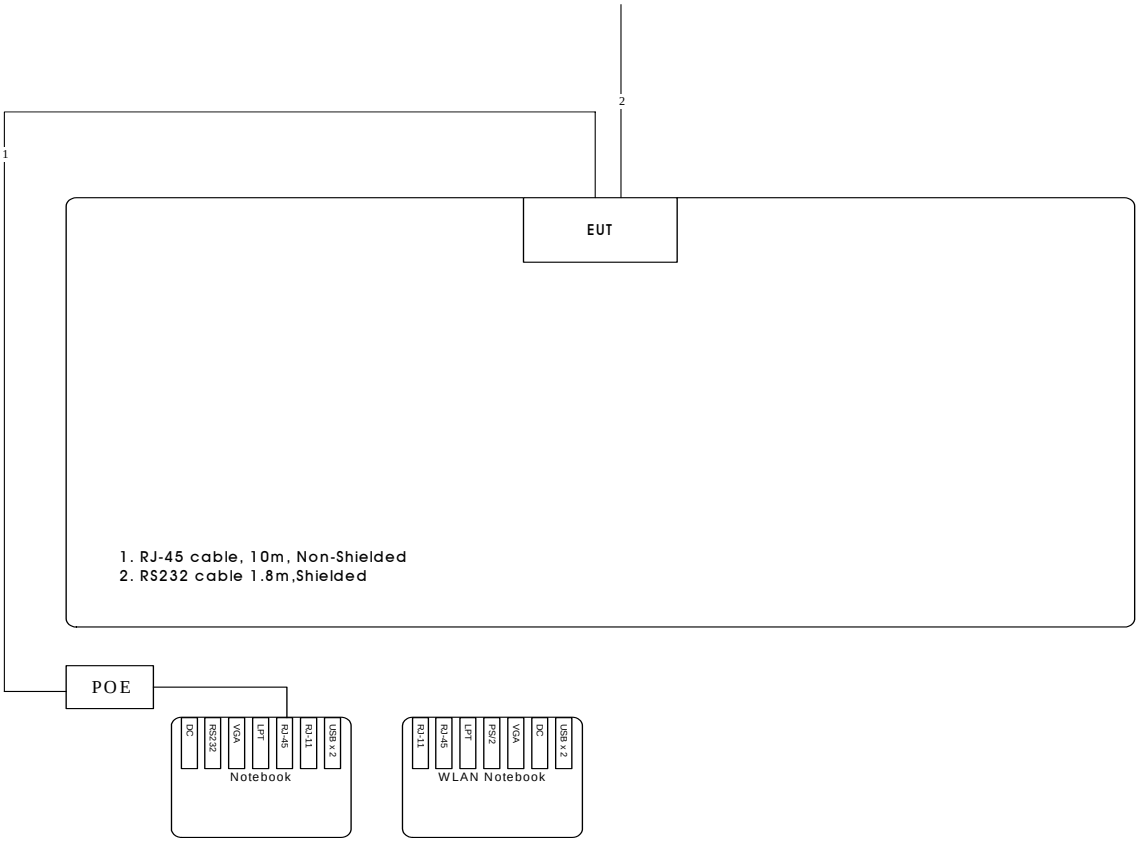
3.10. Test Configurations

3.10.1. Radiation Emissions Test Configuration

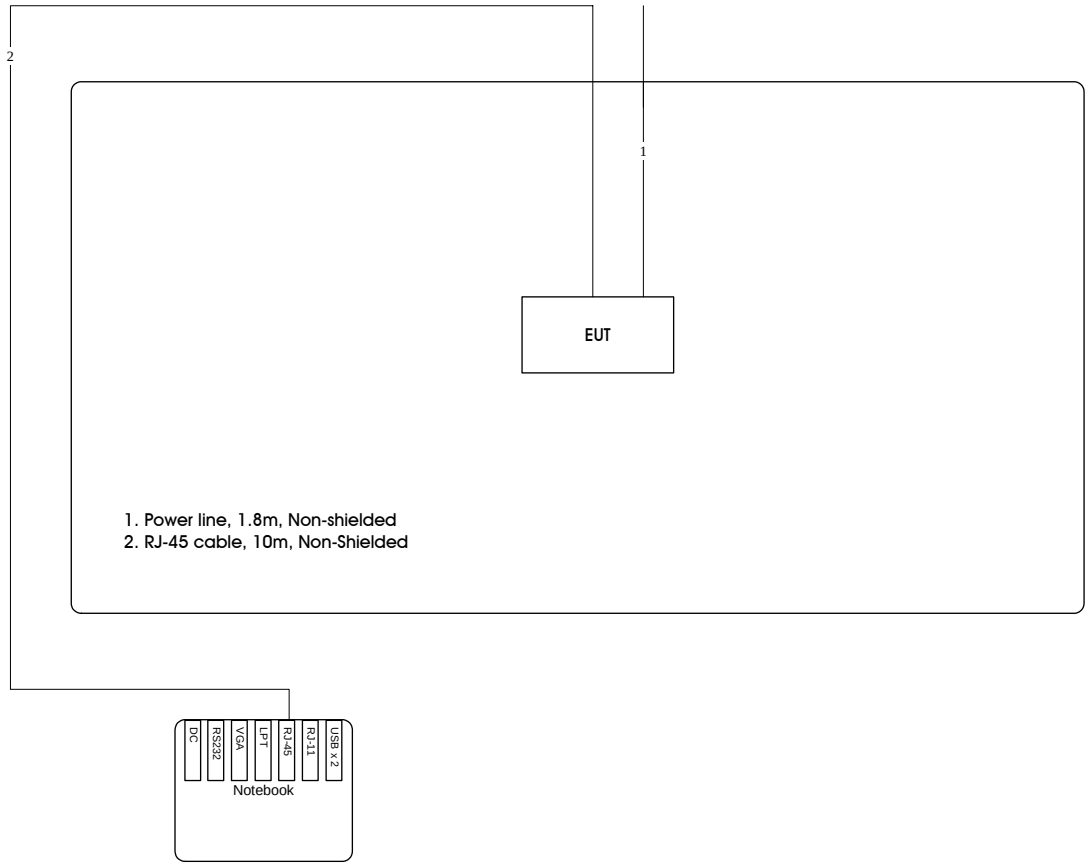
Test Configuration: 9kHz~1GHz / Mode 1



Test Configuration: 9kHz~1GHz / Mode 2

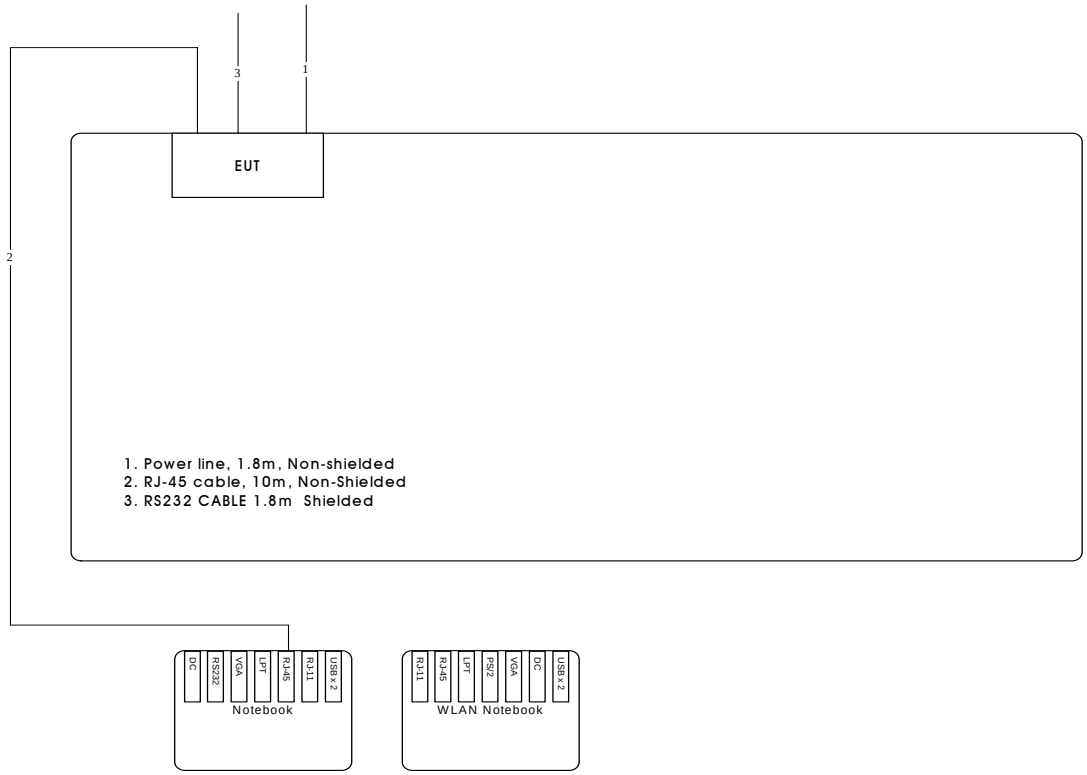


Test Configuration: Above 1GHz

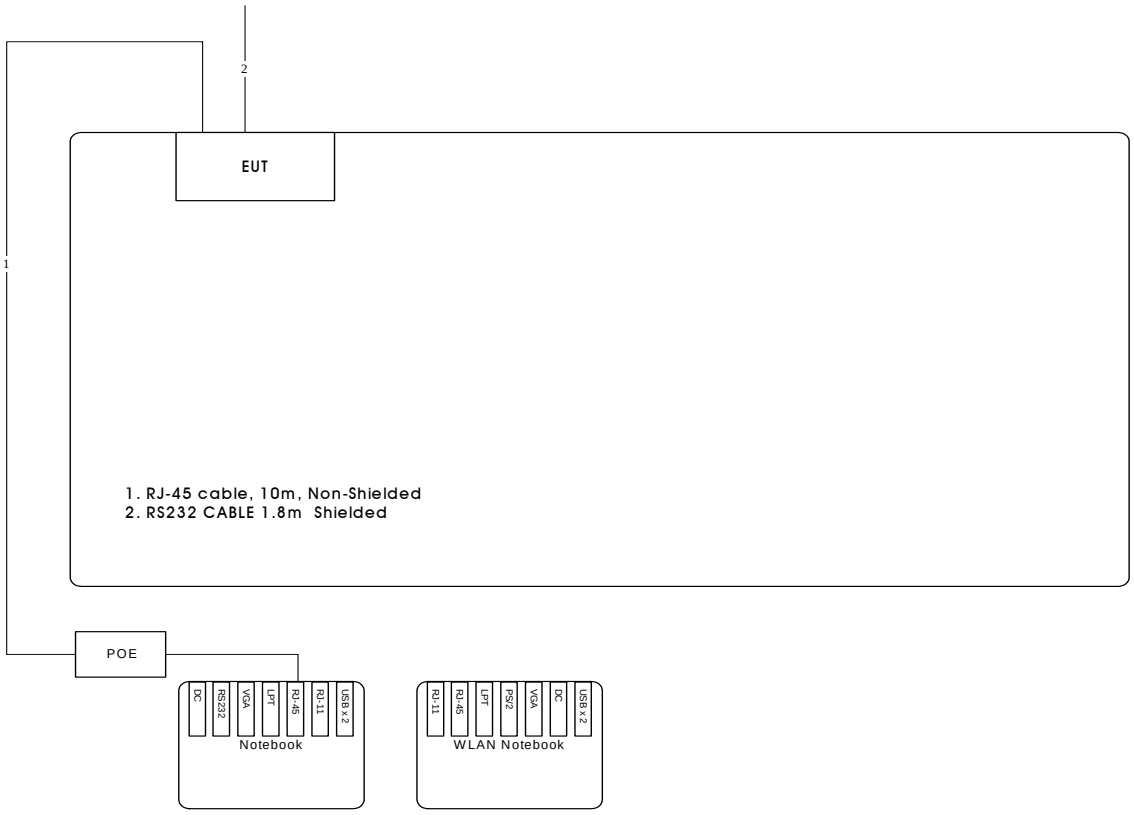


3.10.2. AC Power Line Conduction Emissions Test Configuration

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

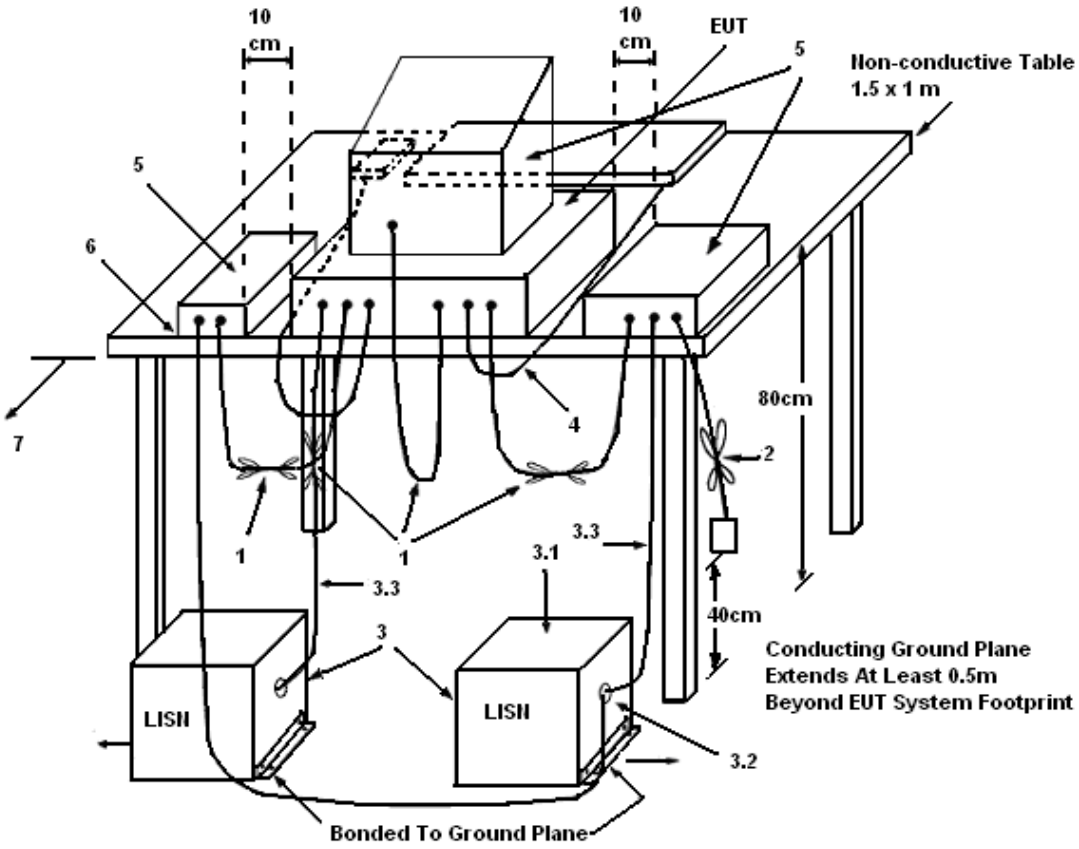
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

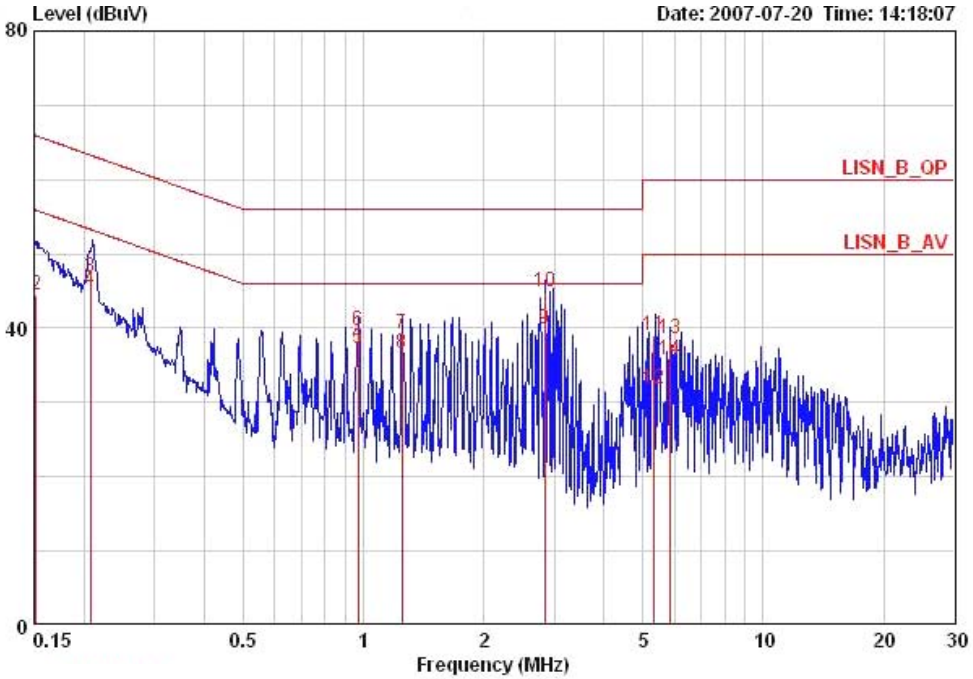
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

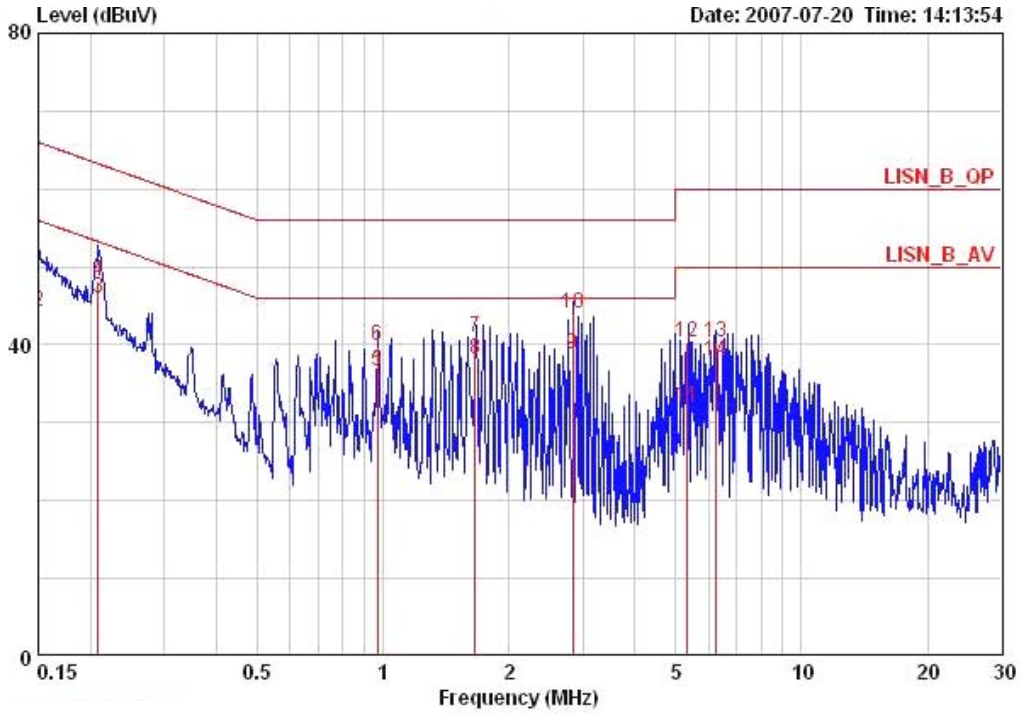
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	27℃	Humidity	50%
Test Engineer	Andy Tsai	Phase	Line
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.15160	23.59	-32.32	55.91	23.19	0.20	0.20	AVERAGE	LINE
2	0.15160	44.53	-21.38	65.91	44.13	0.20	0.20	QP	LINE
3	0.20775	46.91	-16.38	63.29	46.61	0.10	0.20	QP	LINE
4	0.20775	45.12	-8.17	53.29	44.82	0.10	0.20	AVERAGE	LINE
5	0.97114	37.36	-8.64	46.00	37.16	0.00	0.20	AVERAGE	LINE
6	0.97114	39.65	-16.35	56.00	39.45	0.00	0.20	QP	LINE
7	1.249	39.16	-16.84	56.00	39.01	0.00	0.15	QP	LINE
8	1.249	36.56	-9.44	46.00	36.41	0.00	0.15	AVERAGE	LINE
9	2.842	39.97	-6.03	46.00	39.77	0.00	0.20	AVERAGE	LINE
10	2.842	44.81	-11.19	56.00	44.61	0.00	0.20	QP	LINE
11	5.341	39.00	-21.00	60.00	38.68	0.02	0.30	QP	LINE
12	5.341	31.87	-18.13	50.00	31.55	0.02	0.30	AVERAGE	LINE
13	5.825	38.58	-21.42	60.00	38.25	0.03	0.30	QP	LINE
14	5.825	35.79	-14.21	50.00	35.46	0.03	0.30	AVERAGE	LINE

Temperature	27℃	Humidity	50%
Test Engineer	Andy Tsai	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.15000	26.28	-29.72	56.00	25.78	0.30	0.20	AVERAGE	NEUTRAL
2	0.15000	44.35	-21.65	66.00	43.85	0.30	0.20	QP	NEUTRAL
3	0.20833	45.93	-7.34	53.27	45.53	0.20	0.20	AVERAGE	NEUTRAL
4	0.20833	48.10	-15.17	63.27	47.70	0.20	0.20	QP	NEUTRAL
5	0.96994	36.72	-9.28	46.00	36.42	0.10	0.20	AVERAGE	NEUTRAL
6	0.96994	39.83	-16.17	56.00	39.53	0.10	0.20	QP	NEUTRAL
7	1.663	40.93	-15.07	56.00	40.69	0.10	0.14	QP	NEUTRAL
8	1.663	38.17	-7.83	46.00	37.93	0.10	0.14	AVERAGE	NEUTRAL
9	2.843	38.78	-7.22	46.00	38.48	0.10	0.20	AVERAGE	NEUTRAL
10	2.843	44.12	-11.88	56.00	43.82	0.10	0.20	QP	NEUTRAL
11	5.342	32.05	-17.95	50.00	31.65	0.10	0.30	AVERAGE	NEUTRAL
12	5.342	40.33	-19.67	60.00	39.93	0.10	0.30	QP	NEUTRAL
13	6.242	40.36	-19.64	60.00	39.91	0.10	0.35	QP	NEUTRAL
14	6.242	38.02	-11.98	50.00	37.57	0.10	0.35	AVERAGE	NEUTRAL

Note:

Level = Read Level + LISN Factor + Cable Loss

4.2. Maximum Peak 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

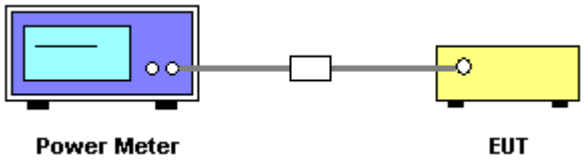
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Filter No.	Auto
Measurement time	0.135 s ~ 26 s
Used Peak Sensor	NRV-Z32 (model 04)

4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Turn on the EUT and power meter and then record the peak power value.
3. Repeat above procedures on all channels needed to be tested.

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 Peak Output Power

Temperature	24℃	Humidity	56%
Test Engineer	Sam Chen	Configurations	802.11a/b/g

Configuration IEEE 802.11b

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	19.43	30.00	Complies
6	2437 MHz	20.28	30.00	Complies
11	2462 MHz	20.46	30.00	Complies

Configuration IEEE 802.11g

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	21.73	30.00	Complies
6	2437 MHz	23.78	30.00	Complies
11	2462 MHz	23.76	30.00	Complies

Configuration IEEE 802.11g Turbo

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
6	2437 MHz	23.11	30.00	Complies

Configuration IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	22.68	30.00	Complies
157	5785 MHz	22.70	30.00	Complies
165	5825 MHz	22.51	30.00	Complies

Configuration IEEE 802.11a Turbo

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
152	5760 MHz	22.25	30.00	Complies
160	5800 MHz	22.03	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 8dBm in any 3 kHz band during any time interval of continuous transmission.

4.3.2. Measuring Instruments and Setting

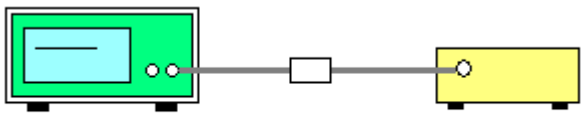
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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.

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	24℃	Humidity	56%
Test Engineer	Sam Chen	Configurations	802.11a/b/g

Configuration IEEE 802.11b

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-6.24	8.00	Complies
6	2437 MHz	-8.94	8.00	Complies
11	2462 MHz	-5.38	8.00	Complies

Configuration IEEE 802.11g

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-10.39	8.00	Complies
6	2437 MHz	-6.70	8.00	Complies
11	2462 MHz	-9.81	8.00	Complies

Configuration IEEE 802.11g Turbo

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
6	2437 MHz	-9.91	8.00	Complies

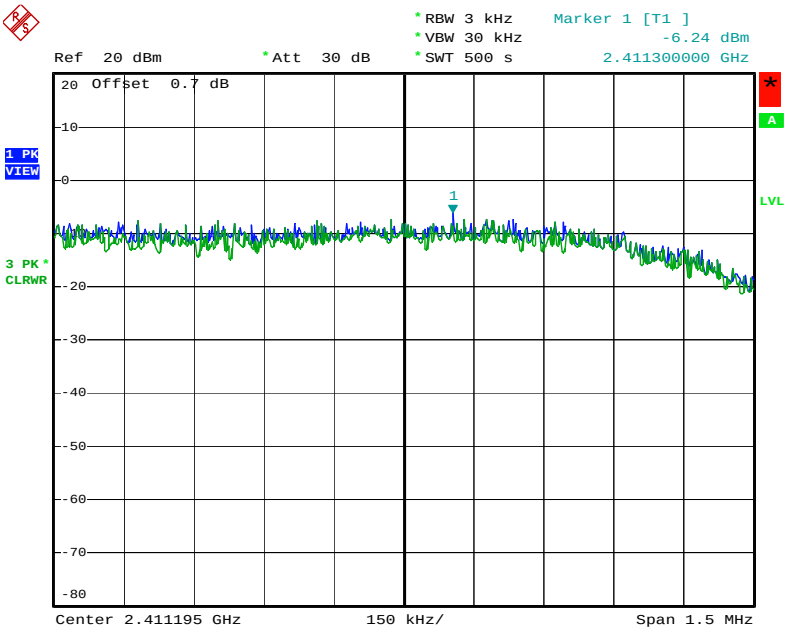
Configuration IEEE 802.11a

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	-4.67	8.00	Complies
157	5785 MHz	-3.16	8.00	Complies
165	5825 MHz	-5.88	8.00	Complies

Configuration IEEE 802.11a Turbo

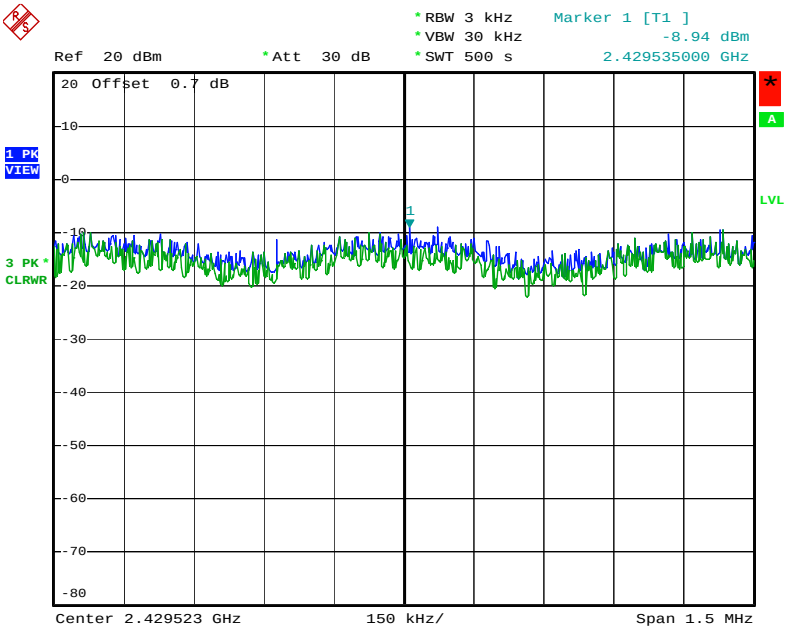
Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
152	5760 MHz	-10.16	8.00	Complies
160	5800 MHz	-11.00	8.00	Complies

Power Density Plot on Configuration IEEE 802.11b / 2412 MHz



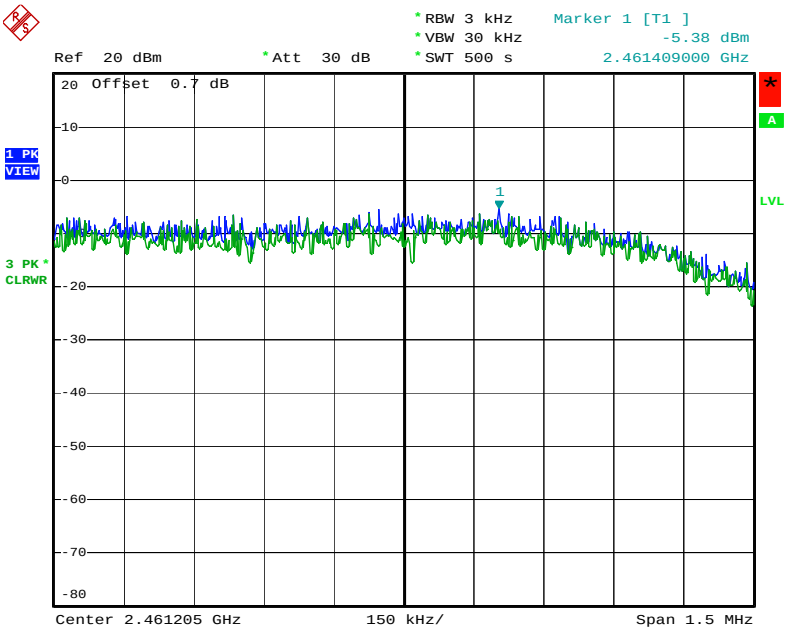
Date: 27.AUG.2007 11:06:42

Power Density Plot on Configuration IEEE 802.11b / 2437 MHz



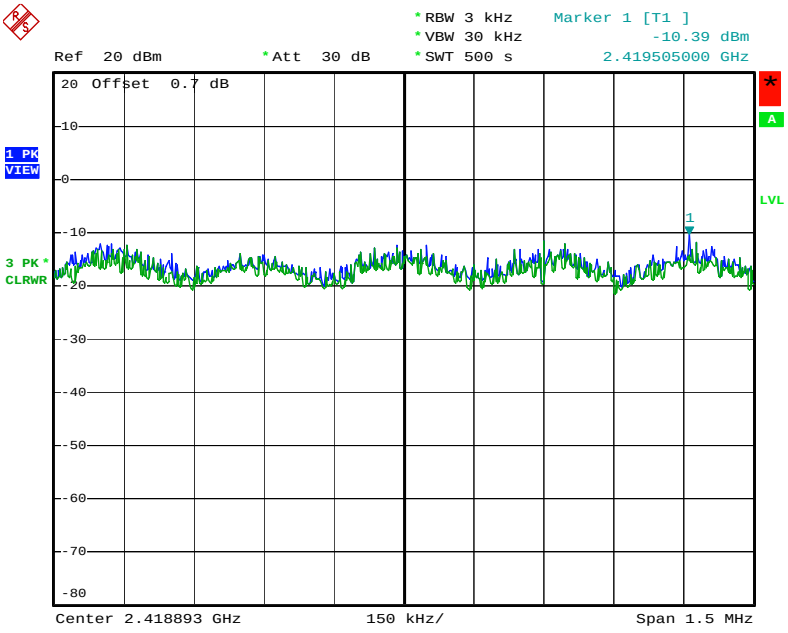
Date: 27.AUG.2007 11:09:02

Power Density Plot on Configuration IEEE 802.11b / 2462 MHz



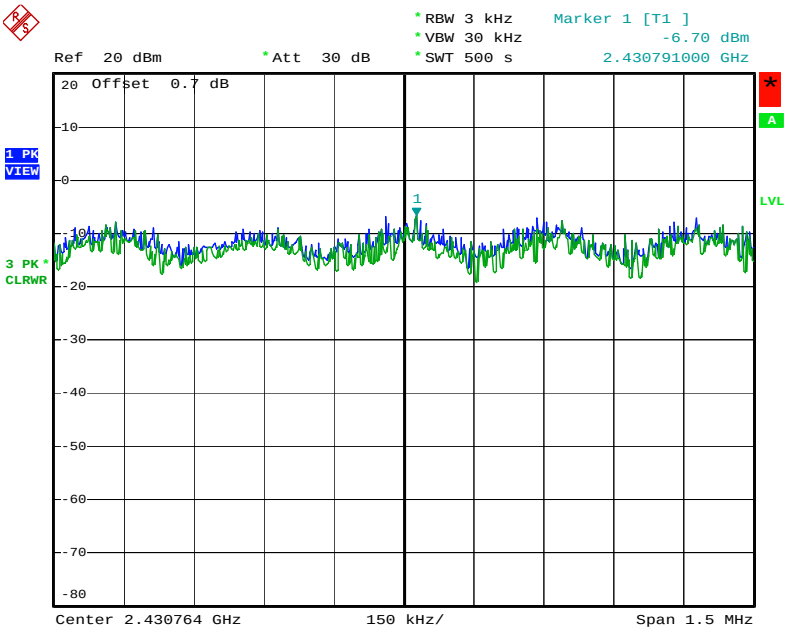
Date: 27.AUG.2007 11:05:10

Power Density Plot on Configuration IEEE 802.11g / 2412 MHz



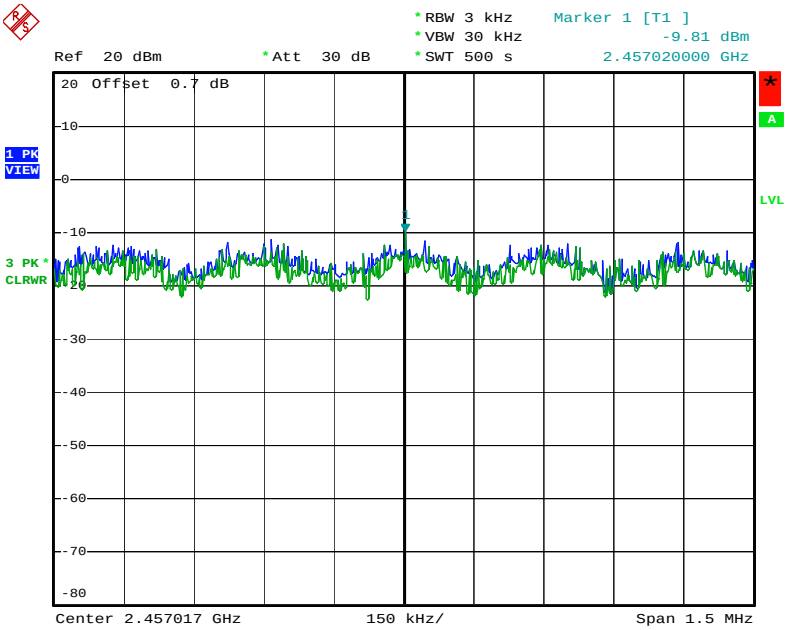
Date: 27.AUG.2007 10:42:58

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz



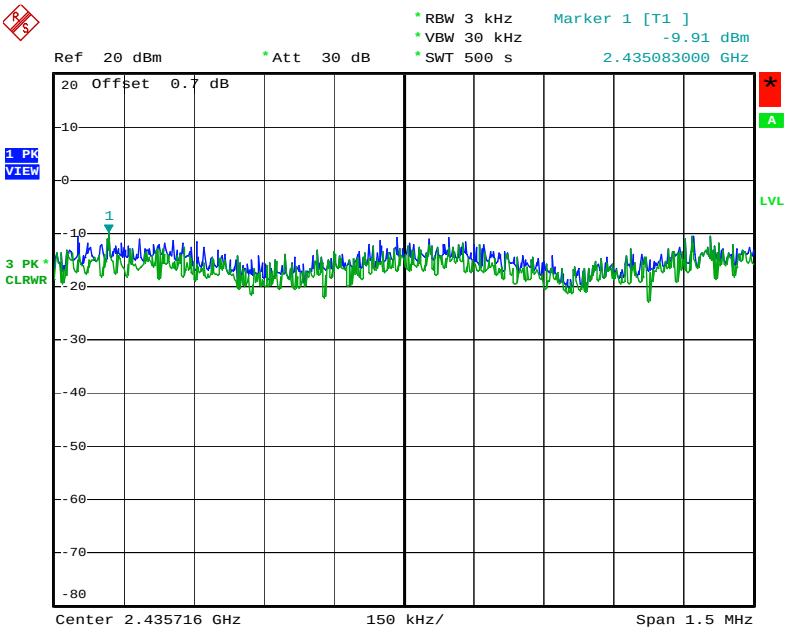
Date: 27.AUG.2007 10:45:37

Power Density Plot on Configuration IEEE 802.11g / 2462 MHz



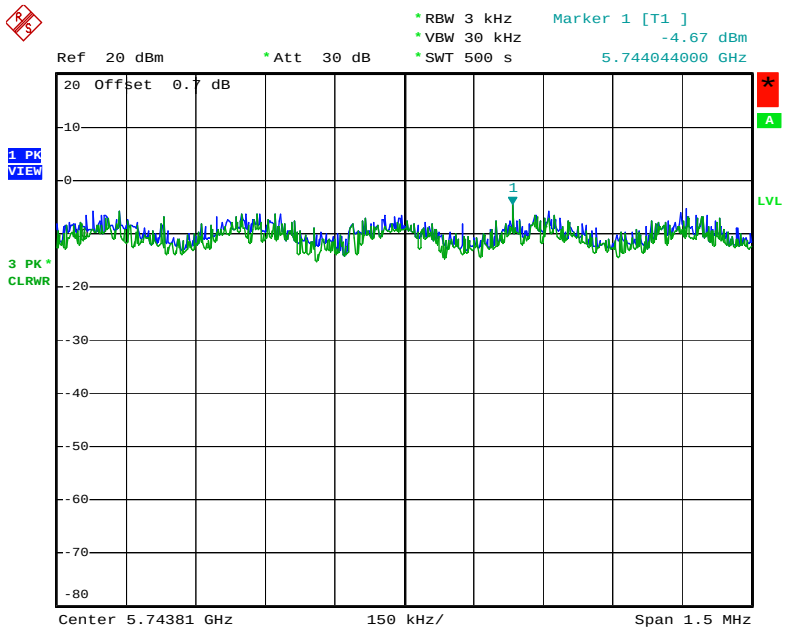
Date: 27.AUG.2007 10:46:49

Power Density Plot on Configuration IEEE 802.11g Turbo / 2437 MHz



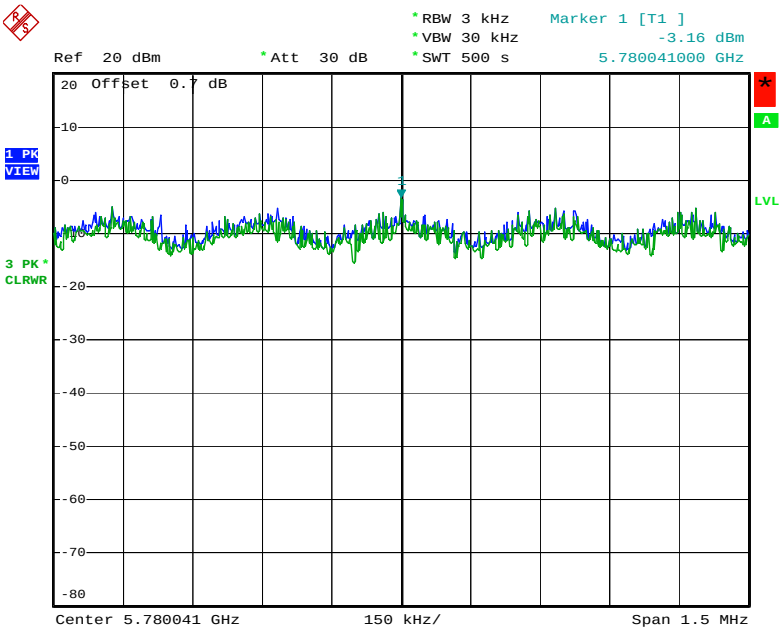
Date: 27.AUG.2007 11:58:54

Power Density Plot on Configuration IEEE 802.11a / 5745 MHz



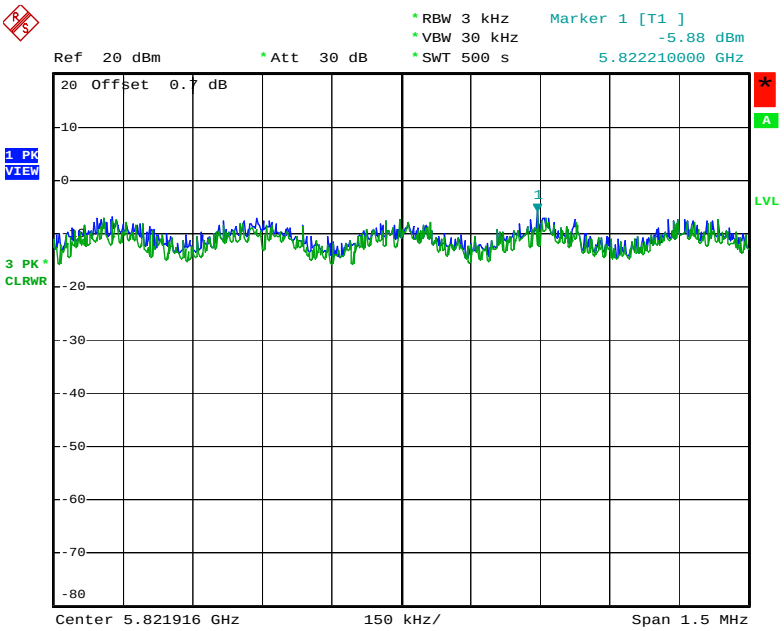
Date: 27.AUG.2007 11:39:26

Power Density Plot on Configuration IEEE 802.11a / 5785 MHz



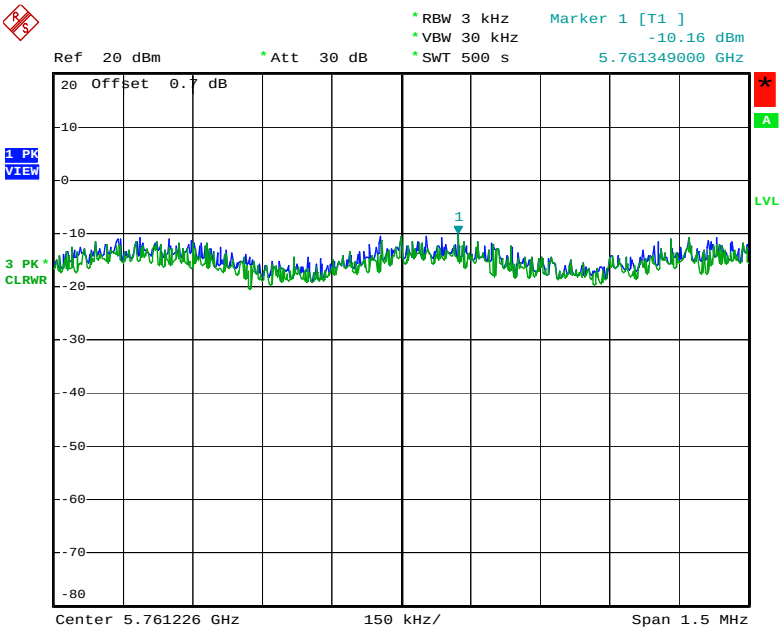
Date: 27.AUG.2007 11:40:35

Power Density Plot on Configuration IEEE 802.11a / 5825 MHz



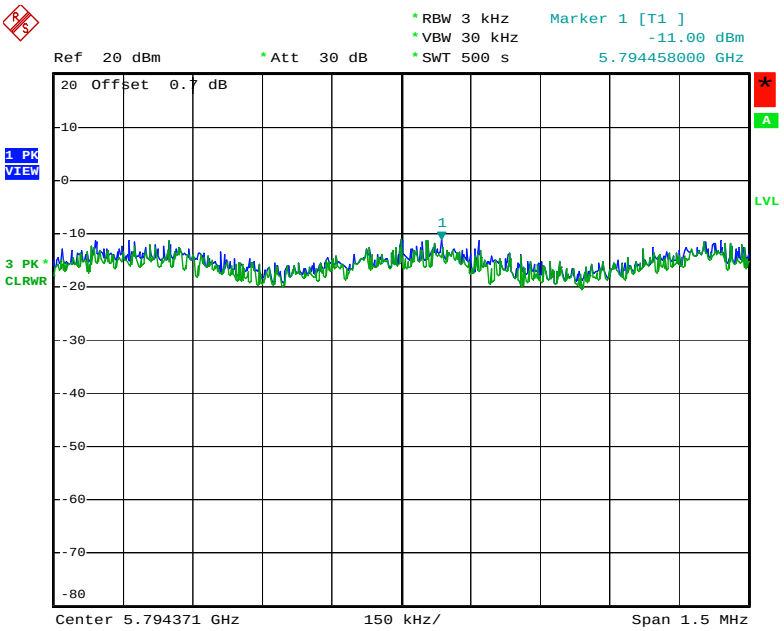
Date: 27.AUG.2007 11:42:13

Power Density Plot on Configuration IEEE 802.11a Turbo / 5760 MHz



Date: 27.AUG.2007 11:43:41

Power Density Plot on Configuration IEEE 802.11a Turbo / 5800 MHz



Date: 27.AUG.2007 11:44:58

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.

4.4.4. 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	24℃	Humidity	56%
Test Engineer	Sam Chen	Configurations	802.11a/b/g

Configuration IEEE 802.11b

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	12.04	15.56	500	Complies
6	2437 MHz	11.56	15.56	500	Complies
11	2462 MHz	11.04	15.56	500	Complies

Configuration IEEE 802.11g

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.36	16.52	500	Complies
6	2437 MHz	16.36	16.56	500	Complies
11	2462 MHz	16.32	16.52	500	Complies

Configuration IEEE 802.11g Turbo

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
6	2437 MHz	31.28	32.88	500	Complies

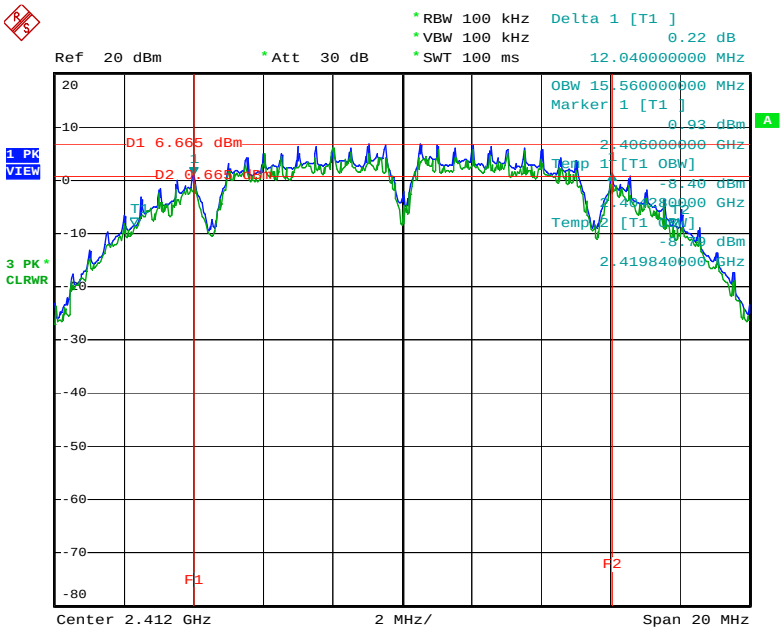
Configuration IEEE 802.11a

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.40	16.76	500	Complies
157	5785 MHz	16.40	16.92	500	Complies
165	5825 MHz	16.40	16.56	500	Complies

Configuration IEEE 802.11a Turbo

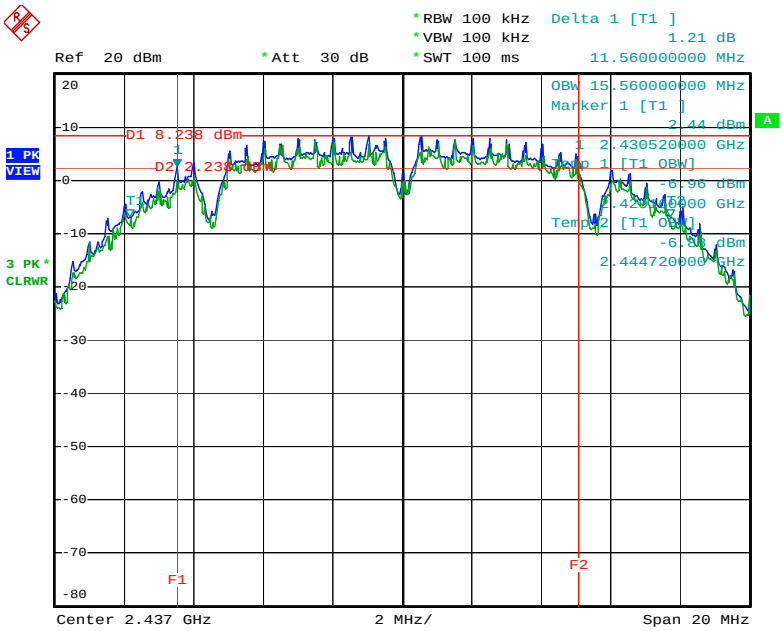
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
152	5760 MHz	32.56	32.96	500	Complies
160	5800 MHz	31.44	32.96	500	Complies

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



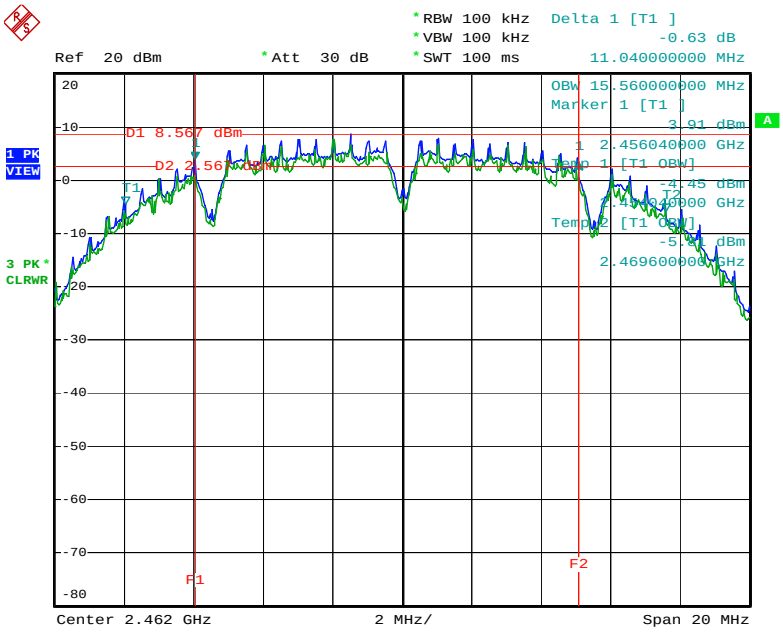
Date: 27.AUG.2007 11:06:16

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



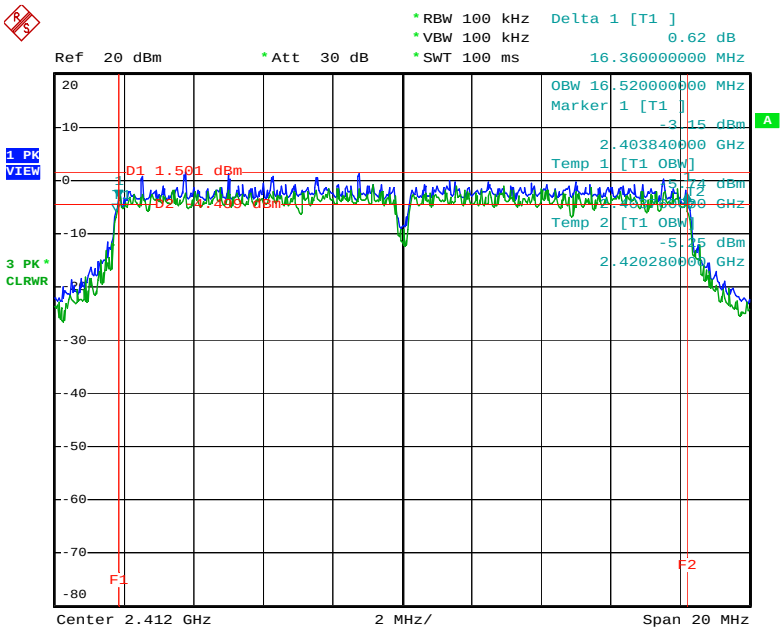
Date: 27.AUG.2007 11:04:03

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



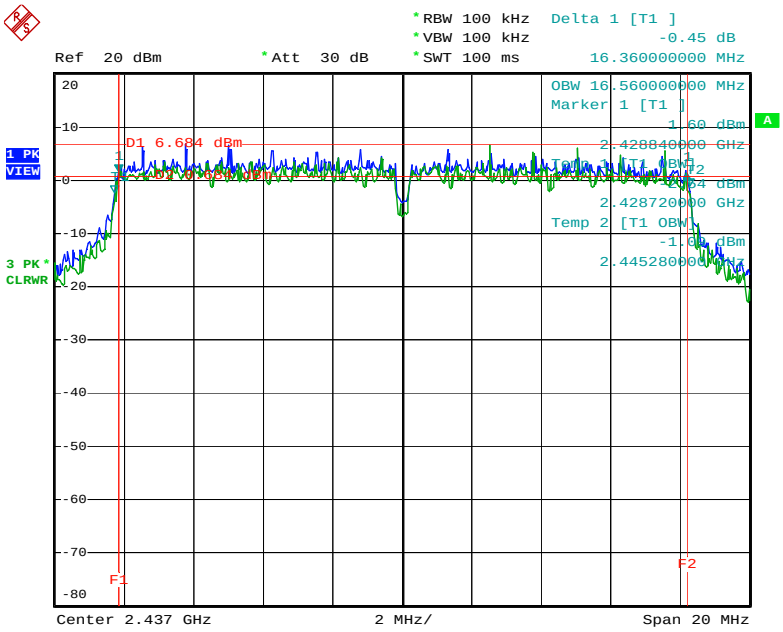
Date: 27.AUG.2007 11:04:55

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



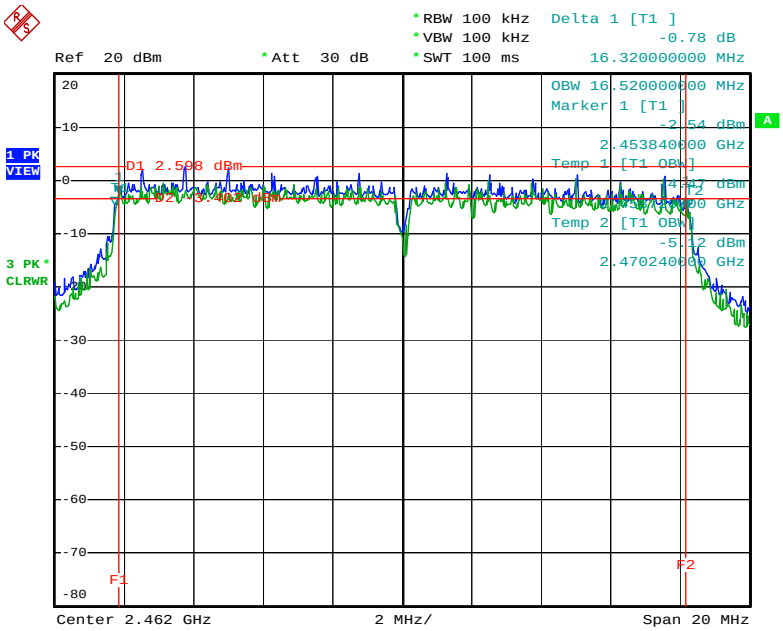
Date: 27.AUG.2007 10:42:33

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



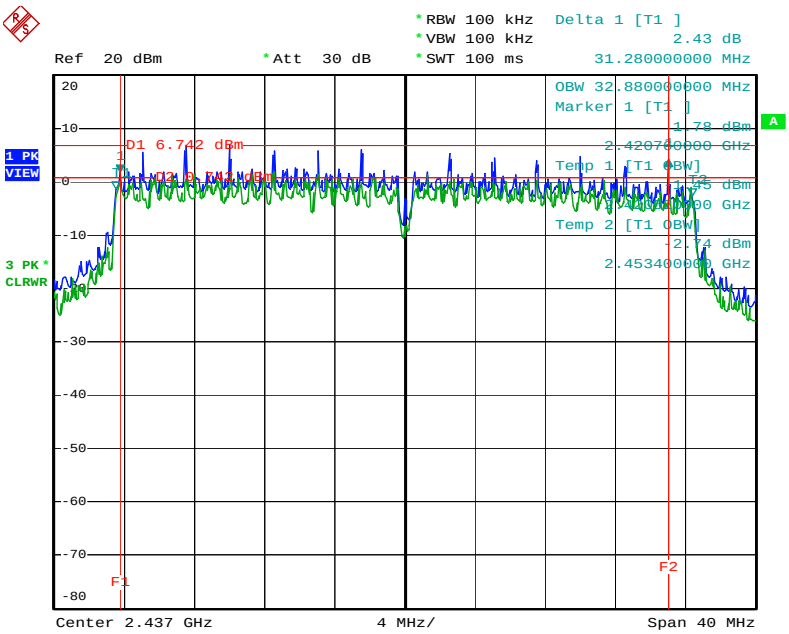
Date: 27.AUG.2007 10:45:20

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



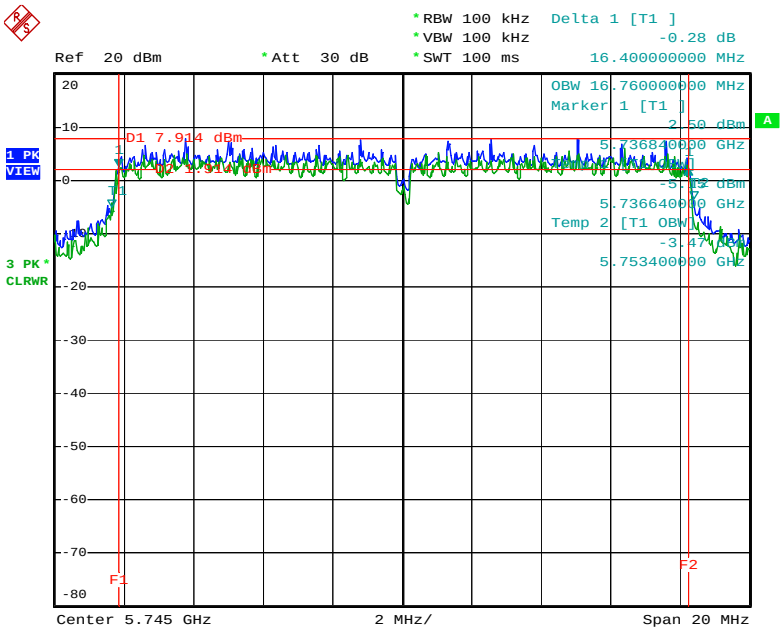
Date: 27.AUG.2007 10:46:33

6 dB Bandwidth Plot on Configuration IEEE 802.11g Turbo / 2437 MHz



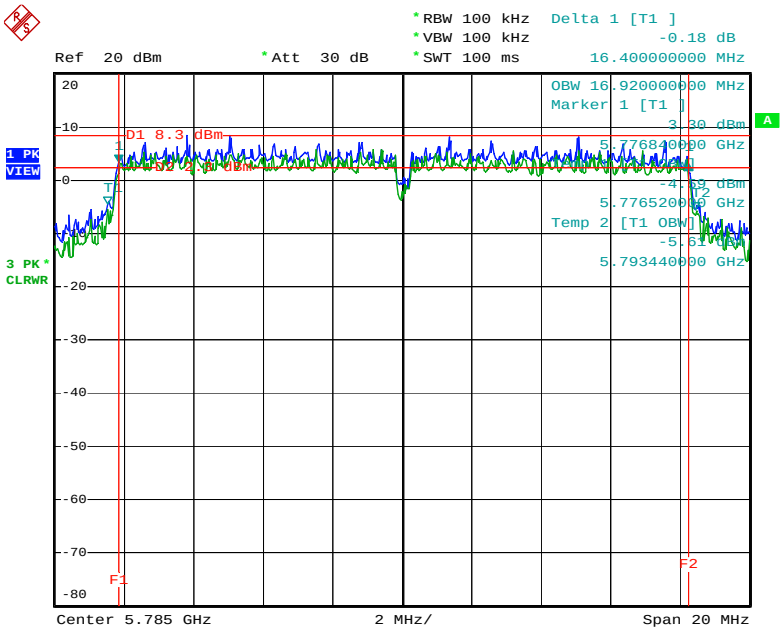
Date: 27.AUG.2007 11:58:38

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



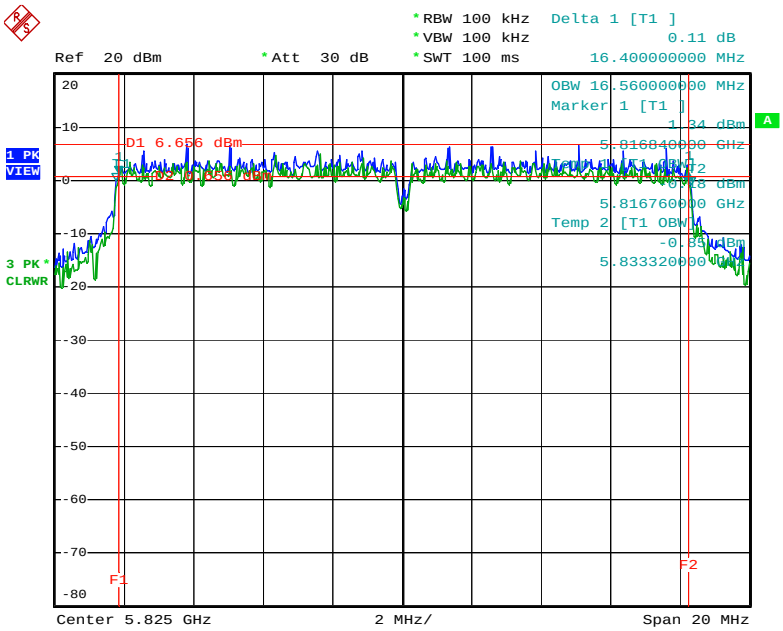
Date: 27.AUG.2007 11:39:01

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



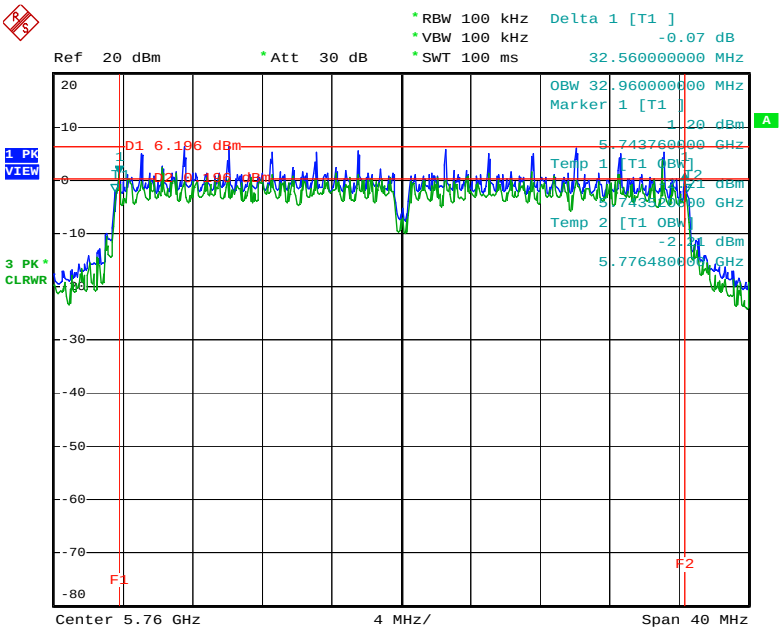
Date: 27.AUG.2007 11:40:10

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



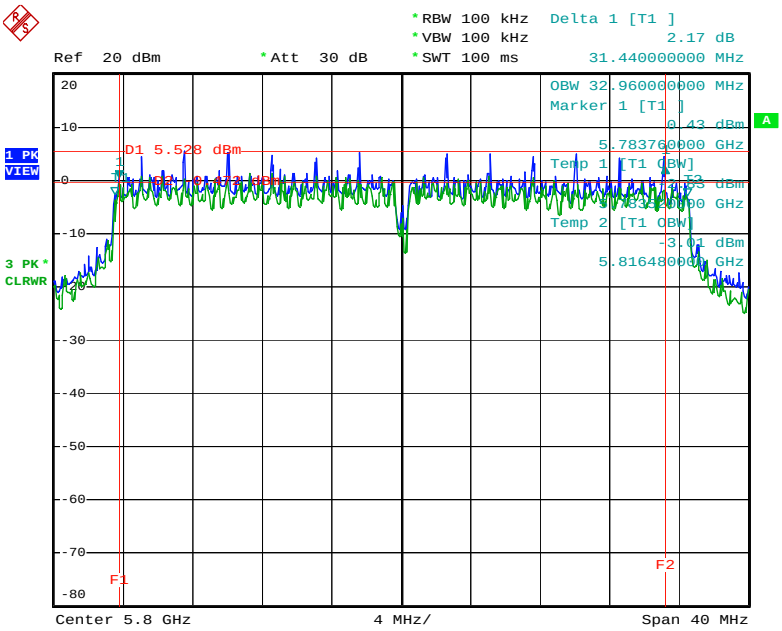
Date: 27.AUG.2007 11:41:47

6 dB Bandwidth Plot on Configuration IEEE 802.11a Turbo / 5760 MHz



Date: 27.AUG.2007 11:43:16

6 dB Bandwidth Plot on Configuration IEEE 802.11a Turbo / 5800 MHz



Date: 27.AUG.2007 11:44:32

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

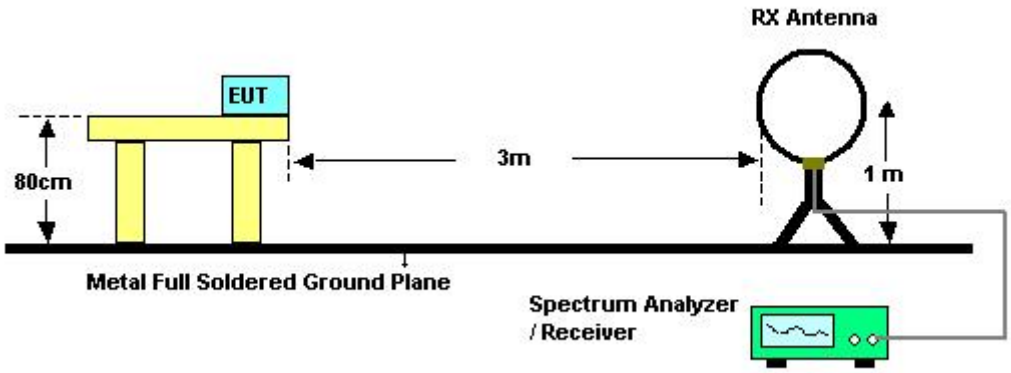
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.5.3. Test Procedures

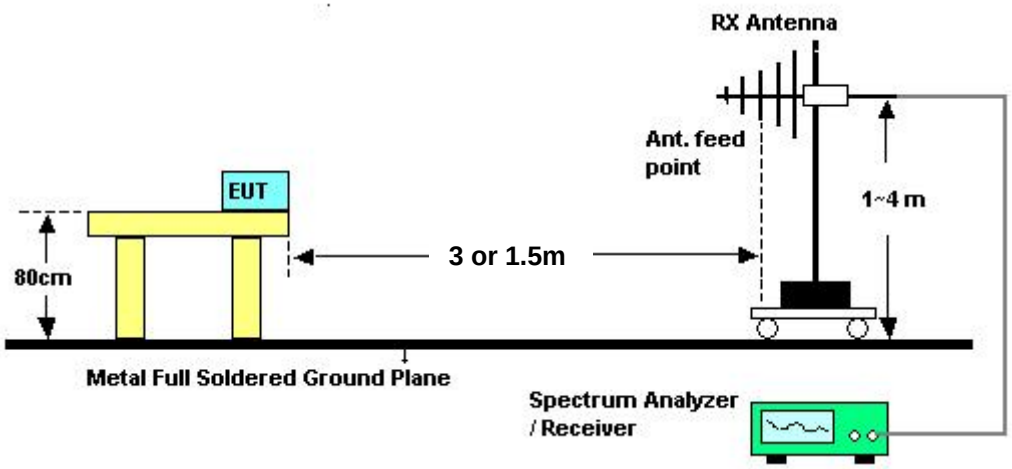
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting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

Distance extrapolation factor = 20 log (specific distance [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	24.3℃	Humidity	56%
Test Engineer	Barry Chen		

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.

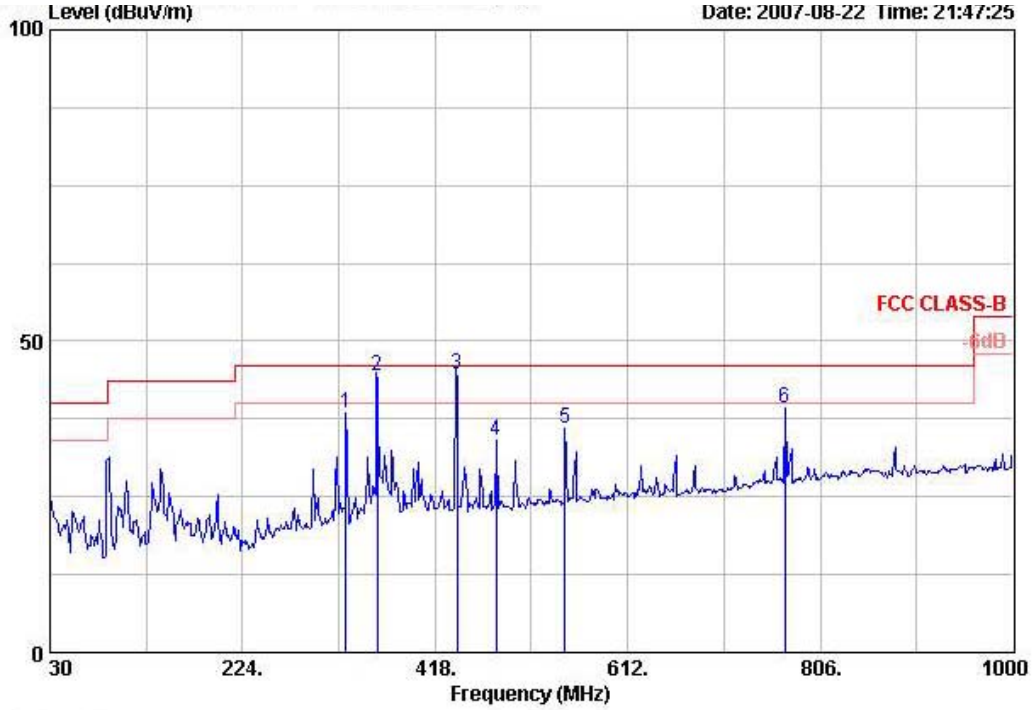
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

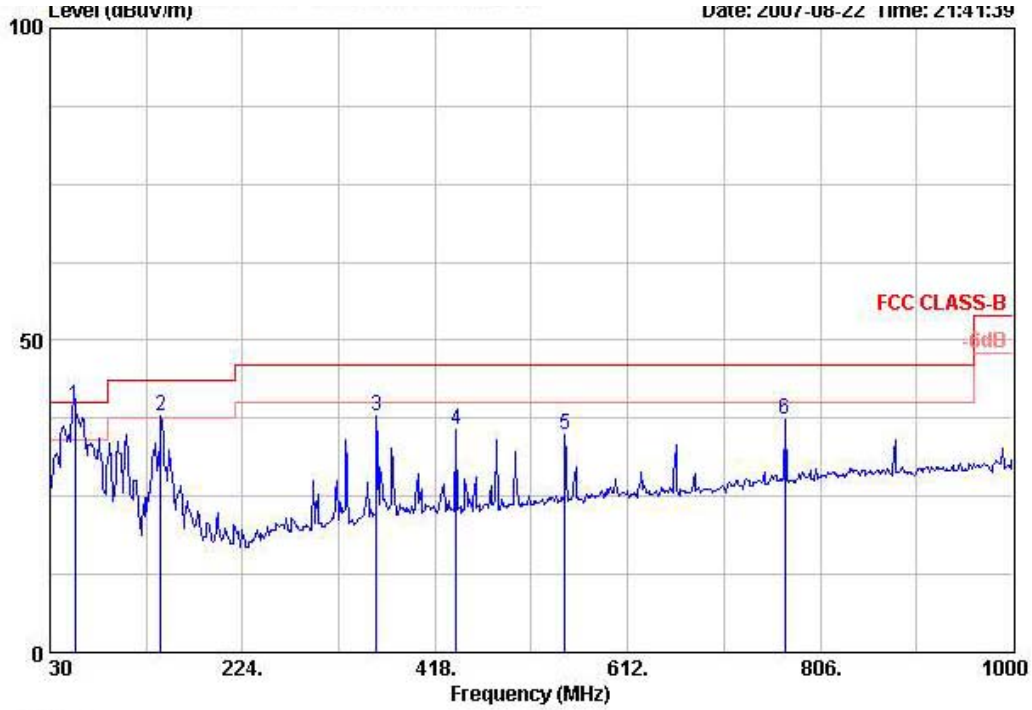
Temperature	24.3℃	Humidity	56%
Test Engineer	Barry Chen	Configurations	Normal Link

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	327.790	38.55	-7.45	46.00	47.69	14.68	1.15	24.97	Peak	100	0
2 !	360.000	44.49	-1.51	46.00	52.80	15.54	1.25	25.10	QP	100	187
3 @	440.000	44.66	-1.34	46.00	52.00	17.07	1.46	25.86	QP	100	307
4	479.110	33.97	-12.03	46.00	40.96	17.55	1.65	26.18	Peak	100	0
5	548.950	35.87	-10.13	46.00	41.94	18.58	1.61	26.27	Peak	100	0
6	770.110	39.33	-6.67	46.00	41.60	20.34	2.49	25.11	Peak	100	0

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	55.270	39.47	-0.53	40.00	57.30	8.00	0.43	26.26	QP	100	0
2 !	141.550	37.99	-5.51	43.50	51.45	11.85	0.49	25.80	Peak	400	0
3	358.830	37.76	-8.24	46.00	46.09	15.51	1.24	25.09	Peak	400	0
4	439.340	35.75	-10.25	46.00	43.10	17.05	1.46	25.86	Peak	400	0
5	548.950	34.82	-11.18	46.00	40.89	18.58	1.61	26.27	Peak	400	0
6	770.110	37.26	-8.74	46.00	39.53	20.34	2.49	25.11	Peak	400	0

Note:

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

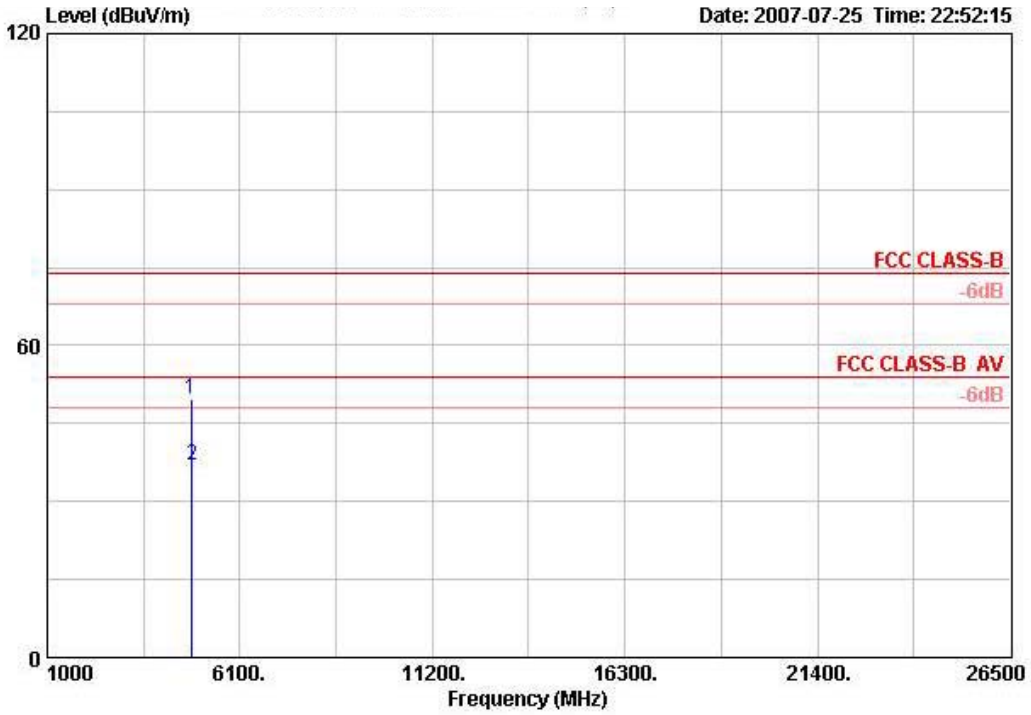
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

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

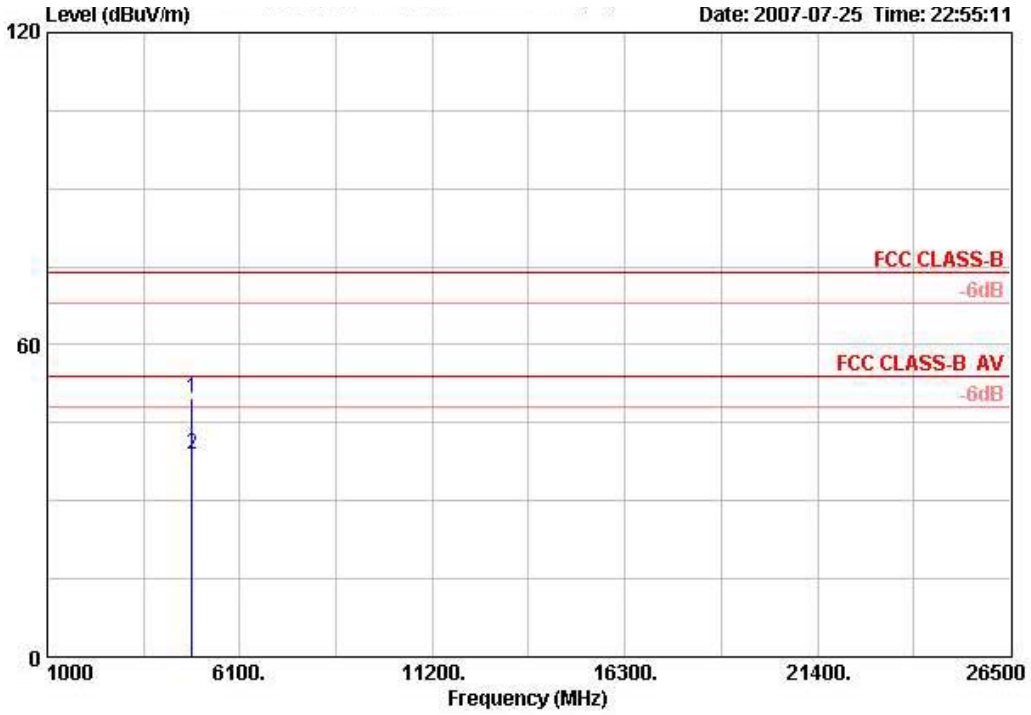
Temperature	24.3℃	Humidity	56%
Test Engineer	Barry Chen	Configurations	802.11b CH 1

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	4821.660	49.64	-24.36	74.00	42.81	33.06	8.95	35.16	PEAK	100	HORIZONTAL
2	4824.040	36.80	-17.20	54.00	29.96	33.06	8.95	35.16	AVERAGE	100	HORIZONTAL

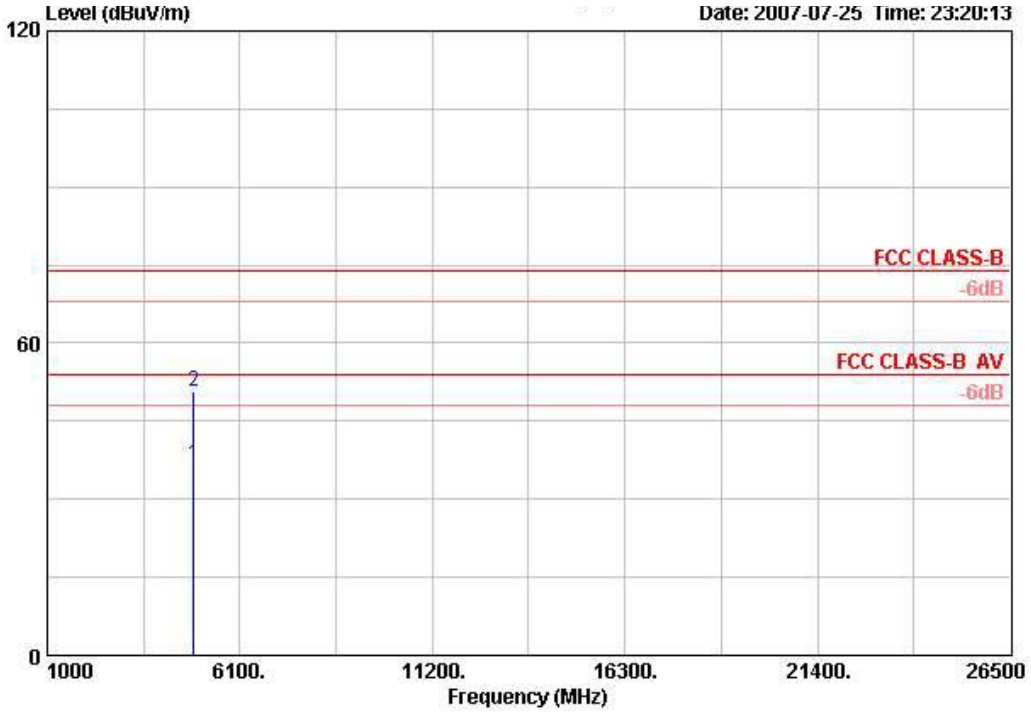
Vertical



	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	4824.000	49.66	-24.34	74.00	42.82	33.06	8.95	35.16	PEAK	100	VERTICAL
2	4824.040	38.99	-15.01	54.00	32.16	33.06	8.95	35.16	AVERAGE	100	VERTICAL

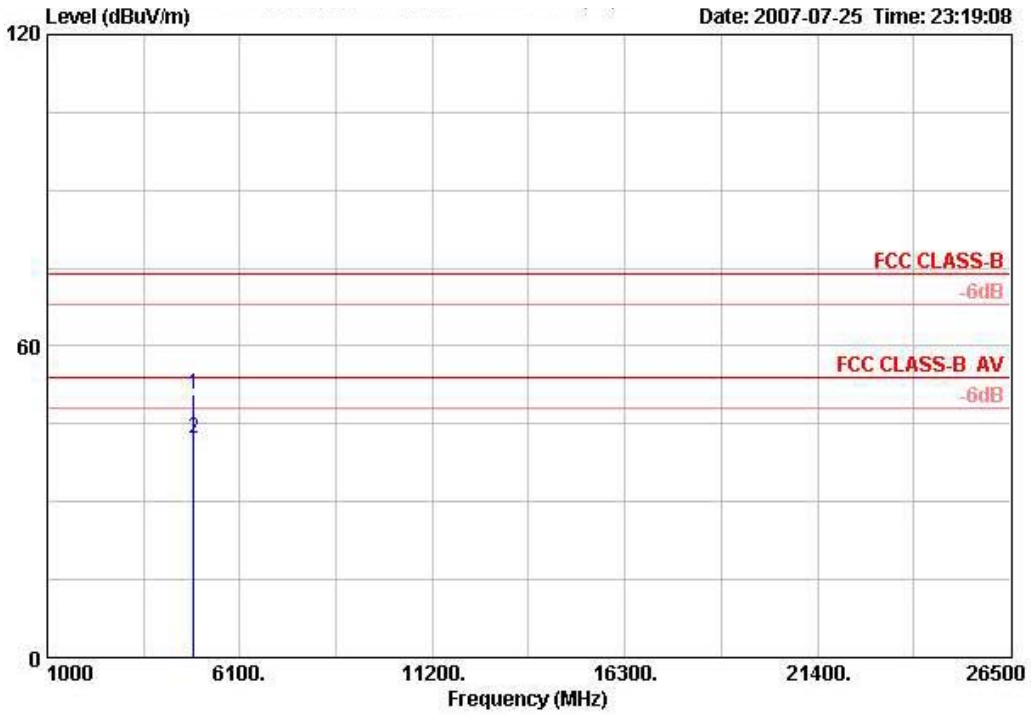
Temperature	24.3℃	Humidity	56%
Test Engineer	Barry Chen	Configurations	802.11b CH 6

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	4874.050	36.76	-17.24	54.00	29.75	33.16	9.01	35.15	AVERAGE	100	HORIZONTAL
2	4874.460	50.68	-23.32	74.00	43.67	33.16	9.01	35.15	PEAK	100	HORIZONTAL

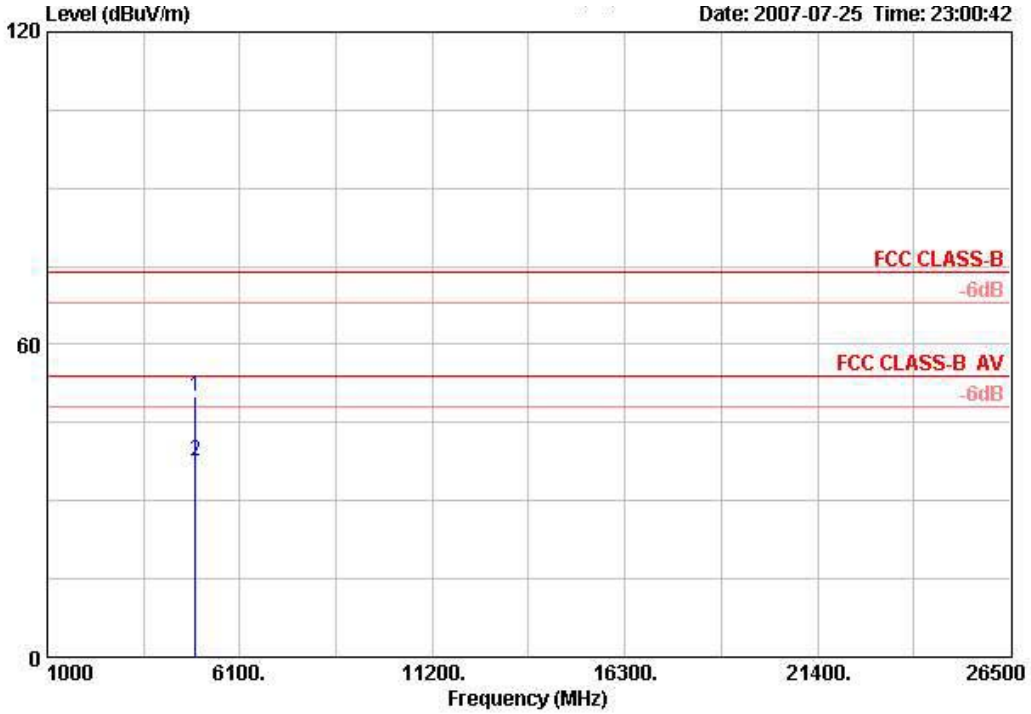
Vertical



	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	4874.020	50.84	-23.16	74.00	43.82	33.16	9.01	35.15	PEAK	100	VERTICAL
2	4874.050	42.05	-11.95	54.00	35.04	33.16	9.01	35.15	AVERAGE	100	VERTICAL

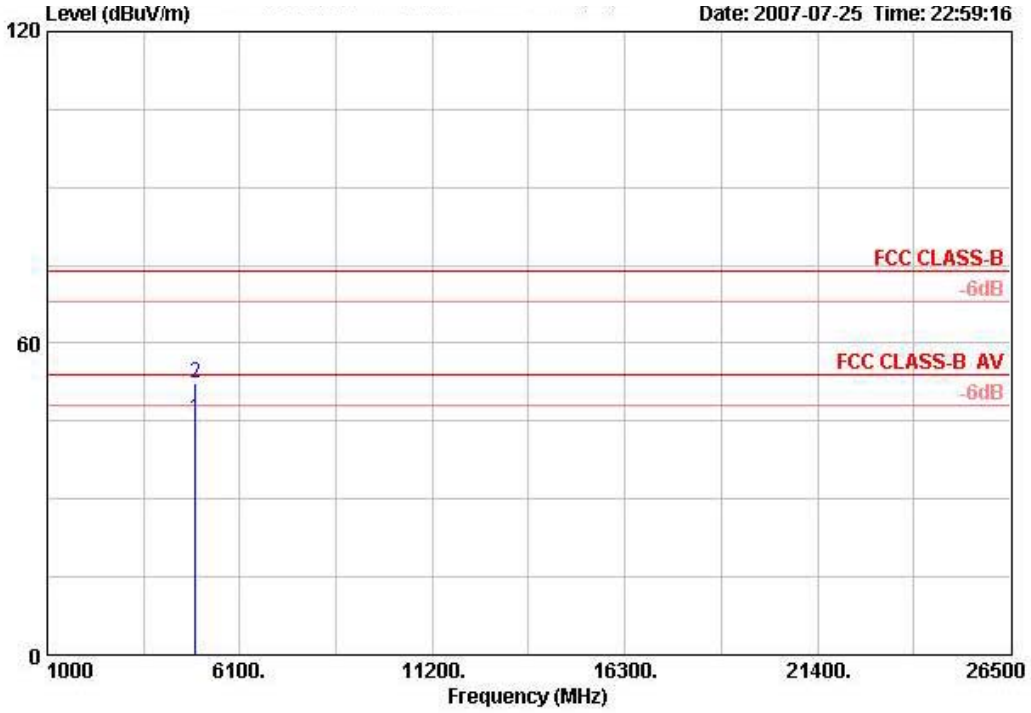
Temperature	24.3℃	Humidity	56%
Test Engineer	Barry Chen	Configurations	802.11b CH 11

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	4923.840	50.01	-23.99	74.00	42.82	33.26	9.07	35.14	PEAK	109	HORIZONTAL
2	4924.120	37.75	-16.25	54.00	30.56	33.26	9.07	35.14	AVERAGE	109	HORIZONTAL

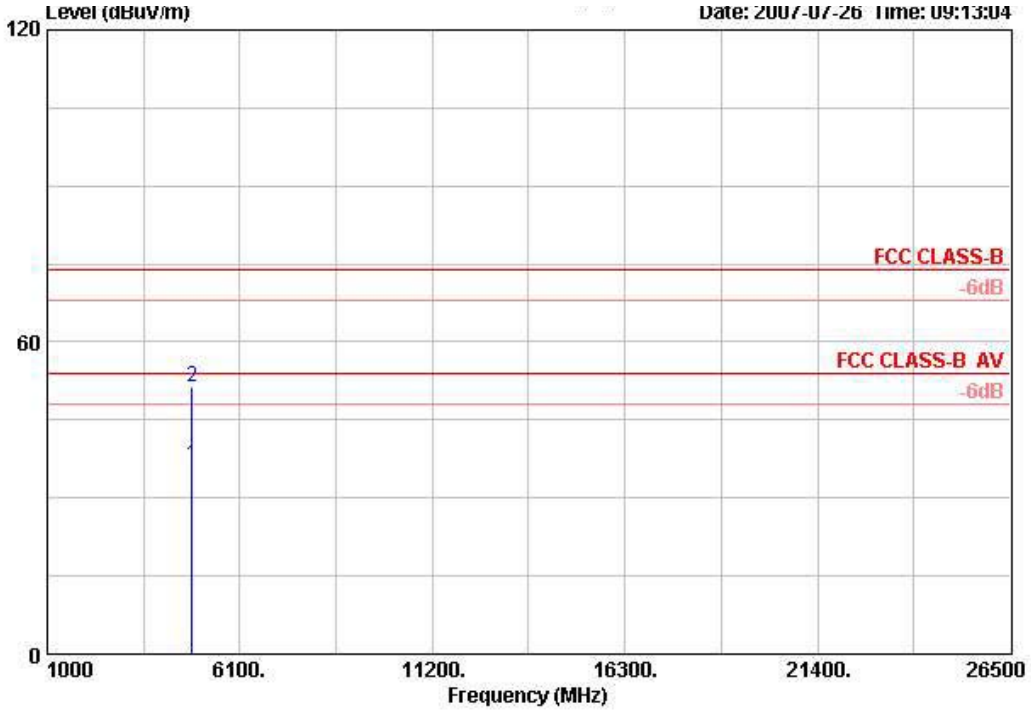
Vertical



	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	4924.180	45.50	-8.50	54.00	38.31	33.26	9.07	35.14	AVERAGE	103	VERTICAL
2	4924.320	52.23	-21.77	74.00	45.04	33.26	9.07	35.14	PEAK	103	VERTICAL

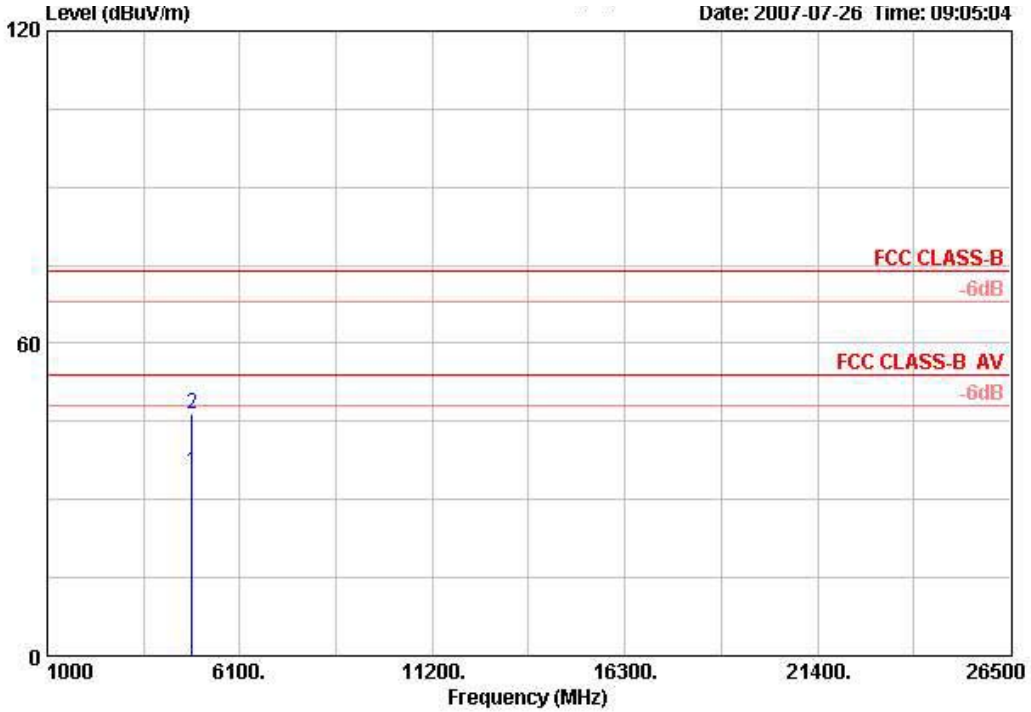
Temperature	24.3℃	Humidity	56%
Test Engineer	Barry Chen	Configurations	802.11g CH 1

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	4823.060	36.42	-17.58	54.00	29.58	33.06	8.95	35.16	AVERAGE	100	HORIZONTAL
2	4827.480	51.18	-22.82	74.00	44.35	33.06	8.95	35.16	PEAK	100	HORIZONTAL

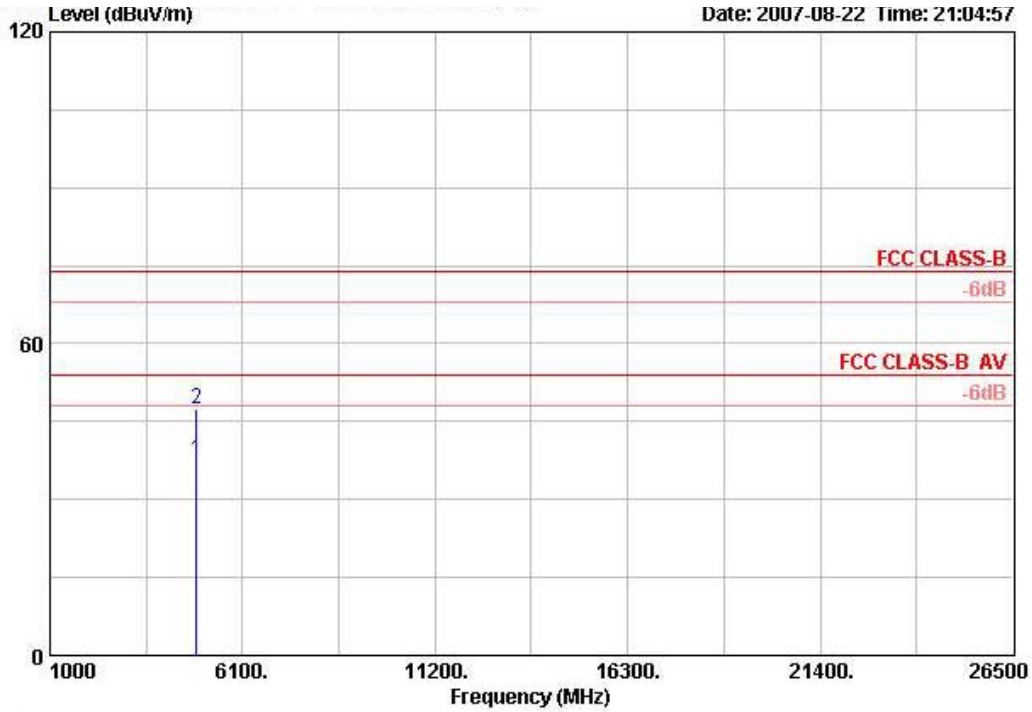
Vertical



	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	4823.860	35.23	-18.77	54.00	31.48	33.06	5.86	35.16	Average	100	VERTICAL
2	4827.890	46.32	-27.68	74.00	42.57	33.06	5.86	35.16	PEAK	100	VERTICAL

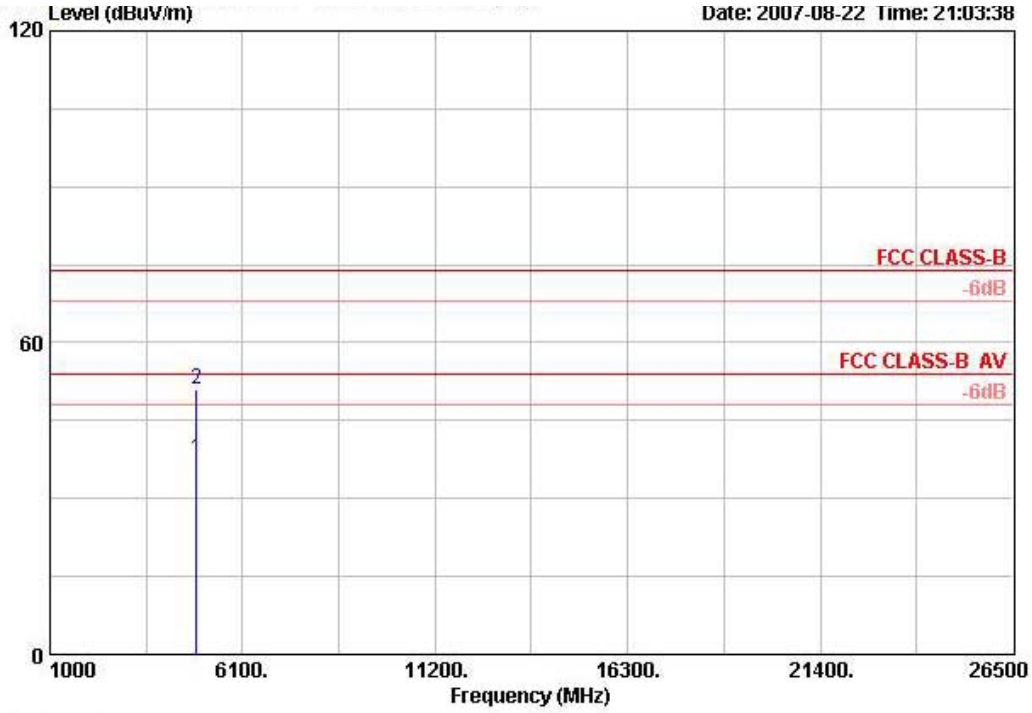
Temperature	24.3℃	Humidity	56%
Test Engineer	Barry Chen	Configurations	802.11g CH 6

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4873.602	37.62	-16.38	54.00	30.13	33.48	7.24	33.23	AVERAGE	110	203
2	4873.688	47.27	-26.73	74.00	39.78	33.48	7.24	33.23	PEAK	110	203

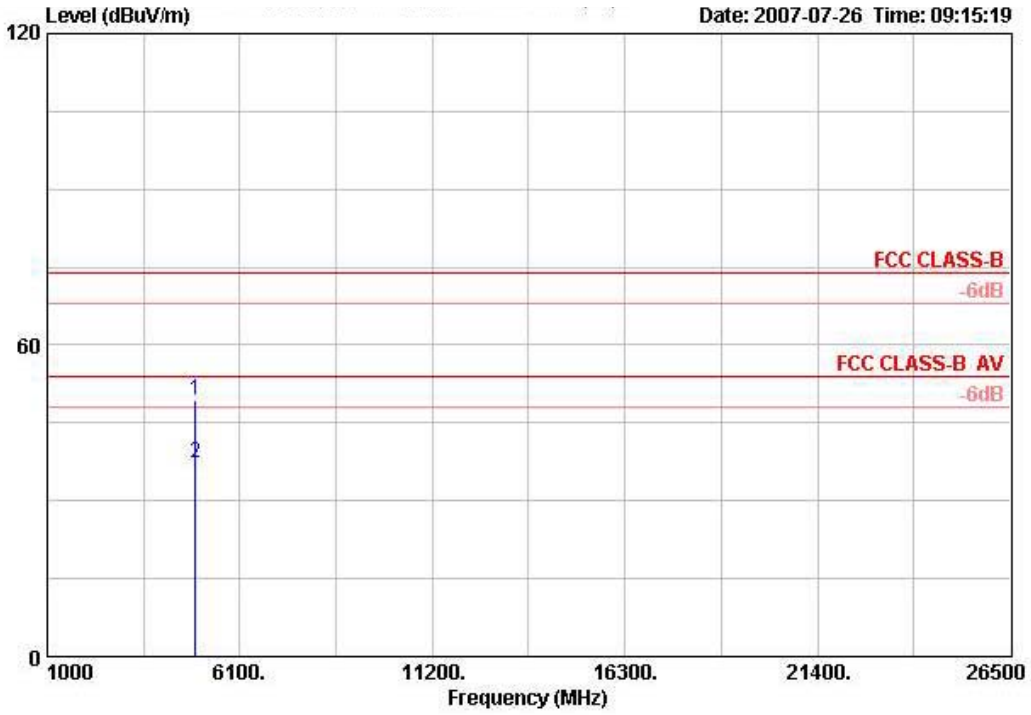
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4873.806	37.65	-16.35	54.00	30.15	33.48	7.24	33.23	AVERAGE	100	325
2	4873.984	50.94	-23.06	74.00	43.45	33.48	7.24	33.23	PEAK	100	325

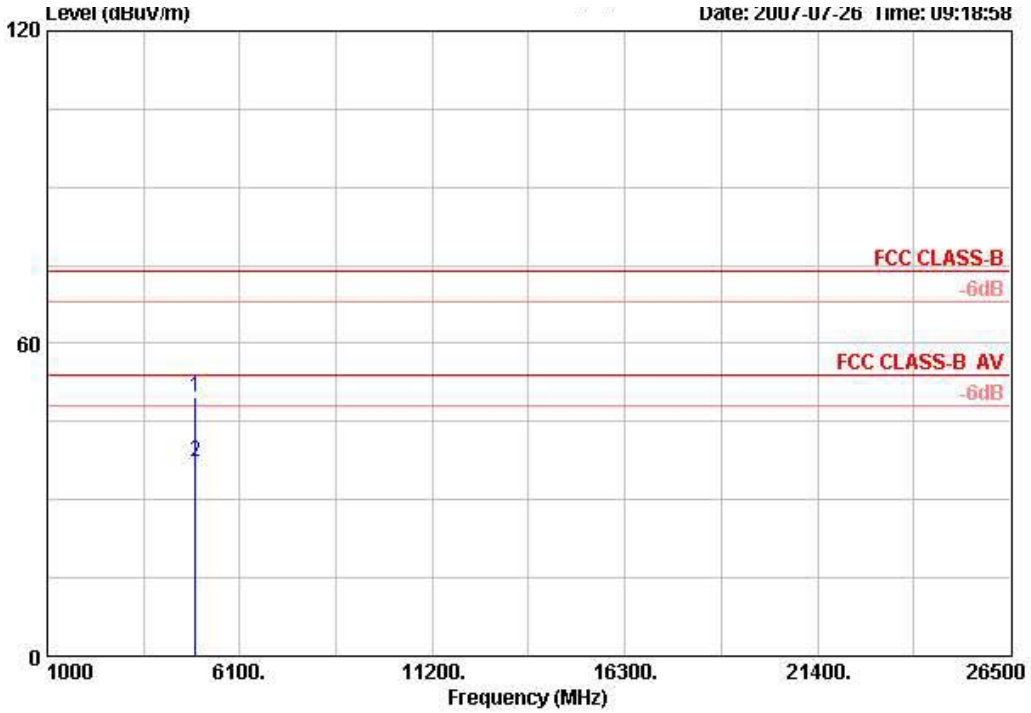
Temperature	24.3℃	Humidity	56%
Test Engineer	Barry Chen	Configurations	802.11g CH 11

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	4927.040	49.42	-24.58	74.00	42.23	33.26	9.07	35.14	PEAK	100	HORIZONTAL
2	4927.060	37.32	-16.68	54.00	30.13	33.26	9.07	35.14	AVERAGE	100	HORIZONTAL

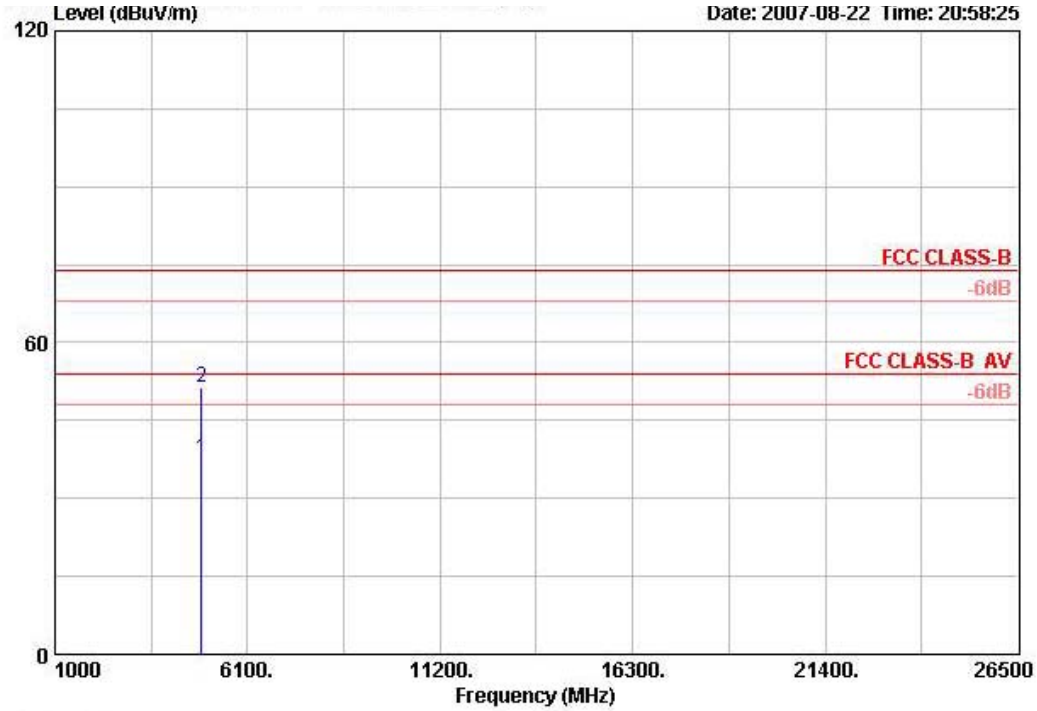
Vertical



	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	4922.040	49.81	-24.19	74.00	42.62	33.26	9.07	35.14	PEAK	100	VERTICAL
2	4928.880	37.42	-16.58	54.00	30.23	33.26	9.07	35.14	AVERAGE	100	VERTICAL

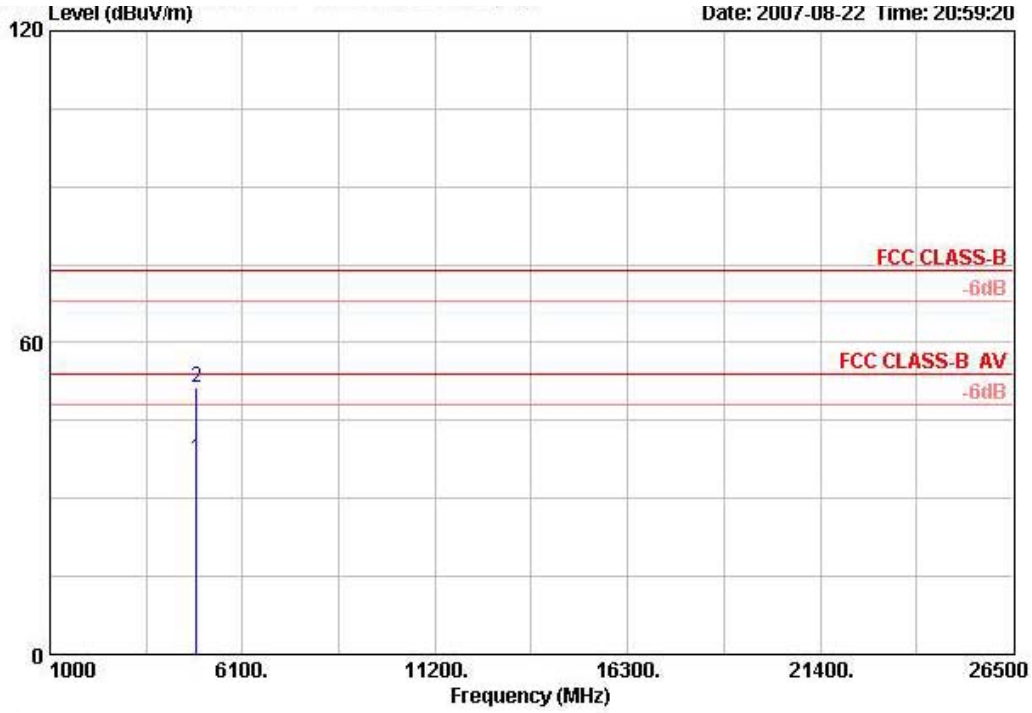
Temperature	24.3℃	Humidity	56%
Test Engineer	Barry Chen	Configurations	802.11g Turbo CH 6

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4873.500	37.68	-16.32	54.00	30.18	33.48	7.24	33.23	AVERAGE	100	145
2	4873.748	51.49	-22.51	74.00	43.99	33.48	7.24	33.23	PEAK	100	145

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4873.786	37.70	-16.30	54.00	30.20	33.48	7.24	33.23	AVERAGE	100	0
2	4874.200	51.45	-22.55	74.00	43.96	33.48	7.24	33.23	PEAK	100	0

Note:

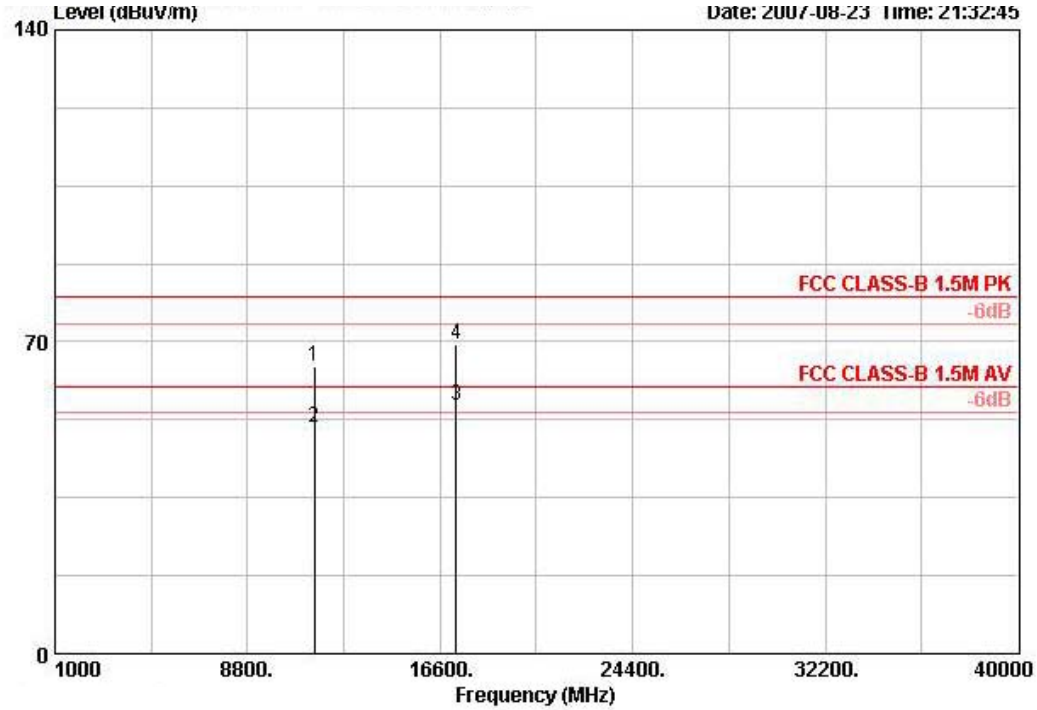
The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

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

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

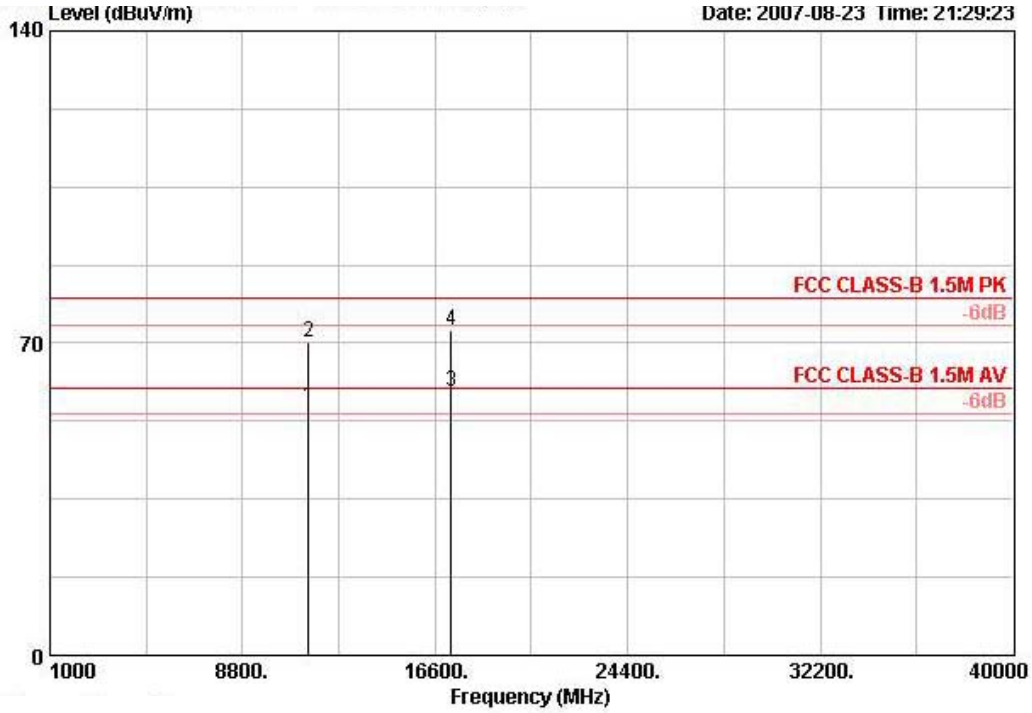
Temperature	24.3℃	Humidity	56%
Test Engineer	Barry Chen	Configurations	802.11a CH 149

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	11492.100	64.29	-15.71	80.00	44.80	39.50	13.09	33.10	PEAK	137	179
2 @	11492.800	50.70	-9.30	60.00	31.21	39.50	13.09	33.10	AVERAGE	137	179
3 @	17243.100	55.70	-4.30	60.00	31.75	41.07	15.28	32.40	AVERAGE	100	308
4 @	17245.800	69.38	-10.62	80.00	45.35	41.15	15.28	32.40	PEAK	100	308

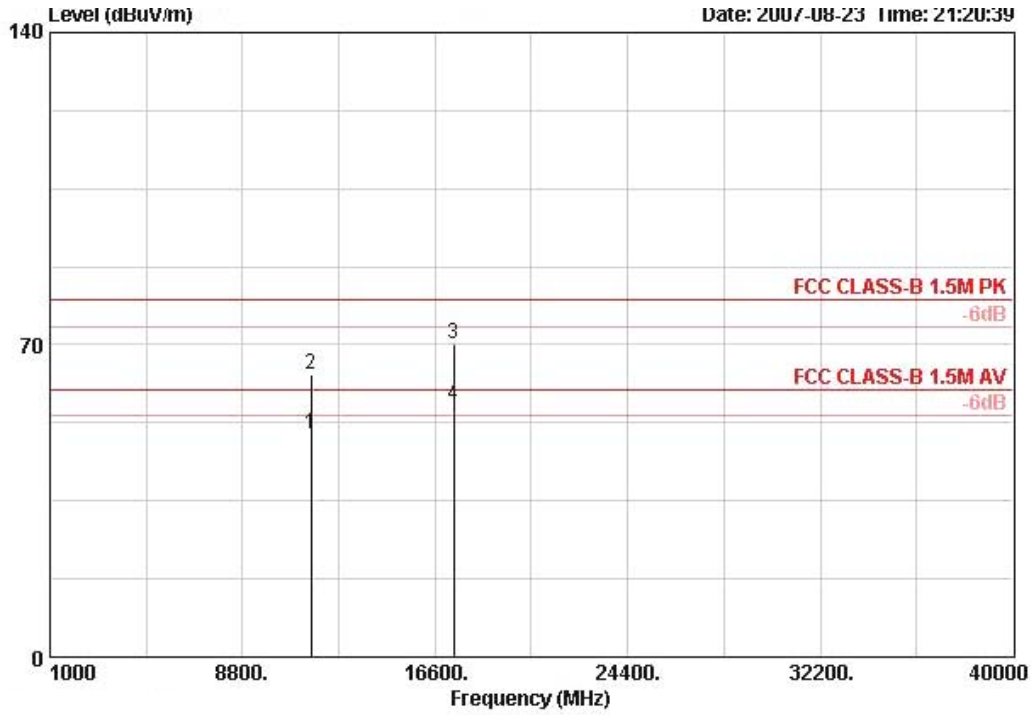
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	11481.600	55.84	-4.16	60.00	36.35	39.50	13.09	33.10	AVERAGE	101	237
2 @	11487.800	70.17	-9.83	80.00	50.68	39.50	13.09	33.10	PEAK	101	237
3 @	17235.300	59.22	-0.78	60.00	35.27	41.07	15.28	32.40	AVERAGE	104	55
4 @	17236.500	72.99	-7.01	80.00	49.04	41.07	15.28	32.40	PEAK	104	55

Temperature	24.3℃	Humidity	56%
Test Engineer	Barry Chen	Configurations	802.11a CH 157

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	11567.200	50.03	-9.97	60.00	30.56	39.47	13.11	33.11	AVERAGE	103	219
2 @	11590.400	63.32	-16.68	80.00	43.85	39.47	13.12	33.12	PEAK	100	219
3 @	17354.100	70.17	-9.83	80.00	45.53	41.65	15.39	32.40	PEAK	100	27
4 @	17359.800	56.50	-3.50	60.00	31.84	41.65	15.42	32.40	AVERAGE	100	27