



FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

Maipu Communication Technology Co., Ltd.

No.16 JiuXing Avenue, High-Tech Park, Chengdu,

Sichuan Province, P. R. of China

FCC ID: YDPMP1800
Model: MP1800 SERIES

Report Type: Original Report	Product Type: Multi-Operation Access Router
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* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "*" (Rev.2)

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The **Maipu Communication Technology Co., Ltd's** product, model number: *MP1800 series* (FCC ID: YDPMP1800) or the "EUT" as referred to in this report is the **Multi-Operation Access Router** operates at 2.4 GHz band, which measures approximately: 34 cm L x 30 cm W x 5 cm H, rated input voltage: AC 100-240V, 50/60Hz.

It has a TX antenna and a RX antenna.

All measurement and test data in this report was gathered from production sample, serial number: 1003251 (Assigned by BACL). The EUT was received on 2010-03-25.

Objective

This type approval report is prepared on behalf of **Maipu Communication Technology Co., Ltd** in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15C, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

N/A

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 KHz to 40 GHz.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Chengdu). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The test site used by BACL to collect test data is located in the Room 5040, HuiLongWan Plaza, No. 1, ShaWan Road, JinNiu District, Chengdu, Sichuan, China

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on July 31, 2009. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 560332. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

Equipment Modifications

No modification was made to the unit tested.

EUT Exercise Software

The Hyper Terminal Program to under transmission condition continuously at lowest, middle and highest channel frequencies individually.

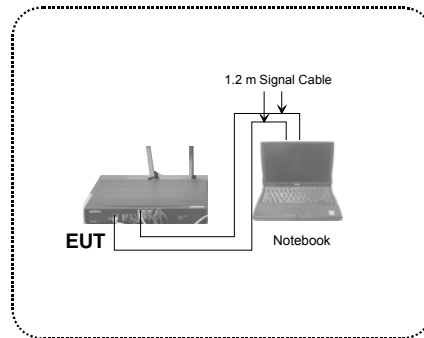
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
DELL	Notebook	PP01L	01014	DOC

External I/O Cable

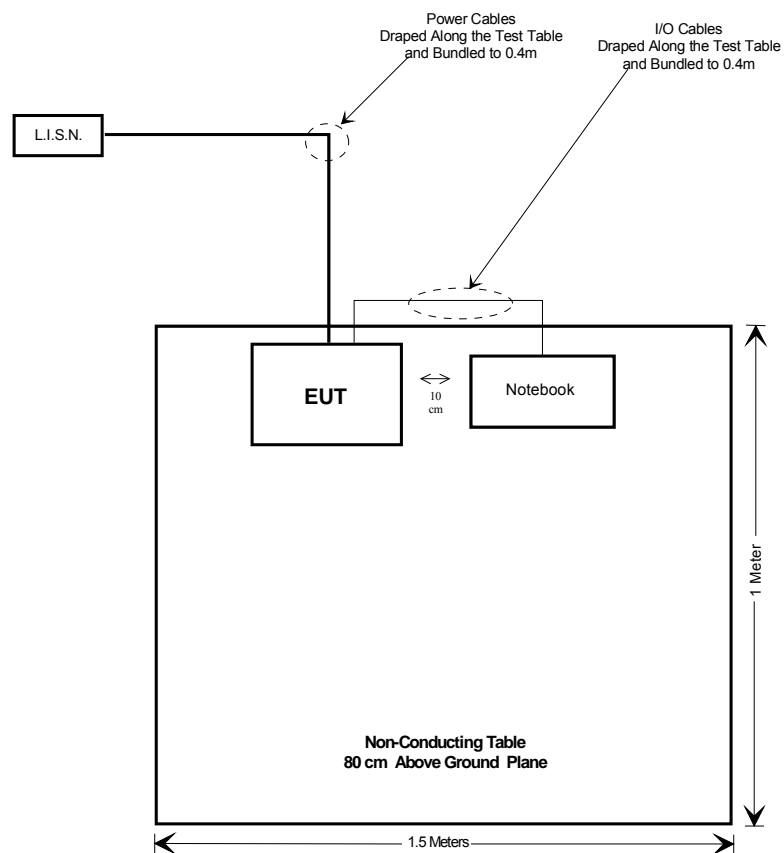
Cable Description	Length (m)	From/Port	To
AC Power Cable	1.5	L.I.S.N.	EUT
Signal Cable	1.2 *2	EUT	Notebook

Configuration of Test Setup

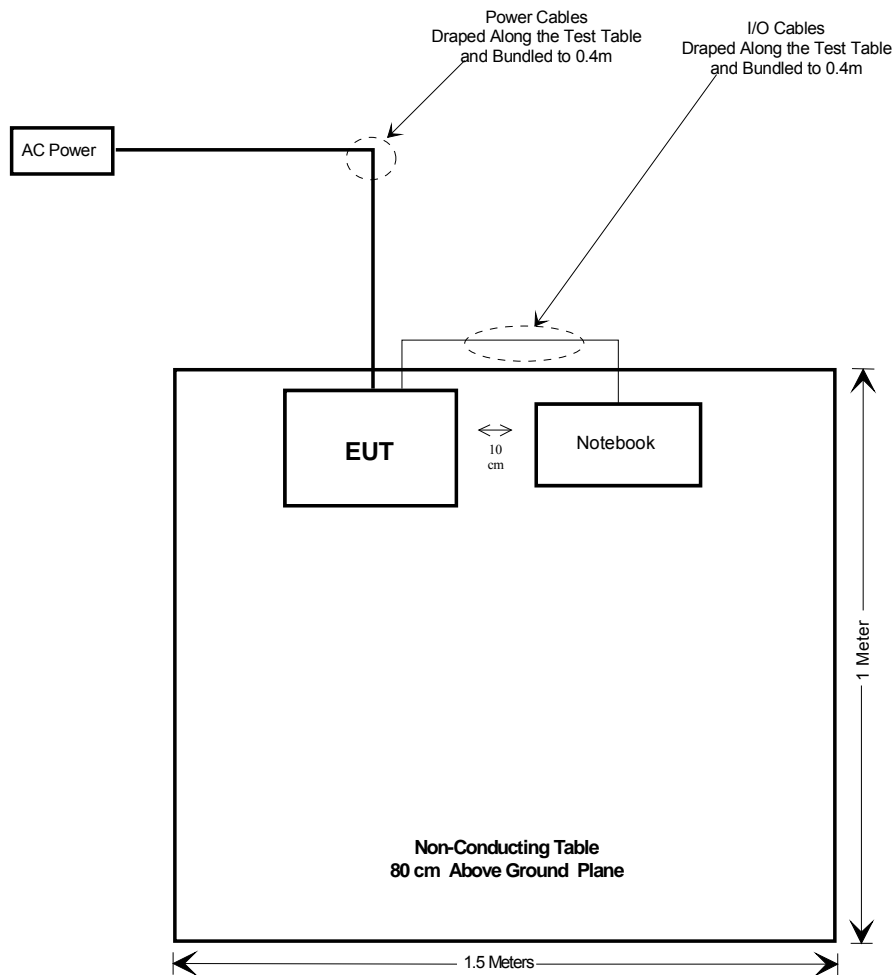


Block Diagram of Test Setup

For Conducted Emission:



For Restricted Bands and Radiated Spurious Emission:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307(b)(1) & §2.1091	RF Exposure	Compliant
§15.203	Antenna Requirement	Compliant
§15.207(a)	Conducted Emission	Compliant
§15.247(d), §2.1051	Spurious Emissions at Antenna Port	Compliant
§15.247(d), §15.205, §15.209(a)	Restricted Bands and Radiated Spurious Emission	Compliant *
§15.247(a)(2)	6 dB Bandwidth	Compliant
§15.247(b)(3)	Maximum Peak Conducted Output Power	Compliant
§15.247(d)	100kHz Bandwidth of Frequency Band Edge	Compliant
§15.247(e)	Power Spectral Density	Compliant

Note: *Within measurement uncertainty.

FCC §15.247 (i), §1.1307 (b) (1) & §2.1091 - RF EXPOSURE

Standard Applicable

According to FCC §15.247(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to FCC §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01.

$$S = PG/4 \pi R^2$$

Where: S = power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

MPE Results

Frequency Band	MPE Distance (cm)	Conducted Ant. Output Power (dBm)	Antenna Gain (dBi)	MPE (mw/cm ²)	MPE Limit (mw/cm ²)	Result
2.4 GHz	20	10.36	3.0	0.004	1.0	Compliant

The predicted power density level at 20 cm is 0.004 mw/cm² which is below the uncontrolled exposure limit of 1.0 mW/cm². The EUT is used at least 20 cm away from user's body. It is determined as mobile equipment and complies with the MPE limit.

FCC §15.203 – ANTENNA REQUIREMENT

Standard Applicable

According to FCC §15.203, 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 a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

EUT has one Transmitter/Receiver antennae which is external antennae and features a permanent attachment to the EUT chassis as well as non-standard connector. The transmitter antenna has a max gain of 3.0 dBi which fulfills the requirements of FCC §15.203. Please refer to the antenna detail photo below:



Result: Compliant

FCC§ 15.207(a) - CONDUCTED EMISSIONS

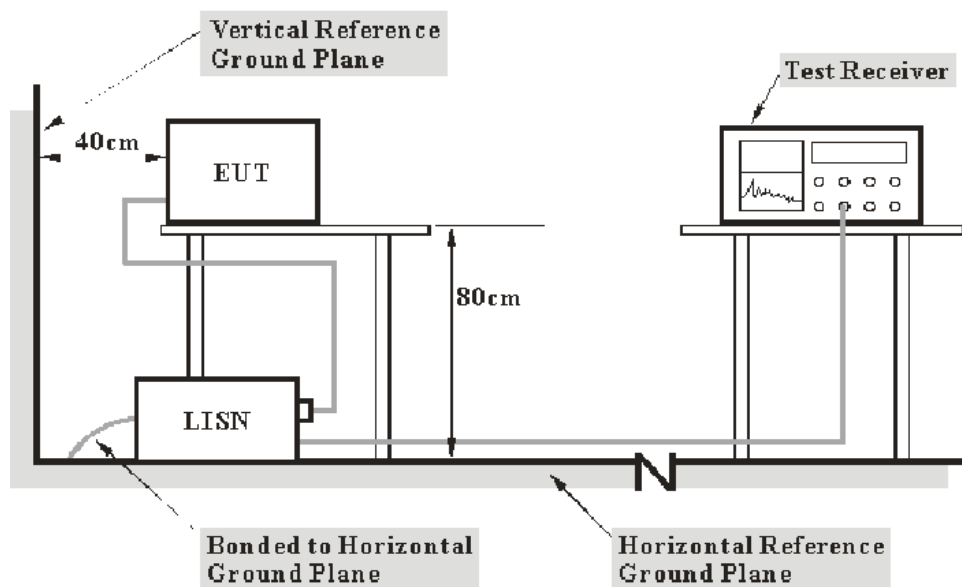
Applicable Standard

According to FCC §15.207(a), for an intentional radiator that is designed to be connected to the public utility (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 the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

Frequency of Emission (MHz)	Conducted limit (dB μ V)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 – 30	60	50

Note: * Decreases with the logarithm of the frequency.

Test Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The specification used was in accordance with FCC §15.207(a) limits.

EMI Test Receiver

The EMI test receiver was set to investigate the spectrum from 150 KHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

<u>Frequency Range</u>	<u>IF B/W</u>
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model Number	Serial Number	Cal. Due Data
Rohde & Schwarz	EMI Receiver	ESCI	10028	2010-09-27
SOLAR	L.I.S.N.	9252-50-R-24-BNC	984412	2010-12-20
SOLAR	L.I.S.N.	9252-50-R-24-BNC	984413	2010-12-20
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2010-11-12
Rohde & Schwarz	Pulse Limiter	ESH3Z2	DE25985	2010-10-12
BACL	Data Entry Software	DES1	0001	2010-12-20

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Chengdu) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

During the conducted emission test, the power cord of the EUT is connected to the outlet of the L.I.S.N.(Line Impedance Stabilization Network).

Maximizing procedure is performed on the six (6) highest emissions to ensure EUT compliance using all installation combination. All data is recorded in the Quasi-peak mode.

Final test data for this test configuration is recorded in the section below.

Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC §15.207(a), with the worst margin reading of:

17.8 dB at 0.19 MHz in the Line conductor mode

Test Result:

Compliant, Please see the following tables and plots.

Conducted Emissions Test Data & Plots

Environmental Conditions

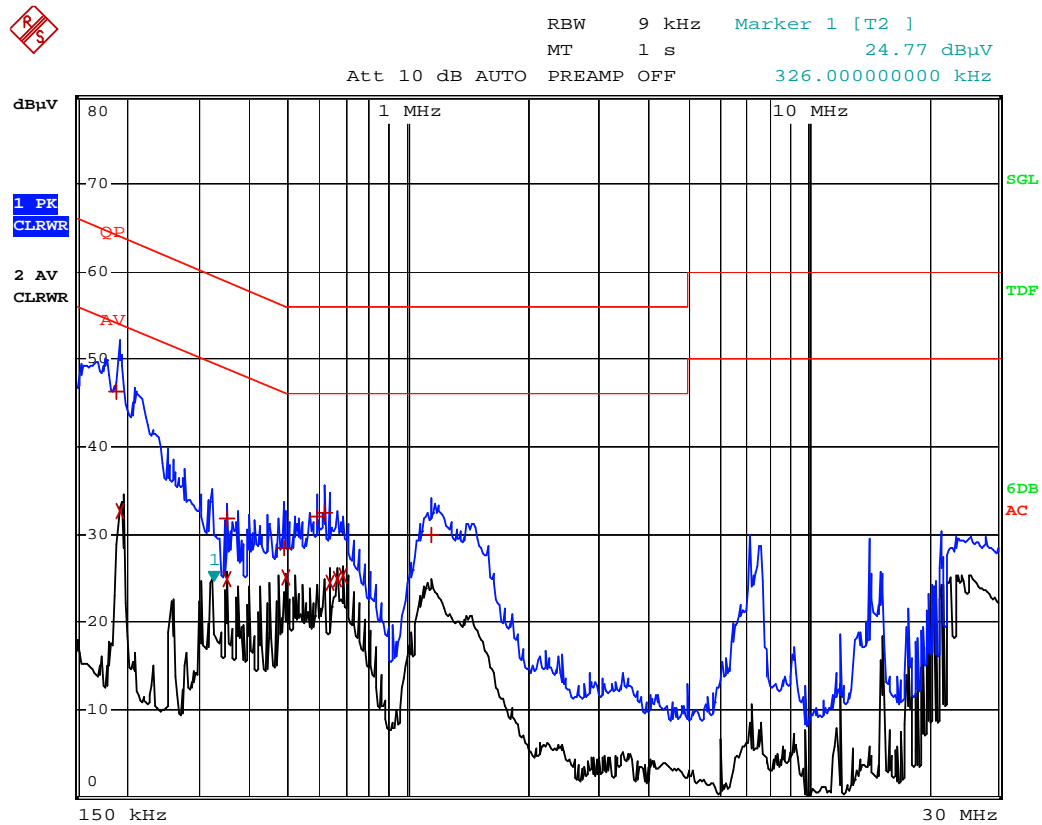
Temperature:	25 ° C
Relative Humidity:	56%
ATM Pressure:	100.0 KPa

The testing was performed by Peter & Marshal on 2010-04-30.

Test mode: operating mode

Line Conducted Emissions				FCC Part 15.207(a)	
Frequency (MHz)	Amplitude (dBμV)	Detector (QP/Ave/Pk)	Phase (Line/Neutral)	Limit (dBμV)	Margin (dB)
0.19	46.24	QP	Line	64.04	17.80
0.69	27.61	AV	Neutral	46.00	18.39
0.66	27.20	AV	Neutral	46.00	18.80
0.19	44.60	QP	Neutral	63.86	19.26
0.64	26.44	AV	Neutral	46.00	19.56
0.59	26.39	AV	Neutral	46.00	19.61
0.61	25.69	AV	Neutral	46.00	20.31
0.19	33.72	AV	Neutral	54.04	20.32
0.69	25.36	AV	Line	46.00	20.64
0.49	25.02	AV	Line	46.10	21.08
0.66	24.88	AV	Line	46.00	21.12
0.61	34.70	QP	Neutral	56.00	21.30
0.19	32.59	AV	Line	54.04	21.45
0.64	24.42	AV	Line	46.00	21.58
0.59	33.23	QP	Neutral	56.00	22.77
0.61	32.47	QP	Line	56.00	23.53
0.16	41.79	QP	Neutral	65.36	23.57
0.35	24.95	AV	Line	48.96	24.01
0.59	31.97	QP	Line	56.00	24.03
1.14	29.98	QP	Line	56.00	26.02
0.32	32.89	QP	Neutral	59.66	26.77
0.35	31.77	QP	Neutral	58.96	27.19
0.35	31.72	QP	Line	58.96	27.24
0.49	28.53	QP	Line	56.17	27.64

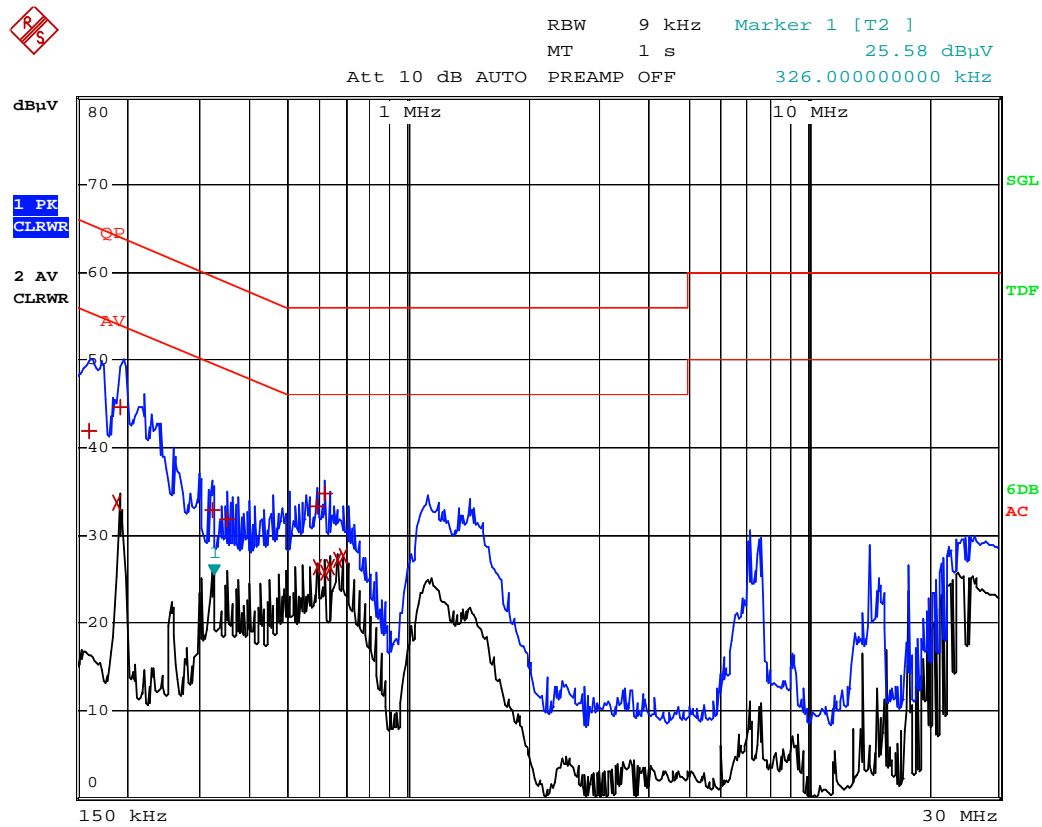
120 V/60 Hz, Line



MP1800-L

Date: 30.APR.2010 18:09:34

120 V/60 Hz, Neutral



MP1800-N

Date: 30.APR.2010 18:05:32

FCC §15.247(d) & §2.1051 – SPURIOUS EMISSIONS AT ANTENNA PORT

Applicable Standard

For §15.247(d) in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Spectrum Analyzer	8562A	3204A07083	2009-08-14	2010-08-14

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Chengdu) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	100.9 kPa

* The testing was performed by Peter Zhang & Marshal Yu on 2010-05-13.

Test Result:

Compliant, Please refer to following tables

Test mode: 802.11b mode

Frequency (MHz)	Emissions (dBm)	Max. Limit (dBm)	Result
802.11b mode, Low CH (2412 MHz), Fund. = 1.24 dBm			
2106	-57.41	-18.76	Compliant
2285	-51.93	-18.76	Compliant
2639	-53.26	-18.76	Compliant
3200	-59.09	-18.76	Compliant
4808	-65.09	-18.76	Compliant
802.11b mode, Middle CH (2437 MHz), Fund. = 1.91 dBm			
3230	-59.09	-18.09	Compliant
4860	-66.09	-18.09	Compliant
2106	-63.00	-18.09	Compliant
2283	-60.01	-18.09	Compliant
2639	-55.26	-18.09	Compliant
802.11b mode, High CH (2462 MHz), Fund. = 0.71 dBm			
2636	-55.66	-19.29	Compliant
2281	-53.92	-19.29	Compliant
2018	-40.42	-19.29	Compliant
1728	-46.09	-19.29	Compliant
3265	-59.76	-19.29	Compliant

Test mode: 802.11g mode

Frequency (MHz)	Emissions (dBm)	Max. Limit (dBm)	Result
802.11g mode, Low CH (2412 MHz), Fund. = -4.26 dBm			
2868	-49.09	-24.26	Compliant
2634	-48.26	-24.26	Compliant
2283	-47.42	-24.26	Compliant
1814	-45.79	-24.26	Compliant
1652	-41.42	-24.26	Compliant
802.11g mode, Middle CH (2437 MHz), Fund. = -3.59 dBm			
3232	-49.09	-23.59	Compliant
1443	-57.59	-23.59	Compliant
1690	-39.09	-23.59	Compliant
1915	-43.42	-23.59	Compliant
2634	-48.42	-23.59	Compliant
802.11g mode, High CH (2462 MHz), Fund. = -4.09 dBm			
3265	-50.92	-24.09	Compliant
1728	-41.26	-24.09	Compliant
2017	-49.42	-24.09	Compliant
2283	-48.76	-24.09	Compliant
2634	-48.59	-24.09	Compliant

FCC §15.247(d), §15.205(a) & §15.209(a) – RESTRICTED BANDS AND RADIATED SPURIOUS EMISSION**Applicable Standard**

As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function.

Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz.

As per FCC §15.209(a): Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (micro volts/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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz.

However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

As per FCC §15.205(a) except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

f (MHz)	f (MHz)	f (MHz)	f (GHz)
0.090 – 0.110	16.42 – 16.423	960 – 1240	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	1300 – 1427	5.35 – 5.46
2.1735 – 2.1905	25.5 – 25.67	1435 – 1626.5	7.25 – 7.75
4.125 – 4.128	37.5 – 38.25	1645.5 – 1646.5	8.025 – 8.5
4.17725 – 4.17775	73 – 74.6	1660 – 1710	9.0 – 9.2
4.20725 – 4.20775	74.8 – 75.2	1718.8 – 1722.2	9.3 – 9.5
6.215 – 6.218	108-121.94	2200 – 2300	10.6 – 12.7
6.26775 – 6.26825	123 – 138	2310 – 2390	13.25 – 13.4
6.31175 – 6.31225	149.9 – 150.5	2483.5 – 2500	14.47 – 14.5
8.291 – 8.294	156.52475 – 156.52525	2690 – 2900	15.35 – 16.2
8.362 – 8.366	156.7 – 156.9	3260 – 3267	17.7 – 21.4
8.37625 – 8.38675	162.0125 – 167.17	3.332 – 3.339	22.01 – 23.12
8.41425 – 8.41475	240 – 285	3.3458 – 3.358	23.6 – 24.0
12.29 – 12.293	322 – 335.4	3.600 – 4.400	31.2 – 31.8
12.51975 – 12.52025	399.9 – 410	-	36.43 – 36.5
12.57675 – 12.57725	608-614	-	Above 38.6
13.36 – 13.41	-	-	-

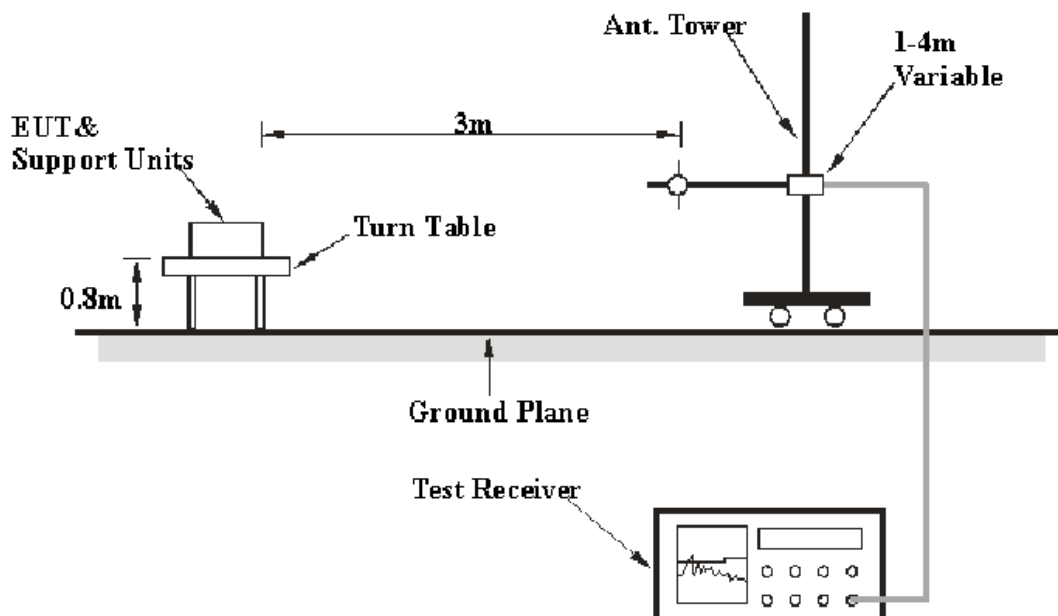
As per FCC §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Chengdu) is ± 4.0 dB.

Test Setup



The radiated emission tests were performed in the 3 meters chamber, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC §15.247(d), §15.205(a) and §15.209(a) limits.

The power cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

A 120VAC/60Hz power source was provided to the EUT.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

<i>Frequency Range</i>	<i>RBW</i>	<i>Video B/W</i>	<i>Detector</i>
30MHz – 1000 MHz	100 kHz	300 kHz	QP
1000 MHz – 25 GHz	1 MHz	3 MHz	PK
1000 MHz – 25 GHz	1 MHz	10 Hz	AV

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Pre-Amplifier	8447E	1937A01046	2009-11-15	2010-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	10028	2009-10-16	2010-10-16
Sunol Sciences	Broadband Antenna	JB3	A040904-2	2009-08-14	2010-08-14
Beijin microwave	Horn Antenna	OMCDH10180	10279001A	2009-08-14	2010-08-14
HP	Amplifier	8449B	3008A00277	2009-08-14	2010-08-14
HP	Spectrum Analyzer	8562A	3204A07083	2009-08-14	2010-08-14

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Chengdu) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

For the radiated emissions test, the power cord of the EUT is connected to the outlet of the AC power.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz and peak and Average detection modes for frequencies above 1 GHz.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205(a), 15.209(a) and 15.247, with the worst margin reading of:

Below 1 GHz:

For 802.11b

1.9 dB at 429.019728 MHz in the **Horizontal** polarization

For 802.11g

1.5 dB at 494.99 MHz in the **Vertical** polarization

Above 1 GHz:

For 802.11b

29.1 dB at 4827.00 MHz in the **Horizontal** polarization (Low Channel for 2412 MHz)

19.9 dB at 4920.00 MHz in the **Vertical** polarization (Middle Channel for 2437 MHz)

20.7 dB at 4915.00 MHz in the **Vertical** polarization (High Channel for 2462 MHz)

For 802.11g

20.9 dB at 4864.00 MHz in the **Vertical** polarization (Low Channel for 2412 MHz)

22.5 dB at 4899.00 MHz in the **Vertical** polarization (Middle Channel for 2437 MHz)

22.2 dB at 4926.00 MHz in the **Vertical** polarization (High Channel for 2462 MHz)

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	48 %
ATM Pressure:	100.9 kPa

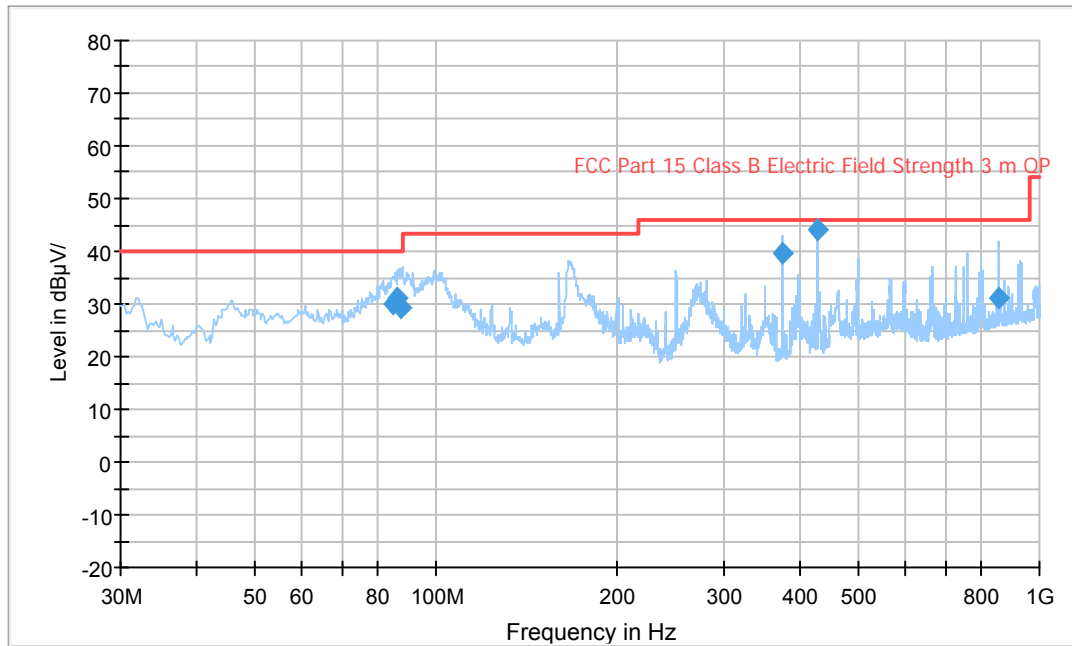
* The testing was performed by Peter Zhang & Marshal Yu on 2010-04-30.

Test Result:

Compliant, Please refer to following tables and plots.

Below 1 GHz*Test mode: 802.11b*

Electric Field Strength with Scans

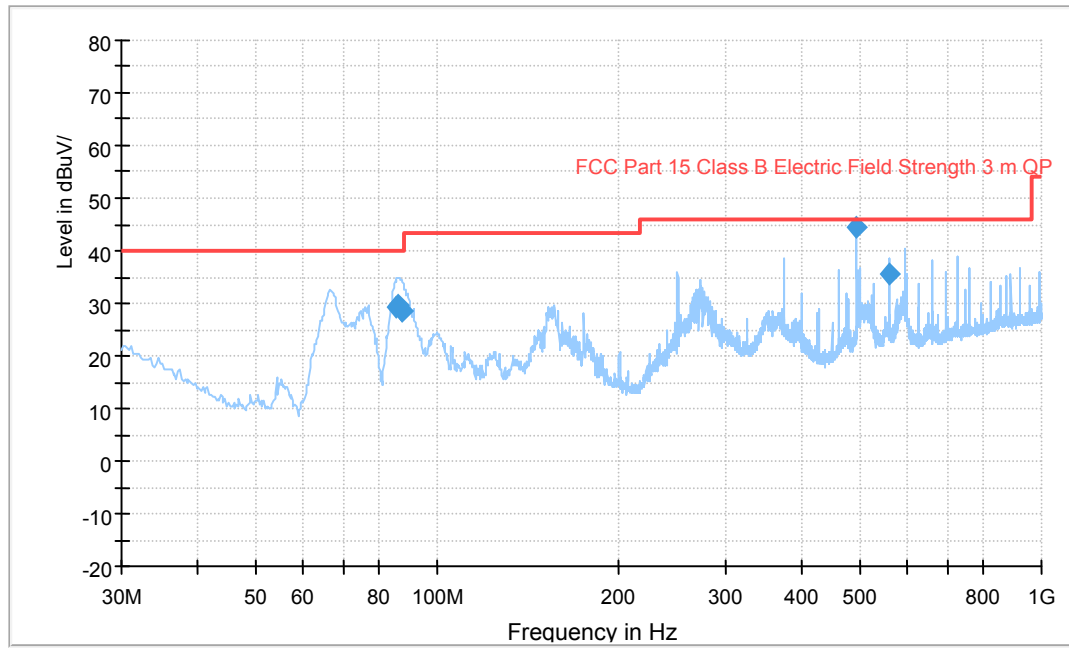


Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
429.019728	44.1	100	H	149	-8.5	46.0	1.90*
375.011861	39.5	100	H	75	-9.4	46.0	6.50
86.331531	31.1	150	V	317	-18.5	40.0	8.90
84.662004	30	150	V	352	-18.8	40	10.00
87.376964	29.3	190	V	359	-18.3	40.0	10.70
858.030232	30.9	150	V	141	-0.6	46.0	15.10

*With measurement uncertainty.

Test mode: 802.11g

Electric Field Strength with Scans



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
494.991221	44.5	113.0	V	293.0	-6.8	46.0	1.5*
85.912617	29.5	112.0	V	86.0	-18.6	40.0	10.5
85.724000	29.4	100.0	V	109.0	-18.7	40.0	10.6
87.631258	28.6	131.0	V	338.0	-18.2	40.0	11.4
87.662371	28.6	100.0	V	300.0	-18.2	40.0	11.4
560.966136	35.5	100.0	V	307.0	-5.8	46.0	10.5

*With measurement uncertainty.

Above 1 GHz*Test mode: 802.11b mode*

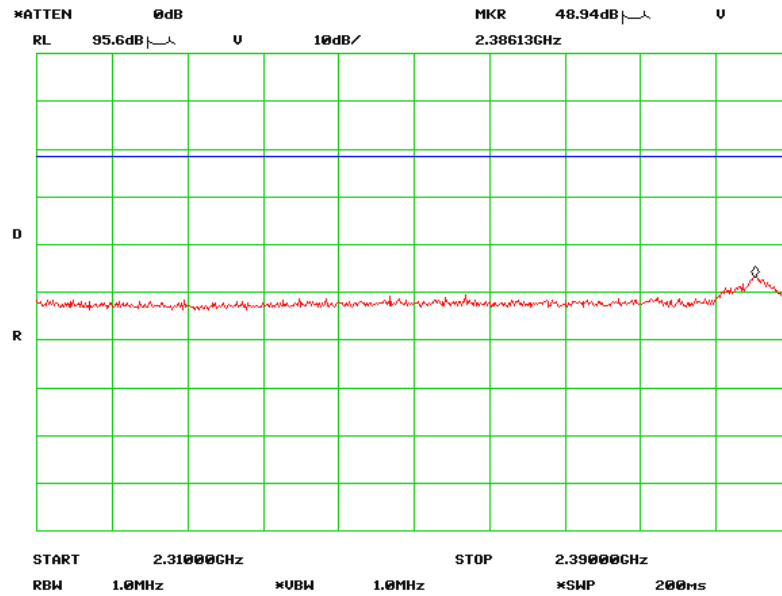
Frequency (MHz)	S.A. Reading (dBμ V/m)	Detector (PK/AV)	Turntable Direction (Degree)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dBuV)	Cord. Amp. (dBuV)	Limit (dBμ V/m)	Margin (dB)
				Height (m)	Polar (H/V)	Factor (dB/m)					
Low Channel (2412 MHz)											
4827.00	42.8	PK	20	1.1	H3	31.5	4.3	33.7	44.9	74	29.1
1314.00	32.67	AV	20.00	1.4	V3	23.9	2.1	35.0	23.7	54	30.3
1637.00	30.2	AV	0	1.6	V3	25.0	2.3	35.0	22.5	54	31.5
1899.00	46.00	PK	30.00	1	V3	25.0	2.5	35.0	38.5	74	35.5
1314.00	46.8	PK	23	1.2	V3	23.9	2.1	35.0	37.8	74	36.2
1637.00	45.0	PK	0	1.5	H3	25.0	2.3	35.0	37.3	74	36.7
Middle Channel (2437 MHz)											
4920.00	32.0	AV	170	1.2	V3	31.5	4.3	33.7	34.1	54	19.9
1912.00	61.5	PK	0	1.6	H3	25.0	2.5	35.0	54.0	74	20.0
2640.00	29.67	AV	22.00	1.5	V3	29.7	3.0	34.0	28.4	54	25.6
1641.00	51.0	PK	30	1.5	V3	25.0	2.3	35.0	43.3	74	30.7
1314.00	32.00	AV	15.00	1.2	H3	23.9	2.1	35.0	23.0	54	31.0
1646.00	30.5	AV	20	1.4	V3	25.0	2.3	35.0	22.8	54	31.2
High Channel (2462 MHz)											
4915.00	51.2	PK	45	1.4	V3	31.5	4.3	33.7	53.3	74	20.7
4871.00	29.83	AV	0.00	1.1	V3	31.5	4.3	33.7	31.9	54	22.1
2640.00	29.33	AV	32.00	1.3	V3	29.7	3.0	34.0	28.1	54	25.9
1899.00	54.7	PK	0	1.4	V3	25.0	2.5	35.0	47.2	74	26.9
1314.00	32.00	AV	0.00	1.1	H3	23.9	2.1	35.0	23.0	54	31.0
1646.00	30.50	AV	10.00	1	V3	25.0	2.3	35.0	22.8	54	31.2
1646.00	49.7	PK	22	1.1	V3	25.0	2.3	35.0	42.0	74	32.0
1310.00	50.33	PK	31.00	1.3	H3	23.9	2.1	35.0	41.3	74	32.7

Test mode: 802.11g mode

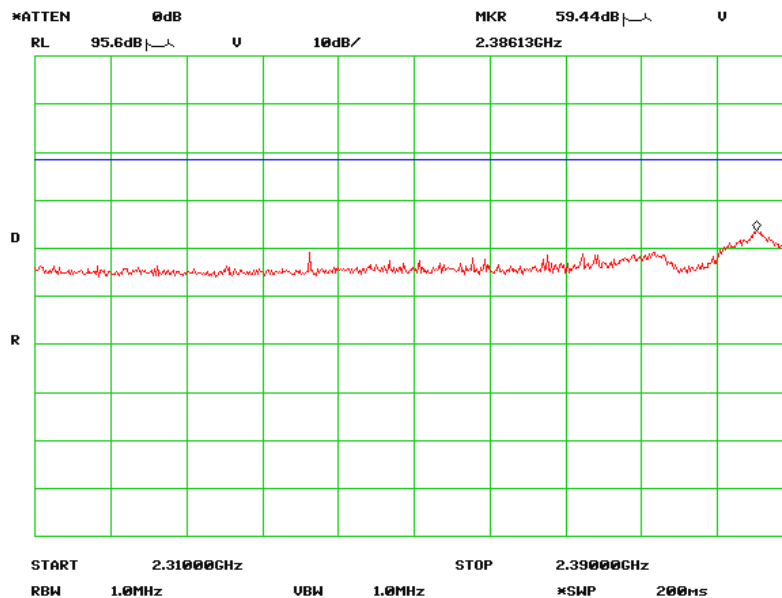
Frequency (MHz)	S.A. Reading (dBμ V/m)	Detector (PK/AV)	Turntable Direction (Degree)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dBuV)	Cord. Amp. (dBuV)	Limit (dBμ V/m)	Margin (dB)
				Height (m)	Polar (H/V)	Factor (dB/m)					
Low Channel (2412 MHz)											
4864.00	31.08	AV	25.00	1.1	V3	31.5	4.3	33.7	33.1	54	20.9
2640.00	31.17	AV	14.00	1	V3	29.7	3.0	34.0	29.9	54	24.1
2644.00	46.67	PK	15.00	1.1	V3	29.7	3.0	34.0	45.4	74	28.6
4817.00	43.0	PK	0	1.1	V3	31.5	4.3	33.7	45.1	74	29.0
3213.00	43.50	PK	20.00	1.2	V3	30.4	3.4	34.0	43.3	74	30.7
1314.00	32.33	AV	25.00	1.4	V3	23.9	2.1	35.0	23.3	54	30.7
1640.00	30.50	AV	0.00	1.3	V3	25.0	2.3	35.0	22.8	54	31.2
1903.00	49.7	PK	14	1.4	V3	25.0	2.5	35.0	42.2	74	31.8
1317.00	47.8	PK	330	1.3	V3	23.9	2.1	35.0	38.8	74	35.2
Middle Channel (2437 MHz)											
4899.00	29.5	AV	0	1.2	V3	31.5	4.3	33.7	31.6	54	22.5
2640.00	30.83	AV	20.00	1.4	V3	29.7	3.0	34.0	29.6	54	24.4
4873.00	42.83	PK	15.00	1.3	V3	31.5	4.3	33.7	44.9	74	29.1
1314.00	32.7	AV	308	1.1	V3	23.9	2.1	35.0	23.7	54	30.3
2647.00	44.0	PK	20	1.1	V3	29.7	3.0	34.0	42.7	74	31.3
1317.00	46.3	PK	0	1.1	H3	23.9	2.1	35.0	37.3	74	36.7
High Channel (2462 MHz)											
4926.00	29.67	AV	20	1.1	V3	31.5	4.3	33.7	31.8	54	22.2
2640.00	31.0	AV	15	1.2	H3	29.7	3.0	34.0	29.7	54	24.3
4923.00	43.83	PK	10.00	1	V3	31.5	4.3	33.7	45.9	74	28.1
2647.00	45.0	PK	0	1	V3	29.7	3.0	34.0	43.7	74	30.3
1314	32.33	AV	20	1.1	V3	23.9	2.1	35.0	23.3	54	30.7
1912.00	50.3	PK	15	1.1	H3	25.0	2.5	35.0	42.9	74	31.1
1652.00	45.17	PK	30.00	1.3	V3	25.0	2.3	35.0	37.5	74	36.5
1317.00	45.8	PK	0	1.1	H3	23.9	2.1	35.0	36.8	74	37.2

Spurious Emissions in the Restricted Band:

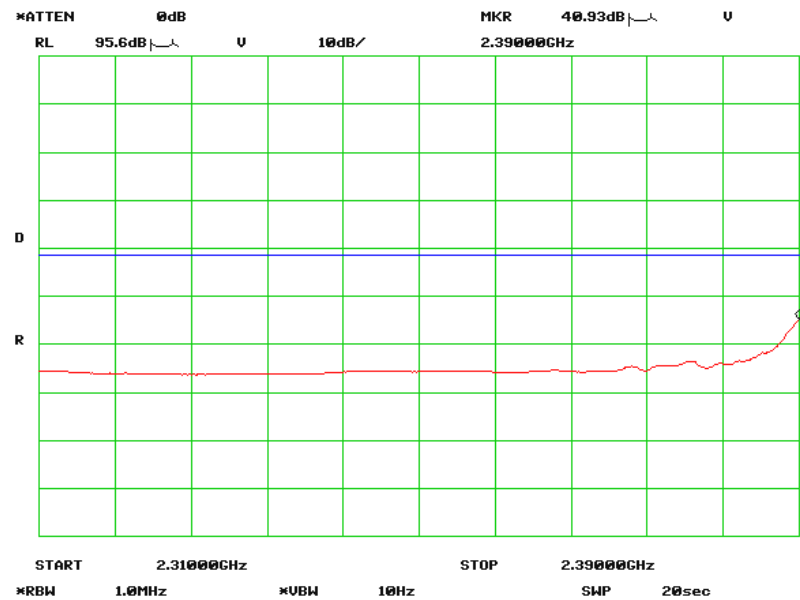
802.11b Lowest Channel at Horizontal: Peak



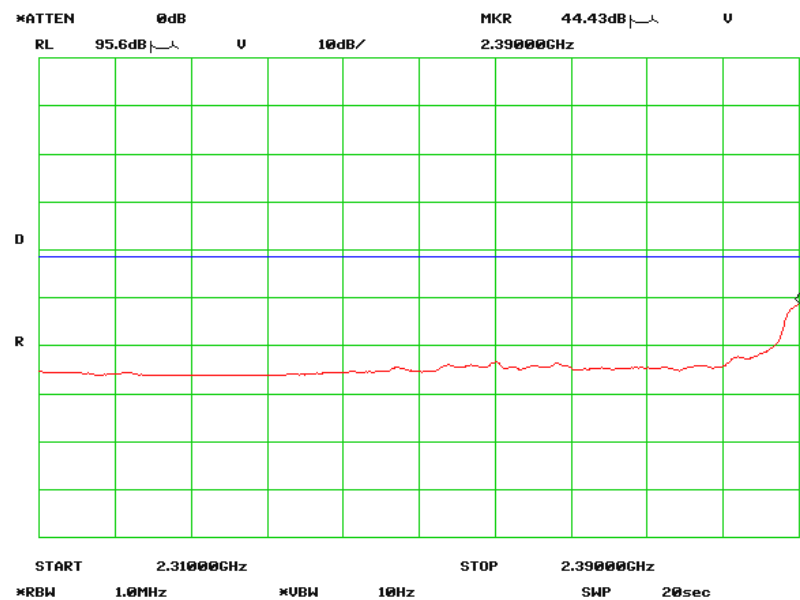
802.11b Lowest Channel at Vertical: Peak



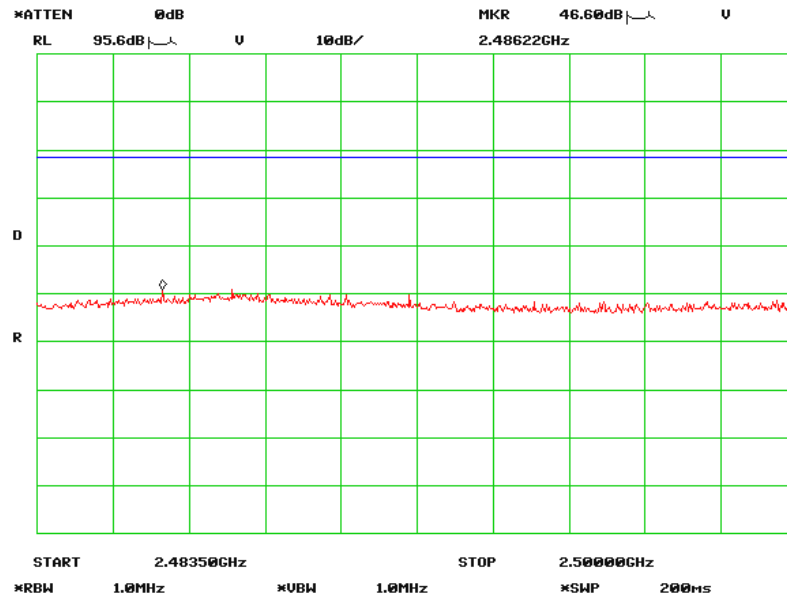
802.11b Lowest Channel at Horizontal: Average



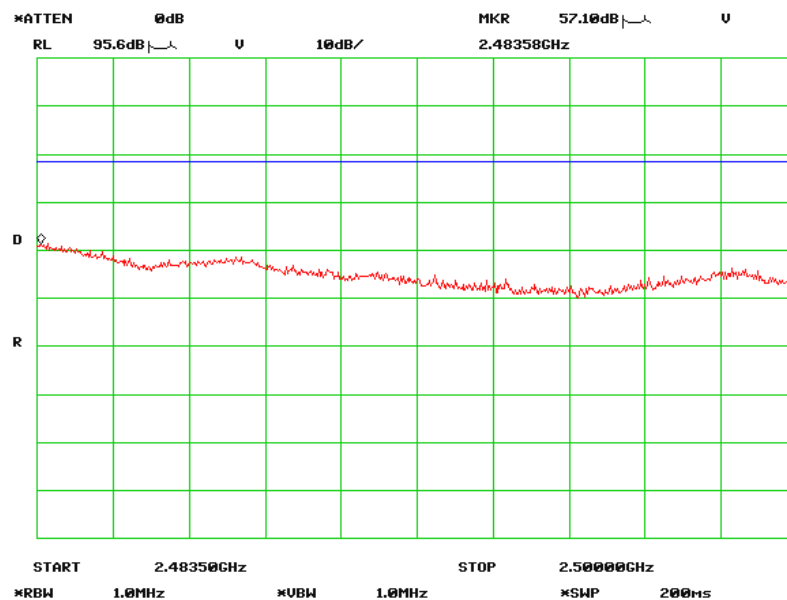
802.11b Lowest Channel at Vertical: Average



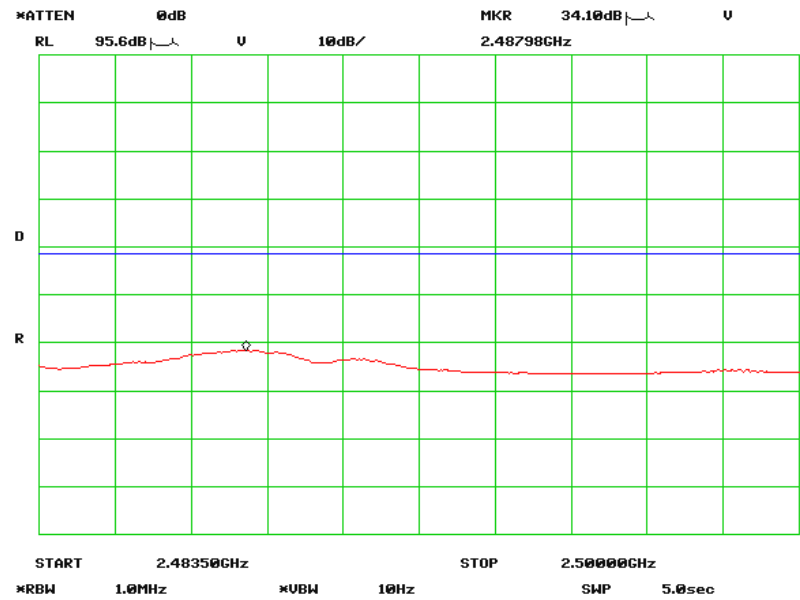
802.11b Highest Channel at Horizontal: Peak



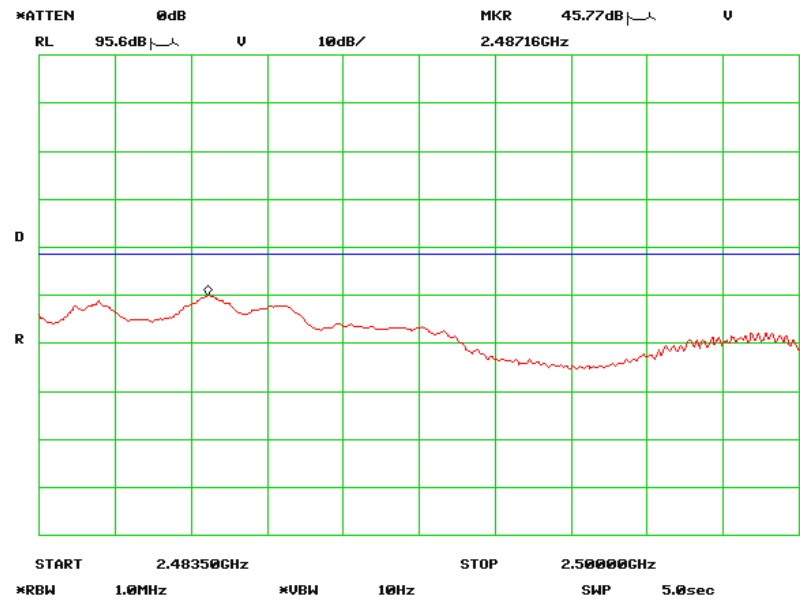
802.11b Highest Channel at Vertical: Peak



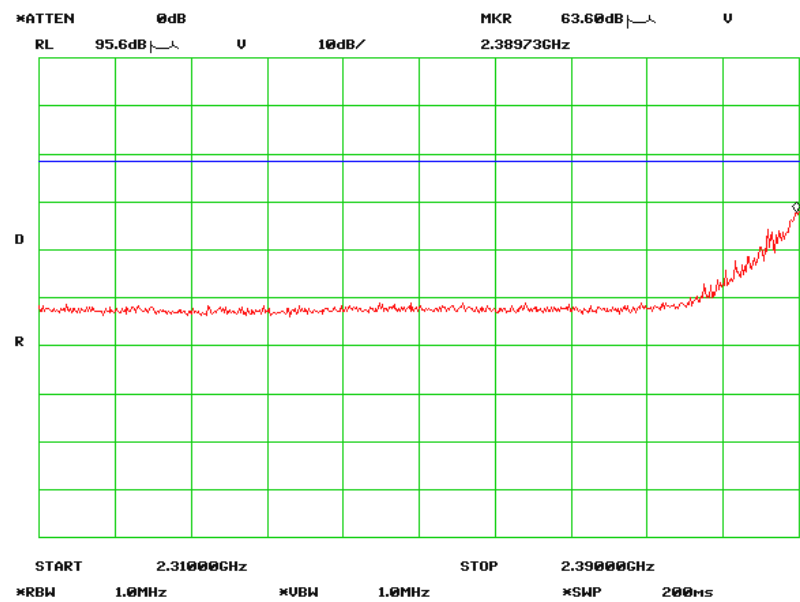
802.11b Highest Channel at Horizontal: Average



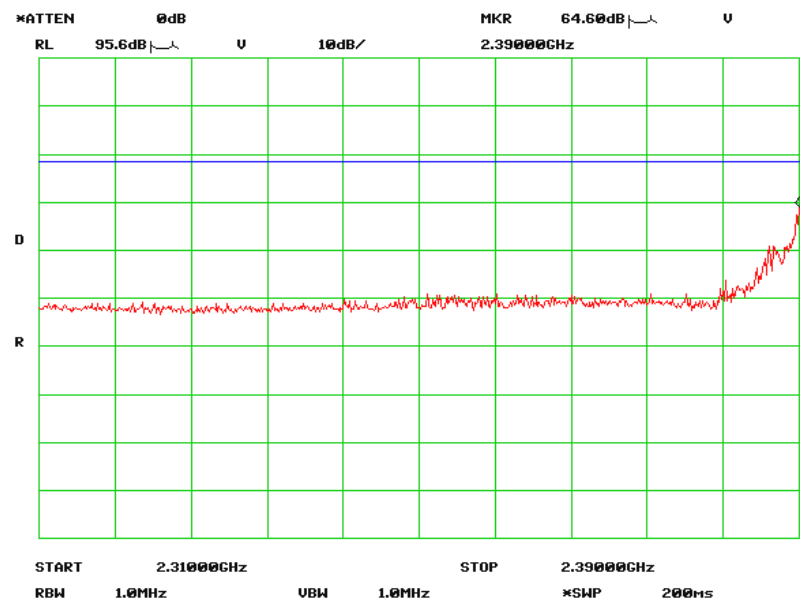
802.11b Highest Channel at Vertical: Average



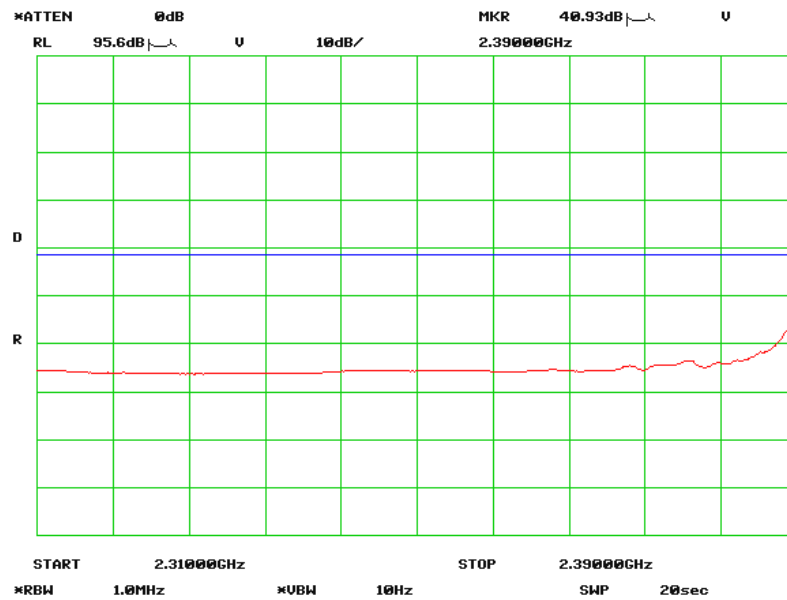
802.11g Lowest Channel at Horizontal: Peak



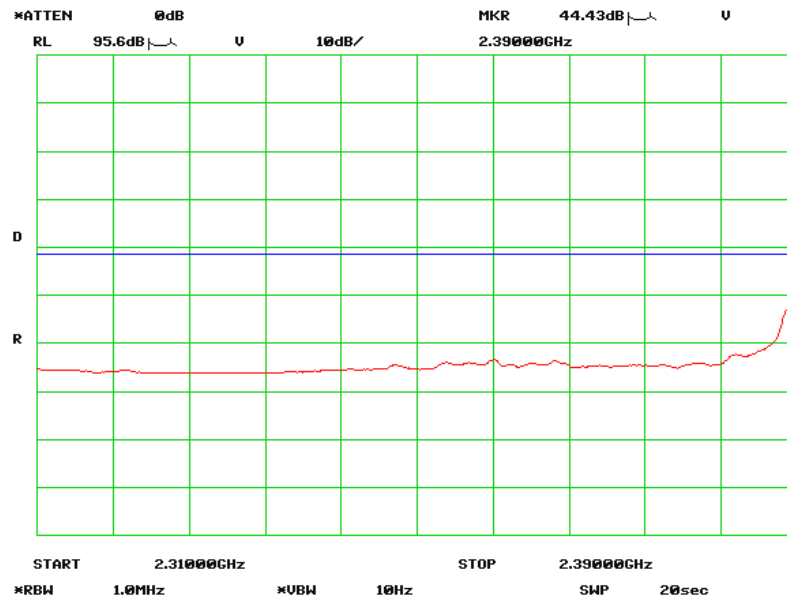
802.11g Lowest Channel at Vertical: Peak



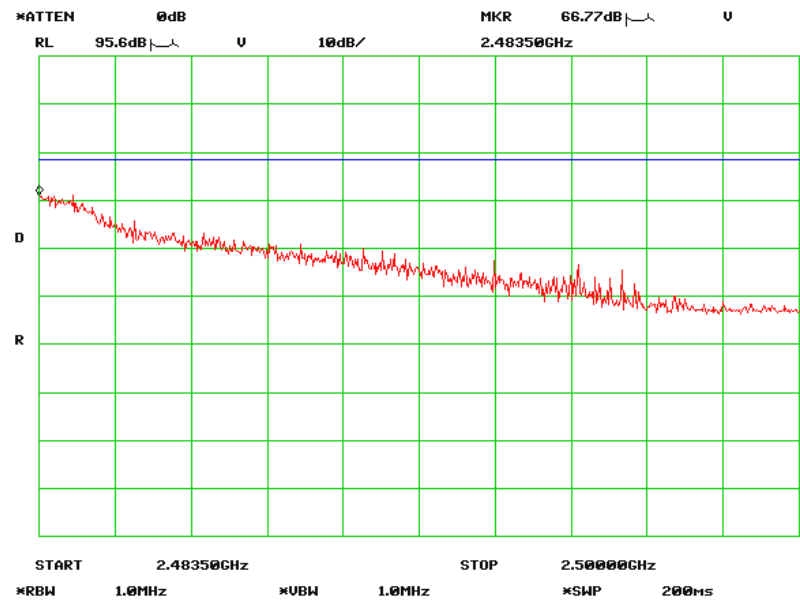
802.11g Lowest Channel at Horizontal: Average



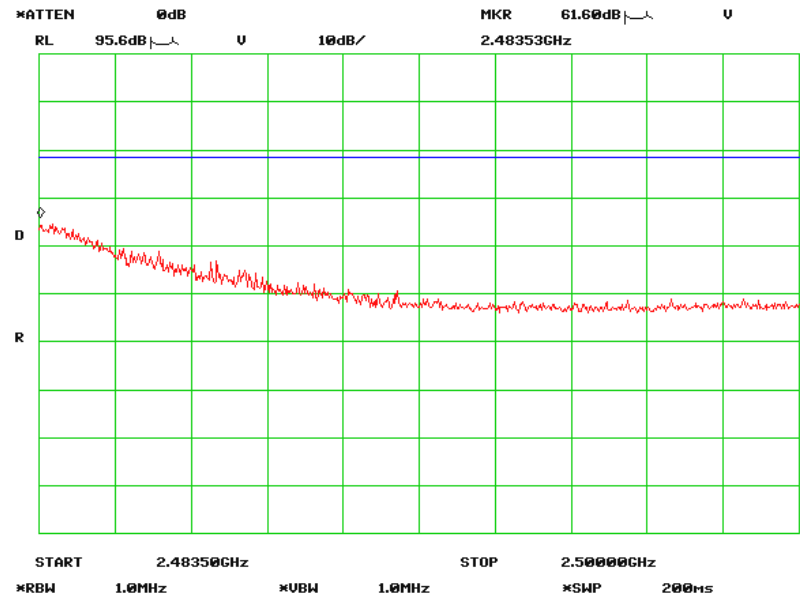
802.11g Lowest Channel at Vertical: Average



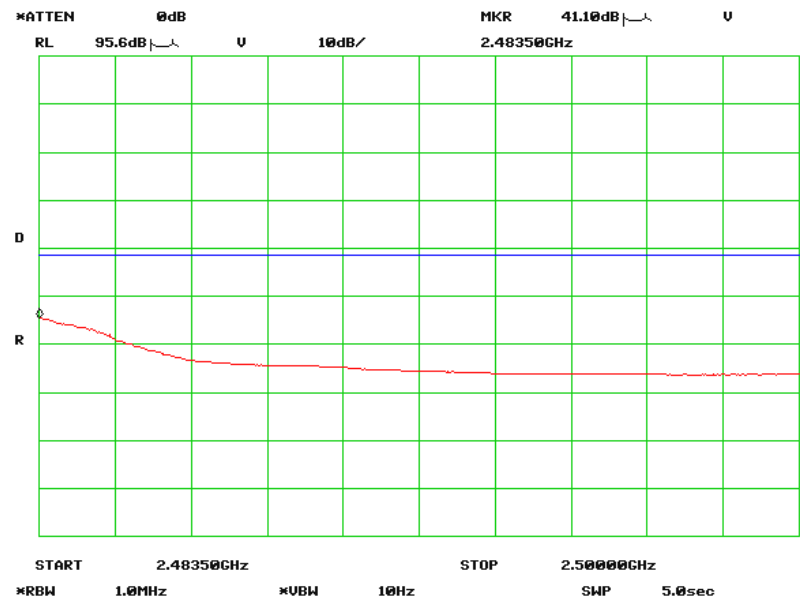
802.11g Highest Channel at Horizontal: Peak



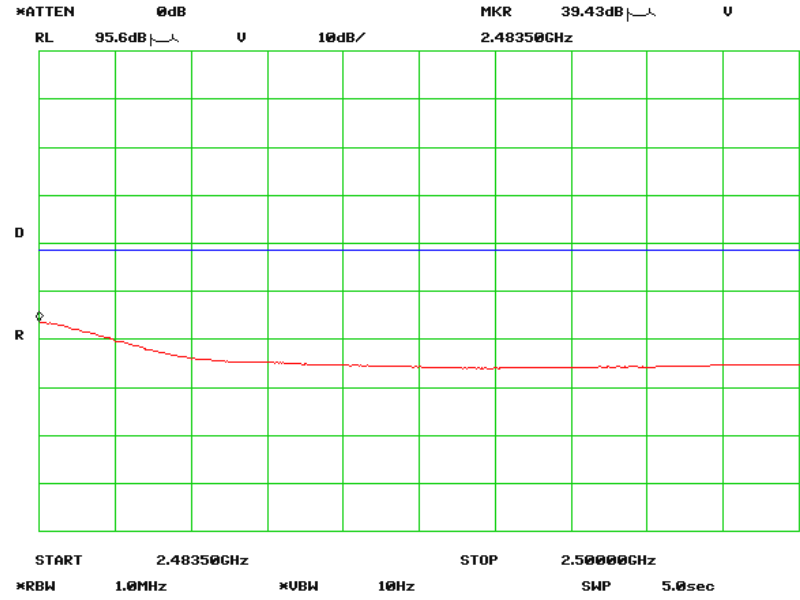
802.11g Highest Channel at Vertical: Peak



802.11g Highest Channel at Horizontal: Average



802.11g Highest Channel at Vertical: Average



FCC §15.247(a) (2) – 6 dB & 99% BANDWIDTH TESTING**Applicable Standard**

According to FCC §15.247(a) (2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	10028	2009-10-16	2010-10-16

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Chengdu) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	100.9 kPa

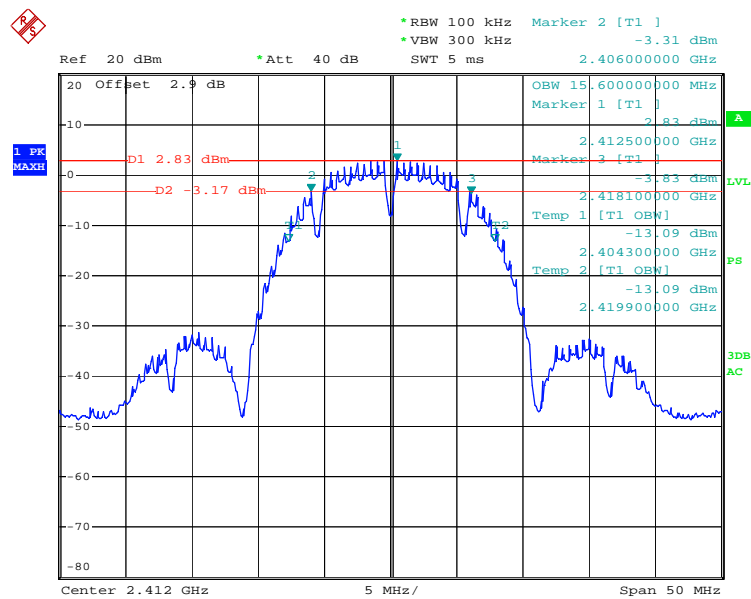
* The testing was performed by peter Zhang & Marshal Yu on 2010-05-13.

Test Result: Compliant, Please refer to following tables and plots

Test Mode: 802.11b

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	FCC Limit (kHz)	Result
Low	2412	12.1	15.6	500	Compliant
Middle	2437	12.0	15.6	500	Compliant
High	2462	11.6	15.6	500	Compliant

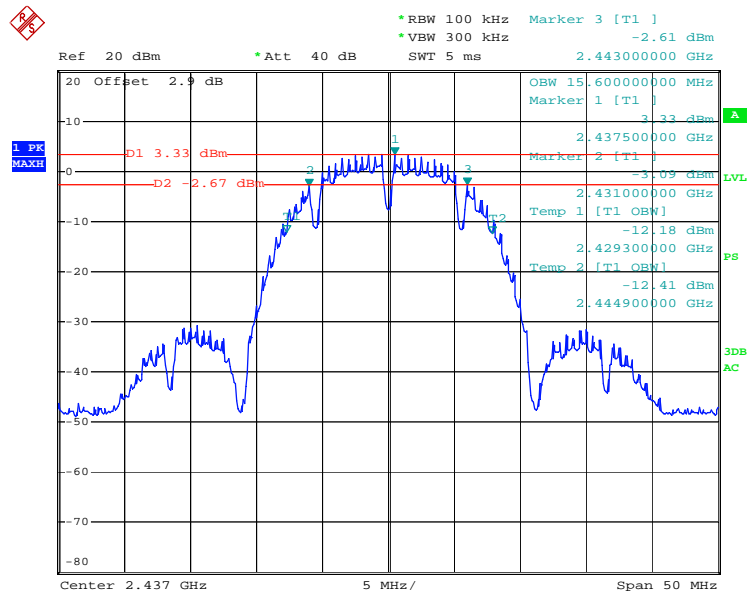
Low Channel



6DBAND99WANDWIDE

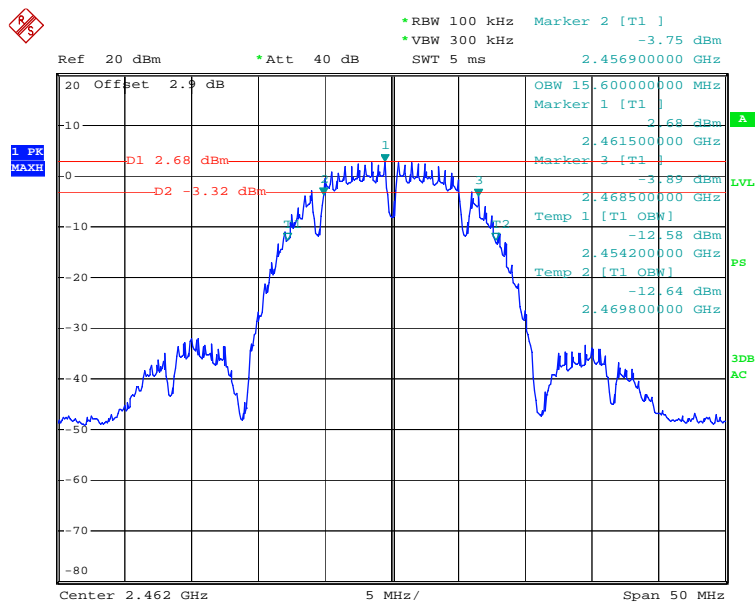
Date: 13.MAY.2010 17:09:12

Middle Channel



-----E
Date: 13.MAY.2010 16:48:24

High Channel

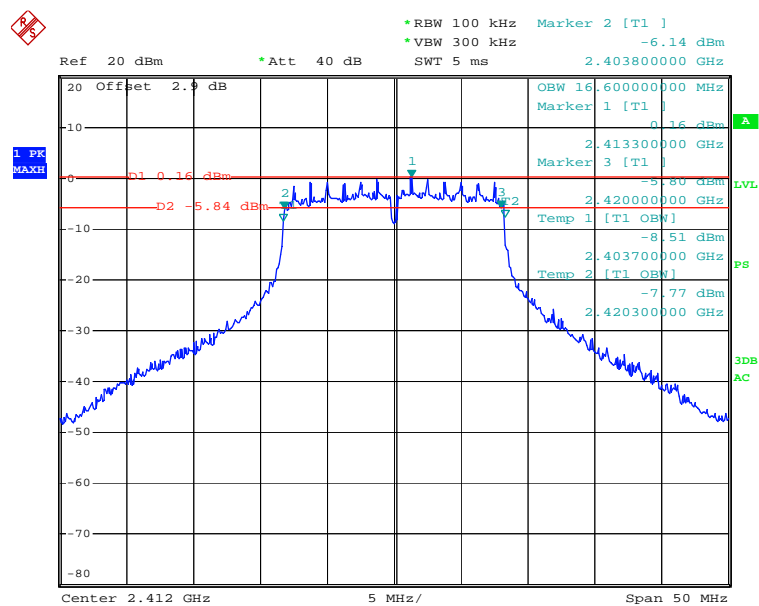


6DBAND99WANDWIDE
Date: 13.MAY.2010 16:58:54

Test Mode: 802.11g

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	FCC Limit (kHz)	Result
Low	2412	16.2	16.6	500	Compliant
Middle	2437	16.3	16.6	500	Compliant
High	2462	16.6	16.6	500	Compliant

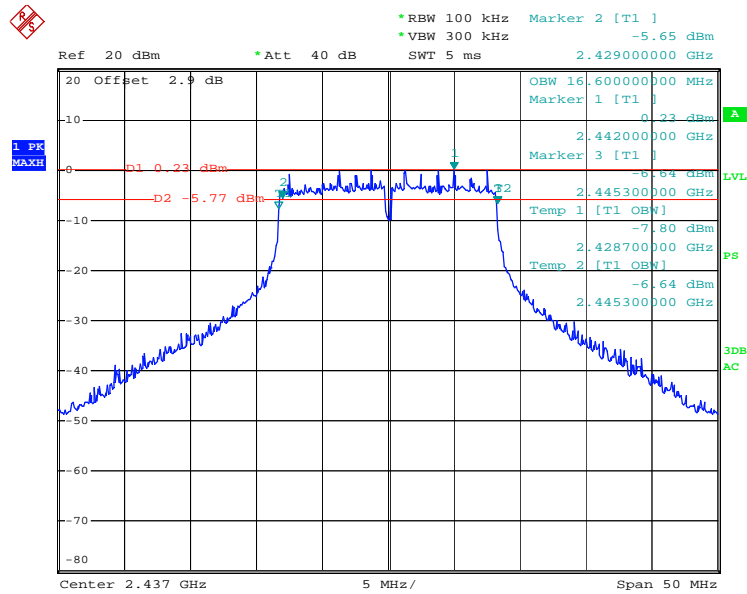
Low Channel



6DBAND99WANDWIDE

Date: 13.MAY.2010 16:42:19

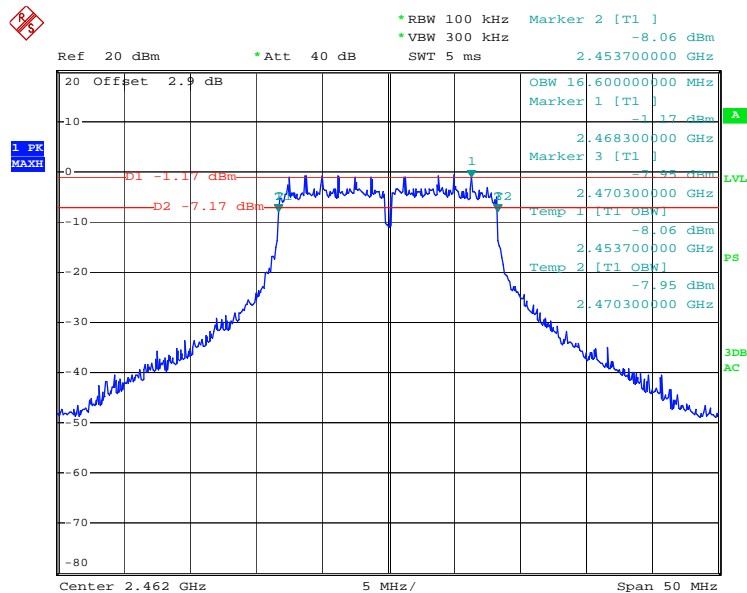
Middle Channel



6DBAND99WANDWIDE

Date: 13.MAY.2010 16:54:16

High Channel



6DBAND99WANDWIDE

Date: 13.MAY.2010 17:02:59

FCC §15.247(b)(3) – MAXIMUM PEAK CONDUCTED OUTPUT POWER

Applicable Standard

According to §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the *maximum conducted output power* is the highest total transmit power occurring in any mode.

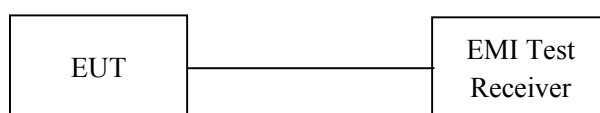
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	10028	2009-10-16	2010-10-16

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Chengdu) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

1. Place the EUT on a bench and set in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to an EMI test receiver.
3. Add a correction factor to the display.



Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	100.9 kPa

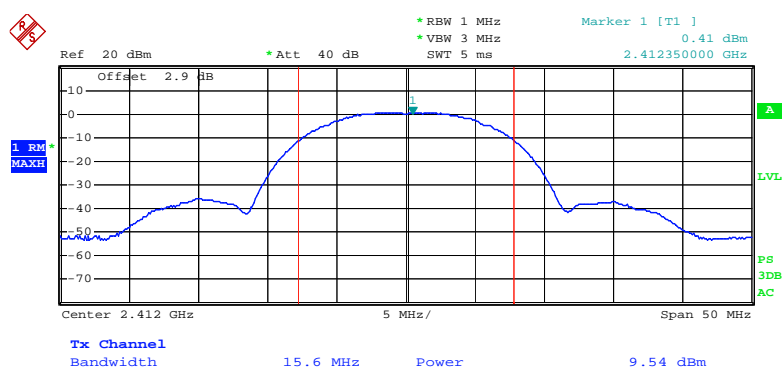
* The testing was performed by Peter Zhang & Marshal Yu on 2010-5-12.

Test Result: Compliant, Please refer to following tables and plots.

Test mode: 802.11b mode

Channel	Frequency (MHz)	Conducted Output Power (dBm)	FCC Limit (dBm)	Result
Low	2412	9.54	30	Compliant
Middle	2437	10.13	30	Compliant
High	2462	9.6	30	Compliant

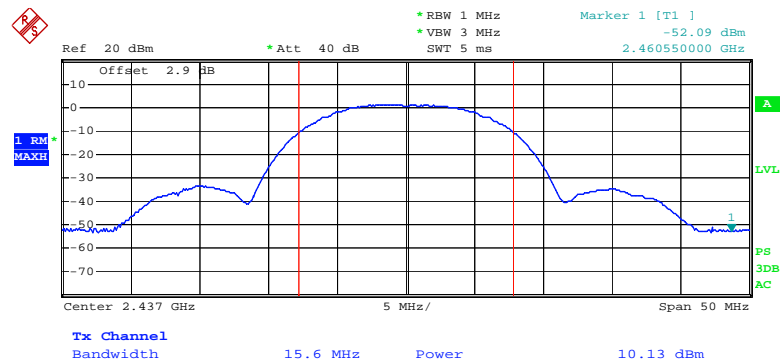
Low Channel



B-2412-120-N

Date: 18.JUN.2010 10:22:15

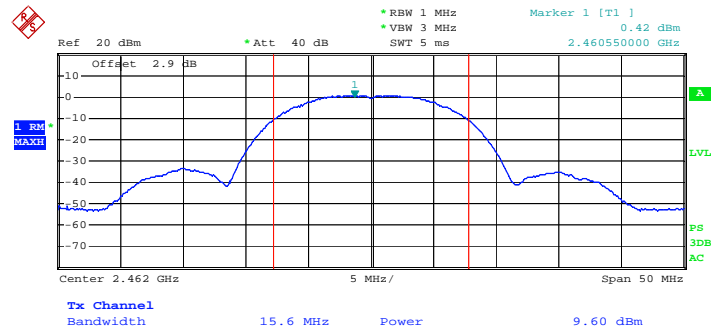
Middle Channel



B-2437-120-N

Date: 18.JUN.2010 11:22:27

High Channel



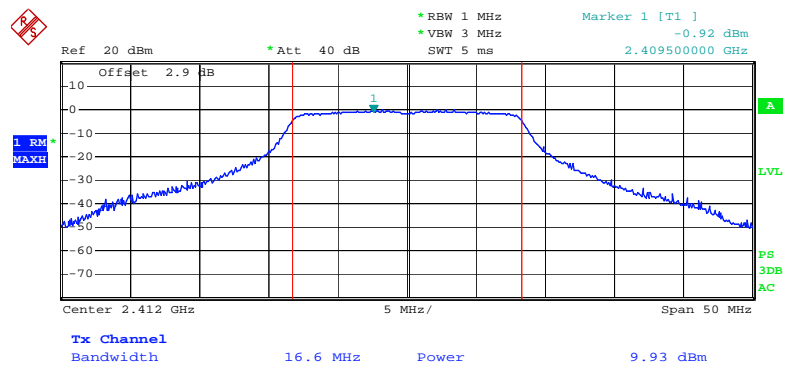
B-2462-120-N

Date: 18.JUN.2010 11:18:00

Test mode: 802.11g mode

Channel	Frequency (MHz)	Conducted Output Power (dBm)	FCC Limit (dBm)	Result
Low	2412	9.93	30	Compliant
Middle	2437	10.36	30	Compliant
High	2462	9.74	30	Compliant

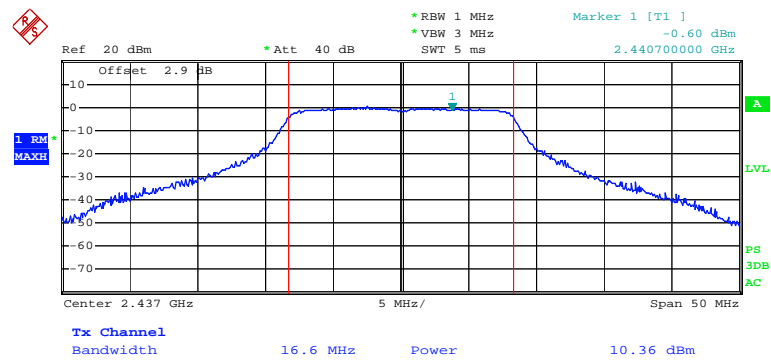
Low Channel



G-2412-120--N

Date: 18.JUN.2010 13:43:47

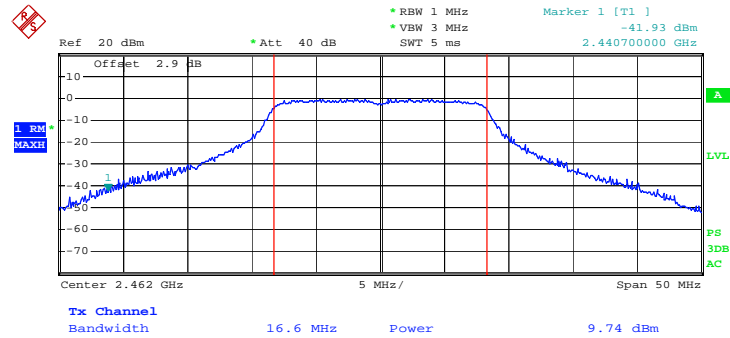
Middle Channel



G-2437-120--N

Date: 18.JUN.2010 14:21:44

High Channel



G-2462-120--N

Date: 18.JUN.2010 14:25:36

FCC §15.247(e) – POWER SPECTRAL DENSITY

Applicable Standard

According to §15.247(e), 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.

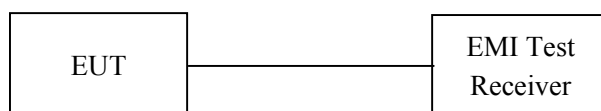
Test Equipment List and Details

Manufacturer	Description	Model Number	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	10028	2009-10-16	2010-10-16

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Chengdu) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of SA on any frequency be measured and set SA to 1.5MHz span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
4. Repeat above procedures until all frequencies measured were complete.



Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	100.9 kPa

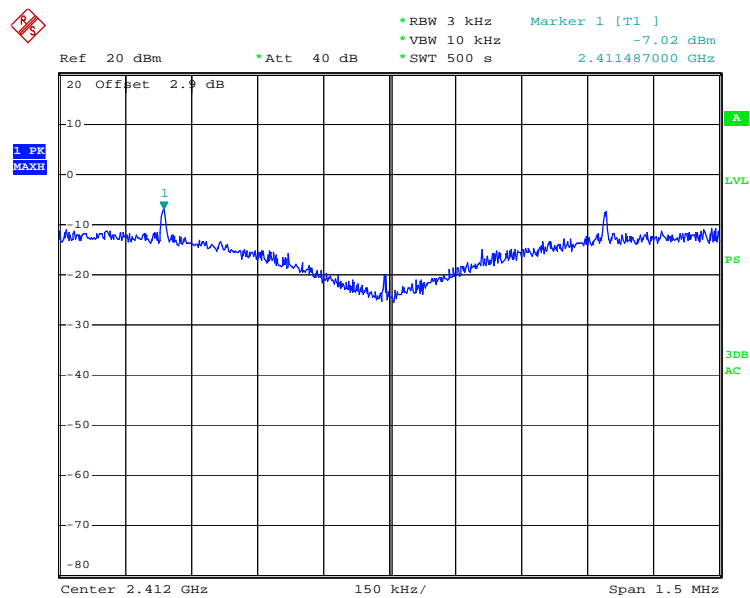
* The testing was performed by Peter Zhang & Marshal Yu on 2010-05-12.

Test Result: Compliant, Please refer to following tables and plots.

Test mode: 802.11b mode

Channel	Frequency (MHz)	Power Density (dBm)	FCC Limit (dBm)	Result
Low	2412	-7.02	8.0	Compliant
Middle	2437	-6.68	8.0	Compliant
High	2462	-7.51	8.0	Compliant

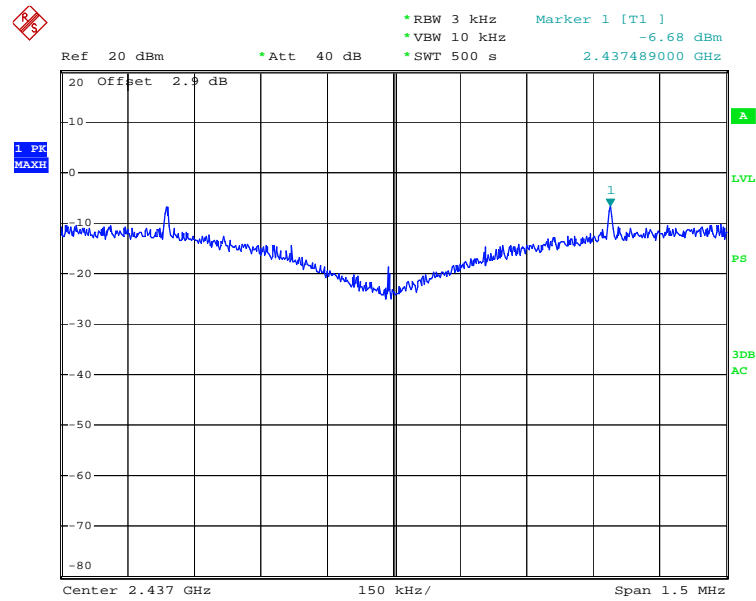
Low Channel



PPD120-LOW-B

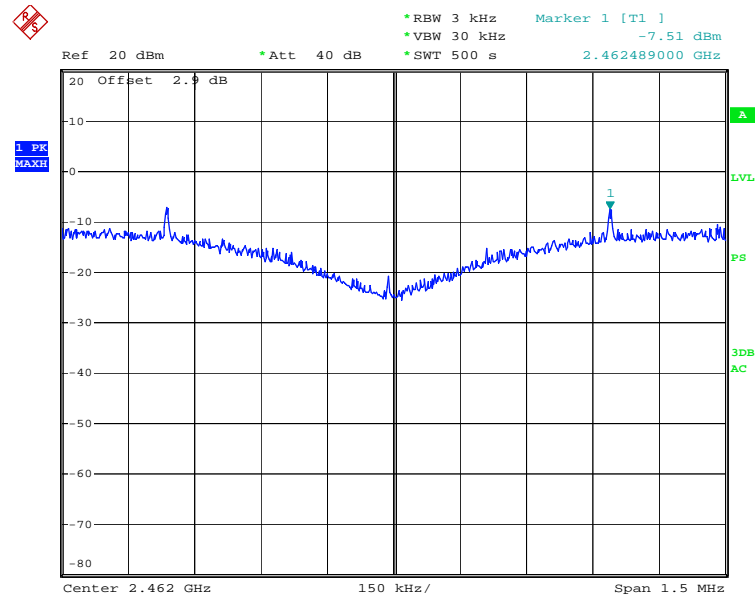
Date: 12.MAY.2010 16:38:38

Middle Channel



PPD120-MIDDLE-B
Date: 12.MAY.2010 16:08:39

High Channel

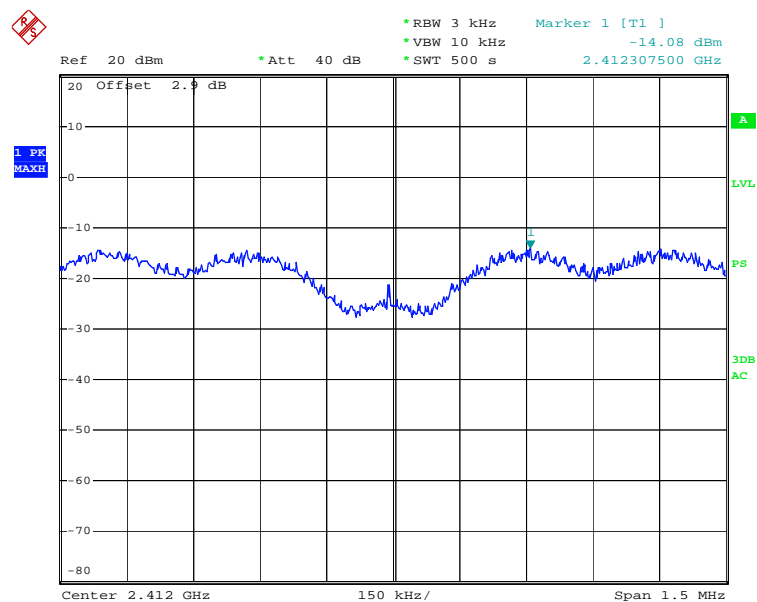


PPD120-HIGH-B
Date: 12.MAY.2010 15:34:12

Test mode: 802.11g mode

Channel	Frequency (MHz)	Power Density (dBm)	FCC Limit (dBm)	Result
Low	2412	-14.08	8.0	Compliant
Middle	2437	-10.59	8.0	Compliant
High	2462	-14.00	8.0	Compliant

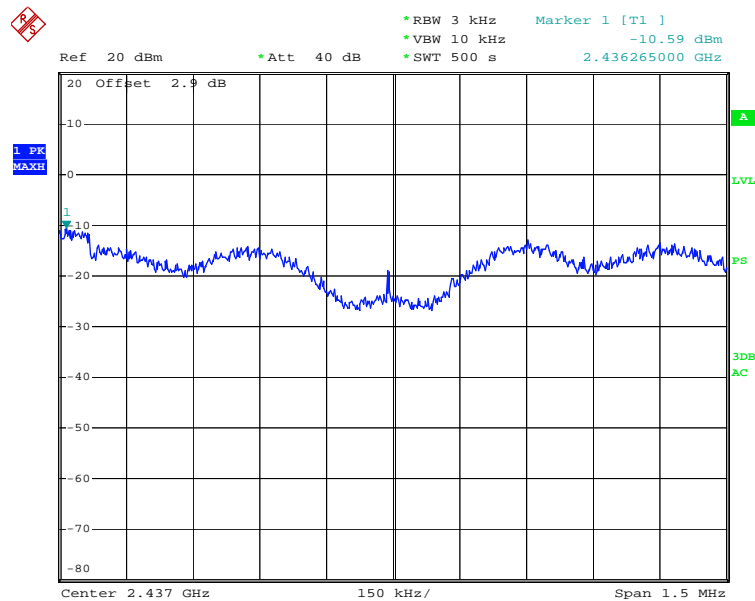
Low Channel



PPD120-LOW-G

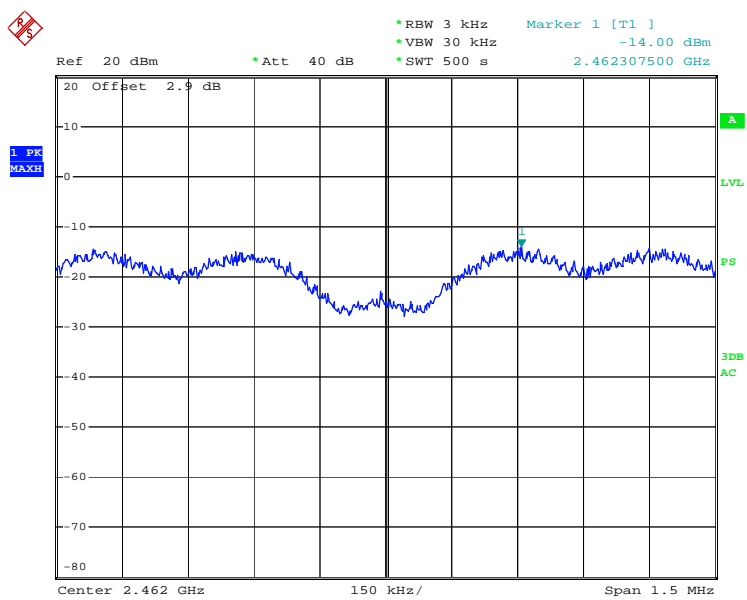
Date: 12.MAY.2010 16:58:01

Middle Channel



PPD120-MIDDLE-G
Date: 12.MAY.2010 16:23:33

High Channel



PPD120-HIGH-G
Date: 12.MAY.2010 15:51:48

FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

Applicable Standard

According to in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	10028	2009-10-16	2010-10-16

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Chengdu) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, for Radiated emissions restricted band RBW=1MHz, VBW=3MHz.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	100.9 kPa

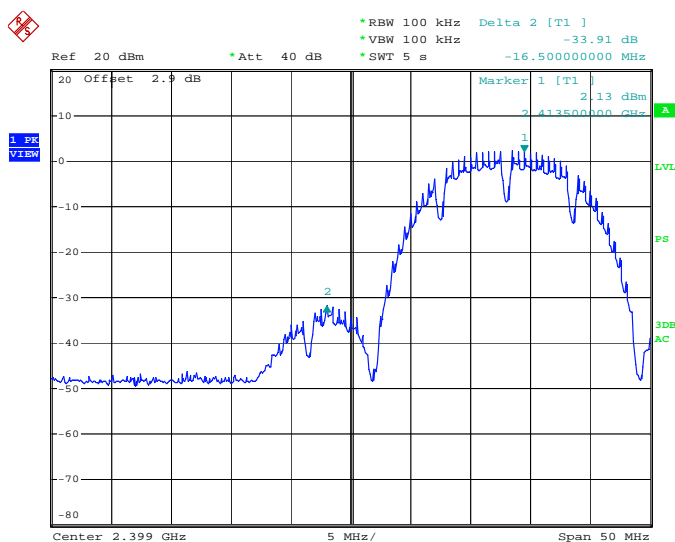
**The testing was performed by Peter Zhang & Marshal Yu on 2010-05-13.*

Test Result:

Compliant, Please refer to the following table and plots.

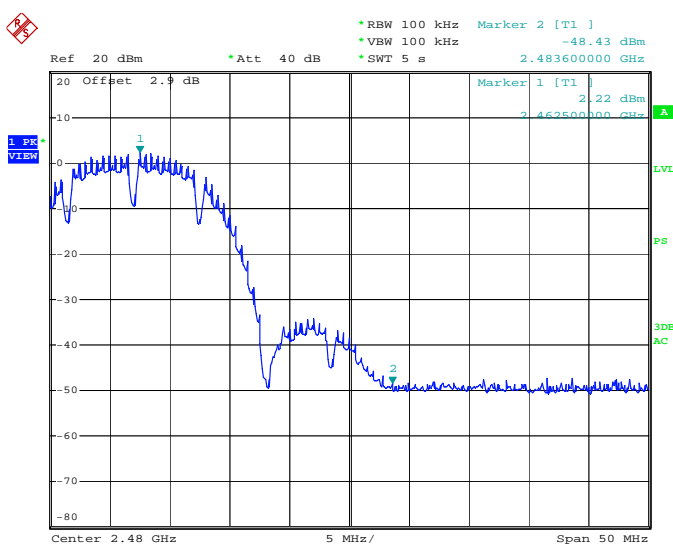
802.11b mode:

Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2397.0	33.91	20
2483.6	50.65	20

Band Edge: Left Side**Band Edge: Right Side**

6DBAND99WANDWIDE

Date: 13.MAY.2010 17:15:32



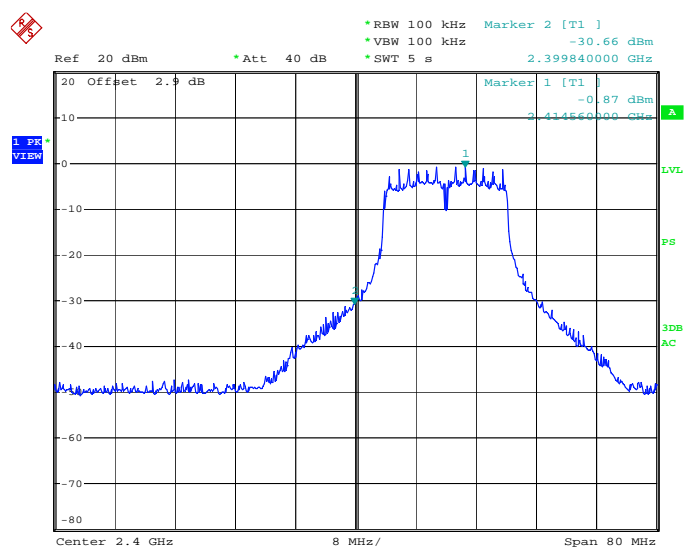
BANEDGE

Date: 13.MAY.2010 17:34:33

802.11g mode:

Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2399.84	29.79	20
2484.94	44.9	20

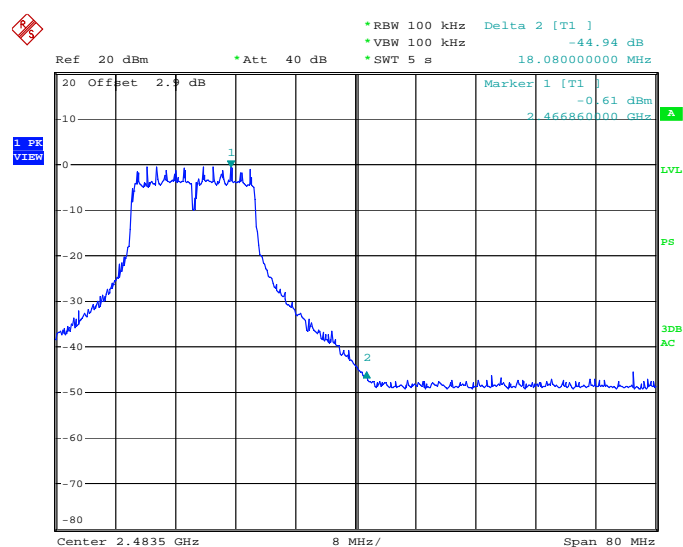
Band Edge: Left Side



BANDEDGE

Date: 13.MAY.2010 17:56:35

Band Edge: Right Side



BANDEDGE

Date: 13.MAY.2010 17:47:55

***** END OF REPORT *****