



NVLAP LAB CODE 200707-0



FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

Aztech Technologies Pte Ltd.

31 UBI Road 1, Aztech Building, Singapore, 408694

FCC ID: I38-DSL1000EWL

Report Type: Original Report	Product Type: ADSL2/2+ 4-Ports 802.11b/g
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Report Number: <u>RSZ09090301-15.247</u>	
Report Date: <u>2009-10-16</u>	
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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 Aztech Technologies Pte Ltd. 's product, model number: *DSL1000EW(L)* (FCC ID: *I38-DSL1000EWL*) or the "EUT" as referred to in this report is a *ADSL2/2+ 4-Ports 802.11b/g*, which measures approximately: 15.5 cm L x 12 cm W x 3 cm H, input voltage: DC 12V Adapter.

Adapter Information: Aztech
Model: SWM11-12120;
Input: AC 100-240V; 0.4A; 50-60Hz;
Output: DC 12.0V 1.00A.

Note: The product has two appearances (white and black), no other electrical change was made to the EUT, which was decalared in the attached Decalaration Letter.

** All measurement and test data in this report was gathered from production sample serial number: 0909005 (Assigned by BACL, Shenzhen). The EUT was received on 2009-09-03.*

Objective

This Type approval report is prepared on behalf of *Aztech Technologies Pte 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 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

FCC Part 15B submission with JBP equipment class.

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. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) 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 November 21, 2007. 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.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Description of Test Configuration

For 802.11b and 802.11g mode, 11 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437	/	/

EUT was tested with Channel 1, 6 and 11.

The worst-case data rates are determined to be as follows for each mode based upon investigation by measuring the average power, peak power and PSD across all data rates bandwidths, and modulations.

EUT Exercise Software

Telnet .

The test was performed under telnet Server about power level and data rate:

The test was performed under 80% level about power.

To test 11b: Select “802.11b Only” mode from 54gtm Mode, data rate 11Mbps

To test 11g: Select “54g Performance” mode from 54gtm Mode, data rate 54Mbps

Equipment Modifications

No modification was made to the unit tested.

Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
DELL	PC	DELL 170L	CN-0TC670-70821-560-F4Q6	DOC
DELL	Keyboard	L100	CN0RH656658907BL05DC	DOC
DELL	Mouse	M071KC	520027907	DOC
DELL	LCD Monitor	1505FP	Y4287-7168-571-GBSH	DOC
Hynix	Memory	PC2-5300U-555-12	HYMP564U64CP8-Y5 AB	N/A
Intel	CPU	Core Processor E5200	N/A	N/A

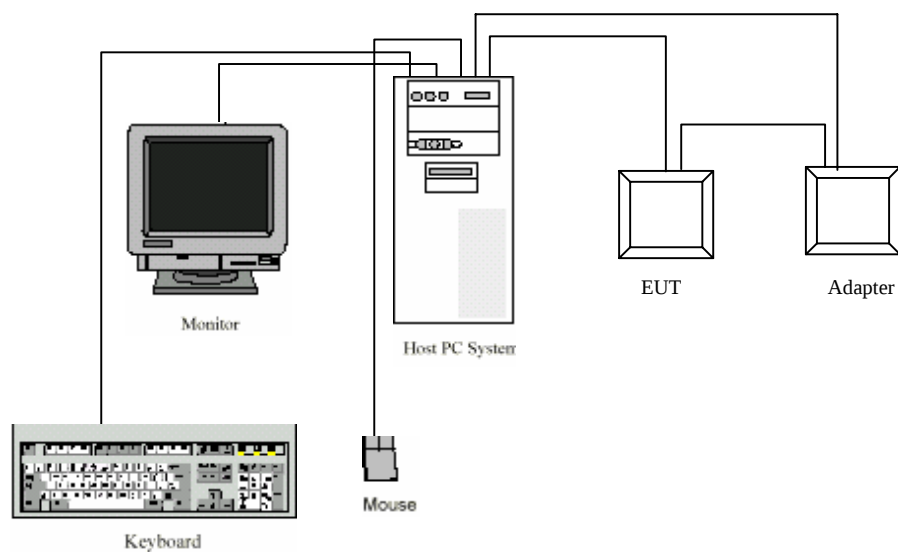
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Foxconn	Motherboard	G33M02	11S19R1949ZJ1WCB46JK8	DOC
Bestec	Power	ATX0300P5WB	070900730657	DOC
Western Digital	Hard Disk	WD800JD	WD-WMAM9YJ07713	DOC
Hitachi-LG	DVD-ROM	LTN-489S	B4F511412	DOC
Intel	Ethernet	PRO 10/100 VE	82562V-2	DOC

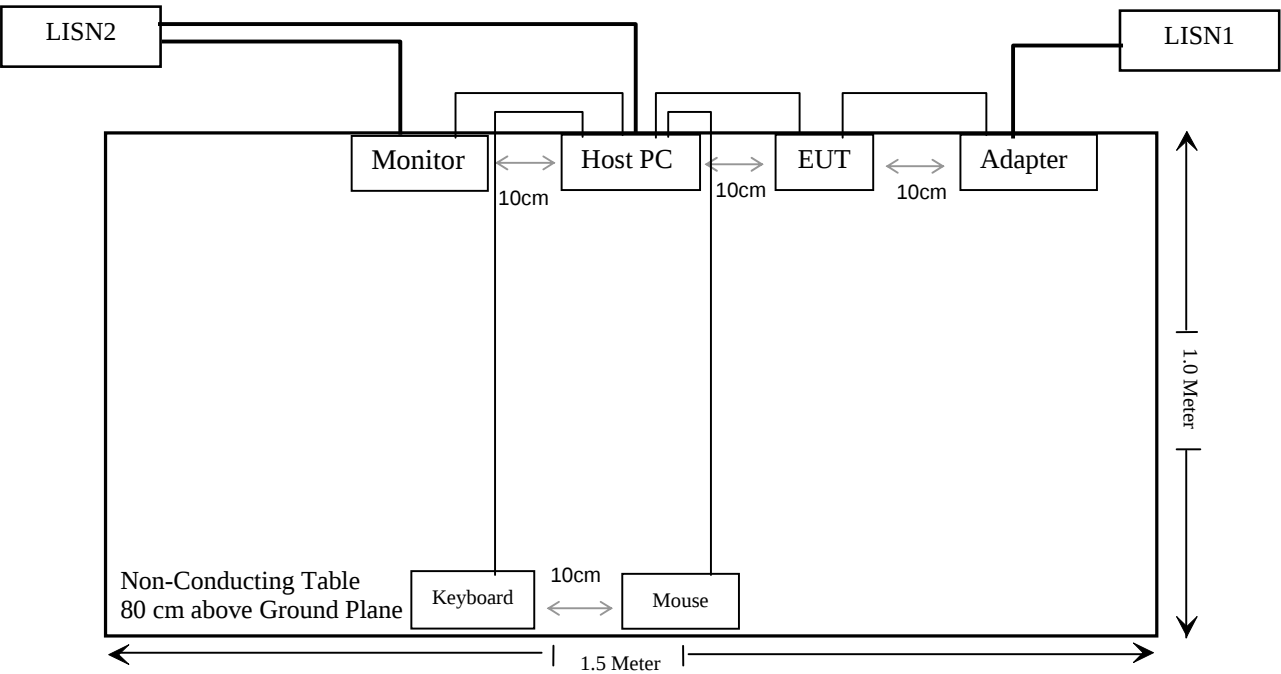
External I/O Cable

Cable Description	Length (m)	From/Port	To
Shielded Detachable K/B Cable	1.50	K/B Port / Host	K/B
Shielded Detachable Mouse Cable	1.50	Mouse Port / Host	Mouse
Shielded Detachable VGA Cable	1.50	VGA Port / Host	Monitor
Unshielded Undetachable DC Cable	1.80	Adapter/DC Port	EUT
Unshielded Detachable RJ11 Cable	3.50	PC	EUT
Unshielded Detachable RJ45 Cable	1.50	RJ45 Port/ Host	EUT
Unshielded Detachable Serial Cable	1.50	Serial Port/ Host	EUT
Unshielded Detachable AC Cable	1.50	Host / AC Port	LISN2

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

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

FCC §15.247 (i) & §1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Standard Applicable

According to subpart 15.247 (i) and subpart 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

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 ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Test Data

Predication of MPE limit at a given distance

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

Where:

S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally **numeric** gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

For 802.11b:

Maximum peak output power at antenna input terminal: 13.95 (dBm)

Maximum peak output power at antenna input terminal: 24.83 (mW)

Prediction distance: 20 (cm)

Predication frequency: 2412 (MHz)

Antenna Gain (typical): 3.0 (dBi)

Maximum Antenna Gain: 1.995 (numeric)

The worst case is power density at predication frequency at 20 cm: 0.00986 (mW/cm²)

MPE limit for general population exposure at prediction frequency: 1.0 (mW/cm²)

$$0.00986 \text{ (mW/cm}^2\text{)} < 1 \text{ (mW/cm}^2\text{)}$$

For 802.11g:

Maximum peak output power at antenna input terminal: 14.47 (dBm)

Maximum peak output power at antenna input terminal: 27.99 (mW)

Prediction distance: 20 (cm)

Predication frequency: 2412 (MHz)

Antenna Gain (typical): 3.0 (dBi)

Maximum Antenna Gain: 1.995 (numeric)

The worst case is power density at predication frequency at 20 cm: 0.01111 (mW/cm²)

MPE limit for general population exposure at prediction frequency: 1.0 (mW/cm²)

$$0.01111 \text{ (mW/cm}^2\text{)} < 1 \text{ (mW/cm}^2\text{)}$$

Result:

The predicted power density level at 20 cm is 0.00985 mw/cm² for 802.11b, 0.01111 mw/cm² for 802.11g, 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 § 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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The antennas of the EUT use a unique type of connector, which in accordance to section 15.203, the maximum gain is 3 dBi; please refer to the internal photos.

Result: Compliant.

FCC §15.207 (a) - CONDUCTED EMISSIONS

Applicable Standard

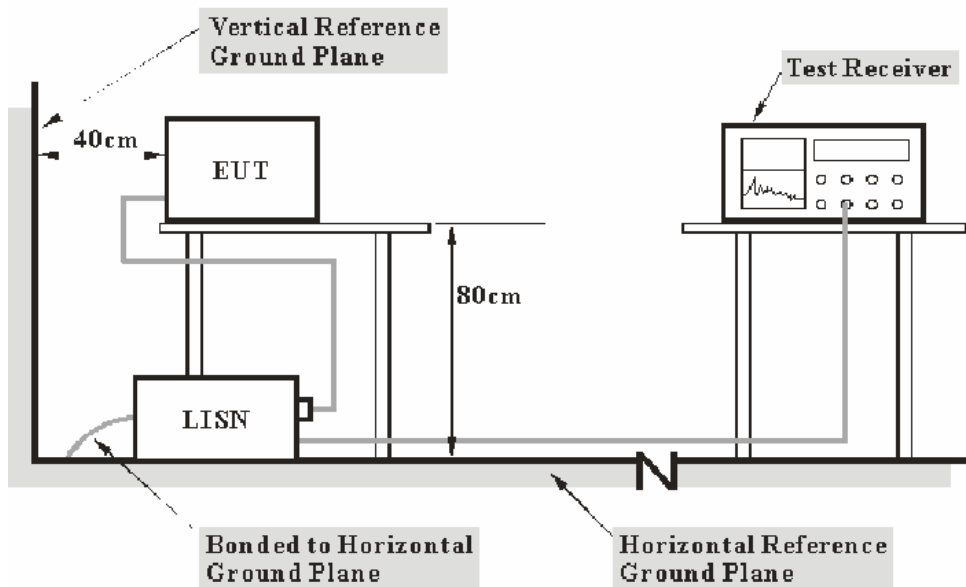
CFR47 §15.207

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is ± 2.4 dB.

EUT 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 setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

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	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2009-04-28	2010-04-27
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2009-04-28	2010-04-27

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

Test Procedure

During the conducted emission test, the adapter was connected to the LISN 1, the host PC and the monitor was connected to the LISN 2.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

802.11b mode:

12.20 dB at **0.1656 MHz** in the **Line** conductor mode
11.77 dB at **0.1656 MHz** in the **Neutral** conductor mode

802.11g mode:

10.00 dB at **26.0836 MHz** in the **Line** conductor mode
9.37 dB at **23.1305 MHz** in the **Neutral** conductor mode

Test Data

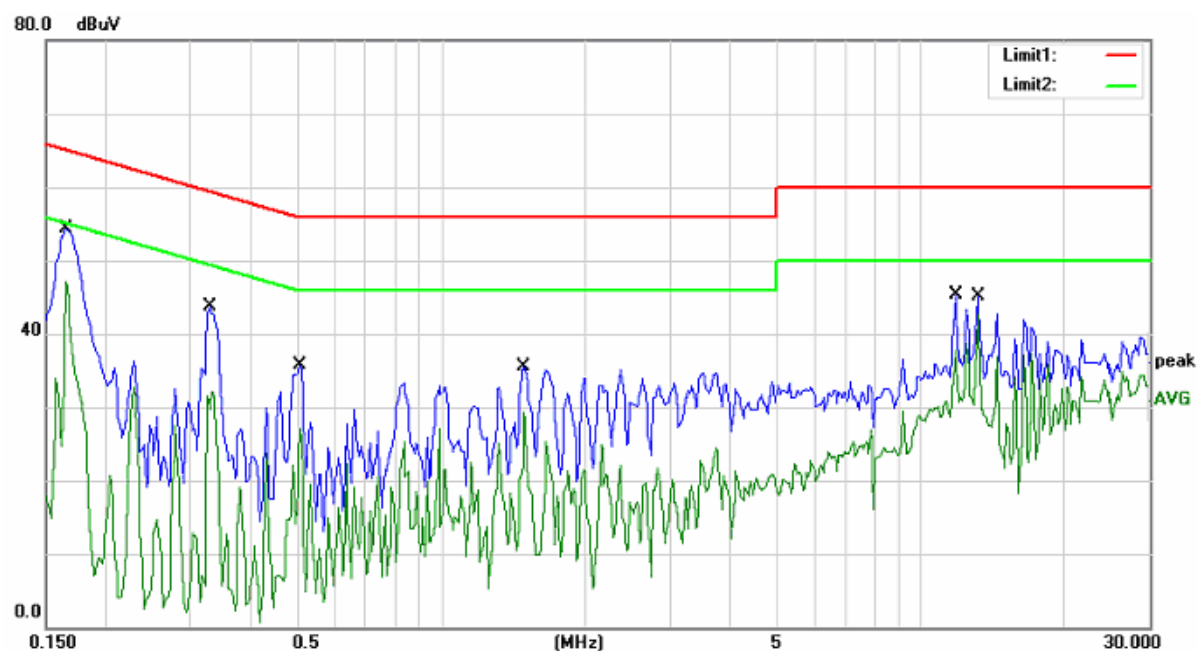
Environmental Conditions

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

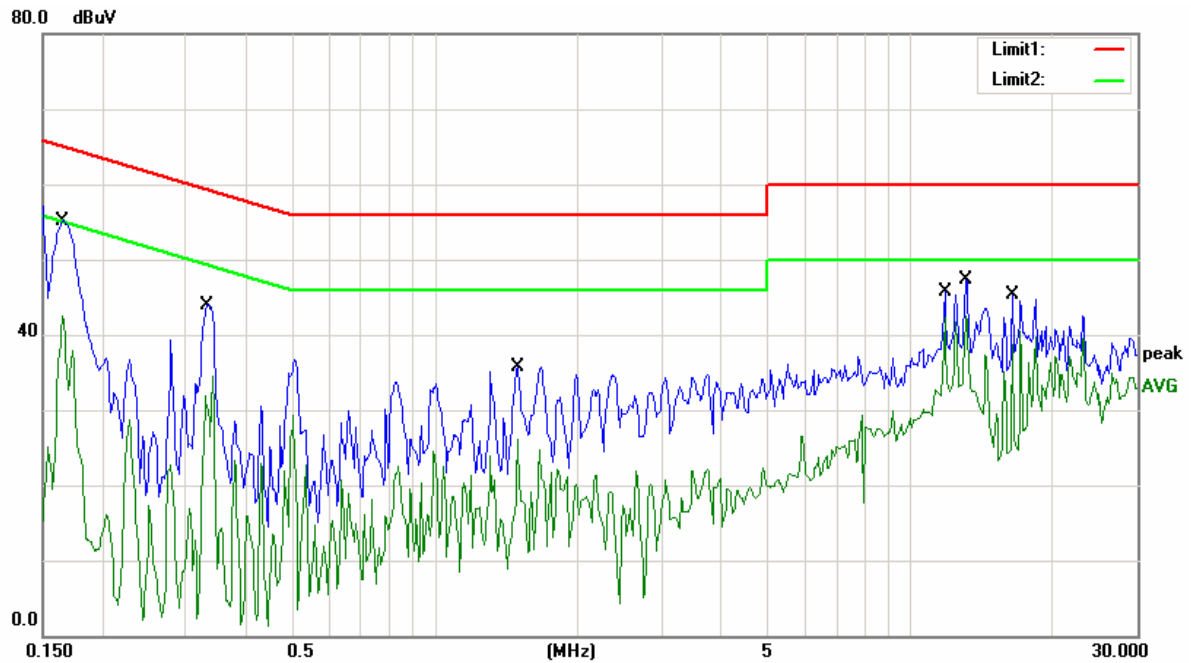
The testing was performed by Weir Zhong on 2009-09-09.

Test Mode: Transmitting (802.11b)

Line:



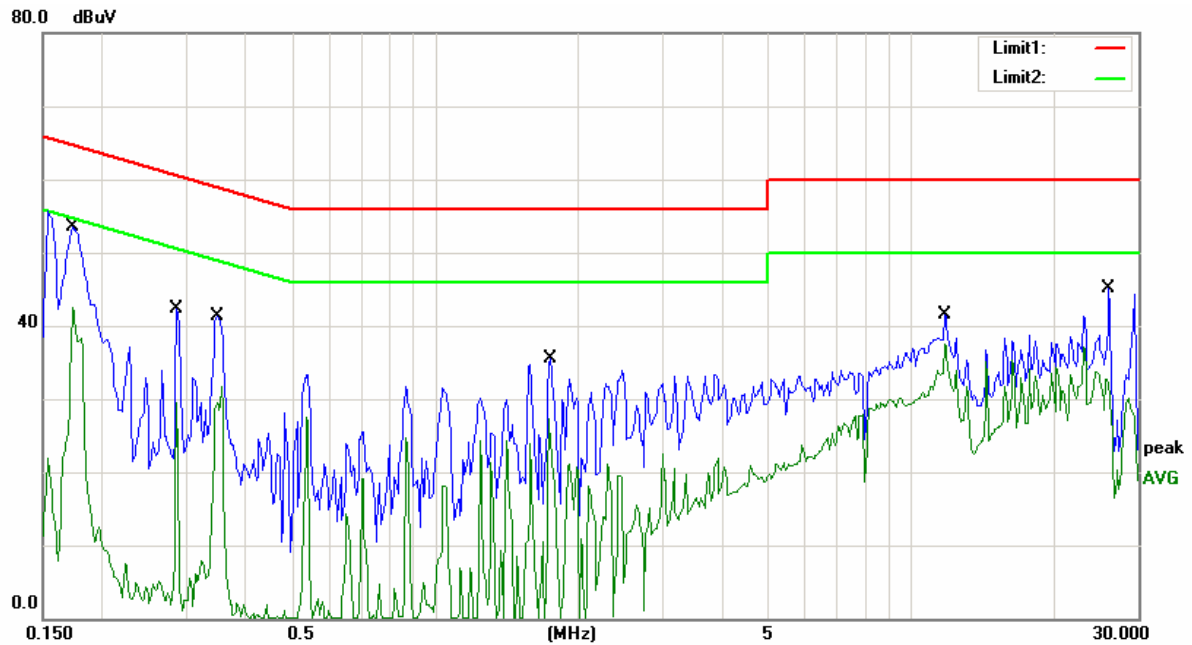
Conducted Emission				FCC Part 15.207		
Frequency (MHz)	Receiver Reading (dBμV)	Correction Factor (dB)	Cord. Result (dBμV)	Limit (dBμV)	Margin (dB)	Remark
0.1656	42.87	10.10	52.97	65.17	12.20	QP
0.1656	30.96	10.10	41.06	55.17	14.11	AV
13.1343	24.89	10.20	35.09	50.00	14.91	AV
13.1343	32.11	10.20	42.31	60.00	17.69	QP
0.3296	29.78	10.10	39.88	59.46	19.58	QP
0.3296	19.65	10.10	29.75	49.46	19.71	AV
11.8179	20.01	10.20	30.21	50.00	19.79	AV
11.8179	27.35	10.20	37.55	60.00	22.45	QP
0.5093	22.58	10.10	32.68	56.00	23.32	QP
1.4937	12.45	10.10	22.55	46.00	23.45	AV
1.4937	21.35	10.10	31.45	56.00	24.55	QP
0.5093	10.73	10.10	20.83	46.00	25.17	AV

Neutral:

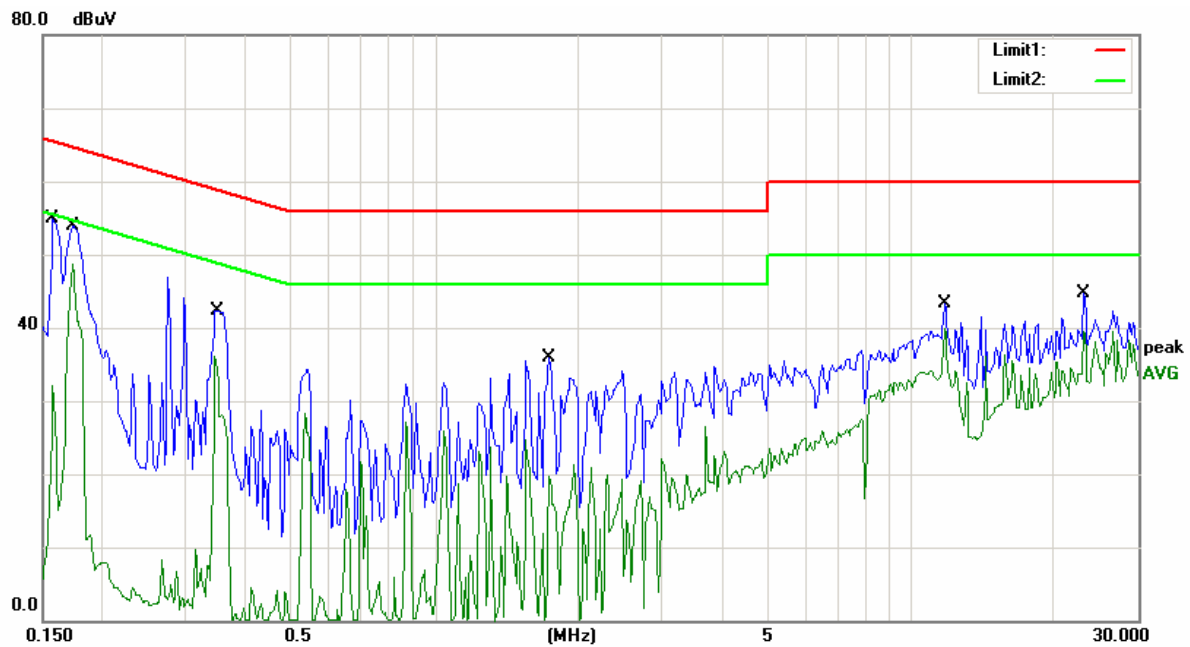
Conducted Emission				FCC Part 15.207		
Frequency (MHz)	Receiver Reading (dBμV)	Correction Factor (dB)	Cord. Result (dBμV)	Limit (dBμV)	Margin (dB)	Remark
0.1656	43.30	10.10	53.40	65.17	11.77	QP
0.1656	31.90	10.10	42.00	55.17	13.17	AV
11.8101	26.62	10.20	36.82	50.00	13.18	AV
0.3335	22.54	10.10	32.64	49.36	16.72	AV
0.3335	30.92	10.10	41.02	59.36	18.34	QP
11.8101	30.61	10.20	40.81	60.00	19.19	QP
16.4039	30.43	10.20	40.63	60.00	19.37	QP
16.4039	20.38	10.20	30.58	50.00	19.42	AV
1.4976	13.56	10.10	23.66	46.00	22.34	AV
1.4976	21.15	10.10	31.25	56.00	24.75	QP
13.1187	13.56	10.20	23.76	50.00	26.24	AV
13.1187	23.35	10.20	33.55	60.00	26.45	QP

Test Mode: Transmitting (802.11g)

Line:



Conducted Emission				FCC Part 15.207		
Frequency (MHz)	Receiver Reading (dBμV)	Correction Factor (dB)	Cord. Result (dBμV)	Limit (dBμV)	Margin (dB)	Remark
26.0836	39.80	10.20	50.00	60.00	10.00	QP
11.7984	26.43	10.20	36.63	50.00	13.37	AV
0.1734	38.85	10.10	48.95	64.80	15.85	QP
26.0836	23.56	10.20	33.76	50.00	16.24	AV
0.1734	28.19	10.10	38.29	54.80	16.51	AV
0.3492	29.05	10.10	39.15	58.98	19.83	QP
11.7984	28.89	10.20	39.09	60.00	20.91	QP
1.7437	7.94	10.10	18.04	46.00	27.96	AV
0.2867	10.87	10.10	20.97	50.62	29.65	AV
0.3492	7.91	10.10	18.01	48.98	30.97	AV
1.7437	14.85	10.10	24.95	56.00	31.05	QP
0.2867	16.12	10.10	26.22	60.62	34.40	QP

Neutral:

Conducted Emission				FCC Part 15.207		
Frequency (MHz)	Receiver Reading (dBμV)	Correction Factor (dB)	Cord. Result (dBμV)	Limit (dBμV)	Margin (dB)	Remark
23.1305	30.43	10.20	40.63	50.00	9.37	AV
11.7906	25.13	10.20	35.33	50.00	14.67	AV
0.1734	29.45	10.10	39.55	54.80	15.25	AV
0.1734	39.38	10.10	49.48	64.80	15.32	QP
23.1305	33.27	10.20	43.47	60.00	16.53	QP
0.3492	22.21	10.10	32.31	48.98	16.67	AV
11.7906	30.63	10.20	40.83	60.00	19.17	QP
0.3492	27.68	10.10	37.78	58.98	21.20	QP
1.7398	23.43	10.10	33.53	56.00	22.47	QP
0.1578	27.32	10.10	37.42	65.58	28.16	QP
1.7398	1.75	10.10	11.85	46.00	34.15	AV
0.1578	0.19	10.10	10.29	55.58	45.29	AV

FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

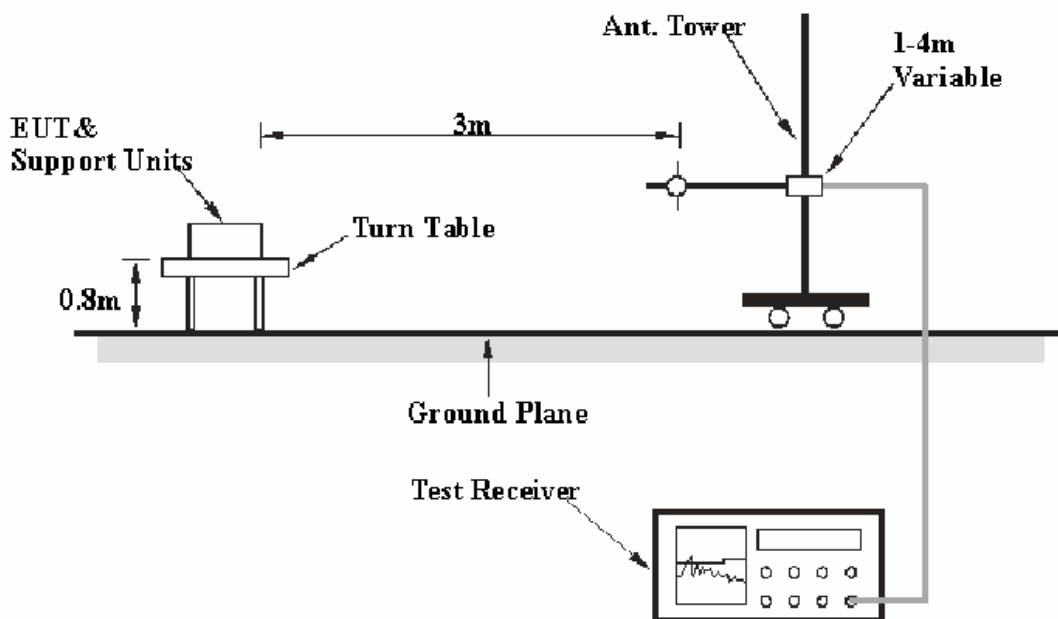
FCC §15.247 (d); §15.209; §15.205;

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. (Shenzhen) is ± 4.0 dB.

EUT Setup



The radiated emission tests were performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209, and FCC 15.247 limits.

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

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source.

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:

<u>Frequency Range</u>	<u>RBW</u>	<u>Video B/W</u>
30MHz – 1000 MHz	100 kHz	300 kHz
1000 MHz – 25 GHz	1 MHz	3 MHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2009-08-02	2010-08-02
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-11-07	2009-11-06
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2009-03-11	2010-03-11
HP	Amplifier	8449B	3008A00277	2009-09-12	2010-09-11
Sunol Sciences	Horn Antenna	DRH-118	A052604	2009-05-05	2010-05-04
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2009-07-08	2010-07-08

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

Test Procedure

For the radiated emissions test, the adapter, the host PC and monitor were connected to the AC floor outlet.

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-1GHz and peak and Average detection modes for frequencies above 1GHz.

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 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, 15.109, 15.209 and 15.247, with the worst margin reading of:

30 -1000 MHz:

802.11b (wost case): **1.9 dB** at **43.808500 MHz** in the **Vertical** polarization

802.11g (wost case): **2.2 dB** at **43.813750 MHz** in the **Vertical** polarization

Above 1 GHz:

802.11b (Low Channel): **6.39 dB** at **2384.54 MHz** in the **Vertical** polarization

802.11b (Middle Channel): **6.15 dB** at **4874 MHz** in the **Horizontal** polarization

802.11b (High Channel): **6.01 dB** at **2372.20 MHz** in the **Vertical** polarization

802.11g (Low Channel): **6.12 dB** at **2388.55 MHz** in the **Vertical** polarization

802.11g (Middle Channel): **6.60 dB** at **4874 MHz** in the **Vertical** polarization

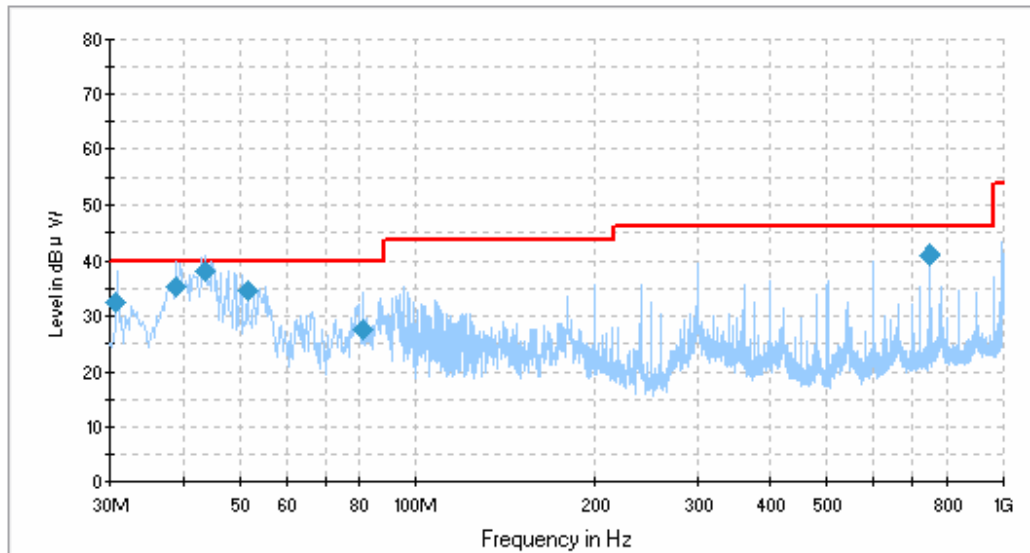
802.11g (High Channel): **6.08 dB** at **4924 MHz** in the **Horizontal** polarization

Test Data

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

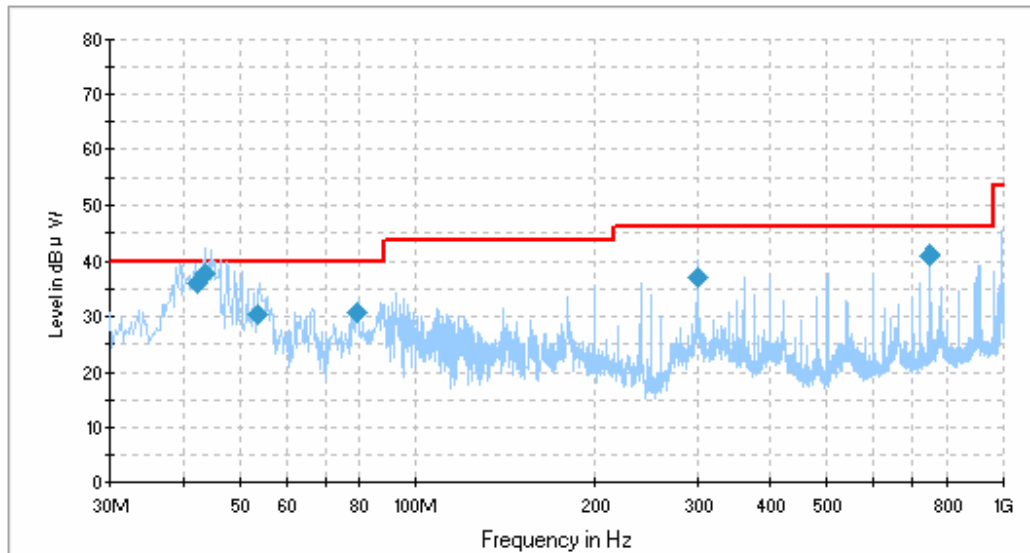
The testing was performed by Weir Zhong on 2009-09-24 to 2009-09-26.

30-1000 MHz:*Test Mode: Transmitting (802.11b worst case)*

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Ant. Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
43.808500	38.1	112.0	V	94.0	-17.5	40.0	1.9*
38.988250	35.5	101.0	V	288.0	-14.7	40.0	4.5
750.070000	41.1	100.0	V	145.0	-6.0	46.0	4.9
51.748500	34.6	99.0	V	132.0	-20.6	40.0	5.4
81.199250	27.6	100.0	V	12.0	-22.2	40.0	12.4
30.656000	32.6	202.0	V	11.0	-9.0	40.0	21.4

* Within measurement uncertainty.

Test Mode: Transmitting (802.11g worst case)



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Ant. Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
43.813750	37.8	114.0	V	204.0	-17.5	40.0	2.2*
42.285750	35.9	99.0	V	281.0	-16.7	40.0	4.1
750.077250	41.0	101.0	V	141.0	-6.0	46.0	5.0
300.013500	37.3	115.0	V	11.0	-14.6	46.0	8.7
79.237750	30.8	112.0	V	2.0	-22.2	40.0	9.2
53.862750	30.4	125.0	V	359.0	-21.1	40.0	9.6

* Within measurement uncertainty.

Above 1 GHz:

802.11b Mode:

Indicated		Detector (PK/AV)	Table Angle Degree	Antenna		Correction Factor			FCC Part 15.247/15.209			
Frequency (MHz)	S.A. Reading (dBμV/m)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
Low Channel (2412 MHz)												
2384.54	41.92	AV	75	1.4	V	30.6	5.52	30.43	47.61	54	6.39	spurious
4824	34.01	AV	200	1.9	V	35.4	8.76	30.81	47.36	54	6.64	harmonic
1507.90	48.00	AV	329	1.1	V	26.0	4.42	31.27	47.15	54	6.85	spurious
4824	32.50	AV	215	1.5	H	36.6	8.76	30.81	47.05	54	6.95	harmonic
4824	49.64	PK	200	1.9	V	35.4	8.76	30.81	62.99	74	11.01	harmonic
2384.54	56.70	PK	75	1.4	V	30.6	5.52	30.43	62.39	74	11.61	spurious
2381.66	36.40	AV	177	1.0	H	30.6	5.52	30.43	42.09	54	11.91	spurious
2488.72	35.41	AV	132	1.0	V	30.6	5.85	30.58	41.28	54	12.72	spurious
4824	46.72	PK	215	1.5	H	36.6	8.76	30.81	61.27	74	12.73	harmonic
2495.17	31.76	AV	182	1.2	H	30.6	5.85	30.58	37.63	54	16.37	spurious
2381.66	49.04	PK	177	1.0	H	30.6	5.52	30.43	54.73	74	19.27	spurious
2488.72	48.54	PK	132	1.0	V	30.6	5.85	30.58	54.41	74	19.59	spurious
1507.90	54.79	PK	329	1.1	V	26.0	4.42	31.27	53.94	74	20.06	spurious
2495.17	44.72	PK	182	1.2	H	30.6	5.85	30.58	50.59	74	23.41	spurious
Middle Channel (2437 MHz)												
4874	33.30	AV	177	1.8	H	36.6	8.76	30.81	47.85	54	6.15	harmonic
2337.73	42.10	AV	0	1.0	V	30.6	5.52	30.43	47.79	54	6.21	spurious
1507.85	47.62	AV	322	1.0	V	26.0	4.42	31.27	46.77	54	7.23	spurious
4874	34.83	AV	360	1.9	V	35.4	8.76	30.81	46.18	54	7.82	harmonic
2483.96	37.83	AV	343	1.3	V	30.6	5.85	30.58	43.7	54	10.30	spurious
4874	48.17	PK	360	1.9	V	35.4	8.76	30.81	61.52	74	12.48	harmonic
4874	46.89	PK	177	1.8	H	36.6	8.76	30.81	61.44	74	12.56	harmonic
2352.48	36.85	AV	183	1.5	H	30.6	5.52	31.83	41.14	54	12.86	spurious
2337.73	55.30	PK	0	1.0	V	30.6	5.52	30.43	60.99	74	13.01	spurious
2488.85	31.98	AV	360	1.0	H	30.6	5.85	30.43	38	54	16.20	spurious
2483.96	50.94	PK	343	1.3	V	30.6	5.85	30.58	56.81	74	17.19	spurious
1507.85	53.85	PK	322	1.0	V	26.0	4.42	31.27	53	74	21.00	spurious
2352.48	48.52	PK	183	1.5	H	30.6	5.52	31.83	52.81	74	21.19	spurious
2488.85	44.15	PK	360	1.0	H	30.6	5.85	30.43	50.17	74	23.83	spurious

Indicated		Detector (PK/AV)	Table Angle Degree	Antenna		Correction Factor			FCC Part 15.247/15.209			
Frequency (MHz)	S.A. Reading (dBμV/m)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
HighChannel (2462 MHz)												
2372.20	42.30	AV	223	1.3	V	30.6	5.52	30.43	47.99	54	6.01	spurious
4924	33.10	AV	173	1.5	H	36.6	8.76	30.81	47.65	54	6.35	harmonic
4924	33.69	AV	70	1.2	V	35.4	8.76	30.81	47.04	54	6.96	harmonic
1507.90	47.42	AV	342	1.0	V	26.0	4.42	31.27	46.57	54	7.43	spurious
2377.49	40.02	AV	360	1.7	H	30.6	5.52	31.83	44.31	54	9.69	spurious
2487.86	35.75	AV	152	1.0	V	30.6	5.85	30.58	41.62	54	12.38	spurious
4924	46.55	PK	173	1.5	H	36.6	8.76	30.81	61.1	74	12.9	harmonic
4924	47.36	PK	70	1.2	V	35.4	8.76	30.81	60.71	74	13.29	harmonic
2372.20	54.21	PK	223	1.3	V	30.6	5.52	30.43	59.9	74	14.1	spurious
2488.41	32.50	AV	351	1.0	H	30.6	5.85	30.43	38.52	54	15.48	spurious
2377.49	52.80	PK	360	1.7	H	30.6	5.52	31.83	57.09	74	16.91	spurious
2487.86	48.21	PK	152	1.0	V	30.6	5.85	30.58	54.08	74	19.92	spurious
1507.90	53.34	PK	342	1.0	V	26.0	4.42	31.27	52.49	74	21.51	spurious
2488.41	45.81	PK	351	1.0	H	30.6	5.85	30.43	51.83	74	22.17	spurious

802.11g Mode:

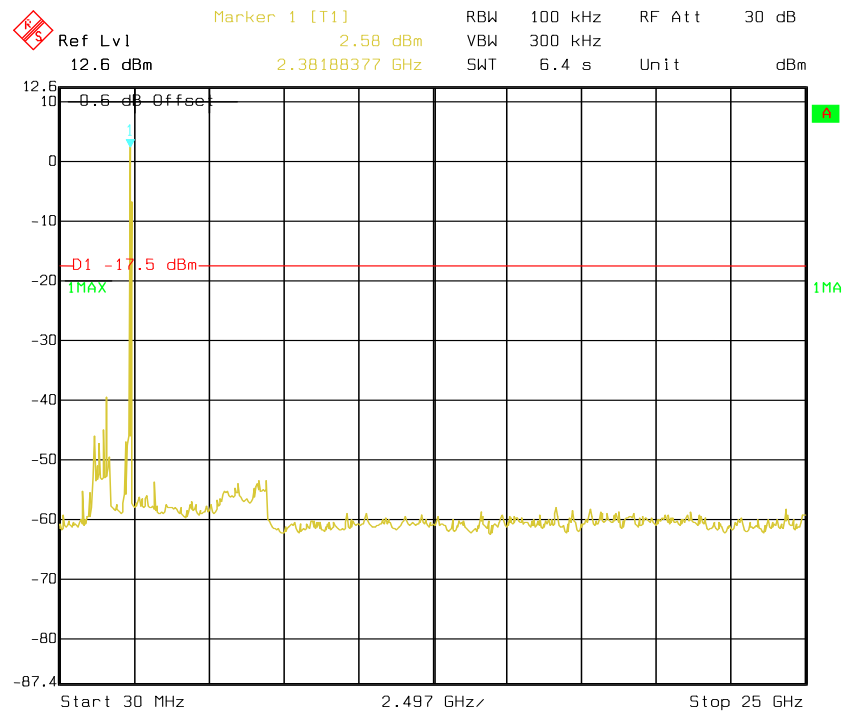
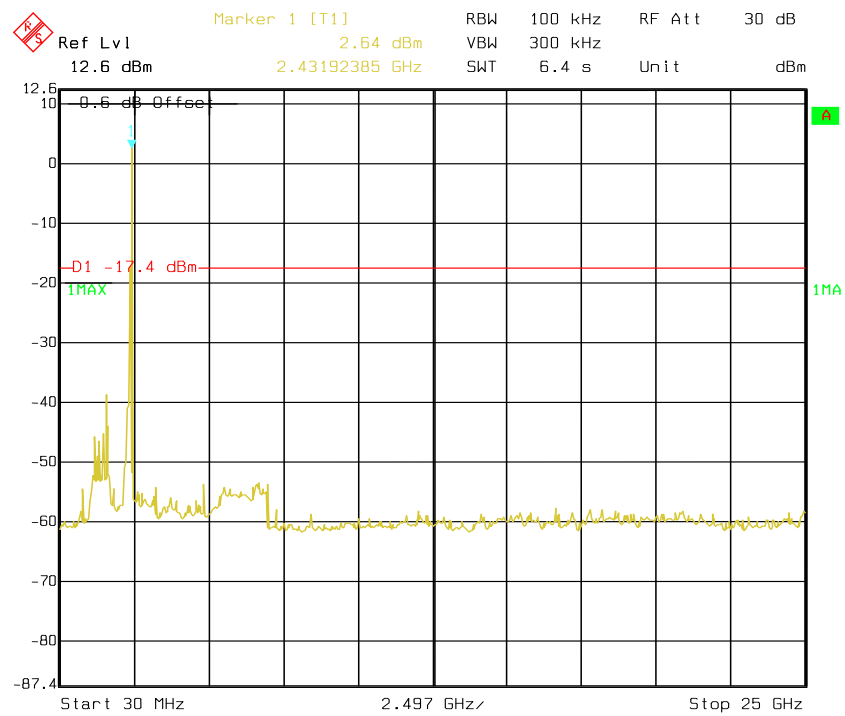
Indicated		Detector (PK/AV)	Table Angle Degree	Antenna		Correction Factor			FCC Part 15.247/15.209			
Frequency (MHz)	S.A. Reading (dBμV/m)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
Low Channel (2412 MHz)												
2388.55	42.19	AV	156	1.8	V	30.6	5.52	30.43	47.88	54	6.12	spurious
4824	34.17	AV	37	1.6	V	35.4	8.76	30.81	47.52	54	6.48	harmonic
1507.90	47.89	AV	337	1.0	V	26.0	4.42	31.27	47.04	54	6.96	spurious
4824	32.34	AV	215	1.2	H	36.6	8.76	30.81	46.89	54	7.11	harmonic
2388.55	57.10	PK	156	1.8	V	30.6	5.52	30.43	62.79	74	11.21	spurious
2487.74	36.14	AV	212	1.3	V	30.6	5.85	30.58	42.01	54	11.99	spurious
4824	48.31	PK	37	1.6	V	35.4	8.76	30.81	61.66	74	12.34	harmonic
4824	46.21	PK	215	1.2	H	36.6	8.76	30.81	60.76	74	13.24	harmonic
2372.52	33.32	AV	180	1.6	H	30.6	5.52	30.43	39.01	54	14.99	spurious
2490.35	32.15	AV	344	1.5	H	30.6	5.85	30.58	38.02	54	15.98	spurious
2487.74	50.78	PK	212	1.3	V	30.6	5.85	30.58	56.65	74	17.35	spurious
1507.90	55.79	PK	337	1.0	V	26.0	4.42	31.27	54.94	74	19.06	spurious
2372.52	48.34	PK	180	1.6	H	30.6	5.52	30.43	54.03	74	19.97	spurious
2490.35	45.80	PK	344	1.5	H	30.6	5.85	30.58	51.67	74	22.33	spurious
Middle Channel (2437 MHz)												
4874	34.05	AV	179	1.5	V	35.4	8.76	30.81	47.4	54	6.60	harmonic
4874	32.12	AV	207	1.4	H	36.6	8.76	30.81	46.67	54	7.33	harmonic
2384.8	40.50	AV	311	1.3	V	30.6	5.52	30.43	46.19	54	7.81	spurious
1507.91	46.31	AV	360	1.2	V	26.0	4.42	31.27	45.46	54	8.54	spurious
2489.2	36.94	AV	360	1.0	V	30.6	5.85	30.58	42.81	54	11.19	spurious
4874	47.86	PK	179	1.5	V	35.4	8.76	30.81	61.21	74	12.79	harmonic
2384.8	54.55	PK	311	1.3	V	30.6	5.52	30.43	60.24	74	13.76	spurious
4874	45.22	PK	207	1.4	H	36.6	8.76	30.81	59.77	74	14.23	harmonic
2488.4	32.45	AV	167	1.2	H	30.6	5.85	30.58	38.32	54	15.68	spurious
2372.8	34.01	AV	0	1.6	H	30.6	5.52	31.83	38.3	54	15.70	spurious
2489.2	50.68	PK	360	1.0	V	30.6	5.85	30.58	56.55	74	17.45	spurious
2372.8	48.94	PK	0	1.6	H	30.6	5.52	31.83	53.23	74	20.77	spurious
1507.91	53.37	PK	360	1.2	V	26.0	4.42	31.27	52.52	74	21.48	spurious
2488.4	46.19	PK	167	1.2	H	30.6	5.85	30.58	52.06	74	21.94	spurious

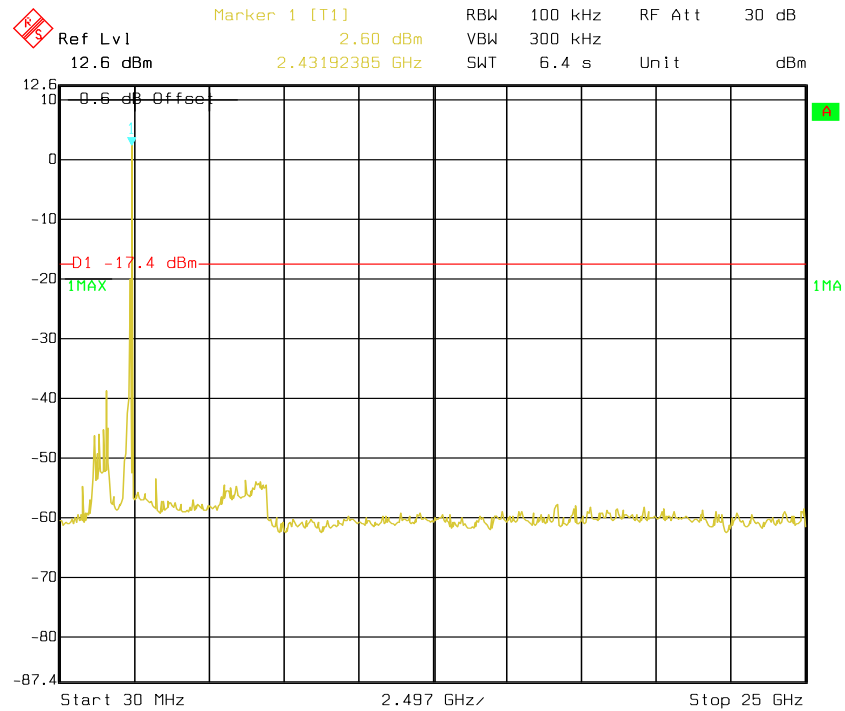
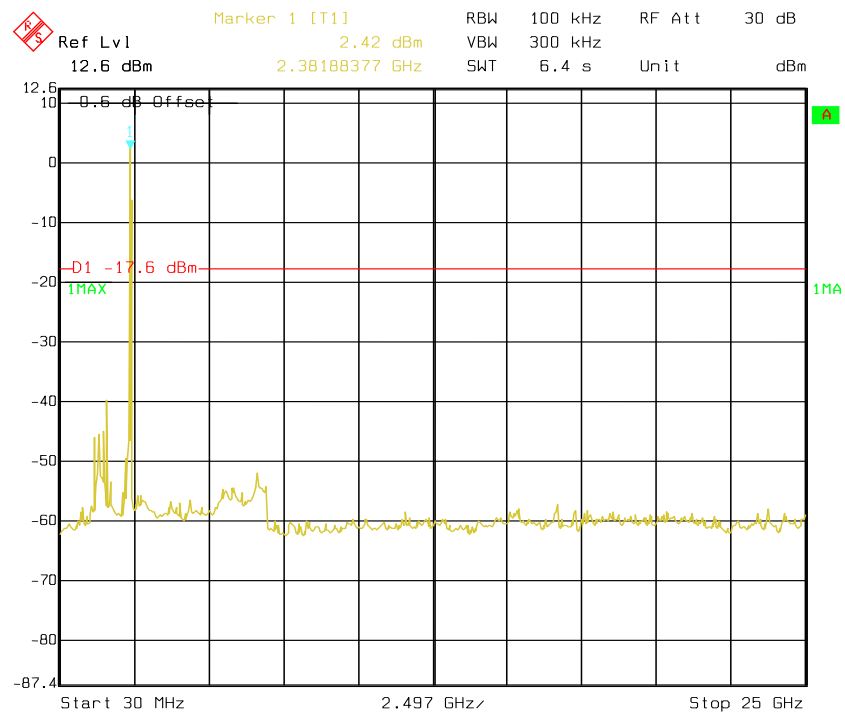
Indicated		Detector (PK/AV)	Table Angle Degree	Antenna		Correction Factor			FCC Part 15.247/15.209			
Frequency (MHz)	S.A. Reading (dBμV/m)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
HighChannel (2462 MHz)												
4924	33.37	AV	176	1.6	H	36.6	8.76	30.81	47.92	54	6.08	harmonic
2385.1	41.80	AV	215	1.3	V	30.6	5.52	30.43	47.49	54	6.51	spurious
1507.91	48.12	AV	178	1.2	V	26.0	4.42	31.27	47.27	54	6.73	Spurious
4924	33.70	AV	360	1.0	V	35.4	8.76	30.81	47.05	54	6.95	harmonic
2487.6	37.92	AV	37	1.0	V	30.6	5.85	30.58	43.79	54	10.21	Spurious
2385.1	56.84	PK	215	1.3	V	30.6	5.52	30.43	62.53	74	11.47	Spurious
4924	48.77	PK	360	1.0	V	35.4	8.76	30.81	62.12	74	11.88	harmonic
4924	47.45	PK	176	1.6	H	36.6	8.76	30.81	62	74	12.00	harmonic
2487.1	33.10	AV	167	1.2	H	30.6	5.85	30.43	39.12	54	14.88	Spurious
2487.6	52.34	PK	37	1.0	V	30.6	5.85	30.58	58.21	74	15.79	Spurious
2374.3	32.67	AV	0	1.0	H	30.6	5.52	31.83	36.96	54	17.04	Spurious
1507.91	54.85	PK	178	1.2	V	26.0	4.42	31.27	54	74	20.00	Spurious
2487.1	47.36	PK	167	1.2	H	30.6	5.85	30.43	53.38	74	20.62	Spurious
2374.3	46.91	PK	0	1.0	H	30.6	5.52	31.83	51.2	74	22.80	Spurious

Antenna Port Conducted Spurious Emissions

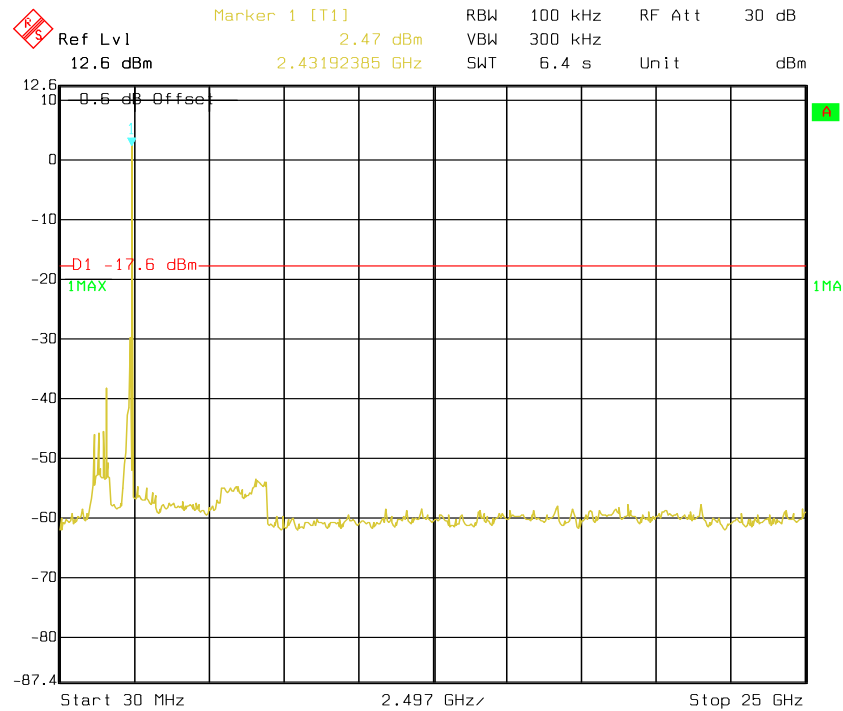
Channel Frequency (MHz)	Data Rate (Mbps)	Delta Value (dBc)	Limit (dBc)	Ref. Plot	Result
802.11b Mode					
2412	11	*	20	Plot 1	Pass
2437	11	*	20	Plot 1	Pass
2462	11	*	20	Plot 1	Pass
802.11g Mode					
2412	54	*	20	Plot 1	Pass
2437	54	*	20	Plot 1	Pass
2462	54	*	20	Plot 1	Pass

Please refer to the following plots.

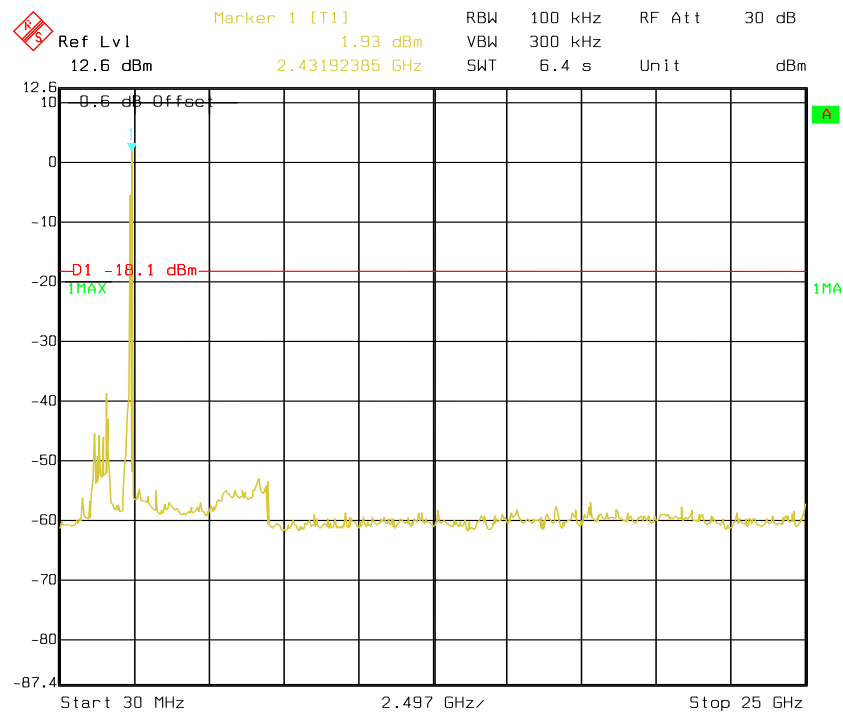
802.11b Low Channel**802.11b Middle Channel**

802.11b High Channel**802.11g Low Channel**

802.11g Middle Channel



802.11g High Channel



FCC §15.247(a) (2) – 6dB BANDWIDTH TESTING

Applicable Standard

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.

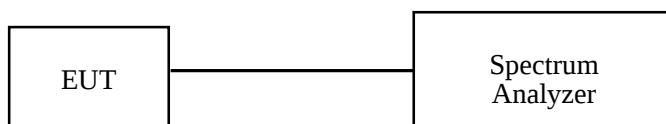
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-11-07	2009-11-06

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) 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 6 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:	56%
ATM Pressure:	100.0kPa

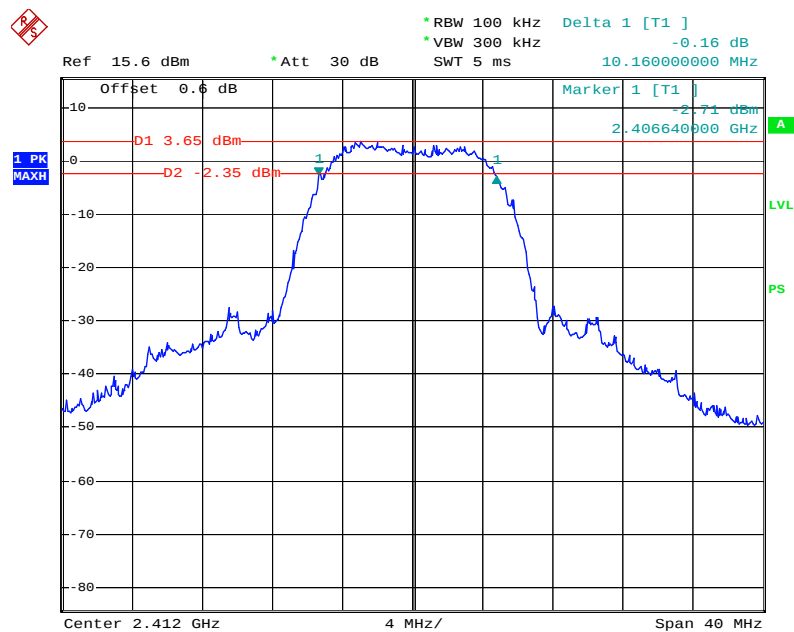
The testing was performed by Weir Zhong on 2009-10-09.

Test Result: Pass.

Please refer to the following tables and plots.

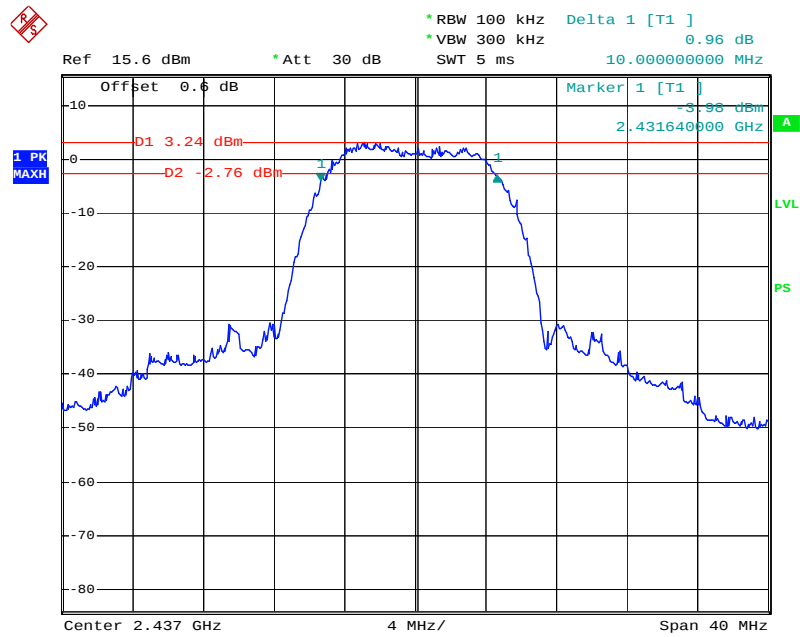
Channel	Channel Frequency (MHz)	Data Rate (Mbps)	Measured 6dB Bandwidth (MHz)	Limit (kHz)
802.11b Mode				
Low	2412	11	10.16	> 500
Middle	2437	11	10.00	> 500
High	2462	11	9.84	> 500
802.11g Mode				
Low	2412	54	15.92	> 500
Middle	2437	54	15.84	> 500
High	2462	54	15.92	> 500

802.11b Low Channel



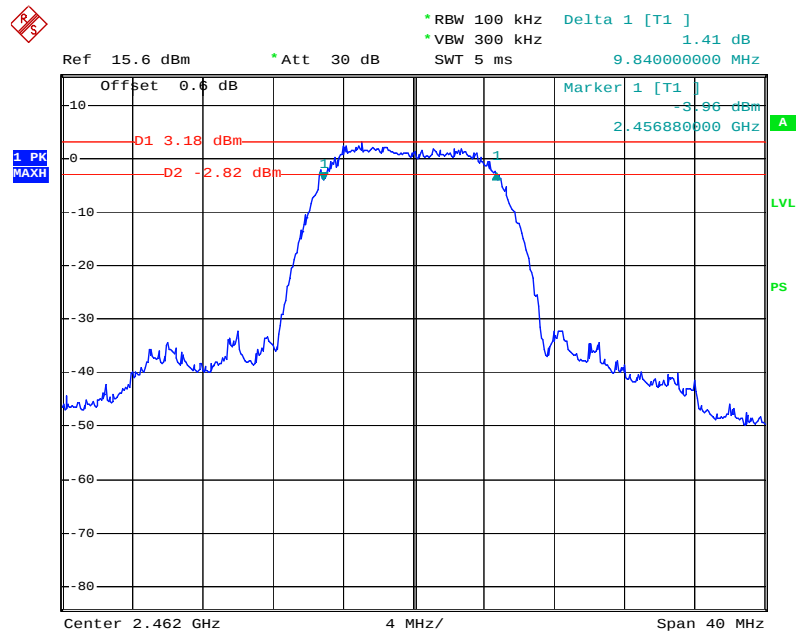
Date: 9.OCT.2009 16:03:51

802.11b Middle Channel



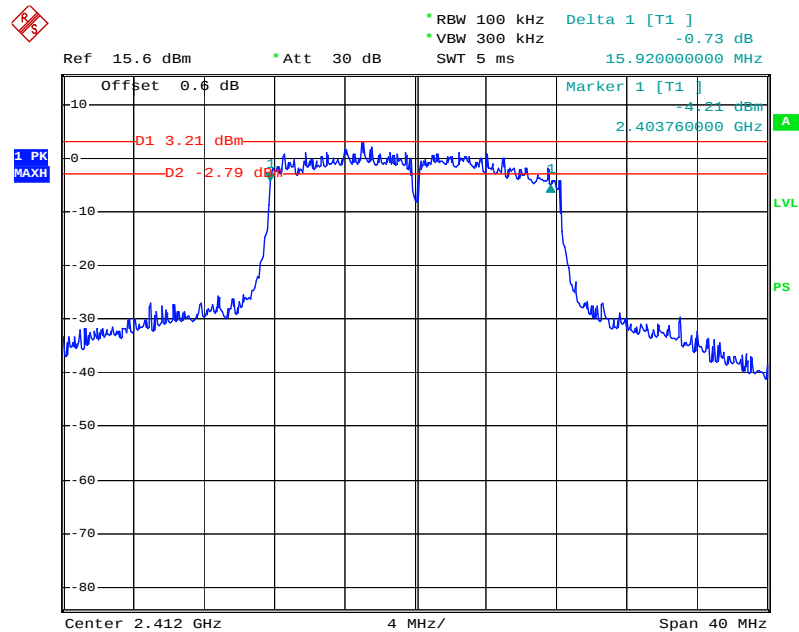
Date: 9.OCT.2009 16:11:18

802.11b High Channel



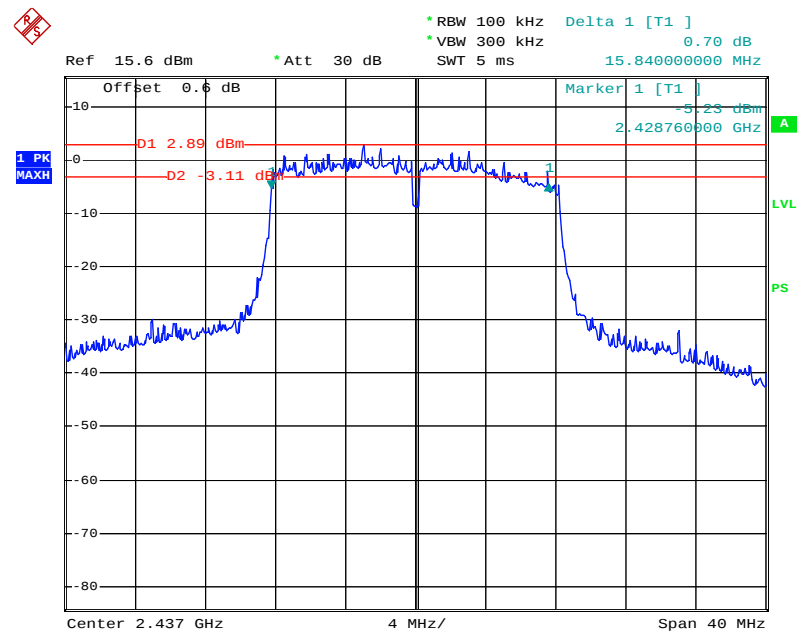
Date: 9.OCT.2009 16:14:50

802.11g Low Channel



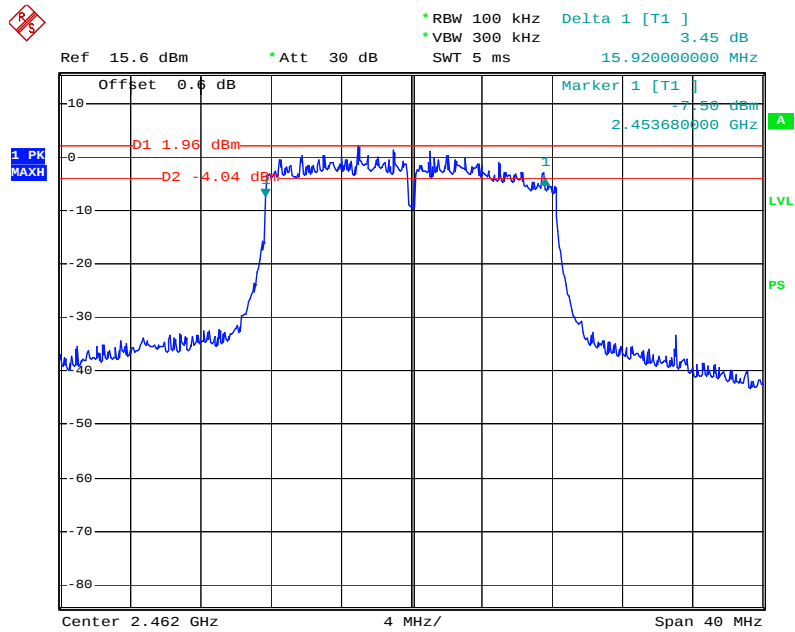
Date: 9.OCT.2009 16:35:44

802.11g Middle Channel



Date: 9.OCT.2009 16:33:12

802.11g High Channel



Date: 9.OCT.2009 16:30:13

FCC §15.247(b) (3) - MAXIMUM PEAK 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.

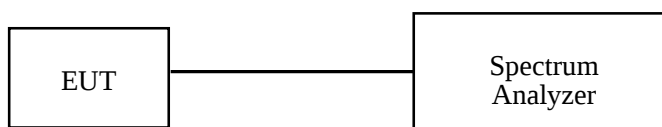
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-11-07	2009-11-06

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) 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 it 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:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Weir Zhong on 2009-10-09 to 2009-10-13.

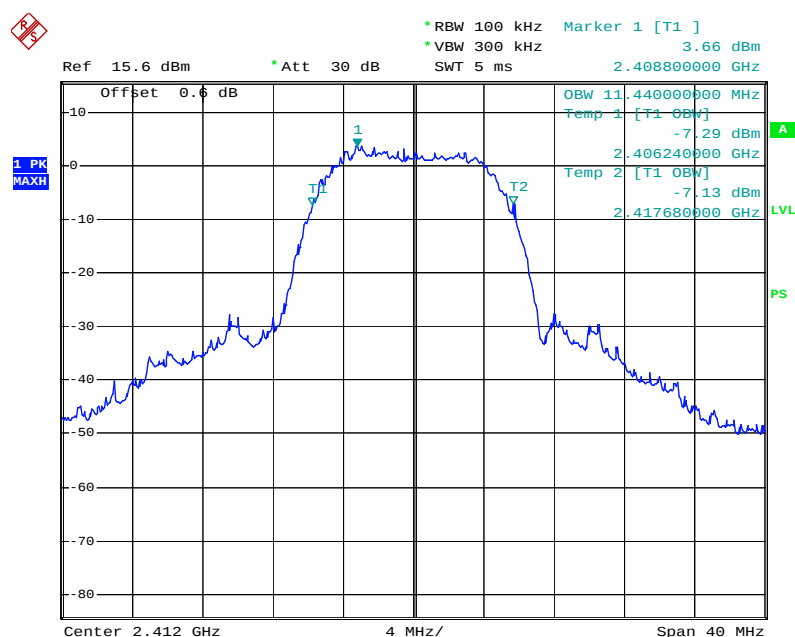
Test Mode: Transmitting

802.11b Mode:

Channel	Channel Frequency (MHz)	Data Rate (Mbps)	Output Power (dBm)	Limit (dBm)
Low	2412	11	13.95	30
Middle	2437	11	13.24	30
High	2462	11	13.14	30

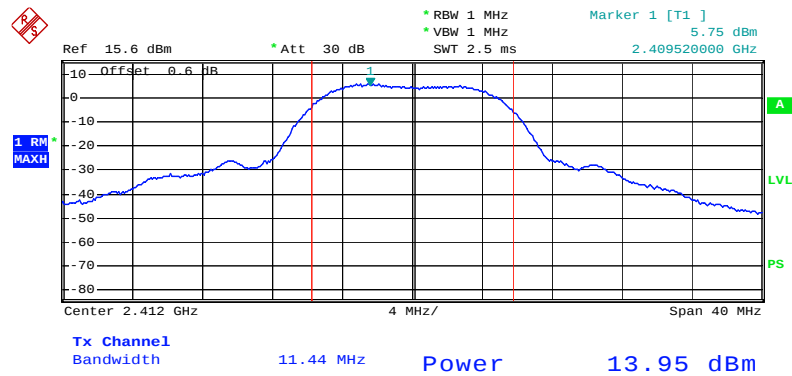
802.11g Mode:

Channel	Channel Frequency (MHz)	Data Rate (Mbps)	Output Power (dBm)	Limit (dBm)
Low	2412	54	14.47	30
Middle	2437	54	13.78	30
High	2462	54	13.55	30

802.11b Mode:**99% Occupied Bandwidth**

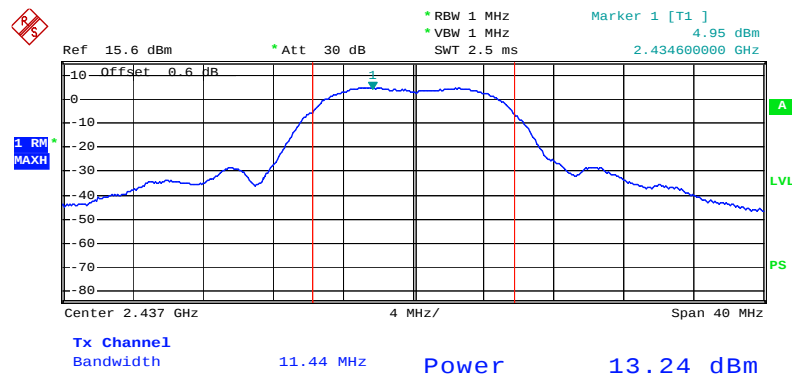
Date: 9.OCT.2009 13:38:43

802.11b RF Output Power, Low Channel

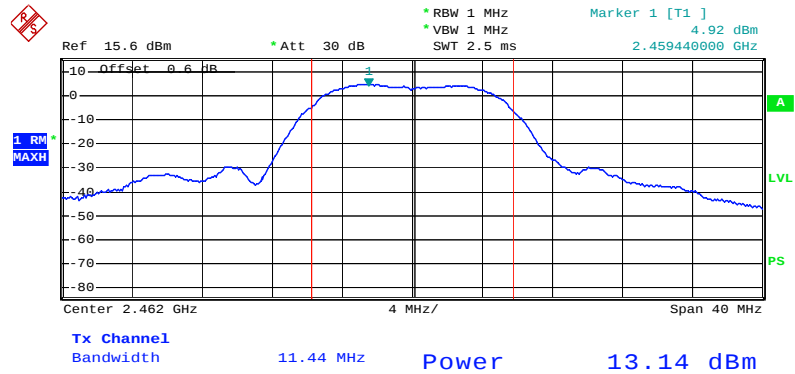


Date: 9.OCT.2009 13:47:52

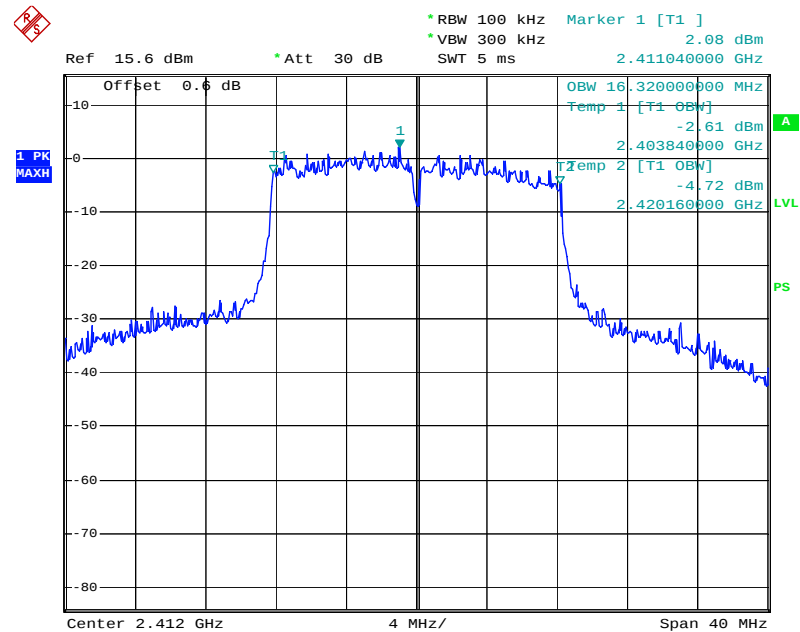
802.11b RF Output Power, Middle Channel



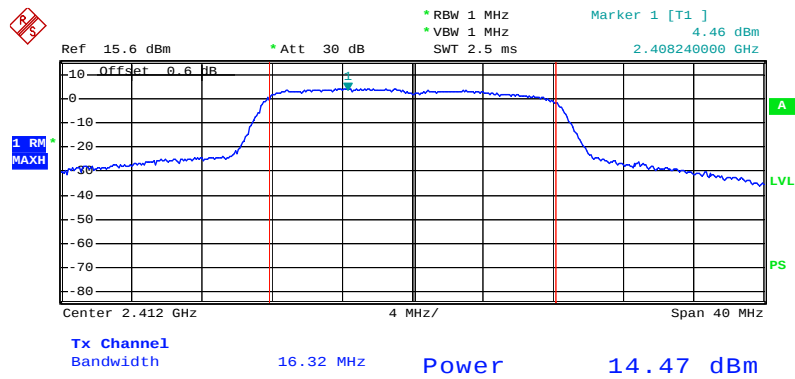
Date: 13.OCT.2009 18:50:01

802.11b RF Output Power, High Channel

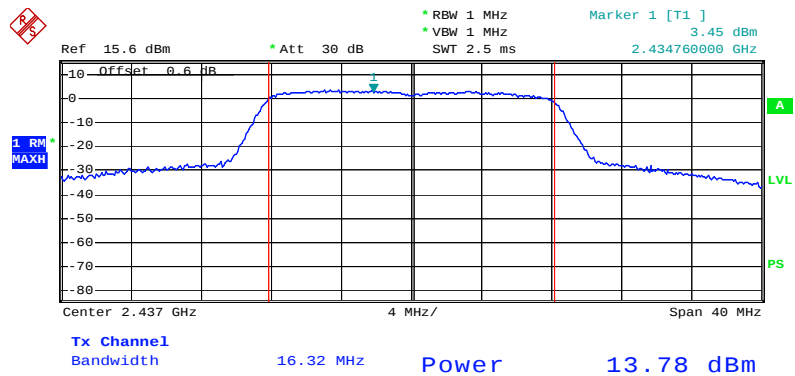
Date: 13.OCT.2009 18:48:35

802.11g Mode:**99% Occupied Bandwith**

Date: 9.OCT.2009 13:40:26

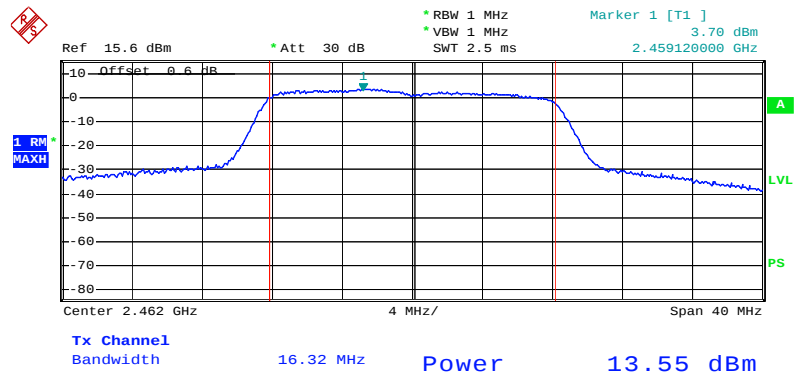
802.11g RF Output Power, Low Channel

Date: 9.OCT.2009 14:00:11

802.11g RF Output Power, Middle Channel

Date: 13.OCT.2009 19:03:04

802.11g RF Output Power, High Channel



Date: 13.OCT.2009 19:00:42

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

Applicable Standard

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)).

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-11-07	2009-11-06

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) 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 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. Set RBW to 1 MHz and VBW of spectrum analyzer to 1 MHz with a convenient frequency span including 100 kHz bandwidth from band edge.
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

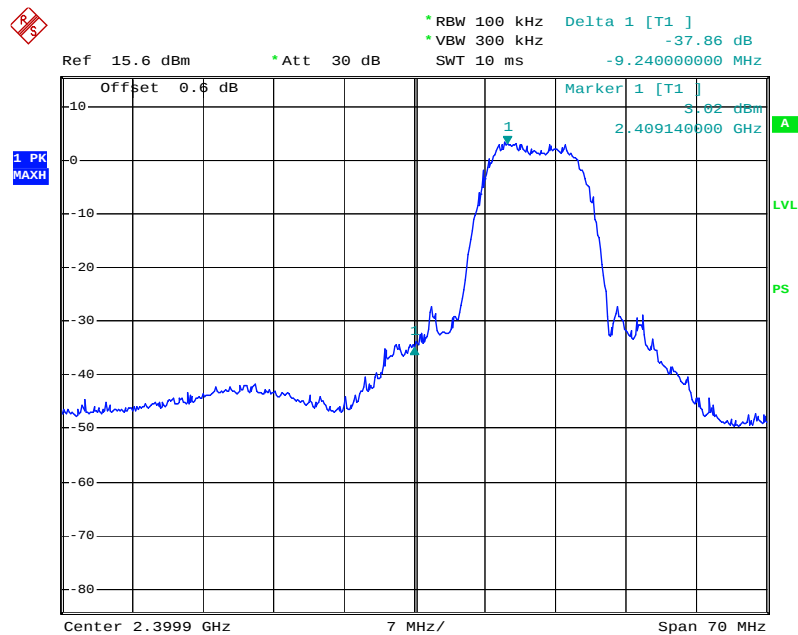
Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Weir Zhong on 2009-10--09.

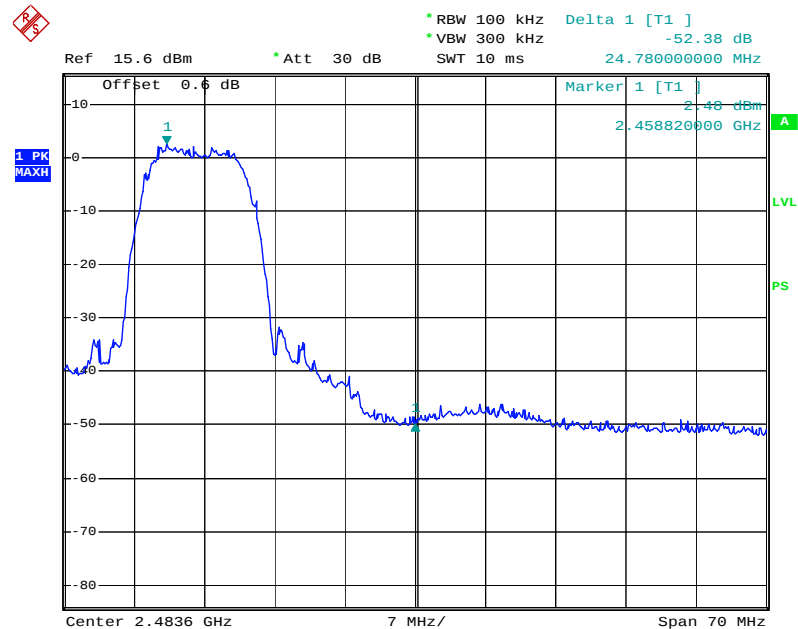
Test Result: *Compliant.*

Frequency (MHz)	Data Rate (Mbps)	Detector (PK/AV)	Delta Value (dBc)	Limit (dBc)	Result
802.11b Mode					
2399.9	11	PK	37.86	20	Pass
2483.6	11	PK	52.38	20	Pass
802.11g Mode					
2399.9	54	PK	30.90	20	Pass
2483.6	54	PK	43.66	20	Pass

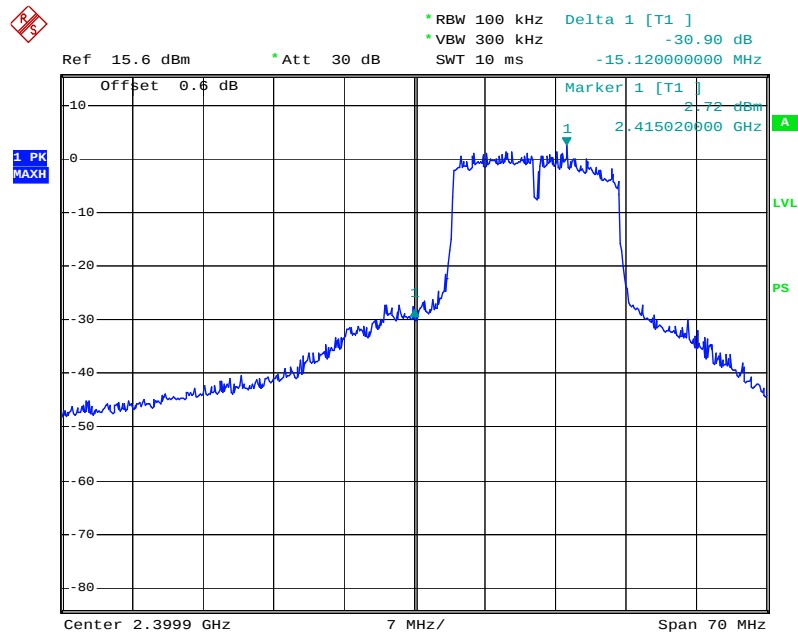
Please refer to following plots.

802.11b: Band Edge, Left Side

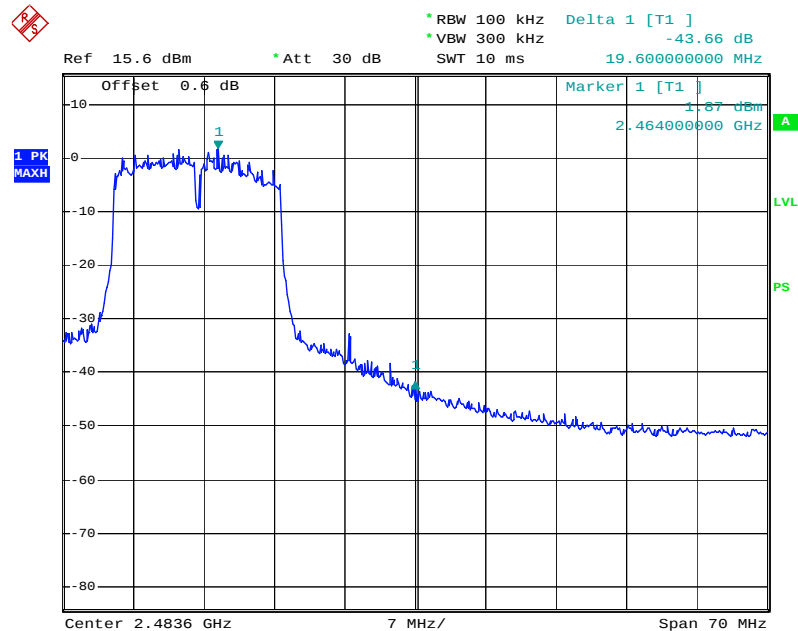
Date: 9.OCT.2009 17:09:11

802.11b: Band Edge, Right Side

Date: 9.OCT.2009 17:06:24

802.11g: Band Edge, Left Side

Date: 9.OCT.2009 17:00:08

802.11g: Band Edge, Right Side

Date: 9.OCT.2009 17:03:07

FCC §15.247(e) - POWER SPECTRAL DENSITY**Applicable Standard**

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. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-11-07	2009-11-06

* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) 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. (DTS)
4. Repeat above procedures until all frequencies measured were complete.

Test Data**Environmental Conditions**

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

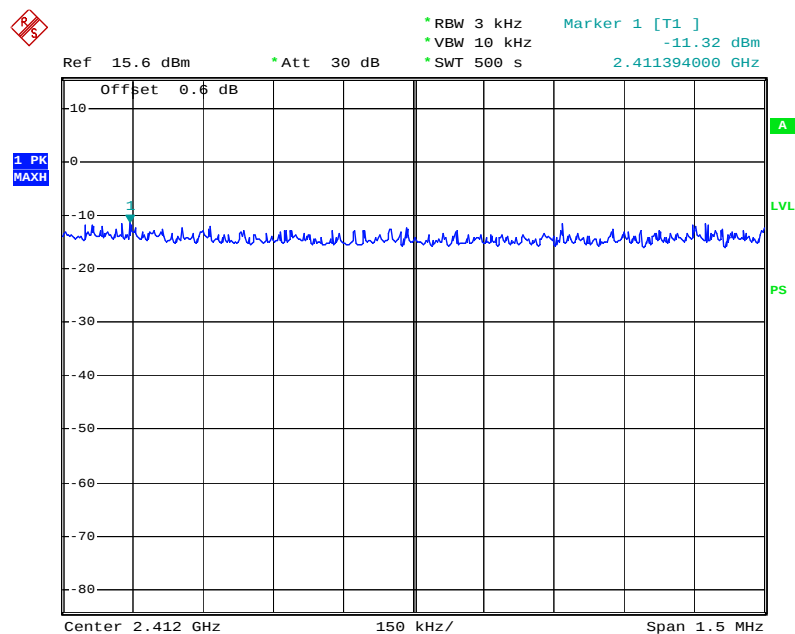
The testing was performed by Weir Zhong on 2009-10-10 to 2009-10-13.

Test Mode: Transmitting

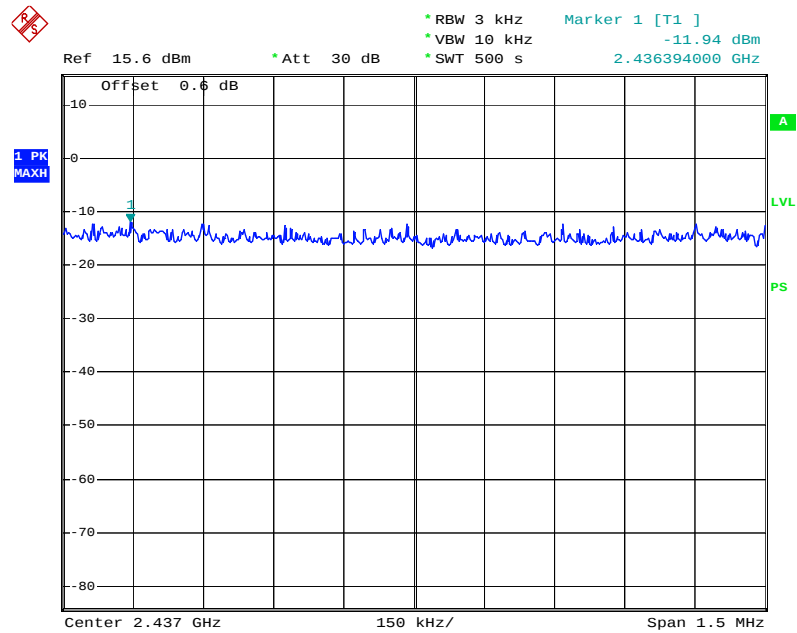
Test Result: Pass

Channel	Frequency (MHz)	Data Rate (Mbps)	Power Spectral Density (dBm/3kHz)	Part 15.247 Limit (dBm/3kHz)	Result
802.11b Mode					
Low	2412	11	-11.32	8	Pass
Middle	2437	11	-11.94	8	Pass
High	2462	11	-11.93	8	Pass
802.11g Mode					
Low	2412	54	-11.77	8	Pass
Middle	2437	54	-11.80	8	Pass
High	2462	54	-11.83	8	Pass

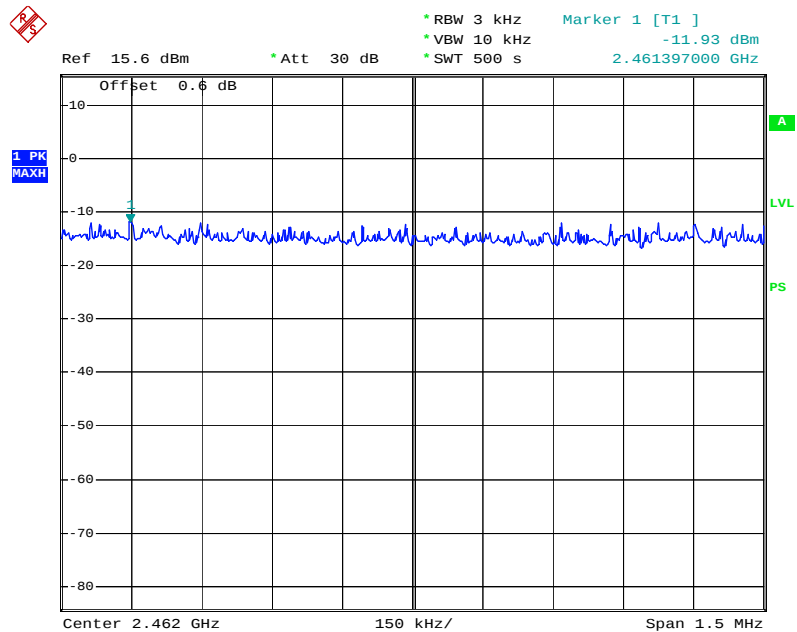
Power Spectral Density, 802.11b Low Channel



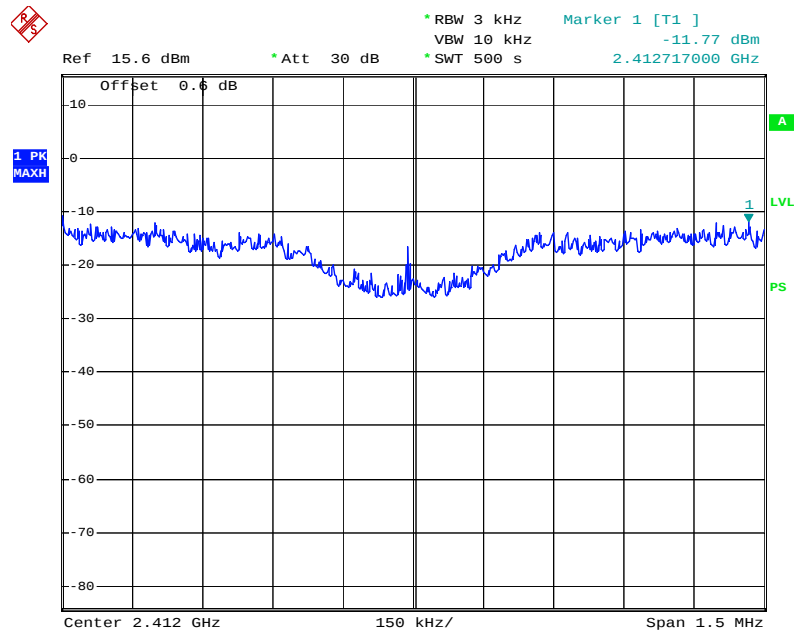
Date: 10.OCT.2009 12:42:34

Power Spectral Density, 802.11b Middle Channel

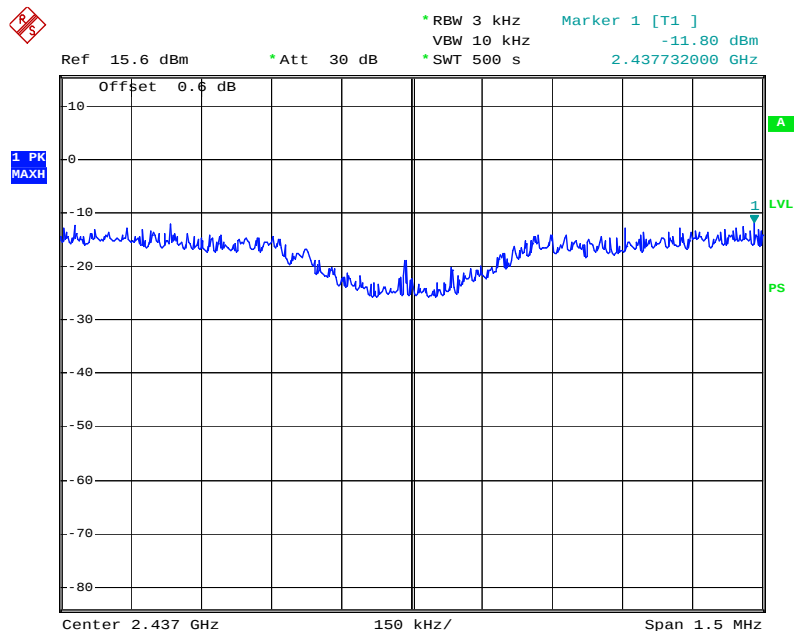
Date: 10.OCT.2009 12:23:36

Power Spectral Density, 802.11b High Channel

Date: 10.OCT.2009 11:55:59

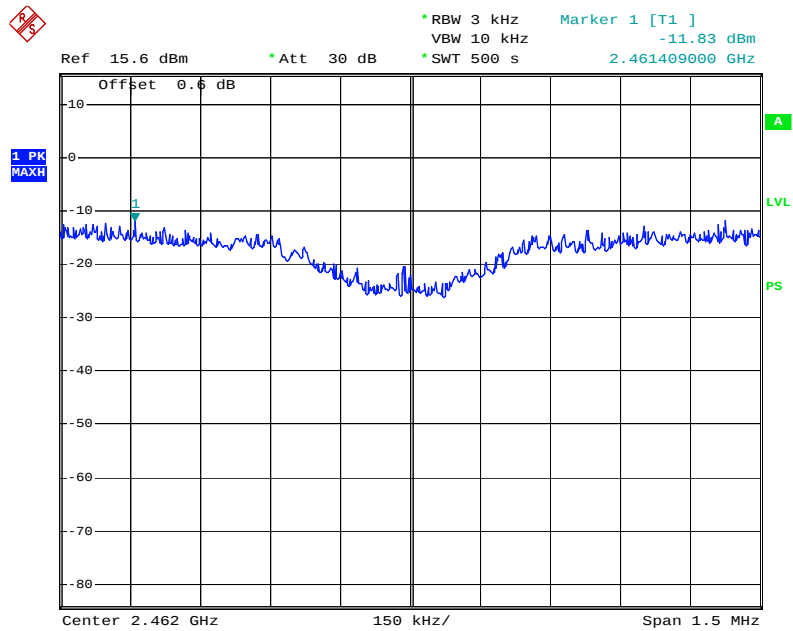
Power Spectral Density, 802.11g Low Channel

Date: 13.OCT.2009 17:11:05

Power Spectral Density, 802.11g Middle Channel

Date: 13.OCT.2009 17:33:42

Power Spectral Density, 802.11g High Channel



Date: 13.OCT.2009 18:15:49

DECLARATION LETTER



Company Address: 31 UBI Road 1, Aztech Building, Singapore 408694
Tel: +65 6594 2288
Fax: +65-6749 1198

Product Similarity Declaration

To Whom It May Concern,

We, Aztech Technologies Pte Ltd, hereby declare that the following ADSL2/2+ 4-Ports 802.11b/g:

Trade Name : Aztech

Model Name : DSL1000EW(L)

Are electrically identical in terms of Bill Of Material, Schematic, PCBA, design architecture on the 2 different samples submitted with different casing. We maintained the same model name, **DSL1000EW(L)** on the 2 different casings. Reason being we are selling the product for different market segment.

Please contact me if you have any question.

Signature:

A handwritten signature in black ink, appearing to read "Cij". The signature is stylized and cursive.

Print Name: Chng Tse Yin

Title: R&D engineer

Date: 2009-10-15

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