

FCC PART 15.247  
MEASUREMENT AND TEST REPORT

For  
**QVS Marketing Inc.**

10721 S Hidden Ridge Lane,  
Sandy, Utah 84092, USA

**FCC ID: YVK-802GAUVC**

<b>Report Type:</b> Original Report	<b>Product Type:</b> IEEE 802.11b/g WLAN USB Dongle
<b>Test Engineer:</b> Felix Li	<i>Felix Li</i>
<b>Report Number:</b> RSZ10091903	
<b>Report Date:</b> 2010-11-12	
<b>Reviewed By:</b> EMC Engineer	<i>Merry Zhao</i>
<b>Prepared By:</b> Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008	

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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

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### Product Description for Equipment under Test (EUT)

The *QVS Marketing Inc*'s product, model number: *TS-802GAU VC (FCC ID: YVK-802GAUVC)* or the "EUT" as referred to in this report is an *IEEE 802.11b/g WLAN USB dongle*. The EUT is measured approximately 8.8 cm (L) x 2.6 cm (W) x 1.05 cm (H), rated input voltage: DC 5V from PC.

*\*All measurement and test data in this report was gathered from production sample serial number: 1009068 (Assigned by BACL, Shenzhen). The EUT was received on 2010-09-19.*

### Objective

This Type approval report is prepared on behalf of *QVS Marketing Inc* 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)

No related submitted(s).

### 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.

### EUT Exercise Software

The test was performed under ZD121xEVL and ZD1211BWinPkgS\_6\_19\_0\_0 provided by the manufacturer

802.11b: The highest TX Power level 0D, data rate: 1 Mbps.

802.11g: The highest TX Power level 0F, data rate: 6 Mbps.

### Equipment Modifications

No modification was made to the unit tested.

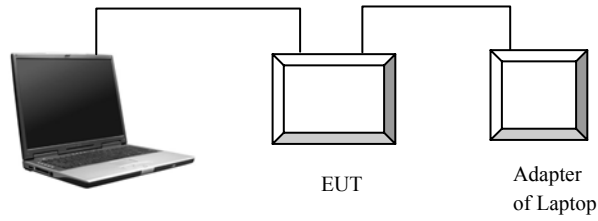
### Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
COMPAQ	Laptop	EVON610C	N/A	N/A

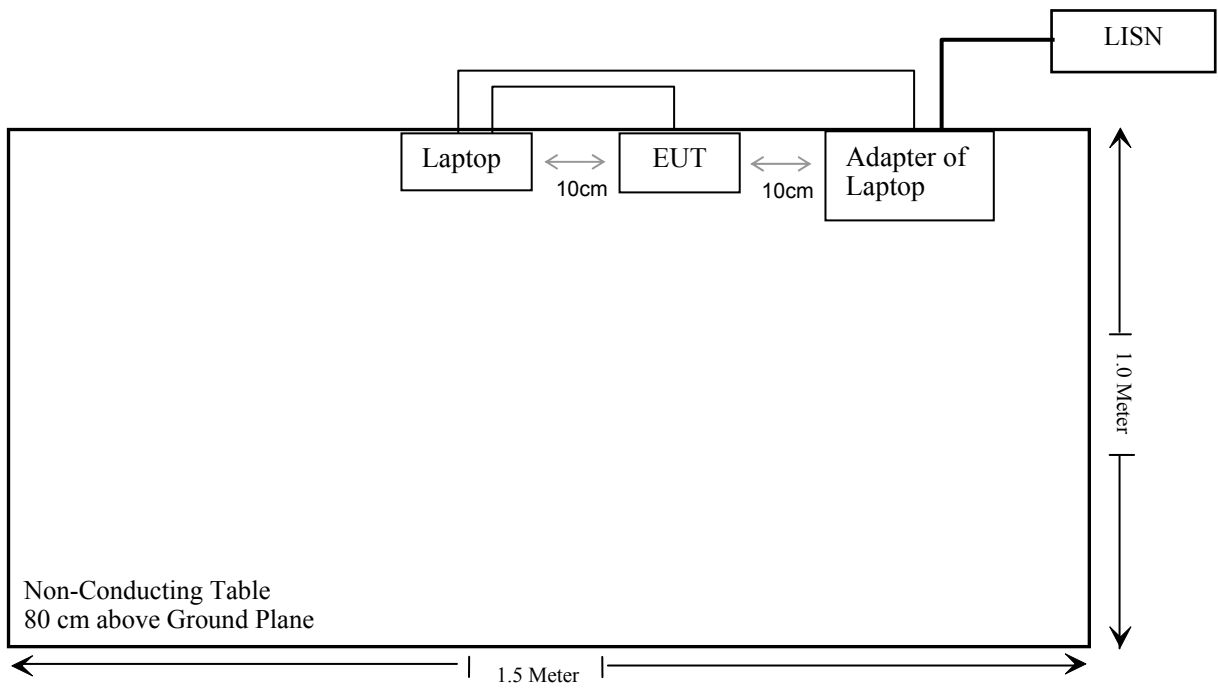
### External I/O Cable

Cable Description	Length (m)	From/Port	To
Unshielded Detachable USB Cable	0.8	USB port of EUT	Laptop

### 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), §2.1093	RF Exposure (SAR)	Compliance*
§15.203	Antenna Requirement	Compliance
§15.207 (a),	Conducted Emissions	Compliance
§15.247(d)	Spurious Emissions at Antenna Port	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions & Restricted Bands	Compliance
§15.247 (a)(2)	6 dB Bandwidth	Compliance
§15.247(b)(3)	Maximum Peak Output Power	Compliance
§15.247(d)	100kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

Note: Compliance\* please refer to SAR report: R1010266-SAR



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**FCC §15.247 (i) & §1.1307 (b) (1) & §2.1093- RF EXPOSURE**

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**Applicable Standard**

According to §15.247(e)(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 KDB 447498 D01 Mobile Portable RF Exposure v03r03, no SAR required if power is lower than the flowing threshold:

When routine evaluation is required for SAR and the output power is  $\leq 60/f(\text{GHz})$  mW, the test reduction and test exclusion procedures given herein, or in KDB 616217 or KDB 648474, are applicable.

A device may be used in portable exposure conditions with no restrictions on host platforms when either the source-based time-averaged output power is  $\leq 60/f(\text{GHz})$  mW or all measured 1-g SAR are  $< 0.4$  W/kg.10 When SAR evaluation is required, the most conservative exposure conditions for all expected operating configurations must be tested.

**Result**

The RF output power of EUT is over the threshold, SAR is required. Please refer to tSAR report released by BACL, report number: R1010266-SAR.

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## **FCC §15.203 - ANTENNA REQUIREMENT**

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### **Applicable Standard**

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 EUT has a PCB antenna, which complies with the Part 15.203. The maximum antenna gain is 0 dBi. Please see EUT photo for details.

**Result:** Compliant.

## FCC §15.207 (a) - CONDUCTED EMISSIONS

### Applicable Standard

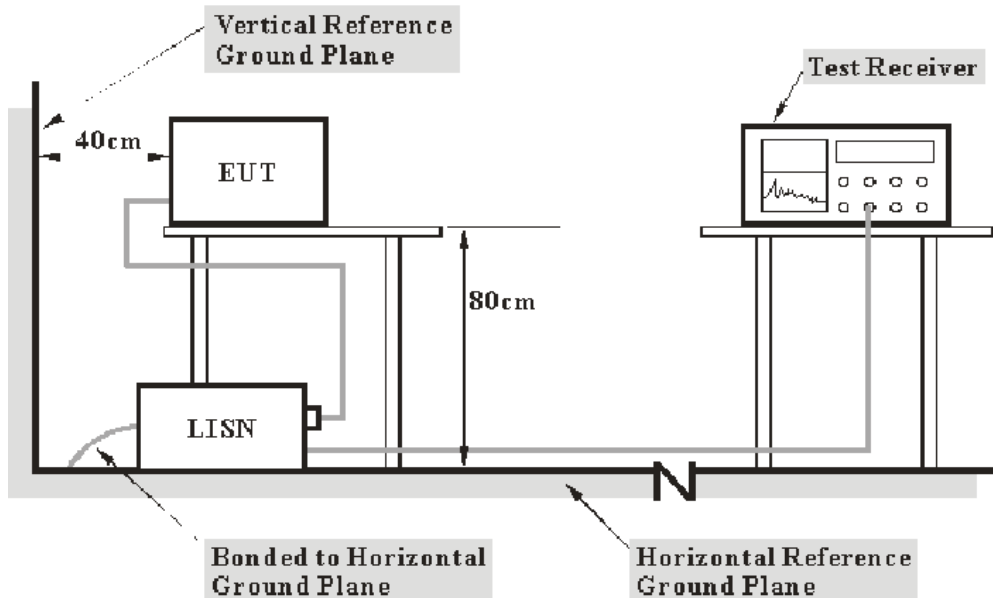
FCC §15.207

### 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  $\pm 2.4$  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 of laptop 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:

<i>Frequency Range</i>	<i>IF B/W</i>
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	2010-03-03	2011-03-02
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2010-03-09	2011-03-08

\* **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 of laptop was connected to the LISN.

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:

**15.28 dB at 0.220 MHz** in the **Line** conductor mode  
**14.57 dB at 0.225 MHz** in the **Neutral** conductor mode

## Test Data

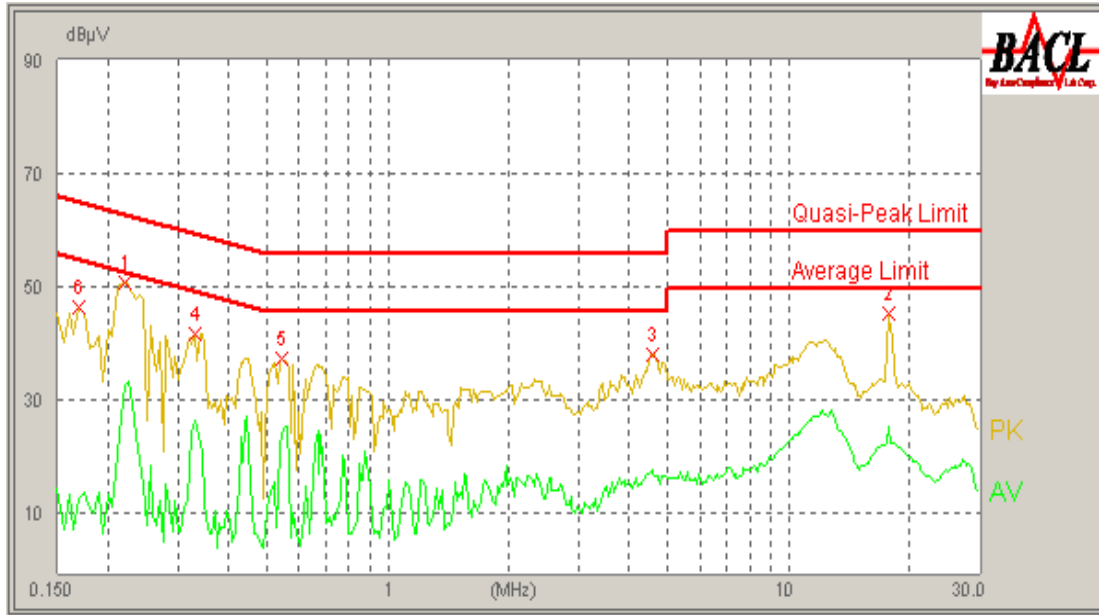
### Environmental Conditions

<b>Temperature:</b>	25 ° C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.0 kPa

*The testing was performed by Felix Li on 2010-10-14*

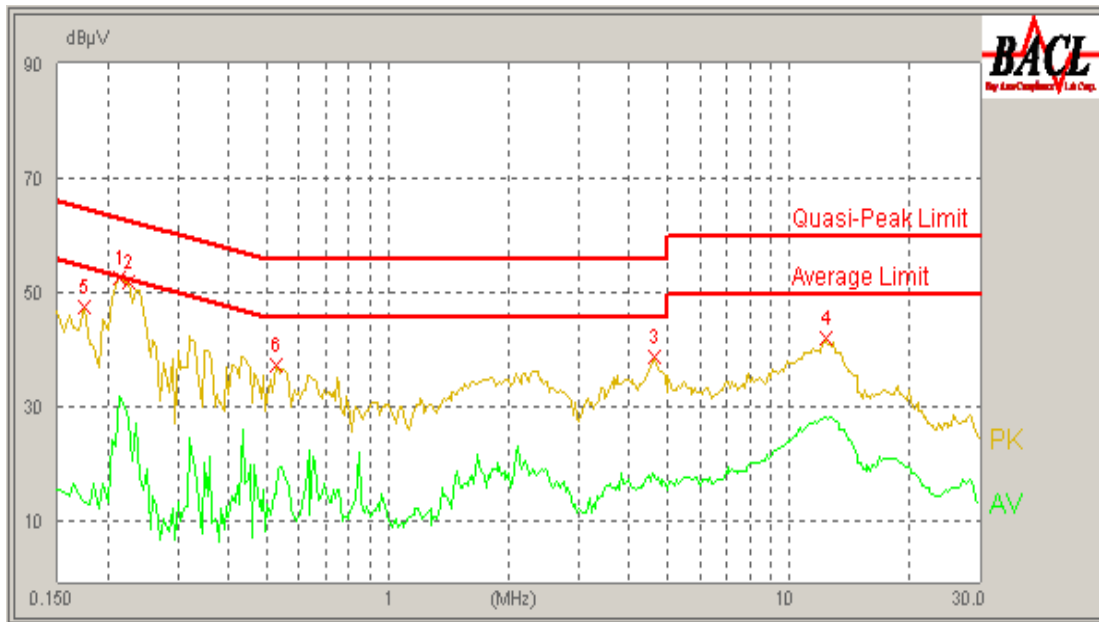
Test Mode: Transmitting (worst case)

AC 120 V/60 Hz, Line



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Correction Factor (dB)	Cord. Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave)
0.220	10.10	48.72	64.00	15.28	QP
0.220	10.10	32.98	54.00	21.02	Ave
0.330	10.00	39.28	60.86	21.58	QP
0.545	10.20	24.27	46.00	21.73	Ave
0.545	10.20	32.74	56.00	23.26	QP
0.330	10.00	26.71	50.86	24.15	Ave
17.725	10.10	25.63	50.00	24.37	Ave
0.170	10.10	38.93	65.43	26.50	QP
4.570	10.10	28.25	56.00	27.75	QP
4.565	10.10	18.22	46.00	27.78	Ave
17.725	10.10	27.64	60.00	32.36	QP
0.170	10.10	12.97	55.43	42.46	Ave

**AC 120 V/ 60 Hz, Neutral**



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Correction Factor (dB)	Cord. Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave)
0.225	10.10	49.29	63.86	14.57	QP
0.215	10.10	49.43	64.14	14.71	QP
12.340	10.10	28.56	50.00	21.44	Ave
0.215	10.10	32.13	54.14	22.01	Ave
4.610	10.10	31.75	56.00	24.25	QP
0.225	10.10	28.41	53.86	25.45	Ave
12.320	10.10	34.32	60.00	25.68	QP
0.175	10.10	38.96	65.29	26.33	QP
4.595	10.10	18.88	46.00	27.12	Ave
0.525	10.20	27.27	56.00	28.73	QP
0.525	10.20	15.27	46.00	30.73	Ave
0.175	10.10	13.93	55.29	41.36	Ave

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

### Applicable Standard

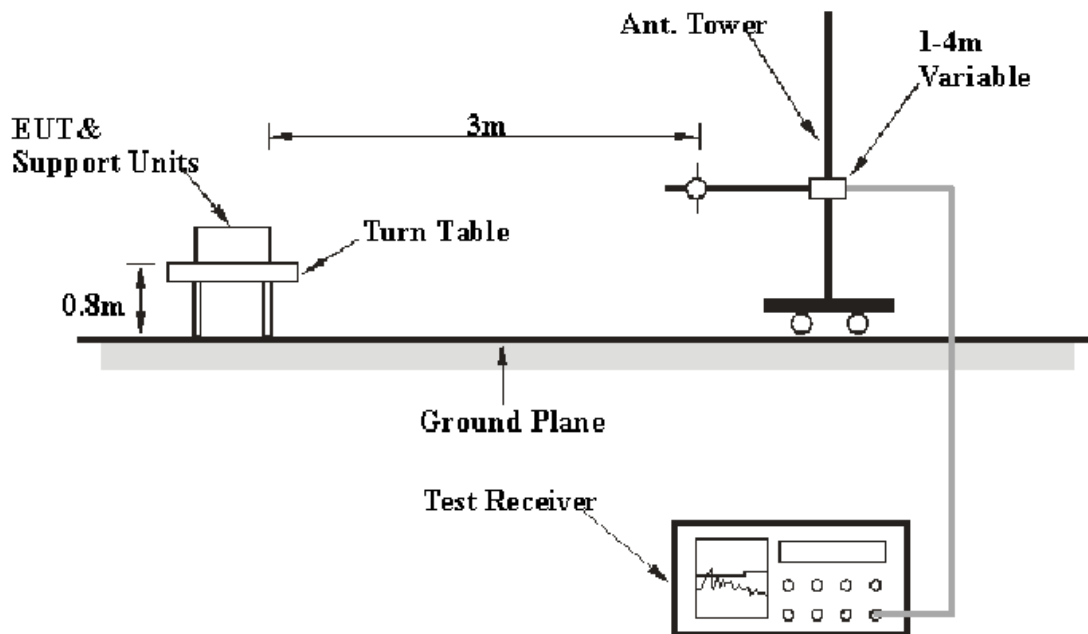
FCC §15.247 (d); §15.209; §15.205;

### 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  $\pm 4.0$  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:

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

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2010-08-02	2011-08-02
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2009-11-24	2010-11-24
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2010-03-11	2011-03-11
HP	Amplifier	2VA-213+	T-E27H	2010-03-08	2011-03-08
Sunol Sciences	Horn Antenna	DRH-118	A052604	2010-05-05	2011-05-04
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-08	2011-07-08

\* **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 was 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 (worst case): **3.6 dB** at **904.612500 MHz** in the **Horizontal** polarization

802.11g (worst case): **5.0 dB** at **797.663500 MHz** in the **Horizontal** polarization

### Above 1 GHz:

802.11b (High Channel): **11.26 dB** at **4924.00 MHz** in the **Vertical** polarization

802.11g (Low Channel): **12.92 dB** at **4824.00 MHz** in the **Horizontal** polarization

## Test Data

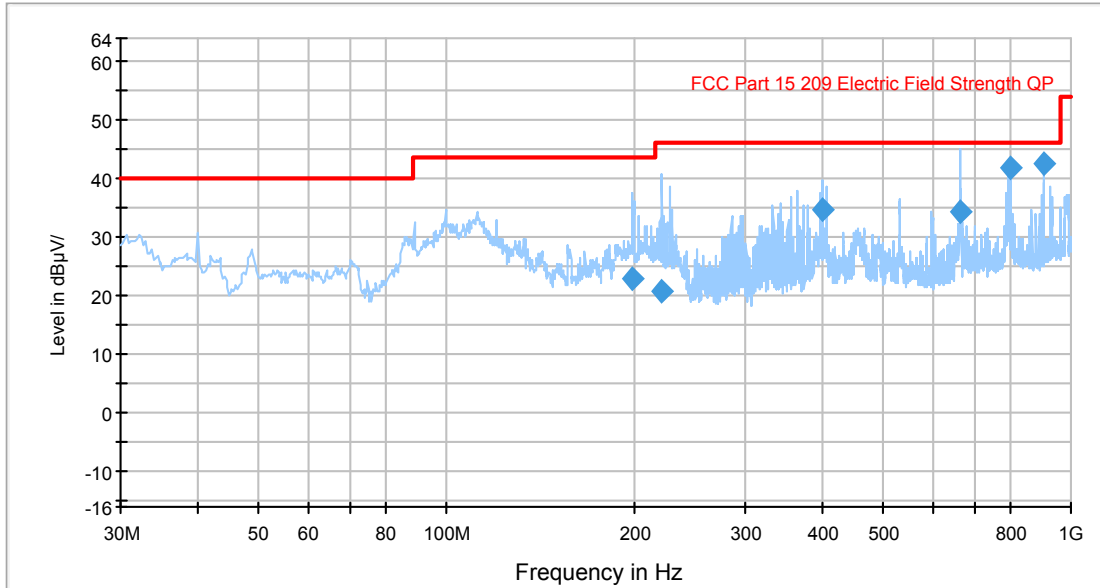
### Environmental Conditions

<b>Temperature:</b>	25 ° C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.0 kPa

*The testing was performed by Felix Li on 2010-10-11*

**30-1000 MHz:**

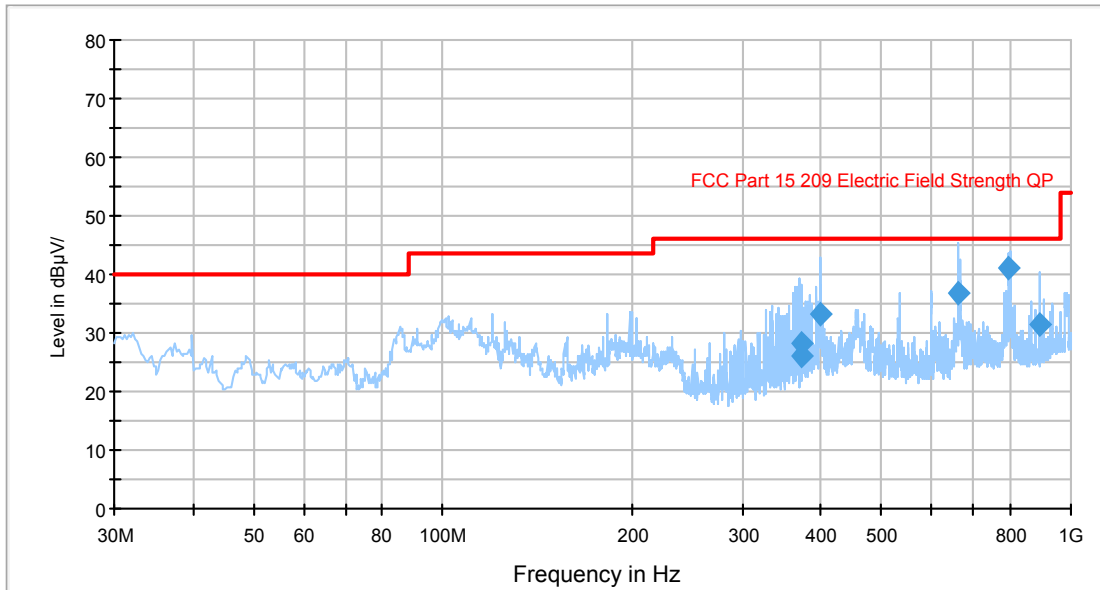
*Test Mode: Transmitting (802.11b worst case)*



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
904.612500	42.4	203.0	H	177.0	-0.7	46.0	3.6*
797.699250	41.9	104.0	H	43.0	-1.9	46.0	4.1
399.000750	34.5	104.0	H	176.0	-10.0	46.0	11.5
664.394250	34.4	102.0	V	0.0	-4.3	46.0	11.6
197.742250	22.9	163.0	H	198.0	-14.5	43.5	20.6
220.951000	20.8	123.0	V	201.0	-14.0	46.0	25.2

*\*With measurement uncertainty!*

Test Mode: Transmitting (802.11g worst case)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
797.663500	41.0	105.0	H	60.0	-1.9	46.0	5.0
663.572750	36.7	123.0	V	27.0	-4.3	46.0	9.3
399.202250	33.2	106.0	H	173.0	-10.0	46.0	12.8
891.268250	31.3	401.0	H	283.0	-1.2	46.0	14.7
372.542250	28.2	291.0	H	349.0	-10.6	46.0	17.8
371.174000	26.2	104.0	H	27.0	-10.6	46.0	19.8

**Above 1 GHz:**

802.11b Mode:

Indicated		Detector (PK/Ave)	Table Angle Degree	Test Antenna		Correction Factor			FCC Part 15.247/15.209			
Frequency (MHz)	S.A. Reading (dBμV)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre- Amp. (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
Low Channel (2412 MHz)												
2385.35	34.10	Ave	315	1.76	H	30.3	3.03	27.54	39.89	54	14.11	spurious
4824.00	30.59	Ave	189	1.62	H	31.2	4.3	26.7	39.39	54	14.61	harmonic
2385.83	33.86	Ave	105	2.01	V	30	3.03	27.54	39.35	54	14.65	spurious
4824.00	26.57	Ave	230	2.00	V	31.2	4.3	26.7	35.37	54	18.63	harmonic
2385.83	47.06	PK	105	2.01	V	30	3.03	27.54	52.55	74	21.45	spurious
2385.35	46.70	PK	315	1.76	H	30.3	3.03	27.54	52.49	74	21.51	spurious
4824.00	38.44	PK	230	2.00	V	31.2	4.3	26.7	47.24	74	26.76	harmonic
4824.00	37.97	PK	189	1.62	H	31.2	4.3	26.7	46.77	74	27.23	harmonic
Middle Channel (2437 MHz)												
4874.00	33.49	Ave	271	1.50	H	31.2	4.3	26.7	42.29	54	11.71	harmonic
4874.00	29.19	Ave	222	2.19	V	31.2	4.3	26.7	37.99	54	16.01	harmonic
4874.00	39.81	PK	271	1.50	H	31.2	4.3	26.7	48.61	74	25.39	harmonic
4874.00	39.80	PK	222	2.19	V	31.2	4.3	26.7	48.6	74	25.4	harmonic
High Channel (2462 MHz)												
4924.00	33.04	Ave	230	1.77	V	31.9	4.4	26.6	42.74	54	11.26	harmonic
4924.00	31.41	Ave	195	1.41	H	31.9	4.4	26.6	41.11	54	12.89	harmonic
2498.64	33.78	Ave	305	1.75	H	30.3	3.2	27.54	39.74	54	14.26	spurious
2491.50	33.86	Ave	42	1.54	V	30	3.2	27.54	39.52	54	14.48	spurious
2491.50	47.54	PK	42	1.54	V	30	3.2	27.54	53.2	74	20.8	spurious
2498.64	46.65	PK	305	1.75	H	30.3	3.2	27.54	52.61	74	21.39	spurious
4924.00	42.50	PK	230	1.77	V	31.9	4.4	26.6	52.2	74	21.8	harmonic
4924.00	41.66	PK	195	1.41	H	31.9	4.4	26.6	51.36	74	22.64	harmonic

**802.11g Mode:**

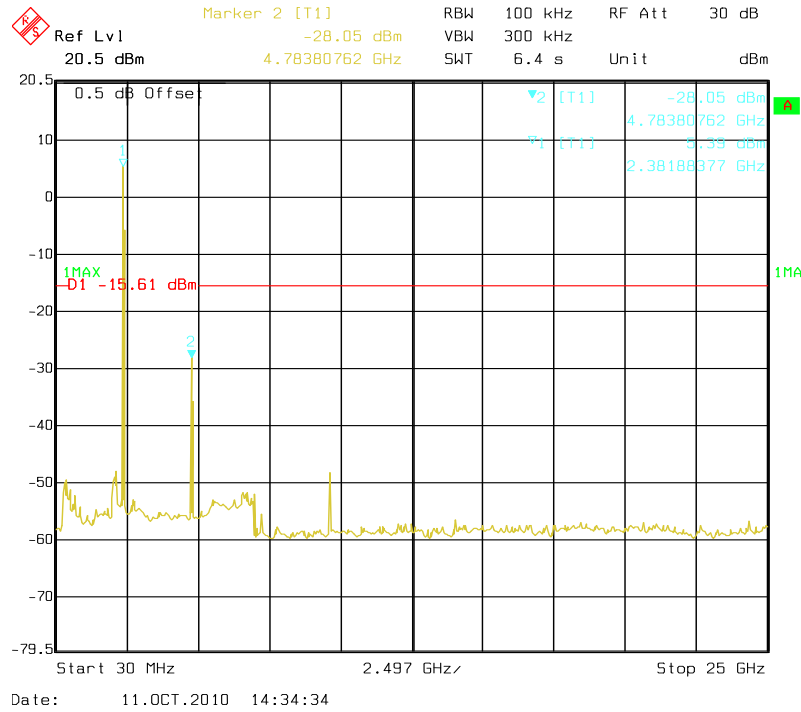
Indicated		Detector (PK/Ave)	Table Angle Degree	Test Antenna		Correction Factor			FCC Part 15.247/15.209			
Frequency (MHz)	S.A. Reading (dB $\mu$ V)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre- Amp. (dB)	Cord. Amp. (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Comment
Low Channel (2412 MHz)												
4824.00	32.28	Ave	189	1.62	H	31.2	4.3	26.7	41.08	54	12.92	harmonic
4824.00	30.04	Ave	230	2.00	V	31.2	4.3	26.7	38.84	54	15.16	harmonic
2389.19	25.17	Ave	247	1.65	V	30	3.03	27.54	30.66	54	23.34	spurious
4824.00	40.00	PK	230	2.00	V	31.2	4.3	26.7	48.8	74	25.20	harmonic
4824.00	39.87	PK	189	1.62	H	31.2	4.3	26.7	48.67	74	25.33	harmonic
2389.19	42.73	PK	247	1.65	V	30	3.03	27.54	48.22	74	25.78	spurious
2389.03	17.26	Ave	125	1.98	H	30.3	3.03	27.54	23.05	54	30.95	spurious
2389.03	34.08	PK	125	1.98	H	30.3	3.03	27.54	39.87	74	34.13	spurious
Middle Channel (2437 MHz)												
4874.00	26.42	Ave	222	2.19	V	31.2	4.3	26.7	35.22	54	18.78	harmonic
4874.00	24.58	Ave	271	1.50	H	31.2	4.3	26.7	33.38	54	20.62	harmonic
4874.00	40.73	PK	222	2.19	V	31.2	4.3	26.7	49.53	74	24.47	harmonic
4874.00	40.51	PK	271	1.50	H	31.2	4.3	26.7	49.31	74	24.69	harmonic
High Channel (2462 MHz)												
4924.00	23.60	Ave	230	1.77	V	31.9	4.4	26.6	33.3	54	20.70	harmonic
4924.00	42.67	PK	230	1.77	V	31.9	4.4	26.6	52.37	74	21.63	harmonic
4924.00	41.90	PK	195	1.41	H	31.9	4.4	26.6	51.6	74	22.40	harmonic
4924.00	21.14	Ave	195	1.41	H	31.9	4.4	26.6	30.84	54	23.16	harmonic
2483.89	43.11	PK	177	1.59	H	30.9	3.2	27.54	49.67	74	24.33	spurious
2484.39	42.91	PK	246	1.64	V	30.3	3.2	27.54	48.87	74	25.13	spurious
2484.39	19.59	Ave	246	1.64	V	30.3	3.2	27.54	25.55	54	28.45	spurious
2483.89	17.03	Ave	177	1.59	H	30.9	3.2	27.54	23.59	54	30.41	spurious

**Antenna Port Conducted Spurious Emissions**

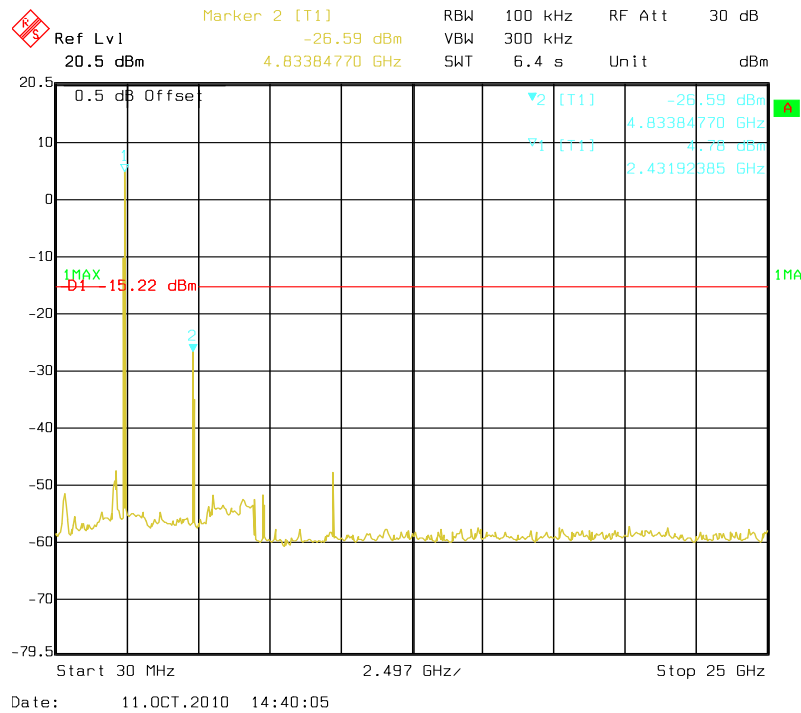
<b>Channel Frequency (MHz)</b>	<b>Delta Value (dBc)</b>	<b>Limit (dBc)</b>	<b>Ref. plot</b>	<b>Result</b>
802.11b mode				
2412	33.44	20	Low channel	Pass
2437	31.37	20	Middle channel	Pass
2462	31.00	20	High Channel	Pass
802.11g mode				
2412	36.77	20	Low channel	Pass
2437	38.19	20	Middle channel	Pass
2462	35.61	20	High Channel	Pass

Please refer to the following plots.

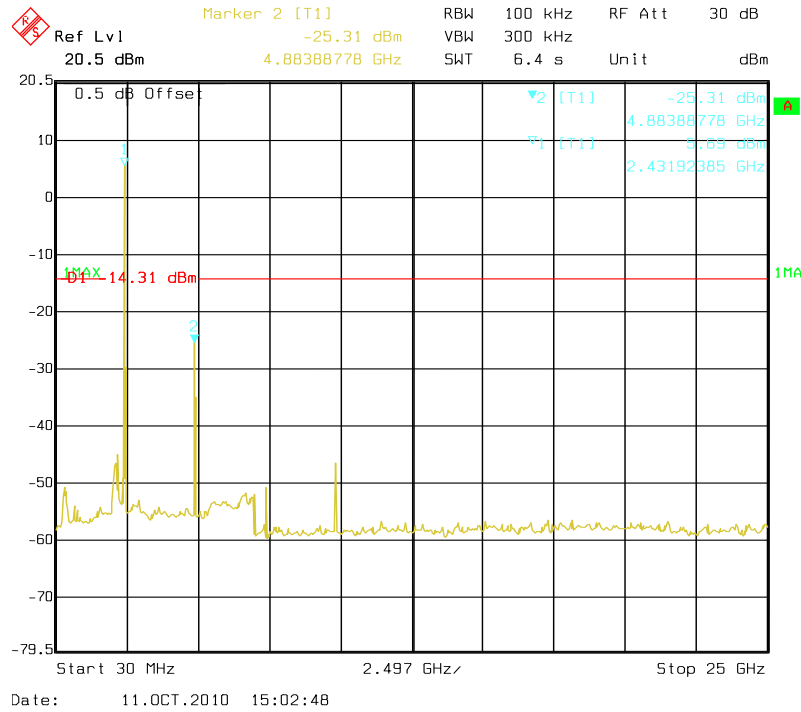
### 802.11b Low Channel



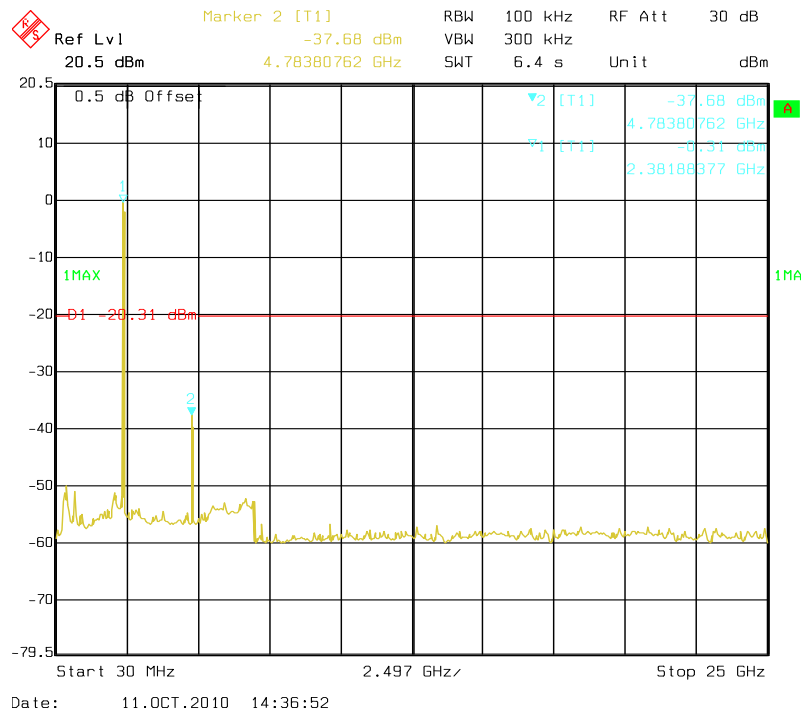
### 802.11b Middle Channel



### 802.11b High Channel

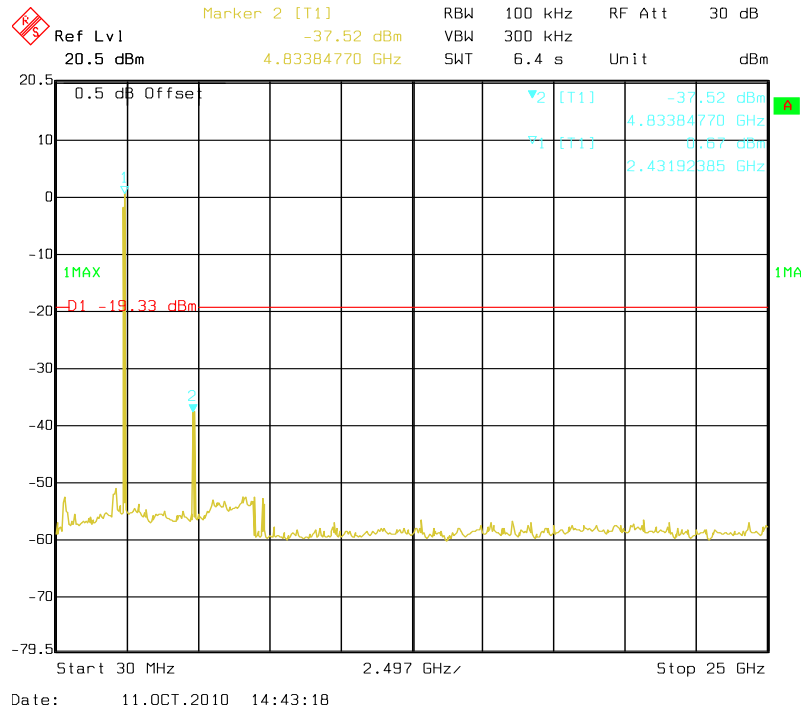


### 802.11g Low Channel

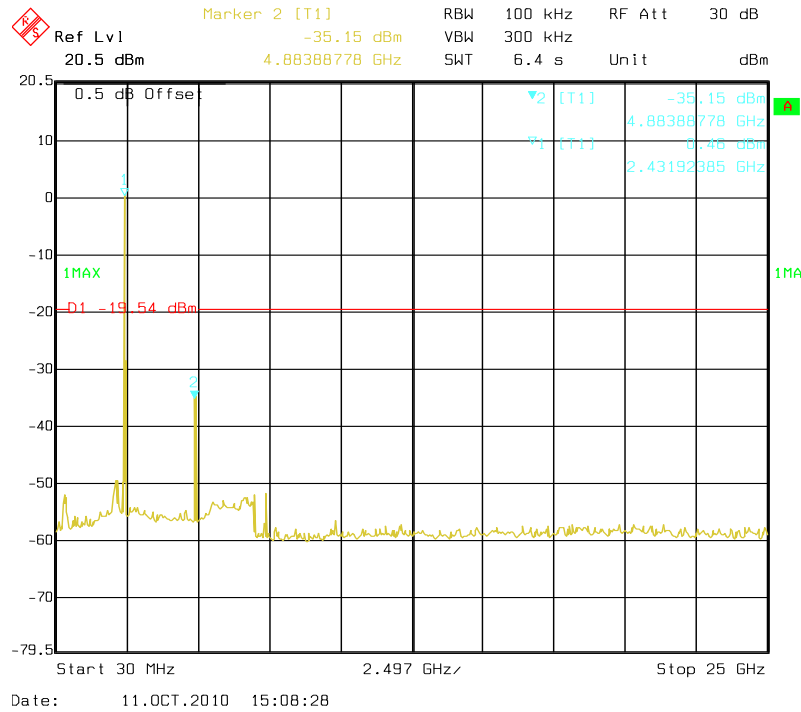




### 802.11g Middle Channel



### 802.11g High Channel



## FCC §15.247(a) (2) – 6 dB 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.

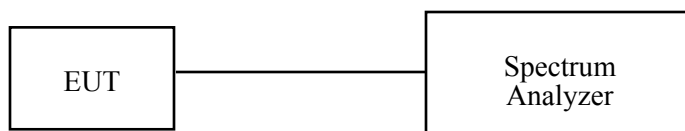
### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2009-11-24	2010-11-24

\* **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

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.0 kPa

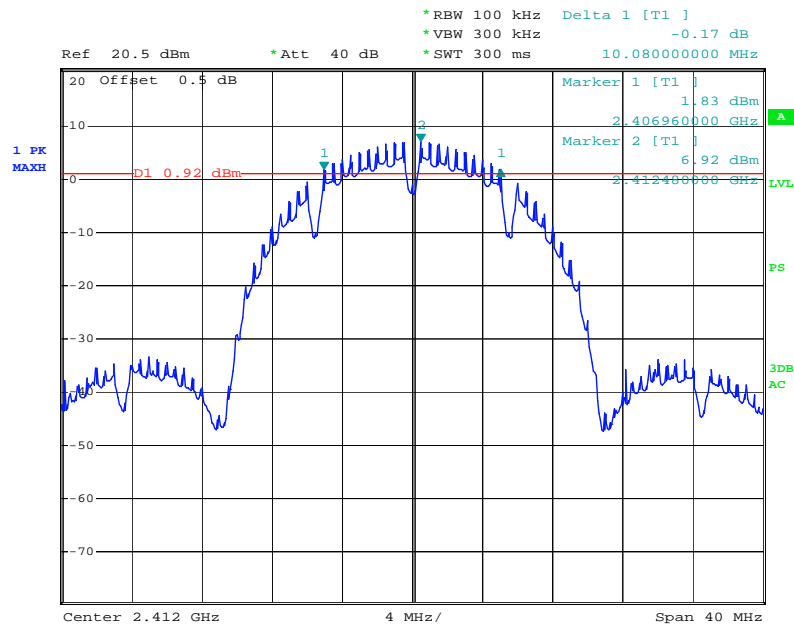
*The testing was performed by Felix Li on 2010-10-10.*

**Test Result:** Pass.

Please refer to the following tables and plots.

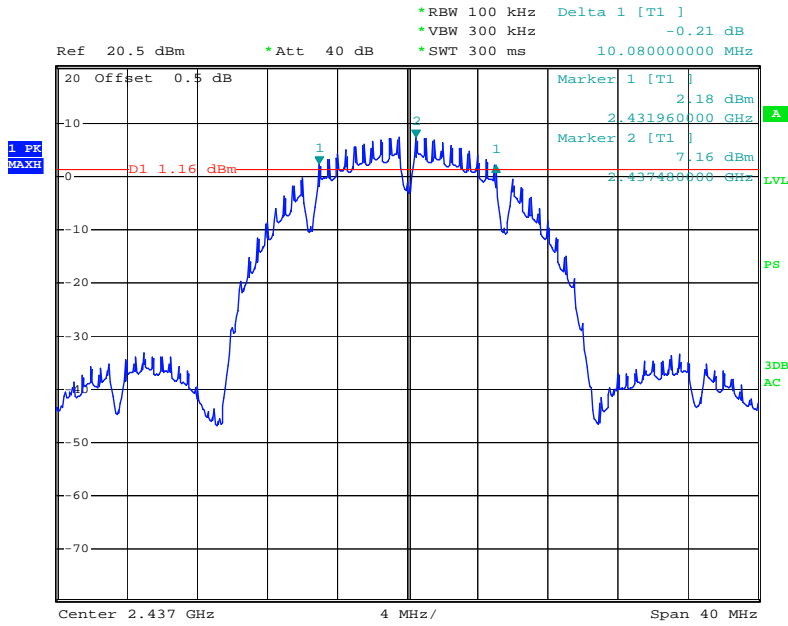
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (kHz)
802.11b mode			
Low	2412	10.08	> 500
Middle	2437	10.08	> 500
High	2462	10.08	> 500
802.11g mode			
Low	2412	16.64	> 500
Middle	2437	16.60	> 500
High	2462	16.64	> 500

**802.11b Low Channel**



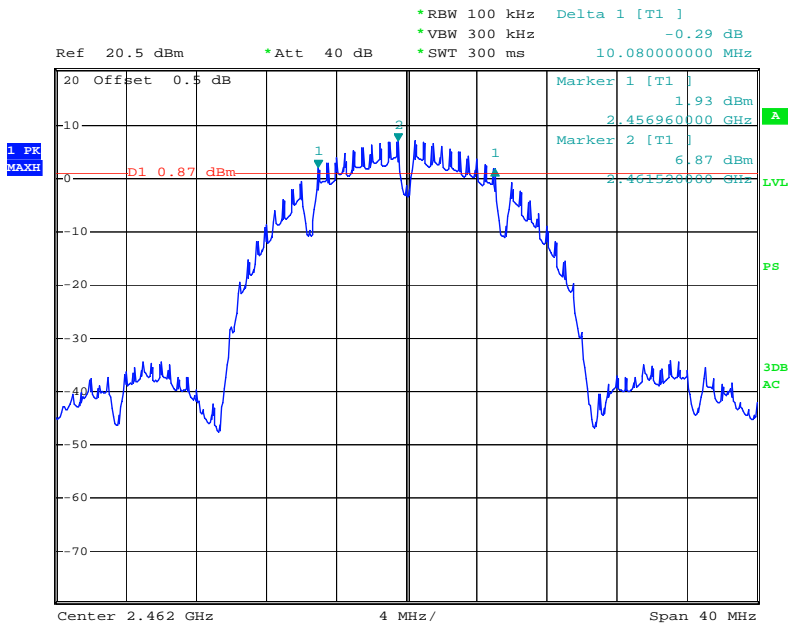
Date: 10.OCT.2010 08:17:40

### 802.11b Middle Channel



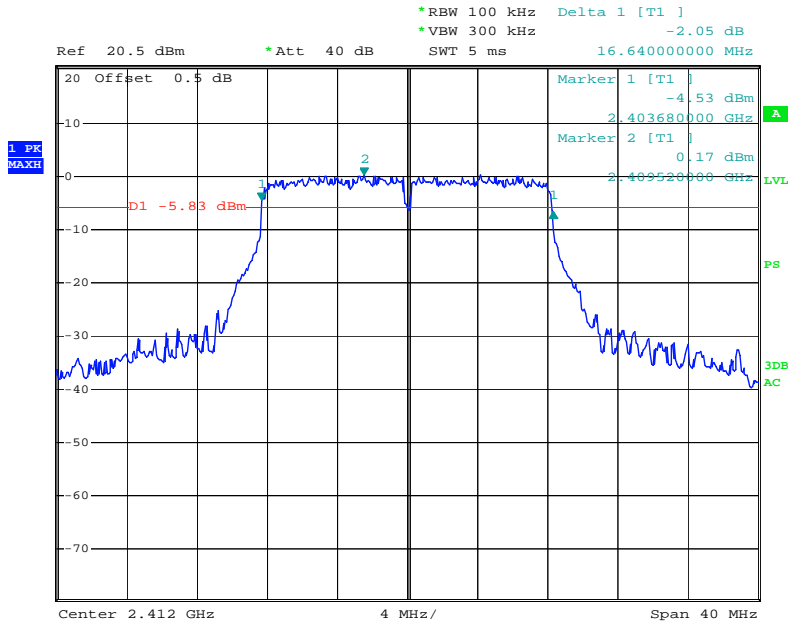
Date: 10.OCT.2010 08:21:57

### 802.11b High Channel



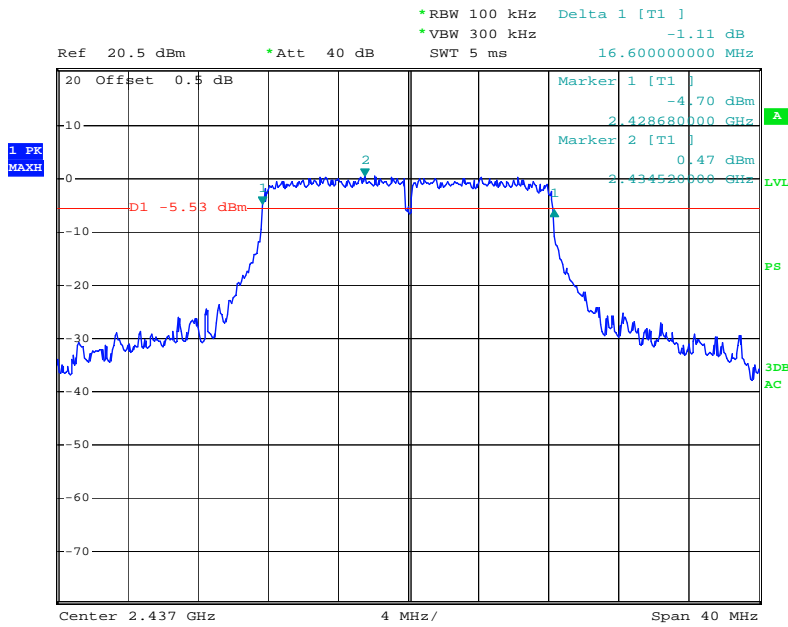
Date: 10.OCT.2010 08:24:24

### 802.11g Low Channel



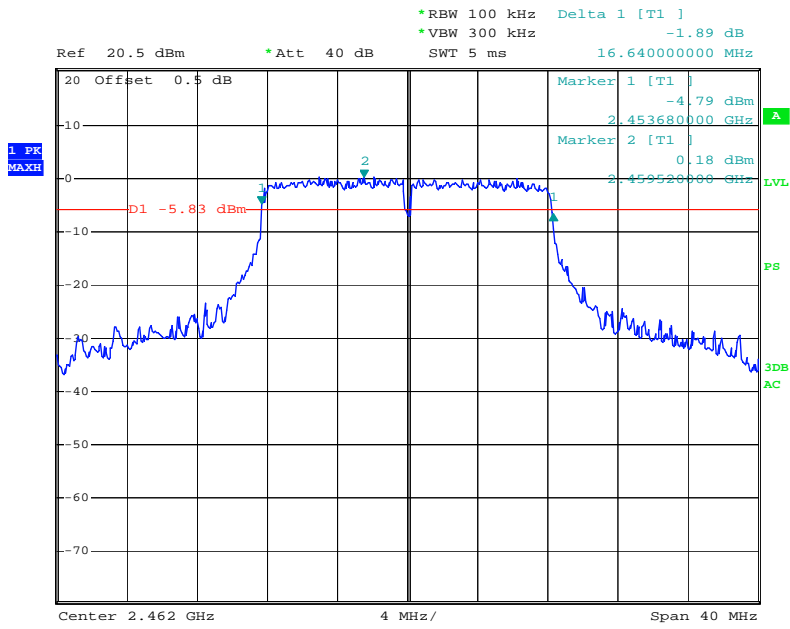
Date: 10.OCT.2010 08:32:04

### 802.11g Middle Channel



Date: 10.OCT.2010 08:34:42

### 802.11g High Channel



Date: 10.OCT.2010 08:41:05

## 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.

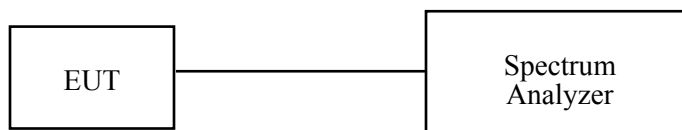
### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2009-11-24	2010-11-24

\* **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:	100.0 kPa

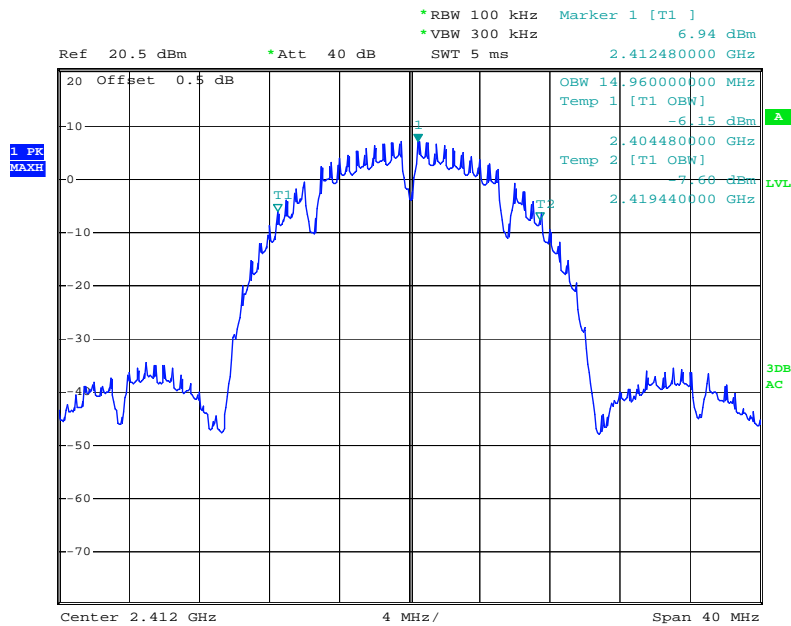
*The testing was performed by Felix Li on 2010-10-14*

*Test Mode: Transmitting*

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)
802.11b mode			
Low	2412	16.00	30
Middle	2437	15.12	30
High	2462	15.31	30
802.11g mode			
Low	2412	14.11	30
Middle	2437	15.14	30
High	2462	15.14	30

**802.11b Mode:**

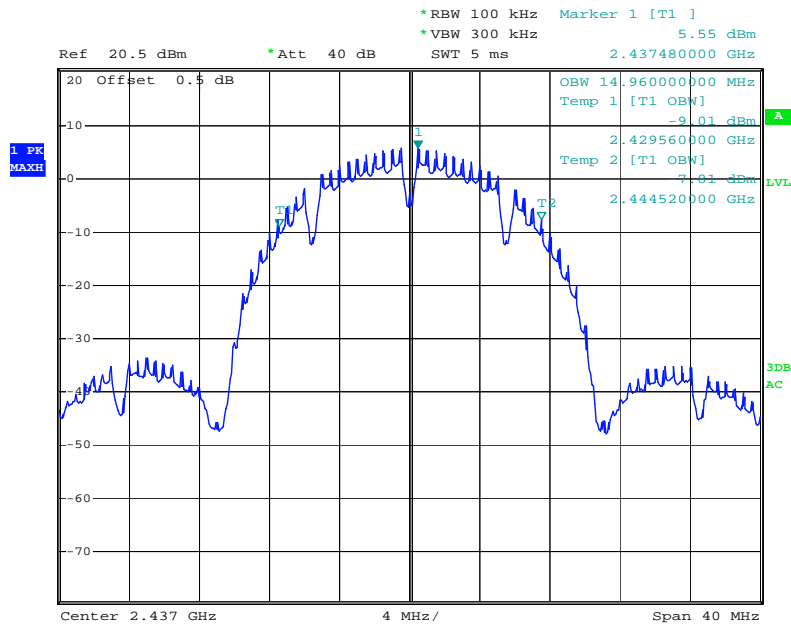
**99% Occupied Bandwidth, Low Channel**



Date: 14.OCT.2010 16:22:10

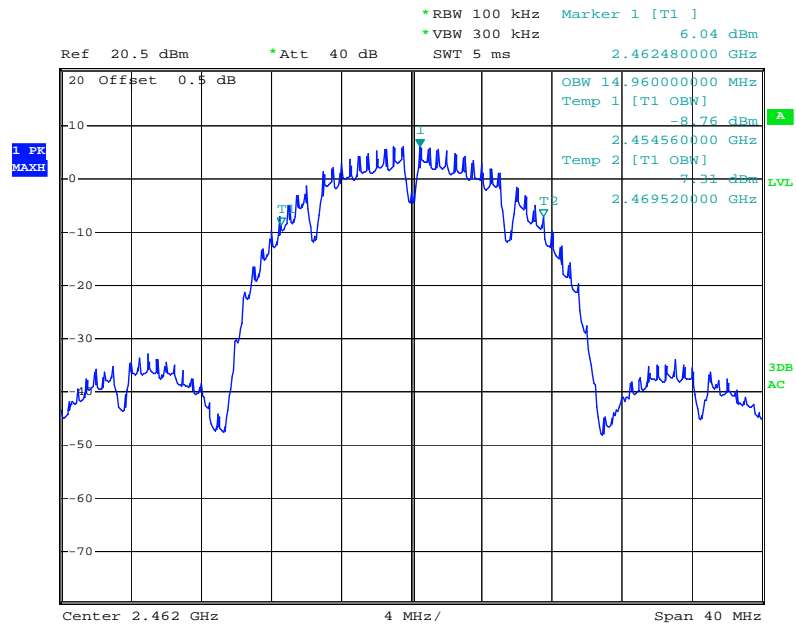


### 99% Occupied Bandwidth, Middle Channel



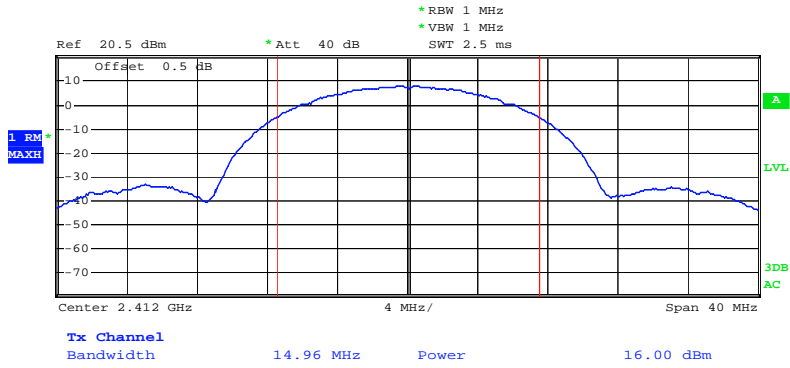
Date: 14.OCT.2010 16:01:56

### 99% Occupied Bandwidth, High Channel



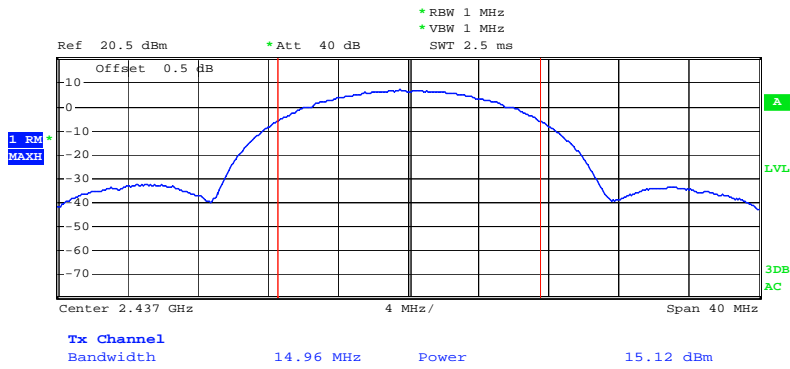
Date: 14.OCT.2010 16:08:55

### RF Output Power, Low Channel



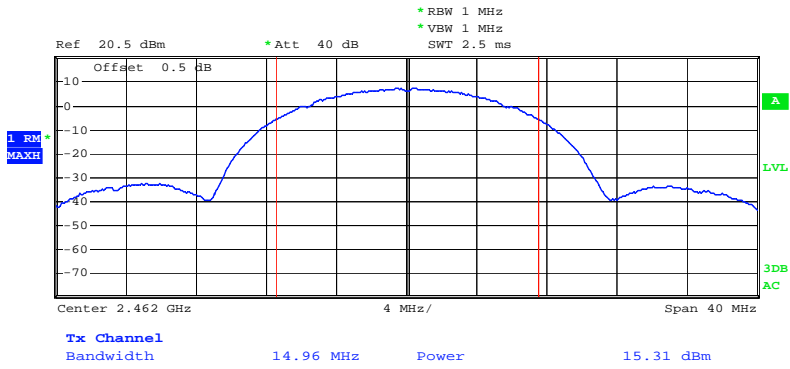
Date: 14.OCT.2010 16:23:08

### RF Output Power, Middle Channel



Date: 14.OCT.2010 16:07:15

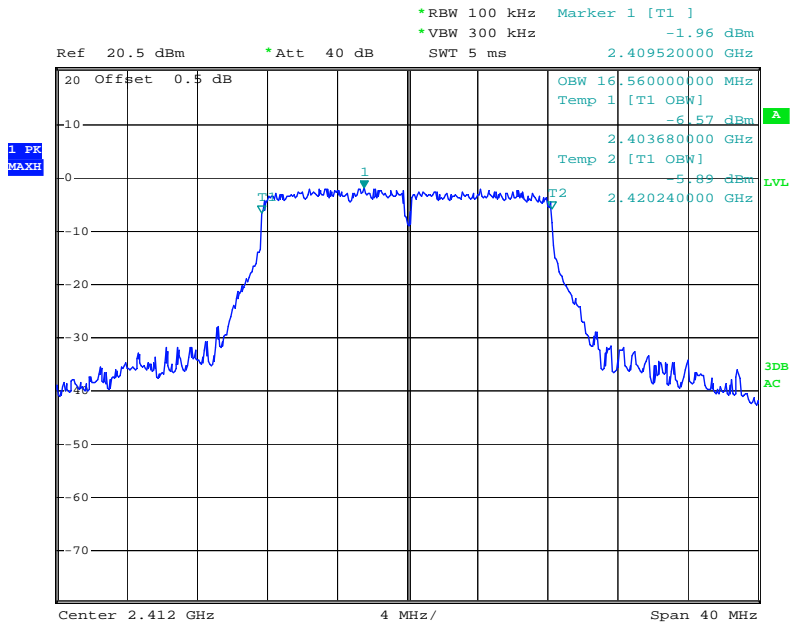
### RF Output Power, High Channel



Date: 14.OCT.2010 16:09:51

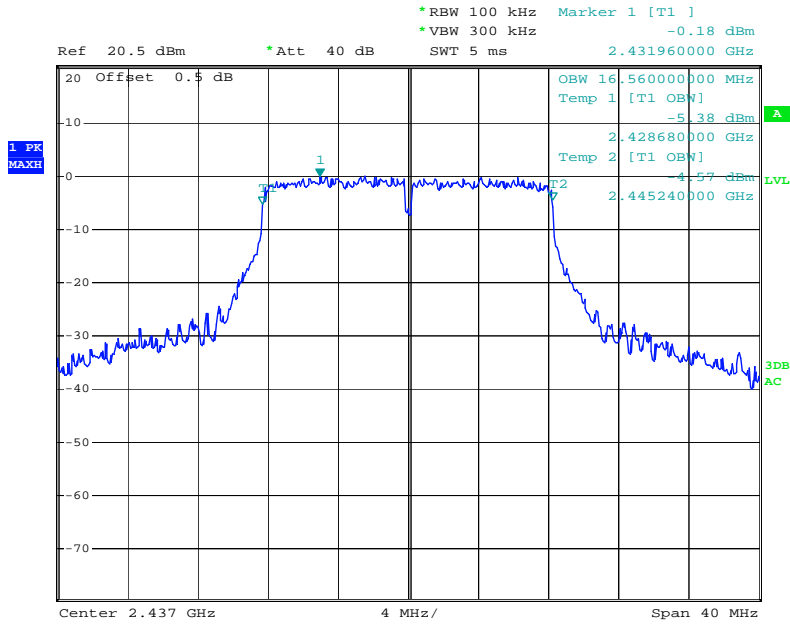
### 802.11g Mode:

### 99% Occupied Bandwith, Low Channel



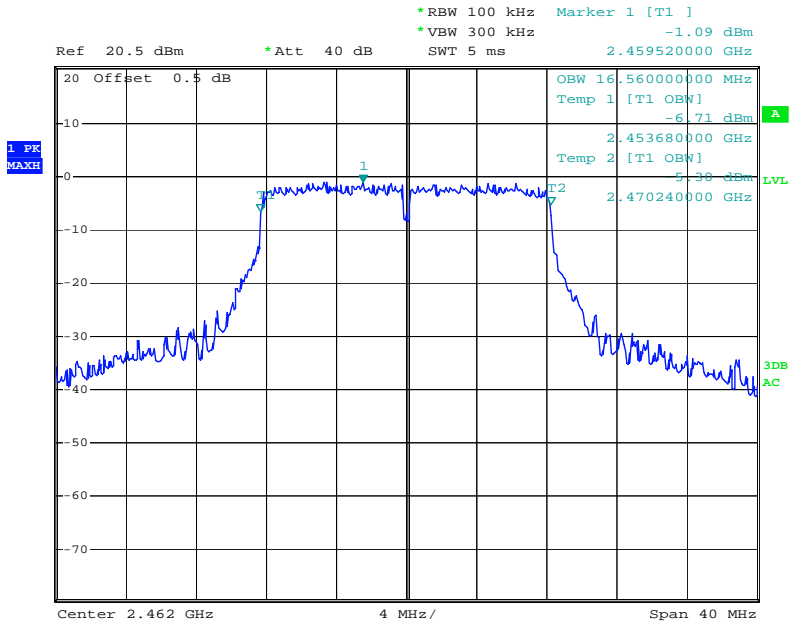
Date: 14.OCT.2010 16:18:51

### 99% Occupied Bandwidth, Middle Channel



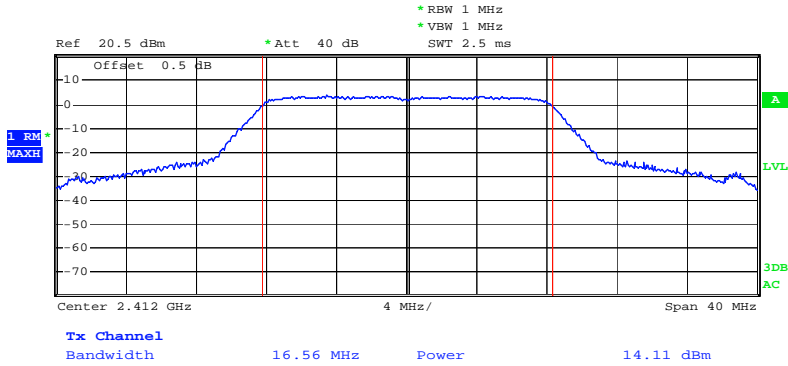
Date: 14.OCT.2010 16:15:49

### 99% Occupied Bandwidth, High Channel



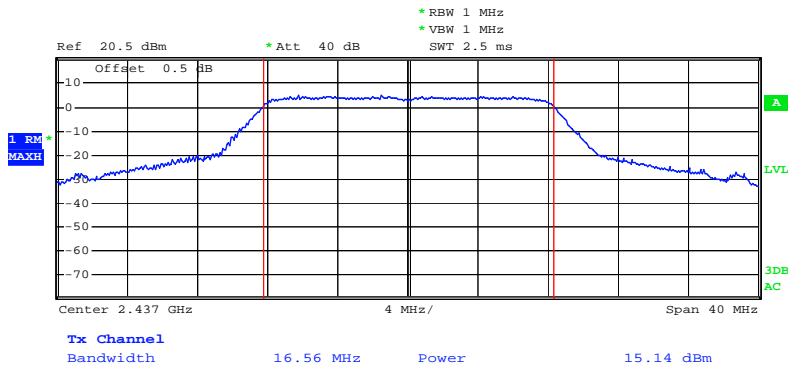
Date: 14.OCT.2010 16:11:29

### RF Output Power, Low Channel



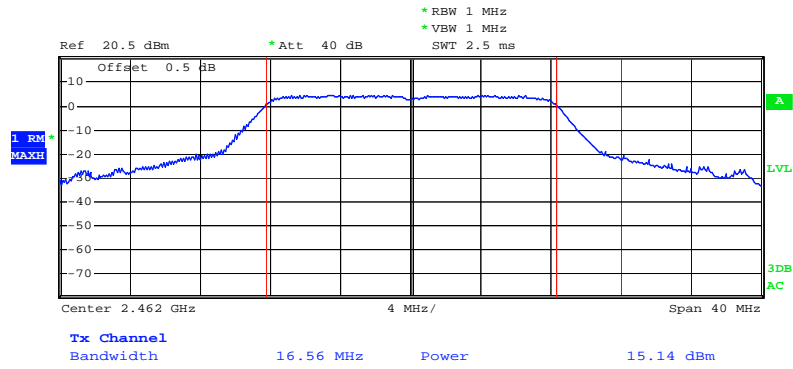
Date: 14.OCT.2010 16:20:02

### RF Output Power, Middle Channel



Date: 14.OCT.2010 16:17:20

### RF Output Power, High Channel



Date: 14.OCT.2010 16:13:13

## **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**

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>	<b>Calibration Due Date</b>
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2009-11-24	2010-11-24

\* **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**

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.0 kPa

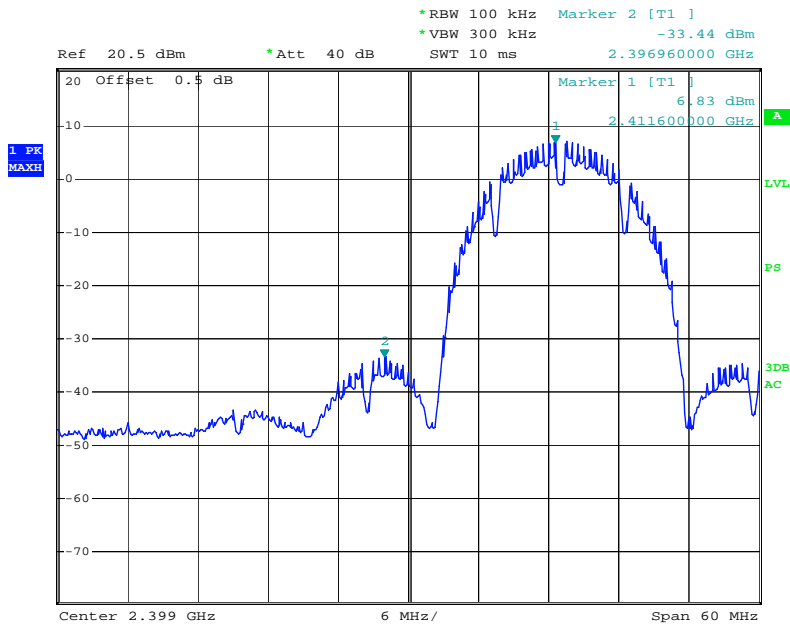
*The testing was performed by Felix Li on 2010-10-10*

**Test Result:** *Compliant.*

Frequency (MHz)	Delta Peak to band emission (dBc)	Limit (dBc)
802.11b mode		
2396.96	40.37	20
2487.32	51.62	20
802.11g mode		
2399.60	29.98	20
2484.68	36.98	20

Please refer to following plots.

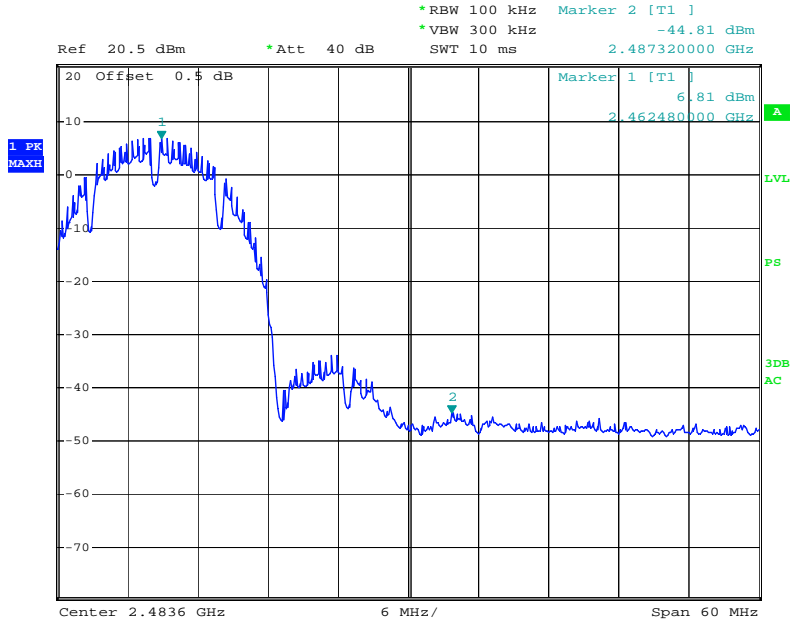
**802.11b: Band Edge, Left Side**



Date: 10.OCT.2010 08:51:21

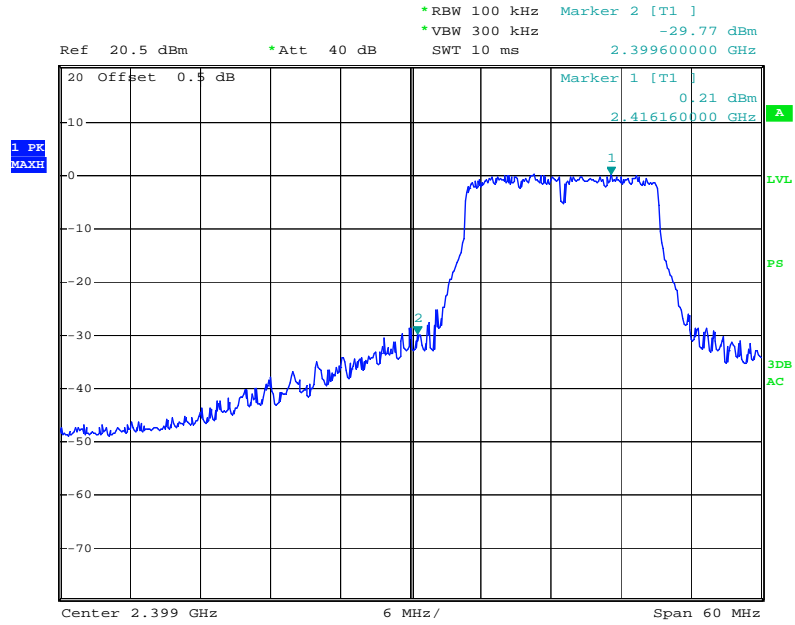


### 802.11b: Band Edge, Right Side



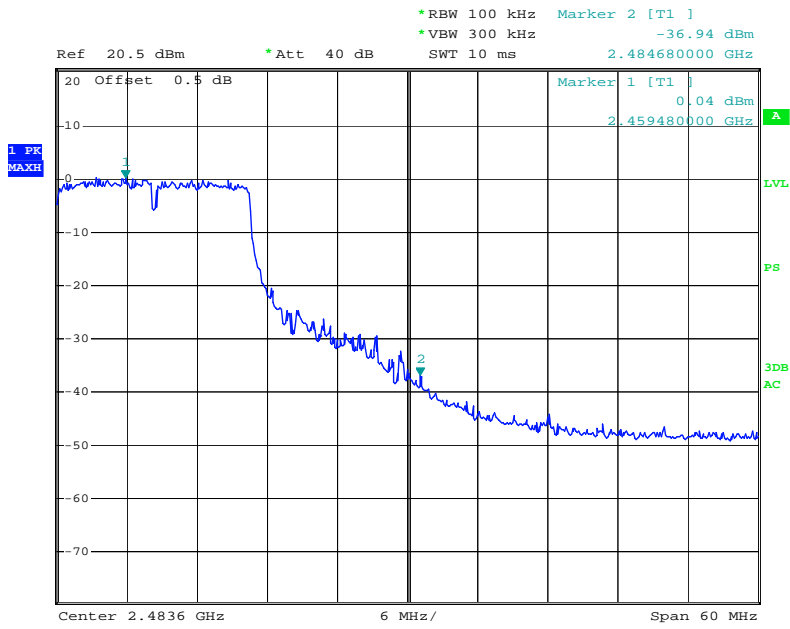
Date: 10.OCT.2010 08:55:41

### 802.11g: Band Edge, Left Side



Date: 10.OCT.2010 09:06:33

### 802.11g: Band Edge, Right Side



Date: 10.OCT.2010 09:04:04

## 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	2009-11-24	2010-11-24

\* **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

<b>Temperature:</b>	25 ° C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.0 kPa

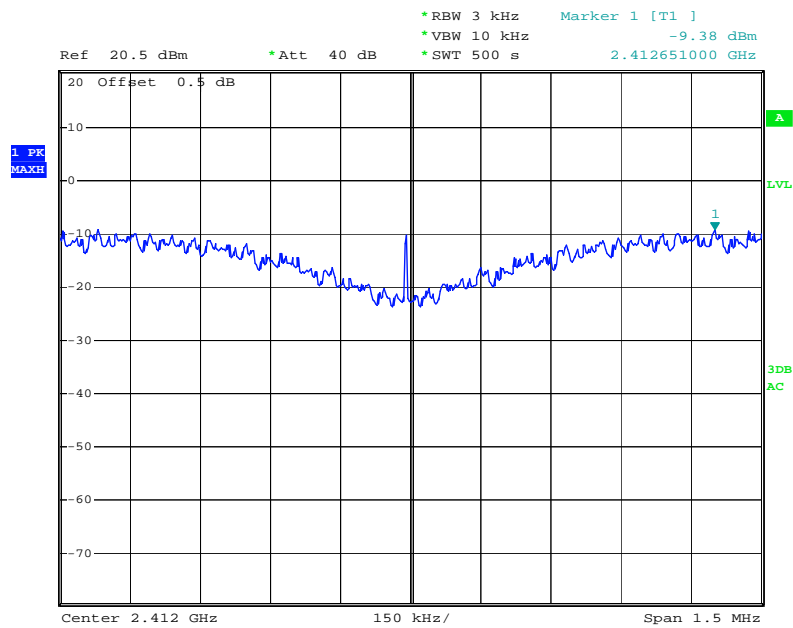
*The testing was performed by Felix Li on 2010-10-10*

*Test Mode: Transmitting*

**Test Result: Pass**

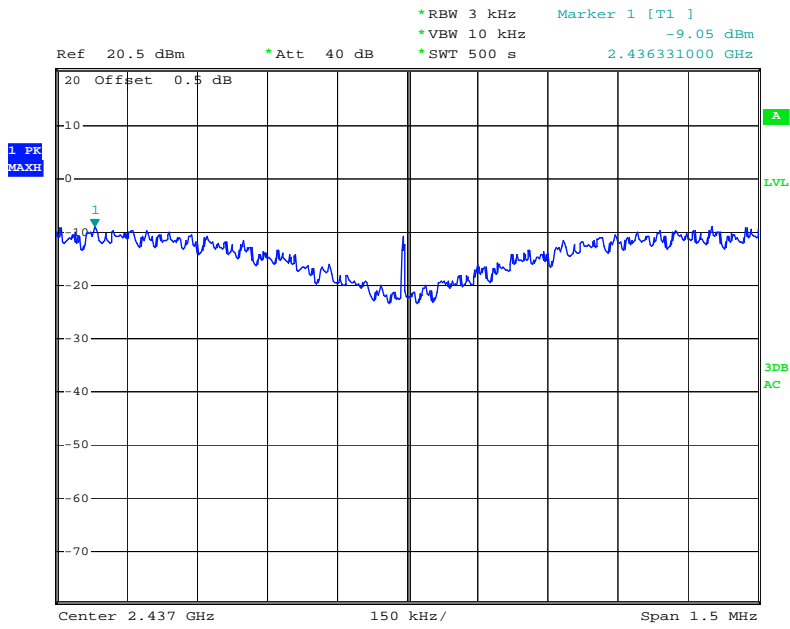
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Result
802.11b mode				
Low	2412	-9.38	8	Pass
Middle	2437	-9.05	8	Pass
High	2462	-9.19	8	Pass
802.11g mode				
Low	2412	-12.91	8	Pass
Middle	2437	-13.75	8	Pass
High	2462	-13.99	8	Pass

**Power Spectral Density, 802.11b Low Channel**



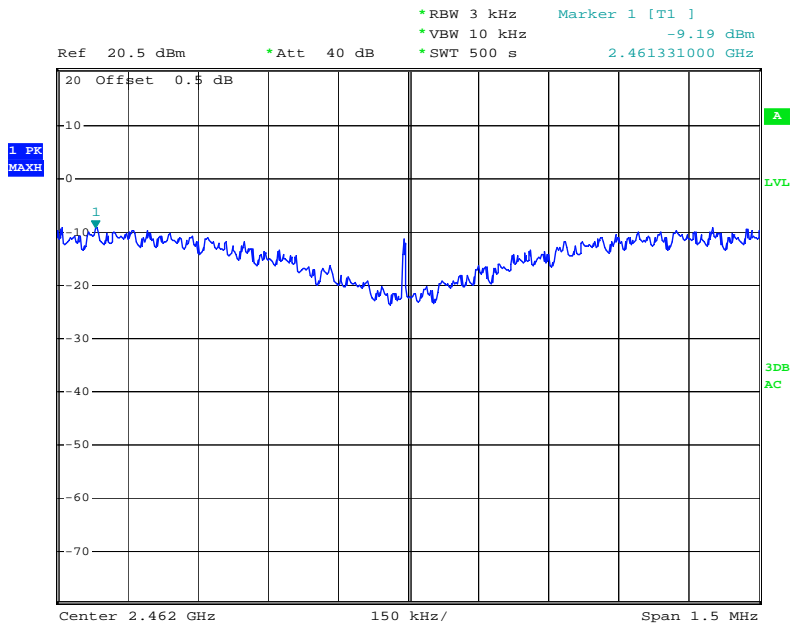
Date: 10.OCT.2010 11:14:40

### Power Spectral Density, 802.11b Middle Channel



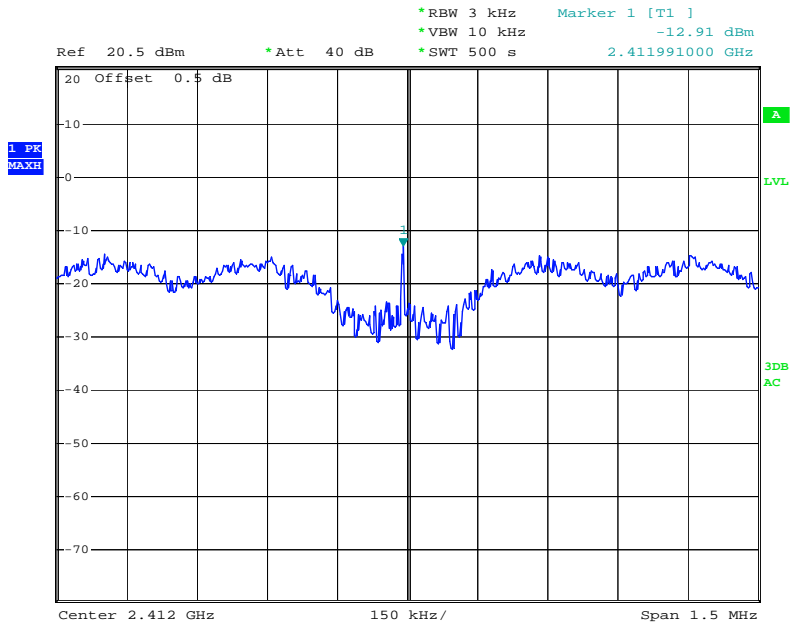
Date: 10.OCT.2010 11:26:15

### Power Spectral Density, 802.11b High Channel



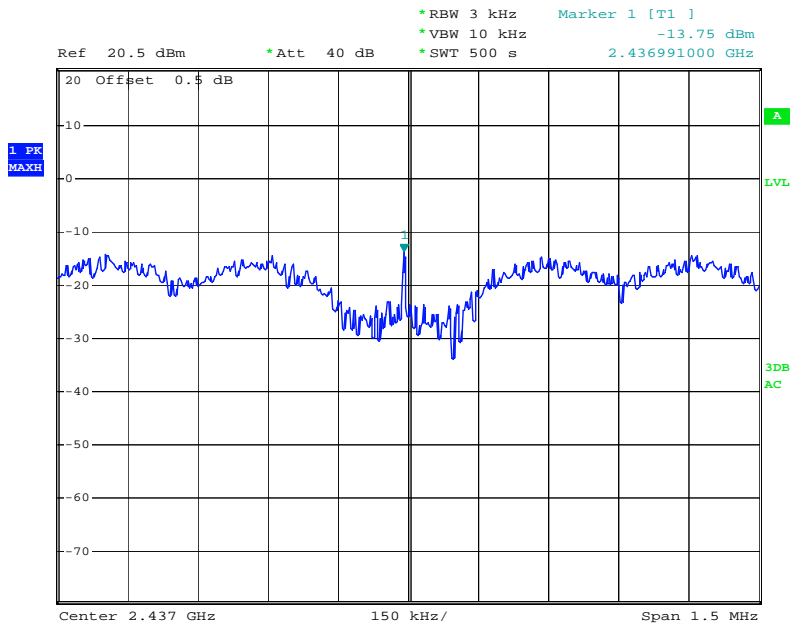
Date: 10.OCT.2010 11:39:48

### Power Spectral Density, 802.11g Low Channel



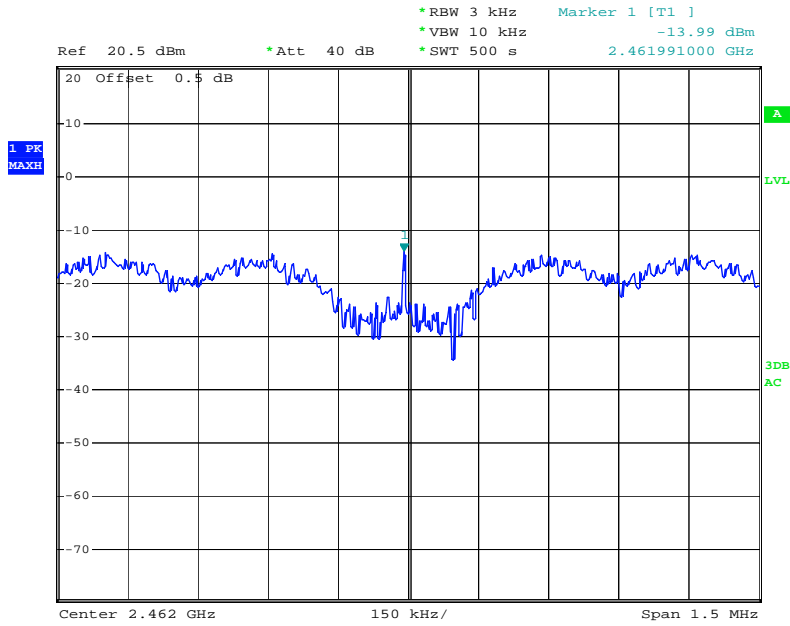
Date: 10.OCT.2010 11:50:04

### Power Spectral Density, 802.11g Middle Channel



Date: 10.OCT.2010 12:20:53

### Power Spectral Density, 802.11g High Channel



Date: 10.OCT.2010 13:00:36

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