NVLAP LAB CODE 200707-0

FCC PART 15.249

EMI MEASUREMENT AND TEST REPORT

For

Shenzhen Gospell Smarthome Electronic Co., Ltd

West, 5F/Block2, Vision (SZ) Park, South HI-Tech Park,
Nanshan, Shenzhen, P.R. of China.

FCC ID: TW5GB8209

This Report Concerns:	Equipment Type:
☒ Original Report	Baby Monitor(Transmitter)

Test Engineer:	Green Xu
Report No.:	RSZ07081403
Test Date:	2007-08-21 to 2007-09-18
Report Date:	2007-09-25
Reviewed By:	EMC Manager: Boni Baniqued
Prepared By:	Bay Area Compliance Laboratory 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

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Shenzhen Gospell Smarthome Electronic Co., Ltd*'s product, model number: *GB8209 t*he "EUT" as referred to in this report is a *Baby Monitor(Transmitter)*, which measures approximately 13.0cmL x 8.5cmW x 4.5cmH, rated input voltage: DC 8V adapter.

Adapter Manufacturer: Gospell, Model: GP006DE
Input: 100-240V~50/60Hz 0.3A, Output: 8V—500mA, 4VA Max LPS

** The test data gathered are from production sample, serial number: 0708022 provided by the manufacturer, we receive the EUT on 2007-08-14.*

Objective

This Type approval report is prepared on behalf of *Shenzhen Gospell Smarthome Electronic Co., Ltd* in accordance with Part 2, Subpart J, and 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 15.249 rules.

Related Submittal(s)/Grant(s)

No Related Submittals.

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

Test Facility

The Test site used by Bay Area Compliance Laboratory 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 Laboratory 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 04, 2004. 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 Laboratory 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/ts/htdocs/210/214/scopes/2007070.htm.

SYSTEM TEST CONFIGURATION

Justification

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

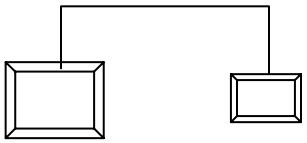
Equipment Modifications

Bay Area Compliance Laboratories Corp. has not done any modification on the EUT.

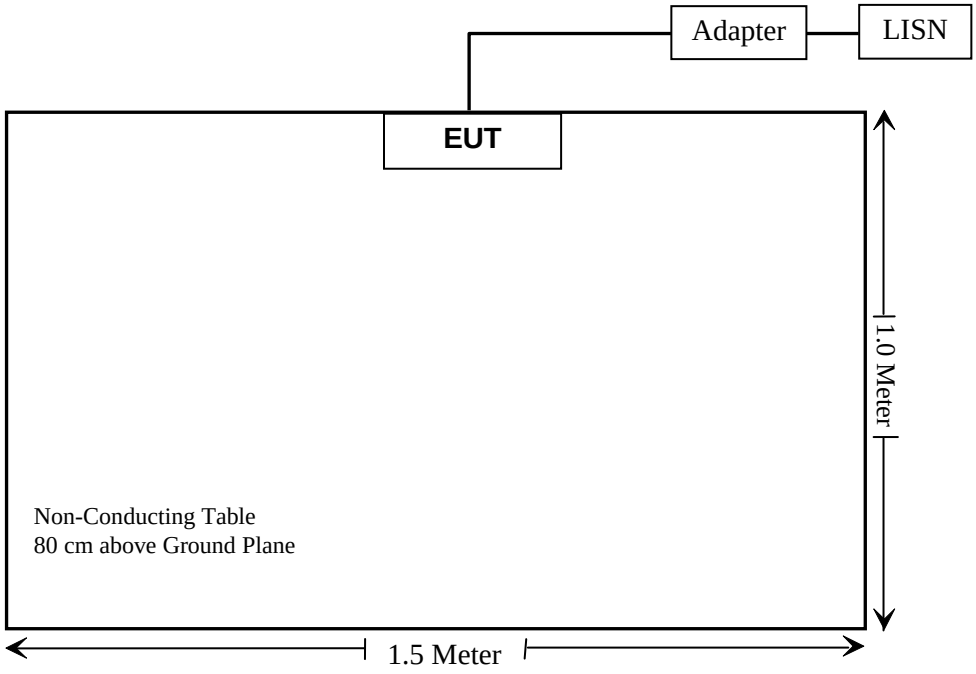
External I/O Cable

Cable Description	Length (M)	From/Port	To
AC/DC PC Cable	1.7	AC Power Supply	DC Power Supply Input

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Compliant
§15.207(a)	Conduction Emissions	Compliant
§15.205(a), §15.209(a), 15.249(a), §15.249(c)	Radiated Emissions	Compliant
§15.249(d)	Out of Band Emissions	Compliant

§15.203 - ANTENNA REQUIREMENT

Applicable Standard

For intentional device, 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.

Antenna Connector Construction

The EUT antenna is a permanently attached antenna, which in accordance to section 15.203, is considered sufficient to comply with the provisions of this section.

Result: Compliant.

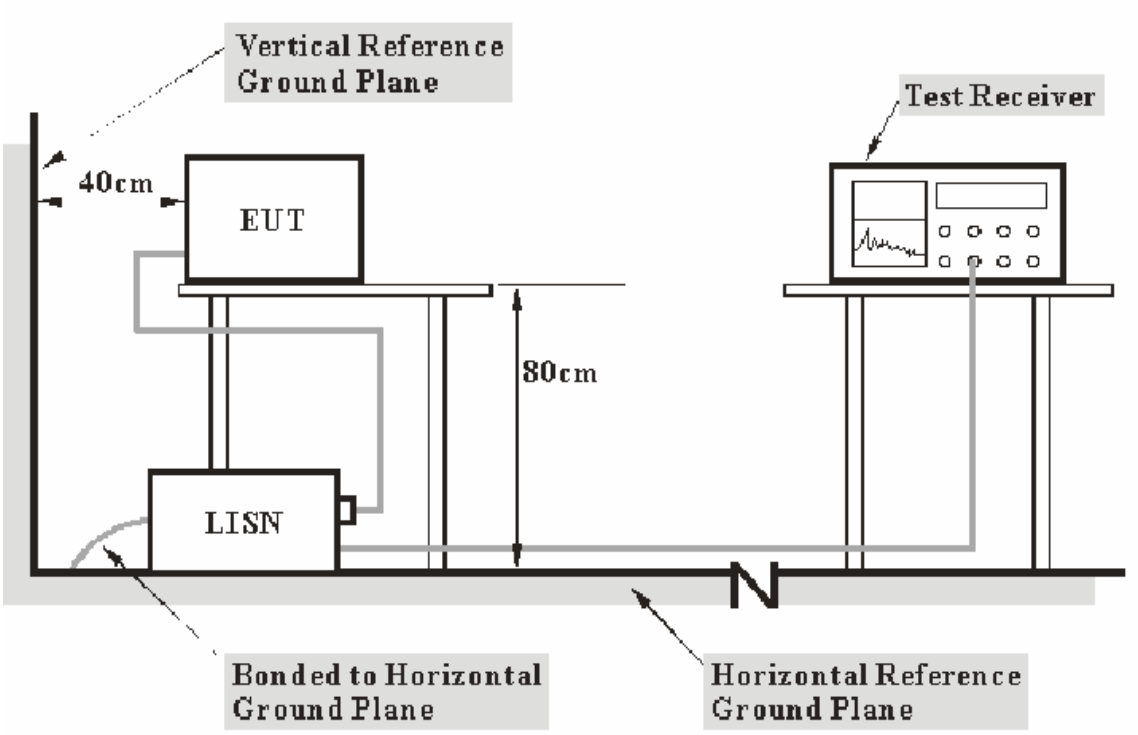
§15.207 - CONDUCTED EMISSIONS

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

EMI Test Receiver Setup

The 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:

Frequency Range	***IFBW***
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Com-Power	L.I.S.N.	LI-200	12005	N/A	N/A
Com-Power	L.I.S.N.	LI-200	12208	N/A	N/A
Rohde & Schwarz	EMI Test Receiver	ESCS30	DE25330	2007-03-26	2008-03-26
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2007-03-26	2008-03-26

***** Com-Power's LISN were used as the supporting equipment.
*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. 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 outlet of 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:

1.30 dB at **28.8350 MHz** in the **Neutral** conductor mode.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	55%
ATM Pressure:	100.0kPa

The testing was performed by Green Xu on 2007-08-21.

Test Mode: Transmitting

Line Conducted Emissions				FCC Part 15 .207	
Frequency (MHz)	**Amplitude (dBμV)**	**Detector (QP/AV)**	**Phase (Live/Neutral)**	**Limit (dBμV)**	**Margin (dB)**
28.8350	58.70	QP	Neutral	60.00	1.30
29.1250	58.30	QP	Live	60.00	1.70
6.4300	44.20	QP	Neutral	60.00	15.80
22.7750	43.90	QP	Live	60.00	16.10
2.5000	39.40	QP	Neutral	56.00	16.60
14.5600	41.80	QP	Live	60.00	18.20
0.3900	38.20	QP	Neutral	58.06	19.86
6.8250	38.80	QP	Live	60.00	21.20
0.3950	36.20	QP	Live	57.96	21.76
13.1850	37.40	QP	Neutral	60.00	22.60
2.5000	21.40	AV	Neutral	46.00	24.60
0.1850	38.40	QP	Live	64.26	25.86
0.3950	21.80	AV	Live	47.96	26.16
0.3900	20.50	AV	Neutral	48.06	27.56
0.1900	34.70	QP	Neutral	64.04	29.34
28.8950	19.30	AV	Neutral	50.00	30.70
0.1850	21.40	AV	Live	54.26	32.86
29.1250	16.90	AV	Live	50.00	33.10
0.1900	19.90	AV	Neutral	54.04	34.14
6.4800	14.50	AV	Neutral	50.00	35.50
6.8250	10.70	AV	Live	50.00	39.30
22.7900	10.50	AV	Live	50.00	39.50
13.2900	9.40	AV	Neutral	50.00	40.60
14.6600	7.60	AV	Live	50.00	42.40

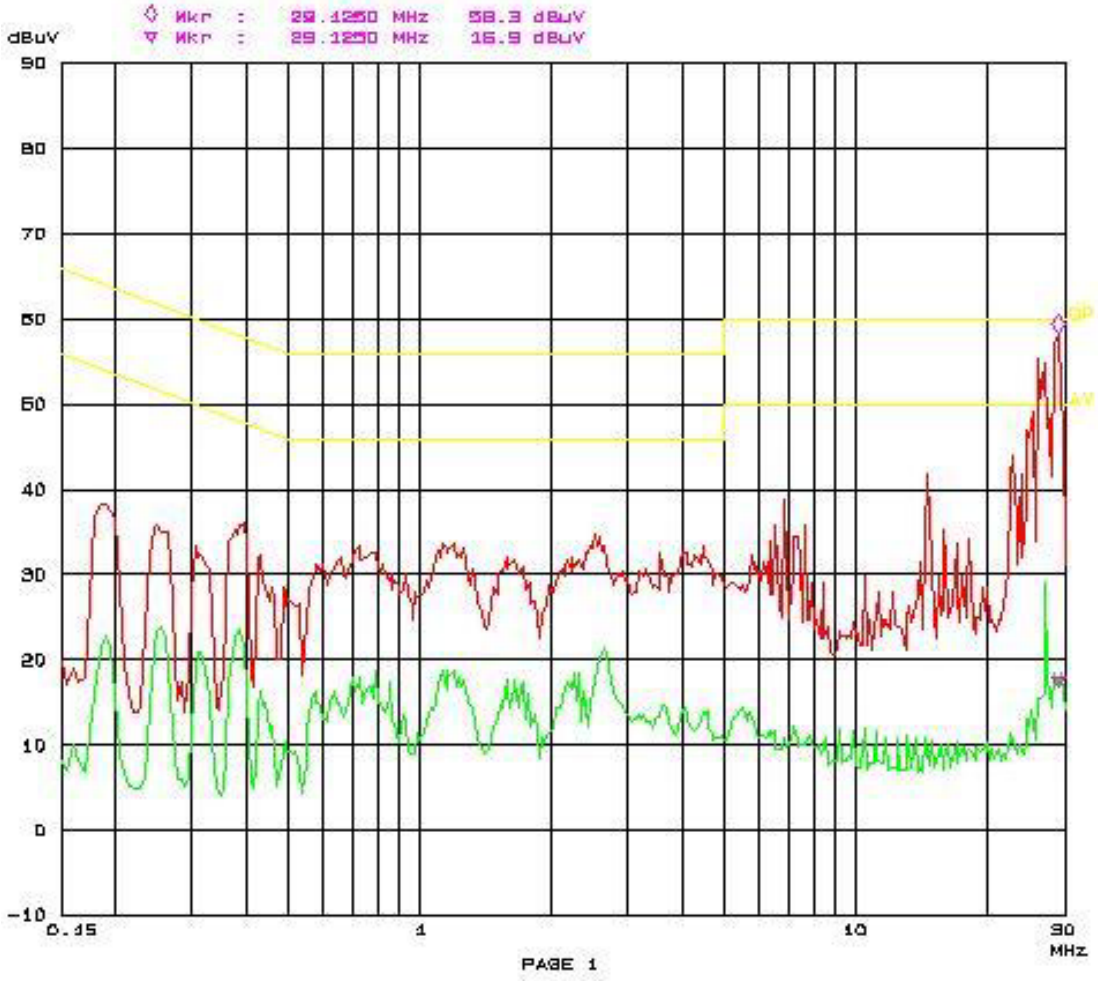
Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

Conducted Emission Test
FCC part15.249

21. Aug 07 10:08

EUT: Baby monirot (transmitter)
Manuf: Gospell M/N GB8209
Op Cond: Transmitting
Operator: Green.Xu
Test Spec: AC 120V/60Hz L
Comment: Temp: 28 Humi 56%

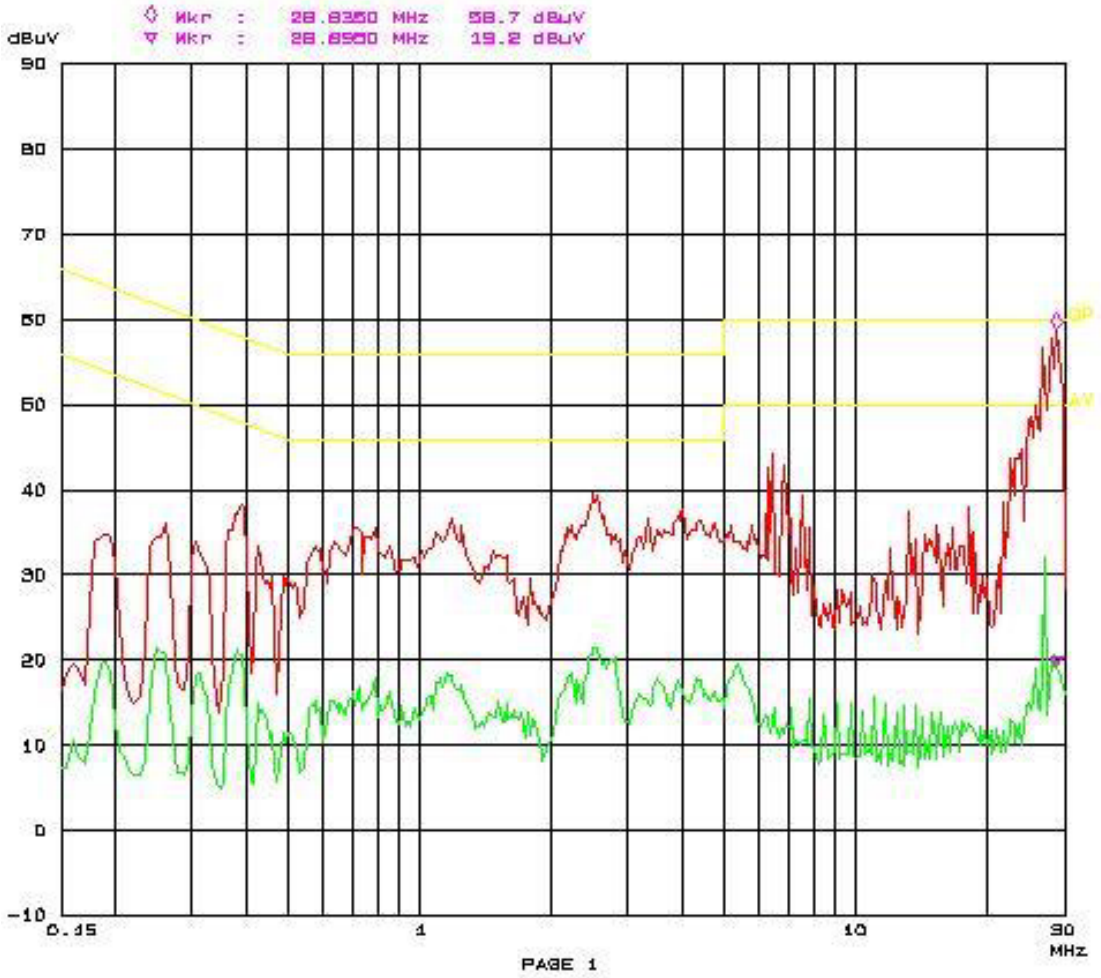


PAGE 1

Conducted Emission Test
FCC part15.249

21. Aug 07 10:51

EUT: Baby monirot (transmitter)
Manuf: Gospell M/N GB8209
Op Cond: Transmitting
Operator: Green.Xu
Test Spec: AC 120V/60Hz N
Comment: Temp: 28 Humi 66%



PAGE 1

§15.205(a) §15.209(a) §15.249(a) §15.249(d) - RADIATED EMISSIONS

Applicable Standard

As per §15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

As per §15.249 (c), Field strength limits are specified at a distance of 3 meters.

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

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. is ±4.0 dB.

Test Equipment Setup

The spectrum analyzer or receiver is set as:

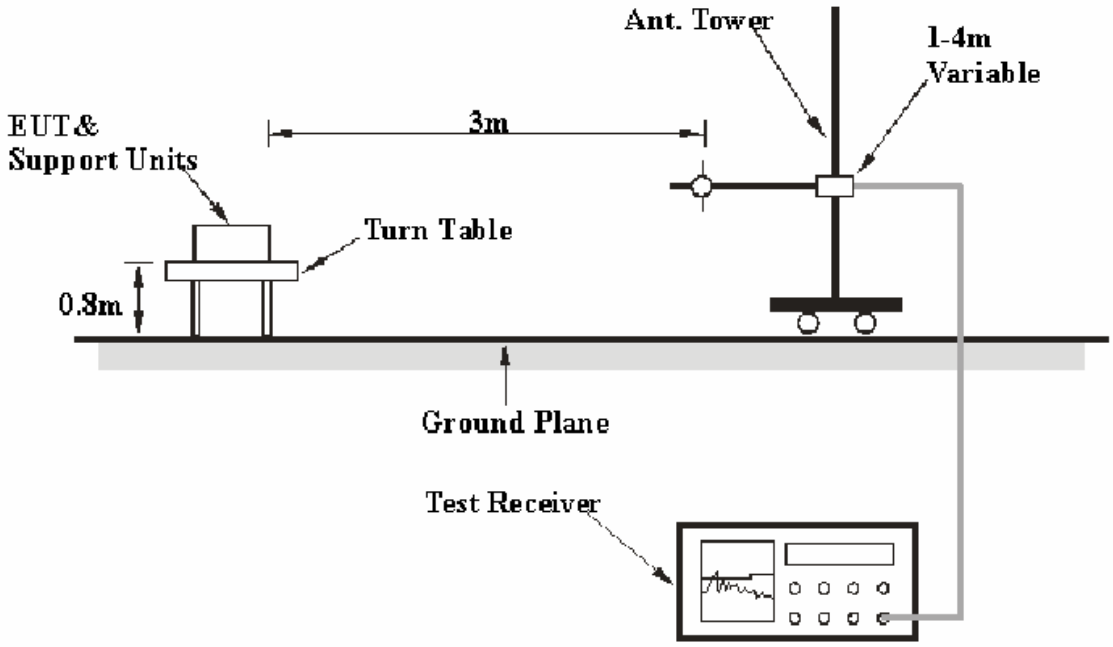
Below 1000MHz:

RBW = 100 kHz / VBW = 300 kHz / Sweep = Auto

Above 1000MHz:

(1) Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto
(2) Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto

EUT Setup



The radiated emission and out of band emission tests were performed in the 3 meters chamber B, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209 and FCC 15.249 limits.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2006-09-29	2007-09-29
HP	Amplifier	8447E	1937A01046	2006-11-15	2007-11-15
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2007-08-14	2008-08-14
HP	Amplifier	8449B	3008A00277	2006-09-29	2007-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2007-07-20	2008-07-20
Agilent	Spectrum Analyzer	8564E	3943A01781	2006-11-22	2007-11-22

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

Test Procedure

For the radiated emissions test, the EUT, and all support equipment power cords 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.

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 meter, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

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:

Cordr. Amp. = Meter Reading + Antenna Factor + Cable Loss- Amplifier Gain

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

Margin = Limit - Corr. Amp.

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209 & 15.249, with the worst margin reading of:

30-1000MHz:

0.7 dB at **61.666825 MHz** in the **Vertical** polarization, for Low Channel
2.2 dB at **61.260325 MHz** in the **Vertical** polarization, for Middle Channel
1.5 dB at **513.008925 MHz** in the **Vertical** polarization, for High Channel

Above 1GHz:

9.3 dB at **4828 MHz** in the **Vertical** polarization, for Low Channel
0.6 dB at **4900 MHz** in the **Horizontal** polarization, for Middle Channel
0.5 dB at **4936 MHz** in the **Horizontal** polarization, for High Channel

Test Data

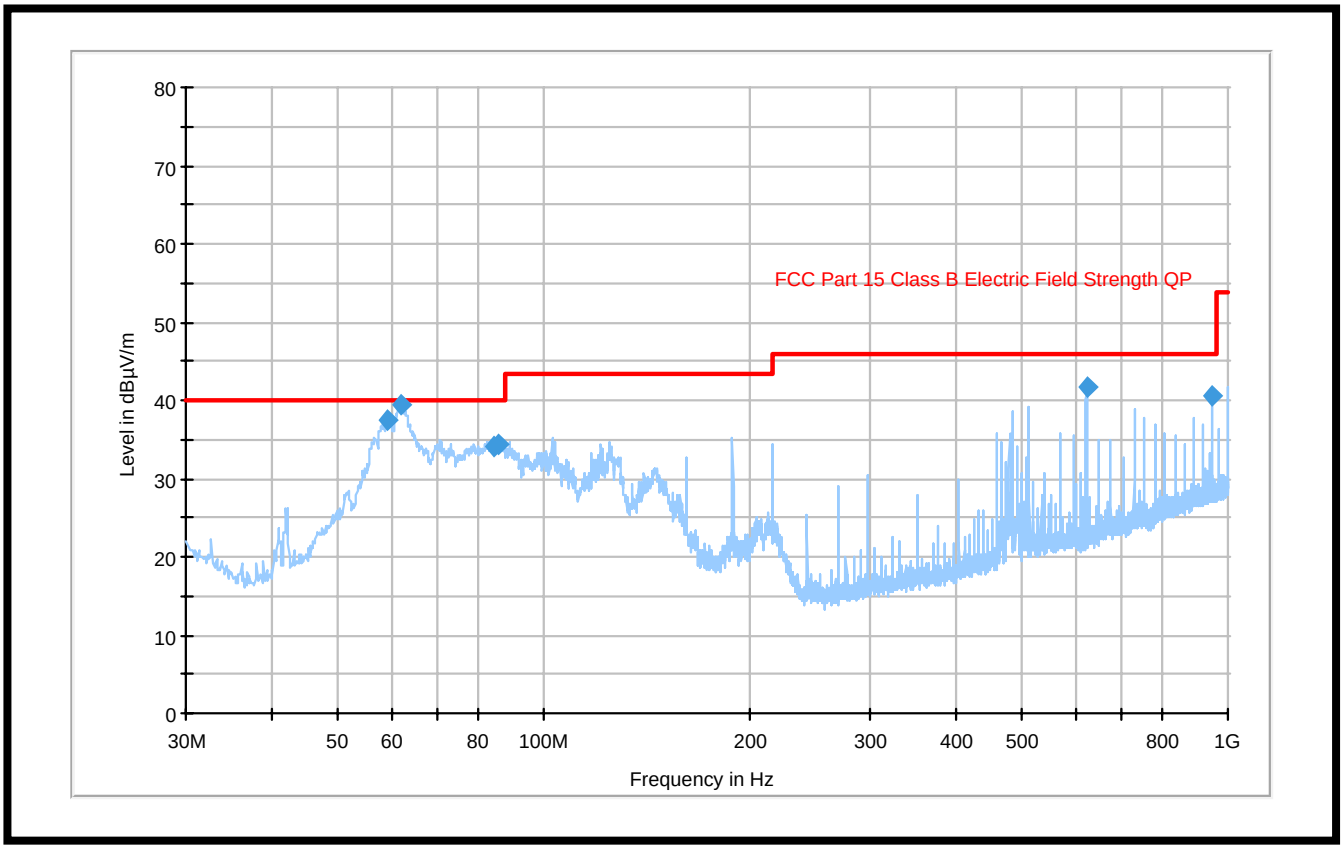
Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	53%
ATM Pressure:	100.9kPa

The testing was performed by Green Xu on 2007-09-18.

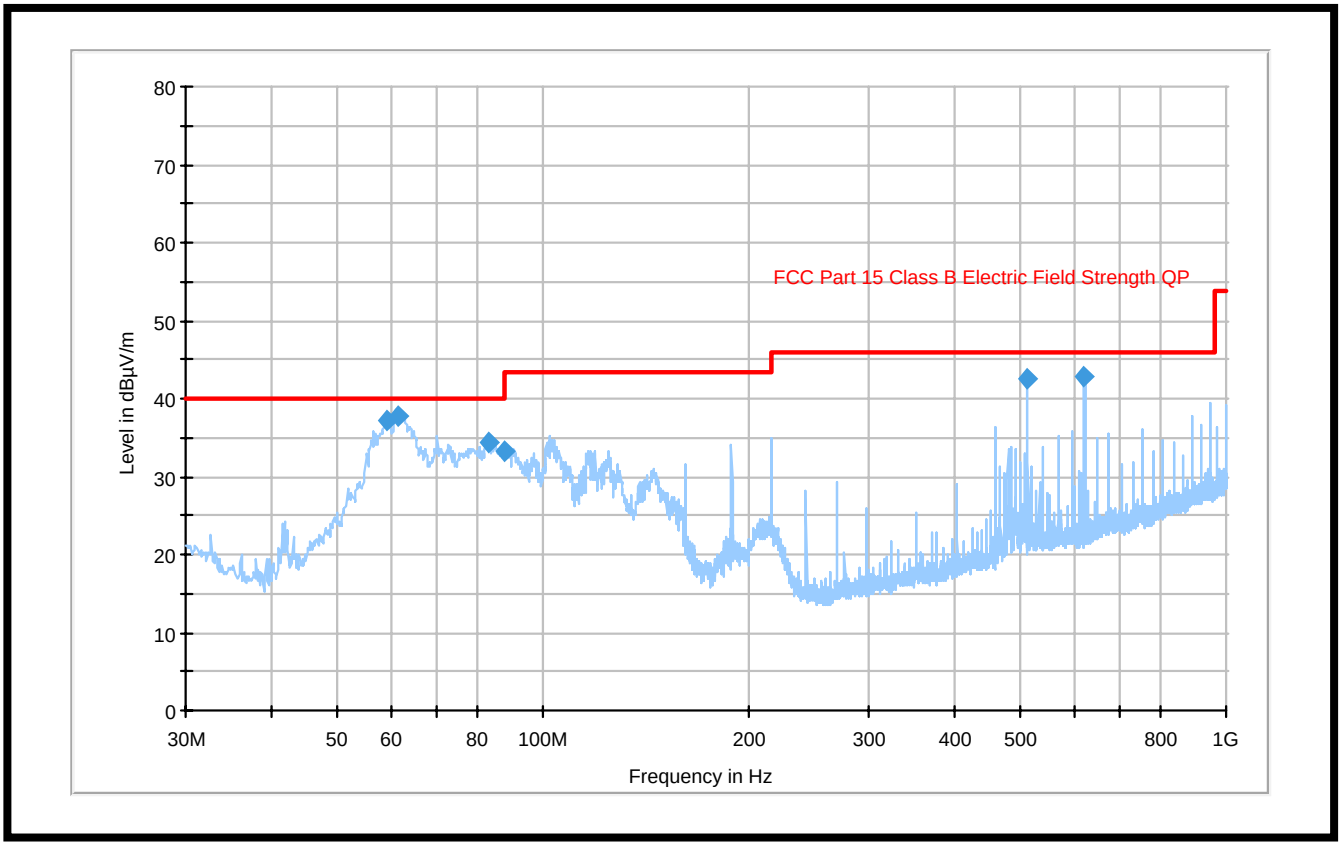
30-1000 MHz

Test Mode: Transmitting (Low Channel)



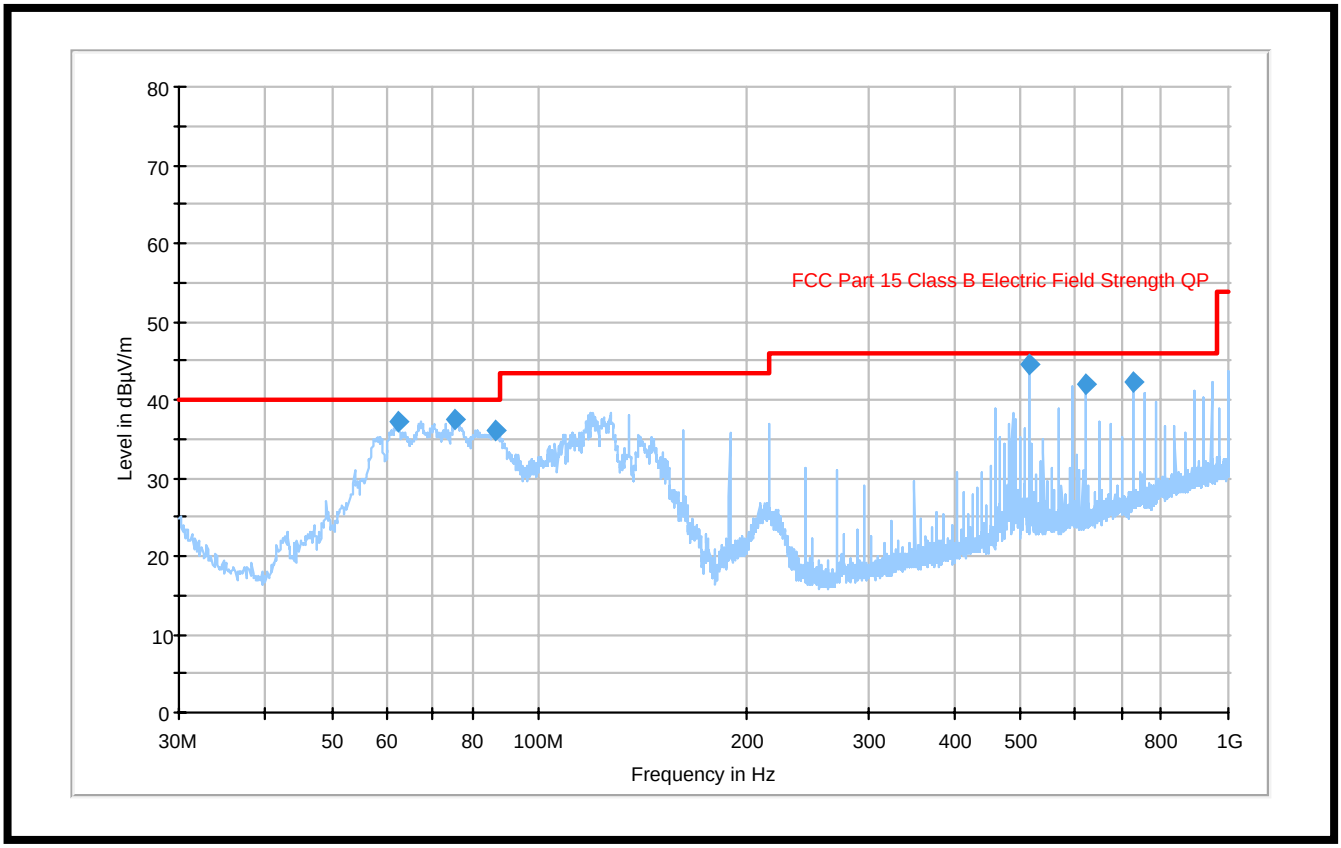
Frequency (MHz)	Quasi Peak (dBµV/m)	Antenna Height (cm)	Polarity (H/V)	Turntable Position (deg)	Corr. (dB)	Limit (dBµV/m)	Margin (dB)
61.666825	39.3	101.0	V	189.0	-16.5	40.0	0.7
59.309725	37.5	125.0	V	356.0	-16.7	40.0	2.5
621.007275	41.8	102.0	V	352.0	-2.3	46.0	4.2
945.007150	40.7	118.0	V	260.0	4.0	46.0	5.3
86.216075	34.3	101.0	V	163.0	-16.5	40.0	5.7
84.622550	34.2	101.0	V	159.0	-16.4	40.0	5.8

Test Mode: Transmitting (Middle Channel)



Frequency (MHz)	Quasi Peak (dBµV/m)	Antenna Height (cm)	Polarity (H/V)	Turntable Position (deg)	Corr. (dB)	Limit (dBµV/m)	Margin (dB)
61.260325	37.8	101.0	V	199.0	-16.5	40.0	2.2
59.232925	37.2	101.0	V	187.0	-16.7	40.0	2.8
620.987550	42.9	126.0	H	158.0	-2.3	46.0	3.1
512.996925	42.6	100.0	V	313.0	-4.0	46.0	3.4
83.256025	34.5	101.0	V	187.0	-16.2	40.0	5.5
87.608700	33.2	118.0	V	159.0	-16.5	40.0	6.8

Test Mode: Transmitting (High Channel)



Frequency (MHz)	Quasi Peak (dBµV/m)	Antenna Height (cm)	Polarity (H/V)	Turntable Position (deg)	Corr. (dB)	Limit (dBµV/m)	Margin (dB)
513.008925	44.5	190.0	V	131.0	-3.4	46.0	1.5
75.611950	37.5	156.0	V	1.0	-15.5	40.0	2.5
62.269000	37.1	98.0	V	4.0	-15.8	40.0	2.9
729.050100	42.3	99.0	V	183.0	1.0	46.0	3.7
86.629850	36.1	122.0	V	346.0	-16.2	40.0	3.9
621.021750	41.9	99.0	V	151.0	-1.4	46.0	4.1

Above 1GHz:

Radiated Emission (Low Channel): 2414MHz										
Freq. (MHz)	Receive Antenna Polarity (H/V)	Uncorrected Field Strength (dBuV/m)	Pre-amp (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Field Strength (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Type	Comment
4828	V	38.46	33.40	35.00	4.64	44.70	54	9.3	AV	Harmonic
4828	H	36.57	33.40	36.00	4.64	43.81	54	10.2	AV	Harmonic
7242	H	32.06	33.70	39.10	4.51	41.97	54	12.0	AV	Harmonic
7242	V	31.26	33.70	37.80	4.51	39.87	54	14.1	AV	Harmonic
4828	H	51.75	33.40	36.00	4.64	58.99	74	15.0	PK	Harmonic
9656	H	25.72	34.10	41.20	5.35	38.17	54	15.8	AV	Harmonic
9656	V	25.71	34.10	40.00	5.35	36.96	54	17.0	AV	Harmonic
4828	V	50.37	33.40	35.00	4.64	56.61	74	17.4	PK	Harmonic
9656	H	40.26	34.10	41.20	5.35	52.71	74	21.3	PK	Harmonic
9656	V	39.88	34.10	40.00	5.35	51.13	74	22.9	PK	Harmonic
7242	V	40.80	33.70	37.80	4.51	49.41	74	24.6	PK	Harmonic
7242	H	38.70	33.70	39.10	4.51	48.61	74	25.4	PK	Harmonic
2414	V	64.63	34.20	30.60	3.61	64.64	94	29.4	AV	Fund.
2414	H	64.35	34.20	30.60	3.61	64.36	94	29.6	AV	Fund.
2414	V	73.89	34.20	30.60	3.61	73.90	114	40.1	PK	Fund.
2414	H	72.75	34.20	30.60	3.61	72.76	114	41.2	PK	Fund.

Radiated Emission (Mid Channel): 2450MHz										
Freq. (MHz)	Receive Antenna Polarity (H/V)	Uncorrected Field Strength (dBuV/m)	Pre-amp (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Field Strength (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Type	Comment
4900	H	45.68	33.40	36.60	4.55	53.43	54	0.6	AV	Harmonic
4900	V	45.22	33.40	35.40	4.55	51.77	54	2.2	AV	Harmonic
7350	H	41.76	34.00	39.10	4.75	51.61	54	2.4	AV	Harmonic
7350	V	41.75	34.00	37.80	4.75	50.30	54	3.7	AV	Harmonic
4900	H	59.51	33.40	36.60	4.55	67.26	74	6.7	PK	Harmonic
7350	H	56.53	34.00	39.10	4.75	66.38	74	7.6	PK	Harmonic
4900	V	59.54	33.40	35.40	4.55	66.09	74	7.9	PK	Harmonic
7350	V	57.06	34.00	37.80	4.75	65.61	74	8.4	PK	Harmonic
9800	H	30.61	34.10	41.50	5.77	43.78	54	10.2	AV	Harmonic
9800	V	30.28	34.10	40.40	5.77	42.35	54	11.7	AV	Harmonic
9800	H	43.84	34.10	41.50	5.77	57.01	74	17.0	PK	Harmonic
9800	V	43.30	34.10	40.40	5.77	55.37	74	18.6	PK	Harmonic
2450	V	65.40	34.20	30.60	3.61	65.41	94	28.6	AV	Fund.
2450	H	64.29	34.20	30.60	3.61	64.30	94	29.7	AV	Fund.
2450	H	73.60	34.20	30.60	3.61	73.61	114	40.4	PK	Fund.
2450	V	73.50	34.20	30.60	3.61	73.51	114	40.5	PK	Fund.

Radiated Emission (High Channel): 2468MHz										
Freq. (MHz)	Receive Antenna Polarity (H/V)	Uncorrected Field Strength (dBuV/m)	Pre-amp (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Field Strength (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Type	Comment
4936	H	45.76	33.40	36.60	4.55	53.51	54	0.5	AV	Harmonic
4936	V	45.11	33.40	35.40	4.55	51.66	54	2.3	AV	Harmonic
4936	H	59.02	33.40	36.60	4.55	66.77	74	7.2	PK	Harmonic
4936	V	58.88	33.40	35.40	4.55	65.43	74	8.6	PK	Harmonic
9872	H	30.70	34.10	41.50	5.77	43.87	54	10.1	AV	Harmonic
7404	H	33.55	34.00	39.10	4.75	43.40	54	10.6	AV	Harmonic
9872	V	31.08	34.10	40.40	5.77	43.15	54	10.9	AV	Harmonic
7404	V	31.62	34.00	37.80	4.75	40.17	54	13.8	AV	Harmonic
9872	H	43.19	34.10	41.50	5.77	56.36	74	17.6	PK	Harmonic
7404	H	46.04	34.00	39.10	4.75	55.89	74	18.1	PK	Harmonic
9872	V	42.74	34.10	40.40	5.77	54.81	74	19.2	PK	Harmonic
7404	V	45.55	34.00	37.80	4.75	54.10	74	19.9	PK	Harmonic
2468	V	62.67	34.20	30.60	3.61	62.68	94	31.3	AV	Fund.
2468	H	61.09	34.20	30.60	3.61	61.10	94	32.9	AV	Fund.
2468	V	70.80	34.20	30.60	3.61	70.81	114	43.2	PK	Fund.
2468	H	69.72	34.20	30.60	3.61	69.73	114	44.3	PK	Fund.

Note: Fund. - Fundamental

§15.249(d) – OUT OF BAND EMISSIONS

Applicable Standard

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

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 the RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including the specified frequencies of band edges.

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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2006-09-29	2007-09-29
HP	Amplifier	8449B	3008A00277	2006-09-29	2007-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2007-07-20	2008-07-20

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

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	53%
ATM Pressure:	100.9kPa

The testing was performed by Green Xu on 2007-09-17.

Test Mode: Transmitting

Test Result: Compliant.

Frequency (MHz)	Receiver Reading (dBuV)	Detector Type	Pre-amp Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Amp. (dBuV/m)	FCC 15.209 Limit (dBuV/m)	Margin (dB)	Result
Low Channel (2414MHz)									
2322.1	37.56	PK	34.2	30.6	3.6	37.57	74	36.43	Pass
2322.1	35.27	AV	34.2	30.6	3.6	35.27	54	18.73	Pass
High Channel (2468MHz)									
2487.3	39.30	PK	34.2	30.6	3.6	39.31	74	34.69	Pass
2487.3	35.43	AV	34.2	30.6	3.6	35.44	54	18.56	Pass

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