Lab Code: 200707-0

FCC PART 15.247
TEST REPORT

For

Gajah International (HK) Co., Ltd

18/F Bel Trade Commercial Building, 1-3, Burrows Street, Wan Chai, Hong Kong.

FCC ID: UFKGD66CT00

Report Type:	Product Type:
Original Report	Speaker

Test Engineer:	Mick Yin
Report Number:	RSZ120716002-00B
Report Date:	2012-07-31
Reviewed By:	Sula Huang RF Engineer
Test Laboratory:	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 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Gajah International (HK) Co., Ltd*'s product, model number: *GD66CT (FCC ID: UFKGD66CT00)* or the "EUT" in this report was a *Speaker,* which was measured approximately: 8.0 cm (L) x 8.0 cm (W) x 7.5 cm (H), rated input voltage: DC 3.7V Li-ion battery or DC 5V charging from USB port.

** All measurement and test data in this report was gathered from production sample serial number: 1207068 (Assigned by BACL, Shenzhen). The EUT was received on 2012-07-16.*

Objective

This test report is prepared on behalf of *Gajah International (HK) Co., Ltd* in accordance with Part 2-Subpart J, Part 15-Subparts A, B and C of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

FCC part 15B JBP submission with FCC ID: UFKGD66CT00

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, 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 on 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 December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

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 an ISO/IEC 17025 accredited laboratory, and is accredited by 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

The system was configured for testing in a testing mode which was controlled by the manufacturer.

Equipment Modifications

Exercise Software (RF Control Kit v1.0) was used.

Support Equipment List and Details

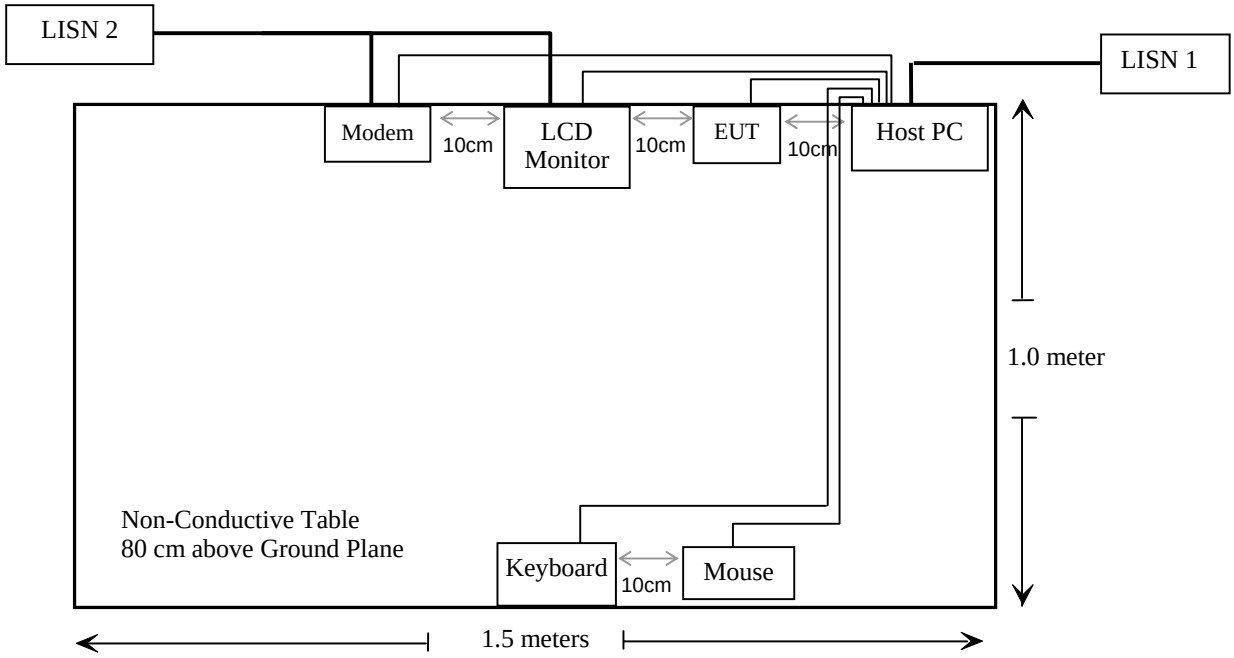
Manufacturer	Description	Model	Serial Number
DELL	PC	VOSTRO 220S	127BP2X
DELL	Keyboard	L100	CNORH656658907BL05DC
DELL	Mouse	MOC5UO	G1900NKD
DELL	LCD Monitor	E178WFPC	CN-OWY564-64180-7C4-2SQH
SAST	Modem	AEM-2100	0293

External I/O Cable

Cable Description	Length (m)	From/Port	To
Shielded Detachable USB Cable	1.5	Host PC	Mouse
Shielded Detachable Serial Cable	1.5	Host PC	Modem
Shielded Detachable K/B Cable	1.5	Host PC	Keyboard
Shielded Detachable VGA Cable	1.8	Host PC	LCD Monitor
Unshielded Detachable USB Cable	1.0	EUT	Host PC

Block Diagram of Test Setup

For conducted emission



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b) (1), §2.1093	RF exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.207(a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209 & §15.247(d)	Radiated Emissions	Compliance
§15.247(a)(1)	20 dB Emission Bandwidth	Compliance
§15.247(a)(1)	Channel Separation Test	Compliance
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliance
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliance
§15.247(b)(1)	Peak Output Power Measurement	Compliance
§15.247(d)	Band edges	Compliance

§15.247 (i) and §1.1307 (b) (1), §2.1093 – RF EXPOSURE

Applicable Standard

According to FCC §15.247 (i) Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See §1.1307(b)(1) of this chapter.
According to KDB 447498 D01 Mobile Portable RF Exposure v04 1) c): Unless excluded by specific FCC test procedures, portable devices with output power > 60/f (GHz) mW shall include SAR data for equipment approval.

RF Exposure Evaluation

Max Peak output power: 2480 MHz: 1.32 dBm = 1.355 mW
SAR exclusion threshold =60/f (GHz) = 60/2.48 = 24.19 mW
The Max peak output power of EUT is less than 24.19 mW.

So the SAR measurement is not necessary.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to FCC § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

This product has one PCB printed antenna with gain 0 dBi arrangement, fulfill the requirement of this section, and please refer to the internal photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

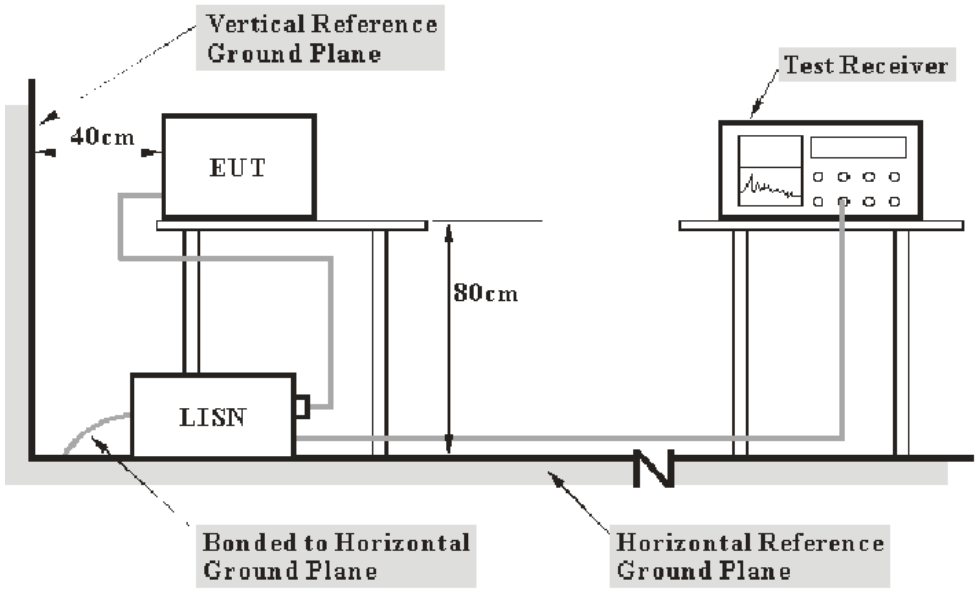
FCC §15.207

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 CISPR 16-4-4, 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 (k=2, 95% level of confidence).

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 measurement procedure is according with ANSI C63.4:2009; the related limits were specified in FCC Part 15.207.

The spacing between the peripherals was 10 cm

The host PC 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:

Frequency Range	***IF B/W***
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	100176	2011-11-24	2012-11-23
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2011-11-17	2012-11-16
Rohde & Schwarz	Pulse limiter	ESH3Z2	DE25985	2011-07-08	2012-07-07
BACL	CE Test software	BACL-CE	V1.0	N/A	N/A

*** 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 host PC was conncected to the outlet of the first LISN, and the other relevant equipments were connected to the second 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.

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Pulse Limiter Attenuation. The basic equation is as follows:

Correction Factor = LISN VDF + Cable Loss + Pulse Limiter Attenuation

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 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

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:

6.47 dB at **0.165 MHz** in the **Neutral** conducted mode

Test Data

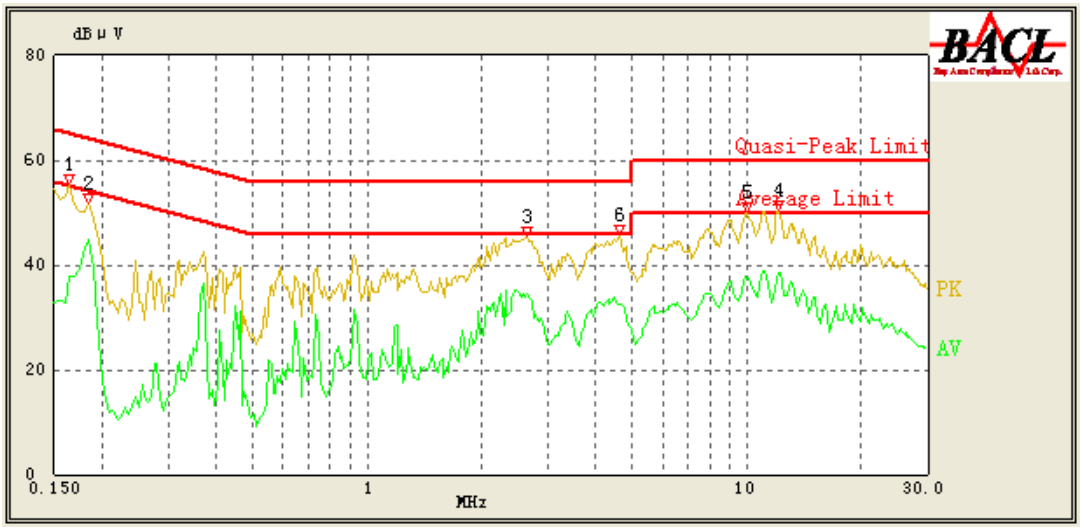
Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	48 %
ATM Pressure:	100.0 kPa

The testing was performed by Mick Yin on 2012-07-30.

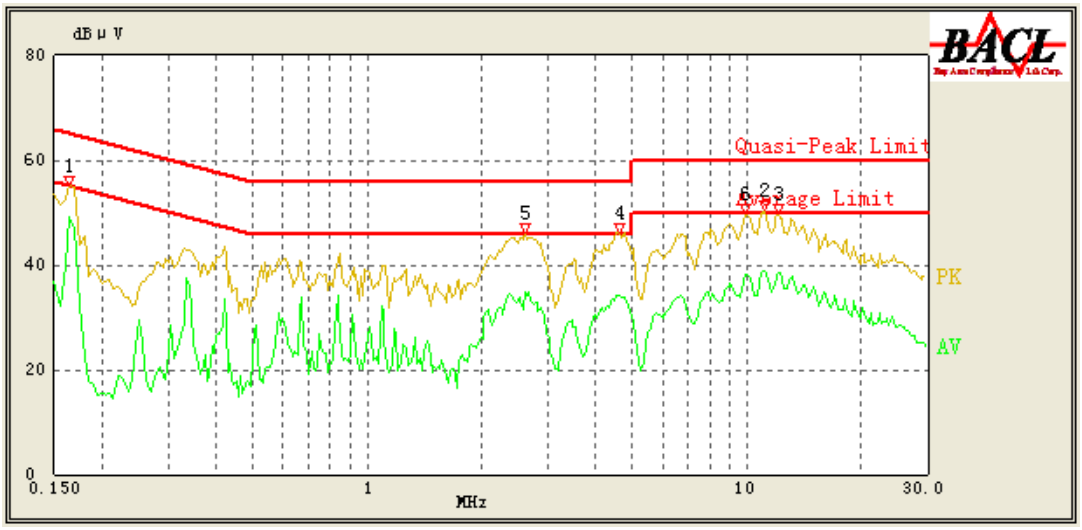
Test Mode: Charging

AC 120 V, 60 Hz, Line:



Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
0.185	44.77	10.27	55.00	10.23	Ave.
2.635	34.56	10.22	46.00	11.44	Ave.
12.170	38.41	10.85	50.00	11.59	Ave.
10.025	37.66	10.49	50.00	12.34	Ave.
4.635	32.50	10.29	46.00	13.50	Ave.
12.145	43.57	10.85	60.00	16.43	QP
10.055	43.31	10.50	60.00	16.69	QP
2.640	39.09	10.22	56.00	16.91	QP
0.185	47.20	10.27	65.00	17.80	QP
0.165	37.70	10.27	55.57	17.87	Ave.
4.635	37.20	10.29	56.00	18.80	QP
0.165	46.25	10.27	65.57	19.32	QP

AC 120V, 60 Hz, Neutral:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.165	49.10	10.24	55.57	6.47	Ave.
11.155	38.93	10.66	50.00	11.07	Ave.
2.595	34.92	10.22	46.00	11.08	Ave.
12.060	38.49	10.80	50.00	11.51	Ave.
9.965	38.17	10.49	50.00	11.83	Ave.
4.600	34.06	10.28	46.00	11.94	Ave.
2.605	41.81	10.22	56.00	14.19	QP
11.180	44.54	10.67	60.00	15.46	QP
0.165	49.59	10.24	65.57	15.98	QP
9.955	43.54	10.49	60.00	16.46	QP
12.095	43.50	10.80	60.00	16.50	QP
4.615	39.35	10.28	56.00	16.65	QP

Note:
1) Corrected Amplitude = Reading + Correction Factor
2) Correction Factor =LISN/ISN VDF (Voltage Division Factor) + Cable Loss + Pulse Limiter Attenuation
The corrected factor has been input into the transducer of the test software.
3) Margin = Limit – Corrected Amplitude

FCC §15.205, §15.209 & §15.247(d) – RADIATED EMISSIONS

Applicable Standard

FCC §15.205; §15.209; §15.247(d)

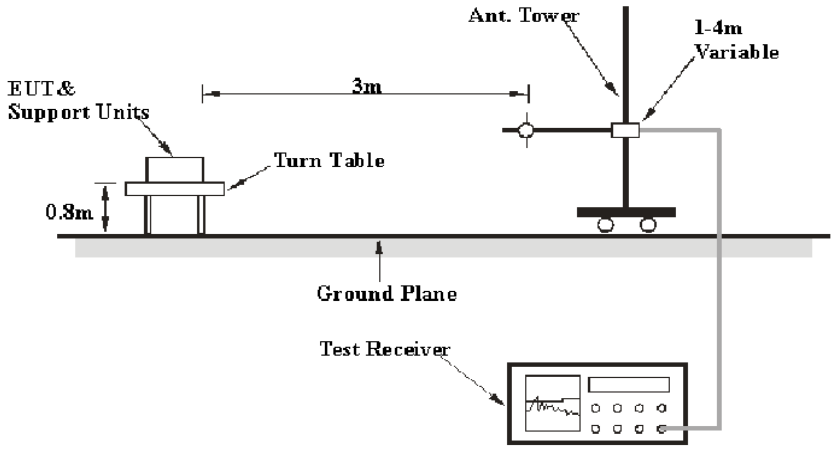
Measurement Uncertainty

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.

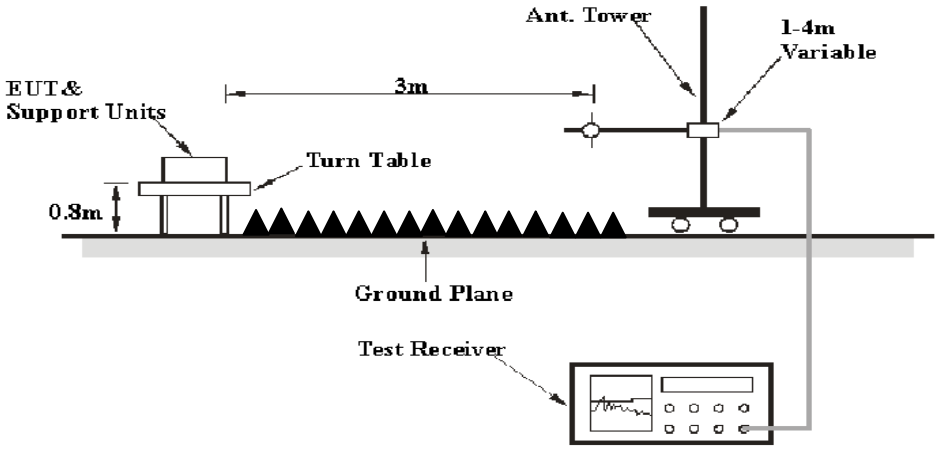
Based on CISPR 16-4-4, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is 4.0 dB. (k=2, 95% level of confidence).

EUT Setup

Below 1 GHz:



Above 1 GHz:



The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.4-2009. 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 host PC 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:

Frequency Range	***RBW***	***Video B/W***	***Detector***
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 Procedure

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

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

Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = 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 7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Limit - Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01057	2011-11-24	2012-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2011-11-17	2012-11-16
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2012-11-27
Mini-Circuits	Amplifier	ZVA-213+	N/A	2011-11-24	2012-11-23
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2012-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23
the electro-Mechanics Co.	Horn Antenna	3116	9510-2270	2011-10-14	2012-10-13
R&S	Auto test Software	EMC32	V6.30	N/A	N/A

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

7.18 dB at **2389.1 MHz** in the **Horizontal** polarization

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	48 %
ATM Pressure:	100.0 kPa

The testing was performed by Mick Yin on 2012-07-30.

Test mode: Transmitting

(Scan with GFSK, π/4-DQPSK, 8-DPSK, and Worst case: BDR Mode (GFSK))

30 MHz-25 GHz

Frequency (MHz)	Meter Reading (dBμV/m)	Detector (PK/QP/Ave.)	Direction (Degree)	Height (m)	Polar (H/V)	Antenna Loss (dB)	Cable loss (dB)	Amplifier Gain (dB)	Corr. Amplitude (dBμV/m)	FCC Part 15.247/15.205/15.209	
										Limit (dBμV/m)	Margin (dB)
Low Channel (2402 MHz)											
2402	86.50	PK	35	1.3	H	29.6	3.03	26.50	92.63	/	/
2402	41.99	Ave.	35	1.3	H	29.6	3.03	26.50	48.12	/	/
2402	85.22	PK	57	1.1	V	29.6	3.03	26.50	91.35	/	/
2402	41.56	Ave.	57	1.1	V	29.6	3.03	26.50	47.69	/	/
1329.7	54.98	PK	224	1.3	V	24.6	2.09	26.50	55.17	74	18.83
2499.3	46.03	PK	156	1.2	V	30.8	3.29	26.50	53.62	74	20.38
7206	32.62	PK	351	1.4	H	37.9	5.22	26.50	49.24	72.63	23.39
4804	34.91	PK	258	1.1	V	34.6	4.30	26.50	47.31	74	26.69
2389.5	40.81	PK	35	1.3	V	29.6	3.03	26.50	46.94	74	27.06
1329.7	24.14	Ave.	224	1.3	V	24.6	2.09	26.50	24.33	54	29.67
2375.1	35.94	PK	60	1.2	V	29.6	3.03	26.50	42.07	74	31.93
Middle Channel (2441 MHz)											
2441	84.66	PK	35	1.2	H	30.6	3.11	26.50	91.87	/	/
2441	40.96	Ave.	35	1.2	H	30.6	3.11	26.50	48.17	/	/
2441	84.81	PK	145	1.1	V	30.2	3.11	26.50	91.62	/	/
2441	40.94	Ave.	145	1.1	V	30.2	3.11	26.50	47.75	/	/