



# FCC PART 15C TEST REPORT

For

**Shenzhen Guo Wei Electronics Co. Ltd.**

No. 3038, Luosha Road, Liantang, Luohu District, Shenzhen, Guangdong, China

**FCC ID: 2AA3EPOWERMAT**

<b>Report Type:</b> Original Report	<b>Product Type:</b> DECT Cordless Telephone (Base Unit)
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<b>Report Number:</b> RSZ130910003-00	
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**Note:** This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

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## GENERAL INFORMATION

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

The *Shenzhen Guo Wei Electronics Co. Ltd.*'s product, model number: *Powermat (FCC ID: 2AA3EPOWERMAT)* or the "EUT" in this report was a base unit of *DECT Cordless Telephone*, which was measured approximately: 22.6 cm (L) x 7.7 cm (W) x 3.3 cm (H), rated input voltage: DC 10V from adapter.

Adapter Information: AC Power Adapter  
Model: MN-A012-L170;  
Input: 100-240V~50/60Hz 0.3A max;  
Output: DC 10V, 1.2A

*\* All measurement and test data in this report was gathered from production sample serial number: 1309018 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2013-09-10.*

### Objective

This report is prepared on behalf of *Shenzhen Guo Wei Electronics 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, section 15.203, 15.205, 15.207 and 15.209 rules.

### Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS and Part 15D PUB base unit submission with FCC ID: 2AA3EPOWERMAT.  
FCC Part 15D PUE handset unit submission with FCC ID: 2AA3EPOWERMAT.

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

Measurement uncertainty with radiated emission is 5.91 dB for 30MHz-1GHz.

## **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.

## SYSTEM TEST CONFIGURATION

### Justification

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

### EUT Exercise Software

No exercise software.

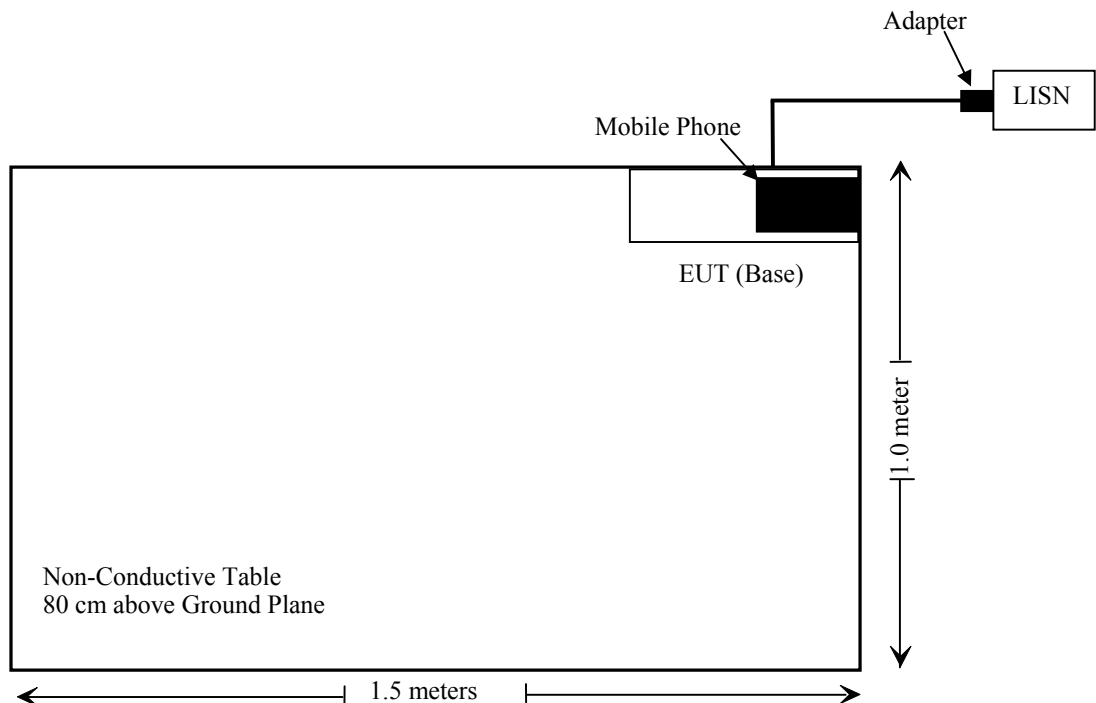
### Equipment Modifications

No modification was made to the EUT tested.

### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
APPLE	iPhone 4	MD245CH	N/A
GUOWEI	Duracell Powermat Jacket	N/A	N/A

### Block Diagram of Test Setup



**SUMMARY OF TEST RESULTS**

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§ 1.1307, 1.1310	RF Exposure	Compliance
§15.207(a)	Conducted Emissions	Compliance
15.205, §15.209	Radiated Emissions	Compliance

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

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### **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 has an integrated antenna arrangement, which was permanently attached; fulfill the requirement of this section. Please refer to EUT photos.

**Result:** Compliant

## FCC §1.1307&1.1310 – RF EXPOSURE

### Applicable Standard

FCC §1.1307 &amp; 1.1310

KDB 680106 D01 RF Exposure Wireless Charging Apps v02

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307

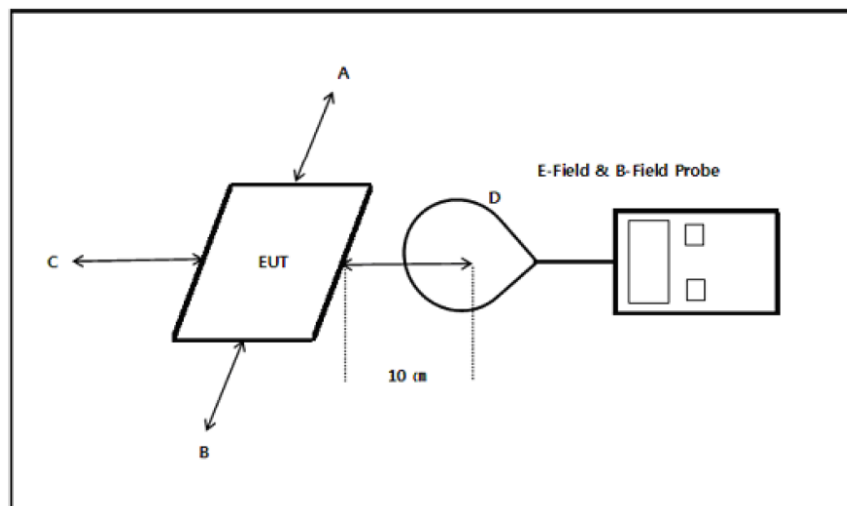
#### Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3-3.0	614	1.63	*{100}	6
3.0-30	1842/f	4.89/f	*{900/f <sup>2</sup> }	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*{100}	30
1.34-30	824/f	2.19/f	*{180/f <sup>2</sup> }	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz

\* = plane-wave equipment power density

### EUT Setup





**Test Equipment List and Details**

Manufacturer	Description	Model	Calibration Date	Calibration Due Date
Hioki	Magnetic Field Test	3470	2013-03-10	2014-03-09

**Test Result**

Test Mode: Charging mode

1) E-Filed Strength at 10 cm from the edges surrounding the EUT

Frequency Range (MHz)	Probe Position A (A/m)	Probe Position B (A/m)	Probe Position C (A/m)	Probe Position D (A/m)	Limits (A/m)
0.244-0.286	0.061	0.043	0.058	0.037	1.63

2) E-Filed Strength (calculated) at 10 cm from the edges surrounding the EUT

Frequency Range (MHz)	Probe Position A (V/m)	Probe Position B (V/m)	Probe Position C (V/m)	Probe Position D (V/m)	Limits (V/m)
0.244-0.286	22.997	16.211	21.866	13.949	614

Note:

$E = 377 * H$ ,

E = electric field strength (V/m)

H = magnetic field strength (A/m)

According with KDB 680106 D01 RF Exposure Wireless Charging Apps v02, Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614 V/m and 1.63 A/m

## FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

### Applicable Standard

FCC §15.207

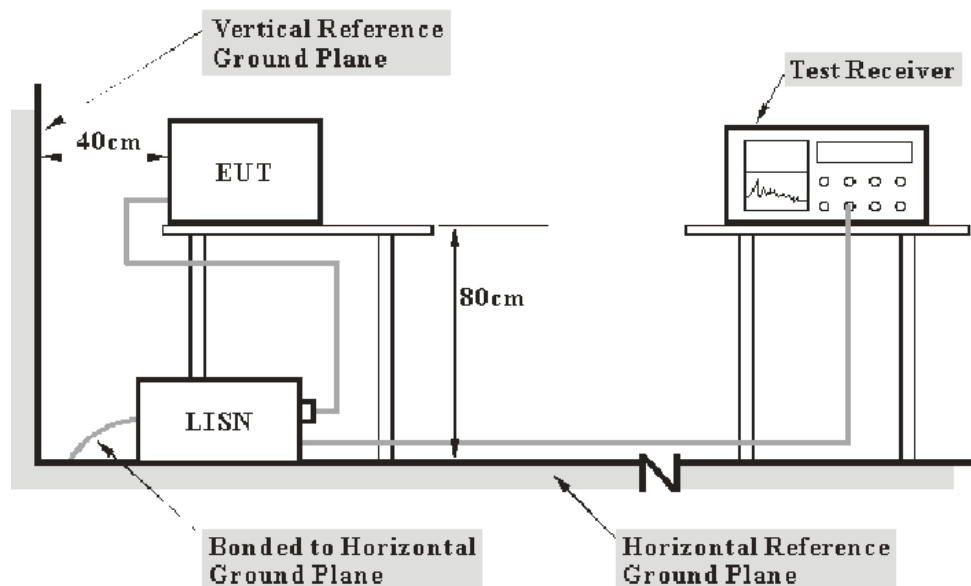
### Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements may be receiver reading, attenuation of the connection between AMN/ISN and receiver, AMN/ISN voltage division factor, AMN/ISN VDF frequency interpolation and receiver related input quantities, etc.

Based on CISPR 16-4-2:2011, the expanded combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown as below. And the uncertainty will not be taken into consideration for the test data recorded in the report

Port	Measurement uncertainty
AC Mains	3.26 dB (k=2, 95% level of confidence)
CAT 3	3.70 dB (k=2, 95% level of confidence)
CAT 5	3.86 dB (k=2, 95% level of confidence)
CAT 6	4.64 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 setup of EUT is according with per ANSI C63.4-2009 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 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 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2013-06-17	2014-06-17
Rohde & Schwarz	LISN	ENV216	3560.6650.12-101613-Yb	2013-05-07	2014-05-07
Rohde & Schwarz	Transient Limitor	ESH3Z2	DE25985	2013-10-15	2014-10-15
Rohde & Schwarz	CE Test software	EMC 32	V8.53	-	-

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

### Test Results Summary

According to the recorded data in following table, with the worst margin reading of:

**4.1 dB at 1.074000 MHz in the Line conducted mode**

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

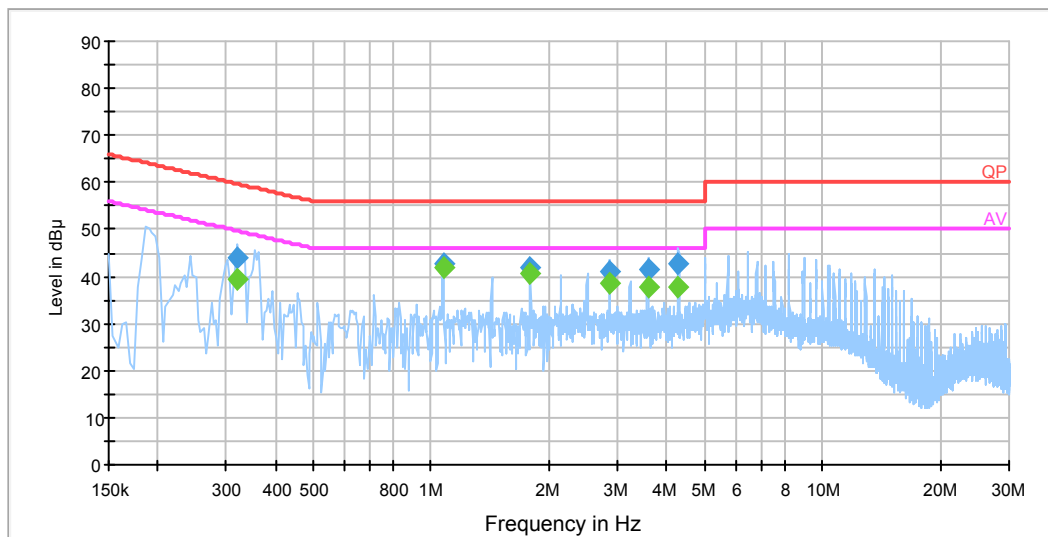
in BACL,  $U_{(Lm)}$  is less than  $U_{cispr}$ , if  $L_m$  is less than  $L_{lim}$ , it implies that the EUT complies with the limit.

**Test Data****Environmental Conditions**

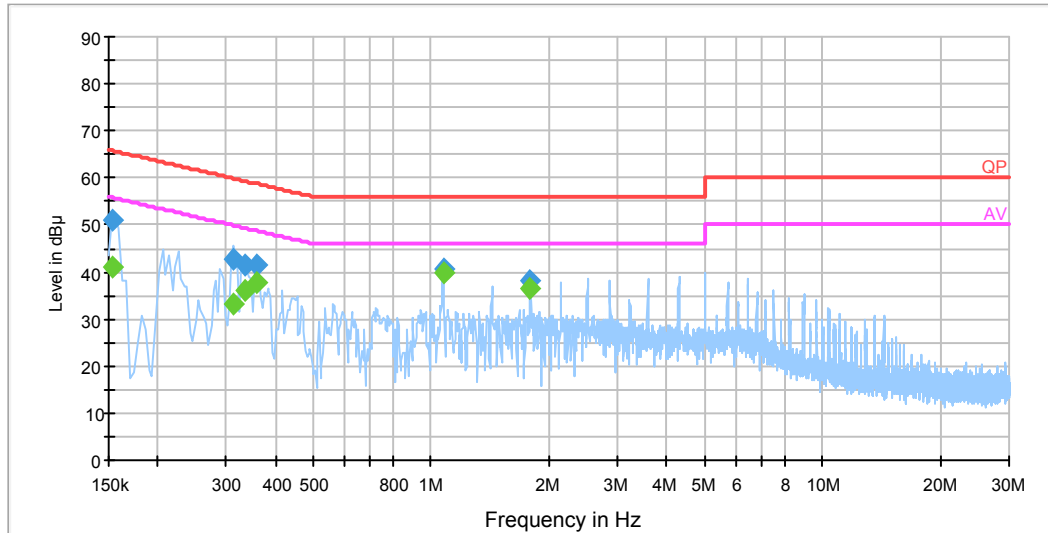
<b>Temperature:</b>	24 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	101.0 kPa

The testing was performed by Gardon Zhang on 2013-11-21.

Test mode: Transmitting & Charging

**AC 120V/60 Hz, Line****EMI Auto Test L**

Frequency (MHz)	Corrected Amplitude (dBμV)	Corrected Factor (dB)	Limit (dBμV)	Margin (dB)	Remark (PK/QP/Ave)
0.318000	44.1	19.5	59.8	15.6	QP
0.318000	39.4	19.5	49.8	10.3	Ave.
1.074000	42.7	19.5	56.0	13.3	QP
1.074000	41.9	19.5	46.0	4.1	Ave.
1.790000	42.0	19.5	56.0	14.0	QP
1.790000	40.9	19.5	46.0	5.1	Ave.
2.862000	40.9	19.5	56.0	15.1	QP
2.862000	38.5	19.5	46.0	7.5	Ave.
3.586000	41.6	19.6	56.0	14.4	QP
3.586000	37.6	19.6	46.0	8.4	Ave.
4.294000	42.8	19.6	56.0	13.2	QP
4.294000	37.9	19.6	46.0	8.1	Ave.

**AC 120V/60 Hz, Neutral****EMI Auto Test N**

Frequency (MHz)	Corrected Amplitude (dBμV)	Corrected Factor (dB)	Limit (dBμV)	Margin (dB)	Remark (PK/QP/Ave)
0.154000	50.8	19.5	65.8	14.9	QP
0.154000	41.0	19.5	55.8	14.8	Ave.
0.314000	42.6	19.5	59.9	17.3	QP
0.314000	33.2	19.5	49.9	16.6	Ave.
0.334000	41.6	19.5	59.4	17.7	QP
0.334000	35.9	19.5	49.4	13.4	Ave.
0.358000	41.3	19.5	58.8	17.5	QP
0.358000	37.6	19.5	48.8	11.2	Ave.
1.074000	40.7	19.5	56.0	15.3	QP
1.074000	39.7	19.5	46.0	6.3	Ave.
1.794000	38.1	19.5	56.0	17.9	QP
1.794000	36.6	19.5	46.0	9.4	Ave.

## **FCC§15.205 & §15.209 - FIELD STRENGTH AND RADIATED EMISSIONS**

### **Applicable Standard**

FCC§15.205, §15.209

### **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 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Shenzhen) will not be taken into consideration for the test data recorded in the report

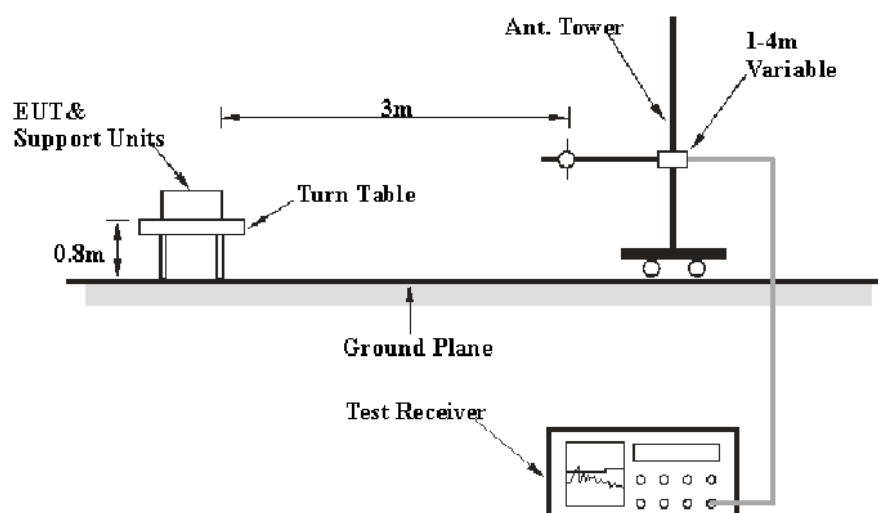
### **Test Equipment Setup**

The spectrum analyzer or receiver is set as:

Frequency Range	RBW	Video B/W	IF B/W	Detector
9 kHz – 30 MHz	10 kHz	30 kHz	9 kHz	QP
30 MHz – 1000 MHz	100 kHz	300 kHz	120kHz	QP

Note: The frequency bands 9-90 kHz and 110-490 kHz, the testing are use an average detector.

### **EUT Setup**



The radiated emission and out of band emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2009 The specification used was the FCC 15.209 and 15.205 limits.

## Test Procedure

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 mete, 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:

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

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

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

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447E	1937A01046	2013-09-30	2014-09-30
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2013-09-17	2014-09-17
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
ETS	Passive Loop Antenna	6512	00029604	2011-11-30	2014-11-29
Rohde & Schwarz	CE Test software	EMC 32	V8.53	-	-

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

## Test Data

### Environmental Conditions

<b>Temperature:</b>	24℃
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Gardon Zhang on 2013-11-21.*

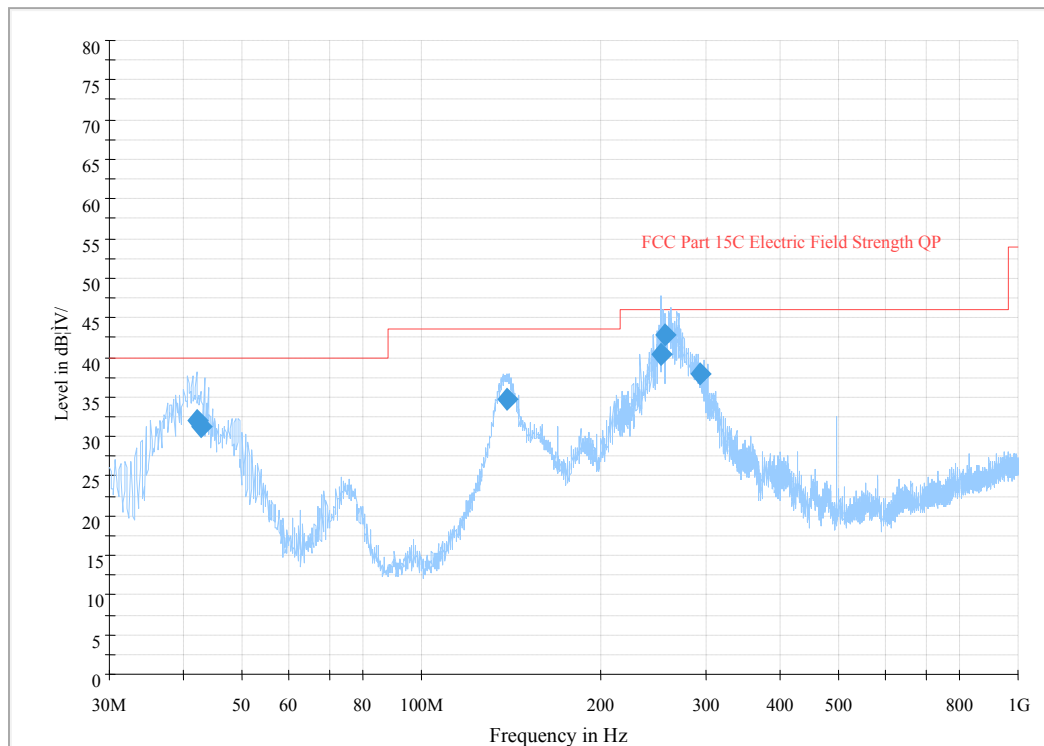
*EUT operation mode: Transmitting*

**1) Field Strength of Radiated Emissions, up to 30MHz**

Frequency (kHz)	Detector (PK/QP/Ave.)	Direction (Degree)	Height (m)	Antenna Factor (dB/m)	Cable Loss (dB)	Result (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
255	Ave.	180.00	1.5	67.5	0.1	85.45	99.5	14.05
360	Ave.	180.00	1.5	55.0	0.1	76.73	96.5	19.77
720	QP	180.00	1.5	48.2	0.1	56.12	70.5	14.38

**2) Spurious Emission, up to 1000MHz:**

Auto Test (FCC part 15C)



Frequency (MHz)	Corrected Amplitude (dB $\mu$ V/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB)	Limit (dB $\mu$ V/m)	Margin (dB)
42.072900	32.0	124.0	V	68.0	-14.8	40.0	8.0
42.711350	31.3	127.0	V	95.0	-15.3	40.0	8.7
139.424700	34.7	339.0	H	9.0	-12.8	43.5	8.8
251.530150	40.4	172.0	H	0.0	-13.3	46.0	5.6
255.991100	42.8	112.0	H	134.0	-13.2	46.0	3.2
293.265200	37.9	100.1	H	198.0	-11.3	46.0	8.1

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