



FCC PART 15 B, CLASS B  
TEST REPORT

For

**Yealink (Xiamen) Network Technology Co., Ltd.**

4th-5th Floor, South Building, NO. 63 WangHai Road, 2nd Software Park, Xiamen, China

**FCC ID: T2C-T42G**

<b>Report Type:</b> Original Report	<b>Product Type:</b> IP Phone
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<b>Report Number:</b> RSZ130221003-00	
<b>Report Date:</b> 2013-03-27	
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**Note:** This test report is prepared for the customer shown above and for the equipment 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 Yealink (Xiamen) Network Technology Co., Ltd.'s product, model number: T42G (FCC ID: T2C-T42G) or the "EUT" in this report is an IP Phone, which was measured approximately: 21.0 cm (L) x 10.0 cm (W) x 18.0 cm (H), rated input voltage: DC 5V from adapter or PoE 48V power. The highest operating frequency is 200 MHz.

Adapter Information: AC/DC SWITCHING ADAPTER

Model: OH-1048A0501200U2

Input: 100-240V~50/60Hz, 250mA

Output: DC 5V, 1.2A

*\*All measurement and test data in this report was gathered from production sample serial number: 1302039 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2013-02-21.*

### Objective

This test report is prepared on behalf of Yealink (Xiamen) Network Technology Co., Ltd. in accordance with Part 2-Subpart J, Part 15-Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to determine the compliance of the EUT with FCC Part 15B, Class B.

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

No related submittal(s)

### 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 C63.4-2003.

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.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in a manufacturer testing fashion.

### EUT Exercise Software

No exercise software was used.

### Equipment Modifications

No modification was made to the EUT.

### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	PC	VOSTRO 220S	127BP2X
DELL	Keyboard	L100	CNORH656658907BL04TY
DELL	Mouse	MOC5UO	G1B0096D
DELL	Monitor	E178WFPC	CN-OWY564-64180-7C4-2SQH
SAST	Modem	AEM-2100	0293
Yealink	VOIP Phone	SIP-T42G	N/A
Netgear	PoE	FS108P	N/A

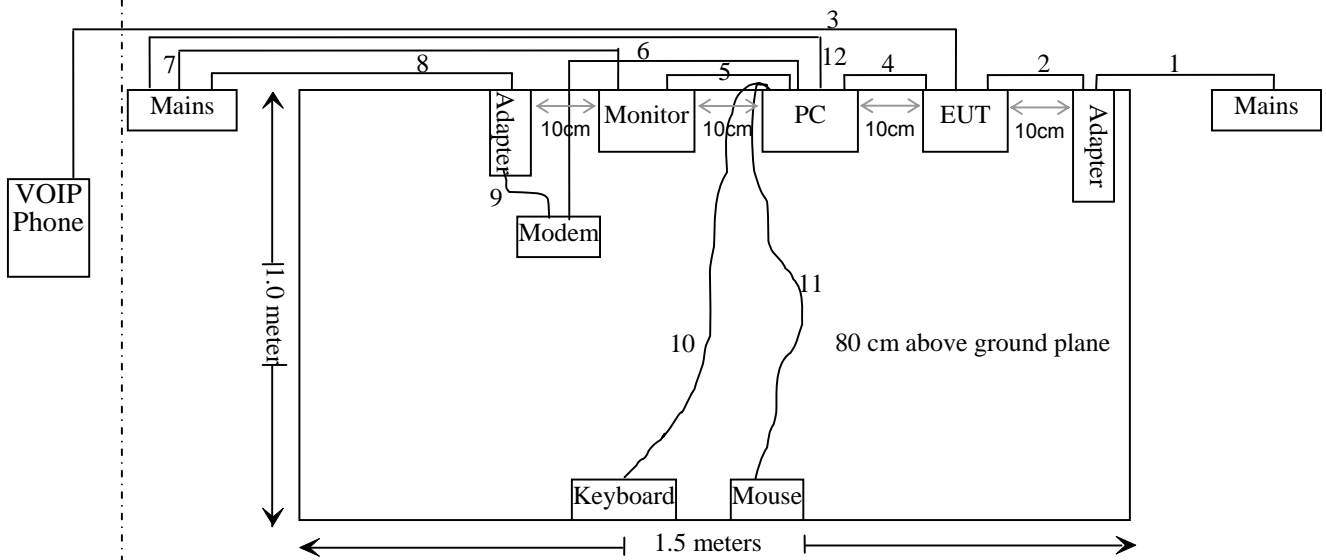
### External I/O Cable

Cable Description	Length (m)	From/Port	To
Unshielding Detachable AC Cable	1.2	Adapter of EUT	Mains
Unshielding Undetachable DC Cable	0.8	Adapter of EUT	EUT
Unshielding Detachable RJ45 Cable	1.2	PC	EUT
Shielding Detachable VGA Cable	1.5	PC	Monitor
Shielding Detachable RS232 Cable	1.2	PC	Modem
Unshielding Detachable AC Cable	1.2	Monitor	Mains
Unshielding Detachable AC Cable	1.0	Adapter of modem	Mains
UnshieldingUndetachable DC Cable	0.8	Adapter of modem	Modem
Shielding Undetachable K/B Cable	1.5	PC	Keyboard
Shielding Undetachable Mouse Cable	1.5	PC	Mouse
Unshielding Detachable AC Cable	1.2	PC	Mains
Unshielding Detachable RJ45 Cable	3.0	VOIP Phone	EUT
Unshielded Detachable AC Cable	1.0	Adapter of PoE	Mains
Unshielded Undetachable DC Cable	0.8	Adapter of PoE	POE switch
Unshielded Detachable RJ45 Cable	1.0	EUT	POE switch
Unshielded Detachable RJ45 Cable	3.0	VOIP phone	POE switch

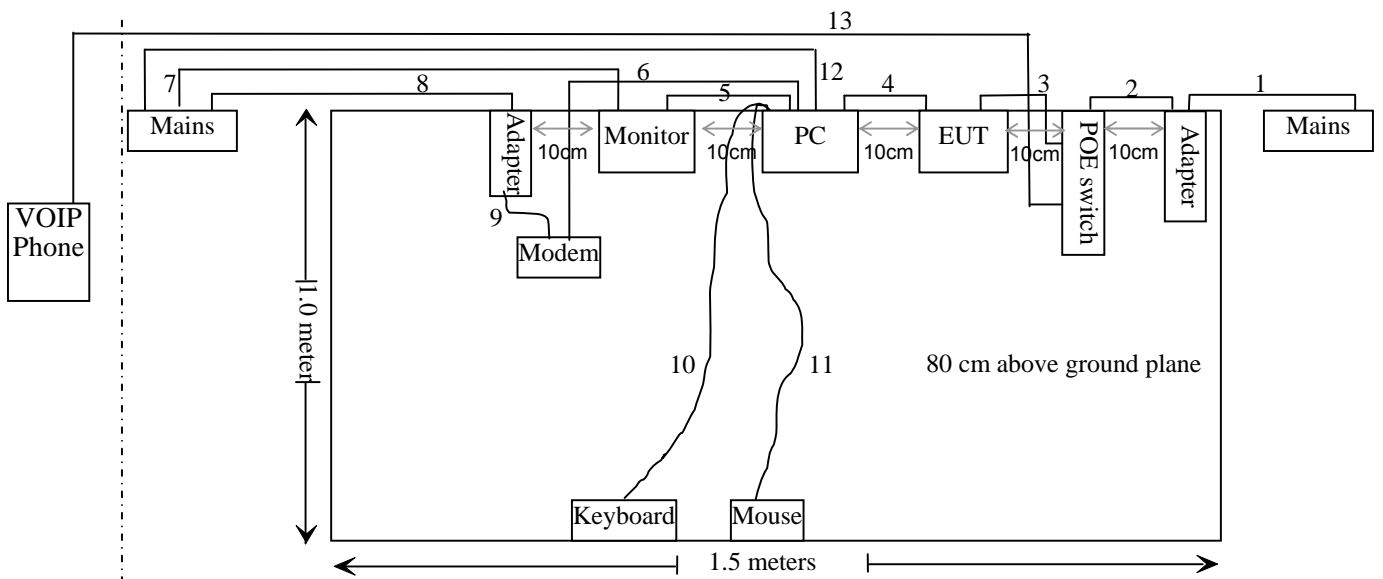
### Block Diagram of Test Setup

For conducted emission

Powered by Adapter:



Powered by PoE:



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## **SUMMARY OF TEST RESULTS**

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<b>FCC Rules</b>	<b>Description of Test</b>	<b>Results</b>
§15.107	AC Line Conducted Emissions	Compliance
§15.109	Radiated Spurious Emissions	Compliance

## FCC §15.107 – AC LINE CONDUCTED EMISSIONS

### Applicable Standard

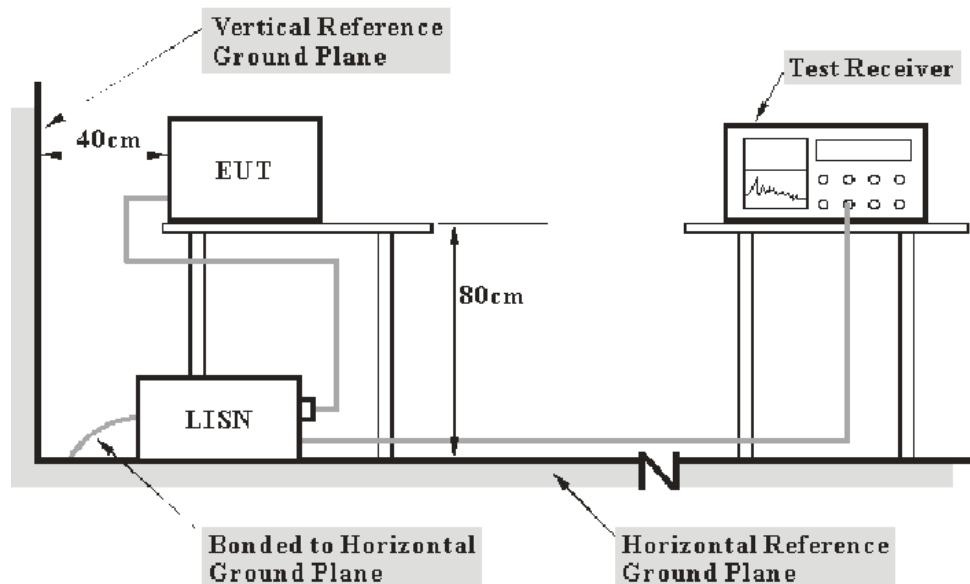
According to FCC §15.107

### 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 16-4-2, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is 2.4 dB(k=2, 95% level of confidence), and the uncertainty will not be taken into consideration for the test data recorded in the report.

### 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 of EUT setup is according with per ANSI C63.4-2003. The related limit was specified in FCC Part 15.107 Class B.

The spacing between the peripherals was 10 cm.

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

## EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

## Test Procedure

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	2012-11-24	2013-11-23
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2012-08-22	2013-08-21
Rohde & Schwarz	Pulse limiter	ESH3Z2	DE25985	2012-07-08	2013-07-07
BACL	CE Test software	BACL-CE	V1.0	-	-

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

## 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:

$$\text{Correction Factor} = \text{LISN VDF} + \text{Cable Loss} + \text{Pulse Limiter Attenuation}$$

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:

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

## Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.107, with the worst margin reading of:

**1.20 dB at 16.230 MHz in the Neutral** conducted mode (Powered by Adapter)



**Test Data**

**Environmental Conditions**

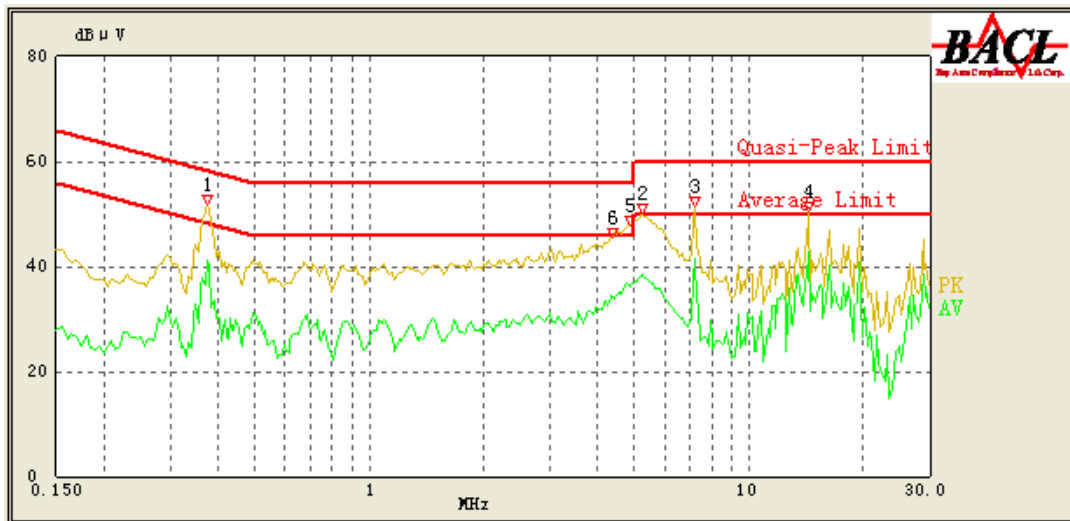
<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.0 kPa

The testing was performed by Andrew Shu on 2013-02-26.

Test Mode: Running

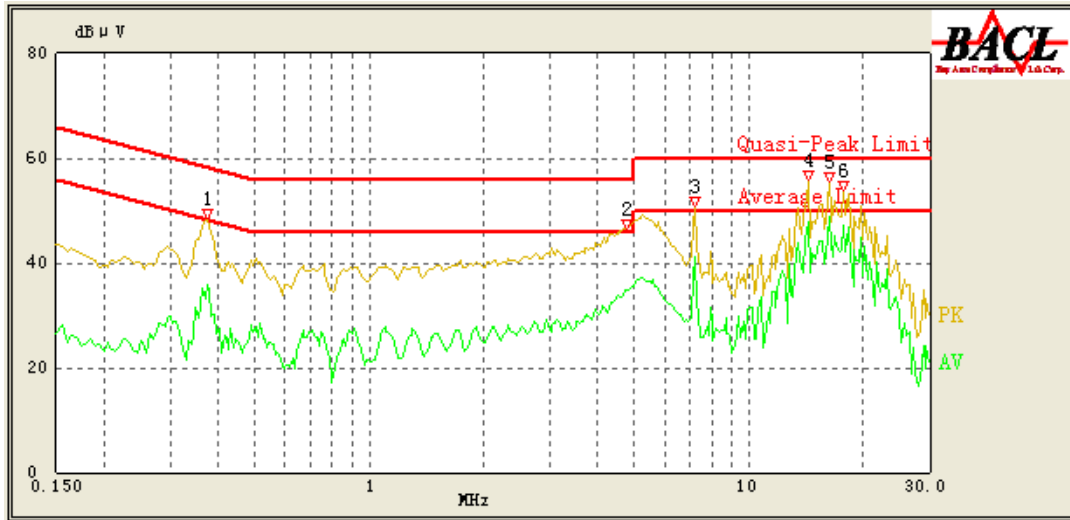
Powered by Adapter:

AC 120V/60 Hz, Line



Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
14.415	42.85	10.58	50.00	7.15	Ave.
0.375	41.14	10.20	49.57	8.43	Ave.
7.185	41.49	10.31	50.00	8.51	Ave.
4.885	36.18	10.20	46.00	9.82	Ave.
0.375	48.54	10.20	59.57	11.03	QP
5.235	38.46	10.21	50.00	11.54	Ave.
4.360	34.44	10.20	46.00	11.56	Ave.
4.860	43.87	10.20	56.00	12.13	QP
14.415	47.31	10.58	60.00	12.69	QP
7.190	45.85	10.31	60.00	14.15	QP
4.380	41.85	10.20	56.00	14.15	QP
5.235	44.99	10.21	60.00	15.01	QP

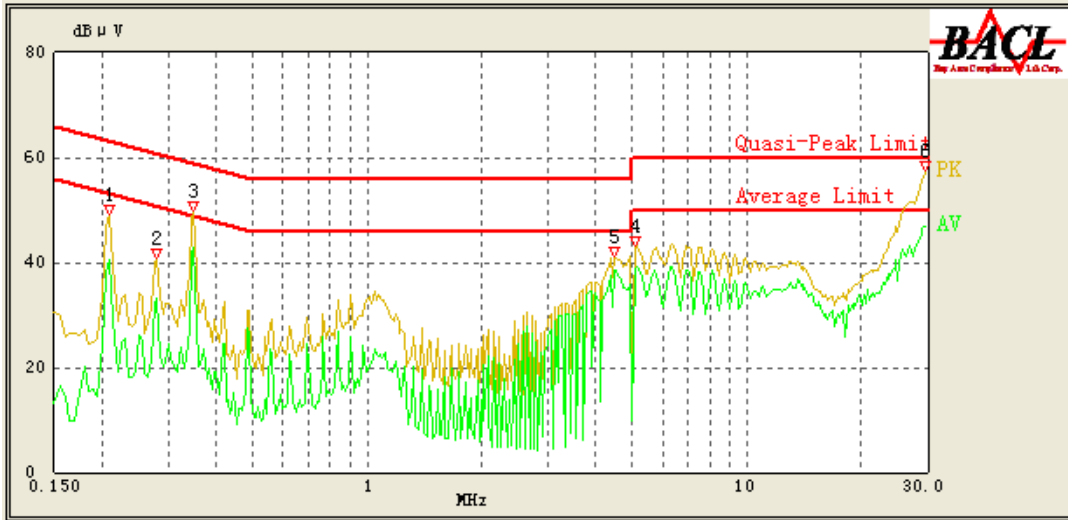
**AC 120V/60 Hz, Neutral**



Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
16.230	48.80	10.60	50.00	1.20	Ave.
14.415	47.79	10.56	50.00	2.21	Ave.
17.695	47.30	10.60	50.00	2.70	Ave.
14.415	53.05	10.56	60.00	6.95	QP
16.230	52.75	10.60	60.00	7.25	QP
7.185	41.28	10.30	50.00	8.72	Ave.
17.695	50.80	10.60	60.00	9.20	QP
4.745	34.70	10.20	46.00	11.30	Ave.
7.185	47.16	10.30	60.00	12.84	QP
4.750	42.95	10.20	56.00	13.05	QP
0.375	46.16	10.10	59.57	13.41	QP
0.375	35.79	10.10	49.57	13.78	Ave.

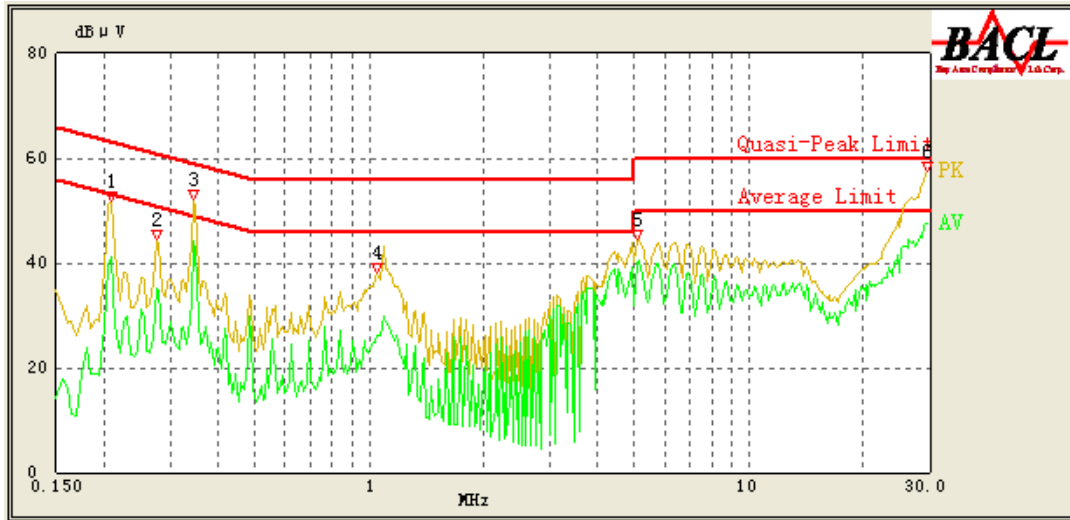
**Power by PoE:**

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



Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
29.665	47.13	11.18	50.00	2.87	Ave.
0.350	42.87	10.20	50.29	7.42	Ave.
4.455	38.51	10.20	46.00	7.49	Ave.
5.080	38.93	10.20	50.00	11.07	Ave.
29.665	47.92	11.18	60.00	12.08	QP
0.350	47.29	10.20	60.29	13.00	QP
0.210	40.35	10.10	54.29	13.94	Ave.
0.210	47.28	10.10	64.29	17.01	QP
4.455	37.89	10.20	56.00	18.11	QP
0.280	33.33	10.16	52.29	18.96	Ave.
5.080	36.79	10.20	60.00	23.21	QP
0.280	38.70	10.16	62.29	23.59	QP

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



Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
29.560	47.58	11.08	50.00	2.42	Ave.
0.345	44.29	10.10	50.43	6.14	Ave.
5.070	40.20	10.20	50.00	9.80	Ave.
0.345	48.81	10.10	60.43	11.62	QP
29.565	47.89	11.08	60.00	12.11	QP
0.210	41.10	10.10	54.29	13.19	Ave.
0.210	49.85	10.10	64.29	14.44	QP
0.275	35.33	10.10	52.43	17.10	Ave.
1.050	26.21	10.20	46.00	19.79	Ave.
0.275	39.55	10.10	62.43	22.88	QP
1.050	30.37	10.20	56.00	25.63	QP
5.070	23.76	10.20	60.00	36.24	QP

## FCC §15.109 - RADIATED SPURIOUS EMISSIONS

### Applicable Standard

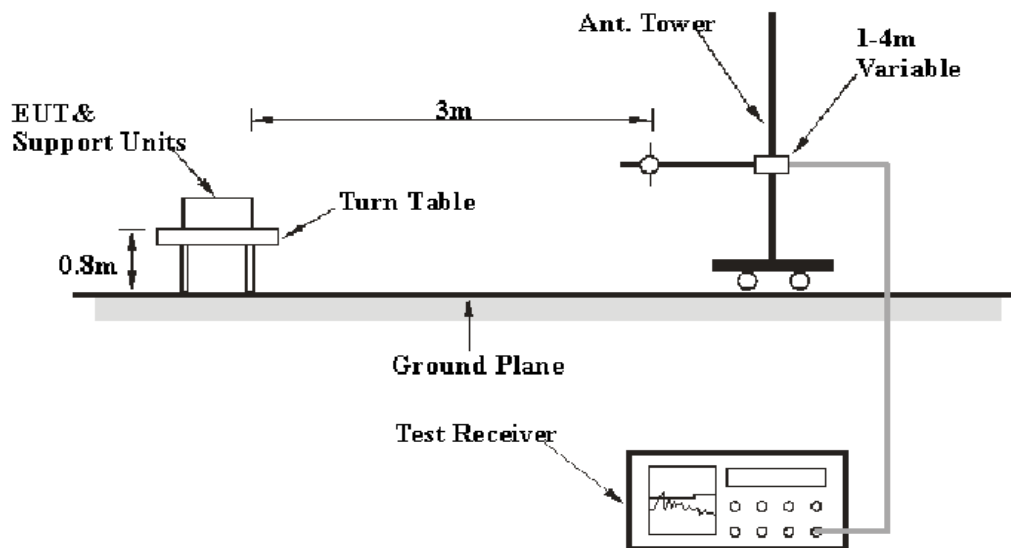
According to FCC §15.109

### 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, the Treatment of Uncertainty in EMC Measurements, the estimation of the uncertainty of radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is 4.0 dB(k=2, 95% level of confidence), and the uncertainty will not be taken into consideration for the test data recorded in the report.

### EUT Setup



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC Part 15.109 Class B 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 Setup

The system was investigated from 30 MHz to 2 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	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.

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01046	2012-11-24	2013-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
Super Ultra	Amplifier	ZVA-213+	N/A	2012-11-24	2013-11-23
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2014-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23
R&S	Auto test Software	EMC32	V6.30	-	-

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

## 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 data in the following table, the EUT complied with the FCC §15.109 Class B, with the worst margin reading of:

**2.2 dB at 359.992550 MHz in the Horizontal polarization (Powered by PoE)**

## Test Data

### Environmental Conditions

<b>Temperature:</b>	24 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.1 kPa

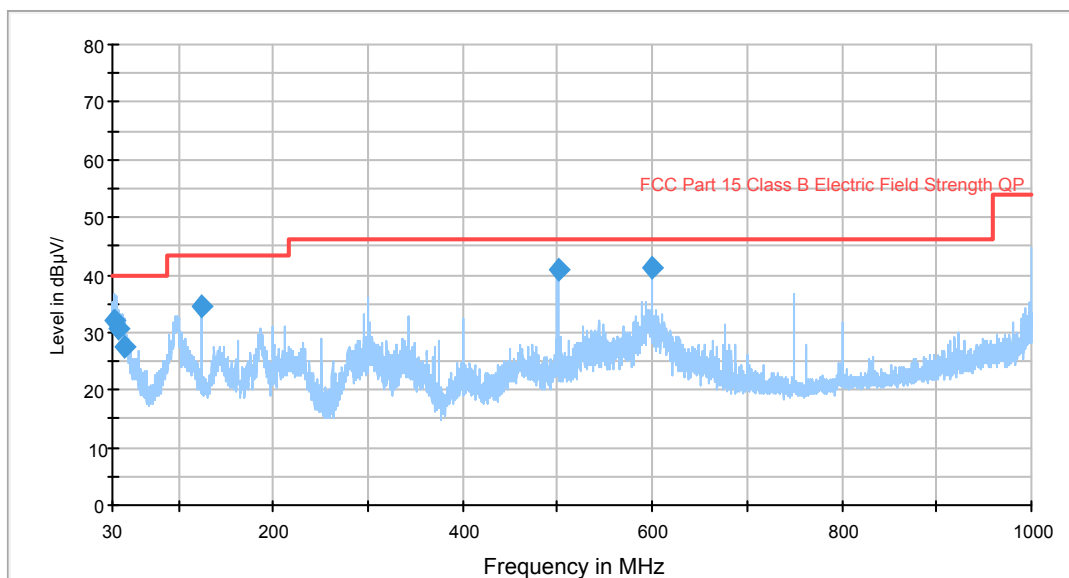
*The testing was performed by Andrew Shu on 2013-02-28.*

*Test mode: Running*

**Powered by Adapter:**

**1) 30~1000 MHz:**

Auto Test(FCC part 15 Class B)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity	Turntable Position (Degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
600.004200	41.3	105.0	V	167.0	-9.4	46.0	4.7
500.029700	40.8	189.0	V	72.0	-10.1	46.0	5.2
32.789000	32.2	120.0	V	139.0	-9.0	40.0	7.8
124.992300	34.7	105.0	V	264.0	-13.4	43.5	8.8
35.474200	30.6	107.0	V	149.0	-11.1	40.0	9.4
42.449750	27.4	106.0	V	24.0	-16.1	40.0	12.6

**2) 1~2 GHz:**

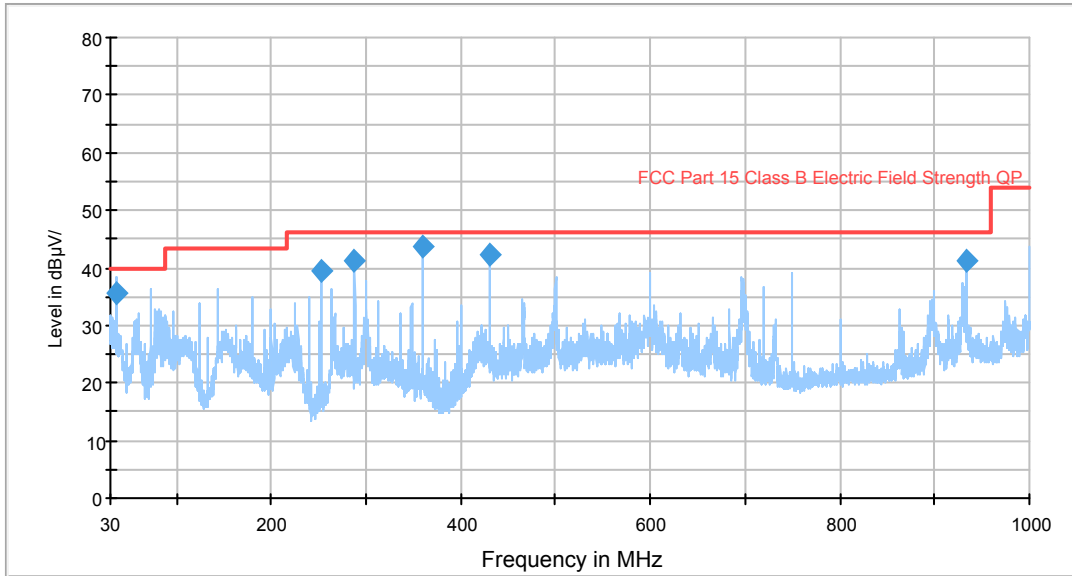
Frequency (MHz)	Receiver		Turn table Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBµV/m)	FCC Part 15.109	
	Reading (dBµV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H / V)			Limit (dBµV/m)	Margin (dB)
1000.0	43.52	Ave.	73	1.0	V	-1.20	42.32	54.00	11.68
1000.0	43.33	Ave.	135	1.2	H	-1.20	42.13	54.00	11.87
1853.7	37.38	Ave.	115	1.1	H	2.63	40.01	54.00	13.99
1400.8	38.31	Ave.	56	1.1	V	0.68	38.99	54.00	15.01
1000.0	51.64	PK	135	1.2	H	-1.20	50.44	74.00	23.56
1885.8	47.69	PK	116	1.1	H	2.63	50.32	74.00	23.68
1000.0	50.35	PK	73	1.0	V	-1.20	49.15	74.00	24.85
1400.8	47.47	PK	56	1.1	V	0.68	48.15	74.00	25.85



**Powered by PoE:**

**1) 30~1000 MHz:**

Auto Test(FCC part 15 Class B)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity	Turntable Position (Degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
359.992550	43.8	100.0	H	204.0	-13.3	46.0	2.2
430.003750	42.3	115.0	V	204.0	-11.4	46.0	3.7
35.941250	35.6	100.0	V	204.0	-11.5	40.0	4.4
288.020000	41.3	210.0	H	204.0	-14.2	46.0	4.7
933.070000	41.3	100.0	H	204.0	-3.5	46.0	4.7
252.008750	39.6	107.0	V	204.0	-15.8	46.0	6.4

2) 1~2 GHz:

Frequency (MHz)	Receiver		Turn table Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBµV/m)	FCC Part 15.109	
	Reading (dBµV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H / V)			Limit (dBµV/m)	Margin (dB)
2032.0	39.41	Ave.	196	1.8	V	3.23	42.64	54.00	11.36
1861.7	38.89	Ave.	65	1.0	V	2.63	41.52	54.00	12.48
2032.0	57.28	PK	196	1.8	H	3.23	60.51	74.00	13.49
1400.8	38.62	Ave.	15	1.2	H	0.74	39.36	54.00	14.64
2132.3	35.28	Ave.	2	1.4	V	3.94	39.22	54.00	14.78
1771.5	36.61	Ave.	183	2.1	H	2.32	38.93	54.00	15.07
1861.7	55.40	PK	65	1.0	V	2.63	58.03	74.00	15.97
1591.2	35.51	Ave.	29	1.0	H	1.70	37.21	54.00	16.79
1771.5	54.17	PK	183	2.1	V	2.32	56.49	74.00	17.51
2132.3	52.06	PK	2	1.4	H	3.94	56.00	74.00	18.00
1400.8	49.68	PK	15	1.2	H	0.74	50.42	74.00	23.58
1591.2	48.19	PK	29	1.0	V	1.70	49.89	74.00	24.11

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