

FCC PART 15B

MEASUREMENT AND TEST REPORT

For

**Grandstream Networks, Inc.**

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Shenzhen, Guangdong, China

**FCC ID: YZZGXP1400**

<b>Report Type:</b> Original Report	<b>Product Type:</b> IP Phone
<b>Test Engineer:</b> Walt Kang	<i>Walt Kang</i>
<b>Report Number:</b> RSZ10121711	
<b>Report Date:</b> 2011-01-13	
<b>Reviewed By:</b> Lisa Zhu EMC Engineer	<i>[Signature]</i>
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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. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP\*, NIST, or any agency of the Federal Government.

\* This report contains 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 *Grandstream Networks, Inc.*'s product, model number: *GXP1405 (FCC ID: YZZGXP1400)* or the "EUT" as referred to in this report is an *IP Phone*, which measures approximately 18.7 cm (L) x 18.7 cm (W) x 4.5 cm (H). Input voltage: DC 5.0 V adapter, the highest operating frequency is 208 MHz.

#### Adapter information:

Model: AK00G-050080UW;

Input: 100-240 VAC 50/60 Hz 0.2 A

Output: DC 5.0 V 0.8 A

*Note: the product IP Phone, model GXP1400 and GXP1405 are electrically identical, the difference between them on the POE power support and P/N silkscreen, which was explained in the declaration letter.*

*\* All measurement and test data in this report was gathered from production sample serial number: 1012085 (Assigned by BACL, Shenzhen). The EUT was received on 2010-12-17.*

### Objective

This Type approval report is prepared on behalf of *Grandstream Networks, Inc.* 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 compliance with FCC Part 15B.

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

N/A

### 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 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 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

### Justification

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

### EUT Exercise Software

N/A

### Equipment Modifications

No modification was made to the unit tested.

### Local Support Equipment List and Details

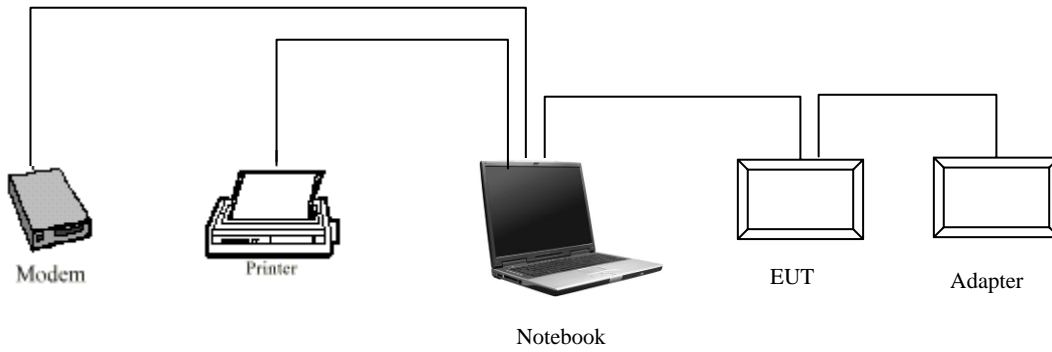
Manufacturer	Description	Model	Serial Number	FCC ID
DELL	Notebook	PP01L	S2-B001	DOC
HP	Laser Jet5L	C3941A	JPTVOB2337	DOC
SAST	Modem	AEM-2100	0293	DOC
N/A	Prosafe Switch with POE	N/A	PSEM04205	N/A

### External I/O Cable

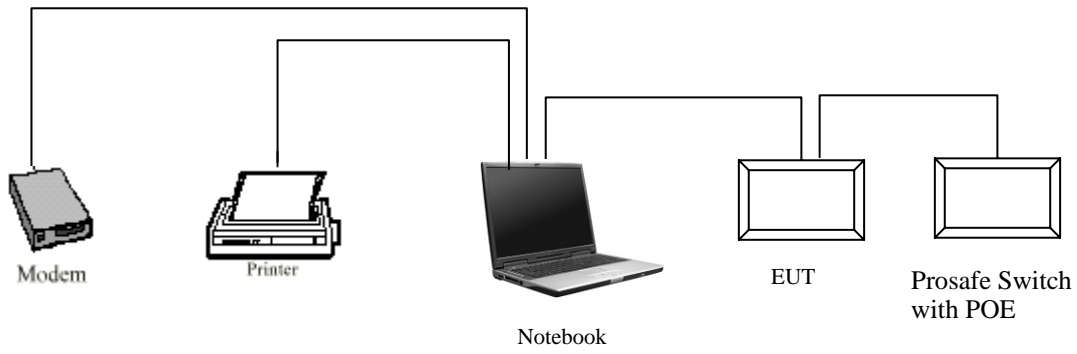
Cable Description	Length (m)	From/Port	To
Shielded Detachable RJ45 Cable	2.0	RJ45 Port/Host	EUT
Unshielded Detachable DC Cable	1.8	Adapter	EUT

### Configuration of Test Setup

For AC/DC adapter power supply

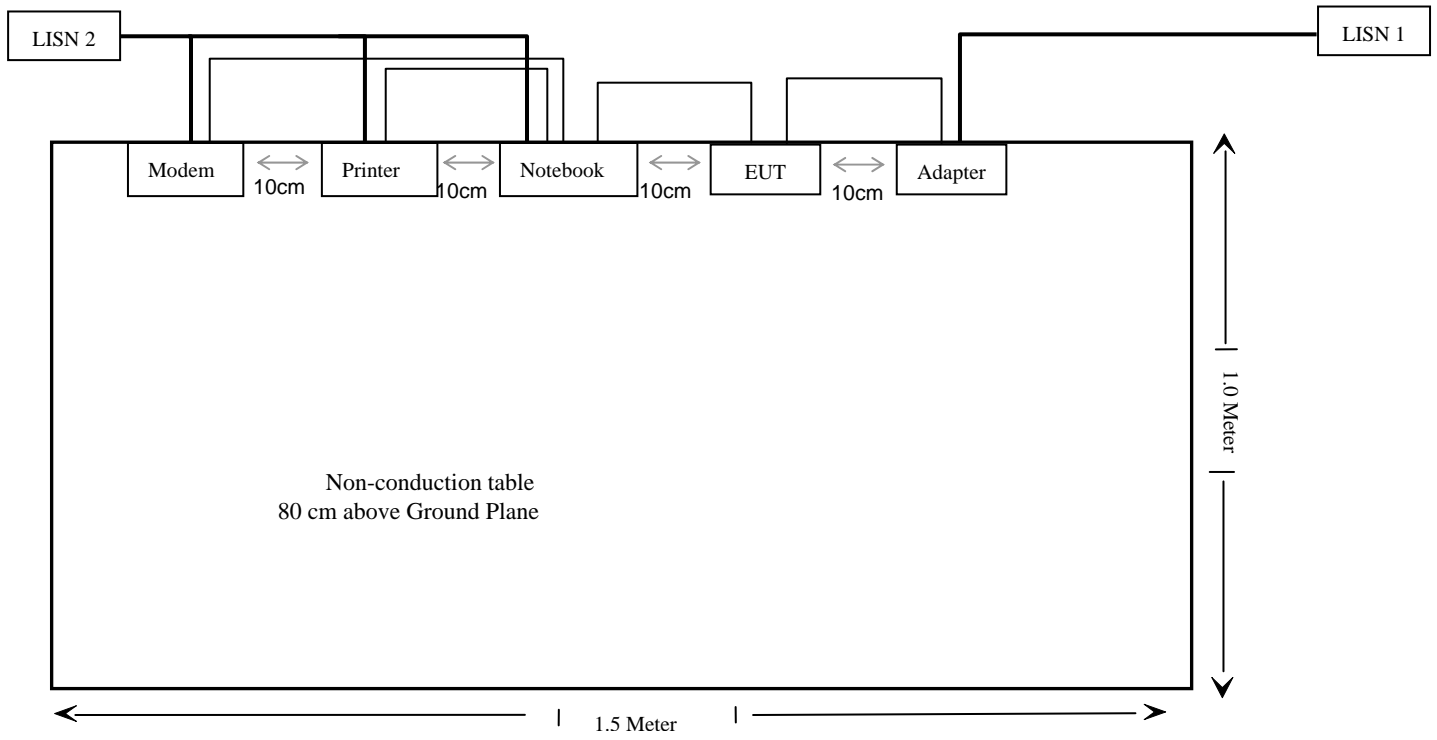


For POE power supply

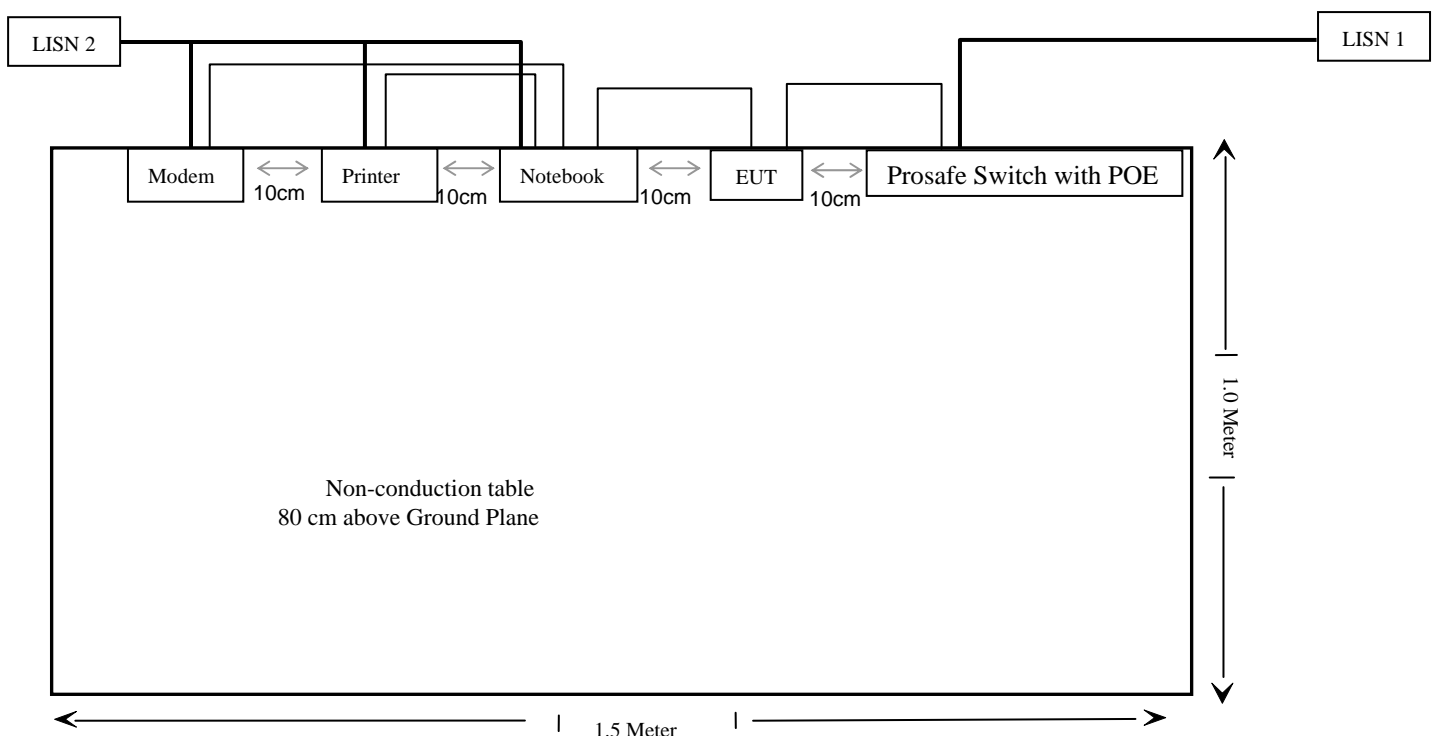


### Block Diagram of Test Setup

For AC/DC adapter power supply



For POE power supply



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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



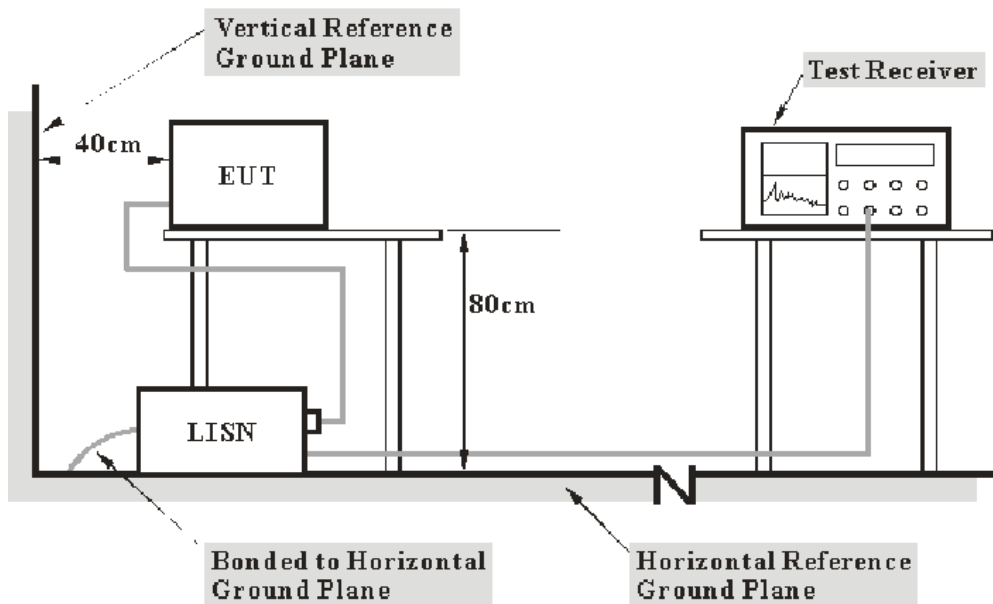
## FCC §15.107 – AC LINE CONDUCTED EMISSIONS

### 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 (Shenzhen) is  $\pm 2.4$  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 setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.107 Class B limits.

The spacing between the peripherals was 10 cm.

For AC/DC adapter power supply, the adapter was connected to a 120 VAC/60 Hz power source.

For POE power supply, the POE 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><b>Frequency Range</b></i>	<i><b>IF B/W</b></i>
150 kHz – 30 MHz	9 kHz

## 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	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. 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 first LISN; the other support equipments were connected to second LISN for AC/DC adapter power supply. EUT and notebook were connected to prosafe switch with POE prosafe switch with POE was connected to the first LISN.all the other relevant support equipments were connected to the second LISN for POE power supply mode.

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 15.107 Class B, with the worst margin reading of:

### AC/DC adapter Power Supply

**15.85 dB at 4.690 MHz** in the **Neutral** conductor mode

### POE Power Supply

**7.92 dB at 2.415 MHz** in the **Line** conductor mode

## Test Data

### Environmental Conditions

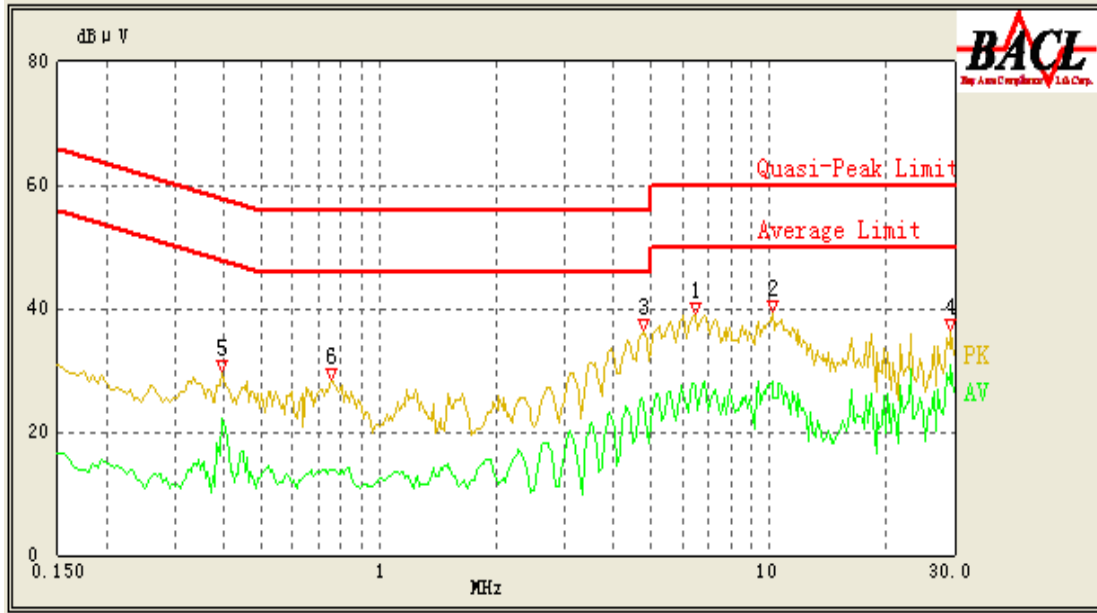
<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	48 %
<b>ATM Pressure:</b>	100.0 kPa

*The testing was performed by Walt Kang on 2010-12-24.*

**AC/DC adapter Power Supply**

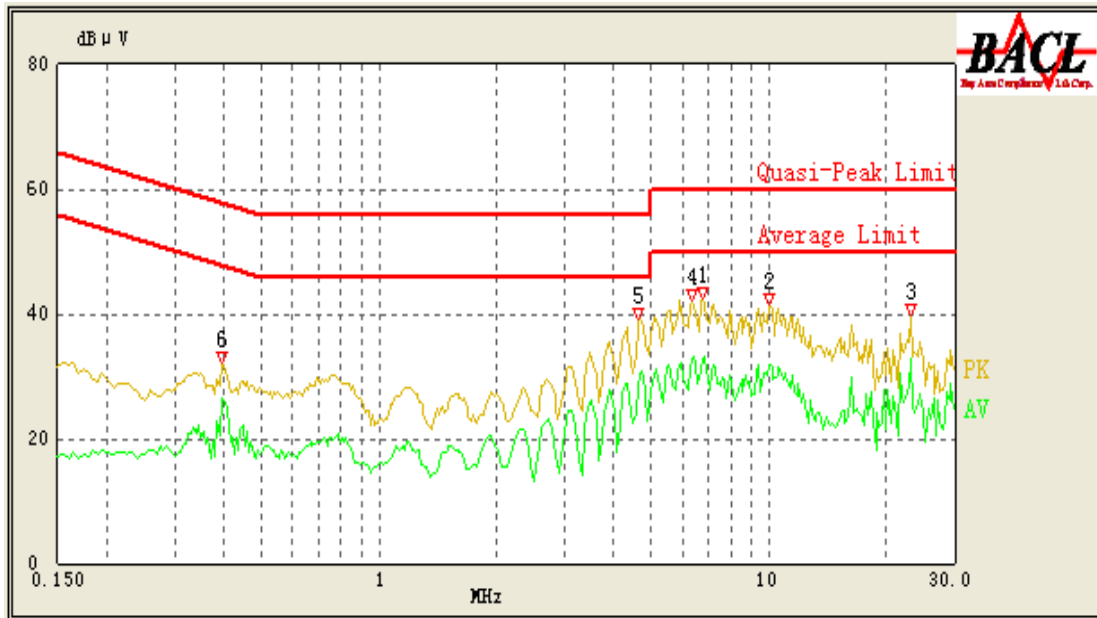
Test Mode: Running (GXP1400)

AC 120V/ 60 Hz, Line:



Conducted Emissions			FCC Part 15.107, Class B		
Frequency (MHz)	Corrected Factor (dB)	Corrected Result (dBµV)	Limit (dBµV)	Margin (dB)	Remark (PK/Ave/QP)
29.235	30.85	10.11	50.00	19.15	Ave
4.760	24.48	10.10	46.00	21.52	Ave
10.245	28.21	10.10	50.00	21.79	Ave
6.460	27.65	10.10	50.00	22.35	Ave
4.775	32.88	10.10	56.00	23.12	QP
10.245	36.08	10.10	60.00	23.92	QP
6.460	35.20	10.10	60.00	24.80	QP
29.235	34.60	10.11	60.00	25.40	QP
0.395	22.28	10.10	49.00	26.72	Ave
0.395	28.02	10.10	59.00	30.98	QP
0.755	13.94	10.15	46.00	32.06	Ave
0.755	22.15	10.15	56.00	33.85	QP

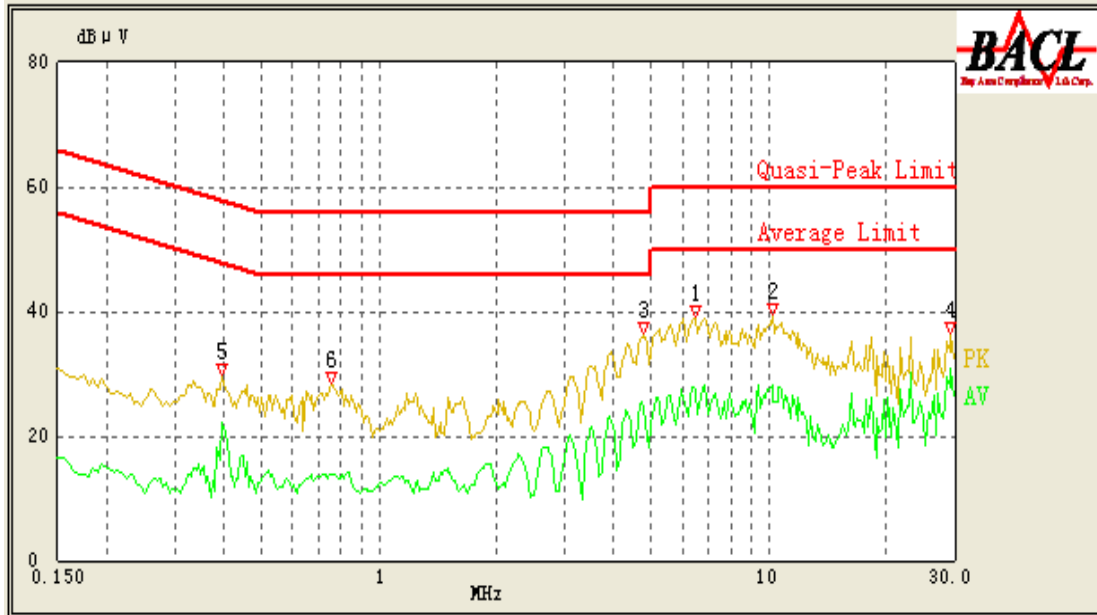
**AC 120V/ 60 Hz, Neutral:**



Conducted Emissions			FCC Part 15.107, Class B		
Frequency (MHz)	Correct (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Remark (PK/Ave/QP)
4.690	30.15	10.10	46.00	15.85	Ave
23.130	32.90	10.17	50.00	17.10	Ave
6.785	32.87	10.10	50.00	17.13	Ave
6.360	32.72	10.10	50.00	17.28	Ave
10.060	31.71	10.10	50.00	18.29	Ave
6.365	39.20	10.10	60.00	20.80	QP
10.060	39.18	10.10	60.00	20.82	QP
4.645	35.08	10.10	56.00	20.92	QP
6.775	39.02	10.10	60.00	20.98	QP
0.395	26.52	10.10	49.00	22.48	Ave
23.130	37.41	10.17	60.00	22.59	QP
0.395	30.93	10.10	59.00	28.07	QP

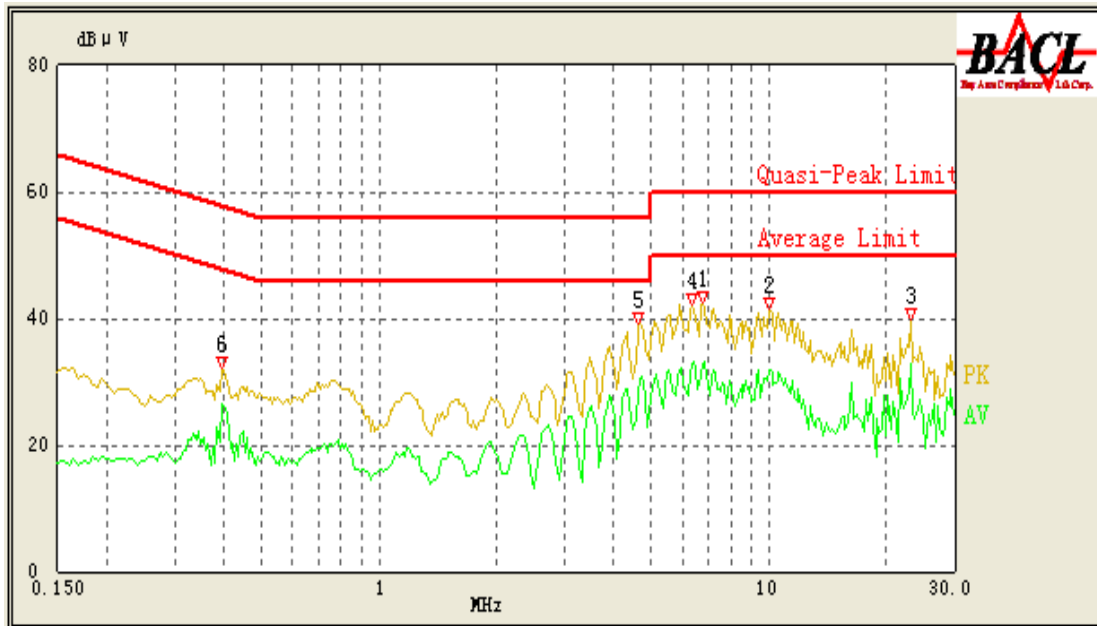
Test Mode: Running (GXP1405)

AC 120V/ 60 Hz, Line:



Conducted Emissions			FCC Part 15.107, Class B		
Frequency (MHz)	Corrected Factor (dB)	Corrected Result (dBμV)	Limit (dBμV)	Margin (dB)	Remark (PK/Ave/QP)
29.235	30.80	10.11	50.00	19.20	Ave
4.760	24.45	10.10	46.00	21.55	Ave
10.245	28.30	10.10	50.00	21.70	Ave
6.460	27.60	10.10	50.00	22.40	Ave
4.775	32.88	10.10	56.00	23.12	QP
10.245	36.08	10.10	60.00	23.92	QP
6.460	35.20	10.10	60.00	24.80	QP
29.235	34.60	10.11	60.00	25.40	QP
0.395	22.25	10.10	49.00	26.75	Ave
0.395	28.05	10.10	59.00	30.95	QP
0.755	13.91	10.15	46.00	32.09	Ave
0.755	22.11	10.15	56.00	33.89	QP

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



Conducted Emissions			FCC Part 15.107, Class B		
Frequency (MHz)	Correct (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Remark (PK/Ave/QP)
4.690	30.10	10.10	46.00	15.90	Ave
23.130	32.91	10.17	50.00	17.09	Ave
6.785	32.86	10.10	50.00	17.14	Ave
6.360	32.75	10.10	50.00	17.25	Ave
10.060	31.70	10.10	50.00	18.30	Ave
6.365	39.16	10.10	60.00	20.84	QP
10.060	39.18	10.10	60.00	20.82	QP
4.645	35.08	10.10	56.00	20.92	QP
6.775	39.02	10.10	60.00	20.98	QP
0.395	26.52	10.10	49.00	22.48	Ave
23.130	37.45	10.17	60.00	22.55	QP
0.395	30.90	10.10	59.00	28.10	QP

**POE Power Supply**

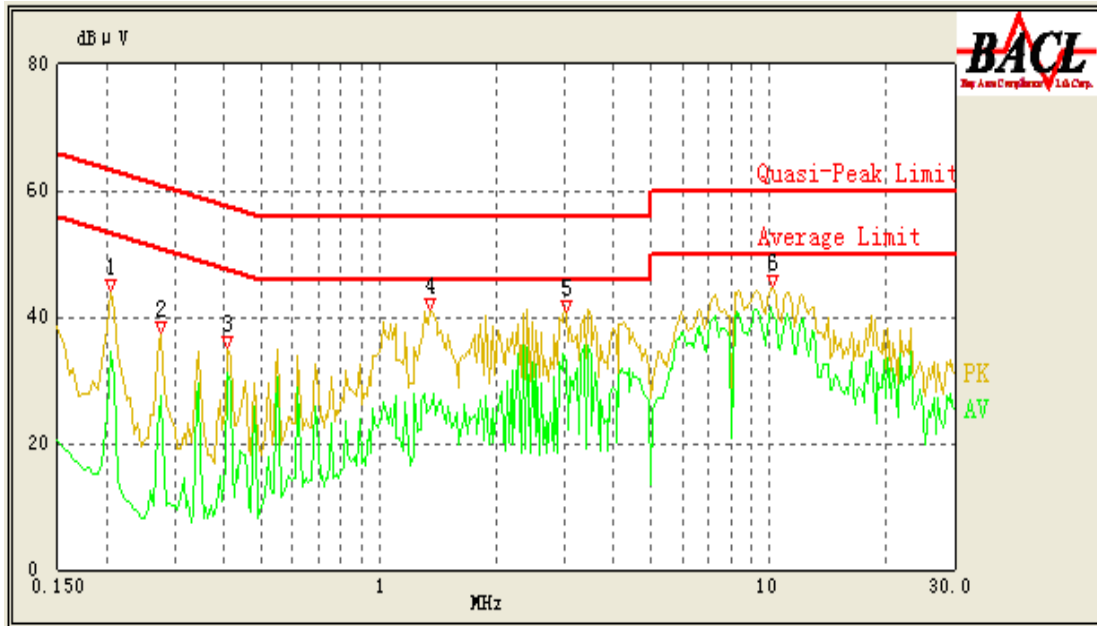
Test Mode: Running (GXP1405)

AC 120V/ 60 Hz, Line:



Conducted Emissions			FCC Part 15.107, Class B		
Frequency (MHz)	Corrected Factor (dB)	Corrected Result (dBµV)	Limit (dBµV)	Margin (dB)	Remark (PK/Ave/QP)
2.415	38.08	10.18	46.00	7.92	Ave
4.205	37.43	10.10	46.00	8.57	Ave
9.375	40.96	10.10	50.00	9.04	Ave
7.310	39.79	10.10	50.00	10.21	Ave
4.205	40.72	10.10	56.00	15.28	QP
2.415	40.42	10.18	56.00	15.58	QP
1.035	30.02	10.10	46.00	15.98	Ave
9.445	41.63	10.10	60.00	18.37	QP
7.310	40.30	10.10	60.00	19.70	QP
1.030	34.57	10.10	56.00	21.43	QP
0.205	41.97	10.06	64.43	22.46	QP
0.205	29.99	10.06	54.43	24.44	Ave

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



Conducted Emissions			FCC Part 15.107, Class B		
Frequency (MHz)	Correct (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Remark (PK/Ave/QP)
10.165	41.15	10.10	50.00	8.85	Ave
3.020	33.10	10.15	46.00	12.90	Ave
3.020	39.28	10.15	56.00	16.72	QP
0.410	31.18	10.11	48.57	17.39	Ave
10.235	41.67	10.10	60.00	18.33	QP
1.365	26.33	10.14	46.00	19.67	Ave
0.205	34.50	10.06	54.43	19.93	Ave
1.355	34.62	10.14	56.00	21.38	QP
0.205	42.47	10.06	64.43	21.96	QP
0.410	34.88	10.11	58.57	23.69	QP
0.275	27.42	10.02	52.43	25.01	Ave
0.275	35.59	10.02	62.43	26.84	QP



## FCC §15.109 – RADIATED SPURIOUS EMISSIONS

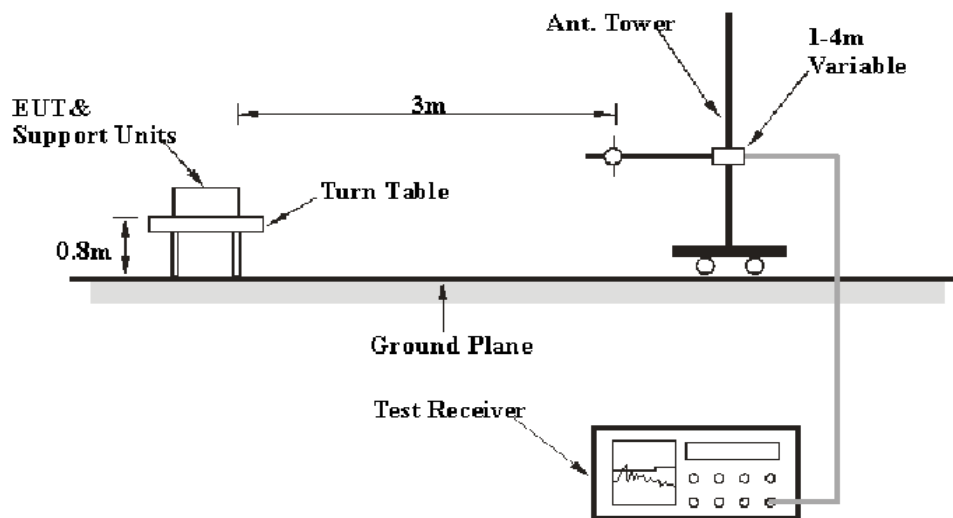
### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, 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.

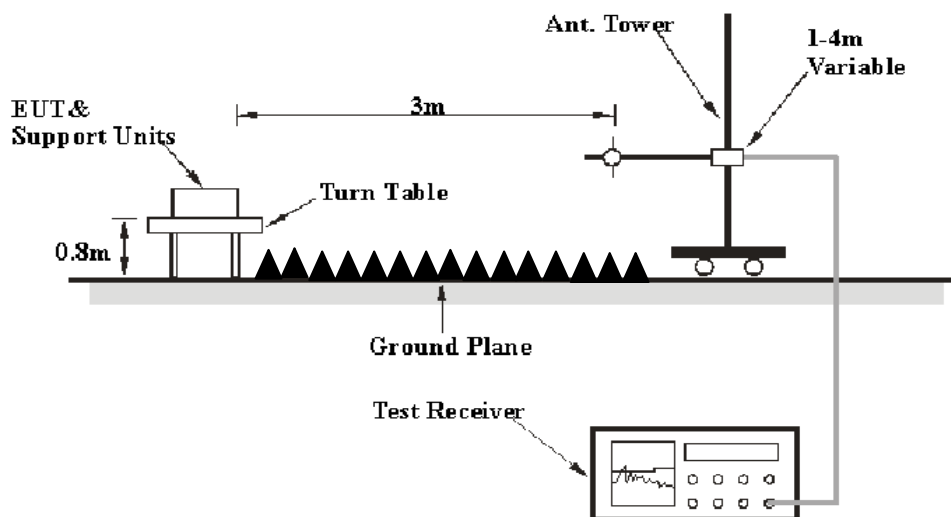
Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. is  $\pm 4.0$  dB. ( $k=2$ , 95% level of confidence)

### 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 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.

For AC/DC adapter power supply, the adapter was connected to a 120 VAC/60 Hz power source.

For POE power supply, the prosafe switch with POE was connected to a 120 VAC/60 Hz power source.

### EMI Test Receiver Setup

The system was investigated from 30 MHz to 2000 MHz.

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

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

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447E	1937A01046	2010-08-02	2011-08-02
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-24	2011-11-24
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2010-07-05	2011-07-04
Rohde&Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-08	2011-07-08
SUPER ULTRA	Pre-amplifier	ZVA-213+	N/A	2010-09-12	2011-09-11
Sunol Sciences	Horn Antenna	DRH-118	A052604	2010-05-05	2011-05-04

\* **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

During the radiated emissions test, the adapter and all the other relevant support equipments were connected to the AC floor outlet for AC/DC adapter power supply mode; EUT and host PC were connected to prosafe switch with POE, all the other relevant support equipments were connected to the AC floor outlet for POE power supply mode.

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

All data was recorded in the Quasi-peak detection mode from 30 MHz to 1 GHz, Peak and average detection mode above 1 GHz.

## Corrected Amplitude & Margin Calculation

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

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

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 Class B 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:

### For AC/DC adapter power supply

**2.7 dB** at **43.513250 MHz** in the **Vertical** polarization for the model *GXP1400*

**6.9 dB** at **47.810000 MHz** in the **Vertical** polarization for the model *GXP1405*

### For POE power supply

**4.8 dB** at **207.386750 MHz** in the **Horizontal** polarization

## Test Data

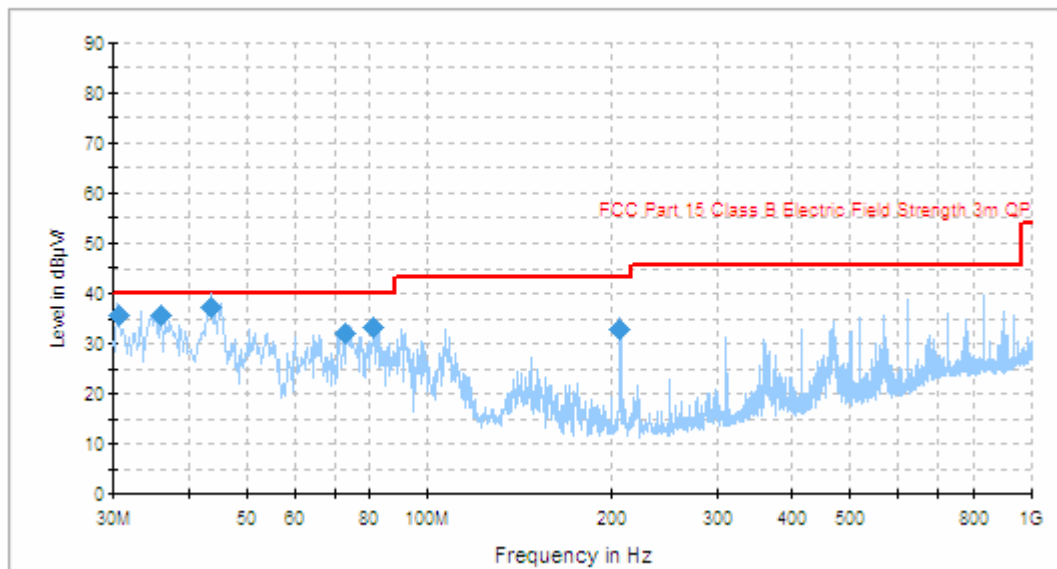
### Environmental Conditions

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	48 %
<b>ATM Pressure:</b>	100.0 kPa

*The testing was performed by Walt Kang on 2011-01-06*

**AC/DC adapter Power Supply**

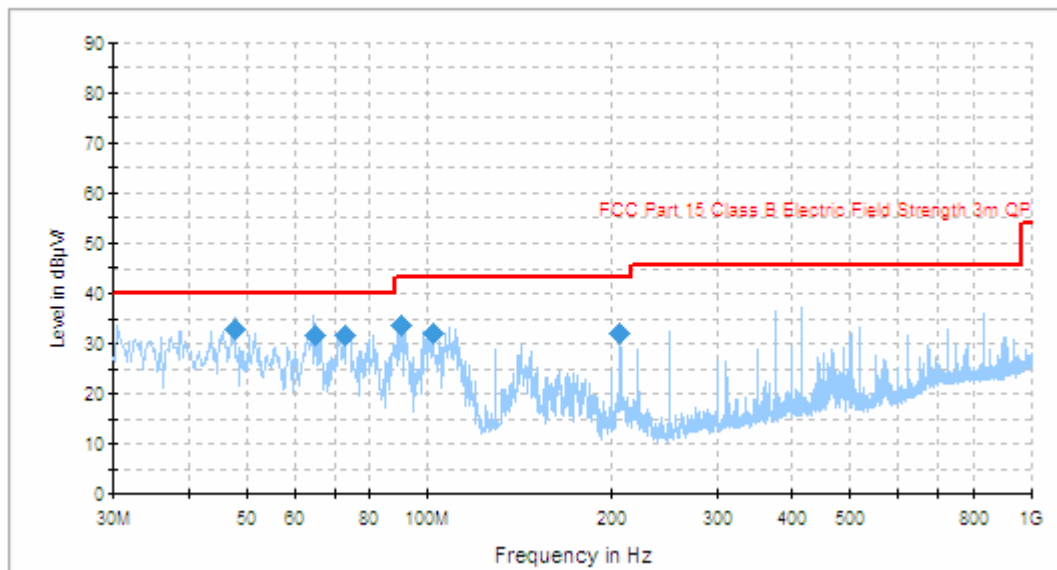
30-1000 MHz

*Test Mode: Running (Model: GXP1400)*

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (Degree)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
43.513250	37.3	100.0	V	301.0	-14.2	40.0	2.7*
30.628430	35.9	100.0	V	103.0	-5.8	40.0	4.1
36.124250	35.9	100.0	V	99.0	-9.6	40.0	4.1
81.167500	33.5	201.0	H	256.0	-17.4	40.0	6.5
73.165000	32.0	157.0	H	123.0	-18.2	40.0	8.0
207.267500	33.1	103.0	H	183.0	-12.7	43.5	10.4

Note: \* within measurement uncertainty.

Test Mode: Running (Model: GXP1405)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (Degree)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
47.810000	33.1	100.0	V	101.0	-16.4	40.0	6.9
64.836500	31.8	122.0	V	73.0	-18.5	40.0	8.2
73.186750	31.7	142.0	V	163.0	-18.2	40.0	8.3
90.365750	33.8	157.0	V	123.0	-17.4	43.5	9.7
101.780000	32.3	201.0	H	256.0	-16.83	43.5	10.2
207.267500	32.0	103.0	H	183.0	-12.7	43.5	11.5

**Above 1 GHz:***Test Mode: Running (Model: GXP1400)*

Frequency (MHz)	S.A. Reading (dBuV)	Detector PK/QP/Ave.	Direction Degree	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Amp. (dBµV/m)	FCC §15.109, Class B	
				Height (m)	Polar (H / V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)
1672.38	36.48	Ave.	315	1.6	V	25.3	2.30	26.52	37.56	54	16.44
1240.50	34.59	Ave.	210	1.4	H	23.6	2.06	26.49	33.76	54	20.24
1672.38	42.23	PK	335	1.3	V	25.3	2.30	26.52	43.31	74	30.69
1240.50	43.93	PK	156	1.5	H	23.6	2.06	26.49	43.10	74	30.90

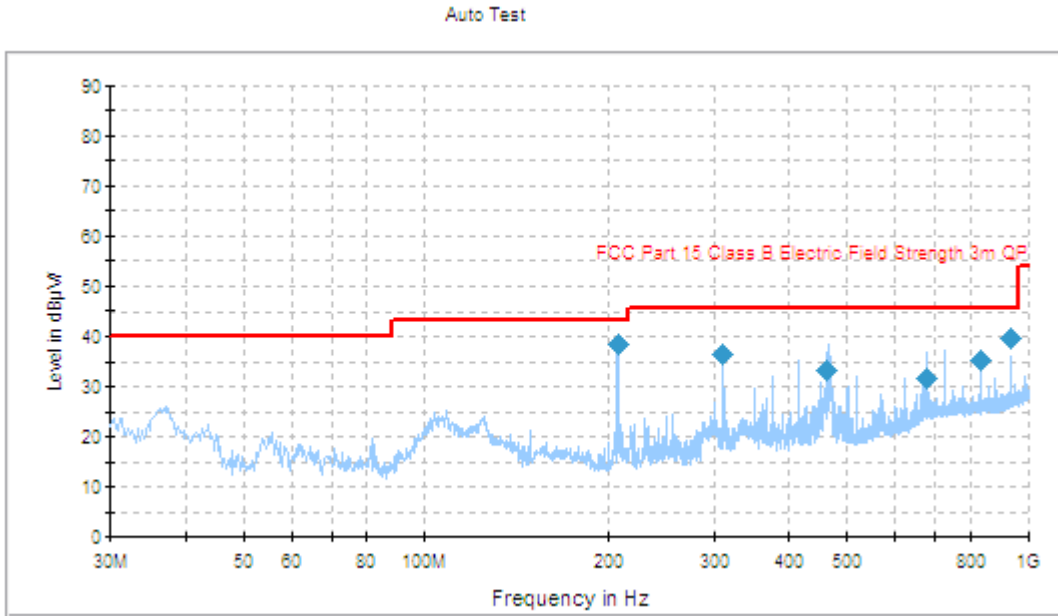
*Test Mode: Running (Model: GXP1405)*

Frequency (MHz)	S.A. Reading (dBuV)	Detector PK/QP/Ave.	Direction Degree	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Amp. (dBµV/m)	FCC §15.109, Class B	
				Height (m)	Polar (H / V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)
1672.38	36.48	Ave.	315	1.6	V	25.3	2.30	26.52	37.56	54	16.44
1240.50	34.59	Ave.	210	1.4	H	23.6	2.06	26.49	33.76	54	20.24
1672.38	43.23	PK	335	1.3	V	25.3	2.30	26.52	40.31	74	33.69
1240.50	40.93	PK	156	1.5	H	23.6	2.06	26.49	40.10	74	33.90

**POE Power Supply**

**30-1000 MHz:**

*Test Mode: Running (Model: GXP1405)*



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (Degree)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
207.386750	38.7	125.0	H	88.0	-14.2	43.5	4.8
933.148750	39.7	131.0	H	6.0	0.2	46.0	6.3
311.063250	36.7	100.0	H	15.0	-12.1	46.0	9.3
829.402750	35.5	100.0	H	19.0	-1.4	46.0	10.5
463.118000	33.4	175.0	H	318.0	-8.9	46.0	12.6
677.031250	31.6	114.0	H	320.0	-3.9	46.0	14.4

**Above 1 GHz:***Test Mode: Running (Model: GXP1405)*

Frequency (MHz)	S.A. Reading (dBuV)	Detector PK/QP/Ave.	Direction Degree	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Amp. (dBµV/m)	FCC §15.109, Class B	
				Height (m)	Polar (H / V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)
1672.38	36.48	Ave.	315	1.6	V	25.3	2.30	26.52	37.56	54	16.44
1240.50	34.59	Ave.	210	1.4	H	23.6	2.06	26.49	33.76	54	20.24
1672.38	40.23	PK	335	1.3	V	25.3	2.30	26.52	41.31	74	32.69
1240.50	40.93	PK	156	1.5	H	23.6	2.06	26.49	40.10	74	33.90



## PRODUCT SIMILARITY DECLARATION LETTER



深圳市潮流网络技术有限公司  
Grandstream Networks, Inc. (China)  
[http:// www.grandstream.com.cn](http://www.grandstream.com.cn)

To: Bay Area Compliance Lab. Corp

From: Grandstream Networks, Inc. (China)

### Product Similarity Declaration

To Whom It May Concern,

We, Grandstream Networks, Inc. hereby declare that our Product : IP Multimedia Phone , Model: GXP1400 GXP1405 were certified by Bay Area Compliance Laboratories Corp. Instruction of difference as followed:

The series phones different on POE power support and P/N silkscreen, the others are the same at circuit PCBA and function.

TABLE 1:

Difference notes:	
GXP140X	POE power support
GXP1400	NO
GXP1405	YES



GXP1405



GXP1400

P/N silkscreen difference:

Red notes show the difference of P/N, P/N are GXP1400,GXP1405





Signature: 李俊德 2010-12-15

Print Name:

Date: 2010-12-15

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