Lab Code: 200707-0

FCC PART 15B, CLASS B

TEST REPORT

For

Grandstream Networks, Inc.

5F, Bldg. #1, No.2 Kefa Road, Science & Technology Park,

Shenzhen, Guangdong, China

FCC ID: YZZGXP2200

Report Type:	Product Name:
Original Report	Wireless IP Phone

Test Engineer:	Lebron Wang
Report Number:	RSZ120919010-00
Report Date:	2012-09-27
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

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Grandstream Networks, Inc.'s* product, model number *GXP2200 (FCC ID: YZZGXP2200)* or the "EUT" in this report was a *IP Phone*, which was measured approximately: 18.8 cm (L) x 21.0 cm (W) x 8.5 cm (H), rated input: DC 12.0V from adapter or PoE, the highest operating frequency of EUT is 648 MHz.

Adapter information:
Model: SFF1200150A1BY
Input: AC 100-240 V, 50/60 Hz, 0.4A
Output: DC 12.0V, 1.5A

**All measurement and test data in this report was gathered from production sample serial number: 1209100 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2012-09-19.*

Objective

The following test report is prepared on behalf of *Grandstream Networks, Inc.* in accordance with Part 2-Subpart J, and 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, Class B.

Related Submittal(s)/Grant(s)

FCC part 15.247 DSS submissions with FCC ID: YZZGXP2200

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.

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 (FCC §15.27)

Justification

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

Equipment Modifications

No modification was made to the EUT tested.

Remote and Support Equipment List and Details

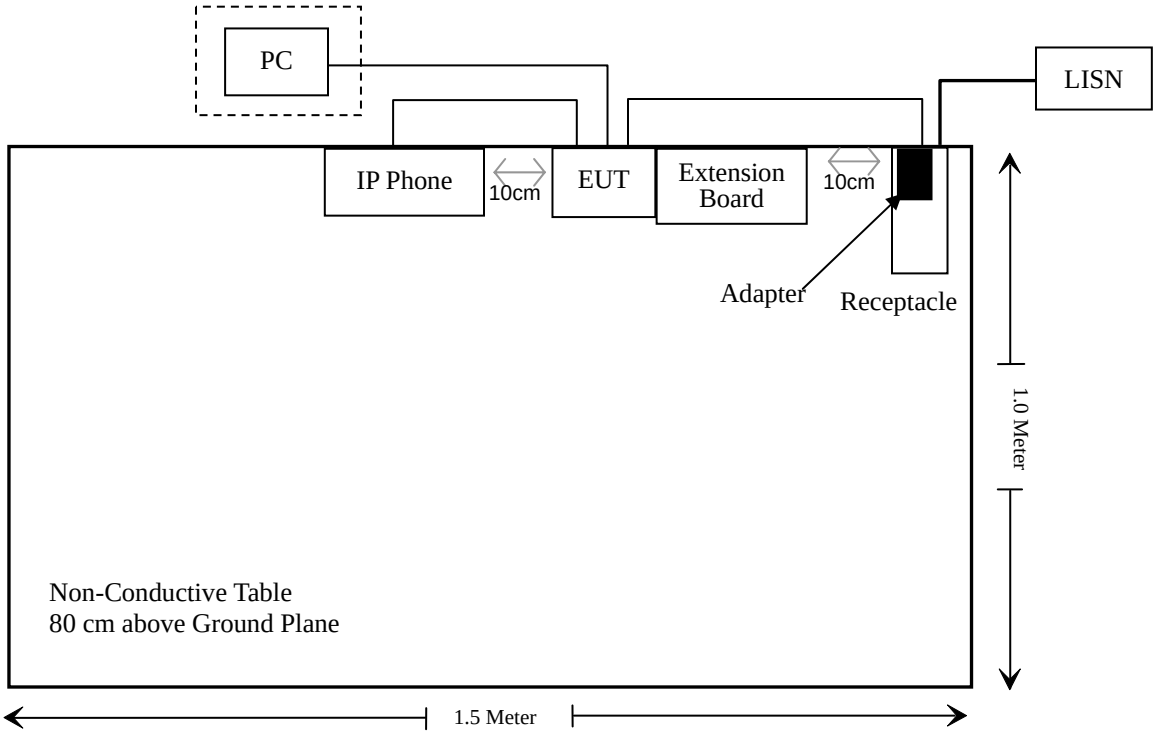
Manufacturer	Description	Model	Serial Number
Grandstream	IP PHONE	GXP200	N/A
DELL	PC	VOSTRO 220S	127BP2X
NETGEAR	POE	FS108P	N/A
Kingston	SD CARD	2GB	N/A
Kingston	U-disk	2GB	N/A
Grandstream	Extension Board	GXP2200EXT	N/A

External I/O Cable

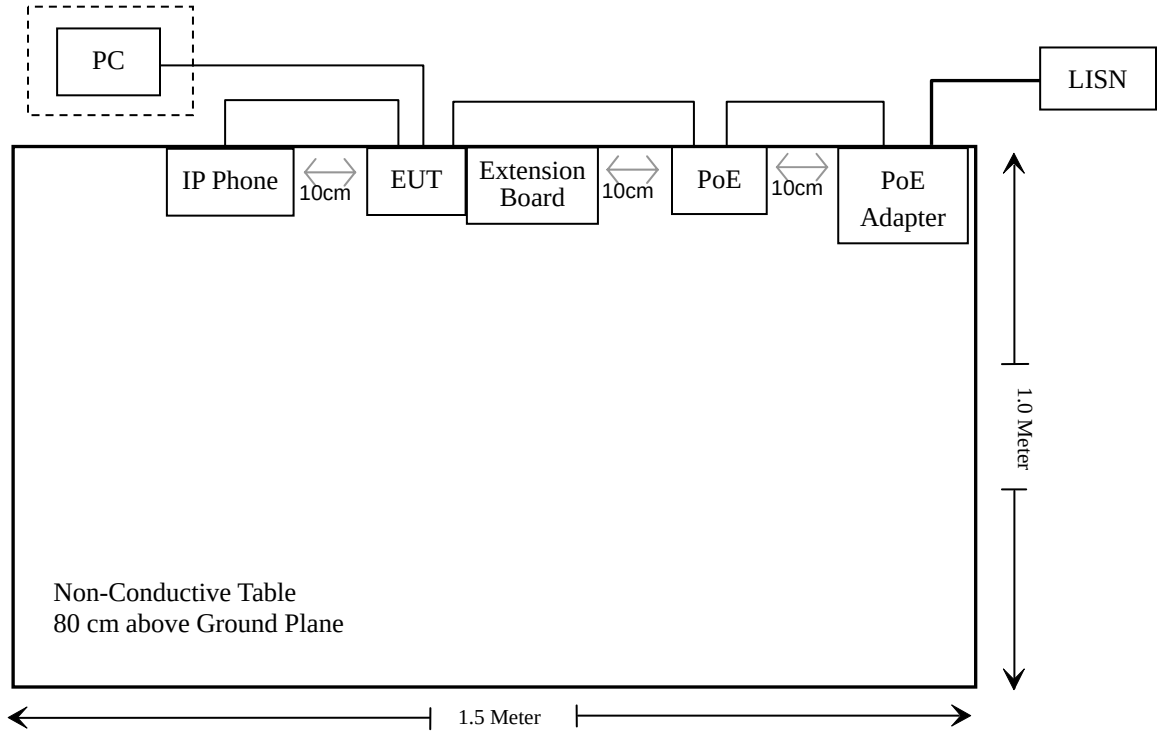
Cable Description	Length (m)	From/Port	To
Unshielded Detachable RJ45 Cable	1.8	EUT	IP Phone
Unshielded Detachable RJ45 Cable	10.0	EUT	PC
Unshielded Detachable RJ45 Cable	0.2	EUT	Extension Board
Unshielded Detachable RJ45 Cable	1.8	EUT	PoE
Unshielded Detachable DC Power Cable	2.6	EUT	EUT Adapter
Unshielded Detachable DC Power Cable	1.8	PoE	PoE Adapter

Block Diagram of Test Setup

Talking (Powered by adapter)



Talking (Powered by PoE)



SUMMARY OF TEST RESULTS

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

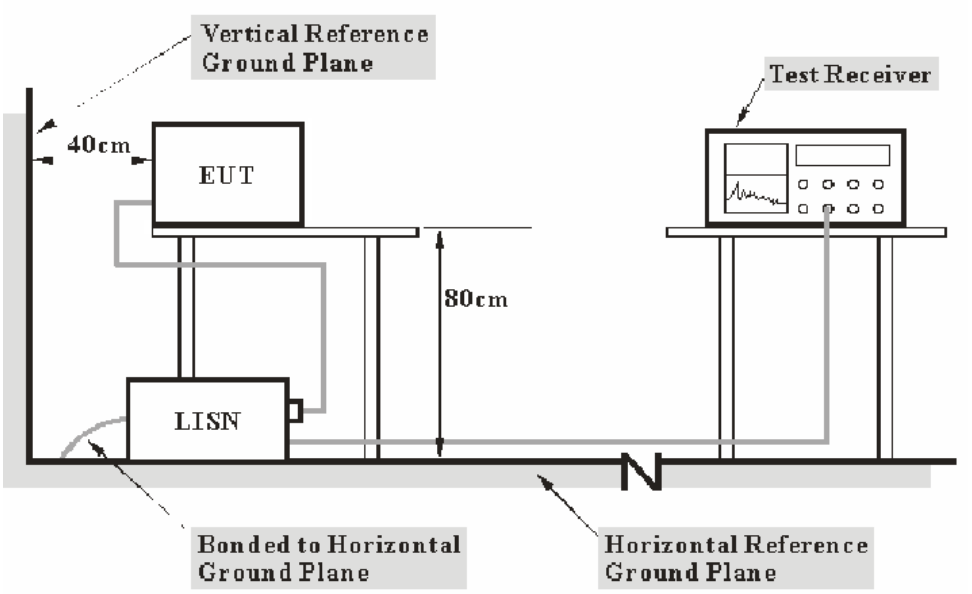
FCC §15.107 – AC LINE CONDUCTED EMISSIONS

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 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 all 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 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.

The receptacle was connected to a 120 VAC/60 Hz power source for AC adapter power supply.

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

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 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	2011-11-24	2012-11-23
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2011-11-17	2012-11-16
Rohde & Schwarz	Attenuator	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 using suitable standards 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:

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 worst margin reading of:

2.35 dB at **0.490 MHz** in the **Line** conducted mode (powered by PoE)

Test Data

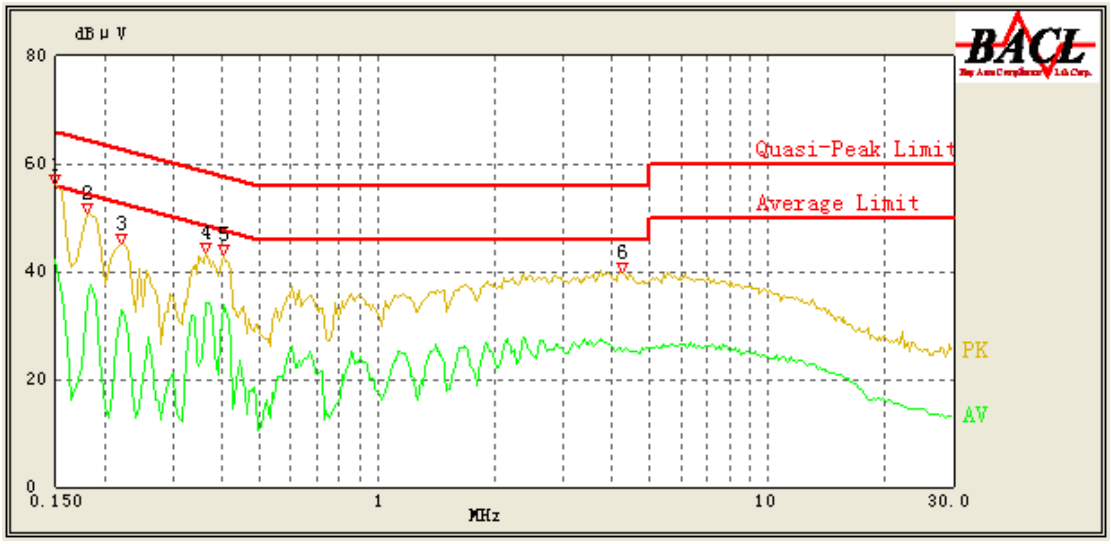
Environmental Conditions

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

The testing was performed by Lebron Wang on 2012-09-26.

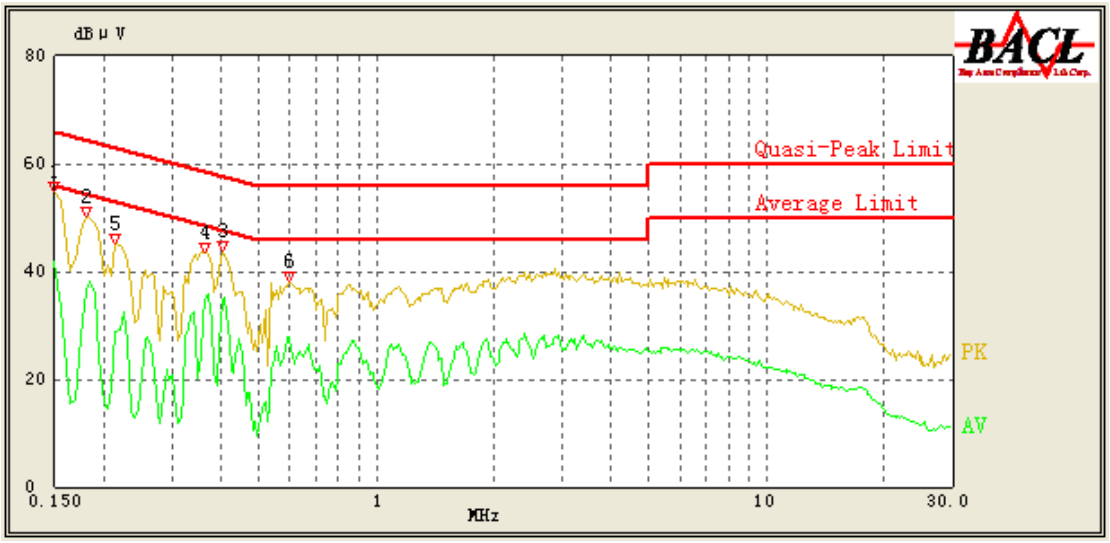
Test Mode: Talking/ Data transferring (Powered by adapter)

AC 120V/60 Hz, Line:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/ QP/Ave.)
0.150	53.79	10.27	66.00	12.21	QP
0.150	42.20	10.27	56.00	13.80	Ave.
0.405	33.76	10.26	48.71	14.95	Ave.
0.365	34.12	10.26	49.86	15.74	Ave.
0.180	47.89	10.27	65.14	17.25	QP
0.405	40.17	10.26	58.71	18.54	QP
0.365	40.74	10.26	59.86	19.12	QP
0.180	34.89	10.27	55.14	20.25	Ave.
4.250	25.18	10.28	46.00	20.82	Ave.
0.220	42.72	10.27	64.00	21.28	QP
0.220	32.69	10.27	54.00	21.31	Ave.
4.245	32.54	10.28	56.00	23.46	QP

AC 120V/60 Hz, Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/ QP/Ave.)
0.150	53.26	10.24	66.00	12.74	QP
0.405	34.48	10.25	48.71	14.23	Ave.
0.150	41.68	10.24	56.00	14.32	Ave.
0.365	34.69	10.25	49.86	15.17	Ave.
0.180	47.52	10.24	65.14	17.62	QP
0.405	40.69	10.25	58.71	18.02	QP
0.600	27.67	10.23	46.00	18.33	Ave.
0.180	36.50	10.24	55.14	18.64	Ave.
0.365	41.16	10.25	59.86	18.70	QP
0.595	35.07	10.23	56.00	20.93	QP
0.215	41.08	10.24	64.14	23.06	QP
0.215	28.73	10.24	54.14	25.41	AV

Test Mode: Talking/ Data transferring (Powered by PoE)

AC 120V/60 Hz, Line:

Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/ QP/Ave.)
0.490	43.94	10.25	46.29	2.35*	Ave.
0.430	42.65	10.26	48.00	5.35	Ave.
0.675	39.59	10.22	46.00	6.41	Ave.
0.735	38.94	10.21	46.00	7.06	Ave.
0.370	41.82	10.26	49.71	7.89	Ave.
0.555	37.66	10.24	46.00	8.34	Ave.
0.490	45.75	10.25	56.29	10.54	QP
0.675	42.75	10.22	56.00	13.25	QP
0.430	44.45	10.26	58.00	13.55	QP
0.735	41.35	10.21	56.00	14.65	QP
0.370	43.14	10.26	59.71	16.57	QP
0.555	39.03	10.24	56.00	16.97	QP

**Within measurement uncertainty!*

AC 120V/60 Hz, Neutral

Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/ QP/Ave.)
0.490	43.43	10.24	46.29	2.86	Ave.
0.430	42.57	10.25	48.00	5.43	Ave.
0.675	38.78	10.22	46.00	7.22	Ave.
0.735	38.29	10.21	46.00	7.71	Ave.
0.370	41.75	10.25	49.71	7.96	Ave.
0.555	38.00	10.23	46.00	8.00	Ave.
0.490	45.32	10.24	56.29	10.97	QP
0.430	44.44	10.25	58.00	13.56	QP
0.675	41.97	10.22	56.00	14.03	QP
0.735	40.80	10.21	56.00	15.20	QP
0.370	43.06	10.25	59.71	16.65	QP
0.555	39.08	10.23	56.00	16.92	QP

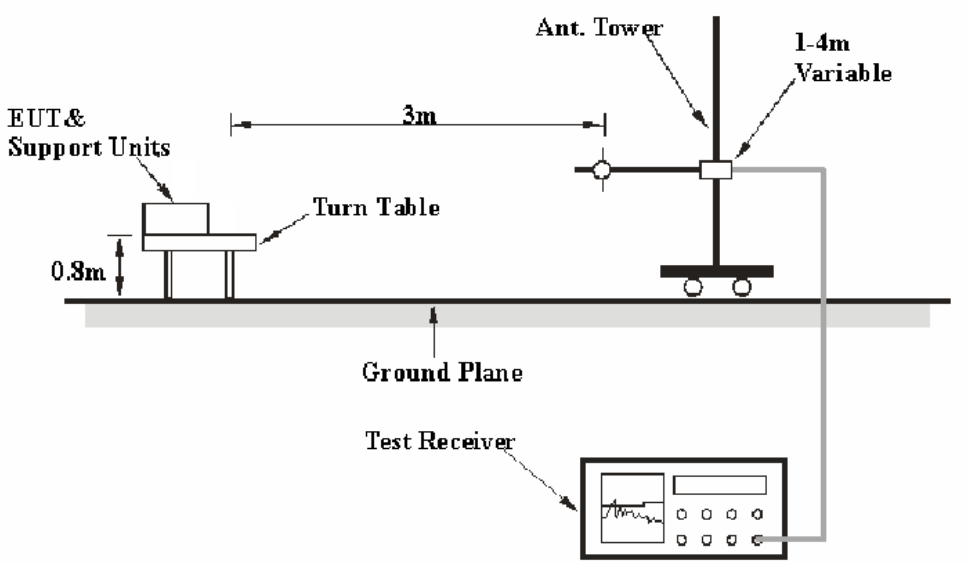
FCC §15.109 - RADIATED SPURIOUS EMISSIONS

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 CISPR 16-4-2, 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), and the uncertainty will not be taken into consideration for all the test data recorded in the report.

EUT Setup



The radiated emission tests were performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC Part 15 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 adapter was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

According to FCC 15.33 requirements, the EUT system was measured from 30 MHz to 5 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

For the radiated emissions test, the adapter was connected to AC floor outlet.

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

The data was recorded in Quasi-peak detection mode for frequency range of 30 MHz to 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
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07
HP	Amplifier	8447E	1937A01046	2011-11-24	2012-11-23
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2012-11-27
SUPER ULTRA	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
Rohde & Schwarz	Auto test Software	EMC32	V6.30	-	-

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed using suitable standards 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:

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

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the data in the following table, the worst margin reading is below:

3.1 dB at **622.076550 MHz** in the **Vertical** polarization (powered by adapter)

Test Data

Environmental Conditions

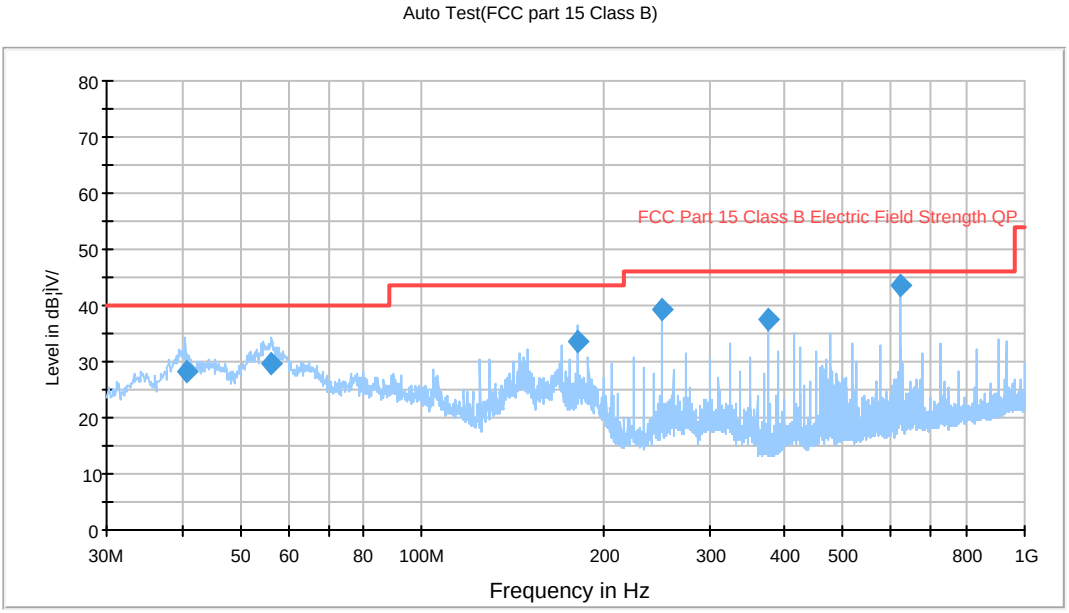
Temperature:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Lebron Wang on 2012-09-26.

Test Mode: Talking/ Data transferring

Below 1 GHz:

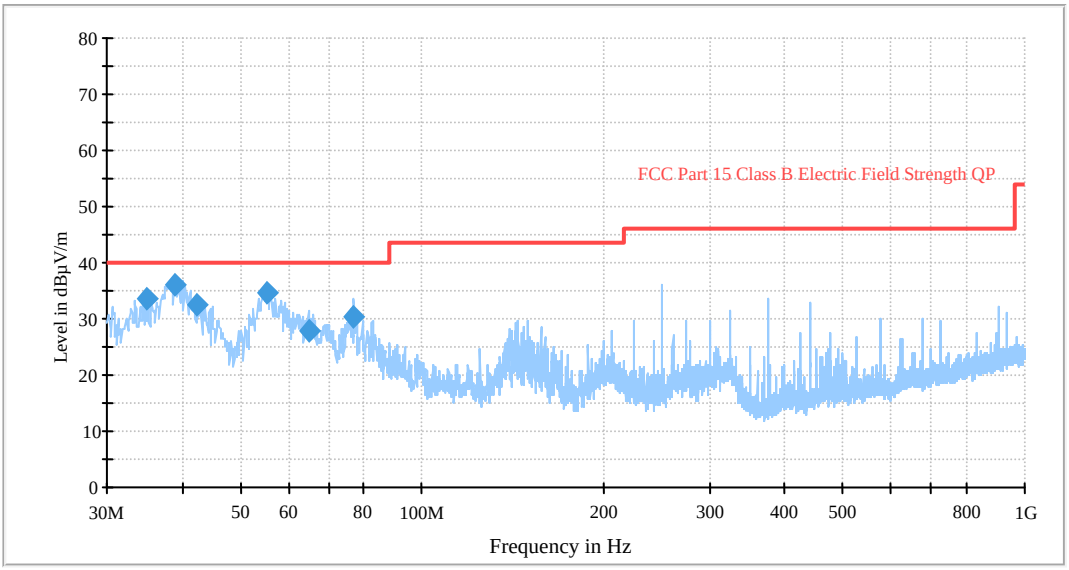
Powered by adapter



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Ant. Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
622.076550	42.9	105.0	V	218.0	-8.3	46.0	3.1*
181.447400	33.6	152.0	H	331.0	-16.1	43.5	6.4
249.993900	39.2	122.0	H	229.0	-15.8	46.0	6.8
375.002150	37.6	152.0	V	170.0	-12.9	46.0	8.4
56.214350	29.6	179.0	V	7.0	-20.9	40.0	10.4
40.867650	28.3	106.0	V	182.0	-15.0	40.0	11.7

*Within measurement uncertainty!

Powered by PoE:



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Ant. Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
38.891750	36.0	106.0	V	4.0	-13.5	40.0	4.0
55.424500	34.6	140.0	V	3.0	-20.9	40.0	5.4
34.901375	33.5	105.0	V	21.0	-10.6	40.0	6.5
42.433875	32.5	107.0	V	3.0	-16.1	40.0	7.5
77.158750	30.4	106.0	V	3.0	-20.2	40.0	9.6
65.059875	27.7	104.0	V	9.0	-20.7	40.0	12.3

Above 1 GHz:

Powered by adapter:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBµV/m	FCC Part 15B	
	Reading (dBµV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBµV/m	Margin (dB)
2492.9	26.43	Ave.	113	1.2	H	7.21	33.64	54	20.36
2492.9	25.81	Ave.	73	1.1	V	7.21	33.02	54	20.98
1551.1	49.83	PK	25	1.0	V	1.70	51.53	74	22.47
1651.3	26.14	Ave.	98	1.1	H	1.77	27.91	54	26.09
1651.3	45.43	PK	98	1.1	H	1.77	47.20	74	26.80
1551.1	25.11	Ave.	25	1.0	V	1.70	26.81	54	27.19
2492.9	39.27	PK	73	1.1	V	7.21	46.48	74	27.52
2492.9	38.59	PK	113	1.2	H	7.21	45.80	74	28.20

Powered by PoE:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBµV/m	FCC Part 15B	
	Reading (dBµV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBµV/m	Margin (dB)
2492.9	25.33	Ave.	122	1.3	H	7.21	32.54	54	21.46
2492.9	24.83	Ave.	53	1.0	V	7.21	32.04	54	21.96
1651.3	50.26	PK	87	1.2	V	1.77	52.03	74	21.97
2492.9	42.49	PK	53	1.0	V	7.21	49.70	74	24.30
1651.3	47.45	PK	13	1.1	H	1.77	49.22	74	24.78
1651.3	26.31	Ave.	13	1.1	H	1.77	28.08	54	25.92
1651.3	24.98	Ave.	87	1.2	V	1.77	26.75	54	27.25
2492.9	36.57	PK	122	1.3	H	7.21	43.78	74	30.22

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