

EMI TEST REPORT

On Model Name: IP Phone

Model Number: GXP2124

Brand Name: Grandstream

Prepared for Grandstream Networks, INC

FCC ID Number: YZZGXP2124

According to FCC 47 CFR Part 15, Subpart B

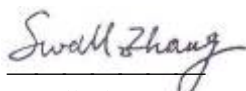
Test Report #: SHE-1202-10782-FCC

Prepared by: Sewen Guo

Reviewed by: Jawen Yin

QC Manager: Swall Zhang

Test Report Released by:


Swall Zhang

February 17, 2012

Date

Test Location

Tests performed in a Certified ANSI Semi-Anechoic Chamber and Shielded Room.

Test Site Location : Galanz

*25 South Ronggui Rd., Shunde,
Foshan, Guangdong, China*

Tel : (86)-757-23612785

Fax : (86)-757-23612537

Test Facility

The test facility was recognized, certified, or accredited by the following organizations:

- *CNAL – LAB Code: L2244*

Galanz EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

- *FCC – Registration No.: 580210*

Galanz EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC was maintained in our files.

Table of Contents

<i>GOVERNMENT DISCLAIMER NOTICE</i>	<i>2</i>
<i>REPRODUCTION CLAUSE</i>	<i>2</i>
<i>OPINIONS AND INTERPRETATIONS</i>	<i>2</i>
<i>STATEMENT OF MEASUREMENT UNCERTAINTY</i>	<i>2</i>
<i>ADMINISTRATIVE DATA</i>	<i>3</i>
<i>EUT DESCRIPTION</i>	<i>4</i>
<i>TEST SUMMARY</i>	<i>5</i>
<i>TEST MODE JUSTIFICATION</i>	<i>6</i>
<i>EUT EXERCISE SOFTWARE</i>	<i>6</i>
<i>EQUIPMENT MODIFICATION</i>	<i>6</i>
<i>EUT SAMPLE PHOTOS</i>	<i>7</i>
<i>TEST SYSTEM DETAILS</i>	<i>11</i>
<i>ATTACHMENT 1 - CONDUCTED EMISSION TEST RESULTS</i>	<i>16</i>
<i>ATTACHMENT 2 - RADIATED EMISSION MEASUREMENT</i>	<i>20</i>

List Attached Files

<i>Exhibit Type</i>	<i>File Description</i>	<i>File Name</i>
<i>Test Report</i>	<i>Test Report</i>	<i>YZZGXP2124 _Test report.pdf</i>
<i>Operation Description</i>	<i>Technical Description</i>	<i>YZZGXP2124_operation description.pdf</i>
<i>External Photos</i>	<i>External Photos</i>	<i>YZZGXP2124_External Photos</i>
<i>Internal Photos</i>	<i>Internal Photos</i>	<i>YZZGXP2124_Internal Photos</i>
<i>Block Diagram</i>	<i>Block Diagram</i>	<i>YZZGXP2124_Block Diagram.pdf</i>
<i>Schematics</i>	<i>Circuit Diagram</i>	<i>YZZGXP2124 _Schematics.pdf</i>
<i>ID Label/Location</i>	<i>Label and Location</i>	<i>YZZGXP2124 _Label & Location.pdf</i>
<i>User Manual</i>	<i>User Manual</i>	<i>YZZGXP2124 _User Manual.pdf</i>
<i>Test setup photos</i>	<i>Test setup photos</i>	<i>YZZGXP2124 _Test Setup Photos</i>

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Opinions and Interpretations

This test report relates to the abovementioned equipment under test (EUT). Without the permission of ECMG Electronic Technical Testing Corp (Shenzhen) Test Lab this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark on this or similar products. The manufacturer has sole responsibility of continued compliance of the device.

Statement of Measurement Uncertainty

The data and results referenced in the document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities that can account for a nominal measurement error. Furthermore, component and process variability of devices similar to that tested may result in additional deviation.

Administrative Data

<i>Test Sample</i>	<i>: IP Phone</i>
<i>Model Numbers</i>	<i>: GXP2124</i>
<i>Model Tested</i>	<i>: GXP2124</i>
<i>Receipt Date</i>	<i>: February 9, 2012</i>
<i>Date Tested</i>	<i>: February 16, 2012</i>
<i>Applicant</i>	<i>: Grandstream Networks, INC</i>
<i>Address</i>	<i>5F, Bldg #1, No.2 Kefa Rd., Science & Technology Park, Shenzhen, China</i>
<i>Telephone</i>	<i>: (86)-755-26014600</i>
<i>Fax</i>	<i>: (86)-755-26014601</i>
<i>Manufacturer</i>	<i>: Grandstream Networks, INC</i>
<i>Address</i>	<i>5F, Bldg #1, No.2 Kefa Rd., Science & Technology Park, Shenzhen, China</i>
<i>Telephone</i>	<i>: (86)-755-26014600</i>
<i>Fax</i>	<i>: (86)-755-26014601</i>
<i>Factory</i>	<i>: Grandstream Networks, INC</i>
<i>Address</i>	<i>5F, Bldg #1, No.2 Kefa Rd., Science & Technology Park, Shenzhen, China</i>
<i>Telephone</i>	<i>: (86)-755-26014600</i>
<i>Fax</i>	<i>: (86)-755-26014601</i>

EUT Description

Grandstream Networks, INC., model tested GXP2124 (referred to as the EUT in this report) is an IP Phone.

Technical specifications of the EUT are as below:

Parameter		Range
<i>Basic parameters</i>	<i>Rated voltage</i>	5VDC
	<i>Rated Current</i>	0.8A
<i>I/O Ports</i>	<i>PC socket</i>	10/100Mbps RJ-45 ports for PC (downlink) connection.
	<i>LAN socket</i>	10/100Mbps RJ-45 port for LAN (uplink) connection. Supports PoE (802.3af). Draws power from either spare line or signal line.
	<i>Power Jack</i>	5V DC power port; UL Certified
	<i>Headset Jack</i>	RJ22
	<i>Handset Jack</i>	RJ11
<i>Power Adapter</i>	<i>Input</i>	100-240VAC 50/60Hz 0.15A
	<i>Output</i>	5VDC, 0.8A,
	<i>Model</i>	SCF0500080A1BA
	<i>Brand name</i>	Mass

NOTE: For more detailed informations or features please refer to user's manual of EUT.

Test Summary

The Electromagnetic Compatibility requirements on model GXP2124 for this test are stated below. All results listed in this report relate exclusively to this above-mentioned model as the Equipment under Test. This report confers no approval or endorsement upon any other component, host or subsystem used in the test set-up.

<i>Emission Tests</i>				
<i>Specifications</i>	<i>Description</i>	<i>Test Results</i>	<i>Test Point</i>	<i>Remark</i>
<i>FCC Part 15.107 ANSI C63.4 -2003</i>	<i>Conducted Emission</i>	<i>Passed</i>	<i>AC Input Port</i>	<i>Attachment 1</i>
<i>FCC Part 15.109 ANSI C63.4 -2003</i>	<i>Radiated Emission</i>	<i>Passed</i>	<i>Enclosure</i>	<i>Attachment 2</i>

Test Mode Justification

Pre-scan has been conducted to determine the worst-case modes from all possible combinations between available operational modes, for example, IP mode and PoE mode. IP call mode was chosen for the final test as described below.

IP Call mode:

Connected the EUT's LAN port to another an IP Phone by a RJ-45 cable and established a call communication between them. Then connected a notebook PC to the EUT's PC port by another a RJ-45 cable and ping "192.168.0.166 -t" to EUT and measured it.

EUT Exercise Software

No test software support this test.

Equipment Modification

Any modifications installed previous to testing by Grandstream Networks, INC. will be incorporated in each production model sold or leased in United States.

There were no modifications installed by ECMG Electronic Technical Testing Corp (Shenzhen). test personnel.

EUT Sample Photos

EUT Model: GXP2124



EUT- Front View



EUT- Rear View



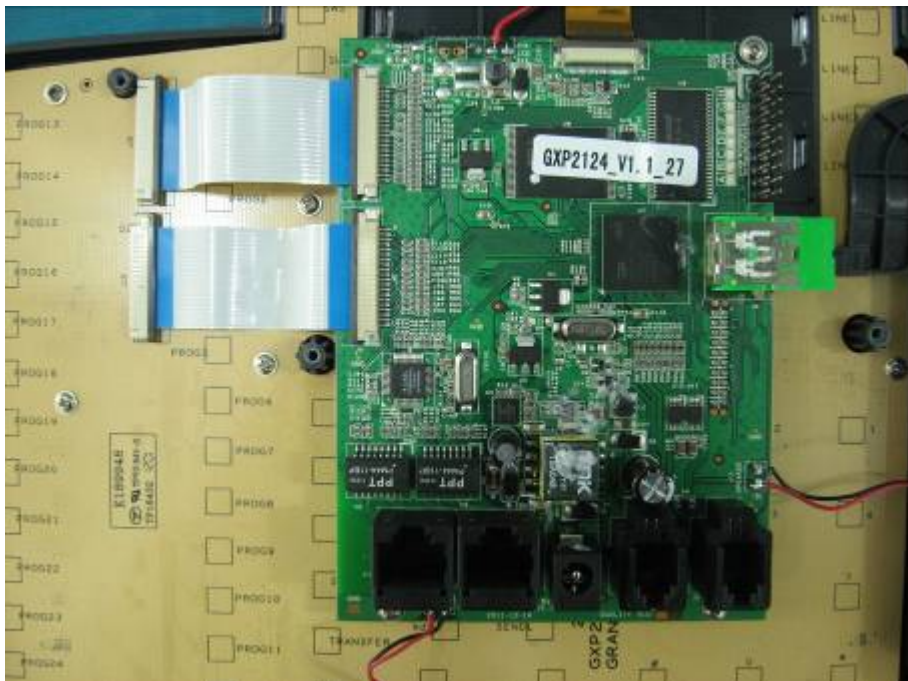
RJ-45 Cable View



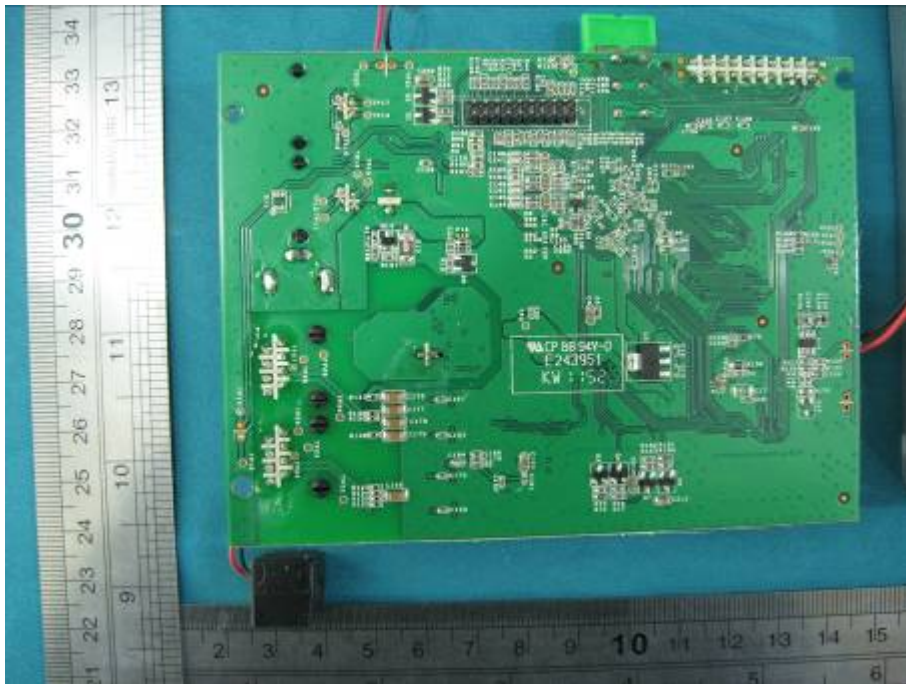
Adaptor #1 View(Manufacturer: Mass Power)



Uncovered View



Mainboard Top View



Mainboard Bottom View

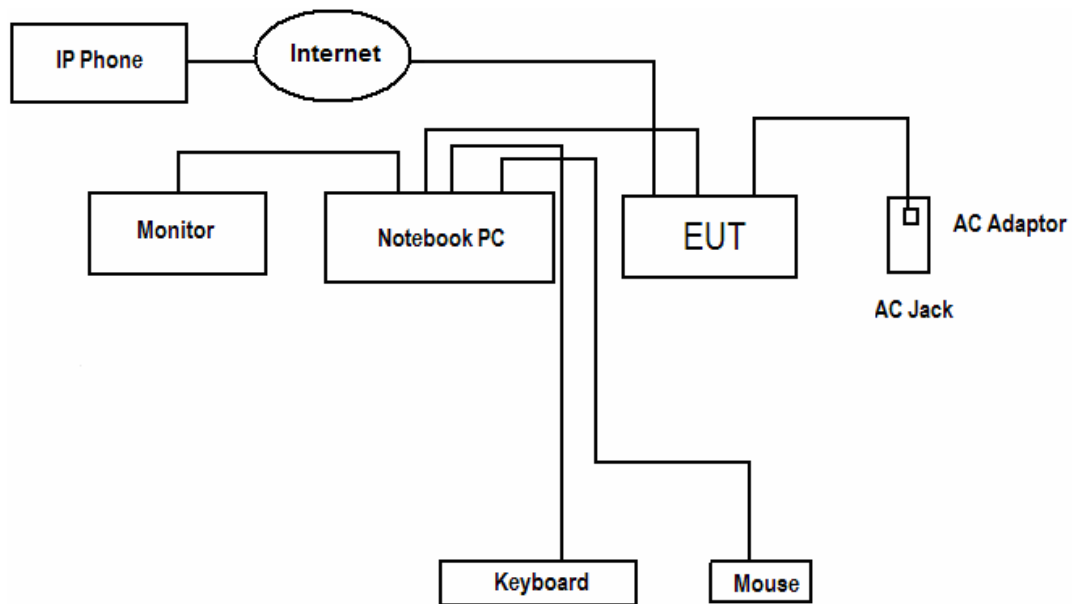
Test System Details

EUT			
Model Number:	GXP2124		
Model Tested:	GXP2124		
Description:	IP Phone		
Input:	AC 120V/60Hz		
Manufacturer:	Grandstream Networks, INC		
Support Equipment			
Description	Model Number	Serial Number	Manufacturer
Notebook PC	NC4000	CNU4122BCL	HP
Adapter Of Notebook PC	PPP009H	239427-003	HP
Mouse	MO32B0	23-033131	HP
Keyboard	SK-1788	N/A	LENOVO

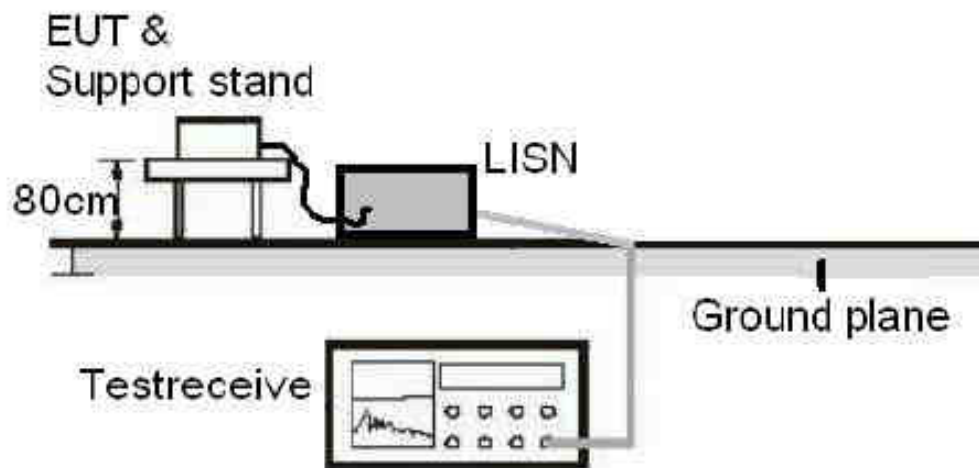
Cable Description					
<i>Description</i>	<i>From</i>	<i>To</i>	<i>Length (Meters)</i>	<i>Shielded (Y/N)</i>	<i>Ferrite (Y/N)</i>
<i>Adapter Cord Of Notebook</i>	<i>AC Adapter</i>	<i>Notebook PC</i>	<i>1.6</i>	<i>N</i>	<i>Y</i>
	<i>AC Adapter</i>	<i>Plug</i>	<i>1.2</i>	<i>N</i>	<i>Y</i>
<i>Mouse cord</i>	<i>Mouse</i>	<i>Plug</i>	<i>1.2</i>	<i>N</i>	<i>Y</i>
<i>Keyboard cord</i>	<i>keyboard</i>	<i>Plug</i>	<i>1.2</i>	<i>N</i>	<i>Y</i>
<i>RJ-45 Cord #1</i>	<i>EUT</i>	<i>Notebook PC</i>	<i>1.5</i>	<i>N</i>	<i>N</i>
<i>RJ-45 Cord #2</i>	<i>EUT</i>	<i>Other IP Phone</i>	<i>>3.0</i>	<i>N</i>	<i>Y</i>
<i>Power Adapter cord of EUT</i>	<i>EUT</i>	<i>Plug</i>	<i>1.8</i>	<i>N</i>	<i>N</i>
<i>Note: The "EUT" means "IP Phone".</i>					

NOTE: The EUT has been tested as an independent unit together with other necessary accessories or support units. The above support units or accessories were used to form a representative test configuration during the test tests.

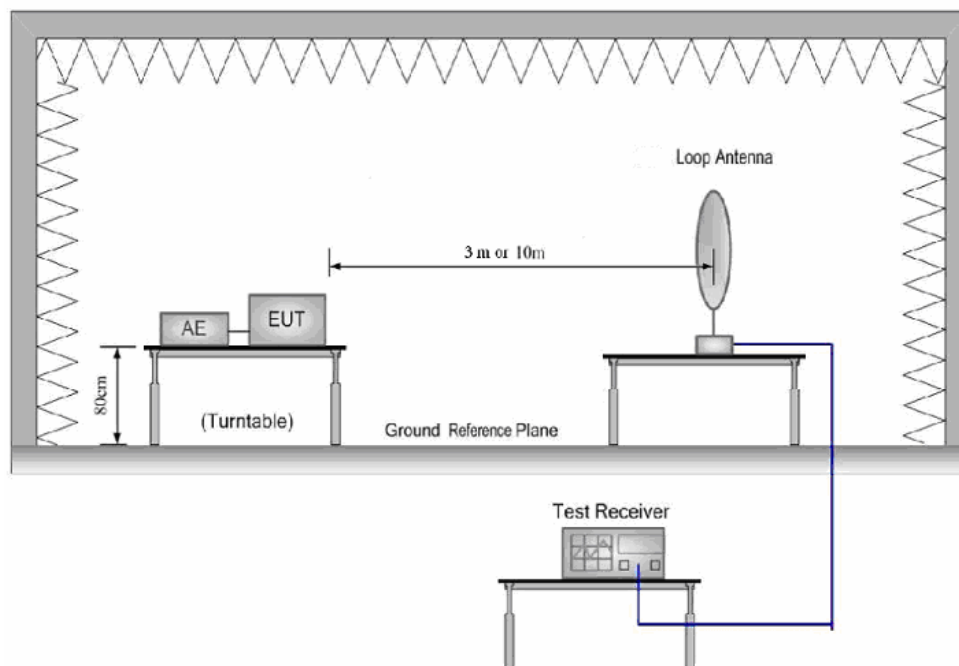
Configuration of Tested System



Note : The same system configuration shall still apply to PoE mode when removed AC Adaptor of EUT.



Conducted Emission Test Set-up Photograph



Radiated Emission Test Set-up Photograph(9KHz to 30MHz)

Figure 1 : Frequencies measured below 1 GHz configuration

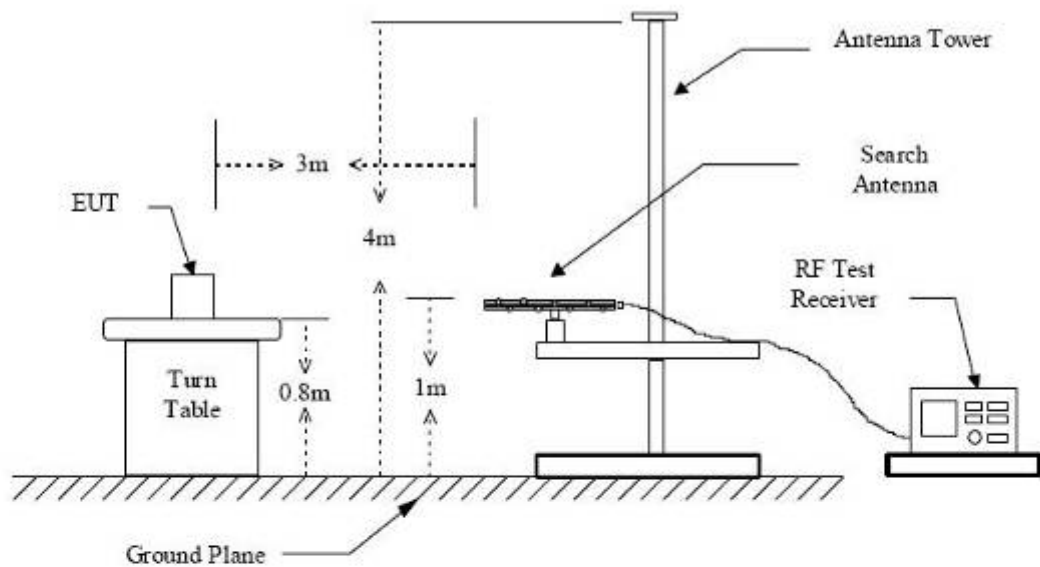
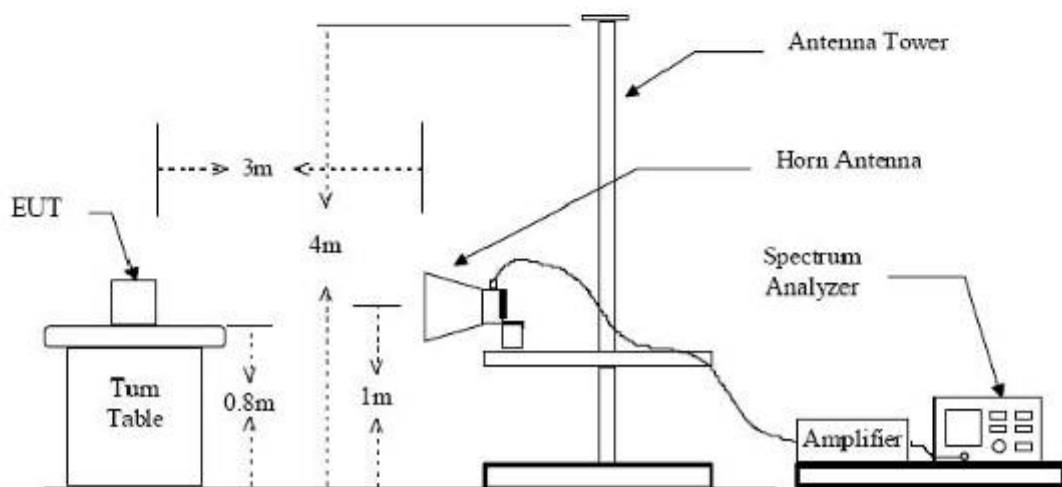


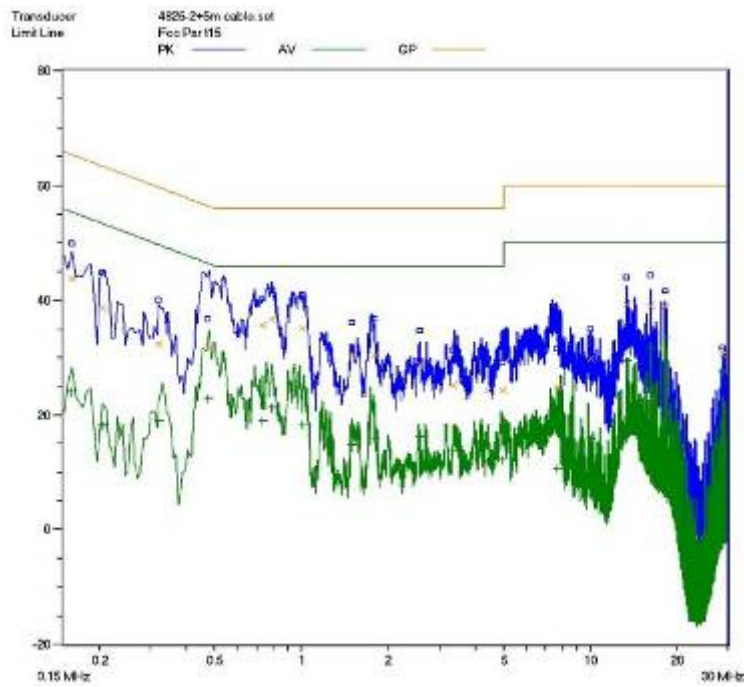
Figure 2 : Frequencies measured above 1 GHz configuration



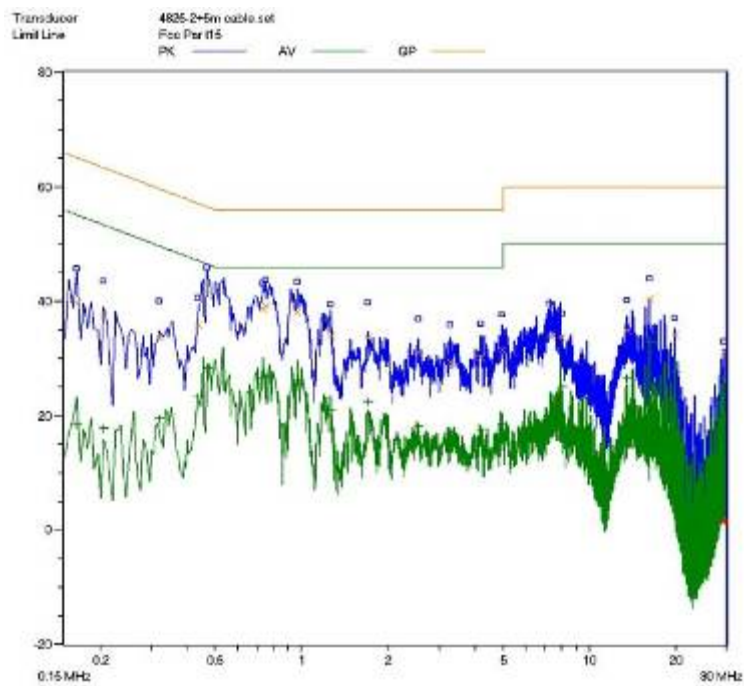
ATTACHMENT 1 - CONDUCTED EMISSION TEST RESULTS

CLIENT:	Grandstream Networks, INC	TEST STANDERD:	FCC Part 15, Subpart B, Section 15.107
MODEL NUMBERS:	GXP2124	PRODUCT:	IP Phone
MODEL TESTED:	GXP2124	EUT DESIGNATION:	Home or Office
TEMPERATURE:	23°C	HUMIDITY:	51%
ATM PRESSURE:	103kPa	GROUNDING:	None
TESTED BY:	Sewen Guo	DATE OF TEST:	February 16, 2012
TEST REFERENCE:	ANSI C63.4- 2003		
TEST PROCEDURE:	The EUT was set up according to the guidelines of ANSI C63.4- 2003 for conducted emissions. The measurement was using a AMN on each line and an EMI receiver peak scan was made at the frequency measurement range. The six highest significant peaks were then marked, and these signals were then quasi-peaked and averaged. The frequency range investigated was from 150KHz to 30MHz.		
DESCRIPTION OF TEST MODE	IP Call mode		
TESTED RANGE:	150kHz to 30MHz		
TEST VOLTAGE:	AC 120V/60Hz		
RESULTS:	The EUT meets the requirements of test reference for Conducted Emissions. The test results relate only to the equipment under test provided by client.		
Changes or Modifications:	There were no modifications installed by ECMG Electronic Technical Testing Corp (Shenzhen). test personnel.		
M. UNCERTAINTY:	Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp ± 2.6 dB		

IP Call Mode:



Line L Conducted Emission Graph



Line N Conducted Emission Graph

Test Data:

<i>Lines (L/N)</i>	<i>Frequency (MHz)</i>	<i>Corrected QP Level (dBuV)</i>	<i>Limits QP (dBuV)</i>	<i>Margin QP (dB)</i>	<i>Frequency (MHz)</i>	<i>Corrected AV Level (dBuV)</i>	<i>Limits AV (dBuV)</i>	<i>Margin QP (dB)</i>
IP Call Mode								
L	0.160	43.8	65.4	-21.6	0.160	24.1	55.4	-31.3
L	0.785	36.8	56.0	-19.2	0.785	18.4	46.0	-27.6
L	13.420	39.3	60.0	-20.7	13.420	29.5	50.0	-20.5
N	0.165	39.6	65.1	-25.5	0.165	18.5	55.1	-36.6
N	0.750	39.3	56.0	-16.7	0.750	26.9	46.0	-19.1
N	16.230	40.5	60.0	-19.5	16.230	33.0	50.0	-17.0
<p>Note :</p> <p>1) All readings are using a bandwidth of 9 kHz, with a 500 ms sweep time. A video filter was not use.</p> <p>2) "QP" means "Quasi-Peak" values, "AV" means "Average" values.</p> <p>3) The other reading are too low against official limits that are not be recorded.</p>								

Test Equipment List:

Test Equipment	Model No.	Manufacturer	Serial No.	Last Cal.	Cal. Interval
Receiver	SMR4503	SCHAFFNER	11725	2011.07.08	2012.07.08
Line impedance stabilization network	4825/2	ETS	1161	2011.07.08	2012.07.08
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.					

SIGNED BY: _____

ENGINEER

REVIEWED BY: _____

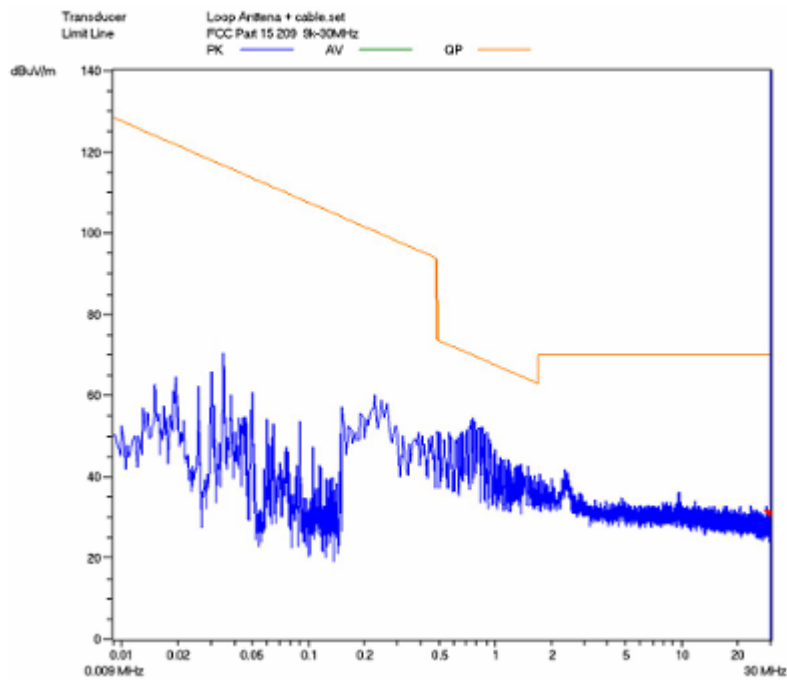
SENIOR ENGINEER

Conducted Emission Test Set-up:

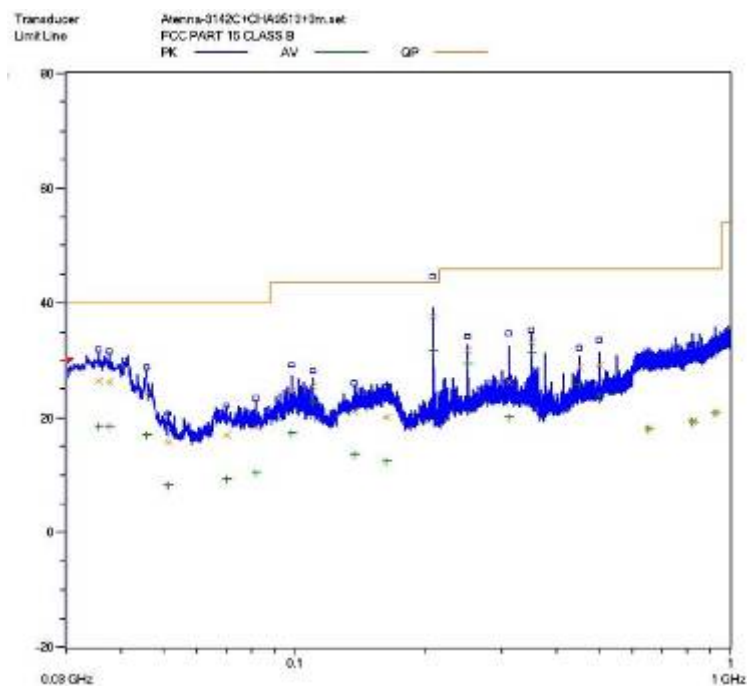
ATTACHMENT 2 - RADIATED EMISSION MEASUREMENT

CLIENT:	Grandstream Networks, INC	TEST STANDERD:	FCC Part 15,Subpart B, Section 15.109
MODEL NUMBERS:	GXP2124	PRODUCT:	IP Phone
EUT MODEL:	GXP2124	EUT DESIGNATION:	Home or Office
TEMPERATURE:	23°C	HUMIDITY:	49%RH
ATM PRESSURE:	103.0kPa	GROUNDING:	None
TESTED BY:	Sewen Guo	DATE OF TEST:	February 16, 2012
TEST REFERENCE:	ANSI C63.4- 2003		
TEST PROCEDURE:	<p>The EUT was set up according to the guidelines of ANSI C63.4- 2003 for radiated emissions. An EMI receiver peak scan was made at the frequency measurement range (pre-scan) in an Anechoic chamber.signal discrimination was then performed and the significant peaks marked.these peaks were then quasi-peaked in the frequency range of 30 MHz to 1GHz and average and peak in the frequency range of 1GHz to 3GHz at an anechoic chamber.</p> <p>The following data lists the significant emission frequencies, measured levels, correction factors (including cable and antenna correction factors), and the corrected readings against the limits. Explanation of the Correction Factor are given as follows:</p> <p>FS= RA + AF + CF - AG</p> <p>Where: FS = Field Strength</p> <p>RA = Receiver Amplitude</p> <p>AF = Antenna Factor</p> <p>CF = Cable Attenuation Factor</p> <p>AG = Amplifier Gain</p>		
TEST MODE	IP Call mode		
TESTED RANGE:	9K-30MHz and 30MHz to 5GHz		
TEST VOLTAGE:	AC 120V/60Hz		
RESULTS:	The EUT meet the requirements of test reference for radiated emissions.The test results relate only to the equipment under test provided by client.		
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Electronic Technical Testing Corp (Shenzhen). Test personnel.		
M. UNCERTAINTY:	Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp ± 2.6 dB		

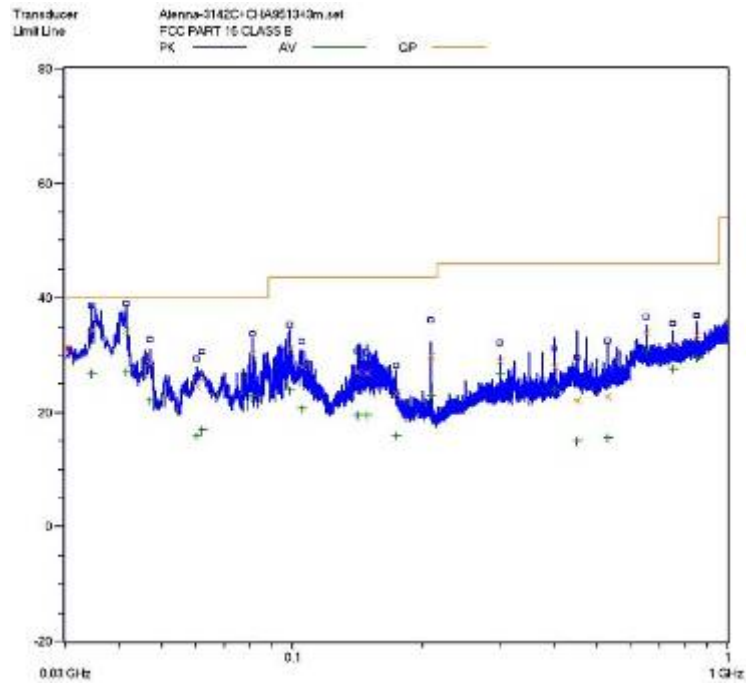
For IP Call Mode:



Radiated Field Strength Emission Test Plot(9KHz-30MHz)



Horizontal:Radiated Emission Test Plot(30MHz-1000MHz)



Vertical:Radiated Emission Test Plot(30MHz-1000MHz)

Test Data:**IP Call mode/9KHz to 30MHz:**

Test No. #:	Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Reading Level QP (dBuV/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	/	/	/	/	/	/	/
2	/	/	/	/	/	/	/
3	/	/	/	/	/	/	/
4	/	/	/	/	/	/	/
5	/	/	/	/	/	/	/
6	/	/	/	/	/	/	/

Note:

- The field strength is calculated by adding the antenna factor, cable factor. The basic equation with a sample calculation is as follows:
$$\text{Emission Level} = \text{Reading Level} + \text{Antenna Factor} + \text{Cable Loss}.$$
- The limits shown are based on quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz. the bandwidth of Test Receiver was set at 200Hz in frequency range of 9KHz to 150KHz, 9kHz in the frequency range of 150KHz to 30MHz.
- All emission levels in the frequency range of 9KHz to 30MHz are 20dB below the official limits that are not reported.

Test Data:
IP Call Mode/Below 1GHz:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Preamplifier Factor (dB)	Reading Level QP (dBuV/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
Horizontal							
35.520	0.02	18.1	/	8.28	26.4	40.0	-13.6
207.360	0.12	7.2	/	30.38	37.7	43.5	-5.8
250.000	0.12	11.8	/	19.78	31.7	46.0	-14.3
350.000	0.16	13.8	/	19.24	33.2	46.0	-12.8
450.000	0.20	16.8	/	11.9	28.9	46.0	-17.1
500.000	0.20	17.4	/	11.5	29.1	46.0	-16.9
Vertical							
34.640	0.02	17.9	/	16.48	34.4	40.0	-5.6
41.600	0.02	16.5	/	17.68	34.2	40.0	-5.8
81.200	0.02	5.7	/	24.48	30.2	40.0	-9.8
98.480	0.02	7.6	/	23.48	31.1	43.5	-12.4
650.000	0.36	20.0	/	13.54	33.9	46.0	-12.1
850.000	0.42	22.4	/	10.68	33.5	46.0	-12.5

Note:

- All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 120kHz, with a 60 s sweep time. A video filter was not used.
- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: Emission Level = Reading Level + Antenna Factor + Cable Loss - Preamplifier Factor.
- The other emission levels are 20dB below the official limits that are not reported.

IP Call Mode/Above 1GHz:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Preamplifier Factor (dB)	Reading Level (dBuV/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization (H/V)
Peak Measurement								
1.072	1.39	23.9	-33.6	-10.23	48.66	74	-25.34	H
1.328	1.56	24.7	-33.6	-4.44	55.42	74	-18.58	H
1.456	1.63	25.4	-33.6	-16.76	43.87	74	-30.13	H
1.608	1.76	26.7	-33.5	-18.81	43.15	74	-30.85	V
1.992	2.01	28.0	-33.1	-20.83	42.28	74	-31.72	V
2.128	2.10	28.6	-33	-10.35	53.35	74	-20.65	V
Average Measurement								
1.072	1.39	23.9	-33.6	-23.81	35.08	54	-18.92	H
1.328	1.56	24.7	-33.6	-26.6	33.26	54	-20.74	H
1.456	1.63	25.4	-33.6	-21.91	38.72	54	-15.28	H
1.608	1.76	26.7	-33.5	-25.49	36.47	54	-17.53	V
1.992	2.01	28.0	-33.1	-26.82	36.29	54	-17.71	V
2.128	2.10	28.6	-33.0	-29.66	34.04	54	-19.96	V

Note:

- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: Emission Level = Reading Level + Antenna Factor + Cable Loss - Preamplifier Factor.
- The limits shown are based on Peak value and Average value detector above 1GHz, the bandwidth of Test Receiver was set at 1MHz above 1GHz.
- The other emission levels are 20dB below the official limits that are not reported.

Test Equipment List:

<i>Test Equipment</i>	<i>Model No.</i>	<i>Manufacturer</i>	<i>Serial No.</i>	<i>Last Cal.</i>	<i>Cal. Due</i>
<i>Receiver</i>	<i>SMR4503</i>	<i>SCHAFFNER</i>	<i>11725</i>	<i>2011.07.08</i>	<i>2012.07.07</i>
<i>HF Loop Antenna</i>	<i>HLA6120</i>	<i>TESEQ</i>	<i>26348</i>	<i>2011.09.27</i>	<i>2012.09.26</i>
<i>Double-ridged Wave guide horn</i>	<i>3115</i>	<i>ETS</i>	<i>6587</i>	<i>2011.08.02</i>	<i>2012.08.01</i>
<i>Microwave system amplifier</i>	<i>83017A</i>	<i>Agilent</i>	<i>MY39500438</i>	<i>2011.07.11</i>	<i>2012.07.10</i>
<i>Biconilog Antenna</i>	<i>3142C</i>	<i>ETS</i>	<i>00042672</i>	<i>2011.09.28</i>	<i>2012.09.27</i>
<i>Band-pass Filter</i>	<i>BRM50702</i>	<i>Micro-Tronic</i>	<i>S/N-030</i>	<i>2011.11.30</i>	<i>2012.11.29</i>
<i>Spectrum Analyzer</i>	<i>FSP30</i>	<i>R&S</i>	<i>100755</i>	<i>2011.11.30</i>	<i>2012.11.29</i>
<i>Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.</i>					

SIGNED BY:**ENGINEER****REVIEWED BY:****SENIOR ENGINEER**



Radiated Emission Test Set-up(9KHz-30MHz)



Radiated Emission Test Set-up(Below 1GHz)



Radiated Emission Test Set-up(Above 1GHz)