

EMI TEST REPORT

On Model Name: IP Multimedia Phone

Model Number: GXV3240

Brand Name: Grandstream

Prepared for Grandstream Networks, INC

FCC ID Number: YZZGXV3240

According to FCC 47 CFR Part 15, Subpart B

Test Report #: SHE-1402-11114-FCC

Tested by: Daomen Galanz
Daomen /Engineer Company Name

Reviewed by: Jawen Yin ECMG
Jawen Yin/ Senior Engineer Company Name

QC Manager: Swall Zhang ECMG
Swall Zhang/QC Manager Company Name

Test Report Released by: Swall Zhang March 19th, 2014
Swall Zhang 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 IP MULTIMEDIA PHONE</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>14</i>
<i>ATTACHMENT 2 - RADIATED EMISSION MEASUREMENT</i>	<i>18</i>

List Attached Files

Exhibit Type	File Description	File Name
<i>Test Report</i>	<i>Test Report</i>	<i>YZZGXV3240 _Test report.pdf</i>
<i>Operation Description</i>	<i>Technical Description</i>	<i>YZZGXV3240_operation description.pdf</i>
<i>External Photos</i>	<i>External Photos</i>	<i>YZZGXV3240_External Photos</i>
<i>Internal Photos</i>	<i>Internal Photos</i>	<i>YZZGXV3240_Internal Photos</i>
<i>Block Diagram</i>	<i>Block Diagram</i>	<i>YZZGXV3240_Block Diagram.pdf</i>
<i>Schematics</i>	<i>Circuit Diagram</i>	<i>YZZGXV3240 _Schematics.pdf</i>
<i>ID Label/Location</i>	<i>Label and Location</i>	<i>YZZGXV3240_Label & Location.pdf</i>
<i>User Manual</i>	<i>User Manual</i>	<i>YZZGXV3240 _User Manual.pdf</i>
<i>Test set-up photos</i>	<i>Test set-up photos</i>	<i>YZZGXV3240 _Test Set-up Photos</i>

Government Disclaimer Notice

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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 dIP Multimedia Phone 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 IP Multimedia Phone

Test Sample : *IP Multimedia Phone*

Model Numbers : *GXV3240*

Model Tested : *GXV3240*

Receipt Date : *March 5th, 2014*

Date Tested : *March 16th, 2014*

Applicant : *Grandstream Networks, INC*

Address : *5F, Bldg #1, No.2 Kefa Rd., Science & Technology Park, Shenzhen, China*

Telephone : *(86)-755-26014600*

Fax : *(86)-755-26014601*

Manufacturer : *Grandstream Networks, INC*

Address : *5F, Bldg #1, No.2 Kefa Rd., Science & Technology Park, Shenzhen, China*

Telephone : *(86)-755-26014600*

Fax : *(86)-755-26014601*

Factory : *Grandstream Networks, INC*

Address : *5F, Bldg #1, No.2 Kefa Rd., Science & Technology Park, Shenzhen, China*

Telephone : *(86)-755-26014600*

Fax : *(86)-755-26014601*

EUT Description

Grandstream Networks, INC. model tested GXV3240 (referred to as the EUT in this report) is an IP Multimedia Phone.

Technical specifications of the EUT are as follows:

Parameter		Range
<i>Basic parameters</i>	<i>Rated voltage</i>	<i>12VDC</i>
	<i>Rated Current</i>	<i>1.5A</i>
<i>I/O Ports</i>	<i>Handset Port</i>	<i>Connect handset.</i>
	<i>RJ9 Headset Port</i>	<i>Connect headsets.</i>
	<i>LAN Port</i>	<i>10/100/1000Mbps Ethernet port connect to LAN. It supports PoE.</i>
	<i>PC Port</i>	<i>10/100/1000Mbps Ethernet port connect to PC.</i>
	<i>Power Jack</i>	<i>12V/5A Power Jack used to connect the power adapter.</i>
	<i>USB Port</i>	<i>Connect to USB device. Note: Supports no USB keyboard or mouse device temporary. i.e., users could insert USB drive as well as USB Wi-Fi.</i>
	<i>Extension Port</i>	<i>Connect the extension board.</i>
	<i>Mini HDMI Port</i>	<i>Connect the display device that supports HDMI.</i>
	<i>SD Port</i>	<i>Connect SD storage device.</i>
<i>Power Adapter</i>	<i>Input</i>	<i>100-240VAC 50/60Hz 0.4A</i>
	<i>Output</i>	<i>12VDC, 1.5A</i>
	<i>Model</i>	<i>SFF1200150A1BY</i>
	<i>Brand name</i>	<i>Mass Power</i>

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

Test Summary

The Electromagnetic Compatibility requirements on model GXV3240 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.

Emission Tests				
Specifications	Description	Test Results	Test Point	Remark
<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 from all possible combinations between available operation modes. The following mode was chosen for the final test as described below.

IP Call mode:

Connected the EUT to another an IP Multimedia Phone by an RJ-45 cable and established a call communication between them. Then connected a notebook computer to PC port of the EUT by another an RJ-45 cable and ping "192.168.0.160 -t" to EUT and measured it.

For PoE Mode:

Let EUT operates PoE mode 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:GXV3240



EUT-Front View



EUT-Rear View



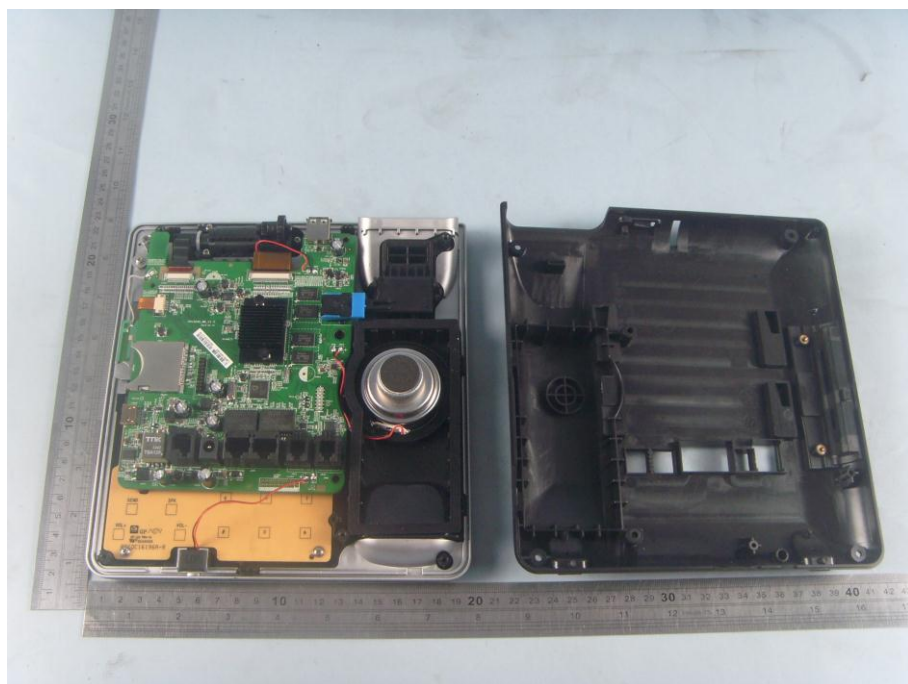
EUT-Side View #1



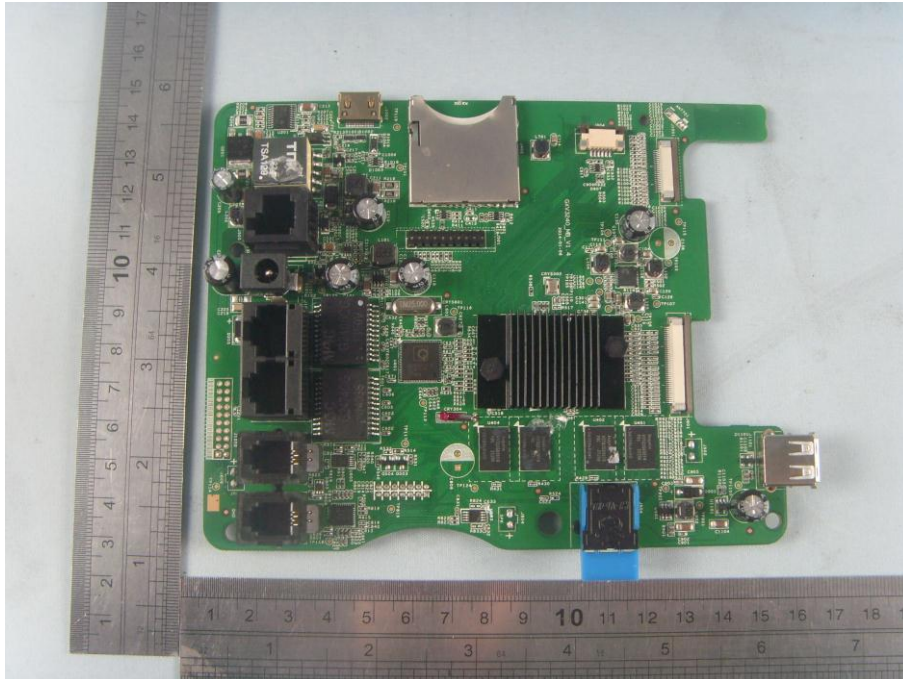
EUT-Side View #2



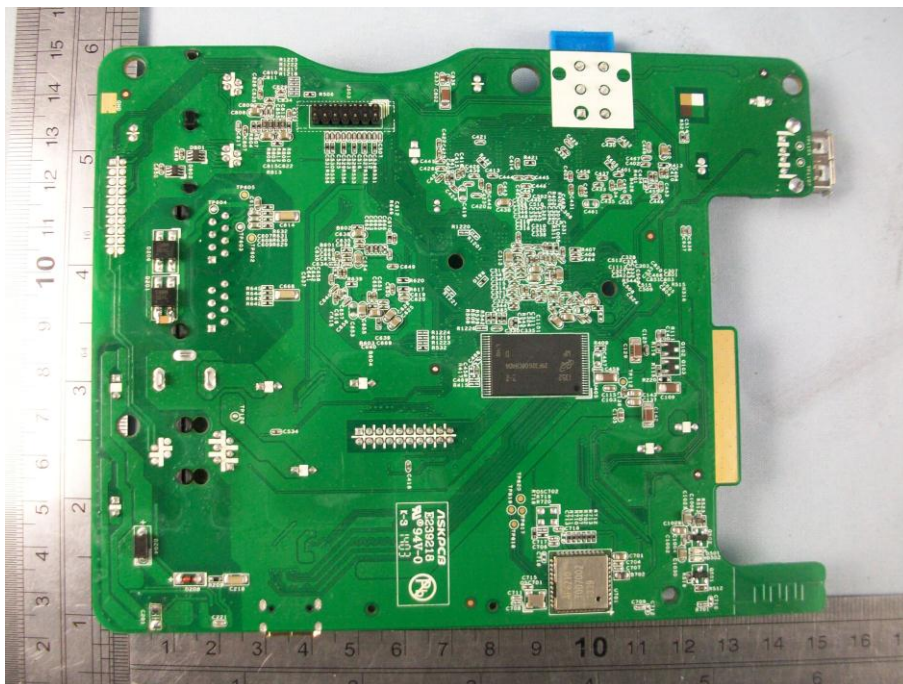
Power Adaptor View (Manufacturer: Mass Power)



EUT-Uncovered View



Main board- Top View



Main board- Bottom View

Test System Details

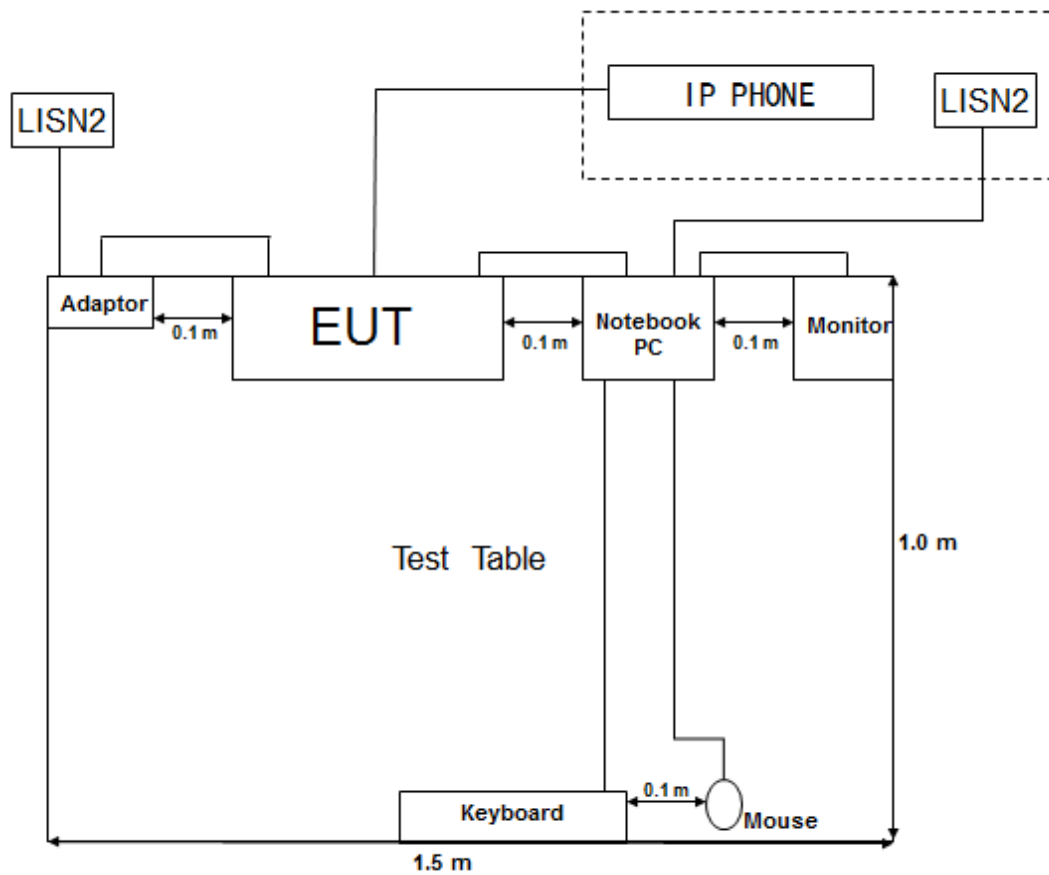
EUT			
Model Number:	GXV3240		
Model Tested:	GXV3240		
Description:	IP Multimedia Phone		
Input:	12VDC		
Manufacturer:	Grandstream Networks, INC		
Support Equipment			
Description	Model Number	Serial Number	Manufacturer
Notebook computer	ThinkPad x121e	---	Lenovo
Power Adapter Of Notebook computer	ThinkPad 57Y4614	---	Lenovo
Mouse	MO32B0	23-033131	IBM
Keyboard	SK-1788	---	Lenovo
Monitor	TFT1780PS	B8879HA021638	AOC
IP Multimedia Phone	GXV3275	N/A	Grandstream
PoE Adapter terminal unit	DWL-P200	F370175001634	D-Link

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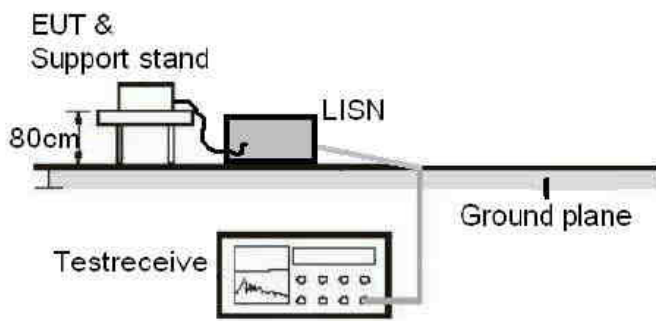
Cable Description					
<i>Description</i>	<i>From</i>	<i>To</i>	<i>Length (Meters)</i>	<i>Shielded (Y/N)</i>	<i>Ferrite (Y/N)</i>
<i>Power Cord Of Notebook computer</i>	<i>Power Adapter</i>	<i>Notebook computer</i>	<i>1.6</i>	<i>N</i>	<i>Y</i>
	<i>Power Adapter</i>	<i>AC Plug</i>	<i>1.2</i>	<i>N</i>	<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>VGA Cord</i>	<i>Monitor</i>	<i>Notebook computer</i>	<i>1.2</i>	<i>Y</i>	<i>Y</i>
<i>RJ-45 Cord #1</i>	<i>EUT</i>	<i>Notebook computer</i>	<i>1.5</i>	<i>N</i>	<i>N</i>
<i>RJ-45 Cord #2</i>	<i>EUT</i>	<i>IP Phone</i>	<i>>3.0</i>	<i>N</i>	<i>N</i>
<i>Power cord of Adapter (Mass power)</i>	<i>EUT</i>	<i>Plug</i>	<i>1.8</i>	<i>N</i>	<i>N</i>
<i>Note: The "EUT" means "IP MULTIMEDIA PHONE".</i>					

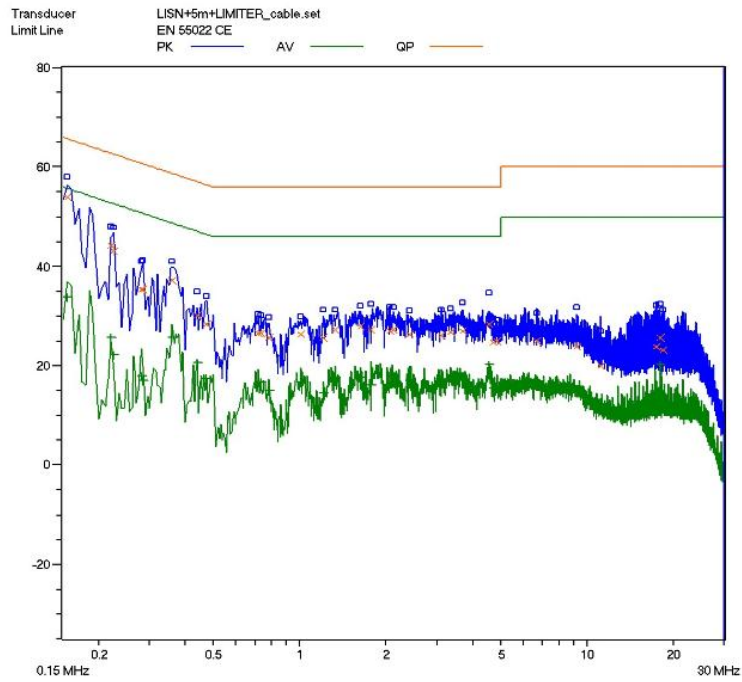
NOTE: The EUT has been tested as an independent unit together with other necessary accessories or support units. The above support units or accessories were used to form a representative test configuration during the test tests.

Configuration of Tested System

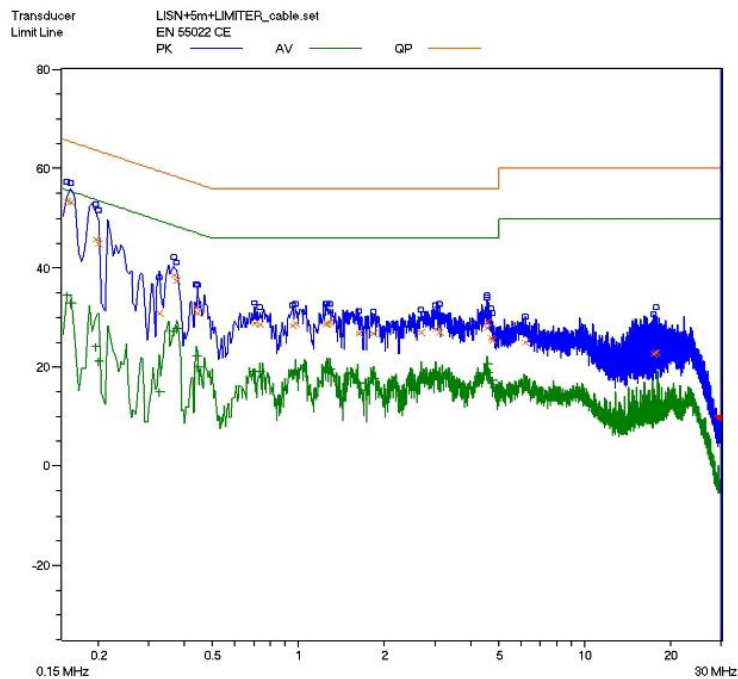


ATTACHMENT 1 - CONDUCTED EMISSION TEST RESULTS

CLIENT:	Grandstream Networks, INC	TEST STANDERD:	FCC Part 15, Subpart B, Section 15.107
MODEL NUMBERS:	GXV3240	PRODUCT:	IP Multimedia Phone
MODEL TESTED:	GXV3240	EUT DESIGNATION:	Home or Office
TEMPERATURE:	23 °C	HUMIDITY:	51%
ATM PRESSURE:	103kPa	GROUNDING:	None
TESTED BY:	Sewen Guo	DATE OF TEST:	March 16 th , 2014
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		
TEST SET UP	 The diagram illustrates the test setup for conducted emissions. It shows an EUT (Equipment Under Test) on a support stand, connected to a LISN (Line Impedance Stabilization Network). The EUT is positioned 80cm above a ground plane. A Test receiver is connected to the LISN and the ground plane.		
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		



Line L Conducted Emission Graph



Line N Conducted Emission Graph

Test Data:

Lines	Frequency (MHz)	Corrected QP Level (dBuV)	Limits QP (dBuV)	Margin QP (dB)	Frequency (MHz)	Corrected AVE Level (dBuV)	Limits AVE (dBuV)	Margin AVE (dB)
L	0.155	53.9	65.7	-11.8	0.155	33.8	55.7	-21.9
L	0.220	44.2	62.8	-18.6	0.220	25.8	52.8	-27.0
L	0.225	43.2	62.6	-19.4	0.225	22.4	52.6	-30.2
N	0.155	53.5	65.7	-12.2	0.155	34.5	55.7	-21.2
N	0.160	53.2	65.5	-12.3	0.160	32.8	55.5	-22.7
N	0.195	45.9	63.8	-17.9	0.195	24.1	53.8	-29.7

Note:

- 1) All readings are using a bandwidth of 9 kHz, with a 500 ms sweep time. A video filter was not used.
- 2) Other emission levels are too low against official limit that are not report.

Test Equipment List:

Test Equipment	Model No.	Manufacturer	Serial No.	Last Cal.	Cal. Interval
Receiver	SMR4503	SCHAFFNER	11725	2013.07.08	2014.07.08
Line impedance stabilization network	4825/2	ETS	1161	2013.07.08	2014.07.08

Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.

TESTED BY:



ENGINEER

GALANZ

COMPANY NAME

REVIEWED BY:



SENIOR ENGINEER

ECMG

COMPANY NAME



Conducted Emission Test Set-up –front view



Conducted Emission Test Set-up –rear view

ATTACHMENT 2 - RADIATED EMISSION MEASUREMENT

CLIENT:	Grandstream Networks, INC	TEST STANDERD:	FCC Part 15,Subpart B, Section 15.109
MODEL NUMBERS:	GXV3240	PRODUCT:	IP Multimedia Phone
EUT MODEL:	GXV3240	EUT DESIGNATION:	Home or Office
TEMPERATURE:	23°C	HUMIDITY:	49%RH
ATM PRESSURE:	103.0kPa	GROUNDING:	None
TESTED BY:	Daomen	DATE OF TEST:	March 16 th , 2014
TEST REFERENCE:	ANSI C63.4 -2003		
TEST PROCEDURE:	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 1 GHz to 5GHz at an anechoic chamber. The following dIP Multimedia Phone 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: FS= RA + AF + CF - AG Where: FS = Field Strength RA = Receiver Amplitude AF = Antenna Factor CF = Cable Attenuation Factor AG = Amplifier Gain		
TEST MODE	IP Call mode,PoE 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		

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Frequency measured at 9KHz to 30MHz:

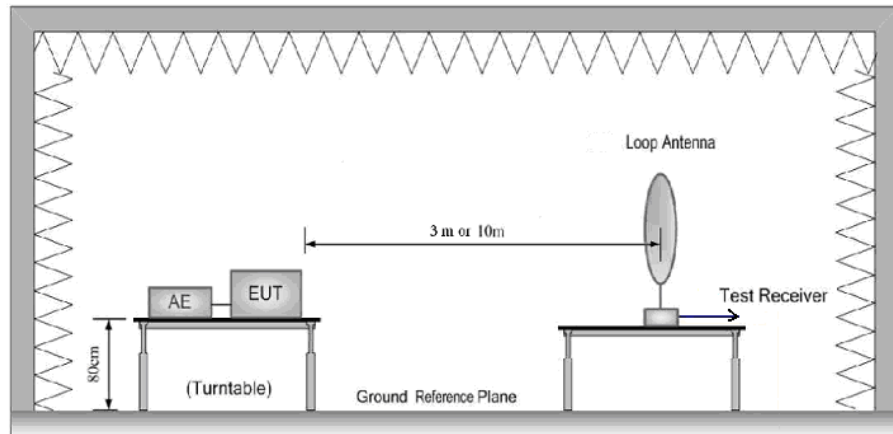


Figure 1 : Frequencies measured below 1 GHz configuration

TEST SET-UP:

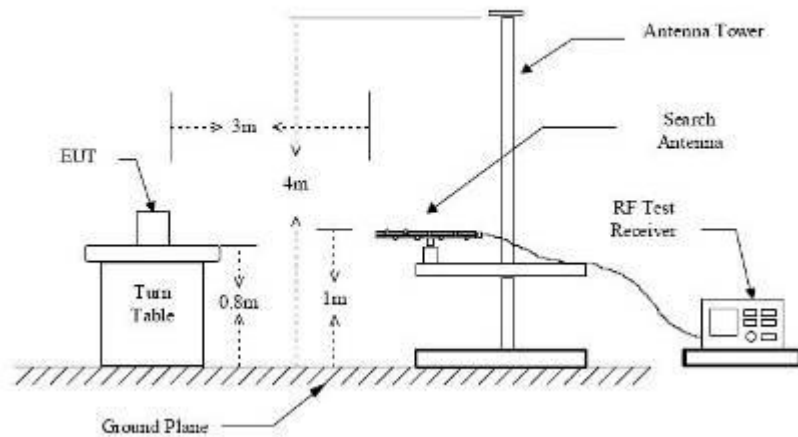
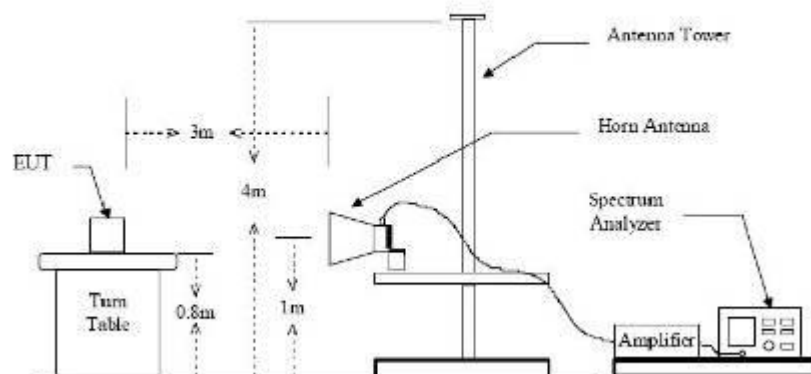
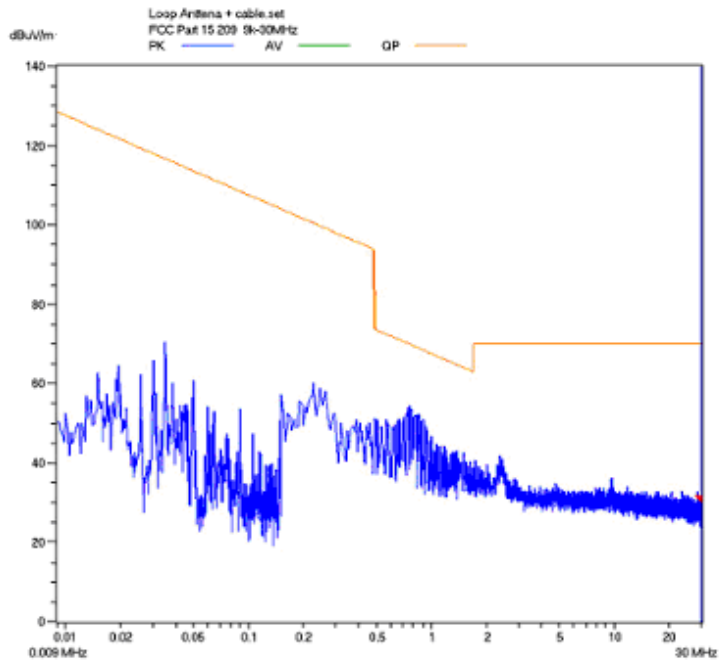


Figure 2 : Frequencies measured above 1 GHz configuration

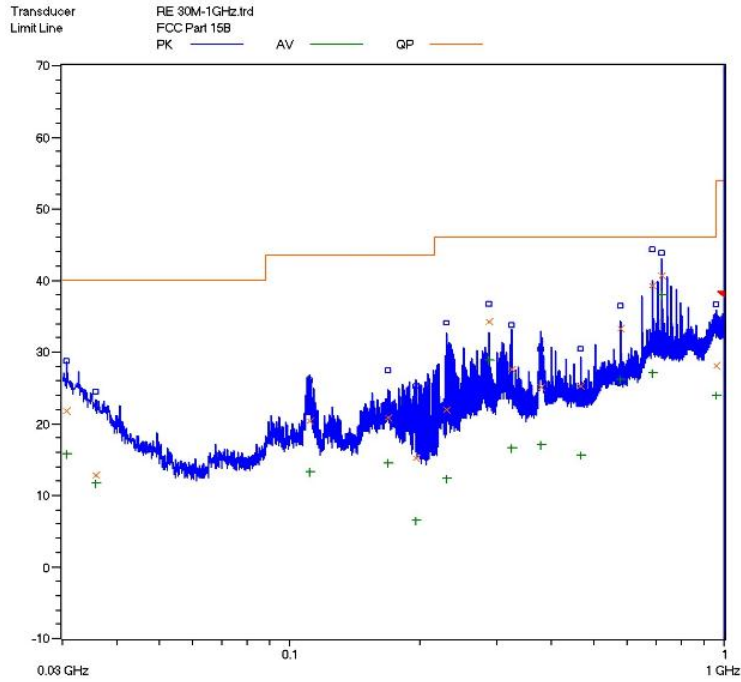


9KHz-30MHz:

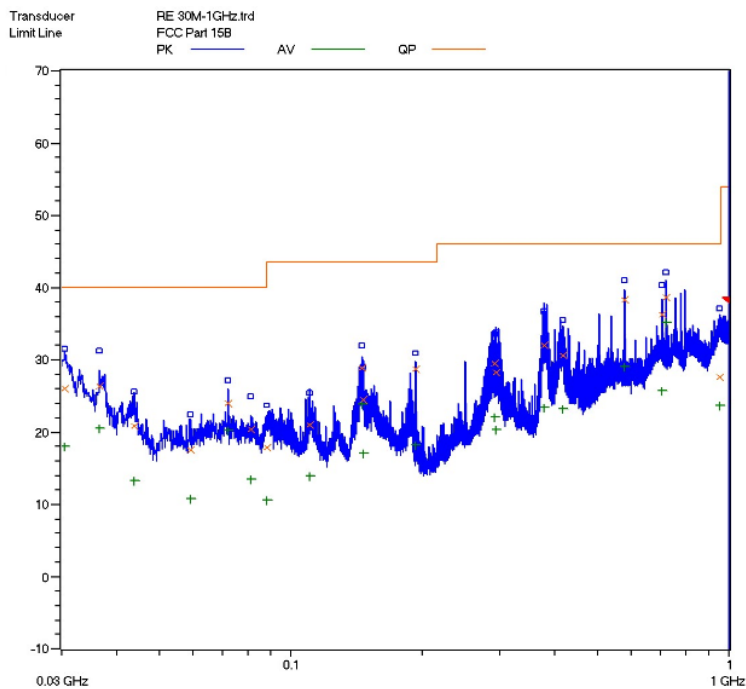


**Radiated Filed Strength Emission Test Plot
(Peak,maxhold)**

30MHz-1000MHz:

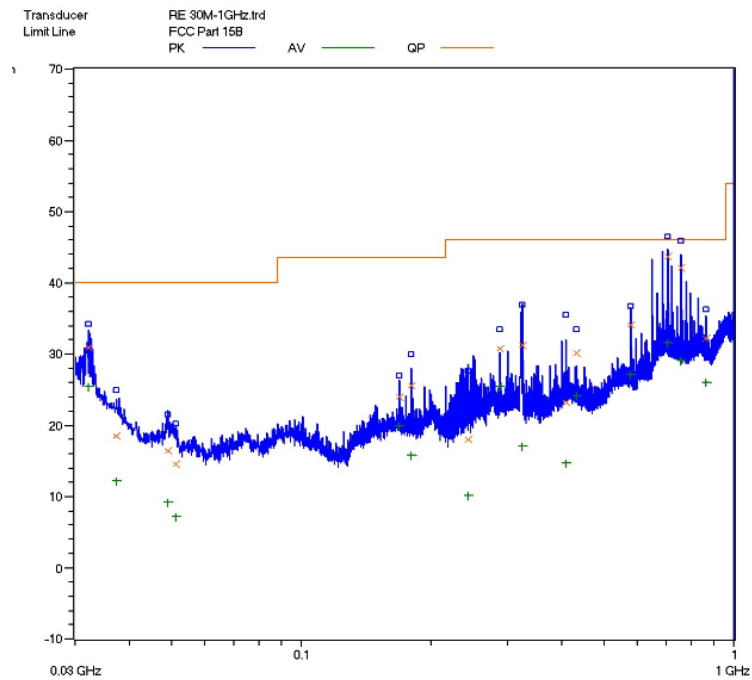


**Horizontal: Radiated Emission Test Plot
(Peak,maxhold)**

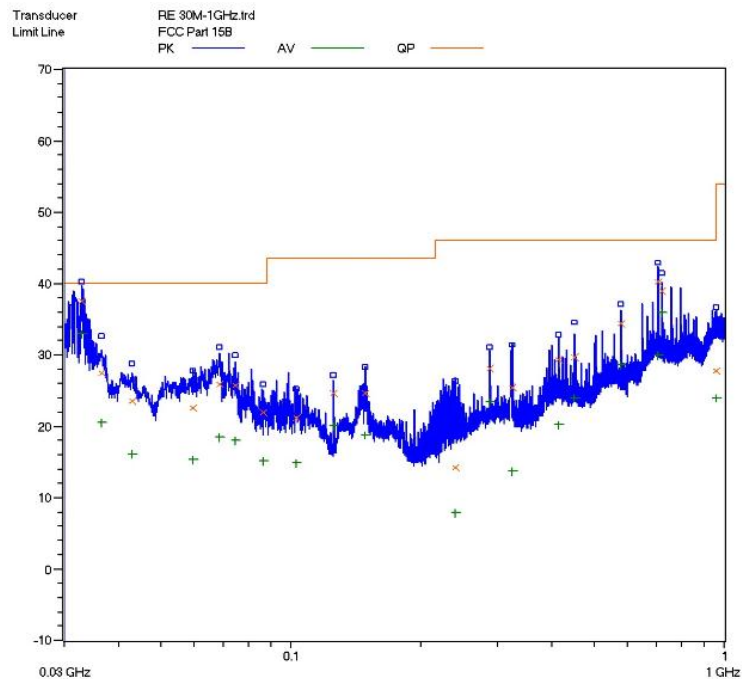


Vertical: Radiated Emission Test Plot (Peak,maxhold)

For PoE mode:



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



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

Test Data:
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:

1. The field strength is calculated by adding the antenna factor, cable factor. The basic equation with a sample calculation is as follows:
Emission Level = Reading Level + Antenna Factor + Cable Loss.
2. 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.
3. All emission levels in the frequency range of 9KHz to 30MHz are 20dB below the official limits that are not reported.

Test Data:
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							
288.000	0.12	13.1	/	21.08	34.3	46	-11.7
323.680	0.16	13.4	/	14.14	27.7	46	-18.3
468.000	0.2	16.8	/	8.3	25.3	46	-20.7
576.000	0.3	18.5	/	14.5	33.3	46	-12.7
684.000	0.36	20.2	/	18.74	39.3	46	-6.7
720.000	0.39	20.7	/	19.71	40.8	46	-5.2
Vertical							
294.560	0.16	13.2	/	14.94	28.3	46	-17.7
379.040	0.16	14.1	/	17.84	32.1	46	-13.9
416.560	0.2	15.1	/	15.3	30.6	46	-15.4
576.000	0.3	18.5	/	19.5	38.3	46	-7.7
702.000	0.36	20.4	/	15.54	36.3	46	-9.7
720.000	0.39	20.7	/	17.61	38.7	46	-7.3

Note:

1. 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.
2. 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.
3. The other emission levels are 20dB below the official limits that are not reported.

Above 1GHz:

Frequency (GHz)	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								
1.169	1.12	24.5	-34.45	-11.91	48.16	74	-25.84	H
1.192	1.20	24.7	-34.45	-12.75	47.6	74	-26.40	H
1.627	1.75	26.8	-33.6	-13.56	48.59	74	-25.41	H
1.169	1.12	24.5	-34.45	-10.44	49.63	74	-24.37	V
1.298	1.45	25.2	-33.6	-12.60	47.65	74	-26.35	V
1.638	1.75	26.8	-33.6	-13.23	48.92	74	-25.08	V
Average Measurement								
1.169	1.12	24.5	-34.45	-22.92	37.15	54	-16.85	H
1.192	1.20	24.7	-34.45	-22.73	37.62	54	-16.38	H
1.627	1.75	26.8	-33.6	-24.05	38.1	54	-15.90	H
1.169	1.12	24.5	-34.45	-22.77	37.3	54	-16.70	V
1.298	1.45	25.2	-33.6	-20.98	39.27	54	-14.73	V
1.638	1.75	26.8	-33.6	-25.03	37.12	54	-16.88	V

Note:

1. 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.
2. 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.
3. The other emission levels are 20dB below the official limits that are not reported.

PoE 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							
32.160	0.02	17.3	/	13.58	30.9	40	-9.1
288.000	0.12	13.1	/	17.48	30.7	46	-15.3
323.360	0.16	13.4	/	17.74	31.3	46	-14.7
576.000	0.3	18.5	/	15.2	34	46	-12.0
702.000	0.36	20.5	/	22.84	43.7	46	-2.3
756.000	0.39	21.3	/	20.51	42.2	46	-3.8
Vertical							
32.800	0.02	17.3	/	20.18	37.5	40	-2.5
414.000	0.2	15.5	/	13.7	29.4	46	-16.6
450.000	0.2	16.8	/	12.7	29.7	46	-16.3
576.000	0.3	18.5	/	15.7	34.5	46	-11.5
702.000	0.36	20.5	/	19.34	40.2	46	-5.8
720.000	0.39	20.7	/	17.91	39	46	-7.0

Note:

1. 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.
2. 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.
3. The other emission levels are 20dB below the official limits that are not reported.

PoE Mode/Above 1GHz:

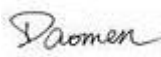
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Preamplifier Factor (dB)	Reading Level (dBuV/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization (H/V)
Peak Measurement								
1.169	1.12	24.5	-34.45	-13.87	46.2	74	-27.8	H
1.192	1.20	24.7	-34.45	-14.85	45.5	74	-28.5	H
1.627	1.75	26.8	-33.6	-13.95	48.2	74	-25.8	H
1.169	1.12	24.5	-34.45	-12.72	47.35	74	-26.65	V
1.298	1.45	25.2	-33.6	-14.47	45.78	74	-28.22	V
1.638	1.75	26.8	-33.6	-14.03	48.12	74	-25.88	V
Average Measurement								
1.169	1.12	24.5	-34.45	-24.9	35.17	54	-18.83	H
1.192	1.20	24.7	-34.45	-23.63	36.72	54	-17.28	H
1.627	1.75	26.8	-33.6	-30.05	32.1	54	-21.9	H
1.169	1.12	24.5	-34.45	-26.8	33.27	54	-20.73	V
1.298	1.45	25.2	-33.6	-25.15	35.1	54	-18.9	V
1.638	1.75	26.8	-33.6	-30.02	32.13	54	-21.87	V

Note:

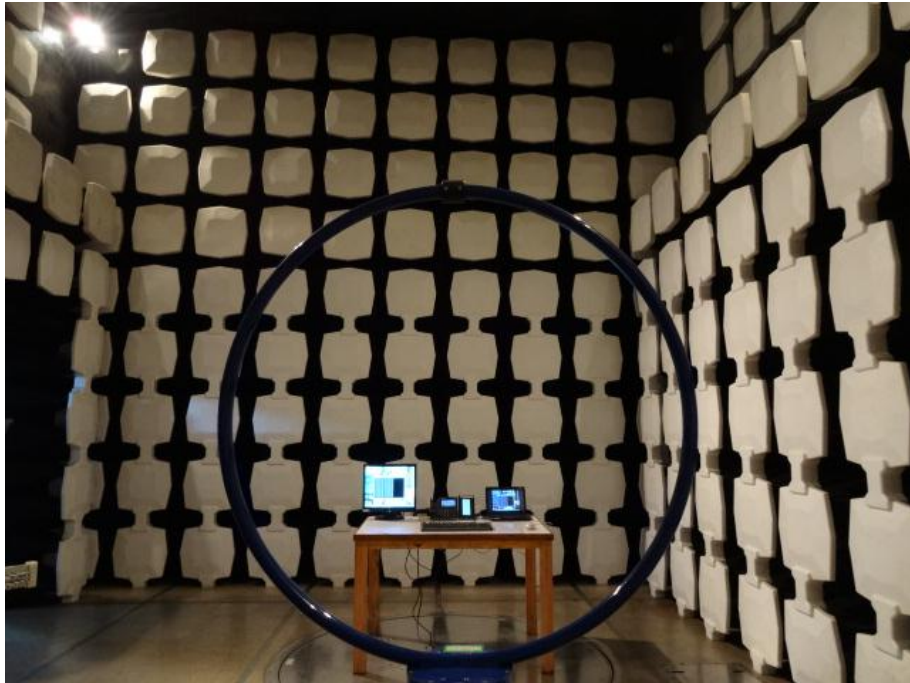
1. The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: Emission Level = Reading Level + Antenna Factor + Cable Loss - Preamplifier Factor.
2. The limits shown are based on Peak value and Average value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

Test Equipment List:

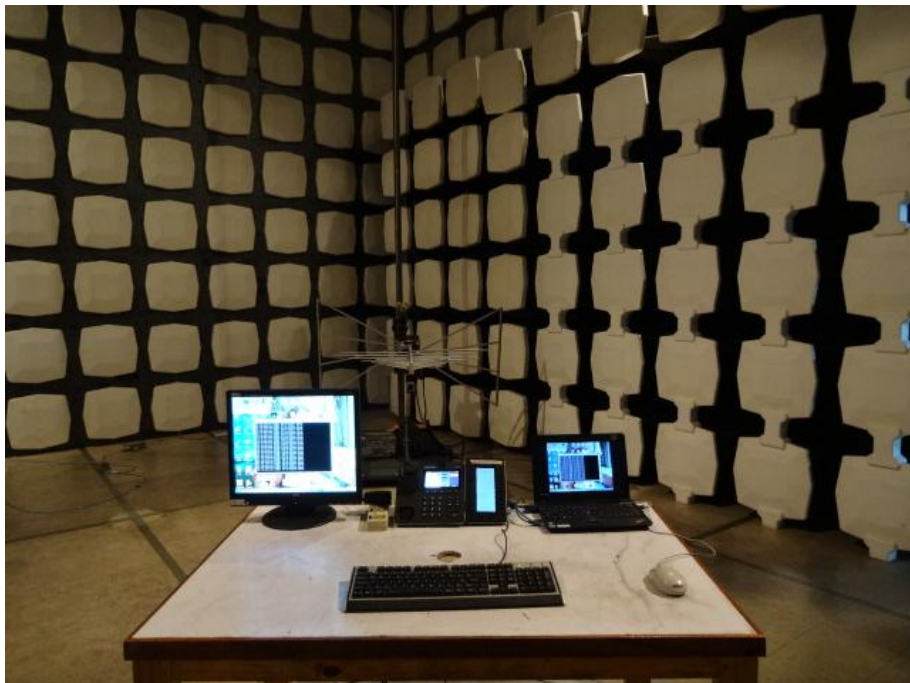
Test Equipment	Model No.	Manufacturer	Serial No.	Last Cal.	Cal. Due
Receiver	SMR4503	SCHAFFNER	11725	2013.07.08	2014.07.07
HF Loop Antenna	HLA6120	TESEQ	26348	2013.09.27	2014.09.26
Double-ridged Wave guide horn	3115	ETS	6587	2013.08.02	2014.08.01
Microwave system amplifier	83017A	Agilent	MY39500438	2013.07.11	2014.07.10
Biconilog Antenna	3142C	ETS	00042672	2013.09.28	2014.09.27
Band-pass Filter	BRM50702	Micro-Tronic	S/N-030	2013.11.30	2014.11.29
Spectrum Analyzer	FSP30	R&S	100755	2013.11.30	2014.11.29
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.					

TESTED BY:  GALANZ
ENGINEER COMPANY NAME

REVIEWED BY:  ECMG
SENIOR ENGINEER COMPANY NAME



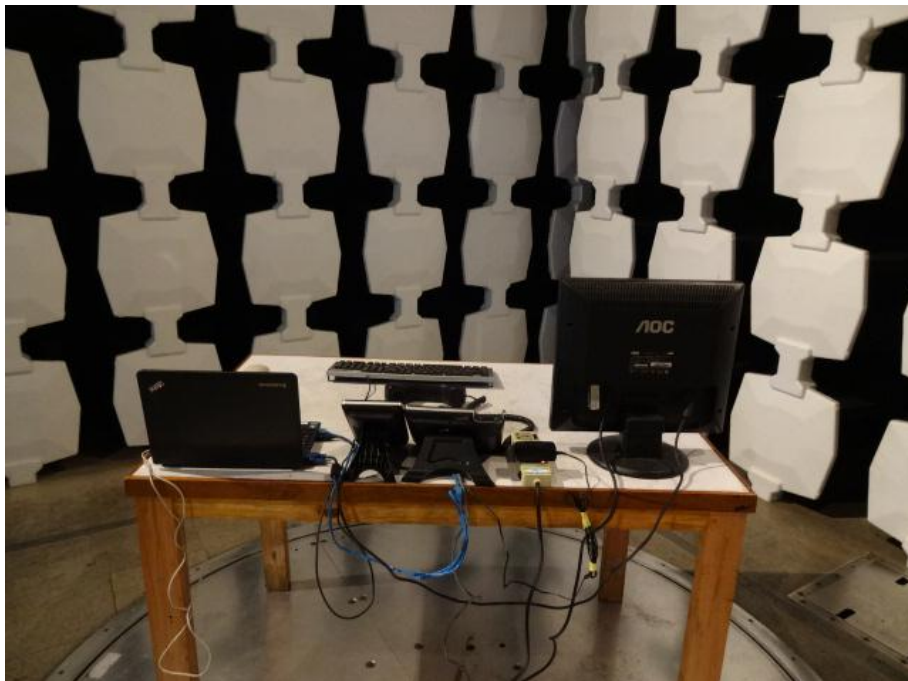
Radiated Emission Test Set-up (9KHz-30MHz)



Radiated Emission Test Set-up (Below 1GHz)



Radiated Emission Test Set-up (Above 1GHz)



Radiated Emission Test Set-up (rear view)