

## EMI TEST REPORT

On Model Name: IP Phone

Model Number: GXP2100

Brand Name: Grandstream

Prepared for Grandstream Networks, INC

FCC ID Number: YZZGXP2100V1

According to FCC 47 CFR Part 15(2012), Subpart B

Test Report #: SHE-1210-10886-FCC

Tested by: Daomen ECMG  
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 October 25<sup>th</sup>, 2012  
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.*

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## List Attached Files

<i>Exhibit Type</i>	<i>File Description</i>	<i>File Name</i>
<i>Test Report</i>	<i>Test Report</i>	<i>YZZGXP2100V1 _Test report.pdf</i>
<i>Operation Description</i>	<i>Technical Description</i>	<i>YZZGXP2100V1_operation description.pdf</i>
<i>External Photos</i>	<i>External Photos</i>	<i>YZZGXP2100V1_External Photos</i>
<i>Internal Photos</i>	<i>Internal Photos</i>	<i>YZZGXP2100V1_Internal Photos</i>
<i>Block Diagram</i>	<i>Block Diagram</i>	<i>YZZGXP2100V1_Block Diagram.pdf</i>
<i>Schematics</i>	<i>Circuit Diagram</i>	<i>YZZGXP2100V1 _Schematics.pdf</i>
<i>ID Label/Location</i>	<i>Label and Location</i>	<i>YZZGXP2100V1 _Label &amp; Location.pdf</i>
<i>User Manual</i>	<i>User Manual</i>	<i>YZZGXP2100V1 _User Manual.pdf</i>
<i>Test set-up photos</i>	<i>Test set-up photos</i>	<i>YZZGXP2100V1 _Test Set-up Photos</i>

### **Government Disclaimer Notice**

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### **Reproduction Clause**

*Any reproduction of this document must be done in full. No single part of this document may be reproduced without permission from ECMG Electronic Technical Testing Corp (Shenzhen).*

### **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**

*Test Sample* : *IP Phone*

*Model Numbers* : *GXP2100*

*Model Tested* : *GXP2100*

*Receipt Date* : *October 18<sup>th</sup>, 2012*

*Date Tested* : *October 19<sup>th</sup> to 23<sup>rd</sup>, 2012*

*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 GXP2100 (referred to as the EUT in this report) is an IP Phone.

Technical specifications of the EUT are as below:

Parameter		Range
Basic parameters	Rated voltage	5VDC
	Rated Current	0.8A
I/O Ports	LAN Port	10/100Mbps RJ-45 port for LAN (uplink) connection. Supports PoE (802.3af). Draws power from either spare line or signal line.
	PC Port	10/100Mbps RJ-45 ports for PC (downlink) connection.
	Power Jack	5V DC power port; UL Certified
	Headset Jack	RJ9 and 2.5mm
	Headset Jack	RJ9
Adapter #1	Input	100-240VAC 50/60Hz 0.15A
	Output	5VDC,0.8A
	Model	SCF0500080A1BA
	Brand name	Mass
Adapter #2	Input	100-240VAC 50/60Hz 0.2A
	Output	5VDC,1.2A
	Model	AMS47-0501200FU
	Brand name	Amigo
Adapter #3	Input	100-240VAC 50/60Hz 0.2A
	Output	5VDC,0.8A
	Model	UE05L5-050080SPAU
	Brand name	UE

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

## **Test Summary**

The Electromagnetic Compatibility requirements on model GXP2100 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.

<b>Emission Tests</b>				
<b>Specifications</b>	<b>Description</b>	<b>Test Results</b>	<b>Test Point</b>	<b>Remark</b>
<i>FCC Part 15.107 ANSI C63.4 -2009</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 -2009</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 operation modes. IP call mode and PoE mode were chosen for the final test as described below.*

#### **IP Call mode:**

*Connected the EUT's LAN port to another an IP Phone by an RJ-45 cable and established a call communication. Then connected a notebook PC to the EUT's PC port by another a RJ-45 cable and ping "192.168.0.160 -t" to EUT and measured it.*

#### **PoE Mode:**

*Let the EUT operated in 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 for model GXP2100***



***EUT- Front View***



***EUT- Rear View***



***Adaptor #1 View (Manufacturer: Mass Power)***



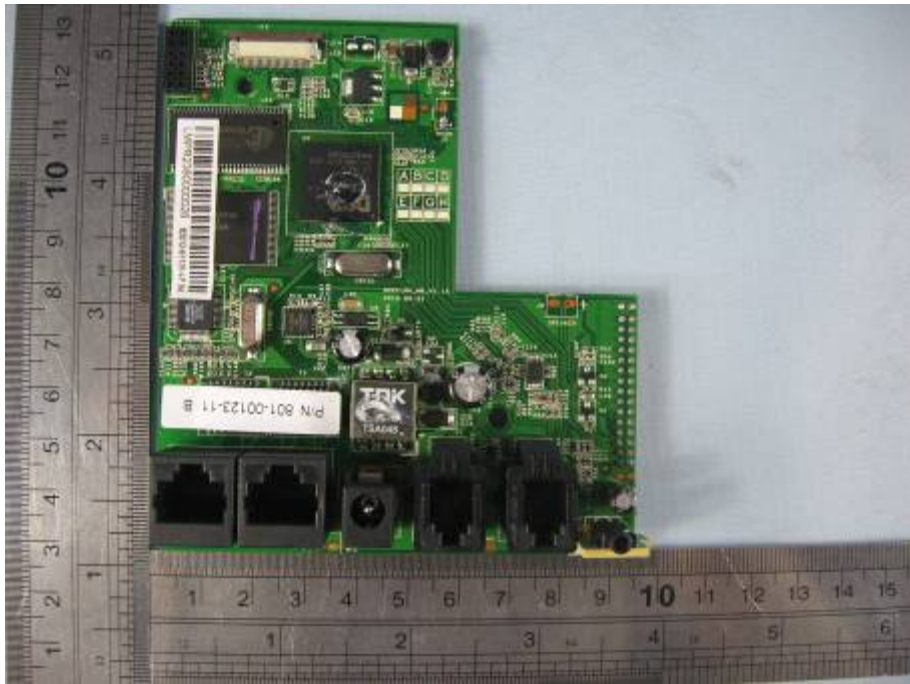
***Adaptor #2 View (Manufacturer: Amigo)***



***Adaptor #3 View (Manufacturer: UE)***



***EUT-Uncovered View***



**Mainboard- Top View**



**Mainboard- Bottom View**

## Test System Details

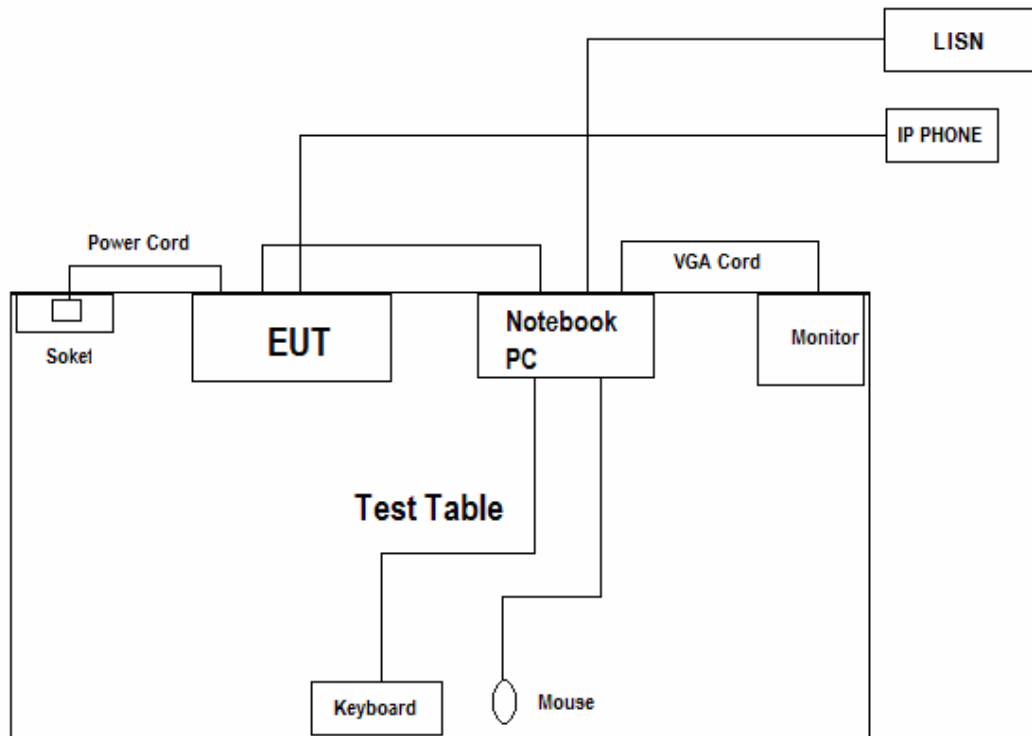
<i>EUT</i>			
<b>Model Number:</b>	<i>GXP2100</i>		
<b>Model Tested:</b>	<i>GXP2100</i>		
<b>Description:</b>	<i>IP Phone</i>		
<b>Input:</b>	<i>AC 120V/60Hz</i>		
<b>Manufacturer:</b>	<i>Grandstream Networks, INC</i>		
<i>Support Equipment</i>			
<i>Description</i>	<i>Model Number</i>	<i>Serial Number</i>	<i>Manufacturer</i>
<i>Notebook PC</i>	<i>ThinkPad X121e</i>	<i>---</i>	<i>Lenovo</i>
<i>Adapter Of Notebook PC</i>	<i>ThinkPad 57Y4614</i>	<i>---</i>	<i>Lenovo</i>
<i>Mouse</i>	<i>MO32B0</i>	<i>23-033131</i>	<i>IBM</i>
<i>Monitor</i>	<i>TFT1780PS</i>	<i>B8879HA021638</i>	<i>AOC</i>

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<b>Cable Description</b>					
<b>Description</b>	<b>From</b>	<b>To</b>	<b>Length (Meters)</b>	<b>Shielded (Y/N)</b>	<b>Ferrite (Y/N)</b>
<i>Power Cord Of Notebook PC</i>	<i>Adapter</i>	<i>Notebook PC</i>	<i>1.6</i>	<i>N</i>	<i>Y</i>
	<i>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>VGA Cord</i>	<i>Monitor</i>	<i>PC</i>	<i>1.2</i>	<i>Y</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>&gt;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>					

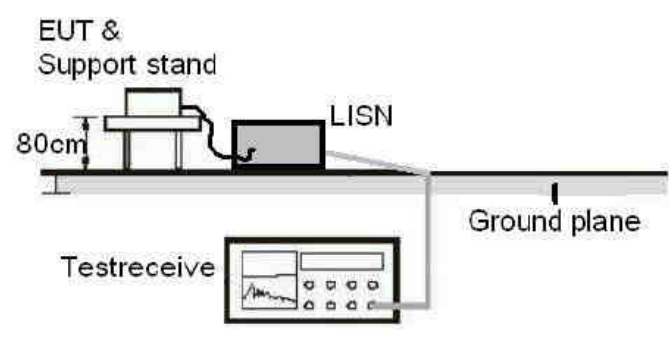
*NOTE: The EUT has been tested as an independent unit together with other necessary accessories or support units. The above support units or accessories were used to form a representative test configuration during the test tests.*

## Configuration of Tested System

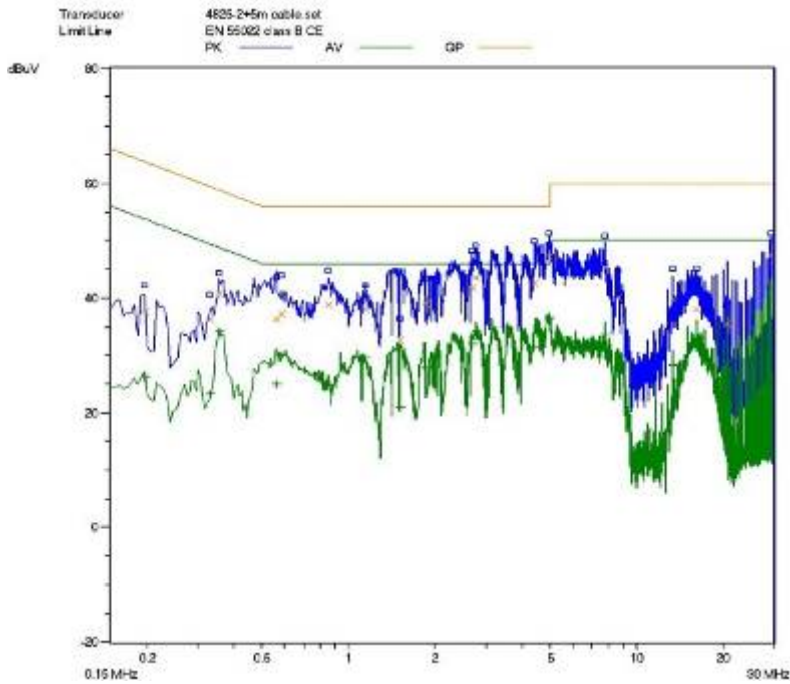




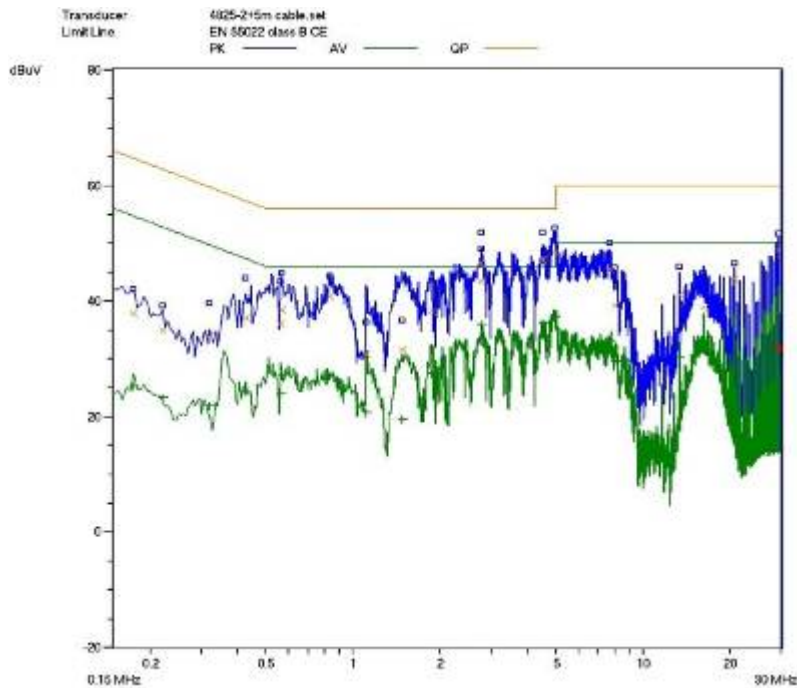
## ATTACHMENT 1 - CONDUCTED EMISSION TEST RESULTS

<b>CLIENT:</b>	Grandstream Networks, INC	<b>TEST STANDERD:</b>	FCC Part 15, Subpart B, Section 15.107
<b>MODEL NUMBERS:</b>	GXP2100	<b>PRODUCT:</b>	IP Phone
<b>MODEL TESTED:</b>	GXP2100	<b>EUT DESIGNATION:</b>	Home or Office
<b>TEMPERATURE:</b>	23°C	<b>HUMIDITY:</b>	51%
<b>ATM PRESSURE:</b>	103kPa	<b>GROUNDING:</b>	None
<b>TESTED BY:</b>	Daomen	<b>DATE OF TEST:</b>	October 23 <sup>rd</sup> , 2012
<b>TEST REFERENCE:</b>	ANSI C63.4 -2009		
<b>TEST PROCEDURE:</b>	The EUT was set up according to the guidelines of ANSI C63.4 -2009 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.		
<b>DESCRIPTION OF TEST MODE</b>	IP Call mode		
<b>TEST SET UP</b>	 <p>The diagram illustrates the test setup. It shows a table with a support stand on it. On the stand, there is a device labeled 'EUT &amp; Support stand'. A vertical dimension line indicates the height of the stand is '80cm'. To the right of the stand is a box labeled 'LISN'. A cable connects the EUT to the LISN. Below the table is a device labeled 'Testreceive'. A cable connects the LISN to the Testreceive. To the right of the Testreceive is a horizontal line labeled 'Ground plane'. A cable connects the Testreceive to the Ground plane.</p>		
<b>TESTED RANGE:</b>	150kHz to 30MHz		
<b>TEST VOLTAGE:</b>	AC 120V/60Hz		
<b>RESULTS:</b>	The EUT meets the requirements of test reference for Conducted Emissions. The test results relate only to the equipment under test provided by client.		
<b>Changes or Modifications:</b>	There were no modifications installed by ECMG Electronic Technical Testing Corp (Shenzhen). test personnel.		
<b>M. UNCERTAINTY:</b>	Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp $\pm 2.6$ dB		

**Adaptor #1:( Mass)**

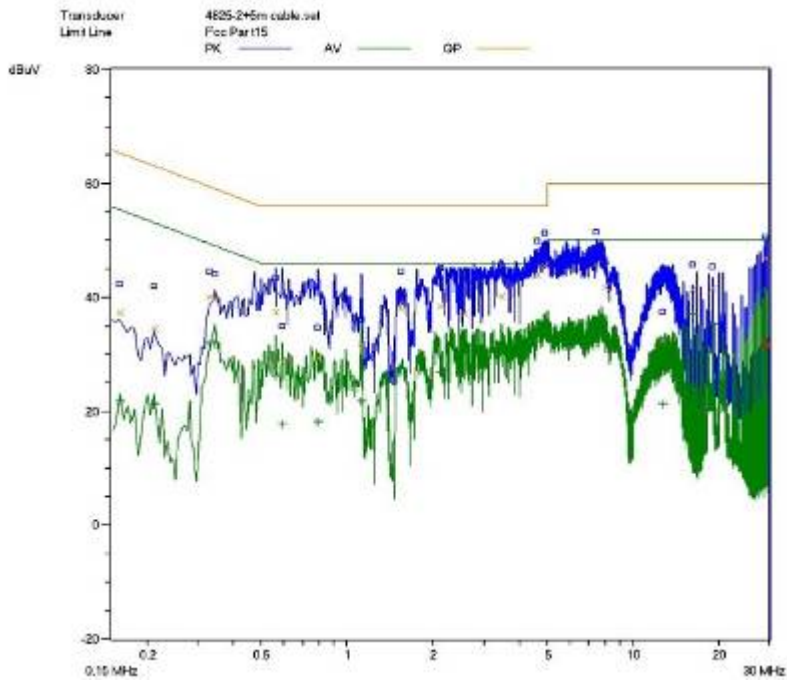


**Line L Conducted Emission Graph Of AC Mains**

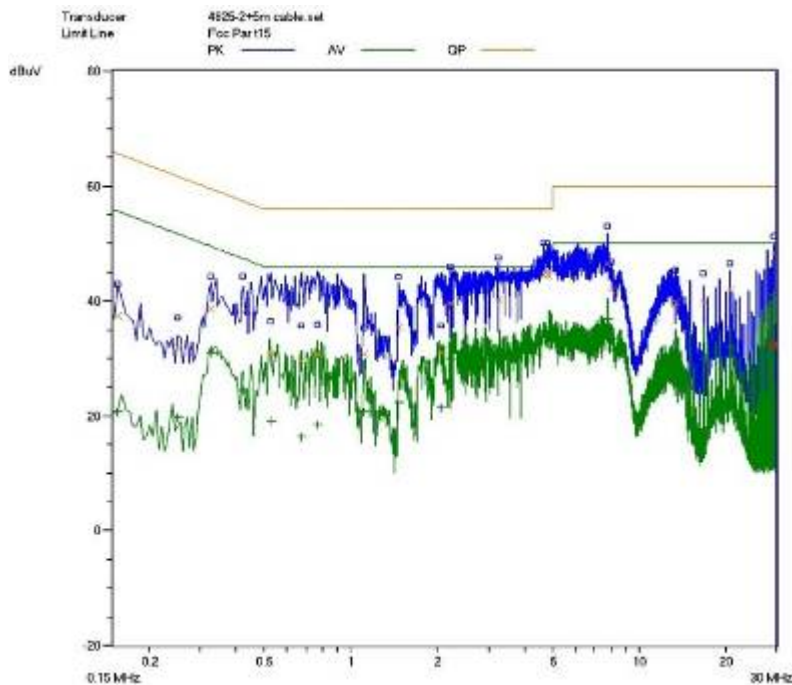


**Line N Conducted Emission Graph Of AC Mains**

**Adaptor #2 :( Amigo)**

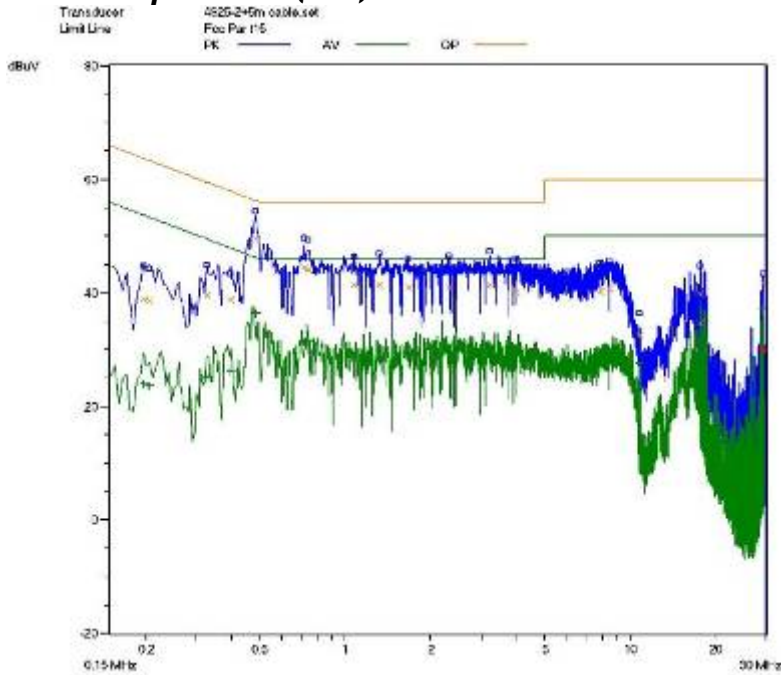


**Line L Conducted Emission Graph Of AC Mains**

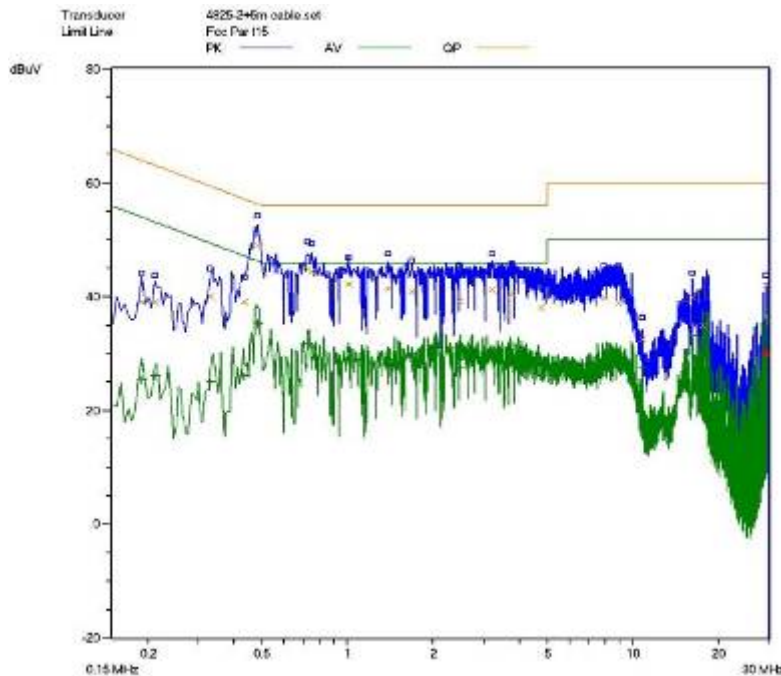


**Line N Conducted Emission Graph Of AC Mains**

### Adaptor #3 :( UE)



**Line L Conducted Emission Graph Of AC Mains**



**Line N Conducted Emission Graph Of AC Mains**

**Test Data:**  
**Adaptor #1(Mass)**

Lines (L/N)	Frequency (MHz)	Corrected QP Level (dBuV)	Limits QP (dBuV)	Margin QP (dB)	Frequency (MHz)	Corrected AV Level (dBuV)	Limits AV (dBuV)	Margin QP (dB)
<b>IP Call Mode</b>								
L	0.494	47.2	56.1	-8.9	0.494	36.2	46.1	-9.9
L	0.718	41.7	56	-14.3	0.718	31.2	46	-14.8
L	0.894	39.8	56	-16.2	0.894	29.1	46	-16.9
N	0.498	49.4	56	-6.6	0.498	37.9	46	-8.1
N	0.762	42.5	56	-13.5	0.762	30.4	46	-15.6
N	9.460	42.8	56	-13.2	9.460	30.9	46	-15.1
<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>								

**Adaptor #2(Amigo)**

Lines (L/N)	Frequency (MHz)	Corrected QP Level (dBuV)	Limits QP (dBuV)	Margin QP (dB)	Frequency (MHz)	Corrected AV Level (dBuV)	Limits AV (dBuV)	Margin QP (dB)
<b>IP Call Mode</b>								
L	0.518	54.8	65.6	-10.8	0.518	38.9	55.6	-16.7
L	0.178	51.9	64.6	-12.7	0.178	37.9	54.6	-16.7
L	2.498	41.9	56	-14.1	2.498	35.9	46	-10.1
N	0.158	53.7	65.6	-11.9	0.158	37.9	55.6	-17.7
N	0.178	51.7	64.6	-12.9	0.178	36	54.6	-18.6
N	2.554	42.9	56	-13.1	2.554	34.8	46	-11.2
<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>								

### Adaptor #3(UE)

Lines (L/N)	Frequency (MHz)	Corrected QP Level (dBuV)	Limits QP (dBuV)	Margin QP (dB)	Frequency (MHz)	Corrected AV Level (dBuV)	Limits AV (dBuV)	Margin QP (dB)
<b>IP Call Mode</b>								
L	0.150	46.7	66	-19.3	0.150	30.8	56	-25.2
L	0.186	42.8	64.2	-21.4	0.186	27.9	54.2	-26.3
L	0.302	43.5	60.2	-16.7	0.302	39.1	50.2	-11.1
N	0.150	45.9	66	-20.1	0.150	28.9	56	-27.1
N	0.166	45.7	65.2	-19.5	0.166	29.7	55.2	-25.5
N	0.338	41.0	59.3	-18.3	0.338	35.9	49.3	-13.4
<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	2012.07.08	2013.07.08
Line impedance stabilization network	4825/2	ETS	1161	2012.07.08	2013.07.08

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

TESTED BY: Daomen ECMG  
COMPANY NAME  
ENGINEER

REVIEWED BY: Janemyon ECMG  
COMPANY NAME  
SENIOR ENGINEER

**Conducted Emission Test Set-up:**



## ATTACHMENT 2 – RADIATED EMISSION MEASUREMENT

<b>CLIENT:</b>	Grandstream Networks, INC	<b>TEST STANDERD:</b>	FCC Part 15,Subpart B, Section 15.109
<b>MODEL NUMBERS:</b>	GXP2100	<b>PRODUCT:</b>	IP Phone
<b>EUT MODEL:</b>	GXP2100	<b>EUT DESIGNATION:</b>	Home or Office
<b>TEMPERATURE:</b>	23°C	<b>HUMIDITY:</b>	49%RH
<b>ATM PRESSURE:</b>	103.0kPa	<b>GROUNDING:</b>	None
<b>TESTED BY:</b>	Daomen	<b>DATE OF TEST:</b>	October 19 <sup>th</sup> , 2012
<b>TEST REFERENCE:</b>	ANSI C63.4 -2009		
<b>TEST PROCEDURE:</b>	<p>The EUT was set up according to the guidelines of ANSI C63.4 -2009 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>		
<b>TEST MODE</b>	IP Call Mode and PoE mode		
<b>TESTED RANGE:</b>	9K-30MHz and 30MHz to 5GHz		
<b>TEST VOLTAGE:</b>	AC 120V/60Hz		
<b>RESULTS:</b>	The EUT meet the requirements of test reference for radiated emissions. The test results relate only to the equipment under test provided by client.		
<b>CHANGES OR MODIFICATIONS:</b>	There were no modifications installed by ECMG Electronic Technical Testing Corp (Shenzhen). Test personnel.		
<b>M. UNCERTAINTY:</b>	Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp $\pm 2.6$ dB		

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**Frequency measured at 9KHz to 30MHz:**

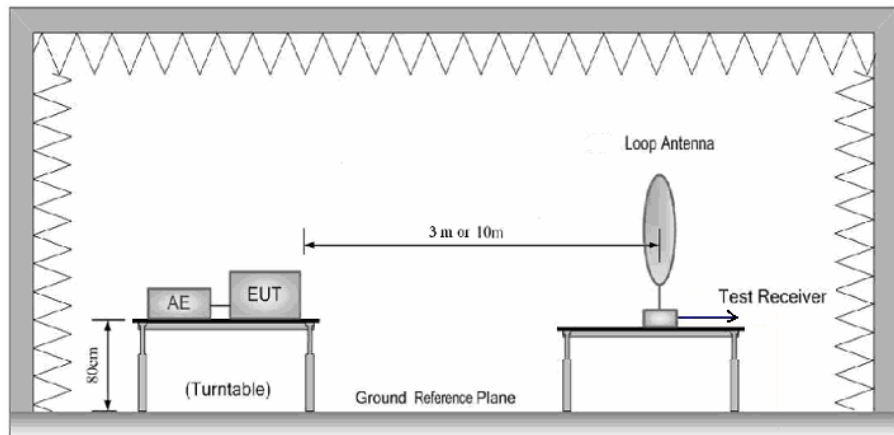


Figure 1 : Frequencies measured below 1 GHz configuration

**TEST SET-UP:**

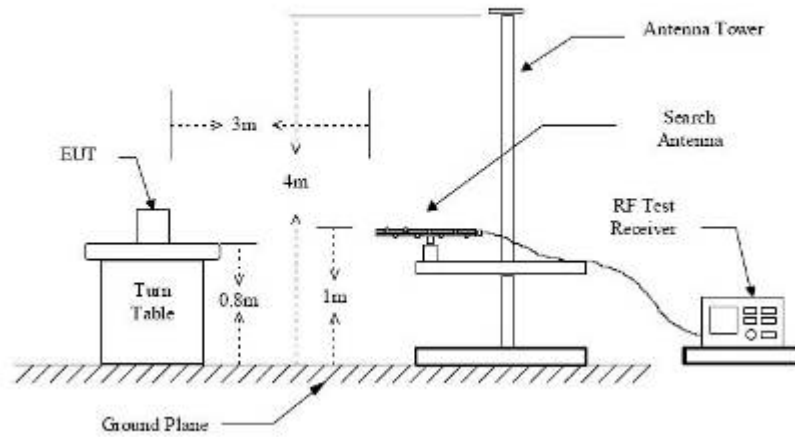
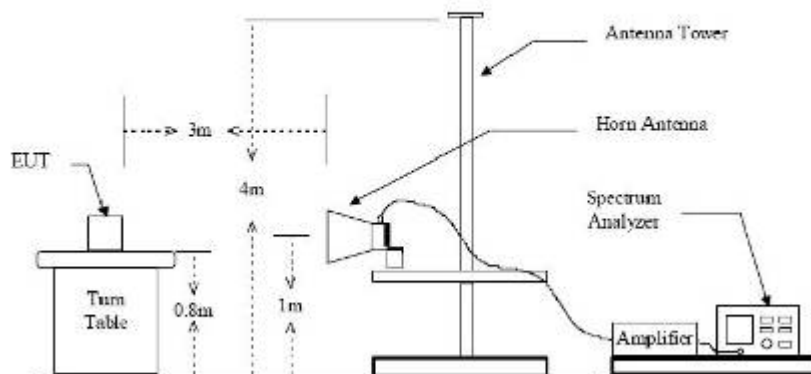
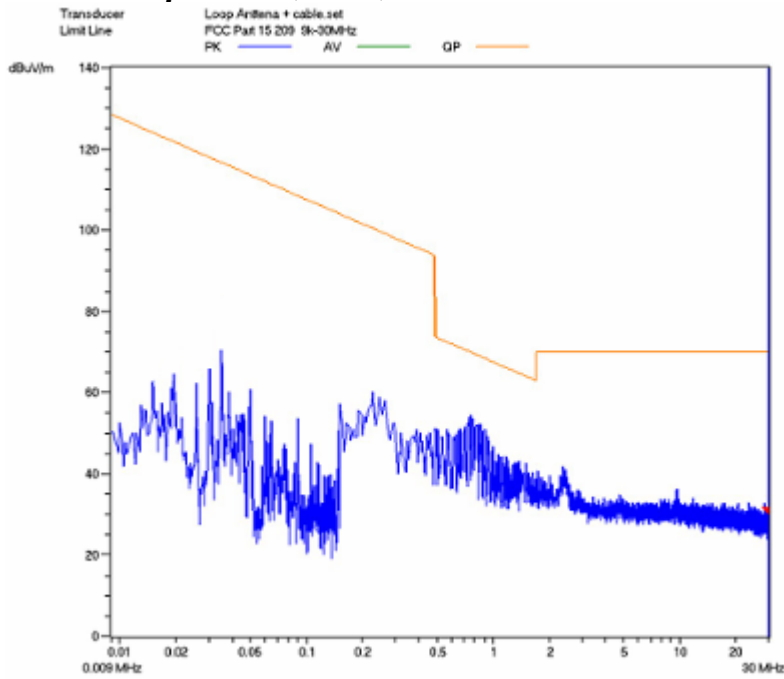


Figure 2 : Frequencies measured above 1 GHz configuration

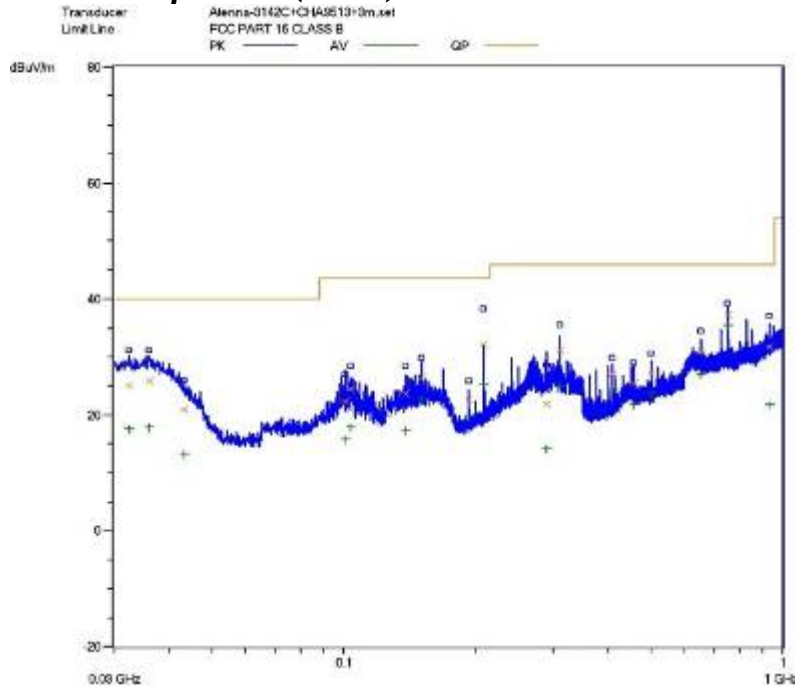


**IP Call Mode:  
Adaptor #1(Mass)**

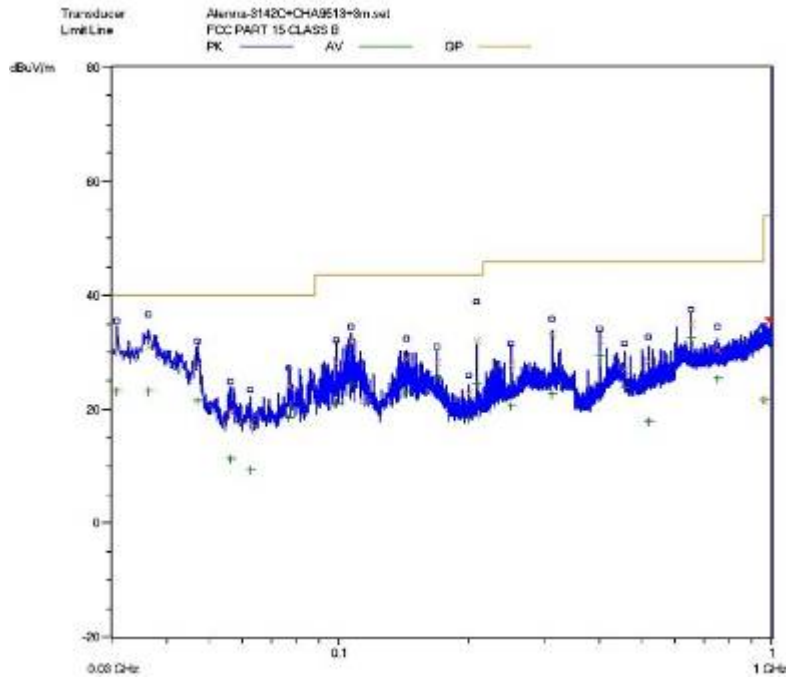


**Radiated Field Strength Emission Test Plot(9KHz-30MHz)**

**Adaptor #1(Mass)**

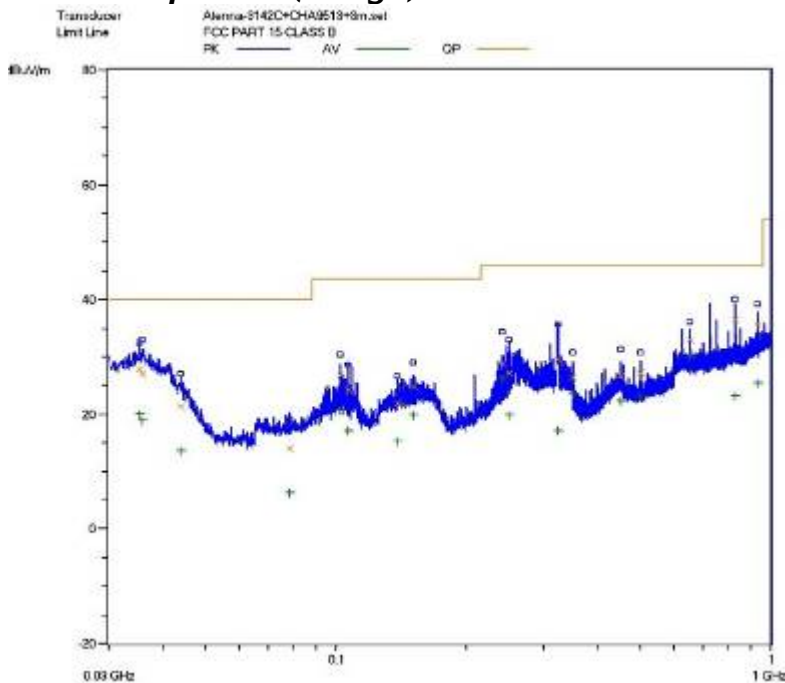


**Horizontal: Radiated Emission Test Plot (30MHz-1000MHz)**

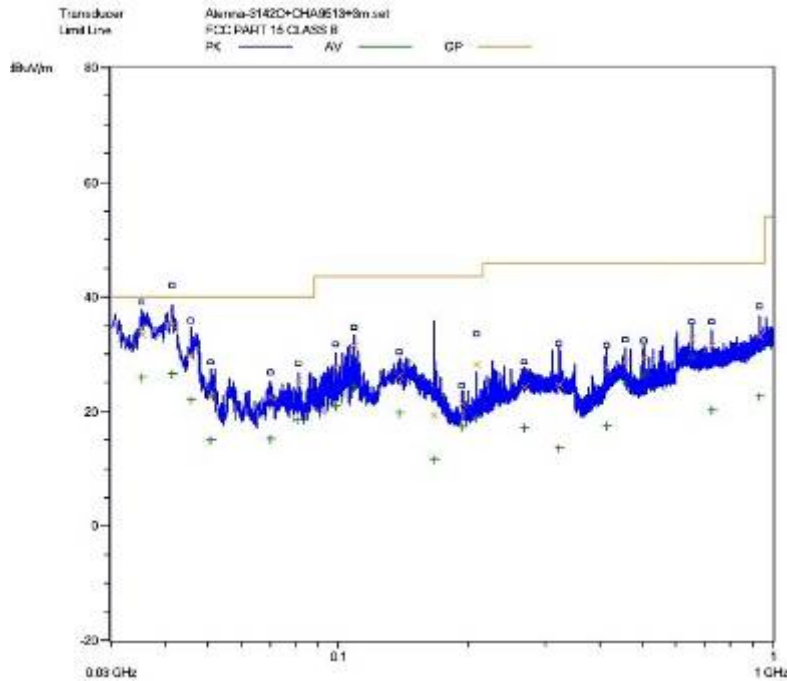


**Vertical: Radiated Emission Test Plot (30MHz-1000MHz)**

**Adaptor #2(Amigo)**

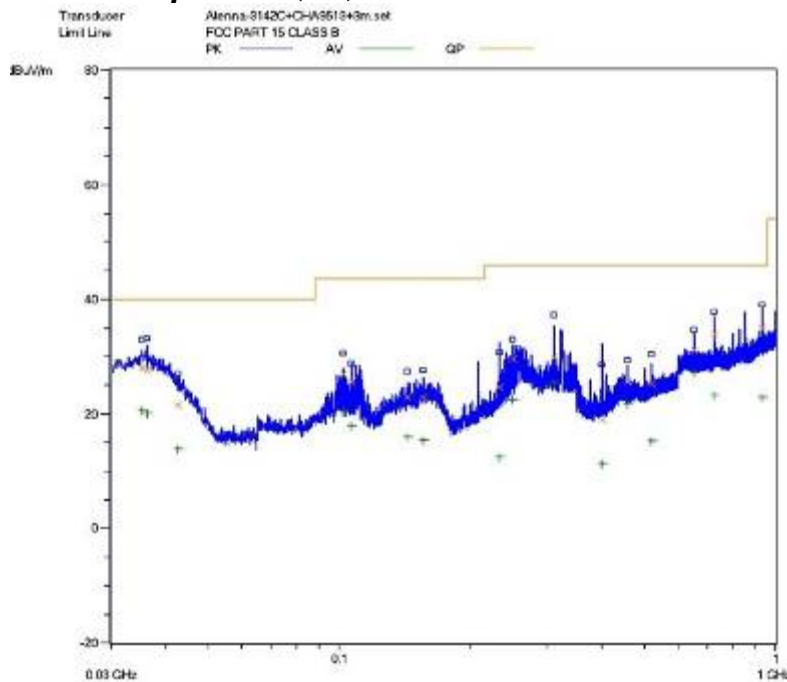


**Horizontal: Radiated Emission Test Plot (30MHz-1000MHz)**

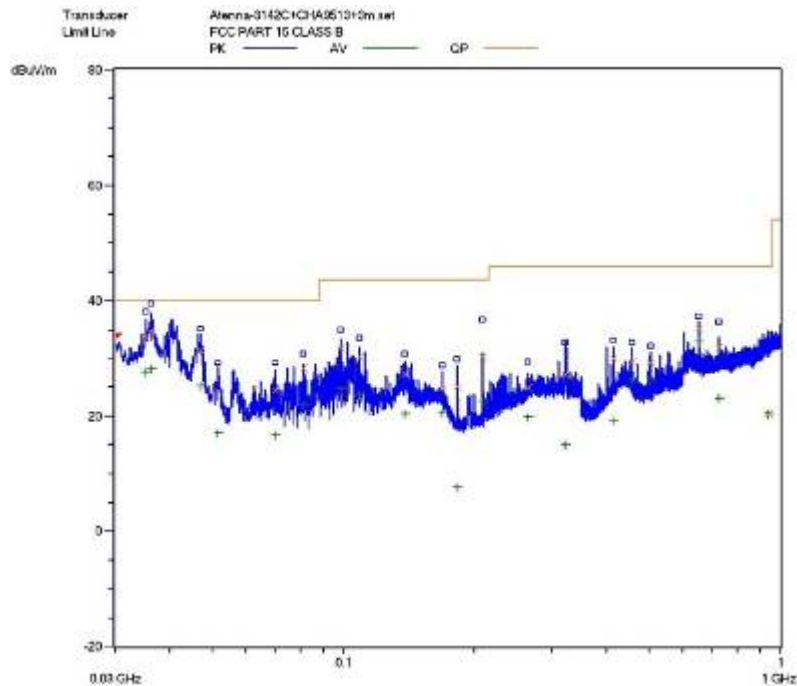


**Vertical: Radiated Emission Test Plot (30MHz-1000MHz)**

**Adaptor #3(UE)**

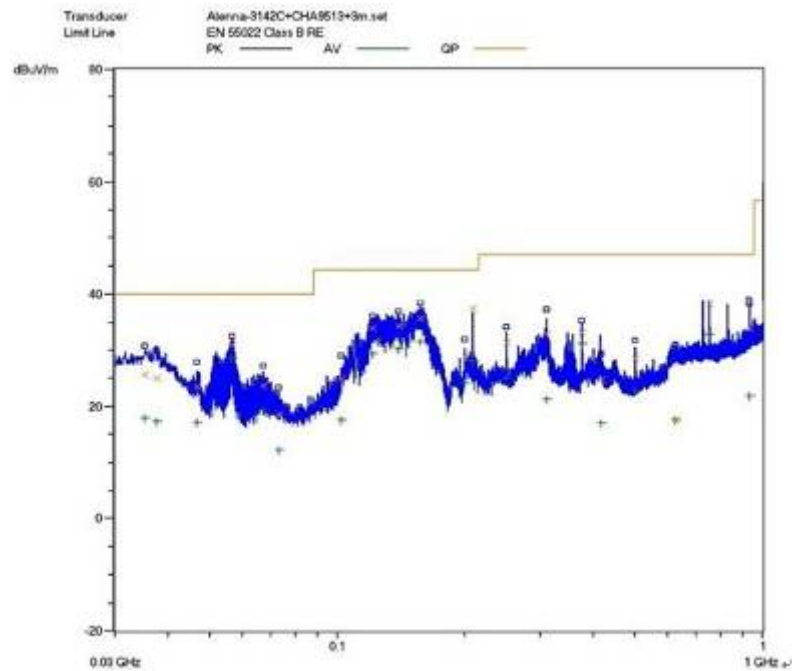


**Horizontal: Radiated Emission Test Plot (30MHz-1000MHz)**

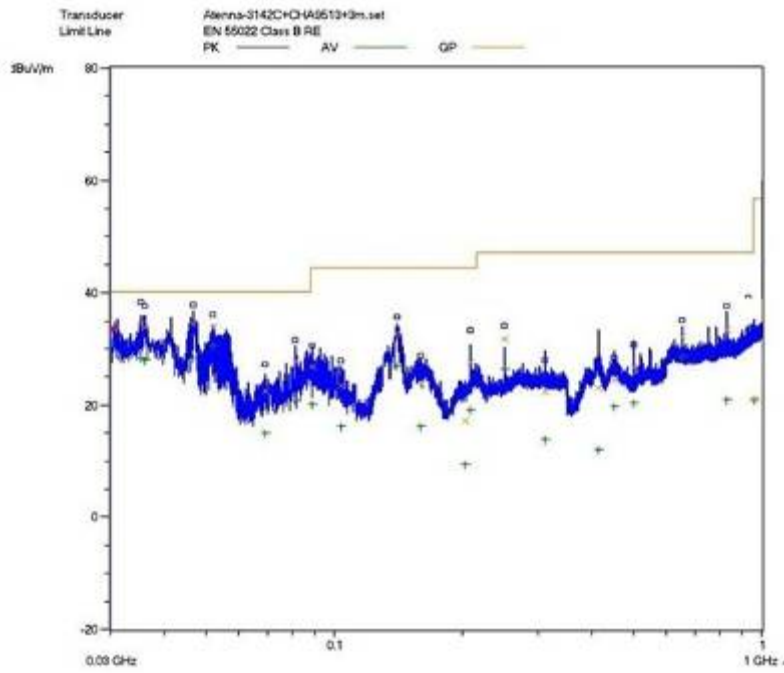


**Vertical: Radiated Emission Test Plot (30MHz-1000MHz)**

**PoE Mode:**



**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:**

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. For band in 9KHz to 30MHz, Pre-scan has been conducted to determine the worst-case from apaptor #1, apaptor #2 and apaptor #3. Apaptor #1 was selected for the fina testing.
3. 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.
4. All emission levels in the frequency range of 9KHz to 30MHz are 20dB below the official limits that are not reported.

**Test Data:**  
**Adaptor #1(Mass):**  
**IP Call Mode/Below 1GHz:**

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Preamp Factor (dB)	Reading Level QP (dBuV/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
<b>Horizontal</b>							
207.360	0.12	7.2	/	24.88	32.2	43.5	-11.3
311.040	0.16	13.4	/	17.54	31.1	46	-14.9
500.000	0.2	17.4	/	9.6	27.2	46	-18.8
650.000	0.36	20	/	10.74	31.1	46	-14.9
750.000	0.39	21.1	/	15.81	37.3	46	-8.7
933.040	0.44	23.8	/	7.66	31.9	46	-14.1
<b>Vertical</b>							
30.640	0.02	16.7	/	14.08	30.8	40	-9.2
36.160	0.02	18.4	/	12.68	31.1	40	-8.9
106.720	0.02	7.7	/	24.28	32.0	43.5	-11.5
207.360	0.12	7.2	/	24.88	32.2	43.5	-11.3
400.000	0.16	14.7	/	17.24	32.1	46	-13.9
650.000	0.36	20	/	14.54	34.9	46	-11.1

**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.



**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)
<b>Peak Measurement</b>								
1.060	1.40	24.1	-33.6	-7.18	51.92	74	-22.08	H
1.430	1.67	25.5	-33.6	-7.9	52.87	74	-21.13	H
1.580	1.74	26.8	-33.6	-9	53.14	74	-20.86	H
1.060	1.40	24.1	-33.6	-4.21	54.89	74	-19.11	V
1.330	1.58	24.7	-33.6	4.36	64.24	74	-9.76	V
1.570	1.73	26.7	-33.6	-7.94	54.09	74	-19.91	V
<b>Average Measurement</b>								
1.060	1.40	24.1	-33.6	-21.97	37.13	54	-16.87	H
1.520	1.71	26.1	-33.6	-24.82	36.59	54	-17.41	H
1.590	1.75	26.8	-33.6	-24.61	37.54	54	-16.46	H
1.060	1.40	24.1	-33.6	-21.44	37.66	54	-16.34	V
1.290	1.46	24.7	-33.6	-20.06	39.70	54	-14.30	V
1.600	1.80	27.0	-33.6	-24	38.40	54	-15.60	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.

**Adaptor #2(Amigo):  
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)
<b>Horizontal</b>							
240.480	0.12	11.4	/	17.38	28.9	46	-17.1
250.000	0.12	11.8	/	15.28	27.2	46	-18.8
324.240	0.16	13.5	/	15.94	29.6	46	-16.4
650.000	0.36	20	/	12.64	33.0	46	-13.0
829.360	0.42	22.4	/	13.78	36.6	46	-9.4
933.040	0.44	23.8	/	11.56	35.8	46	-10.2
<b>Vertical</b>							
35.360	0.02	18.4	/	15.18	33.6	40	-6.4
41.600	0.02	18.4	/	16.68	35.1	40	-4.9
108.800	0.02	7.5	/	24.08	31.6	43.5	-11.9
650.000	0.36	20	/	12.44	32.8	46	-13.2
725.680	0.39	20.9	/	10.21	31.5	46	-14.5
933.040	0.44	23.8	/	8.96	33.2	46	-12.8

**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.

**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)
<b>Peak Measurement</b>								
1.580	1.74	26.8	-33.6	-9	53.14	74	-20.86	H
1.860	1.90	27.2	-33.6	-13.44	49.26	74	-24.74	H
1.950	1.97	27.6	-33.6	-18.06	45.11	74	-28.89	H
1.190	1.42	24.3	-33.6	-4.69	54.63	74	-19.37	V
1.860	1.90	27.2	-33.6	-11	51.70	74	-22.30	V
2.390	2.27	29.1	-33	-15.61	48.76	74	-25.24	V
<b>Average Measurement</b>								
1.060	1.40	24.1	-33.6	-21.97	37.13	54	-16.87	H
1.520	1.71	26.1	-33.6	-24.82	36.59	54	-17.41	H
1.590	1.75	26.8	-33.6	-24.61	37.54	54	-16.46	H
1.060	1.40	24.1	-33.6	-20.57	38.53	54	-15.47	V
1.290	1.46	24.7	-33.6	-22.56	37.20	54	-16.80	V
1.600	1.80	27.0	-33.6	-25.59	36.81	54	-17.19	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.

**Adaptor #3(UE):  
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)
<b>Horizontal</b>							
35.360	0.02	18.4	/	9.68	28.1	40	-11.9
36.160	0.02	18.4	/	9.18	27.6	40	-12.4
250.000	0.12	11.8	/	17.68	29.6	46	-16.4
650.000	0.36	20	/	10.84	31.2	46	-14.8
725.680	0.39	20.9	/	12.61	33.9	46	-12.1
933.040	0.44	23.8	/	10.86	35.1	46	-10.9
<b>Vertical</b>							
35.360	0.02	18.4	/	15.38	33.8	40	-6.2
36.160	0.02	18.4	/	16.38	34.8	40	-5.2
47.040	0.02	11.9	/	19.38	31.3	40	-8.7
98.480	0.02	7.6	/	24.08	31.7	43.5	-11.8
650.000	0.36	20	/	14.74	35.1	46	-10.9
725.680	0.39	20.9	/	10.71	32.0	46	-14.0

**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.

**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)
<b>Peak Measurement</b>								
1.580	1.74	26.8	-33.6	-7.47	54.67	74	-19.33	H
1.860	1.90	27.2	-33.6	-12.69	50.01	74	-23.99	H
1.950	1.97	27.6	-33.6	-10.46	52.71	74	-21.29	H
1.190	1.42	24.3	-33.6	-10.52	48.80	74	-25.20	V
1.860	1.90	27.2	-33.6	-12.57	50.13	74	-23.87	V
2.390	2.27	29.1	-33	-11.65	52.72	74	-21.28	V
<b>Average Measurement</b>								
1.060	1.40	24.1	-33.6	-22.97	36.13	54	-17.87	H
1.520	1.71	26.1	-33.6	-24.19	37.22	54	-16.78	H
1.590	1.75	26.8	-33.6	-25.95	36.20	54	-17.8	H
1.060	1.40	24.1	-33.6	-20.19	38.91	54	-15.09	V
1.290	1.46	24.7	-33.6	-22.76	37.00	54	-17.00	V
1.600	1.80	27.0	-33.6	-24.39	38.01	54	-15.99	V

**Note:**

4. 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.
5. 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.
6. 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)	Preamp Factor (dB)	Reading Level QP (dBuV/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
<b>Horizontal</b>							
56.720	0.02	5.7	/	26.68	32.4	40	-7.6
61.360	0.02	5.6	/	26.58	32.2	40	-7.8
122.000	0.02	6.9	/	25.28	32.2	43.5	-11.3
141.200	0.02	7.8	/	30.58	38.4	43.5	-5.1
157.600	0.02	9.8	/	26.68	36.5	43.5	-7.0
725.680	0.39	20.9	/	14.31	35.6	46	-10.4
<b>Vertical</b>							
35.360	0.02	18.4	/	16.08	34.5	40	-5.5
36.000	0.02	18.4	/	15.58	34.0	40	-6.0
46.880	0.02	11.9	/	22.68	34.6	40	-5.4
51.840	0.02	8.2	/	25.58	33.8	40	-6.2
250.000	0.12	11.8	/	19.88	31.8	46	-14.2
650.000	0.36	20	/	11.74	32.1	46	-13.9

**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)
<b>Peak Measurement</b>								
1.580	1.74	26.8	-33.6	-9.13	53.01	74	-20.99	H
1.860	1.90	27.2	-33.6	-9.94	52.76	74	-21.24	H
1.950	1.97	27.6	-33.6	-8.07	55.10	74	-18.9	H
1.190	1.42	24.3	-33.6	-6.05	53.27	74	-20.73	V
1.860	1.90	27.2	-33.6	-7.08	55.62	74	-18.38	V
2.390	2.27	29.1	-33	-4.26	60.11	74	-13.89	V
<b>Average Measurement</b>								
1.060	1.40	24.1	-33.6	-23.83	35.27	54	-18.73	H
1.520	1.71	26.1	-33.6	-22.49	38.92	54	-15.08	H
1.590	1.75	26.8	-33.6	-24.14	38.01	54	-15.99	H
1.060	1.40	24.1	-33.6	-21.59	37.51	54	-16.49	V
1.290	1.46	24.7	-33.6	-21.76	38.00	54	-16	V
1.600	1.80	27.0	-33.6	-23.54	38.86	54	-15.14	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:**

<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>2012.07.08</i>	<i>2013.07.07</i>
<i>HF Loop Antenna</i>	<i>HLA6120</i>	<i>TESEQ</i>	<i>26348</i>	<i>2012.09.27</i>	<i>2013.09.26</i>
<i>Double-ridged Wave guide horn</i>	<i>3115</i>	<i>ETS</i>	<i>6587</i>	<i>2012.08.02</i>	<i>2013.08.01</i>
<i>Microwave system amplifier</i>	<i>83017A</i>	<i>Agilent</i>	<i>MY39500438</i>	<i>2012.07.11</i>	<i>2013.07.10</i>
<i>Biconilog Antenna</i>	<i>3142C</i>	<i>ETS</i>	<i>00042672</i>	<i>2012.09.28</i>	<i>2013.09.27</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&amp;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>					

TESTED BY: *Daomen* ECMG  
COMPANY NAME  
ENGINEER

REVIEWED BY: *Janeyan* ECMG  
COMPANY NAME  
SENIOR ENGINEER





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



***Radiated Emission Test Set-up (Below 1GHz)***



***Radiated Emission Test Set-up (Above 1GHz)***