ECMG
Electronic Technical Testing Corp.
www.ecmg-global.net

EMI TEST REPORT

On Model Name: IP Phone

Model Number: GXP1628

Brand Name: Grandstream

Prepared for Grandstream Networks, Inc.

FCC ID: YZZGXP1628

According to FCC 47 CFR Part 15, Subpart B

Test Report #: SHE-1502-11289-FCC

Prepared by: Nancy _____ *ECMG*
Nancy Han /Assistant *Company Name*

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

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

Test Report Released by: Swall Zhang _____ *February 28th, 2015*
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.

- *IC – Registration No.: 8801A*

The Laboratory is registered to perform emission tests with Industry Canada (IC), and the registration number is 8801A.

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List Attached Files

Exhibit Type	***File Description***	***File Name***
Test Report	*Test Report*	*YZZGXP1628 _Test Report.pdf*
Operation Description	*Technical Description*	*YZZGXP1628 _Operation description.pdf*
External Photos	*External Photos*	*YZZGXP1628 _External Photos*
Internal Photos	*Internal Photos*	*YZZGXP1628 _Internal Photos*
Block Diagram	*Block Diagram*	*YZZGXP1628 _Block Diagram.pdf*
Schematics	*Circuit Diagram*	*YZZGXP1628 _Schematics.pdf*
ID Label/Location	*Label and Location*	*YZZGXP1628 _Label & Location.pdf*
User Manual	*User Manual*	*YZZGXP1628 _User Manual.pdf*
Test setup photos	*Test set-up photos*	*YZZGXP1628 _Test Set-up Photos*

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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

Test Sample	*: IP Phone*
Model Numbers	*: GXP1628*
Model Tested	*: GXP1628*
Date of Received	*: Feb. 8th, 2015*
Date Tested	*: Feb. 12th, 2015*
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 GXP1628 (referred to as the EUT in this report) is an IP Phone. Technical specifications are as belows:

Parameter		Ranges
Basic parameters	Rated voltage	5.0V
	Rated Current	0.6A
I/O Ports	LAN Port (RJ-45)	Connect to internet or router
	PC port	Connect to PC
	Power Jack	5V 1A power port
	Headset port	To connect to RJ9 or EHS headphones
	Handset port	To connect handset RJ9
Power Adapter #1	Input	AC 100–240 V 50/60 Hz 0.15A max
	Output	DC 5V, 0.6A, UL, FCC certified
	Model	PCF-0500060AV
	Brand name	Mass power
Power Adapter #2	Input	100-240VAC 50/60Hz 0.15A
	Output	5VDC,0.8A
	Model	SCF0500080A1BA
	Brand name	Mass power
Power Adapter #3	Input	100-240VAC 50/60Hz 0.2A
	Output	5VDC,0.6A
	Model	AMS20-0500600FU2
	Brand name	AMIGO
Power Adapter #4	Input	100-240VAC 50/60Hz 0.2A
	Output	5VDC,0.6A
	Model	R60UC0500060A
	Brand name	Sunlight

Note :For other informations &features please refer to user's manual of EUT.

Frequency Range Of Radiated Measurements

(b) For unintentional radiators:

(1) Except as otherwise indicated in paragraphs (b)(2) or (b)(3) of this section, for an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	*Upper frequency of measurement range (MHz)*
Below 1.705	*30.*
1.705-108	*1000.*
108-500	*2000.*
500-1000	*5000.*
Above 1000	*5th harmonic of the highest frequency or 40 GHz, whichever is lower.*

Note: Since the highest frequency operated of the EUT is 266MHz, so upper frequency of radiated emission test is up to 2GHz as per §15.33(b)(1).

Test Summary

The Electromagnetic Compatibility requirements on model GXP1628 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***
FCC Part 15.107 ANSI C63.4 -2009	*Conducted Emission*	*Passed*	*AC Input Port*	*Attachment 1*
FCC Part 15.109 ANSI C63.4 -2009	*Radiated Emission*	*Passed*	*Enclosure*	*Attachment 2*

Test Mode Justification

Pre-Scan has been conducted to determine the worst-case from all possible combination between available operation mode .Following mode(s) was (were) selected for the final test as listed below:

Pre-Test Mode	
EMI Test Mode	***Mode 1:*** *Communication with PC& IP Phone + Mass Power (Model: PCF-0500100AV)*
	Mode 2: *Communication with PC& IP Phone + Mass Power (Model: SCF0500080A1BA)*
	Mode 3: *Communication with PC& IP Phone + AMIGO Power (Model: AMS20-0500600FU2)*
	Mode 4: *Communication with PC& IP Phone + Sunlight Power (Model: R60UC0500060A)*
	Mode 5:*PoE Mode*
Final Test Mode	
EMI Test Mode	***Mode 1:*** *Communication with PC& IP Phone + Mass Power (Model: PCF-0500100AV)*
	Mode 2: *Communication with PC& IP Phone + Mass Power (Model: SCF0500080A1BA)*
	Mode 3: *Communication with PC& IP Phone + AMIGO Power (Model: AMS20-0500600FU2)*
	Mode 4: *Communication with PC& IP Phone + Sunlight Power (Model: R60UC0500060A)*
	Mode 5:*PoE Mode*

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.

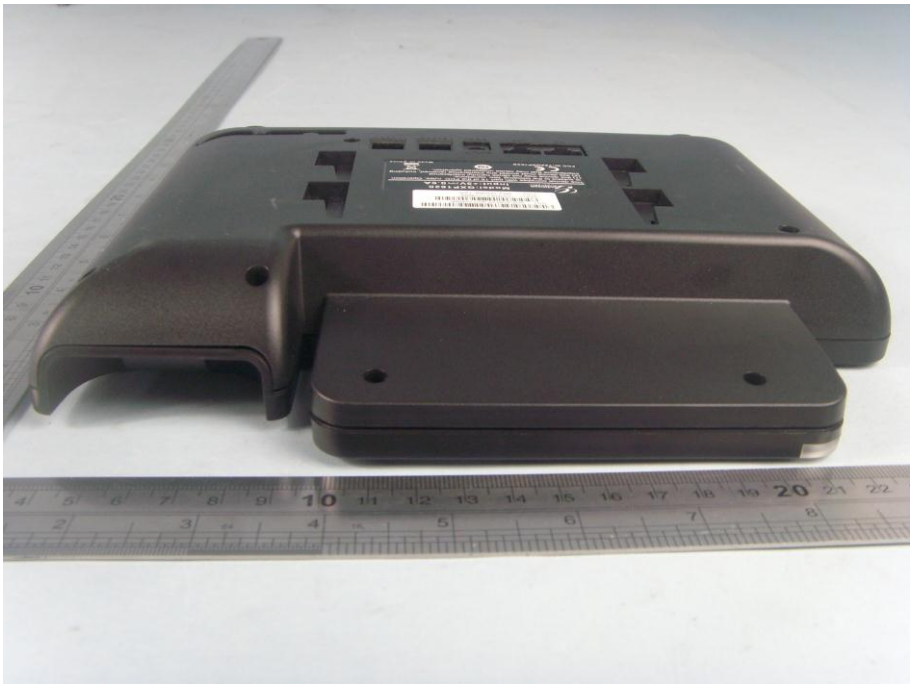
There were no modifications installed by ECMG Electronic Technical Testing Corp (Shenzhen).

EUT Sample Photos

EUT Model: GXP1628

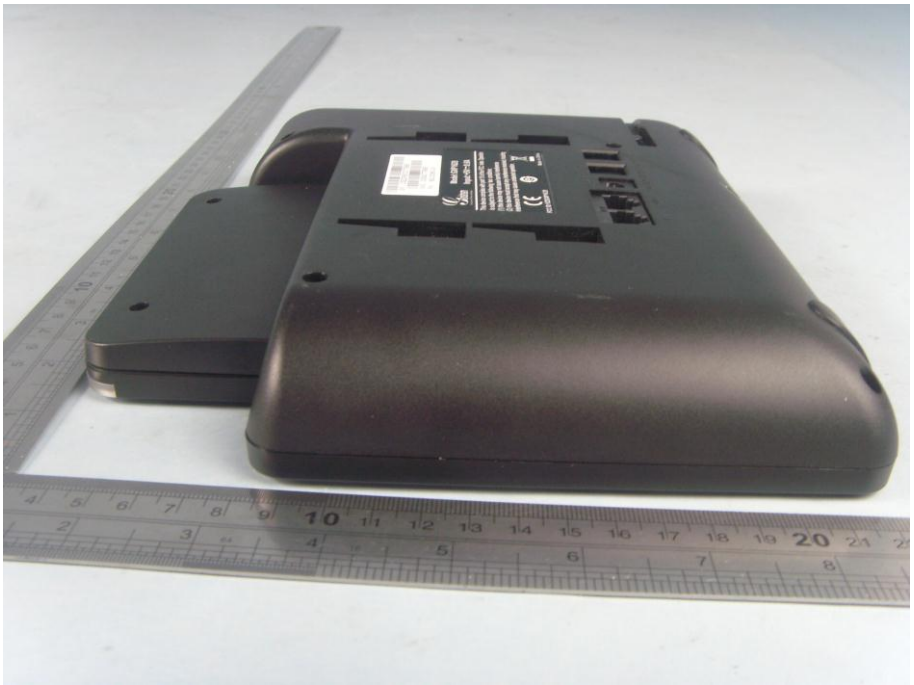
EUT- Front View

EUT- Rear View

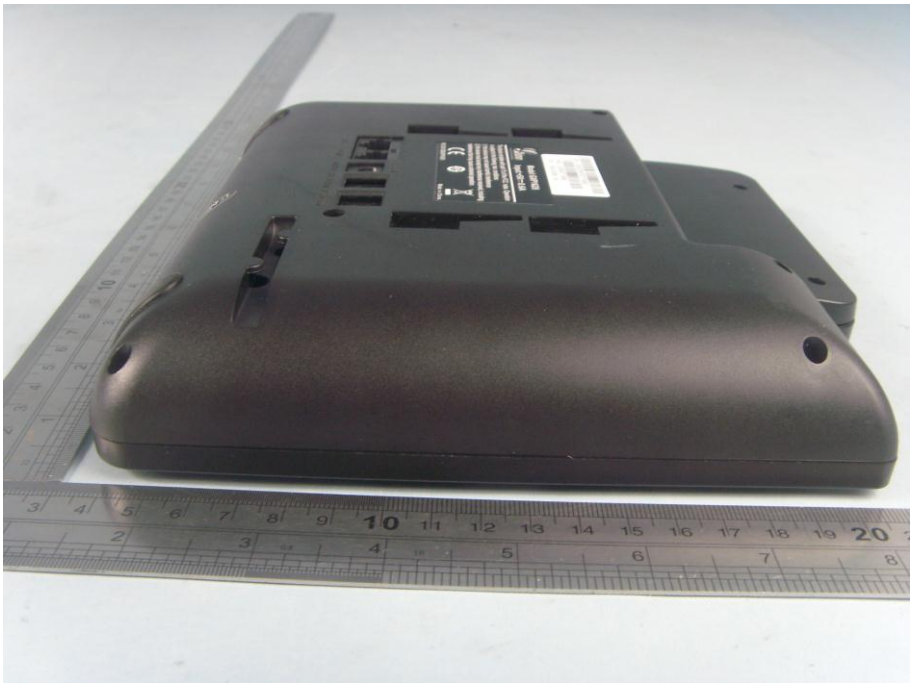


EUT- Top View

EUT- Bottom View



EUT- Left Side View



EUT- Sight Side View

Support View

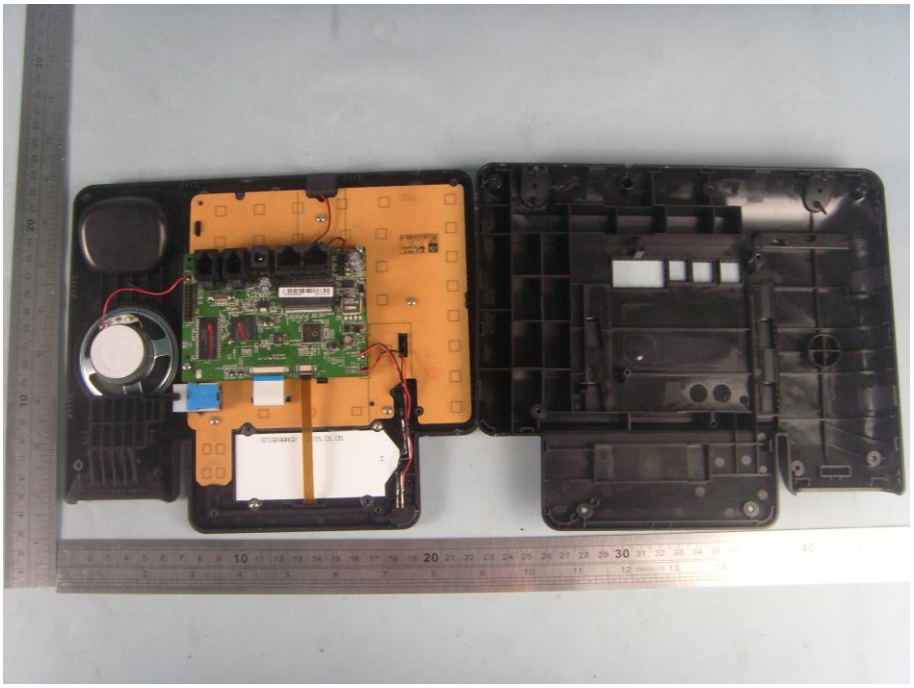
Handset View

Power Adapter #1 View(Manufacturer: Mass power)

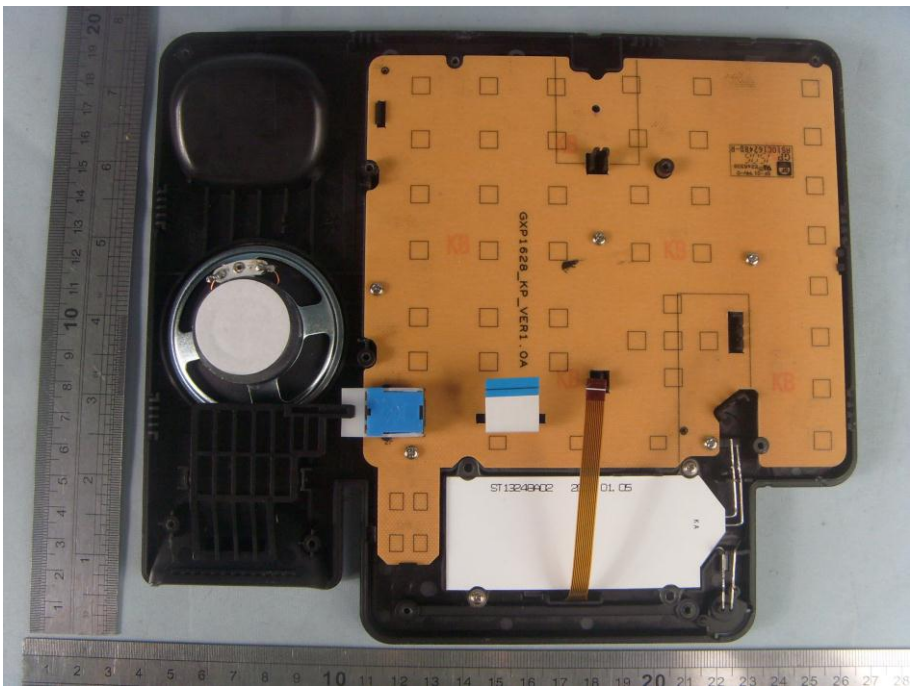
Power Adapter #2 View(Manufacturer: Mass Power)

Power Adapter #3 View(Manufacturer: AMIGO)

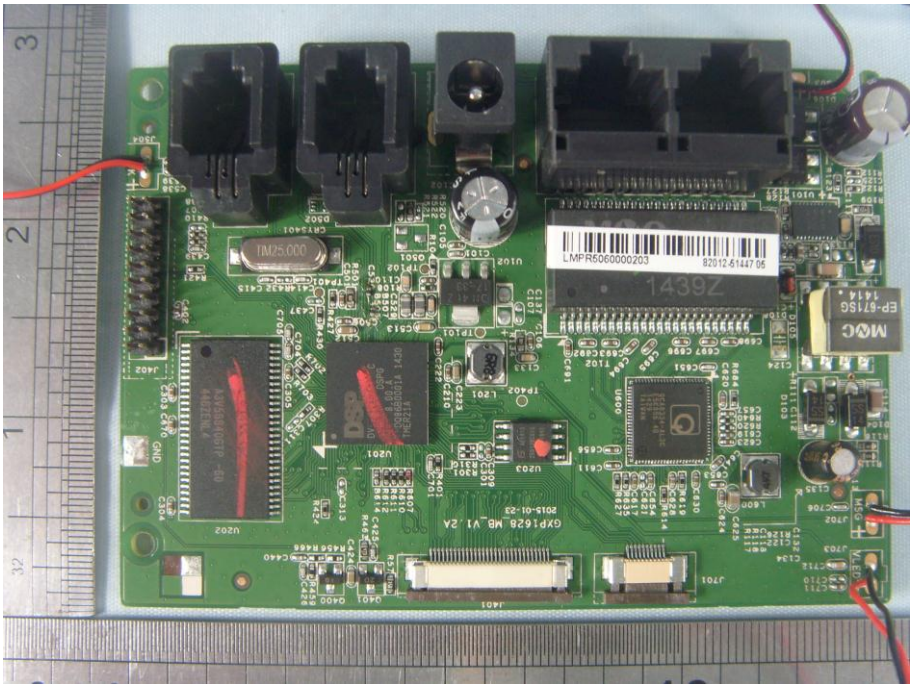
Power Adapter #4 View(Manufacturer: Sunlight)



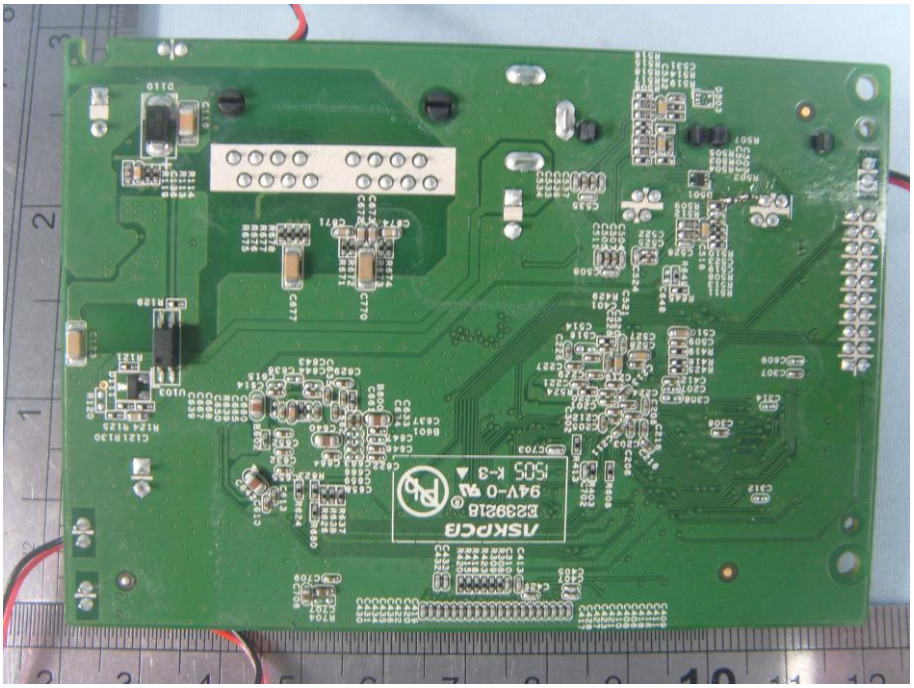
EUT-Uncovered View #1



EUT-Uncovered View #2



Mother board- Top View



Mother board- Bottom View

Test System Details

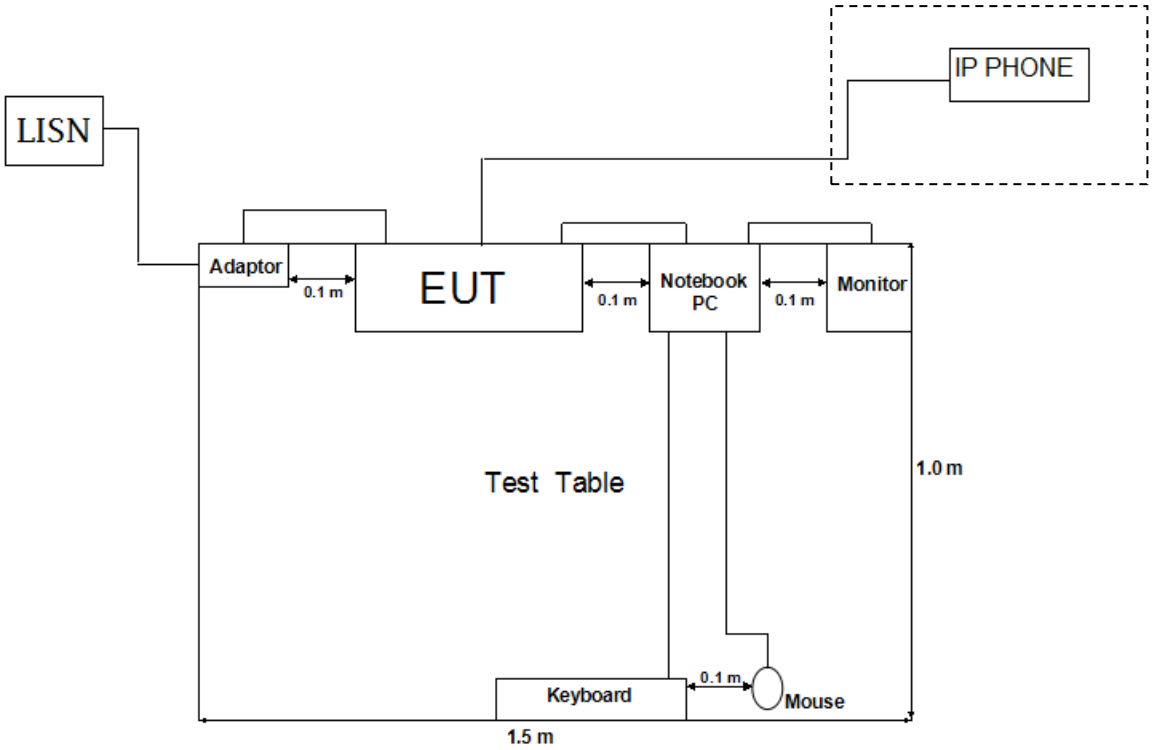
EUT	
Model Number:	GXP1628
Model Tested:	GXP1628
Description:	IP Phone
Input:	AC 120V/60Hz
Manufacturer:	Grandstream Networks, Inc.

Support Equipment				
Description	**Model Number**	**Serial Number**	**FCC Approval**	**Manufacturer**
Notebook COMPUTER	NV57H03c-2412G64Mnc2s	LXWZ4010011 25109 201601	Doc	Gateway
Mouse	MO32B0	23-033131	Doc	IBM
Keyboard	SK-1788	---	Doc	LENOVO
Monitor	TFT1780PS	---	Doc	AOC

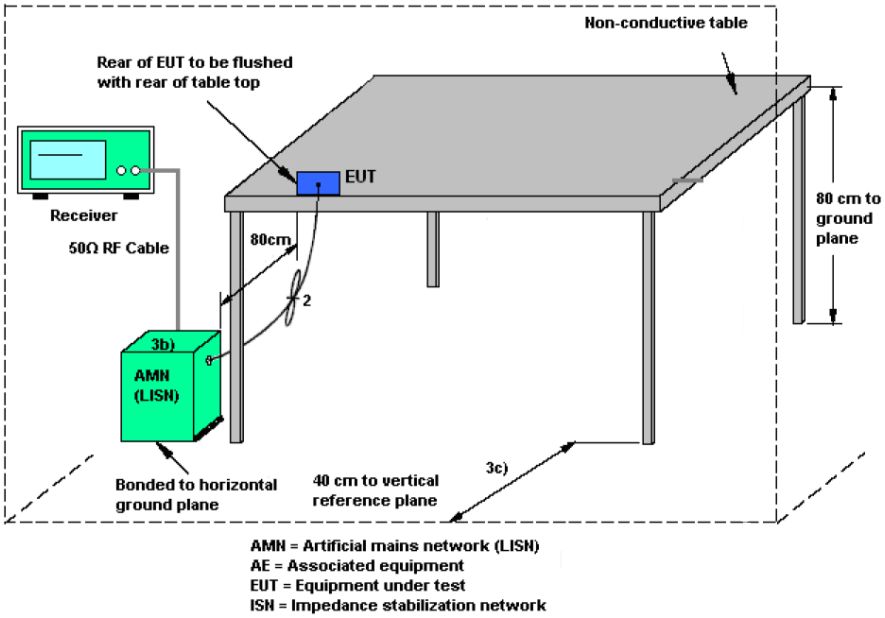
Cable Description					
Description	**From**	**To**	**Length (Meters)**	**Shielded (Y/N)**	**Ferrite (Y/N)**
Power Adapter Cord Of Notebook Computer	Power Adapter	Notebook COMPUTER	1.6	N	Y
	AC Plug	Power Adapter	1.2	N	Y
Mouse Cord	Mouse	Notebook COMPUTER	1.2	N	Y
Keyboard Cord	keyboard	Notebook COMPUTER	1.2	N	Y
RJ-45 Cord 1	EUT	Notebook COMPUTER	1.5	N	N
RJ-45 Cord 2	EUT	IP Phone	3.0	N	N
Power Adapter Cord Of EUT	EUT	Plug	1.8	N	N
Note: The "EUT" means "IP Phone".					

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.*

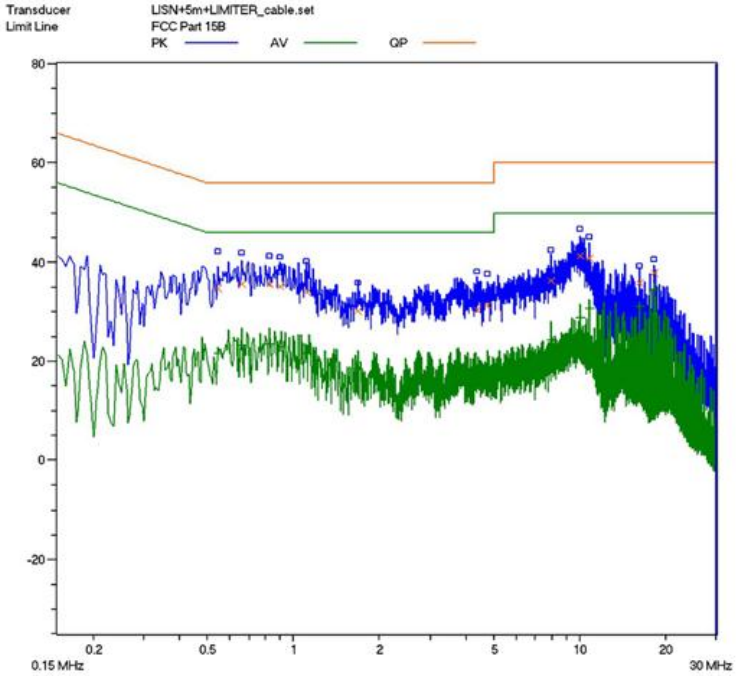
Configuration of Tested System



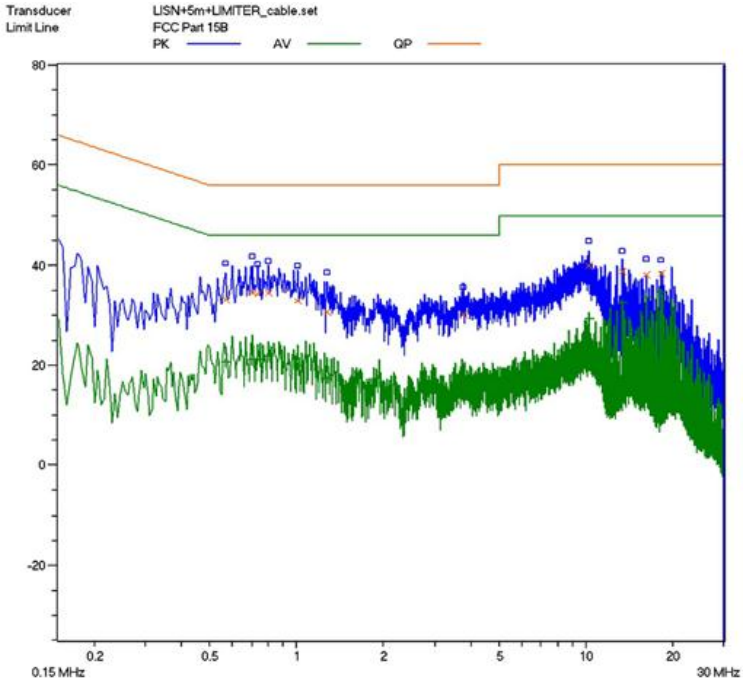
ATTACHMENT 1 - CONDUCTED EMISSION TEST RESULTS

CLIENT:	Grandstream Networks, Inc.	**TEST STANDERD:**	Section 15.107
MODEL NUMBERS:	GXP1628	**PRODUCT:**	IP Phone
MODEL TESTED:	GXP1628	**EUT DESIGNATION:**	Home or Office
TEMPERATURE:	22°C	**HUMIDITY:**	48%
ATM PRESSURE:	103kPa	**GROUNDING:**	None
TESTED BY:	Daomen	**DATE OF TEST:**	Feb. 12th, 2015
TEST REFERENCE:	ANSI C63.4- 2009		
TEST PROCEDURE:	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.		
TEST MODE:	Mode 1,Mode 2,Mode 3,Mode 4		
TEST SET UP:			
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. ± $2x10^{-7}$ x Center Freq., Amp ± 2.6 dB		

Mode 1:

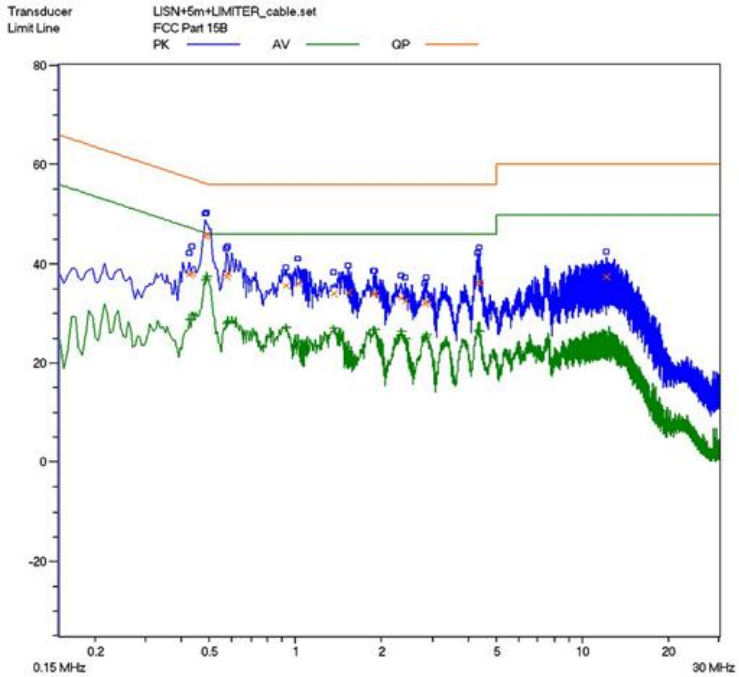


Line L Conducted Emission Graph

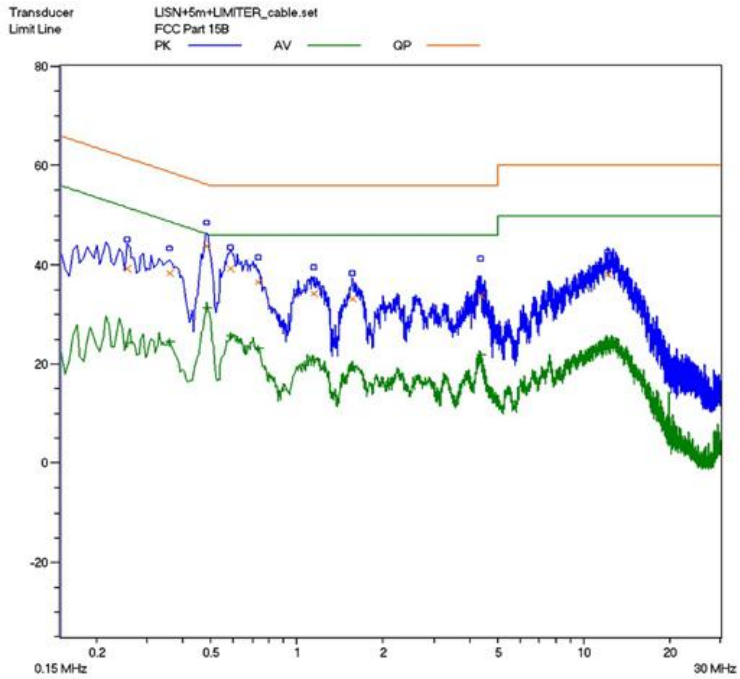


Line N Conducted Emission Graph

Mode 2:

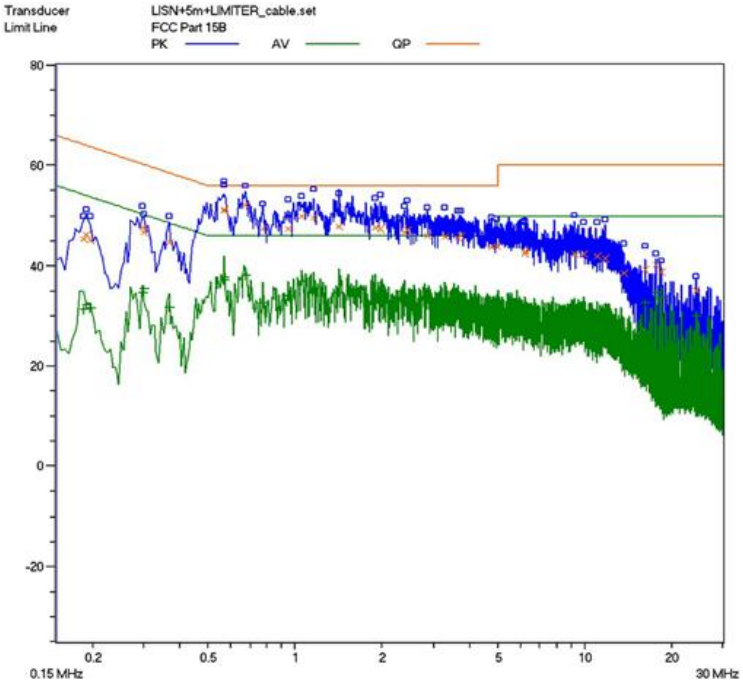


Line L Conducted Emission Graph

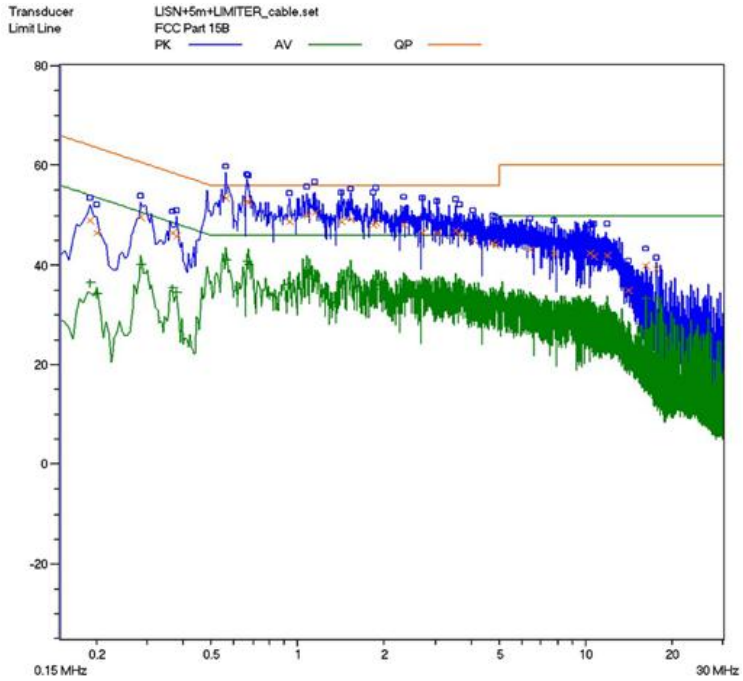


Line N Conducted Emission Graph

Mode 3:

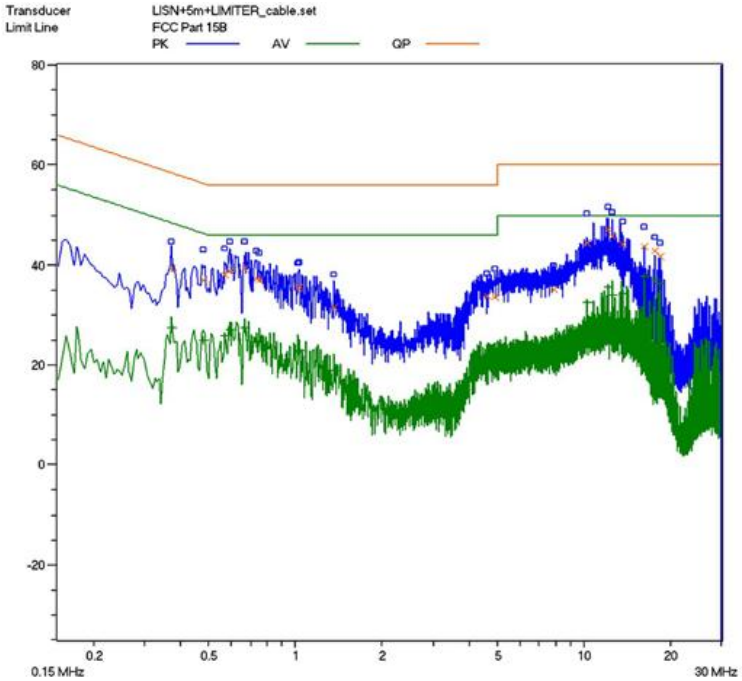


Line L Conducted Emission Graph

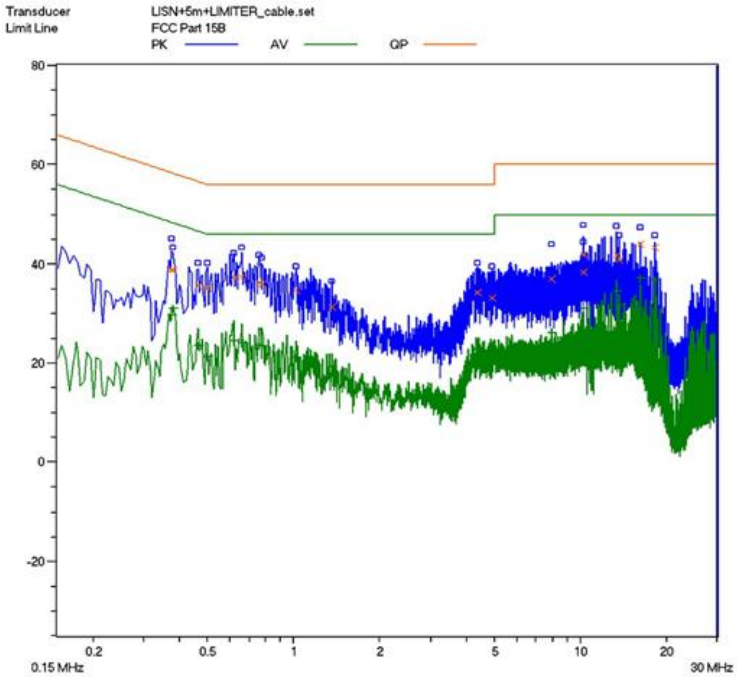


Line N Conducted Emission Graph

Mode 4:



Line L Conducted Emission Graph



Line N Conducted Emission Graph

Test Data:
Mode 1:

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)
L	0.6550	35.6	56.0	-20.4	0.6550	23.1	46.0	-22.9
L	4.7750	31.2	56.0	-24.8	4.7750	18.2	46.0	-27.8
L	7.9250	36.3	60.0	-23.7	7.9250	24.3	50.0	-25.7
N	1.2750	30.6	56.0	-25.4	1.2750	17.4	46.0	-28..6
N	3.7750	43.8	56.0	-12.2	3.7750	30.2	46.0	-15.8
N	10.2450	40.0	60.0	-20.0	10.2450	29.2	50.0	-20.8

Note :
1) All readings are using a bandwidth of 9 kHz, with a 500ms sweep time. A video filter was not use.
2) "QP" means "Quasi-Peak" values, "AV" means "Average" values.
3) The other reading are too low against official limits that are not be recorded.

Mode 2:

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)
L	0.490	46.2	56.2	-10.0	0.490	37.4	46.2	-8.8
L	4.675	43.7	56	-12.3	4.675	30.1	46	-15.9
L	4.730	43.4	56	-12.6	4.730	30.3	46	-15.7
N	0.185	45.8	64.3	-18.5	0.185	24.0	54.3	-30.3
N	0.485	43.8	56.3	-12.5	0.485	31.4	46.3	-14.9
N	0.585	39.2	56	-16.8	0.585	25.7	46	-20.3

Note :
1) All readings are using a bandwidth of 9 kHz, with a 500ms sweep time. A video filter was not use.
2) "QP" means "Quasi-Peak" values, "AV" means "Average" values.
3) The other reading are too low against official limits that are not be recorded.

Mode 3:

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)
L	0.5700	51.1	56.0	-4.9	0.5700	38.1	46.0	-7.9
L	0.5650	51.3	56.0	-4.7	0.5650	37.2	46.0	-8.8
L	0.6750	52.1	56.0	-3.9	0.6750	38.1	46.0	-7.9
N	0.5600	53.5	56.0	-2.5	0.5600	41.1	46.0	-4.9
N	0.6650	52.9	56.0	-3.1	0.6650	40.8	46.0	-5.2
N	0.6700	52.6	56.0	-3.4	0.6700	40.2	46.0	-5.8

Note :
1) *All readings are using a bandwidth of 9 kHz, with a 500ms sweep time. A video filter was not use.*
2) *"QP" means "Quasi-Peak" values, "AV" means "Average" values.*
3) *The other reading are too low against official limits that are not recorded.*

Mode 4:

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)
L	0.6650	39.4	56.0	-16.6	0.6650	27.5	46	-18.5
L	12.2000	47.3	60	-12.7	12.2000	35.6	50	-14.4
L	12.5050	45.9	60	-14.1	12.5050	34.1	50	-15.9
N	0.3800	38.8	58.3	-19.5	0.3800	31.2	48.3	-17.1
N	16.2300	44.1	60	-15.9	16.2300	37.1	46.0	-8.9
N	18.2450	43.4	60	-16.6	18.2450	36.8	46.0	-9.2

Note :
1) *All readings are using a bandwidth of 9 kHz, with a 500ms sweep time. A video filter was not use.*
2) *"QP" means "Quasi-Peak" values, "AV" means "Average" values.*
3) *The other reading are too low against official limits that are not recorded.*

Test Equipment List:

Test Equipment	*Model No.*	*Manufacturer*	*Serial No.*	*Last Cal.*	*Cal. Interval*
EMI Test Receiver	*SMR4503*	*SCHAFFNER*	*11725*	*2014.07.08*	*2015.07.08*
Line impedance stabilization network	*ESH2-Z5*	*R&S*	*/*	*2014.03.14*	*2015.03.13*
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***

Conducted Emission Test Set-up –Front view

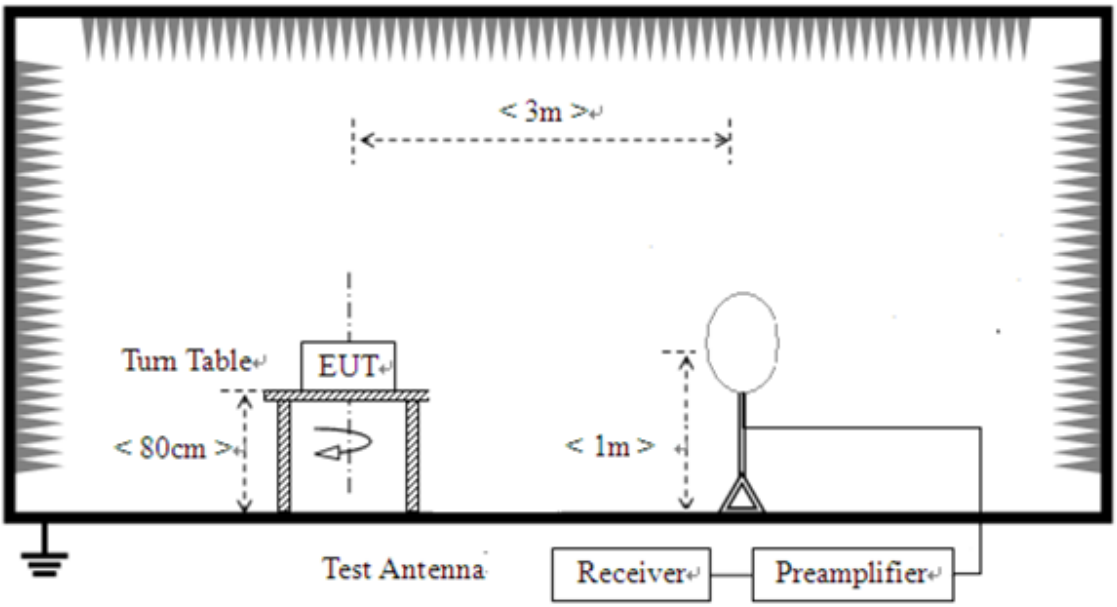
Conducted Emission Test Set-up –Rear view

ATTACHMENT 2 – RADIATED EMISSION MEASUREMENT

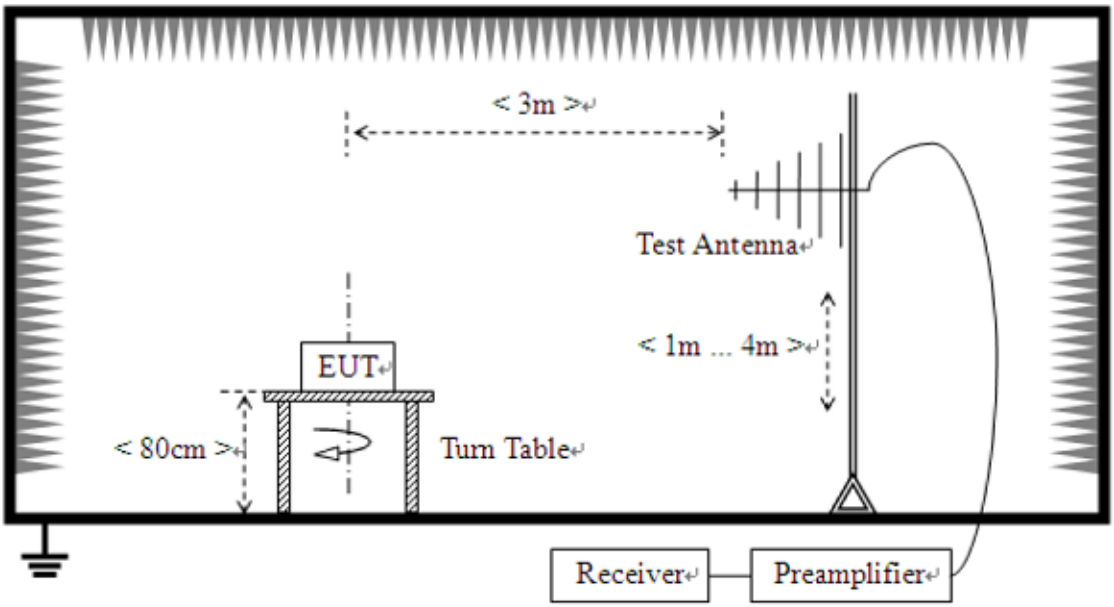
CLIENT:	Grandstream Networks, Inc.	**TEST STANDERD:**	Section 15.109
MODEL NUMBERS:	GXP1628	**PRODUCT:**	IP Phone
EUT MODEL:	GXP1628	**EUT DESIGNATION:**	Home or Office
TEMPERATURE:	22°C	**HUMIDITY:**	47%RH
ATM PRESSURE:	103.0kPa	**GROUNDING:**	None
TESTED BY:	Daomen	**DATE OF TEST:**	Feb. 12th , 2015
TEST REFERENCE:	ANSI C63.4: 2009		
TEST PROCEDURE:	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 2GHz at an anechoic chamber. 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: FS= RA + AF + CF - AG Where: FS = Field Strength RA = Receiver Amplitude AF = Antenna Factor CF = Cable Attenuation Factor AG = Amplifier Gain		
TEST MODE:	Mode 1,Mode 2,Mode 3,Mode 4,Mode 5		
TESTED RANGE:	9KHz to 30MHz and 30 to 2000MHz		
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. ± $2x10^{-7}$ x Center Freq., Amp ± 3.6 dB		

Continue on to next page...

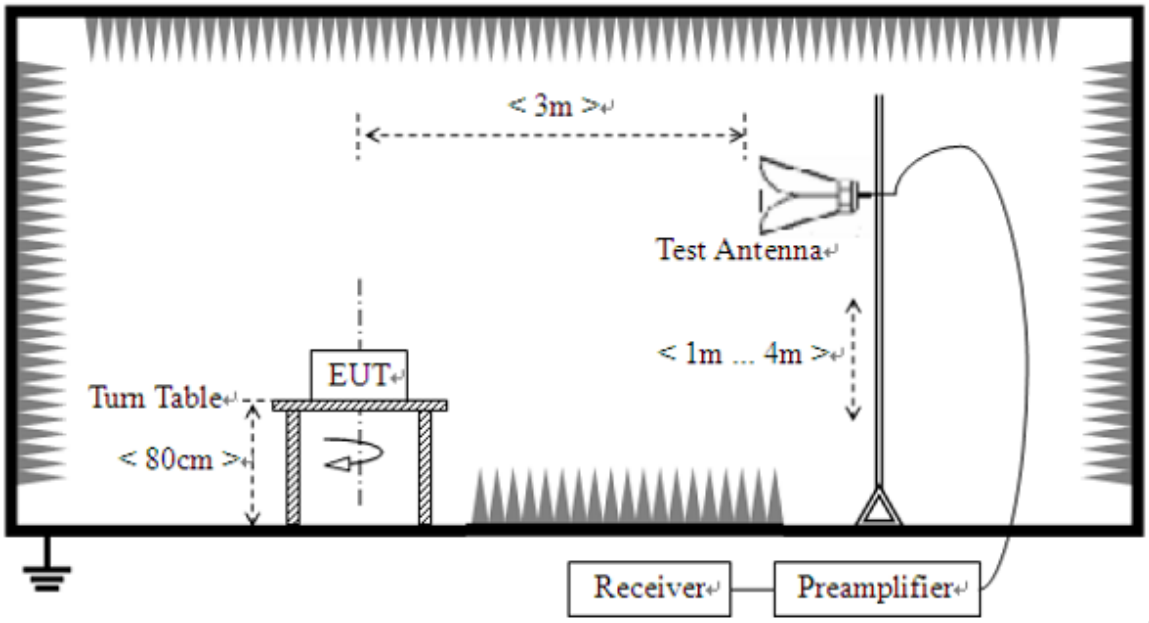
Frequency measured at 9KHz to 30MHz:



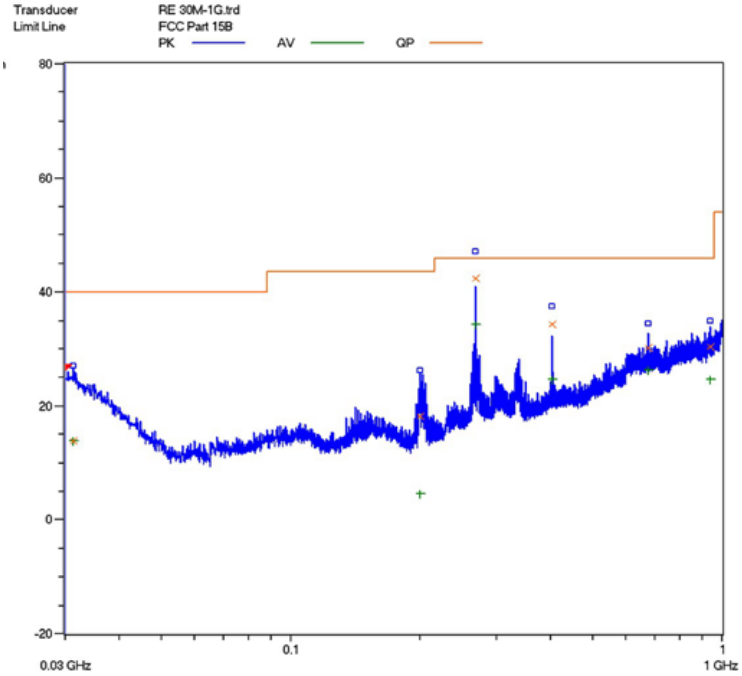
Frequency measured at 30MHz to 1000MHz:



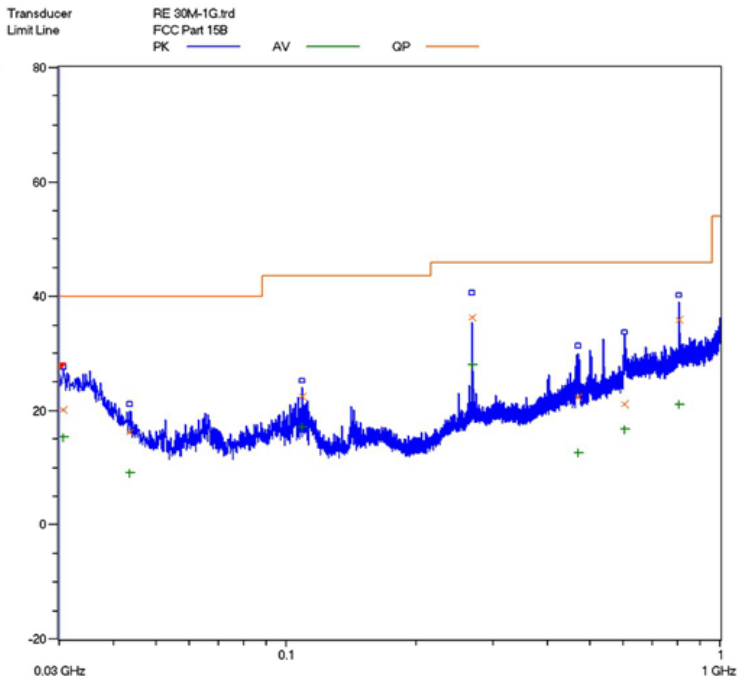
Frequency measured at Above 1GHz:



Mode 1:

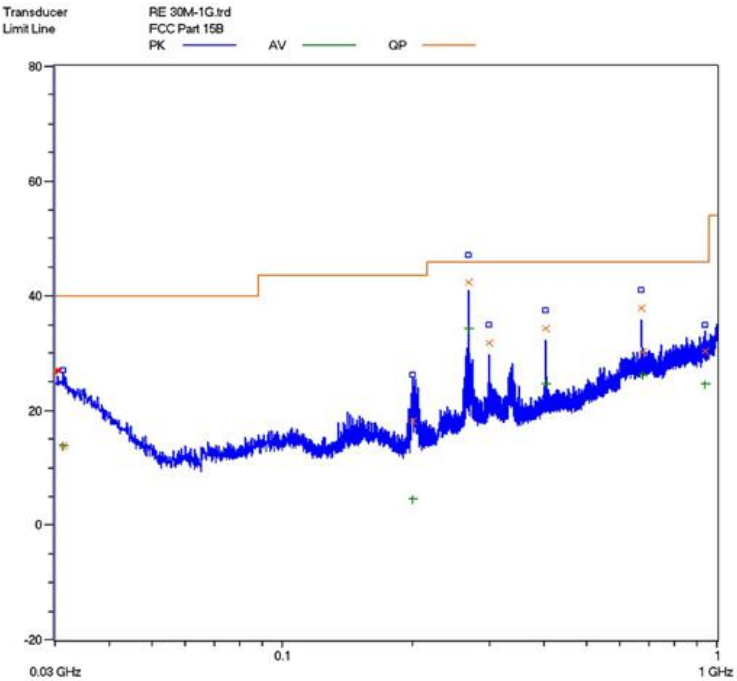


Horizontal: Radiated Emission Test Plot -(30-1000MHz)

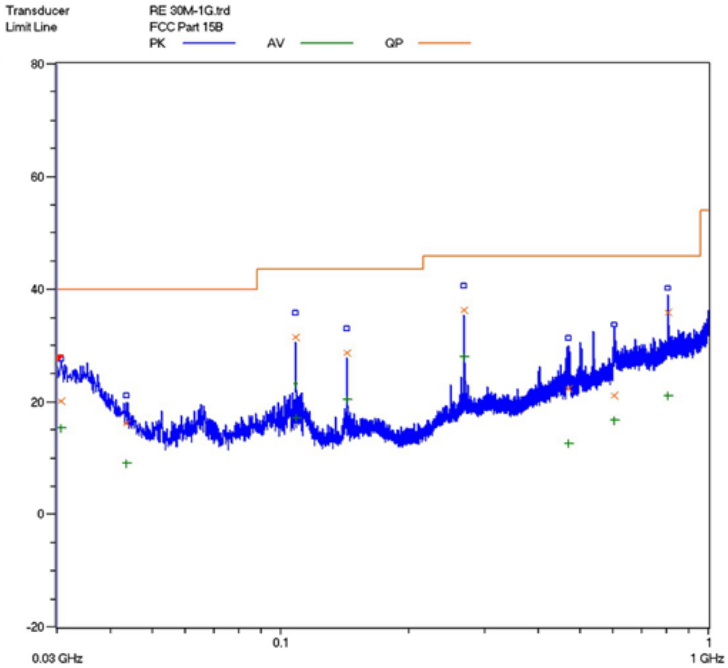


Vertical: Radiated Emission Test Plot (30-1000MHz)

Mode 2:

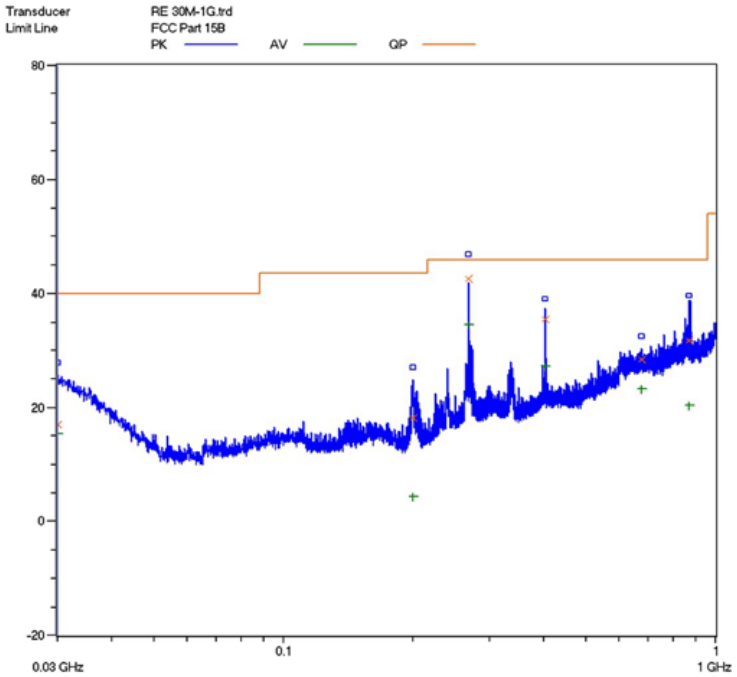


Horizontal: Radiated Emission Test Plot -(30-1000MHz)

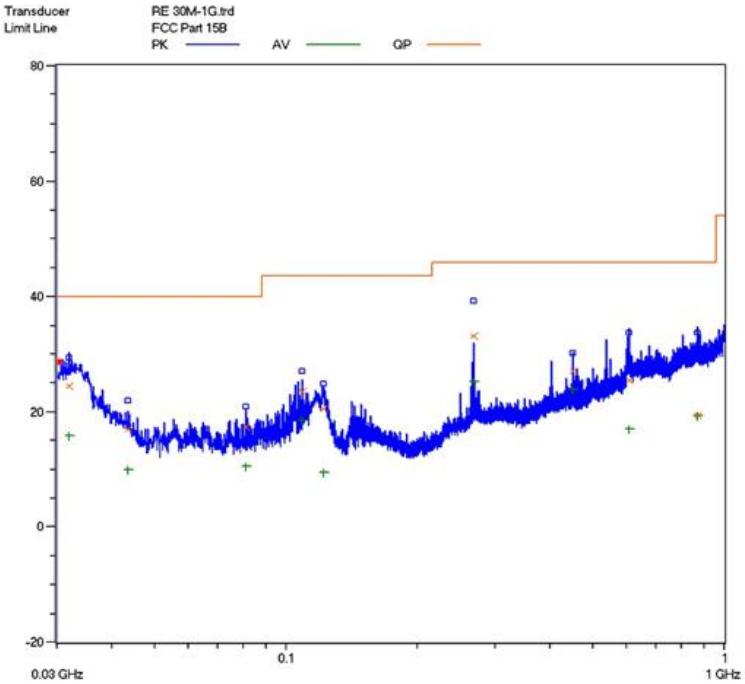


Vertical: Radiated Emission Test Plot (30-1000MHz)

Mode 3:

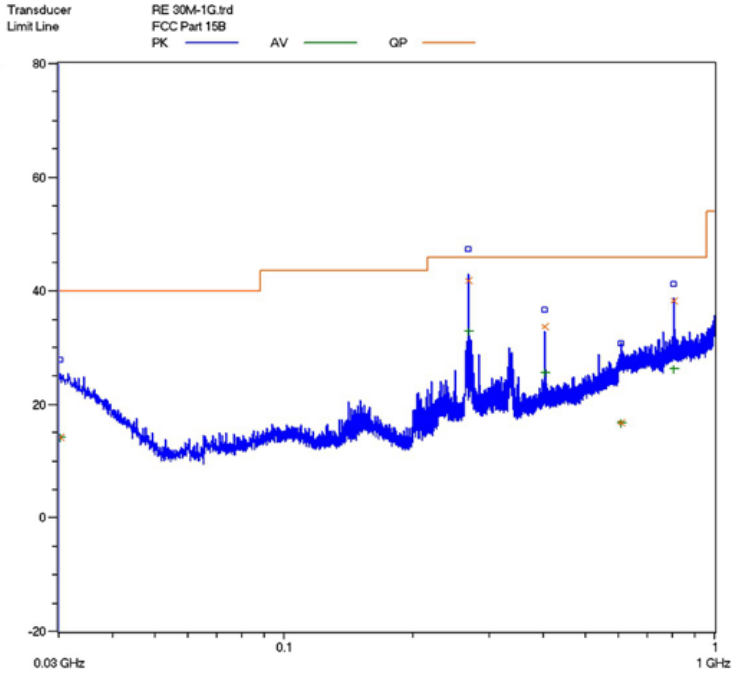


Horizontal: Radiated Emission Test Plot -(30-1000MHz)

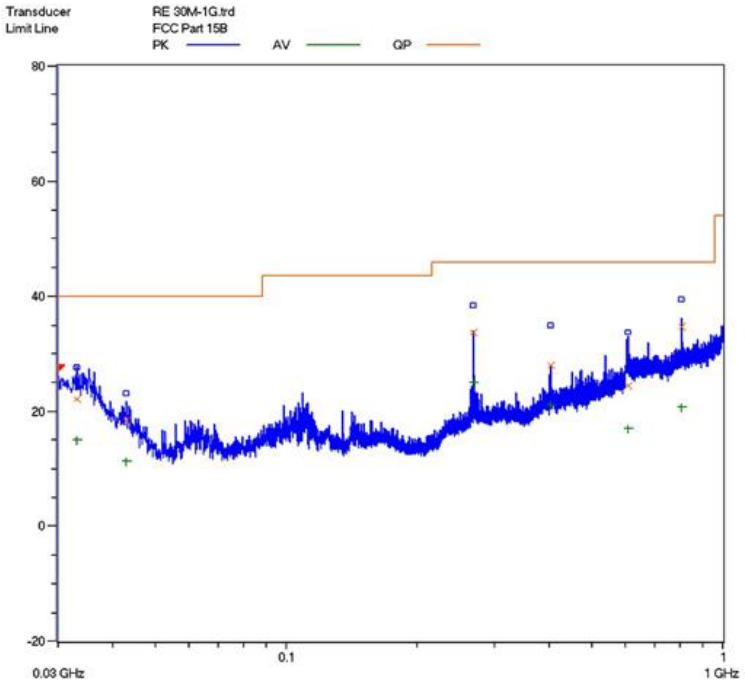


Vertical: Radiated Emission Test Plot (30-1000MHz)

Mode 4:

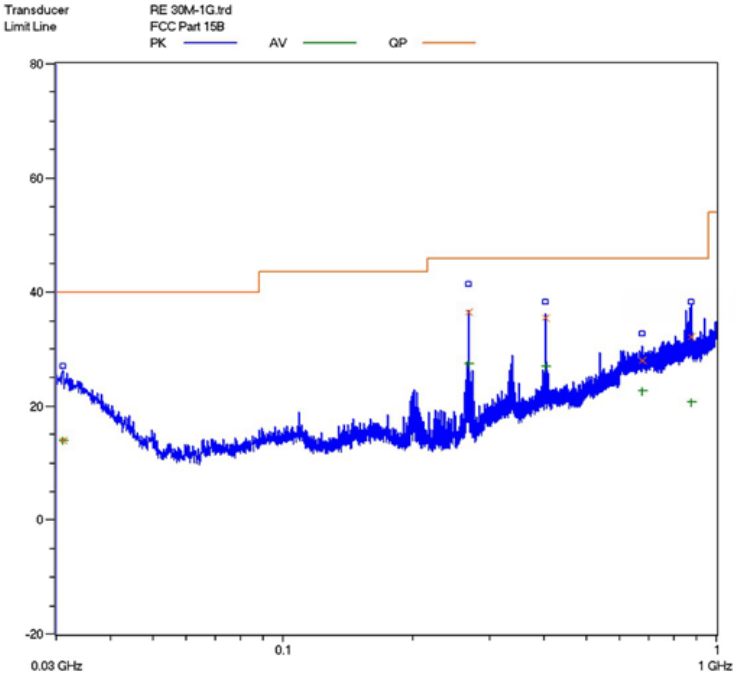


Horizontal: Radiated Emission Test Plot -(30-1000MHz)

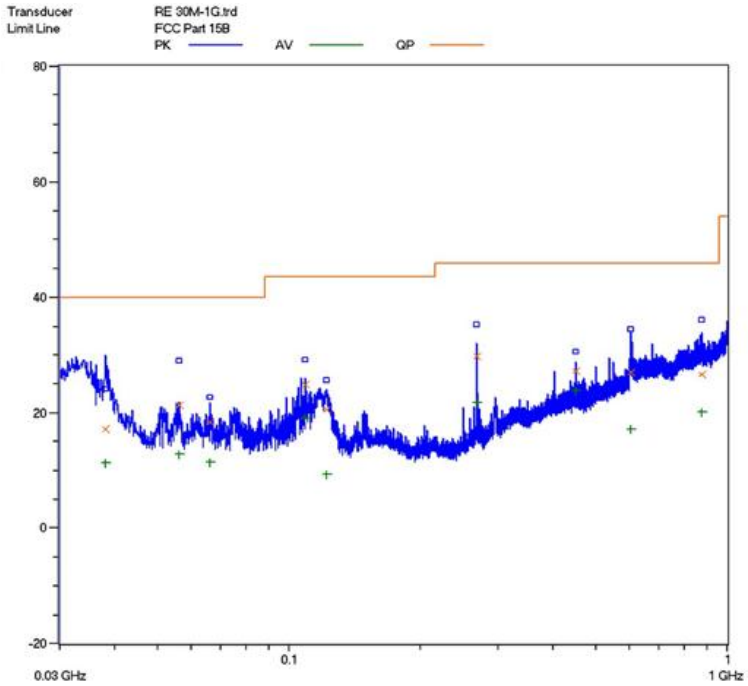


Vertical: Radiated Emission Test Plot (30-1000MHz)

Mode 5:



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



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

Test Data:

Pre-scan has been conducted to determine the worst-case from all possible combinations between available operation mode. The worst-case is mode 1 was selected for the final testing.

Mode 1:

Test No.#:	Frequency (MHz)	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 +Factor.*
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:
Mode 1&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)
Horizontal							
268.7200	0.13	13.4	/	28.97	42.5	46	-3.5
403.1200	0.16	14.7	/	19.34	34.2	46	-11.8
671.8400	0.36	20.1	/	9.74	30.2	46	-15.8
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
Vertical							
108.8000	0.02	7.4	/	14.98	22.4	43.5	-21.1
268.7200	0.13	13.4	/	12.87	36.4	46	-9.6
471.6800	0.2	17.2	/	5.0	22.4	46	-23.6
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/

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.*

Mode 2&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)
Horizontal							
268.7200	0.13	13.4	/	29.97	43.5	46	-2.5
403.1200	0.16	14.7	/	24.34	39.2	46	-6.8
671.8400	0.36	20.1	/	14.74	35.2	46	-10.8
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
Vertical							
108.8000	0.02	7.4	/	19.98	27.4	43.5	-16.1
268.7200	0.13	13.4	/	16.87	40.4	46	-5.6
471.6800	0.2	17.2	/	5.0	32.4	46	-13.6
108.8000	0.02	7.4	/	14.98	22.4	43.5	-21.1
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/

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.*

Mode 3&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)
Horizontal							
268.7200	0.13	13.4	/	18.97	42.6	46	-3.4
403.1200	0.15	14.7	/	20.75	35.6	46	-10.4
671.9200	0.36	20.1	/	8.04	28.5	46	-17.5
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
Vertical							
268.7200	0.13	13.4	/	19.57	33.1	46	-12.9
450.0000	0.16	16.8	/	10.14	27.1	46	-18.9
606.5600	0.3	19.5	/	5.7	25.5	46	-20.5
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/

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.*

Mode 4&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)
Horizontal							
268.7200	0.13	13.4	/	28.27	41.8	46	-4.2
403.1200	0.16	14.7	/	18.84	33.7	46	-12.3
806.2400	0.42	22.1	/	15.78	38.3	46	-7.7
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
Vertical							
403.1200	0.16	14.7	/	13.04	27.9	46	-18.1
607.2800	0.36	19.5	/	4.64	24.5	46	-21.5
806.2400	0.42	22.1	/	12.28	34.8	46	-11.2
403.1200	0.16	14.7	/	13.04	27.9	46	-18.1
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/

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.*

Mode 5&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)
Horizontal							
403.1200	0.16	14.7	/	20.64	35.5	46	-10.5
268.7200	0.13	13.4	/	22.87	36.4	46	-9.6
873.1200	0.42	22.4	/	9.28	32.1	46	-13.9
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
Vertical							
268.7200	0.13	13.4	/	22.87	36.4	46	-9.6
602.0800	0.3	19.1	/	7.7	27.1	46	-18.9
872.7200	0.42	22.4	/	3.78	26.6	46	-19.4
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/

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.*

The mode 1 was selected for the final testing for Above 1GHz measurement.

Mode 1&Above 1GHz:

Frequency (GHz)	Cable Loss (dB)	Antenna Factor (dB)	Preamp Factor (dB)	Reading Level (dBuV/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization (H/V)
Peak Measurement								
2.680	3.59	31.5	33.0	39.62	41.71	74	-32.29	H
3.250	3.89	32.5	32.1	40.12	44.41	74	-29.59	H
4.270	4.30	33.5	32.0	40.35	46.15	74	-27.85	H
2.680	3.59	31.5	33.0	39.07	41.16	74	-32.84	V
3.250	3.89	32.5	32.1	36.61	40.90	74	-33.10	V
4.270	4.30	33.5	32.0	40.35	46.15	74	-27.85	V
Average Measurement								
2.680	3.59	31.5	33.0	26.65	28.74	54	-25.26	H
3.250	3.89	32.5	32.1	27.81	32.10	54	-21.90	H
4.270	4.30	33.5	32.0	24.21	30.01	54	-23.99	H
2.680	3.59	31.5	33.0	29.57	31.66	54	-22.34	V
3.250	3.89	32.5	32.1	32.32	32.72	54	-21.28	V
4.270	4.30	33.5	32.0	24.30	30.10	54	-23.90	V

Note:

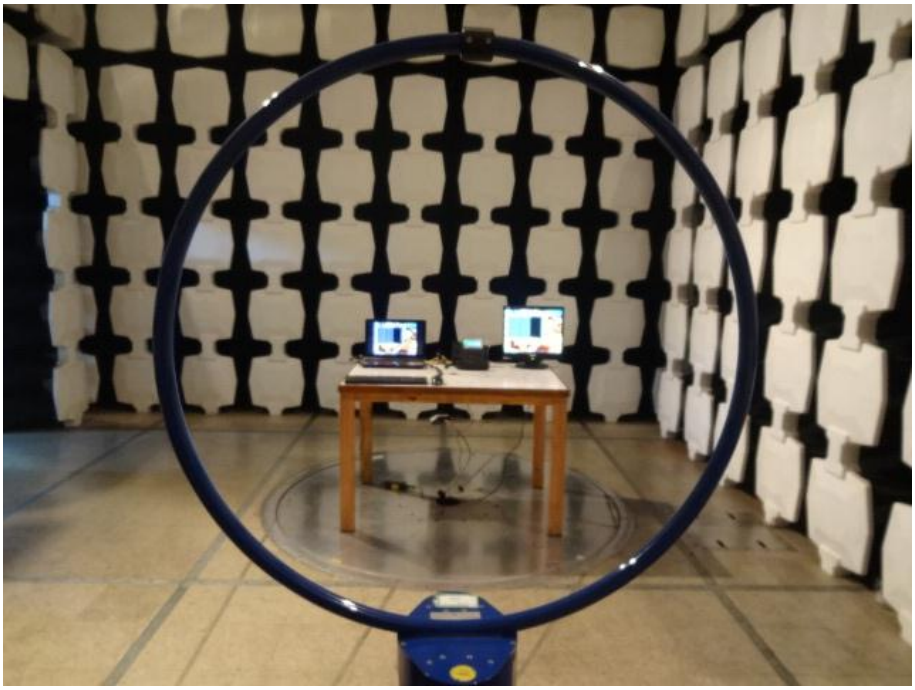
1. *The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: Emission Level =Reading Level + Antenna Factor + Cable Loss –Preamplifier Factor.*
2. *The limits shown are based on Peak value and Average value 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:

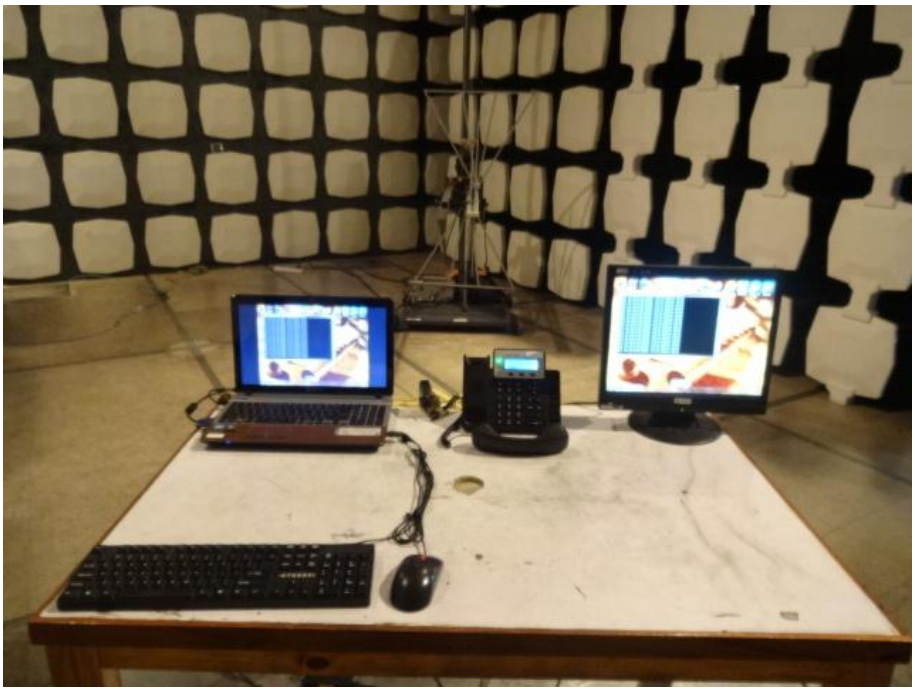
Test Equipment	Model No.	Manufacturer	Serial No.	Last Cal.	Cal. Due
EMI Test Receiver	SMR4503	SCHAFFNER	11725	2014.07.08	2015.07.07
Double-ridged Wave guide horn	3115	ETS	6587	2014.08.02	2015.08.01
Microwave system amplifier	83017A	Agilent	MY39500438	2014.07.11	2015.07.10
Biconilog Antenna	3142C	ETS	00042672	2014.09.28	2015.09.27
Band-pass Filter	BRM50702	Micro-Tronic	S/N-030	2014.11.30	2015.11.29
Spectrum Analyzer	FSP30	R&S	100755	2014.11.30	2015.11.29
HF Loop Antenna	HLA6120	TESEQ	26348	2014-10-11	2015-10-12
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.					

TESTED BY: _____ **GALANZ**
ENGINEER **COMPANY NAME**

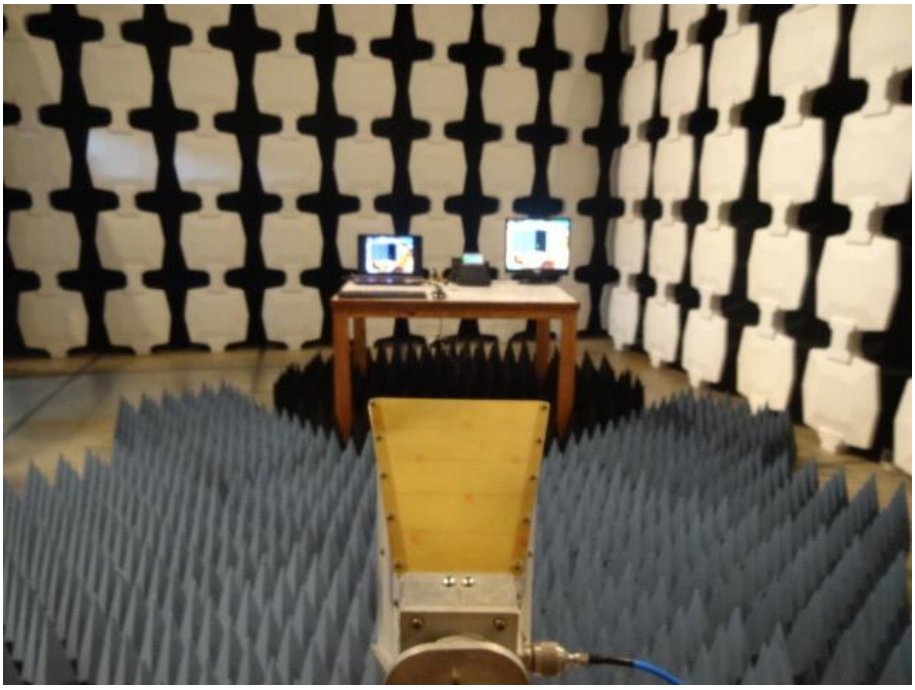
REVIEWED BY: _____ **ECMG**
SENIOR ENGINEER **COMPANY NAME**



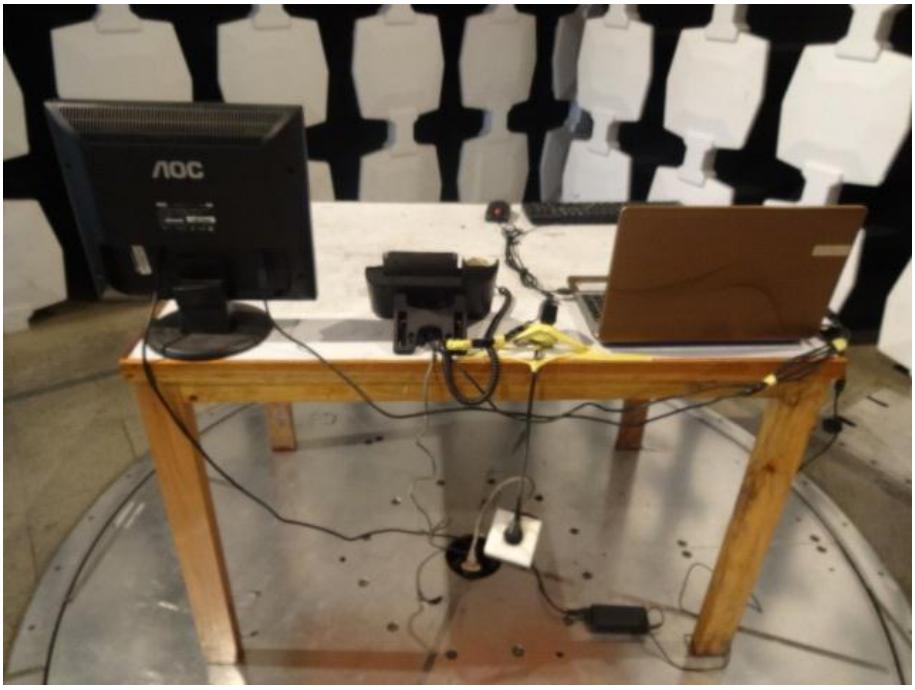
Radiated Emission Test Set-up(9KHz-30MHz)



Radiated Emission Test Set-up(30-1000MHz)



Radiated Emission Test Set-up(Above 1GHz)



Radiated Emission Test Set-up (Rear View)

※※※ End Of Report ※※※