

## EMI TEST REPORT

On Model Name: Analog Telephone Adapter

Model Number: HT702 V2.0

Brand Name: Grandstream

Prepared for Grandstream Networks, INC

FCC ID Number: YZZHT70X

According to FCC 47 CFR Part 15, Subpart B

Test Report #: SHE-1308-11047-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 September 6<sup>th</sup>, 2013  
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>YZZHT70X _Test report.pdf</i>
<i>Operation Description</i>	<i>Technical Description</i>	<i>YZZHT70X_operation description.pdf</i>
<i>External Photos</i>	<i>External Photos</i>	<i>YZZHT70X_External Photos</i>
<i>Internal Photos</i>	<i>Internal Photos</i>	<i>YZZHT70X_Internal Photos</i>
<i>Block Diagram</i>	<i>Block Diagram</i>	<i>YZZHT70X_Block Diagram.pdf</i>
<i>Schematics</i>	<i>Circuit Diagram</i>	<i>YZZHT70X _Schematics.pdf</i>
<i>ID Label/Location</i>	<i>Label and Location</i>	<i>YZZHT70X _Label &amp; Location.pdf</i>
<i>User Manual</i>	<i>User Manual</i>	<i>YZZHT70X _User Manual.pdf</i>
<i>Test set-up photos</i>	<i>Test set-up photos</i>	<i>YZZHT70X _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**

*Test Sample* : *Analog Telephone Adapter*

*Model Numbers* : *HT702 V2.0*

*Model Tested* : *HT702 V2.0*

*Receipt Date* : *August 28<sup>th</sup>, 2013*

*Date Tested* : *Sep. 4<sup>th</sup>, 2013*

*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 HT702 V2.0 (referred to as the EUT in this report) is an Analog Telephone Adapter. Technical specifications of the EUT are as follows:

Parameter		Range
Basic parameters	Rated voltage	12VDC
	Rated Current	0.5A
I/O Ports	Power Cable	Power adapter connection
	INTERNET Port (RJ-45)	Connect to the internal LAN network, pc or router.
	RESET	Factory Reset button. Press for 7 seconds to reset factory default settings.
	PHONE1 (RJ-11)	FXS port to be connected to analog phones / fax machines.
	PHONE2 (RJ-11)	FXS port to be connected to analog phones / fax machines.
Power Adapter #1 (Mass power)	Input	100-240VAC 50/60Hz 0.18A
	Output	12VDC,0.5A
	Model	SDF1200050A1BB
	Brand name	Mass power
Power Adapter #2 (UE power)	Input	100-240VAC 50/60Hz 0.2A
	Output	12VDC,0.5A
	Model	UE06L8-120050SPAU
	Brand name	UE power
Power Adapter #3(Mass power)	Input	100-240VAC 50/60Hz 0.15A
	Output	12VDC,0.5A,
	Model	WCF1200050A1BA
	Brand name	Mass power

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

**Note:** This is an updating report based on the original report # :SHE-1112-10757-FCC. For more details please refer to "Request for Class II Permissive Change letter" provided by manufacturer.

## **Test Summary**

*The Electromagnetic Compatibility requirements on model HT702 V2.0 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 -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.*

#### ***Connected to PC mode:***

*Connected an notebook PC to INTERNET port of the EUT by an RJ-45 signal line and ping "192.168.0.162 -t" to EUT, then connected two phones to PHONE1 and PHONE2 port of the EUT and established a call link between them 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 HT702 V2.0***



***EUT- Front&Top View***



***EUT- Rear View***

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Prepared for Grandstream Networks, INC

Prepared by ECMG Electronic Technical Testing Corp (Shenzhen)

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***I/O Ports view***



***EUT-Uncovered View***



**Main board- Top View**



**Main board- Bottom View**



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



***Power Adaptor #2 View (Manufacturer: UE power)***





***Power Adaptor #3 View (Manufacturer: Mass Power)***

## Test System Details

EUT			
<b>Model Number:</b>	HT702 V2.0		
<b>Model Tested:</b>	HT702 V2.0		
<b>Description:</b>	Analog Telephone Adapter		
<b>Input:</b>	AC 120V/60Hz		
<b>Manufacturer:</b>	Grandstream Networks, INC		
Support Equipment			
Description	Model Number	Serial Number	Manufacturer
Notebook PC	ThinkPad x121e	---	Lenovo
Adapter Of Notebook PC	ThinkPad 57Y4614	---	Lenovo
Mouse	MO32B0	23-033131	IBM
Keyboard	SK-1788	---	Lenovo
Monitor	TFT1780PS	B8879HA021638	AOC
Analog Phones(2pcs)	2957E	---	Daerxun Technology Co., Ltd

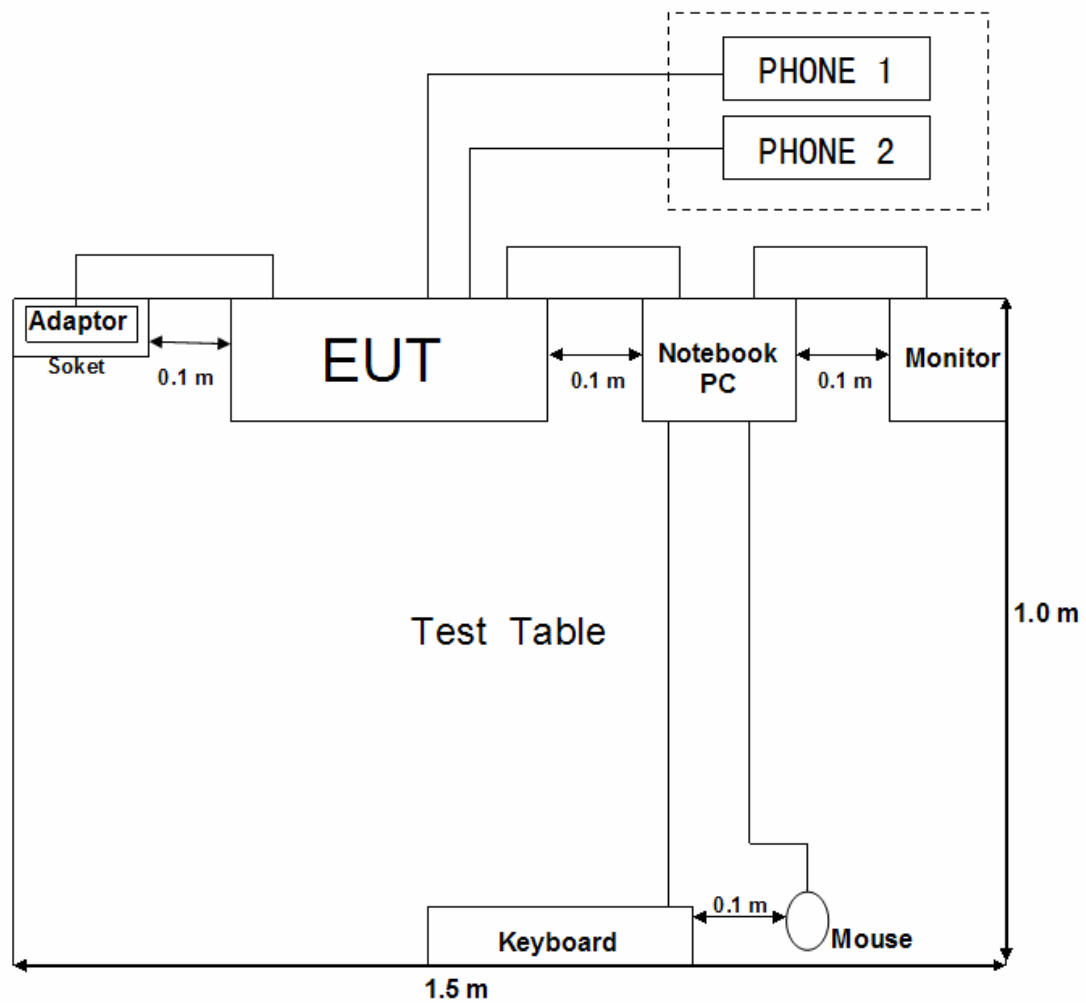
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<b>Cable Description</b>					
<b>Description</b>	<b>From</b>	<b>To</b>	<b>Length (Meters)</b>	<b>Shielded (Y/N)</b>	<b>Ferrite (Y/N)</b>
<i>Power Cord Of Notebook PC</i>	<i>Adapter</i>	<i>Notebook PC</i>	<i>1.6</i>	<i>N</i>	<i>Y</i>
	<i>Adapter</i>	<i>Plug</i>	<i>1.2</i>	<i>N</i>	<i>Y</i>
<i>AC power cord of monitor</i>	<i>Monitor</i>	<i>Plug</i>	<i>1.2</i>	<i>N</i>	<i>Y</i>
<i>Mouse cord</i>	<i>Mouse</i>	<i>Plug</i>	<i>1.2</i>	<i>N</i>	<i>Y</i>
<i>Keyboard cord</i>	<i>Keyboard</i>	<i>Plug</i>	<i>1.2</i>	<i>N</i>	<i>Y</i>
<i>VGA Cord</i>	<i>Monitor</i>	<i>PC</i>	<i>1.2</i>	<i>Y</i>	<i>Y</i>
<i>RJ-45 Cord</i>	<i>EUT</i>	<i>Notebook PC</i>	<i>1.5</i>	<i>N</i>	<i>N</i>
<i>Power cord of Adapter #1 (Mass power)</i>	<i>EUT</i>	<i>Plug</i>	<i>1.8</i>	<i>N</i>	<i>N</i>
<i>Power cord of Adapter #2 (UE power)</i>	<i>EUT</i>	<i>Plug</i>	<i>1.8</i>	<i>N</i>	<i>N</i>
<i>Power cord of Adapter #3 (UE power)</i>	<i>EUT</i>	<i>Plug</i>	<i>1.8</i>	<i>N</i>	<i>N</i>
<i>Note: The "EUT" means "Analog Telephone Adapter".</i>					

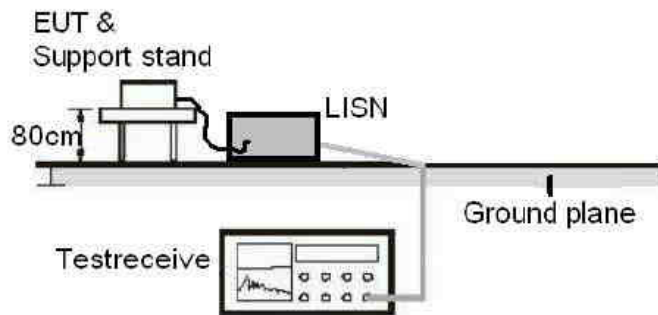
**NOTE:** The EUT has been tested as an independent unit together with other necessary accessories or support units. The above support units or accessories were used to form a representative test configuration during the test tests.



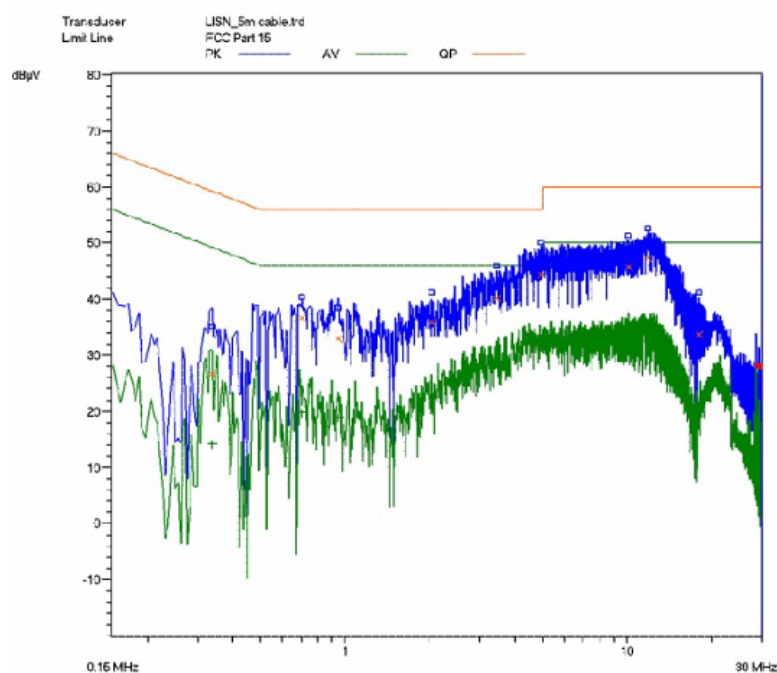
## Configuration of Tested System



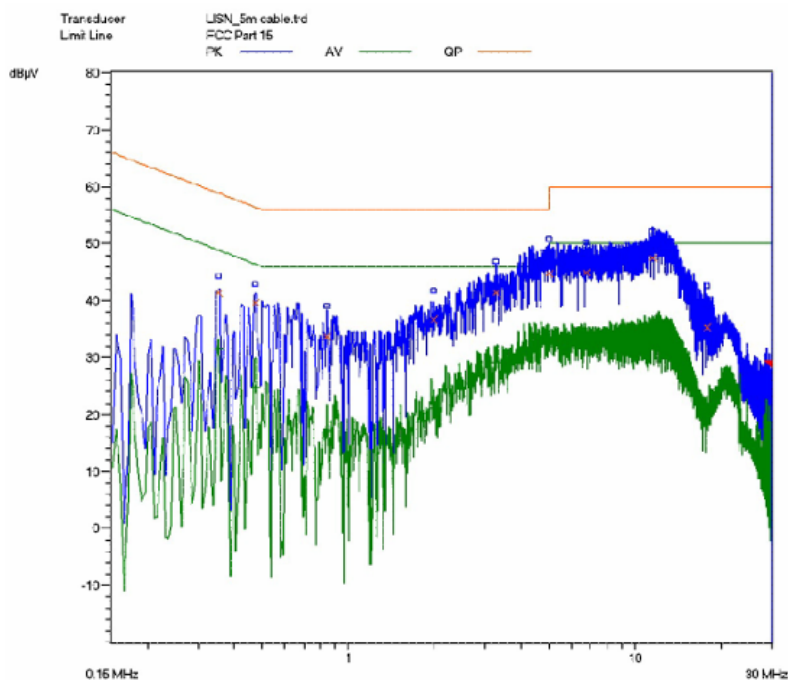
**ATTACHMENT 1 - CONDUCTED EMISSION TEST RESULTS**

<b>CLIENT:</b>	Grandstream Networks, INC	<b>TEST STANDERD:</b>	FCC Part 15, Subpart B, Section 15.107
<b>MODEL NUMBERS:</b>	HT702 V2.0	<b>PRODUCT:</b>	Analog Telephone Adapter
<b>MODEL TESTED:</b>	HT702 V2.0	<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>	Sewen Guo	<b>DATE OF TEST:</b>	September 4 <sup>th</sup> , 2013
<b>TEST REFERENCE:</b>	ANSI C63.4 -2003		
<b>TEST PROCEDURE:</b>	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.		
<b>DESCRIPTION OF TEST MODE</b>	Connected to PC		
<b>TEST SET UP</b>			
<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		

### Power Adaptor #1:(Mass power)

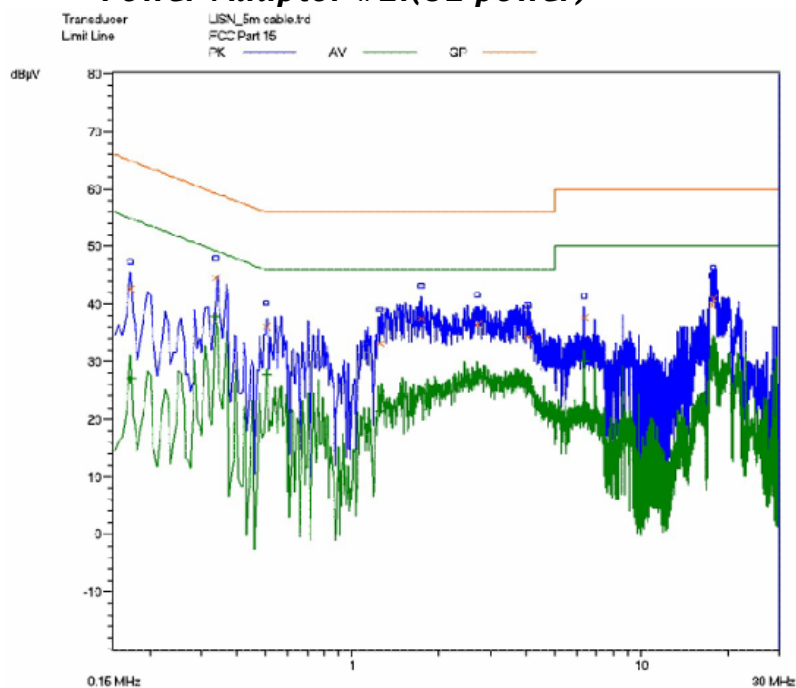


**Line L Conducted Emission Graph**

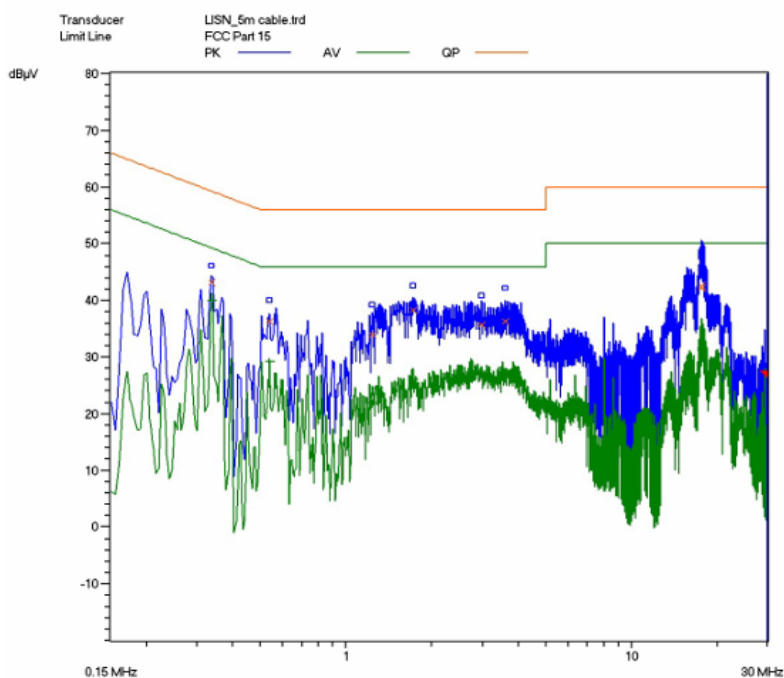


**Line N Conducted Emission Graph**

## Power Adaptor #2:(UE power)

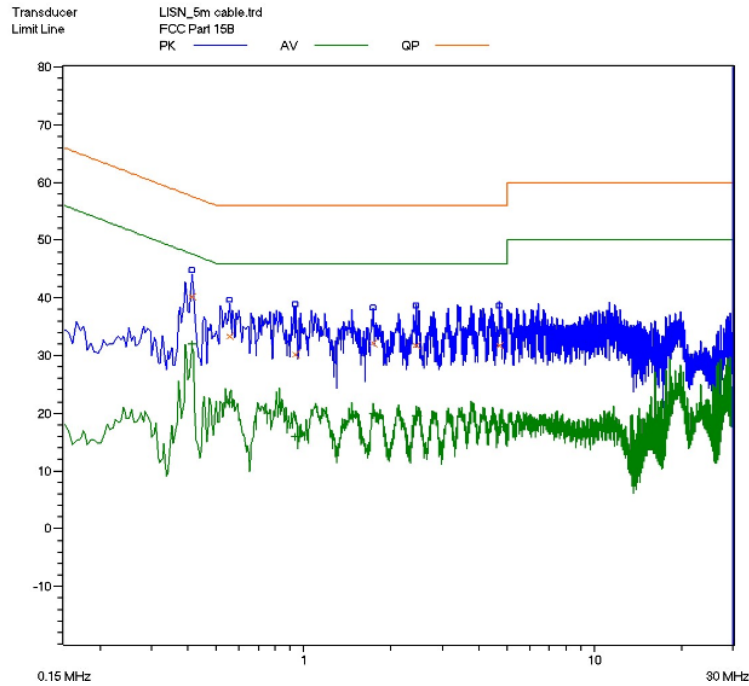


**Line L Conducted Emission Graph**

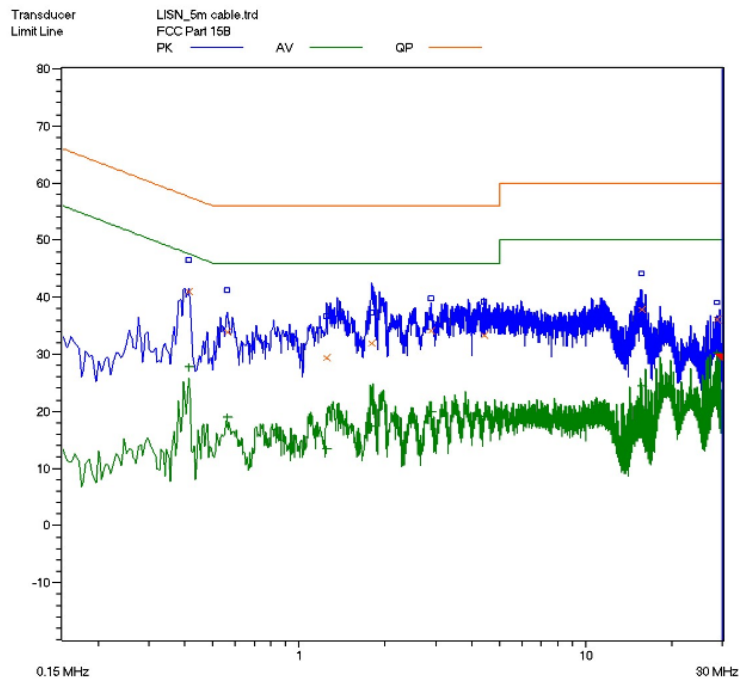


**Line N Conducted Emission Graph**

### Power Adaptor #3:(Mass power)



**Line L Conducted Emission Graph**



**Line N Conducted Emission Graph**

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

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	3.455	40.2	56	-15.8	3.455	29.0	46	-17.0
L	4.960	44.4	56	-11.6	4.960	32.0	46	-14.0
L	10.180	45.8	60	-14.2	10.180	32.5	50	-17.5
N	3.285	41.4	56	-14.6	3.285	29.1	46	-16.9
N	5.000	44.8	56	-11.2	5.000	31.9	46	-14.1
N	6.740	45.0	60	-15.0	6.740	32.3	50	-17.7
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 limits that are not report.								

**Power Adaptor #2(UE power)**

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	0.170	42.7	65.0	-22.3	0.170	27.1	55.0	-27.9
L	0.335	44.5	59.3	-14.8	0.335	38.0	49.3	-11.3
L	0.505	36.1	56.0	-19.9	0.505	27.8	46.0	-18.2
N	0.335	43.3	59.3	-16.0	0.335	40.1	49.3	-9.2
N	0.535	36.4	56.0	-19.6	0.535	29.2	46.0	-16.8
N	1.230	33.9	56.0	-22.1	1.230	22.0	46.0	-24.0
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 limits that are not report.								

**Power Adaptor #3(Mass power)**

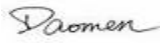
<i>Lines</i>	<i>Frequency (MHz)</i>	<i>Corrected QP Level (dBuV)</i>	<i>Limits QP (dBuV)</i>	<i>Margin QP (dB)</i>	<i>Frequency (MHz)</i>	<i>Corrected AVE Level (dBuV)</i>	<i>Limits AVE (dBuV)</i>	<i>Margin AVE (dB)</i>
L	0.410	40.3	57.6	-17.3	0.410	31.9	47.6	-15.7
L	0.555	33.4	56	-22.6	0.555	22.0	46	-24
L	0.940	30.2	56	-25.8	0.940	16.1	46	-29.9
N	0.410	41.1	57.6	-16.5	0.410	27.9	47.6	-19.7
N	0.560	33.9	56	-22.1	0.560	19.0	46	-27
N	1.250	29.5	56	-26.5	1.250	12.4	46	-33.6

Note :

- 1) All readings are using a bandwidth of 9 kHz, with a 500 ms 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.

**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:  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**

<b>CLIENT:</b>	Grandstream Networks, INC	<b>TEST STANDERD:</b>	FCC Part 15,Subpart B, Section 15.109
<b>MODEL NUMBERS:</b>	HT702 V2.0	<b>PRODUCT:</b>	Analog Telephone Adapter
<b>EUT MODEL:</b>	HT702 V2.0	<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>	September 4 <sup>th</sup> , 2013
<b>TEST REFERENCE:</b>	ANSI C63.4 -2003		
<b>TEST PROCEDURE:</b>	<p>The EUT was set up according to the guidelines of ANSI C63.4 -2003 for radiated emissions. An EMI receiver peak scan was made at the frequency measurement range (pre-scan) in an Anechoic chamber.signal discrimination was then performed and the significant peaks marked.these peaks were then quasi-peaked in the frequency range of 30 MHz to 1GHz and average and peak in the frequency range of 1 GHz to 5GHz at an anechoic chamber.</p> <p>The following d 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>	Conneced to PC		
<b>TESTED RANGE:</b>	9K-30MHz and 30MHz to 5,000MHz		
<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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**TEST SET-UP:**

Frequency measured at 9KHz to 30MHz:

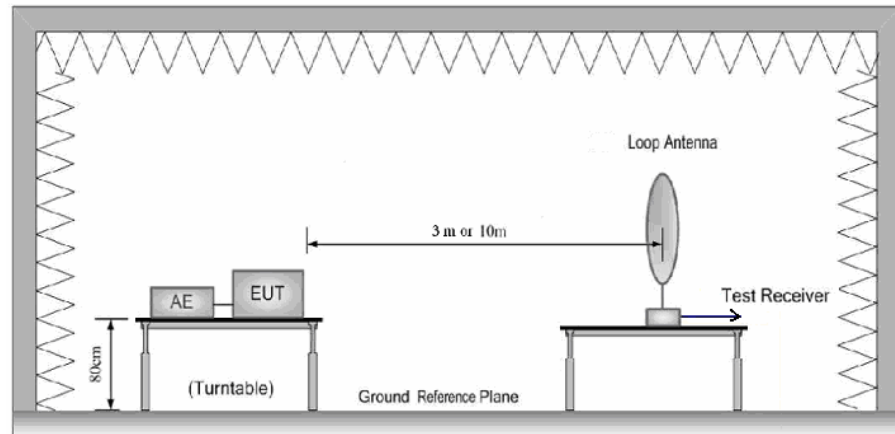


Figure 1 : Frequencies measured below 1 GHz configuration

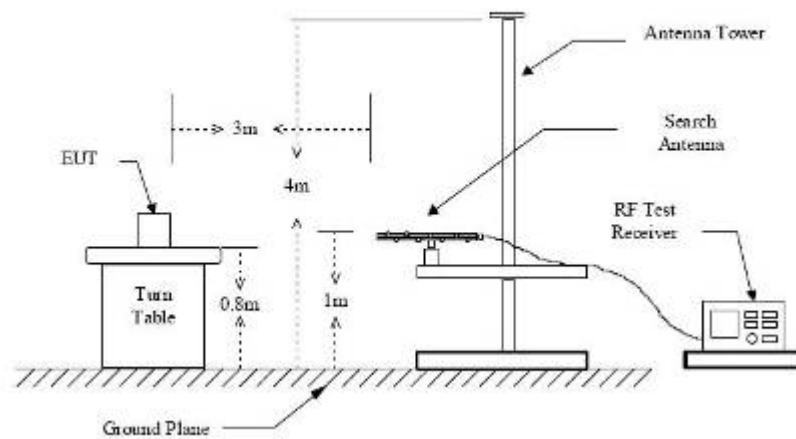
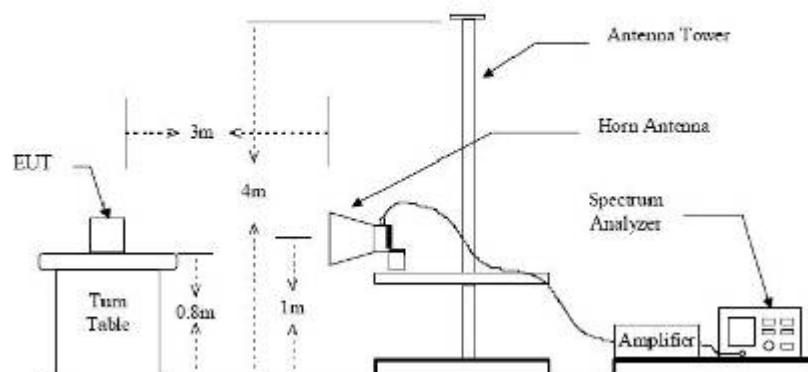
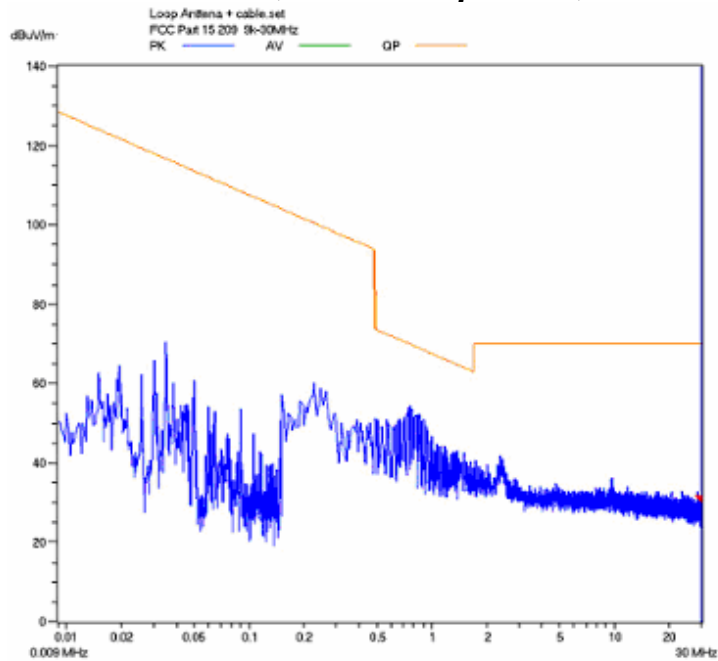


Figure 2 : Frequencies measured above 1 GHz configuration

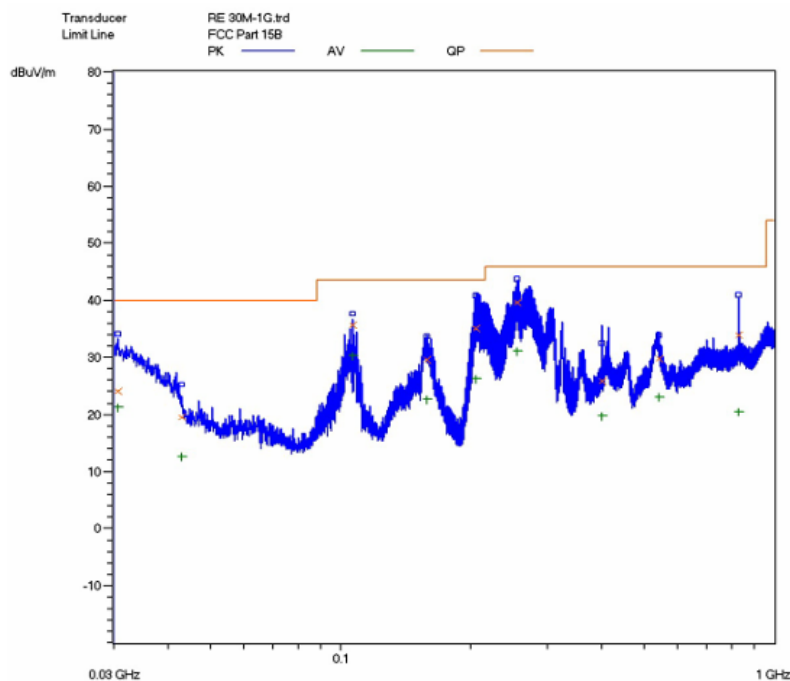


### 9KHz-30MHz(Power Adapter #1):

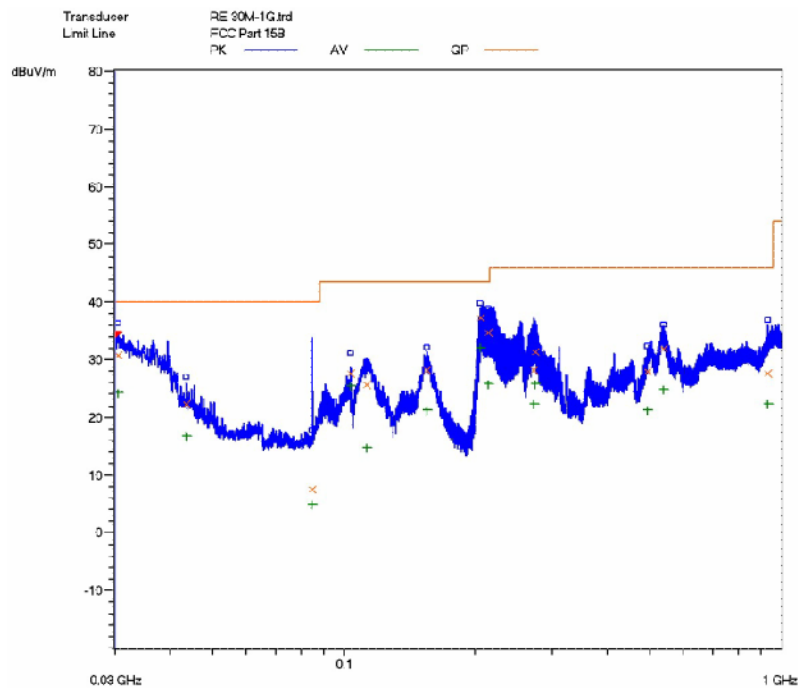


**Radiated Filed Strength Emission Test Plot  
(Peak,maxhold)**

### Power Adaptor #1(Mass power) 30MHz-1000MHz:

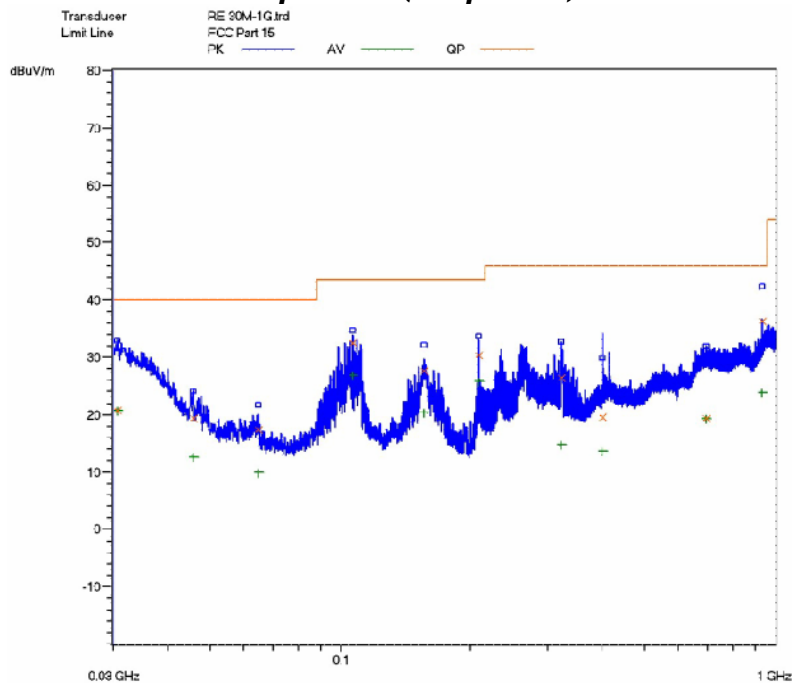


**Horizontal: Radiated Emission Test Plot  
(Peak,maxhold)**

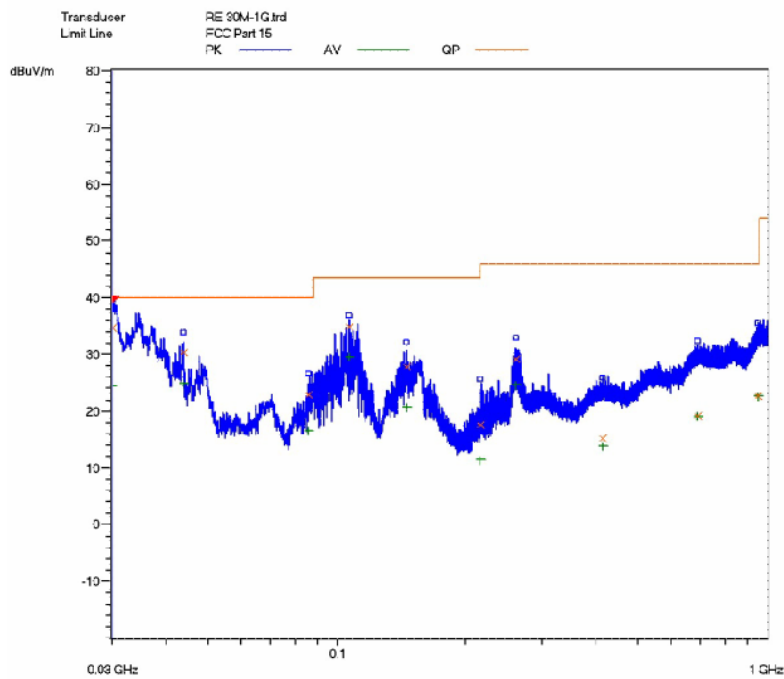


**Vertical: Radiated Emission Test Plot  
(Peak,maxhold)**

**Power Adaptor #2(UE power):**

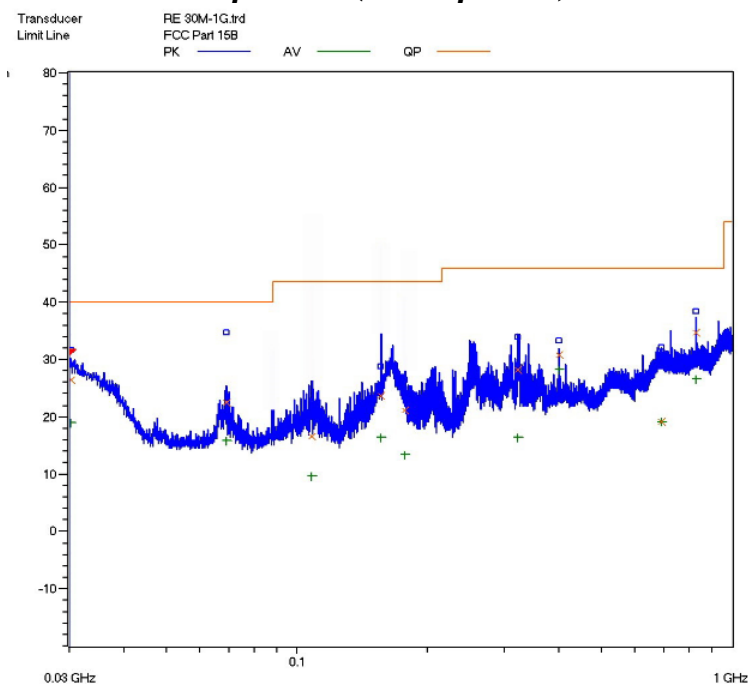


**Horizontal: Radiated Emission Test Plot  
(Peak,maxhold)**

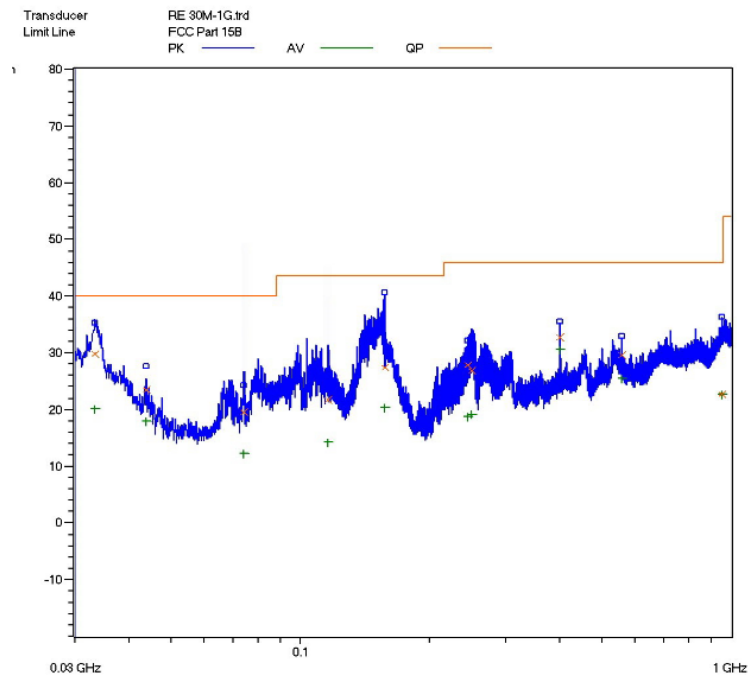


**Vertical: Radiated Emission Test Plot  
(Peak,maxhold)**

### **Power Adaptor #3(Mass power)**



**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. For band in 9KHz to 30MHz, Pre-scan has been conducted to determine the worst-case. 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:**  
**Power Adaptor #1(Mass power):**  
**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>							
30.600	16.7	0.02	/	7.28	24.0	40.0	-16.0
106.740	7.7	0.02	/	27.98	35.7	43.5	-7.8
205.800	7.2	0.12	/	27.78	35.1	43.5	-8.4
255.720	12.2	0.12	/	27.38	39.7	46.0	-6.3
542.160	18.2	0.30	/	11.30	29.8	46.0	-16.2
829.440	22.4	0.42	/	11.18	34.0	46.0	-12.0
<b>Vertical</b>							
30.420	16.7	0.02	/	14.08	30.8	40.0	-9.2
154.380	9.6	0.02	/	18.68	28.3	43.5	-15.2
205.500	7.2	0.02	/	30.08	37.3	43.5	-16.2
273.180	13.4	0.12	/	17.88	31.4	46.0	-14.6
537.420	18.2	0.30	/	13.40	31.9	46.0	-14.1
933.180	23.8	0.44	/	3.46	27.7	46.0	-18.3

**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:**

<i>Frequency (GHz)</i>	<i>Cable Loss (dB)</i>	<i>Antenna Factor (dB)</i>	<i>Preamp Factor (dB)</i>	<i>Reading Level (dBuV/m)</i>	<i>Emission Level (dBuV/m)</i>	<i>Limit (dBuV/m)</i>	<i>Margi n (dB)</i>	<i>Antenna Polariza tion (H/V)</i>
<b>Peak Measurement</b>								
1.001	1.39	23.9	33.6	12.71	46.18	74	-27.82	H
1.331	1.58	24.7	33.6	11.80	48.08	74	-25.92	H
1.858	1.93	27.5	33.6	13.16	49.87	74	-24.13	H
1.128	1.40	24.0	33.6	11.79	47.21	74	-26.79	V
1.325	1.58	24.7	33.6	11.87	48.01	74	-25.99	V
1.859	1.93	27.5	33.6	12.84	50.19	74	-23.81	V
<b>Average Measurement</b>								
1.001	1.39	23.9	33.6	30.80	28.09	54	-25.91	H
1.331	1.58	24.7	33.6	33.15	26.73	54	-27.27	H
1.858	1.93	27.5	33.6	33.28	29.75	54	-24.25	H
1.128	1.40	24.0	33.6	29.69	29.31	54	-24.69	V
1.325	1.58	24.7	33.6	29.23	30.65	54	-23.35	V
1.859	1.93	27.5	33.6	33.91	29.12	54	-24.88	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.

**Power Adaptor #2(UE power):**  
**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>							
30.660	16.7	0.02	/	3.98	20.7	40.0	-19.3
106.740	7.7	0.02	/	24.88	32.6	43.5	-10.9
155.640	9.6	0.02	/	18.08	27.7	43.5	-15.8
207.360	7.5	0.12	/	22.68	30.3	43.5	-13.2
322.740	13.4	0.16	/	12.94	26.5	46.0	-19.5
933.120	23.8	0.44	/	12.06	36.3	46.0	-9.7
<b>Vertical</b>							
30.060	16.7	0.02	/	18.08	34.8	40.0	-5.2
43.800	14.1	0.02	/	16.38	30.5	40.0	-9.5
85.500	6.1	0.02	/	16.68	22.8	40.0	-17.2
106.740	7.7	0.02	/	27.28	35.0	43.5	-8.5
145.260	8.3	0.02	/	19.48	27.8	43.5	-15.7
260.760	12.6	0.12	/	16.48	29.2	46.0	-16.8

**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.

**Above 1GHz:**

<b>Frequency (GHz)</b>	<b>Cable Loss (dB)</b>	<b>Antenna Factor (dB)</b>	<b>Preamplifier Factor (dB)</b>	<b>Reading Level (dBuV/m)</b>	<b>Emission Level (dBuV/m)</b>	<b>Limit (dBuV/m)</b>	<b>Margin (dB)</b>	<b>Antenna Polarization (H/V)</b>
<b>Peak Measurement</b>								
1.058	1.39	23.9	33.6	13.00	45.89	74	-28.11	H
1.329	1.65	25.5	33.6	17.17	43.58	74	-30.42	H
1.656	1.75	26.5	33.6	18.10	43.75	74	-30.25	H
1.092	1.40	24.0	33.6	17.75	41.25	74	-32.75	V
1.128	1.41	24.1	33.6	15.43	43.68	74	-30.32	V
1.323	1.61	25.1	33.6	16.43	43.97	74	-30.03	V
<b>Average Measurement</b>								
1.058	1.39	23.9	33.6	32.11	26.78	54	-27.22	H
1.329	1.65	25.5	33.6	36.60	24.15	54	-29.85	H
1.656	1.75	26.5	33.6	37.49	24.36	54	-29.64	H
1.092	1.40	24.0	33.6	30.39	28.61	54	-25.39	V
1.128	1.41	24.1	33.6	32.54	26.57	54	-27.43	V
1.323	1.61	25.1	33.6	34.02	26.29	54	-27.71	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.

**Power Adaptor #3(Mass power):**  
**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>							
30.180	0.02	16.7	/	9.68	26.4	40	-13.6
69.000	0.02	4.8	/	17.68	22.5	40	-17.5
155.640	0.02	9.6	/	13.98	23.6	43.5	-19.9
322.500	0.16	13.4	/	14.74	28.3	46	-17.7
400.020	0.16	14.7	/	15.94	30.8	46	-15.2
829.440	0.42	22.4	/	11.98	34.8	46	-11.2
<b>Vertical</b>							
33.240	0.02	17.3	/	12.48	29.8	40	-10.2
156.660	0.02	9.6	/	17.78	27.4	43.5	-16.1
245.160	0.12	11.4	/	16.28	27.8	46	-18.2
250.020	0.12	11.8	/	14.98	26.9	46	-19.1
399.960	0.16	14.7	/	17.84	32.7	46	-13.3
557.460	0.3	18.5	/	10.8	29.6	46	-16.4

**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.

**Above 1GHz:**


<i>Frequency (GHz)</i>	<i>Cable Loss (dB)</i>	<i>Antenna Factor (dB)</i>	<i>Preamp Factor (dB)</i>	<i>Reading Level (dBuV/m)</i>	<i>Emission Level (dBuV/m)</i>	<i>Limit (dBuV/m)</i>	<i>Margi n (dB)</i>	<i>Antenna Polariza tion (H/V)</i>
<b>Peak Measurement</b>								
1.001	1.39	23.9	33.6	-2.15	56.74	74	-17.26	H
1.331	1.58	24.7	33.6	-1.58	58.30	74	-15.7	H
1.858	1.93	27.5	33.6	-5.82	57.21	74	-16.79	H
1.128	1.40	24.0	33.6	-3.4	55.60	74	-18.4	V
1.325	1.58	24.7	33.6	-1.57	58.31	74	-15.69	V
1.859	1.93	27.5	33.6	-10.34	52.69	74	-21.31	V
<b>Average Measurement</b>								
1.001	1.39	23.9	33.6	-26.09	32.80	54	-21.2	H
1.331	1.58	24.7	33.6	-26.26	33.62	54	-20.38	H
1.858	1.93	27.5	33.6	-27.27	35.76	54	-18.24	H
1.128	1.40	24.0	33.6	-28.9	30.10	54	-23.9	V
1.325	1.58	24.7	33.6	-27.34	32.54	54	-21.46	V
1.859	1.93	27.5	33.6	-23.86	39.17	54	-14.83	V

**Note:**

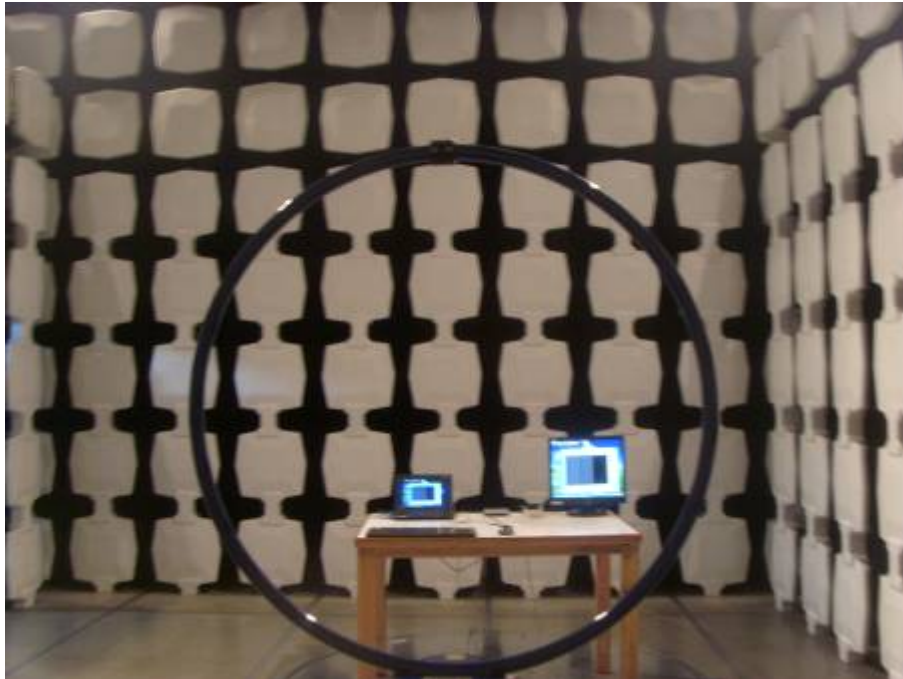
1. The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: Emission Level = Reading Level + Antenna Factor + Cable Loss - Preamplifier Factor.
2. The limits shown are based on Peak value and Average value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

<b>Test Equipment</b>	<b>Model No.</b>	<b>Manufacturer</b>	<b>Serial No.</b>	<b>Last Cal.</b>	<b>Cal. Due</b>
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	2012.11.30	2013.11.29
Spectrum Analyzer	FSP30	R&S	100755	2012.11.30	2013.11.29
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)***