




FCC PART 15B, CLASS B  
MEASUREMENT AND TEST REPORT

For

**Grandstream Networks, Inc.**

126 Brookline Ave, 3rd Floor Boston, MA 02215, USA

**FCC ID: YZZHT801**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Analog Telephone Adaptor
<b>Report Number:</b> <u>RSZ161125002-00</u>	
<b>Report Date:</b> <u>2017-01-11</u>	
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**Note:** This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

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## GENERAL INFORMATION

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### Product Description for Equipment under Test (EUT)

The *Grandstream Networks, Inc.*'s product, model number: *HT801 (FCC ID: YZZHT801)* in this report was an *Analog Telephone Adaptor*, which was measured approximately: 100 mm (L) x 100 mm (W) x 29.5 mm (H), rated with input voltage: DC 5 V from adapter. And the highest operational frequency range is 125MHz.

#### Adapter 1 Information

AC/DC Power Adapter

Model: F06US0500100A

Input: AC100-240V 50/60 Hz, 0.2A max

Output: 5V DC 1A

#### Adapter 2 Information

AC Adapter

Model: NBS05B050100VU

Input: AC100-240V 50/60 Hz, 0.2A

Output: 5V DC 1.0A

*\* All measurement and test data in this report was gathered from production sample serial number 1603757 (Assigned by BACL, Kunshan). The EUT supplied by the applicant was received on 2016-11-25.*

### Objective

This test report is prepared on behalf of *Grandstream Networks, Inc.* in accordance with Part 2-Subpart J, Part 15-Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to determine the compliance of the EUT with FCC Part 15 B.

### Related Submittal(s)/Grant(s)

No related submittal(s)/grant(s).

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

**Measurement Uncertainty**

Item		Uncertainty
AC Power Lines Conducted Emissions		±3.26 dB
Radiated emission	30MHz~1GHz	±5.91dB
	Above 1G	±4.92dB

**Test Facility**

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Test site at Bay Area Compliance Laboratories Corp. (Kunshan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 06, 2014. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 815570. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

## SYSTEM TEST CONFIGURATION (FCC §15.27)

### Justification

The system was configured for testing in normal condition.

### EUT Exercise Software

No exercise software was used.

### Equipment Modifications

No modification was made to the EUT tested.

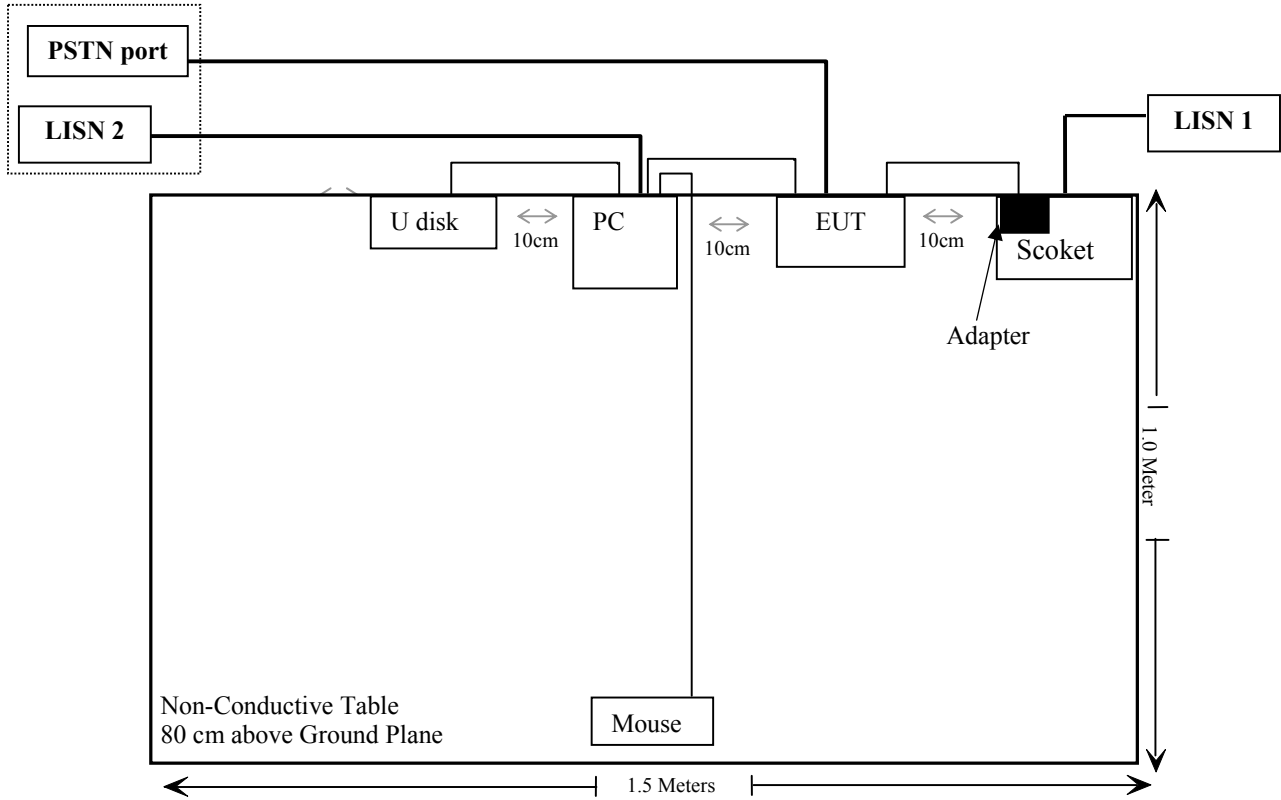
### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Lenovo	Notebook	T400	R8-LXAXE 09/12
DELL	Mouse	MOC5UO	G1900NKD
Kingston	U disk	4 GB	N/A

### External I/O Cable

Cable Description	Length (m)	From/Port	To
Unshielding Detachable USB Cable	1.5	Notebook	Mouse
Unshielding Detachable RJ45 Cable	1.0	EUT	PC
Unshielding Detachable USB Cable	1.0	U disk	PC
Unshielding Detachable RJ11 Cable	3.0	EUT	PSTN Port

### Block Diagram of Test Setup



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## **SUMMARY OF TEST RESULTS**

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<b>FCC Rules</b>	<b>Description of Test</b>	<b>Results</b>
§15.107	AC Line Conducted Emissions	Compliance
§15.109	Radiated Emissions	Compliance

**TEST EQUIPMENT LIST**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
<b>AC Line Conducted Emission Test</b>					
Rohde & Schwarz	EMI Test Receiver	ESCS30	834115/007	2016-11-25	2017-11-25
Rohde & Schwarz	LISN	ESH3-Z5	862770/011	2016-10-10	2017-10-10
Rohde & Schwarz	Pulse limiter	ESH3-Z2	879940/0058	2016-06-19	2017-06-18
MICRO-COAX	Coaxial line	UFB-293B-1-0480-50X50	97F0173	2016-09-08	2017-09-08
Rohde & Schwarz	CE Test software	EMC 32	V 09.10.0	NCR	NCR
<b>Radiated Emission Test</b>					
Sonoma Instrument	Amplifier	330	171377	2016-10-21	2017-10-21
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2016-11-25	2017-11-25
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2016-01-09	2019-01-08
Narda	Pre-amplifier	AFS42-00101800	2001270	2016-09-08	2017-09-08
EMCO	Horn Antenna	3116	00084159	2016-10-18	2019-10-17
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2016-11-25	2017-11-25
ETS	Horn Antenna	3115	6229	2016-01-11	2019-01-10
R&S	Auto test Software	EMC32	V 09.10.0	NCR	NCR
haojintech	Coaxial Cable	Cable-1	001	2016-12-12	2017-12-12
haojintech	Coaxial Cable	Cable-2	002	2016-12-12	2017-12-12
haojintech	Coaxial Cable	Cable-3	003	2016-12-12	2017-12-12
MICRO-COAX	Coaxial Cable	Cable-4	004	2016-12-12	2017-12-12
MICRO-COAX	Coaxial Cable	Cable-5	005	2016-12-12	2017-12-12

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI)

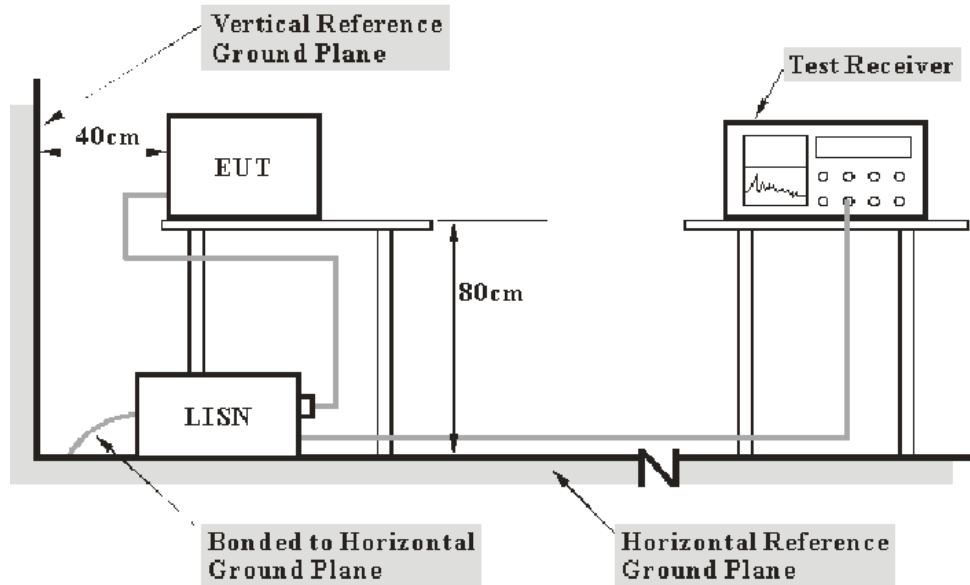


## FCC §15.107 – AC LINE CONDUCTED EMISSIONS

### Applicable Standard

According to FCC§15.107

### EUT Setup



- Note: 1. Support units were connected to second LISN.  
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The measurement procedure of EUT setup is according with ANSI C63.4-2014. The related limit was specified in FCC Part 15.107 Class B.

### EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

### Test Procedure

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

## Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Correction Factor} = \text{LISN VDF} + \text{Cable Loss} + \text{Transient Limiter Attenuation}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Results Summary

According to the recorded data in following table,

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(L_m)} \leq L_{\text{lim}} + U_{\text{cispr}}$$

In BACL,  $U_{(L_m)}$  is less than  $U_{\text{cispr}}$ , if  $L_m$  is less than  $L_{\text{lim}}$ , it implies that the EUT complies with the limit.

## Test Data

### Environmental Conditions

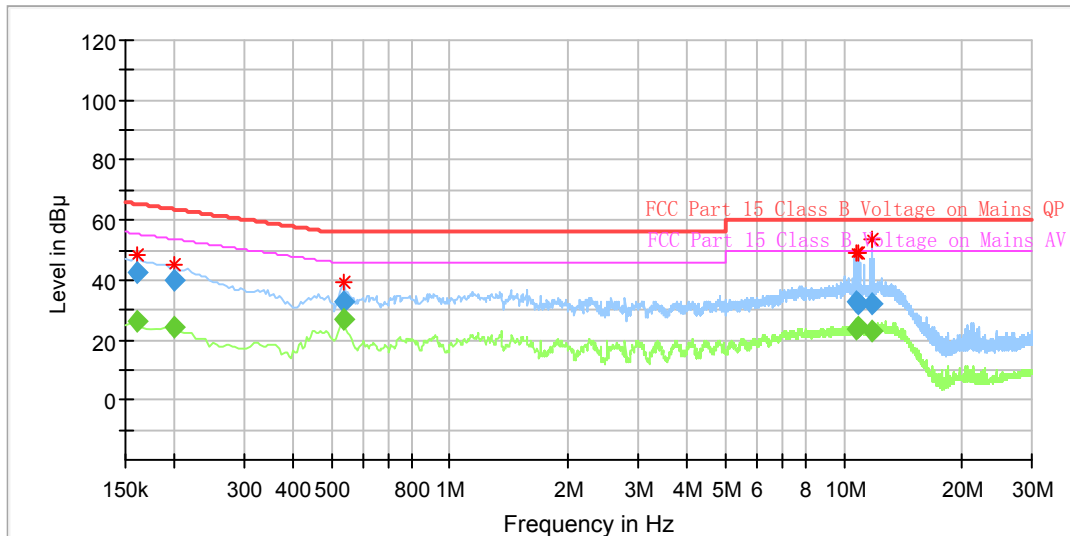
<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	46 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Layne Li on 2017-01-11.*

Tested mode: Running

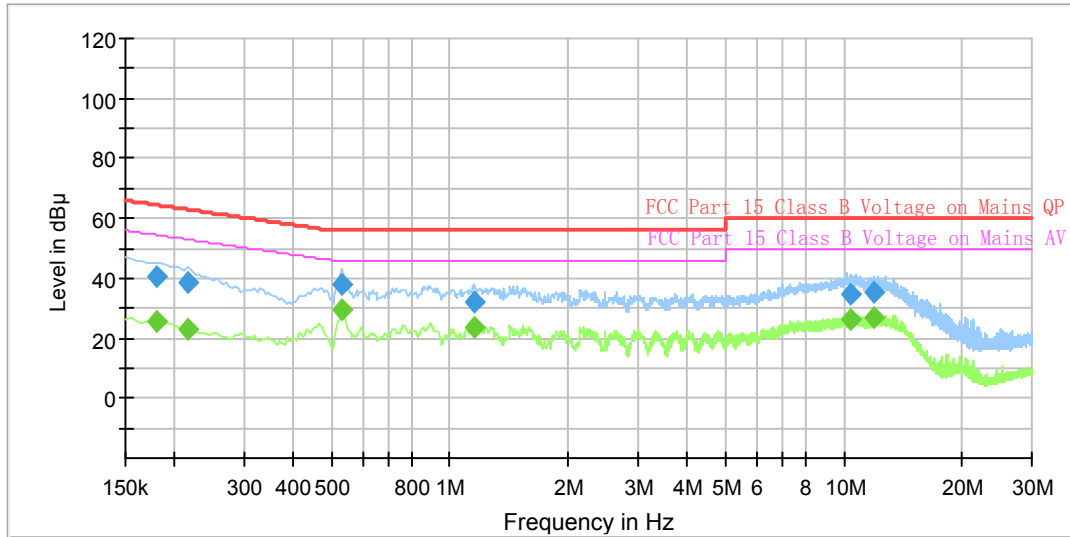
Powered by Adapter 1

AC 120V/60 Hz, Line



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Limit (dBµV)	Margin (dB)	Comment
0.160000	---	25.94	9.000	L1	10.3	55.46	29.52	Compliance
0.160000	42.56	---	9.000	L1	10.3	65.46	22.90	Compliance
0.200000	---	24.37	9.000	L1	10.3	53.61	29.24	Compliance
0.200000	40.17	---	9.000	L1	10.3	63.61	23.44	Compliance
0.540000	---	27.07	9.000	L1	10.3	46.00	18.93	Compliance
0.540000	32.97	---	9.000	L1	10.3	56.00	23.03	Compliance
10.760000	---	23.82	9.000	L1	10.5	50.00	26.18	Compliance
10.760000	32.56	---	9.000	L1	10.5	60.00	27.44	Compliance
10.940000	---	24.05	9.000	L1	10.5	50.00	25.95	Compliance
10.940000	32.29	---	9.000	L1	10.5	60.00	27.71	Compliance
11.775000	---	23.27	9.000	L1	10.4	50.00	26.73	Compliance
11.775000	32.10	---	9.000	L1	10.4	60.00	27.90	Compliance

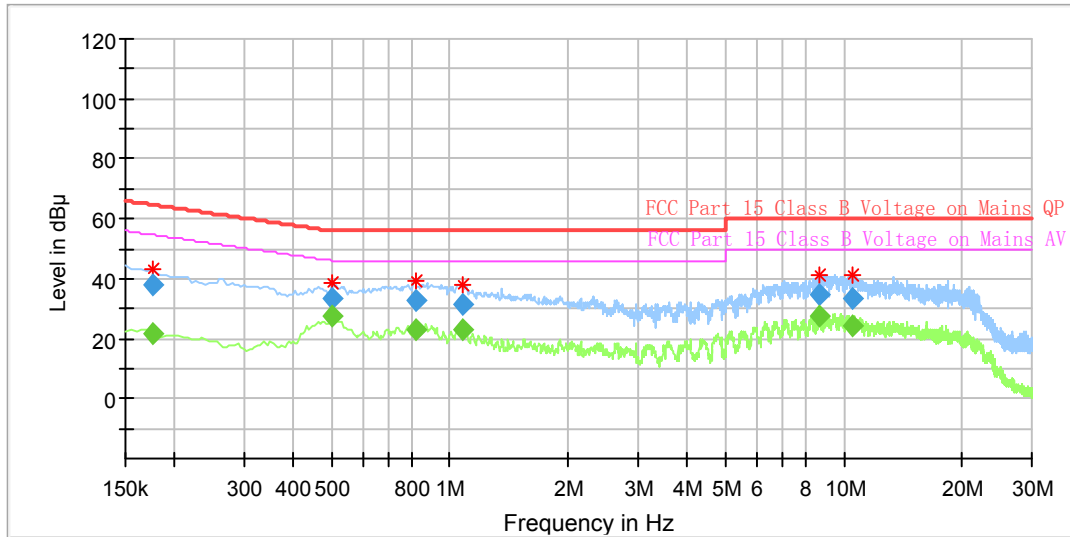
**AC 120V/60 Hz, Neutral**



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Limit (dBµV)	Margin (dB)	Comment
0.180000	---	25.45	9.000	N	10.3	54.49	29.04	Compliance
0.180000	40.85	---	9.000	N	10.3	64.49	23.64	Compliance
0.215000	---	23.12	9.000	N	10.3	53.01	29.89	Compliance
0.215000	38.31	---	9.000	N	10.3	63.01	24.70	Compliance
0.530000	---	29.63	9.000	N	10.3	46.00	16.37	Compliance
0.530000	37.70	---	9.000	N	10.3	56.00	18.30	Compliance
1.150000	---	23.32	9.000	N	10.3	46.00	22.68	Compliance
1.150000	31.90	---	9.000	N	10.3	56.00	24.10	Compliance
10.425000	---	25.91	9.000	N	10.5	50.00	24.09	Compliance
10.425000	34.98	---	9.000	N	10.5	60.00	25.02	Compliance
11.890000	---	27.06	9.000	N	10.5	50.00	22.94	Compliance
11.890000	35.60	---	9.000	N	10.5	60.00	24.40	Compliance

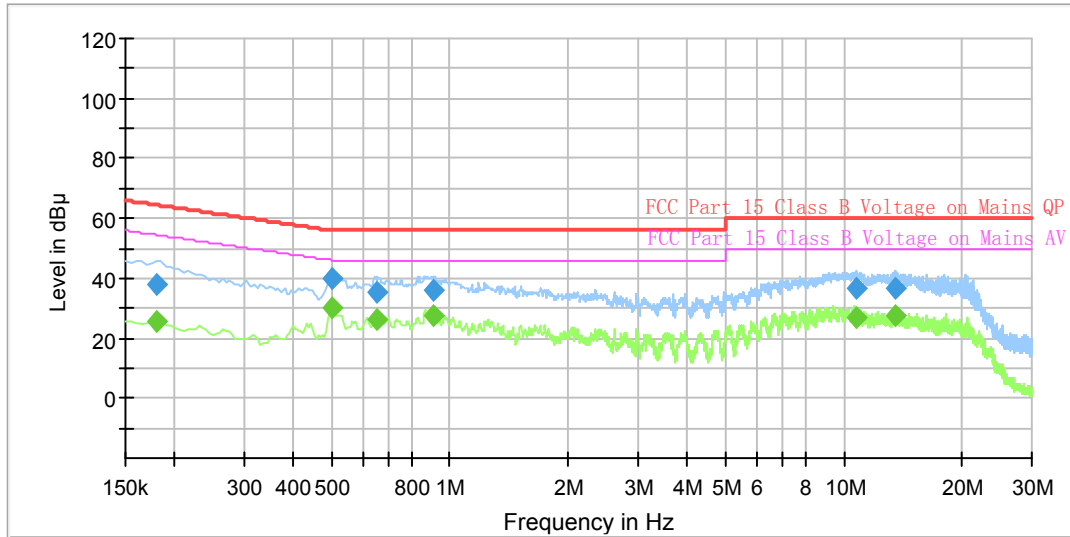
**Powered by Adapter 2**

**AC 120V/60 Hz, Line**



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Limit (dBµV)	Margin (dB)	Comment
0.175000	---	21.67	9.000	L1	10.3	54.72	33.05	Compliance
0.175000	37.90	---	9.000	L1	10.3	64.72	26.82	Compliance
0.500000	---	27.37	9.000	L1	10.3	46.00	18.63	Compliance
0.500000	33.52	---	9.000	L1	10.3	56.00	22.48	Compliance
0.815000	---	23.07	9.000	L1	10.3	46.00	22.93	Compliance
0.815000	32.66	---	9.000	L1	10.3	56.00	23.34	Compliance
1.080000	---	22.67	9.000	L1	10.3	46.00	23.33	Compliance
1.080000	31.38	---	9.000	L1	10.3	56.00	24.62	Compliance
8.710000	---	27.33	9.000	L1	10.5	50.00	22.67	Compliance
8.710000	34.75	---	9.000	L1	10.5	60.00	25.25	Compliance
10.475000	---	24.19	9.000	L1	10.5	50.00	25.81	Compliance
10.475000	33.57	---	9.000	L1	10.5	60.00	26.43	Compliance

**AC 120V/60 Hz, Neutral**



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Limit (dBµV)	Margin (dB)	Comment
0.180000	---	25.59	9.000	N	10.3	54.49	28.90	Compliance
0.180000	37.81	---	9.000	N	10.3	64.49	26.68	Compliance
0.500000	---	29.84	9.000	N	10.3	46.00	16.16	Compliance
0.500000	39.76	---	9.000	N	10.3	56.00	16.24	Compliance
0.655000	---	26.00	9.000	N	10.3	46.00	20.00	Compliance
0.655000	35.28	---	9.000	N	10.3	56.00	20.72	Compliance
0.905000	---	27.22	9.000	N	10.3	46.00	18.78	Compliance
0.905000	35.84	---	9.000	N	10.3	56.00	20.16	Compliance
10.820000	---	27.03	9.000	N	10.5	50.00	22.97	Compliance
10.820000	36.49	---	9.000	N	10.5	60.00	23.51	Compliance
13.480000	---	27.44	9.000	N	10.5	50.00	22.56	Compliance
13.480000	36.71	---	9.000	N	10.5	60.00	23.29	Compliance

**Note:**

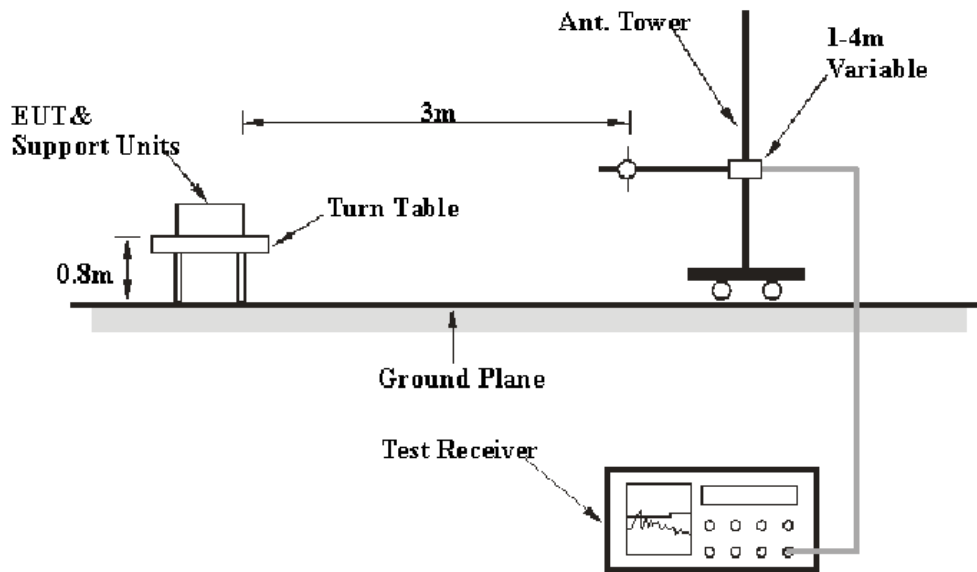
- 1) Corrected Amplitude = Reading + Correction Factor
- 2) Correction Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation
- 3) Margin = Limit – Corrected Amplitude

## FCC §15.109 - RADIATED EMISSIONS

### Applicable Standard

According to FCC§15.109

### Test System Setup



The radiated emission tests were performed in the 3 meters chamber test site.

### EMI Test Receiver Setup

According to FCC 15.33 requirements, the EUT system was measured from 30 MHz to 2 GHz.

During the radiated emission test, the EMI test receiver Setup was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	-	Peak
Above 1 GHz	1 MHz	10 Hz	-	Average

### Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All final data was recorded in the Quasi-peak detection mode for below 1 GHz, and Peak and Average for above 1 GHz.

**Corrected Amplitude & Margin Calculation**

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

**Test Results Summary**

According to the recorded data in following table

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL.,  $U_{(Lm)}$  is less than  $U_{cispr}$ , if  $L_m$  is less than  $L_{lim}$ , it implies that the EUT complies with the limit.

**Test Data**

**Environmental Conditions**

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	46 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Layne Li on 2017-01-10.*

*Tested mode: Running*



**Powered by Adapter 1**

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBuV/m)	FCC Part 15B	
	Reading (dB $\mu$ V)	Detector (PK/QP/Ave.)		Height (m)	Polar (H / V)			Limit (dBuV/m)	Margin (dB)
33.20	39.73	QP	92	1.0	V	-6.01	33.72	40	6.28
58.71	53.40	QP	221	1.0	V	-16.68	36.72	40	3.28
101.89	52.99	QP	67	1.1	V	-16.66	36.33	43.5	7.17
106.73	52.69	QP	89	1.1	V	-16.66	36.03	43.5	7.47
133.32	51.18	QP	233	3.2	H	-13.34	37.84	43.5	5.66
895.04	30.85	QP	62	1.5	H	-1.23	29.62	46	16.38
1002.11	67.98	PK	223	2.0	H	-12.45	55.53	74	18.47
1002.11	42.35	Ave.	223	2.0	H	-12.45	29.90	54	24.1
1990.73	59.88	PK	322	1.9	V	-7.09	52.79	74	21.21
1990.73	36.70	Ave.	322	1.9	V	-7.09	29.61	54	24.39

**Powered by Adapter 2**

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBuV/m)	FCC Part 15B	
	Reading (dB $\mu$ V)	Detector (PK/QP/Ave.)		Height (m)	Polar (H / V)			Limit (dBuV/m)	Margin (dB)
33.19	36.93	QP	127	1.0	V	-6.01	30.92	40	9.08
58.70	52.85	QP	234	1.1	V	-16.68	36.17	40	3.83
66.70	41.94	QP	232	1.1	V	-16.89	25.05	40	14.95
108.82	51.93	QP	86	1.1	V	-16.66	35.27	43.5	8.23
181.67	34.16	QP	333	1.2	V	-11.90	22.26	43.5	21.24
933.33	43.23	QP	295	1.1	H	-0.86	42.37	46	3.63
1053.79	66.28	PK	112	2.5	V	-11.85	54.43	74	19.57
1053.79	45.60	Ave.	112	2.5	V	-11.85	33.75	54	20.25
1999.45	54.37	PK	63	2.4	V	-7.09	47.28	74	26.72
1999.45	37.46	Ave.	63	2.4	V	-7.09	30.37	54	23.63

**Note:**

- 1) Corrected Amplitude = Meter Reading + Correction Factor
- 2) Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain
- 3) Margin = Limit - Corrected Amplitude
- 4) The emission more than 20dB below the limit was not required to be recorded.

**\*\*\*\*\* END OF REPORT \*\*\*\*\***