



## FCC PART 15B CLASS B

### MEASUREMENT AND TEST REPORT

For

**Chengdu Xgimi Technology Co., Ltd.**

5F, Building A7, Tianfu Software Park, Tianfu Avenue, Hi-tech Zone, Chengdu, China

**FCC ID: 2AFENXF09G**

<b>Report Type:</b> Original Report	<b>Equipment Name:</b> LED Projector
<b>Test Engineer:</b>	Mill Chen <i>Mill Chen</i>
<b>Report Number:</b>	RSC160411001-0C
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<b>Reviewed By:</b>	Henry Ding <i>Henry Ding</i>
<b>Prepared By:</b>	EMC Leader Bay Area Compliance Laboratories Corp. (Chengdu) 5040, Huilongwan Plaza, No. 1, Shawan Road, Jinniu District, Chengdu, Sichuan, China Tel: +86-28-65525123 Fax: +86-28-65525125 www.baclcorp.com

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## **TABLE OF CONTENTS**

<b>GENERAL INFORMATION .....</b>	<b>3</b>
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) .....	3
OBJECTIVE .....	3
RELATED SUBMITTAL(S)/GRANT(S) .....	3
TEST METHODOLOGY .....	3
TEST FACILITY .....	4
<b>SYSTEM TEST CONFIGURATION .....</b>	<b>5</b>
JUSTIFICATION .....	5
EUT EXERCISE SOFTWARE .....	5
SPECIAL ACCESSORIES .....	5
EQUIPMENT MODIFICATIONS .....	5
SUPPORT EQUIPMENT LIST AND DETAILS .....	5
EXTERNAL I/O CABLE .....	6
BLOCK DIAGRAM OF TEST SETUP .....	6
<b>SUMMARY OF TEST RESULTS .....</b>	<b>7</b>
<b>FCC §15.107 CONDUCTED EMISSION TEST .....</b>	<b>8</b>
APPLICABLE STANDARD .....	8
MEASUREMENT UNCERTAINTY .....	8
EUT SETUP .....	8
EMI TEST RECEIVER SETUP .....	9
TEST PROCEDURE .....	9
TEST EQUIPMENT LIST AND DETAILS .....	9
SUMMARY OF TEST RESULTS .....	9
CONDUCTED EMISSION TEST DATA AND PLOTS .....	10
<b>FCC §15.109 RADIATED EMISSION TEST .....</b>	<b>12</b>
APPLICABLE STANDARD .....	12
MEASUREMENT UNCERTAINTY .....	12
EUT SETUP .....	12
EMI TEST RECEIVER SETUP .....	13
TEST PROCEDURE .....	13
CORRECTED AMPLITUDE & MARGIN CALCULATION .....	14
TEST EQUIPMENT LIST AND DETAILS .....	14
TEST SOFTWARE .....	14
SUMMARY OF TEST RESULTS .....	15
RADIATED EMISSION TEST .....	15

## GENERAL INFORMATION

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

The **Chengdu Xgimi Technology Co., Ltd.**'s product, model number: **XF09G (FCC ID: 2AFENXF09G)** or ("EUT") in this report was the **LED Projector**, which was measured approximately: 245mm (L) x 245mm (W) x 216mm (H).  
Rated input voltage: DC 17V from adapter.

*The products, test model: XF09G, multiple model: XF10G, XF11G, XF12G, XF13G, XF14G, XF15G, XF16G, XF17G, XF18G, XF19G, XF20G, XF21G, XF22G, XF23G, XF24G, XF25G, XF26G, XF27G, XF28G, XF29G, XF30G, XF31G, XF32G, XF33G, XF34G, XF35G, XF36G, XF37G, XF38G, XF39G, XF40G, XF41G, XF42G, XF43G, XF44G, XF45G, XF46G, XF47G, XF48G, XF49G, XF50G. Their differences were presented in Product Difference Statement provided by the applicant. And we selected XF09G to fully test.*

*\*All measurement and test data in this report was gathered from final production sample, serial number: 160411001/01 (assigned by the BACL, Chengdu). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2016-04-01, and EUT conformed to test requirement.*

### Objective

The following Class B report was prepared on behalf of **Chengdu Xgimi Technology Co., Ltd.**, in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC Part 15 Class B limits.

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

FCC Part 15.247 DTS submissions with FCC ID: 2AFENXF09G.  
FCC Part 15.407 NII submissions with FCC ID: 2AFENXF09G.

### Test Methodology

All measurements contained in this report are 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 radiated and conducted emissions measurement is performed at BACL. The radiated testing is performed at an antenna-to-EUT distance of 3 Meters.

## **Test Facility**

The test site used by BACL to collect test data is located in the 5040, HuiLongWan Plaza, No. 1, ShaWan Road, JinNiu District, ChengDu, China.

Test site at BACL 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 April 24, 2015. 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.: 560332. 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

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### Justification

The system is configured for testing in a typical fashion (as a normally used by a typical user).

### EUT Exercise Software

N/A

### Special Accessories

No special accessories were supplied by BACL.

### Equipment Modifications

No modification to the EUT was made by BACL to make sure the EUT comply with applicable limits.

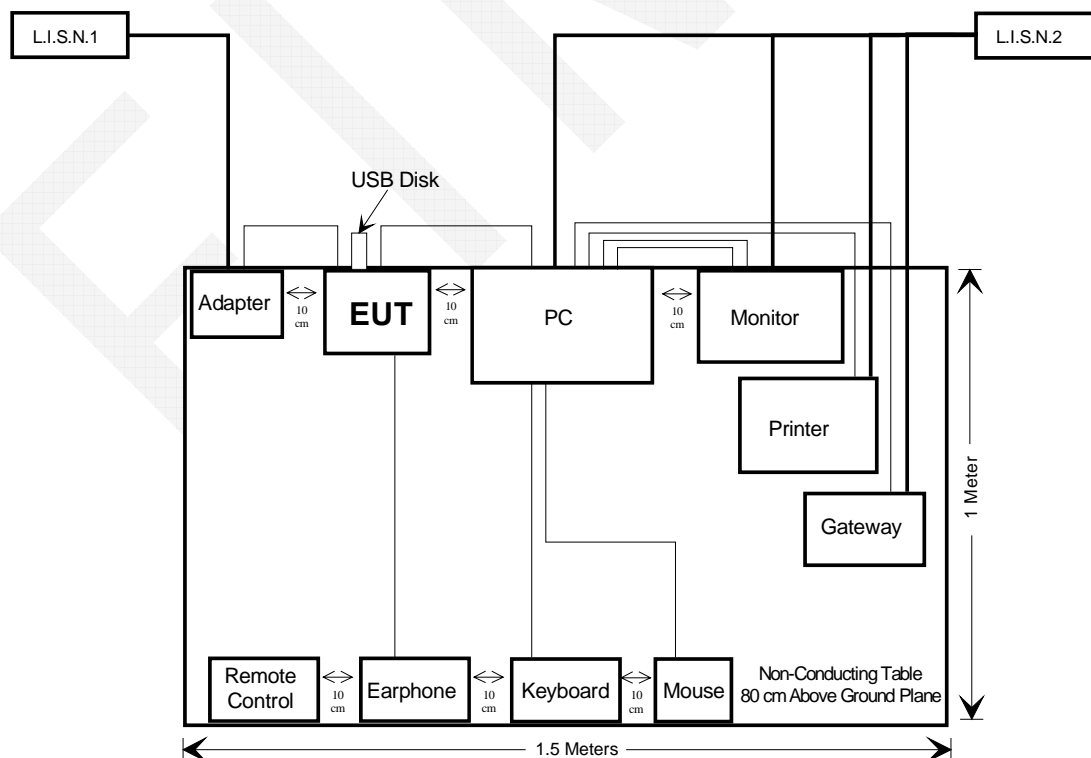
### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
IBM	PC	8176	99Y7315
DELL	Monitor	SK-8815	9161649
IBM	Keyboard	KM-110X	XBK133000993
Logitech	Mouse	M-U0004	810-001808
EPSON	Printer	B261A	GXSK285854
ANTER	Gateway	EGW802	0508350054-1B
XI40MI	Earphone	T9	None
KINGSTON	USB Disk	101G2	None

## External I/O Cable

Cable Description	Length (m)	From	To
Shielded VGA cable	1.5	PC	Monitor
Shielded HDMI cable	1.0	PC	Monitor
Shielded HDMI cable	1.0	PC	EUT
Unshielded Mouse cable	1.5	PC	Mouse
Unshielded Keyboard cable	1.5	PC	Keyboard
Shielded USB Cable	1.5	PC	Printer
Shielded RS232 Cable	1.5	PC	Gateway
Unshielded Earphone Cable	1.2	EUT	Earphone
Unshielded DC Power Cable	1.8	EUT	Adapter

## Block Diagram of Test Setup



## SUMMARY OF TEST RESULTS

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Standard	Description	Result
FCC §15.107	Conducted Emission	Compliance
FCC §15.109	Radiated Emission	Compliance

## FCC §15.107 CONDUCTED EMISSION TEST

### Applicable Standard

FCC §15.107

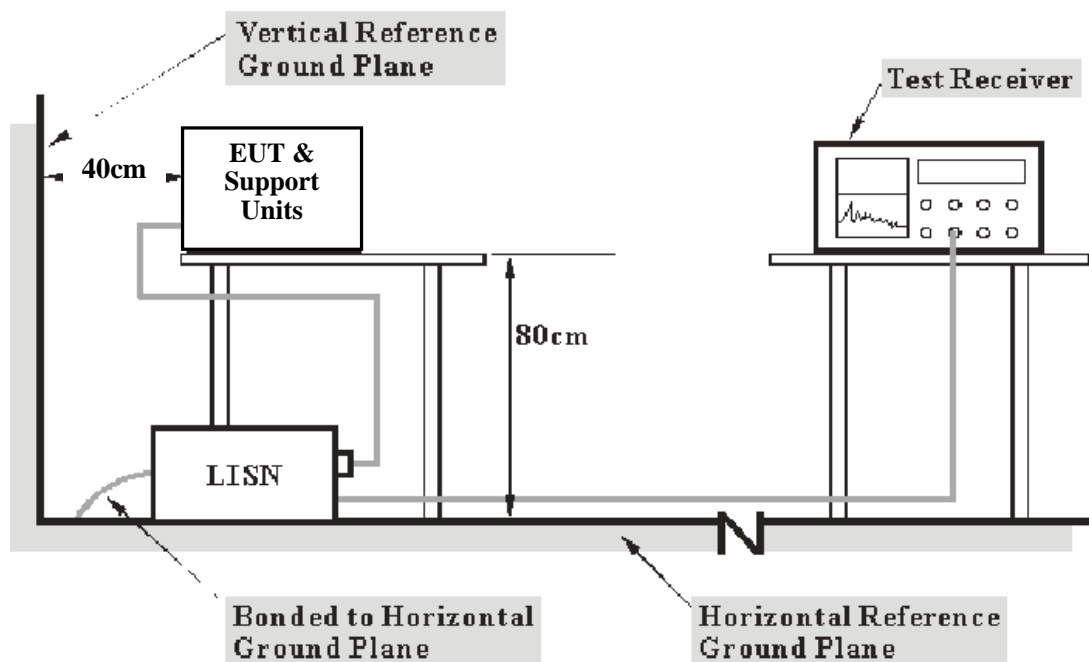
### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMI. The factors contributing to uncertainties are EMI Test Receiver, cable loss, and L.I.S.N.

Based on CISPR 16-4-2, the Treatment of Uncertainty in EMI Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratories Corp. (Chengdu) is  $\pm 3.17$  dB.

### EUT Setup

The setup of EUT was in accordance with ANSI C63.4-2014 measurement procedure. The specification used was the FCC Part 15 Class B limits.



- 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 power cables and excess cables shall be folded at the cable center into a bundle no longer than 40 cm.



The spacing between the peripherals unit & EUT was 10 cm.

The adapter was connected to AC 120V/60Hz power source.

### 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 to ensure EUT is compliant with all installation combination.

All data are recorded in the Quasi-peak and Average detection mode. Quasi-peak readings are distinguished with a "**QP**". Average readings are distinguished with an "**AV**".

The EUT is in the normal operating mode during the final qualification test to represent the worst cases results.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS 30	836858/0016	2015-12-02	2016-12-01
Rohde & Schwarz	L.I.S.N.	ENV216	3560.6550.06	2015-12-02	2016-12-01
Rohde & Schwarz	L.I.S.N.	ENV216	3560.6550.12	None	None
N/A	Conducted Cable	NO.5	N/A	2015-11-10	2016-11-09

\* **Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### Summary of Test Results

According to the data in the following, the EUT complied with the FCC Part 15B.

## Conducted Emission Test Data and Plots

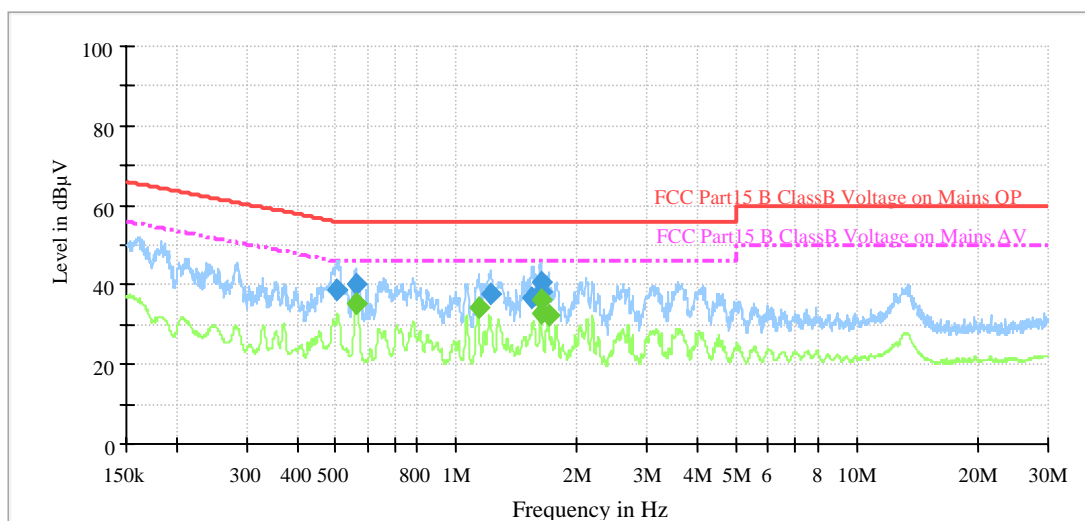
### Test Environment Conditions

Temperature:	25 °C
Relative Humidity:	64 %
ATM Pressure:	100.9 kPa

The testing was performed by Mill Chen on 2016-08-17.

Test Mode: Running(LAN+HDMI INPUT+HDMI ARC OUTPUT)

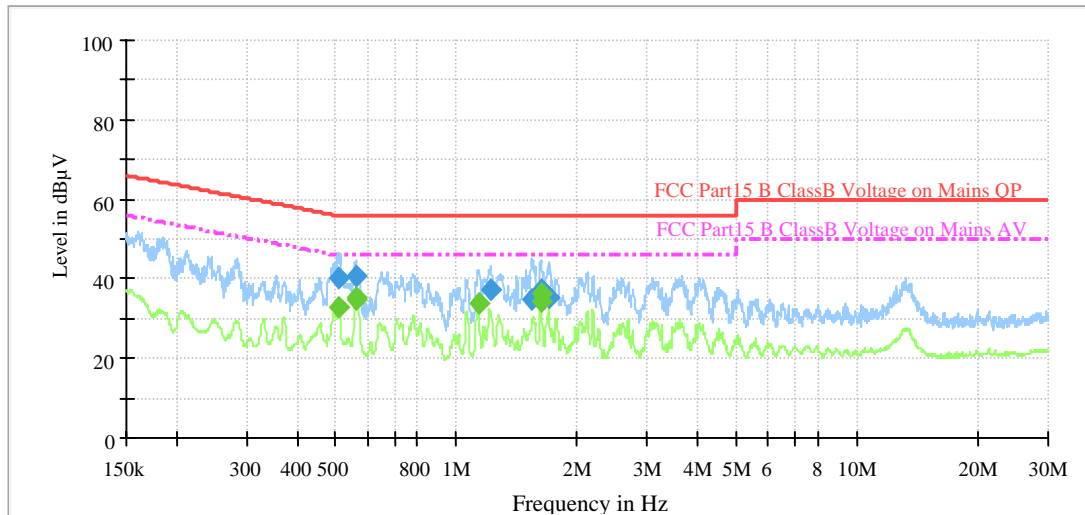
### AC120V/60HZ, Line



Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.502416	38.6	9.000	L1	20.0	17.4	56.0
0.560774	40.4	9.000	L1	20.0	15.6	56.0
1.219920	37.8	9.000	L1	20.0	18.2	56.0
1.541185	36.9	9.000	L1	20.0	19.1	56.0
1.623363	40.6	9.000	L1	20.0	15.4	56.0
1.629863	38.3	9.000	L1	20.0	17.7	56.0

Frequency (MHz)	Average (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.563019	35.2	9.000	L1	20.0	10.8	46.0
0.565274	35.1	9.000	L1	20.0	10.9	46.0
1.132989	34.1	9.000	L1	20.0	11.9	46.0
1.623363	36.1	9.000	L1	20.0	9.9	46.0
1.629863	32.9	9.000	L1	20.0	13.1	46.0
1.699704	32.3	9.000	L1	20.0	13.7	46.0

# AC120V/60HZ, Neutral



Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.506447	40.3	9.000	N	19.9	15.7	56.0
0.560774	40.6	9.000	N	19.9	15.4	56.0
1.222360	37.1	9.000	N	20.0	18.9	56.0
1.538109	34.9	9.000	N	20.0	21.1	56.0
1.633123	37.2	9.000	N	20.0	18.8	56.0
1.713342	35.1	9.000	N	20.0	20.9	56.0

Frequency (MHz)	Average (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.508475	32.6	9.000	N	19.9	13.4	46.0
0.563019	35.4	9.000	N	19.9	10.6	46.0
0.564145	35.0	9.000	N	19.9	11.0	46.0
1.135255	33.6	9.000	N	20.0	12.4	46.0
1.626610	36.1	9.000	N	20.0	9.9	46.0
1.629863	34.3	9.000	N	20.0	11.7	46.0

## FCC §15.109 RADIATED EMISSION TEST

### Applicable Standard

FCC §15.109

### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMI. The factors contributing to uncertainties are EMI Test Receiver, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2, the Treatment of Uncertainty in EMI Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is

30M~200MHz:  $\pm 4.7$  dB;

200M~1GHz:  $\pm 6.0$  dB;

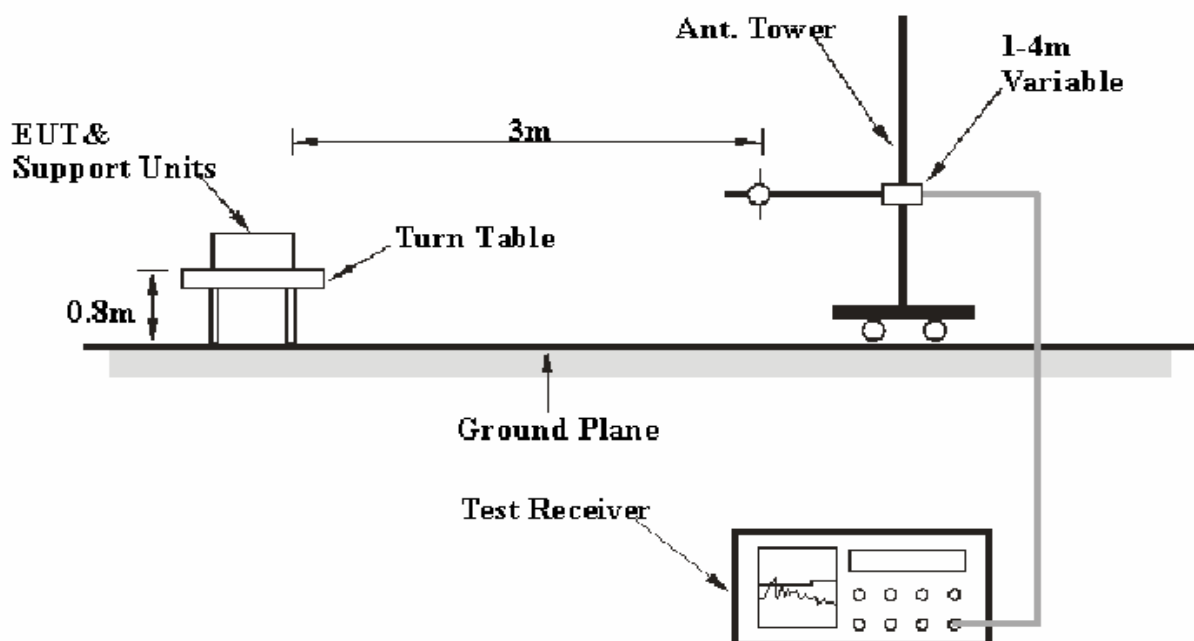
1G-6GHz:  $\pm 5.13$  dB;

6G-25GHz:  $\pm 5.47$  dB.

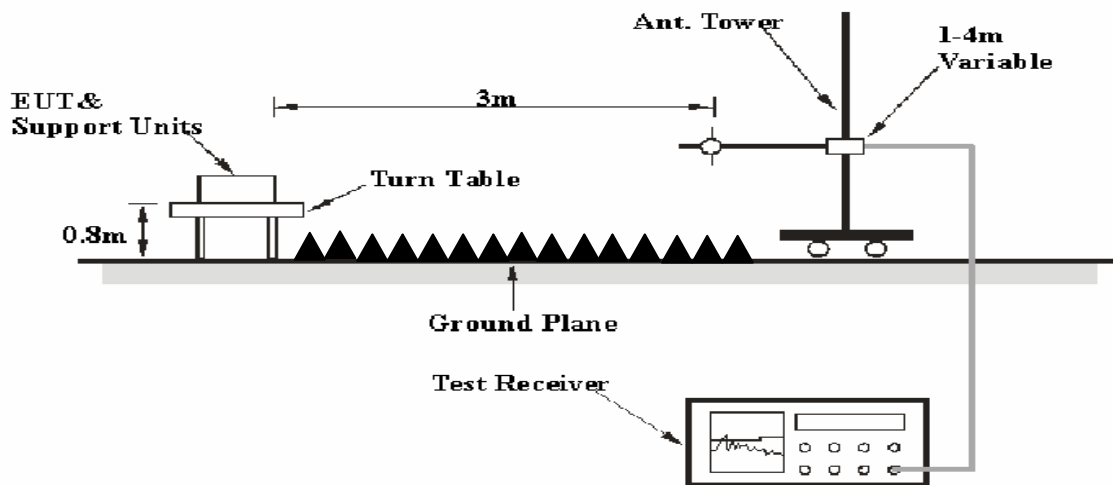
### EUT Setup

The radiated emission tests were performed in the 3 meter Semi Anechoic Chamber, using the setup in accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15 Class B limits.

#### Below 1GHz:



### Above 1GHz:



The excess cables shall be folded at the cable center into a bundle no longer than 40 cm.

The spacing between the peripherals unit & EUT was 10 cm.

The adapter was connected to AC 120V/60Hz power source.

### EMI Test Receiver Setup

According to FCC rules, the frequency range to be tested from 30 MHz to 30 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1 MHz	10 Hz	/	Ave.

### Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.

All data were recorded in the quasi-peak detection mode from 30 MHz to 1GHz. Peak and average detection mode above 1 GHz.

The EUT was in the normal operating mode during the final qualification test to represent the worst case results.

## Corrected Amplitude & Margin Calculation

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

$$\text{Corr. Ampl.} = \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

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 7 dB $\mu$ V/m below the maximum limit for FCC Part 15 Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{FCC Part 15 Class B Limit} - \text{Corr. Ampl.}$$

## Test Equipment List and Details

Manufacturer	Description	Model Number	Serial Number	Calibration Date	Calibration Due Date
Agilent	Amplifier	8447D	2944A10442	2015-12-02	2016-12-01
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2015-12-02	2016-12-01
Sunol Sciences	Broadband Antenna	JB3	A101808	2016-04-10	2019-04-09
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2015-12-02	2016-12-01
EM TEST	Horn Antenna	3115	003-6076	2015-12-02	2016-12-01
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-0113024	2014-06-16	2017-06-15
HP	Amplifier	8449B	3008A00277	2016-04-09	2019-04-08
EMCT	Semi-Anechoic Chamber	966	N/A	2015-04-24	2018-04-23
N/A	RF Cable (below 1GHz)	NO.1	N/A	2015-11-10	2016-11-09
N/A	RF Cable (below 1GHz)	NO.4	N/A	2015-11-10	2016-11-09
N/A	RF Cable (above 1GHz)	NO.2	N/A	2015-11-10	2016-11-09
WEINSCHL ENGINEERING	Attenuator	1A10dB	AA4135	2015-11-10	2016-11-09

\* **Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

## Test Software

Description	Manufacturer	Version
EMC32	R&S	V 8.54.0

## Summary of Test Results

According to the data in the following, the EUT complied with the FCC Part 15 Class B standards.

## Radiated Emission Test

### Test Environment Conditions

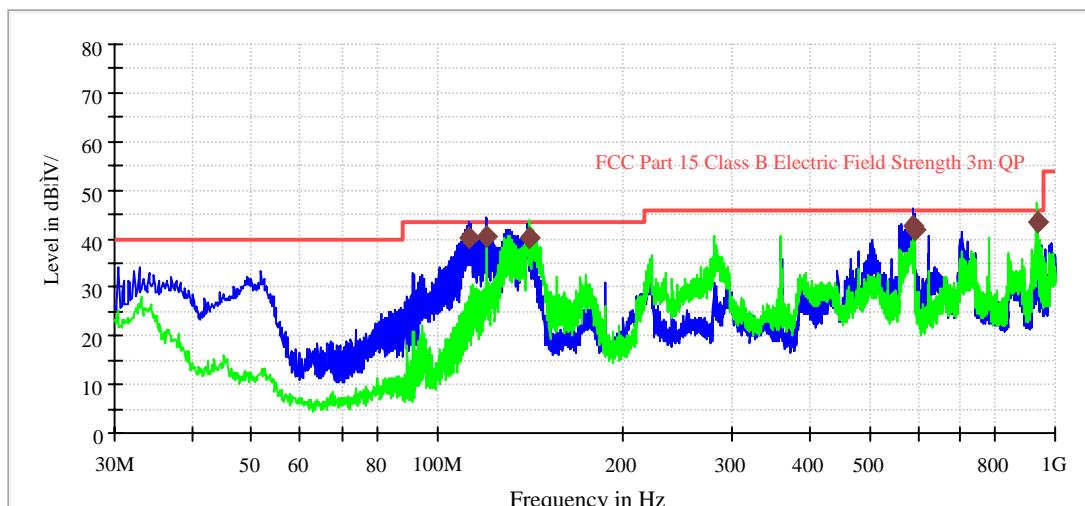
Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	100.9 kPa

The testing was performed by Mill Chen on 2016-08-17.

Test Mode: Running(LAN+HDMI INPUT+HDMI ARC OUTPUT)

### Below 1 GHz:

Electric Field Strength with Scans



Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
112.692500	40.3	120.000	100.0	V	87.0	-13.9	*3.2	43.5
119.967500	40.1	120.000	100.0	V	56.0	-11.9	*3.4	43.5
140.822500	40.1	120.000	100.0	H	38.0	-14.3	*3.4	43.5
589.690000	42.7	120.000	100.0	V	275.0	-7.7	*3.3	46.0
593.570000	41.9	120.000	100.0	V	275.0	-7.6	*4.1	46.0
935.616250	43.5	120.000	100.0	H	0.0	-2.3	*2.5	46.0

\*Within measurement uncertainty!

**Above 1 GHz:**

Frequency	Result	Polarity	Detector	Corrected factor	Limit	Margin
MHz	(dB $\mu$ V/m)	V/H	PK/Ave.	(dB)	(dB $\mu$ V/m)	(dB)
1621.246	57.25	V	PK	0.44	74	16.75
1621.246	39.14	V	AV	0.44	54	14.86
2583.162	52.34	V	PK	-0.7	74	21.66
2583.162	43.58	V	AV	-0.7	54	10.42
1040.12	58.73	H	PK	-2.03	74	15.27
1040.12	41.73	H	AV	-2.03	54	12.27
1714.26	53.52	H	PK	0.48	74	20.48
1714.26	37.96	H	AV	0.48	54	16.04

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