



## FCC PART 15 CLASS B

# MEASUREMENT AND TEST REPORT

For

## ZYCOO Co., LTD.

7F, B7, Tianfu Software park, Chengdu, China

**FCC ID: 2ADWHU80U100V2**  
**Test Model: CooVox-U100**  
**Multi-listing Model: CooVox-U80**

<b>Report Type:</b> Original Report	<b>Equipment Name:</b> IP Phone System
<b>Test Engineer:</b> Lorin Bian	<i>Lorin Bian</i>
<b>Report Number:</b> RSC160530001	
<b>Report Date:</b> 2016-08-23	
<b>Reviewed By:</b> EMC Leader	<i>Henry Ding</i>
<b>Prepared By:</b> 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	

**Note:** This test report was prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Chengdu) Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. This report was valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

**TABLE OF CONTENTS**

**GENERAL INFORMATION .....3**

    PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) .....3

    MECHANICAL DESCRIPTION OF EUT .....3

    OBJECTIVE .....3

    RELATED SUBMITTAL(S)/GRANT(S).....3

    TEST METHODOLOGY .....3

    TEST FACILITY.....4

**SYSTEM TEST CONFIGURATION.....5**

    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 .....7

**SUMMARY OF TEST RESULTS .....8**

**FCC §15.107 CONDUCTED EMISSION TEST .....9**

    APPLICABLE STANDARD.....9

    MEASUREMENT UNCERTAINTY .....9

    EUT SETUP.....9

    EMI TEST RECEIVER SETUP .....10

    TEST PROCEDURE .....10

    CORRECTED AMPLITUDE & MARGIN CALCULATION .....10

    TEST EQUIPMENT LIST AND DETAILS .....11

    SUMMARY OF TEST RESULTS .....11

    CONDUCTED EMISSION TEST DATA .....12

**FCC §15.109 RADIATED EMISSION TEST .....14**

    APPLICABLE STANDARD.....14

    MEASUREMENT UNCERTAINTY .....14

    EUT SETUP.....14

    EMI TEST RECEIVER SETUP .....15

    TEST PROCEDURE .....15

    CORRECTED AMPLITUDE & MARGIN CALCULATION .....16

    TEST EQUIPMENT LIST AND DETAILS .....16

    TEST SOFTWARE.....16

    SUMMARY OF TEST RESULTS .....16

    RADIATED EMISSION TEST.....17

## GENERAL INFORMATION

---

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

The **ZYCOO Co., LTD.**'s product, model number: **CooVox-U100 (FCC ID: 2ADWHU80U100V2)** or the "EUT" as referred to in this report was the **IP Phone System**, which has a metallic enclosure. The highest frequency was 1GHz.

### Mechanical Description of EUT

The EUT was measured approximately 440 mm(L) x 225 mm (W) x 43 mm(H).  
Rated input voltage: AC100-240V, 50-60Hz.

*Note: The products, test model: CooVox-U100, multi-listing model: CooVox-U80. We selected model: CooVox-U100 to fully test, please refer to the Difference Declaration Letter provided by the manufacturer.*

*\*All measurement and test data in this report was gathered from final production sample, serial number: 160530001/01 (CooVox-U100), 160530001/02(CooVox-U80) (assigned by the BAACL, Chengdu). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2016-05-30.*

### Objective

The following Class B report was prepared on behalf of **ZYCOO 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)

No Related Submittals.

### 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 BAACL. 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**

---

### **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.

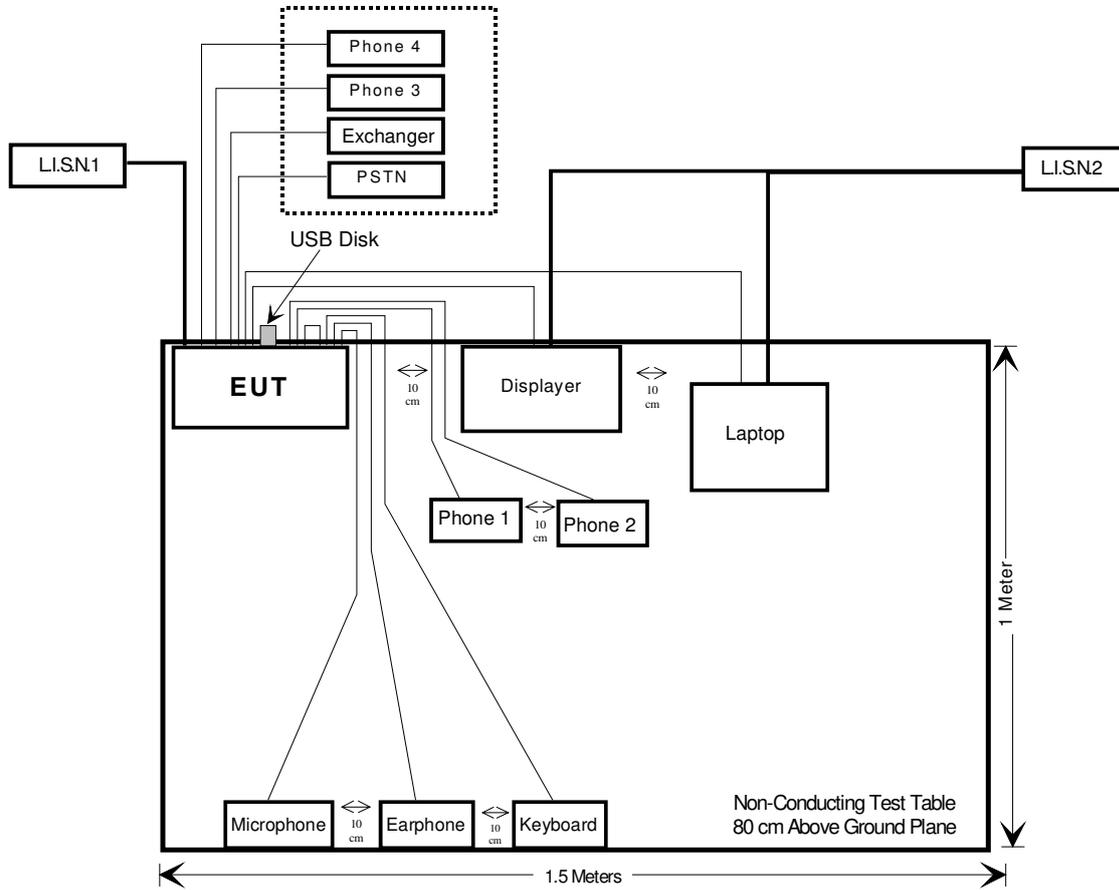
### **Support Equipment List and Details**

<b>Manufacturer</b>	<b>Description</b>	<b>Model Number</b>	<b>Serial Number</b>
KINGSTON	Flash Disk	101G2	None
KINGSTON	Micro SD card	8GB	None
PHILIPS	Display	227ELH	AU3A114001177
Shenzhen CHINO	Phone 1	HA6238P/T	None
Shenzhen CHINO	Phone 2	HA6238P/T	None
Shenzhen CHINO	Phone 3	HA6238P/T	None
Shenzhen CHINO	Phone 4	HA6238P/T	None
LANGBOWANG	Microphone	NO. 101	None
Xiaomi	Earphone	T9	None
DELL	Laptop	C640	5P804A00
DL	Exchanger	DL-S1005PM	None
DELL	Keyboard	L100	CNORH656658907BL 05DC
N/A	PTSN	None	None

### External I/O Cable

Cable Description	Length (m)	From	To
Unshield USB Cable	1.8	EUT/USB Port	Keyboard
Shield HDMI Cable	1.0	EUT/HDMI Port	Display
Unshield Earphone Cable	1.8	EUT/Earphone Port	Earphone
Unshield MIC Cable	1.8	EUT/MIC Port	Microphone
Unshield RJ45 Cable	10	EUT/WAN Port	Exchanger
Unshield RJ45 Cable	1.2	EUT/LAN Port	Laptop
Unshield RJ11 Calbe	0.5	EUT/RJ11 Port	Phone 1
Unshield RJ11 Calbe	0.5	EUT/RJ11 Port	Phone 2
Unshield RJ11 Calbe	10	EUT/RJ11 Port	Phone 3
Unshield RJ11 Calbe	10	EUT/RJ11 Port	Phone 4
Unshield RJ45 Calbe	10	EUT/RJ11 Port	PSTN

### Block Diagram of Test Setup



## **SUMMARY OF TEST RESULTS**

---

<b>Standard</b>	<b>Description</b>	<b>Result</b>
FCC §15.107	Conducted Emission	Compliance
FCC §15.109	Radiated Emission	Compliance

## FCC §15.107 CONDUCTED EMISSION TEST

### Applicable Standard

FCC §15.107

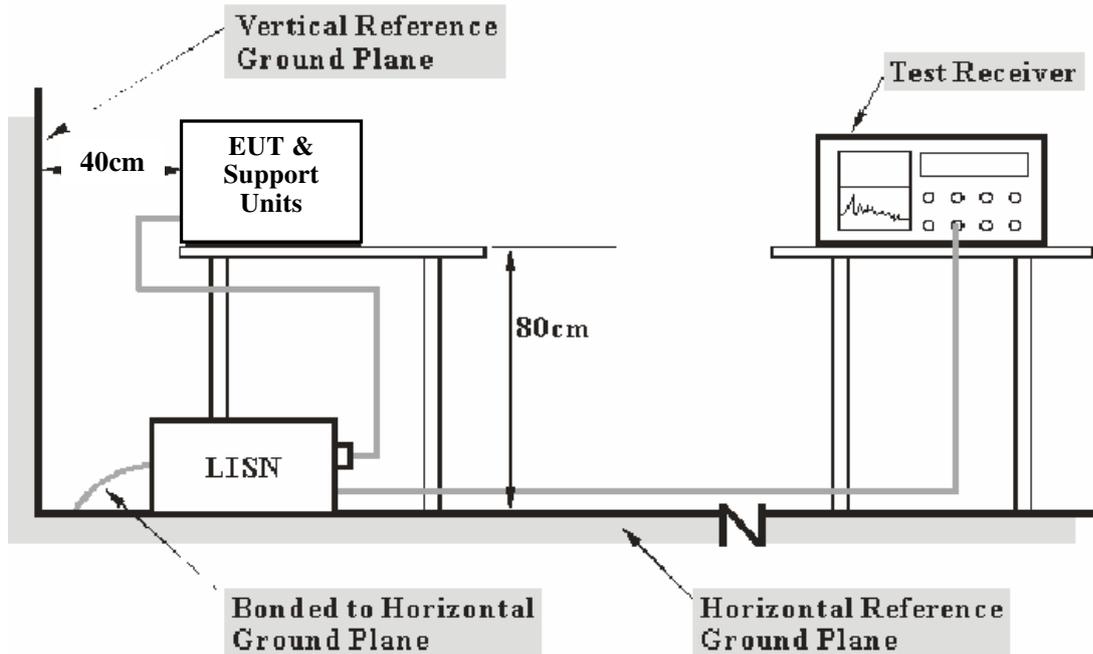
### Measurement Uncertainty

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 external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The EUT was connected to 120V/60Hz AC 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

During the radiated emissions, the EUT was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

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.

### Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$VC = VR + AC + VDF$$

Herein,

VC: corrected voltage amplitude

VR: reading voltage amplitude

Ac: attenuation caused by cable loss

VDF: voltage division factor of AMN or ISN

The "Margin" column of the following data tables indicates the degree of compliance within 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 Equipment List and Details

Manufacturer	Description	Model Number	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
BACL	CVP	CVP	150602	2016-07-17	2017-07-16
N/A	Conducted Cable	NO.1	N/A	2015-11-10	2016-11-09
Rohde & Schwarz	Pulse Limiter	ESH3Z2	357.8810.52	2015-10-31	2016-10-30

\* **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 recorded data in following table, the EUT complied with the FCC Part 15 B Class B.

## Conducted Emission Test Data

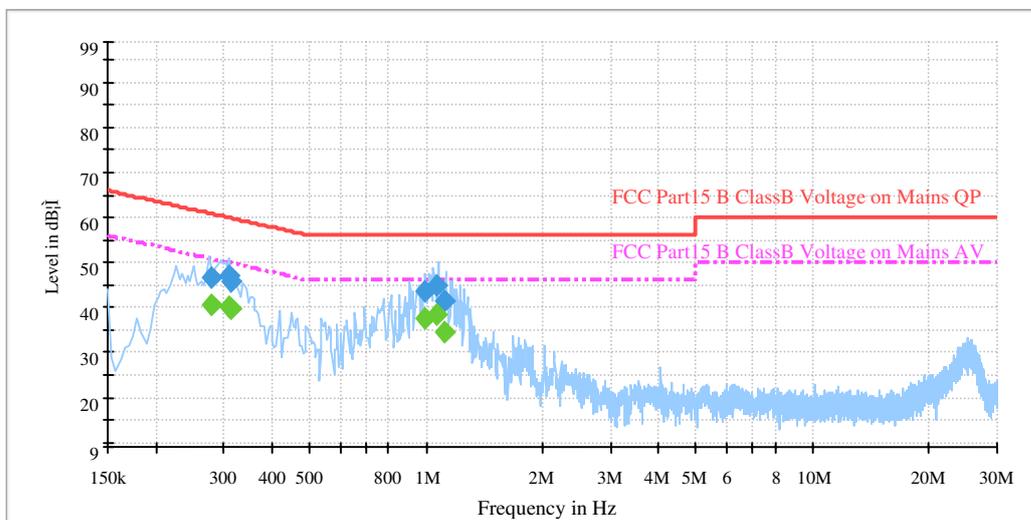
### Test Environment Conditions

Temperature:	29 °C
Relative Humidity:	52 %
ATM Pressure:	94.4 kPa

The testing was performed by Lorin Bian on 2016-08-09.

Test Mode: Running (Talking+WAN+LAN+Video out+Record)

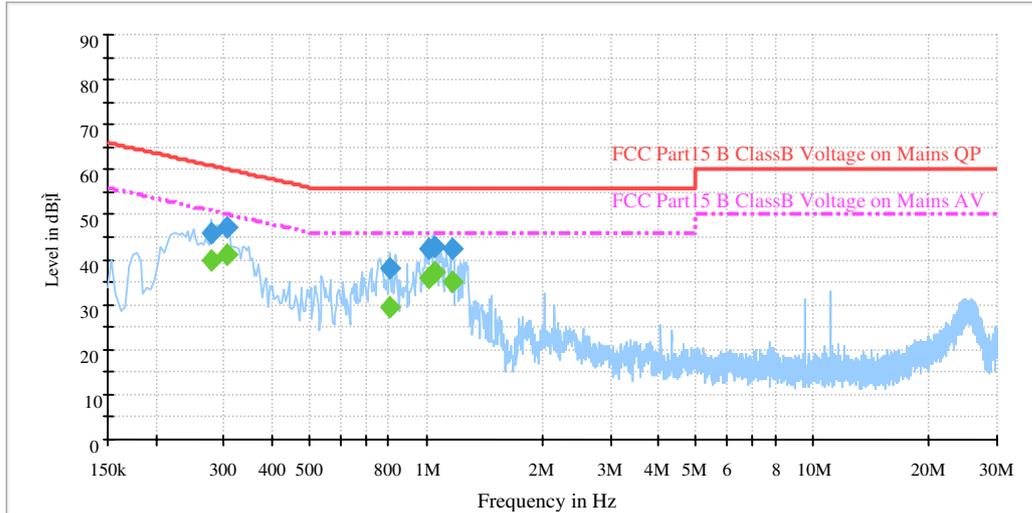
### AC120V/60Hz,Line



Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.278501	46.5	9.000	L1	19.9	14.4	60.9
0.309350	47.0	9.000	L1	19.9	13.0	60.0
0.313230	46.0	9.000	L1	19.9	13.9	59.9
0.995030	43.4	9.000	L1	20.0	12.6	56.0
1.069830	44.8	9.000	L1	20.0	11.2	56.0
1.113110	41.5	9.000	L1	20.0	14.5	56.0

Frequency (MHz)	Average (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.278501	40.4	9.000	L1	19.9	10.5	50.9
0.309350	40.1	9.000	L1	19.9	9.9	50.0
0.313230	39.6	9.000	L1	19.9	10.3	49.9
0.995030	37.7	9.000	L1	20.0	8.3	46.0
1.069830	38.4	9.000	L1	20.0	<b>7.6</b>	46.0
1.113110	34.6	9.000	L1	20.0	11.4	46.0

**AC120V/60Hz,Neutral**



Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.277500	45.9	9.000	N	19.9	15.0	60.9
0.306530	47.2	9.000	N	19.9	12.9	60.1
0.805910	38.2	9.000	N	19.9	17.8	56.0
1.012970	42.3	9.000	N	20.0	13.7	56.0
1.050310	42.8	9.000	N	20.0	13.2	56.0
1.176450	42.5	9.000	N	20.0	13.5	56.0

Frequency (MHz)	Average (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.277500	39.9	9.000	N	19.9	11.0	50.9
0.306530	40.9	9.000	N	19.9	9.2	50.1
0.805910	29.6	9.000	N	19.9	16.4	46.0
1.012970	36.0	9.000	N	20.0	10.0	46.0
1.050310	37.1	9.000	N	20.0	9.0	46.0
1.176450	35.1	9.000	N	20.0	10.9	46.0

## FCC §15.109 RADIATED EMISSION TEST

### Applicable Standard

FCC §15.109

### Measurement Uncertainty

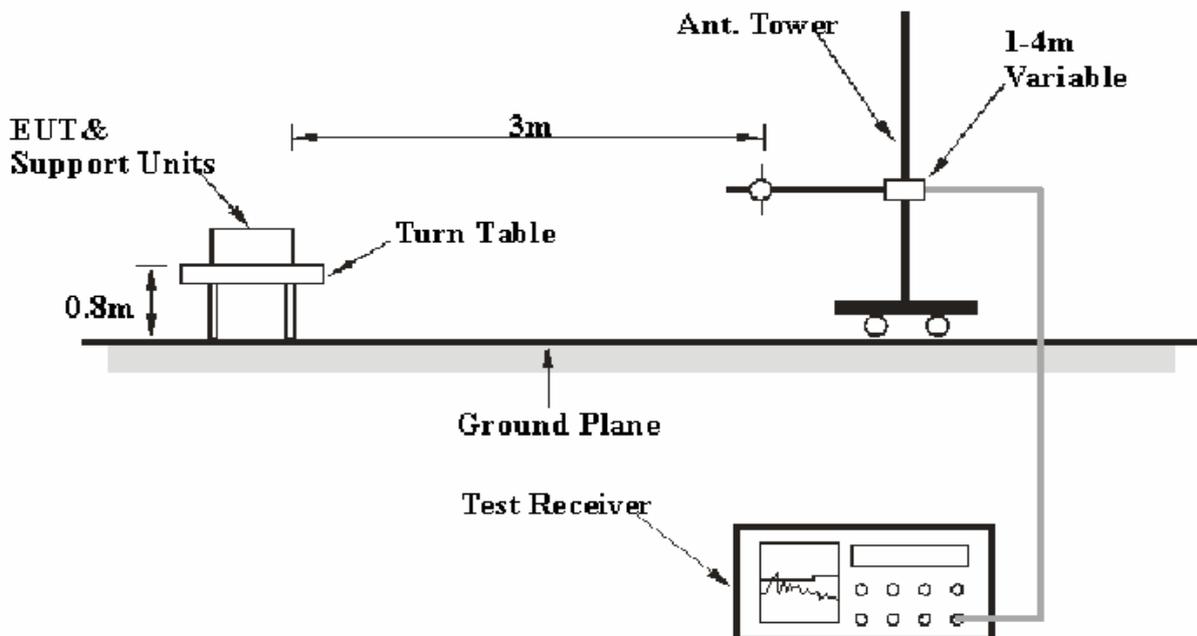
All measurements involve certain levels of uncertainties, especially in the field of EMI. The factors contributing to uncertainties are EMI Test Receiver, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor 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 BAACL 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 .

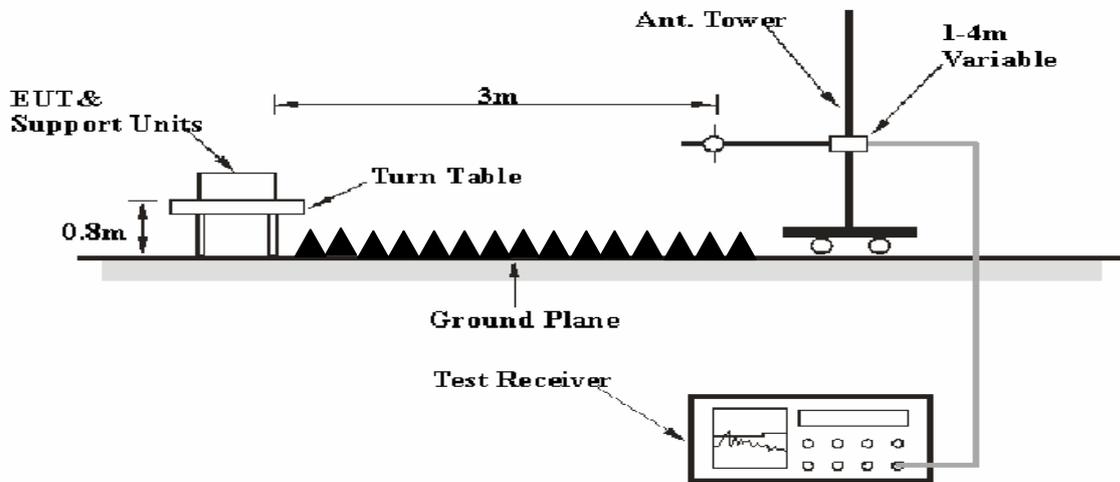
### EUT Setup

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

**EMI Test Receiver Setup**

According to FCC15.33, the system was investigated from 30 MHz to 5 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**

During the radiated emissions, the EUT was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

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 1 GHz, 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:

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

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 below the limit.

The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corr. Ampl.}$$

### Test Equipment List and Details

Manufacturer	Description	Model Number	Serial Number	Calibration Date	Calibration Due Date
EMCT	Semi-Anechoic Chamber	966	N/A	2015-4-24	2018-4-23
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2015-12-2	2016-12-1
Agilent	Amplifier	8447D	2944A10442	2015-12-2	2016-12-1
SUNOL SCIENCES	Broadband Antenna	JB3	A101808	2016-4-10	2019-4-9
Rohde & Schwarz	Spectrum Analyzer	FSL18	100180	2015-12-2	2016-12-1
HP	Amplifier	8449B	3008A00277	2015-12-2	2016-12-1
ETS	Horn Antenna	3115	0036076	2016-4-9	2019-4-8
N/A	RF Cable (below 1GHz)	NO.1	N/A	2015-11-10	2016-11-09
N/A	RF Cable (below 1GHz)	NO.3	N/A	2015-11-10	2016-11-09
N/A	RF Cable (above 1GHz)	NO.2	N/A	2015-11-10	2016-11-09

\* **Statement of Traceability:** BAACL (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.

## **Radiated Emission Test**

### **Test Environment Conditions**

Temperature:	29 °C
Relative Humidity:	68 %
ATM Pressure:	94.9 kPa

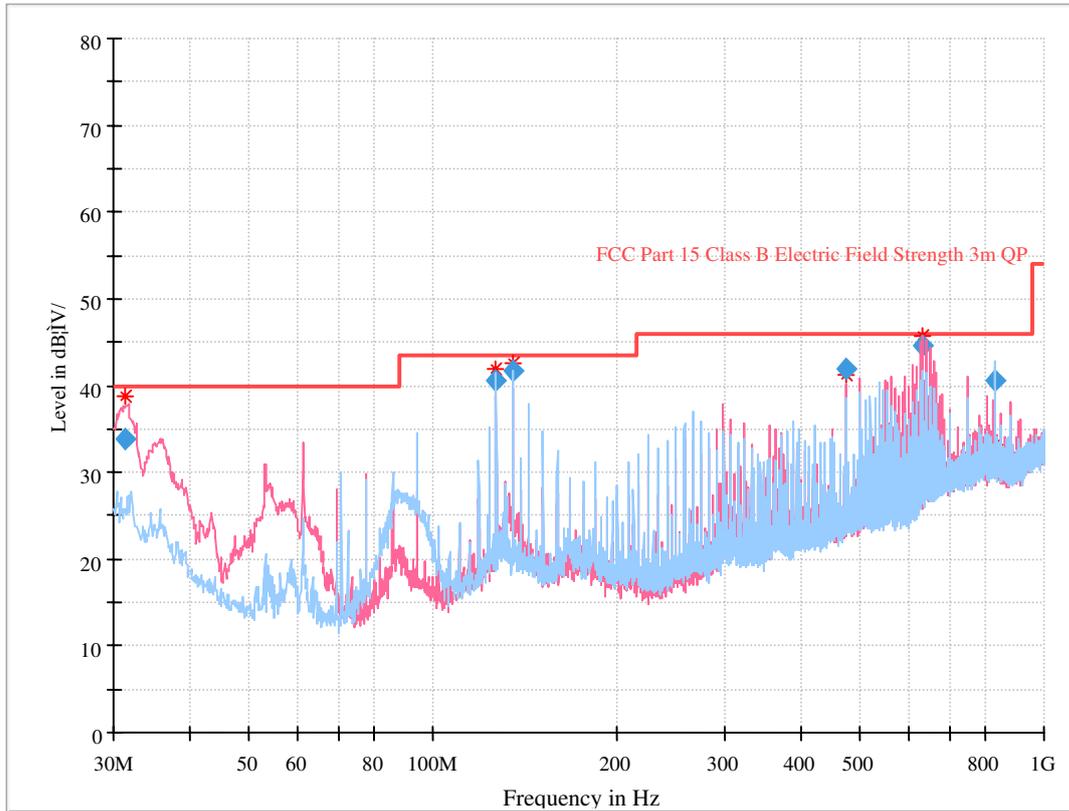
*The testing was performed by Lorin Bian on 2016-08-10.*

*Test Mode: Running (Talking+WAN+LAN+Video out+Record)*

Model Number: CooVox-U100

**Below 1 GHz:**

Electric Field Strength with Scan



Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
31.419375	33.74	120.000	100.0	V	312.0	-2.6	6.26	40.00
126.976500	40.50	120.000	270.0	H	333.0	-7.2	*3.00	43.50
135.171500	41.79	120.000	195.0	H	184.0	-7.0	*1.71	43.50
474.996625	41.82	120.000	114.0	V	193.0	-2.1	*4.18	46.00
634.879375	44.58	120.000	107.0	V	159.0	1.5	*1.42	46.00
830.689375	40.54	120.000	361.0	H	303.0	5.0	*5.46	46.00

\* Within Measurement Uncertainty

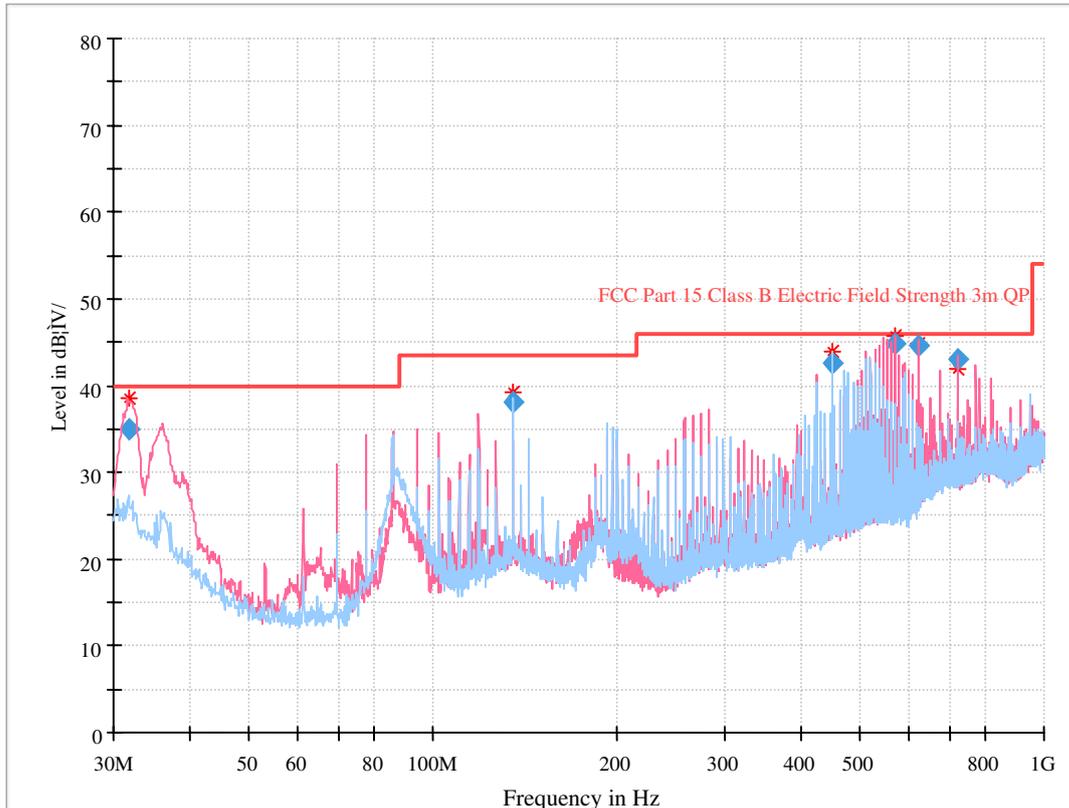
**Above 1 GHz:**

Frequency	Result	Polarity	Detector	Corrected factor	Limit	Antenna Height	Turntable Position	Margin
MHz	(dB $\mu$ V/m)	V/H	PK/Ave.	(dB)	(dB $\mu$ V/m)	(cm)	(deg)	(dB)
1902.13	52.92	V	PK	3.23	74	240	253	21.08
1902.13	25.49	V	AV	3.23	54	240	253	28.51
1901.35	47.20	H	PK	3.23	74	180	273	26.80
1901.35	26.25	H	AV	3.23	54	180	273	27.75
1113.97	40.05	H	PK	-0.46	74	240	278	33.95
1113.97	31.60	H	AV	-0.46	54	240	278	22.40
1114.07	41.61	V	PK	-0.46	74	120	355	32.39
1114.07	30.52	V	AV	-0.46	54	120	355	23.48

Model Number: CooVox-U80

**Below 1 GHz:**

Electric Field Strength with Scan



Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
31.890875	34.88	120.000	106.0	V	355.0	-2.9	5.12	40.00
135.155000	38.12	120.000	321.0	H	200.0	-7.0	5.38	43.50
449.990375	42.68	120.000	389.0	V	48.0	-2.8	3.32	46.00
569.333375	44.89	120.000	121.0	V	130.0	-0.6	*1.11	46.00
624.985750	44.61	120.000	100.0	V	209.0	0.9	*1.39	46.00
724.972750	42.94	120.000	100.0	V	185.0	3.7	*3.06	46.00

\* Within Measurement Uncertainty

**Above 1 GHz:**

Frequency	Result	Polarity	Detector	Corrected factor	Limit	Antenna Height	Turntable Position	Margin
MHz	(dB $\mu$ V/m)	V/H	PK/Ave.	(dB)	(dB $\mu$ V/m)	(cm)	(deg)	(dB)
1897.54	45.30	V	PK	3.23	74	150	267	28.70
1897.54	25.49	V	AV	3.23	54	150	267	28.51
1885.97	47.56	H	PK	3.23	74	140	209	26.44
1885.97	24.66	H	AV	3.23	54	140	209	29.34
1191.43	38.90	V	PK	-0.08	74	130	176	35.10
1191.43	31.46	V	AV	-0.08	54	130	176	22.54
1212.37	38.28	H	PK	-0.08	74	200	329	35.72
1212.37	30.30	H	AV	-0.08	54	200	329	23.70

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