



FCC PART 15 CLASS B

MEASUREMENT AND TEST REPORT

For

ZYCOO Co., LTD.

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

FCC ID: 2ADWH-COOVOXU20V2

Model Number: CooVox-U20

Report Type: Original Report	Equipment Name: IP Phone System
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The **ZYCOO Co., LTD.**'s product, model number: **CooVox-U20**, (FCC ID: **2ADWH-COOVOXU20V2**) or the "EUT" as referred to in this report was the **IP Phone System**, which has the metallic enclosure. The highest frequency was 1GHz.

Mechanical Description of EUT

The EUT was measured approximately 170 mm L x 115 mm W x 30 mm H.

Rated input voltage: DC 12V

Adapter Information:

Manufacturer: GOLDEN PROFIT

Model: GPE018A-120100-Z

Input: 100-240V AC

Output: 12V DC

**All measurement and test data in this report was gathered from final production sample, serial number: 160303005/01 (assigned by the BACL, Chengdu). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2015-12-25, and EUT conformed to test requirement.*

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 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 July 31, 2009. 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.

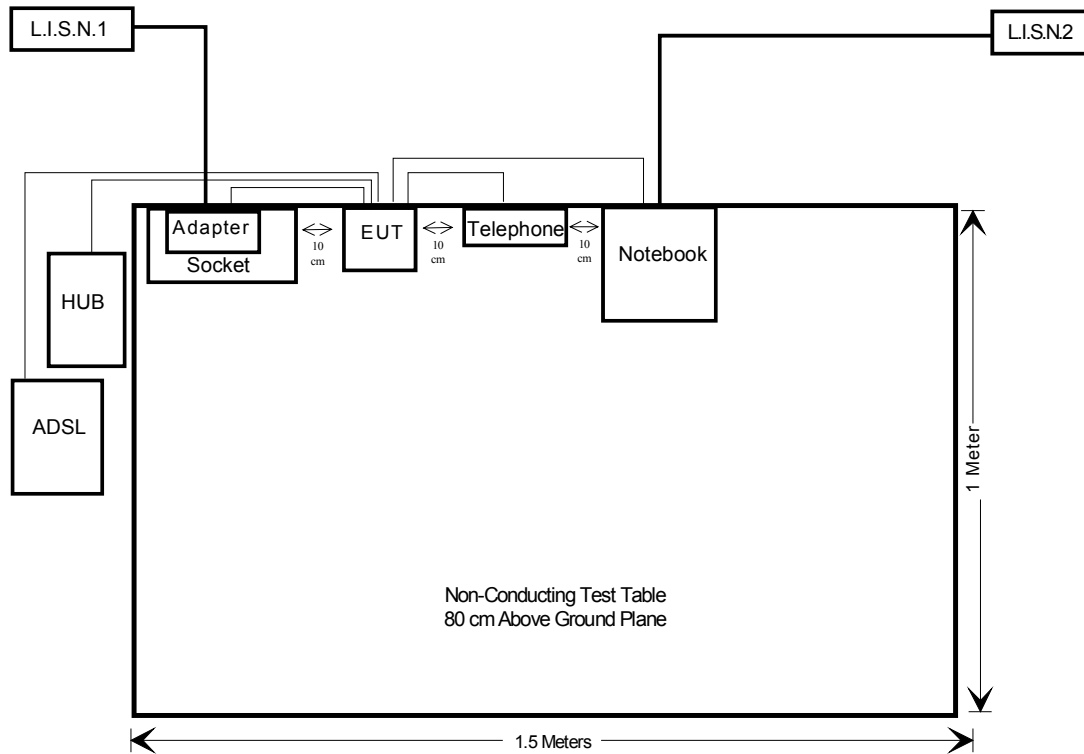
Local Support Equipment List and Details

Manufacturer	Description	Model Number	Serial Number
TP-LINK	ADSL	TD-8620T	1147103014730
DL	HUB	S10005PM	2000000839D00030
ADATA	USB DISK	NONE	NONE
SACHIKOO	TELEPHONE	HA6688T	NONE
DELL	NOTEBOOK	E6410	7480059229

External I/O Cable

Cable Description	Length (m)	From	To
Unshielded RJ11 Cable	3	EUT/RJ11 Port	ADSL
Unshielded RJ11 Cable	1.2	EUT/RJ11 Port	TELEPHONE
Unshielded RJ45 Cable	3	EUT/RJ45 Port	HUB
Unshielded RJ45 Cable	1.5	EUT/ RJ45 Port	NOTEBOOK
Power Cable	1.5	EUT/Input Port	Adapter

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

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

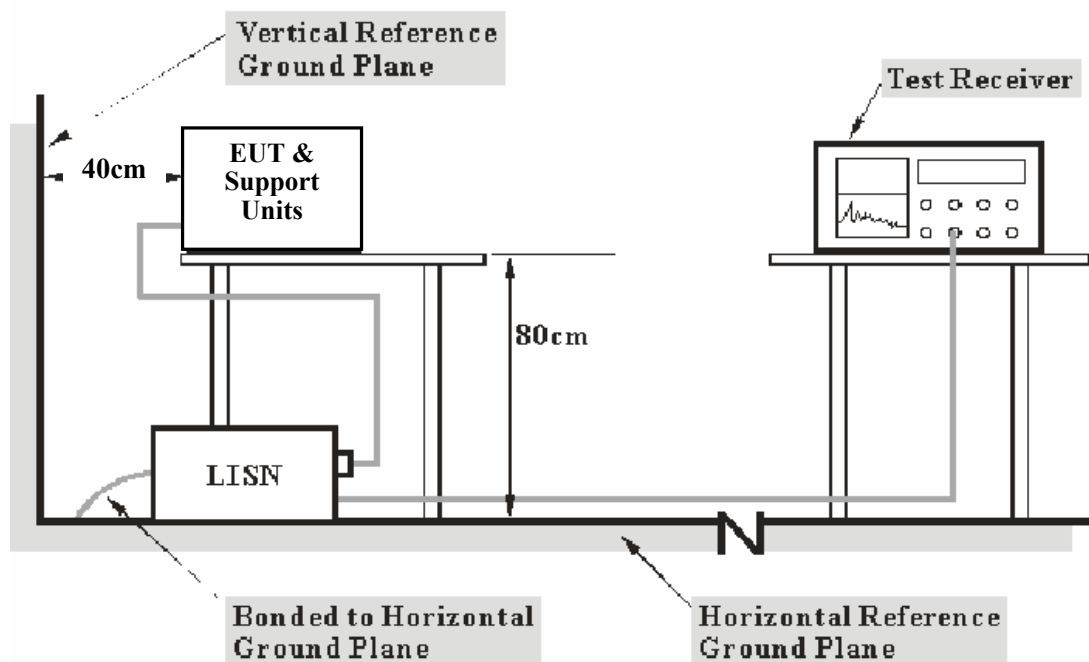
Measurement Uncertainty

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 ± 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.

DC 12V power source was provided to EUT through AC adapter.

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 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	2015-07-17	2016-07-16
N/A	Conducted Cable	NO.1	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 margin for a Class B device, with the *worst* margin reading of:

9.2 dB at 24.042076 MHz in the Neutral Phase

Conducted Emission Test Data and Plots

Test Environment Conditions

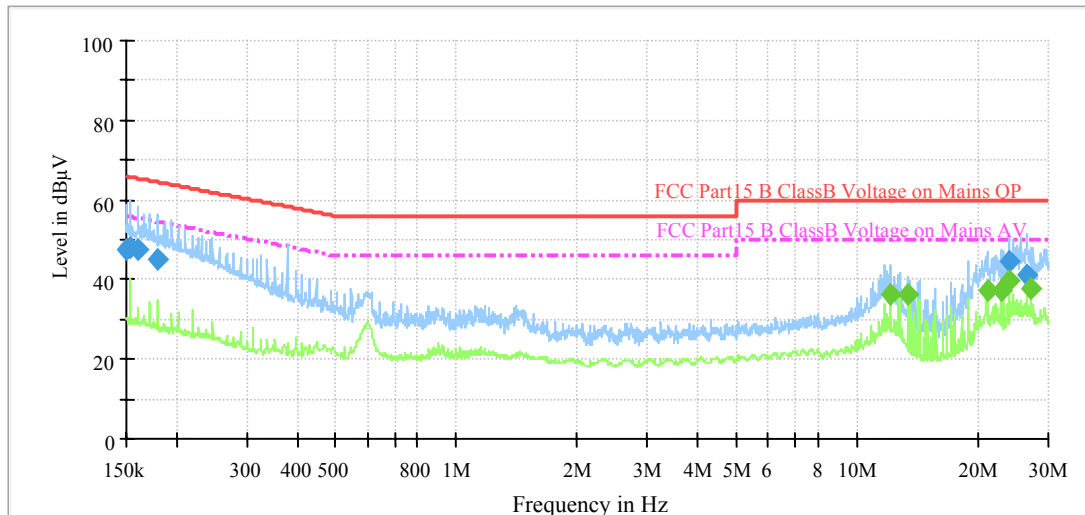
Temperature:	19 °C
Relative Humidity:	70 %
ATM Pressure:	101.1 kPa

The testing was performed by Kevin Hu on 2016-03-18.

Test Mode: Calling Mode

0.15 MHz – 30 MHz

Line



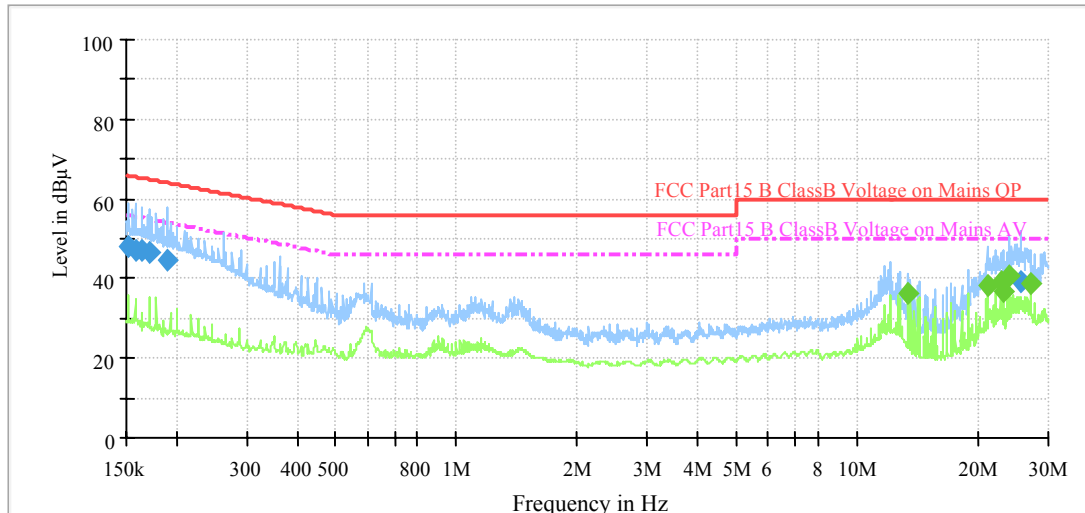
Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	47.7	9.000	L1	18.8	18.3	66.0
0.153333	47.9	9.000	L1	18.8	17.9	65.8
0.160224	47.6	9.000	L1	18.8	17.9	65.5
0.179910	45.3	9.000	L1	18.9	19.2	64.5
24.042076	44.6	9.000	L1	20.6	15.4	60.0
26.514920	41.3	9.000	L1	20.7	18.7	60.0

Frequency (MHz)	Average (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
12.139791	36.2	9.000	L1	20.3	13.8	50.0
13.415204	36.3	9.000	L1	20.4	13.7	50.0
21.113978	37.3	9.000	L1	20.6	12.7	50.0
22.825022	37.3	9.000	L1	20.6	12.7	50.0
24.042076	39.9	9.000	L1	20.6	10.1	50.0
27.158324	38.0	9.000	L1	20.7	12.0	50.0

* Within Measurement Uncertainty

0.15 MHz – 30 MHz

Neutral



Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.151809	47.9	9.000	N	18.8	18.0	65.9
0.157998	47.1	9.000	N	18.8	18.5	65.6
0.164440	46.8	9.000	N	18.8	18.4	65.2
0.171486	46.5	9.000	N	18.8	18.4	64.9
0.190261	44.4	9.000	N	18.8	19.6	64.0
25.680695	39.0	9.000	N	20.6	21.0	60.0

Frequency (MHz)	Average (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
13.415204	36.2	9.000	N	20.4	13.8	50.0
21.113978	38.4	9.000	N	20.6	11.6	50.0
22.825022	39.2	9.000	N	20.6	10.8	50.0
23.192789	36.7	9.000	N	20.6	13.3	50.0
24.042076	40.8	9.000	N	20.6	9.2	50.0
27.158324	38.7	9.000	N	20.7	11.3	50.0

FCC §15.109 RADIATED EMISSION TEST

Applicable Standard

FCC §15.109

Measurement Uncertainty

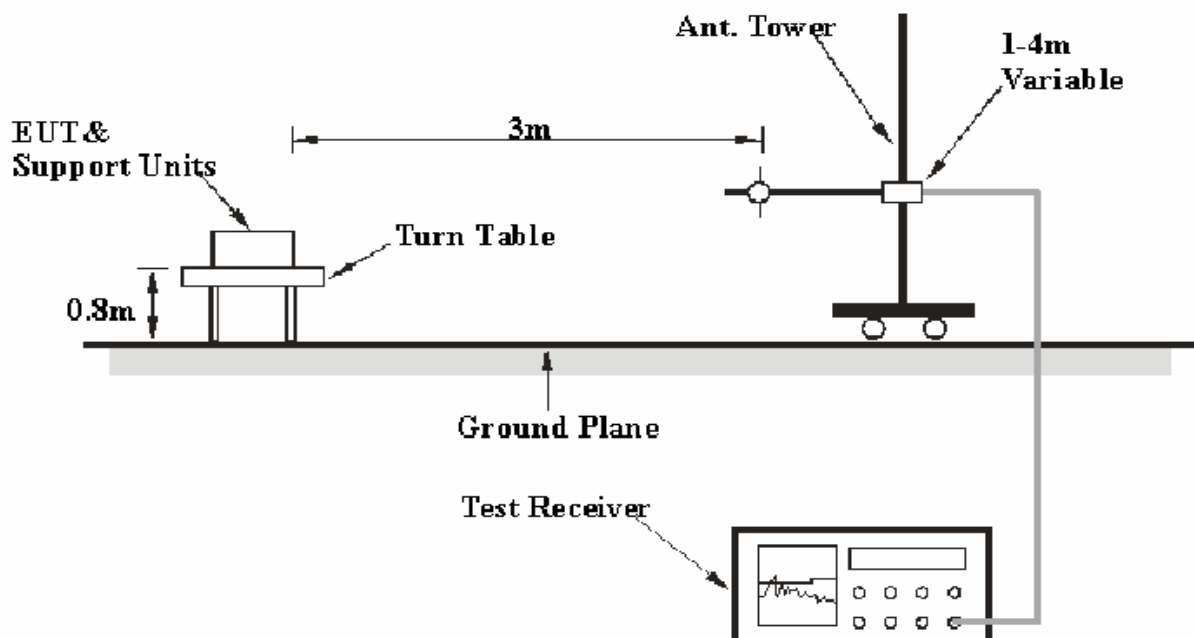
All measurements involve certain levels of uncertainties, especially in the field of EMI. The factors contributing to uncertainties are EMI Test Receiver, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor 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: ± 4.7 dB ; 200M~1GHz: ± 6.0 dB ; 1G-6GHz: ± 5.13 dB.

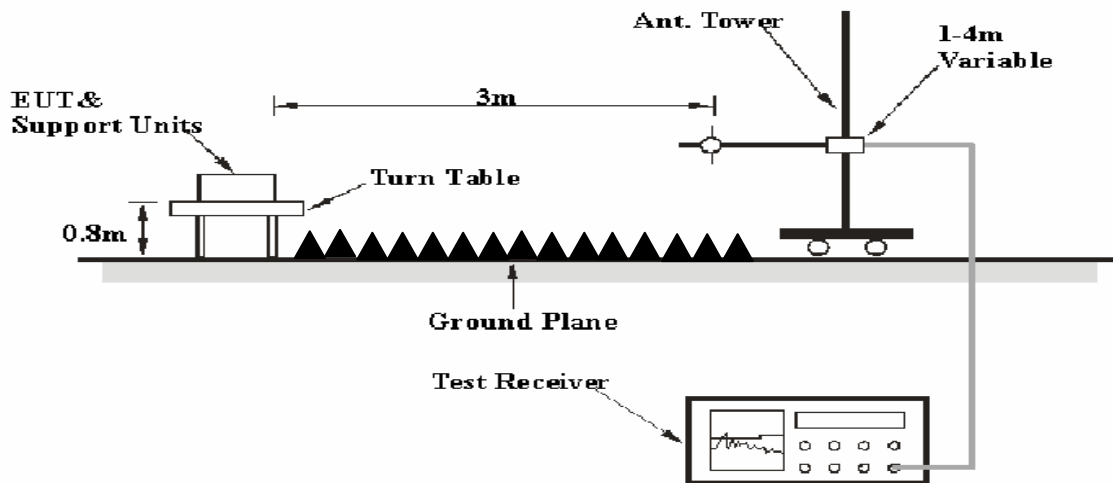
EUT Setup

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.

DC 12V power source was provided to EUT through AC adapter.

EMI Test Receiver Setup

According to FCC Rules, the highest frequency in the device is 1 GHz, so the frequency range to be tested 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

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 μ 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	2013-04-10	2016-04-09
Rohde & Schwarz	Spectrum Analyzer	FSL18	100180	2013-12-02	2016-12-01
EM TEST	Horn Antenna	3115	003-6076	2013-04-09	2016-04-08
Mini-circuits	Amplifier	ZVA-183-S+	771001215	2013-04-09	2016-04-08
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.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:** 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, and had the worst margin of:

2.4 dB at 819.189400 MHz in the Vertical polarization

Radiated Emission Test

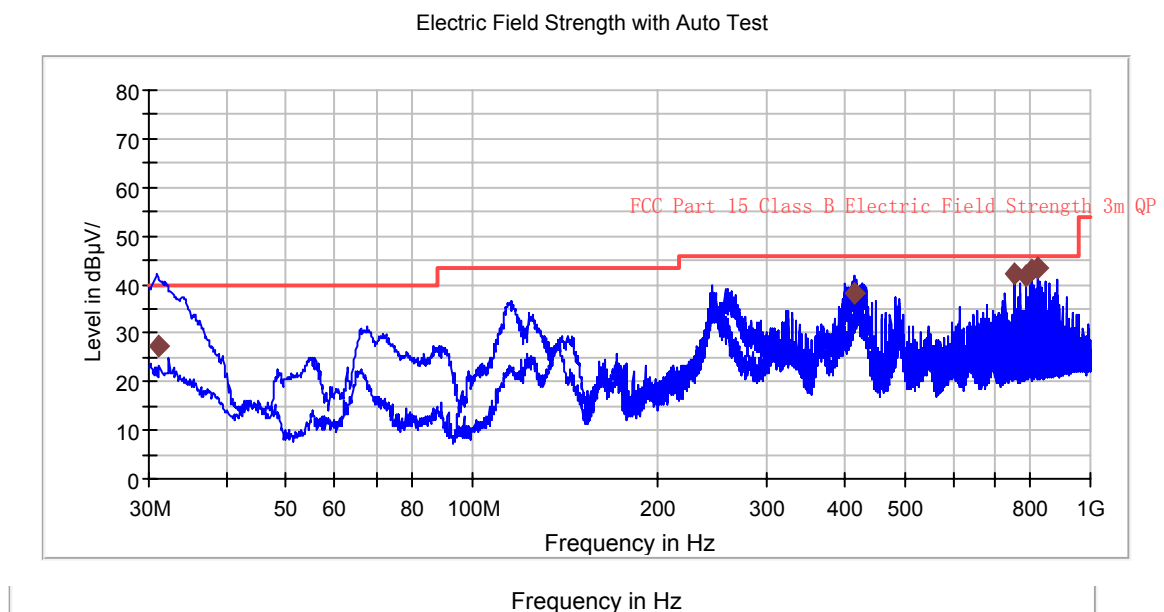
Test Environment Conditions

Temperature:	19 °C
Relative Humidity:	68 %
ATM Pressure:	101.3 kPa

The testing was performed by Kevin Hu on 2016-03-18.

Test Mode: Calling Mode

Below 1 GHz:



Frequency (MHz)	QuasiPeak (dB µ V/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dBµ V/m)	Margin (dB)	Limit (dB µ V/m)
31.012750	27.2	120.000	175.0	V	98.0	-6.2	12.8	40.0
414.223500	38.1	120.000	100.0	H	89.0	-10.2	7.9	46.0
753.660700	42.0	120.000	100.0	H	298.0	-4.8	*4.0	46.0
786.431500	41.9	120.000	100.0	V	11.0	-4.4	*4.1	46.0
802.799800	43.0	120.000	200.0	V	20.0	-4.2	*3.0	46.0
819.189400	43.6	120.000	175.0	V	11.0	-4.1	*2.4	46.0

* Within Measurement Uncertainty

Above 1 GHz:

Frequency	Result	Polarity	Detector	Corrected factor	Limit	Antenna Height	Turntable Position	Margin
MHz	(dBµV/m)	V/H	PK/Ave.	(dBµV/m)	(dBµV/m)	(cm)	(deg)	(dB)
1150.000	50.49	V	PK	0.36	74	100	156	23.51
1150.000	30.78	V	AV	0.36	54	100	156	23.22
1895.000	51.08	V	PK	0.95	74	110	183	22.92
1895.000	30.16	V	AV	0.95	54	110	183	23.84
4550.000	51.21	H	PK	8.58	74	100	215	22.79
4550.000	30.15	H	AV	8.58	54	100	215	23.85

Test Result: Compliance

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