



# FCC PART 15C TEST REPORT

For

## AKUVOX (XIAMEN) NETWORKS CO., LTD.

10/F, No.56, Software Park II , Xiamen, China

**FCC ID: 2AHCR-R27A**

<b>Report Type:</b> Original Report	<b>Product Name:</b> Door Phone
<b>Report Number:</b>	RXM180705054-00A
<b>Report Date:</b>	2018-08-28
<b>Reviewed By:</b>	Jerry Zhang EMC Manager <i>Jerry Zhang</i>
<b>Test Laboratory:</b>	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 <a href="http://www.baclcorp.com.cn">www.baclcorp.com.cn</a>

**Note:** This test report is 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. (Dongguan). This report must not be used by the customer to claim product certification, approval, or endorsement by A2LA\* or any agency of the Federal Government. \* This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk “\*” .

**TABLE OF CONTENTS**

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

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

    OBJECTIVE .....3

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

    TEST METHODOLOGY .....3

    MEASUREMENT UNCERTAINTY .....4

    TEST FACILITY .....4

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

    JUSTIFICATION .....5

    EUT EXERCISE SOFTWARE .....5

    SUPPORT EQUIPMENT LIST AND DETAILS .....5

    SUPPORT CABLE LIST AND DETAILS .....5

    BLOCK DIAGRAM OF TEST SETUP .....6

**SUMMARY OF TEST RESULTS .....7**

**FCC§15.203 - ANTENNA REQUIREMENT.....8**

    APPLICABLE STANDARD .....8

    ANTENNA CONNECTED CONSTRUCTION .....8

**FCC §15.207 – AC LINE CONDUCTED EMISSION .....9**

    EUT SETUP .....9

    EMI TEST RECEIVER SETUP.....9

    TEST EQUIPMENT LIST AND DETAILS.....10

    TEST PROCEDURE .....10

    CORRECTED AMPLITUDE & MARGIN CALCULATION .....10

    TEST RESULTS SUMMARY .....11

    TEST DATA .....11

**FCC§15.225, §15.205 & §15.209 - RADIATED EMISSIONS TEST .....16**

    APPLICABLE STANDARD .....16

    EUT SETUP .....17

    EMI TEST RECEIVER SETUP.....17

    CORRECTED AMPLITUDE & MARGIN CALCULATION .....17

    TEST EQUIPMENT LIST AND DETAILS.....18

    TEST RESULTS SUMMARY .....18

    TEST DATA .....18

**FCC§15.225(E) - FREQUENCY STABILITY.....24**

    APPLICABLE STANDARD .....24

    TEST PROCEDURE .....24

    TEST EQUIPMENT LIST AND DETAILS.....24

    TEST DATA .....24

**FCC §15.215(C) – 20 DB EMISSION BANDWIDTH.....26**

    APPLICABLE STANDARD .....26

    TEST PROCEDURE .....26

    TEST EQUIPMENT LIST AND DETAILS.....26

    TEST DATA .....27

## GENERAL INFORMATION

---

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

<b>EUT Name:</b>	Door Phone
<b>EUT Model:</b>	R27A
<b>FCC ID:</b>	2AHCR-R27A
<b>Rated Input Voltage:</b>	DC 12V from DC port or DC 12V from PoE port
<b>External Dimension:</b>	280mm(L)*130mm(W)*38mm(H)
<b>Serial Number:</b>	180705054
<b>EUT Received Date:</b>	2018.07.10

### Objective

This Type approval report is prepared on behalf of *AKUVOX (XIAMEN) NETWORKS CO., LTD.* in accordance with Part 2, Subpart J, and Part 15, Subparts A and C of the Federal Communications Commission's rules.

The objective is to determine the compliance of the EUT with FCC rules, sec 15.203, 15.205, 15.207, 15.209, 15.215 and 15.225.

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

N/A

### Test Methodology

All measurements detailed in this Test Report were performed in accordance with ANSI C63.10-2013 "American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices".

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

**Measurement Uncertainty**

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
radiated Emissions	9kHz~30MHz: 4.12dB 30M~200MHz: 4.55 dB, 200M~1GHz: 5.92 dB
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

**Test Facility**

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062D.

## SYSTEM TEST CONFIGURATION

### Justification

The system was configured for testing in a test mode

The device operates in 125 kHz and 13.56 MHz simultaneously for RFID detection.

### EUT Exercise Software

No software used in test.

### Support Equipment List and Details

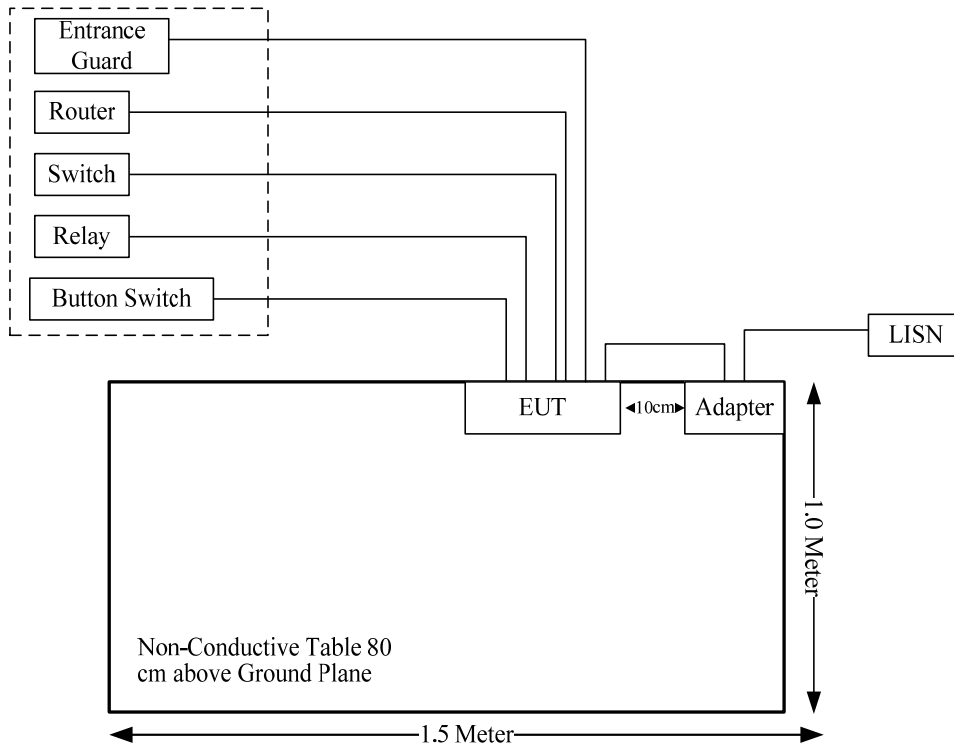
Manufacturer	Description	Model	Serial Number
L.T.E.	AC/DC Adapter	G0548B-480-050	N/A
HUAWEI	PoE Adapter	HW-120200U6W	N/A
RSD	Button Switch	KCD1	N/A
Lotus	Entrance Guard	L8MF-W	N/A
Schneider	Relay	RXM2LB2BD	N/A
TP-LINK	Switch	TL-SF1008P	114A297001782
Tenda	Router	D301	E3941017710003629

### Support Cable List and Details

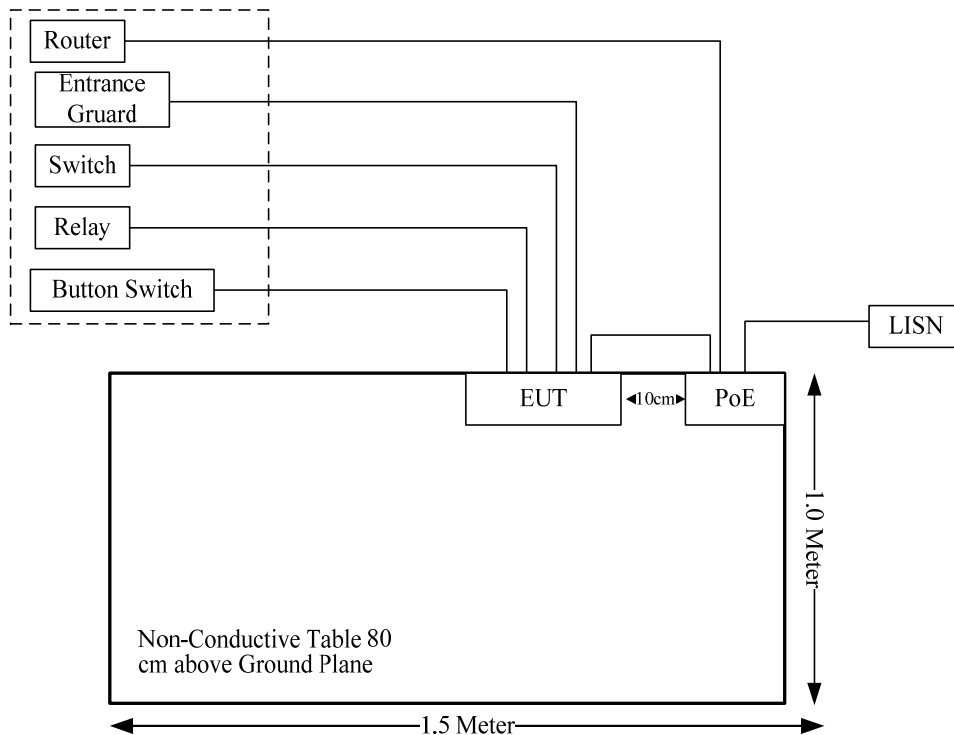
Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
RJ45 Cable	No	No	5	EUT or PoE	router
Signal Cable	No	No	5	EUT	Button Switch
Signal Cable	No	No	5	EUT	Entrance Guard
RS485 Cable	No	No	5	EUT	Switch
Signal Cable	No	No	5	EUT	Relay
RJ45 Cable	No	No	1	EUT	PoE

### Block Diagram of Test Setup

#### AC/DC Adapter supply



#### PoE supply



**SUMMARY OF TEST RESULTS**

<b>FCC Rules</b>	<b>Description of Test</b>	<b>Result</b>
§15.203	Antenna Requirement	Compliance
§15.207	AC Line Conducted Emission	Compliance
§15.225 §15.209 §15.205	Radiated Emission Test	Compliance
§15.225(e)	Frequency Stability	Compliance
§15.215(c)	20 dB Emission Bandwidth	Compliance

---

## **FCC§15.203 - ANTENNA REQUIREMENT**

---

### **Applicable Standard**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

### **Antenna Connected Construction**

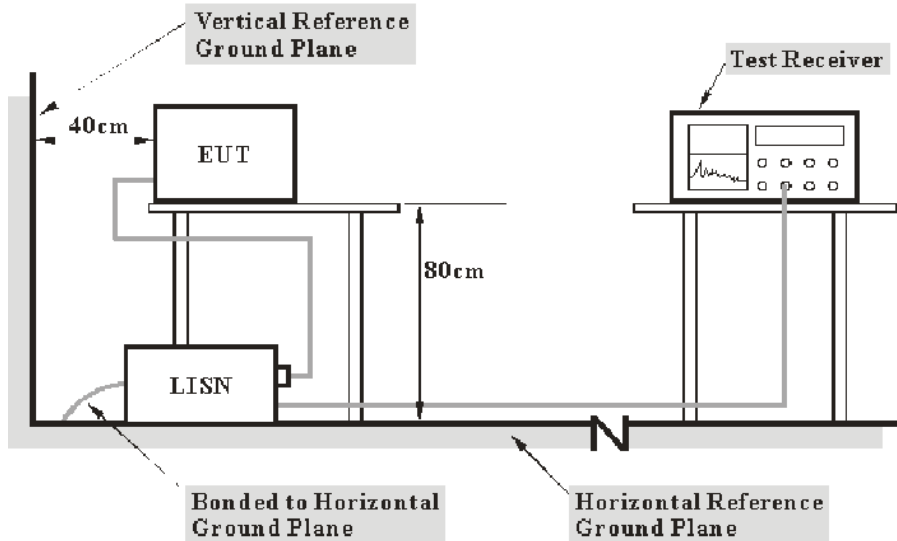
The EUT has two integral antenna arrangement, one for 13.56MHz, one for 125kHz, which was permanently attached and fulfill the requirement of this section. Please refer to the EUT photos.

**Result:** Compliance.



**FCC §15.207 – AC LINE CONDUCTED EMISSION**

**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 setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

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

The spacing between the peripherals was 10 cm.

The adapter was connected to the main LISN with an 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2017-12-11	2018-12-11
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-01	2017-09-05	2018-09-05
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A
R&S	Two-line V-network	ENV 216	101614	2017-12-08	2018-12-08

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

### Test Procedure

During the conducted emission test, the adapter or POE was connected to the outlet of the LISN.

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

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

According FCC publication number 174176, for a device with a permanent antenna operating at or below 30 MHz, the measurements done with a suitable dummy load, in lieu of the permanent antenna under the following conditions: (1) perform the AC line conducted tests with the permanent antenna to determine compliance with the Section 15.207 limits outside the transmitter's fundamental emission band; (2) retest with a dummy load in lieu of the permanent antenna to determine compliance with the Section 15.207 limits within the transmitter's fundamental emission band.

### Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

Herein,

$V_C$ : corrected voltage amplitude

$V_R$ : reading voltage amplitude

$A_C$ : 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 Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

### Test Data

#### Environmental Conditions

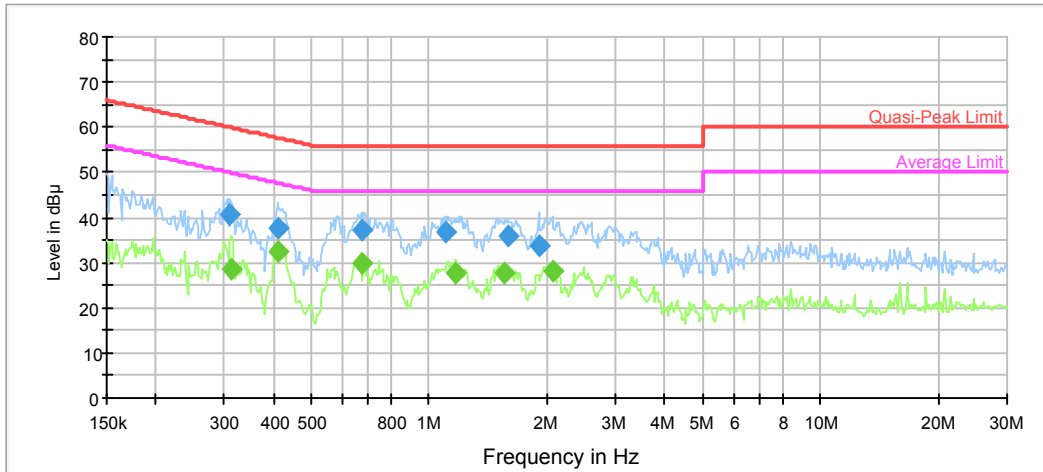
<b>Temperature:</b>	28.2 °C
<b>Relative Humidity:</b>	58 %
<b>ATM Pressure:</b>	100 kPa

*The testing was performed by Sider Huang on 2018-07-25.*

**Test mode: Transmitting**

Test Mode: AC/DC Adapter supply

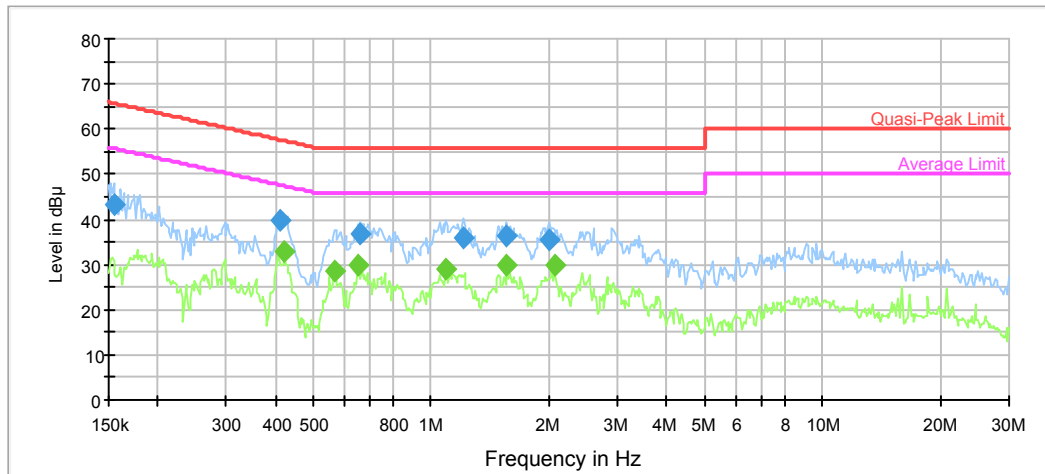
AC 120V, 60 Hz, Line:



Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.309742	41.5	9.000	L1	10.1	19.8	61.3	Compliance
0.409372	38.0	9.000	L1	10.0	20.0	58.0	Compliance
0.670921	38.1	9.000	L1	9.8	17.9	56.0	Compliance
1.099574	37.7	9.000	L1	9.8	18.3	56.0	Compliance
1.586387	36.8	9.000	L1	9.7	19.2	56.0	Compliance
1.905466	34.6	9.000	L1	9.7	21.4	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.312220	28.9	9.000	L1	10.1	21.5	50.4	Compliance
0.409372	33.4	9.000	L1	10.0	15.8	49.2	Compliance
0.670921	31.0	9.000	L1	9.8	15.0	46.0	Compliance
1.171949	28.9	9.000	L1	9.8	17.1	46.0	Compliance
1.561306	28.6	9.000	L1	9.7	17.4	46.0	Compliance
2.080018	29.1	9.000	L1	9.7	16.9	46.0	Compliance

**AC120 V, 60 Hz, Neutral:**

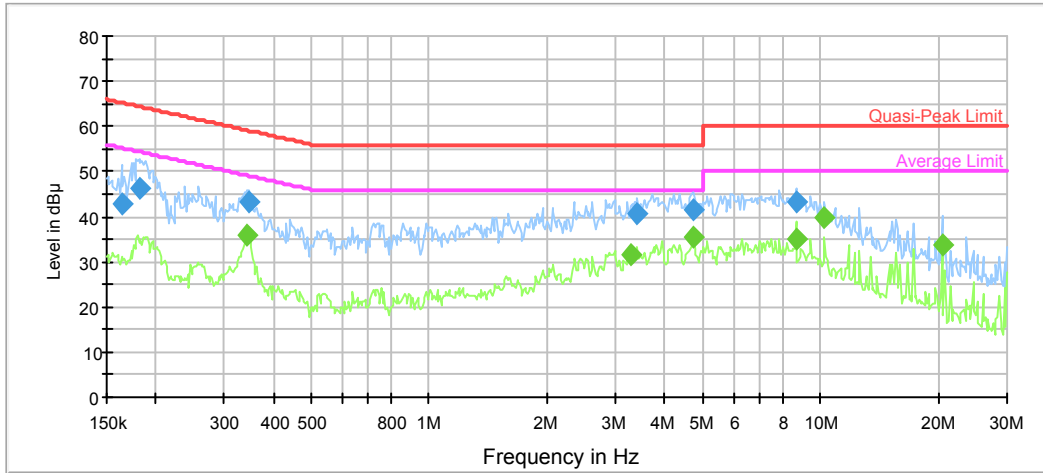


Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.154858	44.1	9.000	N	11.1	23.0	67.1	Compliance
0.409372	40.0	9.000	N	10.0	17.8	57.8	Compliance
0.660314	35.8	9.000	N	9.8	20.2	56.0	Compliance
1.209904	35.0	9.000	N	9.8	21.0	56.0	Compliance
1.561306	35.3	9.000	N	9.7	20.7	56.0	Compliance
1.998778	34.9	9.000	N	9.7	21.1	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.422630	33.0	9.000	N	9.9	14.7	47.7	Compliance
0.567545	27.4	9.000	N	9.8	18.6	46.0	Compliance
0.649874	28.8	9.000	N	9.8	17.2	46.0	Compliance
1.090848	28.0	9.000	N	9.8	18.0	46.0	Compliance
1.561306	28.7	9.000	N	9.7	17.3	46.0	Compliance
2.063510	29.8	9.000	N	9.8	16.2	46.0	Compliance

Test Mode: PoE Power supply

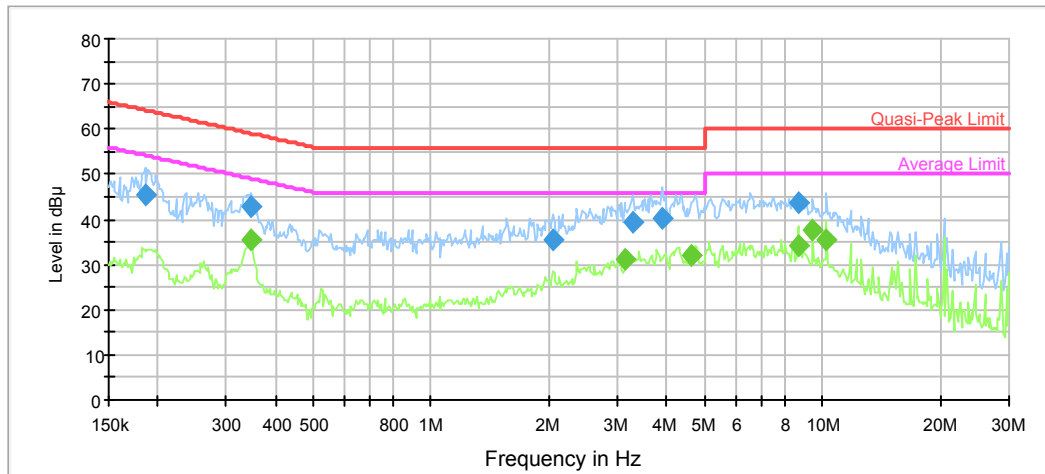
AC 120V, 60 Hz, Line:



Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.163741	43.9	9.000	L1	11.0	22.9	66.8	Compliance
0.181612	46.4	9.000	L1	10.8	18.2	64.6	Compliance
0.346296	43.4	9.000	L1	10.0	15.7	59.1	Compliance
3.408946	40.5	9.000	L1	9.8	15.5	56.0	Compliance
4.726090	41.6	9.000	L1	9.8	14.4	56.0	Compliance
8.659691	42.4	9.000	L1	9.9	17.6	60.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.343548	34.8	9.000	L1	10.1	13.0	47.8	Compliance
3.275801	30.5	9.000	L1	9.8	15.5	46.0	Compliance
4.726090	35.0	9.000	L1	9.8	11.0	46.0	Compliance
8.659691	34.1	9.000	L1	9.9	15.9	50.0	Compliance
10.237020	39.0	9.000	L1	9.9	11.0	50.0	Compliance
20.475752	34.8	9.000	L1	10.1	14.2	50.0	Compliance

**AC120 V, 60 Hz, Neutral:**



Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.186006	46.2	9.000	N	10.7	17.8	64.0	Compliance
0.346296	43.2	9.000	N	10.0	16.0	59.2	Compliance
2.047133	35.8	9.000	N	9.8	20.2	56.0	Compliance
3.275801	39.7	9.000	N	9.8	16.3	56.0	Compliance
3.903455	40.1	9.000	N	9.8	15.9	56.0	Compliance
8.659691	43.2	9.000	N	9.9	16.8	60.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.346296	35.0	9.000	N	10.0	13.9	48.9	Compliance
3.147856	31.4	9.000	N	9.8	14.6	46.0	Compliance
4.651370	32.0	9.000	N	9.8	14.0	46.0	Compliance
8.659691	34.0	9.000	N	9.9	16.0	50.0	Compliance
9.452969	36.8	9.000	N	9.9	13.2	50.0	Compliance
10.237020	35.0	9.000	N	9.9	15.0	50.0	Compliance

**FCC§15.225, §15.205 & §15.209 - RADIATED EMISSIONS TEST**

**Applicable Standard**

FCC Part 15.205, 15.209, 15.225

- (a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

As per FCC Part 15.209

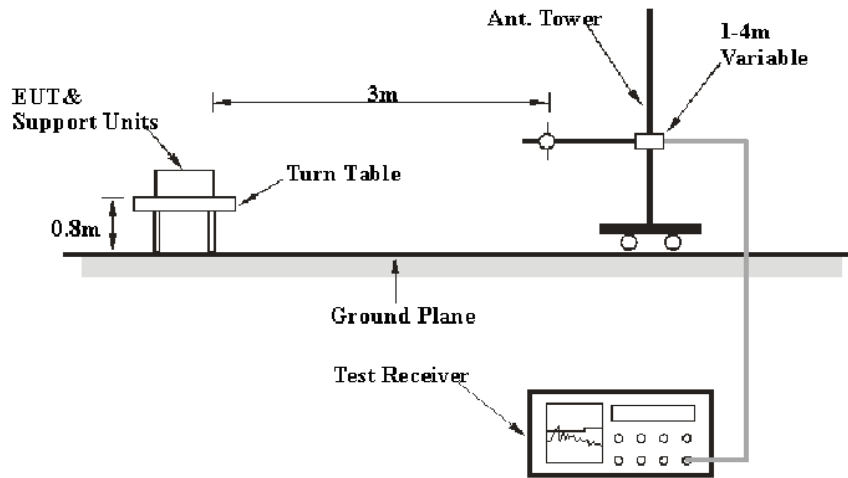
(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

\*\*Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.



**EUT Setup**



The radiated emission tests were performed in the 10-meter chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part Subpart C limits.

The spacing between the peripherals was 10 cm.

**EMI Test Receiver Setup**

The system was investigated from 9 kHz to 1 GHz.

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

Frequency Range	RBW	Video B/W	Measurement
9 kHz – 150 kHz	200 Hz	1 kHz	QP
150 kHz – 30 MHz	9 kHz	30 kHz	QP
30 MHz – 1000 MHz	120 kHz	300 kHz	QP

If the maximized peak measured value complies with the limit, then it is unnecessary to perform an QP/Average measurement

**Corrected Amplitude & Margin Calculation**

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

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

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:

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

**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
R&S	EMI Test Receiver	ESCI	100224	2017-12-11	2018-12-11
HP	Amplifier	8447D	2727A05902	2017-09-05	2018-09-05
EMCO	Passive Loop	6512	9706-1206	2017-03-05	2020-03-04
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2017-09-05	2018-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2017-09-05	2018-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2017-09-05	2018-09-05
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A

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

**Test Results Summary**

According to the data in the following table, the EUT complied with the FCC Part 15.209&15.225.

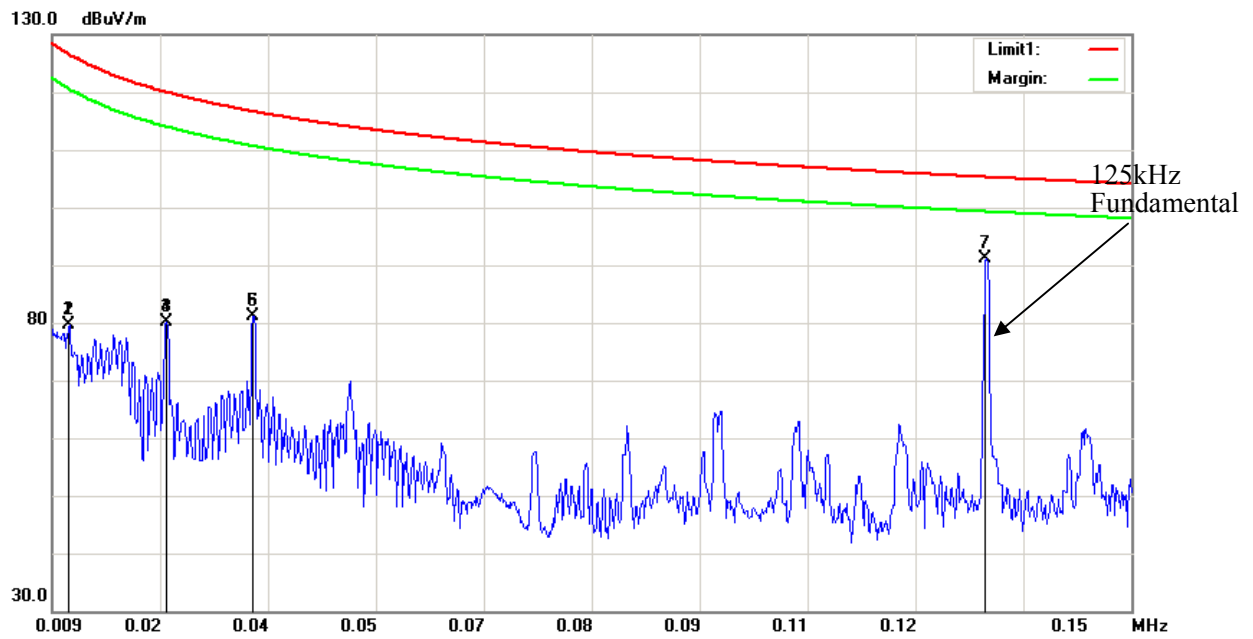
**Test Data****Environmental Conditions**

<b>Temperature:</b>	26.8~27.2 °C
<b>Relative Humidity:</b>	40~41 %
<b>ATM Pressure:</b>	99.5~99.9 kPa

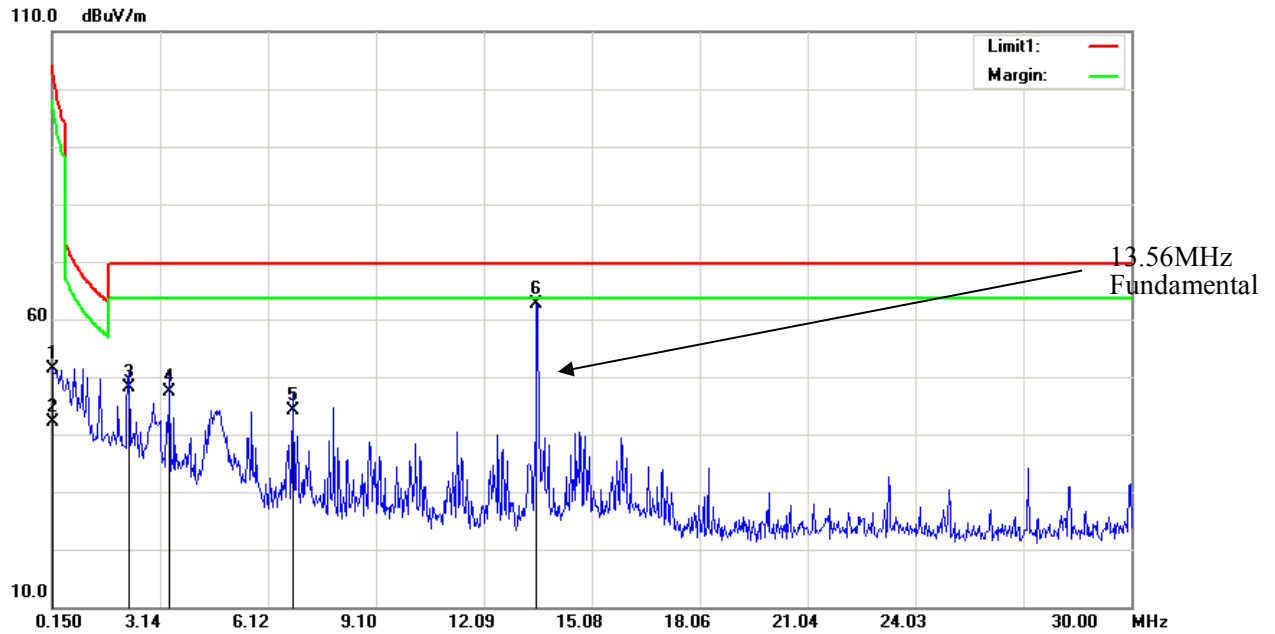
\* *The testing was performed by Vern Shen from 2018-07-23 to 2018-07-24.*

*Test mode: Transmitting(AC/DC Adapter supply was the worst)*

1) 9 kHz~30MHz:

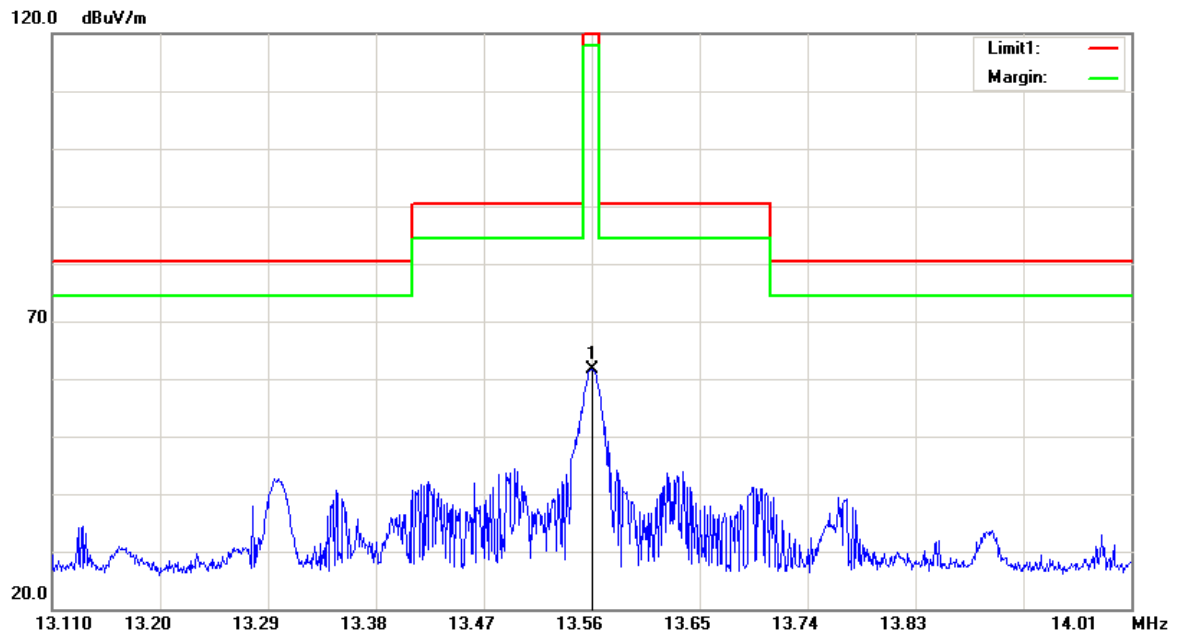


Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
0.0111	-8.18	peak	87.72	79.54	126.70	47.16
0.0240	1.14	peak	78.97	80.11	120.00	39.89
0.0352	5.24	peak	75.94	81.18	116.67	35.49
0.125	26.28	peak	64.97	91.25	105.66	14.41



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
0.1500	12.67	peak	38.68	51.35	104.08	52.73
2.2694	32.80	peak	15.40	48.20	69.54	21.34
3.4037	34.60	peak	12.70	47.30	69.54	22.24
6.8066	34.00	peak	10.20	44.20	69.54	25.34

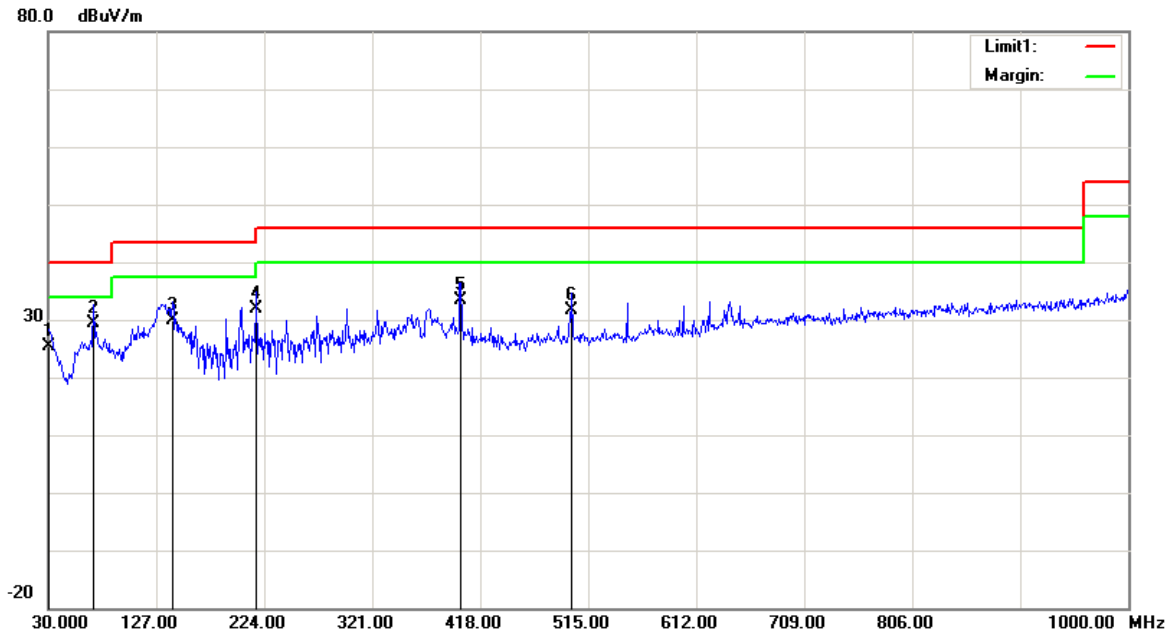
Fundamental:



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
13.5600	52.33	peak	9.29	61.62	124.00	62.38

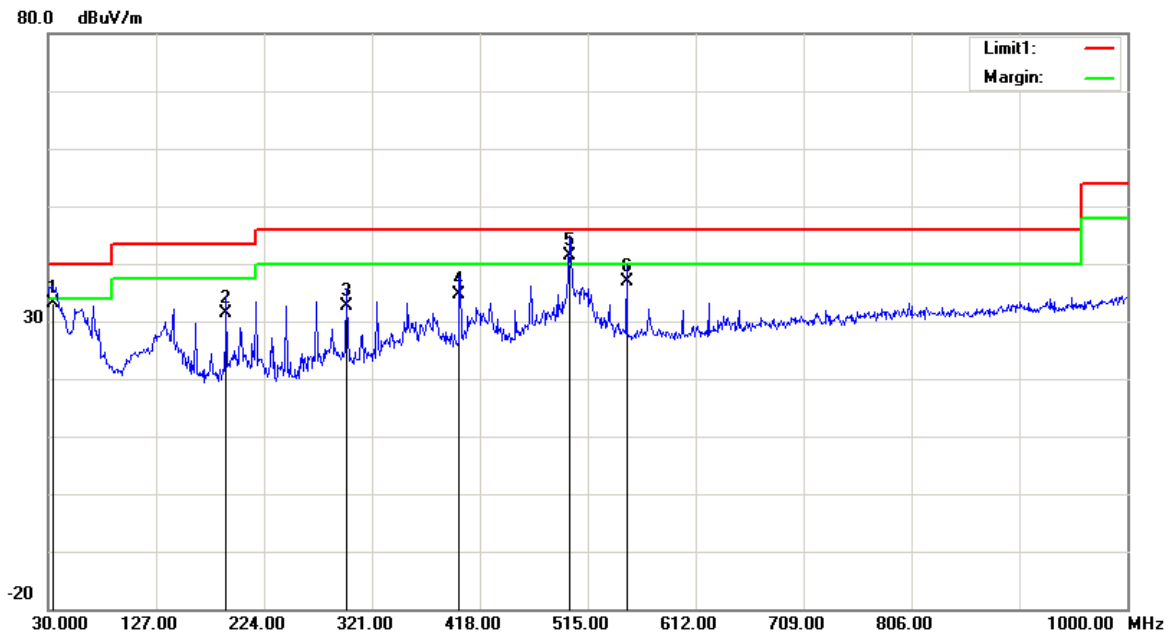
2) Above 30 MHz

Horizontal



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
30.9700	24.58	QP	0.82	25.40	40.00	14.60
70.7400	40.82	QP	-11.32	29.50	40.00	10.50
141.5500	35.93	QP	-5.93	30.00	43.50	13.50
217.2100	39.00	QP	-7.10	31.90	46.00	14.10
400.5400	35.39	QP	-1.99	33.40	46.00	12.60
500.4500	31.91	QP	-0.31	31.60	46.00	14.40

**Vertical**



No.	Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Detector	Correction Factor (dB/m)	Cord. Amp. (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
1	34.8500	35.24	QP	-2.04	33.20	40.00	6.80
2	190.0500	38.65	QP	-7.35	31.30	43.50	12.20
3	297.7200	36.84	QP	-4.14	32.70	46.00	13.30
4	399.5700	36.71	QP	-2.01	34.70	46.00	11.30
5	498.5100	41.82	QP	-0.32	41.50	46.00	4.50
6	549.9200	36.70	QP	0.20	36.90	46.00	9.10

## FCC§15.225(e) - FREQUENCY STABILITY

### Applicable Standard

The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01\%$  of the operating frequency over a temperature variation of  $-20$  degrees to  $+50$  degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

### Test Procedure

Frequency Stability vs. Temperature: The adapter under test was connected to an external AC power.

The EUT was placed inside the temperature chamber.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the Spectrum Analyzer.

Frequency Stability vs. Voltage: An external variable AC or DC power supply Source connected to the EUT or EUT adapter. Test the frequency output in the extremity voltage.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2017-12-11	2018-12-11
HP	Amplifier	8447D	2727A05902	2017-09-05	2018-09-05
EMCO	Passive Loop	6512	9706-1206	2017-03-05	2020-03-04
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2017-09-05	2018-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2017-09-05	2018-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2017-09-05	2018-09-05
UNI-T	Multimeter	UT39A	M130199938	2018-05-09	2019-05-09
Dongzhixu	High Temperature Test Chamber	DP1000	201105083-4	2017-08-28	2018-08-28
Schneider	AC Power Supply	YF6005	005	N/A	N/A
Pro instrument	DC Power Supply	pps3300	N/A	N/A	N/A

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

### Test Data

#### Environmental Conditions

Temperature:	26.8 °C
Relative Humidity:	41 %
ATM Pressure:	99.5 kPa

\* The testing was performed by Vern Shen on 2018-07-23.



Test Mode: Transmitting

Test Result: Pass

POE adapter:

f <sub>0</sub> = 13.56 MHz				
Temperature	Voltage	Measured frequency	Frequency Error	Limit
°C	V <sub>AC</sub>	MHz	Hz	Hz
-20	120V	13.56010	100	±1356
-10		13.56010	100	±1356
0		13.56010	100	±1356
10		13.56010	100	±1356
20		13.56008	80	±1356
25		13.56008	80	±1356
30		13.56008	80	±1356
40		13.56012	120	±1356
50		13.56013	130	±1356
60		13.56013	130	±1356
25		102	13.56013	130
25	138	13.56015	150	±1356

DC Port input:

f <sub>0</sub> = 13.56 MHz				
Temperature	Voltage	Measured frequency	Frequency Error	Limit
°C	V <sub>DC</sub>	MHz	Hz	Hz
-20	12V	13.56008	80	±1356
-10		13.56007	70	±1356
0		13.56008	80	±1356
10		13.56009	90	±1356
20		13.56008	80	±1356
25		13.56007	70	±1356
30		13.56006	60	±1356
40		13.56011	110	±1356
50		13.56012	120	±1356
60		13.56013	130	±1356
25		9.0	13.56012	120
25	15.0	13.56012	120	±1356

Note: Operation voltage range declared by manufacturer.

## **FCC §15.215(c) – 20 dB EMISSION BANDWIDTH**

### **Applicable Standard**

Per FCC §15.215 (c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §15.217 through § 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

### **Test Procedure**

Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.

### **Test Equipment List and Details**

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>	<b>Calibration Due Date</b>
R&S	EMI Test Receiver	ESCI	100224	2017-12-11	2018-12-11
HP	Amplifier	8447D	2727A05902	2017-09-05	2018-09-05
EMCO	Passive Loop	6512	9706-1206	2017-03-05	2020-03-04
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2017-09-05	2018-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2017-09-05	2018-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2017-09-05	2018-09-05

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

**Test Data****Environmental Conditions**

<b>Temperature:</b>	26.8~27.2 °C
<b>Relative Humidity:</b>	40~41 %
<b>ATM Pressure:</b>	99.5~99.9 kPa

*\* The testing was performed by Vern Shen on 2018-07-24&2018-08-28.*

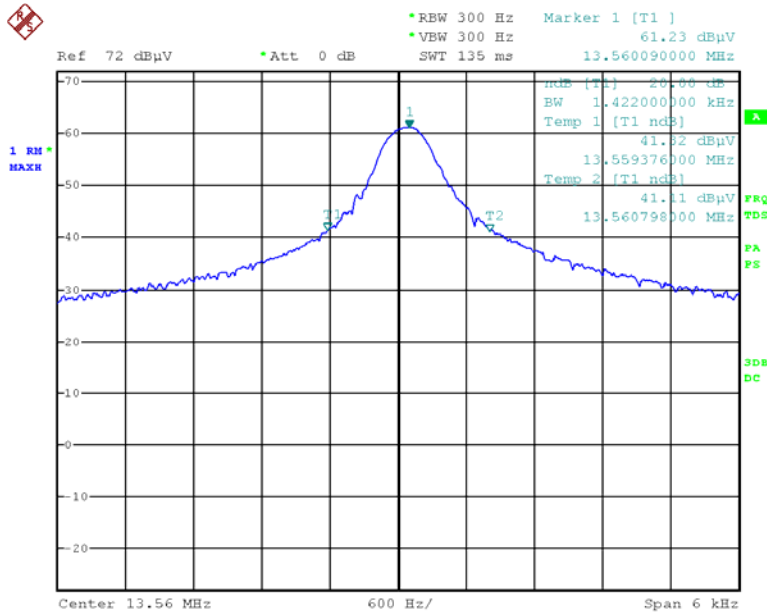
**Test Result:** Compliance.

Please refer to following tables and plots

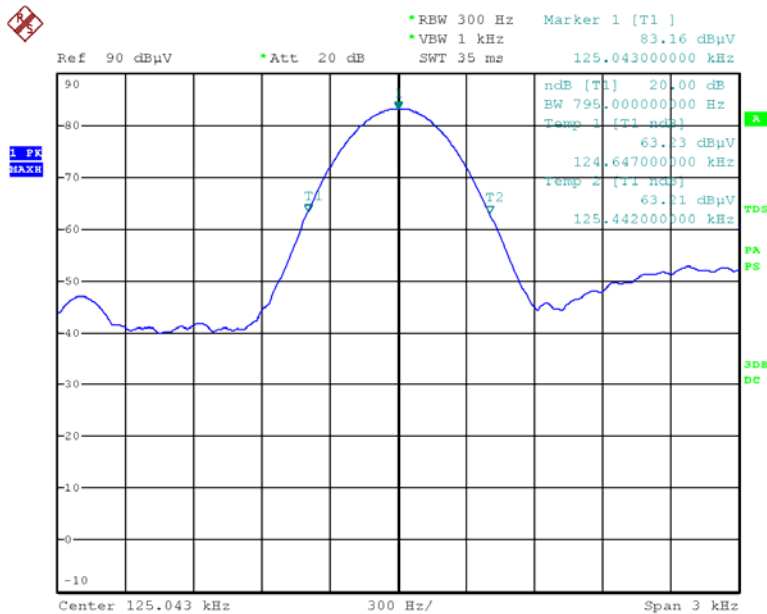
<b>Test Frequency (MHz)</b>	<b>20 dB Bandwidth (kHz)</b>
13.56	1.42
0.125	0.795

Test Mode: Transmitting

### 20 dB Emission Bandwidth



Date: 24.JUL.2018 00:30:57



Date: 28.AUG.2018 17:29:09

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