



TESTING LABORATORY  
CERTIFICATE #4820.01



# FCC PART 15.239

## TEST REPORT

For

### DONGGUAN HONGSHEN ELECTRONICS CO.,LTD

No.262 Tanglong middle road Tangxia Town, Dongguan city Guangdong province China

**FCC ID: 2AQAH-A22**

<b>Report Type:</b> Original Report	<b>Product Name:</b> Car Bluetooth charger
<b>Report Number:</b>	RDG181029003-00C
<b>Report Date:</b>	2018-11-20
<b>Reviewed By:</b>	Allen Qiao RF Supervisor
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**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 “\*”.

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## GENERAL INFORMATION

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

<b>EUT Name:</b>	Car Bluetooth charger
<b>EUT Model:</b>	A22
<b>Multiple Model:</b>	A23, A27, A28, T88
<b>FCC ID:</b>	2AQAH-A22
<b>Rated Input Voltage:</b>	DC 12V
<b>External Dimension:</b>	Length (106.6mm)*Width (51mm)*High (32.2mm)
<b>Serial Number:</b>	181029003
<b>EUT Received Date:</b>	2018.10.29

*Note: The series product model A23, A27, A28, T88 is electrically identical with the tested model A22, we selected A22 for fully testing. The differences between them were explained in the attached declaration letter.*

### Objective

This type approval report is prepared on behalf of *DONGGUAN HONGSHEN ELECTRONICS CO.,LTD* in accordance with Part 2-Subpart J, and Part 15-Subparts A and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Rules Part 15, Subpart C, and section 15.203, 15.205, 15.209 and 15.239 rules.

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

FCC Part 15C DSS submissions with FCC ID: 2AQAH-A22.

### Test Methodology

All measurements contained in this report were conducted 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).

### Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
Unwanted Emissions, radiated	30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical 1G~6GHz: 4.45 dB, 6G~26.5GHz: 5.23 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 the test mode. The operating frequency is 88.1MHz-107.9MHz and the channel spacing is 100 kHz. 88.1MHz, 98MHz and 107.9MHz were selected to testing.

A 2.5 kHz tone input to the device via Bluetooth by smart phone. The level of the tone is set to the manufacturer's maximum rated through tune smart phone voice to maximum level which declared by manufacturer.

### EUT Exercise Software

No software was used in test, the device was configured to engineer mode by manufacturer.

### Equipment Modifications

No modifications were made to the EUT.

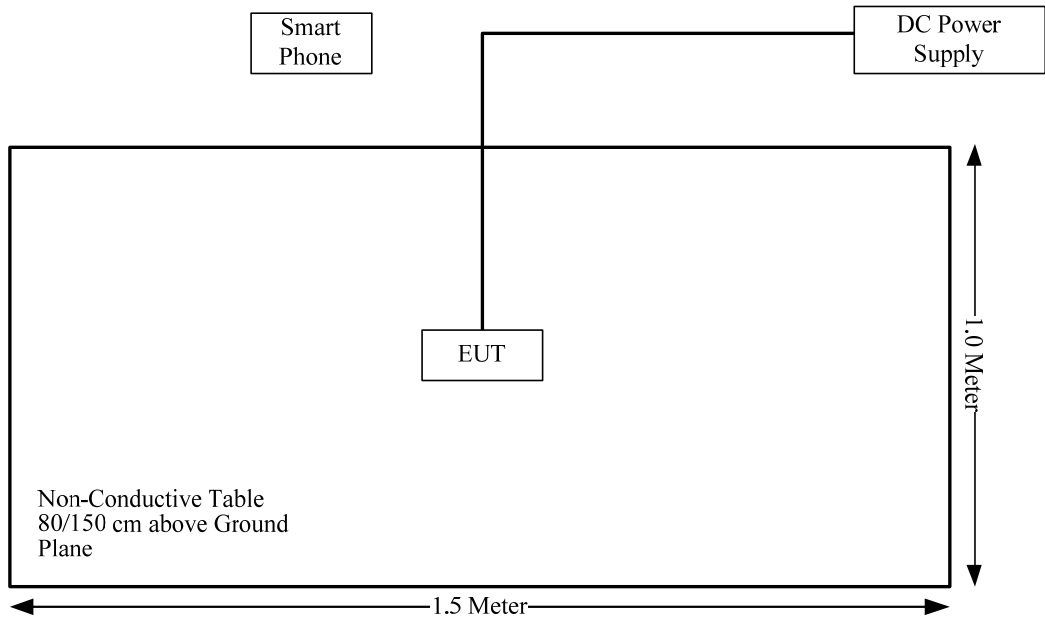
### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Pro instrument	DC Power Supply	pps3300	3300012
MEIZU	Smart Phone	PRO 6 Plus	M960BDQE329UN

### Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
DC Cable	No	No	1m	DC Power Supply	EUT

**Block Diagram of Test Setup**



**SUMMARY OF TEST RESULTS**

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207(a)	Conduction Emissions	Not applicable
15.205, §15.209, §15.239	Radiated Emissions	Compliance
§15.239(a)	Emission Bandwidth	Compliance

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

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### **Applicable Standard**

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used.

### **Antenna Connector Construction**

The EUT has one internal antenna arrangement for FM transmission, fulfill the requirement of this section. Please refer to the EUT photos.

**Result:** Compliant.



## FCC§15.205, §15.209&§15.239- RADIATED EMISSIONS

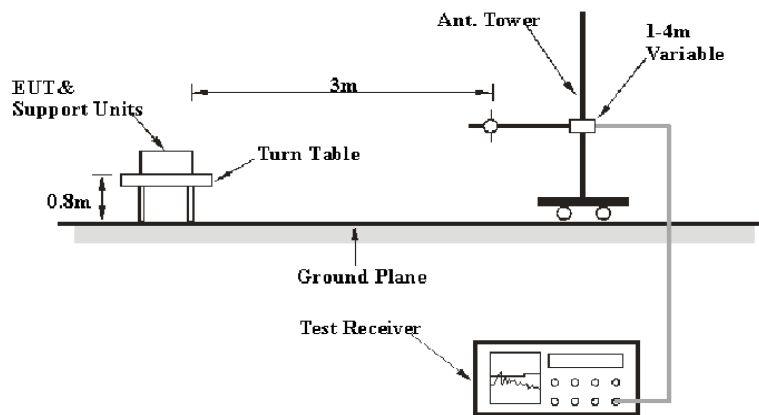
### Applicable Standard

As per FCC§15.239:

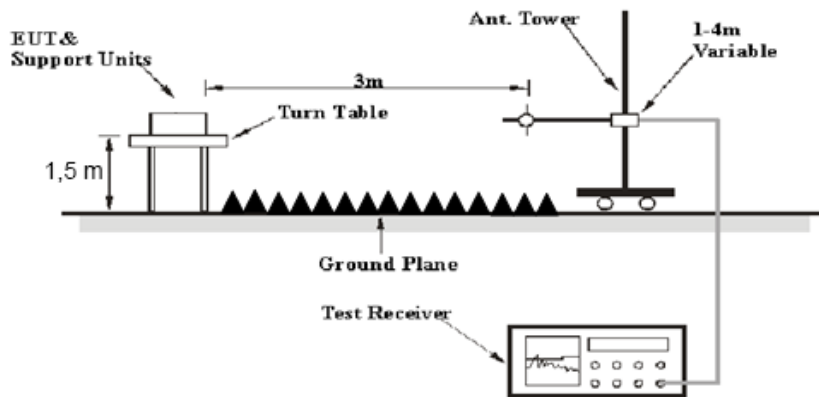
- (a) Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz.
- (b) The field strength of any emissions within the permitted 200 kHz band shall not exceed 250 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.
- (c) The field strength of any emissions radiated on any frequency outside of the specified 200 kHz band shall not exceed the general radiated emission limits in §15.209.

### EUT Setup

Below 1 GHz:



**Above 1 GHz:**



The radiated emission below 1GHz tests were performed in the 10 meters chamber test site , above 1GHz tests were performed in the 3 meters chamber test site B, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, FCC 15.239 limits.

**Test Equipment Setup**

The system was investigated from 30 MHz to 1.1 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

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

**Test Procedure**

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

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz, peak and Average detection modes for frequencies above 1GHz.

All emissions under the average limit and under the noise floor have not recorded in the report.

**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 Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100035	2018-08-03	2019-08-03
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Sunol Sciences	Antenna	JB3	A060611-3	2017-07-21	2019-07-21
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-02	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-2200-01	2018-09-05	2019-09-05
HP	Amplifier	8447F	2443A01912	2018-09-05	2019-09-05
Agilent	Spectrum Analyzer	E4440A	SG43360054	2018-01-04	2019-01-04
ETS-Lindgren	Horn Antenna	3115	000 527 35	2016-01-05	2019-01-04
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2018-09-05	2019-09-05
MITEQ	Amplifier	AFS42-00101800-25-S-42	2001271	2018-09-05	2019-09-05

\* **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>	25.2~26.5 °C
<b>Relative Humidity:</b>	38~55 %
<b>ATM Pressure:</b>	100.7 kPa

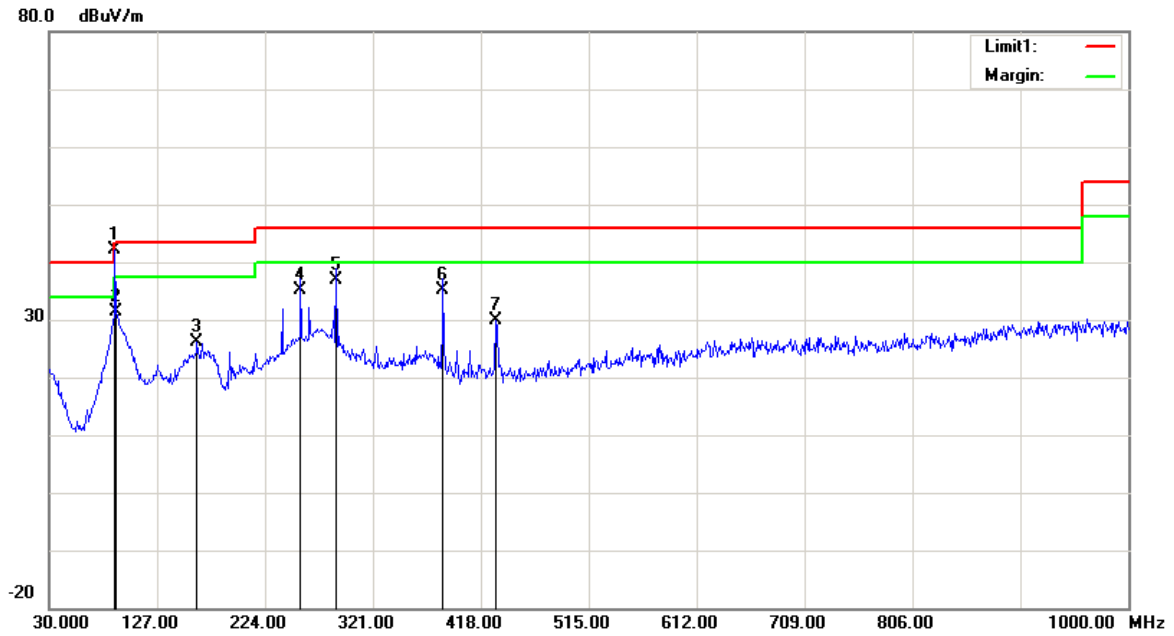
\* The testing was performed by Sunny Cen on 2018-11-20.

*Test Mode: Transmitting*

1) 30MHz-1GHz

Low Channel (88.1MHz)

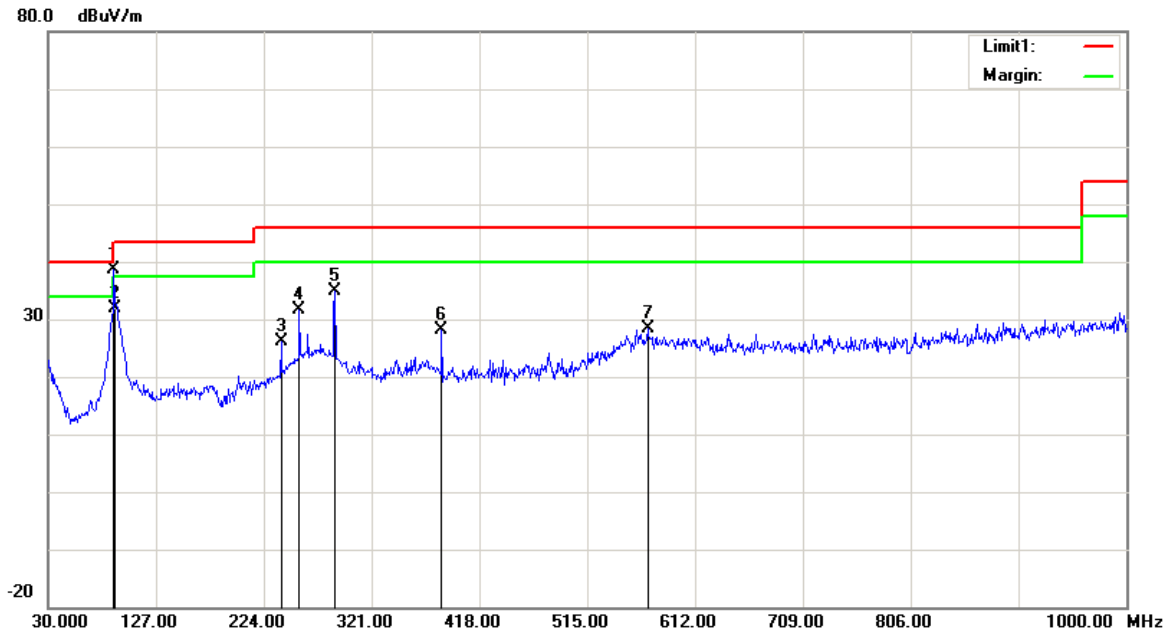
Horizontal:



Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
88.1000	57.28	peak	-15.15	42.13	48.00*	5.87
88.0000	46.46	QP	-15.08	31.38	40.00	8.62
162.8900	35.77	QP	-9.66	26.11	43.50	17.39
256.0100	44.73	QP	-9.63	35.10	46.00	10.90
288.0200	45.11	QP	-8.31	36.80	46.00	9.20
384.0500	40.86	QP	-5.76	35.10	46.00	10.90
431.5800	34.58	QP	-4.63	29.95	46.00	16.05

Note: '\*' means the peak value meets average limit.

**Vertical:**

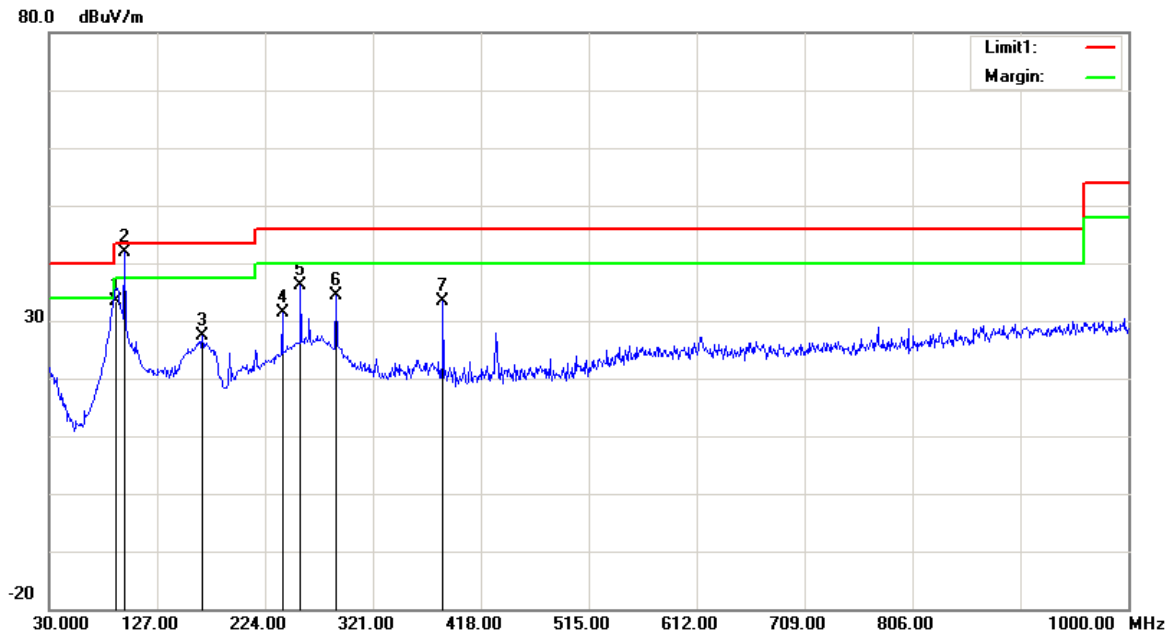


Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
88.1000	53.72	peak	-15.15	38.57	48.00*	9.43
88.0000	46.98	QP	-15.08	31.90	40.00	8.10
239.5200	36.08	QP	-10.03	26.05	46.00	19.95
256.0100	41.20	QP	-9.63	31.57	46.00	14.43
288.0200	43.07	QP	-8.31	34.76	46.00	11.24
384.0500	34.01	QP	-5.76	28.25	46.00	17.75
569.3200	29.88	QP	-1.46	28.42	46.00	17.58

Note: '\*' means the peak value meets average limit.

Middle Channel (98MHz)

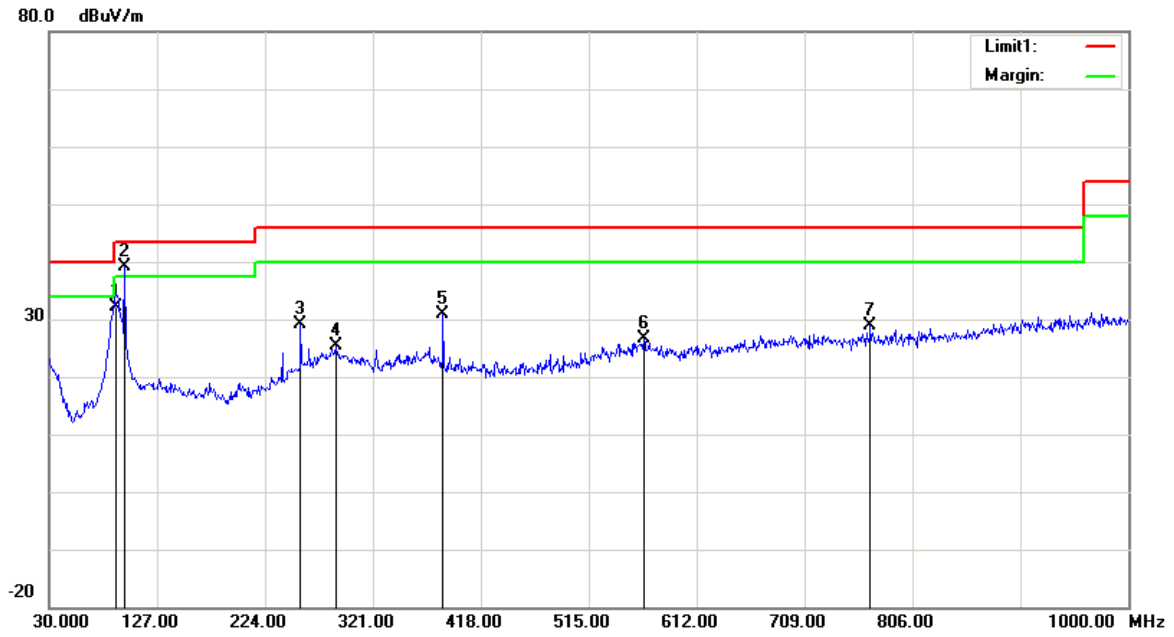
Horizontal:



Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
90.1400	48.58	QP	-15.08	33.50	43.50	10.00
98.0000	56.25	peak	-14.36	41.89	48.00*	6.11
167.7400	37.13	peak	-9.70	27.43	43.50*	16.07
239.5200	41.44	peak	-10.03	31.41	46.00*	14.59
256.0100	45.78	peak	-9.63	36.15	46.00*	9.85
288.0200	42.67	peak	-8.31	34.36	46.00*	11.64
384.0500	39.19	peak	-5.76	33.43	46.00*	12.57

Note: '\*' means the peak value meets QP or average limit.

**Vertical:**

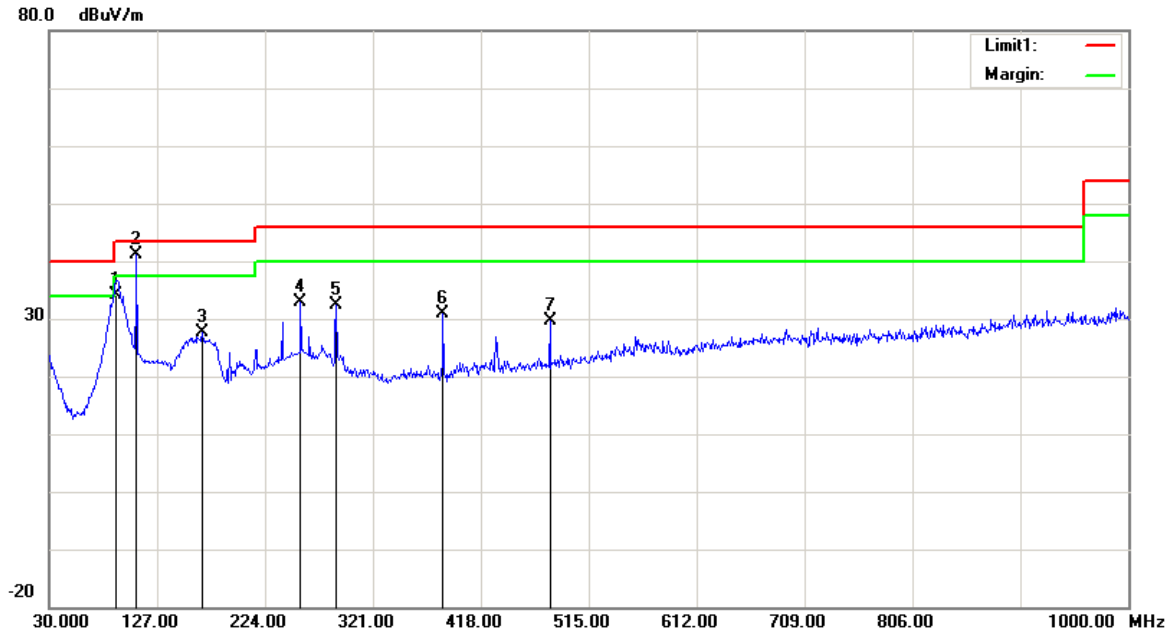


Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
90.1400	47.28	QP	-15.08	32.20	43.50	11.30
97.9000	53.53	peak	-14.36	39.17	48.00*	8.83
256.0100	38.80	peak	-9.63	29.17	46.00*	16.83
288.0200	33.71	peak	-8.31	25.40	46.00*	20.60
384.0500	36.52	peak	-5.76	30.76	46.00*	15.24
564.4700	28.15	peak	-1.56	26.59	46.00*	19.41
768.1700	27.69	peak	1.08	28.77	46.00*	17.23

Note: '\*' means the peak value meets QP or average limit.

**High Channel (107.9MHz)**

**Horizontal:**



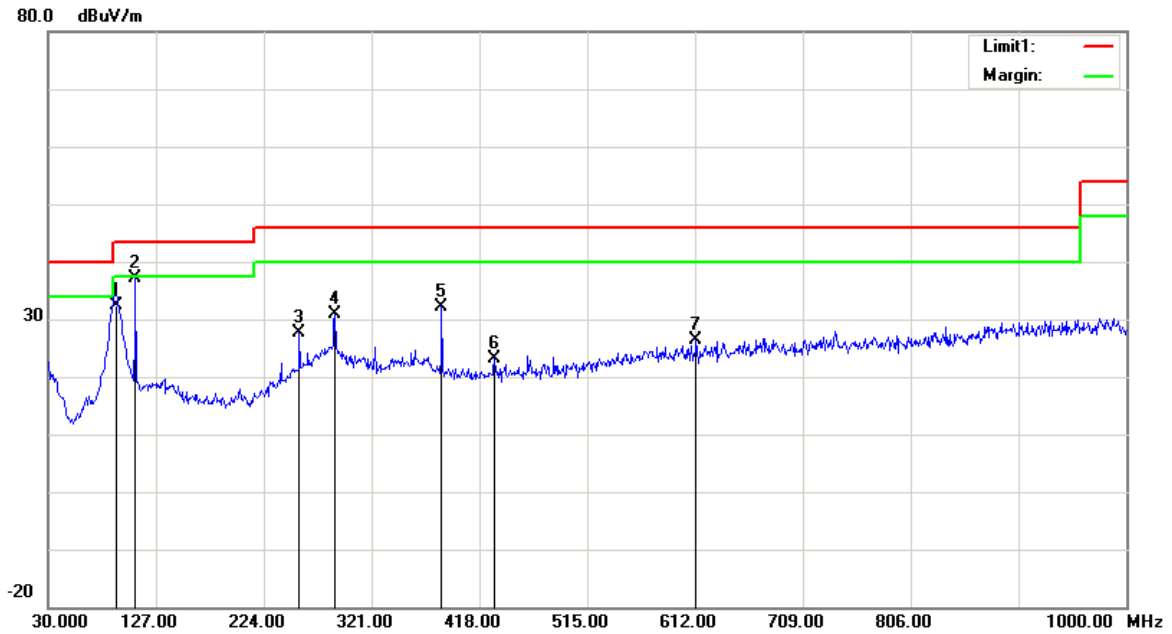
Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
90.1400	49.28	QP	-15.08	34.20	43.50	9.30
107.9000	54.69	peak	-13.57	41.12	48.00*	6.88
167.7400	37.34	peak	-9.70	27.64	43.50*	15.86
256.0100	42.61	peak	-9.63	32.98	46.00*	13.02
288.0200	40.63	peak	-8.31	32.32	46.00*	13.68
384.0500	36.72	peak	-5.76	30.96	46.00*	15.04
480.0800	33.39	peak	-3.83	29.56	46.00*	16.44

Note 1: '\*' means the peak value meets QP or average limit.

Note 2: The fundamental is below emission limit, so band edge no need test.



**Vertical:**



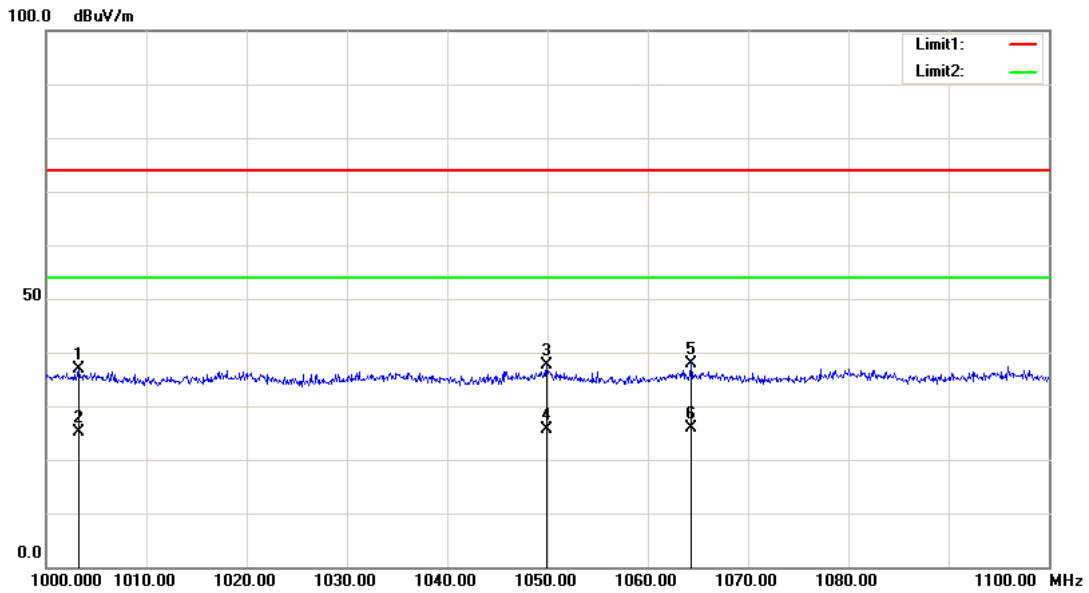
Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
91.1100	47.33	QP	-15.03	32.30	43.50	11.20
107.900	50.66	peak	-13.57	37.09	48.00*	10.91
256.0100	37.25	peak	-9.63	27.62	46.00*	18.38
288.0200	39.24	peak	-8.31	30.93	46.00*	15.07
384.0500	37.86	peak	-5.76	32.10	46.00*	13.90
431.5800	27.73	peak	-4.63	23.10	46.00*	22.90
612.9700	27.23	peak	-0.93	26.30	46.00*	19.70

Note 1: '\*' means the peak value meets QP or average limit.

Note 2: The fundamental is below emission limit, so band edge no need test.

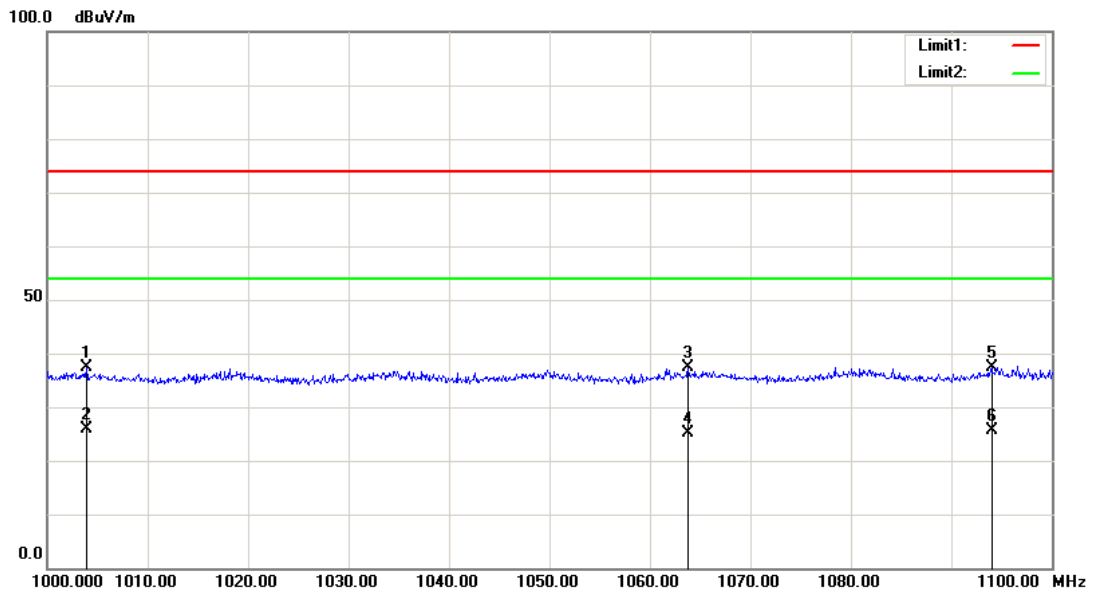
2) Above 1GHz: (Only high channel need to be tested)

Horizontal



Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1003.300	47.64	peak	-10.75	36.89	74.00	37.11
1003.300	35.86	AVG	-10.75	25.11	54.00	28.89
1049.950	48.16	peak	-10.53	37.63	74.00	36.37
1049.950	36.25	AVG	-10.53	25.72	54.00	28.28
1064.350	48.39	peak	-10.46	37.93	74.00	36.07
1064.350	36.28	AVG	-10.46	25.82	54.00	28.18

**Vertical**



Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1003.950	48.24	peak	-10.75	37.49	74.00	36.51
1003.950	36.53	AVG	-10.75	25.78	54.00	28.22
1063.800	47.76	peak	-10.46	37.30	74.00	36.70
1063.800	35.61	AVG	-10.46	25.15	54.00	28.85
1094.000	47.70	peak	-10.32	37.38	74.00	36.62
1094.000	35.85	AVG	-10.32	25.53	54.00	28.47

## FCC §15.239(a) –BANDWIDTH TESTING

### Applicable Standard

As per FCC§15.239 (a)

- (a) Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz.

### Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
3. Repeat above procedures until all frequencies measured were complete.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100035	2018-08-03	2019-08-03
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Sunol Sciences	Antenna	JB3	A060611-3	2017-07-21	2019-07-21
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-02	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-2200-01	2018-09-05	2019-09-05
HP	Amplifier	8447F	2443A01912	2018-09-05	2019-09-05

\* **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>	25.2~26.5 °C
<b>Relative Humidity:</b>	38~55 %
<b>ATM Pressure:</b>	100.7 kPa

\* The testing was performed by Sunny Cen on 2018-11-20.

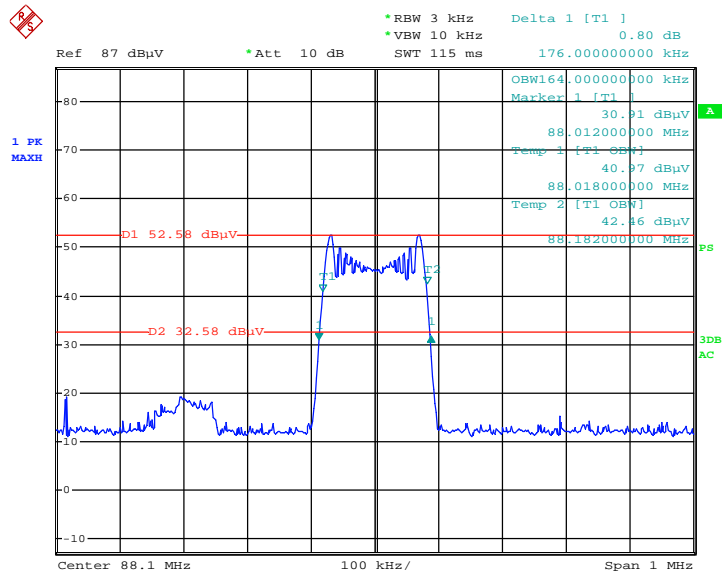
**Test Result:** Compliant.

Please refer to following tables and plots

Test Mode: Transmitting

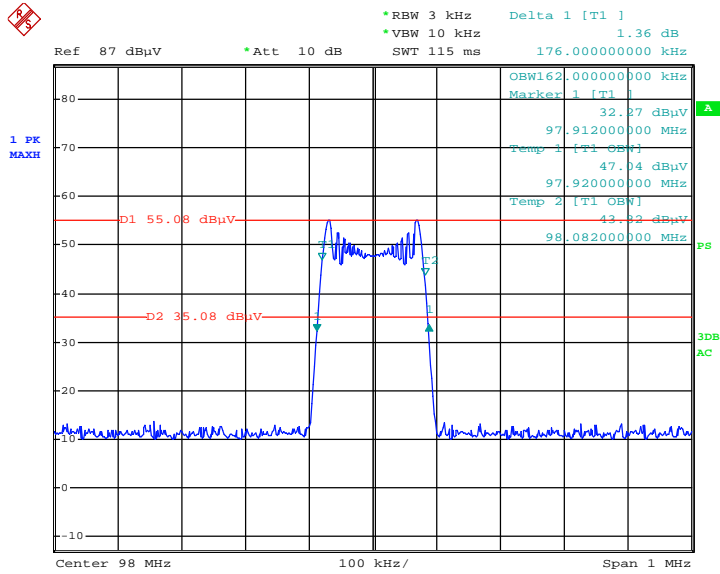
Channel	Frequency (MHz)	99% OBW (kHz)	20 dB Bandwidth (kHz)	Limit (kHz)
Low	88.1	164	176	200
Middle	98.1	162	176	200
High	107.9	162	176	200

Low Channel



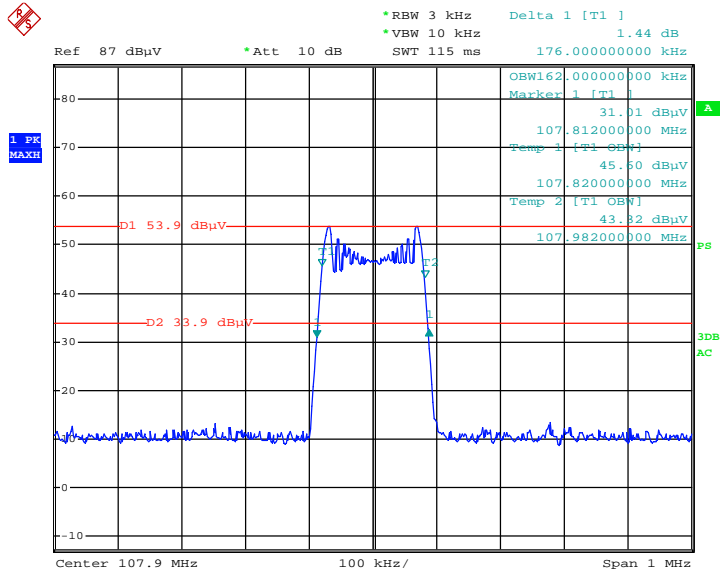
AB  
Date: 20.NOV.2018 19:44:38

### Middle Channel



AB  
Date: 20.NOV.2018 19:46:34

### High Channel



AB  
Date: 20.NOV.2018 19:48:40

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