



FCC PART 95

MEASUREMENT AND TEST REPORT

For

HENAN ESHOW ELECTRONIC COMMERCE CO., LTD

Room 722, Sanjiang Building, No.170 Nanyang Road, Huiji District, Zhengzhou, Henan, China

FCC ID: 2AAR8RETEVISRT27

Report Type: Original Report	Product Type: Tranceiver
Report Number: <u>RXM170909051-00</u>	
Report Date: <u>2017-09-30</u>	
Reviewed By: Reviewed By: <u>Jerry Zhang</u> EMC Manager	<i>Jerry Zhang</i>
Test Laboratory: Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn	

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).

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The **HENAN ESHOW ELECTRONIC COMMERCE CO., LTD**'s product, model number: **RT27** (**FCC ID: 2AAR8RETEVISRT27**) or the "EUT" in this report was a **Tranceiver**, which was measured approximately: 5.8 cm (H) x 3.6 cm (W) x 20.1 cm (H), rated input voltage: DC3.7V from battery or DC 5V from adapter.

Adapter Information:

MODEL: DSA-5PF07-05 FUS 050100

INPUT: AC 100-240V, 50/60Hz, 0.2A

OUTPUT: DC 5V, 1A

*All measurement and test data in this report was gathered from production sample serial number: 170909051 (Assigned by BACL, Dongguan). The EUT was received on 2017-09-09.

Objective

This report is prepared on behalf of **HENAN ESHOW ELECTRONIC COMMERCE CO., LTD** in accordance with Part 2 and Part 95, Subpart B of the Federal Communication Commissions rules.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All tests and measurements indicated in this document were performed in accordance with Part 95 Subpart B and Subpart E of the Federal Communication Commissions rules with TIA-603-D, Land Mobile FM or PM-Communications Equipment-Measurement and Performance Standards.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61dB
Unwanted Emissions, radiated	30MHz ~ 1GHz: 5.85 dB 1G~26.5GHz: 5.23 dB
Unwanted Emissions, conducted	±1.5 dB
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%

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

Bay Area Compliance Laboratories Corp. (Dongguan) has been accredited to ISO 17025 by CNAS(Lab code: L5662). And accredited to ISO 17025 by NVLAP(Test Laboratory Accreditation Certificate Number 500069-0), the FCC Designation No. CN5002 under the KDB 974614 D01.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Bay Area Compliance Laboratories Corp. (Dongguan) was registered with ISED Canada under ISED Canada Registration Number 3062D.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

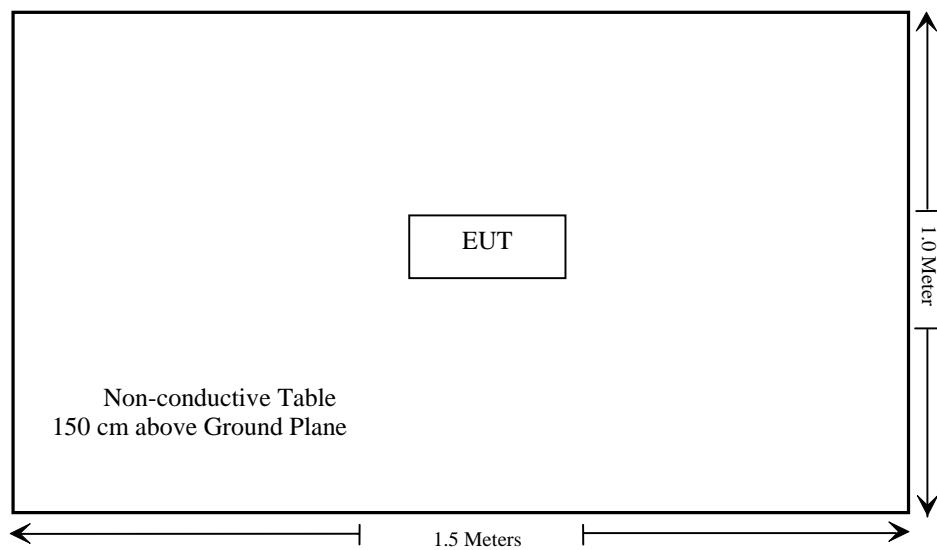
The device uses total 22 FRS channels as below:

Channel No.	(MHz)
1	462.5625
2	462.5875
3	462.6125
4	462.6375
5	462.6625
6	462.6875
7	462.7125
8	467.5625
9	467.5875
10	467.6125
11	467.6375
12	467.6625
13	467.6875
14	467.7125
15	462.5500
16	462.5750
17	462.6000
18	462.6250
19	462.6500
20	462.6750
21	462.7000
22	462.7250

Equipment Modifications

No modification was made to the EUT tested.

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§2.1093	RF Exposure	Compliance
§2.1046, §95.567	RF Output Power	Compliance
§2.1047, §95.575	Modulation Characteristic	Compliance
§2.1049, §95.573, §95.579	Authorized Bandwidth & Emission Mask	Compliance
§2.1053, §95.579	Spurious Radiated Emissions	Compliance
§2.1055(d), §95.565	Frequency Stability	Compliance

FCC §2.1093 - RF EXPOSURE INFORMATION

Applicable Standard

According to FCC §2.1093 and §1.1307(b) (1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

Test Result

Please refer to SAR Report Number: RXM170909051-20.

FCC §2.1046, §95.567 - RF OUTPUT POWER

Applicable Standard

According to FCC §95.567

Each FRS transmitter type must be designed such that the effective radiated power (ERP) on channels 8 through 14 does not exceed 0.5 Watts and the ERP on channels 1 through 7 and 15 through 22 does not exceed 2.0 Watts.

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the emissions were measured by the substitution.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Signal Generator	E8247C	MY43321350	2016-09-23	2017-09-22
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
Sunol Sciences	Antenna	JB3	A060611-1	2014-11-06	2017-11-05
R&S	EMI Test Receiver	ESCI	100224	2017-09-01	2018-09-01
Unknown	Coaxial Cable	Chamber A-1	4m	2017-09-05	2018-09-05
Unknown	Coaxial Cable	Chamber A-2	10m	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

Temperature:	28.9 °C
Relative Humidity:	51.4 %
ATM Pressure:	100.4 kPa

-The testing was performed by Costa Dong on 2017-09-19.

Test Mode: Transmitting

ERP:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
FRS, Frequency:462.6375MHz								
462.6375	H	88.71	7.4	0.0	0.7	6.7	33.0	26.3
462.6375	V	104.20	25.8	0.0	0.7	25.1	33.0	7.9
FRS, Frequency:467.6375MHz								
467.6375	H	89.01	7.8	0.0	0.7	7.1	27.0	19.9
467.6375	V	104.65	26.4	0.0	0.7	25.7	27.0	1.3

Test Result: Compliance.

FCC §2.1047 & §95.575 - MODULATION CHARACTERISTIC

Applicable Standard

Per FCC §2.1047 and §95.575:

Each FRS transmitter type must be designed such that the peak frequency deviation does not exceed 2.5 kHz, and the highest audio frequency contributing substantially to modulation must not exceed 3.125 kHz.

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
HP	RF Communications Test Set	8920A	00 235	2017-07-11	2018-07-11
LEADER	Millivoltmeter	LMV-181A	601788	2017-08-11	2018-08-10
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	Each Time	/
E-Microwave	RF Attenuator	20dB	20dB-1	Each Time	/
Unknown	Coaxial Cable	0.1m	C-1	Each Time	/

* **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

Test Method: TIA/EIA-603-D

Test Data

Environmental Conditions

Temperature:	28.9 °C
Relative Humidity:	51.4 %
ATM Pressure:	100.4 kPa

The testing was performed by Costa Dong on 2017-09-19.

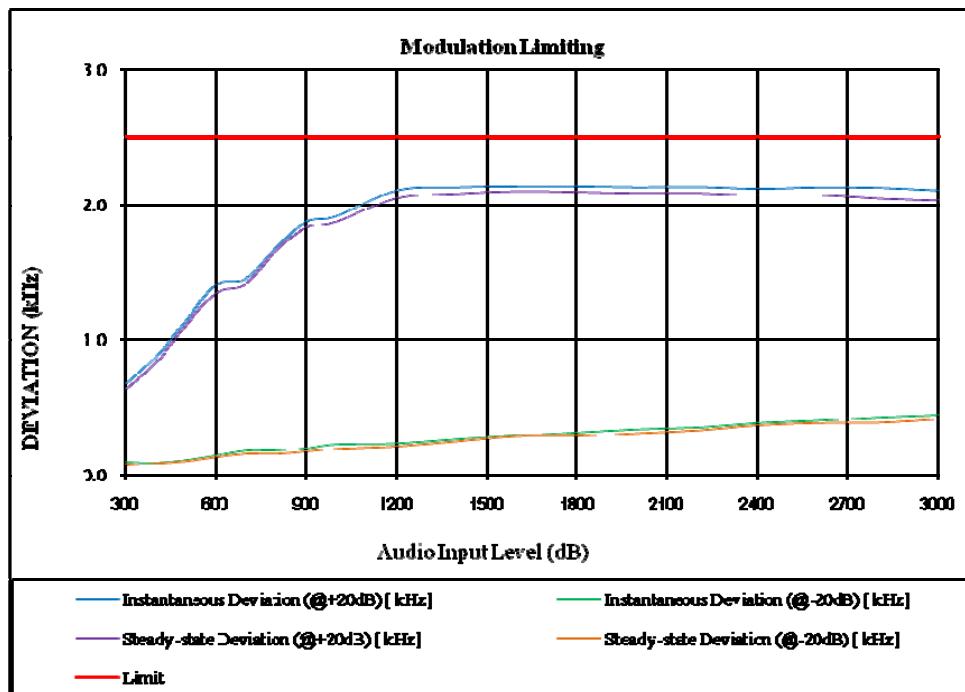
Please refer to the following tables and plots.

Test Mode: Transmitting

MODULATION LIMITING

Carrier Frequency: 467.6375 MHz

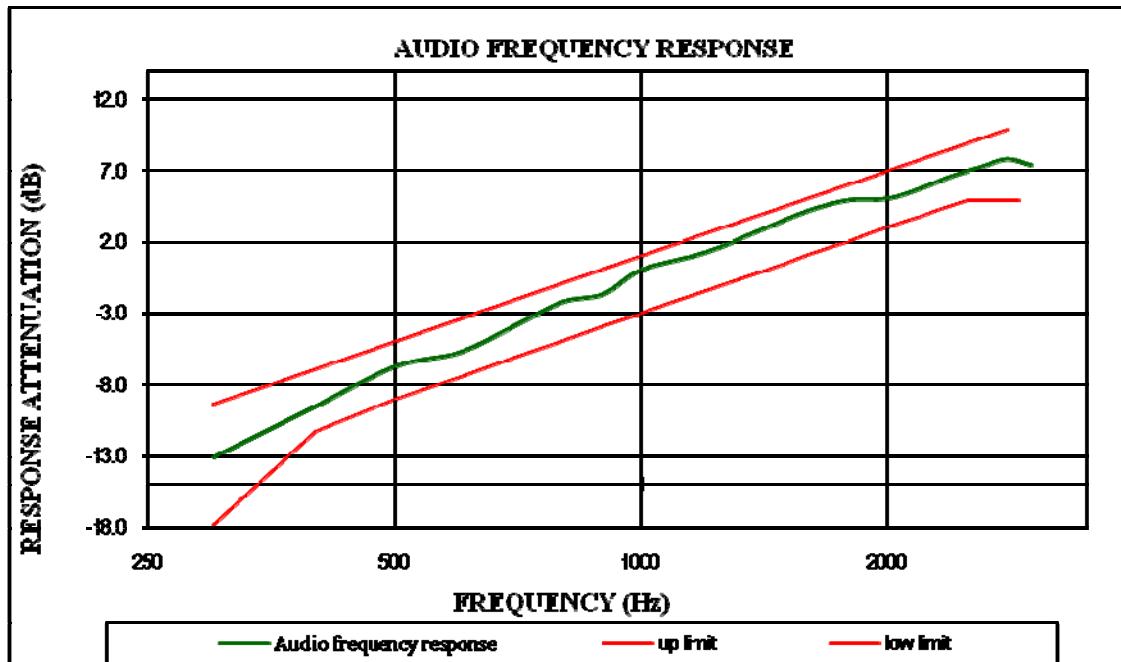
Audio Frequency (Hz)	Instantaneous		Steady-state		Limit [kHz]
	Deviation (@+20dB) [kHz]	Deviation (@-20dB) [kHz]	Deviation (@+20dB) [kHz]	Deviation (@-20dB) [kHz]	
300	0.679	0.100	0.636	0.076	2.5
400	0.877	0.094	0.827	0.090	2.5
500	1.140	0.114	1.103	0.106	2.5
600	1.409	0.147	1.343	0.136	2.5
700	1.455	0.183	1.409	0.160	2.5
800	1.681	0.185	1.658	0.159	2.5
900	1.877	0.200	1.827	0.177	2.5
1000	1.919	0.228	1.874	0.196	2.5
1200	2.109	0.235	2.046	0.214	2.5
1400	2.133	0.266	2.081	0.250	2.5
1600	2.139	0.292	2.099	0.287	2.5
1800	2.139	0.315	2.093	0.290	2.5
2000	2.133	0.339	2.085	0.310	2.5
2200	2.135	0.352	2.085	0.331	2.5
2400	2.122	0.384	2.069	0.368	2.5
2600	2.132	0.402	2.070	0.385	2.5
2800	2.129	0.426	2.045	0.387	2.5
3000	2.109	0.442	2.030	0.412	2.5



Audio Frequency Response

Carrier Frequency: 467.6375 MHz

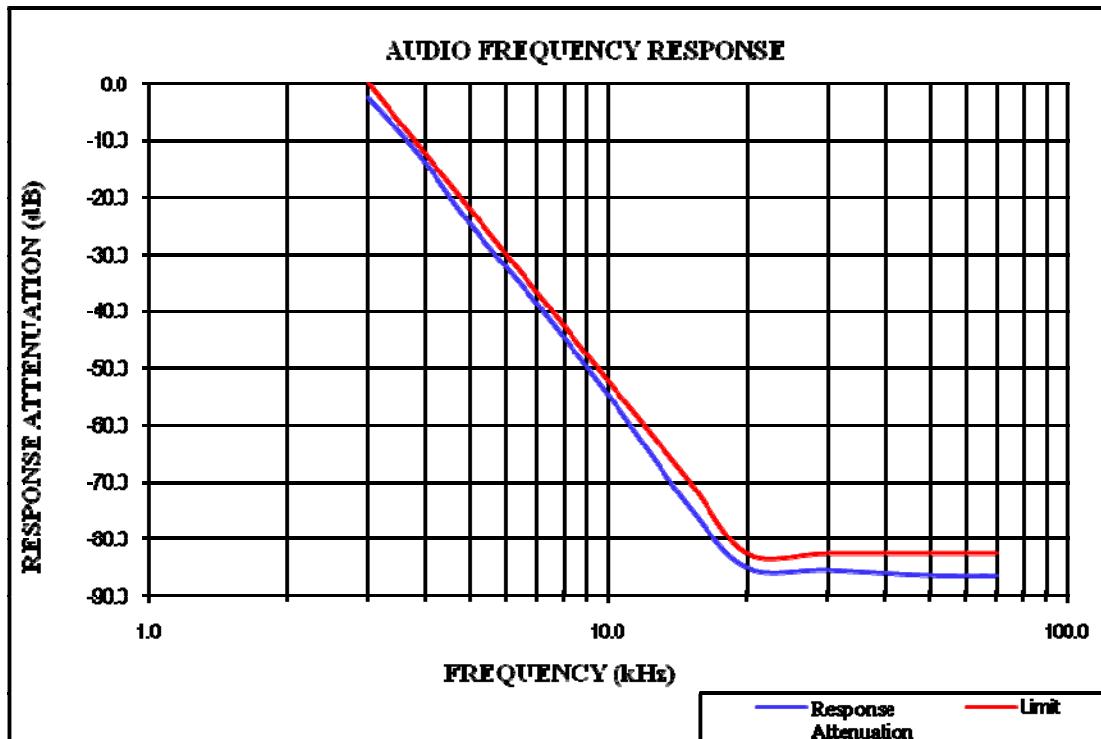
Audio Frequency (Hz)	Response Attenuation (dB)
300	-13.07
400	-9.51
500	-6.72
600	-5.73
700	-3.88
800	-2.25
900	-1.68
1000	0.00
1200	1.23
1400	2.77
1600	4.14
1800	4.91
2000	4.99
2200	5.73
2400	6.60
2600	7.19
2800	7.76
3000	7.35



Audio Low Pass Filter Response

Carrier Frequency: 467.6375 MHz

Audio Frequency (kHz)	Response Attenuation (dB)	Limit (dB)
3.0	-2.6	0.0
3.5	-8.5	-6.7
4.0	-14.1	-12.5
5.0	-24.8	-22.2
7.0	-38.8	-36.8
10.0	-54.8	-52.3
15.0	-74.4	-69.9
20.0	-85.0	-82.5
30.0	-85.4	-82.5
50.0	-86.3	-82.5
70.0	-86.4	-82.5



FCC §2.1049,§95.573, §95.579 - AUTHOURIZED BANDWIDTH AND EMISSION MASK**Applicable Standard**

According to §95.573

Each FRS transmitter type must be designed such that the occupied bandwidth does not exceed 12.5 kHz.

According to §95.579

Each FRS transmitter type must be designed to satisfy the applicable unwanted emissions limits in this paragraph.

(a) Attenuation requirements. The power of unwanted emissions must be attenuated below the carrier power output in Watts (P) by at least:

- (1) 25 dB (decibels) in the frequency band 6.25 kHz to 12.5 kHz removed from the channel center frequency.
- (2) 35 dB in the frequency band 12.5 kHz to 31.25 kHz removed from the channel center frequency.
- (3) $43 + 10 \log (P)$ dB in any frequency band removed from the channel center frequency by more than 31.25 kHz.

Test Procedure

TIA-603-D, section 2.2.11

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSIQ	831929/005	2017-08-31	2018-08-31
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	Each Time	/
E-Microwave	RF Attenuator	20dB	20dB-1	Each Time	/
Unknown	Coaxial Cable	0.1m	C-1	Each Time	/

* **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**

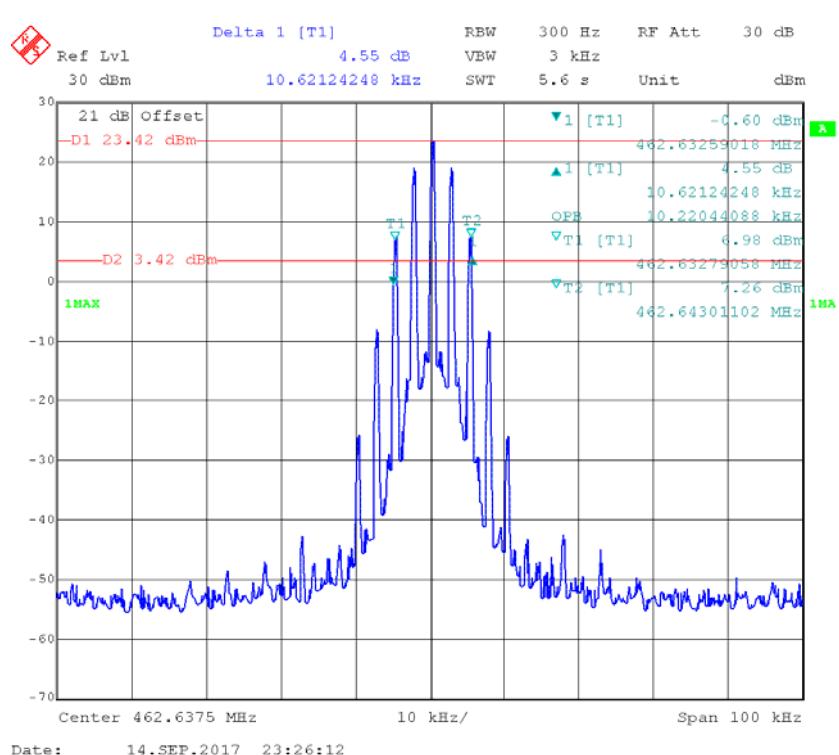
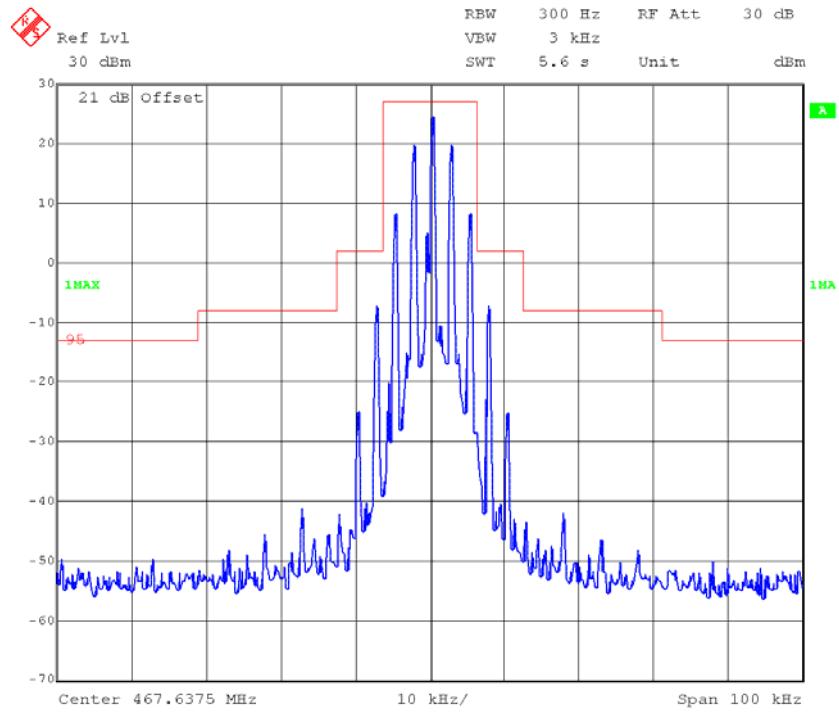
Temperature:	28.9 °C
Relative Humidity:	51.4 %
ATM Pressure:	100.4 kPa

The testing was performed by Costa Dong on 2017-09-14.

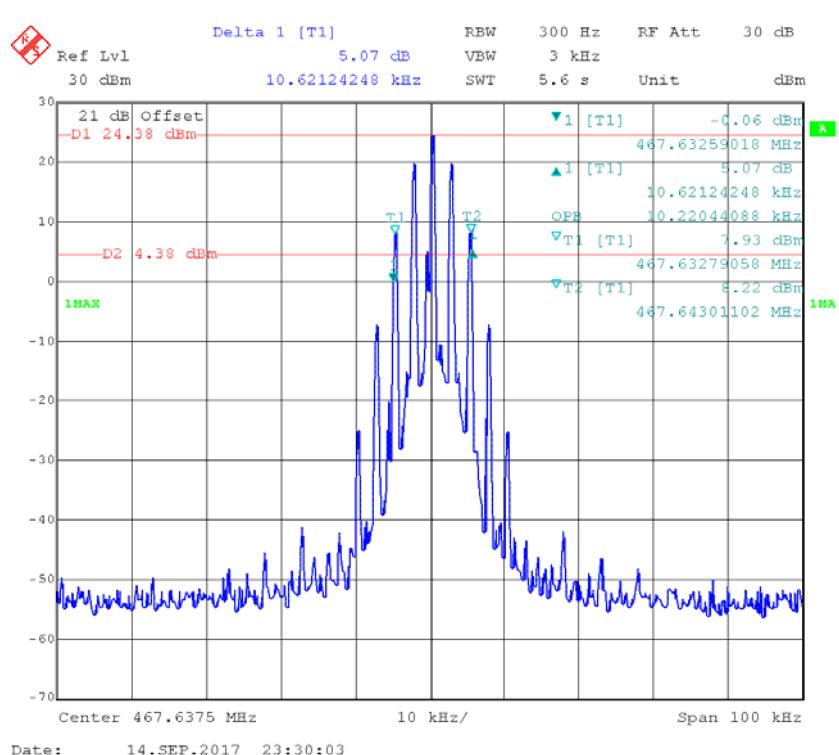
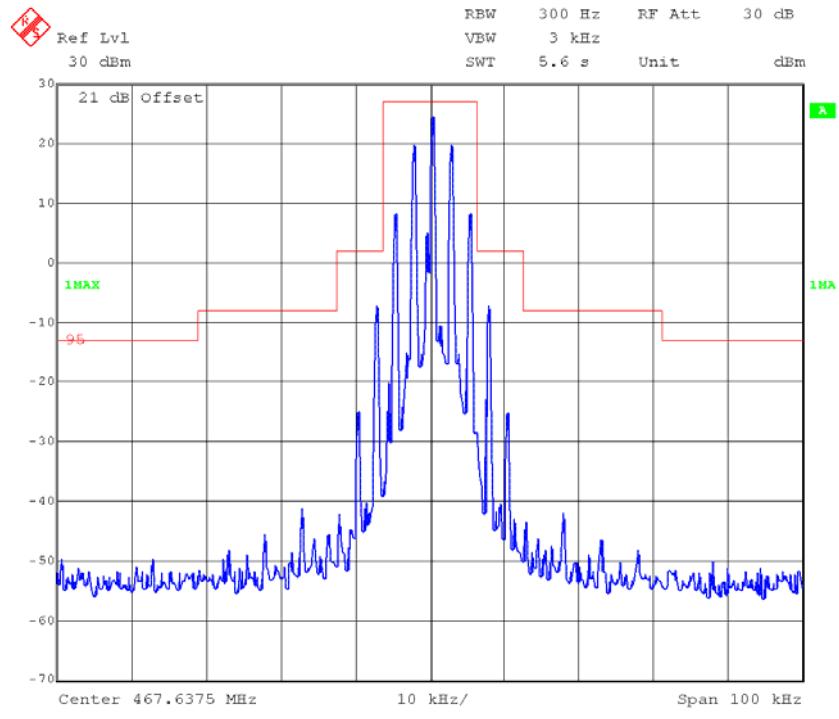
Test Mode: Transmitting

fc (MHz)	99% Occupied Bandwidth (kHz)	20 dB Bandwidth (kHz)	Limit (kHz)
462.6375	10.22	10.62	12.5
467.6375	10.22	10.62	12.5

462.63750 MHz



467.6375 MHz



FCC §2.1053 & §95.579 - RADIATED SPURIOUS EMISSION

Applicable Standard

FCC §2.1053 and §95.579

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = $10 \log_{10} (\text{TXpwr in Watts}/0.001)$ - the absolute level
 Spurious attenuation limit in dB = $43 + 10 \log_{10} (\text{power out in Watts})$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Signal Generator	E8247C	MY43321350	2016-09-23	2017-09-22
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
Sunol Sciences	Antenna	JB3	A060611-1	2014-11-06	2017-11-05
HP	Amplifier	8447E	2434A02181	2017-09-01	2018-09-01
R&S	EMI Test Receiver	ESCI	100224	2017-09-01	2018-09-01
Unknown	Coaxial Cable	Chamber A-1	4m	2017-09-05	2018-09-05
Unknown	Coaxial Cable	Chamber B-1	0.75m	2017-09-05	2018-09-05
Unknown	Coaxial Cable	Chamber A-2	10m	2017-09-05	2018-09-05
Unknown	Coaxial Cable	Chamber B-2	8m	2017-09-05	2018-09-05
Mini-Circuit	Amplifier	ZVA-213-S+	SN054201245	2017-02-19	2018-02-19
TDK RF	Horn Antenna	HRN-0118	130 084	2016-01-05	2019-01-04
ETS-Lindgren	Horn Antenna	3115	000 527 35	2016-01-05	2019-01-04
Agilent	Spectrum Analyzer	E4440A	SG43360054	2016-12-08	2017-12-08
N/A	Coaxial Cable	4m	N/A	2017-09-05	2018-09-05
N/A	Coaxial Cable	8m	N/A	2017-09-05	2018-09-05
HP	Signal Generator	1026	320408	2016-12-08	2017-12-08

* **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 Data

Environmental Conditions

Temperature:	28.9 °C
Relative Humidity:	48 %
ATM Pressure:	100.4 kPa

The testing was performed by Tony Zeng on 2017-09-19.

Test Mode: Transmitting

30MHz-5GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
frequency:462.6375MHz								
925.275	H	40.56	-33.1	0.0	1.1	-34.2	-13.0	21.2
925.275	V	41.73	-28.7	0.0	1.1	-29.8	-13.0	16.8
327.000	H	35.40	-48.9	0.0	0.5	-49.4	-13.0	36.4
283.000	V	36.40	-46.7	0.0	0.5	-47.2	-13.0	34.2
1387.913	H	75.35	-37.9	8.9	1.2	-30.2	-13.0	17.2
1387.913	V	75.21	-38.7	8.9	1.2	-31.0	-13.0	18.0
1850.550	H	67.76	-45.8	11.4	0.9	-35.3	-13.0	22.3
1850.550	V	79.71	-34.3	11.4	0.9	-23.8	-13.0	10.8
2313.188	V	71.17	-41	11.4	1.2	-30.8	-13.0	17.8
2313.188	H	72.19	-40.1	11.4	1.2	-29.9	-13.0	16.9
2775.825	H	69.17	-43.1	13.1	1.3	-31.3	-13.0	18.3
2775.825	V	60.74	-51.7	13.1	1.3	-39.9	-13.0	26.9
frequency:467.6375MHz								
935.275	H	41.10	-32.3	0.0	1.1	-33.4	-13.0	20.4
935.275	V	42.30	-27.8	0.0	1.1	-28.9	-13.0	15.9
535.000	H	35.60	-44.5	0.0	0.7	-45.2	-13.0	32.2
417.000	V	36.80	-43	0.0	0.6	-43.6	-13.0	30.6
1402.913	H	76.32	-36.9	9.0	1.2	-29.1	-13.0	16.1
1402.913	V	75.48	-38.4	9.0	1.2	-30.6	-13.0	17.6
1870.550	H	68.25	-45	11.6	0.9	-34.3	-13.0	21.3
1870.550	V	80.13	-33.5	11.6	0.9	-22.8	-13.0	9.8
2338.118	V	72.41	-40	11.6	1.3	-29.7	-13.0	16.7
2338.118	H	71.24	-41.1	11.6	1.3	-30.8	-13.0	17.8
2805.825	H	70.22	-42	13.2	1.4	-30.2	-13.0	17.2
2805.825	V	61.14	-51.2	13.2	1.4	-39.4	-13.0	26.4

FCC§2.1055 (d), §95.565- FREQUENCY STABILITY

Applicable Standard

According to FCC §2.1055(a) (1),

The frequency stability shall be measured with variation of ambient temperature from -30°C to $+50^{\circ}\text{C}$, and according to FCC 2.1055(d) (2), the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point which is specified by the manufacturer.

According to FCC §95.565

Each FRS transmitter type must be designed such that the carrier frequencies remain within ± 2.5 parts-per-million of the channel center frequencies specified in § 95.563 during normal operating conditions.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a Frequency Counter via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the Frequency Counter.

Frequency Stability vs. Voltage:

1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

The output frequency was recorded for each voltage.

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Dongzhixu	High Temperature Test Chamber	DP1000	201105083-4	2017-09-10	2018-09-10
UNI-T	Multimeter	UT39A	M130199938	2017-04-10	2018-04-10
HP	RF Communications Test Set	8920A	00 235	2017-07-11	2018-07-11
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2017-05-06	2018-05-06
E-Microwave	RF Attenuator	20dB	20dB-1	Each Time	/
Pro instrument	DC Power Supply	pps3300	N/A	N/A	N/A
Unknown	Coaxial Cable	0.1m	C-1	Each Time	/

* **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:	28.9 °C
Relative Humidity:	51.4 %
ATM Pressure:	100.4 kPa

The testing was performed by Costa Dong on 2017-09-19.

Test Mode: Transmitting

FRS, Reference Frequency: 462.63750 MHz				
Temerature	Voltage	Reading	Frequency Error	Limit
°C	Vdc	MHz	ppm	ppm
-30	3.7	462.637134	-0.79	2.5
-20		462.637430	-0.15	
-10		462.637434	-0.14	
0		462.637639	0.30	
10		462.637624	0.27	
20		462.637736	0.51	
30		462.637325	-0.38	
40		462.637732	0.50	
50		462.637132	-0.80	
25	3.5	462.637135	-0.79	
25	4.2	462.637529	0.06	

FRS, Reference Frequency: 467.6375 MHz				
Temerature	Voltage	Reading	Frequency Error	Limit
°C	Vdc	MHz	ppm	ppm
-30	3.7	467.637228	-0.58	2.5
-20		467.637834	0.71	
-10		467.637132	-0.79	
0		467.637332	-0.36	
10		467.637521	0.04	
20		467.637720	0.47	
30		467.637036	-0.99	
40		467.637830	0.71	
50		467.637636	0.29	
25	3.5	467.637228	-0.58	
25	4.2	467.637029	-1.01	

Note: The extreme low voltage was declared by applicant.

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