



## FCC PART 15.231

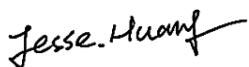
### TEST REPORT

For

### Shenzhen Joy Technology Co. Ltd

5/F, 3rd Building, Shunchengji Park, Huayun Road of Dalang, Longhua, Shenzhen, China

**FCC ID: 2AH83T30**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Medical Alert System
<b>Report Number:</b> <u>RSZ161129002-00B</u>	
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**Note:** This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

## **TABLE OF CONTENTS**

<b>GENERAL INFORMATION.....</b>	<b>.3</b>
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
OBJECTIVE .....	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST METHODOLOGY .....	3
MEASUREMENT UNCERTAINTY.....	3
TEST FACILITY.....	4
<b>SYSTEM TEST CONFIGURATION.....</b>	<b>5</b>
JUSTIFICATION .....	5
SPECIAL ACCESSORIES.....	5
EQUIPMENT MODIFICATIONS .....	5
SUPPORT EQUIPMENT LIST AND DETAILS .....	5
EXTERNAL I/O CABLE.....	5
BLOCK DIAGRAM OF TEST SETUP .....	6
<b>SUMMARY OF TEST RESULTS .....</b>	<b>7</b>
<b>TEST EQUIPMENT LIST AND DETAILS .....</b>	<b>8</b>
<b>FCC §15.203 - ANTENNA REQUIREMENT.....</b>	<b>9</b>
APPLICABLE STANDARD .....	9
ANTENNA CONNECTOR CONSTRUCTION .....	9
<b>FCC §15.207 (A) – AC LINE CONDUCTED EMISSIONS .....</b>	<b>10</b>
APPLICABLE STANDARD .....	10
EUT SETUP .....	10
EMI TEST RECEIVER SETUP.....	10
TEST PROCEDURE .....	10
CORRECTED FACTOR & MARGIN CALCULATION .....	11
TEST RESULTS SUMMARY .....	11
TEST DATA .....	11
<b>FCC §15.205, §15.209, §15.231 (B) - RADIATED EMISSIONS .....</b>	<b>14</b>
APPLICABLE STANDARD .....	14
EUT SETUP .....	14
EMI TEST RECEIVER SETUP.....	15
TEST PROCEDURE .....	15
CORRECTED AMPLITUDE & MARGIN CALCULATION .....	16
TEST RESULTS SUMMARY .....	16
TEST DATA .....	16
<b>FCC §15.231(A) (2) - DEACTIVATION TESTING.....</b>	<b>19</b>
APPLICABLE STANDARD .....	19
TEST PROCEDURE .....	19
TEST DATA .....	19
<b>FCC §15.231(C) – 20 DB EMISSION BANDWIDTH TESTING .....</b>	<b>21</b>
APPLICABLE STANDARD .....	21
TEST PROCEDURE .....	21
TEST DATA .....	21

## GENERAL INFORMATION

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

The *Shenzhen Joy Technology Co. Ltd*'s product, model number: *T30* (*FCC ID: 2AH83T30*) (or the "EUT") in this report was a *Medical Alert System*, which was measured approximately: 18 cm (L) \* 13.6 cm (W) \* 3.0 cm (H), rated with input voltage: DC 3.7V battery.

*Note: For the product, series model T30, T30-L, T30G, T30-W, T30-B, T30-M, T30H and T30-F are identical schematics, the differences between them are model number. T30 was selected for fully testing, which was explained in the attached product similarity declaration letter.*

*\* All measurement and test data in this report was gathered from production sample serial number: 1603771 (Assigned by BACL, Kunshan). The EUT supplied by the applicant was received on 2016-11-29.*

### Objective

This test report is prepared on behalf of *Shenzhen Joy Technology Co. Ltd*. All the test measurements were performed according to the measurement procedure described in ANSI C63.10 - 2013.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.207, 15.209, 15.35(c) and 15.231 rules.

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

No related submittal(s).

### 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 at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

### Measurement Uncertainty

Item	Uncertainty	
AC Power Lines Conducted Emissions	±3.26 dB	
RF conducted test with spectrum	±0.9dB	
RF Output Power with Power meter	±0.5dB	
Radiated emission	30MHz~1GHz	±5.91dB
	Above 1G	±4.92dB
Occupied Bandwidth	±0.5kHz	
Temperature	±1.0 °C	
Humidity	±6%	

## Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China

Test site at Bay Area Compliance Laboratories Corp. (Kunshan) 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 November 06, 2014. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.10-2013.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 815570. 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 was configured for testing in a typical fashion (as normally used by a typical user).

### Special Accessories

No special accessories was used

### Equipment Modifications

No modification was made to the EUT.

### Support Equipment List and Details

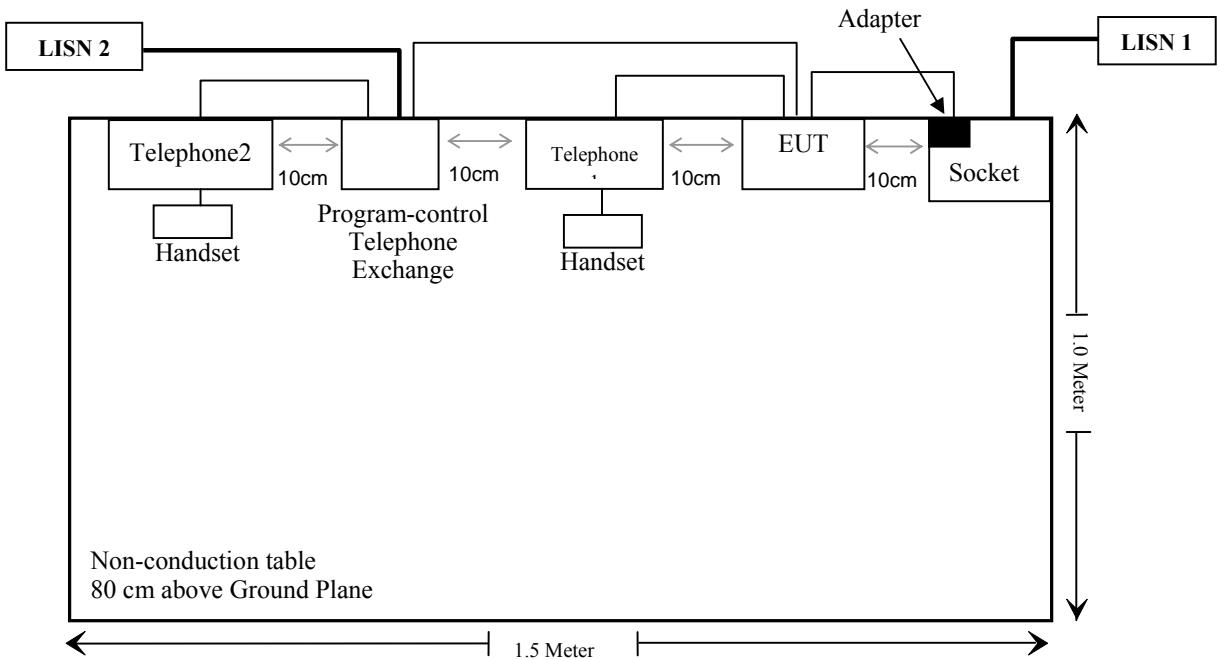
Manufacturer	Description	Model	Serial Number
JISHENG	Socket	506	CH0076104
LECENT	Telephone 1	6408D01A-323	99SP56459266
KeWang	PBX	TC-104L	N/A
AVAYA	Telephone 2	6408D01D(90)-323	041649603900

### External I/O Cable

Cable Description	Length (m)	From / Port	To
Unshielded detachable DC power cable	1.5	EUT	Adapter
Unshielded detachable RJ11 cable	1.5	Telephone 2	Telephone Exchange
Unshielded detachable RJ11 cable	1.5	EUT	Telephone Exchange
Unshielded detachable RJ11 cable	1.5	Telephone 1	EUT
Un-shielding Un-detachable AC cable	1.0	Telephone Exchange	LISN
Un-shielding Un-detachable AC cable	1.5	Socket	LISN

**Block Diagram of Test Setup**

For Conducted Emission:



## SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207 (a)	Conducted Emissions	Compliance
§15.205, §15.209, §15.231(b)	Radiated Emissions	Compliance
§15.231 (c)	20dB Emission Bandwidth	Compliance
§15.231 (a) (2)	Deactivation	Compliance

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
<b>AC Line Conducted Emission Test</b>					
Rohde & Schwarz	EMI Test Receiver	ESCS30	834115/007	2016-11-25	2017-11-25
Rohde & Schwarz	LISN	ESH3-Z5	862770/011	2016-10-10	2017-10-10
Rohde & Schwarz	Pulse limiter	ESH3-Z2	879940/0058	2016-06-19	2017-06-18
MICRO-COAX	Coaxial line	UFB-293B-1-0480-50X50	97F0173	2016-09-08	2017-09-08
Rohde & Schwarz	CE Test software	EMC 32	V 09.10.0	NCR	NCR
<b>Radiated Emission Test</b>					
Sonoma Instrument	Amplifier	330	171377	2015-12-12	2016-12-12
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2016-11-25	2017-11-25
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2016-01-09	2019-01-08
ETS	Horn Antenna	3115	9311-4159	2016-01-11	2019-01-10
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2016-11-25	2017-11-25
Mini	Pre-amplifier	ZVA-183-S+	857001418	2016-09-16	2017-09-16
R&S	Auto test Software	EMC32	V 09.10.0	NCR	NCR
haojintech	Coaxial Cable	Cable-1	001	2016-09-08	2017-09-07
haojintech	Coaxial Cable	Cable-2	002	2016-09-08	2017-09-07
haojintech	Coaxial Cable	Cable-3	003	2016-09-08	2017-09-07
MICRO-COAX	Coaxial Cable	Cable-4	004	2016-11-18	2017-11-17
MICRO-COAX	Coaxial Cable	Cable-5	005	2016-11-18	2017-11-17
<b>RF Conducted test</b>					
WEINSCHEL	10dB Attenuator	5328	N/A	2016-06-18	2017-06-18
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131	2016-09-21	2017-09-21

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

## **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 Connector Construction**

The EUT has one internal arrangement, which was permanently attached. The antenna is 2.0 dBi, fulfill the requirement of this section. Please refer to EUT photos.

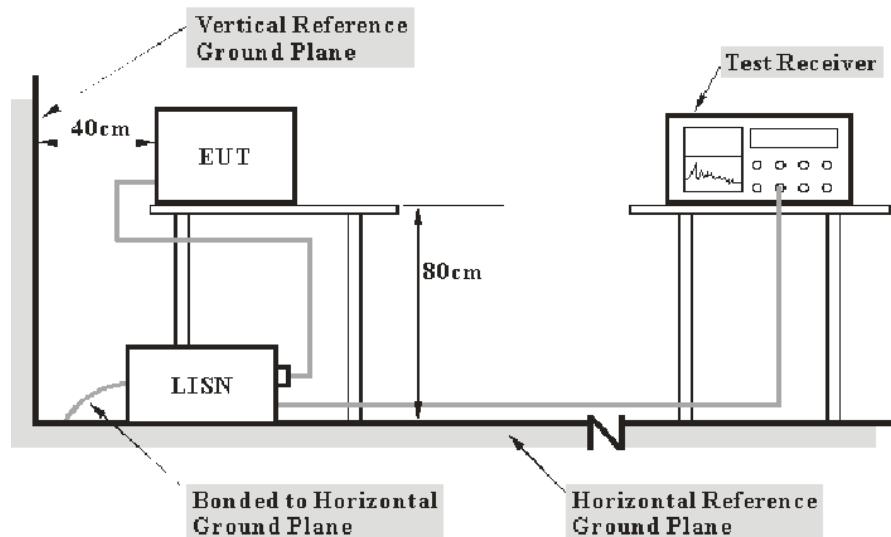
**Result:** Compliant.

## FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

### Applicable Standard

FCC§15.207

### 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 C63.4-2014 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The adapter was connected to a 120 VAC/60 Hz 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 conducted emission test, the adapter was connected to the outlet of the LISN.

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

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

## Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Correction Factor} = \text{LISN VDF} + \text{Cable Loss} + \text{Transient Limiter Attenuation}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB 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.

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(L_m)} \leq L_{\text{lim}} + U_{\text{cisp}}$$

In BACL,  $U_{(L_m)}$  is less than  $U_{\text{cisp}}$ , if  $L_m$  is less than  $L_{\text{lim}}$ , it implies that the EUT complies with the limit.

## Test Data

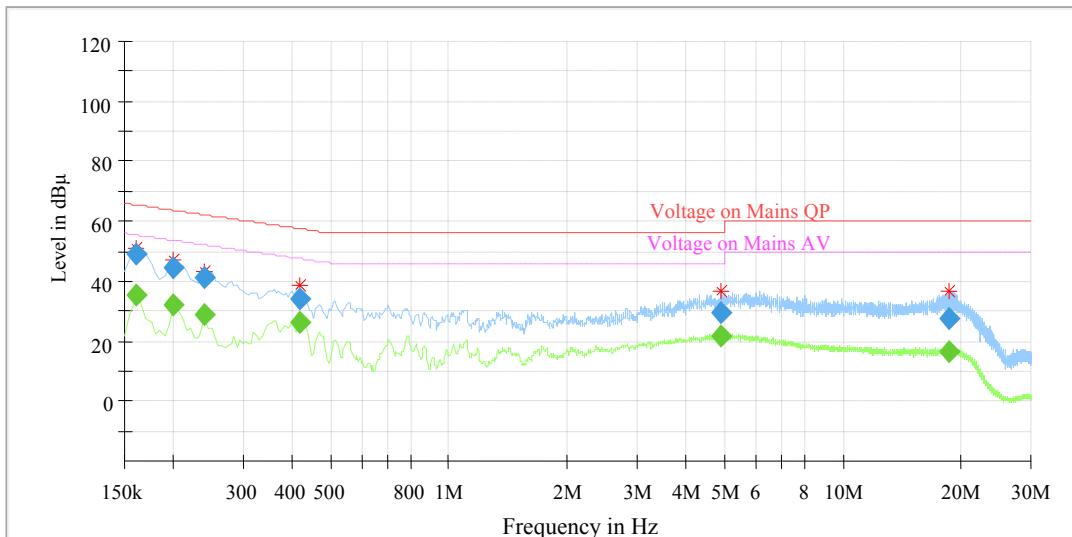
### Environmental Conditions

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	55 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Layne Li on 2016-12-05.*

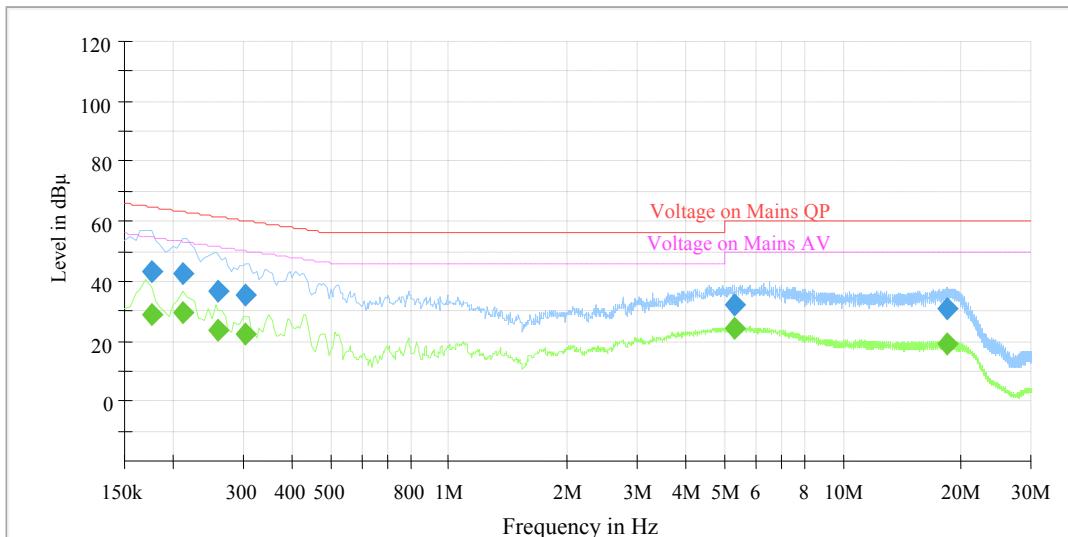
*EUT operation mode: Transmitting*

## AC 120V/60 Hz, Line



Frequency (MHz)	QuasiPeak (dBμV)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.160000	---	35.66	9.000	L1	10.3	19.80	55.46	Compliance
0.160000	48.95	---	9.000	L1	10.3	16.51	65.46	Compliance
0.200000	---	32.37	9.000	L1	10.3	21.24	53.61	Compliance
0.200000	44.65	---	9.000	L1	10.3	18.96	63.61	Compliance
0.240000	---	29.15	9.000	L1	10.3	22.95	52.10	Compliance
0.240000	41.27	---	9.000	L1	10.3	20.83	62.10	Compliance
0.420000	---	25.96	9.000	L1	10.3	21.49	47.45	Compliance
0.420000	33.73	---	9.000	L1	10.3	23.72	57.45	Compliance
4.910000	---	21.57	9.000	L1	10.5	24.43	46.00	Compliance
4.910000	29.19	---	9.000	L1	10.5	26.81	56.00	Compliance
18.660000	---	16.73	9.000	L1	10.5	33.27	50.00	Compliance
18.660000	27.76	---	9.000	L1	10.5	32.24	60.00	Compliance

## AC 120V/60 Hz, Neutral



Frequency (MHz)	QuasiPeak (dBμV)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.175000	---	28.88	9.000	N	10.3	25.84	54.72	Compliance
0.175000	43.28	---	9.000	N	10.3	21.44	64.72	Compliance
0.210000	---	29.34	9.000	N	10.3	23.87	53.21	Compliance
0.210000	42.60	---	9.000	N	10.3	20.61	63.21	Compliance
0.260000	---	23.40	9.000	N	10.3	28.03	51.43	Compliance
0.260000	36.39	---	9.000	N	10.3	25.04	61.43	Compliance
0.305000	---	22.09	9.000	N	10.3	28.02	50.11	Compliance
0.305000	35.03	---	9.000	N	10.3	25.08	60.11	Compliance
5.290000	---	24.02	9.000	N	10.6	25.98	50.00	Compliance
5.290000	32.14	---	9.000	N	10.6	27.86	60.00	Compliance
18.325000	---	18.80	9.000	N	10.5	31.20	50.00	Compliance
18.325000	30.61	---	9.000	N	10.5	29.39	60.00	Compliance

## Note:

- 1) Correction Factor =LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
- 2) Corrected Amplitude = Reading + Correction Factor
- 3) Margin = Limit – Corrected Amplitude

## FCC §15.205, §15.209, §15.231 (b) - RADIATED EMISSIONS

### Applicable Standard

FCC §15.205, §15.209, §15.231 (b)

According to FCC §15.231(b), the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

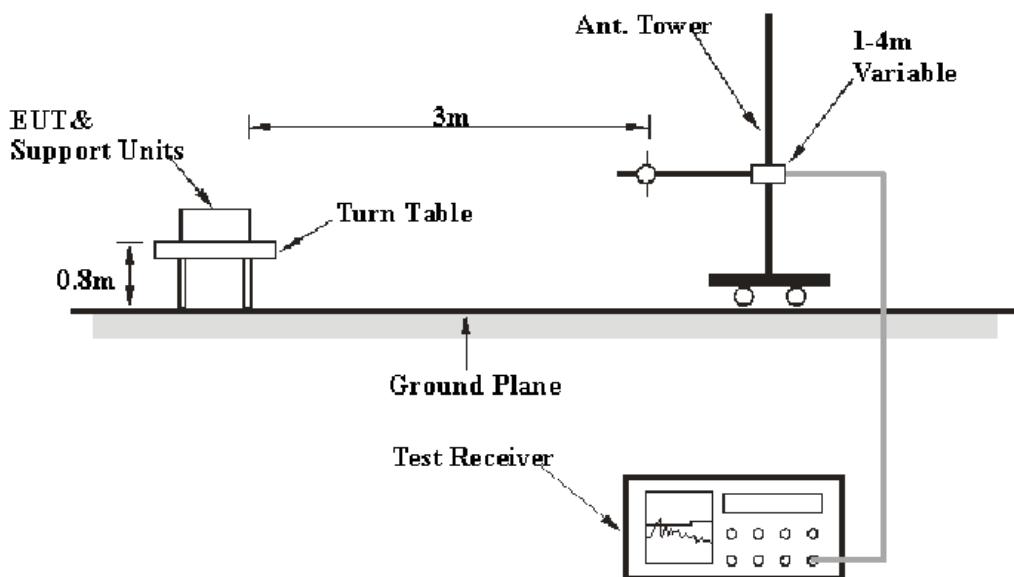
Fundamental frequency (MHz)	Field Strength of Fundamental (Microvolts /meter)	Field Strength of spurious emissions ((Microvolts /meter)
40.66-40.70	2250	225
70-130	1250	125
130-174	1250 to 3750**	125 to 375**
174-260	3750	375
260-470	3750 to 12500**	375 to 1250**
Above 470	12500	1250

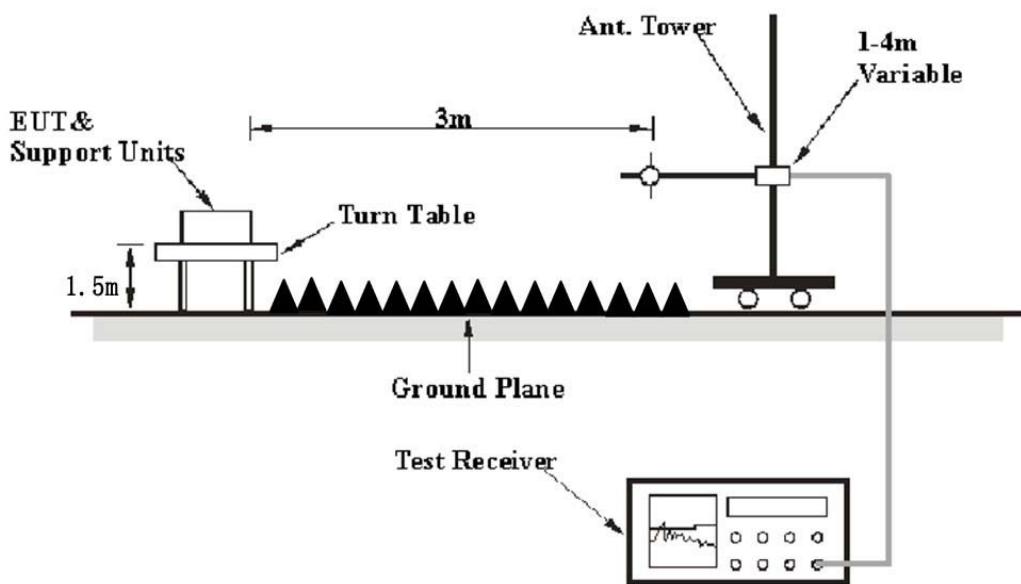
\*Linear interpolations.

The above field strength limits are specified at a distance of 3-meters the tighter limits apply at the band edges.

### EUT Setup

Below 1 GHz:



**Above 1 GHz:**

The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.10 - 2013. The specification used was the FCC 15 § 15.209, 15.205 and 15.231.

**EMI Test Receiver Setup**

The system was investigated from 30 MHz to 5 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz – 1000 MHz	100 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 highest emissions to ensure that the EUT complied with all installation combinations.

All final data was recorded in the Quasi-peak detection mode from 30MHz to 1GHz, Peak and average detection mode above 1 GHz.

## Corrected Amplitude & Margin Calculation

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

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 5.8 dB means the emission is 5.8 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.205, §15.209, §15.231 (b)

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(L_m)} \leq L_{\text{lim}} + U_{\text{cisp}}$$

In BACL,  $U_{(L_m)}$  is less than  $+ U_{\text{cisp}}$ , if  $L_m$  is less than  $L_{\text{lim}}$ , it implies that the EUT complies with the limit.

## Test Data

### Environmental Conditions

Temperature:	26 °C
Relative Humidity:	55 %
ATM Pressure:	100.1 kPa

*The testing was performed by Nefertari Xu on 2016-12-06.*

*Test mode: Transmitting*

**30MHz - 5GHz (GFSK):**

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dB $\mu$ V/m)	FCC Part 15.231(b)/205/209		
	Reading (dB $\mu$ V)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dB $\mu$ V/m)	Margin (dB)	Comment
434.21	90.36	PK	344	2.0	H	-7.32	83.04	100.8	17.76	Fundamental
434.21	87.89	Ave.	344	2.0	H	-7.32	80.57	80.8	0.23	Fundamental
434.21	82.88	PK	32	1.5	V	-7.32	75.56	100.8	25.24	Fundamental
434.21	80.76	Ave.	32	1.5	V	-7.32	73.44	80.8	7.36	Fundamental
868.42	58.81	PK	127	2.1	H	-1.09	57.72	80.8	23.08	Harmonic
868.42	52.35	Ave.	127	2.1	H	-1.09	51.26	60.8	9.54	Harmonic
868.42	55.32	PK	270	1.9	H	-1.09	54.23	80.8	26.57	Harmonic
868.42	50.44	Ave.	270	1.9	H	-1.09	49.35	60.8	11.45	Harmonic
1302.63	52.30	PK	222	1.4	H	-3.91	48.39	80.8	32.41	Harmonic
1302.63	49.36	Ave.	222	1.4	H	-3.91	45.45	60.8	15.35	Harmonic
1302.63	46.63	PK	66	1.7	V	-3.91	42.72	80.8	38.08	Harmonic
1302.63	43.04	Ave.	66	1.7	V	-3.91	39.13	60.8	21.67	Harmonic
1736.84	52.27	PK	87	1.7	H	-5.14	47.13	80.8	33.67	Harmonic
1736.84	49.95	Ave.	87	1.7	H	-5.14	44.81	60.8	15.99	Harmonic
1736.84	47.58	PK	75	1.9	V	-5.14	42.44	80.8	38.36	Harmonic
1736.84	43.94	Ave.	75	1.9	V	-5.14	38.80	60.8	22.00	Harmonic

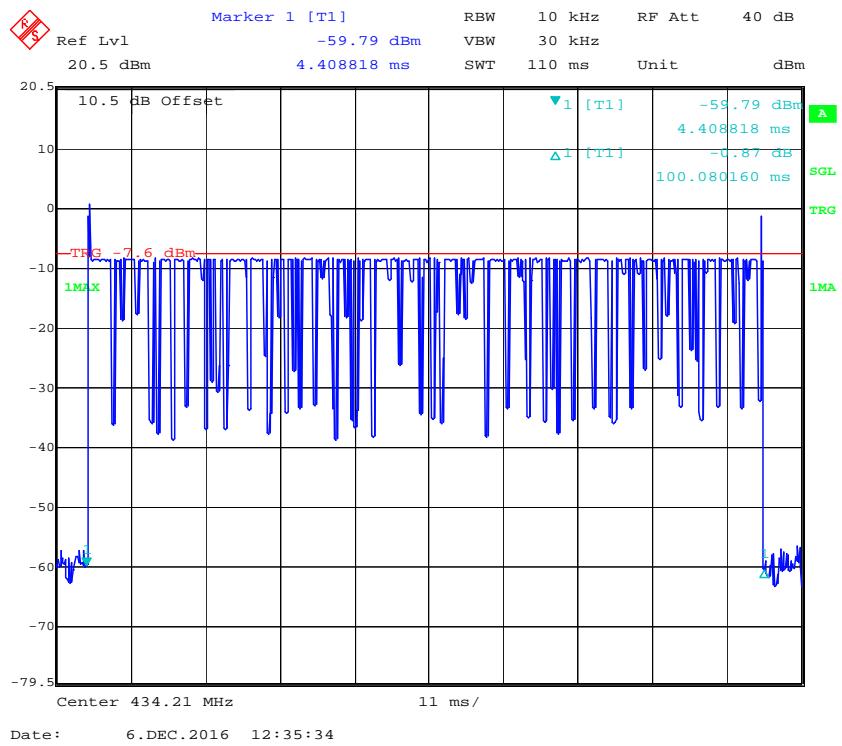
**Note:**

This item was tested with 100% duty cycle.

Corrected Amplitude = Corrected Factor + Reading

Corrected Factor = Antenna factor (Rx) + cable loss – amplifier factor

Margin = Limit - Corr. Amplitude

**Duty Cycle**

## **FCC §15.231(a) (2) - DEACTIVATION TESTING**

### **Applicable Standard**

Per FCC §15.231(a) (2), a transmitter activated automatically shall cease transmission within 5 seconds after activation.

### **Test Procedure**

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set center frequency of spectrum analyzer=operating frequency.
3. Set the spectrum analyzer as RBW=100k VBW=100k Span=0Hz.
4. Repeat above procedures until all frequency measured was complete.

### **Test Data**

#### **Environmental Conditions**

<b>Temperature:</b>	26 °C
<b>Relative Humidity:</b>	55 %
<b>ATM Pressure:</b>	100.1 kPa

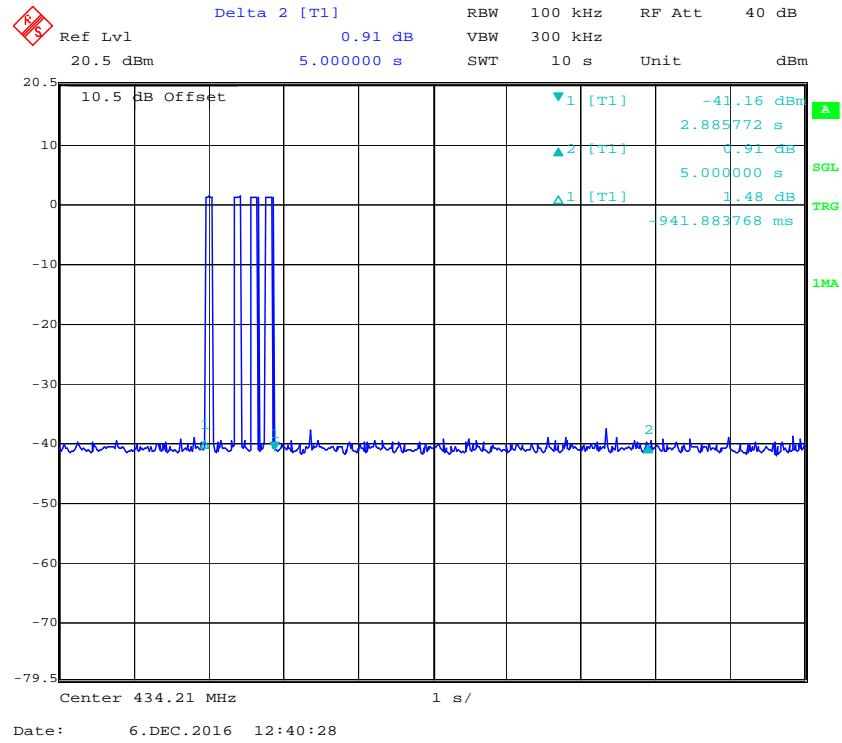
*The testing was performed by Nefertari Xu on 2016-12-06.*

*Test mode: Transmitting*

**Test Result:** Compliant, please refer to following plot.

**GFSK modulation:**

Transmission period	Limit	Result
0.942 s	< 5 s	Pass



## FCC §15.231(c) – 20 dB EMISSION BANDWIDTH TESTING

### Applicable Standard

Per 15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

### Test Procedure

With the EUT's antenna attached, the waveform was received by the test antenna which was connected to the spectrum analyzer, plot the 20 dB bandwidth.

### Test Data

#### Environmental Conditions

Temperature:	26 °C
Relative Humidity:	55 %
ATM Pressure:	100.1 kPa

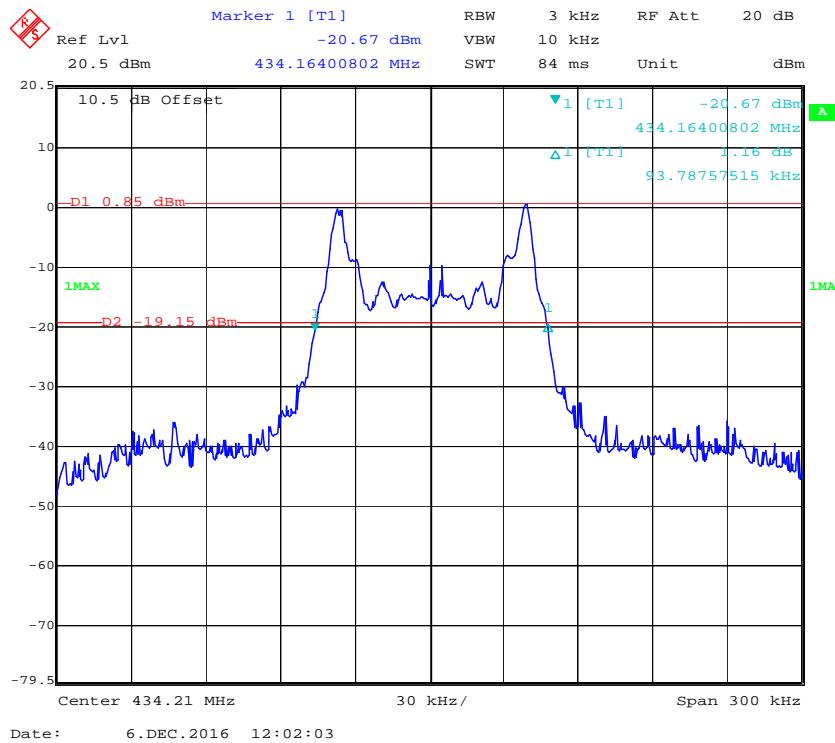
The testing was performed by Nefertari Xu on 2016-12-06.

Test Mode: Transmitting

Please refer to following table and plot.

Channel Frequency (MHz)	20 dB Emission Bandwidth (kHz)	<Limit (kHz)	Result
434.21	93.79	1085.525	Pass

Note: Limit = 0.25% \* center frequency = 0.25% \* 434.21 MHz = 1085.525 kHz  
20dB bandwidth = 93.79 kHz < 1085.525 kHz

**20 dB Emission Bandwidth****\*\*\*\*\* END OF REPORT \*\*\*\*\***