

FCC TEST REPORT

FCC ID : I4S-PVUB7T
Applicant : Peavey Electronics Corporation
Address : 5022 Hartley Peavey Drive Meridian, MS 39305
Manufacturer : Shenzhen Uniwisdom Technologies Co., Ltd.
Address : Bldg.91-94 3rd Industrial Zone, Lisonglang, Gongming Town, Bao'an District, Shenzhen, P.R.China

Equipment Under Test (EUT) :

Product Name : WIRELESS TRANSMITTER
Model No. : PV WIRELESS TRANSMITTER (UB-7)
Rules : FCC CFR47 Part 74 Section 74.861:2013

Date of Test : September 16~18, 2013

Date of Issue : Oct 16, 2013

Test Result : **PASS***

Remarks:

* The sample described above has been tested to be in compliance with the requirements of the rules listed above.

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company.

The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

Waltek Services (Shenzhen) Co., Ltd.

Address: 1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan District, Shenzhen, Guangdong, China

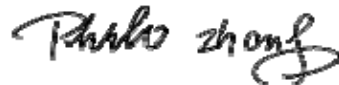
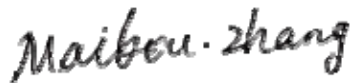
Testing location: 1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan District, Shenzhen, Guangdong, China

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Compiled by:

Approved by:



Maikou Zhang / Project Engineer

Philo Zhong / Manager

2 Test Summary

Test Items	Test Requirement	Test Method	Result
AC Line Conducted Emissions	15.207	ANSI C63.4	N/A
RF Output Power	74.861(e)(1)(ii)	TIA/EIA-603-C-2004	PASS
Modulation Characteristics	2.1047(a)	TIA/EIA-603-C-2004	PASS
Occupied Bandwidth	2.1049(c)(1)	TIA/EIA-603-C-2004	PASS
Radiated Emissions	2.1053 & 74.861(e)(6)	TIA/EIA-603-C-2004	PASS
Spurious emissions at antenna terminals	2.1051	TIA/EIA-603-C-2004	PASS
Frequencies Stability	2.1055(a)(1)	TIA/EIA-603-C-2004	PASS
Remark: PASS means that the test results complies with related requirements. N/A means that the test is not applicable for the EUT.			

3 Contents

	Page
1 COVER PAGE	1
2 TEST SUMMARY	2
3 CONTENTS	3
4 GENERAL INFORMATION	5
4.1 GENERAL DESCRIPTION OF E.U.T.....	5
4.2 DETAILS OF E.U.T.....	5
4.3 TEST FACILITY.....	5
4.4 TEST LOCATION.....	5
5 EQUIPMENT USED DURING TEST	6
5.1 EQUIPMENTS LIST.....	6
5.2 MEASUREMENT UNCERTAINTY.....	6
5.3 TEST EQUIPMENT CALIBRATION.....	6
6 AC LINE CONDUCTED EMISSIONS	7
7 RF OUTPUT POWER	8
7.1 TEST PROCEDURE.....	8
7.2 TEST RESULT.....	8
8 MODULATION CHARACTERISTICS	10
8.1 TEST PROCEDURE.....	10
8.2 TEST RESULT.....	11
9 OCCUPIED BANDWIDTH OF EMISSION	12
9.1 TEST PROCEDURE.....	12
9.2 TEST RESULT.....	12
10 SPURIOUS EMISSIONS AT ANTENNA TERMINALS	14
10.1 TEST PROCEDURE.....	14
10.2 TEST DATA.....	15
11 RADIATED EMISSION TEST	18
11.1 EUT SETUP.....	18
11.2 SPECTRUM ANALYZER SETUP.....	20
11.3 TEST PROCEDURE.....	20
11.4 TEST RESULT.....	22
12 FREQUENCY STABILITY	23
12.1 TEST CONFIGURATION.....	23
12.2 TEST PROCEDURE.....	23
12.3 TEST RESULT.....	24
13 PHOTOGRAPHS OF TESTING	26
13.1 RADIATION EMISSION TEST VIEW FROM 9KHZ-30MHZ.....	26
13.2 RADIATION EMISSION TEST VIEW FROM 30MHZ-1GHZ.....	26
13.3 RADIATION EMISSION TEST VIEW FROM ABOVE 1GHZ.....	27
14 PHOTOGRAPHS - CONSTRUCTIONAL DETAILS	28

14.1 PRODUCT VIEW..... 28
14.2 EUT – OPEN VIEW 29
14.3 PCB - VIEW 30

4 General Information

4.1 General Description of E.U.T.

Product Name	: WIRELESS TRANSMITTER
Model No.	: PV WIRELESS TRANSMITTER (UB-7)
Differences describe	: N/A
Operation Frequency	: 672MHz-679MHz
Antenna Gain (dBi)	: 0dBi

4.2 Details of E.U.T.

Technical Data: : DC 1.5V*2, Size"AA ", 130mA

4.3 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A**

Waltek Services(Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files.

Registration No.:7760A, July 12, 2012.

- **FCC – Registration No.: 880581**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, May 26, 2011.

4.4 Test Location

All the tests were performed at:

Waltek Services(Shenzhen) Co., Ltd. at 1/F, Fukangtai Building, West Baima Rd., Songgang Street, Baoan District, Shenzhen, China

5 Equipment Used during Test

5.1 Equipments List

3m Semi-anechoic Chamber for Radiation Emissions						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer	Agilent	E7405A	MY45114943	Spe.21,2012	Spe.20,2013
2.	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Spe.21,2012	Spe.20,2013
3.	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Spe.21,2012	Spe.20,2013
4.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Spe.21,2012	Spe.20,2013
5.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	399	Spe.21,2012	Spe.20,2013
6.	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Spe.21,2012	Spe.20,2013
7.	Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-148	Spe.21,2012	Spe.20,2013
8.	Cable	Top	EWO2014-7	-	Spe.21,2012	Spe.20,2013
9.	Cable	Top	TYPE16(13M)	-	Spe.21,2012	Spe.20,2013
10.	DC POWER SUPPLY	LWDQGS	PS-303D	-	Spe.21,2012	Spe.20,2013
11.	Humidity Chamber	GTH-225-40-1P	IAA061213	-	Spe.21,2012	Spe.20,2013
12.	Spectrum Analyzer	ROHDE & SCHWARZ	FSL6	-	Sep. 21, 2012	Sep. 20, 2013

5.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-6}$
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 4.74 dB (Horn antenna 1000M~25000MHz)

5.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

6 AC Line Conducted Emissions

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.4:2003
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class:	Class B
Limit:	66-56 dB μ V between 0.15MHz & 0.5MHz 56 dB μ V between 0.5MHz & 5MHz 60 dB μ V between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit
Test Result:	N/A
Remark:	This device powered by battery,this test is not applicable.

7 RF Output Power

Test requirement: FCC CFR47 Part 74 Section 74.861(e)(1)(ii)
 Test method: Based on TIA/EIA-603-C-2004
 Limit: According to Part 74.861(e)(1)(ii), the output power shall not exceed 250mW (23.98 dBm).

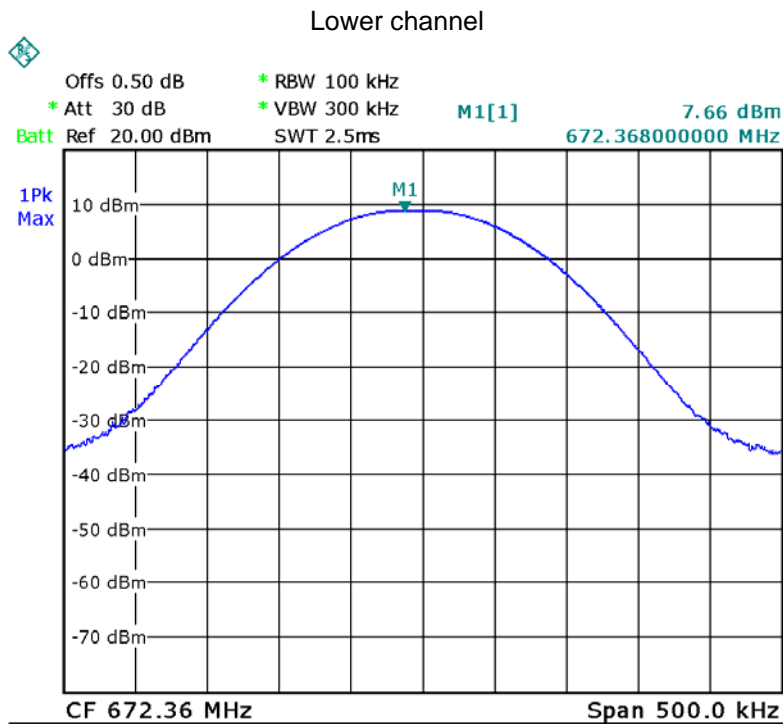
7.1 Test Procedure

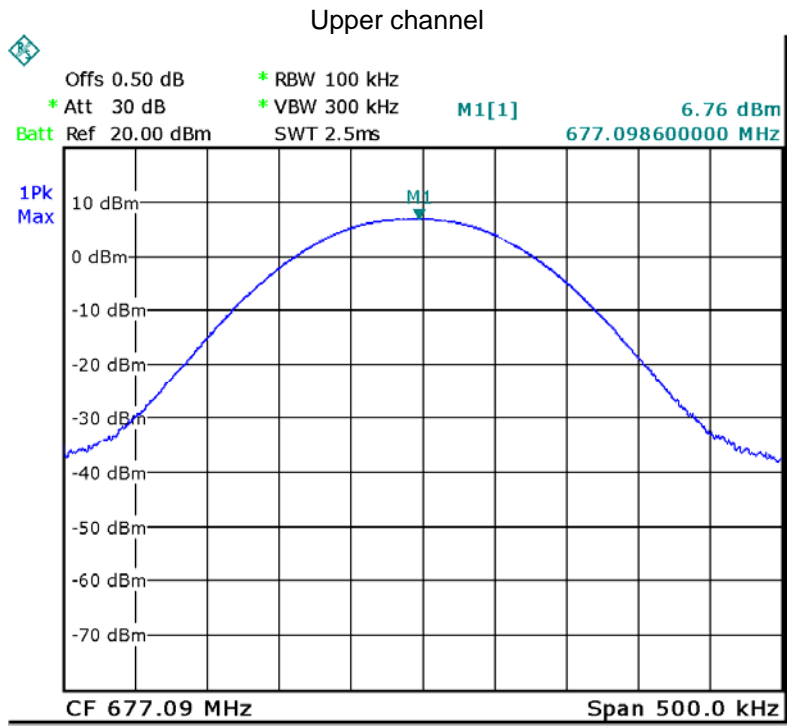
The maximum peak output power was measured with a spectrum analyzer connected to the antenna terminal (conducted measurement) while EUT was operating in normal situation.

7.2 Test result

Frequency (MHz)	RF Output Power (dBm)	Limit (dBm)	Result
672.36	7.66	23.98	PASS
677.09	6.76	23.98	PASS

Please refer to following plot:



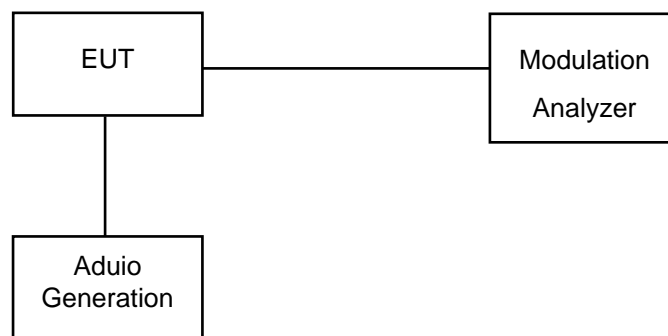


8 Modulation Characteristics

Test requirement:	FCC CFR47 Part 2 Section 2.1047(a)
Test method:	Based on TIA/EIA-603-C-2004
Requirement:	According to Part 2.1047(a), for Voice Modulated Communication Equipment, the frequency response of the audio modulating circuit over a range of 100Hz to 5000Hz shall be measured.

8.1 Test Procedure

(a) Test Configuration



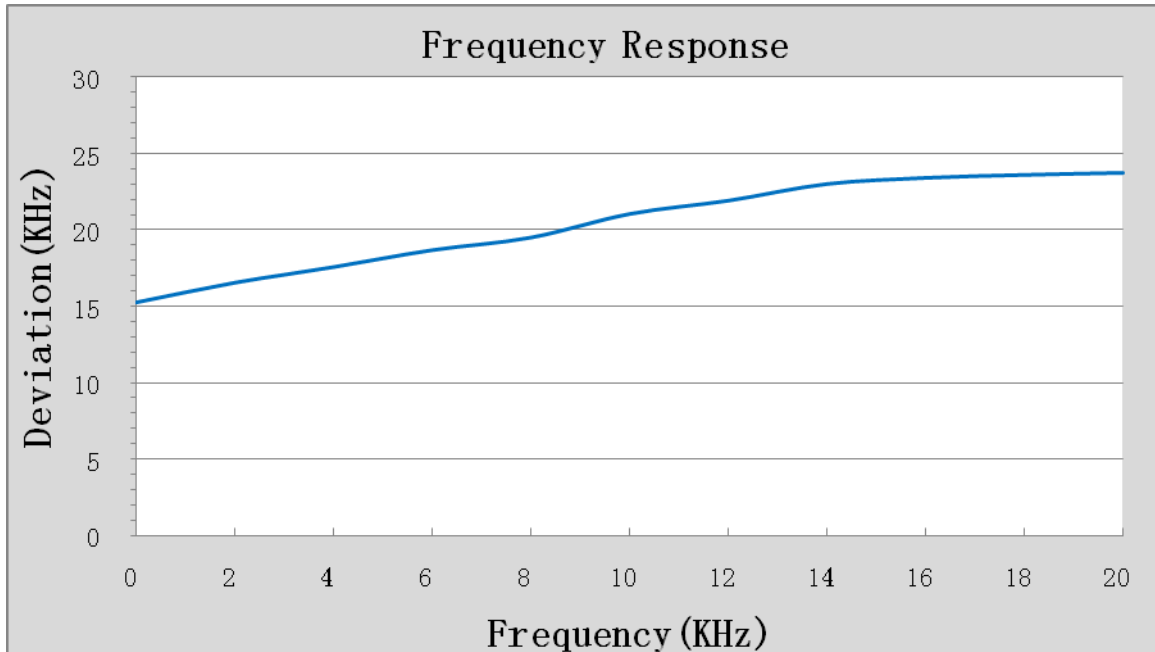
(b) Position the EUT as shown in above, adjust the audio input frequency to 100 Hz and the input level from 0V to maximum permitted input voltage with recording each carrier frequency deviation responding to respective input level.

65. ©Repeat step (b) with changing the input frequency for 100, 500, 1000, 2500 and 5000Hz in sequence.

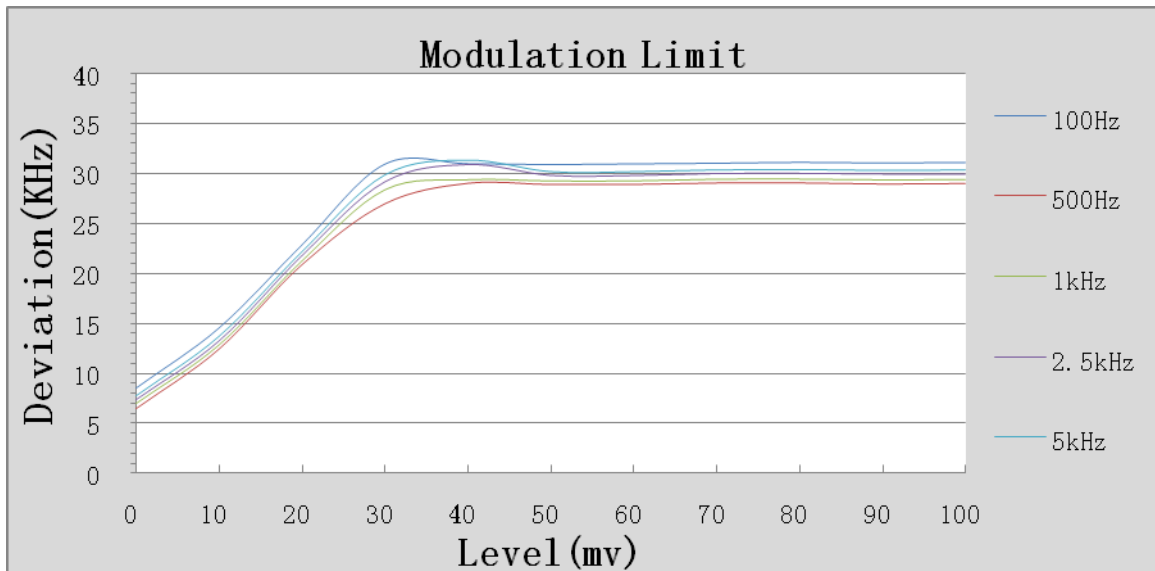
8.2 Test Result

The test data of modulation characteristic is showing as below:

Frequency Response



Modulation Limit



9 Occupied Bandwidth of Emission

Test requirement: FCC CFR47 Part 2 Section 2.1049©(1)
 Test method: Based on TIA/EIA-603-C-2004
 Limit: According to FCC 74.861 (e)(5), the frequency emission bandwidth shall not exceed 200 kHz.

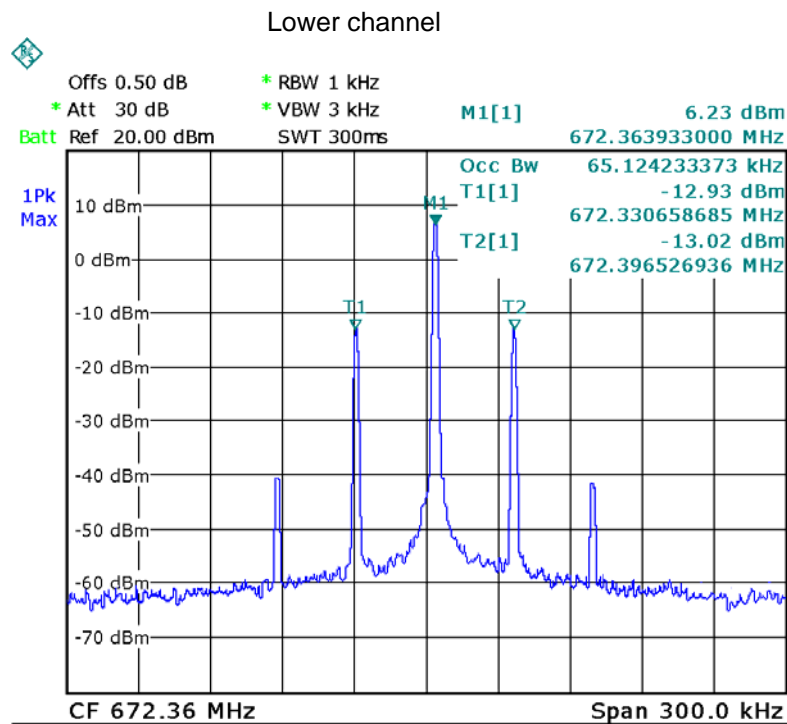
9.1 Test Procedure

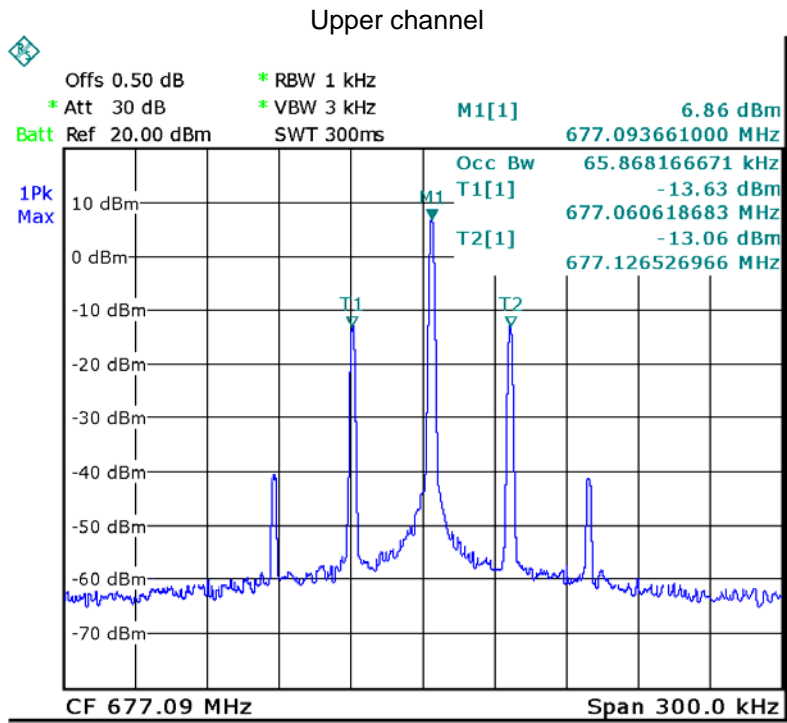
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and set it to any one convenient frequency within its operating range.

9.2 Test Result

Frequency (MHz)	99% Bandwidth (kHz)	Limit (kHz)	Result
672.36	65.124	200	PASS
677.09	65.868	200	PASS

Test Plot:





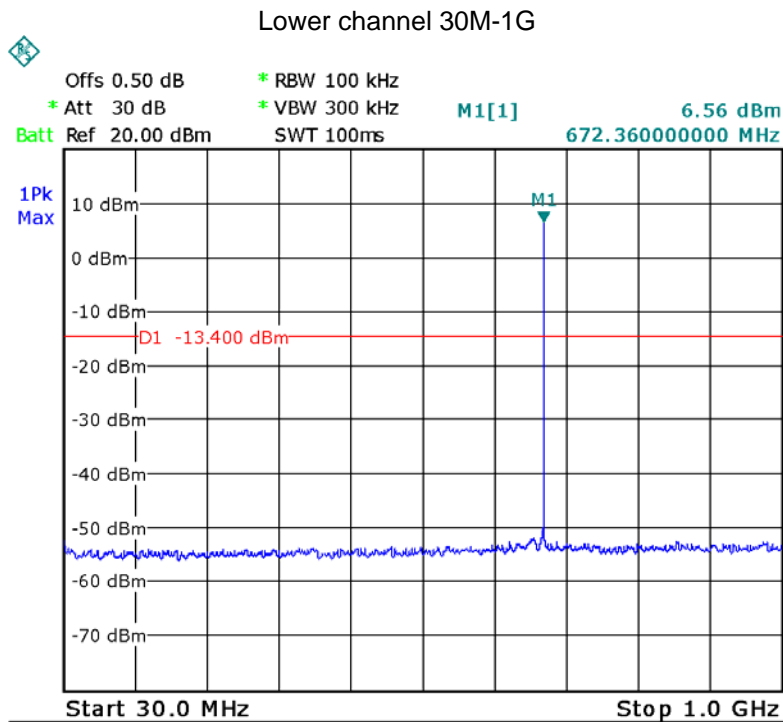
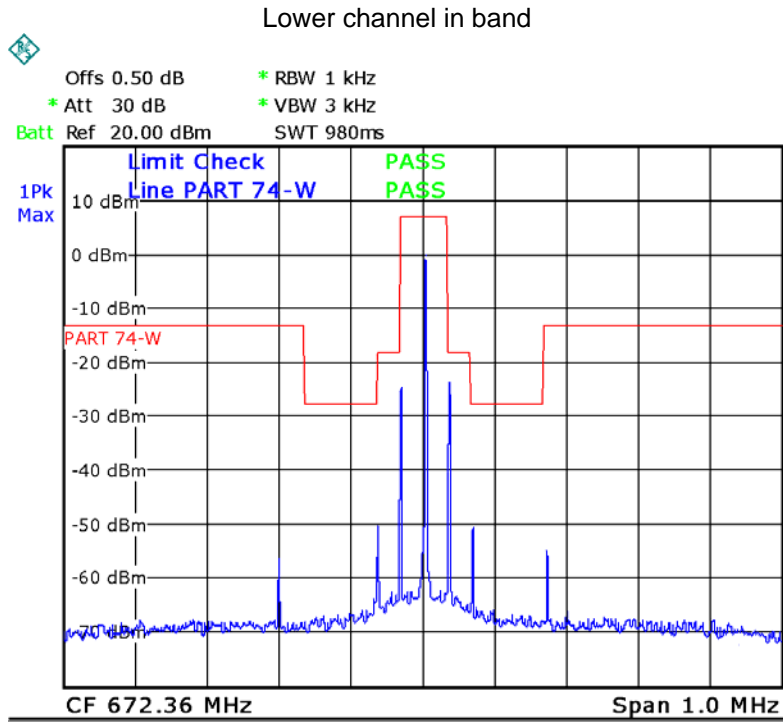
10 Spurious Emissions at Antenna Terminals

Test requirement:	FCC CFR47 Part 2 Section 2.1053
Test method:	Based on TIA/EIA-603-C-2004
Limit:	According to Part 74.861 (e)(6), the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule: (i) on any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB. (ii) on any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB. (iii) on any frequency removed from the operating frequency by more than 250 percent up to and the authorized bandwidth shall be attenuated below the un-modulated carrier by at least $43 + 10 \text{ Log}(\text{output power in watts})\text{dB}$.

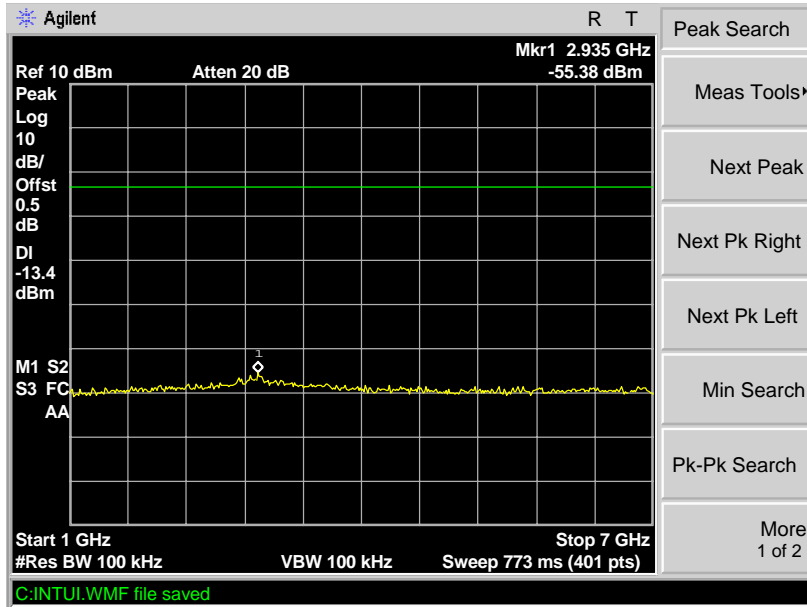
10.1 Test Procedure

1. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
2. Set the SA on Max-Hold Mode, and then keep the EUT in transmitting mode. Record all the signals from each channel until each one has been recorded.
3. Set the SA on View mode and then plot the result on SA screen.
4. Repeat above procedures until all frequencies measured were complete.

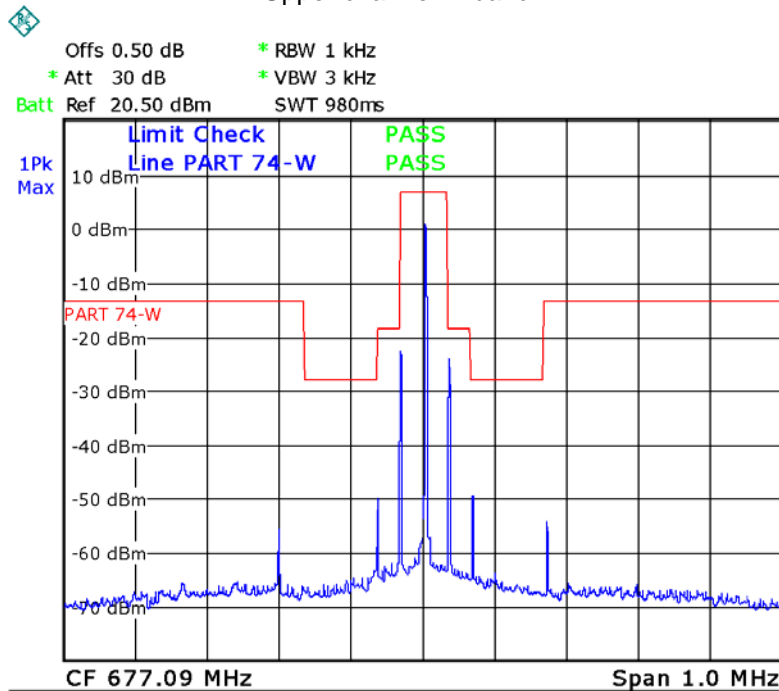
10.2 Test Data

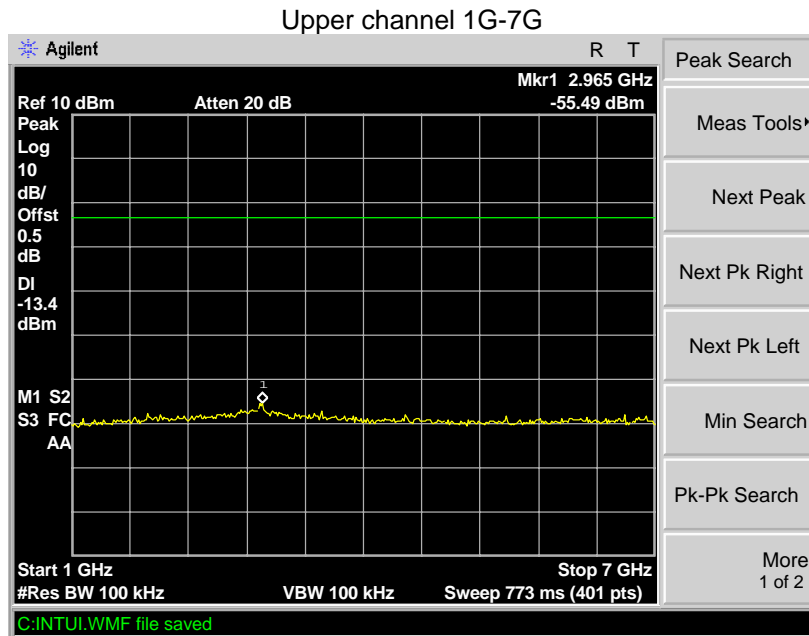
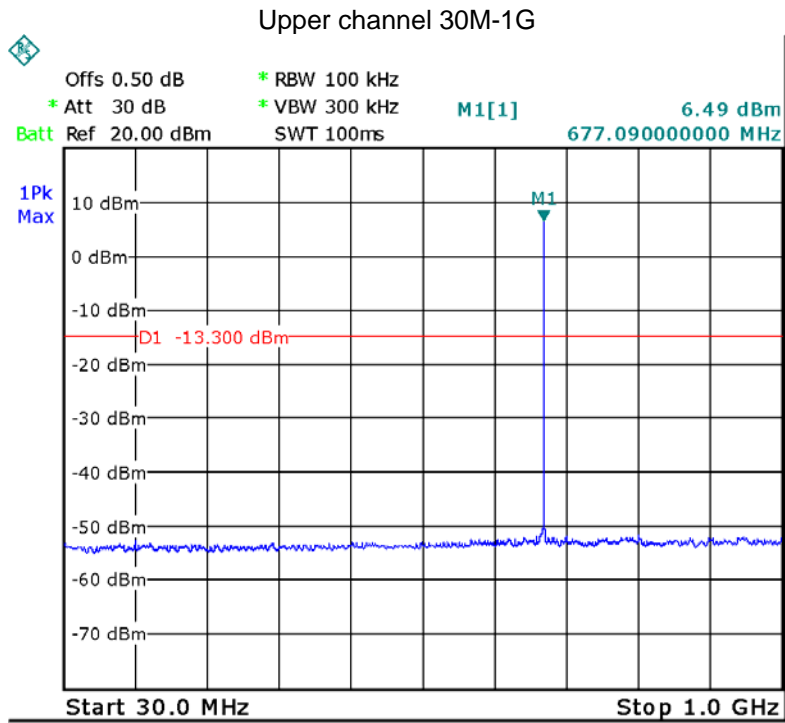


Lower channel 1G-7G



Upper channel in band





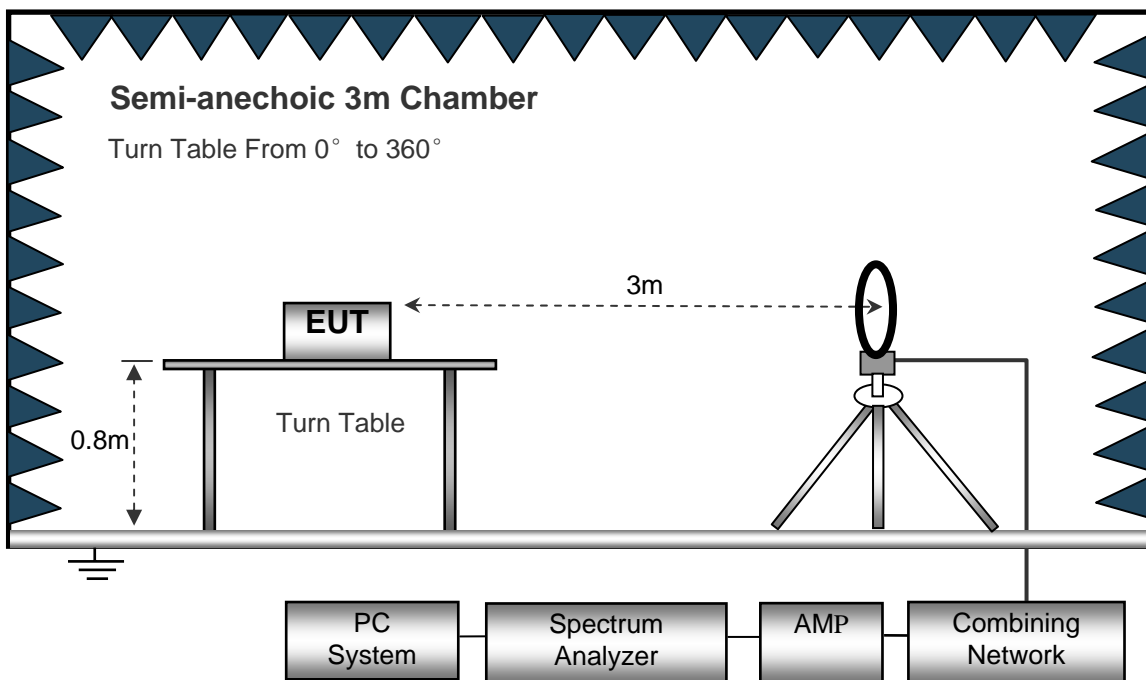
11 Radiated Emission Test

Test requirement:	FCC CFR47 Part 2 Section 2.1053
Test method:	Based on TIA/EIA-603-C-2004
Limit:	According to Part 74.861 (e)(6), the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule: <ul style="list-style-type: none"> (i) on any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB. (ii) on any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB. (iii) on any frequency removed from the operating frequency by more than 250 percent up to and the authorized bandwidth shall be attenuated below the un-modulated carrier by at least $43 + 10 \text{ Log} (\text{output power in watts})\text{dB}$.

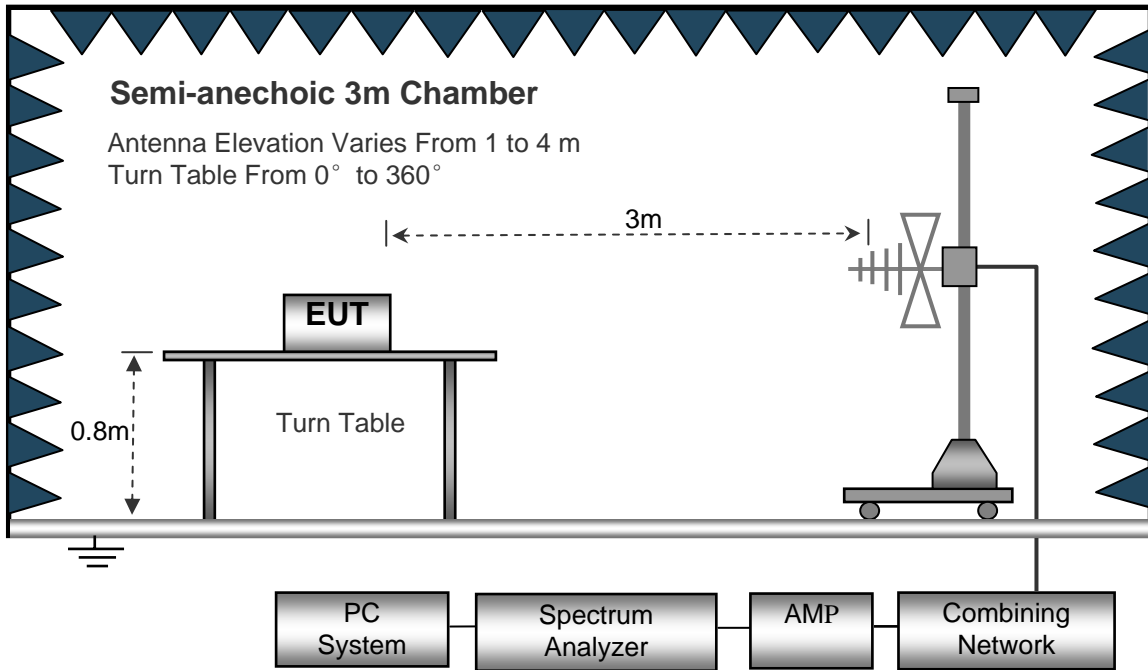
11.1 EUT Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4:2003.

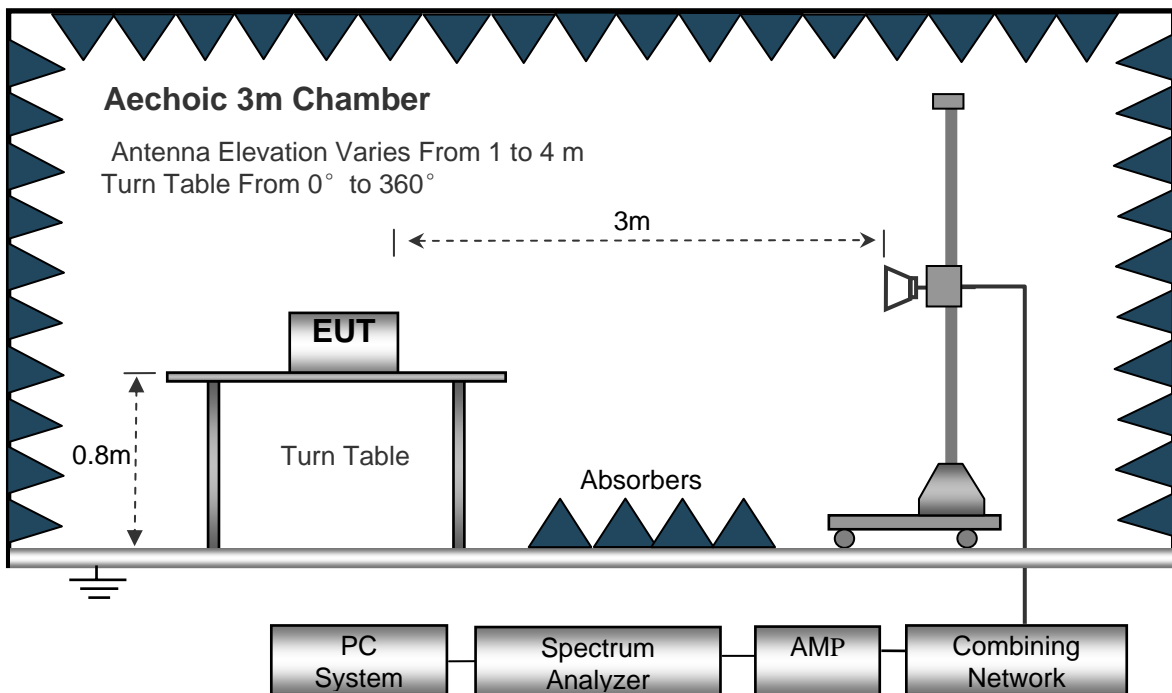
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 KHz to 30 MHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz Emissions.



11.2 Spectrum Analyzer Setup

According to FCC Part15 Rules, the system was tested 9kHz to 7000MHz.

9kHz ~ 30MHz

Start Frequency9kHz
 Stop Frequency30MHz
 Sweep SpeedAuto
 IF Bandwidth.....10KHz
 Video Bandwidth.....10KHz
 Resolution Bandwidth10KHz

30MHz ~ 1GHz

Start Frequency30 MHz
 Stop Frequency.....1000MHz
 Sweep Speed.....Auto
 IF Bandwidth120 KHz
 Video Bandwidth100KHz
 Quasi-Peak Adapter Bandwidth.....120 KHz
 Quasi-Peak Adapter ModeNormal
 Resolution Bandwidth100KHz

Above 1GHz

Start Frequency1000 MHz
 Stop Frequency.....7000MHz
 Sweep Speed.....Auto
 IF Bandwidth120 KHz
 Video Bandwidth3MHz
 Quasi-Peak Adapter Bandwidth.....120 KHz
 Quasi-Peak Adapter ModeNormal
 Resolution Bandwidth1MHz

11.3 Test Procedure

1. Place the transmitter to be tested on the turntable in the standard test site. The transmitter is Transmitting into a non-radiating load, which is placed on the turntable.
2. The output of the antenna was connected to the measuring receiver and a peak detector was used for the measurement as indicated on the report.
3. The transmitter was switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
4. The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
5. The transmitter shall than be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

6. The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
7. The maximum signal level detected by the measuring receiver shall be noted.
8. The measurement shall be repeated with the test antenna set to horizontal polarization.
9. Replace the antenna with a proper antenna (substitution antenna).
10. The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
11. The substitution antenna shall be connected to a calibrated signal generator.
12. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
13. The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
14. The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
15. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
16. The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.
17. The radiation emission was tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.
18. The EUT was under working mode during the final qualification test and the configuration was used to represent the worst case results.

11.4 Test Result

Frequency (MHz)	Detector	Ant. Pol	Antenna Height (m)	Turntable Angle (°)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
Lower channel:672.36MHz							
1344.72	Peak	V	1.6	158	-31.14	-13.00	-18.14
2017.08	Peak	V	1.7	28	-49.57	-13.00	-36.57
2689.44	Peak	V	1.4	205	-48.71	-13.00	-35.71
3361.80	Peak	V	1.9	156	-48.47	-13.00	-35.47
4034.16	Peak	V	1.9	118	-54.44	-13.00	-41.44
4706.52	Peak	V	1.9	50	-62.52	-13.00	-49.52
1344.72	Peak	H	1.3	94	-35.59	-13.00	-22.59
2017.08	Peak	H	1.4	300	-44.48	-13.00	-31.48
2689.44	Peak	H	2.0	164	-46.73	-13.00	-33.73
3361.80	Peak	H	1.4	211	-49.24	-13.00	-36.24
4034.16	Peak	H	1.0	351	-51.95	-13.00	-38.95
4706.52	Peak	H	1.4	187	-43.91	-13.00	-30.91
Upper channel:677.09MHz							
1354.18	Peak	V	1.8	84	-38.33	-13.00	-25.33
2031.27	Peak	V	1.3	95	-44.62	-13.00	-31.62
2708.36	Peak	V	1.1	354	-52.21	-13.00	-39.21
3385.45	Peak	V	2.0	84	-51.44	-13.00	-38.44
4062.54	Peak	V	1.9	266	-54.57	-13.00	-41.57
4739.63	Peak	V	1.9	162	-55.92	-13.00	-42.92
1354.18	Peak	H	1.7	148	-34.59	-13.00	-21.59
2031.27	Peak	H	1.7	84	-50.47	-13.00	-37.47
2708.36	Peak	H	1.1	323	-48.63	-13.00	-35.63
3385.45	Peak	H	1.2	49	-49.38	-13.00	-36.38
4062.54	Peak	H	1.3	203	-48.49	-13.00	-35.49
4739.63	Peak	H	1.0	211	-44.81	-13.00	-31.81

The measurements below 1G were more than 20 dB below the limit and not reported.

12 Frequency Stability

Test requirement:	FCC CFR47 Part 2 Section 2.1055(a)(a)
Test method:	Based on TIA/EIA-603-C-2004
Limit:	According to FCC 74.86(e)(4), the frequency tolerance of the transmitter shall be 0.005 percent.

12.1 Test Configuration

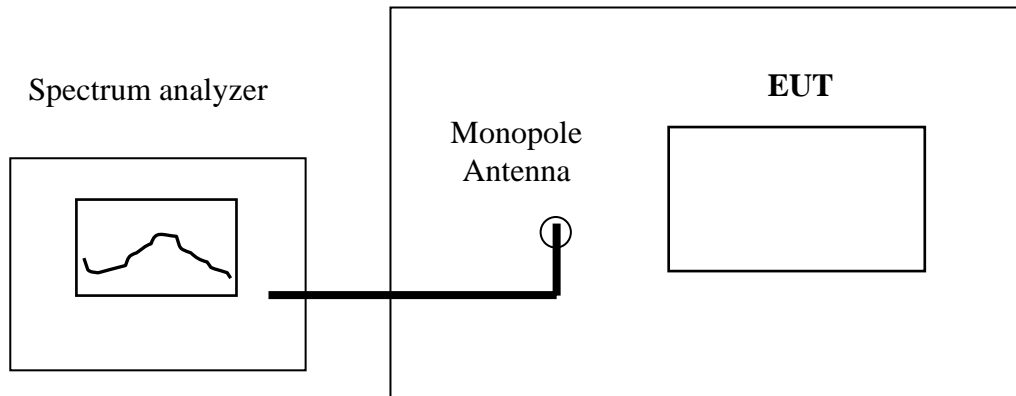


Figure 1

12.2 Test Procedure

A) Frequency stability versus input voltage

1. Setup the configuration per figure 1 for frequencies measured at an environmental chamber whose temperature is set to 20 °C. Install new batteries in the EUT.
2. Set SA center frequency to the EUT operation frequency. Then set SA RBW to 30 kHz, VBW to 100kHz and frequency span to 500 kHz. Record this frequency to be a reference.
3. Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

B) Frequency stability versus environmental temperature

1. Setup the configuration per figure 1 for frequencies measured at an environmental chamber, Install new batteries in the EUT.
2. Turn on EUT and set SA center frequency to the EUT operation frequency, then set SA RBW to 30kHz, VBW to 100kHz and frequency span to 500 kHz. Record this frequency to be a reference.
3. Set the temperature of chamber to 50°C. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. While maintaining a constant temperature inside the chamber, turn the EUT on and measure the EUT operating frequency.
4. Repeat step 2 with a 10°C decreased per stage until the lowest temperature -30°C is measured, record all measurement frequencies.

12.3 Test Result

a) Frequency stability versus input voltage

Lower channel

Power Supply	Reference Frequency (MHz)	Environment Temperature (°C)	Frequency Measured	Frequency Tolerance (%)
3V, DC	672.360	20	672.358	0.0005
3.45V, DC	672.360	20	672.361	0.0004

Upper channel

Power Supply	Reference Frequency (MHz)	Environment Temperature (°C)	Frequency Measured	Frequency Tolerance (%)
3V, DC	677.090	20	677.087	0.0008
3.45V, DC	677.090	20	677.088	0.0006

b) Frequency stability versus environmental temperature

Lower Frequency: 672.36MHz, Limit: 0.005%			
Environment Temperature(°C)	Power Supply	Frequency Deviation measured with time Elapse(30 minutes)	
		MHz	%
50	3V, DC	672.361	0.00226
40	3V, DC	672.365	0.00187
30	3V, DC	672.374	0.00232
20	3V, DC	672.376	0.00187
10	3V, DC	672.351	0.00037
0	3V, DC	672.363	0.00187
-10	3V, DC	672.367	0.00055
-20	3V, DC	672.381	0.00048
-30	3V, DC	672.354	0.00037

Upper Frequency: 677.09MHz, Limit: 0.005%			
Environment Temperature(°C)	Power Supply	Frequency Deviation measured with time Elapse(30 minutes)	
		MHz	%
50	3V, DC	677.096	0.0002
40	3V, DC	677.094	0.0005
30	3V, DC	677.099	0.0016
20	3V, DC	677.097	0.0011
10	3V, DC	677.099	0.0018
0	3V, DC	677.098	0.0021
-10	3V, DC	677.089	0.0023
-20	3V, DC	677.093	0.0017
-30	3V, DC	677.098	0.0013

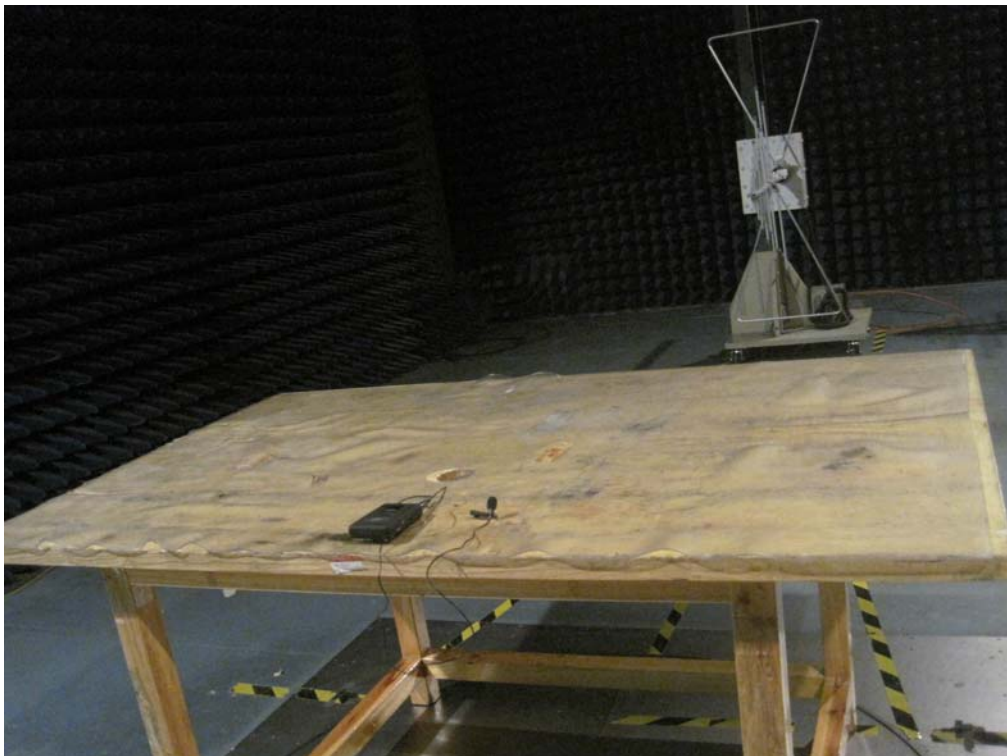
Test Result: The max frequency tolerance rating is 0.0036% < 0.005%. Passed.

13 Photographs of Testing

13.1 Radiation Emission Test View From 9kHz-30MHz



13.2 Radiation Emission Test View From 30MHz-1GHz



13.3 Radiation Emission Test View From above 1GHz



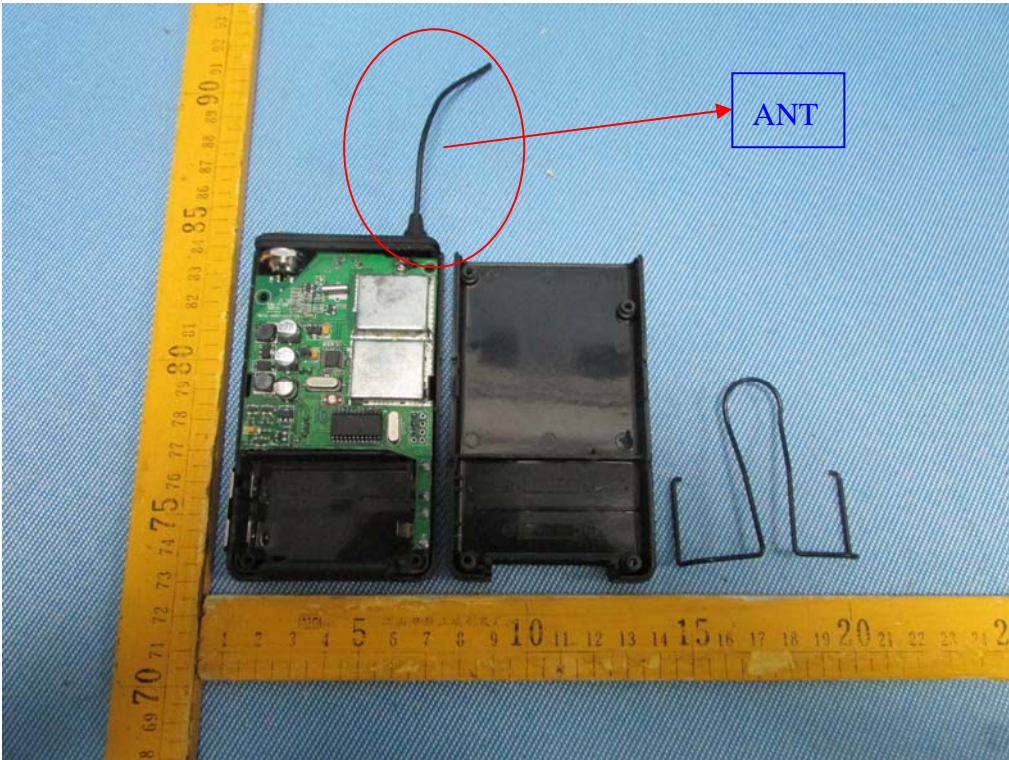
14 Photographs - Constructional Details

14.1 Product View

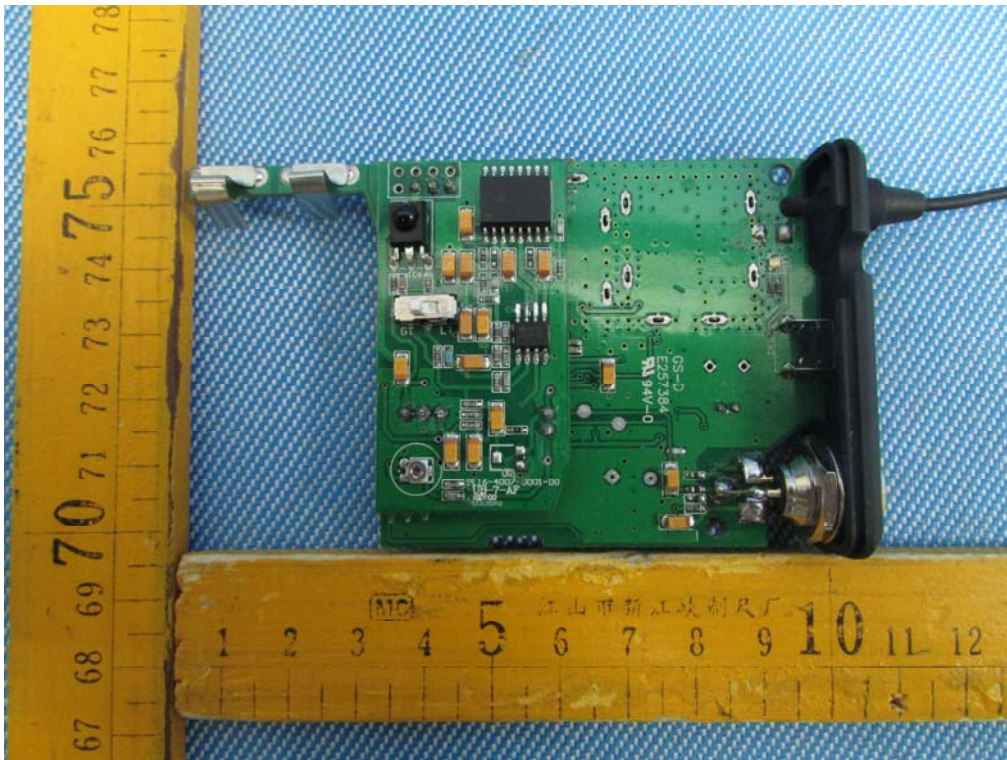
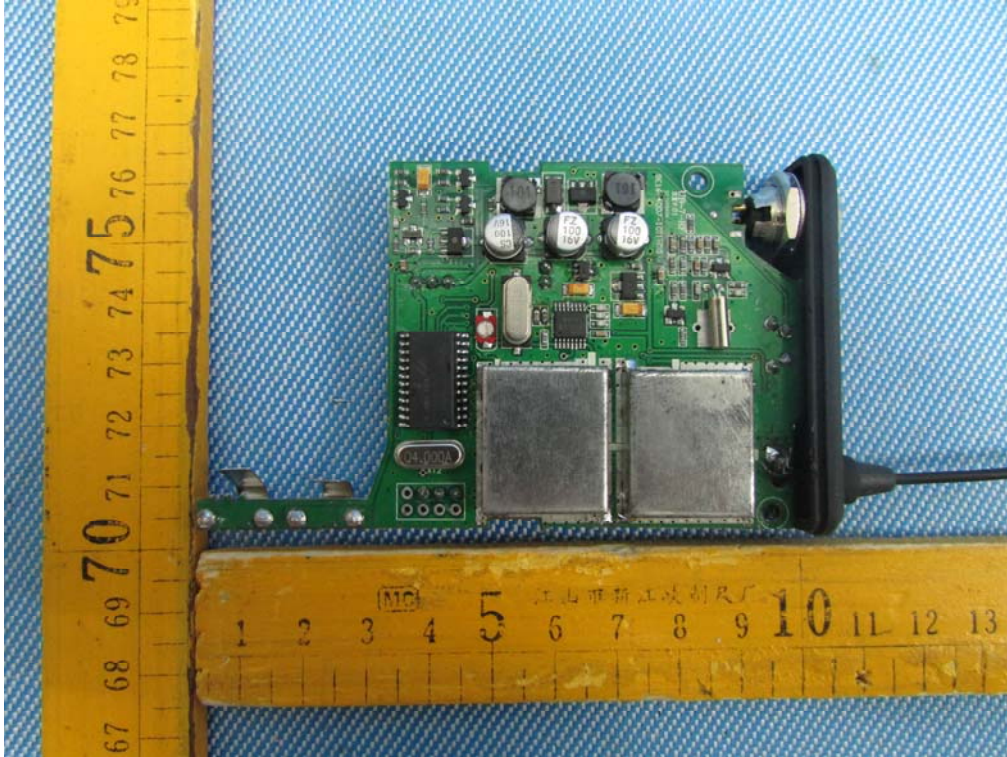


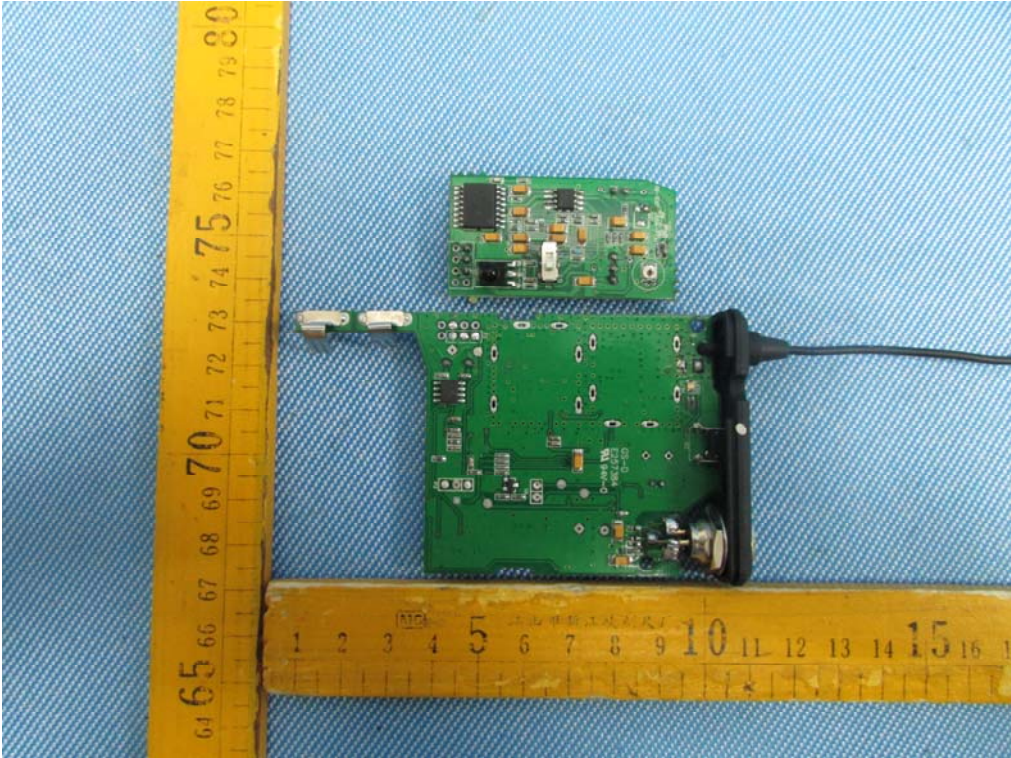
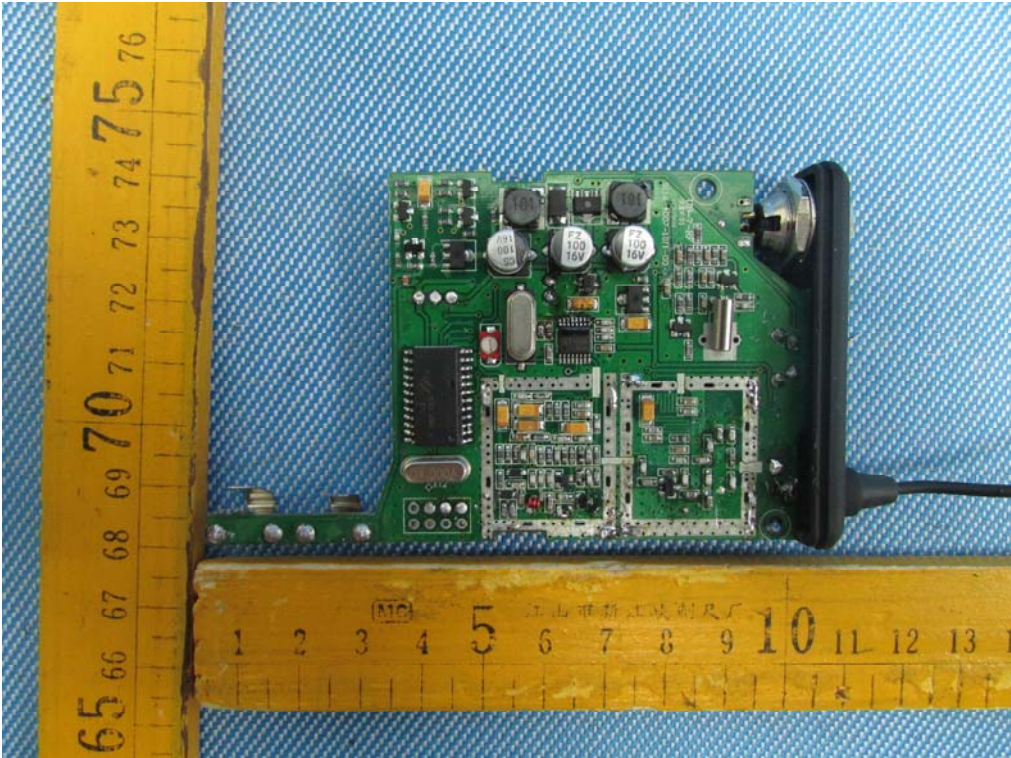


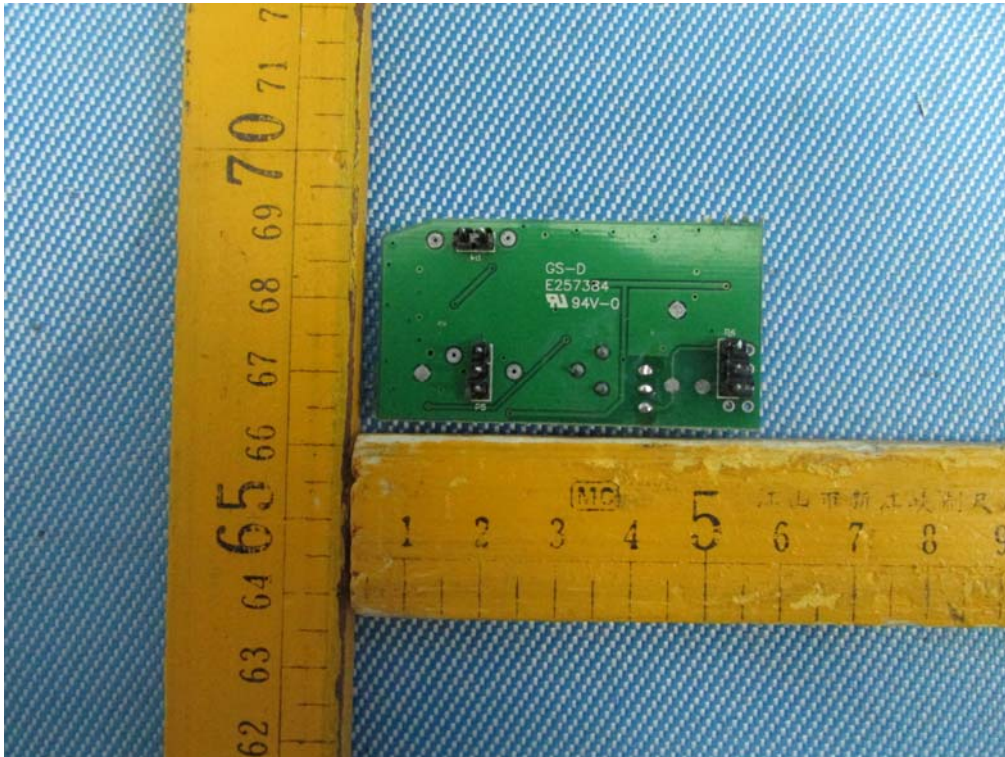
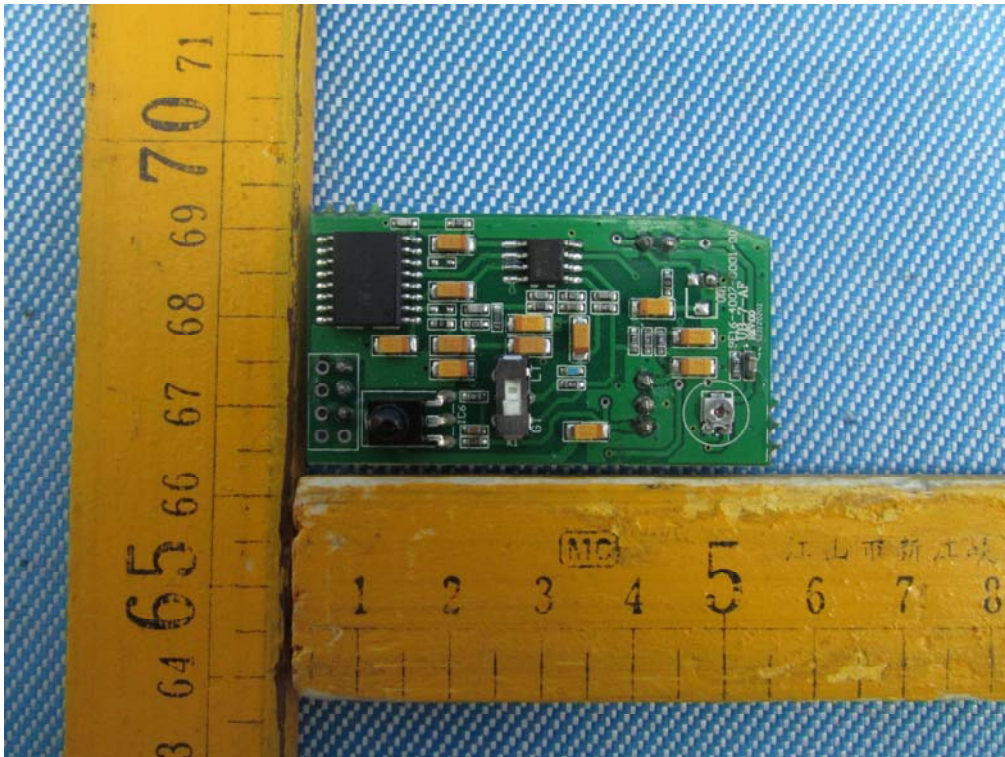
14.2 EUT – Open View



14.3 PCB - View







=End of report=