FCC Test Report

Part 15 subpart C

Client Information:

Applicant:	Fuzhou Ewetime Electronic Co., Ltd
Applicant add.:	No.97,Taiyu Road,Fuwan Industries park,Cangshan Region,Fuzhou,Fujian,China

Product Information:

EUT Name:	Weather station
Model No.:	YD8270A-3+TX6-6 （Pls refer page 5）
Brand Name:	N/A
FCC ID:	2AM888270A3

Standards: FCC PART 15 Subpart C: 2016 section 15.231

Prepared By:

ATS Electronic Technology Co., Ltd.

Add. : 3/F, Building A, No. 1 Hedong Three Road, Jinxia Communityt, Changan Town, DongGuan City, GuangDong, P.R.China

Date of Receipt:	2017.06.29	Date of Test:	2017.06.30 – 2017.07.07
Date of Issue:	2017.07.09	Test Result:	Pass

This device described above has been tested by ATT Product Service Co.,Ltd, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

*This test report must not be used by the client to claim product endorsement by any agency of the U.S. government.

Reviewed by: Rock Huang **Approved by:**

1 Contents

2 Test Summary

2.1 Compliance with FCC Part 15 subpart C

TEST	TEST REQUIREMENT	RESULT
Antenna Requirement	§15.203	Compliant
Manually	§15.231(a)(1)	N/A
automatically	§15.231(a)(2)	Compliant
periodic	§15.231(a)(3)	N/A
emergency(alarm)	§15.231(a)(4)	N/A
security	§15.231(a)(5)	N/A
Average Factor	§15.231(b)	Compliant
Field Strength of Fundamental and Spurious Emission	§15.231(b) & §15.209	Compliant
Bandwidth	§15.231(c)	Compliant
Frequency Tolerance	§15.231(d)	N/A
Field Strength(periodic transmitter)	§15.231(e)	N/A
Conducted Emission	§15.207	N/A

2.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, the following measurements uncertainty Levels have estimated based on standards, the maximum value of the uncertainty as below:

No.	Item	Uncertainty
1	Conducted Emission Test	2.40dB
2	Radiated Emission Test	3.56dB

2.3 Test Location

All tests were performed at:

ATT Product Service Co., Ltd.
No. 3, ChangLianShan Industrial Park, ChangAn Town, DongGuan City, GuangDong, China.

The FCC Registration: 923232

3 General Information

3.1 General Description of EUT

Manufacturer:	Fuzhou Ewetime Electronic Co., Ltd
Manufacturer Address:	No.97,Taiyu Road,Fuwan Industries park,Cangshan Region,Fuzhou,Fujian,China
EUT Name:	Weather station
Model No:	YD8270A-3+TX6-6
Brand Name:	N/A
Derivative model No.:	206085-01,YD8270A-1+TX6-6, YD8270B+TX6-6, YD8270A-2+TX6-6, YD8230A-2+TX6-6 ,YD8211A-2+TX6-6, YD8269A-2+TX6-6 , YD8266W+TX6-6, YD8236F+TX6-6, YD8266F+TX6-6, YD8236FA+TX6-6, YD8266A-1+TX6-6, YD8266D+TX6-6, YD8266B+TX6-6, YD8236B+TX6-6, YD8230A-1+TX6-6, YD8230A-4+TX6-6, YD8230B-2+TX6-6, YD8222B+TX6-6, According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference being the appearence and model name. Therefore only one model YD8270A-3+TX6-6 was tested in this report.
Operation frequency:	433.90MHz
Modulation Technology:	FSK
Antenna Type and Gain:	Internal helix antenna maximum -2 dBi
H/W No.:	V1.1
S/W No.:	V1.0
Power Supply Range:	3Vdc from battery
Note:	For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

3.2 EUT Peripheral List

No.	Equipment	Manufacturer	Model No.	Serial No.	Power cord	signal cable
1	/	/	/	/	/	/

3.3 Test Peripheral List

No.	Equipment	Manufacturer	Model No.	Serial No.	Power cord	signal cable
1	/	/	/	/	/	/

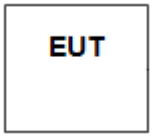
4 Equipments List for All Test Items

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Spectrum Analyzer	ADVANTEST	R3182	150900201	2017.06.27	2018.06.26
2	EMI Measuring Receiver	Schaffner	SCR3501	235	2017.06.27	2018.06.26
3	Low Noise Pre Amplifier	Tsj	MLA-10K01-B01-27	1205323	2017.06.27	2018.06.26
4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2017.06.27	2018.06.26
5	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9160	9160-3206	2017.06.27	2018.06.26
6	Broadband Horn Antenna	SCHWARZBECK	BBHA9120D	452	2017.06.27	2018.06.26
7	SHF-EHF Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170367	2017.06.27	2018.06.26
8	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2017.06.27	2018.06.26
9	EMI Test Receiver	R&S	ESCI	100124	2017.06.27	2018.06.26
10	LISN	Kyoritsu	KNW-242	8-837-4	2017.06.27	2018.06.26
11	LISN	Kyoritsu	KNW-407	8-1789-3	2017.06.27	2018.06.26
12	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2017.06.27	2018.06.26
13	Loop Antenna	ARA	PLA-1030/B	1029	2017.06.27	2018.06.26
14	EMI Test Receiver	Rohde & Schwarz	ESIB26	100394	2017.06.27	2018.06.26
15	Radiated Cable 1# (30MHz-1GHz)	FUJIKURA	5D-2W	01	2017.01.04	2018.01.03
16	Radiated Cable 2# (1GHz -25GHz)	FUJIKURA	10D2W	02	2017.01.04	2018.01.03
17	Conducted Cable 1#(9KHz-30MHz)	FUJIKURA	1D-2W	01	2017.01.04	2018.01.03
18	SMA Antenna connector (Impedance:50OHM, cable loss:0.5dBm)	Dosin	Dosin-SMA	N/A	N/A	N/A
Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.						

5 Test Result

5.1 Description of Test conditions

(1) EUT was tested in normal configuration (Please See following Block diagram)

1. Block diagram of EUT configuration(TX Mode)


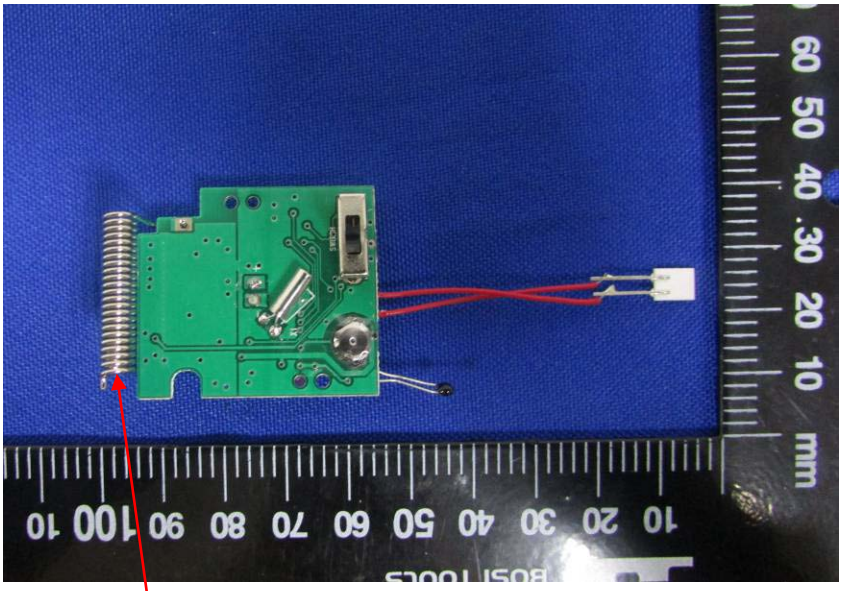
5.2 Antenna Requirement

5.2.1 Standard requirement

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 with the device.

5.2.2 EUT Antenna

The EUT has fixed antenna, which accordance to the above sections, is considered sufficient to comply with the provisions of these sections. Please see EuT photo for details.



5.3 Conduction Emissions Measurement

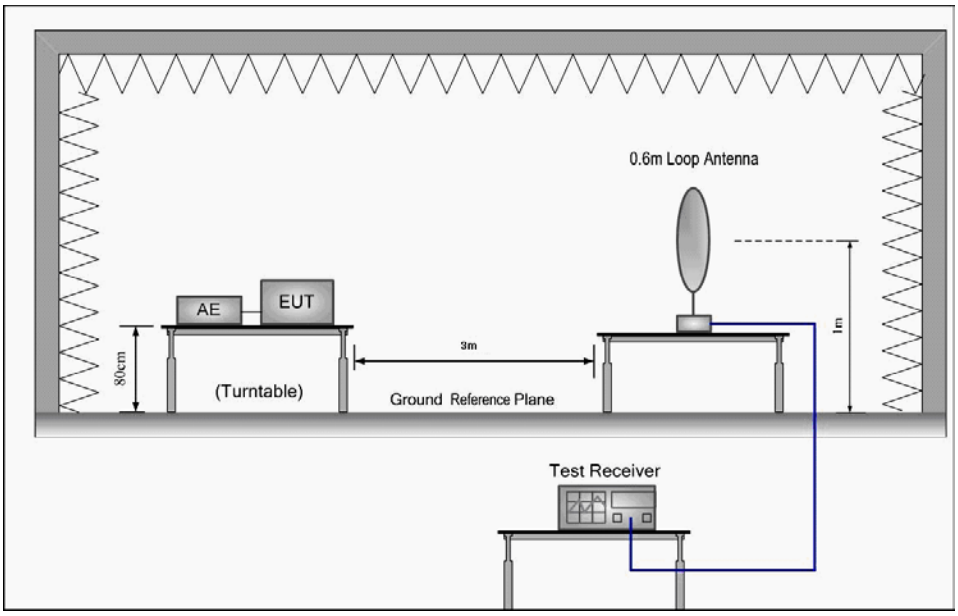
Not available.

5.4 Radiated Emissions Measurement

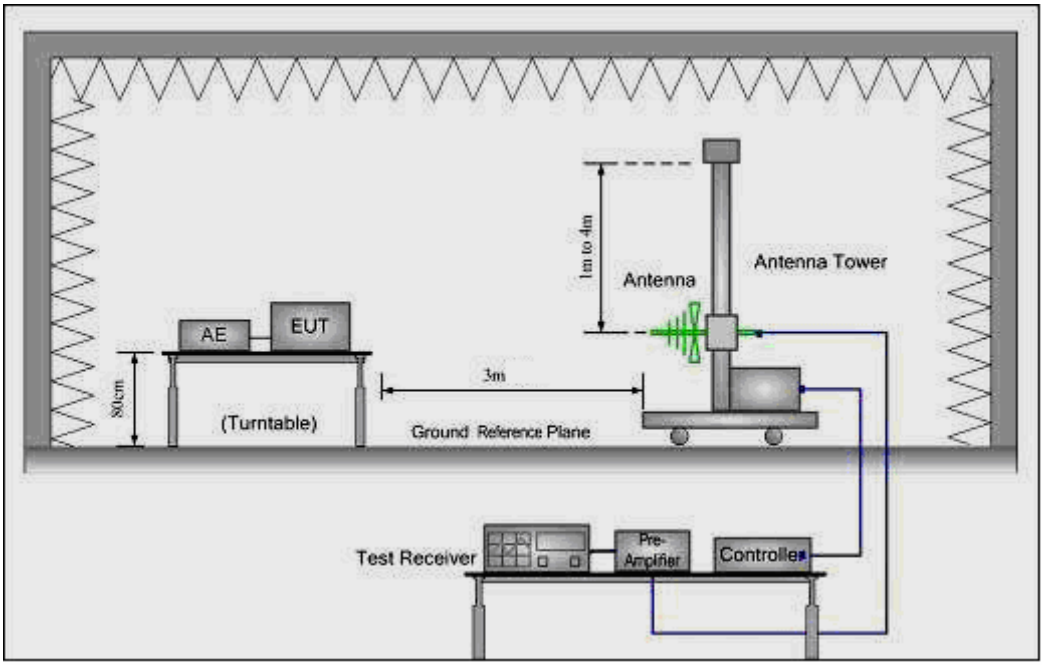
Test Requirement:	FCC Part 15 C section 15.231
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.
15.209 Limit:	40.0 dBμV/m between 30MHz & 88MHz 43.5 dBμV/m between 88MHz & 216MHz 46.0 dBμV/m between 216MHz & 960MHz 54.0 dBμV/m above 960MHz

Test Configuration:

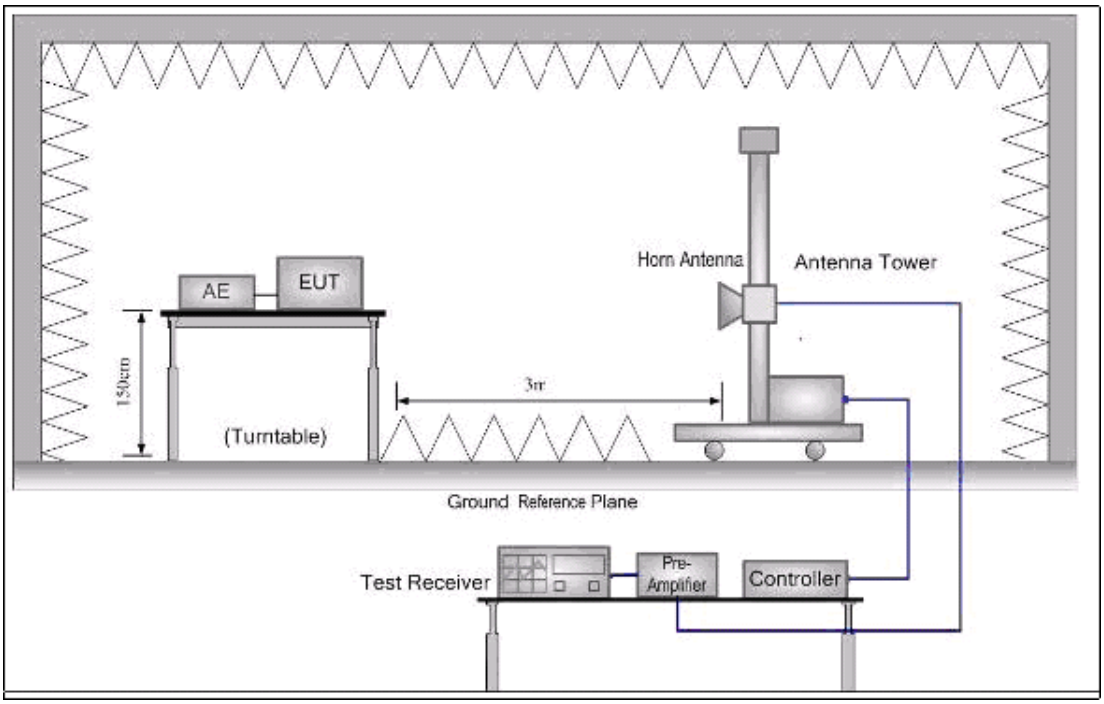
1) 9 kHz to 30 MHz emissions:



2) 30 MHz to 1 GHz emissions:



3) 1 GHz to 40 GHz emissions:



Test procedure:

Test site with RF absorbing material covering the ground plane that met the site validation criterion called out in CISPR 16-1-4:2007 was used to perform radiated emission test above 1 GHz.

The receiver was scanned from 30MHz to 25GHz.When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

From 30MHz to 1GHz, read the Quasi-Peak field strength of the emissions with receiver QP detector RBW=120KHz.

Above 1GHz, read the Peak field strength and Average field strength.

Read the Peak field strength through RBW=1MHz,VBW=3MHz in spectrum analyzer setting;

Read the Average field strength through RBW=1MHz,VBW=10Hz in spectrum analyzer setting;

Pre-test the EUT in continuous transmitting mode with setup as stand-alone in X, Y, Z threes axes, found the worst case is X axes and report the data.

For measurement at frequency above 1GHz

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

While maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the average field strength reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from 20log(dwell time/100 ms), in an effort to demonstrate compliance with the 15.209 limit.

5.4.1 Test Result

5.4.1.1 Radiated Emissions Test Data Below 30MHz

EUT：	Weather station	Model Name. ：	YD8270A-3+TX6-6
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Test Date :	2017.07.07
Test Mode ：	TX	Test Voltage ：	3Vdc
Measurement Distance	3 m	Frequency Range	9KHz to 30MHz
RBW/VBW	9KHz~150KHz/RB 200Hz for QP, 150KHz~30MHz/RB 9KHz for QP		

No emission found between lowest internal used/generated frequencies to 30MHz.

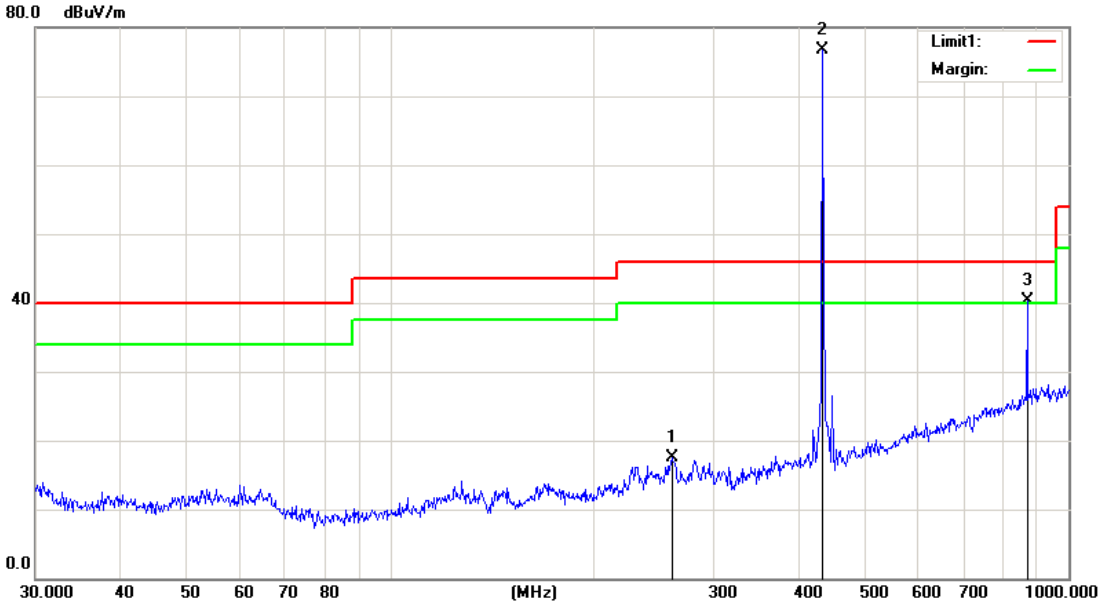
5.4.1.2 TEST RESULTS (Between30 – 1000 MHz)

EUT：	Weather station	Model Name. ：	YD8270A-3+TX6-6
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Test Date :	2017.07.07
Test Mode ：	TX	Test Voltage ：	3Vdc
Measurement Distance	3 m	Frequency Range	30MHz to 1GHz
RBW/VBW	100KHz / 300KHz for spectrum, RBW=120KHz for receiver.		

Vertical:

Peak scan

Level (dBμV/m)



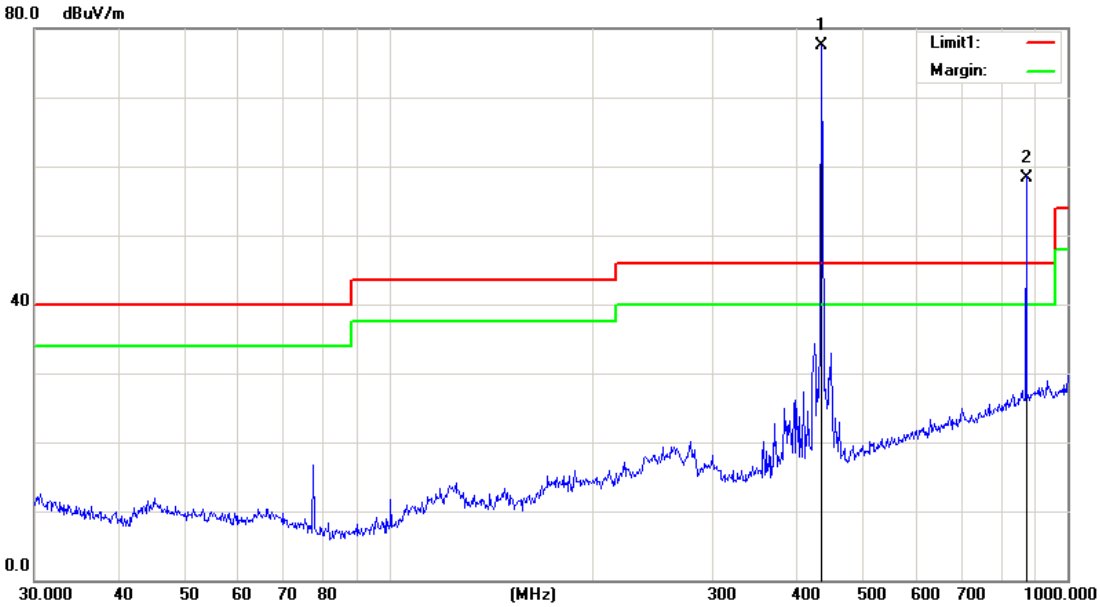
PK list

Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) PK	Limit dB(uV/m) PK	Margin dB	Pass/Fail	Height cm	Angle deg
433.90	V	85.28	-8.59	76.69	92.86	-16.17	Pass	100.0	301.2
867.80	V	39.19	1.11	40.30	72.86	-32.56	Pass	200.0	94.2

AV list

Frequency MHz	Polarization	PK Level dB(uV/m)	Duty Cycle Correction Factor: dB	AV Level dB(uV/m)	Limit dB(uV/m) AV	Margin dB	Pass/Fail	Remark
433.90	V	76.69	-11.73	64.96	72.86	-7.90	Pass	Fundamental
867.80	V	40.30	-11.73	28.57	52.86	-24.29	Pass	Harmonic

Horizontal:



PK list

Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) PK	Limit dB(uV/m) PK	Margin dB	Pass/Fail	Height cm	Angle deg
433.90	H	85.04	-7.59	77.45	92.86	-15.41	Pass	200.0	146.8
867.80	H	57.15	1.07	58.22	72.86	-14.64	Pass	200.0	63.2

AV list

Frequency MHz	Polarization	PK Level dB(uV/m)	Duty Cycle Correction Factor: dB	AV Level dB(uV/m)	Limit dB(uV/m) AV	Margin dB	Pass/Fail	Remark
433.90	H	77.45	-11.73	65.72	72.86	-7.14	Pass	Fundamental
867.80	H	58.22	-11.73	46.49	52.86	-6.37	Pass	Harmonic

RESULT: PASS

Note: 1. Factor=Antenna Factor + Cable loss - Amplifier gain, Margin=Measurement-Limit.

2. AV Level = PK Level + Duty cycle correction factor.

3. The “Factor” value can be calculated automatically by software of measurement system.

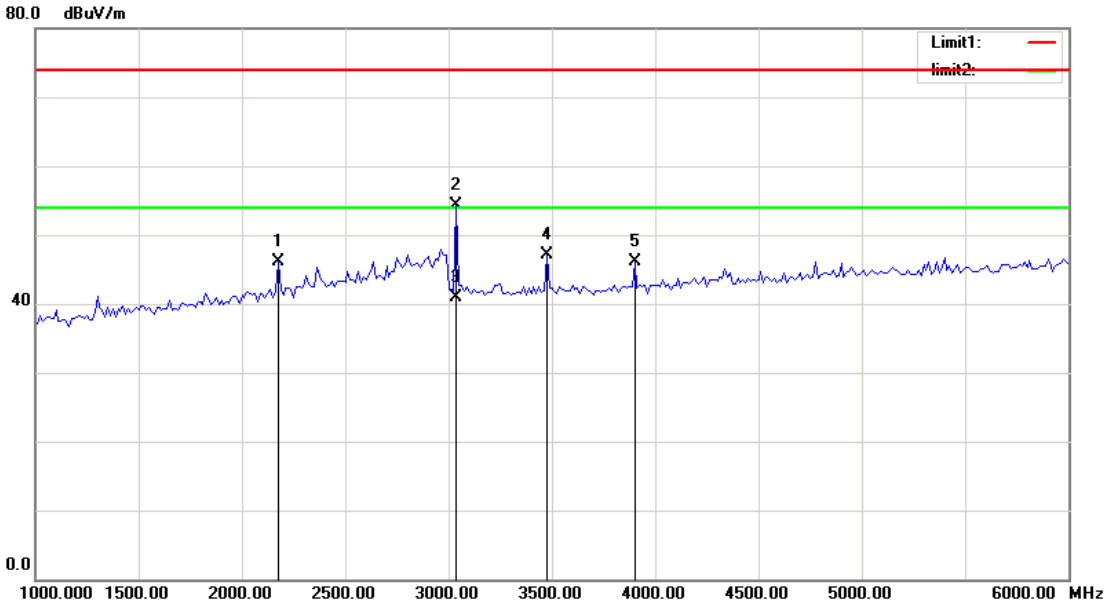
4. Emissions of frequency range from 1GHz to 4GHz have 20dB margin. No recording in the test report.

TEST RESULTS (ABOVE 1000 MHZ)

Vertical:

Peak scan

Level (dBμV/m)



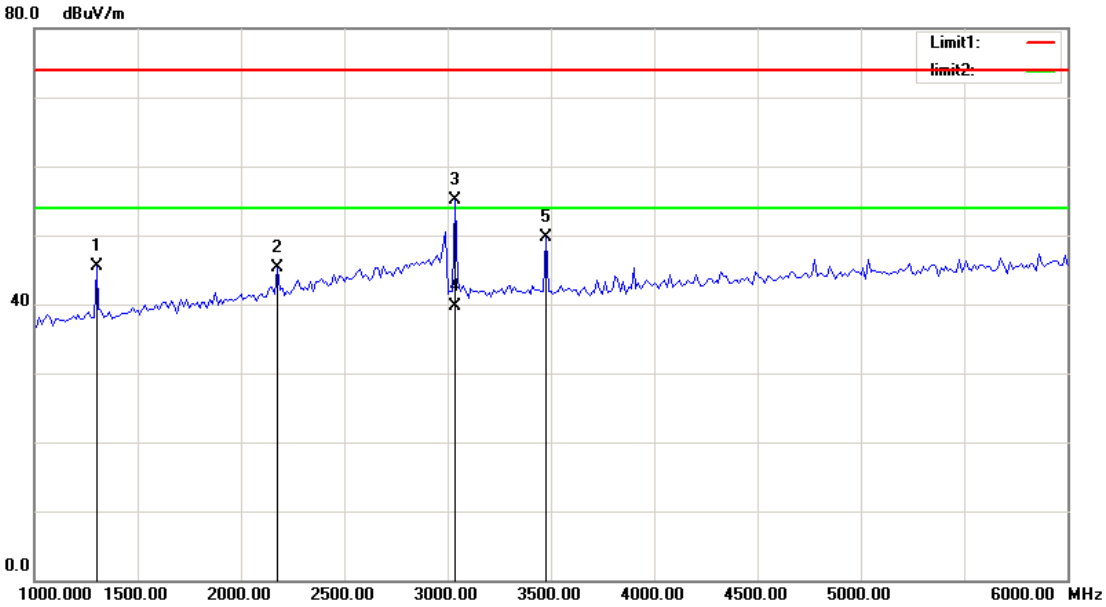
PK list

Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) PK	Limit dB(uV/m) PK	Margin dB	Pass/Fail	Height cm	Angle deg
2169.50	V	47.73	-1.64	46.09	72.86	-26.77	Pass	100.0	301.2
3037.30	V	52.48	1.82	54.03	72.86	-18.83	Pass	200.0	94.2
3471.20	V	44.56	2.59	47.15	72.86	-25.71	Pass	100.0	301.2
3905.10	V	42.47	3.67	46.14	72.86	-26.72	Pass	200.0	94.2

AV list

Frequency MHz	Polarization	PK Level dB(uV/m)	Duty Cycle Correction Factor: dB	AV Level dB(uV/m)	Limit dB(uV/m) AV	Margin dB	Pass/Fail	Remark
433.90	V	46.09	-11.73	34.36	52.86	-18.50	Pass	Fundamental
867.80	V	54.03	-11.73	42.3	52.86	-10.56	Pass	Harmonic
433.90	V	47.15	-11.73	35.42	52.86	-17.44	Pass	Fundamental
867.80	V	46.14	-11.73	34.41	52.86	-18.45	Pass	Harmonic

Horizontal:



PK list

Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) PK	Limit dB(uV/m) PK	Margin dB	Pass/Fail	Height cm	Angle deg
1301.70	H	49.48	-3.89	45.59	72.86	-27.27	Pass	200.0	146.8
2169.50	H	46.88	-1.64	45.24	72.86	-27.62	Pass	200.0	63.2
3037.30	H	53.34	1.82	55.16	72.86	-17.70	Pass	200.0	146.8
3471.20	H	47.18	2.59	49.77	72.86	-23.09	Pass	200.0	63.2

AV list

Frequency MHz	Polarization	PK Level dB(uV/m)	Duty Cycle Correction Factor: dB	AV Level dB(uV/m)	Limit dB(uV/m) AV	Margin dB	Pass/Fail	Remark
433.90	H	45.59	-11.73	33.86	52.86	-19.00	Pass	Fundamental
867.80	H	45.24	-11.73	33.51	52.86	-19.35	Pass	Harmonic
433.90	H	55.16	-11.73	43.43	52.86	-9.43	Pass	Fundamental
867.80	H	49.77	-11.73	38.04	52.86	-14.82	Pass	Harmonic

RESULT: PASS

Note: 1. Factor=Antenna Factor + Cable loss - Amplifier gain, Margin=Measurement-Limit.

2. AV Level = PK Level + Duty cycle correction factor.

3. The “Factor” value can be calculated automatically by software of measurement system.

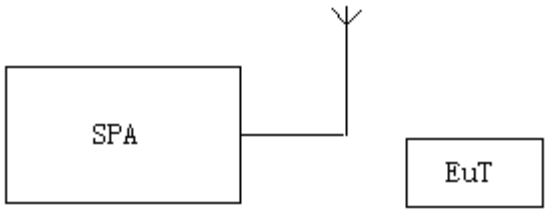
4. Emissions of frequency range from 1GHz to 4GHz have 20dB margin. No recording in the test report.

5.4.2 PROVISION FOR MOMENTARY OPERATION

5.4.2.1 MEASUREMENT PROCEDURE

1. Set the parameters of SPA as below:
   Centre frequency = Operation Frequency
   RBW=VBW=1MHz
   Span: 0Hz
   Sweep time: 10S
2. Set the EUT to transmit by manually operated. Use the “View” function of SPA to find the transmission time of being released.
3. Record the data and Reported.

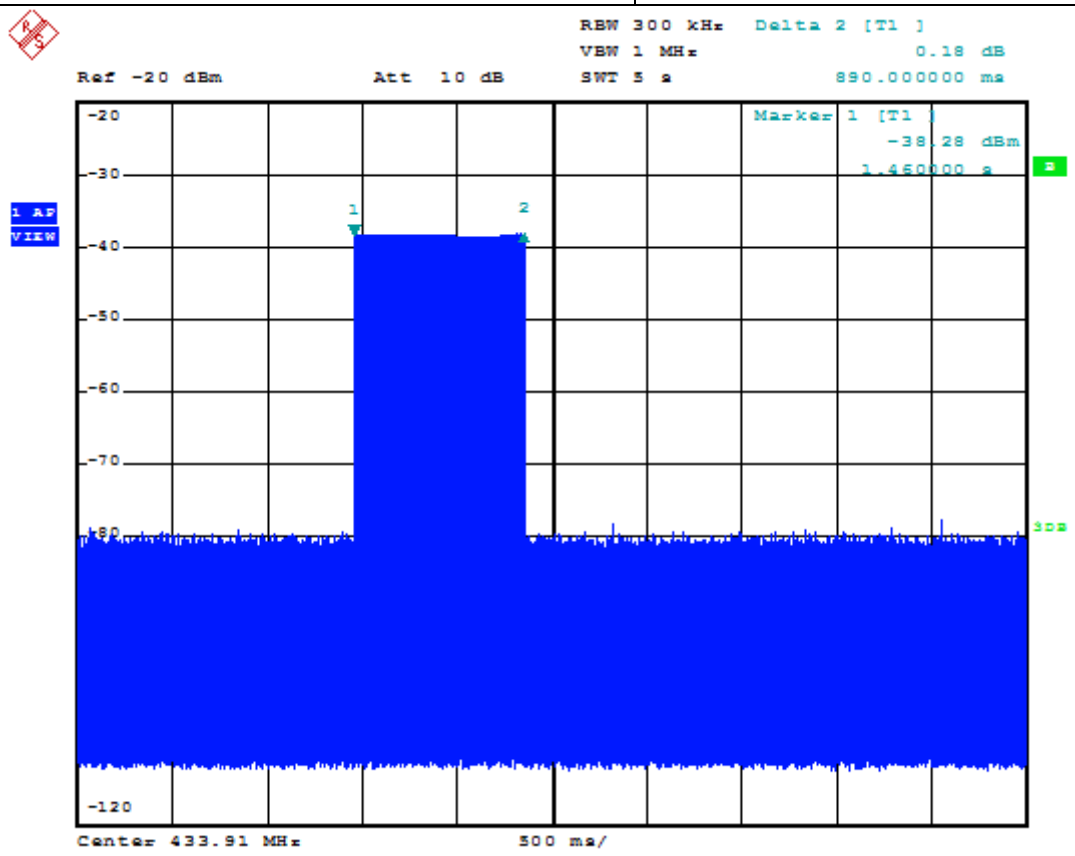
5.4.2.2 **TEST SETUP**



5.4.2.3 Test Result:

Test Mode: EUT @ 433MHz for RF Transmitter

The time of stopping transmission after switch releasing (s)	Limit (s)
0.89	5.00



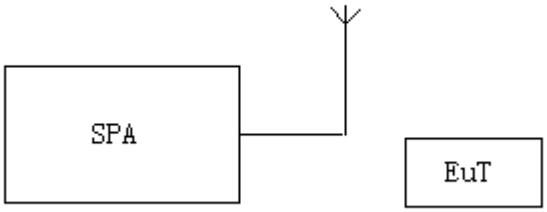
RESULT: PASS

5.4.3 BANDWIDTH

5.4.3.1 MEASUREMENT PROCEDURE

1. Set the parameters of SPA as below:
   Centre frequency = Operation Frequency
   RBW=10KHz
   VBW=30KHz
   Span: 500kHz
   Sweep time: Auto
2. Set the EUT to continue transmitting mode. Allow the trace to stabilize. Use the “N dB down” function of SPA to define the bandwidth.
3. Record the plots and Reported.

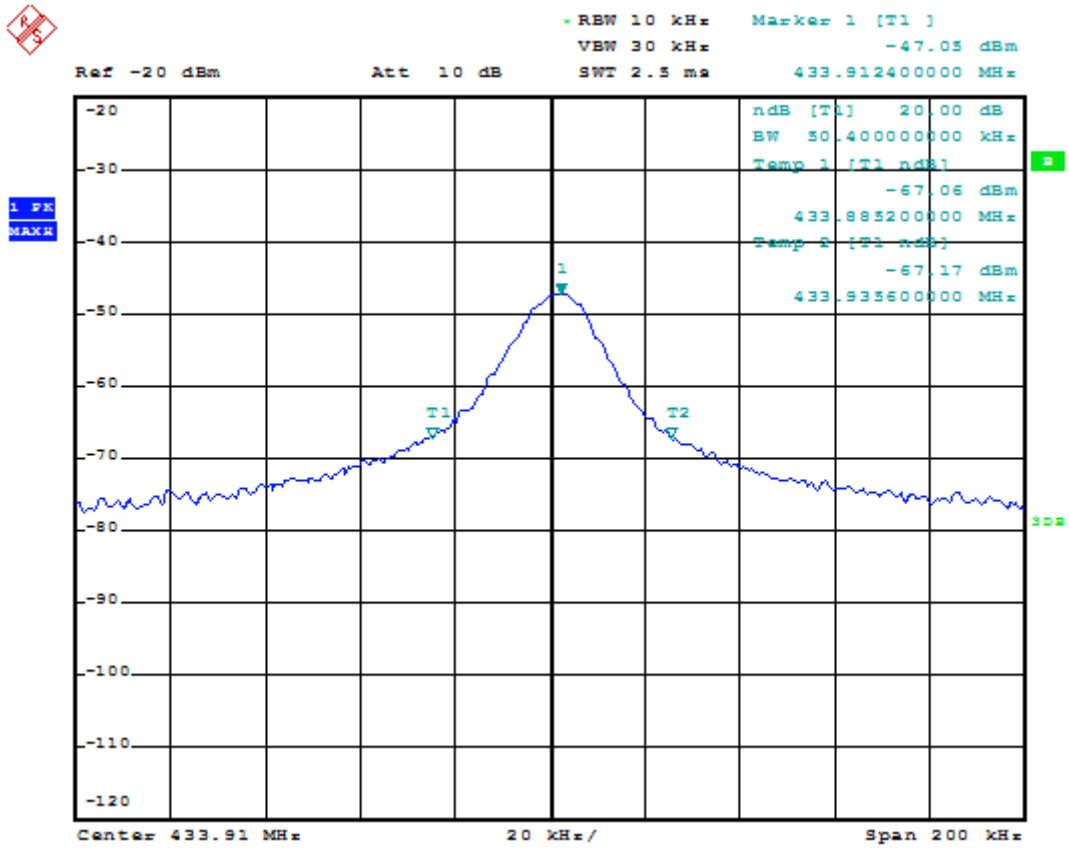
5.4.3.2 TEST SETUP



5.4.3.3 Test result

Test Mode: EUT @ 433MHz for RF Transmitter

-20dB bandwidth	LIMIT	RESULT
50.4kHz	108.25KHz	Pass
Note: Limit= Operation Frequency x0.25%		

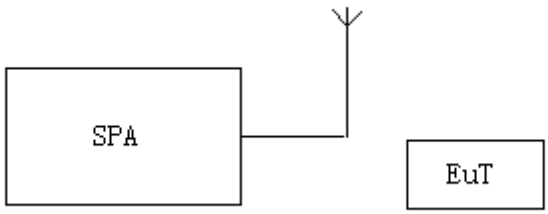


5.4.4 DUTY CYCLE CORRECTION FACTOR

5.4.4.1 MEASUREMENT PROCEDURE

1. Set the parameters of SPA as below:
   Centre frequency = Operation Frequency
   RBW=300KHz
   VBW=1MHz
   Span: 0Hz
   Sweep time: more than two pulse trains or more than each type of pulse occupancy time
2. Set the EUT to transmit by manually operated. Use the “Delta mark” function of SPA to find the period time between two pulse trains and each type of pulse occupancy time.
3. Record the plots and Reported.

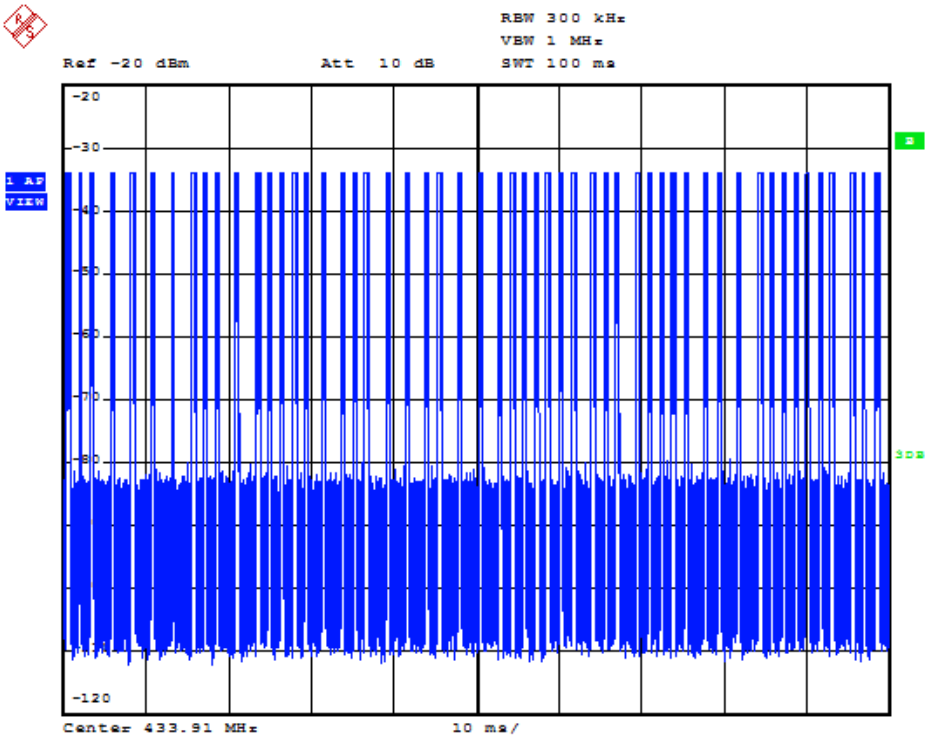
5.4.4.2 TEST SETUP

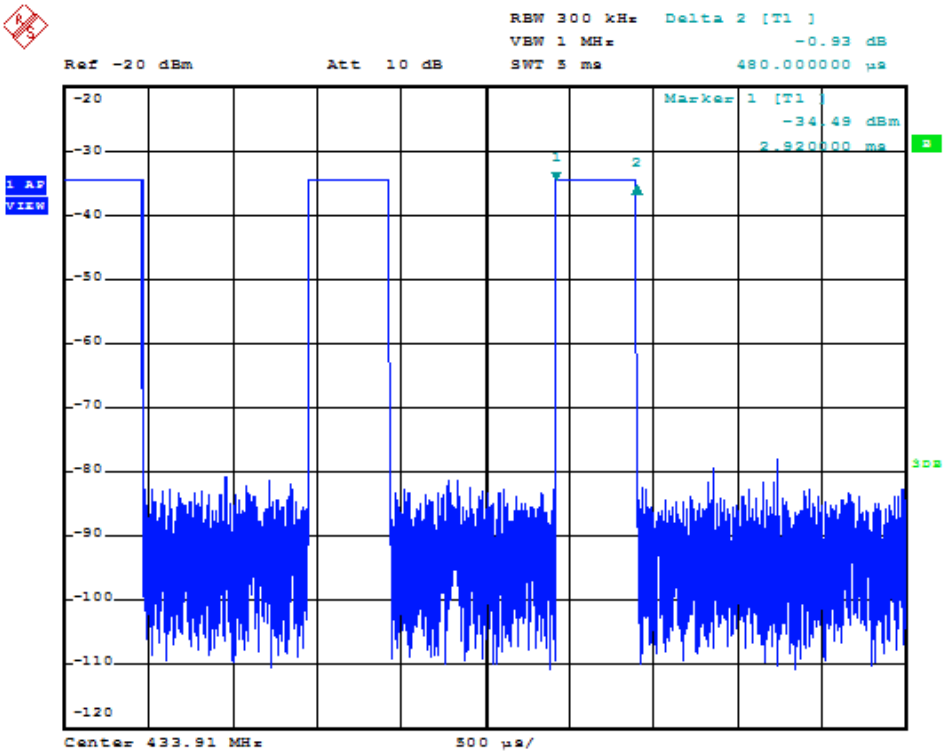


5.4.4.3 TEST RESULT

Test Mode: EUT @ 433MHz for RF Transmitter

Duty Cycle:	(0.48ms*54)/100ms=0.2592
Duty Cycle Correction Factor:	20lg(0.2592)= -11.73dB

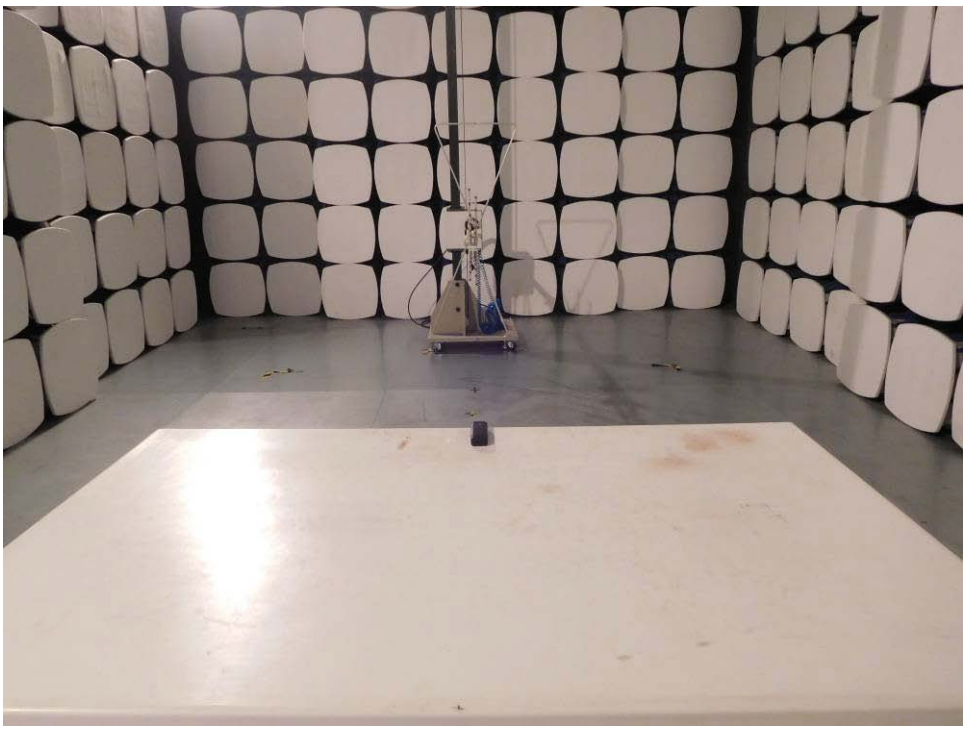




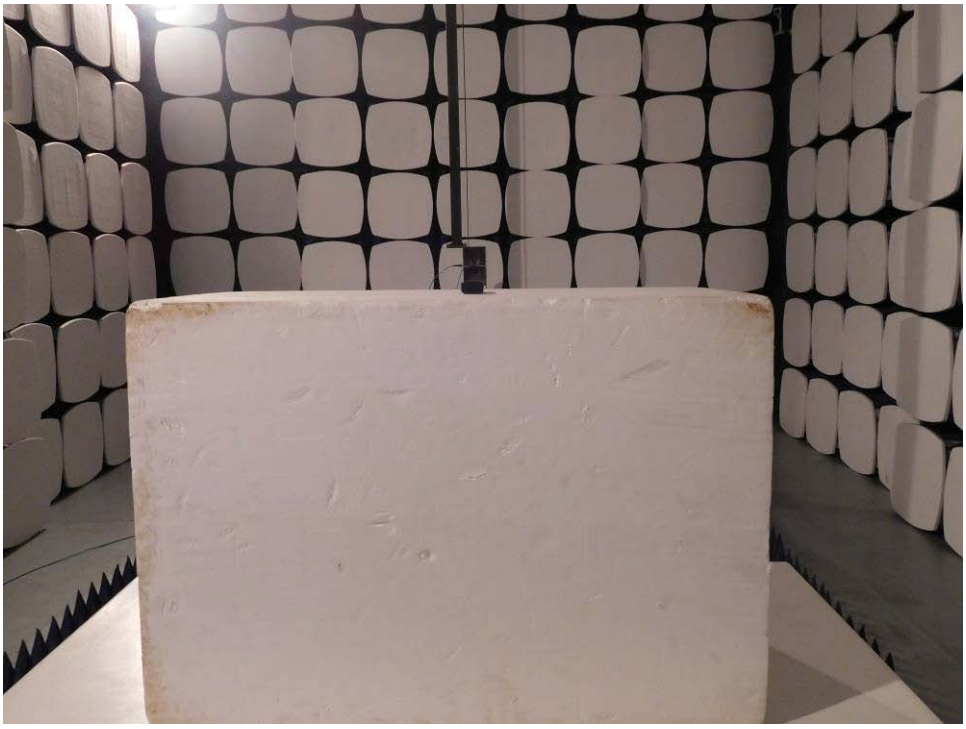
6 Photographs

6.1 Radiated Spurious Emission Test Setup

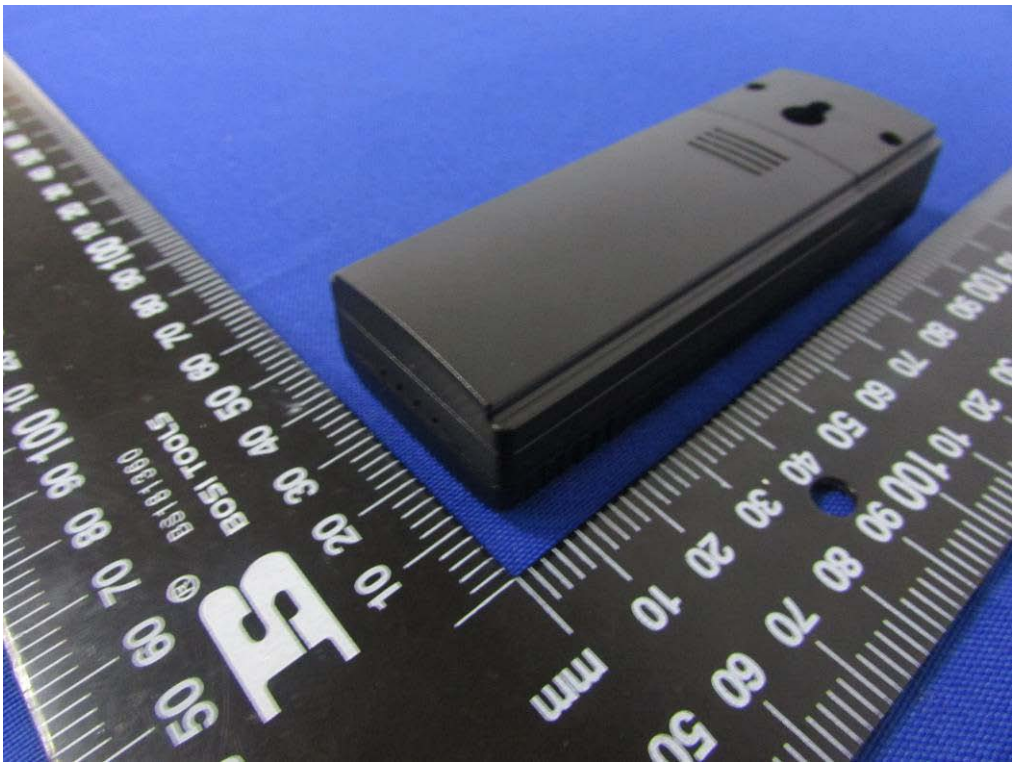
Below 1GHz:

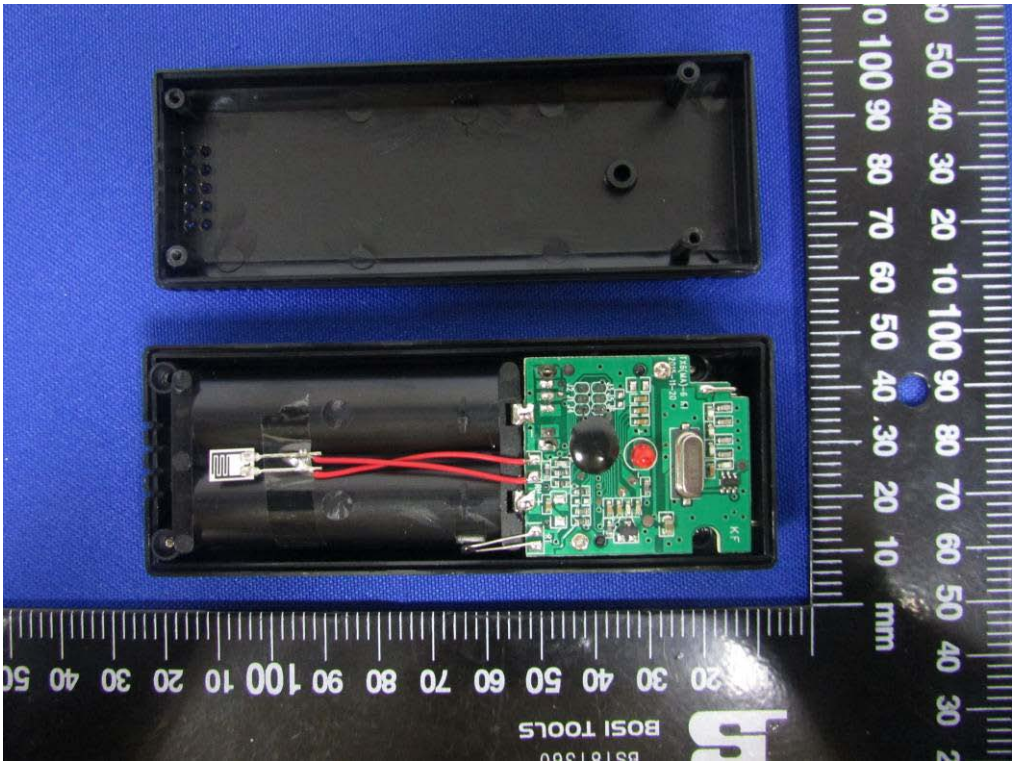


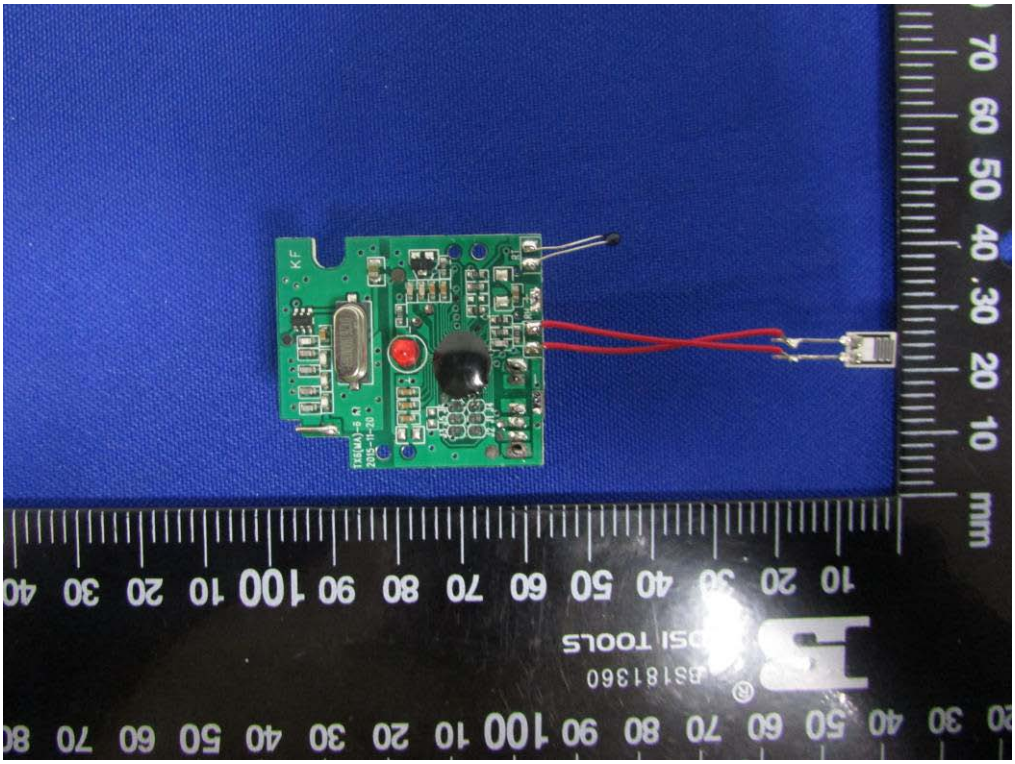
Above 1GHz:



7 APPENDIX-Photographs of EUT Constructional Details




BOSI TOOLS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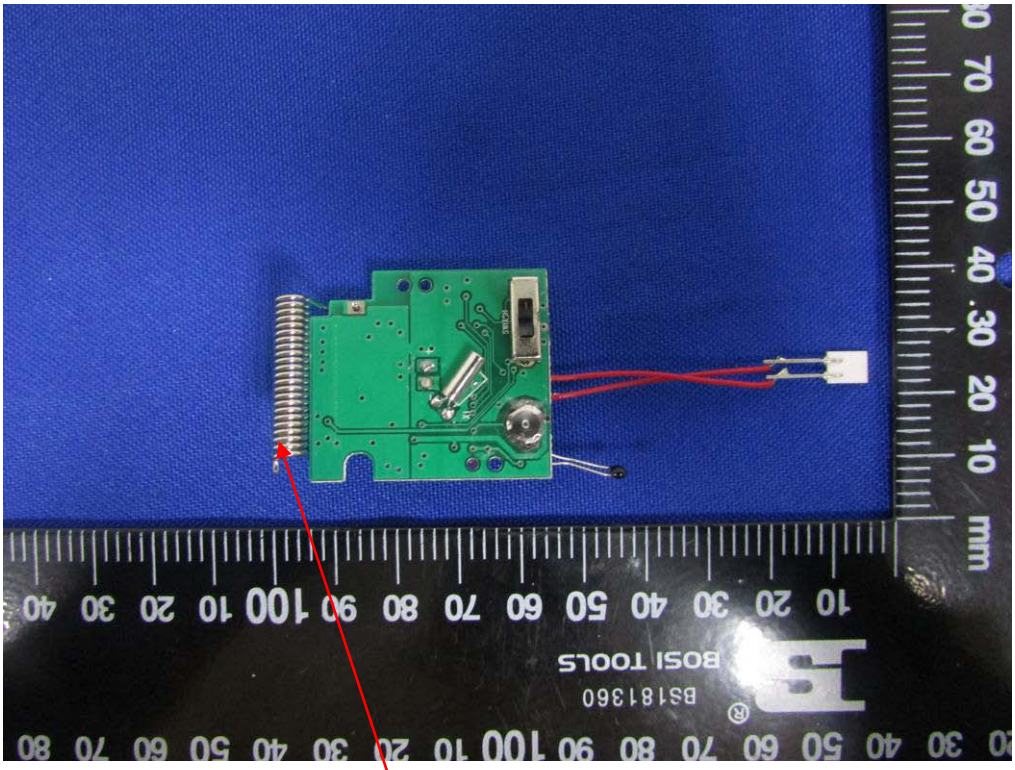

**** End of report ****

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