



## **FCC Report**

**Applicant:** Ambient, LLC dba Ambient Weather

**Address of Applicant:** 6845 W. Frye Road Chandler, AZ 85226, Chandler Arizona  
United States

**Equipment Under Test (EUT)**

Product Name: Wireless Thermo-Hygrometer

Model No.: WS24, WS24C, WS24R

**FCC ID:** S2SWS24

**Applicable standards:** FCC CFR Title 47 Part 15 Subpart B:2014

**Date of sample receipt:** January 07, 2016

**Date of Test:** January 08-11 2016

**Date of report issue:** January 12, 2016

**Test Result :** PASS \*

\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

**Robinson Lo**  
**Laboratory Manager**

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the GTS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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## 2 Version

Version No.	Date	Description
00	January 12, 2016	Original

Prepared By:

*Edward Pan*

Date:

January 12, 2016

Project Engineer

Check By:

*Hank Yan*

Date:

January 12, 2016

Reviewer

## 3 Contents

	Page
1 COVER PAGE .....	1
2 VERSION .....	2
3 CONTENTS .....	3
4 TEST SUMMARY .....	4
5 GENERAL INFORMATION .....	5
5.1 CLIENT INFORMATION.....	5
5.2 GENERAL DESCRIPTION OF EUT .....	5
5.3 TEST MODE .....	5
5.4 TEST FACILITY .....	6
5.5 TEST LOCATION.....	6
5.6 DESCRIPTION OF SUPPORT UNITS .....	6
5.7 DEVIATION FROM STANDARDS .....	6
5.8 ABNORMALITIES FROM STANDARD CONDITIONS.....	6
5.9 OTHER INFORMATION REQUESTED BY THE CUSTOMER .....	6
6 TEST INSTRUMENTS LIST .....	7
7 TEST RESULTS AND MEASUREMENT DATA.....	8
7.1 RADIATED EMISSION .....	8
8 TEST SETUP PHOTO .....	14
9 EUT CONSTRUCTIONAL DETAILS .....	15

## 4 Test Summary

Test Item	Section in CFR 47	Result
Conducted Emission	Part15.107	N/A
Radiated Emissions	Part15.109	PASS

*PASS: The EUT complies with the essential requirements in the standard.*

*Remark: Test according to ANSI C63.4:2014*

### Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	$\pm 4.34\text{dB}$	(1)
Radiated Emission	30MHz ~ 1000MHz	$\pm 4.24\text{dB}$	(1)
Radiated Emission	1GHz ~ 26.5GHz	$\pm 4.68\text{dB}$	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	$\pm 3.45\text{dB}$	(1)

Note (1): The measurement uncertainty is for coverage factor of  $k=2$  and a level of confidence of 95%.

## 5 General Information

### 5.1 Client Information

Applicant:	Ambient, LLC dba Ambient Weather
Address of Applicant:	6845 W. Frye Road Chandler, AZ 85226, Chandler Arizona United States
Manufacturer/Factory:	Unit Connection Technology Co., Ltd
Address of Manufacturer/ Factory:	5/F., Block J, Shifeng Technology Park, Loucun, Guangming New District, Shenzhen ,China

### 5.2 General Description of EUT

Product Name:	Wireless Thermo-Hygrometer
Model No.:	WS24, WS24C, WS24R
Power supply:	DC 6.0V(4*1.5V "AAA" Battery)

### 5.3 Test mode

Test mode:	
Operation mode	Keep the EUT in receiver status.

Receiver frequency: 433.92MHz

## 5.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen 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 files. Registration 600491, June 28, 2013.

- **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, June 26, 2013.

## 5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

## 5.6 Description of Support Units

None.

## 5.7 Deviation from Standards

None.

## 5.8 Abnormalities from Standard Conditions

None.

## 5.9 Other Information Requested by the Customer

None.

## 6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)* 6.0(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	ESU EMI Test Receiver	R&S	ESU26	GTS203	July. 03 2015	July. 02 2016
4	BiConiLog Antenna	SCHWARZBECK	VULB9163	GTS214	July. 06 2015	July. 05 2016
5	RF Amplifier	HP	8347A	GTS204	July. 03 2015	July. 02 2016
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Coaxial cable	GTS	N/A	GTS210	Jul. 05 2015	Jul. 04 2016
8	Thermo meter	N/A	N/A	GTS256	July. 07 2015	July. 06 2016
9	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 27 2015	Mar. 26 2016

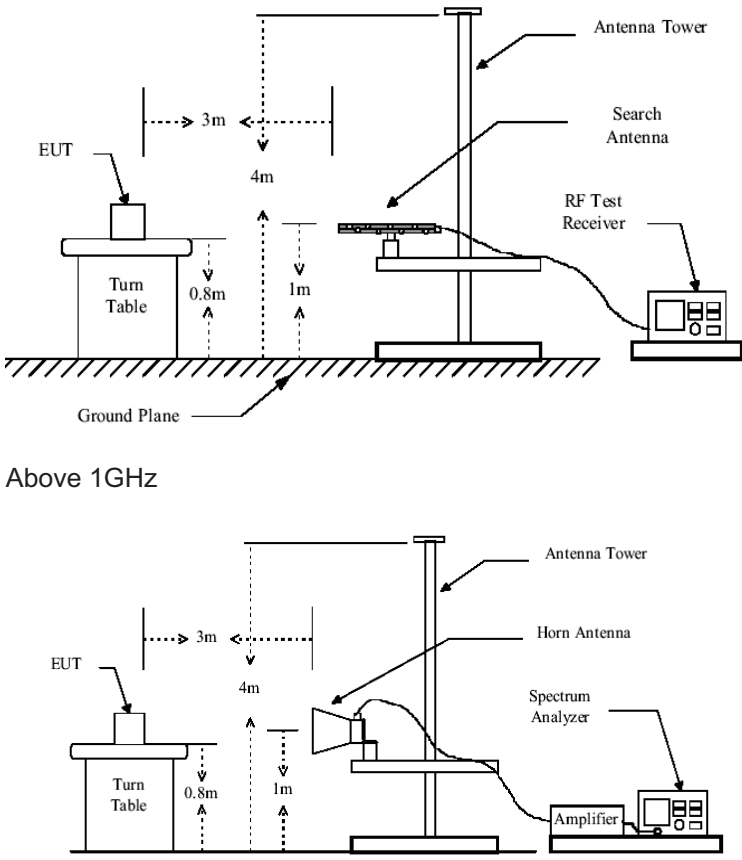
General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Barometer	ChangChun	DYM3	GTS257	July 07 2015	July 06 2016

## 7 Test Results and Measurement Data

### 7.1 Radiated Emission

Test Requirement:	FCC Part15 B Section 15.109																								
Test Method:	ANSI C63.4:2014																								
Test Frequency Range:	30MHz to 2GHz																								
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)																								
Receiver setup:	<table><tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr><tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120kHz</td><td>300kHz</td><td>Quasi-peak Value</td></tr><tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr><tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr></table>					Frequency	Detector	RBW	VBW	Remark	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value	Above 1GHz	Peak	1MHz	3MHz	Peak Value	Peak	1MHz	10Hz	Average Value	
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Limit:	<table><tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr><tr><td>30MHz-88MHz</td><td>40.00</td><td>Quasi-peak Value</td></tr><tr><td>88MHz-216MHz</td><td>43.50</td><td>Quasi-peak Value</td></tr><tr><td>216MHz-960MHz</td><td>46.00</td><td>Quasi-peak Value</td></tr><tr><td>960MHz-1GHz</td><td>54.00</td><td>Quasi-peak Value</td></tr><tr><td rowspan="2">Above 1GHz</td><td>54.00</td><td>Average Value</td></tr><tr><td>74.00</td><td>Peak Value</td></tr></table>					Frequency	Limit (dBuV/m @3m)	Remark	30MHz-88MHz	40.00	Quasi-peak Value	88MHz-216MHz	43.50	Quasi-peak Value	216MHz-960MHz	46.00	Quasi-peak Value	960MHz-1GHz	54.00	Quasi-peak Value	Above 1GHz	54.00	Average Value	74.00	Peak Value
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Test Procedure:	<div>1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.</div> <div>2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</div> <div>3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</div> <div>4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.</div> <div>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</div> <div>6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</div>																								
Test setup:	Below 1GHz																								



	 <p>Above 1GHz</p>
Test environment:	Temp.: 25 °C Humid.: 52% Press.: 1 012mbar
Measurement Record:	Uncertainty: ± 4.5dB
Test Instruments:	Refer to section 6 for details
Test mode:	Keep the EUT in Operation status.
Test results:	Pass

**Note:**

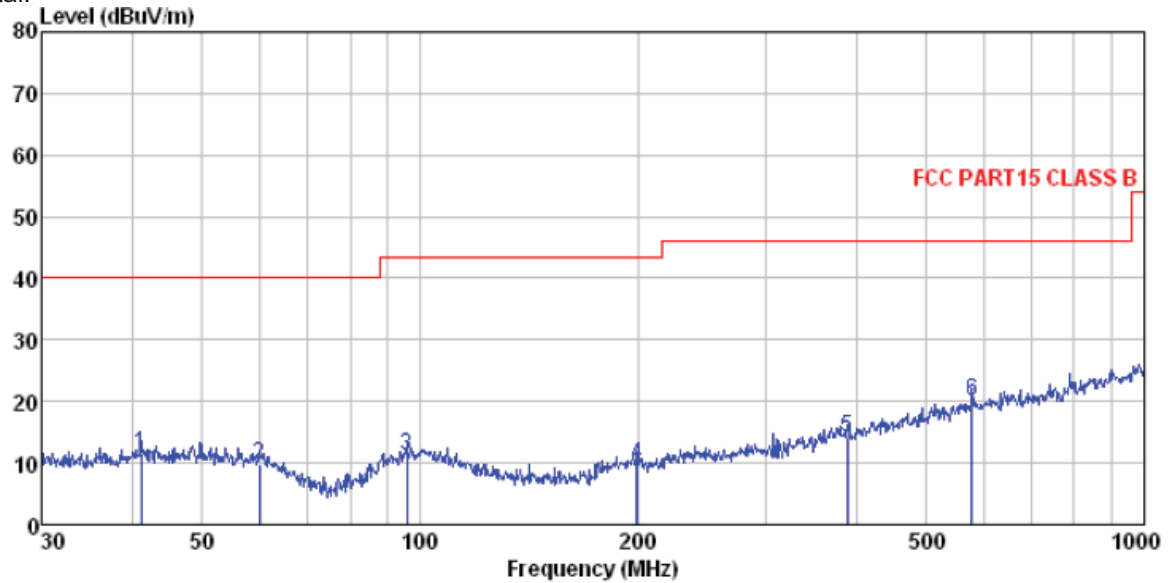
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Preamplifier Factor}$$

## Measurement Data

Below 1GHz

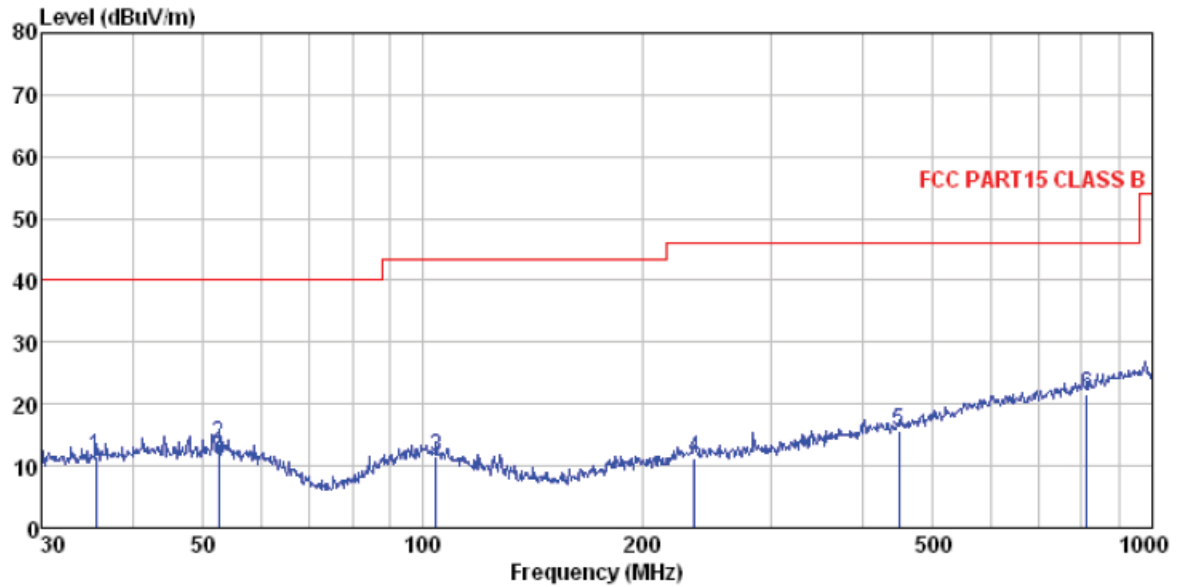
Horizontal:



Condition : FCC PART15 CLASS B VULB9163-2013M HORIZONTAL  
 Job No. : 2377RF  
 Test Mode : Operation mode  
 Test Engineer: Bill

	Freq	ReadAntenna	Cable Preamp		Limit	Over	
	Level	Factor	Loss	Factor	Level	Line	Limit
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB
1	41.132	25.27	15.57	0.67	30.04	11.47	40.00
2	60.069	24.04	14.69	0.86	29.92	9.67	40.00
3	95.762	24.95	14.90	1.16	29.72	11.29	43.50
4	199.286	24.51	12.57	1.84	29.20	9.72	43.50
5	389.355	24.02	16.83	2.80	29.55	14.10	46.00
6	578.670	25.76	20.09	3.64	29.30	20.19	46.00

Vertical:



Condition : FCC PART15 CLASS B VULB9163-2013M VERTICAL

Job No. : 2377RF

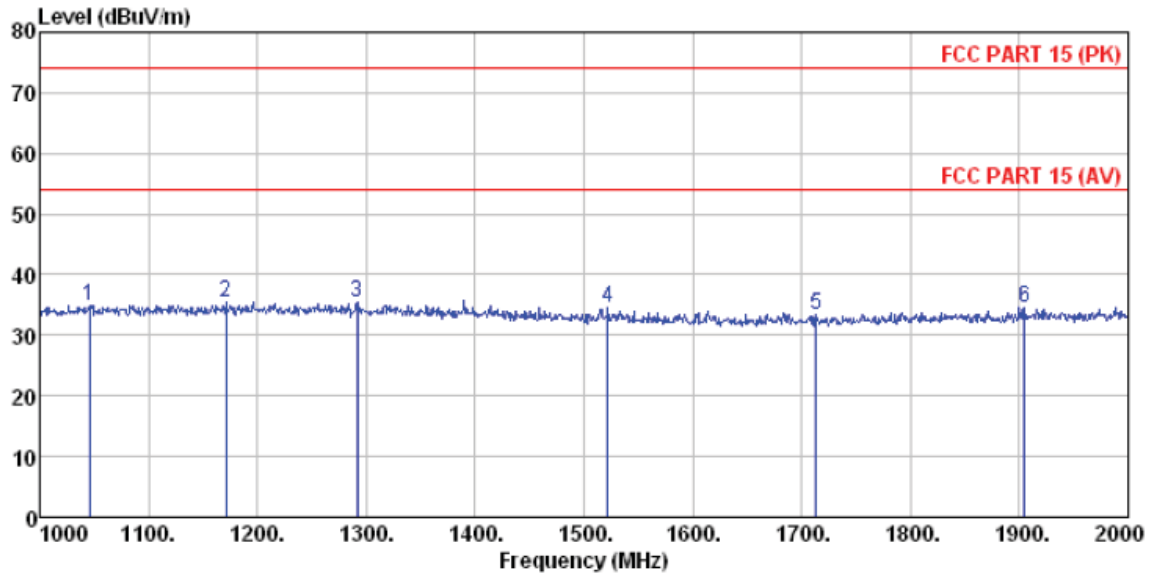
Test Mode : Operation mode

Test Engineer: Bill

	Read	Antenna	Cable	Preamp	Level	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	35.624	26.44	14.49	0.62	30.07	11.48	40.00	-28.52 QP
2	52.575	27.68	15.14	0.79	29.98	13.63	40.00	-26.37 QP
3	104.170	25.09	14.78	1.23	29.67	11.43	43.50	-32.07 QP
4	235.816	24.88	13.88	2.05	29.53	11.28	46.00	-34.72 QP
5	449.556	24.31	17.57	3.08	29.40	15.56	46.00	-30.44 QP
6	813.112	24.11	22.19	4.51	29.19	21.62	46.00	-24.38 QP

Above 1GHz

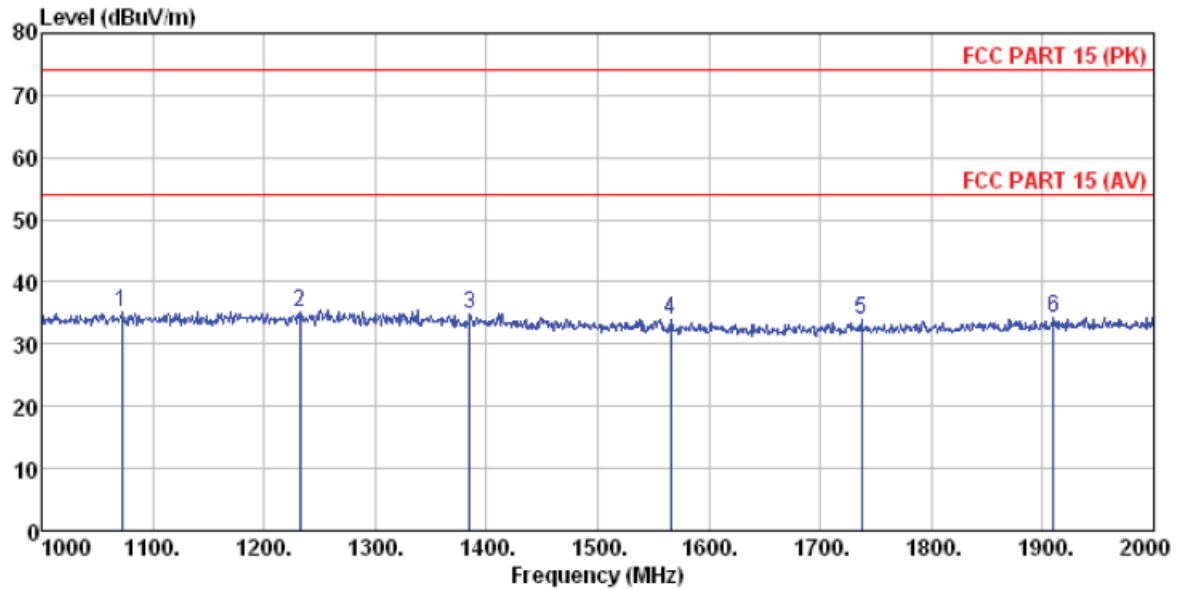
Horizontal:



Condition : FCC PART 15 (PK) BBHA9120D ANT(>1GHZ) HORIZONTAL  
 Job No. : 2377RF  
 Test Mode : Operation mode  
 Test Engineer: Rong

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1046.000	38.81	24.61	4.33	32.84	34.91	74.00	-39.09	Peak
2	1171.000	38.79	25.17	4.44	33.04	35.36	74.00	-38.64	Peak
3	1292.000	38.52	25.62	4.54	33.24	35.44	74.00	-38.56	Peak
4	1522.000	38.32	25.18	4.69	33.65	34.54	74.00	-39.46	Peak
5	1713.000	37.55	25.00	4.81	33.97	33.39	74.00	-40.61	Peak
6	1905.000	38.25	25.77	4.91	34.29	34.64	74.00	-39.36	Peak

Vertical:

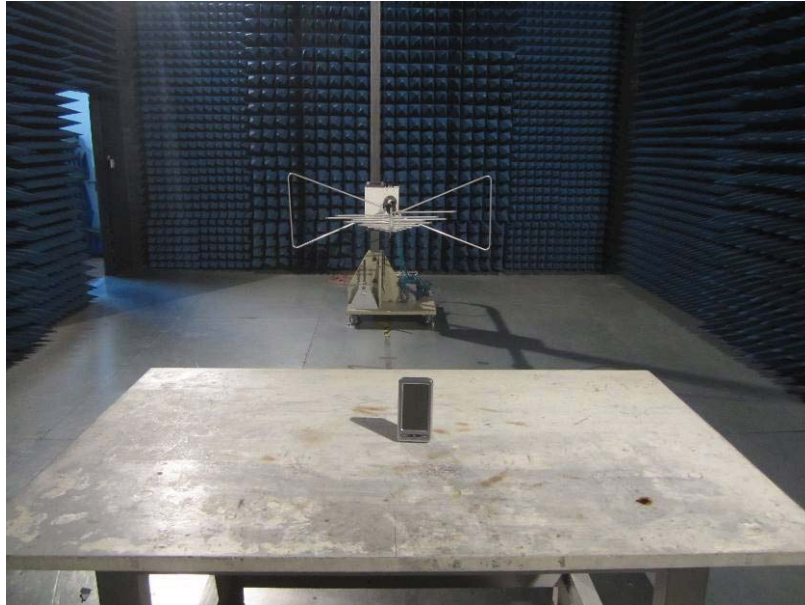


Condition : FCC PART 15 (PK) BBHA9120D ANT(>1GHZ) VERTICAL  
 Job No. : 2377RF  
 Test Mode : Operation mode  
 Test Engineer: Rong

	Freq	ReadAntenna Level	Cable Factor	Preamp Loss	Factor	Level	Limit	Over	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1072.000	38.83	24.68	4.36	32.87	35.00	74.00	-39.00	Peak
2	1232.000	38.38	25.48	4.49	33.16	35.19	74.00	-38.81	Peak
3	1385.000	38.10	25.62	4.61	33.42	34.91	74.00	-39.09	Peak
4	1566.000	37.76	25.05	4.72	33.71	33.82	74.00	-40.18	Peak
5	1737.000	37.94	25.05	4.82	34.00	33.81	74.00	-40.19	Peak
6	1910.000	37.74	25.79	4.92	34.32	34.13	74.00	-39.87	Peak

## 8 Test Setup Photo

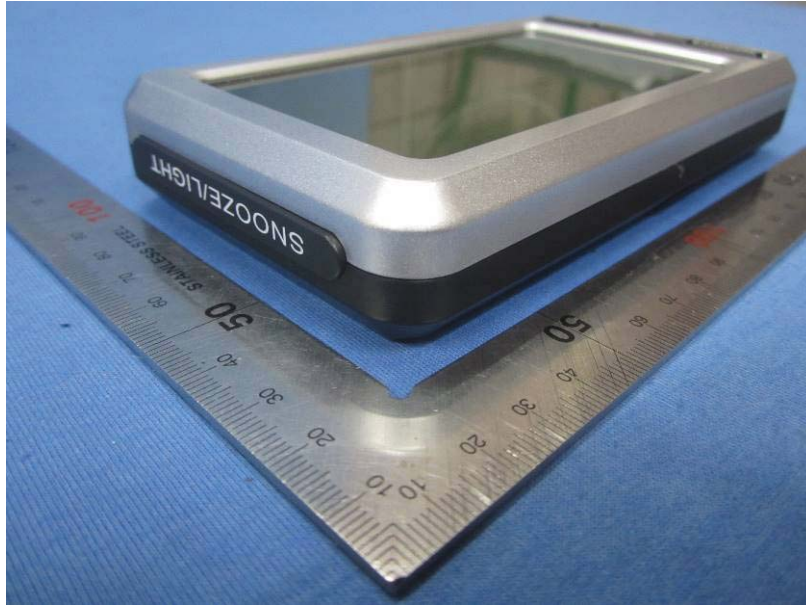
Radiated Emission



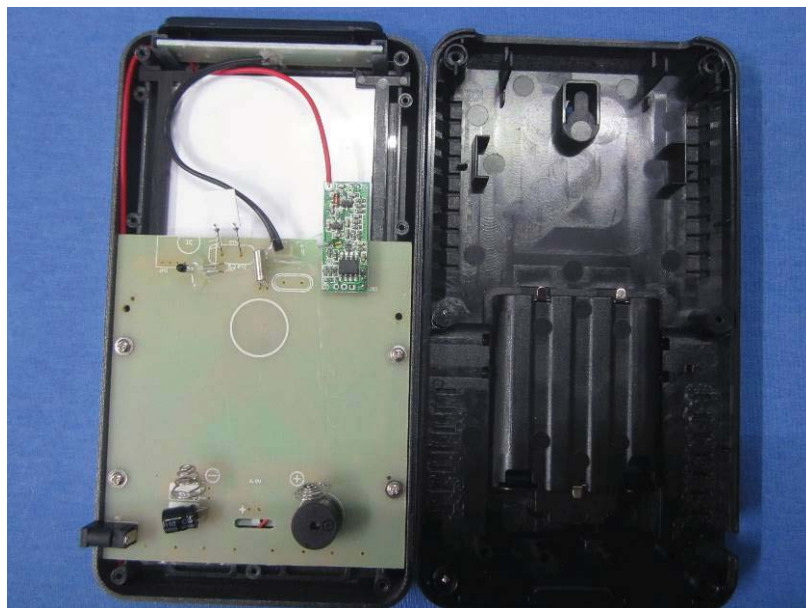


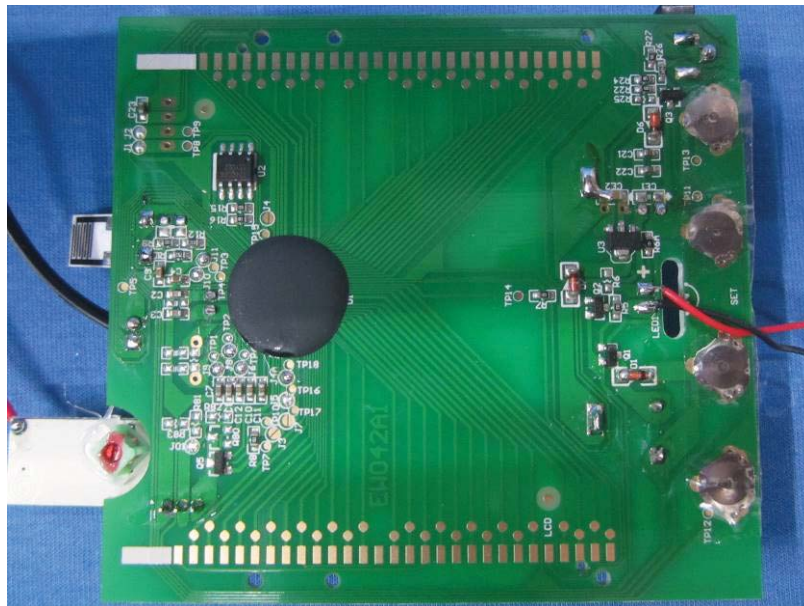
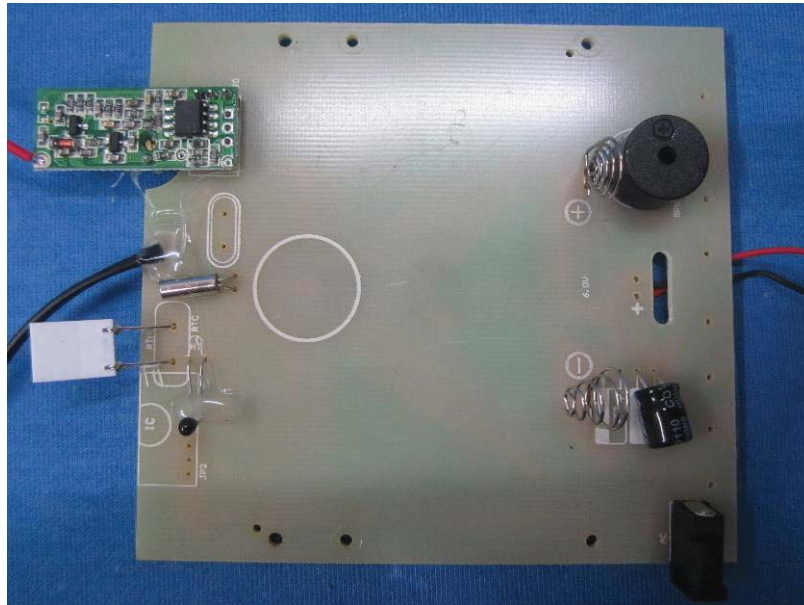
## 9 EUT Constructional Details

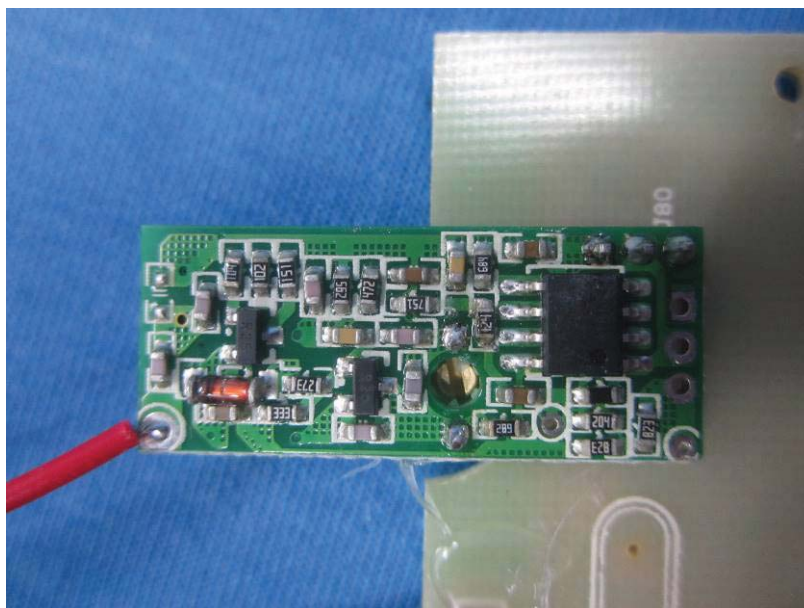












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