



# TEST REPORT

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

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

**Equipment Under Test (EUT)**

Product Name: Wireless Thermometer

Model No.: WS14, WS14-C

**FCC ID:** S2SWS14

**Applicable standards:** FCC CFR Title 47 Part 15 Subpart B:2012

**Date of sample receipt:** October 29, 2013

**Date of Test:** October 29-November 01, 2013

**Date of report issue:** November 01, 2013

**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	November 01, 2013	Original

Prepared By:



Date:

November 01, 2013

Project Engineer

Check By:



Date:

November 01, 2013

Reviewer

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## 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.*

*N/A: not applicable.*

## 5 General Information

### 5.1 Client Information

Applicant:	Ambient, LLC dba Ambient Weather
Address of Applicant:	6845 W. Frye Road Chandler, AZ 85226
Manufacturer:	Shenzhen Kello Sciece Technology Co., Ltd.
Address of Manufacturer:	32nd Building Area B Tanglang Industrial Park Xili Shenzhen Guangdong China
Factory:	Shenzhen Kello Sciece Technology Co., Ltd.
Address of Factory:	32nd Building Area B Tanglang Industrial Park Xili Shenzhen Guangdong China

### 5.2 General Description of EUT

Product Name:	Wireless Thermometer
Model No.:	WS14, WS14-C
Test Model No.:	WS14
Remark:	<i>WS14 and WS14-C are identical in the same PCB layout, interior structure and electrical circuits. The only difference is model name for commercial purpose.</i>
Power supply:	DC 4.5V(3*1.5V("AAA" Size battery))

### 5.3 Test mode

Receiving mode	Keep the EUT in Receiving mode.
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## 5.4 Test Facility

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

- **CNAS —Registration No.: CNAS L5775**

CNAS has accredited Global United Technology Services Co., Ltd. To ISO/IEC 17025 General Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **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: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China

Tel: 0755-27798480

Fax: 0755-27798960

## 5.6 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC ID/DoC
Shenzhen Kello Sciece Technology Co., Ltd.	Wireless Thermometer	F007PF	N/A	FCC ID: S2SF007PF

## 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	Mar. 29 2013	Mar. 28 2014
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	Jun. 29 2013	Jun. 29 2014
4	BiConiLog Antenna	SCHWARZBECK	VULB9163	GTS214	Jun. 29 2013	Jun. 29 2014
5	Double -ridged waveguide horn	SCHWARZBECK	9120D	GTS208	Jun. 29 2013	Jun. 29 2014
6	RF Amplifier	HP	8347A	GTS204	Jun. 29 2013	Jun. 29 2014
7	Preamplifier	HP	8349B	GTS206	Jun. 29 2013	Jun. 29 2014
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial cable	GTS	N/A	GTS210	Jul. 07 2013	Jul. 06 2014
10	Coaxial Cable	GTS	N/A	GTS211	Jul. 07 2013	Jul. 06 2014
11	Thermo meter	N/A	N/A	GTS256	Jul. 01 2013	Jul. 01 2014

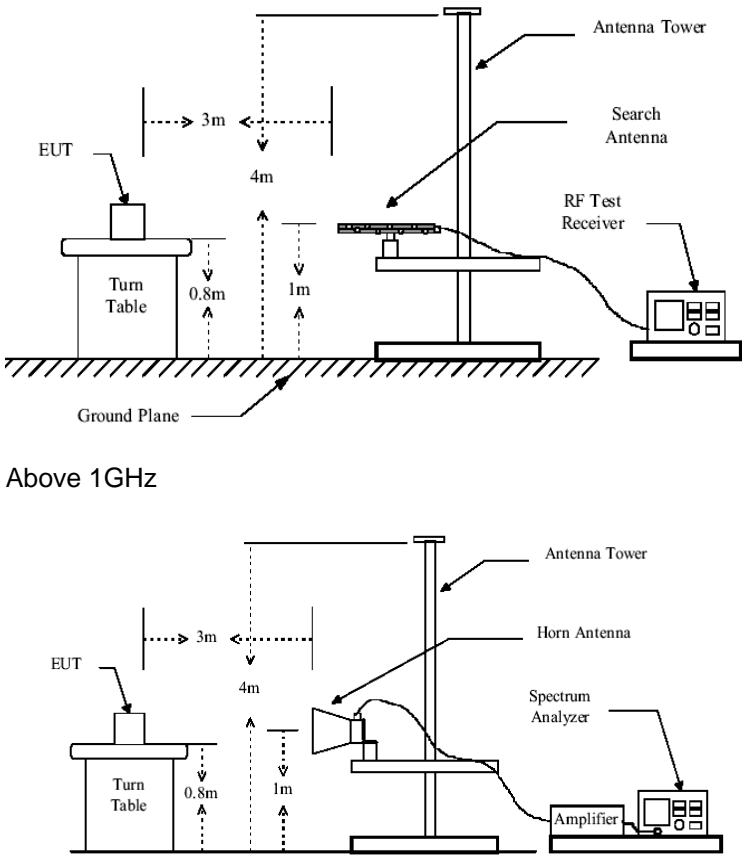
General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
1	Barometer	ChangChun	DYM3	GTS257	Jul. 27 2013	Jul. 27 2014

## 7 Test Results and Measurement Data

### 7.1 Radiated Emission

Test Requirement:	FCC Part15 B Section 15.109																								
Test Method:	ANSI C63.4:2003																								
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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Above 1GHz	54.00	Average 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:	Refer to section 5.3 for details
Test results:	Pass

**Note:**

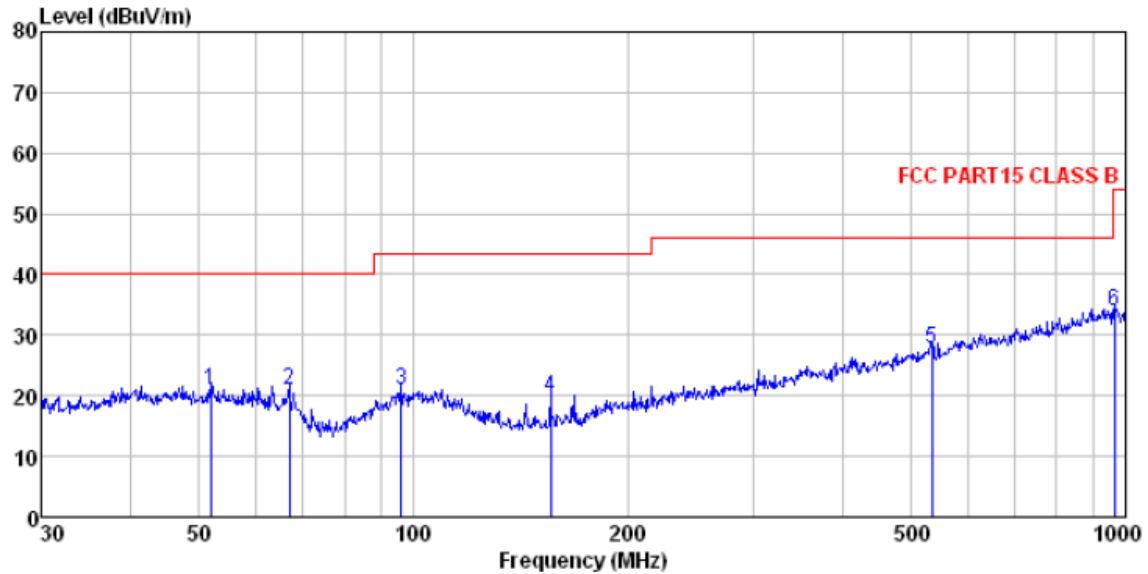
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

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

## Measurement Data

Below 1GHz

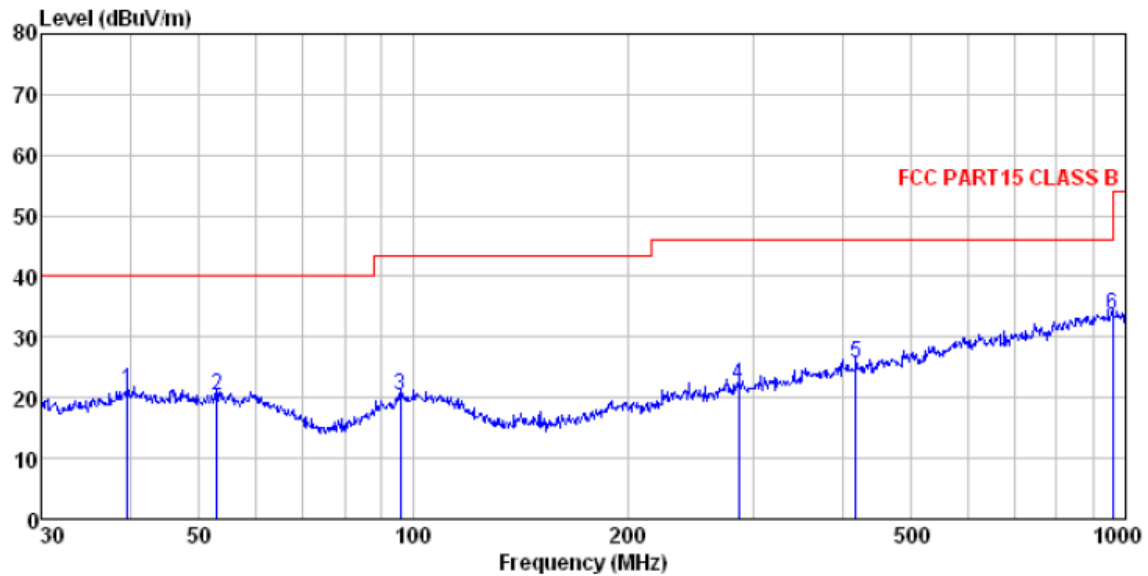
Horizontal:



Site : 3m chamber  
 Condition : FCC PART15 CLASS B 3m VULB9163-2013M HORIZONTAL  
 Job No. : 1745RF  
 Test Mode : Receiving mode  
 Test Engineer: Hank

	Freq	Read	Antenna	Cable	Preamp	Level	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	51.843	37.07	15.16	0.79	31.96	21.06	40.00	-18.94	QP
2	66.967	40.17	11.89	0.92	31.90	21.08	40.00	-18.92	QP
3	96.099	36.65	14.90	1.16	31.75	20.96	43.50	-22.54	QP
4	155.910	39.70	10.51	1.60	32.00	19.81	43.50	-23.69	QP
5	533.832	36.52	19.26	3.46	31.38	27.86	46.00	-18.14	QP
6	965.542	36.42	23.52	5.09	31.22	33.81	54.00	-20.19	QP

Vertical:

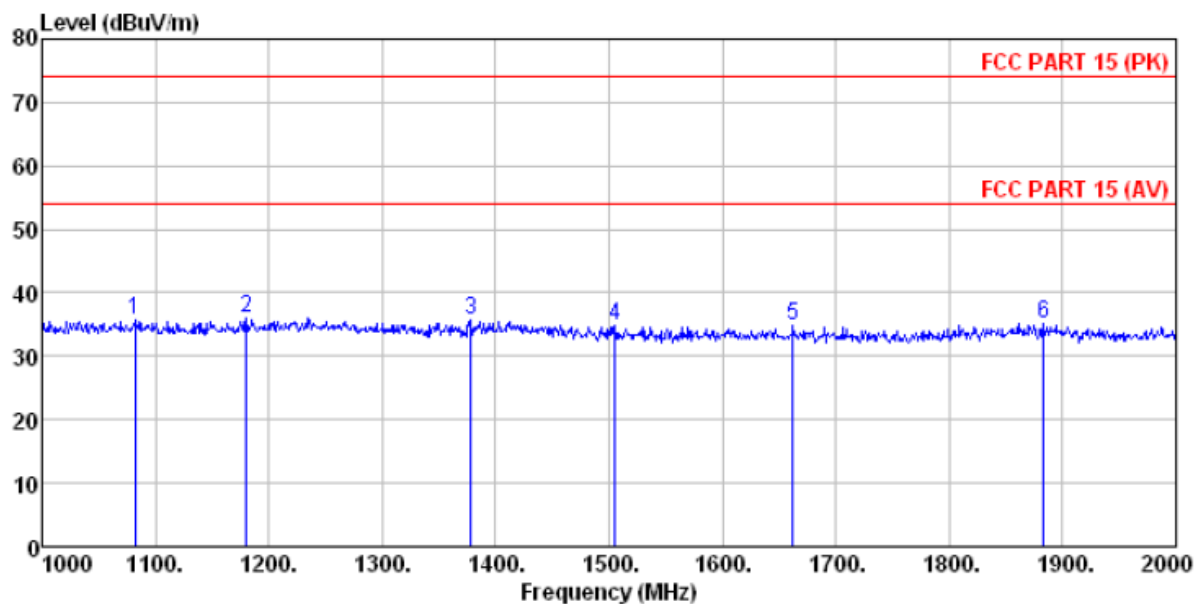


Site : 3m chamber  
 Condition : FCC PART15 CLASS B 3m VULB9163-2013M VERTICAL  
 Job No. : 1745RF  
 Test Mode : Receiving mode  
 Test Engineer: Hank

	Freq	Read	Antenna	Cable	Preamp	Level	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	39.715	37.02	15.49	0.66	32.06	21.11	40.00	-18.89	QP
2	52.945	36.50	15.11	0.80	31.95	20.46	40.00	-19.54	QP
3	95.762	36.17	14.90	1.16	31.74	20.49	43.50	-23.01	QP
4	285.978	37.30	14.78	2.29	32.18	22.19	46.00	-23.81	QP
5	417.641	37.17	17.43	2.93	31.83	25.70	46.00	-20.30	QP
6	958.794	36.44	23.49	5.08	31.22	33.79	46.00	-12.21	QP

Above 1GHz

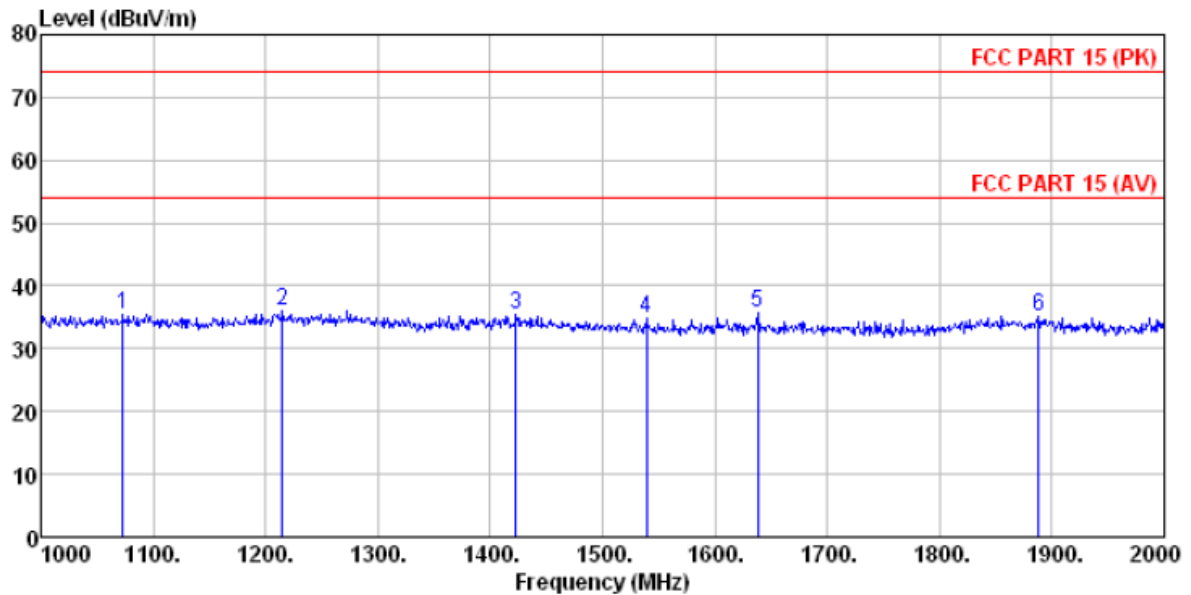
Horizontal:



Site : 3m chamber  
 Condition : FCC PART 15 (PK) 3m BBHA9120D ANT(>1GHZ) HORIZONTAL  
 Job No. : 1745RF  
 Test Mode : Receiving mode  
 Test Engineer: Hank

	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	1082.000	39.52	24.71	4.37	32.89	35.71	74.00	-38.29	Peak
2	1180.000	39.39	25.25	4.45	33.07	36.02	74.00	-37.98	Peak
3	1378.000	38.75	25.64	4.60	33.39	35.60	74.00	-38.40	Peak
4	1505.000	38.54	25.21	4.68	33.62	34.81	74.00	-39.19	Peak
5	1662.000	39.03	24.88	4.78	33.88	34.81	74.00	-39.19	Peak
6	1883.000	38.71	25.67	4.90	34.26	35.02	74.00	-38.98	Peak

Vertical:



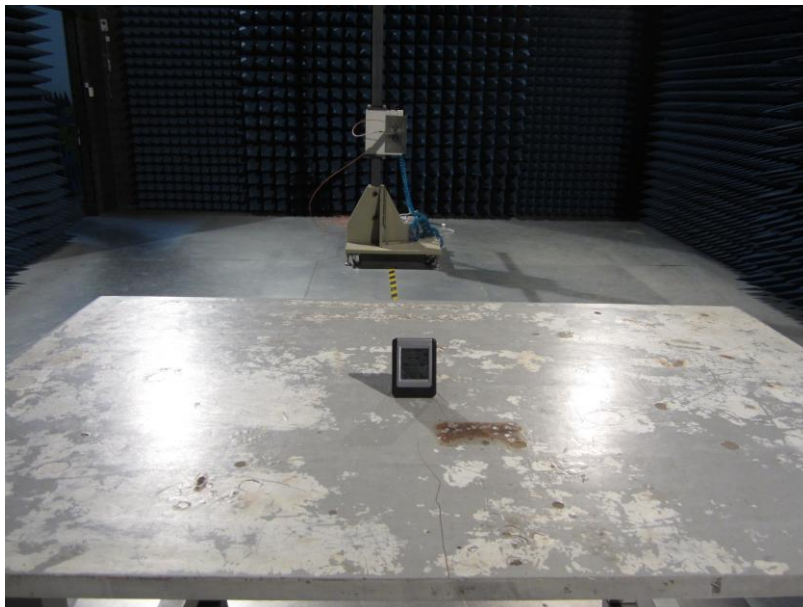
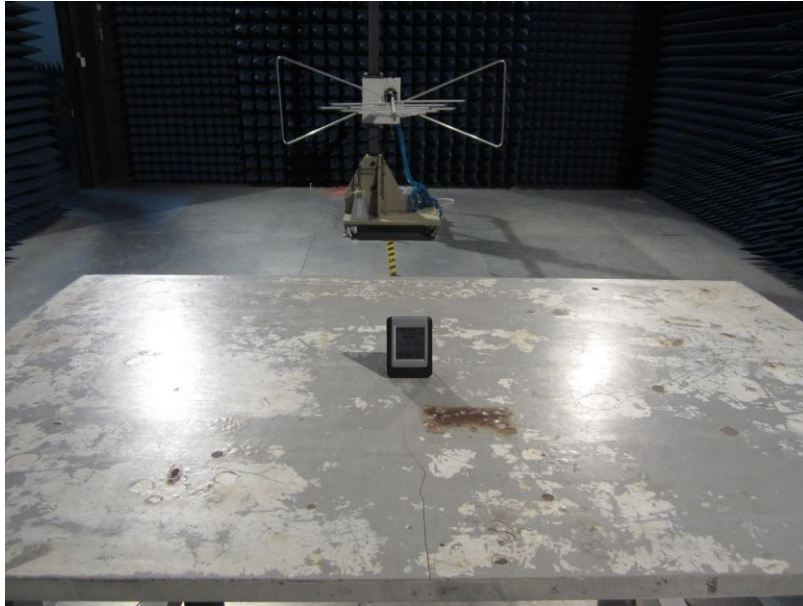
Site : 3m chamber  
 Condition : FCC PART 15 (PK) 3m BBHA9120D ANT(>1GHZ) VERTICAL  
 Job No. : 1745RF  
 Test Mode : Receiving mode  
 Test Engineer: Hank

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier	Level	Limit	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1073.000	39.40	24.68	4.36	32.87	35.57	74.00	-38.43	Peak
2	1215.000	39.14	25.42	4.48	33.13	35.91	74.00	-38.09	Peak
3	1423.000	38.80	25.47	4.63	33.47	35.43	74.00	-38.57	Peak
4	1539.000	38.72	25.13	4.71	33.68	34.88	74.00	-39.12	Peak
5	1638.000	39.85	24.89	4.77	33.85	35.66	74.00	-38.34	Peak
6	1888.000	38.83	25.70	4.90	34.26	35.17	74.00	-38.83	Peak

Remark: If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

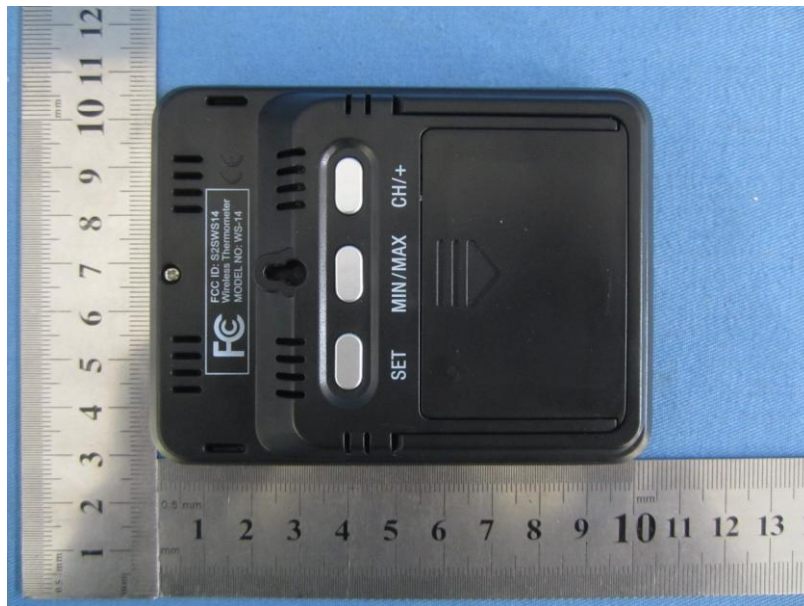
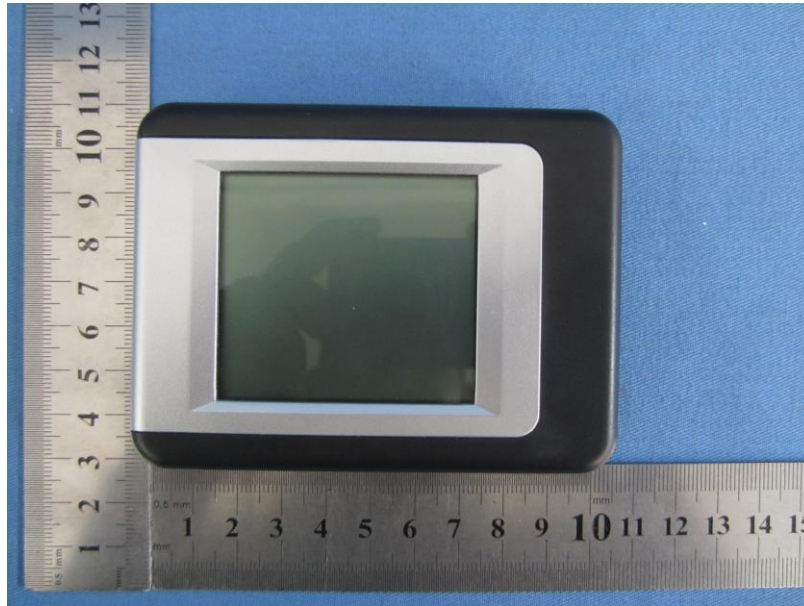
## 8 Test Setup Photo

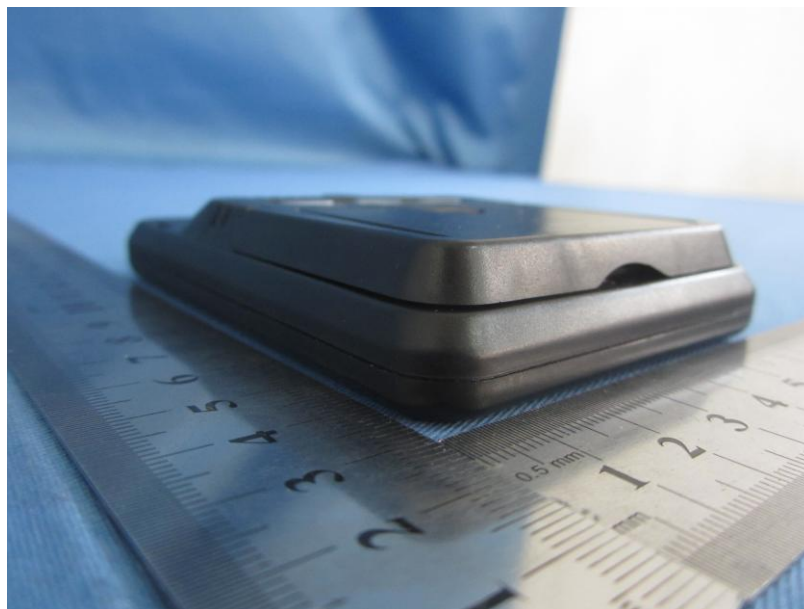
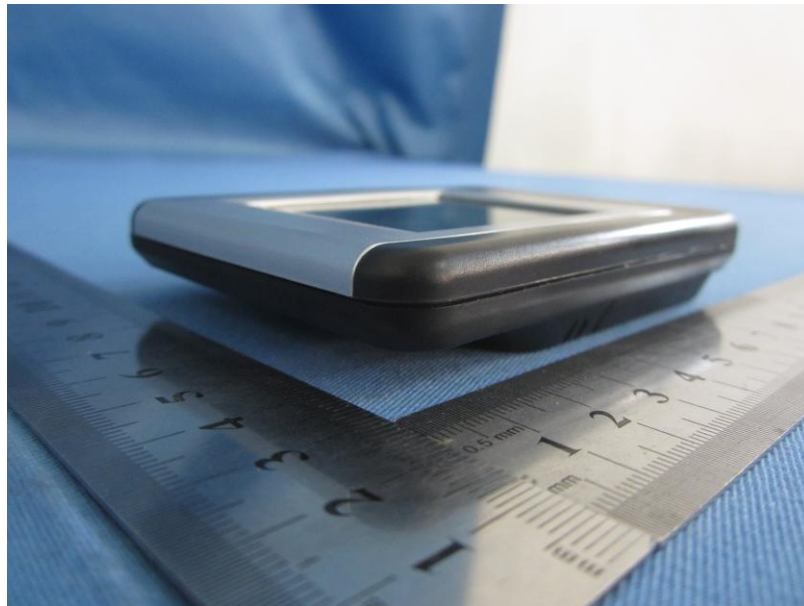
Radiated Emission



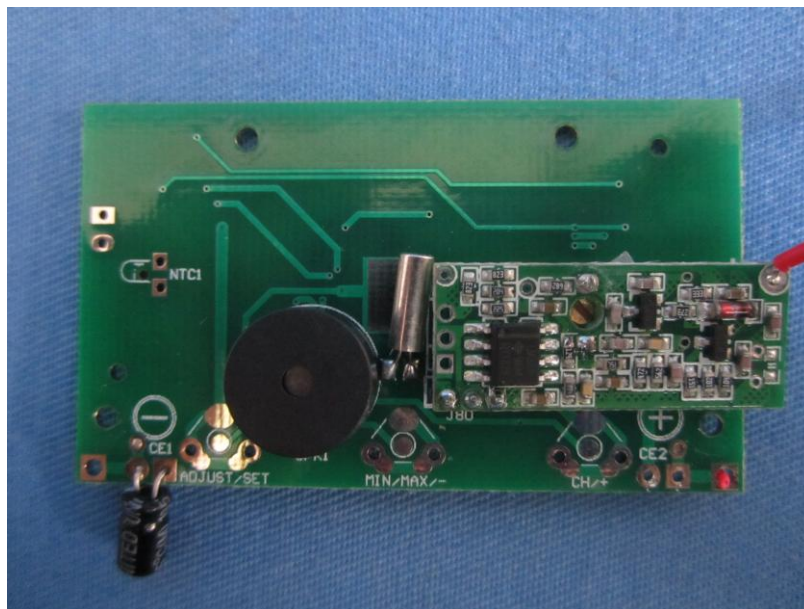
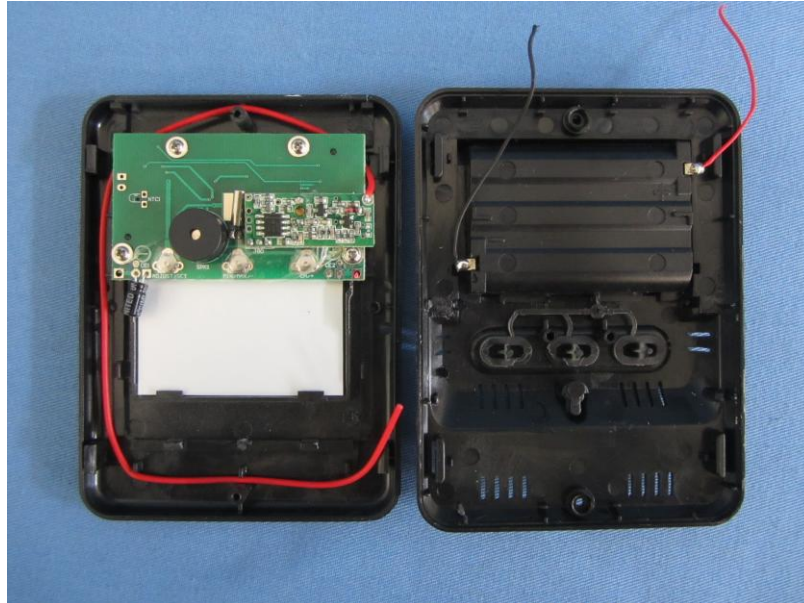


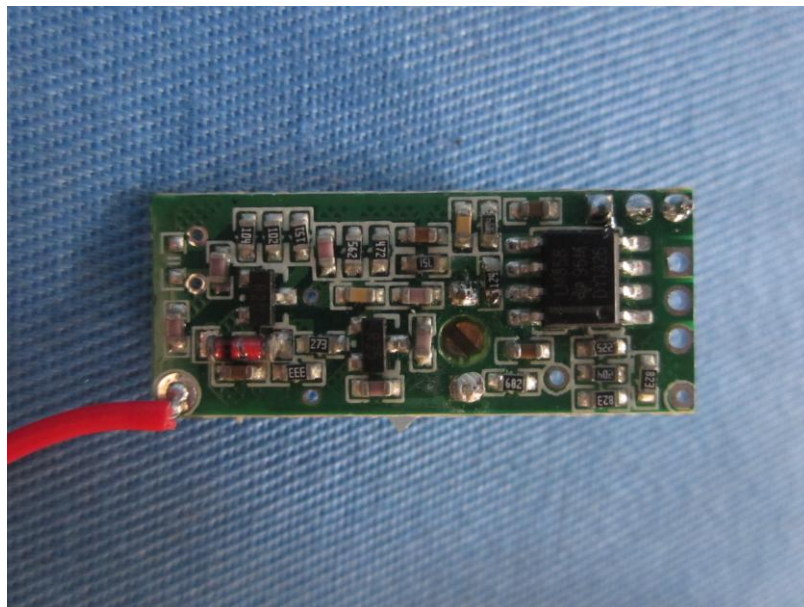
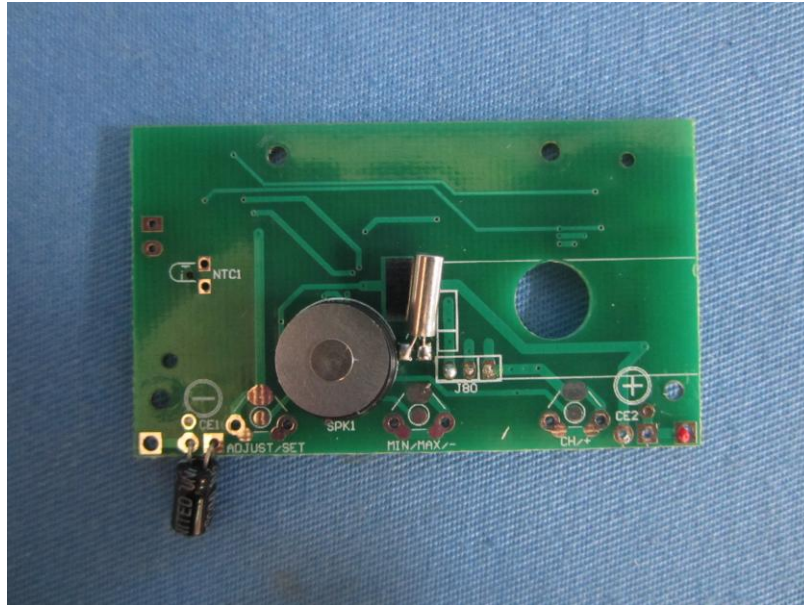
## 9 EUT Constructional Details



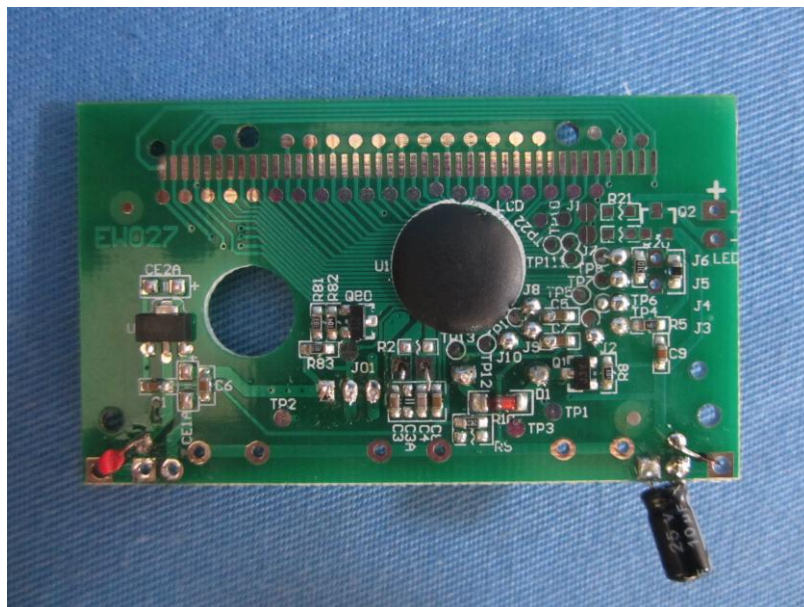
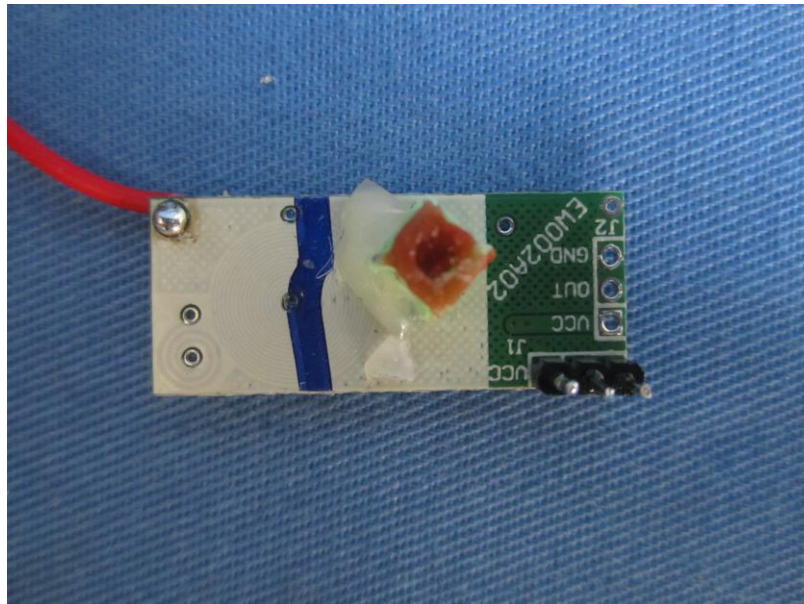












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