



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

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.

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

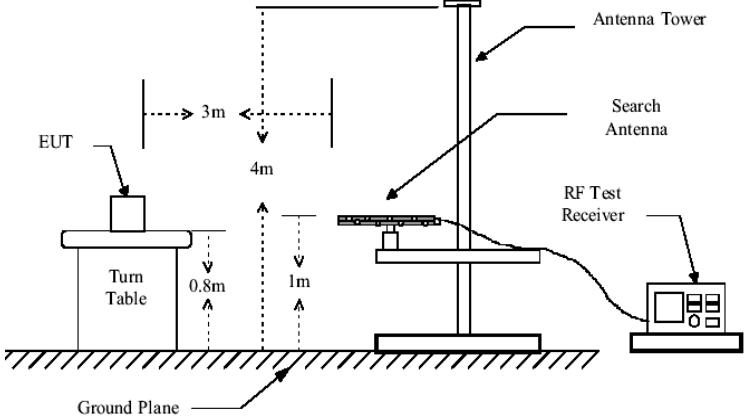
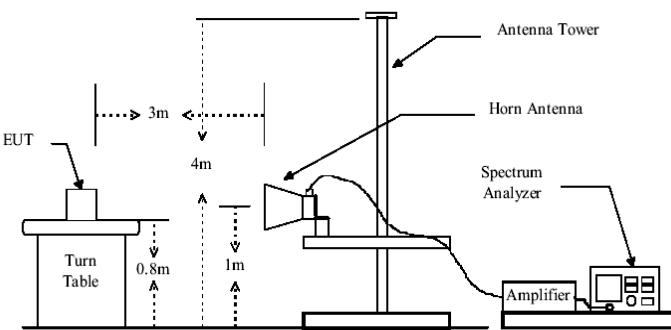
Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)* 6.0(H)	GTS250	Mar. 29 2013	Mar. 28 2014
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	ESU 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 border="1"> <thead> <tr> <th>Frequency</th> <th>Detector</th> <th>RBW</th> <th>VBW</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>30MHz-1GHz</td> <td>Quasi-peak</td> <td>120kHz</td> <td>300kHz</td> <td>Quasi-peak Value</td> </tr> <tr> <td>Above 1GHz</td> <td>Peak</td> <td>1MHz</td> <td>3MHz</td> <td>Peak Value</td> </tr> <tr> <td></td> <td>Peak</td> <td>1MHz</td> <td>10Hz</td> <td>Average Value</td> </tr> </tbody> </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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Test Procedure:	<ol style="list-style-type: none"> 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. 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. 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. 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. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 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. 																									
Test setup:	Below 1GHz																									

	 <p>Above 1GHz</p> 
Test environment:	Temp.: 25 °C Humid.: 52% Press.: 1 012mbar
Measurement Record:	Uncertainty: $\pm 4.5\text{dB}$
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Note:

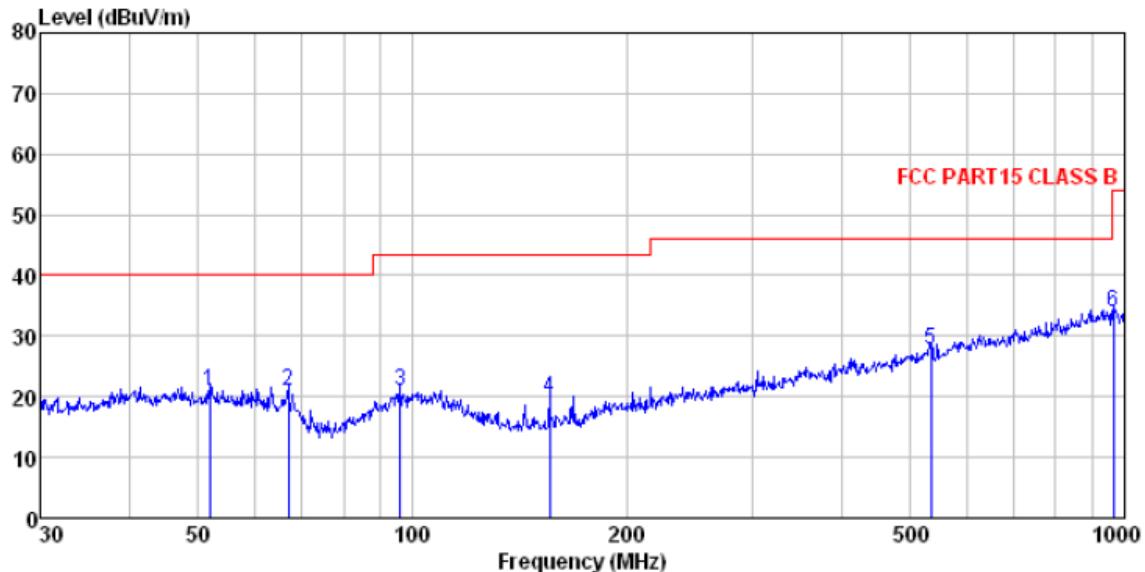
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

Measurement Data

Below 1GHz

Horizontal:



Site : 3m chamber

Condition : FCC PART15 CLASS B 3m VULB9163-2013M HORIZONTAL

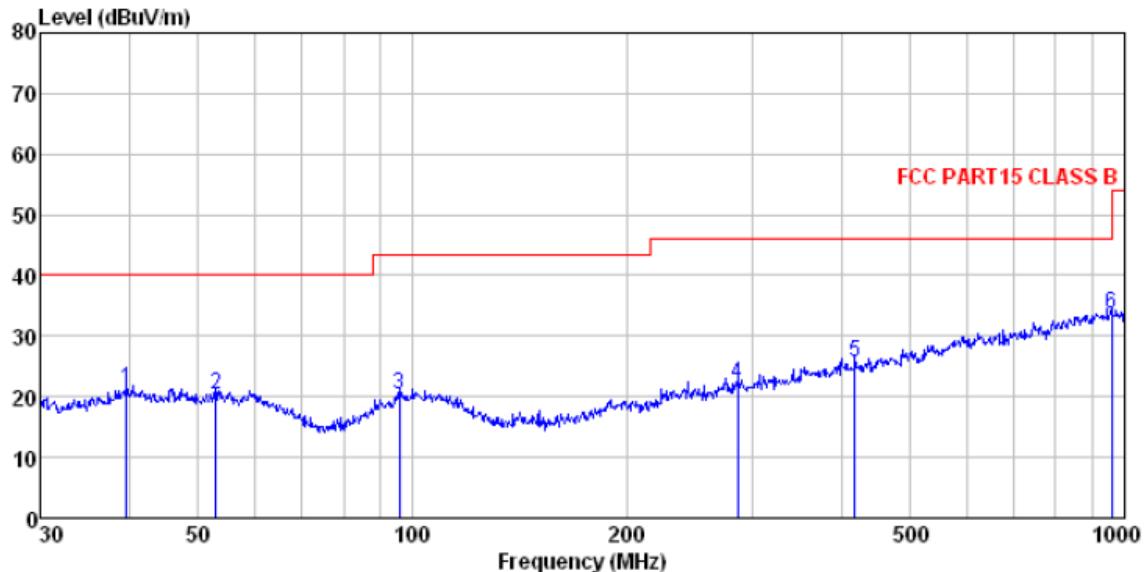
Job No. : 1745RF

Test Mode : Receiving mode

Test Engineer: Hank

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Remark
	Freq	Level	Factor	Loss	Factor	Level	
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

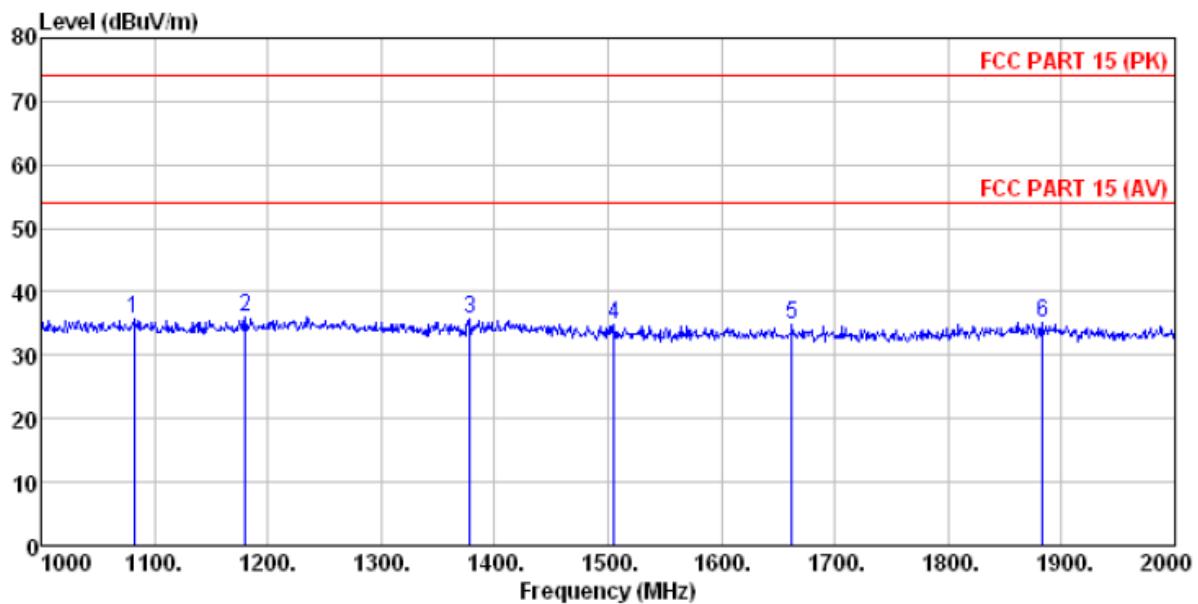
Test Mode : Receiving mode

Test Engineer: Hank

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Remark
	Level	Factor	Loss	Factor	Level	Line	
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

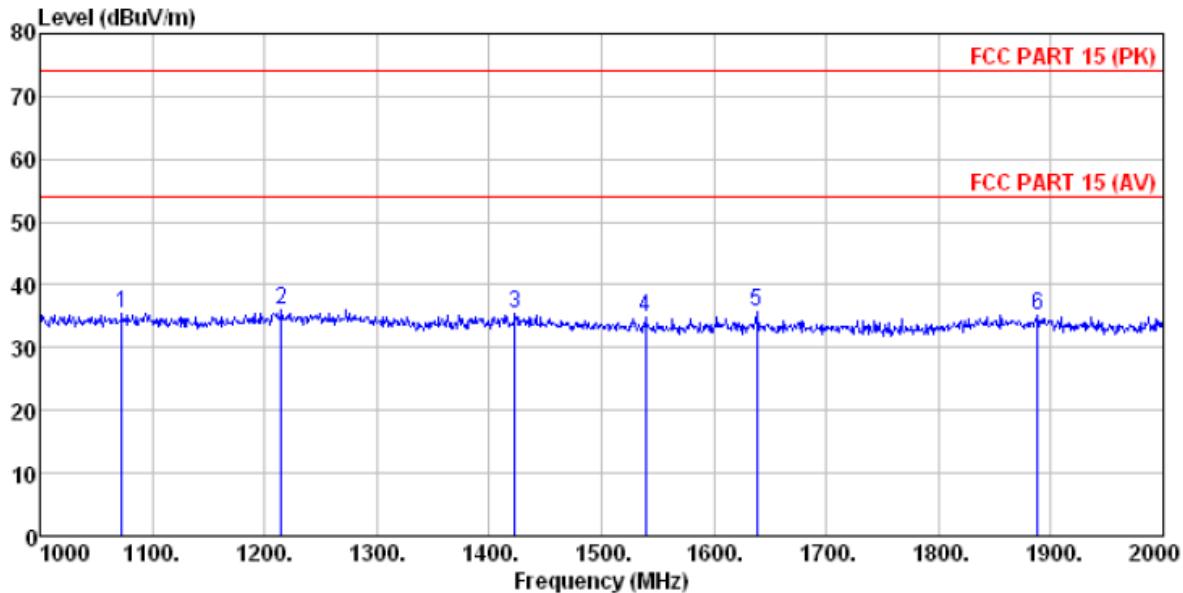
Job No. : 1745RF

Test Mode : Receiving mode

Test Engineer: Hank

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Level	Line	Line	Remark
MHz	dBuV	dB/m		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:



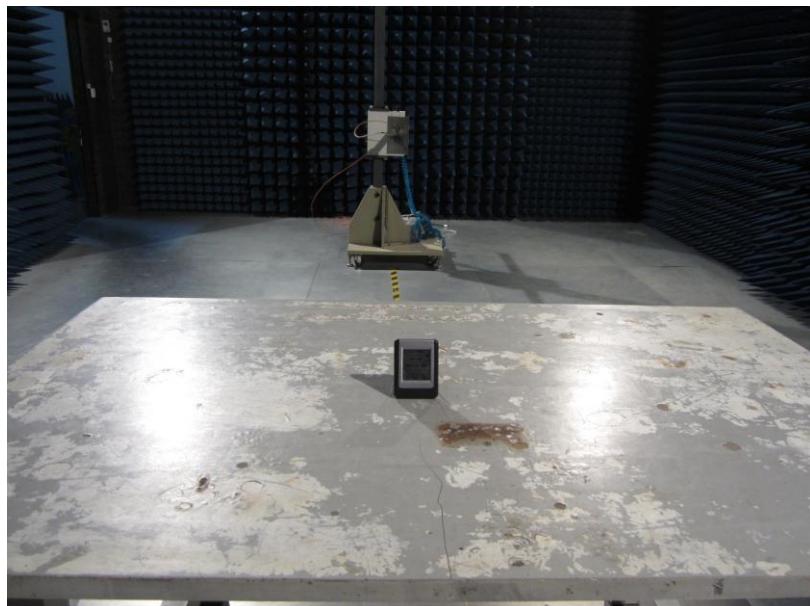
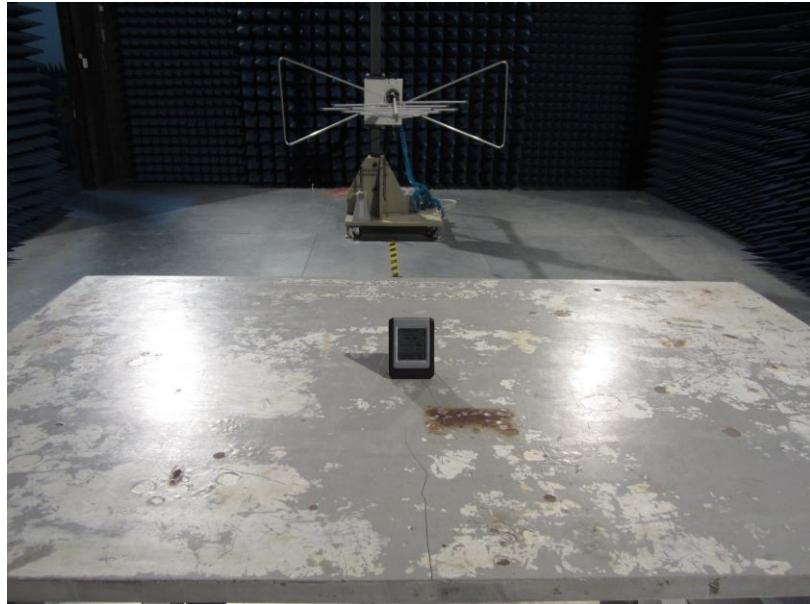
Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120D ANT (>1GHZ) VERTICAL
 Job No. : 1745RF
 Test Mode : Receiving mode
 Test Engineer: Hank

	Read	Antenna	Cable	Preamp	Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	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

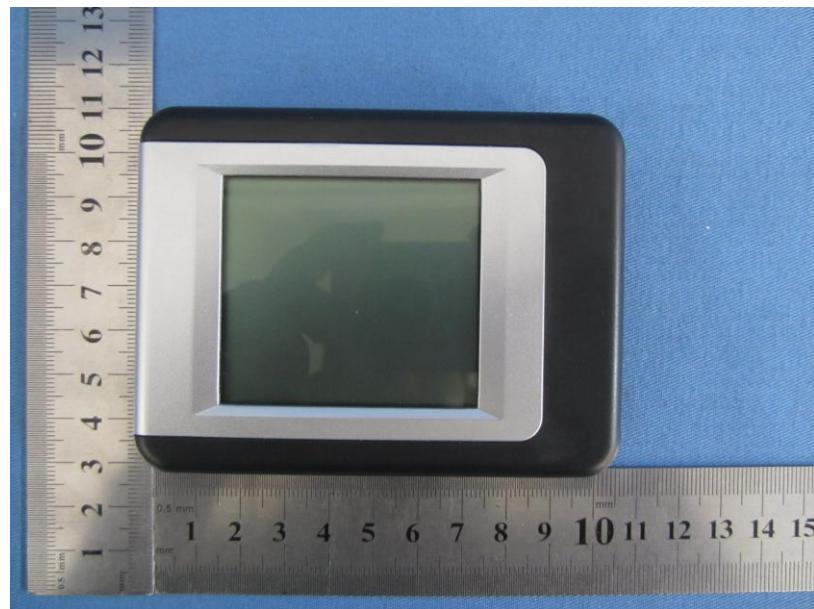
Remark: If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

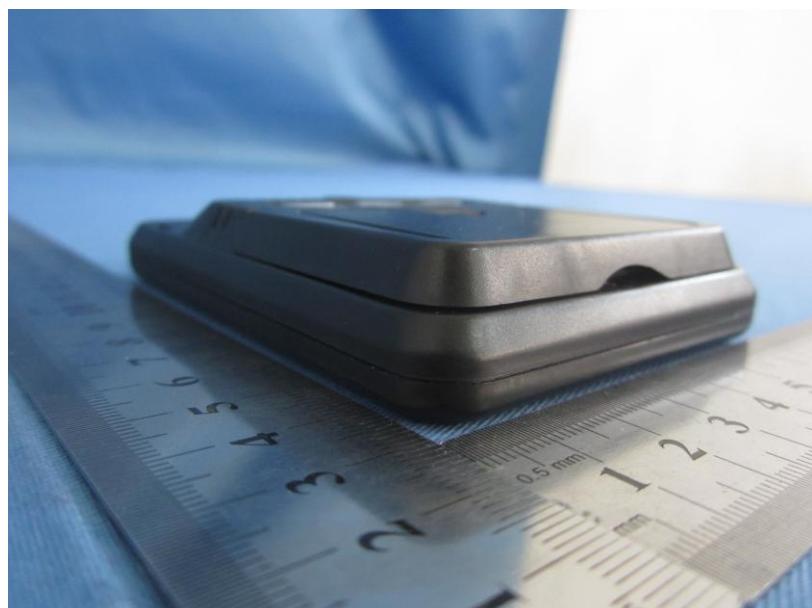
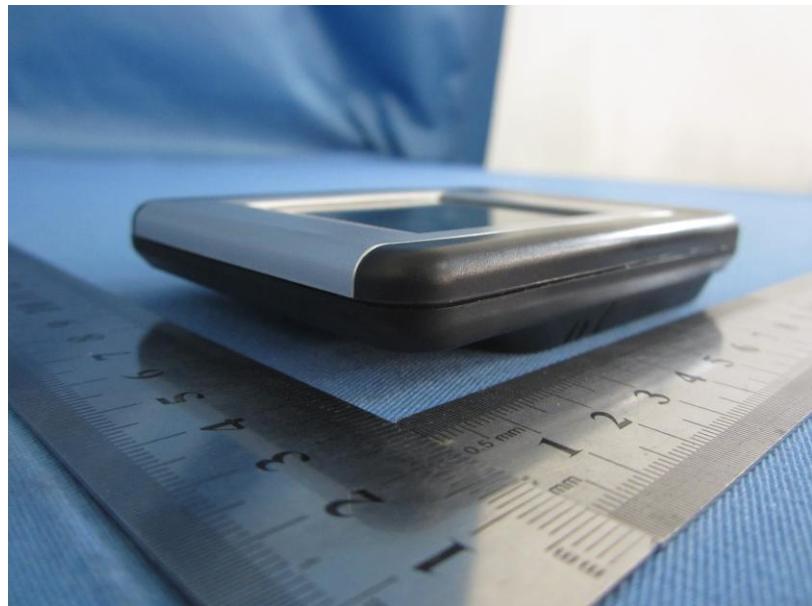
8 Test Setup Photo

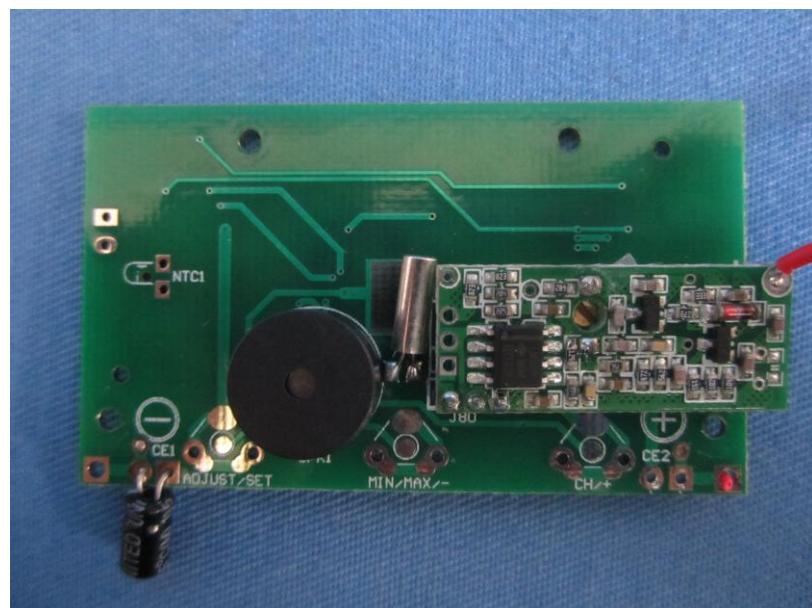
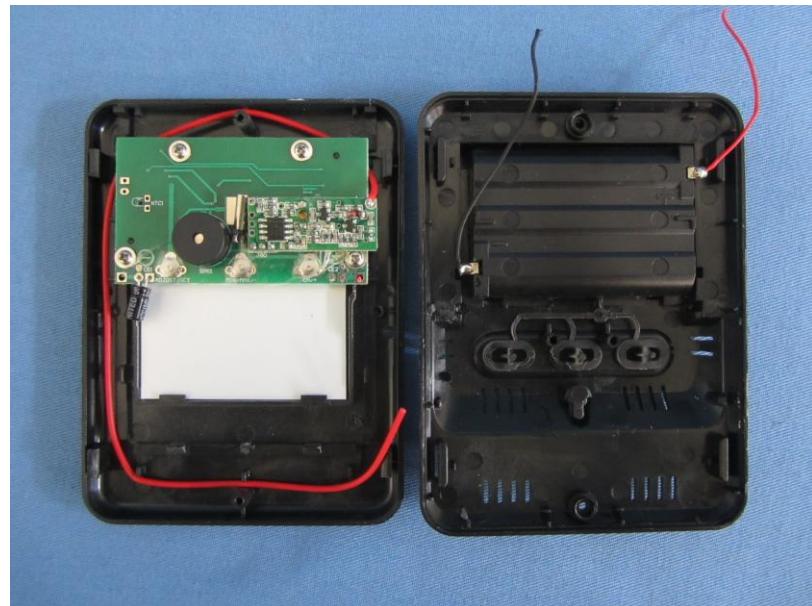
Radiated Emission

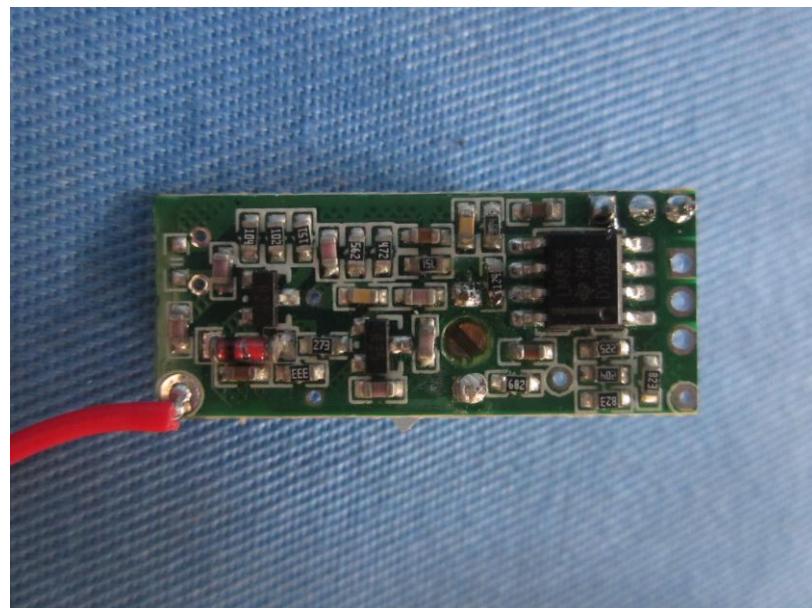
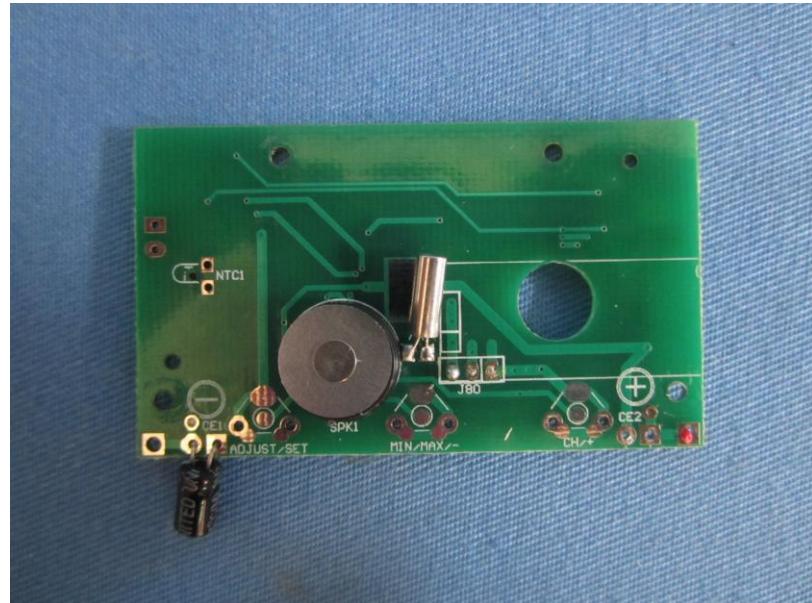


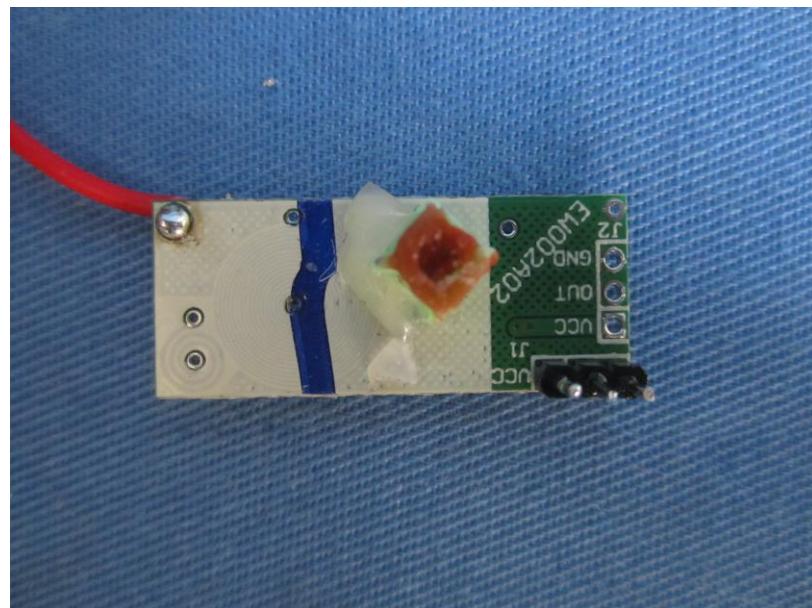
9 EUT Constructional Details











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