



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 Weather Station

Model No.: WS12, WS12C, WS12U

FCC ID: S2SWS12

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

Date of sample receipt: May 18, 2016

Date of Test: May 19-23, 2016

Date of report issue: May 24, 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	May 24, 2016	Original

Prepared By:

Edward Pan

Date:

May 24, 2016

Project Engineer

Check By:

Andy Wu

Date:

May 24, 2016

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Conducted Emission	Part15.107	Pass
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 Weather Station
Model No.:	WS12, WS12C, WS12U
Power supply:	AC Adaptor Model: KSAS0050590050VUD Input: 100-240V~50/60Hz 0.18A Output: 5.9V---0.5A Or DC 6.0V(4*1.5V "AA" Battery)

5.3 Test mode

Test mode:	
Operation mode	Receiving mode

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. 26 2016	Mar. 25 2017

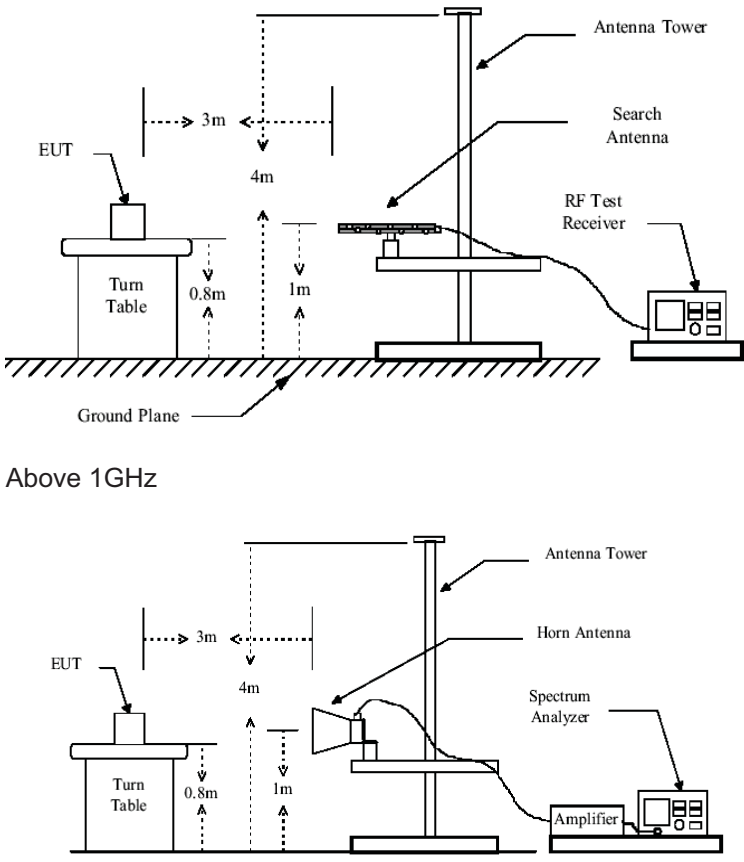
Conducted Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.0(L)x3.0(W)x3.0(H)	GTS264	Sep. 05 2015	Sep. 05 2016
2	EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS223	June 30 2015	June 29 2016
3	10dB Pulse Limita	Rohde & Schwarz	N/A	GTS224	June 30 2015	June 29 2016
4	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June 30 2015	June 29 2016
5	LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	GTS226	June 30 2015	June 29 2016
6	Coaxial Cable	GTS	N/A	GTS227	June 30 2015	June 29 2016
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

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 colspan="2">Frequency</td><td>Limit (dBuV/m @3m)</td><td colspan="2">Remark</td></tr><tr><td colspan="2">30MHz-88MHz</td><td>40.00</td><td colspan="2">Quasi-peak Value</td></tr><tr><td colspan="2">88MHz-216MHz</td><td>43.50</td><td colspan="2">Quasi-peak Value</td></tr><tr><td colspan="2">216MHz-960MHz</td><td>46.00</td><td colspan="2">Quasi-peak Value</td></tr><tr><td colspan="2">960MHz-1GHz</td><td>54.00</td><td colspan="2">Quasi-peak Value</td></tr><tr><td colspan="2" rowspan="2">Above 1GHz</td><td>54.00</td><td colspan="2">Average Value</td></tr><tr><td>74.00</td><td colspan="2">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																																			
		74.00	Peak Value																																			
Test Procedure:	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																																					

	 Above 1GHz
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:	RX mode
Test results:	Pass

Note:

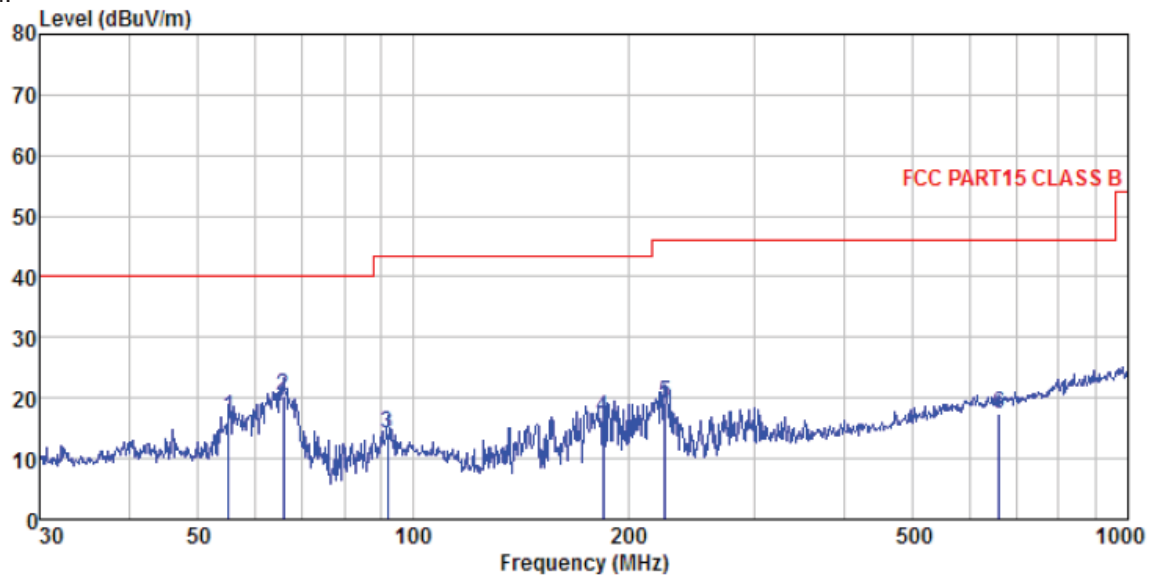
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

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

Measurement Data

Below 1GHz

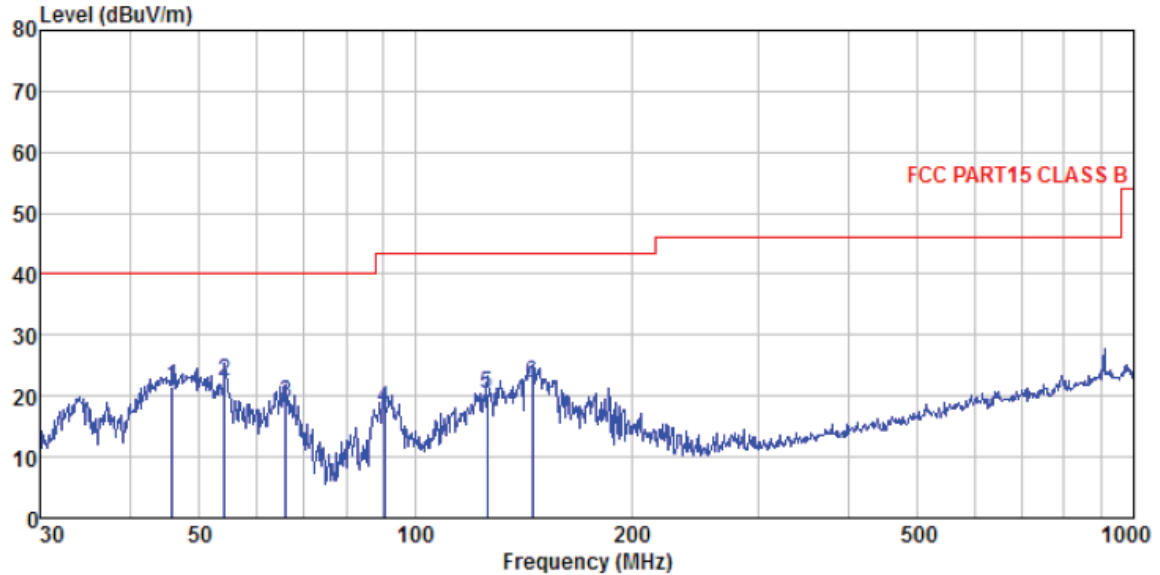
Horizontal:



Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163-2013M HORIZONTAL
 Job No. : 0946
 Test Mode : Operation mode
 Test Engineer: Ben

	Freq	ReadAntenna	Cable	Preamp	Limit	Over	
		Level	Factor	Loss	Factor	Line	Limit
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m
1	55.221	30.96	15.00	0.82	29.96	16.82	40.00
2	65.803	36.95	12.30	0.91	29.88	20.28	40.00
3	92.139	28.49	14.33	1.13	29.74	14.21	43.50
4	184.490	32.31	12.08	1.76	29.26	16.89	43.50
5	225.308	33.17	13.41	1.99	29.44	19.13	46.00
6	661.151	21.91	20.67	3.95	29.24	17.29	46.00

Vertical:

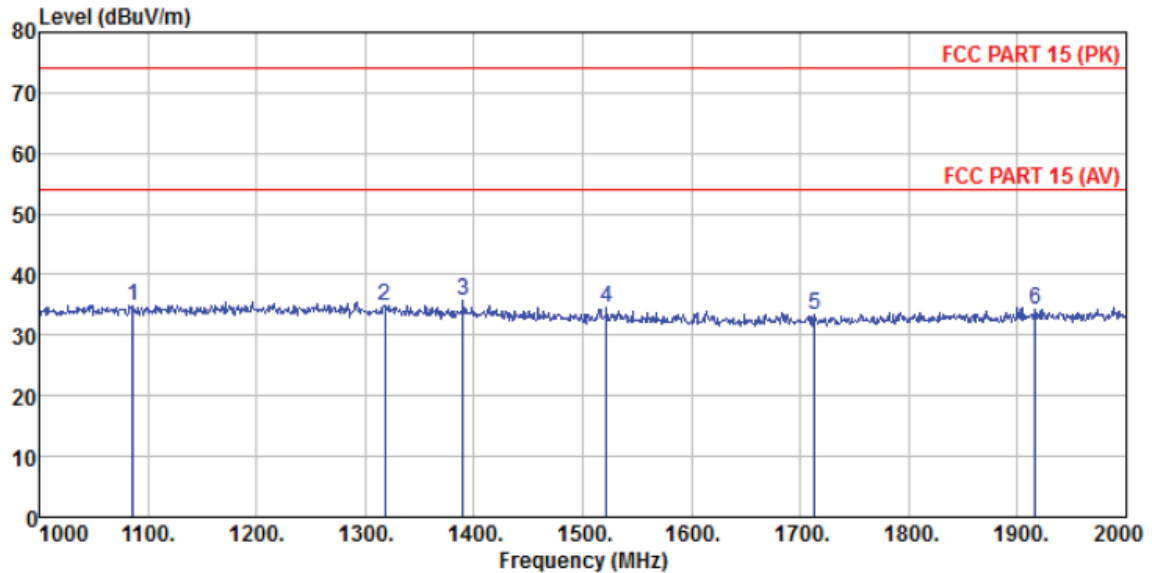


Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163-2013M VERTICAL
Job No. : 0946
Test Mode : Operation mode
Test Engineer: Ben

	Freq	Read	Antenna	Cable	Preamp	Level	Limit	Over	
	MHz	Level	Factor	Loss	Factor	dBuV/m	dBuV/m	Limit	Remark
		dBuV	dB/m	dB	dB			dB	
1	45.855	35.31	15.49	0.73	30.02	21.51	40.00	-18.49	QP
2	54.261	36.58	15.05	0.81	29.96	22.48	40.00	-17.52	QP
3	66.034	35.43	12.30	0.91	29.88	18.76	40.00	-21.24	QP
4	90.537	32.53	14.07	1.11	29.74	17.97	43.50	-25.53	QP
5	125.886	37.02	11.51	1.41	29.53	20.41	43.50	-23.09	QP
6	145.351	39.90	10.23	1.54	29.43	22.24	43.50	-21.26	QP

Above 1GHz

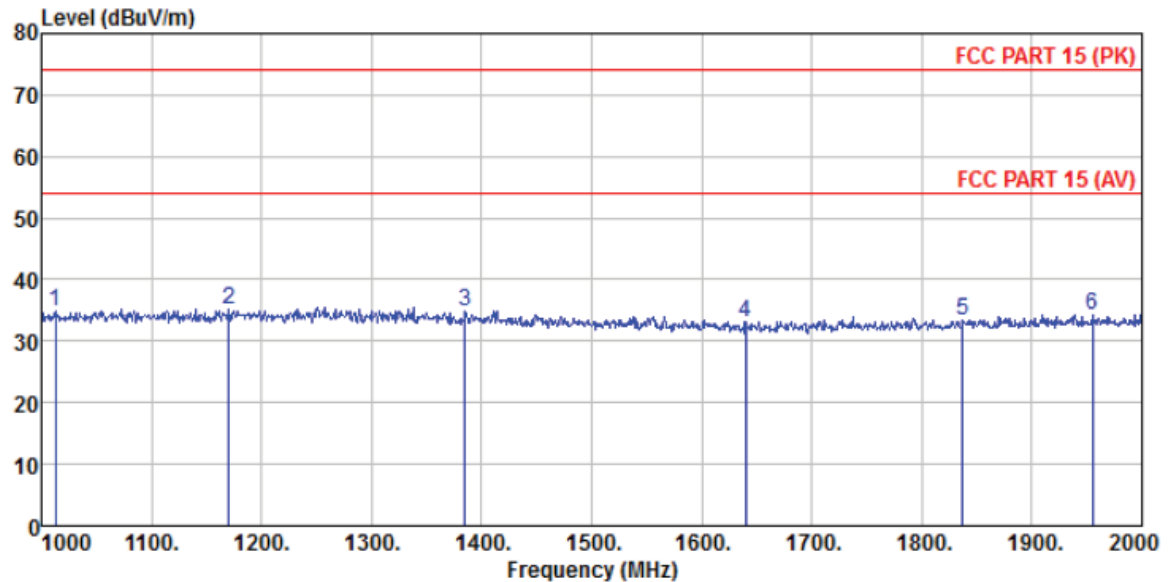
Horizontal:



Condition : FCC PART 15 (PK) BBHA9120D ANT(>1GHZ) HORIZONTAL
 Job No. : 0946
 Test Mode : Operation mode
 Test Engineer: Ben

	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	1086.000	38.65	24.72	4.37	32.89	34.85	74.00	-39.15	Peak
2	1318.000	38.00	25.66	4.56	33.30	34.92	74.00	-39.08	Peak
3	1390.000	39.00	25.60	4.61	33.42	35.79	74.00	-38.21	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	1916.000	37.76	25.81	4.92	34.32	34.17	74.00	-39.83	Peak

Vertical:



Condition : FCC PART 15 (PK) BBHA9120D ANT(>1GHZ) VERTICAL
 Job No. : 0946
 Test Mode : Operation mode
 Test Engineer: Ben

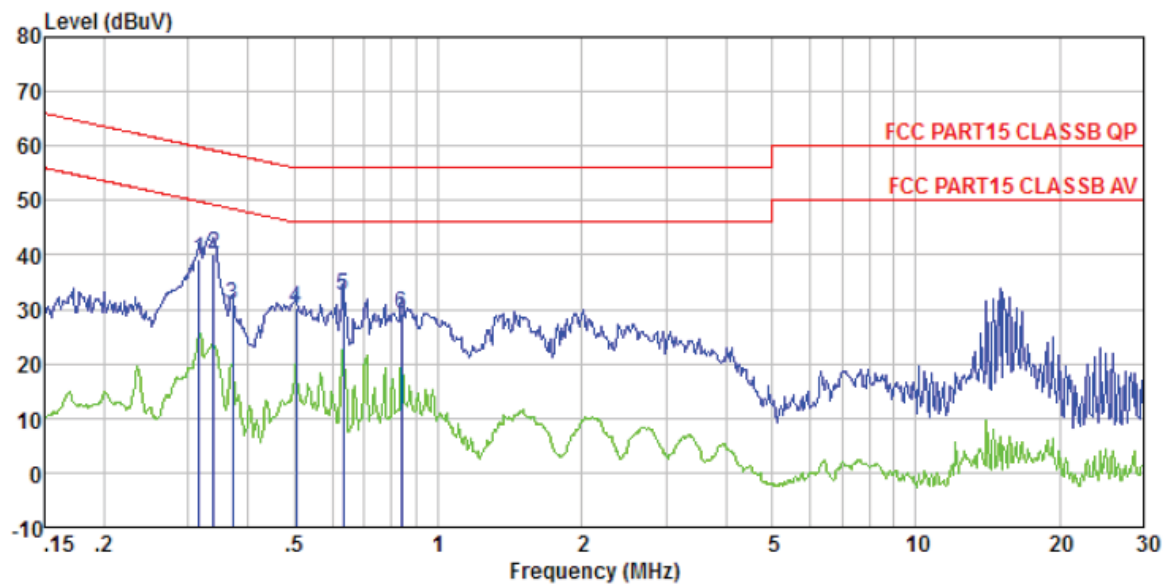
	Freq	ReadAntenna	Cable Preamp		Limit	Over	
	Level Factor	Loss Factor	Level	Line	Limit	Remark	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m
1	1013.000	38.70	24.54	4.30	32.78	34.76	74.00
2	1170.000	38.48	25.17	4.44	33.04	35.05	74.00
3	1385.000	38.10	25.62	4.61	33.42	34.91	74.00
4	1640.000	37.34	24.88	4.77	33.85	33.14	74.00
5	1837.000	37.12	25.45	4.88	34.17	33.28	74.00
6	1955.000	37.69	25.95	4.94	34.37	34.21	74.00

7.2 Conducted Emissions

Test Requirement:	FCC Part15 B Section 15.107														
Test Method:	ANSI C63.4:2014														
Test Frequency Range:	150kHz to 30MHz														
Class / Severity:	Class B														
Receiver setup:	RBW=9kHz, VBW=30kHz														
Limit:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBμV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>0.5-30</td><td>60</td><td>50</td></tr></table> * Decreases with the logarithm of the frequency.	Frequency range (MHz)	Limit (dBμV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	0.5-30	60	50
Frequency range (MHz)	Limit (dBμV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
0.5-30	60	50													
Test setup:	Reference Plane Test table/Insulation plane <i>Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</i>														
Test procedure	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.														
Test environment:	Temp.: 25 °C Humid.: 52% Press.: 1 012mbar														
Test Instruments:	Refer to section 6 for details														
Test mode:	Refer to section 5.3 for details														
Test results:	Pass														

Measurement Data

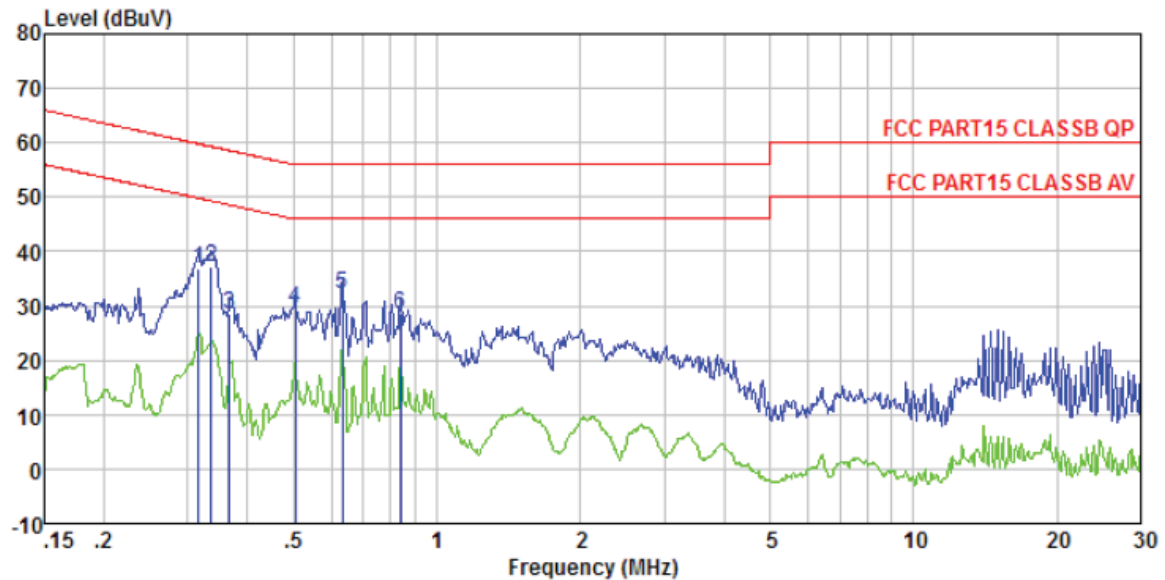
Test mode:	RX mode	Phase Polarity:	Line
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Site : Shielded room
 Condition : FCC PART15 CLASSB QP LISN-2013 LINE
 Job No. : 0946
 Test mode : Operation mode
 Test Engineer: Sky

	Read	LISN	Cable	Limit	Over	
Freq	Level	Level	Factor	Loss	Line	Limit Remark
MHz	dBuV	dBuV	dB	dB	dBuV	dB
1	0.317	38.91	39.12	0.11	0.10	59.80 -20.68 QP
2	0.339	39.92	40.13	0.11	0.10	59.22 -19.09 QP
3	0.371	30.66	30.87	0.11	0.10	58.47 -27.60 QP
4	0.505	29.87	30.10	0.12	0.11	56.00 -25.90 QP
5	0.634	32.27	32.53	0.13	0.13	56.00 -23.47 QP
6	0.839	29.01	29.28	0.14	0.13	56.00 -26.72 QP

Test mode:	RX mode	Phase Polarity:	Neutral
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Site : Shielded room
 Condition : FCC PART15 CLASSB QP LISN-2013 NEUTRAL
 Job No. : 0946
 Test mode : Operation mode
 Test Engineer: Sky

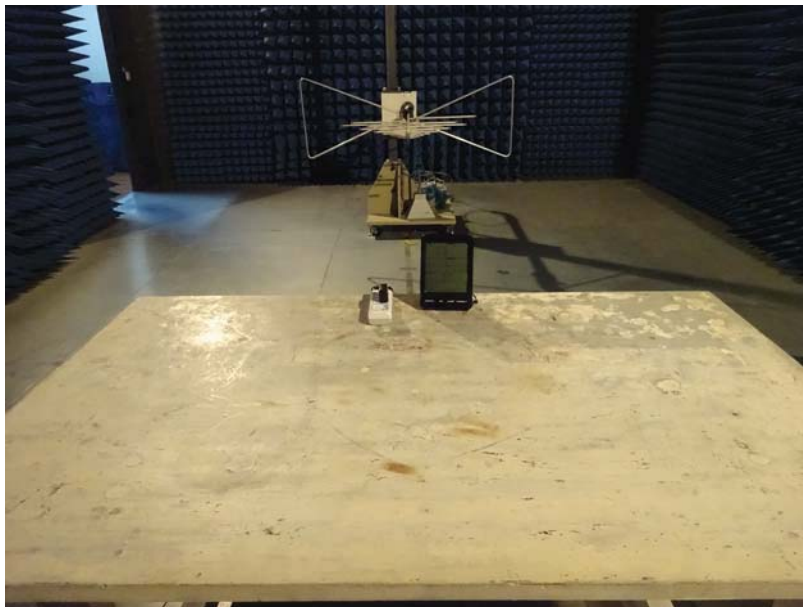
	Freq	Read Level	Level	LISN Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.317	36.71	36.87	0.06	0.10	59.80	-22.93	QP
2	0.336	37.10	37.26	0.06	0.10	59.31	-22.05	QP
3	0.367	28.42	28.58	0.06	0.10	58.56	-29.98	QP
4	0.505	29.20	29.37	0.06	0.11	56.00	-26.63	QP
5	0.634	32.04	32.24	0.07	0.13	56.00	-23.76	QP
6	0.839	28.29	28.49	0.07	0.13	56.00	-27.51	QP

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

8 Test Setup Photo

Radiated Emission



Conducted Emissions

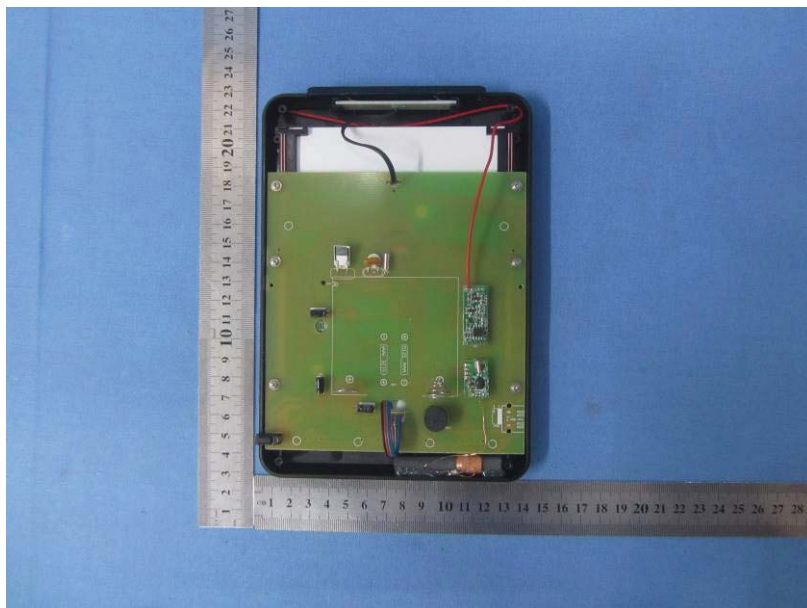


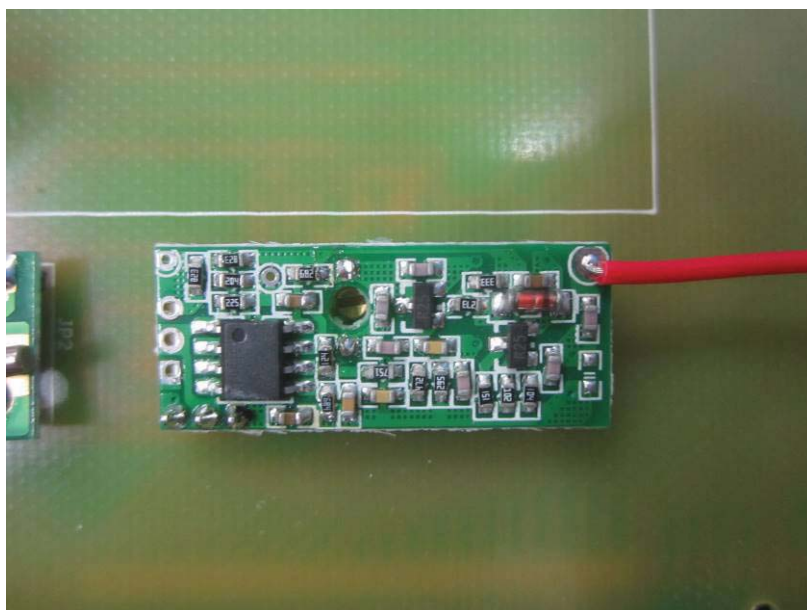
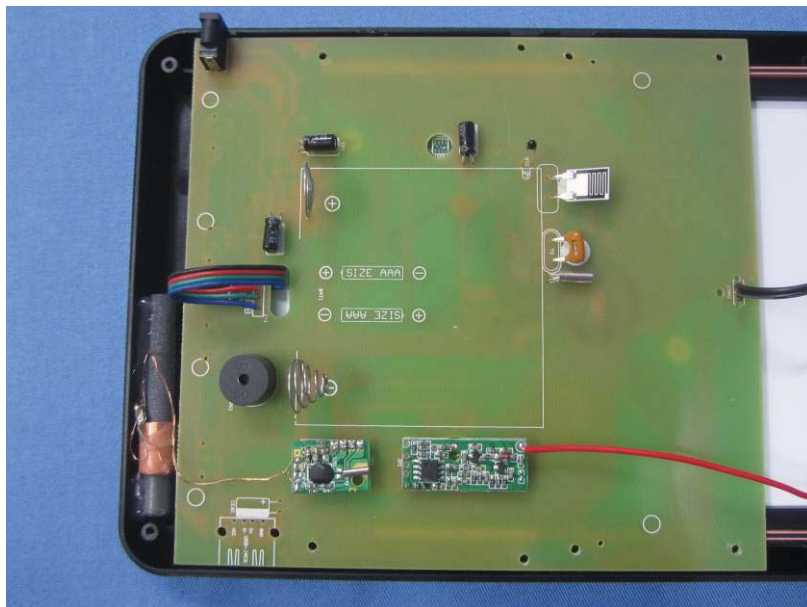
9 EUT Constructional Details

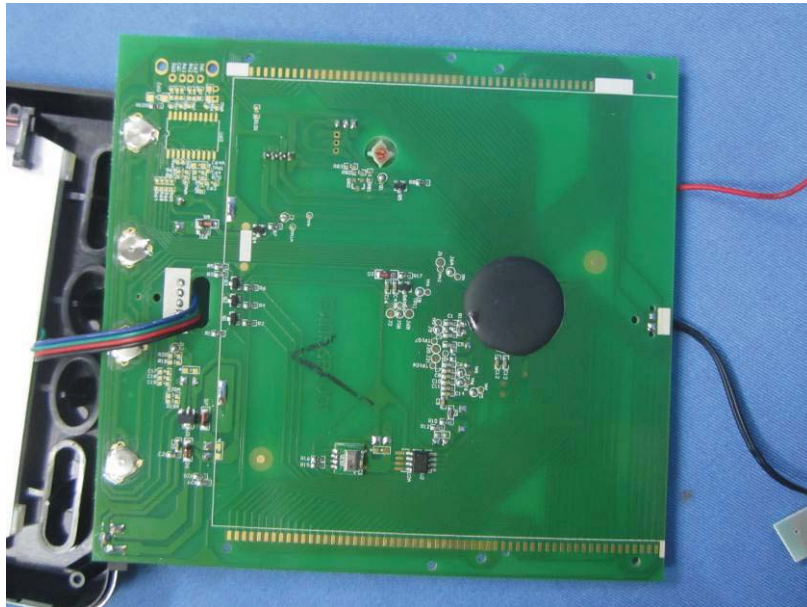
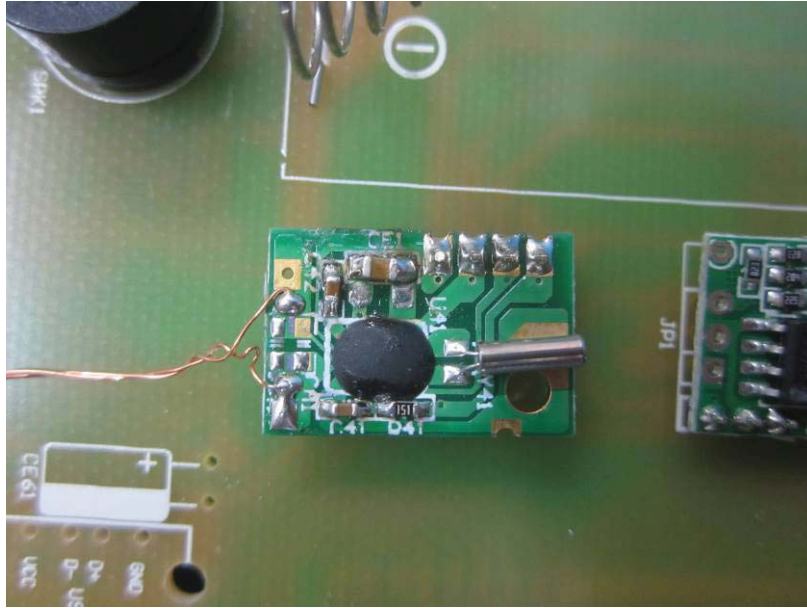














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