

# FCC REPORT

**Applicant:** Yong Lin Technology Co. Ltd.

**Address of Applicant:** 2F, Building 146-147, 42 District, Xin'an Street, Baoan, Shenzhen, China

**Manufacturer:** Yong Lin Technology Co. Ltd.

**Address of Manufacturer:** 2F, Building 146-147, 42 District, Xin'an Street, Baoan, Shenzhen, China

## Equipment Under Test (EUT)

**Product Name:** Anti-lost

**Model No.:** YL-FD01

**FCC ID:** 2AL93-YLFD01

**Applicable standards:** FCC CFR Title 47 Part 15 Subpart C Section 15.231:2016

**Date of sample receipt:** May 18, 2017

**Date of Test:** May 19-24, 2017

**Date of report issued:** May 25, 2017

**Test Result :** PASS \*

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

Authorized Signature:



Robinson Lo  
Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

## 2 Version

Version No.	Date	Description
00	May 25, 2017	Original

Prepared By:

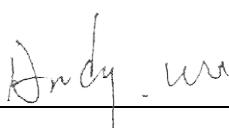


Date:

May 25, 2017

Project Engineer

Check By:



Date:

May 25, 2017

Reviewer

### 3 Contents

	Page
1 COVER PAGE .....	1
2 VERSION .....	2
3 CONTENTS .....	3
4 TEST SUMMARY .....	4
4.1 MEASUREMENT UNCERTAINTY .....	4
5 GENERAL INFORMATION .....	5
5.1 GENERAL DESCRIPTION OF EUT .....	5
5.2 TEST MODE .....	6
5.3 DESCRIPTION OF SUPPORT UNITS .....	6
5.4 TEST FACILITY .....	6
5.5 TEST LOCATION .....	6
5.6 OTHER INFORMATION REQUESTED BY THE CUSTOMER .....	6
6 TEST INSTRUMENTS LIST .....	7
7 TEST RESULTS AND MEASUREMENT DATA .....	8
7.1 ANTENNA REQUIREMENT .....	8
7.2 CONDUCTED EMISSIONS .....	9
7.3 RADIATED EMISSION METHOD .....	12
7.3.1 Field Strength of The Fundamental Signal .....	14
7.3.2 Spurious emissions .....	16
7.4 20DB OCCUPY BANDWIDTH .....	17
7.5 DWELL TIME .....	18
7.6 SILENT PERIOD .....	19
8 TEST SETUP PHOTO .....	20
9 EUT CONSTRUCTIONAL DETAILS .....	22

## 4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
Conduction Emission	15.207	Pass
Field strength of the fundamental signal	15.231(e)	Pass
Spurious emissions	15.231(e) &15.209	Pass
20dB Bandwidth	15.231(c)	Pass
Dwell time	15.231(e)	Pass

Pass: The EUT complies with the essential requirements in the standard.

### 4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 26.5GHz	± 4.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.45dB	(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 General Description of EUT

Product Name:	Anti-lost
Model No.:	YL-FD01
Operation Frequency:	433.93MHz
Modulation technology:	ASK
Antenna Type:	PCB Antenna
Antenna gain:	0dBi (declare by Manufacturer)
Power supply:	DC 3.7V 200mAh polymer Battery Battery charge by DC5V

## 5.2 Test mode

Transmitting mode	Keep the EUT in transmitting mode.
-------------------	------------------------------------

### Per-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

433.94MHz	Axis	X	Y	Z
	Field Strength(dBuV/m)	75.31	77.86	75.95

### Final Test Mode:

According to ANSI C63.10 standards, the test results are both the "worst case" and "worst setup":  
Y axis (see the test setup photo)

## 5.3 Description of Support Units

Manufacturer	Description	Model	Serial Number
Emerson Network Power	USB Charger	A1299	N/A

## 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 22, 2016.

• **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, August 15, 2016.

## 5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.  
No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone,  
Xixiang Road, Baoan District, Shenzhen, Guangdong, China  
Tel: 0755-27798480  
Fax: 0755-27798960

## 5.6 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	9.2(L)*6.2(W)* 6.4(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	Spectrum Analyzer	Agilent	E4440A	GTS533	June 29 2016	June 28 2017
4	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June 29 2016	June 28 2017
5	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June 29 2016	June 28 2017
6	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 29 2016	June 28 2017
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	June 29 2016	June 28 2017
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial Cable	GTS	N/A	GTS213	June 29 2016	June 28 2017
10	Coaxial Cable	GTS	N/A	GTS211	June 29 2016	June 28 2017
11	Coaxial cable	GTS	N/A	GTS210	June 29 2016	June 28 2017
12	Coaxial Cable	GTS	N/A	GTS212	June 29 2016	June 28 2017
13	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June 29 2016	June 28 2017
14	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	June 29 2016	June 28 2017
15	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 29 2016	June 28 2017
16	Band filter	Aminideon	82346	GTS219	June 29 2016	June 28 2017
17	Power Meter	Anritsu	ML2495A	GTS540	June 29 2016	June 28 2017
18	Power Sensor	Anritsu	MA2411B	GTS541	June 29 2016	June 28 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	7.3(L)x3.1(W)x2.9(H)	GTS252	May.16 2014	May.15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 29 2016	June. 28 2017
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 29 2016	June. 28 2017
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 29 2016	June. 28 2017
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 29 2016	June. 28 2017

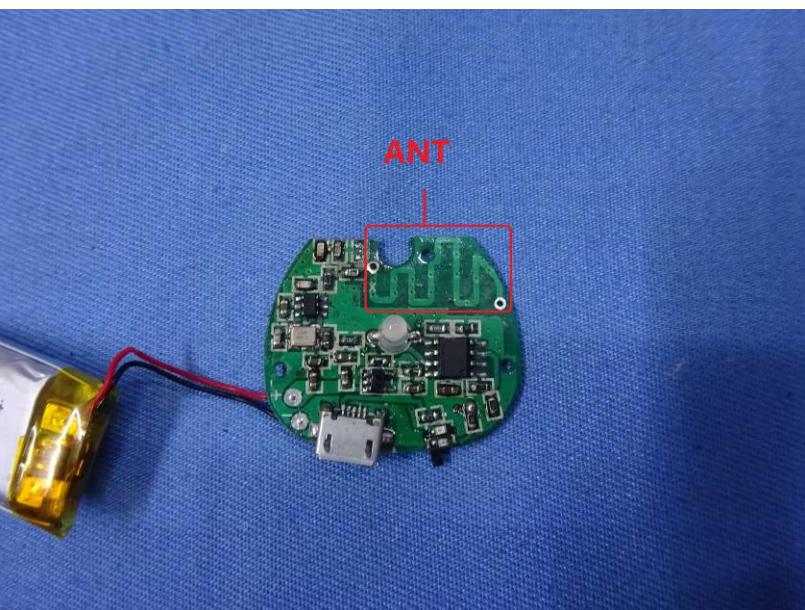
General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Barometer	ChangChun	DYM3	GTS257	June 29 2016	June 28 2017

## 7 Test results and Measurement Data

### 7.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203
<b>15.203 requirement:</b>	
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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
<b>EUT Antenna:</b>	

The antenna is PCB antenna, the best case gain of the antenna is 0dBi



## 7.2 Conducted Emissions

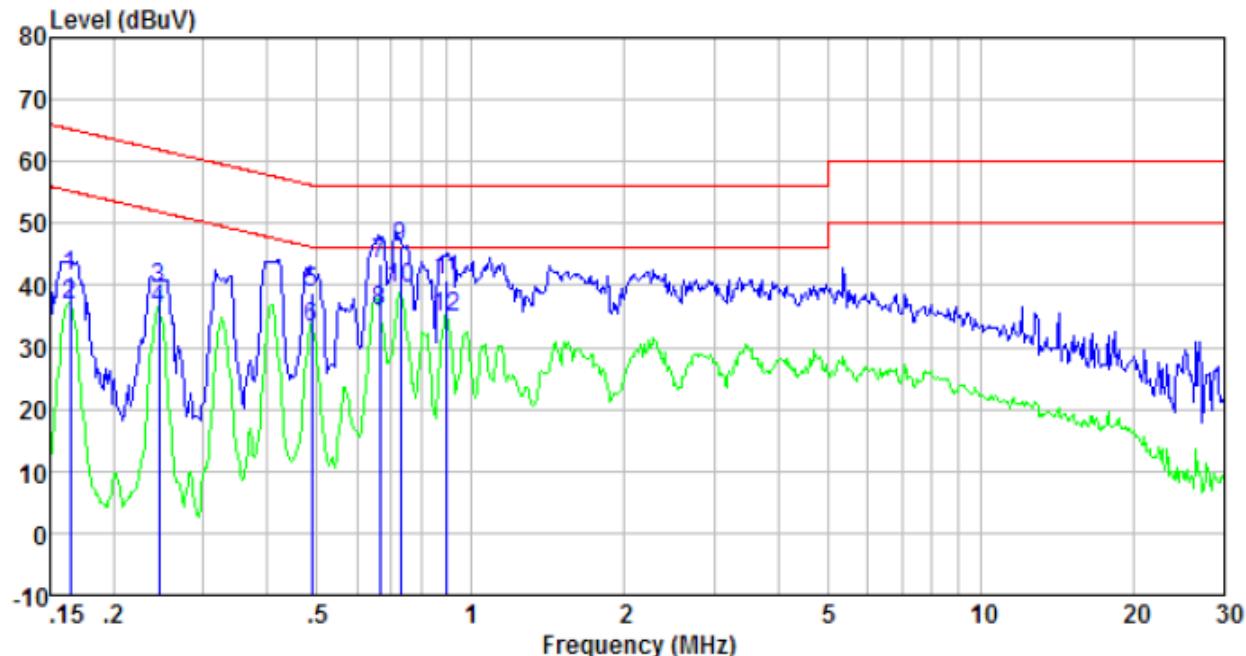
Test Requirement:	FCC Part15 C Section 15.207		
Test Method:	ANSI C63.10:2013		
Test Frequency Range:	150KHz to 30MHz		
Class / Severity:	Class B		
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50

\* Decreases with the logarithm of the frequency.

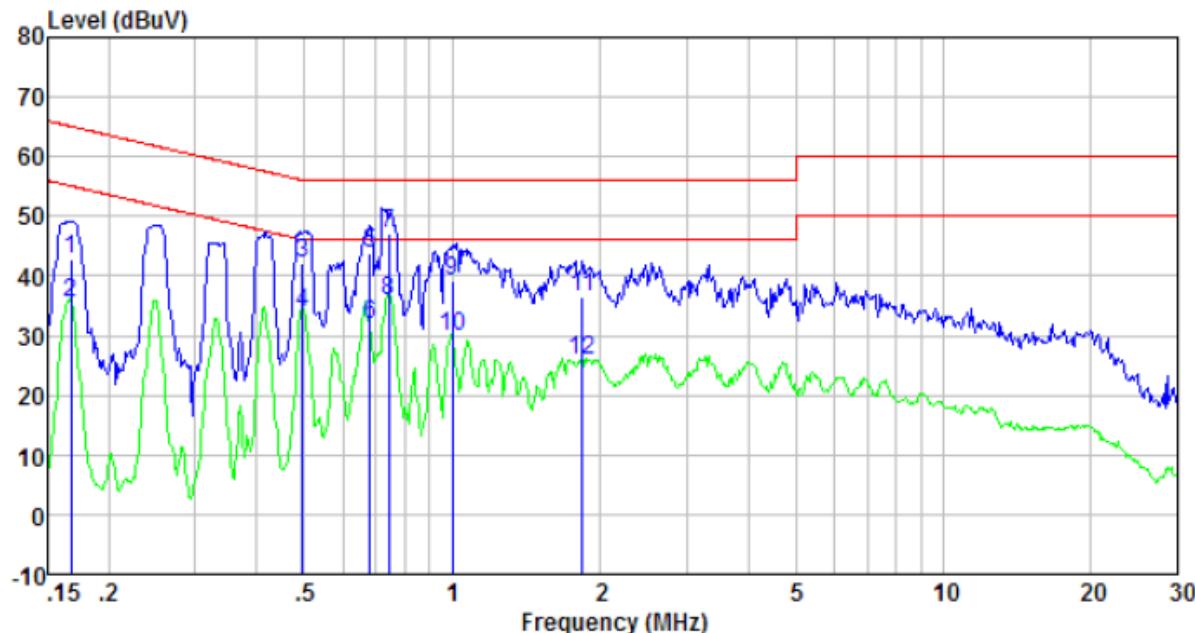
Test setup:	<p>Reference Plane</p> <p>LISN</p> <p>40cm</p> <p>80cm</p> <p>AUX Equipment</p> <p>E.U.T</p> <p>Test table/Insulation plane</p> <p>LISN</p> <p>Filter</p> <p>AC power</p> <p>EMI Receiver</p> <p>Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>
Test procedure:	<ol style="list-style-type: none"> <li>The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</li> <li>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 C63.10:2013 on conducted measurement.</li> </ol>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

### Measurement data:

Line:



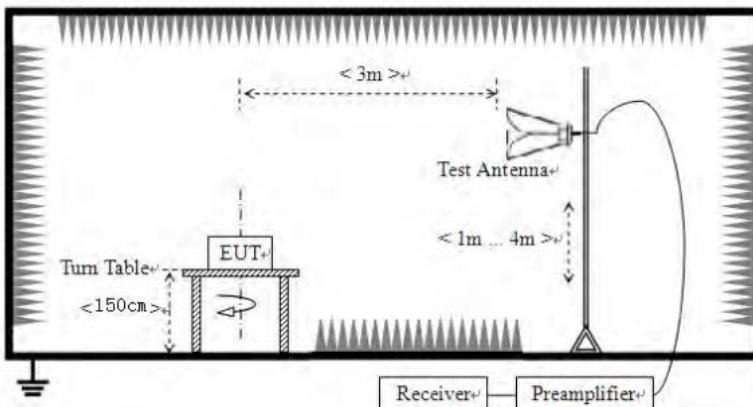
Freq MHz	Reading level dBuV	11SN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.164	40.90	0.42	0.12	41.44	65.25	-23.81	QP
0.164	36.41	0.42	0.12	36.95	55.25	-18.30	Average
0.246	39.08	0.44	0.11	39.63	61.91	-22.28	QP
0.246	35.61	0.44	0.11	36.16	51.91	-15.75	Average
0.489	38.18	0.38	0.11	38.67	56.19	-17.52	QP
0.489	32.65	0.38	0.11	33.14	46.19	-13.05	Average
0.665	43.21	0.29	0.13	43.63	56.00	-12.37	QP
0.665	35.28	0.29	0.13	35.70	46.00	-10.30	Average
0.727	45.76	0.28	0.13	46.17	56.00	-9.83	QP
0.727	38.92	0.28	0.13	39.33	46.00	-6.67	Average
0.899	40.54	0.26	0.13	40.93	56.00	-15.07	QP
0.899	34.47	0.26	0.13	34.86	46.00	-11.14	Average

**Neutral:**


Freq MHz	Reading level dBuV	1IISN/ISM factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.168	42.43	0.41	0.12	42.96	65.08	-22.12	QP
0.168	34.87	0.41	0.12	35.40	55.08	-19.68	Average
0.494	41.71	0.35	0.11	42.17	56.10	-13.93	QP
0.494	33.39	0.35	0.11	33.85	46.10	-12.25	Average
0.679	43.55	0.25	0.13	43.93	56.00	-12.07	QP
0.679	31.45	0.25	0.13	31.83	46.00	-14.17	Average
0.743	46.71	0.24	0.13	47.08	56.00	-8.92	QP
0.743	35.47	0.24	0.13	35.84	46.00	-10.16	Average
1.000	38.71	0.21	0.13	39.05	56.00	-16.95	QP
1.000	29.44	0.21	0.13	29.78	46.00	-16.22	Average
1.839	36.11	0.20	0.14	36.45	56.00	-19.55	QP
1.839	25.53	0.20	0.14	25.87	46.00	-20.13	Average

### 7.3 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209													
Test Method:	ANSI C63.10:2013													
Test Frequency Range:	30MHz to 5000MHz													
Test site:	Measurement Distance: 3m													
Receiver setup:	Frequency	Detector	RBW	VBW	Remark									
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value									
	Above 1GHz	Peak	1MHz	3MHz	Peak Value									
Limit: (Field strength of the fundamental signal)	<table border="1"> <thead> <tr> <th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr> </thead> <tbody> <tr> <td>433.93MHz</td><td>72.87</td><td>Average Value</td></tr> <tr> <td></td><td>92.87</td><td>Peak Value</td></tr> </tbody> </table>					Frequency	Limit (dBuV/m @3m)	Remark	433.93MHz	72.87	Average Value		92.87	Peak Value
Frequency	Limit (dBuV/m @3m)	Remark												
433.93MHz	72.87	Average Value												
	92.87	Peak Value												
Limit: (Spurious Emissions)	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											
	Or The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level whichever limit permits a higher field strength.													
Test setup:	Below 1GHz													
	Above 1GHz													



Test Procedure:	<ol style="list-style-type: none"> <li>During the test, the New Battery was used.</li> <li>The EUT was placed on the top of a rotating table (0.8 meters for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>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.</li> <li>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.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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.</li> </ol>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement data:

### 7.3.1 Field Strength of The Fundamental Signal

#### Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
433.93	88.1	16.17	3.02	29.43	77.86	92.87	-15.01	Horizontal
433.93	75.07	16.17	3.02	29.43	64.83	92.87	-28.04	Vertical

#### Average value:

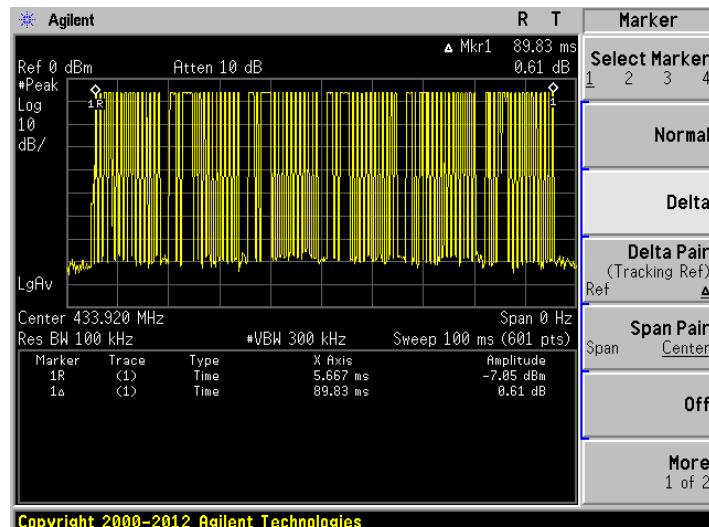
Frequency (MHz)	Peak Value (dBuV/m)	Duty cycle factor	Average value (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
433.93	77.86	-9.32	68.54	72.87	-4.33	Horizontal
433.93	64.83	-9.32	55.51	72.87	-17.36	Vertical

#### 433.93MHz:

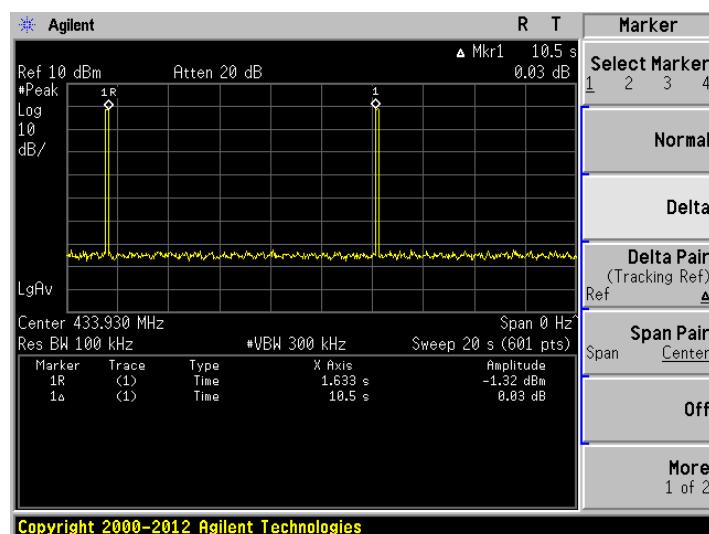
Average value:	
Calculate Formula:	Average value=Peak value + Duty Cycle Factor
	Duty cycle factor=20 log(Duty cycle)
	Duty cycle=on time/100 milliseconds or period, whichever is less
Test data:	T on time =89.83(ms) T period=100 (ms) Duty cycle=0.8983 duty cycle factor=-9.32

Test plot as follows:

Ton time:



T period:



### 7.3.2 Spurious emissions

**Below 1GHz:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
39.58	31.08	12.30	0.66	30.05	13.99	40.00	-26.01	Vertical
99.88	30.32	12.10	1.19	29.70	13.91	43.50	-29.59	Vertical
167.82	36.39	8.33	1.67	29.33	17.06	43.50	-26.44	Vertical
216.78	32.80	10.78	1.94	29.36	16.16	46.00	-29.84	Vertical
379.91	36.31	15.09	2.76	29.59	24.57	46.00	-21.43	Vertical
543.27	30.12	18.29	3.50	29.30	22.61	46.00	-23.39	Vertical
108.27	31.89	11.50	1.26	29.64	15.01	43.50	-28.49	Horizontal
155.91	35.73	7.85	1.60	29.38	15.80	43.50	-27.70	Horizontal
216.78	36.74	10.78	1.94	29.36	20.10	46.00	-25.90	Horizontal
379.91	35.85	15.09	2.76	29.59	24.11	46.00	-21.89	Horizontal
543.27	29.45	18.29	3.50	29.30	21.94	46.00	-24.06	Horizontal
833.32	44.55	21.59	4.58	29.17	41.55	46.00	-4.45	Horizontal

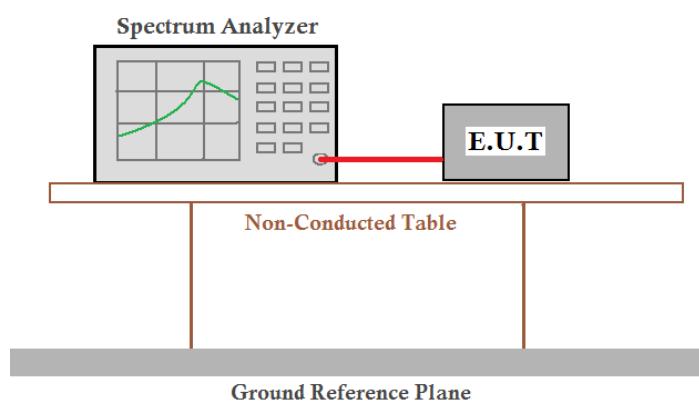
**Above 1GHz:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1365.00	42.92	25.67	4.59	33.36	39.82	74.00	-34.18	Vertical
2000.00	41.92	26.13	4.96	34.46	38.55	74.00	-35.45	Vertical
2690.00	36.74	28.12	5.66	33.68	36.84	74.00	-37.16	Vertical
3575.00	34.43	29.11	7.11	32.67	37.98	74.00	-36.02	Vertical
4120.00	34.82	29.95	7.99	32.03	40.73	74.00	-33.27	Vertical
4855.00	30.62	31.83	8.64	32.11	38.98	74.00	-35.02	Vertical
1245.00	41.02	25.51	4.50	33.16	37.87	74.00	-36.13	Horizontal
1635.00	41.05	24.90	4.76	33.82	36.89	74.00	-37.11	Horizontal
2420.00	38.85	27.54	5.41	33.97	37.83	74.00	-36.17	Horizontal
2920.00	37.29	28.44	5.86	33.41	38.18	74.00	-35.82	Horizontal
3320.00	36.74	28.39	6.60	32.97	38.76	74.00	-35.24	Horizontal
4470.00	30.72	31.26	8.31	31.92	38.37	74.00	-35.63	Horizontal

**Remark:**

1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. Average value=Peak value + Duty cycle factor

## 7.4 20dB Occupy Bandwidth

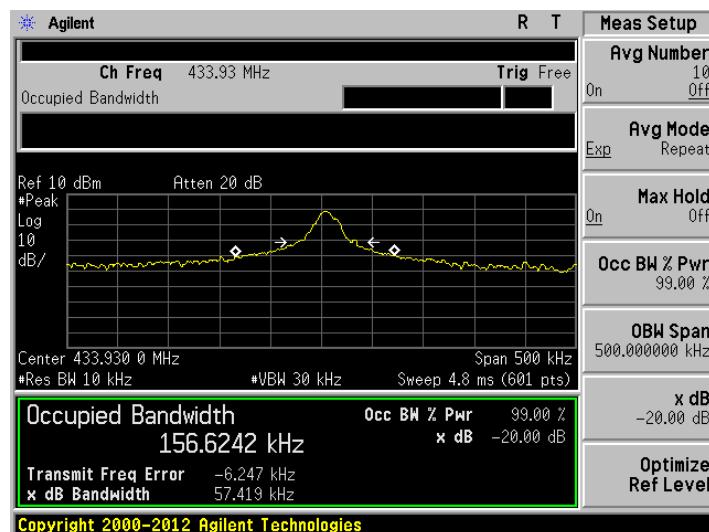
Test Requirement:	FCC Part15 C Section 15.231 (c)
Test Method:	ANSI C63.10:2013
Limit:	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.
Test setup:	 <p>Spectrum Analyzer</p> <p>E.U.T</p> <p>Non-Conducted Table</p> <p>Ground Reference Plane</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

### Measurement Data

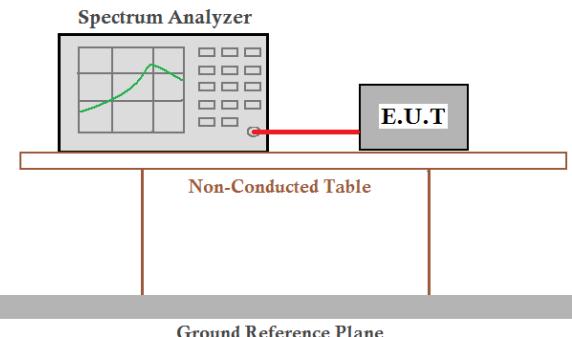
Test Frequency (MHz)	20dB bandwidth (MHz)	Limit (MHz)	Result
433.93	0.057419	1.0848	Pass

Limit: Fundamental frequency $\times$ 0.25% = 433.93 $\times$ 0.25% = 1.0849MHz

Test plot as follows:



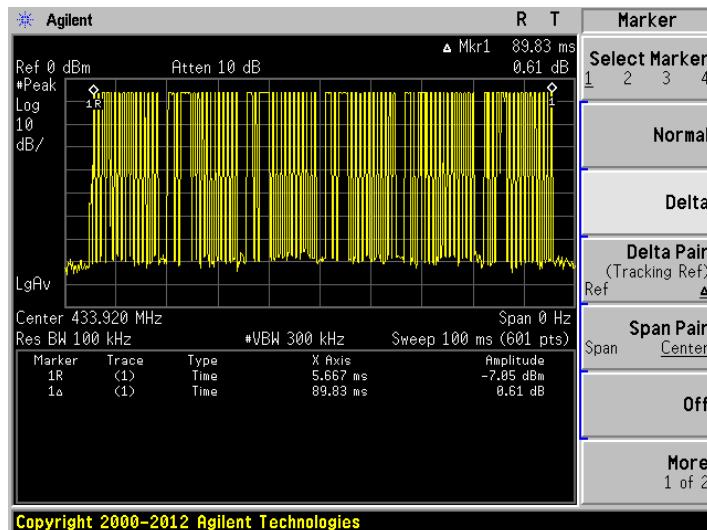
## 7.5 Dwell time

Test Requirement:	FCC Part15 C Section 15.231 (e)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100KHz, VBW=300KHz, span=0Hz, detector: Peak
Limit:	Not more than 1 seconds
Test setup:	<p style="text-align: center;"><b>Spectrum Analyzer</b></p>  <p style="text-align: center;">Non-Conducted Table</p> <p style="text-align: center;">Ground Reference Plane</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

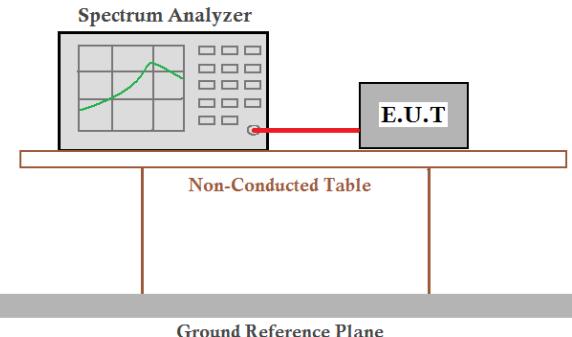
### Measurement data:

Test Frequency (MHz)	Duration of each TX (second)	Limit (second)	Result
433.93	0.0898	<1.0	Pass

Test plot as follows:



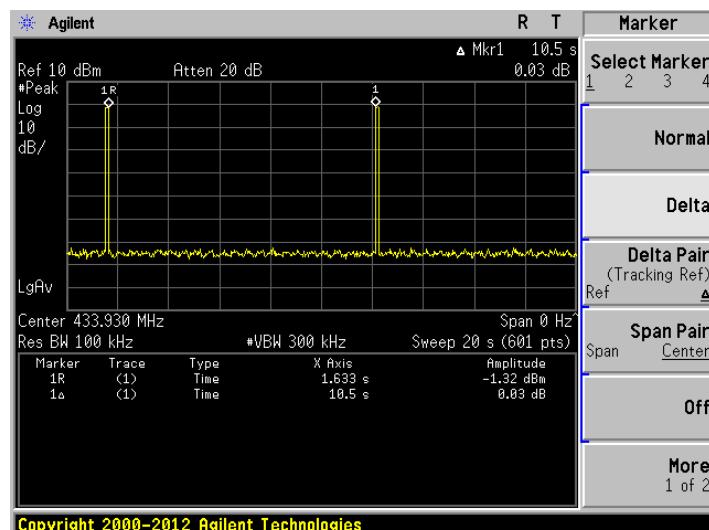
## 7.6 Silent period

Test Requirement:	FCC Part15 C Section 15.231 (e)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100KHz, VBW=300KHz, span=0Hz, detector: Peak
Limit:	at least 30 times the duration of the transmission or more than 10 seconds
Test Procedure:	<ol style="list-style-type: none"> <li>According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.</li> <li>Set the EUT to proper test channel.</li> <li>Single scan the transmit, and read the transmission time.</li> </ol>
Test setup:	 <p>The diagram shows a spectrum analyzer with its screen displaying a signal. A red line connects the output of the spectrum analyzer to a rectangular box labeled 'E.U.T'. This assembly is positioned on a horizontal surface labeled 'Non-Conducted Table'. Below the table is a thick grey bar representing the 'Ground Reference Plane'.</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

### Measurement data:

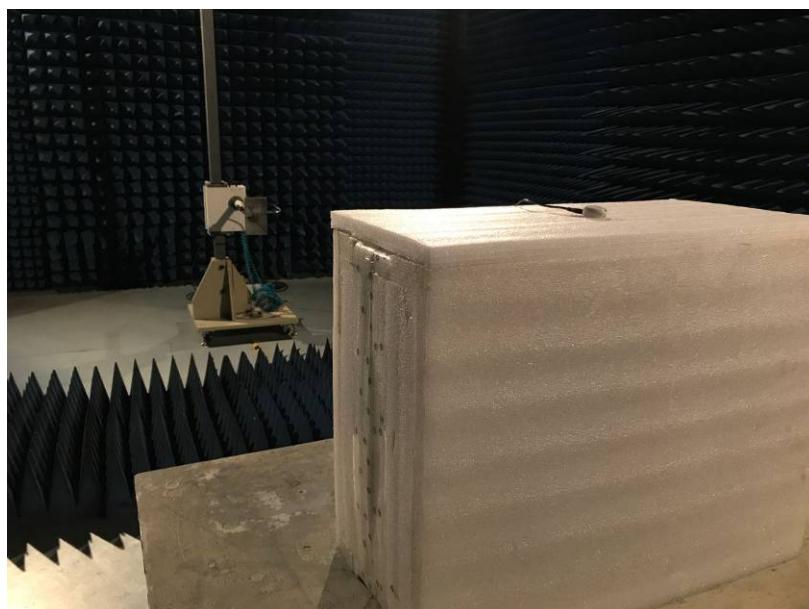
Test Frequency (MHz)	Silent period (second)	Limit (second)	Result
433.93	10.5	>10	Pass

Test plot as follows:



## 8 Test Setup Photo

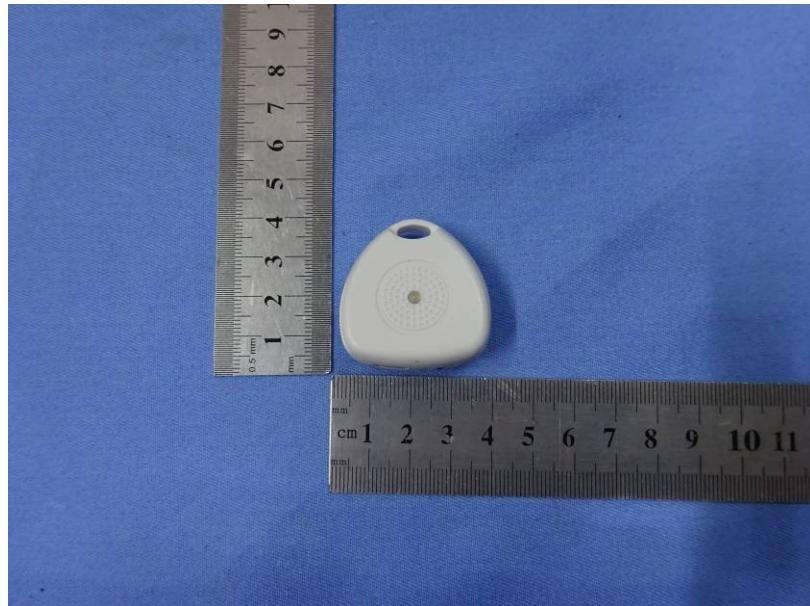
Radiated Emission

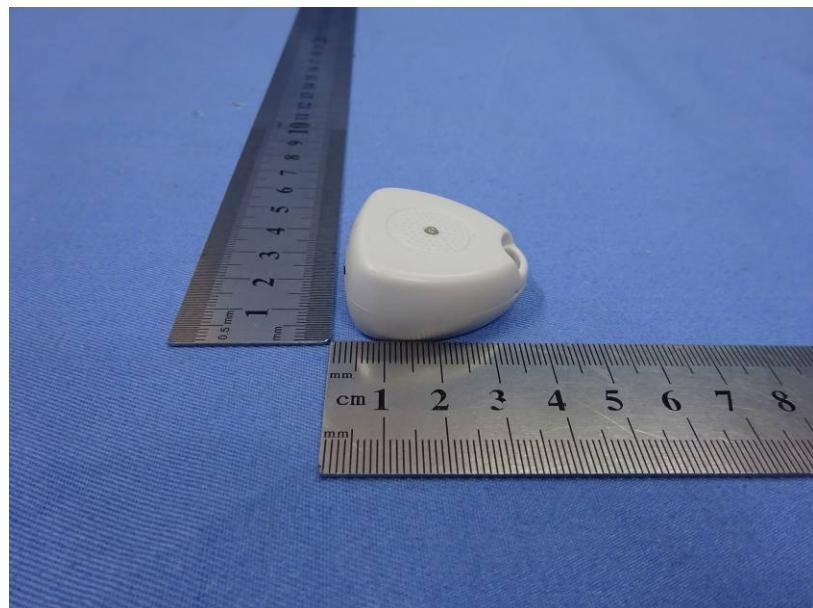
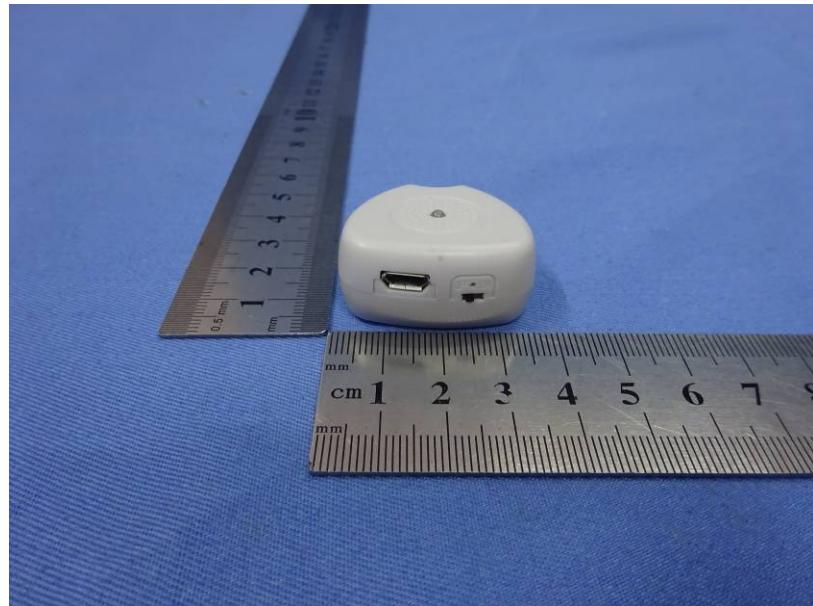


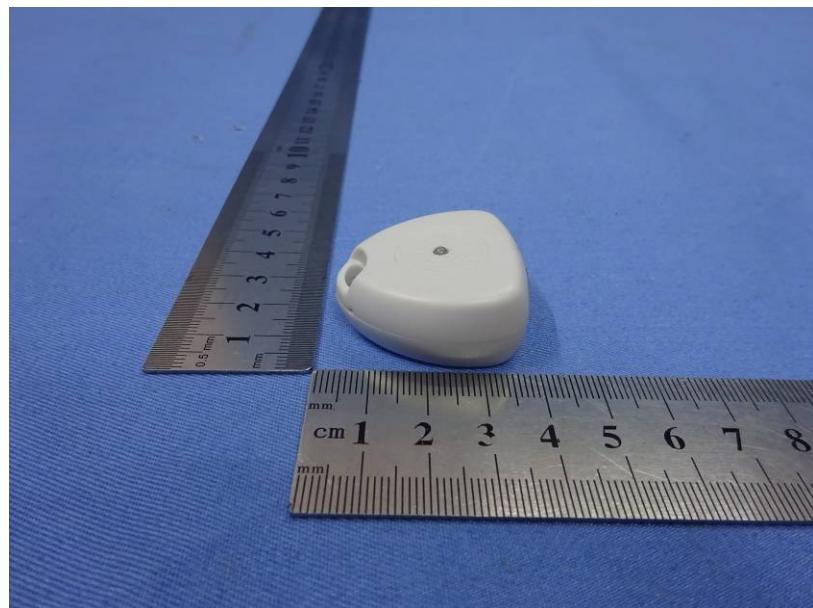
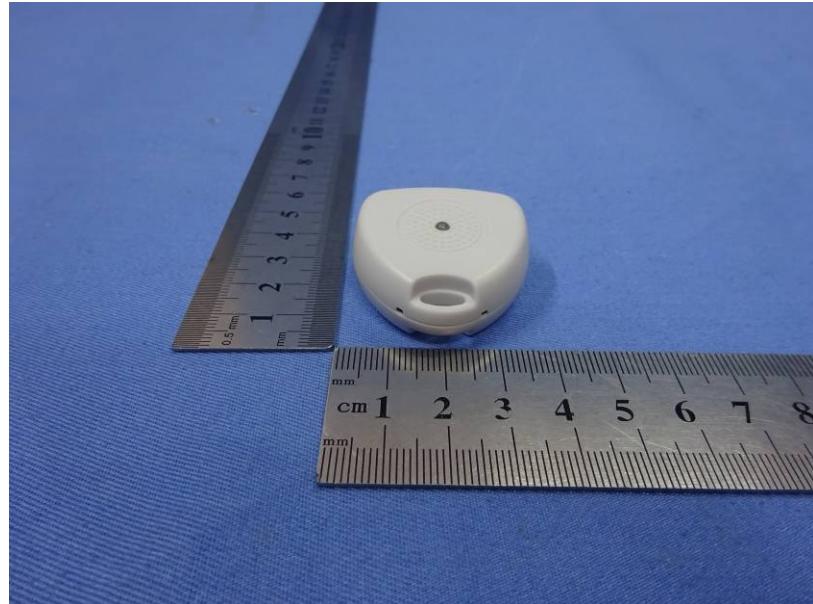
Conduction Emission

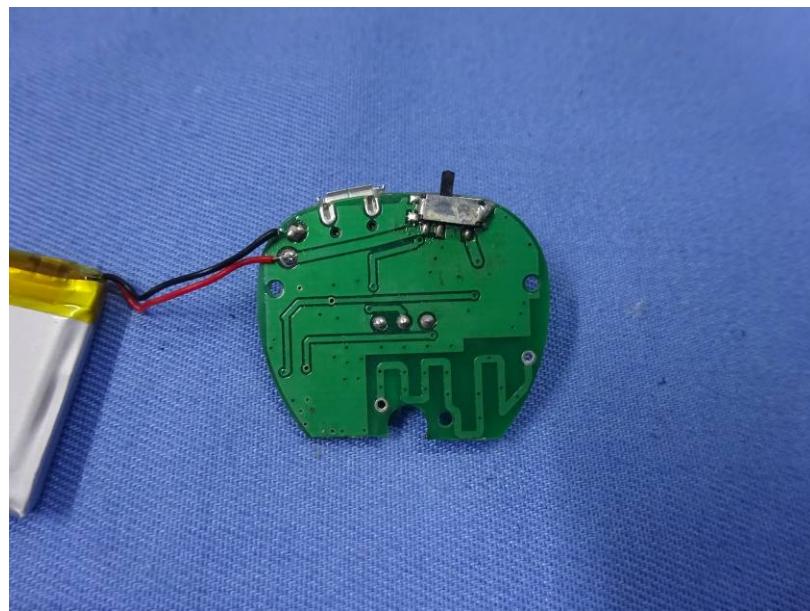
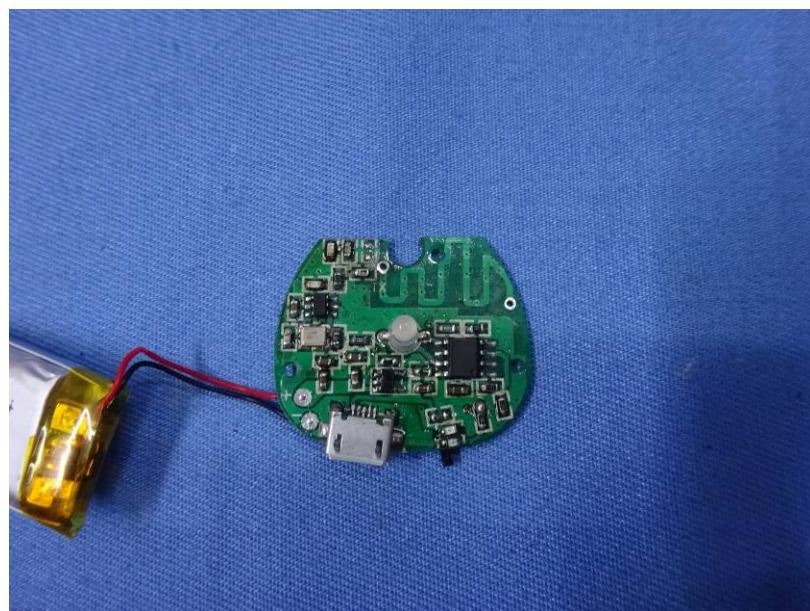


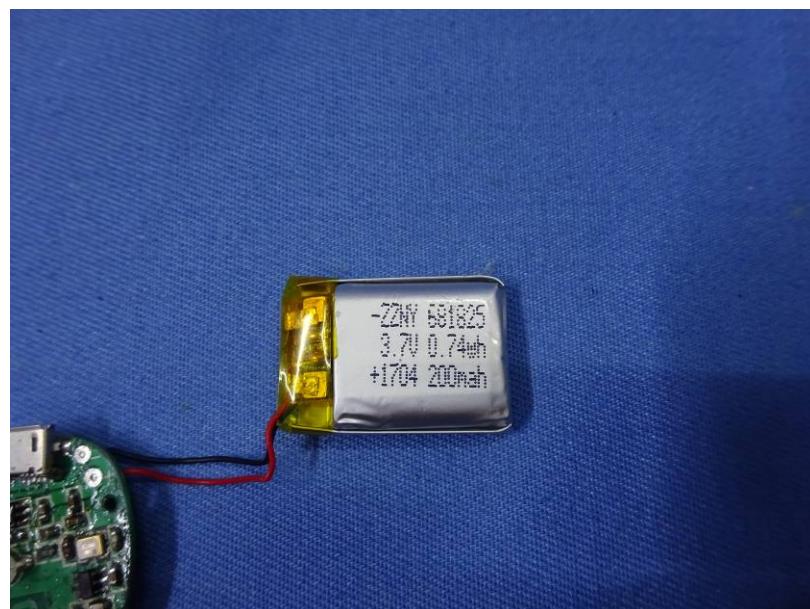
## 9 EUT Constructional Details











----- End -----