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Report Template Version: V03 Report Template Revision Date: Mar.1st, 2017

FCC Test Report

Report No. : CQASZ20180400049E-01

Applicant: Curtis International Ltd.

Address of Applicant:	315 Attwell Drive Toronto, ON, M9W 5C1, Canada
Manufacturer:	Maxtop Digital Technology Co., Ltd
Address of Manufacturer:	B418, Minyou Technology Park, Baoyuan Rd., Xixiang, Bao'an District, Shenzhen, China
Equipment Under Test (E	UT):
Product:	Bluetooth Bracelet
Model No.:	PBTW255-PDQ, PBTW255-BLACK
Brand Name:	N/A
FCC ID:	2APOJPBTW255
Standards:	47 CFR Part 15, Subpart C
Date of Test:	2018-04-25 to 2018-05-22
Date of Issue:	2018-05-22
Test Result :	PASS*

Tested By:

ງດາວກ (Aaron Ma)

Reviewed By:

ten Zhou

Owen Zhou)

Approved By:

Jack Ai



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

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.



2 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20180400049E-01	Rev.01	Initial report	2018-05-22



3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10 2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 2013	N/A
Conducted Peak Output Power	47 CFR Part 15, Subpart C Section 15.247 (b)(3)	ANSI C63.10 2013	PASS
6dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.247 (a)(2)	ANSI C63.10 2013	PASS
Power Spectral Density	47 CFR Part 15, Subpart C Section 15.247 (e)	ANSI C63.10 2013	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
RF Conducted Spurious Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
Radiated Spurious Emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS

N/A: Not Applicable, Bluetooth doesn't work when the product is charging.



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5 General Information

5.1 Client Information

Applicant:	Curtis International Ltd.
Address of Applicant:	315 Attwell Drive Toronto, ON, M9W 5C1, Canada
Manufacturer:	Maxtop Digital Technology Co., Ltd
Address of Manufacturer:	B418, Minyou Technology Park, Baoyuan Rd., Xixiang, Bao'an District, Shenzhen, China

5.2 General Description of EUT

Product Name:	Bluetooth Bracelet
Model No.:	PBTW255-PDQ , PBTW255-BLACK
Trade Mark:	N/A
Hardware Version:	V1.1
Software Version:	V1.1
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	4.0 BLE
Modulation Type:	GFSK
Number of Channel:	40
Sample Type:	Portable production
Test Software of EUT:	Mediatek BT Tool (manufacturer declare)
Antenna Type:	Integral antenna
Antenna Gain:	0.6dBi
EUT Power Supply:	lithium battery:DC3.7V, Charge by USB



Operation F	Operation Frequency each of channel						
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
2	2406MHz	12	2426MHz	22	2446MHz	32	2466MHz
3	2408MHz	13	2428MHz	23	2448MHz	33	2468MHz
4	2410MHz	14	2430MHz	24	2450MHz	34	2470MHz
5	2412MHz	15	2432MHz	25	2452MHz	35	2472MHz
6	2414MHz	16	2434MHz	26	2454MHz	36	2474MHz
7	2416MHz	17	2436MHz	27	2456MHz	37	2476MHz
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel (CH0)	2402MHz
The middle channel (CH19)	2440MHz
The highest channel (CH39)	2480MHz



5.3 Test Environment

Operating Environment	Operating Environment:			
Temperature:	25.0 °C			
Humidity:	53 % RH			
Atmospheric Pressure:	1010mbar			
Test Mode:	Use test software (Mediatek BT Tool) to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT. Note: In the process of transmitting of EUT, the duty cycle >98%.			

5.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Remark	FCC certification
PC	Lenovo	ThinkPad E450c	Provide by lab	ID

5.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate.

The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the **Shenzhen Huaxia Testing Technology Co., Ltd.** quality system acc. to DIN EN ISO/IEC 17025.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Test	Range	Uncertainty	Notes
Radiated Emission	Below 1GHz	±5.12dB	(1)
Radiated Emission	Above 1GHz	±4.60dB	(1)
Conducted Disturbance	0.15~30MHz	±3.34dB	(1)

Hereafter the best measurement capability for CQA laboratory is reported:

(1)This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

5.6 Test Location

Shenzhen Huaxia Testing Technology Co., Ltd,

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

5.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations: **IC Registration No.: 22984-1**

The 3m Semi-anechoic chamber of Shenzhen Huaxia Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

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

CNAS (No. CNAS L5785)

CNAS has accredited Shenzhen Huaxia Testing Technology Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 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.

• A2LA (Certificate No. 4742.01)

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

• FCC Registration No.: 522263

Shenzhen Huaxia Testing Technology 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 our files. Registration No.:522263

5.8 Deviation from Standards

None.

5.9 Other Information Requested by the Customer

None.



5.10Equipment List

Item	Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Due Date
1	EMI Test Receiver	R&S	ESR7	CQA-005	2018/9/24
2	Spectrum analyzer	R&S	FSU26	CQA-038	2018/9/24
3	Preamplifier	MITEQ	AFS4- 00010300-18- 10P-4	CQA-035	2018/9/24
4	Preamplifier	MITEQ	AMF-6D- 02001800-29- 20P	CQA-036	2018/9/24
5	Loop antenna	Schwarzbeck	FMZB1516	CQA-087	2019/3/21
6	Bilog Antenna	R&S	HL562	CQA-011	2018/9/24
7	Horn Antenna	R&S	HF906	CQA-012	2018/9/24
8	Horn Antenna	R&S	BBHA 9170	CQA-088	2018/9/24
9	Coax cable (9KHz~40GHz)	CQA	RE-low-01	CQA-077	2018/9/24
10	Coax cable (9KHz~40GHz)	CQA	RE-high-02	CQA-078	2018/9/24
11	Antenna Connector	CQA	RFC-01	CQA-080	2018/9/24
12	Power divider	CQA	PWD-2533- 02-SMA-79	CQA-067	2018/9/29
13	RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2018/9/24

Note:

The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.



6 Test results and Measurement Data

6.1 Antenna Requirement

Standard requirement: 47 CFR Part 15C Section 15.203 /247(c)

15.203 requirement:

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.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:



The antenna is integral antenna. The best case gain of the antenna is 0.6dBi.



6.2 Conducted Peak Output Power

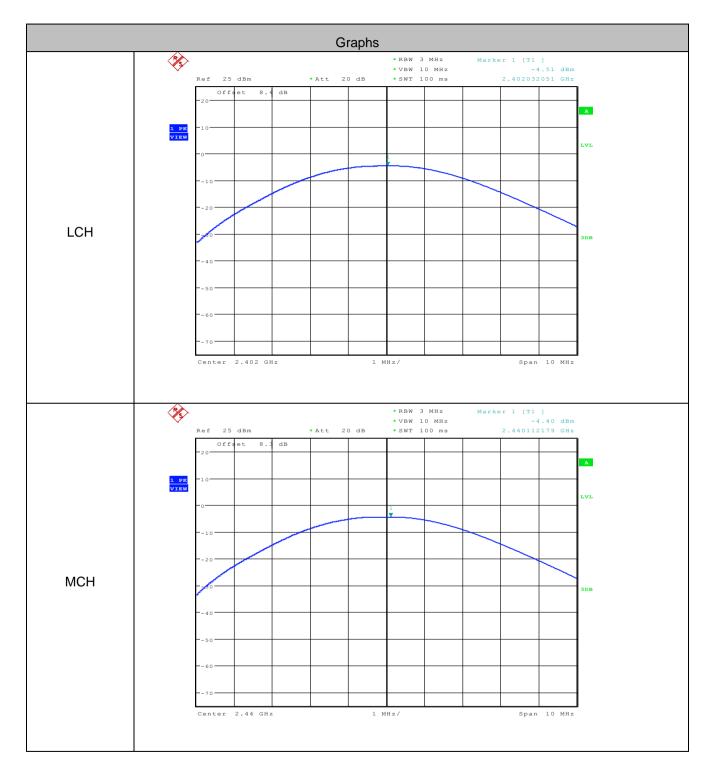
Test Requirement:	47 CFR Part 15C Section 15.247 (b)(1)		
Test Method:	ANSI C63.10 2013		
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane		
	Remark: Offset=Cable loss+ attenuation factor.		
Limit:	30dBm		
Test Mode:			
	Transmitting with GFSK modulation.		
Instruments Used:	Refer to section 5.10 for details.		
Test Results:	Pass		

Measurement Data

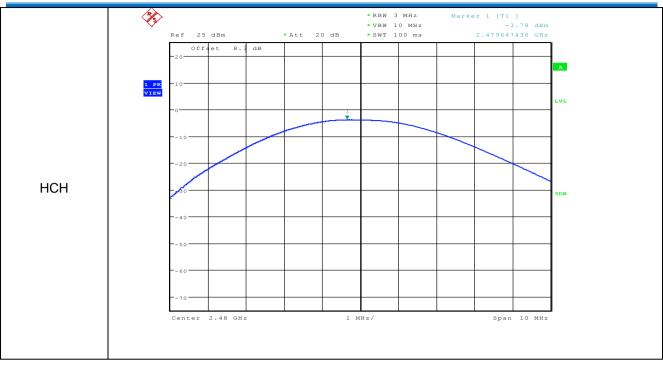
GFSK mode						
Test channel Peak Output Power (dBm) Limit (dBm) Result						
Lowest	-4.51	30.00	Pass			
Middle	-4.4	30.00	Pass			
Highest	-3.78	30.00	Pass			



Test plot as follows:









6.3 6dB Occupy Bandwidth

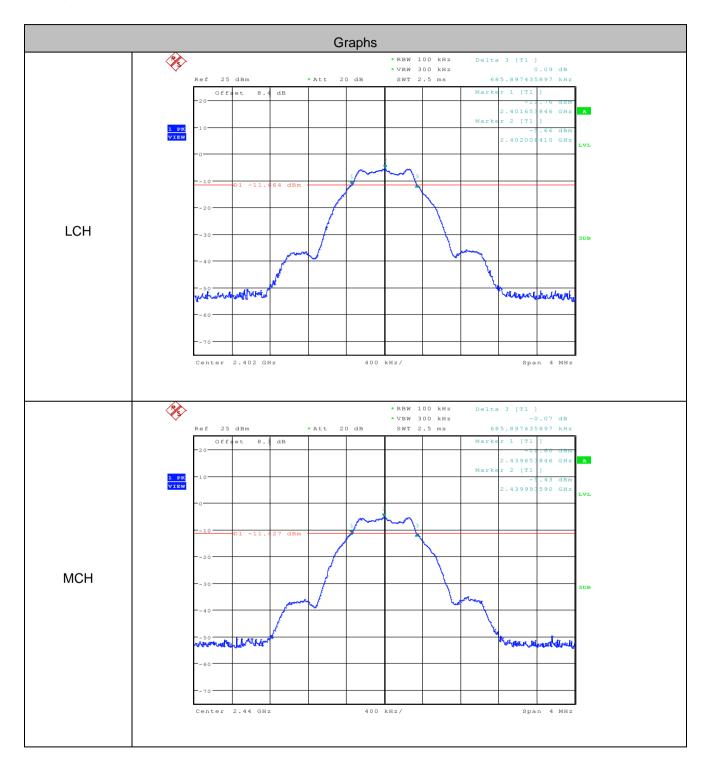
Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)		
Test Method:	ANSI C63.10 2013		
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane Remark: Offset=Cable loss+ attenuation factor.		
Limit:	≥ 500 kHz		
Test Mode:	Transmitting with GFSK modulation.		
Instruments Used:	Refer to section 5.10 for details.		
Test Results:	Pass		

Measurement Data

GFSK mode					
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result		
Lowest	0.686	≥500	Pass		
Middle	0.686	≥500	Pass		
Highest	0.692	≥500	Pass		

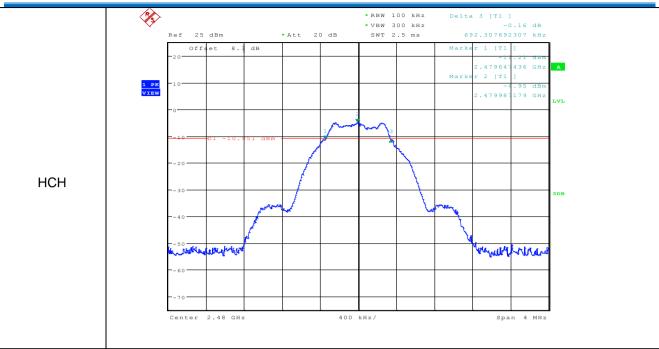


Test plot as follows:



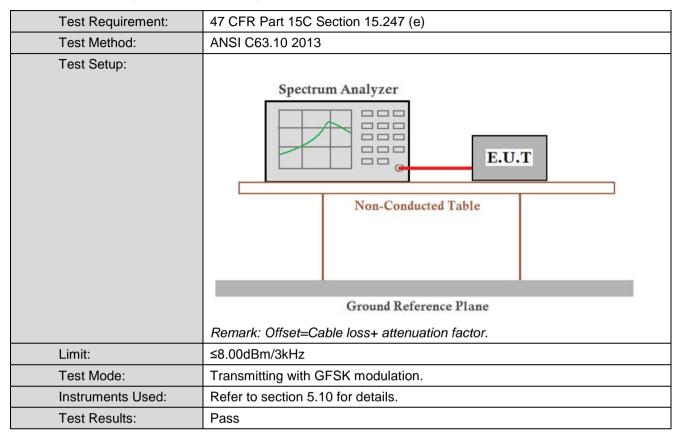








6.4 Power Spectral Density

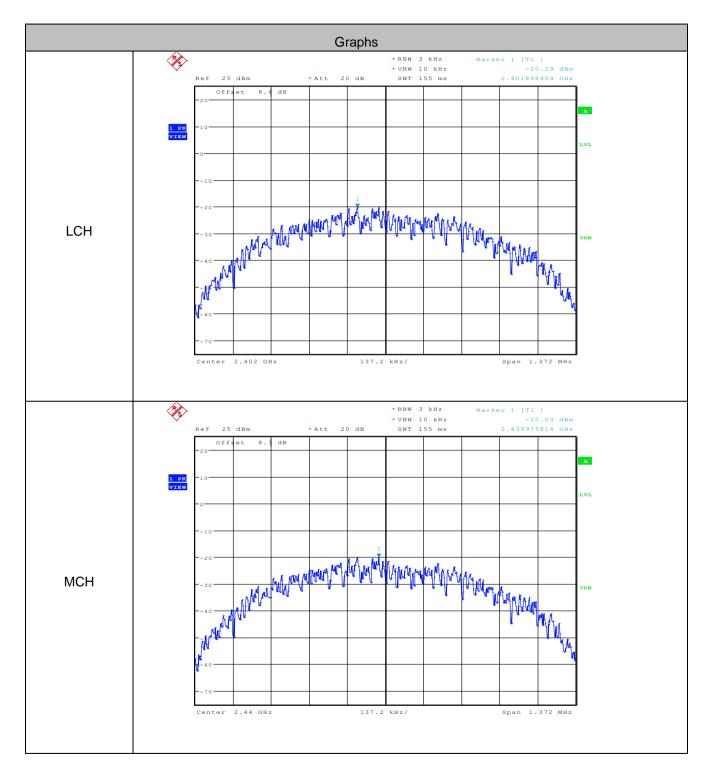


Measurement Data

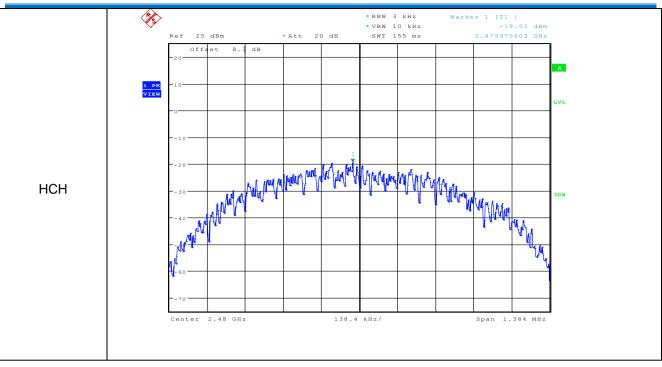
GFSK mode				
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result	
Lowest	-20.290	≤8.00	Pass	
Middle	-20.030	≤8.00	Pass	
Highest	-19.530	≤8.00	Pass	



Test plot as follows:









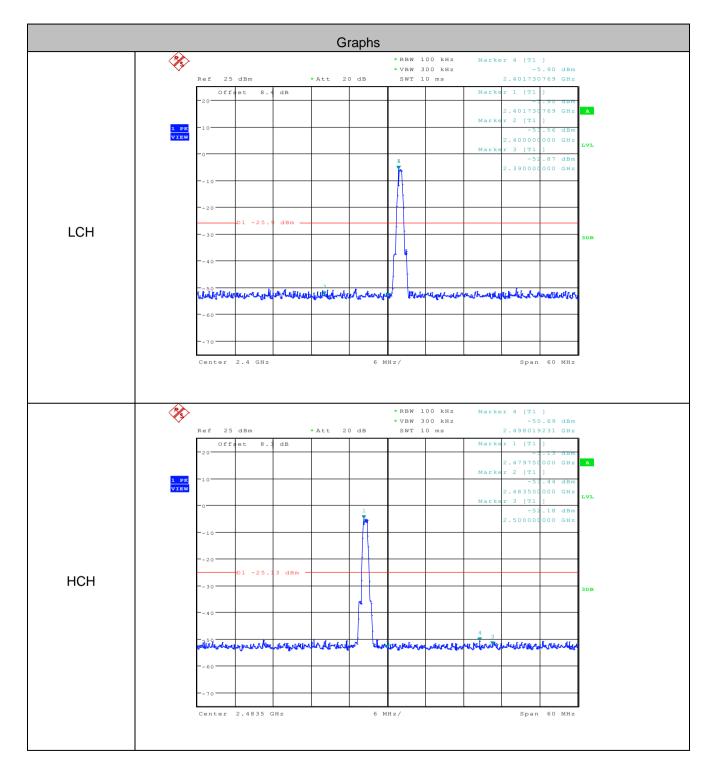
6.5 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10 2013
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane Remark: Offset=Cable loss+ attenuation factor.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test Mode:	Transmitting with GFSK modulation.
Instruments Used:	Refer to section 5.10 for details.
Test Results:	Pass

GFSK mode				
Test				
channel	Frequency(MHz)	Emission Level(dBm)	Limit(dBm)	Result
Lowest	2400	-53.560	-25.9	Pass
Highest	2483.5	-53.440	-25.13	Pass



Test plot as follows:



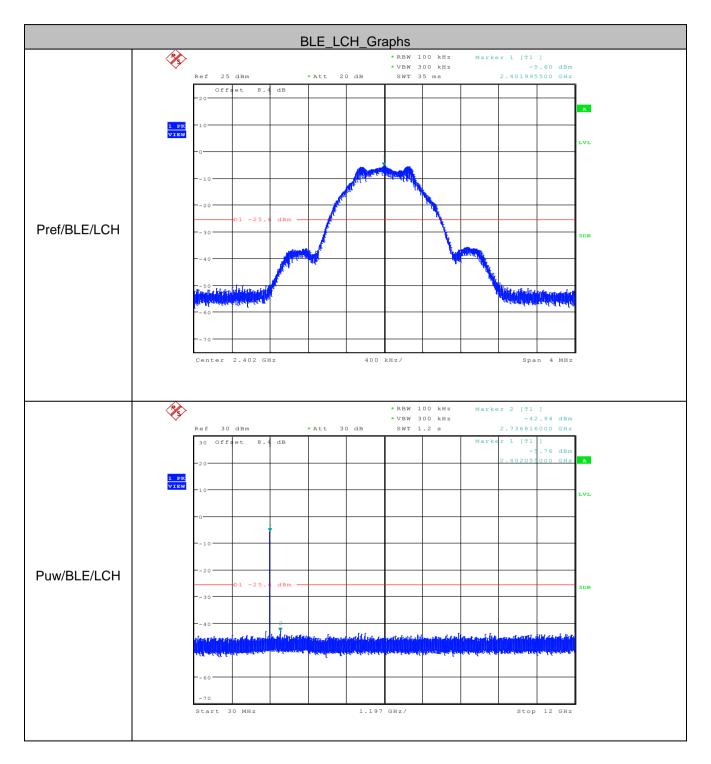


6.6 Spurious RF Conducted Emissions

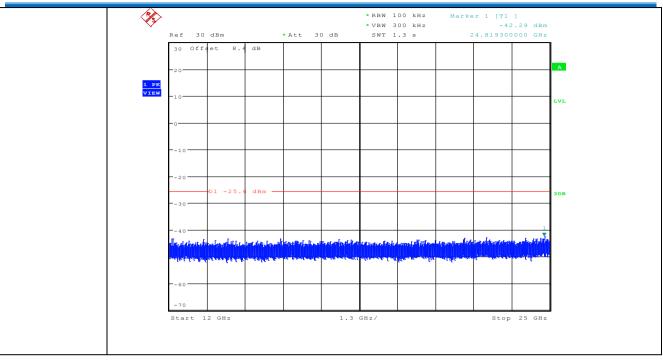
Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10 2013
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane Remark: Offset=Cable loss+ attenuation factor.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test Mode:	Transmitting with GFSK modulation.
Instruments Used:	Refer to section 5.10 for details.
Test Results:	Pass

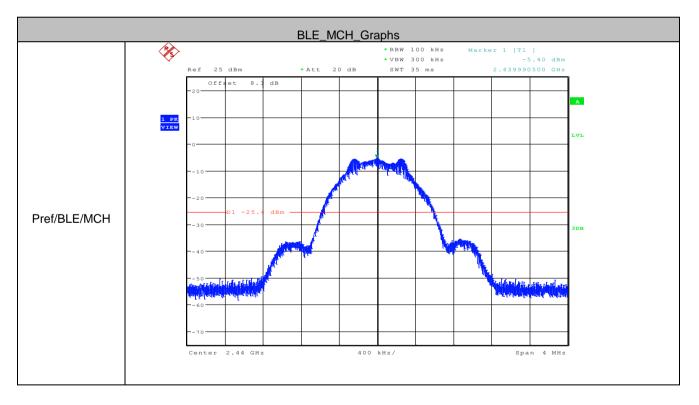


Test plot as follows:

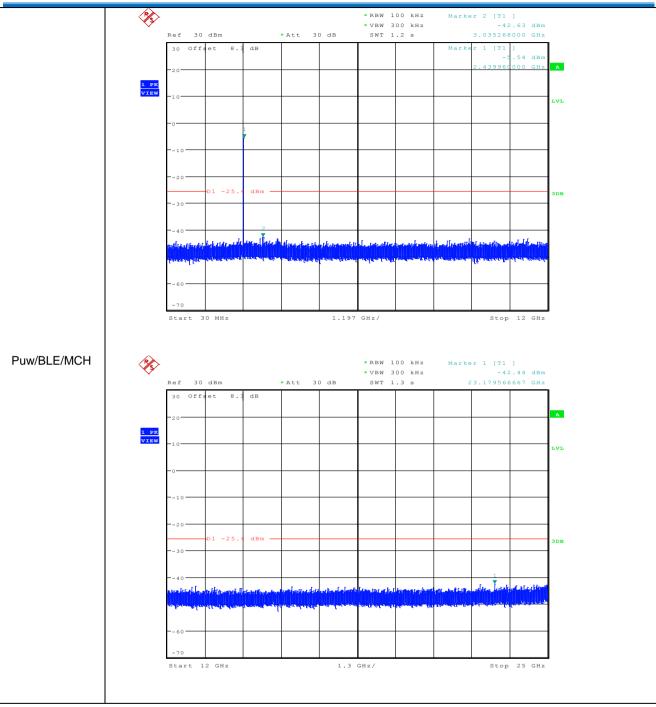




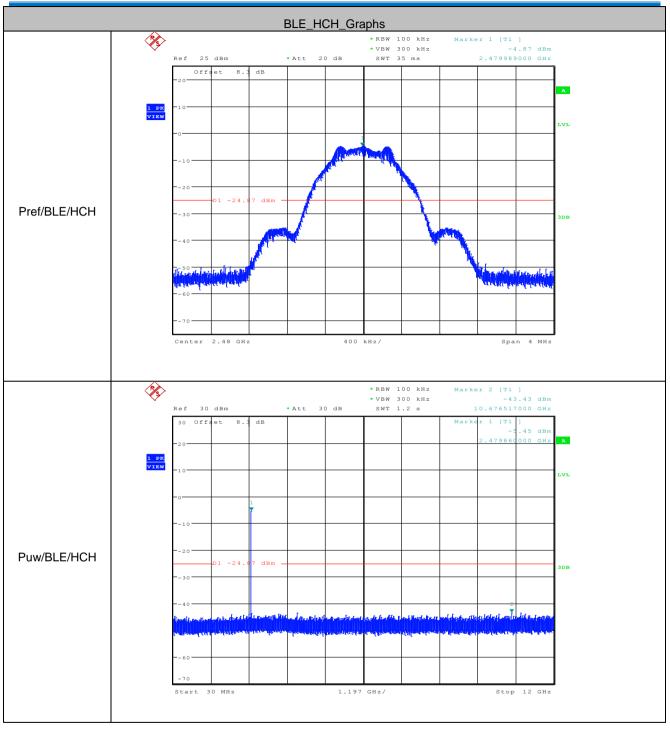






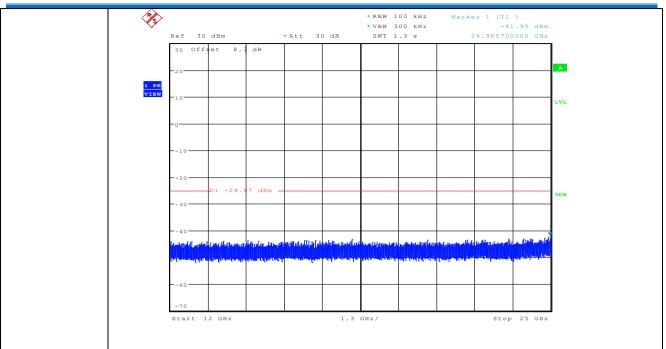








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Remark:

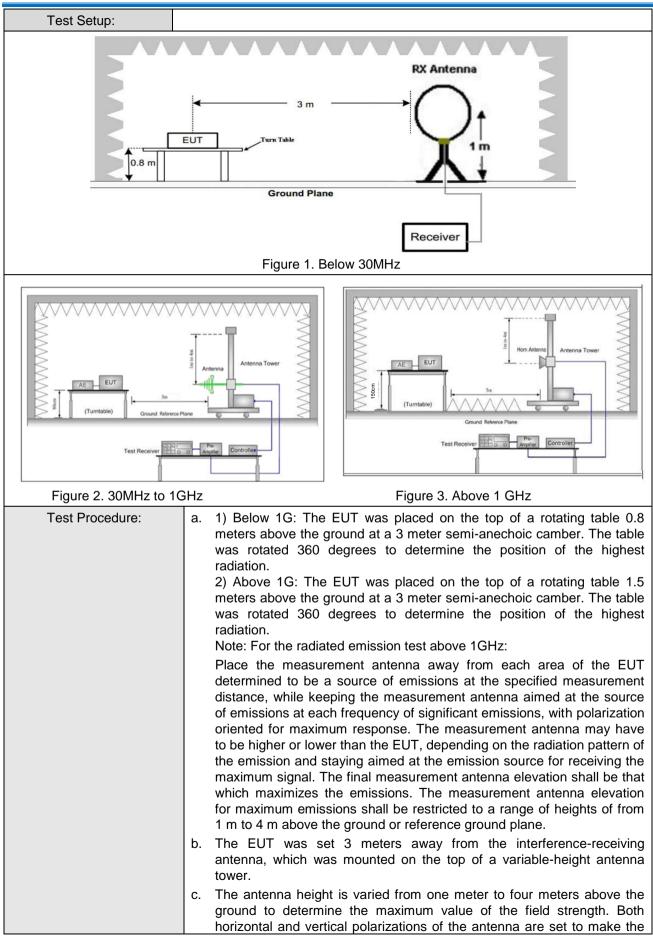
Pretest 9kHz to 25GHz, find the highest point when testing, so only the worst data were shown in the test report. Per FCC Part 15.33 (a) and 15.31 (o) ,The amplitude of spurious emissions from intentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.



6.7 Radiated Spurious Emission & Restricted bands

6.7.1 Spurious Emissions							
Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205						
Test Method:	ANSI C63.10 2013						
Test Site:	Measurement Distance	: 3m	n (Semi-Anech	noic Cham	ber)		
Receiver Setup:	Frequency Detector RBW VBW Remark						
	0.009MHz-0.090MH	z	Peak	10kHz	z 30kHz	Peak	
	0.009MHz-0.090MH	z	Average	10kHz	z 30kHz	Average	
	0.090MHz-0.110MH	z	Quasi-peak	10kHz	z 30kHz	Quasi-peak	
	0.110MHz-0.490MH	z	Peak	10kHz	z 30kHz	Peak	
	0.110MHz-0.490MH	z	Average	10kHz	z 30kHz	Average	
	0.490MHz -30MHz		Quasi-peak	10kHz	z 30kHz	Quasi-peak	
	30MHz-1GHz		Quasi-peak	100 kH	lz 300kHz	Quasi-peak	
	Above 1GHz		Peak	1MHz	z 3MHz	Peak	
			Peak	1MHz	z 10Hz	Average	
Limit:	Frequency		eld strength crovolt/meter)	Limit (dBuV/m)	Remark	Measuremen distance (m)	
	0.009MHz-0.490MHz	2	400/F(kHz)	-	-	300	
	0.490MHz-1.705MHz	24	1000/F(kHz)	-	-	30	
	1.705MHz-30MHz		30	-	-	30	
	30MHz-88MHz		100	40.0	Quasi-peak	3	
	88MHz-216MHz		150	43.5	Quasi-peak	3	
	216MHz-960MHz		200	46.0	Quasi-peak	3	
	960MHz-1GHz 500 5		54.0	Quasi-peak	3		
	Above 1GHz 500 54.0 Average					3	
	Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.						

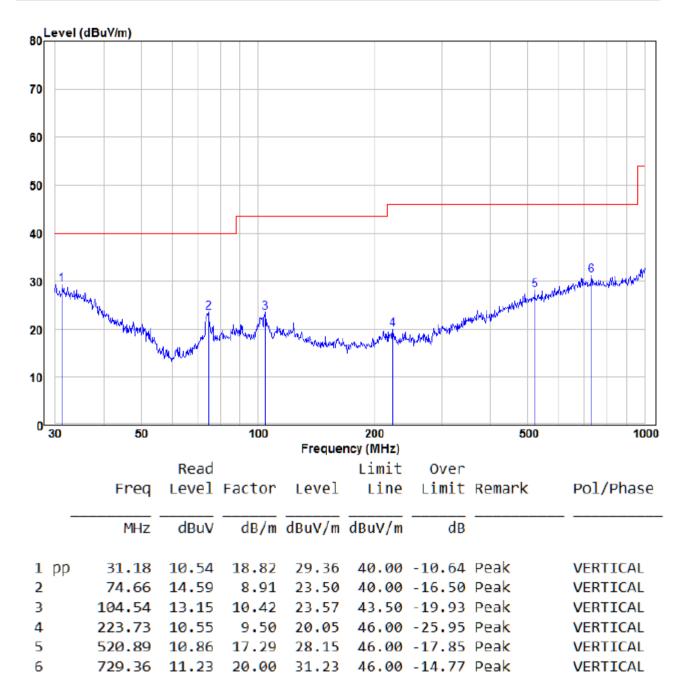




	measurement.
	 d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. 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. g. Test the EUT in the lowest channel (2402MHz),the middle channel (2440MHz),the Highest channel (2480MHz) h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
	i. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with GFSK modulation. Transmitting mode.
Final Test Mode:	Transmitting with GFSK modulation.
	Pretest the EUT at Transmitting mode, found the Transmitting mode which it is worse case.
	For below 1GHz part, through pre-scan, the worst case is the lowest channel. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 5.10 for details.
Test Results:	Pass



Radiated Emission below 1GHz					
30MHz~1GHz, the worst case					
Test mode: Transmitting mode(lowest channel) Vertical					





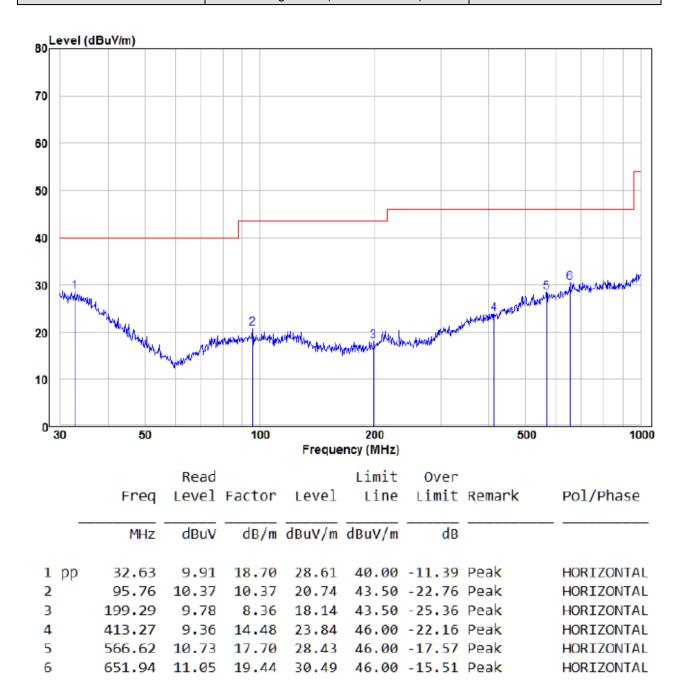
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30MHz~1GHz, the worst case

Test mode:

Transmitting mode (lowest channel)

Horizontal





Transmitter Emission above 1GHz

Worse case m	ode:	GFSK		Test chann	el:	Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		H/V
2390	54.01	-9.2	44.81	74	-29.19	Peak	Н
2400	54.78	-9.39	45.39	74	-28.61	Peak	Н
4804	51.56	-4.33	47.23	74	-26.77	Peak	Н
7206	49.84	1.01	50.85	74	-23.15	Peak	Н
2390	54.24	-9.2	45.04	74	-28.96	Peak	v
2400	51.56	-9.39	42.17	74	-31.83	Peak	V
4804	53.21	-4.33	48.88	74	-25.12	Peak	V
7206	48.25	1.01	49.26	74	-24.74	Peak	V

Worse case mode:		GFSK		Test channel:		Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		H/V
4880	53.14	-4.11	49.03	74	-24.97	peak	Н
7320	48.68	1.51	50.19	74	-23.81	peak	Н
4880	54.08	-4.11	49.97	74	-24.03	peak	V
7320	50.33	1.51	51.84	74	-22.16	peak	V

Worse case mode:		GFSK		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		H/V
2483.5	55.28	-9.29	45.99	74	-28.01	Peak	Н
4960	50.58	-4.04	46.54	74	-27.46	Peak	Н
7440	50.40	1.57	51.97	74	-22.03	Peak	Н
2483.5	55.56	-9.29	46.27	74	-27.73	Peak	v
4960	49.29	-4.04	45.25	74	-28.75	Peak	V
7440	48.57	1.57	50.14	74	-23.86	Peak	V

Remark:

1) 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

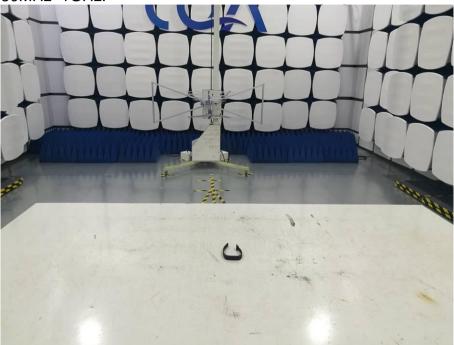
2) Scan from 9kHz to 25GHz, the disturbance above 10GHz and below 30MHz was very low. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.



7 Photographs - EUT Test Setup

7.1 Radiated Spurious Emission

30MHz~1GHz:





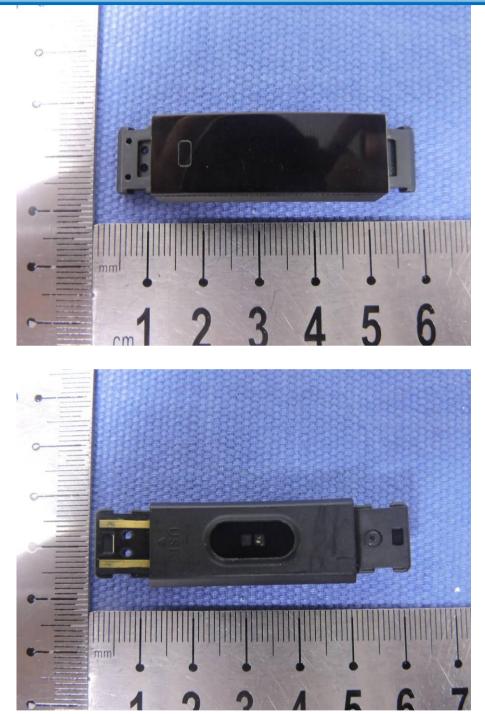


8 Photographs - EUT Constructional Details

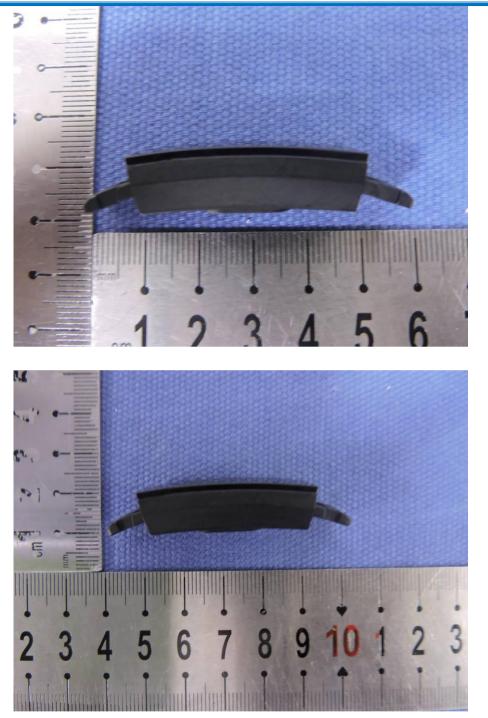








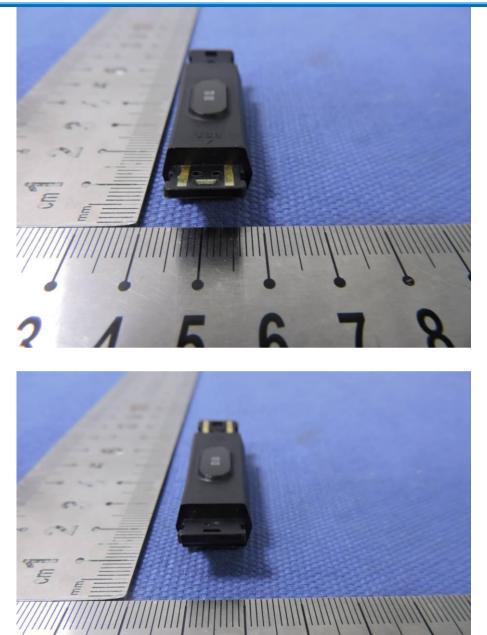




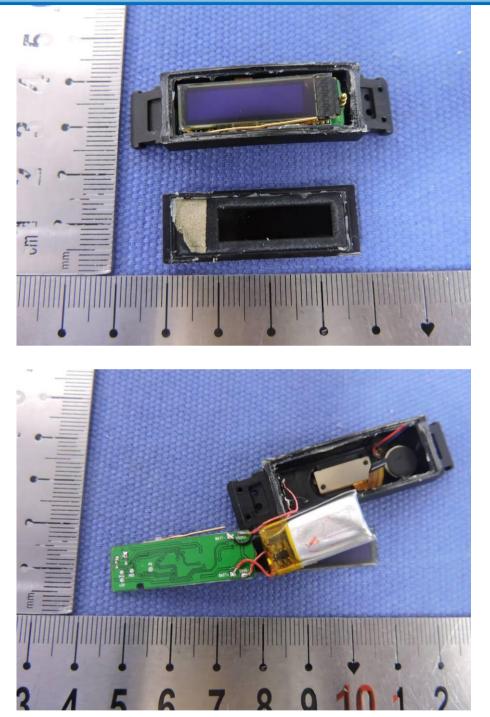


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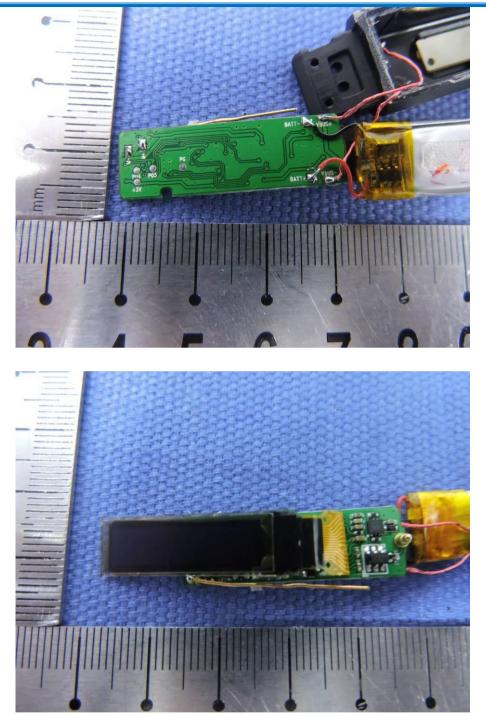
Shenzhen Huaxia Testing Technology Co., Ltd





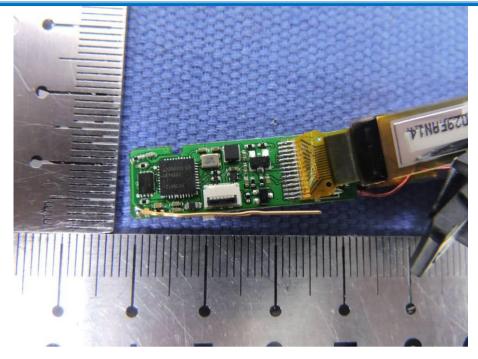








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