FCC TEST REPORT

Test report
On Behalf of
Sum, LLC

For
Sum DROP & DOCK Wireless Charging System

Model No.: P0+D0

FCC ID: 2AXT9-P0

Prepared for :	**Sum, LLC** **8070 Scholarship Irvine, CA 92612, USA**
Prepared By :	**Shenzhen HUAK Testing Technology Co., Ltd.** **1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China**
Date of Test:	**Sep. 16, 2020 ~Oct. 13, 2020**
Date of Report:	**Oct. 13, 2020**
Report Number:	**HK2010152901-1E**

TEST RESULT CERTIFICATION

Applicant's name ..... :	Sum, LLC
Address ..... :	8070 Scholarship Irvine, CA 92612, USA
Manufacture's Name ..... :	SHENZHEN BLUE TIMES TECHNOLOGY CO.,LTD
Address ..... :	B Block, Taixinglong Tech. Zone, Hezhou, Xixiang Town, Bao'an District, Shenzhen, China 518126

Product description

Trade Mark ..... :	Sum Products
Product name ..... :	Sum DROP & DOCK Wireless Charging System
Model and/or type reference .:	P0+D0
Standards ..... :	FCC CFR 47 PART 18

Date of Test ..... :

Date (s) of performance of tests ..... :	Sep. 16, 2020 ~Oct. 13, 2020
Date of Issue ..... :	Oct. 13, 2020
Test Result ..... :	**Pass**

Testing Engineer : Gary Qian

(Gary Qian)

Technical Manager : Eden Hu

(Eden Hu)

Authorized Signatory : Jason Zhou

(Jason Zhou)

Table of Contents

1. TEST SUMMARY

1.1 TEST PROCEDURES AND RESULTS

DESCRIPTION OF TEST	Section number	RESULT
CONDUCTED EMISSIONS TEST	§18.307	COMPLIANT
RADIATED EMISSION TEST	§18.305	COMPLIANT

NOTE: N/A means not applicable in this report.

1.2 TEST FACILITY

Test Firm : Shenzhen HUAK Testing Technology Co., Ltd.

Address 1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China

1.3 MEASUREMENT UNCERTAINTY

Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty(9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty(30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty(Above 1GHz)	=	4.06dB, k=2

2. GENERAL INFORMATION

2.1 General Description of EUT

Equipment	Sum DROP & DOCK Wireless Charging System
Model Name	P0+D0
Serial No.	N/A
Trade Mark	Sum Products
FCC ID	2AXT9-P0
Antenna Type	Coil Antenna
Operation frequency	125KHz
Number of Channels	1
Modulation Type	ASK
Power Source	Type-c input: 5V-2A Wireless output: 5V-1A/5V-1.5A/9V-1.2A Type-c output:5V-2A Max Usb output: 5V-2A Max

2.2. Carrier Frequency of Channels

Operation Frequency each of channel	
Channel	Frequency
1	125KHz

2.3 Operation of EUT during testing

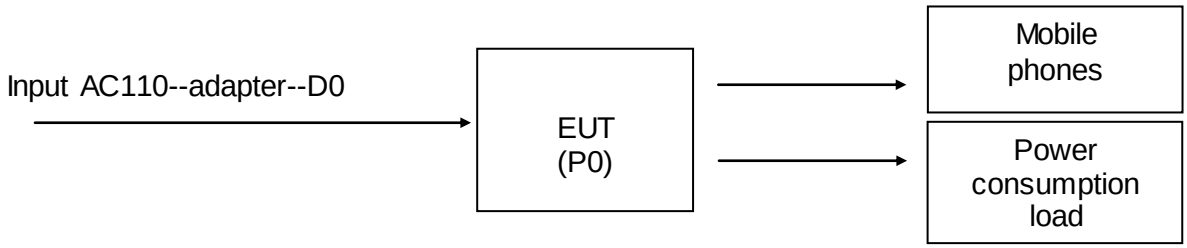
Operating Mode

Mode 1	Type-c output
Mode 2	Wireless output
Mode 3	Charing
Mode 4	Charing+ Wireless output(10W)
Mode 5	Charing+ Wireless output(10W)+ Type-c output

Only the worst mode 5 is recorded in this report

2.4 Description of Test Setup

Operation of EUT during testing



● Mobile phones information
Model: HUAWEI P40

The sample was placed 0.8m height above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. The worst case is X position

2.5 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

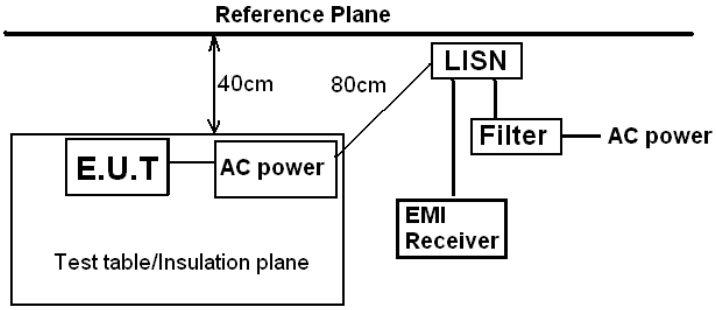
Description	Information	Manufacturer	Remark	Certificate
AC-DC adapter	MODEL: FJ-SW1260502500UN INPUT:100-240 50/60Hz 0.4A Max OUTPUT:5V 2500mA	SHENZHEN FUJIA APPLIANCE CO.,LTD	Provided by lab	SDOC
D0	/	Sum, LLC	Provided by applicant	SDOC

2.5 Measurement Instruments List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	R&S	ENV216	HKE-002	Dec. 26, 2019	1 Year
2.	Receiver	R&S	ESCI 7	HKE-010	Dec. 26, 2019	1 Year
3.	RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 26, 2019	1 Year
4.	Spectrum analyzer	R&S	FSP40	HKE-025	Dec. 26, 2019	1 Year
5.	Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 26, 2019	1 Year
6.	Preamplifier	Schwarzbeck	BBV 9743	HKE-006	Dec. 26, 2019	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESCI 7	HKE-010	Dec. 26, 2019	1 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	HKE-012	Dec. 26, 2019	1 Year
9.	Loop Antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Dec. 26, 2019	1 Year
10.	Horn Antenna	Schewarzbeck	9120D	HKE-013	Dec. 26, 2019	1 Year
11.	Pre-amplifier	EMCI	EMC051845 SE	HKE-015	Dec. 26, 2019	1 Year
12.	Pre-amplifier	Agilent	83051A	HKE-016	Dec. 26, 2019	1 Year
13.	EMI Test Software EZ-EMC	Tonscend	JS1120-B Version	HKE-083	Dec. 26, 2019	N/A
14.	Power Sensor	Agilent	E9300A	HKE-086	Dec. 26, 2019	1 Year
15.	Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 26, 2019	1 Year
16.	Signal generator	Agilent	N5182A	HKE-029	Dec. 26, 2019	1 Year
17.	Signal Generator	Agilent	83630A	HKE-028	Dec. 26, 2019	1 Year
18.	Shielded room	Shiel Hong	4*3*3	HKE-039	Dec. 26, 2019	1 Year

3. CONDUCTED EMISSION TEST

3.1 Test Specification

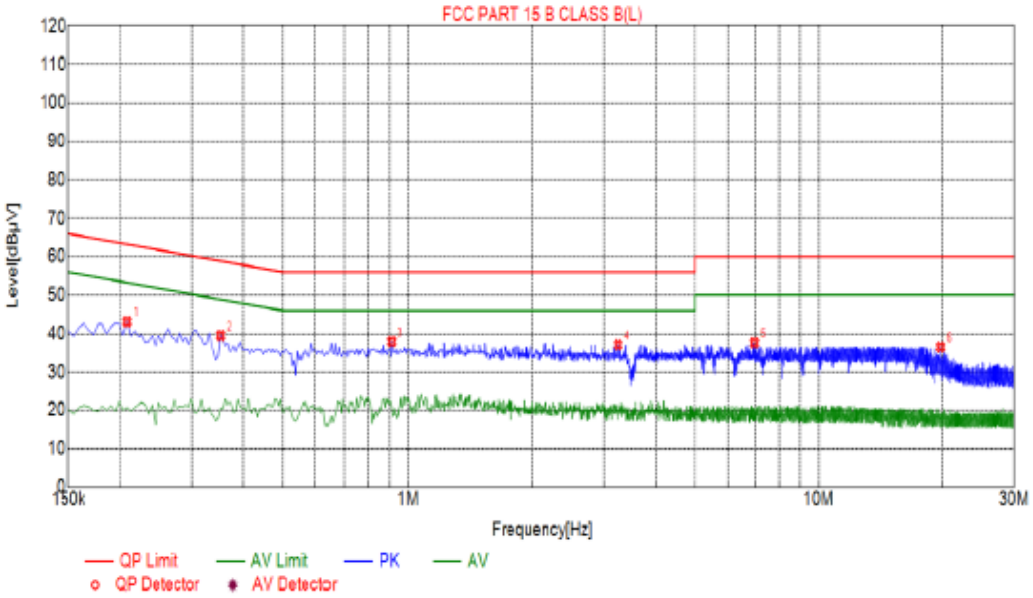
<table>
<tr><td>Test Requirement:</td><td>FCC Part18 Section 18.307</td></tr>
<tr><td>Test Method:</td><td>FCC MP-5</td></tr>
<tr><td>Frequency Range:</td><td>150 kHz to 30 MHz</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9 kHz, VBW=30 kHz, Sweep time=auto</td></tr>
<tr><td>Limits:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></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>5-30</td><td>60</td><td>50</td></tr>
</table>
</td></tr>
<tr><td>Test Setup:</td><td> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test Mode:</td><td>Charging</td></tr>
<tr><td>Test Procedure:</td><td>1. The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). This provides 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 refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference.</td></tr>
<tr><td>Test Result:</td><td>N/A</td></tr>
</table>

3.2 Test data

Note :

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



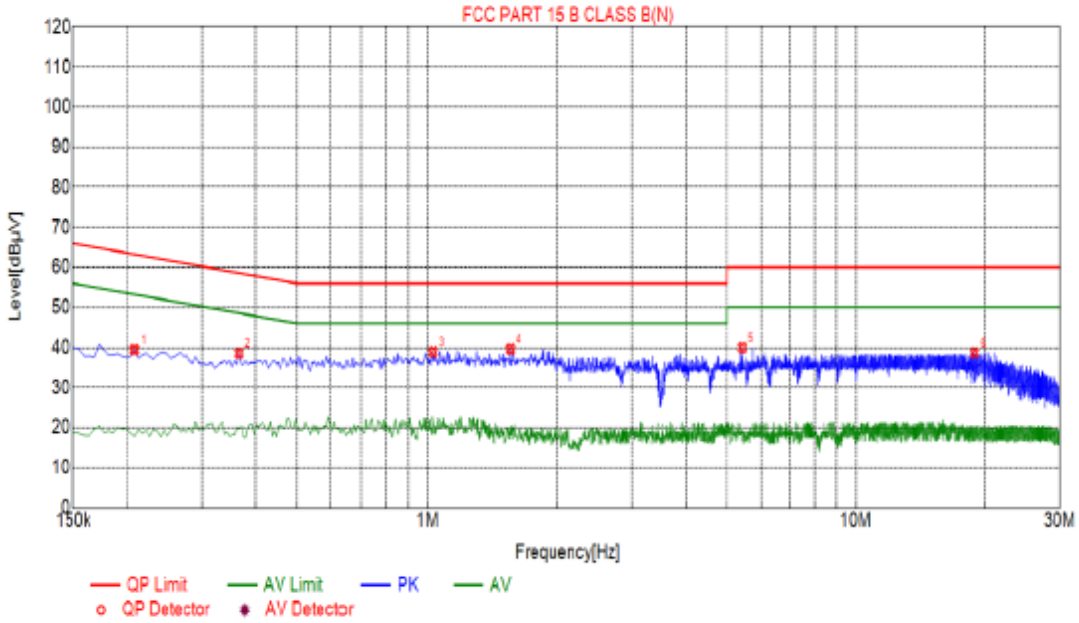
Suspected List								
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.2085	43.12	20.04	63.26	20.14	23.08	PK	L
2	0.3525	39.54	20.03	58.90	19.36	19.51	PK	L
3	0.9105	37.94	20.06	56.00	18.06	17.88	PK	L
4	3.2460	37.10	20.23	56.00	18.90	16.87	PK	L
5	6.9810	37.62	20.20	60.00	22.38	17.42	PK	L
6	19.8330	36.53	20.10	60.00	23.47	16.43	PK	L

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Suspected List								
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.2085	39.42	20.04	63.26	23.84	19.38	PK	N
2	0.3660	38.53	20.04	58.59	20.06	18.49	PK	N
3	1.0275	38.86	20.07	56.00	17.14	18.79	PK	N
4	1.5585	39.59	20.11	56.00	16.41	19.48	PK	N
5	5.4285	39.94	20.26	60.00	20.06	19.68	PK	N
6	18.9420	38.67	20.06	60.00	21.33	18.61	PK	N

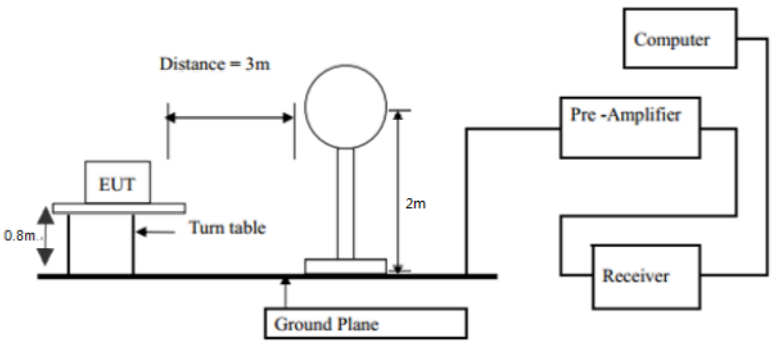
Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

4. Radiated Spurious Emission Measurement

4.1 Block Diagram of Test Setup

<table>
<tr><td>Test Requirement:</td><td>FCC Part18 Section 18.305</td></tr>
<tr><td>Test Method:</td><td>FCC MP-5</td></tr>
<tr><td>Frequency Range:</td><td>9 kHz to 30MHz</td></tr>
<tr><td>Measurement Distance:</td><td>3 m</td></tr>
<tr><td>Antenna Polarization:</td><td>Horizontal & Vertical</td></tr>
<tr><td>Operation mode:</td><td>Refer to item 4.1</td></tr>
<tr><td>Receiver Setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr>
<tr><td>9kHz- 150kHz</td><td>Quasi-peak</td><td>200Hz</td><td>1kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>150kHz-
30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th rowspan="2">Frequency (MHz)</th><th rowspan="2">Distance (Meters)</th><th colspan="2">Field strength Limit</th></tr>
<tr><th>(dBuV/m)</th><th>Remark</th></tr>
<tr><td>0.009 -30</td><td>3</td><td>103.5</td><td>Quasi-Peak</td></tr>
</table>
Remark:
(1) Emission level dBuV/m for 0.009~30MHz = 20log (15) + 40log (300/3) dBuV/m;
(2) Calculated according FCC 18.305.
(3) The smaller limit shall apply at the cross point between two frequency bands.
(4) Distance is the distance in meters between the measuring instrument, antenna and the closest
point of any part of the device or system.
</td></tr>
<tr><td>Test setup:</td><td>For radiated emissions below 30MHz


</td></tr>
<tr><td>Test Procedure:</td><td>1. For the radiated emission test below 1GHz: The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (2 m, refer mp5-2.2.5) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.
2. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
3. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported.</td></tr>
</table>

	Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported. 4. Use the following spectrum analyzer settings: (1) Span shall wide enough to fully capture the emission being measured; (2) Set RBW=200Hz for 9K< f <150 KHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold; (3) Set RBW = 9 KHz, VBW= 30KHz for 150KHz <f 30 MHz for peak measurement.
Test mode:	Refer to section 4.1 for details
Test results:	PASS

4.2 Test Result

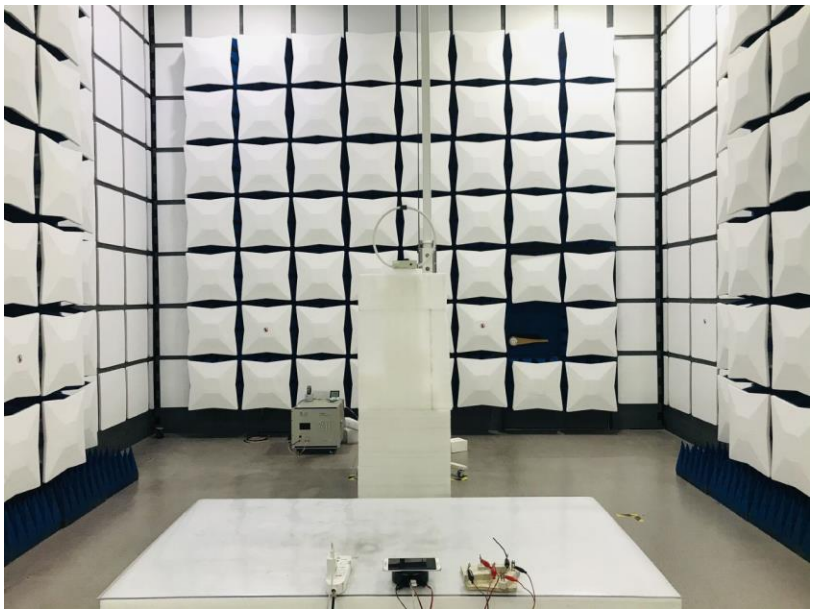
For 9KHz - 30MHz Test Results:

Freq. (MHz)	Detector Mode (PK/QP/AV)	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Level (dBuV/m)	Limits 3m (dBuV/m)	Margin (dBuV/m)
0.108	AV	PK	20.71	24.8	45.51	103.5	57.99
0.125	AV	PK	44.30	24.8	69.10	103.5	34.40
0.484	AV	PK	27.12	25.03	52.15	103.5	51.35
0.5	PK	PK	25.15	25.03	50.18	103.5	53.32

NOTE:

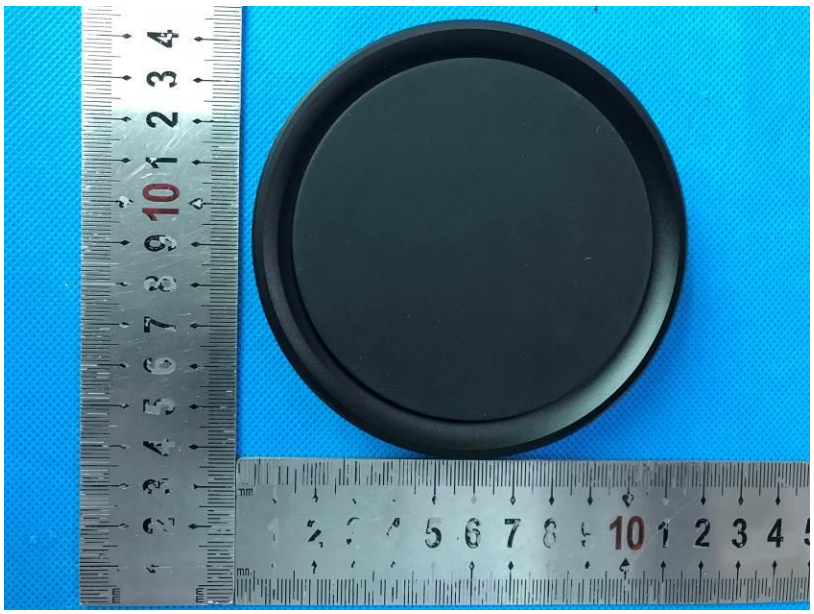
1. Level=Reading+Factor; Margin=Limits-Level;
2. All other emissions are attenuated 20dB below the limit.

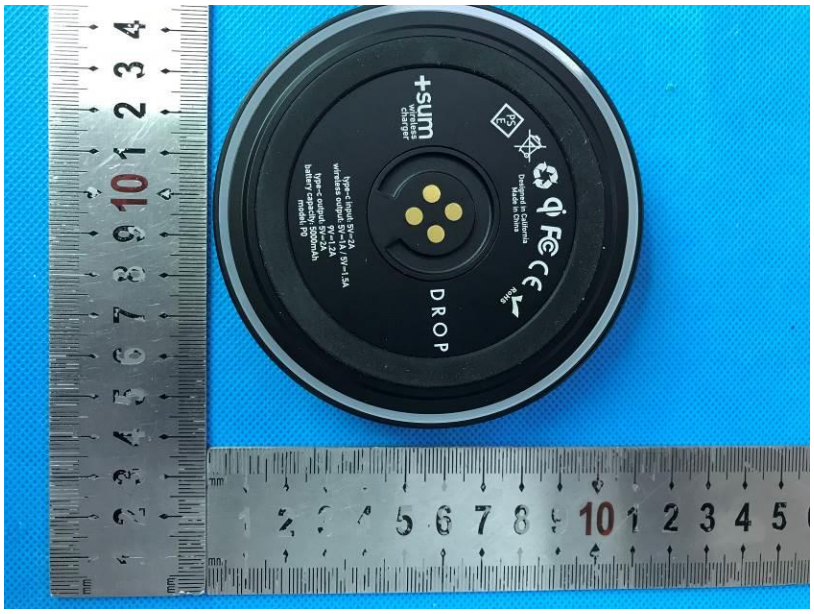
5. PHOTOGRAPH OF TEST

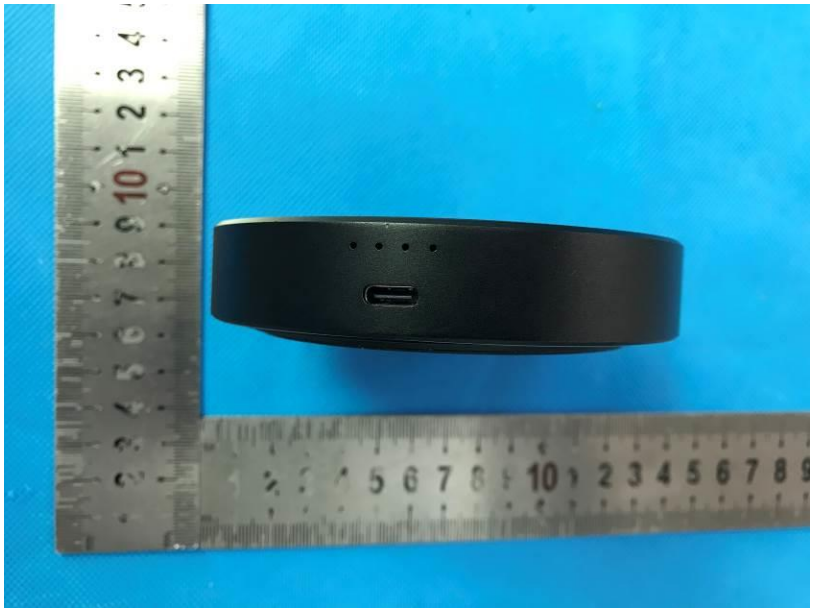


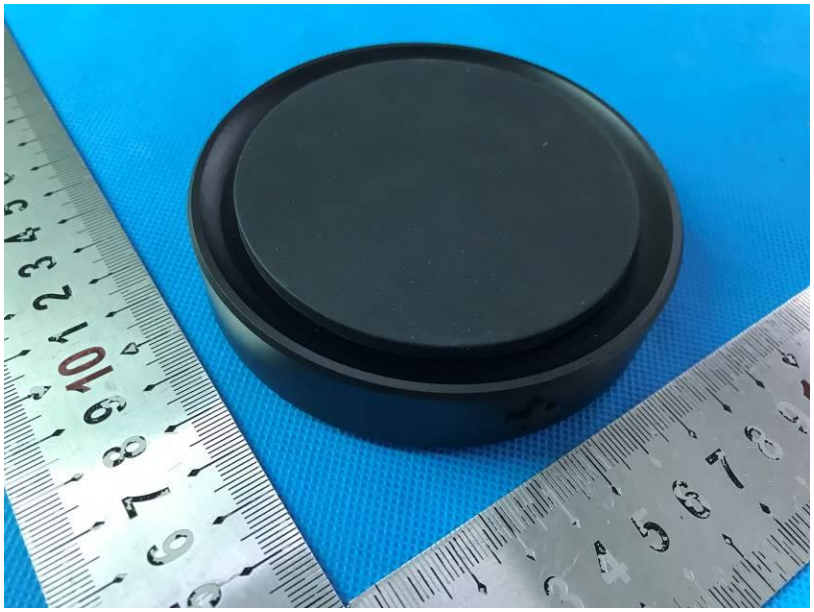
6. PHOTOGRAPH OF TEST

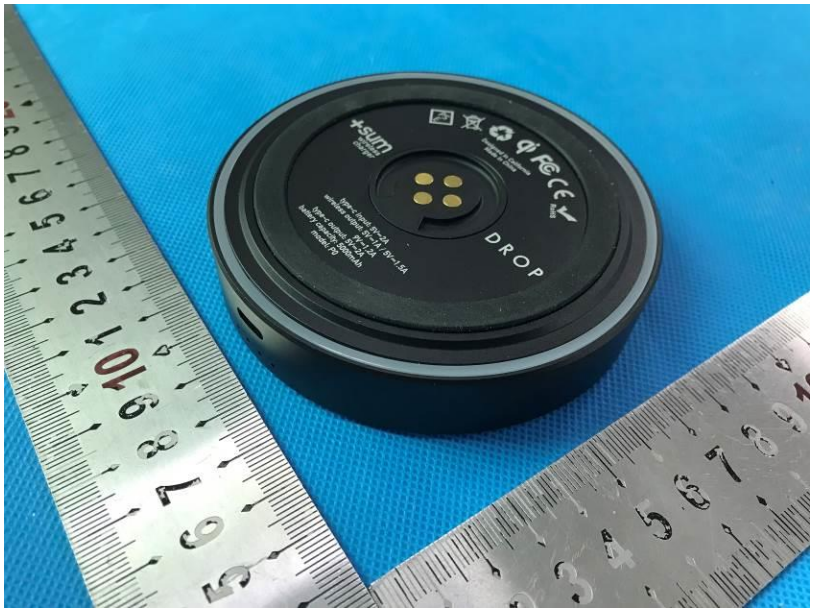
External photos



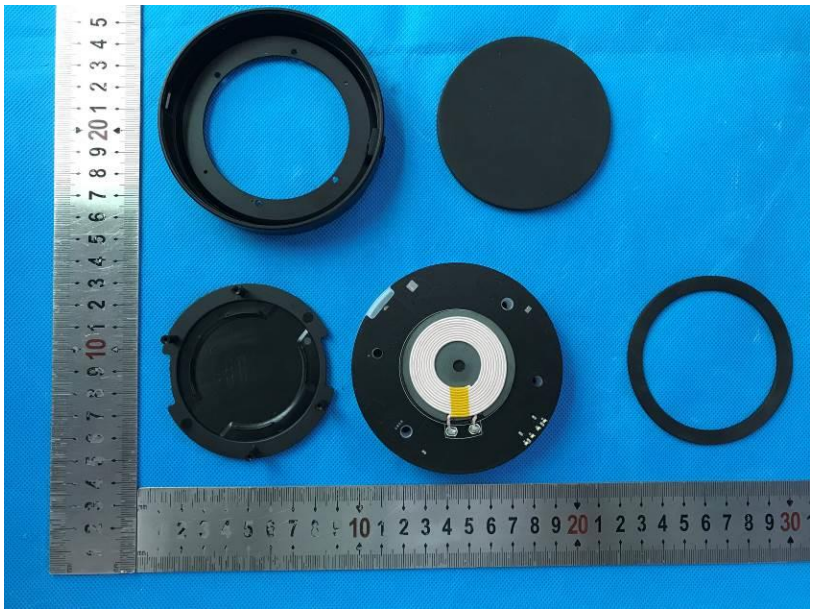

DROP

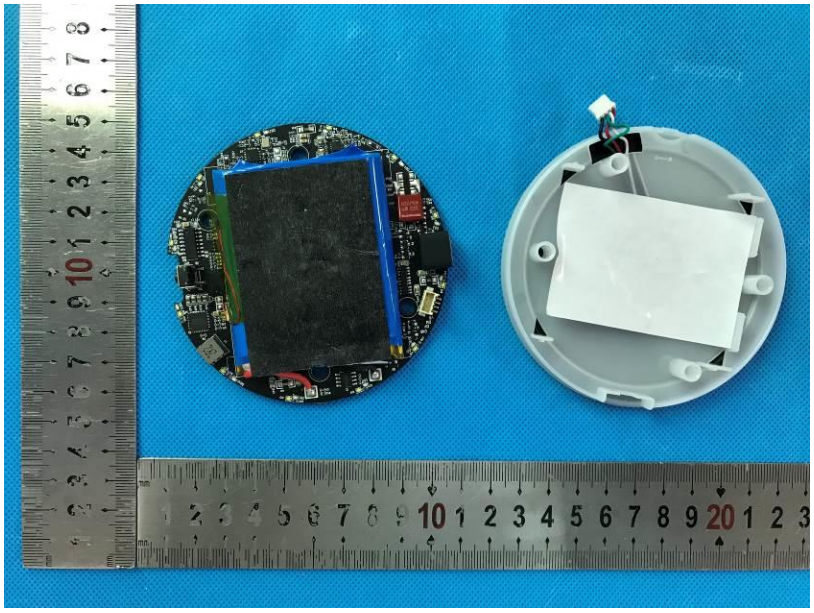


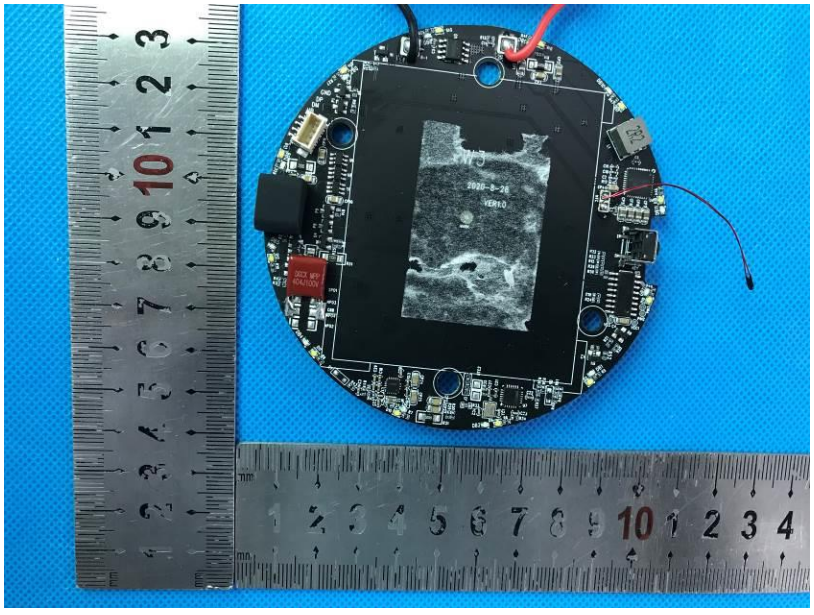


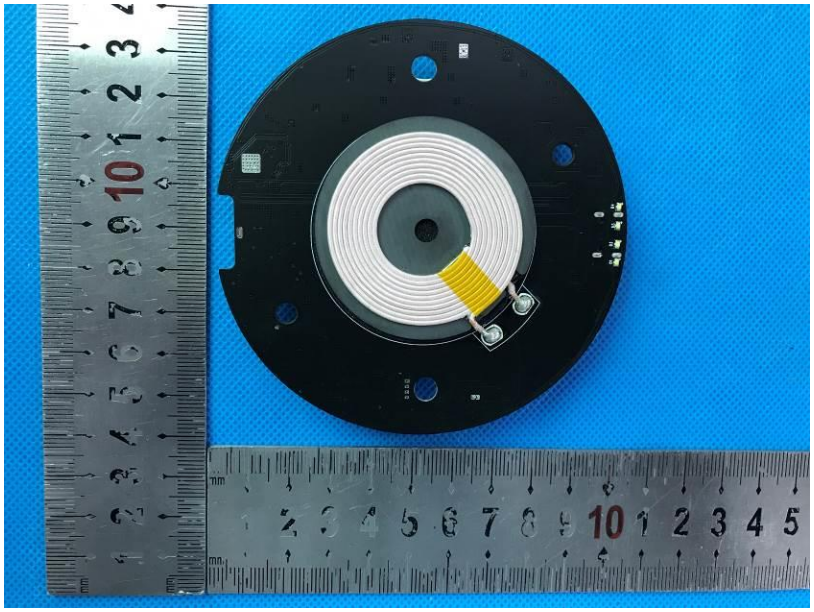

DROP

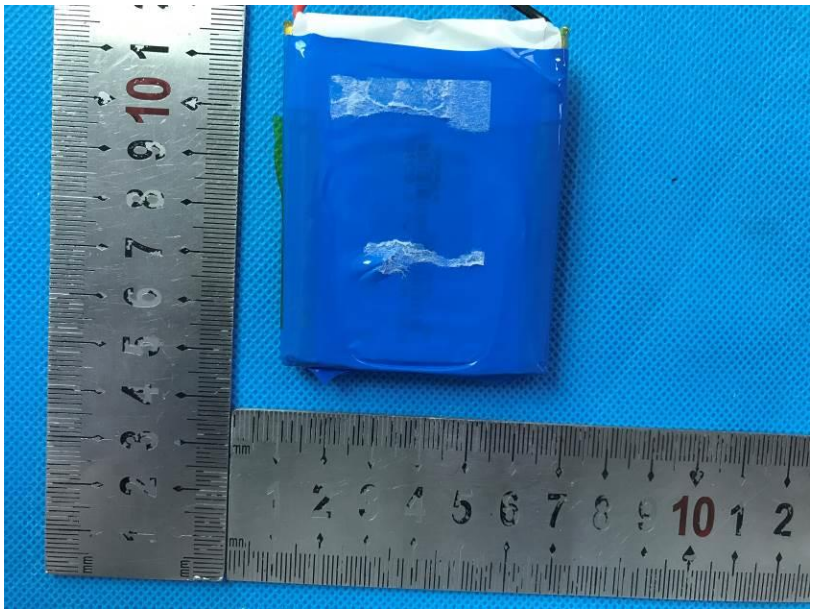
Internal photos











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