



FCC SDoC TEST REPORT

Powerstick.com Inc.

Aura

Test Model: 4116

Prepared for : Powerstick.com Inc.
Address : 29 Camelot Drive, Ottawa, Canada, K2G 5W6

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
Address : Room 101, 201, Building A and Room 301, Building C,
Juji Industrial Park, Yabianxueziwei, Shajing Street,
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Web : www.LCS-cert.com
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Date of receipt of test sample : May 25, 2022
Number of tested samples : 1
Sample No. : A052422040
Serial number : Prototype
Date of Test : May 25, 2022 ~ May 30, 2022
Date of Report : June 01, 2022





FCC SDoC TEST REPORT
FCC 47 CFR Part 15 Subpart B, Class B(SDoC), ANSI C63.4 -2014

Report Reference No. : **LCSA052422040E**
Date Of Issue : June 01, 2022

Testing Laboratory Name : **Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address : Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure... : Full application of Harmonised standards ■
Partial application of Harmonised standards □
Other standard testing method □

Applicant's Name..... : **Powerstick.com Inc.**
Address : 29 Camelot Drive, Ottawa, Canada, K2G 5W6

Test Specification
Standard..... : FCC 47 CFR Part 15 Subpart B, Class B(SDoC), ANSI C63.4 -2014
Test Report Form No...... : LCSEMC-1.0
TRF Originator..... : Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF..... : Dated 2011-03

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Test Item Description..... : **Aura**
Trade Mark : N/A
Test Model : 4116
Ratings : Input: 5V==1A
DC 3.7V by Rechargeable Li-ion Battery, 330mAh
Result : **Positive**

Compiled by:

Jin Wang / Administrator

Supervised by:

Cary Luo / Technique principal

Approved by:

Gavin Liang / Manager





FCC SDOC-- TEST REPORT

Test Report No. : LCSA052422040E	<u>June 01, 2022</u> Date of issue
---	---------------------------------------

Test Model	: 4116
EUT.....	: Aura
Applicant.....	: Powerstick.com Inc.
Address.....	: 29 Camelot Drive, Ottawa, Canada, K2G 5W6
Telephone.....	: /
Fax.....	: /
Manufacturer.....	: Powerstick.com Inc.
Address.....	: 29 Camelot Drive, Ottawa, Canada, K2G 5W6
Telephone.....	: /
Fax.....	: /
Factory.....	: Powerstick.com Inc.
Address.....	: 29 Camelot Drive, Ottawa, Canada, K2G 5W6
Telephone.....	: /
Fax.....	: /

Test Result according to the standards on page 6: **Positive**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.





Revision History

Report Version	Issue Date	Revision Content	Revised By
000	June 01, 2022	Initial Issue	--





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1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION			
Description of Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	FCC 47 CFR Part 15 Subpart B, Class B(SDoC), ANSI C63.4 -2014	Class B	PASS
Radiated disturbance	FCC 47 CFR Part 15 Subpart B, Class B(SDoC), ANSI C63.4 -2014	Class B	PASS
N/A is an abbreviation for Not Applicable.			

Test mode:		
Mode 1	Normal operation	Record





2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT : Aura

Trade Mark : N/A

Test Model : 4116

Power Supply : Input: 5V \pm 1A
DC 3.7V by Rechargeable Li-ion Battery, 330mAh

Highest internal frequency (Fx) : Fx \leq 108 MHz

Highest internal frequency (Fx)	Highest measured frequency
Fx \leq 108 MHz	1 GHz
108 MHz < Fx \leq 500 MHz	2 GHz
500 MHz < Fx \leq 1 GHz	5 GHz
Fx > 1 GHz	5 \times Fx up to a maximum of 6 GHz

NOTE 1 For FM and TV broadcast receivers, Fx is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies.
Where Fx is unknown, the radiated emission measurements shall be performed up to 6 GHz.





2.2. Support Equipment List

Manufacturer	Description	Model	Serial Number	Certificate
OPPO	Adapter	OP52KAUH	--	OPPO

Note: Auxiliary equipment is provided by the laboratory.

2.3 External I/O Cable

I/O Port Description	Quantity	Cable
Power Port	1	N/A

2.4. Description of Test Facility

Site Description
EMC Lab.

: NVLAP Accreditation Code is 600167-0.
FCC Designation Number is CN5024.
CAB identifier is CN0071.
CNAS Registration Number is L4595.
Test Firm Registration Number: 254912.





2.4. 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 LCS 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.

2.5. Measurement Uncertainty

Test	Parameters	Expanded Uncertainty (Ulab)	Expanded Uncertainty (Ucisp)
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 2.63 dB ± 2.35 dB	± 3.8 dB ± 3.4 dB
Radiated Emission	Level accuracy (9kHz to 30MHz)	± 3.68 dB	N/A
Radiated Emission	Level accuracy (30MHz to 1000MHz)	± 3.48 dB	± 5.3 dB
Radiated Emission	Level accuracy (above 1000MHz)	± 3.90 dB	± 5.2 dB

(1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

(2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.



3. TEST RESULTS

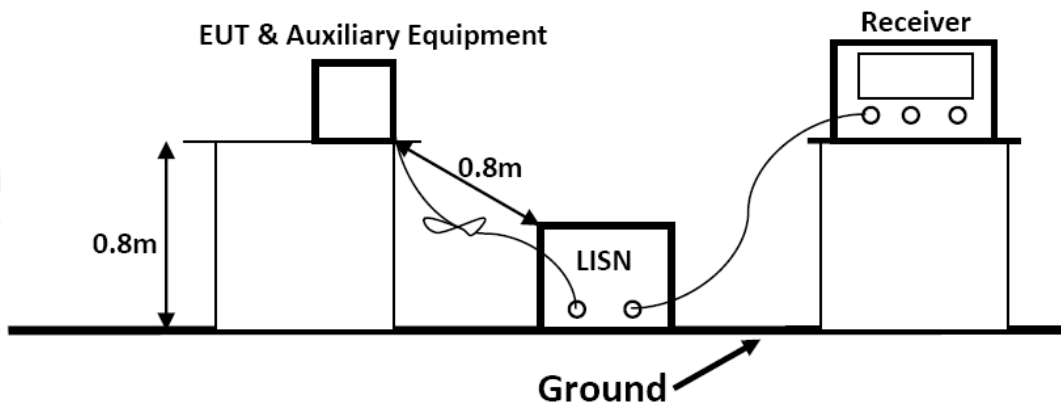
3.1. POWER LINE CONDUCTED EMISSION MEASUREMENT

3.1.1. Test Equipment

The following test equipments are used during the power line conducted measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	Farad	EZ	/	N/A	N/A
2	EMI Test Receiver	R&S	ESR3	102311	2022-03-15	2023-03-14
3	Artificial Mains	R&S	ENV216	101288	2021-06-21	2022-06-20
4	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-0032	2021-06-21	2022-06-20
5	Impedance Stabilization Network	TESEQ	ISN T800	45130	2021-12-01	2022-11-30

3.1.2. Block Diagram of Test Setup



3.1.3. Test Standard

Power Line Conducted Emission Limits (Class B)

Frequency (MHz)			Limit (dB μ V)	
			Quasi-peak Level	Average Level
0.15	~	0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50	~	5.00	56.0	46.0
5.00	~	30.00	60.0	50.0

NOTE1-The lower limit shall apply at the transition frequencies.
NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

3.1.4. EUT Configuration on Test

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.





3.1.5. Operating Condition of EUT

3.1.5.1. Setup the EUT as shown on Section 3.1.2

3.1.5.2. Turn on the power of all equipments.

3.1.5.3. Let the EUT work in measuring Mode 1 and measure it.

3.1.6. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC/ANSI C63.4-2014 on Conducted Emission Measurement.

The bandwidth of the test receiver is set at 9kHz.

The frequency range from 150kHz to 30MHz is investigated

3.1.7. Test Results

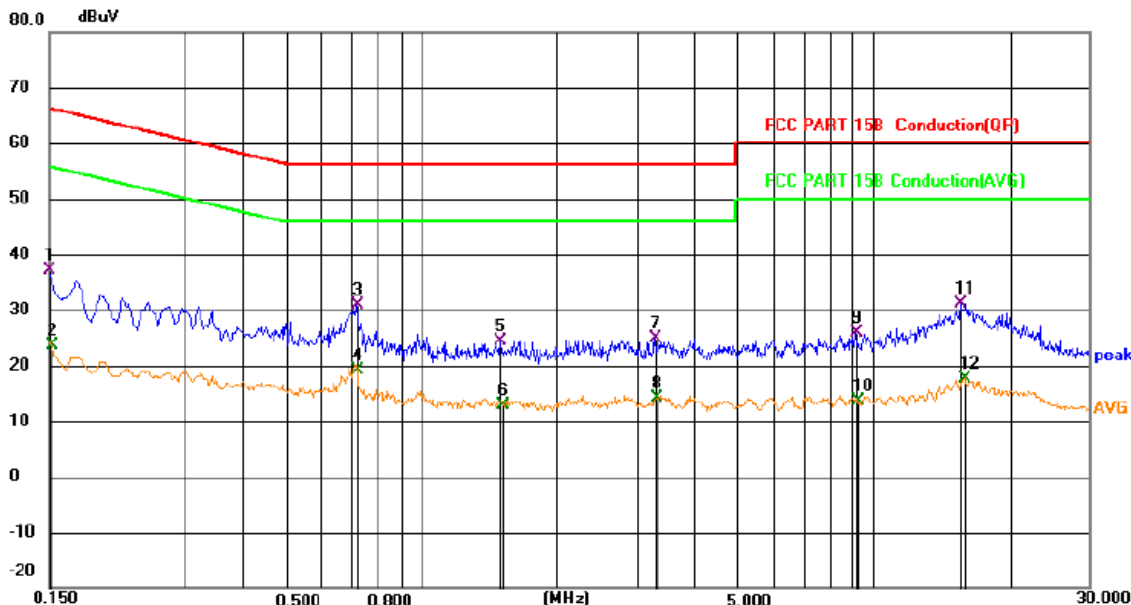
PASS.

The test result please refer to the next page.





Test Model	4116	Test Mode	Mode 1
Environmental Conditions	23.4°C, 54.6% RH	Test Engineer	Bill Zhu
Pol	Line	Test Voltage	AC 120V/60Hz

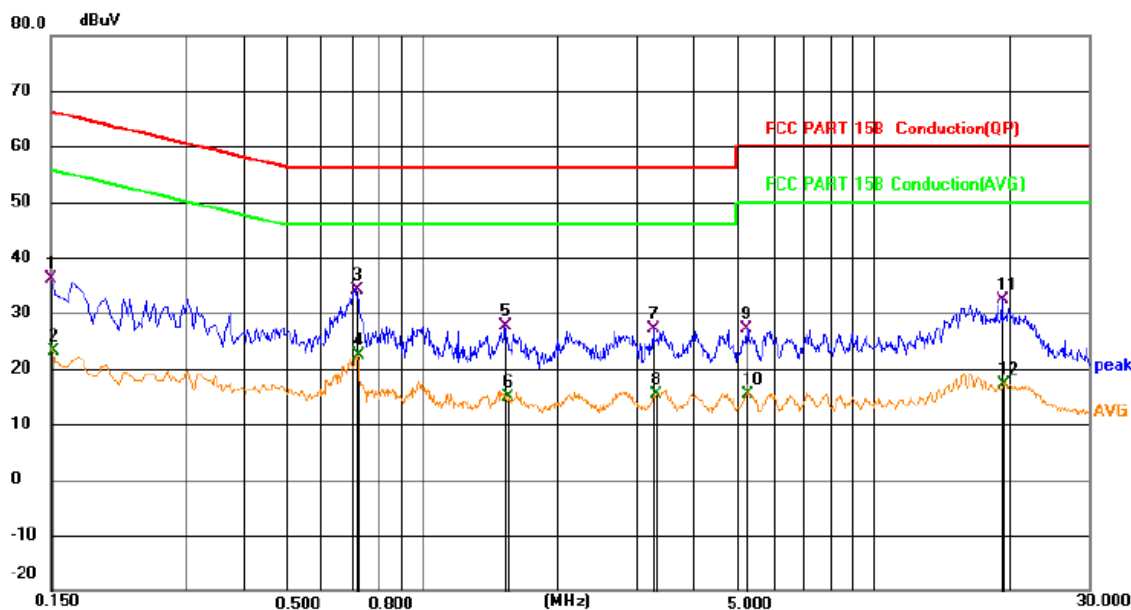


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1500	17.42	19.63	37.05	66.00	-28.95	QP	
2		0.1516	3.98	19.63	23.61	55.91	-32.30	AVG	
3	*	0.7160	11.33	19.65	30.98	56.00	-25.02	QP	
4		0.7198	-0.52	19.65	19.13	46.00	-26.87	AVG	
5		1.4953	4.83	19.66	24.49	56.00	-31.51	QP	
6		1.5113	-6.71	19.67	12.96	46.00	-33.04	AVG	
7		3.2756	5.15	19.76	24.91	56.00	-31.09	QP	
8		3.3105	-5.60	19.77	14.17	46.00	-31.83	AVG	
9		9.1073	5.94	19.85	25.79	60.00	-34.21	QP	
10		9.2043	-6.26	19.85	13.59	50.00	-36.41	AVG	
11		15.5523	11.19	19.90	31.09	60.00	-28.91	QP	
12		15.8014	-2.26	19.90	17.64	50.00	-32.36	AVG	





Test Model	4116	Test Mode	Mode 1
Environmental Conditions	23.4°C, 54.6% RH	Test Engineer	Bill Zhu
Pol	Neutral	Test Voltage	AC 120V/60Hz



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1500	16.48	19.63	36.11	66.00	-29.89	QP	
2		0.1516	3.39	19.63	23.02	55.91	-32.89	AVG	
3	*	0.7126	14.59	19.65	34.24	56.00	-21.76	QP	
4		0.7171	2.65	19.65	22.30	46.00	-23.70	AVG	
5		1.5271	7.88	19.67	27.55	56.00	-28.45	QP	
6		1.5451	-4.86	19.67	14.81	46.00	-31.19	AVG	
7		3.2551	7.36	19.76	27.12	56.00	-28.88	QP	
8		3.3001	-4.28	19.76	15.48	46.00	-30.52	AVG	
9		5.2485	7.35	19.80	27.15	60.00	-32.85	QP	
10		5.2666	-4.47	19.80	15.33	50.00	-34.67	AVG	
11		19.2526	12.20	20.19	32.39	60.00	-27.61	QP	
12		19.4685	-3.06	20.19	17.13	50.00	-32.87	AVG	

Note: Pre-Scan all mode, Thus record worse case mode result in this report.



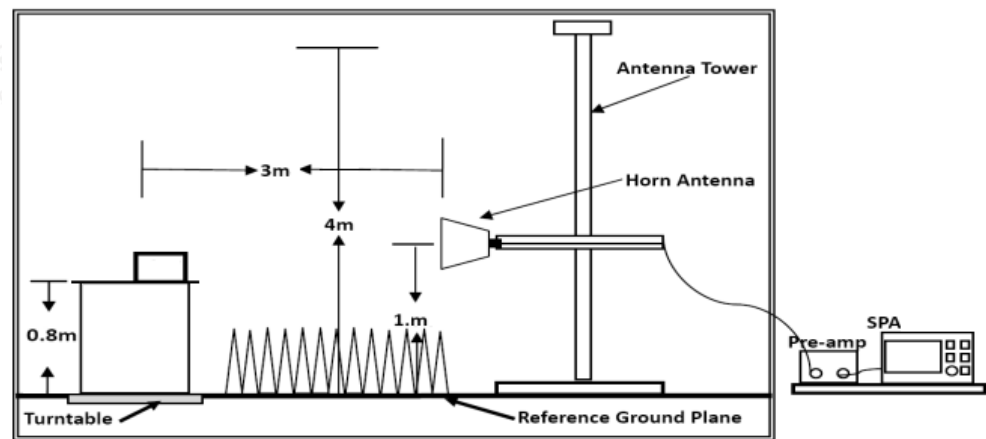
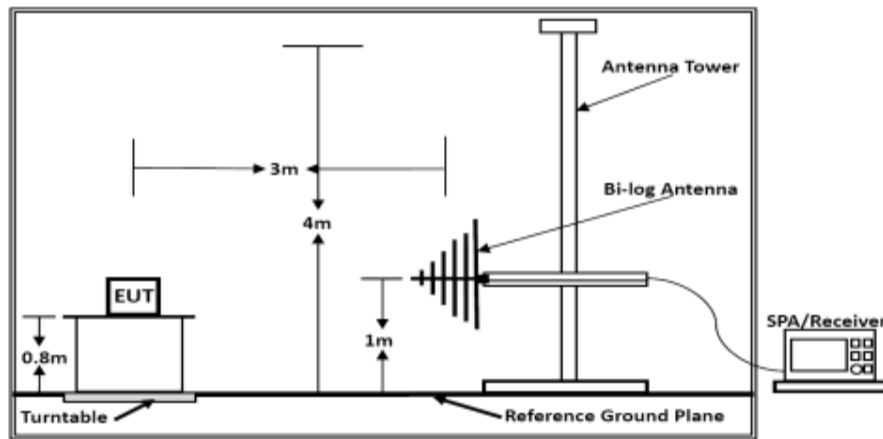
3.2. Radiated emission Measurement

3.2.1. Test Equipment

The following test equipments are used during the radiated emission measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	Farad	EZ	/	N/A	N/A
2	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2021-06-21	2022-06-20
3	Positioning Controller	MF	MF7082	MF78020803	2021-06-21	2022-06-20
4	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2021-07-25	2024-07-24
5	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2021-07-01	2024-06-30
6	EMI Test Receiver	R&S	ESR3	102312	2021-06-21	2022-06-20
7	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2021-11-16	2022-11-15
8	Broadband Preamplifier	/	BP-01M18G	P190501	2021-06-21	2022-06-20

3.2.2. Block Diagram of Test Setup





3.2.3. Radiated Emission Limit (Class B)

Limits for Radiated Disturbance Below 1GHz

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
30 ~ 88	3	100	40
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46
960 ~ 1000	3	500	54
Remark: (1) Emission level (dB)μV = 20 log Emission level μV/m (2) The smaller limit shall apply at the cross point between two frequency bands. (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.			
Limits for Radiated Emission Above 1GHz			
Frequency (MHz)	Distance (Meters)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)
Above 1000	3	74	54
***Note: The lower limit applies at the transition frequency.			

3.2.4. EUT Configuration on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

3.2.5. Operating Condition of EUT

- 3.2.5.1. Setup the EUT as shown in Section 3.2.2.
- 3.2.5.2. Let the EUT work in test Mode 1 and measure it.

3.2.6. Test Procedure

EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated by-log antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2014 on radiated emission measurement.

3.2.7. Measuring Instruments and Setting

Please refer to equipment list in this report. The following table is the setting of spectrum analyzer and receiver





Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB/VB 200Hz/1KHz for QP/AVG
Start ~ Stop Frequency	150kHz~30MHz / RB/VB 9kHz/30KHz for QP/AVG
Start ~ Stop Frequency	30MHz~1000MHz / RB/VB 120kHz/1MHz for QP

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average

The frequency range from 30MHz to 1000MHz and above 1000MHz is checked.

3.2.8. Radiated Emission Noise Measurement Result

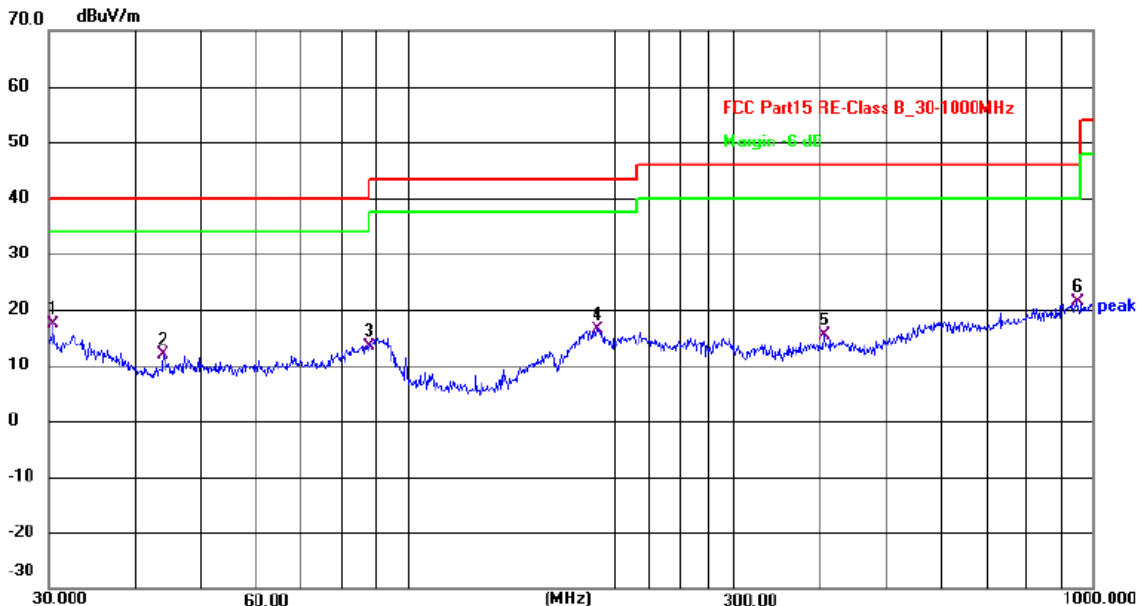
PASS.

The scanning waveforms please refer to the next page.





Test Model	4116	Test Mode	Mode 1
Environmental Conditions	24.1 °C, 52.2% RH	Detector Function	Quasi-peak
Pol	Vertical	Distance	3m
Test Engineer	Bill Zhu	Test Voltage	AC 120V/60Hz

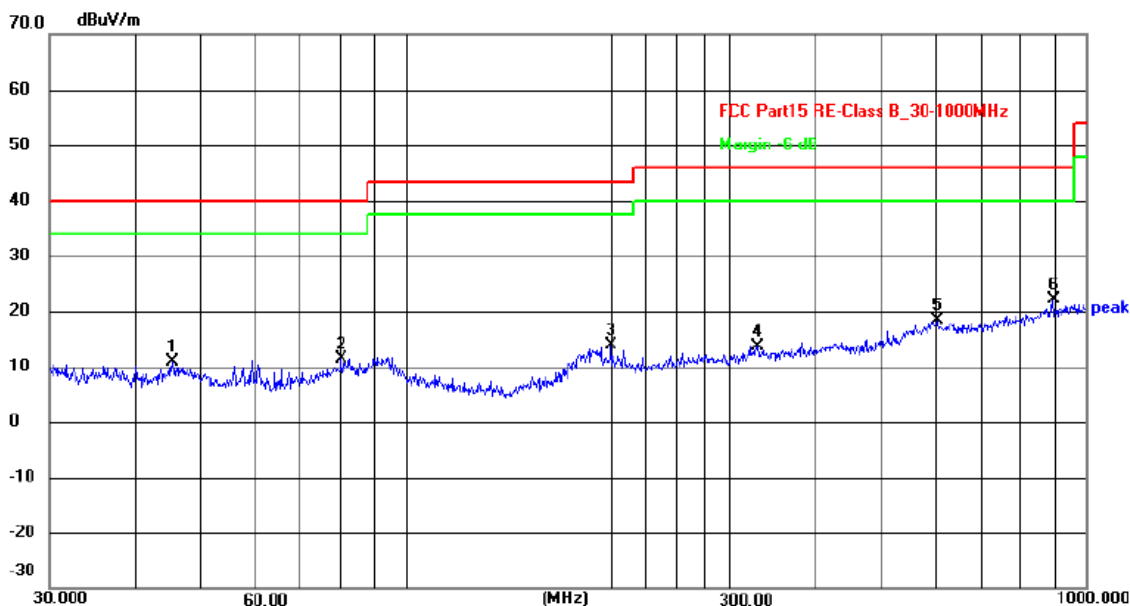


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.4238	35.71	-18.40	17.31	40.00	-22.69	QP
2	44.1202	28.94	-17.01	11.93	40.00	-28.07	QP
3	87.7248	32.60	-19.11	13.49	40.00	-26.51	QP
4	189.7385	34.65	-18.34	16.31	43.50	-27.19	QP
5	406.0880	29.78	-14.41	15.37	46.00	-30.63	QP
6	948.7610	29.47	-8.15	21.32	46.00	-24.68	QP





Test Model	4116	Test Mode	Mode 1
Environmental Conditions	24.1°C, 52.2% RH	Detector Function	Quasi-peak
Pol	Horizontal	Distance	3m
Test Engineer	Bill Zhu	Test Voltage	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	45.5348	27.85	-16.91	10.94	40.00	-29.06	peak
2	80.3619	31.25	-19.84	11.41	40.00	-28.59	peak
3	199.9856	31.17	-17.39	13.78	43.50	-29.72	peak
4	329.0390	27.94	-14.30	13.64	46.00	-32.36	peak
5	603.5392	29.00	-10.52	18.48	46.00	-27.52	peak
6	890.7278	30.52	-8.45	22.07	46.00	-23.93	peak

Note: 1. Pre-Scan all mode, Thus record worse case mode result in this report.



4. PHOTOGRAPH



Photo of Power Line Conducted Measurement

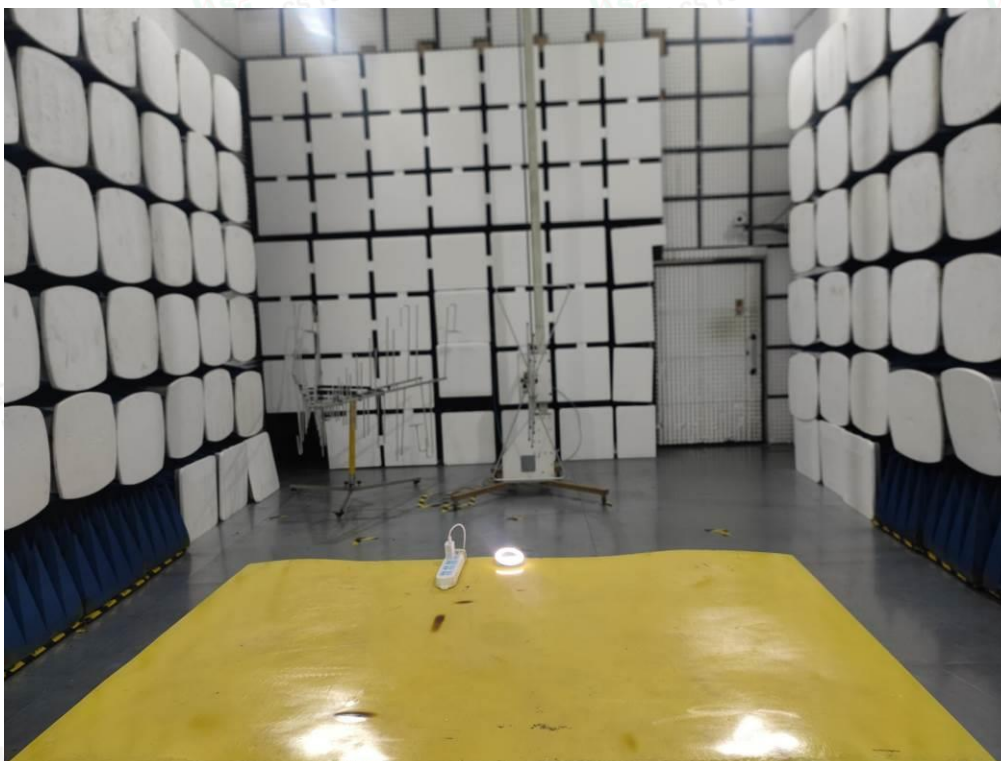


Photo of Radiated Measurement



5. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

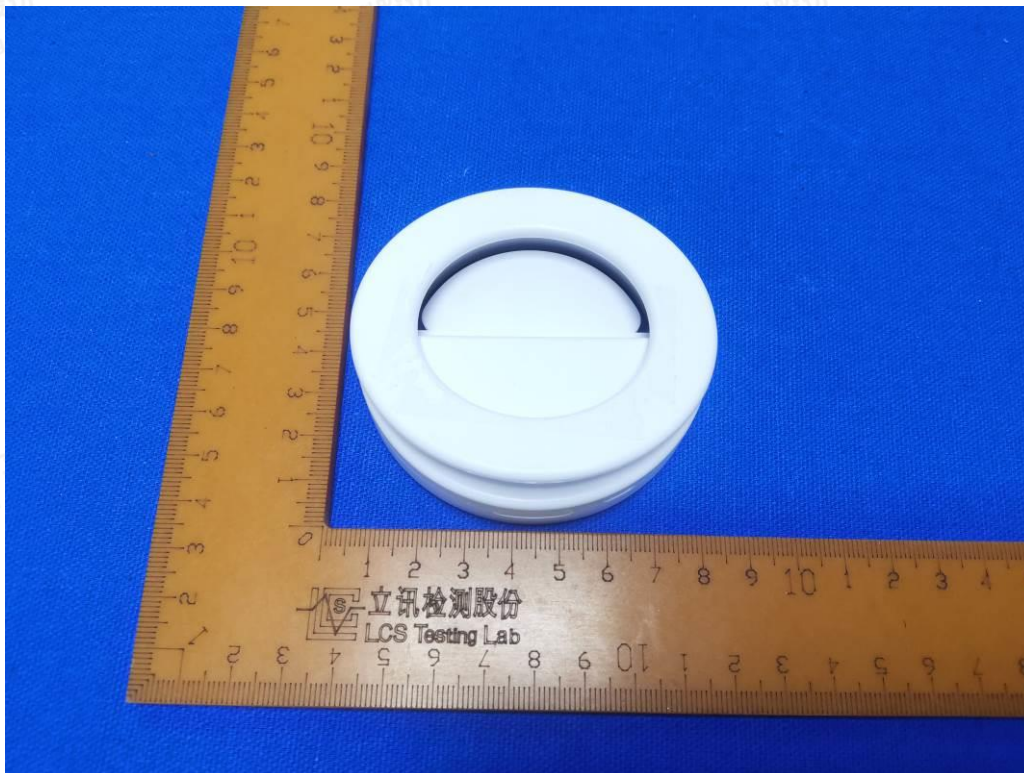


Fig. 1

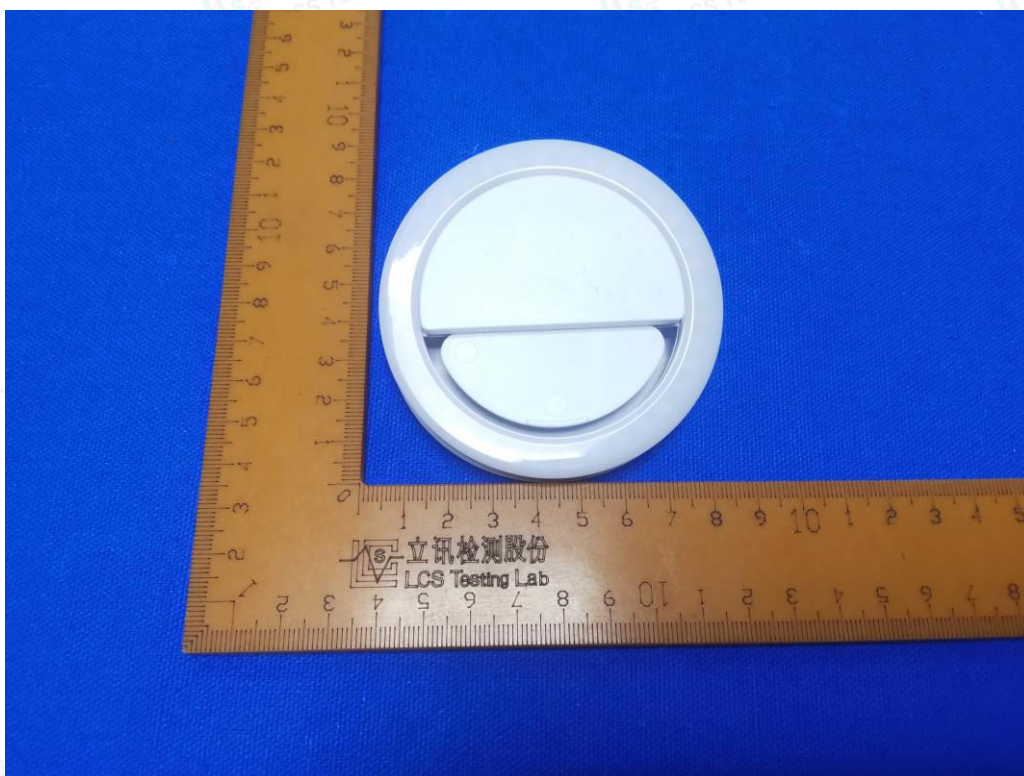


Fig. 2



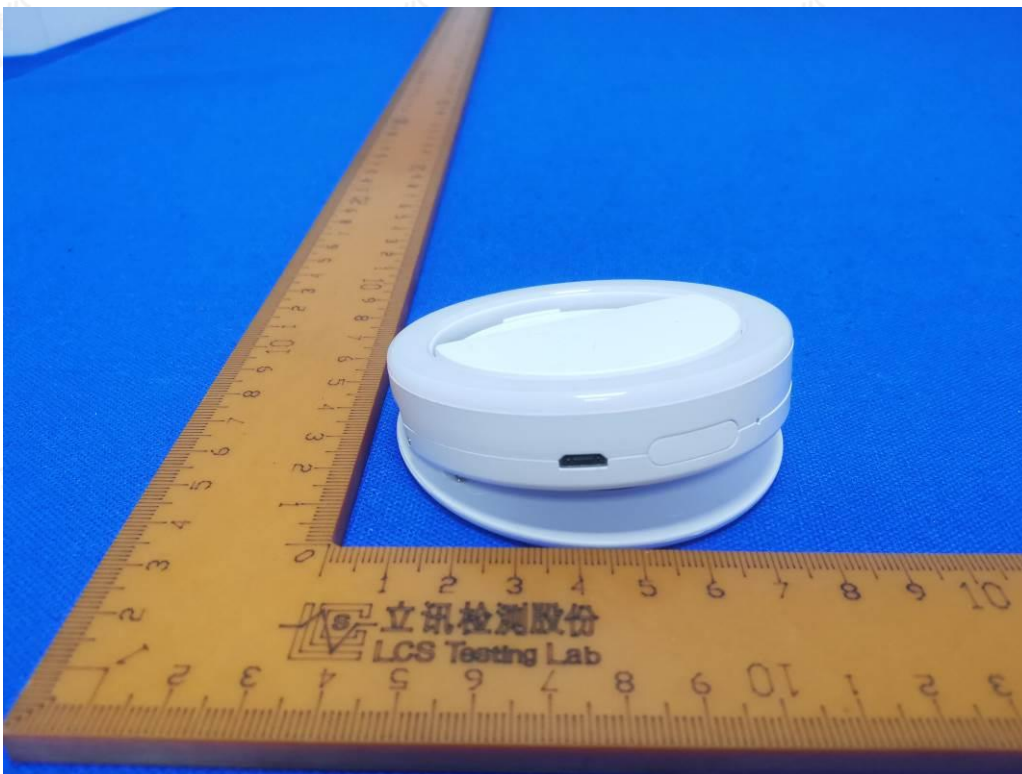


Fig. 3

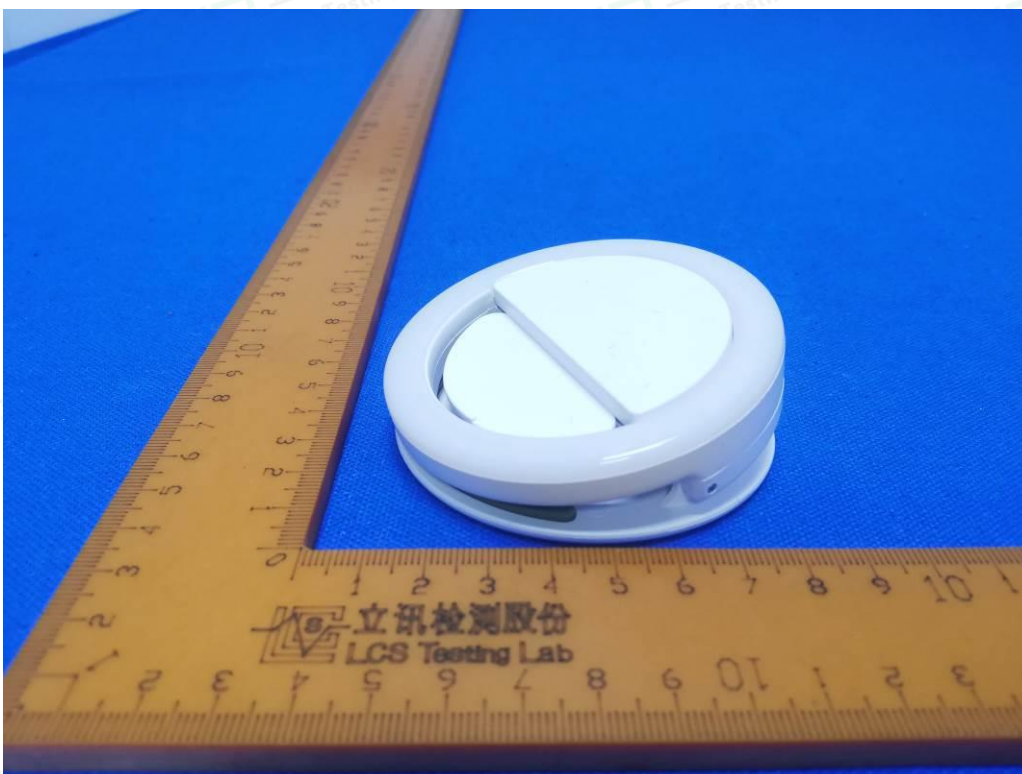


Fig. 4



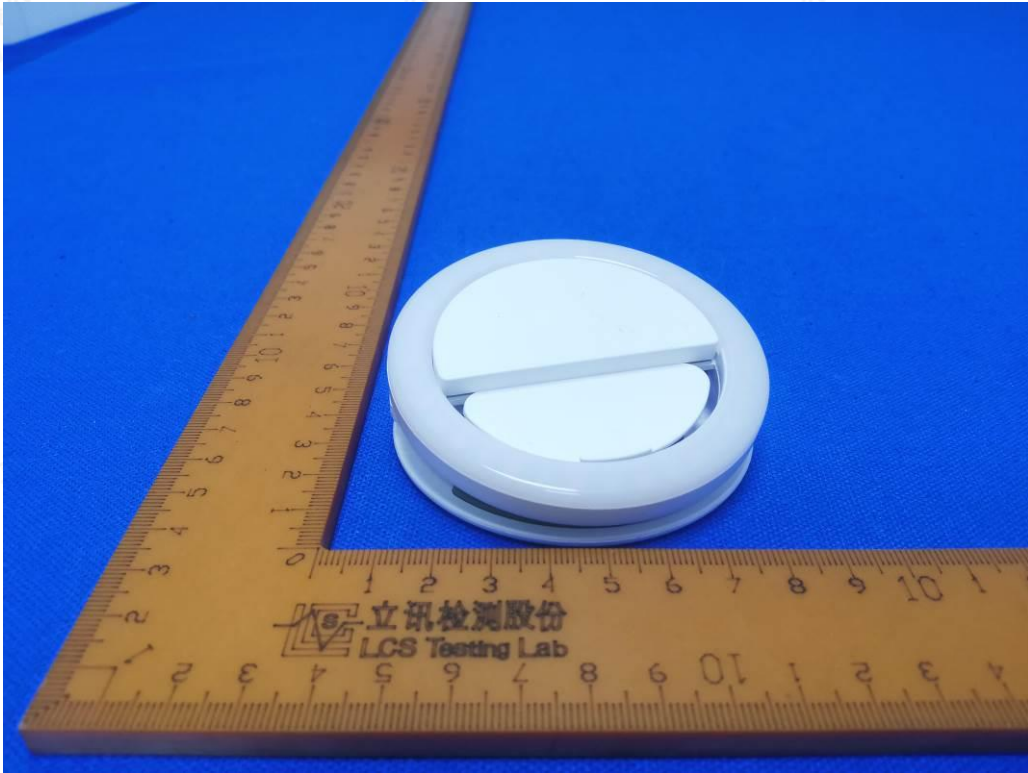


Fig. 5

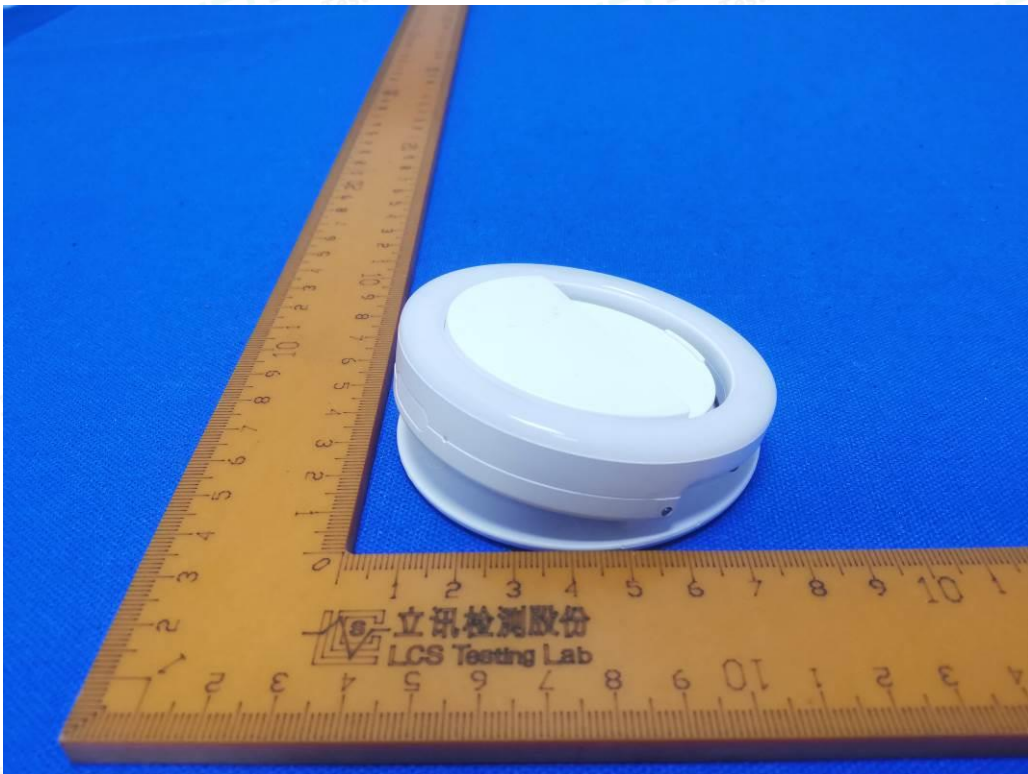


Fig. 6





Fig. 7

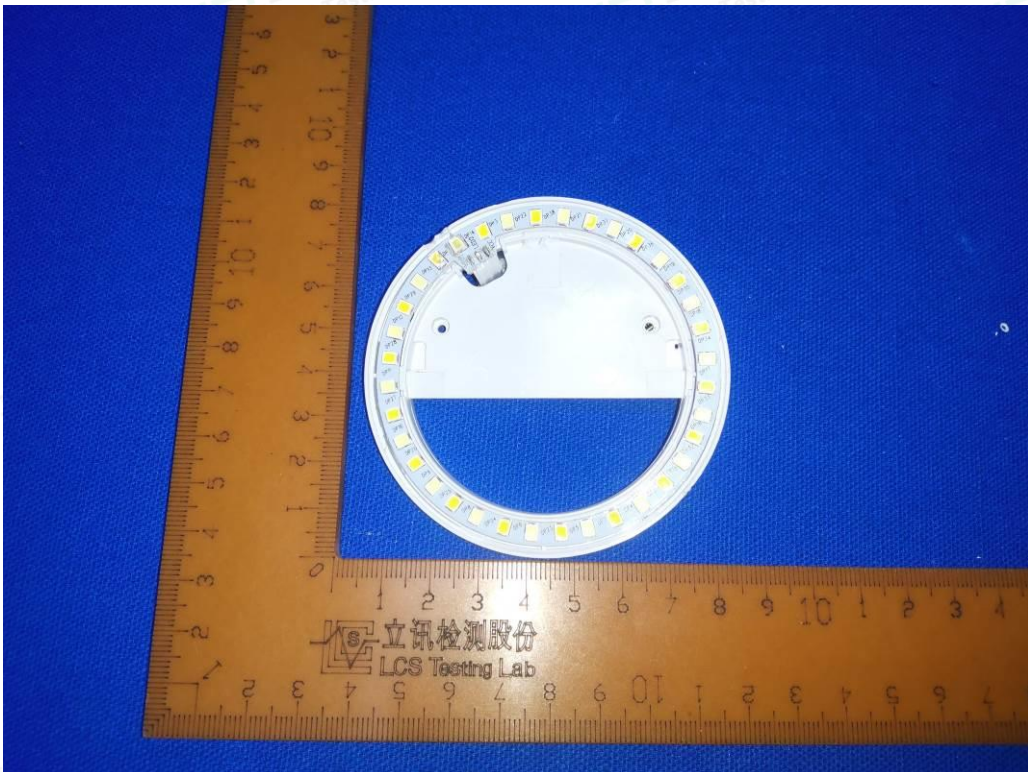


Fig. 8



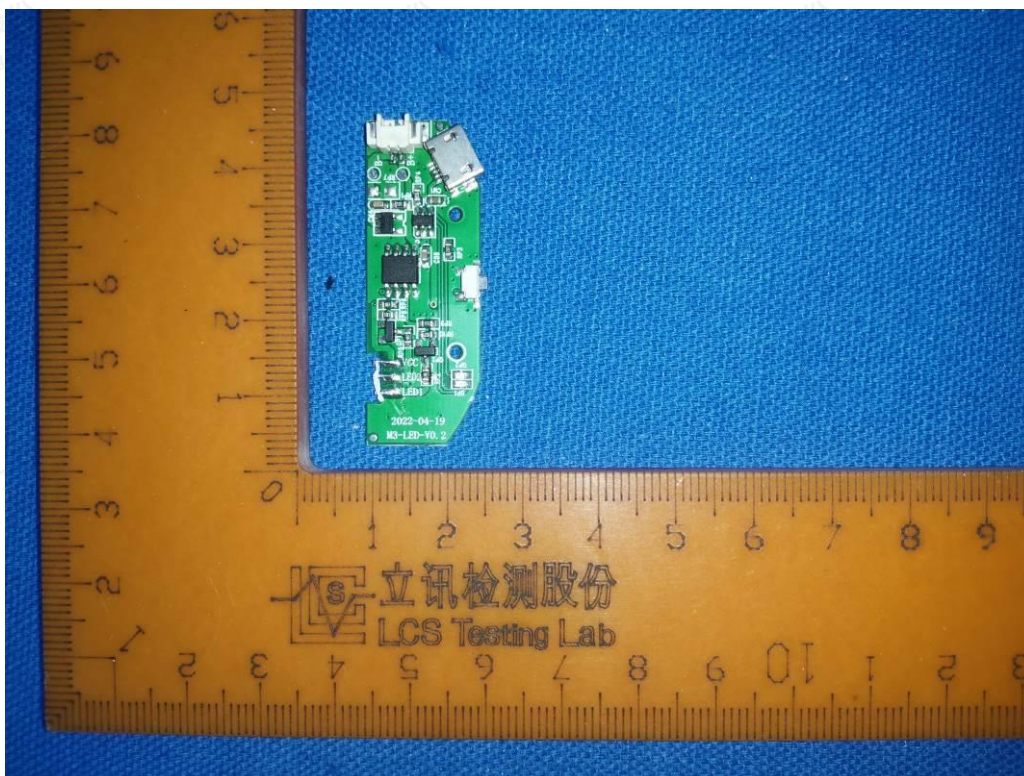


Fig. 9



Fig. 10





Fig. 11

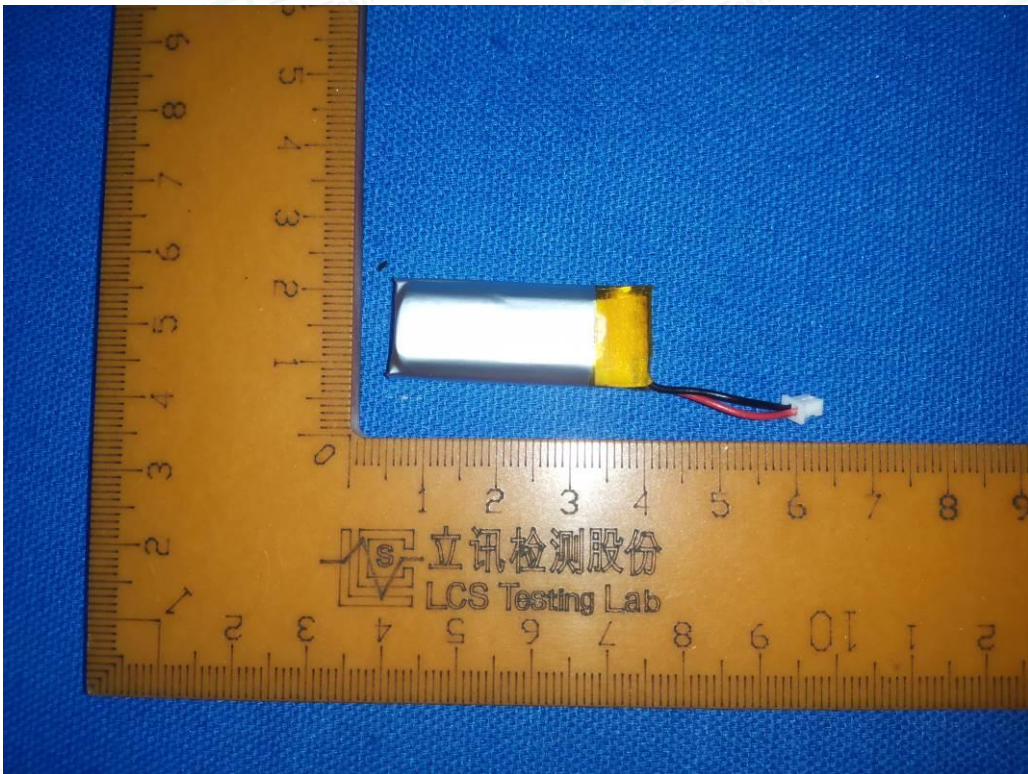


Fig. 12

-----THE END OF TEST REPORT-----

