



# FCC TEST REPORT

On Behalf of

Shenzhen UVLED Optical Technology Co., Ltd

Laptop Guard

Model No.: SZQ05-mini sun 1

Prepared for : Shenzhen UVLED Optical Technology Co., Ltd  
Address : Room 301, FL 3, Phase 1, Bangkai Science and Technology  
Park Phoenix Street Admin, Guangming District, Shenzhen

Prepared By : Shenzhen Alpha Product Testing Co., Ltd.  
Address : Building i, No.2, Lixin Road, Fuyong Street, Bao'an District,  
518103, Shenzhen, Guangdong, China

Report Number : A2006302-C01-R03  
Date of Receipt : July 15, 2020  
Date of Test : July 15, 2020  
Date of Report : July 16, 2020  
Version Number : V0

## TABLE OF CONTENTS

Description	Page
<b>1. General Information .....</b>	<b>5</b>
1.1. Description of Device (EUT).....	5
1.2. Accessories of Device (EUT) .....	5
1.3. Tested Supporting System Details.....	6
1.4. Block Diagram of connection between EUT and simulators.....	6
<b>2. Summary Of Standards And Results .....</b>	<b>7</b>
2.1. Description of Standards and Results .....	7
2.2. Test Mode Description.....	8
2.3. Test Equipment List.....	9
2.4. Test Facility .....	10
2.5. Measurement Uncertainty .....	10
<b>3. Power Line Conducted Emission Test.....</b>	<b>11</b>
3.1. Test Limits .....	11
3.2. Block Diagram of Test Setup.....	11
3.3. Configuration of EUT on Test .....	12
3.4. Operating Condition of EUT .....	12
3.5. Test KZ700-Hcedure .....	12
3.6. Test Results .....	13
3.7. Block Diagram of Test Setup.....	16
3.8. Configuration of EUT on Test .....	17
3.9. Operating Condition of EUT .....	17
3.10. Test Procedure .....	17
3.11. Test Results .....	18
<b>4. Photograph.....</b>	<b>22</b>
4.1. Photo of Power Line Conducted .....	22
4.2. Photo of Radiated Emission Test (In Semi Anechoic Chamber).....	22
<b>5. Photos Of The EUT .....</b>	<b>23</b>

## TEST REPORT DECLARATION

Applicant : Shenzhen UVLED Optical Technology Co., Ltd  
 Address : Room 301, FL 3, Phase 1, Bangkai Science and Technology Park Phoenix Street Admin, Guangming District, Shenzhen  
 Manufacturer : Shenzhen UV Guard Technology Co., Ltd  
 Address : 3/4F, Building A, NO. 2 NO.9, Bangkai Road, High-teach Industrial Park, Phoenix Street, Guangming New District, Shenzhen  
 EUT Description : Laptop Guard  
     (A) Model No. : SZQ05-mini sun 1  
     (B) Trademark : N/A

Measurement Standard Used:

### **FCC Rules and Regulations Part 15 Subpart B Class B, ANSI C63.4:2014**

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the FCC Part 15 requirements.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....: Ben Sun  
 Project Engineer

Approved by (name + signature).....: Simple Guan  
 Project Manager

Date of issue.....: July 16, 2020



**Revision History**

Revision	Issue Date	Revisions	Revised By
V0	July 16, 2020	Initial released Issue	Ben Sun

## 1. General Information

### 1.1. Description of Device (EUT)

Product Name : Laptop Guard

Model Number : SZQ05-mini sun 1

Diff : N/A

Highest Frequency : Less than 108MHz

Test Voltage : DC 5V From DC Power

EUT information : DC 5V

Trademark : N/A

Software version : N/A

Hardware version : N/A

### 1.2. Accessories of Device (EUT)

Power Source : N/A

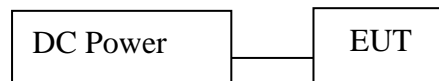
### 1.3. Tested Supporting System Details.

No.	Description	Manufacturer	Model	Serial Number
1.	DC Power	JUNKE	JK12010S	20140927-6

### 1.4. Block Diagram of connection between EUT and simulators

For Tests

For Lighting Mode



### Signal Cable Description of the above Support Units

No.	Port Name	Cable	Length	Shielded (Yes or No)	Detachable (Yes or No)
/	/	/	/	/	/
/	/	/	/	/	/

## 2. Summary Of Standards And Results

### 2.1.Description of Standards and Results

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

<b>EMISSION</b>			
<b>Description of Test Item</b>	<b>Standard</b>	<b>Limits</b>	<b>Results</b>
Power Line Conducted Emission Test	FCC Part 15 ANSI C63.4:2014	Class B	<b>P</b>
Radiated Emission Test	FCC Part 15 ANSI C63.4:2014	Class B	<b>P</b>

Note: 1. P is an abbreviation for Pass.  
2. F is an abbreviation for Fail.

## 2.2. Test Mode Description

For Conducted Emission and Radiated Emission Test		
Mode No.	Test Mode	Test Voltage
1.	Lighting	DC 5V From DC Power



### 2.3.Test Equipment List

For Power Line Conducted Emission Test Equipment:						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	101165	2019.09.05	1 Year
2.	L.I.S.N.#1	Schwarz beck	NSLK8126	8126466	2019.09.05	1 Year
3.	L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2019.09.05	1 Year
4.	Pulse Limiter	Schwarz beck	9516F	9618	2019.09.05	1 Year

For Frequency Range 30MHz~1GHz Radiated Emission Test Equipment:						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Test Receiver	Rohde&Schwarz	ESR	1316.3003K03-102082-Wa	2019.09.06	1 Year
2	Bilog Antenna	Schwarz beck	VULB 9168	9168-627	2020.04.12	2 Year

For Frequency Range above 1GHz Radiated Emission Test Equipment:						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum analyzer	ROHDE&SCHWARZ	FSU	1166.1660.26	2019.09.06	1 Year
2	Horn Antenna	Schwarz beck	BBHA 9120 D	BBHA 9120 D(1201)	2020.04.12	2 Year
3	Amplifier	Agilent	8449B	3008A02664	2019.09.06	1 Year

## 2.4. Test Facility

Shenzhen Alpha Product Testing Co., Ltd.

Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission

Registration Number: 293961

## 2.5. Measurement Uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	2.74dB
Uncertainty for Radiation Emission test (<1G)	3.77 dB (Distance: 3m Polarize: V)
	3.80 dB (Distance: 3m Polarize: H)
Uncertainty for Radiation Emission test (>1G)	4.13 dB (Distance: 3m Polarize: V)
	4.16 dB (Distance: 3m Polarize: H)
(95% confidence levels, k=2)	

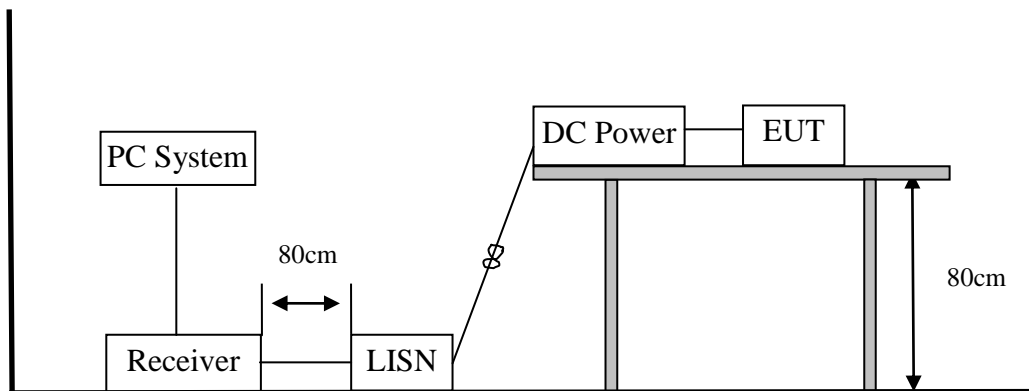
### 3. Power Line Conducted Emission Test

#### 3.1. Test Limits

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB( $\mu$ V)	Average Level dB( $\mu$ V)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

- Notes:
1. Emission level=Read level + LISN factor-Preamplifier factor + Cable loss
  2. \* Decreasing linearly with logarithm of frequency.
  3. The lower limit shall apply at the transition frequencies.

#### 3.2. Block Diagram of Test Setup



### 3.3.Configuration of EUT on Test

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

### 3.4.Operating Condition of EUT

- (1) Setup the EUT as shown as Section 3.2.
- (2) Turn on the power of all equipment.
- (3) Let the EUT work in test mode and 15 minutes before taking the test.

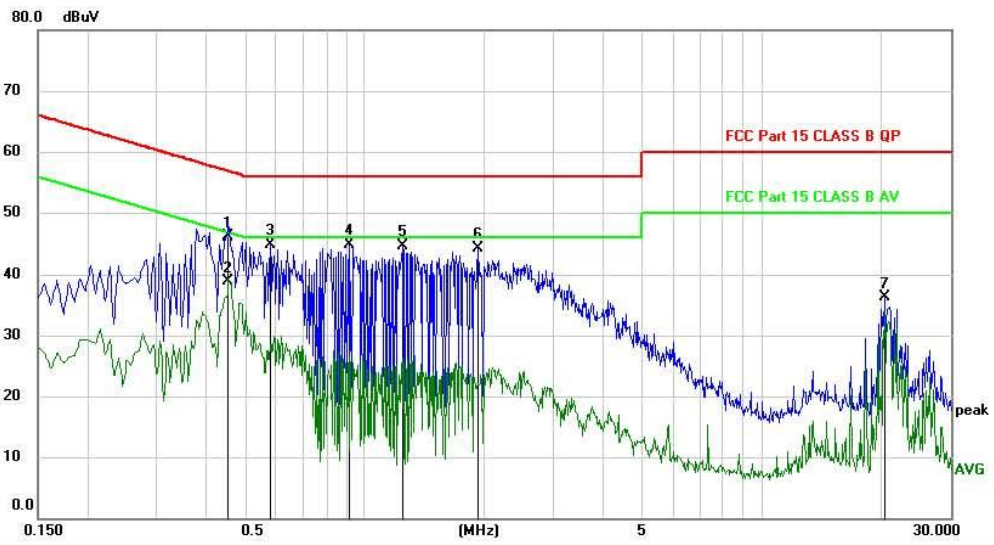
### 3.5.Test KZ700-Hcedure

- (1) The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4:2014 on conducted Emission test.
- (2) The frequency range from 150kHz to 30MHz is checked, the bandwidth of test receiver (R&S TEST RECEIVER ESCI) is set at 9kHz.

### 3.6. Test Results

Test Date : 2020.07.15	Temperature : 24°C
Test Engineer : Ben Sun	Humidity : 56%
Test Mode : Lighting	
Test Results : PASS	
Note: 1. The test results are listed in next pages. 2. If the limits for the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.	

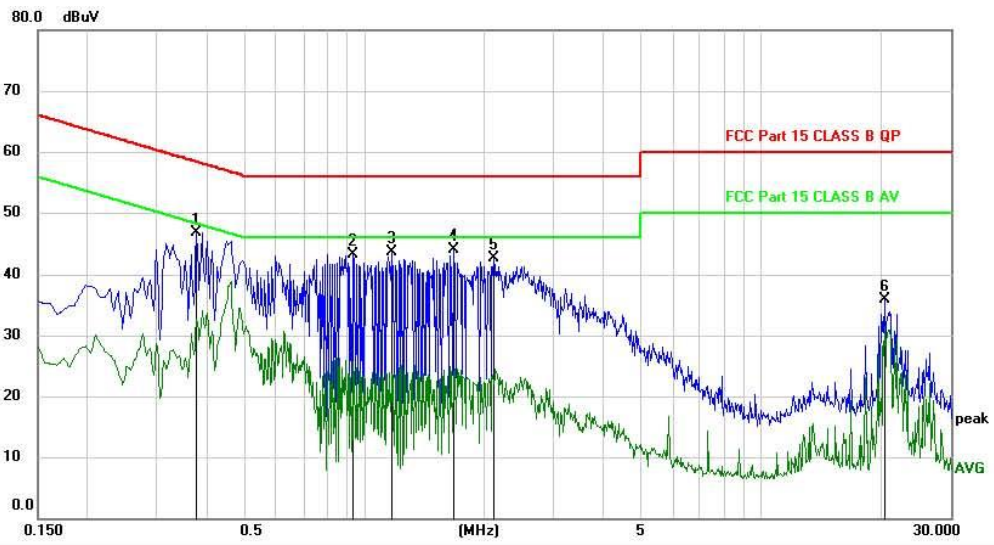
**Phase: L**



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.4560	36.14	9.95	46.09	56.77	-10.68	QP	
2	*	0.4560	28.89	9.95	38.84	46.77	-7.93	AVG	
3		0.5820	34.94	9.93	44.87	56.00	-11.13	peak	
4		0.9180	34.98	9.96	44.94	56.00	-11.06	peak	
5		1.2480	34.79	9.90	44.69	56.00	-11.31	peak	
6		1.9320	34.37	9.89	44.26	56.00	-11.74	peak	
7		20.4240	25.85	10.47	36.32	60.00	-23.68	peak	

\*:Maximum data    x:Over limit    l:over margin    (Reference Only)  
 Note: Measurement=Reading Level+Correc Factor;    Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

**Phase: N**

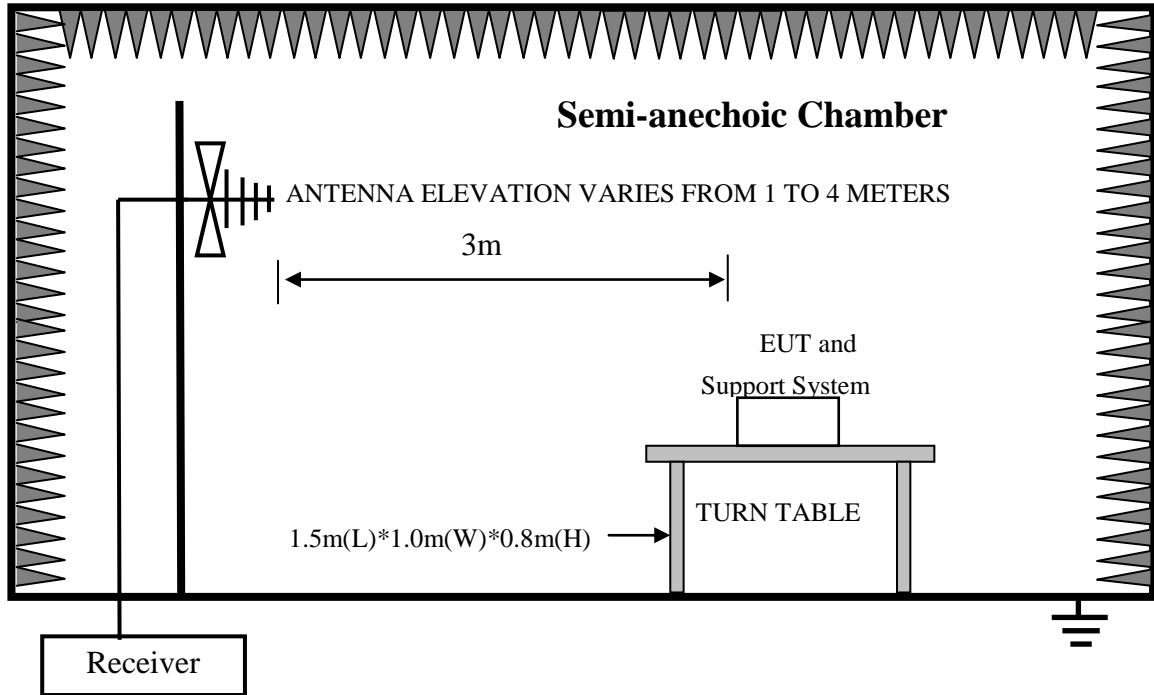


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.3780	36.76	9.94	46.70	58.32	-11.62	peak	
2		0.9300	33.43	9.95	43.38	56.00	-12.62	peak	
3		1.1700	33.83	9.89	43.72	56.00	-12.28	peak	
4		1.6740	34.13	9.89	44.02	56.00	-11.98	peak	
5		2.1120	32.90	9.88	42.78	56.00	-13.22	peak	
6		20.4360	25.42	10.47	35.89	60.00	-24.11	peak	

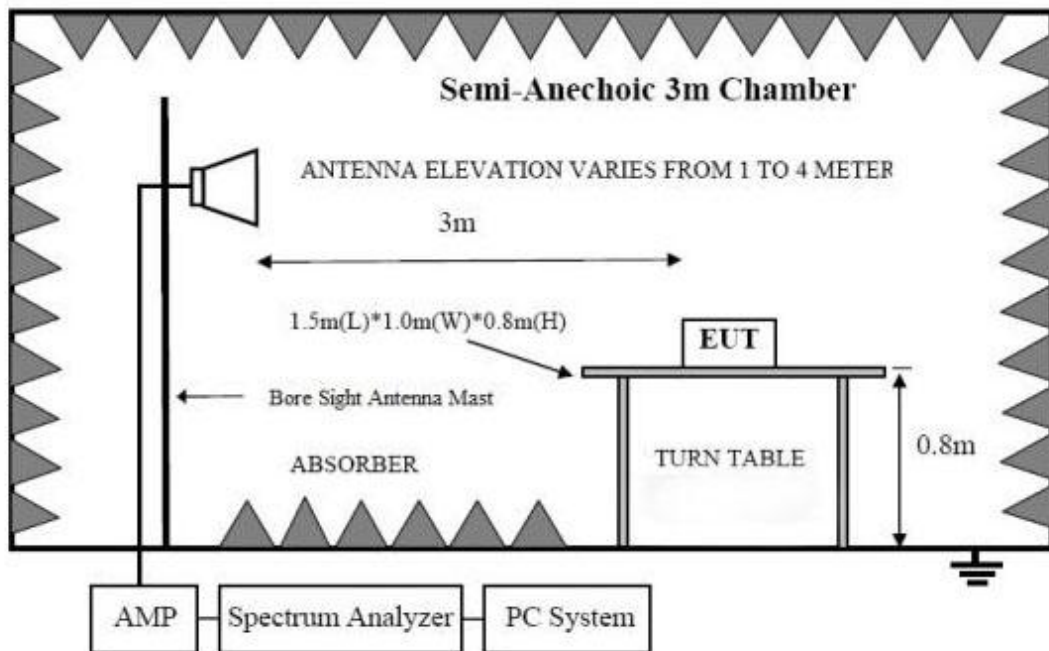
\*:Maximum data    x:Over limit    l:over margin    (Reference Only)  
 Note: Measurement=Reading Level+Correc Factor;    Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

### 3.7. Block Diagram of Test Setup

In Semi Anechoic Chamber (3m) Test Setup Diagram for 30MHz~1000MHz



In Semi Anechoic Chamber (3m) Test Setup Diagram for Above 1GHz





### 3.8.Configuration of EUT on Test

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

### 3.9.Operating Condition of EUT

- (1) Setup the EUT as shown as Section 4.2.
- (2) Turn on the power of all equipment.
- (3) Let the EUT work in test mode and 15 minutes before taking the test.

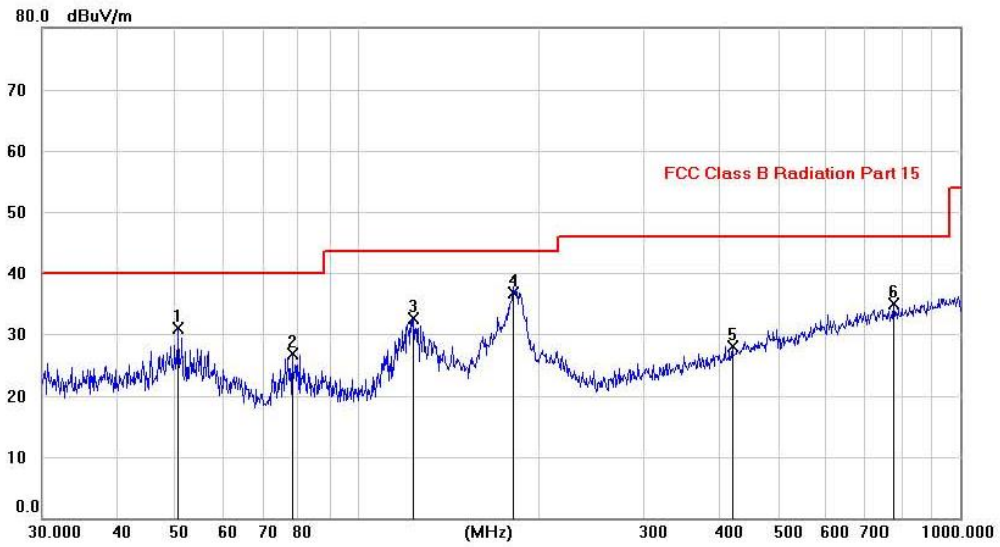
### 3.10.Test Procedure

- (1) The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. An antenna was located 3m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4:2014 on Radiated Emission test.
- (2) For the radiated emission test above 1GHz:  
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- (3) The frequency range from 30MHz to 1000MHz is checked, the bandwidth of test receiver (R&S TEST RECEIVER ESR) is set at 120kHz.
- (4) The frequency range from above 1GHz is checked, the bandwidth of spectrum analyzer (Spectrum Analyzer FSU) is set at 1MHz.
- (5) The frequency range from 30MHz to 1000MHz was pre-scanned with a peak detector and all final readings of measurement from Test Receiver are Quasi-Peak values, the frequency range from 1GHz to 6GHz was pre-scanned with a peak detector and all final readings of measurement from Spectrum Analyzer are peak and average values checked, all measurement distance is 3m in 3m semi anechoic chamber.
- (6) The test results are reported on Section 4.7.

### 3.11.Test Results

Frequency Range	: <b>30MHz~1000MHz</b>		
Test Date	: 2020.07.15	Temperature	: 24°C
Test Engineer	: Ben Sun	Humidity	: 56%
Test Mode	: Lighting		
Test Results	: PASS		
Note: 1. The test results are listed in next pages.			

### Antenna polarity: Vertical

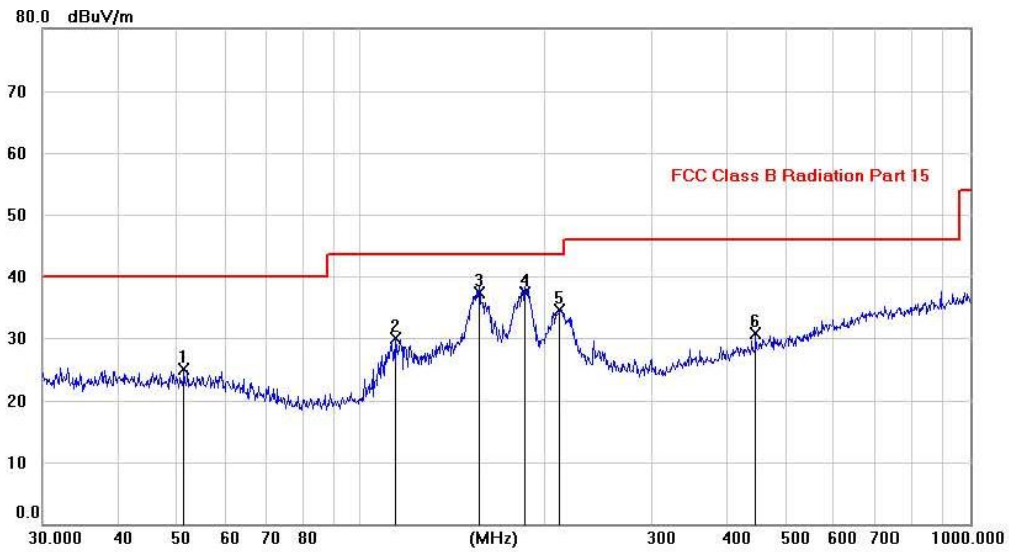


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		50.6392	16.42	14.53	30.95	40.00	-9.05			peak
2		78.0841	15.92	10.88	26.80	40.00	-13.20			peak
3		124.4380	18.43	14.14	32.57	43.50	-10.93			peak
4	*	182.1755	23.28	13.45	36.73	43.50	-6.77			QP
5		419.2551	9.98	17.95	27.93	46.00	-18.07			peak
6		775.2451	10.86	24.08	34.94	46.00	-11.06			peak

Note:1. \*:Maximum data; x:Over limit; l:over margin.

2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

## Antenna polarity: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		51.3725	10.40	14.48	24.88	40.00	-15.12			peak
2		114.2739	16.87	13.13	30.00	43.50	-13.50			peak
3		156.8973	21.29	16.04	37.33	43.50	-6.17			QP
4	*	187.0958	24.48	12.86	37.34	43.50	-6.16			QP
5		211.9720	22.23	12.29	34.52	43.50	-8.98			peak
6		446.2576	11.96	18.74	30.70	46.00	-15.30			peak

Note:1. \*:Maximum data; x:Over limit; l:over margin.

2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Frequency Range : <b>Above 1GHz</b>	
Test Date : N/A	Temperature : N/A
Test Engineer : N/A	Humidity : N/A
Test Mode : N/A	
Test Results : N/A	
1. The highest frequency of the internal sources of the EUT is less than 108 MHz, the Note: measurement shall only be made up to 1 GHz. So the frequency above 1GHz radiation test not applicable.	

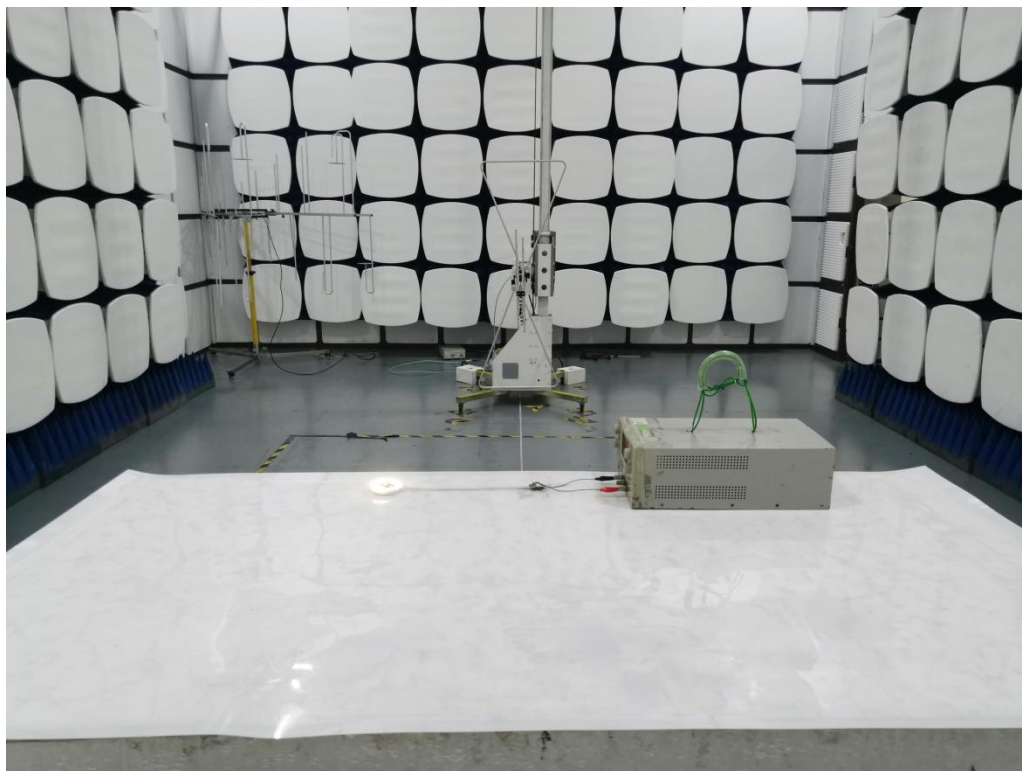
## 4. PHOTOGRAPH

### 4.1.Photo of Power Line Conducted

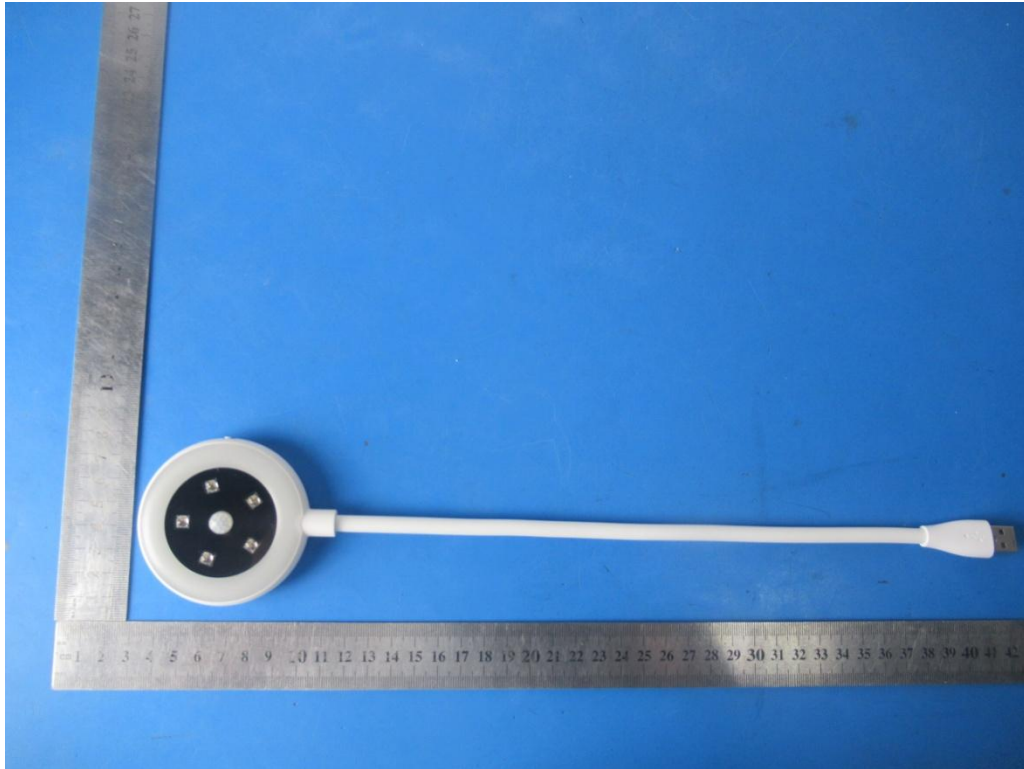


### 4.2.Photo of Radiated Emission Test (In Semi Anechoic Chamber)

**30-1000MHz**



### 5. Photos Of The EUT



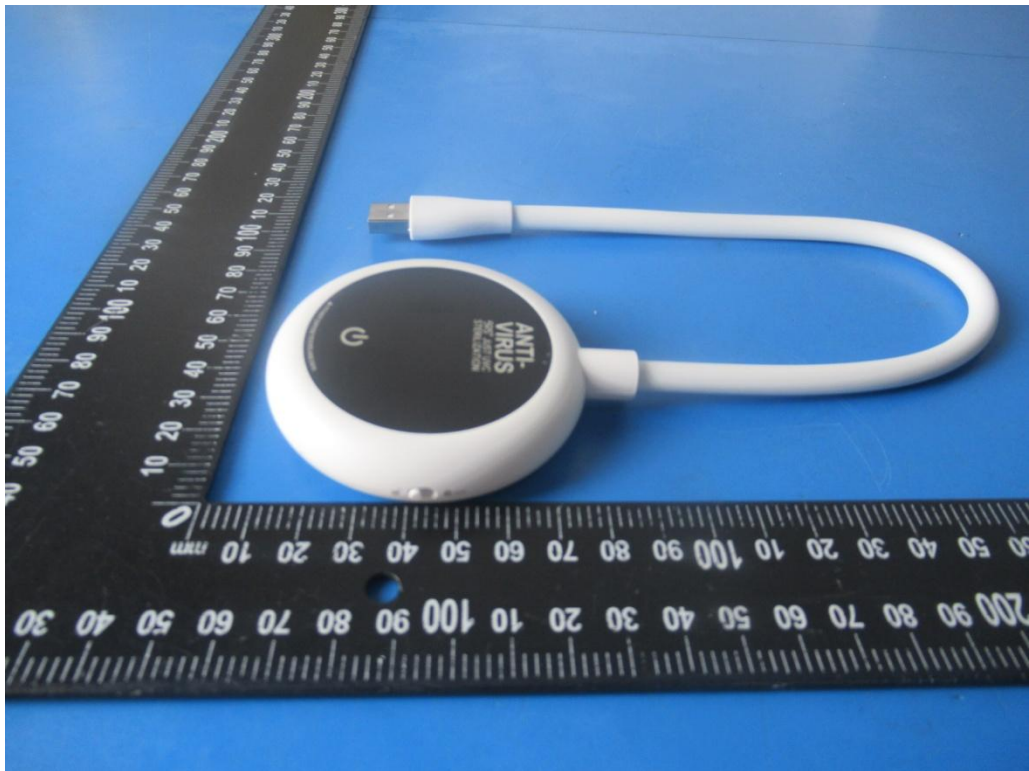
**EUT View**



**EUT View**



**EUT View**



**EUT View**

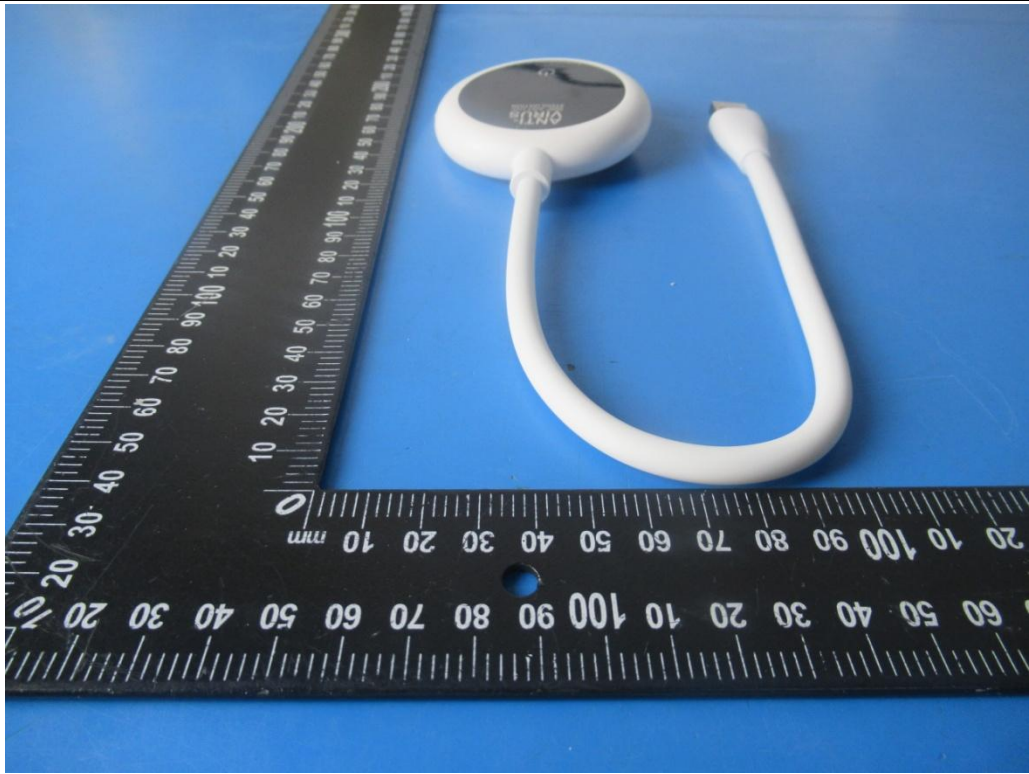




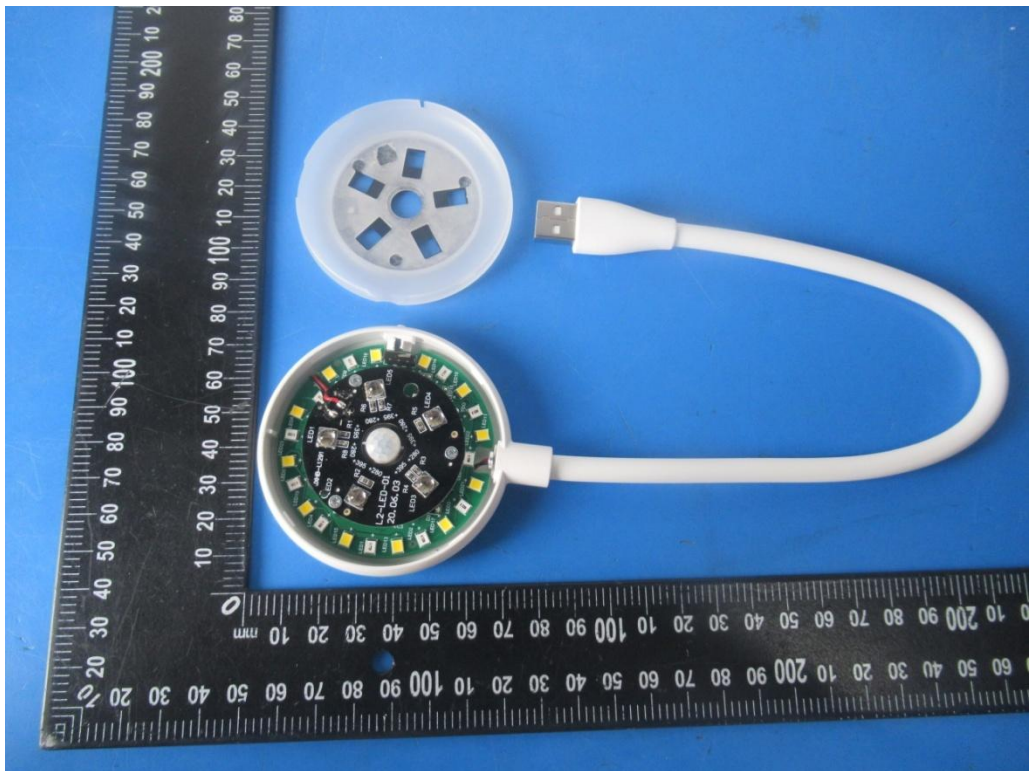
**EUT View**



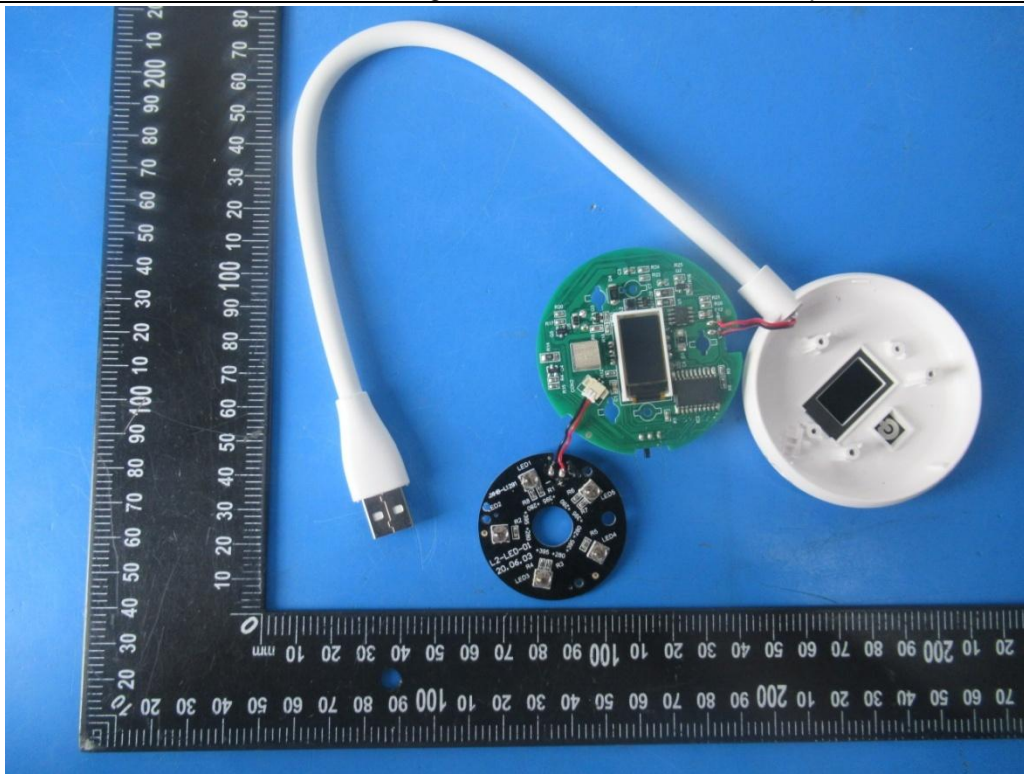
**EUT View**



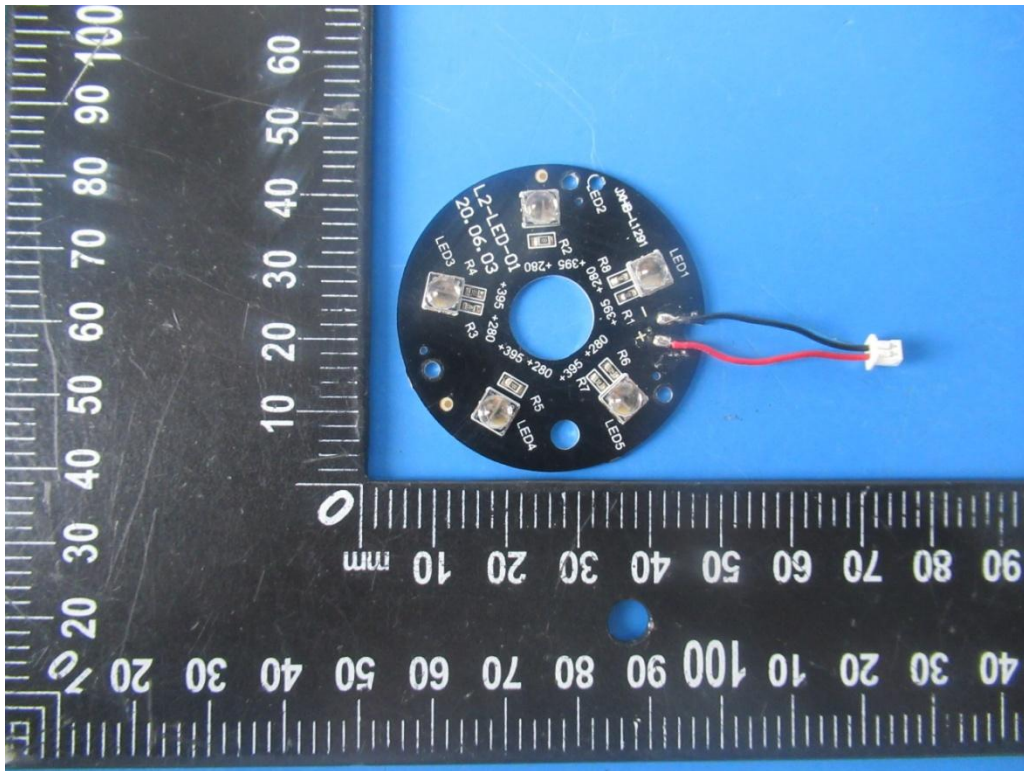
**EUT View**



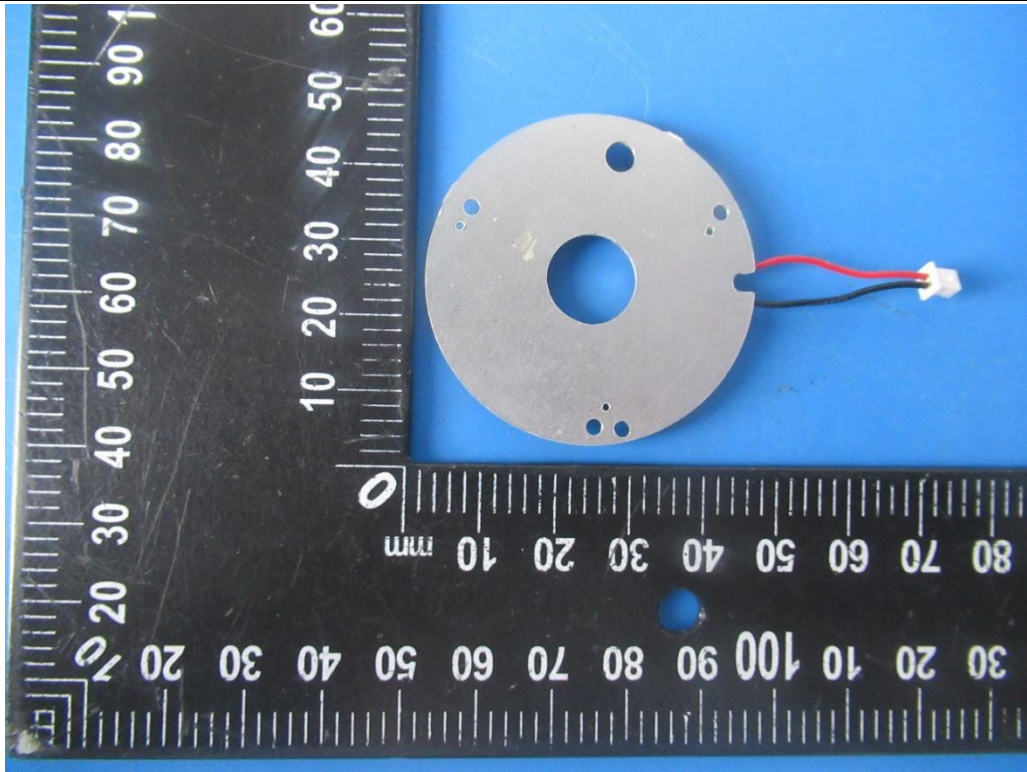
**EUT View**



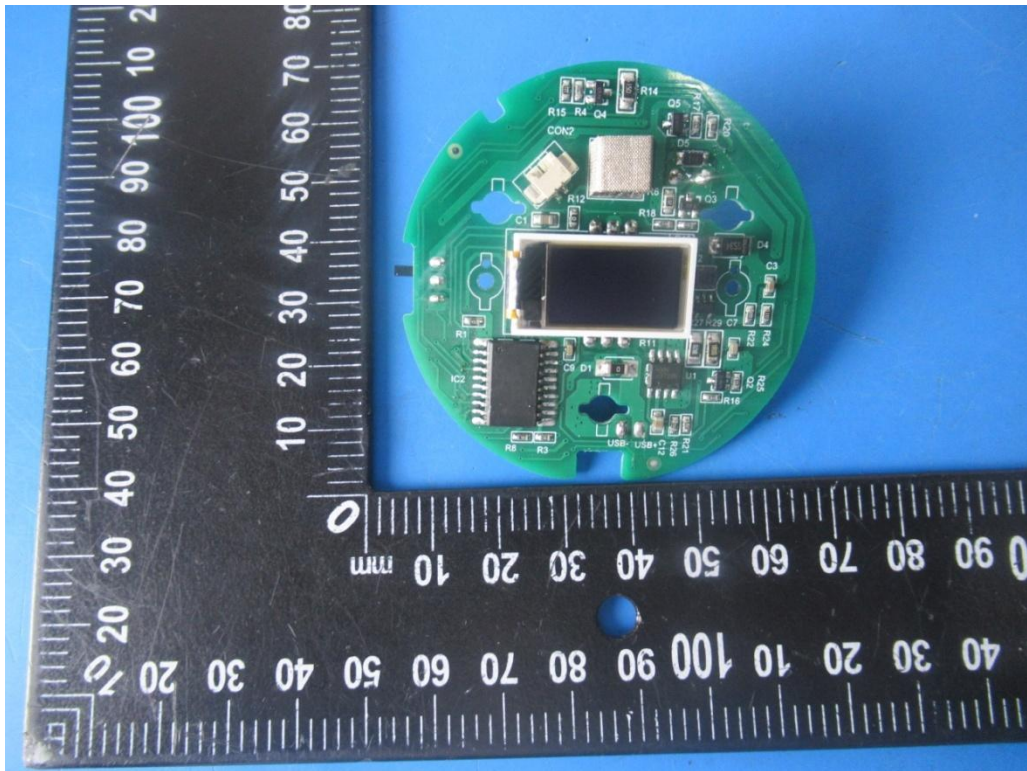
**EUT View**



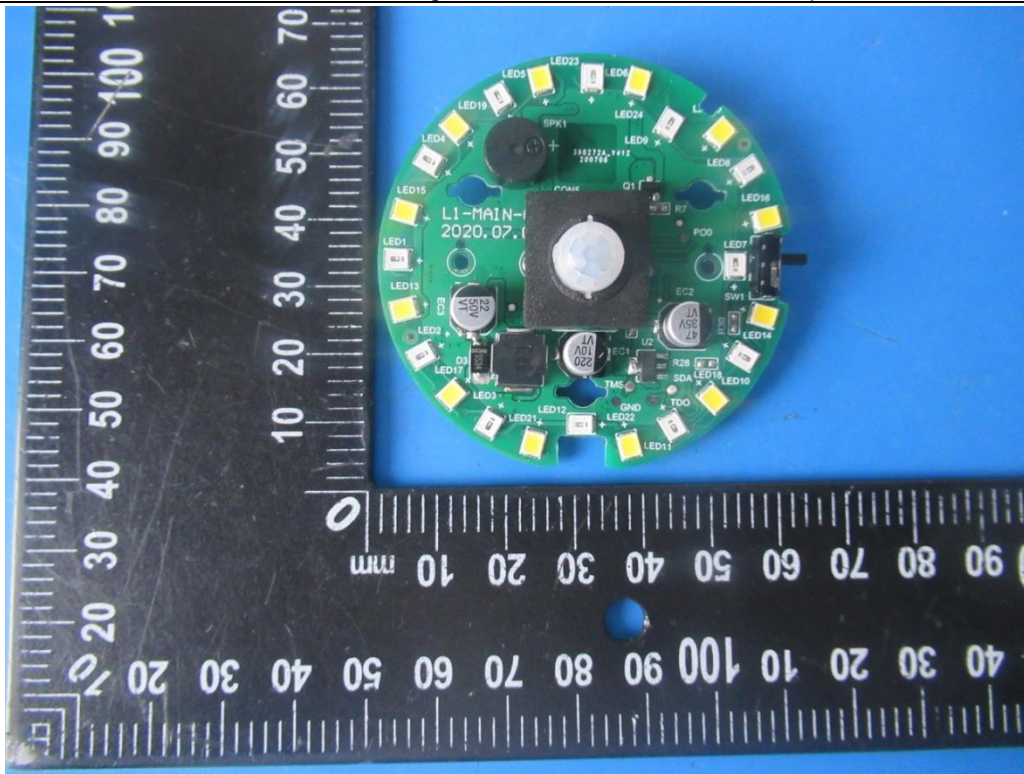
**EUT View**



**EUT View**



**EUT View**



**EUT View**

**-----END OF REPORT-----**