

TEST REPORT

Zhongshan OEPE lighting Co.,LTD

UV Disinfection Lamp

Test Model: OEPE01

Additional Model No.: OEPE02, OEPE03,OEPE04,OEPE05

Prepared for : Zhongshan OEPE lighting Co.,LTD
Address : Floor 6-2, No. 156, East of Xinxing Avenue, Guzhen
Town, Zhongshan City, Guangdong Province, China

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample : April 20, 2020
Number of tested samples : 1
Serial number : Prototype
Date of Test : April 20, 2020 ~ April 22, 2020
Date of Report : April 24, 2020

FCC TEST REPORT

FCC Part 15, Subpart B, Class B

Report Reference No. : LCS200401179AE

Date Of Issue : April 24, 2020

Testing Laboratory Name : Shenzhen LCS Compliance Testing Laboratory Ltd.

Address : 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Shajing Street, Baoan District, Shenzhen, China

Testing Location/ Procedure... : Full application of Harmonised standards ■
Partial application of Harmonised standards □
Other standard testing method □**Applicant's Name..... : Zhongshan OEPE lighting Co.,LTD**

Address : Floor 6-2, No. 156, East of Xinxing Avenue, Guzhen Town, Zhongshan City, Guangdong Province, China

Test Specification

Standard..... : FCC Part 15, Subpart B, Class B

Test Report Form No..... : LCSEMC-1.0

TRF Originator..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF..... : Dated 2011-03

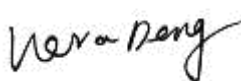
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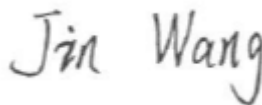
Test Item Description..... : UV Disinfection Lamp

Test Model : OEPE01

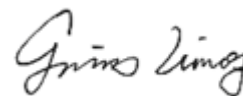
Trade Mark : OEPE

Ratings : Input: 100-240V~, 50/60Hz
Output: 12V=2A**Result : Positive****Compiled by:**

Vera Deng / Administrators

Supervised by:

Jin Wang /Technique principal

Approved by:

Gavin Liang/ Manager

FCC -- TEST REPORT**Test Report No. : LCS200401179AE**April 24, 2020

Date of issue

Test Model : OEPE01

EUT..... : UV Disinfection Lamp

Applicant..... : Zhongshan OEPE lighting Co.,LTDAddress..... : Floor 6-2, No. 156, East of Xinxing Avenue, Guzhen
Town, Zhongshan City, Guangdong Province, China

Telephone..... : /

Fax..... : /

Manufacturer..... : Zhongshan OEPE lighting Co.,LTDAddress..... : Floor 6-2, No. 156, East of Xinxing Avenue, Guzhen
Town, Zhongshan City, Guangdong Province, China

Telephone..... : /

Fax..... : /

Factory..... : Zhongshan OEPE lighting Co.,LTDAddress..... : Floor 6-2, No. 156, East of Xinxing Avenue, Guzhen
Town, Zhongshan City, Guangdong Province, China

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

Revision	Issue Date	Revisions	Revised By
000	April 24, 2020	Initial Issue	Gavin Liang

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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 Part 15, Subpart B, Class B	Class B	PASS
Radiated disturbance	FCC Part 15, Subpart B, Class B	Class B	PASS
N/A is an abbreviation for Not Applicable.			

Test mode:

Mode 1	Full Load	Record
Mode 2	Half Load	Pre-scan
Mode 3	No load	Pre-scan

***Note: All test modes were tested, but we only recorded the worst case in this report.

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT : UV Disinfection Lamp
Trade Mark : OEPE
Test Model : OEPE01
Additional Model No. : OEPE02, OEPE03, OEPE04, OEPE05
Model declaration : PCB board, structure and internal of these model(s) are the same, So no additional models were tested.
Power Supply : Input: 100-240V~, 50/60Hz
Output: 12V $\overline{\text{---}}$ 2A

Highest internal frequency (Fx)	Highest measured frequency
$F_x \leq 108 \text{ MHz}$	1 GHz
$108 \text{ MHz} < F_x \leq 500 \text{ MHz}$	2 GHz
$500 \text{ MHz} < F_x \leq 1 \text{ GHz}$	5 GHz
$F_x > 1 \text{ GHz}$	5 x 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. Description of Test Facility

Site Description

EMC Lab. : FCC Registration Number. is 254912.
Industry Canada Registration Number. is 9642A.
ESMD Registration Number. is ARCB0108.
UL Registration Number. is 100571-492.
TUV SUD Registration Number. is SCN1081.
TUV RH Registration Number. is UA 50296516-001.
NVLAP Registration Code is 600167-0.
FCC Designation Number is CN5024.
CAB identifier: CN0071.

2.3. 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.

2.4. 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 (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

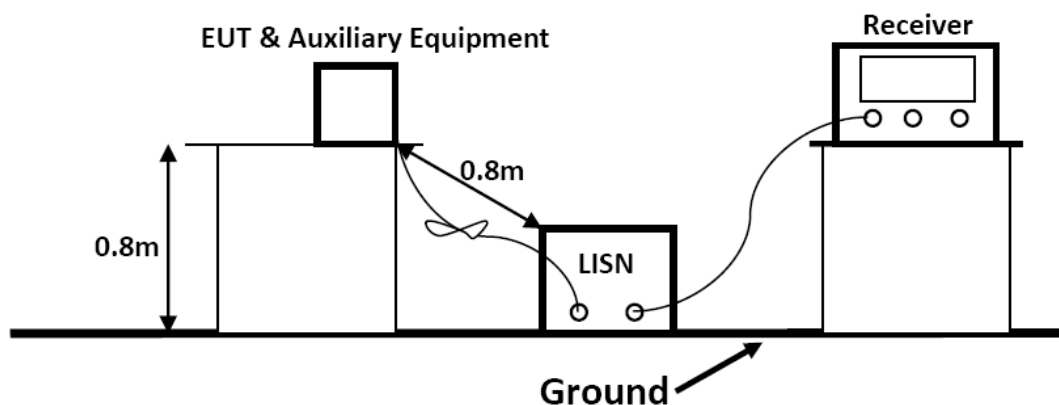
3.1. POWER LINE CONDUCTED EMISSION MEASUREMENT

3.1.1. Test Equipment

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

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Software	EZ	EZ-EMC	/	N/A
2	EMI Test Receiver	R&S	ESPI	101840	2019-06-11
3	Artificial Mains	R&S	ENV216	101288	2019-06-12
4	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-0032	2019-06-11

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.

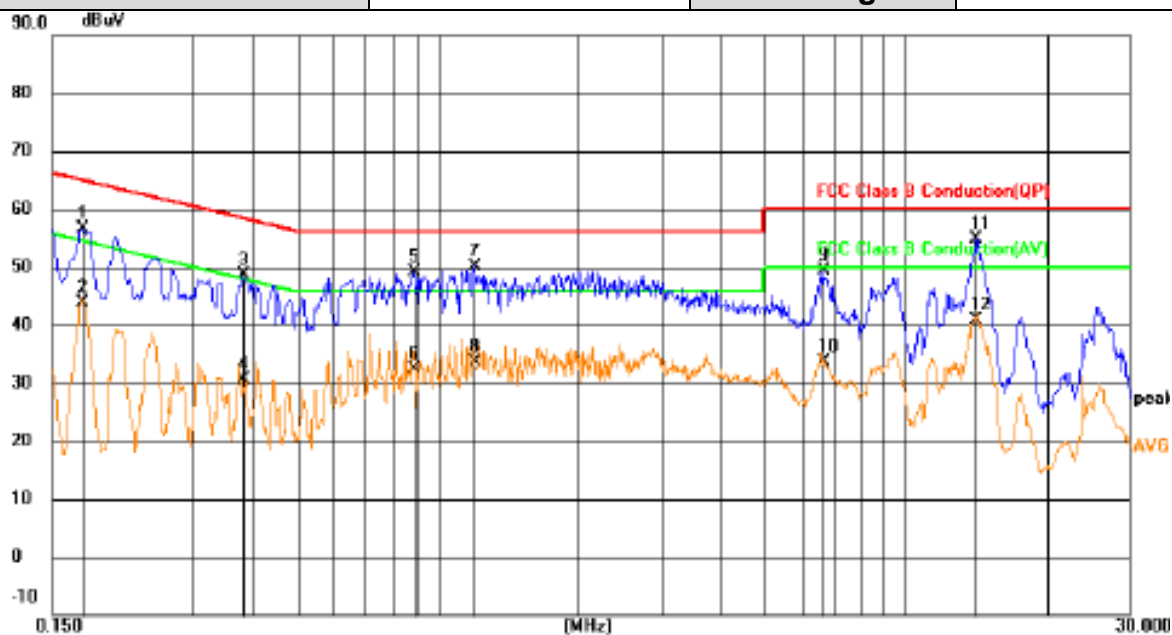
The frequency range from 150kHz to 30MHz is investigated

3.1.7. Test Results

PASS.

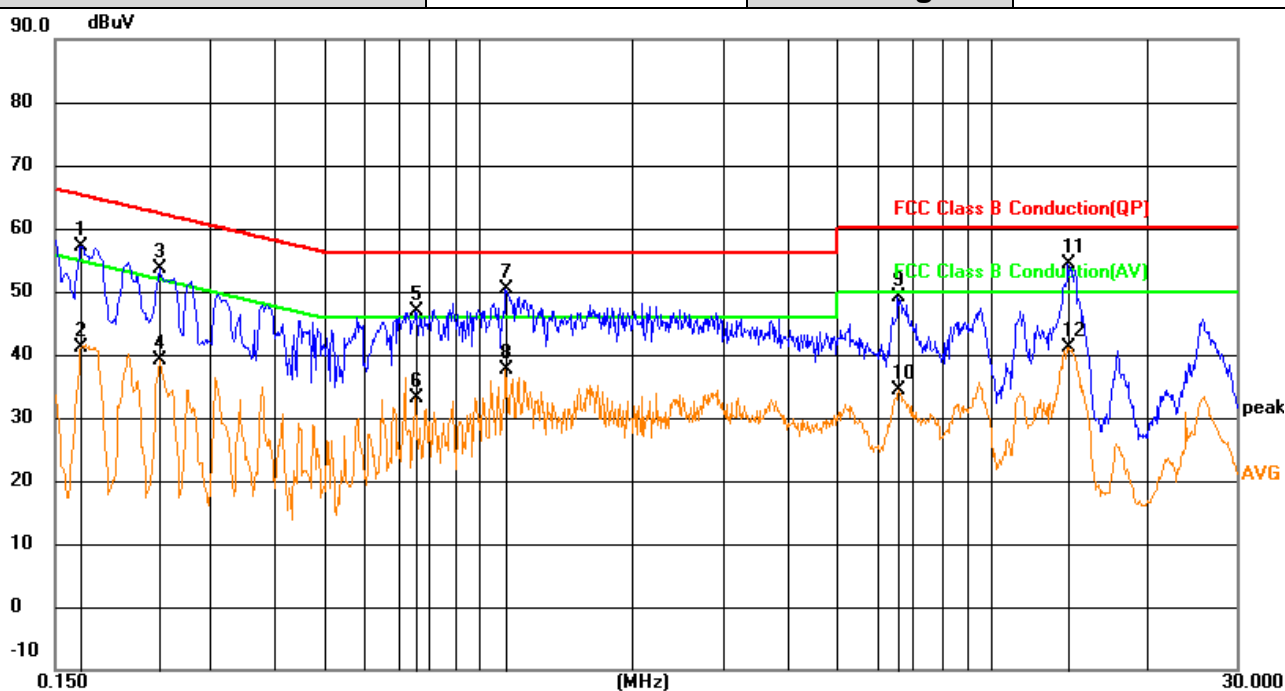
The test result please refer to the next page.

Test Model	OEPE01	Test Mode	Mode 1
Environmental Conditions	24.5°C, 53.3% RH	Test Engineer	David Luo
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		0.1748	37.50	19.16	56.66	64.73	-8.07	QP	
2		0.1748	24.77	19.16	43.93	54.73	-10.80	AVG	
3		0.3840	29.24	19.31	48.55	58.19	-9.64	QP	
4		0.3840	11.35	19.31	30.66	48.19	-17.53	AVG	
5		0.8879	29.94	19.30	49.24	56.00	-6.76	QP	
6		0.8879	13.16	19.30	32.46	46.00	-13.54	AVG	
7		1.1980	30.96	19.29	50.25	56.00	-5.75	QP	
8		1.1980	14.33	19.29	33.62	46.00	-12.38	AVG	
9		6.6660	29.71	19.56	49.27	60.00	-10.73	QP	
10		6.6660	14.11	19.56	33.67	50.00	-16.33	AVG	
11	*	14.1270	34.94	20.04	54.98	60.00	-5.02	QP	
12		14.1270	20.80	20.04	40.84	50.00	-9.16	AVG	

Test Model	OEPE01	Test Mode	Mode 1
Environmental Conditions	24.5°C, 53.3% RH	Test Engineer	David Luo
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		0.1680	37.96	19.16	57.12	65.06	-7.94	QP	
2		0.1680	21.97	19.16	41.13	55.06	-13.93	AVG	
3		0.2400	34.40	19.22	53.62	62.10	-8.48	QP	
4		0.2400	19.95	19.22	39.17	52.10	-12.93	AVG	
5		0.7570	27.65	19.32	46.97	56.00	-9.03	QP	
6		0.7570	13.69	19.32	33.01	46.00	-12.99	AVG	
7		1.1309	31.04	19.28	50.32	56.00	-5.68	QP	
8		1.1309	18.24	19.28	37.52	46.00	-8.48	AVG	
9		6.5579	29.48	19.56	49.04	60.00	-10.96	QP	
10		6.5579	14.85	19.56	34.41	50.00	-15.59	AVG	
11	*	14.1180	34.37	20.04	54.41	60.00	-5.59	QP	
12		14.1180	21.04	20.04	41.08	50.00	-8.92	AVG	

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

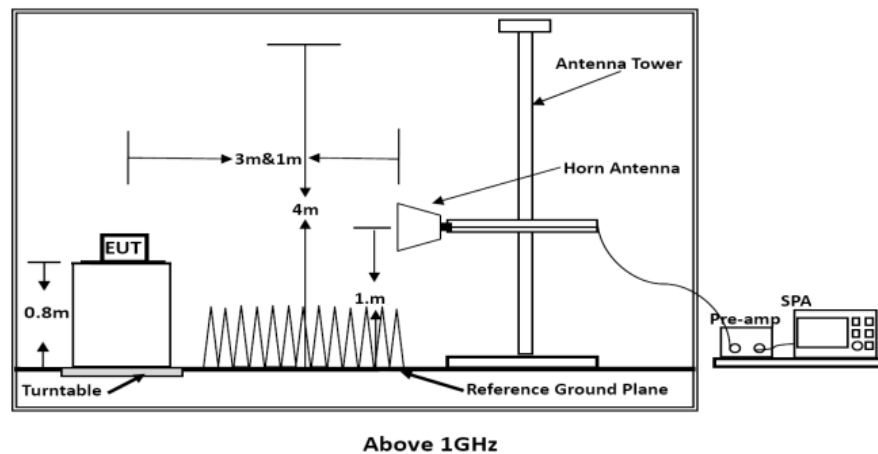
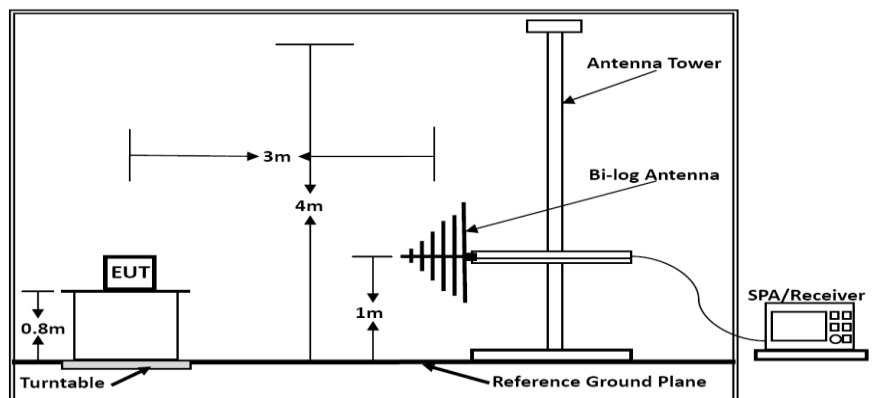
3.2. Radiated emission Measurement

3.2.1. Test Equipment

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

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Software	EZ	EZ-EMC	/	N/A
2	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2019-06-12
3	Positioning Controller	MF	MF-7082	/	2019-06-12
4	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2019-07-25
5	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2019-07-01
6	EMI Test Receiver	R&S	ESR 7	101181	2019-06-12
7	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2019-11-14
8	Broadband Preamplifier	/	BP-01M18G	P190501	2019-07-01
9	RF Cable-R03m	Jye Bao	RG142	CB021	2019-06-12
10	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2019-06-12

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	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
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 $(\text{dB})\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$
 (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 ($\text{dB}\mu\text{V/m}$)	Average Limit ($\text{dB}\mu\text{V/m}$)
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.

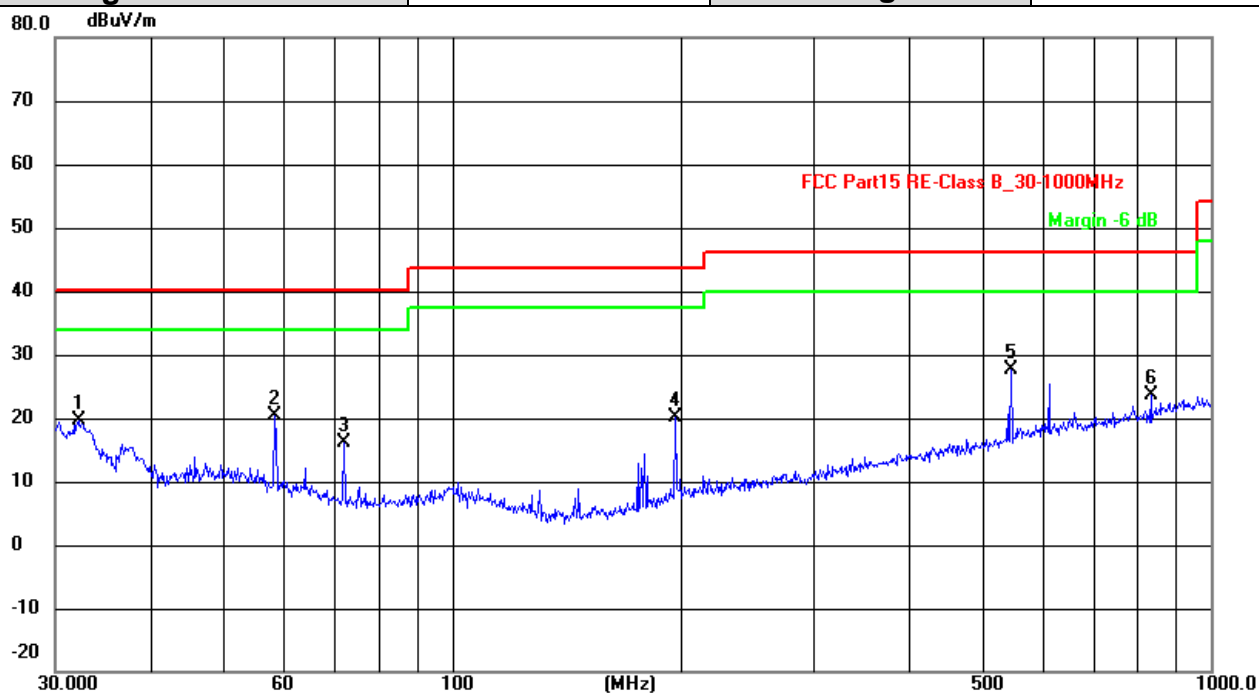
The bandwidth of the EMI test receiver is set at 120kHz, 300kHz.
 The frequency range from 30MHz to 1000MHz is checked.

3.2.7. Radiated Emission Noise Measurement Result

PASS.

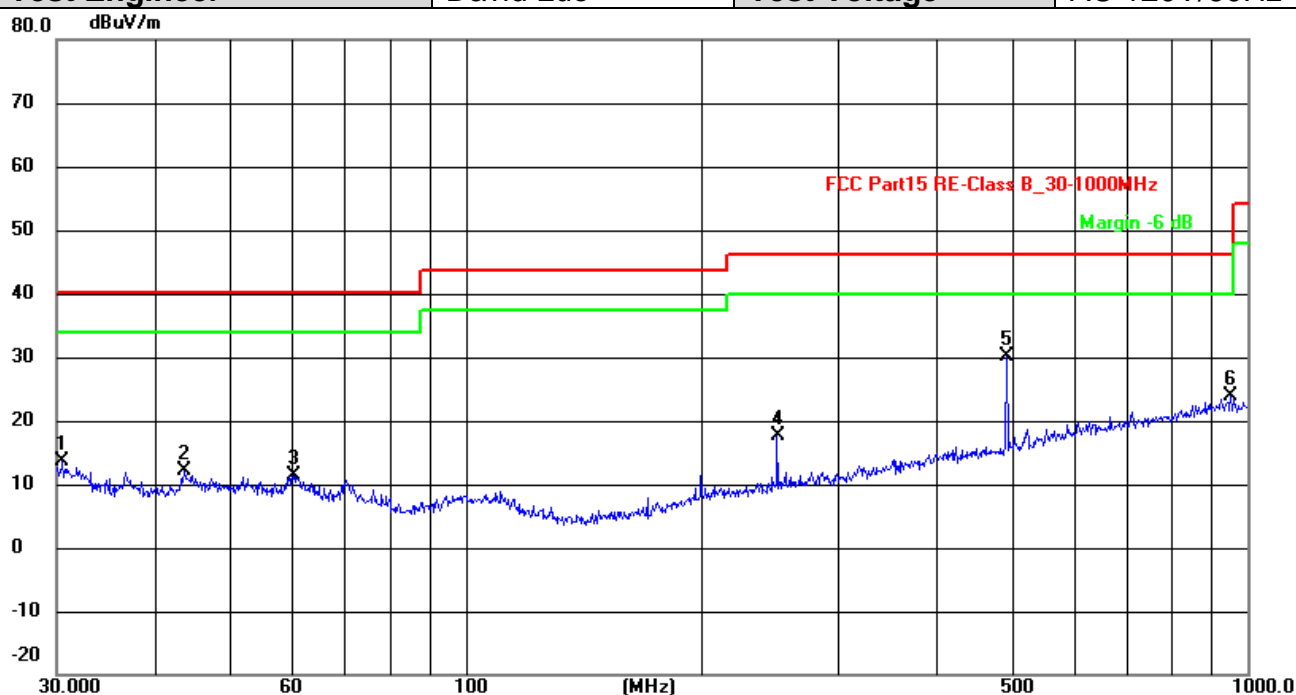
The scanning waveforms please refer to the next page.

Test Model	OEPE01	Test Mode	Mode 1
Environmental Conditions	24.2°C, 54.5% RH	Detector Function	Quasi-peak
Pol	Vertical	Distance	3m
Test Engineer	David Luo	Test Voltage	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	32.2925	38.67	-19.11	19.56	40.00	-20.44	QP
2	58.4074	38.08	-17.73	20.35	40.00	-19.65	QP
3	72.0843	36.99	-20.85	16.14	40.00	-23.86	QP
4	197.2001	38.42	-18.40	20.02	43.50	-23.48	QP
5	545.1825	38.20	-10.52	27.68	46.00	-18.32	QP
6	833.3171	30.30	-6.59	23.71	46.00	-22.29	QP

Test Model	OEPE01	Test Mode	Mode 1
Environmental Conditions	24.2°C, 54.5% RH	Detector Function	Quasi-peak
Pol	Horizontal	Distance	3m
Test Engineer	David Luo	Test Voltage	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.5306	32.70	-19.18	13.52	40.00	-26.48	QP
2	43.6584	28.82	-16.71	12.11	40.00	-27.89	QP
3	60.2801	29.44	-18.05	11.39	40.00	-28.61	QP
4	250.3012	34.44	-16.69	17.75	46.00	-28.25	QP
5	492.4685	41.83	-11.61	30.22	46.00	-15.78	QP
6	952.0937	29.25	-5.37	23.88	46.00	-22.12	QP

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

Test Mode: TM1 (Above 1GHz)				Tested by: David Luo			
Test Voltage: AC 110V/60Hz				Test Distance: 3m			
Detector Function: Peak + AV				Test Results: Passed			
Polarization	Frequency (MHz)	Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)	
Horizontal	1287.37	54.44	38.22	74.00	54.00	-19.56	-15.78
	1833.48	57.08	32.81	74.00	54.00	-16.92	-21.19
	2159.87	53.59	36.87	74.00	54.00	-20.41	-17.13
	3252.81	53.98	40.09	74.00	54.00	-20.02	-13.91
	4478.36	52.31	34.75	74.00	54.00	-21.69	-19.25
	5701.16	52.69	33.68	74.00	54.00	-21.31	-20.32
Vertical	1285.27	54.38	37.96	74.00	54.00	-19.62	-16.04
	1832.64	57.53	32.49	74.00	54.00	-16.47	-21.51
	2158.55	53.52	36.86	74.00	54.00	-20.48	-17.14
	3250.53	53.34	40.11	74.00	54.00	-20.66	-13.89
	4478.83	53.51	34.96	74.00	54.00	-20.49	-19.04
	5701.86	53.19	33.49	74.00	54.00	-20.81	-20.51

4. PHOTOGRAPH

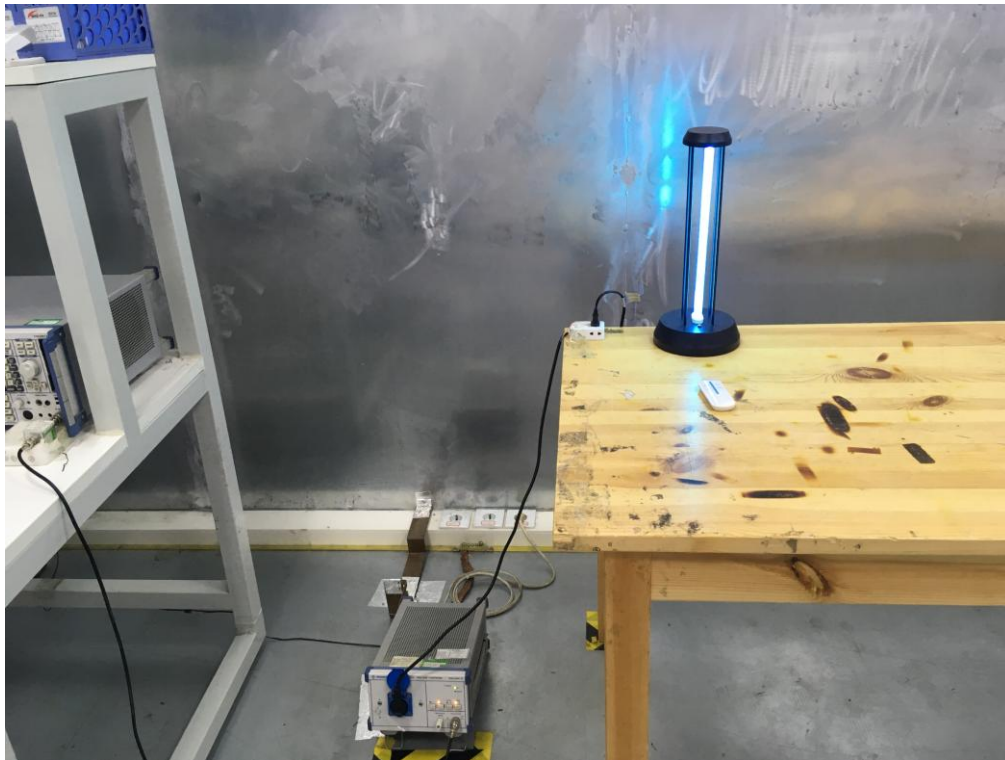


Photo of Power Line Conducted Measurement

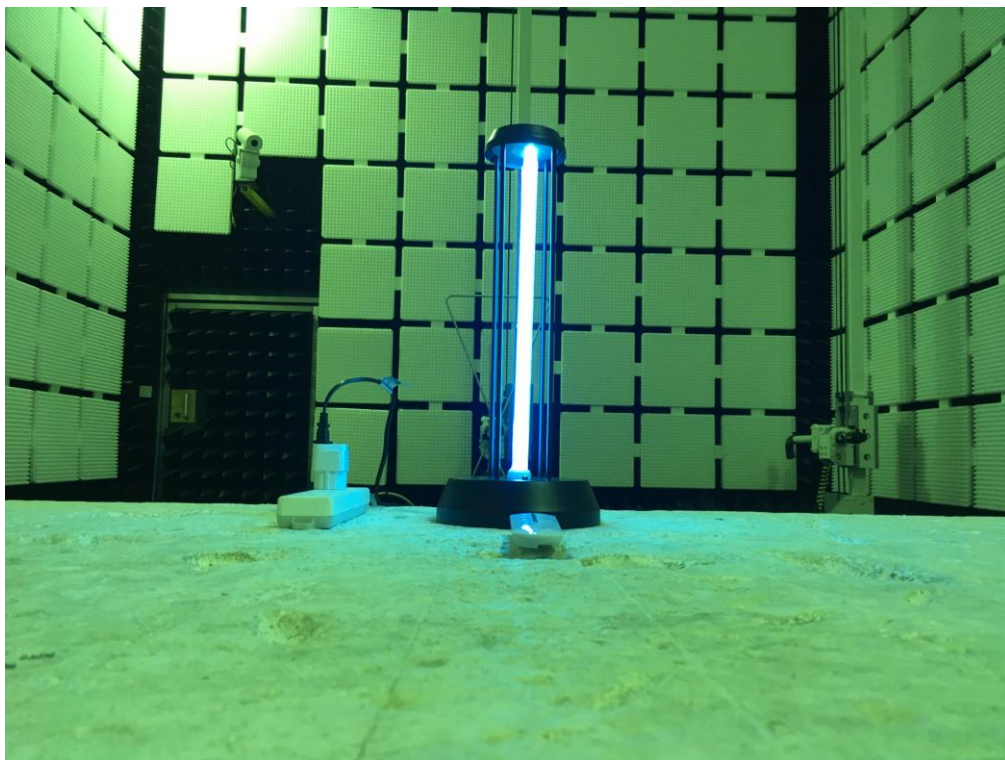


Photo of Radiated Measurement

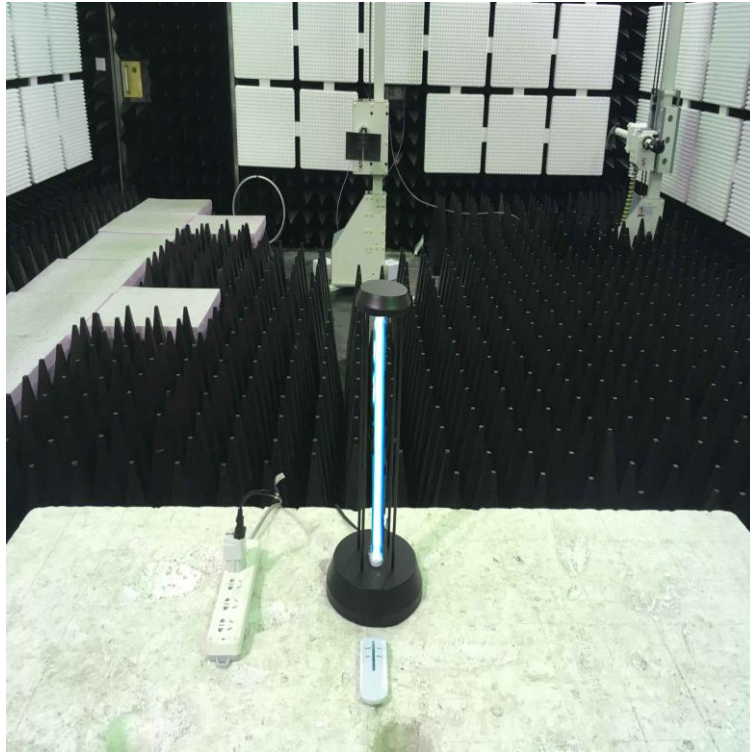


Photo of Radiated Measurement

5. EXTERNAL AND INTERNAL PHOTOS OF THE EUT



Fig. 1



Fig. 2

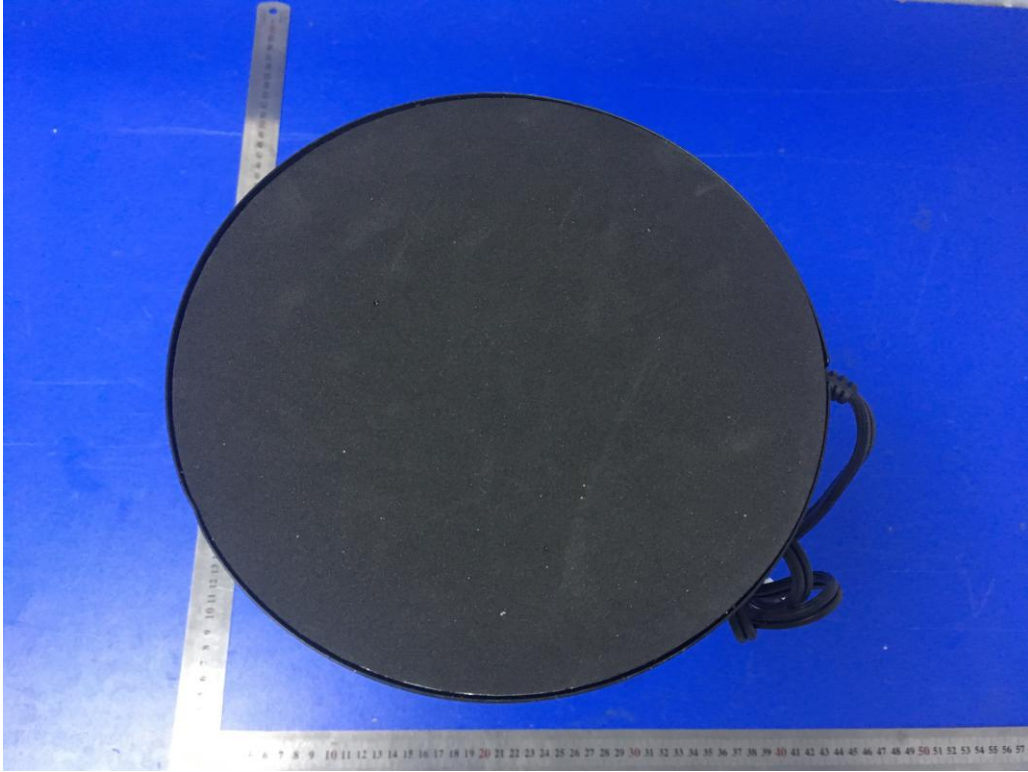


Fig. 3

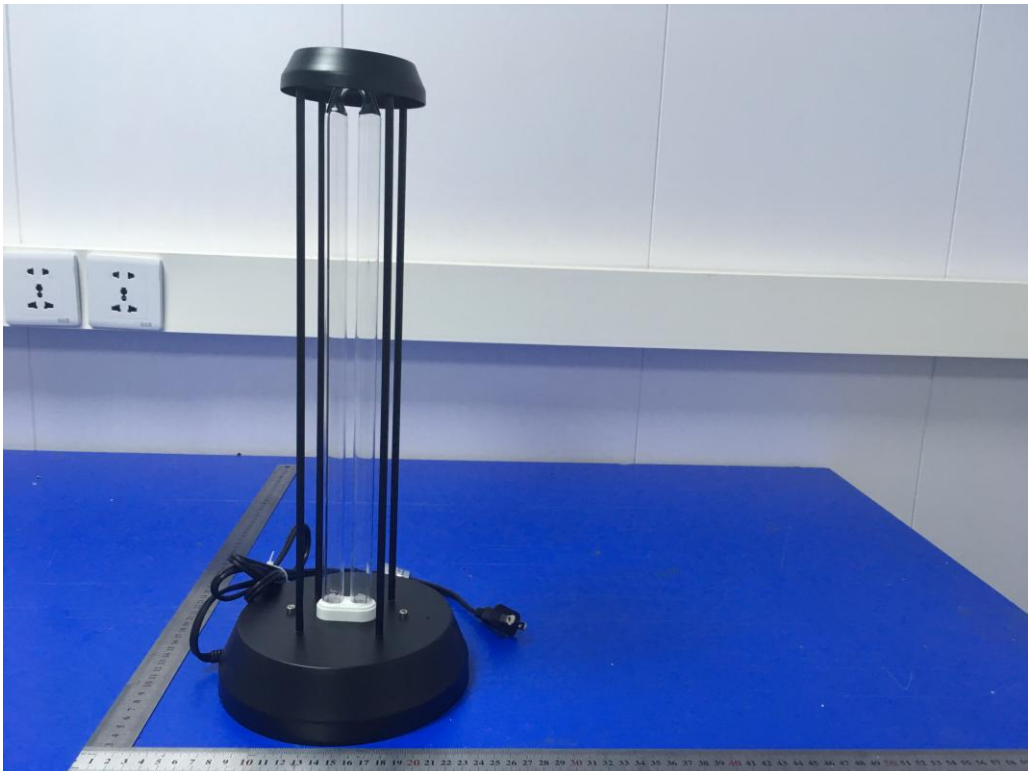


Fig. 4



Fig. 5

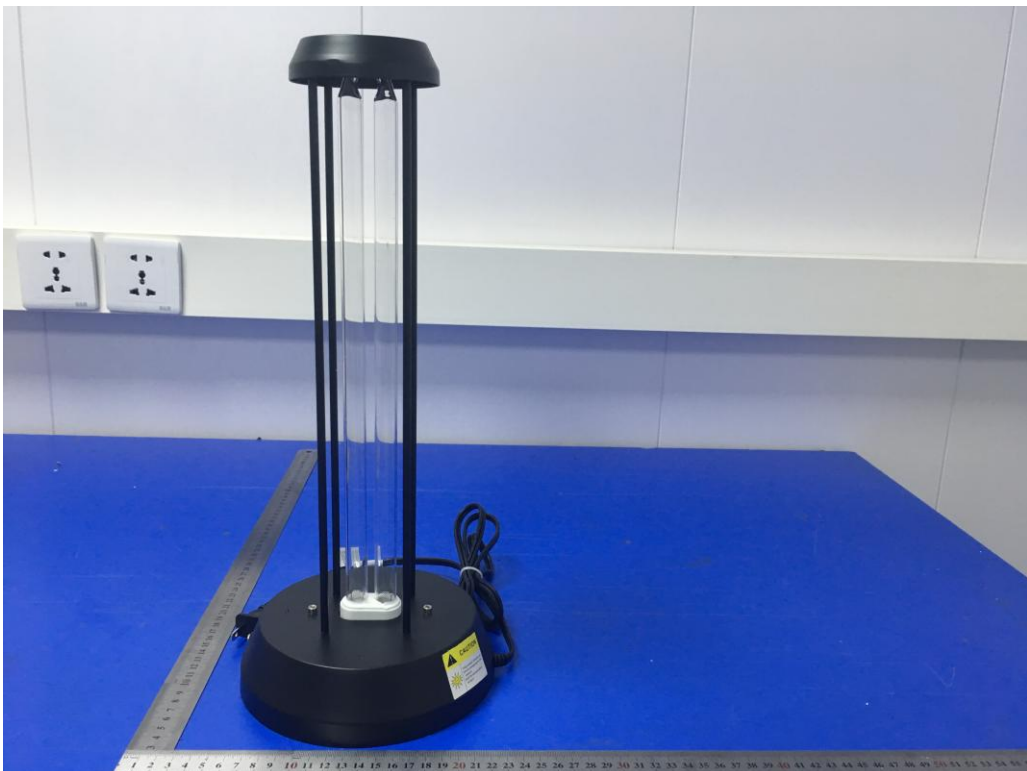


Fig. 6



Fig. 7



Fig. 8



Fig. 9

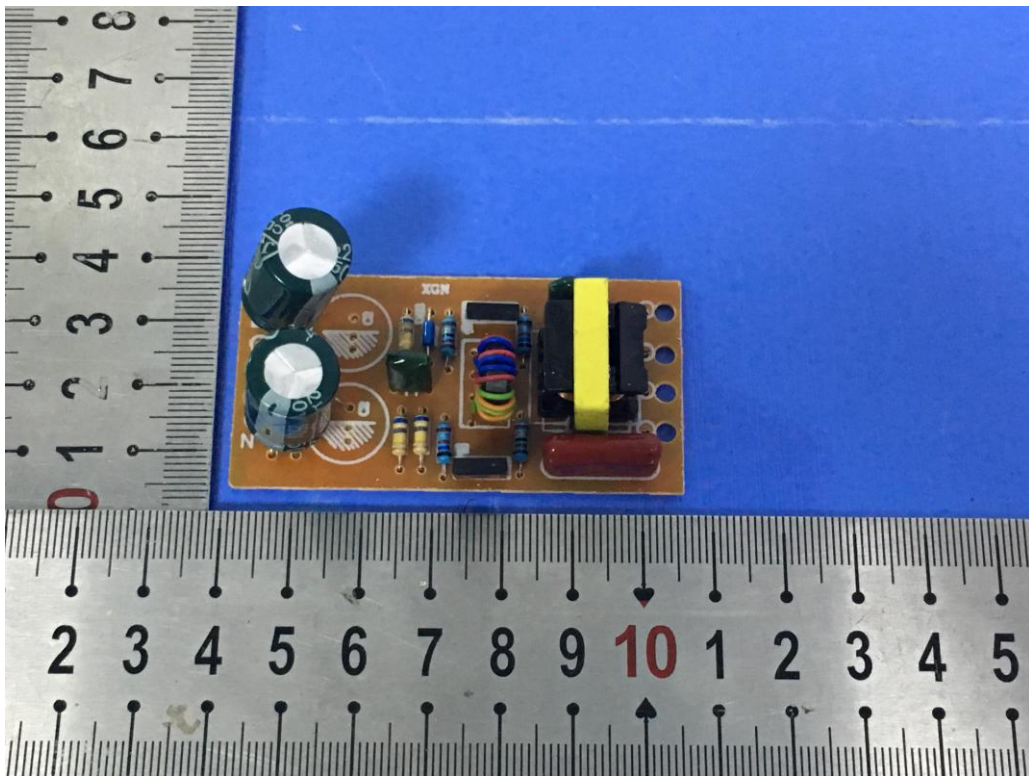


Fig. 10

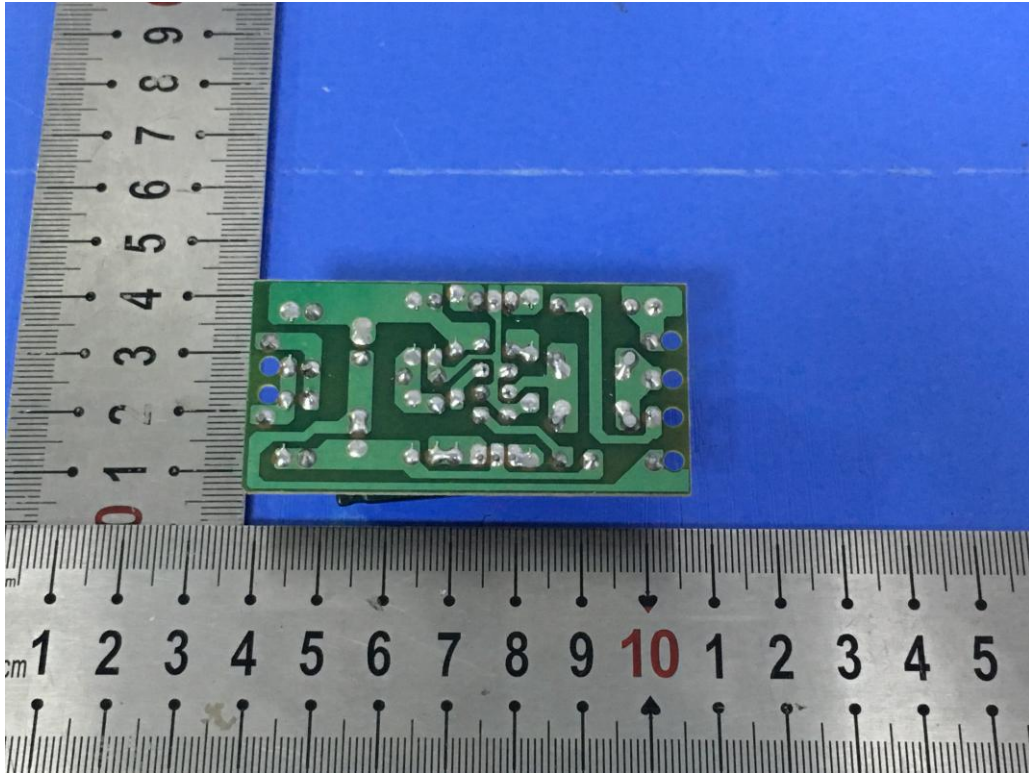


Fig. 11

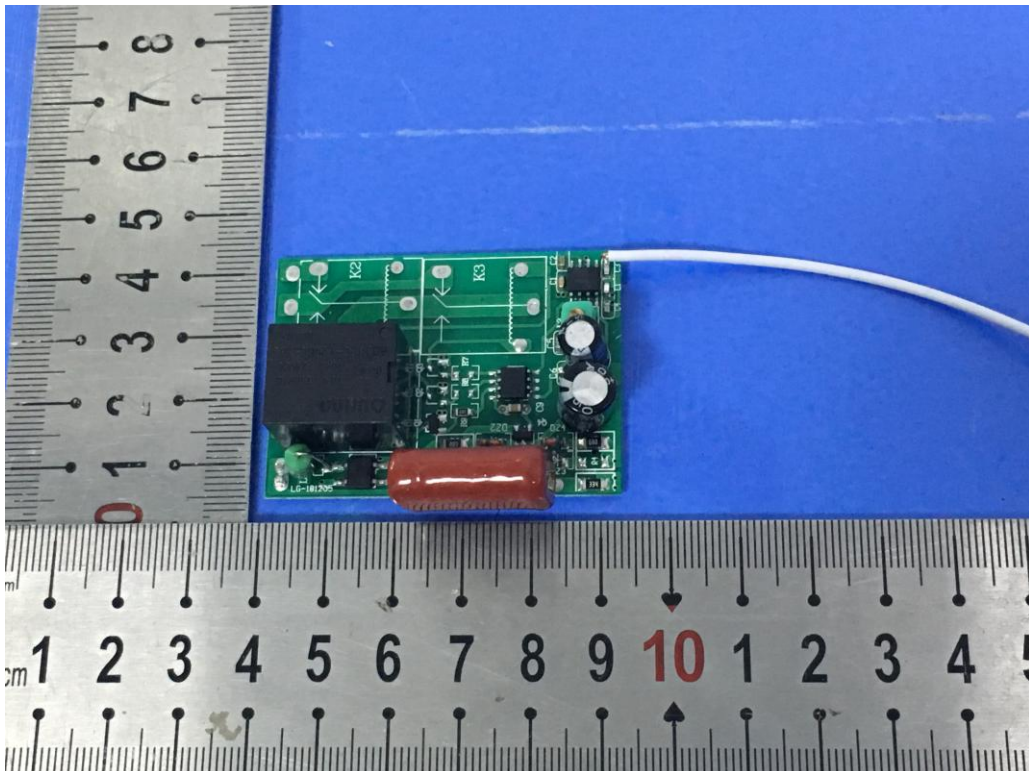


Fig. 12

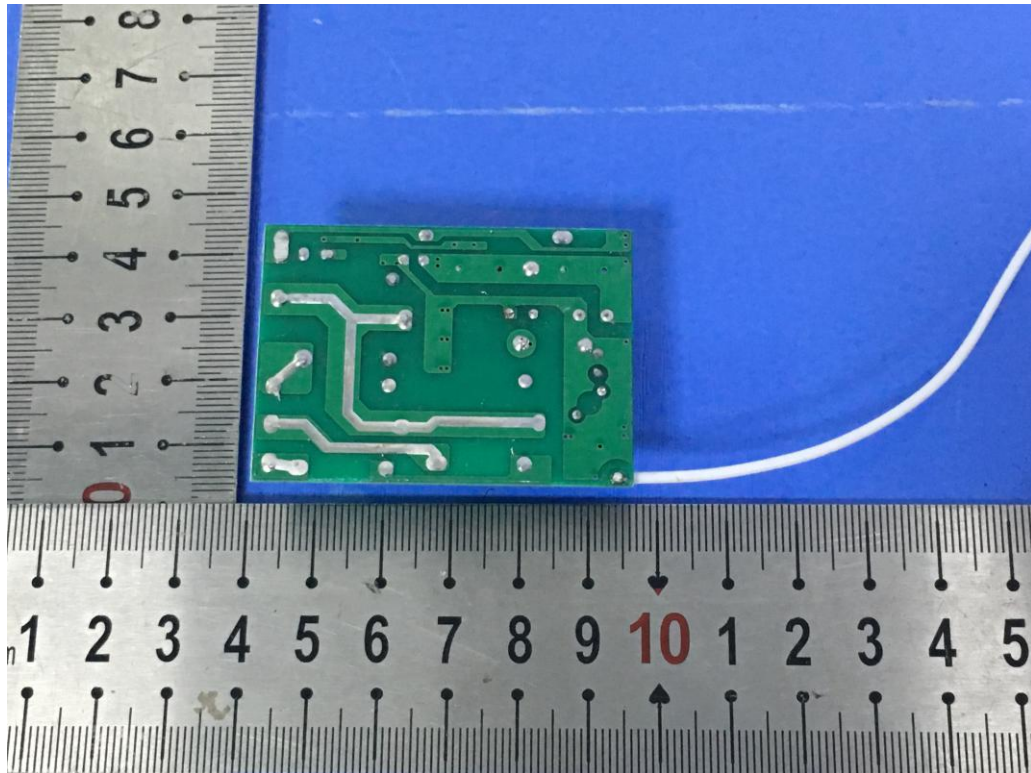


Fig. 13

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