

# EMC Test Report

Client Name : ShenZhen PuSou Electronic Manufactory

Address : 4F, Entrance B, Building F, Xing Hui Science Park, Gu Shu 2Rd, Xixiang of Bao'An District, Shenzhen, China

Product Name : UV BOX STERILIZATION

Date : Jun. 09, 2020



**Shenzhen Anbotek Compliance Laboratory Limited**



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# TEST REPORT

Applicant : ShenZhen PuSou Electronic Manufactory  
Manufacturer : ShenZhen PuSou Electronic Manufactory  
Product Name : UV BOX STERILIZATION  
Model No. : PSUVB01  
Trade Mark : N.A.  
Rating(s) : DC 5V, 2A

Test Standard(s) : **EN 55014-1: 2017;**  
**EN 55014-2: 2015**  
**(IEC 61000-4-2)**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited To determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. This report shows the EUT to be technically compliant with the EN 55014-1 and EN 55014-2 requirements. The test results are contained in this report and Shenzhen Anbotek Compliance Laboratory Limited Is assumed full responsibility for the accuracy and completeness of these tests.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited

Date of Receipt: May 29, 2020

Date of Test: May 29~Jun. 03, 2020

Prepared By:



(Engineer / Winnie Huang)

Reviewer:



(Supervisor / Well Wang)

Approved & Authorized Signer:



(Manager / Tom Chen)



## 1. General Information

### 1.1. Client Information

Applicant	:	ShenZhen PuSou Electronic Manufactory
Address	:	4F, Entrance B, Building F, Xing Hui Science Park, Gu Shu 2Rd, Xixiang of Bao'An District, Shenzhen, China
Manufacturer	:	ShenZhen PuSou Electronic Manufactory
Address	:	4F, Entrance B, Building F, Xing Hui Science Park, Gu Shu 2Rd, Xixiang of Bao'An District, Shenzhen, China
Factory	:	ShenZhen PuSou Electronic Manufactory
Address	:	4F, Entrance B, Building F, Xing Hui Science Park, Gu Shu 2Rd, Xixiang of Bao'An District, Shenzhen, China

### 1.2. Description of Device (EUT)

Product Name	:	UV BOX STERILIZATION	
Model No.	:	PSUVB01	
Trade Mark	:	N.A.	
Test Power Supply	:	DC 5V via adapter	
Test Sample No.	:	1-1-1	
Product Description	:	Adapter:	N/A

**Remark:** (1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

### 1.3. Auxiliary Equipment Used During Test

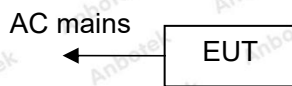
N/A	
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## 1.4. Description of Test Mode

Pretest Mode	Description
Mode 1	On

For Mode 1 Block Diagram of Test Setup



## 1.5. Test Summary

Test Items	Test Mode	Status
Power Line Conducted Emission Test (150kHz To 30MHz)	Mode 1	P
Disturbance Power Test (30MHz To 300MHz)	Mode 1	P
Radiated Emission Test (30MHz To 1000MHz)	/	N
Electrostatic Discharge immunity Test	Mode 1	P
RF Field Strength susceptibility Test	/	N
Electrical Fast Transient/Burst Immunity Test	/	N
Surge Immunity Test	/	N
Injected Currents Susceptibility Test	/	N
Voltage Dips and Interruptions Test	/	N
P) Indicates "PASS". N) Indicates "Not applicable".		

## 1.6. Test Equipment List

### Conducted Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	Nov. 04, 2019	1 Year
2.	L.I.S.N. Artificial Mains Network	Schwarzbeck	NSLK 8127	8127386	Nov. 04, 2019	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Nov. 04, 2019	1 Year
4.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Nov. 04, 2019	1 Year
5.	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A

### Power Clamp Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Absorbing Clamp	FCC	F-201-23MM	08166	Nov. 06, 2019	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Nov. 04, 2019	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Nov. 04, 2019	1 Year
4.	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A

### Electrostatic Discharge Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Simulators	3Ctest	EDS-30T	ES0131505	Nov. 06, 2019	1 Year





### 1.7. Description of Test Facility

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

#### **FCC-Registration No.: 184111**

Shenzhen Anbotek Compliance Laboratory Limited, 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. 184111, September 27, 2019.

#### **ISED-Registration No.: 8058A**

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A, March 07, 2019.

#### **Test Location**

Shenzhen Anbotek Compliance Laboratory Limited.

1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518128

### 1.8. EMS Performance Criteria

- √ A: Normal performance within the specification limits
- √ B: Temporary degradation or loss of function or performance which is self-recoverable
- √ C: Temporary degradation or loss of function or performance which requires operator intervention or system reset
- √ D: Degradation or loss of function which is not recoverable due to damage of equipment (components) or software, or loss of data

Note: The manufacturer's specification may define effects on the EUT which may be considered insignificant, and therefore acceptable.

This classification may be used as a guide in formulating performance criteria, by committees responsible for generic, product and product-family standards, or as a framework for the agreement on performance criteria between the manufacturer and the purchaser, for example where no suitable generic, product or product-family standard exists.



## 2. Power Line Conducted Emission Test

### 2.1. Test Standard and Limit

Test Standard	EN 55014-1
---------------	------------

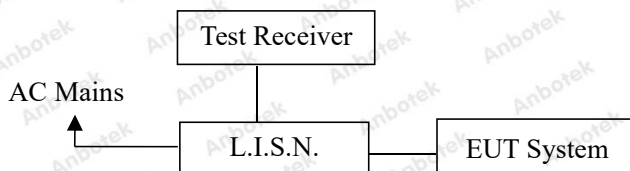
Limits for conducted emissions

Test Limit	Frequency (MHz)	At mains terminals (dB $\mu$ V)	
		Quasi-peak Level	Average Level
	0.15 ~ 0.50	66.0 ~ 56.0*	59.0 ~ 46.0*
	0.50 ~ 5.00	56.0	46.0
	5.00 ~ 30.00	60.0	50.0

**Remark:** (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to

### 2.2. Test Setup



### 2.3. EUT Configuration on Measurement

The following equipments are installed on Conducted Emission Measurement to meet EN 55014–1 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

### 2.4. Operating Condition of EUT

2.4.1. Setup the EUT as shown in Section 2.2.

2.4.2. Turn on the power of all equipments.

2.4.3. Let the EUT work in test mode and measure it.



## 2.5. Test Procedure

The EUT is put on the plane 0.8 m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network(L.I.S.N). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN 55014-1 regulations during conducted emission measurement.

The bandwidth of the field strength meter (R&S Test Receiver ESCI) is set at 9kHz in 150kHz~30MHz.

The frequency range from 150kHz to 30MHz is investigated for AC mains.

All the test results are listed in Section 2.6.

## 2.6. Test Results

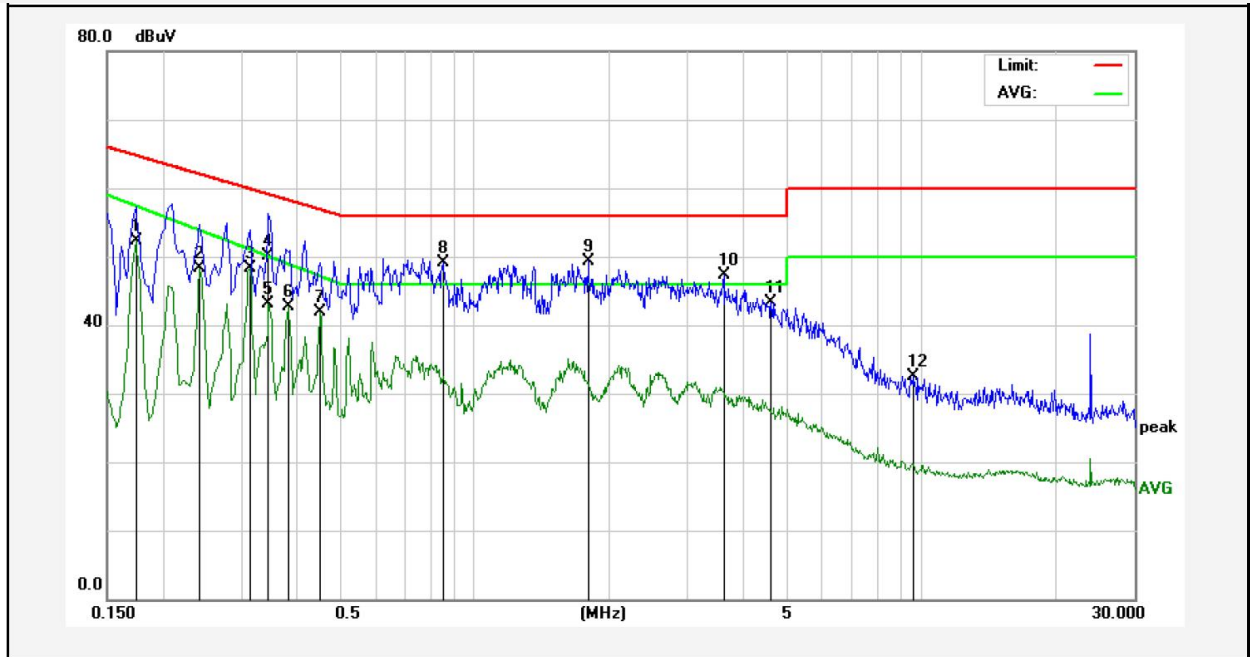
**PASS**

The test curves are shown in the following pages.



## Conducted Emission Test Data

Test Site: 1# Shielded Room  
 Test Specification: DC 5V via adapter  
 Comment: Live Line  
 Temp.: 24.3°C Hum.: 62%

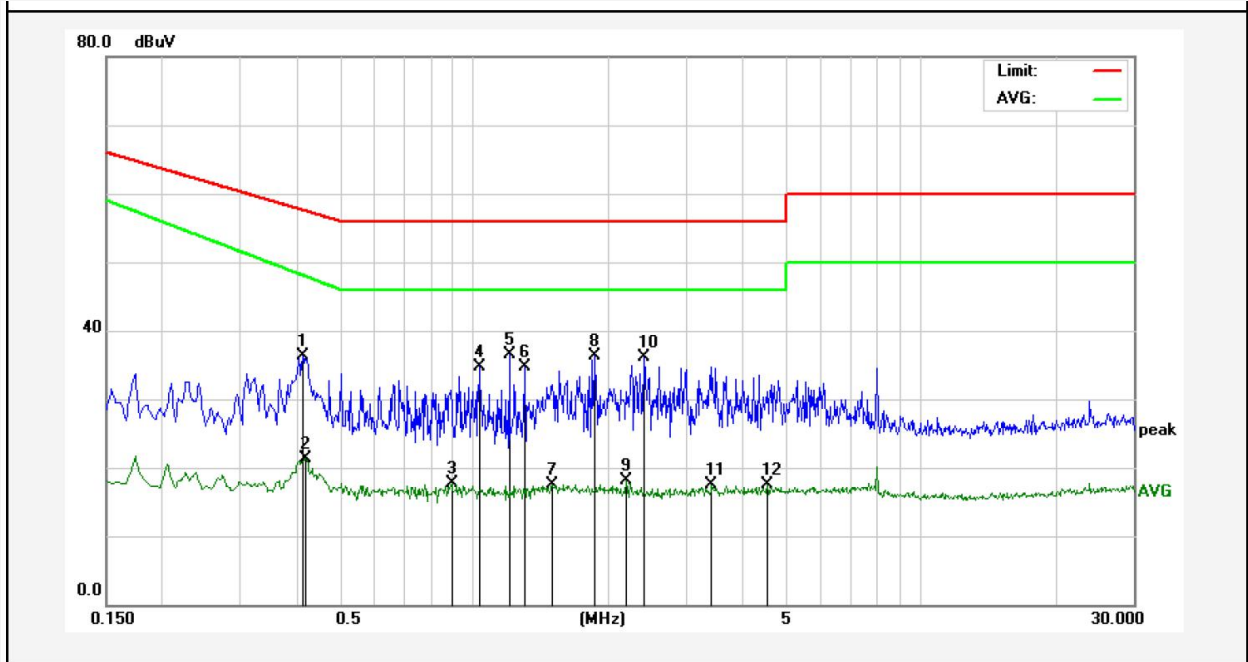


No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1740	32.38	19.90	52.28	57.39	-5.11	AVG	
2	0.2420	28.34	19.89	48.23	53.83	-5.60	AVG	
3	0.3140	28.46	19.90	48.36	51.02	-2.66	AVG	
4	0.3460	30.21	19.91	50.12	59.06	-8.94	QP	
5	0.3460	23.20	19.91	43.11	49.97	-6.86	AVG	
6	0.3820	22.80	19.93	42.73	48.90	-6.17	AVG	
7	0.4500	22.02	19.96	41.98	47.14	-5.16	AVG	
8	0.8500	29.11	20.08	49.19	56.00	-6.81	QP	
9	1.7940	29.11	20.14	49.25	56.00	-6.75	QP	
10	3.6180	27.09	20.17	47.26	56.00	-8.74	QP	
11	4.6099	23.03	20.20	43.23	56.00	-12.77	QP	
12	9.5819	12.19	20.33	32.52	60.00	-27.48	QP	

**Note:** Result=Reading+Factor Over Limit=Result-Limit

## Conducted Emission Test Data

Test Site: 1# Shielded Room  
 Test Specification: DC 5V via adapter  
 Comment: Neutral Line  
 Temp.: 24.3°C Hum.: 62%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.4140	16.27	19.94	36.21	57.57	-21.36	QP	
2	0.4180	1.46	19.94	21.40	47.93	-26.53	AVG	
3	0.8900	-2.37	20.09	17.72	46.00	-28.28	AVG	
4	1.0300	14.64	20.12	34.76	56.00	-21.24	QP	
5	1.1980	16.29	20.12	36.41	56.00	-19.59	QP	
6	1.3020	14.59	20.13	34.72	56.00	-21.28	QP	
7	1.5020	-2.59	20.13	17.54	46.00	-28.46	AVG	
8	1.8660	16.21	20.14	36.35	56.00	-19.65	QP	
9	2.1900	-2.02	20.14	18.12	46.00	-27.88	AVG	
10	2.3980	15.86	20.15	36.01	56.00	-19.99	QP	
11	3.4140	-2.76	20.17	17.41	46.00	-28.59	AVG	
12	4.5340	-2.68	20.19	17.51	46.00	-28.49	AVG	

**Note:** Result=Reading+Factor Over Limit=Result-Limit



## 3. Disturbance Power Test

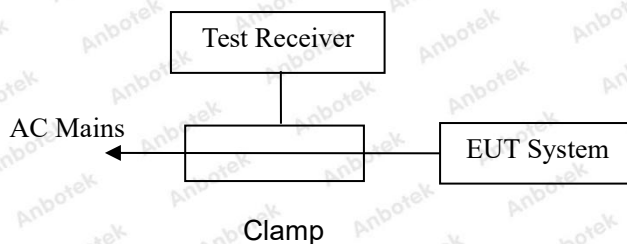
### 3.1. Test Standard and Limit

Test Standard	EN 55014-1
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Disturbance Power Test Limit

Test Limit	Frequency (MHz)	At mains terminals (dB $\mu$ V)	
		Quasi-peak Level	Average Level
	30 ~300	45 Increasing Linearly with Frequency to 55	35 Increasing Linearly with Frequency to 45

### 3.2. Test Setup



### 3.3. EUT Configuration on Measurement

The EN 55014-1 Regulations test method must be used to find the maximum emission during disturbance power measurement. The configuration of the EUT is the same as used in conducted emission measurement.

### 3.4. Operating Condition of EUT

- 3.4.1. Setup the EUT as shown in Section 3.2.
- 3.4.2. Turn on the power of all equipments.
- 3.4.3. Let the EUT work in test mode and measure it.

### 3.5. Test Procedure

The EUT is placed on the ground and away from other metallic surface at least 0.8m. It is connected to the power mains through an extension cord of 6m min. The absorber clamp clamps the cord and moves from the far end to the EUT to measure the disturbing energy emitted from the cord.

The bandwidth of the test receiver(R&S ESCI) is set at 120kHz.

All the test results are listed in Section 3.6.

### 3.6. Test Results

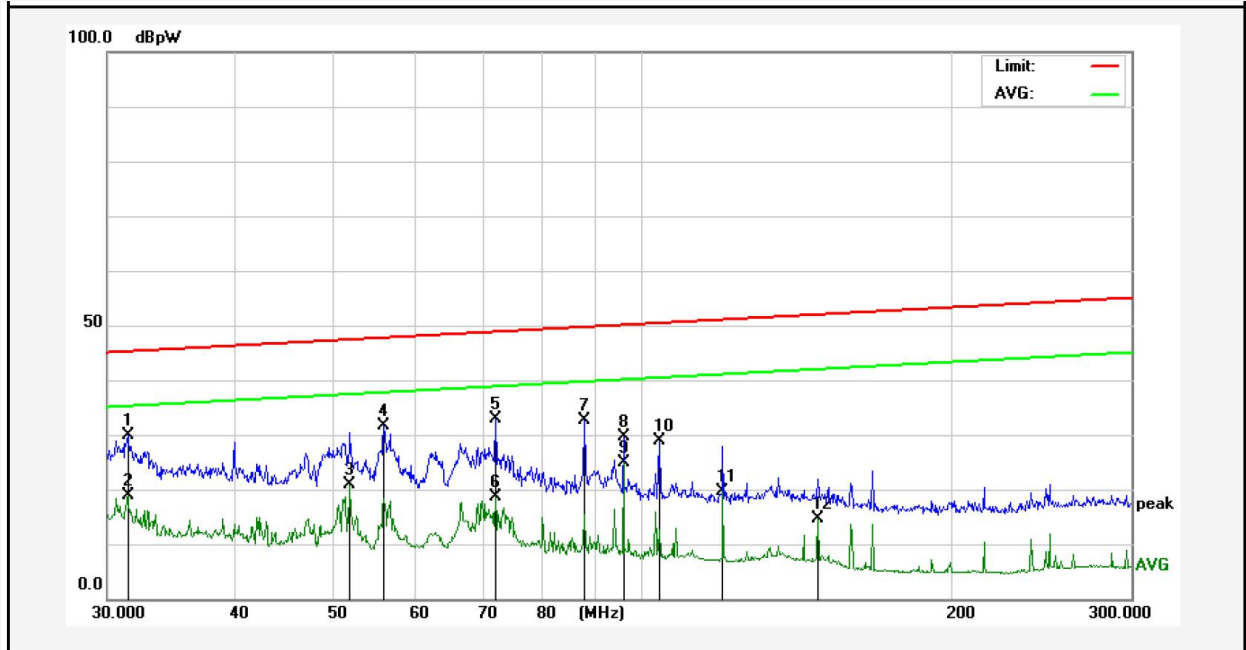
#### PASS

The frequency spectrum from 30MHz to 300MHz is investigated.

The test curves are shown in the following pages.

## Power Clamp Test Data

Test Site: 1# Shielded Room  
 Test Specification: DC 5V via adapter  
 Comment: AC LINE  
 Temp.: 24.3°C Hum.: 62%



No.	Freq. (MHz)	Reading (dBpW)	Factor (dB)	Result (dBpW)	Limit (dBpW)	Over Limit (dB)	Detector	Remark
1	31.4399	2.12	27.81	29.93	45.20	-15.27	QP	
2	31.4399	-9.02	27.81	18.79	35.20	-16.41	AVG	
3	51.7999	-4.88	25.76	20.88	37.37	-16.49	AVG	
4	55.8799	6.08	25.48	31.56	47.70	-16.14	QP	
5	71.8800	6.38	26.39	32.77	48.79	-16.02	QP	
6	71.8800	-7.71	26.39	18.68	38.79	-20.11	AVG	
7	87.8800	8.15	24.37	32.52	49.67	-17.15	QP	
8	95.8800	5.35	24.23	29.58	50.05	-20.47	QP	
9	95.8800	0.64	24.23	24.87	40.05	-15.18	AVG	
10	103.8399	4.38	24.55	28.93	50.39	-21.46	QP	
11	119.8400	-4.70	24.41	19.71	41.01	-21.30	AVG	
12	148.4800	-9.12	23.83	14.71	41.95	-27.24	AVG	

**Note:** Result=Reading+Factor Over Limit=Result-Limit



## 4. Electrostatic Discharge Immunity Test

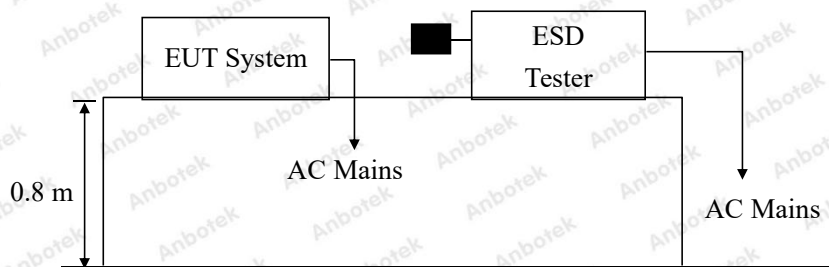
### 4.1. Test Standard and Level

Test Standard:	EN 55014-2 (IEC 61000-4-2)
Performance Criterion:	B
Severity Level: 3 / Air Discharge: $\pm 8$ kV, Level: 2 / Contact Discharge: $\pm 4$ kV	

Test Level

Level	Test Voltage Contact Discharge (kV)	Test Voltage Air Discharge (kV)
1.	$\pm 2$	$\pm 2$
2.	$\pm 4$	$\pm 4$
3.	$\pm 6$	$\pm 8$
4.	$\pm 8$	$\pm 15$
X	Special	Special

### 4.2. Test Setup



### 4.3. EUT Configuration on Measurement

The following equipments are installed on Electrostatic Discharge immunity Measurement to meet EN 55014-2 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

### 4.4. Operating Condition of EUT

- 4.4.1. Setup the EUT as shown on Section 4.2.
- 4.4.2. Turn on the power of all equipments.
- 4.4.3. After that, let the EUT work in test mode measure it.

## 4.5. Test Procedure

### 4.5.1. Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed

### 4.5.2. Contact Discharge:

All the procedure shall be same as Section 4.5.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

### 4.5.3. Indirect discharge for horizontal coupling plane

At least 20 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

### 4.5.4. Indirect discharge for vertical coupling plane

At least 20 single discharge shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m × 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

## 4.6. Test Results

**PASS**

Please refer to the following page.



## Electrostatic Discharge Test Results

Air discharge :	±8.0kV	Temperature :	24.2℃
Contact discharge :	±4.0kV	Humidity :	47%
Power Supply :	DC 5V via adapter	Expert conclusion :	A
Number of discharge :	10	Test Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
<b>Location</b>		<b>Kind</b> A-Air Discharge C-Contact Discharge	<b>Result</b>
Slot	2 points	A	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
Light	4 points	A	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
Button	2 points	A	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
HCP	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
VCP of the front	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
VCP of the rear	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
VCP of the left	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
VCP of the right	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
<p><b>Remark:</b> Discharge should be considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).</p>			



## APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Power Line Conducted Emission Test



Photo of Disturbance Power Test



Photo of Electrostatic Discharge Immunity Test

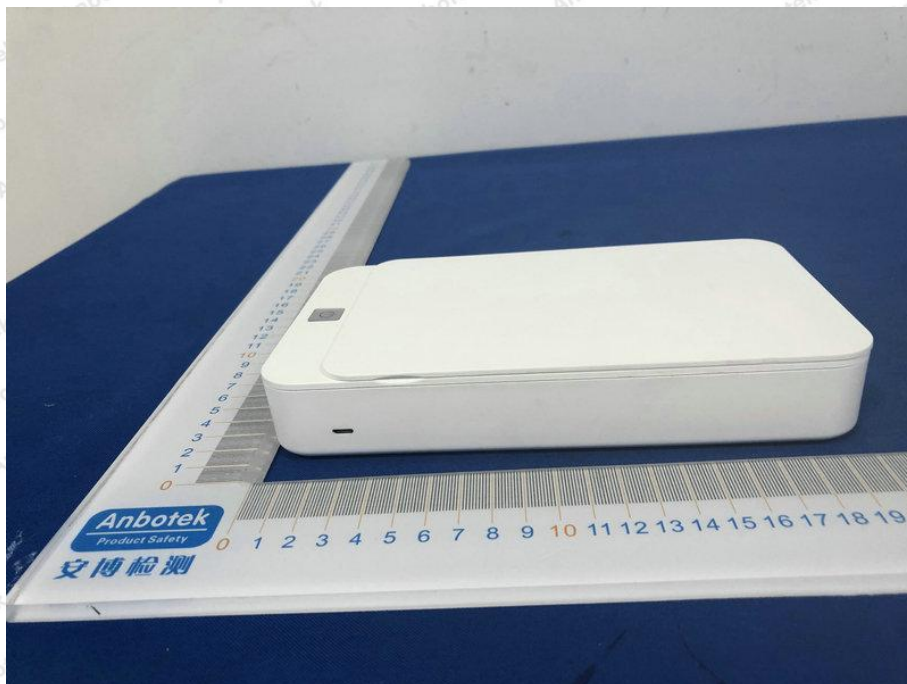


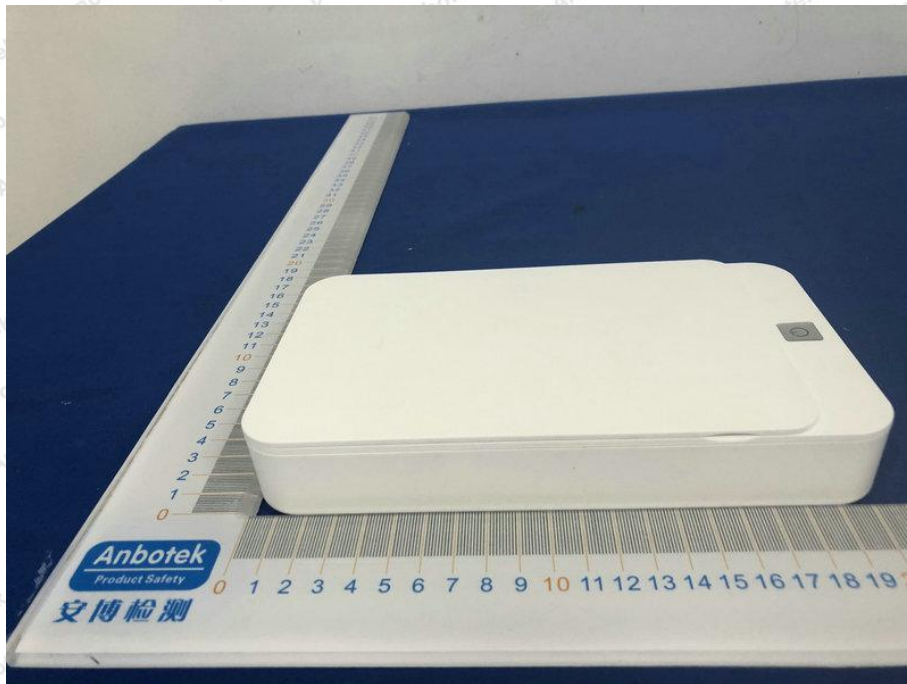


## APPENDIX II -- EXTERNAL PHOTOGRAPH













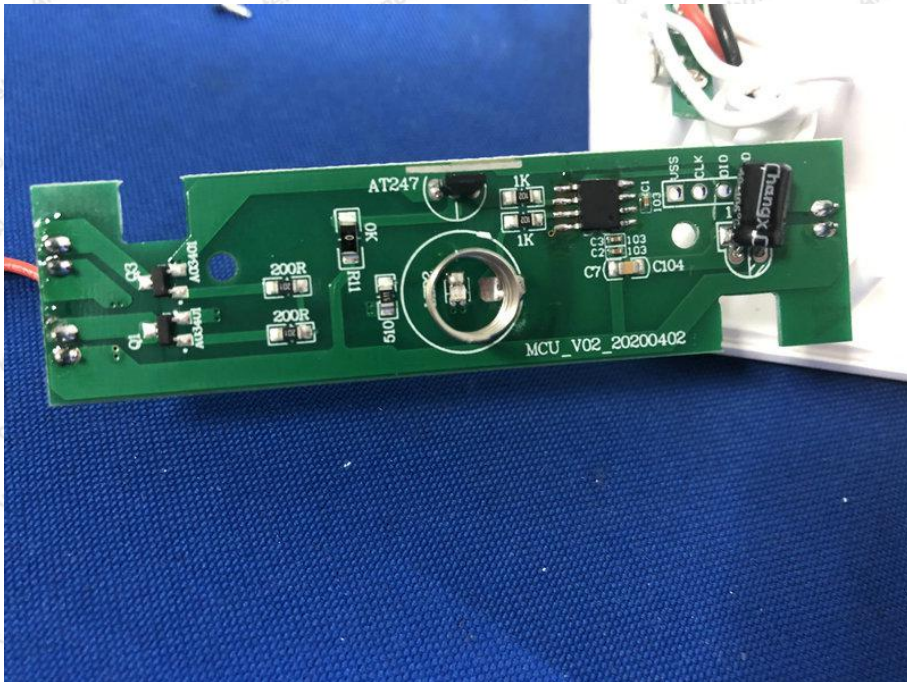
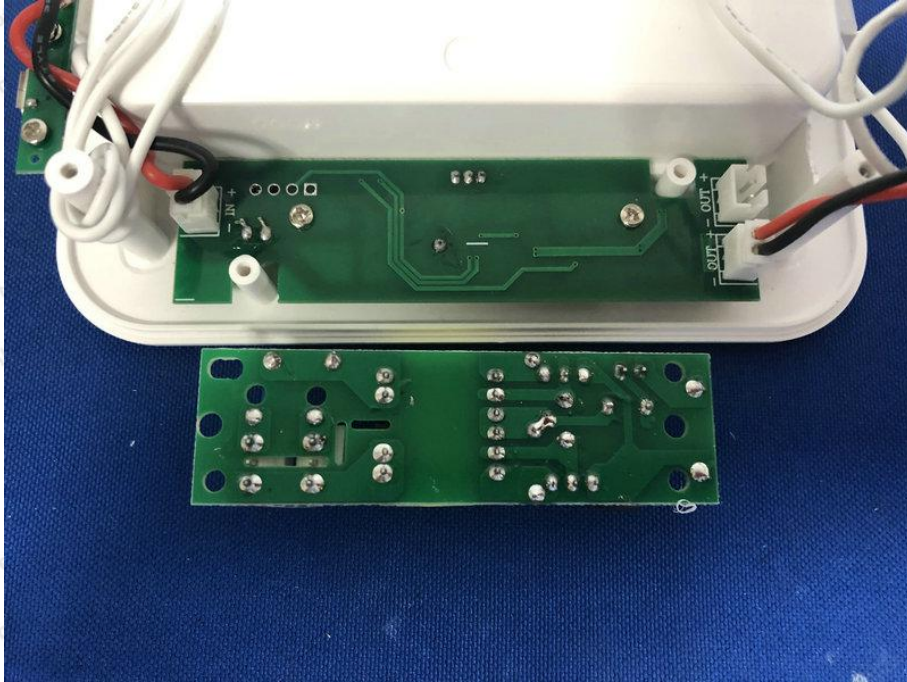


### APPENDIX III -- INTERNAL PHOTOGRAPH











## CE Label

1. The CE conformity marking must consist of the initials 'CE' taking the following form:

If the CE marking is reduced or enlarged, the proportions given in the above graduated drawing must be respected.

2. The CE marking must have a height of at least 5 mm except where this is not possible on account of the nature of the apparatus.

3. The CE marking must be affixed to the product or to its data plate. Additionally it must be affixed to the packaging, if any, and to the accompanying documents.

4. The CE marking must be affixed visibly, legibly and indelibly.

It must have the same height as the initials 'CE'.

----- End of Report -----

