

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
Unintentional RADIATOR CERTIFICATION TO
FCC PART 15 SUBPART B REQUIREMENT**

for

The DEAFWORKS Co.

LED ALARM CLOCK

Model No.: ALM202W, ALM202B

FCC ID:2APXY-ALM202X

Prepared for : The DEAFWORKS Co.
Address : P.O. Box 1265, Provo, UT 84603-1265, United States

Prepared by : EMTEK (SHENZHEN) CO., LTD.
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Report Number : ES181122017E
Date of Test : November 22, 2018 to November 26, 2018
Date of Report : January 11, 2019

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TEST REPORT DESCRIPTION

Applicant : The DEAFWORKS Co.
Manufacturer : The DEAFWORKS Co.
Trade Mark : N/A
EUT : LED ALARM CLOCK
Model No. : ALM202W, ALM202B
Power Supply : AC 120/60Hz Max.0.3A


Measurement Procedure Used:


CFR 47, FCC Part 15 Subpart B
ANSI C63.4-2014


The device described above is tested by EMTEK (SHENZHEN) 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 measurement results are contained in this test report and EMTEK (SHENZHEN) CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK (SHENZHEN) CO., LTD.

Date of Test : November 22, 2018 to November 26, 2018

Prepared by : 
Yaping Shen/Editor

Reviewer : 
Joe Xia /Supervisor

Approved & Authorized Signer : 
Lisa Wang /Manager

Modified Information

Version	Report No.	Revision Data	Summary
Ver.1.0	ES181122017E	/	Original Version
Ver.2.0	ES181122017E	2019-01-11	Modify manufacturer

1. SUMMARY OF TEST RESULTS

EMISSION		
Description of Test Item	Standard & Limits	Results
Conducted Emission at Mains Terminals	FCC Part 15, Subpart B, Class B ANSI C63.4-2014	Pass
Radiated Emission	FCC Part 15, Subpart B, Class B ANSI C63.4-2014	Pass
Note: The internal operation frequency of the EUT is less than 108MHz, so there is no need to test radiation above 1G.		

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT : LED ALARM CLOCK

Model Number : ALM202W, ALM202B
 Note: ALM202W and ALM202B are identical except for the color and model. We choose ALM202B to do all the tests.

Test Voltage : AC 120V/60Hz

Applicant : The DEAFWORKS Co.

Address : P.O. Box 1265, Provo, UT 84603-1265, United States

Manufacturer : The DEAFWORKS Co.

Address : P.O. Box 1265, Provo, UT 84603-1265, United States

Date of Received : November 22, 2018

Date of Test : November 22, 2018 to November 26, 2018

2.2. Input / Output Ports

Port #	Name	Type*	Cable Max. >3m	Cable Shielded	Comments
0	Enclosure	N/E	--	--	None
1	AC Power port	AC	--	--	1 Port
2	AC Output Port	I/O	--	--	2 Port
2	USB Port	I/O	--	--	2 Port

* Note: Use abbreviations:
 AC= AC Power Port
 DC= DC Power Port
 N/E= Non-Electrical
 I/O= Signal Input or Output Port (Not Involved in Process Control)
 TP= Telecommunication Ports

2.3. Independent Operation Modes

- A. Alarm Clock
- B. Alarm Clock+LED On

2.4. Test Manner

Test Items	Test Voltage	Operation Modes	Worst case
Conducted Emission	AC 120V/60Hz	Mode A and Mode B	Mode B
Radiated Emission	AC 120V/60Hz	Mode A and Mode B	Mode B

2.5. Description of Test Facility

Site Description

EMC Lab. : Accredited by CNAS, 2016.10.24
The certificate is valid until 2022.10.28
The Laboratory has been assessed and proved to be in compliance with
CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)
The Certificate Registration Number is L2291.

Accredited by TUV Rheinland Shenzhen 2016.5.19
The Laboratory has been assessed according to the requirements
ISO/IEC 17025.

Accredited by FCC, August 03, 2017
Designation Number: CN1204
Test Firm Registration Number: 882943

Accredited by Industry Canada, November 24, 2015
The Certificate Registration Number is 4480A.

Accredited by A2LA, July 31, 2017
The Certificate Number is 4321.01.

Name of Firm : EMTEK (SHENZHEN) CO., LTD.
Site Location : Bldg 69, Majialong Industry Zone, Nanshan District, Shenzhen,
Guangdong, China

2.6. Test Software

Item : Software
Conducted Emission : EMTEK(Ver.CON-03A1)-Shenzhen

Radiated Emission : EMTEK(Ver.RA-03A1)-Shenzhen





2.7. Description of Support Device

2.8. Measurement Uncertainty








Test Item	Uncertainty
Conducted Emission Uncertainty	: 3.16dB(9k~150kHz Conduction 2#) 2.90dB(150k-30MHz Conduction 2#)
Radiated Emission Uncertainty (3m Chamber)	: 3.78dB (30M~1GHz Polarize: H) 4.27dB (30M~1GHz Polarize: V) 4.46dB (1~6GHz)

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. For Power Line Conducted Emission Measurement

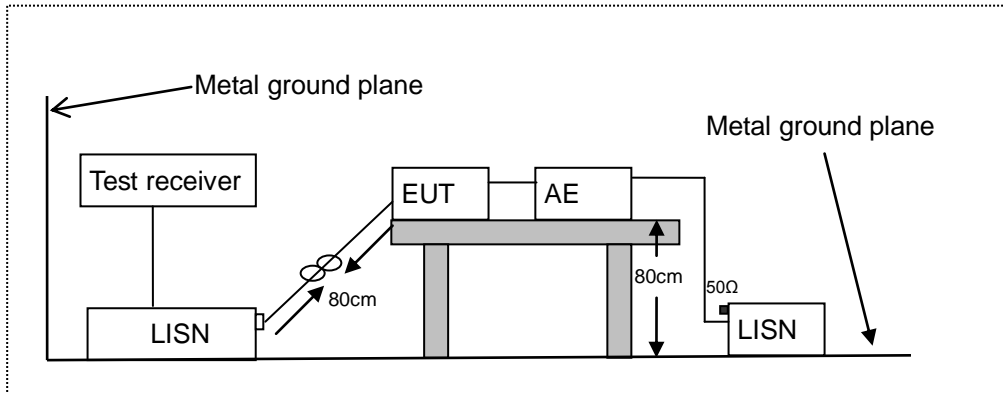
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
	Test Receiver	Rohde & Schwarz	ESCI	26115-010-0027	May 19, 2018	1 Year
	L.I.S.N	Rohde & Schwarz	ENV216	101161	May 19, 2018	1 Year
	50Ω Coaxial Switch	Anritsu	MP59B	6100175589	May 19, 2018	1 Year
	Voltage Probe	Rohde & Schwarz	ESH2-Z3	100122	May 20, 2018	1 Year

3.2. For Radiated Emission Measurement

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
	EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	May 19, 2018	1 Year
	Pre-Amplifier	HP	8447F	2944A07999	May 19, 2018	1 Year
	Bilog Antenna	Schwarzbeck	VULB9163	142	May 20, 2018	1 Year
	Cable	Schwarzbeck	AK9513	ACRX1	May 20, 2018	1 Year
	Cable	Rosenberger	N/A	FP2RX2	May 20, 2018	1 Year
	Cable	Schwarzbeck	AK9513	CRPX1	May 20, 2018	1 Year
	Cable	Schwarzbeck	AK9513	CRRX2	May 20, 2018	1 Year

4. POWER LINE CONDUCTED EMISSION MEASUREMENT

4.1. Block Diagram of Test Setup



LISN: Line Impedance Stabilization Network
 AE: Associated equipment
 EUT: Equipment under test

4.2. Limits

FCC Part 15, Subpart B, 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.

4.3. Test Procedure

The EUT was placed on a desk 0.8 m height from the metal ground plane and 0.4 m from the conducting wall of the shielding room and it was kept at least 0.8 m from any other grounded conducting surface. The size of the table will nominally be 1.5 m x1.0 m.

The rear of the arrangement shall be flush with the back of the supporting tabletop unless that would not be possible or typical of normal use.

All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units.

Connect EUT to the power mains through a line impedance stabilization network (LISN). Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

All the support units are connecting to the other LISN.

The LISN provides 50 ohm coupling impedance for the measuring instrument.

Both sides of AC line were checked for maximum conducted interference.

The frequency range from 150 kHz to 30 MHz was sweep.

Set the test-receiver system to quasi peak detect function and average detect function, and to measure the conducted emissions values.

Test results were obtained from the following equation:

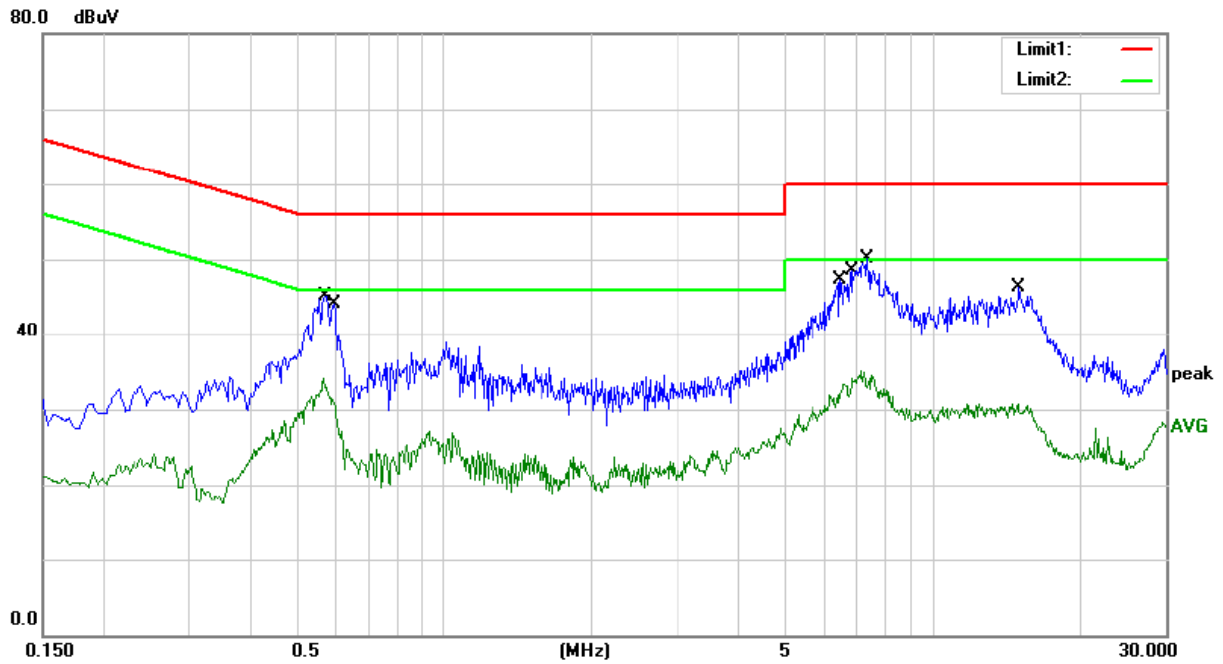
Emission Level (dB μ V) = LISN Factor (dB) + Cable Loss (dB) + Reading (dB μ V)

Margin (dB) = Emission Level (dB μ V) - Limit (dB μ V)

4.4. Measuring Results

PASS.

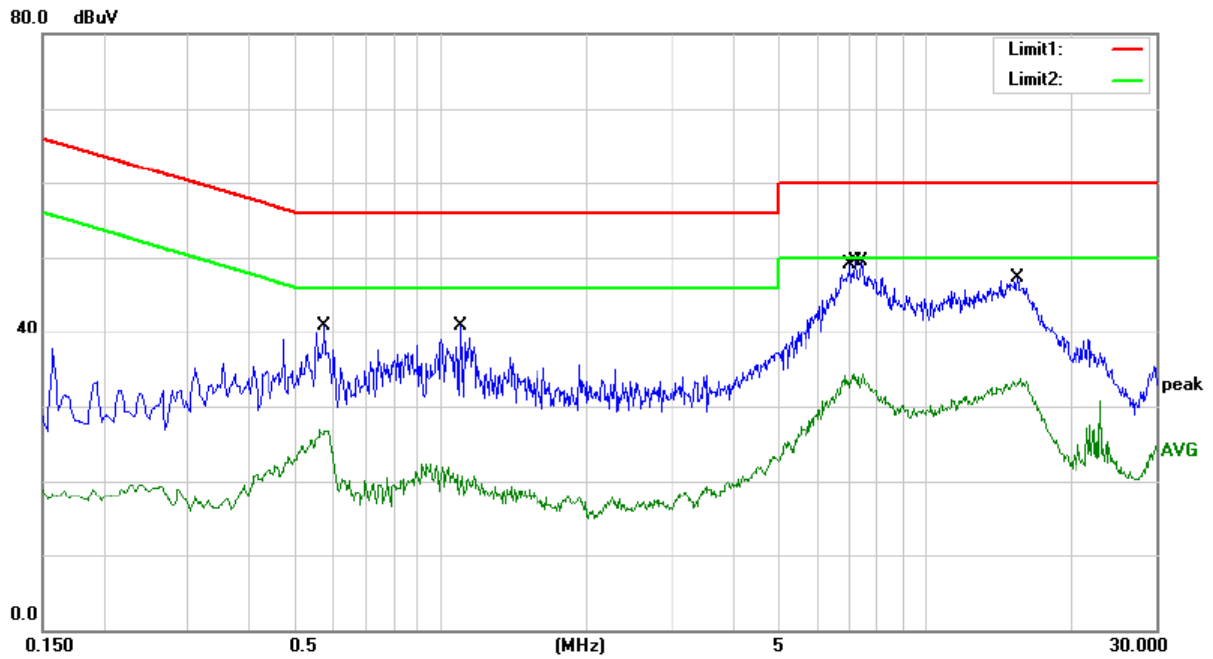
Please refer to following pages.



Site site #1 Phase: **L1** Temperature: 25
 Limit: (CE)FCC PART 15 B_QP Power: AC 120V/60Hz Humidity: 55 %
 Mode: Alarm Clock+LED ON
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.5700	32.36	9.84	42.20	56.00	-13.80	QP	
2	*	0.5700	24.20	9.84	34.04	46.00	-11.96	AVG	
3		0.5940	31.36	9.84	41.20	56.00	-14.80	QP	
4		0.5940	21.48	9.84	31.32	46.00	-14.68	AVG	
5		6.4660	34.35	9.89	44.24	60.00	-15.76	QP	
6		6.4660	23.37	9.89	33.26	50.00	-16.74	AVG	
7		6.8700	35.54	9.90	45.44	60.00	-14.56	QP	
8		6.8700	24.24	9.90	34.14	50.00	-15.86	AVG	
9		7.3460	37.23	9.91	47.14	60.00	-12.86	QP	
10		7.3460	25.13	9.91	35.04	50.00	-14.96	AVG	
11		15.0500	33.28	10.11	43.39	60.00	-16.61	QP	
12		15.0500	20.68	10.11	30.79	50.00	-19.21	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Lin



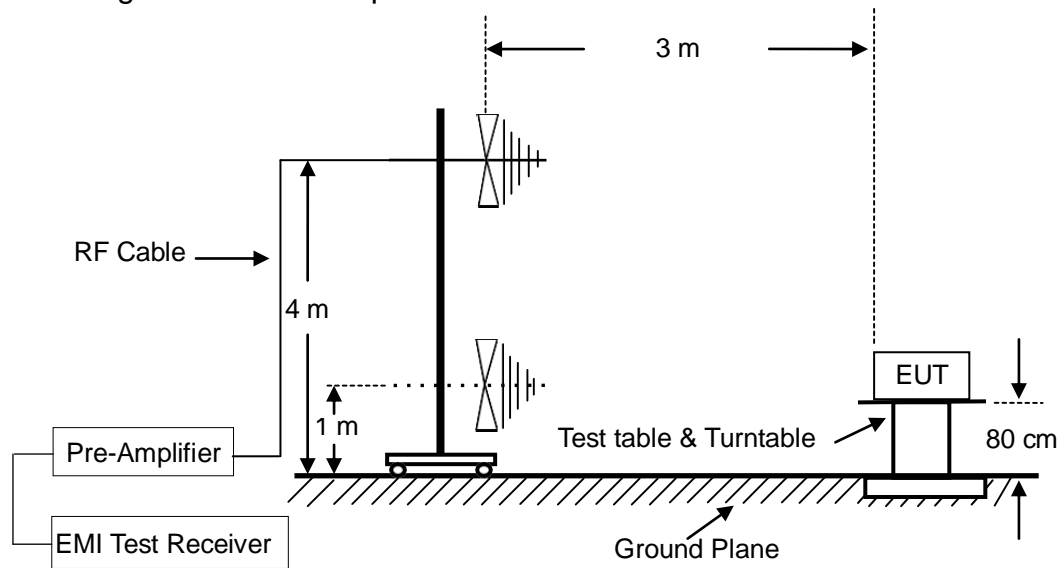
Site site #1 Phase: **N** Temperature: 25
 Limit: (CE)FCC PART 15 B_QP Power: AC 120V/60Hz Humidity: 55 %
 Mode: Alarm Clock+LED ON
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.5740	28.08	9.84	37.92	56.00	-18.08	QP	
2		0.5740	17.02	9.84	26.86	46.00	-19.14	AVG	
3		1.0980	27.96	9.84	37.80	56.00	-18.20	QP	
4		1.0980	10.95	9.84	20.79	46.00	-25.21	AVG	
5		6.9940	36.19	9.90	46.09	60.00	-13.91	QP	
6		6.9940	24.12	9.90	34.02	50.00	-15.98	AVG	
7		7.2060	36.60	9.91	46.51	60.00	-13.49	QP	
8		7.2060	24.45	9.91	34.36	50.00	-15.64	AVG	
9	*	7.3740	36.63	9.91	46.54	60.00	-13.46	QP	
10		7.3740	24.42	9.91	34.33	50.00	-15.67	AVG	
11		15.5500	34.20	10.12	44.32	60.00	-15.68	QP	
12		15.5500	23.54	10.12	33.66	50.00	-16.34	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Lin

5. RADIATED EMISSION MEASUREMENT (UP TO 1GHz)

5.1. Block Diagram of Test Setup



5.2. Radiated Limit

FCC Part 15, Subpart B, Class B

Frequency MHz	Distance Meters	Field Strengths Limit	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0

5.3. Test Procedure

The EUT was placed on a non-conductive table whose total height equaled 80cm. All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units. Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

The EUT was set 3 meters away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

The bandwidth of the Receiver is set at 120 kHz.

Test results were obtained from the following equation:

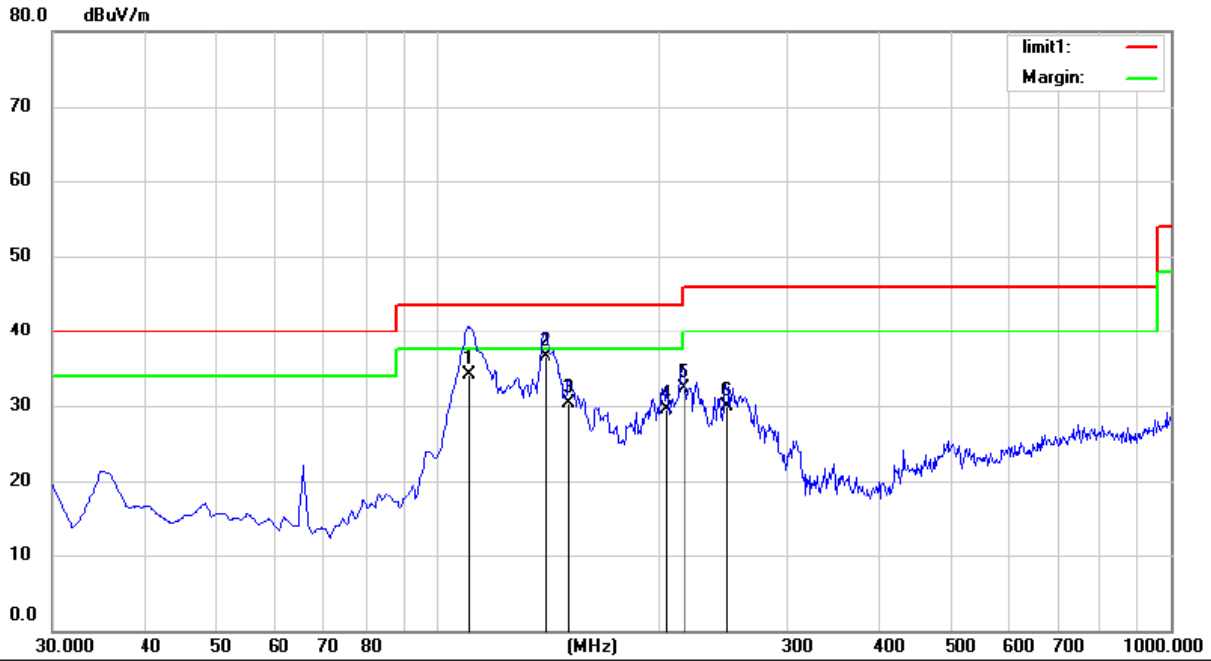
Emission level (dB μ V/m) = Antenna Factor - Amp Factor + Cable Loss + Reading

Margin (dB) = Emission Level (dB μ V/m) - Limit (dB μ V/m)

5.4. Measuring Results

PASS.

Please refer to following pages.



Site Chamber #1

Polarization: **Horizontal**

Temperature: 26

Limit: (RE)FCC PART 15 B 3m

Power: AC 120V/60Hz

Humidity: 55 %

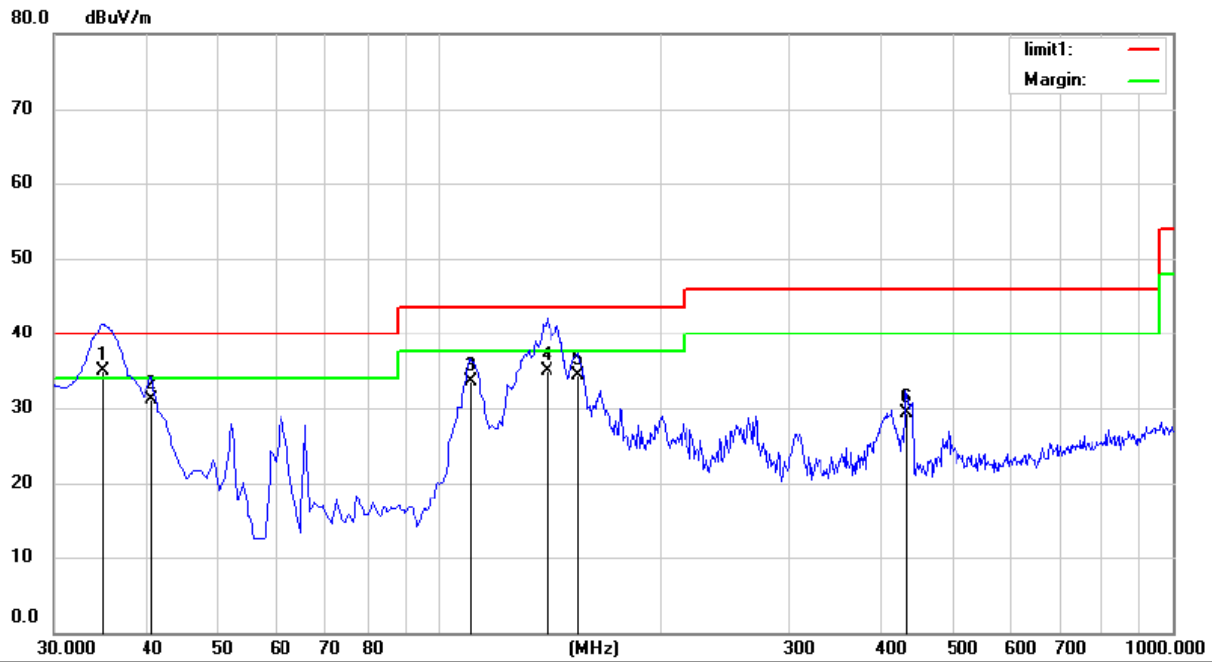
Mode: Alarm Clock+LED ON

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		110.5100	52.60	-18.48	34.12	43.50	-9.38	QP		
2	*	140.5800	58.08	-21.51	36.57	43.50	-6.93	QP		
3		151.2500	51.68	-21.41	30.27	43.50	-13.23	QP		
4		205.5700	46.78	-17.31	29.47	43.50	-14.03	QP		
5		216.2400	49.29	-17.08	32.21	46.00	-13.79	QP		
6		248.2500	45.38	-15.57	29.81	46.00	-16.19	QP		

*:Maximum data x:Over limit !:over margin

Operator: huang



Site Chamber #1

Polarization: **Vertical**

Temperature: 26

Limit: (RE)FCC PART 15 B 3m
Mode: Alarm Clock+LED ON

Power: AC 120V/60Hz

Humidity: 55 %

Note:

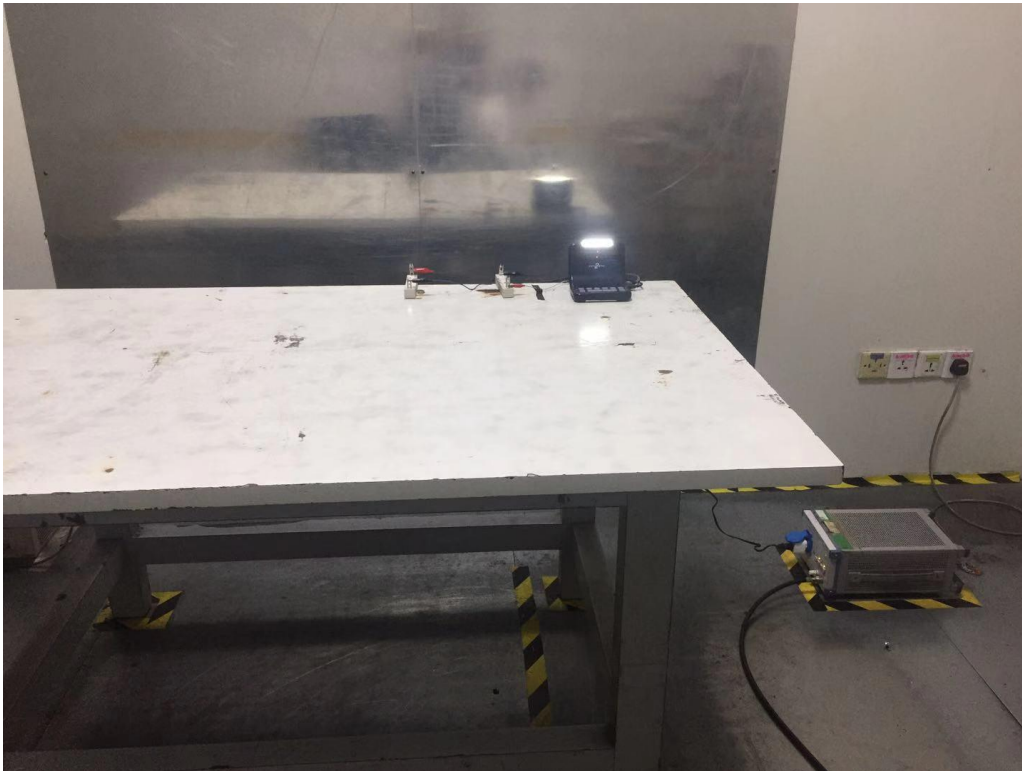
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree	Comment
1	*	34.8822	53.60	-18.62	34.98	40.00	-5.02	QP			
2		40.6700	47.72	-16.57	31.15	40.00	-8.85	QP			
3		110.5686	52.25	-18.75	33.50	43.50	-10.00	QP			
4		140.5800	56.40	-21.51	34.89	43.50	-8.61	QP			
5		155.1300	55.32	-20.96	34.36	43.50	-9.14	QP			
6		432.5500	40.37	-11.06	29.31	46.00	-16.69	QP			

*:Maximum data x:Over limit !:over margin

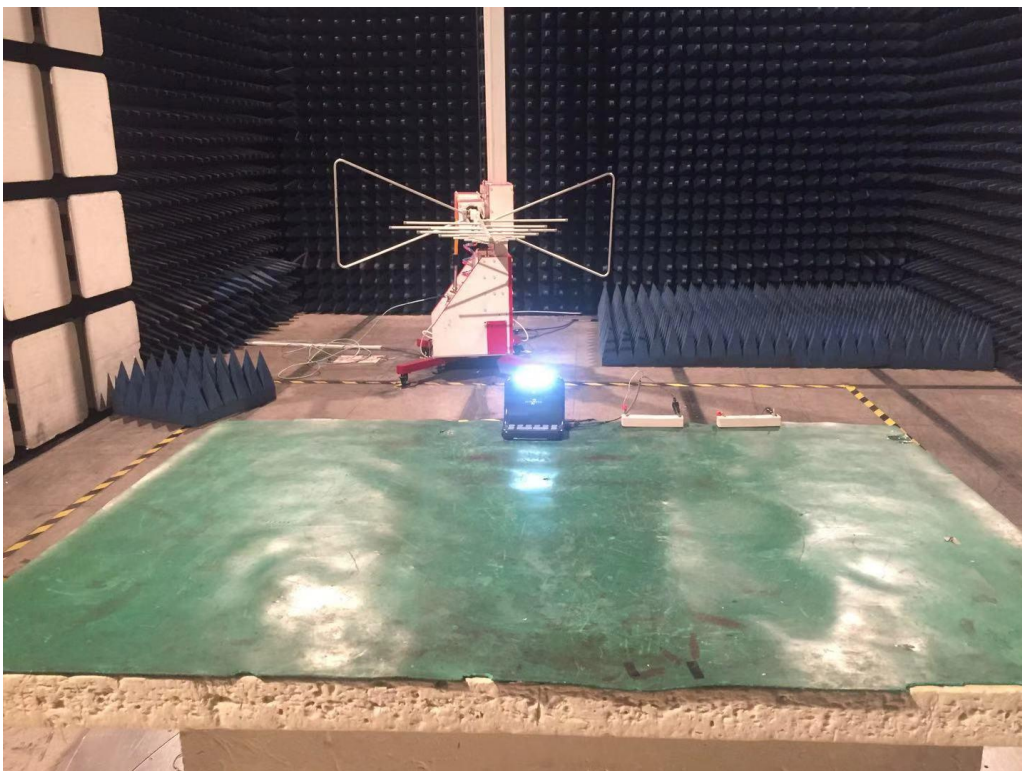
Operator: huang

6. PHOTOGRAPHS

6.1. Photos of Conducted Emission Measurement



6.2. Photos of Radiation Emission Measurement



APPENDIX A: Warning Labels

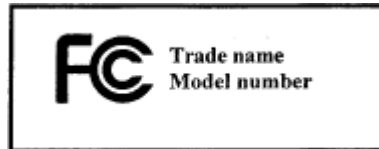
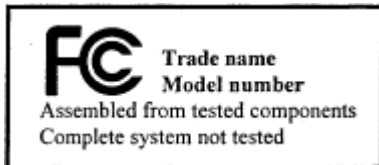
Label Requirements

A Class B digital device subject to Declaration of Conformity of FCC shall carry a label which includes the following statement:

***** WARNING *****

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The sample label shown shall be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time of purchase.



APPENDIX B: Warning Statement

Statement Requirements

The operators' manual for a Class B digital device shall contain the following statements or their equivalent:

***** WARNING *****

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

Notice: The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equivalent.

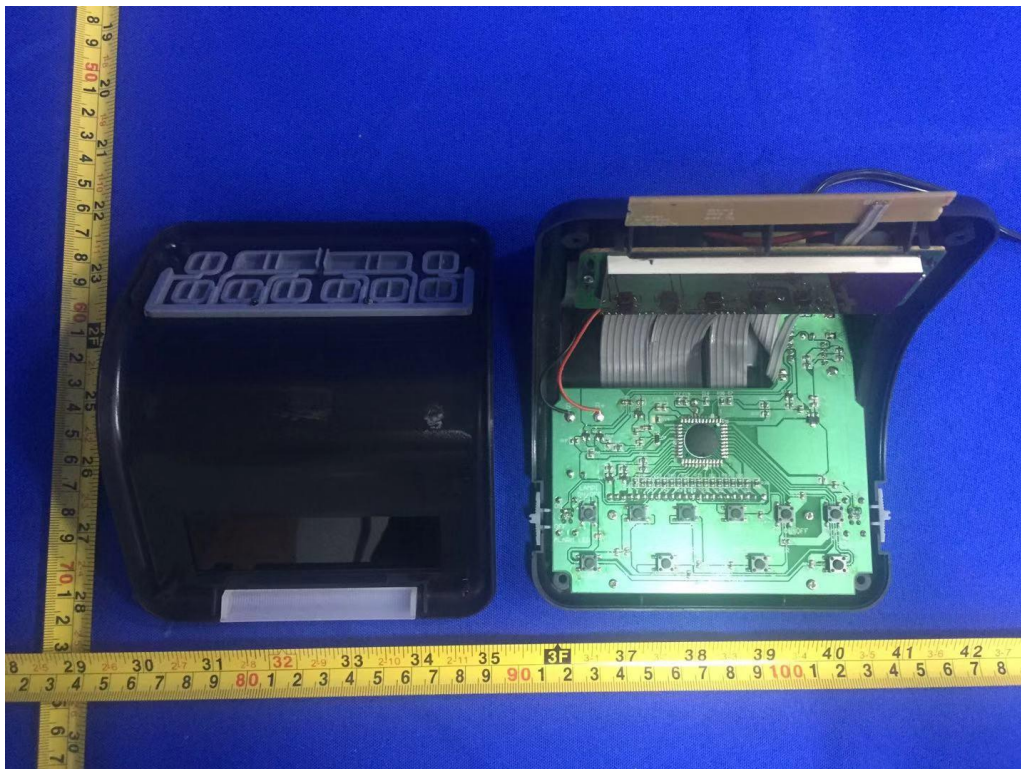
If the EUT was tested with special shielded cables the operators manual for such product shall also contain the following statements or their equivalent:

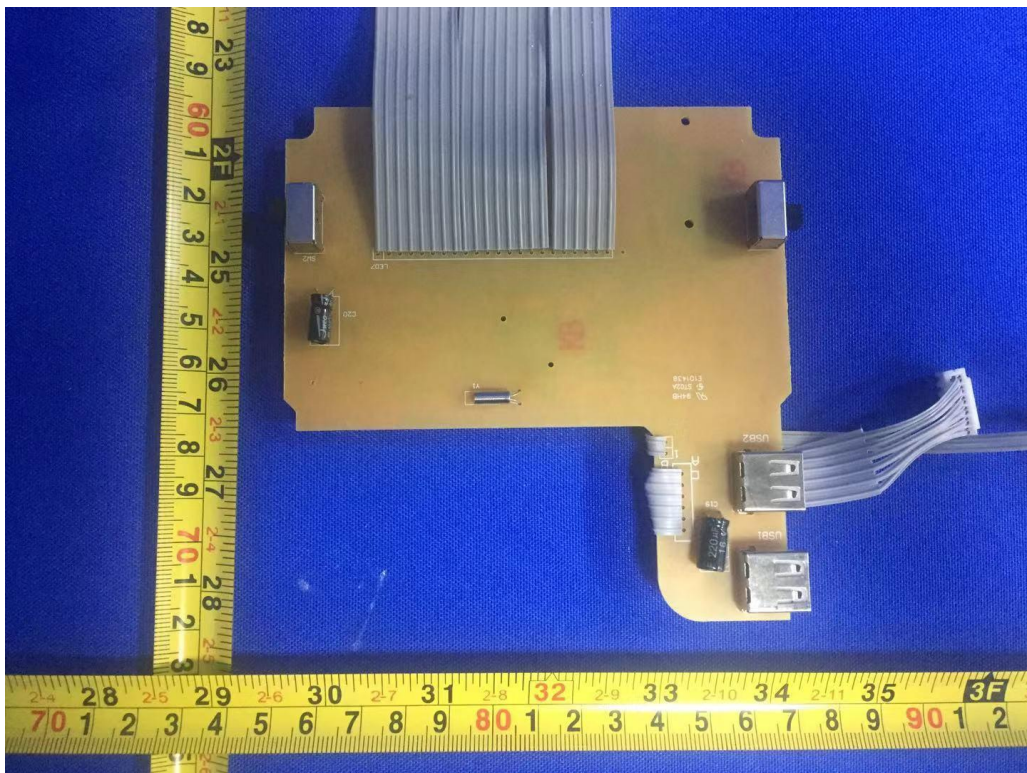
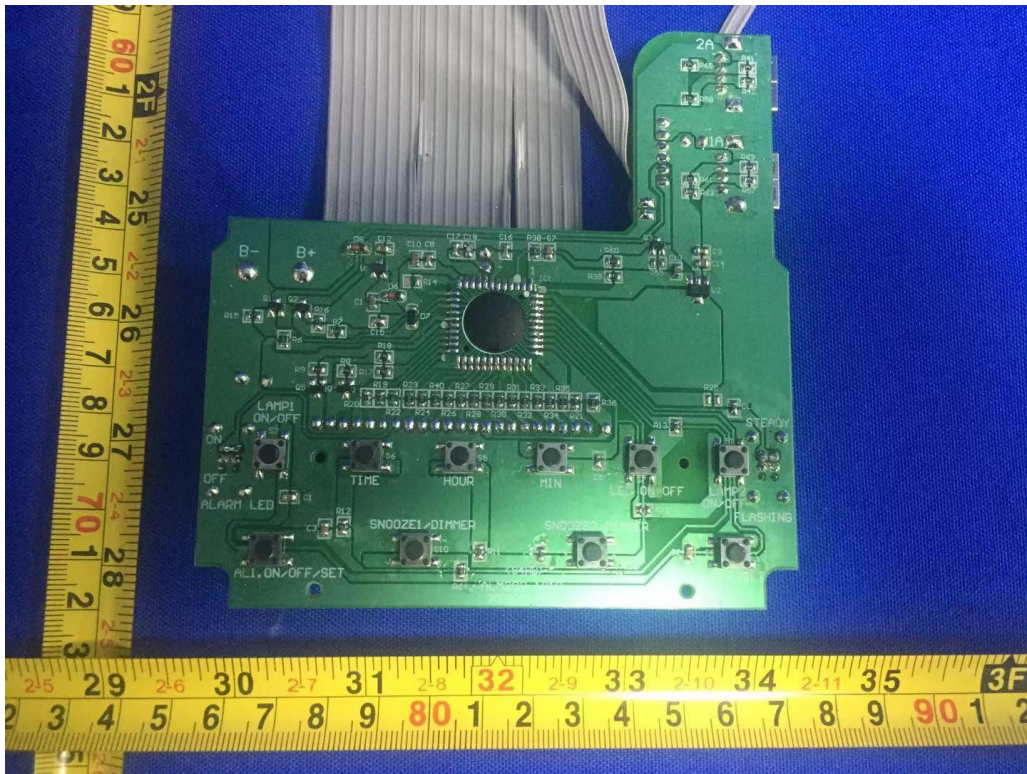
Shielded interface cables and/or AC power cord, if any, must be used in order to comply with the emission limits.

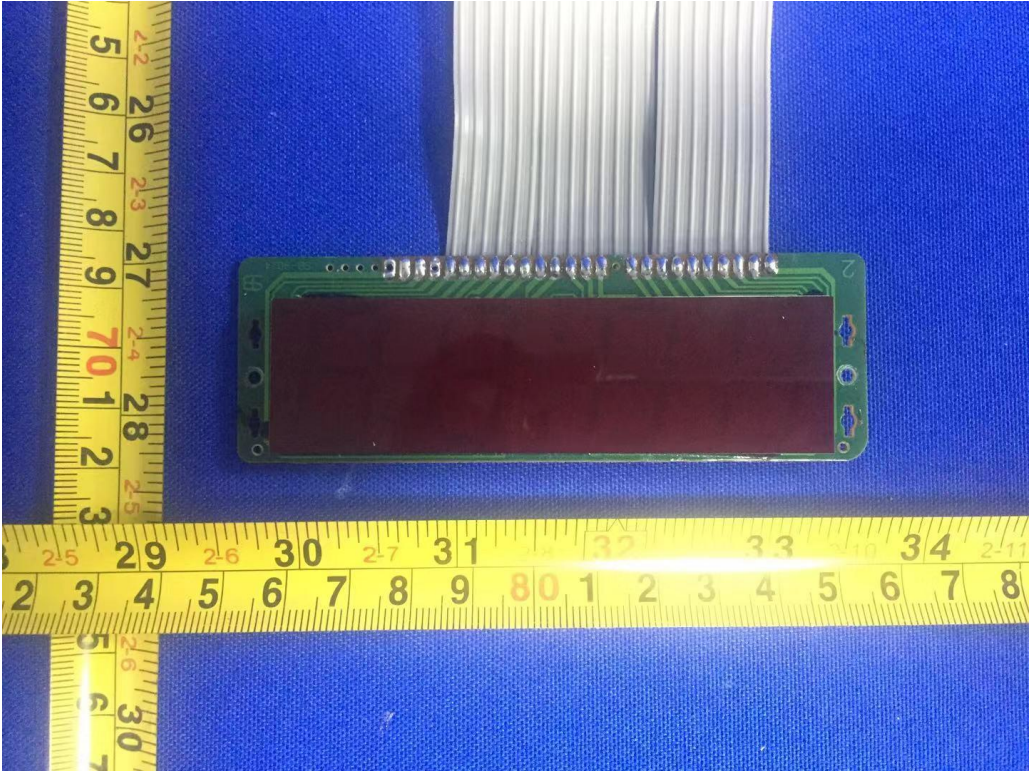
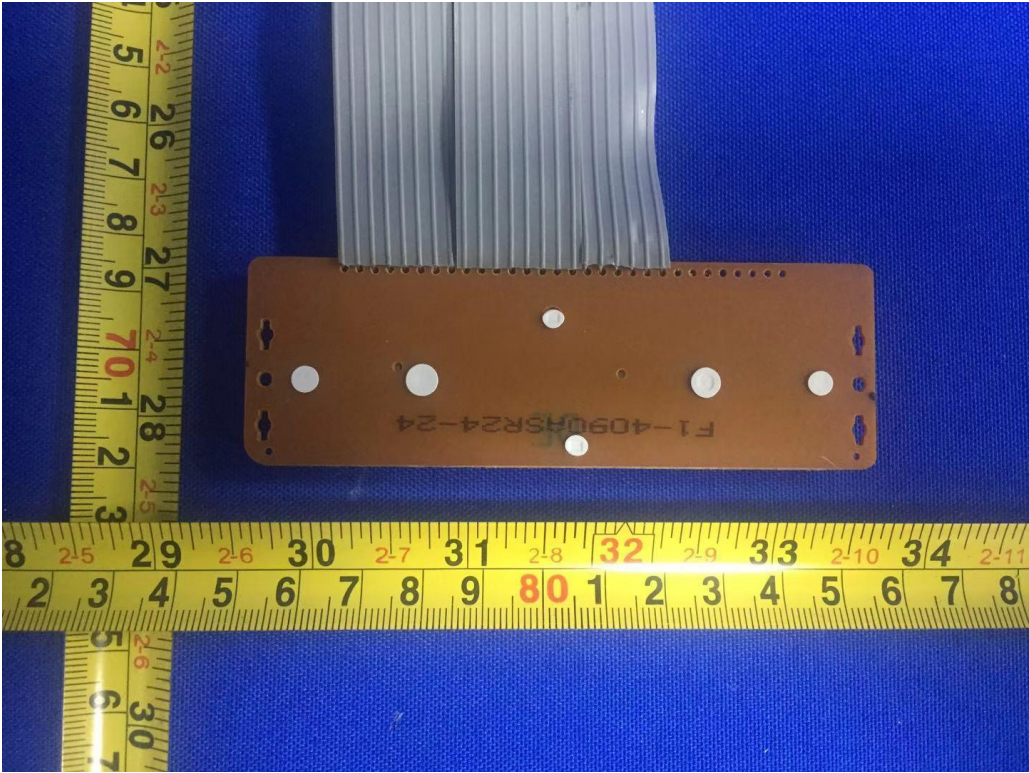
APPENDIX C: Photos of EUT

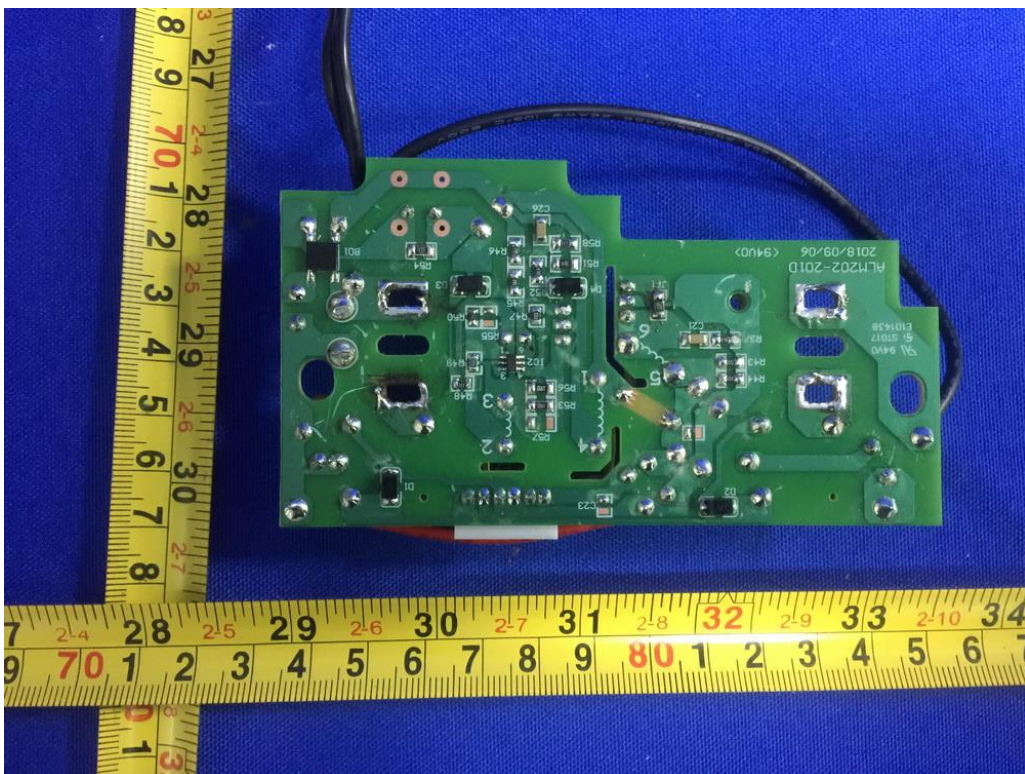
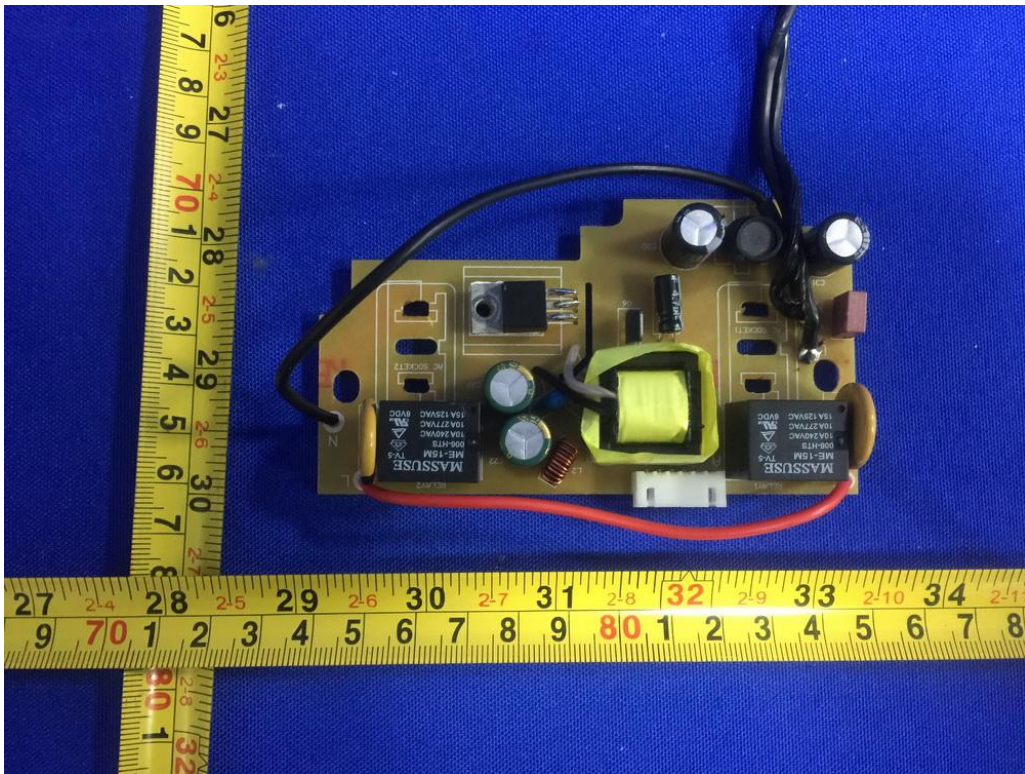












-----The end-----