

TEST REPORT

FCC ID : 2AAVPLX-MV-120LED-D
Applicant : Ningbo lexing inductor electronic co.,ltd
Address : No.35 Zhuquan Road,Science & Technology Area. Ninghai, Ningbo, Zhejiang,China
Manufacturer : Ningbo lexing inductor electronic co.,ltd
Address : No.35 Zhuquan Road,Science & Technology Area. Ninghai, Ningbo, Zhejiang,China

Equipment Under Test (EUT) :

Product Name : Microwave Sensor Lamp
Model No. : See section 4.3 Model List
Rules : FCC CFR47 Part 15 Section 15.249: 2012

Date of Test : June 29~August 11, 2013

Date of Issue : August 22, 2013

Test Result	: PASS*
Remark: * The sample described above has been tested to be in compliance with the requirements of the rules listed above. The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.	

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2 Test Summary

Test Items	Test Requirement	Result
Out-of-band Emissions	15.205	PASS
Conducted Emissions	15.207	PASS
Radiated Emission	15.205(a) 15.209 15.249(a)	PASS
Antenna Requirement	15.203	PASS

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4 General Information

4.1 General Description of E.U.T.

Product Name	: Microwave Sensor Lamp
Model No.	: See section 4.3 Model List
Modulation	: doppler shift
Frequency Range	: 5775.54MHz
Antenna installation	: Integrated Antenna
Model differences	All same except LED driver output power. The model LX-MV-120LED-D is test sample.

4.2 Details of E.U.T.

Technical Data	: See section 4.3 Model List
Adapter	: N/A

4.3 Model List

No.	Model	Input	Rated Power	Battery
1.	LX-360LED-1	100-240V, 50/60Hz	15W Max.	none
2.	LX-360LED-ADS	100-240V, 50/60Hz	15W Max.	7.4V 2000mAh
3.	LX-LD-105P-ADS	100-240V, 50/60Hz	15W Max	7.4V 2000mAh
4.	LX-MV-120LED	100-240V, 50/60Hz	19W Max.	none
5.	LX-MV-120LED-D	100-240V, 50/60Hz	19W Max.	7.4V 2000mAh
6.	LX-MV-122LED	100-240V, 50/60Hz	9W Max.	none
7.	LX-MV-122LED-D	2100-240V, 50/60Hz	9W Max.	7.4V 2600mAh
8.	EE809WMC	100-240V, 50/60Hz	9W Max.	7.4V 2600mAh

4.4 Test Facility

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

- **FCC – Registration No.: 880581**

Waltek Services(Shenzhen) Co., Ltd. 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 880581, May 26, 2011.

- **IC – Registration No.:7760A**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, July 12, 2012.

4.5 Test Location

All Emissions tests were performed at:-
1/F, Fukangtai Building, West Baima Rd., Songgang Street, Baoan District, Shenzhen
518105, Guangdong, China.

4.6 General condition

Ambient Condition: 25.5 °C 58 %RH

4.6.1 Environmental condition of test site

For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

The follow condition is applicable

Test Voltage	Input voltage
Rated voltage-15%	AC 102V
normal	AC 120V
Rated voltage+15%	AC 138V

The follow condition is not applicable.

Test voltage	Test Voltage
Rated voltage	New Battery

4.6.2 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test mode	Lower channel	Middle channel	Upper channel
Transmitting	MHz	5775.54MHz	MHz
Receiving	MHz	MHz	MHz

5 Equipment Used during Test

5.1 Equipments List

Conducted Emissions						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	100947	Aug. 13,2012	Aug. 12,2013
2.	LISN	R&S	ENV216	101215	Aug. 13,2012	Aug. 12,2013
3.	Cable	Top	TYPE16(3.5M)	-	Aug.14,2012	Aug. 13,2013
3m Semi-anechoic Chamber for Radiation Emissions						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer	Agilent	E7405A	MY45114943	Aug. 13,2012	Aug. 12,2013
2.	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Aug. 13,2012	Aug. 12,2013
3.	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr. 20,2013	Apr. 19,2014
4.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr. 20,2013	Apr. 19,2014
5.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	399	Aug. 13,2012	Aug. 12,2013
6.	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Apr.07,2013	Apr.06,2014
7.	Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-148	Aug. 13,2012	Aug. 12,2013
8.	Cable	Top	EWO2014-7	-	Apr. 20,2013	Apr. 19,2014
9.	Cable	Top	TYPE16(13M)	-	Aug. 13,2012	Aug. 12,2013

5.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-6}$
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 4.50 dB (Active Loop Antenna 9kHz~30MHz)
	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 4.74 dB (Horn antenna 1000M~25000MHz)
Conducted Spurious Emissions test	± 3.64 dB (AC mains 150KHz~30MHz)

5.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

6 Conducted Emission Test

Test Requirement:	FCC Part15 Paragraph 15.207
Test Method:	ANSI C63.4: 2003
Frequency Range:	150kHz to 30MHz
Class:	Class B
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average

Limit

6.1 E.U.T. Test Condition

Operating Environment:

Temperature:	25.5 °C
Humidity:	51 % RH
Atmospheric Pressure:	1012 mbar

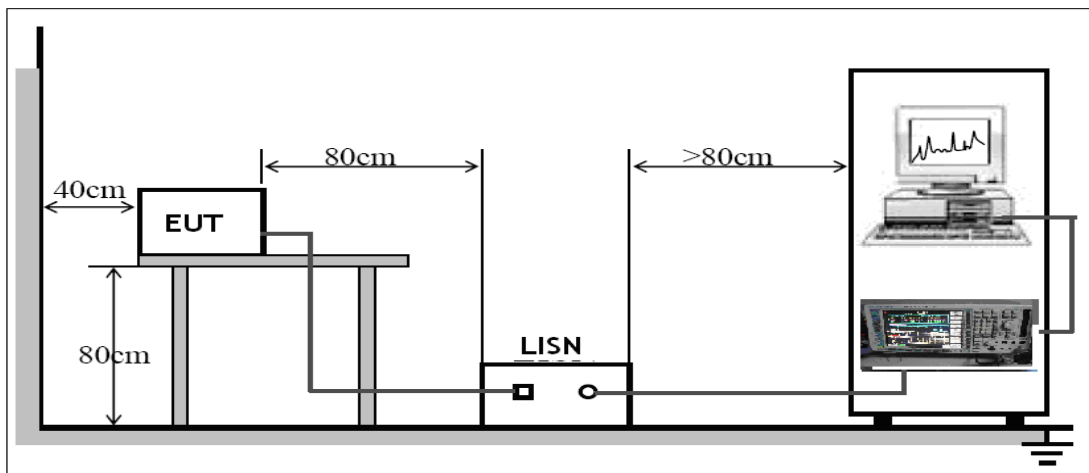
EUT Operation :

The pre-test was performance in **charging & lighting** mode. The test data were shown as follow.

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

6.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.4:2003.

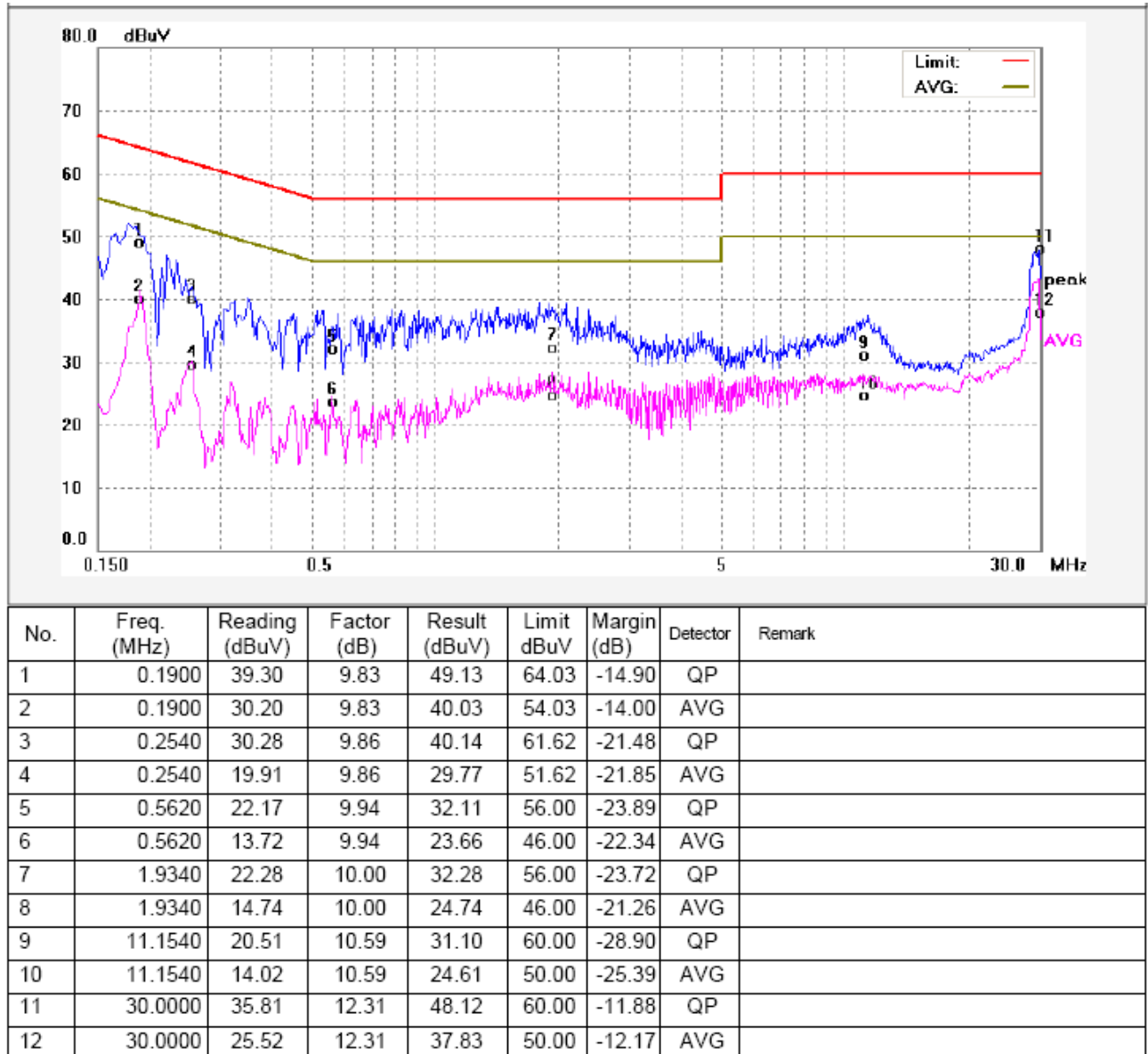


The EUT was placed on the test table in shielding room

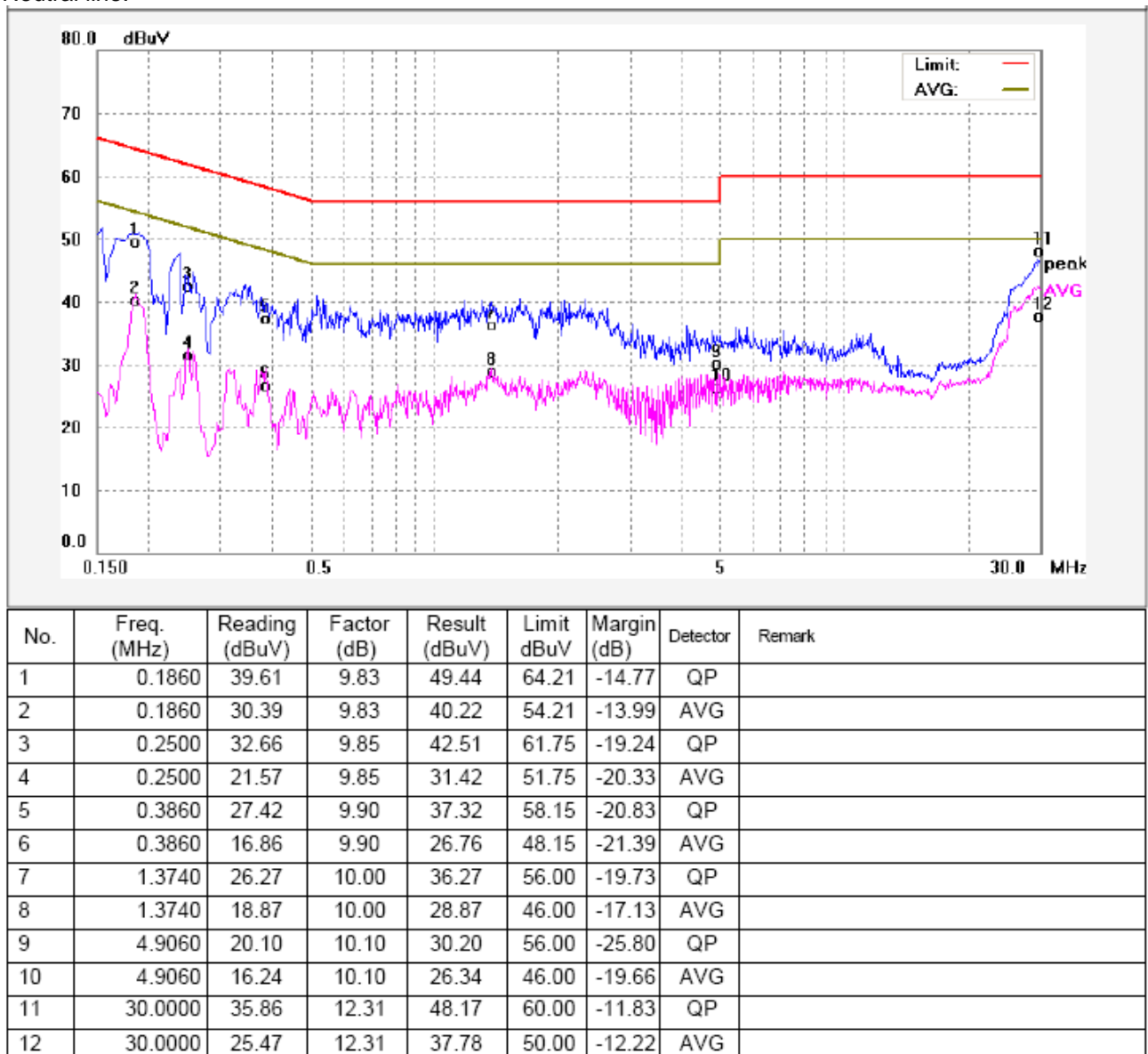
6.3 Conducted Emission Test Result

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

Live line:



Neutral line:



7 Radiation Emission Test

Test Requirement: FCC Part15 Paragraph 15.249
 Test Method: ANSI 63.4:2003
 Measurement Distance: 3m
 Detector: Peak for pre-scan (120kHz resolution bandwidth)
 Quasi-Peak if maximised peak within 6dB of limit
 Test Result: PASS

15.249 Limit:

Fundamental frequency	Field strength of fundamental		Field strength of harmonics	
	mV/m	dBuV/m	uV/m	dBuV/m
902-928 MHz	50	94	500	54
2400-2483.5 MHz	50	94	500	54
5725-5875 MHz	50	94	500	54
24.0-24.25 GHz	250	108	2500	68

15.209 Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

Note: RF Voltage(dBuV)= $20 \log_{10}$ RF Voltage(uV)

7.1 EUT Operation:

Operating Environment:

Temperature: 25.5 °C
 Humidity: 51 % RH
 Atmospheric Pressure: 1012 mbar

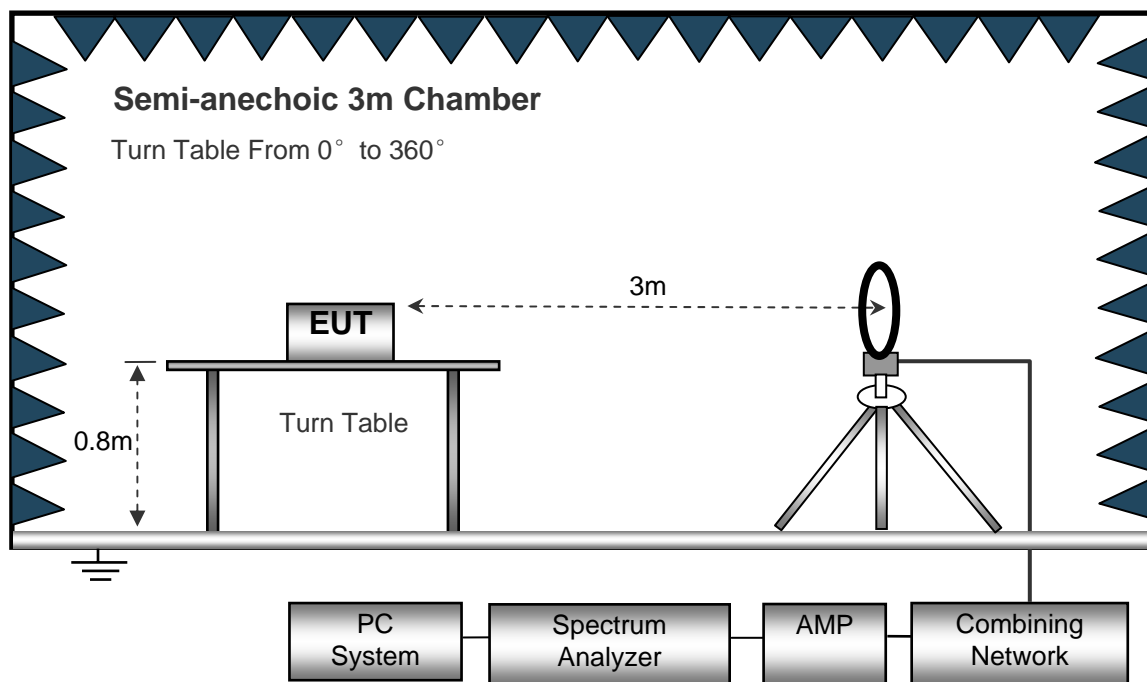
Operation Mode:

The EUT was tested in continuously transmitting mode. The test data were shown as follow.

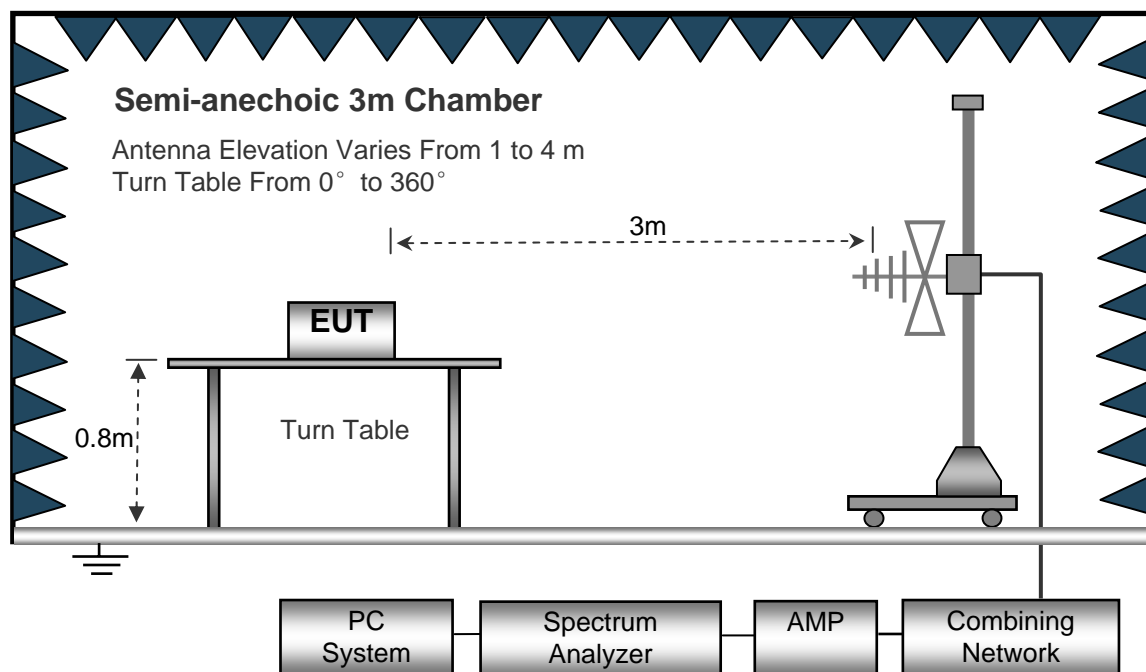
7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4: 2003.

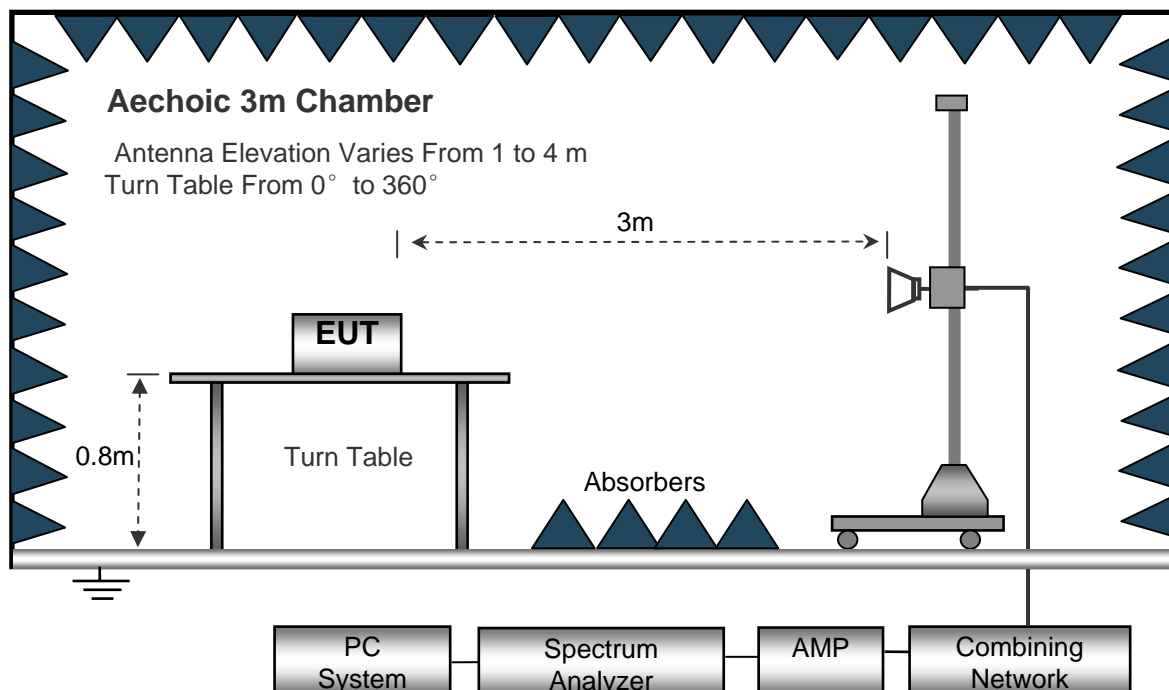
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



7.3 Spectrum Analyzer Setup

According to FCC Part15 Rules, the system was tested from 9KHz to 40GHz.

Below 30MHz

Sweep Speed	Auto
IF Bandwidth	10 KHz
Video Bandwidth	10KHz
Resolution Bandwidth	10 KHz

30MHz ~ 1GHz

Sweep Speed	Auto
IF Bandwidth	120 KHz
Video Bandwidth	100KHz
Quasi-Peak Adapter Bandwidth	120 KHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth	100KHz

Above 1GHz

Sweep Speed	Auto
IF Bandwidth	120 KHz
Video Bandwidth	3MHz
Quasi-Peak Adapter Bandwidth	120 KHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth	1MHz

7.4 Test Procedure

1. This is a handheld device, The radiation emission should be tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position.
So the data shown was the X position only.
2. Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.
3. All data was recorded in the peak and average detection mode.
4. The EUT was under working mode during the final qualification test and the configuration was used to represent the worst case results.

7.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB μ V means the emission is 7dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Class B Limit}$$

7.6 Radiated Emissions Test Result

Formula of conversion factors: the field strength at 3m was established by adding
The meter reading of the spectrum analyzer (which is set to read in units of dB μ V/m)
To the antenna correction factor supplied by the antenna manufacturer. The antenna
Correction factors are stated in terms of dB. The gain of the pressletor was accounted
For in the spectrum analyser meter reading.

Example:

Freq(MHz) Meter Reading + ACF = FS

33 20dB μ V + 10.36dB = 30.36dB μ V/m @3m

7.7 Radiated Emission Data

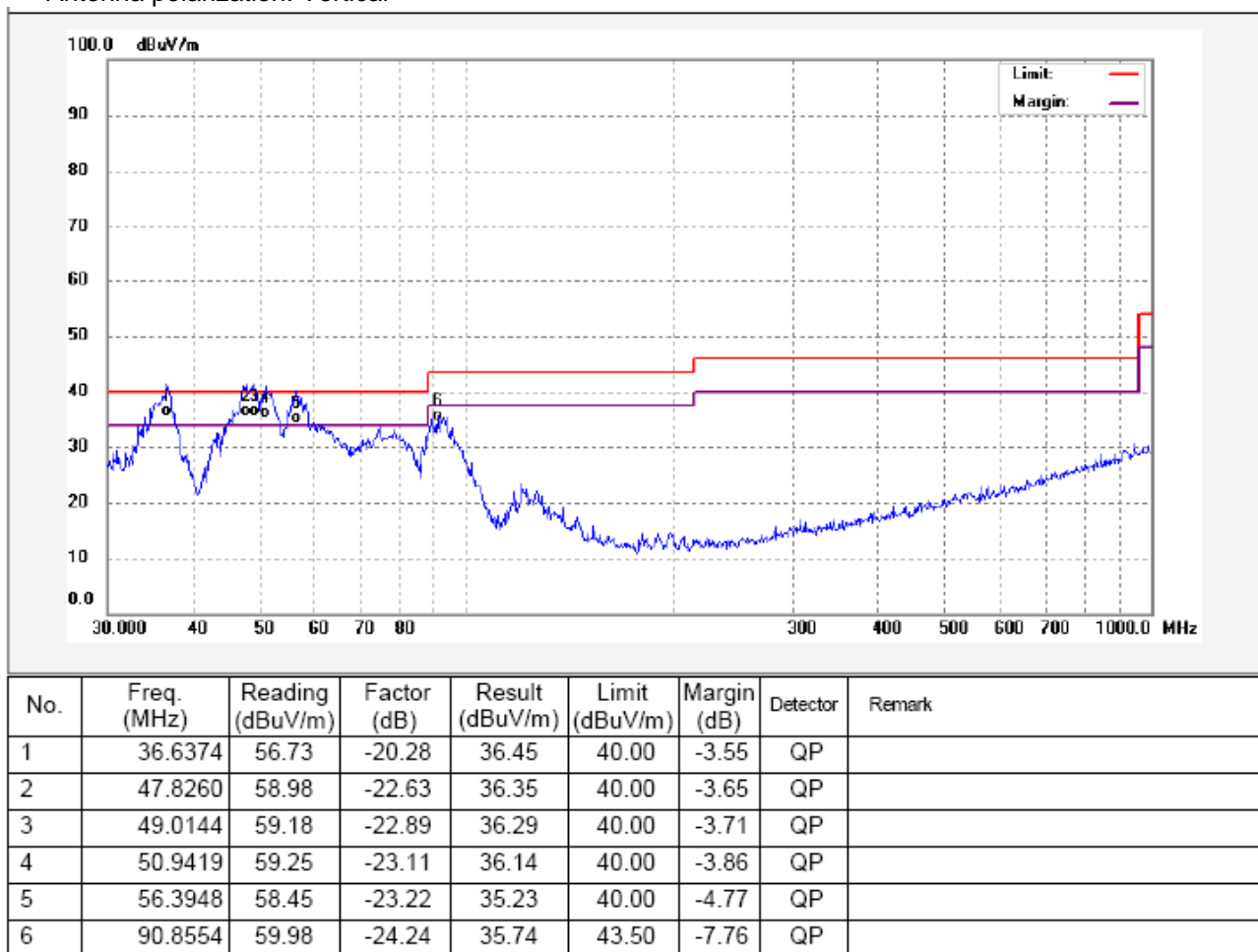
Test mode: normal operation mode:

Test Frequency :Below 30MHz

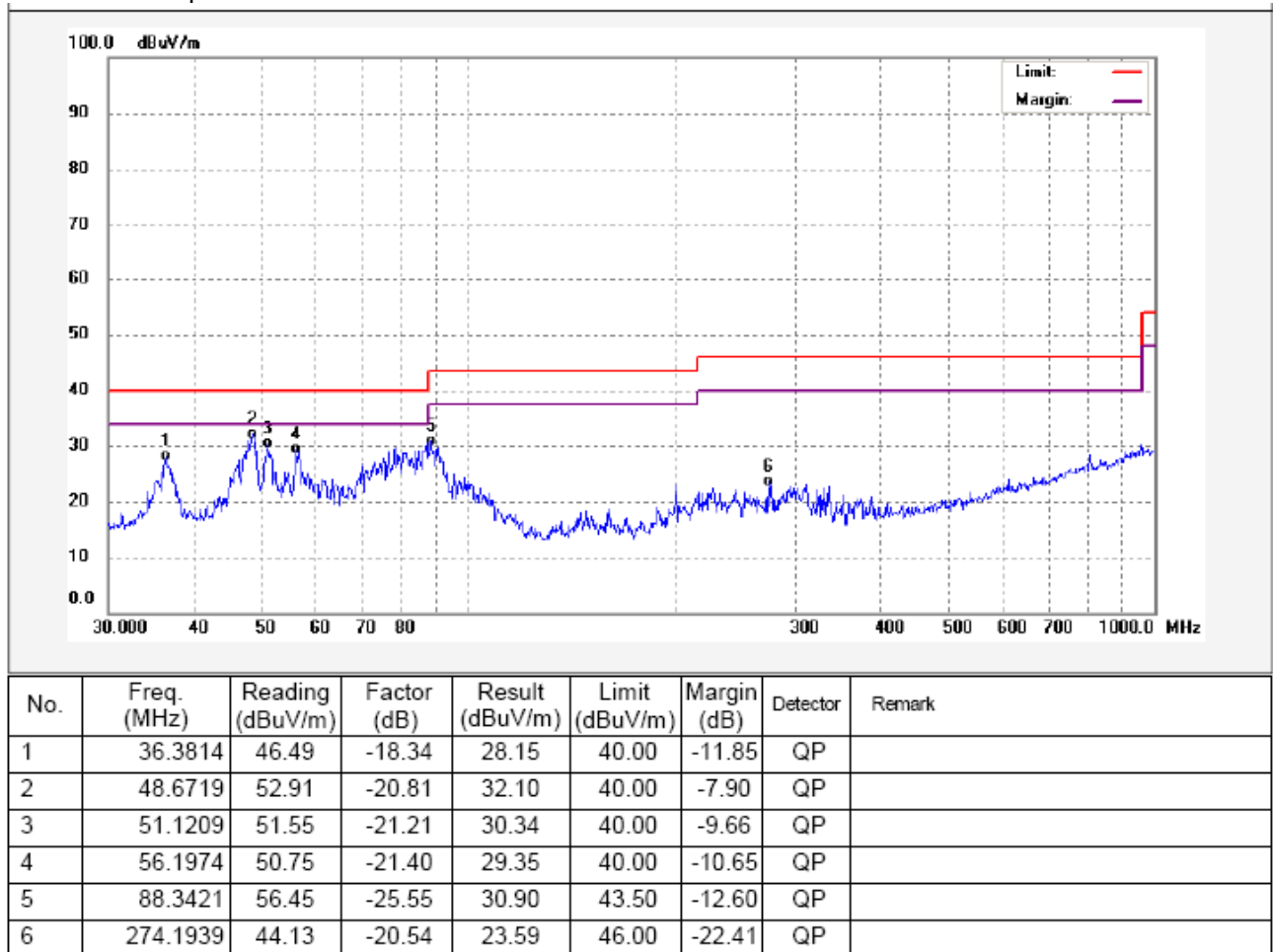
The measurements were more than 20 dB below the limit and not reported.

Test Frequency: 30MHz ~ 1000MHz

Antenna polarization: Vertical



Antenna polarization: Horizontal



Test Frequency: 1GHz ~ 18GHz

Test Mode: Continuously Transmitting

Horizontal:

Freq.	Reading	Factor	Result	Limit	Margin	Detector	Remark
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)		
8089.00	47.50	-6.16	41.34	74.00	-32.66	peak	
8089.00	40.26	-6.16	34.10	54.00	-19.90	AVG	
11551.08	63.00	-3.96	59.04	74.00	-14.96	peak	
11551.08	52.12	-3.96	48.16	54.00	-5.84	AVG	
14668.00	46.29	0.33	46.62	74.00	-27.38	peak	
14668.00	40.21	0.33	40.54	54.00	-13.46	AVG	
17326.62	48.72	1.37	50.09	74.00	-23.91	peak	
17326.62	42.05	1.37	43.42	54.00	-10.58	AVG	
18000.00	42.59	7.08	49.67	74.00	-24.33	peak	
18000.00	35.14	7.08	42.22	54.00	-11.78	AVG	

Vertical:

Freq.	Reading	Factor	Result	Limit	Margin	Detector	Remark
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)		
8106.00	47.22	-6.16	41.06	74.00	-32.94	peak	
8106.00	40.20	-6.16	34.04	54.00	-19.96	AVG	
11551.08	63.14	-3.96	59.18	74.00	-14.82	peak	
11551.08	52.33	-3.96	48.37	54.00	-5.63	AVG	
14651.00	46.49	0.33	46.82	74.00	-27.18	peak	
14651.00	39.56	0.33	39.89	54.00	-14.11	AVG	
17326.62	49.82	1.37	51.19	74.00	-22.81	peak	
17326.62	42.57	1.37	43.94	54.00	-10.06	AVG	
18000.00	44.82	7.08	51.90	74.00	-22.10	peak	
18000.00	37.02	7.08	44.10	54.00	-9.90	AVG	

Test Frequency :Above 18GHz

The measurements were more than 20 dB below the limit and not reported.

8 Restricted band

Test Requirement: FCC Part15 Paragraph 15.205
 Test Method: ANSI C63.4: 2003
 Test Result: N/A

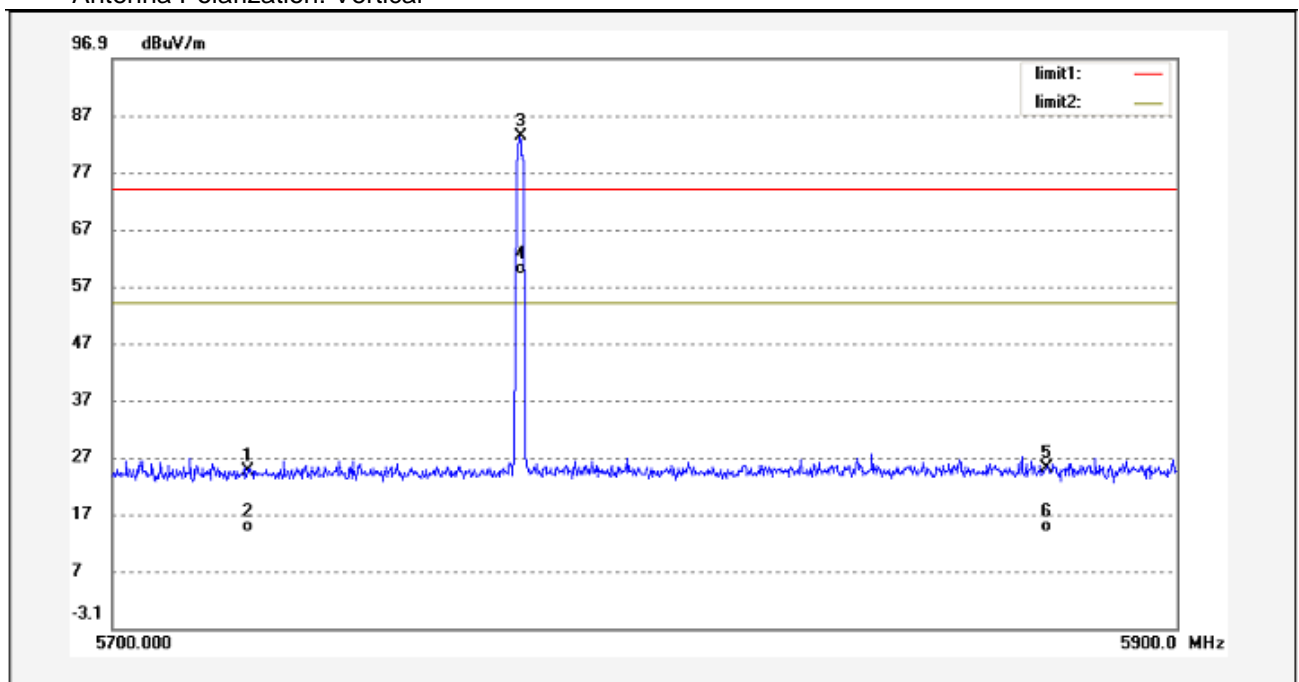
8.1 Requirments:

emissions that fall in the restricted bands(15.205).Above 1000MHz, compliance with the emissions limits in section 15.209 shall be demonstrated based on the average value of the measured emissions,The provisions in section 15.35apply to these measurements.

8.2 Test Result

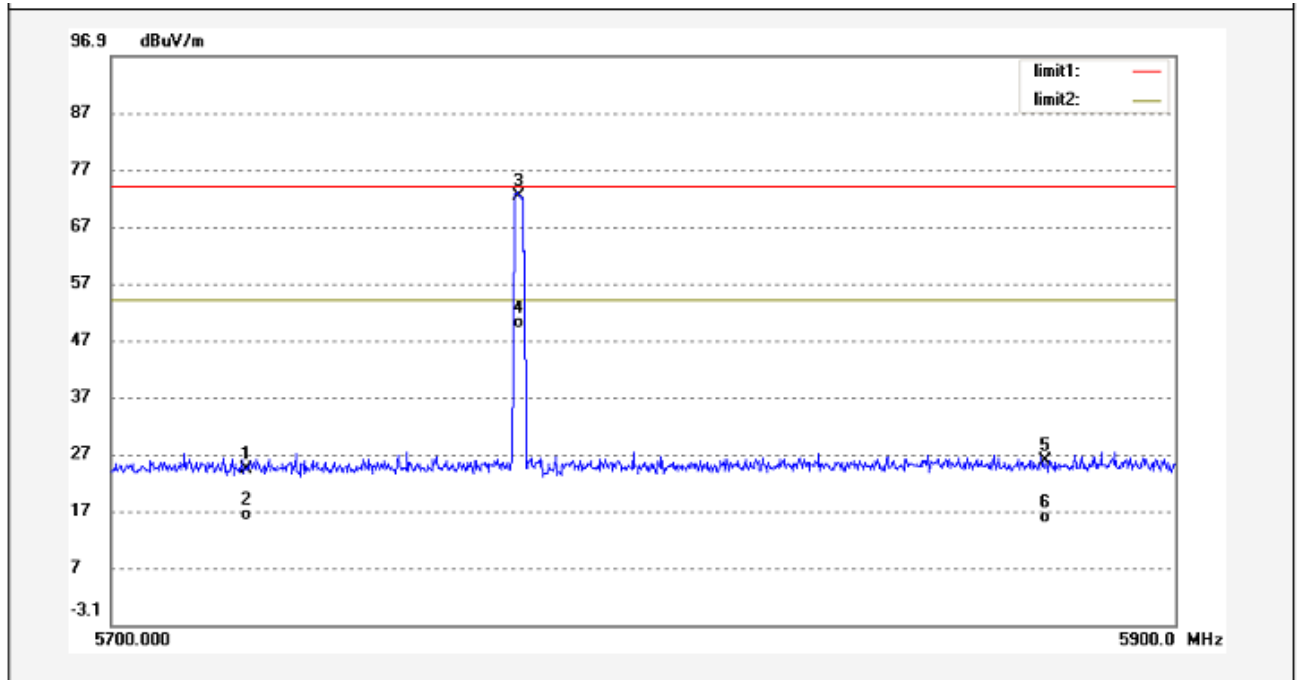
Mode: Continuously Transmitting

Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	5725.000	35.90	-11.31	24.59	74.00	-49.41	peak	
2	5725.000	25.01	-11.31	13.70	54.00	-40.30	AVG	
3	5775.540	94.38	-11.12	83.26	114.00	-30.74	peak	fundamental
4	5775.540	70.03	-11.12	58.91	94.0	-35.09	AVG	
5	5875.000	35.74	-10.82	24.92	74.00	-49.08	peak	
6	5875.000	24.62	-10.82	13.80	54.00	-40.20	AVG	

Antenna Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	5725.000	35.47	-11.31	24.16	74.00	-49.84	peak	
2	5725.000	26.54	-11.31	15.23	54.00	-38.77	AVG	
3	5775.540	83.39	-11.12	72.27	114.00	-37.73	peak	fundamental
4	5775.540	60.11	-11.12	48.99	94.00	-45.01	AVG	
5	5875.000	36.62	-10.82	25.80	74.00	-48.20	peak	
6	5875.000	25.63	-10.82	14.81	54.00	-39.19	AVG	

9 Antenna Requirement

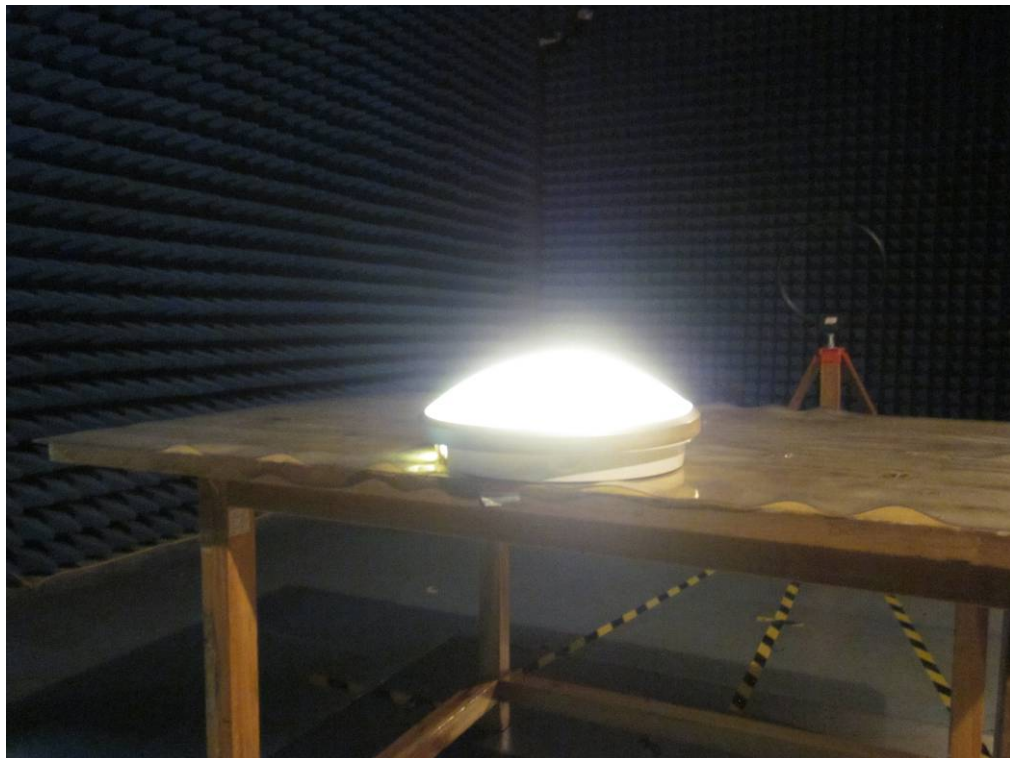
According to the FCC Part 15 Paragraph 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. This product has a integrated antenna, fulfil the requirement of this section.

10 Photographs of Testing

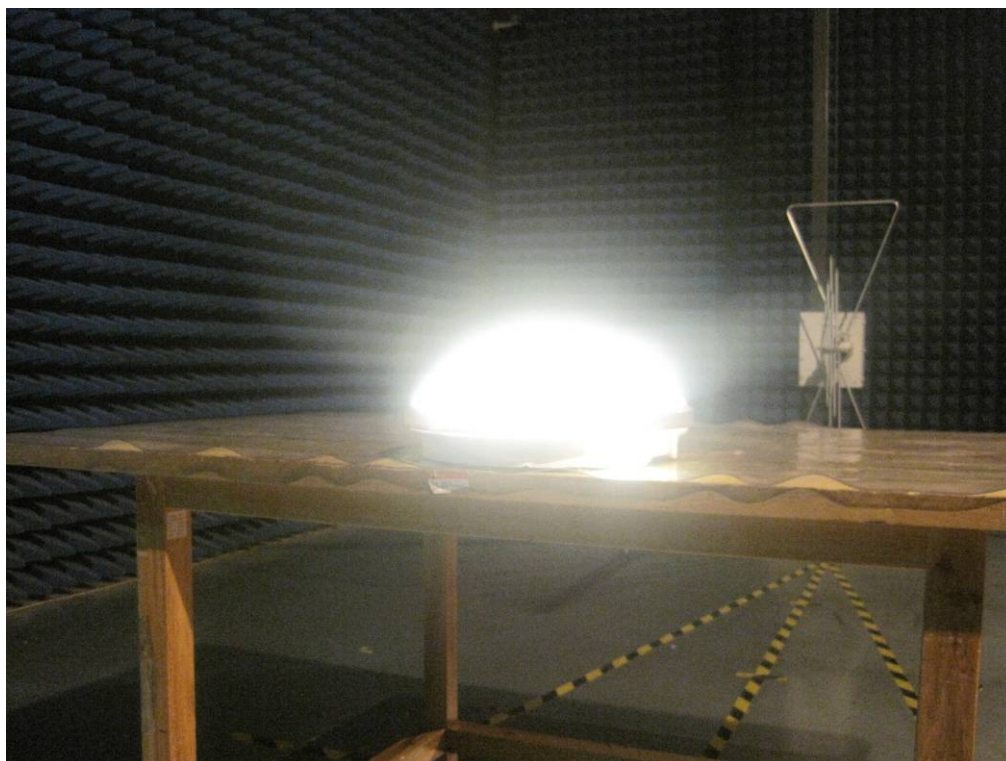
10.1 Conducted Emissions Test View



10.2 Radiation Emission From Below 30MHz



10.3 Radiation Emission From 30MHz-1GHz



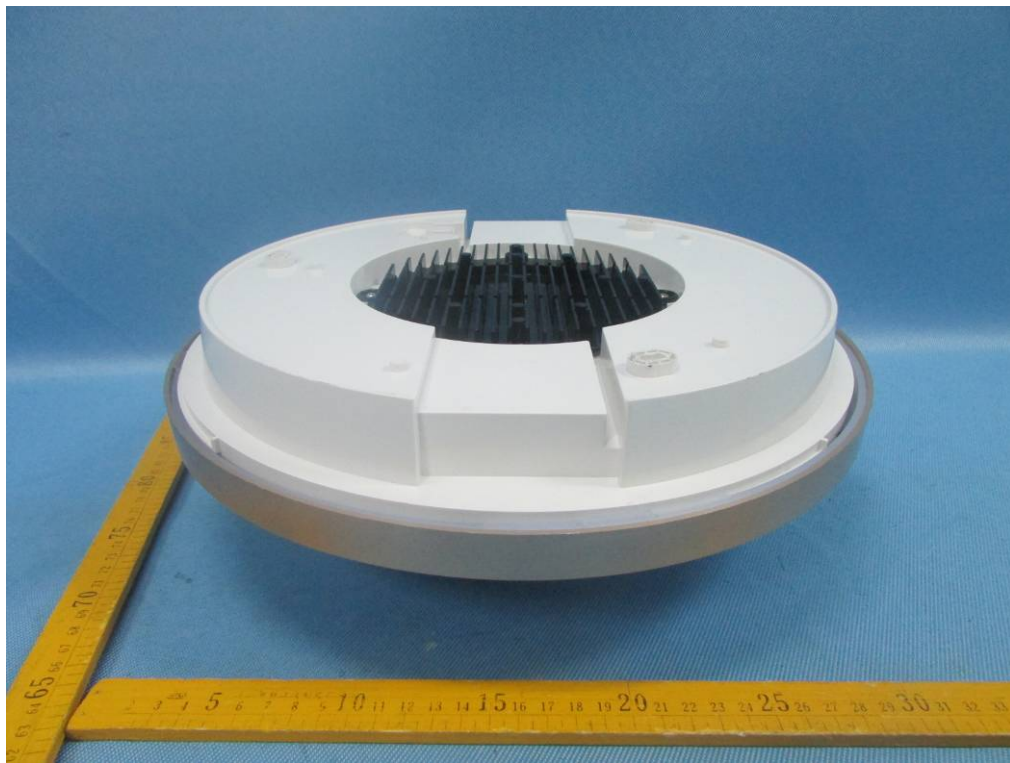
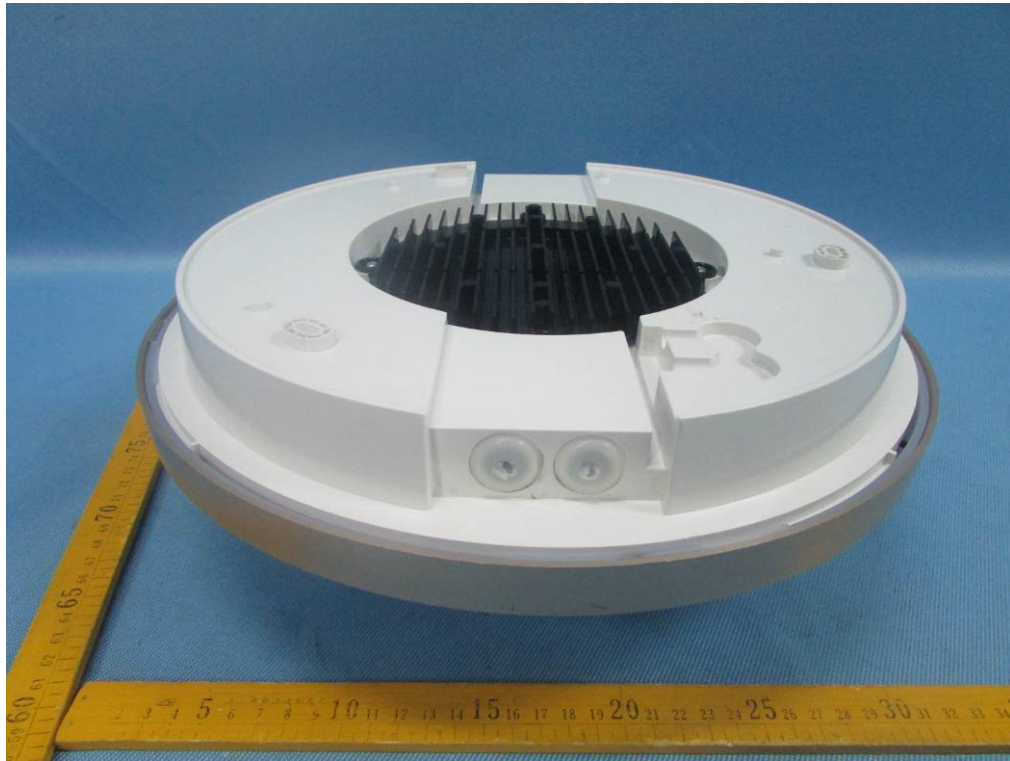
10.4 Radiation Emission Above 1GHz



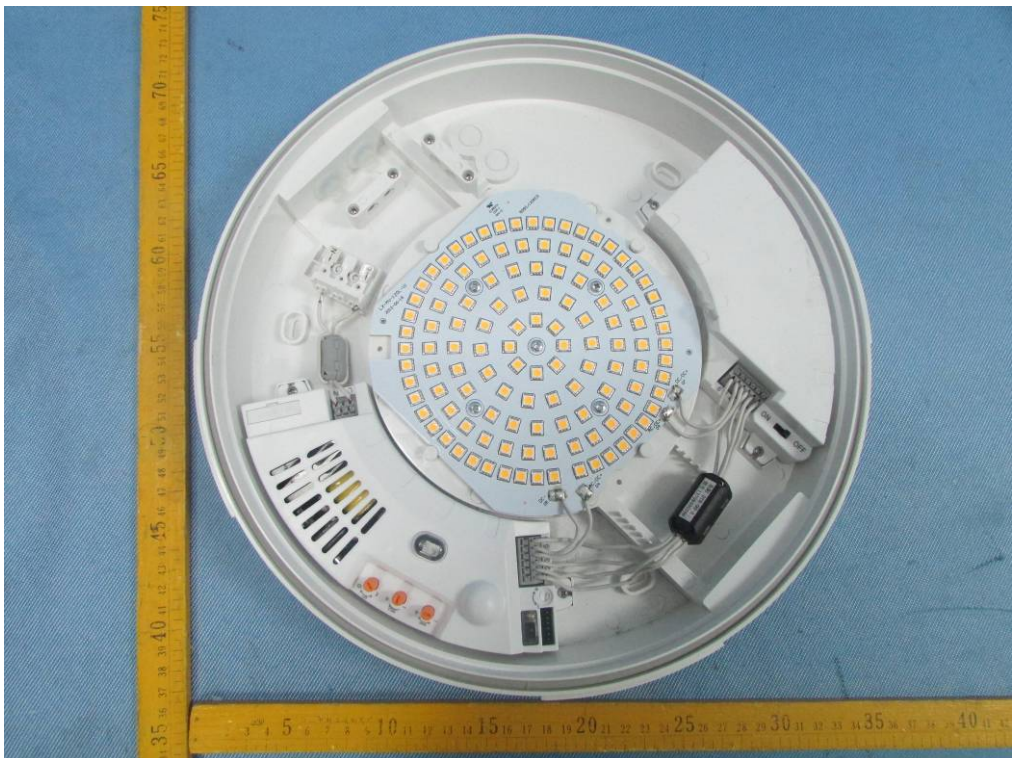
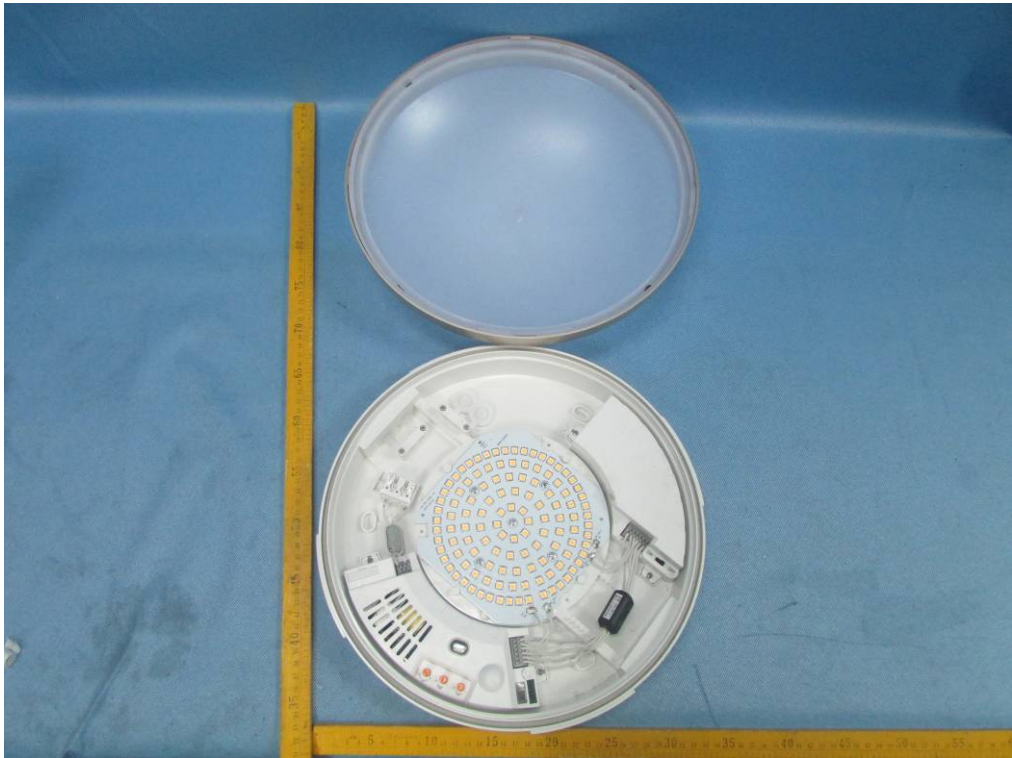
11 Photographs - Constructional Details

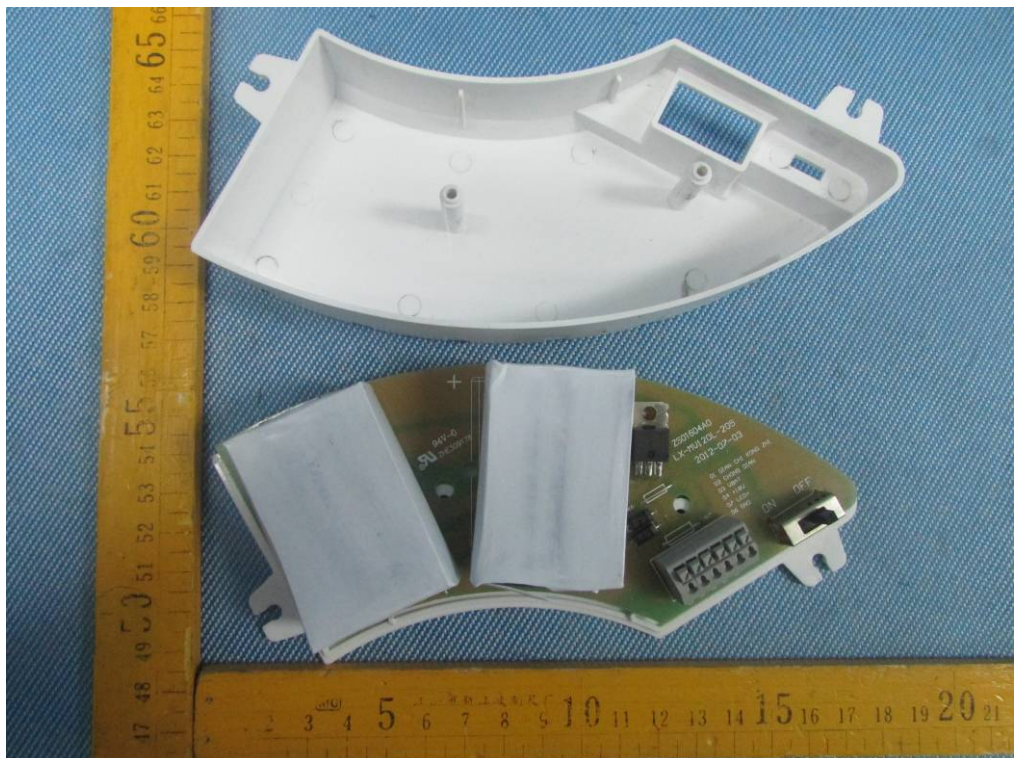
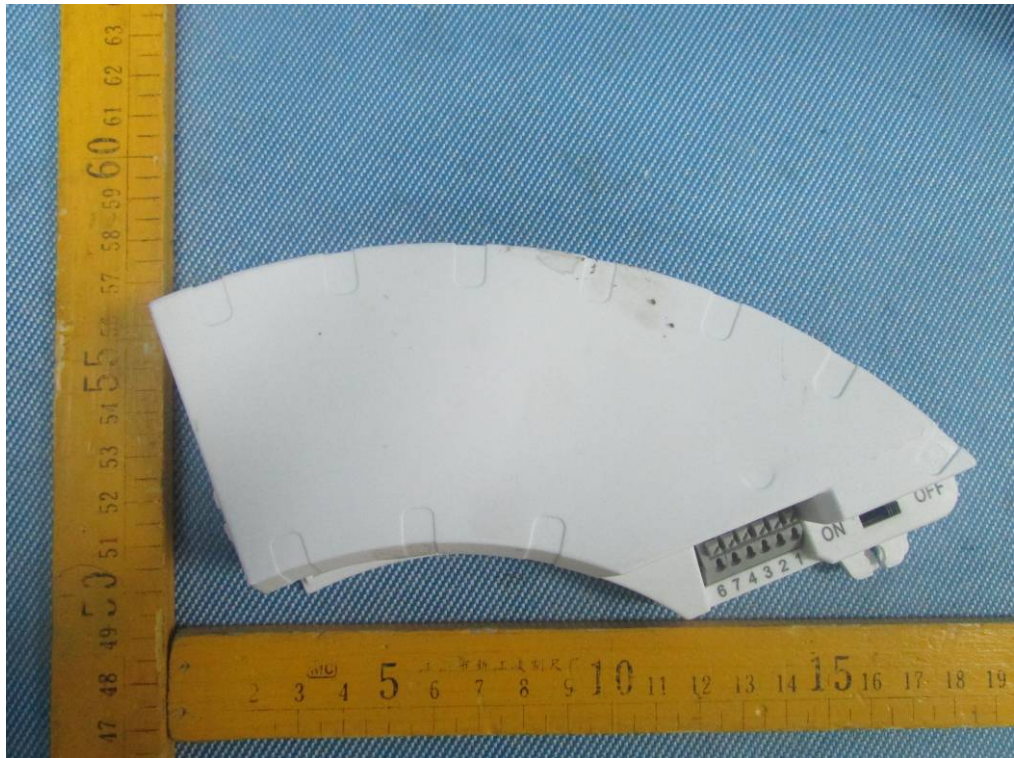
11.1 EUT –Appearance View

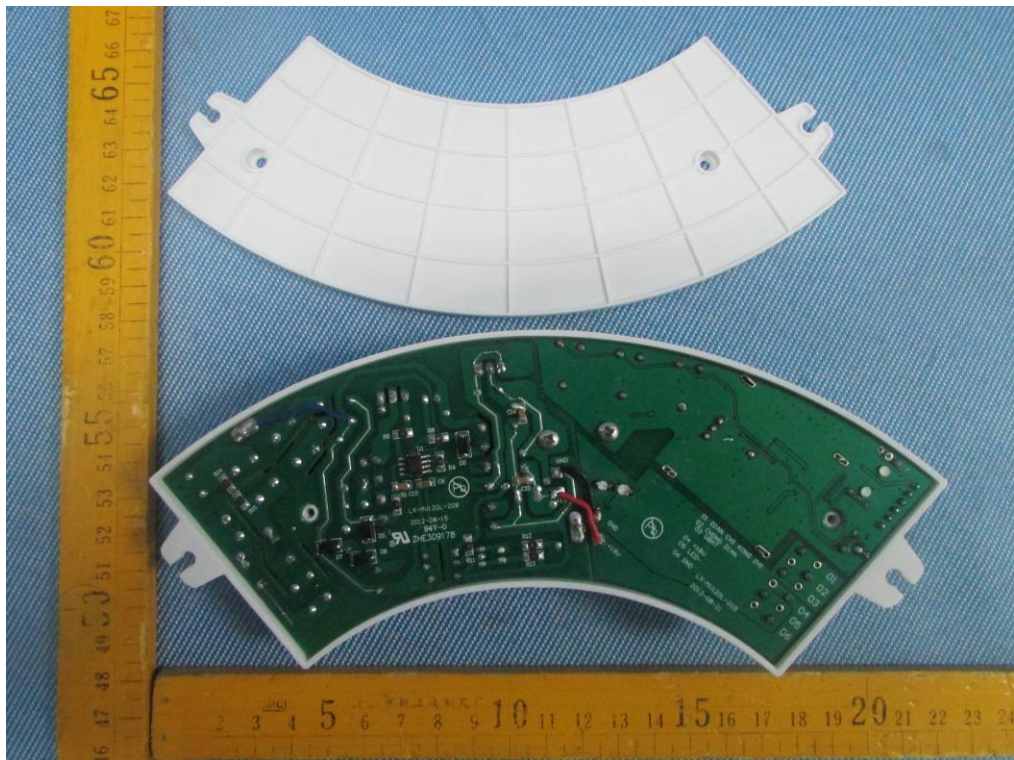
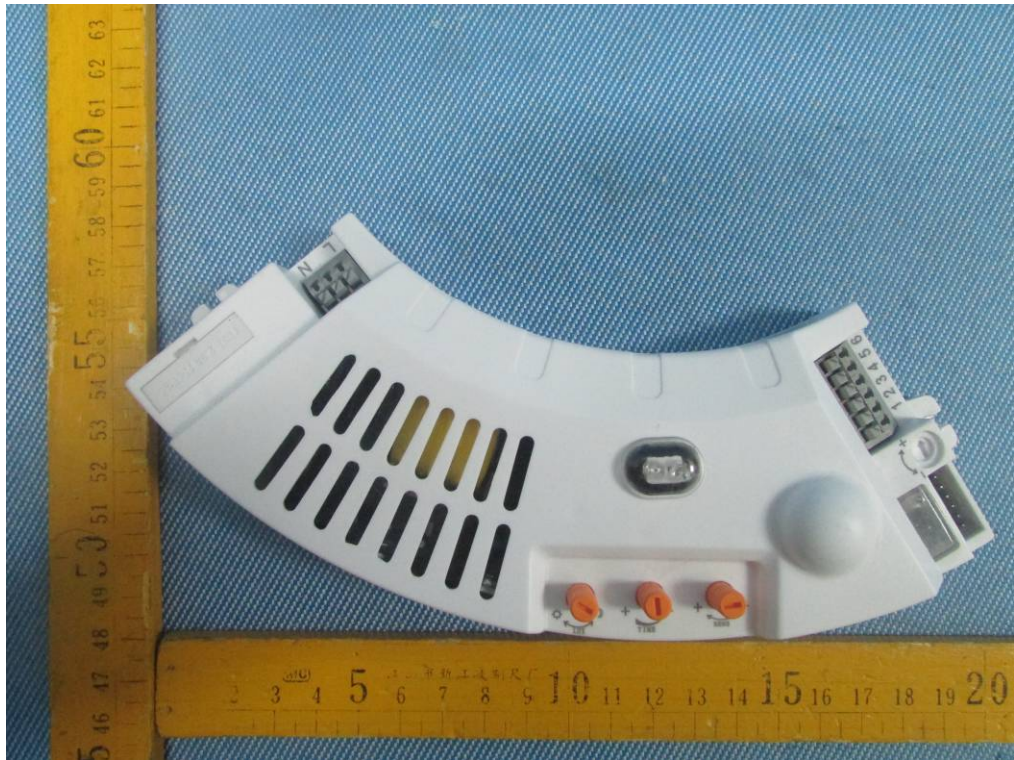




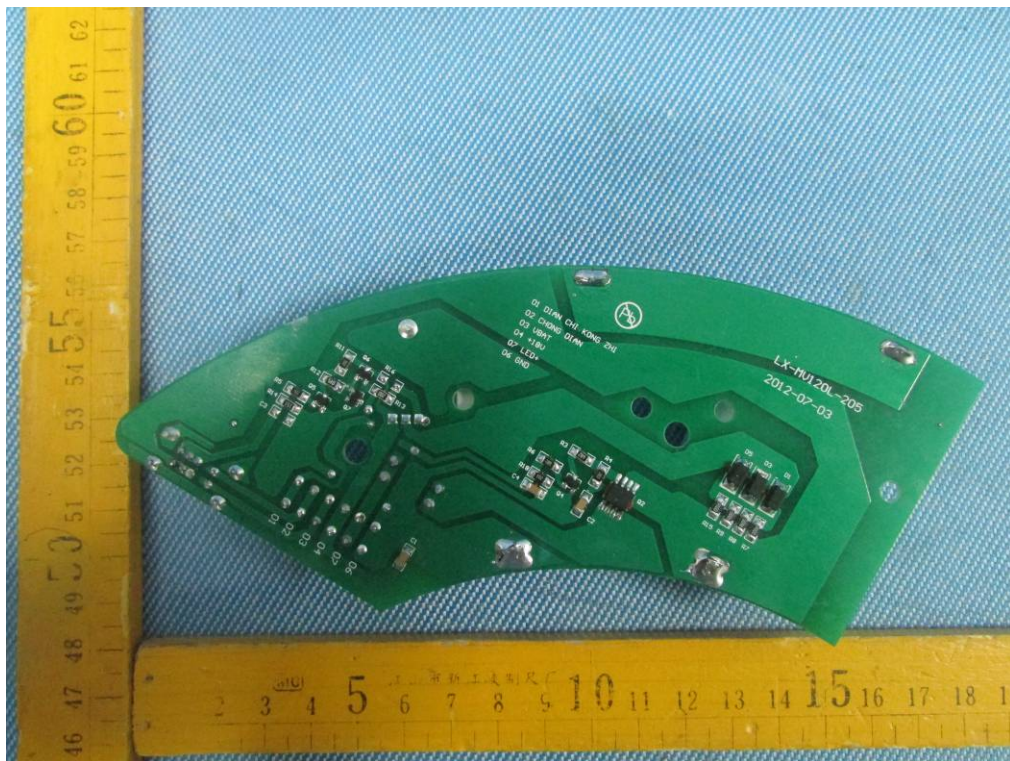
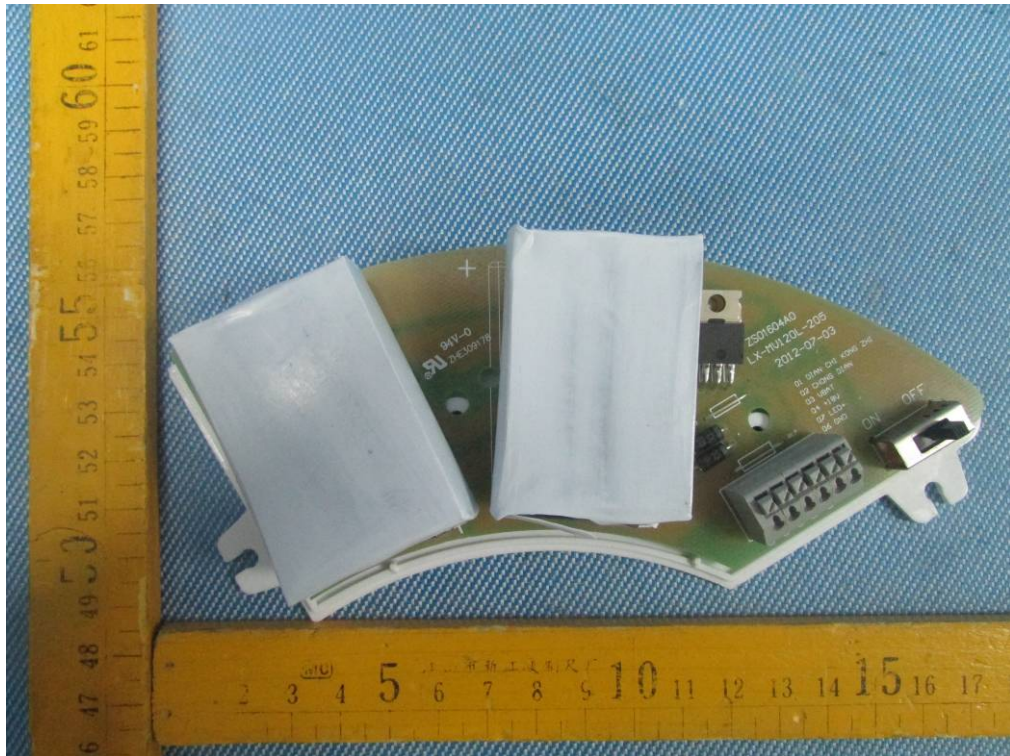
11.2 EUT- Open View

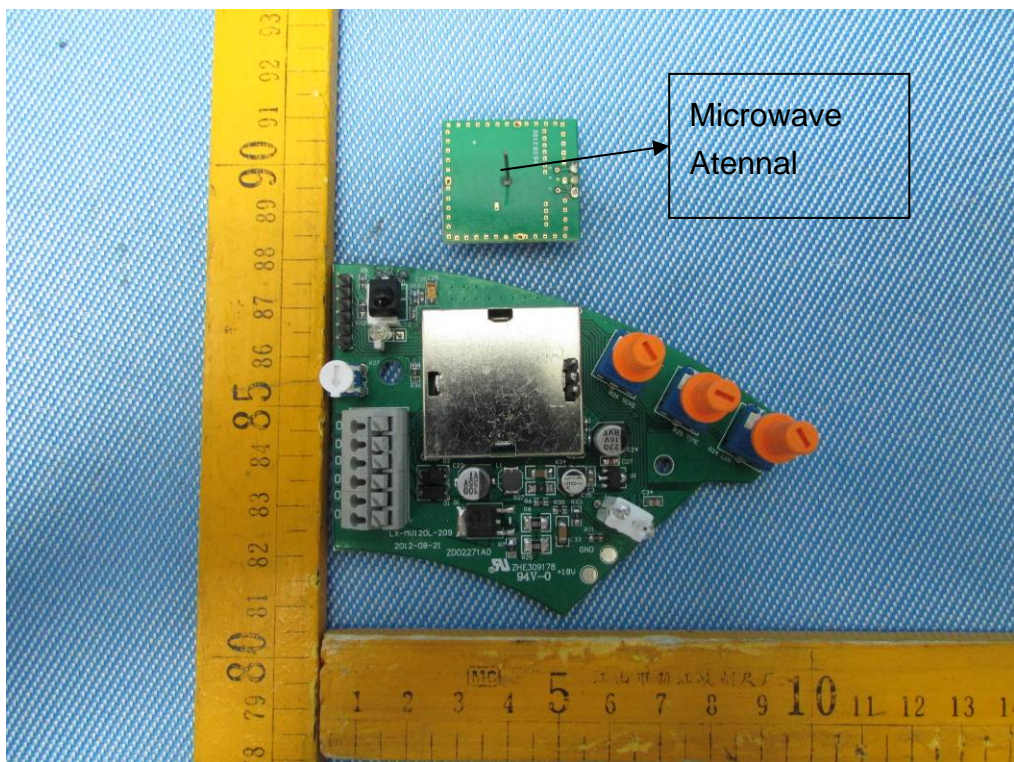
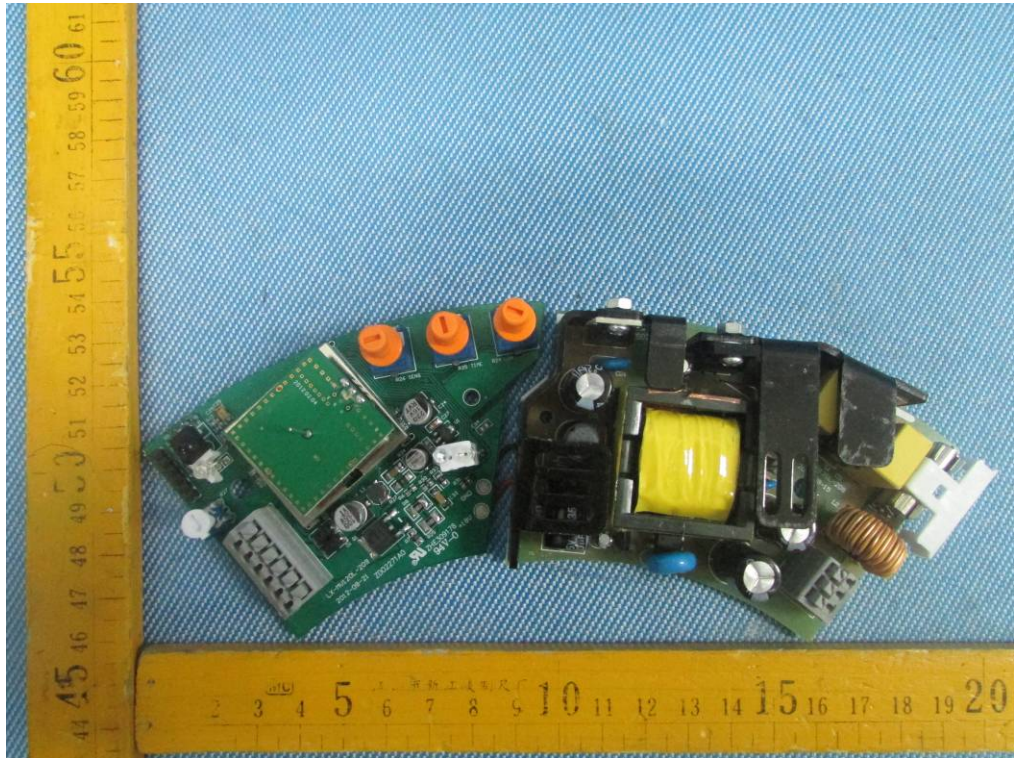


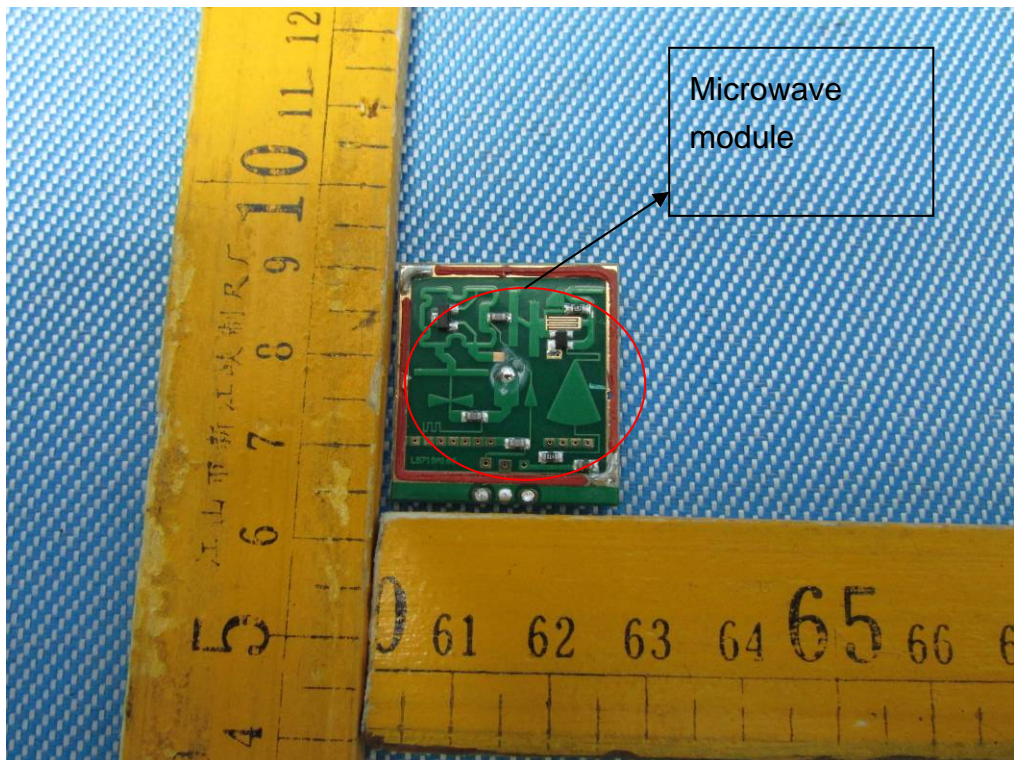
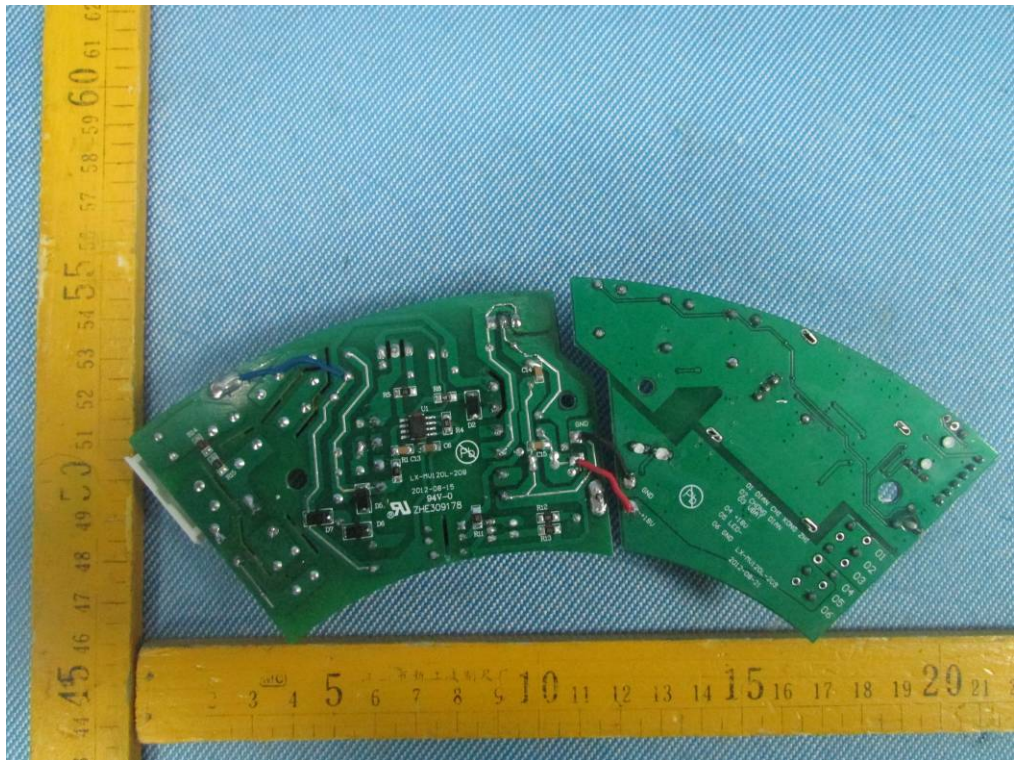


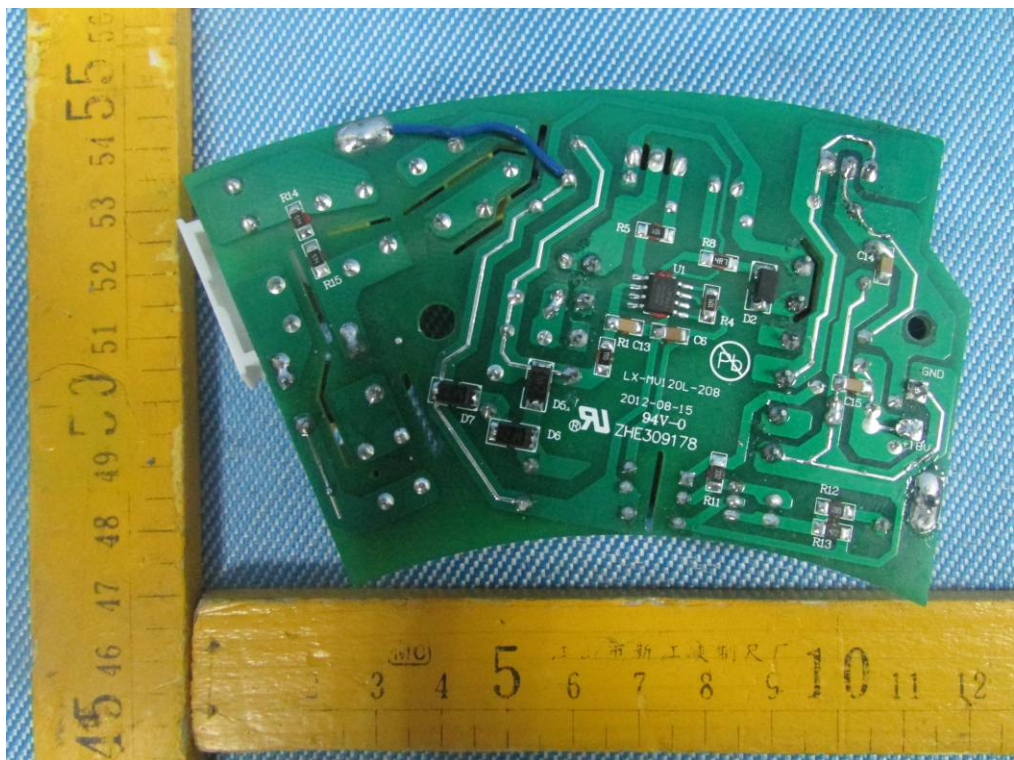


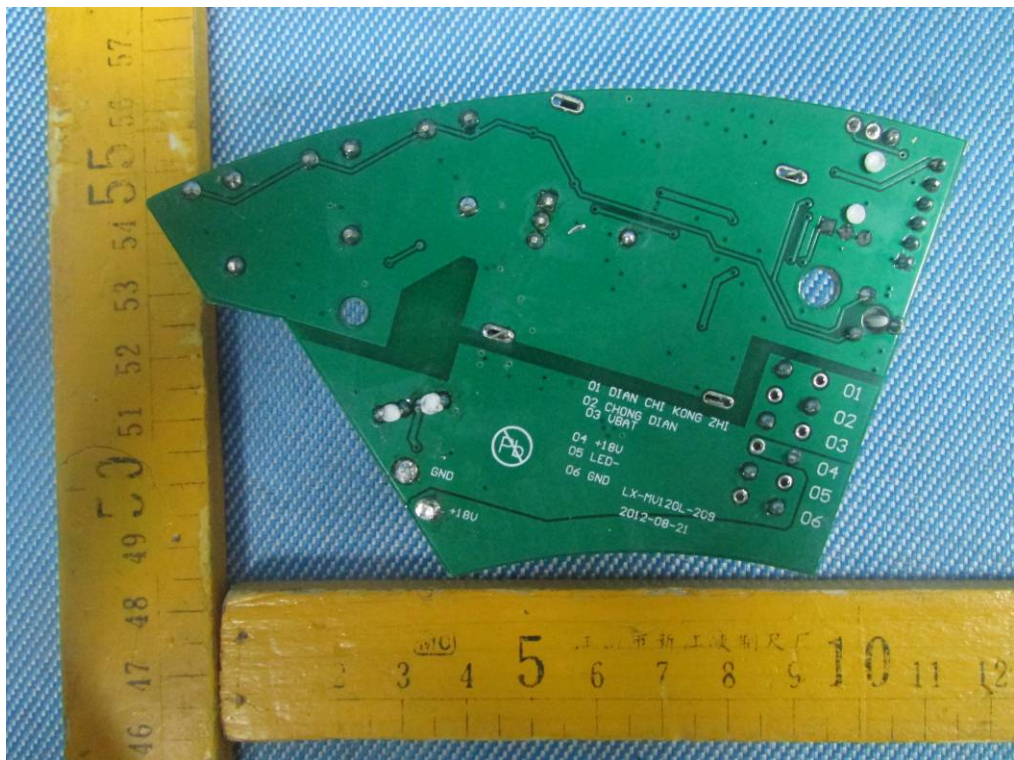
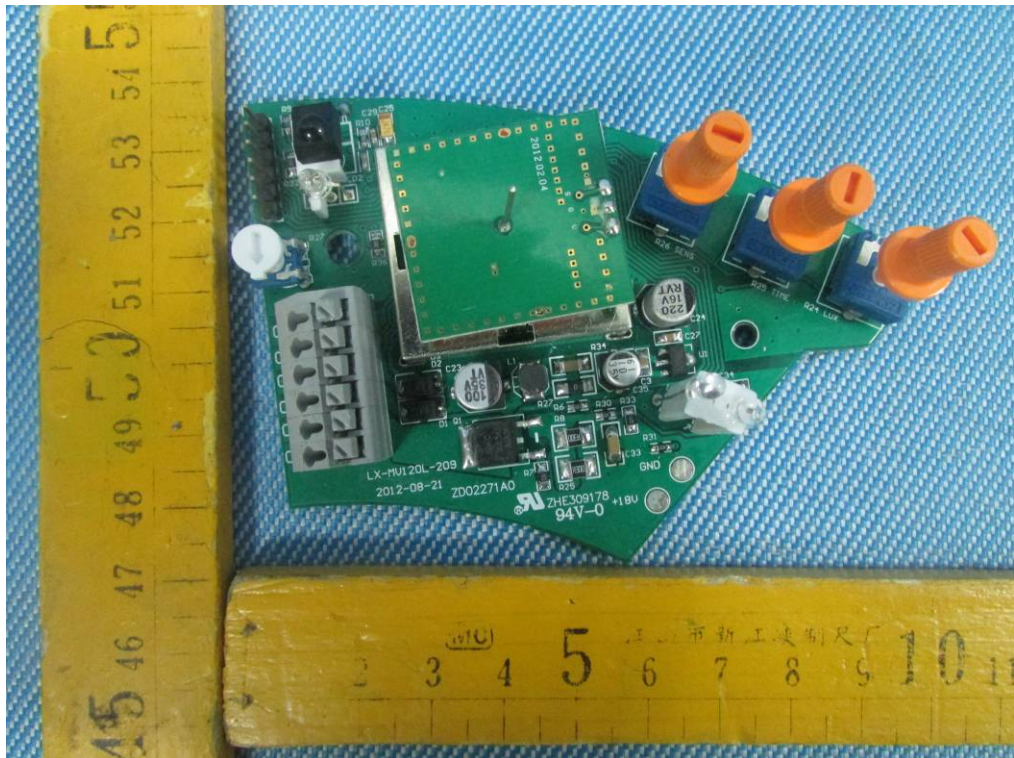
11.3 EUT – PCB View

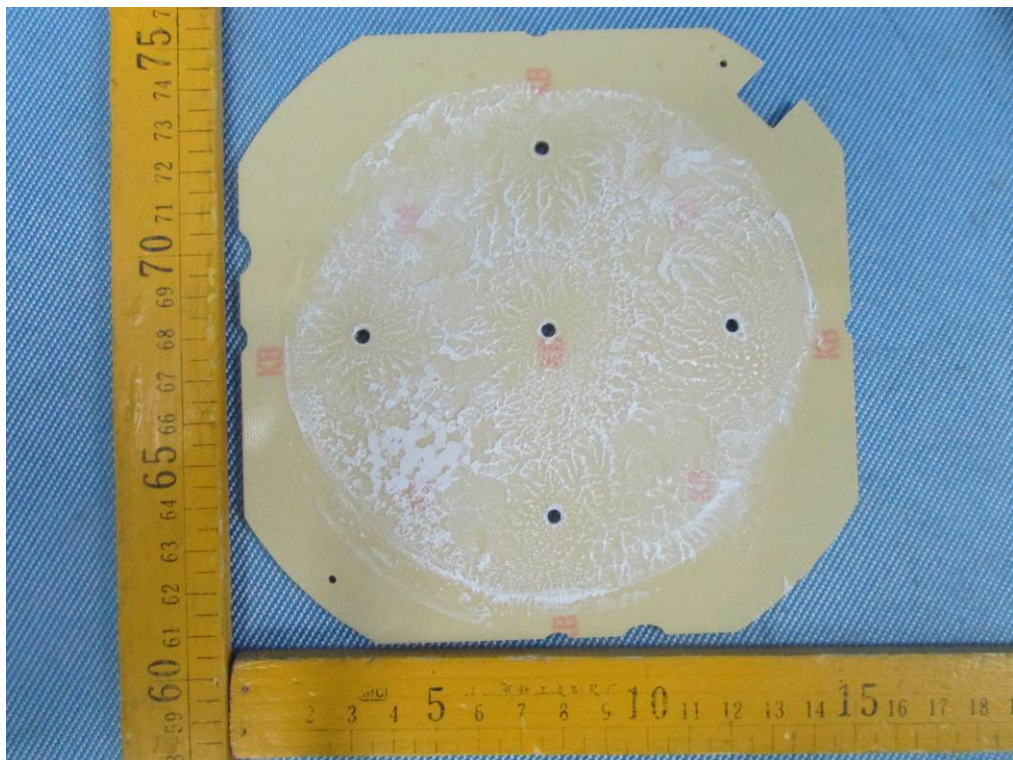
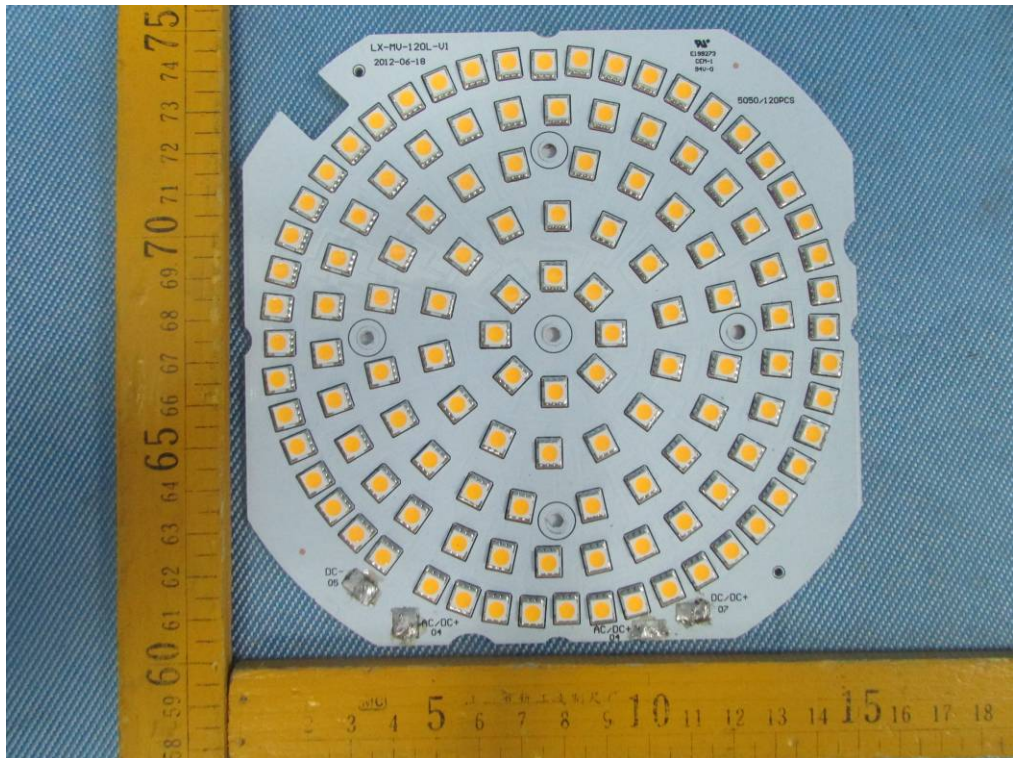












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