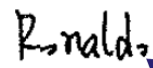
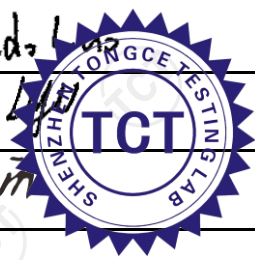


EMC TEST REPORT

Radio Frequency Devices - Unintentional Radiators

FCC ID	2A5TI-HX12FA70	
Test Report No.	TCT220304E002	
Date of issue	Mar. 11, 2022	
Testing laboratory.....	SHENZHEN TONGCE TESTING LAB	
Testing location/ address.....	TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China	
Applicant's name	Ningbo Hanlux Lighting Co., Ltd	
Address.....	No.1 Shunye Street, Zhenhai District, Ningbo, Zhejiang, China	
Manufacturer's name	Ningbo Hanlux Lighting Co., Ltd	
Address.....	No.1 Shunye Street, Zhenhai District, Ningbo, Zhejiang, China	
Standard(s)	FCC 47 CFR Part 15 Subpart B	
Test item description.....	LED sensor bulbs	
Trade Mark.....	N/A	
Model/Type reference	HX-12F-A70-SEN y 12W, HX-5F-A60-SEN y 5W, HX-7F-A65-SEN y 7W, HX-9F-A65-SEN y 9W	
Rating(s)	Input: AC 85-265 V, 50/60 Hz Power: 12 W	
Date of receipt of test item.....	Mar. 04, 2022	
Date (s) of performance of test:	Mar. 04, 2022 ~ Mar. 11, 2022	
Tested by (+signature).....	Ronaldo LUO	
Check by (+signature)	Howie LYU	
Approved by (+signature)	Tomsin	



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1. General Product Information

1.1.EUT description

Test item description..... :	LED sensor bulbs
Model/Type reference	HX-12F-A70-SEN y 12W
Rating(s)	Input: AC 85-265 V, 50/60 Hz Power: 12 W
Highest internal frequency F_x :	☒ $F_x \leq 108$ MHz ☐ $108 \text{ MHz} < F_x \leq 500 \text{ MHz}$ ☐ $500 \text{ MHz} < F_x \leq 1 \text{ GHz}$ ☐ $F_x > 1 \text{ GHz}$
AC Line	☐ Shielded ☐ Unshielded ☐ Detachable ☐ Un-detachable ☒ No applicable ☐ Length:
DC Line	☐ Shielded ☐ Unshielded ☐ Detachable ☐ Un-detachable ☒ No applicable ☐ Length:

1.2.Model(s) list

No.	Model No.	Tested with
1	HX-12F-A70-SEN y 12W	☒
Other models	HX-5F-A60-SEN y 5W, HX-7F-A65-SEN y 7W, HX-9F-A65-SEN y 9W	☐

Note: HX-12F-A70-SEN y 12W is tested model, other models are derivative models. The models are identical in circuit and PCB layout, only different on the model names. So the test data of HX-12F-A70-SEN y 12W can represent the remaining models.

2. Test Information

2.1.EUT operation mode(s)

Mode #	Operating mode description	Test voltage
1	Lighting	AC 120 V/ 60 Hz

2.2.Special accessories and auxiliary equipment

Product Type	Manufacturer	Model No.	Serial No.
/	/	/	/

2.3.Configuration of system under test



(EUT: LED sensor bulbs)

2.4. General test conditions

Environmental reference conditions

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment.

The climatic conditions during the tests were within the following limits:

Temperature	Humidity	Atmospheric pressure
15 °C – 35 °C	30 % - 60 %	86 kPa – 106 kPa

If explicitly required in the basic standard or applied product standard the climatic values are recorded and documented separately in this test report.

Measurement uncertainties

Test Item	Uncertainty
Uncertainty for Disturbance voltage at the mains terminals	3.10 dB
Uncertainty for Radiated emission (30 MHz to 1 GHz)	4.56 dB
Uncertainty for Radiated emission (above 1 GHz)	4.22 dB

The overall measurement uncertainty of a measurement is defined as the range of which can be supposed that it contains the true value with a specified probability.

This probability is 95 % for the generally specified measurement uncertainty (so-called expanded measurement uncertainty).

The limits for emission measurements and the Test levels for immunity tests in the applied standards were defined taking into consideration the accuracy limits for measurement and testing equipment required by the Basic standards.

All measurement and test results of the EMC laboratory of SHENZHEN TONGCE TESTING LAB fulfil the requirements for measurement uncertainties according to the standards applied.

Decision rule for statement(s) of conformity is based on accuracy method specified in Clause 4.4.3 in IEC Guide 115:2021.

3. Test Result Summary

FCC 47 CFR Part 15 Subpart B	
Requirement – Test case	Verdict
Classification Class (☐ A ☒ B)	—
Disturbance voltage at the mains terminals	Pass
Radiated emission	Pass

Test case verdicts	
- Test case does not apply to the test object	N/A
- Test object does meet the requirement.....	P (Pass)
- Test object does not meet the requirement	F (Fail)

4. List of Test Equipment

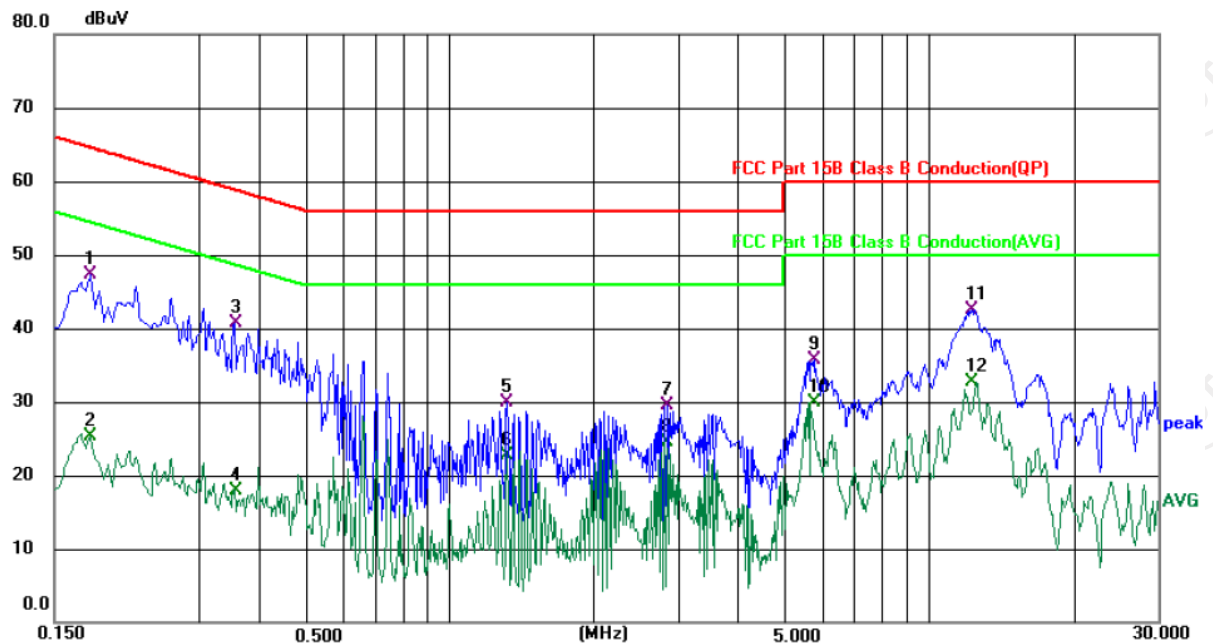
Equipment	Manufacturer	Model No.	Serial No.	Cal. Due
Disturbance voltage at mains terminals				
EMI Test Receiver	R&S	ESCI3	100898	2022/07/07
Line Impedance Stabilisation Network(LISN)	Schwarzbeck	NSLK 8126	8126453	2023/02/24
Attenuator	N/A	10dB	164080	2022/07/07
Radiated emission (30 MHz to 1 GHz)				
Broadband Antenna	Schwarzbeck	VULB9163	340	2022/09/04
EMI Test Receiver	R&S	ESIB7	100197	2022/07/07
Pre-amplifier	HP	8447D	2727A05017	2022/07/07
Radiated emission (above 1 GHz)				
Horn Antenna	Schwarzbeck	BBHA 9120 D	02372	2023/03/06
EMI Test Receiver	R&S	ESIB7	100197	2022/07/07
Pre-amplifier	SKET	LNPA_0118G-4 5	SK2021012102	2023/02/24

5. Test Conditions and Results

5.1. Disturbance voltage at mains terminals

Test requirement	FCC 47 CFR Part 15 Subpart B		
Basic standard	ANSI C63.4: 2014		
Test frequency range..	150 kHz to 30 MHz		
Limits.....	Limits for Class A		
	Frequency (MHz)	dB μ V Quasi-peak	dB μ V Average
	0.15 to 0.5	79	66
	0.5 to 30	73	60
	Limits for Class B		
	Frequency (MHz)	dB μ V Quasi-peak	dB μ V Average
	0.15 to 0.5	66 to 56	56 to 46
	0.5 to 5	56	46
	5 to 30	60	50
Test method	The AMN placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment were at least 0.8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN).		
Ambient temperature..	25 °C		
Relative humidity	55 %		
Test location	TCT Testing Industrial Park Fugiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China		
Test model(s)	HX-12F-A70-SEN y 12W		
EUT operation mode..	Mode 1		
Test results	Pass		
Remark.....	/		

Measurement data and Graphical presentation of the result



Site 844 Shielding Room

Phase: L1

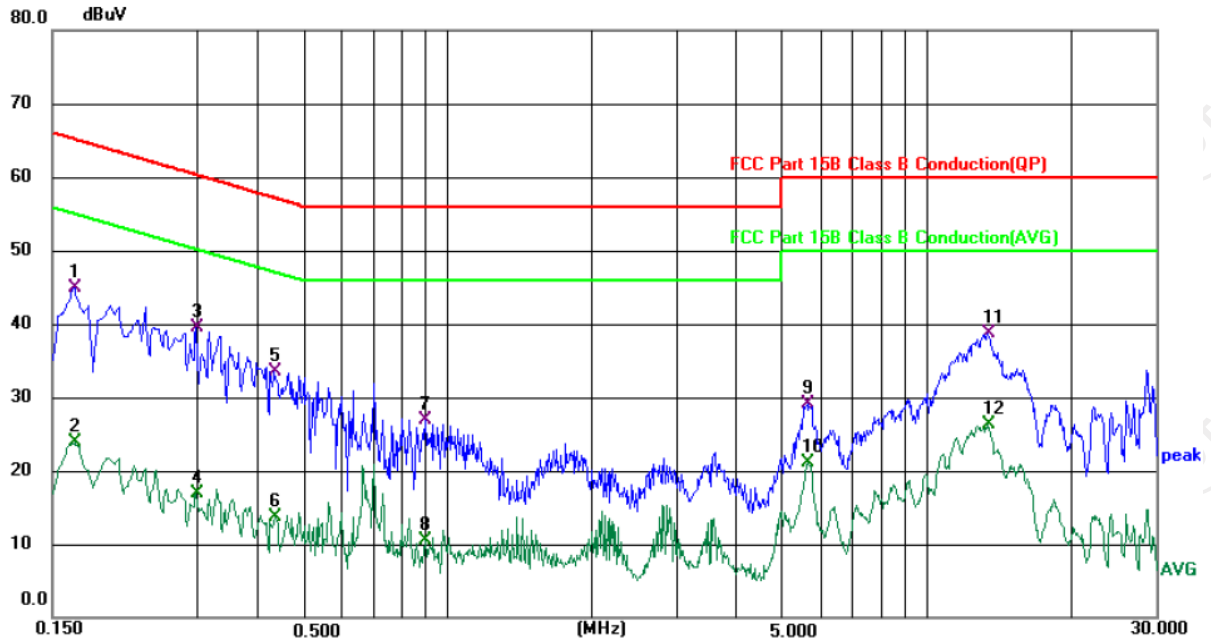
Temperature: 25 (°C)

Humidity: 55 %

Limit: FCC Part 15B Class B Conduction(QP)

Power: AC 120 V/60 Hz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1779	37.62	9.68	47.30	64.58	-17.28	QP	
2		0.1779	15.67	9.68	25.35	54.58	-29.23	AVG	
3		0.3539	31.02	9.62	40.64	58.87	-18.23	QP	
4		0.3539	8.38	9.62	18.00	48.87	-30.87	AVG	
5		1.3180	20.06	9.78	29.84	56.00	-26.16	QP	
6		1.3180	12.93	9.78	22.71	46.00	-23.29	AVG	
7		2.8540	19.64	9.88	29.52	56.00	-26.48	QP	
8		2.8540	14.68	9.88	24.56	46.00	-21.44	AVG	
9		5.7819	25.84	9.80	35.64	60.00	-24.36	QP	
10		5.7819	20.04	9.80	29.84	50.00	-20.16	AVG	
11		12.3139	32.77	9.79	42.56	60.00	-17.44	QP	
12		12.3139	22.83	9.79	32.62	50.00	-17.38	AVG	



Site 844 Shielding Room

Phase: N

Temperature: 25 (°C)

Humidity: 55 %

Limit: FCC Part 15B Class B Conduction(QP)

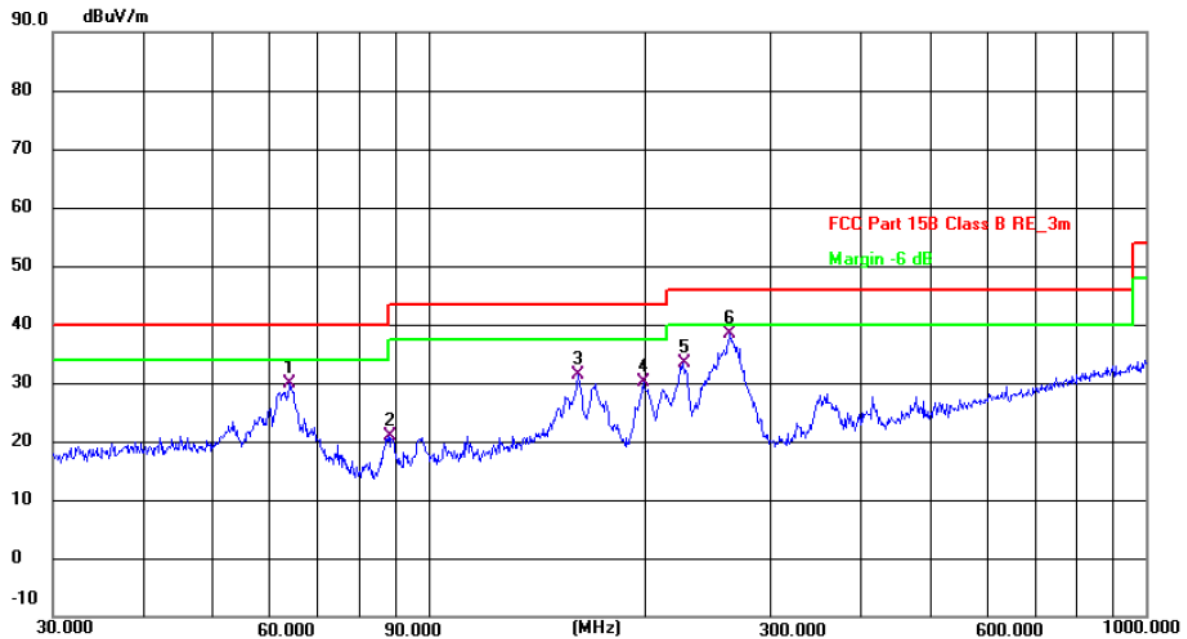
Power: AC 120 V/60 Hz

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1660	35.29	9.70	44.99	65.16	-20.17	QP	
2		0.1660	14.11	9.70	23.81	55.16	-31.35	AVG	
3		0.2980	29.98	9.59	39.57	60.30	-20.73	QP	
4		0.2980	7.25	9.59	16.84	50.30	-33.46	AVG	
5		0.4340	23.76	9.66	33.42	57.18	-23.76	QP	
6		0.4340	4.10	9.66	13.76	47.18	-33.42	AVG	
7		0.9020	17.07	9.74	26.81	56.00	-29.19	QP	
8		0.9020	0.72	9.74	10.46	46.00	-35.54	AVG	
9		5.6380	19.25	9.77	29.02	60.00	-30.98	QP	
10		5.6380	11.41	9.77	21.18	50.00	-28.82	AVG	
11		13.3980	29.08	9.68	38.76	60.00	-21.24	QP	
12		13.3980	16.66	9.68	26.34	50.00	-23.66	AVG	

5.2. Radiated emission

Test requirement	FCC 47 CFR Part 15 Subpart B			
Basic standard	ANSI C63.4: 2014			
Test frequency range..	30 MHz to 40 GHz			
Limits.....	Frequency (MHz)	3 m measurement distance		
		Quasi-peak (dB μ V/m)		
		Class A		Class B
	30 to 88	49		40
	88 to 216	53.5		43.5
	216 to 960	56.4		46
	960 to 1000	59.5		54
	Frequency (MHz)	3 m measurement distance		
		Class A		Class B
		Peak (dB μ V/m)	Average (dB μ V/m)	Peak (dB μ V/m) Average (dB μ V/m)
		Above 1000	79.5 59.5	74 54
Test method.....	Measurements were made in a 3-meter semi-anechoic chamber that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3 meters with the receive antenna located at 1 to 4-meter height in both horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.			
Ambient temperature..	25.3 °C			
Relative humidity	54 %			
Test location	TCT Testing Industrial Park Fugiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China			
Test model(s)	HX-12F-A70-SEN y 12W			
EUT operation mode..	Mode 1			
Test results	Pass			
Remark.....	/			

Measurement data and Graphical presentation of the result



Site #1 3m Anechoic Chamber

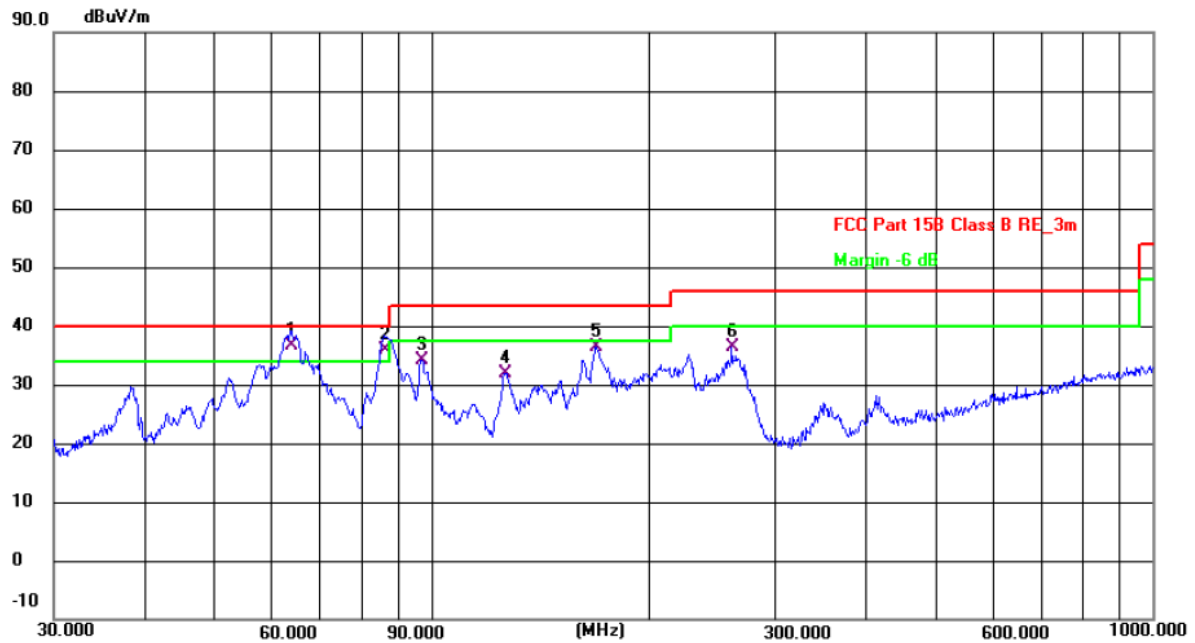
Polarization: **Horizontal**

Temperature: 25.3(C) Humidity: 54 %

Limit: FCC Part 15B Class B RE_3m

Power: AC 120 V/60 Hz

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	64.2074	17.81	12.01	29.82	40.00	-10.18	QP	P	
2	88.0329	11.86	9.08	20.94	43.50	-22.56	QP	P	
3	161.4740	17.57	13.75	31.32	43.50	-12.18	QP	P	
4	199.2855	19.51	10.71	30.22	43.50	-13.28	QP	P	
5	226.8936	21.49	11.85	33.34	46.00	-12.66	QP	P	
6 *	262.8955	25.37	12.96	38.33	46.00	-7.67	QP	P	



Site #1 3m Anechoic Chamber

Polarization: **Vertical**

Temperature: 25.3(C) Humidity: 54 %

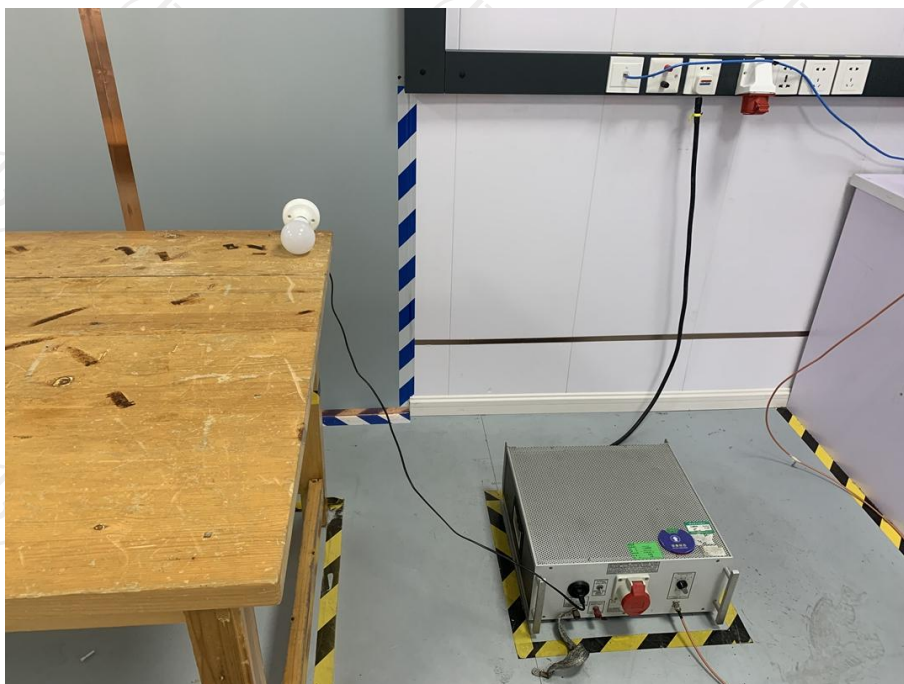
Limit: FCC Part 15B Class B RE_3m

Power: AC 120 V/60 Hz

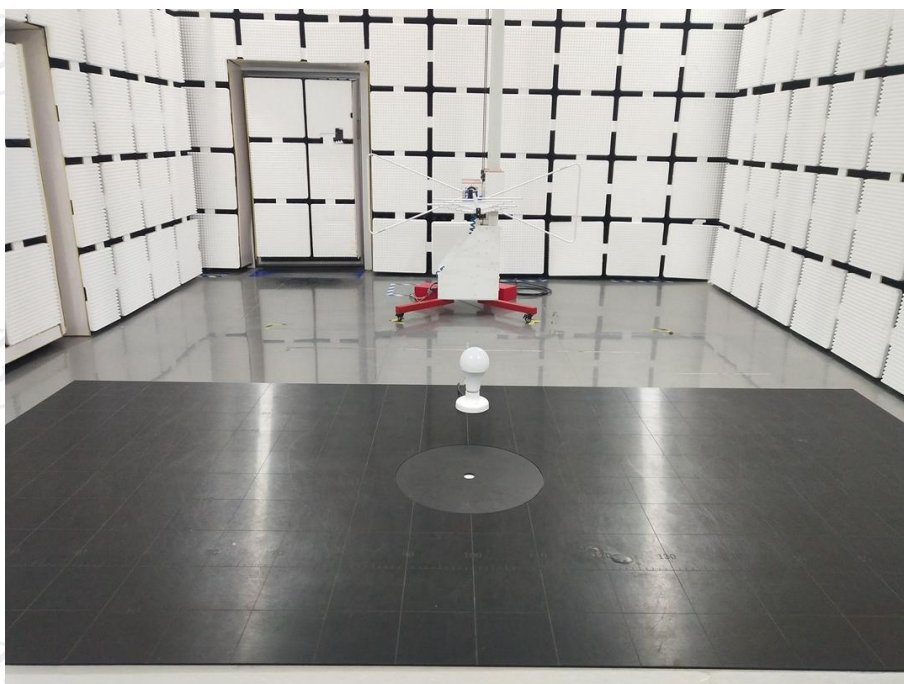
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	63.9828	24.66	12.04	36.70	40.00	-3.30	QP	P	
2 !	86.2001	26.78	9.12	35.90	40.00	-4.10	QP	P	
3	97.1148	24.20	10.00	34.20	43.50	-9.30	QP	P	
4	126.7723	19.45	12.48	31.93	43.50	-11.57	QP	P	
5	169.0054	23.44	13.01	36.45	43.50	-7.05	QP	P	
6	261.0583	23.61	12.89	36.50	46.00	-9.50	QP	P	

6. Test set-up photo

Disturbance voltage at the mains terminals Test View



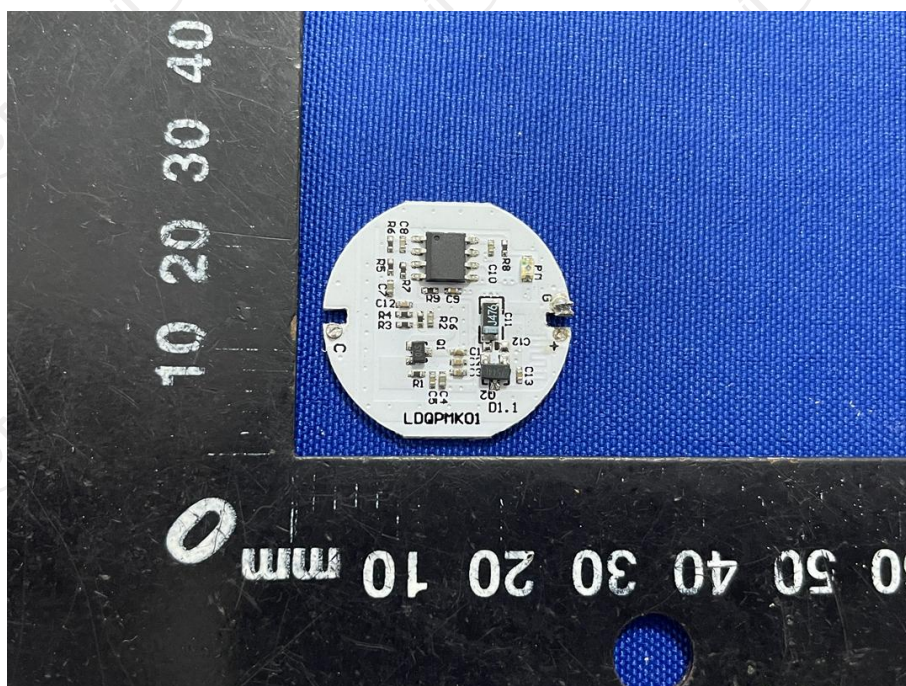
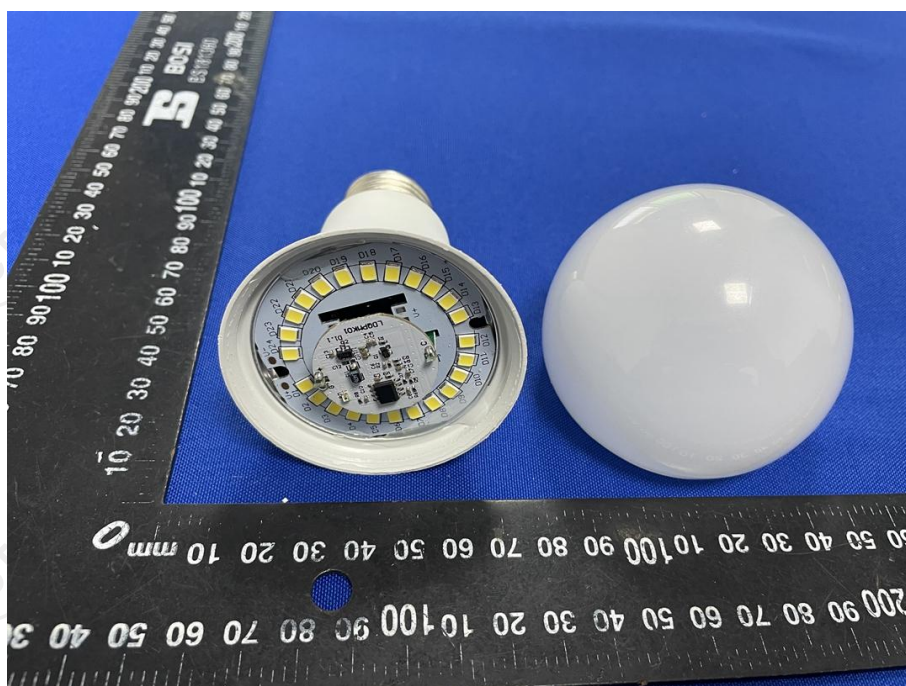
Radiated emission (30 MHz to 1 GHz) Test View

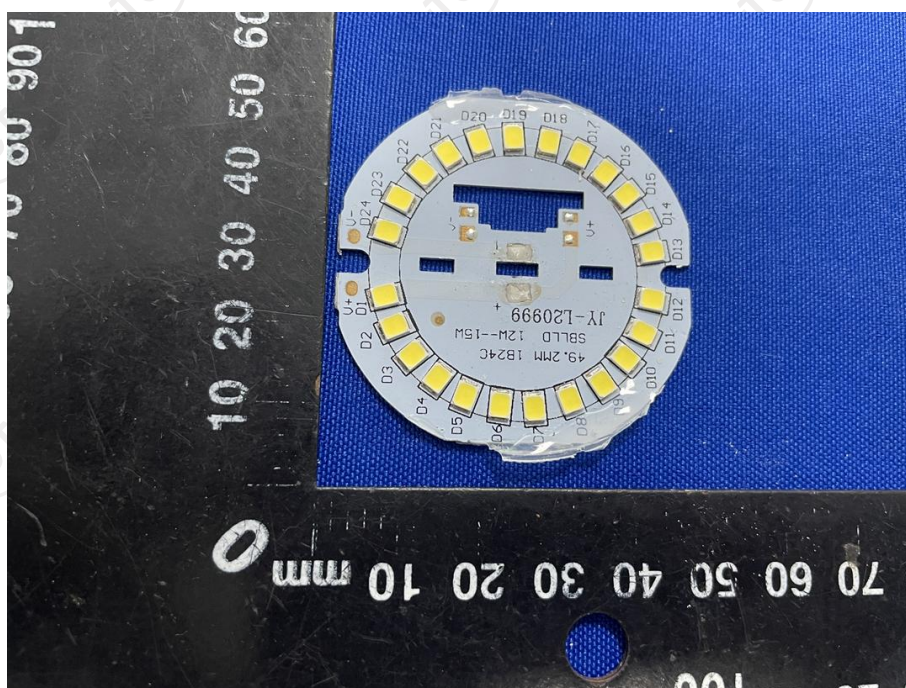
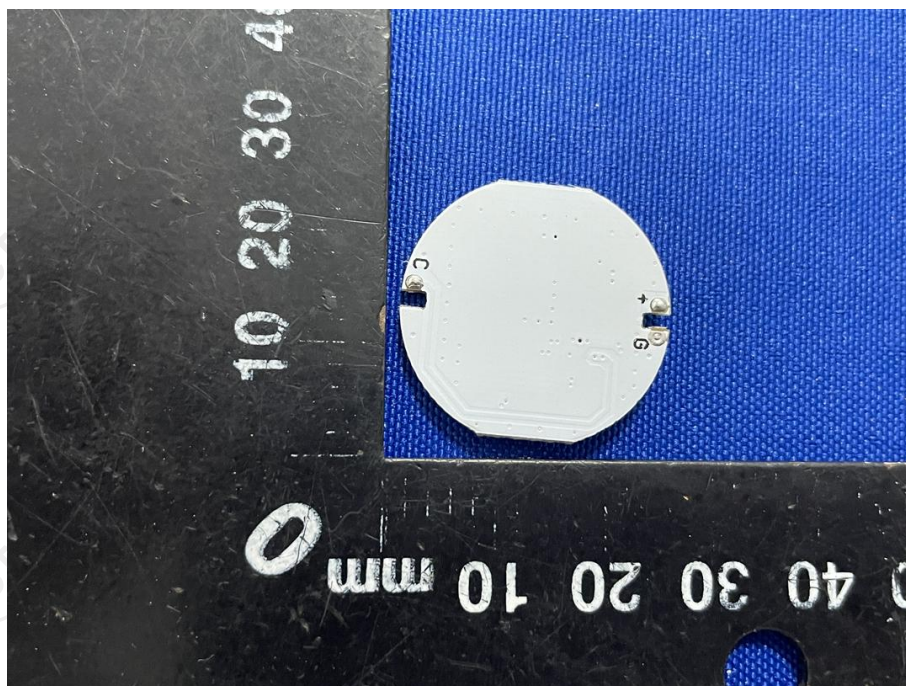


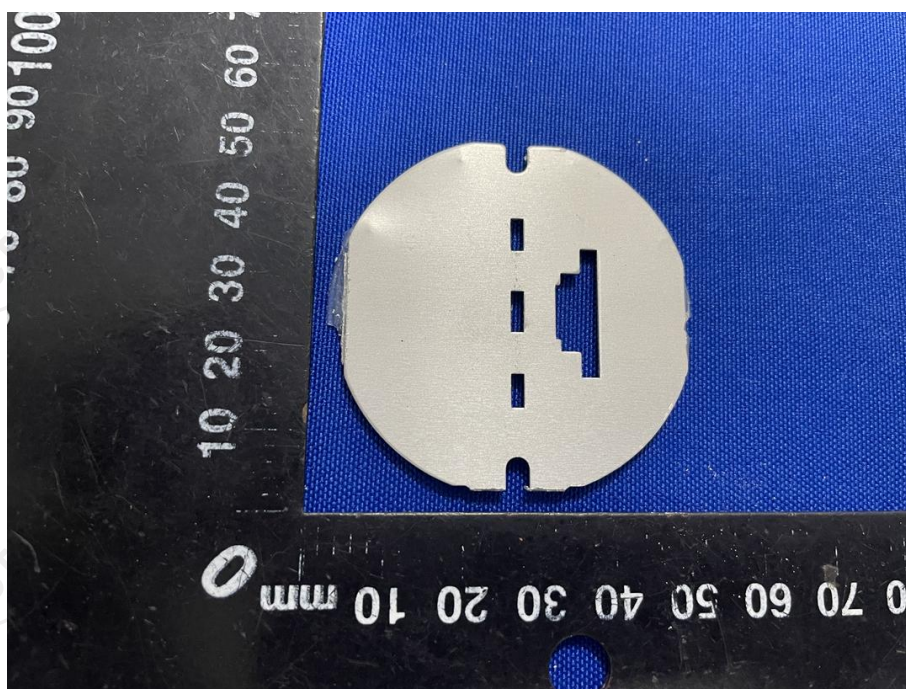
7. Photo of the EUT

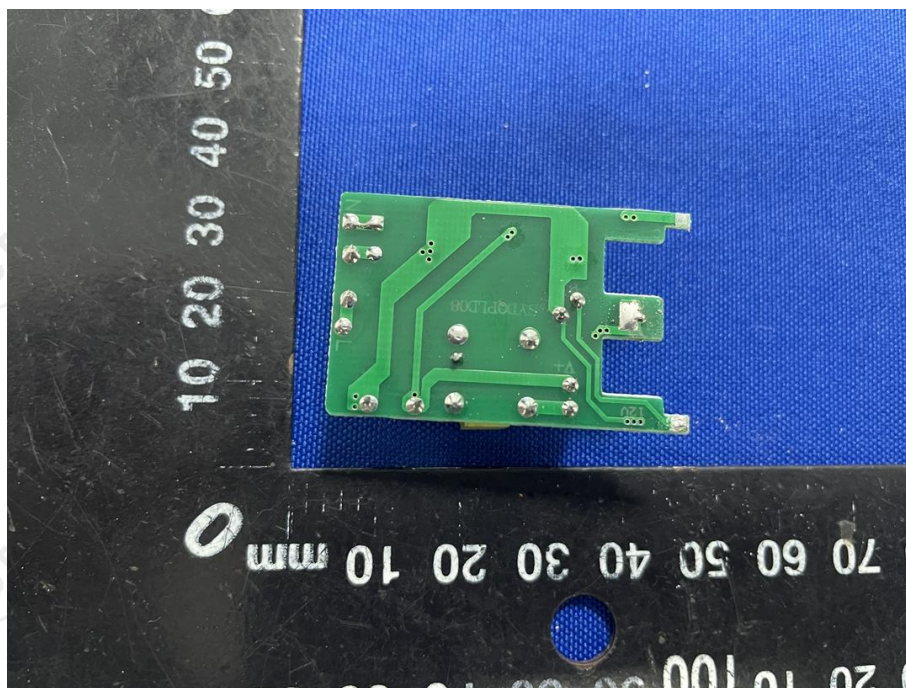












*******End of report*******