

AS CISPR 15:2017

TEST REPORT

For

ULA1L PTY LTD

2/63 Industrial Dr, Braeside VIC 3195

Tested Model: ECO-BT24W-1200-D
Multiple Models: ECO-BT18W-1200-D,
ECO-BT16W-1200-D

Report Type: Original Report	Product Type: LED BATTEN LIGHT
Report Number:	DG5220916-42071E-09
Report Date:	2022-09-29
Reviewed By:	Michael Zhang EMC Engineer
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	LED BATTEN LIGHT
EUT Model:	ECO-BT24W-1200-D
Multiple Models:	ECO-BT18W-1200-D, ECO-BT16W-1200-D
Rated Input Voltage:	AC 220V-240V
The Highest Operating Frequency:	<108MHz
I/O Ports:	Refer to manual
EUT Function:	Lighting
Serial Number:	DG5220916-42071E-EM-S1
EUT Received Date:	2022.9.19
EUT Received Status:	Good

Objective

This report is prepared on behalf of **ULAIL PTY LTD** in accordance with AS CISPR 15:2017 Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment.

The objective is to determine the compliance of EUT with: AS CISPR 15:2017.

Test Methodology

All measurements contained in this report were conducted with AS CISPR 15:2017 Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol“▲”. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

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SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

Mode 1:Lighting

Equipment Modifications

No modification was made to the EUT.

EUT Exercise Software

No EUT software was used for testing.

Support Equipment List and Details

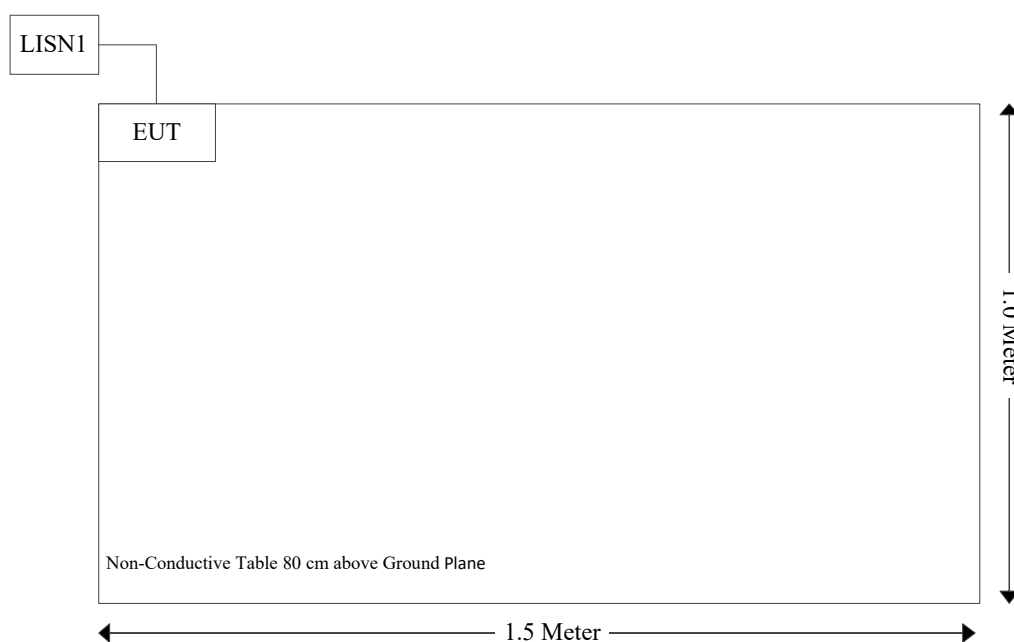
Manufacturer	Description	Model	Serial Number
/	/	/	/

Support Cable List and Details

Cable Description	Shielding Cable	Ferrite Core	Length (m)	From Port	To
AC cable	no	no	1	AC port	power supply

Block Diagram of Test Setup

Mode 1:



Test Equipment List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted emission					
R&S	LISN	ENV 216	101614	2021-10-26	2022-10-25
R&S	EMI Test Receiver	ESCI	100035	2021-10-26	2022-10-25
MICRO-COAX	Coaxial Cable	C-NJNJ-50	C-0200-01	2022-09-05	2023-09-04
R&S	Test Software	EMC32	Version 9.10.00	N/A	N/A
Inducted current					
EVERFINE	TRIPLE-LOOP antenna	LLA-2	903002	2021-07-22	2024-07-21
R&S	EMI Test Receiver	ESCI	100035	2021-10-26	2022-10-25
MICRO-COAX	Coaxial Cable	C-NJNJ-50	C-0200-01	2022-09-05	2023-09-04
R&S	Test Software	EMC32	Version 9.10.00	N/A	N/A
Radiated emissions below 1GHz					
Sunol Sciences	Antenna	JB3	A060611-2	2020/8/25	2023/8/25
R&S	EMI Test Receiver	ESCI	100224	2021/10/26	2022/10/25
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2022/8/19	2023/8/18
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2022/8/19	2023/8/18
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2022/8/19	2023/8/18
Sonoma	Amplifier	310N	185914	2022/8/19	2023/8/18
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Environmental Conditions

Test Item:	Conducted emission& Inducted current	Radiated emissions below 1GHz
Temperature:	26.6℃	29.2℃
Relative Humidity:	56%	52%
ATM Pressure:	100.5kPa	101.1kPa
Tester:	Walker Chen	Colin Yang
Test Date:	2022-09-24	2022-09-26

SUMMARY OF TEST RESULTS

SN	Rule and Clause	Description of Test	Test Result
1	CISPR 15 Clause 4.3.1	Conducted emissions	Compliance
2	CISPR 15 Clause 4.4.1	Radiated electromagnetic disturbances 9 kHz to 30 MHz	Compliance
3	CISPR 15 Clause 4.4.1	Radiated electromagnetic disturbances 30 kHz to 300 MHz	Compliance

1 - CONDUCTED EMISSIONS

Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cisp} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cisp} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit.

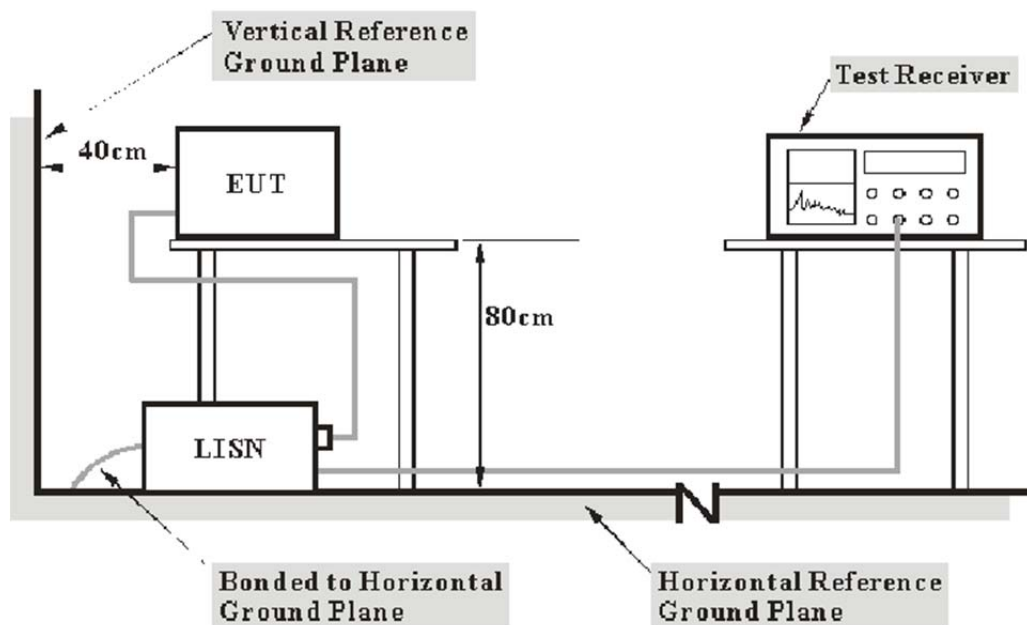
Based on CISPR 16-4-2: 2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Dongguan) is 3.12 dB (9 kHz to 30 MHz).

Table 1 – Values of U_{cisp}

Measurement	U_{cisp}
Conducted disturbance at mains port using AMN(9 kHz to 30 MHz)	3.4 dB

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test System Setup



- Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with CISPR 16-1-1:2010+A1:2010, CISPR 16-2-1:2010 measurement procedure. The specification used was the CISPR 15 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle.

The adapter was connected to a 240 V/50Hz AC power source.

EMI Test Receiver Setup

The EMI Test Receiver was set to investigate the spectrum from 9 kHz to 30 MHz.

During the conducted emission test, the EMI Test Receiver was set with the following configurations:

Frequency Range	IF B/W
9 kHz – 150 kHz	200 Hz
150 kHz – 30 MHz	9 kHz

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

All data was recorded in the Quasi-peak and averaged detection mode.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result (QuasiPeak or Average) = Meter Reading + Corr.

Note:

Corr. = Cable loss + Factor of coupling device

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

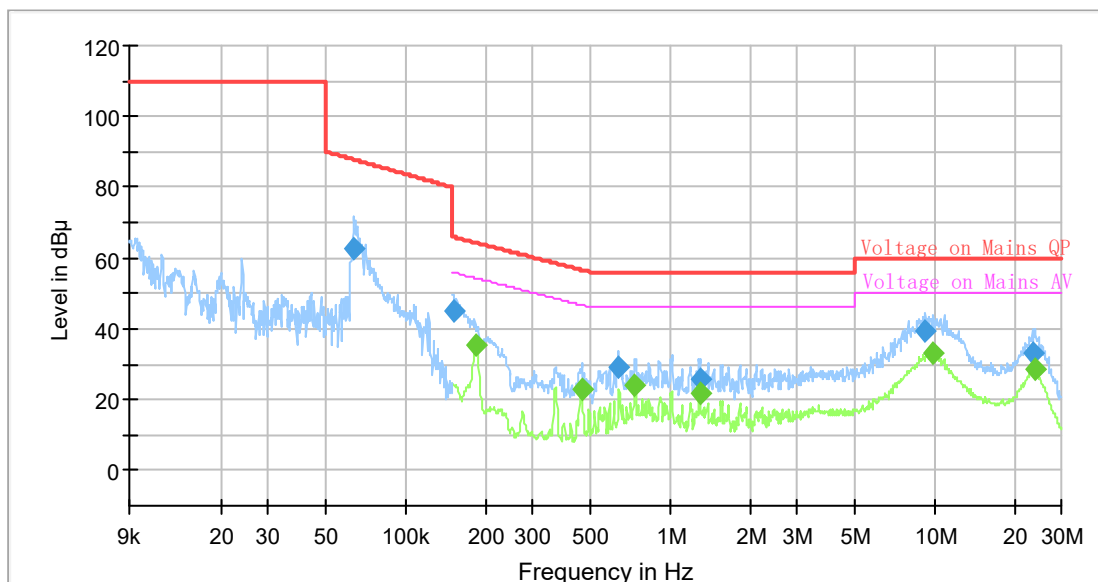
Margin = Limit – Result

Note: Except for the recorded frequency points (no more than 6), the remaining frequency points have a margin more than 20dB.

Test Data

Please refer to following table and plots:

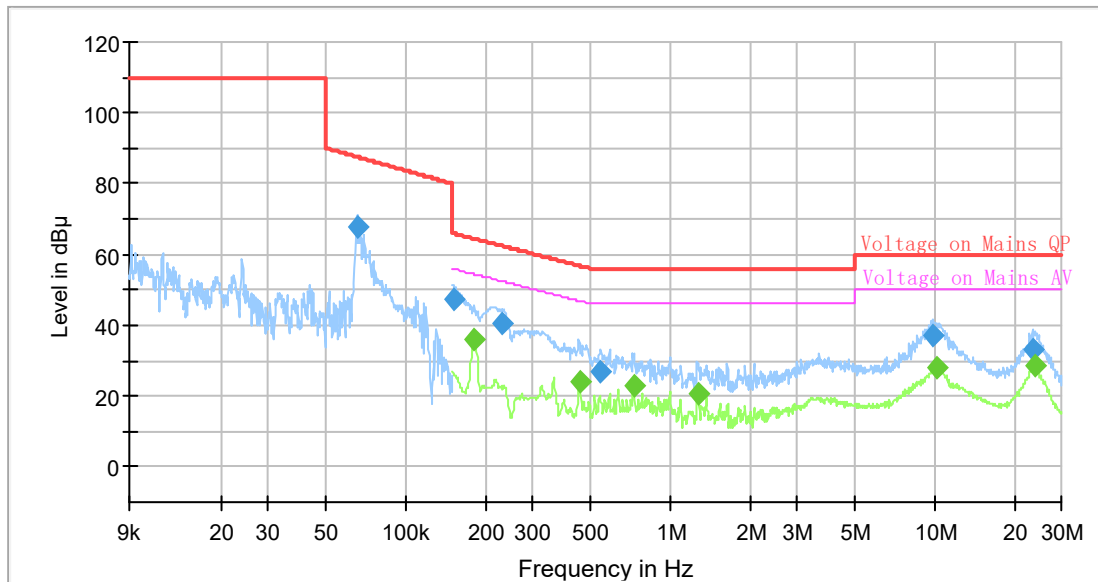
Port: L
Test Mode: Lighting
Power Source: AC 240V/50Hz
Note:



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.063266	62.77	---	87.86	25.09	0.200	L1	9.7
0.150750	45.23	---	65.96	20.73	9.000	L1	9.6
0.183119	---	35.36	54.34	18.98	9.000	L1	9.6
0.460739	---	22.74	46.68	23.94	9.000	L1	9.6
0.637161	28.98	---	56.00	27.02	9.000	L1	9.6
0.736317	---	24.03	46.00	21.97	9.000	L1	9.7
1.287253	---	21.95	46.00	24.05	9.000	L1	9.7
1.293689	25.92	---	56.00	30.08	9.000	L1	9.7
9.231202	39.31	---	60.00	20.69	9.000	L1	9.9
9.898813	---	33.00	50.00	17.00	9.000	L1	9.9
23.342413	33.40	---	60.00	26.60	9.000	L1	10.0
23.812775	---	28.62	50.00	21.38	9.000	L1	10.0

Port: N
 Test Mode: Lighting
 Power Source: AC 240V/50Hz
 Note:

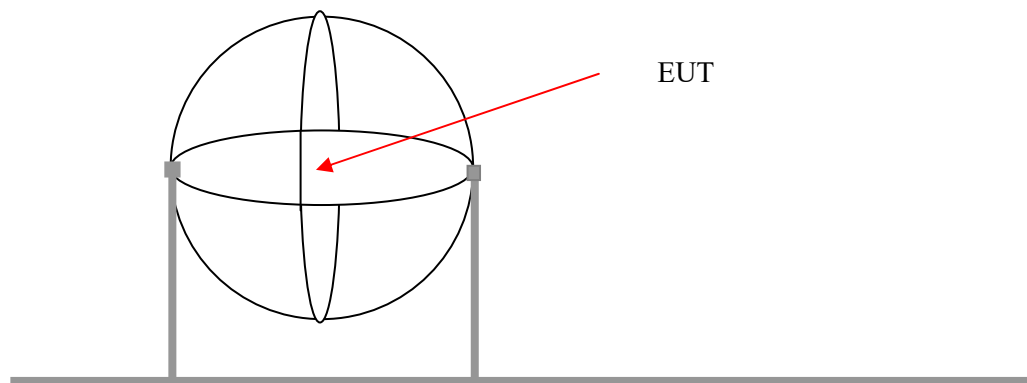


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.065188	67.59	---	87.59	20.00	0.200	N	9.6
0.151504	47.19	---	65.92	18.73	9.000	N	9.6
0.181302	---	35.90	54.43	18.53	9.000	N	9.6
0.231493	40.60	---	62.40	21.80	9.000	N	9.6
0.453897	---	24.32	46.80	22.48	9.000	N	9.6
0.545885	27.05	---	56.00	28.95	9.000	N	9.6
0.729009	---	22.69	46.00	23.31	9.000	N	9.6
1.274476	---	20.59	46.00	25.41	9.000	N	9.6
9.751804	36.91	---	60.00	23.09	9.000	N	9.7
10.098279	---	27.98	50.00	22.02	9.000	N	9.7
23.342413	32.98	---	60.00	27.02	9.000	N	9.9
23.812775	---	28.35	50.00	21.65	9.000	N	9.9

2 - RADIATED ELECTROMAGNETIC DISTURBANCES 9 KHZ TO 30 MHZ

EUT System Setup



EMI Test Receiver Setup

During the radiated emission test, the EMI test receiver was set with the following configurations:

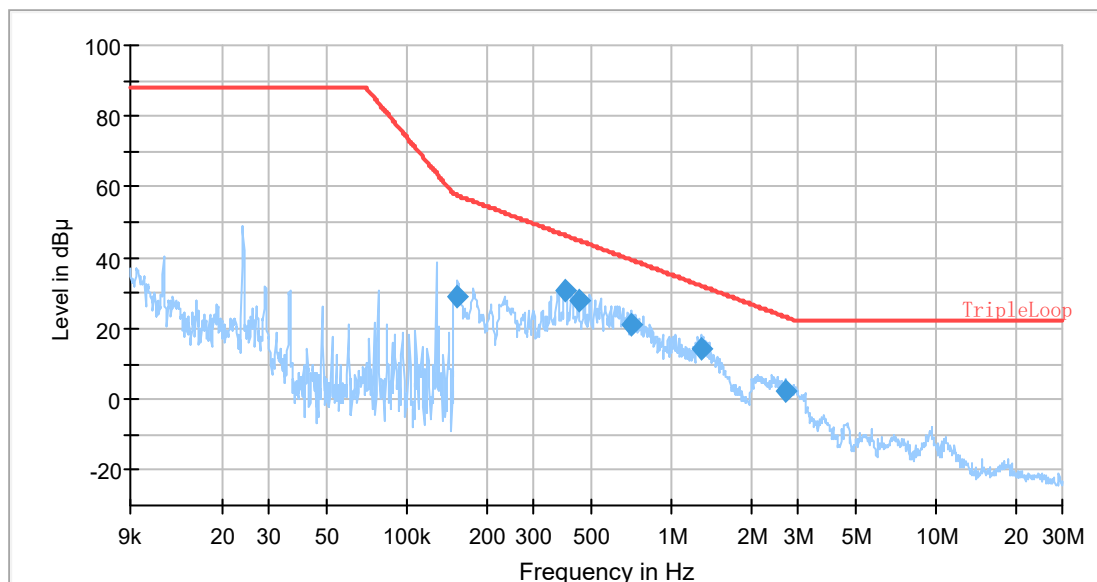
FrequencyRange	IF B/W
9 kHz – 150 kHz	200 Hz
150 kHz – 30 MHz	9 kHz

Note: Except for the recorded frequency points (no more than 6), the remaining frequency points have a margin more than 20dB.

Test Data

Please refer to following table and plots:

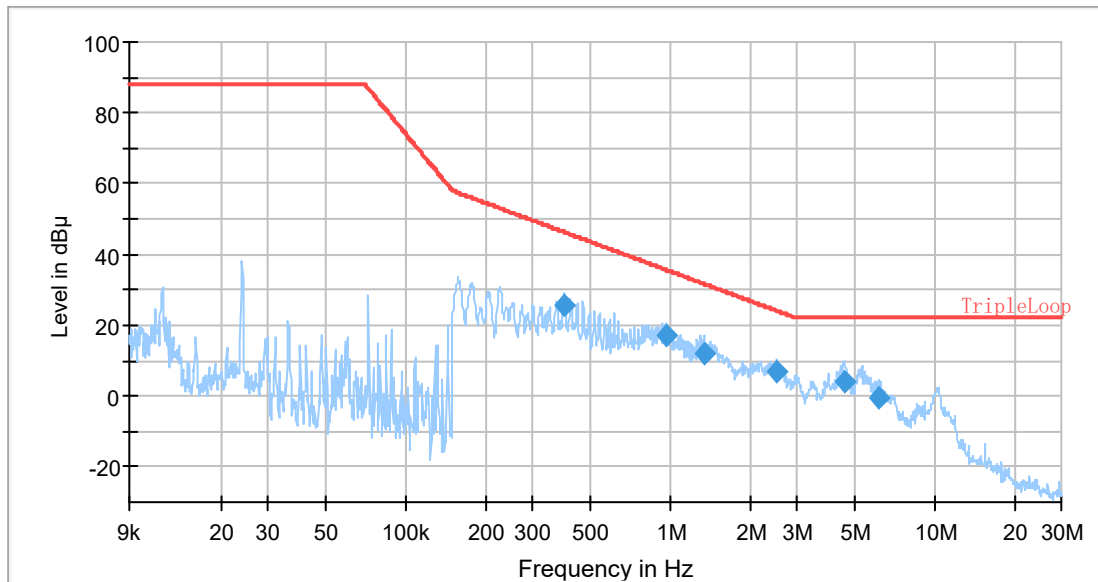
Port: X
Test Mode: Lighting
Power Source: AC 240V/50Hz
Note:



Final Result

Frequency (MHz)	QuasiPeak (dBμA)	Limit (dBμA)	Margin (dB)	Bandwidth (kHz)	Axis	Corr. (dB)
0.155330	29.22	57.58	28.36	9.000	X	-14.8
0.396710	30.65	46.31	15.66	9.000	X	-15.5
0.444931	27.70	44.93	17.23	9.000	X	-15.5
0.707517	20.89	39.36	18.47	9.000	X	-15.6
1.287254	14.20	32.17	17.97	9.000	X	-15.6
2.720028	2.49	23.18	20.69	9.000	X	-15.4

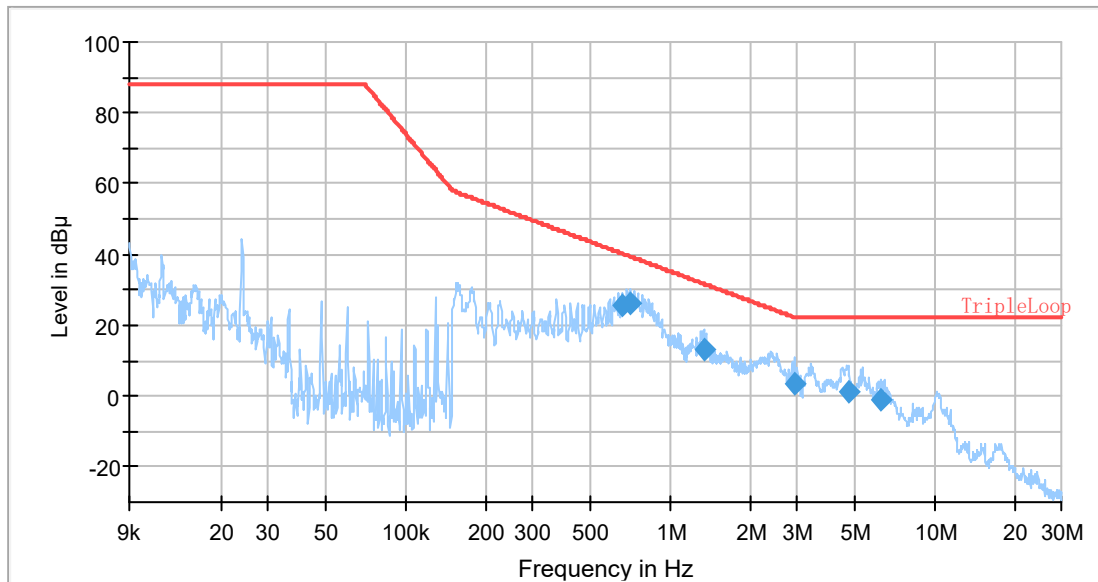
Port: Y
Test Mode: Lighting
Power Source: AC 240V/50Hz
Note:



Final Result

Frequency (MHz)	QuasiPeak (dBμA)	Limit (dBμA)	Margin (dB)	Bandwidth (kHz)	Axis	Corr. (dB)
0.396710	25.78	46.31	20.53	9.000	Y	-15.4
0.973564	16.84	35.52	18.68	9.000	Y	-15.8
1.332989	11.87	31.75	19.88	9.000	Y	-15.7
2.511403	6.72	24.14	17.42	9.000	Y	-15.7
4.546506	4.11	22.00	17.89	9.000	Y	-16.1
6.163218	-0.20	22.00	22.20	9.000	Y	-16.3

Port: Z
Test Mode: Lighting
Power Source: AC 240V/50Hz
Note:



Final_Result

Frequency (MHz)	QuasiPeak (dBμA)	Limit (dBμA)	Margin (dB)	Bandwidth (kHz)	Axis	Corr. (dB)
0.659799	25.60	40.20	14.60	9.000	Z	-15.7
0.707517	26.06	39.36	13.30	9.000	Z	-15.8
1.332989	13.04	31.75	18.71	9.000	Z	-15.8
2.945984	3.70	22.22	18.52	9.000	Z	-15.9
4.684618	1.38	22.00	20.62	9.000	Z	-16.3
6.225005	-0.94	22.00	22.94	9.000	Z	-16.6

3 - RADIATED ELECTROMAGNETIC DISTURBANCES 30 MHZ TO 300 MHZ

Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cisp} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cisp} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit.

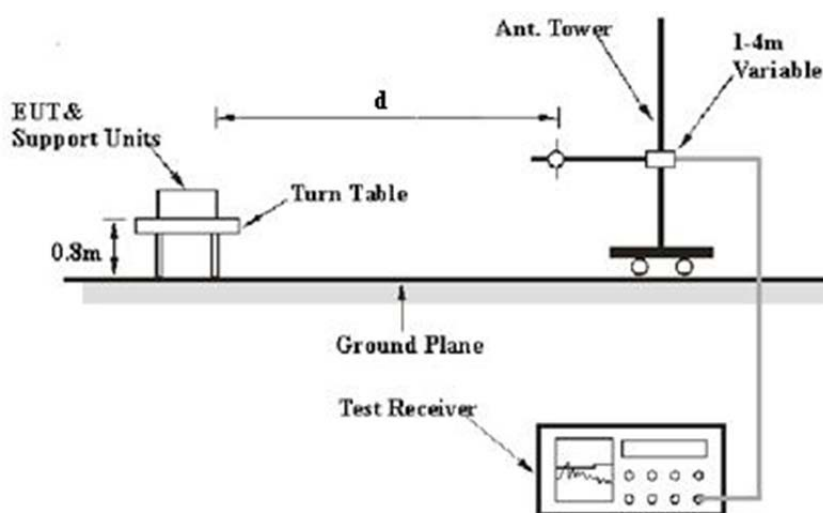
Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 10m at Bay Area Compliance Laboratories Corp. (Dongguan) is: 30M~200MHz: 4.55 dB for Horizontal, 4.57 dB for Vertical; 200M~1GHz: 4.66 dB for Horizontal, 4.56 dB for Vertical; measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is: 30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical; 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical; 1G~6GHz: 4.45 dB, 6G~18GHz: 5.23 dB.

Table 1 – Values of U_{cisp}

Measurement	U_{cisp}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test System Setup



The radiated emission tests were performed in the 3 meters chamber test site A, using the setup accordance with the CISPR 16-1-1:2010+A1:2010, CISPR16-2-3:2010. The specification used was CISPR 15.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.
The Adapter was connected to 240 V/50Hz AC power source.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 300 MHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 300 MHz	120 kHz	300 kHz	120 kHz	QP

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

If the maximized peak measured value complies with under the QP limit more than 6dB, then it is unnecessary to perform QP measurement.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Meter Reading + Corrected

Note:

Corrected = Antenna Factor + Cable Loss - Amplifier Gain

or

Corrected = Antenna Factor + Cable Loss + Insertion loss of attenuator - 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 means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Result

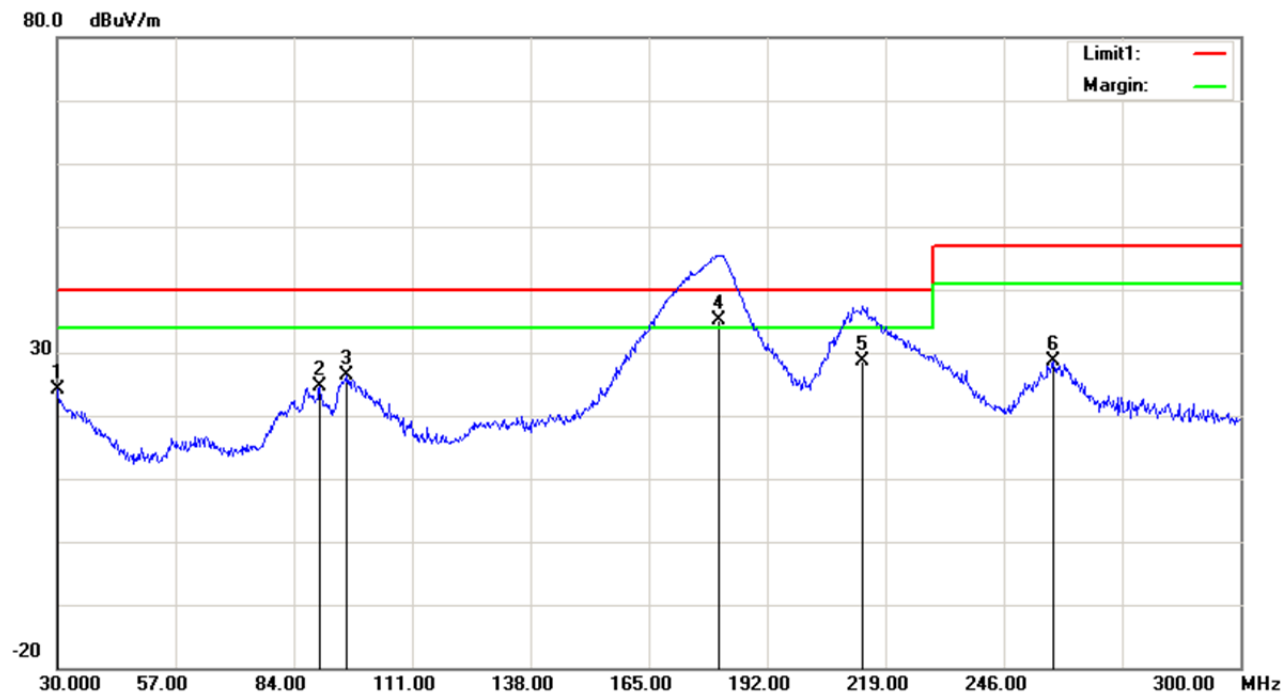
Note: Except for the recorded frequency points (no more than 6), the remaining frequency points have a margin more than 20dB.

Test Data

Please refer to following table and plots:

Condition: CISPR 15 3m Radiation
Test Mode: Mode 1:Lighting

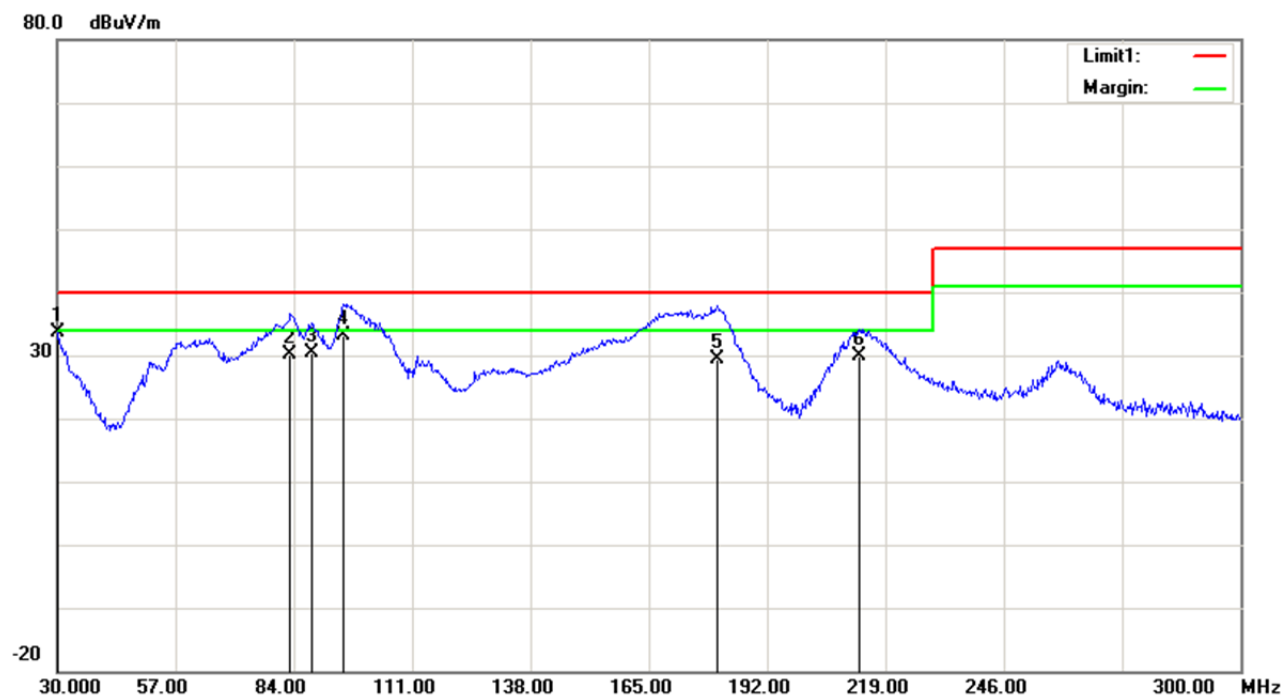
Polarization: Horizontal
Distance: 3m



No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	30.0000	29.03	peak	-4.91	24.12	40.00	15.88
2	89.9400	40.24	peak	-15.70	24.54	40.00	15.46
3	96.1500	41.46	peak	-15.11	26.35	40.00	13.65
4	180.9300	45.81	QP	-10.79	35.02	40.00	4.98
5	213.8700	40.92	QP	-12.22	28.70	40.00	11.30
6	257.3400	39.02	peak	-10.43	28.59	47.00	18.41

Condition: CISPR 15 3m Radiation
Test Mode: Mode 1:Lighting

Polarization: Vertical
Distance: 3m

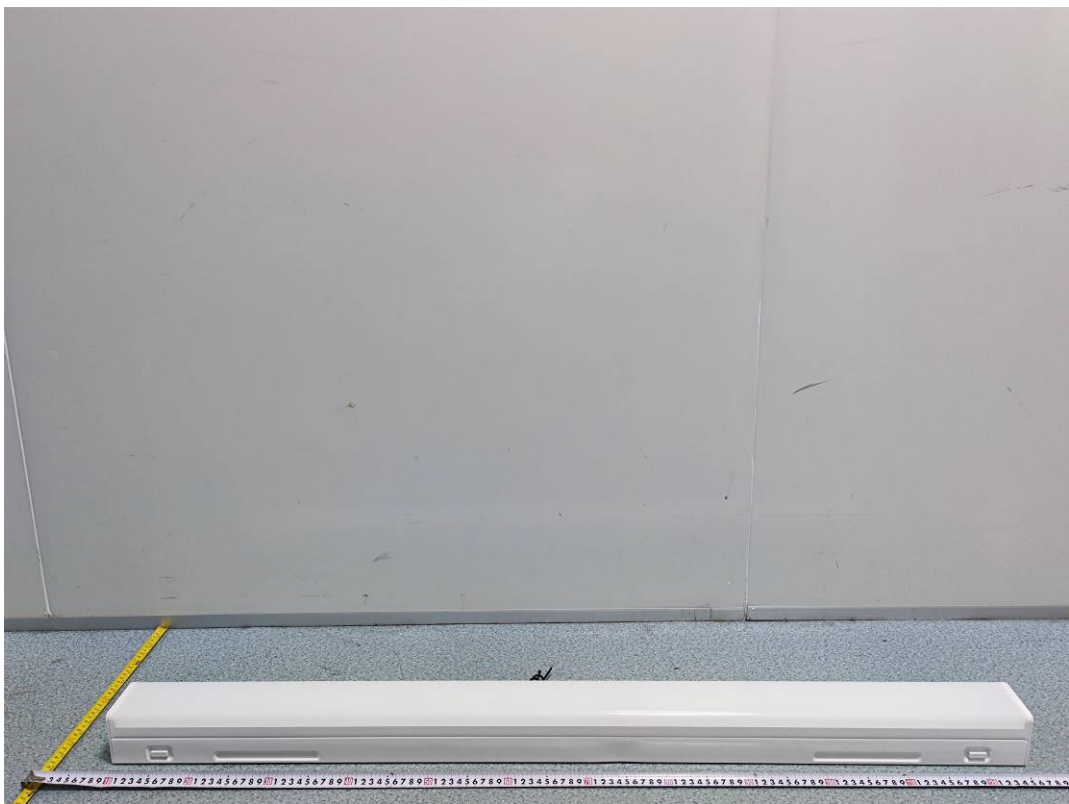
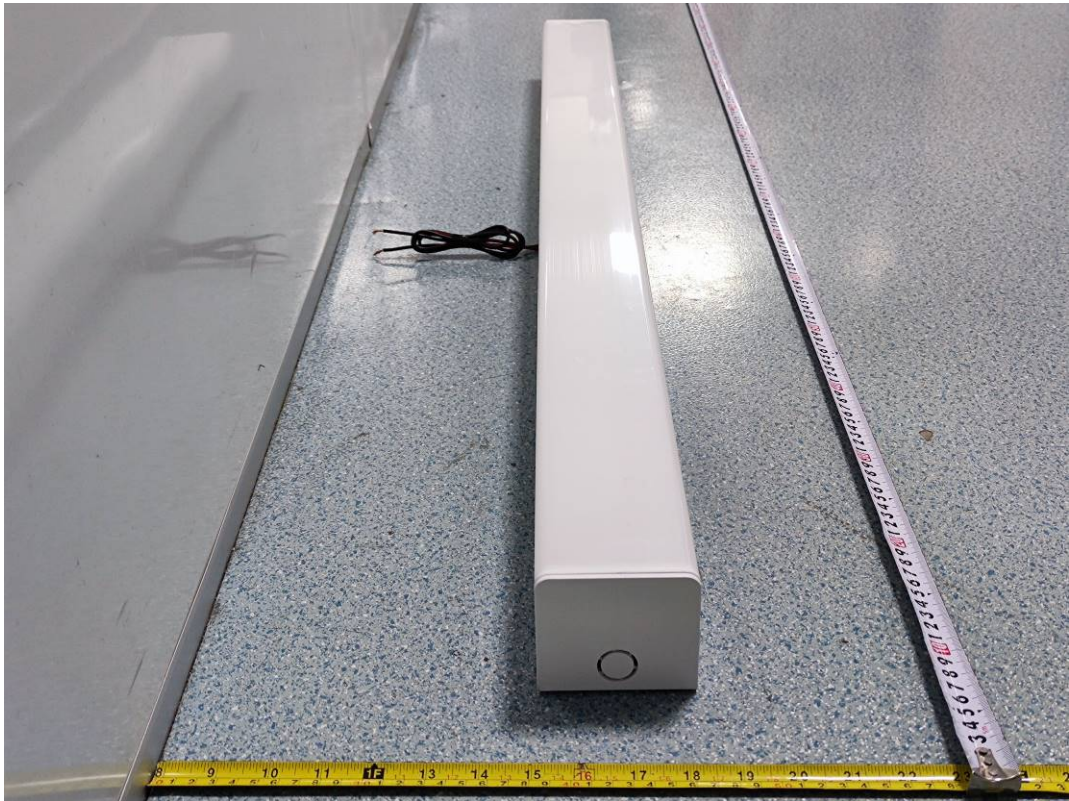


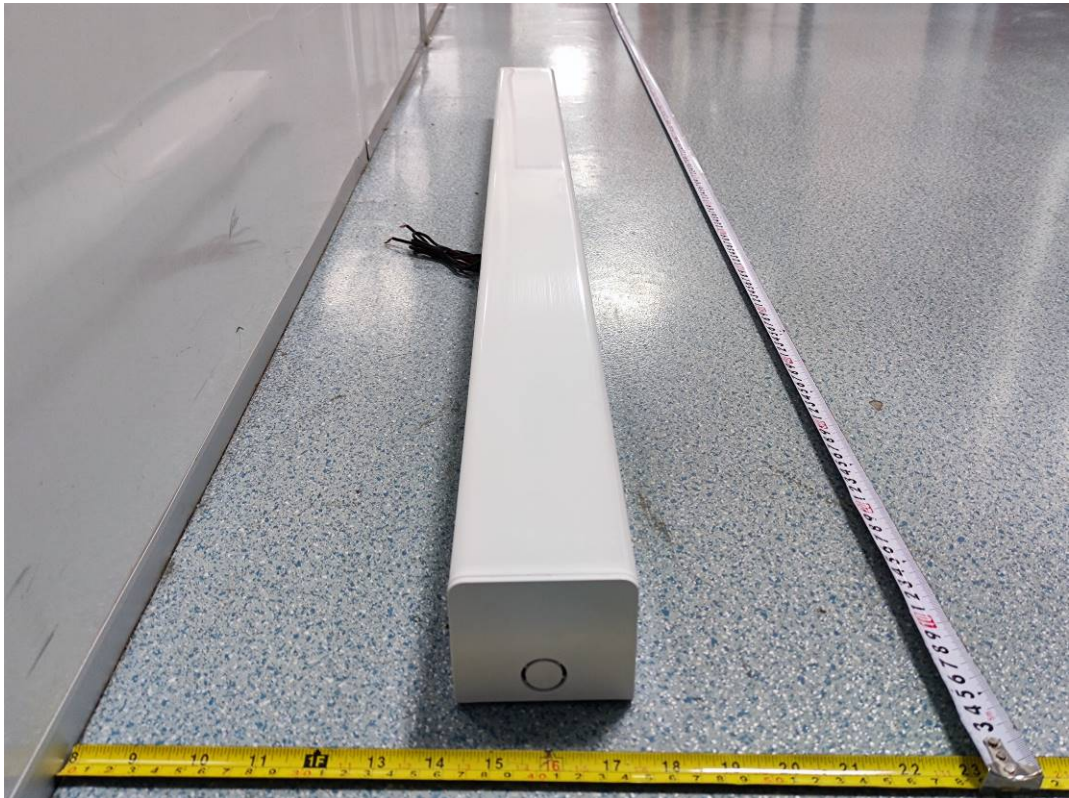
No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	30.0000	38.60	peak	-4.91	33.69	40.00	6.31
2	83.1900	46.42	QP	-16.30	30.12	40.00	9.88
3	88.0500	46.21	QP	-15.87	30.34	40.00	9.66
4	95.3400	48.42	QP	-15.22	33.20	40.00	6.80
5	180.6600	40.26	QP	-10.76	29.50	40.00	10.50
6	213.0600	42.14	QP	-12.25	29.89	40.00	10.11

EXHIBITA – EUT PHOTOGRAPHS

EUT

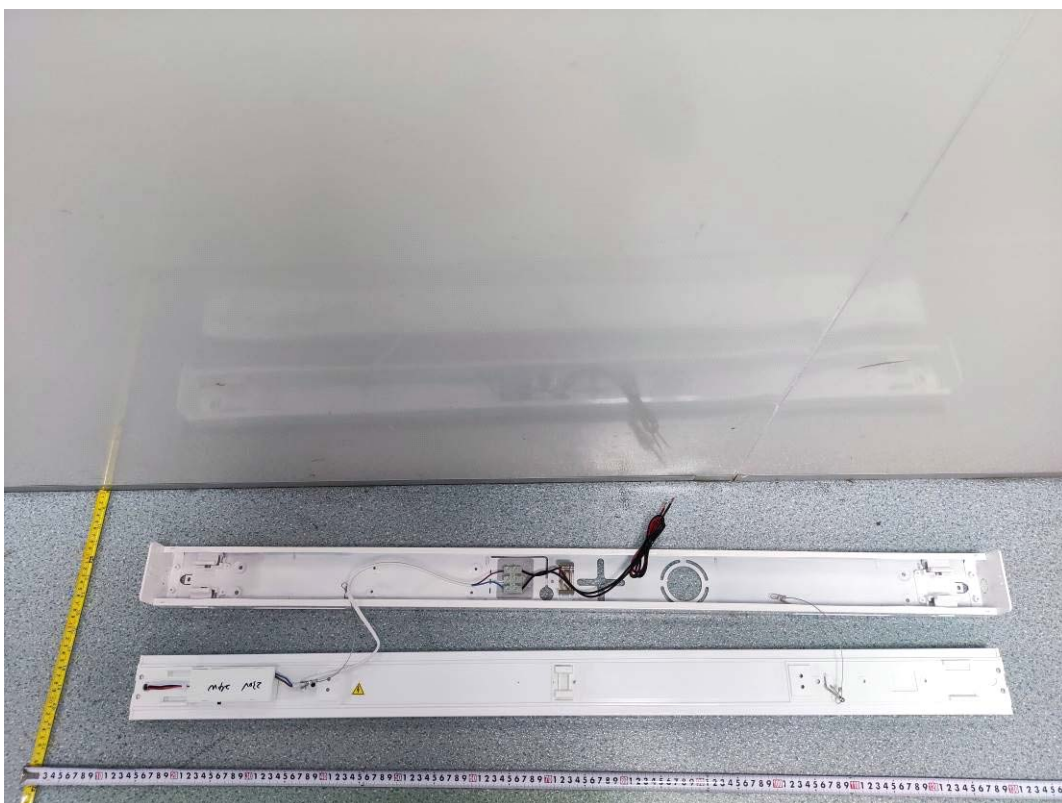


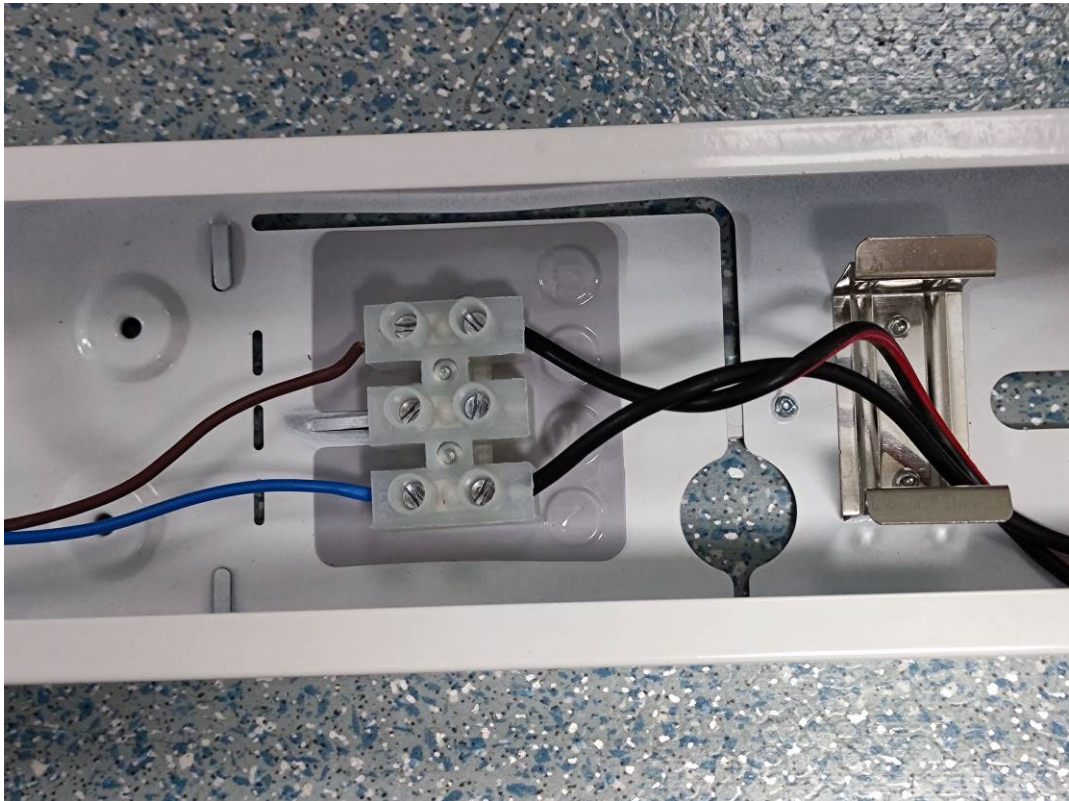


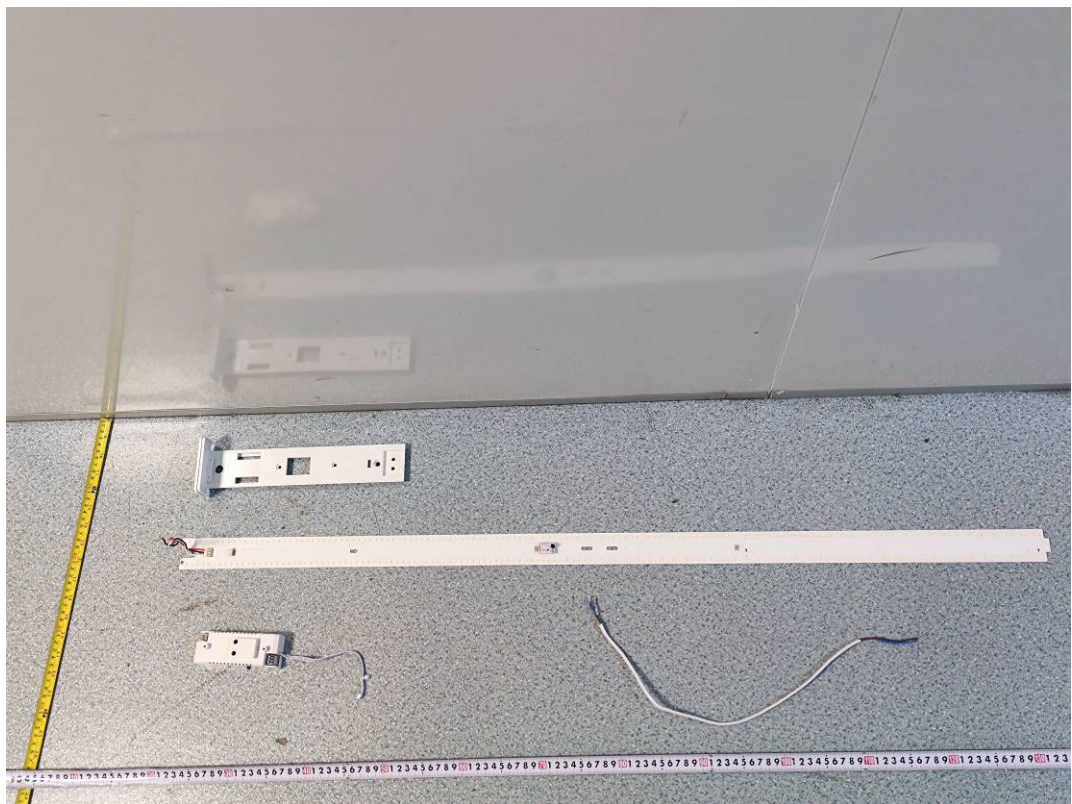


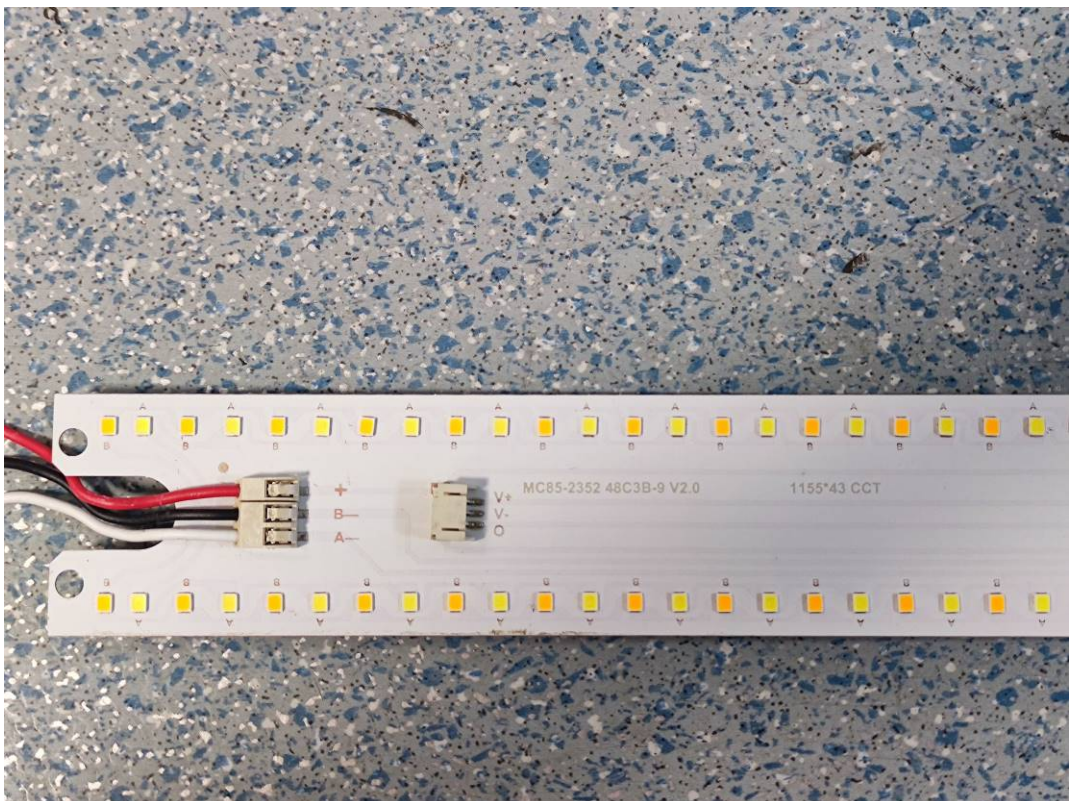


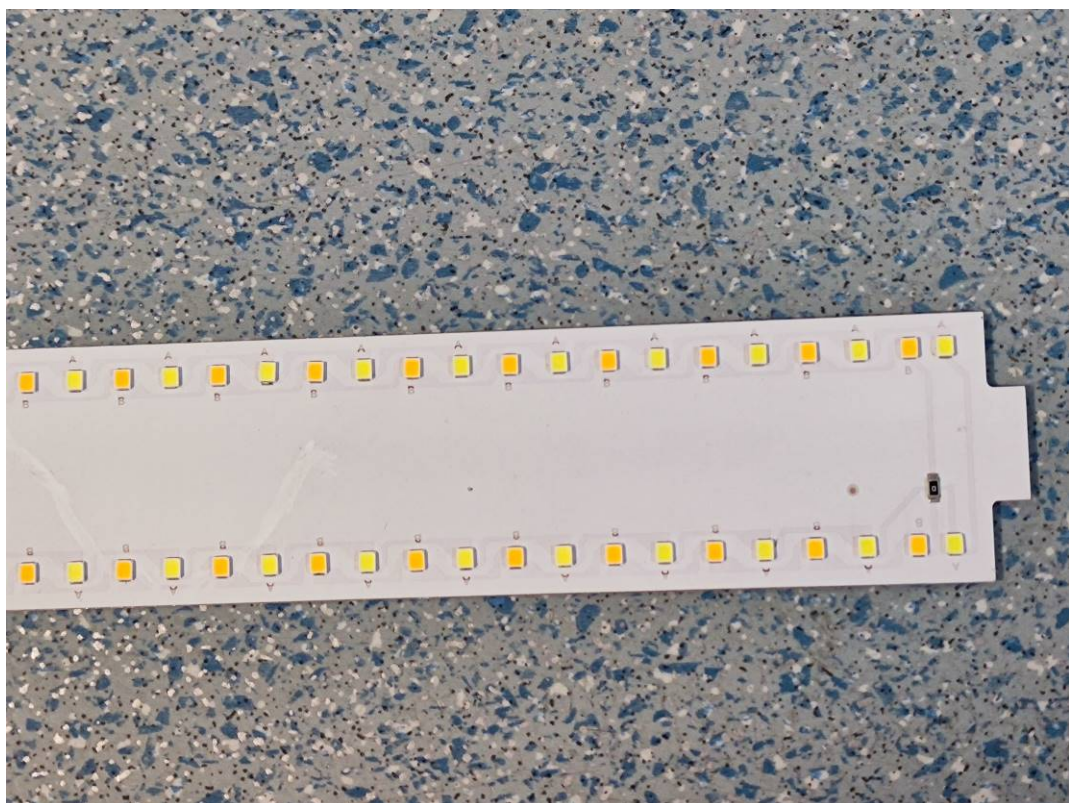
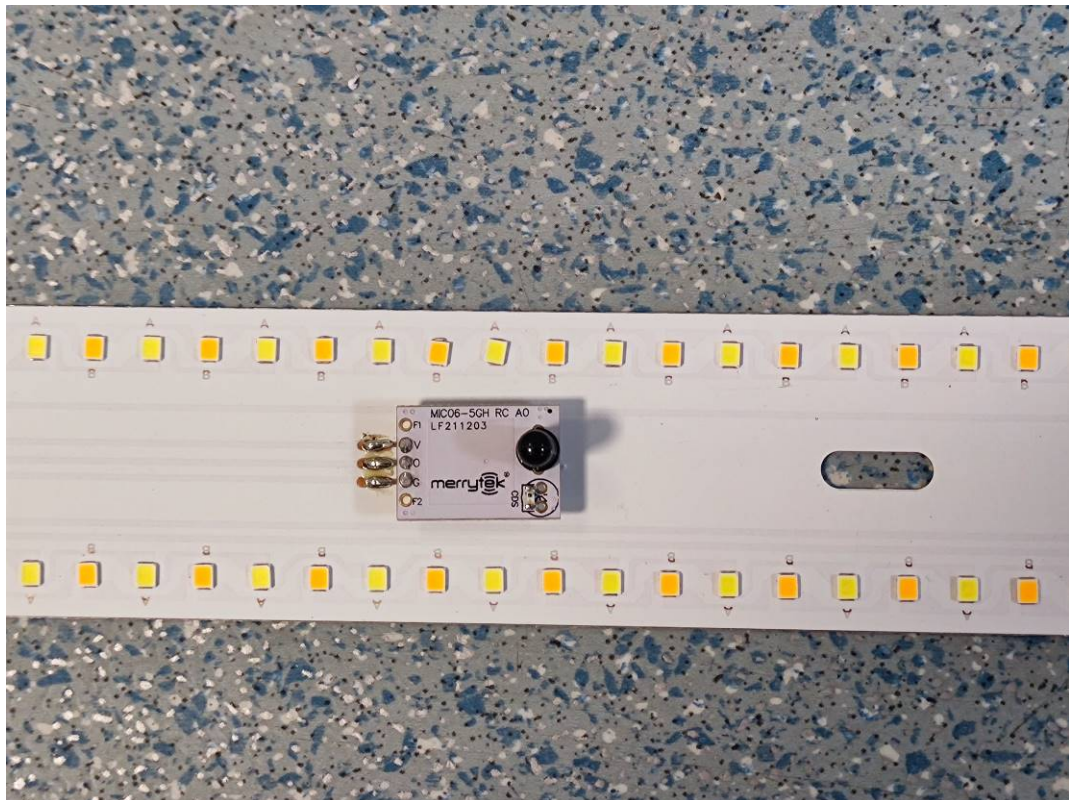
Uncover

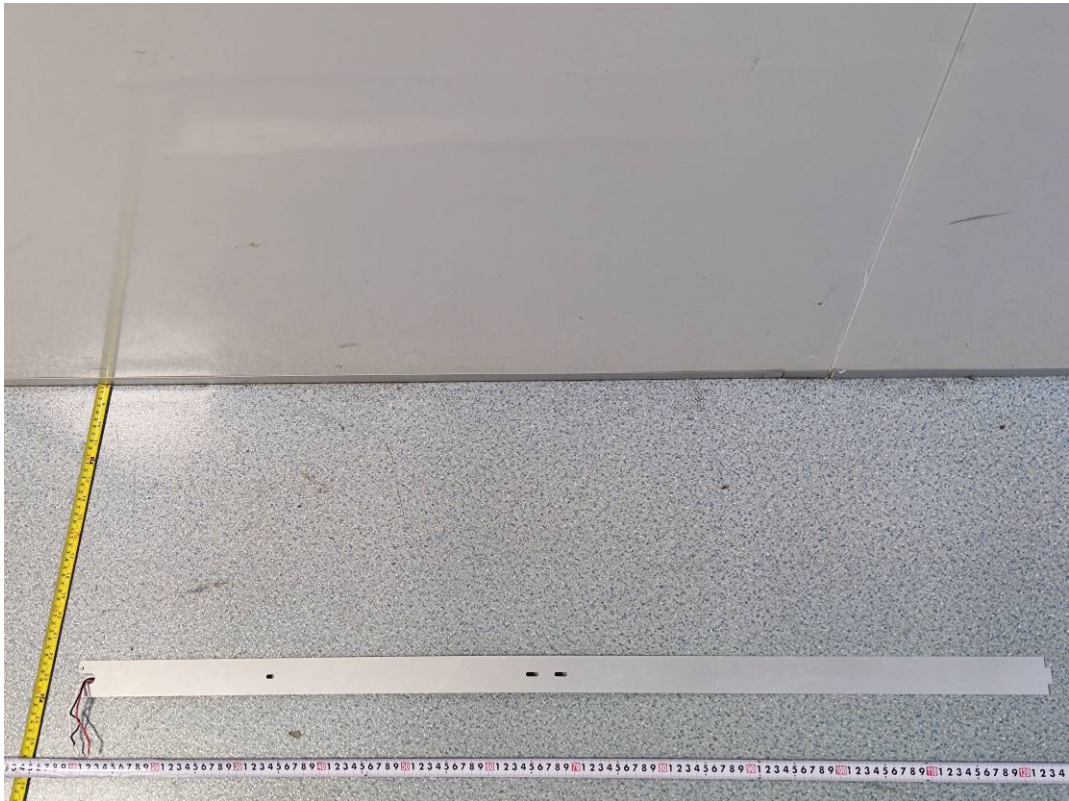




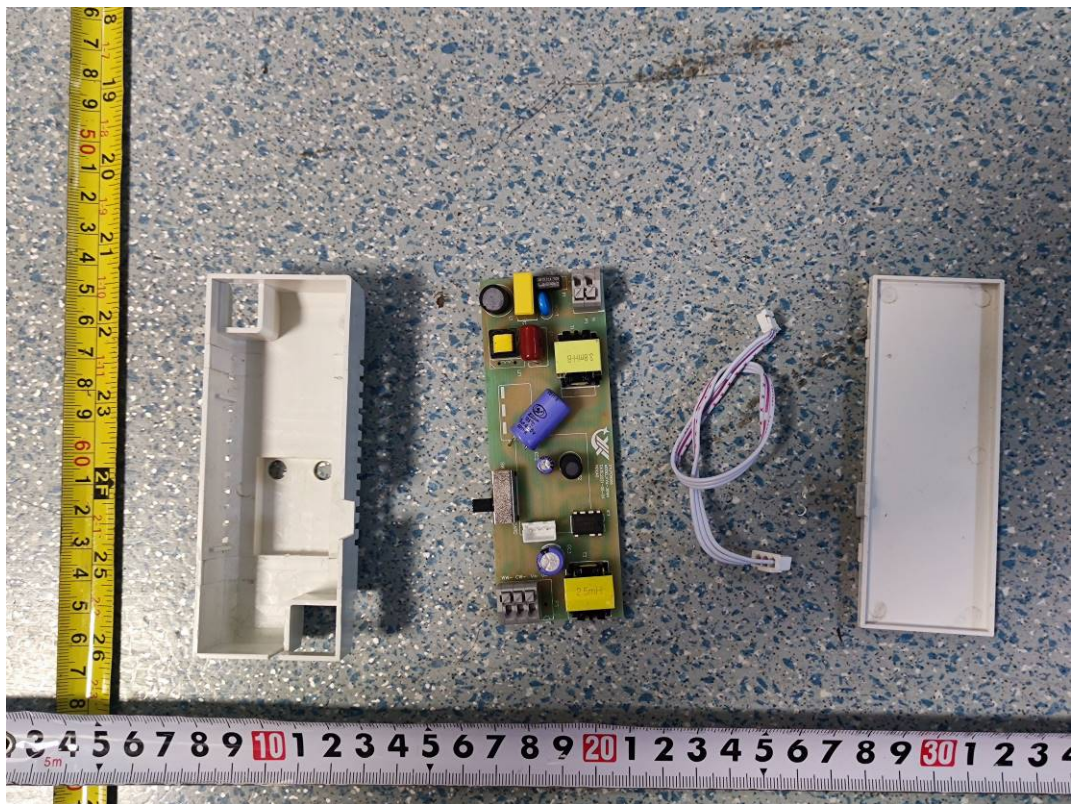


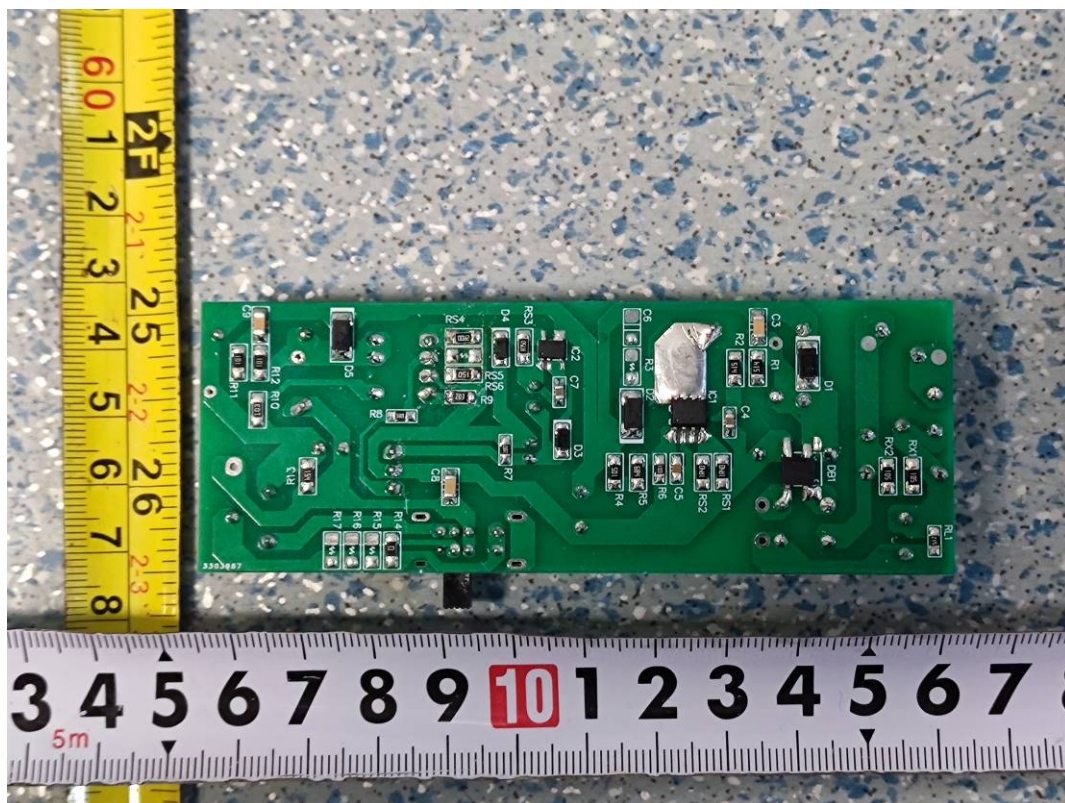












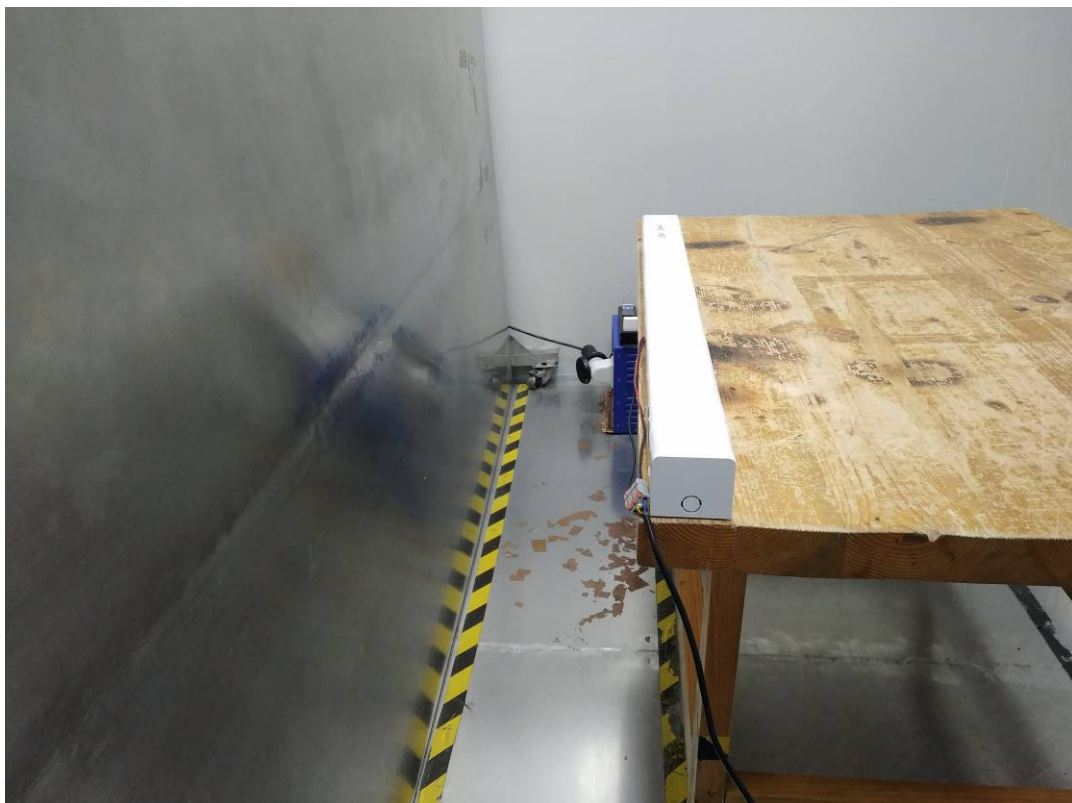
EXHIBITB – TEST SETUP PHOTOGRAPHS

Conducted emissions

Conducted emissions front View



Conducted emissions side View



Indcuted current

Radiated Emissions (Magnetic) View

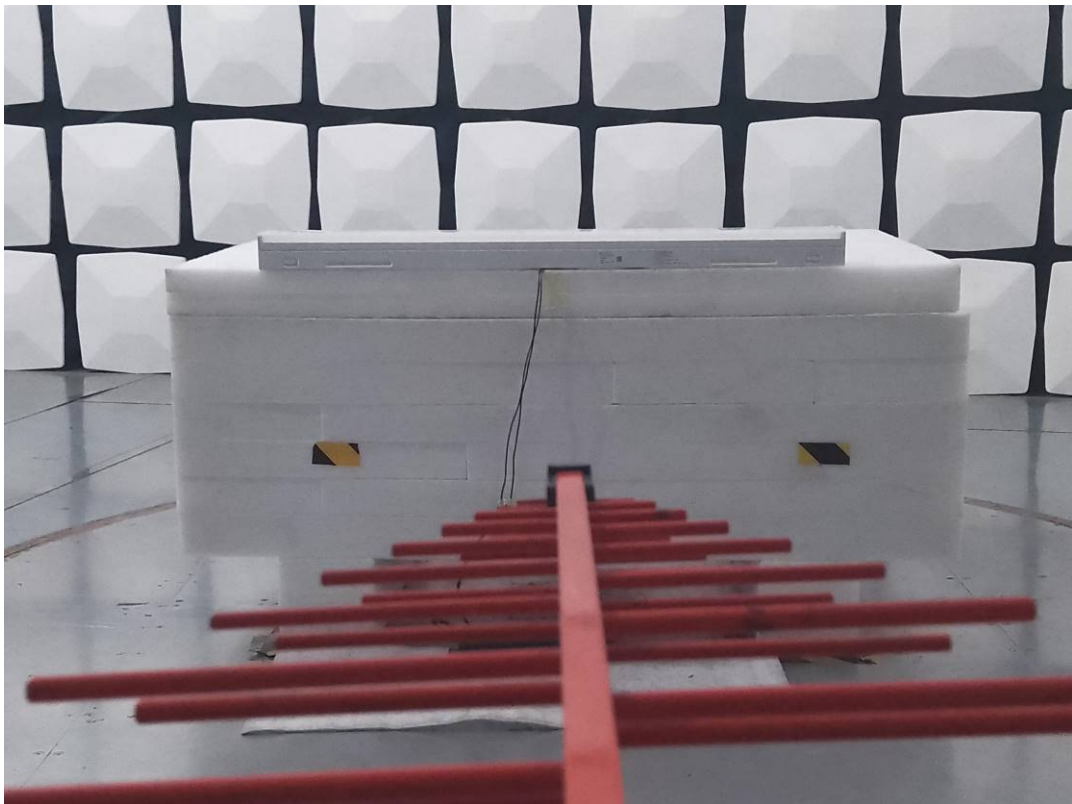


Radiated Emissions

Radiated Emissions Below 1G front View



Radiated Emissions Below 1G rear View



DECLARATION OF SIMILARITY LETTER**Declaration of Alteration**

To Whom It May Concern,

We, ULA1L PTY LTD hereby declare that The following models are the same except the model number, the details are as below:

Products Description	Name	LED BATTEN LIGHT
	Model	ECO-BT24W-1200-D
	Project No.	DG5220916-42071E
Differences Description		
Main Testing Model	Multiple Model	Difference
ECO-BT24W-1200-D	ECO-BT18W-1200-D; ECO-BT16W-1200-D	The only difference between ECO-BT24W-1200-D and ECO-BT18W-1200-D and ECO-BT16W-1200-D is the power, which is 24W, 18W and 16W respectively


Notes: Products tested -the products tested by BACL

Multiple Model- have the same appearance, structure, PCB, Material

and function to the testing products. Besides the differences in the table above, we declare the products are identical We guarantee all the information provided above is true, and notice that we' ll bear all the consequences caused by any false information or concealing.

Best Regards,

Signature



Print Name: Peter Pan
Title: R&D Manager

*****END OF REPORT*****