TCT 通测检测 TESTING CENTRE TECHNOLOGY

EMC TEST REPORT

Electrical lighting and similar equipment

Test Report No. .....:	TCT221018E011
Date of issue .....:	Oct. 21, 2022
Testing laboratory.....:	Shenzhen TCT Testing Technology Co., Ltd.
Testing location/ address.....:	2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Applicant's name .....:	Mynice Optoelectronics co., ltd
Address.....:	Block4-8#TongFuyu Industrial Park, Aiqun Road, ShiYan, Bao'An, Shenzhen, China 518108
Manufacturer's name .....:	Mynice Optoelectronics co., ltd
Address.....:	Block4-8#TongFuyu Industrial Park, Aiqun Road, ShiYan, Bao'An, Shenzhen, China 518108
Standard(s) .....:	EN IEC 55015:2019+A11:2020 EN 61547:2009 EN IEC 61000-3-2:2019+A1:2021 EN 61000-3-3:2013+A1:2019+A2:2021
Test item description.....:	LED Module
Trade Mark.....:	N/A
Model/Type reference.....:	M23GW22A, M_ _ _ _ _ _ _Series, The first letter: Product type, The 2nd_: IP and technical, The 3 to 5_: LED parameter, The 6 and 7 _: Product shape, The 8 _: Product power and driving method
Rating(s) .....:	N/A
Date of receipt of test item.....:	Oct. 18, 2022
Date (s) of performance of test:	Oct. 18, 2022 ~ Oct. 21, 2022
Tested by (+signature).....:	Jack WANG
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 Module
Model/Type reference ..... :	M23GW22A
Rating(s) ..... :	N/A
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	M23GW22A	☒
Other models	M_ _ _ _ _ _ _Series, The first letter: Product type, The 2nd_: IP and technical, The 3 to 5_: LED parameter, The 6 and 7 _: Product shape, The 8 _: Product power and driving method	☐
Note: M23GW22A is tested model, other models are derivative models.		

2. Test Information

2.1.EUT operation mode(s)

Mode #	Operating mode description	Test voltage
1	None	/

2.2.Special accessories and auxiliary equipment

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

2.3.Configuration of system under test

EUT

(EUT: LED Module)

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 – 30 °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 electromagnetic disturbances (9 kHz to 30 MHz)	3.06 dB
Uncertainty for Radiated electromagnetic disturbances (30 MHz to 1 GHz)	4.56 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 TCT Testing Technology Co., Ltd. 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

EN IEC 55015:2019+A11:2020	
Requirement – Test case	**Verdict**
Disturbance voltage	N/A
Radiated electromagnetic disturbances (9 kHz to 30 MHz)	N/A
Radiated electromagnetic disturbances (30 MHz to 1 GHz)	N/A
EN IEC 61000-3-2:2019+A1:2021	
Requirement – Test case	**Verdict**
Harmonic current emissions	N/A
EN 61000-3-3:2013+A1:2019+A2:2021	
Requirement – Test case	**Verdict**
Voltage changes, voltage fluctuations and flicker	N/A
EN 61547:2009	
Requirement – Test case	**Verdict**
Electrostatic discharge immunity (ESD)	N/A
Radiated, radio-frequency, electromagnetic field immunity (RS)	N/A
Electrical fast transient/burst immunity (EFT/B)	N/A
Surge immunity	N/A
Immunity to conducted disturbances, induced by radio-frequency fields (CS)	N/A
Power frequency magnetic field immunity (PFMF)	N/A
Voltage dips, short interruptions and voltage variations immunity (DIPS)	N/A
Remark: ---	

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				
EMI Test Receiver	R&S	ESCI3	100898	2023/07/03
Line Impedance Stabilisation Newtork(LISN)	Schwarzbeck	NSLK 8126	8126453	2023/02/24
Attenuator	N/A	10dB	164080	2023/07/03
844 Shielded room	SKET	8m*4m*4m	CR4	2023/03/02
Test software	EZ_EMC	EMEC-3A1	/	/
Radiated electromagnetic disturbances (9 kHz to 30 MHz)				
EMI Test Receiver	R&S	ESCI3	100898	2023/07/03
Triple-Loop Antenna	Da Ze technology CO.,LTD	ZN30401	160026	2024/07/03
543 Shielded room	SKET	5m*4m*3m	SR2	2023/01/25
Test software	EZ_EMC	EMEC-3A1	/	/
Radiated electromagnetic disturbances (30 MHz to 1 GHz)				
Broadband Antenna	Schwarzbeck	VULB 9168	01197	2023/03/06
EMI Test Receiver	R&S	ESCI7	100529	2023/02/24
Test software	EZ_EMC	FA-03A2 RE+	/	/
3m Anechoic Chamber	SKET	9m*6m*6m	SA01	2023/01/25
Test software	EZ_EMC	FA-03A2 RE+	/	/
Harmonic current emissions & Voltage Fluctuations and Flicker				
AC Power Supply	KIKUSUI	PCR4000M	UC002552	2023/04/11
Harmonic/Flicker Analyzer	KIKUSUI	KHA1000	UD002324	2023/07/03
Line Impedance Network	KIKUSUI	LIN1020JF	UC001738	2023/07/04
Test software	KIKUSUI	HarmoCapture	/	/
Electrostatic discharge immunity (ESD)				
Electrostatic Discharge Generator	HAEFELY	PESD300	H012056	2023/07/01
Radiated, radio-frequency, electromagnetic field immunity (RS)				
Antenna	SKET	STLP 9129_Plus	/	/
Signal Generator	Agilent	N5181A	MY50141997	2022/12/07

Amplifier	SKET	HAP_80M01G-250 W	/	2023/02/24
Amplifier	SKET	HAP_01G03G-75W	202104180	2023/07/03
Amplifier	SKET	HAP_03G06G-80W	202004044	2023/07/03
Field Probe	Narda	EP-601	811ZX01057	2023/07/05
USB Power Sensor	Agilent	U2001A	MY53410013	2023/02/24
USB Power Sensor	Agilent	U2001A	MZ54330012	2023/02/24
743 Anechoic Chamber	SKET	7m*4m*3m	SA04	2023/03/06
Test software	SKET	EMC-S	/	/
Electrical fast transient/burst immunity (EFT/B)				
Fast Transient Burst Simulator	Prima	EFT61004BG	PR12074375	2023/07/03
Capacitive Coupling folder	Prima	EFT-CLAMP	N/A	2024/07/04
Surge immunity				
Lightning Surge Generator	Prima	SUG61005BG	PR12125534	2023/07/03
Immunity to conducted disturbances, induced by radio-frequency fields (CS)				
Conducted Immunity Test System	Schloder	CDG-6000-75	126B1290/2014	2023/05/26
CDN	Schloder	CDN M2+M3-16	A2210281/2014	2023/07/03
EM-Clamp	Schloder	EMCL-20	132A1194/2014	2023/07/03
RF Attenuator	PE	75W 6dB	N/A	2023/07/03
543 Shielded room	SKET	5m*4m*3m	SR2	2023/01/25
Test software	HUBERT	IEC/EN61000-4-6	/	/
Power frequency magnetic field immunity (PFMF)				
Power Frequency Magnetic Field Generator	EVERFINE	EMS61000-8K	G121941CS1341114	2023/07/03
Adjsutable Magnetic Field Coil	EVERFINE	MFC-4	G1242BBS1341114	2023/07/03
Voltage dips, short interruptions and voltage variations immunity (DIPS)				
Cycle Sag Simulator	Prima	DRP61011AG	PR12106201	2023/07/03

5. Test Conditions and Results (Emission)

5.1. Disturbance voltage

<table>
<tr><td>Test requirement ..... :</td><td colspan="5">EN IEC 55015:2019+A11:2020</td></tr>
<tr><td>Test frequency range... :</td><td colspan="5">9/150 kHz to 30 MHz</td></tr>
<tr><td rowspan="20">Limits..... :</td><td colspan="5">Electric power supply interface</td></tr>
<tr><td>Frequency (MHz)</td><td colspan="2">Quasi-peak(dBµV)</td><td colspan="2">Average(dBµV)</td></tr>
<tr><td>0.009 to 0.05</td><td colspan="2">110</td><td colspan="2">N/A</td></tr>
<tr><td>0.05 to 0.15</td><td colspan="2">90 to 80</td><td colspan="2">N/A</td></tr>
<tr><td>0.15 to 0.5</td><td colspan="2">66 to 56</td><td colspan="2">56 to 46</td></tr>
<tr><td>0.5 to 5</td><td colspan="2">56</td><td colspan="2">46</td></tr>
<tr><td>5 to 30</td><td colspan="2">60</td><td colspan="2">50</td></tr>
<tr><td colspan="5">Wired network interfaces other than power supply</td></tr>
<tr><td>Frequency</td><td colspan="2">Voltage Limits(dBµV)</td><td colspan="2">Current Limits(dBµA)</td></tr>
<tr><td>MHz</td><td>Quasi-peak</td><td>Average</td><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15 to 0.5</td><td>84 to 74</td><td>74 to 64</td><td>40 to 30</td><td>30 to 20</td></tr>
<tr><td>0.5 to 30</td><td>74</td><td>64</td><td>30</td><td>20</td></tr>
<tr><td colspan="5">Local wired ports- Electrical power supply interface of non-restricted ELV lamps</td></tr>
<tr><td>Frequency (MHz)</td><td colspan="2">Quasi-peak(dBµV)</td><td colspan="2">Average(dBµV)</td></tr>
<tr><td>0.009 to 0.05</td><td colspan="2">136</td><td colspan="2">N/A</td></tr>
<tr><td>0.05 to 0.15</td><td colspan="2">116 to 106</td><td colspan="2">N/A</td></tr>
<tr><td>0.15 to 0.5</td><td colspan="2">92 to 82</td><td colspan="2">82 to 72</td></tr>
<tr><td>0.5 to 5</td><td colspan="2">82</td><td colspan="2">72</td></tr>
<tr><td>5 to 30</td><td colspan="2">86</td><td colspan="2">76</td></tr>
<tr><td colspan="5">Local wired ports- Other than electrical power supply interface of ELV lamp</td></tr>
<tr><td>Frequency</td><td colspan="2">Voltage Limits(dBµV)</td><td colspan="2">Current Limits(dBµA)</td></tr>
<tr><td>MHz</td><td>Quasi-peak</td><td>Average</td><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15 to 0.5</td><td>80</td><td>70</td><td>40 to 30</td><td>30 to 20</td></tr>
<tr><td>0.5 to 30</td><td>74</td><td>64</td><td>30</td><td>20</td></tr>
<tr><td>Test method..... :</td><td colspan="5">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). Conducted voltage measurements on mains lines were made at the output of the AMN.</td></tr>
<tr><td>Ambient temperature... :</td><td colspan="5">/</td></tr>
<tr><td>Relative humidity ..... :</td><td colspan="5">/</td></tr>
<tr><td>Test location ..... :</td><td colspan="5">/</td></tr>
<tr><td>Test model(s) ..... :</td><td colspan="5">/</td></tr>
<tr><td>EUT operation mode.... :</td><td colspan="5">/</td></tr>
<tr><td>Test results ..... :</td><td colspan="5">N/A</td></tr>
<tr><td>Remark..... :</td><td colspan="5">The EUT no electronic control circuitry, are not expected to produce electromagnetic disturbances. Therefore, they are deemed to fulfil all relevant requirements of EN IEC 55015:2019+A11:2020 without further testing.</td></tr>
</table>

5.2. Radiated electromagnetic disturbances (9 kHz to 30 MHz)

Test requirement ..... :	EN IEC 55015:2019+A11:2020
Test frequency range... :	9 kHz to 30 MHz
Limits..... :	☒ **LLAS radiated disturbance limits**

Frequency (MHz)	Quasi-peak(dBμA)
0.009 to 0.07	88
0.07 to 0.15	88 to 58
0.15 to 3	58 to 22
3 to 30	22

☐ **Loop antenna radiated disturbance limits**

Frequency (MHz)	Quasi-peak(dBμA/m)
0.009 to 0.07	69
0.07 to 0.15	69 to 39
0.15 to 4	39 to 3
4 to 30	3

Test method..... :	The EUT and support equipment are positioned in the centre of loop antenna system (LAS). The LAS consists of three circular, mutually perpendicular large-loop antennas (LLAs), having a diameter of 2 m, supported by a non-metallic base. A 50 Ω coaxial cable between the current probe of an LLA and the coaxial switch, and between this switch and the measuring equipment, shall have a surface transfer impedance smaller than 10 mΩ/m at 100 kHz and 1 mΩ/m at 10 MHz. The distance between the outer diameter of the loop antenna system and nearby objects, such as floor and walls, shall be at least 0.5 m as per CISPR 15. The induced current in the loop antenna is measured by means of a current probe (1 V/A) and the CISPR measuring receiver. By means of a coaxial switch, the three field directions (X, Y, Z) can be measured in sequence. The receiver scanned from 9 kHz to 30 MHz for emissions in each of the test modes. and recorded at least the six highest emission. Each value shall comply with the requirement given. The test data of the worst-case condition(s) was recorded.
Ambient temperature... :	/
Relative humidity ..... :	/
Test location ..... :	/
Test model(s) ..... :	/
EUT operation mode.... :	/
Test results ..... :	N/A
Remark..... :	The EUT no electronic control circuitry, are not expected to produce electromagnetic disturbances. Therefore, they are deemed to fulfil all relevant requirements of EN IEC 55015:2019+A11:2020 without further testing.

5.3. Radiated electromagnetic disturbances (30 MHz to 1 GHz)

Test requirement.....:	EN IEC 55015:2019+A11:2020		
Test frequency range..:	30 MHz to 1 GHz		
Limits.....:	☒ **Limits –OATS or SAC**		
	Frequency (MHz)	**10 m measurement distance**	**3 m measurement distance**
		dBµV/m	
	30 to 230	30 Quasi-peak	40 Quasi-peak
	230 to 1000	37 Quasi-peak	47 Quasi-peak
	☐ **Limits –CDNE method**		
	Frequency (MHz)	**Quasi-peak(dBµV)**	
	30 to 100	64 to 54	
	100 to 200	54	
	200 to 300	54 to 51	
Test method.....:	Measurements were made in a 3/10-meter semi-anechoic chamber that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3/10 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..:	/		
Relative humidity.....:	/		
Test location.....:	/		
Test model(s) .....:	/		
EUT operation mode..:	/		
Test results.....:	N/A		
Remark.....:	The EUT no electronic control circuitry, are not expected to produce electromagnetic disturbances. Therefore, they are deemed to fulfil all relevant requirements of EN IEC 55015:2019+A11:2020 without further testing.		

5.4. Harmonic current emissions

<table>
<tr><td>Test requirement ..... :</td><td colspan="2">EN IEC 61000-3-2:2019+A1:2021</td></tr>
<tr><td rowspan="10">Limit classification in accordance with the standard ..... :</td><td colspan="2">Limits - Class C with rated power > 25 W</td></tr>
<tr><td>Harmonic order (n)</td><td>Maximum permissible harmonic current expressed as a percentage of the input current at the fundamental frequency
%</td></tr>
<tr><td>2</td><td>2</td></tr>
<tr><td>3</td><td>27</td></tr>
<tr><td>5</td><td>10</td></tr>
<tr><td>7</td><td>7</td></tr>
<tr><td>9</td><td>5</td></tr>
<tr><td>11 ≤ n ≤ 39
(odd harmonics only)</td><td>3</td></tr>
<tr><td colspan="2">Limits - Class C with rated power ≥ 5 W and ≤ 25 W</td></tr>
<tr><td colspan="2">1: First requirement, Table 3 column 2
2: 3rd harmonic ≤ 86 %, 5th harmonic ≤ 61 % and waveform conditions
3: THD ≤ 70 %, Harmonics: 3rd ≤35 %, 5th ≤ 25 %, 7th ≤ 30 %, 9th and 11th ≤ 20 %, 2nd ≤ 5 %</td></tr>
<tr><td>Test method ..... :</td><td colspan="2">This test consists on the measurement of harmonics components of the input current which may be produced by equipment having an input current up to and including 16 A per phase, and intended to be connected to public low-voltage distribution systems. The equipment is tested under specified conditions of operation.</td></tr>
<tr><td>Ambient temperature ..... :</td><td colspan="2">/</td></tr>
<tr><td>Relative humidity ..... :</td><td colspan="2">/</td></tr>
<tr><td>Test location ..... :</td><td colspan="2">/</td></tr>
<tr><td>Test model(s) ..... :</td><td colspan="2">/</td></tr>
<tr><td>EUT operation mode ..... :</td><td colspan="2">/</td></tr>
<tr><td>Test results ..... :</td><td colspan="2">N/A</td></tr>
<tr><td>Remark ..... :</td><td colspan="2">The EUT no electronic control circuitry, are not expected to produce electromagnetic disturbances. Therefore, they are deemed to fulfil all relevant requirements of EN IEC 61000-3-2:2019+A1:2021 without further testing.</td></tr>
</table>

5.5. Voltage changes, voltage fluctuations and flicker

Test requirement ..... :	EN 61000-3-3:2013+A1:2019+A2:2021
Applied limit ..... :	The value of P_{st} shall be not greater than 1.0 The value of P_{lt} shall be not greater than 0.65 The value of d(t) during a voltage change shall not exceed 3.3 % for more than 500 ms The relative steady-state voltage change, dc shall not exceed 3.3 % The maximum relative voltage change d_{max} shall not exceed: a) 4 % without additional conditions b) 6 % for equipment which is: - switched manually, or - switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption c) 7 % for equipment which is - attended whilst in use (for example : hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as mowers, portable tools such as electric drills), or - switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.
Test method ..... :	This test consists on the measurement of voltage changes, voltage fluctuations and flicker which may be produced by equipment having an input current ≤ 16 A per phase, and intended to be connected to public low-voltage distribution systems. The equipment is tested under specified conditions of operation.
Observation time ..... :	10 Minutes
	120 Minutes
	24 times switching according to Annex B
Ambient temperature..... :	/
Relative humidity ..... :	/
Test location ..... :	/
Test model(s) ..... :	/
EUT operation mode..... :	/
Test results ..... :	N/A
Remark..... :	The EUT no electronic control circuitry, are not expected to produce electromagnetic disturbances. Therefore, they are deemed to fulfil all relevant requirements of EN 61000-3-3:2013+A1:2019+A2:2021 without further testing.

6. Test Conditions and Results (Immunity)

6.1. General information

Performance criteria as defined by the standard	
Criterion	**Description from standard**
A	During the test no change of the luminous intensity shall be observed and the regulating control. If any, shall operate during the test as intended.
B	During the test the luminous intensity may change to any value. After the test, the luminous intensity shall be restored to its initial value within 1 min. Regulating controls need not function during the test but after the test the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given.
C	During and after the test any change of the luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall return to normal if necessary by temporary interruption of the mains supply and/or operating the regulating control. Additional requirement for lighting equipment incorporating a starting device: After the test, the lighting equipment is switched off. After half an hour, it is switched on again. The lighting equipment shall start and operate as intended.

6.2. Electrostatic discharge immunity

Test requirement ..... :	EN 61547:2009	
Basic standard ..... :	EN 61000-4-2:2009	
Test level ..... :	**Discharge type**	**Discharge voltage**
	Contact discharge voltage	±4 kV
	Air discharge voltage	±8 kV
Storage capacitor ..... :	150 pF	
Discharge resistor ..... :	330 Ω	
Horizontal coupling plate ..... :	1.6 x 0.8 m	
Vertical coupling plate ..... :	0.5 x 0.5 m	
Number of discharges ..... :	Min. 10 per discharge location	
Discharge interval ..... :	1 second	
Performance criteria ..... :	B	
Test method ..... :	The table-top equipment under test is placed on a wooden table, 0.8 m high, standing on the ground reference plane. A horizontal coupling plane (HCP), 1.6 x 0.8 m, is placed on the table. The EUT and the cables are isolated from the coupling plane by an insulating support 0.5 mm thick. The floor standing equipment is isolated from the ground reference plane by an insulating support about 0.1 m thick. The vertical coupling plane (VCP) of dimensions 0.5 m x 0.5 m is placed parallel to, and positioned at a distance of 0.1 m from, the EUT.	
Ambient temperature ..... :	/	
Relative humidity ..... :	/	
Air pressure ..... :	/	
Test location ..... :	/	
Test model(s) ..... :	/	
EUT operation mode ..... :	/	
Test results ..... :	N/A	
Remark ..... :	The EUT no electronic control circuitry, are not expected to produce electromagnetic disturbances. Therefore, they are deemed to fulfil all relevant requirements of EN 61547:2009, EN 61000-4-2:2009 without further testing.	

6.3. Radiated, radio-frequency, electromagnetic field immunity

Test requirement ..... :	EN 61547:2009		
Basic standard ..... :	EN IEC 61000-4-3:2020		
Test level ..... :	**Frequency (MHz)**	**Field strength**	**Modulation**
	80 to 1000	3 V/m (r.m.s.) (unmodulated)	80% AM (1 kHz)
Dwell time ..... :	1 second		
Step size ..... :	1 %		
Distance antenna to EUT..... :	3 m		
Performance criteria..... :	A		
Test method..... :	Measurements were made in a fully anechoic chamber and the indicated field strength was pre-calibrated prior to placement of the system under test. Tests were performed in both the horizontal and vertical polarities, where applicable. The antenna was placed 3 meters from the product under test. All sides of the EUT were investigated for anomalies.		
Ambient temperature..... :	/		
Relative humidity ..... :	/		
Air pressure..... :	/		
Test location ..... :	/		
Test model(s) ..... :	/		
EUT operation mode..... :	/		
Test results ..... :	N/A		
Remark..... :	The EUT no electronic control circuitry, are not expected to produce electromagnetic disturbances. Therefore, they are deemed to fulfil all relevant requirements of EN 61547:2009, EN IEC 61000-4-3:2020 without further testing.		

6.4. Electrical fast transient/burst immunity

Test requirement ..... :	EN 61547:2009	
Basic standard ..... :	EN 61000-4-4:2012	
Test level ..... :	**Measurement port**	**Voltage**
	Input and output a.c. power ports	±1 kV
	Input and output d.c. power ports	±0.5 kV
	Signal and control lines	±0.5 kV
Burst duration ..... :	15 ms	
Burst period ..... :	300 ms	
Repetition frequency ..... :	5 kHz	
Test time ..... :	2 minutes per level & polarity	
Performance criteria ..... :	B	
Test method ..... :	Measurements were made on a ground plane that extends 0.5-meter minimum beyond all sides of the system under test. Mains power tests were conducted with the product connected to a Coupling/Decoupling Network (CDN). One of each unique interface was tested for a period of 2 minute per polarity. The bursts are applied on the mains supply port by using a coupling decoupling network and on signal and control lines ports by using a capacitive clamp.	
Ambient temperature ..... :	/	
Relative humidity ..... :	/	
Air pressure ..... :	/	
Test location ..... :	/	
Test model(s) ..... :	/	
EUT operation mode ..... :	/	
Test results ..... :	N/A	
Remark ..... :	The EUT no electronic control circuitry, are not expected to produce electromagnetic disturbances. Therefore, they are deemed to fulfil all relevant requirements of EN 61547:2009, EN 61000-4-4:2012 without further testing.	

6.5.Surge immunity

Test requirement ..... :	EN 61547:2009			
Basic standard ..... :	EN 61000-4-5:2014+A1:2017			
Test level ..... :	**Characteristics**	**Device**		
		Self-ballasted lamps and semi-luminaires	**Luminaires and independent auxiliaries**	
			Input power	
			≤25 W	**>25 W**
	Wave-shape data	**1.2/50 μs**	**1.2/50 μs**	**1.2/50 μs**
	line to line	±0.5 kV	±0.5 kV	±1 kV
	line to ground	±1 kV	±1 kV	±2 kV
Repetition rate ..... :	1/min			
Phase angles ..... :	Positive pulses are applied 90° and negative pulses are applied 270°			
Number of pulses for each coupling ..... :	5			
Performance criteria ..... :	B (for lighting equipment for emergency lighting) / C			
Test method ..... :	Mains power tests were conducted with the product connected to a Coupling/Decoupling Network (CDN). The test voltage was increased from the lowest indicated level up to the maximum level. Five positive polarity pulses at the 90º phase angle, five negative polarity pulses at the 270º phase angle. Each surge was applied 60 seconds after the previous surge. Signal and Telecommunications ports were subject to five (5) positive and five (negative) surges applied through the appropriate Coupling/Decoupling Network (CDN).			
Ambient temperature ..... :	/			
Relative humidity ..... :	/			
Air pressure ..... :	/			
Test location ..... :	/			
Test model(s) ..... :	/			
EUT operation mode ..... :	/			
Test results ..... :	N/A			
Remark ..... :	The EUT no electronic control circuitry, are not expected to produce electromagnetic disturbances. Therefore, they are deemed to fulfil all relevant requirements of EN 61547:2009, EN 61000-4-5:2014+A1:2017 without further testing.			

6.6. Immunity to conducted disturbances, induced by radio-frequency fields

Test requirement ..... :	EN 61547:2009	
Basic standard ..... :	EN 61000-4-6:2014	
Frequency range ..... :	150 kHz to 80 MHz	
Test level ..... :	**Measurement port**	**Voltage**
	Input and output a.c. power ports	3 V (r.m.s.) (unmodulated)
	Input and output d.c. power ports	3 V (r.m.s.) (unmodulated)
	Signal and control lines	3 V (r.m.s.) (unmodulated)
Dwell time ..... :	1 second	
Step size ..... :	1 %	
Modulation ..... :	80% AM (1kHz)	
Performance criteria ..... :	A	
Test method ..... :	The test allows estimating of the conducted immunity of electrical and electronic equipment to electromagnetic disturbances coming from intended radio-frequency (RF) transmitters in the frequency range 150 kHz to 80 MHz. The interference is applied on mains supply, signal line and earth connection ports by using coupling decoupling networks or a clamp.	
Ambient temperature ..... :	/	
Relative humidity ..... :	/	
Air pressure ..... :	/	
Test location ..... :	/	
Test model(s) ..... :	/	
EUT operation mode ..... :	/	
Test results ..... :	N/A	
Remark ..... :	The EUT no electronic control circuitry, are not expected to produce electromagnetic disturbances. Therefore, they are deemed to fulfil all relevant requirements of EN 61547:2009, EN 61000-4-6:2014 without further testing.	

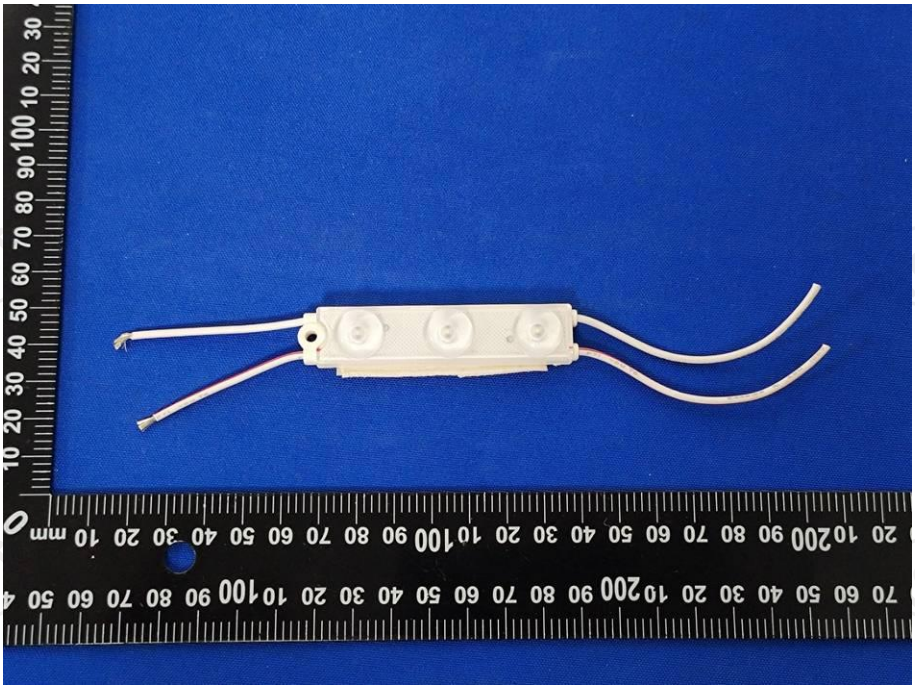
6.7.Power frequency magnetic field immunity (PFMF)

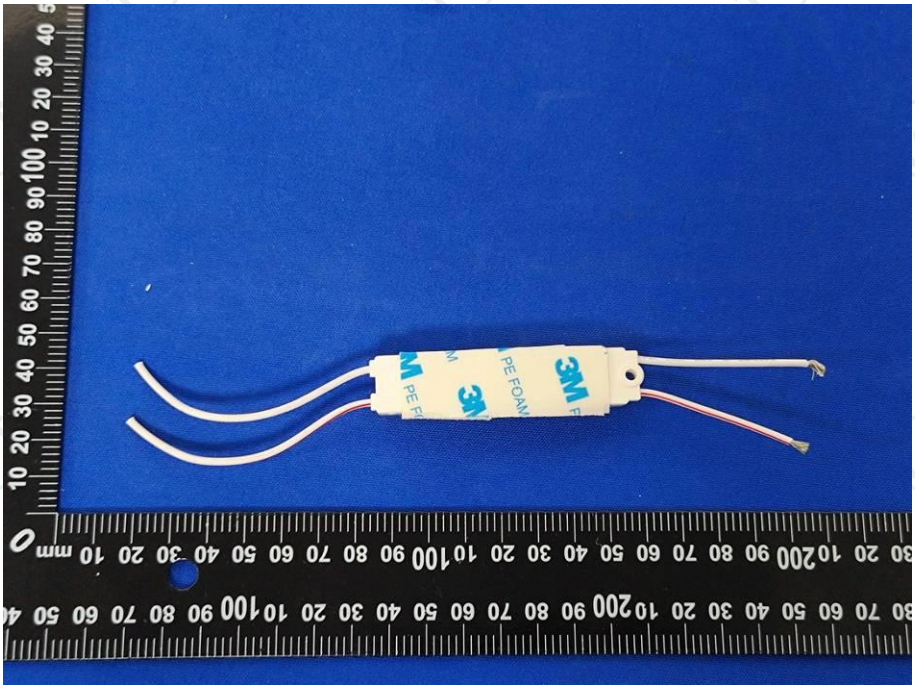
Test requirement ..... :	EN 61547:2009	
Basic standard ..... :	EN 61000-4-8:2010	
Test level ..... :	**Frequency**	**A/m**
	50/60 Hz	3
Performance criteria ..... :	A	
Test method ..... :	Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. The EUT was located 80cm above the reference ground plane and the indicated field was pre-calibrated prior to placement of the system under test.	
Ambient temperature ..... :	/	
Relative humidity ..... :	/	
Air pressure ..... :	/	
Test location ..... :	/	
Test model(s) ..... :	/	
EUT operation mode ..... :	/	
Test results ..... :	N/A	
Remark ..... :	The EUT no electronic control circuitry, are not expected to produce electromagnetic disturbances. Therefore, they are deemed to fulfil all relevant requirements of EN 61547:2009, EN 61000-4-8:2010 without further testing.	

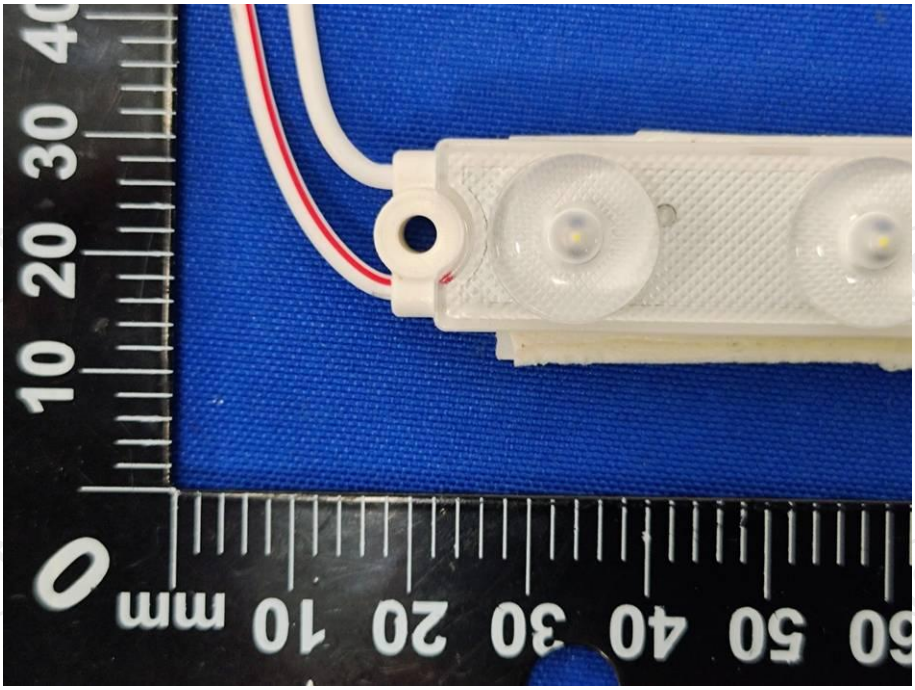
6.8. Voltage dips, short interruptions and voltage variations immunity

Test requirement ..... :	EN 61547:2009		
Basic standard ..... :	EN IEC 61000-4-11:2020		
Test level ..... :	**Voltage Dips**		
	Frequency	**Test level in % U_T**	**Duration**
	50 Hz	70	10 cycles
	Voltage interruptions		
	Frequency	**Test level in % U_T**	**Duration**
	50 Hz	0	0.5 cycle
	U_T is the rated voltage of the equipment under test.		
Repetition rate ..... :	10 seconds		
Number of dips or interruptions ..... :	3		
Performance criteria ..... :	B & C		
Test method ..... :	The test allows estimating of the conducted immunity of electrical and electronic equipment connected to low-voltage power supply networks for voltage dips and short interruptions. The interference is applied on mains supply port by using a testing generator.		
Ambient temperature ..... :	/		
Relative humidity ..... :	/		
Air pressure ..... :	/		
Test location ..... :	/		
Test model(s) ..... :	/		
EUT operation mode ..... :	/		
Test results ..... :	N/A		
Remark ..... :	The EUT no electronic control circuitry, are not expected to produce electromagnetic disturbances. Therefore, they are deemed to fulfil all relevant requirements of EN 61547:2009, EN IEC 61000-4-11:2020 without further testing.		

7. Photo of the EUT







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