

EMC TEST REPORT

For

Zhongshan Upward Lighting Co., Ltd

Led Underground Light

Test Model: UPW-DM-006

Additional Models : Please Refer To Page 9-12 Model List

Prepared for : Zhongshan Upward Lighting Co., Ltd
Address : Floor 5, No. 67 of Jingang Road, Western District,
Zhangshan,Guangdong, China

Prepared by : Shenzhen Southern LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample : January 05, 2021
Number of tested samples : 1
Serial number : Prototype
Date of Test : January 05, 2021 ~ January 08, 2021
Date of Report : August 16, 2022

EMC TEST REPORT**EN IEC 55015:2019+A11:2020**

Limits and methods of measurement of radio disturbance characteristics of electrical lighting
and similar equipment

EN 61547: 2009

Equipment for general lighting purposes - EMC immunity requirements

Report Reference No..... : LCSB080822031E

Date Of Issue.....: August 16, 2022

Testing Laboratory Name : Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

Address.....: 101-201, No.39 Building, Xialang Industrial Zone, Heshuikou
Community, Matian Street, Guangming District, Shenzhen, China

Testing Location/ Procedure: Full application of Harmonised standards
Partial application of Harmonised standards
Other standard testing method

Applicant's Name : Zhongshan Upward Lighting Co., Ltd

Address.....: Floor 5, No. 67 of Jingang Road, Western District,
Zhangshan,Guangdong, China

Test Specification:

Standard.....: EN IEC 55015:2019+A11:2020
EN IEC 61000-3-2:2019+A1:2021
EN 61000-3-3:2013+A1:2019+A2:2021
EN 61547: 2009

Test Report Form No.: SLCSEMC-2.2

TRF Originator.....: Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

Master TRF.....: Dated 2016-08

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Test Item Description..... : Led Underground Light

Trade Mark.....: iPHD

Test Model.....: UPW-DM-006

Power Supply: 220V-240VAC, 50/60Hz, 40W

Results : PASS

Compiled by:

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Aimee Yang/ Engineer

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Dm Gu / Manager

EMC - TEST REPORT

Test Report No. : LCSB080822031E	<u>August 16, 2022</u> Date of issue
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Applicant: **Zhongshan Upward Lighting Co., Ltd**
Address: Floor 5, No. 67 of Jingang Road, Western District,
Zhangshan,Guangdong, China
Telephone: /
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Manufacturer: **Zhongshan Upward Lighting Co., Ltd**
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Factory: **Zhongshan Upward Lighting Co., Ltd**
Address: Floor 5, No. 67 of Jingang Road, Western District,
Zhangshan,Guangdong, China
Telephone: /
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Test Result according to the standards on page 6: **Positive**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.



Revision History

Revision	Issue Date	Revisions	Revised By
00	August 16, 2022	Initial Issue	-

This test report is Updated test standard EN 55015, EN 61000-3-2,EN 61000-3-3 based on original test report“LCS210105001BE001”.after information review and verification, no additional tests were considered necessary. all test data is based on the raw-data of test original report.

Declared by applicant, Added model number, other information and results contained in this report are not changed, original test report become invalid.

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1. REPORT INFORMATION DESCRIPTION

1.1 Summary of Standards and Results

1.1.1 Description of Standards and Results

EMISSION (EN IEC 55015:2019+A11:2020)			
Description of Test Item	Test Standard	Limits	Results
Conducted Disturbance at the electric power supply interface	EN IEC 55015:2019+A11:2020	/	PASS
Conducted Disturbance at wired network interfaces	EN IEC 55015:2019+A11:2020	/	N/A
Radiated Disturbance (9kHz to 30MHz)	EN IEC 55015:2019+A11:2020	2m	PASS
Radiated Disturbance (30MHz to 1000MHz)	EN IEC 55015:2019+A11:2020	/	PASS
Harmonic Current Emissions*	EN IEC 61000-3-2:2019+A1:2021	Class C	PASS
Voltage Fluctuations & Flicker	EN 61000-3-3:2013+A1:2019+A2:2021	/	PASS
IMMUNITY (EN 61547: 2009)			
Description of Test Item	Test Standard	Basic Standard	Results
Electrostatic Discharge Immunity Test (ESD)	EN 61547: 2009	EN 61000-4-2	PASS
Radiated, Radio-Frequency, Electromagnetic Field Immunity Test (RS)	EN 61547: 2009	EN 61000-4-3	PASS
Power Frequency Magnetic Field Immunity Test	EN 61547: 2009	EN 61000-4-8	N/A
Electrical Fast Transient/Burst Immunity Test (EFT)	EN 61547: 2009	EN 61000-4-4	PASS
Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields (CS)	EN 61547: 2009	EN 61000-4-6	PASS
Surge Immunity Test (a.c. Power Ports)	EN 61547: 2009	EN 61000-4-5	PASS
Voltage Dips, Short Interruptions and Voltage Variations Immunity Test	EN 61547: 2009	EN 61000-4-11	PASS
Note 1: N/A is an abbreviation for not applicable.			
Note 2: according to EN IEC 61000-3-2:2019+A1:2021, for LED products <5 watts, no limits are defined for the harmonics test, the EUT is deemed to comply with the standard without test.			

1.1.2 Performance Criteria

The performance of lighting equipment shall be assessed by monitoring:

- the luminous intensity of the luminaire or of the lamp(s).
- the functioning of the control in the case of equipment which includes a regulating control or concerns the regulating control itself.
- the functioning of the starting device, if any.

Performance criterion 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.

Performance criterion 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.

Performance criterion 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.



1.2 Product Information

1.2.1 EUT introduce

EUT : Led Underground Light
Test Model : UPW-DM-006
Additional Models : See page 9-12 model list
EUT Clock Frequency : /

1.2.2 Test Modes

Mode 1 : EUT was test with power on, to get the status ‘Lighting’

1.2.3 Test Auxiliary Equipment

Configuration	Model	Rating	Manufacturer

1.2.4 General Product Information

The EUTs are general luminaires for illumination purpose. detailed differences shown in below.

Model list:

Model	Rating
UPW-DM-001	220V-240VAC, 50/60Hz, 9W
UPW-DM-002	220V-240VAC, 50/60Hz, 3W
UPW-DM-003	220V-240VAC, 50/60Hz, 6W
UPW-DM-004	220V-240VAC, 50/60Hz, 18W
UPW-DM-005	220V-240VAC, 50/60Hz, 7W
UPW-DM-006	220V-240VAC, 50/60Hz, 40W
UPW-DM-007	220V-240VAC, 50/60Hz, 12W
UPW-DM-008	220V-240VAC, 50/60Hz, 12W
UPW-DM-009	220V-240VAC, 50/60Hz, 1W
UPW-DM-011	220V-240VAC, 50/60Hz, 5W
UPW-DM-012	220V-240VAC, 50/60Hz, 9W
UPW-DM-013	220V-240VAC, 50/60Hz, 4W
UPW-DM-014	220V-240VAC, 50/60Hz, 5W
UPW-DM-015	220V-240VAC, 50/60Hz, 15W
UPW-DM-016	220V-240VAC, 50/60Hz, 9W
UPW-DM-017	220V-240VAC, 50/60Hz, 36W
UPW-DM-018	220V-240VAC, 50/60Hz, 3W
UPW-DM-020	220V-240VAC, 50/60Hz, 12W
UPW-DM-021	220V-240VAC, 50/60Hz, 15W
UPW-DM-022	220V-240VAC, 50/60Hz, 24W
UPW-DM-023	220V-240VAC, 50/60Hz, 12W
UPW-DM-024	220V-240VAC, 50/60Hz, 5W
UPW-DM-025	220V-240VAC, 50/60Hz, 1W
UPW-DM-026	220V-240VAC, 50/60Hz, 24W
UPW-DM-027	220V-240VAC, 50/60Hz, 30W
UPW-DM-029	220V-240VAC, 50/60Hz, 3W
UPW-DM-030	220V-240VAC, 50/60Hz, 10W
UPW-DM-031	220V-240VAC, 50/60Hz, 20W
UPW-DM-032	220V-240VAC, 50/60Hz, 30W
UPW-DM-033	220V-240VAC, 50/60Hz, 5W
UPW-DM-035	220V-240VAC, 50/60Hz, 3W
UPW-DM-045	220V-240VAC, 50/60Hz, 5W
UPW-DM-050	220V-240VAC, 50/60Hz, 12W
UPW-DM-052	220V-240VAC, 50/60Hz, 9W
UPW-DM-053	220V-240VAC, 50/60Hz, 9W

UPW-DM-054	220V-240VAC, 50/60Hz, 9W
UPW-DM-055	220V-240VAC, 50/60Hz, 15W
UPW-DM-056	220V-240VAC, 50/60Hz, 15W
UPW-DM-057	220V-240VAC, 50/60Hz, 18W
UPW-DM-058	220V-240VAC, 50/60Hz, 18W
UPW-DM-061	220V-240VAC, 50/60Hz, 20W
UPW-DM-062	220V-240VAC, 50/60Hz, 3W
UPW-DM-065	220V-240VAC, 50/60Hz, 30W
UPW-DM-066	220V-240VAC, 50/60Hz, 6W
UPW-DM-067	220V-240VAC, 50/60Hz, 30W
UPW-DM-068	220V-240VAC, 50/60Hz, 5W
UPW-DM-070	220V-240VAC, 50/60Hz, 3W
UPW-DM-071	220V-240VAC, 50/60Hz, 9W
UPW-DM-072	220V-240VAC, 50/60Hz, 15W
UPW-DM-073	220V-240VAC, 50/60Hz, 10W
UPW-DM-074	220V-240VAC, 50/60Hz, 20W
UPW-DM-075	220V-240VAC, 50/60Hz, 9W
UPW-DM-076	220V-240VAC, 50/60Hz, 9W
UPW-DM-077	220V-240VAC, 50/60Hz, 12W
UPW-DM-078	220V-240VAC, 50/60Hz, 1W
UPW-DM-079	220V-240VAC, 50/60Hz, 18W
UPW-DM-080	220V-240VAC, 50/60Hz, 12W
UPW-DM-081	220V-240VAC, 50/60Hz, 9W
UPW-DM-082	220V-240VAC, 50/60Hz, 18W
UPW-DM-083	220V-240VAC, 50/60Hz, 4W
UPW-DM-084	220V-240VAC, 50/60Hz, 5W
UPW-DM-085	220V-240VAC, 50/60Hz, 12W
UPW-DM-086	220V-240VAC, 50/60Hz, 18W
UPW-DM-087	220V-240VAC, 50/60Hz, 3W
UPW-DM-088	220V-240VAC, 50/60Hz, 4W
UPW-DM-089	220V-240VAC, 50/60Hz, 6W
UPW-DM-090	220V-240VAC, 50/60Hz, 9W
UPW-DM-091	220V-240VAC, 50/60Hz, 36W
UPW-DM-092	220V-240VAC, 50/60Hz, 18W
UPW-DM-093	220V-240VAC, 50/60Hz, 12W
UPW-DM-094	220V-240VAC, 50/60Hz, 36W
UPW-DM-095	220V-240VAC, 50/60Hz, 12W
UPW-DM-096	220V-240VAC, 50/60Hz, 9W
UPW-DM-097	220V-240VAC, 50/60Hz, 24W
UPW-DM-099	220V-240VAC, 50/60Hz, 3W
UPW-DM-100	220V-240VAC, 50/60Hz, 36W
UPW-DM-101	220V-240VAC, 50/60Hz, 36W

UPW-DM-102	220V-240VAC, 50/60Hz, 6W
UPW-DM-103	220V-240VAC, 50/60Hz, 18W
UPW-DM-104	220V-240VAC, 50/60Hz, 2W
UPW-DM-105	220V-240VAC, 50/60Hz, 3W
UPW-DM-106	220V-240VAC, 50/60Hz, 4W
UPW-DM-107	220V-240VAC, 50/60Hz, 9W
UPW-DM-108	220V-240VAC, 50/60Hz, 18W
UPW-DM-109	220V-240VAC, 50/60Hz, 6W
UPW-DM-110	220V-240VAC, 50/60Hz, 2W
UPW-DM-111	220V-240VAC, 50/60Hz, 3W
UPW-DM-112	220V-240VAC, 50/60Hz, 4W
UPW-DM-116	220V-240VAC, 50/60Hz, 18W
UPW-DM-117	220V-240VAC, 50/60Hz, 24W
UPW-DM-118	220V-240VAC, 50/60Hz, 30W
UPW-DM-119	220V-240VAC, 50/60Hz, 36W
UPW-DM-120	220V-240VAC, 50/60Hz, 24W
UPW-DM-121	220V-240VAC, 50/60Hz, 6W
UPW-DM-122	220V-240VAC, 50/60Hz, 18W
UPW-DM-123	220V-240VAC, 50/60Hz, 36W
UPW-DM-124	220V-240VAC, 50/60Hz, 36W
UPW-DM-125	220V-240VAC, 50/60Hz, 8W
UPW-DM-126	220V-240VAC, 50/60Hz, 8W
UPW-DM-127	220V-240VAC, 50/60Hz, 12W
UPW-DM-128	220V-240VAC, 50/60Hz, 24W
UPW-DM-129	220V-240VAC, 50/60Hz, 36W
UPW-DM-131	220V-240VAC, 50/60Hz, 3W
UPW-DM-132	220V-240VAC, 50/60Hz, 5W
UPW-DM-133	220V-240VAC, 50/60Hz, 6W
UPW-DM-134	220V-240VAC, 50/60Hz, 36W
UPW-DM-135	220V-240VAC, 50/60Hz, 9W
UPW-DM-136	220V-240VAC, 50/60Hz, 12W
UPW-DM-137	220V-240VAC, 50/60Hz, 18W
UPW-DM-138	220V-240VAC, 50/60Hz, 24W
UPW-DM-139	220V-240VAC, 50/60Hz, 6W
UPW-DM-140	220V-240VAC, 50/60Hz, 18W
UPW-DM-141	220V-240VAC, 50/60Hz, 36W
UPW-DM-143	220V-240VAC, 50/60Hz, 18W
UPW-DM-145	220V-240VAC, 50/60Hz, 36W
UPW-DM-146	220V-240VAC, 50/60Hz, 9W
UPW-DM-147	220V-240VAC, 50/60Hz, 10W
UPW-DM-148	220V-240VAC, 50/60Hz, 20W
UPW-DM-149	220V-240VAC, 50/60Hz, 30W

UPW-DM-152	220V-240VAC, 50/60Hz, 30W
UPW-DM-153	220V-240VAC, 50/60Hz, 12W
UPW-DM-154	220V-240VAC, 50/60Hz, 24W
UPW-DM-155	220V-240VAC, 50/60Hz, 7W
UPW-DM-156	220V-240VAC, 50/60Hz, 12W
UPW-DM-157	220V-240VAC, 50/60Hz, 30W
UPW-DM-158	220V-240VAC, 50/60Hz, 3W
UPW-DM-159	220V-240VAC, 50/60Hz, 5W
UPW-DM-160	220V-240VAC, 50/60Hz, 6W
UPW-DM-161	220V-240VAC, 50/60Hz, 7W
UPW-DM-162	220V-240VAC, 50/60Hz, 9W
UPW-DM-163	220V-240VAC, 50/60Hz, 12W
UPW-DM-164	220V-240VAC, 50/60Hz, 15W
UPW-DM-165	220V-240VAC, 50/60Hz, 18W
UPW-DM-166	220V-240VAC, 50/60Hz, 24W
UPW-DM-167	220V-240VAC, 50/60Hz, 27W
UPW-DM-168	220V-240VAC, 50/60Hz, 30W
UPW-DM-169	220V-240VAC, 50/60Hz, 36W
UPW-DM-170	220V-240VAC, 50/60Hz, 40W
UPW-DM-171	220V-240VAC, 50/60Hz, 18W
UPW-DM-172	220V-240VAC, 50/60Hz, 36W

1.3 Description of Test Facility

EMC Lab. : TUV RH Registration Number. is UA 50418075 0001.
UL Registration Number. is 100571-492.
NVLAP Registration Code is 600112-0.

Test Facilities : Shenzhen Southern LCS Compliance Testing Laboratory Ltd.
101-201, No.39 Building,Xialang Industrial Zone, Heshuikou Community,
Matian Street, Guangming District, Shenzhen, China.

RF Field Strength : Shenzhen LCS Compliance Testing Laboratory Ltd.
Susceptibility 101, 201 Building A and 301 Building C, Juji Industrial Park,
Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, Guangdong,
China.



2. STATEMENT OF THE MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Test	Parameters	Expanded uncertainty (U_{lab})	Expanded uncertainty (U_{cispr})
Conducted Disturbance	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 1.40 dB ± 2.80 dB	± 4.0 dB ± 3.6 dB
Electromagnetic Radiated Emission (3-loop)	Level accuracy (9kHz to 30MHz)	± 3.46 dB	N/A
Radiated Disturbance	Level accuracy (9kHz to 30MHz)	± 3.12 dB	N/A
Radiated Disturbance	Level accuracy (30MHz to 200MHz)	± 4.66 dB	± 5.2 dB
Radiated Disturbance	Level accuracy (200MHz to 1000MHz)	± 4.64 dB	± 5.0 dB
Harmonic Current	Voltage	$\pm 0.640\%$	N/A
Voltage Fluctuations & Flicker	Voltage	$\pm 0.530\%$	N/A

(1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

(2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

3. MEASURING DEVICES AND TEST EQUIPMENT

Conducted Disturbance

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Due Date.
1	EMI Test Receiver	R&S	ESCI	101142	2021-06-17
2	10dB Attenuator	SCHWARZBECK	VTSD9561-F	9561-F159	2021-06-17
3	Artificial Mains	SCHWARZBECK	NSLK8127	8127716	2021-06-17
4	EMI Test Software	EZ	EZ_EMG	N/A	2021-06-17
5	ISN CAT6	SCHWARZBECK	NTFM 8158	NTFM 8158#120	2021-06-17
6	Voltage Probe	SCHWARZBECK	KT 9420	9420401	2021-06-17

Radiated Disturbance(9kHz to 30MHz)

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Due Date.
1	EMI Test Receiver	R&S	ESPI	101142	2021-06-17
2	Triple-loop Antenna	EVERFINE	LLA-2	9161	2021-06-17
3	EMI Test Software	EZ	EZ_EMG	N/A	2021-06-17

Radiated Disturbance(30MHz to 1000MHz)

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Due Date.
1	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2021-08-05
2	EMI Test Receiver	R&S	ESCI	101010	2021-06-17
3	Log per Antenna	SCHWARZBECK	VULB9163	5094	2022-06-23
4	EMI Test Software	AUDIX	E3	N/A	2021-06-17
5	Positioning Controller	MF	BK8807-4A-2T	2016-0808-008	2021-06-17

Harmonic Current&Voltage Fluctuation and Flicker

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Due Date.
1	Power Analyzer Test System	Laplace	AC2000A	/	2021-06-17

Electrostatic Discharge Immunity Test (ESD)

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Due Date.
1	ESD Simulator	KIKUSUI	KES4021	KC001311	2021-06-19

Electrical Fast Transient/Burst Immunity Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Due Date.
1	Electrical fast transient(EFT)generator	HTEC	HEFT51	162201	2021-06-17
2	Coupling Clamp	HTEC	H3C	163701	2021-06-17

Surge Immunity Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Due Date.
1	Surge test system	3CTEST	SG5006G	EC5581070	2021-06-17
2	Coupling/decoupling network	3CTEST	SGN-5010G	EC5591033	2021-06-17

Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Due Date.
1	Conducted Susceptibility Generator	HTEC	CDG6000	126A140012016	2021-06-17
2	CDN	HTEC	CDN-M2+M3	A22/0382/2016	2021-06-17
3	Attenuator	HTEC	ATT6	HA1601	2021-06-17
4	Electromagnetic Injection Clamp	LUTHI	EM101	35535	2021-06-17

Power Frequency Magnetic Field Immunity Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Due Date.
1	Power frequency mag-field generator System	HTEC	HPFMF100	100-2400	2021-06-17

Voltage Dips, Short Interruptions and Voltage Variations Immunity Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Due Date.
1	Voltage dips and up generator	HTEC	HPFS161P	162202	2021-06-17

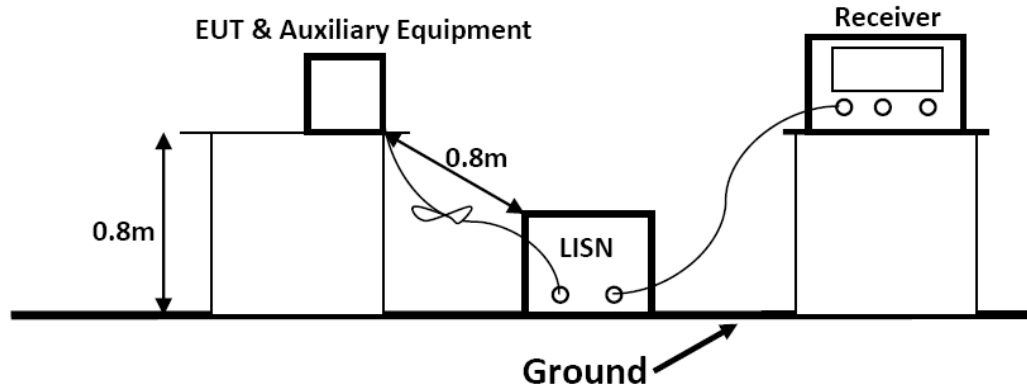
Radiated, Radio-Frequency, Electromagnetic Field Immunity Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Due Date.
1	RS Test Software	Tonscend	/	/	N/A
2	ESG Vector Signal Generator	Agilent	E4438C	MY42081396	2021-11-14
3	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2023-06-11
4	RF POWER AMPLIFIER	OPHIR	5225R	1052	2021-11-21
5	RF POWER AMPLIFIER	OPHIR	5273F	1019	2021-11-21
6	Stacked Broadband Log Periodic Antenna	SCHWARZBECK	STLP 9128	9128ES-145	2021-11-21
7	Stacked Mikrowellen Log.-Per Antenna	SCHWARZBECK	STLP 9149	9149-484	2021-11-21
8	RS Test Software	Tonscend	/	/	2021-03-24

4. TEST DETAILS

4.1 Conducted Disturbance

4.1.1 Block Diagram of Test Setup



4.1.2 Test Standard

EN IEC 55015:2019+A11:2020

4.1.3 Limits

Disturbance voltage limits at the electric power supply interface		
Frequency range	Limits (dB μ V)*	
	Quasi-peak	Average
9kHz to 50kHz	110	--
50kHz to 150kHz	90 ~ 80*	--
150kHz to 0.5MHz	66 ~ 56*	56 ~ 46*
0.5MHz to 5.0MHz	56	46*
5.0MHz to 30MHz	60	50

NOTE 1: at the transition frequency, the lower limit applies.

NOTE 2: The limit decreases linearly with the logarithm of the frequency in the ranges 50 kHz to 150 kHz and 150 kHz to 0,5 MHz.

Disturbance voltage limits at wired network interfaces other than power supply		
Frequency range	Limits (dB μ V)*	
	Quasi-peak	Average
0.15MHz to 5.0MHz	80 to 74	74 to 64
5.0MHz to 30MHz	74	64

NOTE: The disturbance voltage limits are derived for use with an artificial asymmetrical network (AAN) which presents a common mode (asymmetric mode) impedance of 150 Ω to the measured interface.

Disturbance voltage limits of local wired ports: electrical power supply interface of non-restricted ELV lamps		
Frequency range	Limits (dB μ V)*	
	Quasi-peak	Average
9kHz to 50kHz	136	--
50kHz to 150kHz	116 ~ 106*	--
150kHz to 0.5MHz	92 ~ 82*	82 ~ 72*
0.5MHz to 5.0MHz	82	72*
5.0MHz to 30MHz	86	76

NOTE: The limits in this table apply if no 26 dB attenuator is applied.

Disturbance voltage limits at local wired ports: local wired ports other than electrical power supply interface of ELV lamp		
Frequency range	Limits (dB μ V)*	
	Quasi-peak	Average
0.15MHz to 5.0MHz	80	70
5.0MHz to 30MHz	74	64

4.1.4 Test Procedure Description

The EUT is put on the table which is 0.8 meter high above the ground, and connected to the AC mains through a Line Impedance Stabilization Network (LISN). EUT is powered by V-type artificial power network, and the distance from LISN/ISN is 0.8m. The part of the EUT power cord exceeding 0.8m folds in parallel to form a 0.3-0.4 m eight harness.

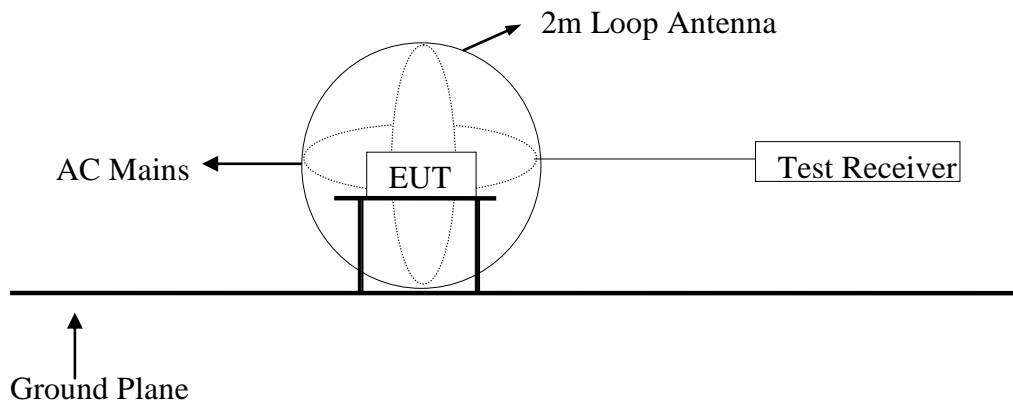
The bandwidth of the test receiver is set at 200Hz in 9k~150kHz range and 9kHz in 150k~30MHz range.

4.1.5 Test Results

Refer to Annex A.1

4.2 Radiated Disturbance (9kHz to 30MHz)

4.2.1 Block Diagram of Test Setup



4.2.2 Test Standard

EN IEC 55015:2019+A11:2020

4.2.3 Limits

LLAS radiated disturbance limits in the frequency range 9 kHz to 30 MHz	
Frequency range	Limits for loop diameter (dB μ A)
	2m
9kHz to 70kHz	88
70kHz to 150kHz	88 to 58*
150kHz to 3.0MHz	58 to 22*
3.0MHz to 30MHz	22

NOTE1: At the transition frequency the lower limit applies.

NOTE2: Decreasing linearly with logarithm of the frequency.

4.2.4 Test Procedure Description

The EUT is placed on a wood table in the center of a loop antenna. The induced current in the loop antenna is measured by means of a current probe and the test receiver. Three field components are checked by means of a coaxial switch.

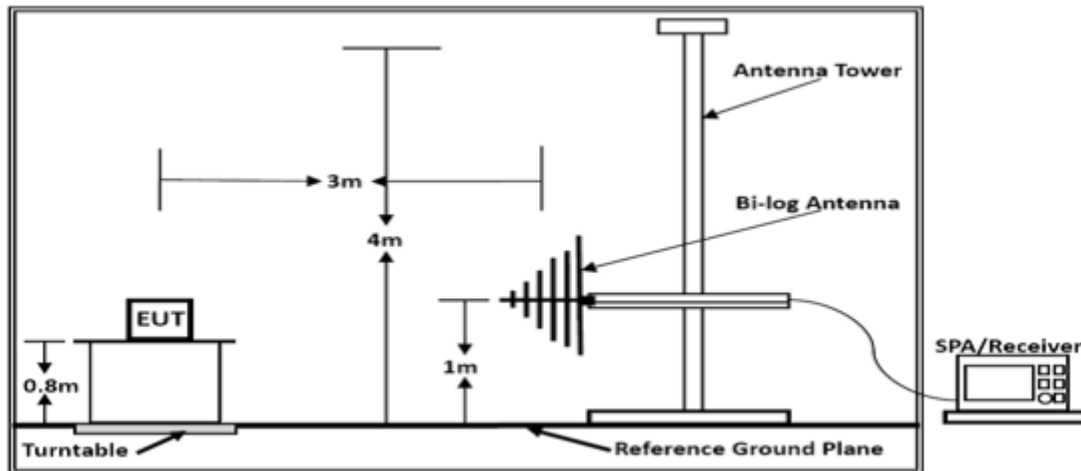
The frequency range from 9kHz to 30MHz is investigated. The receiver is measured with the quasi-peak detector. For frequency band 9kHz to 150kHz, the bandwidth of the field strength meter is set at 200Hz. For frequency band 150kHz to 30MHz, the bandwidth is set at 9kHz.

4.2.5 Test Results

Refer to Annex A.2

4.3 Radiated Disturbance (30MHz to 1000MHz)

4.3.1 Block Diagram of Test Setup



4.3.2 Test Standard

EN IEC 55015:2019+A11:2020

4.3.3 Limits

SAC Radiated disturbance limits and associated measurement methods in the frequency range 30 MHz to 1 GHz (at 3 m distance)	
Frequency range (MHz)	Quasi-Peak Limits(dB μ V/m)
30 ~ 230	40
230 ~ 1000	47

NOTE1: at the transition frequency, the lower limit applies.

NOTE2: Distance refers to the distance in meters between the measuring instrument antenna geometric center and the closed point of any part of the EUT.

NOTE3: Testing method which the Semi Anechoic Chamber

4.3.4 Test Procedure Description

The Radiated Disturbance test was conducted in a 3M Semi Anechoic Chamber and conforming to CISPR 16. The EUT is placed on a turntable, which is 0.8 meter high above the ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. By-log antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

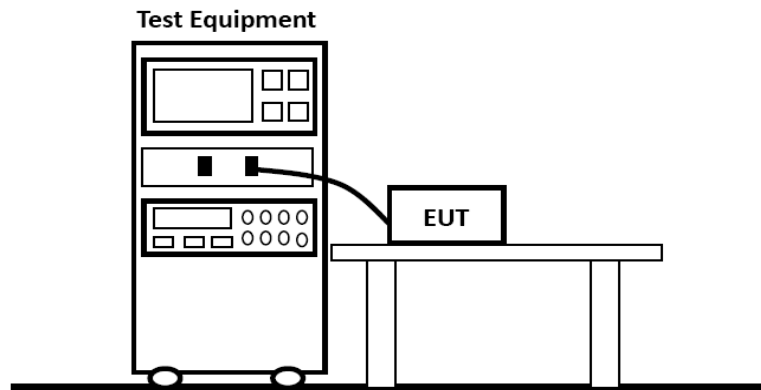
The bandwidth of the Receiver is set at 120kHz; The frequency range from 30MHz to 1000MHz is investigated.

4.3.5 Test Results

Refer to Annex A.3

4.4 Harmonic Current Emissions

4.4.1 Block Diagram of Test Setup



4.4.2 Test Standard

EN IEC 61000-3-2:2019+A1:2021 (for Class C equipment)

4.4.3 Limits

Rated Power > 25W:

Harmonic order n	Maximum permissible harmonic current expressed as a percentage of the input current at the fundamental frequency %
2	2
3	$30 \cdot \lambda^*$
5	10
7	7
9	5
$11 \leq h \leq 39$ (odd harmonics only)	3
* λ is the circuit power factor	

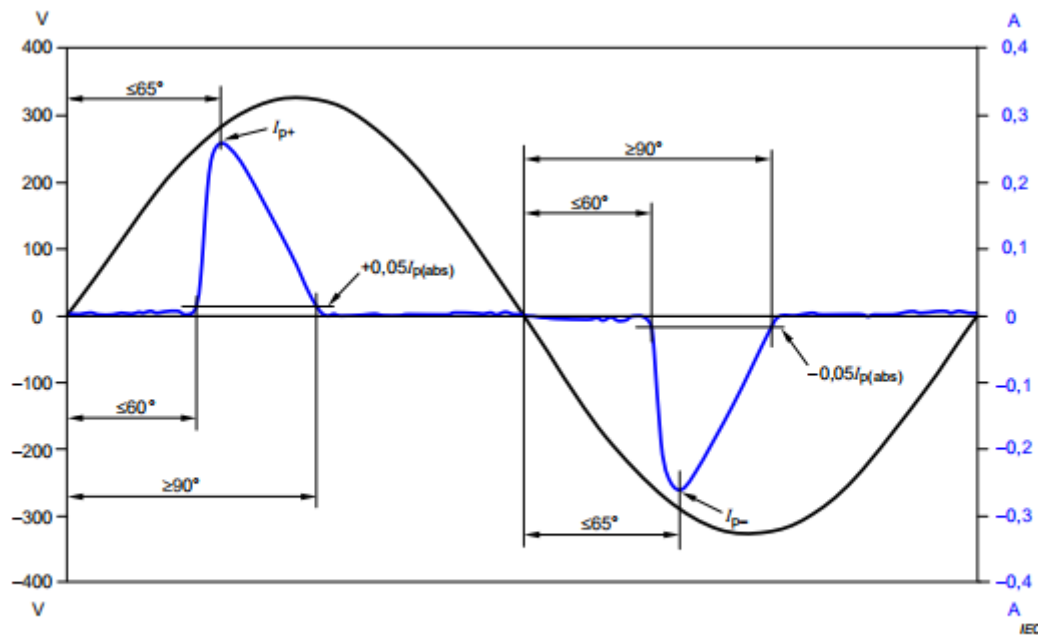
Rated power ≥ 5 W and ≤ 25 W:

Lighting equipment having a rated power greater than or equal to 5 W and less than or equal to 25 W shall comply with one of the following three sets of requirements:

- the harmonic currents shall not exceed the power-related limits of Table;

Harmonic order n	Maximum permissible harmonic current per watt mA/W
3	3,4
5	1,9
7	1,0
9	0,5
11	0,35
$13 \leq h \leq 39$ (odd harmonics only)	3,85/h

- the third harmonic current, expressed as a percentage of the fundamental current, shall not exceed 86 % and the fifth harmonic current shall not exceed 61 %. In addition, the waveform of the input current shall be such that it reaches the 5 % current threshold before or at 60° , has its peak value before or at 65° and does not fall below the 5 % current threshold before 90° , referenced to any zero crossing of the fundamental supply voltage. The current threshold is 5 % of the highest absolute peak value that occurs in the measurement window, and the phase angle measurements are made on the cycle that includes this absolute peak value.



NOTE $I_{p(abs)}$ is the higher absolute value of I_{p+} and I_{p-} .

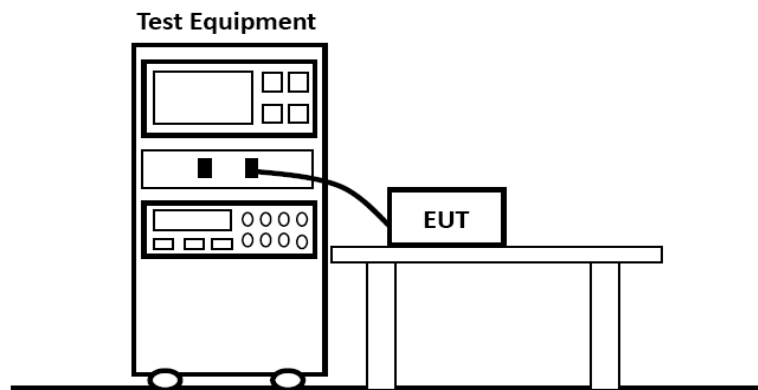
- the THD shall not exceed 70 %. The third order harmonic current, expressed as a percentage of the fundamental current, shall not exceed 35 %, the fifth order current shall not exceed 25 %, the seventh order current shall not exceed 30 %, the ninth and eleventh order currents shall not exceed 20 % and the second order current shall not exceed 5 %.

4.4.4 Test Results

Refer to Annex A.4

4.5 Voltage Fluctuations & Flicker

4.5.1 Block Diagram of Test Setup



4.5.2 Test Standard

EN 61000-3-3:2013+A1:2019+A2:2021

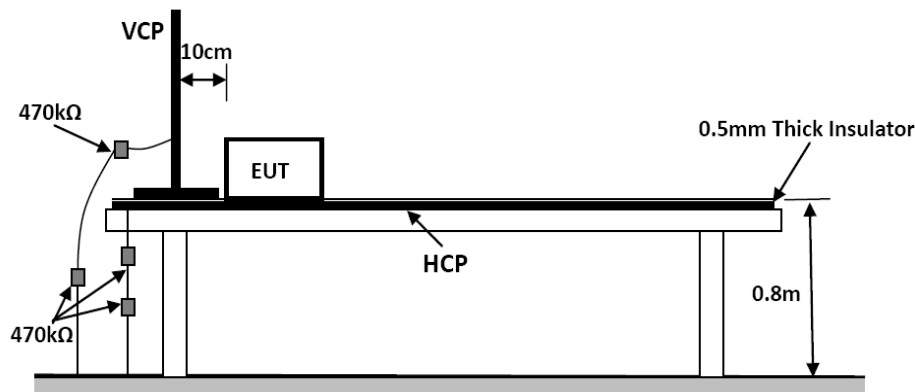
4.5.3 Test Results

Refer to Annex A.5



4.6 Electrostatic Discharge Immunity Test

4.6.1 Block Diagram of Test Setup



4.6.2 Test Standard

EN 61547:2009

4.6.3 Limits

Electrostatic discharges — Test levels				
Discharge Type	Discharge Level (KV)		Number of discharges (Each point)	Performance Criteria
	+	-		
Air Discharge-Direct	2, 4, 8	2, 4, 8	20	B
Contact Discharge-Direct	2, 4	2, 4	20	
Contact Discharge- Indirect	2, 4	2, 4	20	

4.6.4 Test Procedure

a) Air Discharge

This test is done on a non-conductive surfaces. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

b) Contact Discharge

This test is done on a conductive surfaces. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

c) Indirect Discharge For Horizontal Coupling Plane and Vertical Coupling Plane

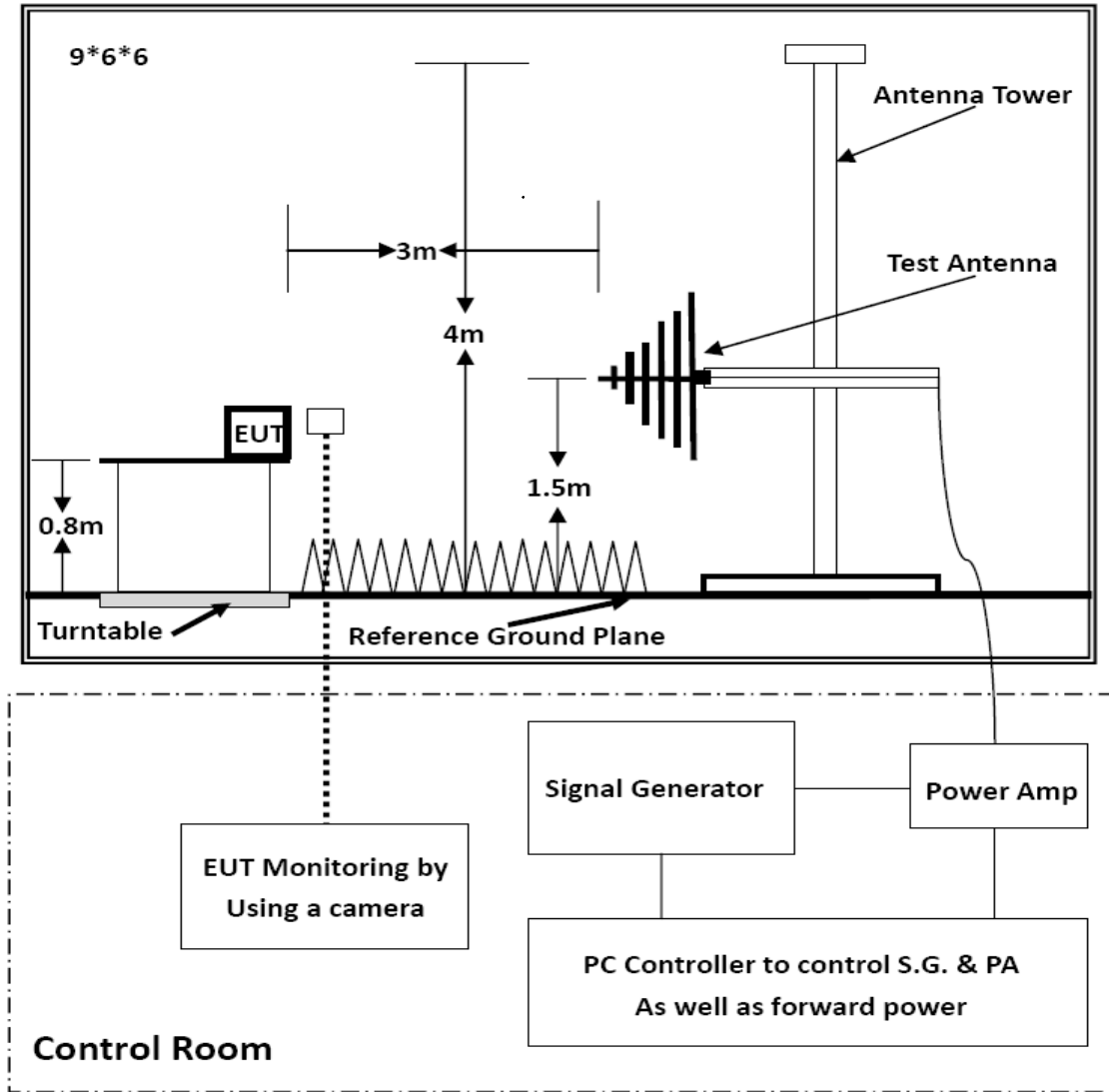
At least 20(+/- 10 times at each pole) single discharges shall be applied to the coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane. with a time interval of at least 1 second between each discharge.

4.6.5 Test Results

Refer to Annex A.6

4.7 Radiated, Radio-Frequency, Electromagnetic Field Immunity Test

4.7.1 Block Diagram of Test Setup



4.7.2 Test Standard

EN 61547:2009

4.7.3 Limits

Radio-frequency electromagnetic fields – Test levels		
Characteristics	Test levels	Performance Criteria
Frequency range	80 MHz to 1 000 MHz	A
Test level	3 V/m (unmodulated)	
Modulation	1 kHz, 80 % AM, sine wave	

4.7.4 Test Procedure

The test was carried out in a half-wave anechoic chamber with absorbent material attached to a reflective ground plate.

Before the test, the test field strength needs to be calibrated. During the calibration, the corresponding relationship between the target field strength and the forward power applied to the transmitting antenna is established. During the test, except for EUT, the indoor layout is consistent with the calibration.

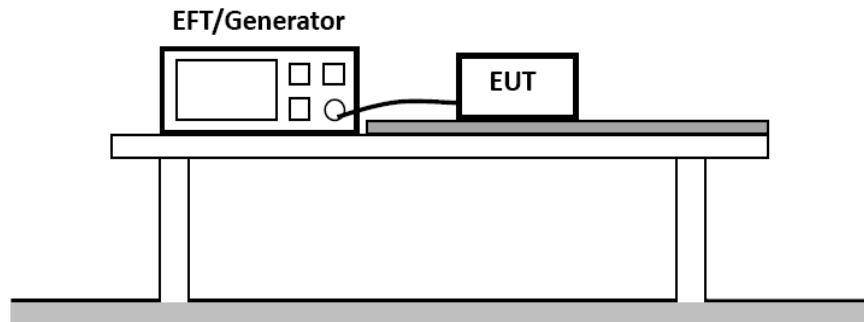
The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. EUT is set 3 meter away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor EUT screen.

4.7.5 Test Results

Refer to Annex A.6

4.8 Electrical Fast Transient/Burst Immunity Test

4.8.1 Block Diagram of Test Setup



4.8.2 Test Standard

EN 61547:2009

4.8.3 Limits

Fast transients - Test levels at input and output a.c. power ports						
Test Levels	Repetition Frequency	Burst Duration	Burst Period	Test Duration	Coupling Method	Performance Criteria
±1 kV	5 kHz	15ms	300ms	2 min per polarity	Direct	B

Fast transients - Test levels at input and output d.c. power ports						
Test Levels	Repetition Frequency	Burst Duration	Burst Period	Test Duration	Coupling Method	Performance Criteria
±0.5kV	5 kHz	15ms	300ms	2 min per polarity	Direct	B

Note: Not applicable to equipment not connected to the mains while in use.

4.8.4 Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

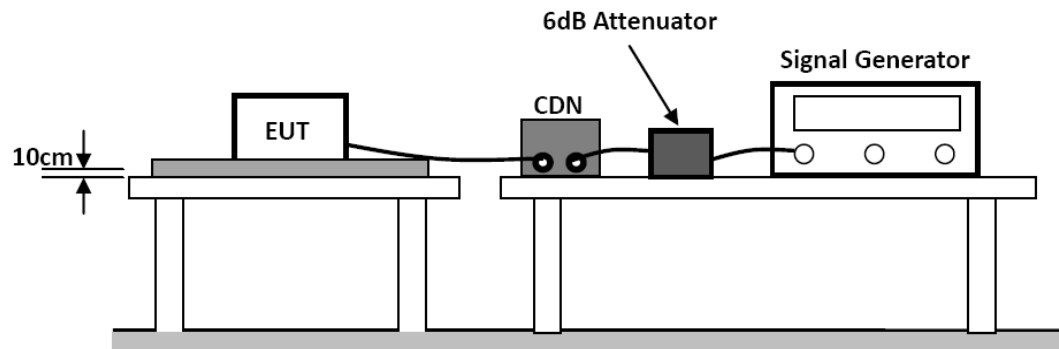
The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC or DC power lines. Both polarities of the test voltage should be applied during compliance test, Fast transients are carried out with a minimum duration of 2 min with a positive polarity and a minimum of 2 min with a negative polarity

4.8.5 Test Results

Refer to Annex A.6

4.9 Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields

4.9.1 Block Diagram of Test Setup



4.9.2 Test Standard

EN 61547:2009

4.9.3 Limits

Radio-frequency common mode – Test levels at input and output a.c. power ports					
Frequency range (MHz)	Test Level (V/m)	Modulation Signal	Coupling Method	Steps	Performance Criteria
0.15 to 80	3	1kHz, 80%, AM, Sine wave	CDN	1%	A
Note: Only applicable to ports interfacing with cables whose total length, according to the manufacturer's specification, may exceed 3 m.					

Radio-frequency common mode – Test levels at input and output d.c. power ports					
Frequency range (MHz)	Test Level (V/m)	Modulation Signal	Coupling Method	Steps	Performance Criteria
0.15 to 80	3	1kHz, 80%, AM, Sine wave	CDN	1%	A
Note: Only applicable to equipment that is connected to the mains while in use.					

4.9.4 Test Procedure

a) The EUT are placed on an insulated wooden table 0.8m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).

b) The test signal is sent to the coupling device through the 6dB attenuator, and then injected into the EUT test port by the common mode of the coupling device. The power port is injected use CDN. The signal line and control line are injected use Electromagnetic Injection Clamp

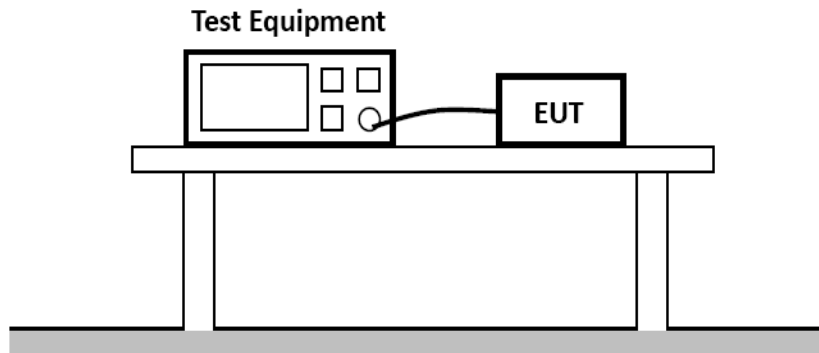
c) The frequency range is swept from 150kHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave. The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.

4.9.5 Test Results

Refer to Annex A.6

4.10 Surge Immunity Test

4.10.1 Block Diagram of Test Setup



4.10.2 Test Standard

EN 61547:2009

4.10.3 Limits

Surges – Test levels at input a.c. power ports					
Characteristics	Device			Performance Criteria	
	Self-ballasted lamps and semi-luminaires	Luminaires and independent auxiliaries			
		Input power			
		≤25	>25 W		
Wave-shape data	1.2/50 μs	1.2/50 μs	1.2/50 μs	C	
Test Levels	line to line	±0.5 kV	±0.5 kV		±1.0 kV
	line to ground	±1.0 kV	±1.0 kV		±2.0 kV

Note: In addition to the specified test level, all lower test levels as detailed in IEC 61000-4-5 should also be satisfied.

4.10.4 Test Procedure

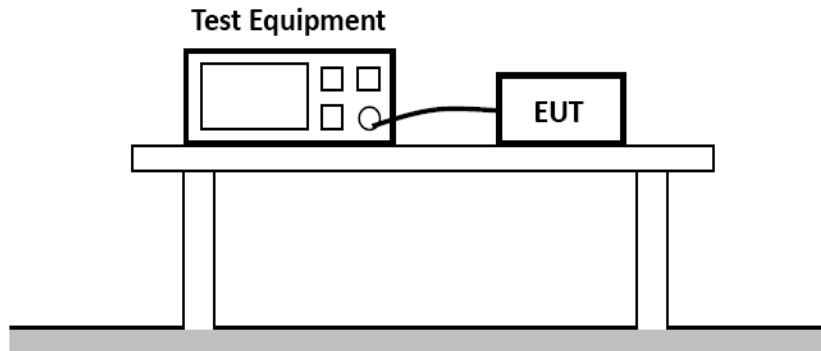
- a) The surge is applied to the EUT power supply terminal via the capacitive coupling network, to the EUT power supply provide a 1.0KV 1.2/50us voltage surge (at open-circuit condition).
- d) At least 5 positive and 5 negative (polarity) tests with 1/min repetition rate are conducted during test. and phase angles is 90° and 270° .
- c) Different phase angles and line-to-line, line-to-ground coupling mode measurements
- d) line-to-line coupling mode, the Generator impedance is 2Ω, line-to-ground coupling mode,the Generator impedance is 12Ω.

4.10.5 Test Results

Refer to Annex A.6

4.11 Voltage Dips, Short Interruptions and Voltage Variations Immunity Test

4.11.1 Block Diagram of Test Setup



4.11.2 Test Standard

EN 61547:2009

4.11.3 Limits

Voltage dips and short interruptions-Test levels at input a.c. power ports			
	Test Level	Duration	Performance criterion
Voltage dips	70% of Vnom	10 cycle(50Hz)	C
Short Interruptions	0% of Vnom	0.5 cycle(50Hz)	B

4.11.4 Test Procedure

- The EUT shall be connected to the test generator for testing using the shortest power cable specified by the EUT manufacturer and, if no cable length is specified, the shortest cable suitable for the EUT.
- The interruptions is introduced at selected phase angles with specified duration.
- EUT shall carry out tests in accordance with the prescribed test grade and duration, and the test interval is 10s

4.11.5 Test Results

Refer to Annex A.6



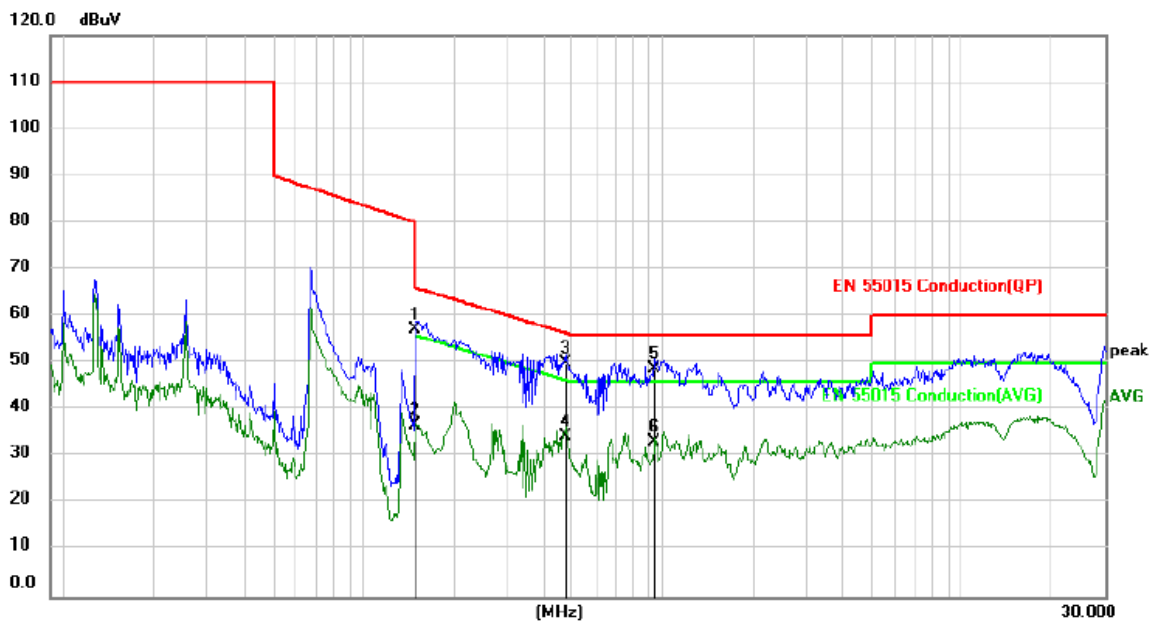
ANNEX A

(Emission and Immunity test results)

A.1 Conducted Disturbance Test Results

Environmental Conditions:	23.9°C, 53% RH
Test Voltage:	AC 230V,50Hz
Test Model:	UPW-DM-006
Test Mode:	Mode 1
Test Engineer:	Peng Dong
Pol:	Line

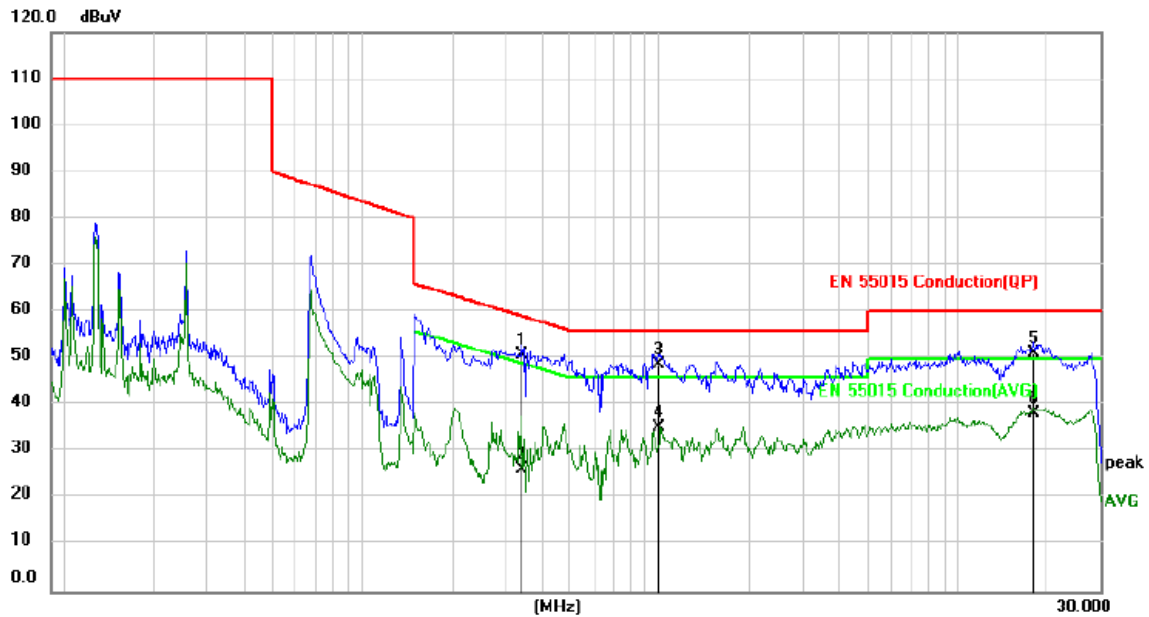
Detailed results are shown below



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	46.79	10.24	57.03	66.00	-8.97	QP	
2		0.1500	26.63	10.24	36.87	56.00	-19.13	AVG	
3	*	0.4739	39.61	10.20	49.81	56.45	-6.64	QP	
4		0.4739	24.00	10.20	34.20	46.45	-12.25	AVG	
5		0.9459	38.62	10.20	48.82	56.00	-7.18	QP	
6		0.9459	22.86	10.20	33.06	46.00	-12.94	AVG	

Environmental Conditions:	23.9°C, 53% RH
Test Voltage:	AC 230V,50Hz
Test Model:	UPW-DM-006
Test Mode:	Mode 1
Test Engineer:	Peng Dong
Pol:	Neutral

Detailed results are shown below

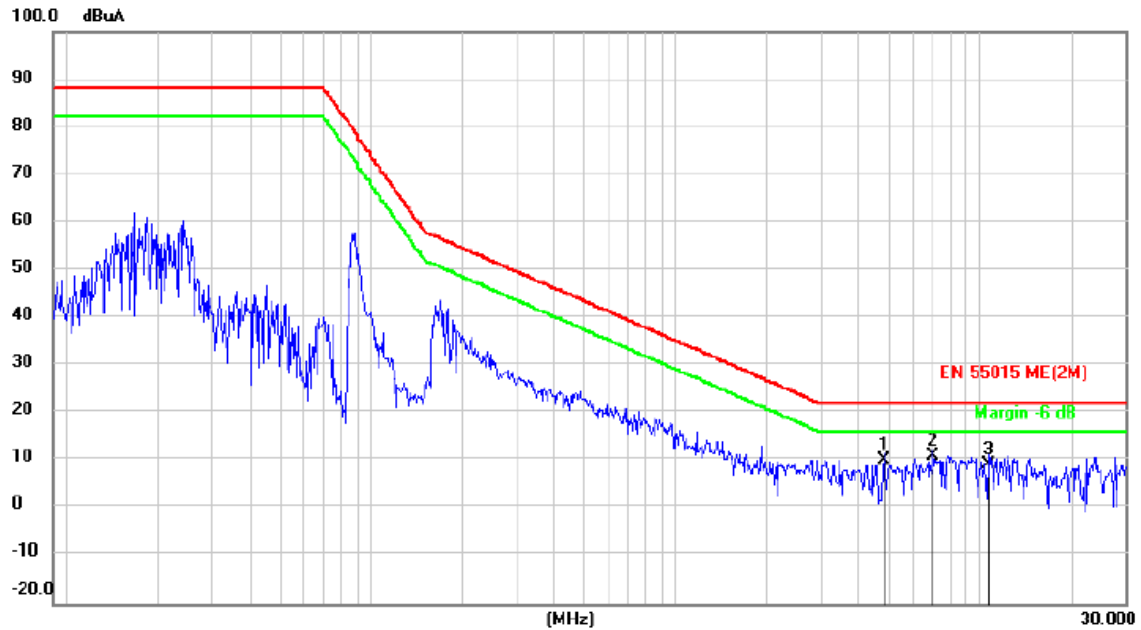


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.3420	40.77	10.20	50.97	59.15	-8.18	QP	
2		0.3420	16.19	10.20	26.39	49.15	-22.76	AVG	
3	*	0.9939	38.67	10.20	48.87	56.00	-7.13	QP	
4		0.9939	25.08	10.20	35.28	46.00	-10.72	AVG	
5		18.0500	41.09	10.20	51.29	60.00	-8.71	QP	
6		18.0500	28.20	10.20	38.40	50.00	-11.60	AVG	

A.2 Radiated Disturbance Test Results (9kHz to 30MHz)

Environmental Conditions:	24.0°C, 56% RH
Test Voltage:	AC 230V,50Hz
Test Model:	UPW-DM-006
Test Mode:	Mode 1
Test Engineer:	Peng Dong
Pol:	X

Detailed results are shown below



No.	Mk.	Freq. MHz	Reading Level dBuA	Correct Factor dB	Measure- ment dBuA	Limit dBuA	Over dB	Detector	Comment
1		4.8357	10.20	0.00	10.20	22.00	-11.80	QP	
2	*	7.0231	12.03	-1.03	11.00	22.00	-11.00	QP	
3		10.6217	14.52	-5.31	9.21	22.00	-12.79	QP	

Environmental Conditions:	24.0°C, 56% RH
Test Voltage:	AC 230V,50Hz
Test Model:	UPW-DM-006
Test Mode:	Mode 1
Test Engineer:	Peng Dong
Pol:	Y

Detailed results are shown below



No.	Mk.	Freq. MHz	Reading Level dBuA	Correct Factor dB	Measure- ment dBuA	Limit dBuA	Over dB	Detector	Comment
1		4.0784	8.58	-0.22	8.36	22.00	-13.64	QP	
2	*	8.2600	11.37	-2.27	9.10	22.00	-12.90	QP	
3		27.2174	30.26	-21.69	8.57	22.00	-13.43	QP	

Environmental Conditions:	24.0°C, 56% RH
Test Voltage:	AC 230V,50Hz
Test Model:	UPW-DM-006
Test Mode:	Mode 1
Test Engineer:	Peng Dong
Pol:	Z

Detailed results are shown below

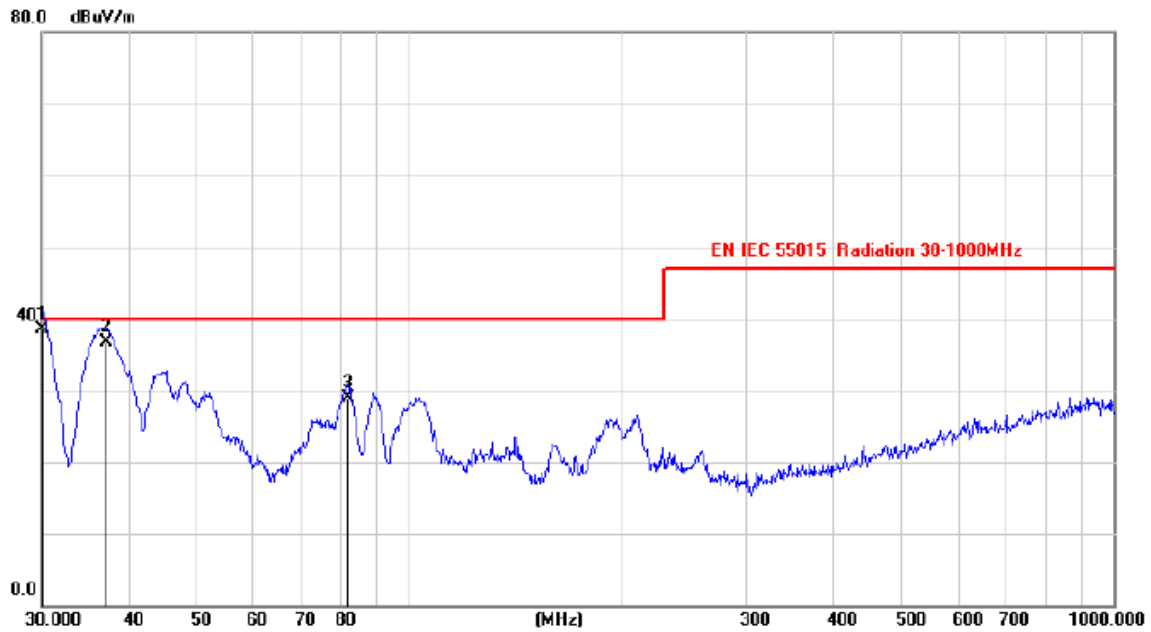


No.	Mk.	Freq. MHz	Reading Level dBuA	Correct Factor dB	Measure- ment dBuA	Limit dBuA	Over dB	Detector	Comment
1	*	3.2761	9.10	0.16	9.26	22.00	-12.74	QP	
2		6.8540	9.89	-1.09	8.80	22.00	-13.20	QP	
3		12.2911	14.73	-6.53	8.20	22.00	-13.80	QP	

A.3 Radiated Disturbance Test Results (30MHz to 1000MHz)

Environmental Conditions:	23.6°C, 51% RH
Test Voltage:	AC 230V,50Hz
Test Model:	UPW-DM-006
Test Mode:	Mode 1
Test Engineer:	Peng Dong
Pol:	Vertical

Detailed results are shown below



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Antenna Height cm	Table Degree degree	Comment
1	*	30.0132	25.56	12.94	38.50	40.00	-1.50	QP			
2		37.2202	22.71	14.00	36.71	40.00	-3.29	QP			
3		82.0346	19.41	9.47	28.88	40.00	-11.12	QP			



Environmental Conditions:	23.6°C, 51% RH
Test Voltage:	AC 230V,50Hz
Test Model:	UPW-DM-006
Test Mode:	Mode 1
Test Engineer:	Peng Dong
Pol:	Horizontal

Detailed results are shown below



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Antenna Height cm	Table Degree	Comment
1	*	82.1066	19.82	9.62	29.44	40.00	-10.56	QP			
2		160.4863	17.49	9.91	27.40	40.00	-12.60	QP			
3		197.9796	16.94	11.55	28.49	40.00	-11.51	QP			

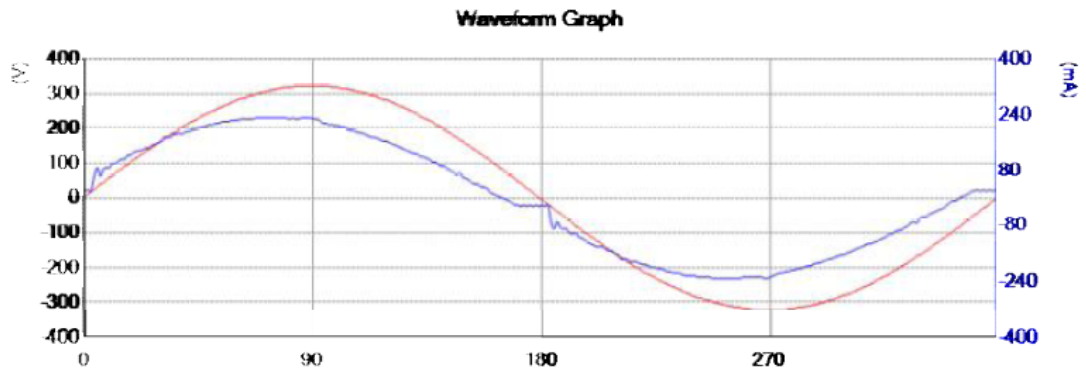
A.4 Harmonic Current Emissions Test Results

Environmental Conditions:	23.9°C, 53% RH
Test Model:	UPW-DM-006
Test Voltage:	AC 230V,50Hz
Test Mode:	Mode 1
Test Engineer:	Peng Dong

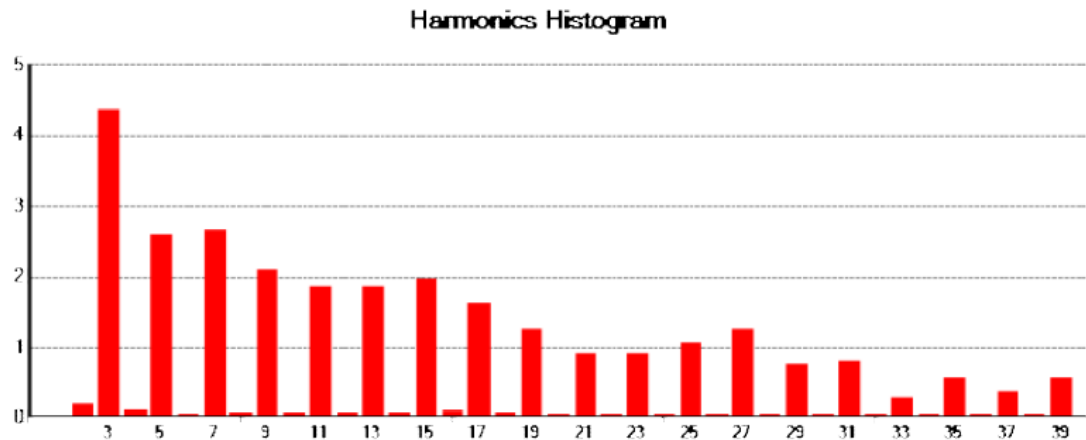
Detailed results are shown below

Test Result: pass Source qualification: Idle - Pass

Current & voltage waveforms



Harmonics and Class C limit line (>25W)



Source qualification: Idle - Pass

Measurements are compliant with IEC/EN61000-3-2 Ed. 4 & IEC/EN61000-4-7 Ed. 2.1

	Nominal	Measured		Deviation	Allowed Deviation	Result
		Low	High			
Supply Voltage	230	229.27	229.52	-0.73	4.6	Pass
Supply Frequency	50	50.0	50.0	0.0	0.25	Pass
Crest Phase	90.0	88.7	89.1	-1.3	3.0	Pass
Crest Factor	1.414	1.414	1.415	0.001	-0.014/0.006	Pass
Fundamental Voltage	229.50	-	-	-	-	-

Harm#	Harmonics Voltage	Harmonic Ratio	Limit	Result
2	0.130	0.063	0.200	Pass
3	0.140	0.065	0.900	Pass
4	0.030	0.026	0.200	Pass
5	0.040	0.021	0.400	Pass
6	0.040	0.018	0.200	Pass
7	0.020	0.013	0.300	Pass
8	0.010	0.015	0.200	Pass
9	0.010	0.005	0.200	Pass
10	0.020	0.009	0.100	Pass
11	0.010	0.010	0.100	Pass
12	0.000	0.003	0.100	Pass
13	0.020	0.008	0.100	Pass
14	0.000	0.003	0.100	Pass
15	0.000	0.003	0.100	Pass
16	0.000	0.003	0.100	Pass
17	0.010	0.003	0.100	Pass
18	0.000	0.003	0.100	Pass
19	0.000	0.003	0.100	Pass
20	0.000	0.000	0.100	Pass
21	0.000	0.000	0.100	Pass
22	0.000	0.000	0.100	Pass
23	0.000	0.003	0.100	Pass
24	0.000	0.000	0.100	Pass
25	0.000	0.000	0.100	Pass
26	0.000	0.000	0.100	Pass
27	0.000	0.001	0.100	Pass
28	0.000	0.000	0.100	Pass
29	0.000	0.000	0.100	Pass
30	0.000	0.000	0.100	Pass
31	0.000	0.000	0.100	Pass
32	0.000	0.000	0.100	Pass
33	0.000	0.000	0.100	Pass
34	0.000	0.000	0.100	Pass
35	0.000	0.000	0.100	Pass
36	0.000	0.000	0.100	Pass
37	0.000	0.000	0.100	Pass
38	0.000	0.000	0.100	Pass
39	0.000	0.000	0.100	Pass
40	0.000	0.000	0.100	Pass

Environmental Conditions:	23.9°C, 53% RH
Test Model:	UPW-DM-006
Test Voltage:	AC 230V,50Hz
Test Mode:	Mode 1
Test Engineer:	Peng Dong

Detailed results are shown below

Test Result: pass

Source qualification: Idle - Pass

THC(A): 7.680

I - THD(%): 4.7

POHC(A): 3.581

POHC Limit(A): 15.464

Parameter values during test:

V_RMS (Volts): 229.4 to 229.4

Frequency(Hz): 50.0

I_RMS(mA): 163.9 to 163.9

Crest Factor: 1.421

Power (Watts): 36.5

Power Factor: 0.970

Harm#	Harms(flitered)	Limit	Harms(avg)	100%Limit	Harms(max)	150%Limit	Status
L_Fund	163.000						
2	0.200	3.3	0.200	6.135	0.260	5.317	Pass
3	4.380	47.4	4.300	9.066	4.380	6.156	Pass
4	0.120	-	0.100	-	0.200	-	N/A
5	2.570	16.3	2.600	15.951	2.600	10.634	Pass
6	0.050	-	0.100	-	0.150	-	N/A
7	2.660	11.4	2.700	23.663	2.680	15.659	Pass
8	0.080	-	0.100	-	0.190	-	N/A
9	2.100	8.2	2.100	25.767	2.110	17.260	Pass
10	0.070	-	0.100	-	0.120	-	N/A
11	1.870	4.9	1.900	38.855	1.890	25.767	Pass
12	0.080	-	0.100	-	0.130	-	N/A
13	1.870	4.9	1.900	38.855	1.890	25.767	Pass
14	0.080	-	0.100	-	0.140	-	N/A
15	1.960	4.9	2.000	40.900	2.010	27.403	Pass
16	0.100	-	0.100	-	0.130	-	N/A
17	1.600	4.9	1.600	32.720	1.650	22.495	Pass
18	0.070	-	0.100	-	0.110	-	N/A
19	1.250	4.9	1.200	24.540	1.270	17.314	Pass
20	0.060	-	0.100	-	0.110	-	N/A
21	0.920	4.9	0.900	18.405	0.950	12.952	Pass
22	0.060	-	0.100	-	0.110	-	N/A
23	0.910	4.9	0.900	18.405	0.960	13.088	Pass
24	0.060	-	0.100	-	0.100	-	N/A
25	1.070	4.9	1.100	22.495	1.150	15.678	Pass
26	0.060	-	0.100	-	0.080	-	N/A
27	1.250	4.9	1.200	24.540	1.270	17.314	Pass
28	0.060	-	0.100	-	0.080	-	N/A
29	0.750	4.9	0.800	16.360	0.770	10.498	Pass
30	0.050	-	0.100	-	0.070	-	N/A
31	0.780	4.9	0.700	14.315	0.790	10.770	Pass
32	0.050	-	0.100	-	0.070	-	N/A
33	0.280	4.9	0.300	6.135	0.300	4.090	Pass
34	0.050	-	0.100	-	0.060	-	N/A
35	0.550	4.9	0.600	12.270	0.580	7.907	Pass
36	0.050	-	0.100	-	0.070	-	N/A
37	0.370	4.9	0.400	8.180	0.390	5.317	Pass
38	0.040	-	0.100	-	0.060	-	N/A
39	0.550	4.9	0.500	10.225	0.570	7.771	Pass
40	0.050	-	0.100	-	0.060	-	N/A

Note: All harmonics are below the minimum limits and are ignored.

A.5 Voltage Fluctuations & Flicker Test Results

Environmental Conditions:	23.9°C, 53% RH		
Test Model:	UPW-DM-006		
Test Voltage:	AC 230V,50Hz		
Test Mode:	Mode 1		
Test Engineer:	Peng Dong		
Detailed results are shown below			
Load Power	: 0.036 kW	0.038 kVA	Power Factor 0.947
Load Current	: 0.2 Arms	0.2 Apk	Crest Factor 1.404
EN 61000-3-3:2013 - Voltage reduction is positive			
Voltage Variations			
	Nominal Voltage: 230 Vrms		
	Highest Half-cycle level: +0.21%		
	Lowest Half-cycle level: +0.35%		
	d(max):	0.00%	Limit: 4% PASS
	t(max):	0.00seconds	Limit: 500ms PASS
Steady State definition: >1000ms within +/- 0.2%			
	Largest d(c) change down: 0.00%		
	Largest d(c) change up: +0.00%		
	Largest d(c) change:	0.00%	Limit: 3.3% PASS
Flicker			
	Pst Classifier		Plt Calculation
	Duration	Flicker	Interval Pst
	0.1%	0.00	
	0.7%	0.00	
	1.0%	0.00	
	1.5%	0.00	
	2.2%	0.00	
	3%	0.00	
	4%	0.00	
	6%	0.00	
	8%	0.00	
	10%	0.00	
	13%	0.00	
	17%	0.00	
	30%	0.00	
	50%	0.00	
	80%	0.00	

A.6 Immunity Test Results

Electrostatic Discharge Immunity Test Results								
Standard	<input checked="" type="checkbox"/> EN 61547: 2009		<input checked="" type="checkbox"/> EN 61000-4-2 : 2009					
Applicant	Zhongshan Upward Lighting Co., Ltd							
EUT	Led Underground Light				Temperature	23.9°C		
M/N	UPW-DM-006				Humidity	51%		
Test Mode	Mode 1				Pressure	1008mbar		
Input Voltage	AC 230V,50Hz				Test Results	Pass		
Test Engineer	Peng Dong							
Discharge mode	Test points	Results						Performance Criteria
		2kv		4kv		8kv		
		+	-	+	-	+	-	
Direct-Contact Discharge	Front	P	P	P	P	/	/	B
	Back	P	P	P	P	/	/	B
	Left	P	P	P	P	/	/	B
	Right	P	P	P	P	/	/	B
	Top	P	P	P	P	/	/	B
	Bottom	P	P	P	P	/	/	B
Direct-Air Discharge	Front	P	P	P	P	P	P	B
	Back	P	P	P	P	P	P	B
	Left	P	P	P	P	P	P	B
	Right	P	P	P	P	P	P	B
	Top	P	P	P	P	P	P	B
	Bottom	P	P	P	P	P	P	B
Indirect-Contact Discharge(VCP)	/	P	P	P	P	/	/	B
Indirect-Contact Discharge(HCP)	/	P	P	P	P	/	/	B
Note: "P" = Pass.								



Radiated, Radio-Frequency, Electromagnetic Field Immunity Test Results

Standard	<input checked="" type="checkbox"/> EN 61547: 2009 <input checked="" type="checkbox"/> EN 61000-4-3: 2006+A2: 2010			
Applicant	Zhongshan Upward Lighting Co., Ltd			
EUT	Led Underground Light	Temperature	23.5°C	
M/N	UPW-DM-006	Humidity	53%	
Test Mode	Mode 1	Pressure	1008mbar	
Input Voltage	AC 230V,50Hz	Test Engineer	Jason deng	
Modulation	80% AM 1KHz	Test Results	Pass	
Steps	1%			
Angle of EUT	Antenna polarization	Frequency Range (MHz)	Test Level (V/m)	Performance Criteria
0°	Vertical, Horizontal	80 to 1000	3	A
90°	Vertical, Horizontal	80 to 1000	3	A
180°	Vertical, Horizontal	80 to 1000	3	A
270°	Vertical, Horizontal	80 to 1000	3	A

Note:

Electrical Fast Transient/Burst Immunity Test Results					
Standard	<input checked="" type="checkbox"/> EN 61547: 2009		<input checked="" type="checkbox"/> EN 61000-4-4: 2012		
Applicant	Zhongshan Upward Lighting Co., Ltd				
EUT	Led Underground Light	Temperature	24.1°C		
M/N	UPW-DM-006	Humidity	54%		
Test Mode	Mode 1	Pressure	1008mbar		
Input Voltage	AC 230V,50Hz	Test Results	Pass		
Test Engineer	Peng Dong				
Test Port Type	Test Level	Repetition Frequency	Test Duration		Performance Criteria
			+	-	
AC Power ports	± 1.0kV	5kHz	2min	2min	B
DC Input /Output Power ports					
Note:					

Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields Test Results				
Standard	<input checked="" type="checkbox"/> EN 61547: 2009		<input checked="" type="checkbox"/> EN 61000-4-6: 2014+A1:2015	
Applicant	Zhongshan Upward Lighting Co., Ltd			
EUT	Led Underground Light	Temperature	24.1°C	
M/N	UPW-DM-006	Humidity	54%	
Test Mode	Mode 1	Pressure	1008mbar	
Input Voltage	AC 230V,50Hz	Test Results	Pass	
Test Engineer	Peng Dong			
Test Port Type	Frequency range (MHz)	Test Level (V/m)	Coupling method	Performance Criteria
AC Power ports	0.15 to 80	3	CDN	A
DC Input /Output Power ports				
Remark: 1.Modulation Signal:1kHz, 80%, AM, Sine wave. 2.Measurement Equipment: Simulator : CIT-10 (FRANKONIA) CDN : <input type="checkbox"/> CDN-M2 (FRANKONIA) <input checked="" type="checkbox"/> CDN-M3 (FRANKONIA)				

Surge Immunity Test Results

Standard	<input checked="" type="checkbox"/> EN 61547: 2009 <input checked="" type="checkbox"/> EN 61000-4-5: 2014+A1:2017		
Applicant	Zhongshan Upward Lighting Co., Ltd		
EUT	Led Underground Light	Temperature	24.1℃
M/N	UPW-DM-006	Humidity	54%
Test Mode	Mode 1	Pressure	1008mbar
Input Voltage	AC 230V,50Hz	Test Results	Pass
Test Engineer	Peng Dong		

Test Port Type	Inject Line	Tset Level (kV)	Phase Angle	Number of surges	Repetition rate	Performance criteria
AC Input	L-N	+ 1.0	90°	5	60s	C
		- 1.0	270°	5	60s	C
AC Input	L-PE	+ 2.0	90°	5	60s	C
		- 2.0	270°	5	60s	C
AC Input	N-PE	+ 2.0	90°	5	60s	C
		- 2.0	270°	5	60s	C
AC Input	L&N-PE	+ 2.0	90°	5	60s	C
		- 2.0	270°	5	60s	C

Note:

Voltage Dips, Short Interruptions and Voltage Variations Immunity Test Results

Standard	<input checked="" type="checkbox"/> EN 61547: 2009 <input checked="" type="checkbox"/> EN 61000-4-11: 2004+A1:2017			
Applicant	Zhongshan Upward Lighting Co., Ltd			
EUT	Led Underground Light	Temperature	24.1°C	
M/N	UPW-DM-006	Humidity	54%	
Test Mode	Mode 1	Pressure	1008mbar	
Input Voltage	AC 230V, 50Hz	Test Results	Pass	
Test Engineer	Peng Dong			
Vnom	Frequency	Test Level	Duration	Performance criteria
AC 230V	50Hz	70% of Vnom	10 cycle(50Hz)	C
AC 230V	50Hz	0% of Vnom	0.5 cycle(50Hz)	B
Note:				

ANNEX B (Test photograph)

B.1 Photo of Conducted Disturbance



B.2 Photo of Radiated Disturbance(9kHz to 30MHz)



B.3 Photo of Radiated Disturbance(30MHz to 1000MHz)



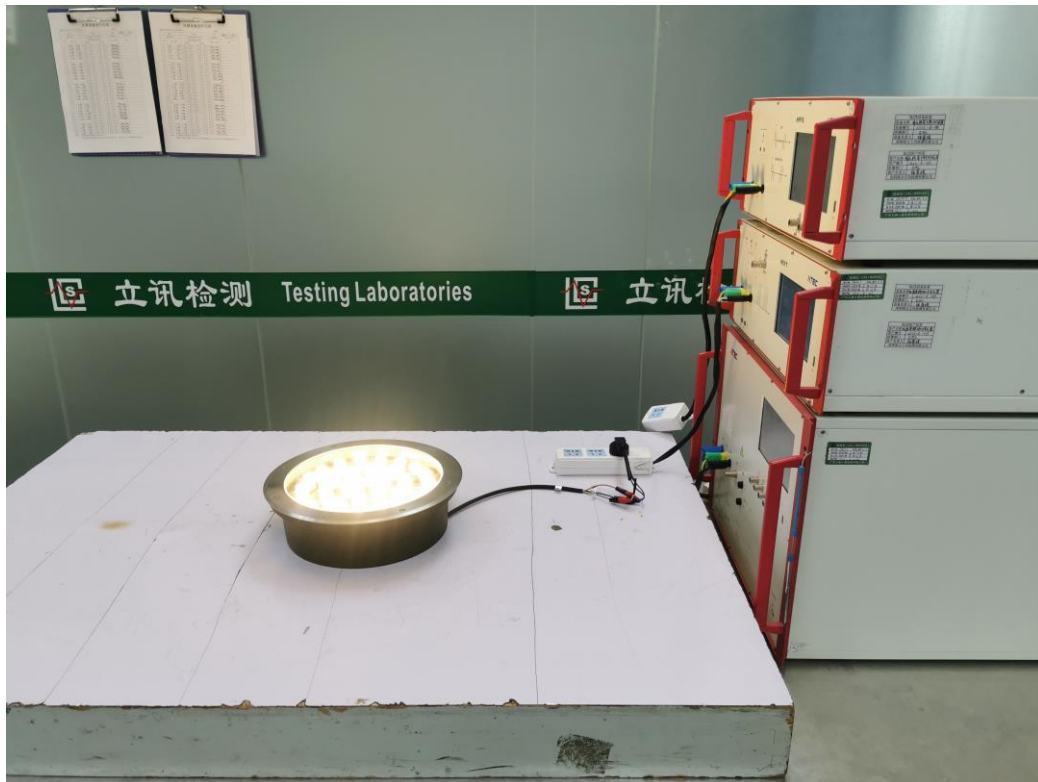
B.4 Photo of Harmonic Current Emissions&Voltage Fluctuations & Flicker



B.5 Photo of Electrostatic Discharge Immunity Test



B.6 Photo of Electrical Fast Transient/Burst Immunity Test



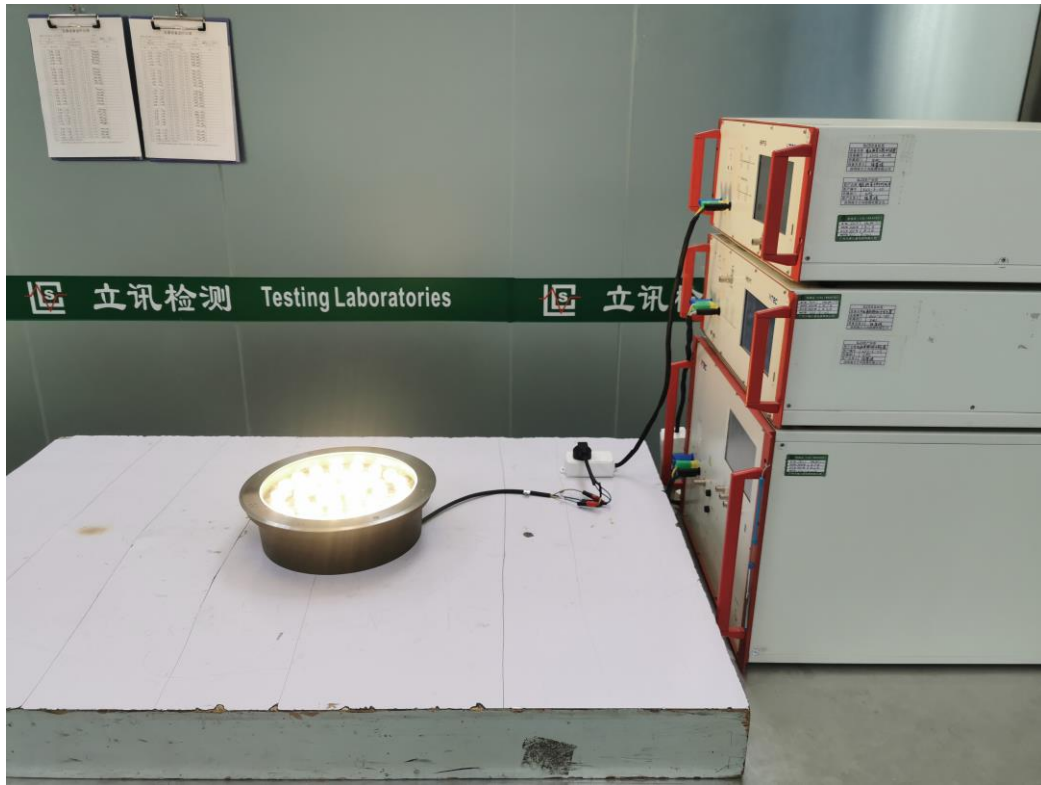
B.7 Photo of Immunity To Conducted Disturbances, Induced by Radio-Frequency Fields



B.8 Photo of Surge Immunity Test



B.9 Photo of Voltage Dips, Short Interruptions and Voltage Variations Immunity Test



ANNEX C (External and internal photos of the EUT)



Figure. 1



Figure. 2



Figure. 3



Figure. 4



-----THE END OF TEST REPORT-----