TEST REPORT

Reference No.	:	WTU21U03018661E
Applicant	:	LUMATEK LTD.
Address	:	Ewropa Business centre Level 3 – 701 Dun Karm Street Birkirkara BKR 9034 MALTA
Manufacturer	:	LUMATEK LTD.
Address	:	Ewropa Business centre Level 3 – 701 Dun Karm Street Birkirkara BKR 9034 MALTA
Product Name	:	LED Luminaires
Model No	:	ZEUS 1000W XTREME PPFD CO2
Standards	:	EN IEC 55015:2019 EN 61547:2009 EN IEC 61000-3-2:2019 EN 61000-3-3:2013+A1:2019
Date of Receipt sample	:	2020-12-15
Date of Test	:	2020-12-15 to 2020-12-22
Date of Issue	:	2021-03-17
Test Report Form No.	:	WEL-55015A-02A
Test Result	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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1 Test Summary

EMISSION			
Test Item	**Test Standard**	**Class / Severity**	**Result**
Mains Terminal Disturbance Voltage, 9kHz to 30MHz	EN IEC 55015:2019	Clause 4.3.1	Pass
Radiated electromagnetic disturbance, 9kHz to 30MHz	EN IEC 55015:2019	Clause 4.5.2	Pass
Radiated Emission, 30MHz to 300MHz	EN IEC 55015:2019	Clause 4.5.3	Pass
Harmonic Current emission	EN IEC 61000-3-2:2019	Clause 7	Pass
Voltage Fluctuation and Flicker	EN 61000-3-3:2013+A1:2019	Clause 5	Pass
IMMUNITY（EN 61547:2009）			
Test Item	**Test Method**	**Performance Criteria**	**Result**
Electrostatic Discharge(ESD)	IEC 61000-4-2:2008	B	Pass
Radio-frequency electromagnetic fields (80MHz to 1GHz)	IEC 61000-4-3:2006+A1:2007	A	Pass
Electrical Fast Transients (EFT)	IEC 61000-4-4:2004	B	Pass
Surge	IEC 61000-4-5:2005	C	Pass
Injected Currents, 0.15MHz to 80MHz	IEC 61000-4-6:2008	A	Pass
Power-frequency magnetic field	IEC 61000-4-8:1993+A1:2000	A	N/A
Voltage Dips	IEC 61000-4-11:2004	C	Pass
Voltage short interruptions		B	Pass

Remark:

Pass	Test item meets the requirement
Fail	Test item does not meet the requirement
N/A	Test case does not apply to the test object

2 Contents

3 General Information

3.1 General Description of E.U.T.

Product Name	:	LED Luminaires
Model No.	:	ZEUS 1000W XTREME PPFD CO2
Protection Class	:	Class I
Remark.....	:	1. The EUT (equipment under test) is an ordinary LED Luminaires for Lighting and similar use. For the further information, refer to the user's manual. 2. Data of this report is based on the original Report No. WTU20N12097178E.In electrical characteristics, all models are similar circuit principle and PCB layout.For details information, refer to the section 3.2. 3. For the test results, the EUT had been tested with the rated input range. But only the worst case was shown in test report. 4. The derived report is based on original report **错误!未找到引用源。** which is prepared by Waltek Testing Group (Ningbo) Co., Ltd. to change applicant、manufaturer and model No.

3.2 Description of Support Units

The EUT has been tested as an independent unit. ZEUS 1000W XTREME PPFD CO2 is the tested sample. All tests were performed in the condition of 230V~, 50Hz input.

3.3 Standards Applicable for Testing

The tests were performed according to following standards:

EN IEC 55015:2019	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
EN 61547:2009	Equipment for general lightingpurposes — EMC immunity requirements
EN IEC 61000-3-2:2019	Electromagnetic compatibility (EMC) Part 3-2: Limits — Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).
EN 61000-3-3:2013+A1:2019	Electromagnetic compatibility (EMC) Part 3-3: Limits — Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection.

3.4 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

☒ Yes ☐ No

If Yes, list the related test items and lab information:

Test items: Radio-frequency electromagnetic fields (80MHz to 1GHz)

Waltek Testing Group (Suzhou) Co., Ltd.
http://www.waltek.com.cn

Lab information: Waltek Services (Foshan) Co., Ltd.

3.5 Abnormalities from Standard Conditions

None.

4 Equipment Used during Test

Mains Terminal Disturbance Voltage (Conducted Emission)					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1	EMI Test Receiver	R&S	ESCI	101406	Valid
2	TWO-LINE V-NETWORK	R&S	ENV216	101208	Valid
Radiated electromagnetic disturbance(9kHz to 30MHz)					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1	EMI Test Receiver	R&S	ESCI	101406	Valid
2	3-dimensional large loop antenna	SCHWARZBECK	HXYZ9170	256	Valid
CDNE method for Lighting Equipments' Radiated Emission					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1	EMI Test Receiver	R&S	ESCI	101406	Valid
2	coupling-Decoupling Network	SCHWARZBECK	CDNE M3	00082	Valid
Harmonics and Flicker Measuring System					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1	Harmonics /Flicker Analyzer	KIKUSUI	KHA1000	TL002966	Valid
2	line Power Supply	KIKUSUI	PCR4000LE	TL003094	Valid
3	Line Impedance Network	KIKUSUI	LIN40MA-PCR-LE	TM001297	Valid
ESD					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1	electrostatic discharge generator	TESEQ	NSG437	699	Valid
Radio-frequency electromagnetic fields					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1	RF Power Amplifier	OPHIR	5225R	1051/1712	Valid
2	RF Power Amplifier	OPHIR	5293RE	1051/171	Valid
3	Stacked double logarithmic periodic antenna	SCHWARZBECK	STLP9128E-SPECIAL	142	Valid
4	Stacked double logarithmic periodic antenna	SCHWARZBECK	STLP 9149	476	Valid
5	RF signal generator	Agilent	N5181A	MY48080720	Valid
6	Power meter	RS	NRP6A	101133	Valid
7	Power meter	RS	NRP6A	101134	Valid

8	Electric field probe	Narda	EP 601	611WX70311	Valid
EFT & Voltage Dips and Interruptions					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1	Multifunction Generator Systems	TESEQ	NSG3040	2094	Valid
2	Single way manual Step regulator	TESEQ	INA 6501	243	Valid
Surge					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1	Multifunction Generator Systems	TESEQ	NSG3060	1654	Valid
2	coupling-Decoupling Network	TESEQ	CDN3061	1485	Valid
Injected Currents					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1	Test System for Conducted and Radiated Immunity	TESEQ	NSG4070	37519	Valid
2	Coupling and Decoupling Network	TESEQ	CDN M016	37358	Valid
3	Attenuator	TESEQ	ATN6075	36917	Valid

4.1 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Mains Terminal Disturbance Voltage	9kHz~30MHz	±2.66dB	(1)
Radiated electromagnetic disturbance	9kHz ~30MHz	±3.00dB	(1)
Radiated Emission(CDNE method)	30MHz~300MHz	±3.32dB	(1)

(1)This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

5 Emission Test Results

5.1 Mains Terminals Disturbance Voltage, 9kHz to 30MHz

Test Requirement..... : EN IEC 55015

Test Method..... : CIPR 16-2-1 and Clause 8.3 of EN IEC 55015

Test Result..... : Pass

Frequency Range..... : 9kHz to 30MHz

Class/Severity..... : Table 1 of EN IEC 55015

5.1.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 22.3°C

Humidity..... : 52%RH

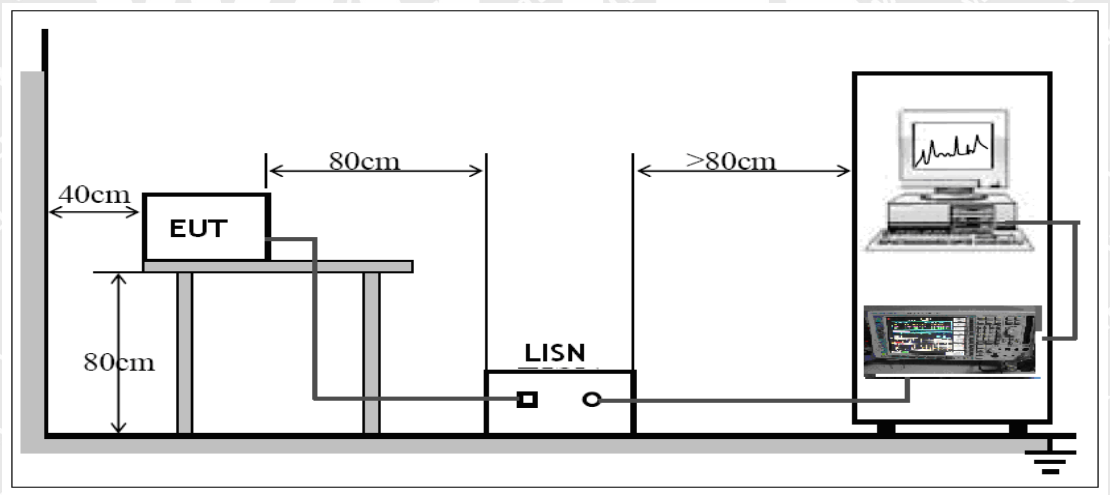
EUT Operation:

Input Voltage ..... : 230V~, 50Hz

Operating Mode..... : On mode

5.1.2 Block Diagram of Test Setup

The Mains Terminals Disturbance Voltage tests were performed in accordance with the EN IEC 55015.

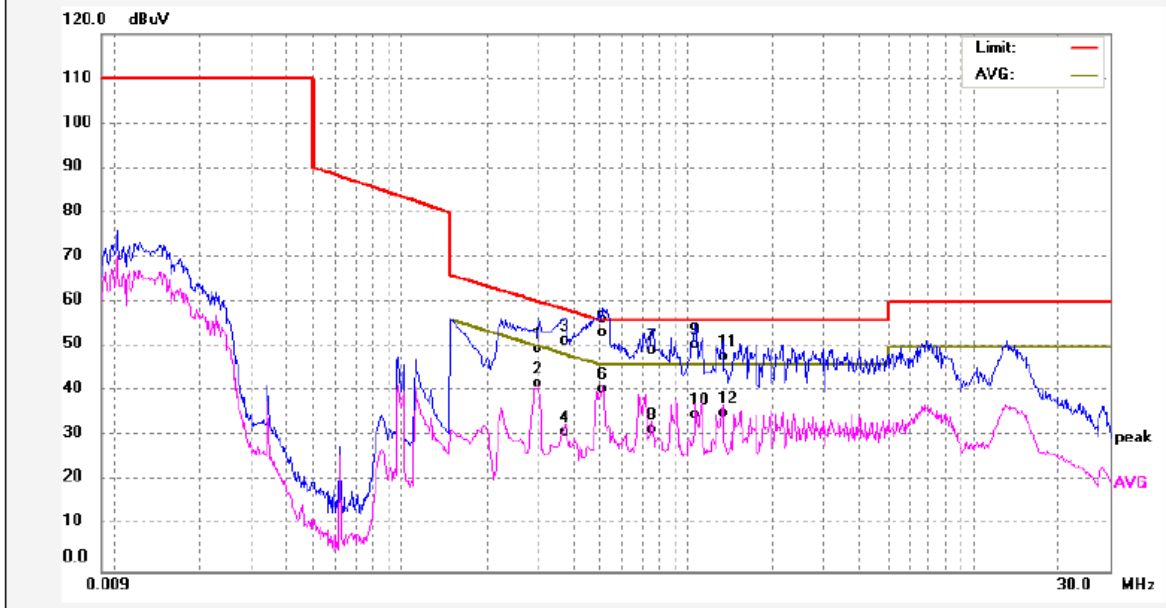


5.1.3 Measurement Data

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

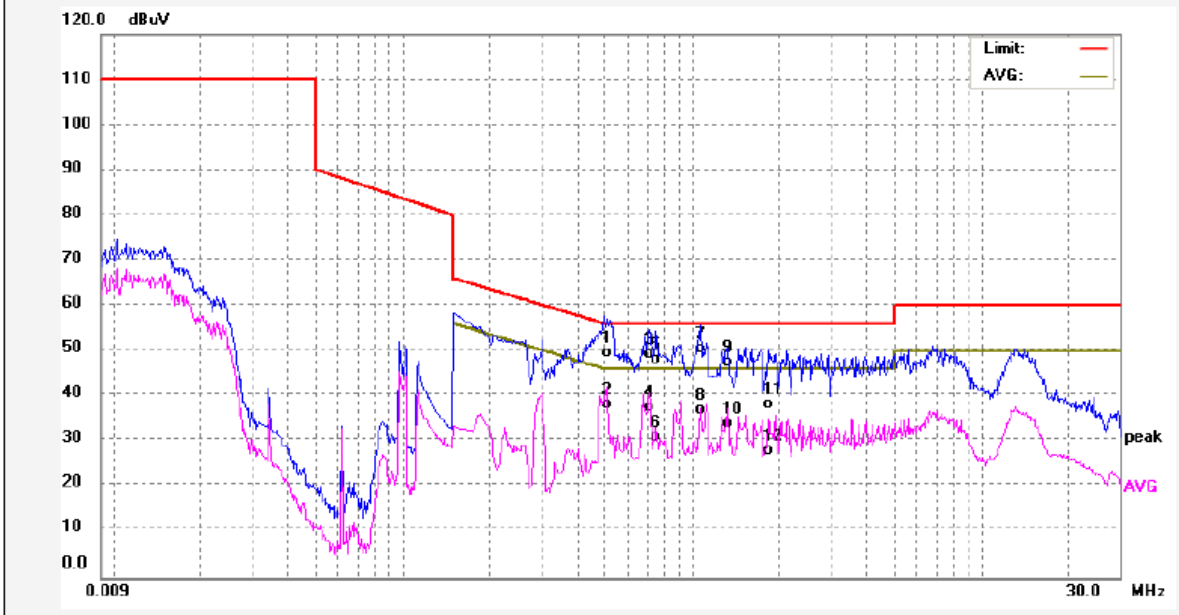
5.1.4 Mains Terminals Disturbance Voltage Test Data

Live Line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.3061	39.91	9.63	49.54	60.07	-10.53	QP	
2	0.3061	32.19	9.63	41.82	50.07	-8.25	AVG	
3	0.3741	41.93	9.62	51.55	58.41	-6.86	QP	
4	0.3741	21.36	9.62	30.98	48.41	-17.43	AVG	
5	0.5101	43.49	9.63	53.12	56.00	-2.88	QP	
6	0.5101	31.13	9.63	40.76	46.00	-5.24	AVG	
7	0.7581	39.75	9.66	49.41	56.00	-6.59	QP	
8	0.7581	22.06	9.66	31.72	46.00	-14.28	AVG	
9	1.0741	41.01	9.67	50.68	56.00	-5.32	QP	
10	1.0741	25.33	9.67	35.00	46.00	-11.00	AVG	
11	1.3340	38.12	9.68	47.80	56.00	-8.20	QP	
12	1.3340	25.57	9.68	35.25	46.00	-10.75	AVG	

Neutral Line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.4981	40.00	9.64	49.64	56.03	-6.39	QP	
2	0.4981	28.68	9.64	38.32	46.03	-7.71	AVG	
3	0.7101	39.63	9.64	49.27	56.00	-6.73	QP	
4	0.7101	28.03	9.64	37.67	46.00	-8.33	AVG	
5	0.7541	38.40	9.65	48.05	56.00	-7.95	QP	
6	0.7541	21.27	9.65	30.92	46.00	-15.08	AVG	
7	1.0701	40.96	9.67	50.63	56.00	-5.37	QP	
8	1.0701	27.34	9.67	37.01	46.00	-8.99	AVG	
9	1.3261	37.92	9.68	47.60	56.00	-8.40	QP	
10	1.3261	24.48	9.68	34.16	46.00	-11.84	AVG	
11	1.8381	28.68	9.70	38.38	56.00	-17.62	QP	
12	1.8381	18.21	9.70	27.91	46.00	-18.09	AVG	

5.2 Radiated Electromagnetic Disturbance, 9kHz to 30MHz

Test Requirement..... : EN IEC 55015

Test Method..... : CISPR 16-2-3 and Clause 9.3.2 of EN IEC 55015

Test Result..... : Pass

Frequency Range..... : 9kHz to 30MHz

Class/Severity..... : Table 7 and Table 8 of EN IEC 55015

5.2.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 21.6°C

Humidity..... : 50%RH

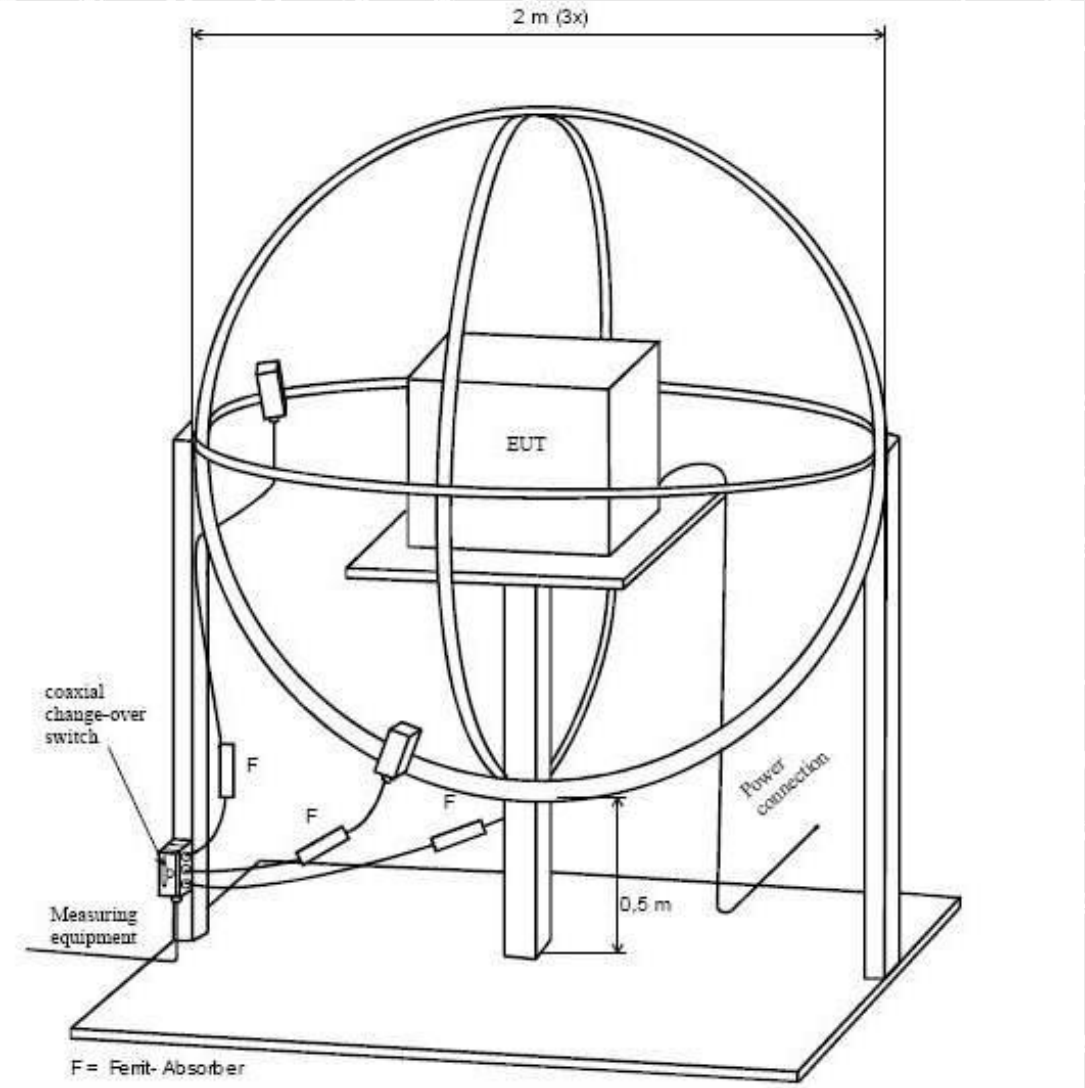
EUT Operation:

Input Voltage ..... : 230V~, 50Hz

Operating Mode..... : On mode

5.2.2 Block Diagram of Test Setup

The Radiated Electromagnetic Disturbance (9kHz to 30MHz) test was performed in accordance with the EN IEC 55015.

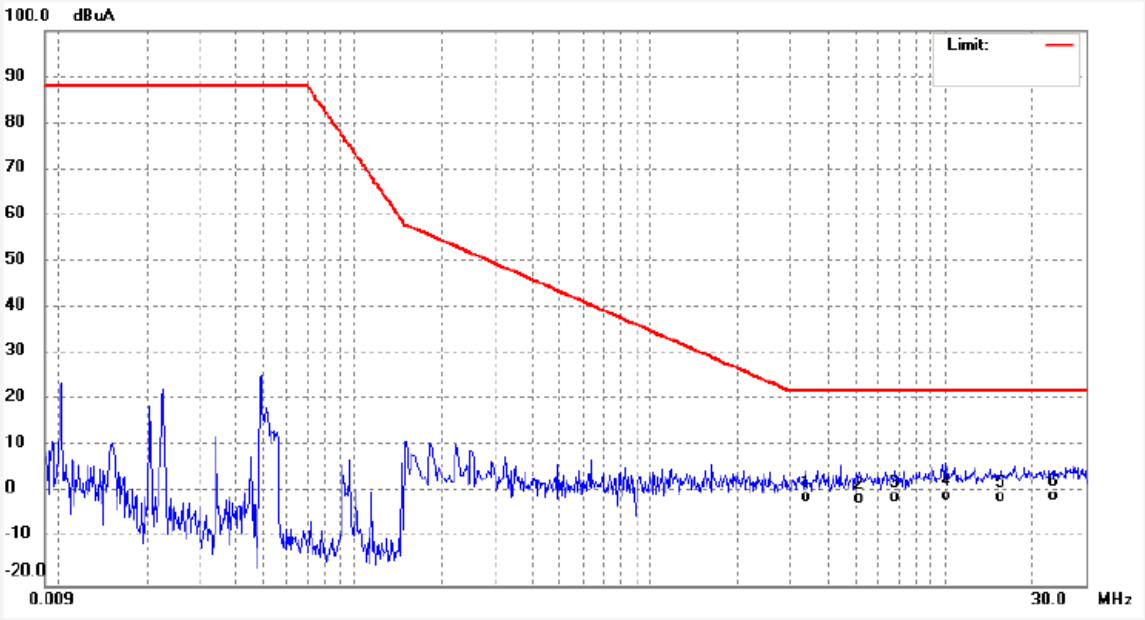


5.2.3 Measurement Data

According to the data in section 5.2.4, the EUT complied with the EN IEC 55015 standards.

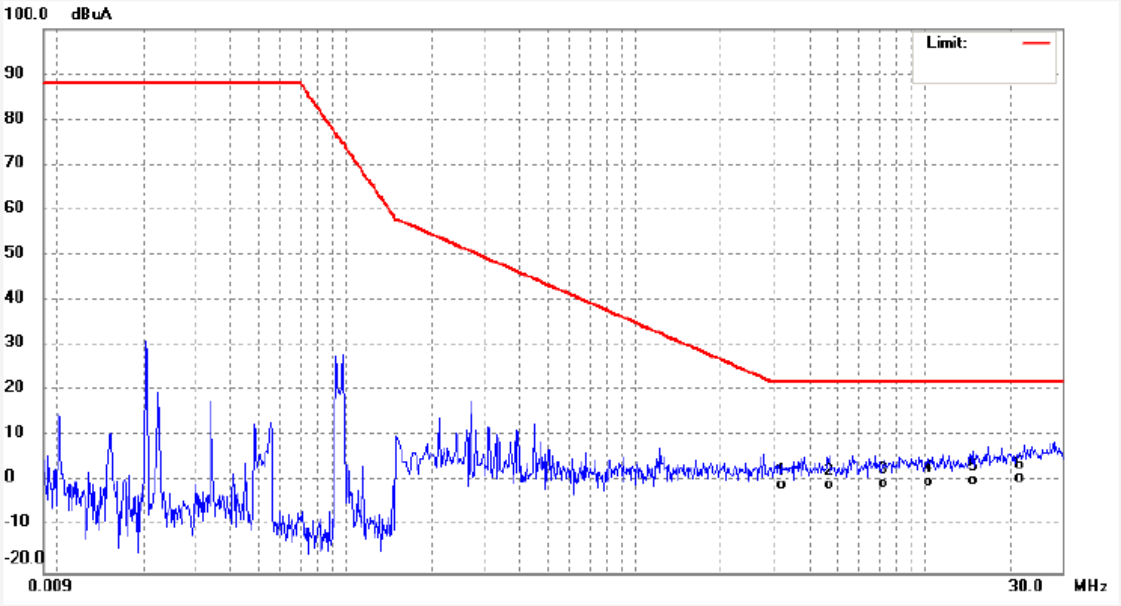
5.2.4 Radiated Electromagnetic Disturbance test data, 9kHz to 30MHz

Loop X



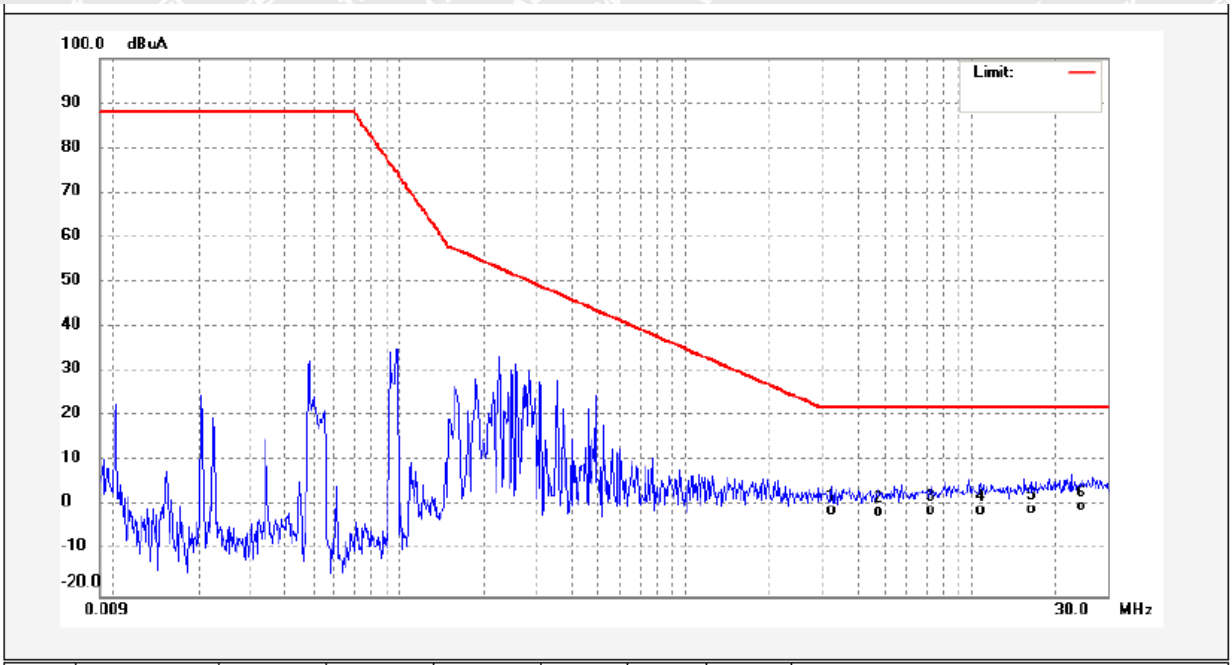
No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	3.3941	-34.68	33.60	-1.08	22.00	-23.08	QP	
2	5.1221	-34.87	33.66	-1.21	22.00	-23.21	QP	
3	6.8421	-34.71	33.72	-0.99	22.00	-22.99	QP	
4	10.1261	-34.54	33.84	-0.70	22.00	-22.70	QP	
5	15.4261	-34.83	33.95	-0.88	22.00	-22.88	QP	
6	23.3061	-34.58	33.89	-0.69	22.00	-22.69	QP	

Loop Y



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	3.2181	-34.75	34.11	-0.64	22.00	-22.64	QP	
2	4.6981	-34.84	34.16	-0.68	22.00	-22.68	QP	
3	7.2461	-34.64	34.25	-0.39	22.00	-22.39	QP	
4	10.3141	-34.52	34.38	-0.14	22.00	-22.14	QP	
5	14.7981	-34.67	34.82	0.15	22.00	-21.85	QP	
6	21.3461	-34.56	35.52	0.96	22.00	-21.04	QP	

Loop Z



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	3.2501	-34.56	33.61	-0.95	22.00	-22.95	QP	
2	4.7581	-34.84	33.63	-1.21	22.00	-23.21	QP	
3	7.2221	-34.69	33.65	-1.04	22.00	-23.04	QP	
4	10.8221	-34.74	33.89	-0.85	22.00	-22.85	QP	
5	16.3101	-34.77	34.22	-0.55	22.00	-22.55	QP	
6	24.3941	-34.36	34.42	0.06	22.00	-21.94	QP	

5.3 Radiated Emission(CDNE method), 30MHz to 300MHz

Test Requirement..... : EN IEC 55015

Test Method..... : CISPR 16-2-1

Test Result..... : Pass

Frequency Range..... : 30MHz to 300MHz

Class/Severity..... : Table 10 of EN IEC 55015

5.3.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 21.5°C

Humidity..... : 53%RH

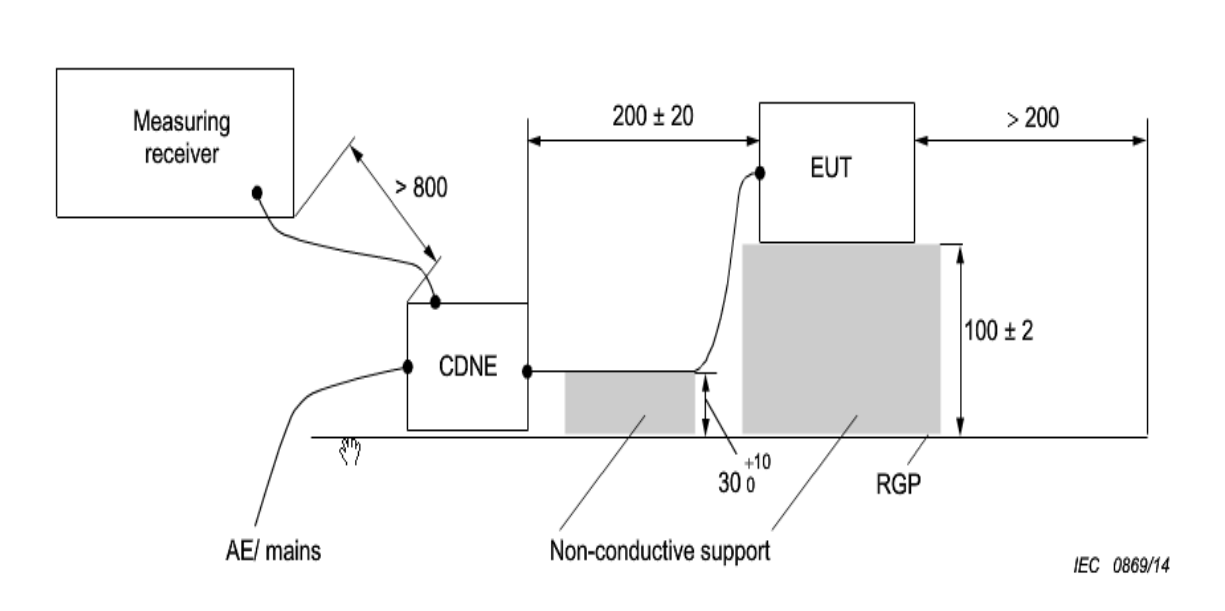
EUT Operation :

Input Voltage ..... : 230V~, 50Hz

Operating Mode..... : On mode

5.3.2 Block Diagram of Setup

The Radiated Emission test was performed in accordance with the CISPR 16-2-1.

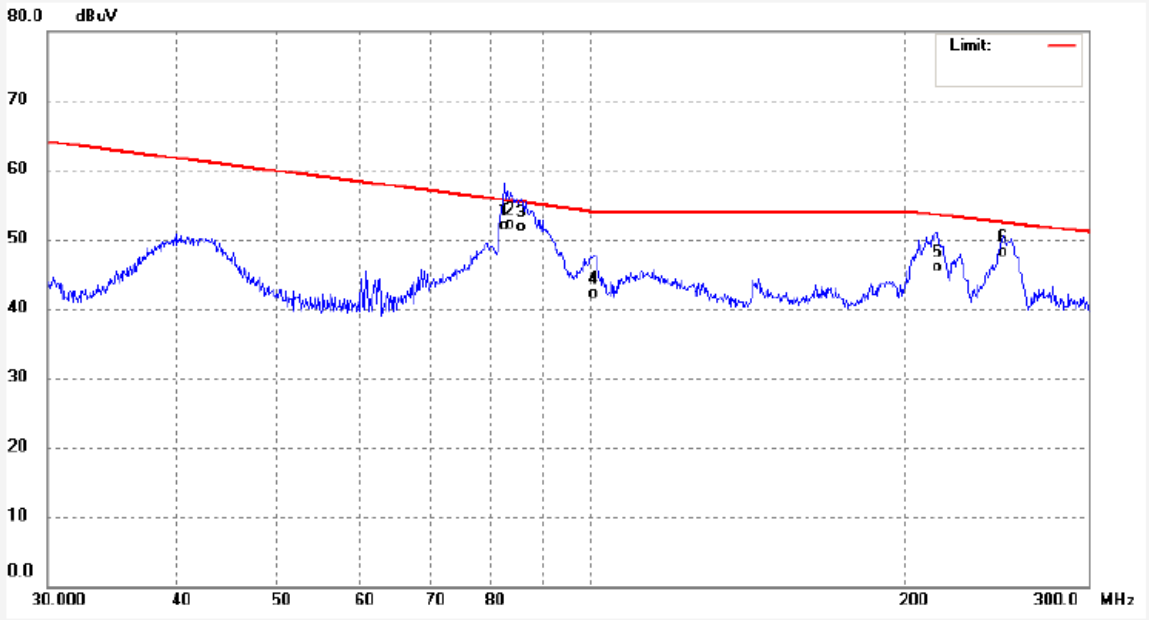


5.3.3 Measurement Data

If the lighting equipment complies with the requirements of this annex, it is deemed to comply with the radiated disturbances requirements in the frequency range 30 MHz to 300 MHz specified in Table 10 of this standard.

5.3.4 Radiated Emission test data,30MHz to 300MHz

CDNE Method



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	82.6200	31.89	19.97	51.86	55.59	-3.73	QP	
2	83.5800	32.11	19.98	52.09	55.49	-3.40	QP	
3	85.6800	31.67	20.00	51.67	55.28	-3.61	QP	
4	100.6200	21.92	20.10	42.02	54.00	-11.98	QP	
5	215.1600	24.92	20.94	45.86	53.46	-7.60	QP	
6	248.8800	26.81	21.28	48.09	52.38	-4.29	QP	

5.4 Harmonics Current Emission

Test Requirement..... : EN IEC 61000-3-2

Test Method..... : EN IEC 61000-3-2

Test Result..... : Pass

Class/Severity..... : Class C

5.4.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 23.8°C

Humidity..... : 43.6%RH

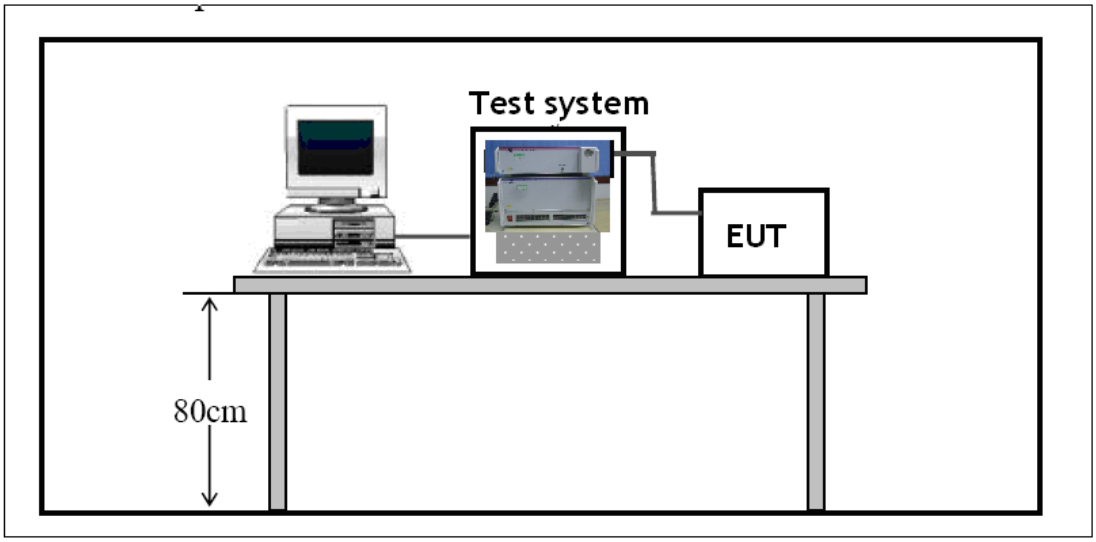
EUT Operation:

Input Voltage ..... : 230V~, 50Hz

Operating Mode..... : On mode

5.4.2 Block Diagram of Setup

The Harmonics Current emission test was performed in accordance with the EN IEC 61000-3-2.



5.4.3 Harmonic Current EmissionTest Data

Final Test Result	Pass	Tobs	Quasi-Stationary
Voltage	229.98 V	THC	0.4570 A
Current	4.8350 A	POHC/Limit	0.0930 A / 0.2513 A *3
Power	1075.04 W	Nominal	230 V / 50 Hz
Power Factor	0.9669	Fundamental Current	4.8120 A
Apparent Power	1111.8 VA	Measuring Period	150 s
THD (max)	9.54 %	Margin	100 %

Order	Limit1(A rms)	Limit2(A rms)	Ave(A rms)	Max(A rms)	Judge
1	-----	-----	4.7949	4.8120	N/A
2	-----	-----	0.0010	0.0020	N/A
3	2.3000	3.4500	0.4137	0.4140	Pass
4	-----	-----	0.0010	0.0010	N/A
5	1.1400	1.7100	0.0455	0.0460	Pass
6	-----	-----	0.0010	0.0010	N/A
7	0.7700	1.1550	0.1033	0.1040	Pass
8	-----	-----	0.0010	0.0010	N/A
9	0.4000	0.6000	0.0630	0.0630	Pass
10	-----	-----	0.0000	0.0010	N/A
11	0.3300	0.4950	0.0404	0.0410	Pass
12	-----	-----	0.0000	0.0010	N/A
13	0.2100	0.3150	0.0420	0.0420	Pass
14	-----	-----	0.0000	0.0010	N/A
15	0.1500	0.2250	0.0526	0.0530	Pass
16	-----	-----	0.0010	0.0010	N/A
17	0.1324	0.1985	0.0590	0.0590	Pass
18	-----	-----	0.0010	0.0010	N/A
19	0.1184	0.1776	0.0514	0.0520	Pass
20	-----	-----	0.0010	0.0010	N/A
21	0.1607	0.1607	0.0440	0.0440	Pass
22	-----	-----	0.0010	0.0010	N/A
23	0.1467	0.1467	0.0386	0.0390	Pass
24	-----	-----	0.0010	0.0010	N/A
25	0.1350	0.1350	0.0390	0.0390	Pass
26	-----	-----	0.0010	0.0010	N/A
27	0.1250	0.1250	0.0350	0.0350	Pass
28	-----	-----	0.0010	0.0010	N/A
29	0.1164	0.1164	0.0299	0.0300	Pass
30	-----	-----	0.0009	0.0010	N/A
31	0.1089	0.1089	0.0220	0.0230	Pass
32	-----	-----	0.0005	0.0010	N/A
33	0.1023	0.1023	0.0190	0.0190	Pass
34	-----	-----	0.0001	0.0010	N/A
35	0.0964	0.0964	0.0170	0.0170	Pass
36	-----	-----	0.0000	0.0000	N/A
37	0.0912	0.0912	0.0150	0.0150	Pass
38	-----	-----	0.0000	0.0010	N/A
39	0.0865	0.0865	0.0130	0.0130	Pass
40	-----	-----	0.0000	0.0010	N/A

N/A : Not Apply

5.5 Voltage Fluctuation and Flicker

Test Requirement ..... : EN 61000-3-3

Test Method ..... : EN 61000-3-3

Test Result..... : Pass

5.5.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 23.8°C

Humidity..... : 43.6%RH

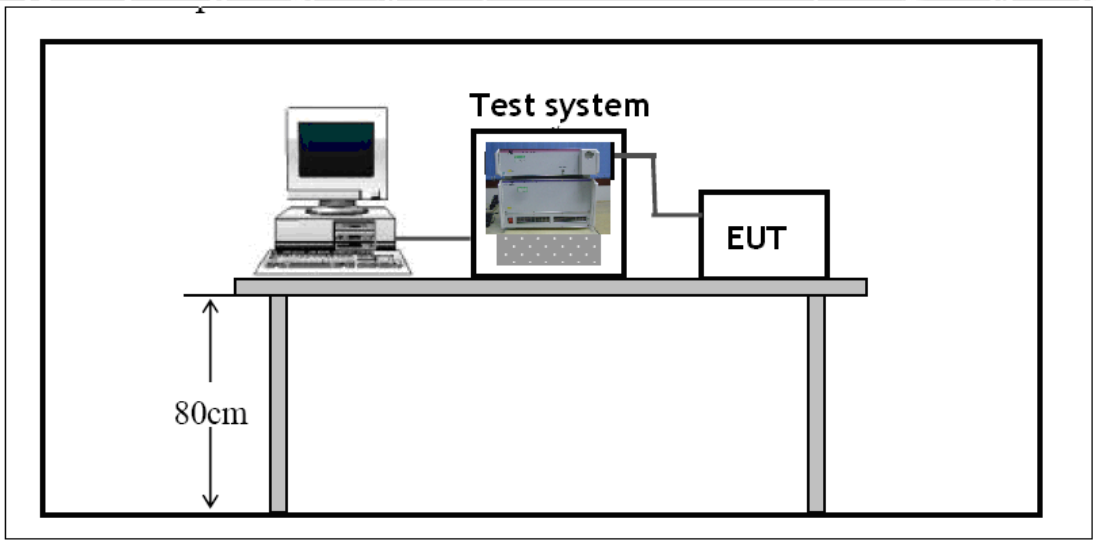
EUT Operation:

Input Voltage ..... : 230V~, 50Hz

Operating Mode..... : On mode

5.5.2 Block Diagram of Setup

The Harmonics test was performed in accordance with the EN 61000-3-3.



5.5.3 Voltage Fluctuation and Flicker Test Data

	d_c（%）	d_{max} (%)	T_{max}(ms)	P_{st}	P_{lt}
Limits	3.3	4	500ms	N/A	N/A
Result	0.000	0.035	0	N/A	N/A

6 Immunity Test Results

6.1 Performance Criteria

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.

6.2 Electrostatic Discharge (ESD)

Test Requirement	:	EN 61547
Test Method	:	IEC 61000-4-2
Test Result	:	Pass
Discharge Impedance	:	330Ω / 150pF
Discharge Voltage	:	Air Discharge: ±8kV Contact Discharge: ±4kV HCP & VCP: ±4kV
Polarity	:	Positive & Negative
Number of Discharge	:	Minimum 10 times at each test point
Discharge Mode	:	Single Discharge
Discharge Period	:	1 second minimum

6.2.1 E.U.T. Operation

Operating Environment:

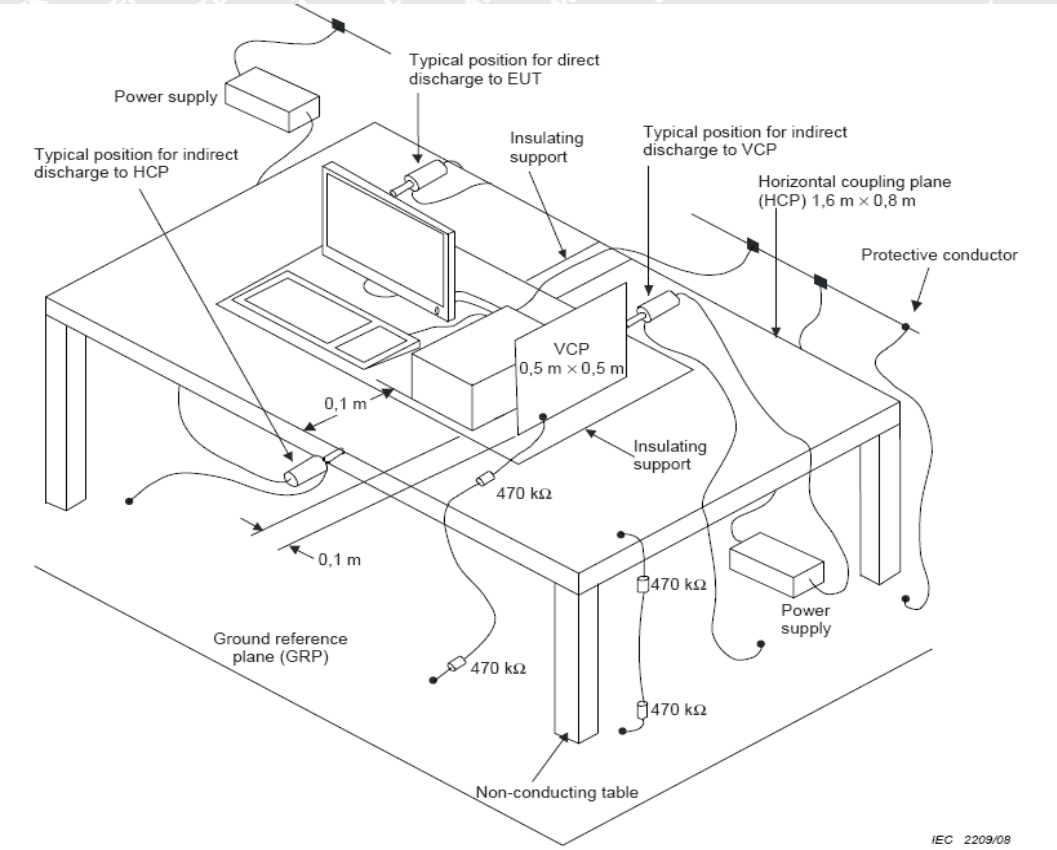
Temperature	:	22.6°C
Humidity	:	51.8%RH
Barometric Pressure	:	100.3kPa

EUT Operation:

Input Voltage	:	230V~, 50Hz
Operating Mode	:	On mode

6.2.2 Block Diagram of Setup

The ESD test was performed in accordance with the IEC 61000-4-2.



6.2.3 Direct Discharge Test Results

Observations: **Test points:** **1. All Exposed Surface & Seams;**
2. All metallic part

Direct Discharge			Test Results		
Applied Voltage (kV)	**Performance Criterion**	**Test Point**	**Contact Discharge**	**Air Discharge**	**Actual performance**
±8	B	1	N/A	Pass*	A
±4	B	2	Pass*	N/A	A

Remark:

* During the test no deviation was detected to the selected operation mode(s)

6.2.4 Indirect Discharge Test Results

Observations: **Test points:** **1. All sides.**

Indirect Discharge			Test Results		
Applied Voltage (kV)	Performance Criterion	Test Point	Horizontal Coupling	Vertical Coupling	Actual performance
±4	B	1	Pass*	Pass*	A

Remark:

* During the test no deviation was detected to the selected operation mode(s)

6.3 Radio-frequency electromagnetic fields, 80MHz to 1GHz

Test Requirement ..... : EN 61547

Test Method ..... : IEC 61000-4-3

Test Result ..... : Pass

Frequency Range ..... : 80MHz to 1GHz

Test level ..... : 3V/m

Modulation ..... : 80%, 1kHz Amplitude Modulation.

Face of EUT ..... : Front, Back, Left, Right

Antenna polarisation ..... : Horizontal& Vertical

6.3.1E.U.T. Operation

Operating Environment:

Temperature ..... : 21.7°C

Humidity ..... : 50.8%RH

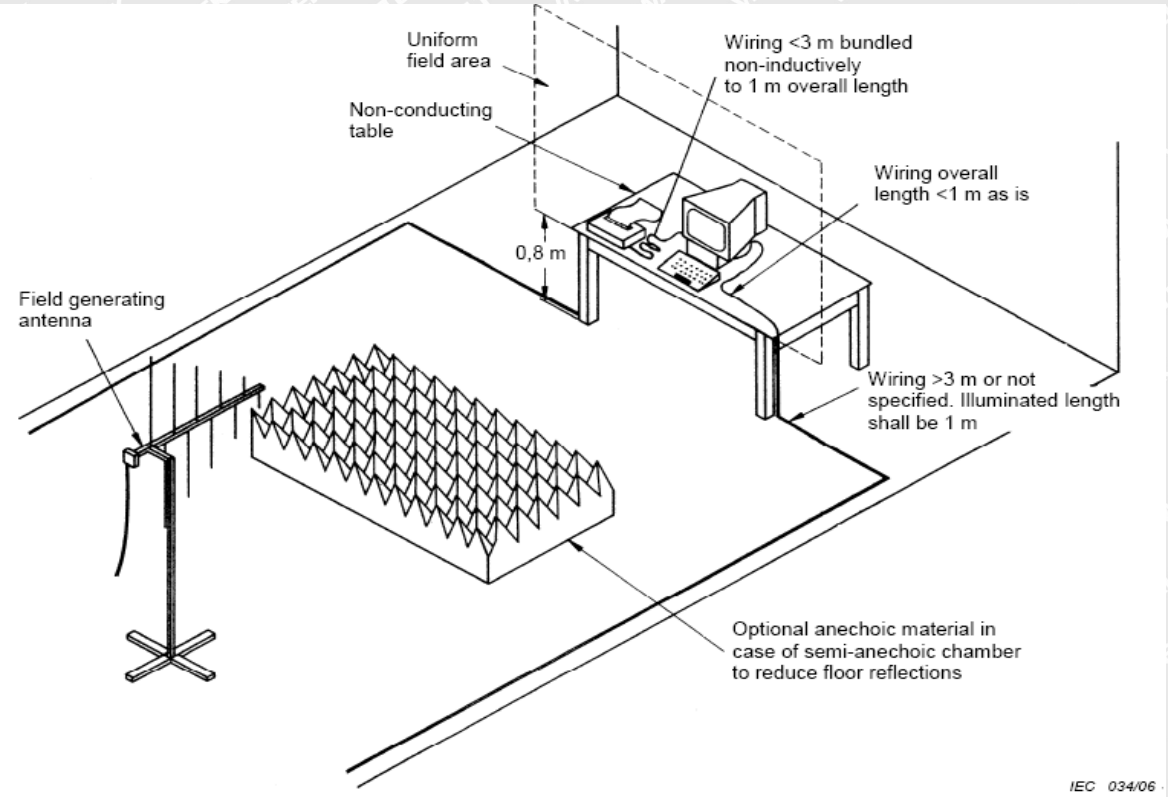
EUT Operation:

Input Voltage ..... : 230V~, 50Hz

Operating Mode ..... : On mode

6.3.2 Block Diagram of Setup

The Radio-frequency electromagnetic fields Immunity test was performed in accordance with the IEC 61000-4-3.



6.3.3 Test Results

Frequency	Face of EUT	Antenna polarisation	Test Level	Step Size	Dwell Time	Performance Criterion	Result	Actual perfor-mance
80 to 1000MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	3s	A	Pass*	A
80 to 1000MHz	Front, Back, Left, Right	Vertical	3V/m	1%	3s	A	Pass*	A

Remark:

* During the test no deviation was detected to the selected operation mode(s)

6.4 Electrical Fast Transients (EFT)

Test Requirement ..... : EN 61547

Test Method ..... : IEC 61000-4-4

Test Result ..... : Pass

Test Level ..... : 1.0kV on AC Mains

Polarity ..... : Positive & Negative

Repetition Frequency .... : 5kHz

Burst Duration ..... : 300ms

Test Duration ..... : 2 minutes per level & polarity

6.4.1E.U.T. Operation

Operating Environment:

Temperature ..... : 22.6°C

Humidity ..... : 51.8%RH

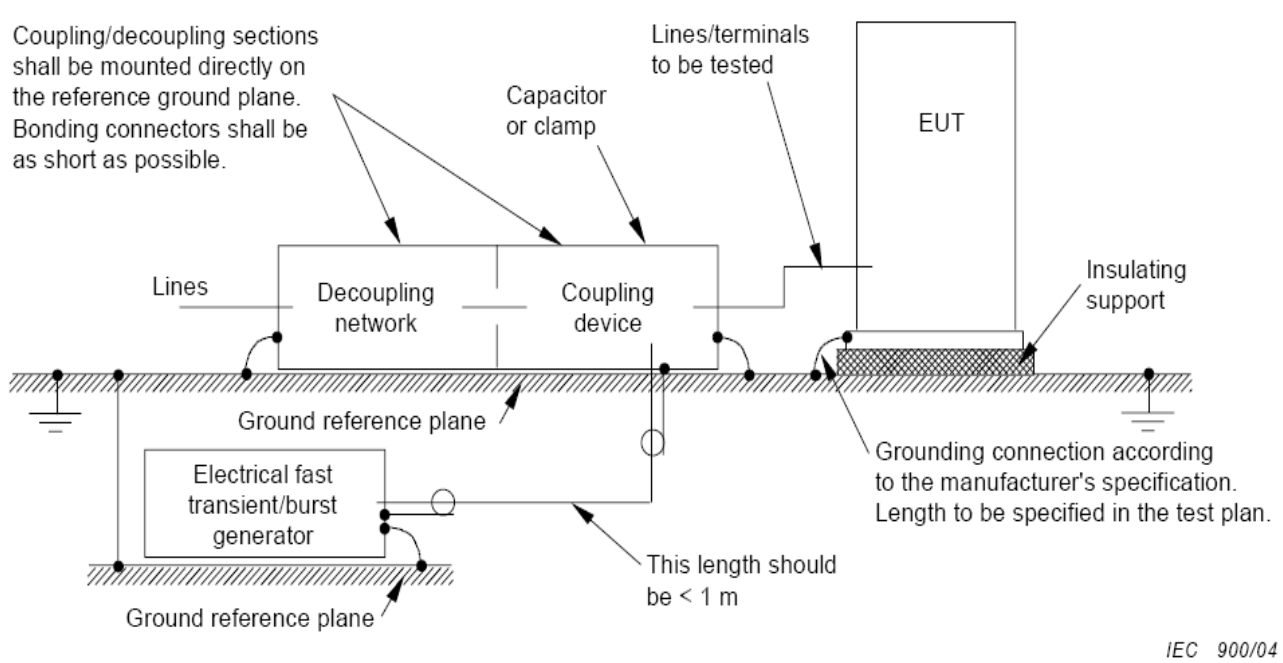
EUT Operation:

Input Voltage ..... : 230V~, 50Hz

Operating Mode ..... : On mode

6.4.2 Block Diagram of Setup

The Electrical Fast Transients Immunity test was performed in accordance with the IEC 61000-4-4.



6.4.3 Test Results

Test Port	Test Level(kV)	Performance Criterion	Result	Actual performance
Line-Neutral-PE	±1.0	B	Pass*	A

Remark:

* During the test no deviation was detected to the selected operation mode(s)

6.5 Surge

Test Requirement..... : EN 61547

Test Method..... : IEC 61000-4-5

Test Result..... : Pass

Test level..... : Table 10 of EN 61547

Interval ..... : 60s between each surge

No. of surges ..... : 5 positive at 90°, 5 negative at 270°.

6.5.1E.U.T. Operation

Operating Environment:

Temperature ..... : 22.6°C

Humidity..... : 51.8%RH

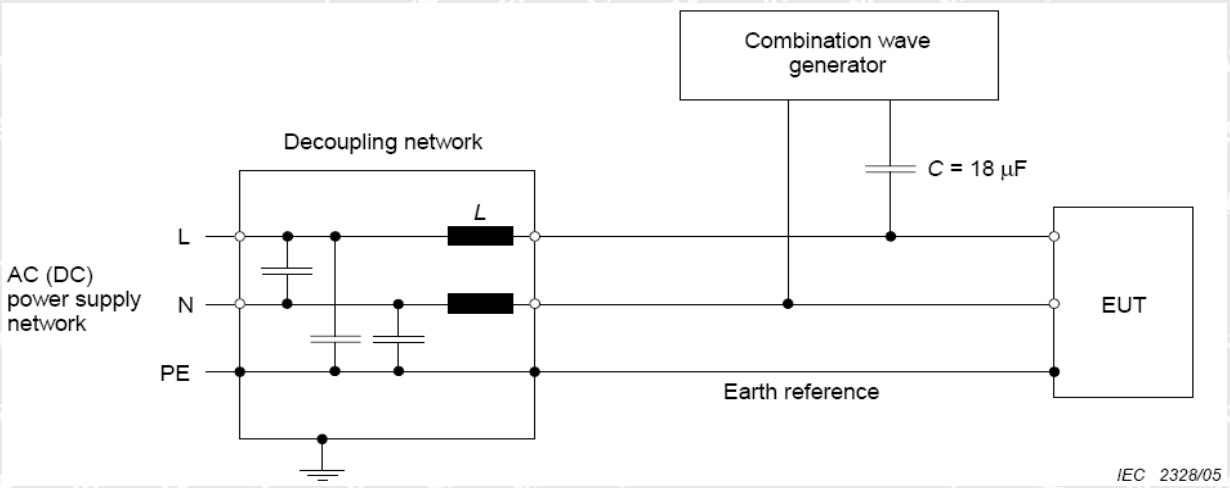
EUT Operation:

Input Voltage ..... : 230V~, 50Hz

Operating Mode..... : On mode

6.5.2Block Diagram of Setup

The Surge Immunity test was performed in accordance with the IEC 61000-4-5.



6.5.3Test Results

Test Port	Applied Voltage (kV)	Performance criterion	Result	Actual performance
Between Live And Neutral	错误!未找到引用源。1	C	Pass*	A
Between Live And Earth	错误!未找到引用源。2	C	Pass*	A
Between Neutral And Earth	错误!未找到引用源。2	C	Pass*	A

Remark:

* During the test no deviation was detected to the selected operation mode(s)

6.6 Injected Currents Immunity 0.15MHz to 80MHz

Test Requirement..... : EN 61547

Test Method..... : IEC 61000-4-6

Test Result..... : Pass

Frequency Range..... : 0.15MHz to 80MHz

Test level..... : 3V r.m.s. (unmodulated emf into 150 Ω)

Modulation..... : 80%, 1kHz Amplitude Modulation.

6.6.1E.U.T. Operation

Operating Environment:

Temperature..... : 22.7°C

Humidity..... : 50.2%RH

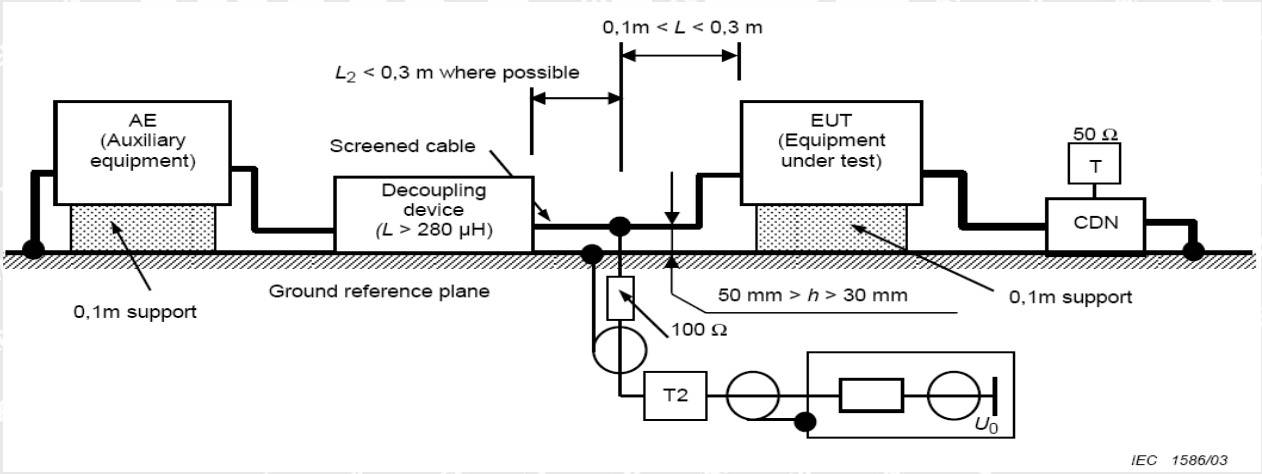
EUT Operation:

Input Voltage..... : 230V~, 50Hz

Operating Mode..... : On mode

6.6.2 Block Diagram of Setup

The Injected Currents Immunity test was performed in accordance with the IEC 61000-4-6.



6.6.3Test Results

Frequency	Line	Test Level	Modulation	Step Size	Dwell Time	Performance Criterion	Result	Actual perform-ance
0.15MHz to 80MHz	3 Wire AC Supply Cables	3Vr.m.s.	80%, 1kHz Amp. Mod.	1%	3s	A	Pass*	A

Remark:

* During the test no deviation was detected to the selected operation mode(s)

6.7 Voltage Dips and Interruptions

Test Requirement..... EN 61547

Test Method..... IEC 61000-4-11

Test Result..... Pass

Test Level(Voltage reduction) 0%&70 % of U_T (Supply Voltage)

No. of Dips / Interruptions..... 1 per Level at 20ms intervals

6.7.1E.U.T. Operation

Operating Environment:

Temperature ..... 22.6°C

Humidity..... 51.8%RH

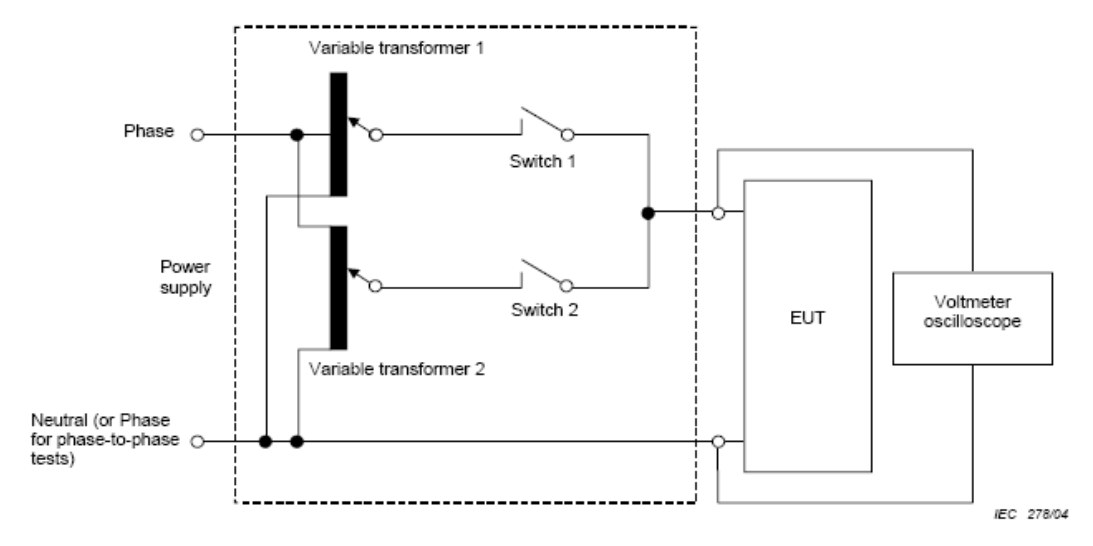
EUT Operation:

Input Voltage ..... 230V~, 50Hz

Operating Mode..... On mode

6.7.2 Block Diagram of Setup

The Voltage Dips and Interruptions Immunity test was performed in accordance with the IEC 61000-4-11.



6.7.3Test Results

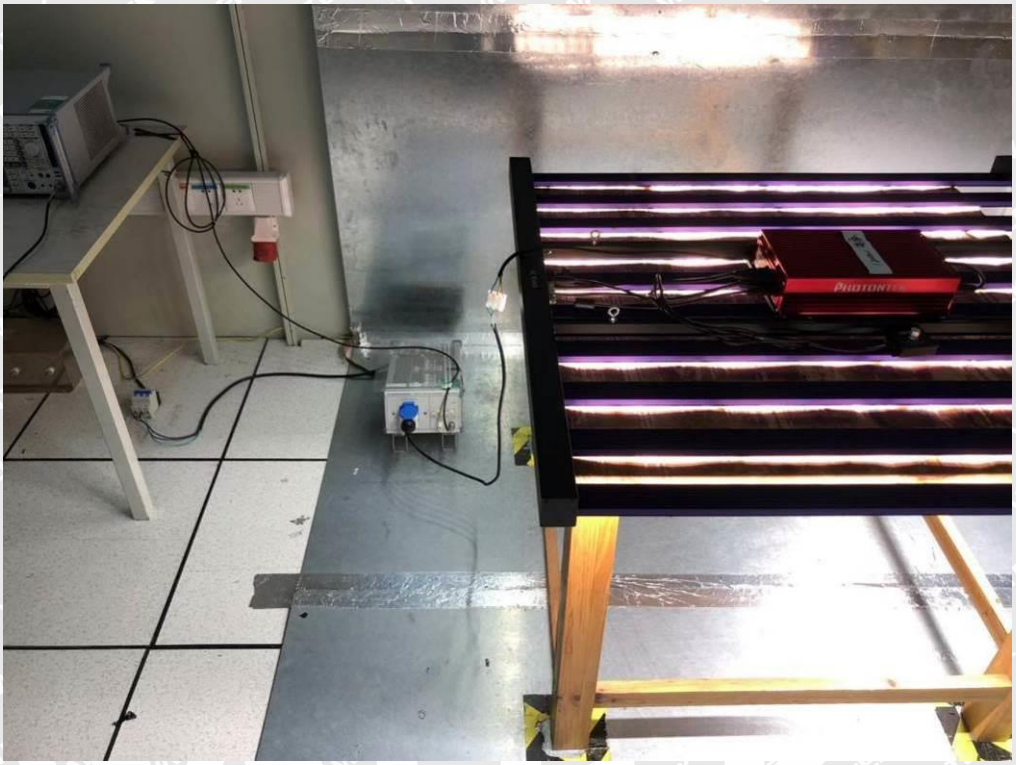
Test Level in %U_T	Phase	Performance criterion	Duration	Result	Actual performance
0	0° & 180°	B	0.5	Pass*	A
70	0° & 180°	C	10	Pass*	A

Remark:

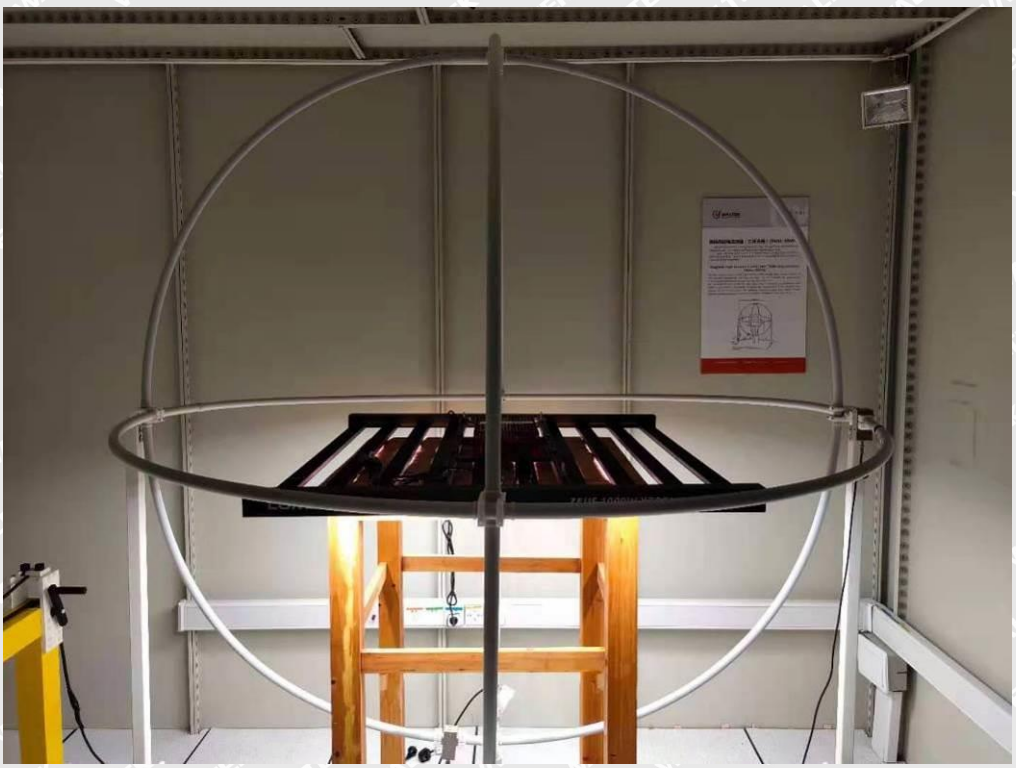
* During the test no deviation was detected to the selected operation mode(s)

7 Photographs – Test Setup

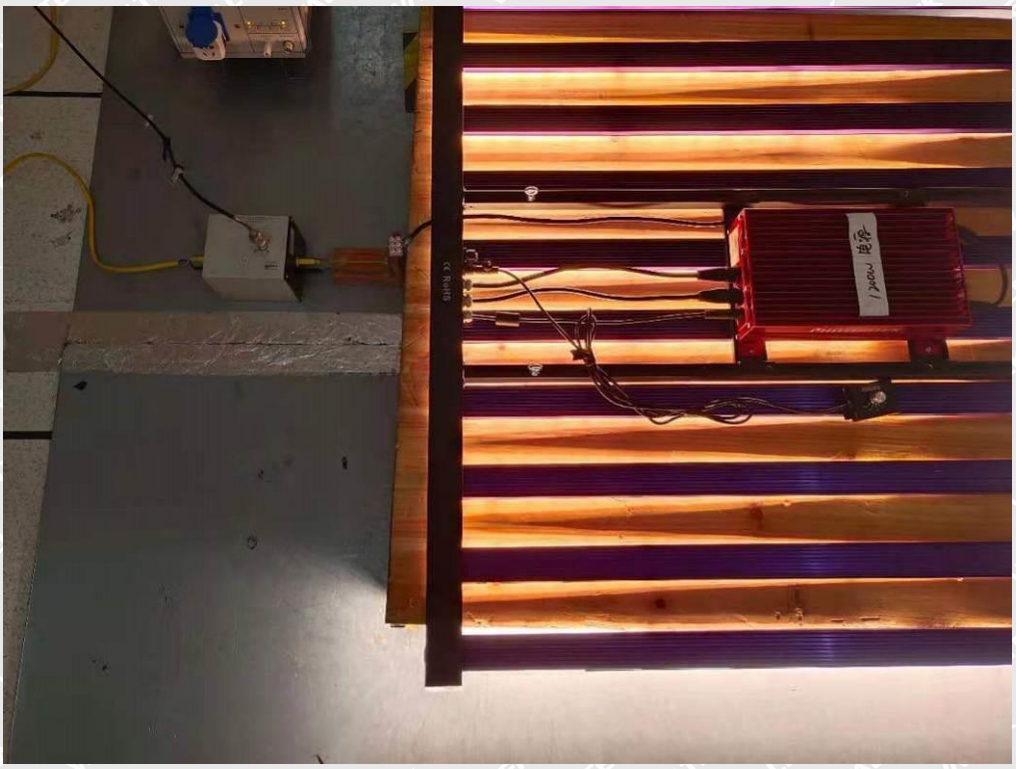
7.1 Photograph – Mains Terminal Disturbance Voltage Test Setup



7.2 Photograph – Radiated electromagnetic disturbance Test Setup, 9kHz to 30MHz

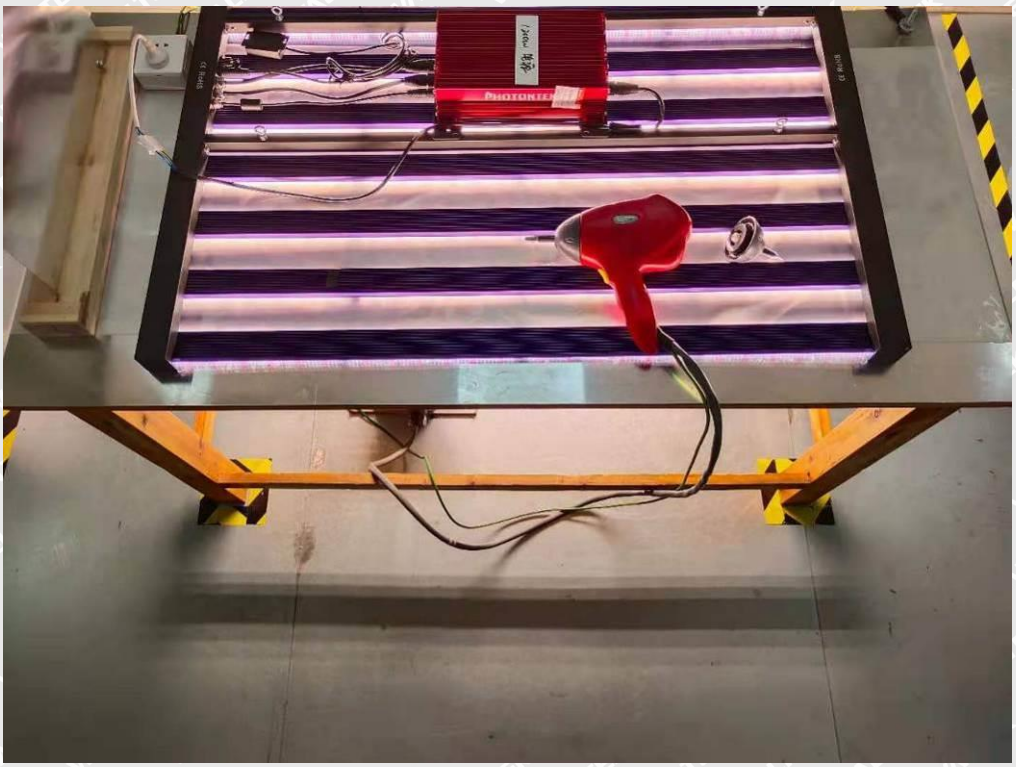


7.3 Photograph – Radiated Emission(CDNE method) Test Setup, 30MHz to 300MHz



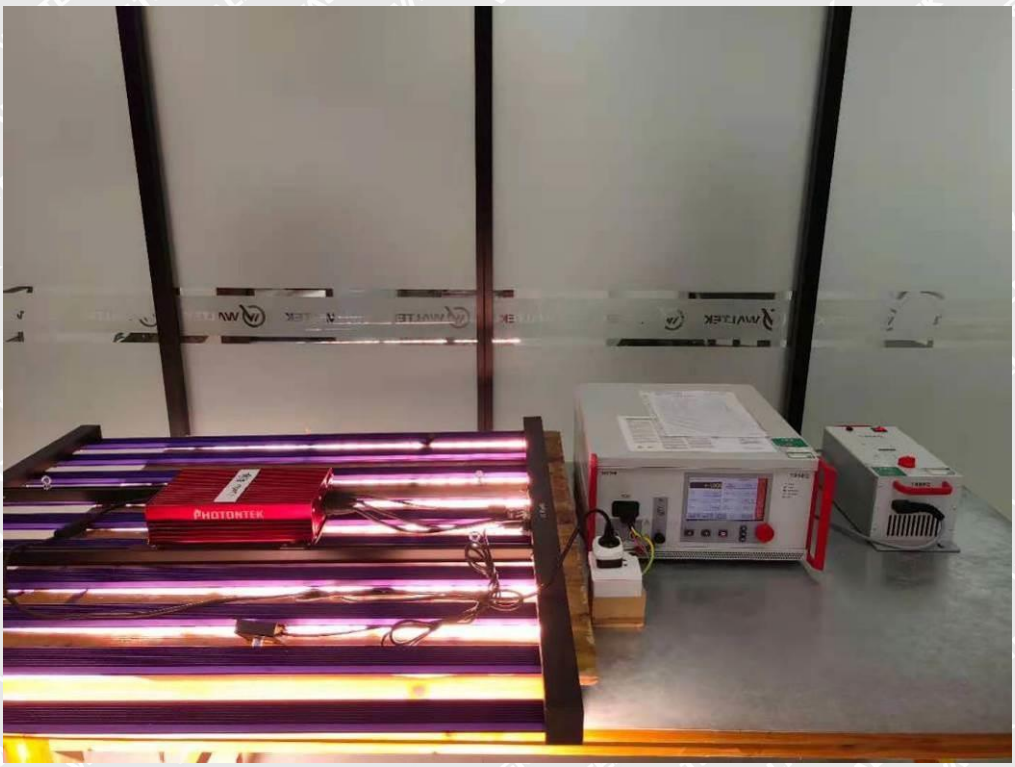
7.4 Photograph – Harmonic Current and Flicker

7.5 Photograph – ESD Immunity Test Setup

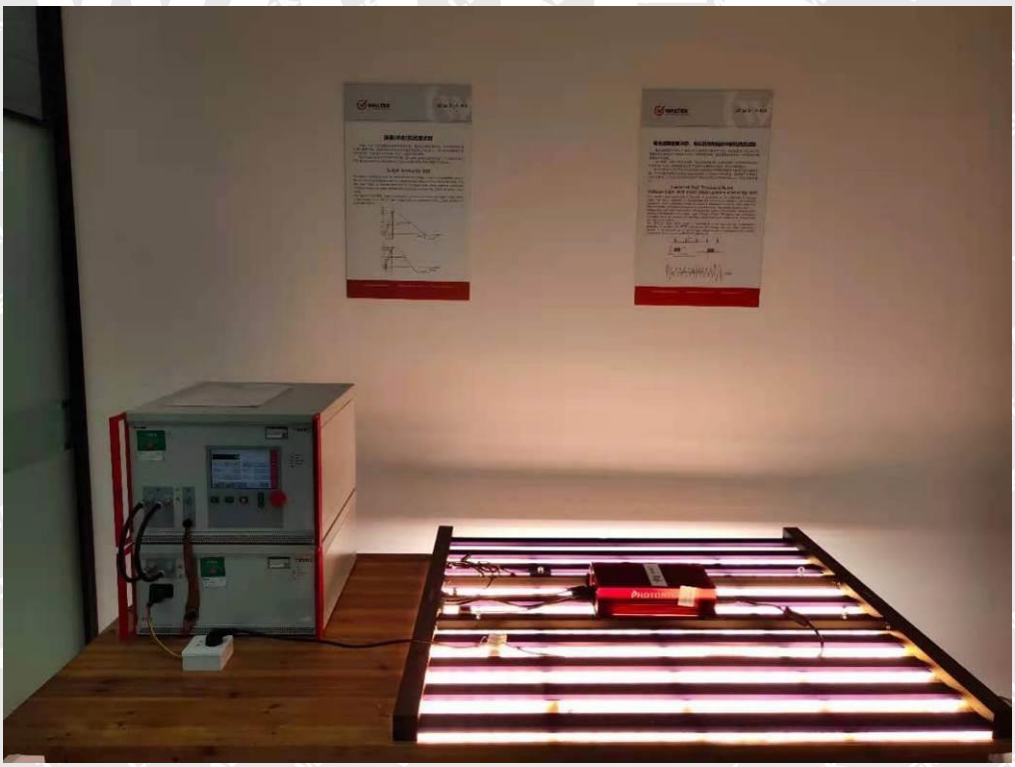


7.6 Photograph – Radio-frequency electromagnetic fields Immunity Test Setup

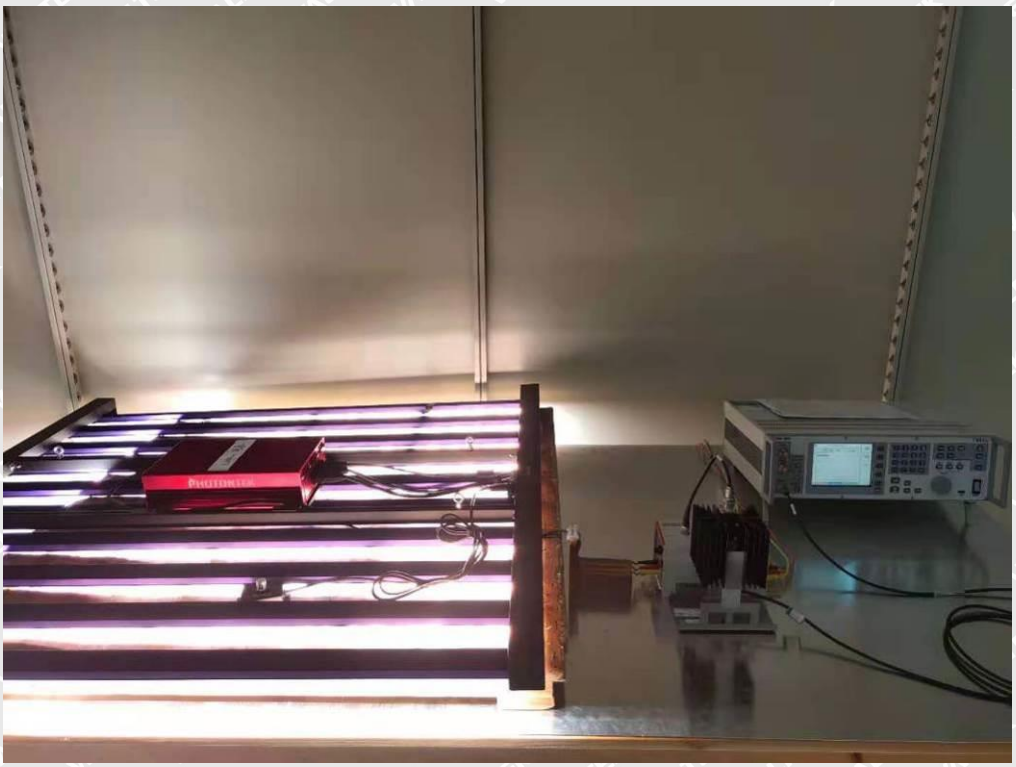
7.7 Photograph – EFT & Voltage Dips and Interruptions Immunity Test Setup



7.8 Photograph – Surge Immunity Test Setup

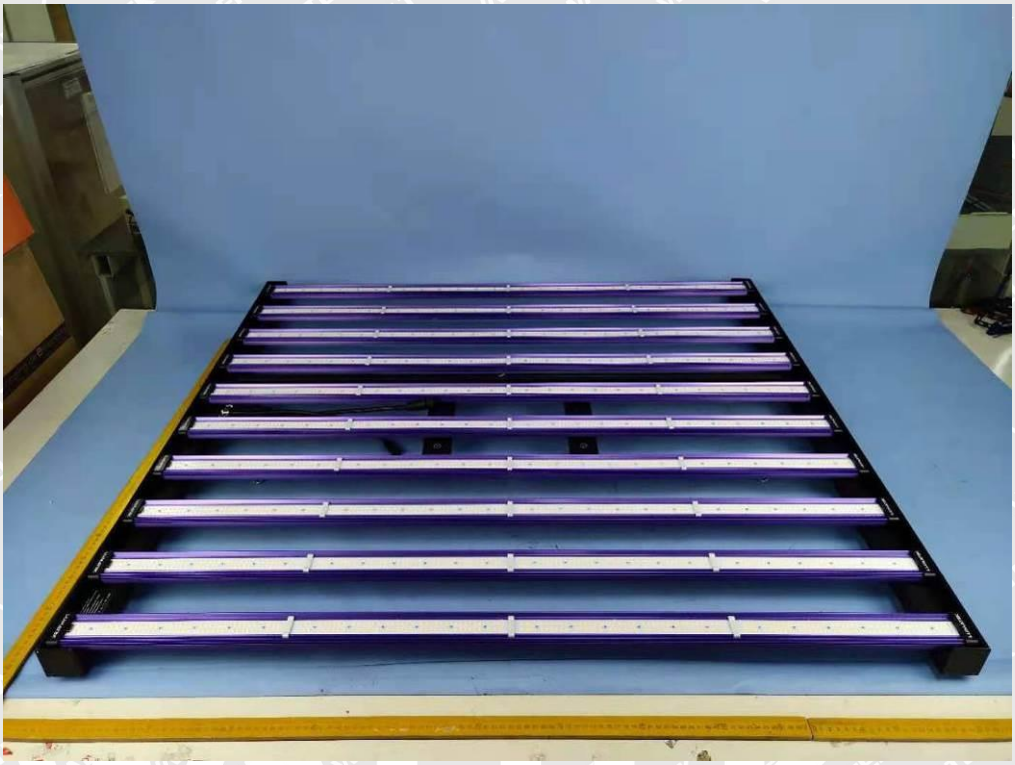


7.9 Photograph – Injected Currents Immunity Test Setup



8 Photographs – Constructional Details

8.1 EUT – Front View



8.2 EUT – Back View

======End of Report======