



TEST REPORT

Reference No...... : WTF15F0122431E
Applicant..... : Foshan Nanhai Vorld Lighting Co., Ltd.
Address..... : 18th west Taoyuan Road, Shishan Town, Nanhai District, Foshan City, Guangdong Province
Manufacturer..... : The same as above
Address..... : The same as above
Product Name..... : LED Lamp
Model No..... : 37650008/01(VC1854-6), VC1854-8
Standards..... : EN 55015:2013
EN 61547:2009
EN 61000-3-2:2006+A1:2009+A2:2009
EN 61000-3-3:2013
Date of Receipt sample..... : 2015-01-27
Date of Test..... : 2015-01-28 to 2015-02-04
Date of Issue..... : 2015-02-05
Test Report Form No...... : WEL-55015A-01A
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.

Prepared By:

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1 Test Summary

EMISSION				
Test Item	Test Standard		Class / Severity	Result
Mains Terminal Disturbance Voltage, 9kHz to 30MHz	EN 55015:2013		Clause 4.3.1	Pass
Radiated electromagnetic disturbance, 9kHz to 30MHz	EN 55015:2013		Clause 4.4.1	Pass
Radiated Emission, 30MHz to 300MHz	EN 55015:2013		Clause 4.4.2	Pass
Harmonic Current emission	EN 61000-3-2:2006+A1:2009+A2:2009		Class C	Pass
Voltage Fluctuation and Flicker	EN61000-3-3:2013		Clause 5	Pass**
IMMUNITY (EN61547:2009)				
Test Item	Test Method	Class / Severity	Performance Criteria	Result
Electrostatic Discharge(ESD)	IEC 61000-4-2:2008	±4 kV Contact ±8 kV Air	B	Pass
Radio-frequency electromagnetic fields (80MHz to 1GHz)	IEC 61000-4-3:2010	3V/m, 80%, 1kHz, Amp. Mod.	A	Pass
Electrical Fast Transients (EFT)	IEC 61000-4-4:2012	AC ±1.0kV DC ±0.5kV	B	Pass
Surge	IEC 61000-4-5:2005	±1kV D.M.† ±2kV C.M.‡	C	Pass
Injected Currents, 0.15MHz to 80MHz	IEC 61000-4-6:2013	3Vr.m.s.(emf), 80%, 1kHz Amp. Mod.	A	Pass
Power-frequency magnetic field	IEC 61000-4-8:2009	3A/m	A	N/A
Voltage Dips and Interruptions	IEC 61000-4-11:2004	0 % UT* for 0.5per	B	Pass
		70 % UT* for 10per	C	Pass

Remark:

Pass

Fail

N/A

A.M

†

‡

*

**

Test item meets the requirement

Test item does not meet the requirement

Test case does not apply to the test object

Amplitude Modulation

Differential Mode

Common Mode

U_T is the nominal supply voltage

According to EN61000-3-3 which states: "Pst and Plt evaluations are required only for lighting equipment which is likely to produce flicker; for example: disco lighting and automatically regulated equipment." Incandescent lamp luminaires with ratings less than or equal to 1 000 W and discharge lamp luminaires with ratings less than or equal to 600 W, are deemed to comply with the dmax limits in this standard and are not required to be tested."

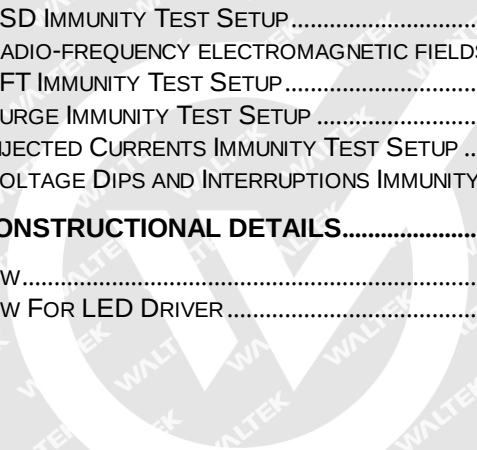


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3 General Information

3.1 General Description of E.U.T.

Product Name : LED Lamp

Model No. : 37650008/01(VC1854-6), VC1854-8

Remark : Two models are identical product only their appearance and rated power is different, model VC1854-8 is the biggest power model, therefore it can represent 37650008/01(VC1854-6) to perform EMC tests.

3.2 Details of E.U.T.

Technical Data : AC 220-240V, 50/60Hz, 37650008/01(VC1854-6):LED 6x4W, VC1854-8:LED 8x4W

3.3 Description of Support Units

The EUT has been tested as an independent unit. VC1854-8 is the test sample. The DV&RE tests were performed in the condition of AC245V/50Hz input. The other tests were performed in the condition of AC 230V/50Hz input.

3.4 Standards Applicable for Testing

The tests were performed according to following standards:

EN 55015:2013	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
EN 61000-3-2:2006 +A1:2009+A2:2009	Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase).
EN 61000-3-3:2013	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.



3.5 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A**

Waltek Services (Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration 7760A, August 03, 2010.

- **FCC – Registration No.: 880581**

Waltek Services (Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, May 26, 2011.

3.6 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: Radiated Immunity (80MHz to 1GHz)

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

3.7 Abnormalities from Standard Conditions

None.



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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	101178	Valid
2.	LISN	R&S	ENV216	101215	Valid
3.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Valid
4.	Cable	HUBER+SUHNER	CBL2-NN-3M	2230300	Valid
5.	Switch	ESE	RSU/M2	---	Valid
Radiated electromagnetic disturbance(9kHz to 30MHz)					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EMI Test Receiver	R&S	ESCI	101178	Valid
2	Three Loops Antenna	SCHWARZBECK	HXYZ9170	213	Valid
Discontinuous Disturbance					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	Discontinues Disturbance Analyzer	TESEQ	DIA1512D	28302	Valid
2.	LISN	R&S	ENV216	101215	Valid
CDN method for Lighting Equipments' Radiated Disturbance					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1	EMI Test Receiver	R&S	ESCI	101178	Valid
2	CDN	TESEQ	M016	31586	Valid
3	Cable	HUBER+SUHNER	CBL2-NN-3M	2230300	Valid
Harmonics and Flicker Measuring System					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	Harmonics and Flicker Measuring System	TESEQ	PROFLINE210 5-400	1133A014 98	Valid
ESD					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	ESD Simulator	TESEQ	NSG437	521	Valid
Radio-frequency electromagnetic fields					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	RF Generator	R&S	SMB100A- B106	105942	Valid
2.	RF Power Amplifier	R&S	BLWA0830- 160/100/40D	128740	Valid



3.	Logarithmic periodic antenna	R&S	STLP9128D	043	Valid
4.	Dynamometer	R&S	NRP2-2*Z91	102031	Valid
EFT & Voltage Dips and Interruptions					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EMS test system	TESEQ	NSG3040	0319	Valid
2.	Clamp	TESEQ	CDN8014	31405	Valid
Surge					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	Surge Simulator	TESEQ	NSG3060	1395	Valid
Injected Currents					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	Conducted Immunity test system	TESEQ	NSG4070-75	31469	Valid
2.	CDN	TESEQ	M016	31586	Valid
3.	Clamp	TESEQ	KEMZ801	32362	Valid

4.1 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Mains Terminal Disturbance Voltage	150kHz~30MHz	$\pm 2.66\text{dB}$	(1)
Radiated electromagnetic disturbance	9kHz to 30MHz	$\pm 3.00\text{dB}$	(1)
Radiated Emission(CDN method)	30MHz~300MHz	$\pm 3.32\text{dB}$	(1)
Radiated Emission	30MHz~300MHz	$\pm 5.03\text{dB}$	(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 55015 Clause 4.3.1

Test Method..... : EN 55015 Clause 8

Test Result : Pass

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

Class/Severity..... : Table 2a of EN55015

5.1.1 E.U.T. Operation

Operating Environment:

Temperature : 23.1°C

Humidity..... : 42.0%RH

Atmospheric Pressure..... : 101.2kPa

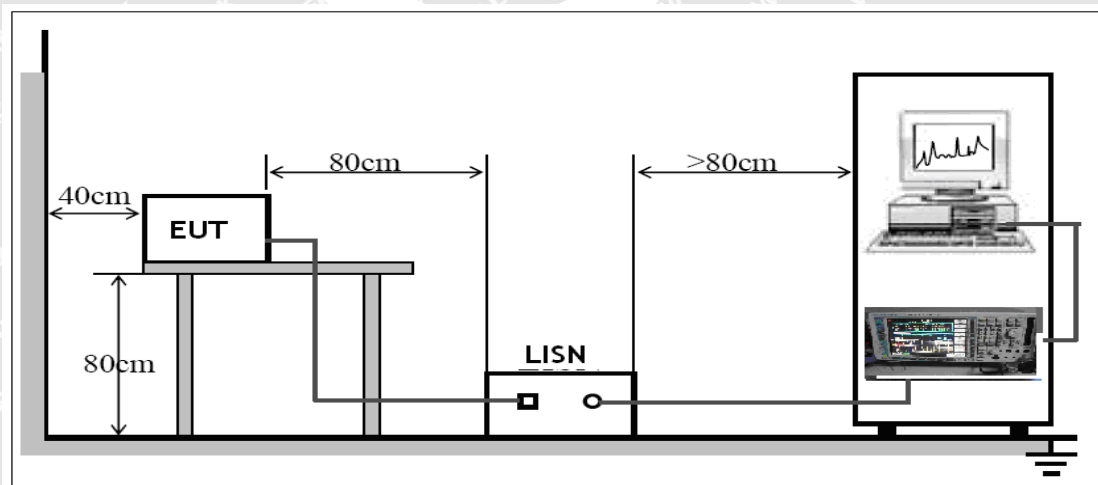
EUT Operation:

Input Voltage : AC 245V/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 55015.



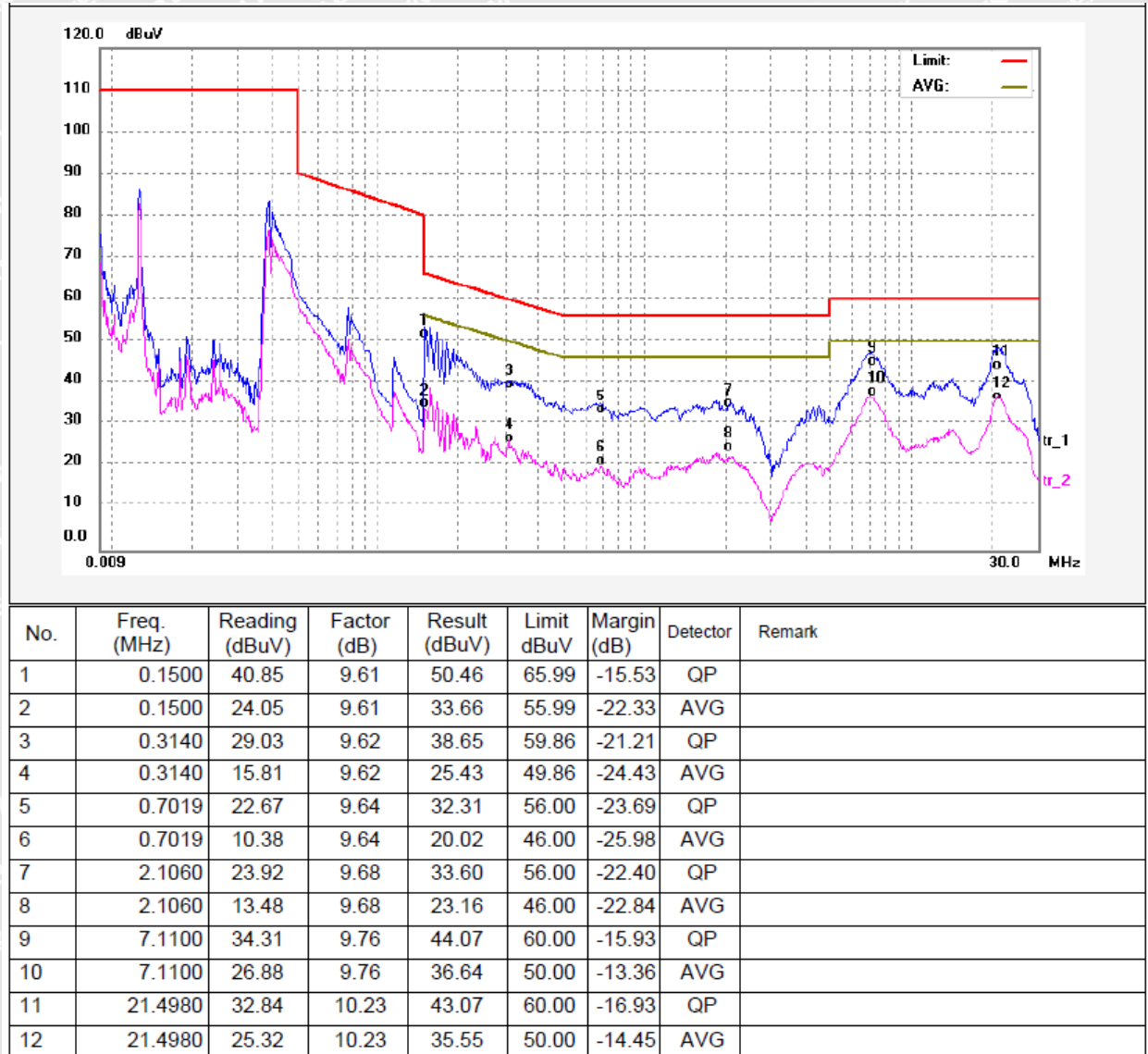


5.1.3 Measurement Data

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.

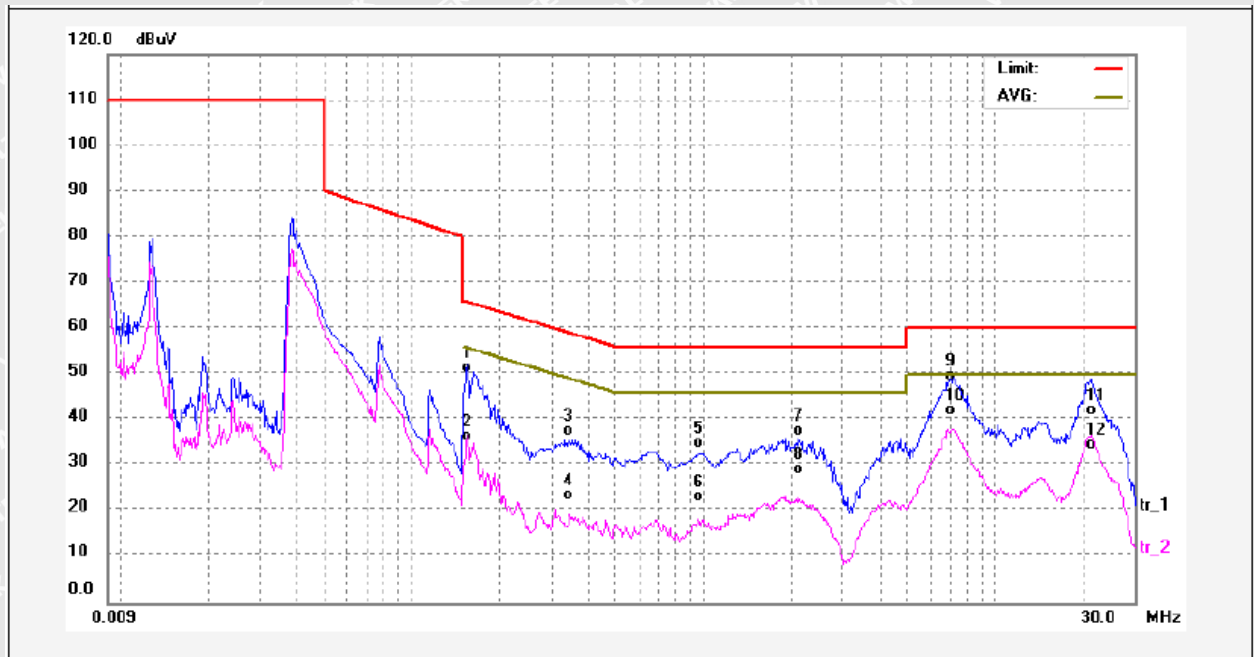
5.1.4 Mains Terminals Disturbance Voltage Test Data

Live Line :





Neutral Line :



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1539	40.69	9.61	50.30	65.78	-15.48	QP	
2	0.1539	25.52	9.61	35.13	55.78	-20.65	AVG	
3	0.3460	26.82	9.62	36.44	59.06	-22.62	QP	
4	0.3460	12.82	9.62	22.44	49.06	-26.62	AVG	
5	0.9860	24.22	9.65	33.87	56.00	-22.13	QP	
6	0.9860	12.33	9.65	21.98	46.00	-24.02	AVG	
7	2.1020	26.85	9.68	36.53	56.00	-19.47	QP	
8	2.1020	18.39	9.68	28.07	46.00	-17.93	AVG	
9	7.1740	38.79	9.76	48.55	60.00	-11.45	QP	
10	7.1740	31.14	9.76	40.90	50.00	-9.10	AVG	
11	21.4100	30.75	10.23	40.98	60.00	-19.02	QP	
12	21.4100	23.13	10.23	33.36	50.00	-16.64	AVG	



5.2 Radiated Electromagnetic Disturbance, 9kHz to 30MHz

Test Requirement..... : EN 55015 Clause 4.4.1

Test Method..... : EN 55015 Clause 9.1

Test Result : Pass

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

Class/Severity : Table 3a of EN55015

5.2.1 E.U.T. Operation

Operating Environment:

Temperature : 23.1°C

Humidity..... : 42.0%RH

Barometric Pressure : 101.2kPa

EUT Operation:

Input Voltage : AC 245V/50Hz

Operating Mode..... : On mode

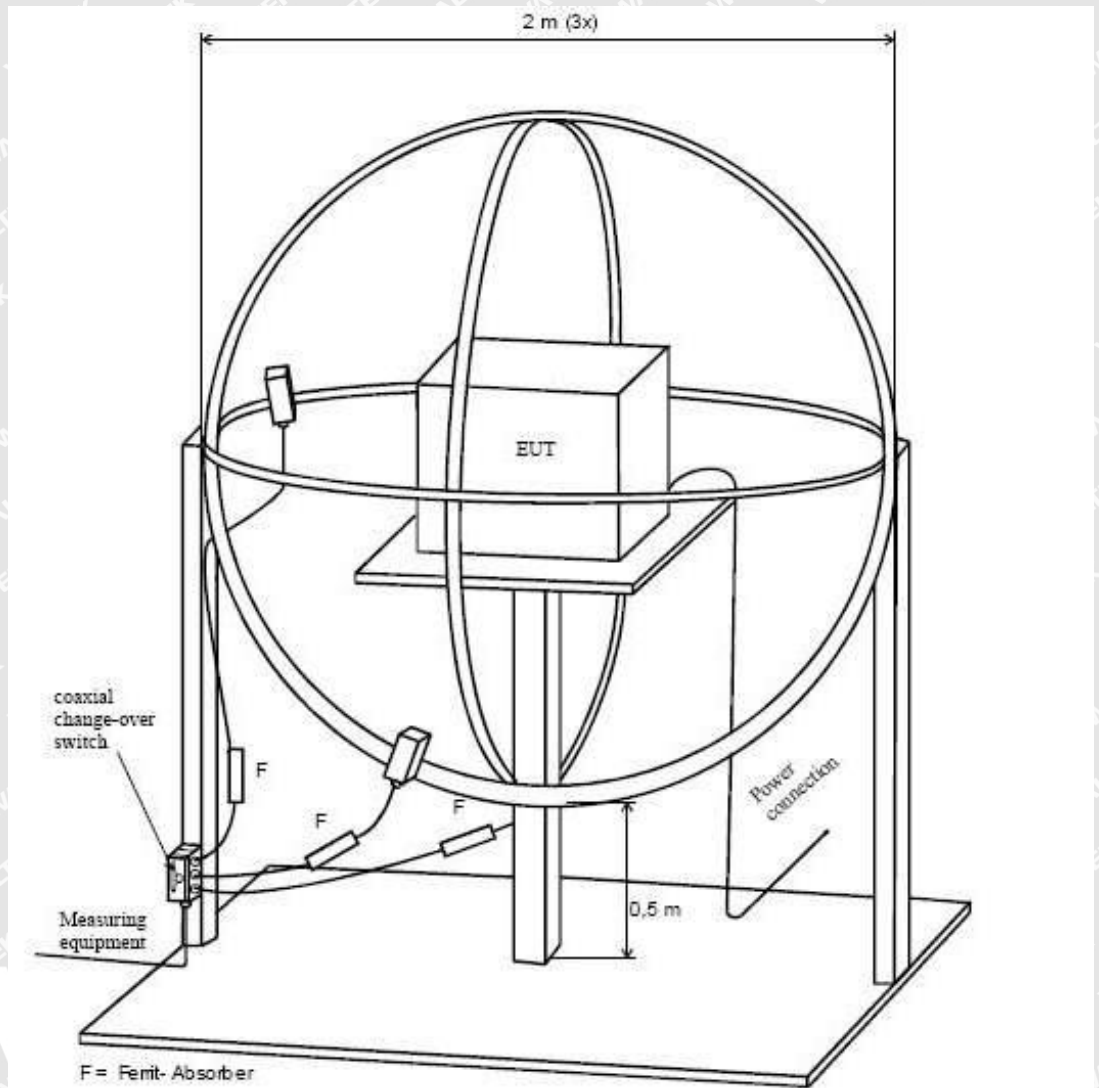


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5.2.2 Block Diagram of Test Setup

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



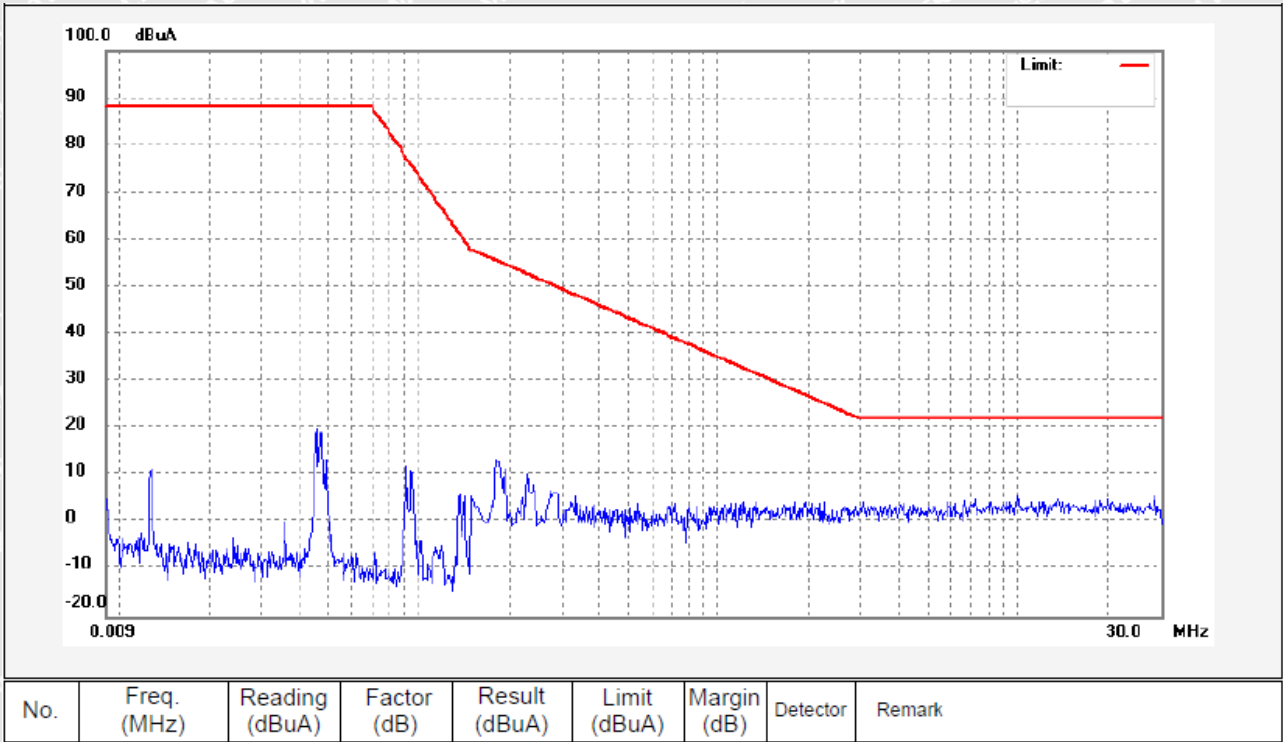
5.2.3 Measurement Data

According to the data in section 5.2.4, the EUT complied with the EN55015 standards.



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

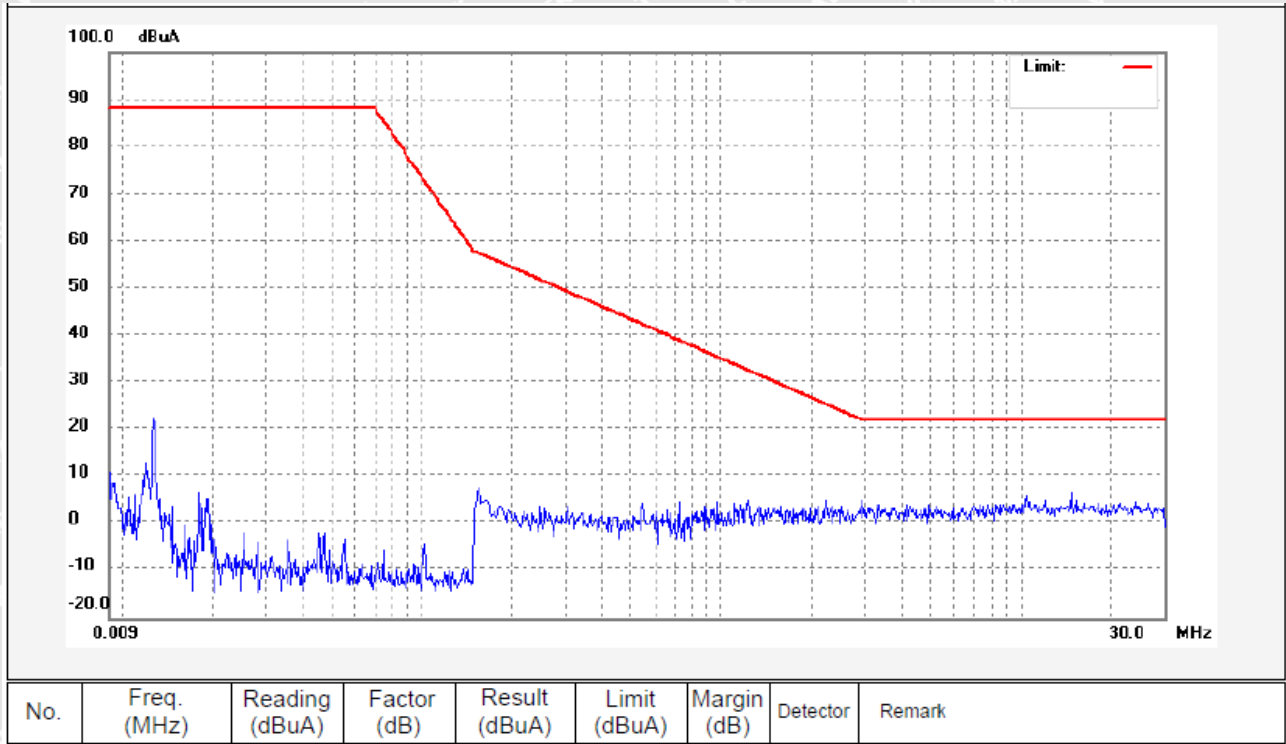
Loop X:



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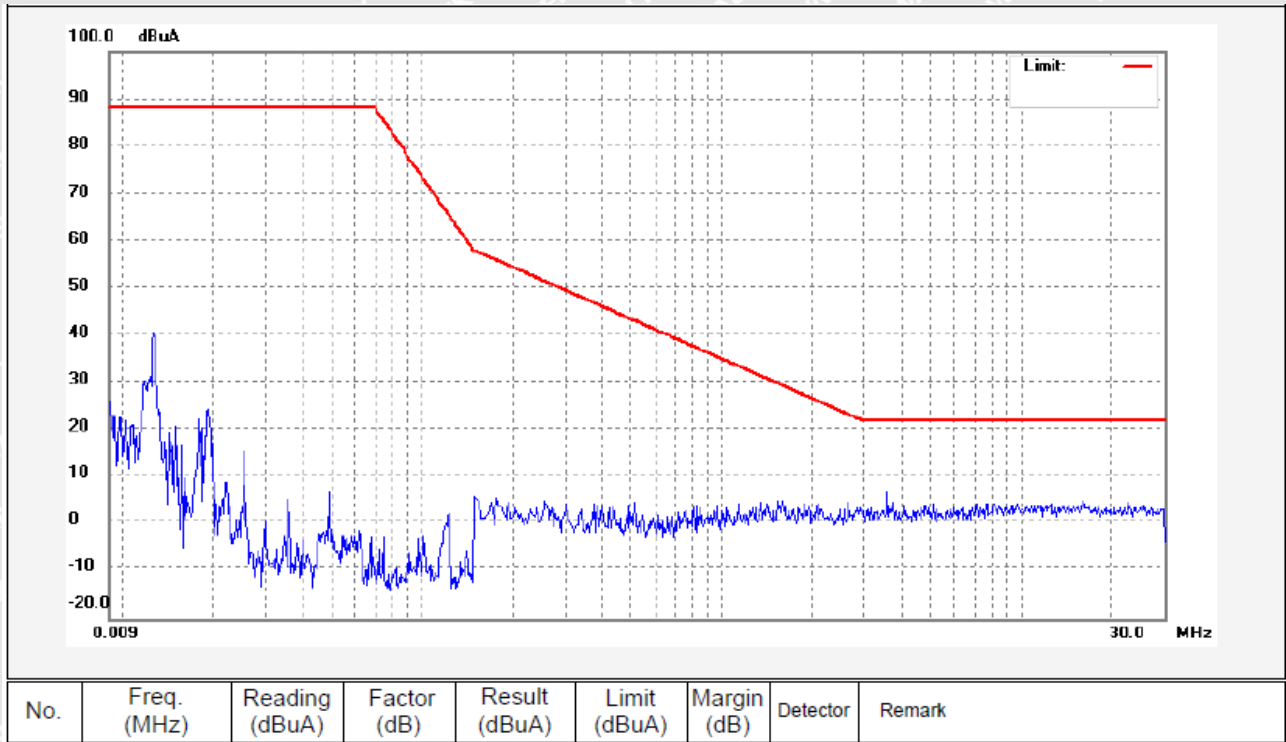
Loop Y:



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Loop Z:



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5.3 Radiated Emission, 30MHz to 300MHz

Test Requirement..... : EN 55015 Clause 4.4.2

Test Method..... : EN 55015 Annex B

Test Result..... : Pass

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

Class/Severity..... : Table B.1 of EN55015

5.3.1 E.U.T. Operation

Operating Environment:

Temperature..... : 23.1°C

Humidity..... : 42.0%RH

Atmospheric Pressure..... : 101.2kPa

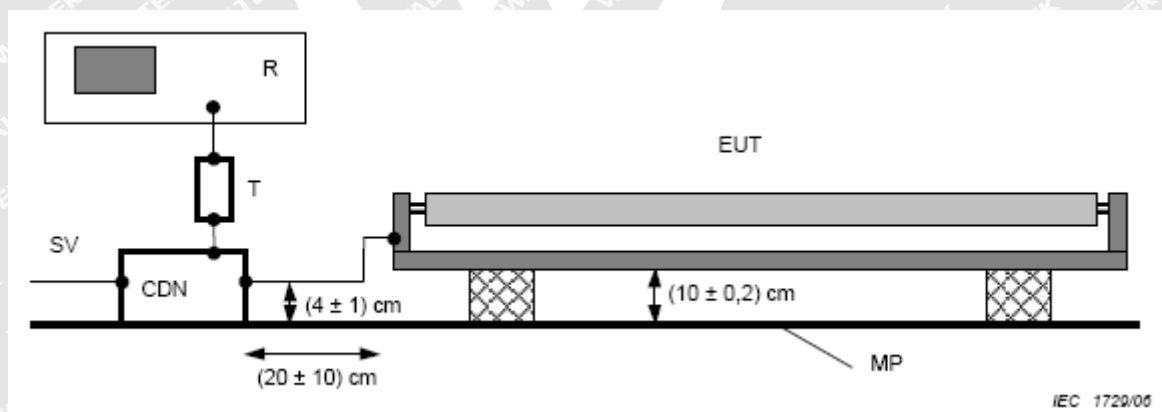
EUT Operation :

Input Voltage..... : AC 245V/50Hz

Operating Mode..... : On mode

5.3.2 Block Diagram of Setup

The Radiated Emission test was performed in accordance with EN55015 Annex B.

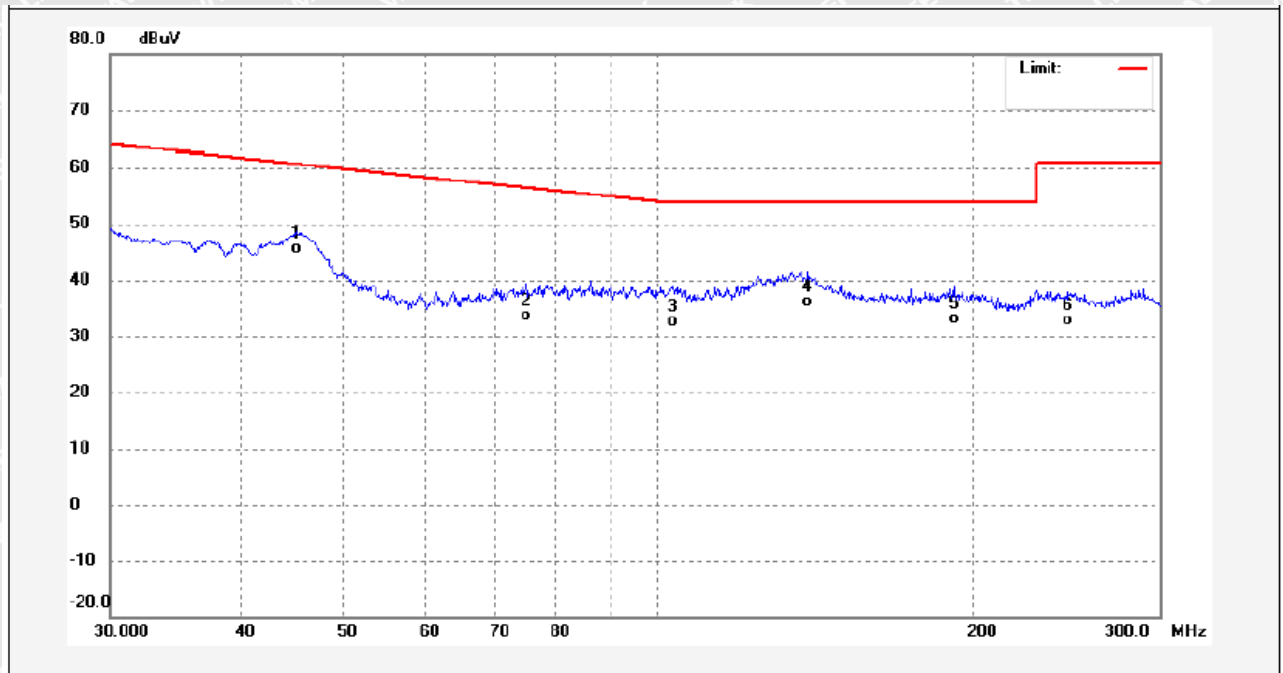


5.3.3 Measurement Data

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 4.4.2 of this standard.



5.3.4 Radiated Emission test data, 30MHz to 300MHz



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Remark
1	45.2800	28.28	16.25	44.53	60.58	-16.05	QP	
2	75.0000	16.44	16.27	32.71	56.39	-23.68	QP	
3	103.5199	15.40	16.33	31.73	54.00	-22.27	QP	
4	139.0000	18.66	16.40	35.06	54.00	-18.94	QP	
5	191.4400	15.69	16.42	32.11	54.00	-21.89	QP	
6	246.0800	15.06	16.90	31.96	61.00	-29.04	QP	

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5.4 Harmonics Current Emission

Test Requirement..... : EN61000-3-2

Test Method..... : EN61000-3-2

Test Result : Pass

Class/Severity..... : Class C

5.4.1 E.U.T. Operation

Operating Environment:

Temperature : 23.1°C

Humidity..... : 42.0%RH

Barometric Pressure : 101.2kPa

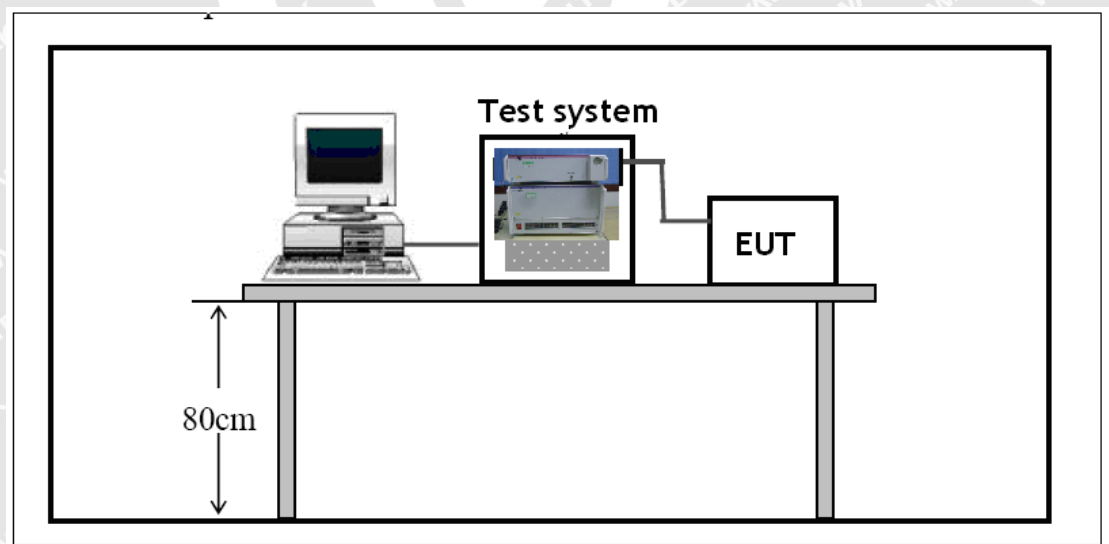
EUT Operation:

Input Voltage : AC 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 61000-3-2.





5.4.3 Harmonic Current Emission Test Data

Harmonics – Class-C per Ed. 4.0 (2014)(Run time)

EUT: LED Lamp VC1854-8 (WTF15F0122431E)

Tested by: Roy

Test category: Class-C per Ed. 4.0 (2014) (European limits)

Test Margin: 100

Test date: 2015/2/2

Start time: 10:40:03

End time: 10:42:54

Test duration (min): 2.5

Data file name: H-000473.cts_data

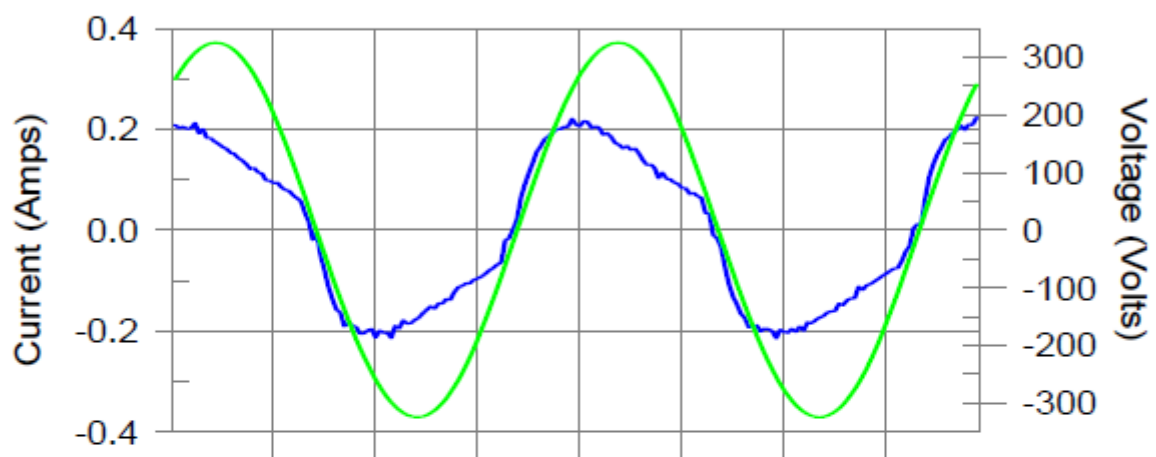
Comment: on mode

Customer: Foshan Nanhai Vorld Lighting Co.,Ltd

Test Result: Pass

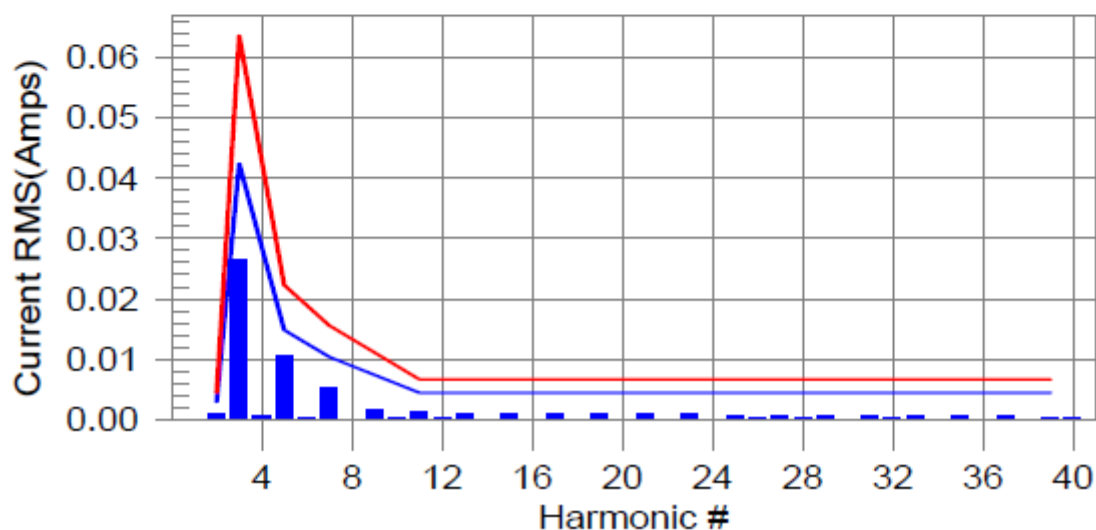
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class C limit line

European Limits



Test result: Pass Worst harmonics H5-72.2% of 100% limit, H5-49% of 150% limit.



Current Test Result Summary (Run time)

EUT: LED Lamp VC1854-8 (WTF15F0122431E) Tested by: Roy
 Test category: Class-C per Ed. 4.0 (2014) (European limits) Test Margin: 100
 Test date: 2015/2/2 Start time: 10:40:03 End time: 10:42:54
 Test duration (min): 2.5 Data file name: H-000473.cts_data
 Comment: on mode
 Customer: Foshan Nanhai World Lighting Co., Ltd

Test Result: Pass Source qualification: Normal
 THCA: 0.029 I-THD(%): 19.9 POHC(A): 0.000 POHC Limit(A): 0.014
 Highest parameter values during test:
 V_{RMS} (Volts): 230.01 Frequency(Hz): 50.00
 I_{Peak} (Amps): 0.241 I_{RMS} (Amps): 0.152
 I_{Fund} (Amps): 0.149 Crest Factor: 1.601
 Power (Watts): 33.1 Power Factor: 0.951

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	0.003	N/A	0.001	0.004	N/A	Pass
3	0.027	0.042	62.8	0.028	0.064	43.3	Pass
4	0.001	0.000	N/A	0.001	0.000	N/A	Pass
5	0.011	0.015	72.2	0.011	0.022	49.0	Pass
6	0.000	0.000	N/A	0.000	0.000	N/A	Pass
7	0.005	0.010	50.1	0.006	0.016	36.3	Pass
8	0.000	0.000	N/A	0.000	0.000	N/A	Pass
9	0.002	0.007	N/A	0.002	0.011	N/A	Pass
10	0.000	0.000	N/A	0.000	0.000	N/A	Pass
11	0.001	0.004	N/A	0.001	0.007	N/A	Pass
12	0.000	0.000	N/A	0.000	0.000	N/A	Pass
13	0.001	0.004	N/A	0.001	0.007	N/A	Pass
14	0.000	0.000	N/A	0.000	0.000	N/A	Pass
15	0.001	0.004	N/A	0.001	0.007	N/A	Pass
16	0.000	0.000	N/A	0.000	0.000	N/A	Pass
17	0.001	0.004	N/A	0.001	0.007	N/A	Pass
18	0.000	0.000	N/A	0.000	0.000	N/A	Pass
19	0.001	0.004	N/A	0.001	0.007	N/A	Pass
20	0.000	0.000	N/A	0.000	0.000	N/A	Pass
21	0.001	0.004	N/A	0.001	0.007	N/A	Pass
22	0.000	0.000	N/A	0.000	0.000	N/A	Pass
23	0.001	0.004	N/A	0.001	0.007	N/A	Pass
24	0.000	0.000	N/A	0.000	0.000	N/A	Pass
25	0.001	0.004	N/A	0.001	0.007	N/A	Pass
26	0.000	0.000	N/A	0.000	0.000	N/A	Pass
27	0.001	0.004	N/A	0.001	0.007	N/A	Pass
28	0.000	0.000	N/A	0.000	0.000	N/A	Pass
29	0.001	0.004	N/A	0.001	0.007	N/A	Pass
30	0.000	0.000	N/A	0.000	0.000	N/A	Pass
31	0.001	0.004	N/A	0.001	0.007	N/A	Pass
32	0.000	0.000	N/A	0.000	0.000	N/A	Pass
33	0.001	0.004	N/A	0.001	0.007	N/A	Pass
34	0.000	0.000	N/A	0.000	0.000	N/A	Pass
35	0.001	0.004	N/A	0.001	0.007	N/A	Pass
36	0.000	0.000	N/A	0.000	0.000	N/A	Pass
37	0.000	0.004	N/A	0.001	0.007	N/A	Pass
38	0.000	0.000	N/A	0.000	0.000	N/A	Pass
39	0.000	0.004	N/A	0.001	0.007	N/A	Pass
40	0.000	0.000	N/A	0.000	0.000	N/A	Pass

Note: Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.



Voltage Source Verification Data (Run time)

EUT: LED Lamp VC1854-8 (WTF15F0122431E) Tested by: Roy
 Test category: Class-C per Ed. 4.0 (2014) (European limits) Test Margin: 100
 Test date: 2015/2/2 Start time: 10:40:03 End time: 10:42:54
 Test duration (min): 2.5 Data file name: H-000473.cts_data
 Comment: on mode
 Customer: Foshan Nanhai World Lighting Co.,Ltd

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	230.01	Frequency(Hz):	50.00
I _{Peak} (Amps):	0.241	I _{RMS} (Amps):	0.152
I _{Fund} (Amps):	0.149	Crest Factor:	1.601
Power (Watts):	33.1	Power Factor:	0.951

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.072	0.460	15.63	OK
3	0.516	2.070	24.95	OK
4	0.082	0.460	17.88	OK
5	0.043	0.920	4.66	OK
6	0.031	0.460	6.79	OK
7	0.031	0.690	4.55	OK
8	0.013	0.460	2.81	OK
9	0.019	0.460	4.14	OK
10	0.016	0.460	3.57	OK
11	0.012	0.230	5.33	OK
12	0.012	0.230	5.20	OK
13	0.011	0.230	4.99	OK
14	0.006	0.230	2.54	OK
15	0.010	0.230	4.46	OK
16	0.011	0.230	4.64	OK
17	0.007	0.230	2.91	OK
18	0.013	0.230	5.49	OK
19	0.009	0.230	4.10	OK
20	0.021	0.230	9.26	OK
21	0.008	0.230	3.67	OK
22	0.005	0.230	2.03	OK
23	0.007	0.230	3.06	OK
24	0.004	0.230	1.63	OK
25	0.006	0.230	2.68	OK
26	0.004	0.230	1.81	OK
27	0.007	0.230	2.84	OK
28	0.003	0.230	1.41	OK
29	0.007	0.230	2.92	OK
30	0.004	0.230	1.81	OK
31	0.004	0.230	1.57	OK
32	0.004	0.230	1.53	OK
33	0.004	0.230	1.66	OK
34	0.003	0.230	1.31	OK
35	0.004	0.230	1.55	OK
36	0.002	0.230	0.91	OK
37	0.004	0.230	1.67	OK
38	0.003	0.230	1.27	OK
39	0.005	0.230	2.09	OK
40	0.009	0.230	3.94	OK



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	:	330 Ω / 150pF
Discharge Voltage	:	Air Discharge: ± 8 kV Contact Discharge: ± 4 kV HCP & VCP: ± 4 kV
Polarity.....	:	Positive & Negative
Number of Discharge.....	:	Minimum 10 times at each test point
Discharge Mode	:	Single Discharge
Discharge Period	:	1 second minimum

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6.2.1 E.U.T. Operation

Operating Environment:

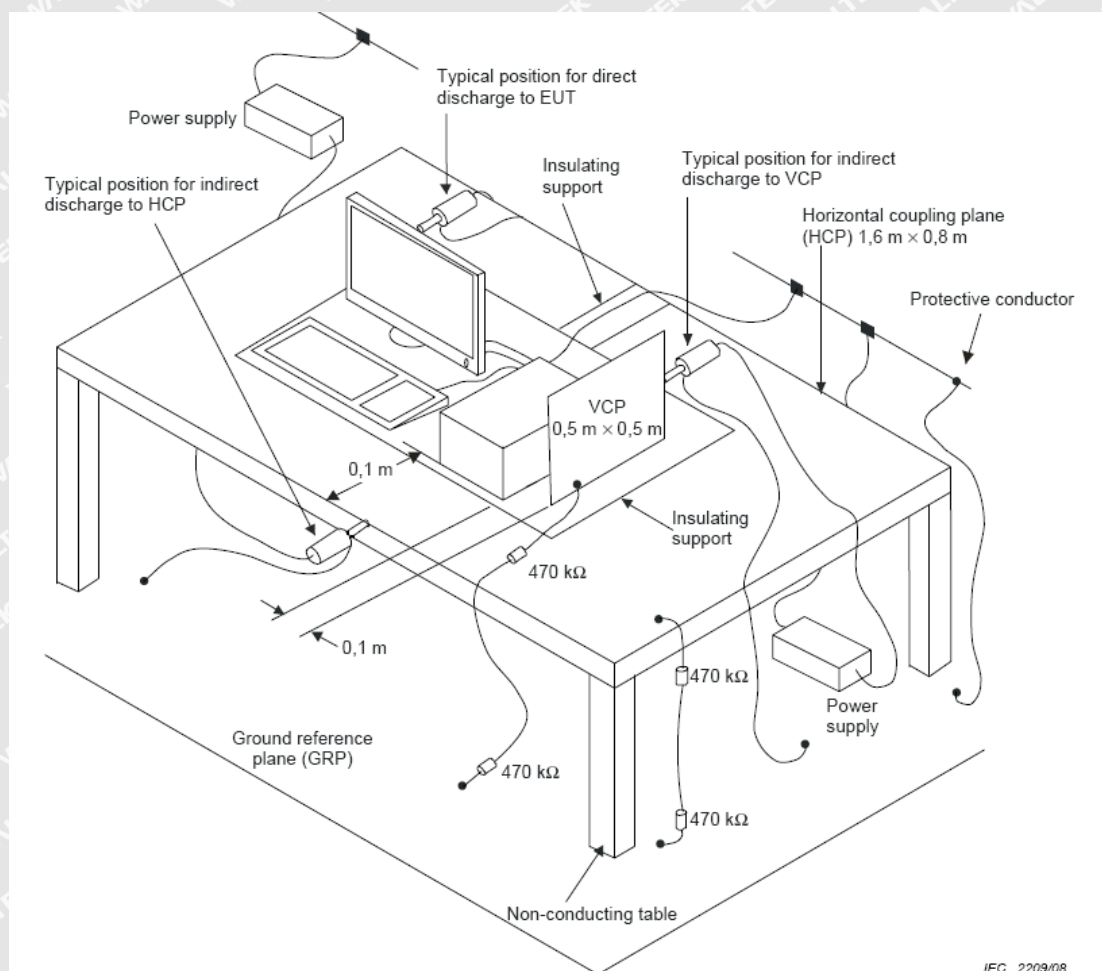
Temperature : 18.5°C
 Humidity : 55.6%RH
 Barometric Pressure : 101.9kPa

EUT Operation:

Input Voltage : AC 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.



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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
±8	B	1	N/A	Pass*
±4	B	2	Pass*	N/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
±4	B	1	Pass*	Pass*

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:

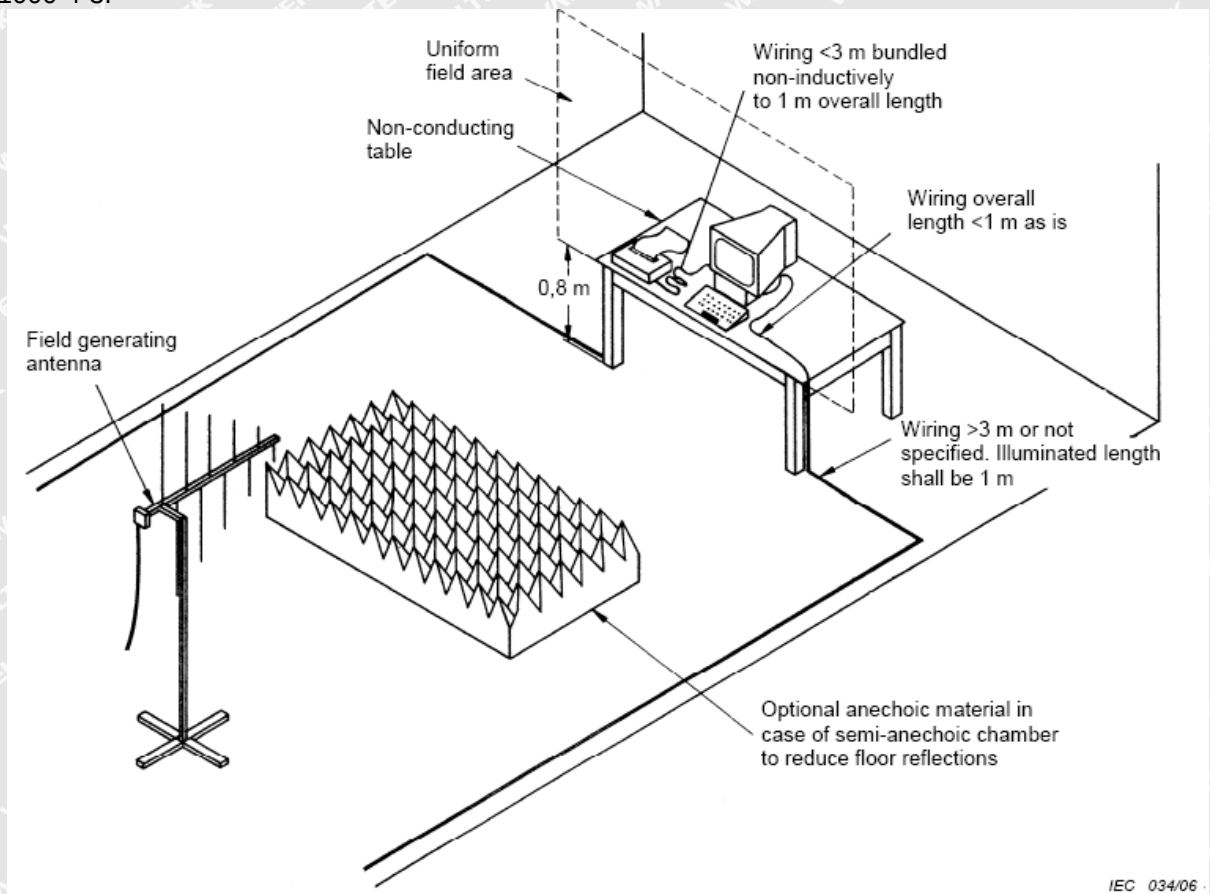
Temperature : 18.5°C
Humidity : 55.6%RH
Barometric Pressure..... : 101.9kPa

EUT Operation:

Input Voltage : AC 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
80 to 1000MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
80 to 1000MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*

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

6.4.1 E.U.T. Operation

Operating Environment:

Temperature : 18.5°C
Humidity..... : 55.6%RH
Barometric Pressure : 101.9kPa

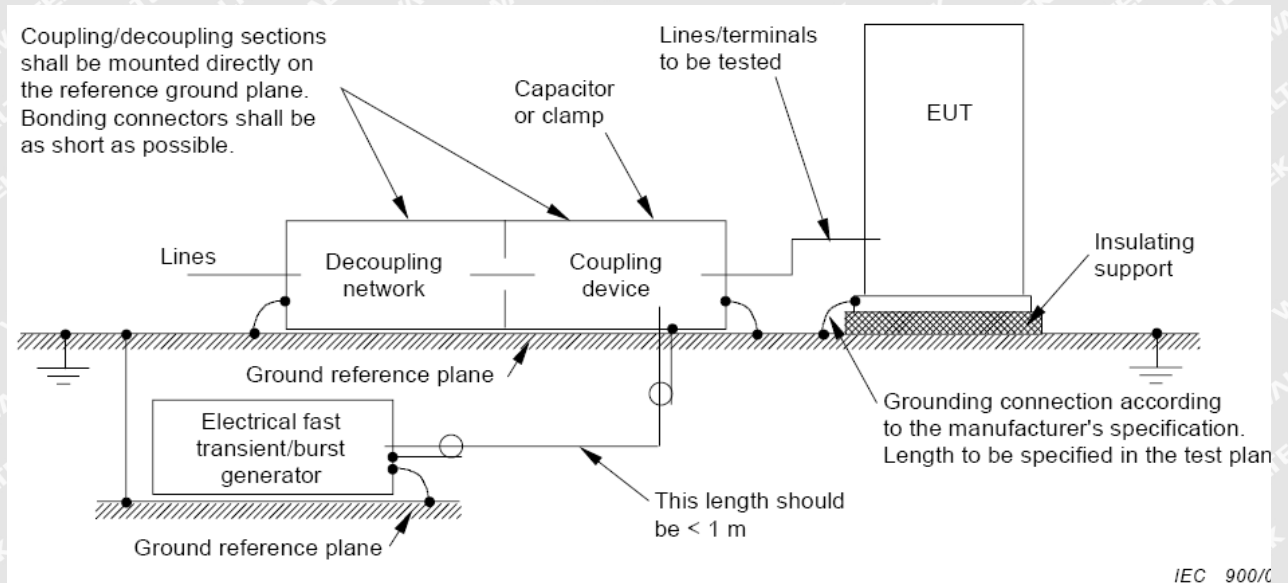
EUT Operation:

Input Voltage : AC 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
Line-Neutral	± 1.0	B	Pass*

Remark:

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

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6.5 Surge

Test Requirement	: EN 61547
Test Method	: IEC 61000-4-5
Test Result	: Pass
Test level	: Table 10 of EN61547
Interval	: 60s between each surge
No. of surges	: 5 positive at 90°, 5 negative at 270°.

6.5.1 E.U.T. Operation

Operating Environment:

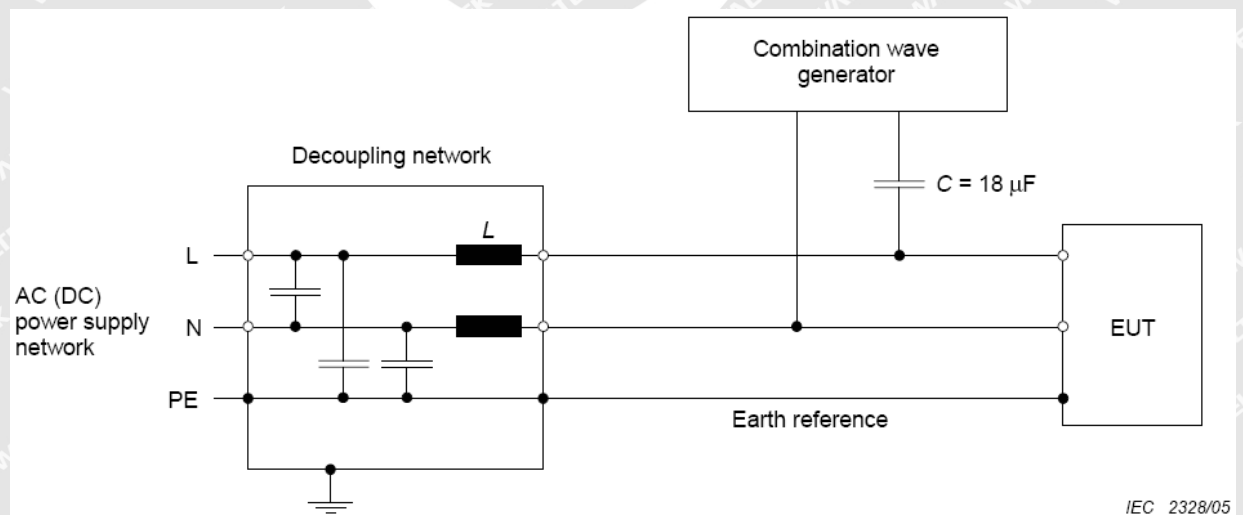
Temperature	: 18.5°C
Humidity	: 55.6%RH
Barometric Pressure	: 101.9kPa

EUT Operation:

Input Voltage	: AC 230V/50Hz
Operating Mode	: On mode

6.5.2 Block Diagram of Setup

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





6.5.3 Test Results

Test Port	Applied Voltage (kV)	Performance criterion	Result
Between Phase And Phase	± 1	C	N/A
Between Live And Neutral	± 1	C	Pass*
Between Live And Earth	± 2	C	N/A
Between Neutral And Earth	± 2	C	N/A

Remark:

* The lamp was flickered during the test, it could be recovered automatically after tests.

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.

6.6.1 E.U.T. Operation

Operating Environment:

Temperature..... : 18.5°C
Humidity..... : 55.6%RH
Barometric Pressure..... : 101.9kPa

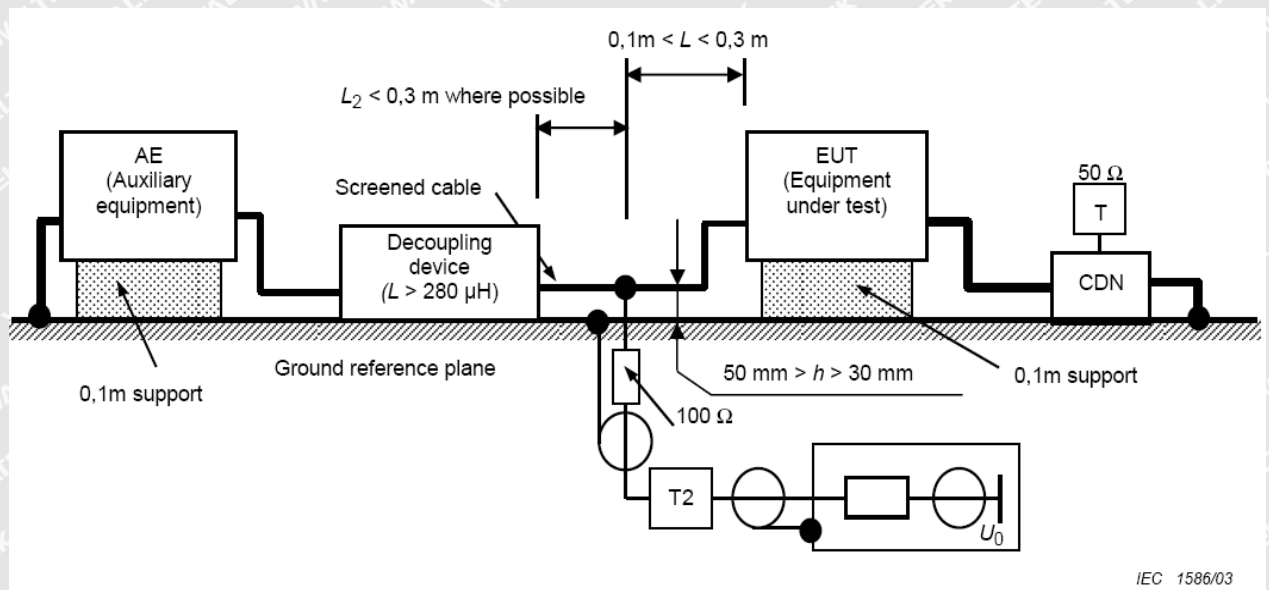
EUT Operation:

Input Voltage..... : AC 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.



6.6.3 Test Results

Frequency	Line	Test Level	Modulation	Step Size	Dwell Time	Performance Criterion	Result
0.15MHz to 80MHz	2 Wire AC Supply Cables	3Vr.m.s.	80%, 1kHz Amp. Mod.	1%	1s	A	Pass*

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:

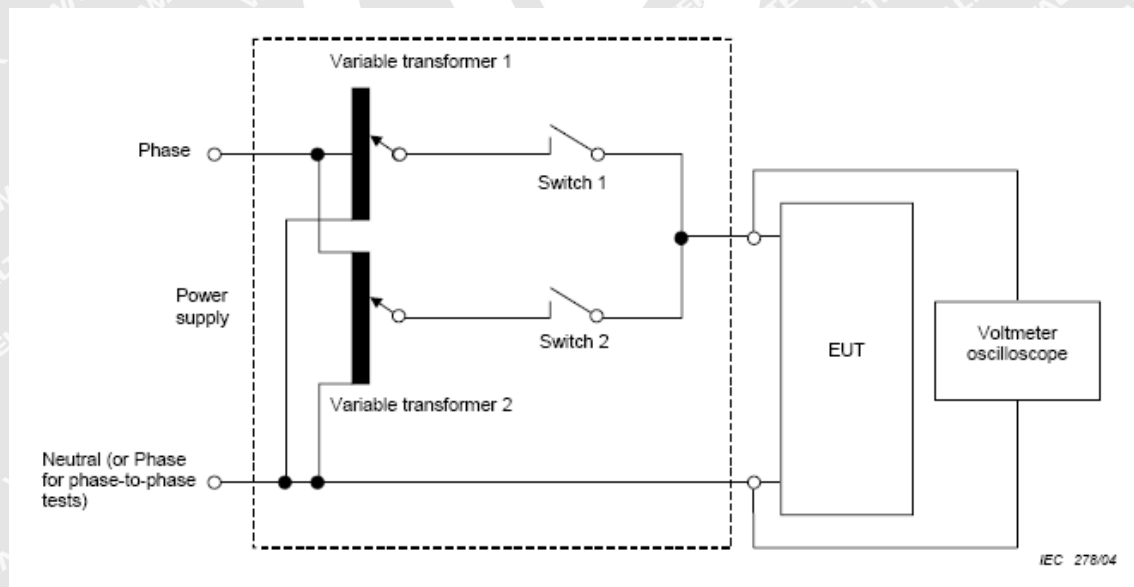
Temperature	18.5°C
Humidity.....	55.6%RH
Barometric Pressure	101.9kPa

EUT Operation:

Input Voltage	AC 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.





6.7.3 Test Results

Test Level in %U _T	Phase	Performance criterion	Duration	Result
0	0°	B	0.5	Pass*
	180°			Pass*
70	0°	C	10	Pass*
	180°			Pass*

Remark:

- * The lamp was flickered during the test, it could be recovered automatically after tests.



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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(CDN method) Test Setup, 30MHz to 300MHz



7.4 Photograph – Harmonic Current and Voltage Fluctuation and Flicker Test Setup

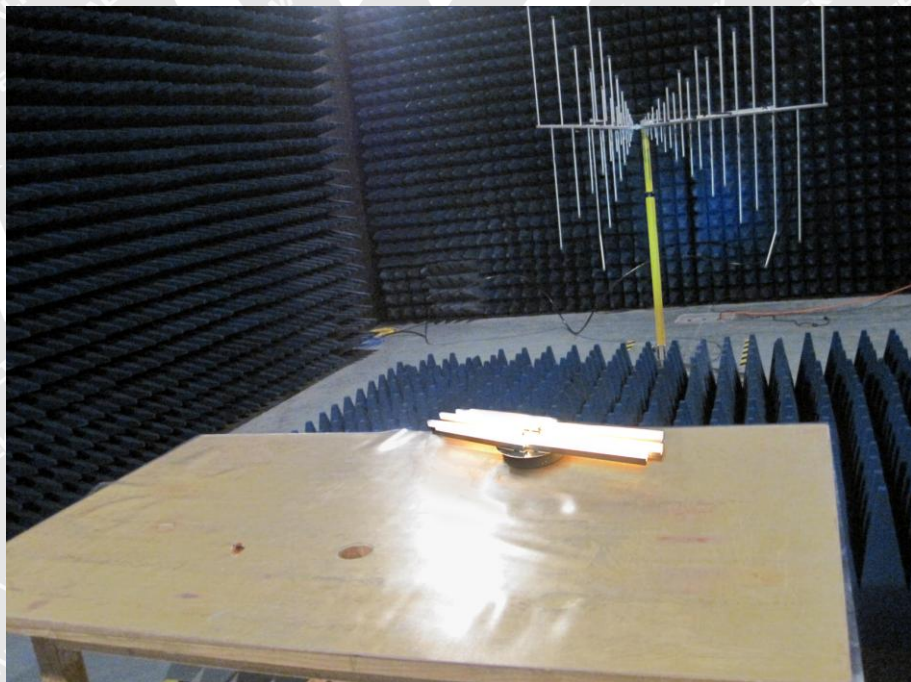




7.5 Photograph – ESD Immunity Test Setup



7.6 Photograph – Radio-frequency electromagnetic fields Immunity Test Setup





7.7 Photograph – EFT Immunity Test Setup



7.8 Photograph – Surge Immunity Test Setup

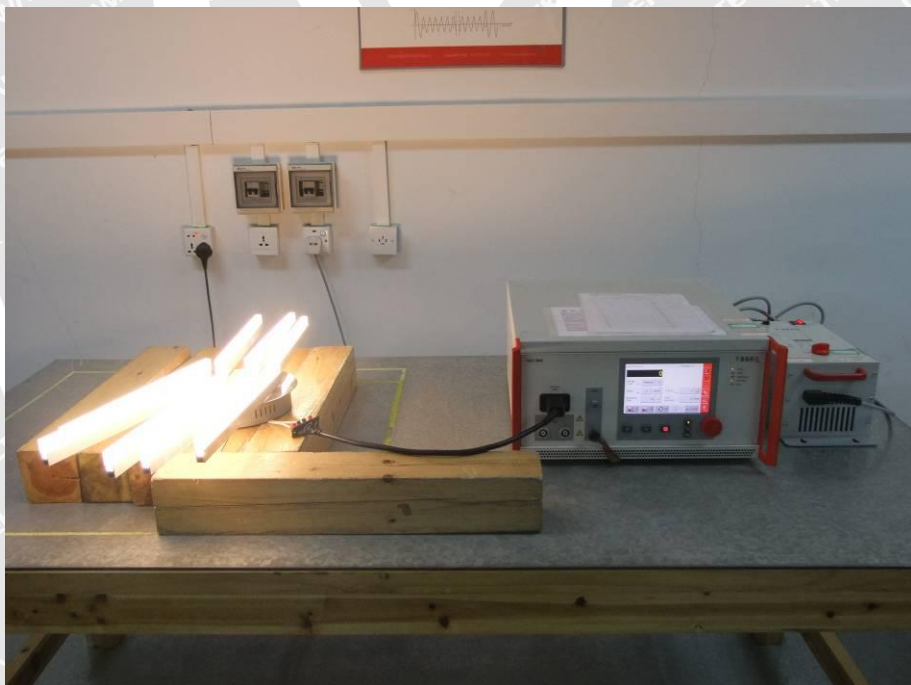




7.9 Photograph – Injected Currents Immunity Test Setup



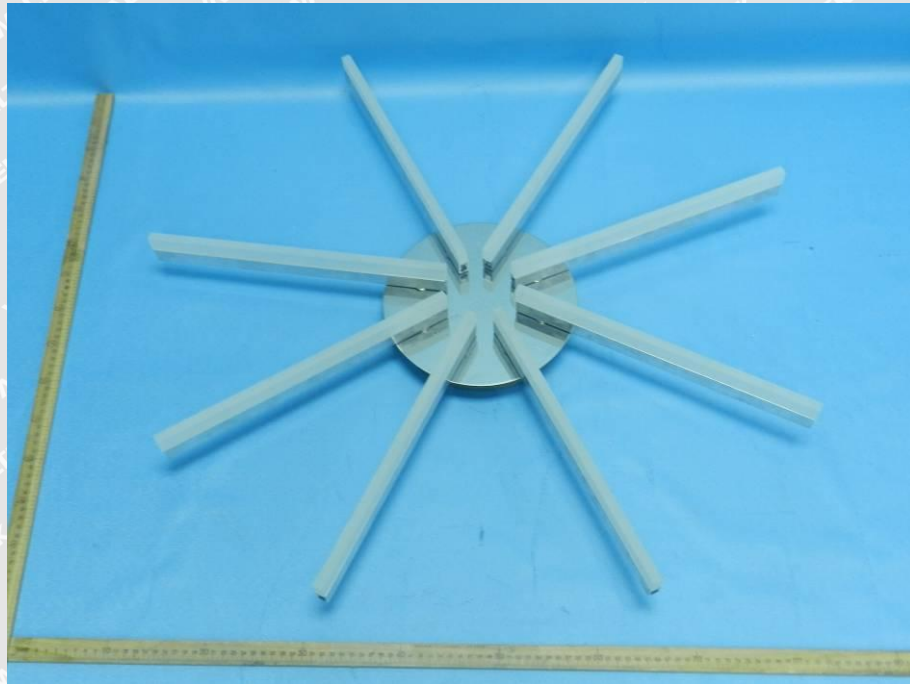
7.10 Photograph – Voltage Dips and Interruptions Immunity Test Setup





8 Photographs – Constructional Details

8.1 EUT – Front View



8.2 EUT – Front View For LED Driver



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