



中国认可  
国际互认  
检测  
TESTING  
CNAS L6478



# TEST REPORT

Reference No. .... : WTF16F1267798E  
 Applicant ..... : Foshan Ronse Lighting Technology CO.,LTD  
 Address ..... : Liansha Industrial Zone,Jinsha, Danzao Town, Nanhai, Foshan,  
GuangDong, China.  
 Manufacturer ..... : The same as above  
 Address ..... : The same as above  
 Trade Mark ..... : **荣仕照明®**  
**RONSE** 我们的阳光  
 Product Name ..... : LED High Bay Light Series  
 Model No ..... : Refer to the model list on page 5  
 Standards ..... : EN 55015:2013  
 EN 55015:2013+A1:2015  
 EN 61547:2009  
 EN 61000-3-2:2014  
 EN 61000-3-3:2013  
 Date of Receipt sample .... : 2016-12-12  
 Date of Test ..... : 2016-12-14 to 2016-12-27  
 Date of Issue ..... : 2016-12-28  
 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.

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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, EN 55015:2013+A1:2015	Clause 4.3.1	Pass	
Radiated electromagnetic disturbance, 9kHz to 30MHz	EN 55015:2013, EN 55015:2013+A1:2015	Clause 4.4.1	Pass	
Radiated Emission, 30MHz to 300MHz	EN 55015:2013, EN 55015:2013+A1:2015	Clause 4.4.2	Pass	
Harmonic Current emission	EN 61000-3-2:2014	Class C	Pass	
Voltage Fluctuation and Flicker	EN 61000-3-3:2013	Clause 5	Pass**	
IMMUNITY (EN 61547:2009)				
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 % U <sub>T</sub> * for 0.5per	B	Pass
		70 % U <sub>T</sub> * for 10per	C	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  
 A.M Amplitude Modulation  
 † Differential Mode  
 ‡ Common Mode  
 \* U<sub>T</sub> is the nominal supply voltage

\*\* According to EN 61000-3-3 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 and LED luminaires with ratings less than or equal to 200W, are deemed to comply with the dmax limits in this standard and are not required to be tested."

\*\*\* The Radio-frequency electromagnetic fields test is not in our CNAS scope, the test was subcontracted to a CNAS accredited laboratory and test result is pass.





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### 3 General Information

#### 3.1 General Description of E.U.T.

- Product Name** ..... : LED High Bay Light Series
- Model No.** ..... : Refer to the model list on page 5
- Remark**..... : All models have same electric circuit only their rated power is different. Model GK02C200 is one of the biggest power model. Therefore it can represent other models to performed EMC tests.

#### 3.2 Details of E.U.T.

Technical Data..... :

Item	Model	Input voltage (Vac)	Input frequency (Hz)	Input Power(W)
1	GK01A050	AC 110-240V	50/60Hz	50W
2	GK01A100	AC 110-240V	50/60Hz	100W
3	GK01A150	AC 110-240V	50/60Hz	150W
4	GK01A200	AC 110-240V	50/60Hz	200W
5	GK01B050	AC 110-240V	50/60Hz	50W
6	GK01B100	AC 110-240V	50/60Hz	100W
7	GK01B150	AC 110-240V	50/60Hz	150W
8	GK01B200	AC 110-240V	50/60Hz	200W
9	GK01C050	AC 110-240V	50/60Hz	50W
10	GK01C100	AC 110-240V	50/60Hz	100W
11	GK01C150	AC 110-240V	50/60Hz	150W
12	GK02C050	AC 110-240V	50/60Hz	50W
13	GK02C200	AC 110-240V	50/60Hz	200W
14	GK02C100	AC 110-240V	50/60Hz	100W
15	GK02C150	AC 110-240V	50/60Hz	150W
16	GK01C200	AC 110-240V	50/60Hz	200W
17	GK02A050	AC 110-240V	50/60Hz	50W
18	GK02A100	AC 110-240V	50/60Hz	100W
19	GK02A150	AC 110-240V	50/60Hz	150W
20	GK02A200	AC 110-240V	50/60Hz	200W
21	GK03A050	AC 110-240V	50/60Hz	50W
22	GK03A100	AC 110-240V	50/60Hz	100W
23	GK03A150	AC 110-240V	50/60Hz	150W





Item	Model	Input voltage (Vac)	Input frequency (Hz)	Input Power(W)
24	GK03A200	AC 110-240V	50/60Hz	200W
25	GK01D050	AC 110-240V	50/60Hz	50W
26	GK01D100	AC 110-240V	50/60Hz	100W
27	GK01D150	AC 110-240V	50/60Hz	150W
28	GK01D200	AC 110-240V	50/60Hz	200W
29	GK01E050	AC 110-240V	50/60Hz	50W
30	GK01E100	AC 110-240V	50/60Hz	100W
31	GK01E150	AC 110-240V	50/60Hz	150W
32	GK01E200	AC 110-240V	50/60Hz	200W
33	GK01F050	AC 110-240V	50/60Hz	50W
34	GK01F100	AC 110-240V	50/60Hz	100W
35	GK01F150	AC 110-240V	50/60Hz	150W
36	GK01F200	AC 110-240V	50/60Hz	200W
37	GK01G050	AC 110-240V	50/60Hz	50W
38	GK01G100	AC 110-240V	50/60Hz	100W
39	GK01G150	AC 110-240V	50/60Hz	150W
40	GK01G200	AC 110-240V	50/60Hz	200W
41	GK02D050	AC 110-240V	50/60Hz	50W
42	GK02D100	AC 110-240V	50/60Hz	100W
43	GK02D150	AC 110-240V	50/60Hz	150W
44	GK02D200	AC 110-240V	50/60Hz	200W
45	GK02E050	AC 110-240V	50/60Hz	50W
46	GK02E100	AC 110-240V	50/60Hz	100W
47	GK02E150	AC 110-240V	50/60Hz	150W
48	GK02E200	AC 110-240V	50/60Hz	200W
49	GK02F050	AC 110-240V	50/60Hz	50W
50	GK02F100	AC 110-240V	50/60Hz	100W
51	GK02F150	AC 110-240V	50/60Hz	150W
52	GK02F200	AC 110-240V	50/60Hz	200W
53	GK02G050	AC 110-240V	50/60Hz	50W
54	GK02G100	AC 110-240V	50/60Hz	100W
55	GK02G150	AC 110-240V	50/60Hz	150W



Item	Model	Input voltage (Vac)	Input frequency (Hz)	Input Power(W)
56	GK02G200	AC 110-240V	50/60Hz	200W
57	GK03D050	AC 110-240V	50/60Hz	50W
58	GK03D100	AC 110-240V	50/60Hz	100W
59	GK03D150	AC 110-240V	50/60Hz	150W
60	GK03D200	AC 110-240V	50/60Hz	200W
61	GK03E050	AC 110-240V	50/60Hz	50W
62	GK03E100	AC 110-240V	50/60Hz	100W
63	GK03E150	AC 110-240V	50/60Hz	150W
64	GK03E200	AC 110-240V	50/60Hz	200W
65	GK03F050	AC 110-240V	50/60Hz	50W
66	GK03F100	AC 110-240V	50/60Hz	100W
67	GK03F150	AC 110-240V	50/60Hz	150W
68	GK03F200	AC 110-240V	50/60Hz	200W
69	GK03G050	AC 110-240V	50/60Hz	50W
70	GK03G100	AC 110-240V	50/60Hz	100W
71	GK03G150	AC 110-240V	50/60Hz	150W
72	GK03G200	AC 110-240V	50/60Hz	200W

### 3.3 Description of Support Units

The EUT has been tested as an independent unit. GK02C200 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 55015:2013+A1:2015	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 61000-3-2:2014	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 $\leq 16$ 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.: 21895-1**

Waltek Services (Foshan) 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 IC number:21895-1, Nov. 14, 2016.

- **FCC Test Site 1# – Registration No.: 880581**

Waltek Services (Shenzhen) Co., Ltd. EMC Laboratory 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, April 29, 2014.

- **FCC Test Site 2# – Registration No.: 328995**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `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 328995, December 3, 2014.

### 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

<b>Mains Terminal Disturbance Voltage (Conducted Emission)</b>					
<b>Item</b>	<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Status</b>
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
<b>Radiated electromagnetic disturbance(9kHz to 30MHz)</b>					
<b>Item</b>	<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Status</b>
1.	EMI Test Receiver	R&S	ESCI	101178	Valid
2	Three Loops Antenna	SCHWARZBECK	HXYZ9170	213	Valid
<b>CDN method for Lighting Equipments' Radiated Disturbance</b>					
<b>Item</b>	<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Status</b>
1	EMI Test Receiver	R&S	ESCI	101178	Valid
2	CDN	TESEQ	M016	31586	Valid
3	Cable	HUBER+SUHNER	CBL2-NN-3M	2230300	Valid
<b>Harmonics and Flicker Measuring System</b>					
<b>Item</b>	<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Status</b>
1.	Harmonics and Flicker Measuring System	TESEQ	PROFLINE210 5-400	1133A014 98	Valid
<b>ESD</b>					
<b>Item</b>	<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Status</b>
1.	ESD Simulator	TESEQ	NSG437	521	Valid
<b>Radio-frequency electromagnetic fields</b>					
<b>Item</b>	<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Status</b>
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
<b>EFT &amp; Voltage Dips and Interruptions</b>					
<b>Item</b>	<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Status</b>
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	±2.66dB	(1)
Radiated electromagnetic disturbance	9kHz to 30MHz	±3.00dB	(1)
Radiated Emission(CDN 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  $k=2$ .

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## 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**..... : 24.8°C

**Humidity**..... : 49.3%RH

**Atmospheric Pressure**..... : 101.2kPa

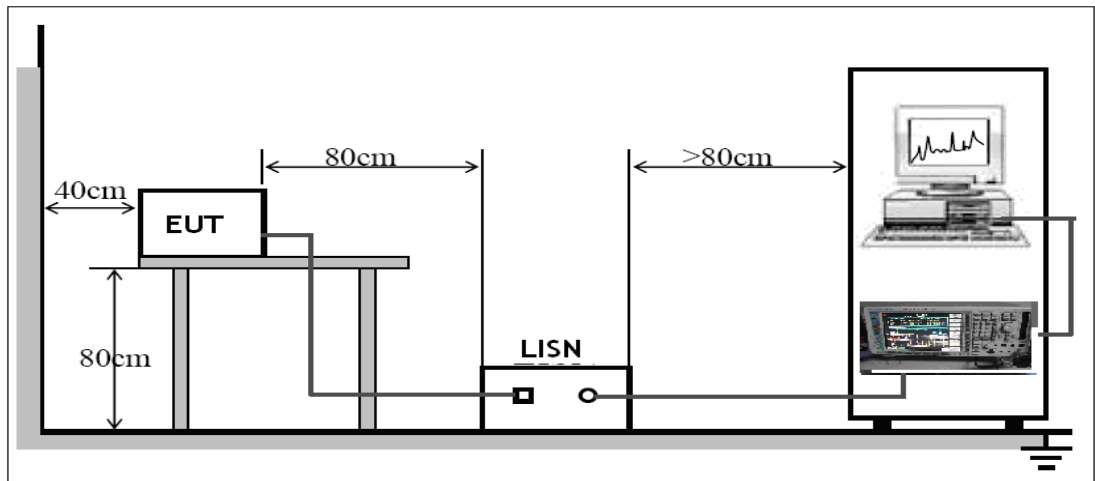
##### EUT Operation:

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

**Operating Mode**..... : Lighting mode

#### 5.1.2 Block Diagram of Test Setup

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





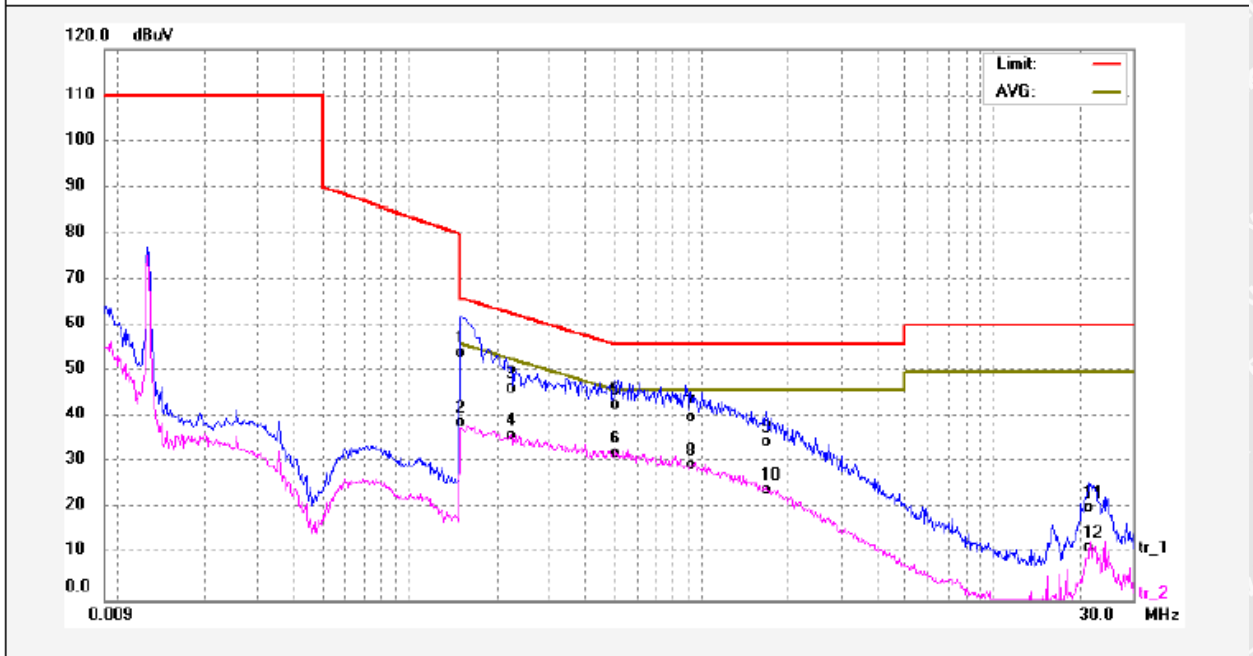


### 5.1.3 Measurement Data

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

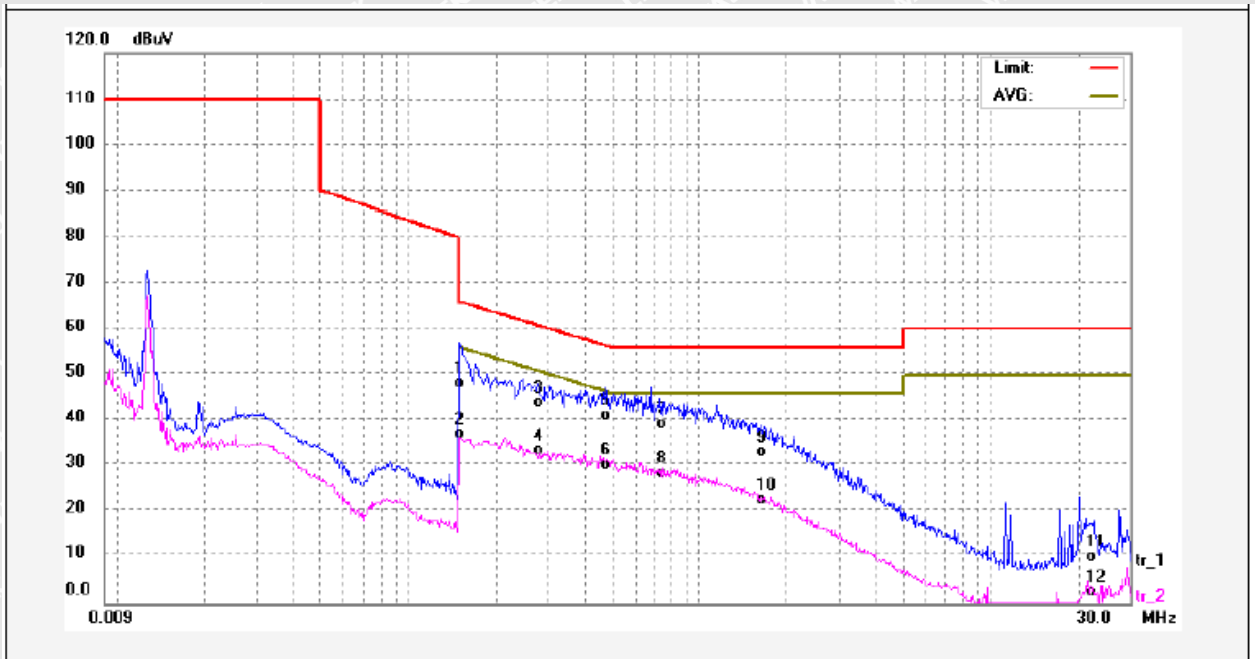
Live Line :



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1500	43.27	9.64	52.91	65.99	-13.08	QP	
2	0.1500	28.14	9.64	37.78	55.99	-18.21	AVG	
3	0.2220	35.60	9.63	45.23	62.74	-17.51	QP	
4	0.2220	25.46	9.63	35.09	52.74	-17.65	AVG	
5	0.5100	31.84	9.65	41.49	56.00	-14.51	QP	
6	0.5100	21.50	9.65	31.15	46.00	-14.85	AVG	
7	0.9180	29.10	9.67	38.77	56.00	-17.23	QP	
8	0.9180	18.60	9.67	28.27	46.00	-17.73	AVG	
9	1.6700	23.67	9.66	33.33	56.00	-22.67	QP	
10	1.6700	13.33	9.66	22.99	46.00	-23.01	AVG	
11	21.1660	8.93	10.06	18.99	60.00	-41.01	QP	
12	21.1660	0.34	10.06	10.40	50.00	-39.60	AVG	



**Neutral Line :**



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Remark
1	0.1500	37.21	9.65	46.86	65.99	-19.13	QP	
2	0.1500	26.05	9.65	35.70	55.99	-20.29	AVG	
3	0.2779	32.98	9.63	42.61	60.88	-18.27	QP	
4	0.2779	22.55	9.63	32.18	50.88	-18.70	AVG	
5	0.4780	30.49	9.65	40.14	56.37	-16.23	QP	
6	0.4780	19.63	9.65	29.28	46.37	-17.09	AVG	
7	0.7300	28.69	9.65	38.34	56.00	-17.66	QP	
8	0.7300	17.77	9.65	27.42	46.00	-18.58	AVG	
9	1.6100	22.40	9.67	32.07	56.00	-23.93	QP	
10	1.6100	11.80	9.67	21.47	46.00	-24.53	AVG	
11	22.4580	-0.91	9.96	9.05	60.00	-50.95	QP	
12	22.4580	-8.72	9.96	1.24	50.00	-48.76	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** ..... : 24.8°C  
**Humidity**..... : 49.3%RH  
**Barometric Pressure**..... : 101.2kPa

#### EUT Operation:

**Input Voltage** ..... : AC 245V/50Hz  
**Operating Mode**..... : Lighting mode



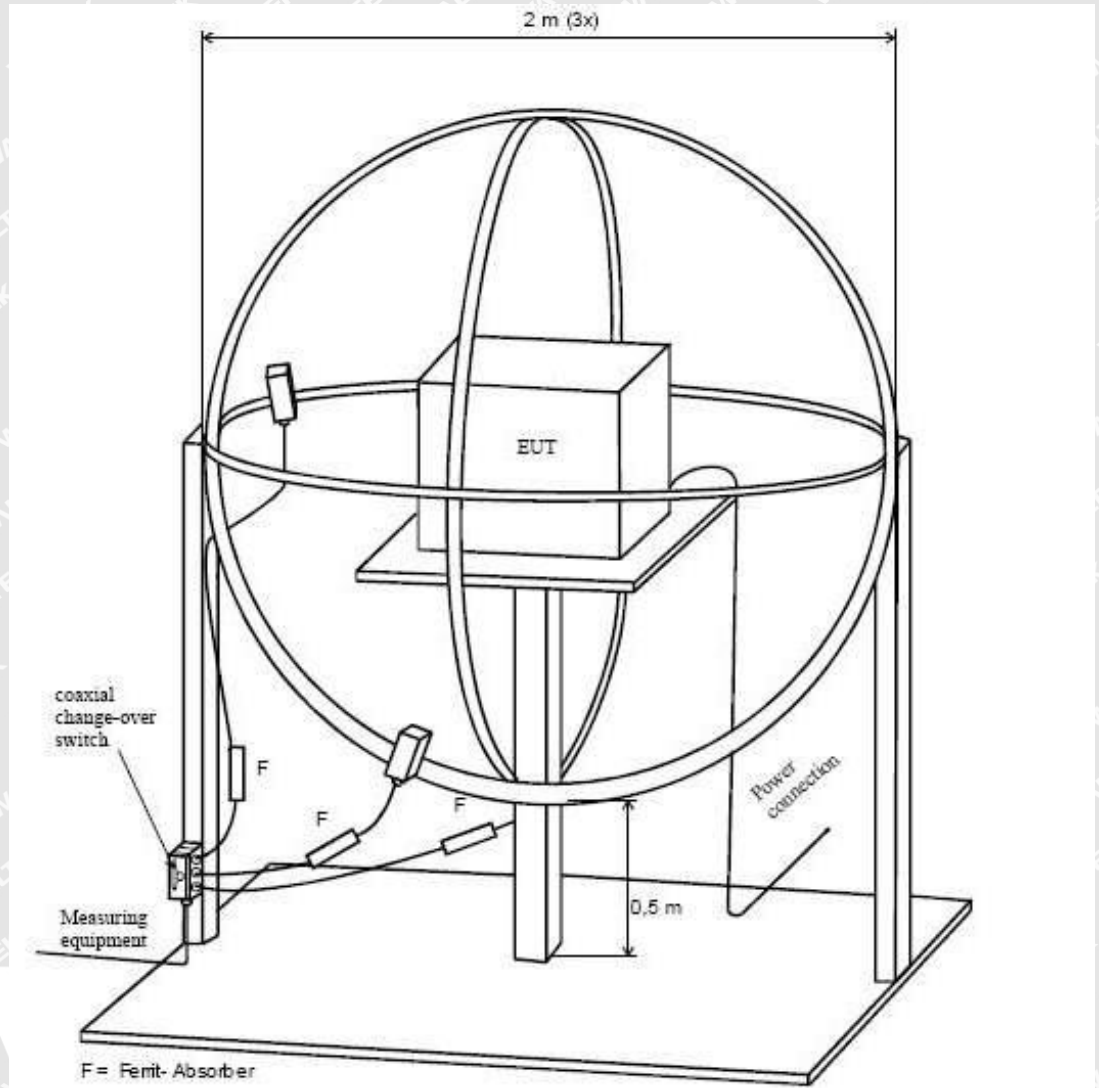
# WALTEK





### 5.2.2 Block Diagram of Test Setup

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



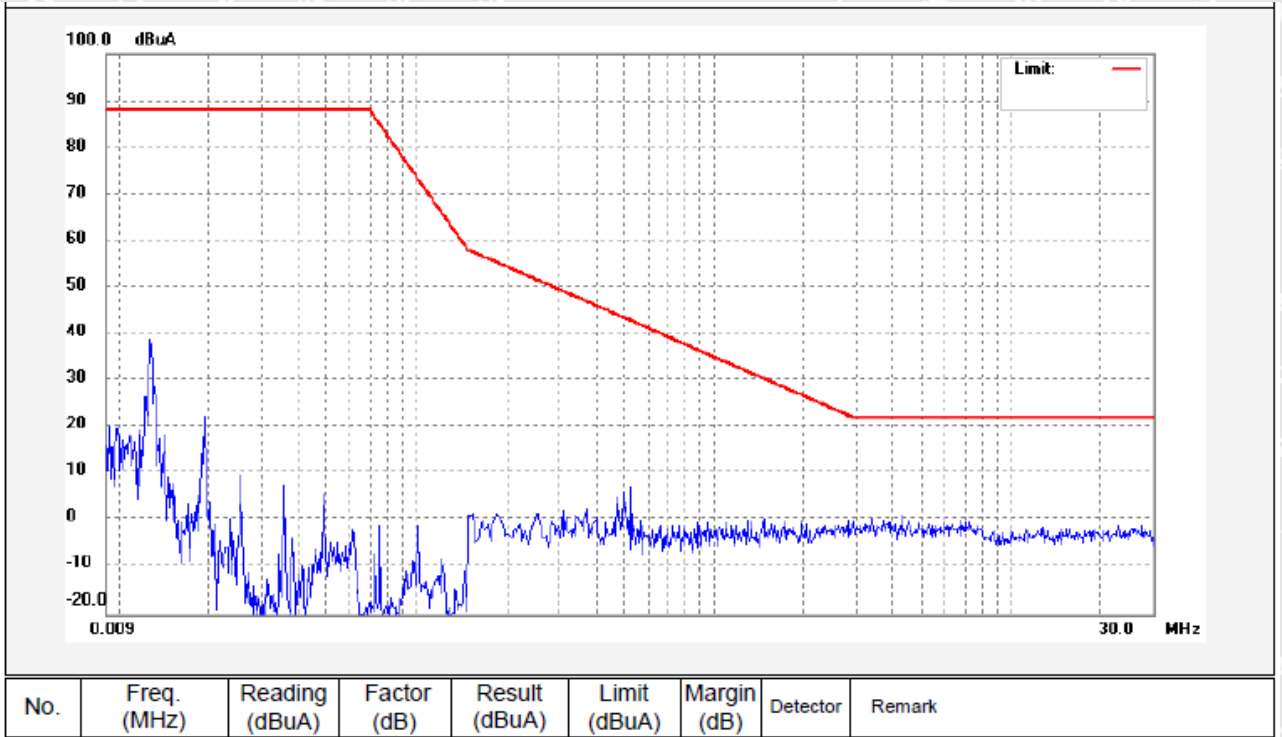
### 5.2.3 Measurement Data

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

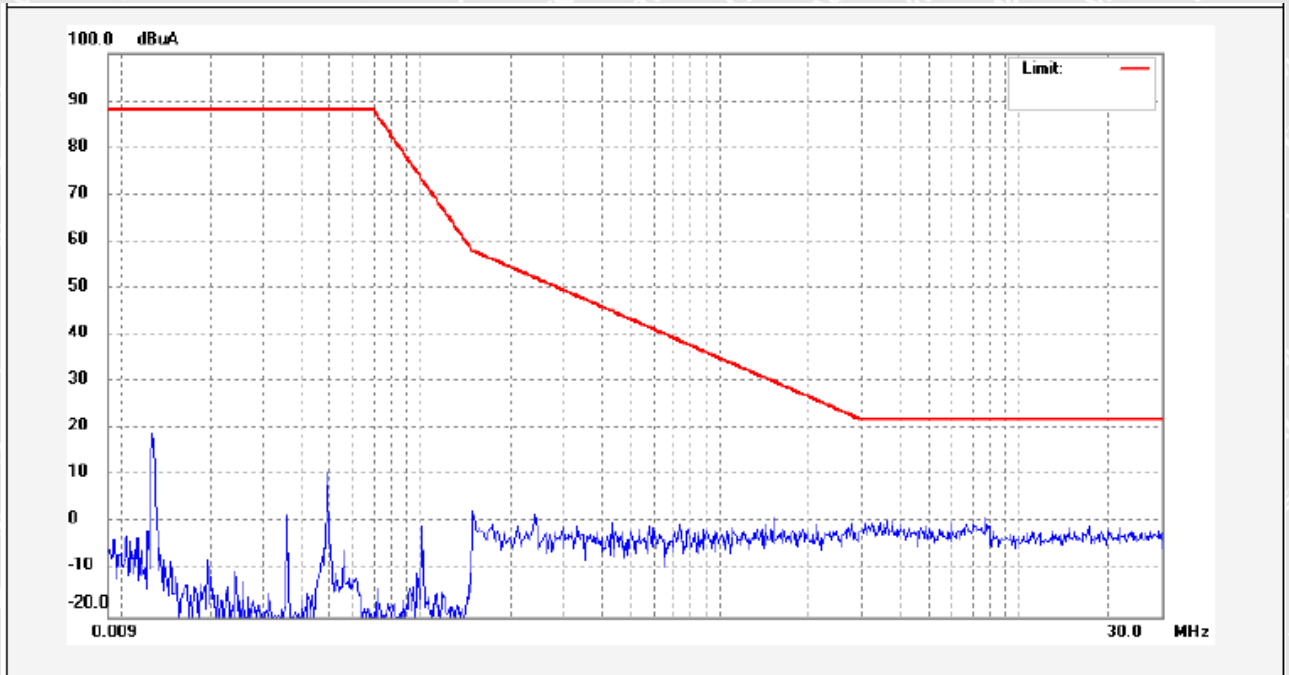
Loop X:



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Loop Y:



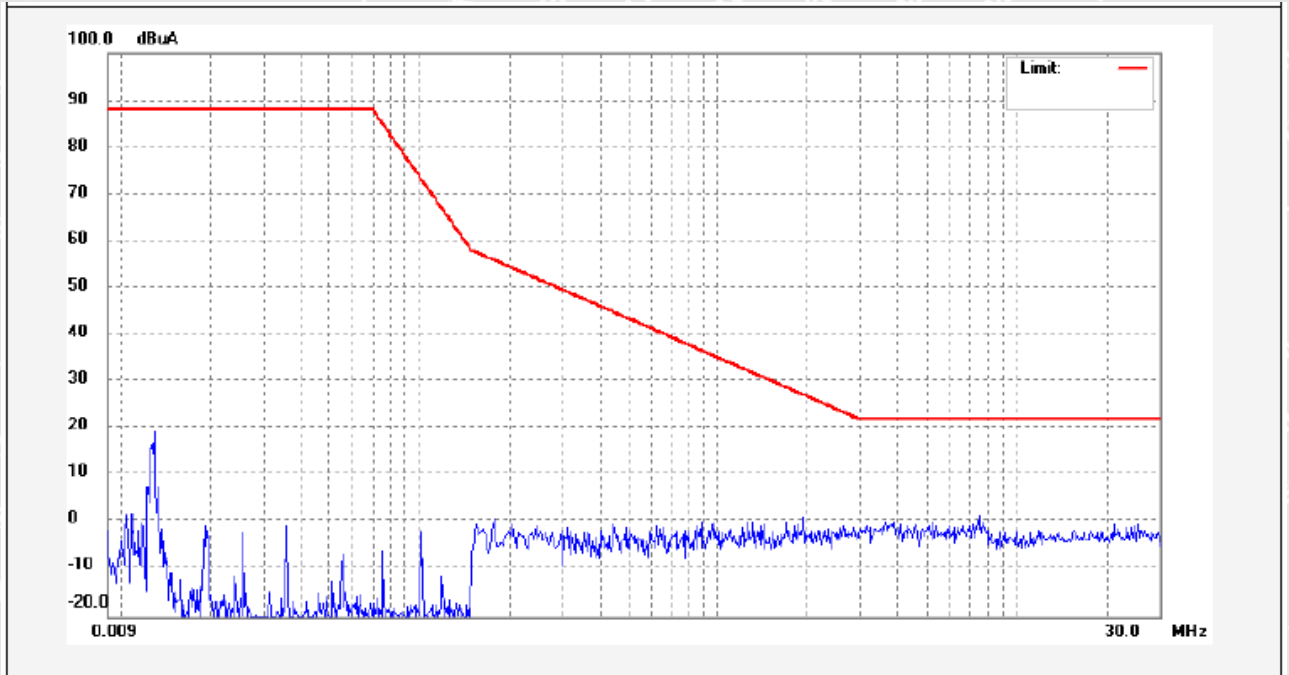
No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit (dBuA)	Margin (dB)	Detector	Remark
-----	-------------	----------------	-------------	---------------	--------------	-------------	----------	--------







Loop Z:



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit (dBuA)	Margin (dB)	Detector	Remark
-----	-------------	----------------	-------------	---------------	--------------	-------------	----------	--------

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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:

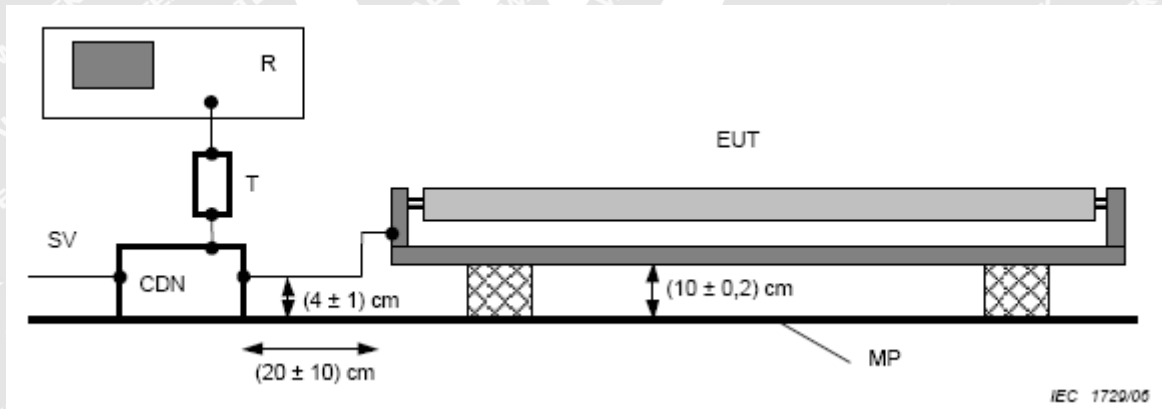
Temperature.....	: 24.8°C
Humidity.....	: 49.3%RH
Atmospheric Pressure.....	: 101.2kPa

##### EUT Operation :

Input Voltage.....	: AC 245V/50Hz
Operating Mode.....	: Lighting mode

#### 5.3.2 Block Diagram of Setup

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

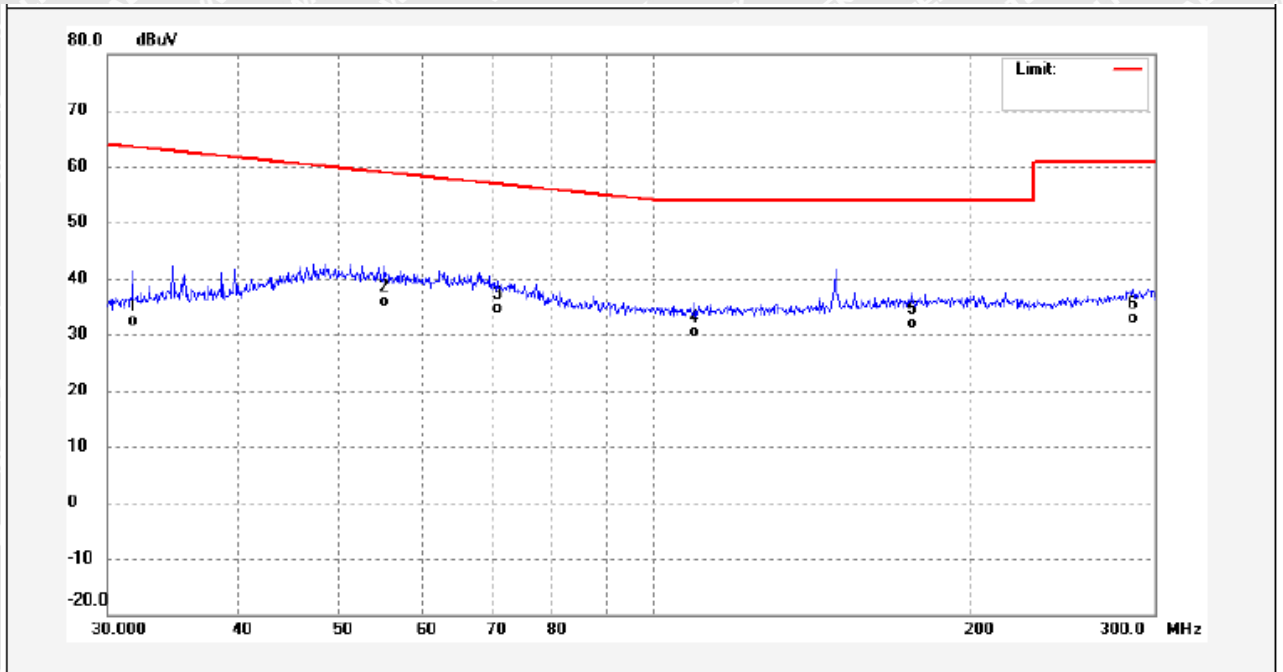


#### 5.3.3 Measurement Data

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	31.7600	15.51	15.79	31.30	63.53	-32.23	QP	
2	55.2000	19.02	15.90	34.92	58.94	-24.02	QP	
3	70.8000	17.61	15.94	33.55	56.87	-23.32	QP	
4	109.4000	13.50	16.00	29.50	54.00	-24.50	QP	
5	176.2400	14.71	16.13	30.84	54.00	-23.16	QP	
6	286.4800	13.81	18.14	31.95	61.00	-29.05	QP	

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## 5.1 Harmonics Current Emission

Test Requirement.....	:	EN61000-3-2
Test Method.....	:	EN61000-3-2
Test Result.....	:	Pass
Class/Severity.....	:	Class C

### 5.1.1 E.U.T. Operation

#### Operating Environment:

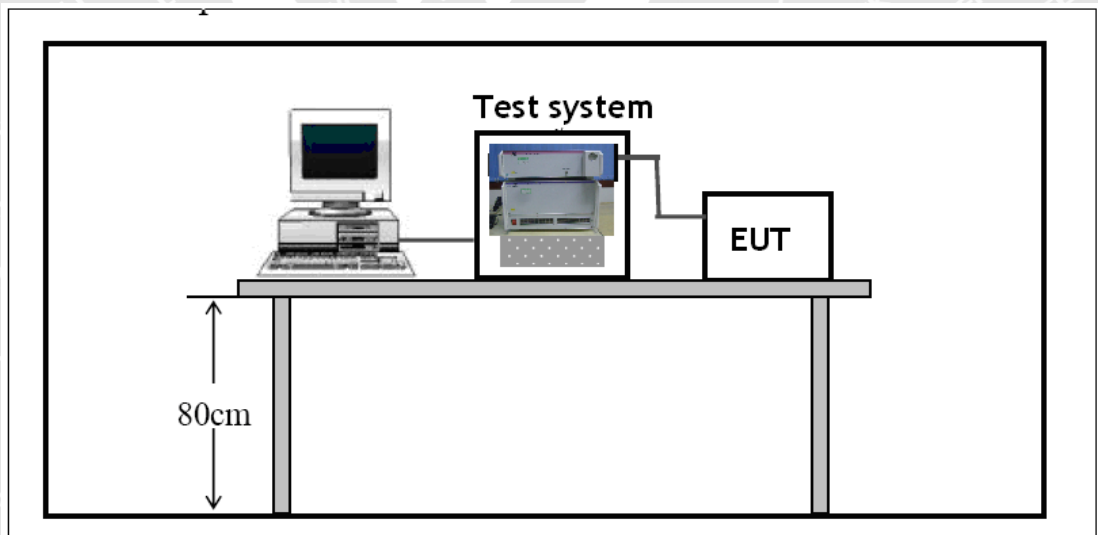
Temperature.....	:	23.1°C
Humidity.....	:	42.0%RH
Barometric Pressure.....	:	101.2kPa

#### EUT Operation:

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

### 5.1.2 Block Diagram of Setup

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





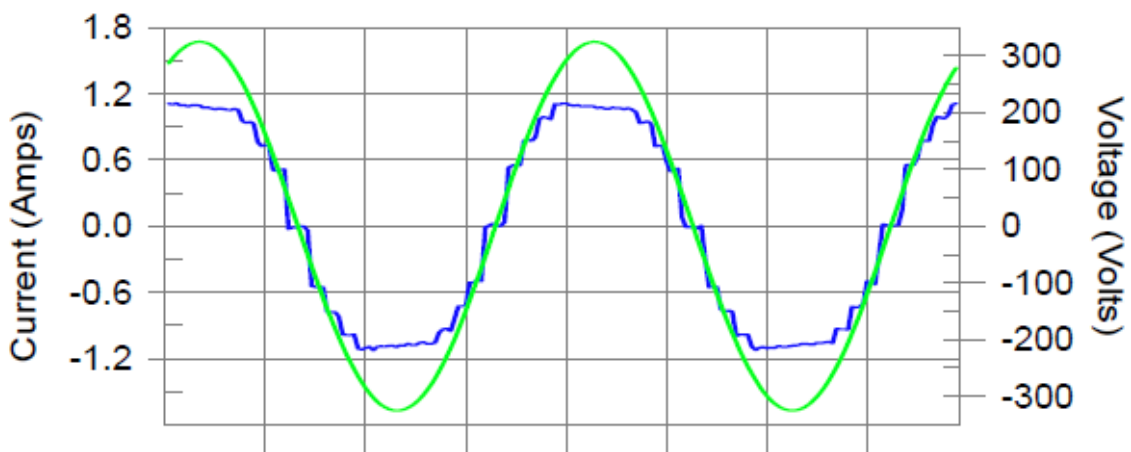
### 5.1.3 Harmonic Current Emission Test Data

#### Harmonics – Class-C per Ed. 4.0 (2014)(Run time) incl. inter-harmonics

EUT: LED High Bay Light Series GK02C200 (WTF16F1267798E)      Tested by: David  
Test category: Class-C per Ed. 4.0 (2014) (European limits)      Test Margin: 100  
Test date: 2016/12/27      Start time: 15:53:00      End time: 15:55:52  
Test duration (min): 2.5      Data file name: H-002673.cts\_data  
Comment: Lighting mode  
Customer:

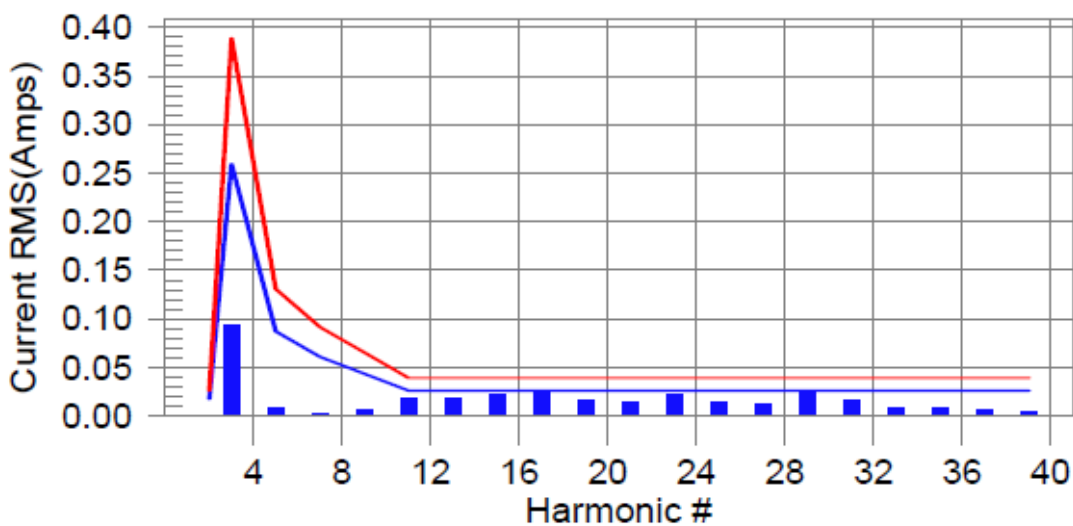
Test Result: Pass      Source qualification: Normal

#### Current & voltage waveforms



#### Harmonics and Class C limit line

#### European Limits



Test result: Pass      Worst harmonics H23-65.6% of 150% limit, H29-94.6% of 100% limit.



### Current Test Result Summary (Run time)

EUT: LED High Bay Light Series GK02C200 (WTF16F1267798E) Tested by: David

Test category: Class-C per Ed. 4.0 (2014) (European limits) Test Margin: 100

Test date: 2016/12/27 Start time: 15:53:00 End time: 15:55:52

Test duration (min): 2.5 Data file name: H-002673.cts\_data

Comment: Lighting mode

Customer:

Test Result: Pass Source qualification: Normal

THC(A): 0.115 I-THD(%): 13.5 POHC(A): 0.046 POHC Limit(A): 0.083

#### Highest parameter values during test:

V<sub>RMS</sub> (Volts): 230.27

Frequency(Hz): 50.00

I<sub>Peak</sub> (Amps): 1.164

I<sub>RMS</sub> (Amps): 0.881

I<sub>Fund</sub> (Amps): 0.872

Crest Factor: 1.329

Power (Watts): 200.8

Power Factor: 0.991

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	0.017	N/A	0.001	0.026	N/A	Pass
3	0.094	0.259	36.4	0.097	0.389	24.9	Pass
4	0.001	0.000	N/A	0.002	0.000	N/A	Pass
5	0.008	0.087	8.8	0.010	0.131	7.8	Pass
6	0.001	0.000	N/A	0.001	0.000	N/A	Pass
7	0.002	0.061	N/A	0.003	0.092	N/A	Pass
8	0.001	0.000	N/A	0.001	0.000	N/A	Pass
9	0.007	0.044	15.6	0.009	0.065	13.5	Pass
10	0.001	0.000	N/A	0.001	0.000	N/A	Pass
11	0.018	0.026	68.6	0.019	0.039	49.4	Pass
12	0.001	0.000	N/A	0.001	0.000	N/A	Pass
13	0.018	0.026	70.6	0.019	0.039	49.4	Pass
14	0.001	0.000	N/A	0.001	0.000	N/A	Pass
15	0.023	0.026	86.1	0.025	0.039	64.1	Pass
16	0.001	0.000	N/A	0.001	0.000	N/A	Pass
17	0.025	0.026	94.3	0.025	0.039	64.3	Pass
18	0.001	0.000	N/A	0.001	0.000	N/A	Pass
19	0.016	0.026	60.6	0.017	0.039	42.4	Pass
20	0.001	0.000	N/A	0.001	0.000	N/A	Pass
21	0.014	0.026	53.9	0.017	0.039	44.1	Pass
22	0.001	0.000	N/A	0.001	0.000	N/A	Pass
23	0.023	0.026	86.7	0.026	0.039	65.6	Pass
24	0.001	0.000	N/A	0.001	0.000	N/A	Pass
25	0.015	0.026	56.5	0.017	0.039	43.5	Pass
26	0.001	0.000	N/A	0.001	0.000	N/A	Pass
27	0.012	0.026	44.4	0.017	0.039	44.1	Pass
28	0.001	0.000	N/A	0.001	0.000	N/A	Pass
29	0.025	0.026	94.6	0.025	0.039	64.0	Pass
30	0.001	0.000	N/A	0.001	0.000	N/A	Pass
31	0.017	0.026	64.9	0.019	0.039	49.0	Pass
32	0.001	0.000	N/A	0.001	0.000	N/A	Pass
33	0.009	0.026	34.0	0.010	0.039	25.3	Pass
34	0.001	0.000	N/A	0.001	0.000	N/A	Pass
35	0.007	0.026	28.6	0.008	0.039	21.5	Pass
36	0.001	0.000	N/A	0.001	0.000	N/A	Pass
37	0.006	0.026	22.5	0.006	0.039	15.6	Pass
38	0.001	0.000	N/A	0.001	0.000	N/A	Pass
39	0.005	0.026	N/A	0.006	0.039	N/A	Pass
40	0.001	0.000	N/A	0.002	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 High Bay Light Series GK02C200 (WTF16F1267798E)**      Tested by: David  
**Test category: Class-C per Ed. 4.0 (2014) (European limits)**      Test Margin: 100  
**Test date: 2016/12/27**      Start time: 15:53:00      End time: 15:55:52  
**Test duration (min): 2.5**      Data file name: H-002673.cts\_data  
**Comment: Lighting mode**  
**Customer:**  
**Test Result: Pass**      Source qualification: Normal

#### Highest parameter values during test:

Voltage (Vrms):	230.27	Frequency(Hz):	50.00
I_Peak (Amps):	1.164	I_RMS (Amps):	0.881
I_Fund (Amps):	0.872	Crest Factor:	1.329
Power (Watts):	200.8	Power Factor:	0.991

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.069	0.460	15.01	OK
3	0.541	2.072	26.11	OK
4	0.105	0.460	22.85	OK
5	0.048	0.921	5.20	OK
6	0.036	0.460	7.91	OK
7	0.037	0.691	5.32	OK
8	0.015	0.460	3.18	OK
9	0.022	0.460	4.79	OK
10	0.013	0.460	2.81	OK
11	0.016	0.230	6.92	OK
12	0.015	0.230	6.58	OK
13	0.014	0.230	6.18	OK
14	0.007	0.230	3.16	OK
15	0.018	0.230	7.77	OK
16	0.009	0.230	3.91	OK
17	0.018	0.230	7.82	OK
18	0.014	0.230	5.92	OK
19	0.017	0.230	7.60	OK
20	0.019	0.230	8.35	OK
21	0.016	0.230	7.02	OK
22	0.006	0.230	2.47	OK
23	0.022	0.230	9.51	OK
24	0.004	0.230	1.92	OK
25	0.018	0.230	7.75	OK
26	0.005	0.230	2.04	OK
27	0.014	0.230	6.29	OK
28	0.004	0.230	1.89	OK
29	0.025	0.230	10.66	OK
30	0.004	0.230	1.60	OK
31	0.021	0.230	8.99	OK
32	0.004	0.230	1.94	OK
33	0.011	0.230	4.79	OK
34	0.005	0.230	2.31	OK
35	0.011	0.230	4.95	OK
36	0.005	0.230	1.96	OK
37	0.008	0.230	3.33	OK
38	0.005	0.230	2.15	OK
39	0.011	0.230	4.62	OK
40	0.010	0.230	4.46	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.....	:	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

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### 6.2.1 E.U.T. Operation

**Operating Environment:**

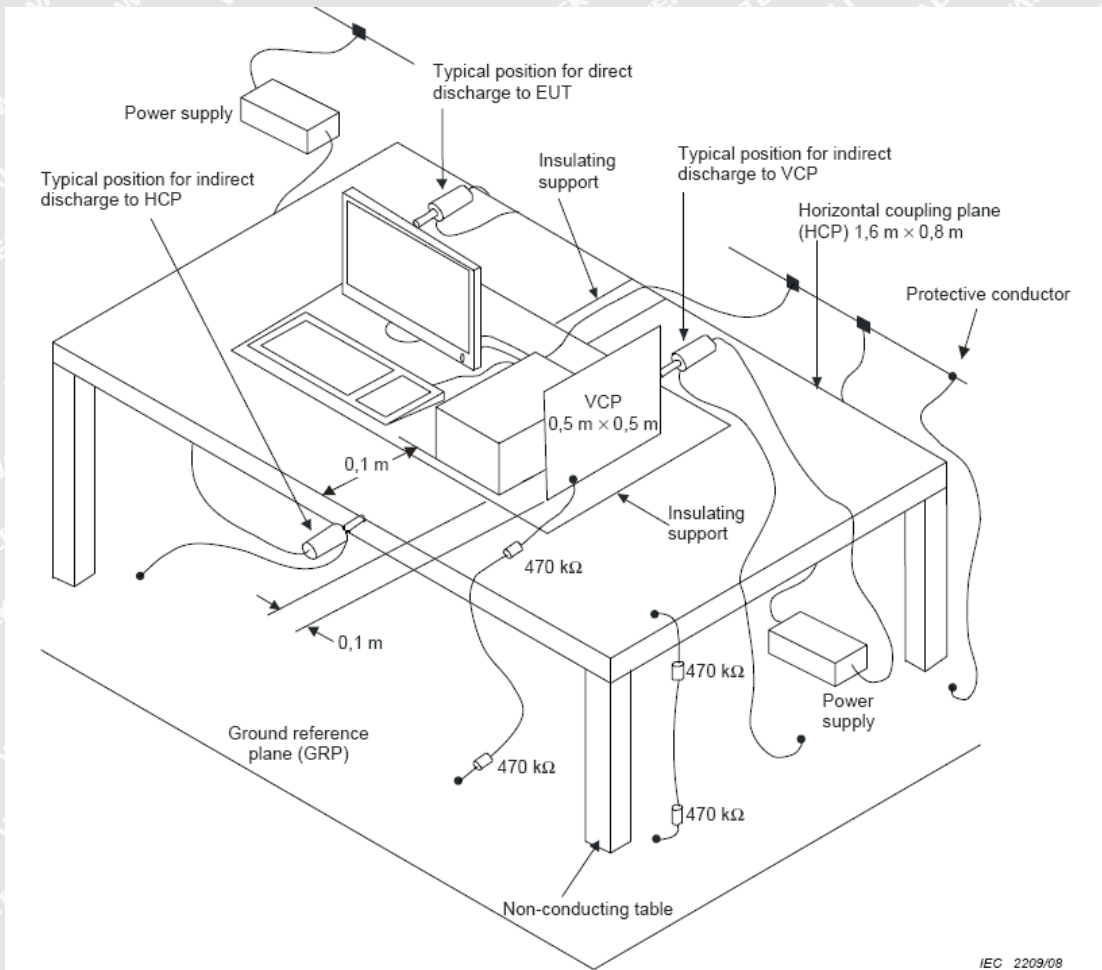
- Temperature ..... : 18.8°C
- Humidity ..... : 34.1%RH
- Barometric Pressure ..... : 101.5kPa

**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.









### 6.3.1E.U.T. Operation

#### Operating Environment:

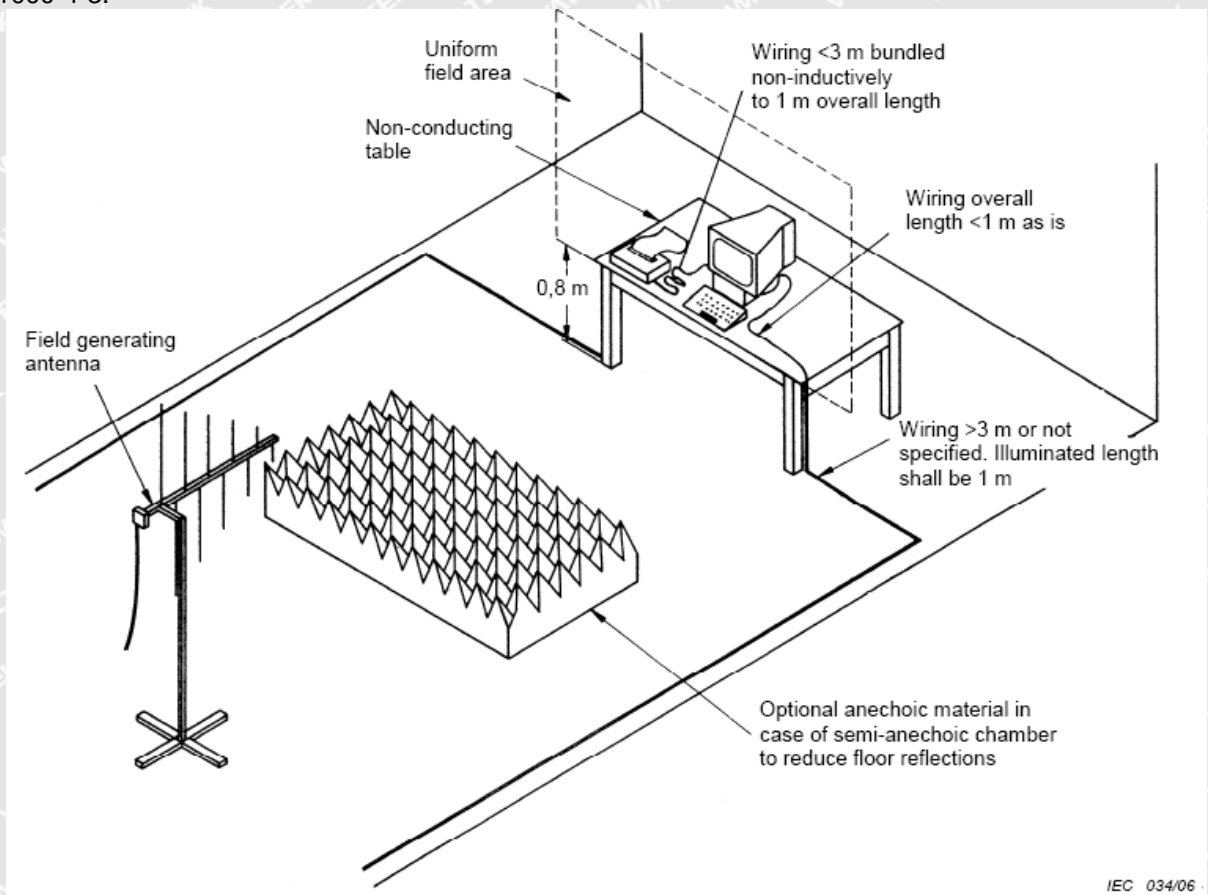
Temperature .....	: 18.8°C
Humidity .....	: 34.1%RH
Barometric Pressure .....	: 101.5kPa

#### 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** ..... : 18.8°C  
**Humidity**..... : 34.1%RH  
**Barometric Pressure**..... : 101.5kPa

**EUT Operation:**

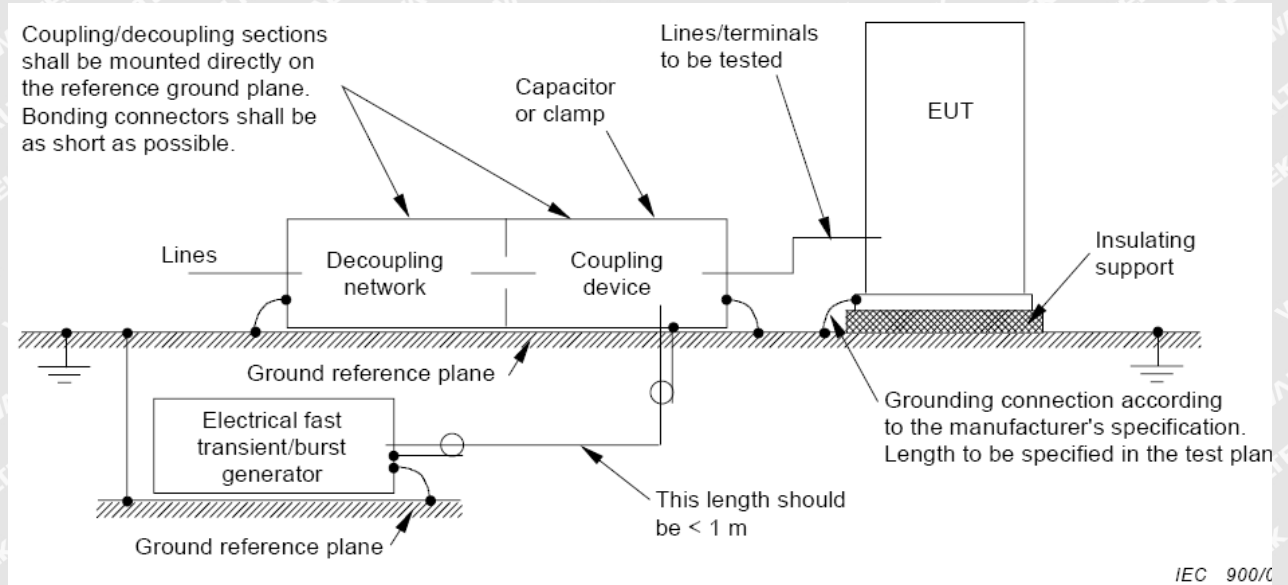
**Input Voltage** ..... : AC 230V/50Hz  
**Operating Mode**..... : On mode





### 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-PE	±1.0	B	Pass*

Remark:

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





### 6.5 Surge

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

#### 6.5.1 E.U.T. Operation

**Operating Environment:**

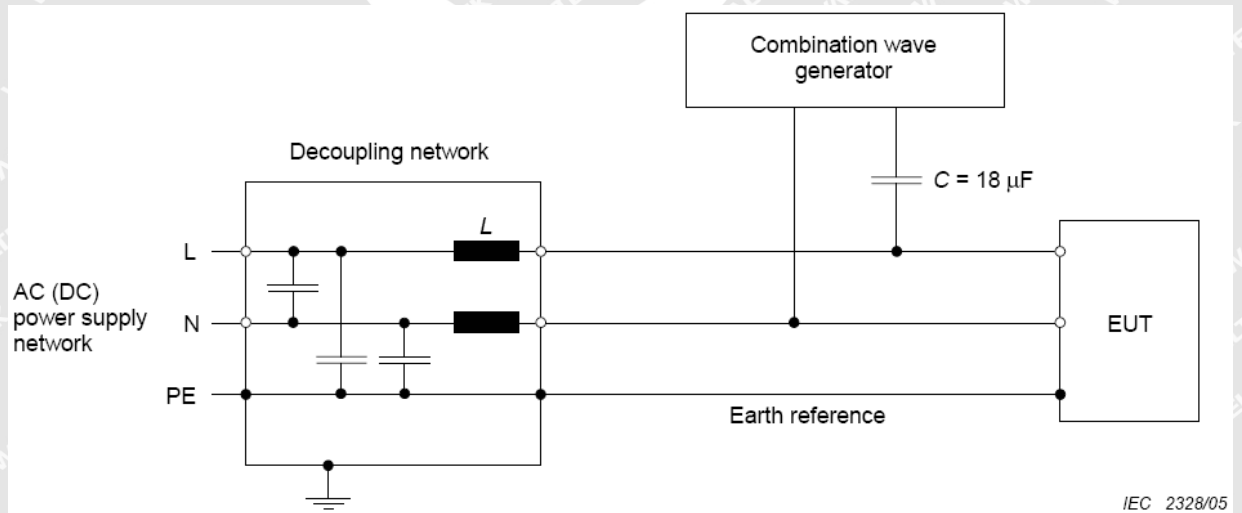
<b>Temperature</b> .....	:	18.8°C
<b>Humidity</b> .....	:	34.1%RH
<b>Barometric Pressure</b> .....	:	101.5kPa

**EUT Operation:**

<b>Input Voltage</b> .....	:	AC 230V/50Hz
<b>Operating Mode</b> .....	:	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	$\pm 1$	C	N/A
Between Live And Neutral	$\pm 1$	C	Pass*
Between Live And Earth	$\pm 2$	C	Pass*
Between Neutral And Earth	$\pm 2$	C	Pass*

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 $\Omega$ )
Modulation.....	: 80%, 1kHz Amplitude Modulation.

#### 6.6.1 E.U.T. Operation

Operating Environment:

Temperature.....	: 18.8°C
Humidity.....	: 34.1%RH
Barometric Pressure.....	: 101.5kPa

EUT Operation:

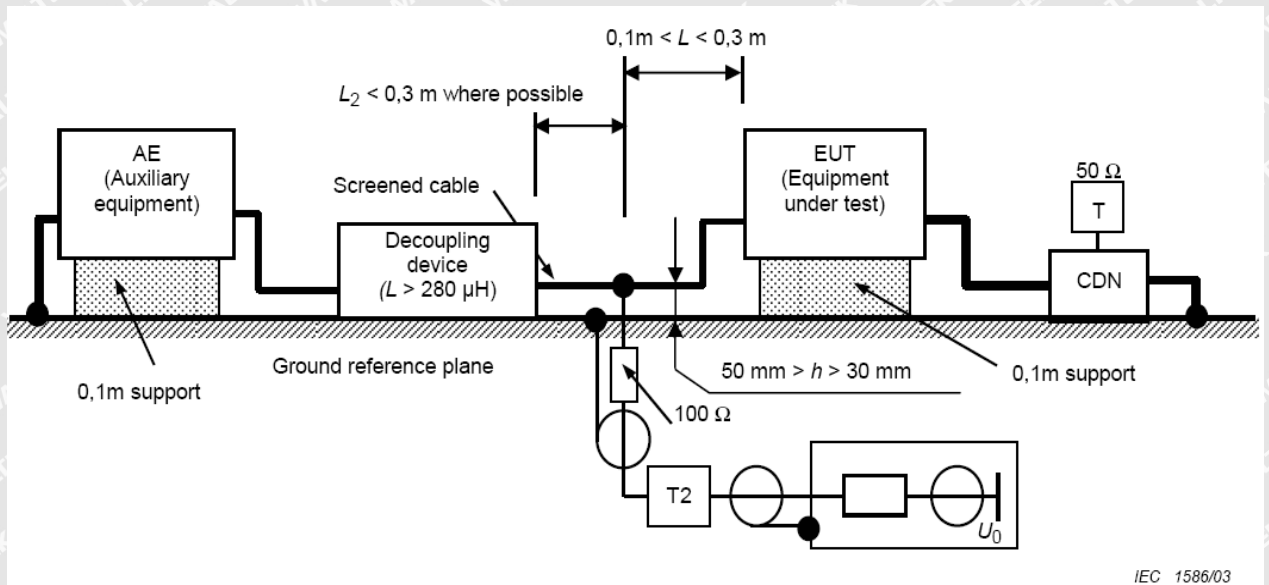
Input Voltage.....	: AC 230V/50Hz
Operating Mode.....	: On mode





### 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	3 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

### 6.7.1 E.U.T. Operation

#### Operating Environment:

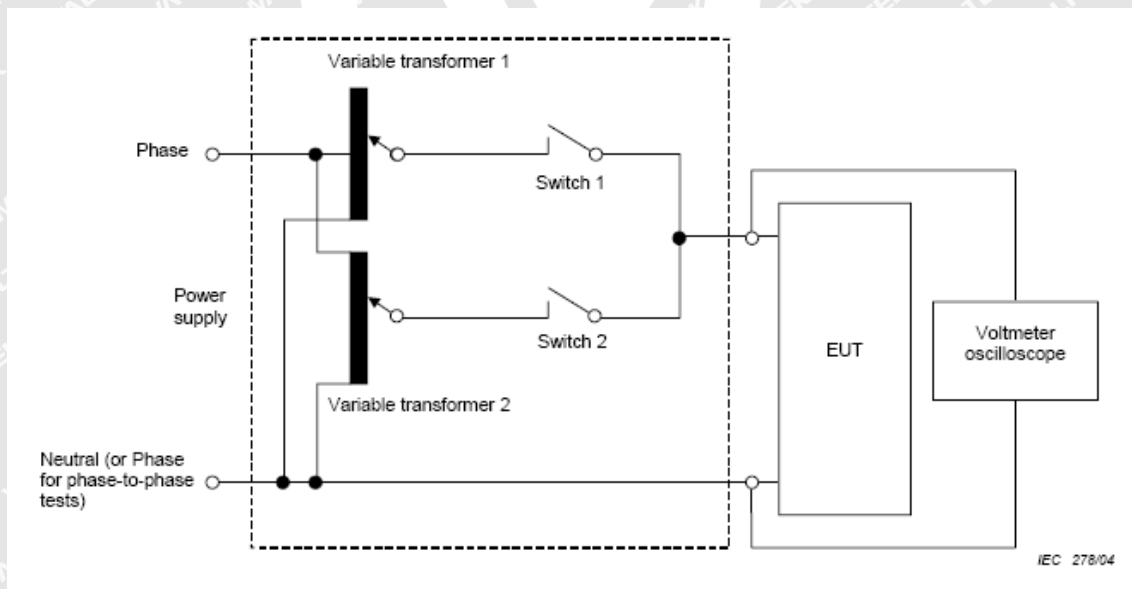
Temperature .....	18.8°C
Humidity.....	34.1%RH
Barometric Pressure.....	101.5kPa

#### 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 <sub>T</sub>	Phase	Performance criterion	Duration	Result
0	0°	B	0.5	Pass*
	180°			Pass*
70	0°	C	10	Pass*
	180°			Pass*

Remark:

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



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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



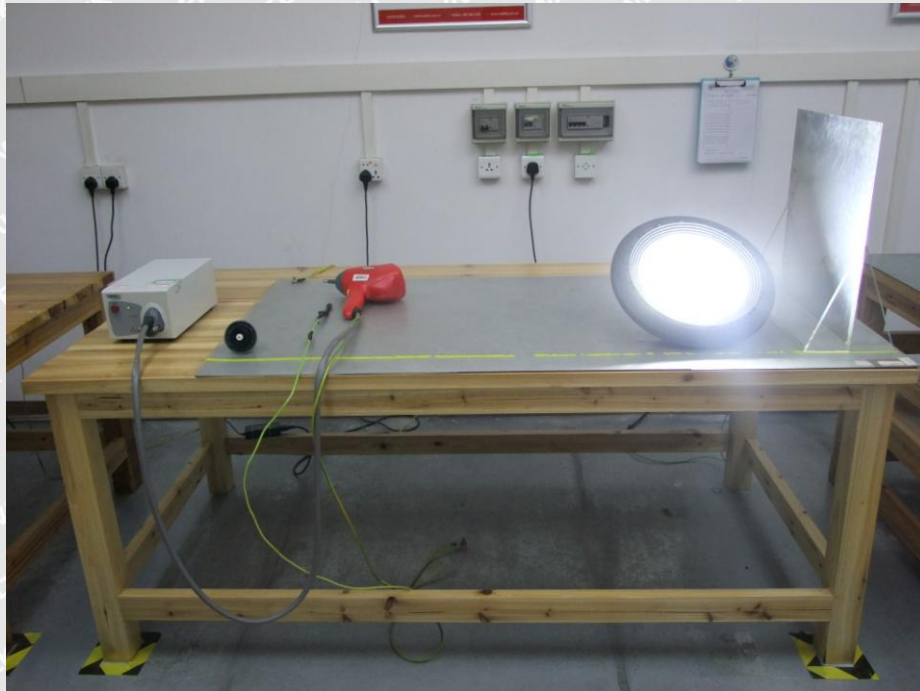
### 7.4 Photograph – Harmonic Current Test Setup



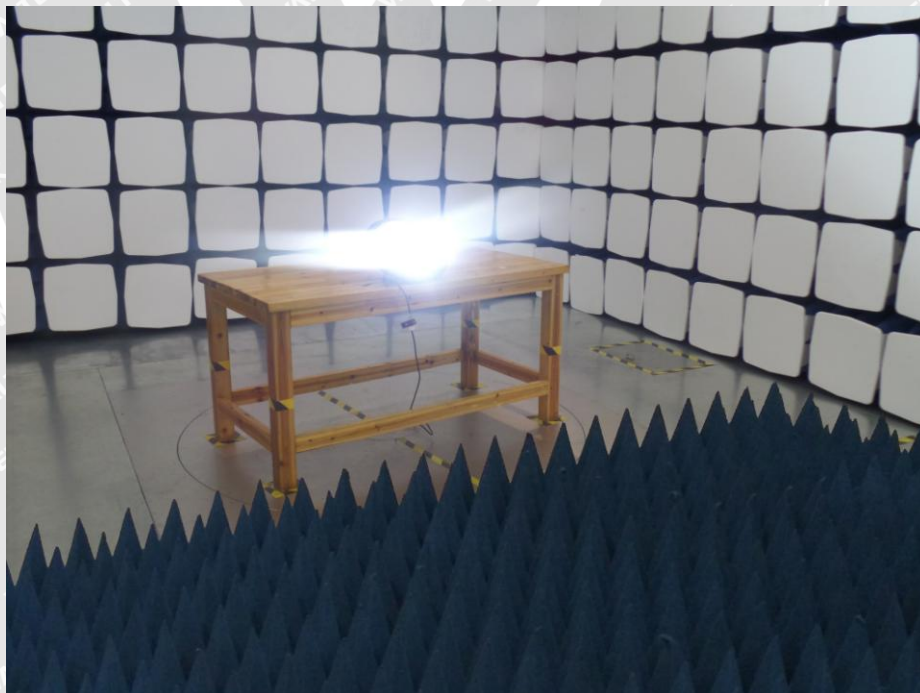




### 7.5 Photograph – ESD Immunity Test Setup



### 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 – Back View



==== End of Report ====