



TEST REPORT

Reference No. : WTF16F0345645E
Applicant : Leader Lighting Co., Ltd.
Address : No.16 Jun Ye Bei Road, Zone C, Shishan Technology & Industry Garden, Nanhai District, Foshan City, Guangdong Province, China
Manufacturer : The same as above
Address : The same as above
Product Name : LED Lamps
Model No : LD-3008D/2(89830008/01), LD-3008D/3(89830008/02), LD-3008D/4A(89830008/03), LD-3008D/5(89830008/04), LD-3008D/9(89830008/05), C10594+558(89830003/05)
Standards : EN 55015:2013
EN 61547:2009
EN 61000-3-2:2014
EN 61000-3-3:2013
Date of Receipt sample : 2016-03-22
Date of Test : 2016-03-22 to 2016-04-15
Date of Issue : 2016-04-16
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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Janice Lu / Project Engineer



Approved by:

Tom Xiao

Tom Xiao / Manager



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 61000-3-2:2014		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 % U _T * for 0.5per	B	Pass
		70 % U _T * 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_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."

*** According to EN 61000-3-2, no limit apply to the non-discharge lighting equipment with rated power less than or equal to 25W. The rated power of model C10594+558 (89830003/05) is less than 25W. Therefore, this equipment is deemed to fulfil this standard without any testing.

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<http://www.waltek.com.cn>

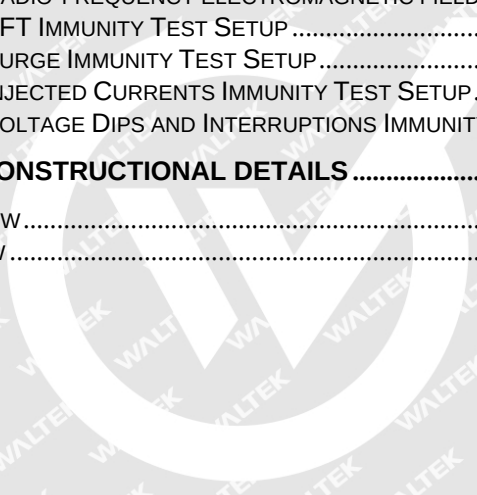


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3 General Information

3.1 General Description of E.U.T.

Product Name : LED Lamps

Model No. : LD-3008D/2(89830008/01), LD-3008D/3(89830008/02), LD-3008D/4A(89830008/03), LD-3008D/5(89830008/04), LD-3008D/9(89830008/05), C10594+558(89830003/05)

Remark : The LED drivers used in models which with "LD" have same electric circuit only their output parameter is different, model C10594+558 (89830003/05) have different LED driver with other five models, therefore the full EMC tests were performed on two biggest rated power models LD-3008D/9(89830008/05) and C10594+558(89830003/05).

3.2 Details of E.U.T.

Technical Data..... :

Item	Model	Rated voltage (VAC)	Rated frequency (Hz)	Rated power input (W)
1	LD-3008D/2 (89830008/01)	220-240	50	LED 2x 4W
2	LD-3008D/3(89830008/02)	220-240	50	LED 3x 4W
3	LD-3008D/4A (89830008/03)	220-240	50	LED 4x 4W
4	LD-3008D/5 (89830008/04)	220-240	50	LED 5x 4W
5	LD-3008D/9 (89830008/05)	220-240	50	LED 9x 4W
6	C10594+558 (89830003/05)	220-240	50	LED 23.6W

3.3 Description of Support Units

The EUT has been tested as an independent unit. LD-3008D/9(89830008/05) and C10594+558(89830003/05) are the test samples. The DV&RE tests were performed In the condition of AC245V/50Hz input. The other tests were performed in the condition of AC230V/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 61000-3-2:2014	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 ≤ 16 A per phase and not subject to conditional connection.



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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

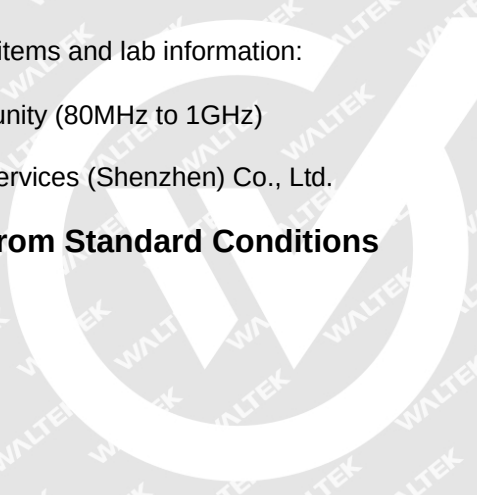
If Yes, list the related test items and lab information:

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	PROFLINE21 05-400	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	±2.66dB	(1)
Radiated electromagnetic disturbance	9kHz to 30MHz	±3.00dB	(1)
Radiated Emission(CDN method)	30MHz~300MHz	±3.32dB	(1)
Radiated Emission	30MHz~300MHz	±5.03dB	(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

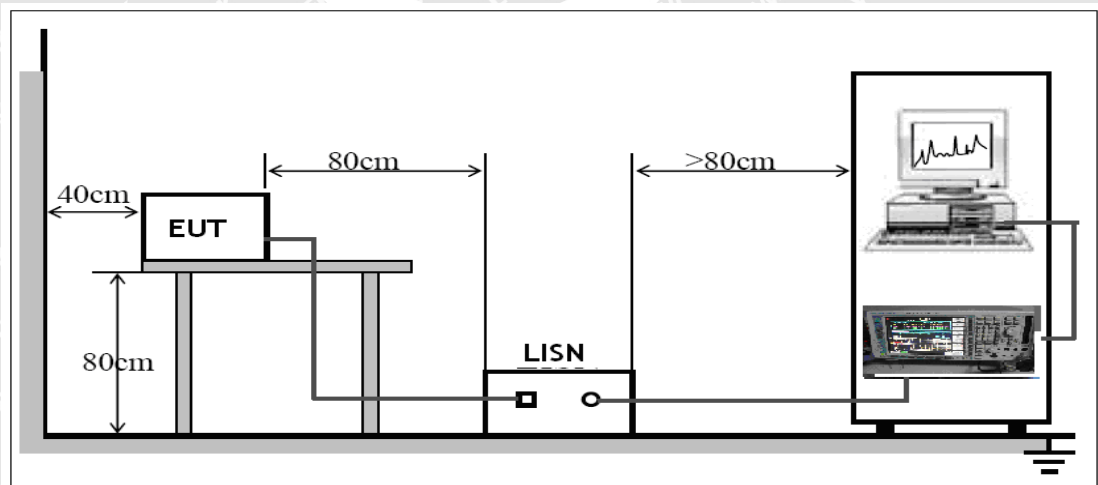
EUT Operation:

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.



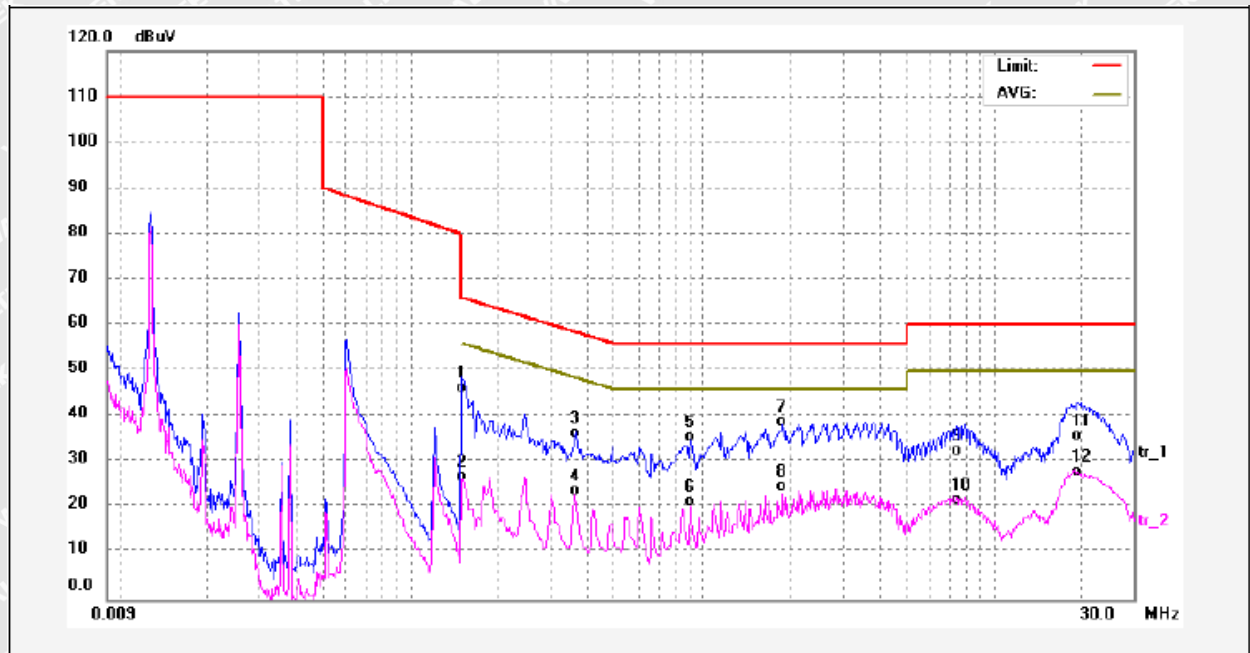


5.1.3 Measurement Data

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

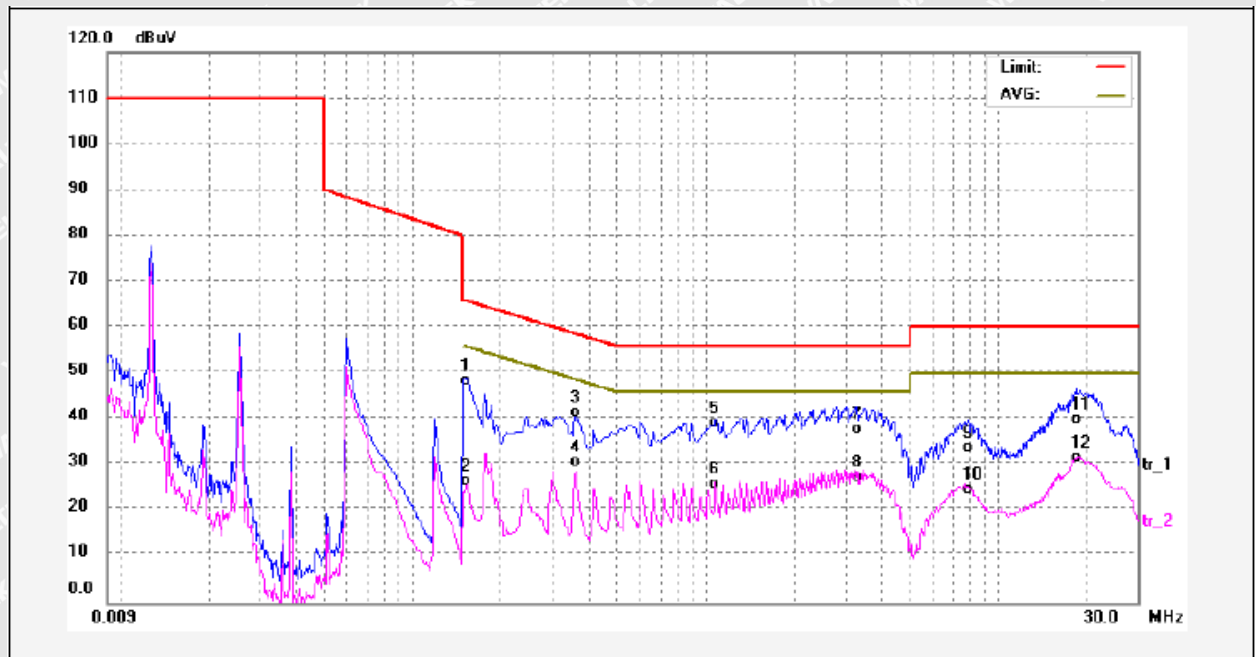
Live Line For Model LD-3008D/9 (89830008/05):



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1500	35.63	9.64	45.27	65.99	-20.72	QP	
2	0.1500	16.11	9.64	25.75	55.99	-30.24	AVG	
3	0.3700	25.59	9.66	35.25	58.50	-23.25	QP	
4	0.3700	12.89	9.66	22.55	48.50	-25.95	AVG	
5	0.9020	24.62	9.67	34.29	56.00	-21.71	QP	
6	0.9020	10.46	9.67	20.13	46.00	-25.87	AVG	
7	1.8660	27.91	9.65	37.56	56.00	-18.44	QP	
8	1.8660	14.00	9.65	23.65	46.00	-22.35	AVG	
9	7.3900	21.60	9.77	31.37	60.00	-28.63	QP	
10	7.3900	10.80	9.77	20.57	50.00	-29.43	AVG	
11	19.2900	24.65	10.05	34.70	60.00	-25.30	QP	
12	19.2900	16.82	10.05	26.87	50.00	-23.13	AVG	



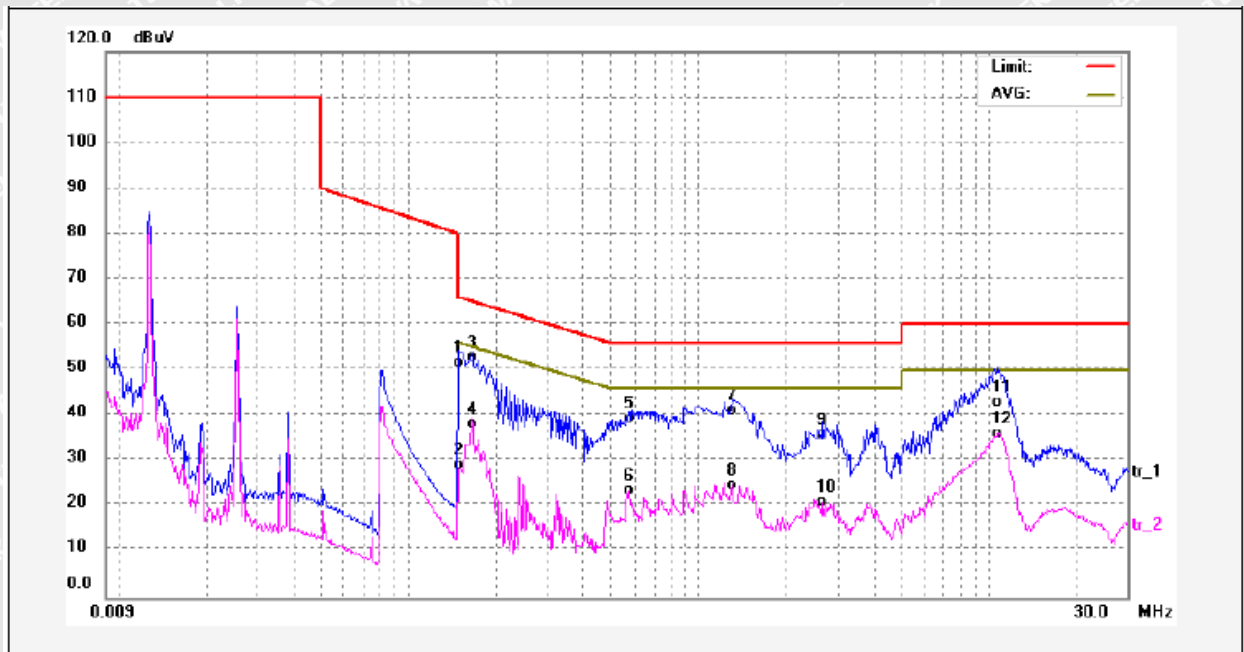
Neutral Line For Model LD-3008D/9 (89830008/05):



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Remark
1	0.1500	37.61	9.64	47.25	65.99	-18.74	QP	
2	0.1500	15.70	9.64	25.34	55.99	-30.65	AVG	
3	0.3620	30.70	9.67	40.37	58.68	-18.31	QP	
4	0.3620	19.85	9.67	29.52	48.68	-19.16	AVG	
5	1.0740	28.24	9.66	37.90	56.00	-18.10	QP	
6	1.0740	14.96	9.66	24.62	46.00	-21.38	AVG	
7	3.2780	26.92	9.68	36.60	56.00	-19.40	QP	
8	3.2780	16.65	9.68	26.33	46.00	-19.67	AVG	
9	7.9300	22.66	9.77	32.43	60.00	-27.57	QP	
10	7.9300	13.88	9.77	23.65	50.00	-26.35	AVG	
11	18.6020	28.84	10.02	38.86	60.00	-21.14	QP	
12	18.6020	20.43	10.02	30.45	50.00	-19.55	AVG	



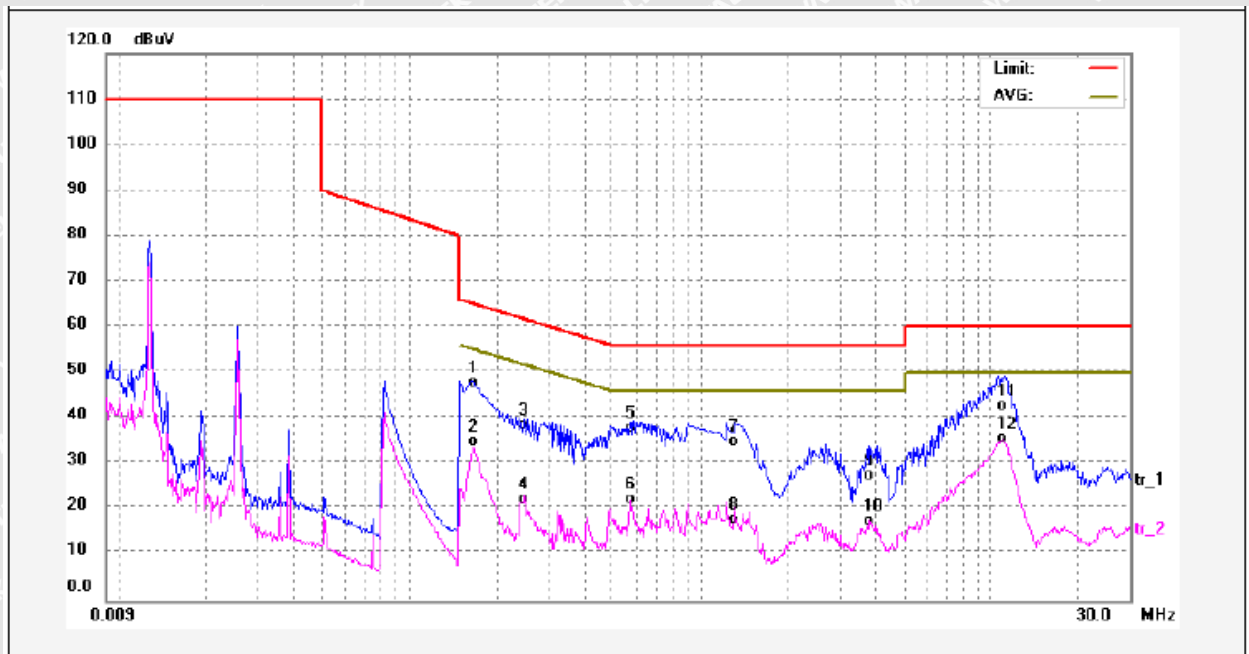
Live Line For Model C10594+558 (89830003/05):



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1500	40.97	9.64	50.61	65.99	-15.38	QP	
2	0.1500	18.35	9.64	27.99	55.99	-28.00	AVG	
3	0.1660	42.06	9.62	51.68	65.15	-13.47	QP	
4	0.1660	27.29	9.62	36.91	55.15	-18.24	AVG	
5	0.5700	28.66	9.64	38.30	56.00	-17.70	QP	
6	0.5700	12.61	9.64	22.25	46.00	-23.75	AVG	
7	1.2940	30.45	9.65	40.10	56.00	-15.90	QP	
8	1.2940	14.04	9.65	23.69	46.00	-22.31	AVG	
9	2.6619	24.99	9.68	34.67	56.00	-21.33	QP	
10	2.6619	10.14	9.68	19.82	46.00	-26.18	AVG	
11	10.7940	31.97	9.80	41.77	60.00	-18.23	QP	
12	10.7940	25.17	9.80	34.97	50.00	-15.03	AVG	



Neutral Line For Model C10594+558 (89830003/05):



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1660	36.99	9.62	46.61	65.15	-18.54	QP	
2	0.1660	24.04	9.62	33.66	55.15	-21.49	AVG	
3	0.2500	27.56	9.64	37.20	61.75	-24.55	QP	
4	0.2500	11.47	9.64	21.11	51.75	-30.64	AVG	
5	0.5700	26.99	9.64	36.63	56.00	-19.37	QP	
6	0.5700	11.55	9.64	21.19	46.00	-24.81	AVG	
7	1.3140	24.09	9.65	33.74	56.00	-22.26	QP	
8	1.3140	7.05	9.65	16.70	46.00	-29.30	AVG	
9	3.8220	16.56	9.70	26.26	56.00	-29.74	QP	
10	3.8220	6.69	9.70	16.39	46.00	-29.61	AVG	
11	10.9340	31.71	9.80	41.51	60.00	-18.49	QP	
12	10.9340	24.65	9.80	34.45	50.00	-15.55	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

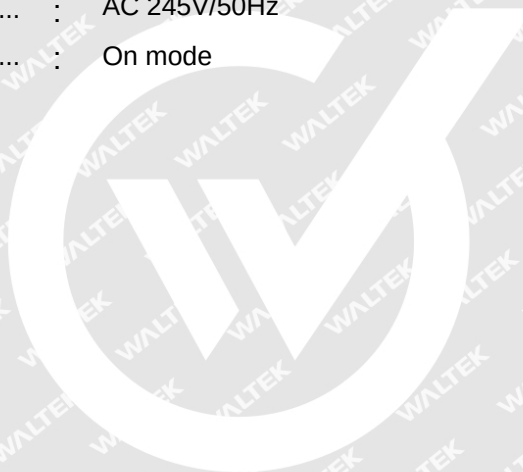
Humidity..... : 42.0%RH

Barometric Pressure..... : 101.2kPa

EUT Operation:

Input Voltage : AC 245V/50Hz

Operating Mode..... : On mode

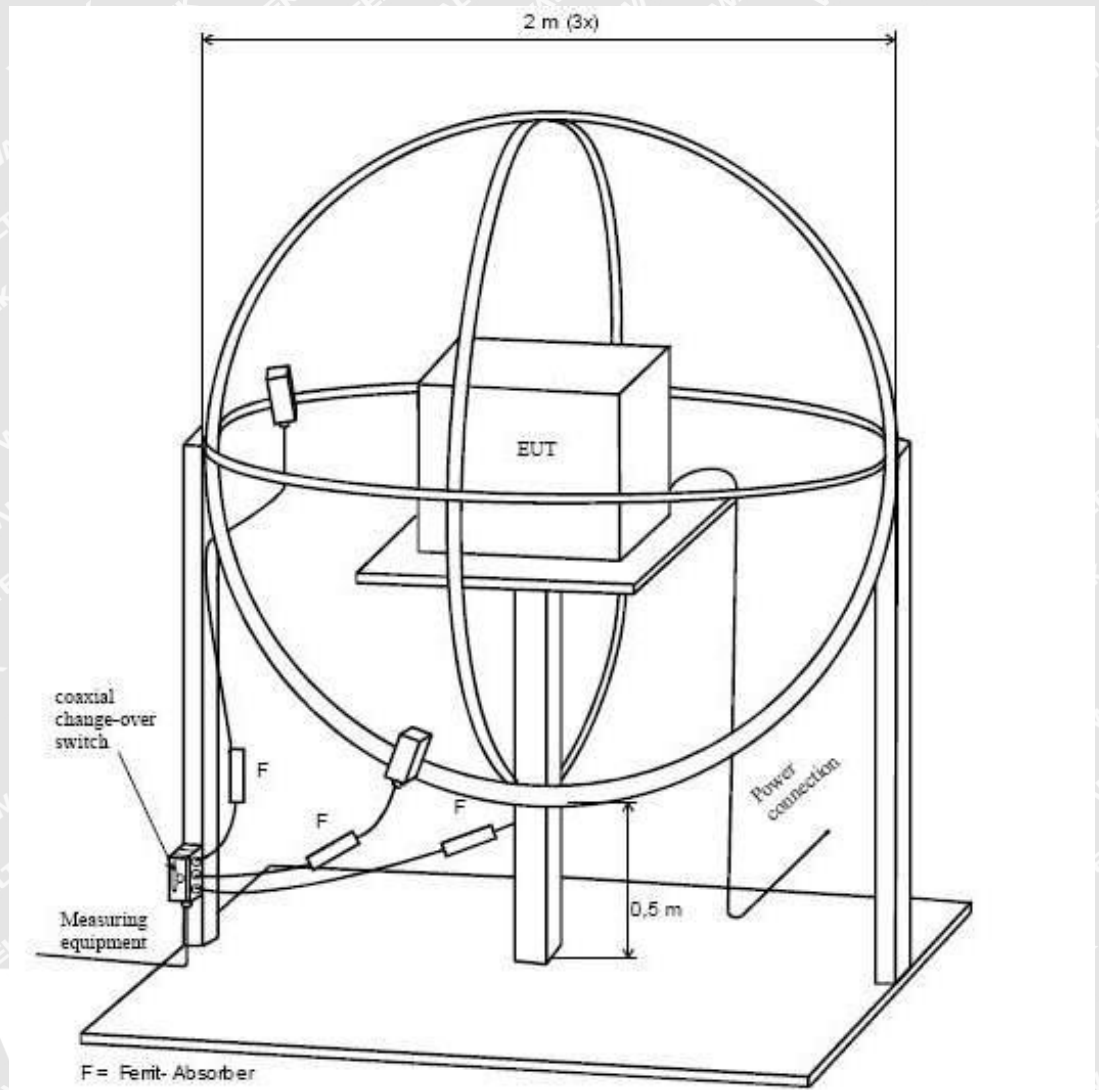


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5.2.2 Block Diagram of Test Setup

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



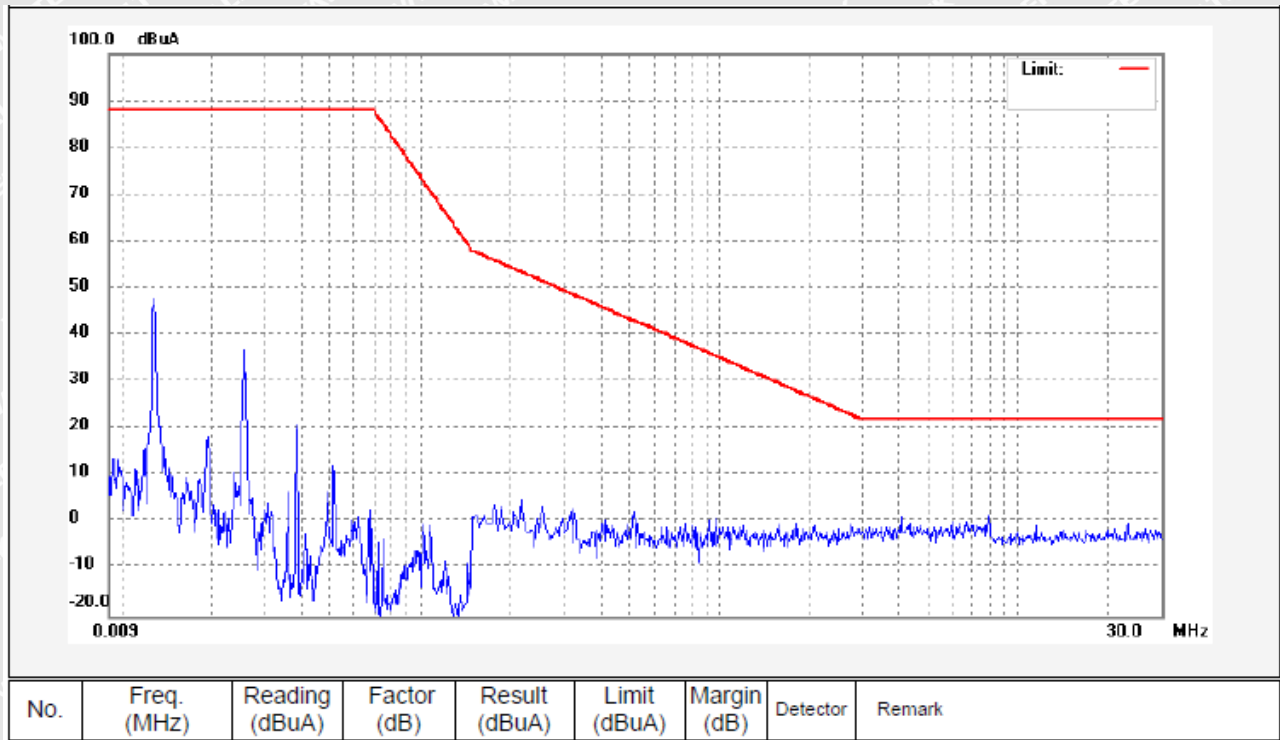
5.2.3 Measurement Data

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

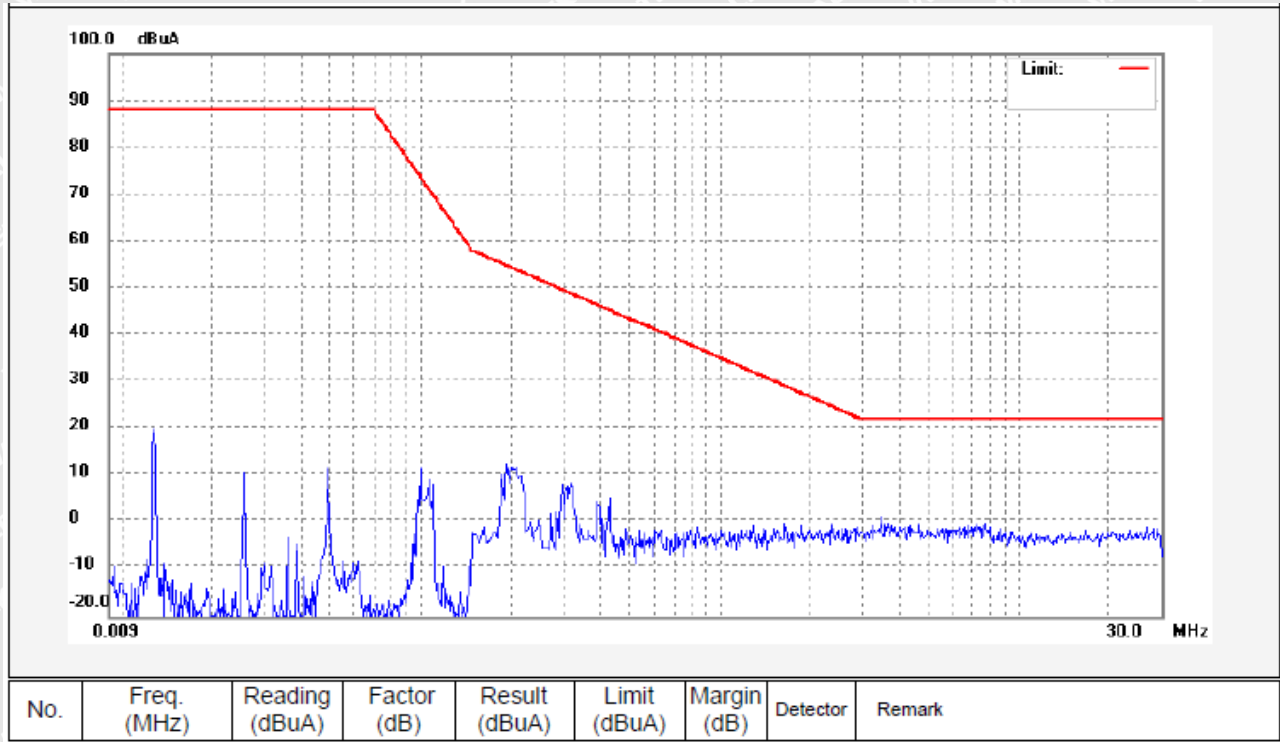
Loop X For Model LD-3008D/9 (89830008/05):



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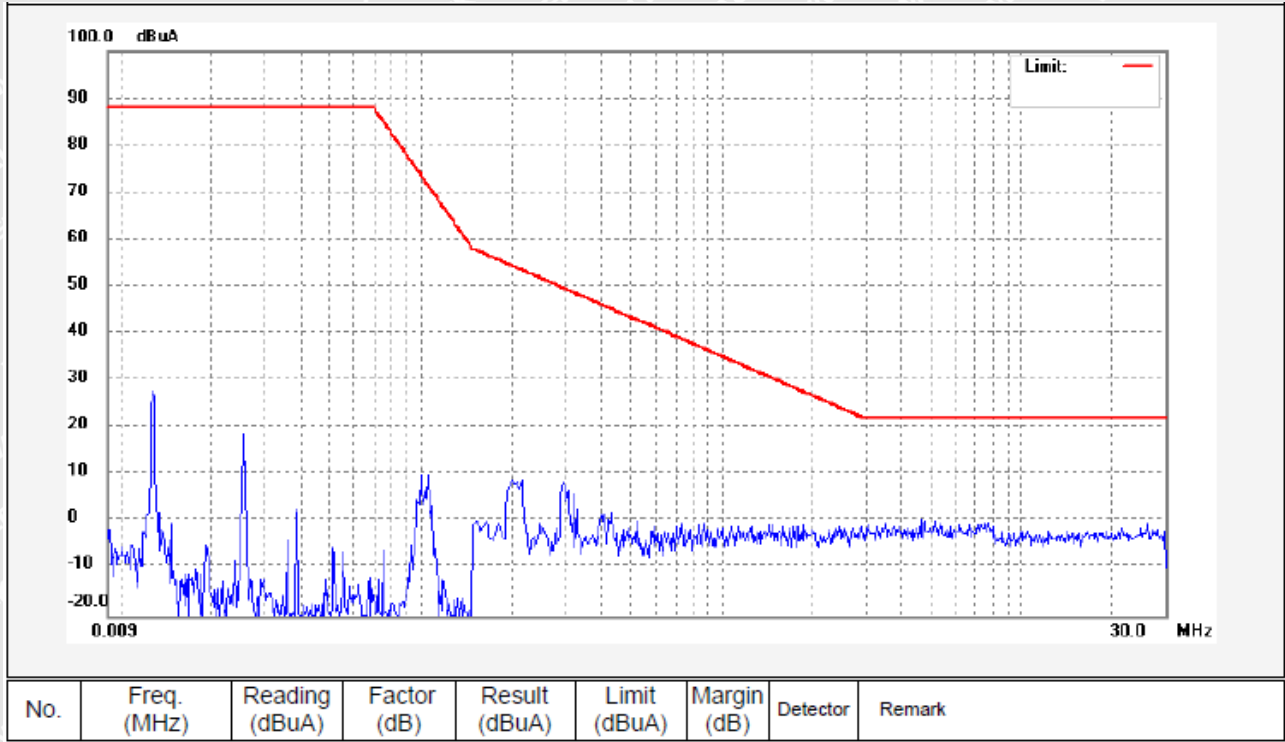
Loop Y For Model LD-3008D/9 (89830008/05):



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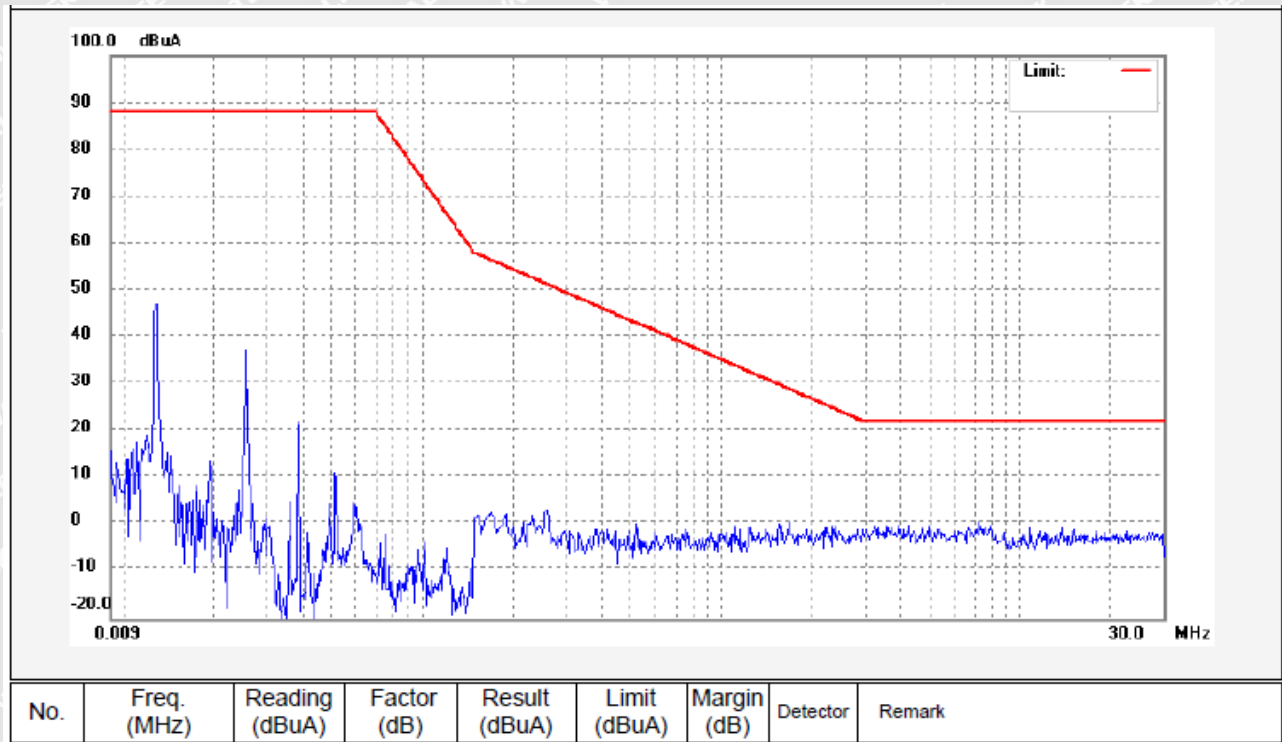
Loop Z For Model LD-3008D/9 (89830008/05):



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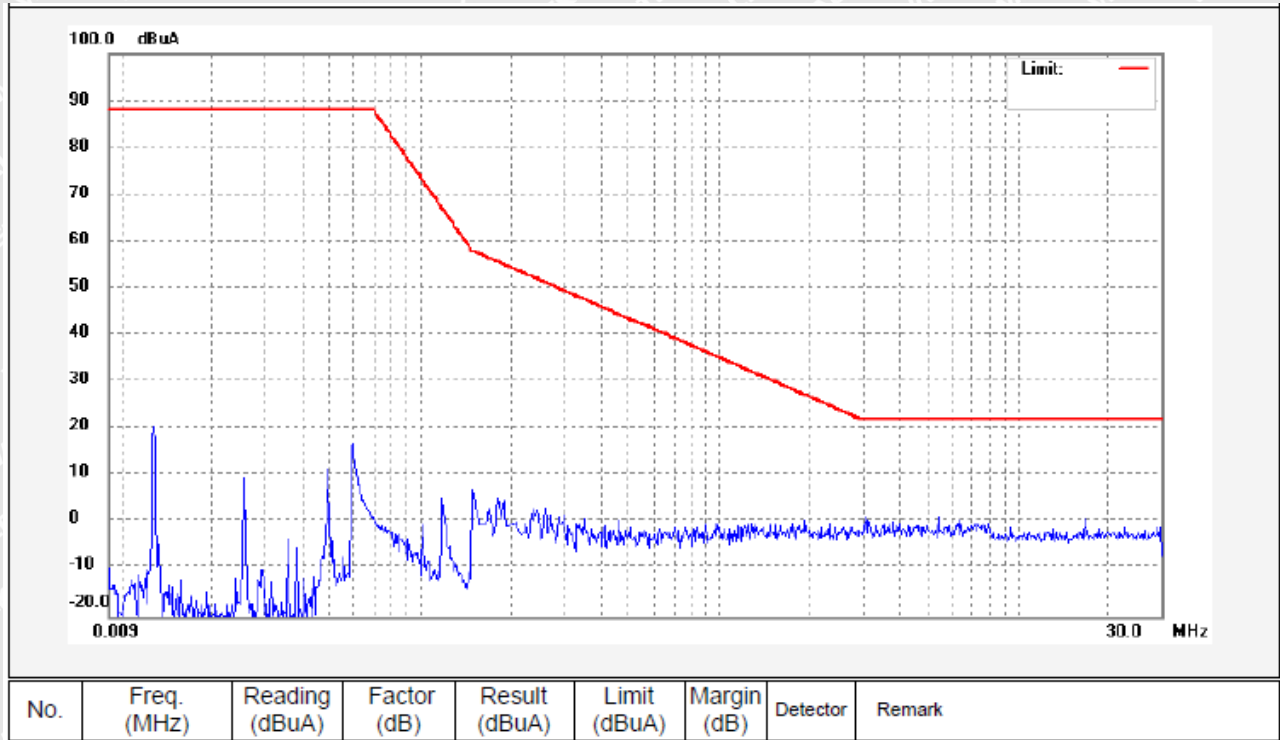
Loop X For Model C10594+558 (89830003/05):



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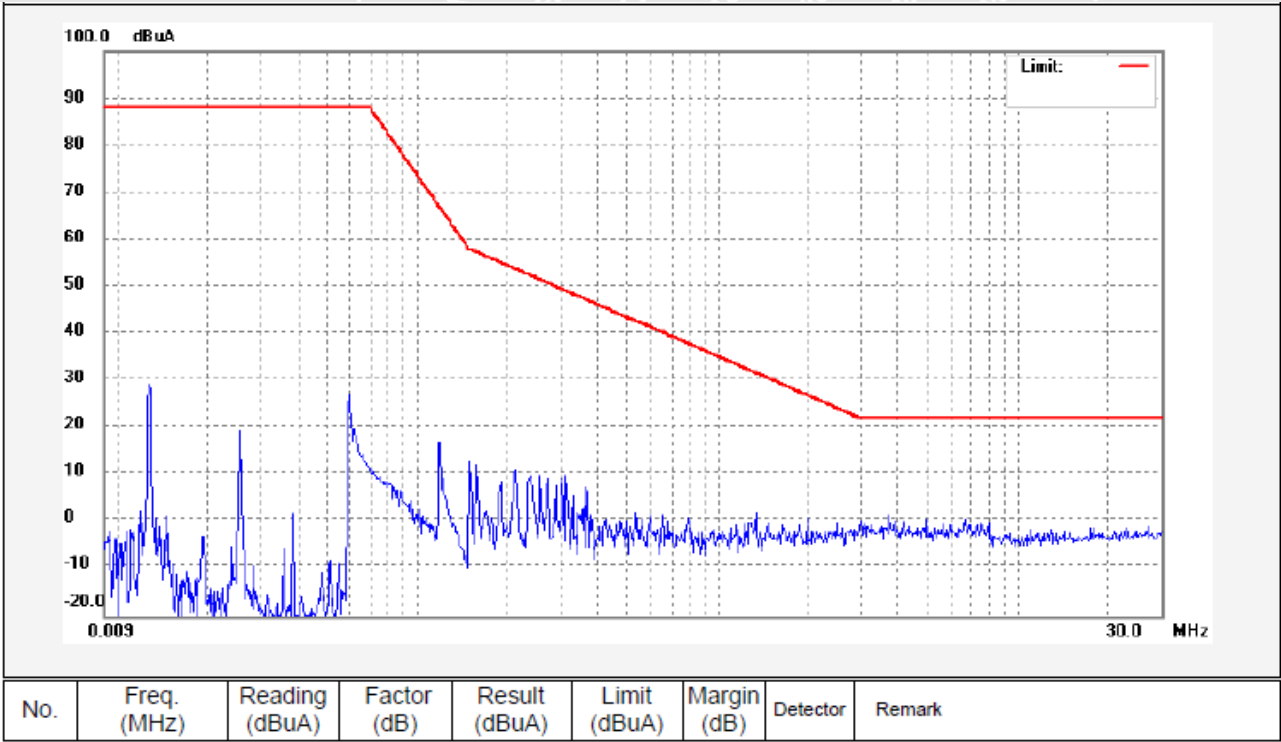
Loop Y For Model C10594+558 (89830003/05):



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Loop Z For Model C10594+558 (89830003/05):



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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

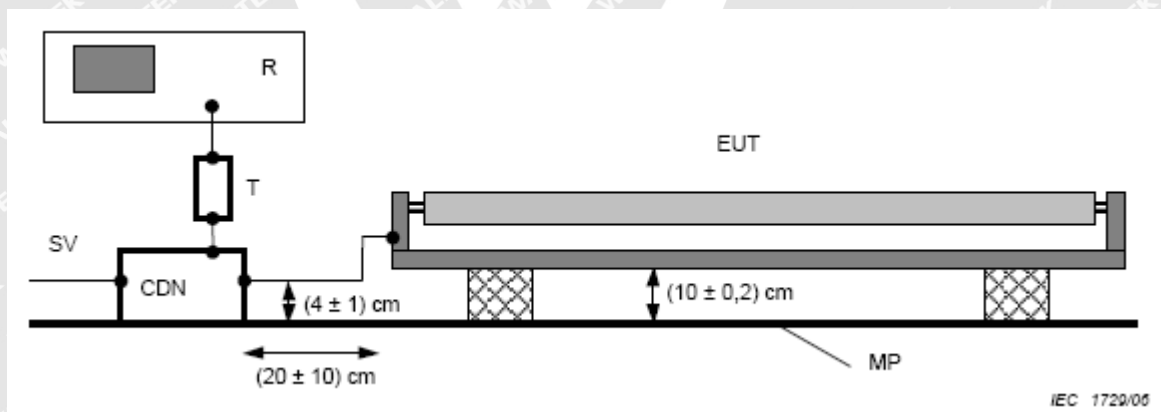
EUT Operation :

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.



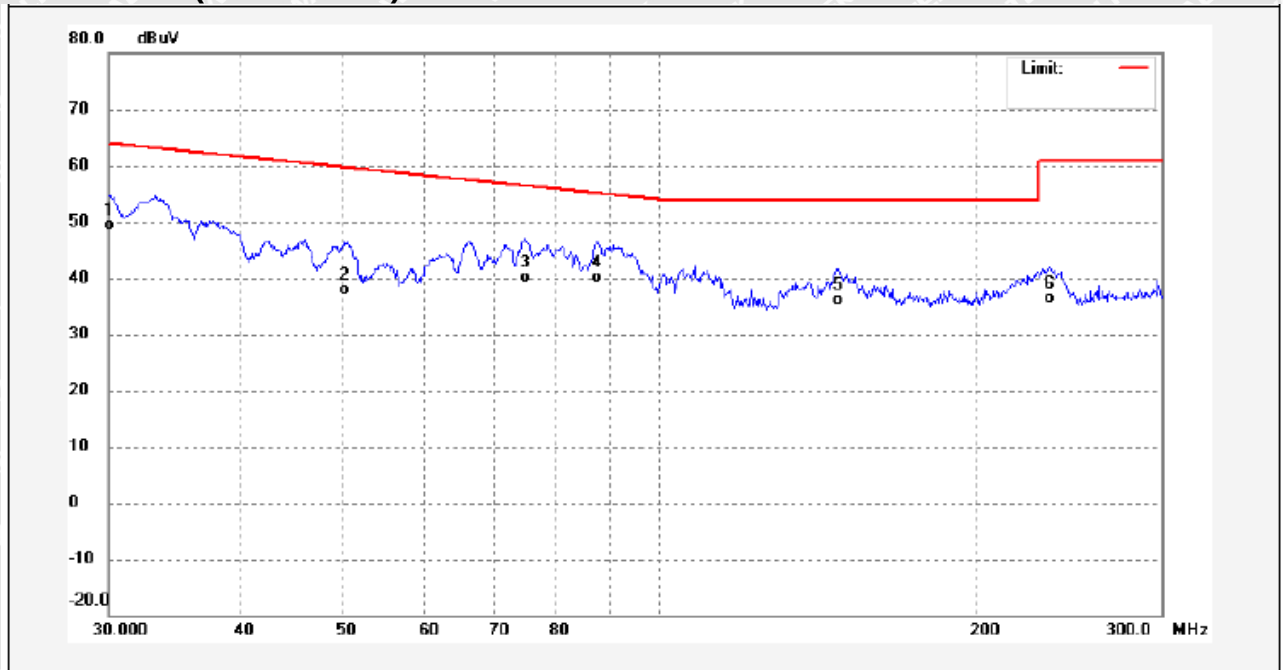
5.3.3 Measurement Data

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.



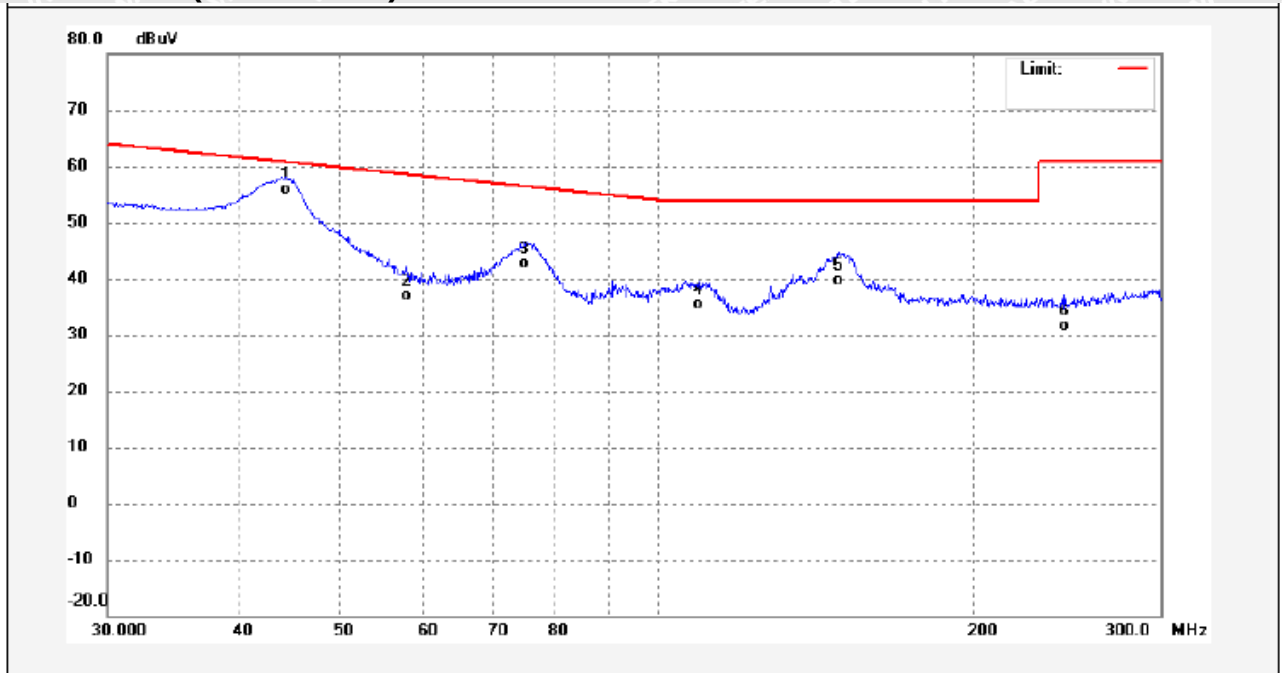
5.3.4 Radiated Emission test data, 30MHz to 300MHz

LD-3008D/9 (89830008/05)



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Remark
1	30.0000	32.50	15.79	48.29	64.00	-15.71	QP	
2	50.4800	20.92	15.88	36.80	59.68	-22.88	QP	
3	74.8000	23.29	15.96	39.25	56.41	-17.16	QP	
4	87.7200	23.21	15.98	39.19	55.09	-15.90	QP	
5	148.2800	18.99	16.07	35.06	54.00	-18.94	QP	
6	235.5600	18.76	16.59	35.35	61.00	-25.65	QP	

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**C10594+558 (89830003/05)**

No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Remark
1	44.4400	39.07	15.86	54.93	60.74	-5.81	QP	
2	57.8000	19.87	15.90	35.77	58.55	-22.78	QP	
3	75.0000	25.76	15.96	41.72	56.39	-14.67	QP	
4	109.4000	18.29	16.00	34.29	54.00	-19.71	QP	
5	148.6000	22.59	16.07	38.66	54.00	-15.34	QP	
6	243.8400	13.79	16.72	30.51	61.00	-30.49	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

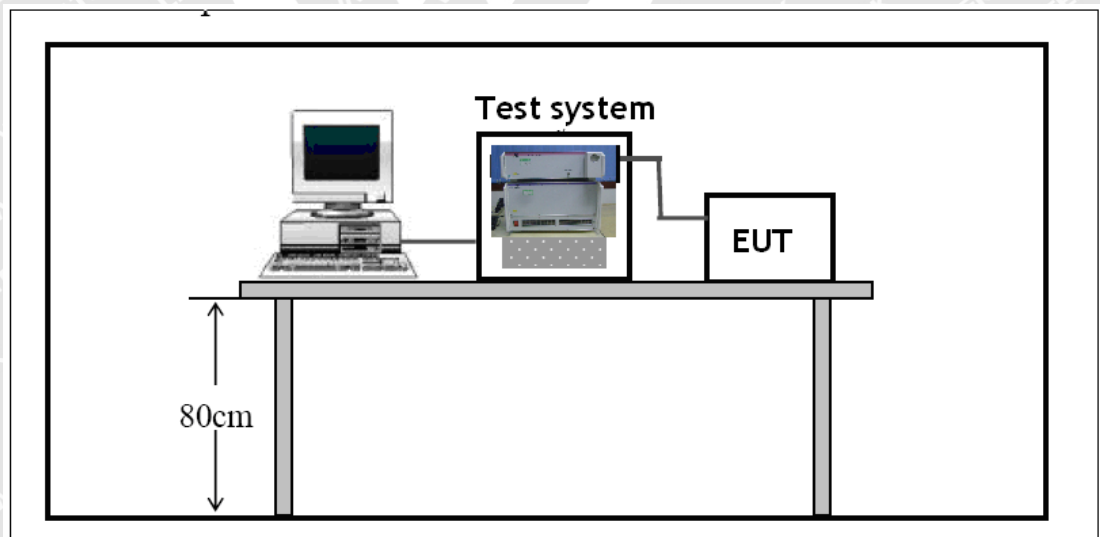
EUT Operation:

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.





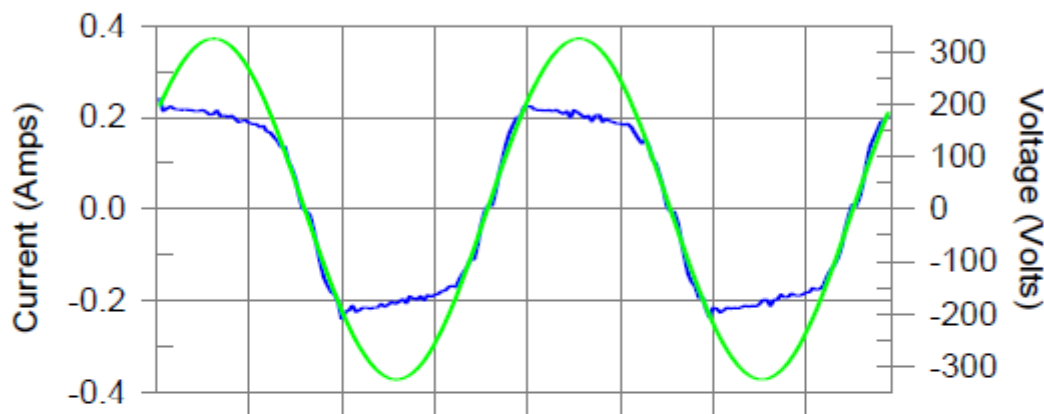
5.1.3 Harmonic Current Emission Test Data

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

EUT: LED Lamp LD-3008D/9 (89830008/05) (WTF16F0345645E) Tested by: Roy
Test category: Class-C per Ed. 4.0 (2014) (European limits) Test Margin: 100
Test date: 2016/3/30 Start time: 10:49:33 End time: 10:52:24
Test duration (min): 2.5 Data file name: H-000274.cts_data
Comment: on mode
Customer:

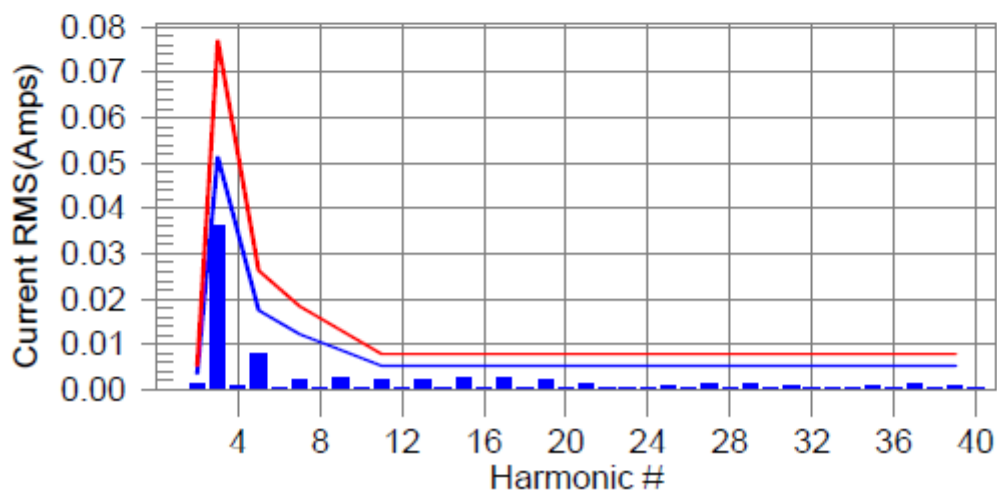
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class C limit line

European Limits



Test result: Pass Worst harmonics H3-48.1% of 150% limit, H3-70.2% of 100% limit.



Current Test Result Summary (Run time)

EUT: LED Lamp LD-3008D/9 (89830008/05) (WTF16F0345645E) Tested by: Roy
 Test category: Class-C per Ed. 4.0 (2014) (European limits) Test Margin: 100
 Test date: 2016/3/30 Start time: 10:49:33 End time: 10:52:24
 Test duration (min): 2.5 Data file name: H-000274.cts_data
 Comment: on mode
 Customer:

Test Result: Pass Source qualification: Normal
 THCA: 0.038 I-THD(%): 21.7 POHC(A): 0.000 POHC Limit(A): 0.017

Highest parameter values during test:

V_RMS (Volts):	230.21	Frequency(Hz):	50.00
I_Peak (Amps):	0.258	I_RMS (Amps):	0.179
I_Fund (Amps):	0.175	Crest Factor:	1.454
Power (Watts):	40.3	Power Factor:	0.977

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	0.004	N/A	0.001	0.005	N/A	Pass
3	0.036	0.051	70.2	0.037	0.077	48.1	Pass
4	0.001	0.000	N/A	0.001	0.000	N/A	Pass
5	0.008	0.018	45.6	0.008	0.026	31.3	Pass
6	0.000	0.000	N/A	0.001	0.000	N/A	Pass
7	0.002	0.012	N/A	0.002	0.018	N/A	Pass
8	0.000	0.000	N/A	0.000	0.000	N/A	Pass
9	0.003	0.009	N/A	0.003	0.013	N/A	Pass
10	0.000	0.000	N/A	0.001	0.000	N/A	Pass
11	0.002	0.005	N/A	0.002	0.008	N/A	Pass
12	0.000	0.000	N/A	0.000	0.000	N/A	Pass
13	0.002	0.005	N/A	0.002	0.008	N/A	Pass
14	0.000	0.000	N/A	0.000	0.000	N/A	Pass
15	0.003	0.005	N/A	0.003	0.008	N/A	Pass
16	0.000	0.000	N/A	0.001	0.000	N/A	Pass
17	0.003	0.005	N/A	0.003	0.008	N/A	Pass
18	0.000	0.000	N/A	0.000	0.000	N/A	Pass
19	0.002	0.005	N/A	0.002	0.008	N/A	Pass
20	0.000	0.000	N/A	0.001	0.000	N/A	Pass
21	0.001	0.005	N/A	0.002	0.008	N/A	Pass
22	0.000	0.000	N/A	0.001	0.000	N/A	Pass
23	0.001	0.005	N/A	0.001	0.008	N/A	Pass
24	0.000	0.000	N/A	0.000	0.000	N/A	Pass
25	0.001	0.005	N/A	0.001	0.008	N/A	Pass
26	0.000	0.000	N/A	0.001	0.000	N/A	Pass
27	0.001	0.005	N/A	0.001	0.008	N/A	Pass
28	0.000	0.000	N/A	0.001	0.000	N/A	Pass
29	0.001	0.005	N/A	0.001	0.008	N/A	Pass
30	0.000	0.000	N/A	0.000	0.000	N/A	Pass
31	0.001	0.005	N/A	0.001	0.008	N/A	Pass
32	0.001	0.000	N/A	0.001	0.000	N/A	Pass
33	0.000	0.005	N/A	0.001	0.008	N/A	Pass
34	0.000	0.000	N/A	0.001	0.000	N/A	Pass
35	0.001	0.005	N/A	0.001	0.008	N/A	Pass
36	0.000	0.000	N/A	0.000	0.000	N/A	Pass
37	0.001	0.005	N/A	0.001	0.008	N/A	Pass
38	0.001	0.000	N/A	0.001	0.000	N/A	Pass
39	0.001	0.005	N/A	0.001	0.008	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 LD-3008D/9 (89830008/05) (WTF16F0345645E) Tested by: Roy
 Test category: Class-C per Ed. 4.0 (2014) (European limits) Test Margin: 100
 Test date: 2016/3/30 Start time: 10:49:33 End time: 10:52:24
 Test duration (min): 2.5 Data file name: H-000274.cts_data
 Comment: on mode
 Customer:

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	230.21	Frequency(Hz):	50.00
I _{Peak} (Amps):	0.258	I _{RMS} (Amps):	0.179
I _{Fund} (Amps):	0.175	Crest Factor:	1.454
Power (Watts):	40.3	Power Factor:	0.977

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.076	0.460	16.49	OK
3	0.541	2.072	26.11	OK
4	0.104	0.460	22.57	OK
5	0.048	0.921	5.19	OK
6	0.035	0.460	7.56	OK
7	0.035	0.690	5.07	OK
8	0.011	0.460	2.43	OK
9	0.021	0.460	4.55	OK
10	0.014	0.460	3.07	OK
11	0.014	0.230	6.03	OK
12	0.014	0.230	5.88	OK
13	0.011	0.230	4.97	OK
14	0.007	0.230	2.83	OK
15	0.014	0.230	6.06	OK
16	0.010	0.230	4.54	OK
17	0.008	0.230	3.51	OK
18	0.014	0.230	6.29	OK
19	0.011	0.230	4.90	OK
20	0.019	0.230	8.13	OK
21	0.011	0.230	4.77	OK
22	0.004	0.230	1.89	OK
23	0.007	0.230	3.20	OK
24	0.004	0.230	1.89	OK
25	0.008	0.230	3.51	OK
26	0.004	0.230	1.71	OK
27	0.009	0.230	3.85	OK
28	0.005	0.230	2.00	OK
29	0.008	0.230	3.47	OK
30	0.003	0.230	1.39	OK
31	0.005	0.230	2.37	OK
32	0.005	0.230	2.02	OK
33	0.005	0.230	2.01	OK
34	0.004	0.230	1.93	OK
35	0.004	0.230	1.94	OK
36	0.003	0.230	1.14	OK
37	0.005	0.230	2.37	OK
38	0.005	0.230	2.01	OK
39	0.005	0.230	2.30	OK
40	0.008	0.230	3.51	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:

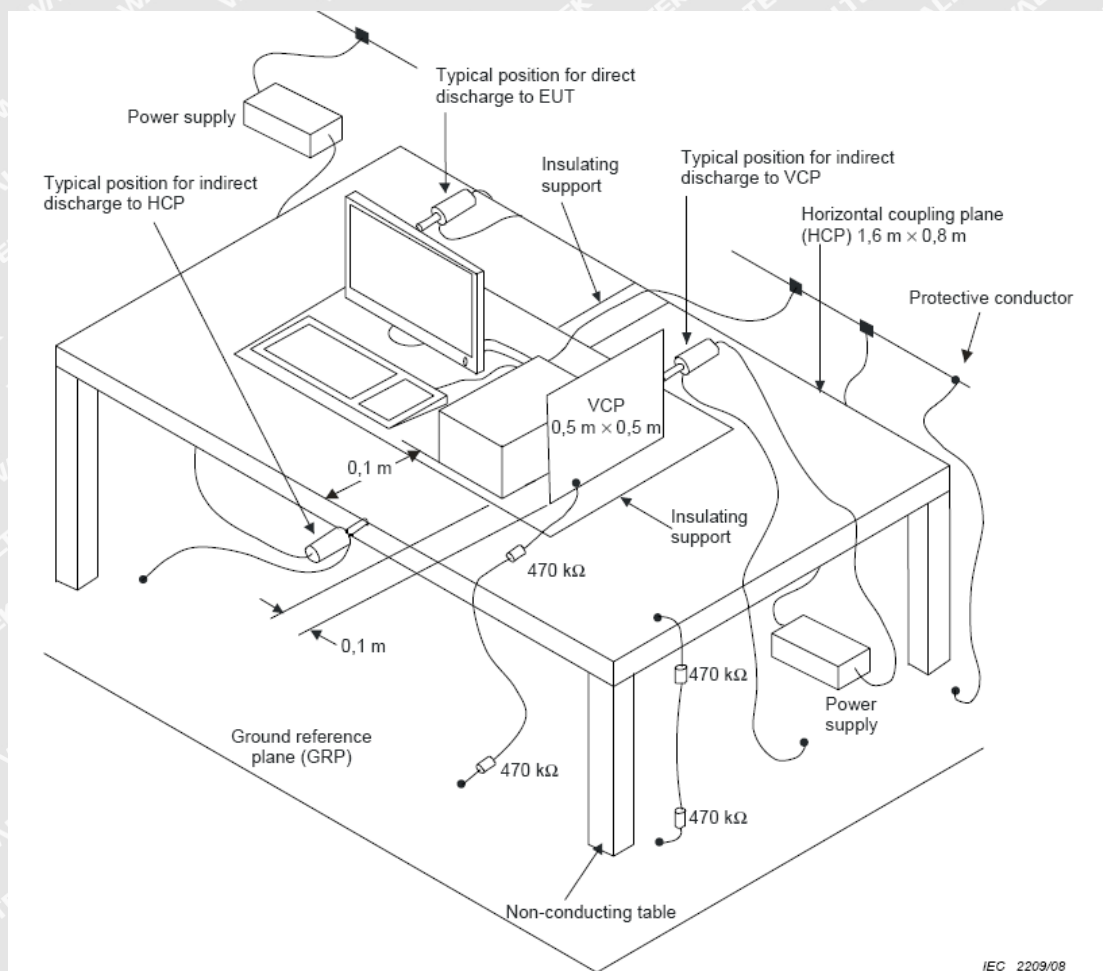
Temperature : 23.2°C
 Humidity : 42.1%RH
 Barometric Pressure : 100.8kPa

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.





6.2.3 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 : 23.2°C

Humidity : 42.1%RH

Barometric Pressure..... : 100.8kPa

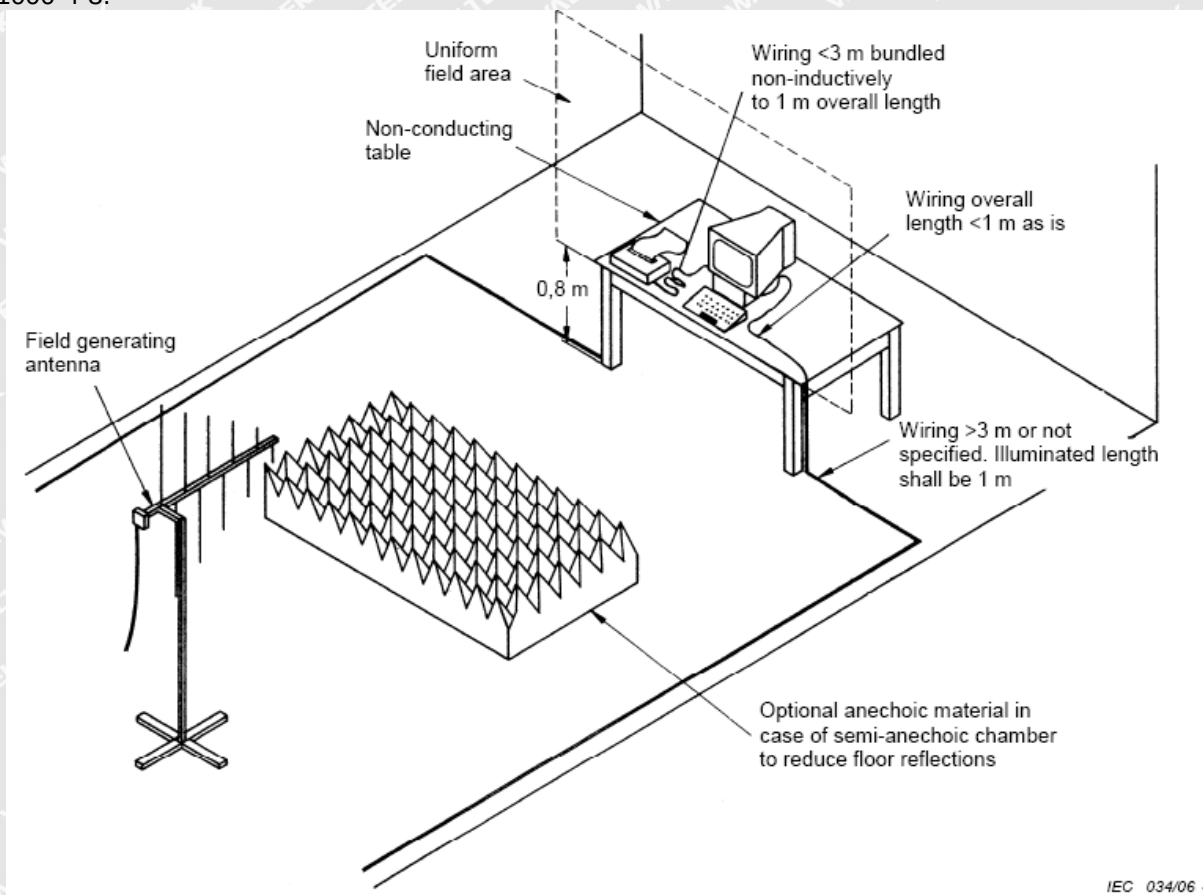
EUT Operation:

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 : 23.2°C
 Humidity..... : 42.1%RH
 Barometric Pressure : 100.8kPa

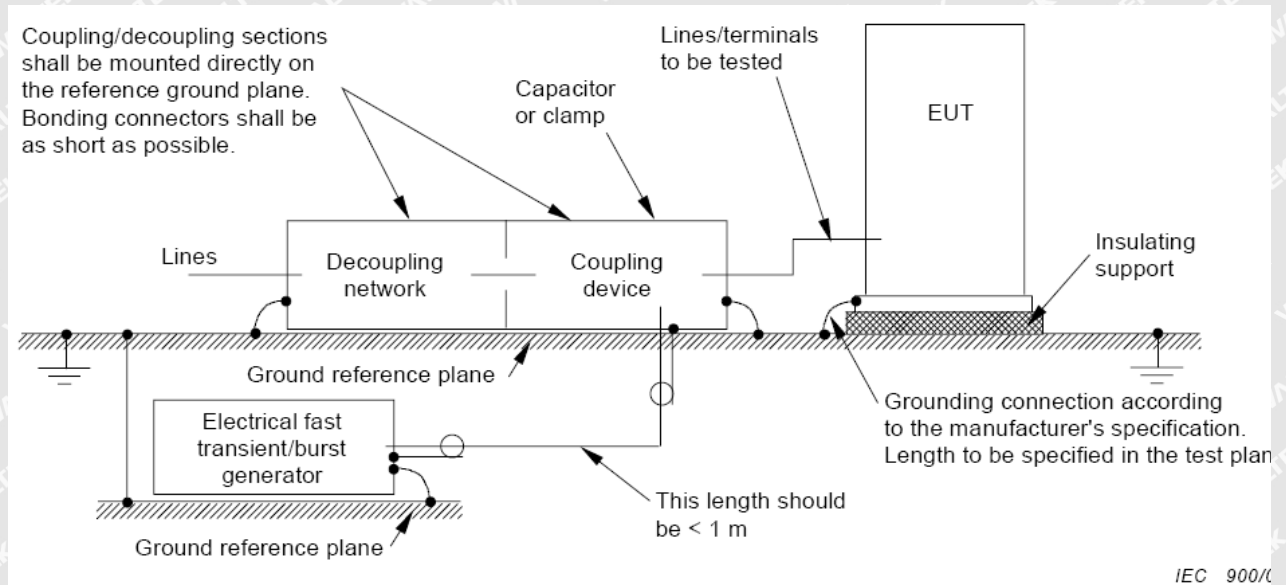
EUT Operation:

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°.

6.5.1E.U.T. Operation

Operating Environment:

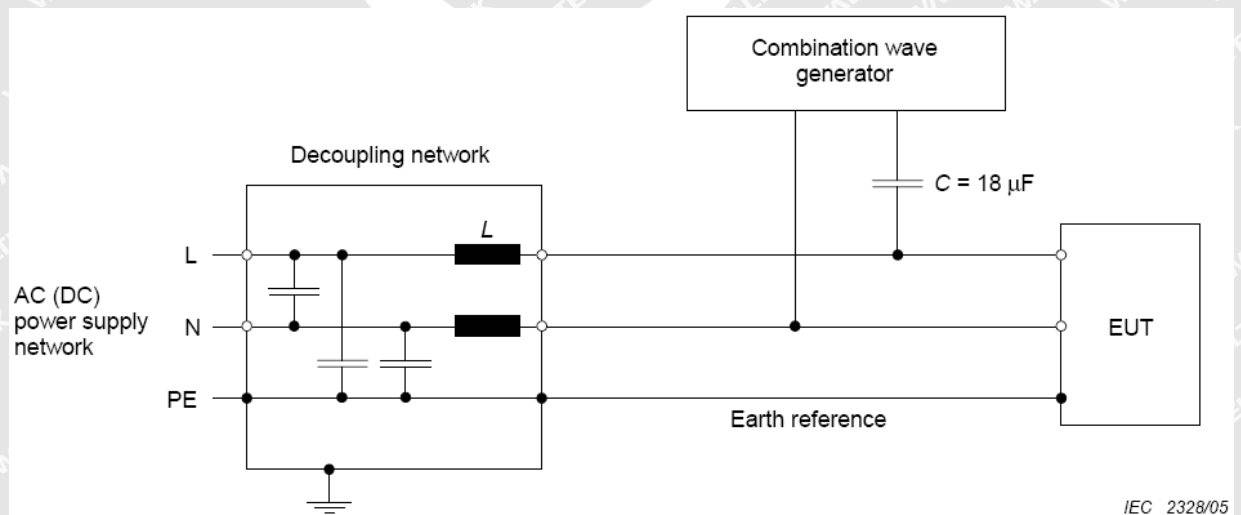
Temperature	: 23.2°C
Humidity.....	: 42.1%RH
Barometric Pressure.....	: 100.8kPa

EUT Operation:

Input Voltage	: AC 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.





6.5.3 Test Results

Test Port	Applied Voltage (kV)	Performance criterion	Result
Between Phase And Phase	± 1	C	N/A
Between Live And Neutral	± 0.5 for Model C10594+558 (89830003/05)	C	Pass*
Between Live And Neutral	± 1 for Model LD-3008D/9 (89830008/05)	C	Pass*
Between Live And Earth	± 2	C	N/A
Between Neutral And Earth	± 2	C	N/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.

6.6.1 E.U.T. Operation

Operating Environment:

Temperature : 23.2°C
Humidity : 42.1%RH
Barometric Pressure : 100.8kPa

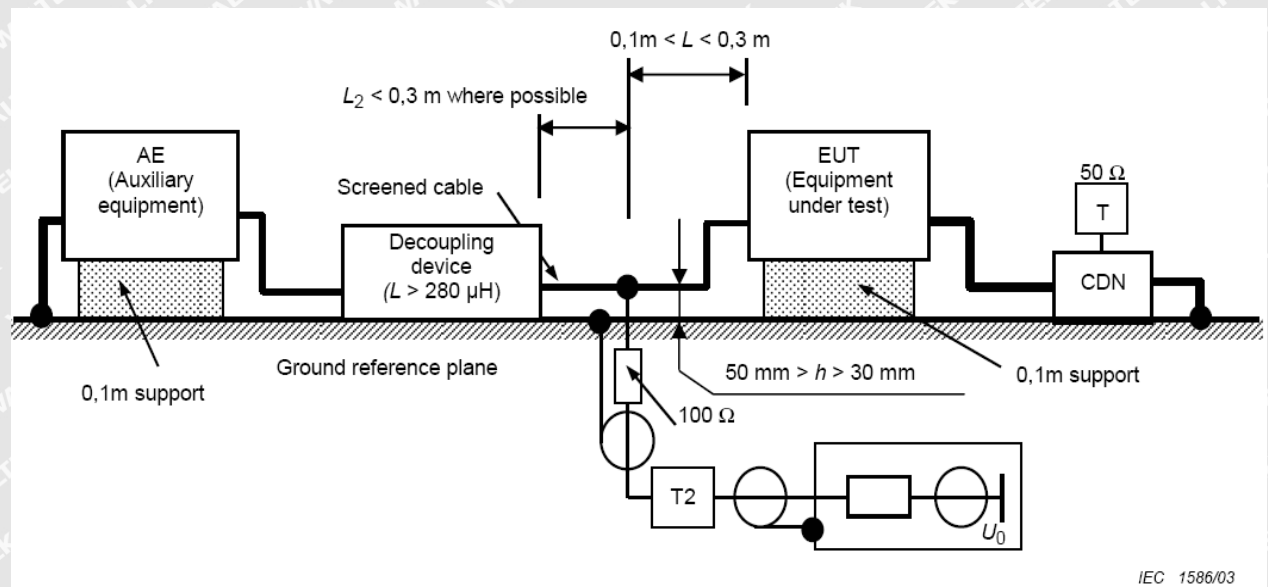
EUT Operation:

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

6.7.1 E.U.T. Operation

Operating Environment:

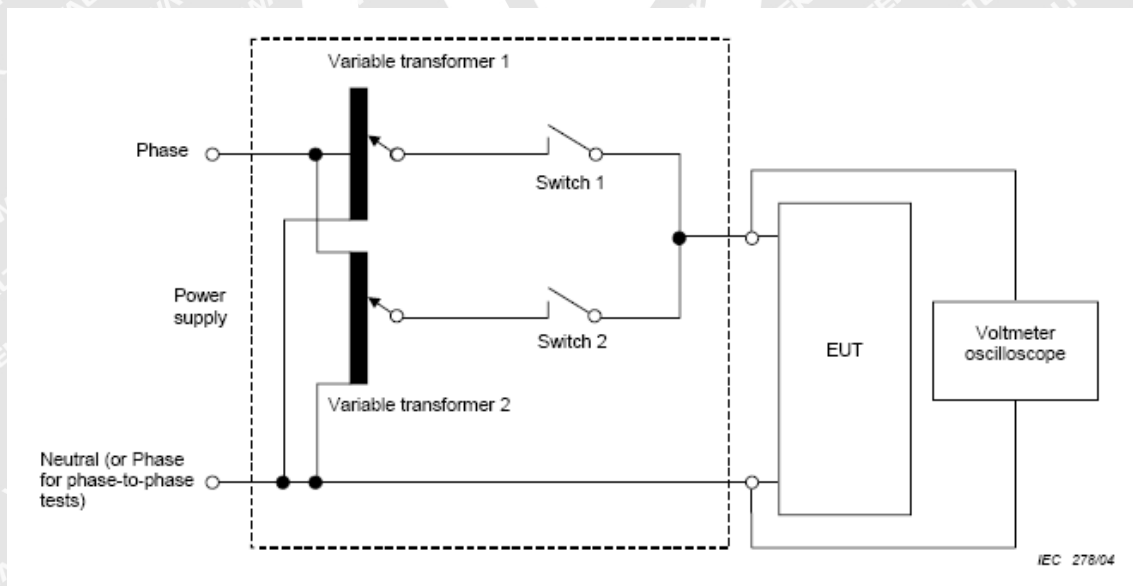
Temperature	23.2°C
Humidity.....	42.1%RH
Barometric Pressure.....	100.8kPa

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:

* 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

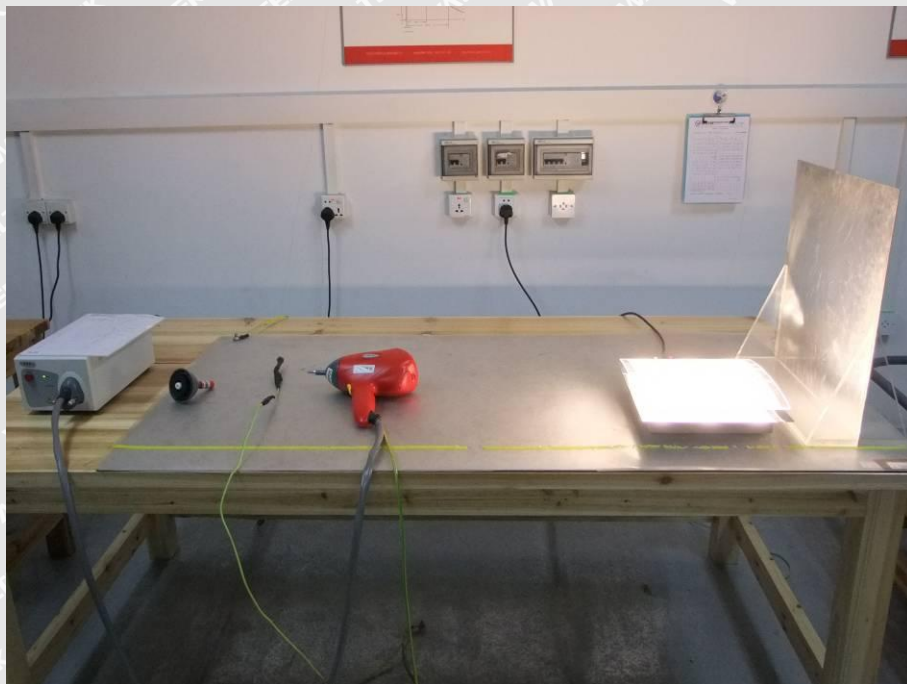


7.4 Photograph – Harmonic Current Test Setup





7.5 Photograph – ESD Immunity Test Setup

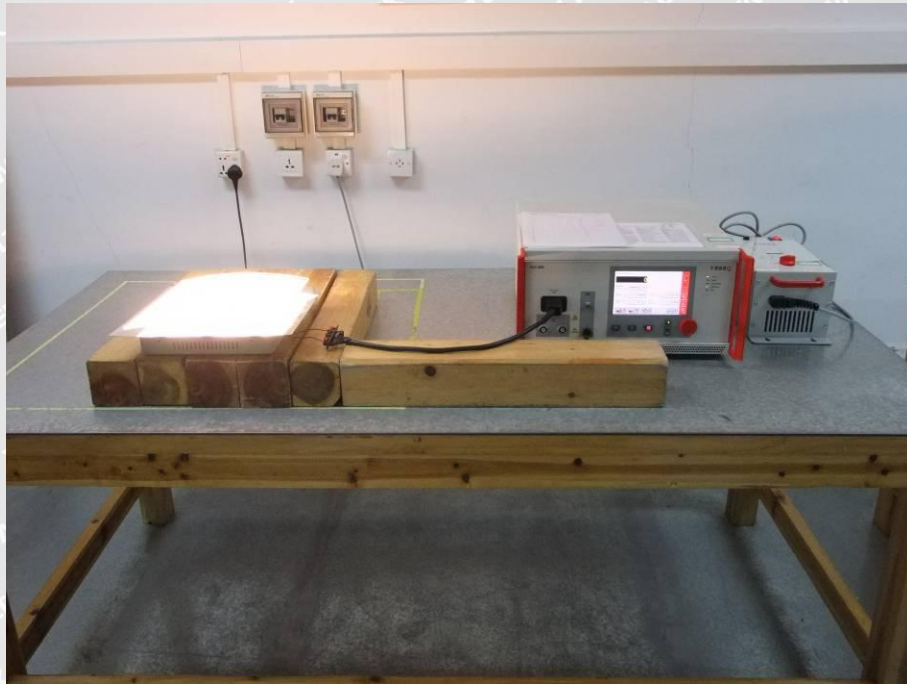


7.6 Photograph – Radio-frequency electromagnetic fields Immunity Test Setup





7.7 Photograph – EFT Immunity Test Setup



7.8 Photograph – Surge Immunity Test Setup

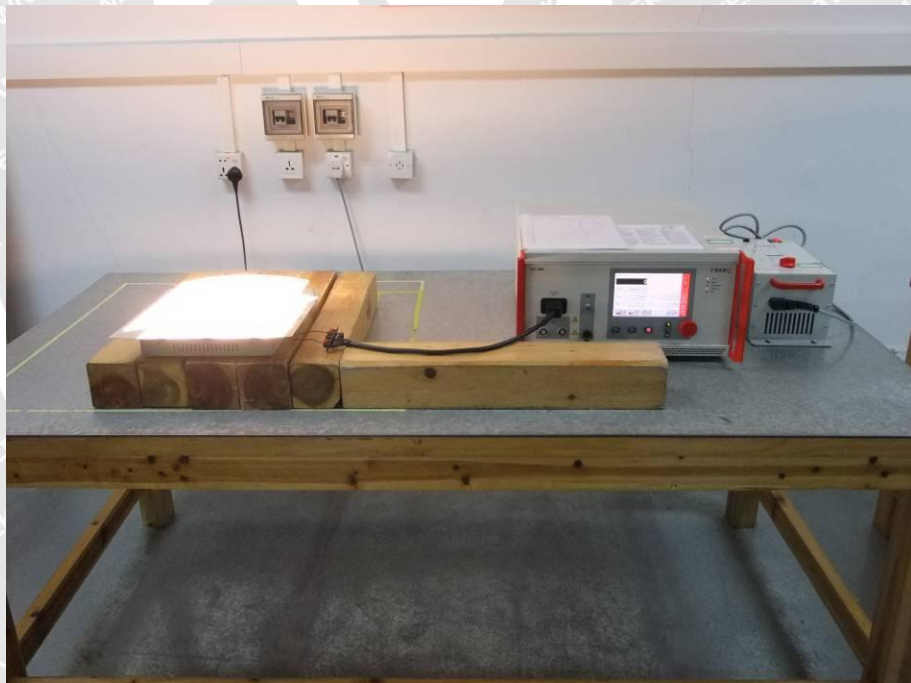




7.9 Photograph – Injected Currents Immunity Test Setup



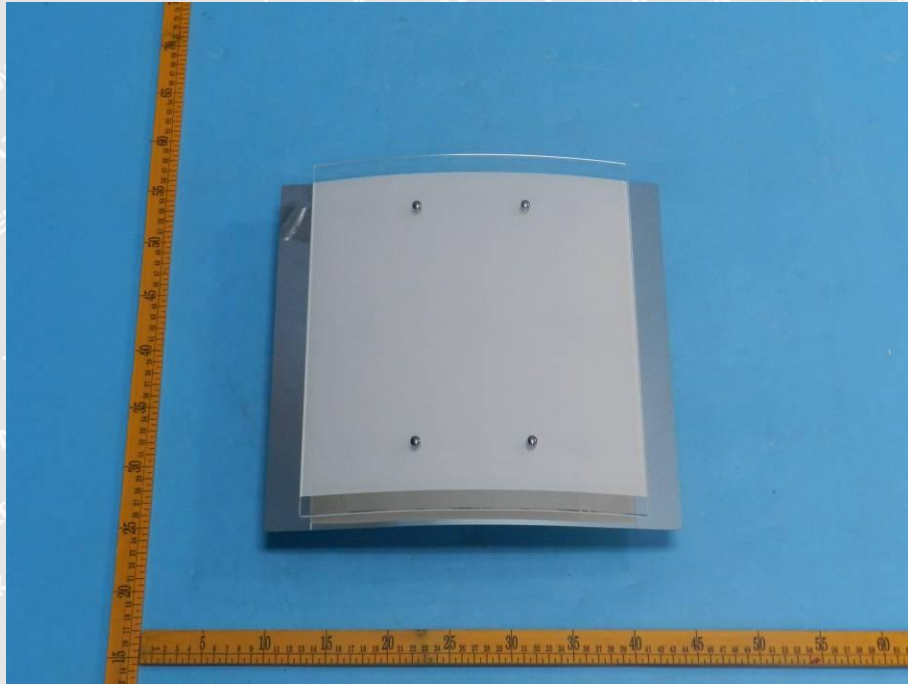
7.10 Photograph – Voltage Dips and Interruptions Immunity Test Setup





8 Photographs – Constructional Details

8.1 EUT – Front View



8.2 EUT – Back View



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