



TEST REPORT

Reference No. : WTU24N03055020E
Applicant : LUMATEK LTD.
Address : Ewropa Business centre Level 3 – 701 Dun Karm Street
Birkirkara BKR 9034 MALTA
Manufacturer : Same as applicant
Address : Same as applicant
Product Name : LED Luminaires
Model No. : ZEUS 1000W PRO EVO 3.1
Test specification : EN IEC 55015:2019+A11:2020
EN IEC 61547:2023
EN IEC 61000-3-2:2019+A1:2021
EN 61000-3-3:2013+A1:2019+A2:2021
Date of Receipt sample : 2024-01-24
Date of Test : 2024-01-29 to 2024-01-31
Date of Issue : 2024-05-14
Test Report Form No. : WEL-55015A-14B
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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Tested by:

Approved by:

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1 Test Summary

EMISSION			
Test Item	Test Standard	Class / Severity	Result
Conducted Disturbance, 9 kHz to 30 MHz	EN IEC 55015:2019+A11:2020	Clause 4.3	Pass
Radiated Disturbance, 9 kHz to 30 MHz	EN IEC 55015:2019+A11:2020	Clause 4.5.2	Pass
Radiated Disturbance, 30 MHz to 1 GHz	EN IEC 55015:2019+A11:2020	Clause 4.5.3	Pass
Harmonic Current Emissions	EN IEC 61000-3-2:2019+A1:2021	Clause 7	Pass
Voltage Changes, Voltage Fluctuation and Flicker	EN 61000-3-3:2013+A1:2019+A2:2021	Clause 5	Pass
IMMUNITY (EN IEC 61547:2023)			
Test Item	Test Method	Performance Criteria	Result
Electrostatic Discharge (ESD)	IEC 61000-4-2:2008	B	Pass
Radio-frequency Electromagnetic Fields (80 MHz to 1 GHz)	IEC 61000-4-3:2006+A1:2007+A2:2010	A	Pass
Fast Transients (EFT)	IEC 61000-4-4:2012	B	Pass
Surges	IEC 61000-4-5:2014	C	Pass
Injected Currents, 0.15 MHz to 80 MHz	IEC 61000-4-6:2013	A	Pass
Power-frequency Magnetic Field	IEC 61000-4-8:2009	A	N/A
Voltage Dips	IEC 61000-4-11:2004+A1:2017	B	Pass
Voltage Short Interruptions		B	Pass

Remark:

Pass

EUTs meet the requirement

Fail

EUTs do not meet the requirement

N/A

EUTs do not apply to the test object



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3 General Information

3.1 General Description of E.U.T.

Product Name	: LED Luminaires
Model No.	: ZEUS 1000W PRO EVO 3.1
Protection Class	: Class I
Remark	: 1. The EUT (equipment under test) is an ordinary LED Luminaires for Lighting and similar use. For the further information, refer to the user's manual. 2. This report is based on original test report "WTU24N01018917E" to issue a co-license. 3. For details information, refer to the section 3.2. 4. For the test results, the EUT had been tested with the rated input range. But only the worst case was shown in test report.

3.2 Details of E.U.T.

No.	Model	Rated Input	Rated Power	Note
1.	ZEUS 1000W PRO EVO 3.1	220 - 240 Vac, 50 / 60 Hz	1000 W	/

3.3 Description of Support Units

The EUT has been tested as an independent unit. ZEUS 1000W PRO EVO 3.1 is the tested sample. All tests were performed in the condition of 230 Vac, 50 Hz input.

3.4 Standards Applicable for Testing

The tests were performed according to following standards:

EN IEC 55015:2019+A11:2020	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
EN IEC 61547:2023	Equipment for general lighting purposes — EMC immunity requirements
EN IEC 61000-3-2:2019+A1:2021	Electromagnetic compatibility (EMC) Part 3-2: Limits — Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).
EN 61000-3-3:2013+A1:2019+A2:2021	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 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: ---

Lab information: ---

Address:---

3.6 Abnormalities from Standard Conditions

None.

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4 Equipment Used during Test

Conducted Disturbance					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1	EMI Test Receiver	R&S	ESCI	101406	Valid
2	TWO-LINE V-NETWORK	R&S	ENV216	101208	Valid
3	EZ-EMC	Farad Technology	RA-03A1-A	/	/
Radiated Disturbance (9 kHz to 30 MHz)					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1	EMI Test Receiver	R&S	ESCI	101406	Valid
2	3-dimensional large loop antenna	SCHWARZBECK	HXYZ9170	256	Valid
3	EZ-EMC	Farad Technology	RA-03A1-A	/	/
Radiated Disturbance (30 MHz to 1 GHz)					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1	EMI Test Receiver	R&S	ESR7	101777	Valid
2	TRILOG Biconic logarithmic periodic broadband antenna	SCHWARZBECK	VULB9163	01025	Valid
3	coupling-Decoupling Network	SCHWARZBECK	CDNE M3	00081	Valid
4	coupling-Decoupling Network	SCHWARZBECK	CDNE M2	00093	Valid
5	EZ-EMC	Farad Technology	EMEC-03A1	/	/
Harmonic Current & Voltage Changes, Voltage Fluctuation and Flicker Measuring System					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1	Harmonics /Flicker Analyzer	KIKUSUI	KHA1000	TL002966	Valid
2	line Power Supply	KIKUSUI	PCR4000LE	TL003094	Valid
3	Line Impedance Network	KIKUSUI	LIN40MA-PCR-LE	TM001297	Valid
4	Harmo Capture	KIKUSUI	Ver.3.9x	/	/
ESD					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1	electrostatic discharge generator	TESEQ	NSG437	699	Valid
Radio-frequency Electromagnetic Fields					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1	Power Amplifier	SKET	HAP_80M01G-250W	-	Valid
2	Power Amplifier	SKET	HAP_01G06G-75W	-	Valid
3	Stacked log periodic antenna	SKET	STLP 9129 Plus	-	Valid



4	Analog Signal Generator	Agilent	N5181A	MY48180307	Valid
5	Power meter	R&S	NPR-Z11	106957	Valid
6	Power meter	R&S	NPR-Z11	118349	Valid
7	Field strength probe	FRANKONIA	EFS-10	811ZX10321	Valid
8	EMC-S	SKET	V2.1.1.26	/	/

EFT & Voltage Dips and Short Interruptions

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1	Multifunction Generator Systems	TESEQ	NSG3040	2094	Valid
2	Single way manual Step regulator	TESEQ	INA 6501	243	Valid

Surges

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1	Multifunction Generator Systems	TESEQ	NSG3060	1654	Valid
2	coupling-Decoupling Network	TESEQ	CDN3061	1485	Valid

Injected Currents

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1	Test System for Conducted and Radiated Immunity	TESEQ	NSG4070	37519	Valid
2	Coupling and Decoupling Network	TESEQ	CDN M016	37358	Valid
3	Attenuator	TESEQ	ATN6075	36917	Valid

4.1 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conducted Disturbance	9 kHz - 150 kHz	± 2.66 dB	(1)
Conducted Disturbance	150 kHz - 30 MHz	± 2.66 dB	(1)
Radiated Disturbance	9 kHz - 30 MHz	± 3.00 dB	(1)
Radiated Disturbance	30 MHz - 1 GHz	± 5.03 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 Conducted Disturbance, 9 kHz to 30 MHz

Test Requirement.....	: EN IEC 55015
Test Method.....	: CSIPR 16-2-1 and Clause 8.3 of EN IEC 55015
Test Result.....	: Pass
Frequency Range.....	: 9 kHz to 30 MHz
Class/Severity	: Table 1 of EN IEC 55015

5.1.1 E.U.T. Operation

Operating Environment:

Temperature : 22.5 °C

Humidity..... : 53%RH

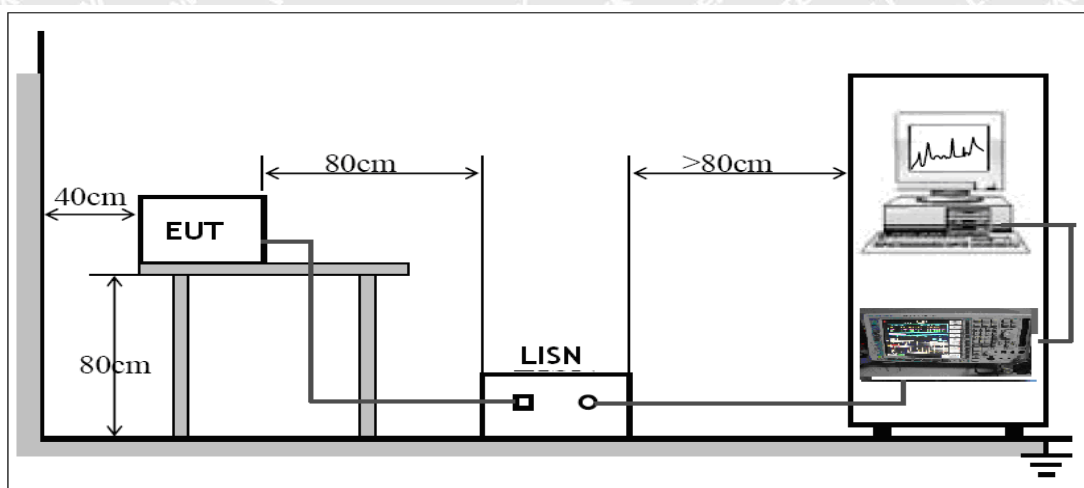
EUT Operation:

Input Voltage : 230 Vac, 50 Hz

Operating Mode..... : On mode

5.1.2 Block Diagram of Test Setup

The Conducted Disturbance tests were performed in accordance with the EN IEC 55015.



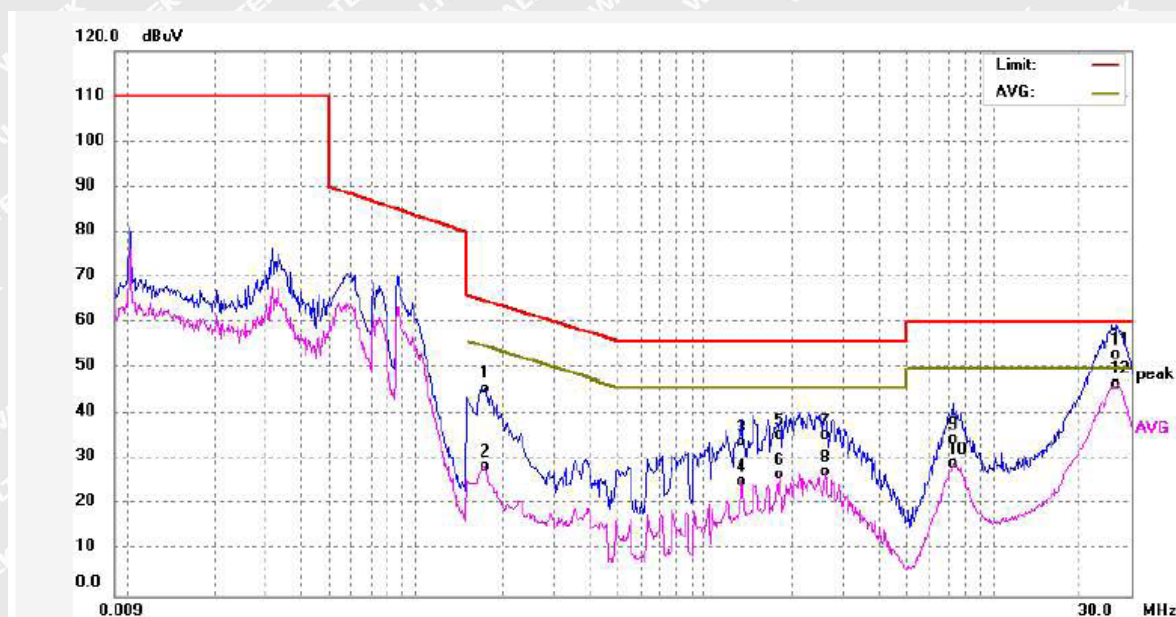
5.1.3 Measurement Data

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



5.1.4 Electric Power Supply Interface Disturbance Voltage Test Data

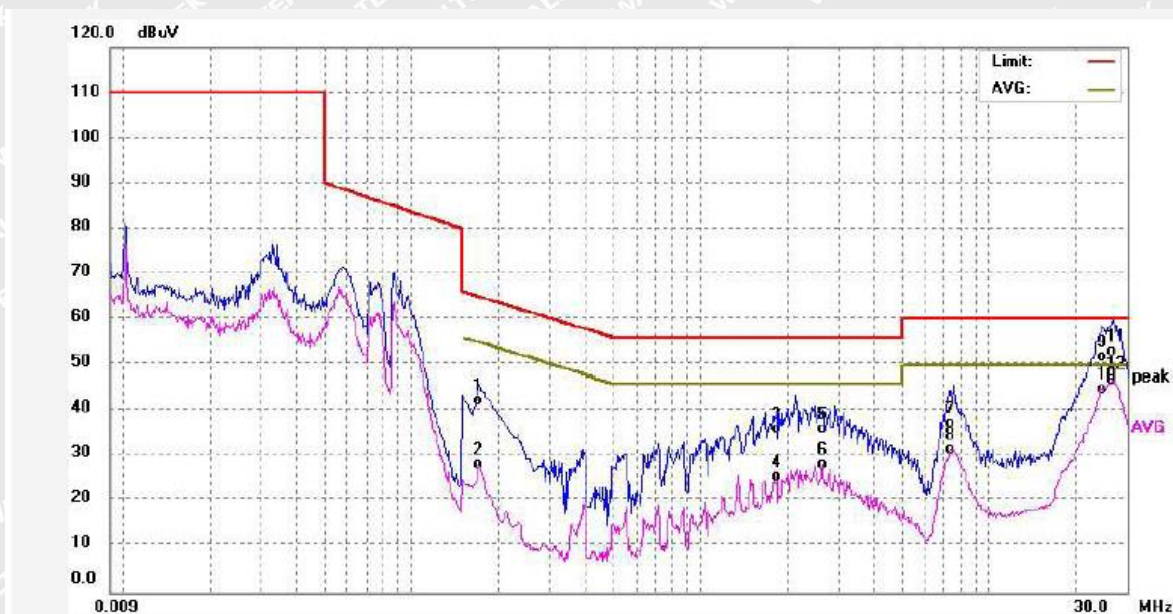
Live Line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1741	36.02	9.67	45.69	64.76	-19.07	QP	
2	0.1741	18.92	9.67	28.59	54.76	-26.17	AVG	
3	1.3501	24.13	9.85	33.98	56.00	-22.02	QP	
4	1.3501	15.65	9.85	25.50	46.00	-20.50	AVG	
5	1.8261	25.83	9.85	35.68	56.00	-20.32	QP	
6	1.8261	16.87	9.85	26.72	46.00	-19.28	AVG	
7	2.6221	25.59	9.85	35.44	56.00	-20.56	QP	
8	2.6221	17.67	9.85	27.52	46.00	-18.48	AVG	
9	7.2341	24.53	10.07	34.60	60.00	-25.40	QP	
10	7.2341	19.04	10.07	29.11	50.00	-20.89	AVG	
11	26.9501	42.36	10.64	53.00	60.00	-7.00	QP	
12	26.9501	36.08	10.64	46.72	50.00	-3.28	AVG	



Neutral Line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1701	32.76	9.67	42.43	64.95	-22.52	QP	
2	0.1701	18.67	9.67	28.34	54.95	-26.61	AVG	
3	1.8381	26.21	9.85	36.06	56.00	-19.94	QP	
4	1.8381	15.83	9.85	25.68	46.00	-20.32	AVG	
5	2.6421	26.38	9.85	36.23	56.00	-19.77	QP	
6	2.6421	18.36	9.85	28.21	46.00	-17.79	AVG	
7	7.3581	27.17	10.07	37.24	60.00	-22.76	QP	
8	7.3581	21.71	10.07	31.78	50.00	-18.22	AVG	
9	24.4940	41.14	10.57	51.71	60.00	-8.29	QP	
10	24.4940	34.27	10.57	44.84	50.00	-5.16	AVG	
11	26.6381	42.26	10.64	52.90	60.00	-7.10	QP	
12	26.6381	36.21	10.64	46.85	50.00	-3.15	AVG	



5.2 Radiated Disturbance, 9 kHz to 30 MHz

Test Requirement..... : EN IEC 55015

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

Test Result..... : Pass

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

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

5.2.1 E.U.T. Operation

Operating Environment:

Temperature : 22.5 °C

Humidity..... : 53%RH

EUT Operation:

Input Voltage : 230 Vac, 50 Hz

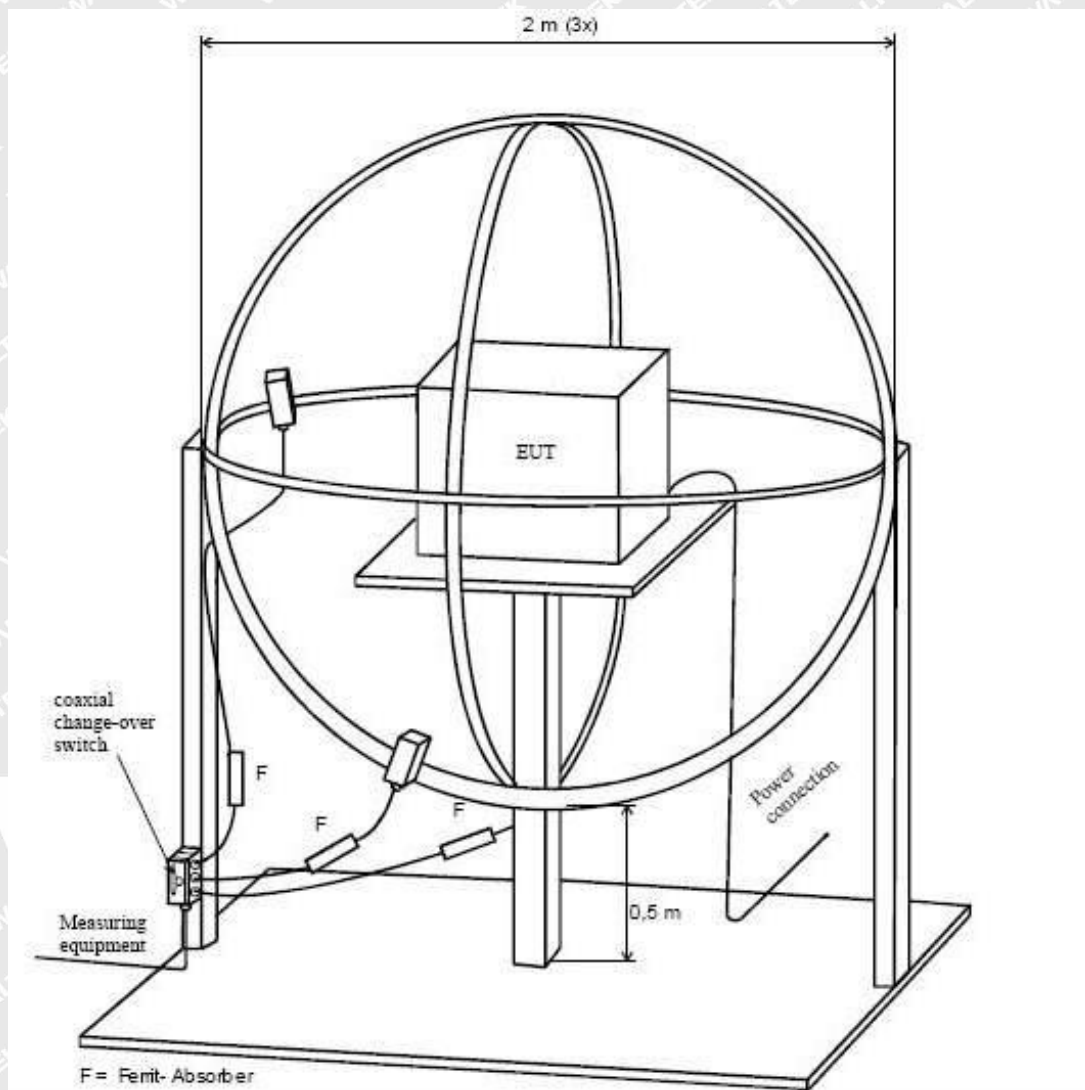
Operating Mode..... : On mode

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5.2.2 Block Diagram of Test Setup

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



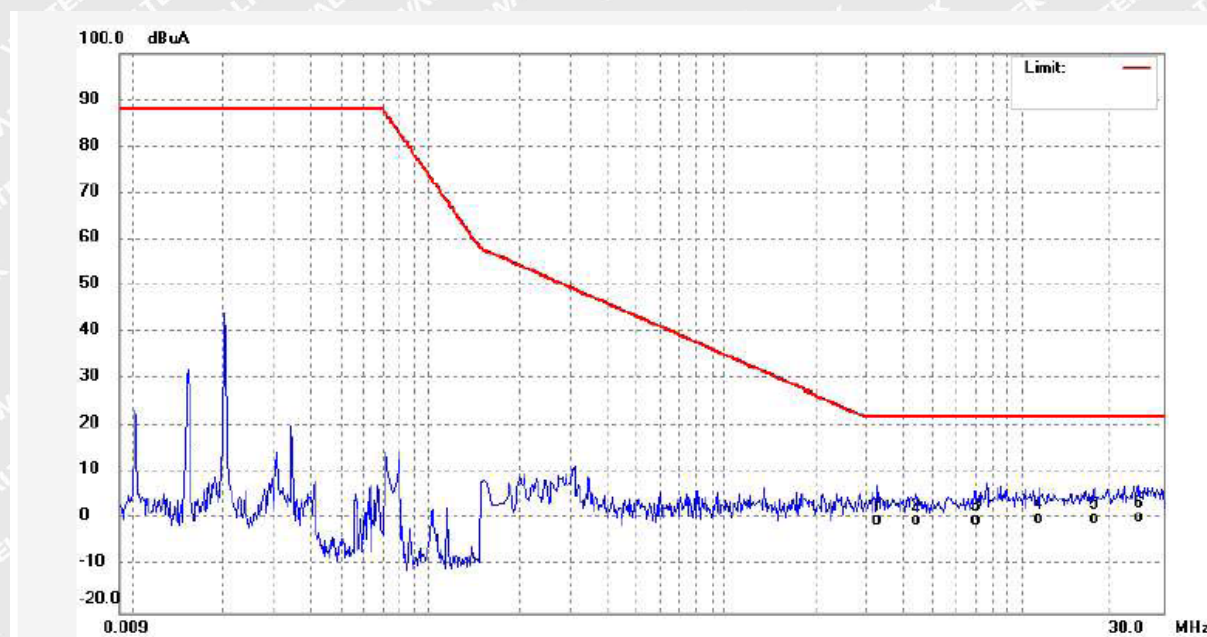
5.2.3 Measurement Data

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



5.2.4 Radiated Disturbance Test Data, 9 kHz to 30 MHz

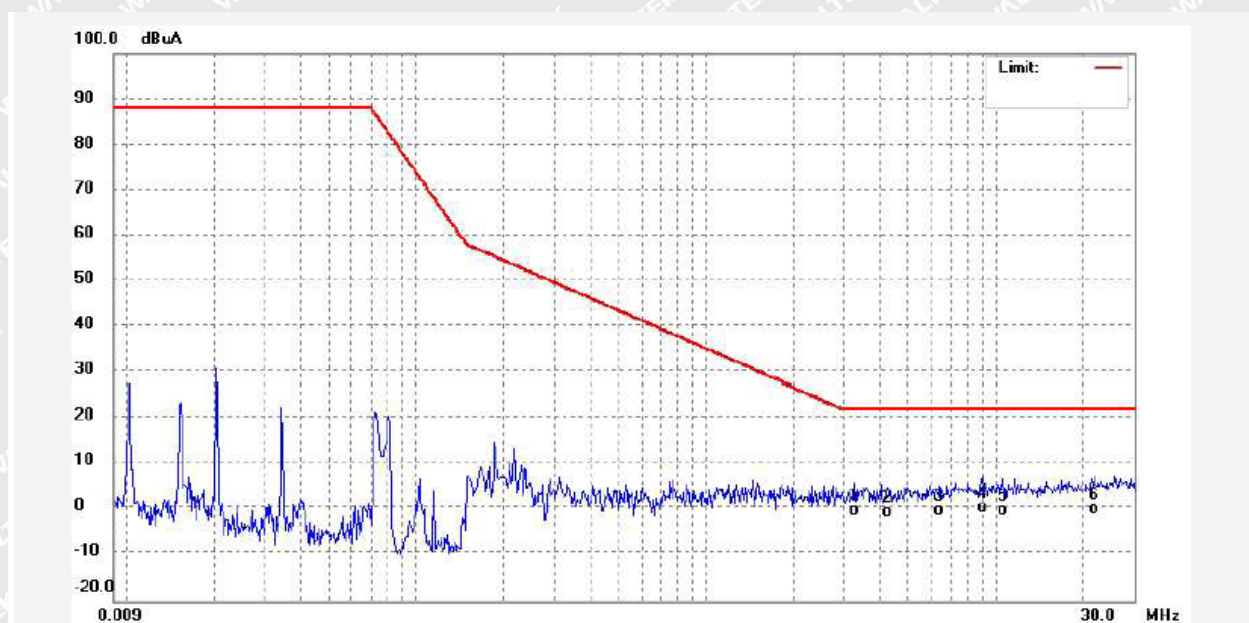
Loop X



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	3.2701	-34.33	34.26	-0.07	22.00	-22.07	QP	
2	4.4101	-34.45	34.30	-0.15	22.00	-22.15	QP	
3	7.0301	-34.37	34.38	0.01	22.00	-21.99	QP	
4	11.3621	-34.25	34.49	0.24	22.00	-21.76	QP	
5	17.6781	-34.35	34.60	0.25	22.00	-21.75	QP	
6	24.9141	-34.03	34.72	0.69	22.00	-21.31	QP	



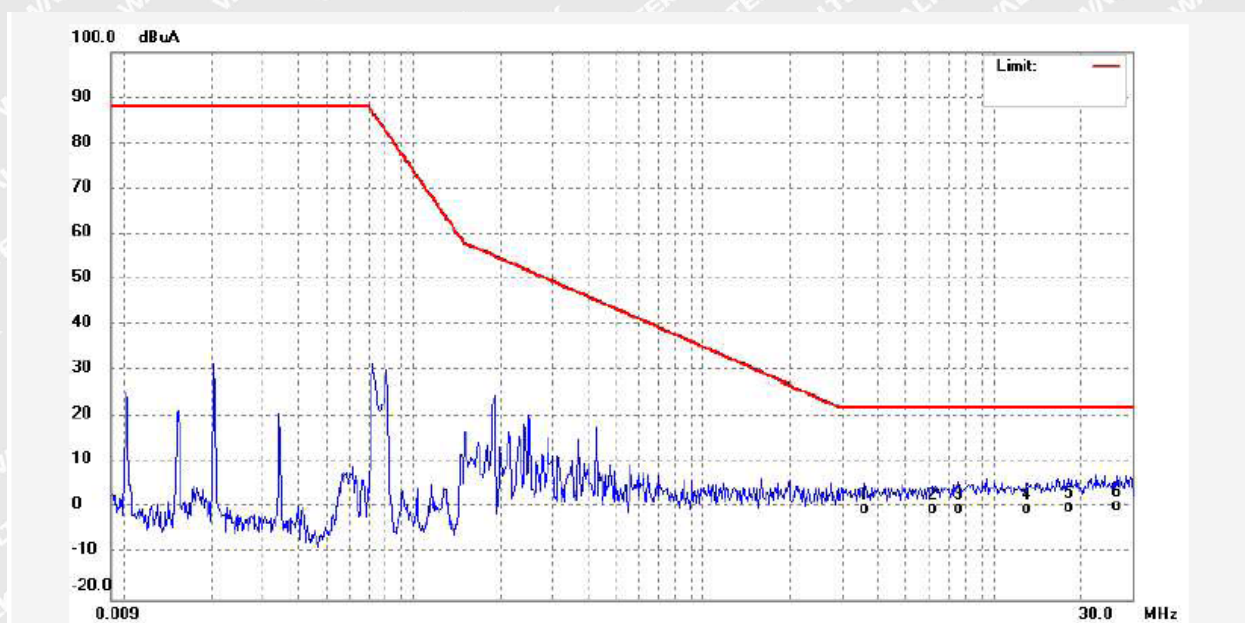
Loop Y



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	3.2621	-34.41	34.26	-0.15	22.00	-22.15	QP	
2	4.2221	-34.56	34.29	-0.27	22.00	-22.27	QP	
3	6.4101	-34.44	34.36	-0.08	22.00	-22.08	QP	
4	8.9621	-33.92	34.43	0.51	22.00	-21.49	QP	
5	10.5541	-34.38	34.47	0.09	22.00	-21.91	QP	
6	21.8061	-34.28	34.67	0.39	22.00	-21.61	QP	



Loop Z



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	3.6021	-34.27	34.27	0.00	22.00	-22.00	QP	
2	6.1341	-34.52	34.35	-0.17	22.00	-22.17	QP	
3	7.6101	-34.35	34.40	0.05	22.00	-21.95	QP	
4	13.0261	-34.43	34.51	0.08	22.00	-21.92	QP	
5	18.2101	-34.45	34.61	0.16	22.00	-21.84	QP	
6	26.3981	-34.06	34.74	0.68	22.00	-21.32	QP	

5.3 Radiated Disturbance, 30 MHz to 1 GHz

Test Requirement.....	: EN IEC 55015
Test Method	: CISPR 16-2-3
Test Result.....	: Pass
Frequency Range.....	: 30 MHz to 1 GHz
Class/Severity	: Table 10 of EN IEC 55015

5.3.1 E.U.T. Operation

Operating Environment:

Temperature : 20.8 °C

Humidity..... : 52%RH

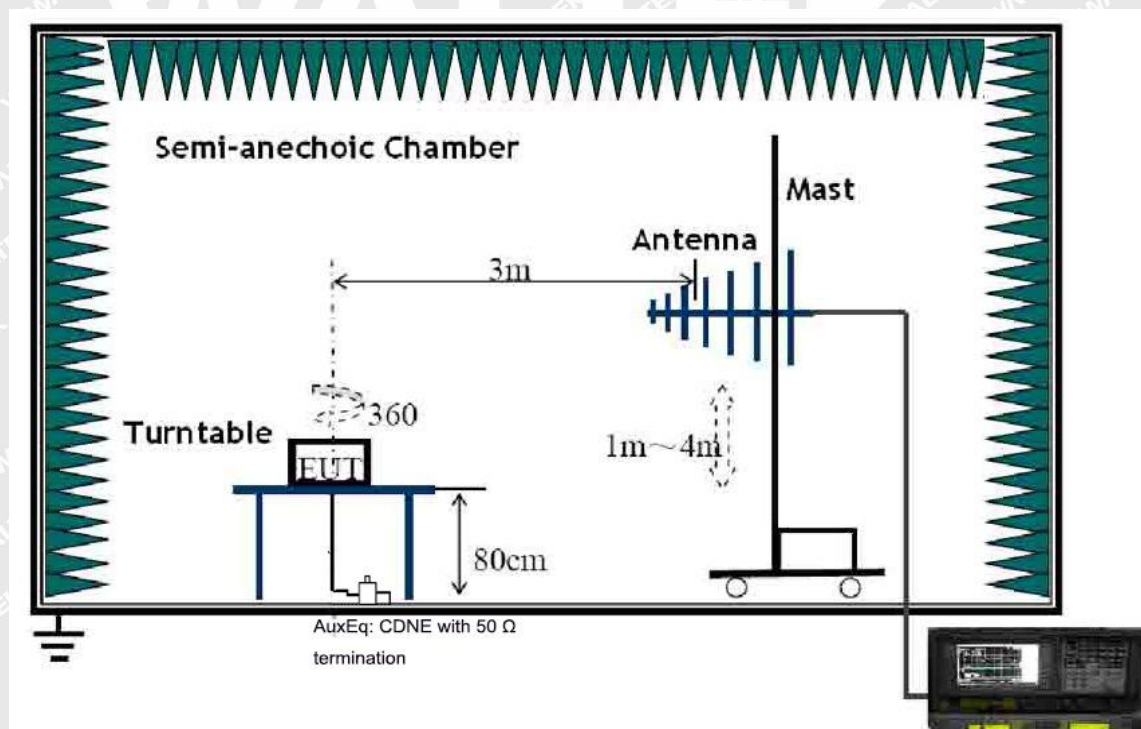
EUT Operation:

Input Voltage : 230 Vac, 50 Hz

Operating Mode..... : On mode

5.3.2 Block Diagram of Setup

The Radiated Disturbance tests were performed in the 3 m Semi- Anechoic Chamber test site, using the setup accordance with the CISPR 16-2-3.



5.3.3 Measurement Data

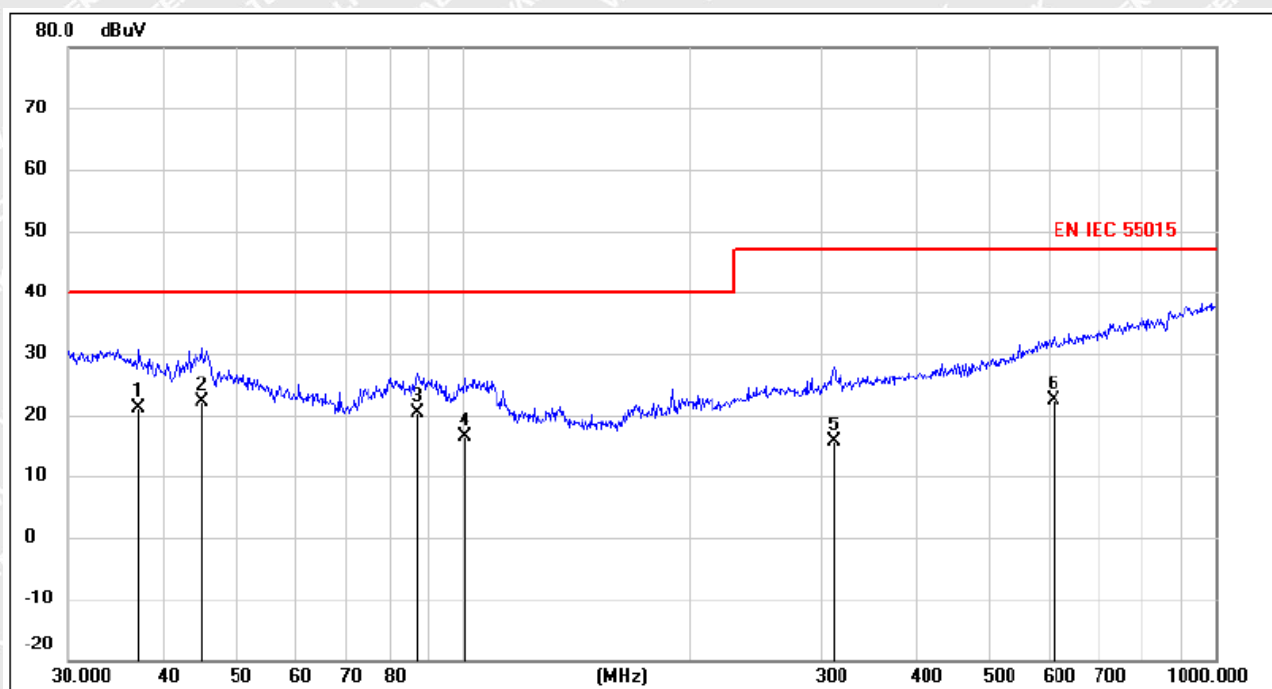
The maximised peak emissions from the EUT was scanned and measured for Horizontal & Vertical polarisation. Quasi-peak measurements were performed if peak emissions were within 6 dB of the limit line. According to the data in section 5.3.4, the EUT complied with the EN IEC 55015 standards.

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5.3.4 Radiated Disturbance Test Data, 30 MHz to 1 GHz

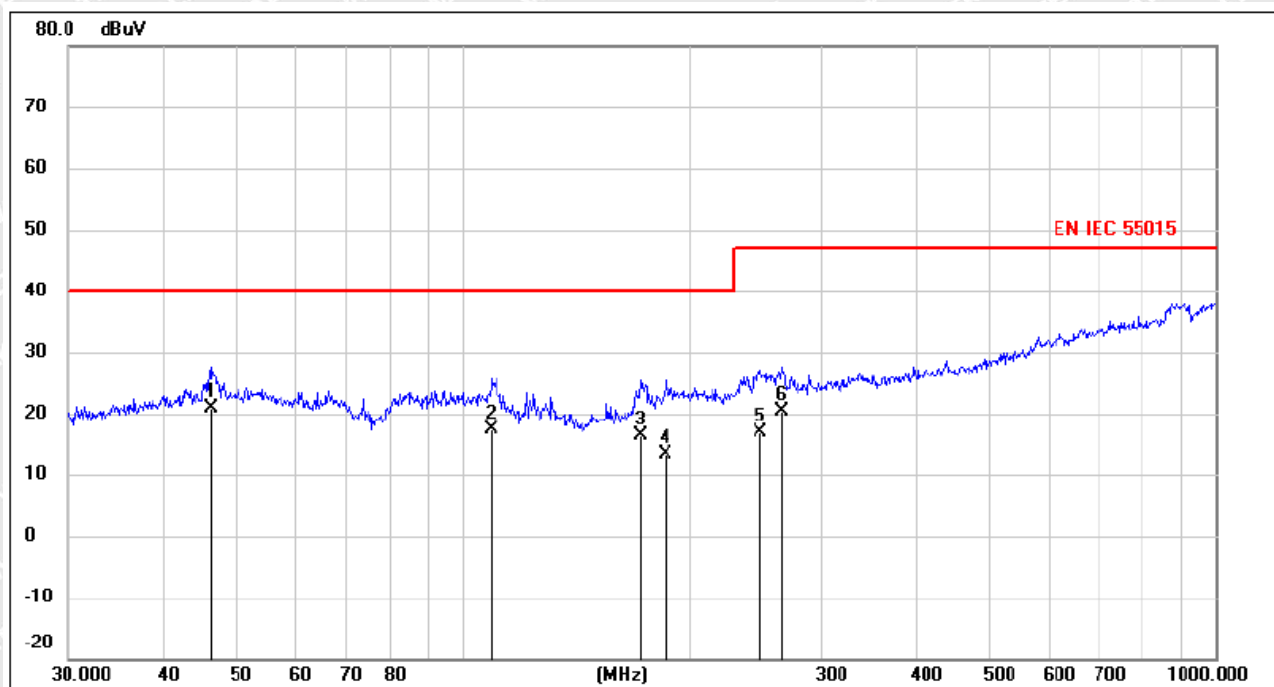
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct dB	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	37.1550	8.69	12.39	21.08	40.00	-18.92	QP
2	45.0583	7.91	14.16	22.07	40.00	-17.93	QP
3	87.1117	10.56	9.75	20.31	40.00	-19.69	QP
4	100.9339	3.70	12.74	16.44	40.00	-23.56	QP
5	311.0867	1.06	14.68	15.74	47.00	-31.26	QP
6	609.9217	0.75	21.61	22.36	47.00	-24.64	QP



Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	
1	46.3402	6.73	14.22	20.95	40.00	-19.05	QP
2	109.4116	5.20	12.28	17.48	40.00	-22.52	QP
3	172.5988	6.55	9.89	16.44	40.00	-23.56	QP
4	186.4408	2.37	11.10	13.47	40.00	-26.53	QP
5	248.5518	3.25	13.63	16.88	47.00	-30.12	QP
6	265.6757	6.41	13.90	20.31	47.00	-26.69	QP



5.4 Harmonic Current Emissions

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

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

Test Result..... : Pass

Class/Severity : Class C

5.4.1 E.U.T. Operation

Operating Environment:

Temperature : 23.9 °C

Humidity..... : 49.5%RH

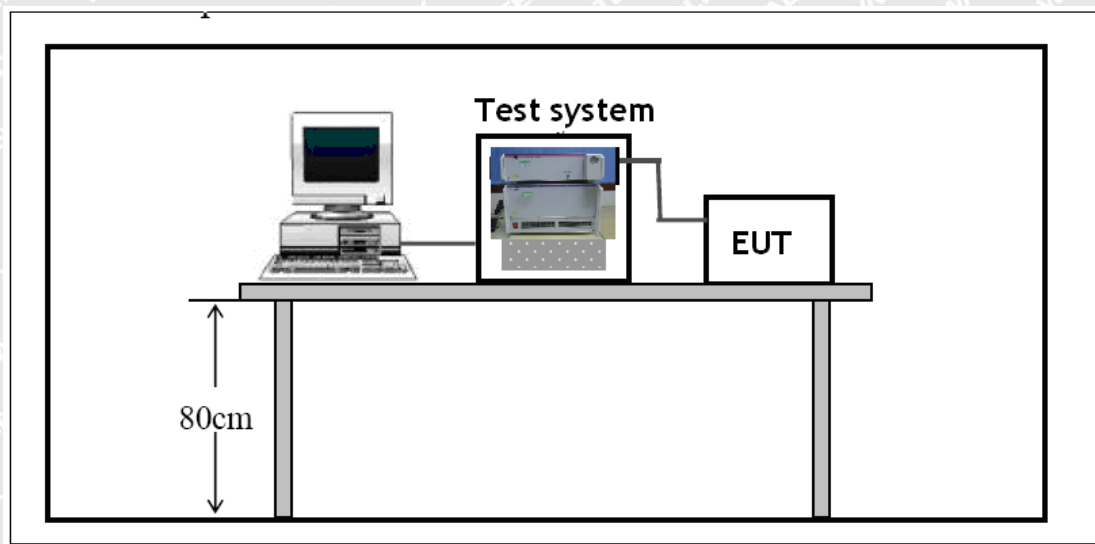
EUT Operation:

Input Voltage : 230 Vac, 50 Hz

Operating Mode..... : On mode

5.4.2 Block Diagram of Setup

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





5.4.3 Harmonic Current Emissions Test Data

Final Test Result	Pass	Tobs	Quasi-Stationary
Voltage	229.92 V	THC	0.2020 A
Current	4.7690 A	POHC/Limit	0.0690 A / 0.4522 A *3
Power	1084.18 W	Nominal	230 V / 50 Hz
Power Factor	0.9888	Fundamental Current	4.7650 A
Apparent Power	1096.7 VA	Measuring Period	150 s
THD (max)	4.24 %	Margin	100 %

Order	Limit1(A rms)	Limit2(A rms)	Ave(A rms)	Max(A rms)	Judge
1	----	----	4.7625	4.7650	N/A
2	0.0953	0.1430	0.0010	0.0020	N/A
3	1.4134	2.1202	0.0750	0.0750	Pass
4	----	----	0.0010	0.0010	N/A
5	0.4765	0.7148	0.1054	0.1060	Pass
6	----	----	0.0010	0.0010	N/A
7	0.3336	0.5003	0.1051	0.1060	Pass
8	----	----	0.0010	0.0010	N/A
9	0.2383	0.3574	0.0670	0.0670	Pass
10	----	----	0.0007	0.0010	N/A
11	0.1430	0.2144	0.0290	0.0290	Pass
12	----	----	0.0001	0.0010	N/A
13	0.1430	0.2144	0.0180	0.0180	N/A
14	----	----	0.0000	0.0010	N/A
15	0.1430	0.2144	0.0266	0.0270	N/A
16	----	----	0.0004	0.0010	N/A
17	0.1430	0.2144	0.0320	0.0320	Pass
18	----	----	0.0006	0.0010	N/A
19	0.1430	0.2144	0.0280	0.0280	N/A
20	----	----	0.0004	0.0010	N/A
21	0.2144	0.2144	0.0223	0.0230	N/A
22	----	----	0.0005	0.0010	N/A
23	0.2144	0.2144	0.0210	0.0210	N/A
24	----	----	0.0008	0.0010	N/A
25	0.2144	0.2144	0.0240	0.0240	N/A
26	----	----	0.0010	0.0010	N/A
27	0.2144	0.2144	0.0270	0.0270	N/A
28	----	----	0.0010	0.0010	N/A
29	0.2144	0.2144	0.0260	0.0260	N/A
30	----	----	0.0010	0.0010	N/A
31	0.2144	0.2144	0.0200	0.0200	N/A
32	----	----	0.0010	0.0010	N/A
33	0.2144	0.2144	0.0180	0.0180	N/A
34	----	----	0.0010	0.0010	N/A
35	0.2144	0.2144	0.0210	0.0210	N/A
36	----	----	0.0010	0.0010	N/A
37	0.2144	0.2144	0.0210	0.0210	N/A
38	----	----	0.0010	0.0010	N/A
39	0.2144	0.2144	0.0180	0.0180	N/A
40	----	----	0.0010	0.0010	N/A

N/A : Not Apply

5.5 Voltage Changes, Voltage Fluctuation and Flicker

Test Requirement : EN 61000-3-3

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

Test Result : Pass

5.5.1 E.U.T. Operation

Operating Environment:

Temperature : 23.0 °C

Humidity..... : 49.5%RH

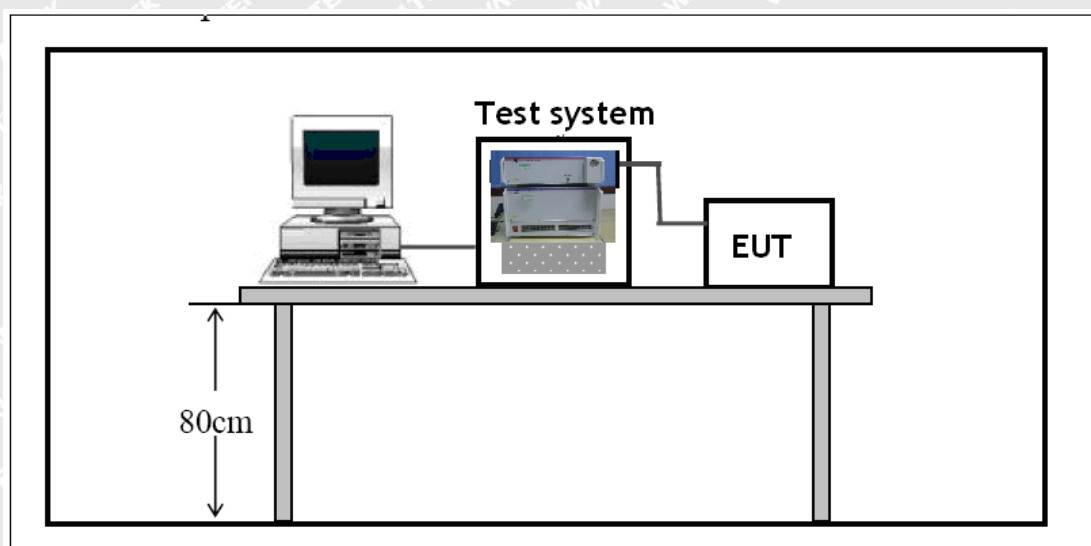
EUT Operation:

Input Voltage : 230 Vac, 50Hz

Operating Mode..... : On mode

5.5.2 Block Diagram of Setup

The Voltage Changes, Voltage Fluctuation and Flicker test was performed in accordance with the EN 61000-3-3.



5.5.3 Voltage Changes, Voltage Fluctuation and Flicker Test Data

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



6 Immunity Test Results

6.1 Performance Criteria

Performance criterion A: During the test, no change of the luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended.

Performance criterion B: During the test, the luminous intensity may change to any value. After the test, the luminous intensity shall be restored to its initial value within 1 min (30 min for high pressure gas discharge lamps). 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 IEC 61547

Test Method..... : IEC 61000-4-2

Test Result..... : Pass

Discharge Impedance..... : 330 Ω / 150 pF

Discharge Voltage..... : Air Discharge: ± 2 kV, ± 4 kV, ± 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

6.2.1 E.U.T. Operation

Operating Environment:

Temperature..... : 22.5 $^{\circ}\text{C}$

Humidity..... : 48.1%RH

Barometric Pressure..... : 103.6 kPa

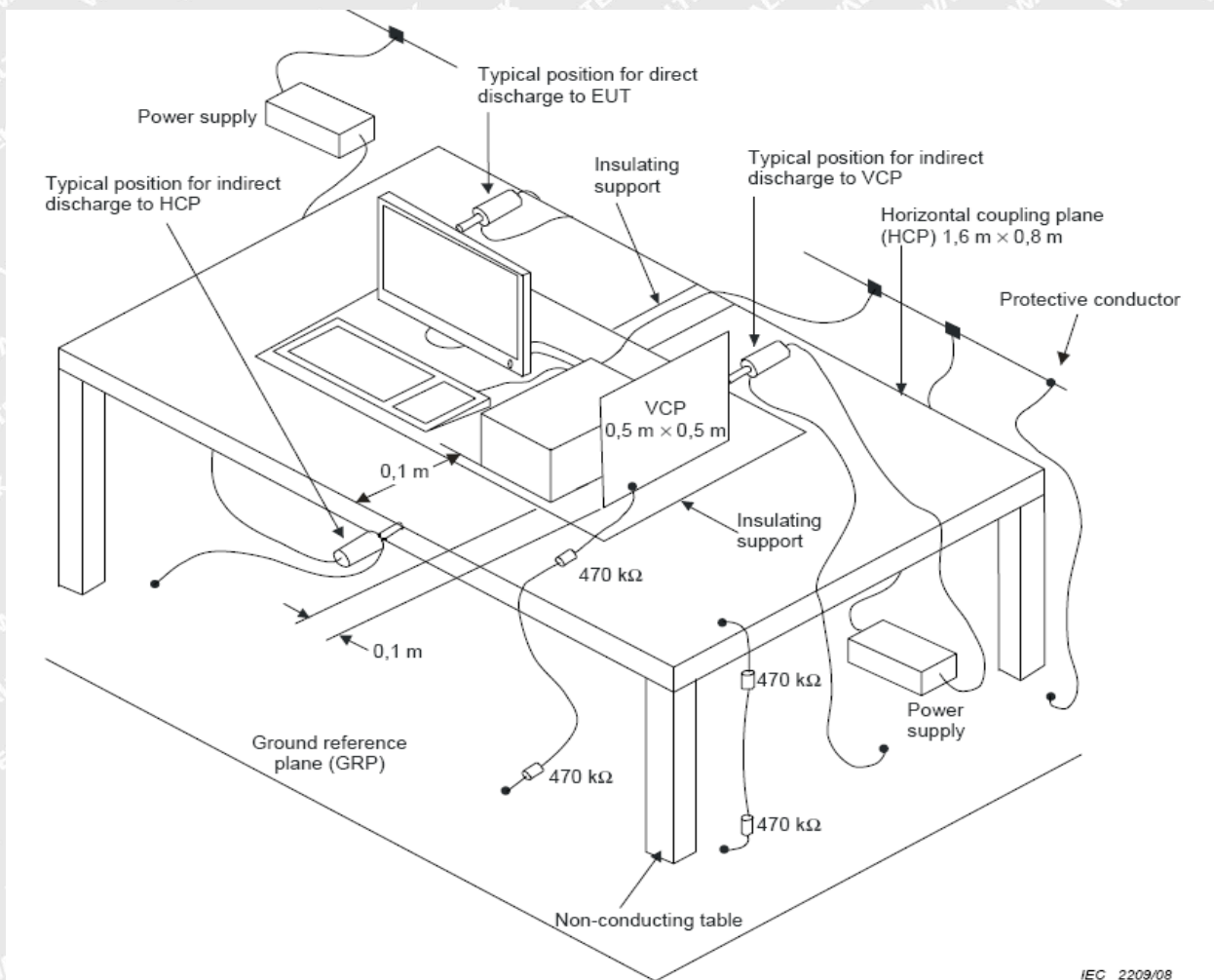
EUT Operation:

Input Voltage..... : 230 Vac, 50 Hz

Operating Mode..... : On mode

6.2.2 Block Diagram of Setup

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



IEC 2209/08

6.2.3 Direct Discharge Test Results

Observations:

Test points:

1. All Exposed Surface & Seams;
2. All metallic part

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

Remark:

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



6.2.4 Indirect Discharge Test Results

Observations:

Test points: 1. All sides.

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

Remark:

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

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6.3 Radio-frequency Electromagnetic Fields, 80 MHz to 1 GHz

Test Requirement	: EN IEC 61547
Test Method	: IEC 61000-4-3
Test Result	: Pass
Frequency Range	: 80 MHz to 1 GHz
Test level	: 3 V/m
Modulation	: 80%, 1 kHz Amplitude Modulation.
Face of EUT	: Front, Back, Left, Right
Antenna polarisation	: Horizontal & Vertical

6.3.1E.U.T. Operation

Operating Environment:

Temperature	: 22.1 °C
Humidity	: 51%RH

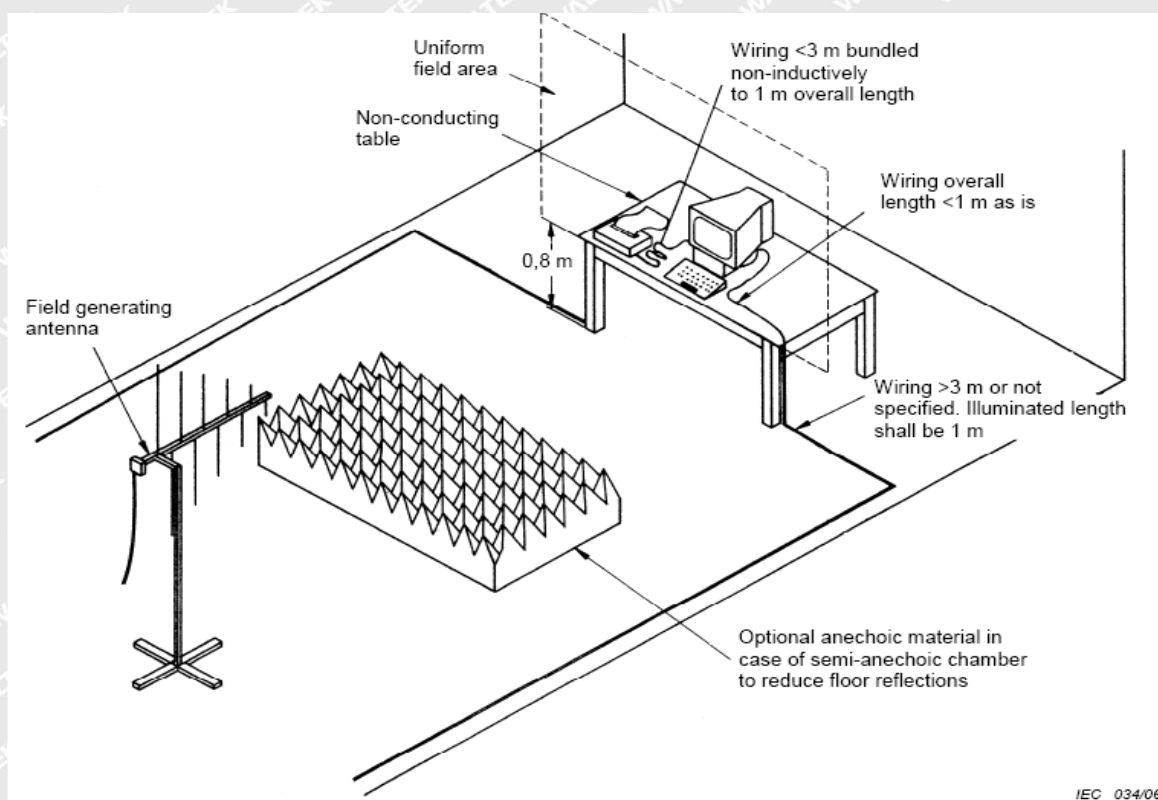
EUT Operation:

Input Voltage	: 230 Vac, 50 Hz
Operating Mode	: On mode

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6.3.2 Block Diagram of Setup

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



6.3.3 Test Results

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

Remark:

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



6.4 Fast Transients (EFT)

Test Requirement.....	: EN IEC 61547
Test Method.....	: IEC 61000-4-4
Test Result.....	: Pass
Test Level.....	: 1.0 kV on AC Mains
Polarity.....	: Positive & Negative
Repetition Frequency	: 5 kHz
Burst Duration.....	: 300 ms
Test Duration.....	: 2 minutes per level & polarity

6.4.1E.U.T. Operation

Operating Environment:

Temperature.....	: 22.5 °C
Humidity	: 48.1%RH

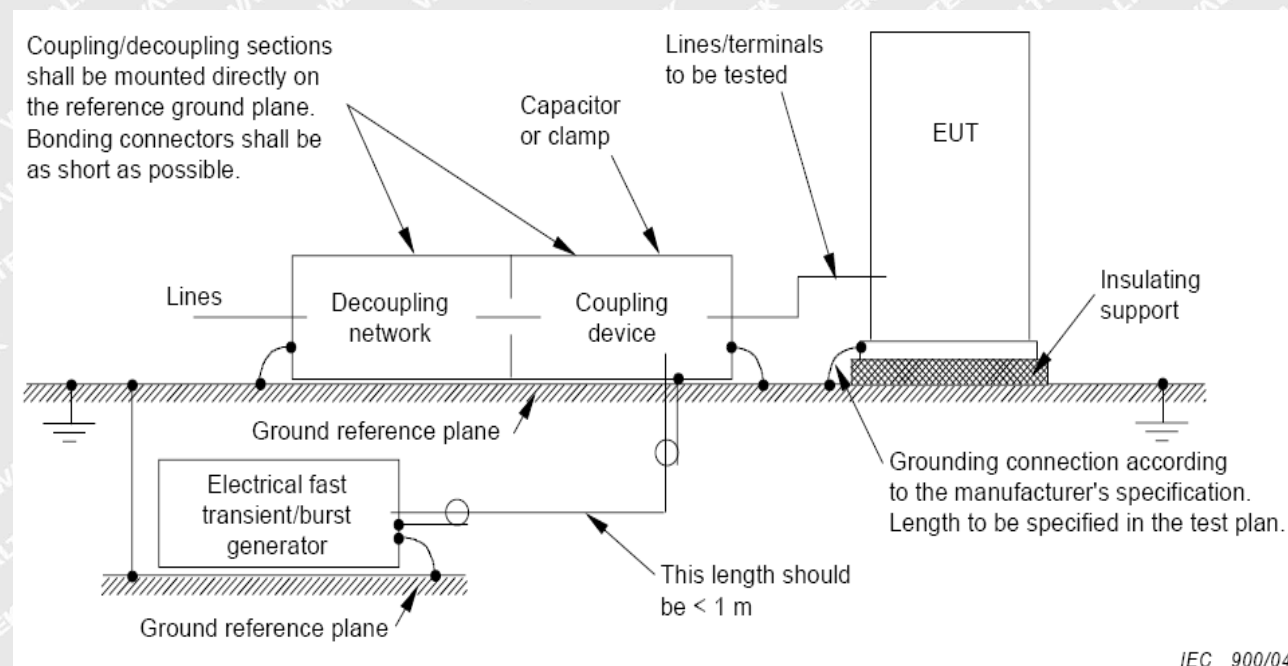
EUT Operation:

Input Voltage.....	: 230 Vac, 50 Hz
Operating Mode	: On mode

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6.4.2 Block Diagram of Setup

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



6.4.3 Test Results

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

Remark:

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



6.5 Surges

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

6.5.1E.U.T. Operation

Operating Environment:

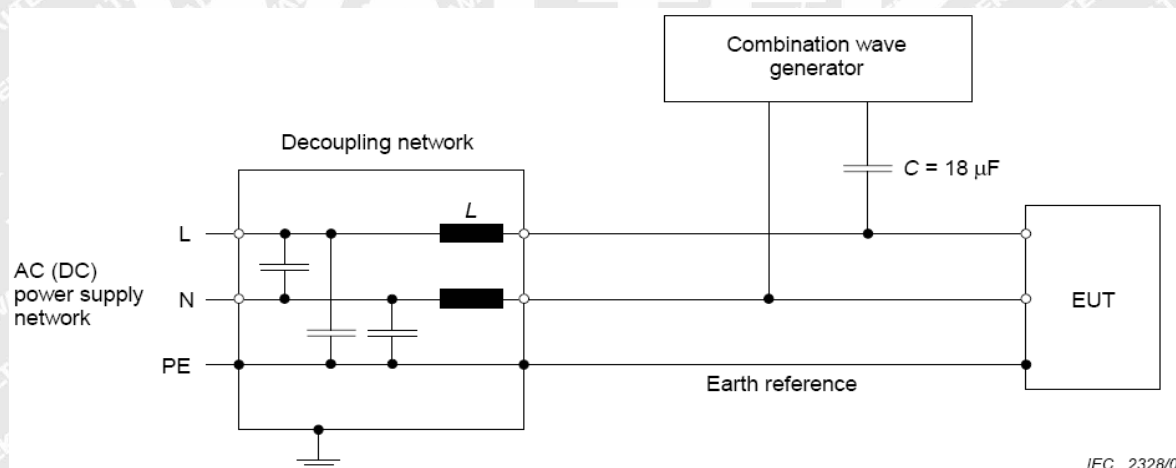
Temperature..... : 22.5 °C
Humidity..... : 48.1%RH

EUT Operation:

Input Voltage..... : 230 Vac, 50 Hz
Operating Mode..... : On mode

6.5.2Block Diagram of Setup

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



6.5.3Test Results

Test Port	Applied Voltage (kV)	Performance criterion	Result	Actual performance
Between Live to Neutral	$\pm 0.5 / 1$	C	Pass	B*
Between Live to Earth	$\pm 0.5 / 1 / 2$	C	Pass	B*
Between Neutral to Earth	$\pm 0.5 / 1 / 2$	C	Pass	B*

Remark:

- * During the test, the EUT flickered. After the test, the EUT automatically returned to its original working state within 1 min.



6.6 Injected Currents Immunity, 0.15 MHz to 80 MHz

Test Requirement..... : EN IEC 61547
Test Method..... : IEC 61000-4-6
Test Result..... : Pass
Frequency Range..... : 0.15 MHz to 80 MHz
Test level..... : 3 Vr.m.s. (unmodulated emf into 150 Ω)
Modulation..... : 80%, 1 kHz Amplitude Modulation.

6.6.1E.U.T. Operation

Operating Environment:

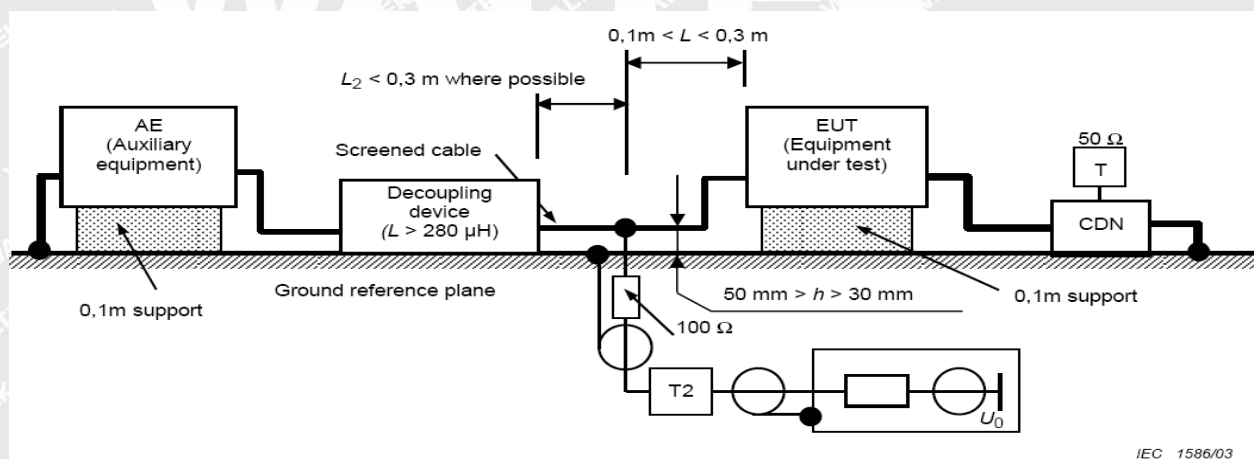
Temperature..... : 23.1 $^{\circ}\text{C}$
Humidity..... : 47.2%RH

EUT Operation:

Input Voltage..... : 230 Vac, 50 Hz
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	Actual performance
0.15 MHz to 80 MHz	3 Wire AC Supply Cables	3 Vr.m.s.	80%, 1 kHz Amp. Mod.	1%	3 s	A	Pass	A*

Remark:

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

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6.7 Voltage Dips and Short Interruptions

Test Requirement..... : EN IEC 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 20 ms intervals

6.7.1 E.U.T. Operation

Operating Environment:

Temperature..... : 22.5 °C

Humidity..... : 48.1%RH

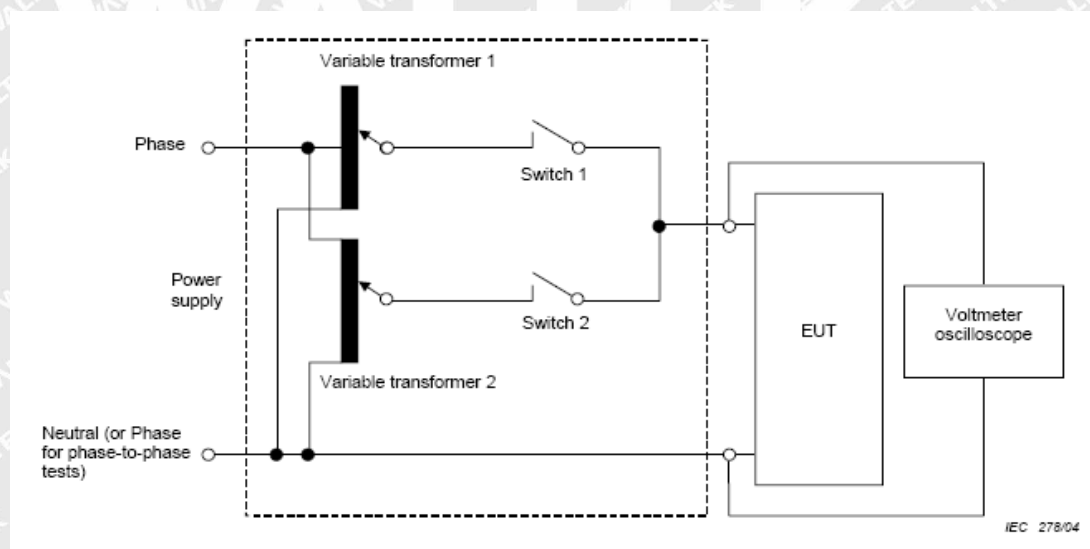
EUT Operation:

Input Voltage..... : 230 Vac, 50 Hz

Operating Mode..... : On mode

6.7.2 Block Diagram of Setup

The Voltage Dips and Short 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	Actual performance
0	0° & 180°	B	0.5	Pass	B *
70	0° & 180°	B	10	Pass	B *

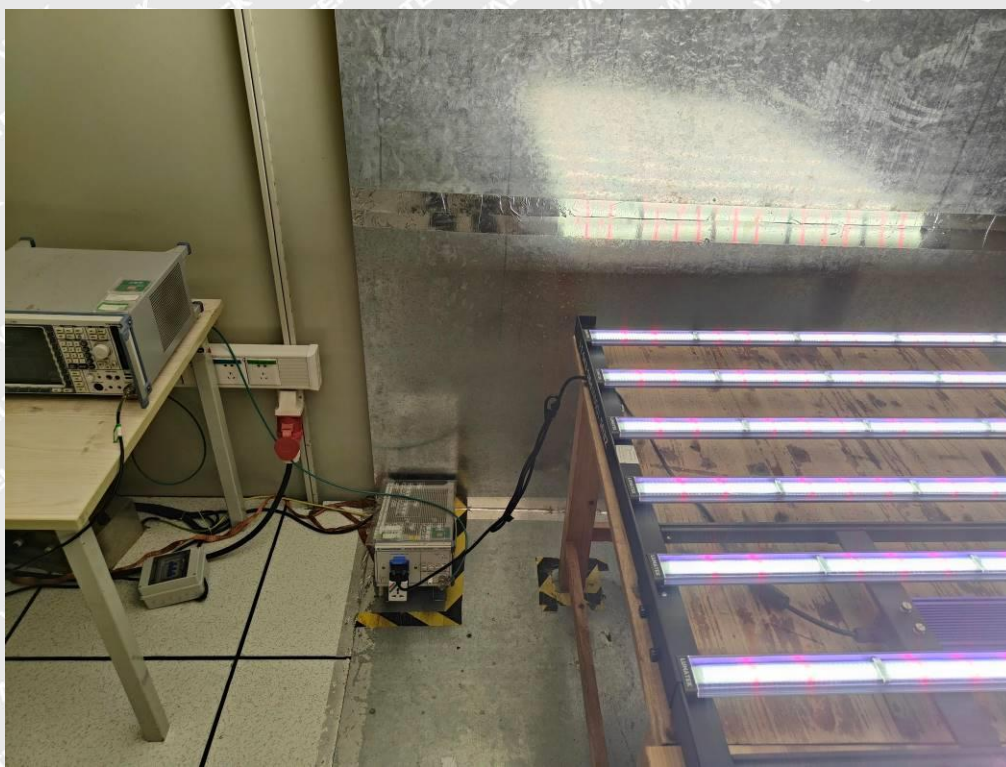
Remark:

* During the test, the EUT flickered. After the test, the EUT automatically returned to its original working state within 1 min.

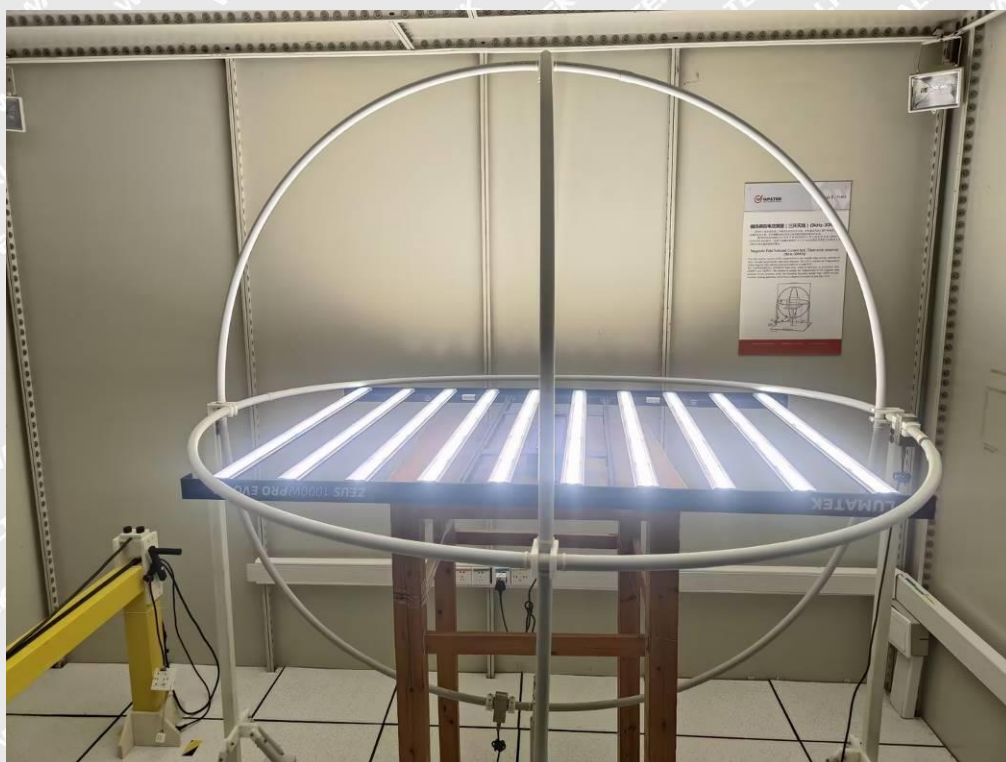


7 Photographs – Test Setup

7.1 Photograph – Electric Power Supply Interface Disturbance Voltage Test Setup



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

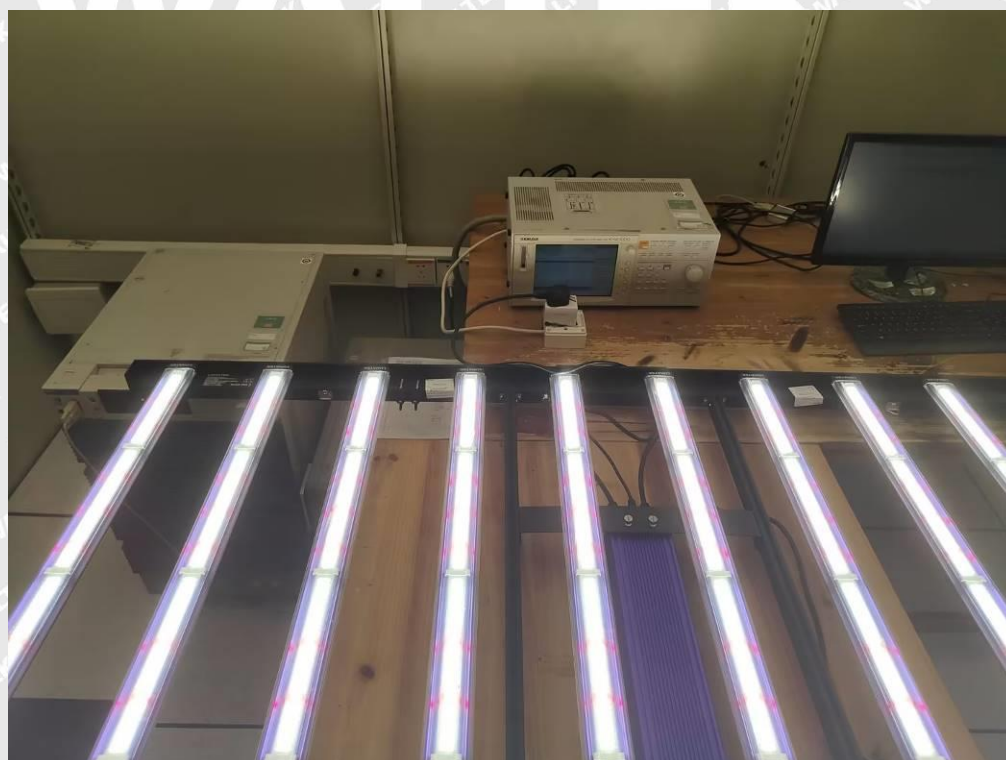




7.3 Photograph – Radiated Disturbance Test Setup, 30 MHz to 1 GHz



7.4 Photograph – Harmonic Current Emissions Test Setup





7.5 Photograph – ESD Immunity Test Setup



7.6 Photograph – Radio-frequency Electromagnetic Fields Immunity Test Setup





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



7.8 Photograph – Surges Immunity Test Setup





7.9 Photograph – Injected Currents Immunity Test Setup

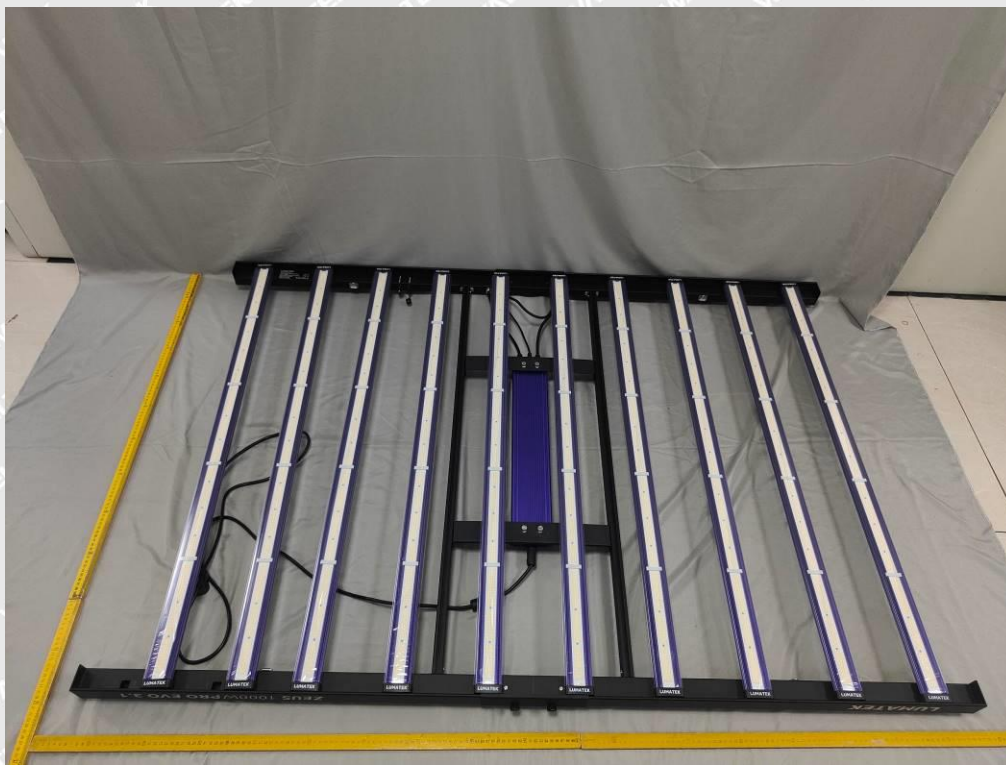


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8 Photographs – Constructional Details

8.1 Photo – Appearance View



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