Zhongshan Dayong Lighting Co., Ltd.

CE

EMC REPORT

Prepared For :	Zhongshan Dayong Lighting Co., Ltd. Layer 6, No.17, Qinglong Road, Xinmao Industrial Zone, Henglan Town, Zhongshan City, Guangdong Province, China
Product Name:	Floor lamp
Trademark	N/A
Main Test Model :	DY-190801
Additional Model:	Additional models see next page.
Prepared By :	Rhenish-Lab Certification & Testing (Shenzhen) Co., Ltd.
	101, Building B, Bailu Plaza, No. 48, Gonghe Industrial Road, Gongle Community, Xixiang Street, Baoan District, Shenzhen, Guangdong, China
Test Date:	Oct. 22, 2024 to Oct. 25, 2024
Date of Report :	Oct. 28, 2024
Report No.:	RLT2410099-01R1

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TEST REPORT DECLARATION

Applicant	:	Zhongshan Dayong Lighting Co., Ltd.
Address	:	Layer 6, No.17, Qinglong Road, Xinmao Industrial Zone, Henglan Town, Zhongshan City, Guangdong Province, China
EUT Description	:	Floor lamp
Model Number	:	190801, Additional models see next page. (Note: All models are identical except for model numbers, all tests were tested on model DY-190801)
Rated input		220-240VAC, 50/60Hz

Test Standards:

EN IEC 55015:2019+A11:2020,
EN 61547:2023
EN IEC 61000-3-2:2019/A1:2021
EN 61000-3-3:2013/A2:2021/AC:2022

This report shows that the EUT technically complies with the 2014/30/EU directive and its amendment requirements.
The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Tested by : huay Jiang
Test Engineer

Reviewer : Cindy yang
Supervisor

RHENISH-LAB TESTING (SHENZHEN) CO.,LTD. APPROVED

Approved & Authorized Signer :
Manager

1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	Test Results
Conducted Emission	PASS
Radiated electromagnetic disturbances	PASS
Radiated disturbance	PASS
Harmonic Current Emissions	PASS
Voltage Changes, Voltage Fluctuations and Flicker	PASS
Electrostatic Discharge	PASS
Radio frequency electromagnetic fields	PASS
Power frequency magnetic fields	PASS
Electrical Fast Transients	PASS
Injected currents (RF common mode)	PASS
Surge immunity	PASS
Voltage dips and short interruption	PASS
Discontinuous disturbance	PASS

2. GENERAL INFORMATION

2.1.Report information

2.1.1.This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that RLT approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that RLT in any way guarantees the later performance of the product/equipment.

2.1.2.The sample/s mentioned in this report is/are supplied by Applicant, RLT therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

2.1.3.Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through RLT, unless the applicant has authorized RLT in writing to do so.

2.2.Measurement Uncertainty

Available upon request.

3. PRODUCT DESCRIPTION

3.1.EUT Description

Description	:	Floor lamp
Applicant	:	Zhongshan Dayong Lighting Co., Ltd. Layer 6, No.17, Qinglong Road, Xinmao Industrial Zone, Henglan Town, Zhongshan City, Guangdong Province, China
Manufacturer	:	Zhongshan Dayong Lighting Co., Ltd. Layer 6, No.17, Qinglong Road, Xinmao Industrial Zone, Henglan Town, Zhongshan City, Guangdong Province, China
Model Number	:	190801, DY-202102,DY-202103,DY-202104,DY-202105,DY-202106,DY-202107, DY-202108,DY-202109,DY-202110,DY-202111,DY-202112,DY-202113, DY-202114,DY-202115,DY-202116,DY-202117,DY-202118,DY-202119, DY-202120,DY-202121,DY-202122,DY-202123,DY-202124,DY-202125, DY-202126,DY-202127,DY-202128,DY-202129,DY-202130,DY-202131, DY-202132,DY-202133,DY-202134,DY-202135,DY-202136,DY-202137, DY-202138,DY-202139,DY-202140,DY-202141,DY-202142,DY-202143, DY-202144,DY-202145,DY-202146,DY-202147,DY-202148,DY-202149, DY-202150,DY-0001,DY-0002,DY-0003,DY-0004,DY-0005,DY-0006,DY-0007, DY-0008,DY-0009,DY-0010,DY-0011,DY-0012,DY-0013, DY-0014, DY-0015, DY-0016,DY-0017,DY-0018,DY-0019,DY-0020,DY-0021,DY-0022,DY-0023,DY-0024, DY-0025,DY-0026,DY-0027,DY-0028,DY-0029,DY-0030,SM-DY-16002, SM-DY-16003,SM-DY-16004,SM-DY-16005,SM-DY-16006,SM-DY-16007, SM-DY-16008,SM-DY-16009,SM-DY-16010,SM-DY-16011,SM-DY-16012, SM-DY-16013,SM-DY-16014,SM-DY-16015,SM-DY-16016,SM-DY-16017, SM-DY-16018,SM-DY-16019,SM-DY-16020,SM-DY-16021,SM-DY-16022, SM-DY-16023,SM-DY-16024,SM-DY-16025,SM-DY-16026,SM-DY-16027, SM-DY-16028,SM-DY-16029,SM-DY-16030,SM-DY-16031,SM-DY-16032, SM-DY-16033,SM-DY-16034,SM-DY-16035,SM-DY-16036,SM-DY-16037, SM-DY-16038,SM-DY-16039,SM-DY-16040,SM-DY-16041,SM-DY-16042, SM-DY-16043,SM-DY-16044,SM-DY-16045,SM-DY-16046,SM-DY-16047, SM-DY-16048,SM-DY-16049,SM-DY-16050,SM-DY-16051,SM-DY-16052, SM-DY-16053,SM-DY-16054,SM-DY-16055,SM-DY-16056,SM-DY-16057, SM-DY-16058,SM-DY-16059,SM-DY-16060,SM-DY-16061,SM-DY-16062, SM-DY-16063,DY-190802,DY-190803,DY-190808,DY-190809,DY-190810, DY-190811, 90501, 90502, 90503, 90504, 90505, 90506, 90507, 90512, 90513, 90514,SM-DY-1603003,SM-DY-1603004,SM-DY-1605004,SM-DY-1605006, SM-DY-1605007,SM-DY-1605008,SM-DY-1605009,SM-DY-1605010, SM-DY-1605011,SM-DY-1605012,SM-DY-1605013,SM-DY-1605014, SM-DY-1605021,SM-DY-1604002,SM-DY-1604, S0159491, S0187086, S0261040, S0340615, S0340617, S1359972, SM20150516003, SM20150516004, S0143246, S0342378, S1359877, SMH000002, 20150831-001,20150831-002, S0201566, S0218340, S0360200, S0712432, SM0194939, SM00218363, DY-202401, DY-202402,DY-202403,DY-202404,DY-202405,DY-202406,DY202407,DY-202408, DY-202409,DY-202410,DY-202411,DY-202412,DY-202413,DY-202414,DY-202415, DY-202416,DY-202417,DY-202418,DY-202419,DY-202420 (Note: All models are identical except for model numbers, all tests were tested on model DY-190801)

3.2.Block Diagram of EUT Configuration

3.3.Operating Condition of EUT

Test mode 1: ON

3.4.Test Conditions

Temperature: 23-26℃
Relative Humidity: 55-68 %

3.5.Modifications

No modification was made.

3.6.Abbreviations

AC	Alternating Current
AMN	Artificial Mains Network
DC	Direct Current
EM	ElectroMagnetic
EMC	ElectroMagnetic Compatibility
EUT	Equipment Under Test
IF	Intermediate Frequency
RF	Radio Frequency
rms	root mean square
EMI	Electromagnetic Interference
EMS	Electromagnetic Susceptibility

3.7.Performance Criterion

Criterion A: The equipment shall continue to operate as intended without operator intervention. No degradation of performance of loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

Criterion B: After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended.

Criterion C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

4. TEST EQUIPMENT USED

4.1.For Conducted Emission Test

Item	Equipment	Manufacturer	Model No.	Serial No.
1.	Test Receiver	Rohde & Schwarz	ESHS30	828985/018
2.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006
3.	L.I.S.N.	Rohde & Schwarz	ESH2-Z5	834549/005
4.	Conical	Emtek	N/A	N/A
5.	Voltage Probe	Schwarzbeck	TK9416	N/A
6.	Coaxial Switch	Anritsu	MP59B	6100214550

4.2.For Magnetic Test (In Shielding Room)

Item	Equipment	Manufacturer	Model No.	Serial No.
1.	Test Receiver	Rohde & Schwarz	ESHS20	836600/006
2.	Triple-loop Antenna	Rohde & Schwarz	HM020	843885/002
3.	RF Cable	MIYAZAKI	5D-2W	Tri-loop Cable
4.	Coaxial Switch	Anritsu	MP59B	M73989

4.3.For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.
1.	Spectrum Analyzer	ANRITSU	MS2661C	6200140915
2.	Test Receiver	Rohde&Schwarz	ESC830	828982/018
3.	Bilog Antenna	Schwarzbeck	VULB9163	142
4.	50 Coaxial Switch	Anritsu Corp	MP59B	6100237248
5.	Cable	Schwarzbeck	AK9513	ACRX1
6.	Cable	Rosenberger	N/A	FR2RX2
7.	Cable	Schwarzbeck	AK9513	CRRX2
8.	Cable	Schwarzbeck	AK9513	CRRX2
9.	Signal Generator	HP	864A	3625U00573

4.4.For Harmonic / Flicker Test

Item	Equipment	Manufacturer	Model No.	Serial No.
1.	Power Frequency test system	HAEFELY	PHF555	080419-03

4.5.For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.
1.	ESD Tester	HAEFELY	PSD 1600	H911’292

4.6.For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.
1.	Signal Generator	HP	8648A	3633A02081
2.	Amplifier	A&R	500A100	17034
3.	Amplifier	A&R	100W/1000M1	17028
4.	Isotropic Field Monitor	A&R	FM2000	16829
5.	Isotropic Field Probe	A&R	FLW220100	16755
6.	Biconic Antenna	EMCO	3108	9507-2534
7.	Log-periodic Antenna	A&R	AT1080	16812
8.	PC	N/A	486DX2	N/A

4.7.For Electrical Fast Transient/Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.
1.	Burst Tester	HAEFELY	PEFT 4010	080981-16

4.8.For Surge Test

Item	Equipment	Manufacturer	Model No.	Serial No.
1.	Surge Tester	HAEFELY	PSURGE4.1	080107-04

4.9.For Injected Currents Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.
1.	Simulator	EMTEST	CWS 500C	0900-12
2.	CDN	EMTEST	CDN-M2	510010010010
3.	VDN	EMTEST	CDN-M3	0900-11
4.	Injection Clamp	EMTEST	F-2031-23MM	368
5.	Attenuator	EMTEST	ATT6	0010222a

4.10.For Magnetic Field Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.
1.	Magnetic Field Tester	HEAFELY	MAG100.1	083858-10

4.11.For Voltage Dips and Interruptions Test

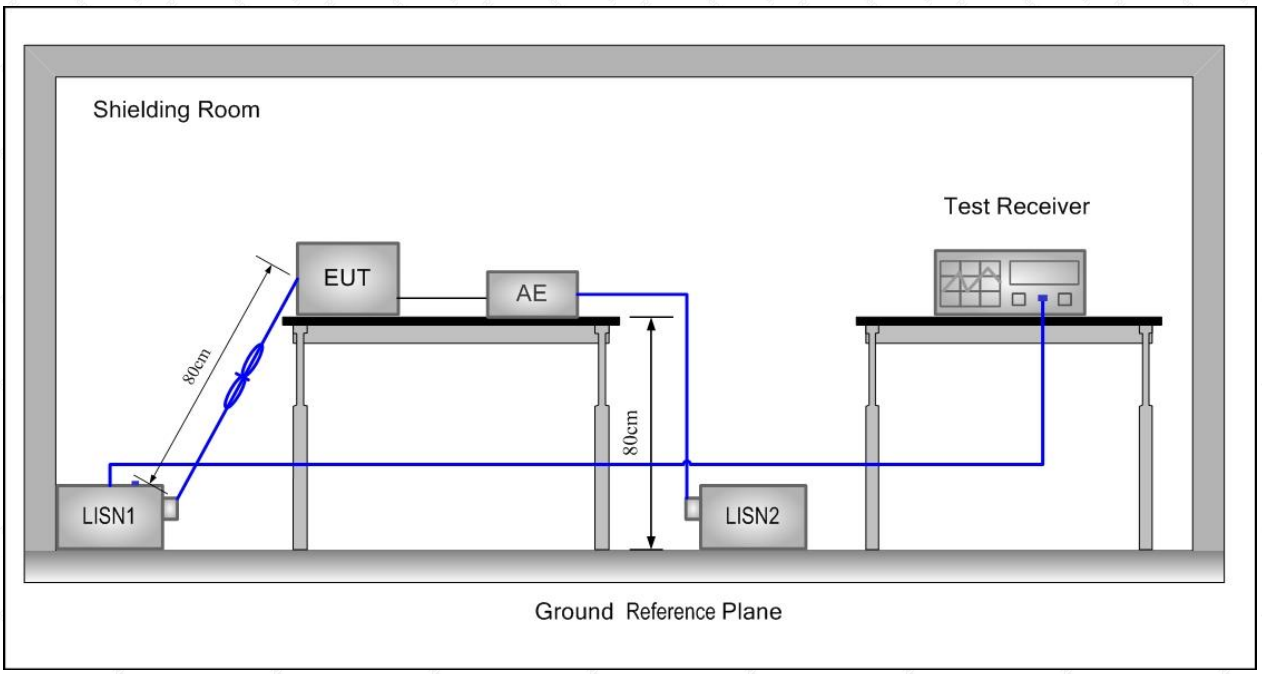
Item	Equipment	Manufacturer	Model No.	Serial No.
2.	Dips Tester	HEAFELY	PLINE 1610	083732-18

5. EMISSION TEST

5.1.Conducted Emission

This clause lays down the general requirements for the measurement of disturbance voltage produced at the terminals of apparatus.

5.1.1.Measurement procedure



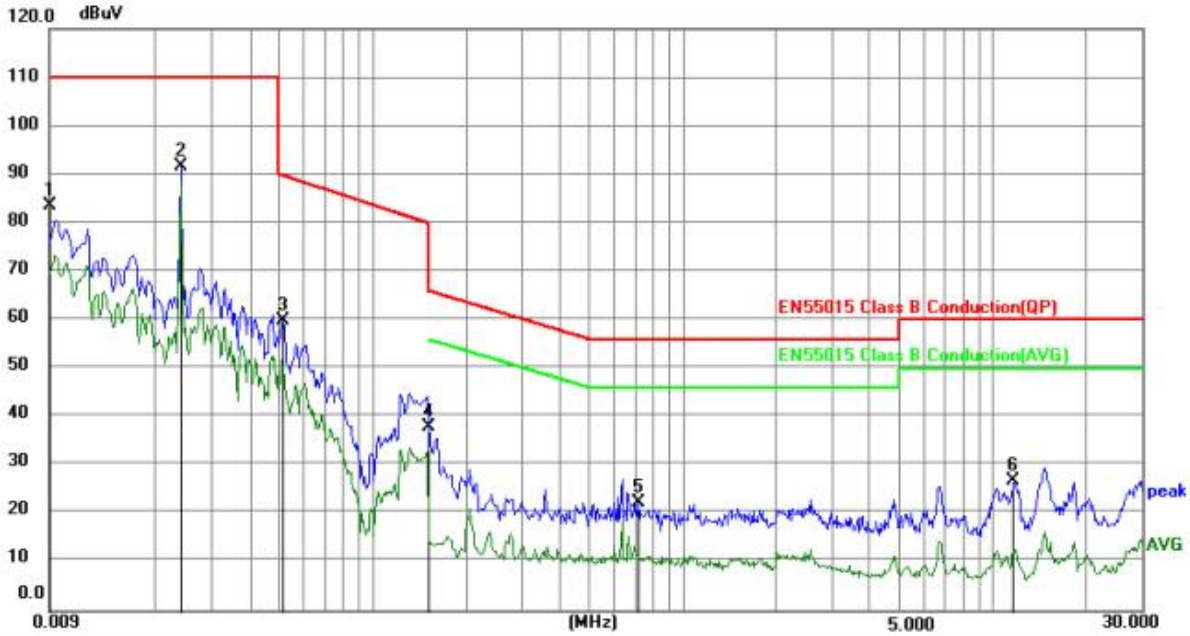
1. The mains terminal disturbance voltage was measured with the EUT in a shielded room.
2. The EUT was connected to AC power source through a LISN (Line Impedance Stabilization Network) which provides a (50 μH + 5 Ω) || 50 Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN, which was bonded to the ground reference plane in the same way as the LISN for the unit being measured.
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. Before get the final emission results with quasi-peak(QP) detector and average(AV) detector, a pre-scan was performed with the peak(PK) and average(AV) detector to find out the maximum emission data plots of the EUT.

5.1.2.Measurement uncertainty

Ulab(cond) = 1.8dB at 95% level of confidence, K=2

5.1.3.Results -Measurement Data

Temperature:	24℃	Relative Humidity:	48%
Test Voltage:	AC 230V, 50Hz	Pressure:	DY-190801hPa
Test Mode:	Mode 1	Phase:	Line



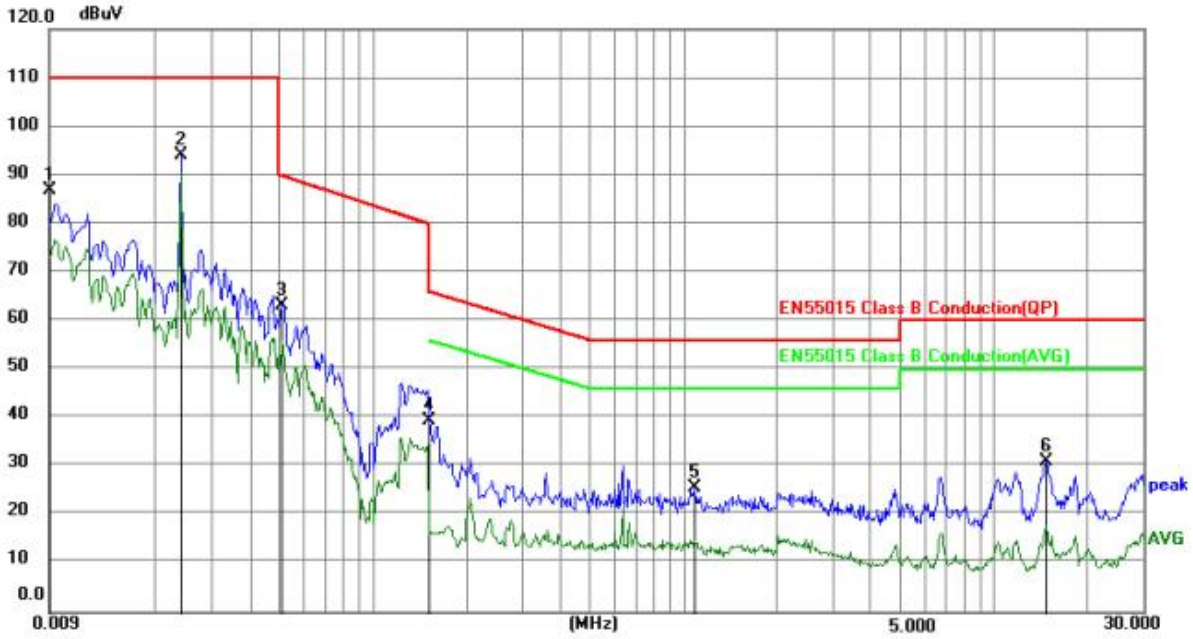
Site LAB
Limit: EN55015 Class B Conduction(QP)
EUT:
M/N:
Mode:
Note:

Phase: *L1*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz		dB	dBuV	dBuV	dB	Detector	Comment
1		0.0090	72.33	11.10	83.43	110.00	-26.57	peak	
2	*	0.0240	80.89	10.64	91.53	110.00	-18.47	peak	
3		0.0511	49.57	10.31	59.88	89.80	-29.92	peak	
4		0.1500	27.81	10.16	37.97	66.00	-28.03	peak	
5		0.7170	11.91	10.34	22.25	56.00	-33.75	peak	
6		11.6879	16.05	10.82	26.87	60.00	-33.13	peak	

Temperature:	24℃	Relative Humidity:	48%
Test Voltage:	AC 230V, 50Hz	Pressure:	DY-190801hPa
Test Mode:	Mode 1	Phase:	Neutral



Site LAB
Limit: EN55015 Class B Conduction(QP)
EUT:
M/N:
Mode:
Note:

Phase: *N*
Power:

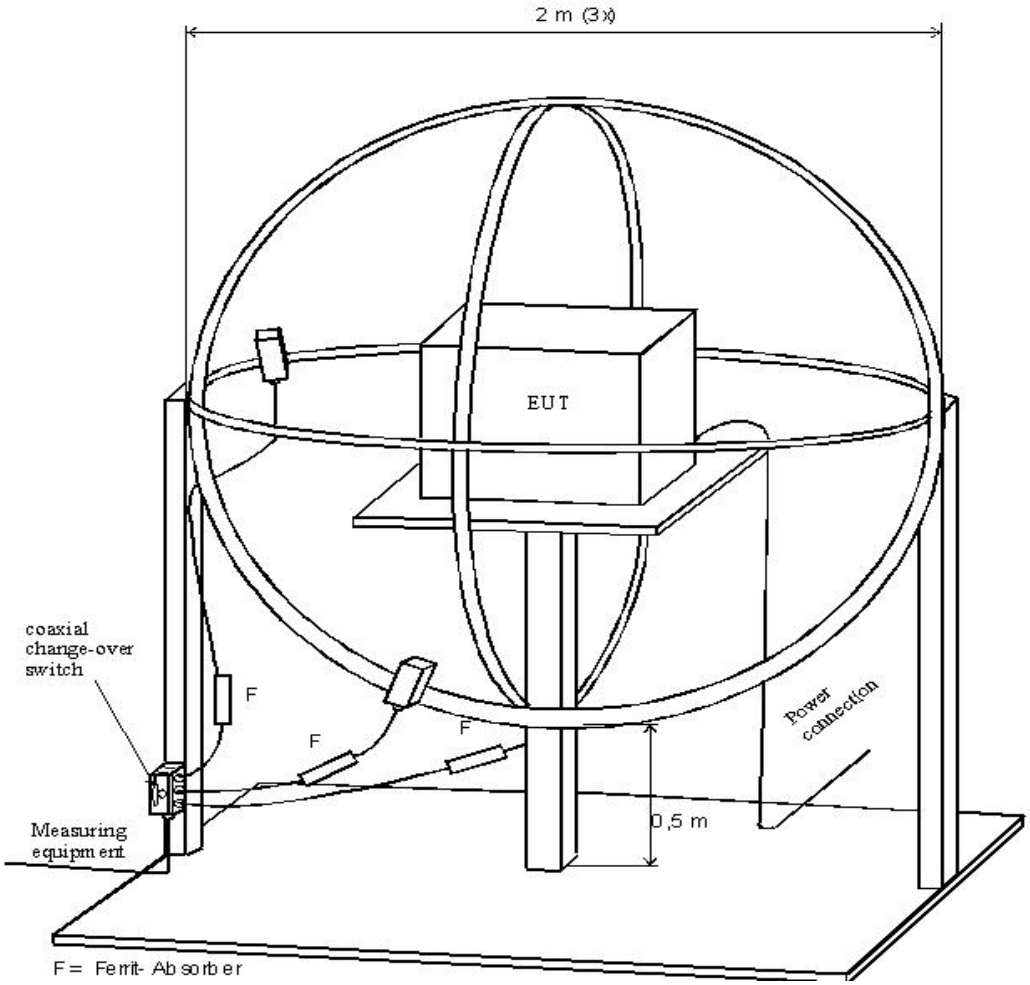
Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz		dB	dBuV	dBuV	dB	Detector	Comment
1		0.0090	75.84	11.09	86.93	110.00	-23.07	peak	
2	*	0.0240	83.40	10.63	94.03	110.00	-15.97	peak	
3		0.0510	52.88	10.31	63.19	89.82	-26.63	peak	
4		0.1500	29.31	10.16	39.47	66.00	-26.53	peak	
5		1.0814	15.18	10.41	25.59	56.00	-30.41	peak	
6		14.6040	19.92	11.04	30.96	60.00	-29.04	peak	

Radiated electromagnetic disturbances

This clause lays down the general requirements for the magnetic component of the radiated disturbance field strength in the frequency range 9 kHz to 30 MHz

5.1.4.Measurement procedure



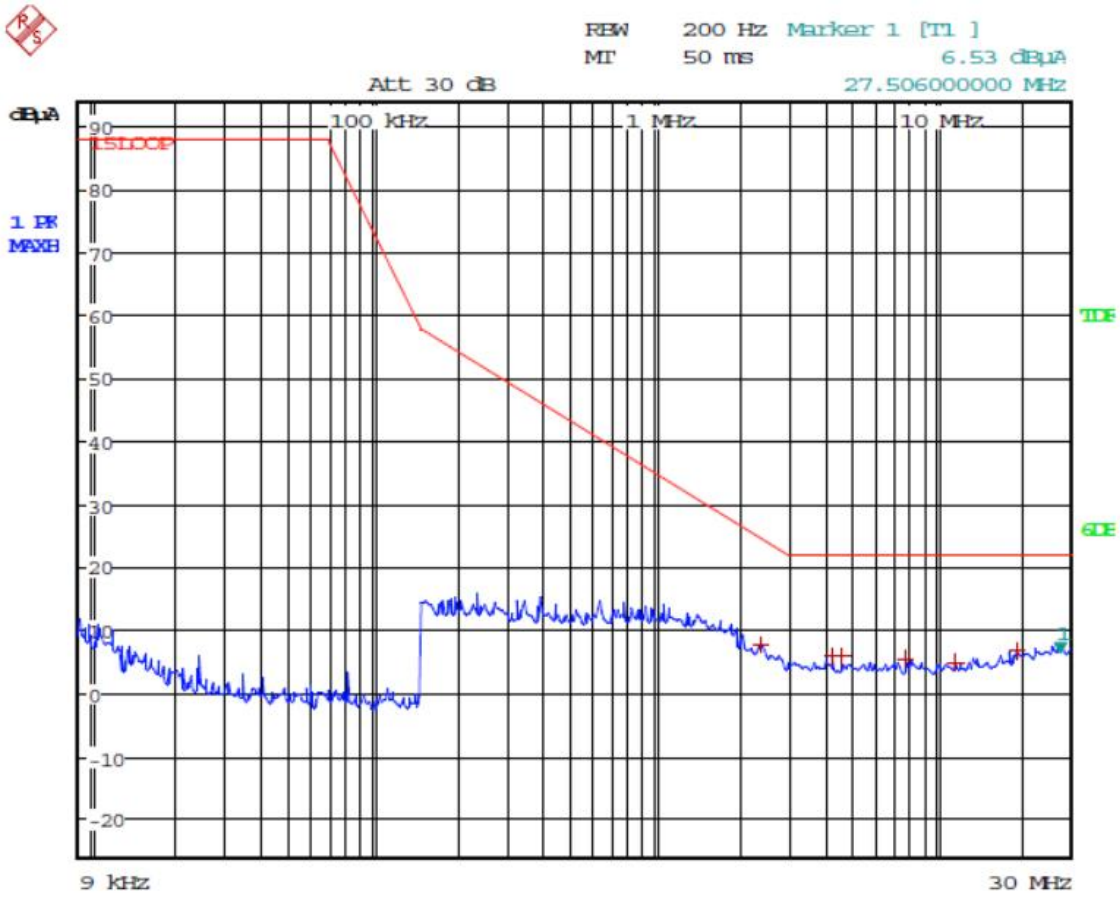
The EUT is placed in the centre of the loop antenna system. The current induced by the magnetic field from the EUT into each of the three large loop antennas of the loop antenna system is measured by connecting the current probe of the large loop antenna to a measuring receiver. During the measurements the EUT remains in a fixed position. Before get the final emission results with quasi-peak(QP) detector, a pre-scan was performed with the peak(PK) to find out the maximum emission data plots of the EUT.

5.1.5.Measurement uncertainty

Ulab(cond) = 2.44 dB at confidence of 95%, K=2

5.1.6.Results

X direction
Level

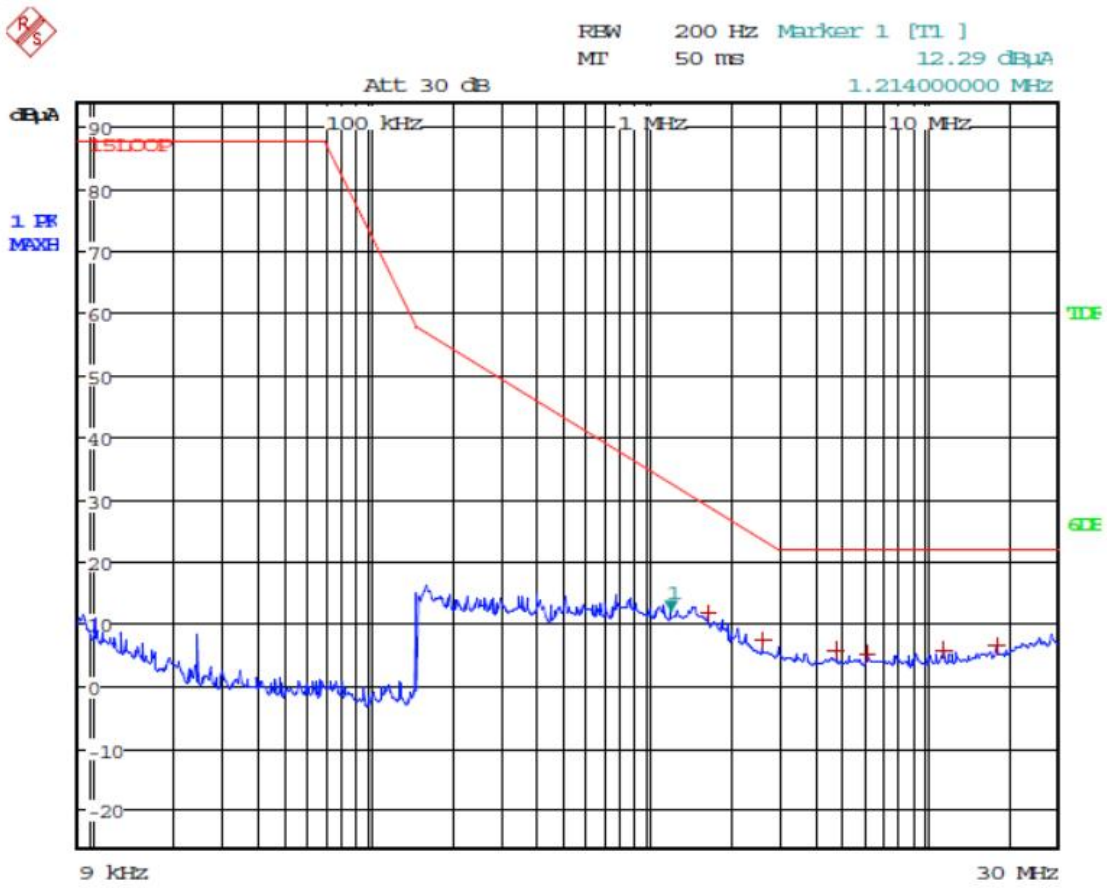


EDIT PEAK LIST (Prescan Results)

Trace1:	15LOOP
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµA	DELTA LIMIT dB
1 Max Peak	2.39 MHz	7.94	-16.78
1 Max Peak	4.302 MHz	6.09	-15.90
1 Max Peak	4.626 MHz	5.82	-16.17
1 Max Peak	7.814 MHz	5.57	-16.43
1 Max Peak	11.67 MHz	4.93	-17.06
1 Max Peak	19.438 MHz	7.05	-14.94

Y direction
Level

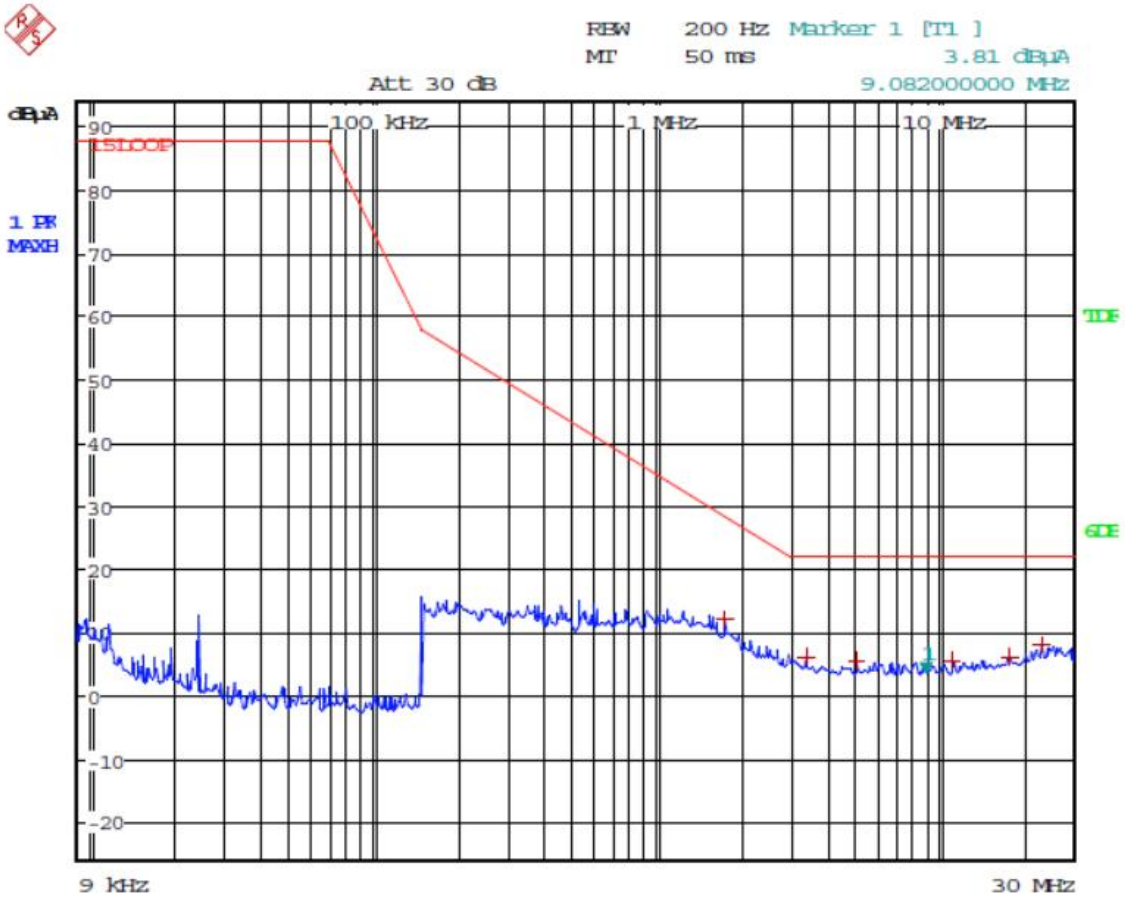


EDIT PEAK LIST (Frescan Results)

Trace1:	15LOOP	
Trace2:	---	
Trace3:	---	

TRACE	FREQUENCY	LEVEL dBµA	DELTA LIMIT dB
1 Max Peak	1.654 MHz	11.92	-17.23
1 Max Peak	2.614 MHz	7.40	-16.24
1 Max Peak	4.826 MHz	5.99	-16.00
1 Max Peak	6.17 MHz	5.43	-16.56
1 Max Peak	11.774 MHz	5.83	-16.16
1 Max Peak	18.206 MHz	6.65	-15.34

Z direction
Level



EDIT PEAK LIST (Prescan Results)

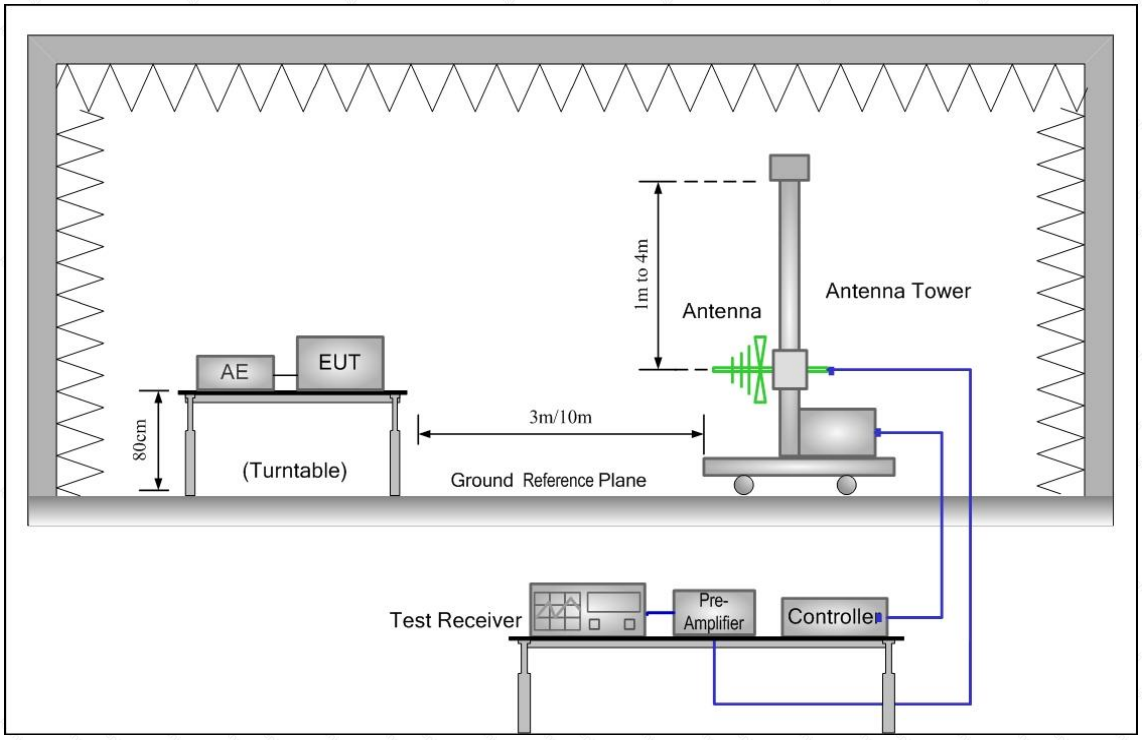
Trace1:	15LOOP
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµA	DELTA LIMIT dB
1 Max Peak	1.746 MHz	12.16	-16.34
1 Max Peak	3.402 MHz	6.19	-15.80
1 Max Peak	5.146 MHz	5.54	-16.45
1 Max Peak	11.114 MHz	5.63	-16.36
1 Max Peak	17.762 MHz	6.28	-15.71
1 Max Peak	23.186 MHz	8.31	-13.68

5.2. **Radiated disturbance**

This clause lays down the general requirements for the measurement of Radiated disturbance produced at the space of apparatus.

5.2.1.Measurement procedure



1. The radiated emissions test was conducted in a semi-anechoic chamber. The EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.

2. Before get the final emission results with quasi-peak(QP) detector, a pre-scan was performed with the peak(PK) detector to find out the maximum emission data plots of the EUT.

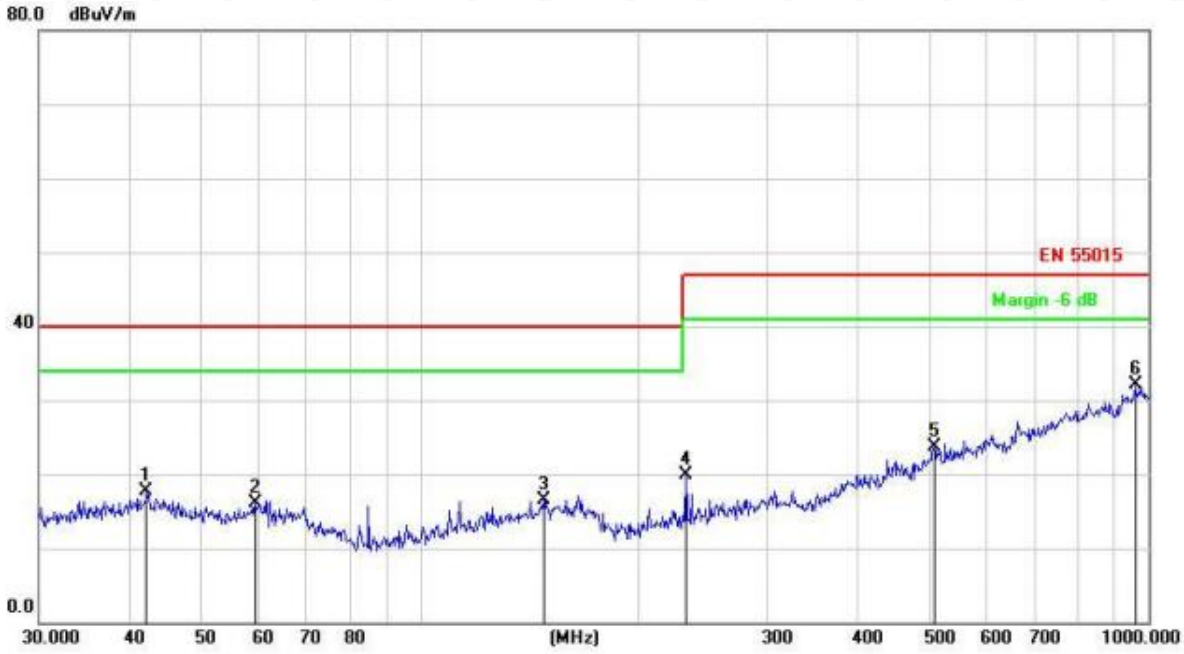
3. The frequencies of maximum emission were determined in the final radiated emissions measurement, the physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization. Test was performed on subcontractor at 3 m distance.

5.2.2.Measurement uncertainty

Ulab(cond) = 3.9dB at 95% level of confidence,k=2

5.2.3.Results

Temperature:	24℃	Relative Humidity:	48%
Test Voltage:	AC 230V, 50Hz	Pressure:	DY-190801hPa
Test Mode:	Mode 1	Polarization:	Horizontal



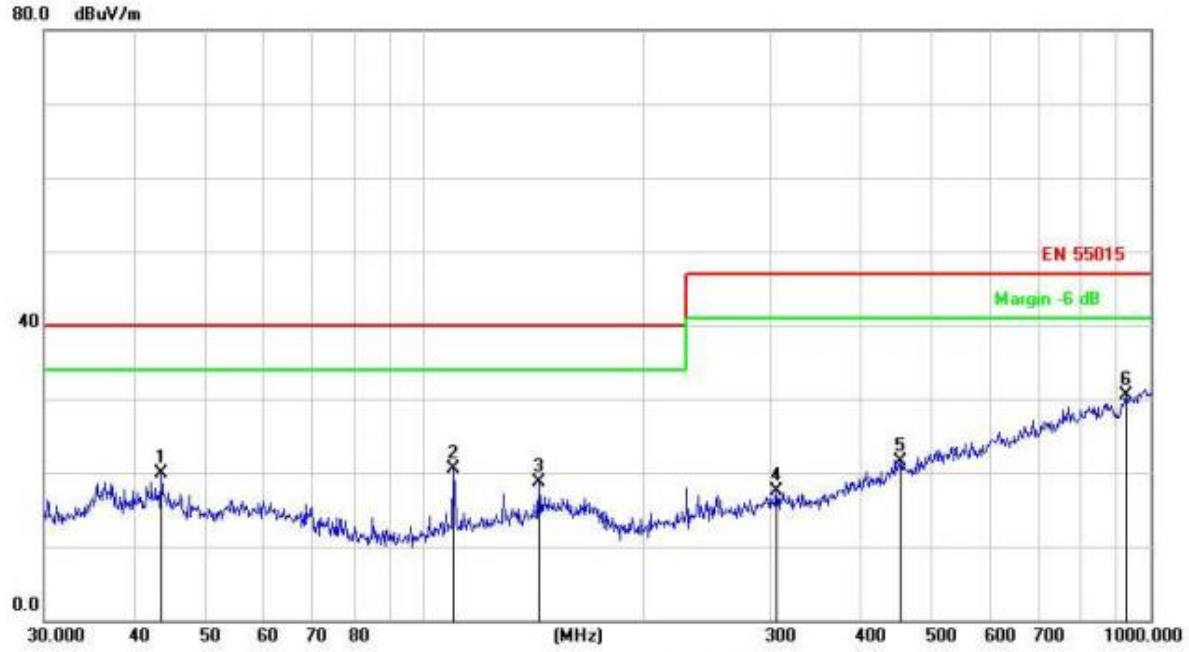
Site LAB
Limit: EN 55015
EUT:
M/N:
Mode:
Note:

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree	Comment
1		42.1542	27.88	-10.25	17.63	40.00	-22.37	peak			
2		59.4405	27.78	-11.61	16.17	40.00	-23.83	peak			
3		147.9214	27.33	-10.83	16.50	40.00	-23.50	peak			
4		231.7179	32.48	-12.48	20.00	47.00	-27.00	peak			
5		508.2581	28.55	-4.84	23.71	47.00	-23.29	peak			
6	*	958.7943	28.66	3.42	32.08	47.00	-14.92	peak			

Temperature:	24℃	Relative Humidity:	48%
Test Voltage:	AC 230V, 50Hz	Pressure:	DY-190801hPa
Test Mode:	Mode 1	Polarization:	Vertical



Site LAB
Limit: EN 55015
EUT:
M/N:
Mode:
Note:

Polarization: *Vertical*
Power:
Distance: 3m

Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree	Comment
1		43.5057	30.26	-10.26	20.00	40.00	-20.00	peak			
2		109.7960	34.50	-14.09	20.41	40.00	-19.59	peak			
3		143.8295	30.04	-11.38	18.66	40.00	-21.34	peak			
4		305.6800	27.83	-10.42	17.41	47.00	-29.59	peak			
5		452.7197	27.70	-6.25	21.45	47.00	-25.55	peak			
6	*	925.7563	28.14	2.38	30.52	47.00	-16.48	peak			

Harmonic Current Emissions

This part deals with the limitation of harmonic currents injected into the public supply system.

5.2.4.Limits

1. For lighting equipment having an active input power greater than 25 W, the harmonic currents shall not exceed the following limits

Harmonic order n	Maximum permissible harmonic currrent expressed as a percentage of the input current at the fundamental frequency %
2	2
3	30 · λ *
5	10
7	7
9	5
11 ≤ n ≤ 39 (odd harmonics only)	3
* λ is the circuit power factor	

For discharge lighting equipment that has built-in dimmers or consists of independent dimmers or dimmers built in an enclosure, the following conditions apply:
the harmonic current values for the maximum load condition derived from the percentage limits given in above table shall not be exceeded; in any dimming position, the harmonic current shall not exceed the value of current allowed in the maximum load condition.

2. For incandescent lighting equipment that has built-in dimmers or consists of dimmers built in an enclosure, the harmonic currents shall not exceed the following limits

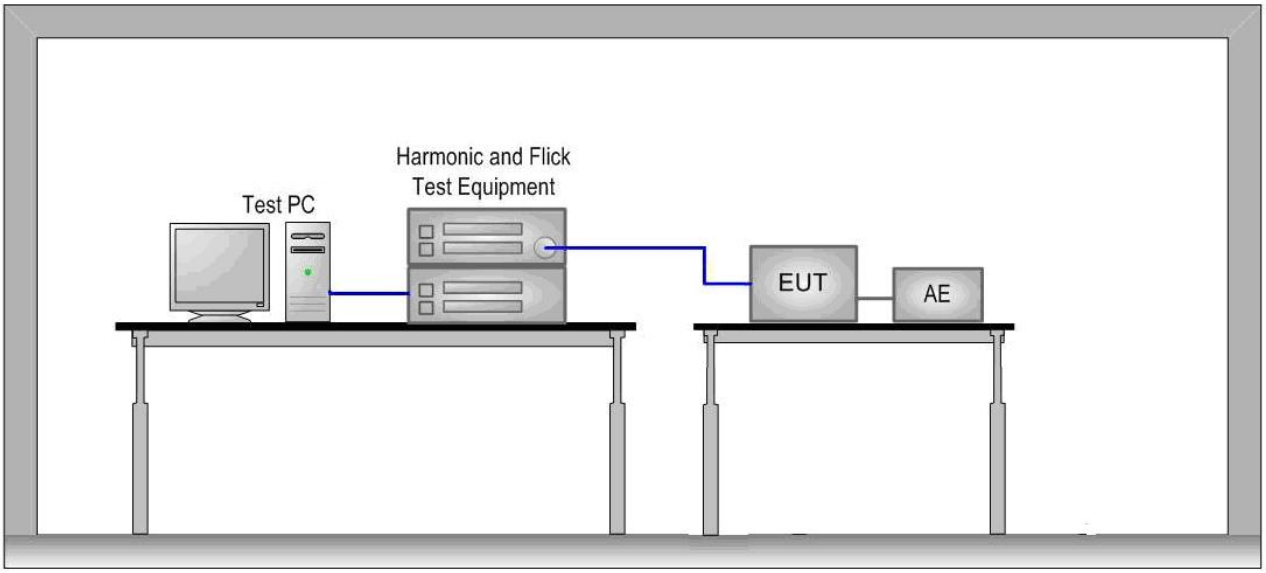
Harmonic order n	Maximum permissible harmonic current A
Odd harmonics	
3	2,30
5	1,14
7	0,77
9	0,40
11	0,33
13	0,21
15 ≤ n ≤ 39	$0{,}15\ \frac{15}{n}$
Even harmonics	
2	1,08
4	0,43
6	0,30
8 ≤ n ≤ 40	$0{,}23\ \frac{8}{n}$

3. Discharge lighting equipment having an active input power smaller than or equal to 25 W shall comply with one of the following two sets of requirements: The harmonic currents shall not exceed the power-related limits,

Harmonic order n	Maximum permissible harmonic current per watt mA/W
3	3,4
5	1,9
7	1,0
9	0,5
11	0,35
$13 \leq n \leq 39$ (odd harmonics only)	$\frac{3,85}{n}$

Or the third harmonic current, expressed as a percentage of the fundamental current, shall not exceed 86 % and the fifth harmonic current shall not exceed 61 %. Also, the waveform of the input current shall be such that it reaches the 5 % current threshold before or at 60º, has its peak value before or at 65º and does not fall below the 5 % current threshold before 90º, referenced to any zero crossing of the fundamental supply voltage. The current threshold is 5 % of the highest absolute peak value that occurs in the measurement window, and the phase angle measurements are made on the cycle that includes this absolute peak value.

5.2.5.Measurement procedure



The equipment under test is placed on a wooden table with a height of 0,8 m in the EMC lab. For each harmonic order, measure the 1,5 s smoothed r.m.s. harmonic current in each DFT time window and calculate the arithmetic average of the measured values from the DFT time windows, over the entire observation period. Each harmonic order, all 1.5 s smoothed r.m.s. harmonic current values and the average values for the individual harmonic currents, taken over the entire test observation period shall be less than or equal to the applicable limits.

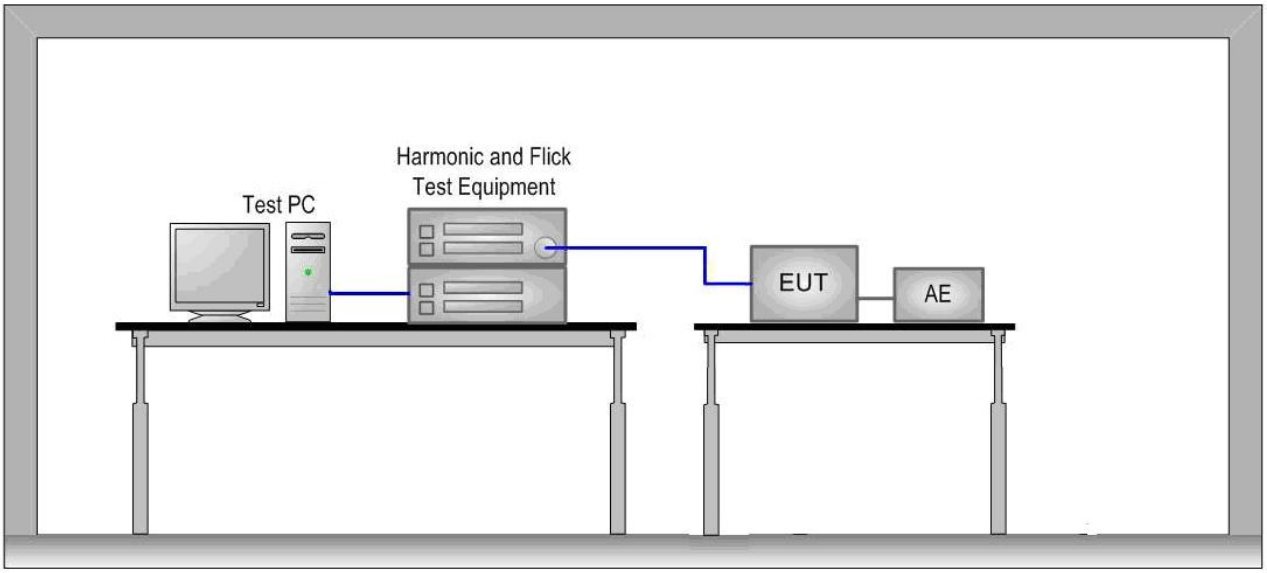
5.2.6.Results

Test Result: Pass

5.3.Voltage Changes, Voltage Fluctuations and Flicker

This part is concerned with the limitation of voltage fluctuations and flicker impressed on the public low-voltage system.

5.3.1.Measurementest procedure



The equipment under test is placed on a wooden table with a height of 0,8 m in the EMC lab. The voltage changes, fluctuations and flicker were measured at the supply terminals of the EUT.

5.3.2.Results

Test Result: Pass

6. IMMUNITY TEST

6.1.Performance Criteria Description in Clause 4 of EN 61547

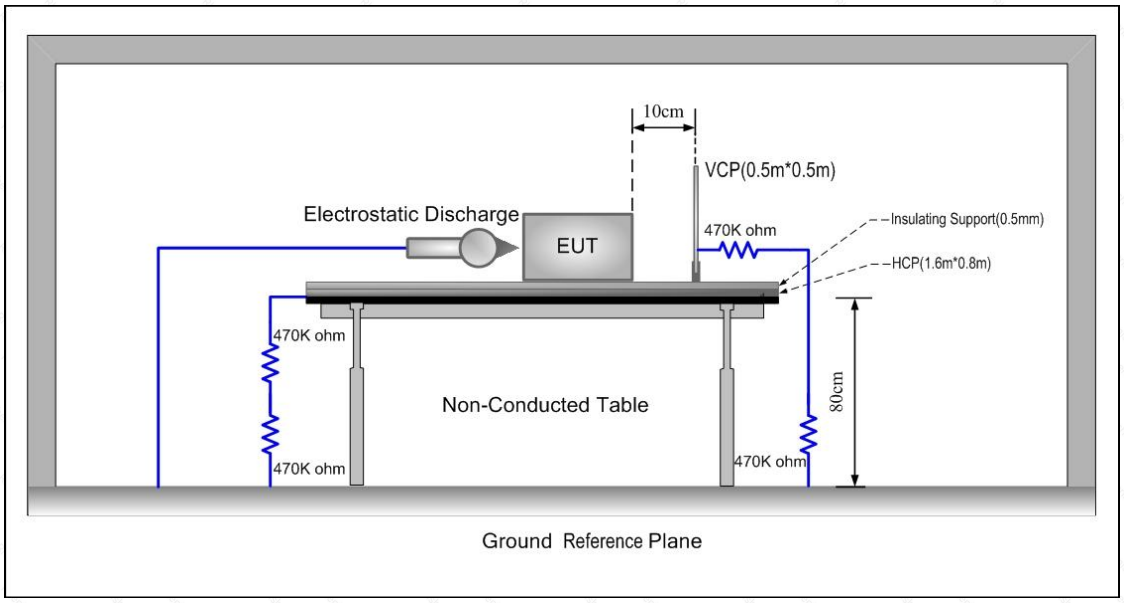
Criterion A:	During the test, no change of the luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended.
Criterion B:	During the test, the luminous intensity may change to any value. After the test, the luminous intensity shall be restored to 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.
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. Additional requirement for lighting equipment incorporating a starting device: After the test, the lighting equipment is switched off. After half an hour, it is switched on again. The lighting equipment shall start and operate as intended.

6.2.Conditions during testing

The test shall be applied while the equipment is operated as intended under the normal operating conditions as laid down in the relevant product standard at stabilized luminous (radiant) flux and at normal laboratory conditions. Testing is only required at one combination of supply voltage and frequency, as specified by the manufacturer. Equipment including a regulating control shall be tested at a light output level of 50 % ± 10 %.The lamp load of the equipment under test shall be the maximum allowed. Luminaires and independent auxiliaries shall be tested with lamps for which they are intended. Where equipment can operate with lamps of different wattages, lamps of maximum wattage shall be applied. For independent auxiliaries, the length of the cables between device and lamp shall be 3 m unless the manufacturer prescribes another length.

6.3.ESD

6.3.1.Test Procedures



1. Contact discharge was applied only to conductive surfaces of the EUT. Air discharge was applied only to non-conducted surfaces of the EUT.
2. The EUT was put on a 0.8m high wooden table for table-top equipment or 0.1m high for floor standing equipment standing on the ground reference plane (GRP).
3. A horizontal coupling plane(HCP) 1.6m by 0.8m in size was placed on the table, and the EUT with its cables were isolated from the HCP by an insulating support thick than 0.5mm. The VCP 0.5m by 0.5m in size while HCP were constructed from the same material type and thickness as that of the GRP, and connected to the GRP via a 470kΩ resistor at each end. The distance between EUT and any of the other metallic surfaces excepted the GRP, HCP and VCP was greater than 1m.
4. During the contact discharges, the tip of the discharge electrode was touching the EUT before the discharge switch is operated. During the air discharges, the round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the ESD generator was removed from the EUT, the generator is then retriggered for a new single discharge. For ungrounded product, a discharge cable with two resistances was used after each discharge to remove remnant electrostatic voltage. 10 times of each polarity single discharge were applied to HCP and VCP.

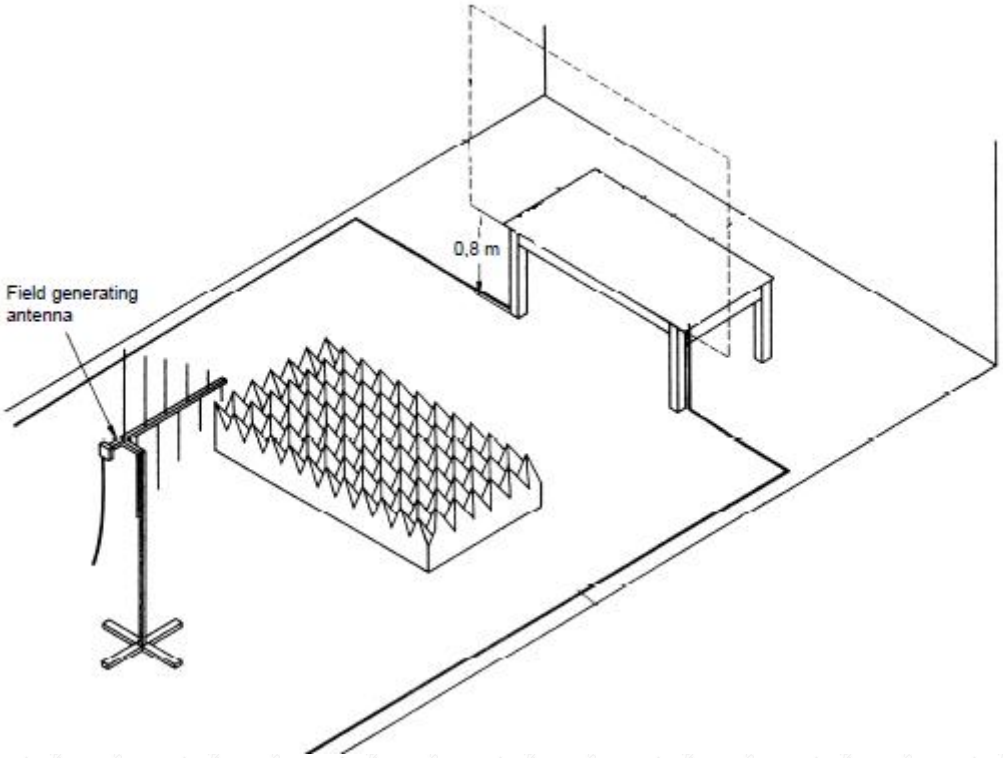
6.3.2.Results

Test point	Table (T) Floor (F)	Contact (C) Air (A)	Voltage (kV)	Number of discharge	Polarity (+ / -)	Opinion
Air contact	T	A	8	20	+ / -	A
Direct contact	T	C	4	20	+ / -	A
HCP	T	C	4	20	+ / -	A
VCP	T	C	4	20	+ / -	A

A: no loss of function.

6.4.Radio frequency electromagnetic fields

6.4.1.Measurement procedure



1. The EUT was placed on 0.8m high wooden table for table-top equipment. For floor standing equipment, the EUT was placed on a 0.1m high wooden support above the GRP. The tests normally shall be performed with the generating antenna facing each of four sides of the EUT. When equipment can be used in different orientations (e.g. vertical or horizontal) the test shall be performed on all possible sides of the EUT.
2. The tests are carried out with a field strength by 3 V/m (measured in the unmodulated field) with amplitude modulated signal by a depth of 80 % by a sinusoidal audio signal of 1 kHz. The logarithmic step was 1% and the dwell time was 3s dependent of the EUT cycle time. Test was performed on subcontractor.

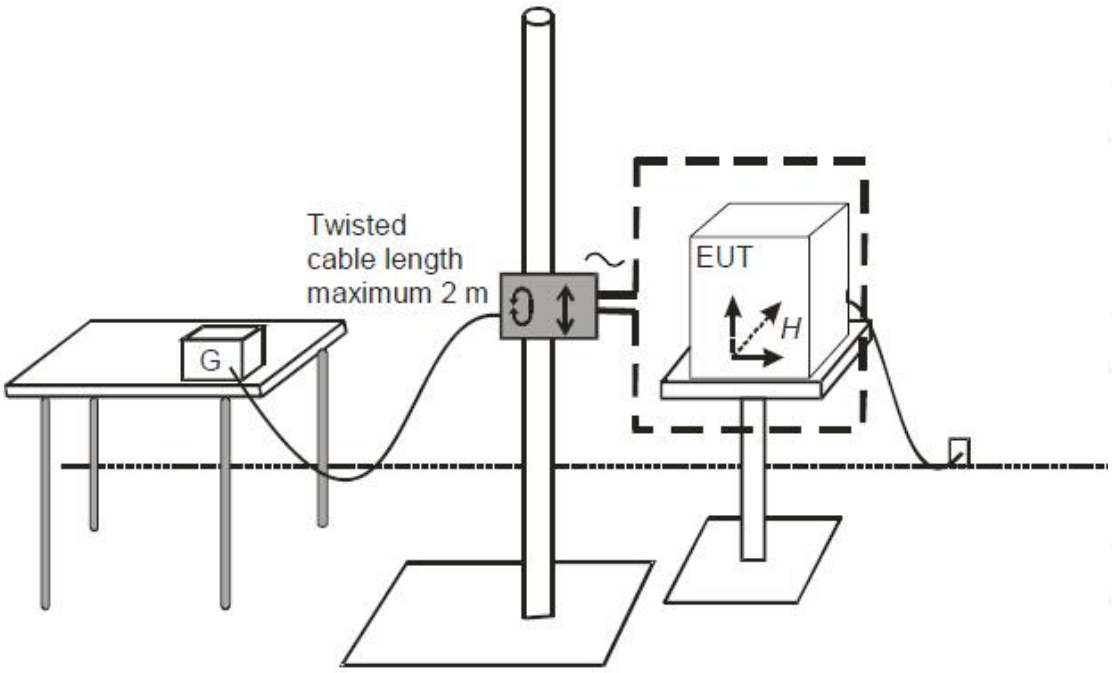
6.4.2.Results

Frequency Range	**Voltage(RMS)** V/m	**Modulation Frequency**	**Opinion**
80M-1GHz	3	1kHz,80%,AM	A

A: no loss of function.

6.5. Power frequency magnetic fields

6.5.1.Measurement procedure



1. These tests are need only to be applied to equipment containing components susceptible to magnetic fields, such as Hall elements or magnetic field sensors.
2. The power supply, signal and other functional electrical quantities shall be applied within their rated range. Preliminary verification of equipment performances shall be carried out prior to applying the test magnetic field.
3. The equipment shall be subjected to the test magnetic field as shown in above figure. The plane of the inductive coil shall then be rotated by 90° in order to expose the EUT to the test field with different orientations.

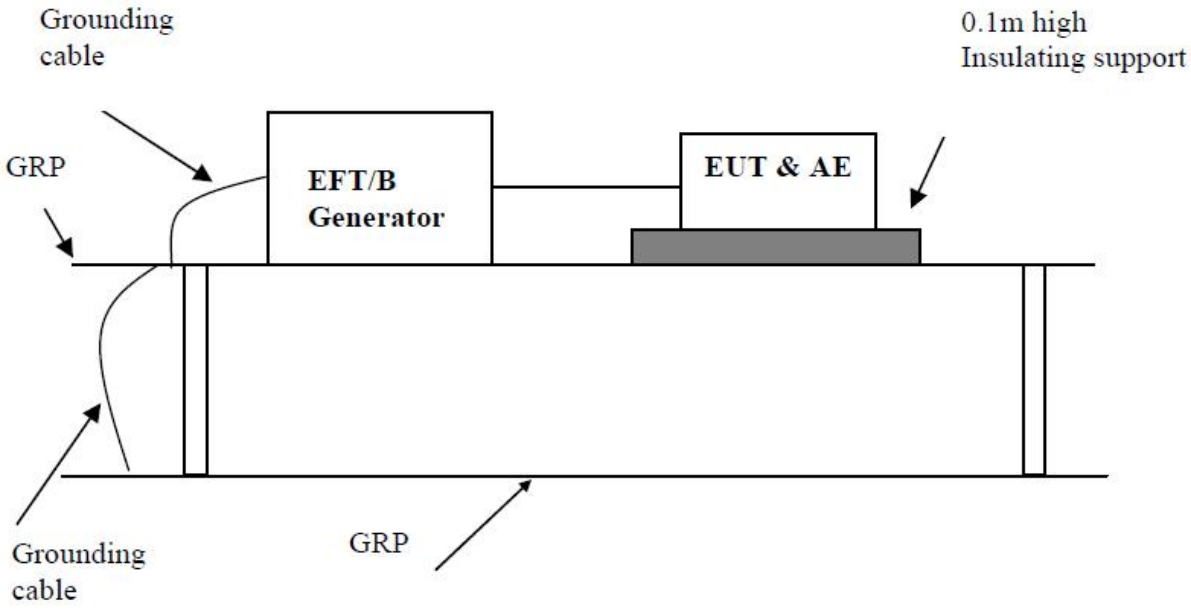
6.5.2.Results

Frequency	**Test level** A/m	**Opinion**
50Hz	3	A

A: no loss of function.

6.6.Electrical Fast Transients

6.6.1.Measurement procedure



1. The EUT was placed on a ground reference plane(GRP) insulated by an insulating support 0,1 m thick and the GRP was placed on a 0.8m high wooden table for table-top equipment. For floor standing equipment, the EUT was placed on a 0.1m high wooden support above the GRP.
2. The GRP shall project beyond the EUT and the clamp by at least 0.1m on all sides. The distance between the EUT and any other of the metallic surface except the GRP was greater than 0.5m. All cables to the EUT were placed on the insulation support 0.1m above GRP. Cables not subject to EFT were routed as far as possible from cable under test to minimize the coupling between the cables.
3. The length of signal and power cable between the EUT and EFT generator was 0.5m. If the cable is a non-detachable supply cable more than 0.5m, the excess length of this cable shall be folded to avoid a flat coil and situated at a distance of 0.1m above the GRP.

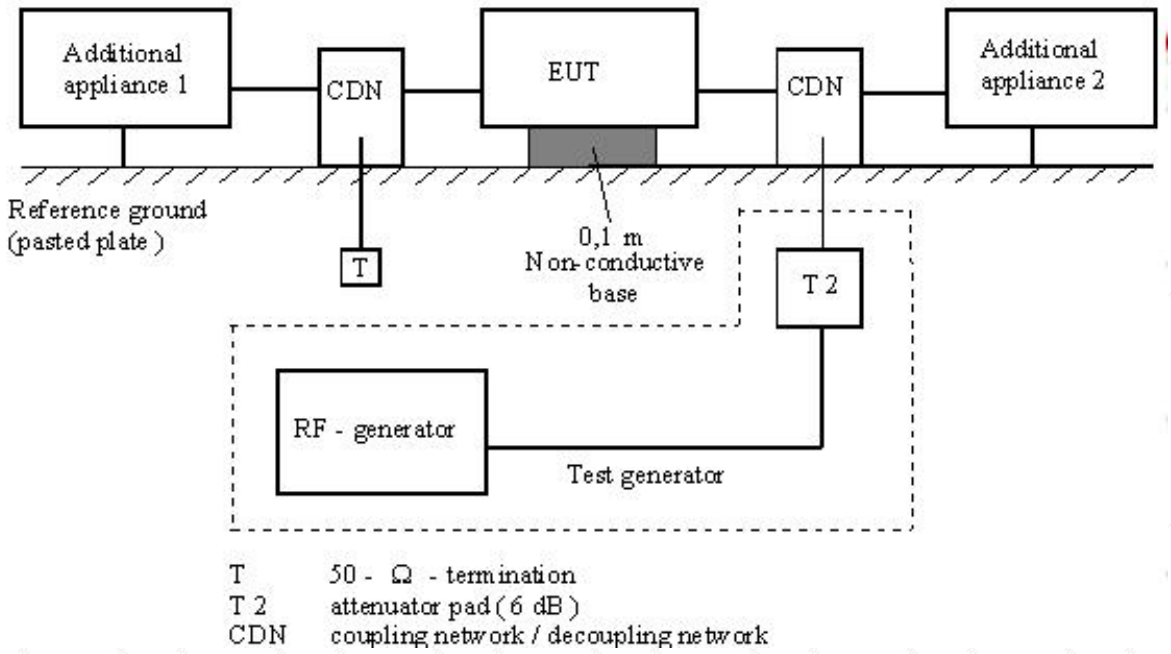
6.6.2.Results

Test port	Voltage (kV)	Polarity (+ / -)	Duration (s or min)	Waveform Tr / Th	Repetition Frequency (kHz)	Opinion
AC power line	1	+ / -	2 min	5/50 ns	5	A

A: no loss of function.

6.7.Injected currents(RF continues conducted)

6.7.1.Measurement procedure



1. The EUT was placed on an insulating support of 0.1m height above a ground reference Plane, arranged and connected to satisfy its functional requirement. All cables exiting the EUT was supported at a height of at least 30 mm above the ground reference plane.
2. The coupling and decoupling devices were required, they were located between 0,1 m and 0,3 m from the EUT. This distance was to be measured horizontally from the projection of the EUT on to the ground reference plane to the coupling and decoupling device.
3. The frequency range was swept from 150 kHz to 80 MHz, using the signal levels established during the setting process, and with the disturbance signal 80 % amplitude modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or to change coupling devices as necessary. Where the frequency was swept incrementally, the step size does not exceed 1 % of the preceding frequency value. The dwell time of the amplitude modulated carrier at each frequency was not less than the time necessary for the EUT to be exercised and to respond, and was not less than 3 s.

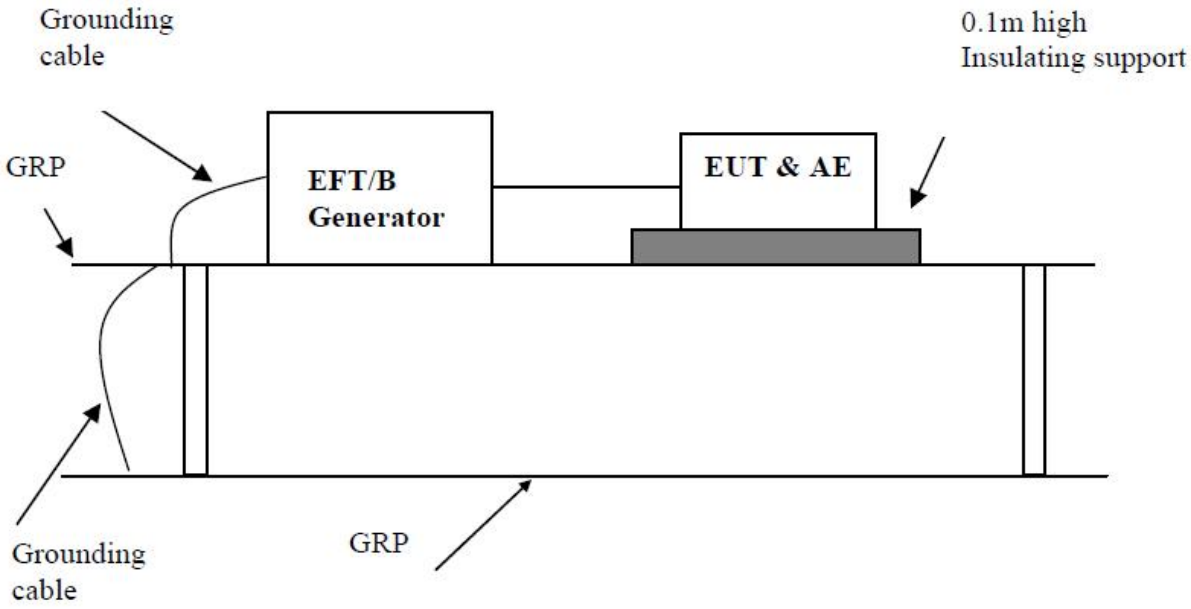
6.7.2.Results

Test port	Voltage (rms) V	Modulation Frequency	Frequency Range	Opinion
AC power line	3	1 kHz, 80%,AM	150 kHz - 80 MHz	A

A: no loss of function.

6.8.Surge Immunity

6.8.1.Measurement procedure



1. The EUT was placed on a ground reference plane(GRP) insulated by an insulating support 0,1 m thick and the GRP was placed on a 0.8m high wooden table for table-top equipment. For floor standing equipment, the EUT was placed on a 0.1m high wooden support above the GRP.
2. The 1,2/50 μs surge was to be applied to the EUT power supply terminals via the capacitive coupling network .Decoupling networks were required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines and to provide sufficient decoupling impedance to the surge wave so that the specified wave may be applied on the lines under test.
3. Pulses shall be applied to the a.c. voltage wave as follows; five positive polarity pulses at the 90º phase angle, five negative polarity pulses at the 270º phase angle.

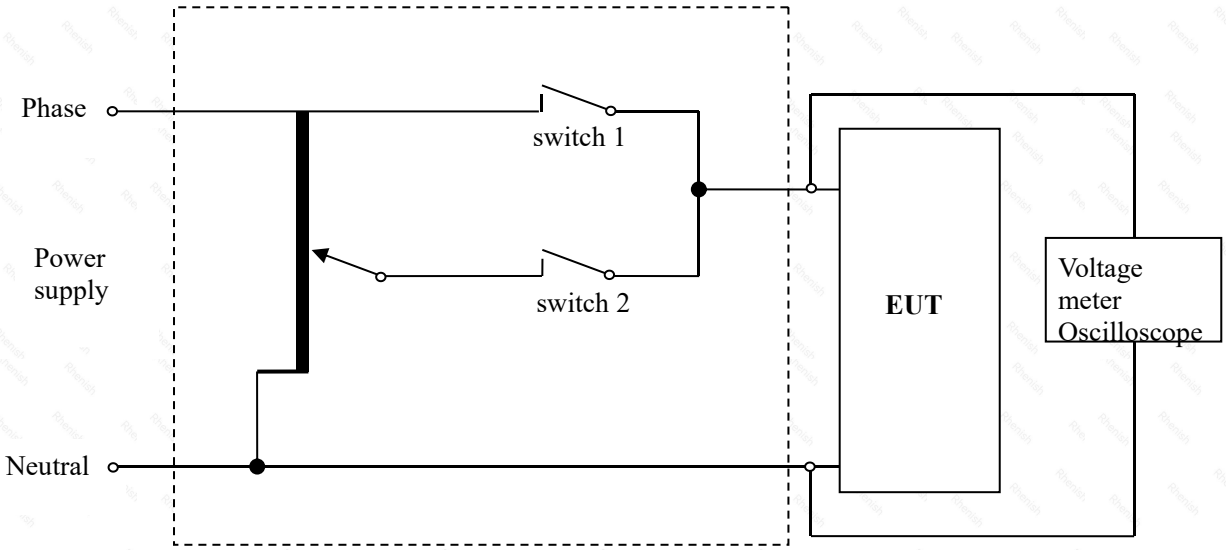
6.8.2.Results

Test mode	Voltage (kV)	Waveform Tr / Th	Number of pulses	Opinion
Live-Neutral	1	1.2/50 μs	5 (+/-)	A
Live-PE	2	1.2/50 μs	5 (+/-)	A
Neutral-PE	2	1.2/50 μs	5 (+/-)	A

A: no loss of function.

6.9.Voltage dips and Interruption

6.9.1.Measurement procedure



1. The EUT was placed on a ground reference plane(GRP) insulated by an insulating support 0,1 m thick and the GRP was placed on a 0.8m high wooden table for table-top equipment. For floor standing equipment, the EUT was placed on a 0.1m high wooden support above the GRP.
2. The test was performed with the EUT connected to the test generator with the shortest power supply cable as specified by the EUT manufacturer.Changes to the voltage level shall occur at a zero crossing point in the a.c. voltage waveform.
3. The EUT was tested for each selected combination of test level and duration with a sequence of three dips /interruptions with intervals of 10 s minimum. Each representative mode of operation was tested.

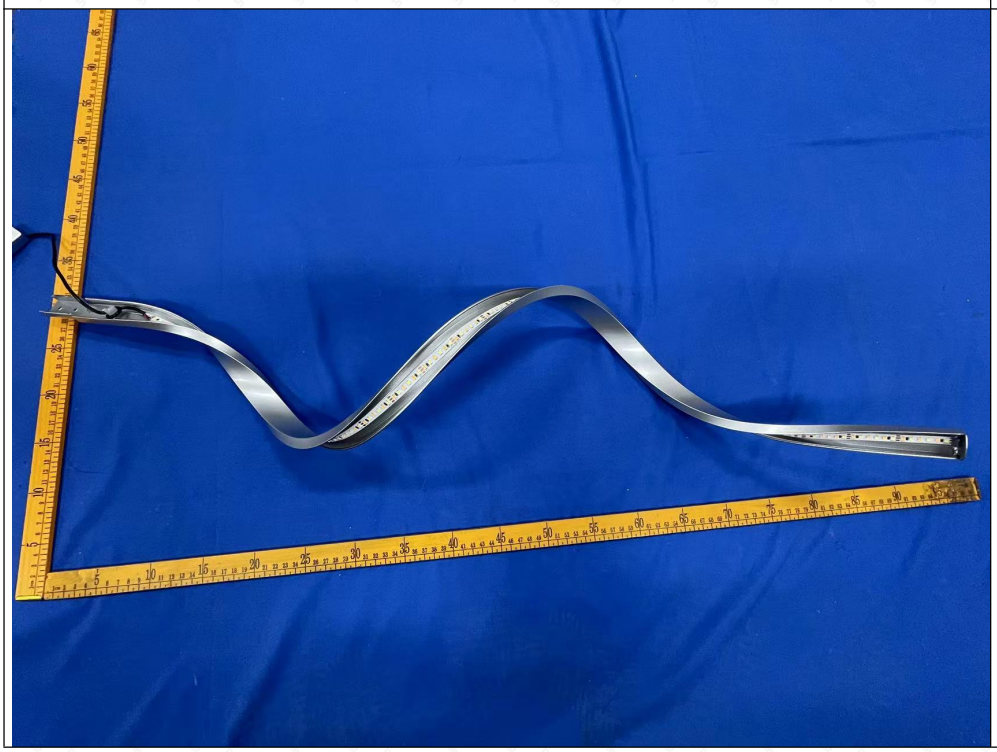
6.9.2.Results

Test level (in %U_T)	Duration (in period of the rated frequency)	Performance criteria	Opinion
0	0.5 (10ms)	B	A
70	10 (200ms)	B	A

A: no loss of function.
B: the appliance would not work normal(darkle) during test, but after test it would recover.

APPENDIX I

APPENDIX I

	Overview
	Light sources

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