



# TEST REPORT

**Reference No.** : WTN22N04062655E  
**Applicant** : Ningbo Ehome Electronic Co.,Ltd  
**Address** : Yonghe Road, Qiaotouhu Industrial Zone, Ninghai, Ningbo, China  
**Manufacturer** : Same as applicant  
**Address** : Same as applicant  
**Product Name** : MICROWAVE SENSOR  
**Model No.** : ST701, ST701E  
**Test specification** : EN IEC 55015:2019+A11:2020  
EN 61547:2009  
EN IEC 61000-3-2:2019+A1:2021  
EN 61000-3-3:2013+A1:2019  
EN 50130-4:2011+A1:2014  
**Date of Receipt sample** : 2022-04-06  
**Date of Test** : 2022-04-07 to 2022-06-01  
**Date of Issue** : 2022-06-23  
**Test Report Form No.** : WEL-55015&50130A-01B  
**Test Result** : **Pass**

**Remarks:**

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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## 1 Test Summary

EMISSION			
Test Item	Test Standard	Class / Severity	Result
Mains Terminal Disturbance Voltage, 9kHz to 30MHz	EN IEC 55015:2019+A11:2020	Clause 4.3.1	Pass
Radiated electromagnetic disturbance, 9kHz to 30MHz	EN IEC 55015:2019+A11:2020	Clause 4.5.2	Pass
Radiated Emission, 30MHz to 1GHz	EN IEC 55015:2019+A11:2020	Clause 4.5.3	Pass
Harmonic Current Emission	EN IEC 61000-3-2:2019+A1:2021	Clause 7	Pass
Voltage Changes, Voltage Fluctuation and Flicker	EN 61000-3-3:2013+A1:2019	Clause 5	Pass
IMMUNITY (EN 61547:2009, EN 50130-4:2011+A1:2014)			
Test Item	Test Method	Performance Criteria	Result
Electrostatic Discharge(ESD)	IEC 61000-4-2:2008	B	Pass
	EN 61000-4-2:2009	B1	
Radio-frequency electromagnetic fields (80MHz to 2.7GHz)	IEC 61000-4-3:2006+A1:2007	A	Pass
	EN 61000-4-3:2006+A1:2008+A2:2010	A1	
Electrical Fast Transients (EFT)	IEC 61000-4-4:2004	B	Pass
	EN 61000-4-4:2004+A1:2010	B1	
Surge	IEC 61000-4-5:2005	C	Pass
	EN 61000-4-5:2006	B1	
Injected Currents, 0.15MHz to 100MHz	IEC 61000-4-6:2008	A	Pass
	EN 61000-4-6:2009	A2	
Power-frequency magnetic field	IEC 61000-4-8:1993+A1:2000	A	N/A
Voltage Dips	IEC 61000-4-11:2004	C	Pass
	EN 61000-4-11:2004	B1	
Voltage short interruptions	IEC 61000-4-11:2004	B	Pass
	EN 61000-4-11:2004	B1	
Mains supply voltage variations	EN 50130-4:2011+A1:2014	B1	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





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### 3 General Information

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

<b>Product Name</b> .....	:	MICROWAVE SENSOR
<b>Model No.</b> .....	:	ST701, ST701E
<b>Protection Class</b> .....	:	Class II
<b>Remark</b> .....	:	<ol style="list-style-type: none"> <li>1. The EUT (equipment under test) is an ordinary MICROWAVE SENSOR for Lighting and similar use. For the further information, refer to the user's manual.</li> <li>2. In electrical characteristics, the two models are similar circuit principle and PCB layout, except for model name. For details information, refer to the section 3.2.</li> <li>3. For the test results, the EUT had been tested with the rated input range. But only the worst case was shown in test report.</li> </ol>

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

No.	Model	Rated Input	Rated Power	Note
1.	ST701	220-240V~, 50Hz	1200W	Incandescent Lamp
			300W	LED Light Energy saving lamp
2.	ST701E	220-240V~, 50Hz	1200W	Incandescent Lamp
			300W	LED Light Energy saving lamp

#### 3.3 Description of Support Units

The EUT has been tested as an independent unit. ST701 is the tested sample. All tests were performed in the condition of 230V~, 50Hz 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 61547:2009

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  $\leq 16$  A per phase).

EN 61000-3-3:2013+A1:2019

Electromagnetic compatibility (EMC) Part 3-3: Limits — Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current  $\leq 16$  A per phase and not subject to conditional connection.



EN 50130-4:2011+A1:2014

Alarm systems -

Part 4: Electromagnetic compatibility — Product family  
standard: Immunity requirements for components of fire,  
intruder, hold up, CCTV, access control and social alarm  
systems

### 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

Mains Terminal Disturbance Voltage (Conducted Emission)					
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
Radiated electromagnetic disturbance(9kHz to 30MHz)					
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
3m Semi-anechoic Chamber for Radiated Emission					
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
Harmonics 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
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	Agilent	E4419B	106957	Valid



6	Power meter	Agilent	E9300A	118349	Valid
7	Field strength probe	Narda	EP 601	811ZX10321	Valid
<b>EFT &amp; Voltage Dips and Interruptions</b>					
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
<b>Surge</b>					
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
<b>Injected Currents</b>					
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
Mains Terminal Disturbance Voltage	9kHz~30MHz	±2.66dB	(1)
Radiated electromagnetic disturbance	9kHz~30MHz	±3.00dB	(1)
Radiated Emission	30MHz~1GHz	±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 IEC 55015

Test Method..... : CIPR 16-2-1 and Clause 8.3 of EN IEC 55015

Test Result..... : Pass

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

Class/Severity..... : Table 1 of EN IEC 55015

#### 5.1.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 22.3°C

Humidity..... : 51%RH

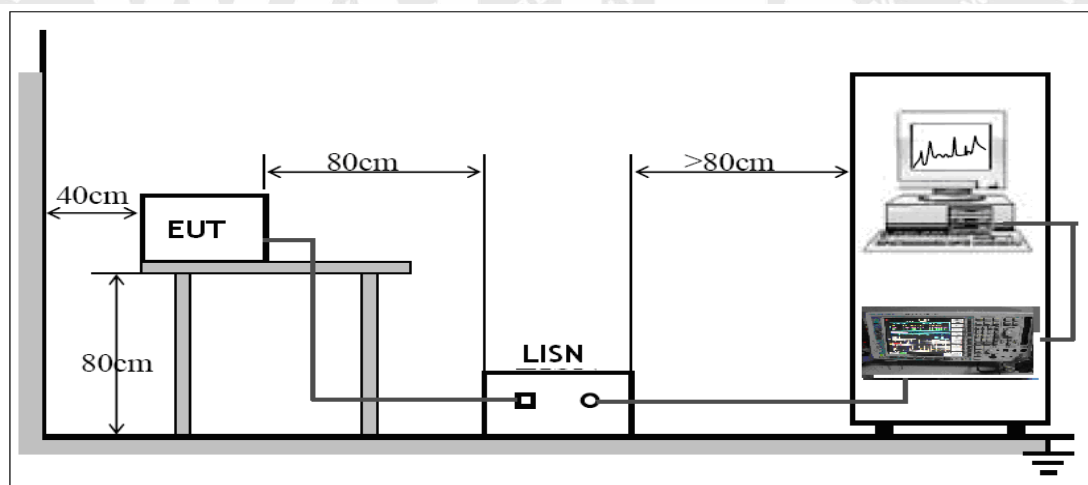
EUT Operation:

Input Voltage ..... : 230V~, 50Hz

Operating Mode..... : Max time+Max sens+Max lux mode

#### 5.1.2 Block Diagram of Test Setup

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



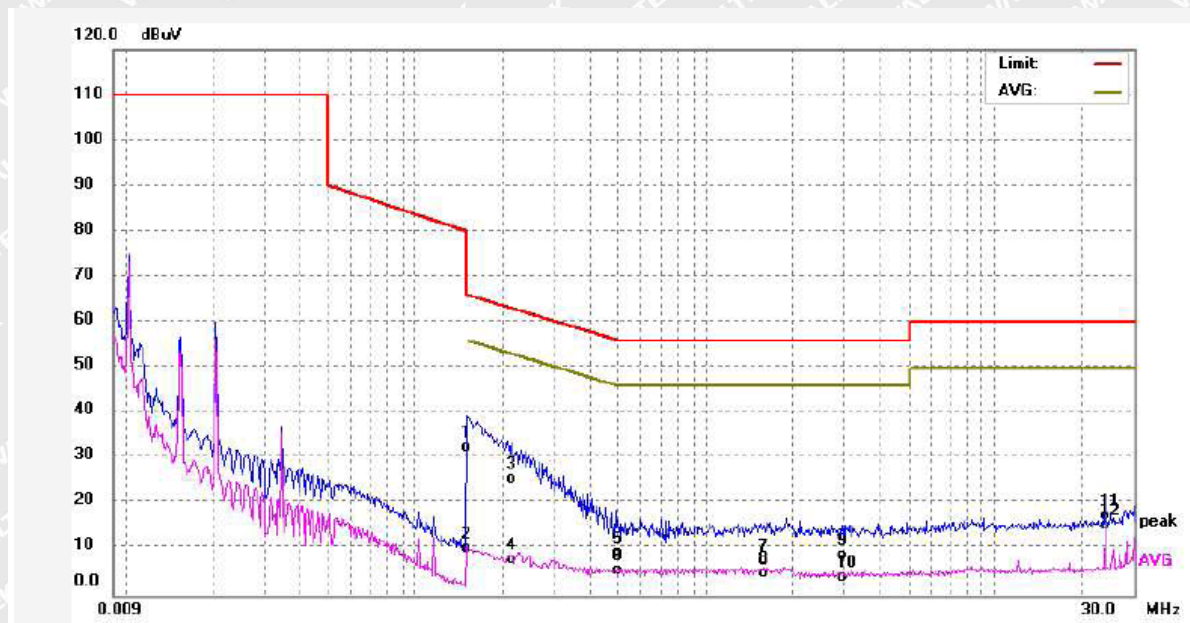
#### 5.1.3 Measurement Data

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 Mains Terminals Disturbance Voltage Test Data

#### Live Line

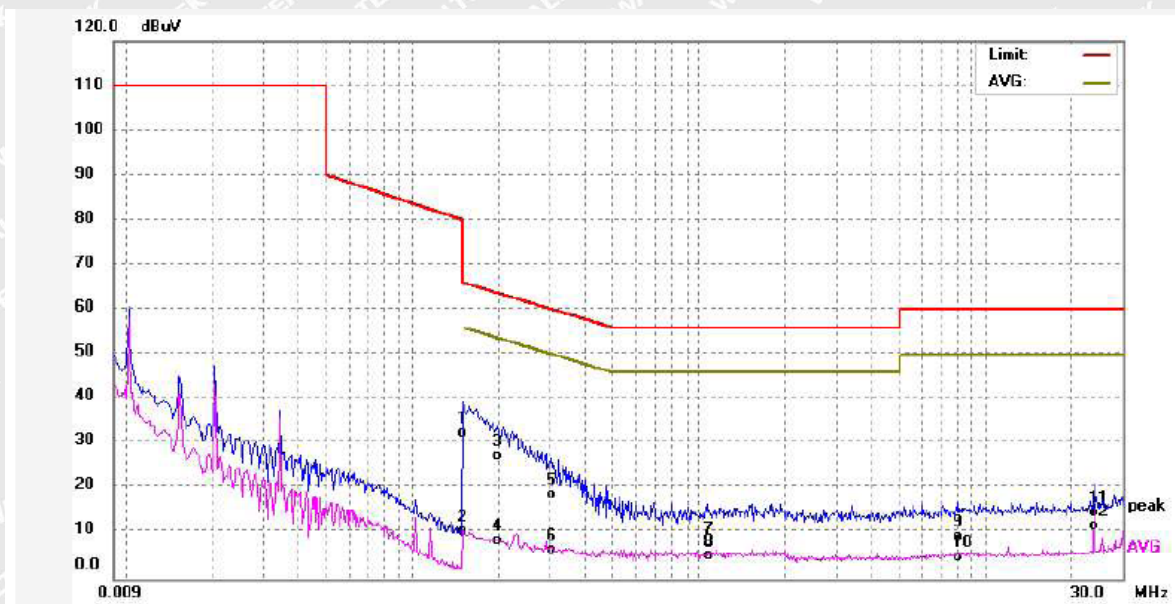


No.	Freq. (MHz)	Reading (dBUV)	Factor (dB)	Result (dBUV)	Limit dBUV	Margin (dB)	Detector	Remark
1	0.1500	23.01	9.63	32.64	65.99	-33.35	QP	
2	0.1500	0.75	9.63	10.38	55.99	-45.61	AVG	
3	0.2141	15.89	9.63	25.52	63.04	-37.52	QP	
4	0.2141	-1.78	9.63	7.85	53.04	-45.19	AVG	
5	0.4901	-0.63	9.64	9.01	56.17	-47.16	QP	
6	0.4901	-4.18	9.64	5.46	46.17	-40.71	AVG	
7	1.6141	-1.90	9.69	7.79	56.00	-48.21	QP	
8	1.6141	-4.62	9.69	5.07	46.00	-40.93	AVG	
9	2.9661	-1.02	9.73	8.71	56.00	-47.29	QP	
10	2.9661	-5.72	9.73	4.01	46.00	-41.99	AVG	
11	23.8141	7.26	10.28	17.54	60.00	-42.46	QP	
12	23.8141	5.17	10.28	15.45	50.00	-34.55	AVG	





## Neutral Line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1501	23.04	9.64	32.68	65.99	-33.31	QP	
2	0.1501	0.90	9.64	10.54	55.99	-45.45	AVG	
3	0.1981	17.86	9.63	27.49	63.69	-36.20	QP	
4	0.1981	-1.17	9.63	8.46	53.69	-45.23	AVG	
5	0.3061	9.18	9.63	18.81	60.07	-41.26	QP	
6	0.3061	-3.24	9.63	6.39	50.07	-43.68	AVG	
7	1.0781	-1.71	9.67	7.96	56.00	-48.04	QP	
8	1.0781	-4.54	9.67	5.13	46.00	-40.87	AVG	
9	8.0221	-0.42	9.89	9.47	60.00	-50.53	QP	
10	8.0221	-5.04	9.89	4.85	50.00	-45.15	AVG	
11	23.8141	4.46	10.28	14.74	60.00	-45.26	QP	
12	23.8141	1.72	10.28	12.00	50.00	-38.00	AVG	



## 5.2 Radiated Electromagnetic Disturbance, 9kHz to 30MHz

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.....	: 9kHz to 30MHz
Class/Severity.....	: Table 7 and Table 8 of EN IEC 55015

### 5.2.1 E.U.T. Operation

#### Operating Environment:

Temperature .....	: 22.3°C
Humidity.....	: 51%RH

#### EUT Operation:

Input Voltage .....	: 230V~, 50Hz
Operating Mode.....	: Max time+Max sens+Max lux mode

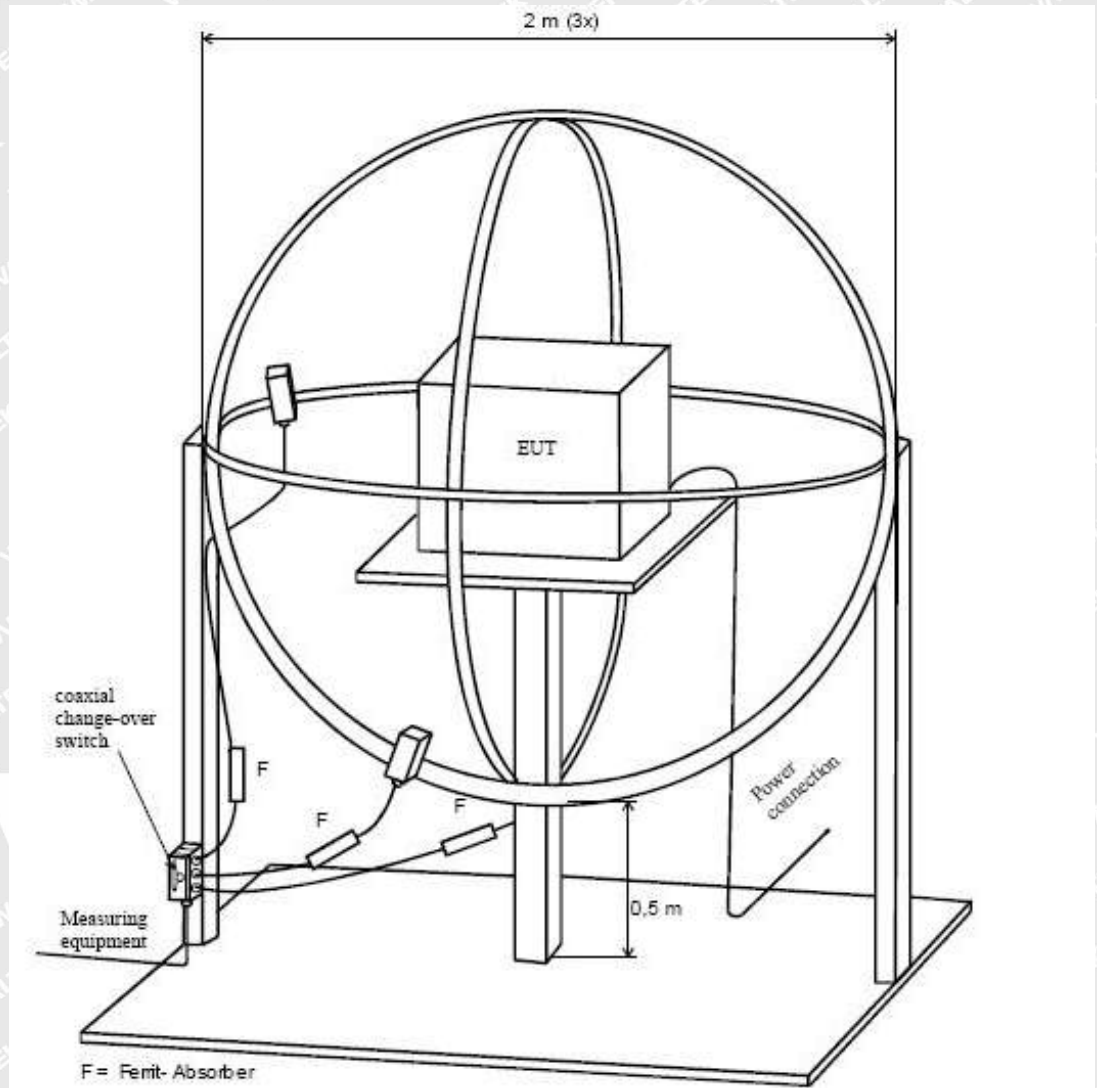
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### 5.2.2 Block Diagram of Test Setup

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



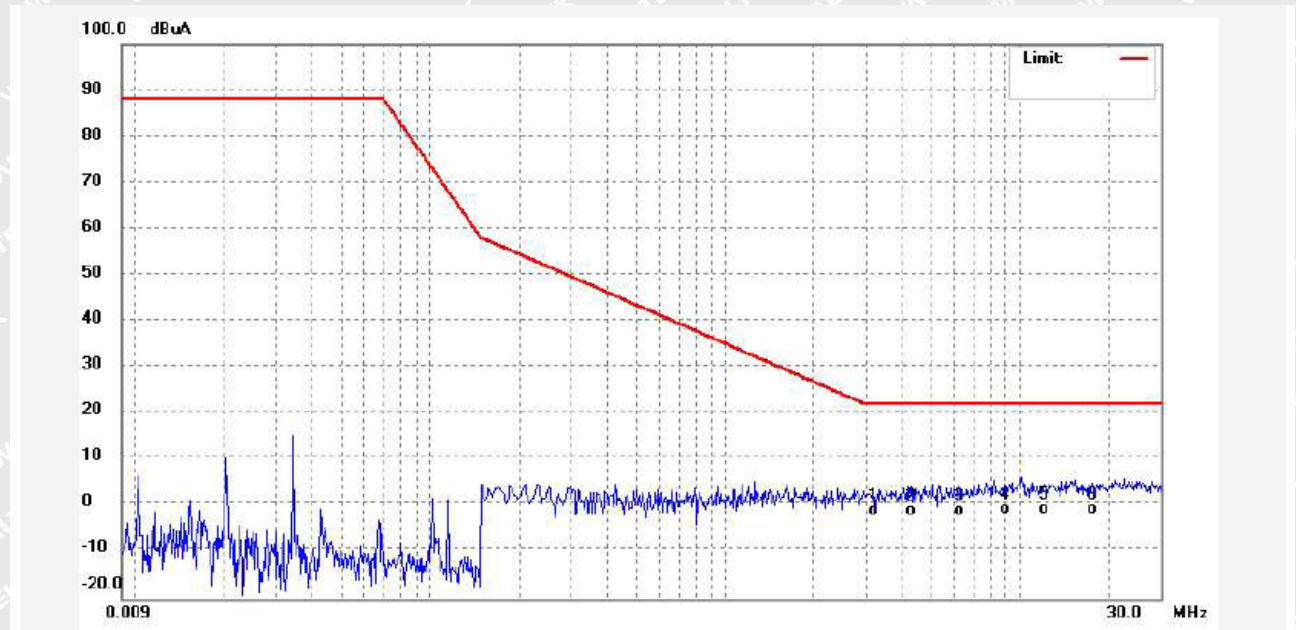
### 5.2.3 Measurement Data

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



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

Loop X

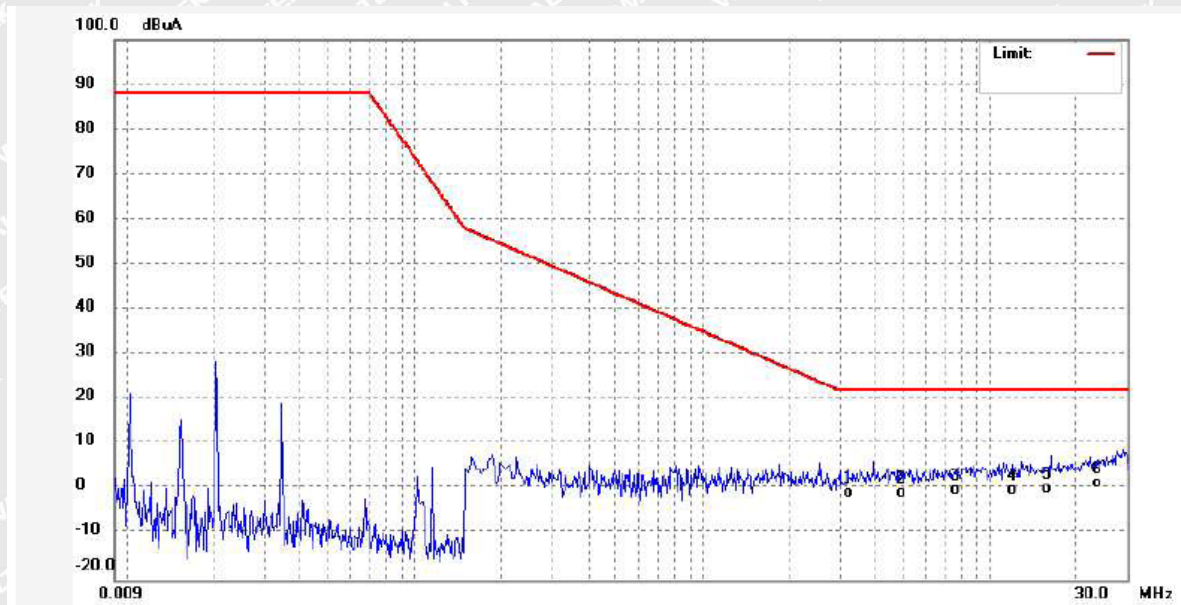


No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	3.1901	-34.69	33.61	-1.08	22.00	-23.08	QP	
2	4.2541	-34.67	33.58	-1.09	22.00	-23.09	QP	
3	6.2501	-34.75	33.73	-1.02	22.00	-23.02	QP	
4	8.8860	-34.28	33.76	-0.52	22.00	-22.52	QP	
5	12.0621	-34.65	33.89	-0.76	22.00	-22.76	QP	
6	17.6421	-34.76	33.99	-0.77	22.00	-22.77	QP	

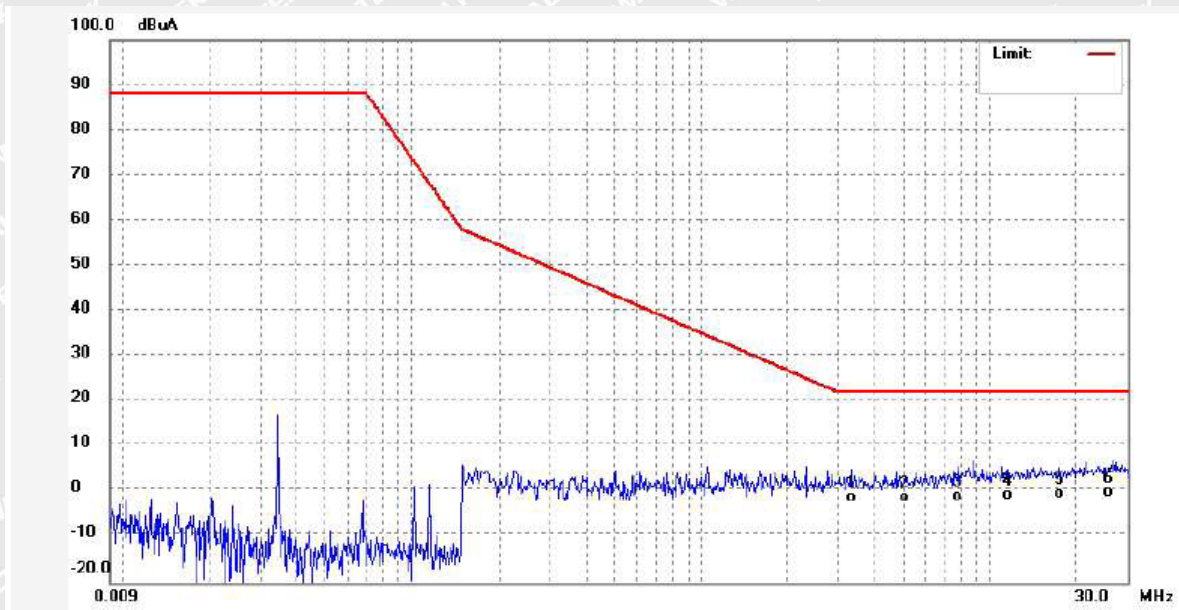




## Loop Y



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	3.2061	-34.62	34.11	-0.51	22.00	-22.51	QP	
2	4.9021	-34.92	34.19	-0.73	22.00	-22.73	QP	
3	7.5821	-34.29	34.22	-0.07	22.00	-22.07	QP	
4	11.9541	-34.61	34.54	-0.07	22.00	-22.07	QP	
5	15.7861	-34.70	34.92	0.22	22.00	-21.78	QP	
6	23.6741	-34.48	35.80	1.32	22.00	-20.68	QP	

**Loop Z**

No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	3.3181	-34.76	33.60	-1.16	22.00	-23.16	QP	
2	5.0981	-34.89	33.66	-1.23	22.00	-23.23	QP	
3	7.7861	-34.41	33.60	-0.81	22.00	-22.81	QP	
4	11.5940	-34.67	33.93	-0.74	22.00	-22.74	QP	
5	17.5421	-34.71	34.29	-0.42	22.00	-22.42	QP	
6	25.7380	-34.34	34.42	0.08	22.00	-21.92	QP	





### 5.3 Radiated Emission, 30MHz to 1GHz

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

#### 5.3.1 E.U.T. Operation

##### Operating Environment:

Temperature ..... : 24.2°C

Humidity..... : 47%RH

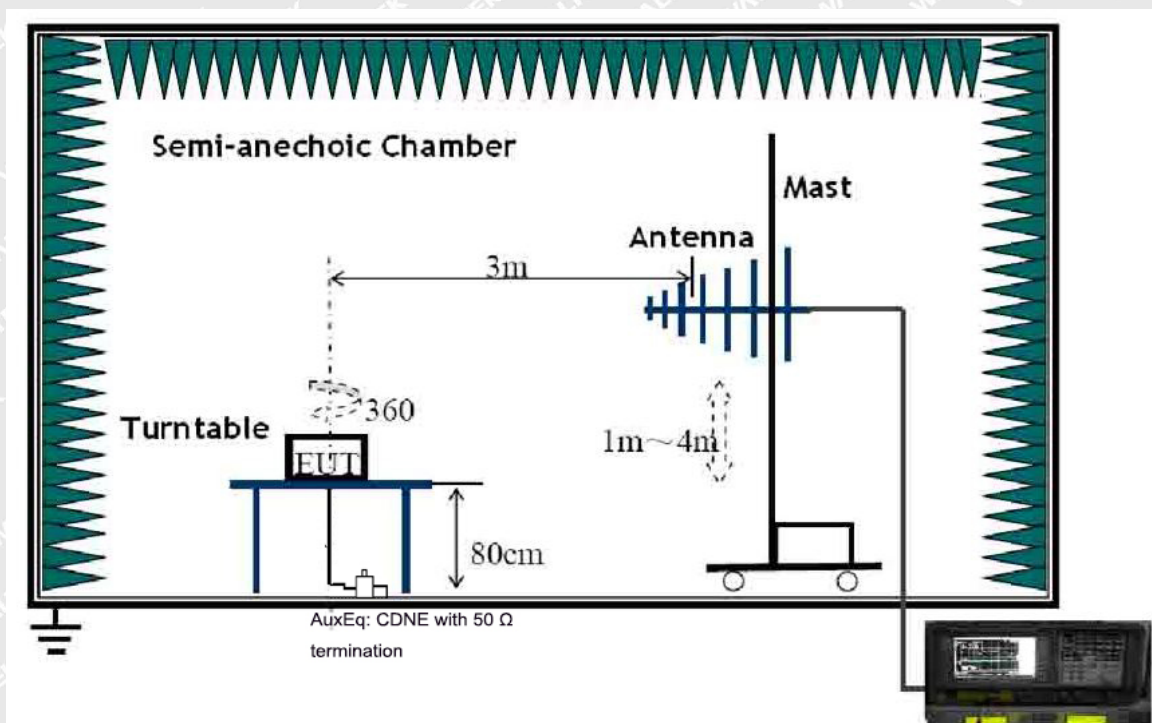
##### EUT Operation :

Input Voltage ..... : 230V~, 50Hz

Operating Mode..... : Max time+Max sens+Max lux mode

#### 5.3.2 Block Diagram of Setup

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



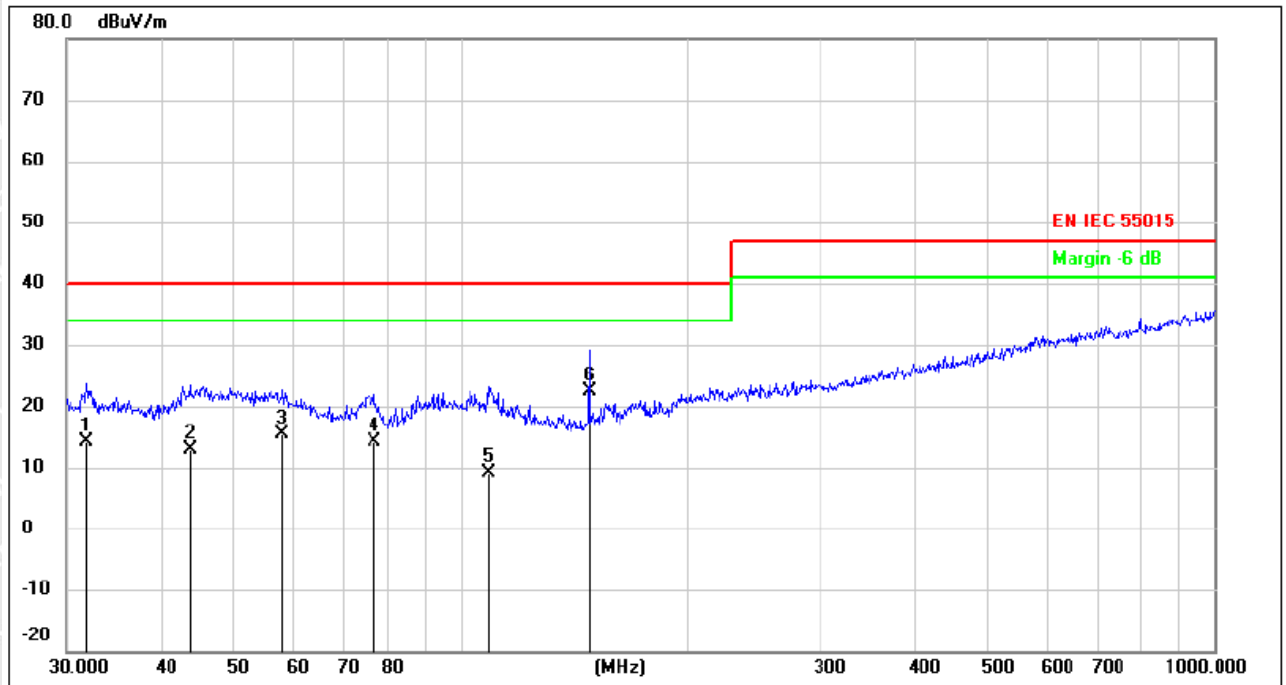
#### 5.3.3 Measurement Data

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 6dB of the limit line. According to the data in section 5.3.4, the EUT complied with the EN IEC 55015 standards.



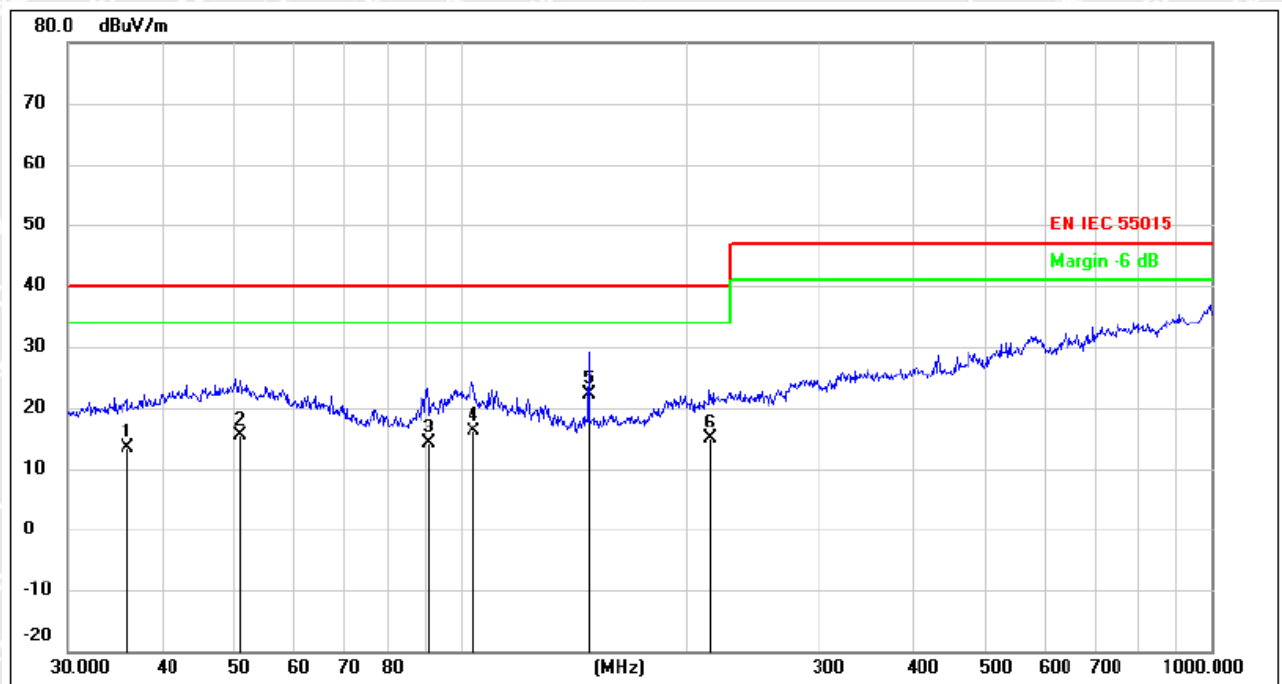
### 5.3.4 Radiated Emission test data, 30MHz to 1GHz

#### Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	31.9546	3.28	10.94	14.22	40.00	-25.78	QP
2	43.8119	-0.13	12.95	12.82	40.00	-27.18	QP
3	58.2030	2.99	12.39	15.38	40.00	-24.62	QP
4	76.7808	5.85	8.25	14.10	40.00	-25.90	QP
5	109.0286	-2.40	11.62	9.22	40.00	-30.78	QP
6	148.4410	14.06	8.27	22.33	40.00	-17.67	QP



**Horizontal**

No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	36.0007	1.26	12.11	13.37	40.00	-26.63	QP
2	50.9420	0.35	14.96	15.31	40.00	-24.69	QP
3	90.5374	3.23	10.96	14.19	40.00	-25.81	QP
4	103.8054	3.52	12.65	16.17	40.00	-23.83	QP
5	148.4410	13.21	8.86	22.07	40.00	-17.93	QP
6	214.5142	2.80	11.96	14.76	40.00	-25.24	QP



## 5.4 Harmonics Current Emission

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 ..... : 23.4°C

Humidity..... : 53.6%RH

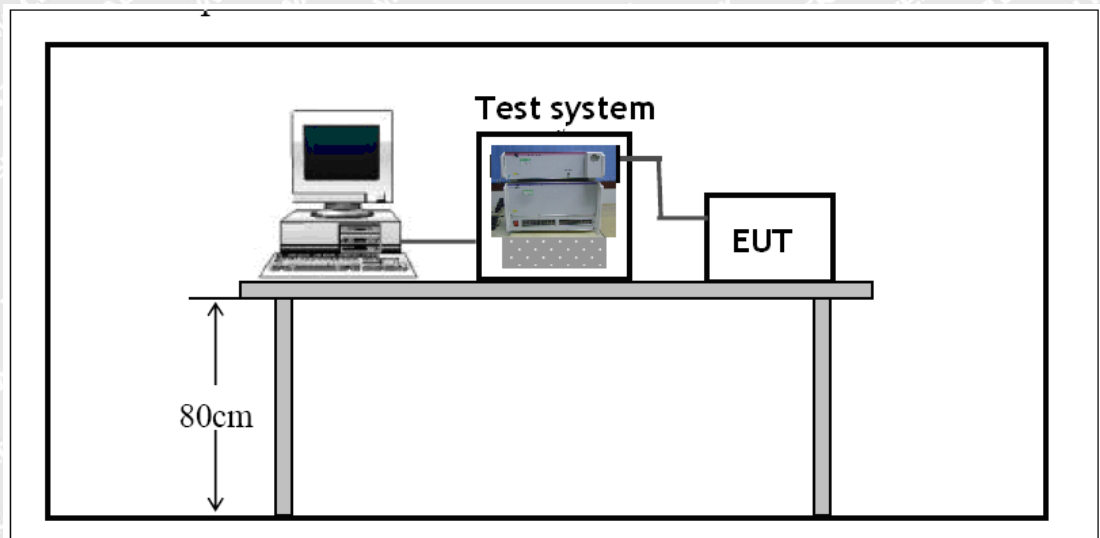
#### EUT Operation:

Input Voltage ..... : 230V~, 50Hz

Operating Mode..... : Max time+Max sens+Max lux mode

### 5.4.2 Block Diagram of Setup

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





### 5.4.3 Harmonic Current Emission Test Data

Final Test Result	<b>Pass</b>		Tobs	Quasi-Stationary	
Voltage	229.90 V		THC	0.0070 A	
Current	5.2360 A		POHC/Limit	0.0020 A / 0.4967 A *3	
Power	1203.90 W		Nominal	230 V / 50 Hz	
Power Factor	1.0000		Fundamental Current	5.2360 A	
Apparent Power	1203.9 VA		Measuring Period	150 s	
THD (max)	0.13 %		Margin	100 %	

Order	Limit1(A rms)	Limit2(A rms)	Ave(A rms)	Max(A rms)	Judge
1	----	----	5.2327	5.2360	N/A
2	0.1047	0.1571	0.0010	0.0010	N/A
3	1.4137	2.1205	0.0010	0.0040	N/A
4	----	----	0.0000	0.0000	N/A
5	0.5236	0.7854	0.0030	0.0040	N/A
6	----	----	0.0000	0.0000	N/A
7	0.3665	0.5498	0.0020	0.0030	N/A
8	----	----	0.0010	0.0010	N/A
9	0.2618	0.3927	0.0020	0.0020	N/A
10	----	----	0.0000	0.0010	N/A
11	0.1571	0.2356	0.0010	0.0010	N/A
12	----	----	0.0000	0.0000	N/A
13	0.1571	0.2356	0.0010	0.0010	N/A
14	----	----	0.0000	0.0000	N/A
15	0.1571	0.2356	0.0010	0.0010	N/A
16	----	----	0.0000	0.0000	N/A
17	0.1571	0.2356	0.0010	0.0010	N/A
18	----	----	0.0000	0.0000	N/A
19	0.1571	0.2356	0.0010	0.0010	N/A
20	----	----	0.0000	0.0000	N/A
21	0.2356	0.2356	0.0010	0.0010	N/A
22	----	----	0.0000	0.0000	N/A
23	0.2356	0.2356	0.0010	0.0010	N/A
24	----	----	0.0000	0.0000	N/A
25	0.2356	0.2356	0.0009	0.0010	N/A
26	----	----	0.0000	0.0000	N/A
27	0.2356	0.2356	0.0007	0.0010	N/A
28	----	----	0.0000	0.0000	N/A
29	0.2356	0.2356	0.0001	0.0010	N/A
30	----	----	0.0000	0.0000	N/A
31	0.2356	0.2356	0.0000	0.0010	N/A
32	----	----	0.0000	0.0000	N/A
33	0.2356	0.2356	0.0000	0.0010	N/A
34	----	----	0.0000	0.0000	N/A
35	0.2356	0.2356	0.0000	0.0000	N/A
36	----	----	0.0000	0.0000	N/A
37	0.2356	0.2356	0.0000	0.0010	N/A
38	----	----	0.0000	0.0000	N/A
39	0.2356	0.2356	0.0000	0.0000	N/A
40	----	----	0.0000	0.0000	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 ..... : 23.4°C

Humidity..... : 53.6%RH

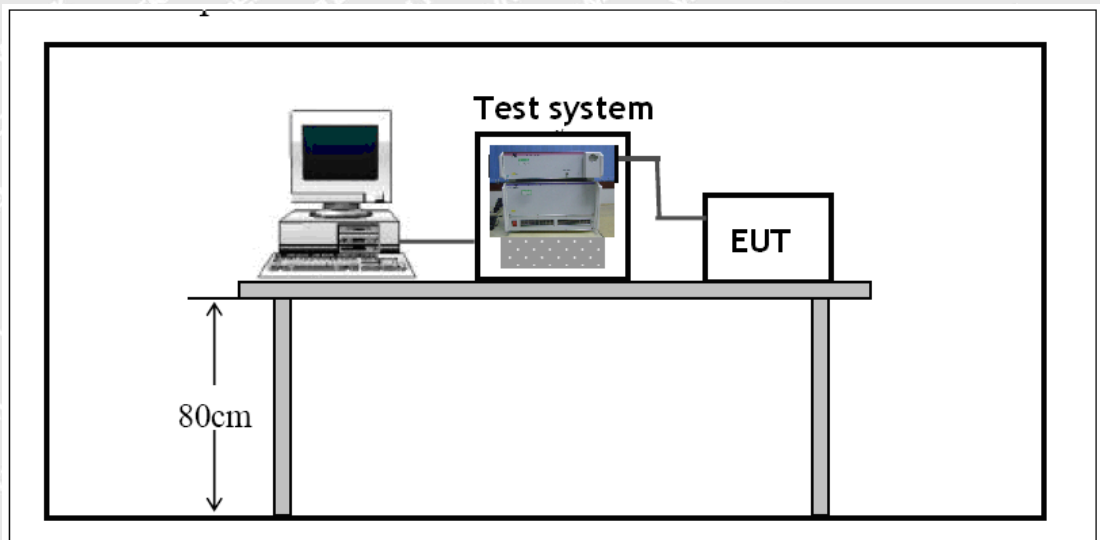
EUT Operation:

Input Voltage ..... : 230V~, 50Hz

Operating Mode..... : Max time+Max sens+Max lux 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

	$d_c$ (%)	$d_{max}$ (%)	$T_{max}$ (ms)	$P_{st}$	$P_{It}$
<b>Limits</b>	3.3	4	500ms	N/A	N/A
<b>Result</b>	0.000	0.061	0.000	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. 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.

**Performance criterion A1:** There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicators occurs at a field strength of 3 V/m.

For components of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at 10 V/m, providing.

- a) there is no permanent damage or change to the EUT (e.g. no corruption of memory or changes to programmable settings etc.);
- b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used; and
- c) there is no observable deterioration of the picture at 1 V/m.

For components with radio links, it is accepted that communications via the radio link may not be possible during the conditioning within the transmitter and receiver exclusion bands defined in the relevant part of ETSI EN 301 489 for that type of radio link equipment. If no other part of ETSI EN 301 489 is applicable to the type of radio link equipment, then the definition of the exclusion bands shall be taken from ETSI EN 301 489-1.

If the EUT is designed to detect and indicate this loss of communication, then this indication is permitted unless specifically prohibited in the EUT's product performance standard. If no performance standard has been published, then it shall be in accordance with the manufacturer's specification.

It may be necessary to use appropriate filters to ensure that failures out of the exclusion bands are not due to harmonics generated by the test system.

The EUT shall meet the acceptance criteria for the functional test (see Clause 6), after the conditioning.





**Performance criterion A2:** There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicators occurs at  $U_0 = 130 \text{ dB}\mu\text{V}$ .

For components of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at  $U_0 = 140 \text{ dB}\mu\text{V}$ , providing

- a) there is no permanent damage or change to the EUT (e.g. no corruption of memory or changes to programmable settings, etc.),
- b) at  $U_0 = 130 \text{ dB}\mu\text{V}$ , any deterioration of the picture is so minor that the system could still be used, and
- c) there is no observable deterioration of the picture at  $U_0 = 120 \text{ dB}\mu\text{V}$ .

For components with radio links, it is accepted that communications via the radio link may not be possible during the conditioning within the transmitter and receiver exclusion bands defined in the relevant part of ETSI EN 301 489 for that type of radio link equipment. If no other part of ETSI EN 301 489 is applicable to the type of radio link equipment then the definition of the exclusion bands shall be taken from ETSI EN 301 489-1.

The EUT shall meet the acceptance criteria for the functional test (see Clause 6), after the conditioning.

**Performance criterion B1:** There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

The EUT shall meet the acceptance criteria for the functional test (see Clause 6), after the conditioning.

For further details, please refer to EN 61547, EN 50130-4.

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## 6.2 Electrostatic Discharge (ESD)

Test Requirement.....	:	EN 61547, EN 50130-4
Test Method.....	:	IEC 61000-4-2, EN 61000-4-2
Test Result.....	:	Pass
Discharge Impedance.....	:	330Ω / 150pF
Discharge Voltage.....	:	Air Discharge: ±8kV Contact Discharge: ±6kV HCP & VCP: ±6kV
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:

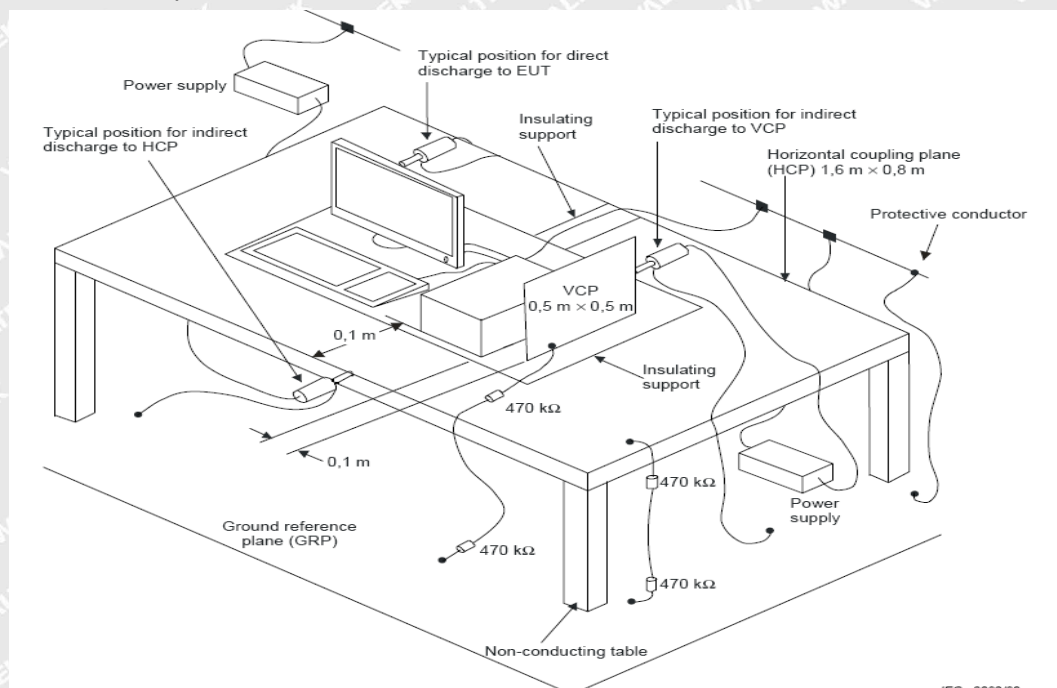
Temperature .....	:	20.9-23.8°C
Humidity .....	:	45.4-57.9%RH
Barometric Pressure .....	:	101.1-102.6kPa

#### EUT Operation:

Input Voltage.....	:	230V~, 50Hz
Operating Mode.....	:	Max time+Max sens+Max lux mode

### 6.2.2 Block Diagram of Setup

The ESD test was performed in accordance with the IEC 61000-4-2, EN 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	Actual performance
±2, ±4, ±8	B&B1	1	N/A	Pass*	A&B1
±4	B	2	Pass*	N/A	A
±6	B1	2	Pass*	N/A	B1

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
±6	B1	1	Pass*	Pass*	B1

Remark:

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

## 6.3 Radio-frequency electromagnetic fields, 80MHz to 2.7GHz

Test Requirement..... : EN 61547, EN 50130-4

Test Method..... : IEC 61000-4-3, EN 61000-4-3

Test Result..... : Pass

Frequency Range..... : 80MHz to 2.7GHz

Test level..... : 10V/m

Modulation..... : 80%, 1kHz Amplitude Modulation,  
1 Hz (0,5 s ON : 0,5 s OFF) Pulse modulation

Face of EUT..... : Front, Back, Left, Right

Antenna polarisation..... : Horizontal&amp; Vertical

### 6.3.1 E.U.T. Operation

Operating Environment:

Temperature..... : 23.4-23.9°C



**Humidity**..... : 49-50%RH

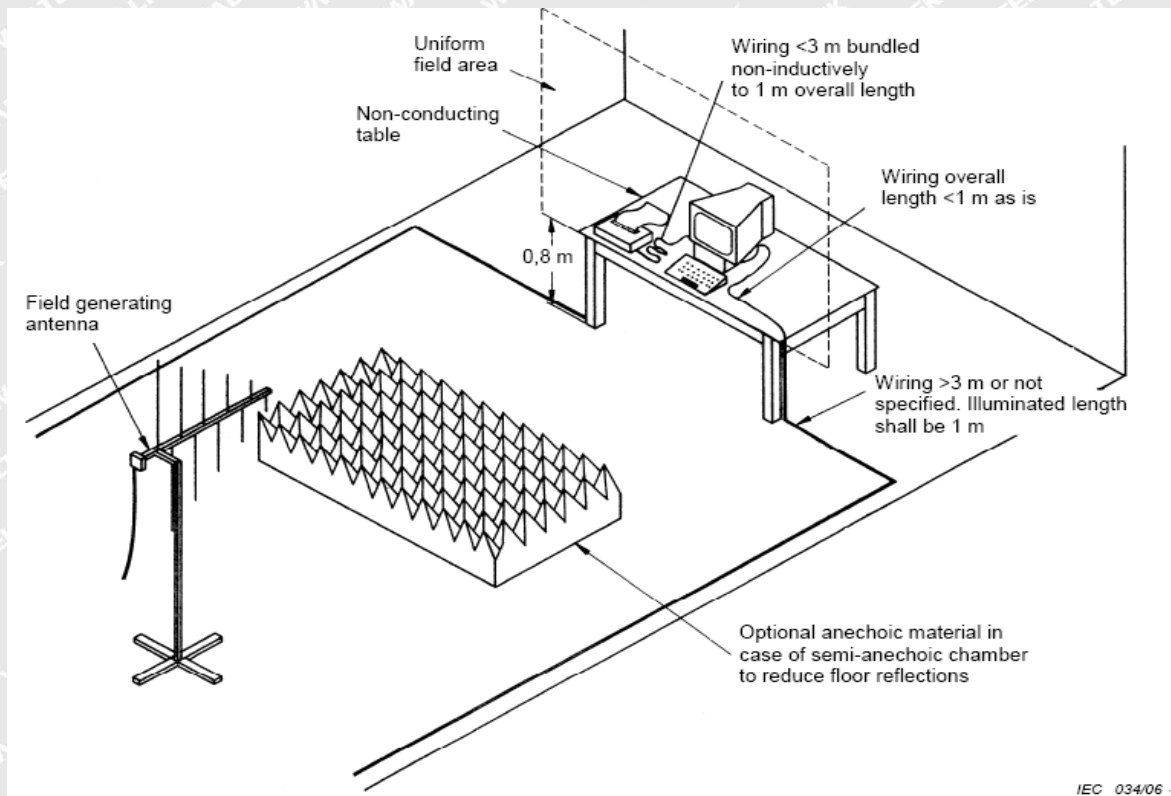
**EUT Operation:**

**Input Voltage** ..... : 230V~, 50Hz

**Operating Mode**..... : Min time+Max sens+Min lux 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, EN 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 1000MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	3s	A	Pass*	A
80 to 1000MHz	Front, Back, Left, Right	Vertical	3V/m	1%	3s	A	Pass*	A
80 to 2700MHz (Amplitude Modulation)	Front, Back, Left, Right	Horizontal	10V/m	1%	3s	A1	Pass*	A1





80 to 2700MHz (Amplitude Modulation)	Front, Back, Left, Right	Vertical	10V/m	1%	3s	A1	Pass*	A1
80 to 2700MHz (Pulse modulation)	Front, Back, Left, Right	Horizontal	10V/m	1%	3s	A1	Pass*	A1
80 to 2700MHz (Pulse modulation)	Front, Back, Left, Right	Vertical	10V/m	1%	3s	A1	Pass*	A1

Remark:

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

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## 6.4 Electrical Fast Transients (EFT)

<b>Test Requirement</b> .....	: EN 61547, EN 50130-4
<b>Test Method</b> .....	: IEC 61000-4-4, EN 61000-4-4
<b>Test Result</b> .....	: Pass
<b>Test Level</b> .....	: 2.0kV on AC Mains
<b>Polarity</b> .....	: Positive & Negative
<b>Repetition Frequency</b> ....	: 5kHz, 100kHz
<b>Burst Duration</b> .....	: 300ms
<b>Test Duration</b> .....	: 2 minutes per level & polarity

### 6.4.1 E.U.T. Operation

#### Operating Environment:

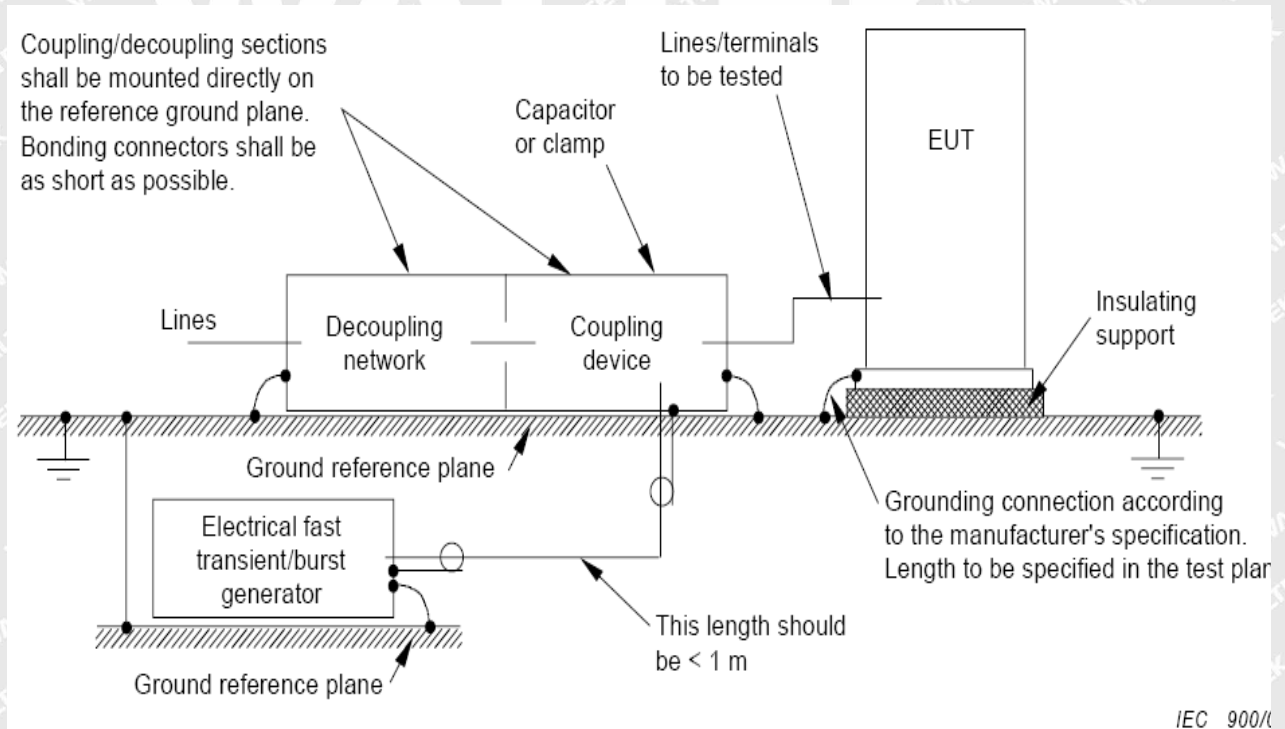
<b>Temperature</b> .....	: 20.9-23.8°C
<b>Humidity</b> .....	: 45.4-57.9%RH

#### EUT Operation:

<b>Input Voltage</b> .....	: 230V~, 50Hz
<b>Operating Mode</b> .....	: Max time+Max sens+Max lux mode

### 6.4.2 Block Diagram of Setup

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





### 6.4.3 Test Results

Test Port	Test Level(kV)	Performance Criterion	Result	Actual performance
Line-Neutral	$\pm 1.0$	B	Pass*	A
Test Port	Test Level(kV)	Performance Criterion	Result	Actual performance
Line-Neutral	$\pm 2.0$	B1	Pass*	B1

Remark:

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

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## 6.5 Surge

<b>Test Requirement</b> .....	:	EN 61547, EN 50130-4
<b>Test Method</b> .....	:	IEC 61000-4-5, EN 61000-4-5
<b>Test Result</b> .....	:	Pass
<b>Test level</b> .....	:	Table 10 of EN 61547, Table 7 of EN 50130-4
<b>Interval</b> .....	:	60s between each surge
<b>No. of surges</b> .....	:	5 positive at 0° 90° 180° 270°, 5 negative at 0° 90° 180° 270°.

### 6.5.1 E.U.T. Operation

#### Operating Environment:

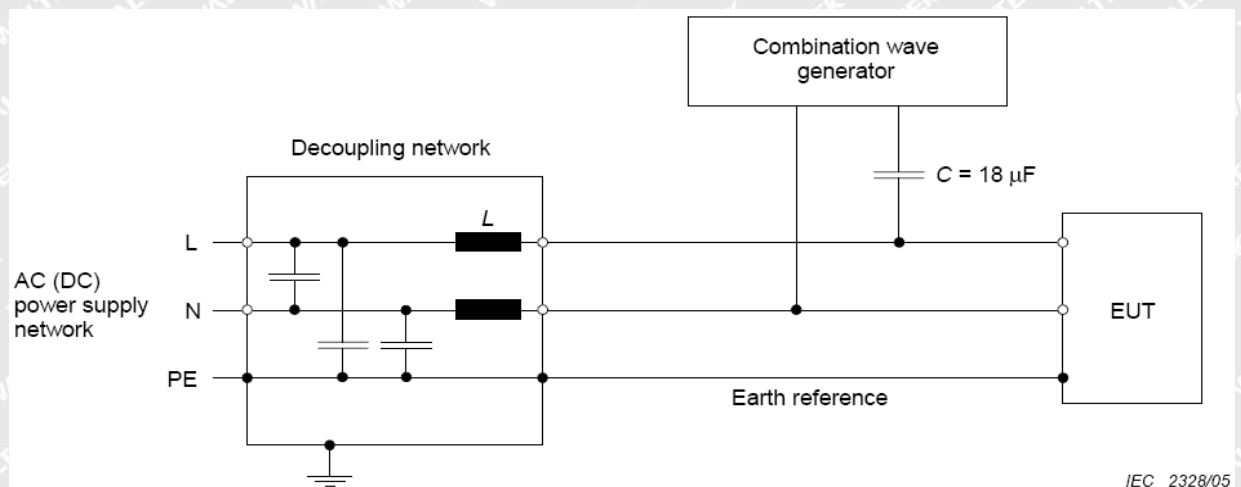
<b>Temperature</b> .....	:	20.9-23.8°C
<b>Humidity</b> .....	:	45.4-57.9%RH

#### EUT Operation:

<b>Input Voltage</b> .....	:	230V~, 50Hz
<b>Operating Mode</b> .....	:	Max time+Max sens+Max lux mode

### 6.5.2 Block Diagram of Setup

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



### 6.5.3 Test Results

Test Port	Applied Voltage (kV)	Performance criterion	Result	Actual performance
Between Live And Neutral	$\pm 0.5/1$	C	Pass*	A
Between Live And Earth	$\pm 0.5/1/2$	C	N/A	N/A
Between Neutral And Earth	$\pm 0.5/1/2$	C	N/A	N/A
Between Live And Neutral	$\pm 0.5/1$	B1	Pass*	B1
Between Live And Earth	$\pm 0.5/1/2$	N/A	N/A	N/A
Between Neutral And Earth	$\pm 0.5/1/2$	N/A	N/A	N/A

Remark:

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

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## 6.6 Injected Currents Immunity 0.15MHz to 100MHz

Test Requirement.....	: EN 61547, EN 50130-4
Test Method .....	: IEC 61000-4-6, EN 61000-4-6
Test Result .....	: Pass
Frequency Range .....	: 0.15MHz to 100MHz
Test level .....	: 10V r.m.s. (unmodulated emf into 150 $\Omega$ )
Modulation .....	: 80%, 1kHz Amplitude Modulation 1 Hz (0,5 s ON : 0,5 s OFF) Pulse modulation

### 6.6.1 E.U.T. Operation

#### Operating Environment:

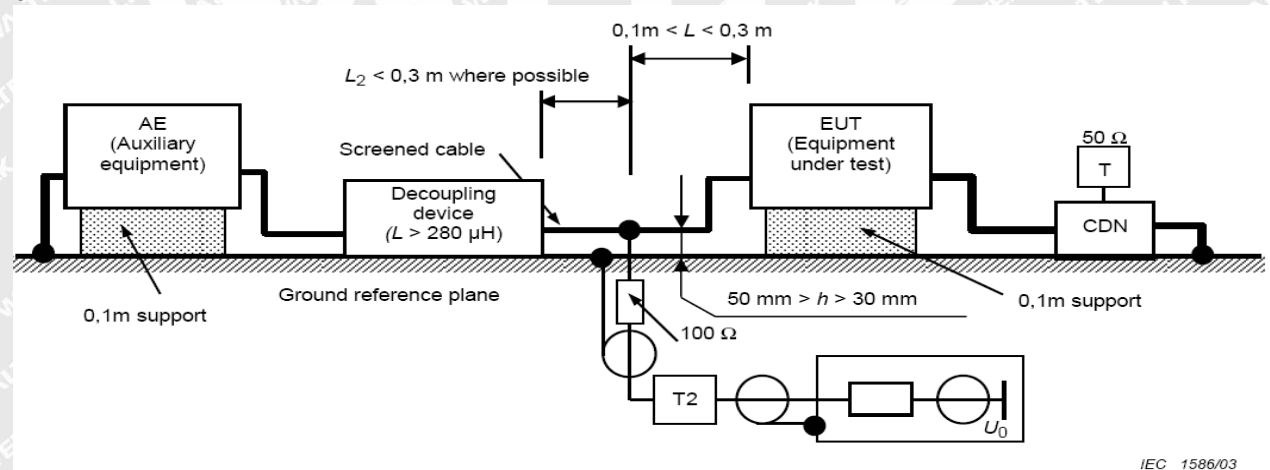
Temperature .....	: 21.1-23.4°C
Humidity .....	: 53.6-55.6%RH

#### EUT Operation:

Input Voltage .....	: 230V~, 50Hz
Operating Mode .....	: Min time+Max sens+Min lux mode

### 6.6.2 Block Diagram of Setup

The Injected Currents Immunity test was performed in accordance with the IEC 61000-4-6, EN 61000-4-6.



### 6.6.3 Test Results

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



0.15MHz to 100MHz	2 Wire AC Supply Cables	10Vr.m. s.	1 Hz (0,5 s ON : 0,5 s OFF) Pulse modulation	1%	3s	A2	Pass*	A2
0.15MHz to 100MHz	2 Wire AC Supply Cables	10Vr.m. s.	80%, 1kHz Amp. Mod.	1%	3s	A2	Pass*	A2

Remark:

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

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## 6.7 Voltage Dips and Interruptions

Test Requirement.....	EN 61547, EN 50130-4
Test Method.....	IEC 61000-4-11, EN 61000-4-11
Test Result.....	Pass
Test Level(Voltage reduction)	20% & 30% & 60%& 100 %
No. of Dips / Interruptions.....	1 per Level at 20ms intervals

### 6.7.1 E.U.T. Operation

#### Operating Environment:

Temperature ..... 23.8°C

Humidity..... 57.9%RH

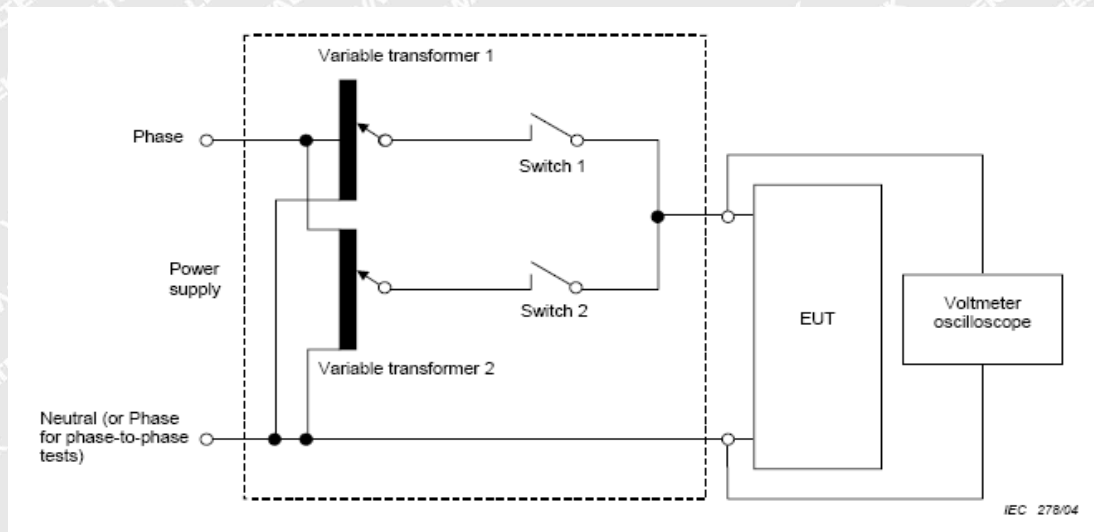
#### EUT Operation:

Input Voltage ..... 230V~, 50Hz

Operating Mode..... Max time+Max sens+Max lux 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, EN 61000-4-11.



### 6.7.3 Test Results

Voltage reduction	Performance criterion	Duration(cycle)	Result	Actual performance
100%	B	0.5	Pass*	A
30%	C	10	Pass*	A
20%	B1	250	Pass*	B1
30%	B1	25	Pass*	B1
60%	B1	10	Pass*	B1



100%	B1	250	Pass*	B1
------	----	-----	-------	----

Remark:

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

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## 6.8 Mains supply voltage variations

Test Requirement..... EN 50130-4  
Test Method..... EN 50130-4  
Test Result..... Pass  
Test Level..... Unom + 10 % & Unom - 15 %

### 6.8.1E.U.T. Operation

#### Operating Environment:

Temperature..... 23.5°C  
Humidity..... 56.0%RH

#### EUT Operation:

Input Voltage..... 230V~, 50Hz  
Operating Mode..... Max time+Max sens+Max lux mode

### 6.8.2Test Results

Test Level	Performance criterion	Duration	Result	Actual performance
Unom + 10 %	B1	Until temperature stability is reached	Pass*	B1
Unom - 15 %	B1	Until temperature stability is reached	Pass*	B1

#### Remark:

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





## 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 Test Setup, 30MHz to 1GHz



### 7.4 Photograph – Harmonic Current & Voltage Changes, Voltage Fluctuation and Flicker Test Setup







## 7.5 Photograph – ESD Immunity Test Setup



## 7.6 Photograph – Radio-frequency electromagnetic fields Immunity Test Setup







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



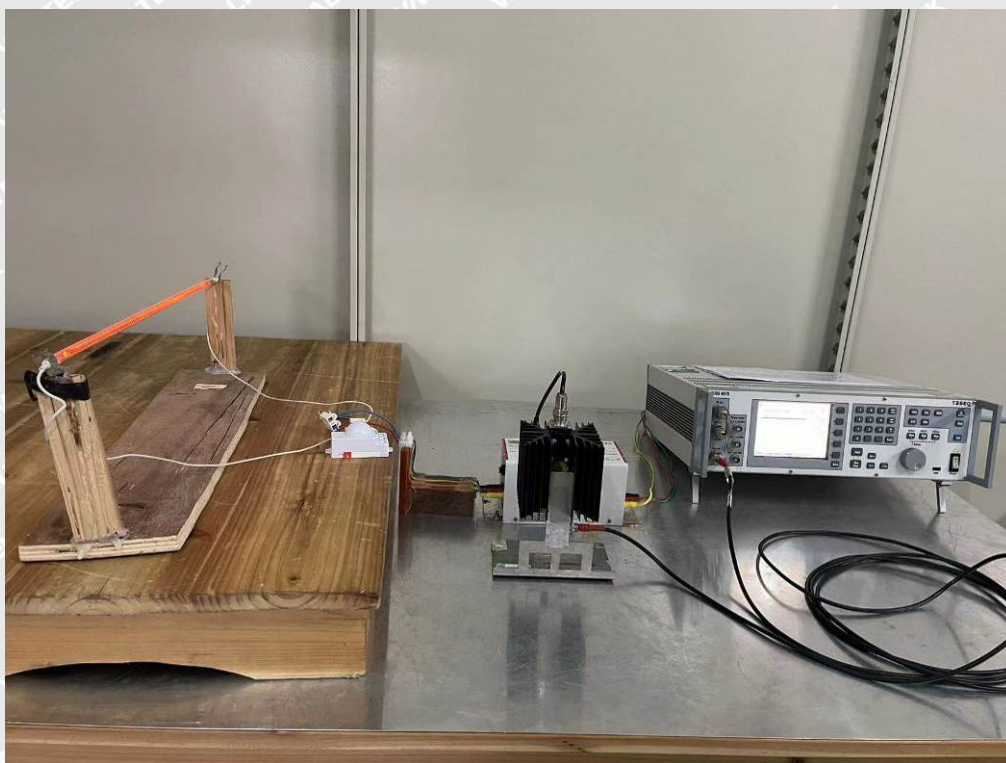
## 7.8 Photograph – Surge Immunity Test Setup



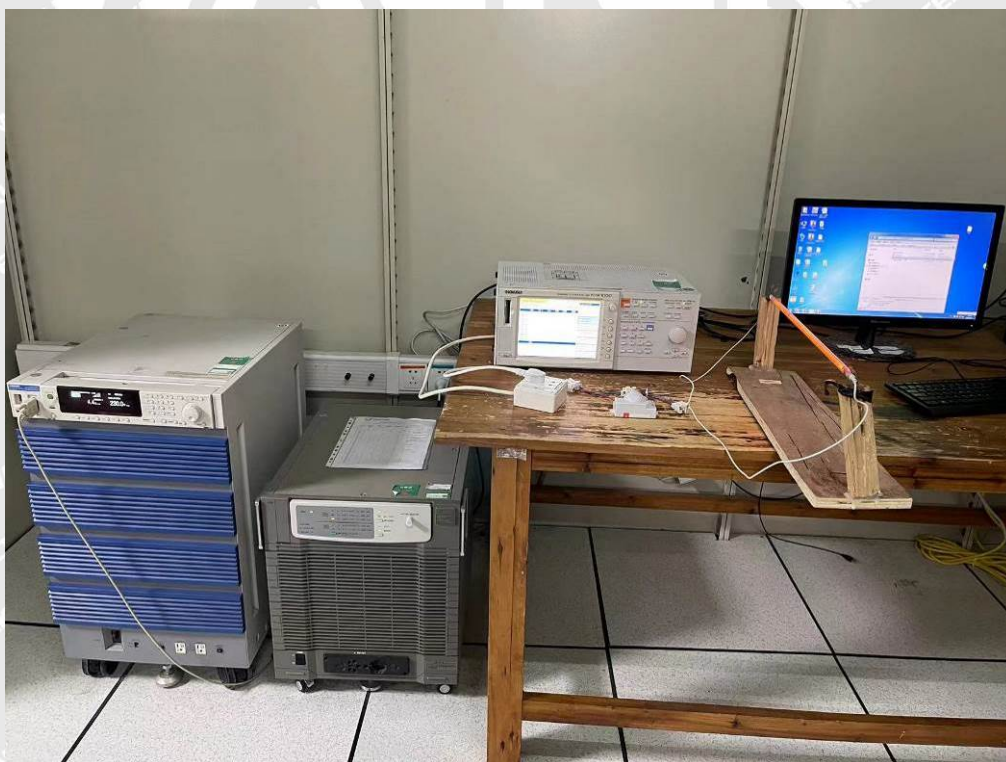




## 7.9 Photograph – Injected Currents Immunity Test Setup



## 7.10 Photograph – Mains supply voltage variations Immunity Test Setup

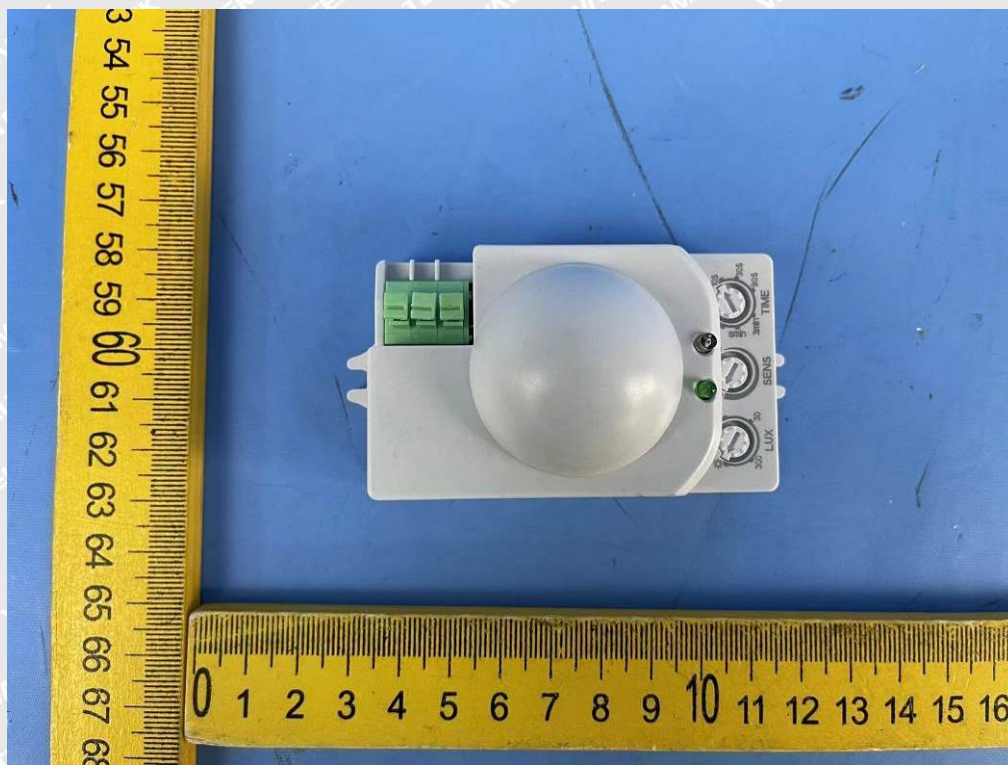




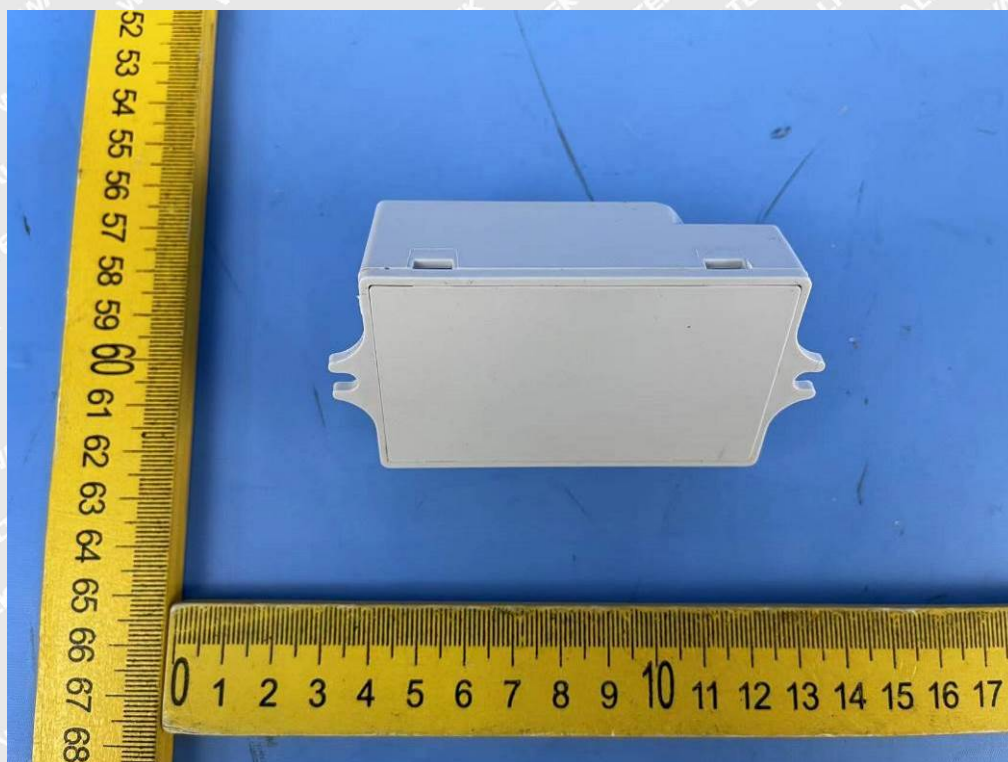


## 8 Photographs – Constructional Details

### 8.1 EUT – Front View



### 8.2 EUT – Back View



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