

EMC Test Report

Client Name : Zhongshan Litian Lighting co., Ltd

Client Address : Block B 4/F, No.2 Yihui NO.2 Road Maohui
Industry, Sisha, Henglan Town , Zhongshan
City, Guang dong Provice

Product Name : LED landscape light

Report Date : Jun. 17, 2023



Shenzhen Anbotek Compliance Laboratory Limited



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TEST REPORT

Applicant : Zhongshan Litian Lighting co., Ltd
Manufacturer : Zhongshan Litian Lighting co., Ltd
Product Name : LED landscape light
Test Model No. : 6012-15W
Reference Model No. : 6012-10W, 6012-12W

Trade Mark : 
LI-TIAN LIGHTING

Rating(s) : 220-240VAC, 50/60Hz, 15W

Test Standard(s) : **EN IEC 55015: 2019+A11: 2020;**
EN IEC 61000-3-2: 2019+A1: 2021;
EN 61000-3-3: 2013+A1:2019+A2:2021;
EN 61547: 2009;
(IEC 61000-4-2; IEC 61000-4-3; IEC 61000-4-4;
IEC 61000-4-5; IEC 61000-4-6; IEC 61000-4-8; IEC 61000-4-11)

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the EN IEC 55015, EN IEC 61000-3-2, EN 61000-3-3, EN 61547 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Receipt: May 26, 2023

Date of Test: May 26~Jun. 05, 2023

Prepared By:

We Zeng

(We Zeng)

Approved & Authorized Signer:

KingKong Jin

(KingKong Jin)




1. General Information

1.1. Client Information

Applicant	:	Zhongshan Litian Lighting co., Ltd
Address	:	Block B 4/F, No.2 Yihui NO.2 Road Maohui Industry, Sisha, Henglan Town , Zhongshan City, Guang dong Provice
Manufacturer	:	Zhongshan Litian Lighting co., Ltd
Address	:	Block B 4/F, No.2 Yihui NO.2 Road Maohui Industry, Sisha, Henglan Town , Zhongshan City, Guang dong Provice
Factory	:	Zhongshan Litian Lighting co., Ltd
Address	:	Block B 4/F, No.2 Yihui NO.2 Road Maohui Industry, Sisha, Henglan Town , Zhongshan City, Guang dong Provice

1.2. Description of Device (EUT)

Product Name	:	LED landscape light
Test Model No.	:	6012-15W
Reference Model No.	:	6012-10W, 6012-12W (Note: All samples are the same except the model number & appearance, so we prepare "6012-15W" for test only.)
Trade Mark	:	 LI-TIAN LIGHTING
Test Power Supply	:	AC 230V, 50Hz
Test Sample No.	:	1-1-1
Product Description	:	N/A

Remark: (1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

1.3. Auxiliary Equipment Used During Test

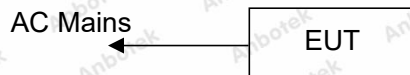
N/A	
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1.4. Description of Test Mode

Pretest Mode	Description
Mode 1	On

For Mode 1 Block Diagram of Test Setup



1.5. Test Summary

Test Items	Test Mode	Status
Power Line Conducted Emission Test	Mode 1	P
Magnetic Field Induced Current	Mode 1	P
Magnetic Field Strength (9KHz-30MHz)	/	N
Radiated Emission Test (Below 1 GHz)	Mode 1	P
Harmonic Current Test	Mode 1	P
Voltage Fluctuations & Flicker Test	Mode 1	P
Electrostatic Discharge Immunity Test	Mode 1	P
RF Field Strength Immunity Test	Mode 1	P
Electrical Fast Transient/Burst Immunity Test	Mode 1	P
Surge Immunity Test	Mode 1	P
Injected Currents	Mode 1	P
Power Frequency Magnetic Field Immunity Test	/	N
Voltage Dips and Interruptions Immunity Test	Mode 1	P
P) Indicates "PASS". F) Indicates "Fail". N) Indicates "Not applicable".		



1.6. Test Equipment List Power Line Conducted Emission Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	Oct. 23, 2022	1 Year
2.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040D T001	Jul. 05, 2022	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 13, 2022	1 Year
4.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 22, 2022	1 Year
5.	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A

 Magnetic Field Inducted Current

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 13, 2022	1 Year
2.	Triple-Loop Antenna(2M)	EVERFINE	LLA-2	905003	Oct. 23, 2022	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 22, 2022	1 Year
4.	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A

 Magnetic Field Strength (9KHz-30MHz)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 13, 2022	1 Year
2.	Pre-amplifier	Schwarzbeck	BBV-9745	9745-075	Oct. 23, 2022	1 Year
3.	Loop Antenna (9K-30M)	Schwarzbeck	FMZB1519B	00053	Oct. 23, 2022	1 Year
4.	Software Name EZ-EMC	Ferrari Technology	EMEC-3A1	N/A	N/A	N/A



Radiated Emission Test (Below 1 GHz)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESPI7	101340	Feb. 22, 2023	1 Year
2.	Pre-amplifier	Emtrace	RP01A	00517	Feb. 22, 2023	1 Year
3.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	01471	Feb. 25, 2023	1 Year
4.	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A

 Harmonic Current and Flicker Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Programmable AC Power source	IVYTECH	APS-5005A	632734	Oct. 23, 2022	1 Year
2.	Harmonic and Flicker Analyzer	EMC-PARTNER	HMONICS 1000-1P	164	Oct. 23, 2022	1 Year
3.	Harmonics-1000	N/A	Ed.3.0+4.0	N.A	N/A	N/A

 Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Simulators	emtest	ESD NX30.1	11936	Mar. 17, 2023	1 Year

 RF Field Strength Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	Agilent	N5181A	MY5014310 7	Apr. 20, 2023	1 Year
2.	Power Meter	Agilent	E4417A	MY4510138 4	Apr. 20, 2023	1 Year
3.	Amplifier	Micotop	MPA-80-100 0-600	MPA211031 8	Apr. 20, 2023	1 Year
4.	Amplifier	Micotop	MPA-1000-6 000-100	MPA211032 7	Apr. 20, 2023	1 Year
5.	Log.-Per.-Antenna	Schwarzbeck	VULP 9118E	01012	N/A	N/A
6.	Microwave Log.-Per. Antenna	Schwarzbeck	STLP 9149	00788	N/A	N/A
7.	Power Sensor	KEYSIGHT	E9323A	US40410647	Apr. 20, 2023	1 Year
8.	Power Sensor	KEYSIGHT	E9323A	MY5310000 7	Apr. 20, 2023	1 Year
9.	Electric field Probe	Narda S.T.S /PMM	EP 601	811ZX10351	Apr. 20, 2023	1 Year
10.	Software	EMtrace	EM 3	/	N/A	N/A



Electrical Fast Transient/Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Surge Generator	TESEQ	NSG 3060	1480	Oct. 23, 2022	1 Year
2.	CDN	TESEQ	CDN 3061	1408	Oct. 23, 2022	1 Year
3.	EFT-Clamp	PRIMA	EFT-Clamp	/	Oct. 13, 2022	1 Year

 Surge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Combined Wave Lightning Surge Simulator	3Ctest	CCS600	ES3771702	Jul. 05, 2022	1 Year
2.	Three Phase Power Coupling Network	3Ctest	SEPN69100 T	ES0801757	Jul. 05, 2022	1 Year
3.	Telecom port surge generator	PMI	TW101	190411	Apr. 20, 2023	1 Year

 Injected Currents Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	C/S Conducted Immunity Test System	FRANKONIA	CIT-10	126A1196/20 12	Oct. 23, 2022	1 Year
2.	CDN	FRANKONIA	CDN - M2+ M3	A2210178/20 12	Oct. 23, 2022	1 Year
3.	6dB Attenuator	FRANKONIA	DAM 26W	1172202	Oct. 23, 2022	1 Year
4.	CIT-10	FRANKONIA	Version1.1.7	N/A	N/A	N/A
5.	EM-Clamp	FRANKONIA	EMCL-20	18101728-01 03	Apr. 20, 2023	1 Year

 Power frequency Magnetic Field Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Power Frequency Magnetic Field Generator	EVERFINE	EMS61000-8 K	906002	Oct. 23, 2022	1 Year

 Voltage Dips and Interruptions Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	CYCLE SAG Simulator	PRIMA	DRP61011A G	PR12046234	Oct. 23, 2022	1 Year



1.7. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.

1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518128

1.8. EMS 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.

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.



2. Power Line Conducted Emission Test

2.1. Test Standard and Limit

Test Standard:	EN IEC 55015
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Disturbance voltage limits at the electric power supply interface

Frequency (MHz)	Limits (dB μ V)	
	Quasi-peak Level	Average Level
0.009 ~ 0.05	110	-
0.05 ~ 0.15	90~80	-
0.15 ~ 0.50	66~56	56~46
0.50 ~ 5.00	56	46
5.00 ~30.00	60	50

Remark:

- (1) The lower limit shall apply at the transition frequencies.
- (2) The limit decreases linearly with the logarithm of the frequency in the range 0.05MHz to 0.50MHz.

Disturbance voltage limits at the electric power supply interface (Electrodeless lamp)

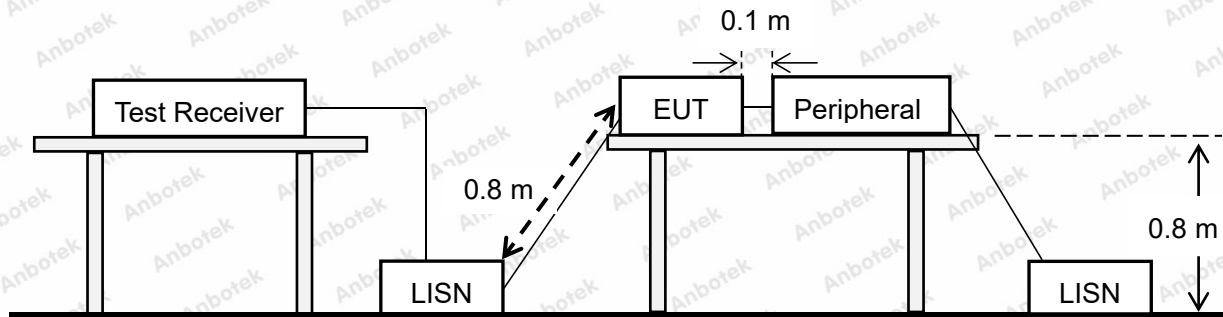
Frequency (MHz)	Limits (dB μ V)	
	Quasi-peak Level	Average Level
0.009 ~ 0.05	110	-
0.05 ~ 0.15	90~80	-
0.15 ~ 0.50	66~56	56~46
0.50 ~ 2.20	56	46
2.20 ~ 3.00	73	63
3.00 ~ 5.00	56	46
5.00 ~30.00	60	50

Remark:

- (1) The lower limit shall apply at the transition frequencies.
- (2) The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.



2.2. Test Setup



2.3. Test Procedure

The table-top EUT is placed on a non-conductive table 0.8 m above the horizontal ground reference plane, and the back of the EUT is 0.4 m away from the vertical ground reference plane, and at least 0.8 m from any other metal surface or ground plane. The floor-standing EUT is placed on an insulating support 0.1 m above the horizontal ground reference plane, at least 0.8 m away from other metal objects.

Connect EUT to the power mains through an LISN. Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the center into a bundle no longer than 0.4 m, so that its length is shortened to 1 m. All the peripherals are connecting to the other LISN (Handheld devices shall be tested with a simulated hand).

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest disturbance with respect to the limit was found by investigating disturbances at a number of significant frequencies. The probable frequency of maximum disturbance had been found and that the associated cable and EUT configuration and mode of operation had been identified.

Set the test-receiver to quasi peak detect function and average detect function, and to measure the conducted emissions values.

2.4. Test Results

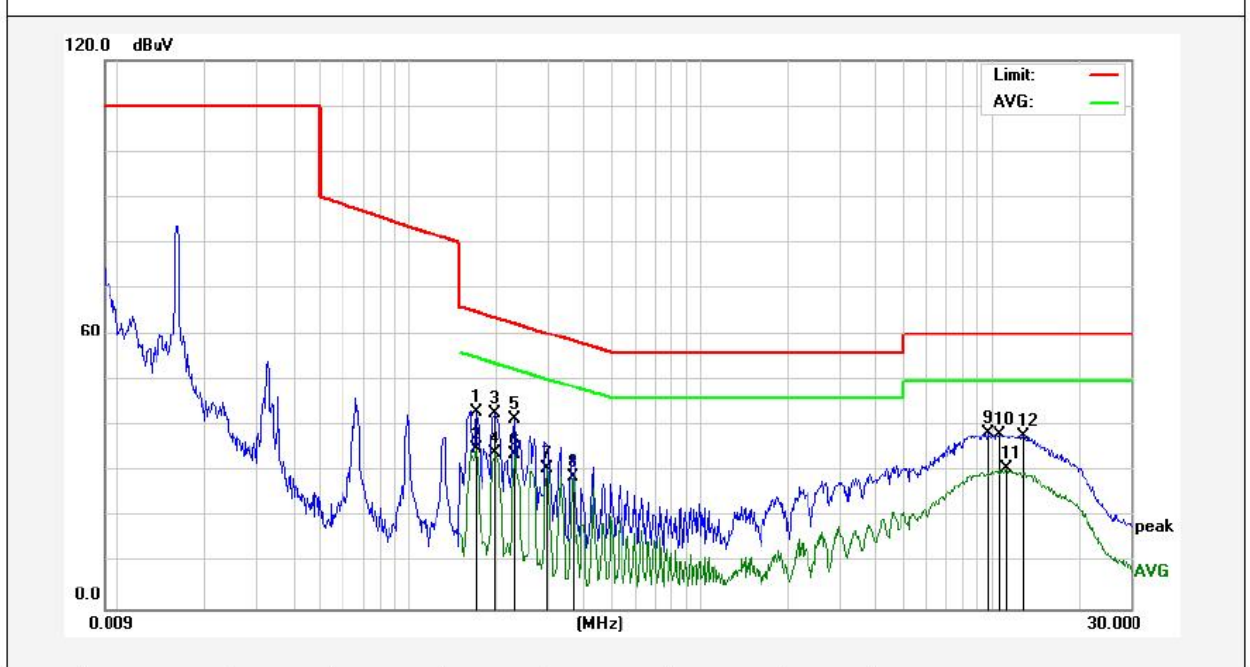
PASS

The test curves are shown in the following pages.



Power Line Conducted Test Data

Test Site: 1# Shielded Room
 Test Specification: AC 230V, 50Hz
 Comment: Live Line
 Temp.: 24.6°C Hum.: 49%



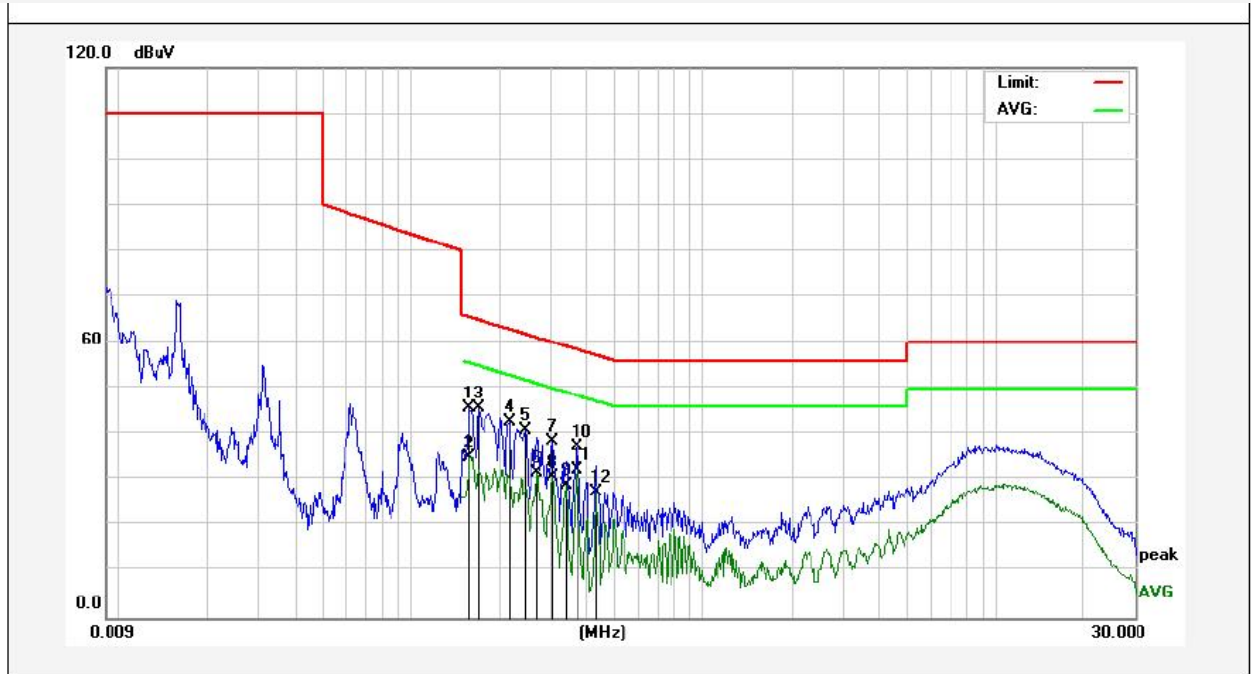
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1700	33.31	9.83	43.14	64.96	-21.82	QP	
2	0.1700	25.22	9.83	35.05	54.96	-19.91	AVG	
3	0.1980	33.02	9.83	42.85	63.69	-20.84	QP	
4	0.1980	24.27	9.83	34.10	53.69	-19.59	AVG	
5	0.2300	31.76	9.83	41.59	62.45	-20.86	QP	
6	0.2300	24.02	9.83	33.85	52.45	-18.60	AVG	
7	0.2980	20.89	9.83	30.72	50.30	-19.58	AVG	
8	0.3660	18.99	9.82	28.81	48.59	-19.78	AVG	
9	9.6380	28.65	9.97	38.62	60.00	-21.38	QP	
10	10.6899	28.28	10.01	38.29	60.00	-21.71	QP	
11	11.3060	20.77	10.03	30.80	50.00	-19.20	AVG	
12	12.8979	27.78	10.10	37.88	60.00	-22.12	QP	

Note: Result = Reading + Factor Over Limit = Result - Limit



Power Line Conducted Test Data

Test Site: 1# Shielded Room
 Test Specification: AC 230V, 50Hz
 Comment: Neutral Line
 Temp.: 24.6°C Hum.: 49%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1580	35.79	9.83	45.62	65.56	-19.94	QP	
2	0.1580	25.19	9.83	35.02	55.56	-20.54	AVG	
3	0.1700	35.85	9.83	45.68	64.96	-19.28	QP	
4	0.2180	32.93	9.82	42.75	62.89	-20.14	QP	
5	0.2460	31.17	9.82	40.99	61.89	-20.90	QP	
6	0.2700	21.84	9.84	31.68	51.12	-19.44	AVG	
7	0.3060	28.73	9.84	38.57	60.08	-21.51	QP	
8	0.3060	20.80	9.84	30.64	50.08	-19.44	AVG	
9	0.3379	19.02	9.83	28.85	49.25	-20.40	AVG	
10	0.3700	27.38	9.82	37.20	58.50	-21.30	QP	
11	0.3700	22.47	9.82	32.29	48.50	-16.21	AVG	
12	0.4300	17.73	9.82	27.55	47.25	-19.70	AVG	

Note: Result = Reading + Factor Over Limit = Result - Limit



3. Magnetic field induced current

3.1. Test Standard and Limit

Test Standard	EN IEC 55015
---------------	--------------

Limits for the magnetic field induced current

Frequency (MHz)	limits (dB μ A)		
	2m	3m	4m
0.009 ~ 0.070	88	81	75
0.070 ~ 0.150	88~58	81~51	75~45
0.150~3.000	58~22	51~15	45~9
3.000~30.000	22	15~16	9~12

Remark:

The limit decreases linearly with the logarithm of the frequency in the range 0.070MHz to 3.000MHz.

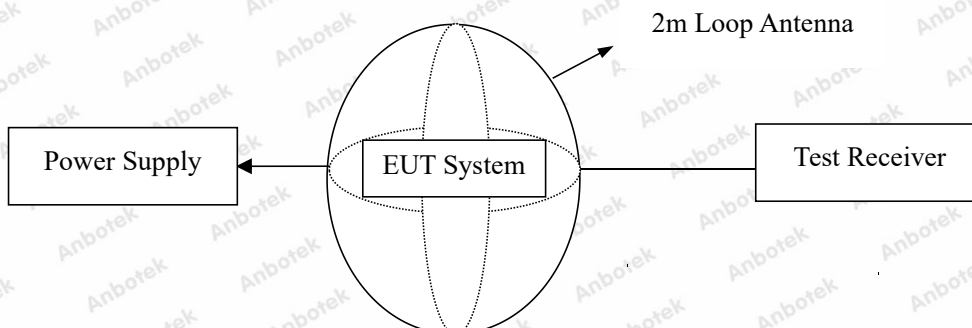
Limits for the magnetic field induced current (Electrodeless lamp)

Frequency (MHz)	limits (dB μ A)		
	2m	3m	4m
0.009 ~ 0.070	88	81	75
0.070 ~ 0.150	88~58	81~51	75~45
0.150~2.200	58~32	51~25	45~19
2.200~3.000	58	51	45
3.000~30.000	22	15~16	9~12

Remark:

The limit decreases linearly with the logarithm of the frequency in the range 0.070MHz to 2.200MHz.

3.2. Test Setup



3.3. Test Procedure

Place the test sample in the center of the three loop antenna so that each edge point of the test sample is more than 20cm away from the inner edge of the antenna. If this requirement cannot be met, please use the radiation method for testing.

Connect the tested equipment to the corresponding power supply, and connect all auxiliary equipment to the tested equipment.

3.4. Test Results

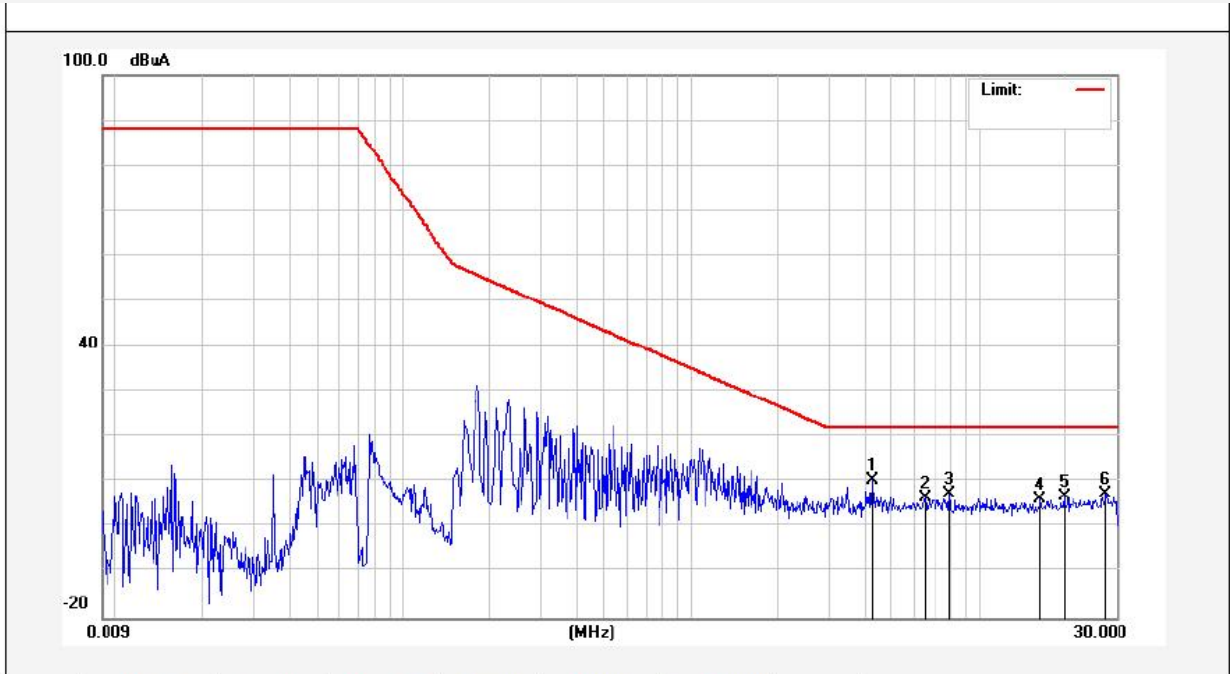
PASS

The test curves are shown in the following pages.



Magnetic field induced current Test Data

Test Site: 1# Shielded Room
 Test Specification: AC 230V, 50Hz
 Comment: X
 Temp.: 24.6°C Hum.: 49%



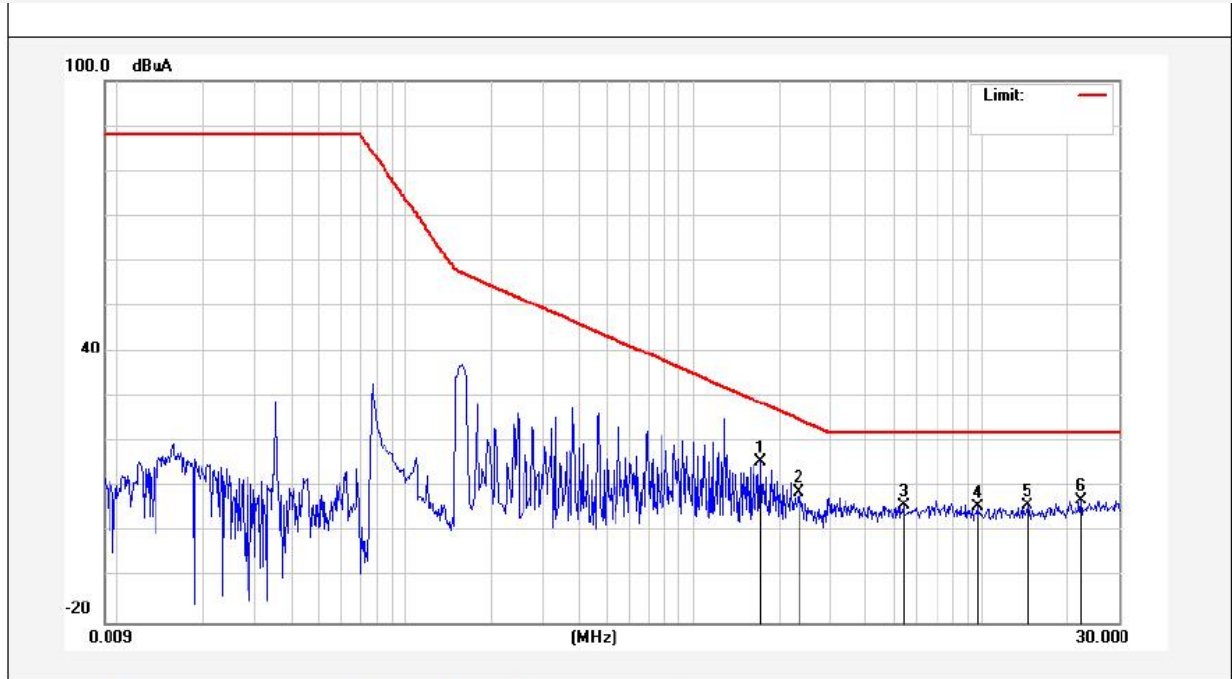
No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit (dBuA)	Over Limit (dB)	Detector	Remark
1	4.2740	10.37	0.03	10.40	22.00	-11.60	QP	
2	6.5060	6.56	0.07	6.63	22.00	-15.37	QP	
3	7.8740	7.25	0.06	7.31	22.00	-14.69	QP	
4	16.4100	6.24	0.02	6.26	22.00	-15.74	QP	
5	19.7220	6.93	0.02	6.95	22.00	-15.05	QP	
6	27.4460	7.46	0.02	7.48	22.00	-14.52	QP	

Note: Result = Reading + Factor Over Limit = Result - Limit



Magnetic field induced current Test Data

Test Site: 1# Shielded Room
 Test Specification: AC 230V, 50Hz
 Comment: Y
 Temp.: 24.6°C Hum.: 49%



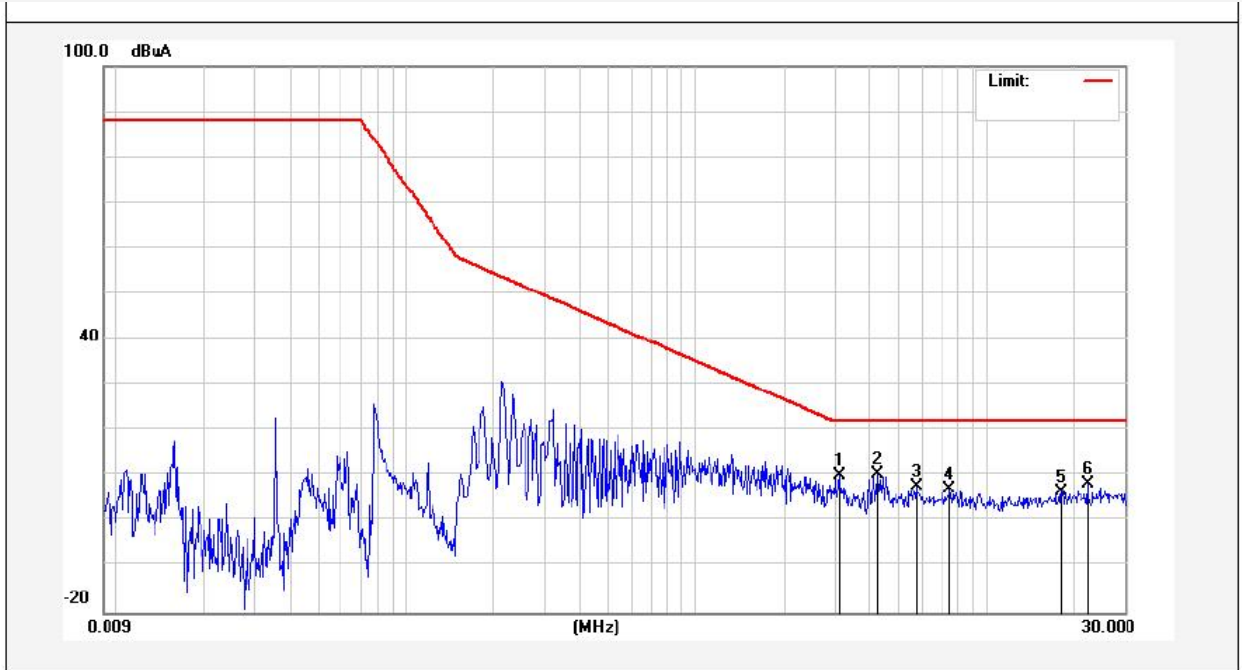
No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit (dBuA)	Over Limit (dB)	Detector	Remark
1	1.7140	15.43	0.01	15.44	28.73	-13.29	QP	
2	2.3300	8.98	0.01	8.99	25.04	-16.05	QP	
3	5.4100	5.99	0.05	6.04	22.00	-15.96	QP	
4	9.6580	5.57	0.02	5.59	22.00	-16.41	QP	
5	14.5140	5.85	0.02	5.87	22.00	-16.13	QP	
6	22.3380	7.16	0.02	7.18	22.00	-14.82	QP	

Note: Result = Reading + Factor Over Limit = Result - Limit



Magnetic field induced current Test Data

Test Site: 1# Shielded Room
 Test Specification: AC 230V, 50Hz
 Comment: Z
 Temp.: 24.6°C Hum.: 49%



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit (dBuA)	Over Limit (dB)	Detector	Remark
1	3.1020	10.13	0.02	10.15	22.00	-11.85	QP	
2	4.2140	10.46	0.03	10.49	22.00	-11.51	QP	
3	5.7340	7.66	0.05	7.71	22.00	-14.29	QP	
4	7.4980	6.97	0.07	7.04	22.00	-14.96	QP	
5	18.2060	6.57	0.02	6.59	22.00	-15.41	QP	
6	22.5380	8.44	0.02	8.46	22.00	-13.54	QP	

Note: Result = Reading + Factor Over Limit = Result - Limit



4. Magnetic field strength

4.1. Test Standard and Limit

Test Standard	EN IEC 55015
---------------	--------------

- Radiation disturbance limit of loop antenna for equipment with diameter ≥ 1.6 m

Frequency (MHz)	Limits at 3m distance (dB μ A/m)
	Quasi-peak Level
0.009 ~ 0.070	69
0.070 ~ 0.150	69~ 39 *
0.150~4.000	39~ 3 *
4.000~30.000	3

Remark:

The limit decreases linearly with the logarithm of the frequency in the range 0.070MHz to 4.000MHz.

- Radiation disturbance limit of loop antenna for equipment with diameter ≥ 1.6 m
(Electrodeless lamp)

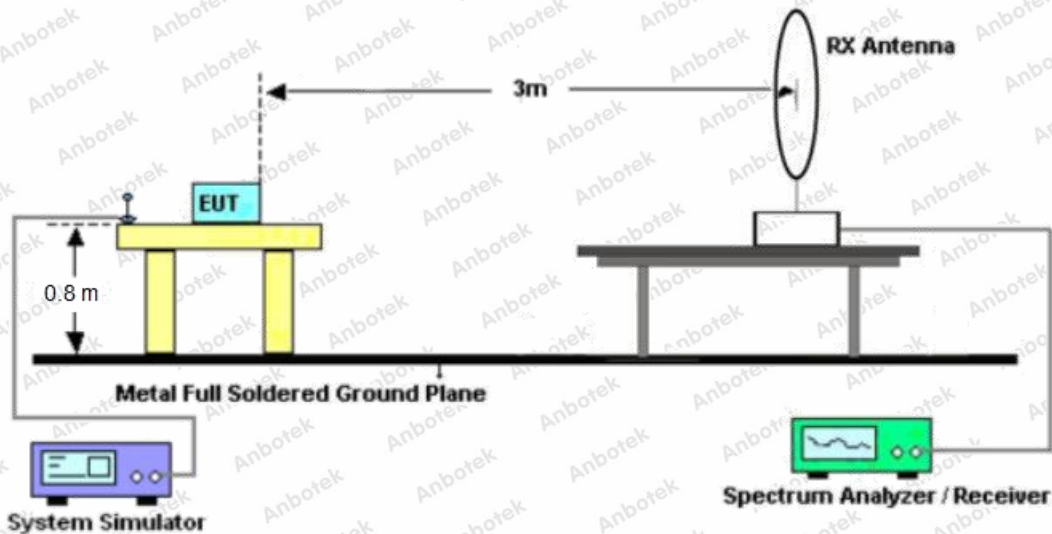
Frequency (MHz)	Limits at 3m distance (dB μ A/m)
	Quasi-peak Level
0.009 ~ 0.070	69
0.070 ~ 0.150	69~ 39 *
0.150~2.200	39~ 19.8 *
2.200~3.000	39
3.000~4.000	12.4~ 3 *
4.000~30.000	3

Remark:

The limit decreases linearly with the logarithm of the frequency in the range 0.070MHz to 4.000MHz.



4.2. Test Setup



4.3. Test Procedure

The table-top EUT is placed on a non-conductive table 0.8 m above the horizontal ground reference plane. The floor-standing EUT is placed on an insulating support 0.1 m above the horizontal ground reference plane.

The EUT shall be vertically above the center of the turntable, the antenna shall be 3m away from the center of the turntable, and the lower edge of the antenna shall be more than 1m away from the horizontal reference ground plane.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

In the test frequency range of 0.009MHz-0.15MHz, the analytical bandwidth of the receiver is set to 200Hz, and in the test frequency range of 0.15MHz-30MHz, the analytical bandwidth of the receiver is set to 9KHz.

4.4. Test Results

Not applicable.



5. Radiated Emission Test (Below 1 GHz)

5.1. Test Standard and Limit

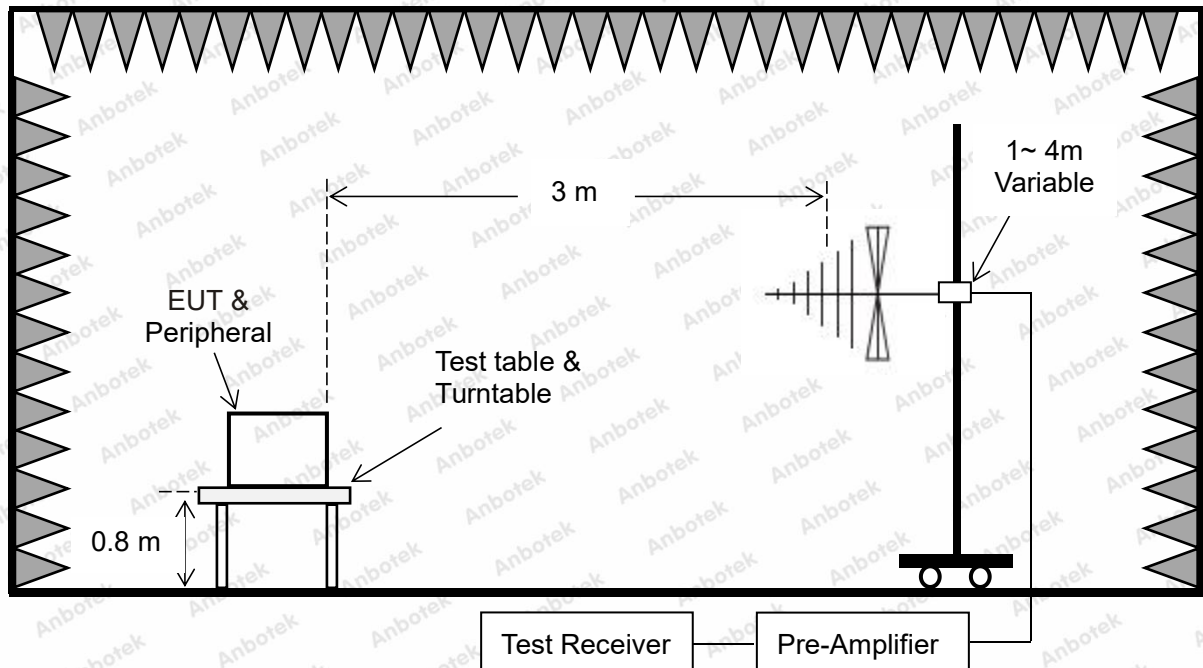
Test Standard	EN IEC 55015
---------------	--------------

Limit for radiated emissions at frequencies up to 1 GHz

Frequency (MHz)	Distance (Meters)	Field Strengths Limit (dB μ V/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Remark: The lower limit shall apply at the transition frequencies.

5.2. Test Setup



5.3. Test Procedure

The table-top EUT is placed on a non-conductive table 0.8 m above the horizontal ground reference plane. The floor-standing EUT is placed on an insulating support 0.1 m above the horizontal ground reference plane.

The EUT was set 3 m away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 m to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

The bandwidth of the Receiver is set at 120 kHz.

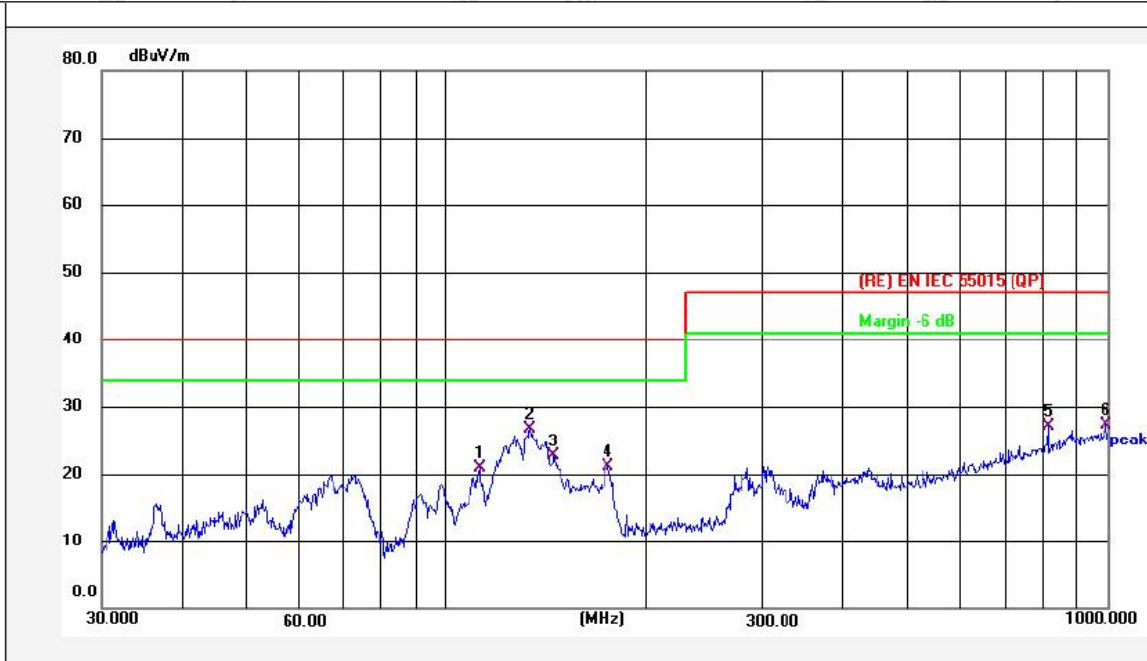
5.4. Test Results

PASS

The test curves are shown in the following pages.



Test item: Radiation Test Polarization: Horizontal
 Standard: (RE)EN IEC 55015 Power Source: AC 230V, 50Hz
 Frequency Range: 30MHz ~ 1000MHz Temp.(°C)/Hum.(%RH): 22.5(°C)/48%RH
 Distance: 3m

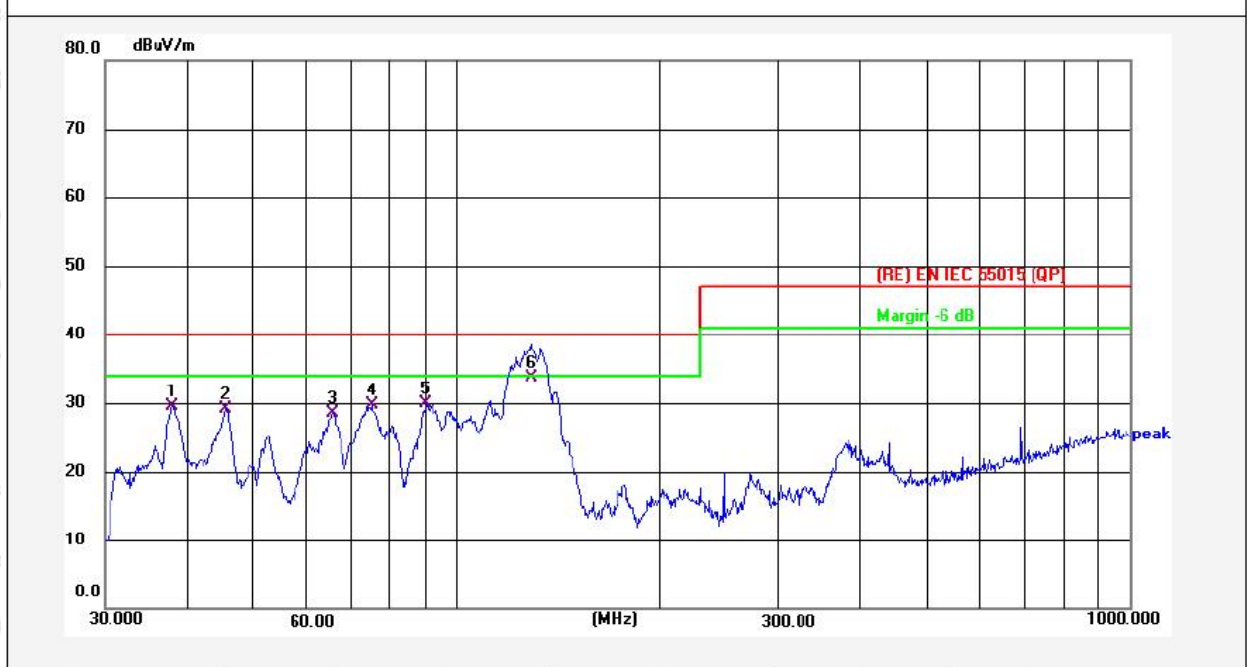


No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	112.3272	43.26	-22.34	20.92	40.00	-19.08	QP			
2	134.0294	51.79	-25.11	26.68	40.00	-13.32	QP			
3	145.0324	47.71	-25.08	22.63	40.00	-17.37	QP			
4	175.1135	45.07	-23.89	21.18	40.00	-18.82	QP			
5	812.7553	37.05	-10.00	27.05	47.00	-19.95	QP			
6	995.1901	35.22	-7.86	27.36	47.00	-19.64	QP			peak

Note: Result= Reading + Factor Over Limit=Result-Limit



Test item:	Radiation Test	Polarization:	Vertical
Standard:	(RE)EN IEC 55015	Power Source:	AC 230V, 50Hz
Frequency Range:	30MHz ~ 1000MHz	Temp.(°C)/Hum.(%RH):	22.5(°C)/48%RH
Distance:	3m		



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	37.8453	52.76	-23.23	29.53	40.00	-10.47	QP			
2	45.5348	50.60	-21.50	29.10	40.00	-10.90	QP			
3	65.4579	52.45	-23.86	28.59	40.00	-11.41	QP			
4	74.8535	55.37	-25.60	29.77	40.00	-10.23	QP			
5	89.9835	53.73	-23.84	29.89	40.00	-10.11	QP			
6	129.4191	58.61	-24.87	33.74	40.00	-6.26	QP			

Note: Result= Reading + Factor Over Limit=Result-Limit

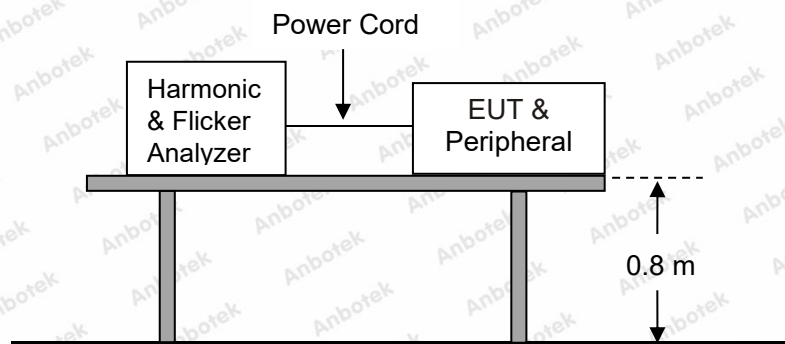


6. Harmonic Current Test

6.1. Test Standard

Test Standard:	EN IEC 61000-3-2
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6.2. Test Setup



6.3. Test Procedure

The table-top EUT is placed on the top of a wooden table 0.8 m above the ground (0.1 m for the floor-standing EUT) and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the necessary for the EUT to be exercised.

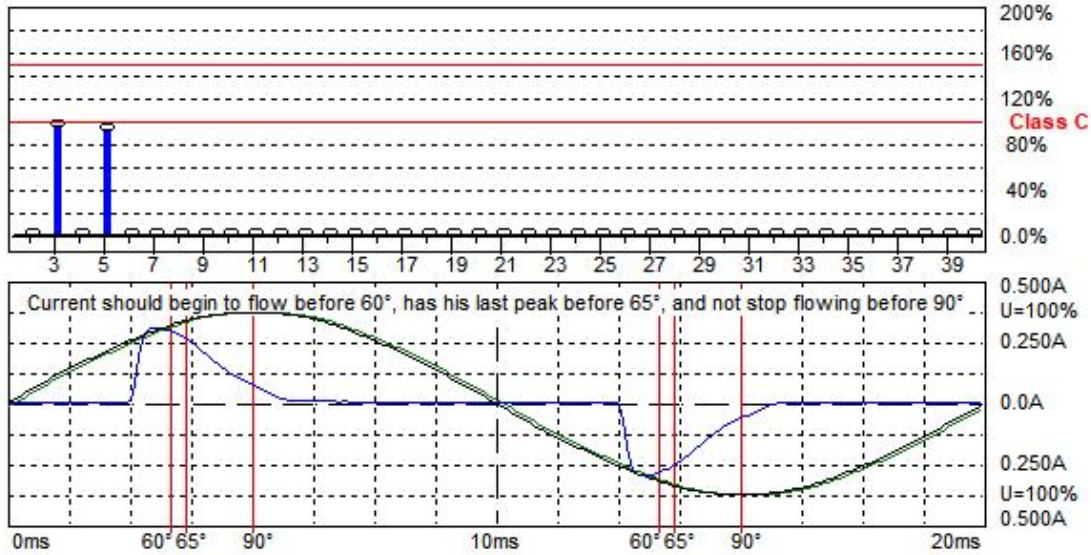
6.4. Test Results

PASS

The test curves are shown in the following pages.



Harmonic Current Test Result Summary (Run time)



Harmonic Emission - IEC 61000-3-2 , EN 61000-3-2 , (EN60555-2)

Urms =	229.3 V	P =	15.08 W	THC =	0.082 A	Range:	0.5 A
Irms =	0.109 A	pf =	0.603	H1max =	0.073 A	V-nom:	230 V

Test aborted, Result: PASSED

HAR-1000 EMC-Partner

Full Bar : Actual Values

Empty Bar : Maximum Values

Blue : Current , Green : Voltage , Red : Failed



Harmonic Current Test Result Summary (Run time)

Urms = 229.3V Freq = 50.000 Range: 0.5 A
 Irms = 0.109A Ipk = 0.310A cf = 2.839
 P = 15.08W S = 25.03VA pf = 0.603
 THDi = 74.7 % THDu = 1.40 % Class C

Test - Time : 3min (100 %)

Limit Reference: H1(max)= 0.0731A pf(max)= 0.979

Test aborted, Result: PASSED

Order	Freq. Status [Hz]	Iavg [A]	Iavg%L [%]	Irms [A]	Irms% [%]	Irms%L [%]	I _{max} [A]	I _{max} %L [%]	Limit [A]
1	50	0.0732		0.0732	67.030		0.0732		
2	100	0.0000		0.0002	0.1398		0.0002		
3	150	0.0595	94.660	0.0595	54.530	94.600	0.0596	94.794	0.0629
4	200	0.0000		0.0002	0.1678		0.0002		
5	250	0.0408	91.455	0.0407	37.332	91.307	0.0410	91.786	0.0446
6	300	0.0000		0.0002	0.1678		0.0002		
7	350	0.0245		0.0245	22.427		0.0247		
8	400	0.0000		0.0002	0.1957		0.0002		
9	450	0.0170		0.0170	15.576		0.0172		
10	500	0.0000		0.0002	0.1678		0.0002		
11	550	0.0137		0.0137	12.584		0.0139		
12	600	0.0000		0.0001	0.1119		0.0002		
13	650	0.0099		0.0099	9.0884		0.0101		
14	700	0.0000		0.0001	0.0559		0.0001		
15	750	0.0081		0.0081	7.4664		0.0082		
16	800	0.0000		0.0001	0.0559		0.0001		
17	850	0.0082		0.0082	7.5503		0.0083		
18	900	0.0000		0.0001	0.0559		0.0001		
19	950	0.0072		0.0072	6.5716		0.0072		
20	1000	0.0000		0.0001	0.0559		0.0001		
21	1050	0.0059		0.0058	5.3412		0.0059		
22	1100	0.0000		0.0000	0.0280		0.0000		
23	1150	0.0056		0.0056	5.1734		0.0057		
24	1200	0.0000		0.0000	0.0280		0.0001		
25	1250	0.0054		0.0053	4.8937		0.0054		
26	1300	0.0000		0.0000	0.0280		0.0001		
27	1350	0.0000		0.0046	4.1946		0.0046		
28	1400	0.0000		0.0000	0.0280		0.0001		
29	1450	0.0000		0.0042	3.8870		0.0043		
30	1500	0.0000		0.0000	0.0280		0.0000		
31	1550	0.0000		0.0041	3.7192		0.0042		
32	1600	0.0000		0.0000	0.0280		0.0001		
33	1650	0.0000		0.0036	3.3277		0.0037		
34	1700	0.0000		0.0000	0.0280		0.0000		
35	1750	0.0000		0.0033	3.0481		0.0034		
36	1800	0.0000		0.0000	0.0280		0.0000		
37	1850	0.0000		0.0032	2.9642		0.0033		
38	1900	0.0000		0.0001	0.0559		0.0001		
39	1950	0.0000		0.0030	2.7125		0.0031		
40	2000	0.0000		0.0000	0.0280		0.0000		

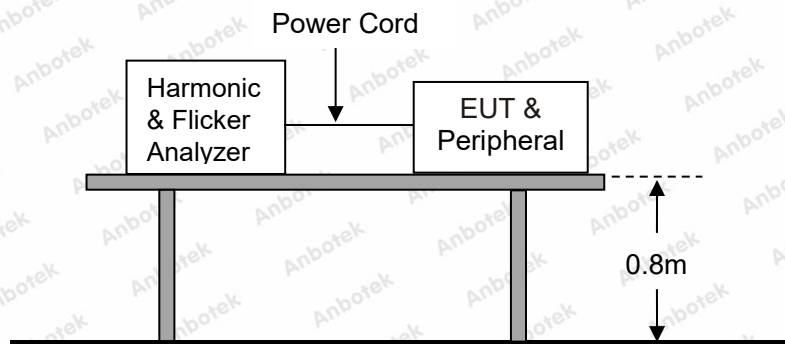


7. Voltage Fluctuations & Flicker Test

7.1. Test Standard

Test Standard:	EN 61000-3-3
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7.2. Test Setup



7.3. Test Procedure

The table-top EUT is placed on the top of a wooden table 0.8 m above the ground (0.1 m for the floor-standing EUT) and operated to produce the most unfavorable sequence of voltage changes under normal conditions during the flicker measurement. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

7.4. Test Results

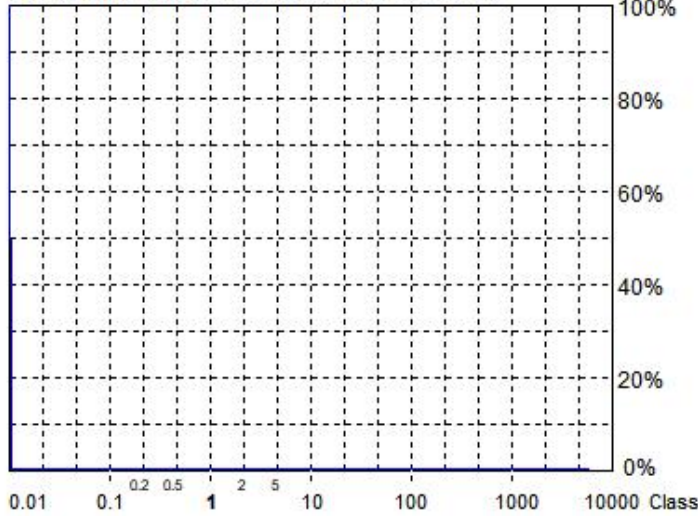
PASS

The test curves are shown in the following pages.



Flicker Test Summary (Run time)

Flicker Emission IEC 61000-4-15 for 230V/50Hz



Actual Flicker (Fli):	0.00
Short-term Flicker (Pst):	0.07
Limit (Pst):	1.00
Long-term Flicker (Plt):	0.00
Limit (Plt):	0.65
Maximum Relative Volt. Change (dmax):	0.00%
Limit (dmax):	4.00%
Relative Steady-state Voltage Change (dc):	0.05%
Limit (dc):	3.30%
Tmax 3.30% (dt):	0.00ms
Limit (dt>Lim):	500ms

Flicker Emission - IEC 61000-3-3, EN 61000-3-3

Urms = 229.3 V P = 15.11 W
 Irms = 0.109 A pf = 0.602

Range: 0.5 A
 V-nom: 230 V

Test aborted, Result: PASSED

HAR-1000 EMC-Partner

- Full Bar : Actual Values**
- Empty Bar : Maximum Values**
- Circles : Average Values**
- Blue : Current , Green : Voltage , Red : Failed**

Urms = 229.3V Freq = 50.000 Range: 0.5 A
 Irms = 0.109A Ipk = 0.311A cf = 2.842
 P = 15.11W S = 25.08VA pf = 0.602

Test - Time : 10 x 1min = 10min (100 %)

LIN (Line Impedance Network) : No LIN

Limits : Plt : 0.65 Pst : 1.00
 dmax : 4.00 % dc : 3.30 %
 dtLim: 3.30 % dt>Lim: 500ms

Test aborted, Result: PASSED

	dmax	dc	dt>Lim
	[%]	[%]	[ms]
1	0.000	0.000	0.000

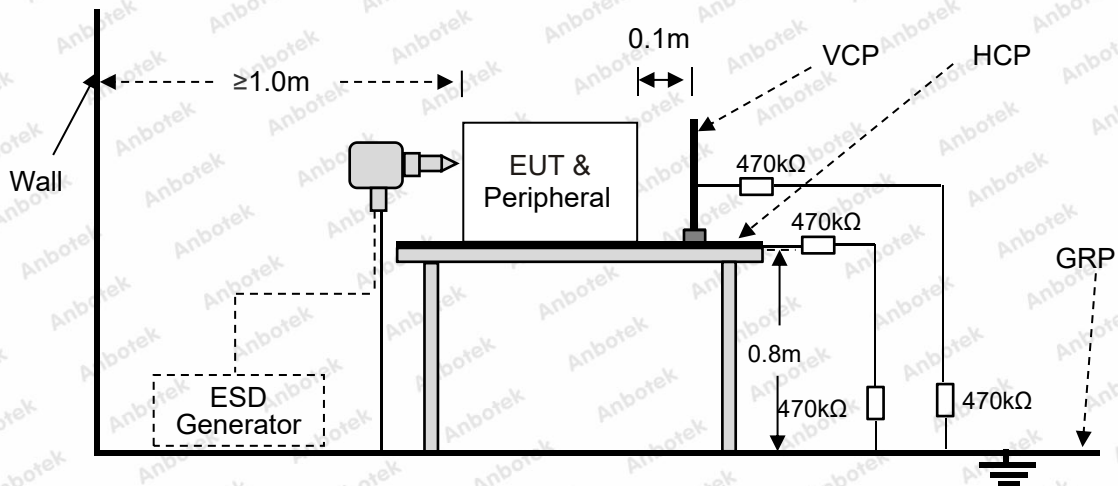


8. Electrostatic Discharge Immunity Test

8.1. Test Specification

Test Standard :	EN 61547	
Basic standard :	IEC 61000-4-2: 2008	
Performance criteria:	B	
Test Level :	± 8kV (Air Discharge)	± 4kV (Contact Discharge)

8.2. Test Setup



8.3. Test Procedure

a. In the case of air discharge testing, the climatic conditions shall be within the following ranges:

- Ambient temperature: 15°C to 35°C;
- Relative humidity: 30% to 60%;
- Atmospheric pressure: 86 kPa (860 mbar) to 106 kPa (1060 mbar)

b. In the case of contact discharges, the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

c. In the case of painted surface covering a conducting substrate, the following procedure shall be adopted: - If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate. - Coating declared as insulating by the manufacturer shall only be submitted to the air discharge. - The contact discharge test shall not be applied to such surfaces.



d. In the case of air discharges, the round discharge tip of the discharge electrode shall be approached as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator (discharge electrode) shall be removed from the EUT. The generator is then retriggered for a new single discharge. This procedure shall be repeated until the discharges are completed. In the case of an air discharge test, the discharge switch, which is used for contact discharge, shall be closed.

e. The test voltage shall be increased from the minimum to the selected test severity level, in order to determine any threshold of failure. The final test level should not exceed the product specification value in order to avoid damage to the equipment.

f. The test shall be performed with both air discharge and contact discharge. The test shall be performed with single discharges. On each pre-selected point at least 10 single discharges (in the most sensitive polarity) shall be applied. For the time interval between successive single discharges an initial value of 1 s is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.

g. Ensure that the applied charge on the EUT has been dis-charged before next ESD pulse.

8.4. Test Results

PASS

Please refer to the following page.



Electrostatic Discharge Test Results

Test Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	Temperature:	23.2℃
Power Supply:	AC 230V, 50Hz	Humidity:	50%
Location		Kind A-Air Discharge C-Contact Discharge	Result
Air discharge: ±2.0 kV, ±4.0 kV, ±8.0 kV		Contact discharge: ±4.0 kV	
Slot	4 points	A	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
Light	4 points	A	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
Metal	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
HCP	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
VCP of the front	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
VCP of the rear	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
VCP of the left	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
VCP of the right	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
Note: N/A			

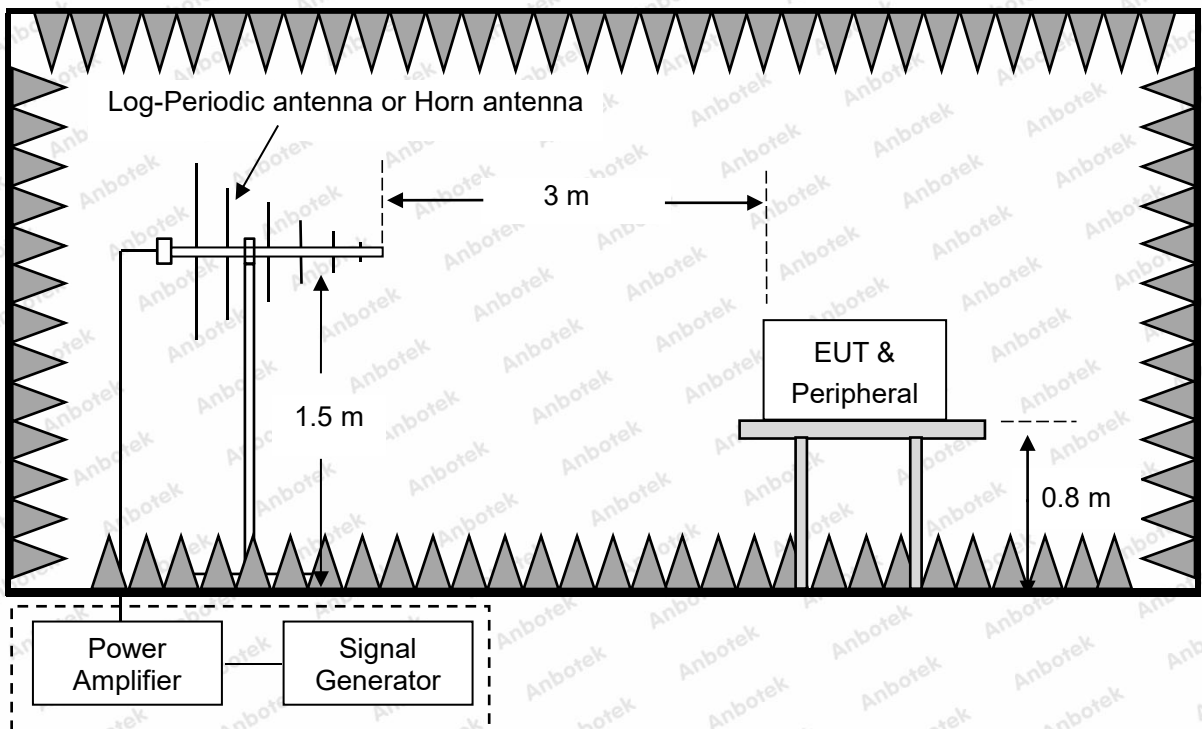


9. RF Field Strength Immunity Test

9.1. Test Specification

Test Standard:	EN 61547
Basic standard:	IEC 61000-4-3: 2020
Performance criteria:	A
Frequency Range:	80MHz to 1000MHz
Test level:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of preceding frequency value
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	at least 0.5s

9.2. Test Setup



9.3. Test Procedure

The procedure defined in this part requires the generation of electromagnetic fields within which the test sample is placed and its operation observed. To generate fields that are useful for simulation of actual (field) conditions may require significant antenna drive power and the resultant high field strength levels. To comply with local regulations and to prevent biological hazards to the testing personnel, it is recommended that these tests be carried out in a shielded enclosure or semi-anechoic chamber.

a. The antenna is placed 3 m from the equipment. The required field strength is determined by placing the field strength meter(s) on top of or directly alongside the equipment under test and monitoring the field strength meter via a remote field strength indicator outside the enclosure while adjusting the continuous-wave to the antenna.

b. The test shall normally be performed with the generating antenna facing each side of the EUT. When equipment can be used in different orientations (i.e. vertical or horizontal) all sides shall be exposed to the field during the test. When technically justified, some EUTs can be tested by exposing fewer faces to the generating antenna. In other cases, as determined for example by the type and size of EUT or the frequencies of test, more than four azimuths may need to be exposed.

c. The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally.

d. The step size of the frequency is set to 1%. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to be able to respond. However, the dwell time should not exceed 5 s at each of the frequencies during the scan.

9.4. Test Results

PASS

Please refer to the following page.



RF Field Strength Susceptibility Test Results

Test Result:		<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		Temperature:		23.5°C	
Power Supply:		AC 230V, 50Hz		Humidity:		50%	
Frequency Range	Antenna Polarity	R.F. Field Strength	Dwell Time	Azimuth	Result		
80 MHz ~ 1000 MHz	H / V	3 V/m	1s	Front	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C		
				Rear			
				Left			
				Right			
Note: N/A							



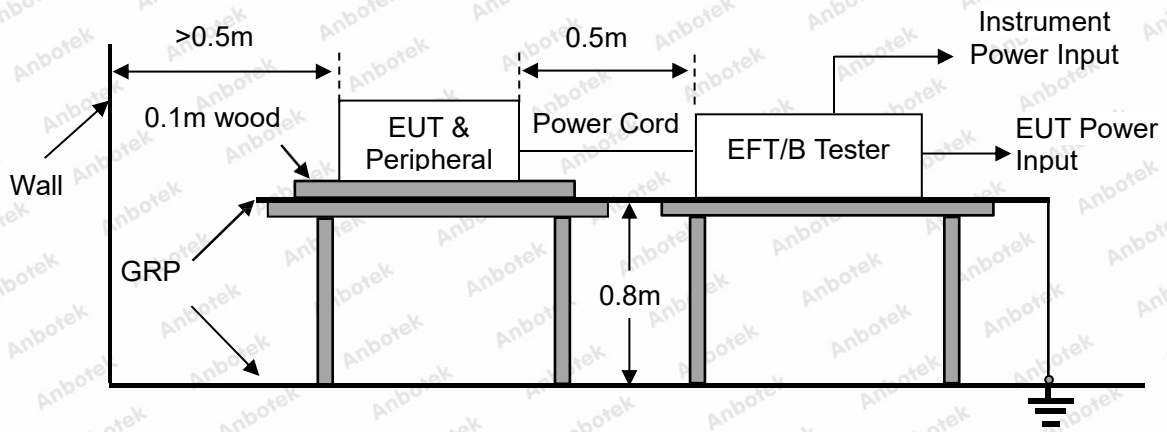
10. Electrical Fast Transient/Burst Immunity Test

10.1. Test Specification

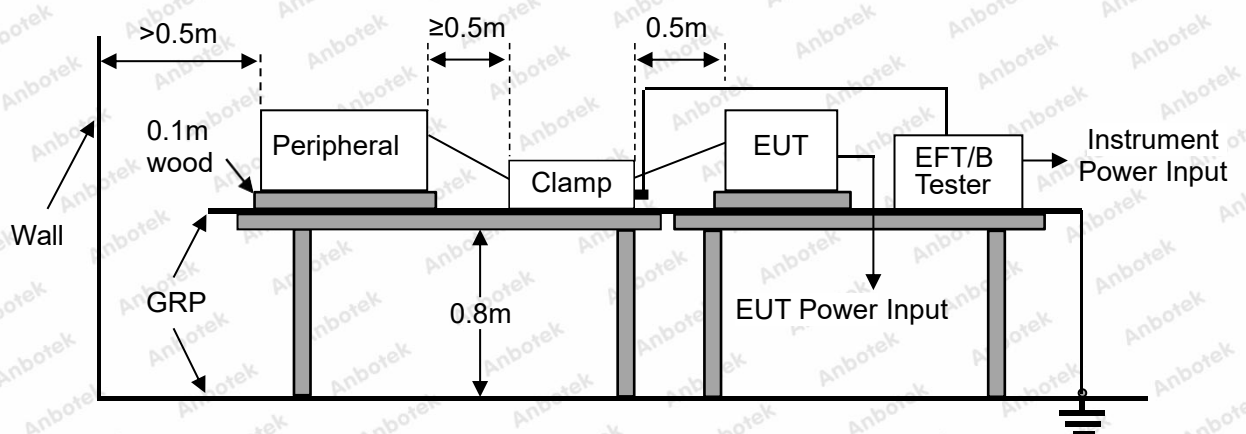
Test Standard:	EN 61547
Basic standard:	IEC 61000-4-4: 2012
Performance criteria:	B
Test Level:	<input checked="" type="checkbox"/> 1 kV, AC mains power ports
	<input type="checkbox"/> 0.5 kV, DC network power ports
	<input type="checkbox"/> 0.5 kV, Signal ports and control line

10.2. Test Setup

AC mains power ports and DC network power ports:



Analogue/digital data ports:



10.3. Test Procedure

The table-top EUT is placed on a table that is 0.8 m height, a ground reference plane is placed on the table, and uses 0.1 m insulation between the EUT and ground reference plane. The floor-standing EUT is placed on a ground reference plane and insulated from it by an insulating support with a thickness of 0.1 m. This reference ground plane shall project beyond the EUT by at least 0.1 m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5 m.

All cables to the EUT shall be placed on the insulation support 0.1 m above the ground reference plane. Cables not subject to electrical fast transients shall be routed as far as possible from the cable under test to minimize the coupling between the cables.

10.4. Test Results

PASS

Please refer to the following page.



Electrical Fast Transient/Burst Test Results

Test Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	Temperature:	23.9℃	
Power Supply:	AC 230V, 50Hz	Humidity:	50%	
Ports	Polarity	Inject Time(s)	Test Voltage (kV)	Result
<input checked="" type="checkbox"/> AC mains power ports	±	120 s	1.0 kV	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
<input type="checkbox"/> DC network power ports	±	120 s	0.5 kV	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
<input type="checkbox"/> Signal ports and control line	±	120 s	0.5 kV	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
Note: N/A				

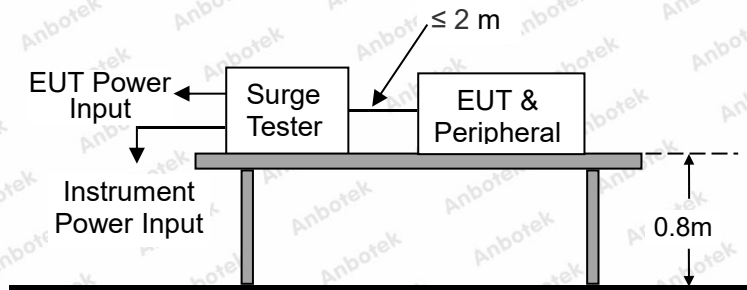


11. Surge Immunity Test

11.1. Test Specification

Test Standard:		EN 61547
Basic standard:		IEC 61000-4-5: 2014+A1:2017
Test level	Self-ballasted lamps and semi-luminaires	<input checked="" type="checkbox"/> 0.5 kV, Line to Line, Criterion C
		<input checked="" type="checkbox"/> 1kV, Line to Ground, Criterion C
	Luminaires and independent auxiliaries (Input power \leq 25W)	<input type="checkbox"/> 0.5 kV, Line to Line, Criterion C
		<input type="checkbox"/> 1kV, Line to Ground, Criterion C
Luminaires and independent auxiliaries (Input power $>$ 25W)	<input type="checkbox"/> 1 kV, Line to Line, Criterion C	
	<input type="checkbox"/> 2kV, Line to Ground, Criterion C	
Number of surges		5 (for each combination of parameters)
Repetition rate		1 minute / time
Polarity:		Positive / Negative
Phase angle:		90°, 270°
Waveform:		1.2 us / 50 us (8 us / 20us)

11.2. Test Setup



11.3. Test Procedure

Table-top EUT is placed on a table of 0.8 m heights above a metal ground reference plane. Floor standing EUT is placed on a ground reference plane and insulated from it by an insulating support with a thickness of 0.1 m. The length of the power cord between the EUT and the coupling/decoupling network is not more than 2 m, and the length of the interconnection line between the EUT and the coupling/decoupling network is not more than 2 m. The tests were done at repetition rate 1 per minute.

11.4. Test Results

PASS

Please refer to the following page.



Surge Immunity Test Results

Test Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	Temperature :	23.9℃		
Power Supply :	AC 230V, 50Hz	Humidity :	50%		
Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (kV)	Result
<input checked="" type="checkbox"/> Self-ballasted lamps and semi-luminaires <input type="checkbox"/> Luminaires and independent auxiliaries (Input power≤25W)					
L-N	+	<input type="checkbox"/> 0° <input checked="" type="checkbox"/> 90° <input type="checkbox"/> 180° <input type="checkbox"/> 270°	5	0.5kV	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
	-	<input type="checkbox"/> 0° <input type="checkbox"/> 90° <input type="checkbox"/> 180° <input checked="" type="checkbox"/> 270°	5	0.5kV	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
L-GND	+	<input type="checkbox"/> 0° <input checked="" type="checkbox"/> 90° <input type="checkbox"/> 180° <input type="checkbox"/> 270°	5	1kV	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
	-	<input type="checkbox"/> 0° <input type="checkbox"/> 90° <input type="checkbox"/> 180° <input checked="" type="checkbox"/> 270°	5	1kV	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
N-GND	+	<input type="checkbox"/> 0° <input checked="" type="checkbox"/> 90° <input type="checkbox"/> 180° <input type="checkbox"/> 270°	5	1kV	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
	-	<input type="checkbox"/> 0° <input type="checkbox"/> 90° <input type="checkbox"/> 180° <input checked="" type="checkbox"/> 270°	5	1kV	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
<input type="checkbox"/> Luminaires and independent auxiliaries (Input power>25W)					
L-N	+	<input type="checkbox"/> 0° <input checked="" type="checkbox"/> 90° <input type="checkbox"/> 180° <input type="checkbox"/> 270°	5	1kV	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
	-	<input type="checkbox"/> 0° <input type="checkbox"/> 90° <input type="checkbox"/> 180° <input checked="" type="checkbox"/> 270°	5	1kV	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
L-GND	+	<input type="checkbox"/> 0° <input checked="" type="checkbox"/> 90° <input type="checkbox"/> 180° <input type="checkbox"/> 270°	5	2kV	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
	-	<input type="checkbox"/> 0° <input type="checkbox"/> 90° <input type="checkbox"/> 180° <input checked="" type="checkbox"/> 270°	5	2kV	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
N-GND	+	<input type="checkbox"/> 0° <input checked="" type="checkbox"/> 90° <input type="checkbox"/> 180° <input type="checkbox"/> 270°	5	2kV	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
	-	<input type="checkbox"/> 0° <input type="checkbox"/> 90° <input type="checkbox"/> 180° <input checked="" type="checkbox"/> 270°	5	2kV	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
Note: N/A					



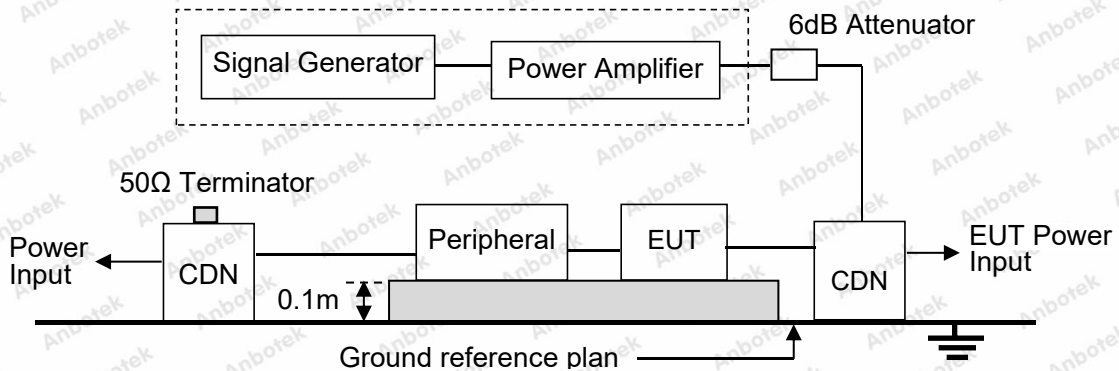
12. Injected Currents Susceptibility Test

12.1. Test Specification

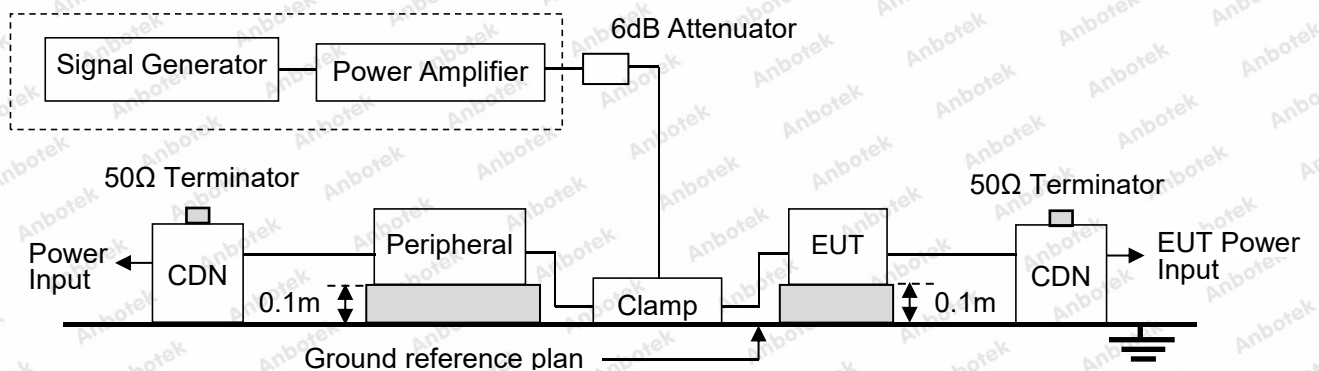
Test Standard:	EN 61547
Basic standard:	IEC 61000-4-6: 2013
Performance criteria:	A
Frequency range:	0.15MHz-80MHz
Test level:	<input checked="" type="checkbox"/> AC power ports: 3V/m(rms, unmodulated)
	<input type="checkbox"/> DC Power Ports: 3V/m(rms, unmodulated)
	<input type="checkbox"/> Signal ports,control lines: 3V/m(rms, unmodulated)
Modulation:	AM 80%, 1kHz sine-wave
Frequency Step:	1% of fundamental

12.2. Test Setup

CDN injection:



Clamp injection:



12.3. Test Procedure

- a. The EUT and peripheral are placed on an insulating support of 0.1 m height above a ground reference plan. The distance between EUT and CDN is 0.1 m to 0.3 m. All cables exiting the EUT are supported at a height of at least 30 mm above the ground reference plan.
- b. The frequency range is swept from 150 kHz to 80MHz, with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5×10^{-3} decade/s. The frequency range is swept incrementally. The step size was 1% of fundamental from 0.15MHz to 80MHz.
- c. The dwell time at each frequency isn't less than the time necessary for the EUT to be able to respond.

12.4. Test Results

PASS

Please refer to the following page.



Injected Currents Susceptibility Test Results

Test Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	Temperature:	23.9°C
Power Supply:	AC 230V, 50Hz	Humidity:	50%
Frequency Range (MHz)	Injected Position	Strength (Un-modulated)	Result
0.15 ~ 80	<input checked="" type="checkbox"/> AC Mains	3V	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
0.15 ~ 80	<input type="checkbox"/> DC Line	3V	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
0.15 ~ 80	<input type="checkbox"/> Signal ports and control lines	3V	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C

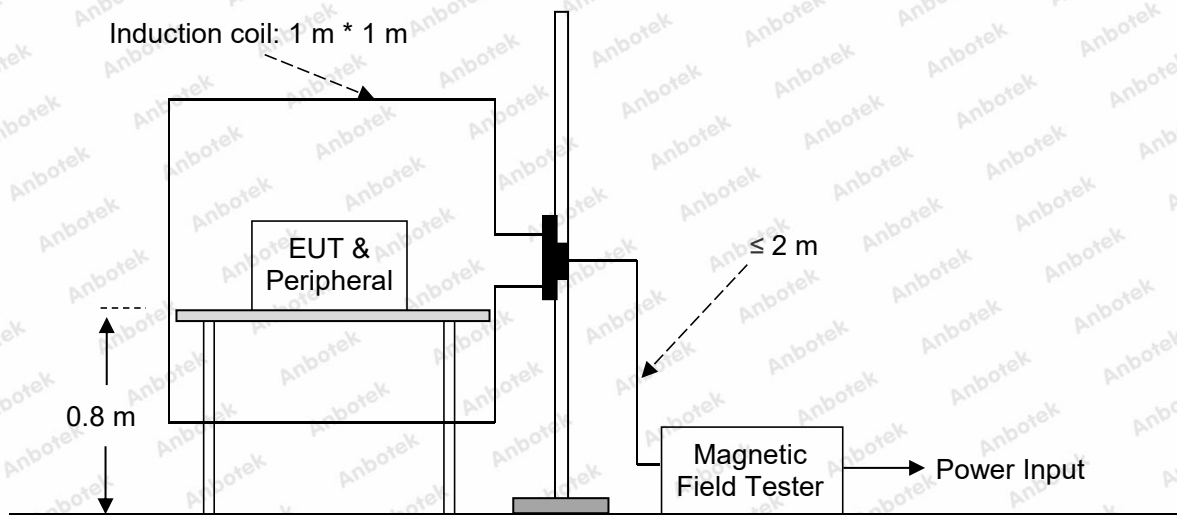


13. Power Frequency Magnetic Field Immunity Test

13.1. Test Specification

Test Standard:	EN 61547
Basic Standard	IEC 61000-4-8: 2009
Performance criteria	A
Test level	3A/m

13.2. Test Setup



13.3. Test Procedure

Table-top EUT is placed on a table that is 0.8 m height. Floor standing EUT is placed on a ground reference plane and insulated from it by an insulating support with a thickness of 0.1 m.

The EUT is placed in the middle of an induction coil. The proximity method is used when the EUT does not fit into the standard inductive coil

13.4. Test Results

Not applicable.

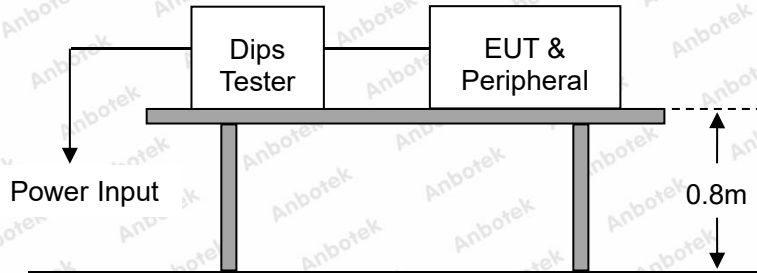


14. Voltage Dips and Interruptions Immunity Test

14.1. Test Specification

Test Standard:		EN 61547
Basic standard:		IEC 61000-4-11: 2020
	Voltage Dips	70%, 10 periods, Criteria C
	Voltage short interruptions	0%, 0.5 periods, Criteria B

14.2. Test Setup



14.3. Test Procedure

a. Where the equipment has a rated voltage the following shall apply:

- If the voltage range does not exceed 20% of the lower voltage specified for the rated voltage range, a single voltage within that range may be specified as a basis for test level specification.
- In all other cases, the test procedure shall be applied for both the lowest and highest voltages declared in the voltage range.

b. Test Conditions

- Select operated voltage and frequency of EUT - Test of interval: 10 sec.
- Level and duration: Sequence of 3 dips/interrupts.
- Voltage rise (and fall) time: 1.5 μ s.

c. Changes to occur at 0 degree crossover point of the voltage waveform.

14.4. Test Results

PASS

Please refer to the following page.



Voltage Dips and Interruptions Test Results

Test Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	Temperature :	23.9°C
Power Supply :	AC 230V, 50Hz	Humidity :	50%
Test Level % UT	Voltage Dips % UT	Duration (in periods)	Result
70	30	10P	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
Test Level % UT	Short Interruptions % UT	Duration (in periods)	Result*
0	100	0.5P	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
<p>Note: For luminaires where the lamp is not able to restart within 1 min, due to the physical constraints of the lamp, performance criterion C applies.</p>			



APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Power Line Conducted Emission Test



Photo of Magnetic Field Induced Current



Photo of Radiated Emission Test (Below 1 GHz)



Photo of Harmonic Current And Flicker Test

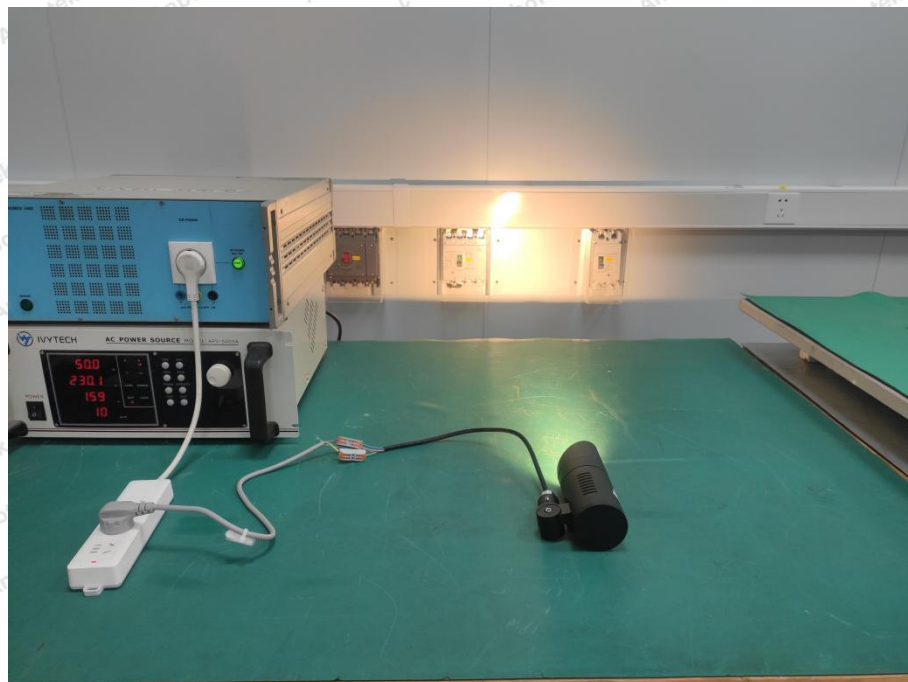


Photo of Electrostatic Discharge Immunity Test



Photo of RF Field Strength Immunity Test



Photo of Electrical Fast Transient/Burst Immunity Test

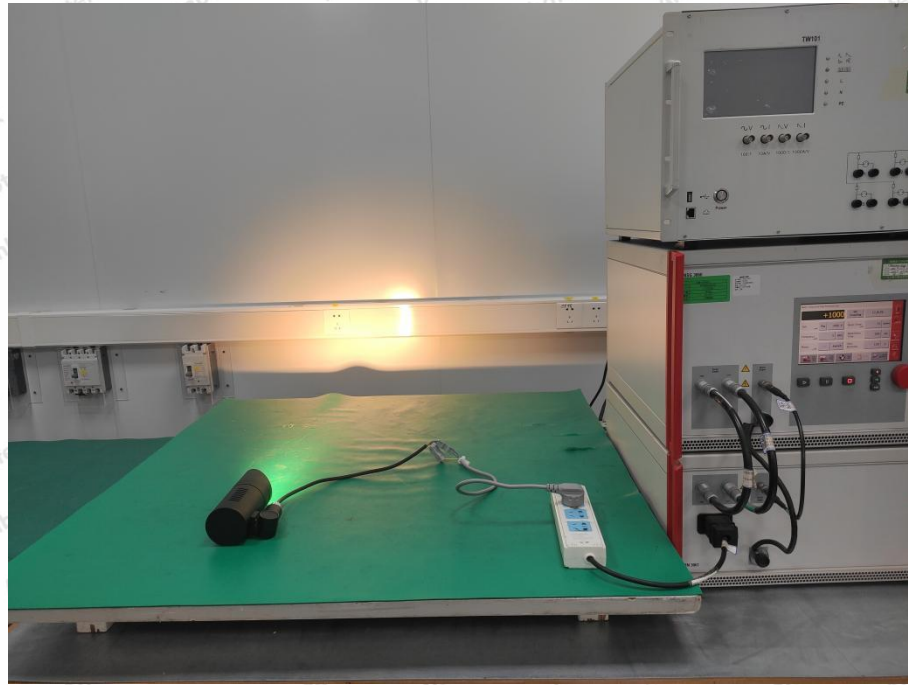


Photo of Surge Immunity Test



Photo of Injected Currents Susceptibility Test

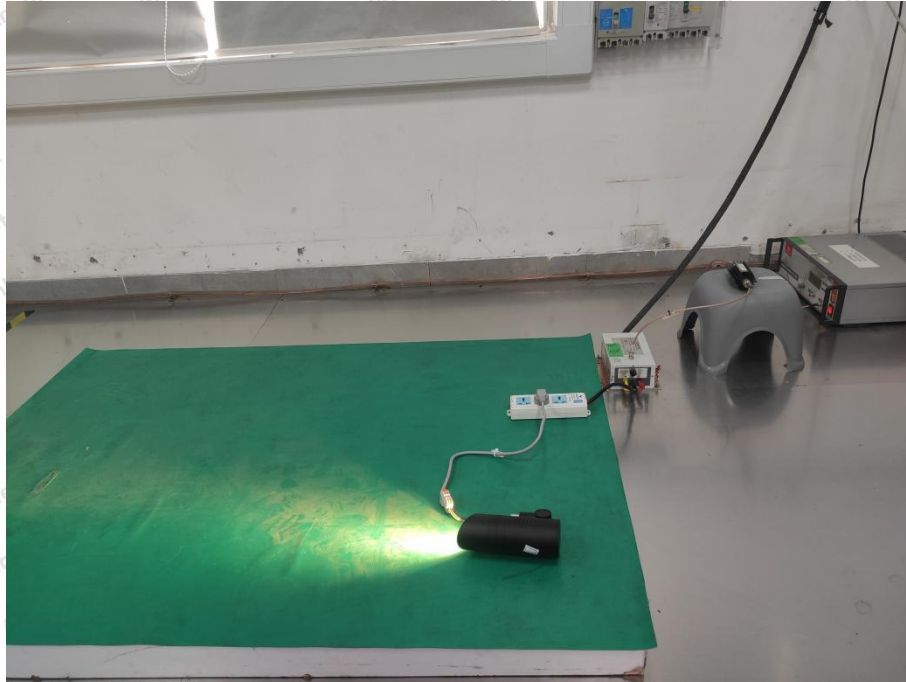
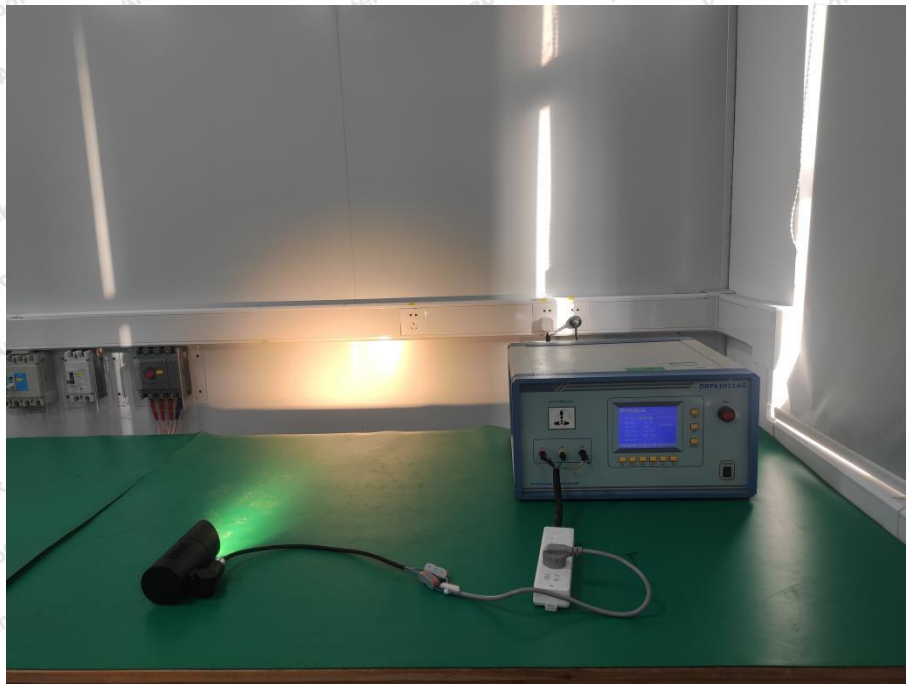


Photo of Voltage Dips and Interruptions Immunity Test



APPENDIX II -- Photo documentation

Photo 1



Photo 2

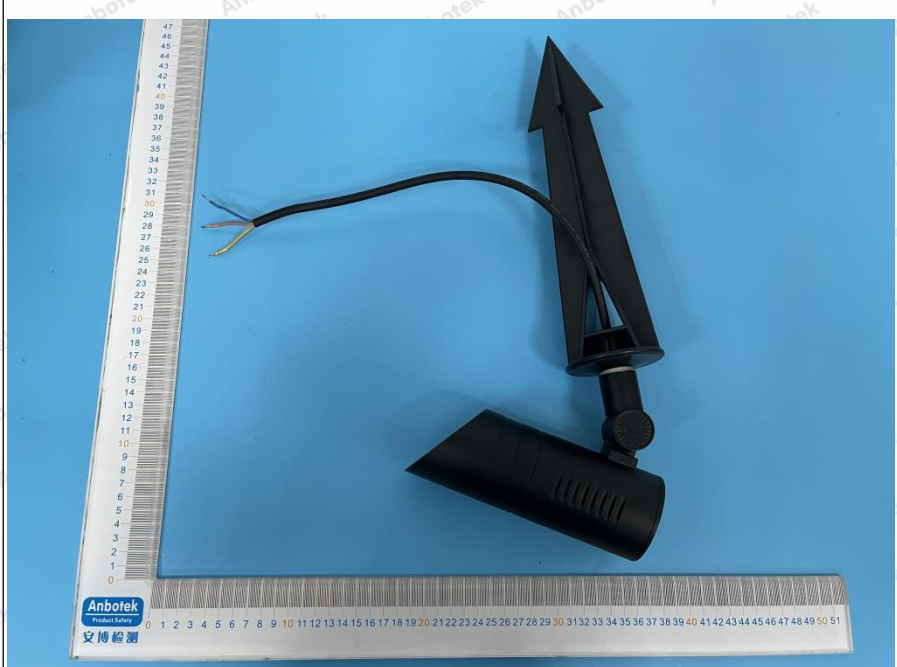


Photo 3



Photo 4



Photo 5

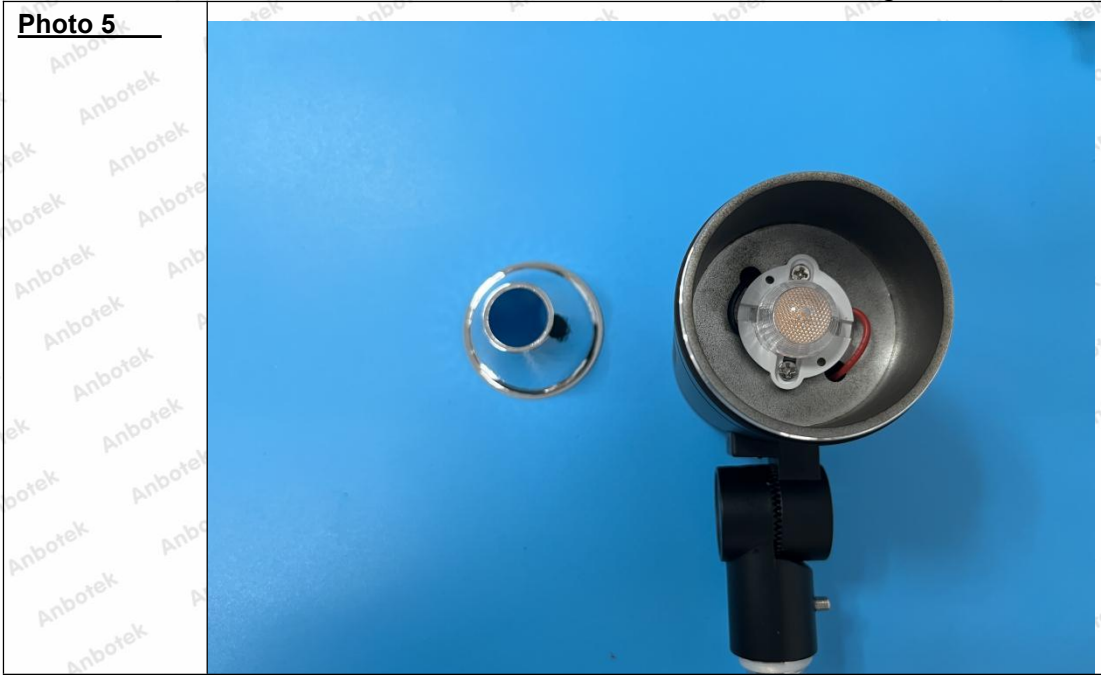


Photo 6

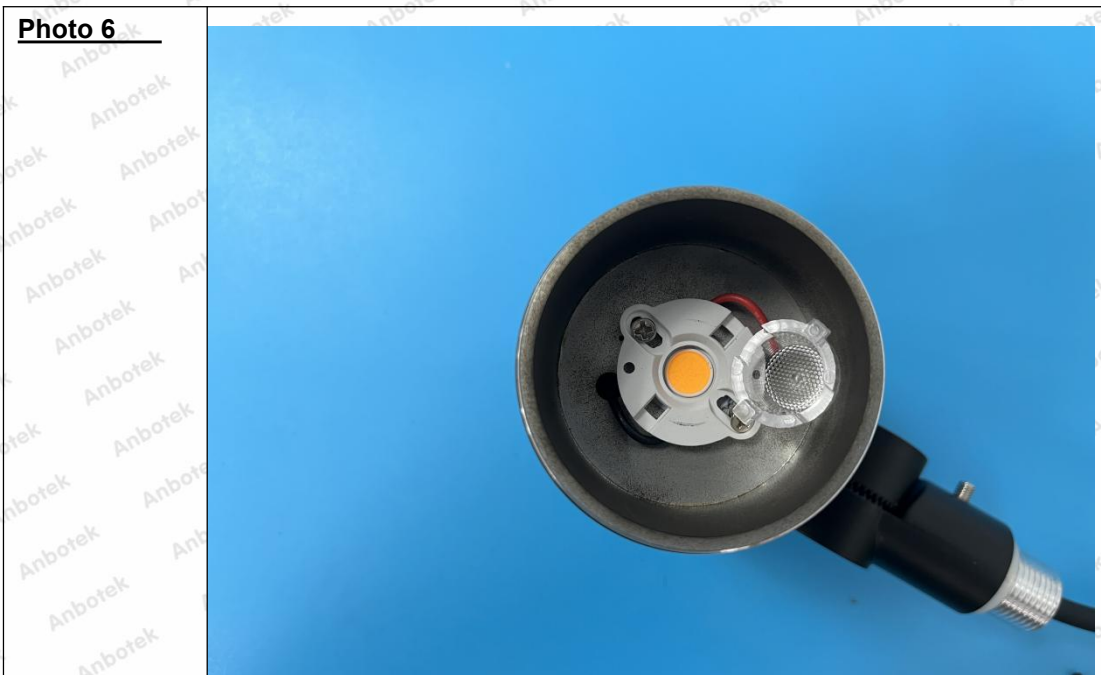


Photo 7



Photo 8

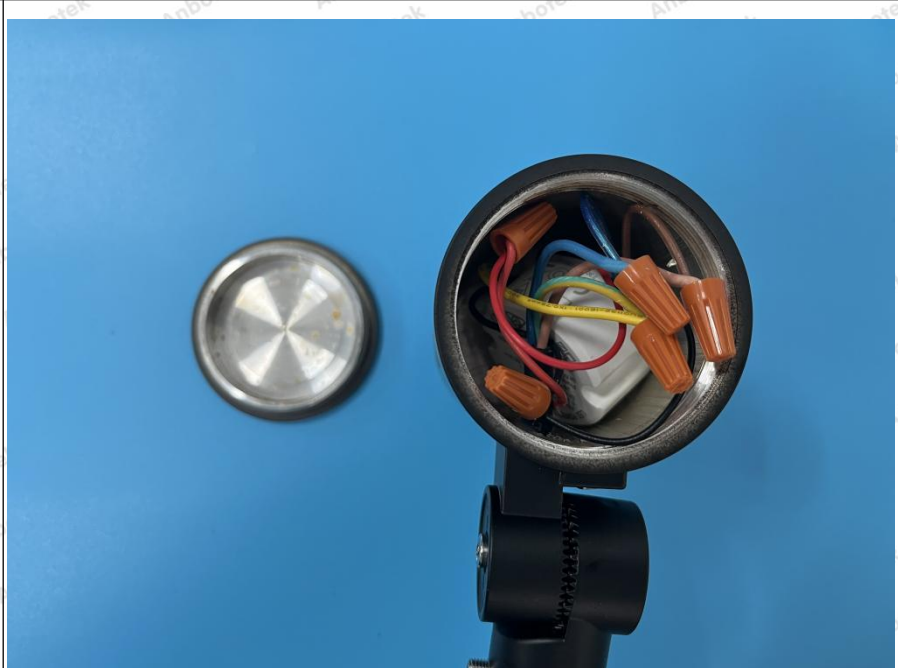
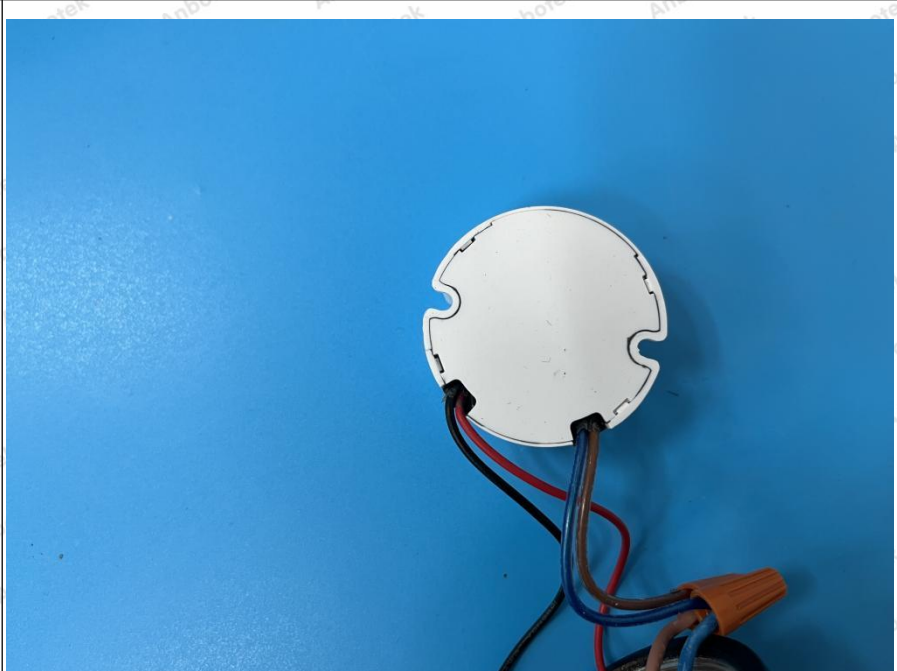


Photo 9



Photo 10



CE Label

1. The CE conformity marking must consist of the initials 'CE' taking the following form:

If the CE marking is reduced or enlarged, the proportions given in the above graduated drawing must be respected.

2. The CE marking must have a height of at least 5 mm except where this is not possible on account of the nature of the apparatus.

3. The CE marking must be affixed to the product or to its data plate. Additionally it must be affixed to the packaging, if any, and to the accompanying documents.

4. The CE marking must be affixed visibly, legibly and indelibly.

It must have the same height as the initials 'CE'.

----- End of Report -----

