EMC TEST REPORT

For

Foshan Rayven Lighting Co., Ltd.

LED Downlight

Test Model: RAVOLJ3800D

Additional Models : please refer to model list

Prepared for	:	Foshan Rayven Lighting Co., Ltd.
Address	:	A1 New Lighting Source Industry Zone, Luocun,Nanhai District, Foshan city, Guangdong province 528200, P.R. China
Prepared by	:	Shenzhen Southern LCS Compliance Testing Laboratory Ltd.
Address	:	101-201, No.39 Building, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China
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Date of receipt of test sample	:	January 02, 2024
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	January 02, 2024 - January 17, 2024
Date of Report	:	April 24, 2024

EMC TEST REPORT

BS EN IEC 55015:2019+A11:2020

Emission - Electrical lighting and similar equipment

BS EN IEC 61547:2023

Equipment for general lighting purposes - EMC immunity requirements

Report Number..... :	**LCSB03134024E**
Date of Issue..... :	April 24, 2024
Testing Laboratory Name..... :	**Shenzhen Southern LCS Compliance Testing Laboratory Ltd.**
Address..... :	101-201, No.39 Building,Xialang Industrial Zone, Heshuikou Community, Matian Street,Guangming District, Shenzhen, China.
Testing Procedure..... :	Full application of Harmonised standards ☒ Partial application of Harmonised standards ☐ Other standard testing method ☐
Applicant's Name..... :	**Foshan Rayven Lighting Co., Ltd.**
Address..... :	A1 New Lighting Source Industry Zone, Luocun,Nanhai District, Foshan city, Guangdong province 528200, P.R. China
Test Specification:	
Standard..... :	BS EN IEC 55015:2019+A11:2020 BS EN IEC 61000-3-2:2019+A1:2021 BS EN 61000-3-3:2013+A1:2019+A2:2021 BS EN IEC 61547:2023
Test Report Form No..... :	SLCSEMC-2.3
TRF Originator..... :	Shenzhen Southern LCS Compliance Testing Laboratory Ltd.
Master TRF..... :	Dated 2016-08

Equipment Under Test..... :	**LED Downlight**
Trademark..... :	Rayvenlights™
Test Model/Type..... :	RAVOLJ3800D
Rating..... :	See Model List
Results ..... :	**PASS**

Compiled by:	Supervised by:	Approved by:
Kris Mai / Engineer	Aimee Yang / Technique Director	Dm Gu / Manager

EMC - TEST REPORT

Test Report No.....: LCSB03134024E	

Applicant.....:	**Foshan Rayven Lighting Co., Ltd.**
Address.....:	A1 New Lighting Source Industry Zone, Luocun,Nanhai District, Foshan city, Guangdong province 528200, P.R. China
Telephone.....:	/
Fax.....:	/
Manufacturer.....:	**Foshan Rayven Lighting Co., Ltd.**
Address.....:	A1 New Lighting Source Industry Zone, Luocun,Nanhai District, Foshan city, Guangdong province 528200, P.R. China
Telephone.....:	/
Fax.....:	/
Factory.....:	**Foshan Rayven Lighting Co., Ltd.**
Address.....:	A1 New Lighting Source Industry Zone, Luocun,Nanhai District, Foshan city, Guangdong province 528200, P.R. China
Telephone.....:	/
Fax.....:	/

The applicant and manufacturer information, product name, model, trademark and other information in this report are all provided by the applicant, and this laboratory is not responsible for verifying its authenticity.

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the test are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. the climatic conditions during the test were in the following Limits:

Ambient temperature	15℃ - 30℃
Relative Humidity air	30% - 60%
Atmospheric pressure	86 kPa - 106 kPa

Climate values will be recorded and recorded separately if specifically required in the base standard or application product/product series standard.

POSSIBLE TEST CASE VERDICTS

Test cases does not apply to test object	N/A
Test object does meet requirement	P(Pass) / PASS
Test object does not meet requirement	F(Fail) / FAIL
Not measured	N/M

DEFINITION OF SYMBOLS USED IN THIS TEST REPORT

☒ Indicate that the conditions, standards or equipment listed is applicable to this report / test / EUT.
☐ Indicate that the conditions, standards or equipment listed is not applicable to this report / test / EUT.

REVISION HISTORY

Revision	Issue Date	Revision Content	Revised by
000	April 24, 2024	Initial Issue	-

Remark：
This report is based on the test raw-data of test original report “LCSB01024034E”.Test standard from “EN 55015,EN 61547,EN 61000-3-2,EN 61000-3-3” to “BS EN 55015, EN 61547, BS EN 61000-3-2,BS EN 61000-3-3”. other information and results contained in this report are not changed,after information review and verification, no additional tests were considered necessary.

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1. GENERAL DESCRIPTION OF THE ITEM(S)

Equipment Under Test	LED Downlight
Test Model/Type	RAVOLJ3800D
Additional Models/Type	See Model List
Description of Model difference	See Model List
Rating	See Model List

Model List:

Declared by applicant as follows:

- All models of drives use the same circuit and PCB layout.
- This report after information review and verification, the model(s) “RAVOLJ3800D” were chosen as the representative model to perform all the tests.

Model	Rating	Size(Φ *H)	Function
RAVOLJ3800B	220-240VAC, 50/60Hz, 12W/16W/20W, IP65, ta.40°C	380*80mm	Without sensor
RAVOLJ3200B	220-240VAC, 50/60Hz, 9W/12W/14W, IP65, ta.40°C	320*80mm	Without sensor
RAVOLJ3800D	220-240VAC, 50/60Hz, 12W/16W/20W, IP65, ta.40°C	380*80mm	With sensor
RAVOLJ3200D	220-240VAC, 50/60Hz, 9W/12W/14W, IP65, ta.40°C	320*80mm	With sensor
RAVOLJ3200E	220-240VAC, 50/60Hz, 12W/16W/18W, IP65, ta.40°C	320*80mm	With sensor
RAVOLI2250A	220-240VAC, 50/60Hz, 8W/13W, IP65, ta.40°C	250*65mm	With sensor
RAVOLJ3200G	220-240VAC, 50/60Hz, 9W/12W/14W, IP65, ta.40°C	320*80mm	Without sensor
RAVOLJ3800G	220-240VAC, 50/60Hz, 12W/16W/20W, IP65, ta.40°C	380*80mm	Without sensor

1.2. OPERATING MODE(S) USED OF TESTS

During the tests, the following operating mode(s) has(have) been used.

Operating Mode	Operating Mode description	Used for testing	
		Emission	Immunity
1	Lighting on mode	☐	☐
2	Charging	☒	☒
3	Discharging	☒	☒
4	Full load	☐	☐

1.3. SUPPORT / AUXILIARY EQUIPMENT FOR THE EUT

EUT has been tested using the following auxiliary equipment :

Auxeq	Model/Type	Manufacturer	Supplied by
--			

1.4. DESCRIPTION OF TEST FACILITY

Test Location	Shenzhen Southern LCS Compliance Testing Laboratory Ltd. 101-201, No.39 Building,Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China. CNAS Registration Number is L10160.
Date of receipt of test item	January 02, 2024
Date(s) of performance of test	January 02, 2024 - January 17, 2024

2. STATEMENT OF THE MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. the reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. the measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 “Specification for radio disturbance and immunity measuring apparatus and methods - Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. the manufacturer has the sole responsibility of continued compliance of the device.

Measurement	Uncertainty (U_{lab})
Conducted disturbance (9kHz - 30MHz)	± 2.80 dB
Magnetic field disturbance (9kHz - 30MHz)	± 3.46 dB
Radiated disturbance (30MHz - 200MHz)	± 4.66 dB
Radiated disturbance (200MHz - 1GHz)	± 4.64 dB

Supplementary information:

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

3. MEASURING DEVICES AND TEST EQUIPMENT

CONDUCTED DISTURBANCE						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	No. 1 shielded Room	CHENGYU	843	/	2023-04-26	2026-04-25
2	EMI Test Receiver	R&S	ESCI	101142	2023-04-26	2024-04-25
3	10dB Attenuator	SCHWARZBECK	VTSD9561-F	9561-F159	2023-04-26	2024-04-25
4	Artificial Mains Network	SCHWARZBECK	NSLK 8163	00043	2023-09-04	2024-09-03
5	Impedance Stabilization Network	SCHWARZBECK	NTFM 8158	NTFM8158#120	2023-04-26	2024-04-25
6	Voltage Probe	SCHWARZBECK	KT 9420	9420401	2023-04-26	2024-04-25
7	EMI Test Software	EZ	EZ_EMC	N/A	/	/

RADIATED DISTURBANCE (9KHz - 30MHz)						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	No. 1 shielded Room	CHENGYU	843	/	2023-04-26	2026-04-25
2	EMI Test Receiver	R&S	ESCI	101142	2023-04-26	2024-04-25
3	10dB Attenuator	SCHWARZBECK	VTSD9561-F	9561-F159	2023-04-26	2024-04-25
4	Triple-loop Antenna	EVERFINE	LLA-2	11050003	2023-04-26	2024-04-25
5	EMI Test Software	EZ	EZ_EMC	N/A	/	/

RADIATED DISTURBANCE (above 30MHz)						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2021-05-28	2024-05-29
2	EMI Test Receiver	R&S	ESCI3	101010	2023-04-26	2024-04-25
3	Log-periodic Antenna	SCHWARZBECK	VULB9163	5094	2022-05-08	2025-05-07
4	Coupling Decoupling Network	SCHWARZBECK	CDNE M2	00251	2023-04-26	2024-04-25
5	Coupling Decoupling Network	SCHWARZBECK	CDNE M3	00248	2023-04-26	2024-04-25
6	EMI Test Software	EZ	EZ_EMC	N/A	/	/
7	Controller system	SKET	SKC1000	N/A	/	/

HARMONIC CURRENT & FLICKER						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Harmonic Current and Flicker Test System	HTEC	AC2000A	/	2023-04-26	2024-04-25
2	Linear variable frequency power supply	HTEC	HHF-5010	/	2023-04-26	2024-04-25

ELECTROSTATIC DISCHARGE						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	ESD Simulator	TESEQ	NSG 437	1615	2023-03-20	2024-03-19

ELECTRICAL FAST TRANSIENT / BURST						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date

1	Electrical Fast Transient Generator	HTEC	HEFT51	162201	2023-04-26	2024-04-25
2	EFT Coupling Clamp	HTEC	H3C	163701	2023-04-26	2024-04-25

SURGE						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Surge Generator	3CTEST	SG5006G	EC5581070	2023-04-26	2024-04-25
2	Coupling / Decoupling network	3CTEST	SGN-5010G	EC5591033	2023-04-26	2024-04-25

INJECTED CURRENTS (RADIO-FREQUENCY COMMON MODE)						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	No. 2 shielded room	CHENGYU	743	/	2023-04-26	2026-04-25
2	Conducted Susceptibility Generator	HTEC	CDG6000	126A140012016	2023-04-26	2024-04-25
3	CDN	HTEC	CDN-M2+M3	A22/0382/2016	2023-04-26	2024-04-25
4	6dB attenuator	HTEC	ATT6	HA1601	2023-04-26	2024-04-25
5	Electromagnetic clamp	LUTHI	EM101	35535	2023-04-26	2024-04-25

POWER FREQUENCY MAGNETIC FIELD						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Power Frequency Mag-Field Generator System	HTEC	HPFMF100	100-2400	2023-04-26	2024-04-25

VOLTAGEDIPS AND SHORT INTERRUPTIONS						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Voltage Dips and up Generator	HTEC	HPFS161P	162202	2023-04-26	2024-04-25

RADIO-FREQUENCY ELECTROMAGNETIC FIELDS						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2023-03-02	2026-03-01
2	RF signal generator	Agilent	8648B	3847M00804	2023-03-02	2024-03-01
3	Power amplifier	SKET	LPA 0810-150	202302457	2023-03-02	2024-03-01
4	Field generating antenna	SKET	STLP 9129 Plus	/	/	/
5	Power probe	R&S	NRP-Z11	115232	2023-03-02	2024-03-01
6	Power probe	R&S	NRP-Z11	117755	2023-03-02	2024-03-01
7	Test Software	SKET	EMC-S	N/A	/	/

4. VERDICT SUMMARY SECTION

This chapter present an overview of the standards and results. Refer the next chapter for details of measured test results and applied test levels.

4.1. STANDARD(S)

BS EN IEC 55015:2019+A11:2020 - Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment.

BS EN IEC 61547:2023 - Equipment for general lighting purposes — EMC immunity requirements.

BS EN IEC 61000-3-2:2019+A1:2021 - Electromagnetic compatibility (EMC) Part 3-2: Limits for harmonic current emissions (equipment input current ≤16 A per phase).

BS EN 61000-3-3:2013+A1:2019+A2:2021 - Electromagnetic compatibility (EMC)Part 3-3: Limits for voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤16 A per phase and not subject to conditional connection.

4.2. OVERVIEW OF RESULTS

EMISSION TESTS - BS EN IEC 55015, BS EN IEC 61000-3-2, BS EN 61000-3-3		
Requirement - Test case	**Limit**	**Verdict**
Conducted Disturbance - electric power supply	Table 1, Table 4	PASS
Conducted Disturbance - wired network ports at other than power supply	Table 2, Table 3	N/A
Conducted Disturbance - local wired ports at other than electrical power supply interface of ELV lamp	Table 5, Table 6	N/A
Assessment of the enclosure port	---	---
Radiated Disturbance in the frequency range 9 kHz to 30 MHz	Table 8, Table 9	PASS
Radiated Disturbance in the frequency range 30 MHz to 1 GHz	Table 10	PASS
Harmonic Current	Clause 7	PASS
Voltage Fluctuations and Flicker [2]	Clause 5	N/A
IMMUNITY TESTS - BS EN IEC 61547		
Requirement - Test case	**Basic Standard(s)**	**Verdict**
Electrostatic Discharge	BS EN 61000-4-2	PASS
Radio-Frequency Electromagnetic Fields	BS EN 61000-4-3	PASS
Electrical Fast Transient / Burst	BS EN 61000-4-4	PASS
Surge	BS EN 61000-4-5	PASS
Injected Currents (Radio-Frequency Common Mode)	BS EN 61000-4-6	PASS
Power Frequency Magnetic Field [1]	BS EN 61000-4-8	N/A
Voltage Dips and Short Interruptions	BS EN 61000-4-11	PASS

Supplementary information:

1) Only need to be applied to equipment containing components susceptible to magnetic fields.

2) According to BS EN 61000-3-3:2013+A1:2019+A2:2021 Clause A.2, Incandescent lamp luminaires with ratings less than or equal to 1000W and discharge and LED lamp luminaires with ratings less than or equal to 600W, are deemed to comply with the standard and are not required to be tested.

5. EMISSION TESTS

5.1. CONDUCTED DISTURBANCE

Standard	BS EN IEC 55015:2019+A11:2020
Basic Standard(s)	CISPR 16-2-1

Disturbance voltage limits at the electric power supply interface

Frequency range [MHz]	Limit: Quasi-peak [dB(μV)]	Limit: Average[dB(μV)]	IF BW
0,009 - 0,05	110	N/A	200 Hz
0,05 - 0,15	90 - 80	N/A	200 Hz
0,15 - 0,5	66 - 56	56 - 46	9 kHz
0,5 - 5,0	56	46	9 kHz
5,0 - 30	60	50	9 kHz

1) At the transition frequency, the lower limit applies.
2) The limit decreases linearly with the logarithm of the frequency in the ranges 50 kHz to 150 kHz and 150 kHz to 0,5 MHz.
3) If the EUT is non-restricted ELV lamps, the limits add 26dB.

Disturbance voltage limits at wired network interfaces other than power supply

Frequency range [MHz]	Limit: Quasi-peak [dB(μV)]	Limit: Average[dB(μV)]	IF BW
0,15 - 5,0	84 - 74	74 - 64	9 kHz
5,0 - 30	74	64	9 kHz

1) The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.
2) The disturbance voltage limits are derived for use with an artificial asymmetrical network (AAN) which presents a common mode (asymmetric mode) impedance of 150 Ω to the measured interface.

Disturbance current limits at wired network interfaces other than power supply

Frequency range [MHz]	Limit: Quasi-peak [dB(μA)]	Limit: Average[dB(μA)]	IF BW
0,15 - 5,0	40 - 30	30 - 20	9 kHz
5,0 - 30	30	20	9 kHz

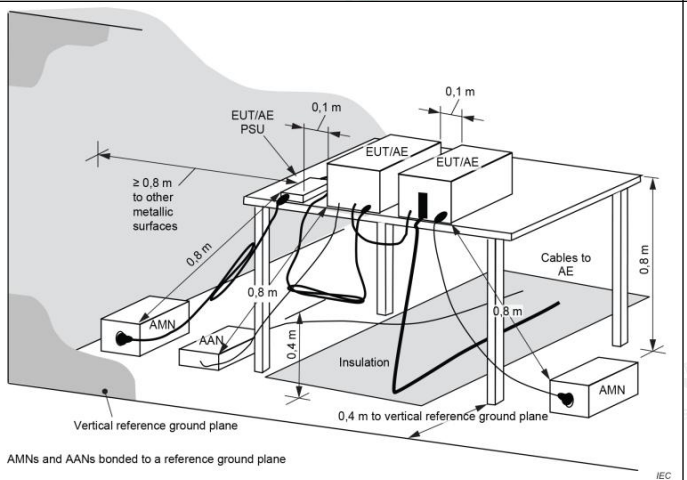
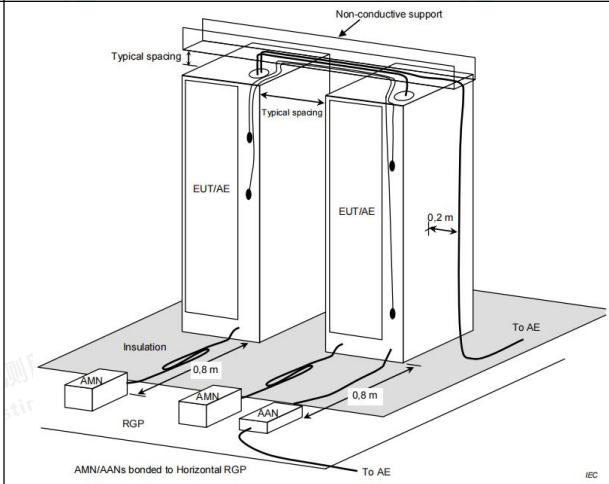
1) The limits decrease linearly with the logarithm of the frequency in the range 0.15MHz to 0.5 MHz.

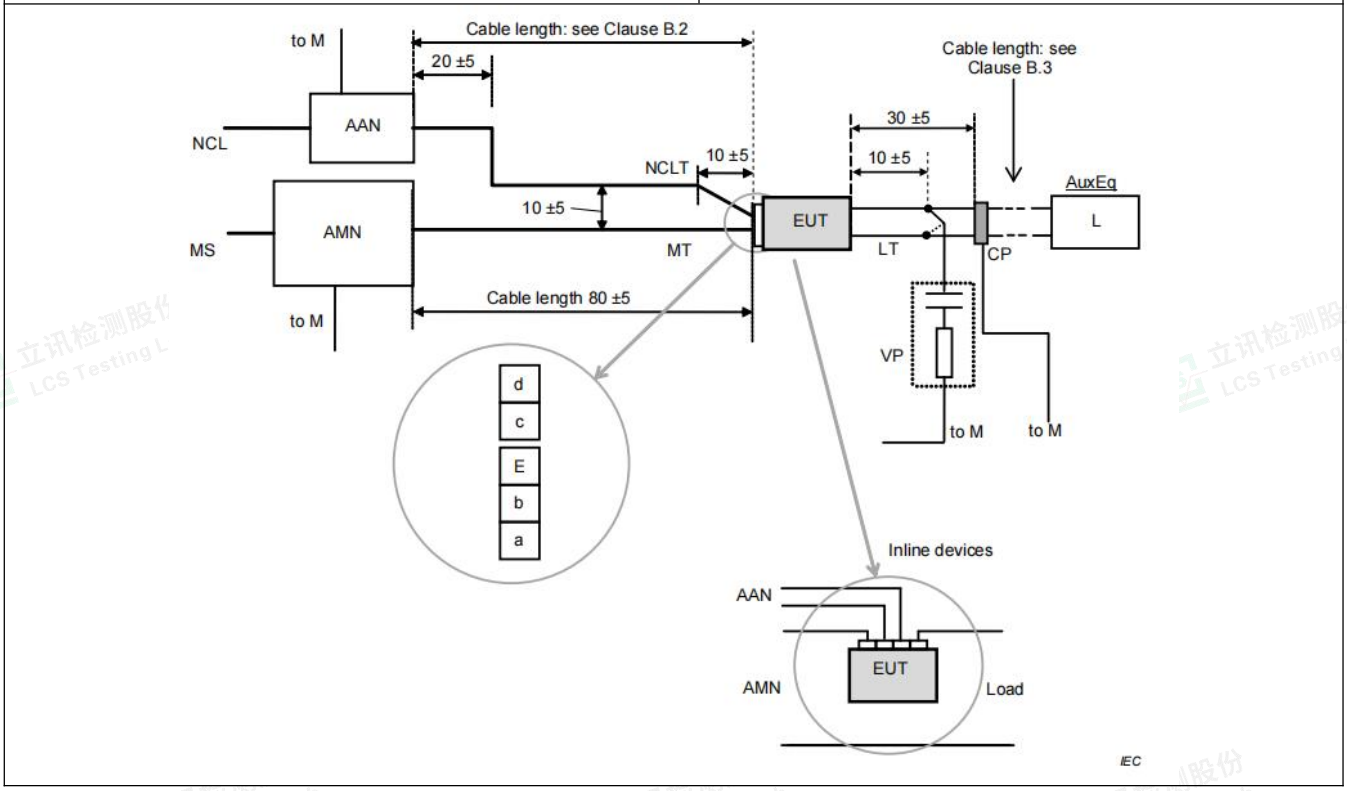
Disturbance voltage limits at local wired ports: local wired ports other than electrical power supply interface of ELV lamp

Frequency range [MHz]	Limit: Quasi-peak [dB(μV)]	Limit: Average[dB(μV)]	IF BW
0,15 - 5,0	80	70	9 kHz
5,0 - 30	74	64	9 kHz

1) At the transition frequency, the lower limit applies.

Test configuration

Test Setup for table-top	Test Setup for Floor standing
	



Test Procedure Description

For Table-top, EUT shall be placed at (0,8 ± 0,05) m above the reference plane of the test site selected for measurement. for Floor standing, EUT shall be placed at (0,12 ± 0,04) m above the reference plane of the test site selected for measurement.
and connected to the AC mains through artificial mains network (LISN). EUT is powered by V-type artificial power network,and the distance from LISN or ANN is 0,8m. the part of the EUT power cord exceeding 0,8m folds in parallel to form a 0,3-0,4 m eights harness.

Test Results refer to Annex A.1

5.2. RADIATED DISTURBANCE (9KHz - 30MHz)

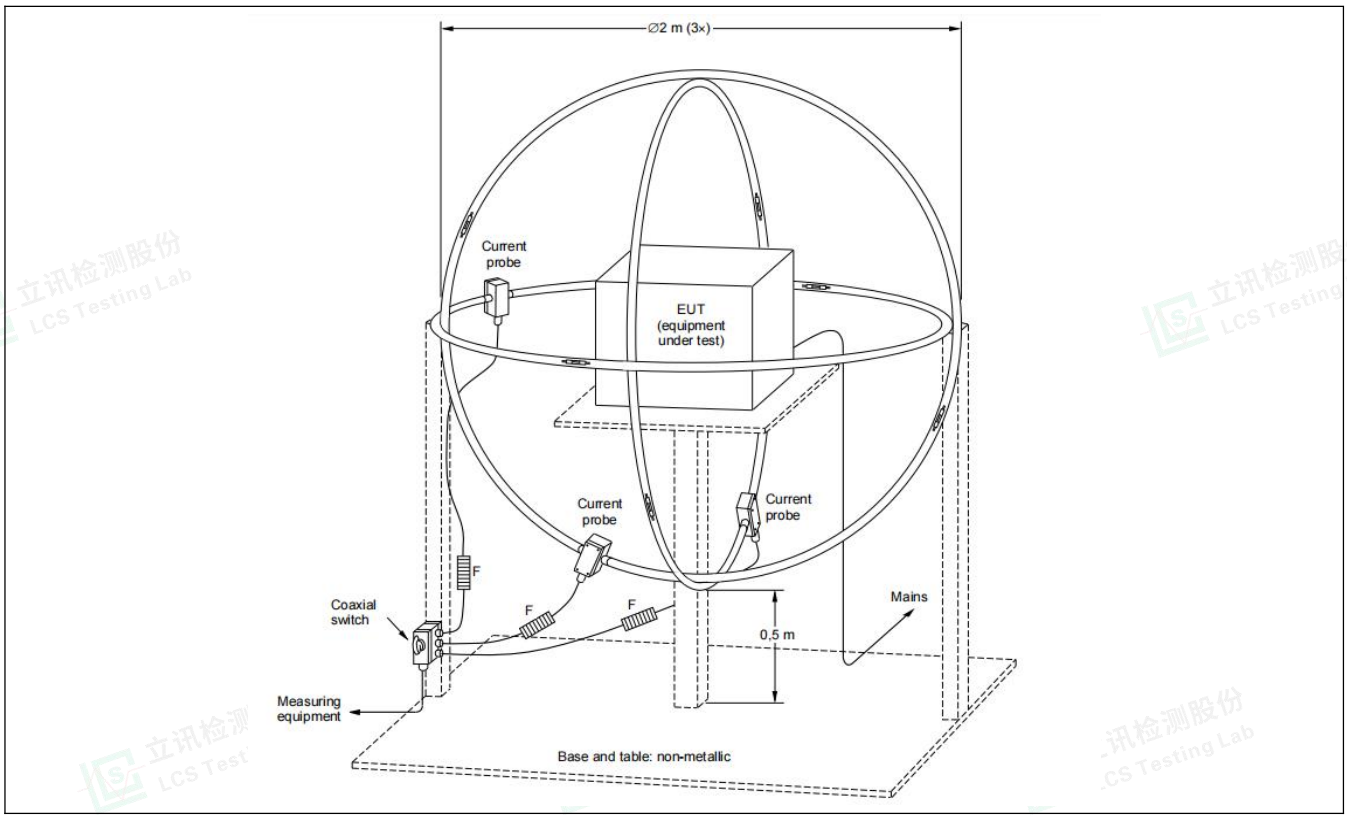
Standard	BS EN IEC 55015:2019+A11:2020
Basic Standard(s)	CISPR 16-2-3
Test method	Large Loop Antenna (LLA)

LLAS Radiated disturbance limits (2m)

Frequency range [MHz]	Limit: Quasi-peak [dB(μA)]	IF BW
0,009 - 0,07	88	200 Hz
0,07 - 0,15	88 - 58	200 Hz
0,15 - 3,0	58 - 22	9 kHz
3,0 - 30	22	9 kHz

1) At the transition frequency the lower limit applies.
2) Decreasing linearly with logarithm of the frequency.

Test configuration



Test Procedure Description

The EUT is placed on a wood table in the center of a loop antenna. the induced current in the loop antenna is measured by means of a current probe and the test receiver. Three field components are checked by means of a coaxial switch.

Test Results refer to Annex A.2

5.3. RADIATED DISTURBANCE (30MHz - 1GHz)

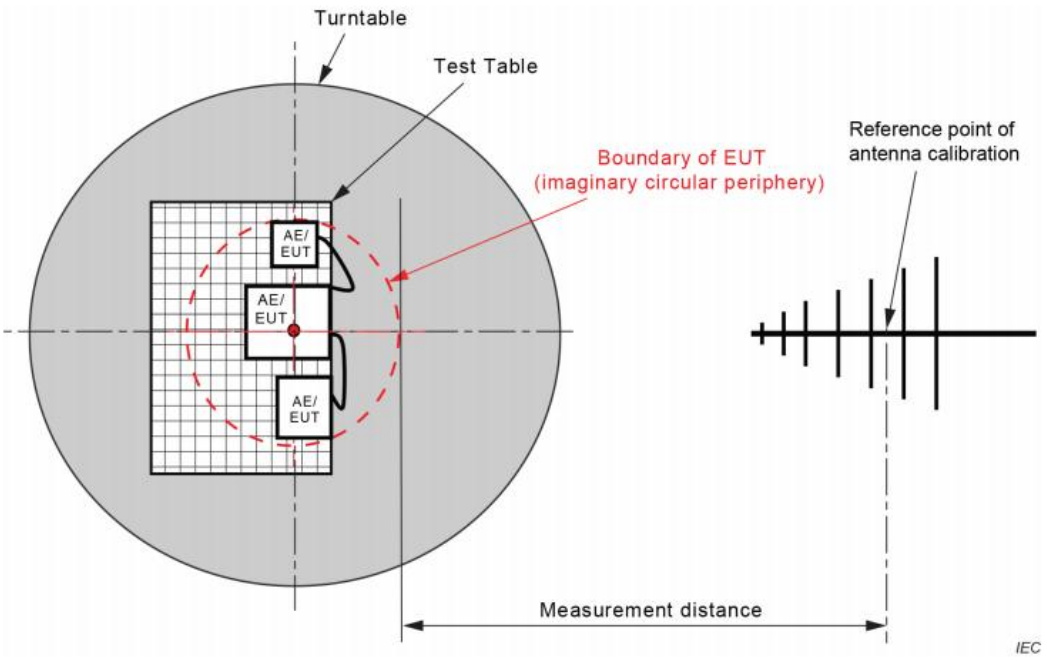
Standard	BS EN IEC 55015:2019+A11:2020
Basic Standard(s)	CISPR 16-2-3
Test method	Semi Anechoic Chamber (SAC)

SAC Radiated disturbance limit

Frequency range [MHz]	Limit: Quasi-peak [dB(μV/m)]		IF BW
	3 m distance	10 m distance	
30 - 230	40	30	120 KHz
230 - 1000	47	37	120 KHz

1) At the transition frequency, the lower limit applies.
2) Distance refers to the distance in meters between the measuring instrument antenna geometric center and the closed point of any part of the EUT.

Test configuration



Test Procedure Description

The radiated disturbance test was conducted in a 3m Semi Anechoic Chamber and conforming to CISPR 16-2-3. the EUT is placed on a turntable, which is 0.8 meter high above the ground. the turntable can rotate 360 degrees to determine the position of the maximum emission level. the EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower. the antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Log-periodic Antenna (calibrated by Dipole antenna) is used as a receiving antenna. both horizontal and vertical polarization of the antenna is set on test.

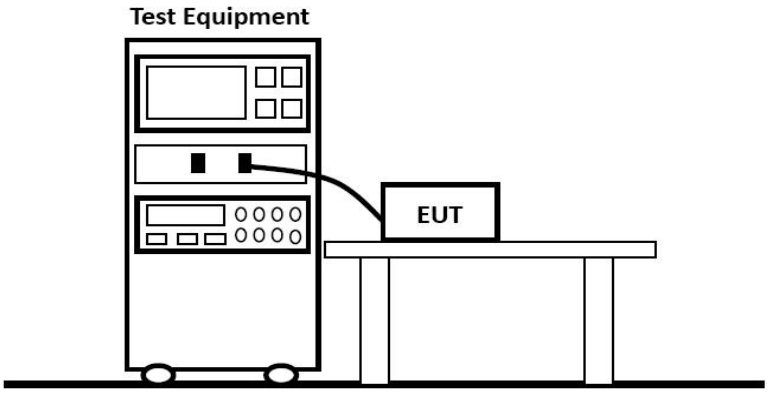
Test Results refer to Annex A.3

5.4. HARMONIC CURRENT

Standard	BS EN IEC 61000-3-2:2019+A1:2021	
Exlusions (For these categories of equipment, limits are not specified in the BS EN IEC 61000-3-2)	☐	Systems with nominal voltages less than 220VAC (line-to-neutral)
	☐	Lighting equipment with rated power < 5 W
	☐	Equipment with rated power of ≤ 75 W (other than lighting equipment)
	☐	Professional equipment with a total rated power >1kW
	☐	Symmetrically controlled heating elements with rated power ≤ 200 W
	☐	Independent dimmers for incandescent lamps with rated power ≤ 1kW

Classification				
☐	Class A	All equipment not specified as belonging to Class B, C or D		
☐	Class B	Portable tools		
☒	Class C	☐	Lighting equipment with active input power > 25W	
		☒	Lighting equipment with active input power ≥ 5W and ≤ 25W	
			☐	Table 3, column 2 (Power-related limits)
			☐	3rd harmonic ≤ 86%, 5th harmonic ≤ 61% and waveform conditions
			☒	THD ≤ 70%, Harmonic:3rd ≤ 35%, 5th ≤ 25%, 7th ≤ 30%, 9th and 11th ≤ 20%, 2nd ≤ 5%
☐	Class D	Personal computers, television receivers,refrigerators and freezers having one or more variable-speed drives to control compressor		

Test configuration



Test Results refer to Annex A.4

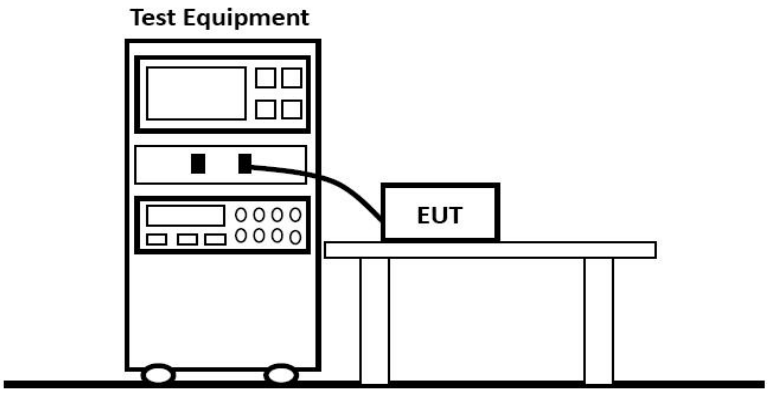
5.5. VOLTAGE FLUCTUATIONS & FLICKER

Standard	BS EN 61000-3-3:2013+A1:2019+A2:2021

Limit

P_{st} (Short term flicker)	☐	≤ 1	☒	Not applicable
P_{lt} (Long-term flicker)	☐	≤ 0,65	☒	Not applicable
T_{max} (Accumulated time)	☐	≤ 500 ms	☒	Not applicable
d_c (Relative voltage change)	☐	≤ 3.3%	☒	Not applicable
d_{max} (Max.voltage change)	☐	≤ 4%	☐	≤ 6%
	☐	≤ 7%	☒	Not applicable

Test configuration



6. IMMUNITY TESTS

6.1. PERFORMANCE CRITERIA

Standard	BS EN IEC 61547:2023

For the various immunity tests that apply, the performance of the following functions shall be assessed, as far as applicable or specified by the manufacturer:

– the luminous intensity of the luminaire or of the light source(s);

– the control function, for example on/off switching, light level setting, colour adjustment, wireless control.

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

Performance criterion B: during the test, the luminous intensity may change to any value. after the test, the luminous intensity shall be restored to its initial value within 1 min(30 min for high pressure gas discharge lamps) regulating controls need not function during the test, but after the test, the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given.

Performance criterion C: during and after the test, any change of the luminous intensity is allowed and the lamp(s) may be extinguished. after the test, within 30 min, all functions shall return to normal, if necessary by temporary interruption of the mains supply and / or operating the regulating control.

Electronic lighting equipment		Tests and performance criteria							
		5.2 (ESD)	5.3 (RS)	5.4 (PFMF)	5.5 (EFT)	5.6 (CS)	5.7 (Surge)	5.8 (Dips)	5.8 (Interruption)
☐	Self-ballasted lamps	B	A	A	B	A	C	B	B
☐	Lighting equipment (excluding self-ballasted lamps) Module in host	B	A	A	B	A	C	B	B[1]
☒	Luminaire for emergency lighting	B[2]	A	A	B[2]	A	B[2]	See[3]	See[3]

Supplementary information:

1) For ballasts where the lamp is not able to restart within 1 min, due to the physical constraints of the lamp, performance criterion C applies.

2) Luminaires for emergency lighting shall be tested in both the normal and emergency mode of operation.

3) These tests do not apply as they are covered by the test in IEC 60598-2-22.

4) For emergency luminaires designed to operate in high-risk task areas, after the test, the luminous intensity shall be restored to its initial value within 0,5 s.

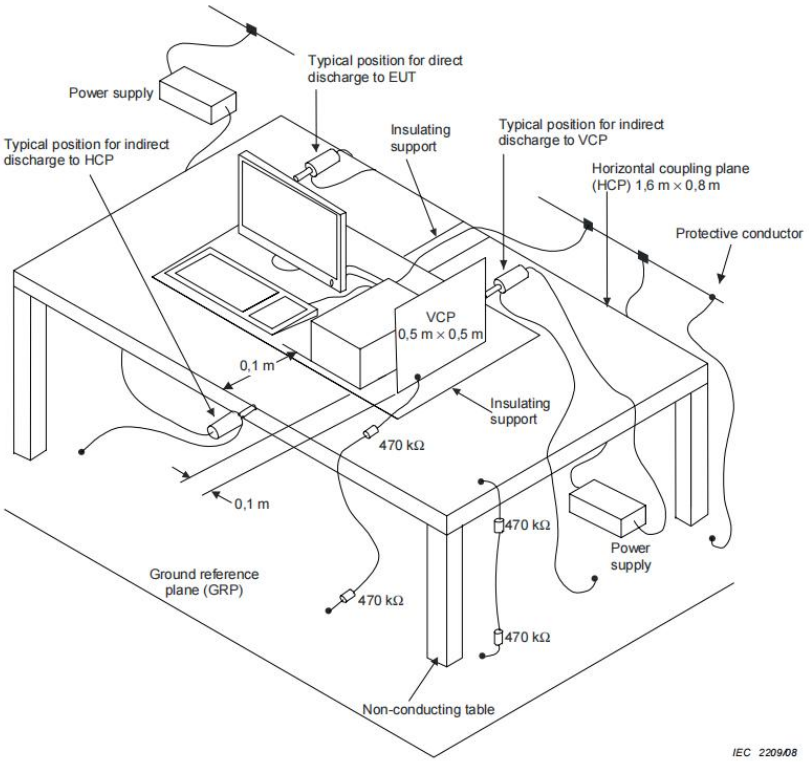
6.2. ELECTROSTATIC DISCHARGE

Electrostatic discharge (ESD) is the result of accumulated static electricity from a person or object, for example, walking on a synthetic carpet. ESD can indirectly affect the operation of equipment or damage its electronic components through direct discharge or coupling. both effects were simulated during the test. contact discharge is the preferred test method. twenty discharges (10 with positive and 10 with negative polarity) shall be applied on each accessible metallic part of the enclosure (terminals are excluded). air discharges shall be used where contact discharges cannot be applied. discharges shall be applied on the horizontal or vertical coupling planes.

Requirements

Standard	BS EN IEC 61547:2023							
Basic standard	BS EN 61000-4-2							
Port under test	Enclosure							
Contact discharge	☒	± 2 kV	☒	± 4 kV	☐	±8 kV	☐	±15 kV
Air discharge	☒	± 2 kV	☒	± 4 kV	☒	±8 kV	☐	±15 kV
Number of discharges	≥ 10 per polarity with ≥ 1 sec interval							
Note : Road and street lighting equipment shall be tested for air discharge at ±15 kV and for contact discharge at ±8 kV. This is to simulate the phenomenon of static charging during thunderstorms.								

Test configuration



Test Results refer to Annex A.5

6.3. RADIO-FREQUENCY ELECTROMAGNETIC FIELDS

During the test it is verified if the EUT has sufficient immunity against radiated electromagnetic fields.

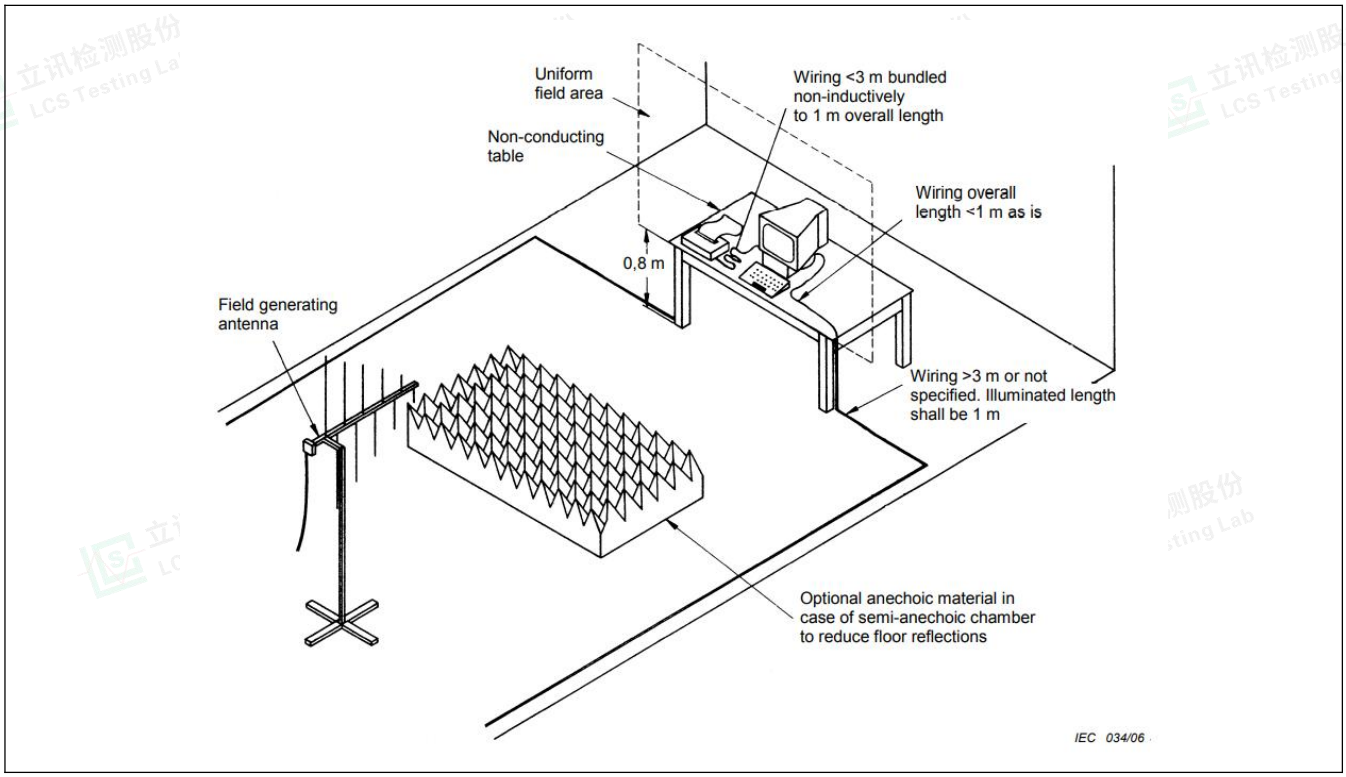
The test was carried out in a half-wave anechoic chamber with absorbent material attached to a reflective ground plate, Before the test, the test field strength needs to be calibrated. during the calibration, the corresponding relationship between the target field strength and the forward power applied to the transmitting antenna is established.during the test, except for EUT, the indoor layout is consistent with the calibration.

The EUT and its simulators are placed on a turn table which is 0,8 meter above ground. EUT is set 3 meter away from the transmitting antenna which is mounted on an antenna tower. both horizontal and vertical polarization of the antenna are set on test. each of the four sides of EUT must be faced this transmitting antenna and measured individually. in order to judge the EUT performance, a CCD camera is used to monitor EUT screen.

Requirements

Standard	BS EN IEC 61547:2023			
Basic standard	BS EN 61000-4-3			
Port under test	Enclosure			
Frequency range	Test level	Modulation	Dwell time	Step size
80 - 1000 MHz	3 V/m	1 kHz, 80 % AM	≥ 0,5 s	≤ 1%

Test configuration



Test Results refer to Annex A.5

6.4. ELECTRICAL FAST TRANSIENT / BURST

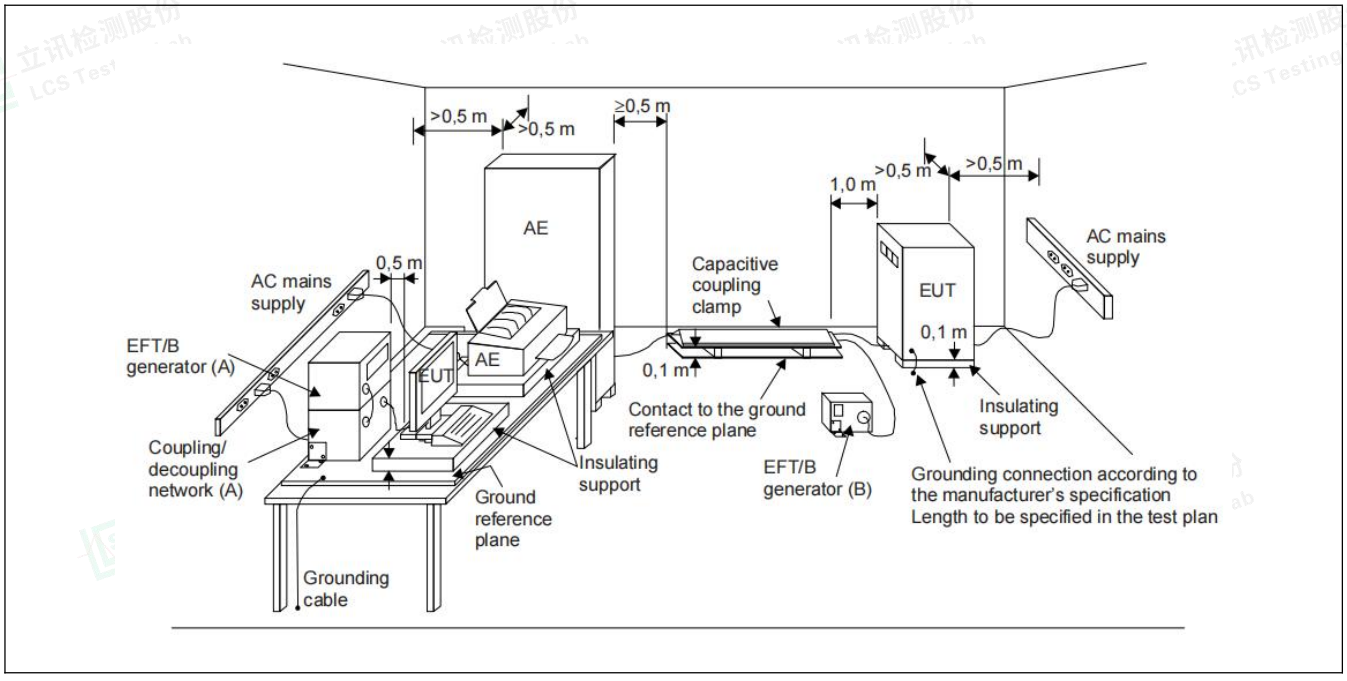
The EFT immunity test simulates the disturbances by caused of very short transient bursts.

The EUT is put on the Insulating support which is 0.1 meter high above the ground reference plane. the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5 m. both polarities of the test voltage should be applied during test, fast transients are carried out with a minimum duration of 2 min with a positive polarity and a minimum of 2 min with a negative polarity.

Requirements

Standard		BS EN IEC 61547:2023		
Basic standard		BS EN 61000-4-4		
Pulse characteristics		5/50 ns		
Port under test		Test level	Repetition frequency	Duration
☒	AC input / output power	± 1000 V	5 kHz	2 min / polarity
☐	DC input / output power ²	± 500 V	5 kHz	2 min / polarity
☐	Signal / control lines and load¹ ports	± 500 V	5 kHz	2 min / polarity
1) Only applicable to ports interfacing with cables whose whose total length may exceed 3 m. 2) Not applicable to equipment not connected to the mains while in use.				

Test configuration



Test Results refer to Annex A.5

6.5. INJECTED CURRENTS (RADIO-FREQUENCY COMMON MODE)

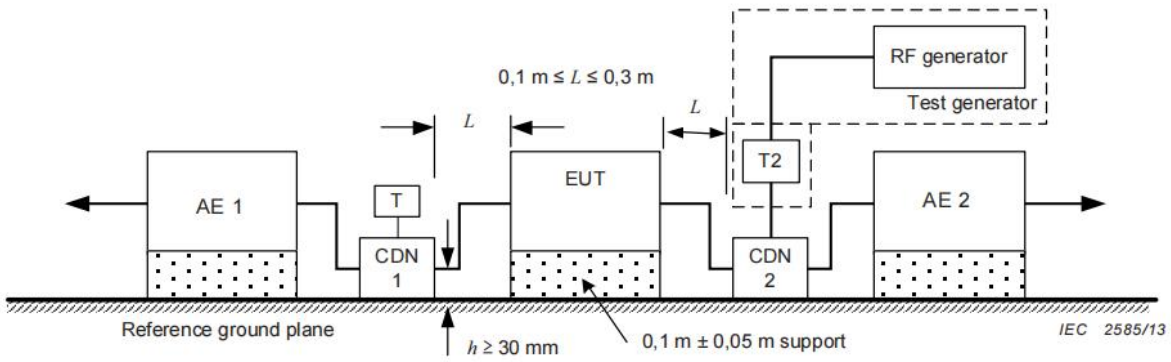
During the test the immunity of the EUT for conducted electromagnetic fields is checked .

The equipment to be tested is placed on an insulating support of 0,1 m ± 0,05 m height above a reference ground plane. a non conductive roller / caster in the range of 0,1 m ± 0,05 m above the reference ground plane can be used as an alternative to an insulating support. all cables exiting the EUT shall be supported at a height of at least 30 mm above the reference ground plane.The coupling and decoupling devices shall be placed on the reference ground plane, making direct contact with it at a distance of 0,1 m to 0,3 m from the EUT.

Requirements

Standard		BS EN IEC 61547:2023			
Basic standard		BS EN 61000-4-6			
Frequency range		0,15 - 80 MHz			
Port under test		Test level	Modulation	Dwell time	Step size
☒	AC input / output power	3 V	1 kHz, 80 % AM	≥ 0,5 s	≤ 1%
☐	DC input / output power [1] [2]	3 V	1 kHz, 80 % AM	≥ 0,5 s	≤ 1%
☐	Signal / control line [2]	3 V	1 kHz, 80 % AM	≥ 0,5 s	≤ 1%
1) Not applicable to equipment not connected to the mains while in use. 2) Only applicable to ports interfacing with cables whose whose total length may exceed 3 m.					

Test configuration



Test Results refer to Annex A.5

6.6. SURGE

The surge immunity test is simulates unidirectional surges caused by overvoltages from switching and lightning transients.

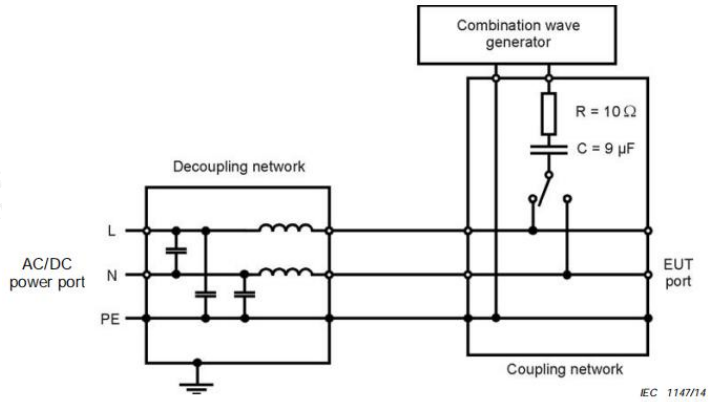
The surge is applied to the EUT power supply terminal via the capacitive coupling network, to the EUT power supply provide a 1,2/50us voltage surge (at open-circuit condition), at least 5 positive and 5 negative tests with 1 min or less repetition rate are conducted during test. and phase angles is 90°and 270°.

Requirements

Standard		BS EN IEC 61547:2023			
Basic standard		BS EN 61000-4-5			
Pulse wave-shape		1,2/50 µs			
Repetition rate		1 per minute or faster			
Number of pulses		5 pulses (at each polarity and phase angles)			
Classification		Port under test	Test Level	Coupling	Phase angle
☒	Lighting equipment (except self ballasted lamps ≤ 25 W)	AC input power	+ 1 kV	line - line	90°
			- 1 kV	line - line	270°
			+ 2 kV	line - ground	90°
			- 2 kV	line - ground	270°
☐	Self-ballasted lamps ≤ 25 W	AC input power	+ 0,5 kV	line - line	90°
			- 0,5 kV	line - line	270°
			N/A	line - ground	N/A
			N/A	line - ground	N/A

1) In addition to the specified test level, all lower test levels as detailed in EN 61000-4-5 should also be satisfied.
2) Road and street lighting equipment shall comply with ±2,0 kV line to line and ±4,0 kV line to ground voltages.

Test configuration



Test Results refer to Annex A.5

6.7. VOLTAGE DIPS AND SHORT INTERRUPTIONS

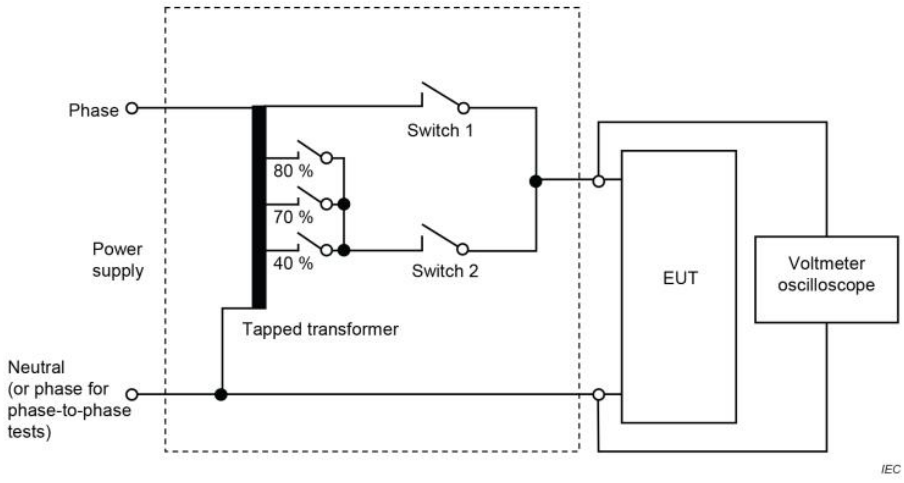
The surge immunity test is simulates Voltage dips and short interruptions occur due to faults in a (public or non-public) network or in installations by sudden changes of large loads.

The EUT shall be connected to the test generator for testing using the shortest power cable specified by the EUT manufacturer and, if no cable length is specified, the shortest cable suitable for the EUT, each representative mode of operation shall be tested. for short interruptions to use 0° for one of the phases.

Requirements

Standard	BS EN IEC 61547:2023		
Basic standard	BS EN 61000-4-11		
# of dips / interruptions	3 dips / interruptions for each test level and phase angle		
Intervals between events	≥ 10 s		
Port under test	Test level [1]	Number of periods (cycles)	
		50Hz	60Hz
AC input power	70% of U_{NOM}	10	12
	0% of U_{NOM}	0,5	0,5
1) Where the equipment has a rated voltage range 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 the 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.			

Test configuration

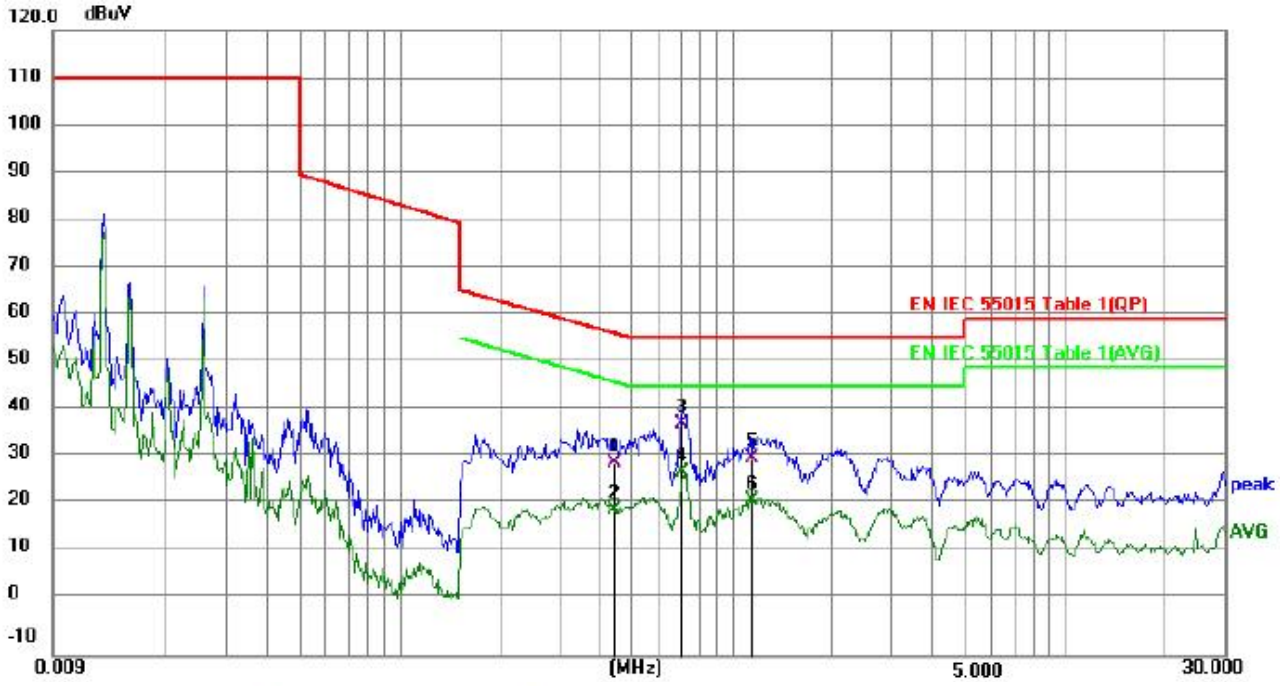


Test Results refer to Annex A.5

ANNEX A - TEST RESULTS

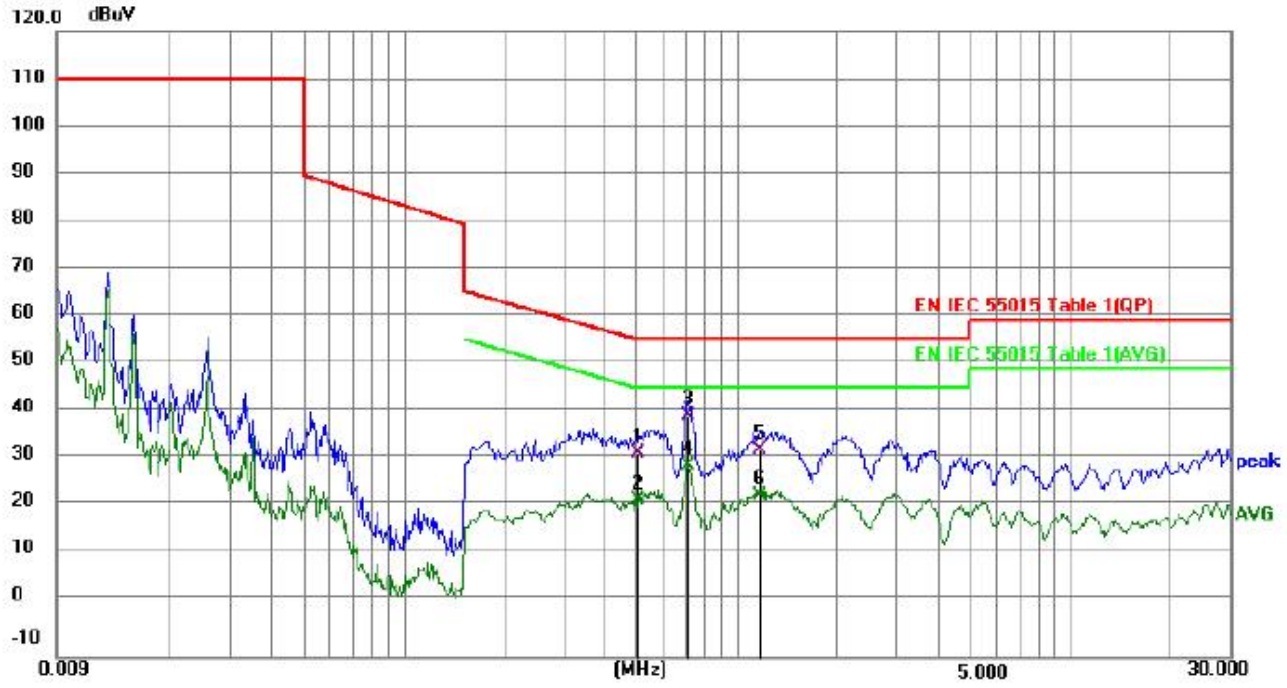
A.1. CONDUCTED DISTURBANCE TEST RESULTS

Environmental Conditions	24.3℃, 51% RH
Model	RAVOLJ3800D
Operating mode	Mode 2
Test voltage	AC 230V,50Hz
Test engineer	ZOM ZHANG
Pol	Line



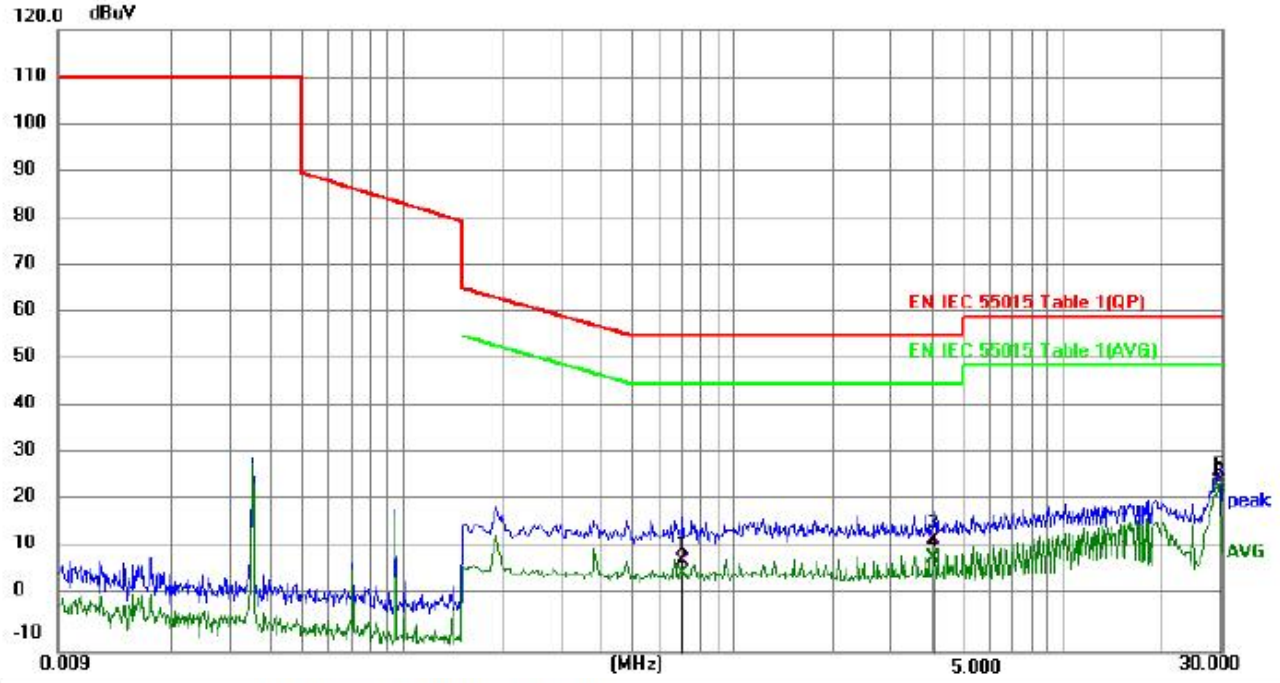
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.4411	19.84	10.35	30.19	57.04	-26.85	QP	
2		0.4411	10.02	10.35	20.37	47.04	-26.67	AVG	
3	*	0.7102	28.04	10.37	38.41	56.00	-17.59	QP	
4		0.7102	17.66	10.37	28.03	46.00	-17.97	AVG	
5		1.1363	20.60	10.38	30.98	56.00	-25.02	QP	
6		1.1363	12.06	10.38	22.44	46.00	-23.56	AVG	

Environmental Conditions	24.3℃, 51% RH
Model	RAVOLJ3800D
Operating mode	Mode 2
Test voltage	AC 230V,50Hz
Test engineer	ZOM ZHANG
Pol	Neutral



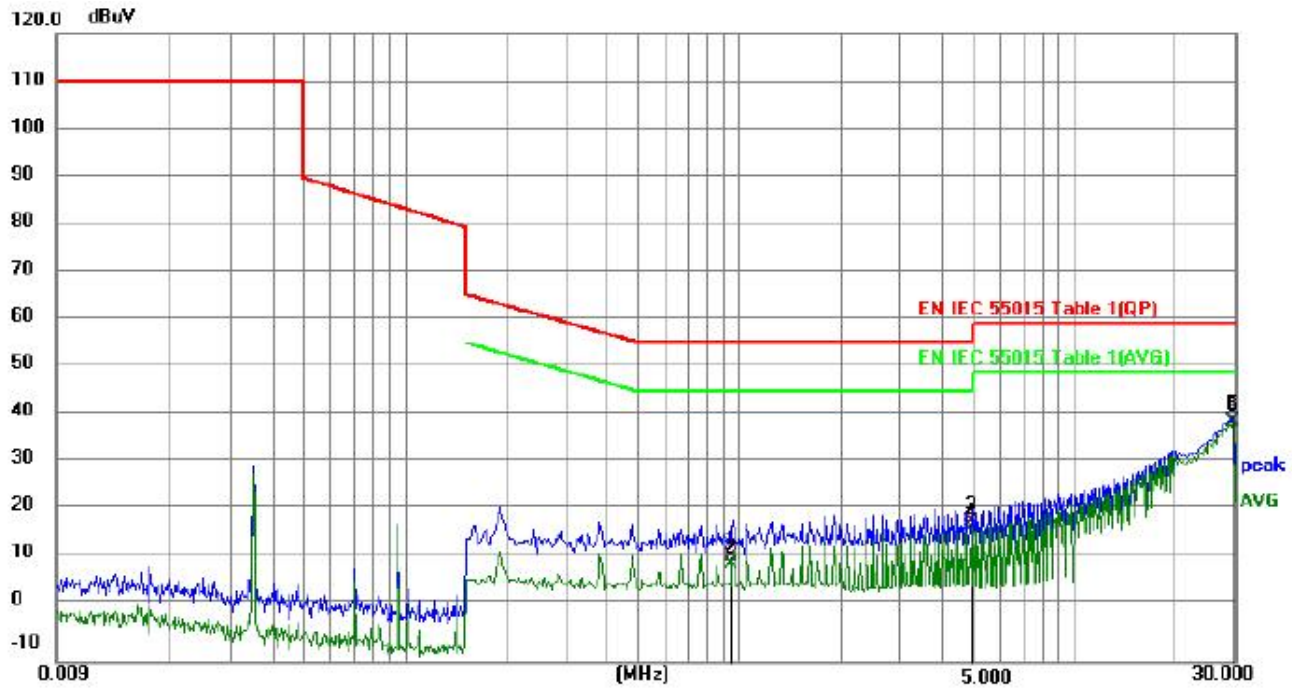
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.5024	22.05	10.37	32.42	56.00	-23.58	QP	
2		0.5024	12.27	10.37	22.64	46.00	-23.36	AVG	
3	*	0.7137	29.97	10.37	40.34	56.00	-15.66	QP	
4		0.7137	19.51	10.37	29.88	46.00	-16.12	AVG	
5		1.1701	22.59	10.38	32.97	56.00	-23.03	QP	
6		1.1701	13.22	10.38	23.60	46.00	-22.40	AVG	

Environmental Conditions	24.3℃, 51% RH
Model	RAVOLJ3800D
Operating mode	Mode 3
Test voltage	DC
Test engineer	ZOM ZHANG
Pol	Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.7056	-1.33	10.37	9.04	56.00	-46.96	QP	
2		0.7056	-4.03	10.37	6.34	46.00	-39.66	AVG	
3		4.0772	3.08	10.48	13.56	56.00	-42.44	QP	
4		4.0772	-0.74	10.48	9.74	46.00	-36.26	AVG	
5		29.7875	14.48	11.13	25.61	60.00	-34.39	QP	
6	*	29.7875	13.29	11.13	24.42	50.00	-25.58	AVG	

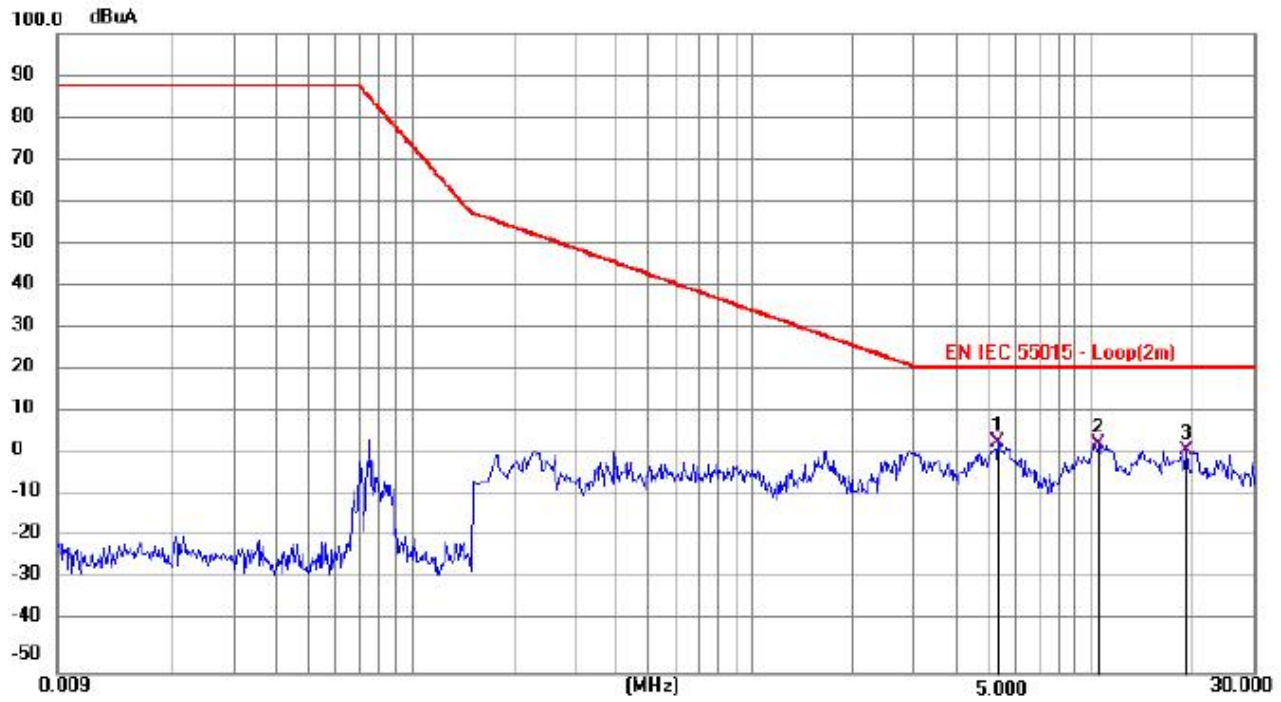
Environmental Conditions	24.3℃, 51% RH
Model	RAVOLJ3800D
Operating mode	Mode 3
Test voltage	DC
Test engineer	ZOM ZHANG
Pol	Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.9457	1.56	10.38	11.94	56.00	-44.06	QP	
2		0.9457	-0.16	10.38	10.22	46.00	-35.78	AVG	
3		4.9383	8.45	10.53	18.98	56.00	-37.02	QP	
4		4.9383	7.17	10.53	17.70	46.00	-28.30	AVG	
5		29.8278	28.75	11.13	39.88	60.00	-20.12	QP	
6	*	29.8278	28.55	11.13	39.68	50.00	-10.32	AVG	

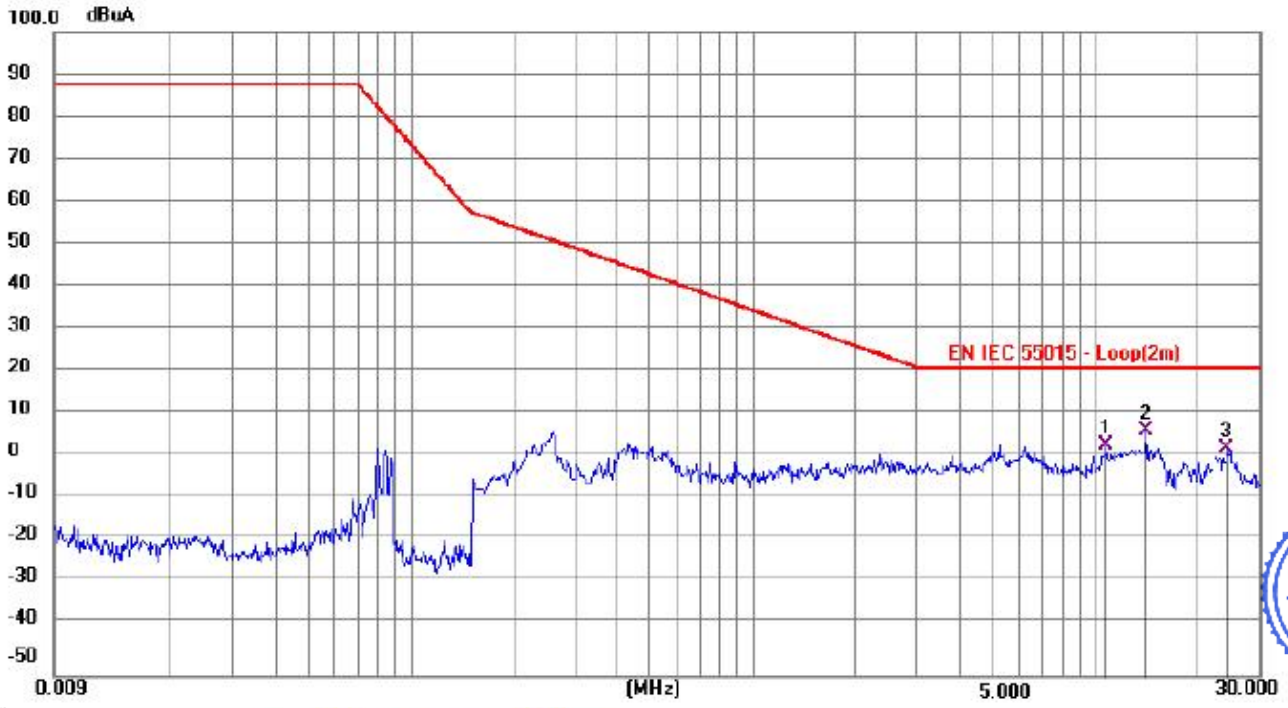
A.2. RADIATED DISTURBANCE TEST RESULTS (9kHz - 30MHz)

Environmental Conditions	24.3℃, 51% RH
Model	RAVOLJ3800D
Operating mode	Mode 2
Test voltage	AC 230V,50Hz
Test engineer	ZOM ZHANG
Pol	X



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment
1	*	5.2934	-20.83	25.07	4.24	22.00	-17.76	QP	
2		10.5135	-22.15	26.15	4.00	22.00	-18.00	QP	
3		18.9825	-23.04	25.30	2.26	22.00	-19.74	QP	

Environmental Conditions	24.3℃, 51% RH
Model	RAVOLJ3800D
Operating mode	Mode 2
Test voltage	AC 230V,50Hz
Test engineer	ZOM ZHANG
Pol	Y

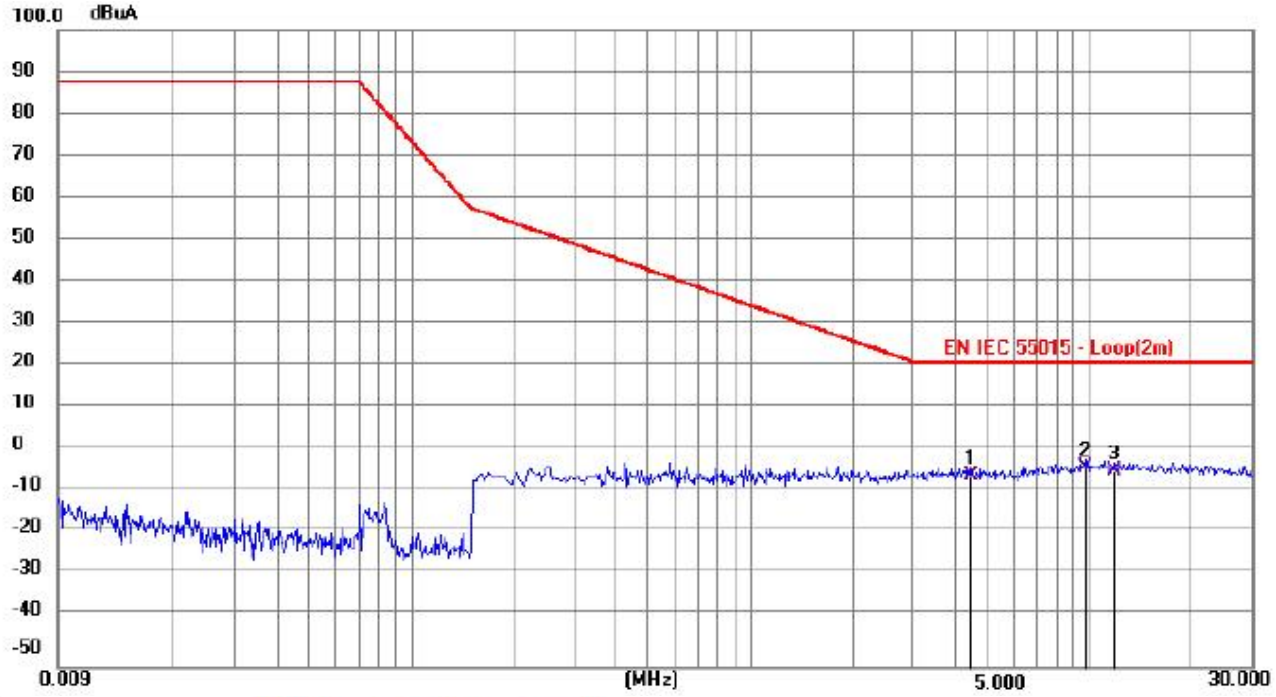


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment
1		10.7250	-22.55	26.34	3.79	22.00	-18.21	QP	
2	*	13.9961	-18.73	26.08	7.35	22.00	-14.65	QP	
3		24.1570	-21.68	24.73	3.05	22.00	-18.95	QP	

Environmental Conditions	24.3℃, 51% RH
Model	RAVOLJ3800D
Operating mode	Mode 2
Test voltage	AC 230V,50Hz
Test engineer	ZOM ZHANG
Pol	Z

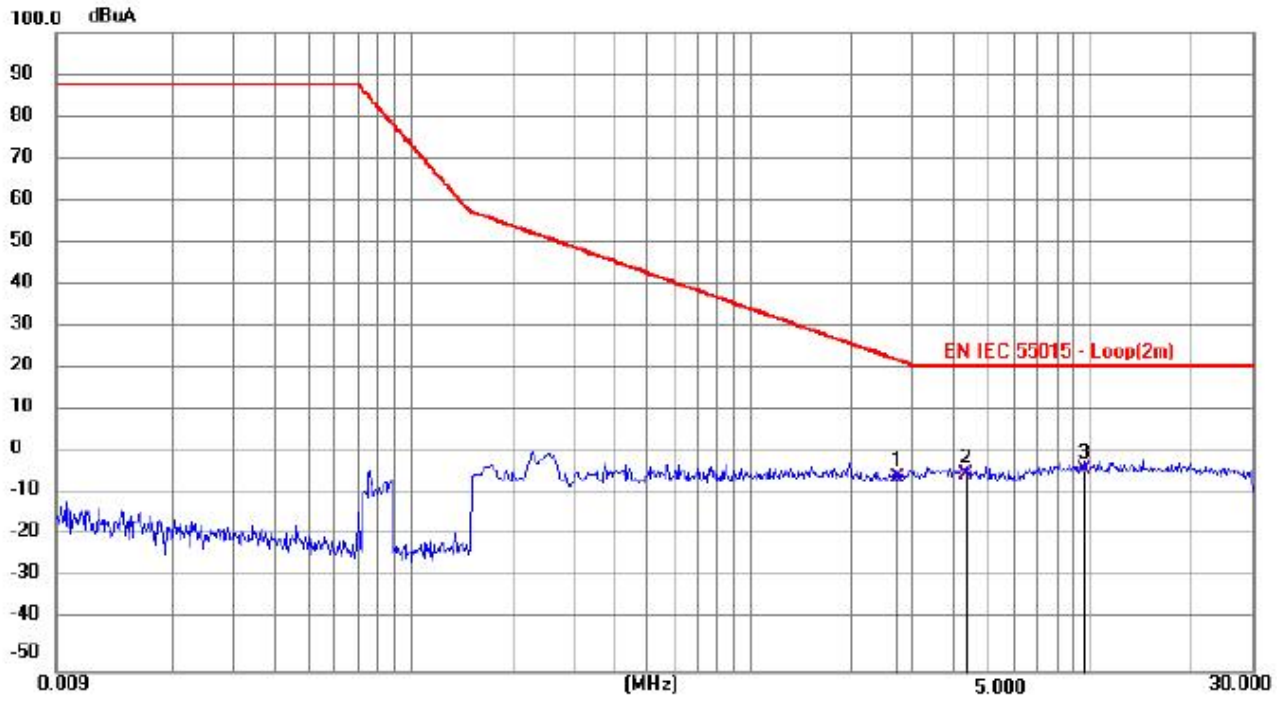
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment
1		6.4230	-24.06	25.73	1.67	22.00	-20.33	QP	
2		11.5980	-23.43	26.81	3.38	22.00	-18.62	QP	
3	*	23.3920	-19.84	24.99	5.15	22.00	-16.85	QP	

Environmental Conditions	24.3℃, 51% RH
Model	RAVOLJ3800D
Operating mode	Mode 3
Test voltage	DC
Test engineer	ZOM ZHANG
Pol	X



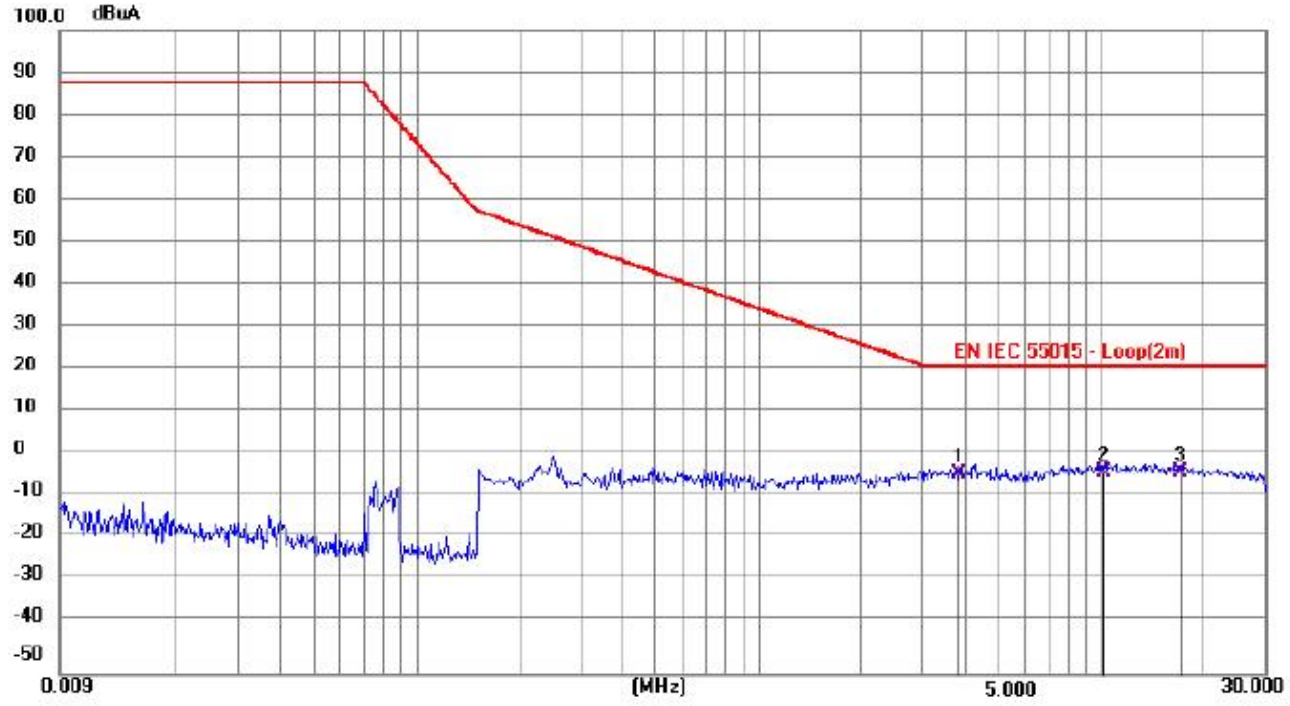
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment
1		4.4250	-29.97	25.16	-4.81	22.00	-26.81	QP	
2	*	9.6450	-29.06	26.02	-3.04	22.00	-25.04	QP	
3		11.7690	-29.80	26.02	-3.78	22.00	-25.78	QP	

Environmental Conditions	24.3℃, 51% RH
Model	RAVOLJ3800D
Operating mode	Mode 3
Test voltage	DC
Test engineer	ZOM ZHANG
Pol	Y



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment
1		2.7015	-30.18	25.65	-4.53	23.26	-27.79	QP	
2		4.3125	-29.57	25.94	-3.63	22.00	-25.63	QP	
3	*	9.6180	-29.06	26.34	-2.72	22.00	-24.72	QP	

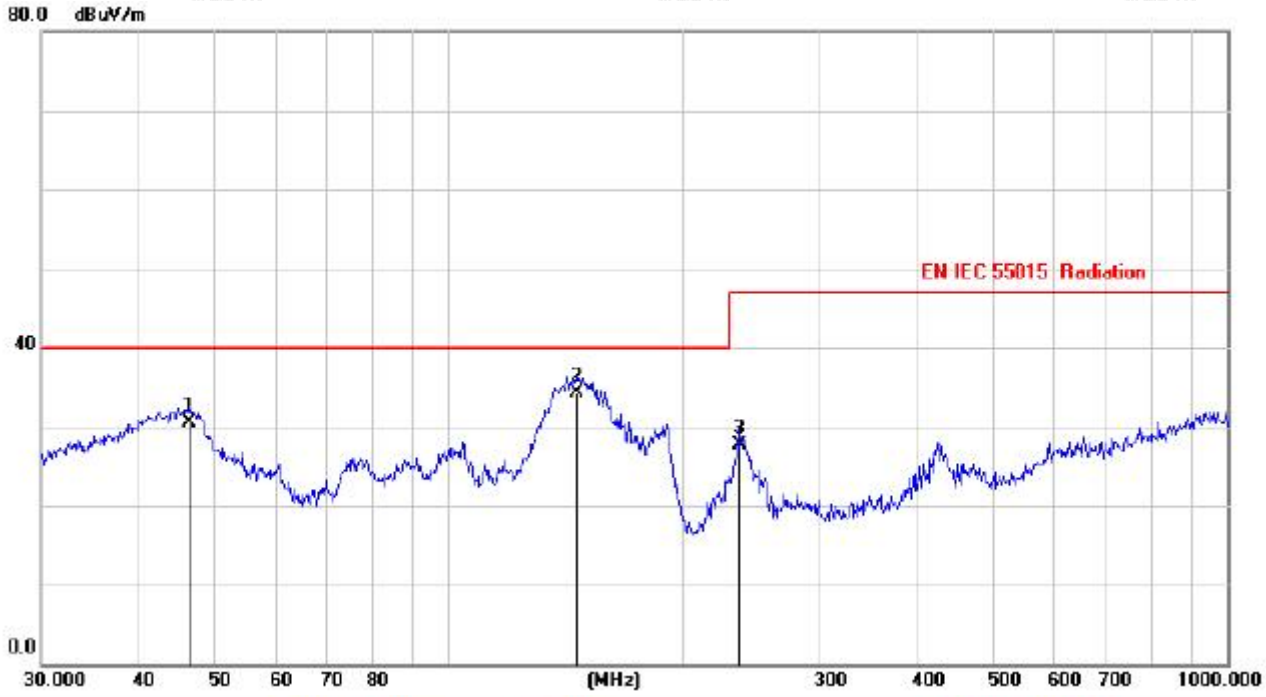
Environmental Conditions	24.3℃, 51% RH
Model	RAVOLJ3800D
Operating mode	Mode 3
Test voltage	DC
Test engineer	ZOM ZHANG
Pol	Z



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment
1		3.8310	-29.83	26.40	-3.43	22.00	-25.43	QP	
2	*	10.2299	-29.74	26.97	-2.77	22.00	-24.77	QP	
3		17.0610	-29.11	26.15	-2.96	22.00	-24.96	QP	

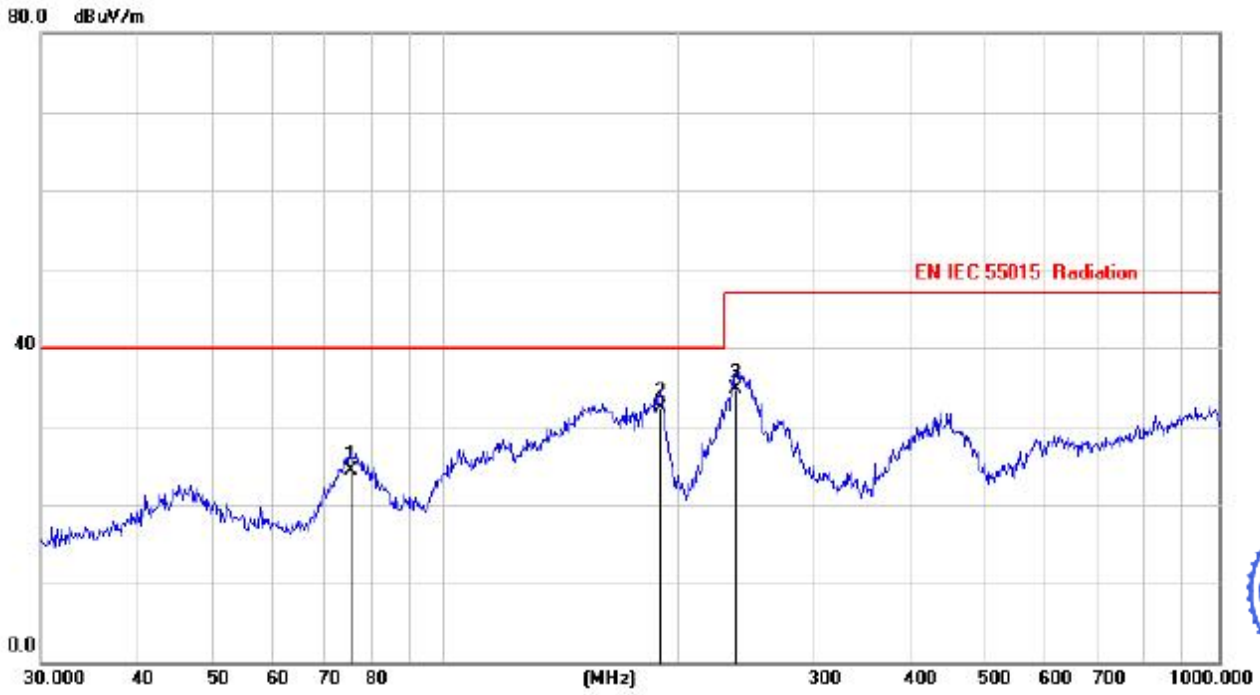
A.3. RADIATED DISTURBANCE TEST RESULTS (30MHz - 1GHz)

Environmental Conditions	24.4℃, 52% RH
Model	RAVOLJ3800D,
Operating mode	Mode 2
Test voltage	AC 230V,50Hz
Test engineer	ZOM ZHANG
Pol	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		46.5030	18.27	12.33	30.60	40.00	-9.40	QP			
2	*	146.1811	23.41	10.82	34.23	40.00	-5.77	QP			
3		237.3719	15.22	12.42	27.64	47.00	-19.36	QP			

Environmental Conditions	24.4℃, 52% RH
Model	RAVOLJ3800D,
Operating mode	Mode 2
Test voltage	AC 230V,50Hz
Test engineer	ZOM ZHANG
Pol	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		75.5456	14.77	9.63	24.40	40.00	-15.60	QP			
2	*	189.8217	21.24	11.06	32.30	40.00	-7.70	QP			
3		238.3102	22.41	12.21	34.62	47.00	-12.38	QP			

Environmental Conditions	24.4℃, 52% RH
Model	RAVOLJ3800D
Operating mode	Mode 3
Test voltage	DC
Test engineer	ZOM ZHANG
Pol	Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		60.8109	5.04	11.68	16.72	40.00	-23.28	QP			
2	*	87.9943	6.70	10.45	17.15	40.00	-22.85	QP			
3		292.5708	9.53	14.13	23.66	47.00	-23.34	QP			

Environmental Conditions	24.4℃, 52% RH
Model	RAVOLJ3800D
Operating mode	Mode 3
Test voltage	DC
Test engineer	ZOM ZHANG
Pol	Horizontal

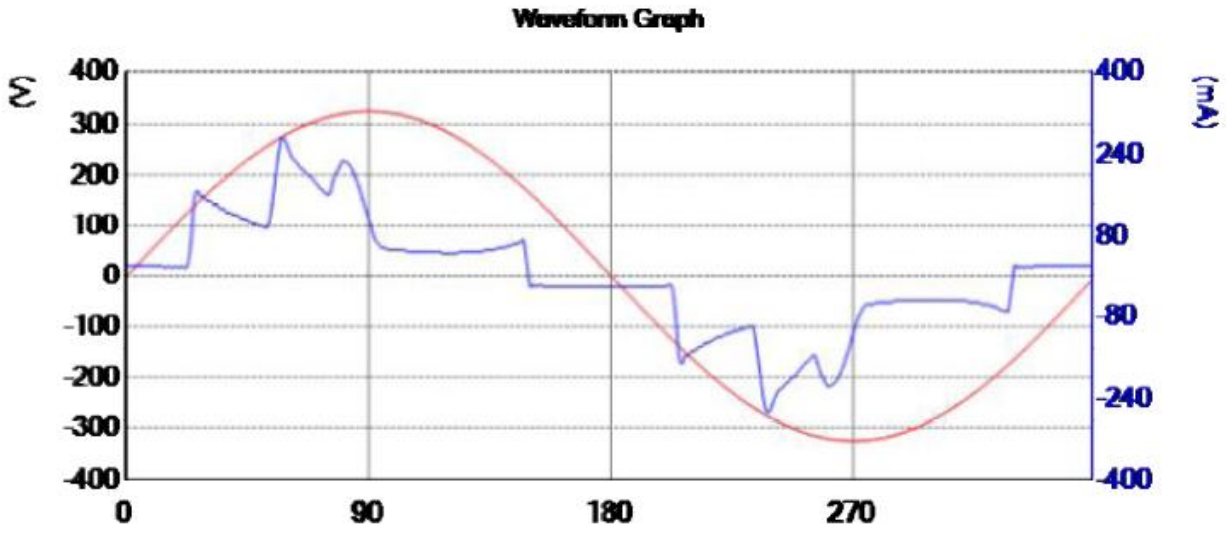
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		46.2387	4.18	12.57	16.75	40.00	-23.25	QP			
2		216.5928	12.41	11.59	24.00	40.00	-16.00	QP			
3	*	290.6535	22.22	13.78	36.00	47.00	-11.00	QP			

A.4. HARMONIC CURRENT TEST RESULTS

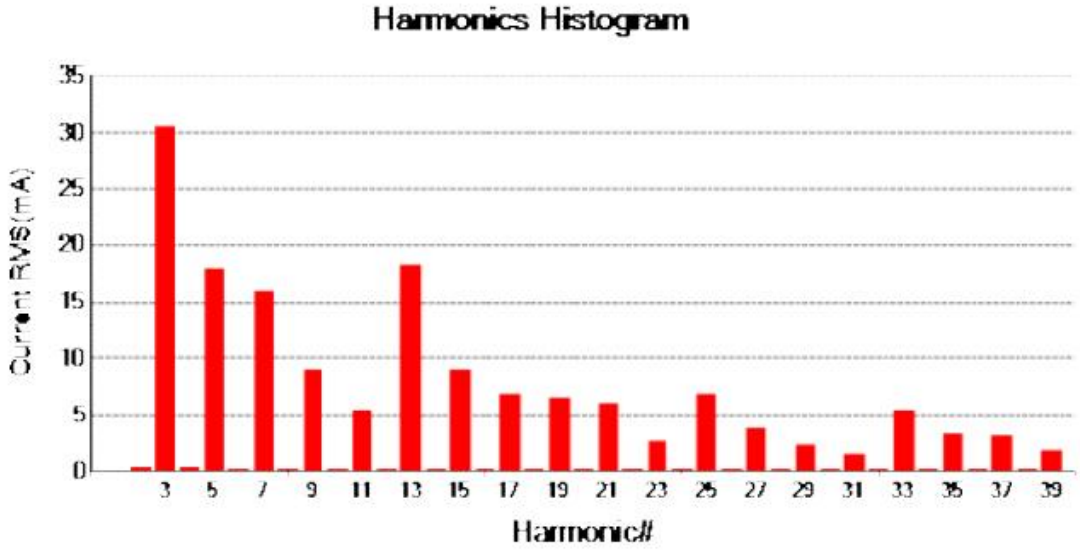
Model	RAVOLJ3800D
Operating mode	Mode 2
Test voltage	AC 230V,50Hz
Test engineer	ZOM ZHANG

Test Result: Pass **Source qualification(Power On Load):** Idle - Pass

Current & voltage waveforms



Harmonics and Class C limit line (/<=25W THD)



Model	RAVOLJ3800D
Operating mode	Mode 2
Test voltage	AC 230V,50Hz
Test engineer	ZOM ZHANG

Test Result: Pass **Source qualification(Power On Load):** Idle - Pass

THC(mA): 47.650 **I - THD(%):** 48.4 **I-THD Limit(%):** 70.0 **Status:** Pass

Parameter values during test:

V_RMS (Volts): 229.9 **Frequency(Hz):** 50.0
I_RMS(mA): 109.9 **Crest Factor:** 2.279
Power (Watts): 21.1 **Power Factor:** 0.836

Harm#	Harms(filtered) (mA)	Limit (mA)	Harms(avg) (mA)	100%Limit	Harms(max) (mA)	150%Limit	Status
I_Fund	98.400						
2	0.330	4.920	0.500	10.163	0.770	10.434	Pass
3	30.490	34.440	30.600	88.850	30.730	59.485	Pass
5	17.760	24.600	17.800	72.358	17.850	48.374	Pass
7	15.940	29.520	16.100	54.539	16.360	36.947	Pass
9	8.890	19.680	8.900	45.224	8.940	30.285	Pass
11	5.320	19.680	5.200	26.423	5.360	18.157	Pass

Model	RAVOLJ3800D
Operating mode	Mode 2
Test voltage	AC 230V,50Hz
Test engineer	ZOM ZHANG

Source qualification(Power On Load): Pass
Measurements are compliant with IEC/EN61000-3-2 Ed. 5 & IEC/EN61000-4-7 Ed. 2.1

	Nominal	Measured Low	Measured High	Deviation	Allowed Deviation	Result
Supply Voltage	230	229.79	229.88	0.21	4.6	Pass
Supply Frequency	50	50.0	50.0	0.0	0.25	Pass
Crest Phase	90.0	88.8	89.2	1.2	87 - 93	Pass
Crest Factor	1.414	1.414	1.415	0.001	1.40 - 1.42	Pass
Fundamental Voltage	229.80	-	-	-	-	-

Harm#	Harmonics Voltage	Harmonic Ratio	Limit	Result
2	0.070	0.065	0.200	Pass
3	0.140	0.068	0.900	Pass
4	0.040	0.024	0.200	Pass
5	0.030	0.018	0.400	Pass
6	0.020	0.014	0.200	Pass
7	0.010	0.010	0.300	Pass
8	0.010	0.008	0.200	Pass
9	0.000	0.006	0.200	Pass
10	0.010	0.010	0.100	Pass
11	0.030	0.013	0.100	Pass
12	0.010	0.003	0.100	Pass
13	0.010	0.008	0.100	Pass
14	0.000	0.003	0.100	Pass
15	0.000	0.003	0.100	Pass
16	0.000	0.003	0.100	Pass
17	0.010	0.005	0.100	Pass
18	0.000	0.000	0.100	Pass
19	0.000	0.003	0.100	Pass
20	0.000	0.001	0.100	Pass
21	0.000	0.001	0.100	Pass
22	0.000	0.000	0.100	Pass
23	0.000	0.003	0.100	Pass
24	0.000	0.000	0.100	Pass
25	0.000	0.003	0.100	Pass
26	0.000	0.000	0.100	Pass
27	0.000	0.003	0.100	Pass
28	0.000	0.000	0.100	Pass
29	0.000	0.000	0.100	Pass
30	0.000	0.000	0.100	Pass
31	0.000	0.000	0.100	Pass
32	0.000	0.000	0.100	Pass
33	0.000	0.005	0.100	Pass
34	0.000	0.000	0.100	Pass
35	0.000	0.003	0.100	Pass
36	0.000	0.000	0.100	Pass
37	0.000	0.003	0.100	Pass
38	0.000	0.000	0.100	Pass
39	0.000	0.000	0.100	Pass
40	0.000	0.000	0.100	Pass

A.5. IMMUNITY TEST RESULTS

ELECTROSTATIC DISCHARGE TEST RESULTS					
Test model	RAVOLJ3800D		Temperature	23.5℃	
Test mode	Mode 2，Mode 3		Humidity	52%	
Input voltage	AC 230V,50Hz/DC		Pressure	1008mbar	
Test engineer	ZOM ZHANG				
Discharge Mode	**Test Points**	**Test Valtage (kV) & polarity**	**Number of discharges/polarity**	**Discharge interval (s)**	**Performance Criteria**
Contact Discharge	Conductive surfaces	± 4	10	1	B
Air Discharge	Insulating surfaces	± 2&4&8	10	1	B
VCP	-	± 4	10	1	B
HCP	-	± 4	10	1	B
Note :					

RADIO-FREQUENCY ELECTROMAGNETIC FIELD TEST RESULTS				
Test model	RAVOLJ3800D		Temperature	24.5℃
Test mode	Mode 2		Humidity	53%
Input voltage	AC 230V,50Hz		Pressure	1008mbar
Test engineer	ZOM ZHANG			
Angle of EUT	**Antenna polarization**	**Frequency Range**	**Test Level**	**Performance Criteria**
0°	Vertical, Horizontal	80 - 1000 MHz	3 V/m	A
90°	Vertical, Horizontal	80 - 1000 MHz	3 V/m	A
180°	Vertical, Horizontal	80 - 1000 MHz	3 V/m	A
270°	Vertical, Horizontal	80 - 1000 MHz	3 V/m	A
Note : (1) Modulation:1kHz, 80% AM.				

ELECTRICAL FAST TRANSIENT/BURST TEST RESULTS				
Test model	RAVOLJ3800D		Temperature	24.0℃
Test mode	MODE 2,MODE 3		Humidity	54%
Input voltage	AC 230V,50Hz/DC		Pressure	1008mbar
Test engineer	ZOM ZHANG			
Port under test	**Test Level&polarity**	**Repetition Frequency**	**Test duration /polarity**	**Performance Criteria**
AC input power	± 1 kV	5 kHz	2min	B
DC input power				
Signal/control/load				
Note :				

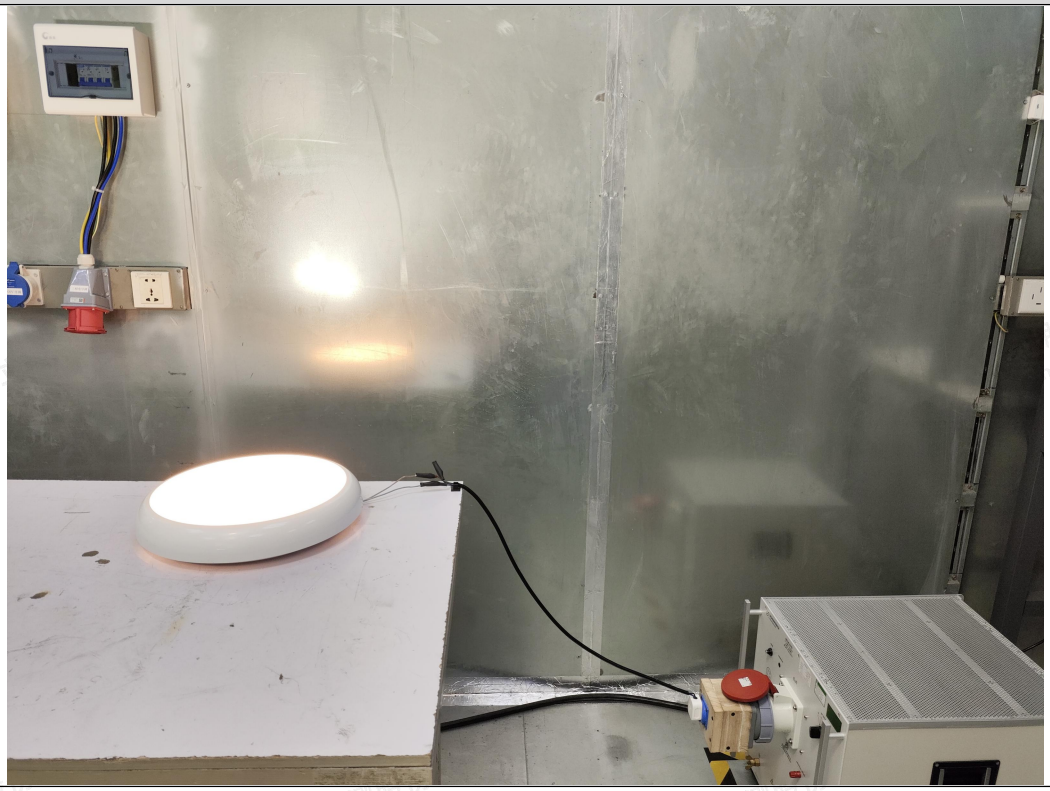
INJECTED CURRENTS (RADIO-FREQUENCY COMMON MODE) TEST RESULTS				
Test model	RAVOLJ3800D		Temperature	24.0℃
Test mode	Mode 2		Humidity	54%
Input voltage	AC 230V,50Hz		Pressure	1008mbar
Test engineer	ZOM ZHANG			
Port under test	**Test Level**	**Coupling method**	**Dwell time**	**Performance Criteria**
AC input power	3 V	CDN	1 seconds	A
DC input power				
Signal/control				
Note: (1) Frequency range:0.15MHz - 80MHz.				

SURGE TEST RESULTS						
Test model	RAVOLJ3800D			Temperature	24.0℃	
Test mode	MODE 2,MODE 3			Humidity	54%	
Input voltage	AC 230V,50Hz/DC			Pressure	1008mbar	
Test engineer	ZOM ZHANG					
Port under test	**Coupling**	**Test Level & polarity(kV)**	**Phase angle (°)**	**Number of surges**	**Repetition rate(s)**	**Performance criteria**
AC Input power	L - N	+ 1	90	5	60	B
		- 1	270	5	60	B
	L - PE					
	N - PE					
	L&N - PE					
Note:						

VOLTAGE DIPS AND SHORT INTERRUPTIONS TEST RESULTS					
Test model	RAVOLJ3800D			Temperature	24.0℃
Test mode	Mode 2			Humidity	54%
Input voltage	AC 230V,50Hz			Pressure	1008mbar
Test engineer	ZOM ZHANG				
U_{NOM} (Vac)	**Test Level (% U_{NOM})**	**Number of periods**		**Phase angle (°)**	**Performance criteria**
		50Hz	**60Hz**		
230	70	10	12	0, 90, 180, 270	B
	0	0,5	0,5	0	B
Note:					

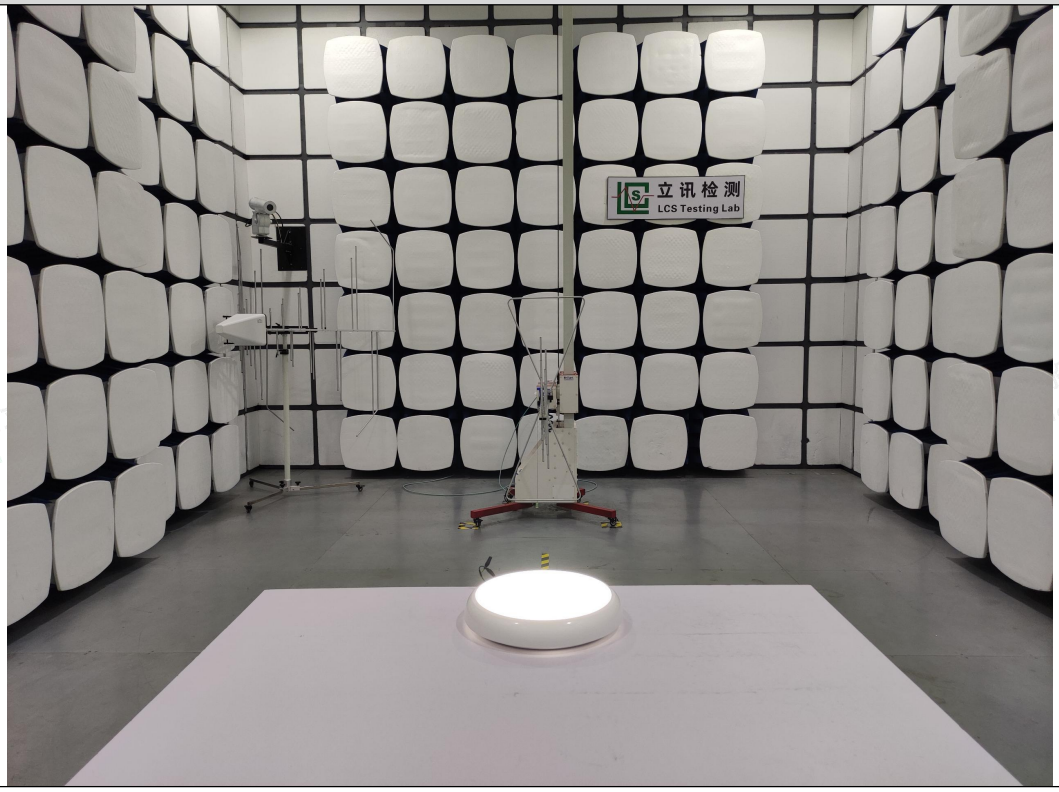
ANNEX B - TEST PHOTOS

B.1. Conducted Disturbance

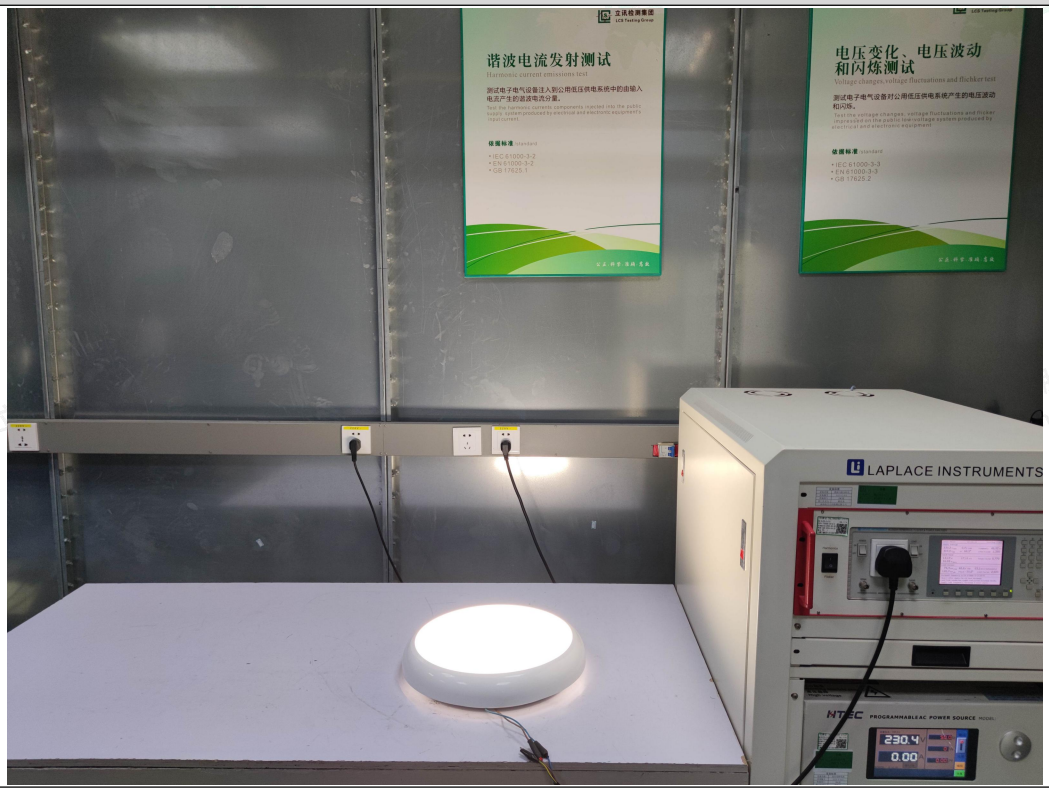


B.2. Radiated Disturbance (9kHz - 30MHz)

B.3. Radiated Disturbance (30MHz to 1GHz) & Radio-Frequency Electromagnetic Fields

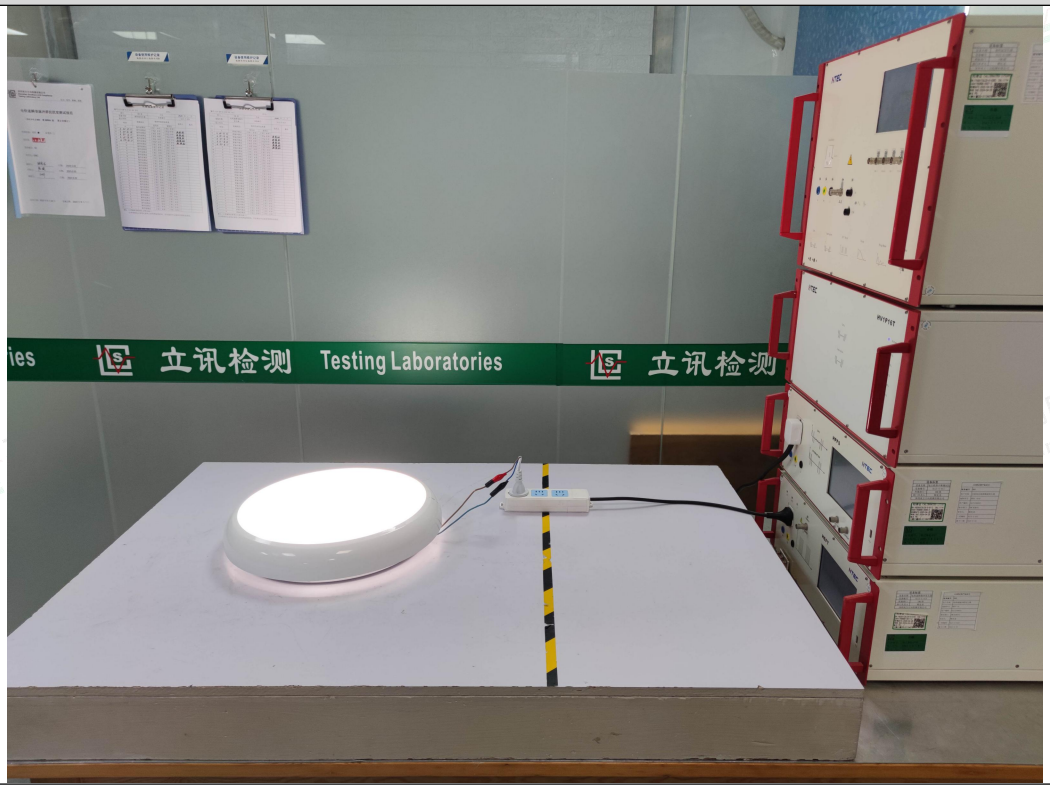


B.4. Harmonic Current

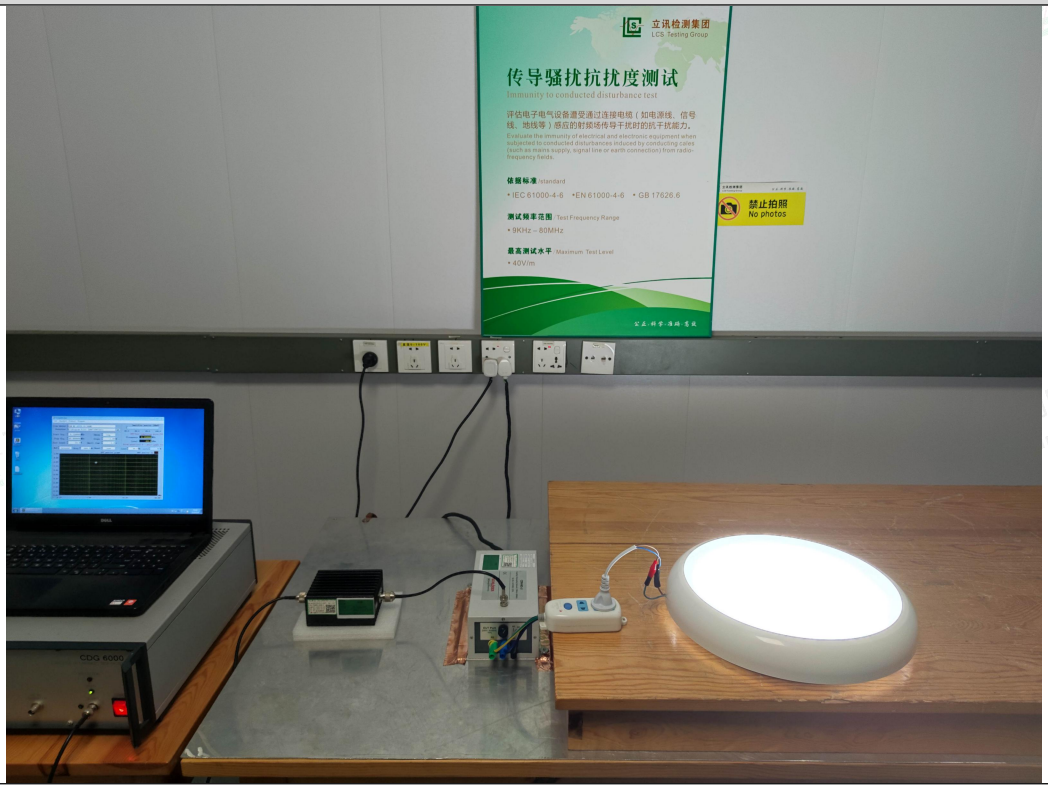


B.5. Electrostatic Discharge

B.6. Electrical Fast Transient / Burst

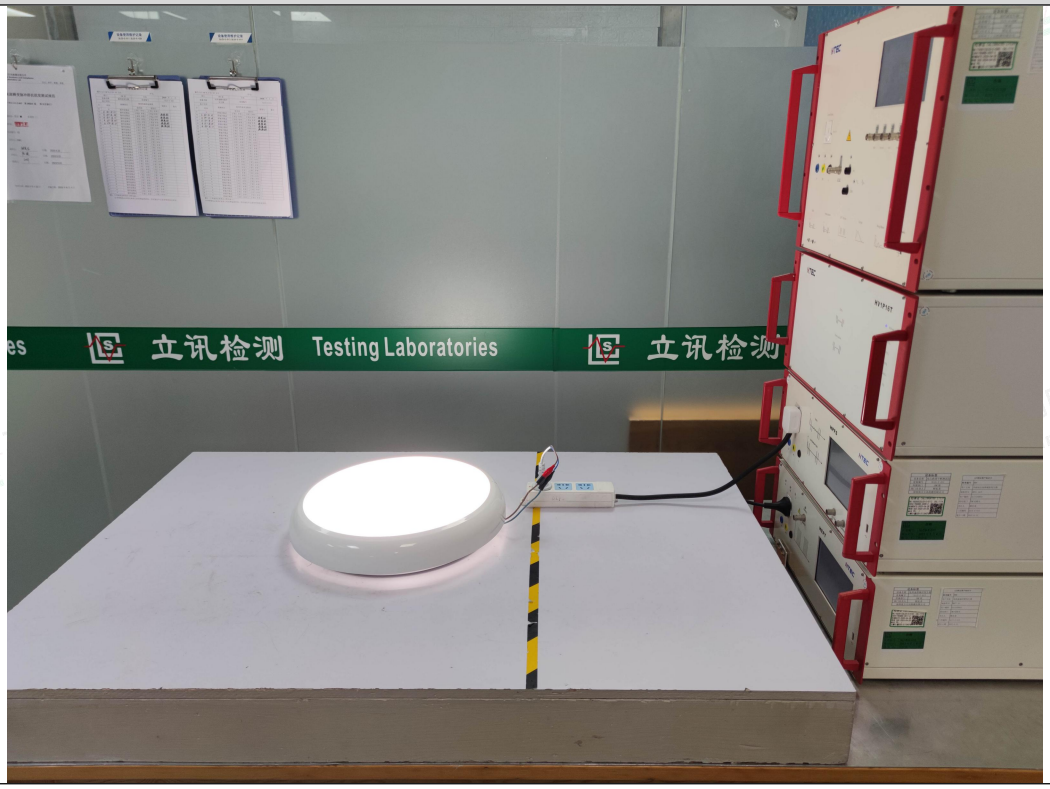


B.7. Injected Currents (Radio-Frequency Common Mode)



B.8. Surge

B.9. Voltage Dips and Short Interruptions



ANNEX C - EXTERNAL AND INTERNAL PHOTOS OF THE EUT

Model: RAVOLJ3800D

Photo 1

Photo 2

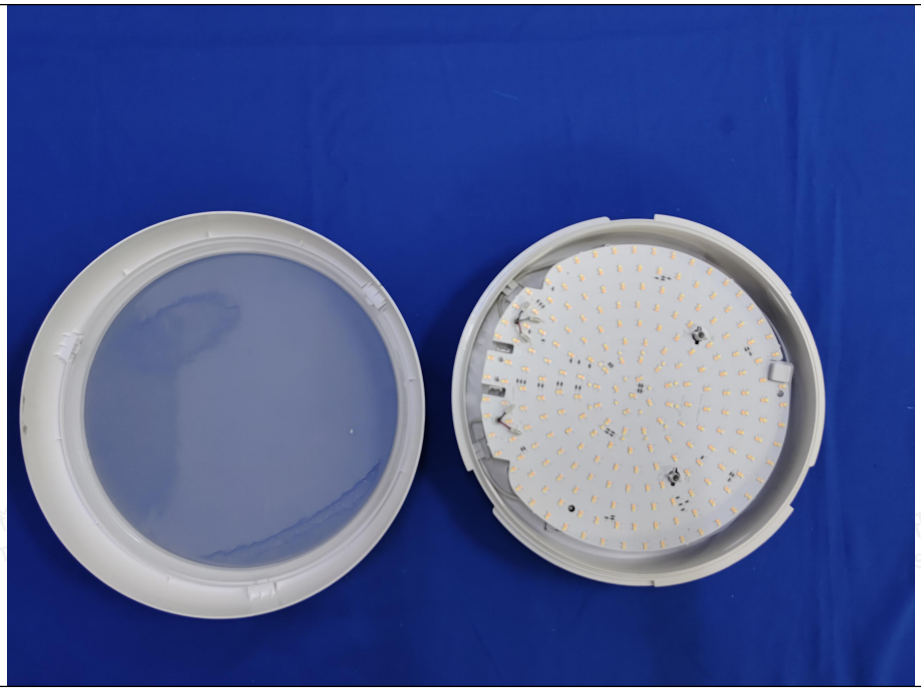


Photo 3

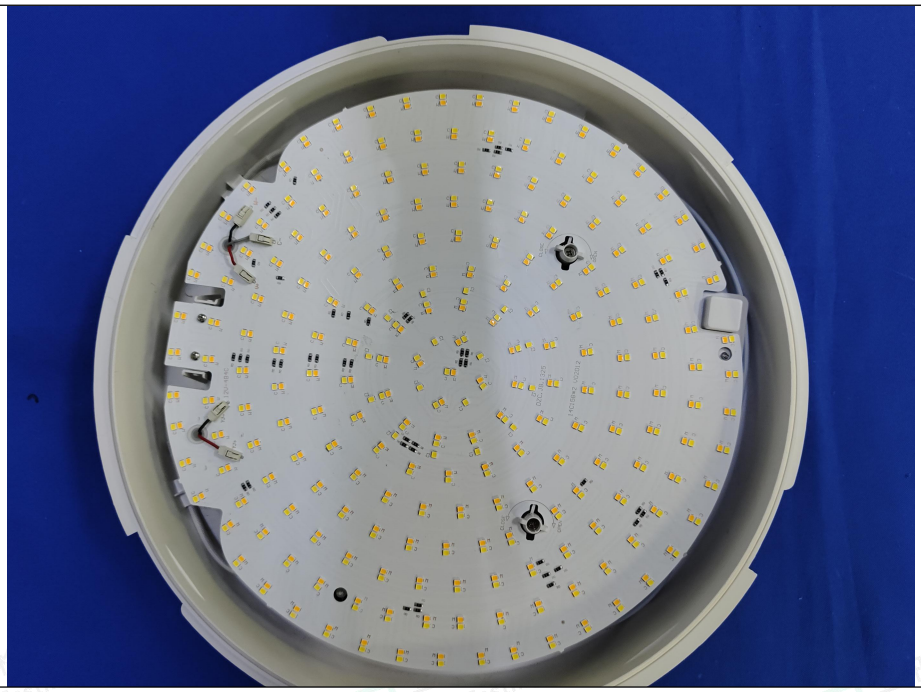


Photo 4

Photo 5

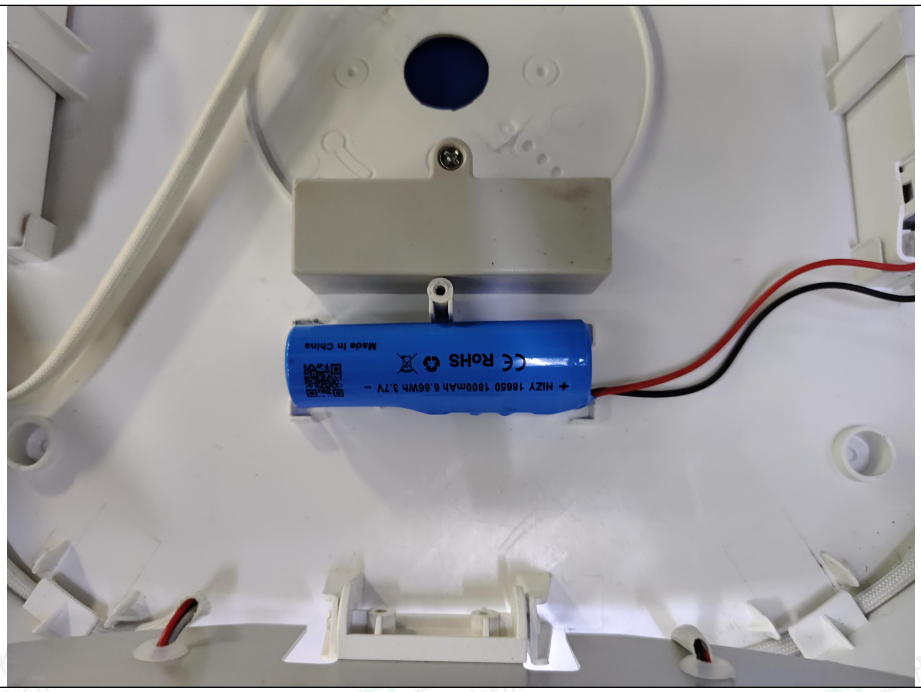


Photo 6(battery)

Photo 7(LED driver)

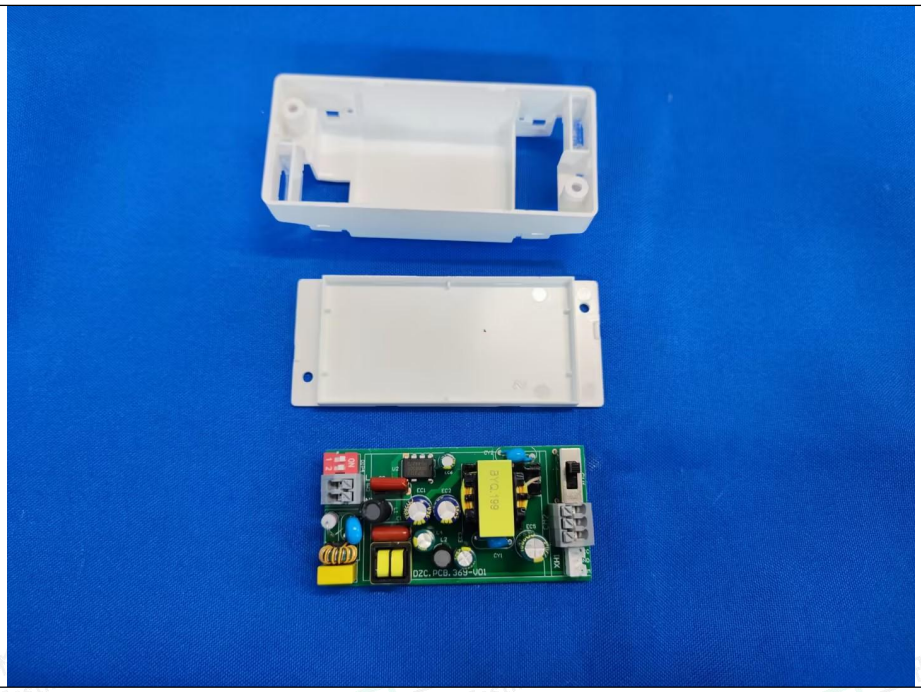


Photo 8

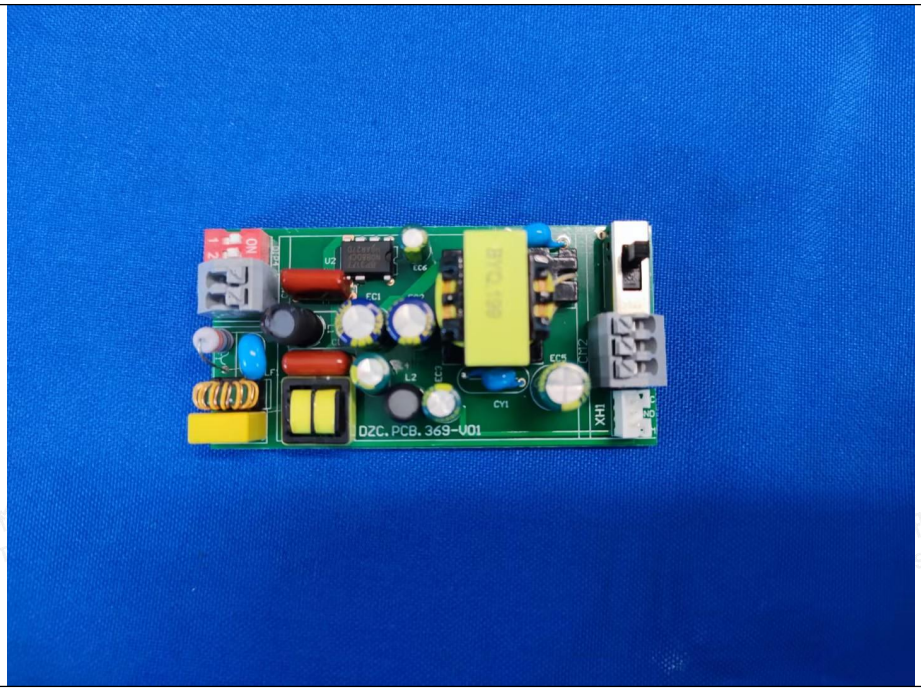


Photo 9

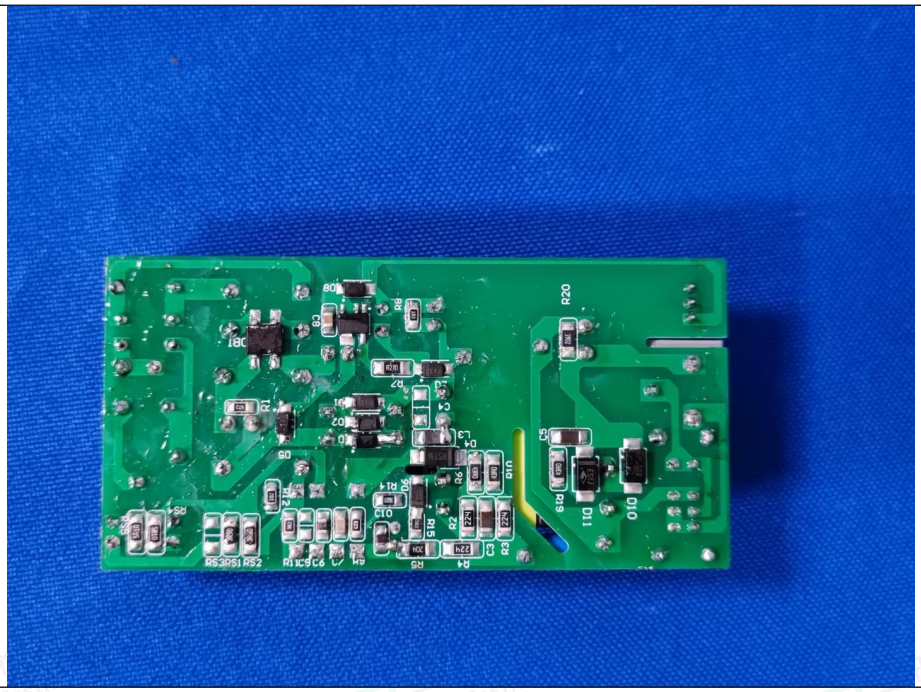


Photo 10

Photo 11(LED emergency driver)

Photo 12

Photo 13

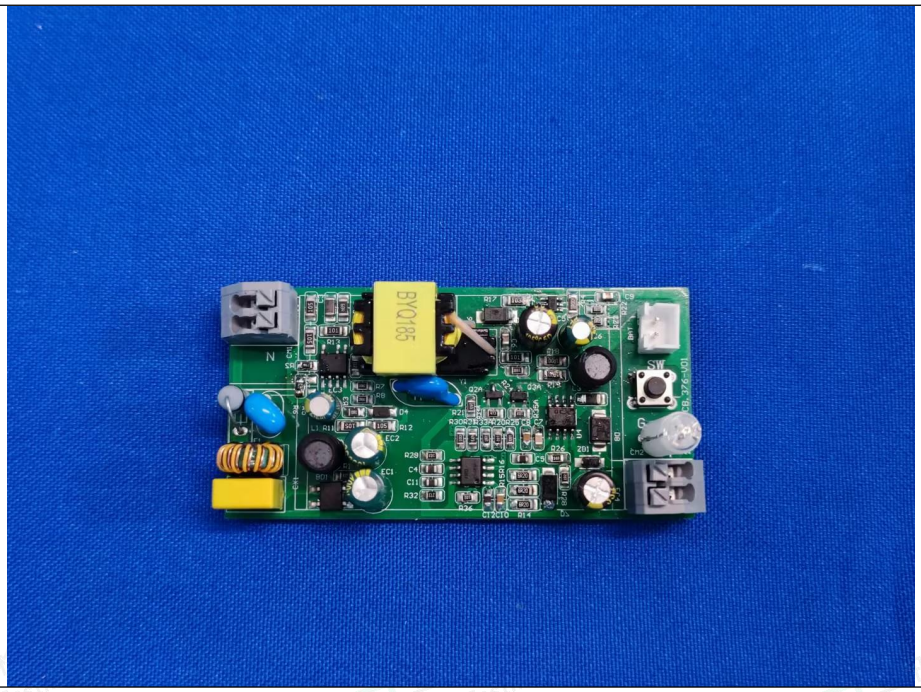


Photo 14

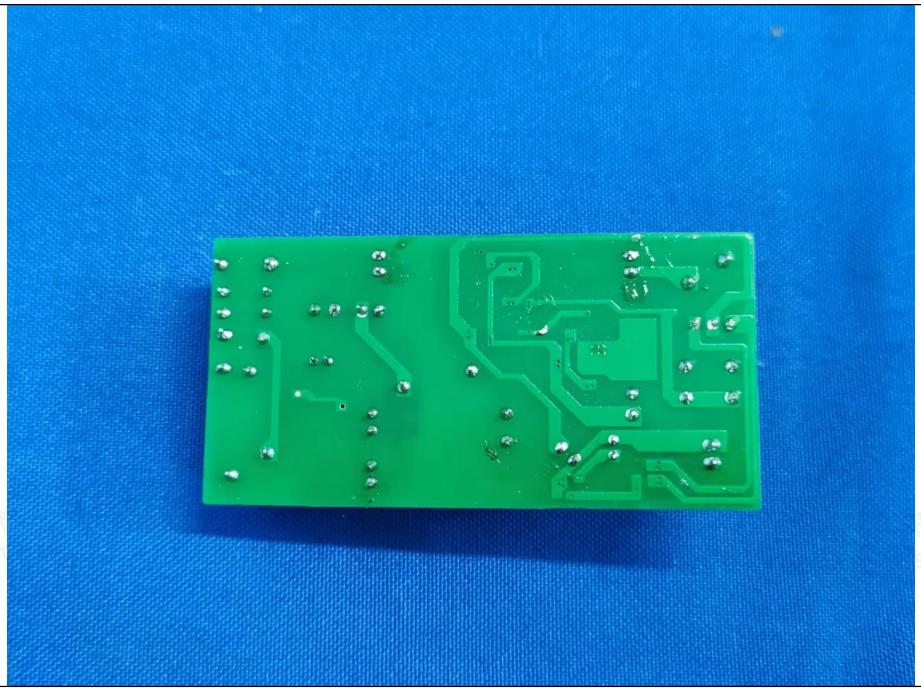


Photo 15

Photo 16(sensor)

Photo 17

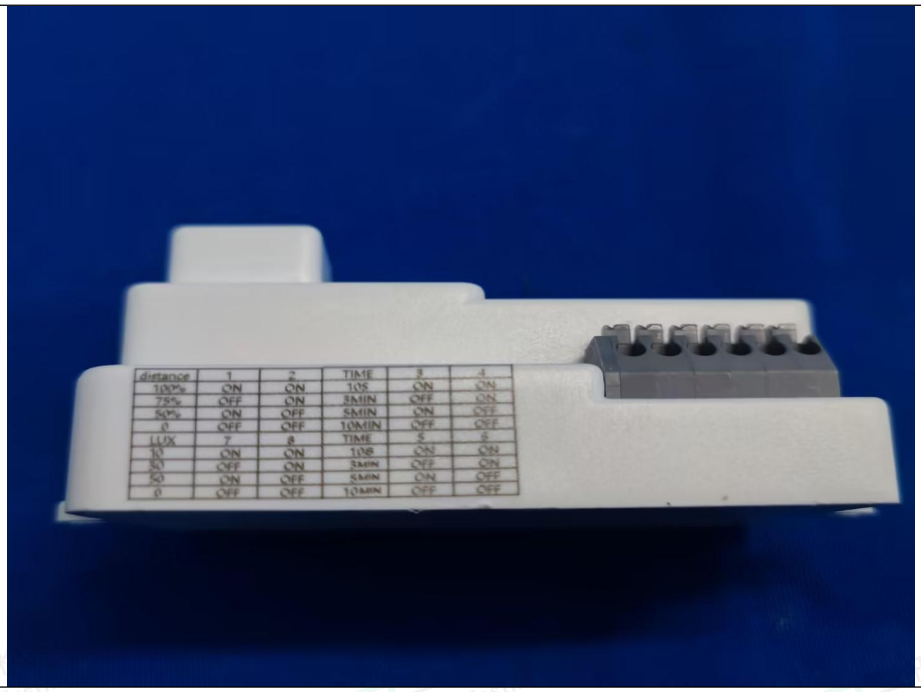


Photo 18

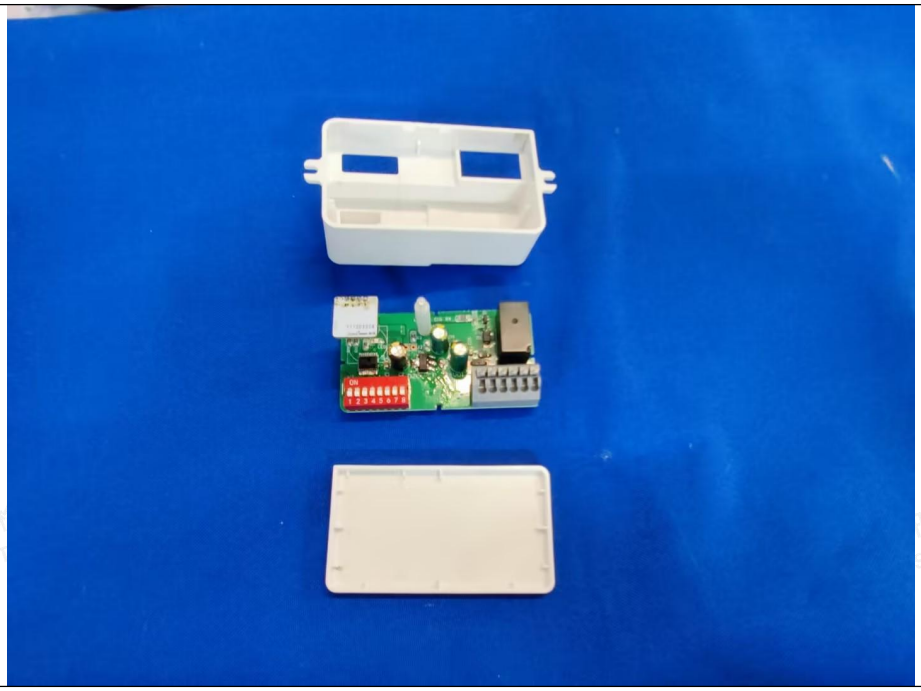


Photo 19

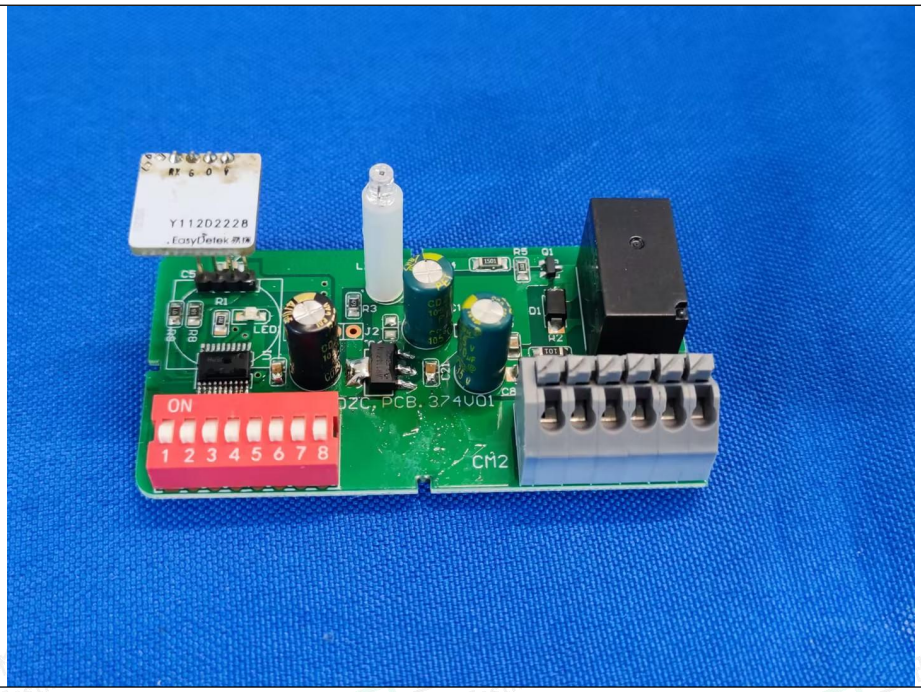


Photo 20

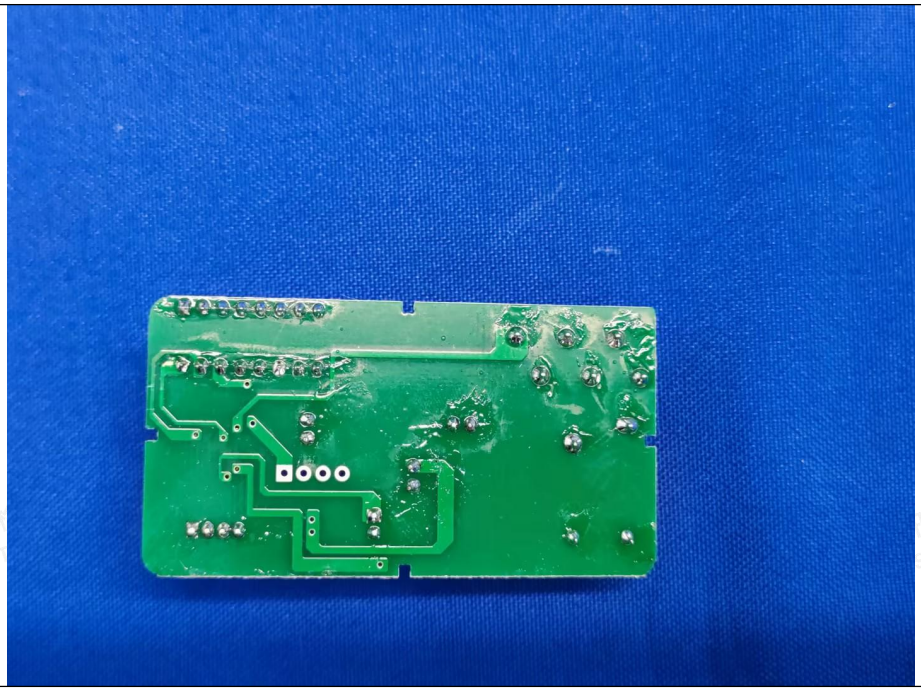


Photo 21

Photo 22 (with AC connector)

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