



EMC TEST REPORT

For

MEDIAPRO INTERNATIONAL LLC

Stage luminaire

Test Model: Krypton LW5015 IP

Prepared for : MEDIAPRO INTERNATIONAL LLC
Address : P.O.Box 114657 | Dubai | United Arab Emirates

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

Tel : (+86)755-29871520
Fax : (+86)755-29871521
Web : www.LCS-cert.com
Mail : webmaster@LCS-cert.com

Date of receipt of test sample : June 12, 2023
Number of tested samples : 1
Serial number : Prototype
Date of Test : June 12, 2023 - June 20, 2023
Date of Report : June 20, 2023



**EMC TEST REPORT****EN IEC 55015:2019+A11:2020**

Emission - Electrical lighting and similar equipment

EN 61547:2009

Equipment for general lighting purposes - EMC immunity requirements

Report Number..... : LCSB061223022E

Date of Issue..... : June 20, 2023

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..... : MEDIAPRO INTERNATIONAL LLC**

Address..... : P.O.Box 114657 | Dubai | United Arab Emirates

Test Specification:Standard..... : 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

Test Report Form No..... : SLCSEMC-2.3

TRF Originator..... : Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

Master TRF..... : Dated 2016-08

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Equipment Under Test..... : Stage luminaire

Trademark..... : KRYPTON

Test Model/Type..... : Krypton LW5015 IP

Rating..... : 100-240V~, 50/60Hz, 800W, IP65, ta45°C

Results : PASS**Compiled by:**

Amy Liu / Engineer

Supervised by:

Kris Mai / Technique Director

Approved by:

Dm Gu / Manager



Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

101-201, No. 39 Building, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China.

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com.

Scan code to check authenticity.



EMC - TEST REPORT

Test Report No.....: LCSB061223022E

Applicant.....: MEDIAPRO INTERNATIONAL LLC
Address.....: P.O.Box 114657 | Dubai | United Arab Emirates
Telephone.....: /
Fax.....: /

Manufacturer.....: MEDIAPRO INTERNATIONAL LLC
Address.....: P.O.Box 114657 | Dubai | United Arab Emirates
Telephone.....: /
Fax.....: /

Factory.....: CKC Lighting Co., Ltd(Lite Angle Limited)
Address.....: Guan Keng Gongye Yuan, Building#A, 2nd Floor, Dashi, Panyu,
Guangzhou 510300, China
Telephone.....: /
Fax.....: /

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The test report merely corresponds to the test sample.

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Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

101-201, No. 39 Building, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China.

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com.

Scan code to check authenticity.



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°C - 30°C
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	June 20, 2023	Initial Issue	-

Remark:
000) : “---”





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1. GENERAL INFORMATION

1.1. GENERAL DESCRIPTION OF THE ITEM(S)

Equipment Under Test	Stage luminaire
Test Model/Type	Krypton LW5015 IP
Additional Models/Type	-
Description of Model difference	-
Rating	100-240V~, 50/60Hz, 800W, IP65, ta45℃





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	Maximum light	☐	☐
3	Minimum light	☐	☐
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	June 12, 2023
Date(s) of performance of test	June 12, 2023 - June 20, 2023





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	NSLK8127	8127716	2023-04-26	2024-04-25
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 presents an overview of the standards and results. Refer to the next chapter for details of measured test results and applied test levels.

4.1. STANDARD(S)

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

EN 61547:2009 - Equipment for general lighting purposes — EMC immunity requirements.

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

EN 61000-3-3:2013+A1:2019+A2:2021 - Electromagnetic compatibility (EMC) Part 3-3: Limits 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 - EN IEC 55015, EN IEC 61000-3-2, 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	PASS
IMMUNITY TESTS - EN IEC 61547		
Requirement - Test case	Basic Standard(s)	Verdict
Electrostatic Discharge	IEC/EN 61000-4-2	PASS
Radio-Frequency Electromagnetic Fields	IEC/EN 61000-4-3	PASS
Electrical Fast Transient / Burst	IEC/EN 61000-4-4	PASS
Surge	IEC/EN 61000-4-5	PASS
Injected Currents (Radio-Frequency Common Mode)	IEC/EN 61000-4-6	PASS
Power Frequency Magnetic Field ¹	IEC/EN 61000-4-8	N/A
Voltage Dips and Short Interruptions	IEC/EN 61000-4-11	PASS

Supplementary information:

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

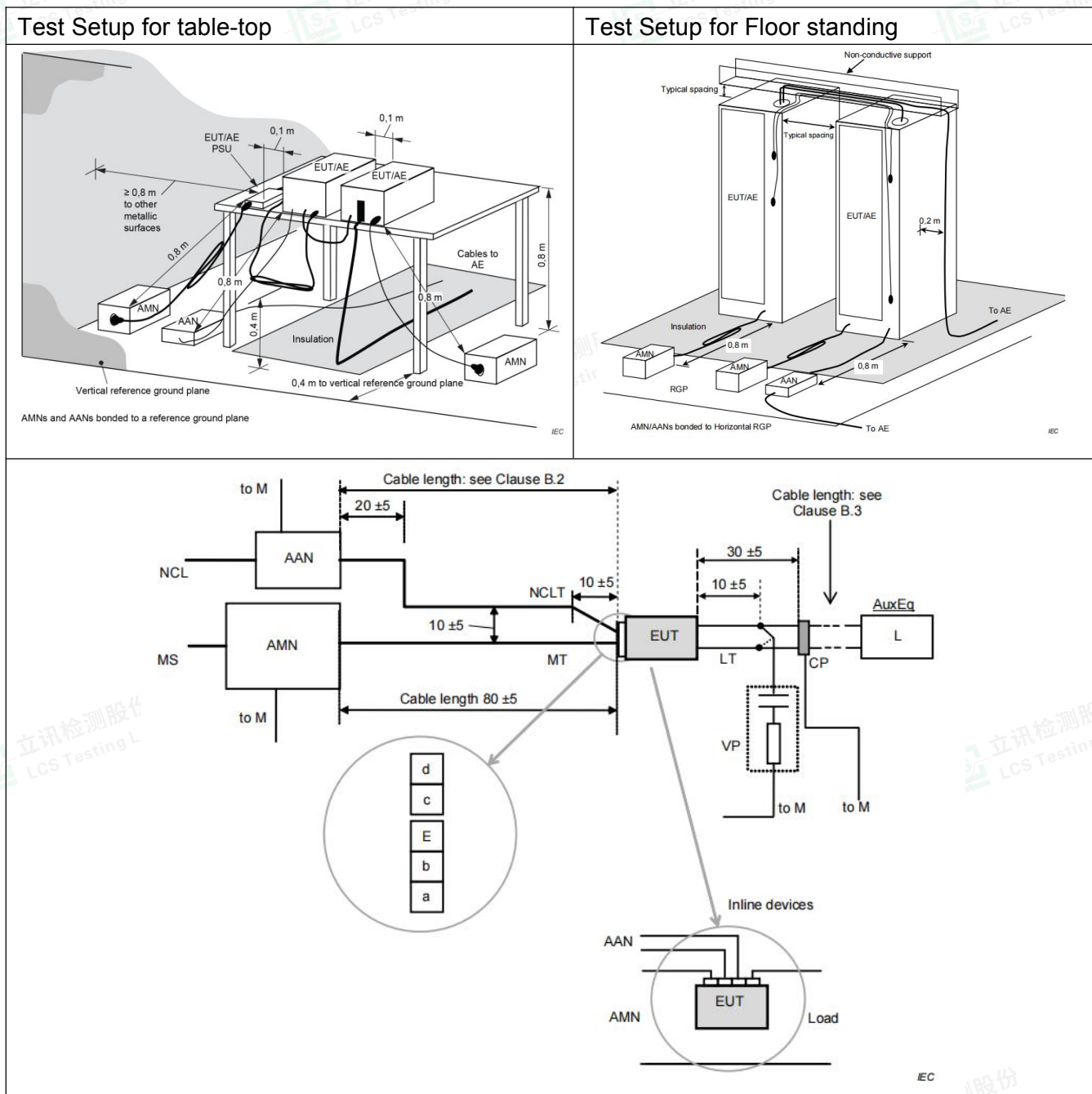
Disturbance voltage limits at local wired ports: local wired ports other than electrical power supply interface of ELV lamp

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 Procedure Description

For Table-top, EUT shall be placed at $(0,8 \pm 0,05)$ m above the reference plane of the test site selected for measurement. for Floor standing, EUT shall be placed at $(0,12 \pm 0,04)$ 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)

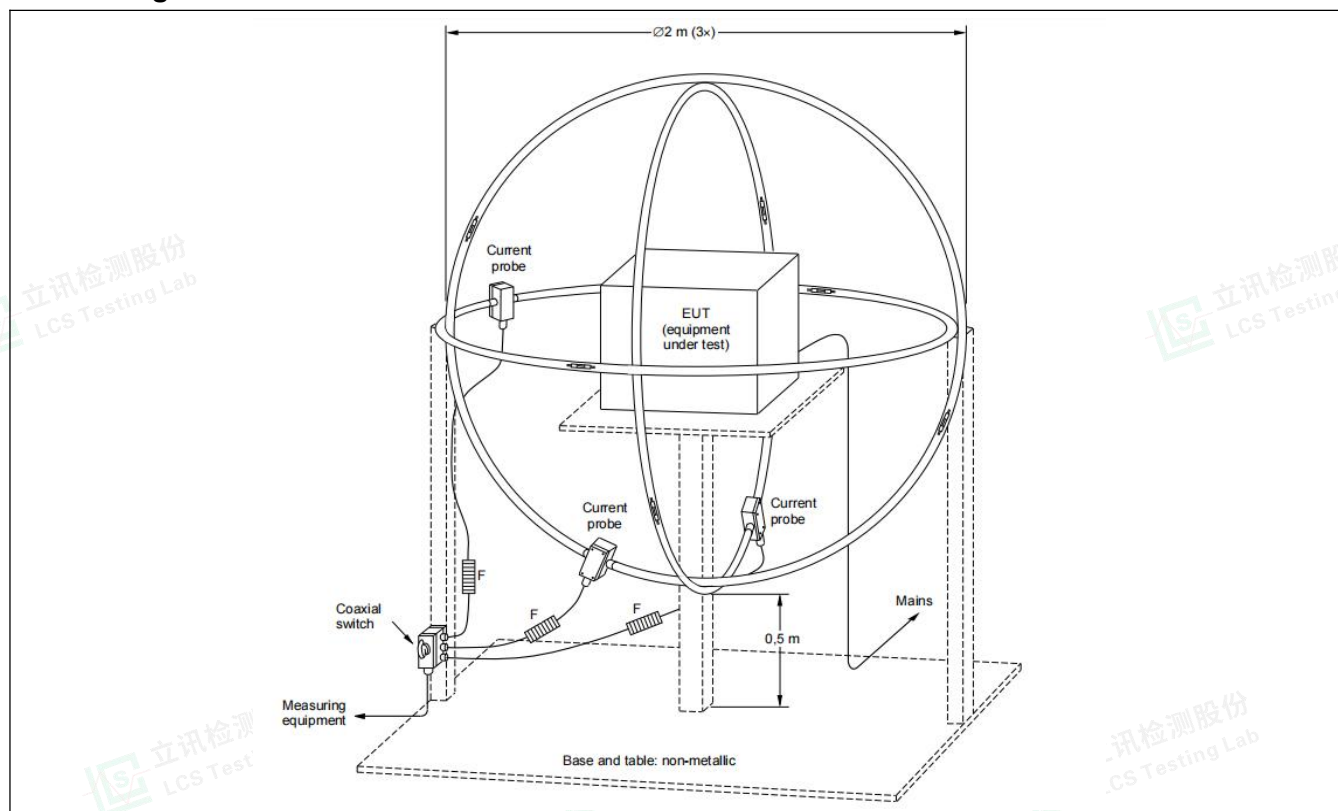
Standard	EN IEC 55015:2019+A11:2020
Basic Standard(s)	CISPR 16-2-3
Test method	Large Loop Antenna (LLA)

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)

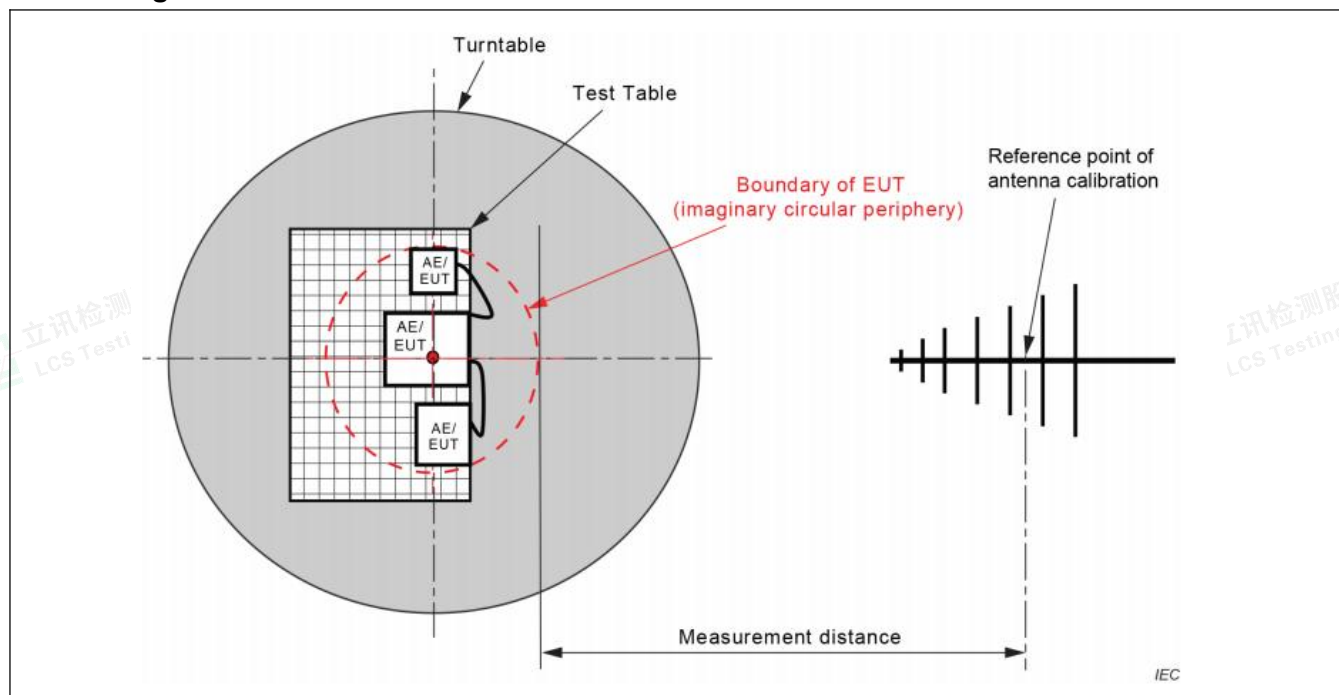
Standard	EN IEC 55015:2019+A11:2020
Basic Standard(s)	CISPR 16-2-3
Test method	Semi Anechoic Chamber (SAC)

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



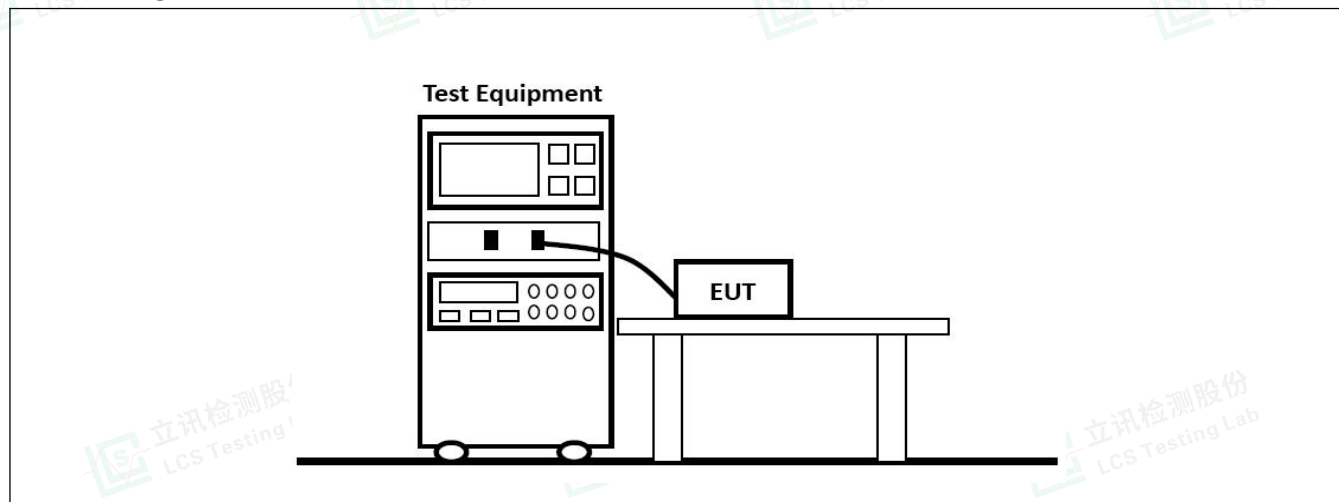


5.4. HARMONIC CURRENT

Standard	EN IEC 61000-3-2:2019+A1:2021	
Exclusions (For these categories of equipment, limits are not specified in the EN IEC 61000-3-2)	☐	Systems with nominal voltages less than 220V _{AC} (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





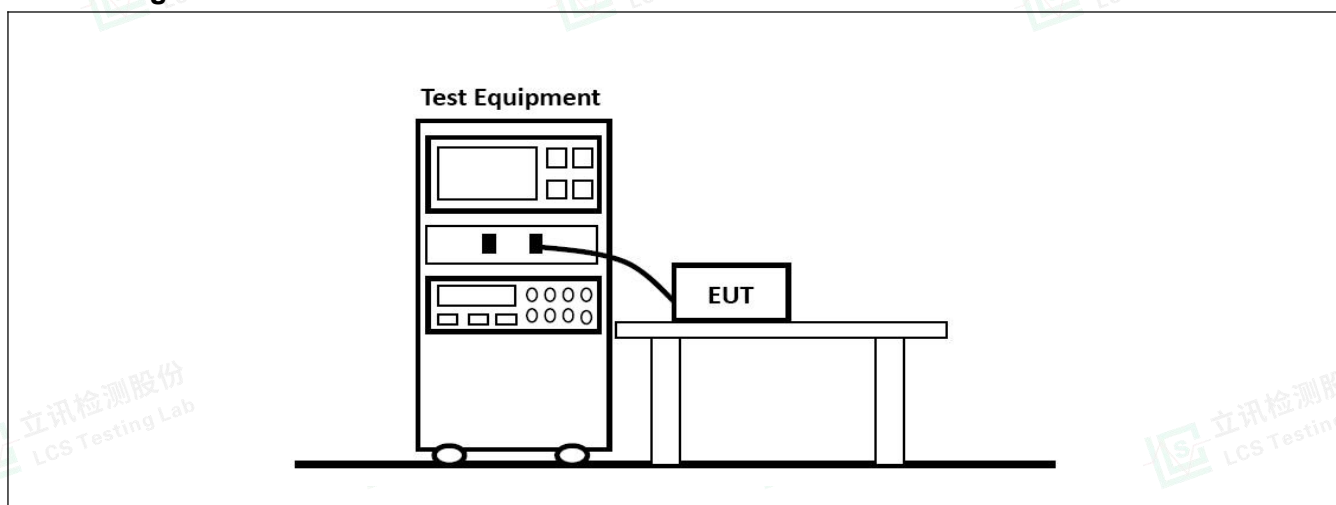
5.5. VOLTAGE FLUCTUATIONS & FLICKER

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



Test Results refer to Annex A.5





6. IMMUNITY TESTS

6.1. PERFORMANCE CRITERIA

Standard	EN 61547:2009
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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	C	B
☒	Lighting equipment (excluding self-ballasted lamps) Module in host	B	A	A	B	A	C	C	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.





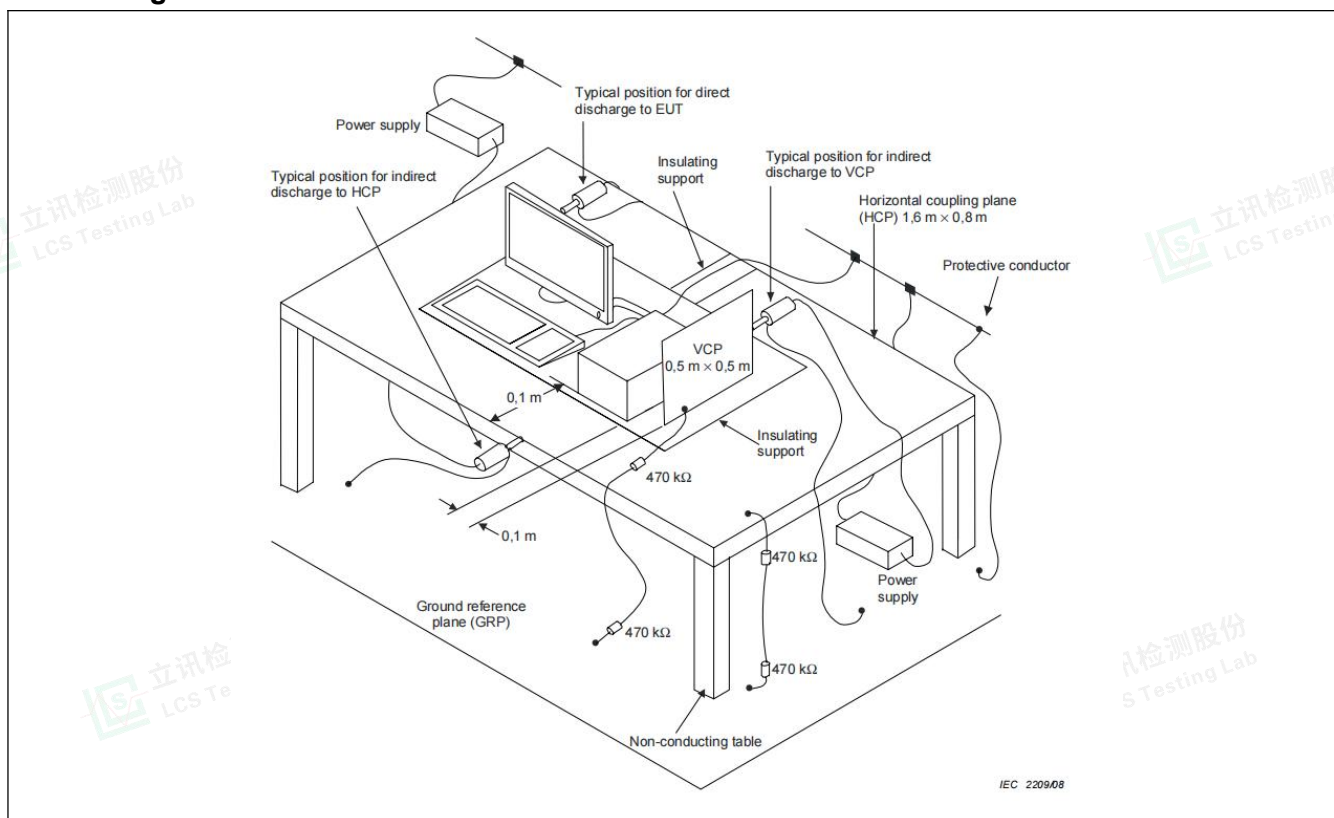
6.2. ELECTROSTATIC DISCHARGE

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	EN 61547:2009							
Basic standard	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							

Test configuration



Test Results refer to Annex A.6





6.3. RADIO-FREQUENCY ELECTROMAGNETIC FIELDS

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

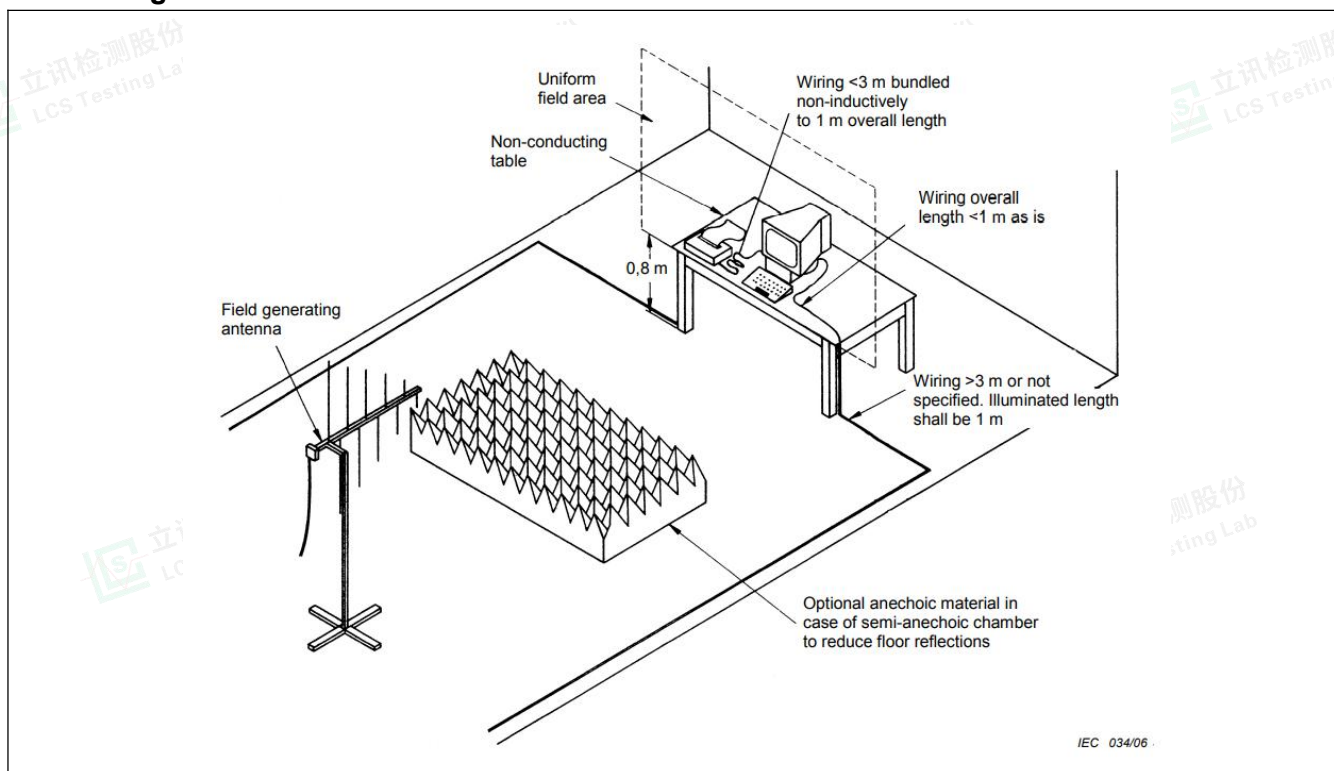
The test was carried out in a half-wave anechoic chamber with absorbent material attached to a reflective ground plate. Before the test, the test field strength needs to be calibrated. during the calibration, the corresponding relationship between the target field strength and the forward power applied 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	EN 61547:2009			
Basic standard	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.6



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6.4. ELECTRICAL FAST TRANSIENT / BURST

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

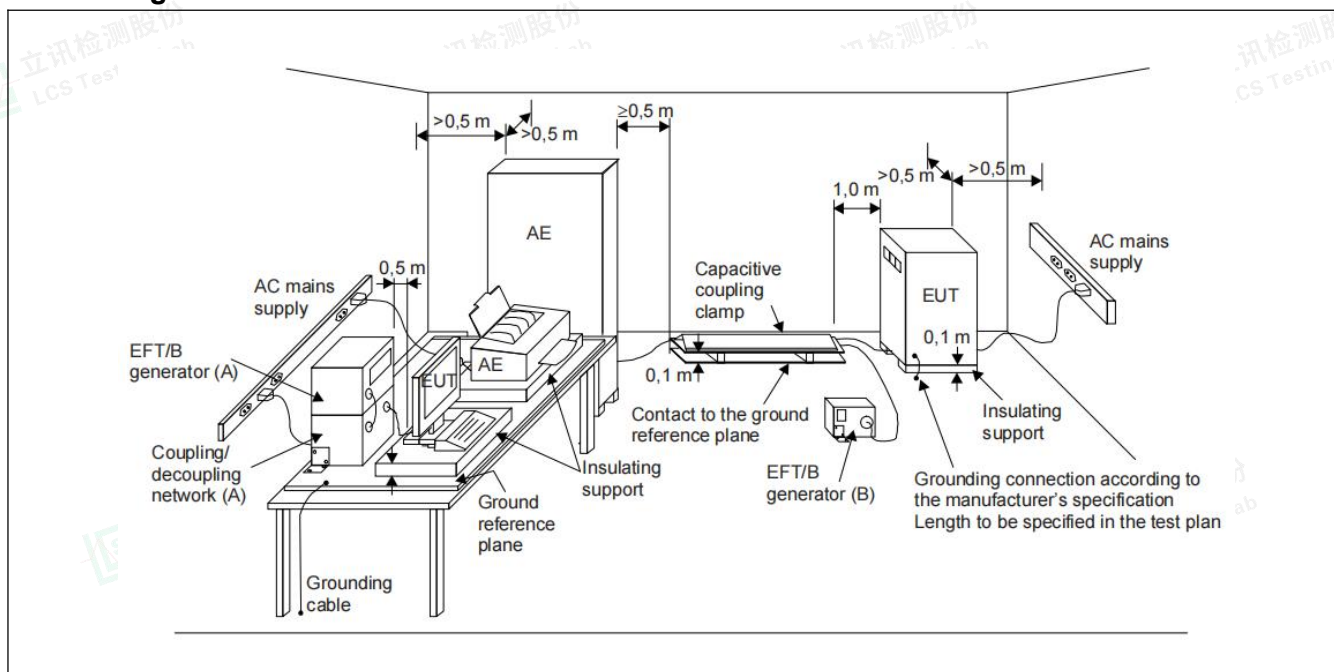
The EUT is put on the Insulating support which is 0.1 meter high above the ground reference plane. the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5 m. both polarities of the test voltage should be applied during test, 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		EN 61547:2009		
Basic standard		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 load ¹ ports	± 500 V	5 kHz	2 min / polarity

1) Only applicable to ports interfacing with cables 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.6



6.5. INJECTED CURRENTS (RADIO-FREQUENCY COMMON MODE)

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

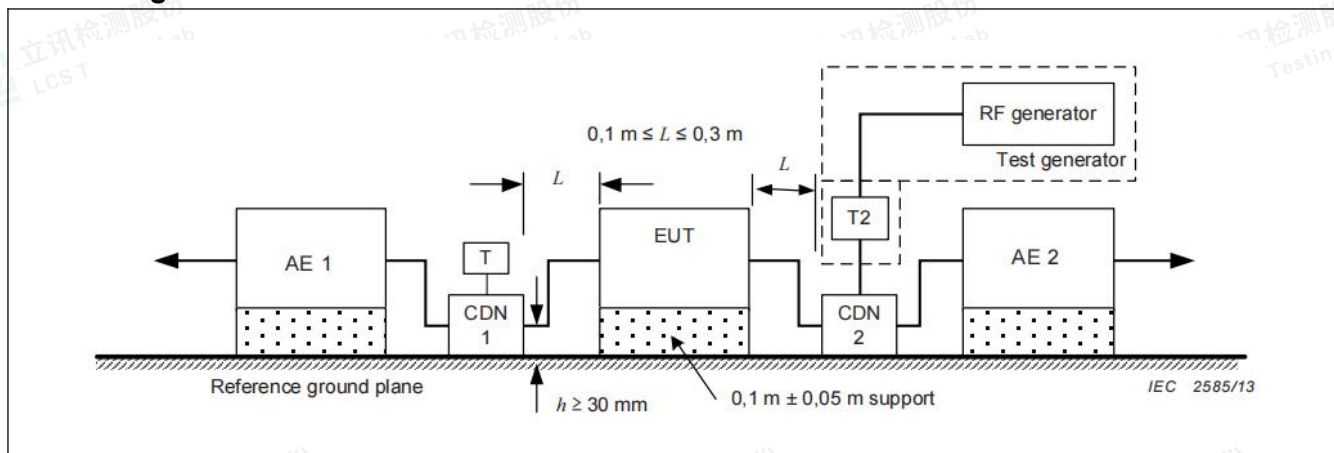
The equipment to be tested is placed on an insulating support of $0,1 \text{ m} \pm 0,05 \text{ m}$ height above a reference ground plane. a non conductive roller / caster in the range of $0,1 \text{ m} \pm 0,05 \text{ m}$ above the reference ground plane can be used as an alternative to an insulating 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		EN 61547:2009			
Basic standard		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 total length may exceed 3 m.

Test configuration



Test Results refer to Annex A.6





6.6. SURGE

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

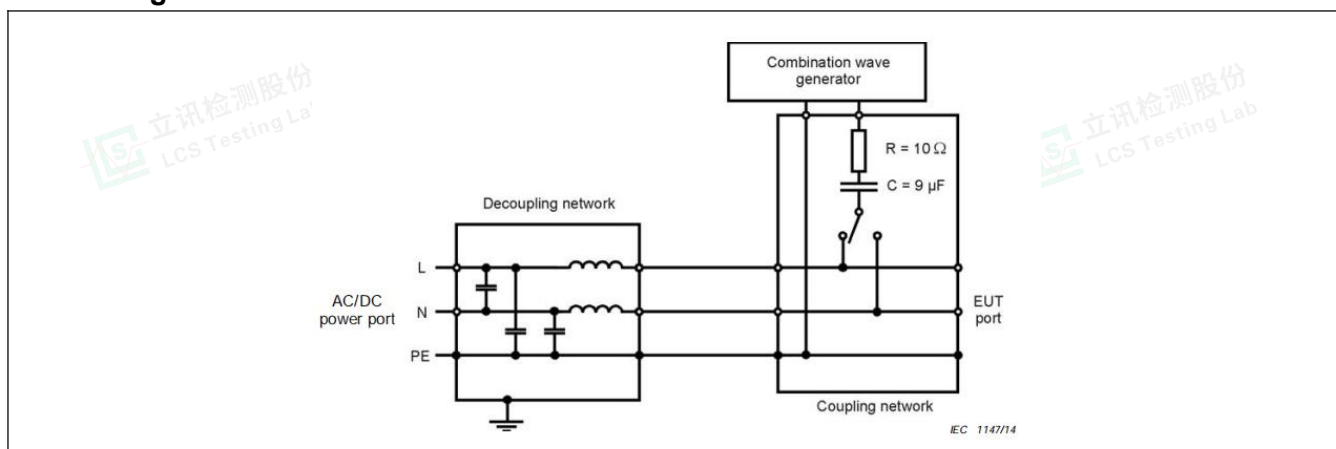
The surge is applied to the EUT power supply terminal via the capacitive coupling network, to the EUT power supply provide a 1,2/50 μ s voltage surge (at open-circuit condition), at least 5 positive and 5 negative tests with 1 min or less repetition rate are conducted during test. and phase angles is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

Requirements

Standard		EN 61547:2009			
Basic standard		EN 61000-4-5			
Pulse wave-shape		1,2/50 μ s			
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
☒	Luminaires and independent auxiliaries Input power >25W	AC input power	+ 1 kV	line - line	90°
			- 1 kV	line - line	270°
			+ 2 kV	line - ground	90°
			- 2 kV	line - ground	270°
☐	Luminaires and independent auxiliaries Input power $\leq$ 25W	AC input power	+ 0,5 kV	line - line	90°
			- 0,5 kV	line - line	270°
			+ 1 kV	line - ground	90°
			- 1 kV	line - ground	270°
☐	Self-ballasted lamps and semi-luminaires	AC input power	+ 0,5 kV	line - line	90°
			- 0,5 kV	line - line	270°
			+ 1 kV	line - ground	90°
			- 1 kV	line - ground	270°

1) In addition to the specified test level, all lower test levels as detailed in EN 61000-4-5 should also be satisfied.

Test configuration



Test Results refer to Annex A.6





6.7. VOLTAGE DIPS AND SHORT INTERRUPTIONS

The surge immunity test 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.

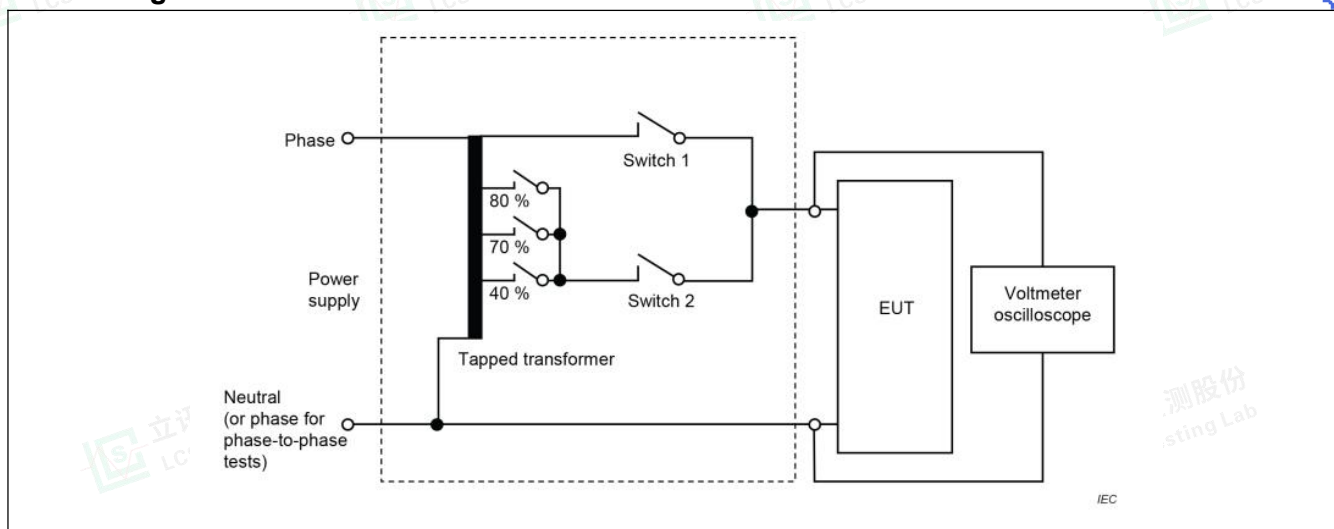
Requirements

Standard	EN 61547:2009		
Basic standard	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.6

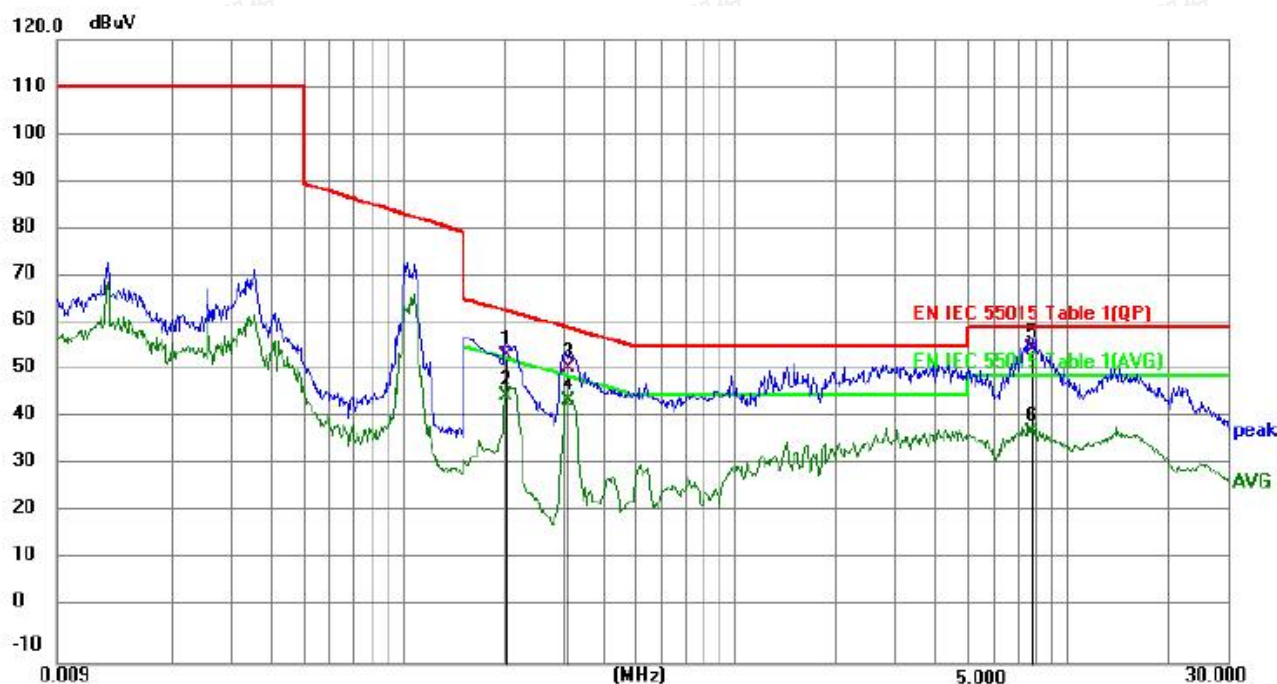




ANNEX A - TEST RESULTS

A.1. CONDUCTED DISTURBANCE TEST RESULTS

Environmental Conditions	24.5°C, 55% RH
Model	Krypton LW5015 IP
Operating mode	Mode 1 (worst case)
Test voltage	AC 230V, 50Hz
Test engineer	Zom Zhang
Pol	Line

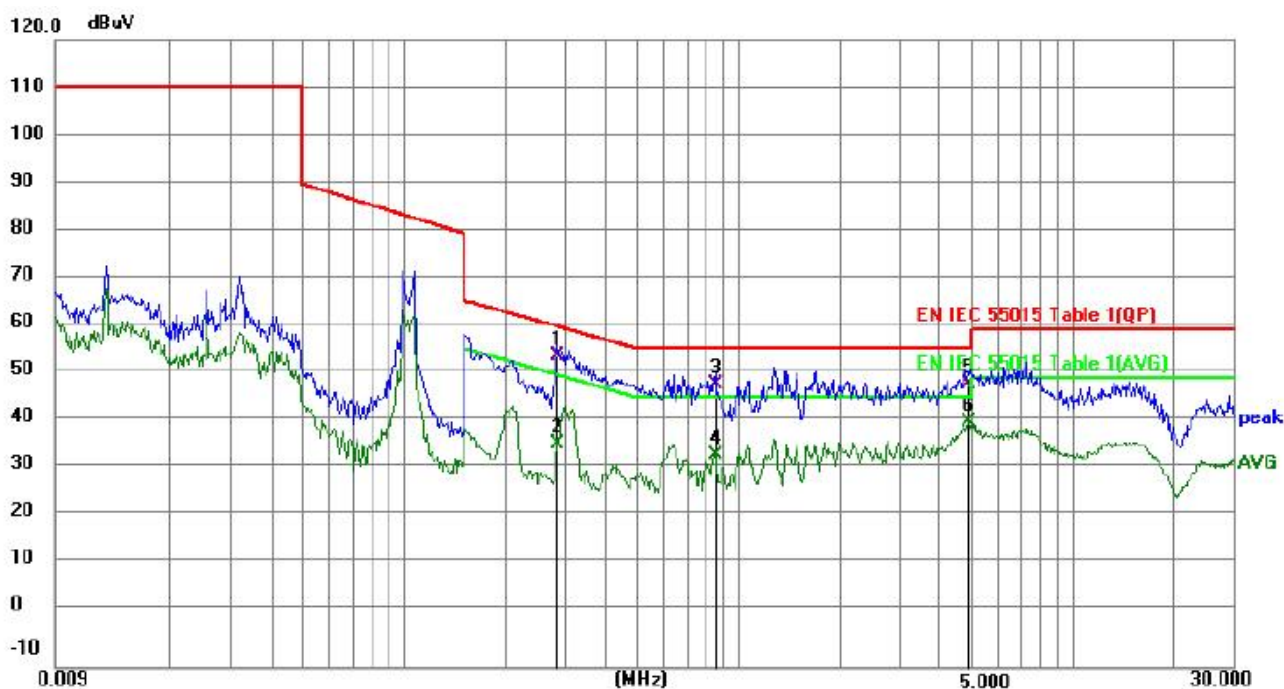


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2011	44.68	9.61	54.29	63.57	-9.28	QP	
2		0.2011	35.99	9.61	45.60	53.57	-7.97	AVG	
3		0.3074	42.01	9.63	51.64	60.04	-8.40	QP	
4		0.3074	35.03	9.63	44.66	50.04	-5.38	AVG	
5	*	7.7460	45.86	9.62	55.48	60.00	-4.52	QP	
6		7.7460	28.61	9.62	38.23	50.00	-11.77	AVG	





Environmental Conditions	24.5°C, 55% RH
Model	Krypton LW5015 IP
Operating mode	Mode 1 (worst case)
Test voltage	AC 230V, 50Hz
Test engineer	Zom Zhang
Pol	Neutral



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2850	45.03	9.64	54.67	60.67	-6.00	QP	
2		0.2850	26.66	9.64	36.30	50.67	-14.37	AVG	
3		0.8475	39.28	9.52	48.80	56.00	-7.20	QP	
4		0.8475	24.51	9.52	34.03	46.00	-11.97	AVG	
5		4.8525	39.28	9.50	48.78	56.00	-7.22	QP	
6	*	4.8525	31.40	9.50	40.90	46.00	-5.10	AVG	



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

Environmental Conditions	24.5°C, 55% RH
Model	Krypton LW5015 IP
Operating mode	Mode 1 (worst case)
Test voltage	AC 230V, 50Hz
Test engineer	Zom Zhang
Pol	X



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBμA	dB	dBμA	dBμA	dB	Detector	Comment
1		1.4955	-33.90	24.75	-9.15	30.37	-39.52	QP	
2		3.6780	-34.62	25.12	-9.50	22.00	-31.50	QP	
3	*	10.6755	-34.11	26.13	-7.98	22.00	-29.98	QP	



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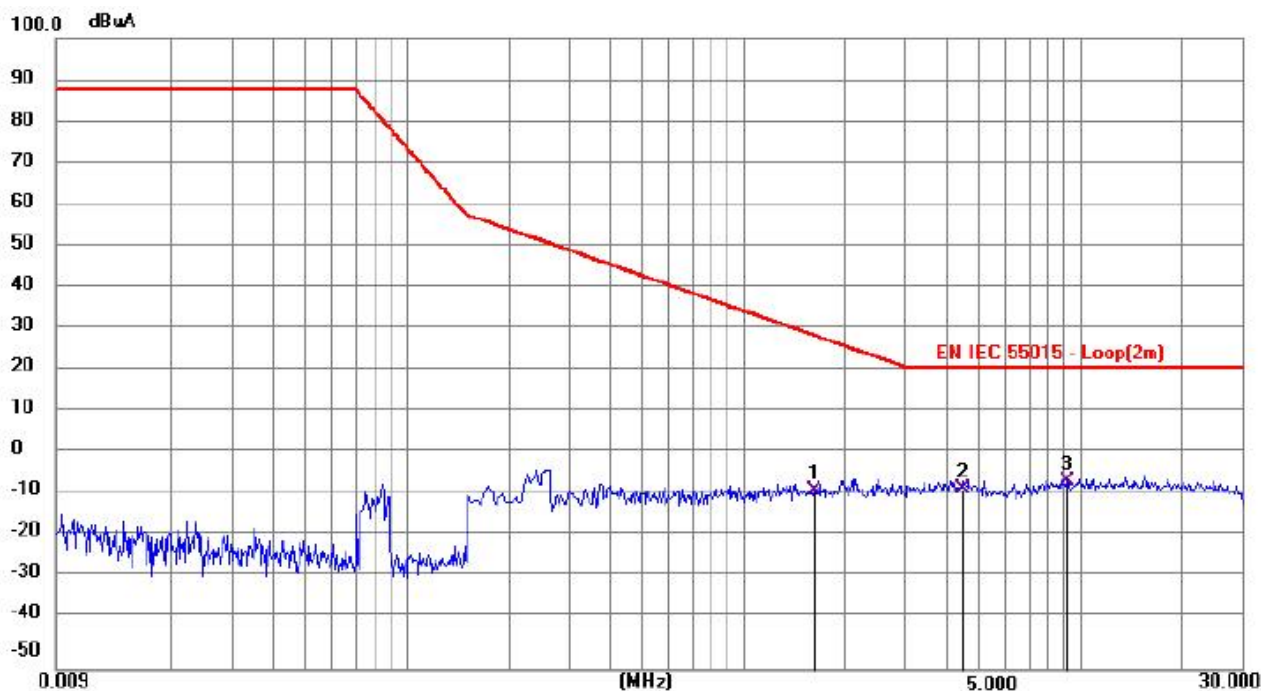
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Environmental Conditions	24.5°C, 55% RH
Model	Krypton LW5015 IP
Operating mode	Mode 1 (worst case)
Test voltage	AC 230V, 50Hz
Test engineer	Zom Zhang
Pol	Y

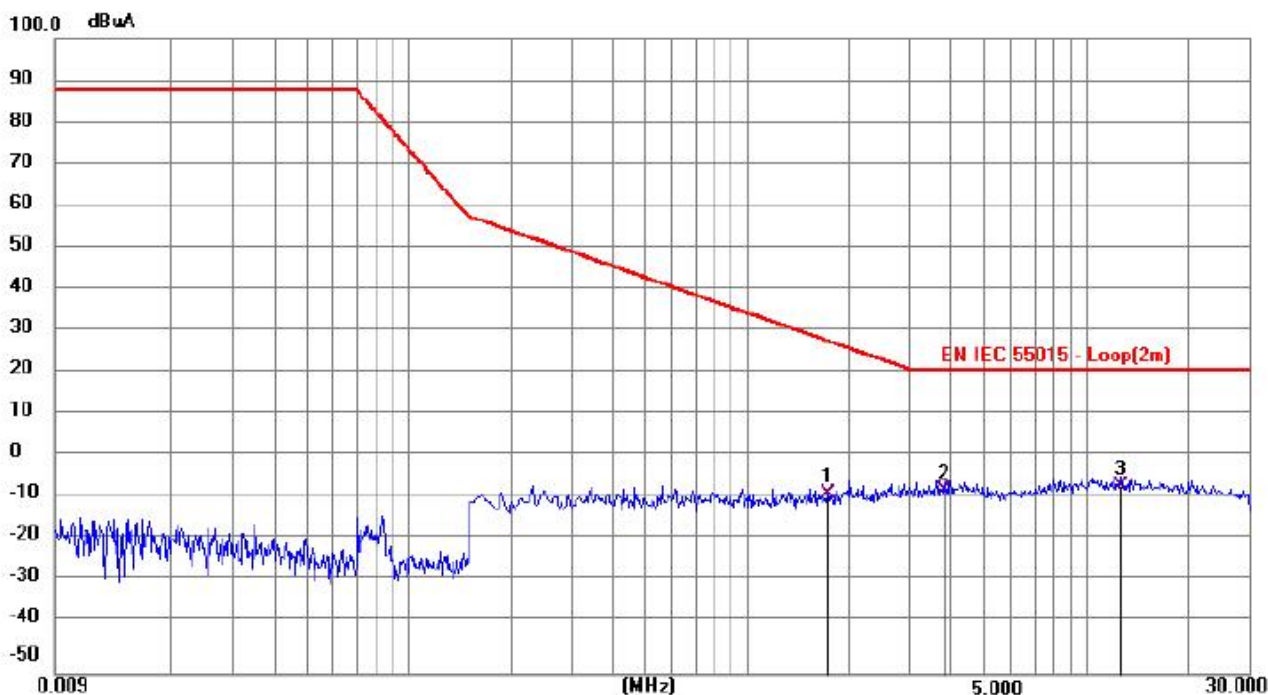


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment
1		1.6125	-32.80	25.44	-7.36	29.46	-36.82	QP	
2		4.4610	-32.97	25.87	-7.10	22.00	-29.10	QP	
3	*	9.1725	-31.64	26.28	-5.36	22.00	-27.36	QP	





Environmental Conditions	24.5℃, 55% RH
Model	Krypton LW5015 IP
Operating mode	Mode 1 (worst case)
Test voltage	AC 230V,50Hz
Test engineer	Zom Zhang
Pol	Z



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuA	dB	dBuA	dBuA	dB		
1		1.7205	-32.45	25.10	-7.35	28.68	-36.03	QP	
2		3.7995	-33.23	26.38	-6.85	22.00	-28.85	QP	
3	*	12.6735	-32.08	26.68	-5.40	22.00	-27.40	QP	





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

Environmental Conditions	24.5°C, 56% RH
Model	Krypton LW5015 IP
Operating mode	Mode 1 (worst case)
Test voltage	AC 230V, 50Hz
Test engineer	Zom Zhang
Pol	Vertical



o.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	
1	*	73.2950	23.57	9.95	33.52	40.00	-6.48	QP		
2		183.2807	21.47	10.89	32.36	40.00	-7.64	QP		
3		348.9438	22.42	15.63	38.05	47.00	-8.95	QP		



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Environmental Conditions	24.5℃, 56% RH
Model	Krypton LW5015 IP
Operating mode	Mode 1 (worst case)
Test voltage	AC 230V,50Hz
Test engineer	Zom Zhang
Pol	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		111.7378	19.93	12.28	32.21	40.00	-7.79	QP		
2		127.3850	22.14	10.99	33.13	40.00	-6.87	QP		
3	*	137.7216	22.46	10.89	33.35	40.00	-6.65	QP		



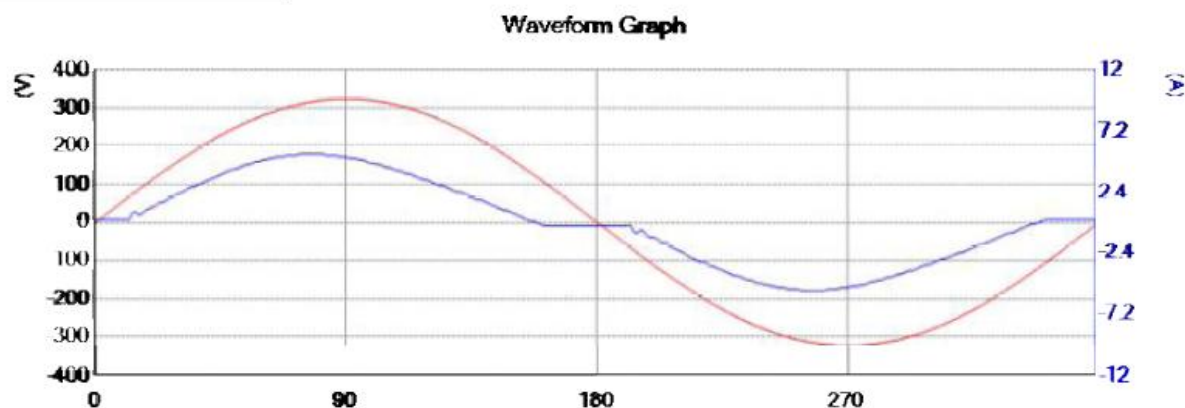


A.4. HARMONIC CURRENT TEST RESULTS

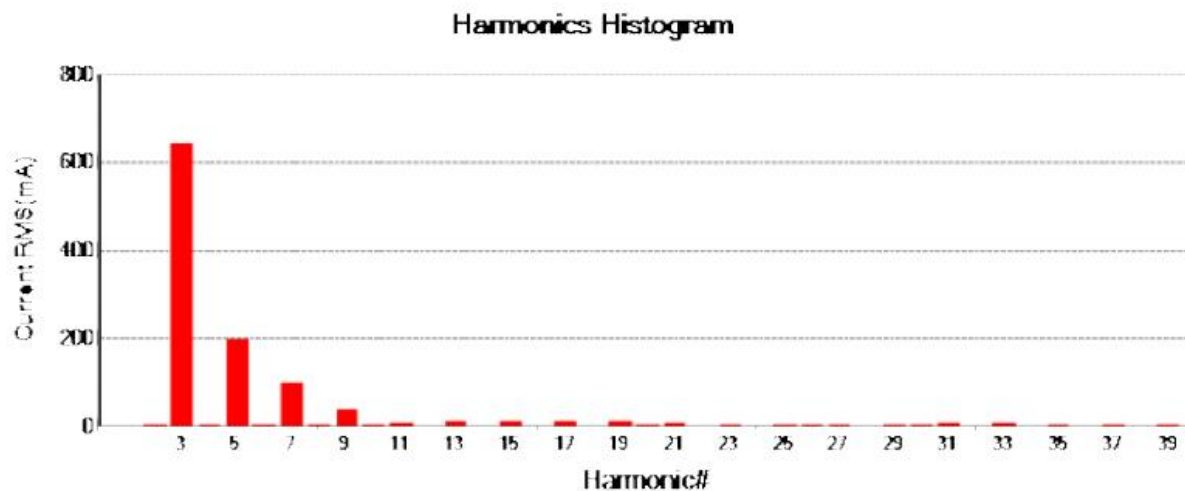
Model	Krypton LW5015 IP
Operating mode	Mode 1
Test voltage	AC 230V,50Hz
Test engineer	Zom Zhang

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

Current & voltage waveforms



Harmonics and Class A



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Model	Krypton LW5015 IP
Operating mode	Mode 1
Test voltage	AC 230V,50Hz
Test engineer	Zom Zhang

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

THC(mA): 678.300 I - THD(%): 20.8 POHC(mA):16.100 POHC Limit(mA):251.353

Parameter values during test:

V_RMS (Volts): 229.7

Frequency(Hz): 50.0

I_RMS(A): 3.3

Crest Factor: 1.613

Power (Watts): 738.9

Power Factor: 0.965

Harm#	Harms(filtered) (mA)	Limit (mA)	Harms(avg) (mA)	100%Limit	Harms(max) (mA)	150%Limit	Status
I_Fund	3258.900						
2	2.100	1080.000	2.300	0.213	2.800	0.173	Pass
3	639.800	2300.000	638.000	27.739	639.800	18.545	Pass
4	1.000	430.000	1.000	0.233	1.700	0.264	Pass
5	196.000	1140.000	195.100	17.114	196.300	11.480	Pass
6	0.300	300.000	0.400	0.133	1.000	0.222	Pass
7	101.000	770.000	100.800	13.091	101.400	8.779	Pass
8	0.000	230.000	0.200	0.087	0.300	0.087	Pass
9	36.600	400.000	37.300	9.325	37.700	6.283	Pass
10	0.700	184.000	0.400	0.217	0.700	0.254	Pass
11	7.100	330.000	7.600	2.303	7.900	1.596	Pass
12	0.000	153.300	0.200	0.130	0.700	0.304	Pass
13	10.700	210.000	10.300	4.905	10.700	3.397	Pass
14	0.000	131.400	0.200	0.152	0.300	0.152	Pass
15	12.500	150.000	12.500	8.333	12.900	5.733	Pass
16	0.000	115.000	0.200	0.174	0.300	0.174	Pass
17	11.800	132.400	12.000	9.063	12.200	6.143	Pass
18	0.000	102.200	0.100	0.098	0.300	0.196	Pass
19	11.800	118.400	12.100	10.220	12.500	7.038	Pass
20	0.000	92.000	0.200	0.217	0.300	0.217	Pass
21	8.200	107.100	8.100	7.563	8.200	5.104	Pass
22	0.000	83.600	0.100	0.120	0.300	0.239	Pass
23	4.300	97.800	4.600	4.703	4.600	3.136	Pass
24	0.000	76.700	0.100	0.130	0.300	0.261	Pass
25	1.000	90.000	1.300	1.444	1.400	1.037	Pass
26	0.000	70.800	0.200	0.282	0.300	0.282	Pass
27	3.200	83.300	3.100	3.721	3.200	2.561	Pass
28	0.000	65.700	0.100	0.152	0.300	0.304	Pass
29	4.300	77.600	4.500	5.799	4.600	3.952	Pass
30	0.000	61.300	0.200	0.326	0.300	0.326	Pass
31	6.100	72.600	6.000	8.264	6.100	5.601	Pass
32	0.000	57.500	0.200	0.348	0.300	0.348	Pass
33	6.100	68.200	6.300	9.238	6.400	6.256	Pass
34	0.300	54.100	0.200	0.370	0.300	0.370	Pass
35	4.300	64.300	4.500	6.998	4.600	4.769	Pass
36	0.000	51.100	0.200	0.391	0.300	0.391	Pass
37	3.500	60.800	3.700	6.086	3.900	4.276	Pass
38	0.300	48.400	0.200	0.413	0.300	0.413	Pass
39	4.300	57.700	4.500	7.799	4.600	5.315	Pass
40	0.000	46.000	0.200	0.435	0.300	0.435	Pass

Note: All harmonics are below the minimum limits and are ignored.



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Model	Krypton LW5015 IP
Operating mode	Mode 1
Test voltage	AC 230V,50Hz
Test engineer	Zom Zhang

Source qualification(Power On Load): **Pass**

Measurements are compliant with IEC/EN61000-3-2 Ed. 4 & IEC/EN61000-4-7 Ed. 2.1

	Nominal	Measured	Measured	Deviation	Allowed	Result
		Low	High		Deviation	
Supply Voltage	230	229.58	229.70	0.42	4.6	Pass
Supply Frequency	50	50.0	50.0	0.0	0.25	Pass
Crest Phase	90.0	89.3	90.0	0.7	87 - 93	N/A
Crest Factor	1.414	1.414	1.415	0.001	1.40 - 1.42	N/A
Fundamental Voltage	229.60	-	-	-	-	-

Harm#	Harmonics Voltage	Harmonic Ratio	Limit	Result
2	0.070	0.040	0.200	Pass
3	0.320	0.139	0.900	Pass
4	0.050	0.031	0.200	Pass
5	0.110	0.054	0.400	Pass
6	0.020	0.016	0.200	Pass
7	0.080	0.037	0.300	Pass
8	0.010	0.008	0.200	Pass
9	0.020	0.019	0.200	Pass
10	0.030	0.013	0.100	Pass
11	0.020	0.018	0.100	Pass
12	0.000	0.003	0.100	Pass
13	0.010	0.009	0.100	Pass
14	0.000	0.003	0.100	Pass
15	0.010	0.008	0.100	Pass
16	0.000	0.003	0.100	Pass
17	0.010	0.010	0.100	Pass
18	0.000	0.000	0.100	Pass
19	0.000	0.010	0.100	Pass
20	0.000	0.003	0.100	Pass
21	0.000	0.005	0.100	Pass
22	0.000	0.003	0.100	Pass
23	0.000	0.003	0.100	Pass
24	0.000	0.001	0.100	Pass
25	0.000	0.003	0.100	Pass
26	0.000	0.003	0.100	Pass
27	0.000	0.002	0.100	Pass
28	0.000	0.000	0.100	Pass
29	0.000	0.003	0.100	Pass
30	0.000	0.001	0.100	Pass
31	0.000	0.003	0.100	Pass
32	0.000	0.000	0.100	Pass
33	0.010	0.003	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	0.003	0.100	Pass
40	0.000	0.000	0.100	Pass



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A.5. VOLTAGE FLUCTUATIONS & FLICKER TEST RESULTS

Model	Krypton LW5015 IP
Operating mode	Mode 1
Test voltage	AC 230V,50Hz
Test engineer	Zom Zhang

Load Power :735.800 W Power Factor:0.965
Load Current : 3.324 mArms Crest Factor:1.614
Nominal Voltage : 229.28 Vrms

Test Result: Pass Status: Test Completed

Pst_i and limit line European Limits



Result:

T-max (ms):	0.00	Test limit (ms):	500.00	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.00	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.03	Test limit:	1.00	Pass
Highest Plt (2 hr. period):	0.00	Test limit:	0.65	Pass



**A.6. IMMUNITY TEST RESULTS**

ELECTROSTATIC DISCHARGE IMMUNITY TEST RESULTS					
Standard	☒ EN 61547:2009 ☒ EN 61000-4-2				
EUT	Stage luminaire	Temperature	23.5℃		
M/N	Krypton LW5015 IP	Humidity	52%		
Test Mode	Mode 1	Pressure	1008mbar		
Input voltage	AC 230V,50Hz	Test Results	Pass		
Test engineer	Zom Zhang				
Discharge Mode	Test Points	Test Voltage (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 IMMUNITY TEST RESULTS**

Standard	☒ EN 61547:2009		☒ EN 61000-4-3	
EUT	Stage luminaire		Temperature	22.5°C
M/N	Krypton LW5015 IP		Humidity	55%
Test Mode	Mode 1		Pressure	1008mbar
Input voltage	AC 230V,50Hz		Test engineer	Zom Zhang
Modulation	1 kHz, 80 % AM		Test Results	Pass
Steps	1%			
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 :



**ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST RESULTS**

Standard	☒ EN 61547:2009		☒ EN 61000-4-4	
EUT	Stage luminaire		Temperature	23.6℃
M/N	Krypton LW5015 IP		Humidity	52%
Test Mode	Mode 1		Pressure	1008mbar
Input voltage	AC 230V,50Hz		Test Results	Pass
Test engineer	Zom Zhang			
Port under test	Test Level & polarity	Repetition Frequency	Test duration / polarity	Performance Criteria
AC input / output power	± 1 kV	5 kHz	2min	B
DC input / output power				
Signal / control lines and load ports				

Note:



**INJECTED CURRENTS (RADIO-FREQUENCY COMMON MODE) TEST RESULTS**

Standard	☒ EN 61547:2009		☒ EN 61000-4-6	
EUT	Stage luminaire		Temperature	23.6℃
M/N	Krypton LW5015 IP		Humidity	52%
Test Mode	Mode 1		Pressure	1008mbar
Input voltage	AC 230V,50Hz		Test Results	Pass
Frequency range	0,15 - 80 MHz		Test engineer	Zom Zhang
Port under test	Test Level	Coupling method	Dwell time	Performance Criteria
AC input / output power	3 V	CDN	1 seconds	A
DC input / output power				
Signal / control line				



**SURGE IMMUNITY TEST RESULTS**

Standard	☒ EN 61547:2009 ☒ EN 61000-4-5					
EUT	Stage luminaire			Temperature	23.6°C	
M/N	Krypton LW5015 IP			Humidity	52%	
Test Mode	Mode 1			Pressure	1008mbar	
Input voltage	AC 230V,50Hz			Test Results	Pass	
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	C
		- 1	270	5	60	C
	L - PE	+ 2	90	5	60	C
		- 2	270	5	60	C
	N - PE	+ 2	90	5	60	C
		- 2	270	5	60	C
	L&N - PE	+ 2	90	5	60	C
		- 2	270	5	60	C

Note:



**VOLTAGE DIPS AND SHORT INTERRUPTIONS IMMUNITY TEST RESULTS**

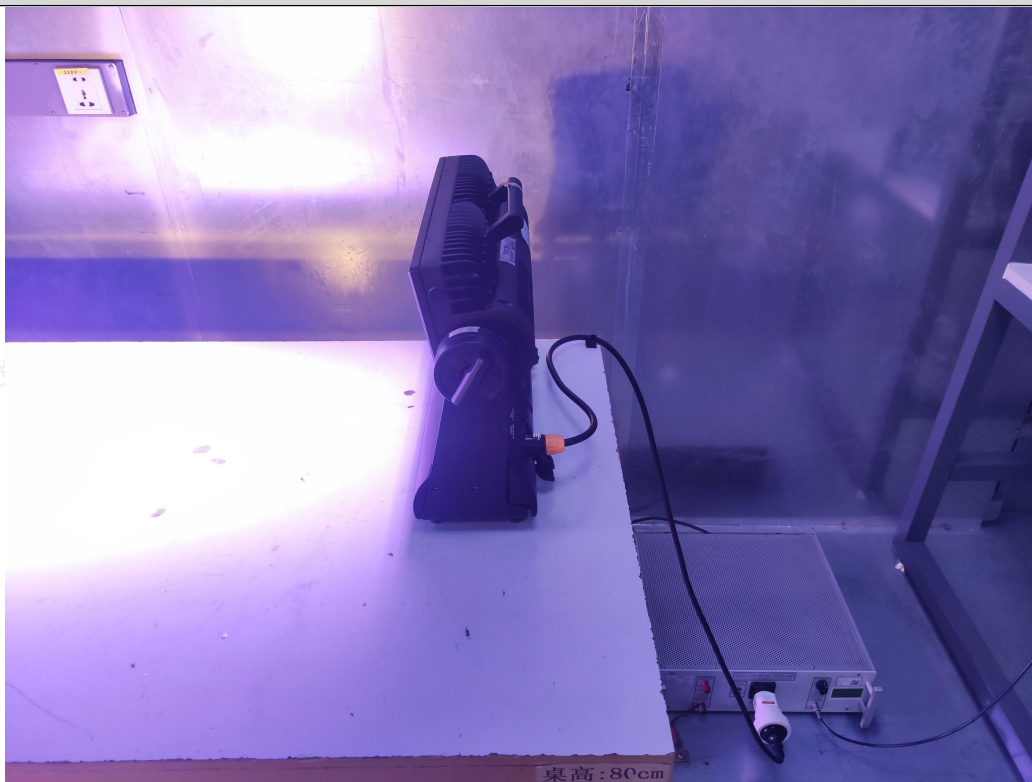
Standard	☒ EN 61547:2009		☒ EN 61000-4-11		
EUT	Stage luminaire		Temperature	23.6℃	
M/N	Krypton LW5015 IP		Humidity	52%	
Test Mode	Mode 1		Pressure	1008mbar	
Input voltage	AC 230V,50Hz		Test Results	Pass	
Test engineer	Zom Zhang				
U _{NOM} (Vac)	Test Level (% U _{NOM})	Number of periods		Phase angle (°)	Performance criteria
		50Hz	60Hz		
230	70	10	12	0, 90, 180, 270	C
	0	0,5	0,5	0	B

Note:



ANNEX B - TEST PHOTOS

B.1. Conducted Disturbance

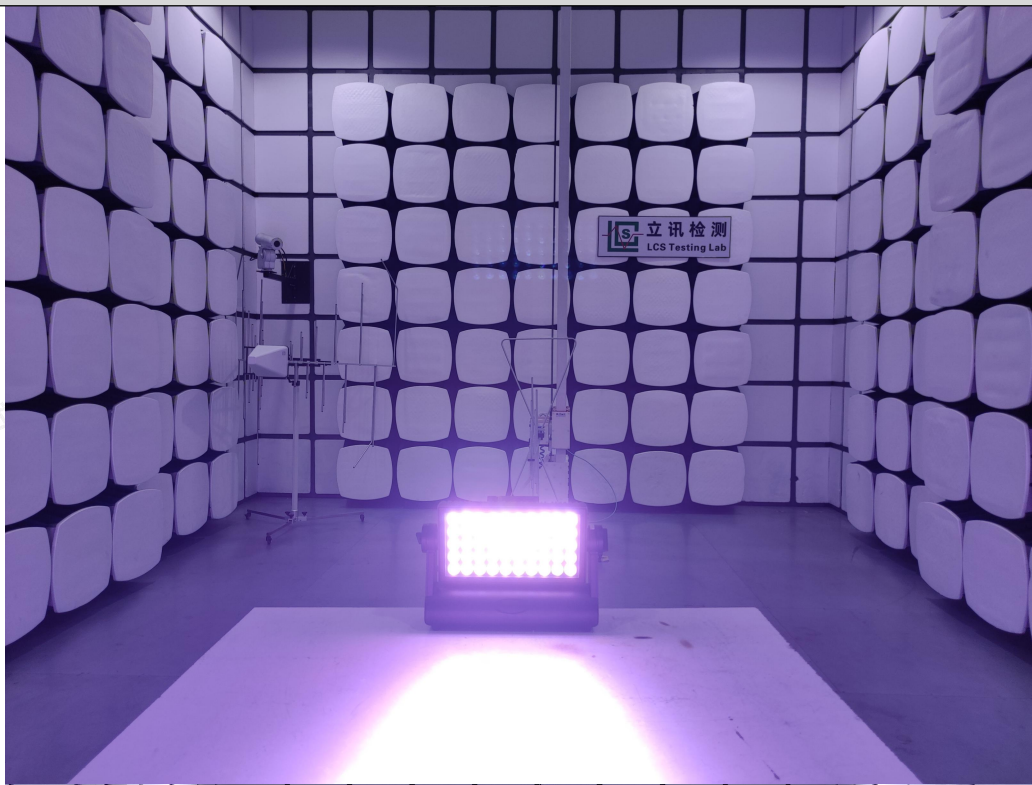


B.2. Radiated Disturbance (9kHz - 30MHz)

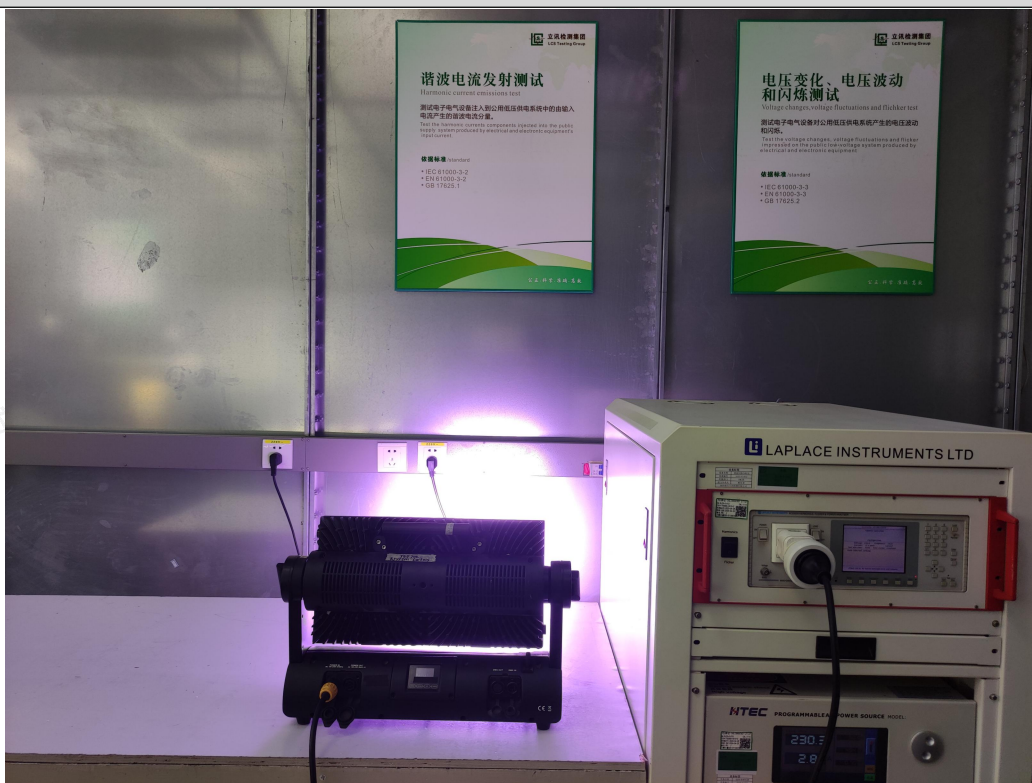




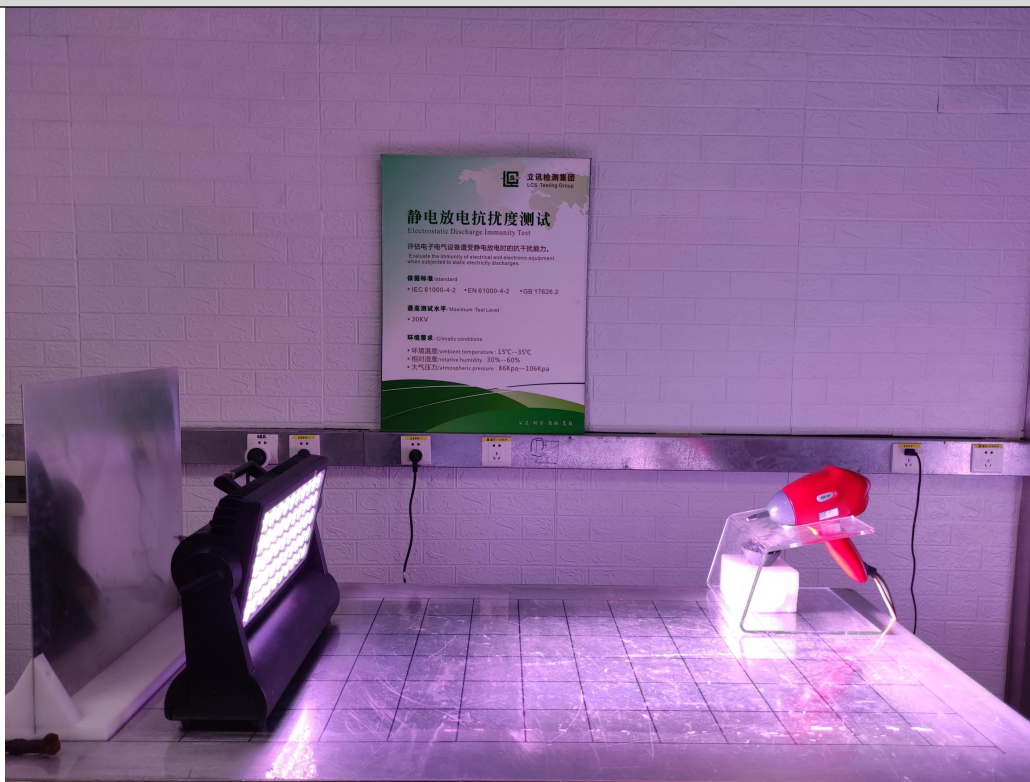
B.3. Radiated Disturbance (30MHz to 1GHz) & Radio-Frequency Electromagnetic Fields



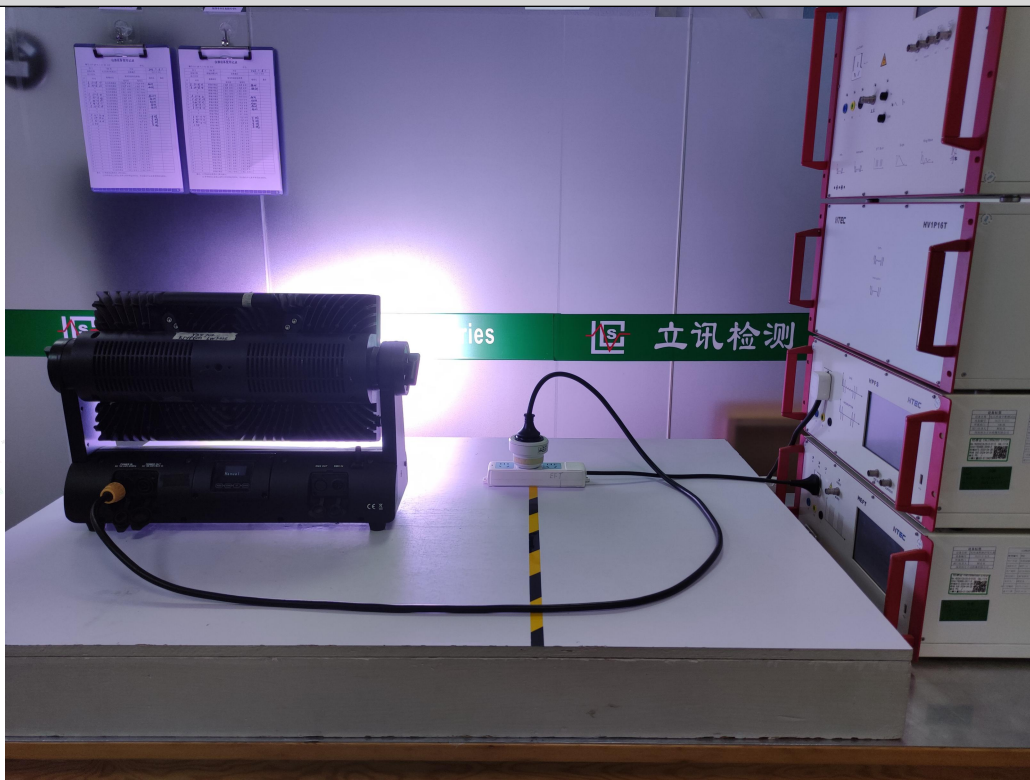
B.4. Harmonic Current & Flicker



B.5. Electrostatic Discharge



B.6. Electrical Fast Transient / Burst





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



B.8. Surge



Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

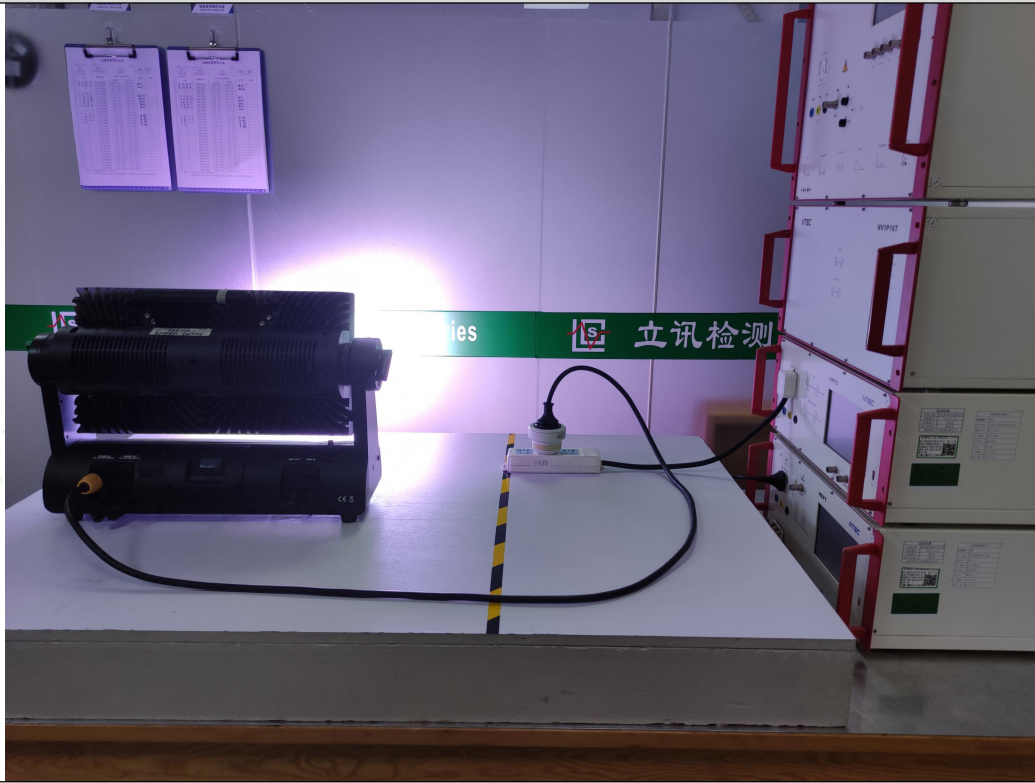
101-201, No. 39 Building, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China.

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com.

Scan code to check authenticity.



B.9. Voltage Dips and Short Interruptions





ANNEX C - EXTERNAL AND INTERNAL PHOTOS OF THE EUT



Photo.1 Krypton LW5015 IP

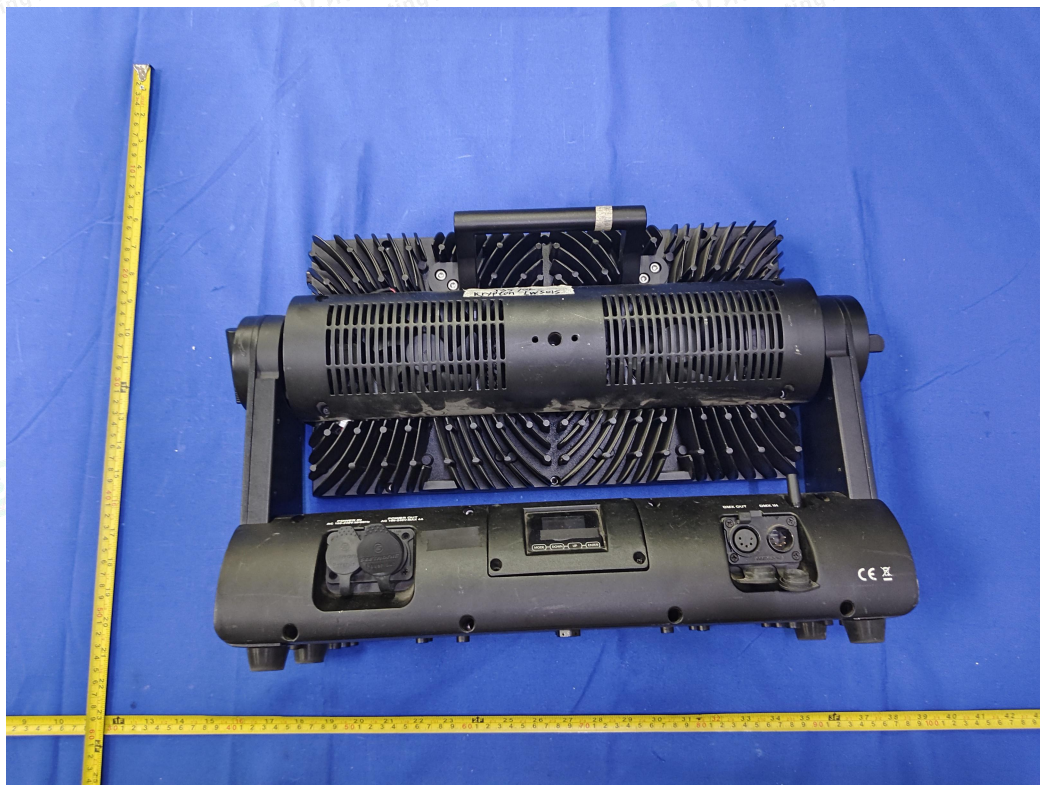


Photo.2





Photo.3



Photo.4





Photo.5



Photo.6





Photo.7

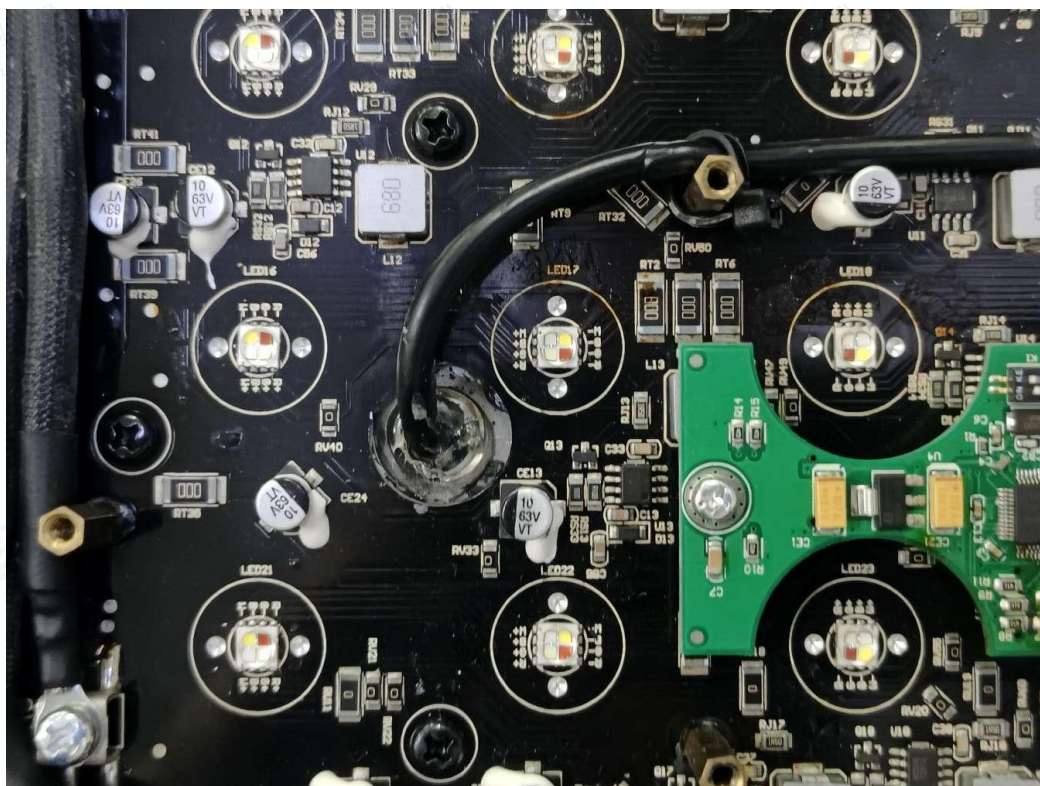


Photo.8



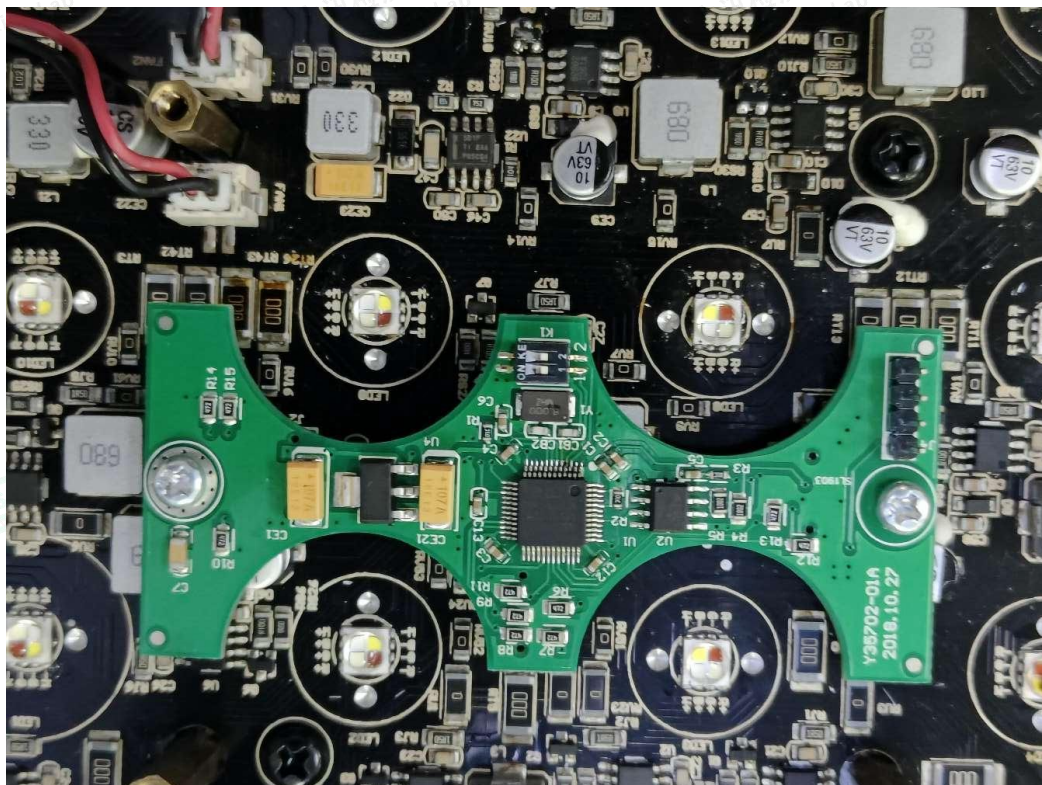


Photo.9

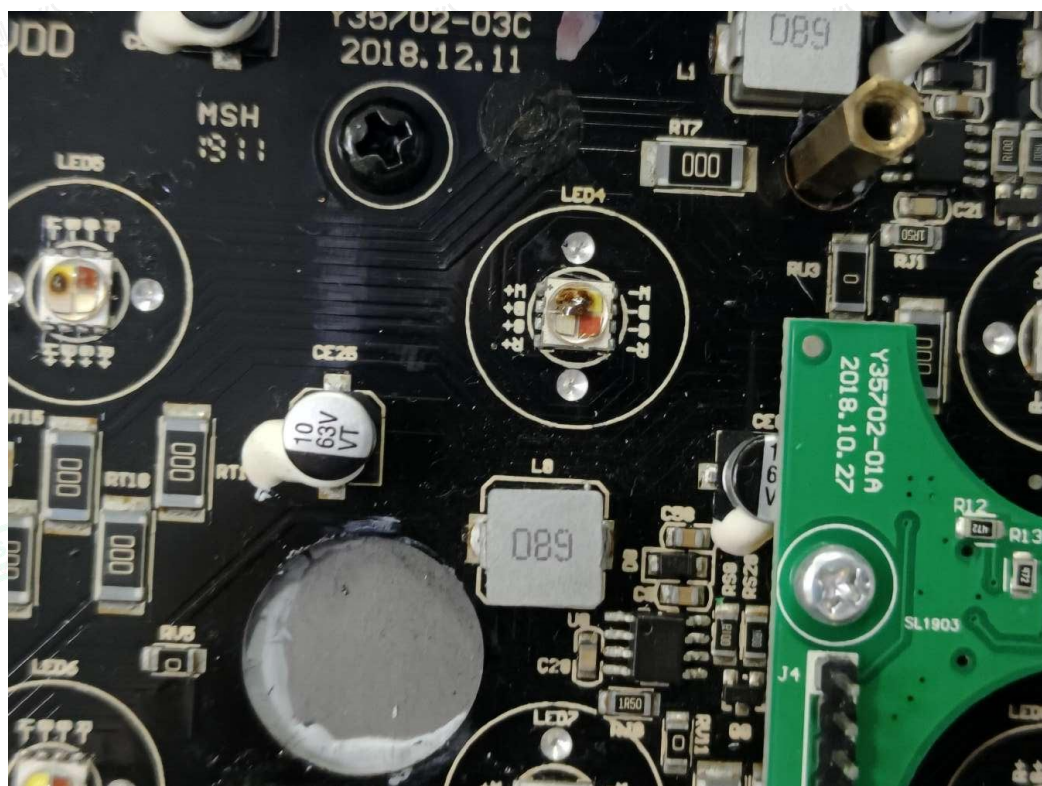


Photo.10



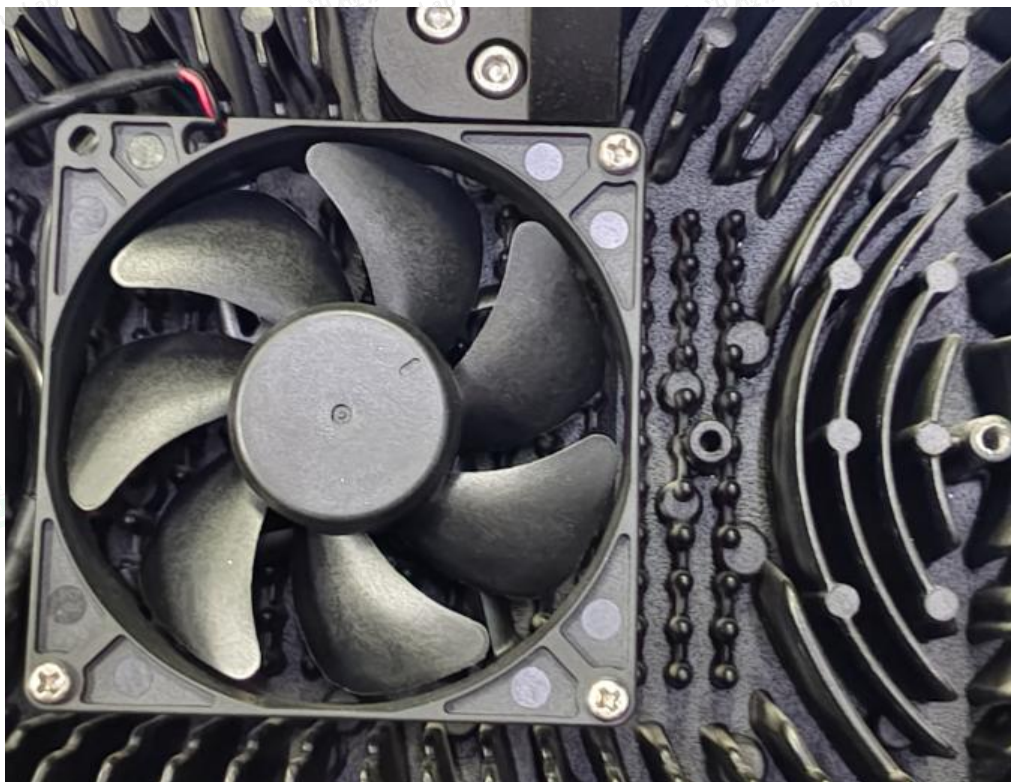


Photo.11

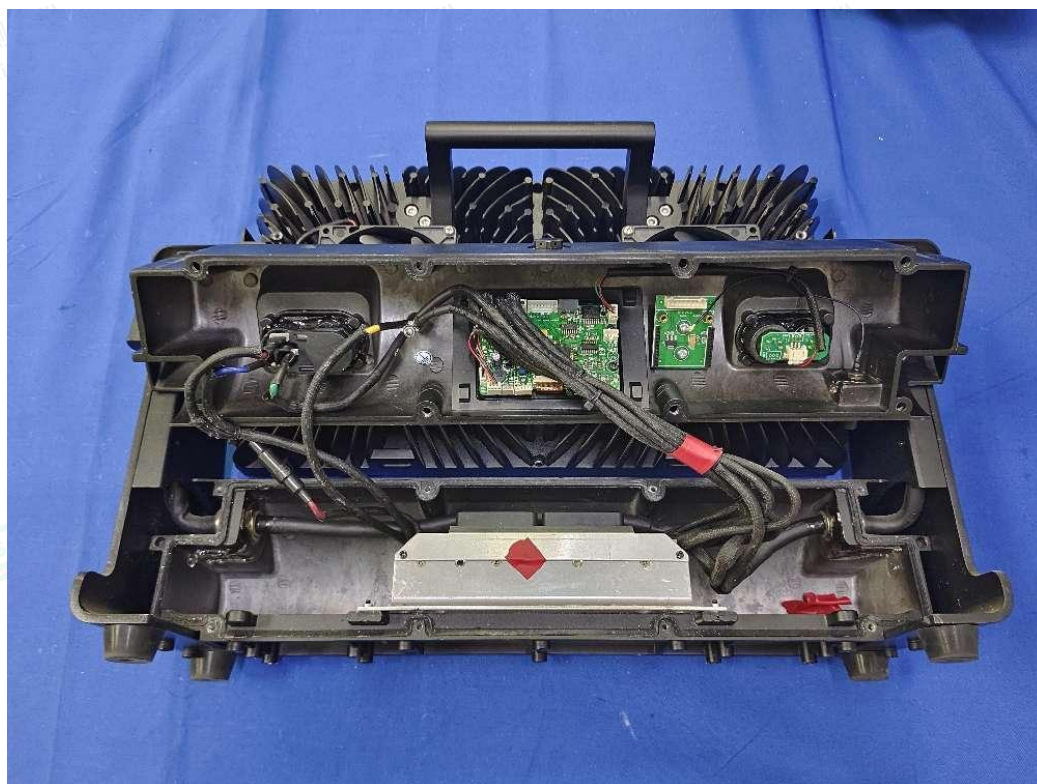


Photo.12



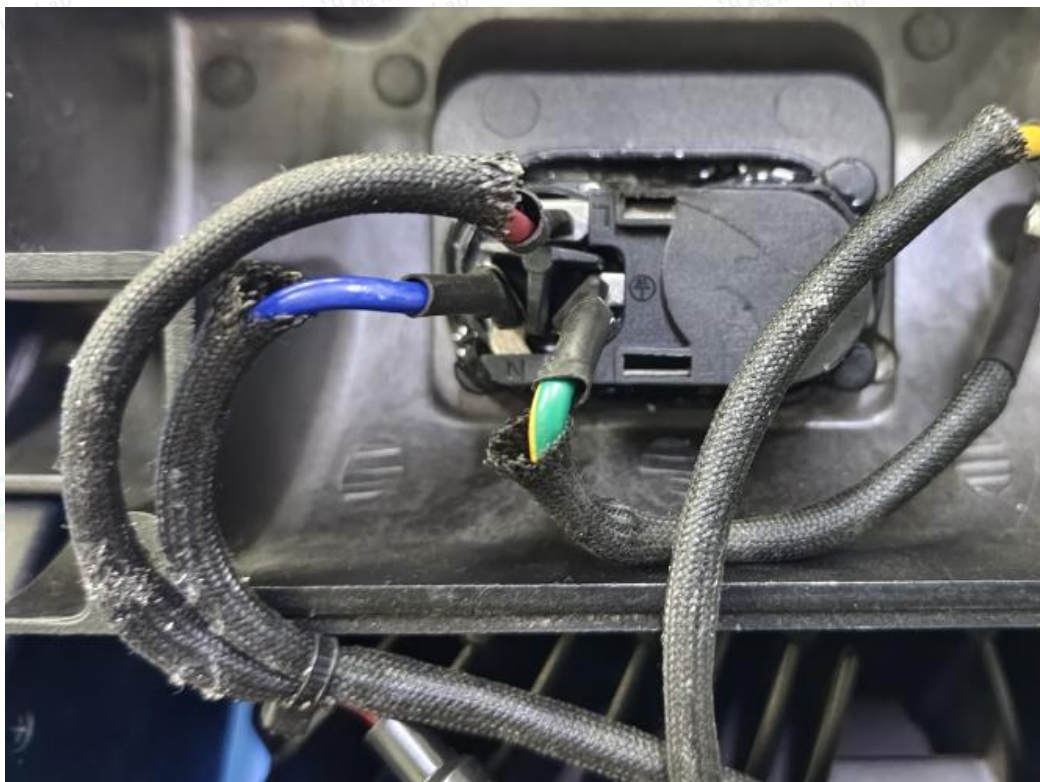


Photo.13

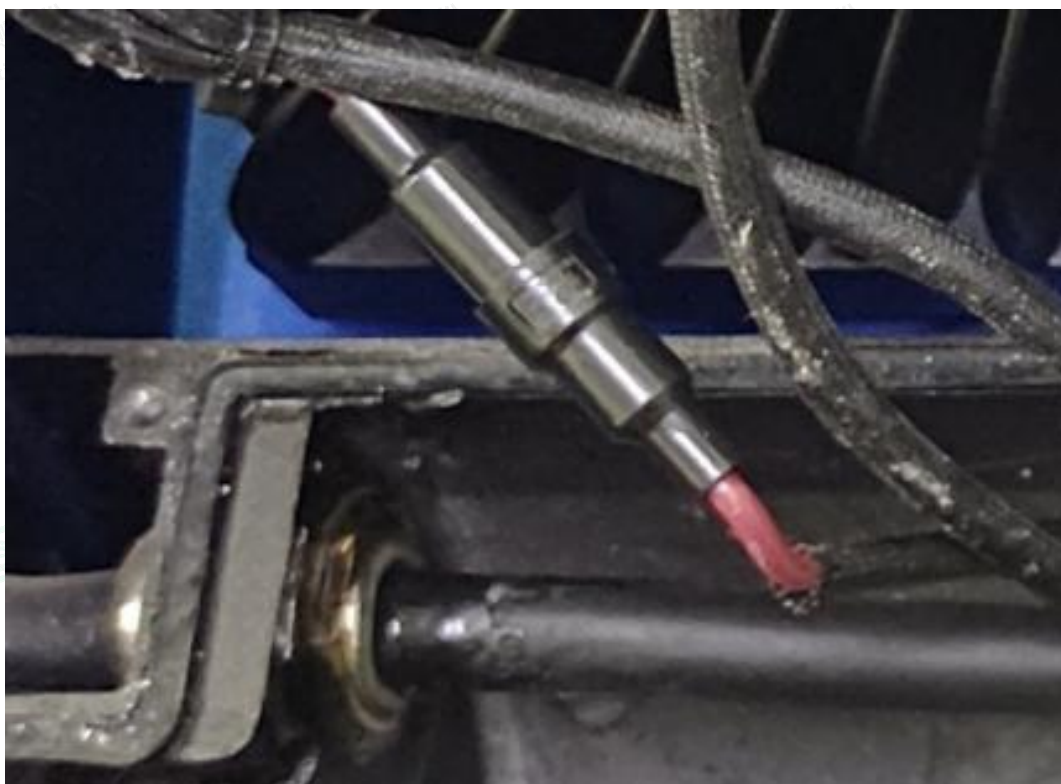


Photo.14





Photo.15

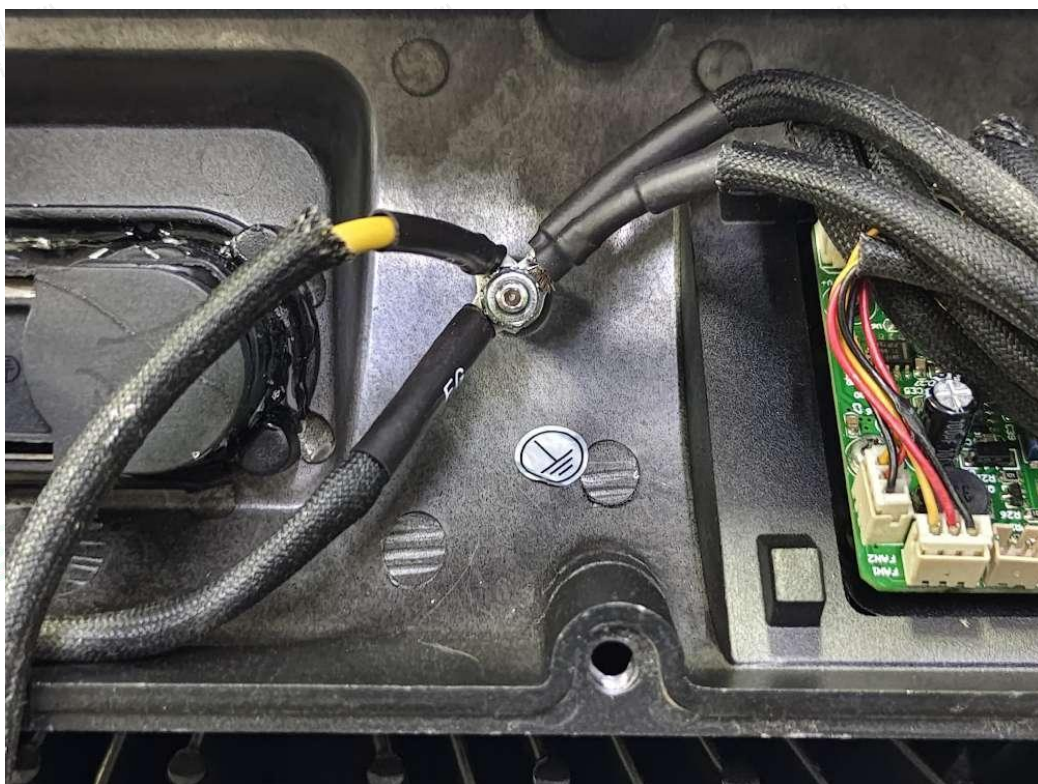


Photo.16



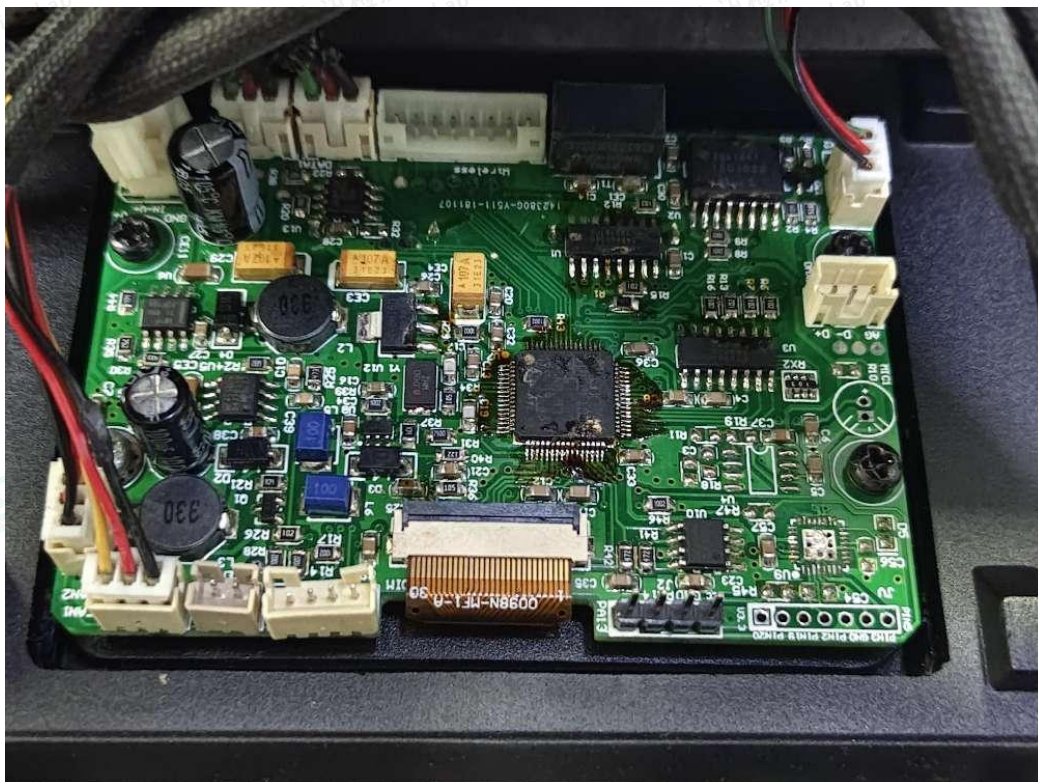


Photo.17

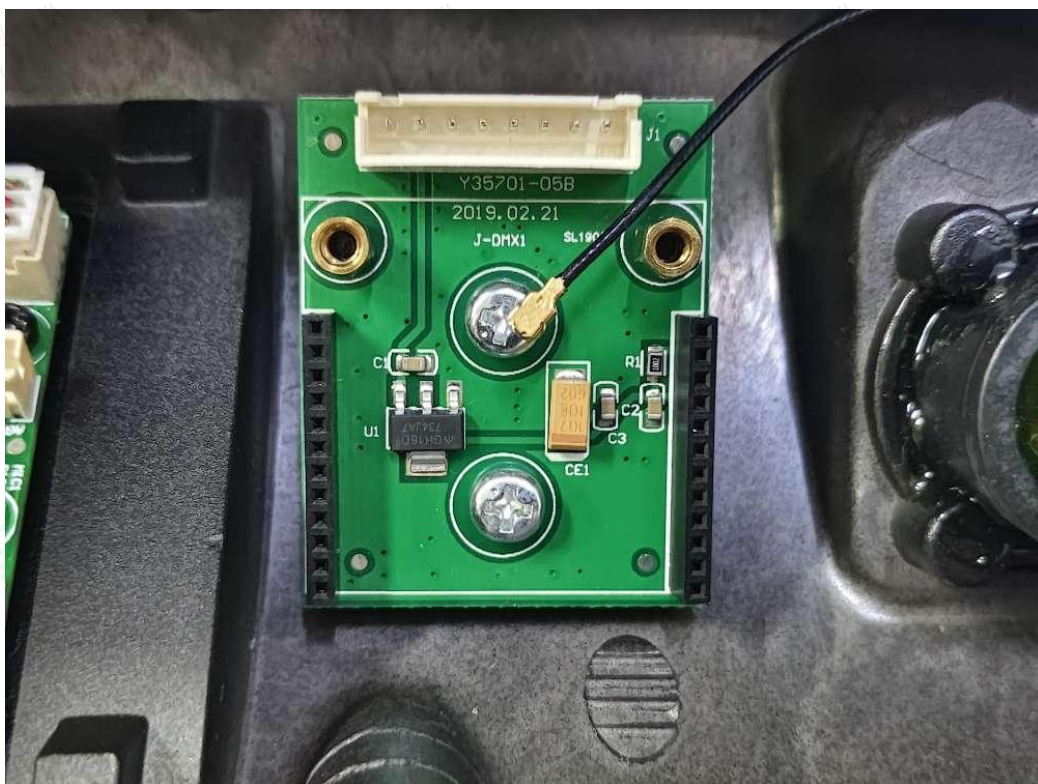


Photo.18





Photo.19

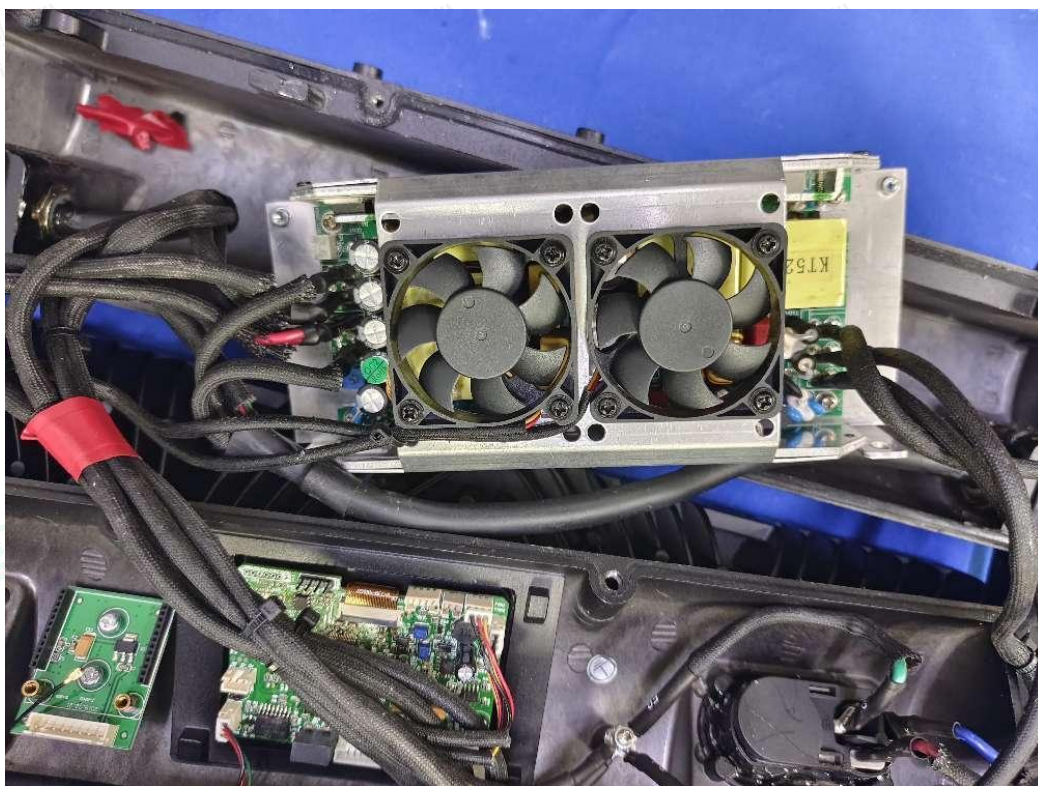


Photo.20



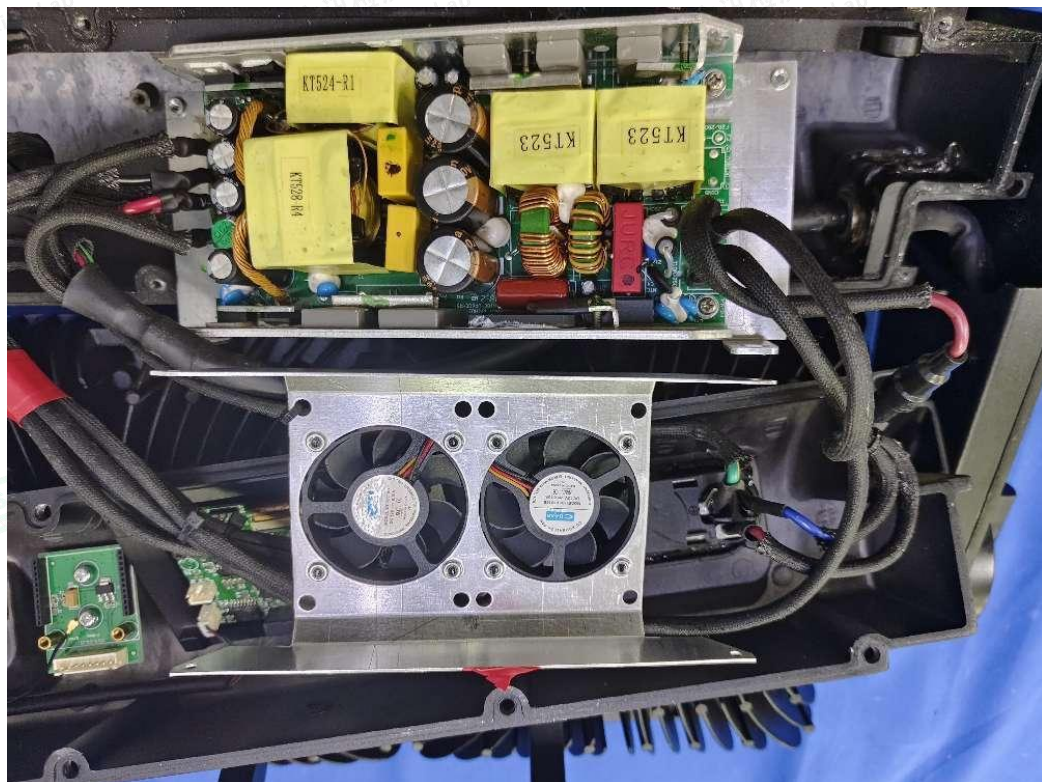


Photo.21

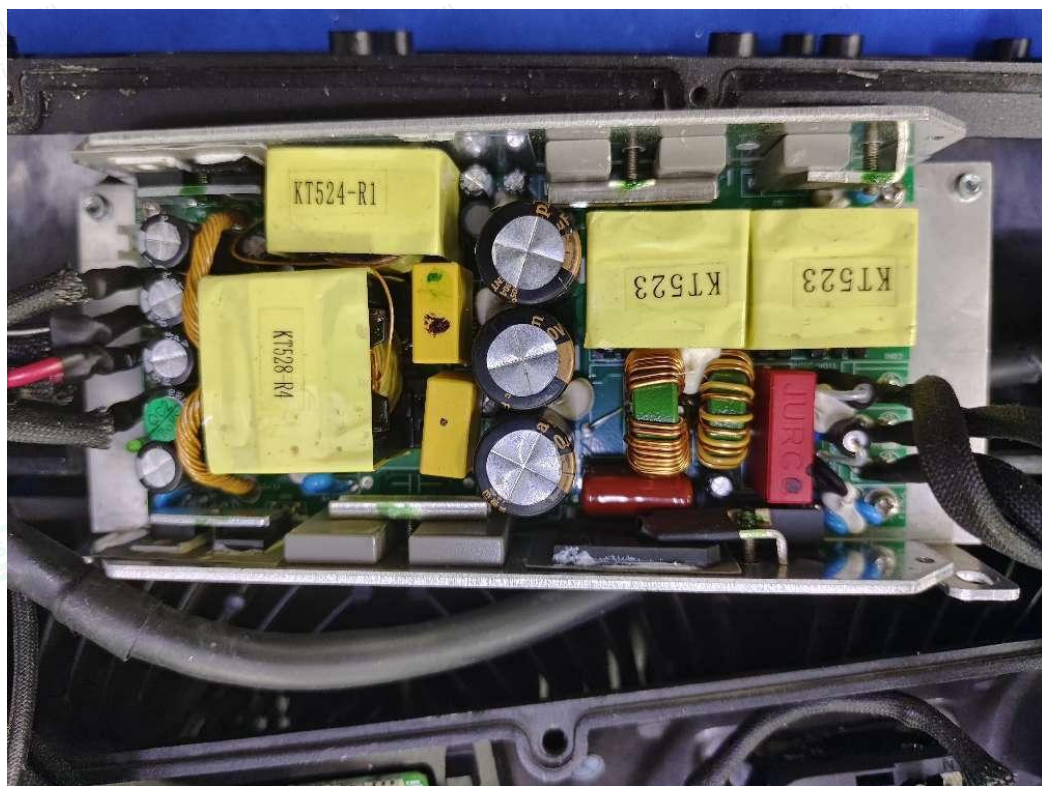


Photo.22



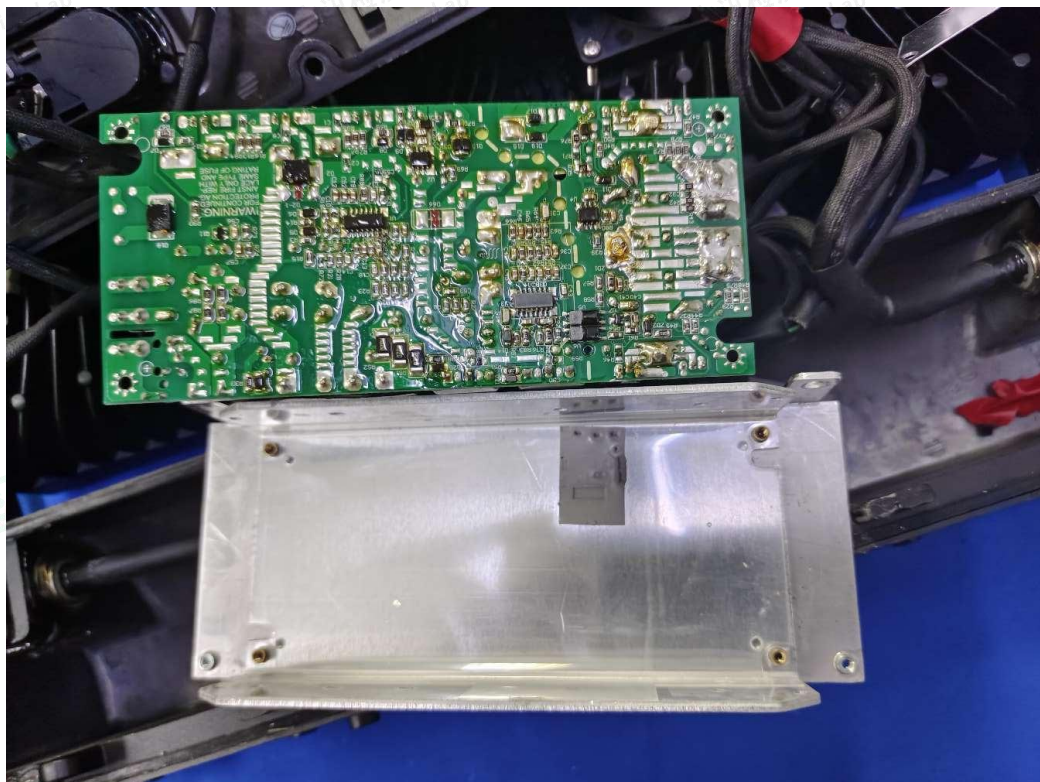


Photo.23

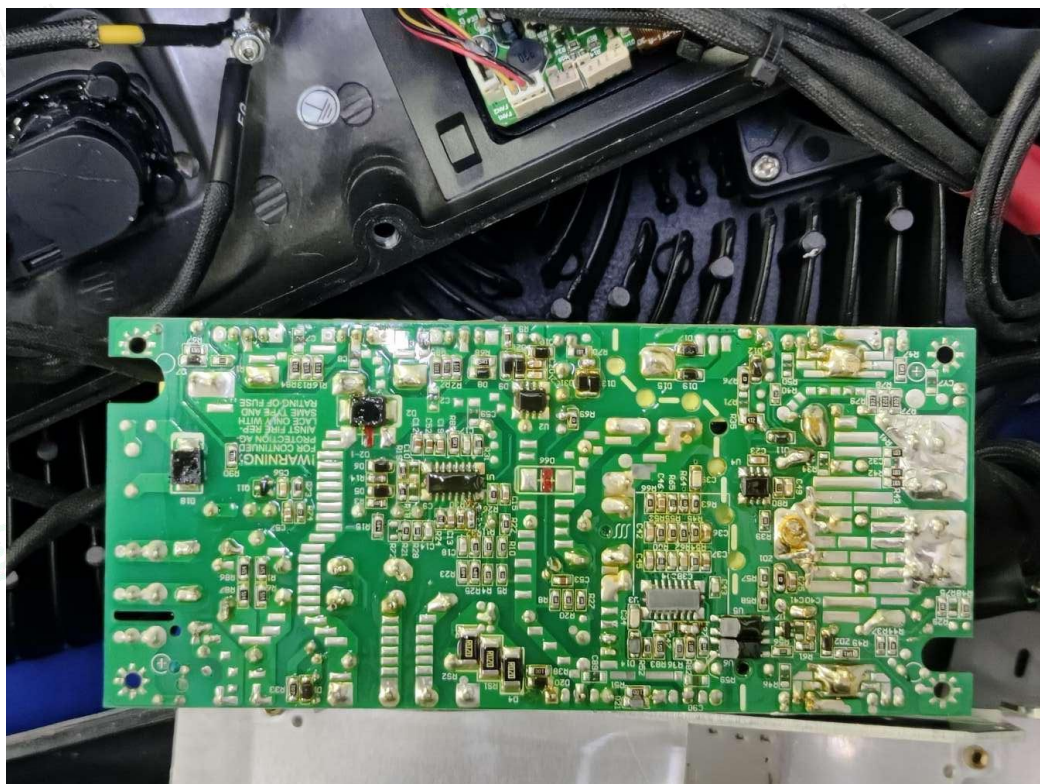


Photo.24

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