

# EMC TEST REPORT

For

Limited Liability Company «Energoresursy»

Luminaire

Model No.: LineRays HL01-1200-160-002

Additional Model No.: N/A

Prepared for : Limited Liability Company «Energoresursy»  
Address : RF, 198205, St.Peterburg, sh.Tallinskoe (Staro-Panovo ter.),  
no. 198, bldg.. 2, lit. Ah, pom. 1-N, office 1

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Date of receipt of test sample : September 29, 2025  
Number of tested samples : 1  
Serial number : Prototype  
Date of Test : September 29, 2025 - October 11, 2025  
Date of Report : October 11, 2025



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

Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment

**EN IEC 61547: 2023**

Equipment for general lighting purposes - EMC immunity requirements

**Report Reference No. .... : AOC251011102E**

Date Of Issue..... : October 11, 2025

**Testing Laboratory Name..... : Shenzhen AOCE Electronic Technology Service Co., Ltd.**

Address..... : Room 202, 2nd Floor, No.12th Building of Xinhe Tongfuyu Industrial Park, Fuhai Street, Baoan District, Shenzhen, Guangdong, China

Testing Location/ Procedure..... : Full application of Harmonised standards ■  
 Partial application of Harmonised standards □  
 Other standard testing method □

**Applicant's Name..... : Limited Liability Company «Energoresursy»**

Address..... : RF, 198205, St.Peterburg, sh.Tallinskoe (Staro-Panovo ter.), no. 198, bldg.. 2, lit. Ah, pom. 1-N, office 1

**Test Specification:**

Standard..... : EN 55015:2019+A11:2020  
 EN IEC 61000-3-2:2019+A1:2021+A2:2024  
 EN 61000-3-3:2013+A1:2019+A2:2021+AC:2022  
 EN IEC 61547: 2023

Test Report Form No..... : AOCEMC-1.0

TRF Originator..... : Shenzhen AOCE Electronic Technology Service Co., Ltd.

Master TRF..... : Dated 2011-03

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**Test Item Description..... : Luminaire**

Trade Mark..... : N/A

Model/ Type Reference..... : LineRays HL01-1200-160-002

Ratings..... : 220-240V, 50/60Hz, 160W

**Result ..... : Positive**

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Kevin Huang/ Technique principal

**Approved by:**

*Jackson Fang*

Jackson Fang/ Manager

# EMC -- TEST REPORT

**Test Report No. : AOC251011102E**October 11, 2025

Date of issue

Type / Model..... : LineRays HL01-1200-160-002

EUT..... : Luminaire

**Applicant..... : Limited Liability Company «Energoresursy»**Address..... : RF, 198205, St.Peterburg, sh.Tallinskoe (Staro-Panovo ter.), no.  
198, bldg.. 2, lit. Ah, pom. 1-N, office 1

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**Manufacturer..... : JIANGMEN LANGJIE TRADING CO., LTD**Address..... : ROOM 407,11 BUILDING YINGCUI, ZHONGTIANGUOJI  
GARDEN, JIANGMEN, GUANGDONG, CHINA

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**Factory..... : JIANGMEN LANGJIE TRADING CO., LTD**Address..... : ROOM 407,11 BUILDING YINGCUI, ZHONGTIANGUOJI  
GARDEN, JIANGMEN, GUANGDONG, CHINA

Telephone..... : /

Fax..... : /

**Test Result** according to the standards on page 7:**Positive**

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.

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## 1. SUMMARY OF STANDARDS AND RESULTS

### 1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

| EMISSION (EN 55015:2019+A11:2020 )                |                                           |                      |         |
|---------------------------------------------------|-------------------------------------------|----------------------|---------|
| Description of Test Item                          | Standard                                  | Limits               | Results |
| Conducted disturbance at mains terminals          | EN 55015:2019+A11:2020                    | -----                | PASS    |
| Magnetic field emission                           | EN 55015:2019+A11:2020                    | -----                | PASS    |
| Radiated disturbance                              | EN 55015:2019+A11:2020                    | -----                | PASS    |
| Harmonic current emissions                        | EN IEC 61000-3-2:2019+A1:2021+A2:2024     | Class C              | PASS    |
| Voltage fluctuations & flicker                    | EN 61000-3-3:2013+A1:2019+A2:2021+AC:2022 | -----                | PASS    |
| IMMUNITY (EN IEC 61547: 2023 )                    |                                           |                      |         |
| Description of Test Item                          | Basic Standard                            | Performance Criteria | Results |
| Electrostatic discharge (ESD)                     | EN 61000-4-2: 2009                        | B                    | PASS    |
| Radio-frequency, Continuous radiated disturbance  | EN 61000-4-3: 2020                        | A                    | PASS    |
| Electrical fast transient (EFT)                   | EN 61000-4-4: 2012                        | B                    | PASS    |
| Surge (Input a.c. power ports)                    | EN 61000-4-5: 2014+A1: 2017               | B                    | PASS    |
| Radio-frequency, Continuous conducted disturbance | EN 61000-4-6: 2014+AC: 2015               | A                    | PASS    |
| Power frequency magnetic field                    | EN 61000-4-8: 2010                        | A                    | PASS    |
| Voltage dips, 30% reduction                       | EN 61000-4-11: 2020                       | C                    | PASS    |
| Voltage interruptions                             |                                           | B                    | PASS    |
| N/A is an abbreviation for Not Applicable.        |                                           |                      |         |

## 1.2. Description of Performance Criteria

### General Performance Criteria

Examples of functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

- essential operational modes and states;
- tests of all peripheral access (hard disks, floppy disks, printers, keyboard, mouse, etc.);
- quality of software execution;
- quality of data display and transmission;
- quality of speech transmission.

#### 1.2.1. Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacture when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### 1.2.2. Performance criterion B

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacture, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operation state or stored data is allowed to persist after the test.

If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### 1.2.3. Performance criterion C

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

Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

## **2. GENERAL INFORMATION**

### **2.1. Description of Device (EUT)**

|              |                              |
|--------------|------------------------------|
| EUT          | : Luminaire                  |
| Model Number | : LineRays HL01-1200-160-002 |
| Power Supply | : 220-240V, 50/60Hz, 160W    |

### **2.2. Description of Test Facility**

EMC Lab.

### **2.3. 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 AOC 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.

## 2.4.Measurement Uncertainty

| Test Item              |   | Frequency Range | Uncertainty | Note |
|------------------------|---|-----------------|-------------|------|
| Radiation Uncertainty  | : | 30MHz~200MHz    | ±2.96dB     | (1)  |
|                        |   | 200MHz~1000MHz  | ±3.10dB     | (1)  |
| Conduction Uncertainty | : | 150kHz~30MHz    | ±1.63dB     | (1)  |
| Power disturbance      | : | 30MHz~300MHz    | ±1.60dB     | (1)  |

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

### 3. MEASURING DEVICES AND TEST EQUIPMENT

#### 3.1. Conducted Disturbance

| Item | Test Equipment    | Manufacturer    | Model No. | Serial No. | Last Cal.  |
|------|-------------------|-----------------|-----------|------------|------------|
| 1    | EMI Test Receiver | ROHDE & SCHWARZ | ESCI      | 101142     | 2025/04/13 |
| 2    | 10dB Attenuator   | SCHWARZBECK     | OSPAM236  | 9729       | 2025/04/13 |
| 3    | Artificial Mains  | ROHDE & SCHWARZ | ENV216    | 101288     | 2025/04/13 |
| 4    | EMI Test Software | AUDIX           | E3        | N/A        | 2025/04/13 |

#### 3.2. Disturbance Power

| Item | Test Equipment    | Manufacturer    | Model No. | Serial No. | Last Cal.  |
|------|-------------------|-----------------|-----------|------------|------------|
| 1    | EMI Test Receiver | ROHDE & SCHWARZ | ESCI      | 101142     | 2025/04/13 |
| 2    | Absorbing clamp   | ROHDE & SCHWARZ | MDS 21    | 4033       | 2025/04/13 |
| 3    | EMI Test Software | AUDIX           | E3        | N/A        | 2025/04/13 |
| 4    | EMI Test Receiver | ROHDE & SCHWARZ | ESPI      | 101840     | 2025/04/13 |

#### 3.3. Radiated Electromagnetic Disturbance

| Item | Test Equipment      | Manufacturer    | Model No. | Serial No. | Last Cal.  |
|------|---------------------|-----------------|-----------|------------|------------|
| 1    | EMI Test Receiver   | ROHDE & SCHWARZ | ESCI      | 1011423    | 2025/04/13 |
| 2    | Triple-loop Antenna | EVERFINE        | LLA-2     | 11050003   | 2025/04/13 |
| 3    | EMI Test Receiver   | ROHDE & SCHWARZ | ESPI      | 101840     | 2025/04/13 |
| 4    | EMI Test Software   | AUDIX           | E3        | N/A        | 2025/04/13 |

#### 3.4. Radiated Disturbance (Electric Field)

| Item | Test Equipment           | Manufacturer    | Model No. | Serial No. | Last Cal.  |
|------|--------------------------|-----------------|-----------|------------|------------|
| 1    | 3m Semi Anechoic Chamber | SIDT FRANKONIA  | SAC-3M    | 03CH03-HY  | 2025/04/13 |
| 2    | EMI Test Receiver        | ROHDE & SCHWARZ | ESPI      | 101840     | 2025/04/13 |
| 3    | Log per Antenna          | SCHWARZBECK     | VULB9163  | 9163-470   | 2025/04/13 |
| 4    | EMI Test Software        | AUDIX           | E3        | N/A        | 2025/04/13 |
| 5    | Positioning Controller   | MF              | MF-7082   | /          | 2025/04/13 |
| 6    | Horn Antenna             | ETS.LINDGREN    | 3115      | 00034771   | 2025/04/13 |
| 7    | Spectrum Analyzer        | Agilent         | E4407B    | MY41440754 | 2025/04/13 |

#### 3.5. Harmonic Current

| Item | Test Equipment             | Manufacturer | Model No. | Serial No.  | Last Cal.  |
|------|----------------------------|--------------|-----------|-------------|------------|
| 1    | Power Analyzer Test System | Voltech      | PM6000    | 20000670053 | 2025/04/13 |

#### 3.6. Voltage fluctuation and Flicker

| Item | Test Equipment             | Manufacturer | Model No. | Serial No.  | Last Cal.  |
|------|----------------------------|--------------|-----------|-------------|------------|
| 1    | Power Analyzer Test System | Voltech      | PM6000    | 20000670053 | 2025/04/13 |

### 3.7. Electrostatic Discharge

| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Last Cal.  |
|------|----------------|--------------|-----------|------------|------------|
| 1    | ESD Simulator  | KIKUSUI      | KC001311  | KES4021    | 2025/04/13 |

### 3.8. RF Field Strength Susceptibility

| Item | Test Equipment          | Manufacturer    | Model No.   | Serial No. | Last Cal.  |
|------|-------------------------|-----------------|-------------|------------|------------|
| 1    | SIGNAL GENERATOR        | HP              | 8648A       | 625U00573  | 2025/04/13 |
| 2    | Amplifier               | AR              | 500A100     | 17034      | 2025/04/13 |
| 3    | Amplifier               | AR              | 100W/1000M1 | 17028      | 2025/04/13 |
| 4    | Isotropic Field Monitor | AR              | FM2000      | 16829      | 2025/04/13 |
| 5    | Isotropic Field Probe   | AR              | FP2000      | 16755      | 2025/04/13 |
| 6    | Bi-conic Antenna        | EMCO            | 3108        | 9507-2534  | 2025/04/13 |
| 7    | By-log-periodic Antenna | AR              | AT1080      | 16812      | 2025/04/13 |
| 8    | EMS Test Software       | ROHDE & SCHWARZ | ESK1        | N/A        | 2025/04/13 |

### 3.9. Electrical Fast Transient/Burst

| Item | Test Equipment                          | Manufacturer | Model No. | Serial No. | Last Cal.  |
|------|-----------------------------------------|--------------|-----------|------------|------------|
| 1    | Electrical fast transient(EFT)generator | 3CTEST       | EFT-4021  | EC0461044  | 2025/04/13 |
| 2    | Coupling Clamp                          | 3CTEST       | EFTC      | EC0441098  | 2025/04/13 |

### 3.10. Surge

| Item | Test Equipment              | Manufacturer | Model No. | Serial No. | Last Cal.  |
|------|-----------------------------|--------------|-----------|------------|------------|
| 1    | Surge test system           | 3CTEST       | SG5006G   | EC5581070  | 2025/04/13 |
| 2    | Coupling/decoupling network | 3CTEST       | SGN-5010G | CS5591033  | 2025/04/13 |

### 3.11. Conducted Susceptibility

| Item | Test Equipment | Manufacturer | Model No. | Serial No.   | Last Cal.  |
|------|----------------|--------------|-----------|--------------|------------|
| 1    | Simulator      | EMTEST       | CIT-10    | A126A1195    | 2025/04/13 |
| 2    | CDN            | EMTEST       | CDN-M2    | A2210177     | 2025/04/13 |
| 3    | CDN            | EMTEST       | CDN-M3    | A2210177     | 2025/04/13 |
| 4    | Attenuator     | EMTEST       | ATT6      | 50FP-006-H3B | 2025/04/13 |

### 3.12. Power Frequency Magnetic Field Susceptibility

| Item | Test Equipment                             | Manufacturer | Model No.   | Serial No. | Last Cal.  |
|------|--------------------------------------------|--------------|-------------|------------|------------|
| 1    | Power frequency mag-field generator System | EVERFINE     | EMS61000-8K | 906003     | 2025/04/13 |

### 3.13.Voltage Dips

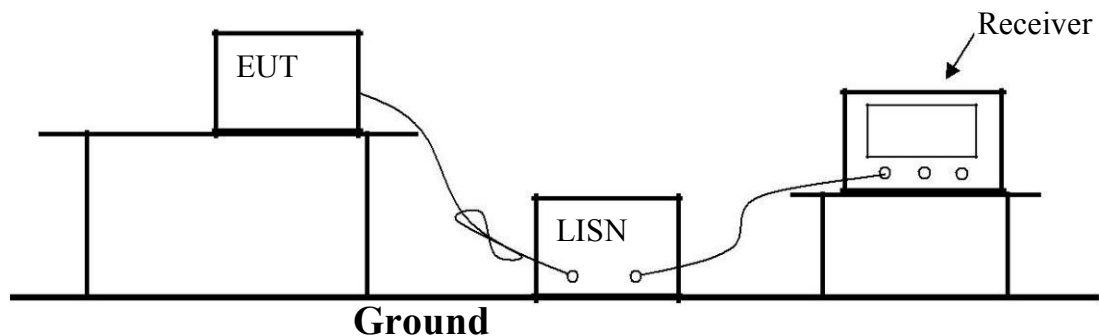
| Item | Test Equipment                | Manufacturer | Model No. | Serial No. | Last Cal.  |
|------|-------------------------------|--------------|-----------|------------|------------|
| 1    | Voltage dips and up generator | 3CTEST       | VDG-1105G | EC0171014  | 2025/04/13 |

### 3.14.Voltage Short Interruptions

| Item | Test Equipment                | Manufacturer | Model No. | Serial No. | Last Cal.  |
|------|-------------------------------|--------------|-----------|------------|------------|
| 1    | Voltage dips and up generator | 3CTEST       | VDG-1105G | EC0171014  | 2025/04/13 |

## 4. POWER LINE CONDUCTED MEASUREMENT

### 4.1. Block Diagram of Test Setup



### 4.2. Conducted Power Line Emission Measurement Standard and Limits

#### 4.2.1. Standard:

EN 55015:2019+A11:2020

#### 4.2.2. Limits

| Frequency       | At mains terminals (dB $\mu$ V) |               |
|-----------------|---------------------------------|---------------|
|                 | Quasi-peak Level                | Average Level |
| 9kHz ~ 50kHz    | 110                             | --            |
| 50kHz ~ 150kHz  | 90 ~ 80*                        | --            |
| 150kHz ~ 0.5MHz | 66 ~ 56*                        | 56 ~ 46*      |
| 0.5MHz ~ 5.0MHz | 56                              | 46            |
| 5.0MHz ~ 30MHz  | 60                              | 50            |

1. At the transition frequency the lower limit applies.
2. \* decreasing linearly with logarithm of the frequency.

### 4.3. EUT Configuration on Test

The configuration of the EUT is same as Section 3.1.

### 4.4. Operating Condition of EUT

- 4.4.1. Setup the EUT as shown in Section 4.1.
- 4.4.2. Turn on the power of all equipments.
- 4.4.3. Let the EUT work in test mode (On) and measure it.

#### 4.5. Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground and connected to the AC mains through a Line Impedance Stabilization Network (L.I.S.N.). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission according to the EN 55015 regulations during conducted emission measurement. And the voltage probe had been used for the load terminals measurement according to the EN 55015 standard.

The bandwidth of the test receiver is set at 200Hz in 9k~150kHz range and 9kHz in 150k~30MHz range.

The frequency range from 9kHz to 30MHz is checked.

All the test results are listed in Section 4.6.

The frequency range from 9kHz to 30MHz is investigated.

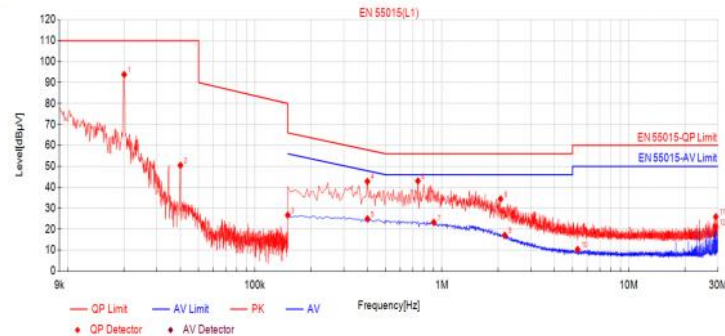
#### 4.6. Test Results

**PASS.**

The test result please refer to the next page.

|                                 |                            |                      |                    |
|---------------------------------|----------------------------|----------------------|--------------------|
| <b>Model No.</b>                | LineRays HL01-1200-160-002 | <b>Test Mode</b>     | ON                 |
| <b>Environmental Conditions</b> | 24°C/ 56% RH               | <b>Test Engineer</b> | Liang              |
| <b>Pol</b>                      | Line                       | <b>Test Date</b>     | September 29, 2025 |

Test Graph

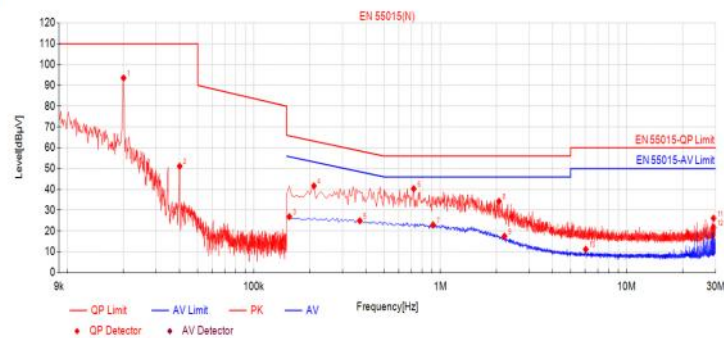


Suspected List

| NO. | Freq. [MHz] | Reading [dBμV] | Level [dBμV] | Factor [dB] | Limit [dBμV] | Margin [dB] | Detector | Type | Verdict |
|-----|-------------|----------------|--------------|-------------|--------------|-------------|----------|------|---------|
| 1   | 0.02        | 83.31          | 93.81        | 10.50       | 110.00       | 16.19       | PK       | L1   | PASS    |
| 2   | 0.04        | 39.98          | 50.48        | 10.50       | 110.00       | 59.52       | PK       | L1   | PASS    |
| 3   | 0.15        | 16.20          | 26.70        | 10.50       | 56.00        | 29.30       | AV       | L1   | PASS    |
| 4   | 0.4         | 32.31          | 42.81        | 10.50       | 57.85        | 15.04       | PK       | L1   | PASS    |
| 5   | 0.4         | 14.45          | 24.95        | 10.50       | 47.85        | 22.90       | AV       | L1   | PASS    |
| 6   | 0.745       | 32.54          | 43.04        | 10.50       | 56.00        | 12.96       | PK       | L1   | PASS    |
| 7   | 0.905       | 12.77          | 23.27        | 10.50       | 46.00        | 22.73       | AV       | L1   | PASS    |
| 8   | 2.06        | 23.94          | 34.44        | 10.50       | 56.00        | 21.56       | PK       | L1   | PASS    |
| 9   | 2.17        | 6.61           | 17.11        | 10.50       | 46.00        | 28.89       | AV       | L1   | PASS    |
| 10  | 5.325       | -0.14          | 10.36        | 10.50       | 50.00        | 39.64       | AV       | L1   | PASS    |
| 11  | 29.235      | 15.45          | 25.95        | 10.50       | 60.00        | 34.05       | PK       | L1   | PASS    |
| 12  | 29.235      | 10.62          | 21.12        | 10.50       | 50.00        | 28.88       | AV       | L1   | PASS    |

|                                 |                            |                      |                    |
|---------------------------------|----------------------------|----------------------|--------------------|
| <b>Model No.</b>                | LineRays HL01-1200-160-002 | <b>Test Mode</b>     | ON                 |
| <b>Environmental Conditions</b> | 24°C/ 56% RH               | <b>Test Engineer</b> | Liang              |
| <b>Pol</b>                      | Neutral                    | <b>Test Date</b>     | September 29, 2025 |

Test Graph

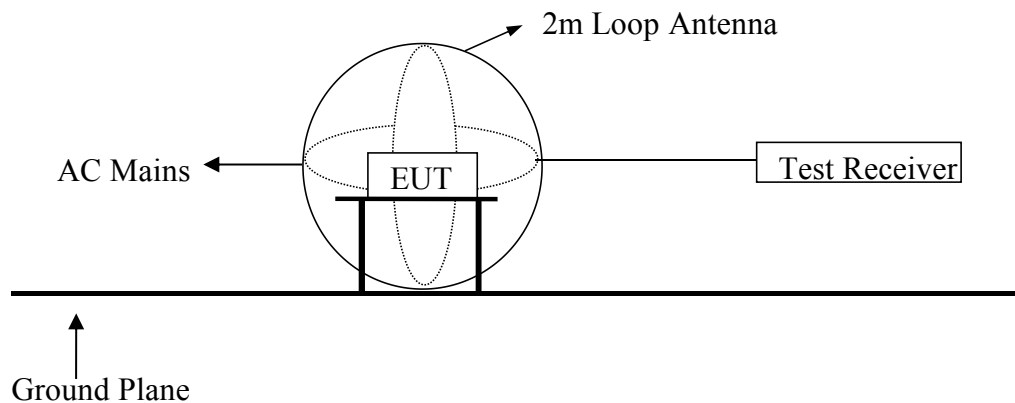


Suspected List

| NO. | Freq. [MHz] | Reading [dBμV] | Level [dBμV] | Factor [dB] | Limit [dBμV] | Margin [dB] | Detector | Type | Verdict |
|-----|-------------|----------------|--------------|-------------|--------------|-------------|----------|------|---------|
| 1   | 0.02        | 83.07          | 93.57        | 10.50       | 110.00       | 16.43       | PK       | N    | PASS    |
| 2   | 0.04        | 40.64          | 51.14        | 10.50       | 110.00       | 58.86       | PK       | N    | PASS    |
| 3   | 0.155       | 16.39          | 26.89        | 10.50       | 55.73        | 28.84       | AV       | N    | PASS    |
| 4   | 0.21        | 31.19          | 41.69        | 10.50       | 63.21        | 21.52       | PK       | N    | PASS    |
| 5   | 0.37        | 14.43          | 24.93        | 10.50       | 48.50        | 23.57       | AV       | N    | PASS    |
| 6   | 0.72        | 29.84          | 40.34        | 10.50       | 56.00        | 15.66       | PK       | N    | PASS    |
| 7   | 0.915       | 12.43          | 22.93        | 10.50       | 46.00        | 23.07       | AV       | N    | PASS    |
| 8   | 2.065       | 23.75          | 34.25        | 10.50       | 56.00        | 21.75       | PK       | N    | PASS    |
| 9   | 2.21        | 7.00           | 17.50        | 10.50       | 46.00        | 28.50       | AV       | N    | PASS    |
| 10  | 6.03        | 0.68           | 11.18        | 10.50       | 50.00        | 38.82       | AV       | N    | PASS    |
| 11  | 29.235      | 15.62          | 26.12        | 10.50       | 60.00        | 33.88       | PK       | N    | PASS    |
| 12  | 29.235      | 11.15          | 21.65        | 10.50       | 50.00        | 28.35       | AV       | N    | PASS    |

## 5. MAGNETIC FIELD EMISSION MEASUREMENT

### 5.1. Block Diagram of Test Setup



### 5.2. Magnetic Field Emission Measurement Standard and Limits

#### 5.2.1. Test Standard

EN 55015:2019+A11:2020

#### 5.2.2. Test Limits

| Frequency       | Limits for loop diameter (dB $\mu$ A) |
|-----------------|---------------------------------------|
|                 | 2m                                    |
| 9kHz ~ 70kHz    | 88                                    |
| 70kHz ~ 150kHz  | 88 ~ 58*                              |
| 150kHz ~ 3.0MHz | 58 ~ 22*                              |
| 3.0MHz ~ 30MHz  | 22                                    |

1. At the transition frequency the lower limit applies.
2. \* decreasing linearly with logarithm of the frequency.

### 5.3. EUT Configuration on Test

The configuration of the EUT is same as Section 4.3.

### 5.4. Operating Condition of EUT

- 5.4.1. Setup the EUT as shown in Section 5.1.
- 5.4.2. Turn on the power of all equipments.
- 5.4.3. Let the EUT work in test mode (On) and measure it.

### 5.5. Test Procedure

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.

The frequency range from 9kHz to 30MHz is investigated. The receiver is measured with the quasi-peak detector. For frequency band 9kHz to 150kHz, the bandwidth of the field strength meter is set at 200Hz. For frequency band 150kHz to 30MHz, the bandwidth is set at 9kHz.

All the test results are listed in Section 5.6.

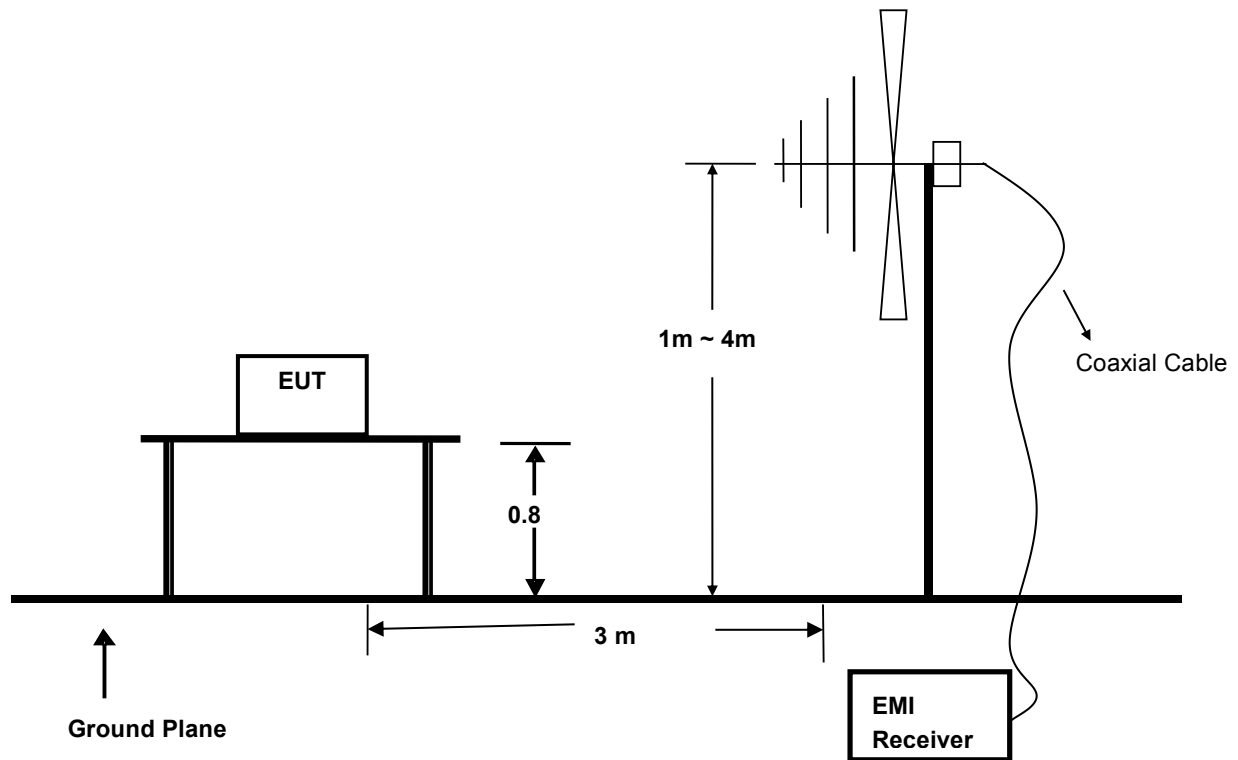
### 5.6. Test Results

**PASS.**

The frequency range from 9kHz to 30MHz is investigated.

## 6. RADIATED EMISSION MEASUREMENT

### 6.1. Block Diagram of Test Setup



### 6.2. Test Standard

EN 55015:2019+A11:2020

### 6.3. Radiated Emission Limits

All emanations from a class B device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

| FREQUENCY<br>(MHz) | DISTANCE<br>(Meters) | FIELD STRENGTHS LIMIT<br>(dB $\mu$ V/m) |
|--------------------|----------------------|-----------------------------------------|
| 30 ~ 230           | 3                    | 40                                      |
| 230 ~ 300          | 3                    | 47                                      |

Note: (1) The smaller limit shall apply at the combination point between two frequency bands.

(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

#### 6.4.EUT Configuration on Test

The EN 55015 regulations test method must be used to find the maximum emission during radiated emission measurement.

#### 6.5.Operating Condition of EUT

6.5.1 Turn on the power.

6.5.2 After that, let the EUT work in test mode (ON) and measure it.

#### 6.6.Test Procedure

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 10 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. By-log antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The bandwidth of the Receiver is set at 120kHz.

The frequency range from 30MHz to 300MHz is investigated.

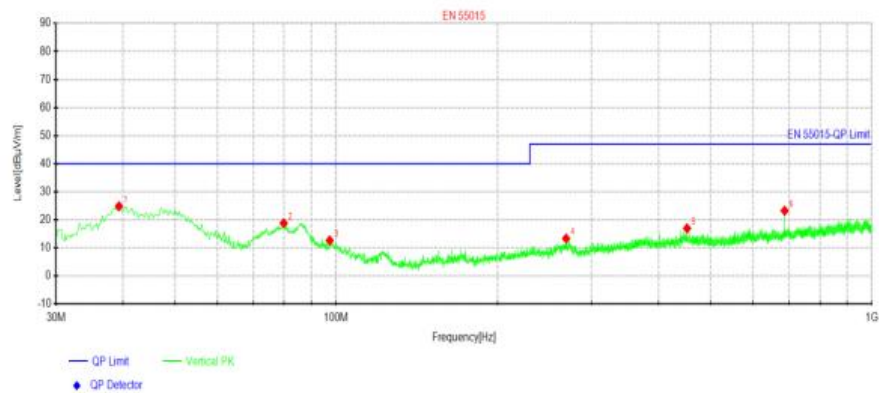
#### 6.7.Test Results

**PASS.**

The test result please refer to the next page.

|                                 |                            |                          |                    |
|---------------------------------|----------------------------|--------------------------|--------------------|
| <b>Model No.</b>                | LineRays HL01-1200-160-002 | <b>Test Mode</b>         | ON                 |
| <b>Environmental Conditions</b> | 24°C / 56% RH              | <b>Detector Function</b> | Quasi-peak         |
| <b>Pol</b>                      | Vertical                   | <b>Distance</b>          | 3m                 |
| <b>Test Engineer</b>            | Liang                      | <b>Test Date</b>         | September 29, 2025 |

Test Graph

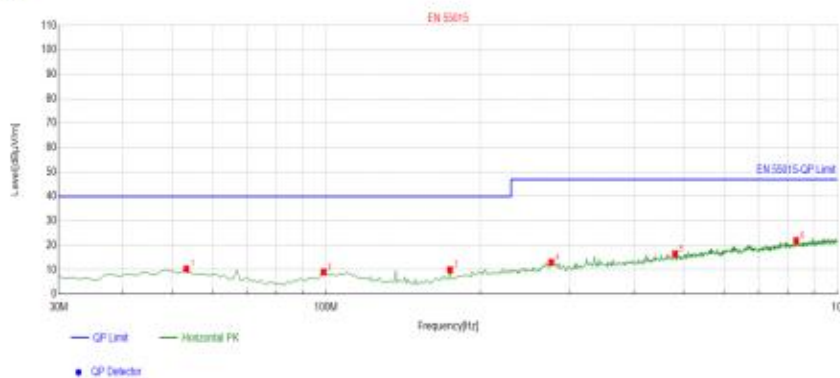


Suspected Data List

| NO. | Freq. [MHz] | Reading [dBμV] | Level [dBμV/m] | Factor [dB/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|-----|-------------|----------------|----------------|---------------|----------------|-------------|-------------|-----------|----------|
| 1   | 39.3362     | 42.12          | 24.88          | -17.24        | 40.00          | 15.12       | 100         | 359       | Vertical |
| 2   | 79.8338     | 40.18          | 18.86          | -21.32        | 40.00          | 21.14       | 100         | 3         | Vertical |
| 3   | 97.2938     | 31.49          | 12.71          | -18.78        | 40.00          | 27.29       | 100         | 270       | Vertical |
| 4   | 268.741     | 31.10          | 13.40          | -17.70        | 47.00          | 33.60       | 100         | 32        | Vertical |
| 5   | 451.95      | 32.06          | 16.99          | -15.07        | 47.00          | 30.01       | 100         | 360       | Vertical |
| 6   | 687.538     | 35.02          | 23.28          | -11.74        | 47.00          | 23.72       | 100         | 10        | Vertical |

|                                 |                            |                          |                    |
|---------------------------------|----------------------------|--------------------------|--------------------|
| <b>Model No.</b>                | LineRays HL01-1200-160-002 | <b>Test Mode</b>         | ON                 |
| <b>Environmental Conditions</b> | 24°C / 56% RH              | <b>Detector Function</b> | Quasi-peak         |
| <b>Pol</b>                      | Horizontal                 | <b>Distance</b>          | 3m                 |
| <b>Test Engineer</b>            | Liang                      | <b>Test Date</b>         | September 29, 2025 |

Test Graph

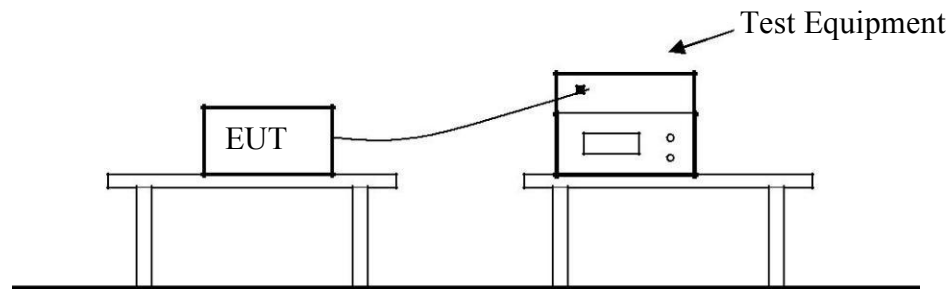


Suspected List

| NO. | Freq. [MHz] | Factor [dB] | Reading [dBμV/m] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity   |
|-----|-------------|-------------|------------------|----------------|----------------|-------------|-------------|-----------|------------|
| 1   | 53.3033     | -14.15      | 24.46            | 10.31          | 40.00          | 29.69       | 100         | 13        | Horizontal |
| 2   | 98.9389     | -15.58      | 24.66            | 9.08           | 40.00          | 30.92       | 100         | 52        | Horizontal |
| 3   | 174.6747    | -17.09      | 27.05            | 9.96           | 40.00          | 30.04       | 100         | 298       | Horizontal |
| 4   | 275.6557    | -13.43      | 26.47            | 13.04          | 47.00          | 33.96       | 100         | 76        | Horizontal |
| 5   | 481.5015    | -8.46       | 25.02            | 16.56          | 47.00          | 30.44       | 100         | 359       | Horizontal |
| 6   | 830.0801    | -2.44       | 24.34            | 21.90          | 47.00          | 25.10       | 100         | 242       | Horizontal |

## 7. HARMONIC CURRENT MEASUREMENT

### 7.1. Block Diagram of Test Setup



### 7.2. Test Standard

EN IEC 61000-3-2:2019+A1:2021+A2:2024

### 7.3. Operating Condition of EUT

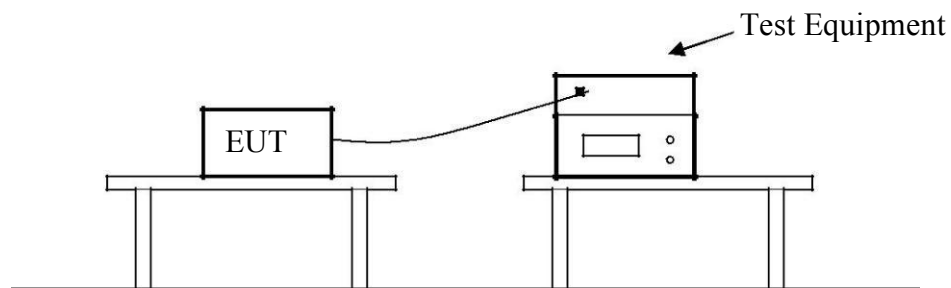
Same as Section 4.4. except the test setup replaced by Section 7.1.

### 7.4. Test Results

**PASS.**

## 8. VOLTAGE FLUCTUATIONS & FLICKER MEASUREMENT

### 8.1. Block Diagram of Test Setup



### 8.2. Test Standard

EN 61000-3-3:2013+A1:2019+A2:2021+AC:2022

### 8.3. Operating Condition of EUT

Same as Section 4.4. except the test setup replaced by Section 8.1.

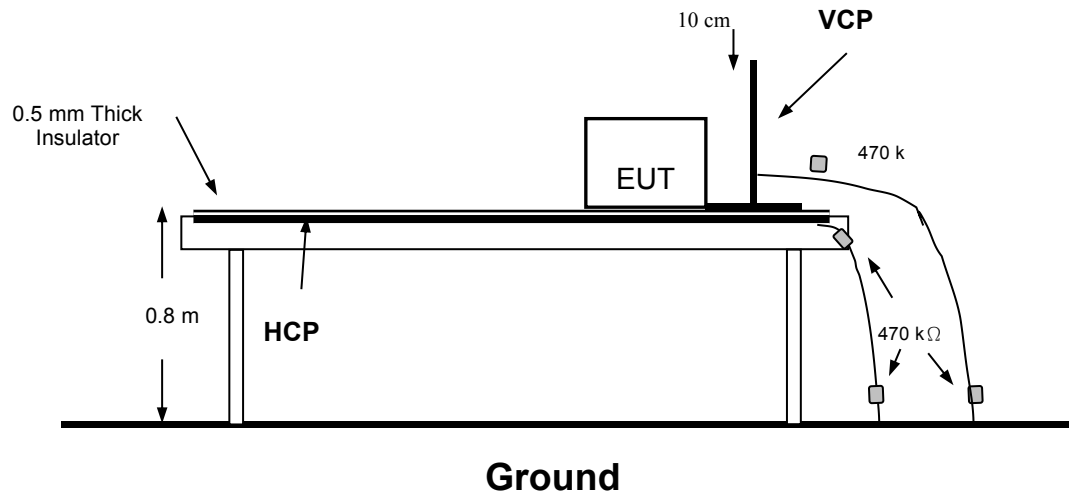
### 8.4. Test Results

**PASS.**

The test result please refer to the next page.

## 9. ELECTROSTATIC DISCHARGE TEST

### 9.1. Block Diagram of Test Setup



### 9.2. Test Standard

EN IEC 61547: 2023 (EN 61000-4-2: 2009, Severity Level: Air Discharge: Level 3,  $\pm 8$  KV  
Contact Discharge: Level 2,  $\pm 4$  KV)

### 9.3. Severity Levels and Performance Criterion

#### 9.3.1. Severity level

| Level | Test Voltage<br>Contact Discharge (KV) | Test Voltage<br>Air Discharge (KV) |
|-------|----------------------------------------|------------------------------------|
| 1.    | $\pm 2$                                | $\pm 2$                            |
| 2.    | $\pm 4$                                | $\pm 4$                            |
| 3.    | $\pm 6$                                | $\pm 8$                            |
| 4.    | $\pm 8$                                | $\pm 15$                           |
| X     | Special                                | Special                            |

#### 9.3.2. Performance criterion: **B**

### 9.4. EUT Configuration on Test

The configuration of EUT is listed in Section 3.7.

## 9.5. Operating Condition of EUT

9.5.1. Setup the EUT as shown in Section 6.1.

9.5.2. Turn on the power of all equipments.

9.5.3. Let the EUT work in test mode (ON) and measure it.

## 9.6. Test Procedure

### 9.6.1. Air Discharge

This test is done on a non-conductive surfaces. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

Because the case of the EUT is metal surface, so it does not need to be tested.

### 9.6.2. Contact Discharge

All the procedure shall be same as Section 6.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

### 9.6.3. Indirect Discharge For Horizontal Coupling Plane

At least 20 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

### 9.6.4. Indirect Discharge For Vertical Coupling Plane

At least 20 single discharge shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

## 9.7. Test Results

**PASS.**

Please refer to the following page.

# Electrostatic Discharger Test Results

|                  |                                                                                         |                      |          |
|------------------|-----------------------------------------------------------------------------------------|----------------------|----------|
| <b>Standard</b>  | <input type="checkbox"/> IEC 61000-4-2 <input checked="" type="checkbox"/> EN 61000-4-2 |                      |          |
| <b>Applicant</b> | Limited Liability Company «Energoresursy»                                               |                      |          |
| <b>EUT</b>       | Luminaire                                                                               | <b>Temperature</b>   | 26°C     |
| <b>M/N</b>       | LineRays HL01-1200-160-002                                                              | <b>Humidity</b>      | 51%      |
| <b>Criterion</b> | B                                                                                       | <b>Pressure</b>      | 1021mbar |
| <b>Test Mode</b> | ON                                                                                      | <b>Test Engineer</b> | Liang    |

## Air Discharge

| Test Points | Test Levels                         |                                     |                                     | Results                             |                          |                                                                  |
|-------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|------------------------------------------------------------------|
|             | ± 2KV                               | ± 4KV                               | ± 8KV                               | Pass                                | Fail                     | Performance Criterion                                            |
| Front       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Back        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Left        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Right       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Top         | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Bottom      | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |

## Contact Discharge

| Test Points | Test Levels                         |                                     | Results                             |                          |                                                                  |
|-------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|------------------------------------------------------------------|
|             | ± 2 KV                              | ± 4 KV                              | Pass                                | Fail                     | Performance Criterion                                            |
| Front       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Back        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Left        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Right       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Top         | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Bottom      | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |

## Discharge To Horizontal Coupling Plane

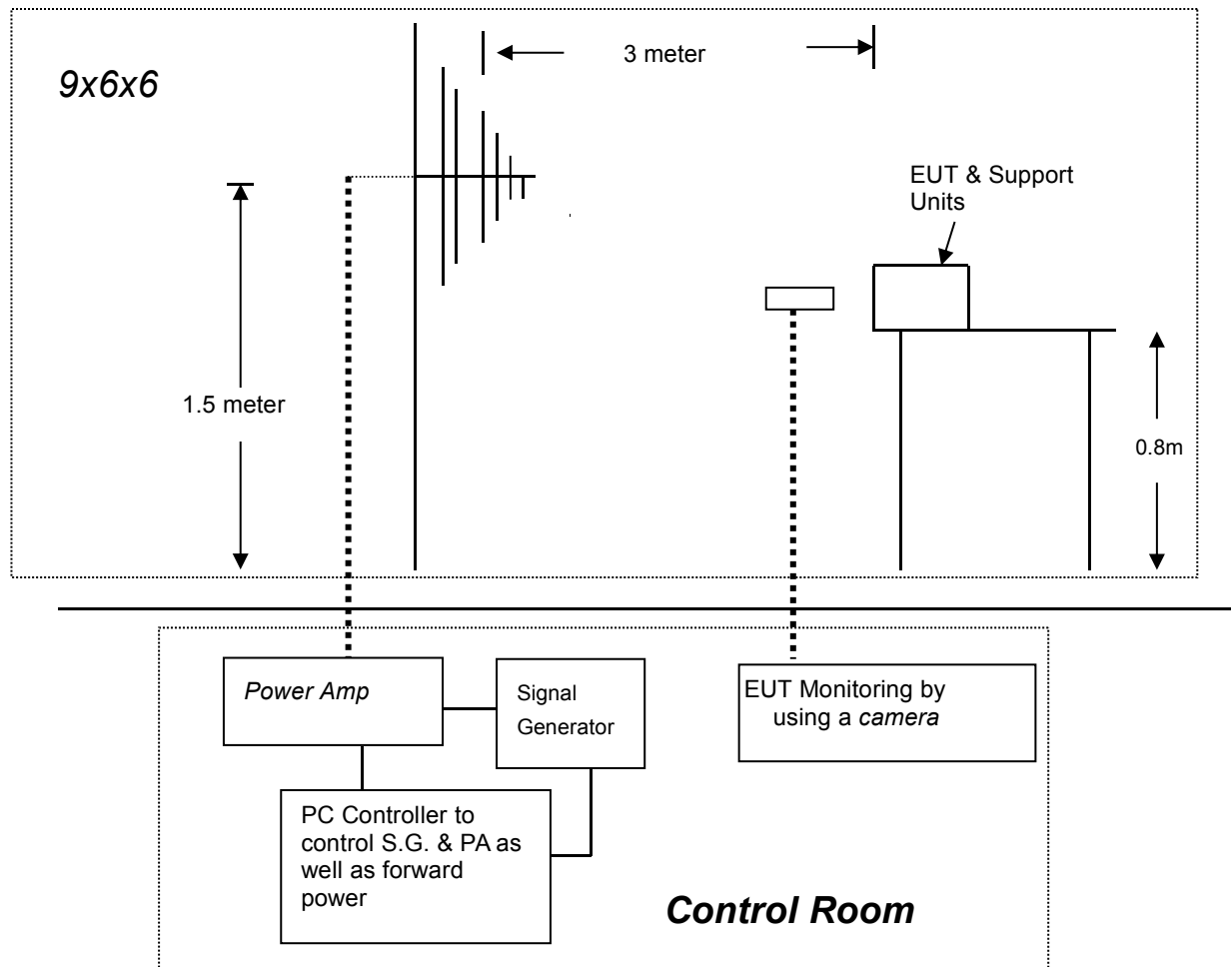
| Side of EUT | Test Levels                         |                                     | Results                             |                          |                                                                  |
|-------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|------------------------------------------------------------------|
|             | ± 2 KV                              | ± 4 KV                              | Pass                                | Fail                     | Performance Criterion                                            |
| Front       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Back        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Left        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Right       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |

## Discharge To Vertical Coupling Plane

| Side of EUT | Test Levels                         |                                     | Results                             |                          |                                                                  |
|-------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|------------------------------------------------------------------|
|             | ± 2 KV                              | ± 4 KV                              | Pass                                | Fail                     | Performance Criterion                                            |
| Front       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Back        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Left        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Right       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |

## 10. RF FIELD STRENGTH SUSCEPTIBILITY TEST

### 10.1. Block Diagram of Test Setup



### 10.2. Test Standard

EN IEC 61547: 2023 (EN 61000-4-3: 2020, Severity Level: 2, 3V / m)

### 10.3. Severity Levels and Performance Criterion

#### 10.3.1. Severity level

| Level | Field Strength (V/m) |
|-------|----------------------|
| 1     | 1                    |
| 2     | 3                    |
| 3     | 10                   |
| X     | Special              |

#### 10.3.2. Performance criterion: A

#### 10.4.EUT Configuration on Test

The configuration of EUT are listed in Section 2.1.

#### 10.5.Operating Condition of EUT

10.5.1.Setup the EUT as shown in Section 7.1.

10.5.2.Turn on the power of all equipments.

10.5.3.Let the EUT work in test mode (On) and measure it.

#### 10.6.Test Procedure

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. All the scanning conditions are as follows:

| Condition of Test         | Remarks                  |
|---------------------------|--------------------------|
| -----                     | -----                    |
| 1. Fielded Strength       | 3 V/m (Severity Level 2) |
| 2. Radiated Signal        | Unmodulated              |
| 3. Scanning Frequency     | 80 - 1000 MHz            |
| 4. Dwell time of radiated | 0.0015 decade/s          |
| 5. Waiting Time           | 3 Sec.                   |

#### 10.7.Test Results

**PASS.**

Please refer to the following page.

## RF Field Strength Susceptibility Test Results

|                        |                                                                                                              |                      |       |
|------------------------|--------------------------------------------------------------------------------------------------------------|----------------------|-------|
| <b>Standard</b>        | <input type="checkbox"/> IEC 61000-4-3 <input checked="" type="checkbox"/> EN 61000-4-3                      |                      |       |
| <b>Applicant</b>       | Limited Liability Company «Energoresursy»                                                                    |                      |       |
| <b>EUT</b>             | Luminaire                                                                                                    | <b>Temperature</b>   | 26°C  |
| <b>M/N</b>             | LineRays HL01-1200-160-002                                                                                   | <b>Humidity</b>      | 51%   |
| <b>Field Strength</b>  | 3 V/m                                                                                                        | <b>Criterion</b>     | A     |
| <b>Test Mode</b>       | ON                                                                                                           | <b>Test Engineer</b> | Liang |
| <b>Frequency Range</b> | 80 MHz to 1000 MHz                                                                                           |                      |       |
| <b>Modulation</b>      | <input type="checkbox"/> None <input type="checkbox"/> Pulse <input checked="" type="checkbox"/> AM 1KHz 80% |                      |       |
| <b>Steps</b>           | 1%                                                                                                           |                      |       |

|              | Horizontal | Vertical |
|--------------|------------|----------|
| <b>Front</b> | PASS       | PASS     |
| <b>Right</b> | PASS       | PASS     |
| <b>Rear</b>  | PASS       | PASS     |
| <b>Left</b>  | PASS       | PASS     |

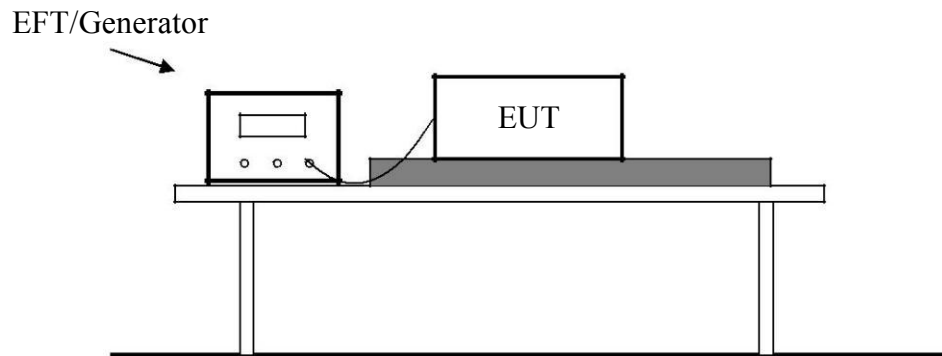
### Test Equipment:

1. Signal Generator: 2031 (MARCONI)
2. Power Amplifier: 500A100 & 100W/1000M1 (A&R)
3. Power Antenna: 3108 (EMCO) & AT1080 (A&R)
4. Field Monitor: FM2000 (A&R)

Note:

## 11. ELECTRICAL FAST TRANSIENT/BURST TEST

### 11.1. Block Diagram of Test Setup



### 11.2. Test Standard

EN IEC 61547: 2023 (EN 61000-4-4: 2012, Severity Level: Level 2: 1KV)

### 11.3. Severity Levels and Performance Criterion

#### 11.3.1. Severity level

| Open Circuit Output Test Voltage $\pm 10\%$ |                       |                                                     |
|---------------------------------------------|-----------------------|-----------------------------------------------------|
| Level                                       | On Power Supply Lines | On I/O (Input/Output) Signal data and control lines |
| 1.                                          | 0.5 KV                | 0.25 KV                                             |
| 2.                                          | 1 KV                  | 0.5 KV                                              |
| 3.                                          | 2 KV                  | 1 KV                                                |
| 4.                                          | 4 KV                  | 2 KV                                                |
| x.                                          | Special               | Special                                             |

#### 11.3.2. Performance criterion: **B**

### 11.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.9.

### 11.5. Operating Condition of EUT

11.5.1. Setup the EUT as shown in Section 11.1.

11.5.2. Turn on the power of all equipments.

11.5.3. Let the EUT work in test mode (ON) and measure it.

## 11.6. Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

### 11.6.1. For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

### 11.6.2. For signal lines and control lines ports:

No I/O ports. It's unnecessary to test.

### 11.6.3. For DC output line ports:

It's unnecessary to test.

## 11.7. Test Results

**PASS.**

Please refer to the following page.

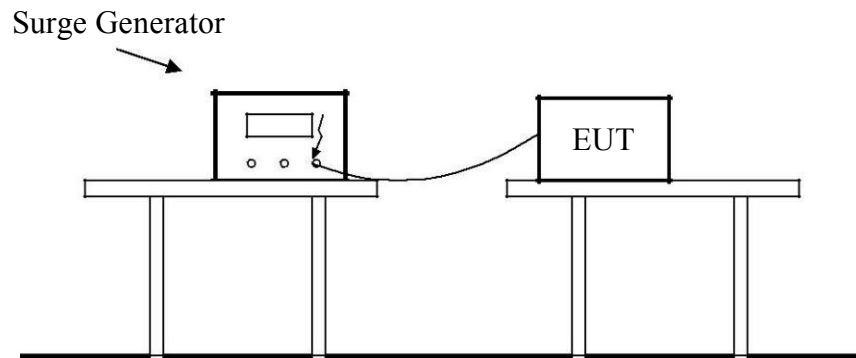
## Electrical Fast Transient/Burst Test Results

|                  |                                                                                         |                      |          |
|------------------|-----------------------------------------------------------------------------------------|----------------------|----------|
| <b>Standard</b>  | <input type="checkbox"/> IEC 61000-4-4 <input checked="" type="checkbox"/> EN 61000-4-4 |                      |          |
| <b>Applicant</b> | Limited Liability Company «Energoresursy»                                               |                      |          |
| <b>EUT</b>       | Luminaire                                                                               | <b>Temperature</b>   | 26°C     |
| <b>M/N</b>       | LineRays HL01-1200-160-002                                                              | <b>Humidity</b>      | 51%      |
| <b>Criterion</b> | B                                                                                       | <b>Pressure</b>      | 1021mbar |
| <b>Test Mode</b> | ON                                                                                      | <b>Test Engineer</b> | Liang    |

| Line        | Test Voltage | Result (+) | Result (-) |
|-------------|--------------|------------|------------|
| L           | 1KV          | PASS       | PASS       |
| N           | 1KV          | PASS       | PASS       |
| PE          |              |            |            |
| L-N         | 1KV          | PASS       | PASS       |
| L-PE        |              |            |            |
| N-PE        |              |            |            |
| L-N-PE      |              |            |            |
| Signal Line |              |            |            |
| I/O Cable   |              |            |            |
| Note:       |              |            |            |

## 12. SURGE IMMUNITY TEST

### 12.1. Block Diagram of Test Setup



### 2.2. Test Standard

EN IEC 61547: 2023 (EN61000-4-5: 2014, Severity Level: Line to Line: Level 2, 1.0KV; Line to Earth: Level 3, 2.0KV)

### 12.3. Severity Levels and Performance Criterion

#### 12.3.1. Severity level

| Severity Level | Open-Circuit Test Voltage (KV) |
|----------------|--------------------------------|
| 1              | 0.5                            |
| 2              | 1.0                            |
| 3              | 2.0                            |
| 4              | 4.0                            |
| *              | Special                        |

#### 12.3.2. Performance criterion: **B**

### 12.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.10.

## 12.5. Operating Condition of EUT

- 12.5.1. Setup the EUT as shown in Section 12.1.
- 12.5.2. Turn on the power of all equipments.
- 12.5.3. Let the EUT work in test mode (ON) and measure it.

## 12.6. Test Procedure

- 12.6.1. Set up the EUT and test generator as shown on Section 12.1.
- 12.6.2. For line to line coupling mode, provide a 0.5KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
- 12.6.3. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 12.6.4. Different phase angles are done individually.
- 12.6.5. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

## 12.7. Test Results

**PASS.**

Please refer to the following page.

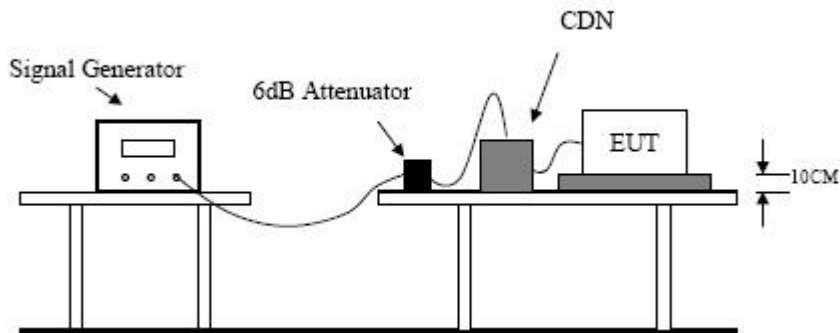
## Electrical Fast Transient/Burst Test Results

|                  |                                                                                         |                      |          |
|------------------|-----------------------------------------------------------------------------------------|----------------------|----------|
| <b>Standard</b>  | <input type="checkbox"/> IEC 61000-4-5 <input checked="" type="checkbox"/> EN 61000-4-5 |                      |          |
| <b>Applicant</b> | Limited Liability Company «Energoresursy»                                               |                      |          |
| <b>EUT</b>       | Luminaire                                                                               | <b>Temperature</b>   | 26°C     |
| <b>M/N</b>       | LINERAYS HL01-1200-160-002                                                              | <b>Humidity</b>      | 51%      |
| <b>Criterion</b> | B                                                                                       | <b>Pressure</b>      | 1021mbar |
| <b>Test Mode</b> | ON                                                                                      | <b>Test Engineer</b> | Liang    |

| Location    | Polarity | Phase Angle | Number of Pulse | Pulse Voltage (KV) | Result |
|-------------|----------|-------------|-----------------|--------------------|--------|
| L-N         | +        | 0°          | 5               | 0.5                | PASS   |
|             | +        | 90°         | 5               | 0.5                | PASS   |
|             | +        | 180°        | 5               | 0.5                | PASS   |
|             | +        | 270°        | 5               | 0.5                | PASS   |
|             | -        | 0°          | 5               | 0.5                | PASS   |
|             | -        | 90°         | 5               | 0.5                | PASS   |
|             | -        | 180°        | 5               | 0.5                | PASS   |
|             | -        | 270°        | 5               | 0.5                | PASS   |
| L-PE        |          |             |                 |                    |        |
|             |          |             |                 |                    |        |
|             |          |             |                 |                    |        |
|             |          |             |                 |                    |        |
|             |          |             |                 |                    |        |
|             |          |             |                 |                    |        |
|             |          |             |                 |                    |        |
|             |          |             |                 |                    |        |
| N-PE        |          |             |                 |                    |        |
|             |          |             |                 |                    |        |
|             |          |             |                 |                    |        |
|             |          |             |                 |                    |        |
|             |          |             |                 |                    |        |
|             |          |             |                 |                    |        |
|             |          |             |                 |                    |        |
|             |          |             |                 |                    |        |
| Signal Line |          |             |                 |                    |        |
|             |          |             |                 |                    |        |
| Note        |          |             |                 |                    |        |

## 13. INJECTED CURRENTS SUSCEPTIBILITY TEST

### 13.1. Block Diagram of Test Setup



### 13.2. Test Standard

EN IEC 61547: 2023 (EN 61000-4-6: 2014+A1: 2015 , Severity Level: 3V (rms), 0.15MHz ~ 80MHz)

### 13.3. Severity Levels and Performance Criterion

#### 13.3.1. Severity level

| Level | Field Strength (V) |
|-------|--------------------|
| 1.    | 1                  |
| 2.    | 3                  |
| 3.    | 10                 |
| X     | Special            |

#### 13.3.2. Performance criterion: A

### 13.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.11.

### 13.5.Operating Condition of EUT

- 13.5.1.Setup the EUT as shown in Section 13.1.
- 13.5.2.Turn on the power of all equipments.
- 13.5.3.Let the EUT work in test mode (ON) and measure it.

### 13.6.Test Procedure

- 13.6.1.Set up the EUT, CDN and test generators as shown on Section 13.1.
- 13.6.2.Let the EUT work in test mode and measure it.
- 13.6.3.The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 13.6.4.The disturbance signal described below is injected to EUT through CDN.
- 13.6.5.The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 13.6.6.The frequency range is swept from 150kHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.
- 13.6.7.The rate of sweep shall not exceed  $1.5 \times 10^{-3}$  decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 13.6.8.Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

### 13.7.Test Results

**PASS.**

Please refer to the following page.

## Injected Currents Susceptibility Test Results

|                      |                                                                                         |                    |                    |
|----------------------|-----------------------------------------------------------------------------------------|--------------------|--------------------|
| <b>Standard</b>      | <input type="checkbox"/> IEC 61000-4-6 <input checked="" type="checkbox"/> EN 61000-4-6 |                    |                    |
| <b>Applicant</b>     | Limited Liability Company «Energoresursy»                                               |                    |                    |
| <b>EUT</b>           | Luminaire                                                                               | <b>Temperature</b> | 26°C               |
| <b>M/N</b>           | LineRays HL01-1200-160-002                                                              | <b>Humidity</b>    | 51%                |
| <b>Test Mode</b>     | Normal                                                                                  | <b>Criterion</b>   | A                  |
| <b>Test Engineer</b> | Liang                                                                                   | <b>Test Date</b>   | September 29, 2025 |

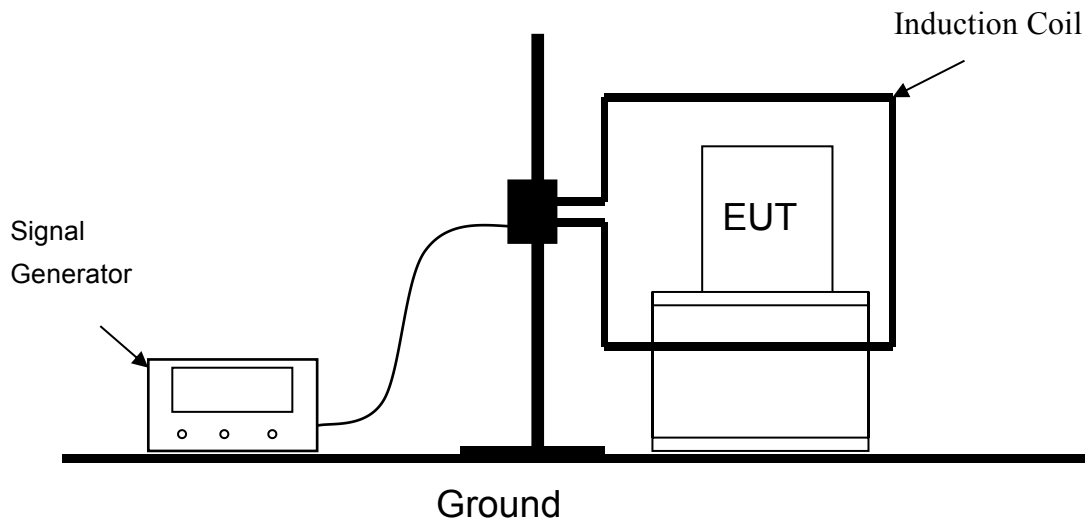
| <b>Frequency Range (MHz)</b> | <b>Injected Position</b> | <b>Strength (Unmodulated)</b> | <b>Criterion</b> | <b>Result</b> |
|------------------------------|--------------------------|-------------------------------|------------------|---------------|
| 0.15 ~ 80                    | AC Mains                 | 3V                            | A                | PASS          |

Remark:  
Modulation Signal: 1kHz 80% AM

Note:

## 14. MAGNETIC FIELD IMMUNITY TEST

### 14.1. Block Diagram of Test Setup



### 14.2. Test Standard

EN IEC 61547: 2023 (EN 61000-4-8: 2010, Severity Level 2: 3A/m)

### 14.3. Severity Levels and Performance Criterion

#### 14.3.1. Severity level

| Level | Magnetic Field Strength (A/m) |
|-------|-------------------------------|
| 1.    | 1                             |
| 2.    | 3                             |
| 3.    | 10                            |
| 4.    | 30                            |
| 5.    | 100                           |
| X     | Special                       |

#### 14.3.2. Performance criterion: A

### 14.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.12.

### 14.5.Operating Condition of EUT

- 14.5.1.Setup the EUT as shown in Section 14.1.
- 14.5.2.Turn on the power of all equipments.
- 14.5.3.Let the EUT work in test mode (On) and measure it.

### 14.6.Test Procedure

- 14.6.1.Set up the EUT system as shown on Section 14.1.
- 14.6.2.The Induction coil is set up in horizontal or vertical.
- 14.6.3.Let the EUT work in test mode and measure it.

### 14.7.Test Results

**PASS.**

Please refer to the following page.

## Magnetic Field Immunity Test Result

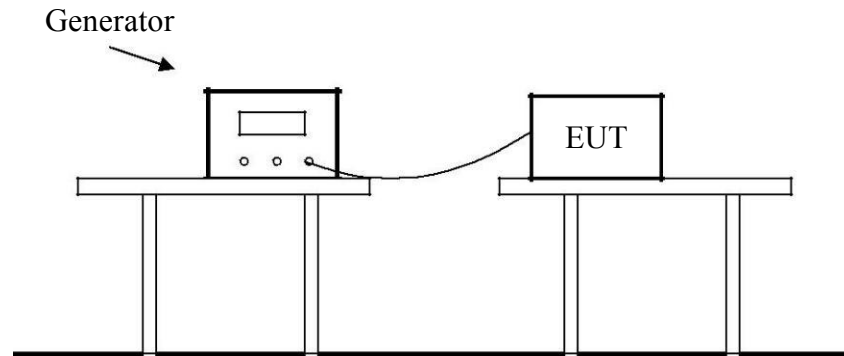
|                      |                                                                                         |                    |                    |
|----------------------|-----------------------------------------------------------------------------------------|--------------------|--------------------|
| <b>Standard</b>      | <input type="checkbox"/> IEC 61000-4-8 <input checked="" type="checkbox"/> EN 61000-4-8 |                    |                    |
| <b>Applicant</b>     | Limited Liability Company «Energoresursy»                                               |                    |                    |
| <b>EUT</b>           | Luminaire                                                                               | <b>Temperature</b> | 26°C               |
| <b>M/N</b>           | LineRays HL01-1200-160-002                                                              | <b>Humidity</b>    | 51%                |
| <b>Test Mode</b>     | Normal                                                                                  | <b>Criterion</b>   | A                  |
| <b>Test Engineer</b> | Liang                                                                                   | <b>Test Date</b>   | September 29, 2025 |

| Test Level<br>(A/M) | Testing<br>Duration | Coil Orientation | Criterion | Result |
|---------------------|---------------------|------------------|-----------|--------|
| 3                   | 5 mins              | X                | A         | PASS   |
| 3                   | 5 mins              | Y                | A         | PASS   |
| 3                   | 5 mins              | Z                | A         | PASS   |

Note:

## 15. VOLTAGE DIPS AND INTERRUPTIONS TEST

### 15.1. Block Diagram of Test Setup



### 15.2. Test Standard

EN IEC 61547: 2023 (EN 61000-4-11: 2020)

### 15.3. Severity Levels and Performance Criterion

#### 15.3.1. Severity level

| Test Level<br>(% $U_T$ ) | Voltage dip and short<br>Interruptions<br>(% $U_T$ ) | Duration<br>(in period) |
|--------------------------|------------------------------------------------------|-------------------------|
| 0                        | 100                                                  | 0.5                     |
| 70                       | 30                                                   | 10                      |

#### 15.3.2. Performance criterion: **B&C**

### 15.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.13&3.14.

## 15.5.Operating Condition of EUT

- 15.5.1.Setup the EUT as shown in Section 15.1.
- 15.5.2.Turn on the power of all equipments.
- 15.5.3.Let the EUT work in test mode (ON) and measure it.

## 15.6.Test Procedure

- 15.6.1.Set up the EUT and test generator as shown on Section 15.1.
- 15.6.2.The interruptions is introduced at selected phase angles with specified duration.
- 15.6.3.Record any degradation of performance.

## 15.7.Test Result

**PASS.**

Please refer to the following page.

## Magnetic Field Immunity Test Result

|                      |                                                                                           |                    |                    |
|----------------------|-------------------------------------------------------------------------------------------|--------------------|--------------------|
| <b>Standard</b>      | <input type="checkbox"/> IEC 61000-4-11 <input checked="" type="checkbox"/> EN 61000-4-11 |                    |                    |
| <b>Applicant</b>     | Limited Liability Company «Energoresursy»                                                 |                    |                    |
| <b>EUT</b>           | Luminaire                                                                                 | <b>Temperature</b> | 26°C               |
| <b>M/N</b>           | LineRays HL01-1200-160-002                                                                | <b>Humidity</b>    | 51%                |
| <b>Test Mode</b>     | Normal                                                                                    | <b>Criterion</b>   | A                  |
| <b>Test Engineer</b> | Liang                                                                                     | <b>Test Date</b>   | September 29, 2025 |

| Test Level<br>% U <sub>T</sub> | Voltage Dips & Short<br>Interruptions<br>% U <sub>T</sub> | Duration<br>(in periods) | Criterion | Result |
|--------------------------------|-----------------------------------------------------------|--------------------------|-----------|--------|
| 0                              | 100                                                       | 0.5P                     | B         | PASS   |
| 70                             | 30                                                        | 10P                      | C         | PASS   |

Note:

## 16. PHOTOGRAPH



Fig.1

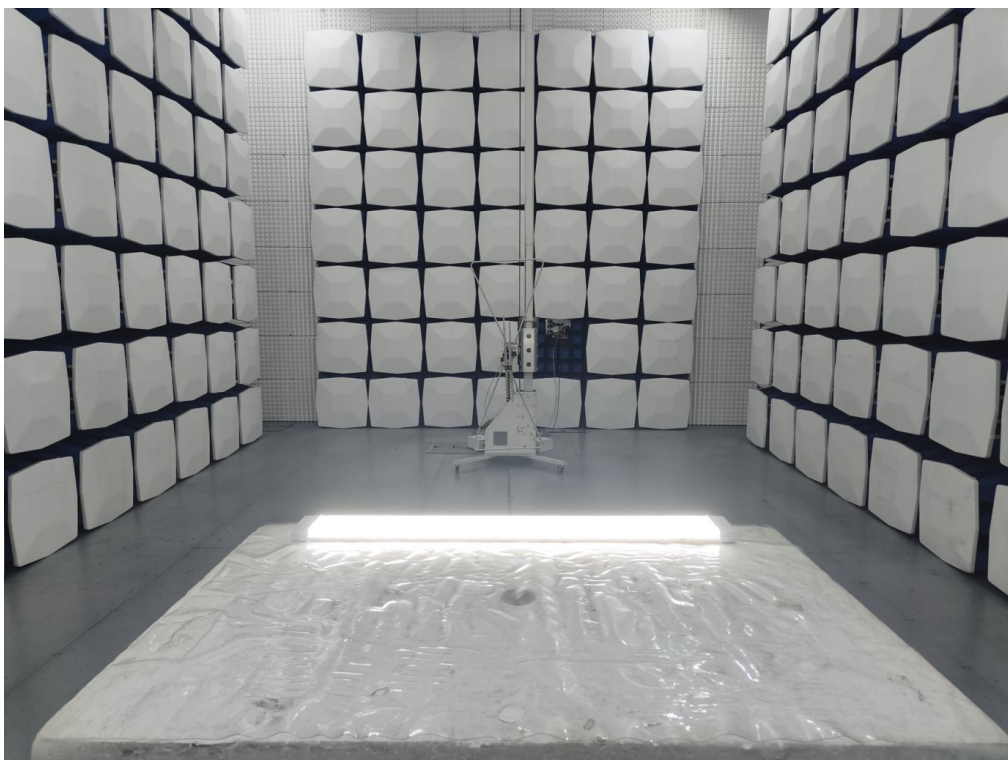


Fig.2

## 17. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

### PHOTOS

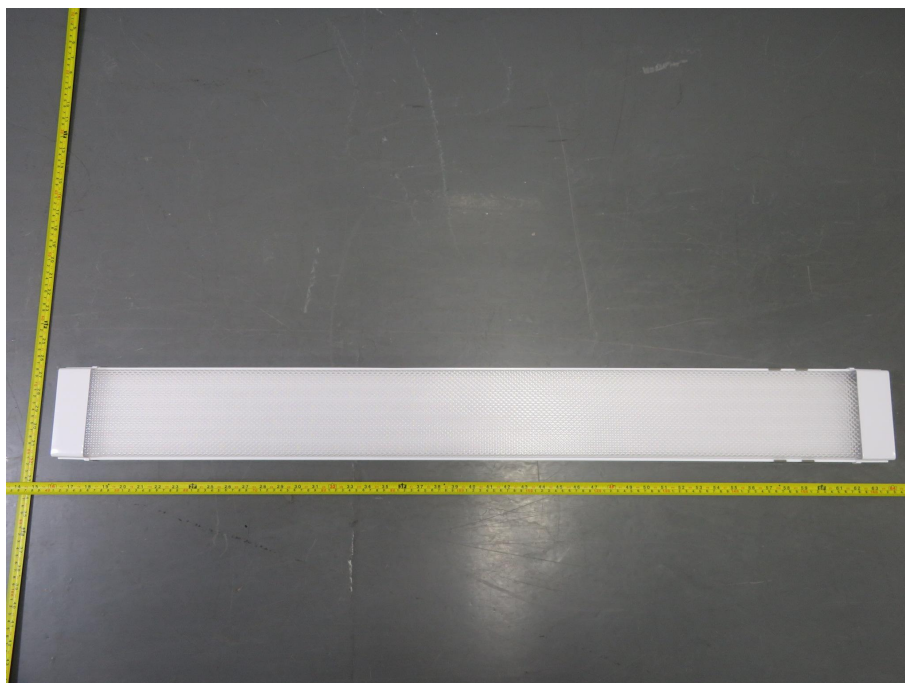


Fig. 1

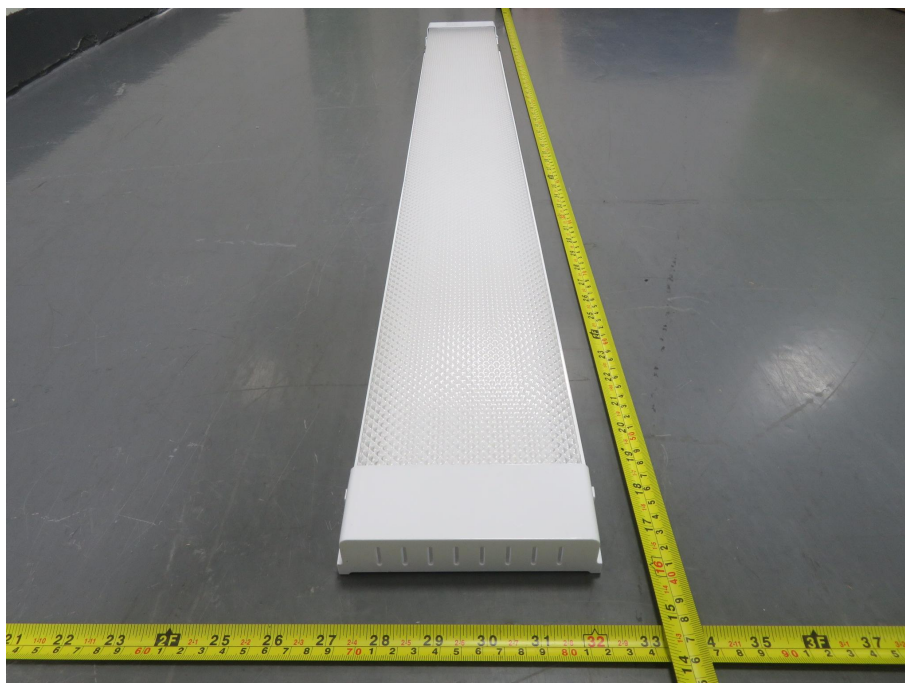


Fig.2

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