# PRODUCT SPECIFICATION

## BFH009V11 BFH009V12

## Rev. 1.1

## BOE MLED TECHNOLOGY Co., Ltd.

# Change History

( √ ) Original Specification
(  ) Final Specification

| Rev. | Page | Modified Content Description | Revision Date | Revision Person |
|---|---|---|---|---|
| 1.0 | - | Original Design | 2025/11/6 | gaobo |
| 1.1 | P5 | Mechanical Parameters update | 2026/1/6 | yangchen |
| | P6 | Electrical and Optical Parameters update | 2026/1/6 | yangchen |
| | P7 | System Parameters update | 2026/1/6 | yangchen |
| | P8 | Product Brand update | 2026/1/6 | yangchen |
| | P14 | Assembly Unit Weight update | 2026/1/6 | yangchen |
| | | | | |
| | | | | |

# Contents

# 1.0 Scope of Application

This specification applies to indoor COG front-maintenance cabinet with full-color performance and point spacing P0.935. The following are general product parameters, which can be customized according to customer requirements.

# 2.0 Product Description

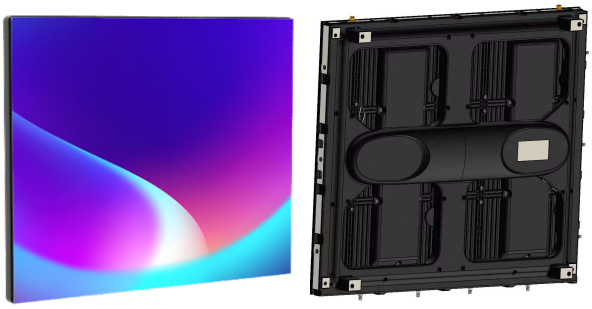
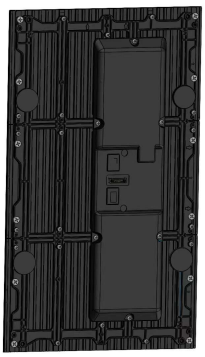
## 2.1 Product Introduction

P0.935 COG products adopt TFT yellow light technology, without PCB process. It use active-matrix driving method and Mini-LED flip-chip to achieve healthy display performance of full grayscale low-flicker and hardware-level low blue light. Combined with the leading optical surface treatment scheme, it can achieve low power consumption, environmental protection and better experience of higher display quality.

## 2.2 Product Feature

1) Active-matrix driving method, full grayscale low-flicker, low-blue light scheme, healthy eye care.
2) Every pixel on the display lamp panel, using R, G, B flip-chip. Each chip is fixed on the glass substrate with high flatness.
3) The assembly display unit is a front-maintenance magnetic suction structure, which is equipped with professional magnetic attraction tools to complete installation and maintenance.
4) Modular structure design, simple connection, light weight, convenient installation and disassembly.
5) The product uses advanced surface packaging technology with good dark ink consistency and excellent bright display effect.
6) Low power consumption, energy saving and environmental protection.

## 2.3 Product Picture

| Cabinet Front Appearance | Cabinet Backside Appearance |
|---|---|
|  |  |

# 3.0 Product Technical Parameters

## 3.1 Mechanical Parameters

| Project | | Technical Parameters | Remark |
|---|---|---|---|
| **Lamp Panel** | **Pitch(mm)** | 0.935 | |
| | **LED Type** | Flip chip | |
| | **Resolution** | 320*180 | |
| | **Size (mm*mm)** | 299.2 (H) * 168.3 (V) | |
| | **Protection Grade** | IP65 | |
| **Assembly Unit** | **Composition of Assembly Unit** | 1*3 (Lamp Panel) | |
| | **Assembly Unit Resolution** | 320*540 | |
| | **Unit Size (mm*mm)** | 299.2*504.9 | |
| | **Pixel Density (dot/m$^2$)** | 1143870 | |
| | **Maintenance Mode** | Front maintenance | |
| | **Carrier board Material** | Metal | |
| **Cabinet Unit** | **Composition of Cabinet Unit** | 1*2 (Assembly Unit) | |
| | **Cabinet Unit Size (mm*mm)** | 598.4*504.9 | 30.8inch |
| | **Cabinet Unit Resolution** | 640*540 | |
| | **Cabinet Overall Thickness (mm)** | 63.5mm@Central / 28.6mm@Edge | |
| | **Cabinet Overall Weight (kg)** | 8.2 | |
| | **Cabinet Flatness (mm)** | ≤0.09 | |

## 3.2 Electrical Parameters

| Project | Technical Parameters | Remark |
|---|---|---|
| **Average Power of a cabinet (W)** | 37 | |
| **Maximum Power of a cabinet (W)** | 112 | |
| **Average Power Per Square Meter (W)** | 123 | |
| **Maximum Power Per Square Meter (W)** | 370 | @600nit |
| **Power Supply Requirement (V)** | AC 100-240 | |

## 3.3 Optical Parameters

| Project | Parameters | Remark |
|---|---|---|
| **Single Point Luminance Correction** | support | |
| **Single Point Chromaticity Correction** | support | |
| **Equilibrium Luminance (cd/m²)** | Typ. 600, Peak.1000 | |
| **Chromaticity Coordinate** | Typ 0.284 0.294 | |
| **Color Temperature (K)** | Typ 9300，1500～15000 | |
| **Color Gamut** | ≥110% NTSC | |
| **Luminance Uniformity** | ≥97% | |
| **Chromaticity Nonuniformity** | Δu'v'≤0.005 | |
| **Horizontal Luminance Viewing Angle ( °)** | 160±10 | |
| **Vertical Luminance Viewing Angle ( °)** | 160±10 | |
| **Horizontal Chroma Viewing Angle ( °)** | 170±10 | Δu'v' ≤0.02 |
| **Vertical Chroma Viewing Angle ( °)** | 170±10 | Δu'v' ≤0.02 |
| **Bright-room Contrast** | ≥10000:1 | 10 lx环境光 |
| **Dark-room Contrast** | ≥1,000,000:1 | |
| **Darkscreen non-uniformity** | ≤8% | |

## 3.4 System Parameters

| Project | Parameters | Remark |
|---|---|---|
| **Frame Frequency (Hz)** | 120 | |
| **Drive Mode** | AM constant current drive | |
| **color depth** | 8/10bit | |
| **HDR** | support | |
| **EMC** | Class A | |

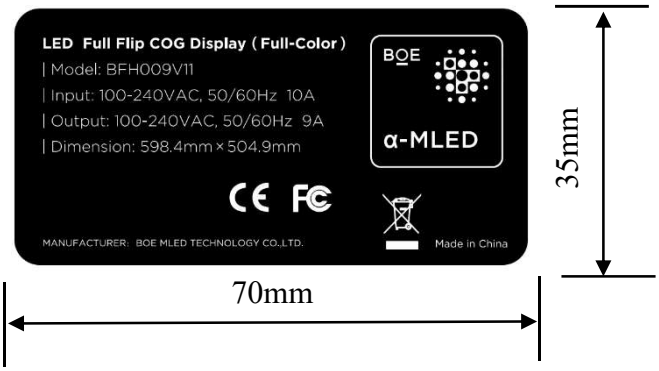
## 3.5 Packaging Parameters

| Project | Parameters | Remark |
|---|---|---|
| **Assembly Unit Packing Size (mm)** | 694×517×288 | |
| **Assembly Unit /box** | 4 | |
| **Box /Pallet (Assembly Unit)** | 12 | |
| **Assembly Unit & Pallet Size (mm)** | 1430×1080×999 | |
| **Cabinet Packing Size (mm)** | 671×374×585 | |
| **Cabinet / Box** | 4 | |
| **Box /Pallet (Cabinet)** | 12 | |
| **Cabinet & Pallet Size (mm)** | 1140×1380×1305 | |

## 4.0 Product Interface

| Legend | Type | Description |
|---|---|---|
|  | Power Interface | power supply to the cabinet, maximum current 10A |
|  | Type-C | Transmit the video source signal |

## 5.0 Product Brand




This product has passed CCC and energy-saving certification.

**Warning**

Warning: In residential environment, running this equipment may cause Radio interference.

## 6.0 Requirements for Hazardous Substances in Products (Conforming to EU RoHS2.0 requirements)

| Hazardous Substances | Qualifying standard (PPM: How many milligrams per kilogram) |
|---|---|
| **Cd** | <100 ppm (0.01%) |
| **Pb** | <1000 ppm (0.1%) |
| **Hg** | <1000 ppm (0.1%) |
| **Cr VI** | <1000 ppm (0.1%) |
| **PBB** | <1000 ppm (0.1%) |
| **PBDE** | <1000 ppm (0.1%) |
| **DEHP** | <1000 ppm (0.1%) (RoHS 3) |
| **BBP** | <1000 ppm (0.1%) (RoHS 3) |
| **DBP** | <1000 ppm (0.1%) (RoHS 3) |
| **DIBP** | <1000 ppm (0.1%) (RoHS 3) |

## 7.0 Reliability test specifications and methods

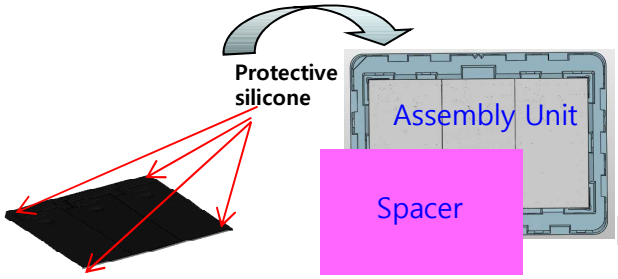
The following test conditions are met without poor functionality.

| Project | Test Condition |
|---|---|
| **High Temperature Storage** | 60 ℃, 120 hrs |
| **Low Temperature Storage** | -30 ℃, 120 hrs |
| **High Temperature and Humidity Operation** | 50 ℃, 90%RH, 120hrs |
| **Low Temperature Operation** | -10 ℃, 120hrs |
| **High Temperature Operation** | 50 ℃, 120hrs |
| **Thermal Shock** | -20℃/30min~60℃/30min，100cycle |
| **Package Vibration** | 5~200Hz，0.82G，30min in X/Y direction, and 1hr in Z direction |
| **Package Drop** | The drop height is 400mm, and the bottom surface and four edges are respectively once |
| **Safety Test** | Grounding Resistance: specified in 2.6.3.4 of GB 4943.1-2011 and 5.7.2 of SJ/T 11141-2017.<br>Ground leakage current: specified in 5.1.6 of GB 4943.1-2011 and 5.7.4 of SJ/T11141-2017.<br>Dielectric strength: specified in 5.2 of GB 4943.1-2011 and 5.7.5 of SJ/T 11141-2017. |

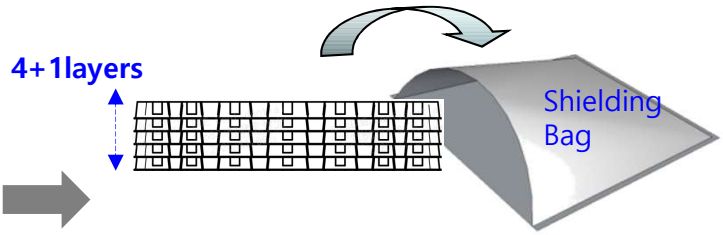
# 8.0 Packaging Scheme

Unless the customer specifies its packaging information, BOE provides the customer with standard shipping containers. The packaging method and label information are as follows.

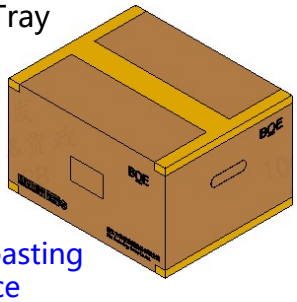
## 8.1 Assembly Unit Packaging Scheme

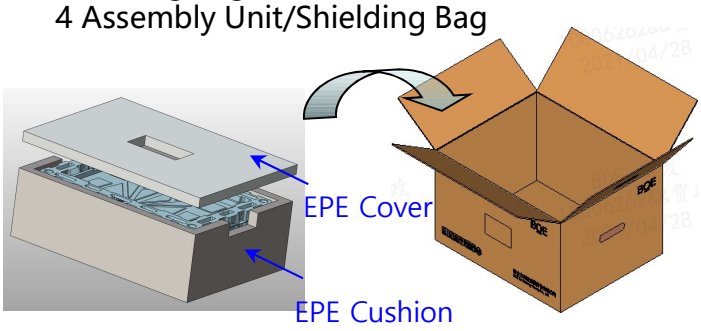



Assembly Unit is placed horizontally on the Tray, and the display surface is placed upward. Protective silicone is installed on the four corners and spacer is placed on the product.
1 Assembly Unit /4 Protective silicone/1 Spacer/Tray




Stack 4 layers of Trays (straight stack), put 1 empty Trays on the top as a cover, and place 2 desiccants in the top product slot. then put the whole stack of Trays into a Shielding Bag and vacuumize.
4 Assembly Unit/Shielding Bag



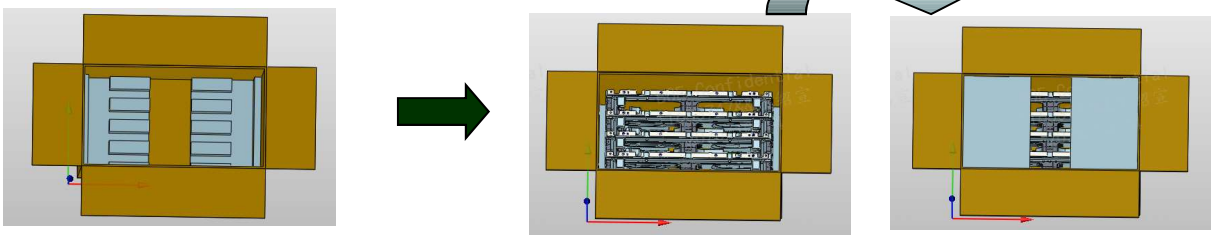




Use the "H" box sealing method to seal the box, and paste the corresponding box label at the Mark of the box.

Place a package of the product flat into an EPE cushion, put an EPE cover on top, with the EPE cushion facing up. Place the EPE cushion and EPE cover into a box.
4 Assembly Unit/1 EPE Cover/1 EPE Cushion/Box


Three layers of boxes are placed on each Pallet, and four boxes are placed on each layer according to the "田" shape. Place the Angle protectors on the length, width and height sides. Then, wrap at least 3 layers of film outside the Pallet, and then bundle the long, wide, and high sides with 2 layers of packaging tape.
12 Box/Pallet, 48 Assembly Unit/Pallet

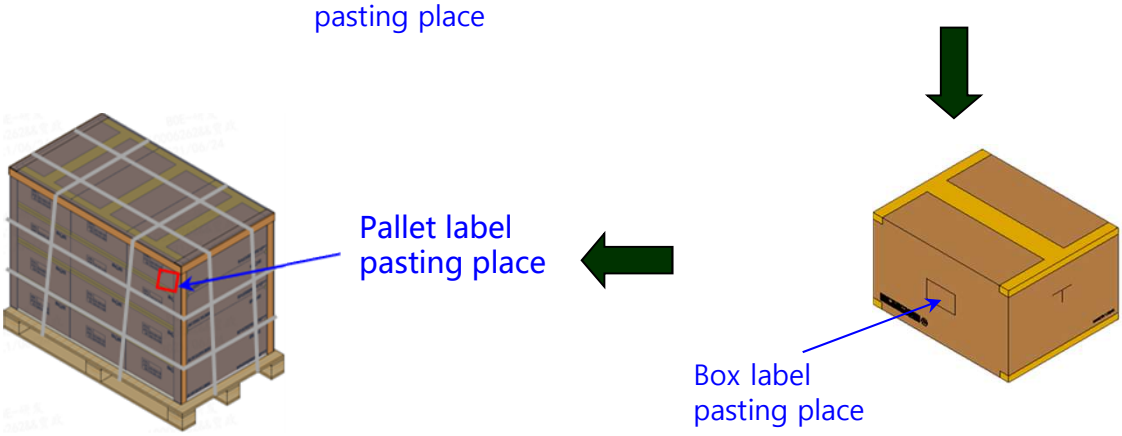
## 8.2 Box Packaging Scheme



Place 2 EPE bottoms at the edge of the carton.

Place 4 boxes vertically into the EPE slot, 4 pcs/box, and invert 2 EPE bottoms on the top.

Pallet label pasting place




Place 2 layers of boxes on each pallet, with 6 boxes per layer arranged in a "日" shape. Install corner protectors along the length, width, and height. Use 2 straps along the length, width, and height sides. Wrap the pallet with at least 3 layers of stretch film and attach a full pallet label.

12 boxes/pallet, 48 cabient/pallet.

Paste the box label on the corresponding position on the side.

## 9.0 Precautions for Product Use

| Project | Parameters |
|---|---|
| **Working temperature range (℃)** | Ambient temperature: - 10 ℃~40 ℃. Temperature control equipment shall be added for other temperature ranges.<br>Working process lamp surface temperature ≤ 60℃, and temperature control equipment needs to be added if the temperature exceeds the standard. |
| **Storage temperature range (℃)** | Ambient temperature: - 30℃～55℃. If the temperature exceeds 30 ℃, cooling treatment is required. If the temperature exceeds -20 ℃, heating treatment is required. |
| **Working Humidity Range (RH)** | Ambient humidity: 10-85%RH. If the humidity exceeds the standard, it needs to be dehumidified before it can be used normally. |
| **Storage Humidity Range (RH)** | Ambient humidity: 10-60% RH. Dehumidification treatment is required if the humidity exceeds 60% RH. |
| **Overdue storage processing** | If the product is stored unopened for more than one month or powered off for more than 48 hours after unpacking, it can be used normally after aging for 6 hours before use. The aging method is: full luminance setting 10% 1hrs, full luminance setting 30% 1hrs, full luminance setting 60% 2hrs, full luminance setting 80% 1hrs, full luminance setting 100% 1hrs (luminance gradually increases aging) |
| **Dust-proof** | No degree of protection. It should not be exposed to dusty environments, such as studio decoration, renovation, etc., and special protection is required for the display cabinet. |
| **Anti-corrosive gas** | Corrosive gas in the environment containing salt or acid gas in the air will cause corrosion of electronic components, crystal leakage and other phenomena. |
| **Anti-electromagnetic radiation** | The assembly unit should not be placed in an environment where electromagnetic radiation and radio frequency radiation exceed the interference source of electric field strength 5V/m. |
| **Anti-static** | Prevent damage to electronic devices caused by static electricity in wet environment, and avoid damage to human body caused by electric leakage. |
| **Shockproof** | The display screen should be installed on a solid and reliable installation structure without strong vibration |
| **Keep away from water** | The protection level of indoor products is low, and water conduction can cause short circuit, resulting in damage to circuit components, so it is necessary to keep away from water sources |

| Project | Parameters |
|---|---|
| **Personal Injury** | The installation angle and height of the assembly unit should be appropriate. The sharp corners need to be packaged to prevent the hard shell from harming the human body |
| **Security Requirements** | It is necessary to ensure the stability of the power supply system and maintain the normal level of frequency, voltage and current harmonics. When splicing multiple LED display cabinets, the metal shell should be grounded together with the metal frame where the LED display screen is installed. And the grounding resistance of the overall system of the display screen should not exceed 1Ω, and the leakage current to the ground should not exceed 5% of the input current. Dielectric strength should meet the provisions of 5.7.5 of SJ/T 11141-2025 General Specifications for Light-Emitting Diode (LED) Displays. |
| **Other** | The screen surface must not be wiped with other organic solvents except alcohol, and can be wiped with pure water or alcohol plus a fine dust-free cloth.<br>Do not touch the screen surface directly with your hands, and wear rubber gloves when disassembling. |

# 10.0 Instructions for Product Use

## 10.1 Guiding Principles:

1) Make sure to install the display screen on the basis of reading and understanding the user manual.
2) In any case, the company's products cannot be repaired by unauthorized personnel of the factory.
3) The installation foundation must be firm, such as no sinking, tilting or falling, and the environment must not be overweight, radioactive, polluted, corrosive or poisonous.
4) All components can only be provided by the original factory or suppliers certified by the original factory.
5) Without the consent of the original factory, do not repair or replace components at will.
6) Please operate under the guidance of the product manual, if you have any questions, please contact our company.

## 10.2 Safety Instructions:

**1) Personnel:**
When working at heights, protective measures must be taken. Operators need to wear qualified safety helmets, seat belts and other necessary personal safety protective equipment.
A single assembly unit is about 2.5kg. Pay high attention to personal safety during operation, and do not throw the tools and materials used. When it is really necessary for the cross operation, isolation facilities must be provided in the middle.
**2) Product :**
All products must be well protected and packaged firmly during transportation or storage, and there must be no external pressure beyond the specification on the product.
The product should not be in contact with rainwater before or during installation, and it shall be operated in a dry and clean environment.
All parts shall not be trampled, knocked or dropped. Please follow the instructions when moving or handling products.
Flammables: Keep inflammables away from the equipment. A large amount of energy is converted into heat during equipment operation. Equipment operation requires a certain amount of air flow to avoid heat endangering safe operation. Therefore, proper ventilation must be provided, and air conditioning and cooling must be installed at the rear of the equipment if necessary.

**3) Installation:**

When installing, disassembling, taking and placing the assembly unit, it is necessary to use a passive or active vacuum suction cup tool, and the screen needs to be disassembled vertically. At the same time, pay attention to the edges around the assembly unit, and there should be no collision with its adjacent assembly unit edges.

Wear rubber gloves when installing and disassembling assembly unit.

When installing the supporting assembly unit, it is recommended to install it from the lower part of the screen, from the middle to both sides, and from the bottom to the top.

After installation, clean the screen surface with clean water or alcohol plus a fine dust-free cloth, and do not use other solvents.

**4) Power supply:**

Provide power supply and power distribution cabinets according to power consumption. All power distribution systems must be protected by enclosures and comply with local circuit safety standards. The power distribution system is installed close to the display screen, and the power line and data line cannot be pulled or damaged.

Confirm whether the local voltage input to the screen matches the power supply of the screen, please ensure that the setting is correct before connecting the power cord.

Do not try to install the damaged wire, please replace it with a new one.

When the display screen is powered on, the instantaneous current is relatively large. Select an appropriate air switch, such as D-type air switch.

**5) Grounding:**

The display screen must be grounded with a separate ground wire.

**6) Attention during use:**

The display screen cannot be subject to excessive external pressure or collision, otherwise it will be damaged.

Please follow the guidelines when cleaning the surface of the display screen. Only soft dust-free cloth can be used during cleaning.

The power supply must be cut off before dismantling the display screen.

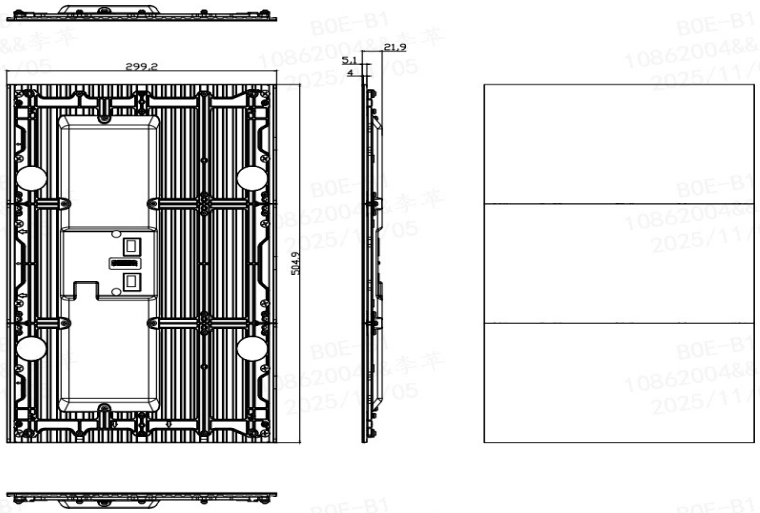
The design of all installation accessories is only applicable to the installation and connection of this LED display screen.

Modification or duplication of any components is prohibited. This display screen uses special materials and production procedures to achieve component strength.

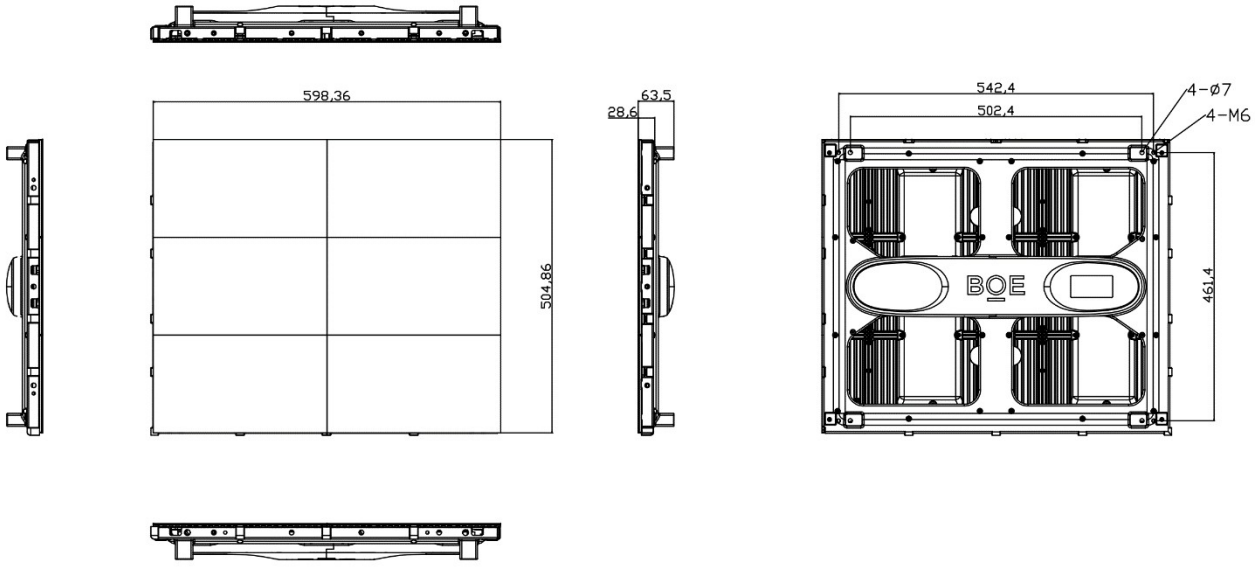
Always follow the installation instructions. If you have any questions about safe application, you can consult the factory. The manufacturer shall not bear any legal liability for the consequences caused by incorrect, incomplete, irresponsible or unsafe use of the installation system.

# 11 The Appendix

## 11.1 Product Plane Structure Diagram




**Assembly Unit Diagram**




**Cabinet Diagram**

## 11.2 Test Method of Bright-room Contrast

### 11.2.1 Purpose

To test the Bright-room Contrast of the display screen.

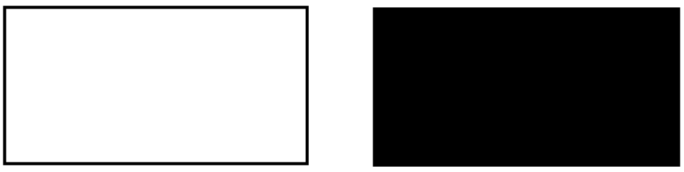
### 11.2.2 Test Conditions

The test requirements are as follows.

a) Test Device:

—— Optical Measuring Equipment
—— Driving Power Supply
—— Driving Signal Equipment
—— Light Source
—— Integrating Sphere

b) The test screen is the full white screen (R=G=B=255) and the full black screen (R=G=B=0), as shown in the following figure.



The full white screen and the full black screen

### 11.2.3 Test Method

The test steps are as follows.

a) The lighting conditions of the integrating sphere shall comply with the provisions of 5.2.2.3 in SJ/T 11461.6.2-2016, using the 8-degree incident illumination condition.

b) Place the integrating sphere close to the surface of the display screen. Set the display screen to the full white screen, and aging for 30 minutes. After setting the light source illumination of integrating sphere A to 10 lx and stabilized, test the luminance $L_h$ of the white screen, and test the luminance $L_d$ of the black screen.

c) Calculate the Bright-room Contrast using the following formula:

$$ACR = L_h / L_d$$

## 11.3 Test Method of Dark-room Contrast

### 11.3.1 Purpose

To test the Dark-room Contrast of the display screen.

### 11.3.2 Test Conditions

The test requirements are as follows.

a) Test Device:

—— Dark-room Environment

—— Optical Measuring Equipment

—— Driving Power Supply

—— Driving Signal Equipment

b) The test screen is the full white screen (R=G=B=255) and the full black screen (R=G=B=0), as shown in the following figure.

The full white screen and the full black screen

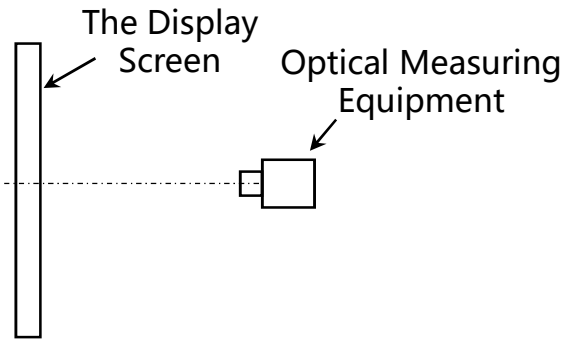
### 11.3.3 Test Method

The test steps are as follows.

a) The test device is shown in the following figure. Set the display screen to the full white screen, aging for 30min. Use the optical measuring equipment to test the luminance of the white screen L255, and then test the luminance of the black screen L0.

b) Use the following formula to calculate the dark-room contrast:

$$CR = L_{255} / L_0$$



## 11.4 Darkscreen non-uniformity

### 11.4.1Purpose

To test the Darkscreen non-uniformity between panels on the same display.

### 11.4.2 Test Conditions

The test requirements are as follows.

a) Test Device:

—— Luminance meter

—— Stable light source

b)The test screen is the full black screen (R=G=B=0).

### 11.4.3 Test Method

The test steps are as follows.

a) Place the display screen in a stable indoor lighting environment with an illuminance of 200×(1±10%) lx. Visually select nine pairs of adjacent areas with the largest deviations on the large screen, and use a luminance meter to measure the luminance values of adjacent positions, recording the values of each pair of adjacent positions as $L_{i1}$, $L_{j2}$, respectively.

b) Use the following formula to calculate the luminance non-uniformity between each pair of adjacent positions:

$$L_i = \frac{|Li_1 - L_{i2}|}{\min |Li_1 Lj_{2|}} \times 100\%$$

In the formula:

$L_i$ represents the non-uniformity of each pair of adjacent regions (i=1, 2, 3...9);

$L_{i1}$ / $L_{i2}$ represents the luminance measurement of the first / second display unit in each pair of adjacent regions (i=1, 2, 3...9), in candelas per square meter (cd/㎡);

c) Take the maximum value of the 9 pairs as the darkscreen non-uniformity $L_B$.

## 11.5 Test Method of Power

### 11.5.1 Purpose

Test the maximum power of a cabinet of display screen.

### 11.5.2 Test Conditions

The test requirements are as follows.

a) Test Device:

—— Dynamometer

—— Driving Power Supply

—— Driving Signal Equipment

b) The test screen is the full white screen with a luminance of 600nit.

The full white screen

### 11.5.3 Test Method

The test steps are as follows.

a) Adjust the display screen to the working state and connect it with the Dynamometer.

b) Set the display screen to the full white screen with a luminance of 600nit, aging for 30 minutes.

c) The test result of the dynamometer is the maximum power of a cabinet $P_{\max}$ . According to industry experience, calculate the average power of a cabinet $P_{ave}$ according to the following formula:

$$P_{ave} = P_{\max} /3 \quad (1)$$

The area of a single cabinet is 0.3 $\mathrm{m}^2$, and the maximum power per square meter $P'_{\max}$ and the average power per square meter $P'_{ave}$ are calculated according to formulas (2) and (3):

$$P'_{\max} = P_{\max} /0.3 \quad (2)$$

$$P'_{ave} = P_{ave} /03 \quad (3)$$