

## 承认书

### SPECIFICATION FOR APPROVAL

Part No. HWA537V5E-SS

Description:

Revision: 1.1

Customer.

Customer Approval No. :

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| 日期 DATE:                | 日期 DATE:                |
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# HWA537V5E-SS

■ High-efficiency Switching Power Supply product

**HWA537V5E-SS is a High-efficiency power supply with a rated output of 7.5V / 53 A, designed for LED display products. The power supply has the following characteristics:**

- ◆ Small size: 220mm\*46mm\*26mm(L\*W\*H)
- ◆ Light weight : 470g
- ◆ High efficiency: 91.5% (@Input 230VAC, Output 7.5V/53A)
- ◆ Small Leakage current: <1mA
- ◆ Output voltage : 7.5V
- ◆ EMI standard: EN55032 CLASS B
- ◆ Wide operating temp. range: -40~+70°C (+50 °C ~ +70°C linear de-rating, referring to fig. 1)
- ◆ Wide Input voltage range: 180VAC~264VAC
- ◆ Power factor:  $\geq 0.95$
- ◆ Cooling mode: conduction cooling
- ◆ Output over-voltage protection
- ◆ Output over-current protection
- ◆ Output short-circuit protection
- ◆ Over temperature protection
- ◆ Compliance with CE, CCC certifications



## Product Picture



### NOTES:

1. The final installation environment of the product needs to meet the environment where the heat sink is simulated. (Refer to fig. 4 for the aluminum radiator size.)
2. The indicators in this specification are the results of testing under the recommended environment. That is, the power supply must be installed on a heat sink with the size of 450\*450\*4mm.

### safety rule

|                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>High voltage</p> | <p>Power input port with high voltage, cannot be touched by hand (Port d'entrée d'alimentation à haute tension, ne peut pas être touché à la main)</p>                                                                                                                                                                                                                                                       |
|  <p>Warning</p>      | <p>The power supply is a product with large leakage current. Please ground reliably before powering on. When install the product, the metal enclosure needs to be reliably earthed, and the earthing connection is to be evaluated in the end installation.<br/>(L'alimentation est un produit avec un fort courant de fuite. Veuillez mettre à la terre de manière fiable avant de mettre sous tension)</p> |
|  <p>High voltage</p> | <p>It is strictly forbidden to carry out high voltage and alternating current operation under thunderstorms (Il est strictement interdit d'effectuer des opérations à haute tension et à courant alternatif sous des orages)</p>                                                                                                                                                                             |

## 1. Specifications

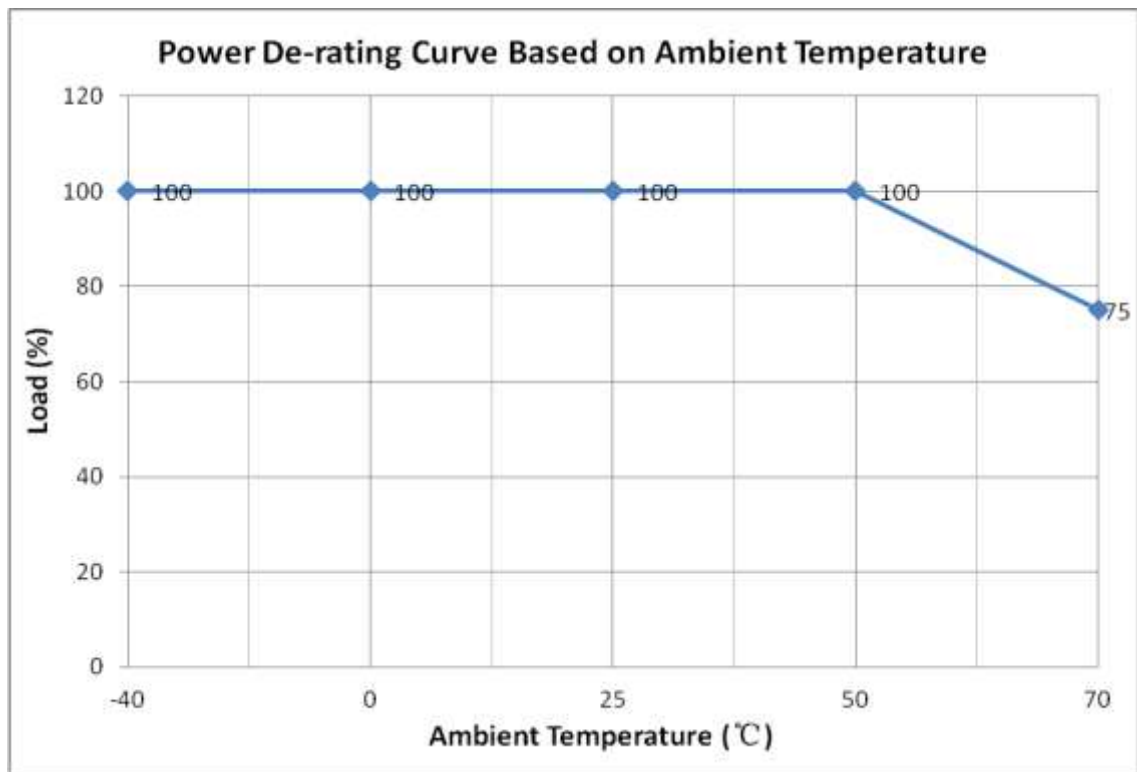
| Environmental Requirements |      |      |      |      |                                                                                |
|----------------------------|------|------|------|------|--------------------------------------------------------------------------------|
| Parameter                  | Min. | Typ. | Max. | Unit | Remark                                                                         |
| Operating Temperature      | -40  | -    | +70  | ℃    | Full load @-40℃~+50℃. +50℃ ~+70℃ linear de-rating by 1.25% per degree Celsius. |
| Storage Temperature        | -40  | +25  | +90  | ℃    | /                                                                              |
| Humidity                   | 5    | /    | 95   | %    | Relative humidity, no condensing                                               |
| Altitude                   | 0    | /    | 5000 | m    | /                                                                              |
| Cooling                    | /    | /    | /    | /    | conduction cooling                                                             |

| Input Characteristics   |      |                          |      |      |                                 |
|-------------------------|------|--------------------------|------|------|---------------------------------|
| Parameter               | Min. | Typ.                     | Max. | Unit | Remark                          |
| Input Voltage Range     | 180  | 220                      | 264  | Vac  | /                               |
| Input Voltage Frequency | 47   | 50/60                    | 63   | Hz   | /                               |
| Power Factor            | 0.95 | /                        | /    | /    | @220Vac, full load              |
| Input Inrush Current    | /    | /                        | 60   | A    | @220Vac, full load & Cold state |
| AC Input Mode           | /    | Single phase input (L、N) | /    | /    | /                               |

| Output Characteristics                     |      |      |      |      |                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------|------|------|------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter                                  | Min. | Typ. | Max. | Unit | Remark                                                                                                                                                                                                                                                                                                                                |
| Output Voltage Range                       | 7.4  | 7.5  | 7.6  | Vdc  | Non-adjustable                                                                                                                                                                                                                                                                                                                        |
| Output Current                             | 0    | /    | 53   | A    | Universal input (refer to fig.1 & fig.2)                                                                                                                                                                                                                                                                                              |
| Load Regulation                            | /    | /    | ±1   | %    | Rated voltage input, load changing from min. to max.                                                                                                                                                                                                                                                                                  |
| Output voltage accuracy                    | /    | /    | ±2   | %    | Universal input, full load                                                                                                                                                                                                                                                                                                            |
| Line Regulation                            | /    | /    | ±0.5 | %    | Full range of input voltage, full load                                                                                                                                                                                                                                                                                                |
| Ripple and Noise (V <sub>peak-peak</sub> ) | /    | /    | 250  | mV   | Full range of input voltage & load condition, with one 0.1μF film capacitor and one 10μF high frequency electrolyte capacitor in parallel with the end of sensor lines. Use twisted pair with length of 30±2cm as the sensor lines. Oscilloscope band width shall be set to 20MHz, and need to remove the probe cap and ground clamp. |

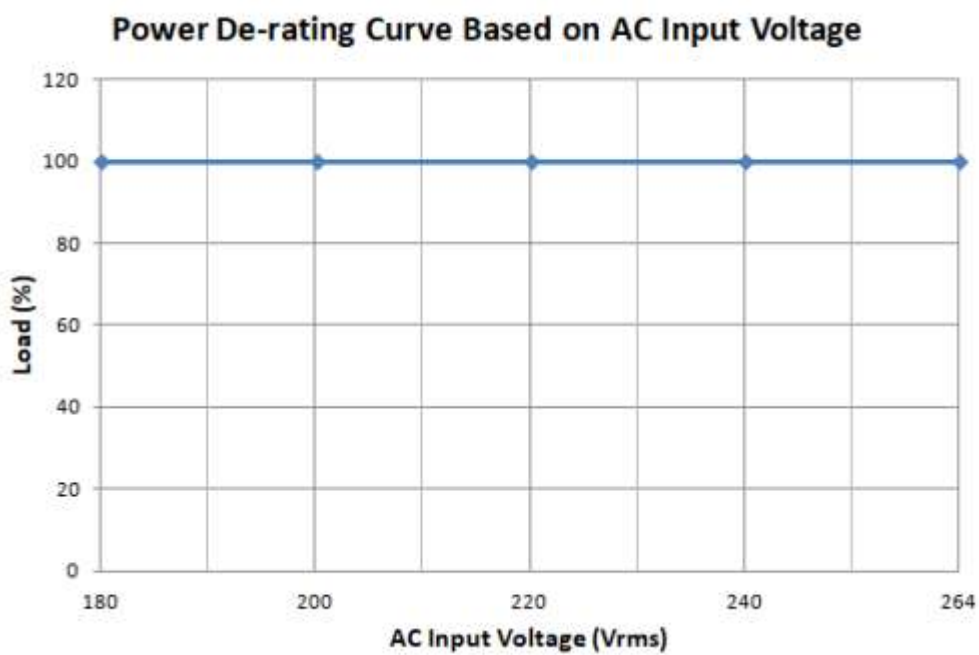
### HWA537V5E-SS Output Graphs

#### 1) Load - ambient temperature de-rating curve



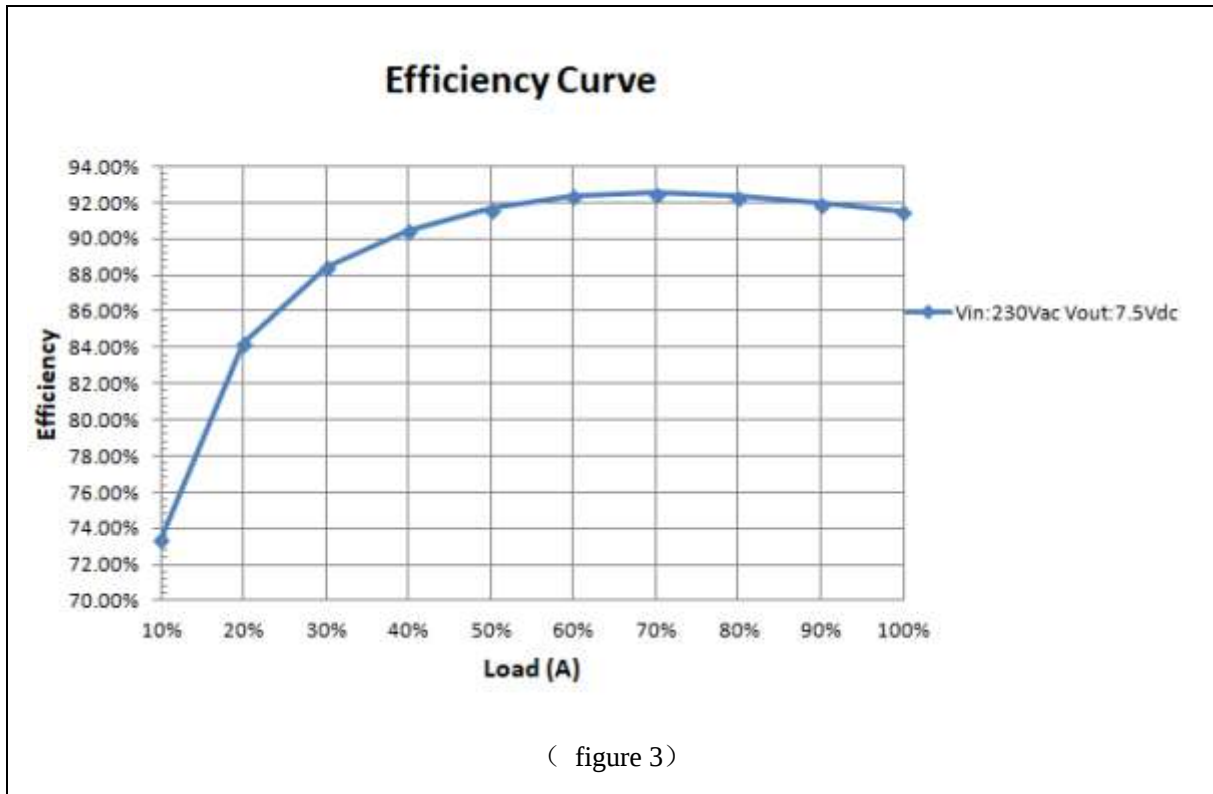
( figure 1)

#### 2) Input voltage - load de-rating curve



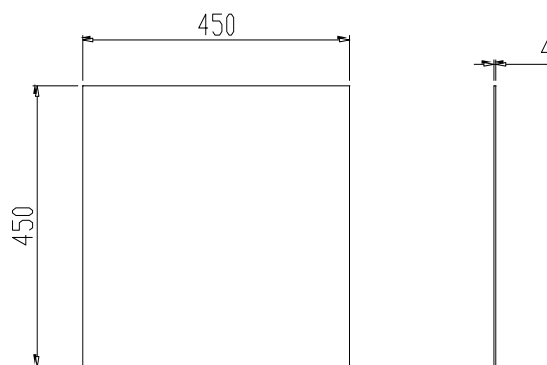
( figure 2)

### 3) Efficiency Curve



### 4) Installation requirement

In order to meet the requirement of the de-rating curves and the performance of the whole machine, the actual installation requires that the bottom of the chassis be tightly close to the heat-dissipating aluminum plate or to the case of the system of the same size (the recommended size of the heat-dissipating plate is shown in Figure 4, the unit is mm). In order to optimize heat dissipation, the surface of the aluminum plate must be smooth and coated with thermal grease, and the power supply must be installed on the center of the aluminum plate.



( figure 4 ) Aluminum Radiator Size

## 1. Specifications

| Miscellaneous                         |      |      |        |      |                                                                                                                                                |
|---------------------------------------|------|------|--------|------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter                             | Min. | Typ. | Max.   | Unit | Remarks                                                                                                                                        |
| Efficiency                            | 90.5 | 91.5 | /      | %    | @25℃, 230Vac input, output :7.5V/53A                                                                                                           |
| Dynamic response 1                    | /    | /    | ±5     | %    | Load variation:<br>25%-50%-25% or 50%-75%-50%<br>Rate: 1A/us, Period: 4ms                                                                      |
| Dynamic response 2                    | /    | /    | ±10    | %    | Load variation:<br>5%-100%-5%<br>Rate: 1A/us, Period: 10ms                                                                                     |
| Temperature coefficient               | /    | /    | ±0.02  | %/℃  | Universal input, full load                                                                                                                     |
| Turn On Delay Time                    | /    | /    | 2      | S    | Full range of input voltage & load condition                                                                                                   |
| Over/under shoot @ start -up/shutdown | /    | /    | ±10    | %    | Full range of input voltage & load condition                                                                                                   |
| Rise Time                             | /    | /    | 100    | ms   | Rated input, full load                                                                                                                         |
| Capacitive loading                    | /    | /    | 20,000 | μF   | For LED display product, we recommend that the extra electrolyte capacitor's value should be not less than 2,200μF for per 10A output current. |

| Protections                     |      |      |      |      |                                                                                                                      |
|---------------------------------|------|------|------|------|----------------------------------------------------------------------------------------------------------------------|
| Parameter                       | Min. | Typ. | Max. | Unit | Remarks                                                                                                              |
| Output Over Voltage Protection  | 8.5  | /    | 10   | V    | Auto recovery                                                                                                        |
| Output Over Current Protection  | 60   | /    | 80   | A    | Hiccup Mode                                                                                                          |
| Output Short-circuit Protection | /    | /    | /    | /    | Long-term short-circuit endurable.<br>Auto recovery                                                                  |
| Over Temperature Protection     | 85   | /    | 100  | ℃    | Over temperature shutdown, recover automatically.<br>The test point is the surface center of the power supply cover. |

## 1. Specifications

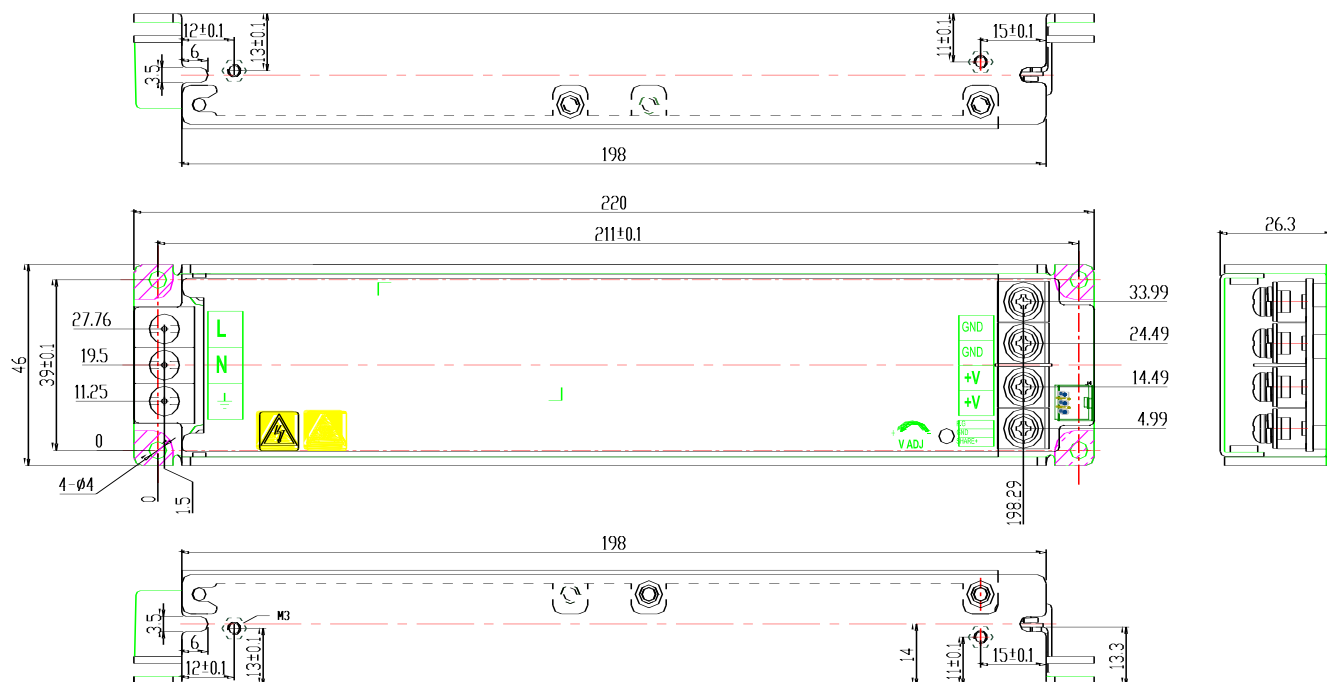
| EMC and other parameters              |                                                                                                                                                                                                                                                                                                                                          |                   |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Item                                  | Level                                                                                                                                                                                                                                                                                                                                    | Standard          |
| CE                                    | CLASS B                                                                                                                                                                                                                                                                                                                                  | EN55032           |
| RE                                    | CLASS B                                                                                                                                                                                                                                                                                                                                  | EN55032           |
| SURGE                                 | Input level B(1.2/50us)<br>line-line : 1kV<br>line-PGND: 2kV                                                                                                                                                                                                                                                                             | IEC61000-4-5      |
| ESD                                   | level B Contact discharge: $\pm 4\text{kV}$ Air discharge: $\pm 8\text{kV}$                                                                                                                                                                                                                                                              | IEC61000-4-2      |
| CS                                    | LEVEL 3; level A; 10V                                                                                                                                                                                                                                                                                                                    | IEC61000-4-6      |
| RS                                    | Level 3 ; level A; 10V/m                                                                                                                                                                                                                                                                                                                 | IEC61000-4-3      |
| Immunity to Electrical Fast Transient | $\pm 2\text{kv}$ , LEVEL 3, level B                                                                                                                                                                                                                                                                                                      | IEC61000-4-4      |
| Voltage fluctuation and Flicker       | $P_{st} \leq 1.0$ , $P_{lt} \leq 0.65$ , $dc \leq 3\%$ , $d_{max} \leq 4\%$<br>the value of $d(t)$ during a voltage change shall not exceed 3% for more than 200ms                                                                                                                                                                       | IEC61000-3- 3     |
| Harmonic Current Emission             | CLASS A                                                                                                                                                                                                                                                                                                                                  | IEC61000-3- 2 [6] |
| Audible Noise                         | 45dB(A)                                                                                                                                                                                                                                                                                                                                  | Test distance:1m  |
| MTBF                                  | $\geq 100,000\text{hrs}$ @ 25°C                                                                                                                                                                                                                                                                                                          |                   |
| Vibration                             | Frequency 1-4Hz, acceleration spectral density $0.0001\text{g}^2/\text{Hz}$ . Frequency 4-100Hz, acceleration spectral density $0.01\text{g}^2/\text{Hz}$ . Frequency 100-200Hz, acceleration spectral density $0.001\text{g}^2/\text{Hz}$ . Total rms acceleration: 0.781Grms. Test axis Direction: 3 axes. Test time: 30 min per axis. |                   |
| Shock                                 | Half sine wave. Peak acceleration: $300\text{m/s}^2$ . Pulse width: 6ms. Axis Direction: 6 directions. 3 shocks on each direction.                                                                                                                                                                                                       |                   |
| Odor                                  | No peculiar and deleterious odor                                                                                                                                                                                                                                                                                                         |                   |

| Insulation rating     |                                                                                                                                                                                      |                           |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Parameter             | Requirement                                                                                                                                                                          | Remark                    |
| Input - Output        | 3000Vac/10mA//1min                                                                                                                                                                   | No flashover or breakdown |
| Input - Chassis       | 1800Vac/10mA//1min                                                                                                                                                                   |                           |
| Output - Chassis      | 500Vdc/10mA//1min                                                                                                                                                                    |                           |
| Leakage Current       | $< 1\text{ mA}$                                                                                                                                                                      | 240Vac/50Hz Input         |
| Grounding Resistance  | $< 0.1\ \Omega$                                                                                                                                                                      | Test condition: 40A/2mins |
| Insulation Resistance | @ Normal atmospheric pressure, relative humidity: 90% Testing voltage: 500V dc Insulation of primary-secondary, primary-ground, secondary-ground shall not be less than 10M $\Omega$ |                           |

## 2. Mechanical

| Mechanical specifications |                |
|---------------------------|----------------|
| Length (mm)               | 220 $\pm$ 0.5  |
| Width (mm)                | 46 $\pm$ 0.5   |
| Height (mm)               | 26.3 $\pm$ 0.7 |
| Weight (g)                | $\leq$ 470     |

### Dimensions and mounting holes - terminal coordinates



### Definition and Installation Notes for Input Terminal and Output Terminal

| Name            | Function | Maximum Torque | Wiring Diameter                   |
|-----------------|----------|----------------|-----------------------------------|
| Input Terminal  | L        | 6.5kgf.cm      | 18AWG min.                        |
|                 | N        |                |                                   |
|                 | ⏏        |                |                                   |
| Output Terminal | +V       | 12kgf.cm       | According to the actual situation |
|                 | +V       |                |                                   |
|                 | GND      |                |                                   |
|                 | GND      |                |                                   |