



# 深圳市华浩德电子有限公司

Shenzhen Fahold Electronics CO.,LTd.

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|                        |                                                                                                                   |
|------------------------|-------------------------------------------------------------------------------------------------------------------|
| Product Name:<br>产品名称  | FD-320E 系列防水电源                                                                                                    |
| Product Model:<br>产品型号 | FD-320E-056*/B/C/D 27-56V 4.0-9.0A FCC <input checked="" type="checkbox"/> UL <input checked="" type="checkbox"/> |

|                             |                                  |                     |
|-----------------------------|----------------------------------|---------------------|
| Customer/客户:                |                                  |                     |
| Products code<br>产品代码:      | Sample NO.<br>样品编码:              | Customer ID<br>客户代码 |
| Customer Model No.<br>客户型号: | Fahold Model No.<br>我司型号:FD-320E | Version.<br>版本: 00  |

|                                 |               |                |
|---------------------------------|---------------|----------------|
| IGNATURE AND SEAL BY US /我司签字盖章 |               |                |
| 日期:                             | 2020/11/06    |                |
| Prepared By 编制                  | Checked By 审核 | Approved By 批准 |
| 王金林                             | 薄文钊           |                |

Please confirm and send it back with signature within 7 days.Otherwise we will assume your acceptance.And if any quality dissent ,will execute according to this product specification.

请确认后七日内回签，如不回签则视贵公司默认接受，在发生品质异常时按此份产品规格书执行。

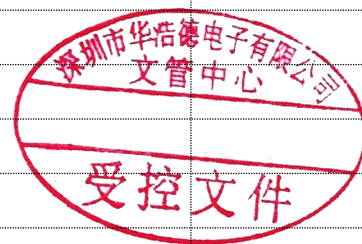
**CUSTOMER APPROVED SIGNATURE /客户承认盖章**

Customer Model No.客户型号:

|         |       |          |
|---------|-------|----------|
| 日期:     |       |          |
| ENG./工程 | QA/品管 | OTHER/其他 |
|         |       |          |

Comments 建议:

## ECN History ECN 变更

[illegible]



### Feature特征:

- ◆ IP65防护等级
- ◆ Max output power 320W.最大输出功率320W
- ◆ Constant current design. 恒流设计
- ◆ 3 in 1 dimming mode:0-10V,PWM,RX. 三合一调光模式: 0-10V, PWM,RX
- ◆ Smoothly dimming(0-100%),can dim to off. 从0%-100%平滑调光, 且调光输出可关断
- ◆ TUV CB CE UL FCC Certified.多个国家与机构认证
- ◆ PROTECTION: Short Circuit, Open Circuit 保护: 短路保护, 开路保护
- Surge protection :  
Differential mode:4KV.Common mode:6KV;  
差模4KV, 共模6KV
- ◆ Auxiliary Output 12V可带12V辅助源
- ◆ 可提供12V/200mA辅助电源。
- ◆ Dimming signal is isolated from LED output;调光信号与LED输出隔离

### Application应用

- ◆ Street lights、High bay lights.路灯、工矿灯

### Introduction 介绍

The document detail the electrical, mechanical and environmental specifications of a 320W constant current LED driver with 0(1)-10V Dimming. This LED drive power supply is suitable only for LED load.

此份资料详细描述了一款 320W 系列带 0(1)-10V 调光的 LED 恒流驱动电源的电器性能, 环境要求等。此款电源只适用于 LED 负载。

### Model and Key parameters 型号和关键参数 Table 1, 表 1

| Model 型号           | 功率 (W) | Output voltag 输出 电压(V) | Max output voltage (Vdc)最大空载电压 | output current 输出电流(A) | Efficiency 效率 (%) @120V | Efficiency 效率 (%) @220V |
|--------------------|--------|------------------------|--------------------------------|------------------------|-------------------------|-------------------------|
| FD-240E-054*/B/C/D | 320    | 27-56                  | 58                             | 4.0-9.0                | 91.5                    | 93                      |
|                    |        |                        |                                |                        |                         |                         |

Note:

1:Max output voltage test带载最大电压测试

2: Optional letters B, C, D or empty, indicating that the output increases with different optional functions. The default position indicates that the current can be adjustable(basic model); letter B can be three-in-one dimming and fine-tuning current, letter C indicates that non dimmable and output current unadjustable, letter D refers to three-in-one dimming.

2: 可选字母 B,C,D 或空位, 表示输出增加不同的可选功能。默认空位表示可调电流 (基础机型);B 字母表示可三合一调光并可调电流, C 字母表示不可调光不可调电流, D 字母表示可三合一调光。

3:The model C / D on the back of the label to write YYY and YYY for the output current, such as FD-240E-54C-6700

型号 C/D 后面标签上要写 YYY,YYY 代表输出电流, 如FD-240E-54C-6700

**Technical data 技术参数**

| <b>Input characteristics 输入特性</b>                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input Voltage 输入电压                                                                                                                                                                                                                                                                                                                                                                | 120-277Vac(max 100-305Vac)                                                                                                                                                                                                                                                |
| Input Frequency 输入频率                                                                                                                                                                                                                                                                                                                                                              | 50/60Hz                                                                                                                                                                                                                                                                   |
| Input Current (Typ.)<br>输入电流 (典型值)                                                                                                                                                                                                                                                                                                                                                | 3.7 A @100-305 Vac , 100% load                                                                                                                                                                                                                                            |
| No load Voltage 空载功耗                                                                                                                                                                                                                                                                                                                                                              | 2.5Wmax                                                                                                                                                                                                                                                                   |
| Inrush Current 浪涌电流                                                                                                                                                                                                                                                                                                                                                               | 75Amax. @ 220Vac, 25℃                                                                                                                                                                                                                                                     |
| Power factor (Typ.)<br>功率因数 (典型值)                                                                                                                                                                                                                                                                                                                                                 | PF>0.95 @ 120Vac, PF>0.90 @ 277Vac,100% load, 见图 2                                                                                                                                                                                                                        |
| THD 总谐波失真                                                                                                                                                                                                                                                                                                                                                                         | THD<20% @ 120-277 Vac, 100% load 见图 3                                                                                                                                                                                                                                     |
| <b>Output characteristics 输出特性</b>                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                           |
| Current accuracy 电流精度                                                                                                                                                                                                                                                                                                                                                             | ± 5% I <sub>o</sub>                                                                                                                                                                                                                                                       |
| No load Voltage 空载电压                                                                                                                                                                                                                                                                                                                                                              | V <sub>out</sub> 58V max                                                                                                                                                                                                                                                  |
| Efficiency 效率                                                                                                                                                                                                                                                                                                                                                                     | ≥91.5% @120-277 Vac 见图 1                                                                                                                                                                                                                                                  |
| Output Voltage 输出电压                                                                                                                                                                                                                                                                                                                                                               | 27-56V ; Table 1 , 见表 1                                                                                                                                                                                                                                                   |
| Ripple and Noise<br>纹波与噪声                                                                                                                                                                                                                                                                                                                                                         | 270mVp-p                                                                                                                                                                                                                                                                  |
| Line Regulation<br>线性调整率                                                                                                                                                                                                                                                                                                                                                          | 3%I <sub>o</sub>                                                                                                                                                                                                                                                          |
| Load Regulation<br>负载调整率                                                                                                                                                                                                                                                                                                                                                          | 3%I <sub>o</sub>                                                                                                                                                                                                                                                          |
| Turn On Delay Time<br>开机延时                                                                                                                                                                                                                                                                                                                                                        | Under normal conditions, the maximum delay time is 3second<br>最大延迟时间小于 3 秒                                                                                                                                                                                                |
| <b>内置电位器调电流</b>                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                           |
| Potentiometer current<br>output range 电位器调电流<br>输出范围                                                                                                                                                                                                                                                                                                                              | The minimum value:4000mA; maximum value: 9000mA; Remark: the total output power does not exceed 320W (actual output voltage * actual output current = power), otherwise, it can not be guaranteed.最小值:4000mA;最大值:9000mA;备注:输出总功率不超过320W (实际输出电压*实际输出电流=功率) 否则不能质保。        |
| Please use the debugging plastic cross or slotted screw driver to adjust the current of the power supply, otherwise it is easy to damage the potentiometer. (the use of a 2mm screwdriver is also acceptable. The torque should not exceed 0.5knm, and a good insulation screwdriver should be used.) 请使用调试塑胶十字或一字螺丝刀对电源进行电流调节, 否则容易损坏电位器。(使用2mm螺丝刀亦可, 扭力请勿超过0.5KNM,并使用绝缘性良好的螺丝刀) |                                                                                                                                                                                                                                                                           |
| <b>Protection functions 保护功能</b>                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                           |
| Open circuit 开路保护                                                                                                                                                                                                                                                                                                                                                                 | When the LED disconnection the product is protected such as hiccup or when it is at the highest point of output voltage, the power supply shall be self-recovery when the fault condition is removed.当 LED 开路时, 产品进入保护状态, 如打嗝或钳在某输出最高电压状态, 产品不会损伤, 当故障排除或重新开机时, 电源恢复工作正常。 |
| Short Circuit 短路保护                                                                                                                                                                                                                                                                                                                                                                | The input power shall decrease when the output rail short, the power supply shall be self-recovery when the fault condition is removed.当输出短路时输入功率会相应减小, 短路情况解除后, 电源自动恢复正常。                                                                                                |
| <b>Environmental conditions 环境条件</b>                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                           |
| Operating Temperature<br>工作温度                                                                                                                                                                                                                                                                                                                                                     | -40℃ to +60℃                                                                                                                                                                                                                                                              |
| Operating Relative Humidity<br>湿度                                                                                                                                                                                                                                                                                                                                                 | 10% to 90% RH, non-condensing                                                                                                                                                                                                                                             |
| Storage Temperature<br>储存温度                                                                                                                                                                                                                                                                                                                                                       | -40℃ to +85℃                                                                                                                                                                                                                                                              |
| Storage Relative Humidity<br>储存湿度                                                                                                                                                                                                                                                                                                                                                 | 10% to 90%RH, non-condensing (Sea level to 2,000 m)                                                                                                                                                                                                                       |
| Vibration 振动                                                                                                                                                                                                                                                                                                                                                                      | 10 to 500HZ Sweep at constant acceleration of 1.0G (depth: 3.5mm )for 1 Hour for each of the perpendicular axes X, Y, Z.                                                                                                                                                  |

|                                                                                                                                                                                                                                                                            |                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Degrees of Protection<br>防护等级                                                                                                                                                                                                                                              | IP65                                                                                                                              |
| <b>Safety compliance 安全标准</b>                                                                                                                                                                                                                                              |                                                                                                                                   |
| Safety Standard 安规标准                                                                                                                                                                                                                                                       | GB19510.1,GB19510.14;EN61347-1,EN61347-2-13;UL8750, CSA C22.2No.250.13-12.                                                        |
| Dielectric Strength 介电强度                                                                                                                                                                                                                                                   | 初级-次级: P-S:3750VAC/5mA/60S      初级-地: P-E:1500VAC/5mA/60S<br>次级-地:    P-E:500VAC/5mA/60S                                          |
| Insulation Resistance<br>绝缘电阻                                                                                                                                                                                                                                              | I/P-O/P:>50M Ohms / 500VDC / 25℃ / 70% RH.                                                                                        |
| Leakage Current 泄漏电流                                                                                                                                                                                                                                                       | The leakage current shall be less than 0.25mA for Class 2 at maximum input voltage                                                |
| EMI                                                                                                                                                                                                                                                                        | GB17743, GB17625.1; EN55015, EN61000-3-2, EN61000-3-3, FCC Class B.                                                               |
| EMS                                                                                                                                                                                                                                                                        | EN 61000-4-2, 3,4,5,6,8,11, EN 61547.                                                                                             |
| ESD 静电放电（静电）免疫                                                                                                                                                                                                                                                             | 静电放电/免疫    Severity Level 等级    Level3/3 级    空气放电: ±8KV<br>Severity Level 等级    Level2/2 级    接触放电: ±4KV    性能标准: B              |
| RF 射频场强度                                                                                                                                                                                                                                                                   | 射频电磁场药敏试验, 80-1000MHZ; Severity Level 等级    Level2/2 级,    3V/M;<br>Performance Criterion 性能标准: A                                 |
| EFT 电快速瞬变脉冲                                                                                                                                                                                                                                                                | Severity Level 等级:    Level2/2 级    line to line    1.0kv                                 性能标准: B                                 |
| Surge Immunity 浪涌雷击                                                                                                                                                                                                                                                        | Severity Level 等级:    Level2/2 级,    差模    4kV<br>Severity Level 等级:    Level3/3 级,    共模    6KV<br>Performance Criterion 性能标准: B |
| <b>Reliability 可靠性</b>                                                                                                                                                                                                                                                     |                                                                                                                                   |
| Life Time 寿命                                                                                                                                                                                                                                                               | ≥5Years H@230Vac, 100% load. See lifetime vs. Tc curve for the details                                                            |
| MTBF 平均无故障时间                                                                                                                                                                                                                                                               | ≥ 200,000H@ 25℃,120Vac, 80% load. (MIL-HDBK-217F)                                                                                 |
| Warranty 质保                                                                                                                                                                                                                                                                | 5 years                                                                                                                           |
| <b>Others 其它</b>                                                                                                                                                                                                                                                           |                                                                                                                                   |
| Dimensions 尺寸                                                                                                                                                                                                                                                              | 250*84*41mm (L*W*H) 不含线材                                                                                                          |
| Weight 重量                                                                                                                                                                                                                                                                  | 1500±10g                                                                                                                          |
| <b>Remark 备注</b>                                                                                                                                                                                                                                                           |                                                                                                                                   |
| 1. The parameters above including the power factor, THD, efficiency are all tested under the ambient temperature 25℃ and humidity 50%, AC input 277V and 90% output load.此参数所得包括功率因数，总谐波失真，效率等所有测试均在 25℃ 50%湿度 输入电压 277V 以及 90%输出负载的环境下测试。<br>2.lo is rate output current. |                                                                                                                                   |

■ **Dimmable** 调光功能

| 调光类型           | 参数                   | Min 最小值 | Typ 典型值 | Max 最大 | 备注      |
|----------------|----------------------|---------|---------|--------|---------|
| 0-10V<br>1-10V | Signal Level 信号电平    | -20V    | 0-10V   | 14V    |         |
|                | Dim Range 调光范围       | 10%     |         | 100%   | 输出电流百分比 |
|                | On Level 关断电平        | 0.3V    |         | 1.5V   |         |
|                | Dim-off Level 开启电平   | 0.4V    |         | 1.6V   |         |
| PWM            | Signal Level 信号电平    | 0V      | 10Vp-p  | 14V    |         |
|                | SignalFrequency 信号频率 | 1KHz    |         | 2KHz   |         |

|      |                        |      |  |       |         |
|------|------------------------|------|--|-------|---------|
|      | duty ratio<br>占空比      | 5%   |  | 100%  |         |
| 电阻调光 | Resistance<br>value电阻值 | 10kΩ |  | 100kΩ |         |
|      | Dim Range 调<br>光范围     | 10%  |  | 100%  | 输出电流百分比 |

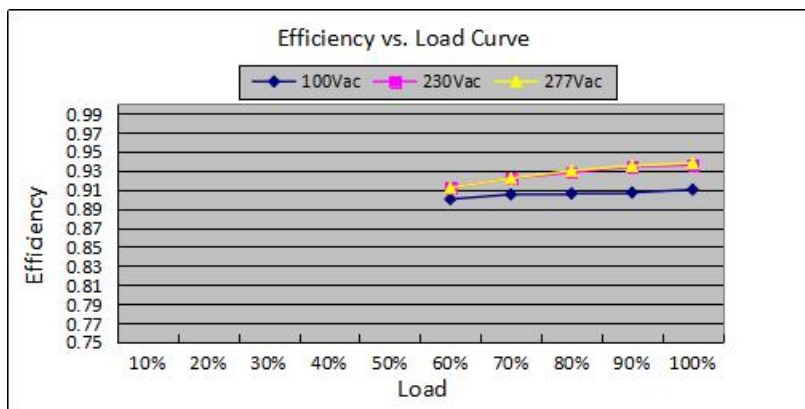
### Dimmable 调光范围

| Function       |    |          | 0-10V    |          |          | PWM      |          |          | RX       |          |           |      |
|----------------|----|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|------|
| Yes Or No      |    |          | Y        |          |          | Y        |          |          | Y        |          |           |      |
| 0-10V          | 0  | 1        | 2        | 3        | 4        | 5        | 6        | 7        | 8        | 9        | 10        | open |
| I <sub>r</sub> | 0  | 10%      | 20%      | 30%      | 40%      | 50%      | 60%      | 70%      | 80%      | 90%      | 100%      | 100% |
| PWM            | 0% | 10%      | 20%      | 30%      | 40%      | 50%      | 60%      | 70%      | 80%      | 90%      | 100%      | open |
| I <sub>r</sub> | 0  | 10%      | 20%      | 30%      | 40%      | 50%      | 60%      | 70%      | 80%      | 90%      | 100%      | 100% |
| RX             | 0Ω | 10K<br>Ω | 20K<br>Ω | 30K<br>Ω | 40K<br>Ω | 50K<br>Ω | 60K<br>Ω | 70K<br>Ω | 80K<br>Ω | 90K<br>Ω | 100K<br>Ω | open |
| I <sub>r</sub> | 0  | 10%      | 20%      | 30%      | 40%      | 50%      | 60%      | 70%      | 80%      | 90%      | 100%      | 100% |

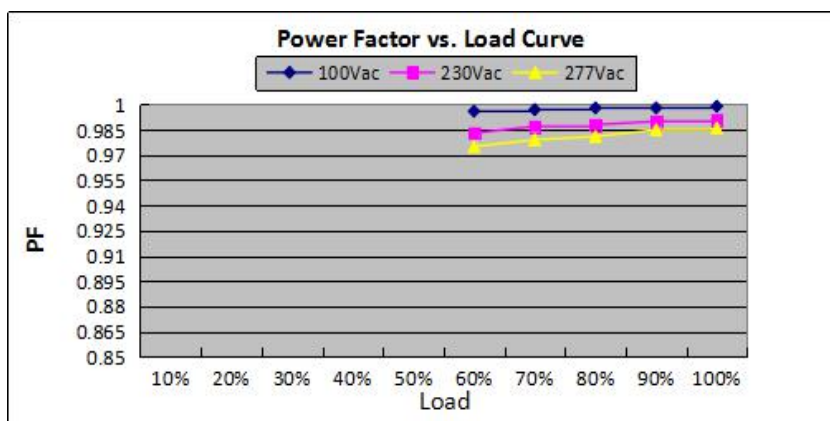
Note:

1. I<sub>r</sub> is the output current percentages. I<sub>r</sub> 为输出电流百分比
2. I<sub>r</sub> above is typical values. 以上 I<sub>r</sub> 均为典型值

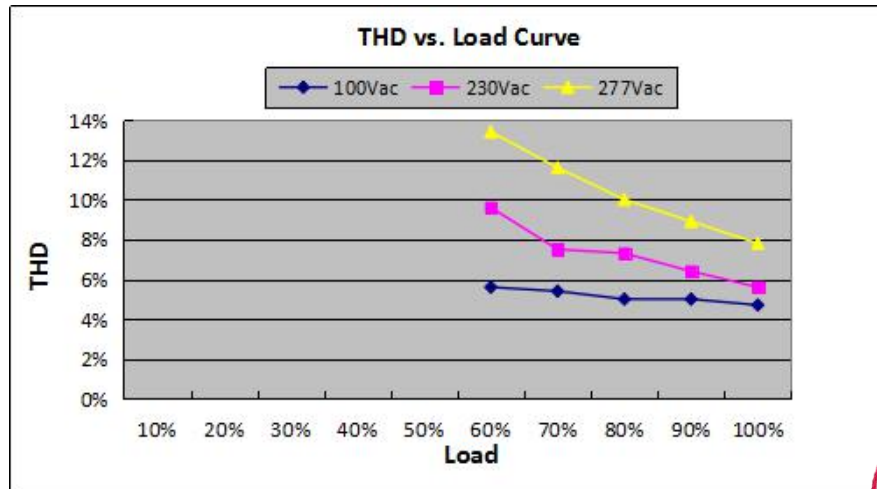
### Efficiency vs. Load 效率负载



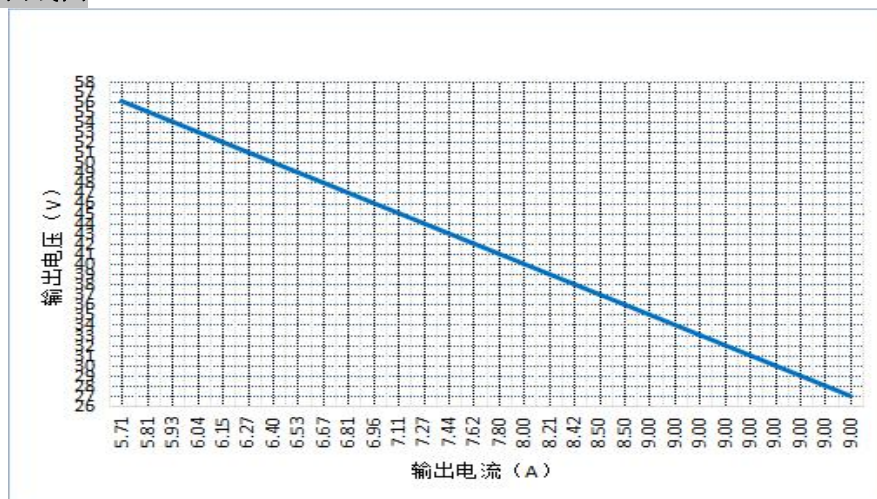
### Power Factor 功率因素



### THD vs. Load THD和负载



### Power Curve产品功率曲线图

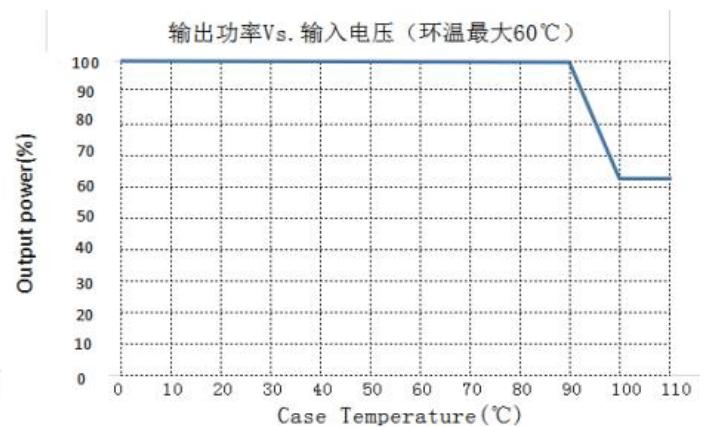
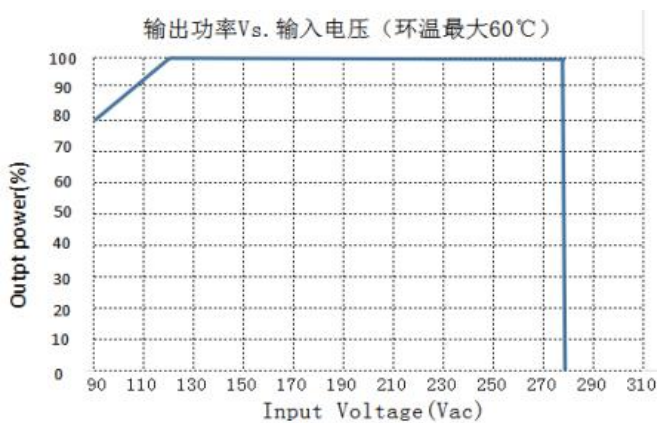


### 输出功率Vs.输入电压(环温最大60°C)

Output power VS Input voltage

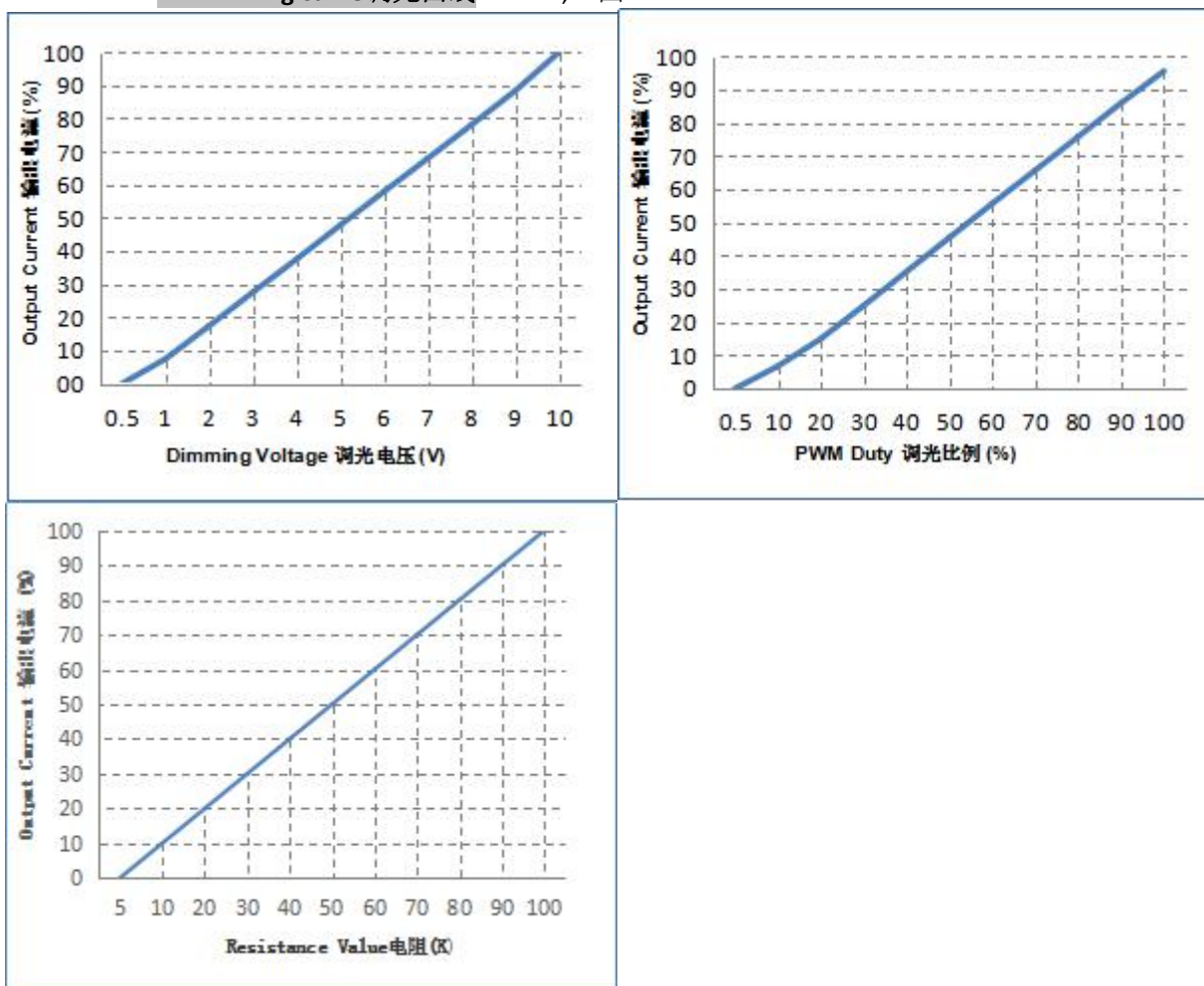
### 输出功率Vs.壳温

Output power VS Shell temperature



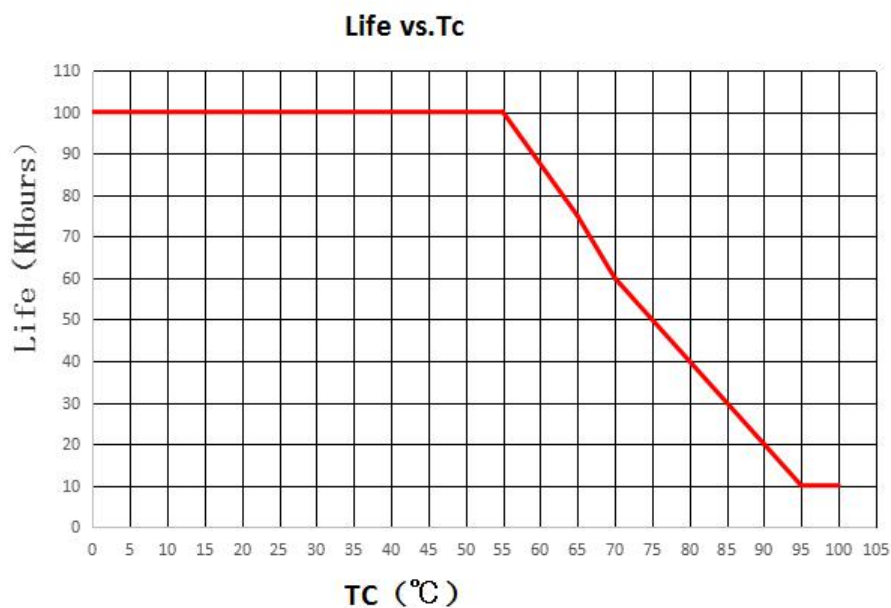
Dimming curve调光曲线

P4, 图 4

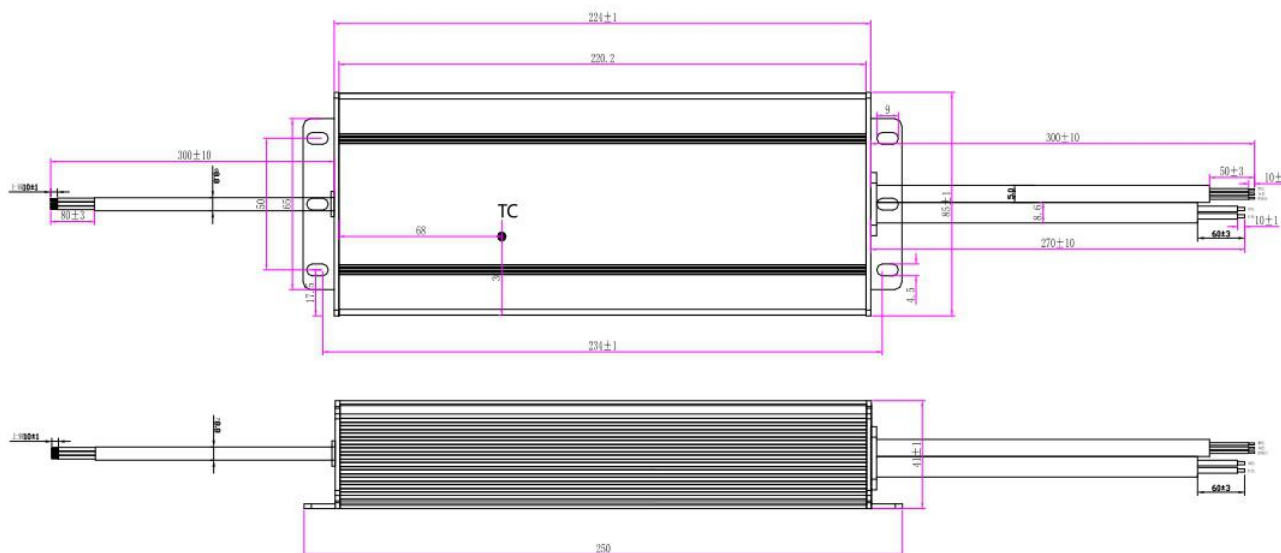


Life vs. Tc 寿命和温度

P5, 图 5



### Dimensional Drawing (unit: mm)尺寸



Input Wire UL 300V 18#, Black-L, White-N, Green-PE

Output Wire UL 300V 18#, Red\_LED+, Black\_LED-

Dimming Wire UL 300V 20#, Purple\_DIM+, Grey\_DIM-

Auxiliary Wire UL 300V 20#, Black\_+12V

输入线 美规 300V 18#, 黑L, 白N, 绿色PE

输出线 美规 300V 18#, 红LED+, 黑色LED-

调光线 美规 300V 20#, 紫色DIM+, 灰色DIM-

辅助源 美规 300V 20#, 黑滚白 +12V



### LABEL标签示例



### Installation considerations安装注意事项

1. If the power supply has adjustable external potentiometer, after adjust output current, suggest using 704 silicone sealing good the hole and plug waterproof rubber.

1. 若产品有外部可调电位器, 请在调整好电流之后, 建议用 704 硅胶将调整电流的孔密封好, 将防水胶塞盖好.

2. Lightning protection level to meeting IEC61000-4-5 standard requirement, if you use the

lightning occurs or the area of power grid environment is relatively complex, suggest in the power supply of the AC input terminal equipped with professional lightning protection module.

2. 电源的防雷等级满足 IEC61000-4-5 等各国的标准要求, 如果使用在雷电多发地区或电网环境相对复杂的地区, 建议在电源的AC 输入端加装专业的防雷模块。

### Package, Transportation & Storage 包装, 运输, 贮存

#### 1. Package 包装

a. package box outside dimension:  $L \times W \times H$  (unit: mm);

包装箱的外形尺寸为 (单位: mm): 长X宽X高;

b. product number in each box: PCS;

每箱产品的包装数量为 台;

c. whole box gross weight: kg;

整箱毛重 KG

#### 2. Transportation 运输

Packaging is designed suitable for transportation by truck, ship, and plane. The products should be shielded from sunshine, and loaded and unloaded carefully.

适用于车, 船, 飞机运输, 运输中应遮蓬, 防晒, 文明装卸。

#### 3. Storage 贮存

The product storage meet the standard of the GB 3873-83.

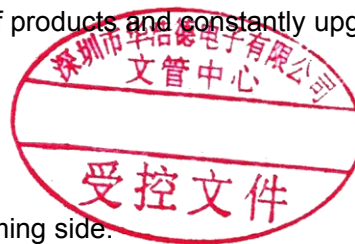
Product should be rechecked over 1 year.

产品贮存应符合GB3873-83 的规定。

贮存期限超过一年的产品要重新检验, 合格后方可使用。

### Disclaimer: :

The content of this manual is made according to the existing information of the product. Due to the product version upgrade or other reasons, the content of the manual may be changed. Our company reserves the right to improve the product without prior notice, and reserves the right of final explanation for the performance description of the company's products. Our company is committed to improving the quality of products and constantly upgrading and optimizing the products.



### Products Installation and Using should Note:

- Do not connect alternating current to DC output side and dimming side.
- Please adjust the current and plug the potentiometer hole with 704 silica gel.
- Do not adjust the potentiometer without permission, so as to avoid the influence of current change on power.
- Application do not exceed the power 320W.
- Do not use the Driver in parallel on the same lamp.
- This product is a constant current LED Driver, only suitable for LED lamps and lanterns.

### Safety and Attentions

In order to reduce the risk of personal injury, electric shock, fire, and power supply damage, please read the following specifications carefully and follow these rules to prevent danger.

- Do not install the Driver in the area with inflammable and explosive materials to avoid explosion and fire.
- Please do not disassemble the Driver and replace the components without permission, so as to avoid electric shock.

### 免责声明:

本手册内容根据产品现有信息制作，由于产品版本升级或其他原因，其内容有可能变更，本公司保留不作预先通知的情况下对产品进行改进的权利，对公司产品的性能说明保留最终解释权，本公司致力于改善产品的质量，不断对产品进行升级优化。

### 产品安装与使用注意事项

- 请勿将 AC 供电接入 DC 输出端口及调光端口。
- 请调好电流之后用 704 硅胶将电位器孔堵住。
- 请勿私自调节可调电位器，以免电流变化影响功率。
- 请勿超过电源标称功率 320W 使用。
- 请勿将电源并联使用在同一灯具上。
- 本产品为恒流 LED 电源，仅适用于 LED 灯具。



### 安全及注意事项

为了减少对人身伤害、电击、火的危险，以及电源的损坏，请仔细阅读以下规格，并遵守这些规则，以防危险。

- 请勿将电源安装在有易燃易爆物区域，以免引起爆炸及火灾。
- 请勿私自拆装电源、更换器件，以免触电。