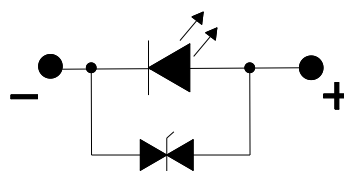
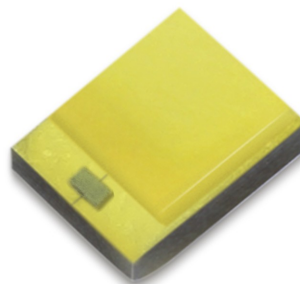


Product naming rules 产品命名规则

HL-C 2017 K9 W 3 C B (Ra1) -FC-LVR-CZ
1 2 3 4 5 6 7 8 9 10 11 12

- 1：鸿利光电代码
- 2：产品系列代码
- 3：尺寸代码
- 4：芯片代码
- 5：表示发光颜色为白光
- 6：表示建议使用的瓦数
- 7：模具代码
- 8：基板材质代码
- 9：显色指数
- 10：倒装工艺
- 11：齐纳代码
- 12：车载使用



ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
DISCHARGE
SENSITIVE
DEVICES

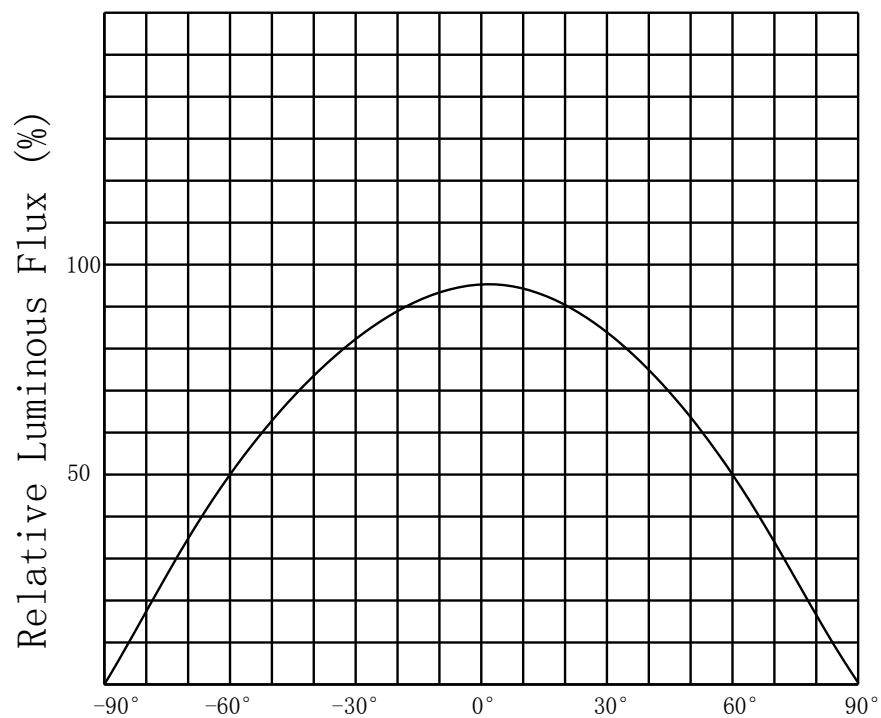
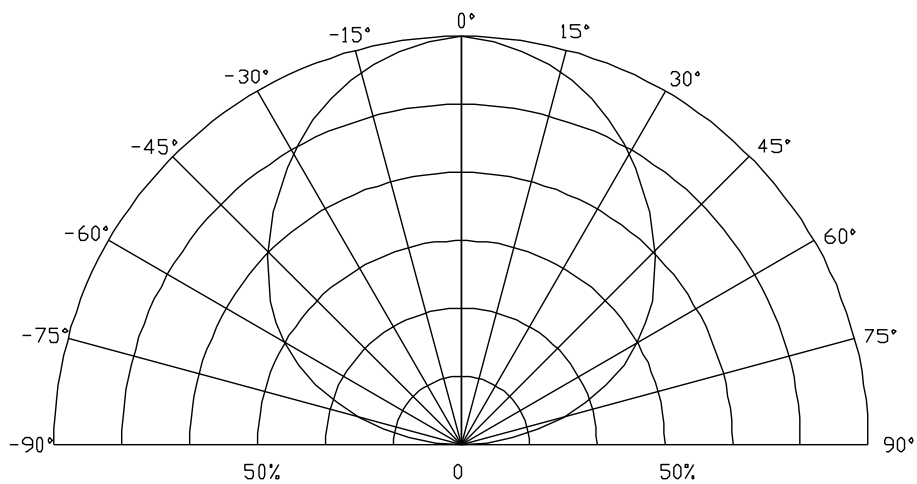
Features 特点

- Long operating life 寿命长
- High flux 光通量高
- Low voltage DC operated 低电压直流工作
- Cool beam, safe to the touch 冷光源，接触安全
- Instant light (less than 100ns) 瞬间点亮（小于100ns）
- No UV 无紫外线
- Flip Chip Technology 倒装芯片工艺
- RoHS compliant 符合RoHS标准
- Thermoelectric separation 热电分离
- Car use 车载使用

Application range 应用范围

- Headlight 车前大灯
- Signal light 转向灯

Radiation Pattern 辐射模式



Specifications规范

(1) Absolute Maximum Ratings at Ta=25°C

在25°C时绝对极限条件

Parameter参数	Symbol符号	Rating 值	Units单位
Input power 输入功率	Pi	5	W
Forward Current 正向电流	I _F	1500	mA
Reverse Current 反向漏电流	I _R	1@5V	uA
Junction Temperature 结温	Tj	145	°C
View Angle (FWHM)-White 发光角度	—	120	degrees
Operating Temperature Range 工作温度	Topr	-35°C To +100°C	
Storage Temperature Range 储藏温度	Tstg	-40°C To +85°C	
ESD Sensitivity (HBM) 抗静电能力	ESD	≤8KV	
Reverse voltage (反向电压)	Vr	not designed for reverse bias 不允许反向工作	

Notes注:

1.All high power emitter LED products mounted on aluminum metal-core printed circuit board, can be lighted directly, but we do not recommend lighting the high power products for more than 5 seconds without a appropriate heat dissipation equipment.

所有高功率的发光LED产品安装在铝金属为核心印刷电路板，可直接点亮，但我们不建议在没有一个适当的散热设备时,照明高功率LED点亮超过5秒。

2.Reflow soldering should not be done more than two times.The reflow temperature we recommend is 260°C,When the temperature exceeds 260°C, the product failure of LED can be caused

回流焊不能超过两次,回流焊最高温度建议260°C，当温度超过260°C极大可能引起LED产品失效.

3.The amplitude of the reverse voltage does not exceed 5V and the reverse current is less than 200uA.A maximum 5V reverse voltage for up to 10s is an acceptable beginning of life, one time, test.

产品加反向电压时不能超过5V，反向电流不能超过200uA,而且通最大的反向电压时不能超过10s,测试不能超过1次。

(2) Optical Characteristics at Ta=25°C

在Ta=25°C 时的典型光学特性

Center Tc (K)	Tc (K)	1000mA光通量			显色指数 (Ra)
		Min (lm)	Typ (lm)	Max (lm)	
2400	2270-2550	275	290	320	70
3465	3220-3710	300	330	360	
3985	3710-4260	330	365	400	
4650	4260-5028	330	365	400	
6020	5665-6530	330	365	400	
6530	6020-7040	330	365	400	
7040	6530-7560	330	365	400	
8210	7560-9000	320	355	390	
10000	8000-12000	300	330	360	

Notes 注意事项:

*1.the products after this specification refer to the parameters prevail, before the release of specification without refer to the above parameters.

此规格书发布日后生产的产品以上述参数为准，发布前生产的库存品不参考上述参数。

2.Tolerance of measurement of forward voltage±3%、Color-rendering index±2、luminous flux±5%

不同标准源测试存在仪器公差：正向电压公差为±3%、显指公差为±2、光通量公差为±5%。

(3) Optical Electrical /Thermal Characteristics at Ta=25°C

在Ta=25°C 时典型的电学/热学特性

IF (mA)	VF typ (V)	R (j-s) (°C/W)	Po (W)
350	2.8	—	0.98
700	2.94	—	2.06
1000	3.03	3.25	3.03

1.Products are tested and binned at a transient forward current(IF) with 700mA. With the use of different IF, it may probably cause differences in CCT & forward voltage. Generally, with the increase of IF, the CCT will be raised as well. Thermal resistance test according to our standard

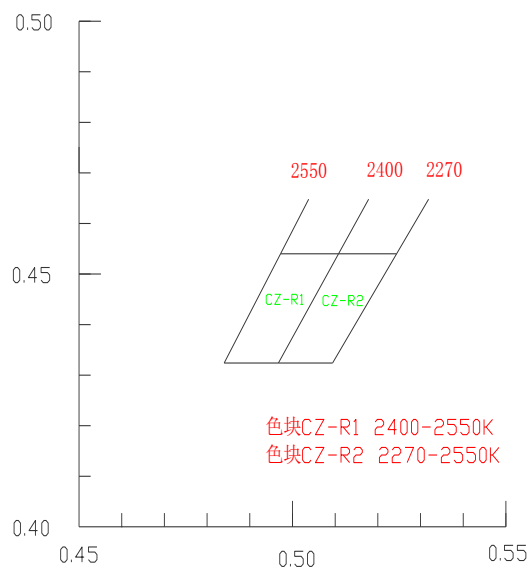
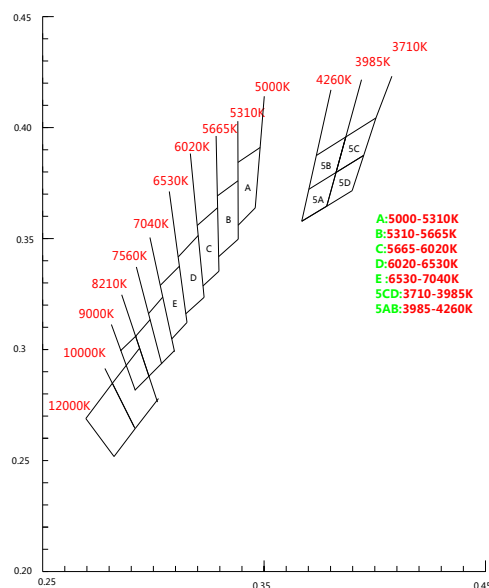
该产品通过瞬态1000mA 点亮，分光分色.若使用不同电流，可能会引起色温及电压的变化,一般情况下，使用电流增加，色温会上升，热阻测试根据我司标准测试。

Product bins 产品分级

(1) Forward Voltage bins 电压分级

Min (V)	Max (V)
2.6	2.8
2.8	3.0
3.0	3.2
3.2	3.4

(2) Chromaticity bins 色温分级



区块		2270-2400	2400-2550	3710-3985	3985-4260	5000-5310
坐标	左下	0.4967,0.4324	0.4840,0.4324	0.4005,0.4043	0.3869,0.3958	0.3383,0.3560
	左上	0.5094,0.4324	0.4967,0.4324	0.3898,0.3716	0.3783,0.3646	0.3382,0.3843
	右上	0.5244,0.4540	0.5108,0.4540	0.3783,0.3646	0.367,0.3578	0.3482,0.3910
	右下	0.5108,0.4540	0.4972,0.4540	0.3869,0.3958	0.3736,0.3874	0.3460,0.3638
区块		5310-5665	5665-6020	6020-6530	6530-7040	7040-7560
坐标	左下	0.3291,0.3418	0.3221,0.3267	0.3142,0.3197	0.3079,0.3058	0.3037,0.2937
	左上	0.3028,0.3304	0.3200,0.3550	0.3106,0.3461	0.3028,0.3304	0.2978,0.3162
	右上	0.3116,0.3392	0.3290,0.3636	0.3200,0.3550	0.3116,0.3392	0.3042,0.3236
	右下	0.3152,0.3123	0.3290,0.3329	0.3221,0.3267	0.3152,0.3123	0.3095,0.2994
区块		7560-8210	8210-9000	8000-10000	10000-12000	
坐标	左下	0.2980,0.2880	0.2918,0.2818	0.2938,0.3006	0.2815,0.2848	
	左上	0.2920,0.3060	0.2853,0.2996	0.3016,0.2771	0.2917,0.2644	
	右上	0.2984,0.3133	0.2920,0.3060	0.2917,0.2644	0.2822,0.2518	
	右下	0.3037,0.2937	0.2980,0.2880	0.2815,0.2848	0.2695,0.2689	

Notes 注:

*1.Products are tested and binned at a transient forward current(IF) with 700mA. With the use of different IF, it may probably cause differences in CCT & forward voltage. Generally, with the increase of IF, the CCT will be raised as well.

该产品通过瞬态1000mA 点亮，分光分色.若使用不同电流，可能会引起色温及电压的变化,一般情况下，使用电流增加，色温会上升。

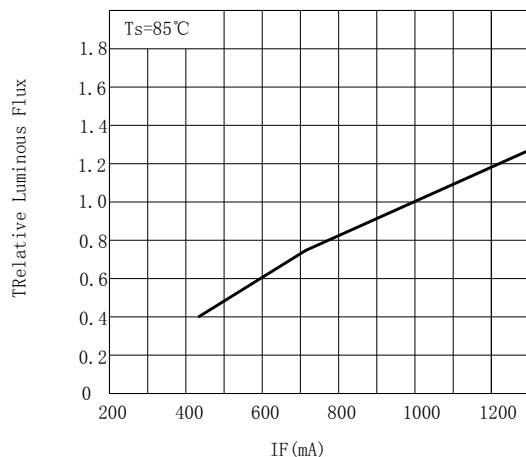
2. Tolerance of ± 0.005 on x,y coordinates.

色坐标的测量误差允许在 ± 0.005

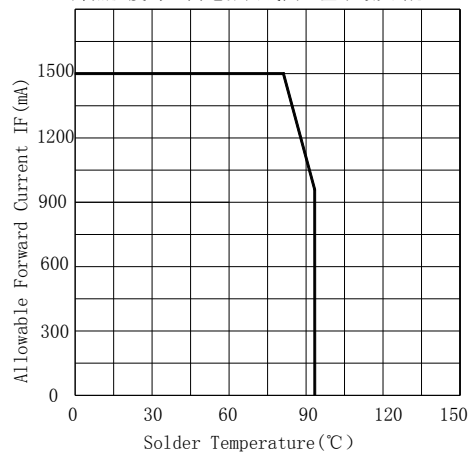
Typical Optical/Electrical Characteristics Curves ($T_s=85^\circ\text{C}$ Unless Otherwise Noted)

典型光学/电性特征曲线 ($T_s=85^\circ\text{C}$ 除非另有注释)

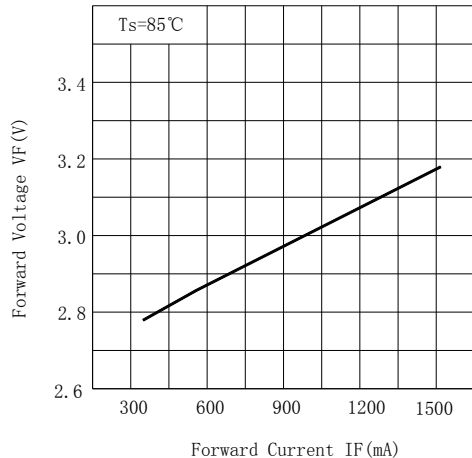
Relative Luminous Flux-IF
正向电流与相对光通量曲线图



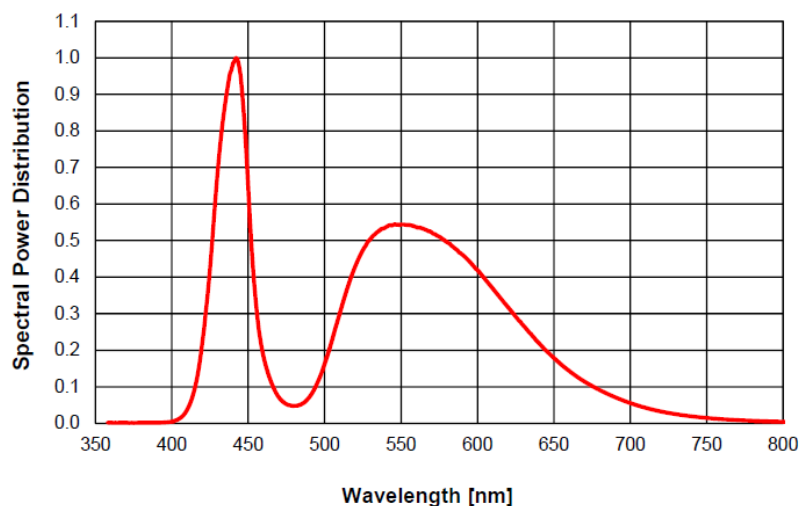
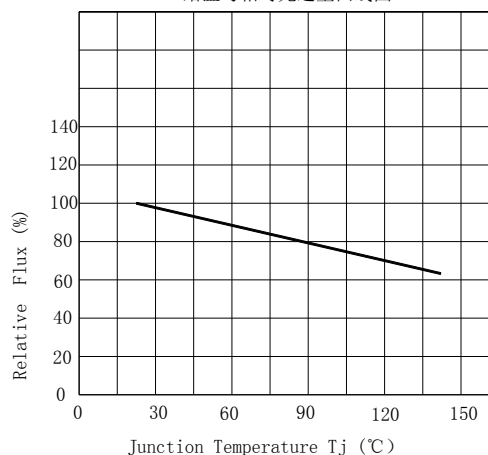
Relative Luminous Flux - Ts(based on Tj max 145°C)
焊点温度与正向电流曲线图 (基于最大结温145°C)



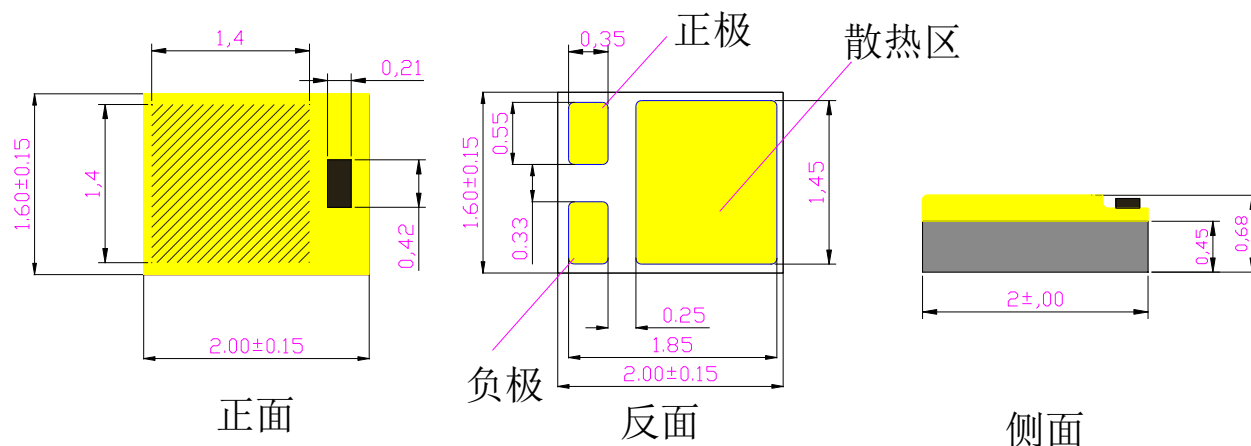
IF - VF
正向电流与正向电压曲线图



TJ - Relative Flux
结温与相对光通量曲线图



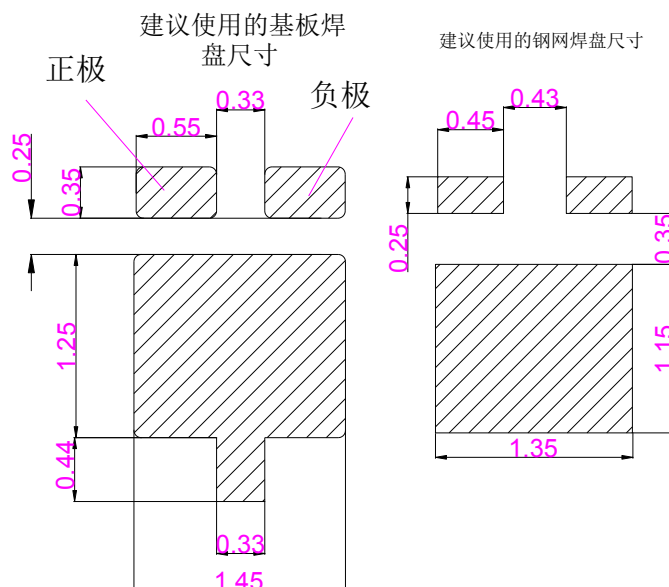
Package Dimensions 封装尺寸



Notes 注:

1. All dimension units are millimeters.
所有尺寸单位均为毫米.
2. All dimension tolerance is $\pm 0.15\text{mm}$ unless otherwise noted.
所有尺寸误差是 ± 0.15 毫米除非另有说明

Welded plate and steel mesh Dimensions 焊盘及钢网尺寸



Notes 注:

When the circuit configuration is not affected, suggested the increase in the middle of the copper area, or the connection between the middle and the pad and the negative electrode can improve the cooling performance of the product. It is recommended to use 0.1 mm thickness of steel mask.

在不影响电路配置时，建议增加中间焊盘覆铜区域，或中间焊盘和负极焊盘连接，能提高产品散热性能。

建议使用热电分离的铜基板作为散热基板。建议使用钢网厚度为0.1mm。

Label 标签

 HONGLITRONIC 鸿利光电		
TYPE:		QTY:
VF:	IF:	ϕV :
TC:	X/Y:	
SDCM<	Ra>	
DATE:	LOT.NO:	

 HONGLITRONIC 鸿利光电	成品标示卡 (Product Identity Card) 
品名 (Description):	
产品型号 (Type):	
发光颜色 (Color):	
数量 (QTY):	
生产批号 (LOT NO):	
出货日期 (Date):	
操作员 (Operator):	

Label on ESD shielding 静电袋上标签

Label on box 外箱标签

ϕV : Luminous Flux rank 光通量档次范围

VF: Forward voltage rank 正向电压档次范围

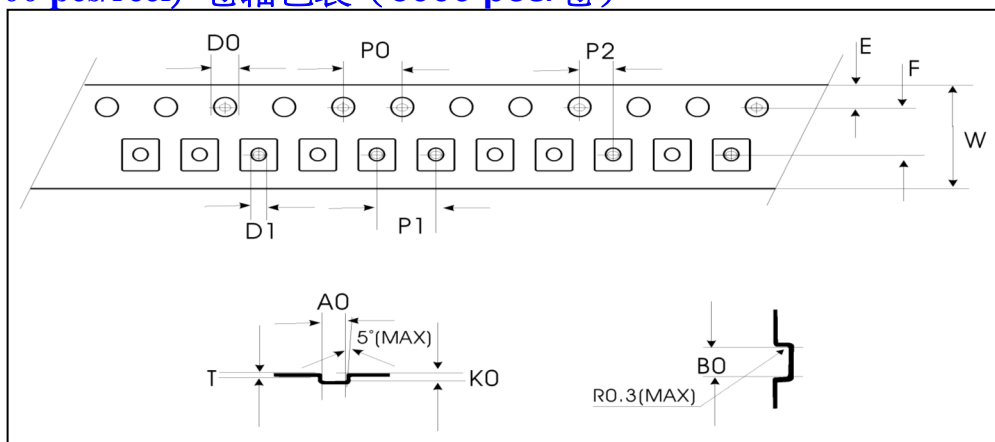
TC: Color temperature 色温

SDCM: 相对色容差

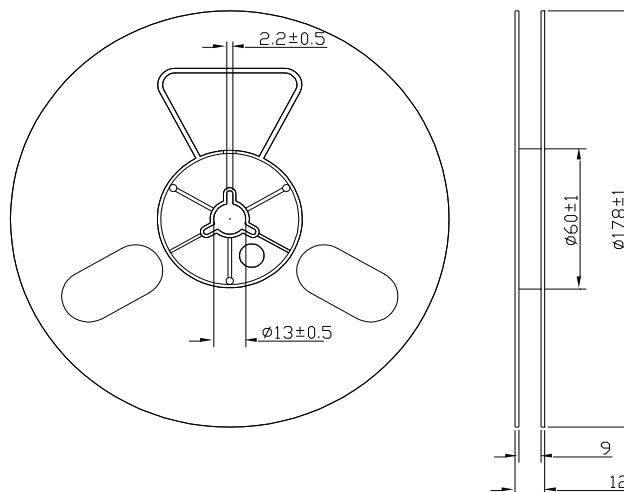
Tape Specifications(Units:mm)包装规格

(1)Reel package (5000 pcs/reel) 卷轴包装 (5000 pcs/卷)

AO	1.85± 0.1
BO	2.35± 0.1
KO	0.80± 0.1
PO	4.00± 0.1
P1	4.00± 0.1
P2	2.00± 0.05
T	0.25± 0.05
E	1.75± 0.1
F	3.50± 0.05
DO	1.55± 0.05
D1	1.0(MIN)
W	8.00± 0.1
10PO	40.00± 0.2



Reel Dimensions 卷轴尺寸

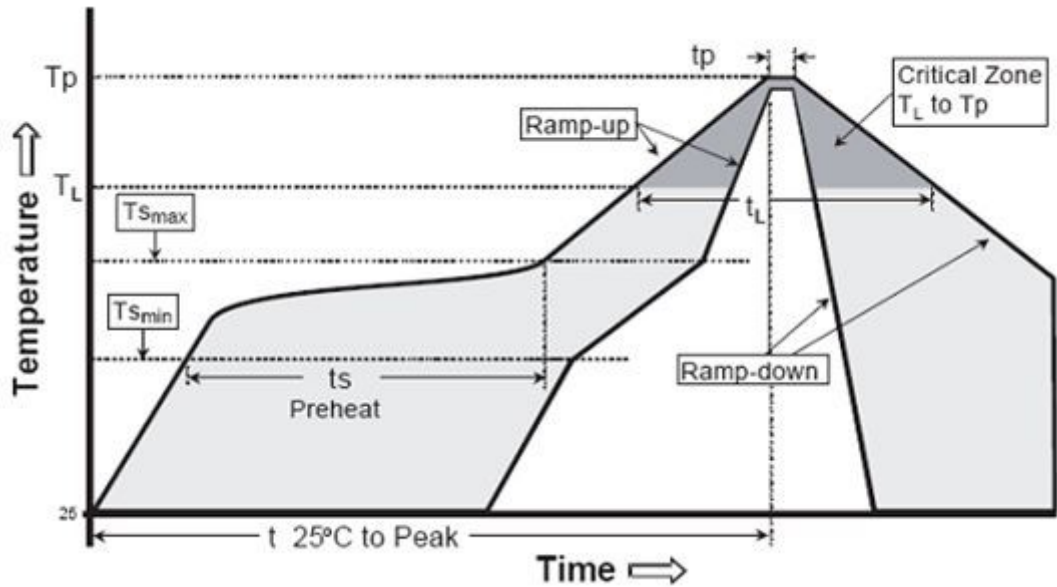


(2)Moisture resistant packaging 防潮包装





Reflow soldering instructions 回流焊说明



Profile Feature	Lead-Based solder	Lead-Free Solder
Average Ramp-Rate (Ts _{max} to Tp)	3°C/second max	3°C/second max
Preheat: Temperature Min (Ts _{min})	100°C	150°C
Preheat:Temperature Max (Ts _{max})	150°C	200°C
Preheat:Time(ts _{min} to ts _{max})	60-120 seconds	60-180 seconds
Time Maintained Above: Temperature(T _L)	183°C	217°C
Time Maintained Above: Time(t _L)	60-150 seconds	60-150 seconds
Peak/Classification Temperature(Tp)	215°C	260°C
Time Within 5°C of Actual Peak Temperature(tp)	10-15 seconds	20-40 seconds
Ramp-Down Rate	6°C/second max	6°C/second max
Time 25°C to Peak Temperature	6 minutes max	8 minutes max

- Note:
- 1.recommend to use a convection type reflow machine with 8 zones.
建议使用八温区回流焊机，参考曲线 145°C-165°C-185°C-210°C-220°C-240°C-260°C-240°C 运输速度 90cm/min。
 - 2.recommend to use Lead-Free Paste with a melting point between 210°C-220°C.For example M705。
建议使用熔点为210°C-220°C的无铅锡膏,建议使用千住 M705锡膏。
 - 3.the reflow soldering time should not be more than 400s.all temperature means the temperature measured on the surface of the package body
总的回流焊时间不要超过400s，所有温度均指在封装本体表面上测得的温度。。
 - 4.When using hot plate, the temperature is no more than 260 °C, the time is not more than 10 seconds.
当使用热板作业时，温度不超过260°C，时间不超过10秒。

Use the matters needing attention(使用注意事项)

一、储存(storage)：

为避免受潮的影响，我司建议产品在未开包装前储存条件为 5°C - 30°C ，相对湿度小于 60%；已开包装的 LED 光源请在 24H 内使用安装完毕，如未用完之产品，请进行除湿并抽真空后密封保存。开封超过一周或湿度卡发生变化时，请务必进行除湿，除湿条件： $60^{\circ}\text{C}\pm 5^{\circ}\text{C}$ ，12H；产品密封保存有效使用期为一年。

To avoid moisture, we recommend storage conditions for the unopened LED $+5^{\circ}\text{C}\sim +30^{\circ}\text{C}$, relative humidity $<60\%$. LED should be used within 24 Hrs. of opening the package. Please make sure to dehumidify and vacuum pack the remaining/ unused LED. Dehumidifying condition: $+60^{\circ}\text{C}\pm 5^{\circ}\text{C}$, 12Hrs. Effective age for the sealed led is one year.

二、组装注意事项(the assembly notes)：

焊接条件：此产品必须使用回流焊接的作业方式，回流曲线最高温度不可超过 260°C 。作业或存放过程中不可有 1000g 以上的外力或尖锐物体作用于灯珠表面（如压力，摩擦等外力以及钳子镊子等工具），以免造成元件损伤；如果超出此使用条件，鸿利光电将不能保证产品的稳定性，如需使用超出的操作条件，请务必进行风险评。

Soldering Conditions：This product must be used reflow soldering practices, the maximum temperature of reflow should not exceed 260°C . Please make sure when soldering, there is no external force on the soldering surface (such as pressure, friction or sharp metal nails, etc.), to avoid gold wire deformation or damage and other abnormalities. If beyond recommended conditions, we cannot guarantee the LED stability, please do the risk assessment first.

三、防静电措施(anti-Static Measures)：

请采取足够的措施来防止静电产生，比如带静电环或防静电手指套等；每个制造工程关于产品（工厂、设备、机器、载波机和运输单位）应当连接地面，避免产品电气带电。

Please take adequate measures to prevent electrostatic generation, such as wearing electrostatic ring or anti-static fingerstall etc; any relative products like plant equipment, machinery, carrier and transportation units shall be connected to discharging unit/ ground. After assembly, please make sure to discharge Static Electricity with proper ESD equipment.

四、温度控制(temperature Control)：

为确保在组装时降低接触热阻，请注意在组装过程中，散热片采用良好品质的导热膏涂布均匀且分布面积合理，不可出现太少或高低不平等现象。散热介质需保证电介质耐压测试至少通过 500V。

During assembly, please ensure that a good quality thermal paste is applied and distributed evenly over the surface. While using thermal pad (Heat Sink), make sure LED is firmly tightened and there is no gap between surfaces. The need to ensure the cooling medium dielectric withstand test at least through 500V.

五、驱动控制(drive control)：

本产品需使用恒流源进行驱动，且输出电流符合规格书上的功率使用范围，如需使用恒压源或其他使用条件，请进行使用效果风险评估。

Drive this product at constant current. Output current range specifications should be according to the operational and other conditions, as mentioned in data sheet. Before using a constant voltage source or altered specifications, other than recommended, please consider risk factors.

六、其他(other)：

本产品不可在以下条件下使用，如果产品在以下条件下使用，评估其使用效果和风险是有必要的：

- 直接或间接的打湿或受潮，比如淋雨等；
- 被海水损害或侵蚀；
- 被暴露于腐蚀性气体(如 Cl₂、H₂S、NH₃、SO_x、NO_x等)；
- 被暴露于粉尘、液体或油；
- 符合使用手册情况下，产品质保期为24个月，有保质协议的则以保质协议为准；

产品生命周期后进行回收处理。

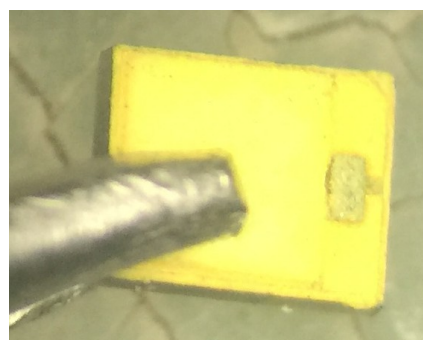
Product is not suitable to use in following conditions;

- Direct or indirect wet / damp conditions, such as rain, etc;
- in contact with sea water and erosive materials;
- Exposed to corrosive gases (e.g., Cl₂, H₂S, NH₃, SO_x, NO_x, etc.);
- Exposed to dust, liquids or oils;
- In accordance with the user manual, the product shelf life is 24 months, If there is a warranty agreement, the warranty agreement shall prevail;

After the produce life cycle for recycling



OK



NG

Reliability 可靠性测试

Test (测试项目)	Reference Standard(测试标准)	Test Conditions (测试条件)	Test Duration (测试时间)	Decision criteria (判定标准)	Units Failed/Tested (失败/测试数目)
Normal Temperature Operating Life (常温寿命)	JESD22 A-108	25°C 1500mA 1008H	168H/1008H	VF≤1.1VF (初始) 光通量维持率≥85%	0/15PCS
Temperature Humidity Operating Life (高温高湿寿命)	JESD22 A-101	85°C 85%RH 1500mA 1008H	168H/1008H	VF≤1.1VF (初始) 光通量维持率≥85%	0/15PCS
Temperature Cycle (温度循环)	JESD22 A-104	-40°C--100°C 30min/5min/30min 500cycle	100cy/500cycle	无死灯、无外观不良	0/15PCS

修订次数	修订人	修订内容	修订日期	版次
1	赵万宝	新建文件	2017. 10. 30	A/0
2	王芝烨	修改工作/储存温度、ESD值	2018. 03. 09	A/1
3	冯广春	新增3710-4260K光通量330-360-390lm	2019. 04. 01	A/1
4	赵明深	增加7040-10000-18000K规格	2019. 06. 18	A/1
5	梁依雯	修改产品尺寸公差为 $\pm 0.15\text{mm}$	2021. 10. 19	A/2
6	伍学海	1000mA亮度范围	2022. 01. 23	A/3
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				