



# 江西省晶能半导体有限公司

JiangXi LatticePower Semiconductor Corporation

## 产 品 规 格 书

### Specification

产品名称 Product Name: ASL1

产品型号 Product P/N: AA

客 户 Client name: \_\_\_\_\_

客户料号 Client P/N: \_\_\_\_\_

版 本 号 Version No.: A11

日 期 Sending Date: 2024.11.04

客户承认栏 Client Approval	
核准 Approval	确认 Audit

制定 Confirmation: \_\_\_\_\_ 审核 Approval: \_\_\_\_\_

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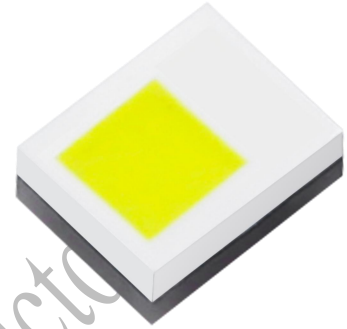


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## 1、特点 Features

- ◆ 陶瓷封装, 高亮度, 高可靠性,主要用于汽车应用  
Ceramic Substrate package , High brightness ,High reliability, It is mainly used in automobile applications
- ◆ 尺寸: 2.00mm\*1.60mm\*0.78mm  
Size: 2.00mm\*1.60mm\*0.78mm
- ◆ 根据白光标准分档  
According to standard white color gamut
- ◆ MSL 等级 2a  
MSL 2a
- ◆ 通过 AEC-Q102  
AEC-Q102 qualified
- ◆ 适于 SMT 贴片  
Compatible with SMT
- ◆ 发光角度: 120°  
Viewing Angle: 120°
- ◆ 包装: 最大 3000 颗/卷  
Package: Max: 3000pcs /reel
- ◆ 建议额定使用电流为 1.0A  
Recommended current 1.0A



## 2、应用 Applications

汽车照明 Automobile Lighting





### 3、性能 Performance

#### a) 极限参数 Maximum Ratings

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
最小正向电流 Min DC Forward Current	$I_F$	50	mA
最大正向电流 Max DC Forward Current	$I_F$	1200	mA
功率 Power Dissipation	P	3	W
峰值正向电流 Peak Forward Current	$I_{FP}$	2500	mA
最大反向电压 Maximum Reverse Current		不可施加反向电压 Do not apply for reverse current	
结温 (DC 模式) LED Junction Temperature (DC mode)	$T_j$	150	°C
工作温度 Operating Temperature Range	$T_{opr}$	-40~135	°C
存储温度 Storage Temperature	$T_{stg}$	-40~135	°C
ESD (人体模式) ESD Human Body Mode	----	8000	V

备注 Notes :

- ◇ 绝对最大额定值环境温度  $T_a=25^{\circ}\text{C}$   
Absolute Maximum Ratings at  $T_a=25^{\circ}\text{C}$
- ◇  $I_{FP}$  脉冲时间 $\leq 10\text{ms}$ , 宽度 $\leq 10\%$   
 $I_{FP}$  Conditions with pulse width  $\leq 10\text{ms}$  and duty cycle $\leq 10\%$

b) 光电参数 Electro-Optical Characteristics (T solder pad =25 °C, I<sub>F</sub> =1000mA)

项目 Item	符号 Symbol	最小值 Min.	典型值 Typ.	最大值 Max.	单位 Unit
光通量 Luminous Flux	Φ	340	435	500	Lm
正向电压 Forward Voltage	VF	2.75	3.20	3.50	V
色坐标 Chromaticity coordinates	X		0.323		
	Y		0.335		
显指 Ra	Ra	60	----	----	----
实际热阻 PN/焊点 Real Thermal Resistance (Junction to Solder point)	RthJS real		4.9	5.8	°C/W
电热阻 PN/焊点 Electrical Thermal Resistance (Junction to Solder point)	RthJS elec.		3	3.9	°C/W
发光角度 Viewing Angle	2θ		120		°
光电转换效率 Photoelectric conversion efficiency	η		42		%

## 备注 Notes :

- ◇ 晶能测试系统为远方，对比国际 IS 测试系统，光通量约高 4%；  
LatticePower Testing System Is everfine, Compared With International IS Testing System,  
The Luminous Flux Is About 4% Higher.
- ◇ 光通量测量误差范围±6%  
Luminous flux measurement tolerance: ±6%
- ◇ 光电参数测试是瞬态时间为 20ms  
Electric and optical data is tested at 20 ms pulse condition

c) 亮度分布特性 Luminous Flux Characteristics (T solder pad = 25 °C, I<sub>F</sub> =1000mA)

产品型号 Product	常规色温 Normal CCT	色区块 Chromaticity	最小光通量 Minimum Luminous Flux		出货代码 (例) Order Code (e. g.)
			代码 Code	亮度值 Value	
ASL1	5400~5850	CW	B21B	400	AA-B-CW-B22A-DD7
			B22A	420	
			B22B	440	
	5600~6100	CX	B21B	400	AA-B-CX-B22A-DD7
			B22A	420	
			B22B	440	
	5850~6350	CY	B21B	400	AA-B-CY-B22A-DD7
			B22A	420	
			B22B	440	
	6100~6650	CZ	B21B	400	AA-B-CZ-B22A-DD7
			B22A	420	
			B22B	440	


## 4、产品代码 Product Order Code

AA - B - CX - B22A - DD7

①                      ②                      ③                      ④                      ⑤


- ① 产品型号      Product Type (AA:ASL1)
- ② 显色指数      Ra level
- ③ 色温区块      Color Area
- ④ 亮度等级      Brightness Level
- ⑤ 电压等级      VF Level

### 出货标签(例) Shipping label (e.g.)




**LatticePower Corporation Limited**


Item: AA-B-CX-B22A-DD7 ASL1



MSL 2a      Reel ID: AAAC00000001



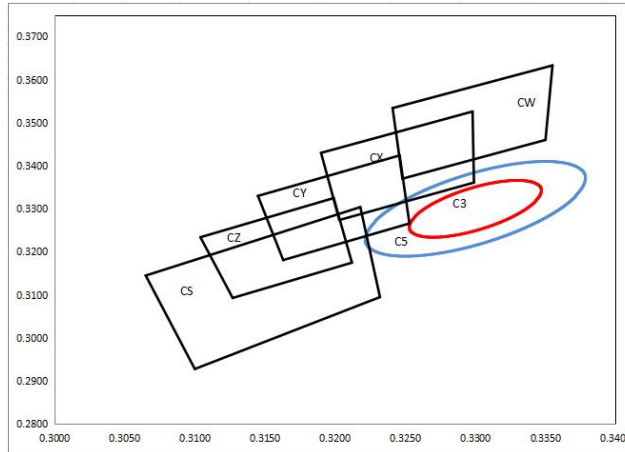
Qty: 3000      6AATCKCA



Date: 2024-11-04

## 5、分档规则 Bin Regulations

### a) 色度区域 Chromaticity Regions (T solder pad = 25°C, I<sub>F</sub> = 1000 mA)



CRI60	center		3-step (C3)		5-step (C5)		rotation (deg)
	x0	y0	major axis (a)	minor axis (b)	major axis (a)	minor axis (b)	
5700K	0.3300	0.3300	0.007455	0.003195	0.012425	0.005325	59.09

ASL Series Color Chromaticity Groups						
Color Bin	x	y	Color Bin	x	y	
CW 5400K~5850K	0.3241	0.3534	CY 5850K~6350K	0.3145	0.3330	
	0.3248	0.3370		0.3163	0.3181	
	0.3350	0.3460		0.3246	0.3424	
	0.3355	0.3633		0.3253	0.3266	
CX 5600K~6100K	0.3190	0.3430	CZ 6100K~6650K	0.3104	0.3234	
	0.3203	0.3274		0.3127	0.3093	
	0.3298	0.3526		0.3199	0.3325	
	0.3299	0.3361		0.3212	0.3175	
CX1 5600K~6100K	0.3190	0.3380	CS 6000K~7000K	0.3100	0.2928	
	0.3203	0.3274		0.3065	0.3145	
	0.3299	0.3361		0.3218	0.3304	
	0.3298	0.3450		0.3232	0.3095	

备注 Notes :

- ◇ 色度坐标 (x, y) 来自 CIE1931 色度图  
The chromaticity coordinates(x,y)is derived from the CIE 1931 chromaticity diagram
- ◇ PT86 测试设备用于光通量 (lm) 和 CIE1931 色度坐标 (x, y) 测试。  
PT86 is for the luminous flux(lm) and the CIE1931 chromaticity coordinates(x,y) testing.
- ◇ 色度坐标 (x, y) 存在±0.006 公差。  
The chromaticity coordinates(x,y) guarantee should be added ±0.006 tolerance.



b) 亮度分档 Luminous Flux Groups (T solder pad = 25°C, I<sub>F</sub> =1000 mA)

组合代码 Group Code	细分代码 Group Code	范围 Range
B20	B20	340~380
B21	B21A	380~400
	B21B	400~420
B22	B22A	420~440
	B22B	440~460
B23	B23A	460~480
	B23B	480~500

c) 电压分档 Voltage Groups (T solder pad = 25°C, I<sub>F</sub> =1000 mA)

代码 Group Code	范围 Range
DD6	2.75~3.00
DD7	3.00~3.25
DD8	3.25~3.50

c) 显指分档 Ra Groups (T solder pad = 25°C, I<sub>F</sub> =1000 mA)

代码 Group Code	范围 Range
B	60~100

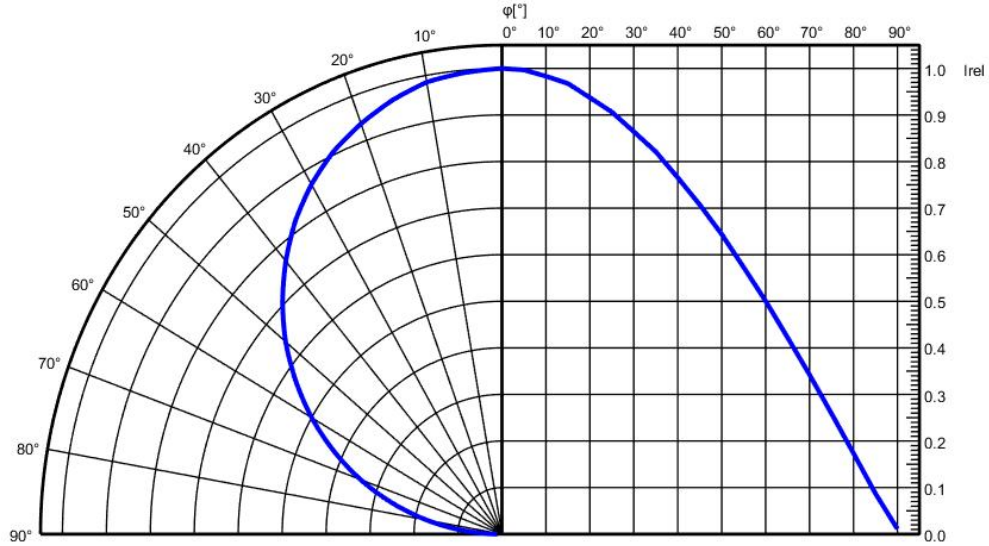
备注 Notes :

- ◇ 亮度测试存在±6%的公差  
It maintains a tolerance of ±6% on luminous flux measurements.
- ◇ 显指测试存在±2 的公差  
It maintains a tolerance of ±2 on CRI measurements

## 6、光电特性图 The Photoelectric Characteristics Graph

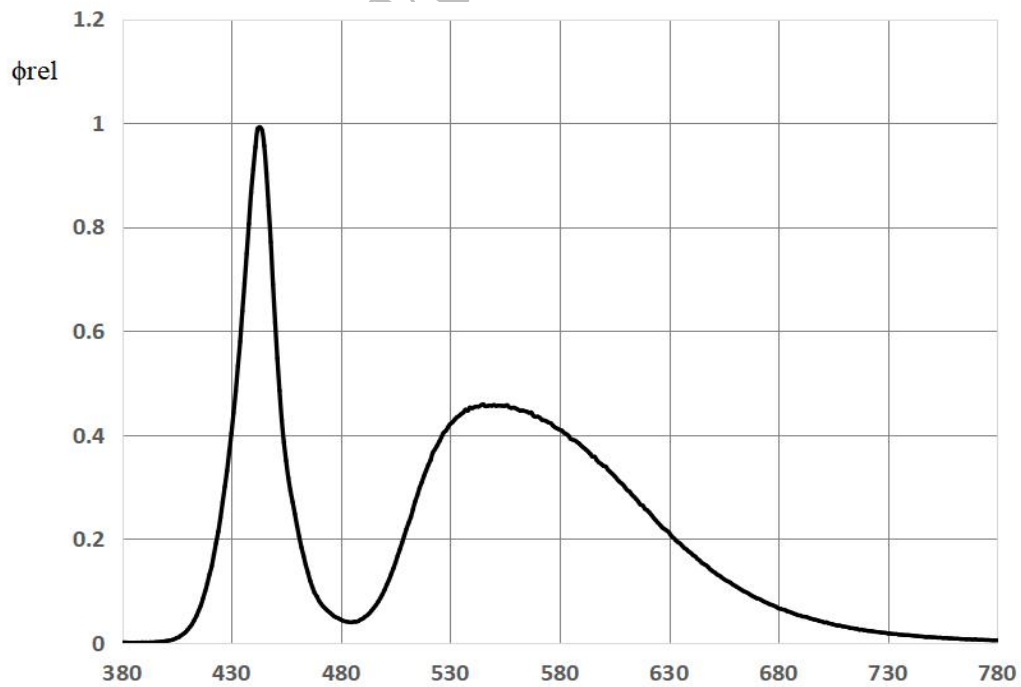
**Fig 1. 辐射特性 / Radiation Characteristics**

IF=1000mA; TS = 25°C



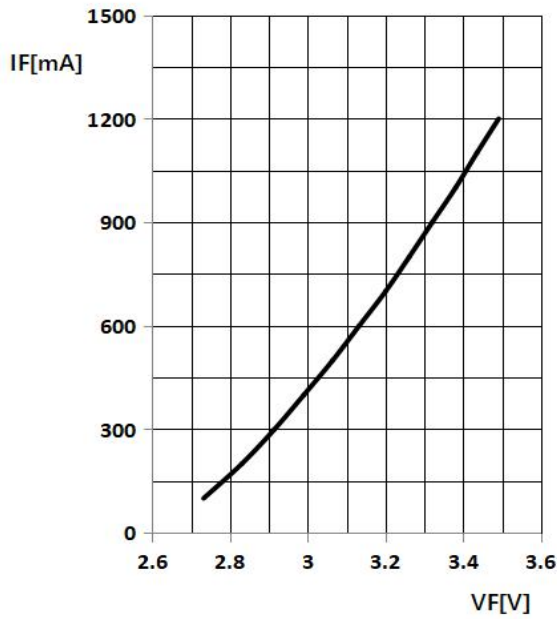
**Fig 2. 相对发光光谱 / Relative Spectral Power Distribution vs. Wavelength**

IF=1000mA; TS = 25°C



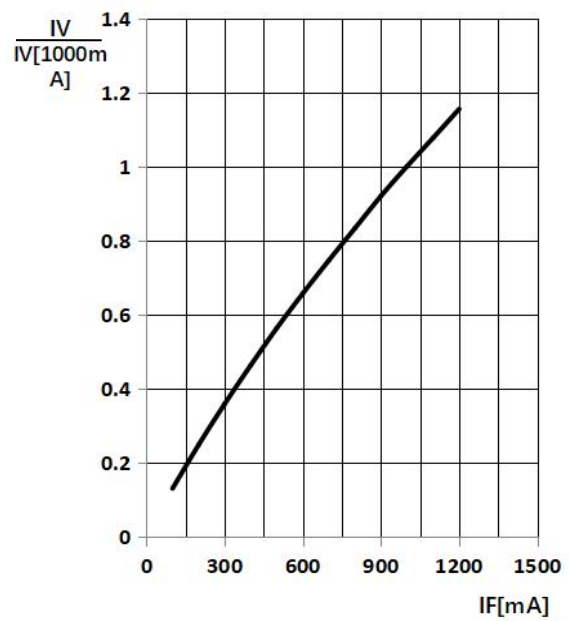
**Fig 3. 正向电流/Forward Voltage**

$I_F = f(V_F)$ ;  $TS = 25^\circ C$



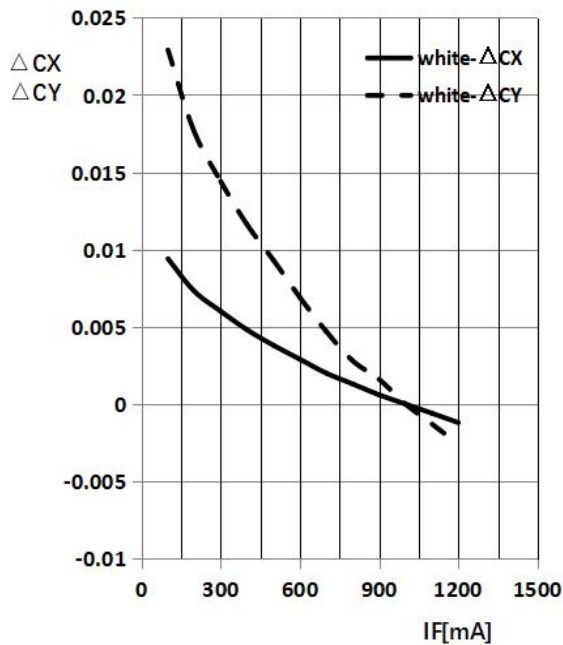
**Fig 4. 相对发光强度/Relative Luminous Intensity**

$I_v / I_v(1000 \text{ mA}) = f(I_F)$ ;  $TS = 25^\circ C$



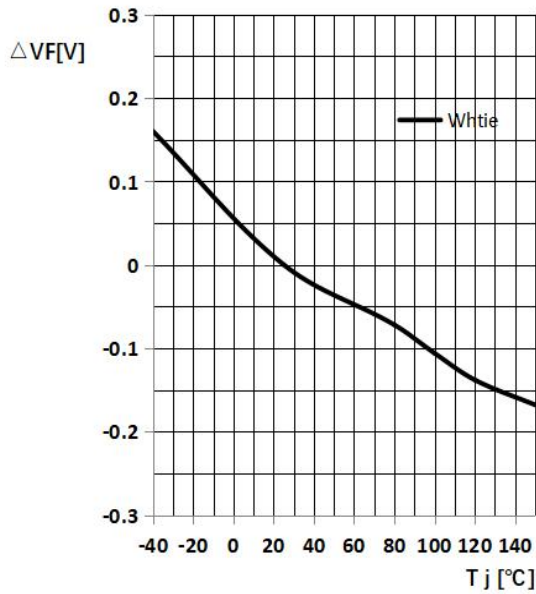
**Fig 5. 色坐标偏移/Chromaticity Coordinate Shift**

$\Delta C_x, \Delta C_y = f(I_F)$ ;  $TS = 25^\circ C$



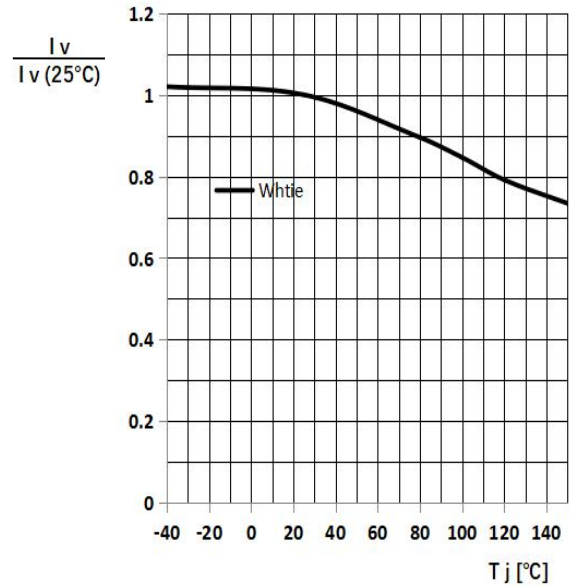
**Fig 6. 正向电压/Forward Voltage**

$$\Delta VF = VF - VF(25^\circ\text{C}) = f(T_j); I_F = 1000\text{mA}$$



**Fig 7. 相对发光强度 Relative Luminous Flux**

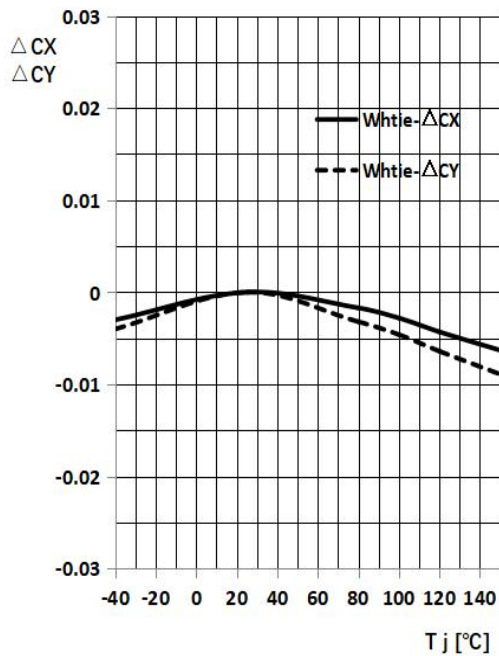
$$I_v / I_v(25^\circ\text{C}) = f(T_j); I_F = 1000\text{mA}$$



**Fig 8. 色坐标偏移/**

**Chromaticity Coordinate Shift**

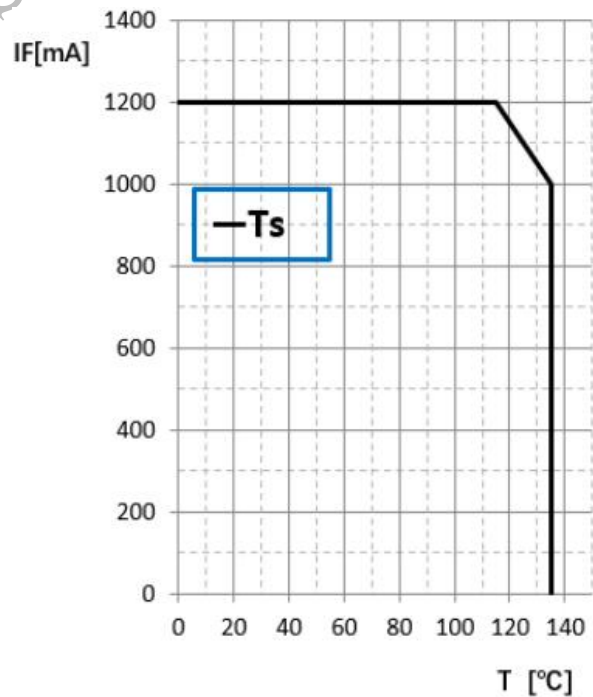
$$\Delta C_x, \Delta C_y = f(I_F); T_S = 25^\circ\text{C}$$



**Fig 9. 最大正向电流/**

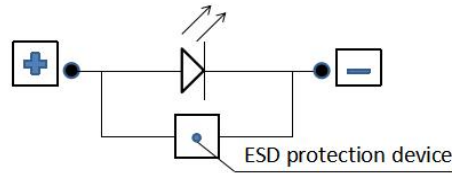
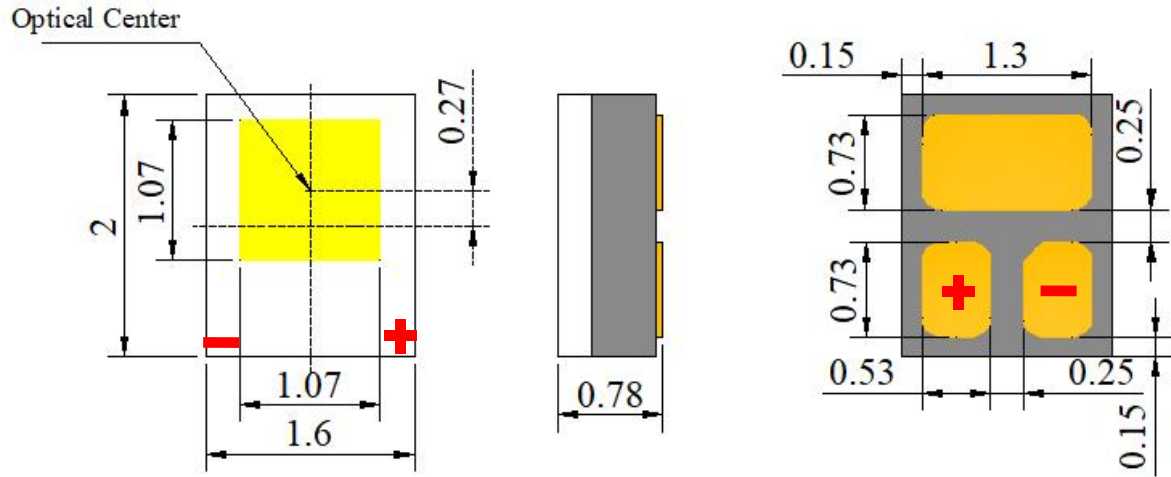
**Max. Permissible Forward Current**

$$I_F = f(T)$$

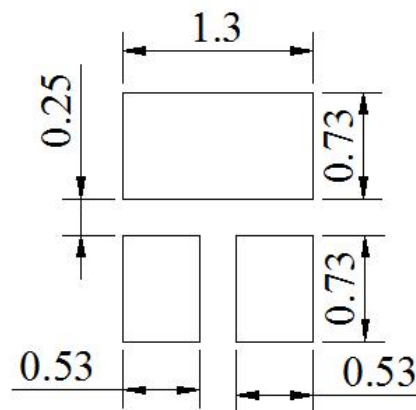


## 7、产品及钢网尺寸 Product and PCB Pad Dimensions

### a) 产品尺寸 Product Dimensions:



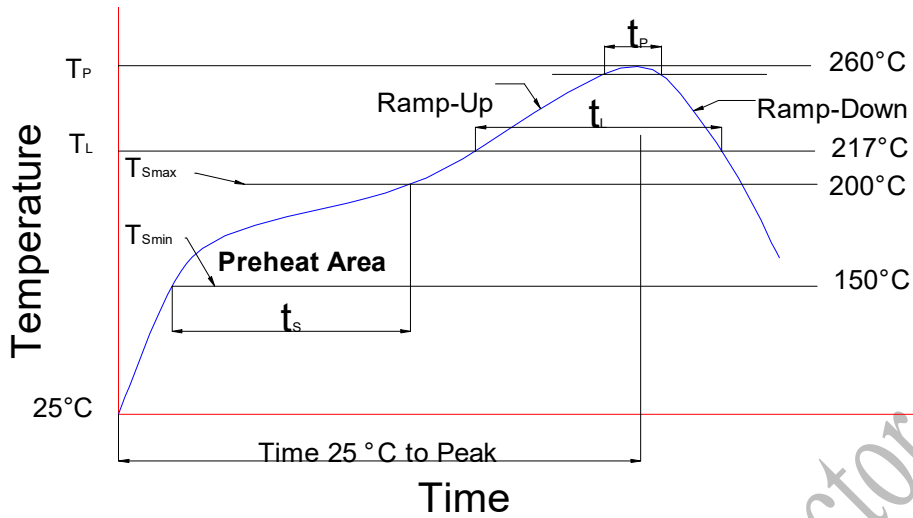
### b) 推荐焊盘尺寸 PCB Pad Dimensions



#### 备注 Notes:

- ◇ 所有尺寸均以 mm 为单位  
All dimensions are in millimeters
- ◇ 尺寸未按照公差±0.1mm 标记的, 按照图纸标记  
Size is not marked in accordance with tolerance ±0.1mm and dimension tolerances in accordance with drawings
- ◇ 灯珠近似重量: 8.1mg  
Approximate Weight: 8.1mg

## 8、回流焊特性 Reflow Soldering Characteristics

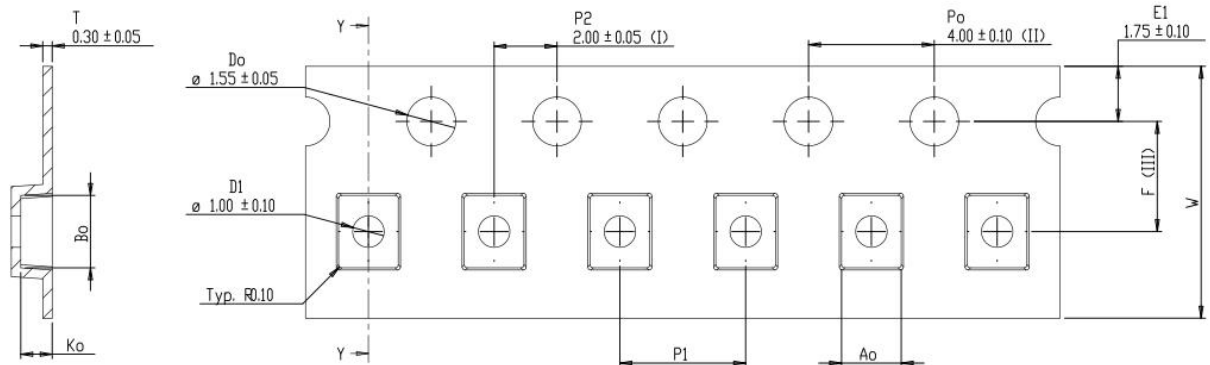


根据 EDEC-J-STD-020E 内容，参考以下内容。

Compatible with the JEDEC-J-STD-020E, using the parameters listed below.

特制参数 Profile Feature	无铅焊料 Lead-Free Solder
平均上升速率 (T <sub>Smax</sub> 至 T <sub>p</sub> ) Average Ramp-Up Rate (T <sub>Smax</sub> to T <sub>p</sub> )	3 °C/sec max.
预热: 温度最小值 (T <sub>Smin</sub> ) Preheat: Temperature Min (T <sub>Smin</sub> )	150
预热: 最高温度 (T <sub>Smax</sub> ) Preheat: Temperature Max (T <sub>Smax</sub> )	200
预热: 时间 (t <sub>Smin</sub> 到 t <sub>Smax</sub> ) Preheat: Time (t <sub>Smin</sub> to t <sub>Smax</sub> )	60-180 secs
回流温度 (T <sub>L</sub> ) Time Maintained Above: Temperature (T <sub>L</sub> )	217°C
回流时间 (t <sub>L</sub> ) Time Maintained Above: Time (t <sub>L</sub> )	60-150 secs
峰值/分类温度 (T <sub>p</sub> ) Peak/Classification Temperature (T <sub>p</sub> )	255 ± 5°C
实际峰值温度 (t <sub>p</sub> ) 在 5°C 以内的时间 Time Within 5°C of Actual Peak Temperature (t <sub>p</sub> )	20~40 secs
降低速率 Ramp-Down Rate	4°C/sec max.

## 9、卷轴 Reel Dimensions



Ao	1.90	+/- 0.05
Bo	2.30	+/- 0.05
Ko	1.00	+/- 0.10
F	3.50	+/- 0.05
P1	4.00	+/- 0.10
W	8.00	+0.30/-0.10

备注 Notes:

- ◇ 卷轴包装 3000pcs  
Reel:3000pcs.
- ◇ 卷轴包装方法符合 IJSC0806 (连续胶带上的电子元件包装)  
The tape packing method complies with IJSC0806(Packing of Electronic Components on Continuous Tapes).
- ◇ 当卷轴由于工作中断而重绕时, 载带上压力不应超过 10N, 否则 LED 可能会粘在盖带上  
When the tape is rewound due to work interruptions, no more than 10N should be applied to the embossed carrier tape.  
The LEDs may stick to the cover tape.



## 10、可靠性 Reliability

### a) 测试和结果 Tests and Results

测试项目 Test Item	标准 Reference Standard	测试条件 Test Conditions	测试周期 Test Duration
回流焊 Solderability(Reflow Soldering)	JESD22-B102	Tsld=255±5°C,5sec,Lead-free Solder (Sn-3.0Ag-0.5Cu)	3 times
高低温循环 Temperature Cycle	JESD22-L105	I <sub>F</sub> =1000mA , -40°C(30min)~85°C (30min)	200cycles
冷热冲击 Thermal Shock	JESD22-L106	-40°C(15min)~125°C(15min)	200cycles
低温存储 Low Temperature Storage	JESD22-L119	T <sub>A</sub> =-40°C	1000H
高温老化 High Temperature Operating Life	JESD22-L108	T <sub>j</sub> =150°C, I <sub>F</sub> =1200mA	1000H
高温高湿 Temperature Humidity Operating Life	JESD22- L101	T <sub>a</sub> =85°C, RH=85%, I <sub>F</sub> =1000mA	1000H
间歇性点亮测试 Intermittent operation life	MIL-STD-750	T <sub>a</sub> =80°C, I <sub>F</sub> =1000mA ,2min On/4 min Off,	10000 cycles
震动 Vibration	JESD22-B103	10m/s <sup>2</sup> ,100~20000~100Hz,4cycles,4min, each X,Y,Z	3 times
静电放电测试 Electrostatic Discharge Test	JESD22-L114/L115	Human body model :8000 V Mechanical mode:400V (forward and reverse current conduct electricity, each 1 time)	

### b) 失效标准 Failure Criteria

Criteria #	Items	Conditions	Failure Criteria
#1	Forward Voltage (V <sub>F</sub> )	I <sub>F</sub>	> Initial value×1.1 or < Initial value×0.9
	Luminous Flux (Φ <sub>v</sub> )	I <sub>F</sub>	< Initial value×0.7



## 11、注意事项 Cautions

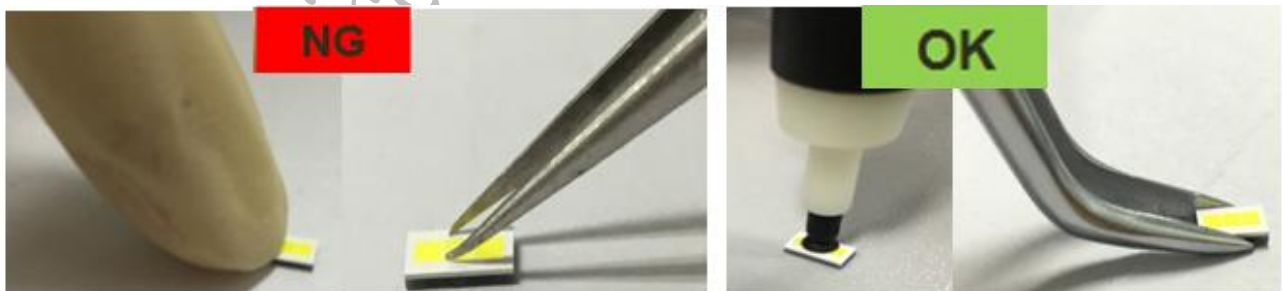
### a) 存储 Storage

- 不要将芯片放在潮湿的地方，存放温度在 5°C~30°C 之间，相对湿度在 30% 以下。  
Do not place the chips in damp places, Storage temperature between 5 °C and 30 °C, Relative humidity under 30%.
- 开包后建议在 24 小时内过完回流焊，车间条件 ≤30°C/60%RH。  
After opening the package, it is recommended to finish the reflow within 24 hours. The workshop conditions are ≤30°C/60%RH
- 如果受潮，需将贴片卷盘放入 60°C 烤箱烘烤 24 小时；打开后，LED 灯可重新密封在原始真空袋中。  
If it is wet, the patch reel should be baked in a 60 ° C oven for 24 hours; after opening, the LED light can be resealed in the original vacuum bag.
- 不要接触任何未知的液体，特别是丙酮。  
Don't touch any unknown liquid, In particular, acetone.
- 防止静电死亡，手动操作需要戴橡胶手套并佩戴静电环。  
Prevent electrostatic killed, Manual operation is required to wear rubber gloves and wear electrostatic ring.

### b) 清洗 Cleaning

- 通常，LED 不建议对部件进行湿式清洁处理，因为封装不是密封的。  
In general, LED does not recommend a wet cleaning process for component as the package is not hermetically sealed.
- 由于采用开放式设计，所有类型的清洁液都可能渗透到封装中，导致 LED 退化或完全失效。  
Due to the open design, all kind of cleaning liquids can infiltrate the package and cause a degradation or a complete failure of the LED.

### c) 操作注意 Handling Precautions



- 在处理过程中，还应注意确保组件顶面没有压力。  
During the handling, care should be taken as well to ensure no pressure on the top surface of component.
- 应避免使用所有类型的尖锐物体（例如镊子，指甲等），以防止对硅树脂造成压力，因为这会导致部件损坏。  
All types of sharp objects(e.g. forceps, fingernail, etc) should be avoided in order to prevent stress to the silicone, since this can lead to damage of the component.



## 12、文件履历表 Document Resume

序号	变更日期	变更人	版本	变更内容
01	2020.11.23	袁丁	Y00	1.新制定;
02	2020.12.23	李雄斌	Y01	1.新增 5E 色区相关参数;
03	2021.05.25	李雄斌	A01	1.尺寸标注方式变更;
04	2021.09.25	李雄斌	A02	1.图标错误修改;
05	2023.03.27	袁丁	A03	1. 晶能 logo 更新; 2. 新增琥珀色亮度 T5 (260-280), 删除低亮度 T1 (180-200);
06	2023.07.25	袁丁	A04	1.更新公司标签抬头;
07	2023.09.25	袁丁	A05	1. 更新参数;
08	2024.03.07	李俊杰	A06	1. 新增 CX1、5F 色区; 2. 新增 LED 质量信息;
09	2024.04.02	袁丁	A07	1.新增产品湿敏等级信息;
10	2024.06.11	袁丁	A08	1.新增 CS 色区块;
11	2024.08.26	李俊杰	A09	1. 新增光电转换效率 2. 新增晶能与国际测试系统光通量差异说明
12	2024.09.02	袁丁	A10	1. 新增椭圆色区块 C3 和 C5; 2. 删除琥珀色信息;
13	2024.11.04	袁丁	A10	1.对亮度档位进行细分, 如 B21 拆分为 B21A 和 B21B;