Part No：SEL-2835-RC-2V060



Applications/应 用：

★ Automotive lighting

汽车照明

★ Industrial Lighting

工业照明

Features/特 征:

★ Package：PLCC2 package

封装：PLCC2 封装

★ Emitting Color：Red

发光颜色：红色

★ Device Outline:3.5×2.8×0.8(mm)

外形特征：3.5×2.8×0.8 (mm)

★ Viewing Angle:120°

发光指向角：120°

★ HBM ESD:2000V

人体抗静电指标：2000V

★ MSL:3

湿气敏感性等级：3

★ Compliance with RoHS and REACH

符合 RoHS 和 REACH 标准

★ Pb-Free

无铅

1、Absolute maximum ratings/极限参数：

Parameter 参数	Symbol 符号	Value 参数	Unit 单位
Power Dissipation 损耗功率	P_d	150	mW
Forward Current 正向工作电流	I_{Fm}	60	mA
Surge Current 正向峰值电流 (t<=10 μs; D=0.005; T_S=25 ℃)	I_{Fs}	100	mA
Reverse Voltage 反向电压 (T_S=25 ℃)	V_R	5	V
Operating Temperature 工作温度范围	T_{opr}	- 40 ~ +85	℃
Storage Temperature 储存温度范围	T_{str}	- 40 ~ +100	℃
Junction Temperature 结温	T_j	115	℃
HBM ESD 人体抗静电指标	V_{ESD}	2	KV

2、Electrical and optical characteristics/光电参数（T_S = 25℃）：

Parameter 参数		Symbol 符号	Test Condition 测试条件	Value 参数 Min.	Typ.	Max.	Unit 单位
Forward Current 正向工作电流		I_{Fm}	——	5	60	60	mA
Reverse Current 反向电流		IR	VR = 5V	——	2	10	μA
Forward Voltage 正向电压		VF	IF = 60mA	1.8	2.1	2.5	V
Luminous Intensity 发光强度		IV	IF = 60mA	2.1	——	3.0	cd
Dominant Wavelength 主波长		λ_{dom}	IF = 60mA	618	——	627	nm
Spectral Bandwidth at 50% $I_{rel,max}$ 光谱带宽, 50% $I_{rel,max}$		$\Delta\lambda$	IF = 60mA	——	20	——	nm
Viewing Angle 发光指向角		2θ1/2	IF = 60mA	——	120	——	Deg.
Thermal Resistance (Junction to Solder) 热阻 (PN 结/焊点)	Real 实测	$R_{th\ JS\ real}$	IF = 60mA	——	——	35	K/W
	Electrical 电热阻	$R_{th\ JS\ el}$	IF = 60mA	——	——	30	

Notes/备注：Error/误差： VF：±0.10V， IV：±8%，Other/其它：±5%

3、Product Ranks/产品分档范围:

Brightness Grading / 亮度分档（cd）

(Ta=25℃; IF=60mA)

Rank	Luminous Intensity 发光强度 (min)	Luminous Intensity 发光强度 (max)
V1	2.1	2.6
V2	2.6	3.0

Notes/备注：Brightness error/亮度误差：±8%

Voltage Grading / 电压分档（V）

(Ta=25℃; IF=60mA)

Rank	Voltage 电压 (min)	Voltage 电压 (max)
C	1.8	1.9
D	1.9	2.0
E	2.0	2.1
F	2.1	2.2
G	2.2	2.3
H	2.3	2.4
J	2.4	2.5

Notes/备注：Voltage error/电压误差：±0.10V

Wavelength Grading / 波长分档（nm）

(Ta=25℃; IF=60mA)

Rank	Dominant Wavelength 主波长 (min)	Dominant Wavelength 主波长 (max)
R1	618	621
R2	621	624
R3	624	627

Notes/备注：Wavelength error/波长误差：±1nm

4、Characteristics Graph/特性曲线：

Fig.1 Relative spectral curve

相对光谱曲线

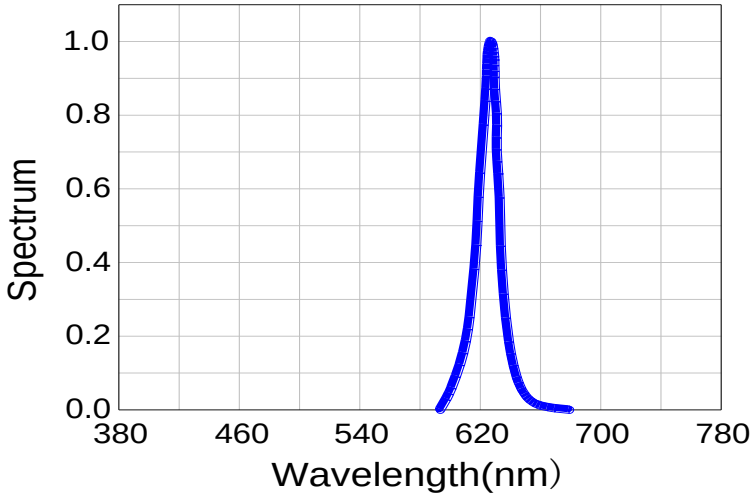


Fig.2 Radiation Characteristic

辐射特性

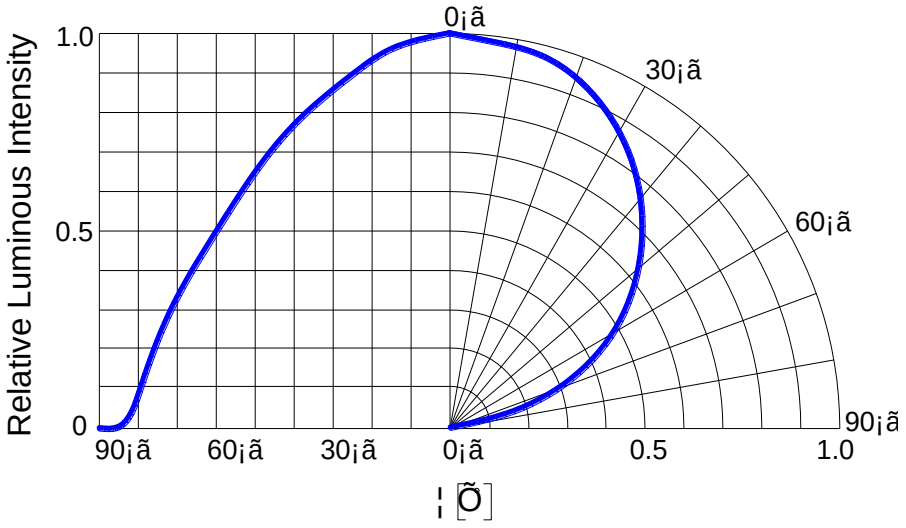


Fig.3 Forward Current vs. Forward Voltage

正向电流 Vs. 正向电压

$I_F=f(V_F)$; T_S=25°C

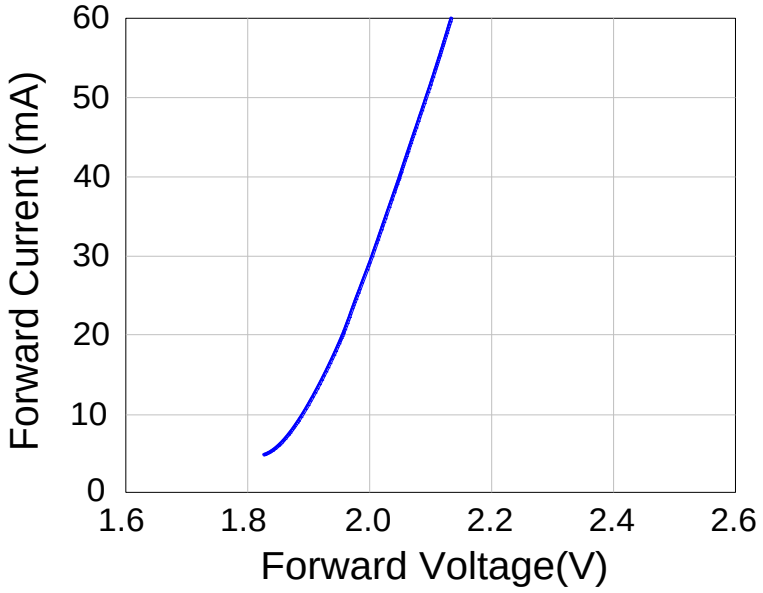


Fig.4 Relative Luminous Intensity vs. Forward Current

相对发光强度 Vs. 正向电流

Iv / Iv (60mA)=f(IF);T_S=25°C

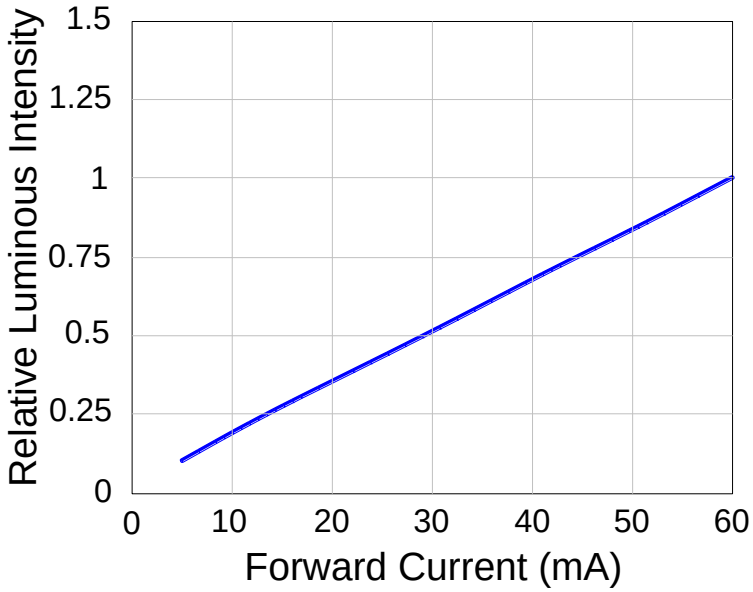


Fig.5 Dominant Wavelength vs. Forward Current

主波长 Vs. 正向电流

$\lambda_d = f(I_F); T_S=25°C$

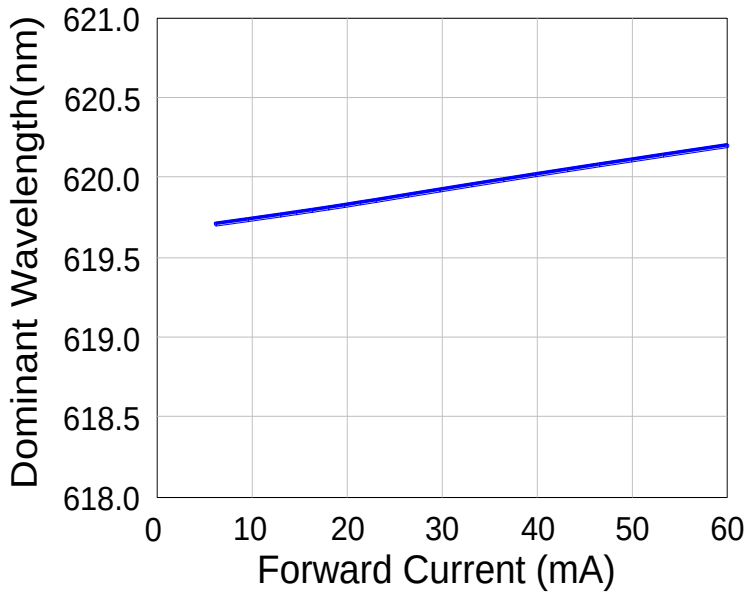


Fig.6 Max. Permissible Forward Current

允许最大正向电流

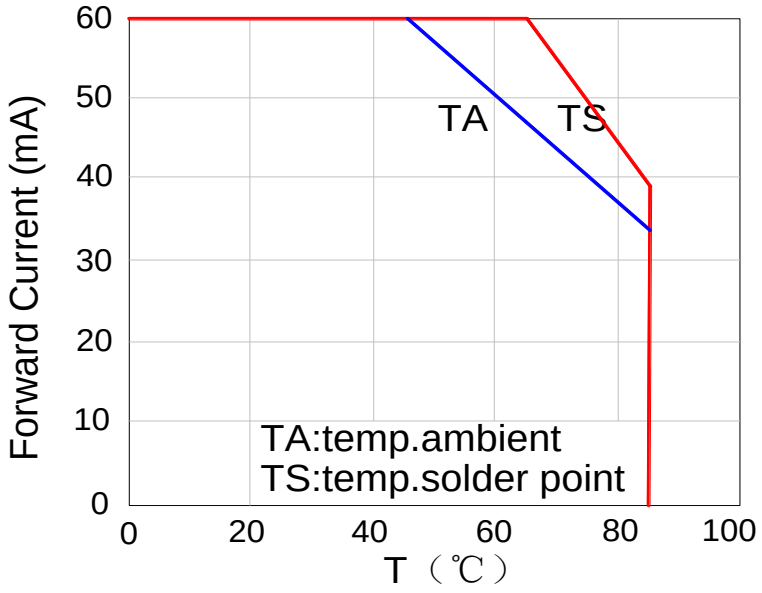


Fig.7 Relative Luminous Intensity vs. Temp.solder point Temperature

相对发光强度 Vs. 焊点温度

Iv / Iv (25°C)=f(T_j);I_F=60mA

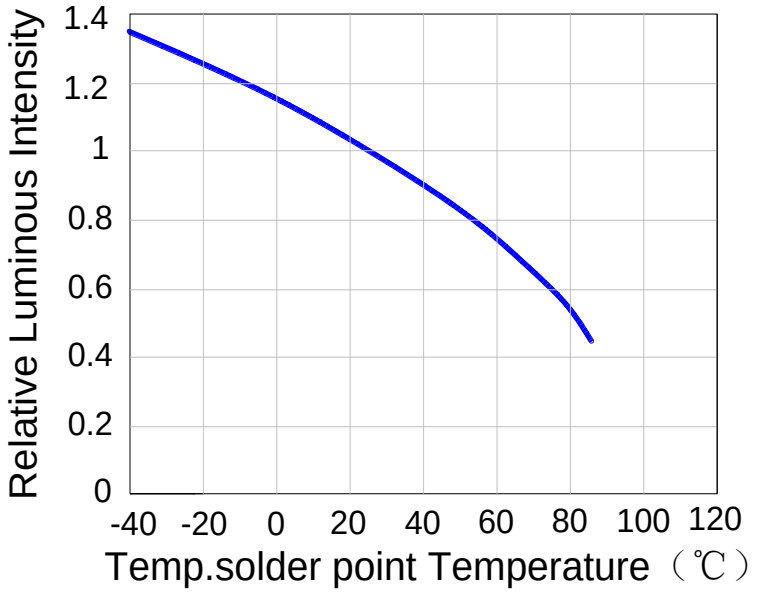


Fig.8 Relative Forward Voltage vs. Temp.solder point Temperature

相对电压 Vs. 焊点温度

$\Delta V_F = V_F - V_F(25°C) = f(T_j); I_F$=60mA

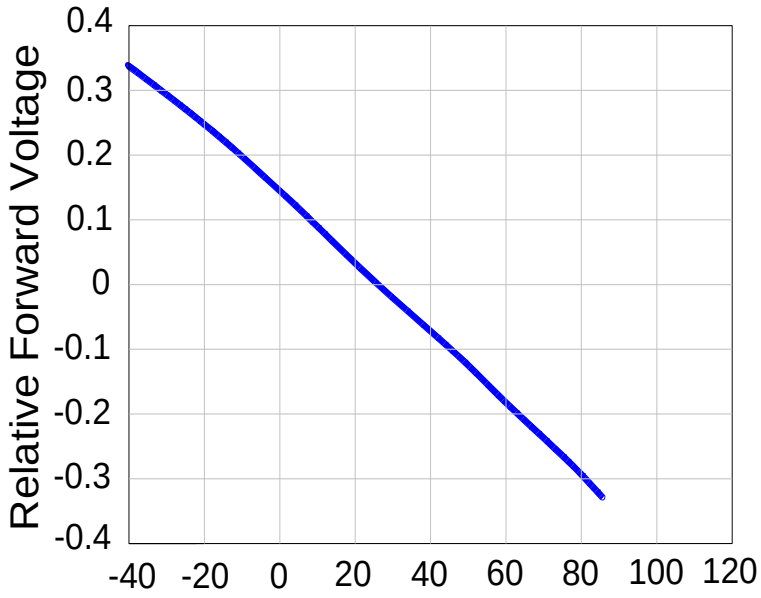
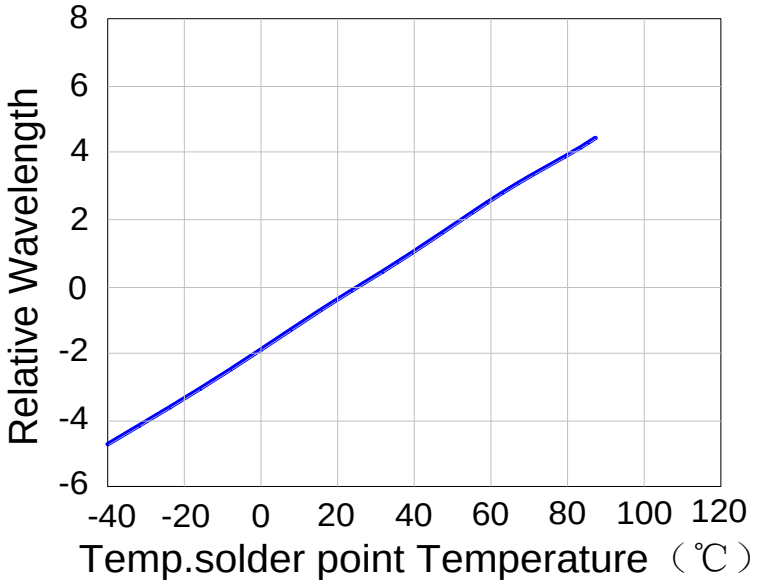


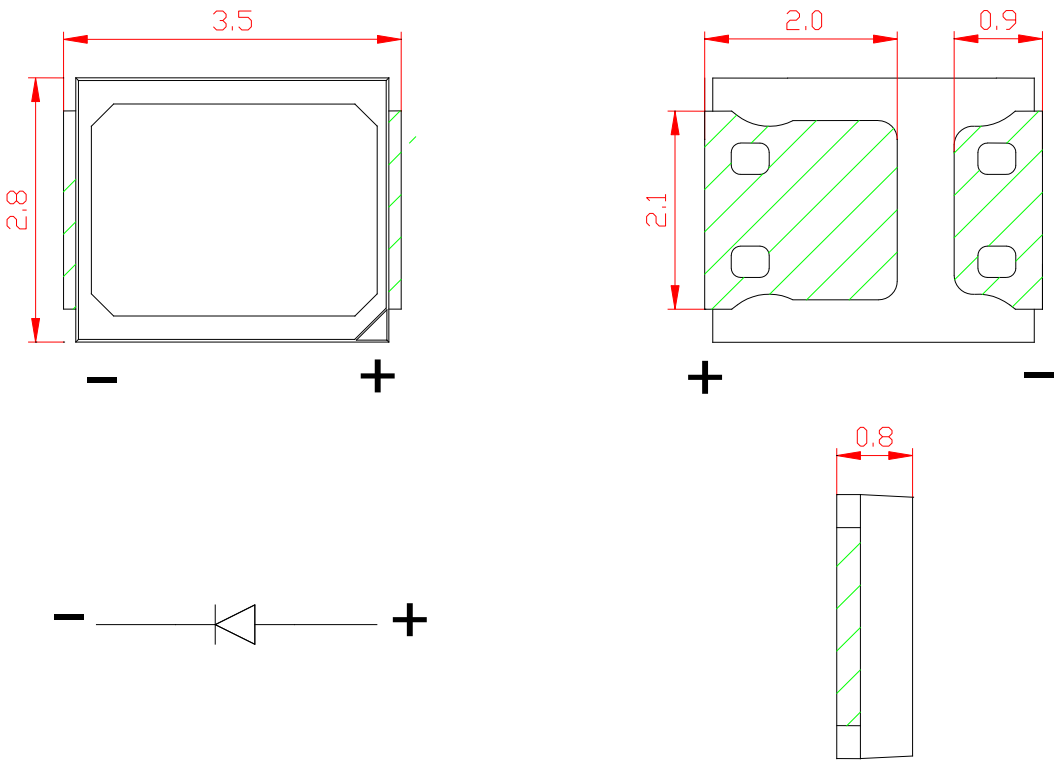
Fig.9 Relative Wavelength vs. Temp.solder point Temperature

相对波长 Vs. 焊点温度

$\Delta\lambda_d=\lambda_d-\lambda_d(25°C)=f(T_j)$;IF=60mA

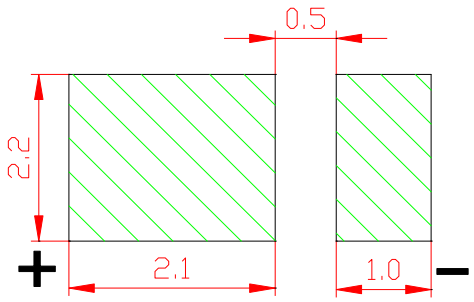


5、Outline Dimensions/产品外形尺寸：



Notes/备注：Tolerance is ±0.1mm(公差±0.1mm)

6、Reference Pad size/参考焊盘尺寸：



参考焊盘尺寸

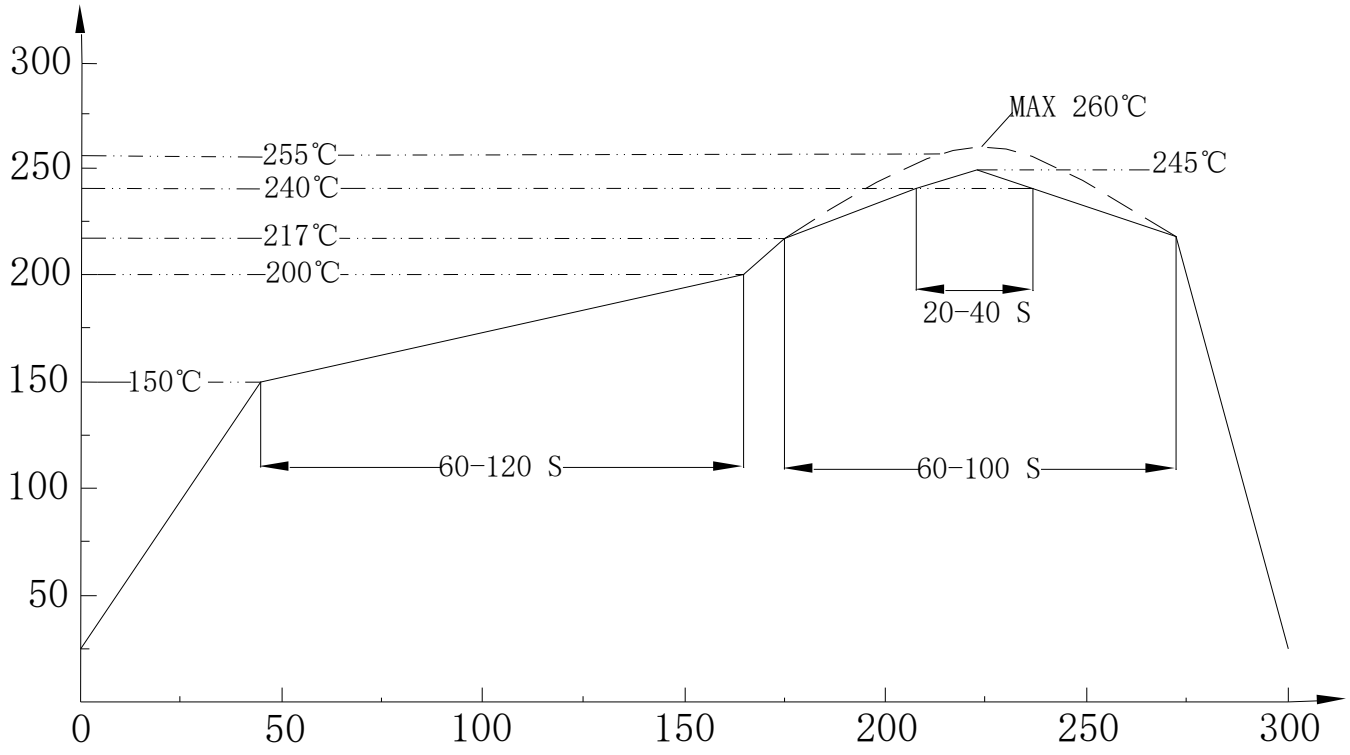
Notes/备注：

1、Tolerance is ±0.1mm(公差±0.1mm)

2、For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere. Package not suitable for ultra sonic cleaning./ 为了获得更佳的焊点连接效果，我们建议在标准氮气环境下进行焊接。 封装不适合超声波清洁。

7、Reflow curve /回流焊曲线

Product complies to MSL Level 3. to JEDEC J-STD-020E
产品符合 MSL 等级 3 根据 JEDEC J-STD-020E

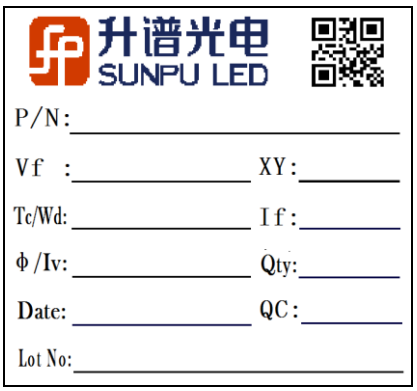


Curvilinear feature 曲线特征	Lead-free combination/无铅组合 Recommended criteria/建议标准	Unit/单位
Average preheating heating rate 25 °C to 150 °C 预热平均升温速率 25℃至 150℃	2	℃/sec
Warm-up time 预热时间	60-120	secs
Reflux temperature 回流温度	217	℃
Reflux time 回流时间	60-100	secs
Peak temperature(max) 峰值温度（最大）	260	℃
The time when the actual peak temperature is within 5 °C 实际峰值温度在 5℃以内的时间	20-40	secs
Cooling rate 降温速度	4	℃/sec

Notes/备注： Hand Soldering（Not Recommended）/手工焊接（不推荐）

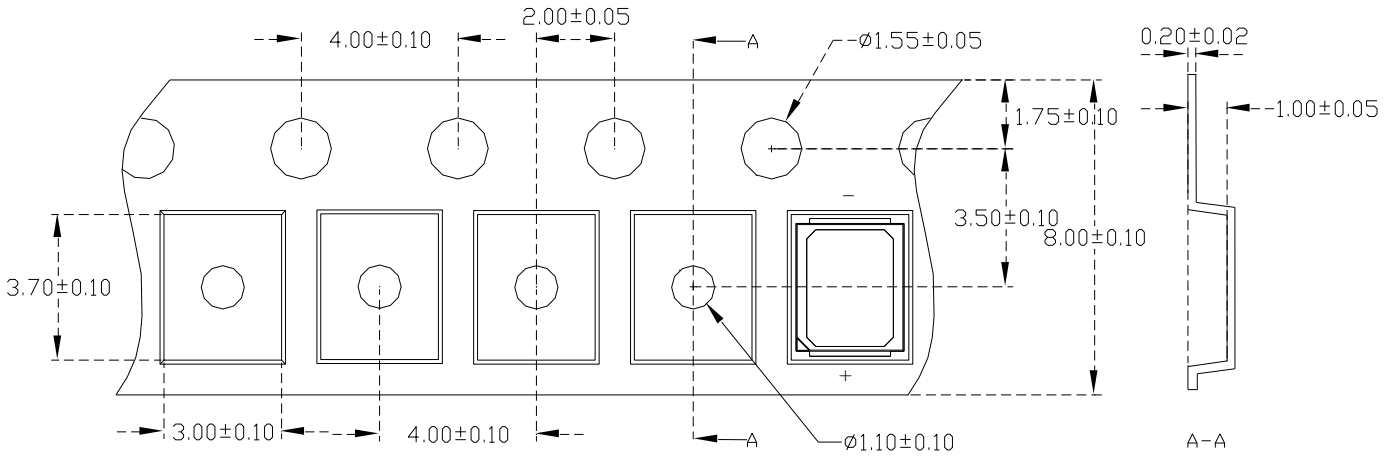
8、Specification of Packing /包装规格

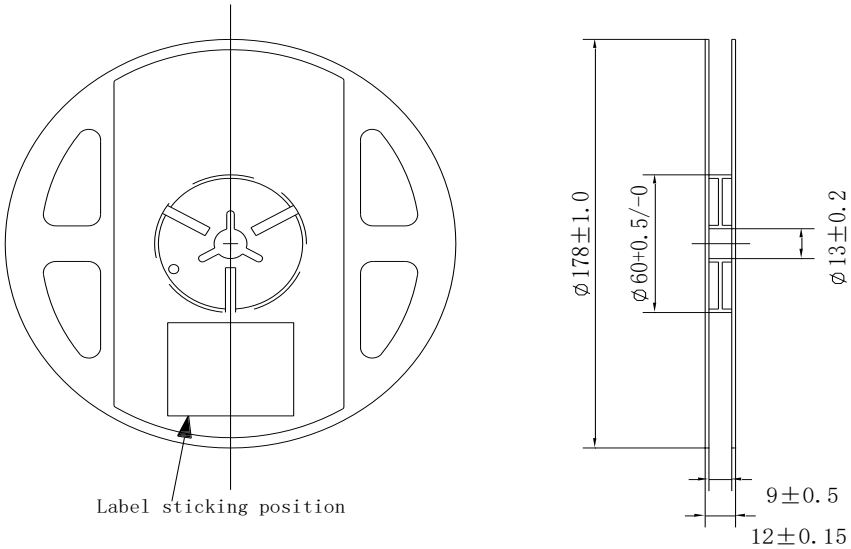
8.1 Label Form Specification/标签格式规范



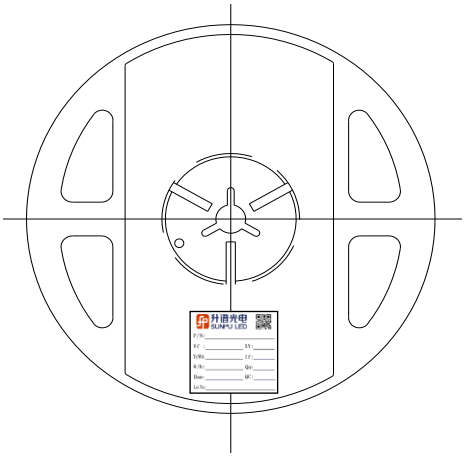
P/N：Product code 产品编号
Vf：Voltage电压 XY：Color Group色系
Tc/Wd：Color Temperature色温/ Dominant Wavelength 主波长 IF： Test Current测试电流
Φ/Iv：Luminous flux光通量/ Luminous Intensity 发光强度； Qty：Packing Quantity包装数量
Date：Year年- Month月- Date日
Lot No：Production batch Number生产批号

8.2 Taping and Orientation/编带和方向(Reel packing/卷盘包装：4000PCS)

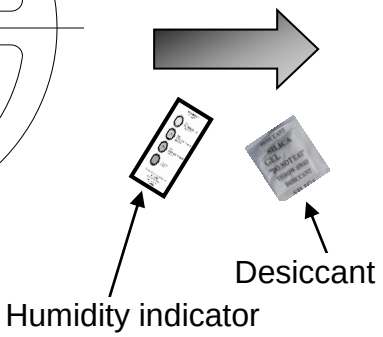




8.3 Specification of Packing/包装规格



Reel

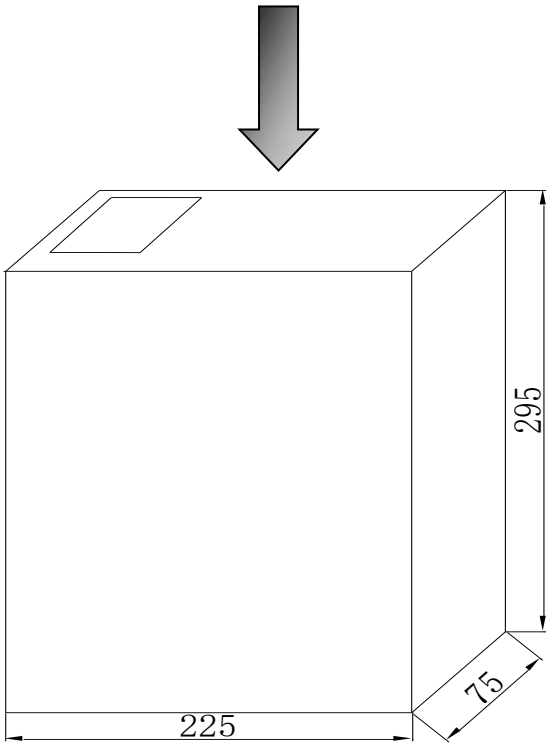


Humidity indicator

Desiccant



Aluminum moistuer-proof bag



Boxed

Notes/备注：

- Reel packing/卷盘包装：4000PCS
- Boxed/盒装：5 Bags（20000PCS）
- humidity sensitive products packed in aluminum foil bags, containing humidity cards and desiccant.湿敏产品包装在铝箔袋中，内含湿度卡和干燥剂。

9、Notes/注意

9.1Please note that the Light Board in the test, not live plug-in operation, to avoid the instant high current LED breakdown

请注意灯板在测试时 ，不可带电插拔作业 ，避免 LED 受到瞬间大电流击穿

9.2 To ensure the quality of our LEDs, So please do not put pressure on the LEDs. Do not fold, bend or squeeze LED devices

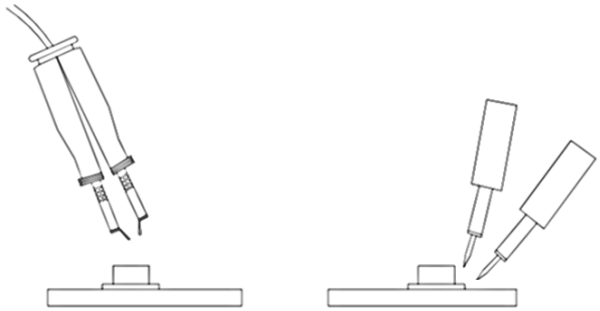
为确保 LED 的可靠性，在操作过程中不可施加压力在 LED 器件胶体表面。不可折叠、弯曲、挤压 LED 器件.

9.3 in order to ensure the reliability of LED, sealed packaging is recommended for semi-finished products or module components that have been pasted during circulation, transportation and storage.

为确保 LED 的可靠性, 已贴片好的半成品或模组组件，在流转、运输、储存过程中建议密封包装。

9.4 To ensure the reliability of LED, please complete one time welding, not too many reflow soldering, otherwise on the bead will have a destructive impact.Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure).

为确保 LED 的可靠性, 请一次焊接完成, 不可过多次回流焊, 否则对灯珠会有破坏性影响。LED 焊接后不应进行维修。如不得不修理，应使用双头烙铁(如图所示)。



附1、Revision History /修订历史

Rev 版本号	Revision time 修订时间	Revisions 修订内容
A0	2015/04/01	初始版本
A1	2021/06/25	标签格式
A2	2021/08/10	新版面制定

附 2、Relibility Analysis/可靠性试验

No.	Item 项目	Test Condition 测试条件	Spec. 引用标准	Time 时间	Standard 判定
1	ESD 静电测试	HBM 法 2000V 以上 （R = 1.5 kΩ, C = 100pF）	ANSI/ESDA/JED EC JS-001	3 times Negative/ Positive	ALL PASS
2	IR Reflow (Reflow Soldering) 回流焊接	Tsld=260℃ T=10sec	JESD22-B106	3times	ALL PASS
3	Solder ability 可焊性	Tsld=235±5℃，3sec	JESD22-B102	1times Over 95%	ALL PASS
4	High Temperature Storage 高温储存	Ta=100℃(-0/+10℃)	JESD22-A103	1000hrs	ALL PASS
5	Low Temperature Storage 低温储存	Ta=-40℃(-10℃/+0)	JESD22-A119	1000hrs	ALL PASS
6	Temperature Cycle 高低温循环	100℃ 15mins ↑ ↓5mins -40℃ 15mins	JESD22-A104	1000cycles	ALL PASS
7	High Temperature High Humidity Homework 高温高湿作业	Ts=85℃/ 85%RH, If=60mA.	JESD22-A101	1000hrs	ALL PASS
8	High Temperature Operating Life 高温老化	T_A = 85°C, If = 60mA	JESD22-A108	1000hrs	ALL PASS
9	Low Temperature Operating Life 低温老化	Ta = -40°C, If = 60mA	JESD22-A108	1000hrs	ALL PASS
10	Steady State operating Life 电耐久性	Ta=25℃±5℃ IF=60mA	JESD22-A108	1000hrs	ALL PASS

Criteria For Judging Damage/判断标准

Item 项目	Symbol 符号	Test conditions 测试条件	Criteria for Judgement 判断标准
Luminous Intensity/亮度	Iv	IF=60mA；T=25℃	+/- 20% from initial value
Forward Voltage/正向电压	VF	IF=60mA；T=25℃	+/- 10% from initial value
Reverse current/反向电流	IR	IF=60mA；T=25℃	IR＜10μA@5V