

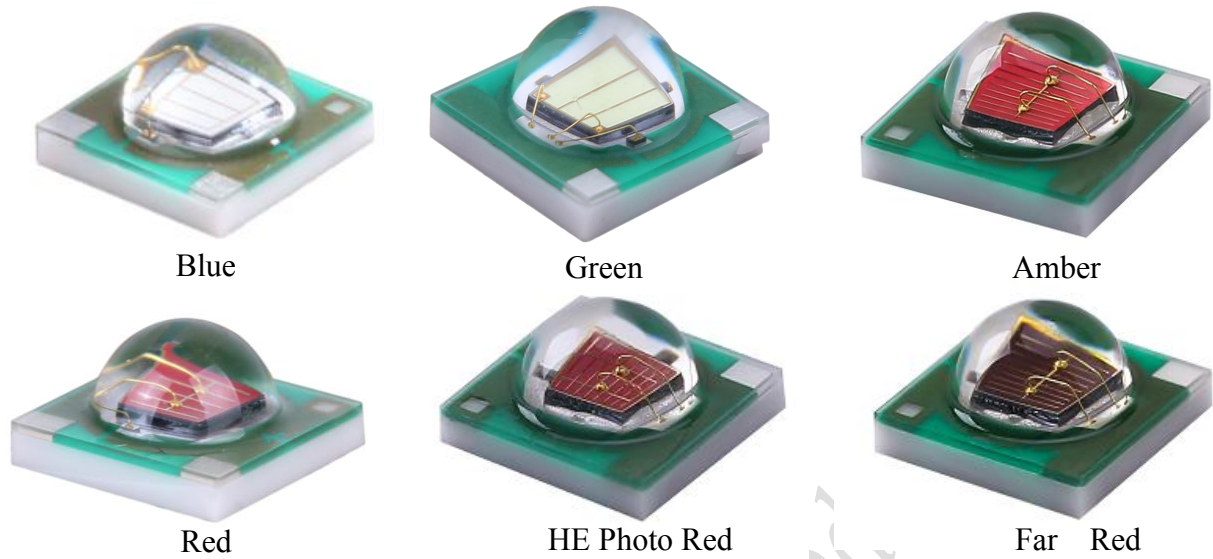


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## 1、特点 Features



- ◆ 陶瓷封装，高亮度，高光效  
Ceramic Substrate package , High brightness ,High efficiency
- ◆ 尺寸：3.5mm\*3.5mm  
Size: 3.5mm\*3.5mm
- ◆ 适于 SMT 贴片  
Compatible with SMT
- ◆ 发光角度：120°  
Viewing Angle: 120°
- ◆ 包装：最大 1000 颗/卷  
Package: Max: 1000pcs /reel

## 2、应用 Applications

- |      |                    |
|------|--------------------|
| 植物照明 | Plant lighting     |
| 景观照明 | Landscape lighting |
| 舞台照明 | Stage lighting     |



### 3、性能 Performance

#### a) 绝对最大额定值 Absolute Maximum Ratings

参数 Parameter	符号 Symbol	最大参数值 Maximum Rating	单位 Unit
电流 Forward Current	$I_F$	1000	mA
功率 Power Dissipation	P	Blue	3.3
		Green	3.2
		Amber	2.6
		Red	2.4
		Photo Red	2.6
		Far Red	2.6
反向电压 Reverse Voltage	$V_R$	5	V
工作温度 Operating Temperature Range	$T_{opr}$	-40~105	°C
存储温度 Storage Temperature	$T_{stg}$	-40~120	°C
ESD (人体模式) ESD Human Body Mode	----	8000	V

## b) 光电参数

### Electro-Optical Characteristics (T solder pad =25 °C, I<sub>F</sub> =350mA)

项目 Item	符号 Symbol	最小值 Min.	典型值 Typ.	最大值 Max.	单位 Unit
波长λ Wavelength	Blue	450	460	475	nm
	Green	495	520	550	
	Amber	580	590	600	
	Red	615	620	635	
	Photo Red	650	660	670	
	Far Red	720	730	740	
光通量Φ Luminous Flux	Blue	400	550	650	mW
	Green	100	140	150	Lm
	Amber	40	46	52	Lm
	Red	50	70	90	Lm
	Photo Red	300	350	400	mW
	Far Red	250	300	400	mW
电压 V <sub>F</sub> Forward Voltage	Blue	2.8	3.1	3.3	V
	Green	2.4	2.8	3.2	
	Amber	2	2.2	2.6	
	Red	2	2.2	2.4	
	Photo Red	1.9	2.2	2.6	
	Far Red	1.9	2.2	2.6	
热阻 Thermal Resistance	R <sub>th</sub>	----	5-7	----	°C/W
发光角度 Viewing Angle	2θ <sub>1/2</sub>	----	120	----	°
结温 LED Junction Temperature	T <sub>j</sub>	----	125	----	°C

备注 Notes :

◇ 光通量测量误差范围±7%

Luminous flux measurement tolerance: ±7

## 4、产品代码 Product Order Code

XE   -   GRN   -   G1   -   R3   -   CF  
 ①            ②            ③            ④            ⑤

- ① 产品型号 Product Type
- ② 蓝光 BLU: Blue  
 绿光 GRN: Green  
 琥珀 AMB: Amber  
 红光 RED: Red  
 红光 RED: HE Photo Red  
 红光 RED: Far Red
- ③ 波长等级 Wavelength Level
- ④ 亮度等级 Brightness Level
- ⑤ 电压等级 Voltage Level

### 出货标签(例) Shipping label (e.g.)



## 5、分档规则 Bin Regulations

### 5.1 波长分档 Wavelength Bins (T<sub>solder pad</sub> =25 °C, I<sub>F</sub> =350mA)

颜色 Colour	代码 Group Code	最小值 Min.	最大值 Max.
Blue	D1	450	455
	D2	455	460
	D3	460	465
	D4	465	470
	D5	470	475
Green	G1	515	520
	G2	520	525
	G3	525	530
	G4	530	535
	G5	535	540
	G6	495	500
	G7	500	505
	G8	545	550
	G9	550	555
Amber	A1	580	585
	A2	585	590
	A3	590	595
	A4	595	600
Red	R1	615	620
	R2	620	625
	R3	625	630
	R4	630	635
Photo Red * peak wavelength	H2	650	655
	H3	655	660
	H4	660	665
	H5	665	670
Far Red * peak wavelength	F2	720	725
	F3	725	730
	F4	730	735
	F5	735	740

## 5.2 亮度分档 Luminous Flux Groups (T solder pad = 25°C, I<sub>F</sub> = 350 mA)

### a) Bins for Green,Amber,Red (Lm)

代码 Group Code	最小值 Min.	最大值 Max.
M2	39.8	45.7
M3	45.7	51.7
N2	51.7	56.8
N3	56.8	62
N4	62	67.2
P2	67.2	73.9
P3	73.9	80.6
P4	80.6	87.4
Q2	87.4	93.9
Q3	93.9	100
Q4	100	107
Q5	107	114
R2	114	122
R3	122	130
R4	130	139
R5	139	148
S2	148	156
S3	156	164

备注 Notes :

✧ 亮度测试存在±7%的公差

It maintains a tolerance of ±7% on luminous flux measurements.



**b) Bins for Blue, HE Photo Red and Far Red (mW)**

代码 Group Code	最小值 Min.	最大值 Max.
EA	300	325
EB	325	350
EC	350	375
ED	375	400
EF	400	425
J2	175	210
J3	210	250
J4	250	300
J5	300	350
J6	350	425
E1	425	500
E2	500	575
E3	575	650
L1	545	620
L2	620	695
L3	695	770

备注 Notes :

- ◇ 亮度测试存在±7%的公差  
It maintains a tolerance of ±7% on luminous flux measurements.



### 5.3 电压分档 Voltage Groups

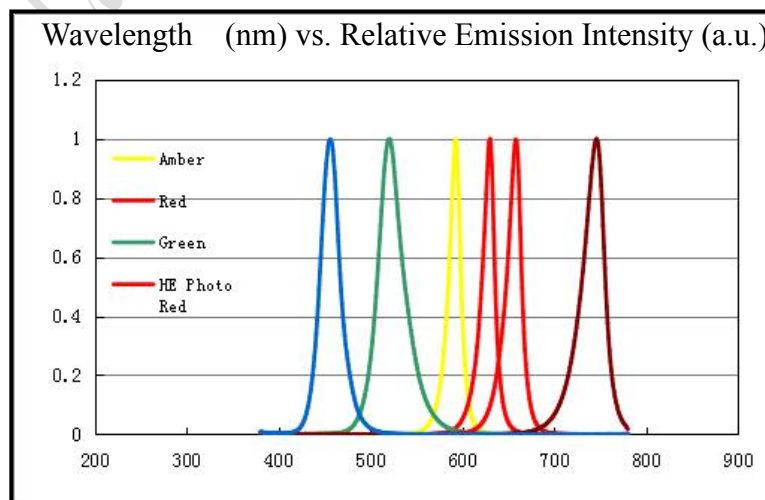
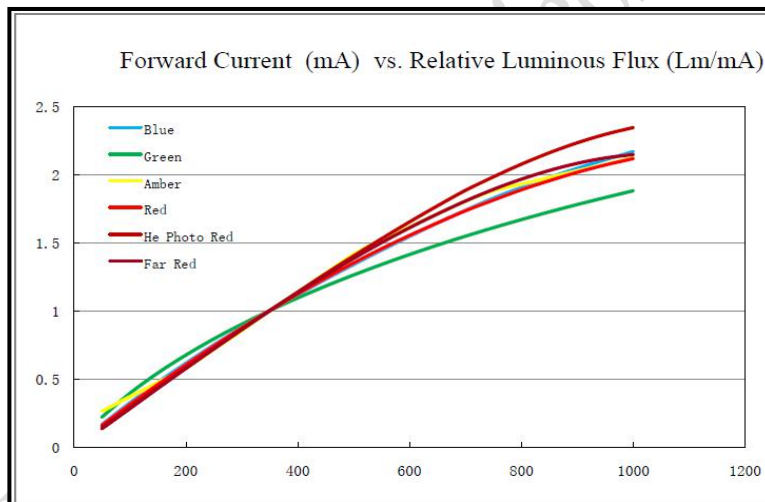
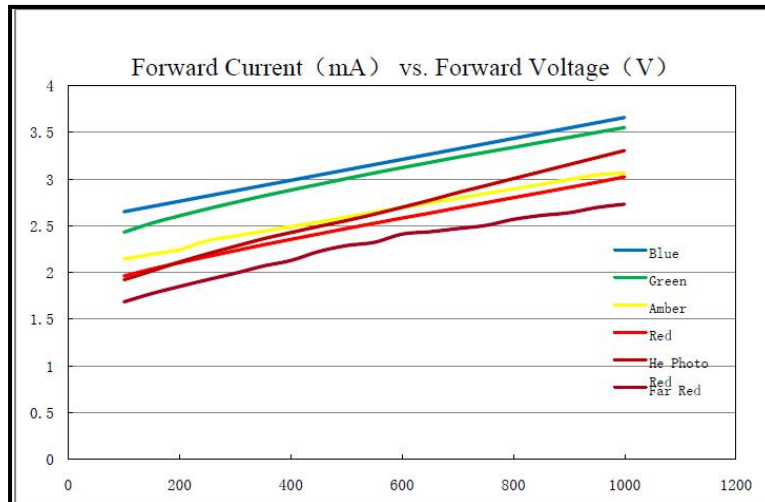
代码	最小值	最大值	代码	最小值	最大值
Group Code	Min.	Max.	Group Code	Min.	Max.
AA8	1.9	2	AAB	2.2	2.3
AA9	2	2.1	AAC	2.3	2.4
AAA	2.1	2.2	AAD	2.4	2.5
AAB	2.2	2.3	AAE	2.5	2.6
AAC	2.3	2.4	AC4	2.4	2.8
AAD	2.4	2.5	AC5	2.8	3.2
AAE	2.5	2.6	AB4	1.8	2
DD1	1.5	1.75	AB5	2	2.2
DD2	1.75	2	AB6	2.2	2.4
DD3	2	2.25	AB7	2.4	2.6
DD4	2.25	2.5	AB8	2.6	2.8
DD5	2.5	2.75	ABB	3.2	3.4
DD6	2.75	3			
DD7	3	3.25			
DD8	3.25	3.5			
DD9	3.5	3.75			
DDA	3.75	4			

备注 Notes :

- ◇ 电压测试存在 $\pm 0.1V$ 的公差
- ◇ It maintains a tolerance of  $\pm 0.1$  on voltage measurements.

## 6、光电特性图

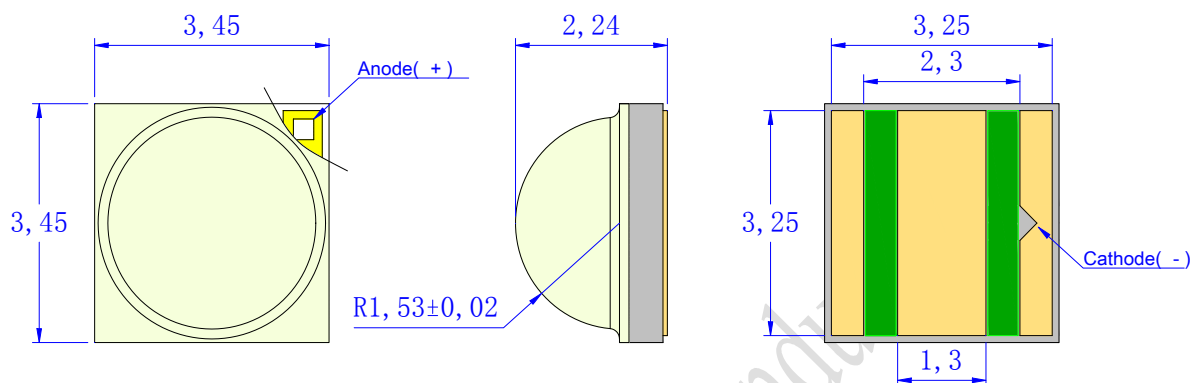
### The Photoelectric Characteristics Graph (Ta= 25 °C)



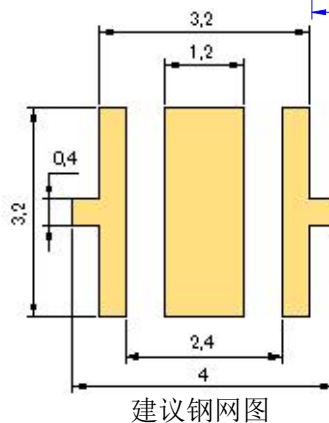
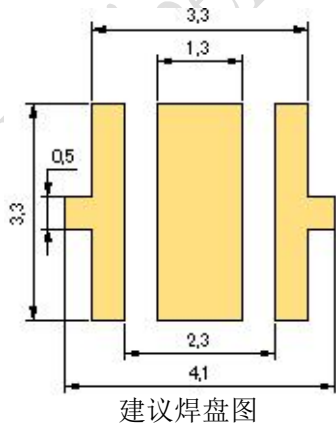
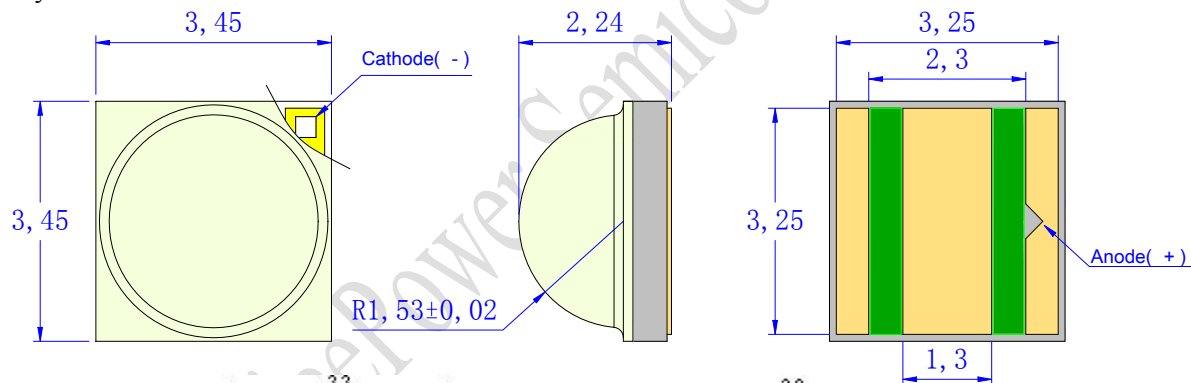
## 7、产品及钢网尺寸 Product and PCB Pad Dimensions

### Product Dimensions:

Size for Green,Red,Amber,Red,HE Photo Red,Far Red



Only Size for Blue



备注 Notes:

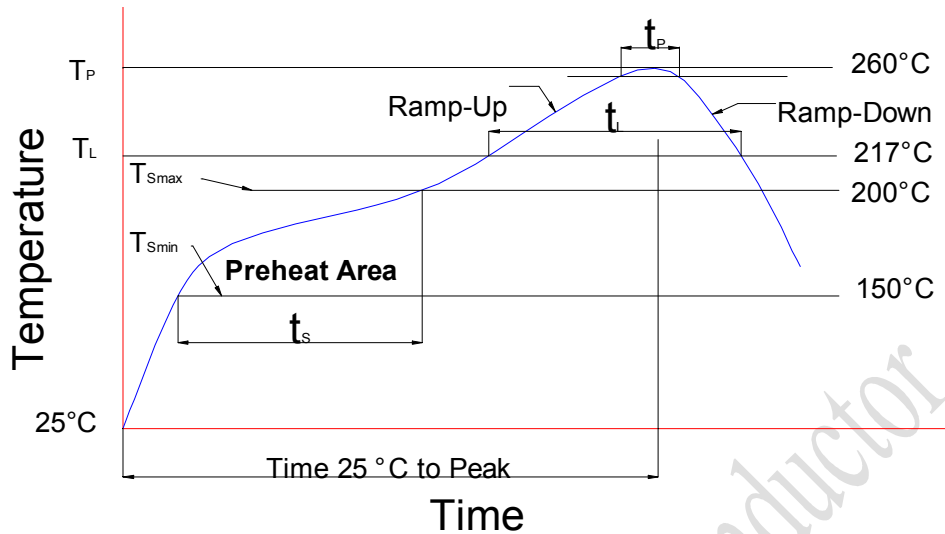
◇ 所有尺寸均以 mm 为单位

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  $\pm 0.1\text{mm}$  and dimension tolerances in accordance with drawings

## 8、回流焊特性 Reflow Soldering Characteristics

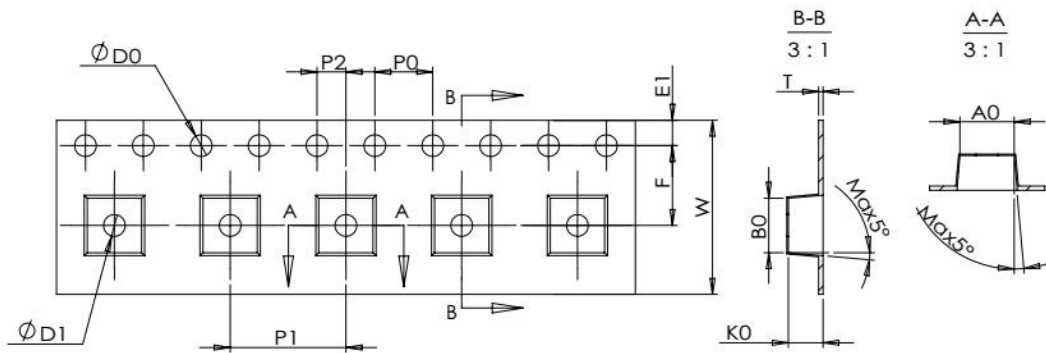


根据 EDEC-J-STD-020D 内容，参考以下内容。

Compatible with the JEDEC-J-STD-020D, 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	5°C/sec max.

## 9、 卷轴 Reel Dimensions



Item	Spec
W	12.00+0.30/-0.10
P1	8.00±0.10
E1	1.75±0.10
F	5.50±0.10
D0	1.50+0.10/0
D1	1.50±0.10
P0	4.00±0.10
P010	40.00±0.20
P2	2.00±0.10
A0	3.65±0.10
B0	3.65±0.10
K0	2.45±0.10
T	0.30±0.05
	Unit: mm

### 备注 Notes:

- ◇ 卷轴包装 1000pcs  
Reel:1000pcs.
- ◇ 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	参考标准 Reference Standard	测试条件 Test Conditions	测试周期 Test Duration	失效标准 Failure Criteria#	失效数/测试数 Units Failed/Tested
可焊性(回流焊) Solderability(Reflow Soldering)	JEITA ED=4701 303 303A	$T_{\text{slid}}=255\pm 5^{\circ}\text{C}$ ,5sec,Lead-free Solder(Sn-3.0Ag-0.5Cu)	3times	#2	0/12
高低温循环 Temperature Cycle	JEITA ED=4701 100 105	$-40^{\circ}\text{C}$ (30min)~ $25^{\circ}\text{C}$ (5min)~ $85^{\circ}\text{C}$ (30min)~ $25^{\circ}\text{C}$ (5min)	100cycles	#1	0/12
高温/低温储存 High/Low Temperature Storage	JEITA ED=4701 200 201/ JEITA ED=4701 200 202	$T_{\text{A}}=120^{\circ}\text{C}/T_{\text{A}}=-40^{\circ}\text{C}$	1000h	#1	0/12
高温老化 High Temperature Operating		$T_{\text{A}}=85^{\circ}\text{C}$ , $I_{\text{F}}=500\text{mA}$ Test board: See NOTES below	1000h	#1	0/12
高温高湿老化 Temperature Humidity Operating		$85^{\circ}\text{C}$ , RH=85%, $I_{\text{F}}=500\text{mA}$ Test board: See NOTES below	1000h	#1	0/12
震动 Vibration	JESD22-B103	$10\text{m/s}^2$ ,100~20000~100Hz,4cycles,4min, each X,Y,Z	5times	#1	0/6

### b) 失效判定 Failure Criteria

判定 Criteria #	项目 Items	条件 Conditions	失效判定 Failure Criteria
#1	正向电压 Forward Voltage ( $V_{\text{F}}$ )	$I_{\text{F}}$	> 初始值×1.1 倍 > Initial value×1.1
	光通量 Luminous Flux ( $\Phi_{\text{v}}$ )	$I_{\text{F}}$	< 初始值×0.9 倍 < Initial value×0.9
	反向电流 Reverse Current ( $I_{\text{R}}$ )	$V_{\text{R}}=5\text{V}$	> 1uA > 1uA
#2	回流焊 Solderability	-	焊接面积 < 80% Less than 80% solder coverage

## 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
1	2020.7.13	王宝	A00	新版发行

LatticePower Semiconductor