



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: HFL2

产品型号 Product P/N: T4

客户 Client name: _____

客户料号 Client P/N: _____

版本号 Version No.: A02

日期 Sending Date: 2023.08

客户承认栏 Client Approval	
核准 Approval	确认 Audit

制定 Confirmation: _____ 审核 Approval: _____

工厂地址:江西省南昌市高新区艾溪湖北路 699 号

Address: No.699 Aixihu North Road, Nanchang, Jiangxi Province, China

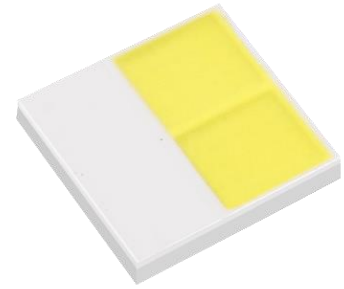


目录 Contents

1、特点 Features	1
2、应用 Applications	1
3、性能 Performance	2
4. 产品代码 Product Order Code	5
5. 分档规则 Bin Regulations	6
6、光电特性图 The Photoelectric Characteristics Graph	8
7. 产品及钢网尺寸 Product and PCB Pad Dimensions.....	11
8、回流焊特性 Reflow Soldering Characteristics	12
9、载带及卷轴 Reel Dimensions	13
10、可靠性 Reliability	14
11、注意事项 Cautions.....	15
12、文件履历表 Document Resume	16

1、特点 Features

- ◆ 陶瓷封装，高亮度，高可靠性
Ceramic Substrate package , High brightness ,High reliability
- ◆ 尺寸：2.90mm*2.90mm*0.7mm
Size: 2.90mm*2.90mm*0.7mm
- ◆ 根据 ANSI 标准分档
According to the ANSI standard colour gamut
- ◆ 适于 SMT 贴片
Compatible with SMT
- ◆ 发光角度：120°
Viewing Angle: 120°
- ◆ 包装：最大 2000 颗/卷
Package: Max: 2000pcs /reel
- ◆ 建议额定使用电流为 700mA
Recommended current 700mA



2、应用 Applications

汽车照明	Automobile
摩托车照明	Motorcycle
非机动车	Non-motorized vehicle



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 DC (Video Mode) Forward Current	I_F	1000	mA
功率 Power Dissipation	P	7	W
脉冲电流 Pulsed(Flash Mode) Forward Current	I_{FP}	1200	mA
结温 (DC 模式) LED Junction Temperature(DC mode)	T_j	150	°C
工作温度 Operating Temperature Range	T_{opr}	-40~105	°C
存储温度 Storage Temperature	T_{stg}	-40~125	°C

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_F =700mA)

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	440	560	800	Lm
正向电压 Forward Voltage	VF	5.6	6.5	7.2	V
显指 Ra	----	60	----	----	----
热阻 Thermal Resistance	----	----	4.5	----	°C/W
发光角度 Viewing Angle	2θ1/2	----	120	----	°
结温 LED Junction Temperature	T _j	----	150	----	°C

备注 Notes :

◇ 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_F =700mA)

产品号 Product	最低显指 Min. Ra	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	
HFL2	60	6500~7000	1A	B02	440	T4-B-1A-B03-BC4
				B03	500	
				B04	560	
				B05	630	
		6000~6500	1D	B02	440	T4-B-1D- B03-BC4
				B03	500	
				B04	560	
				B05	630	
		5700~6000	2B	B02	440	T4-B-2B- B03-BC4
				B03	500	
				B04	560	
				B05	630	
		5300~5700	2C	B02	440	T4-B-2C- B03-BC4
				B03	500	
				B04	560	
				B05	630	

4. 产品代码 Product Order Code

T4 - B - 1D - B04 - BC4
① ② ③ ④ ⑤

- ① 产品型号 Product Type
- 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: T4-B-1D-B04-BC4 HFL2



Reel ID: AT4C00000001



Qty: 2000



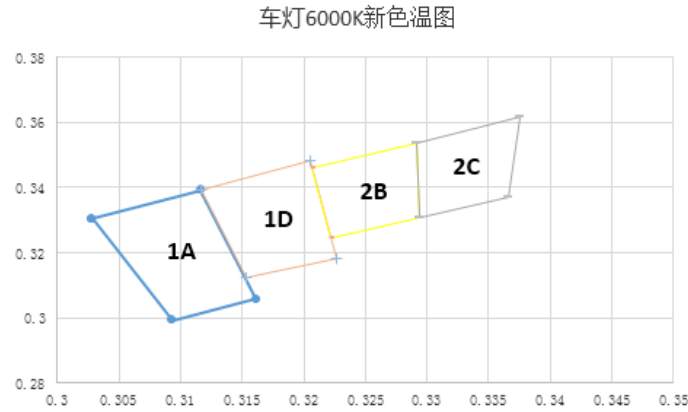
6T4TCHCA

Date:2023-08-11

5. 分档规则 Bin Regulations

a) 色度区域 Chromaticity Regions

Cool White



Color Chromaticity Groups					
Color Bin	x	y	Color Bin	x	y
1A 6500K~7000K	0.3028	0.3304	1D 6000K~6500K	0.31165	0.33925
	0.31165	0.33925		0.3205	0.3481
	0.3161	0.3059		0.32264	0.31814
	0.3093	0.2993		0.31527	0.3123
2B 5700K~6000K	0.32912	0.35387	2C 5300K~5700K	0.32912	0.35387
	0.32064	0.34615		0.33760	0.36160
	0.32220	0.32430		0.33660	0.33690
	0.32940	0.33060		0.32940	0.33060

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_F =700 mA)

代码 Group Code	最小值 Min.	最大值 Max.
B02	440	500
B03	500	560
B04	560	630
B05	630	710
B06	710	800

c) 电压分档 **Voltage Groups** (T solder pad = 25°C, I_F =700 mA)

代码 Group Code	范围 Range
BC2	5.6~6.0
BC3	6.0~6.4
BC4	6.4~6.8
BC5	6.8~7.2

d) 显指分档 **Ra Groups** (T solder pad = 25°C, I_F =700 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=700mA; TS = 25°C

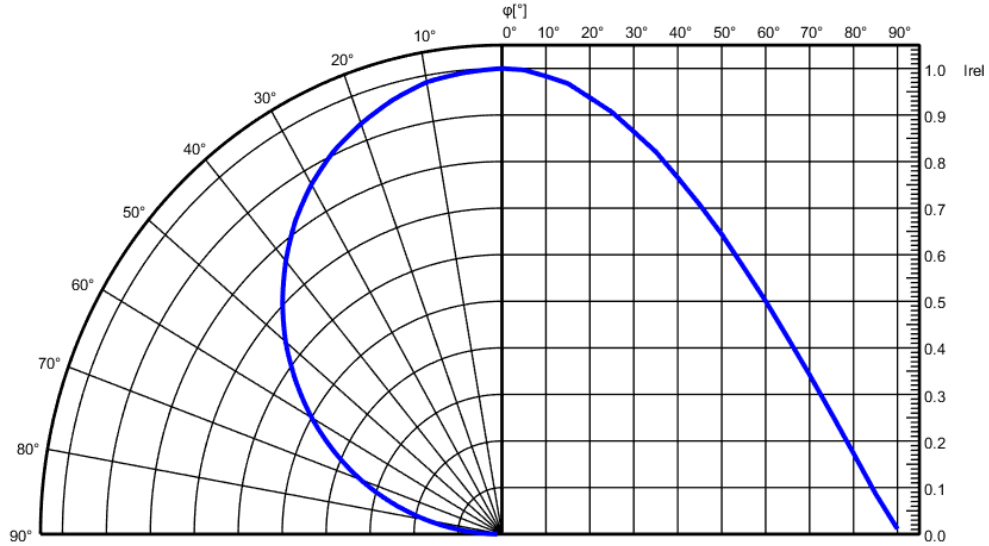


Fig 2. 相对发光光谱 / Relative Spectral Power Distribution vs. Wavelength

$\Phi_{rel} = f(\lambda)$; IF=700mA; TS = 25°C

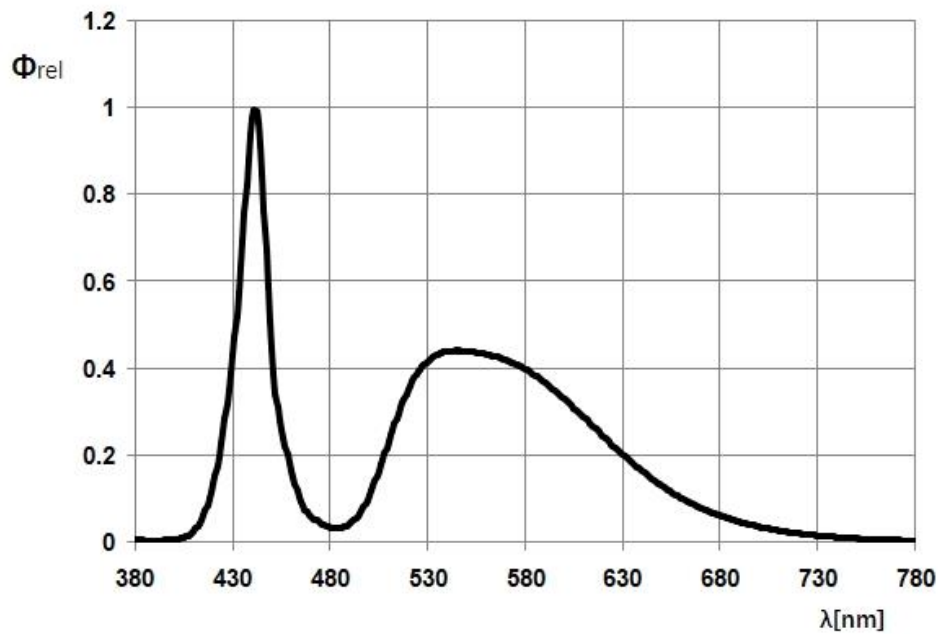


Fig 3. 正向电流/Forward Voltage

$I_F = f(V_F)$; $T_S = 25^\circ\text{C}$

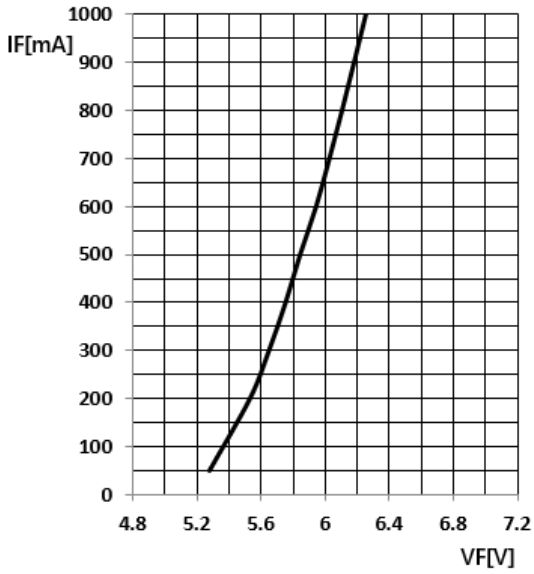


Fig 4. 相对发光强度/Relative Luminous Intensity

$I_v / I_v(700\text{ mA}) = f(I_F)$; $T_S = 25^\circ\text{C}$

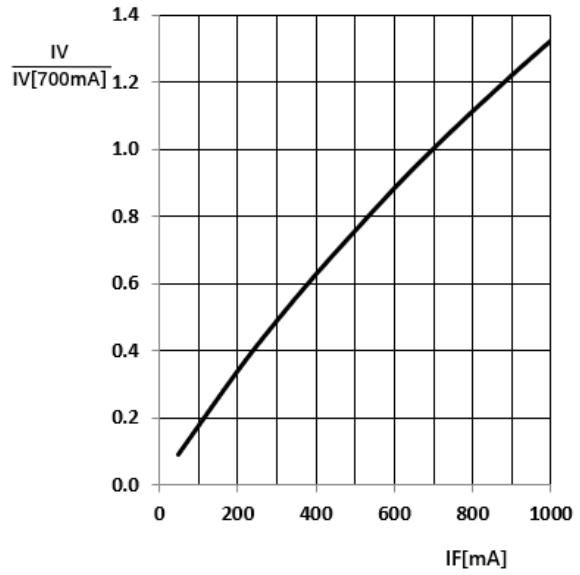


Fig 5. 色坐标偏移/Chromaticity Coordinate Shift

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

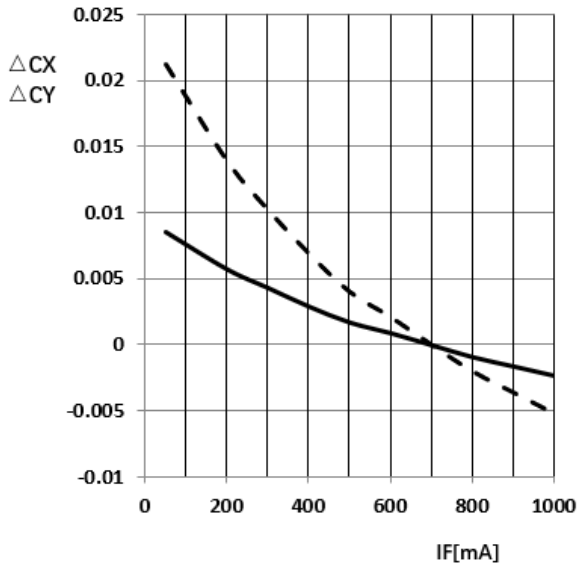


Fig 6. 正向电压/Forward Voltage

$$\Delta VF = VF - VF(25^\circ\text{C}) = f(T_j); I_F = 700\text{mA}$$

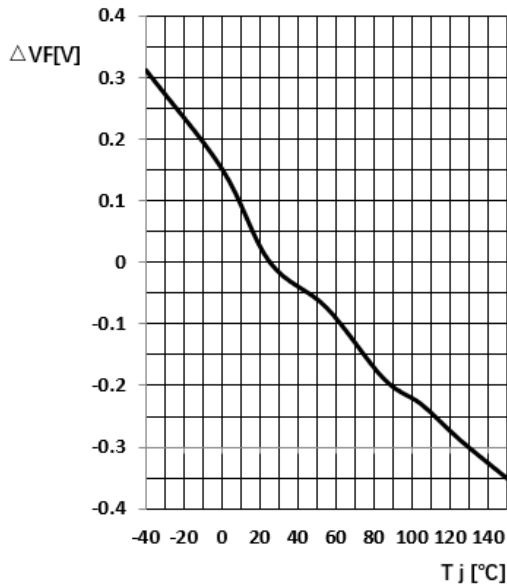


Fig 7. 相对发光强度 Relative Luminous Flux

$$I_v / I_v(25^\circ\text{C}) = f(T_j); I_F = 700\text{mA}$$

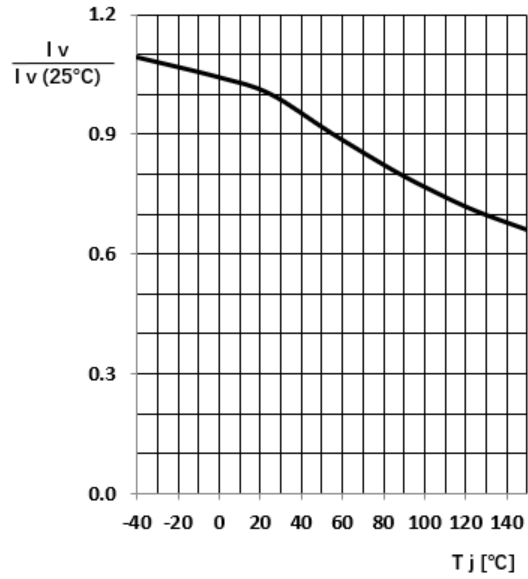


Fig 8. 色坐标偏移/

Chromaticity Coordinate Shift

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

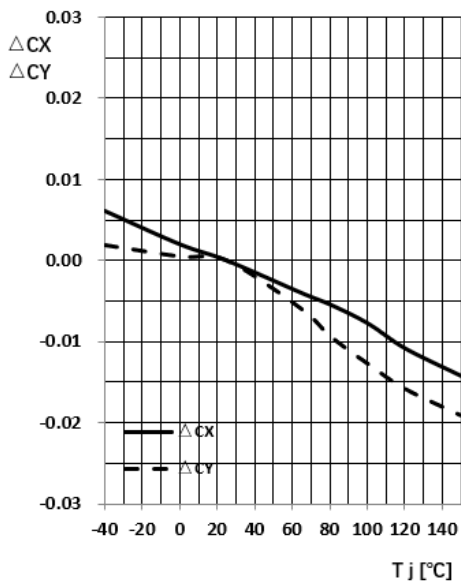
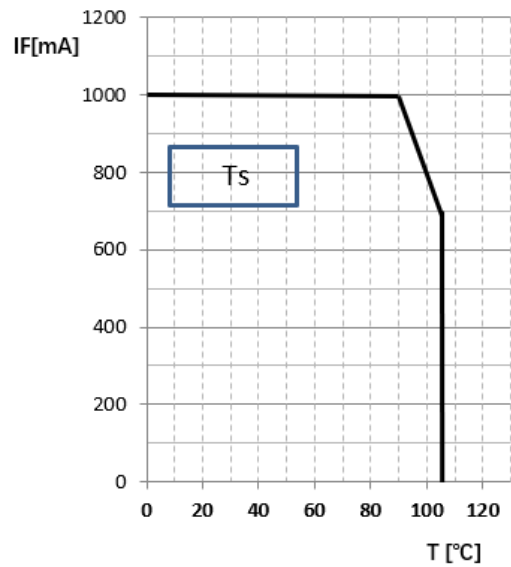


Fig 9. 最大正向电流/

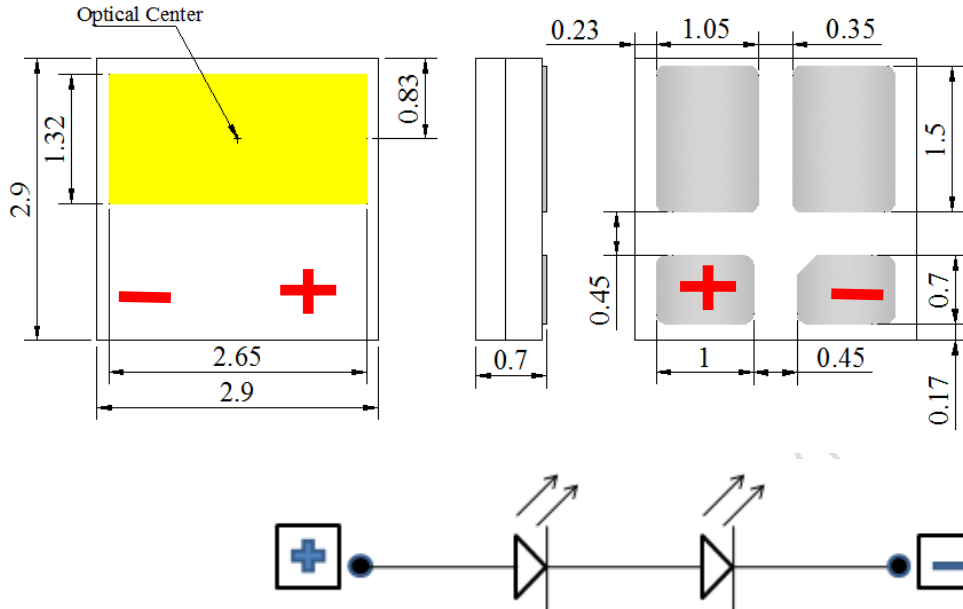
Max. Permissible Forward Current

$$I_F = f(T)$$

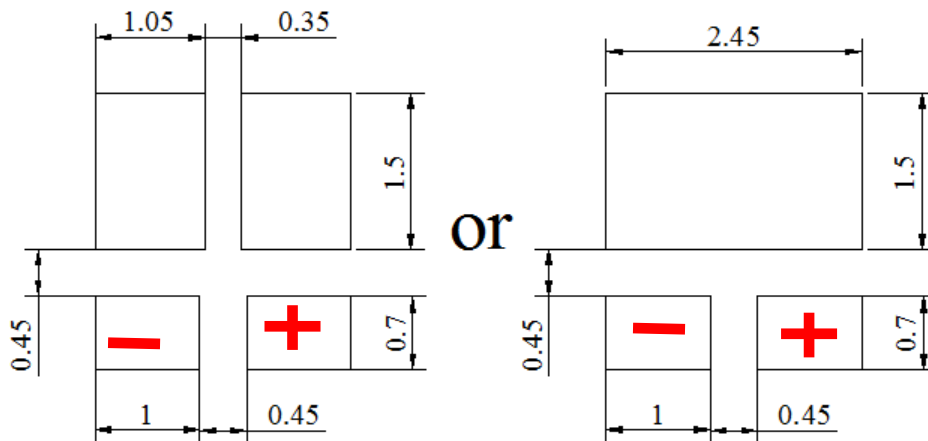


7. 产品及钢网尺寸 Product and PCB Pad Dimensions

a) 产品尺寸 Product Dimensions:



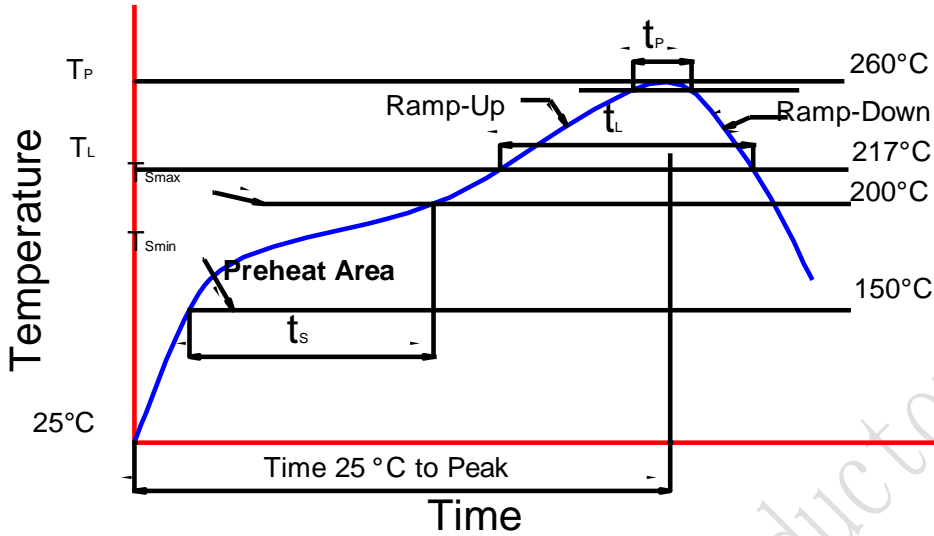
b) 推荐焊盘尺寸 PCB Pad Dimensions



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

8、回流焊特性 Reflow Soldering Characteristics

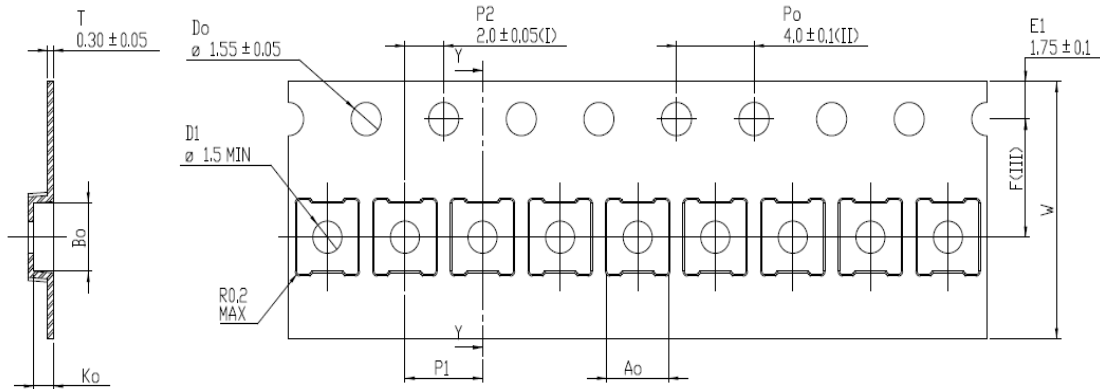


根据 EDEC-J-STD-020D 内容，参考以下内容。

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 _{Smax} 至 T _p) Average Ramp-Up Rate (T _{Smax} to T _p)	3 °C/sec max.
预热: 温度最小值 (T _{Smin}) Preheat: Temperature Min (T _{Smin})	150
预热: 最高温度 (T _{Smax}) Preheat: Temperature Max (T _{Smax})	200
预热: 时间 (t _{Smin} 到 t _{Smax}) Preheat: Time (t _{Smin} to t _{Smax})	60-180 secs
回流温度 (T _L) Time Maintained Above: Temperature (T _L)	217°C
回流时间 (t _L) Time Maintained Above: Time (t _L)	60-150 secs
峰值/分类温度 (T _p) Peak/Classification Temperature (T _p)	255 ± 5°C
实际峰值温度 (t _p) 在 5°C 以内的时间 Time Within 5°C of Actual Peak Temperature (t _p)	20~40 secs
降低速率 Ramp-Down Rate	4°C/sec max.

9、载带及卷轴 Reel Dimensions



Ao	3.18	+/- 0.1
Bo	3.18	+/- 0.1
Ko	1.02	+/- 0.1
F	5.50	+/- 0.05
P1	4.00	+/- 0.1
W	12.00	+/- 0.3

备注 Notes:

- ◇ 卷轴包装 2000pcs
Reel:2000pcs.
- ◇ 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℃,5sec,Lead-free Solder (Sn-3.0Ag-0.5Cu)	3 times
高低温循环 Temperature Cycle	JESD22-A105	I _F =700mA, -40℃(30min)~85℃(30min)	200cycles
冷热冲击 Thermal Shock	JESD22-A106	-40℃(15min)~125℃(15min)	200cycles
低温存储 Low Temperature Storage	JESD22-A119	T _A =-40℃	1000H
高温老化 High Temperature Operating Life	JESD22-A108	T _j =150℃, I _F =700mA	1000H
高温高湿 Temperature Humidity Operating Life	JESD22- A101	T _a =85℃, RH=85%, I _F =700mA	1000H
震动 Vibration	JESD22-B103	10m/s ² ,100~20000~100Hz,4cycles,4min, each X,Y,Z	3 times

11、注意事项 Cautions

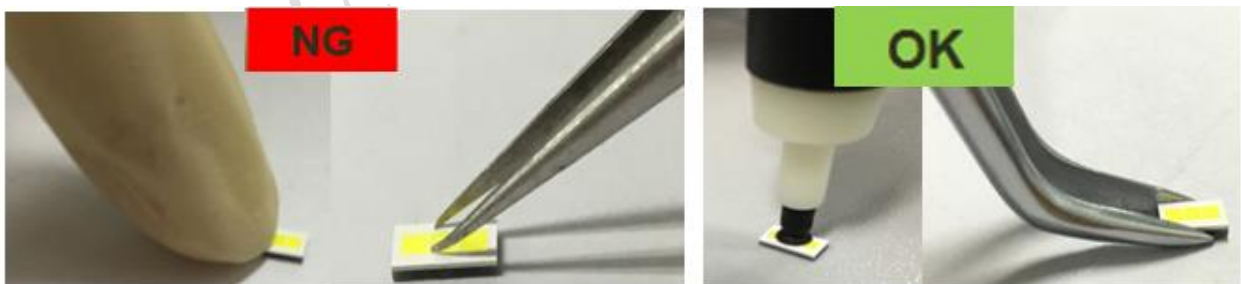
a) 存储 Storage

- 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	2020.07.08	袁丁	A00	1. 新增文件编号及序号;
02	2020.10.08	袁丁	A01	1.新增 PCB Pad 建议尺寸;
03	2023.08.11	袁丁	A02	1. 更新公司标签抬头; 2. 更新产品不同温度下曲线;