

江西晶亮光电科技协同创新有限公司

JiangXi JingLiang Sci & Tech Corporation

产 品 规 格 书

Specification

产品名称 Product Name:	Chip Scale Package
产品型号 Product P/N:	CSP1111
客 户 Client name:	
客户料号 Client P/N:	
版 本 号 Version No.:	A02
日 期 Seeding Date:	



RoHS



REACH



Halogen
Free

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 Code	5
5、分档规则 Bin Regulations	6
6、光电特性图 The Photoelectric Characteristics Graph	10
7、产品及钢网尺寸 Product and PCB Pad Dimensions	12
8、回流焊特性 Reflow Soldering Characteristics	13
9、卷轴 Reel Dimensions	14
10、可靠性 Reliability	15
11、注意事项 Cautions	16

1、特点 Features

- ◆ 芯片级封装，高亮度，高可靠性

Chip Scale Package , High brightness ,High reliability

- ◆ 尺寸：1.10*1.10*0.32mm，单面发光

Size: 1.10*1.10*0.32mm, 1-sided emitter

- ◆ 根据 ANSI 标准分档

According to the ANSI standard color gamut

- ◆ 适于 SMT 贴片

Compatible with SMT

- ◆ 发光角度：120°

Viewing Angle: 120°

- ◆ 包装：最大 6000 颗/卷

Package: Max:6000pcs /reel



2、应用 Applications

商业照明

Commercial lighting

室内外照明

Indoor and outdoor 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 DC (Video Mode) Forward Current	I_F	500	mA
功率 Power Dissipation	P	1.60	W
脉冲电流 Pulsed(Flash Mode) Forward Current	I_{FP}	1000	mA
结温 (DC 模式) LED Junction Temperature(DC mode)	T_j	135	°C
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	----	2000	V

备注 Notes:

- ✧ 最大额定值环境温度测试温度 $T_a=25^{\circ}\text{C}$
Absolute Maximum Ratings at $T_a=25^{\circ}\text{C}$.
- ✧ I_{FP} 脉冲时间 $\leq 5\text{ms}$, 占空比 $\leq 50\%$
 I_{FP} conditions with the pulse on-time is $\leq 5\text{ms}$ per cycle and the duty cycle is $\leq 50\%$.
- ✧ 绝对最大额定值需要满足在最高结温以下工作为前提条件
Absolute maximum ratings must be observed to maintain the temperature below the maximum allowable junction temperature.

b) 光电参数

Electro-Optical Characteristics (T solder pad =85 °C, I_F =350mA)

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	60	----	130	Lm
正向电压 2 Forward Voltage 2	VF2	2.6	3.0	3.2	V
正向电压 1 Forward Voltage 1	VF1	2.1	---	3.0	V
色温 CCT	----	1800	----	6500	K
显指 Ra	----	90	----	----	----
发光角度 Viewing Angle	201/2	----	120	----	°

备注 Notes :

✧ 亮度测试允许最大误差范围: ±7%

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

✧ 电压测试允许最大误差范围: 0.1V

LP maintains a tolerance of ±0.1V on forward voltage measurement.

✧ 限制显指测试允许最大误差范围: ±2

LP maintains a tolerance of ±2 on Ra measurement.

c) 亮度分布特性

Luminous Flux Characteristics (T solder pad = 85 °C, IF=350mA)

CRI	CCT (K)	D1		E1		F1		G1		H1		I1		J1	
		60	70	70	80	80	90	90	100	100	110	110	120	120	130
90	1800														
	2700														
	3000														
	3500														
	4000														
	5000														
	5700														
	6500														

4、产品代码 Product Code

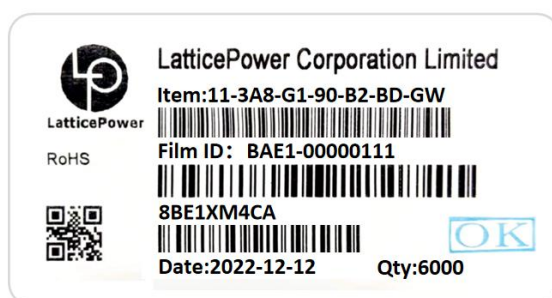
11 - 3A8 - G1 - 90 - B2 - BD - GW

① ② ③ ④ ⑤ ⑥ ⑦

- ① 产品型号 Product Type (Example: 11 means CSP size = 1.1 mm)
- ② 色温区块 Colour Area (Example: . 8-2700K, 3 for 3-step MacAdam ellipse)
- ③ 亮度等级 Brightness Level (Example: G1=90 to 100 lm)
- ④ 显色指数 Ra level (Example: 90 means $Ra \geq 90$)
- ⑤ 电压等级 VF Level (Example: B2=2.8 to 3.0V)
- ⑥ 内部波长代码 (不影响其他参数, 不用参考)
Internal Wavelength Code (Do not affect other parameters)
- ⑦ 色温显指代码 Colour temperature & Ra Code

CRI	CCT	Colour Area
90	6500K	3A1、5A1、PE、PF、PG、PH
	5700K	3A2、5A2、QE、QF、QG、QH
	5000K	3A3、5A3、RE、RF、RG、RH
	4000K	3A5、5A5、TE2、TF2、TG2、TH2
	3500K	3A6、5A6、UE、UF、UG、UH
	3000K	3A7、5A7、VE、VF、VG、VH
	2700K	3A8、5A8、WE、WF、WG、WH
	2200K	3AA、5AA、AE、AF、AG、AH
	1800K	3AB、5AB、BE、BF、BG、BH

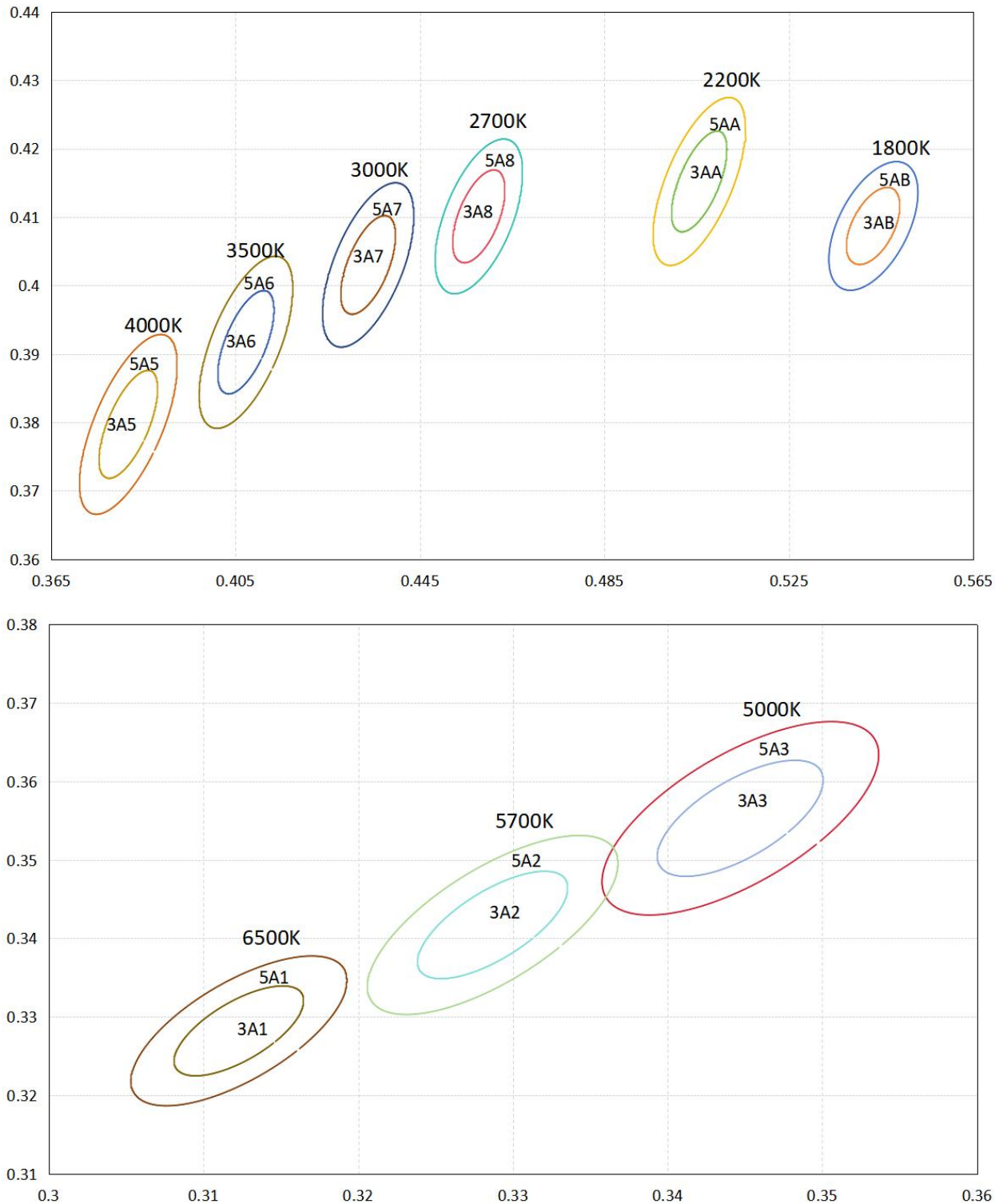
出货标签(例) Shipping label (e.g.)

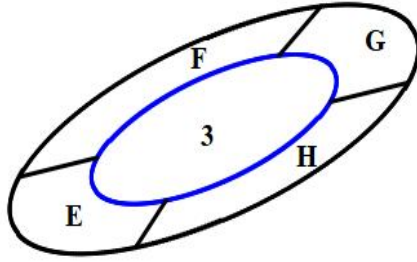


5、分档规则 Bin Regulations

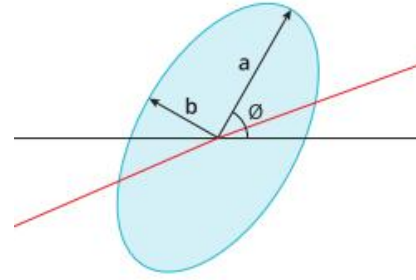
a) 色度区域 Chromaticity Regions

① 3 步/5 步椭圆 3Step/5Step SDCM





产品的色区块定义
Color space definition



关于 3 步、5 步麦克亚当椭圆的说明
3- and 5-step MacAdam ellipse illustration

麦克亚当椭圆色块 3-Step and 5-Step MacAdam ellipse color bin definitions

CCT(K)	色区 COLOR APACE	中心点 CENTER POINT	a MAJOR AXIS	b MAJOR AXIS	θ ANGLE	色块 COLOR BIN
1800	3-step	(0.5433, 0.4087)	0.0070	0.0040	46.50°	3AB
	5-step		0.0117	0.0066		5AB/BE/BF/BG/BH
2200	3-step	(0.5056, 0.4152)	0.0086	0.0040	49.27°	3AA
	5-step		0.0144	0.0066		5AA/AE/AF/AG/AH
2700	3-step	(0.4578, 0.4101)	0.0079	0.0041	53.95°	3A8
	5-step		0.0131	0.0068		5A8/WE/WF/WG/WH/
3000	3-step	(0.4338, 0.4030)	0.0084	0.0041	54.00°	3A7
	5-step		0.014	0.0068		5A7/VE/VF/VG/VH
3500	3-step	(0.4073, 0.3917)	0.0088	0.0041	54.53°	3A6
	5-step		0.0147	0.0068		5A6/UE/UF/UG/UH
4000	3-step	(0.3818, 0.3797)	0.0093	0.0041	54.05°	3A5
	5-step		0.0155	0.0068		5A5/TE2/TF2/TG2/TH2
5000	3-step	(0.3447, 0.3553)	0.0084	0.0036	58.22°	3A3
	5-step		0.014	0.0059		5A3/RE/RF/RG/RH
5700	3-step	(0.3287, 0.3417)	0.0078	0.0031	58.44°	3A2
	5-step		0.0130	0.0051		5A2/QE/QF/QG/QH
6500	3-step	(0.3123, 0.3282)	0.0066	0.0027	57.65°	3A1
	5-step		0.0109	0.0045		5A1/PE/PF/PG/PH

备注 Notes :

✧ 色度坐标来自 CIE1931 色度图，测试误差 Cx、Cy 允许范围在±0.006

LP maintains a tolerance of ±0.006 on x and y coordinates in the CIE 1931 color space.

b) 亮度分档 Luminous Flux Groups (T solder pad = 85°C, I_F = 350 mA)

典型显指 Typ.Ra	常规色温 Normal CCT	最小光通量	
		Minimum Luminous Flux	
		代码 Code	亮度值 Value
90	1800K~6500K	D1	60 70
		E1	70 80
		F1	80 90
		G1	90 100
		H1	100 110
		I1	110 120
		J1	120 130

备注 Notes :

◇ 亮度测试存在±7%的公差

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

c) 电压分档 Voltage Groups

代码 Group Code	范围 Range
B1	2.6-2.8
B2	2.8-3.0
B3	3.0-3.2
B4	3.2-3.4

备注 Notes :

◇ 电压测试允许最大误差范围: ±0.1V

LP maintains a tolerance of ±0.1V on forward voltage measurements

d) 显指分档 Ra Groups

代码 Group Code	范围 Range
90	90~100

备注 Notes :

◇ 显指测试允许最大误差范围: ±2

◇ LP maintains a tolerance of ±2 on Ra measurements

e) 内部代码 Internal Groups

代码 Group Code	范围 Range
BB	447.5~450
BC	450~452.5
BD	452.5~455
BE	455~457.5

备注 Notes :

✧ 内部波长代码 (不影响其他参数)

Internal Wavelength Code (Do not affect other parameters)

f) 色温显指代码 Colour temperature & Ra Code

显指 Ra	代码 Code	色温 Colour	代码 Code
70	C	1800	A
80	E	2200	Y
90	G	2700	W
95	H	3000	V
		3500	U
		4000	T
		5000	R
		5700	Q
		6500	P

6、光电特性图 The Photoelectric Characteristics Graph (Ta= 25 °C)

Fig 1. 相对光谱分布特性 Relative Spectrum Distribution Characteristics

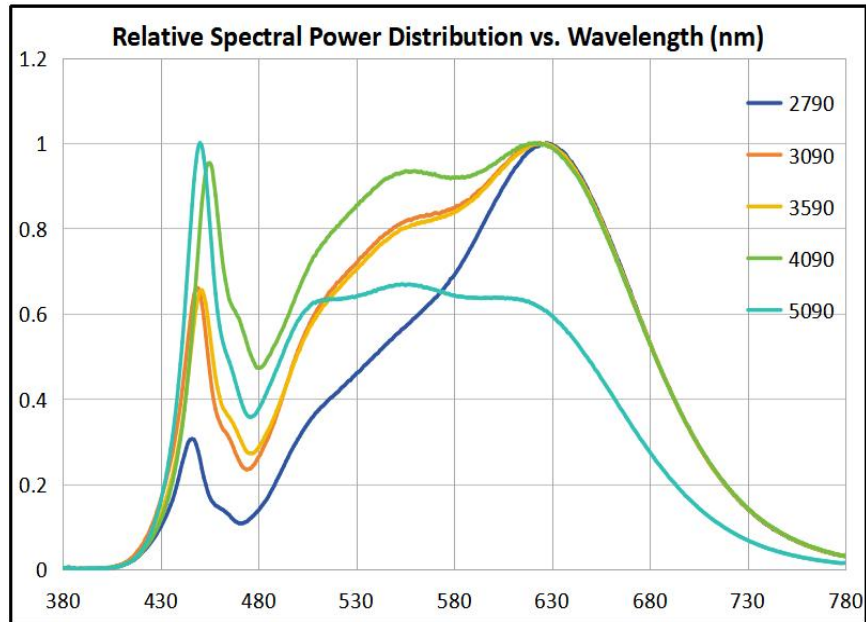


Fig 2. 辐射特性 Radiation Pattern Characteristics

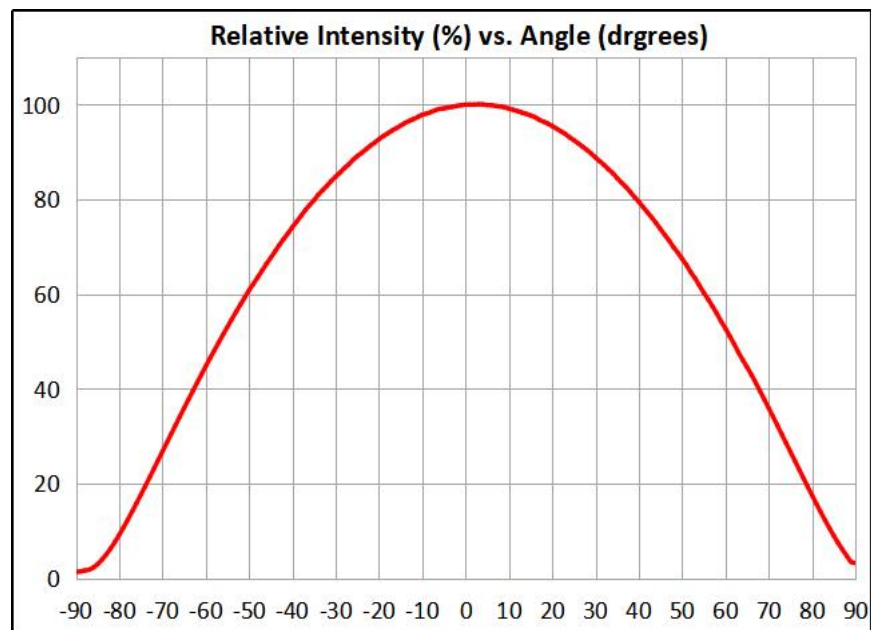


Fig 3. 正向电流特性 Forward Current Characteristics

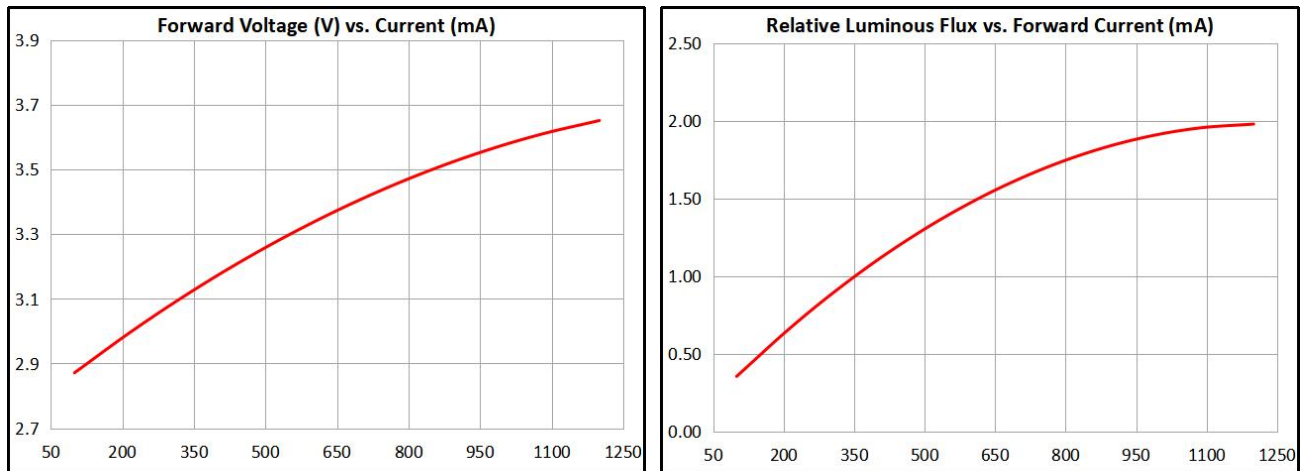


Fig 4. 温度特性 Temperature Characteristics

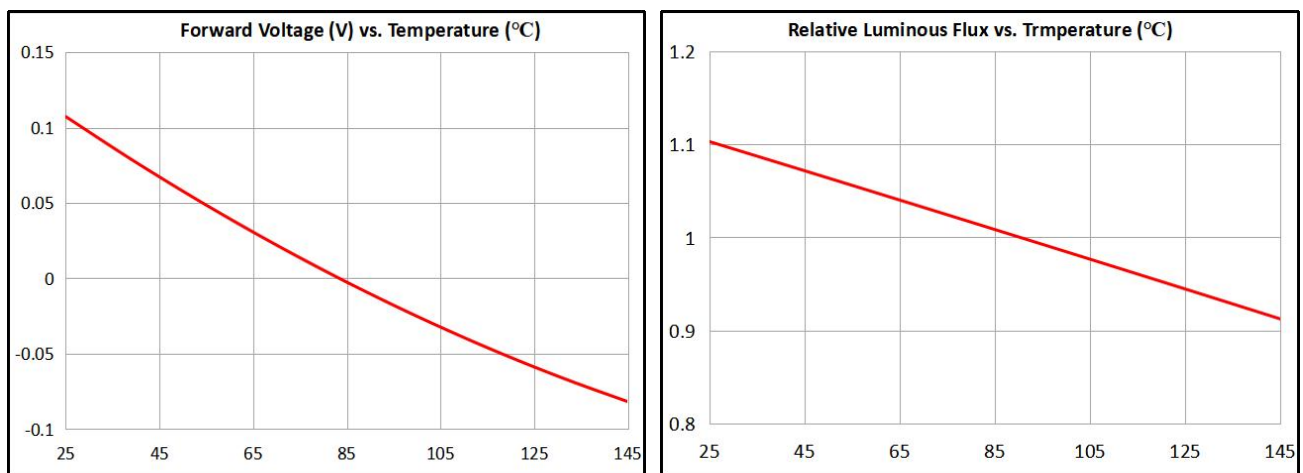
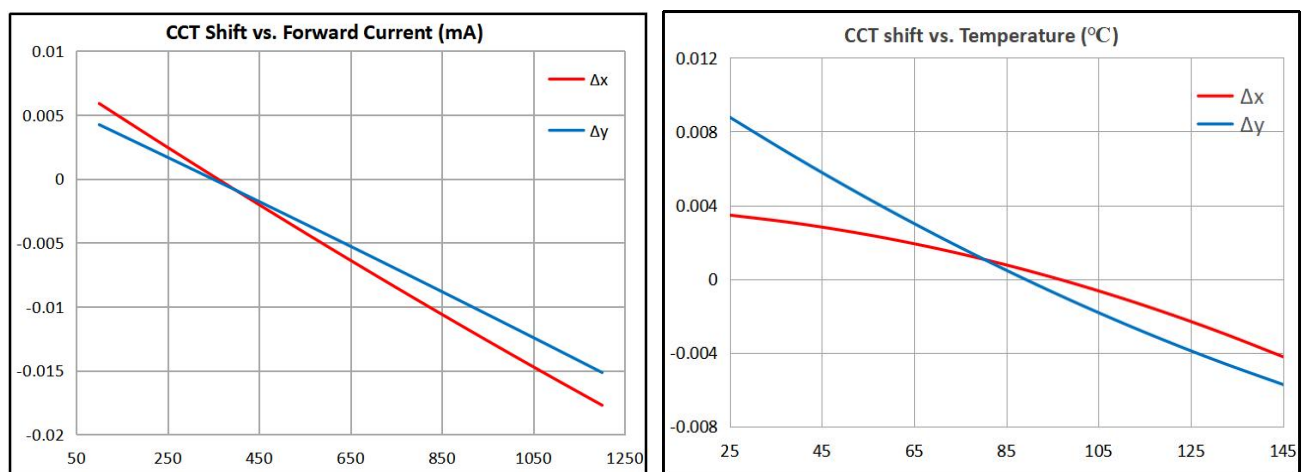
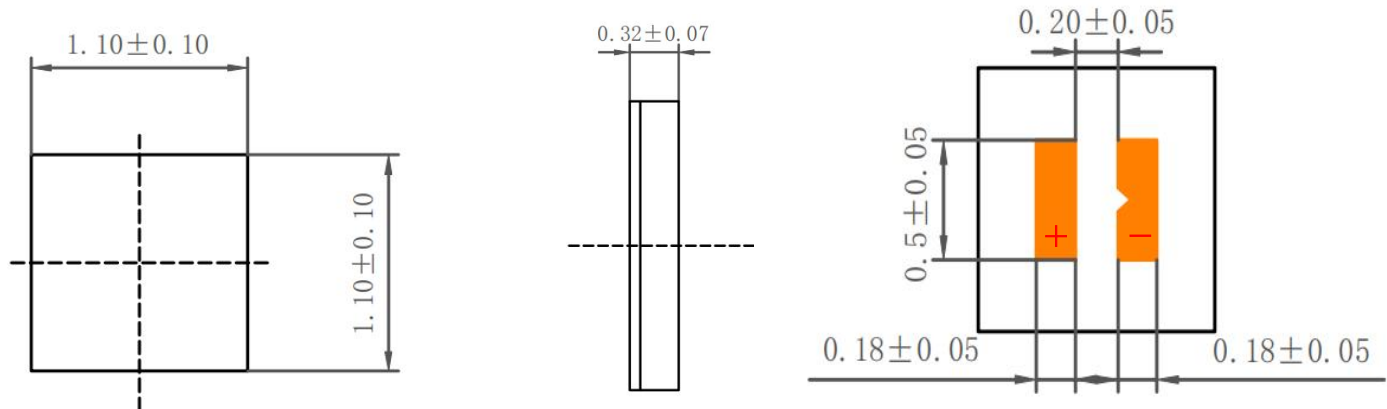


Fig 5. 色移特性 Chromaticity Coordinate Shift Characteristics

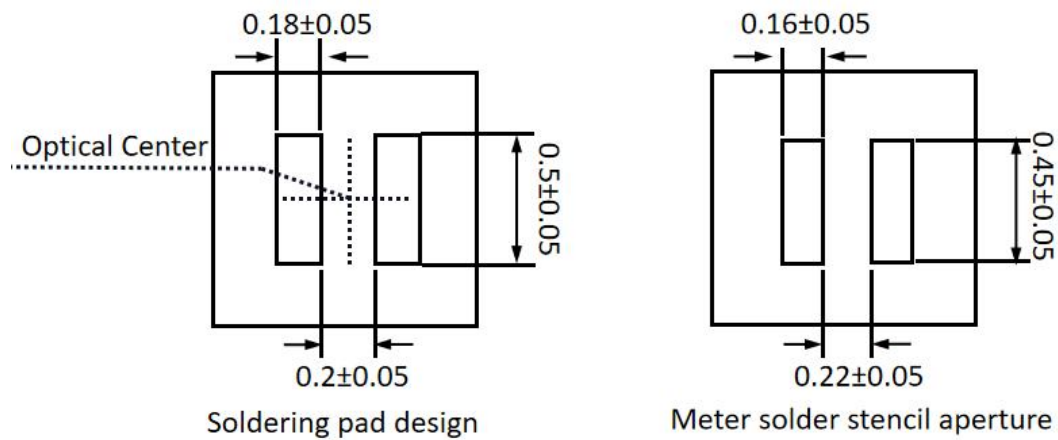


7、产品及钢网尺寸 Product and PCB Pad Dimensions

Product Dimensions:



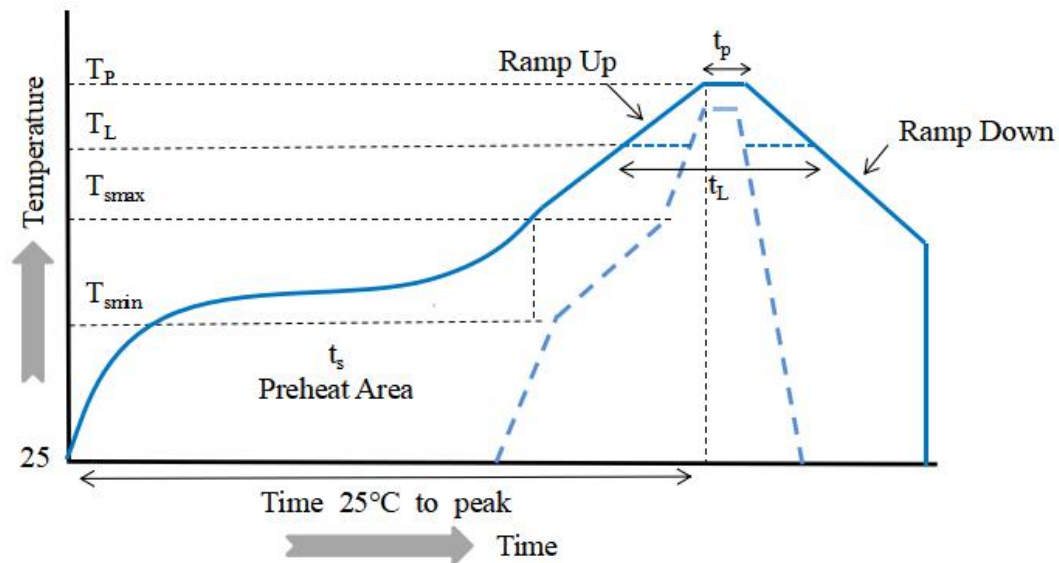
PCB Pad Dimensions:



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 $\pm 0.1\text{mm}$ 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

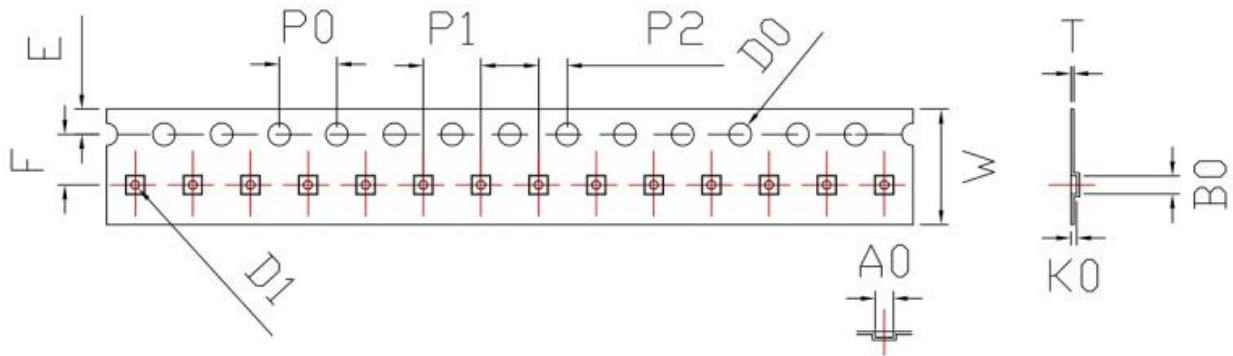


根据 EDEC-J-STD-020D 内容，参考以下内容。

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、卷轴 Reel Dimensions



Symbol	A0	B0	K0	P0	P1	P2
Spec	1.25±0.05	1.25±0.05	0.40±0.05	4.00±0.10	4.00±0.10	2.00±0.10
Symbol	W	T	E	F	D0	D1
Spec	8.00±0.20	0.20±0.05	1.75±0.10	3.5±0.10	1.50±0.10	0.60±0.10

Unit:mm

备注 Notes:

- ✧ 卷轴包装最大 6000pcs
Reel:max 6000pcs.
- ✧ 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

老化电流条件: $I_F = 500\text{mA}$

测试项目 Test Item	标准 Reference Standard	测试条件 Test Conditions	测试周期 Test Duration	失效判定 Failure Criteria#
回流焊 Reflow Soldering	JESD22-B102	$T_{\text{sld}} = 255 \pm 5^\circ\text{C}$, 5sec, Lead-free Solder (Sn-3.0Ag-0.5Cu)	3 times	#2
高低温循环 Temperature Cycle	JESD22-A105	I_F , -40°C (30min) ~ 85°C (30min)	200cycles	#1
高低温存储 High/Low Temperature Storage	JESD22-A119	$T_A = 120^\circ\text{C}$ / $T_A = -40^\circ\text{C}$	1000H	#1
高温老化 High Temperature Operating Life	JESD22-A108	$T_A = 85^\circ\text{C}$, I_F	1000H	#1
高温高湿 Temperature Humidity Operating Life	JESD22-A101	$T_A = 85^\circ\text{C}$, RH=85%, I_F	1000H	#1

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_F)	I_F	$> \text{初始值} \times 1.1 \text{ 倍}$ $< \text{初始值} \times 0.9 \text{ 倍}$ $> \text{Initial value} \times 1.1 \text{ or}$ $< \text{Initial value} \times 0.9$
	光通量 Luminous Flux (Φ_v)	I_F	$< \text{初始值} \times 0.7 \text{ 倍}$ $< \text{Initial value} \times 0.7$
#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.

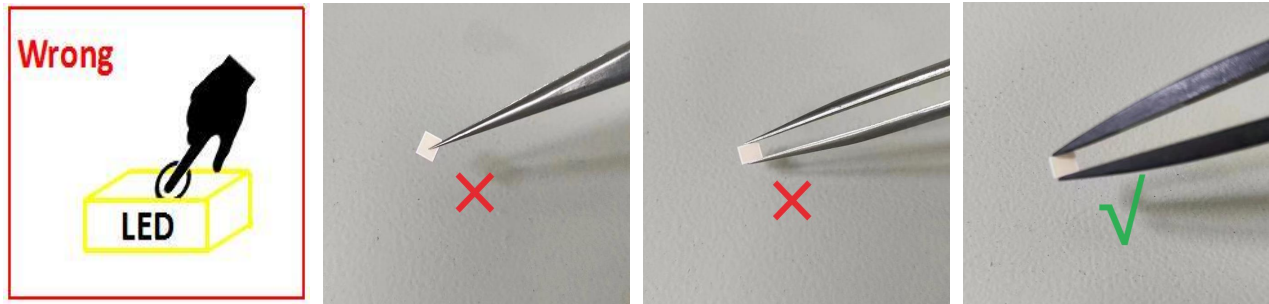
b) 清洗 Cleaning

- 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) 推荐吸嘴 Recommend Nozzle Dimensions

- 建议使用聚四氟乙烯等材料作为喷嘴，锐化钢材料拾取工具不建议使用
Recommend using Teflon material for the nozzle, sharpen steel material pick up tools are refused.

d) 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	版本号	变更内容
01	2022.11.15	吴政	A00	新制定
02	2023.04.12	赵德志	A01	增加第七位编码
03	2023.08.27	赵德志	A01	更新亮度档
04	2024.03.05	赵德志	A02	图表更新