

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:	<u>Chip Scale Package</u>
产品型号 Product P/N:	<u>CSP2323</u>
客 户 Client name:	<u>XX</u>
客户料号 Client P/N:	<u></u>
版 本 号 Version No.:	<u>V1.1</u>
日 期 Sending Date:	<u>2022.05.27</u>



RoHS



REACH



Halogen
Free

制定 Confirmation: _____ 审核 Approval: _____

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1、特点 Features

- ◆ 小尺寸封装，高亮度，高光效

Small footprint package , High brightness ,High efficiency

- ◆ 尺寸：2.3*2.3*0.36 mm，单面发光

Size: 2.3*2.3*0.36 mm, 1-sided emitter

- ◆ 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 4000 颗/卷

Package: Max: 4000pcs /Reel



2、应用 Applications

路灯照明

Street lighting

隧道照明

Tunnel lighting

工业照明

Industrial lighting



3、性能 Performance

a) 绝对最大额定值 Absolute Maximum Ratings

表 1. 产品 CSP2323 绝对最大额定参数

Table 1. Absolute maximum ratings for CSP2323

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	1400	mA
功率 Power Dissipation	P	4.5	W
脉冲电流 Pulsed(Flash Mode) Forward Current	I_{FP}	2000	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}	-40~100	°C
存储温度 Storage Temperature	T_{stg}	-40~125	°C
ESD (人体模式) ESD Human Body Mode	----	2000	V

备注:

Notes :

◇ 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.

◇ I_{FP} 脉冲时间 $\leq 10ms$, 宽度 $\leq 10\%$

I_{FP} Conditions with pulse width $\leq 10ms$ and duty cycle $\leq 10\%$

b) 光电参数

Electo-Optical Characteristics

表 2. 产品 CSP2323 光电性能

Table 2. Electo-Optical Characteristics for CSP2323 at 700mA, Tj =85°C

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	200	----	370	Lm
正向电压 Forward Voltage	VF	2.65	2.85	3.0	V
色温 CCT	----	2700	----	6500	K
显指 Ra	----	70	----	90	----
发光角度 Viewing Angle	θ	----	120	----	°

备注:

Notes :

- ◇ 亮度测试允许最大误差范围: $\pm 7\%$

LP maintains a tolerance of $\pm 7\%$ on luminous flux measurements.

- ◇ 电压测试允许最大误差范围: 0.1V

LP maintains a tolerance of $\pm 0.1V$ 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.

- ◇ 发光角度的测试, 是在捕获 90% 的光通量的基础上测量的结果

Total angle at which 90% of total luminous flux is captured.

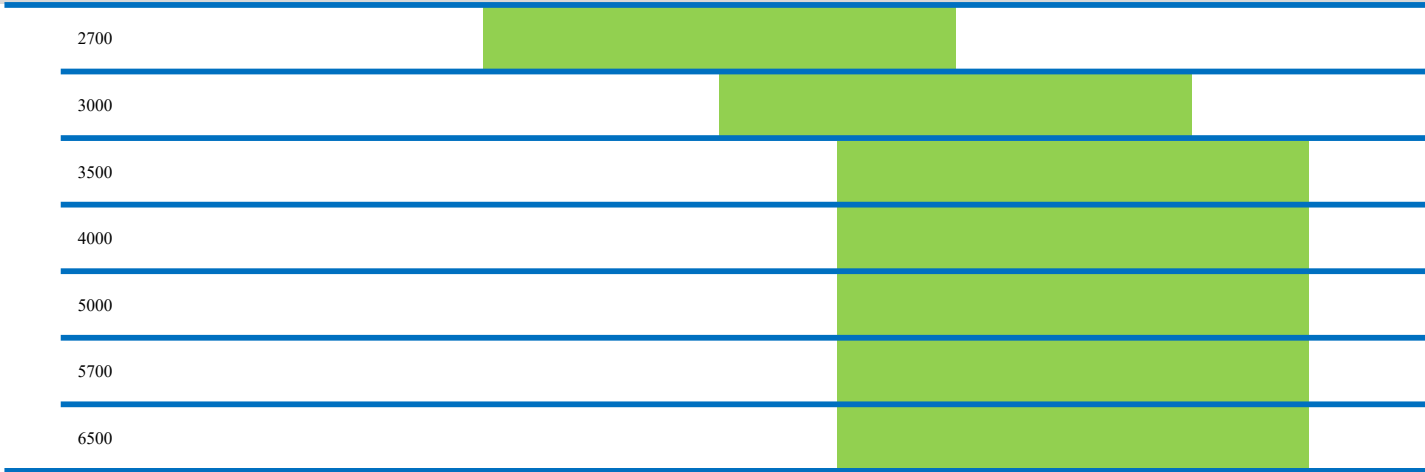
c) 亮度分布特性

Luminous Flux Characteristics

表 3. 产品 CSP2323 亮度分布

Table 3. Product performance of CSP 2323 at 700mA, T_j = 85° C.

CR	CCT	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	LA													
I	(K)	240	250	250	260	260	270	270	280	280	290	290	300	300	310	310	320	320	330	330	340	340	350		
70	2200	█																							
	2700				█																				
	3000						█																		
	3500							█																	
	4000								█																
	5000								█																
	5700								█																
	6500								█																
CR	CCT	LM	LN	LP	LQ	LR	LS	LT	LU	LV	LW	LX													
I	(K)	210	220	220	230	230	240	240	250	250	260	260	270	270	280	280	290	290	300	300	310	310	320		
80	2200		█																						
	2700			█																					
	3000				█																				
	3500						█																		
	4000							█																	
	5000							█																	
	5700							█																	
	6500							█																	
CR	CCT	LH	LJ	LK	LL	LM	LN	LP	LQ	LR	LS	LT													
I	(K)	170	180	180	190	190	200	200	210	210	220	220	230	230	240	240	250	250	260	260	270	270	280		
90	2200	█																							



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4. 产品代码 Product Order Code

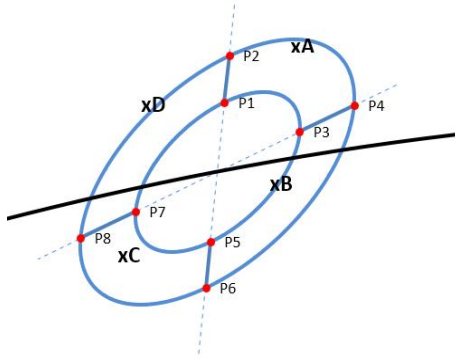
23 - 83 - LW - 70 - LX
 ① ② ③ ④ ⑤

- ① 产品型号 Product Type (Example:23 means CSP size = 2.3 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: LS=260 to 270 lm, LT=270 to 280lm)
- ④ 显色指数 Ra Level (Example:70 means Ra≥70)
- ⑤ 电压等级 VF Level (Example: X=2.65 to 2.80V, Y=2.80 to 3.00V)

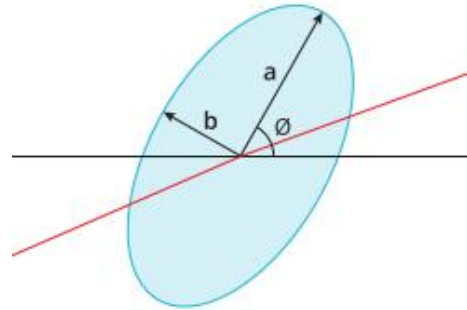
CRI	CCT	Colour Area
70	6500K	13、15
	5700K	23、25
	5000K	33、35
	4000K	53、55
	3500K	63、65
	3000K	73、75
	2700K	83、85
	2200k	A3、A5
80/90	6500K	13、1A、1B、1C、1D
	5700K	23、2A、2B、2C、2D
	5000K	33、3A、3B、3C、3D
	4000K	53、5A、5B、5C、5D
	3500K	63、6A、6B、6C、6D
	3000K	73、7A、7B、7C、7D
	2700K	83、8A、8B、8C、8D
	2200K	A3、AA、AB、AC、AD

5. 分档规则 Bin Regulations

a) 色度区域 Chromaticity Regions



图片 1. 产品 CSP2323 的色区块定义
Figure 1. Color space definition for CSP2323.



图片 2. 关于 3 步、5 步麦克亚当椭圆的说明
Figure 2. 3- and 5-step MacAdam ellipse illustration for Table 4

表 4. 产品 CSP2323 3 步&5 步麦克亚当椭圆色块定义
Table 4. 3- and 5-step MacAdam ellipse color bin definitions for CSP2323.

CCT (K)	色区块 COLOR APACE	中心点 CENTER POINT	a MAJOR AXIS	b MAJOR AXIS	θ ANGLE
2200	Single 3-step Mac ellipse	(0.5018, 0.4153)	0.008625	0.003975	49.27°
	Single 5-step Mac ellipse		0.014375	0.006625	
2700	Single 3-step Mac ellipse	(0.4578, 0.4101)	0.008100	0.004200	53.70°
	Single 5-step Mac ellipse		0.013500	0.007000	
3000	Single 3-step Mac ellipse	(0.4338, 0.4030)	0.008340	0.004080	53.22°
	Single 5-step Mac ellipse		0.013900	0.006800	
3500	Single 3-step Mac ellipse	(0.4073, 0.3917)	0.00927	0.00414	54°
	Single 5-step Mac ellipse		0.01545	0.0069	
4000	Single 3-step Mac ellipse	(0.3818, 0.3797)	0.009390	0.004020	53.72°
	Single 5-step Mac ellipse		0.015650	0.006700	
5000	Single 3-step Mac ellipse	(0.3447, 0.3553)	0.008220	0.003540	59.62°
	Single 5-step Mac ellipse		0.013700	0.005900	
5700	Single 3-step Mac ellipse	(0.3287, 0.3417)	0.007455	0.003195	59.09°
	Single 5-step Mac ellipse		0.012425	0.005325	
6500	Single 3-step Mac ellipse	(0.3123, 0.3282)	0.006690	0.002850	58.57°
	Single 5-step Mac ellipse		0.001150	0.004750	

备注

Notes :

◇ 色度坐标来自 CIE1931 色度图，测试误差 C_x 、 C_y 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 ($T_j=85^{\circ}\text{C}$, $I_F=700\text{ mA}$)

表 5. 产品 CSP2323 亮度分 BIN 定义

Table 5. Luminous flux bin definitions for CSP2323, $T_j=85^{\circ}\text{C}$

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
70/80/90	2700K~6500K	LH	170 180
		LJ	180 190
		LK	190 200
		LL	200 210
		LM	210 220
		LN	220 230
		LP	230 240
		LQ	240 250
		LR	250 260
		LS	260 270
		LT	270 280
		LU	280 290
		LV	290 300
		LW	300 310
		LX	310 320
		LY	320 330
		LZ	330 340
		LA	340 350
		LB	350 360
		LC	360 370

备注

Notes :

◇ 亮度测试允许最大误差范围： $\pm 7\%$

It maintains a tolerance of $\pm 7\%$ on luminous flux measurements

c) 电压分档

Voltage Groups

代码 Group Code	范围 Range
LX	2.65-2.8
LY	2.8-3.0

备注

Notes :

✧ 电压测试允许最大误差范围: $\pm 0.1V$

LP maintains a tolerance of $\pm 0.1V$ on forward voltage measurements

d) 显指分档 Ra Groups

代码 Group Code	范围 Range
70	70~100
80	80~100
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

6、光电特性图

The Photoelectric Characteristics Graph (Ta= 25 °C)

a) Spectral Power Distribution Characteristics

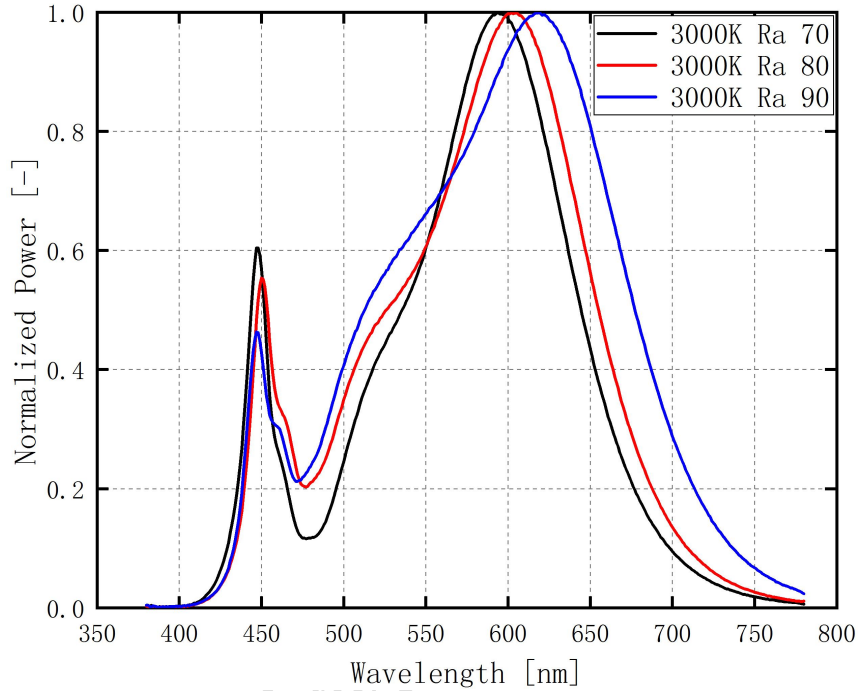


图3. 产品 CSP2323 光谱

Figure 3. Typical normalized power vs. wavelength for CSP2323 at 700mA, Tj =85°C.

b) Light Output Characteristics

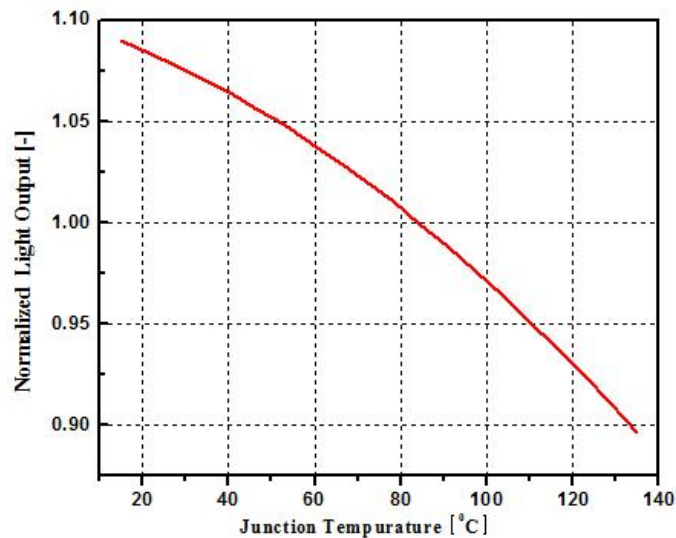


图4. 产品 2323 亮度-结温关系

Figure 4. Typical normalized light output vs. junction temperature for CSP 2323 at 700mA, Tj =85°C.

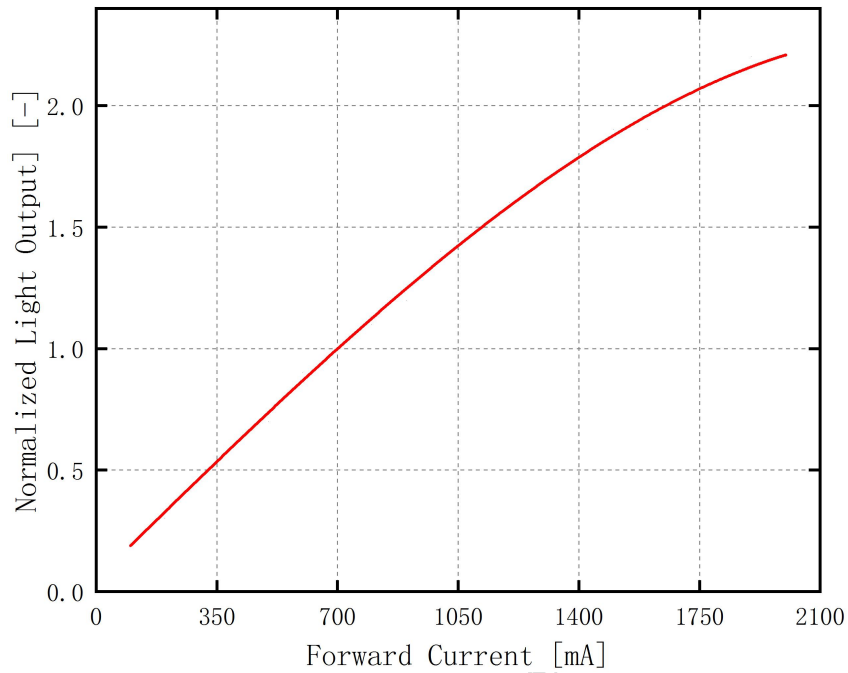


图 5. 产品 CSP2323 电流-亮度关系

Figure 5. Typical normalized light output vs. forward current for CSP2323 at 700mA, $T_j = 85^\circ\text{C}$.

c) Forward Current Characteristics

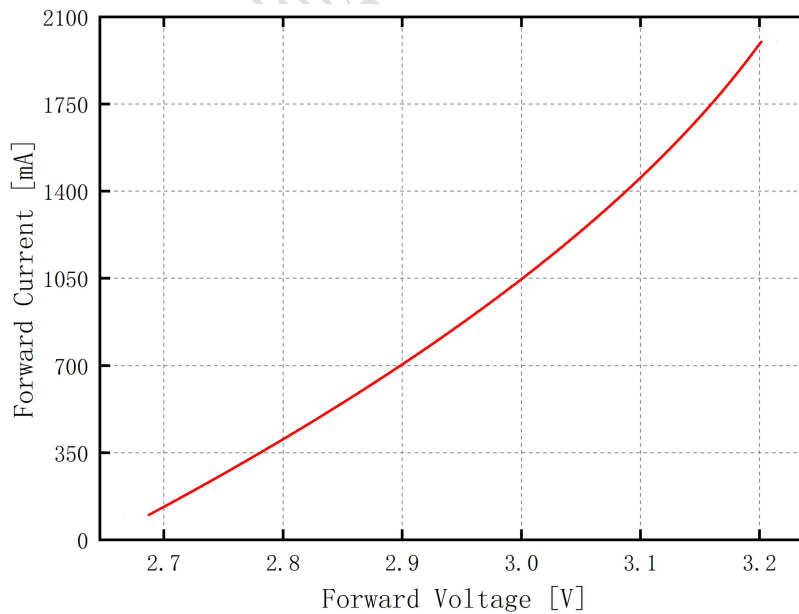


图 6. 产品电流-电压关系

Figure 6. Typical forward current vs. forward voltage for CSP2323 at $T_j = 85^\circ\text{C}$.

d) Radiation Pattern Characteristics

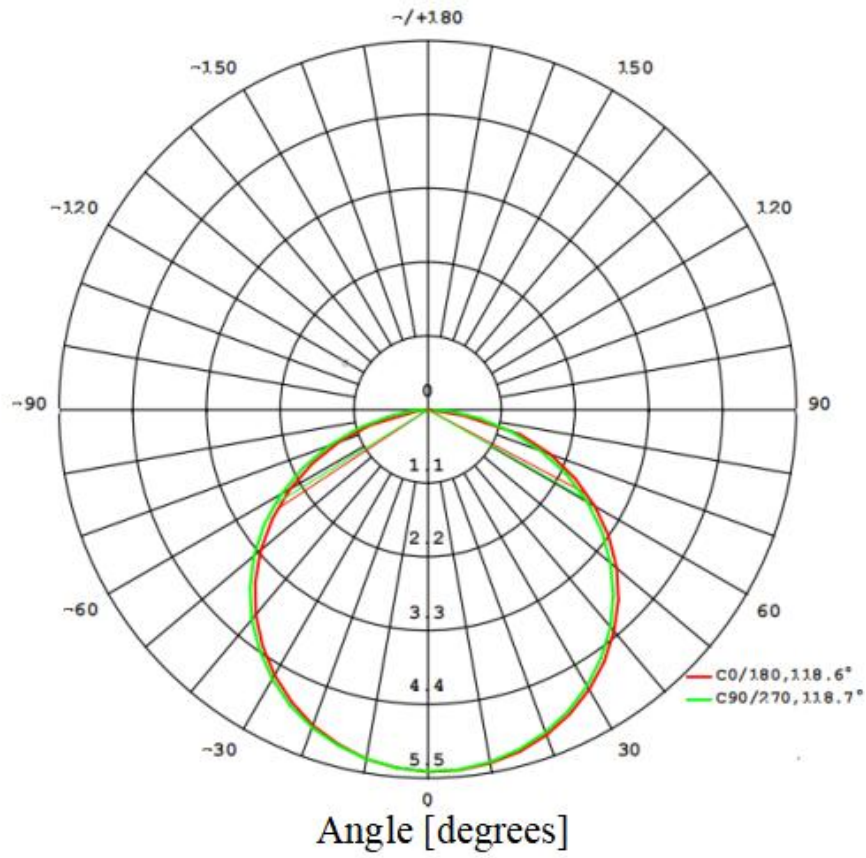
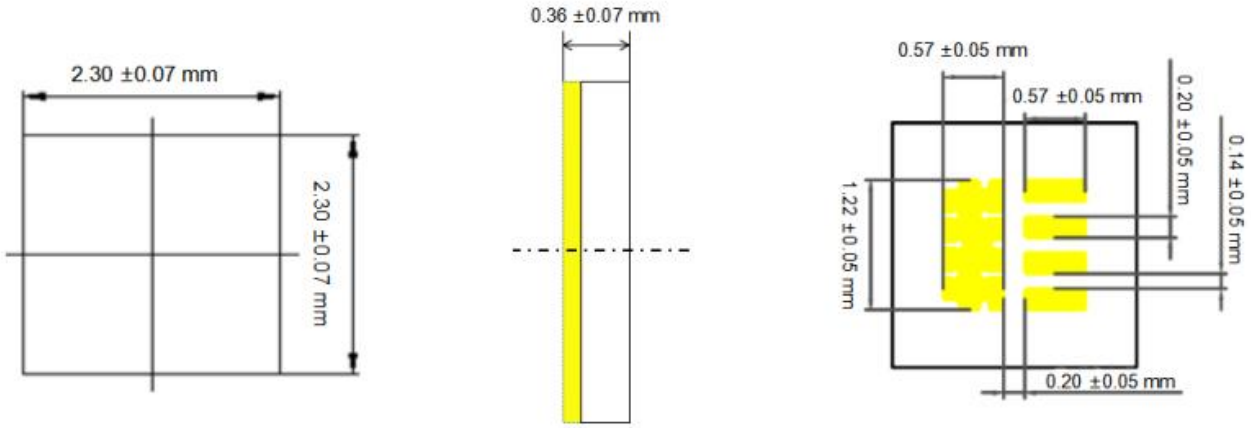


图 7. 产品 CSP2323 发光角度

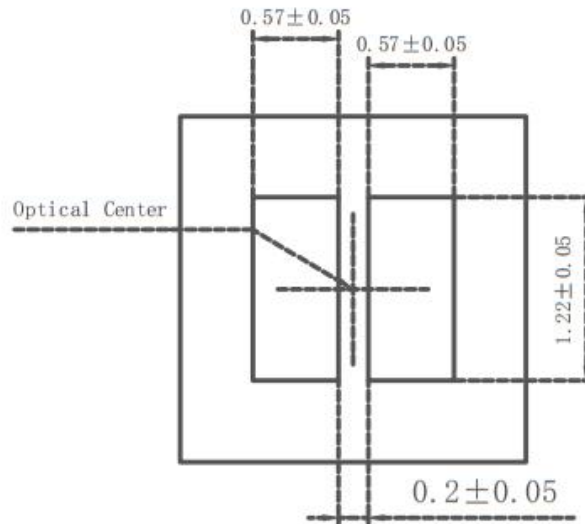
Figure 7. Typical radiation pattern for CSP2323 at 700mA, T_j = 85°C.

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

8、回流焊特性 Reflow Soldering Characteristics

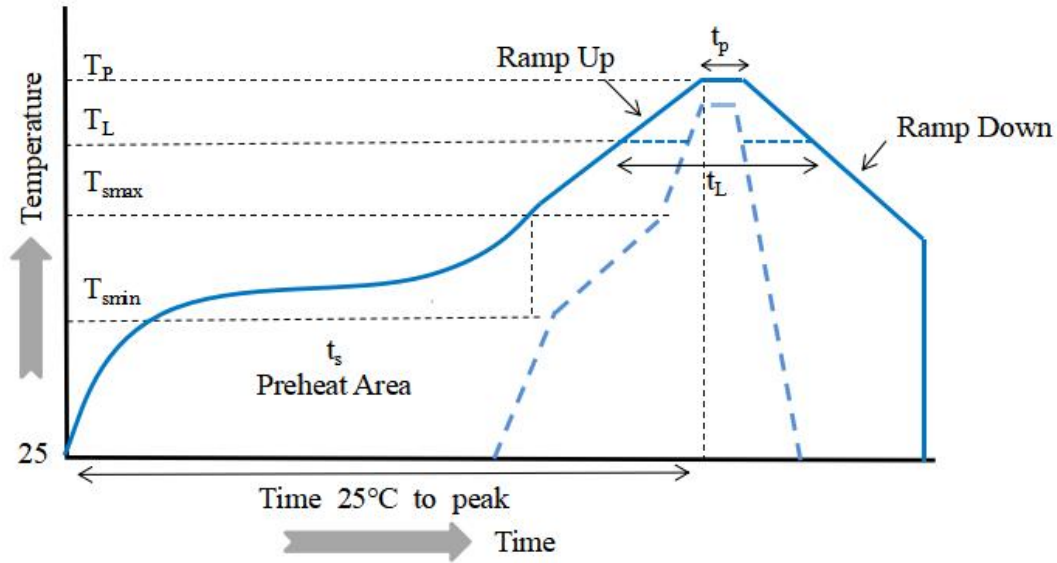


图 8. 可接受的回流温度曲线见表 6

Figure 8. Visualization of the acceptable reflow temperature profile as specified in Table 6.

表 6. 产品 CSP2323 回流焊参数

Table 6. Reflow profile characteristics for CSP2323.

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})	60-120 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)	5 secs
降低速率 Ramp-Down Rate	4°C/sec max.

9、 卷轴 Reel Dimensions

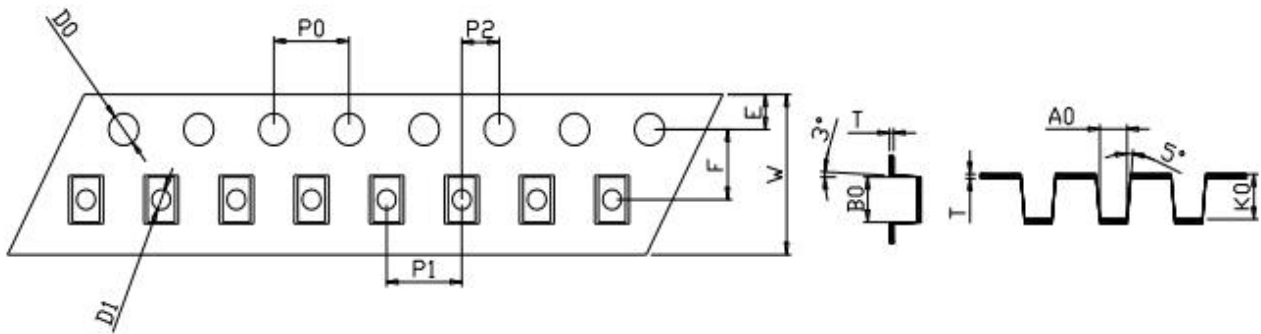


表 9. 产品 CSP2323 载带图纸

Figure 9. Pocket tape dimensions for CSP2323.

W	8.00 ± 0.05
T	0.20 ± 0.02
A0	2.50 ± 0.05
B0	2.50 ± 0.05
K0	0.55 ± 0.05
D0	1.60 ± 0.10
D1	1.10 ± 0.10
E	1.75 ± 0.10
F	3.50 ± 0.10
P0	4.00 ± 0.10
P1	4.00 ± 0.10
P2	2.00 ± 0.10
10P0	40.00 ± 0.20

Unit:mm

备注 Notes:

- ◇ 卷轴包装最大 4000pcs
Reel: max 4000pcs.
- ◇ 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

表 7. 产品 CSP2323 可靠性测试项目

Table 7. Reliability test items for CSP2323.

测试项目 Test Item	测试条件 Test Conditions	测试周期 Test Duration	失效标准 Failure Criteria#
可焊性 (回流焊) Solderability (Reflow Soldering)	$T_{sld}=255\pm 5^{\circ}\text{C}, 5\text{sec}, \text{Lead-free Solder}(\text{Sn}-3.0\text{Ag}-0.5\text{Cu})$	5times	#2
高低温循环 Temperature Cycle	$I_F=1400\text{mA},$ -40°C 30 min 90 min $\uparrow\downarrow$ 15 min 85°C 30 min	200 cycles	#1
高温/低温储存 High/Low Temperature Storage	$T_a=125^{\circ}\text{C}/T_a=-40^{\circ}\text{C}$	1000H	#1
高温老化 High Temperature Operating	$T_a=85^{\circ}\text{C}, I_F=1400\text{ mA}$	1000H	#1
高温高湿老化 Temperature Humidity Operating	$85^{\circ}\text{C}, \text{RH}=85\%, I_F=1400\text{ mA}$	1000H	#1
冷热冲击 Thermal Shock Test	-40°C 15min $\uparrow\downarrow$ 3min 125°C 15min	200 cycles	#1
静电测试 (ESD)	人体模式 (HBM): 8KV 机械模式 (MM): 400V	3 cycles	#1
气密性 Hermeticity	$T_a=80^{\circ}\text{C}, 1\text{H} (\text{Red ink})$	/	#1

b) 失效判定 Failure Criteria

表 8. 产品 CSP2323 可靠性失效判定
Table 8. Judging the damage for CSP2323.

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	> 初始值×1.1 倍 > Initial value×1.1
	光通量 Luminous Flux (Φ_v)	I_F	< 初始值×0.9 倍 < Initial value×0.9
	反向电流 Reverse Current (I_R)	$V_R=5V$	> 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。

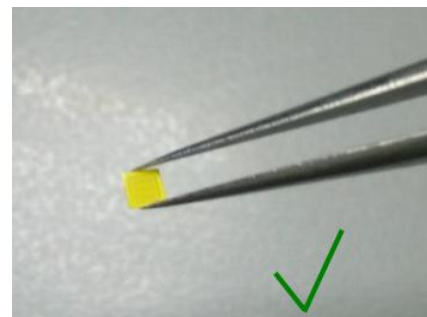
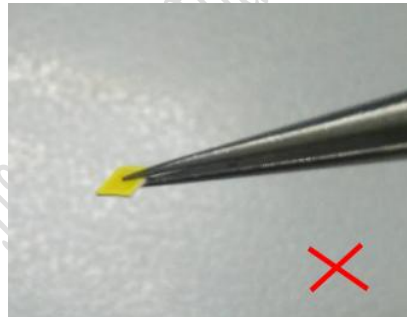
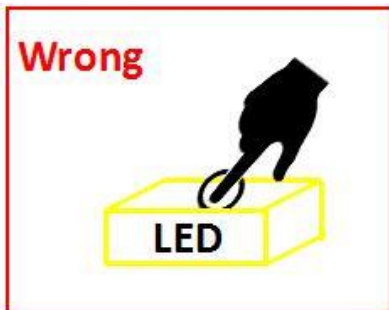
Due to the open design, all kind of cleaning liquids can infiltrate the package and cause a degradation or a complete failure of the LED.

c) 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.