

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-ABW1
客 户 Client name:	
客户料号 Client P/N:	
版 本 号 Version No.:	A01
日 期 Seeding Date:	2024.8.15



RoHS



REACH



Halogen
Free

工厂地址:江西省南昌市高新区艾溪湖北路 699 号

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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：1.05*1.05*0.28mm，单面发光
Size: 1.05*1.05*0.28mm, 1-sided emitter
- ◆ 根据白光标准分档
According to standard white color gamut
- ◆ 通过 AEC-Q102
AEC-Q102 qualified
- ◆ 适于 SMT 贴片
Compatible with SMT
- ◆ MSL 等级 3
MSL level 3
- ◆ 发光角度：115°
Viewing Angle: 115°
- ◆ 包装：最大 6000 颗/卷
Package: Max:6000pcs /reel
- ◆ 建议额定使用电流为 250mA
Recommended current 250mA



2、应用 Applications

汽车照明

Automobile 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
最小电流 Min DC Forward Current	I_F	25	mA
最大电流 Max DC Forward Current	I_F	500	mA
功率 Power Dissipation	P	1.6	W
结温 (DC 模式) LED Junction Temperature(DC mode)	T_j	135	°C
工作温度 Operating Temperature Range	T_{opr}	-40~125	°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 :

- ◇ 最大额定值环境测试温度 $T_a=25^{\circ}\text{C}$
Absolute Maximum Ratings at $T_a=25^{\circ}\text{C}$

b) 光电参数

Electro-Optical Characteristics (T solder pad =25 °C, I_F =250mA)

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	90	100	----	Lm
正向电压 Forward Voltage	V _F	2.8	3.0	3.4	V
色坐标 Chromaticity coordinates	C _x C _y	----	0.323 0.335	----	----
实际热阻 PN/焊点 Real Thermal Resistance (Junction to Case point)	R _{thJC} real	----	4.3	6.5	°C/W
电热阻 PN/焊点 Electrical Thermal Resistance (Junction to Case point)	R _{thJC} elec.	----	2.8	4.6	°C/W
发光角度 Viewing Angle	2θ _{1/2}	----	115	----	°

备注 Notes :

- 光通量误差: ±7%
Luminous flux measurement tolerance: ±7%
- 正向电压测量公差: ±0.1V
Forward voltage measurement tolerance: ±0.1V
- R_a 测量公差: ±2
R_a measurement tolerance: ±2 .
- LP 在 CIE 1931 颜色空间中的 x 和 y 坐标上保持 ±0.006 的公差。
LP maintains a tolerance of ±0.006 on x and y coordinates in the CIE 1931 color space.
- 在 20ms 脉冲条件下测试电气和光学数据
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 =250mA)

产品型号 Product	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	
CSP1111	5400~5850	CW	X2	90	11-CW-X3-00-B3-BD
			X3	100	
			X4	110	
			X5	120	
	5600~6100	CX	X2	90	11-CX-X3-00-B3-BD
			X3	100	
			X4	110	
			X5	120	
	5850~6350	CY	X2	90	11-CY-X3-00-B3-BD
			X3	100	
			X4	110	
			X5	120	
	6100~6650	CZ	X2	90	11-CZ-X3-00-B3-BD
			X3	100	
			X4	110	
			X5	120	

4、产品代码 Product Code

11 - CX - X3 - 00 - B3 - BD
① ② ③ ④ ⑤ ⑥

- ① 产品型号 Product Type
- ② 色温区块 Colour Area
- ③ 亮度等级 Brightness Level
- ④ 显色指数 Ra level
- ⑤ 电压等级 VF Level
- ⑥ 内部波长代码（不影响其他参数，不用参考）

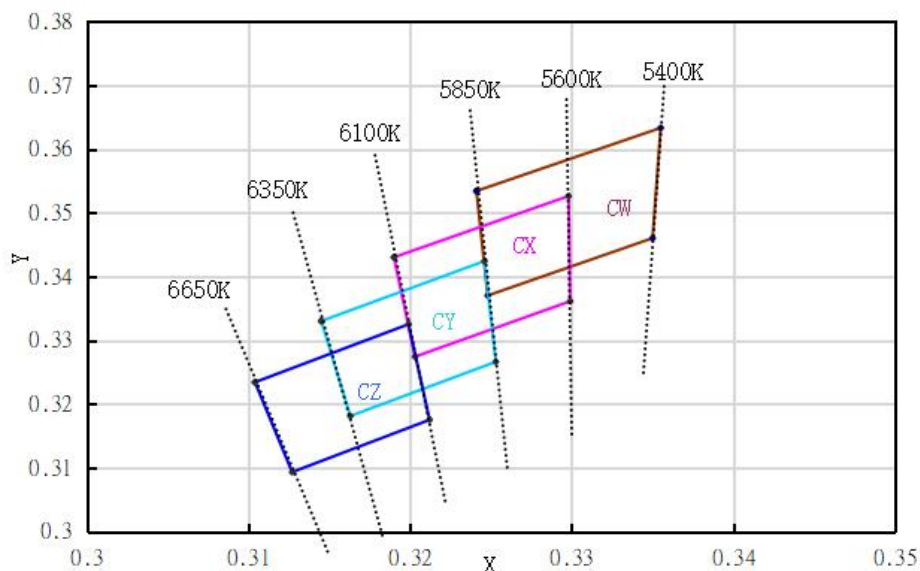
Internal Wavelength Code (Do not affect other parameters)

出货标签(例) Shipping label (e.g.)



5、分档规则 Bin Regulations

a) 色块区域 Chromaticity Regions



Series Color Chromaticity Groups

系列色温分组

Color Bin 色温 Bin	x	y	Color Bin 色温 Bin	x	y
CW 5400K~5850K	0.3241	0.3534	CY 5850K~6350K	0.3145	0.3330
	0.3248	0.3370		0.3163	0.3181
	0.3350	0.3460		0.3246	0.3424
	0.3355	0.3633		0.3253	0.3266
CX 5600K~6100K	0.3190	0.3430	CZ 6100K~6650K	0.3104	0.3234
	0.3203	0.3274		0.3127	0.3093
	0.3298	0.3526		0.3199	0.3325
	0.3299	0.3361		0.3212	0.3175

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

◇ 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 = 250mA)

代码 Group Code	最小值 Min.	最大值 Max.
X2	90	100
X3	100	110
X4	110	120
X5	120	130

c) 电压分档 Voltage Groups

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

d) 显指分档 Ra Groups

代码 Group Code	范围 Range
00	00~100

6、光电热特性图

The Photoelectric and Thermal Characteristics Graph ($T_a = 25^\circ\text{C}$)

Fig 1. 相对发光光谱/ Relative Spectral Power Distribution vs. Wavelength

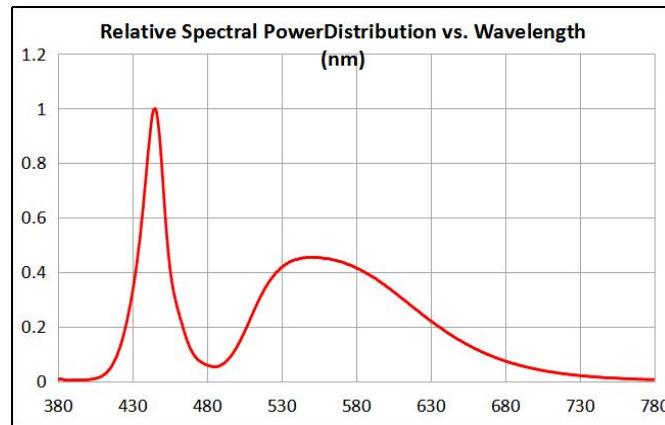


Fig 2. 辐射特性 / Radiation Characteristics

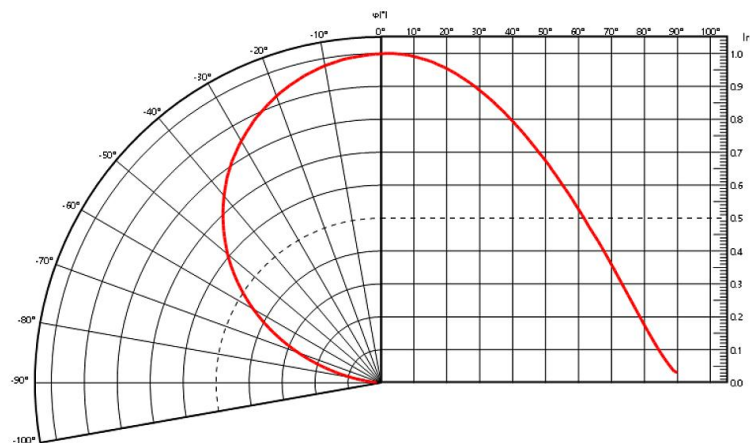


Fig 3. 最大正向电流 / Max. Permissible Forward Current

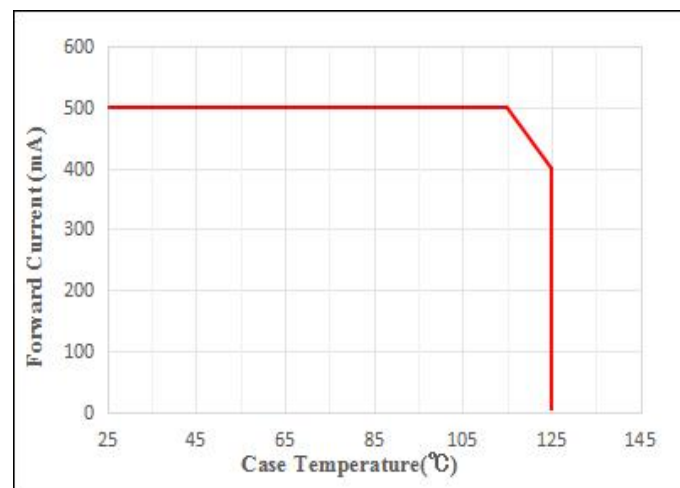


Fig 3. 正向电流 $T_j=25^\circ\text{C}$
Forward Voltage

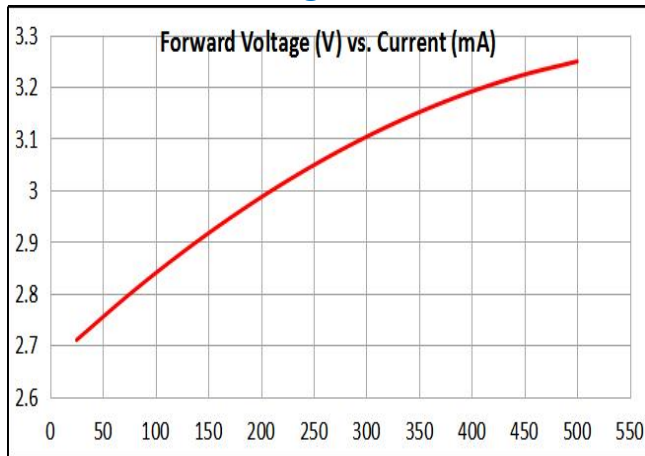


Fig 4. 正向电流/ $V_f(T_j)-V_f(25^\circ\text{C})$
Forward Voltage

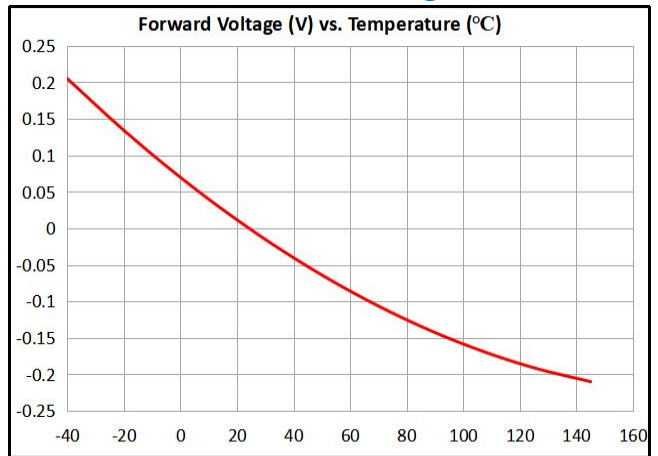


Fig 5. 相对发光强度 $T_j=25^\circ\text{C}$
Relative Luminous Intensity

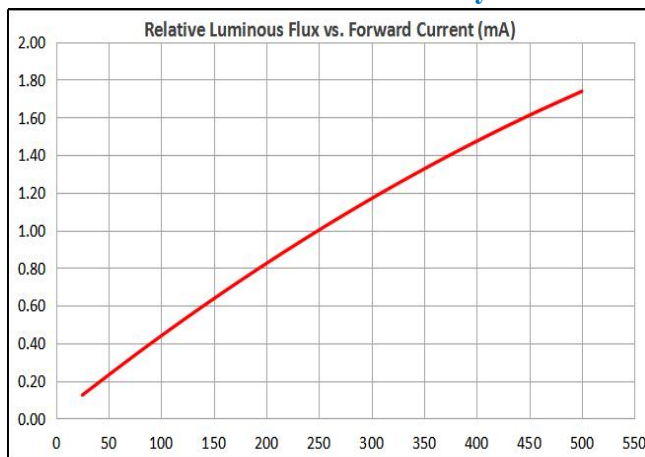


Fig 6. 相对发光强度/ $I_v(T_j)/I_v(25^\circ\text{C})$
Relative Luminous Intensity

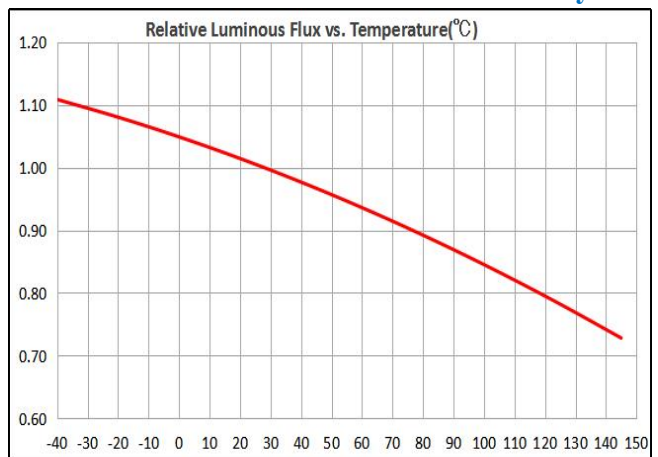


Fig7. 色坐标偏移 $T_j=25^\circ\text{C}$
Chromaticity Coordinate Shift

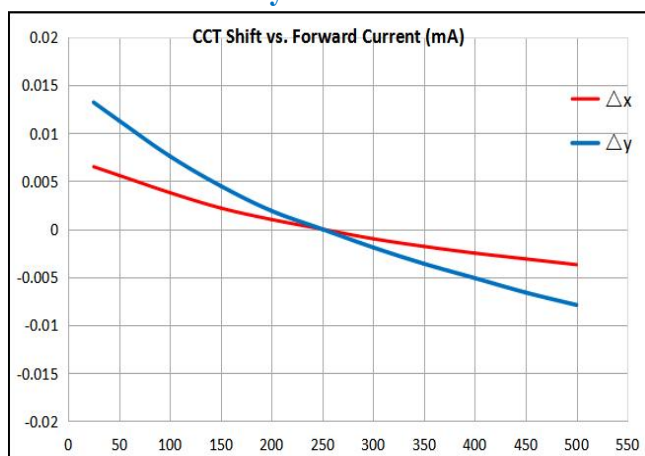
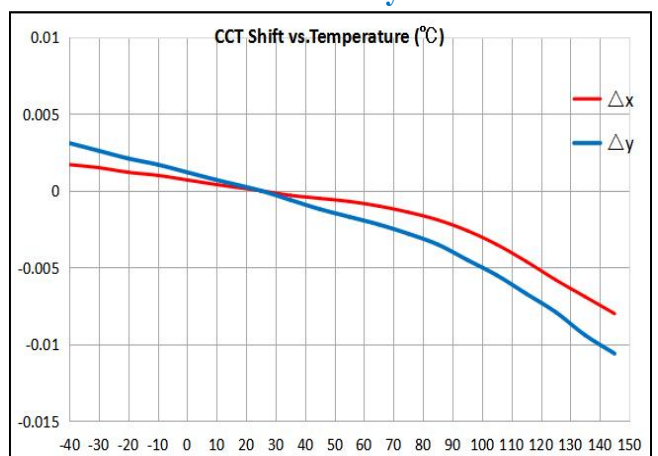
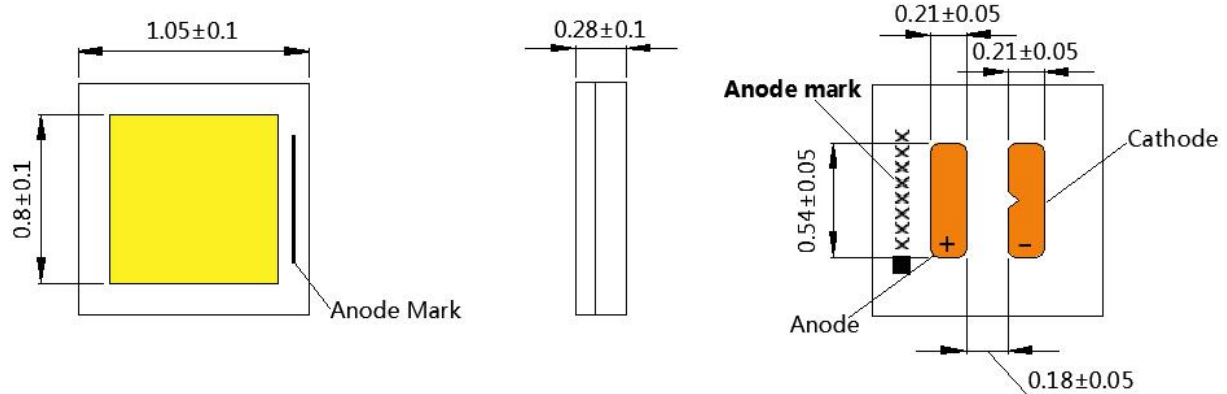


Fig 8. 色坐标偏移
Chromaticity Coordinate Shift

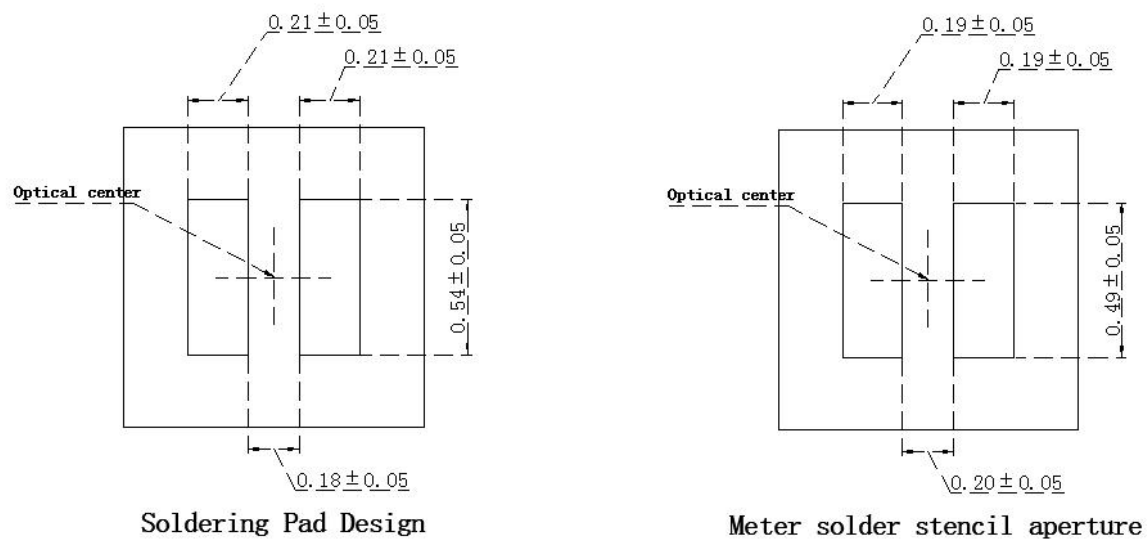


7、产品及钢网尺寸 Product and PCB Pad Dimensions

Product Dimensions:



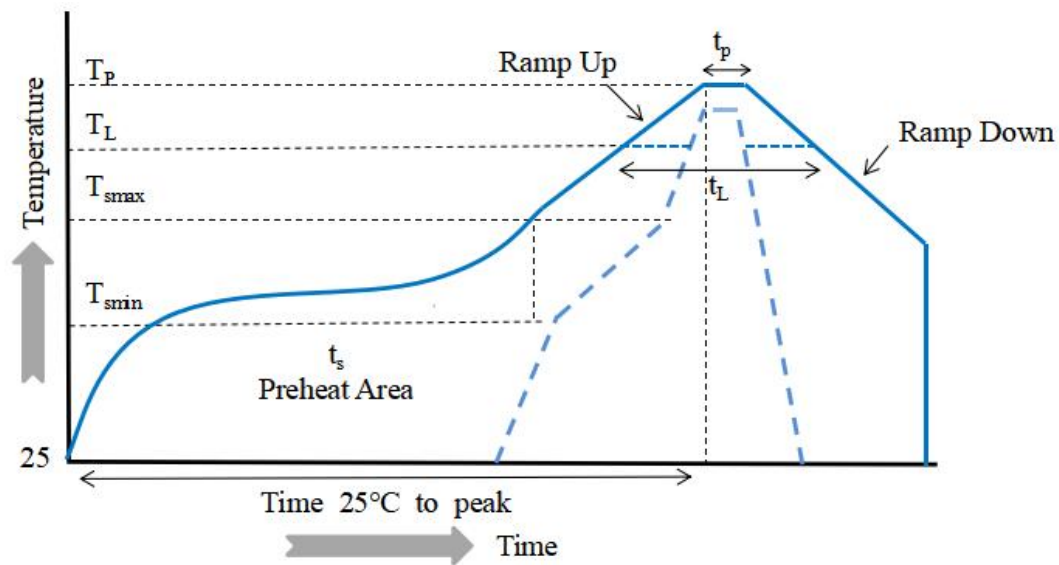
PCB Pad Dimensions:



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 ± 0.1 mm 标记的, 按照图纸标记
Size is not marked in accordance with tolerance ± 0.1 mm and dimension tolerances in accordance with drawings

8、回流焊特性 Reflow Soldering Characteristics

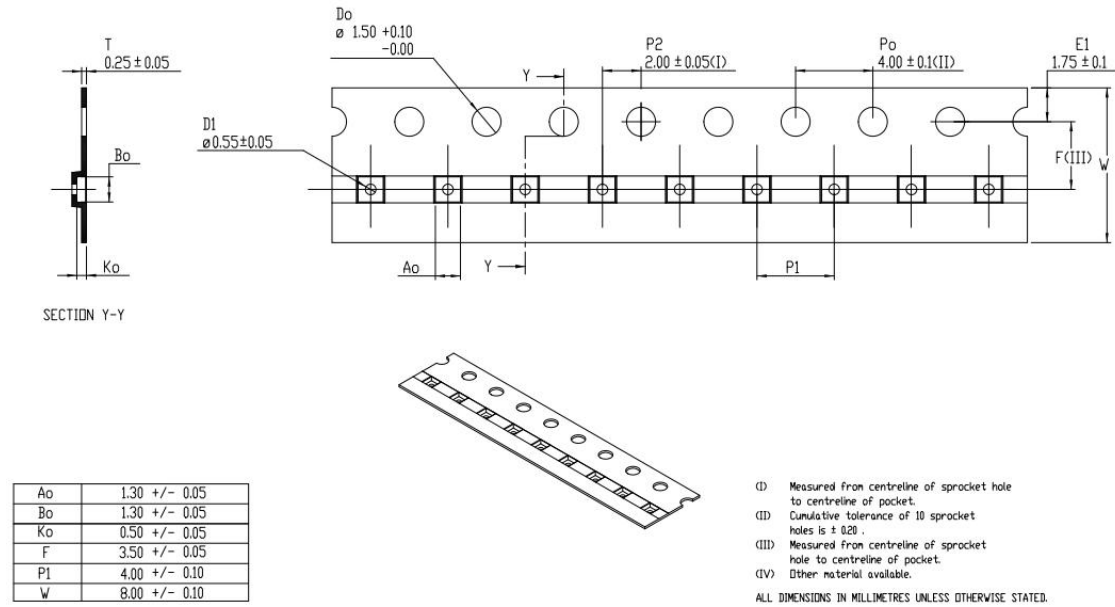


根据 EDEC-J-STD-020D 内容，参考以下内容

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



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

测试项目 Test Item	标准 Reference Standard	测试条件 Test Conditions	测试周期 Test Duration
预处理 Pre-conditioning	JEDEC JESD22-A113	Ta=125°C 24H Ta=30°C, RH=60% 192H Tsld=255±5°C, 5sec, Lead-free Solder (Sn-3.0Ag-0.5Cu) 3cycles	1time
高温高湿寿命 Wet High Temperature Operating Life	JEDEC JESD22-A101	Ta=85°C, RH=85%, If=500mA 30mins ON/30mins OFF	1000H
高温高湿寿命 Wet High Temperature Operating Life	JEDEC JESD22-A101	Ta=85°C, RH=85%, If=25mA	1000H
功率温度循环 Power Temperature Cycling	JEDEC JESD22-A105	If=500mA on/off=5min Ta:-40°C~85°C Dwell time 10min Transfer time 20min	1000cycles
温度循环 Temperature Cycling	JEDEC JESD22-A104	Ta:-40°C(15mins)~125°C(15mins)	1000cycles
高温工作寿命 High Temperature Operating Life	JEDEC JESD22-A108	Tj=135°C, If=500mA	1000H
高温工作寿命 High Temperature Operating Life	JEDEC JESD22-A108	Tj=135°C, If=700mA	1000H
脉冲寿命 Pulsed Life	JEDEC JESD22-A108	If=700mA, PW=100 μs, DC=3%	1000H
凝露 Dew	AEC-Q102-001	If=25mA	65H
可焊性 Solderability	JEDEC J-STD-002	Preconditioning: 155°C for 4H Reflow: 250°C, 30~60s	1 time
硫化氢腐蚀 Hydrogen Sulphide	IEC 60068-2-43	CLASS A: 15ppm, Ta=40°C, RH=90%,	336H

测试项目 Test Item	标准 Reference Standard	测试条件 Test Conditions	测试周期 Test Duration
混合气体腐蚀 Flowing Mixed Gas	IEC 60068-2-60 Test method 4	H2S:10ppb, SO2:200ppb NO2:200ppb, Cl2:10ppb Ta=25°C, RH=75%, Probe Radius 340mm, Support span 90mm, Speed 1 mm/s, Deflection 2mm for 60 sec. Power supply:If=25mA	500H
板弯曲 Board Flex	AEC-Q102-002		1 time
抗静电人体模式 Electrostatic Discharge Human Body Model	ANSI/ESDA/JEDEC JS-001	2000V	1 time
振动测试 Vibration Variable Frequency	JEDEC JESD22-B103 Condition 1	20~2000~20Hz, 4cycles,4min, each X,Y,Z	1 time
机械冲击 Mechanical Shock	JEDEC JESD22-B110	PW=0.5ms,a=1500g 5cycles each X,Y,Z	1 time

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	> 初始值×1.1 倍或 < 初始值×0.9 倍 > Initial value×1.1 or < Initial value×0.9
#2	光通量 Luminous Flux (Φ_v)	I_F	< 初始值×0.9 倍 < Initial value×0.9
#3	色度坐标 Chromaticity coordinates (C_x, C_y)	I_F	> 初始值+0.01 或 < 初始值-0.01 > Initial value+0.01 or < Initial value-0.01

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。

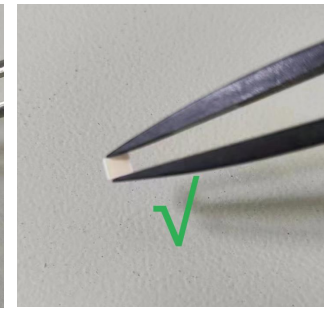
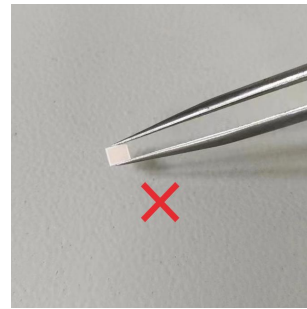
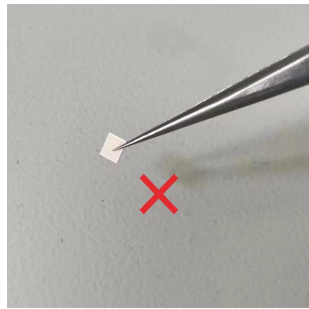
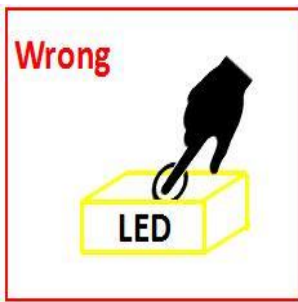
Due to the open design, all kind of cleaning liquids can infiltrate the package and cause a degradation or a complete failure of the LED.

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



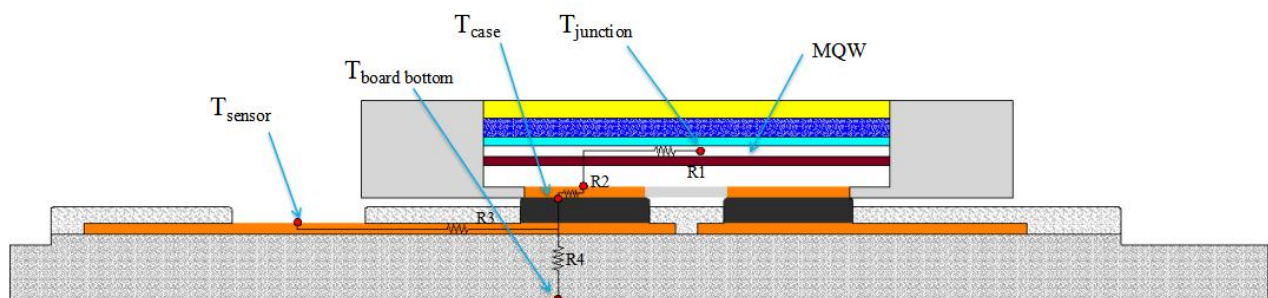
- 在处理过程中，还应注意确保组件顶面没有压力

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、 R_{TH} 结构示意图 Structural schematic diagram of R_{TH}



$T_{junction}$ =LED junction temperature

T_{case} =Solder pad case temperature

T_{sensor} =Temperature at thermo sensor location (not solder location)

$$R_{th_{j-c}} = R1 + R2$$

$$R_{th_{c-s}} = R3$$

$$R_{th_{c-b}} = R4$$

13、变更履历 Document Resume

NO.	Update Date	Person	Version	Content
1	2024.08.15	Li Rong xiang	A01	New Version