



洲光源
CHAULIGHT

产品规格书 SPECIFICATION

客户名称: _____

Customer Name

产品类型: _____ 对射式光电开关

Product Name

产品型号: _____ ZOS-T1405-B02-S38

Part No.

☐ 技术参考 Technical Reference		☐ 样品 Sample		☐ 量产供货 Mass Product	
客户审核（加盖公章） Client approval（Stamp）		洲光源审核 Chaulight approval			
核准Approval	确认Checked	核准Approval	确认Checked	制作Edited	
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广东洲光源红外半导体有限公司
Guangdong Chaulight Infrared Semiconductor Co.,Ltd.

ZOS-T404-B02-S38 由红外发射二极管和NPN 硅光晶体管组成，它们并排封装在黑色热塑性外壳中的汇聚光轴上。光电晶体管只接收来自 IR 的辐射。这是正常情况。但当物体在中间时，光电晶体管不能接收辐射。有关更多组件信息，请参阅 IR 和 PT。

The ZOS-T1405-B02-S38 consist of an infrared emitting diode and an NPN silicon phototransistor, encased side-by-side on converging optical axis in a black thermoplastic housing. The phototransistor receives radiation from the IR only. This is the normal situation. But when an object is in between, phototransistor could not receive the radiation. For additional component information, please refer to IR and PT.



特性 Feature

- 可靠性高、辐射强度高、低电压驱动
High reliability、High radiant intensity、Low forward voltage、
- 感应速度快、感光度强
Fast response time、High photo sensitivity
- 截止感应波长 940nm
Cut-off visible wavelength $\lambda_p=940\text{nm}$
- 无铅材料、Rosh 认证
Pb.Free、RoHS compliant version

应用 Application

- 打印机、非接触开关
Printer、Non-contact Switching
- 智能电子产品
Intelligent Electronic Products
- 工业机械设备
Industrial Intelligent Equipment
- 安防防护应用
Safety Application Products

最大额定值 Absolute Maximum Ratings

测试项目	Parameter (Ta=25℃)	符合Symbol	范围 Ratings	单位 Unit
输入端发射极 Input Emitter	最大功率Power Dissipation * ¹	Pd	75	mW
	最大反向电压Reverse Voltage	V _R	5	V
	最大持续正向电流Forward Current	I _F	50	mA
	最大脉冲正向电流Peak Forward Current * ²	I _{FP}	1	A
输出端接收极 Output Detector	最大功率Power Dissipation * ¹	Pd	75	mW
	集电极-发射极电压Collector-Emitter Voltage	V _{CEO}	35	V
	发射极-集电极电压Emitter-Collector Voltage	V _{ECO}	5	V
	集电极电流Collector Current	I _{C(ON)}	20	mA
工作温度Operating Temperature		Topr	-25~+85	℃
储存温度Storage Temperature		Tstg	-40~+85	℃
焊接温度Lead Soldering Temperature * ³		Tsol	260	℃

*1、在 25 摄氏度的环境中测试 below 25 Free Air Temperature

*2、脉宽少于等于 100us, 占空比 1% Pulse width ≤ 100μs, Duty cycle= 1%

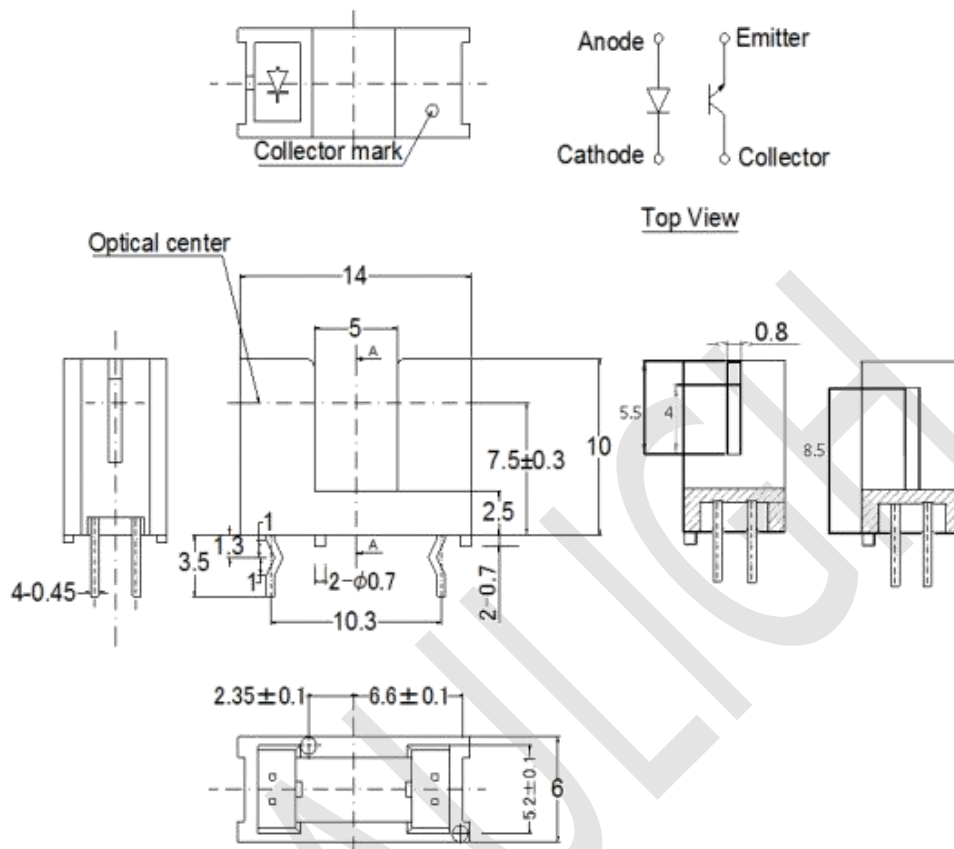
*3、离胶体 2mm 以上焊接 5s 内 2mm form body for 5 seconds

光电特性 Electro-Optical Characteristics

电性参数 (温度=25℃) Parameter (Ta=25℃)		符号 Symbol	条件 Condition	最小值 Min.	典型值 Typ.	最大值 Max.	单位 Units
输入端 Input	正向电压Forward Voltage	V _F	I _F =20mA	--	1.2	1.5	V
			IF=100mA* ²	--	1.4	1.85	
			IF=1A * ²	--	2.6	4.0	
	峰值波长Peak Wavelength	λ _p	I _F =20mA	--	940	--	nm
	反向电流Reverse Current	I _R	V _R =5V	--	--	10	μA
输出端 Output	暗电流 Dark Current	I _{CEO}	Ee=0mW/cm ² V _{CE} =20V	--	--	100	nA
	集电极-发射极的工作电压 C-E Saturation Voltage	V _{CE(SAT)}	I _C =2mA Ee=1mW/cm ²	--	--	0.4	V
转换特性 Transfer Characteristics	上升时间Rise Time	t _r	V _{CE} =5V	--	15	--	μS
	下降时间Fall Time	t _f	I _C =1mA R _L =1000Ω	--	15	--	
	光电流 Collector Current	I _{C(ON)}	IF=10mA V _{CE} =5V	1	15	25	mA

*2、脉宽少于等于 100us, 占空比 1% Pulse width ≤ 100μs, Duty cycle= 1%

产品尺寸 Package Dimension



备注Notes:

--所有尺寸为毫米标识

All dimensions are in millimeters

--未标识尺寸正负公差为 0.3mm

Tolerances unless dimensions $\pm 0.3\text{mm}$

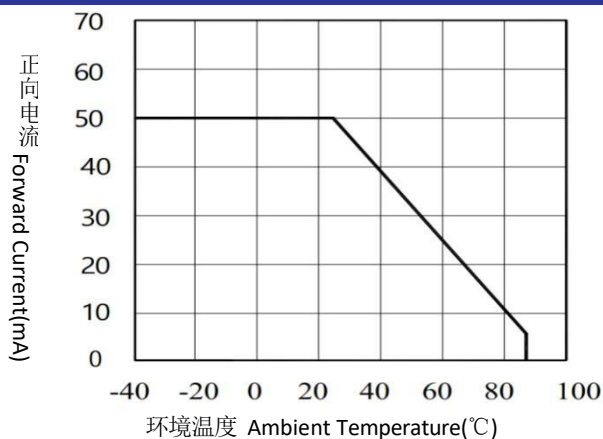
--折脚角度 $\pm 5^\circ$

Fold foot angle $\pm 5^\circ$

发射管特性曲线图 Typical Electro-Optical Characteristics Curves-IR

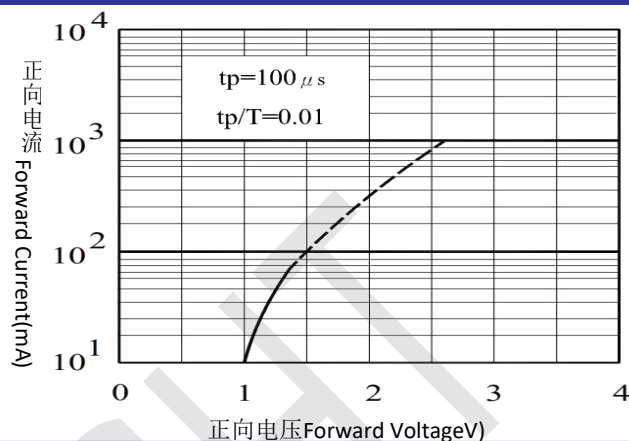
正向电流与环境温度的关系

Forward Current vs. Ambient Temperature



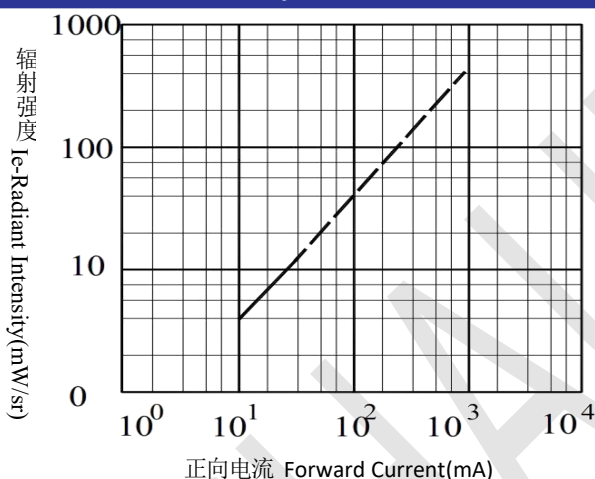
正向电流与正向电压的关系

Forward Current vs. Forward Voltage



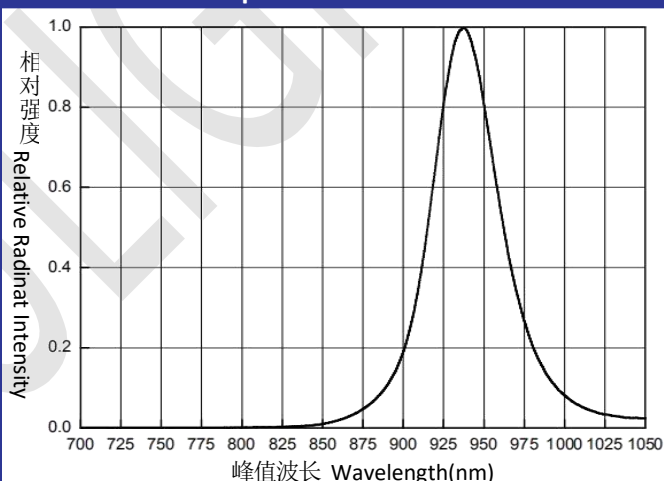
辐射强度与正向电流的关系

Radiant Intensity vs. Forward Current



波长曲线图

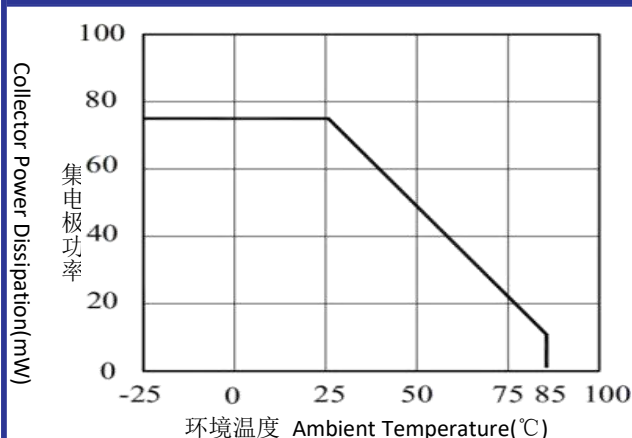
Spectral Distribution



接收管特性曲线图 Typical Electro-Optical Characteristics Curves-PT

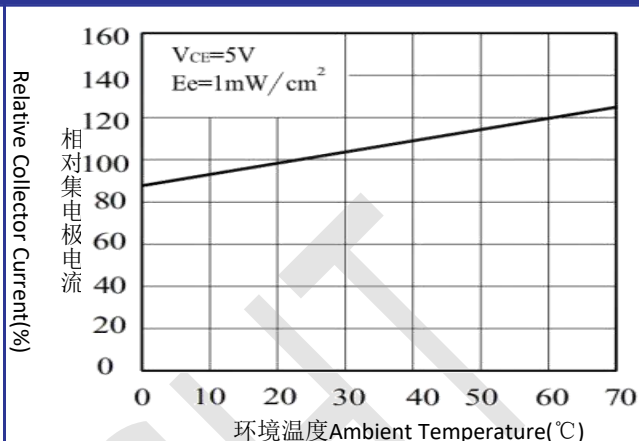
集电极功率与环境温度的关系

Collector Power Dissipation vs. Ambient Temperature



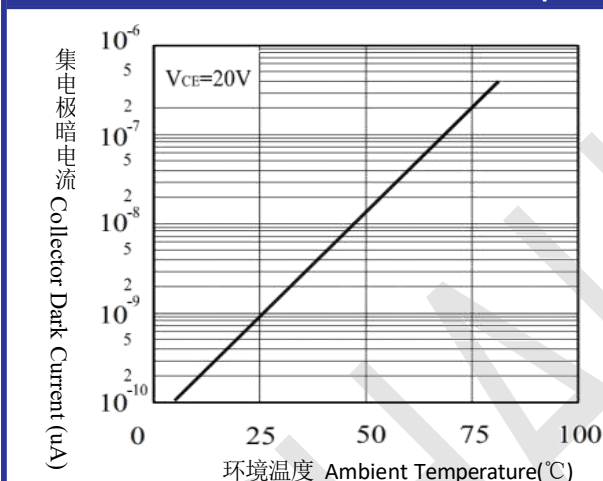
相对集电极电流与环境温度的关系

Relative Collector Current vs. Ambient Temperature



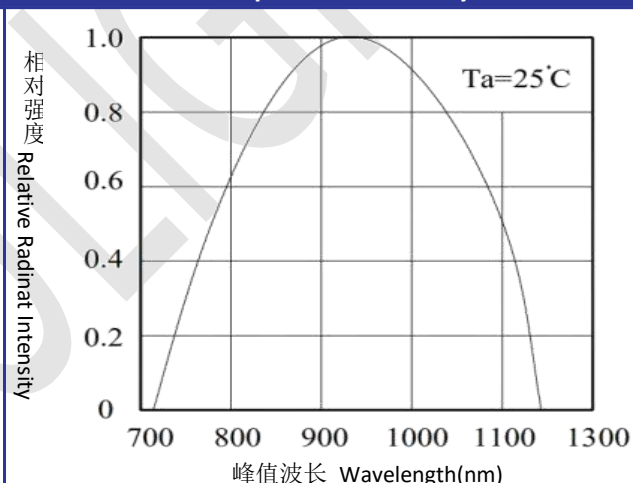
集电极暗电流与环境温度的关系

Collector Dark Current vs. Ambient Temperature



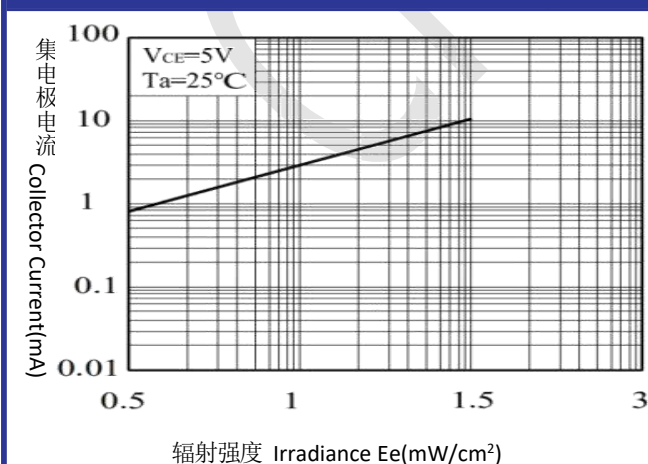
感应波长曲线图

Spectral Sensitivity



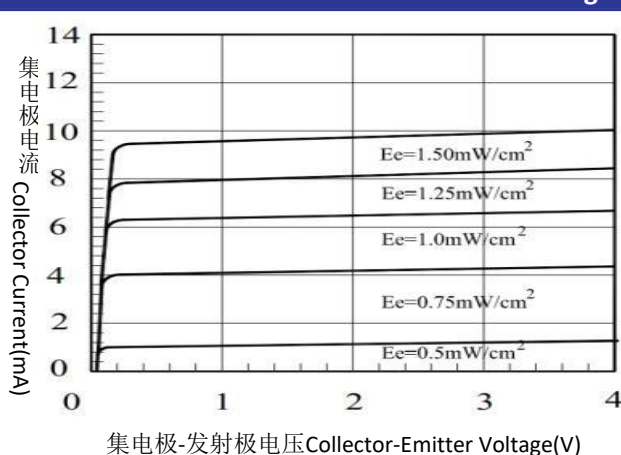
集电极电流与辐射强度的关系

Collector Current vs. Irradiance



集电极电流与集电极-发射极电压的关系

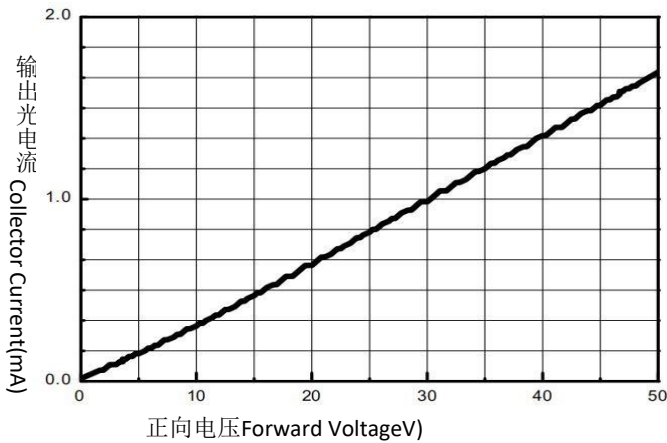
Collector Current vs. Collector-Emitter Voltage



光电开关特性曲线图 Typical Electro-Optical Characteristics Curves-ITR

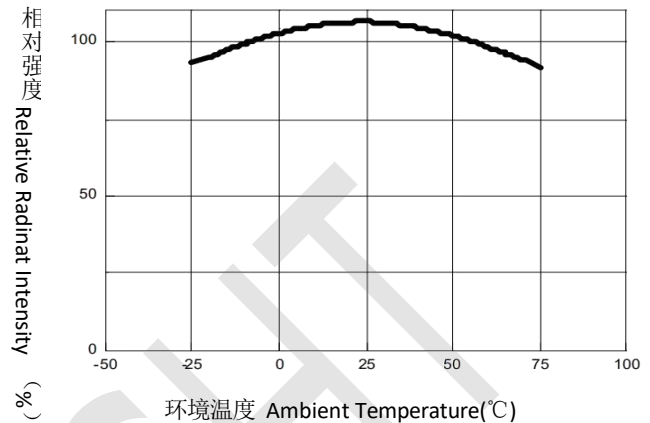
光电流与正向电压的关系

Collector Current vs. Forward Voltage



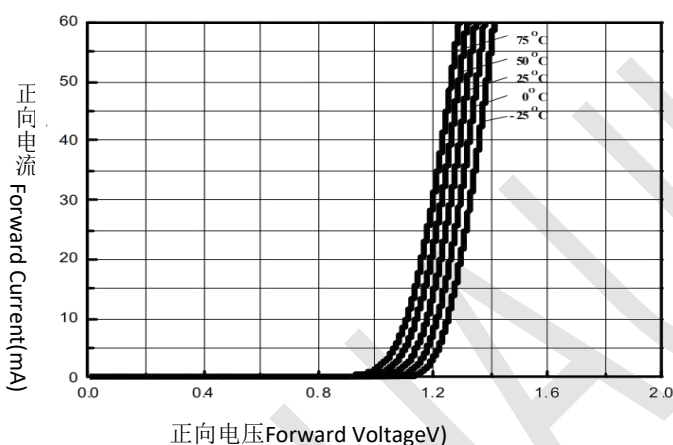
输出强度与环境温度的关系

Relative Output vs. Ambient Temperature



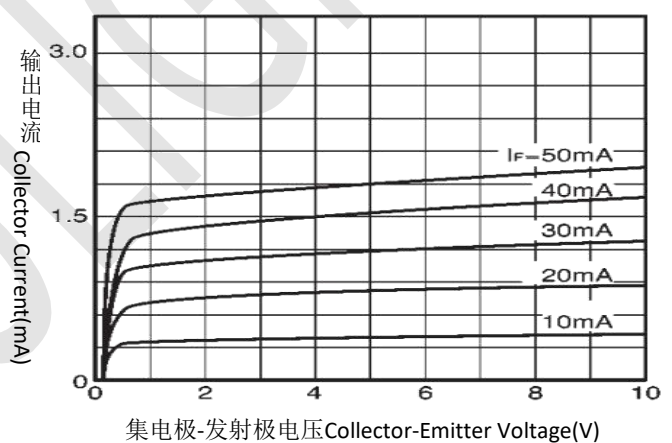
正向电流和正向电压的关系

Forward Current vs. Forward Voltage

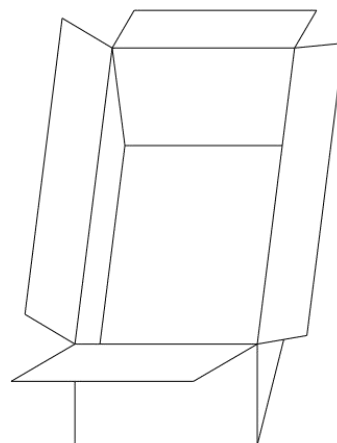
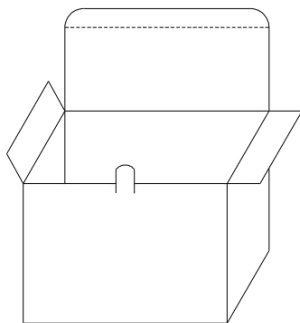


输出特性

Output Characteristics



包装规格 Packing Specification



包装管	内盒	箱
90PCS	48 管/内箱	4 内箱/外箱

注意事项 Note

--设计指南 Design Guide

1、避免检测失败 Prevention of detection error

为了防止外部光引起的光中断器故障操作，不要将检测面设置为外部光 To prevent photointerrupter from faulty operation caused by external light, do not set the detecting face to the external light.

2、检测板的位置 Position of opaque board

检测板应安装在距元件顶部 1.6mm 或以上的地方 Opaque board shall be installed at place 1.6mm or more from the top of elements.

(示例 Example)

--衰减状况 Degradation

一般情况下，光中断器中使用的 IRED 的发射会随着时间的推移而降低。在长期运行的情况下，请将一般的发射管衰减（5 年内衰减 50%）纳入设计考虑。In general, the emission of the IRED used in photointerrupter will degrade over time. In the case of long term operation, please take the general IRED degradation (50% degradation over 5 years) into the design consideration.

--开封后的储存和管理 Storage and management after open

1、储存条件 Storage condition

储存温度在 5 至 30℃，储存湿度 70%RH 或以下的常规包装 Storage temp.: 5 to 30℃, Storage humidity : 70%RH or less at regular packaging.

2、打开防潮包装后处理 Treatment after opening the moisture-proof package

打开后，您应该在 4 天内安装产品，同时保持在 5 至 25℃ 和 70%RH 或湿度较小的条件下。After opening, you should mount the products while keeping them on the condition of 5 to 25℃ and 70%RH or less in humidity within 4 days.

3、一旦打开袋子，必须按照要求进行延长储存，你也应该把产品两个星期内安装完产品。After opening the bag

once even if the prolonged storage is necessary, you should mount the products within two weeks.

4、当你储存其余的产品时，你应该把它放进一个干燥的盒子里。否则以后其余产品硅胶再次密封，你应该保持在 5 至 30°C 和 70%RH 或条件下湿度较小。And when you store the rest of products you should put into a DRY BOX. Otherwise after the rest of products and silicagel are sealed up again, you should keep them under the condition of 5 to 30°C and 70%RH or less in humidity.

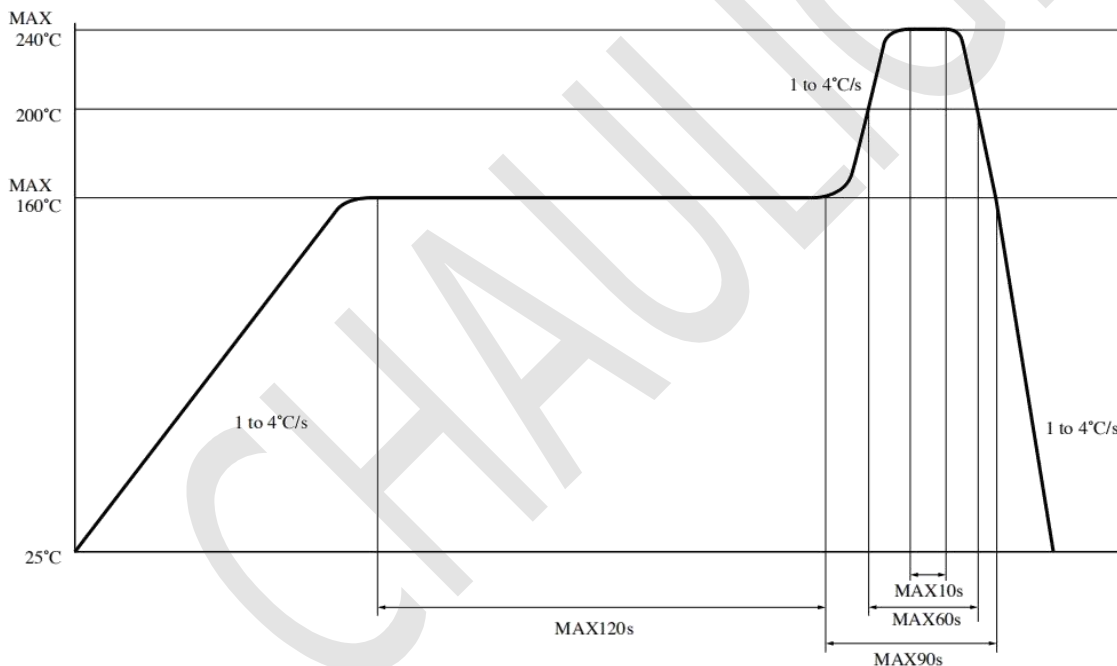
5、当上述储存方法无法执行时，请在安装产品之前进行烘焙处理。When the above-mentioned storage method could not be executed, please process the baking treatment before mounting the products.

6、然而，烘焙处理是允许在一次内。推荐条件：125°C，16 至 24 小时 However the baking treatment is permitted within one time. Recommended condition : 125°C, 16 to 24 hours

7、不要将产品包装一起加工烘焙处理。烘焙处理时，应将产品移至金属托盘或将产品临时固定在基板上。Do not process the baking treatment with the product wrapped. When the baking treatment processing, you should move the products to a metallic tray or fix temporarily the products to substrate.

--焊接方法 Soldering Method

1、回流焊接应遵循下面所示的温度剖面。焊接不应超过温度剖面 and 时间的曲线。请在一次内焊锡 Reflow soldering should follow the temperature profile shown below. Soldering should not exceed the curve of temperature profile and time. Please solder within one time.



2、当焊锡铁点低于 350 时，手工焊接应在 3s 内完成℃请在一次内焊接。请不要直接用烙铁触摸端子。灭菌产品应在常温下处理。Hand soldering should be completed within 3 s when the point of solder iron is below 350°C Please solder within one time. Please don't touch the terminals directly by soldering iron. Soldered product shall treat at normal temperature.

3、请注意不要让任何外力施加在引脚上。请在实际情况下测试焊接方法，并确保焊接工作良好，因为对器件和PCB 之间的连接的影响取决于冷却和焊接条件。Please take care not to let any external force exert on lead pins. Please test the soldering method in actual condition and make sure the soldering works fine, since the impact on the junction between the device and PCB varies depending on the cooling and soldering conditions.

4、本产品的引线端子为镀锡铜合金。在使用前，请评估确认可焊性的实际条件。并且没有指定引线端子的颜色均匀性。Lead terminals of this product are tin copper alloy plated. Before usage, please evaluate solderability with actual conditions and confirm. And the uniformity in color for the lead terminals are not specified.

--清洁说明 Cleaning instructions

- 1、溶剂温度应在 45° C 或以下。浸泡时间应在 3 分钟或以下。Solvent temperature should be 45° C or below. Immersion time should be 3 minutes or less.
- 2、不执行超声波清洗。Do not execute ultrasonic cleaning.
- 3、推荐溶剂材料：乙醇、甲醇和异丙醇 Recommended solvent materials :Ethyl alcohol, Methyl alcohol and Isopropyl alcohol.

--其他 Other

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更改记录表 Engineering Change Notice-Record

版本 Edition	更改日期 Date	主要更改内容 Main Content	拟制 Prepared	确认 Checked
1.0	2022-7-20	新产品发布New Production	王乐	郝三强