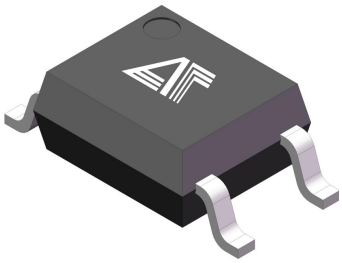
AOTE
SEMICONDUCTOR



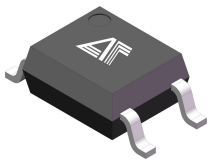
可控硅光耦
Thyristor optocoupler

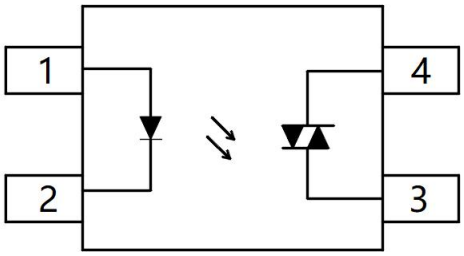
ATM3023

Product Data Sheet

AOTE DCC
RELEASE

SOP4





Pin Configuration
1.Anode
2.Cathode
3.Terminal
4.Terminal

◆ 封装逻辑原理图 Encapsulation logic schematic

ATM301X,ATM302X,ATM305X,ATM307X系列光耦采用高效光电转换技术，结合先进封装工艺，提供输入输出间的可靠隔离，支持SOP4封装形式，适配多样化场景需求。

The ATM301X,ATM302X,ATM305X,ATM307X series optocoupler adopts high-efficiency photoelectric conversion technology and advanced packaging processes, providing reliable input-output isolation. It supports package types (SOP4) to meet diverse application requirements.

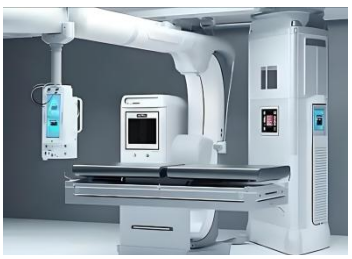
◆ 产品特征Product features

- 输入-输出隔离电压Vios=3750Vrms
  Input output isolation voltage：Vios=3750 Vrms
- 断态输出端电压V_{DRM}=800,600,400,250；Off-state output terminal voltage V_{DRM}=800,600,400,250;
- 峰值重复浪涌电流 I_{TSM}=1A; Peak repetitive surge currentpw I_{TSM}=1A
- 爬电距离>7.0mm ; Creepage distance > 7.0mm;
- 输入-输出绝缘距离 >0.4mm ; Input-Output insulation Thickness > 0.4mm
- 防潮等级 class1； MSL class1
- 产品符合 ROHS、REACH 及 HF 等环保法规要求;
  The products comply with ROHS, REACH and HF;

◆ 应用领域 Applications

- 工业自动化与控制 Industrial Automation and Control;
  PLC与变频器，伺服驱动系统，工业机器人PLC and frequency converter, servo drive system, industrial robot 过零型产品用于交流调压Zero crossing products are used for AC voltage regulation
- 家用电器与消费电子：Household appliances and consumer electronics 电机正反转、加热控制、调速等 Motor forward and reverse heating control, speed regulation, etc 智能照明系统中用于调光控制Used for dimming control in lighting systems
- 电力系统与能源管理：Power System and Energy Management 用于整流、变压器保护和电网监测Used for rectification, transformer protection, and power grid monitoring 应用于不间断电源（UPS）和电源保护设备Applied to uninterruptible power supply (UPS) and power protection equipment
- 医疗与特殊场景：Medical and Special Scenarios 用于心率监测仪、X光机等设备隔离与电路保护Used for isolation and circuit protection of devices such as heart rate monitors and X-ray machines



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◆ 极限参数 Absolute Maximum Ratings (Ta =25℃)

参数 Parameter			符号 Symbol	额定值 Rating	单位 Unit
发射端 Input	正向电流 Forward Current		IF	60	mA
	反向电压 Backward Voltage		VR	6	V
	功耗 Power Dissipation		PD	70	mW
	额定值降低因子(在 Ta = 90°C 以上) Power dissipation Derating factor (above Ta = 90°C)		PDD	3.8	mW/℃
接收端 Output	断态输出端电压 Off-state output terminal voltage	ATM301X	VDRM	250	V
		ATM302X		400	
		ATM305X		600	
		ATM307X		800	
	峰值重复浪涌电流(pw=100μs,120pps) Peak repetitive surge current (pw=100μs,120pps)		ITSM	1	A
	开启态电流 (均方根值) On-state current (root mean square value)		IT(RMS)	100	mA
	功耗 Power Dissipation		PC	300	mW
	额定值降低因子(在 Ta = 85°C 以上) Power dissipation Derating factor (above Ta = 90°C)			7.4	mW/℃
隔离电压 Isolation Voltage			Viso	3750	Vrms
工作温度 Operating Temperature			Topr	-55 ~+110	℃
存储温度 Storage Temperature			Tstg	-55 ~+125	℃
焊接温度 Soldering Temperature			Tsol	260	℃

◆ 推荐操作条件 Recommended Operating Conditions

参数 Parameter	符号 Symbd	最小值 Min	最大值 Max	单位 unit
正向电流 Forward Current	IF	5	15	mA
峰值重复浪涌电流(pw=100μs,120pps) Peak repetitive surge current (pw=100μs,120pps)	ITSM	-	1	A
开启态电流 (均方根值) On-state current (root mean square value)	IT(RMS)	-	100	mA

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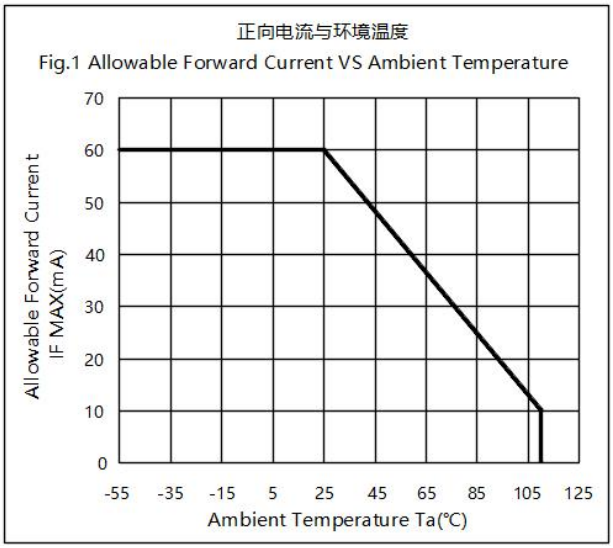
◆ 产品特性参数Product characteristic parameters (Ta =25℃)

参数 Parameter			符号 Symbol	条件 Condition	最小 Min.	典型 Typ.	最大 Max.	单位 Unit
发射端 Input	正向电压 Forward Voltage		VF	IF=20mA	-	1.23	1.5	V
	反向电流 Back current		IR	VR=6V	-	-	10	uA
接收端 Output	断态峰值电流 Off-state peak current		IDRM	VDRM=Rated VDRM IF= 0mA	-	-	100	nA
	通态峰值电压 On-state peak voltage		VTM	ITM=100mA peak IF=Rated IFT	-	-	2.5	V
	断态电压临界上升率 Critical rise rate of off-state voltage	ATM301X	dv/dt	VPEAK=Rated VDRM IF=0	-	100	-	V/μs
		ATM302X						
		ATM305X		VPEAK=400V, IF =0	1000	-	-	
		ATM307X						
传输特性 Transfer Characteristics	LED 触发电流 LED trigger current	ATM3020	IFT	主端电压 Main terminal Voltage =3V	-	-	30	mA
		ATM3011			-	-	15	
		ATM3021						
		ATM3051						
		ATM3071						
		ATM3012			-	-	10	
		ATM3022						
		ATM3052						
		ATM3072						
		ATM3013			-	-	5	
		ATM3023						
		ATM3053						
		ATM3073						
	维持电流 Maintain current		IH	-	-	250	-	uA

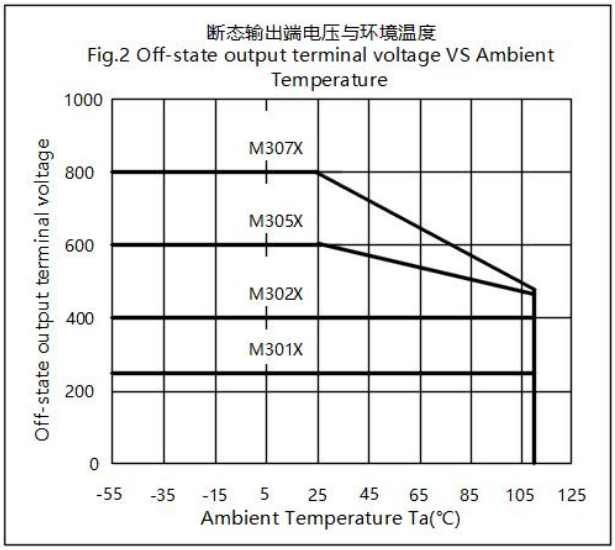
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◆ 电性特性曲线Electrical characteristic curve(Ta =25℃)

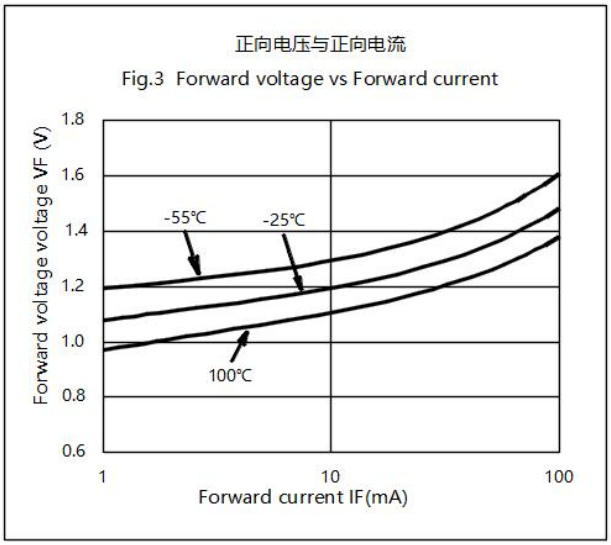
正向电流与环境温度
Fig.1 Allowable Forward Current VS Ambient Temperature



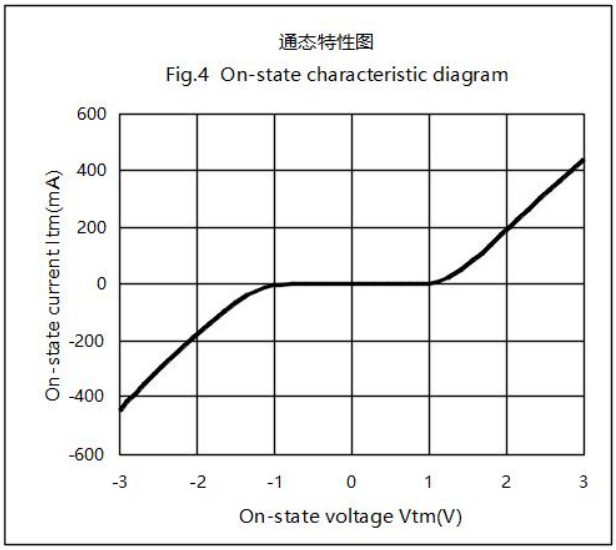
断态输出端电压与环境温度
Fig.2 Off-state output terminal voltage VS Ambient Temperature



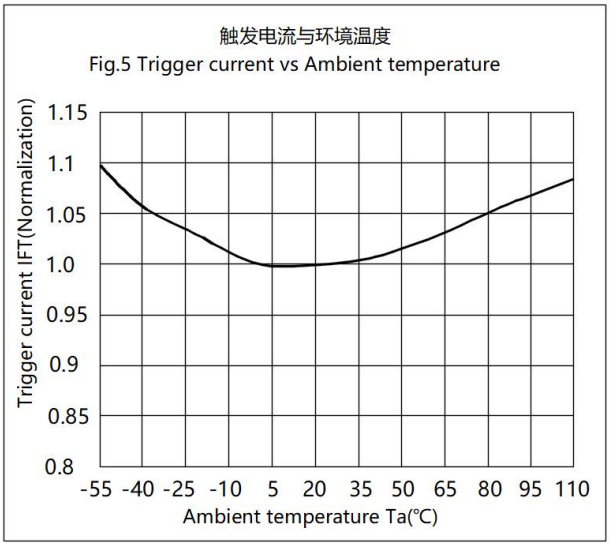
正向电压与正向电流
Fig.3 Forward voltage vs Forward current



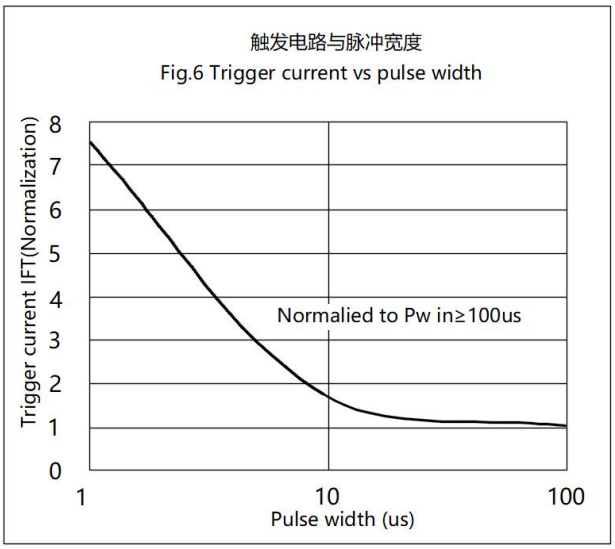
通态特性图
Fig.4 On-state characteristic diagram



触发电流与环境温度
Fig.5 Trigger current vs Ambient temperature

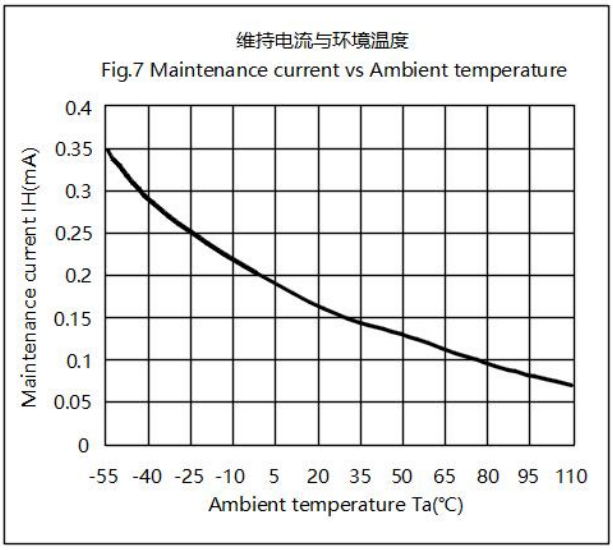


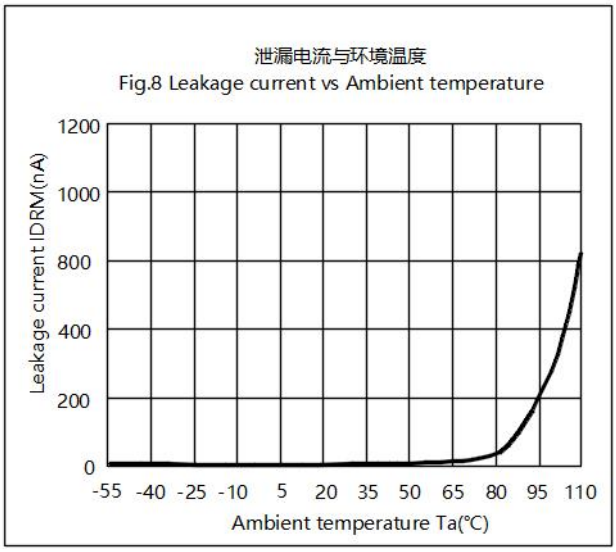
触发电路与脉冲宽度
Fig.6 Trigger current vs pulse width



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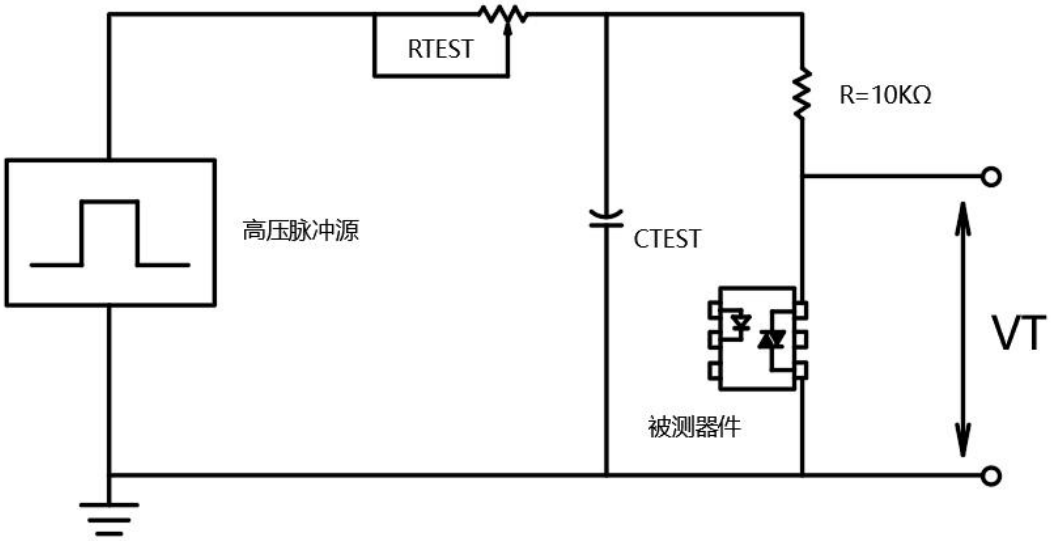
◆ 电性特性曲线Electrical characteristic curve(Ta =25℃)

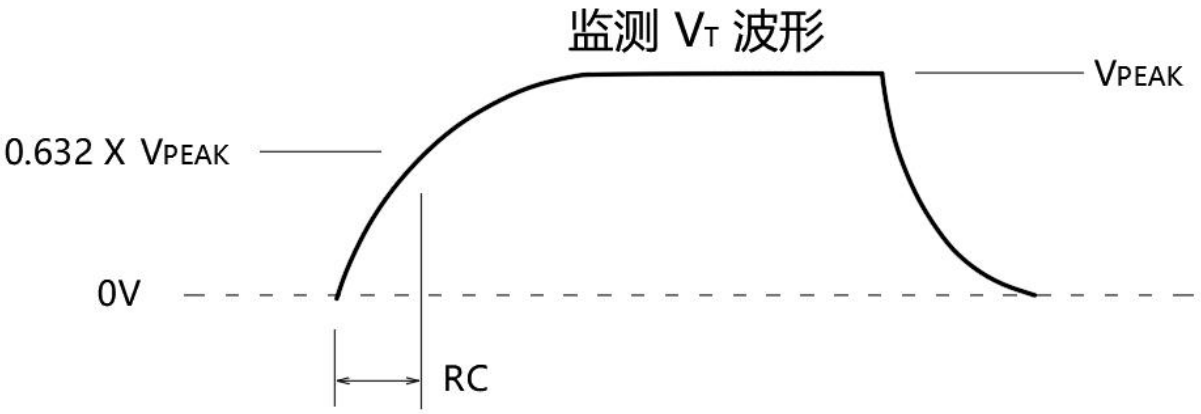




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◆ **静态 dv/dt 测试电路和波形Static dv/dt test circuit and waveform**

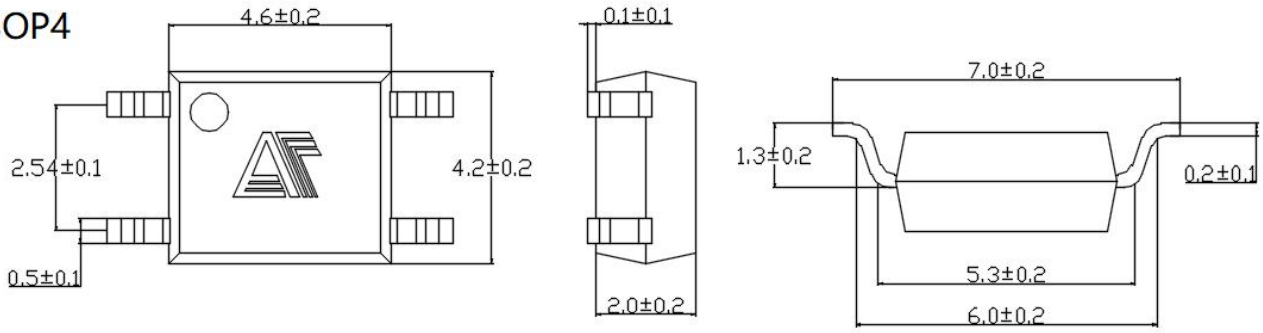




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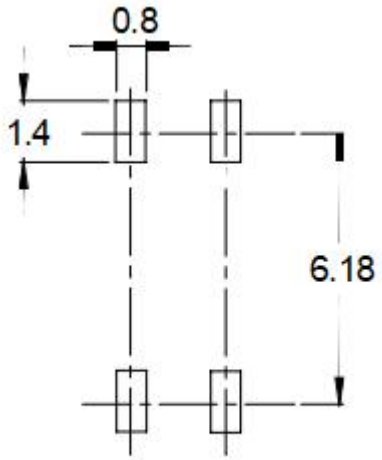
◆ 外形尺寸Overall dimension

SOP4



推荐焊盘:

Recommended



单位：mm

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◆ 产品型号命名规则 Order Code

AT M30VX - UN Y - W (V) (ZZ)

① ② ③ ④ ⑤ ⑥ ⑦

① 公司代码 Company Code (AT: 奥特 Aote)

② 产品系列 Product Series (30VX: ATM301X, ATM302X, ATM305X,ATM307X)

③ 框架类型 Lead Frame (Cu: 铜框架 Copper)

④ 树脂类型 Epoxy Type (H: 无卤 Halogen-free)

⑤ 封装形式 Package (D: DIP, S: SMD)

⑥ 器件工作温度范围 Device Operating Temperature Range (特殊范围需填或者空白 Special Range need to be filled in or left blank)

⑦ 内部补充代码 Internal Supplementary Code (数字或者空白 Number or None)

◆ 印字信息 Marking Information

- 印字中“ ”为奥特品牌LOGO
  “ ” denotes LOGO
- 印字中“Y”代表年份； A(2018),B(2019),C(2020) … …
  “Y” denotes YEAR： A(2018), B(2019), C(2020) … …
- 印字中“WW”代表周号
  “WW” denotes Week’ s number
- 印字中“ E”代表内部代码
  “E” denotes Internal code
- 印字中的“H”代表无卤
  “H” denotes Halogen-free



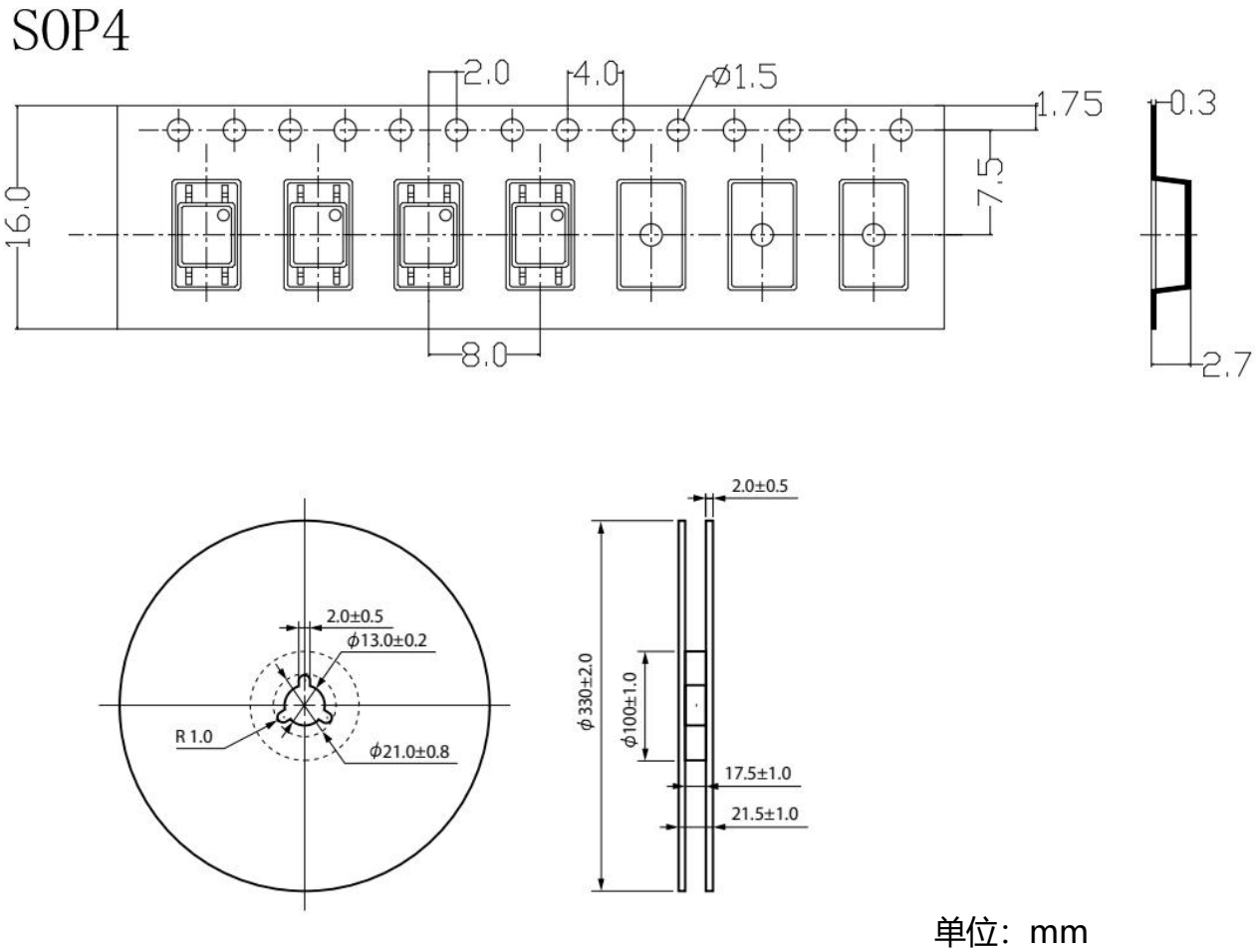
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◆ 包装packing

封装形式	包装方式	盘数量	盒数量	箱数量	静电袋规格	盒规格	箱(双瓦楞)规　格	备注
SOP4	卷盘 (ϕ330mm蓝盘)	3000 只/盘	2 盘/盒	10 盒/箱	450*390*0.1mm	34*6*34cm	62*36*36.5cm	首尾端空至少 200mm
Package Type	Packing Form	Quantity per Reel	Quantity per Box	Quantity per Carton	Antistatic Bag Specification	Box Specification	Carton Specification	Note
SOP4	Reel (ϕ330mm Blue)	3000 pcs /reel	2 reels /box	10 boxes /ctn	450*390*0.1mm	34*6*34cm	62*36*36.5cm	Leave at least 200mm of blank space at both ends

▪ 编带包装 Tape & Reel

1) 每卷数量：3000 只；Qty/reel：3000 pcs；
2) 每箱数量：60000 只；Qty/ctn：60000 pcs；
3) 内包装：每盒 2 盘；Inner packing：2 reels/box；
4) 示意图 Schematic:



单位：mm

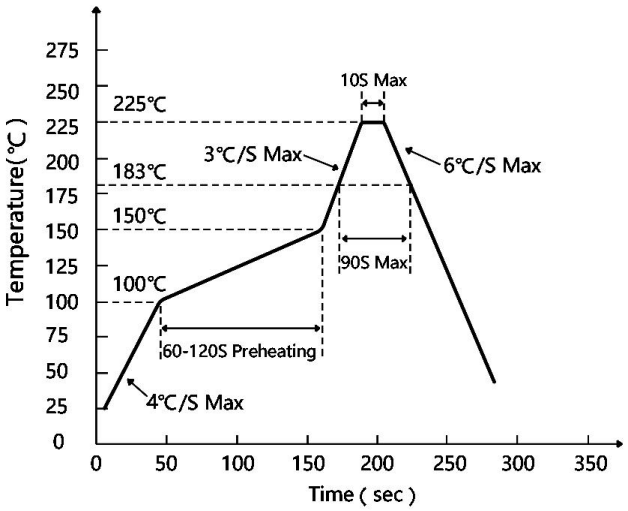
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◆ 可靠性测试 Reliability Test Items And Conditions

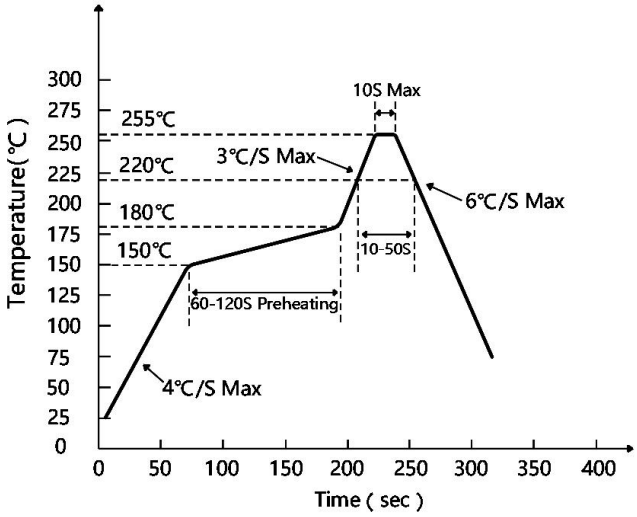
实验项目 Test Items	参考标准 Reference	实验条件 Test Conditions	时间 Time	样品数 Quantity	判据 Criterion
可焊性 Solderability	JESD22-B102	Tsol=（245±5）℃, t=5s;	1 次1 times	22	0/22
耐焊接热 Resistance to Soldering Heat	JESD22-A106	Tsol=（260±5）℃, t=10s	3 次3 times	22	0/22
静电放电 ESD-HBM	JESD22-A114	Ta=25℃, HBM (2000V)	正反各 3 次 P&N 3 times	10	0/10
高温贮存 High emperature Storage	JESD22-A103	Ta=125℃	1000h	22	0/22
低温贮存 Low Temperature Storage	JESD22-A119	Ta= -55℃	1000h	22	0/22
冷热冲击 Thermal Shock	JESD22-A104	-55℃(15min)←→ 125℃(15min)	循环 300 次 300 cycles	22	0/22
常温寿命试验 Lifespan Test	JESD22-A108	Ta=25℃, IF=50mA ， Vcc=5V	1000h	22	0/22
高温寿命试验 DC Operating Life	JESD22-A108	Ta=110℃, IF=20mA ， Vcc=5V	1000h	76	0/76
高温高湿偏压 High Temperature High Humidity bias Voltage	JESD22-A101	Ta =85℃ , RH=85% IF=0mA ， VCE=64V	1000h	22	0/22
高温偏压 High Temperature bias Voltage	JESD22-A108	Ta =110℃ , IF=0mA ， VCE=80V	1000h	22	0/22
高压蒸汽试验 High pressure steam test	JESD22-A102	P=15PSIG ， 121℃, 100%RH	96h	22	0/22

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◆ 回流焊温度曲线图 Solder Reflow Profile

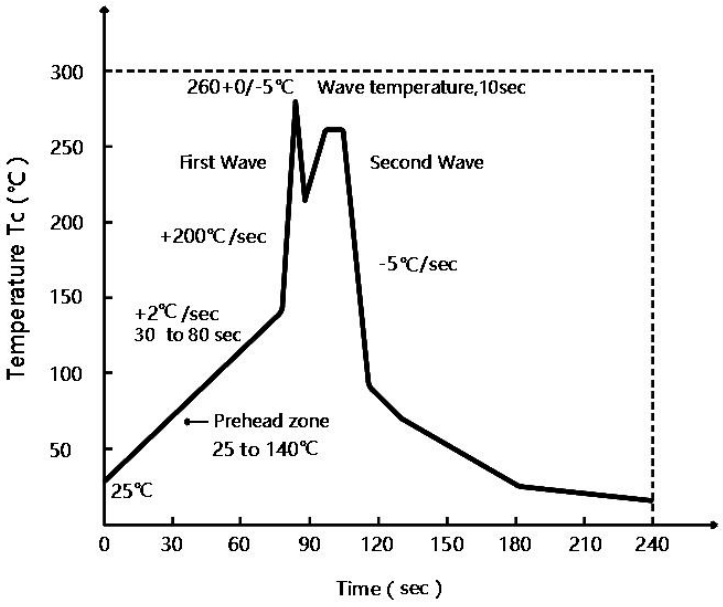


有铅制程 Lead Process



无铅制程 Lead Process

◆ 波峰焊温度曲线图 Wave Soldering Profile



◆ 手工烙铁焊接 Soldering with hand soldering iron

A. 手工烙铁焊仅用于产品返修或样品测试;

Hand soldering iron is only used for product rework or sample testing;

B. 手工烙铁焊要求: 温度 350℃ ± 5℃, 时间≤3s。

Hand soldering iron requirements: Temperature: 350℃ ± 5℃, within 3s.

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◆ 注意 Attention

- 奥特半导体实施动态技术迭代机制，产品规格可能随工艺升级调整，最新技术参数以官网发布版本为准。

AOTE implements dynamic technical updates. Specifications are subject to change. Refer to the official website for the latest version.

- 用户需严格遵循本规格书限定的操作条件，因超范围使用（包括但不限于过载、高温、非兼容电路设计）导致的器件失效，不在质量保证范围内。

Users must strictly adhere to specified conditions. Failures caused by misuse (overload, high temperature, incompatible circuits) are excluded from warranty.

- 医疗设备、工业控制等关键场景应用前，需联系技术支持获取定制化验证方案。

Contact technical support for customized validation in critical applications (medical devices, industrial control).

- 本文档有效期至2025年12月31日，后续更新将通过官网公告推送。

This document is valid until Dec 31, 2025. Updates will be notified on the official website.

- 如需对技术参数或应用方案进行进一步确认，欢迎通过以下渠道获取官方支持：

For further clarification on technical specifications or application solutions, please contact us through official channels:

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