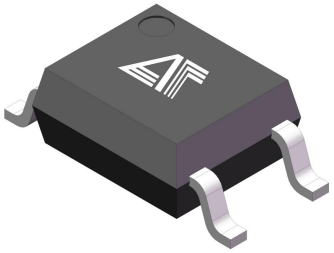
AOTE SEMICONDUCTOR



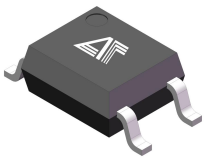
可控硅光耦
Thyristor optocoupler

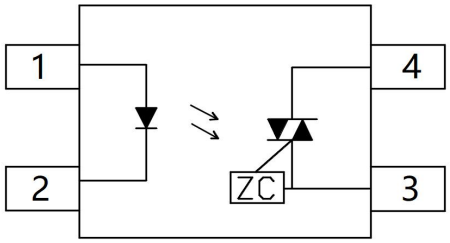
ATM3042

Product Data Sheet

AOTE DCC
RELEASE

SOP4





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

◆ 封装逻辑原理图 Encapsulation logic schematic

ATM303X，ATM304X，ATM306X，ATM308X 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 ATM303X，ATM304X，ATM306X，ATM308X 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.

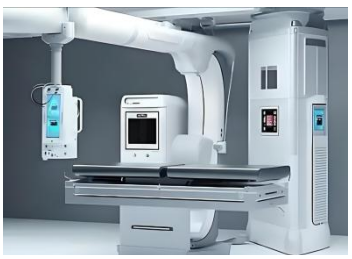
◆ 产品特征Product features

- 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



AOTE All Rights Reserved. Release Date :Nov 1, 2024.

◆ 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	ATM303X	VDRM	250	V
		ATM304X		400	
		ATM306X		600	
		ATM308X		800	
	峰值重复浪涌电流 (pw=100 μ s,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=100 μ s,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

AOTE All Rights Reserved. Release Date :Nov 1, 2024.

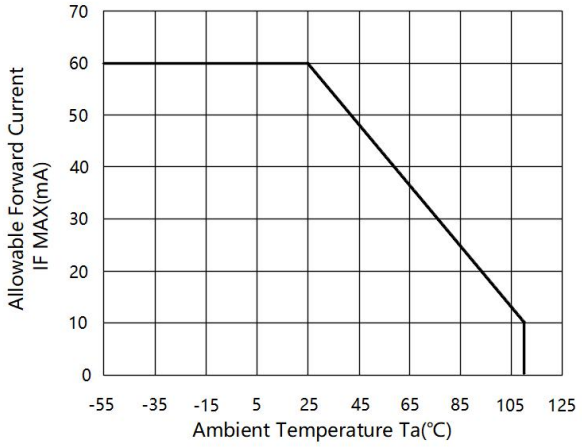
◆ 产品特性参数Product characteristic parameters (Ta =25℃)

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	ATM303X	IDRM1	VDRM =Rated VDRM IF = 0mA	-	-	100	nA
		ATM304X						
		ATM306X			-	-	500	
		ATM308X						
	通态峰值电压 On-state peak voltage		VTM	ITM=100mA peak IF = Rated IFT	-	-	3	V
	断态电压临界上升率 Critical rise rate of off-state voltage	ATM303X	dv/dt	VPEAK =Rated VDRM, IF =0	1000	-	-	V/μs
		ATM304X						
		ATM306X						
		ATM308X			600	-	-	
	抑制电压 （MT1-MT2 高于多少电压不会触发) Suppression voltage (MT1-MT2 will not be triggered if it is higher than this voltage)		VInh	IF = Rated IFT	-	-	20	V
	抑制状态的漏电流 Leakage current in suppression state		IDRM2	IF = Rated IFT, VDRM=Rated VDRM, Off state	-	-	500	uA
传输特性 Transfer Characteristics	LED 触发电流 LED trigger current	ATM3031	IFT	主端电压 Main terminal Voltage =3V	-	-	15	mA
		ATM3041						
		ATM3061						
		ATM3081						
		ATM3032			-	-	10	
		ATM3042						
		ATM3062						
		ATM3082						
		ATM3033			-	-	5	
		ATM3043						
		ATM3063						
		ATM3083						
	维持电流 Maintain current		IH	-	-	280	-	uA

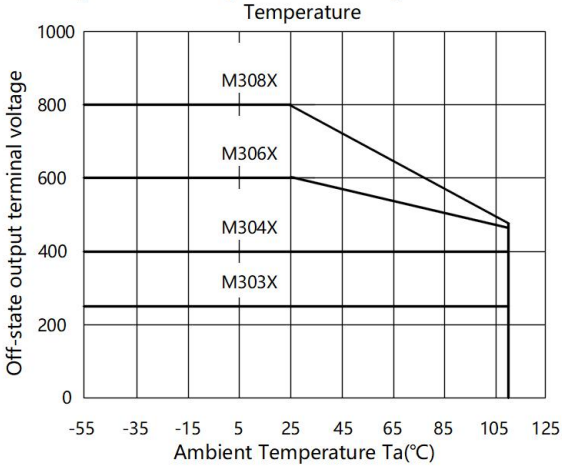
AOTE All Rights Reserved. Release Date :Nov 1, 2024.

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

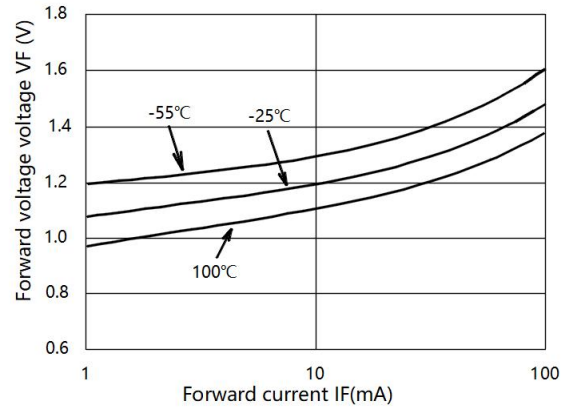
正向电流与环境温度
Fig.1 Allowable Forward Current VS Ambient Temperature



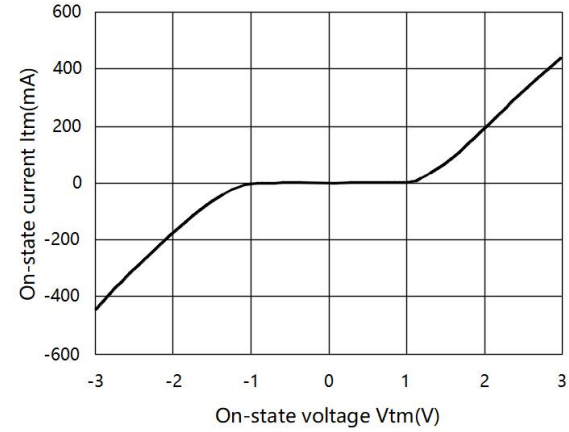
断态输出端电压与环境温度
Fig.2 Off-state output terminal voltage VS Ambient Temperature



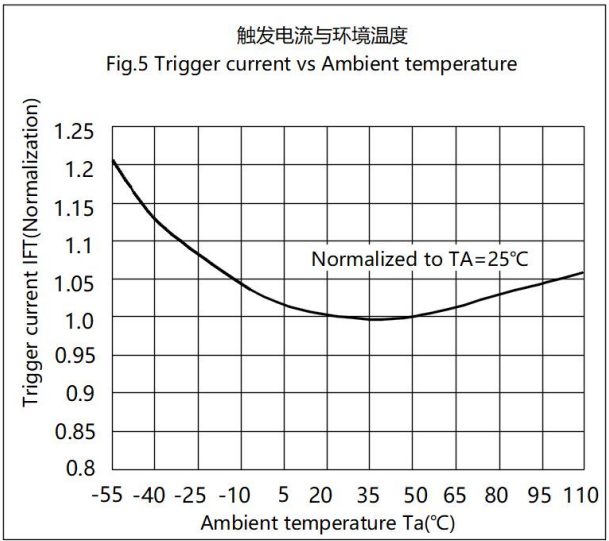
正向电压与正向电流
Fig.3 Forward voltage vs Forward current



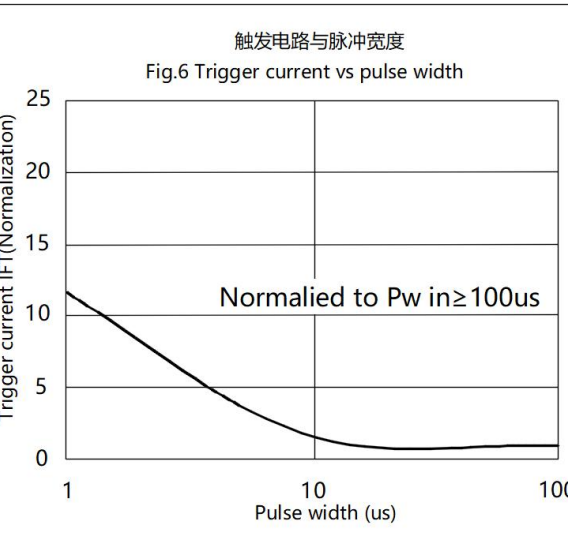
通态特性图
Fig.4 On-state characteristic diagram



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



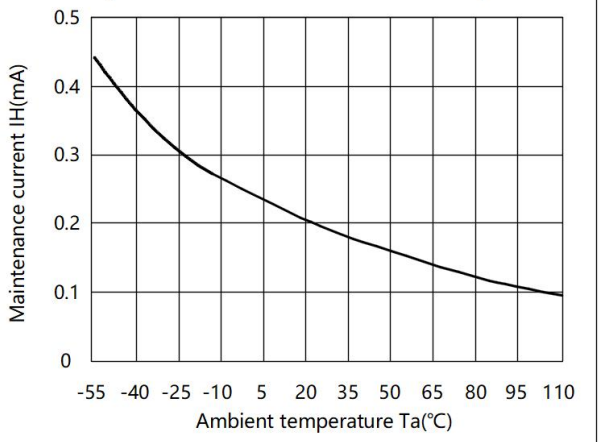
触发电路与脉冲宽度
Fig.6 Trigger current vs pulse width



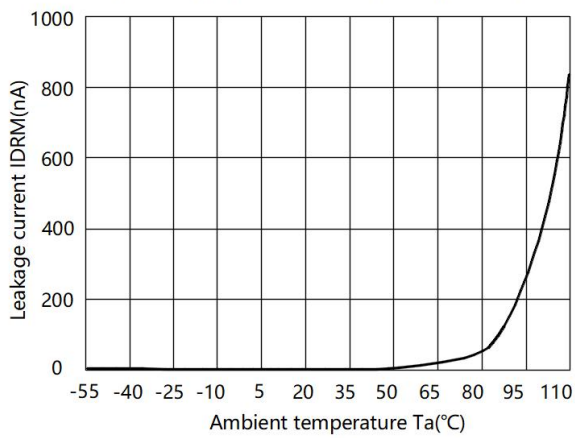
AOTE All Rights Reserved. Release Date :Nov 1, 2024.

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

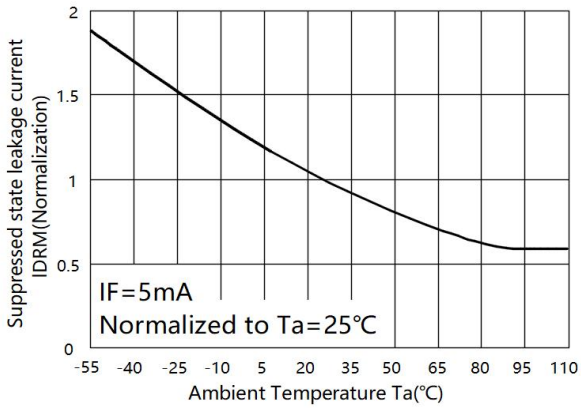
维持电流与环境温度
Fig.7 Maintenance current vs Ambient temperature



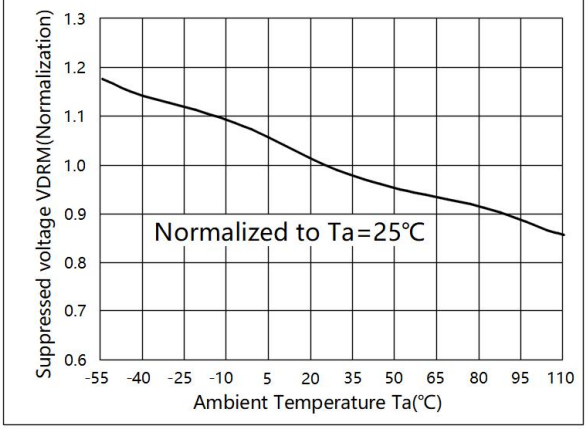
泄漏电流与环境温度
Fig.8 Leakage current vs Ambient temperature



抑制状态泄露电流与环境温度
Fig.9 Suppressed state leakage current vs Ambient temperature

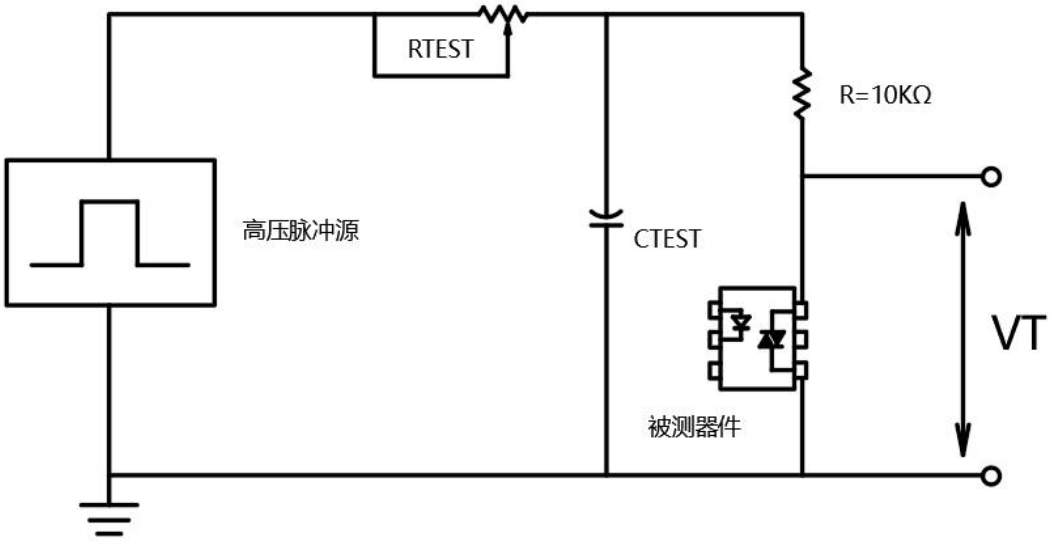


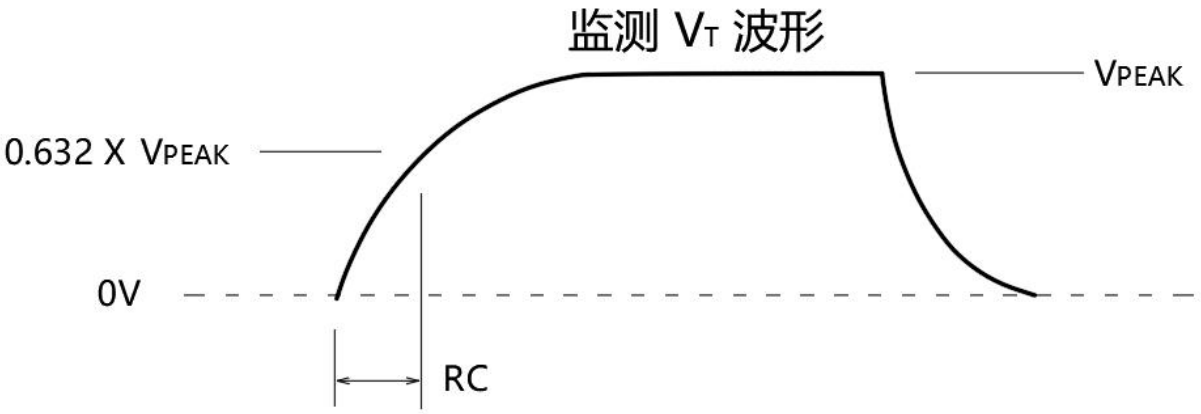
抑制电压与环境温度
Fig.10 Suppressed voltage vs Ambient temperature



AOTE All Rights Reserved. Release Date :Nov 1, 2024.

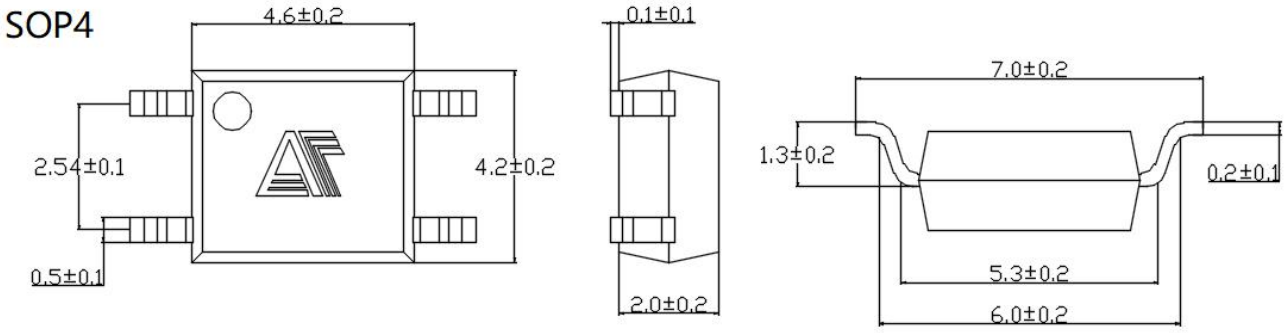
◆ **静态 dv/dt 测试电路和波形Static dv/dt test circuit and waveform**



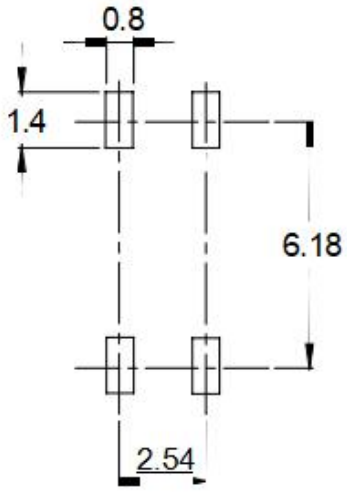


AOTE All Rights Reserved. Release Date :Nov 1, 2024.

◆ 外形尺寸Overall dimension



推荐焊盘：
Recommended



单位：mm

AOTE All Rights Reserved. Release Date :Nov 1, 2024.

◆ 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: ATM303X, ATM304X, ATM306X,ATM308X)

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



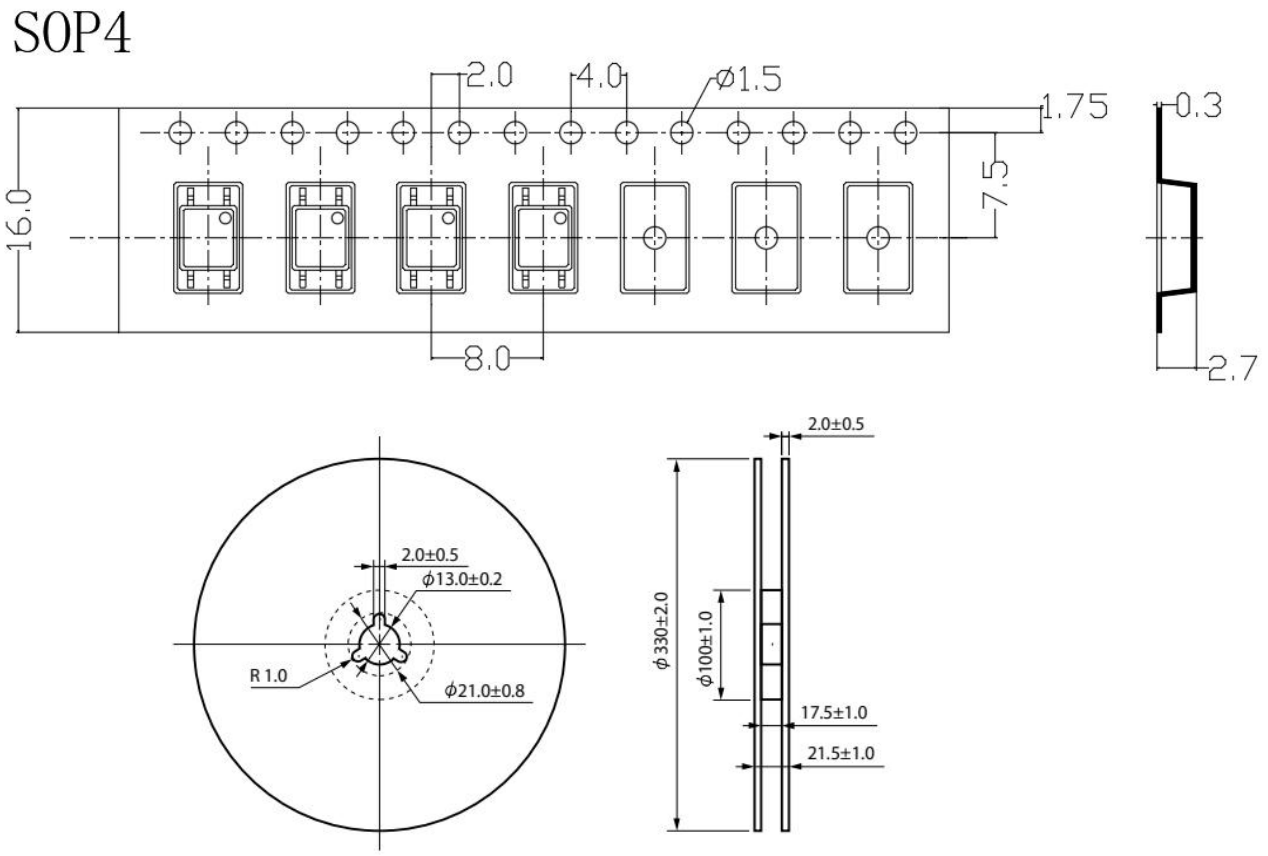
AOTE All Rights Reserved. Release Date :Nov 1, 2024.

◆ 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

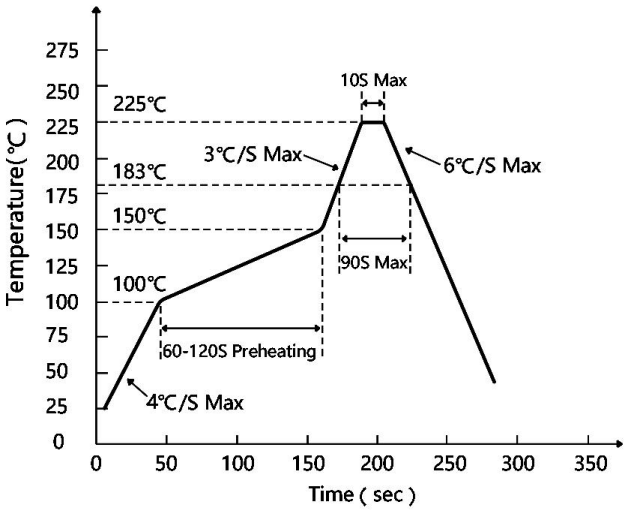
AOTE All Rights Reserved. Release Date :Nov 1, 2024.

◆ 可靠性测试 Reliability Test Items And Conditions

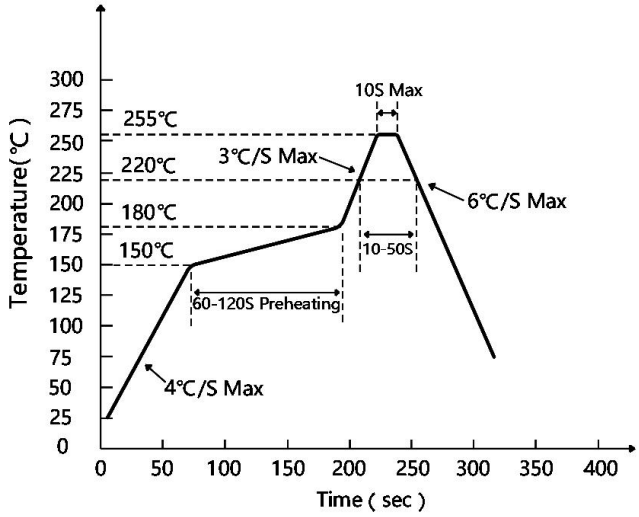
实验项目 Test Items	参考标准 Reference	实验条件 Test Conditions	时间 Time	样品数 Quantity	判据 Criterion
可焊性 Solderability	JESD22-B102	Tsol=（245±5）℃, t=5s;	1 次1 times	22	0/22
耐焊接热 Resistance to Soldering Heat	JESD22-A106	Tsol=（260±5）℃, t=10s	3 次3 times	22	0/22
静电放电 ESD-HBM	JESD22-A114	Ta=25℃, HBM (2000V)	正反各 3 次 P&N 3 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

AOTE All Rights Reserved. Release Date :Nov 1, 2024.

◆ 回流焊温度曲线图 Solder Reflow Profile

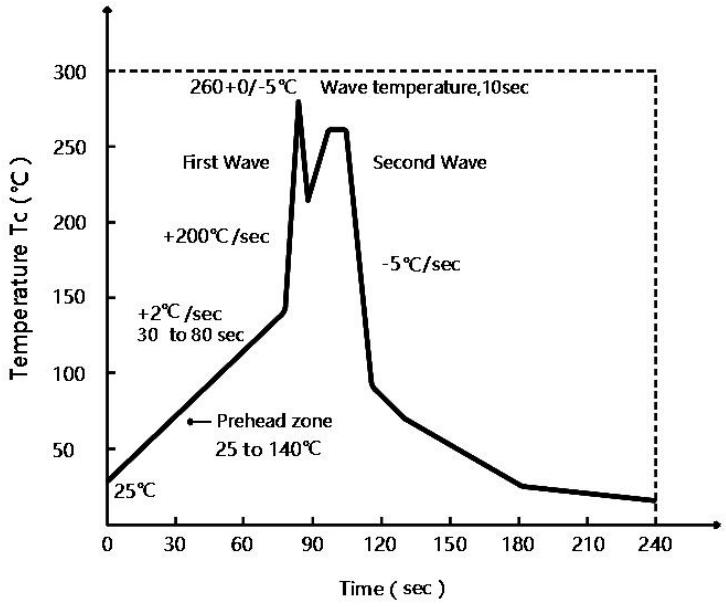


有铅制程 Lead Process



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.

AOTE All Rights Reserved. Release Date :Nov 1, 2024.

◆ 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:

AOTE All Rights Reserved. Release Date :Nov 1, 2024.