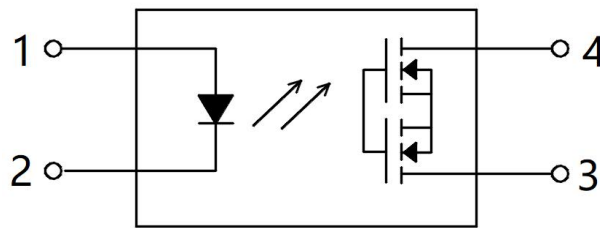


光继电器光耦
Photo Transistor

ATAQY221S

Product Data Sheet

AOTE DCC
RELEASE



Pin Configuration
 1.Anode
 2.Cathode
 3.Drain1
 4.Drain2

◆ 封装逻辑原理图 Encapsulation logic schematic

ATAQY221S 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 ATAQY221S 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.

◆ 主要特征 Main features

- 输入-输出隔离电压 $V_{ios}=3750V_{rms}$
Input output isolation voltage: $V_{ios}=3750V_{rms}$
- 负载电压 (AC峰值) VL: 60V; Load Voltage (PeakAC): 60V;
- 持续负载电流IL: 0.5A; Continuous Load Current: 0.5A;
- 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: 用于控制电机、传感器、加热器及机器人动作; Industrial Automation Used to control motors, sensors, heaters, and robot movements;
- 家用电器: 应用于空调、洗衣机、智能家居等设备; Household Electric Appliances Applied to devices such as air conditioning, washing machines, smart homes, etc
- 通信与安防: 在通信基站、交换机中切换信号, 并用于监控摄像头、门禁系统的电源控制; Communication and Security: Switching signals in communication base stations and switches, and used for power control of monitoring cameras and access control systems
- 医疗设备: 用于医疗器械 (如复印机、自动消毒设备) 的电源管理和信号处理; medical equipment: Used for power management and signal processing of medical devices such as copiers and automatic disinfection equipment



◆ 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	LED 正向电流 LED Forward Current	IF	50	mA
	LED 反向电压 LED Reverse Voltage	VR	5	V
	峰值正向电流 Peak Forward Current	IFP	1	A
	输入功率 Power Dissipation	Pin	70	mW
接收端 Output	负载电压(AC 峰值) Load Voltage (Peak AC)	VL	60	V
	持续负载电流 Continuous Load Current	IL	0.5	A
	峰值负载电流 Peak Load Current	Ipeak	1.5	A
	输出功率 Power Dissipation	Pout	300	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 Symbol	最小值 Min	最大值 Max.	单位 Unit
正向电流 Forward Current	IF	5	15	mA
负载电压(AC 峰值) Load Voltage (Peak AC)	VL	-	60	V
持续负载电流 Continuous Load Current	IL	-	0.5	A

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

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	LED 开启电流 LED Operate Current	IFon	IL = 0.5A	-	0.4	3	mA
	LED 关断电流 LED Turn Off Current	IFoff	IL = 0.5A	0.05	0.3	-	mA
	LED 正向压降 LED Dropout Voltage	VF	IF =5mA	1	1.3	1.4	V
接收端 Output	导通电阻 On Resistance	Ron	IF = 5mA , IL = 0.5A. Within 1s on time	-	0.9	1.5	Ω
	关断漏电 Off State Leakage Current	ILeak	IF = 0 mA VL = 60V	-	-	1000	nA
传输特性 Transfer Characteristics	开启时间 Turn On Time	Ton	IF = 5mA IL = 0.5A.	-	0.17	2	ms
	关断时间 Turn Off Time	Toff	IF = 5mA IL = 0.5A	-	0.14	1	ms
	I/O 电容 I/O Capacitance	CISO	f = 1 MHz VB =0V	-	0.8	1.5	pF
	初始 I/O 隔离电阻 Initial I/O Isolation Resistance	RISO	500 V DC	1000	-	-	MΩ

注: LED 正向电流推荐值 IF =5mA 到 10mA。

Note: LED forward current recommendation value: IF =5mA to 10mA.

◆ 电性特性曲线Electrical characteristic curve($T_a = 25^\circ\text{C}$)

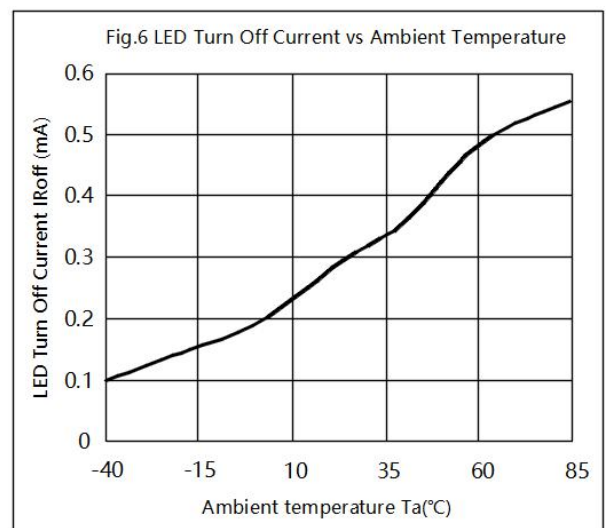
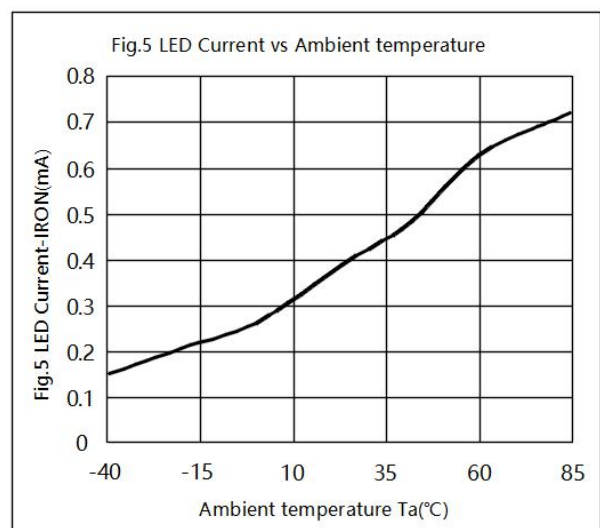
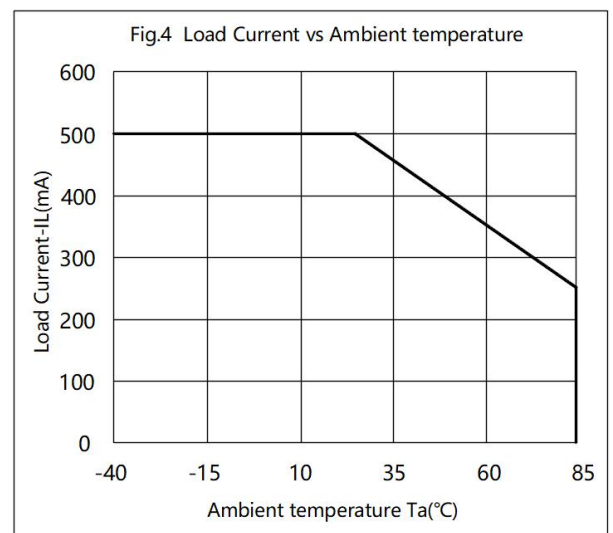
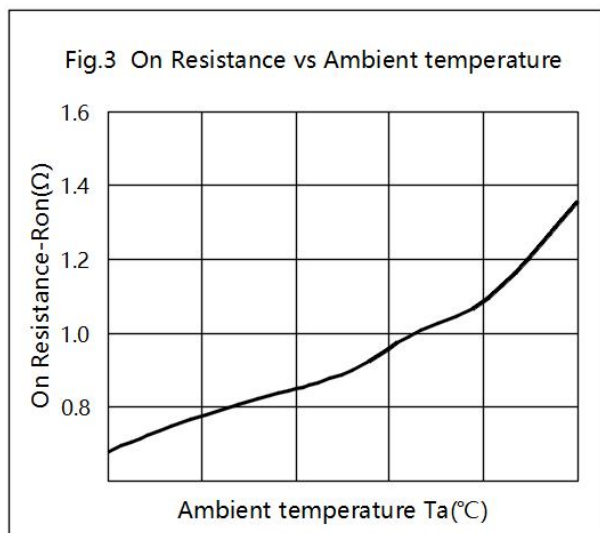
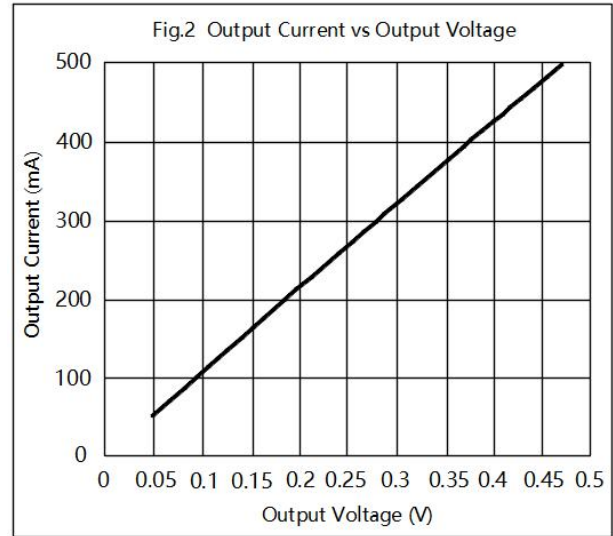
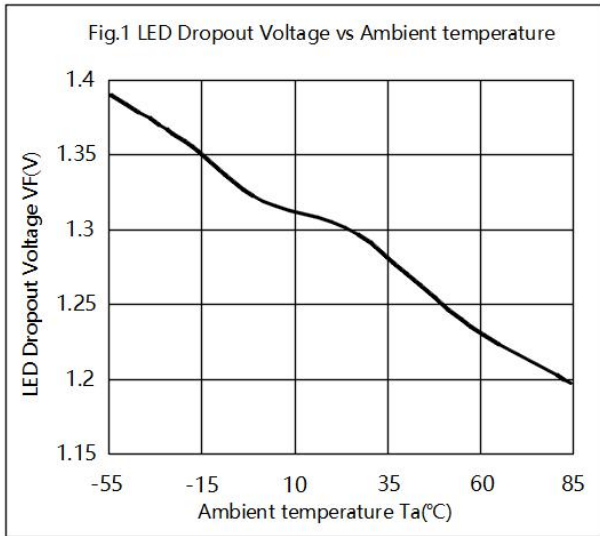


Fig.7 Turn On Time vs Ambient Temperature

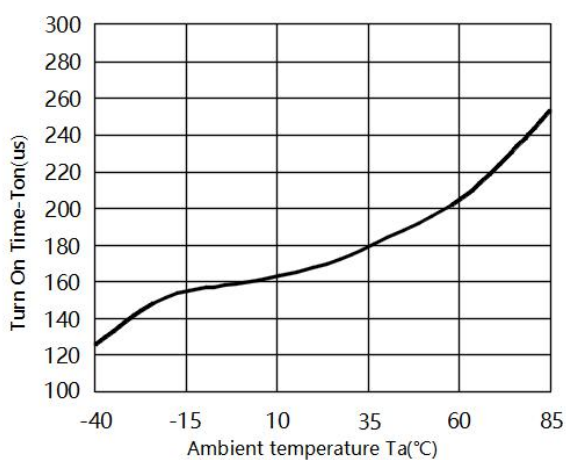


Fig.8 Turn Off Time vs Ambient Temperature

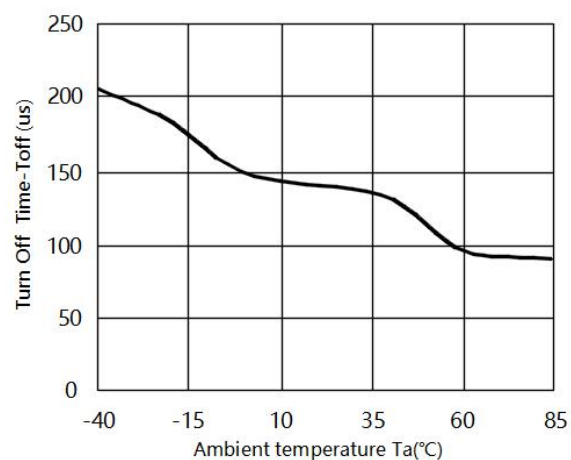


Fig.9 Turn On Time vs LED Forward Current

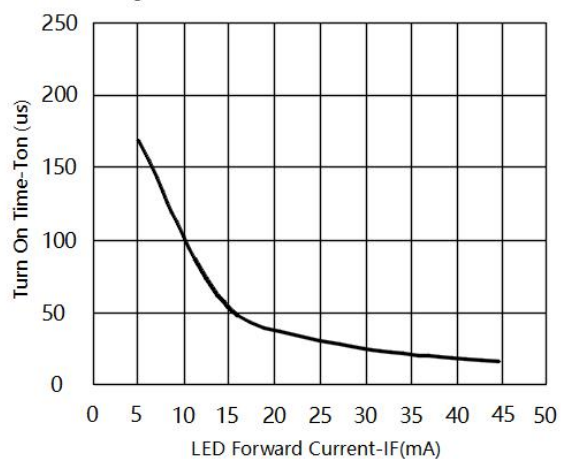
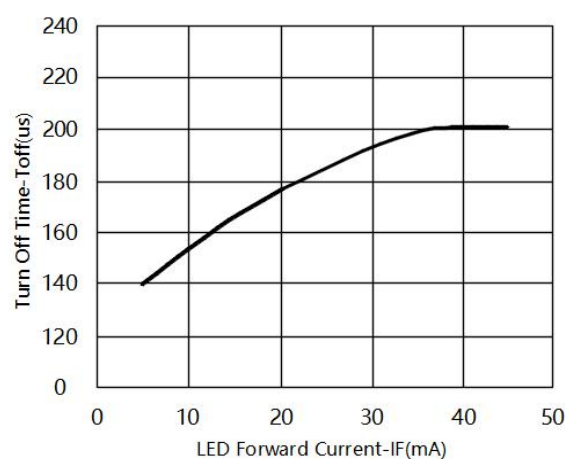
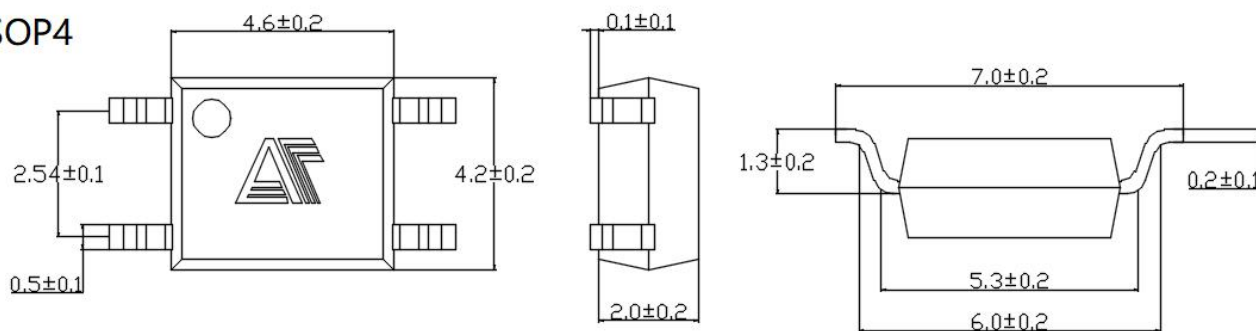


Fig.10 Turn Off Time vs LED Forward Current



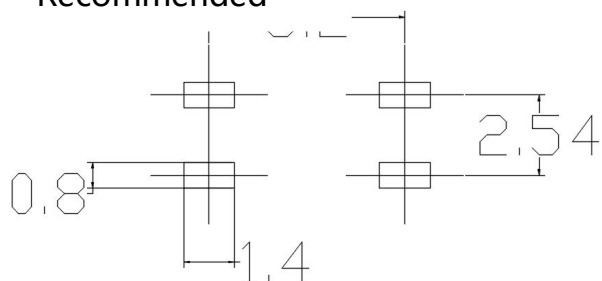
◆ 外形尺寸Overall dimension

SOP4



推荐焊盘:

Recommended



单位: mm

◆ 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



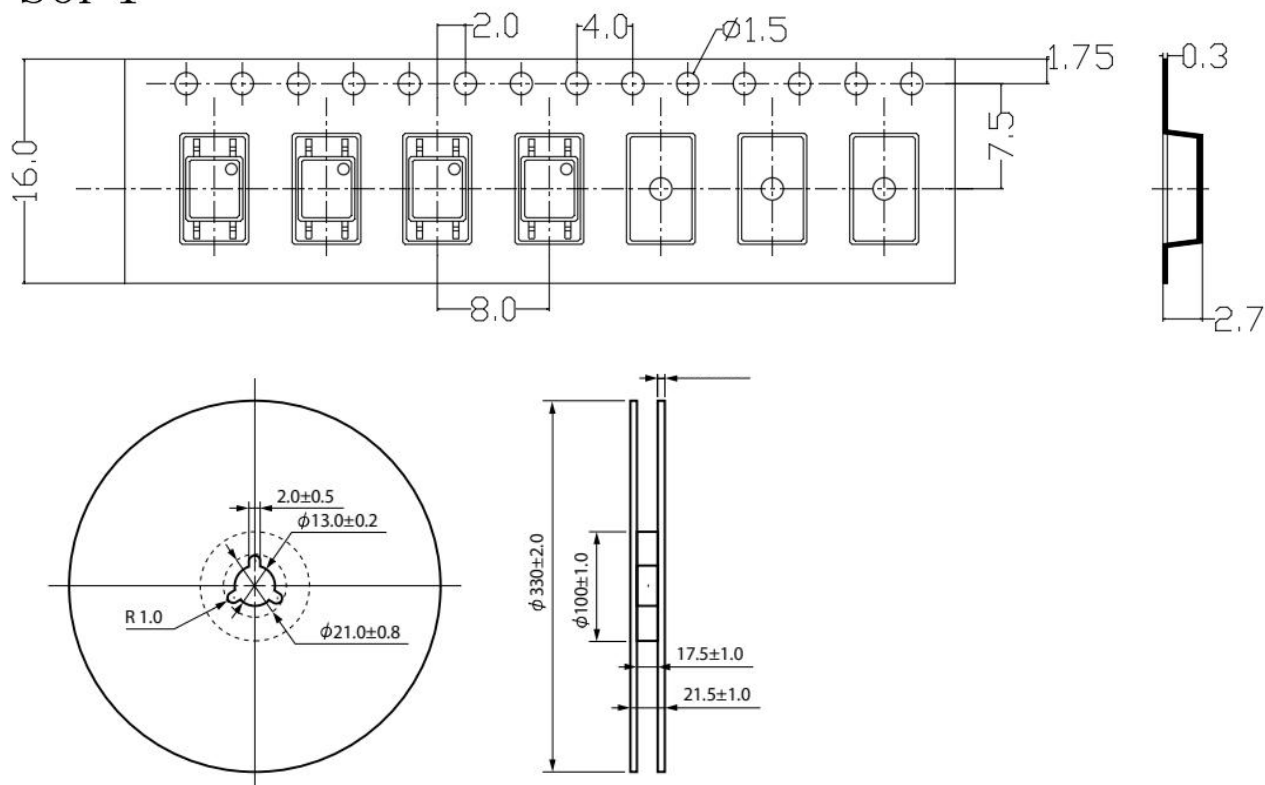
◆ 包装packing

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 ($\phi 330$ mm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 ($\phi 330$ mm 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:

SOP4

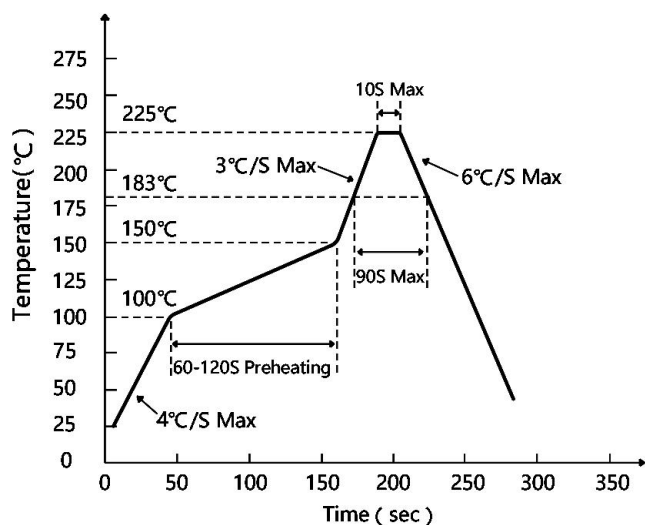


单位: mm

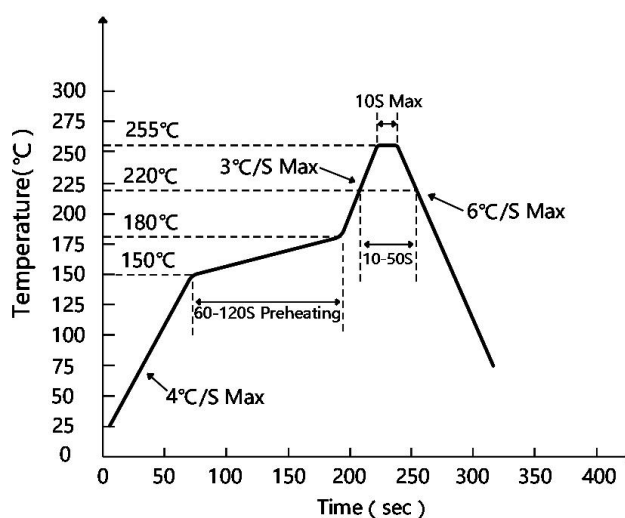
◆ 可靠性测试 Reliability Test Items And Conditions

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) °C, t=5s;	1 次1 times	22	0/22
耐焊接热 Resistance to Soldering Heat	JESD22-A106	Tsol= (260±5) °C, t=10s	3 次3 times	22	0/22
静电放电 ESD-HBM	JESD22-A114	Ta=25°C, 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°C	1000h	22	0/22
低温贮存 Low Temperature Storage	JESD22-A119	Ta= -55°C	1000h	22	0/22
冷热冲击 Thermal Shock	JESD22-A104	-55°C(15min)↔ 125°C(15min)	循环 300 次 300 cycles	22	0/22
常温寿命试验 Lifespan Test	JESD22-A108	Ta=25°C, IF=50mA , Vcc=5V	1000h	22	0/22
高温寿命试验 DC Operating Life	JESD22-A108	Ta=110°C, IF=20mA , Vcc=5V	1000h	76	0/76
高温高湿偏压 High Temperature High Humidity bias Voltage	JESD22-A101	Ta =85°C , RH=85% IF=0mA , VCE=64V	1000h	22	0/22
高温偏压 High Temperature bias Voltage	JESD22-A108	Ta =110°C , IF=0mA , VCE=80V	1000h	22	0/22
高压蒸汽试验 High pressure steam test	JESD22-A102	P=15PSIG , 121°C, 100%RH	96h	22	0/22

◆ 回流焊温度曲线图 Solder Reflow Profile

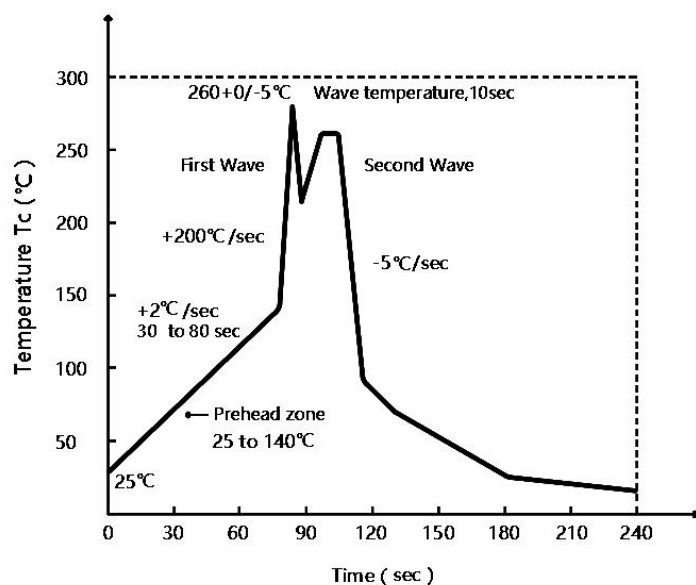


有铅制程 Lead Process



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 $350^{\circ}\text{C} \pm 5^{\circ}\text{C}$, 时间 $\leq 3\text{s}$.

Hand soldering iron requirements: Temperature: $350^{\circ}\text{C} \pm 5^{\circ}\text{C}$, within 3s.

◆ 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: