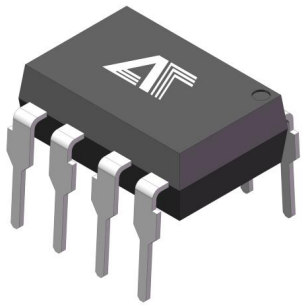


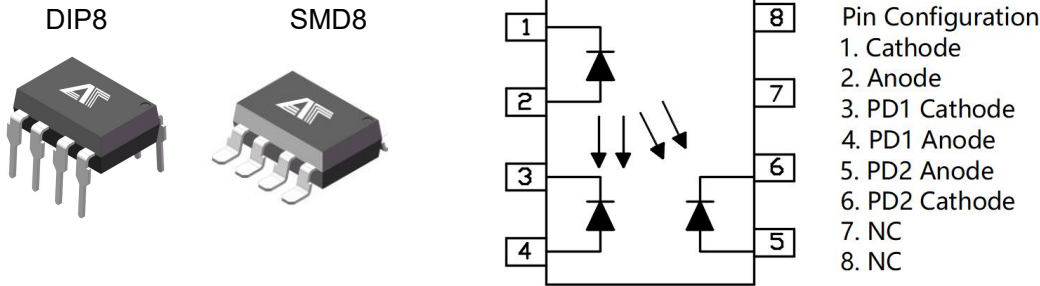


晶体管光耦 Photo Transistor

ATN200

Product Data Sheet

AOTE DCC
RELEASE



◆ 封装逻辑原理图 Encapsulation logic schematic

ATN200 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DIP8及SMD8两种封装形式，适配多样化场景需求。

The ATN200 optocoupler adopts high-efficiency photoelectric conversion technology and advanced packaging processes, providing reliable input-output isolation. It supports two package types (DIP8 SMD8) to meet diverse application requirements.

◆ 产品特征Product features

- 输入-输出隔离电压 $V_{ios}=5000V_{rms}$
Input output isolation voltage: $V_{ios}=5000V_{rms}$
- 线性误差：±0.05%；linear error of ±0.05%；
- 传输增益误差：±5%；transmission gain error: ±5%；
- 峰值击穿电压: $V(BR)_{KAO}=150V$ ；
peak breakdown voltage $V(BR)_{KAO}=150V$ ；
- 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

- 电源调节器：通常包括电压调节器、温度调节器、电流调节器等设备
Power regulator: It typically includes devices such as voltage regulators, temperature regulators, and current regulators.
- 数字逻辑输入：如传感器输入设备、编码器输入设备、计数器类输入设备。
Digital logic input: Sensor input devices, encoder input devices, counter-type input devices.
- 微处理器输入：如扫描仪、条码阅读机。
Microprocessor input: Like scanners, barcode readers



◆ 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	50	mA
	反向电压 Reverse Voltage	VR	6	V
	功耗 Power Dissipation	PD	70	mW
接收端 Output	阳极-阴极电压 Cathode-anode voltage	VKAO	150	V
	阴极-阳极电压 Anode-cathode voltage	VAKO	0.5	V
	光电二极管输出电流 Photo diode output current	IL	100	uA
	结温范围 Junction temperature range	Tj	125	℃
总功率消耗 Total Power Dissipation		Ptot	200	mW
隔离电压 Isolation Voltage		Viso	5000	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

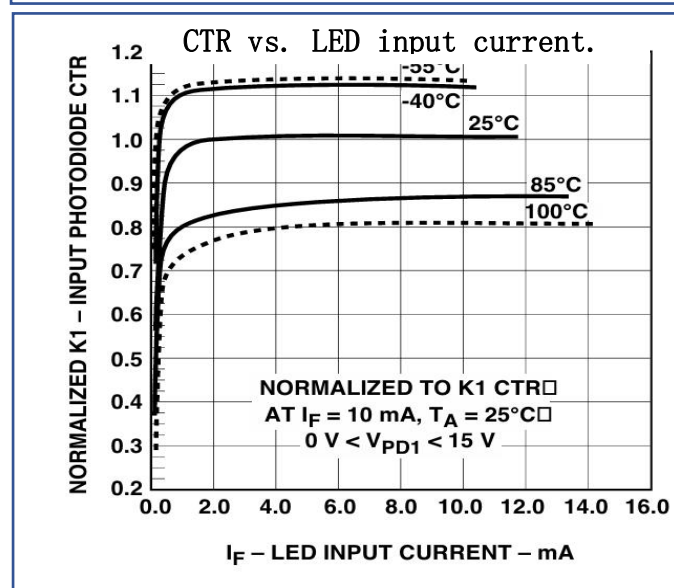
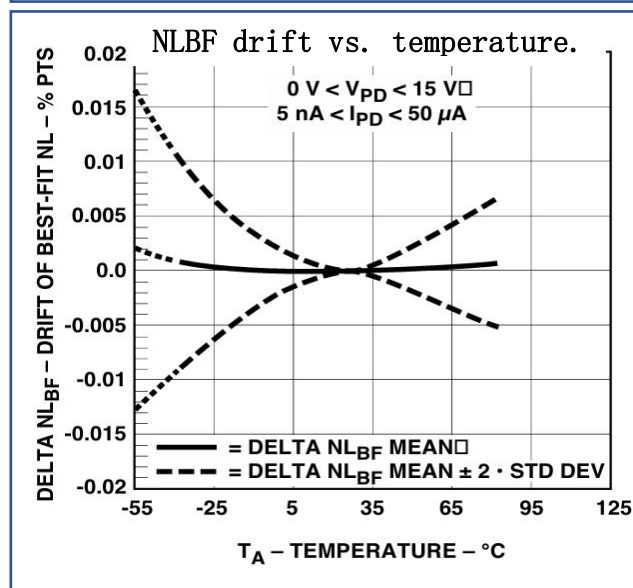
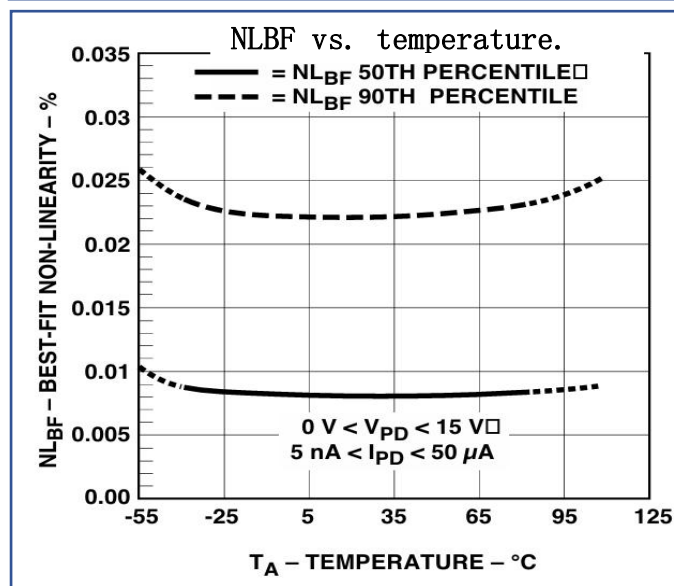
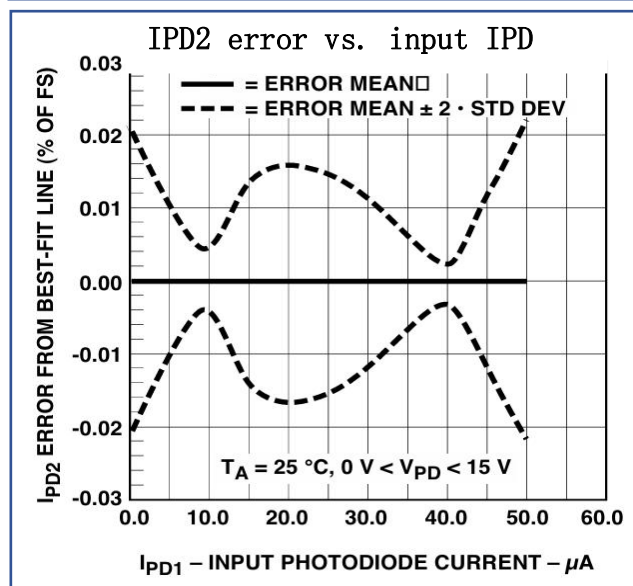
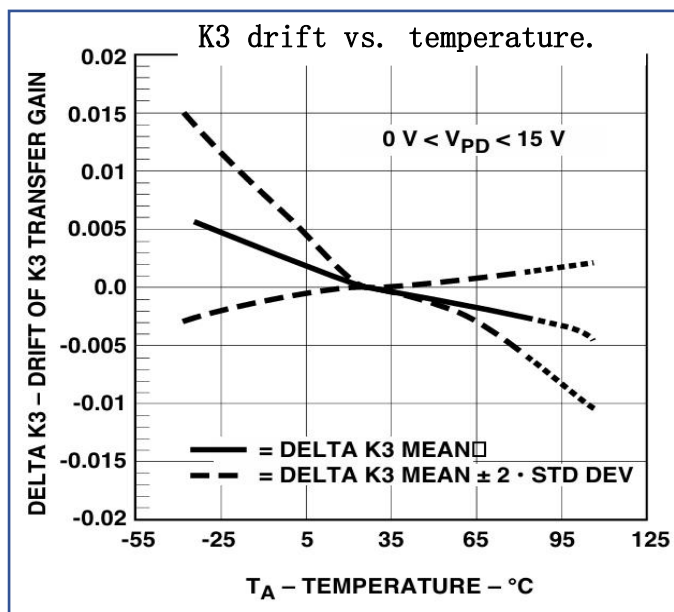
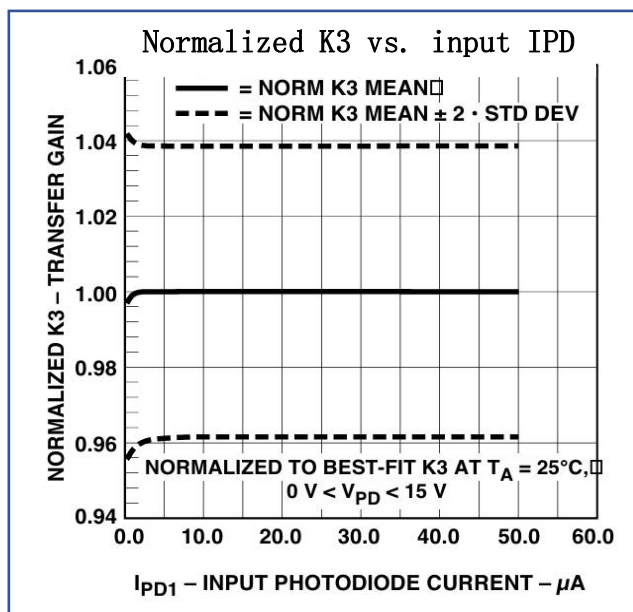
参数 Parameter	符号 Symbol	最小值 Min	最大值 Max.	单位 Unit
正向电流 Forward Current	IF	5	15	mA
阳极-阴极电压 Cathode-anode voltage	VKAO	5	150	V
光电二极管输出电流 Photo diode output current	IL	10	100	uA

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

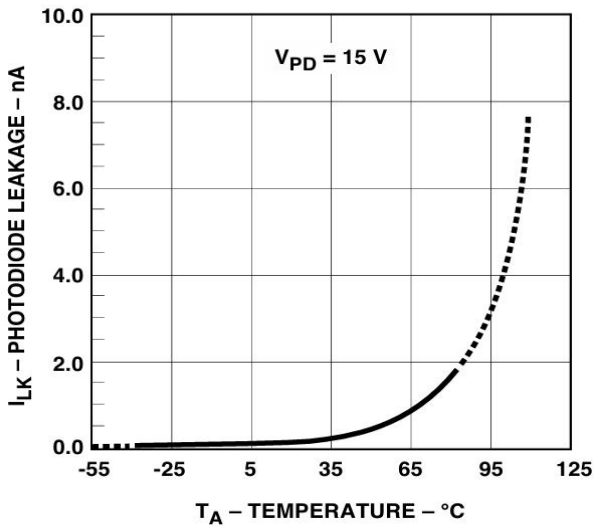
参数 Parameter		符号 Symbol	条件 Condition	最小 Min	典型 Typ	最大 Max	单位 Unit
发射端 Input	正向电压 Forward Voltage	VF	IF=10mA	1.3	-	1.85	V
	反向电流 Reverse Current	IR	VR =5V	-	-	10	uA
	输入电容 Terminal Capacitance	Ct	V=0V, F =1KHz	-	22	-	pF
接收端 Output	暗电流 Dark current	ILK	IF=0 0V<VPD<15V	0.5	-	25	nA
	阴极-阳极击穿电压 Cathode-anode breakdown voltage	V(BR)KAO	Ir=100uA	30	150	-	V
	阳极-阴极击穿电压 Anode-cathode breakdown voltage	V(BR)AKO	IAK=0.1mA	0.5	-	-	V
	光电二极管输出电流 Photo diode output current	IL	IF=5mA VKA=5V	-	-	75	uA
	输出电容 Capacitance	CAK	V=0, f=1MHz	-	10	-	PF
	传输增益 transfer gain	K3	5 nA < IPD < 50uA 0 V < VPD < 15 V	0.85	1.0	1.15	%
	应用电路带宽 Application Circuit Bandwidth	/	IF=10mA	-	1.5	-	MHZ
	隔离电阻 Isolation Resistance	RISO	DC500V, 40 ~60%R.H.	1x10 ¹²	1x10 ¹³	-	Ω
	隔离电容 Isolation capacitance	CISO	V=0,f=1MHz	-	0.4	0.6	pF
	上升时间 Rise Time	Tr	VCC=3.3V, RD =510Ω RL =20kΩ F=11520HZ	-	2	10	μs
	下降时间 Fall Time	Tf		-	3	10	μs

注 电流传输比= $I_C/I_F \times 100\%$;Note*: CTR= $I_C/I_F \times 100\%$.

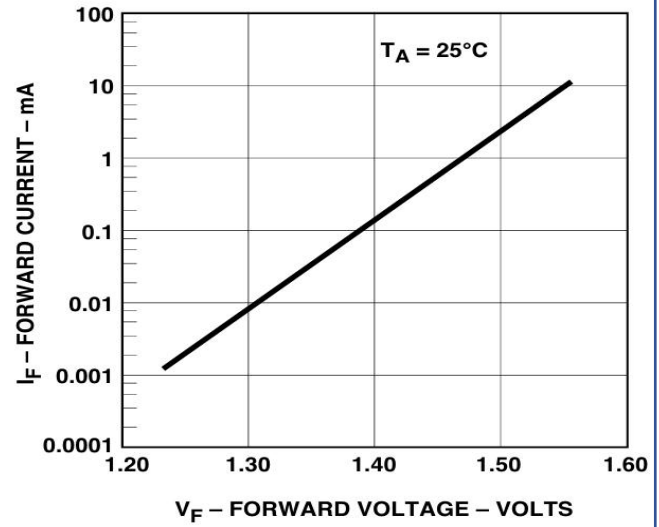
◆ 电性特性曲线 Electrical characteristic curve ($T_A = 25^\circ\text{C}$)



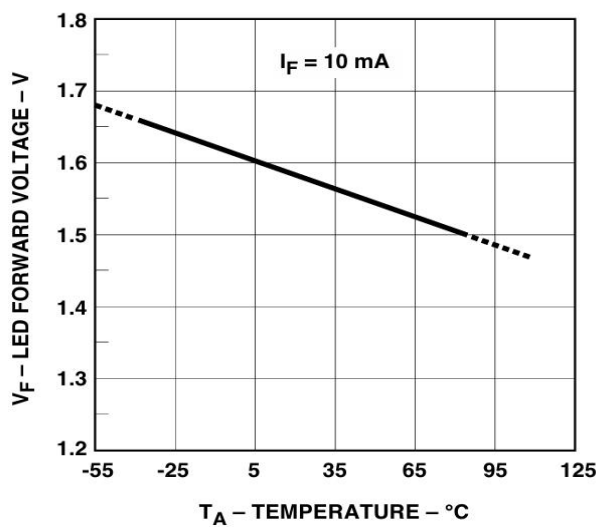
Typical photodiode leakage
vs. temperature.



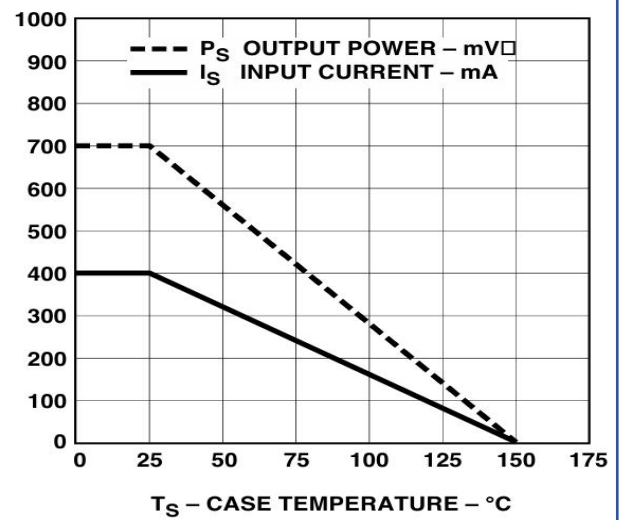
LED input current
vs. forward voltage.



LED forward voltage vs.
temperature.

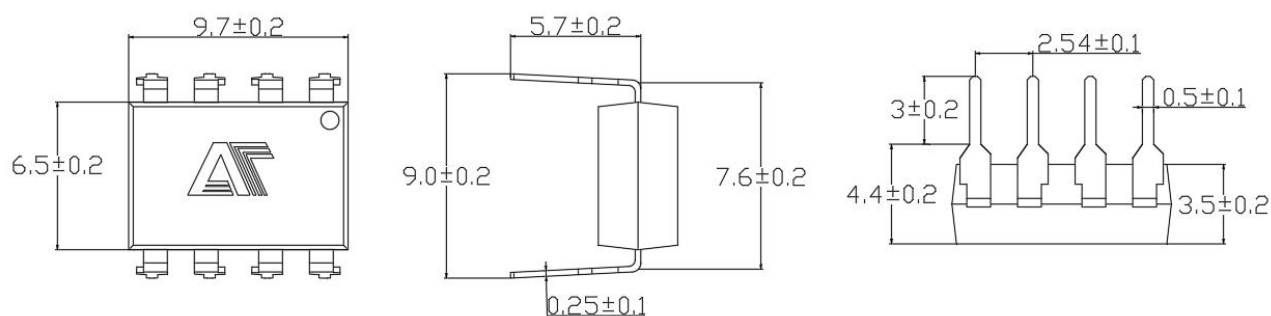


Thermal derating curve
dependence of safety limiting
value with case temperature

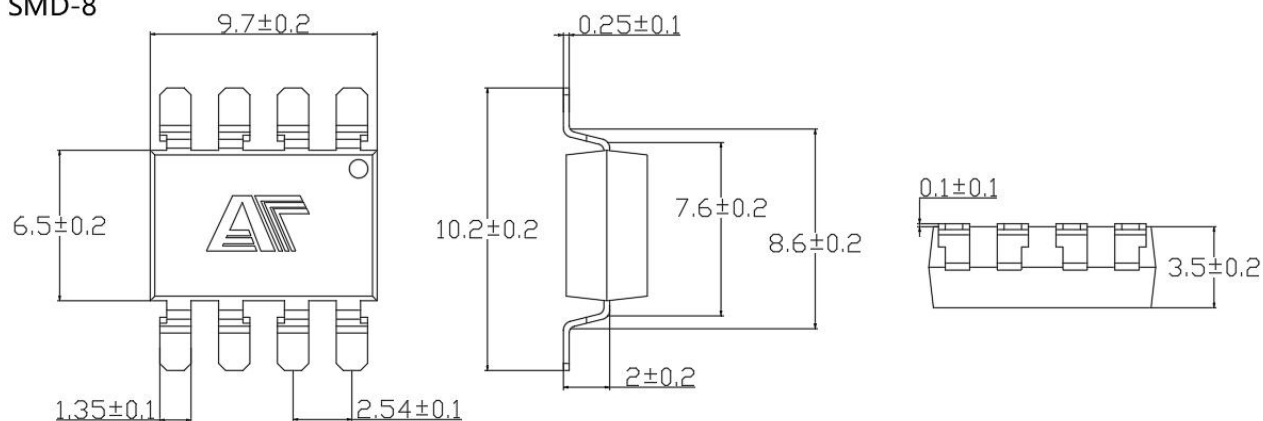


◆ 外形尺寸Overall dimension

DIP8

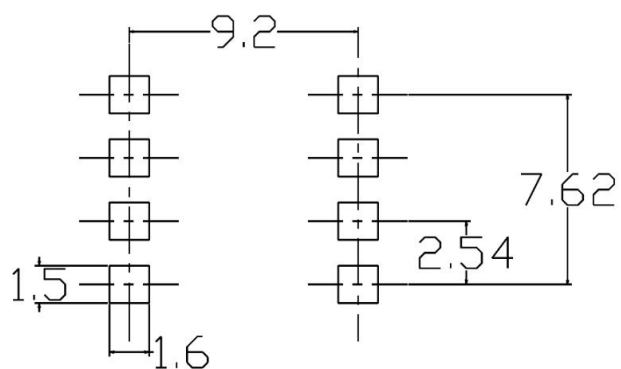


SMD-8



推荐焊盘:

Recommended



单位: mm

◆ 产品型号命名规则 Order code

AT N200 - 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 (N200)
- ③ 框架类型 Lead Frame (Cu: 铜框架 Copper, Fe: 铁框架 Ferrum)
- ④ 树脂类型 Epoxy Type (H: 无卤 Halogen-free)
- ⑤ 封装形式 Package (D:DIP,S:SMD,M:DIP-M)
- ⑥ 细分档位 Subdivision Code (T: D1, Y: D2)
- 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
- 印字中的 “X” 代表产品分档：A、B、C、D或空白
“X” denotes the classification：A、B、C、D or None
- 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

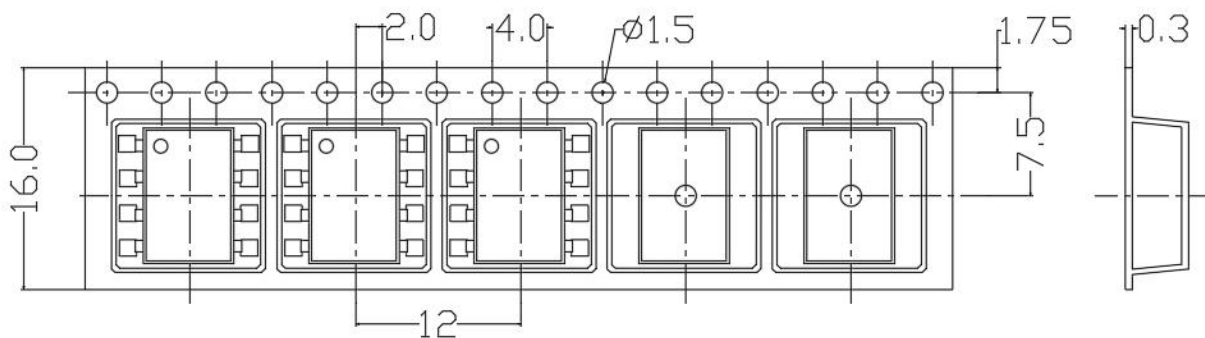
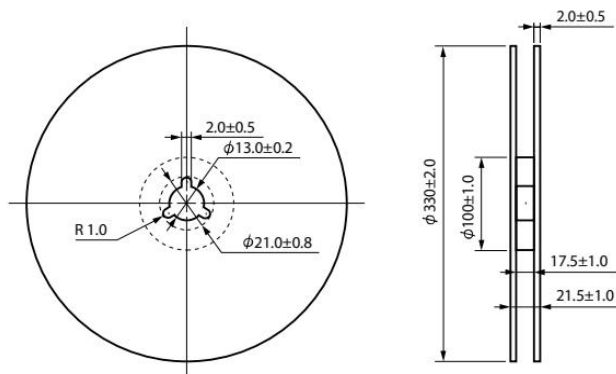


◆ 包装packing

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
SMD8	卷盘 (φ330mm蓝盘)	1000 只/盘	2 盘/盒	10 盒/箱	450*390*0.1mm	340*60*340mm	620*360*365mm	首尾端空至少200mm
DIP8	管装 (500*12*11mm)	45 只/管	50 管/盒	10 盒/箱	不适用	525*128*56mm	535*275*300mm	每管使用蓝白胶塞，方向须一致
Package Type	Packing Form	Quantity per Reel	Quantity per Box	Quantity per Carton	Antistatic Bag Specification	Box Specification	Carton Specification	Note
SMD8	Reel (φ330mm Blue)	1000 pcs/reel	2 reels/box	10 boxes/ctn	450*390*0.1mm	340*60*340mm	620*360*365mm	Leave at least 200mm of blank space at both ends
DIP8	Tube (500*12*11mm)	45 pcs/tube	50 tubes/box	10 boxes/ctn	NA	525*128*56mm	535*275*300mm	Use blue and white rubber plugs for each tube in the same direction

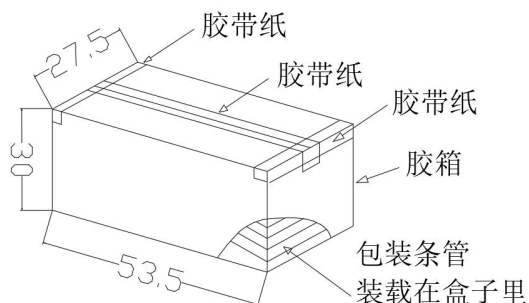
- **编带包装 Tape & Reel**

- 1) 每卷数量: 2000 只;
Qty/reel: 2000 pcs;
2) 每箱数量: 40000 只;
Qty/ctn: 40000 pcs;
3) 内包装: 每盒 2 盘;
Inner packing: 2 reels/box;
4) 示意图 Schematic:



- 管条包装Tape&Tube

- 1) 每管数量: 45 只。
Qty/Tube : 45 pcs.
- 2) 每箱数量: 22500 只。
Qty/ctn: 22500 pcs.
- 3) 内包装 : 每盒 50 管。
Inner packing: 50 Tube/box.
- 4) 示意图 Schematic

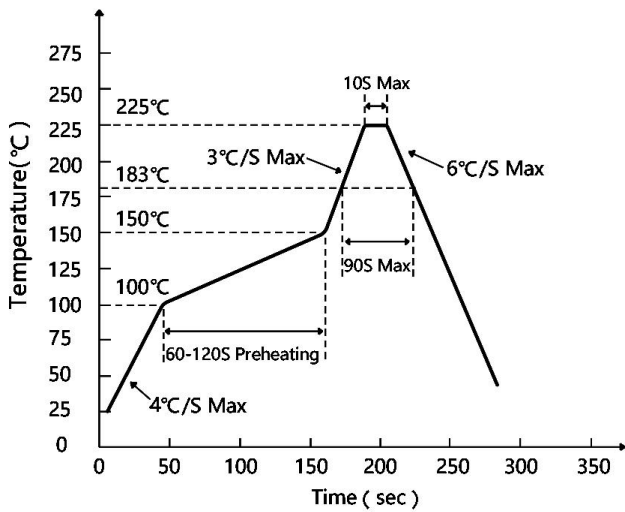


单位: mm

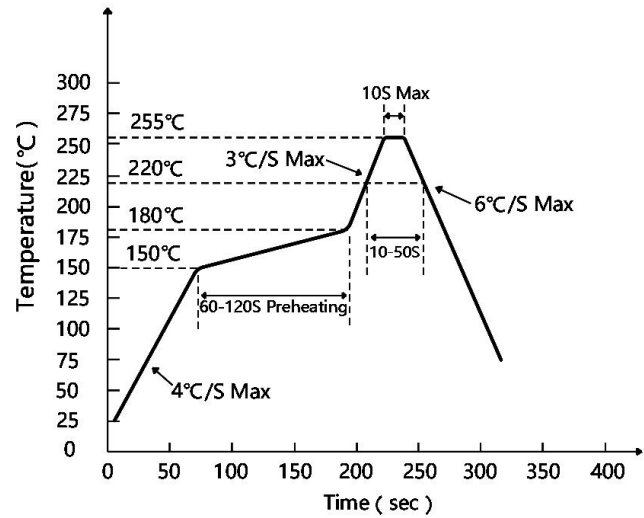
◆ 可靠性测试 Reliability Test Items And Conditions

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

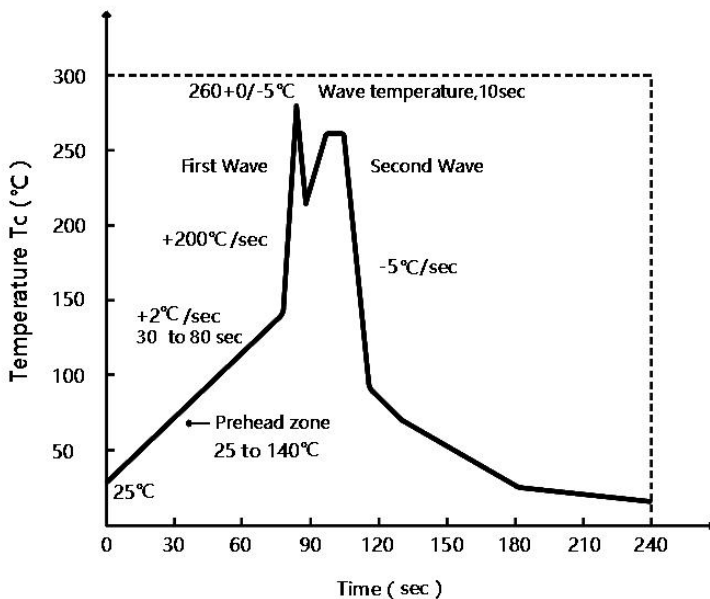


有铅制程 Lead Process



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: