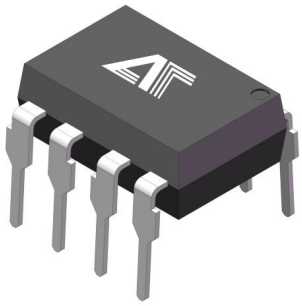
AOTE
SEMICONDUCTOR



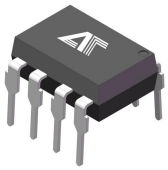
高速光耦
High speed optocoupler

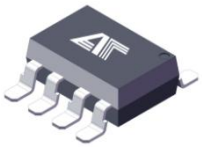
AT6N137

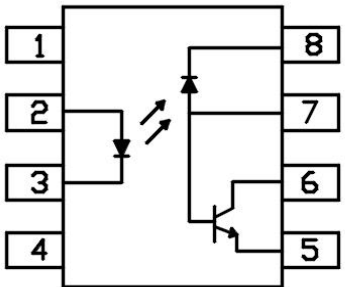
Product Data Sheet

AOTE DCC
RELEASE

DIP8 SMD8







Pin Configuration
1.NC
2.Anode
3.Cathode
4.NC
5.GND
6.VO
7.VB
8.VCC

◆ 封装逻辑原理图 Encapsulation logic schematic

AT6N137 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。

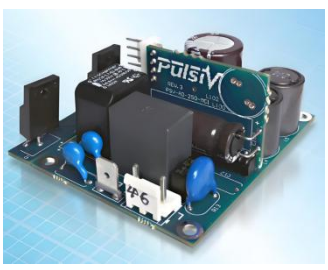
The AT6N137 optocoupler adopts high-efficiency photoelectric conversion technology and advanced packaging processes, providing reliable input-output isolation. It supports two package types (DIP8 SMD8) to meet diverse application requirements.

◆ 产品特征Product features

- 输入-输出隔离电压Vios=5000Vrms
  Input output isolation voltage：Vios=5000 Vrms
- 高传输比特率：10MBit/s；High transmission ratio 10MBit/s；
- 输出高电平共模瞬态抑制 5KV/US; Common Mode Transient Immunity at High Output Level 5K/US
- 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

- 通信与网络Communications and Networking光纤通信，数据中心Fiber optic communication, data center
- 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
- 电机驱动与能源管理 Motor Drive and Energy Management；电机控制，电机保护，电力电子，消费电子
  Motor control, motor protection，Power electronics，Consumer Electronics
- 新兴技术领域Emerging technology fields
  智能交通系统，医疗设备，自动化生产线Intelligent Transportation System，medical equipment，Automatic production line



◆ 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	正向输入电流（平均） DC/Average Forward Input Current	IF	20	mA
	使能输入电压不超过 VCC 500mV Enable Input Voltage Not to Exceed VCC by more than 500mV	VE	5.5	V
	反向输入电压 Reverse Input Voltage	VR	5.0	V
	功耗 Power Dissipation	PI	70	mW
接收端 Output	电源电压 Supply Voltage	VCC	7.0	V
	输出电流 Output Current	IO	50	mA
	输出电压 Output Voltage	VO	7.0	V
	输出功率 Collector Output	PO	85	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 Symbd	最小值 Min	最大值 Max	单位 unit
低电平输入电流 Low Level Input Current	IFL	0	250	μA
高电平输入电流 High Level Input Current	IFH	6.3	15	mA
电源电压 Supply Voltage	VCC	2.7	5.5	V
低电平使能电压 Low Level Enable Voltage	VEL	0	0.8	V
高电平使能电压 Low Level Enable Voltage	VEH	2.0	VCC	V

◆ 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 =16mA	-	1.38	1.75	V
	反向击穿电压 Reverse Breakdown Voltage	BVR	IR =10μA	5	20	45	V
	输入电容 Input Capacitance	Cin	V=0, f=1MHz	-	70	-	pF
接收端 Output	正向电压的温度系数 Input Diode Temperature Coefficient	ΔVF/ΔTA	IF =10mA	-	-1.4	-	mV/°C
	高电平电源电流 High Level Supply Current	ICCH	VCC =5.5V, IF =0mA , VE =0.5V	-	6.5	10	mA
	低电平电源电流 Low Level Supply Current	ICCL	VCC =5.5V, IF =10mA	-	9	13	mA
传输特性 Transfer Characteristics	低电平使能电流 Low Level Enable Current	IEL	VCC =5.5V, VE =0.5V	-	-0.8	-1.6	mA
	高电平使能电流 High Level Enable Current	IEH	VCC =5.5V, VE =2.0V	-	-0.6	-1.6	mA
	高电平使能电压 High Level Enable Voltage	VEH	VCC =5.5V, IF =10mA	2.0	-	-	V
	低电平使能电压 Low Level Enable Voltage	VEL	VCC =5.5V, IF =10mA	-	-	0.8	V
	高电平输出电流 High Level Output Current	IOH	VCC =5.5V, VO =5.5V IF = 250μA, VE =2V	-	-	100	μA
	低电平输出电压 Low Level Output Current	VOL	VCC =5.5V, IF =5mA IOL =13mA, VE =2V	-	0.35	0.6	V
	输入阈值电流 Input Threshold Current	IFT	VCC =5.5V, VO <0.6V IOL =13mA, VE =2V	-	3	5	mA
隔离电阻 Isolation Resistance		Ri-o	VI-O =500V	-	10^{12}	-	Ω
隔离电容 Isolation Capacitance		Ci-o	f=1MHz	-	0.6	-	pF

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

◆ 开关特性 Switching Specification

参数 Parameter	符合 Symbol	条件 Condition	最小 Min.	典型 Typ.	最大 Max.	单位 Unit
输出高电平传播延迟 Propagation Delay Time to Output HIGH Level	TPLH	IF =7.5mA, VCC =5V, RL =350Ω, CL =15pF	20	41	100	ns
输出低电平传播延迟 Propagation Delay Time to Output LOW Level	TPHL		25	50	100	ns
脉宽失真（|TPHL–TPLH|） Pulse Width Distortion	PWD		-	5	35	ns
输出上升时间(10% – 90%) Output Rise Time (10–90%)	tr		-	30	-	ns
输出下降时间(90% - 10%) Output Rise Time (90–10%)	tf		-	10	-	ns
输出高电平使能传播延迟 Enable Propagation Delay Time to Output HIGH Level	tELH	IF =7.5mA, VEH =3.5V, RL =350Ω, CL =15pF	-	15	-	ns
输出低电平使能传播延迟 Enable Propagation Delay Time to Output LOW Level	tEHL		-	40	-	ns
输出高电平共模瞬态抑制 Common Mode Transient Immunity (at Output HIGH Level)	|CMH|	TA =25°C VCC =5V , IF =0mA |VCM|=50V(Peak) VO(MIN) =2.0V , RL =350Ω	5000	10000	-	V/μs
输出低电平共模瞬态抑制 Common Mode Transient Immunity (at Output LOW Level)	|CML |	TA =25°C VCC =5V , IF =10mA |VCM|=50V(Peak) VO(MAX) =2.0V, RL =350Ω	5000	10000	-	V/μs

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

Fig.1 Low-level output voltage vs.Ambient temperature

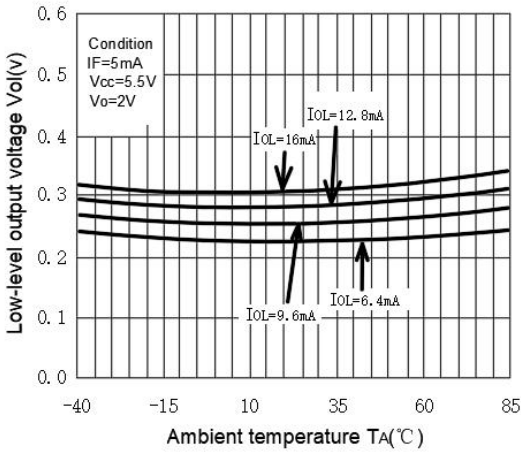


Fig.2 Forward current vs. Forward voltage

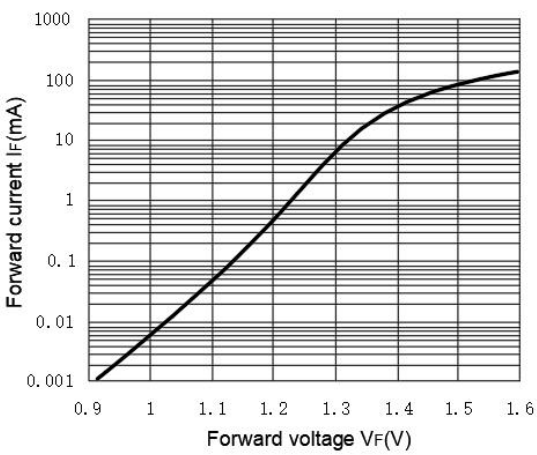


Fig.3 Propagation delay time vs. Forward current

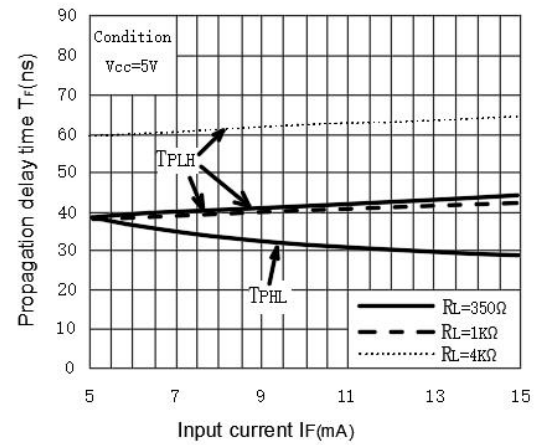


Fig.4 low-level output current vs. Ambient temperature

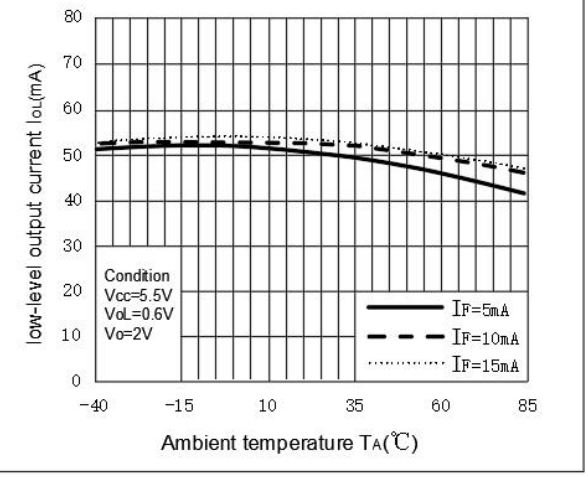


Fig.5 Input threshold current vs. Ambient temperature

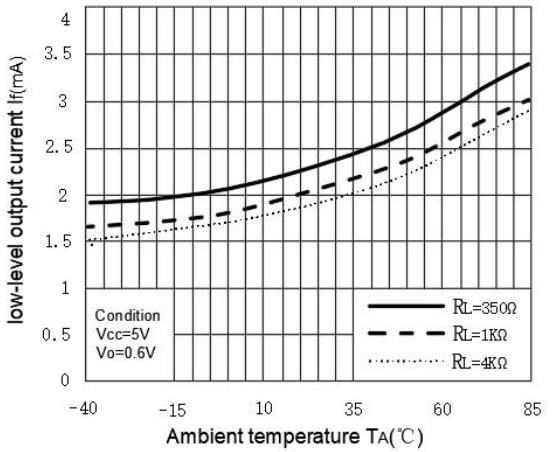


Fig.6 Output voltage vs. Forward current

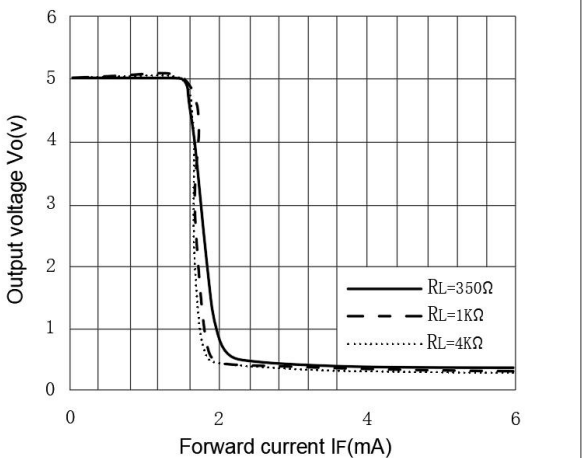


Fig.7 Pulse-width distortion vs. Ambient tempertature

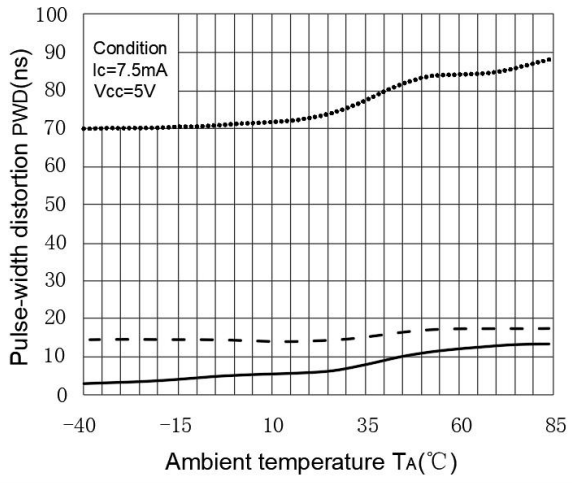


Fig.8 Switching time vs. Ambient tempertature

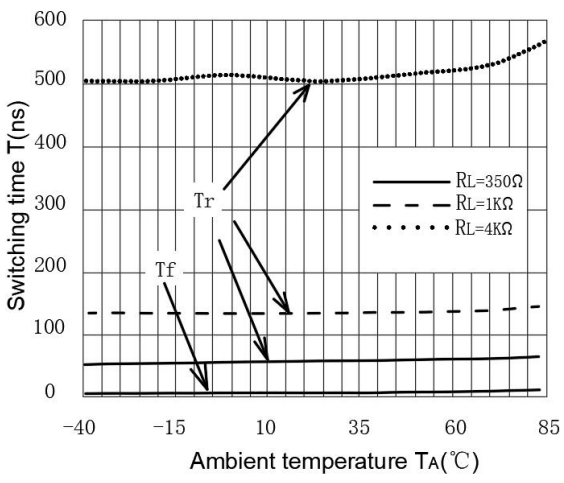


Fig.9 Propagation delay time vs. Ambient temperature

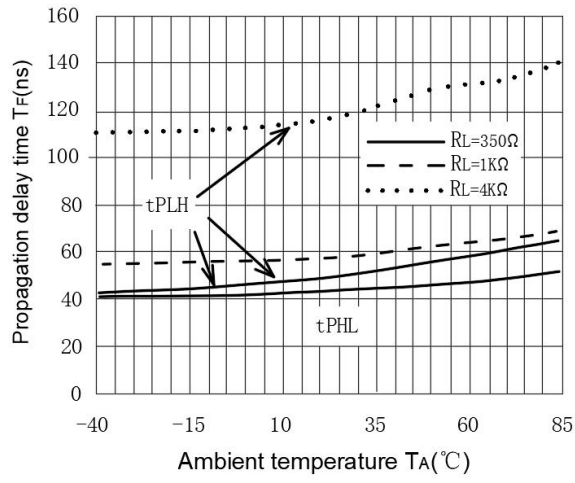


Fig.10 Propagation delay time vs. Ambientemperature

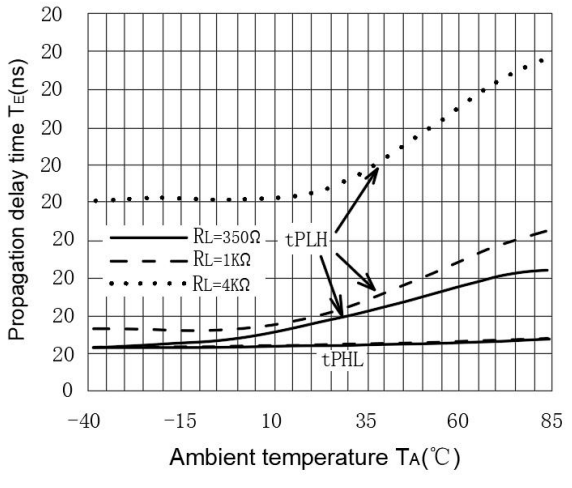
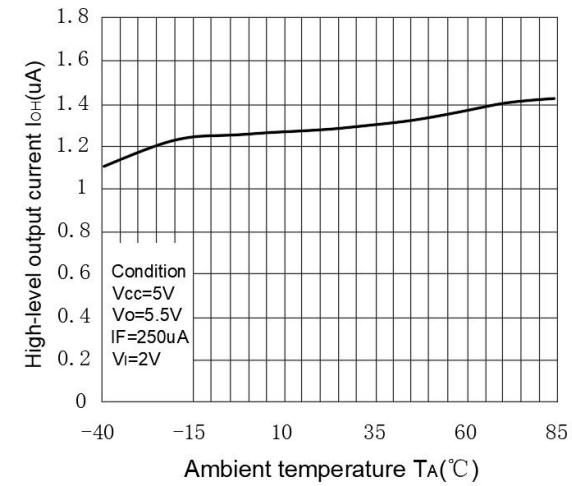
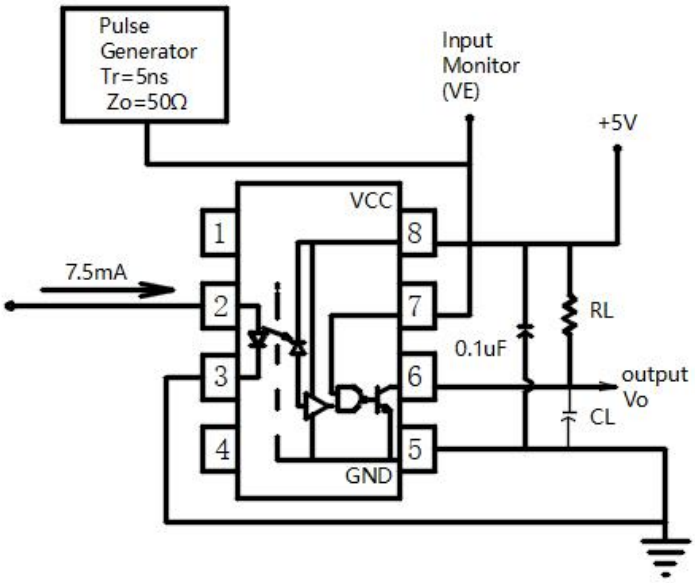
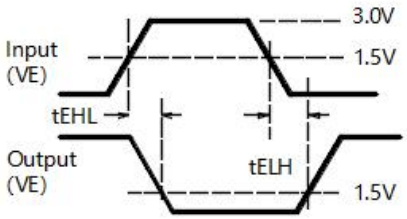


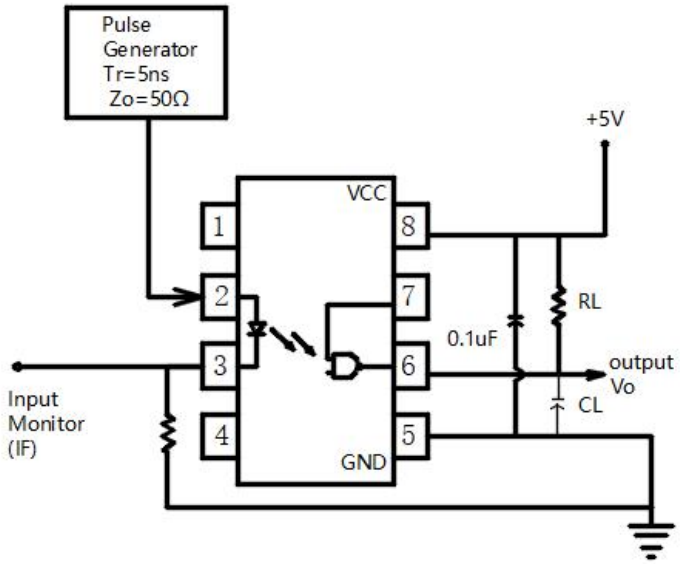
Fig.11 High-level output current vs.Ambient temperature

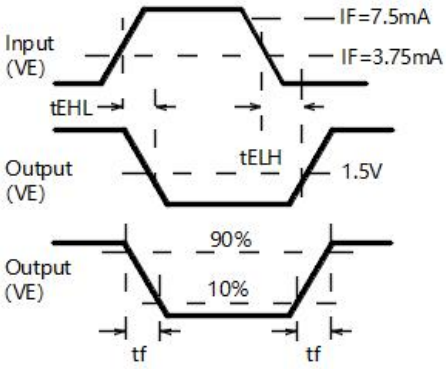


◆ 传输延迟时间测试电路 Test Circuit for Propagation Delay Time

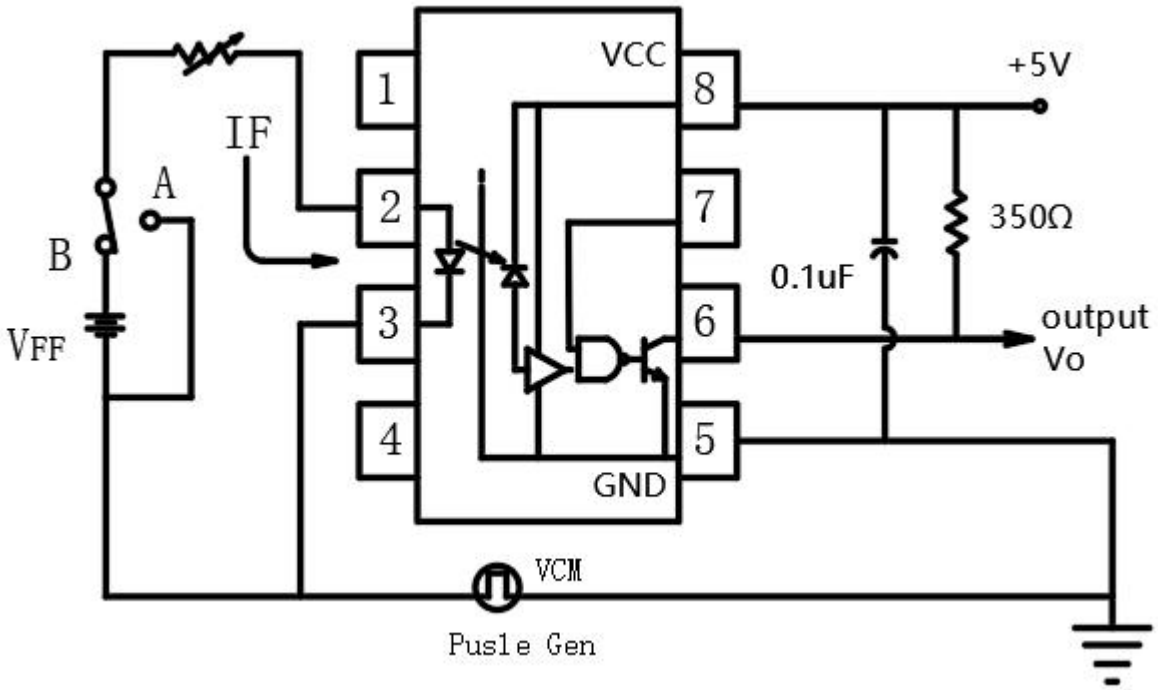


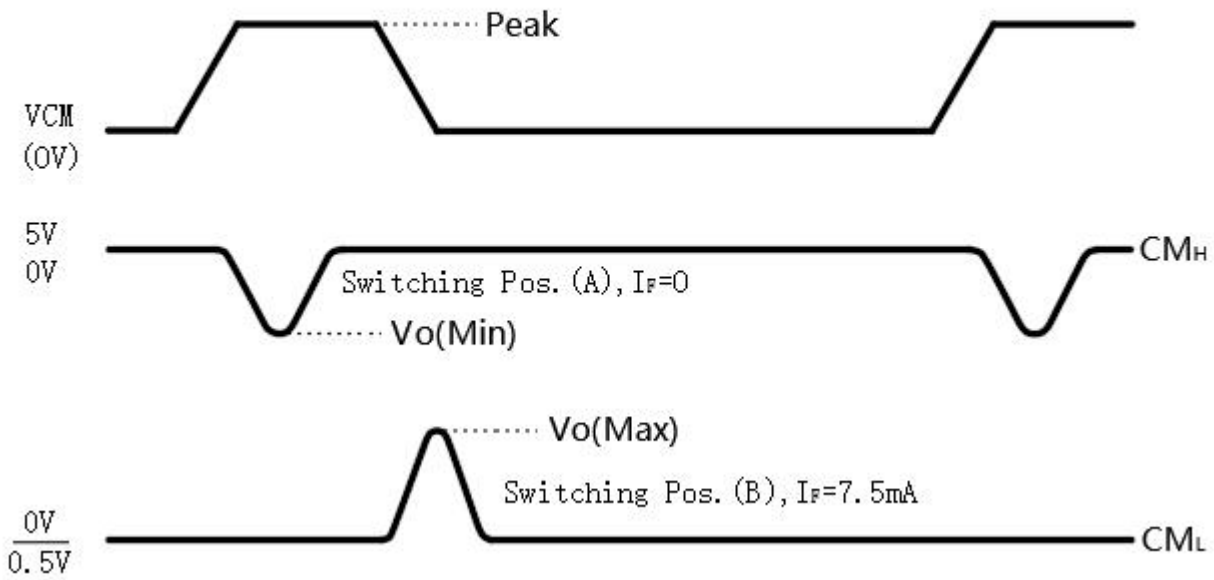






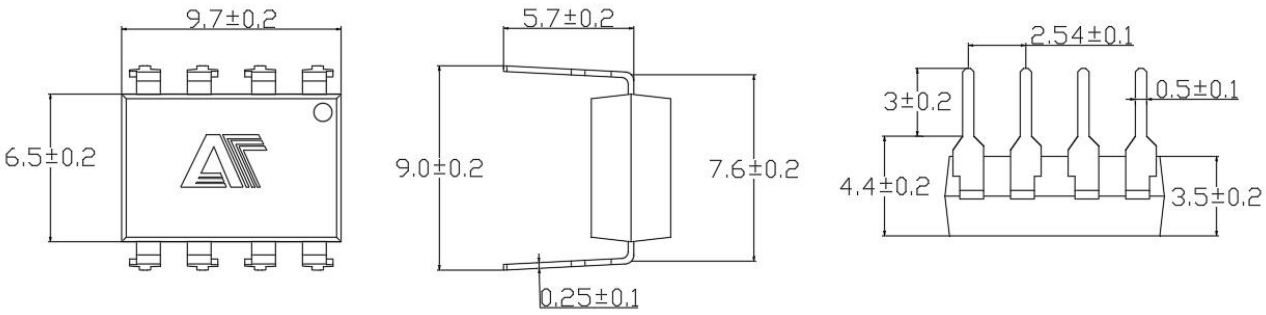
◆ **CMR 测试电路 Test Circuit for Common Mode Transient Immunity**



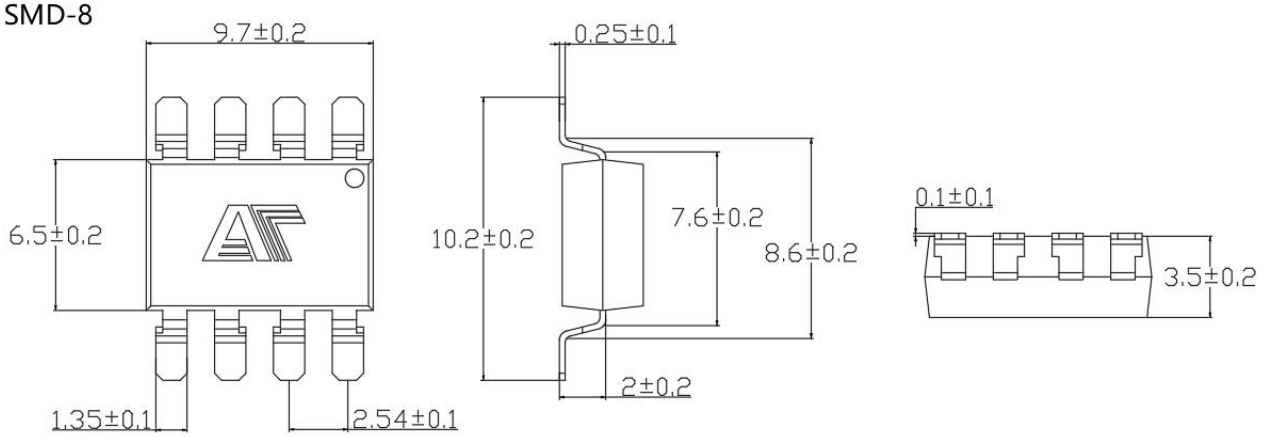


◆ 外形尺寸Overall dimension

DIP8

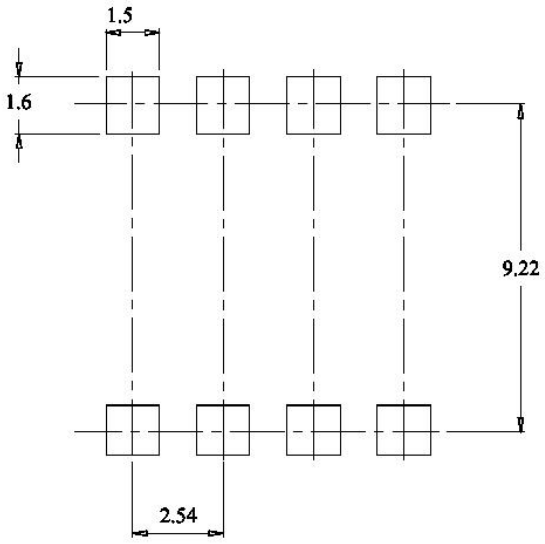


SMD-8



推荐焊盘:

Recommended



单位：mm

◆ 产品型号命名规则 Order Code

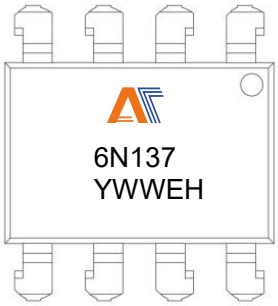
AT 6N137 - UN Y - W (V) (ZZ)

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 (6N137)
③ 框架类型 Lead Frame (Cu: 铜框架 Copper)
④ 树脂类型 Epoxy (H: 无卤 Halogen-free)
⑤ 封装形式 Package (S: SOP)
⑥ 器件工作温度范围 Device Operating Temperature Range (H:125℃)
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

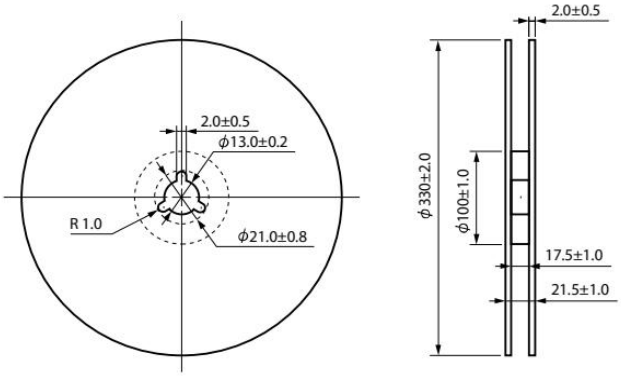


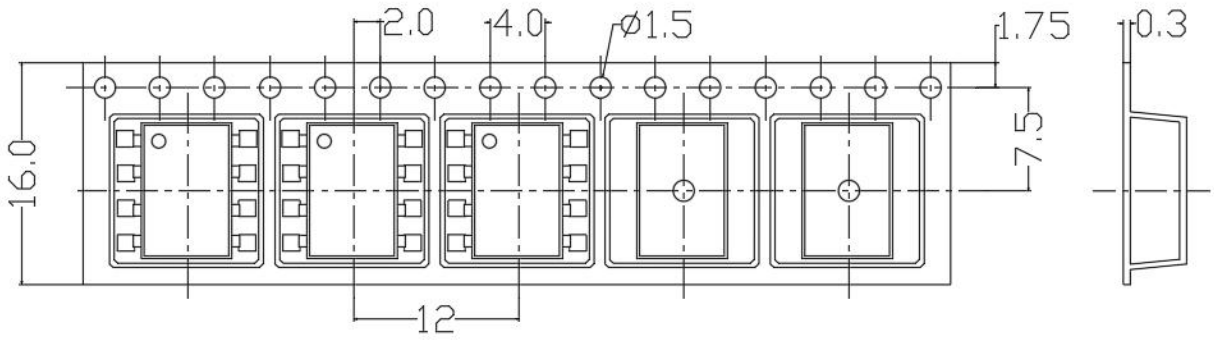
◆ 包装packing

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*340 mm	620*360*365m m	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*56 mm	535*275*300m m	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*340 mm	620*360*365m m	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*56 mm	535*275*300m m	Use blue and white rubber plugs for each tube in the same direction

• 编带包装 Tape & Reel

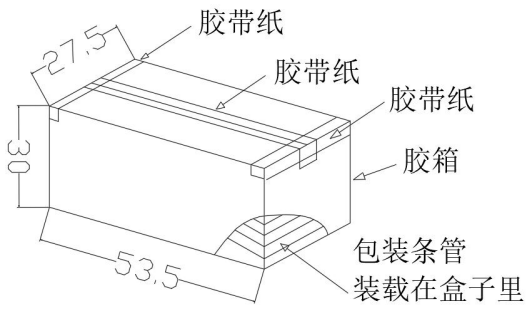
1）每卷数量：2000 只；
Qty/reel：2000 pcs；
2）每箱数量：40000 只；
Qty/ctn：40000 pcs；
3）内包装：每盒 2 盘；
Inner packing：2 reels/box；
4）示意图 Schematic:





• 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

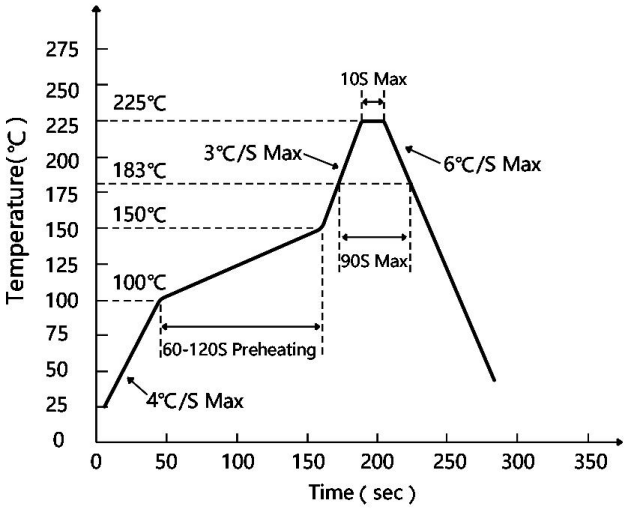


单位：mm

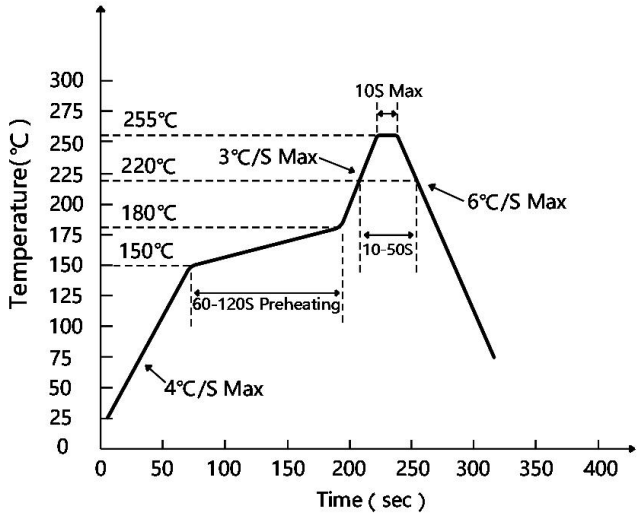
◆ 可靠性测试 Reliability Test Items And Conditions

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）℃, 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

◆ 回流焊温度曲线图 Solder Reflow Profile

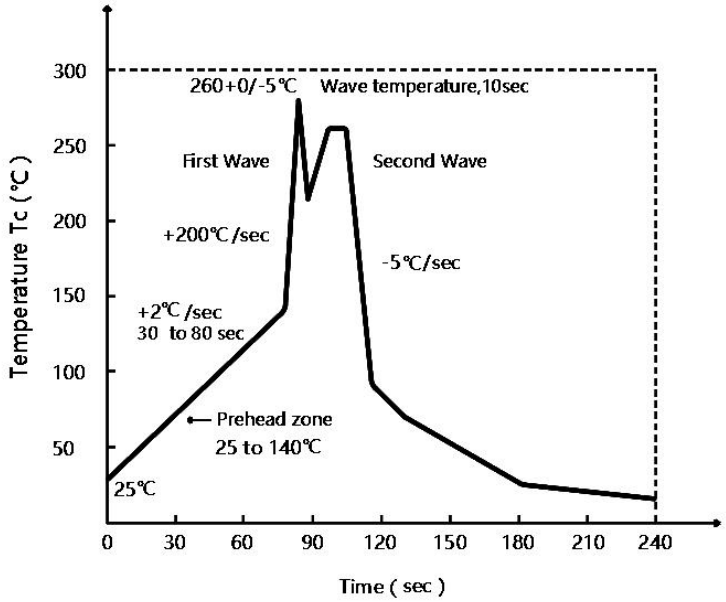


有铅制程 Lead Process



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.

◆ 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: