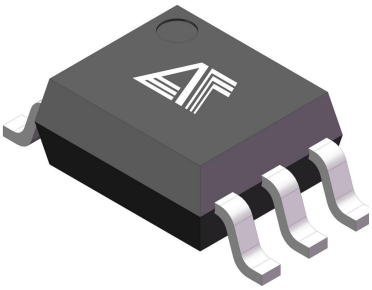
AOTE
SEMICONDUCTOR



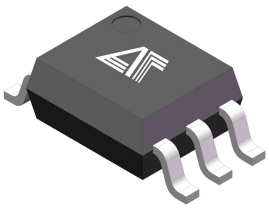
高速光耦
High speed optocoupler

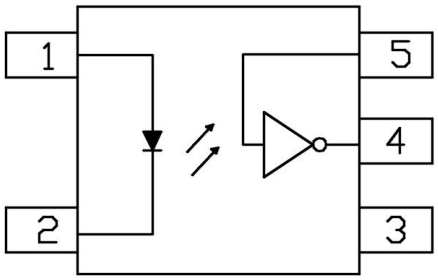
ELM6XX

Product Data Sheet

AOTE DCC
RELEASE

SOP5





Pin Configuration
1.Anode
2.Cathode
3.GND
4.VO
5.VCC

◆ 封装逻辑原理图 Encapsulation logic schematic

ELM6XX 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SOP5封装形式，适配多样化场景需求。

The ELM6XX optocoupler adopts high-efficiency photoelectric conversion technology and advanced packaging processes, providing reliable input-output isolation. It supports package types (SOP5) to meet diverse application requirements.

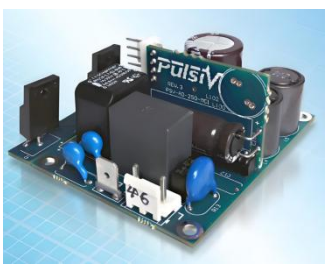
◆ 产品特征Product features

- 输入-输出隔离电压Vios=3750Vrms
  Input output isolation voltage：Vios=3750 Vrms
- 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






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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	50	mA
	反向电压 Reverse Voltage	VR	5	V
	功耗 Power Dissipation	PD	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
	集电极功耗 Collector Power Dissipation	PC	85	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
电源电压 Supply Voltages	VCC	4.5	5.5	V
高电平输入电流 Input Current , High level	IFH	5	10.0	mA
低电平输入电流 Input Current , Low level	IFL	0	250	uA

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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 =10mA	-	1.33	1.8	V
	反向击穿电压 Reverse Breakdown Voltage	VR	IR =10μA	5	-	-	V
	电容 Capacitance	C-in	V=0, f=1MHz	-	70	-	pF
	正向电压的温度系数 Diode Temperature Coefficient	ΔVF/ΔTA	IF =10mA	-	-1.9	-	mV/°C
接收端 Output	高电平电源电流 High Level Supply Current	ICCH	VCC=5.5V , IF =0mA	-	6.0	9	mA
	低电平电源电流 Low Level Supply Current	ICCL	VCC=5.5V , IF =0mA	-	7.5	10	mA
传输特性 Transfer Characteristics	高电平输出电流 HIGH Level Output Current	IOH	VCC=5.5V VO =5.5V IF =250μA	-	2.1	30	uA
	低电平输出电压 LOW Level Output Voltage	VOL	VCC=5.5V IF =5mA ICL=13mA	-	0.4	0.6	V
	输入阈值电流 Input Threshold Current	ITH	VCC=5.5V VO =0.6V IOL=13mA	-	2.4	5	mA
电阻 (输入到输出) Resistance (Input to Output)		RI-O	VI-O =500V	-	10^{12}	-	Ω
电容 (输入到输出) Resistance (Input to Output)		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%.

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◆ 开关特性 Switching Specification

参数 Parameter		符号 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 High Output Level		TPLH	CL =15pF RL =350Ω TA =25°C	-	41	100	ns
输出低电平传播延迟 Propagation Delay Time to Low Output Level		TPHL		-	50	100	ns
脉宽失真 Pulse Width Distortion		|TPHL–TPLH|		-	9	35	ns
输出上升时间(10% – 90%) Output Rise Time (10 to 90%)		tr		-	40	-	ns
输出下降时间(90% - 10%) Output Fall Time (90 to 10%)		tf		-	10	-	ns
传播延迟偏斜 Propagation Delay Skew		tpsk		-	-	40	ns
输出高电平共模瞬态抑制 Common Mode Transient Immunity at High Output Level	M600	|CMH |	TA =25°C,IF =0mA |VCM|=10V(Peak) VOH=2.0V,RL =350Ω	-	-	-	V/μs
	M601		TA =25°C,IF =0mA |VCM|=50V(Peak) VOH=2.0V,RL =350Ω	5000	-	-	
	M611		TA =25°C,IF =0mA |VCM|=1000V(Peak) VOH=2.0V,RL =350Ω	20000	-	-	
输出低电平共模瞬态抑制 Common Mode Transient Immunity at Low Output Level	M600	|CML |	IF =7.5mA,VOL=0.8V RL =350Ω,TA =25°C |VCM|=10V(Peak)	5000	-	-	V/μs
	M601		IF =7.5mA,VOL=0.8V RL =350Ω,TA =25°C |VCM|=50V(Peak)	5000	-	-	
	M611		IF =7.5mA,VOL=0.8V RL =350Ω,TA =25°C |VCM|=1000V(Peak)	20000	-	-	

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

Fig.1 Low-level voltage vs. Ambient temperature

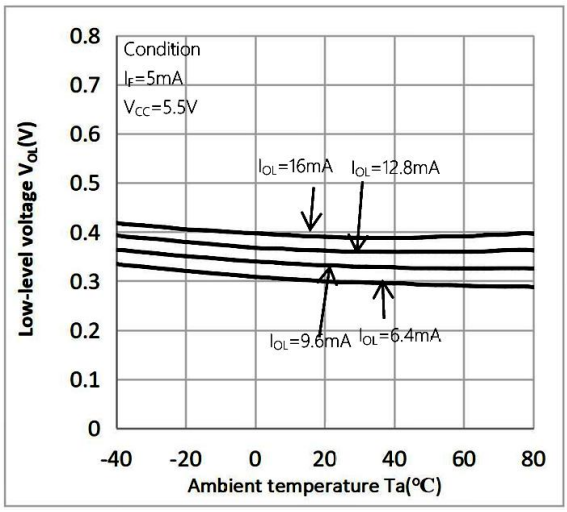


Fig.2 Forward current voltage vs. Forward voltage

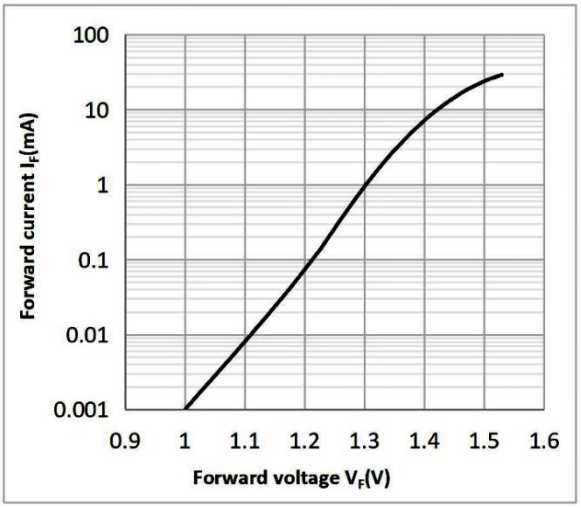


Fig.3 Switch time vs. Forward current

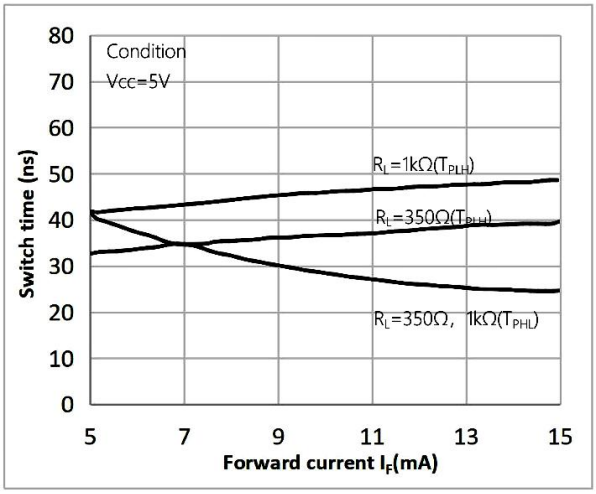


Fig.4 Low-level output current vs. Ambient temperature

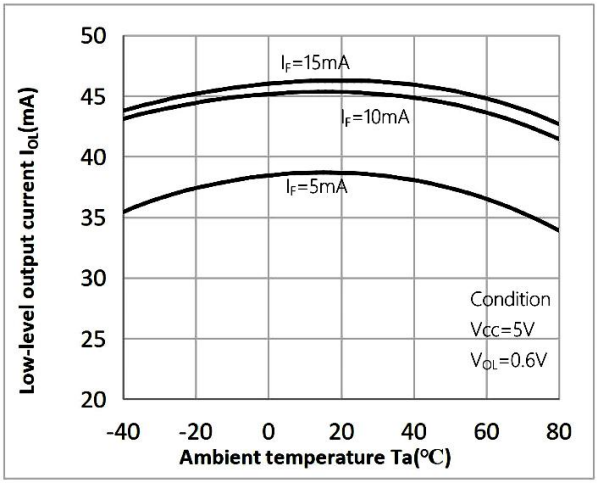


Fig.5 Starting current vs. Ambient temperature

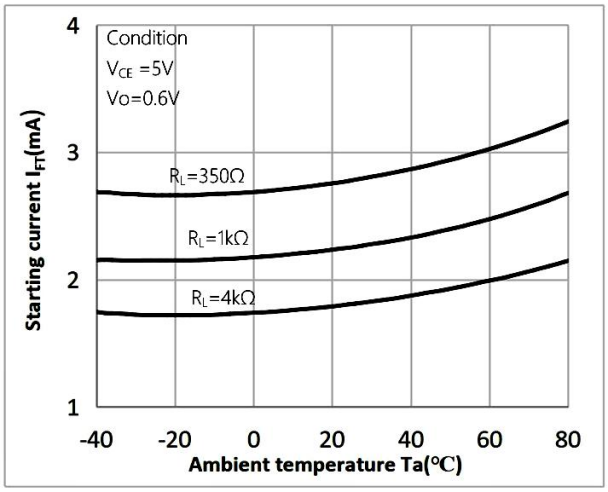
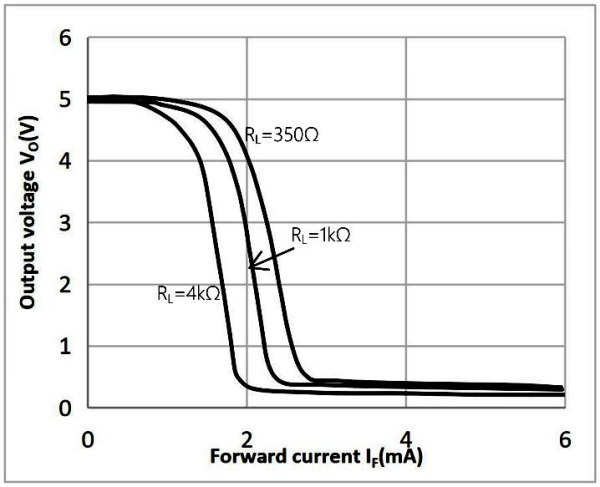


Fig.6 Output voltage vs. Input Forward current



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Fig.7 Pulse-width distortion vs. Ambient temperature

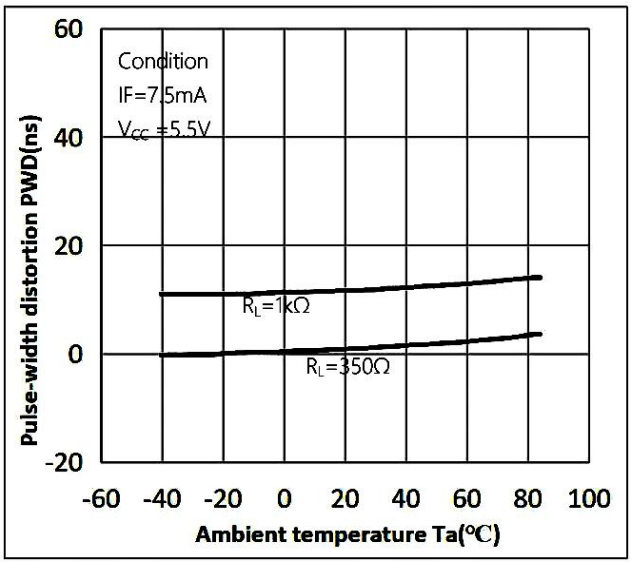
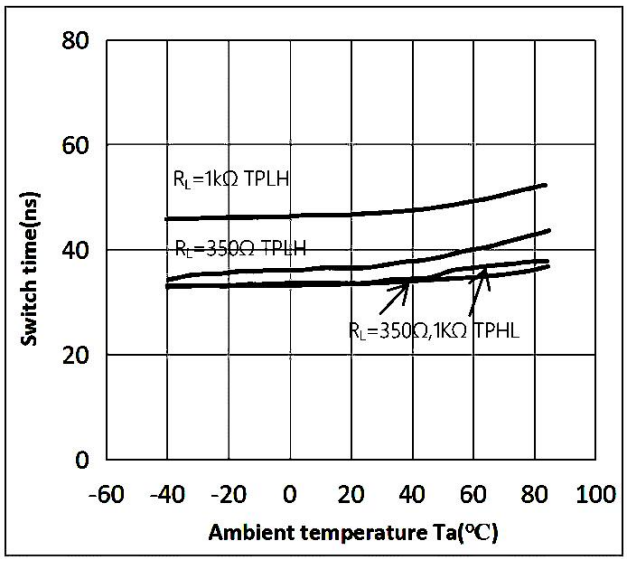
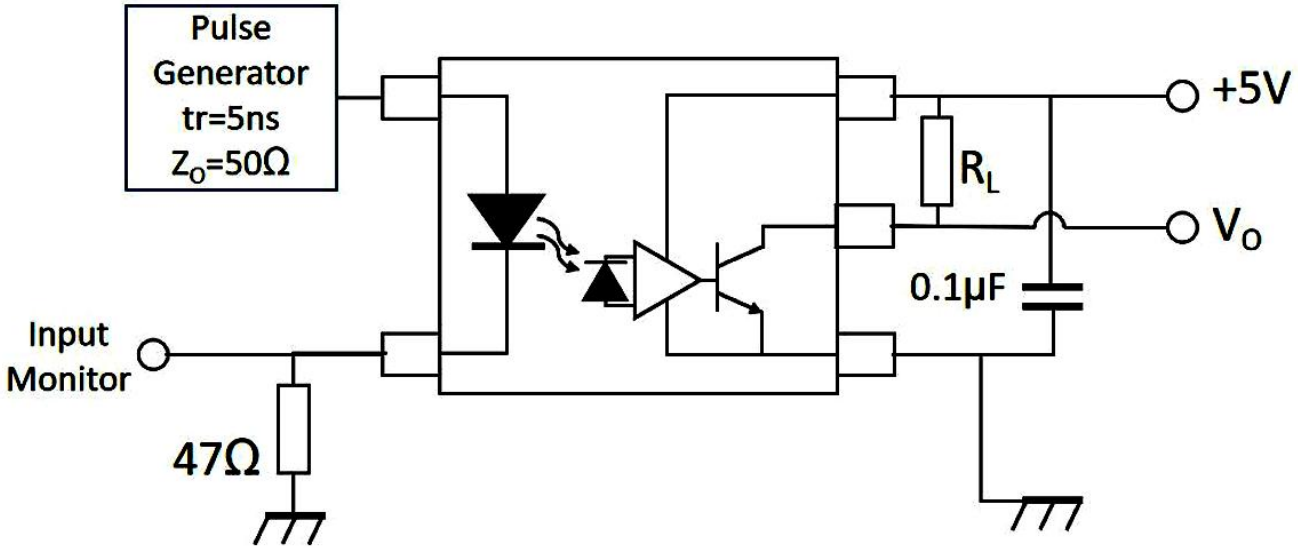


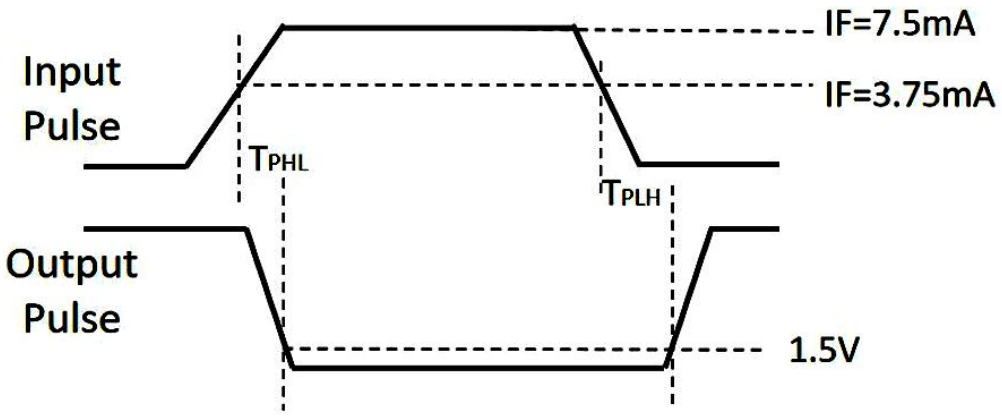
Fig.8 Switch time vs. Ambient temperature

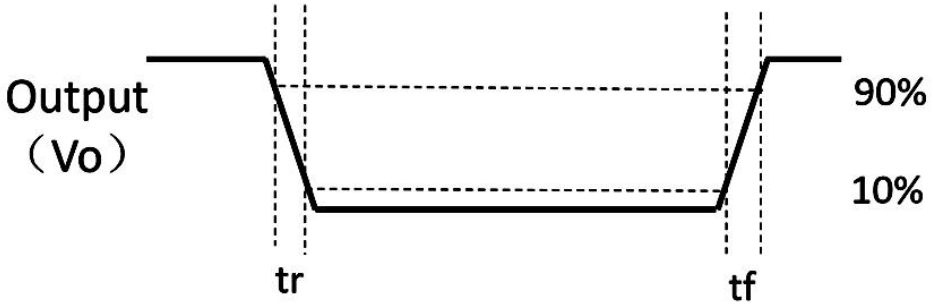


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◆ 开关时间测试电路 Witch Time Test Circuit

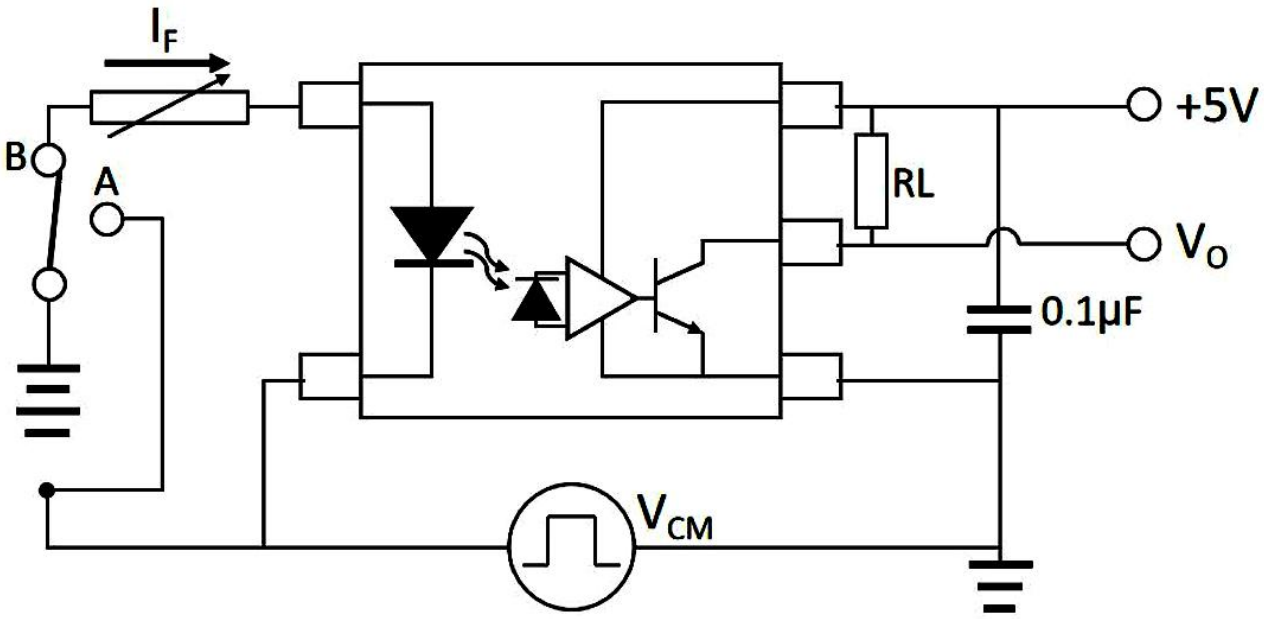


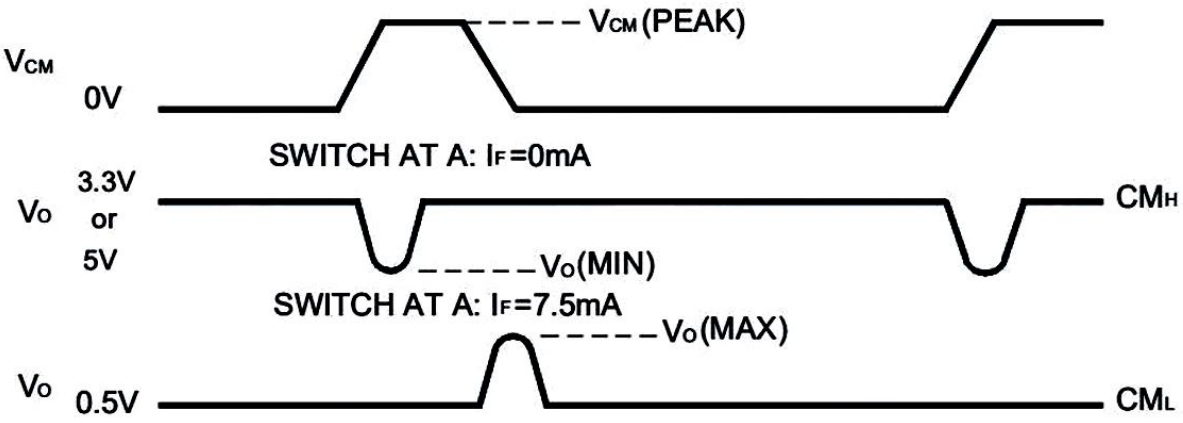




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◆ **CMR 测试电路 Test Circuit for Common Mode Transient Immunity**

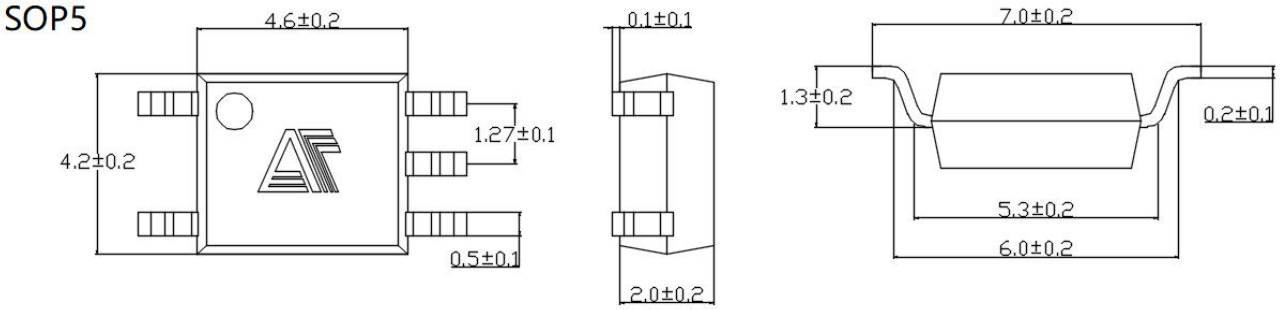




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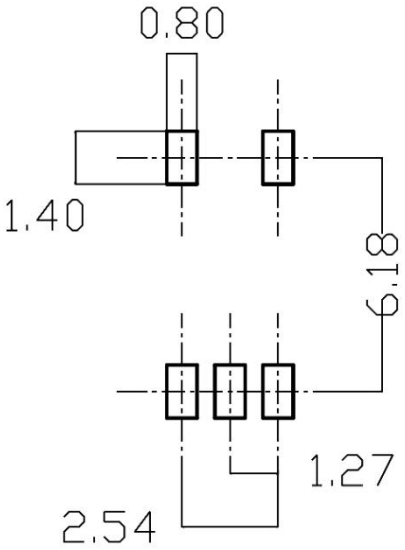
◆ 外形尺寸Overall dimension

SOP5



推荐焊盘：

Recommended

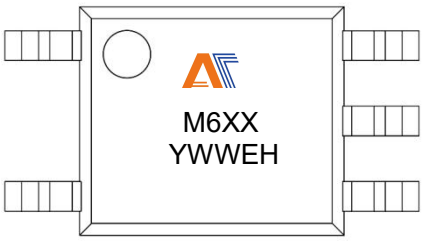


单位：mm

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◆ 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



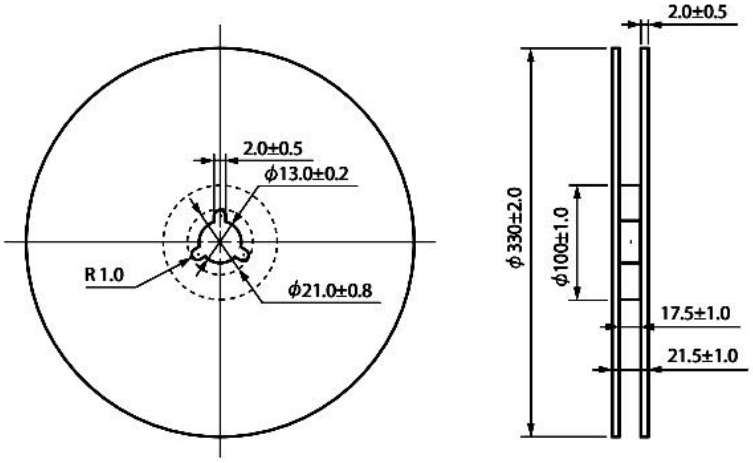
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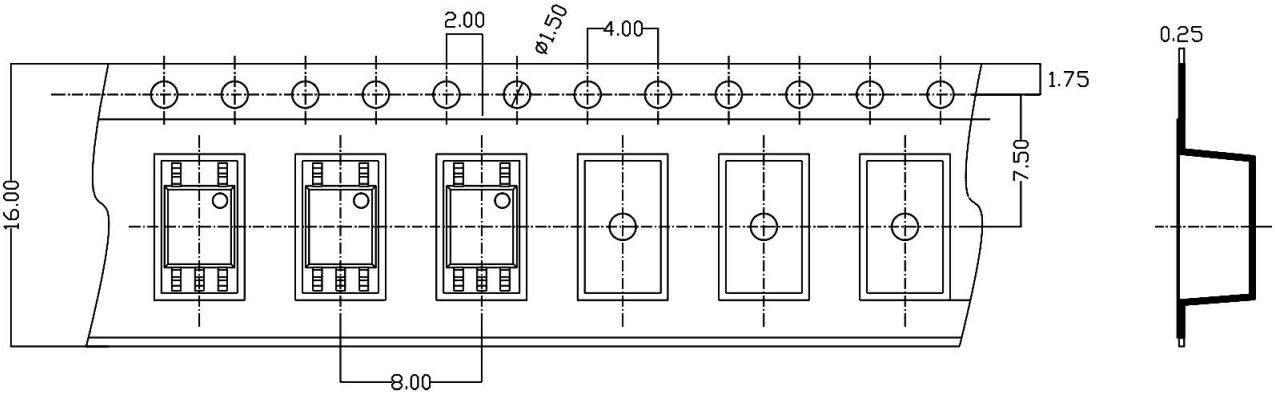
◆ 包装packing

封装	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
SOP5	编带 (ϕ330mm 蓝)	3k /盘	2 盘/盒	10 盒/箱	450*390*0.1mm	340*60*340mm	620*360*365mm	保护带 200mm (min)
Package Type	**Packing Form**	**Quantity per Reel**	**Quantity per Box**	**Quantity per Carton**	**Antistatic Bag Specification**	**Box Specification**	**Carton Specification**	**Note**
SOP5	Reel(ϕ330mm Blue)	3k pcs/reel	2 reels /box	10 boxes /ctn	450*390*0.1mm	340*60*340mm	620*360*365mm	Guard band 200mm min.

• 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: 2reels/box
4) 示意图 Schematic:





单位：m m

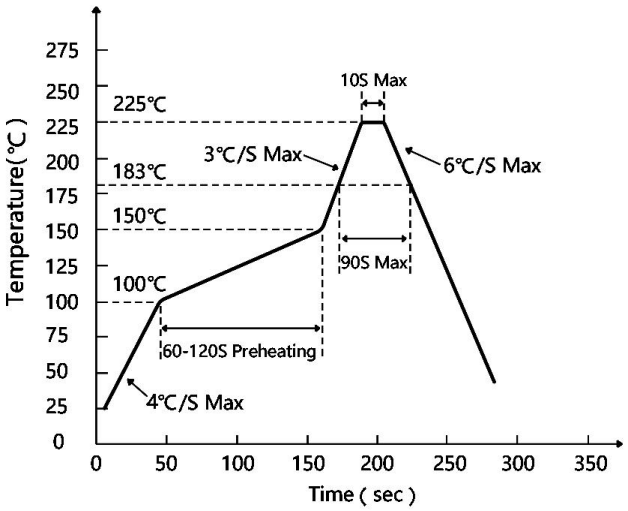
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◆ 可靠性测试 Reliability Test Items And Conditions

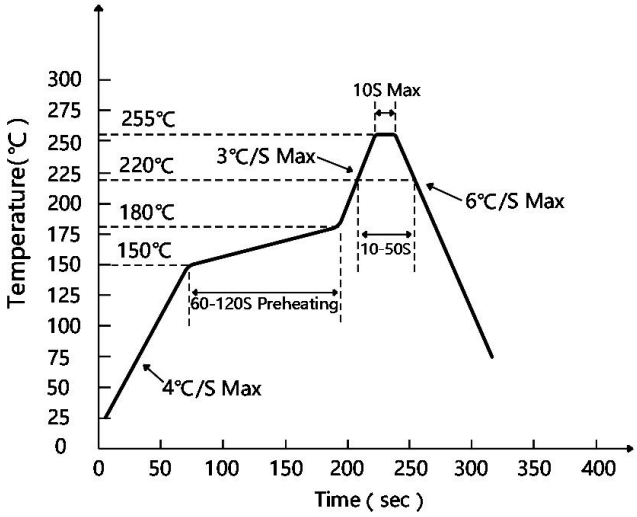
实验项目 Test Items	参考标准 Reference	实验条件 Test Conditions	时间 Time	样品数 Quantity	判据 Criterion
可焊性 Solderability	JESD22-B102	Tsol=（245±5）℃, t=5s;	1 次1 times	22	0/22
耐焊接热 Resistance to Soldering Heat	JESD22-A106	Tsol=（260±5）℃, t=10s	3 次3 times	22	0/22
静电放电 ESD-HBM	JESD22-A114	Ta=25℃, HBM (2000V)	正反各 3 次 P&N 3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

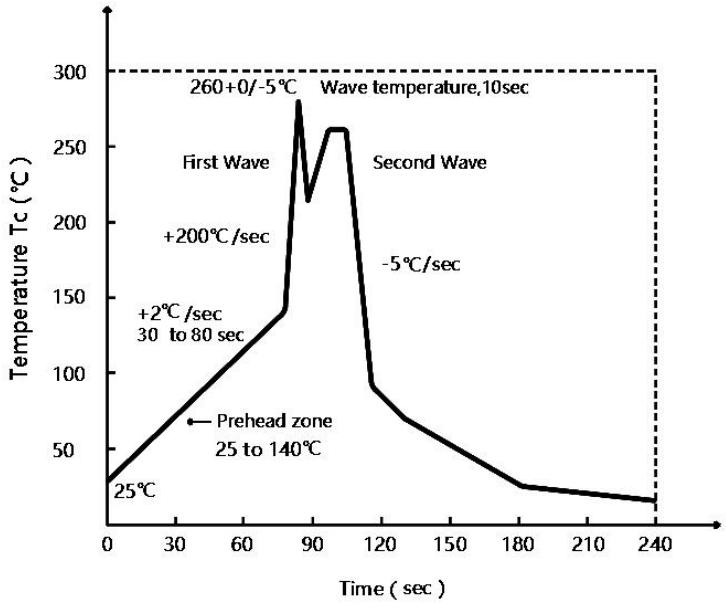


有铅制程 Lead Process



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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