

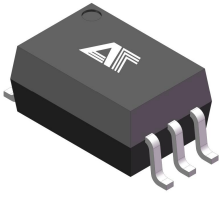
**高速光耦**  
**High speed optocoupler**

**ATW720-CuH-P**

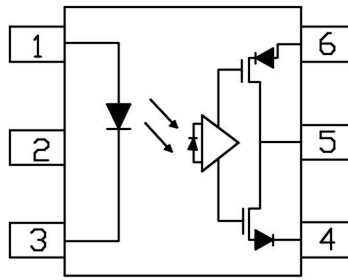
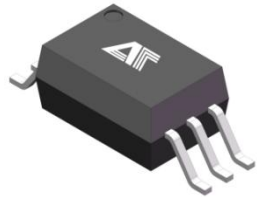
**Product Data Sheet**

**AOTE DCC**  
**RELEASE**

SOP6-P



SOP6-W



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

### ◆ 封装逻辑原理图 Encapsulation logic schematic

ATW720 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SOP6-P, SOP6-W 两种封装形式, 适配多样化场景需求。

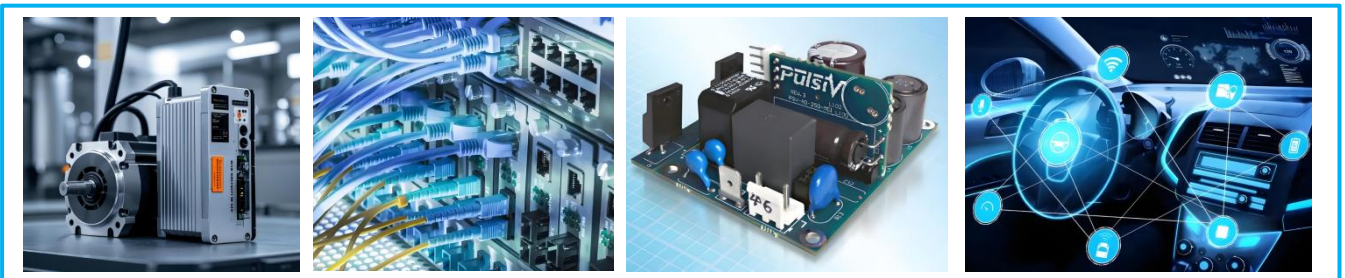
The ATW720 optocoupler adopts high-efficiency photoelectric conversion technology and advanced packaging processes, providing reliable input-output isolation. Supports two types of packaging (SOP6-P, SOP6-W) to meet diverse application requirements.

### ◆ 产品特征Product features

- 输入-输出隔离电压 $V_{ios}=5000V_{rms}$   
Input output isolation voltage:  $V_{ios}=5000 V_{rms}$
- 高传输比特率: 15MBit/s; High transmission ratio 15MBit/s;
- 输出高电平共模瞬态抑制 10KV/US; Common Mode Transient Immunity at High Output Level 10K/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°C)**

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	电源电压 Supply Voltage	Vcc	6.0	V
	输出电流 Output Current	Io	50	mA
	输出电压 Output Voltage	Vo	0.5-VDD+0.5	V
	集电极功耗 Collector Power Dissipation	PC	100	mW
隔离电压 Isolation Voltage		Viso	5000	Vrms
工作温度 Operating Temperature		Topr	-55 ~ +110	°C
存储温度 Storage Temperature		Tstg	-55 ~ +125	°C
焊接温度 Soldering Temperature		Tsol	260	°C

**◆ 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
电源电压 Supply Voltages	VDD	4.5	5.5	V
		3	3.6	
开启电流 Forward Input Current (ON)	IFH	3	10	mA
关断电压 Forward Input Voltage (OFF)	IFL	0	1.3	mA

**◆ 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	正向电压 Forward Voltage	VF	IF = 6mA	1	1.3	1.8	V
	反向击穿电压 Reverse Breakdown Voltage	VR	IR = 10μA	5.0	-	-	V
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	逻辑高输出电压 Logic High Output Voltage	VOH	IF = 0, IO = -4 mA, VDD=5V	VDD-1	VDD -0.2	-	V
	逻辑低输出电压 Logic Low Output Voltage	VOL	IF = 6mA, IO = 4mA, VDD=5V	-	0.35	0.8	V
	输入阈值电流 Input Threshold Current	ITH	IOL = 20μA	-	3	5	mA
	逻辑低输出电源电流 Logic Low Output Supply Current	IDDL	IF = 6mA	-	4.5	6.5	mA
	逻辑高输出电源电流 Logic High Output Supply Current	IDDH	IF = 0	-	4	6	mA

**◆ 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
逻辑低电平传输延迟 Propagation Delay Time to Low Output Level	$t_{PHL1}$	IF = 6mA, CL = 15pF CMOS Signal Levels	-	40	55	ns
逻辑高电平传输延迟 Propagation Delay Time to High Output Level	$t_{PLH1}$		-	36	55	
脉冲宽度 Pulse Width	$t_{PW}$		66.7	-	-	
脉宽失真 Pulse Width Distortion $ t_{PHL}-t_{PLH} $	PWD		0	4	25	
传播延迟偏斜 Propagation Delay Skew	$t_{PSK}$		-	-	40	
输出上升时间 Output Rise Time	Tr		-	3.5	-	
输出下降时间 Output Fall Time	Tf		-	3.5	-	
输出高电平共模抑制 Output High Level Common Mode Transient Immunity	CMH 2	VCM =1000V IF =0mA	10	15	-	kV/ $\mu$ s
输出低电平共模抑制 Output Low Level Common Mode Transient Immunity	CML 3	VCM =1000V IF =6.0mA	10	15	-	

注 Note:

- 从输入脉冲上升沿的 50% $V_{DD}$  电平到  $V_O$  信号下降沿的 50% $V_{DD}$  电平，测量  $t_{PHL}$  传播延迟。从输入脉冲下降沿的 50% $V_{DD}$  水平到  $V_O$  信号上升沿的 50% $V_{DD}$  水平，测量  $t_{PLH}$  传播延迟。  
 $t_{PHL}$  propagation delay is measured from the 50%  $V_{DD}$  level on the rising edge of the input pulse to the 50%  $V_{DD}$  level of the falling edge of the  $V_O$  signal.  $t_{PLH}$  propagation delay is measured from the 50%  $V_{DD}$  level on the falling edge of the input pulse to the 50%  $V_{DD}$  level of the rising edge of the  $V_O$  signal.
- CMH 是共模电压上升的最大可容忍速率，以确保输出将保持在高逻辑状态。  
CMH is the maximum tolerable rate of rise of the common mode voltage to assure that the output will remain in a high logic state.
- CML 是共模电压的最大可容忍的下降率，以确保输出将保持在低逻辑状态。  
CML is the maximum tolerable rate of fall of the common mode voltage to assure that the output will remain in a low logic state.

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

Fig.1 Input current vs. Forward Voltage

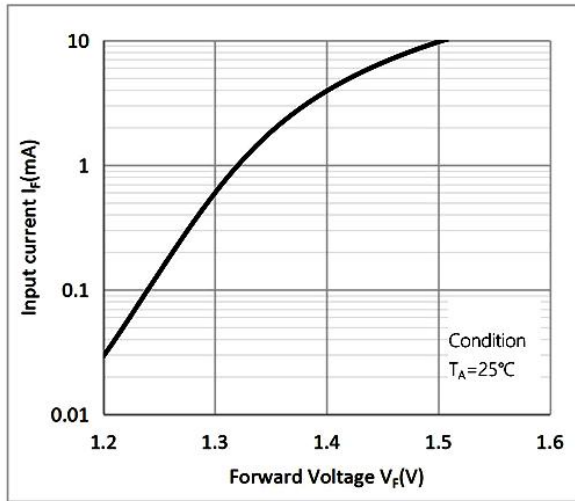


Fig.2 Input threshold current  $I_{TH}$  (mA) vs. Ambient temperature

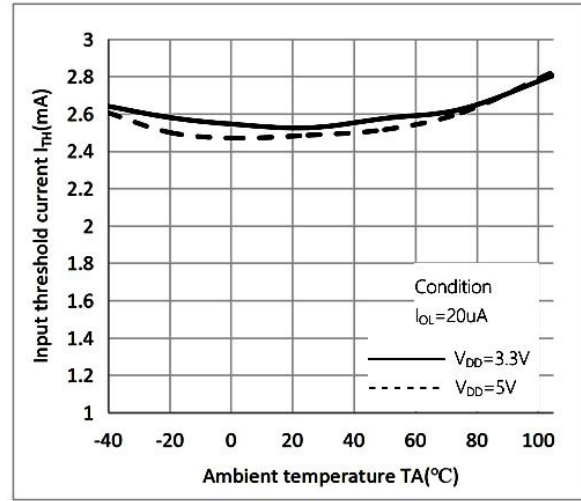


Fig.3 Logic high output supply current vs. Ambient temperature

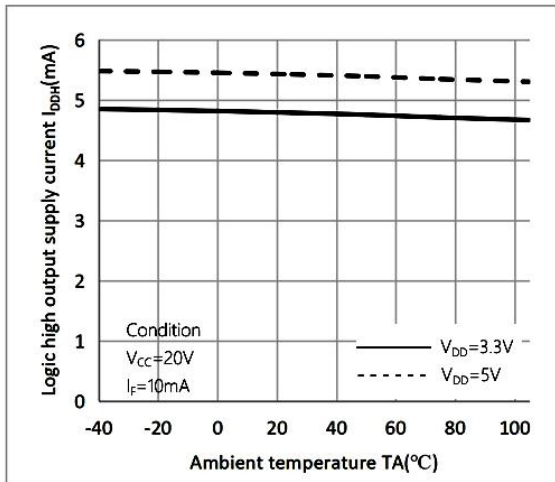


Fig.4 Logic low output supply current vs. Ambient temperature

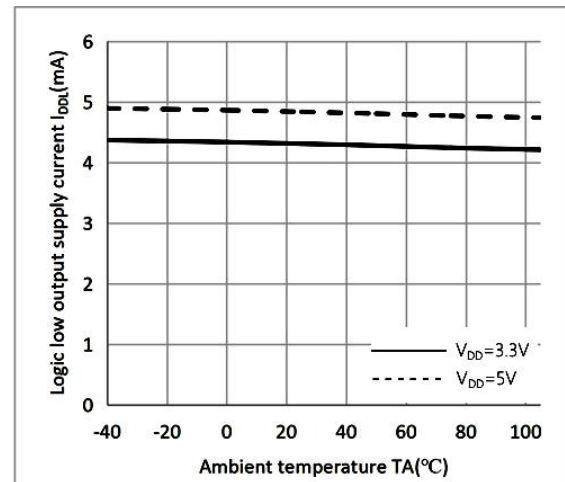


Fig.5 Propagation delay vs. Pulse input current

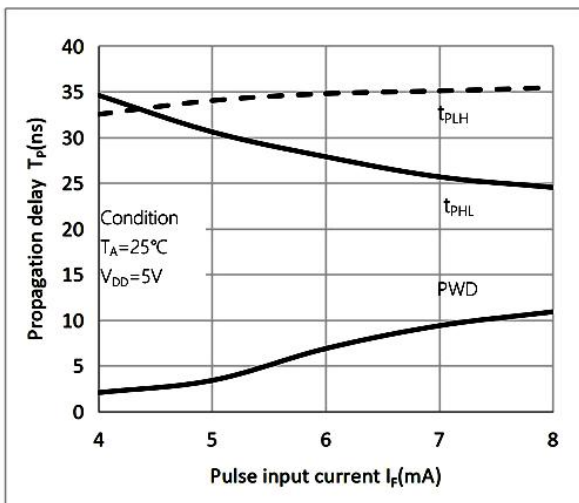


Fig.6 Propagation delay vs. Pulse input current

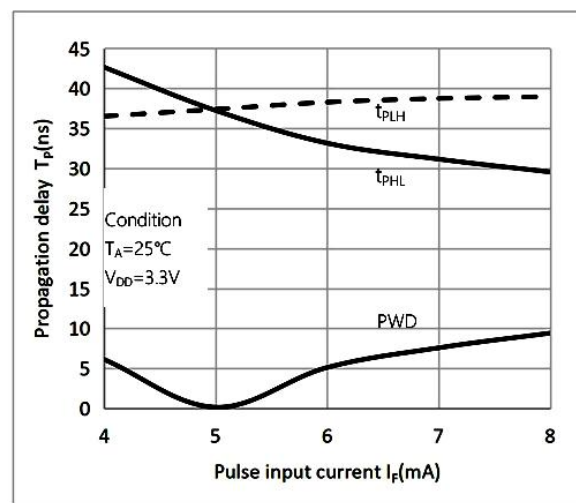


Fig.7 Forward voltage vs. Ambient temperature

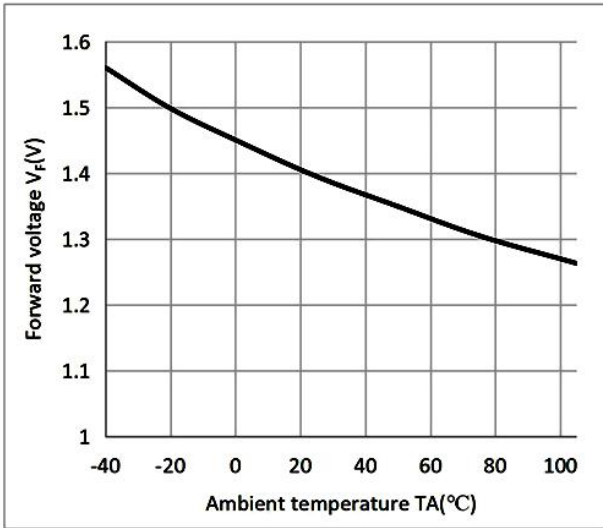


Fig.8 Propagation delay vs. Ambient temperature  
( $V_{DD}=5V, C_{peak}=100pF, R_{limit}=530 \Omega$ )

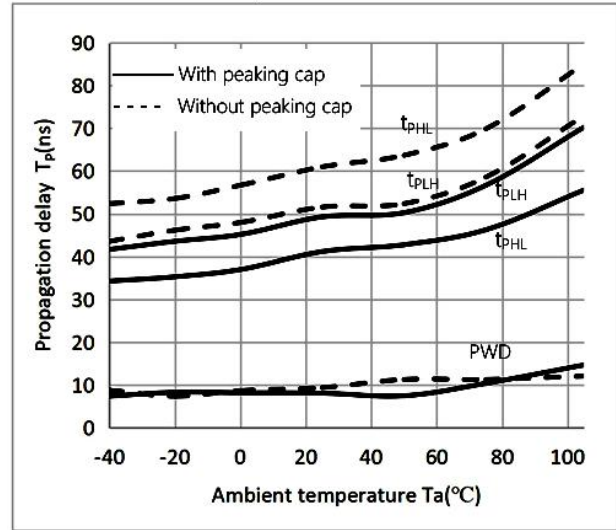
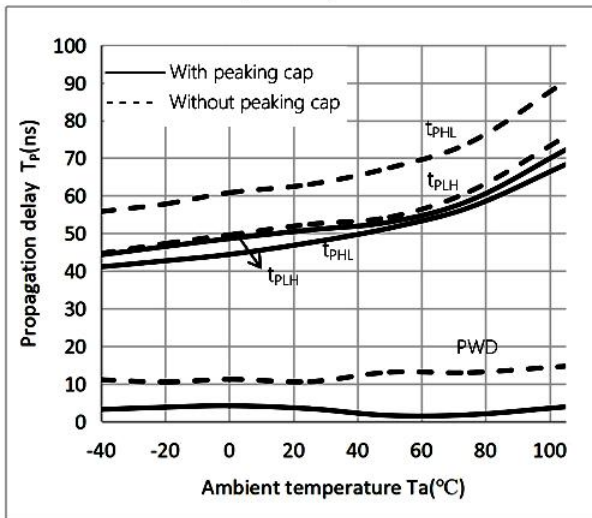
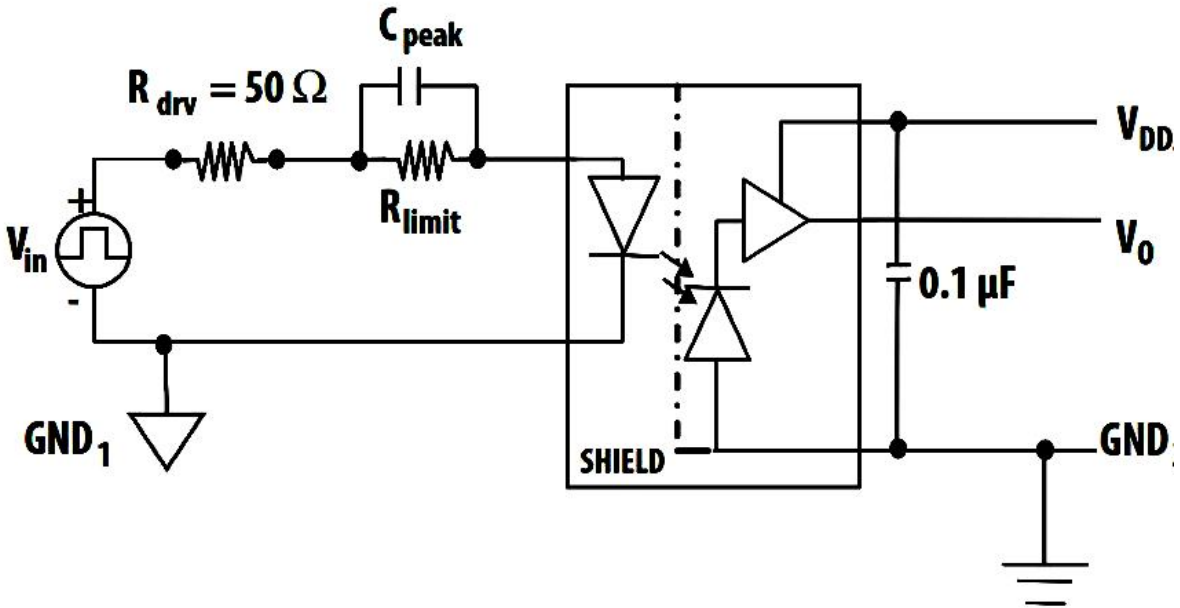


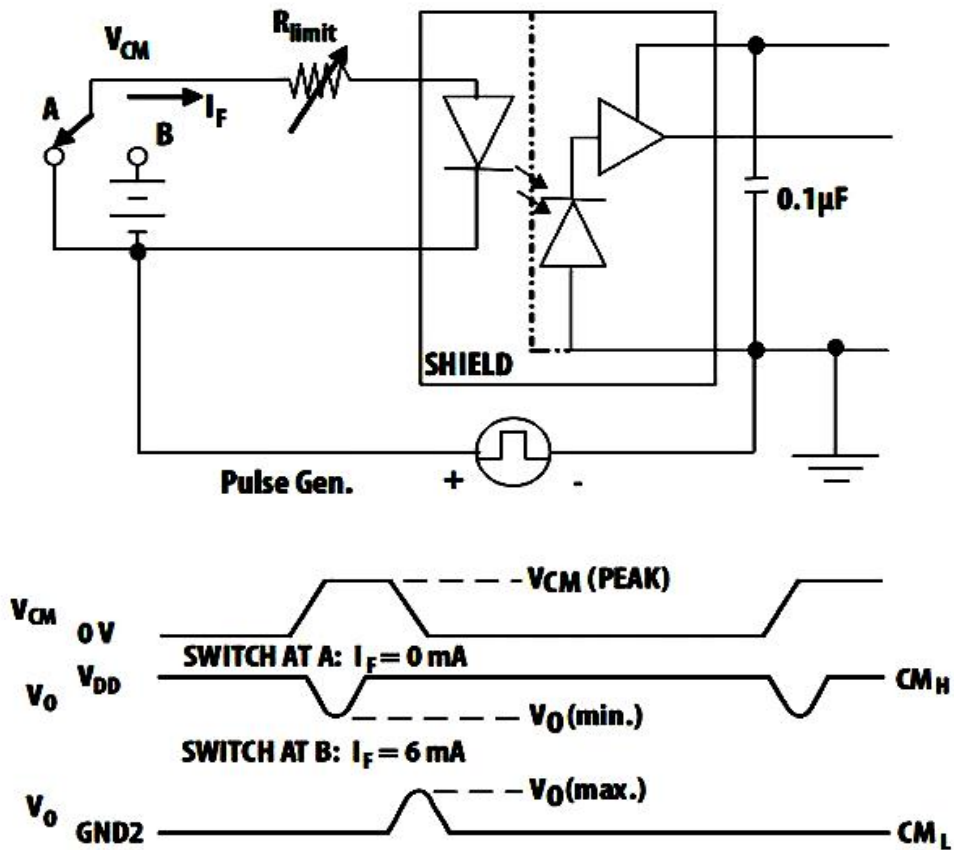
Fig.9 Propagation delay vs. Ambient temperature  
( $V_{DD}=3.3V, C_{peak}=100pF, R_{limit}=250 \Omega$ )



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

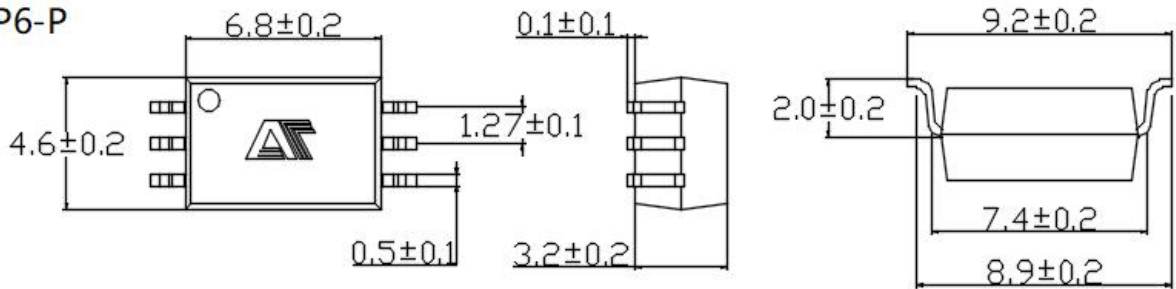


◆ CMR 测试电路 Test Circuit for Common Mode Transient Immunity

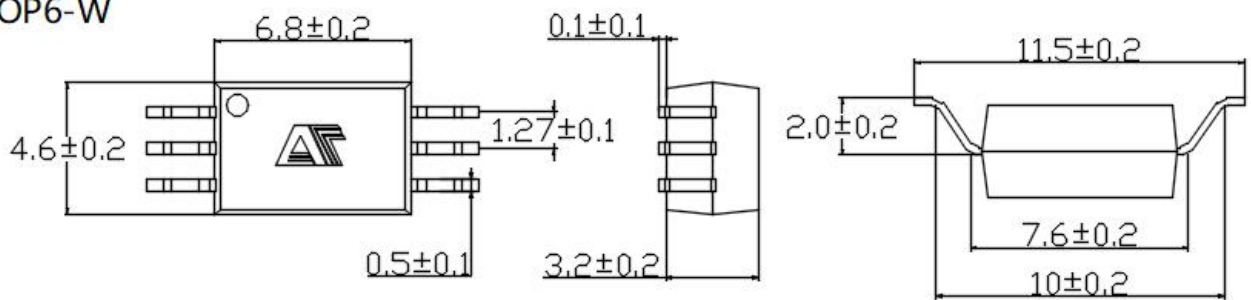


◆ 外形尺寸Overall dimension

SOP6-P

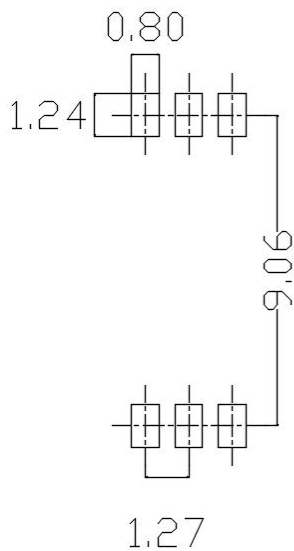


SOP6-W

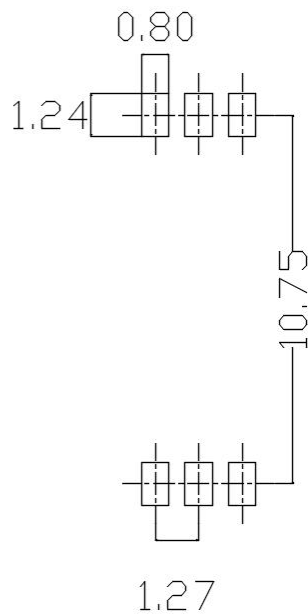


推荐焊盘:

Recommended



SOP6-P



SOP6-W


单位: mm

**◆ 产品型号命名规则 Order Code**
**AT W720 - 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 (W720)
- 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 (S: SOP)
- 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

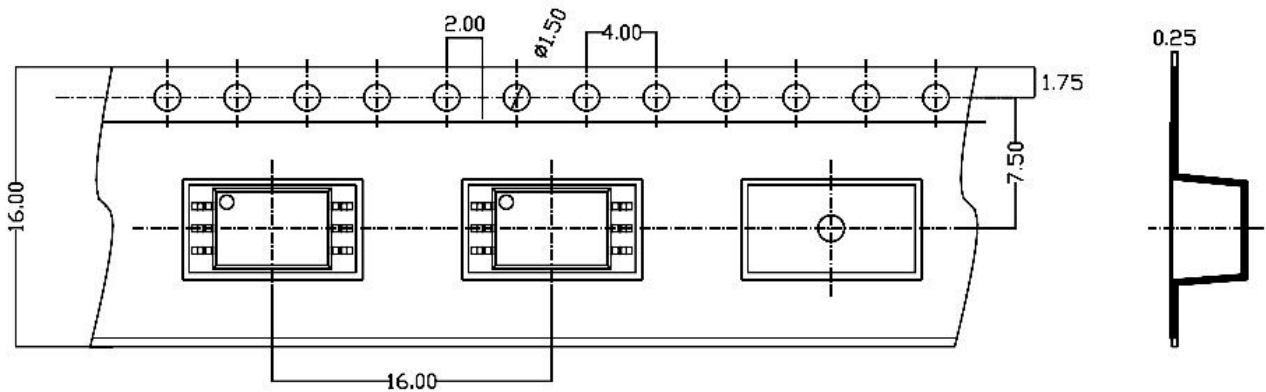
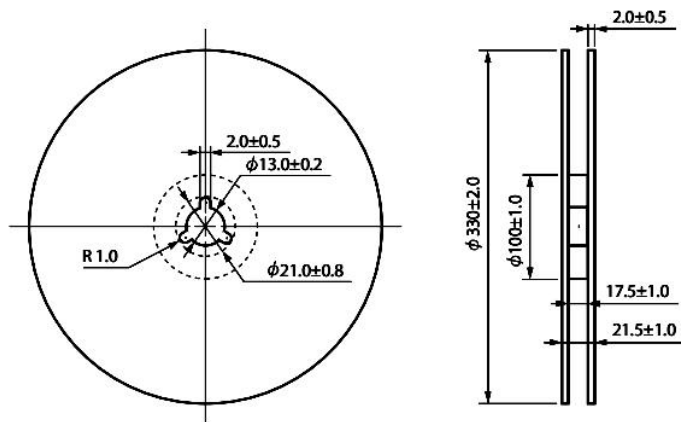


**◆ 包装packing**

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
SOP6	卷盘 ( $\phi 330\text{mm}$ 蓝盘)	1 千只/盘	2 盘/盒	10 盒/箱	450*390*0.1mm	340*60*340mm	620*360*365mm	首尾端空至少 200mm
Package Type	Packing Form	Quantity per Reel	Quantity per Box	Quantity per Carton	Antistatic Bag Specification	Box Specification	Carton Specification	Note
SOP6	Reel( $\phi 330\text{mm}$ Blue)	1k pcs/reel	2Reel/box	10box/ctn	450*390*0.1mm	340*60*340mm	620*360*365mm	Guard band 200mm min.

**• 编带包装 Tape & Reel**

- 每卷数量: 1000 只。  
Qty/reel: 1000 pcs.
- 每箱数量: 20000 只。  
Qty/ctn: 20000 pcs.
- 内包装: 每卷盘 1000 只。  
Inner packing: 1000pcs/reel.
- 示意图 Schematic:

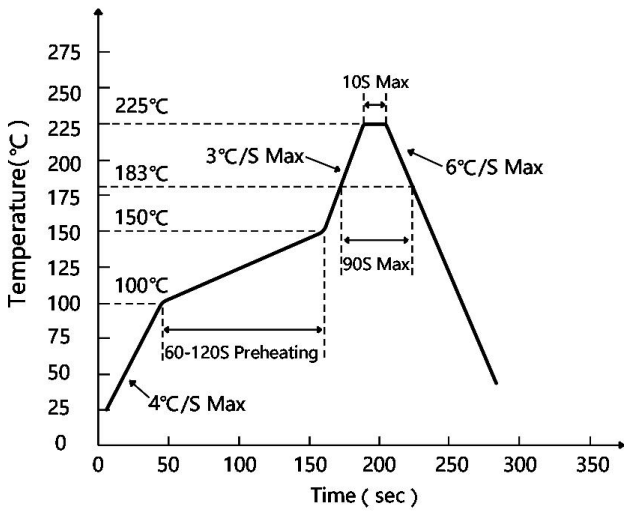


单位: mm

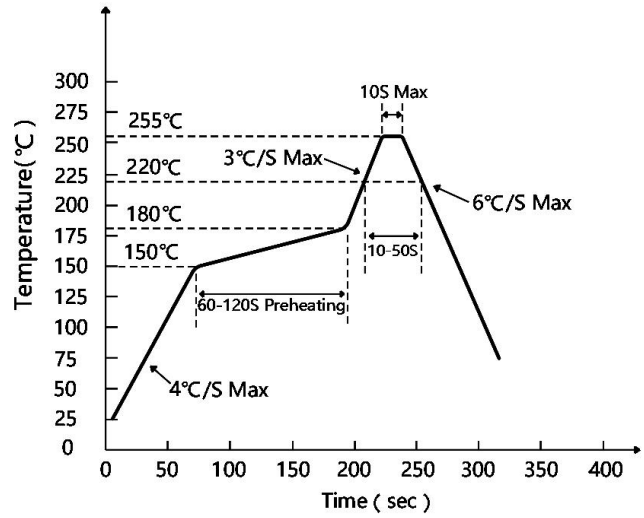
**◆ 可靠性测试 Reliability Test Items And Conditions**

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**

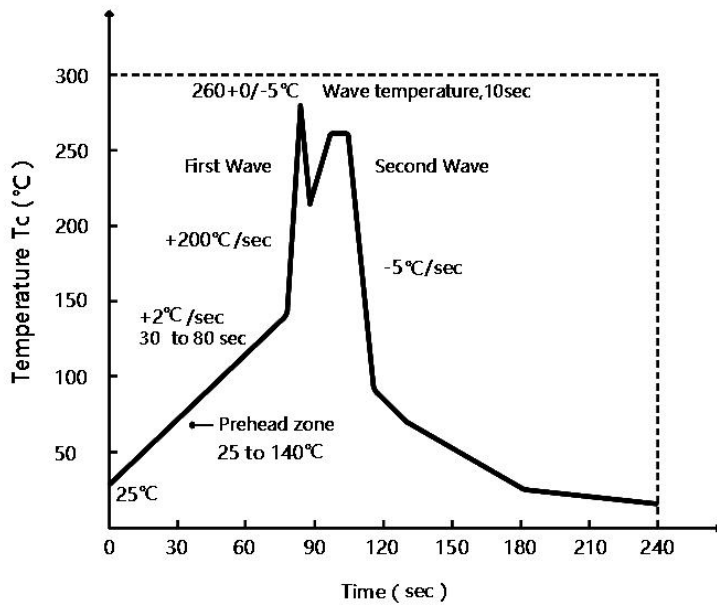


有铅制程 Lead Process



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: