概述 Description

CYMOC304X,CYMOC306X,CYMOC308X 系列器件中系由一个GaAs红外发光二极管一个硅感光双向可控硅组成的光电耦合器件。元件设计为电子及功率双向可控硅控制单元，可应用于交流负载及电感负载等电路之间的信号传输，使输入端与负载完全隔离，目的在于增加安全性，减小电路干扰，减化电路设计。

The CYMOC304X, CYMOC306X, and CYMOC308X series devices are optoelectronic coupling components consisting of a GaAs infrared light-emitting diode and a silicon photosensitive bidirectional triode thyristor. The components are designed as electronic and power bidirectional triode thyristor control units, suitable for signal transmission between AC loads and inductive loads in circuits. They achieve complete isolation between the input and load, aiming to enhance safety, reduce circuit interference, and simplify circuit design.

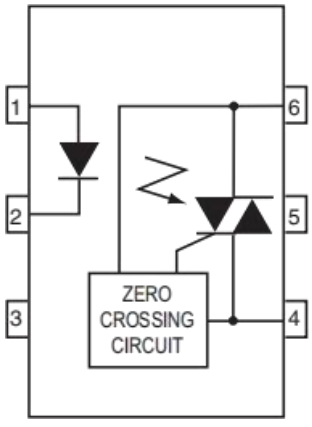
特性 Features

- 峰值击穿电压
  Peak breakdown voltage
  - 400V: CYMOC304X
  - 600V: CYMOC306X
  - 800V: CYMOC308X
- 输入输出之间高隔离电压(Viso=5000V rms)
  High isolation voltage between input and output(V_{ISO}=5000 Vrms)
- 无铅和符合EU REACH 和RoHS
  Compliance with EU REACH and RoHS

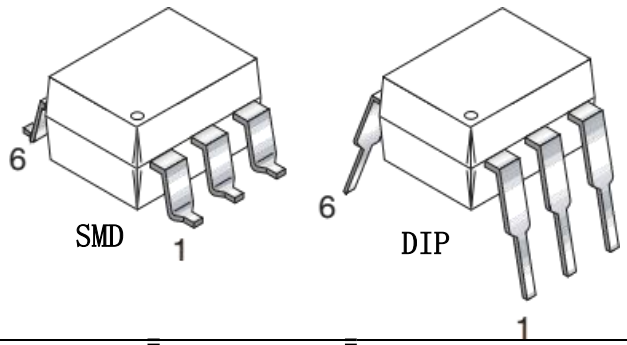
电性应用 Applications

- 工业控制；Industrial control
- 红绿灯；Traffic lights
- 自动售货机；Vending machines
- 固态继电器；Solid state relays
- 镇流器；amperite
- 电磁阀/阀控制；Electromagnetic valve/valve control
- 静态 AC 电源开关；Static AC power switch
- 白炽灯调光器；Incandescent dimmer
- 电机控制器。motor controller

结构图和封装 Block Diagram and Package



产品型号Model	封装Package Type
CYMOC304X/CYMOC306X/CYMOC308X	DIP
CYMOC304XS(TP1)/CYMOC306XS(TP1)/CYMOC308XS(TP1)	SMD



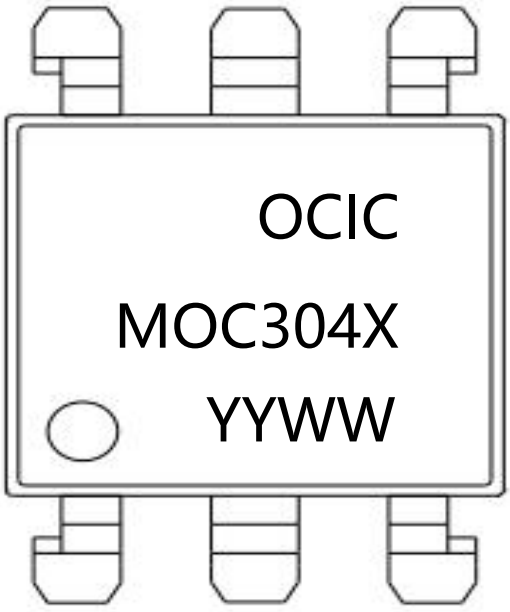
产品型号命名规则Order Code

CY MOC304X W (V)(ZZ)

① ② ③ ④ ⑤

1. 公司代码： CY代表公司简称
Company code: CY stands for Company Abbreviation
2. 产品系列： MOC304X,MOC306X,MOC308X
Product series: MOC304X,MOC306X,MOC308X
3. 封装形式：W代表封装形式,空代表DIP,S代表SMD
Packaging form: Empty represents DIP, S represents SMD
4. 包装形式：V代表包装形式，如TP为卷盘包装，空为管装
Packaging form: V represents packaging form, such as TP for reel packaging and empty for tube packaging
5. 内部补充代码：ZZ代表内部补充代码，数字或者空白
Internal supplementary code: ZZ represents internal supplementary code, numerical or blank

印丝Marking Information



●印字中“OCIC”表示为品牌LOGO
In the printing, "OCIC" represents the brand logo
●印字中“MOC304X”表示为产品系列
In the printing, "MOC304X" represents the product series
●印字中“X”代表：1,2,3；
The "X" in the printing represents: 1, 2, 3;
●印字中“YY”代表年份：21(2021),22(2022),23(2023)...
In the printing, "Y" represents the year: 21 (2021),22 (2022), 23 (2023)
●印字中“WW”代表周期：01（第一周),02(第二周)....
In the printing, "WW" represents the cycle: 01 (first week), 02 (second week)

极限参数(Ta=25℃)Absolute Maximum Ratings (Ta=25℃)

参数 Parameter			符号 Symbol	额定值 Rated	单位 Unit
输入 Input	正向电流 Forward Current		I_F	60	mA
	反向电压 Backward Voltage		V_R	6	V
	功耗 Power Dissipation		P_D	100	mW
	额定值降低因子(Ta=85℃以上) Power dissipation Derating factor (above Ta = 85° C)			3.8	mW/℃
输出 output	输出端电压 Off-state output terminal voltage	CYMOC304X	V_{DRM}	400	V
		CYMOC306X		600	
		CYMOC308X		800	
	峰值重复浪涌(pw=100μs,120pps) Peak repetitive surge current (pw=100μs,120pps)		I_{TSM}	1	A
	工作RMS电流 On-state current (root mean square value)		$I_{T(RMS)}$	100	mA
	整体功耗在环境温度为25℃时 Power Dissipation		P_C	300	mW
	额定值降低因子(Ta=85℃以上) Power dissipation Derating factor (above Ta = 85° C			7.6	mW/℃
整体功耗在环境温度为25℃时 Total Power Dissipation			Ptot	330	mW
隔离电压* Isolation Voltage			Viso	5000	Vrms
工作温度 Operating Temperature			Topr	-40~+85	℃
储存温度 Storage Temperature			Tstg	-55~+125	℃
焊接温度（10s） Soldering Temperature（10s）			Tsol	260	℃

*在相对湿度40~60%下的进行交流电测试，此时1、2和3脚短接，4、5和6脚短接。

* Conduct AC test at 40%~60% relative humidity. At this time, pins 1, 2 and 3 are short-circuited, and pins 4, 5 and 6 are short-circuited.

光电特性 (Ta =25℃)Electro-optical Characteristics (Ta=25℃)

参数 Parameter			符号 Symbol	条件 Condition	最小值 Min.	典型 Typ.	最大值 Max.	单位 Unit
输入 Input	正向电压 Forward Voltage		V_F	I_F=30mA			1.5	V
	反向电流 Back current		I_R	V_R=6V			10	μA
输出 Output	断态峰值电流 Off-state peak current	CYMOC304X	I_{DRM}	V_{DRM}=Rated V_{DRM}, I_F=0mA			100	nA
		CYMOC306X					500	
		CYMOC308X						
	通态峰值电压 On-state peak voltage		V_{TM}	I_{TM}=100mA peak, I_F=Rated I_{FT}			3	V
	断态电压临界上升率 Critical rise rate of off-state voltage	CYMOC304X	dv/dt	V_{PEAK}=Rated V_{DRM}, I_F=0	1000			V/μs
		CYMOC306X						
		CYMOC308X			600			
	抑制电压 (MT1-MT2以上电压不触发) Suppression voltage (MT1-MT2 will not be triggered if it is higher than this voltage)		V_{INH}	I_F= Rated I_{FT}			20	V
	抑制状态漏电 Leakage current in suppression state		I_{DRM2}	I_F= Rated I_{FT}, V_{DRM}=Rated, V_{DRM}, off state			500	μA
传输特性 Transfer Characteristics	LED 触发电流 LED trigger current	CYMOC3041	I_{FT}	Main terminal Voltage=3V		15		mA
		CYMOC3061						
		CYMOC3081						
		CYMOC3042				10		
		CYMOC3062						
		CYMOC3082						
		CYMOC3043				5		
		CYMOC3063						
		CYMOC3083						
	维持电流 Maintain current		I_H			250		μA

典型光电特性曲线 Typical Electro-Optical Characteristics Curves

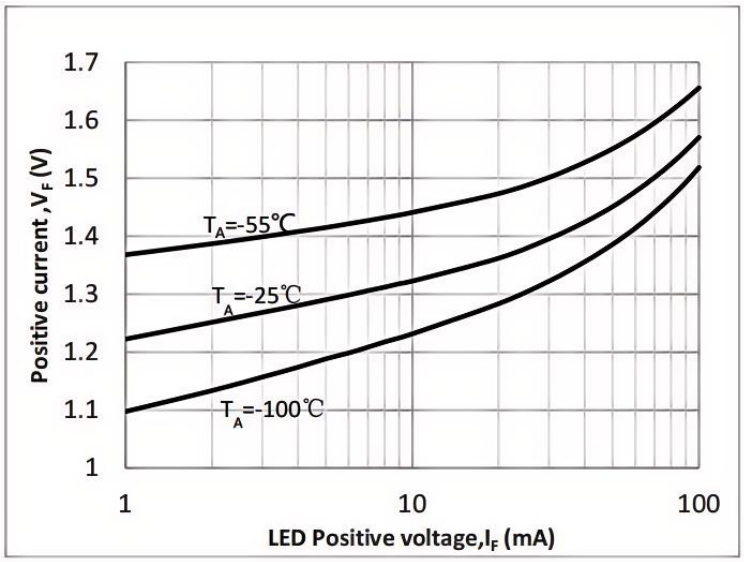


Fig.1 LED Positive voltage vs Positive current

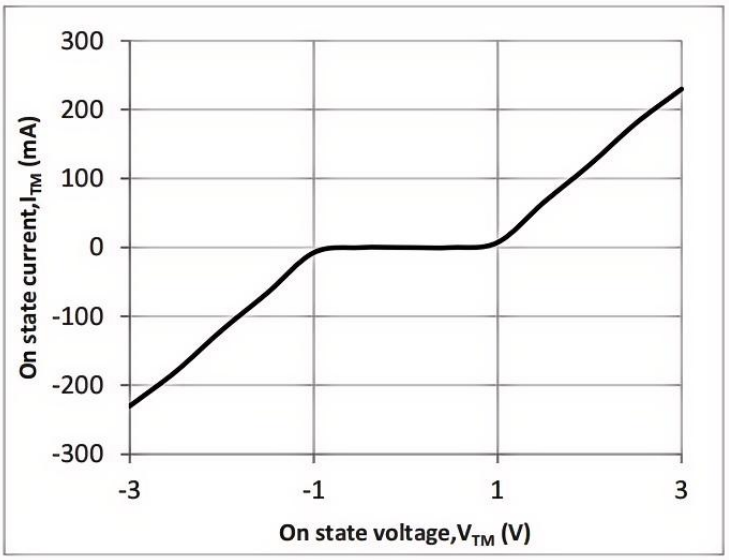


Fig.2 On-state characteristic

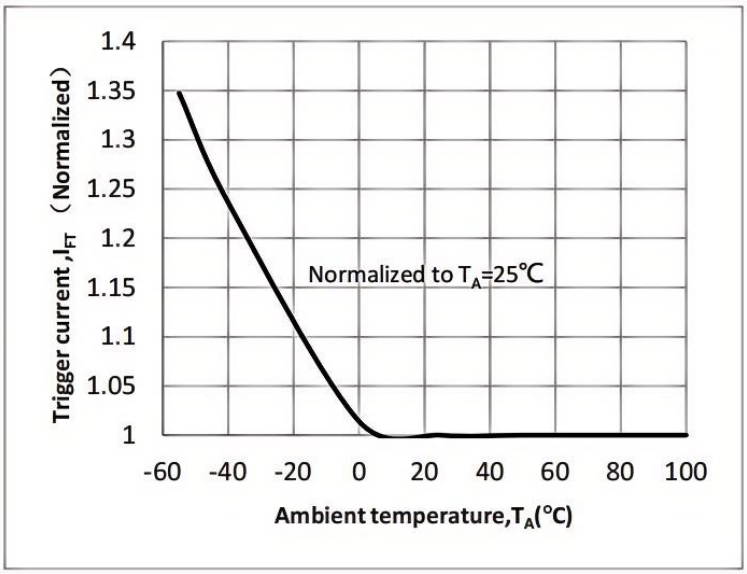


Fig.3 Trigger current vs Ambient temperature

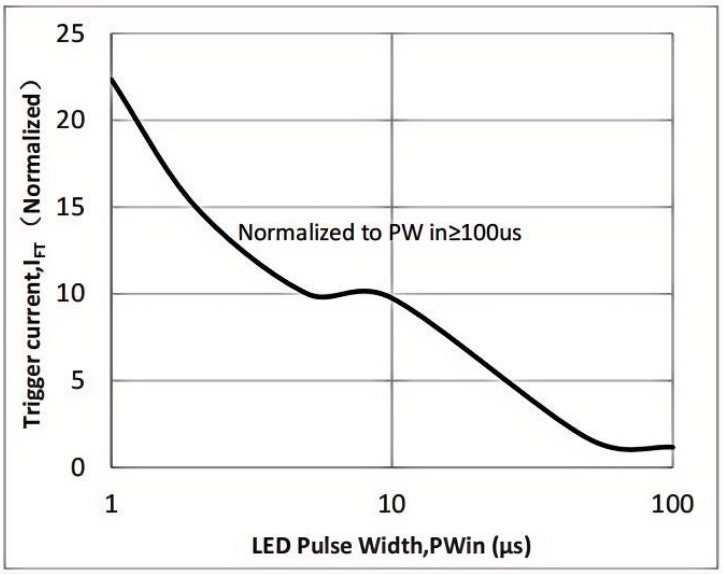


Fig.4 LED Trigger current vs LED Pulse Width

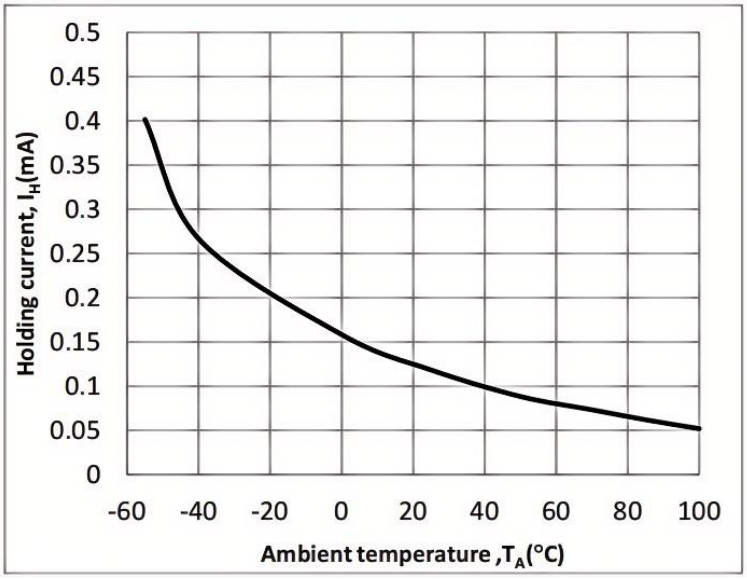


Fig.5 Holding current vs Temperature

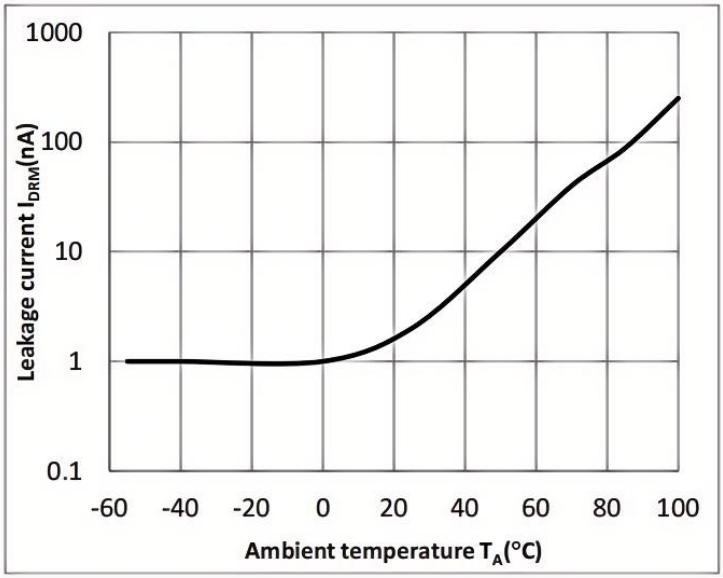


Fig.6 Leakage current vs Temperature

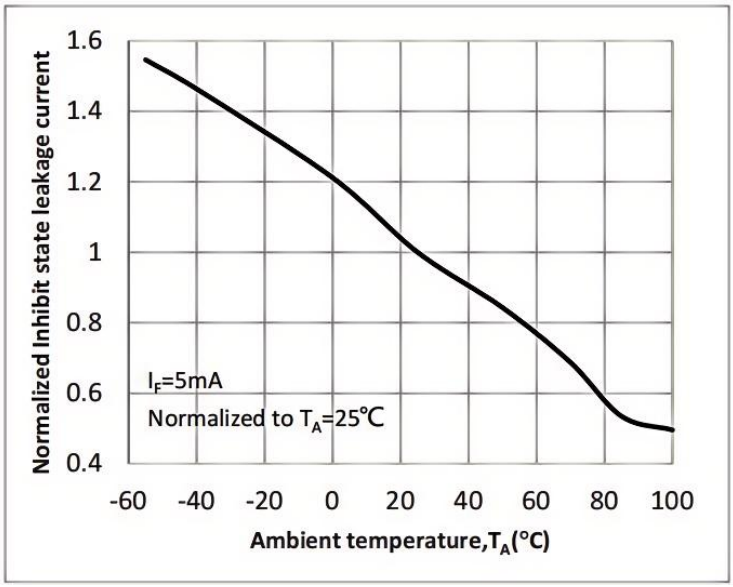


Fig.7 Inhibit state leakage current vs Ambient temperature

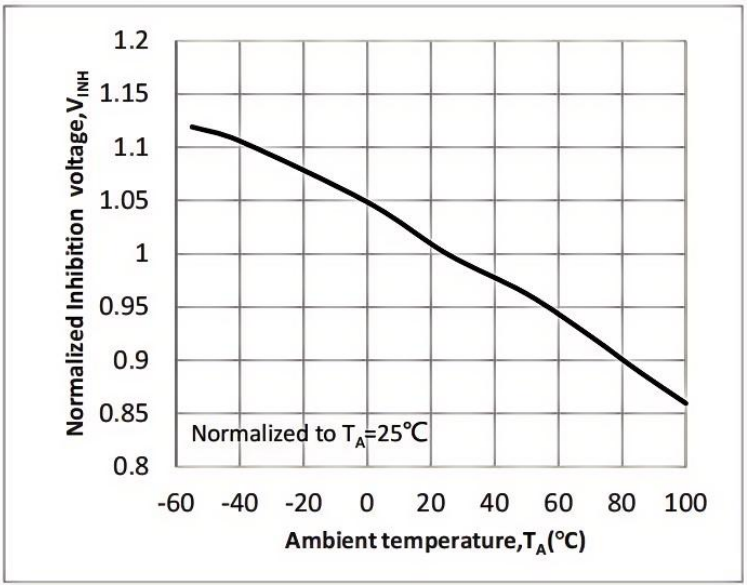
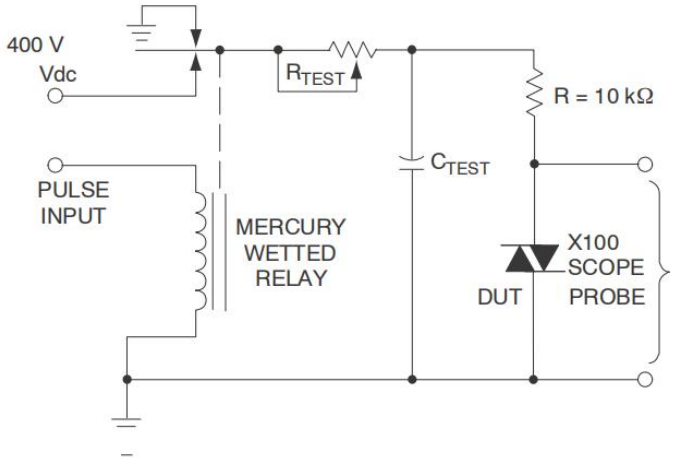


Fig.8 Inhibition voltage vs Ambient temperature

测试电路



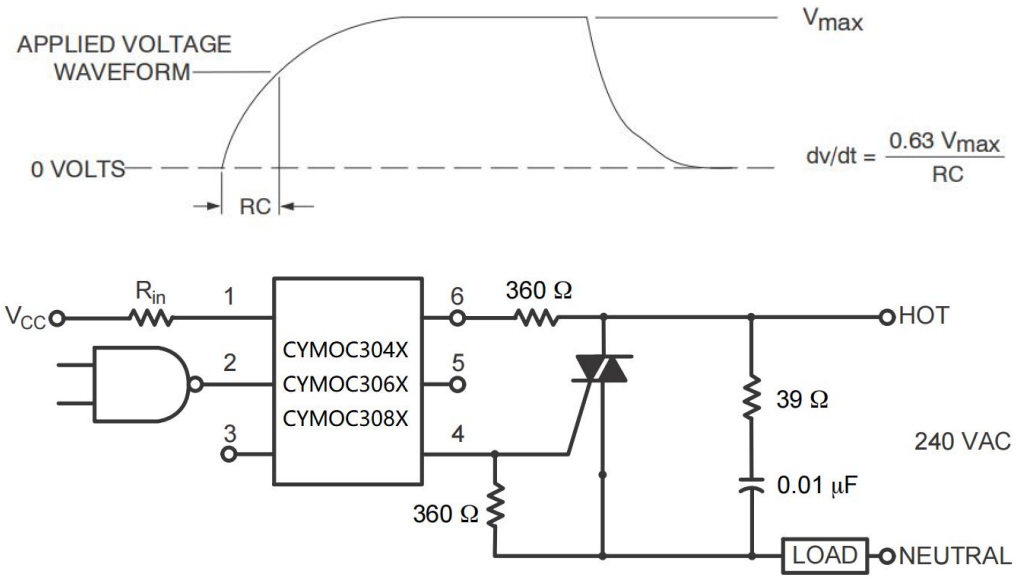


图9: dv/dt 测试电路 & 波形.

通过RC电路施加于被测器件的输出端的高电压脉冲设置到所需的VPEAK值上。LED电流无需加上。波形VT使用 X100探头监测。通过调节RTEST值，dv/dt（斜度）增加，直到被测器件观察到被触发（波形崩溃）。dv/dt然后下降，直到被测器件停止被触发。此时，记录 τ RC值并可计算dv/dt了。

$$dv/dt = \frac{0.632 \times V_{PEAK}}{\tau_{RC}}$$

例如:, V_{PEAK} = 400V 的 CYMOC304X 系列. dv/dt 值计算如下:

$$dv/dt = \frac{0.632 \times 400}{\tau_{RC}} = \frac{252}{\tau_{RC}}$$

回流焊温度曲线图Solder Reflow Profile

1. 焊接注意事项

不管是使用烙铁还是回流焊，焊接温度应尽可能接近下面所示的条件。

• 回流焊时

回流焊不超过260° C时须在10秒内完成焊接，焊接温度曲线是基于塑封体表面温度（见下图，以塑封体表面温度为基准）

回流焊只限过一至两次。

拆开包装后必须在2周内使用完。

Welding precautions

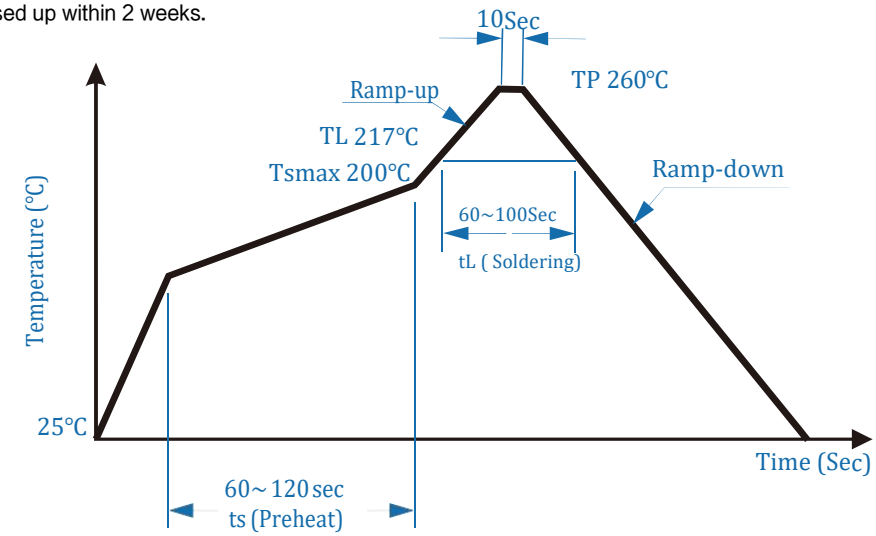
Whether using a soldering iron or reflow soldering, the soldering temperature should be as close as possible to the conditions shown below.

During reflow soldering

When reflow soldering does not exceed 260 ° C, the soldering must be completed within 10 seconds. The soldering temperature curve is based on the surface temperature of the plastic enclosure (see the figure below, with the surface temperature of the plastic enclosure as the reference)

Reflow soldering is only allowed once or twice.

After unpacking, it must be used up within 2 weeks.



• 波峰焊

建议在温度条件下进行一次性焊接。

温度：260+0/−5℃

时间： 10秒。

预热温度：25至140℃，

预热时间： 30至80秒。

• Wave soldering

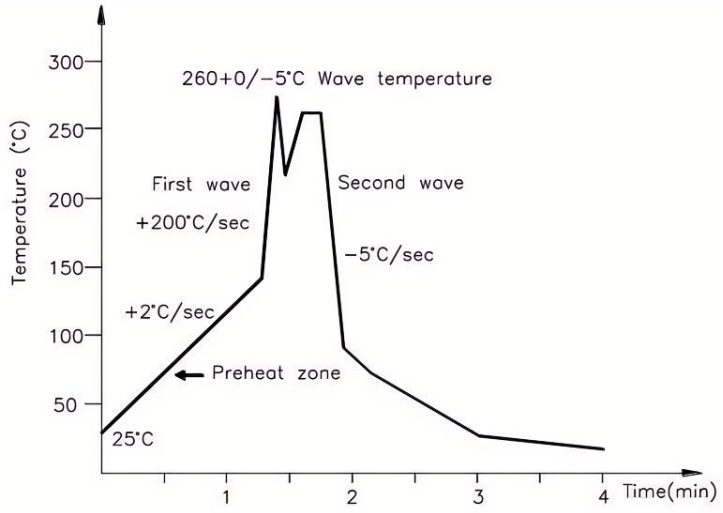
It is recommended to perform one-time welding under temperature conditions.

Temperature: 260+0/−5 ℃

Time: 10 seconds.

Preheating temperature: 25 to 140 ℃,

Preheating time: 30 to 80 seconds.



• 使用烙铁焊接

建议在温度条件下进行一次性焊接。

温度：260+0/−5℃；时间： 10秒。

预热温度：25至140℃，预热时间： 30至80秒。

• Use a soldering iron to weld

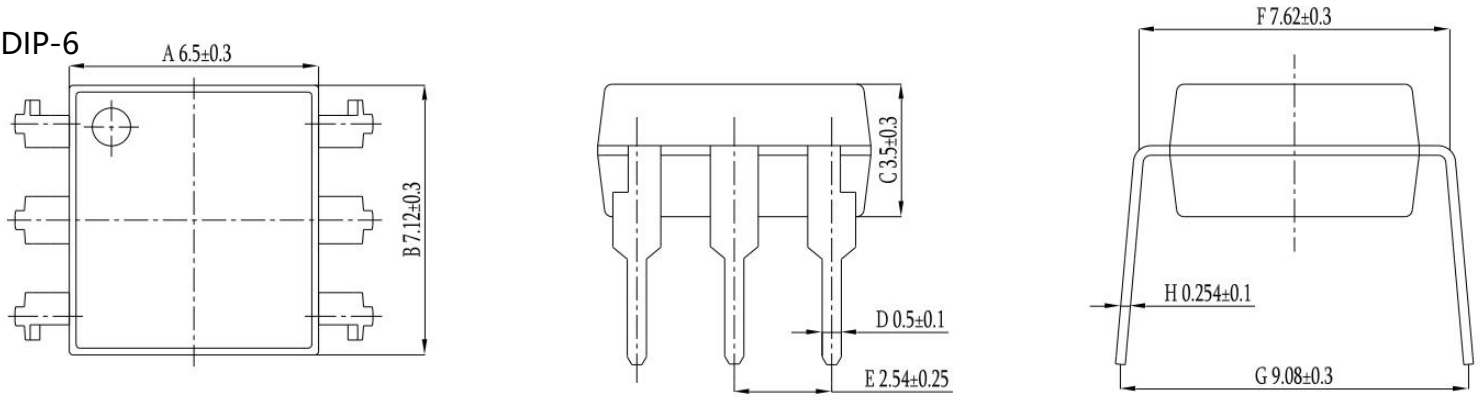
It is recommended to perform one-time welding under temperature conditions.

Temperature: 260+0/−5℃; Time: 10 seconds.

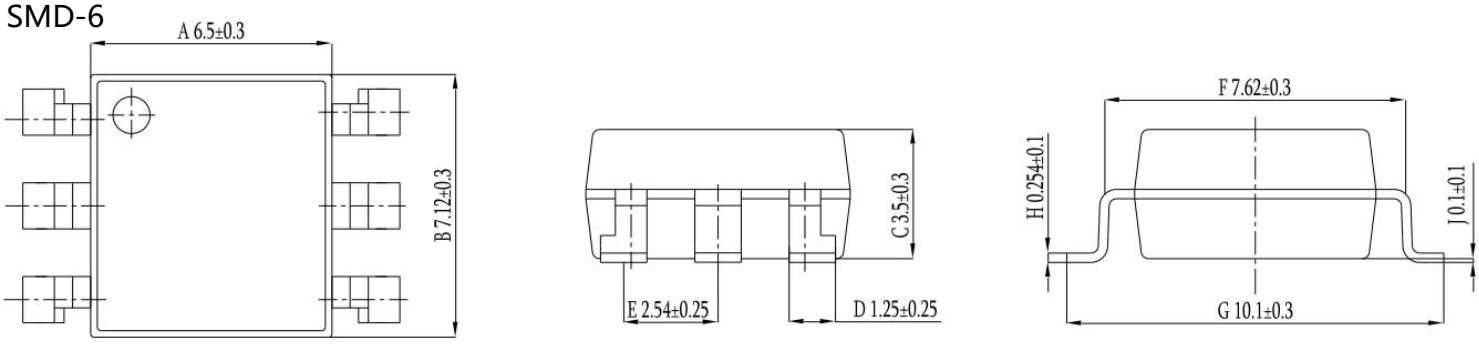
Preheating temperature: 25 to 140 ℃, preheating time: 30 to 80 seconds.

封装尺寸(单位:mm)Outline Dimension (Unit:mm)

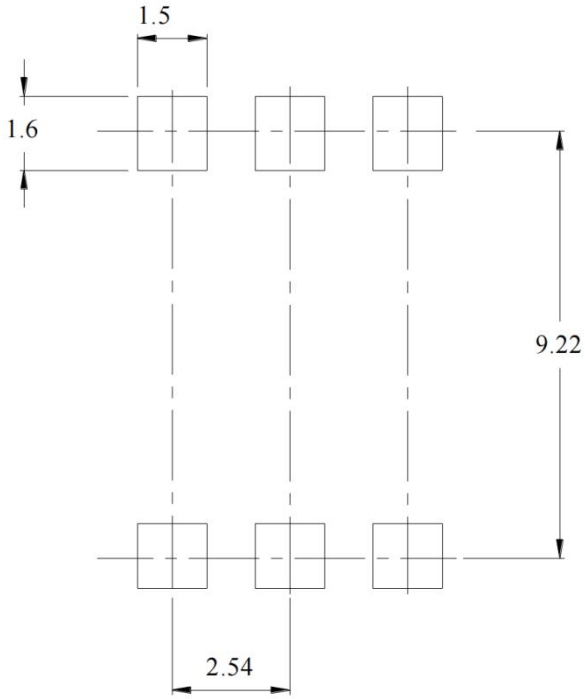
DIP-6



SMD-6



建议焊盘布局（单位: mm）Recommended pad layout（Unit: mm）



包装Packing

封装形式 Package Type	包装方式 Packing Form	管/盘数量 Quantity per Tube &Reel	盒数量 Quantity per Box	箱数量 Quantity per Carton	静电袋 Antistatic Bag Specification	盒规格 Box Specification	箱规格 Carton Specification
DIP-6	Tube(500mm)	65 pcs/tube	50 tubes /box	10 boxes /ctn	-	526*128*60mm	540*290*330mm
SMD-6	Reel(ϕ330mm)	1000 pcs/reel	2 reels /box	10 boxes /ctn	380*420mm	350*340*60mm	645*360*365mm

汇总表Summary table

■DIP-6 (Tube)

管/数量：65 pcs. 盒数量：3,250 pcs.

Qty/ tube ： 65 pcs. Qty/box：3,250 pcs.

箱/数量：32,500 pcs.

Qty/ctn ： 32,500 pcs.

■SMD-6 (Reel)

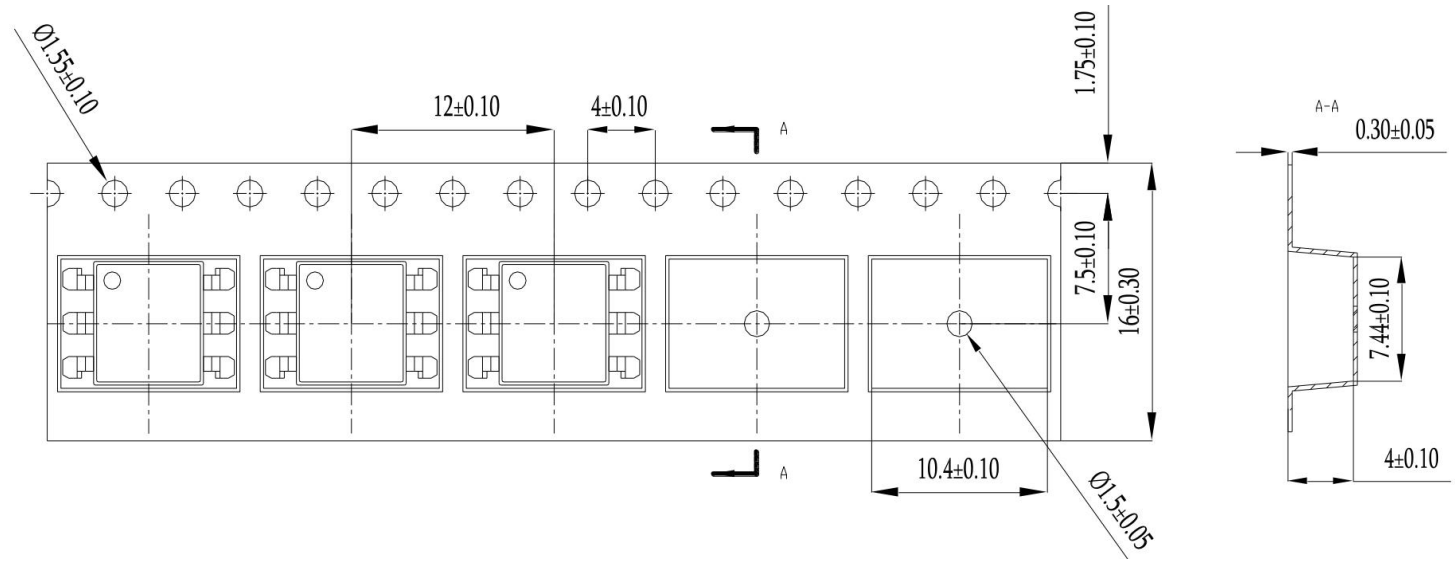
盘/数量：1,000 pcs. 盒数量：2,000 pcs.

Qty/reel：1,000 pcs. Qty/box：2,000 pcs.

箱/数量：20,000 pcs.

Qty/ctn ： 20,000 pcs.

编带尺寸Tape dimensions



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