



# ORIENT

## Photocoupler

### Product Data Sheet

Name: OR-MOC305X

Customer: \_\_\_\_\_

Date: \_\_\_\_\_

Add: Block A 3rd Floor No.4 Building Tian An Cyber Park Huang Ge Rd, Long Gang Dist, Shenzhen, Guangdong, 518172

Web: [www.orient-opto.com](http://www.orient-opto.com)

**1. Features**

- (1) Isolation voltage between input and output Viso : 5,000V rms
- (2) 6pin non zero-cross optoisolators triac driver output
- (3) High repetitive peak off-state voltage VDRM : Min. 600V
- (4) High critical rate of rise of off-state voltage( dV/dt : MIN. 1000V / s )
- (5) Dual-in-line package : [OR-MOC3050](#), [OR-MOC3051](#), [OR-MOC3052](#), [OR-MOC3053](#)
- (6) Wide lead spacing package : [OR-MOC3050M](#),[OR-MOC3051M](#), [OR-MOC3052M](#),[OR-MOC3053M](#)
- (7) Surface mounting package : [OR-MOC3050S](#),[OR-MOC3051S](#), [OR-MOC3052S](#), [OR-MOC3053S](#)
- (8) Tape and reel packaging : [OR-MOC3050S-TA](#), [OR-MOC3051S-TA](#), [OR-MOC3052S-TA](#),  
[OR-MOC3053S-TA](#),[OR-MOC3050S-TA1](#), [OR-MOC3051S-TA1](#), [OR-MOC3052S-TA1](#), [OR-MOC3053S-TA1](#)

**2. Description**

The [OR-MOC305X](#) consists of a non zero crossing photo triac, optically coupled to a gallium arsenide [infrared emitting diode](#). The [OR-MOC305X](#) is housed in the DIP6 package and guarantees insulation thickness. Therefore, the [OR-MOC305X](#) meets the reinforced insulation class requirements of international safety standards.

**3. Application Range**

- AC Motor Drives
- AC Motor Starters
- Static power switch
- Lighting Controls
- Solenoid/Valve Controls
- Solid State Relays
- Temperature Controls

**4. Absolute Maximum Ratings (Ta=25°C)**

Parameter		Symbol	Rated Value	Unit
Input	Forward Current	I <sub>F</sub>	50	mA
	Junction Temperature	T <sub>J</sub>	125	°C
	Reverse Voltage	V <sub>R</sub>	6	V
	Power Dissipation	P	100	mW
Output	Off-State Output Terminal Voltage	V <sub>DRM</sub>	600	V
	Peak Repetitive Surge Current (PW=1ms, 120 pps)	I <sub>TSM</sub>	1	A
	Junction Temperature	T <sub>J</sub>	125	°C
	Collector Power Dissipation	P <sub>C</sub>	300	mW
Total Power Dissipation		P <sub>tot</sub>	330	mW
*1 Insulation Voltage		V <sub>iso</sub>	5000	Vrms
Working Temperature		T <sub>opr</sub>	-40 ~ + 100	°C
Deposit Temperature		T <sub>stg</sub>	-55 ~ + 150	
*2 Soldering Temperature		T <sub>sol</sub>	260	

Notes:

\*1 AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2&3 are shorted together, and pins 4, 6 are shorted together.

\* 2 For 10 seconds

5. Electrical Optical Characteristics at Ta=25°C

Parameter		Symbol	Condition	Min	Typ.*	Max	Unit	
Input	Forward Voltage	$V_F$	$I_F=20mA$	---	1.2	1.6	V	
	Reverse Current	$I_R$	$V_R=6V$	---	0.05	10	$\mu A$	
Output	1. Peak Blocking Current, Either Direction	$I_{DRM}$	$V_{DRM} = 600V$	---	10	100	nA	
	Peak On-State Voltage, Either Direction	$V_{TM}$	$I_{TM}=100mA$ Peak	---	1.7	3.0	V	
	2. Critical rate of Rise of Off-State Voltage	dv/dt	$V_{in}=240V_{rms}$	1000	---	---	V/us	
Couple	3. Led Trigger Current, Current Required to Latch Output, Either Direction	<u>OR-MOC3050</u>	$I_{FT}$	Main Terminal Voltage = 3V	---	---	30	mA
		<u>OR-MOC3051</u>			---	---	15	
		<u>OR-MOC3052</u>			---	---	10	
		<u>OR-MOC3053</u>			---	---	5	
	Holding Current, Either Direction	$I_H$		---	200	---	$\mu A$	

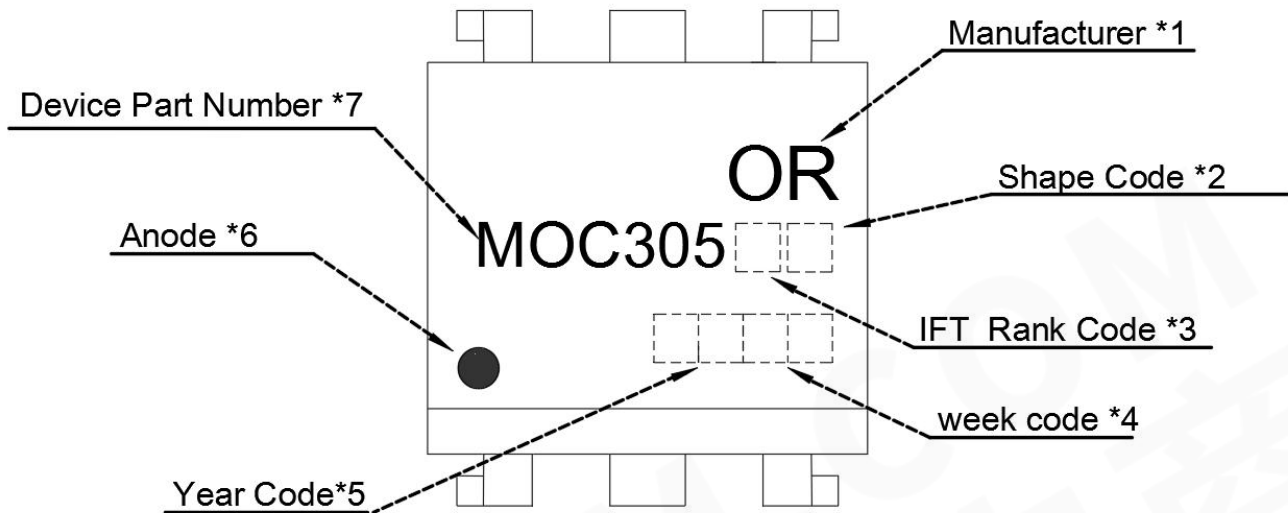
\*1. Test voltage must be applied within dv/dt rating.

\*2. This is static dv/dt. Commutating dv/dt is a function of the load-driving thyristor(s) only.

\*3. All devices are guaranteed to trigger at an  $I_F$  value less than or equal to max  $I_{FT}$ .

Therefore, recommended operating  $I_F$  lies between max  $I_{FT}$ , 30 mA for OR-MOC3050, 15 mA for OR-MOC3051, 10 mA for OR-MOC3052, 5 mA for OR-MOC3053, and absolute max  $I_F$  (50mA).

## 6.Naming Rule

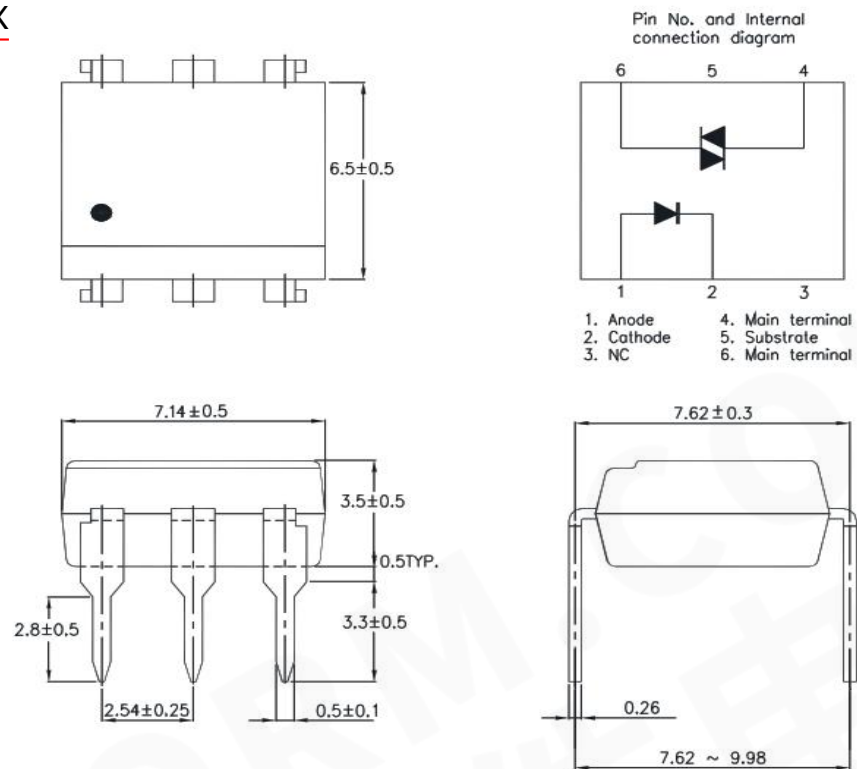


### NOTE:

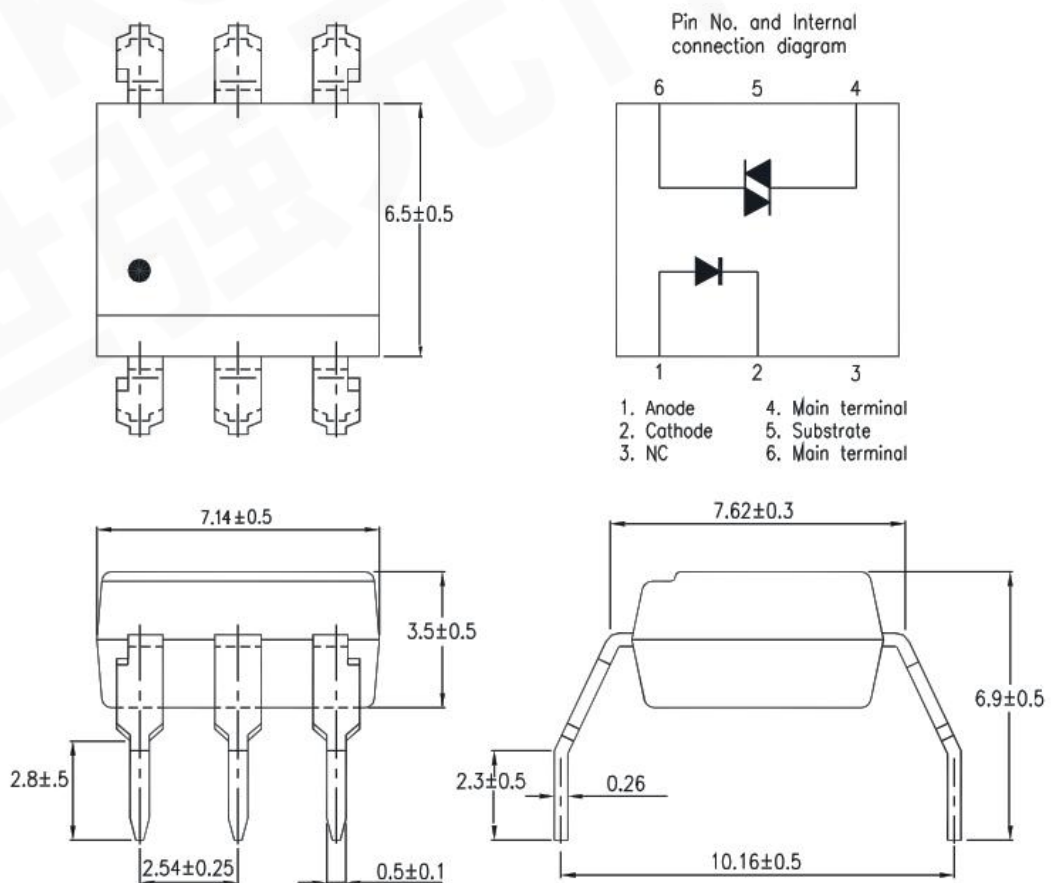
- (1) Manufacturer denotes Shenzhen Orient Components Co ., Ltd.
- (2) □□ denotes Shape Code .
- (3) □□□ denotes IFT Rank Code ,0=MOC3050; 1=MOC3051; 2=MOC3052; 3=MOC3053.
- (4) □□□□ denotes Week code.
- (5) □□□□□ denotes Year code.
- (6) ● denotes Anode.
- (7) MOC305 denotes Device Part Number.
- (8) Unit:mm

## 7. Package Dimension

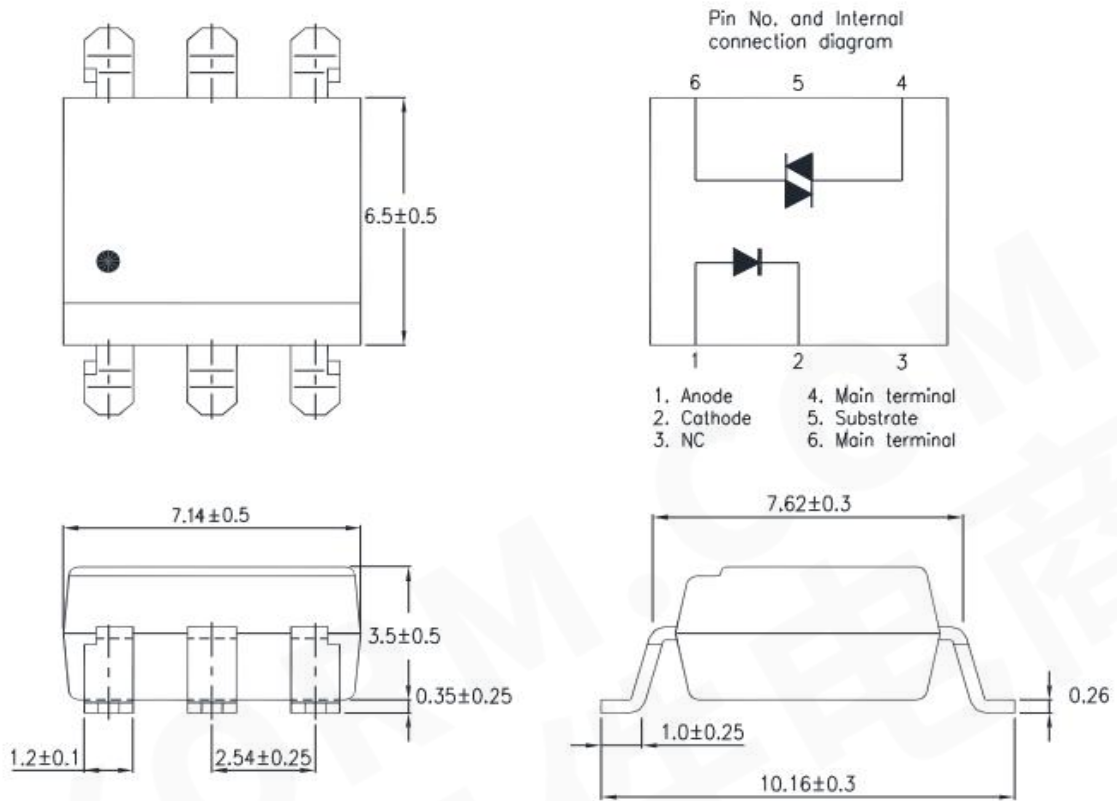
### (1).OR-MOC305X



### (2).OR-MOC305XM

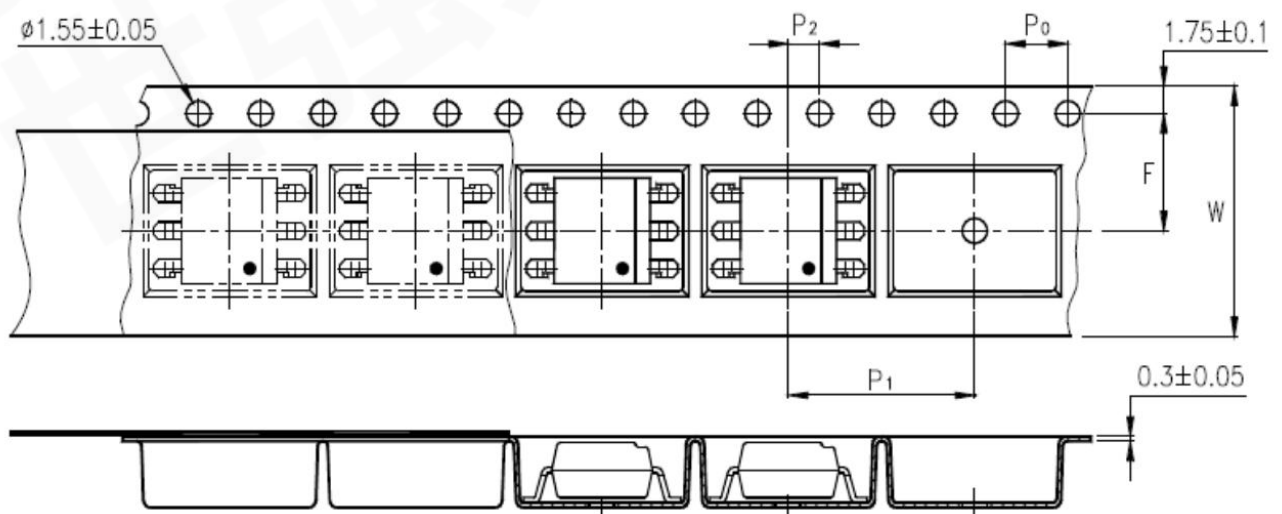


(3). OR-MOC305XS

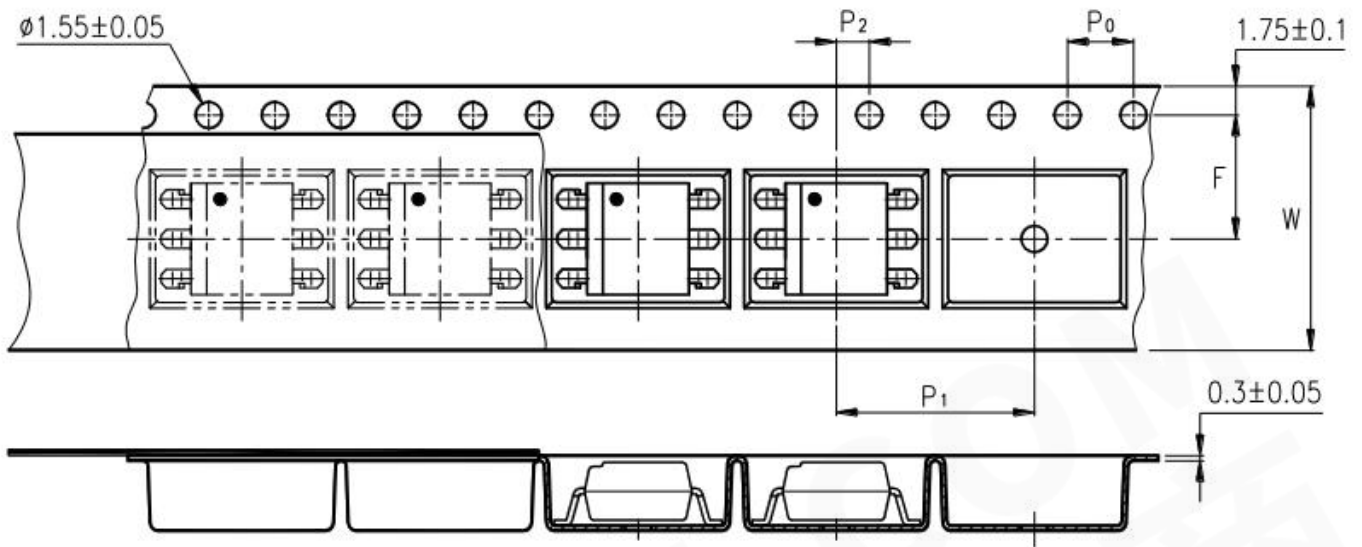


8. Taping Dimensions

(1). OR-MOC305XS-TA



2. OR-MOC305XS-TA1



Description	Symbol	Dimension in mm (inch)
Tape wide	W	$16 \pm 0.3$ (0.63)
Pitch of sprocket holes	$P_0$	$4 \pm 0.1$ (0.15)
Distance of compartment	F	$7.5 \pm 0.1$ (0.295)
	$P_2$	$2 \pm 0.1$ (0.079)
Distance of compartment to compartment	$P_1$	$12 \pm 0.1$ (0.472)

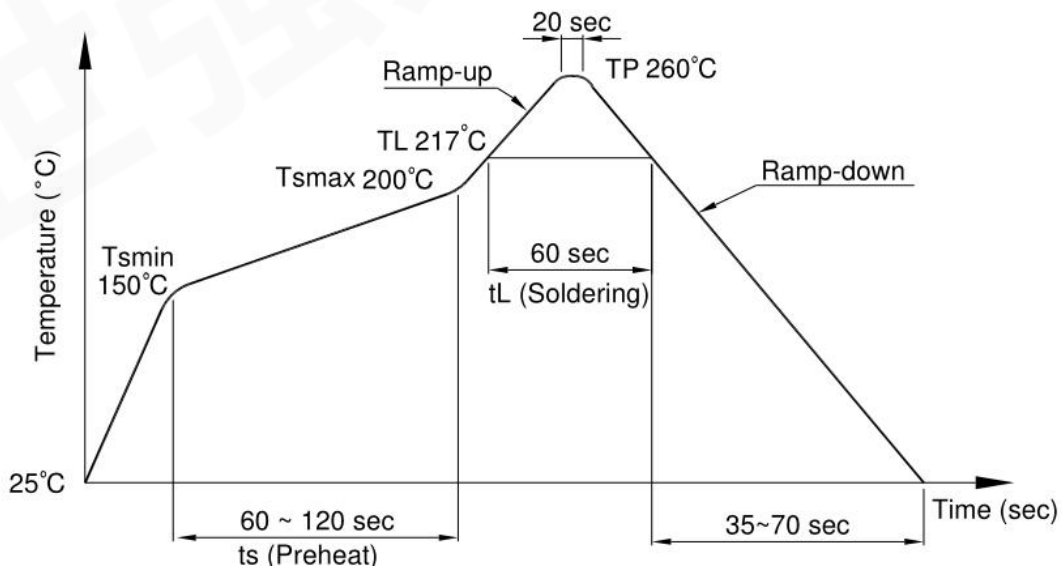
Package Type	<u>OR-MOC305XS</u> series(TA/TA1)
Quantities(pcs)	1000

### 9. Temperature Profile Of Soldering

(1).IR Reflow soldering (JEDEC-STD-020C compliant)

One time soldering reflow is recommended within the condition of temperature and time profile shown below. Do not solder more than three times.

Profile item	Conditions
Preheat	
- Temperature Min ( $T_{smin}$ )	150°C
- Temperature Max ( $T_{smax}$ )	200°C
- Time (min to max) (ts)	90±30 sec
Soldering zone	
- Temperature (TL)	217°C
- Time ( $t_L$ )	60 sec
Peak Temperature( $T_P$ )	260°C
Ramp-up rate	3°C / sec max.
Ramp-down rate	3~6°C / sec

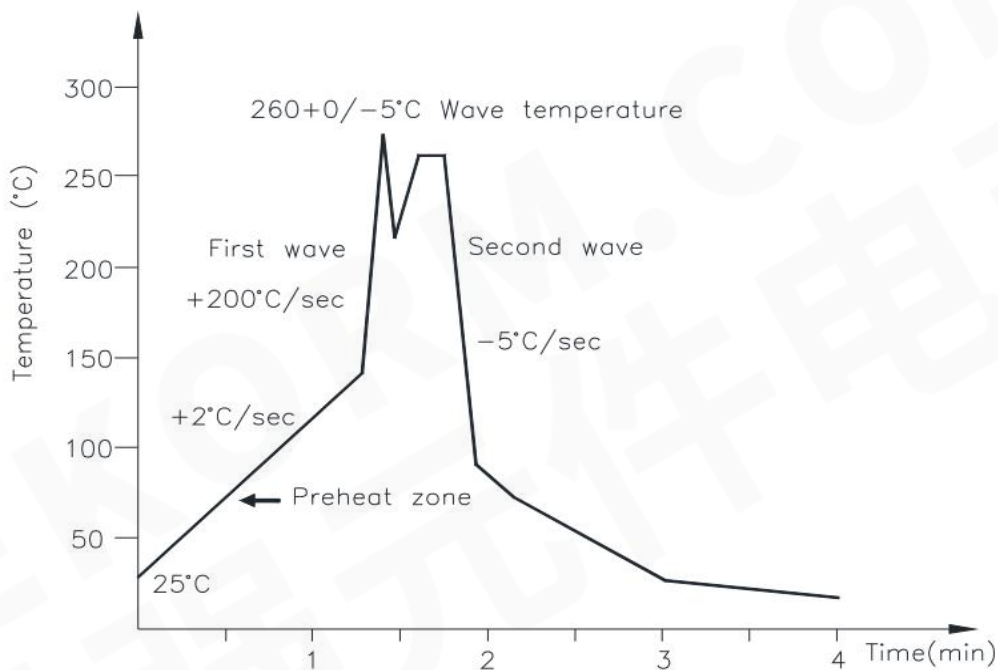




**(3) .Wave soldering (JEDEC22A111 compliant)**

One time soldering is recommended within the condition of temperature.

Temperature	260+0/-5°C
Time	10 sec
Preheat temperature	5 to 140°C
Preheat time	30 to 80 sec



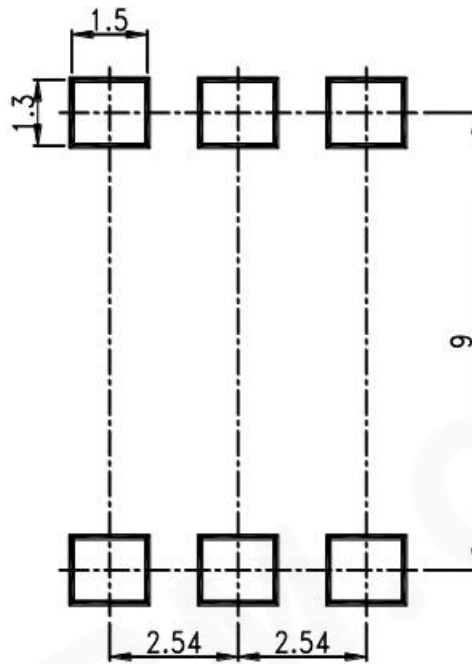
**(3).Hand soldering by soldering iron**

Allow single lead soldering in every single process. One time soldering is recommended.

Temperature	380+0/-5°C
Time	3 sec max

### 10. RECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

Unit: mm



11.CHARACTERISTICS CURVES (TYPICAL PERFORMANCE)

Fig.1 Forward current vs Ambient temperature

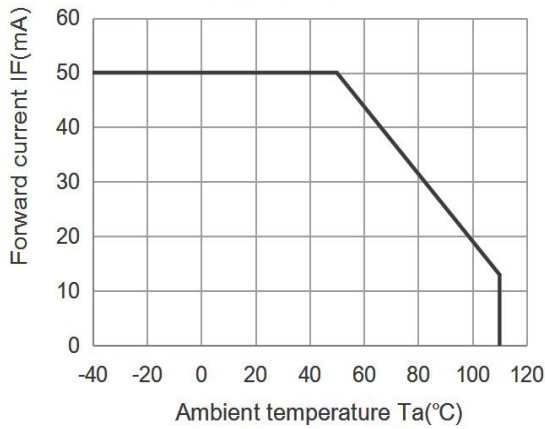


Fig.2 On-state current I<sub>TM</sub> (A) vs. Ambient temperature

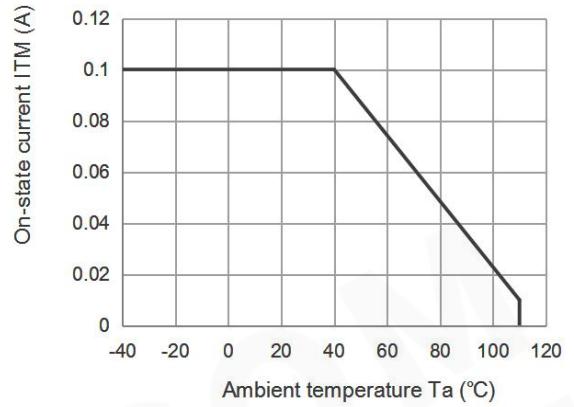


Fig.3 Minimum Trigger Current vs. Ambient temperature

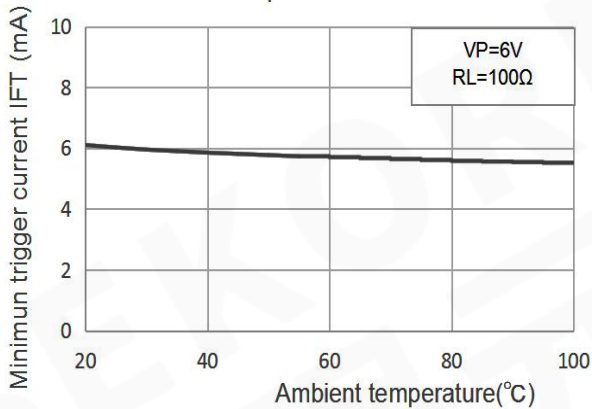


Fig.4 Forward current vs. Forward voltage

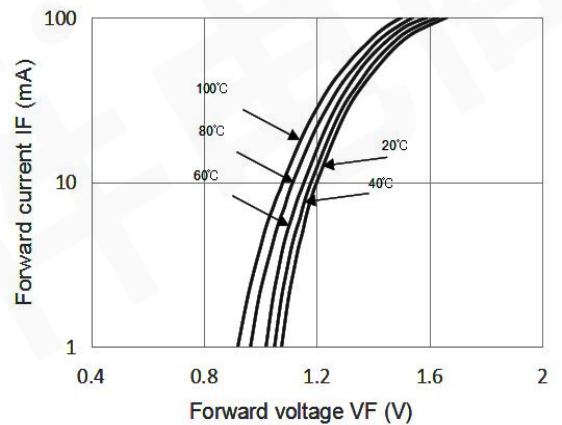


Fig.5 On-state voltage vs. Ambient temperature

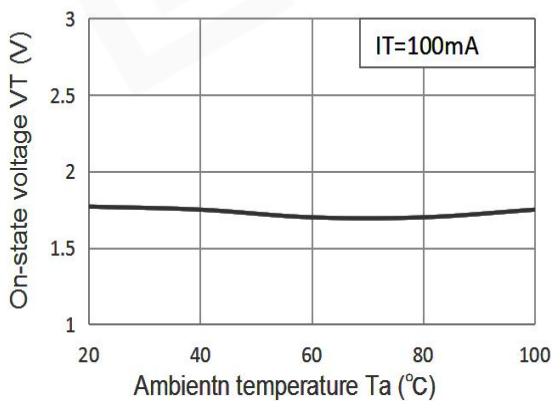


Fig.6 Holding current vs. Ambient temperature

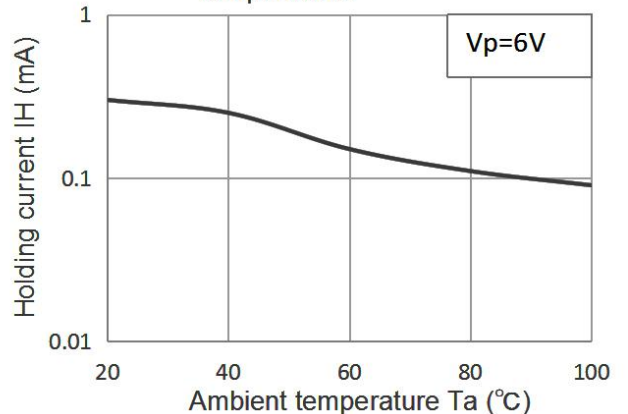


Fig.7 Repetitive peak off-state current vs. Temperature

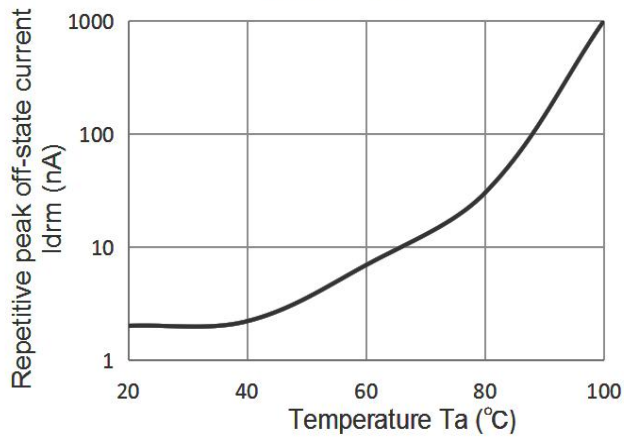
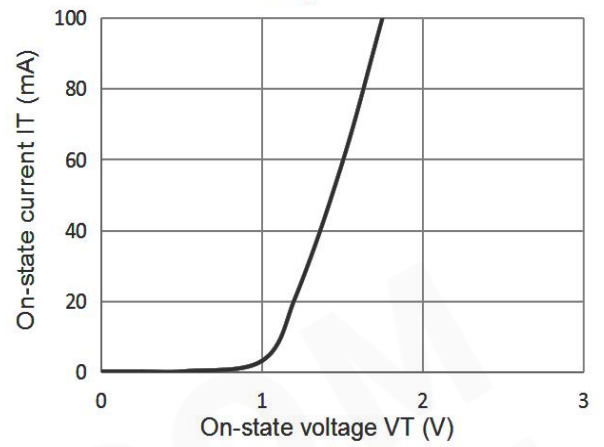
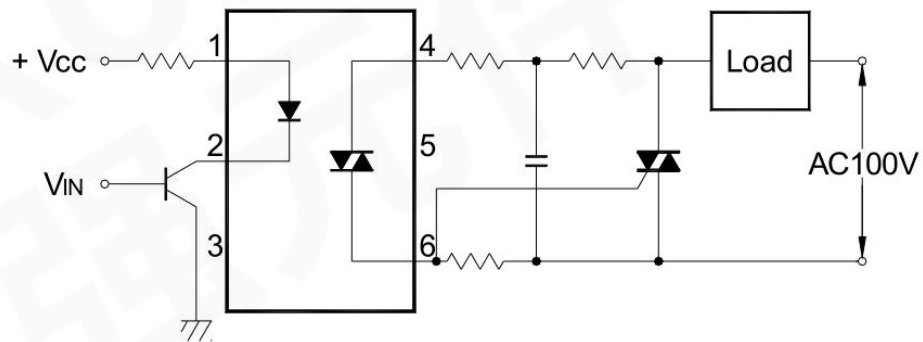


Fig.8 On-state current vs. On-state voltage



### Basic Operation Circuit

### Medium/High Power Triac Drive Circuit



► **Notes:**

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