



# ORIENT

## Photo coupler

### Product Data Sheet

Part Number: OR-MOC304X(L)/306X(L)/308X(L)

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

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

**SHENZHEN ORIENT COMPONENTS CO ., LTD**

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### 1. Features

- (1) High isolation voltage between input and output (Viso:5000 V rms )
- (2) 6pin zero-cross optoisolators triac driver output
- (3) High repetitive peak off-state voltage VDRM.  
MOC304X: Min. 400V;MOC306X: Min. 600V;MOC308X: Min. 800V
- (4) High critical rate of rise of off-state voltage( dV/dt : MIN. 1000V /s )
- (5) Have Dual-in-line package;Wide lead spacing package and Surface mounting package .
- (6) Operating temperature -40 °C to +110 °C
- (7) Safety approval  
  - UL approved (No.E323844)
  - VDE approved(No.40029733)
  - CQC approved (No.CQC19001231480)
- (8) In compliance with RoHS, REACH standards
- (9) MSL Level 1



### 2. Description

The OR-MOC304X(L)/306X(L)/308X(L) series of devices each consist of a GaAs infrared emitting diode optically coupled to a monolithic silicon zero voltage crossing photo triac.They are designed for use with a discrete power triac in the interface of logic systems , such as solid-state relays, industrial controls, motors, solenoids and consumer appliances.

### 3. Application Range

- (1)AC Motor Drives    (2)AC Motor Starters    (3)Static power switch    (4)Lighting Controls
- (5)Solenoid/Valve Controls                    (6)Solid State Relays    (7)Temperature Controls

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

Parameter		Symbol	Rateing	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	120	mW	
Output	Off-State Output Terminal Voltage	OR-MOC304X	400	V	
		OR-MOC306X	600		
		OR-MOC308X	800		
	Peak Repetitive Surge Current (PW=1ms, 120 pps)		I <sub>TSM</sub>	1	A
	On-State RMS Current		I <sub>T(RMS)</sub>	100	mA
	Junction Temperature		T <sub>J</sub>	125	°C
	Collector Power Dissipation		P <sub>C</sub>	150	mW
Total Power Dissipation		P <sub>tot</sub>	250	mW	
*Insulation Voltage		V <sub>iso</sub>	5000	V <sub>rms</sub>	
Working Temperature		T <sub>opr</sub>	-40 ~ + 110	°C	
Deposit Temperature		T <sub>stg</sub>	-55 ~ + 125		
*2 Soldering Temperature		T <sub>sol</sub>	260		

\*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 second

**5. Electrical Optical Characteristics at Ta=25°C**

Parameter		Symbol	Min	Typ.	Max	Unit	Condition	
Input	Forward Voltage	$V_F$	---	1.2	1.6	V	$I_F=20mA$	
	Reverse Current	$I_R$	---	---	5	$\mu A$	$V_R=6V$	
Output	1.Peak Blocking Current, Either Direction	$I_{DRM}$	---	---	500	nA	$V_{DRM} =$ Rated $V_{DRM}$	
	Peak On-State Voltage, Either Direction	$V_{TM}$	---	---	3.0	V	$I_{TM}=100mA$ Peak	
	2.Critical rate of Rise of Off-State Voltage	dv/dt	1000	---	---	V/ $\mu s$	$V_{in}=240V_{rms}$	
Couple	3.Led Trigger Current, Current Required to Latch Output, Either Direction	OR-MOC3040 OR-MOC3060 OR-MOC3080	---	---	30	mA	Main Terminal Voltage = 3V	
		OR-MOC3041 OR-MOC3061 OR-MOC3081	---	---	15			
		OR-MOC3042 OR-MOC3062 OR-MOC3082	---	---	10			
		OR-MOC3043 OR-MOC3063 OR-MOC3083	---	---	5			
		OR-MOC3044 OR-MOC3064 OR-MOC3084	---	---	3			
		$I_{FT}$	---	---	---			---
		$I_{FT}$	---	---	---			---
		$I_{FT}$	---	---	---			---
		$I_{FT}$	---	---	---			---
		$I_{FT}$	---	---	---			---
Holding Current, Either Direction		$I_H$	---	400	---	$\mu A$		
ZERO CROSSING	Inhibit Voltage	$V_{INH}$	---	5	20	Volts	$I_F = \text{Rated } I_{FT}$ , MT1-MT2 Voltage above which device will not trigger.	
	Leakage in Inhibited State	$I_{DRM2}$	---	---	500	$\mu A$	$I_F = \text{Rated } I_{FT}$ , Rated $V_{DRM}$ , Off State	



- \*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-MOC3040, OR-MOC3060 and OR-MOC3080, 15 mA for OR-MOC3041, OR-MOC3061 and OR-MOC3081, 10 mA for OR-MOC3042, OR-MOC3062 and OR-MOC3082, 5 mA for OR-MOC3043, OR-MOC3063 and OR-MOC3083, 3 mA for OR-MOC3044, OR-MOC3064 and OR-MOC3084, and absolute  $\max I_F$  (50mA).

## 6. Order Information

### Part Number

**OR-MOC304X(L)V-W-Y**  
**or OR-MOC306X(L)V-W-Y**  
**or OR-MOC308X(L)V-W-Y**

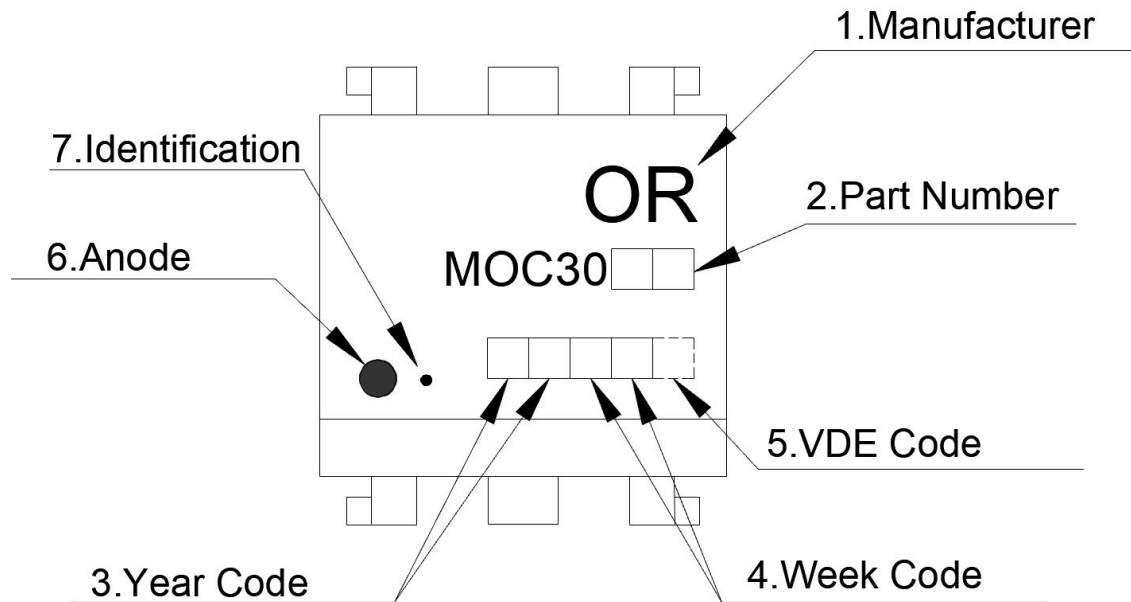
### Note

MOC304X(L)/306X(L)/308X(L) = Part number. (X = 0, 1, 2, 3 or 4).  
V = Lead form option (S, M or None).  
W = Tape and reel option (TA, TA1 or none).  
Y = 'V' code for VDE safety (This options is not necessary).

\* VDE Code can be selected.

Option	Description	Packing quantity
None	Standard DIP-6	66 units per tube
M	Wide lead bend (0.4 inch spacing)	66 units per tube
S(TA)	Surface mount lead form (low profile) + TA tape & reel option	1000 units per reel
S(TA1)	Surface mount lead form (low profile) + TA1 tape & reel option	1000 units per reel

## 7. Naming Rule

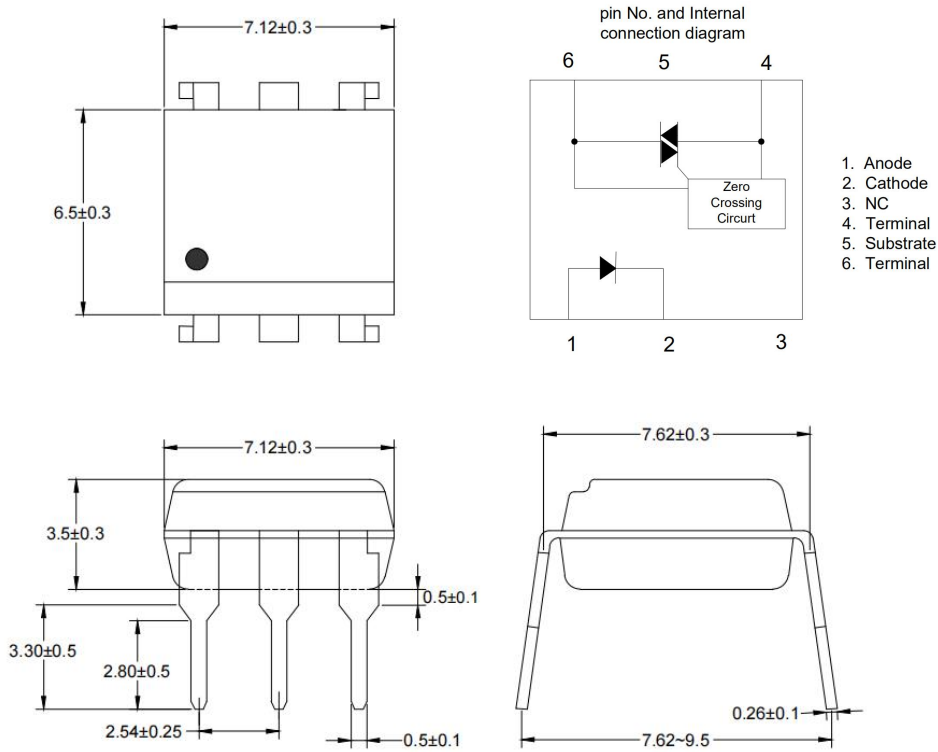


1. Manufacturer : ORIENT.
2. Part Number : MOC30  .
3. Year Code   : '21' means '2021' and so on.
4. Week Code  : 01 means the first week, 02 means the second week and so on.
5. VDE Code . (Optional)
6. Anode.
7. Identification.

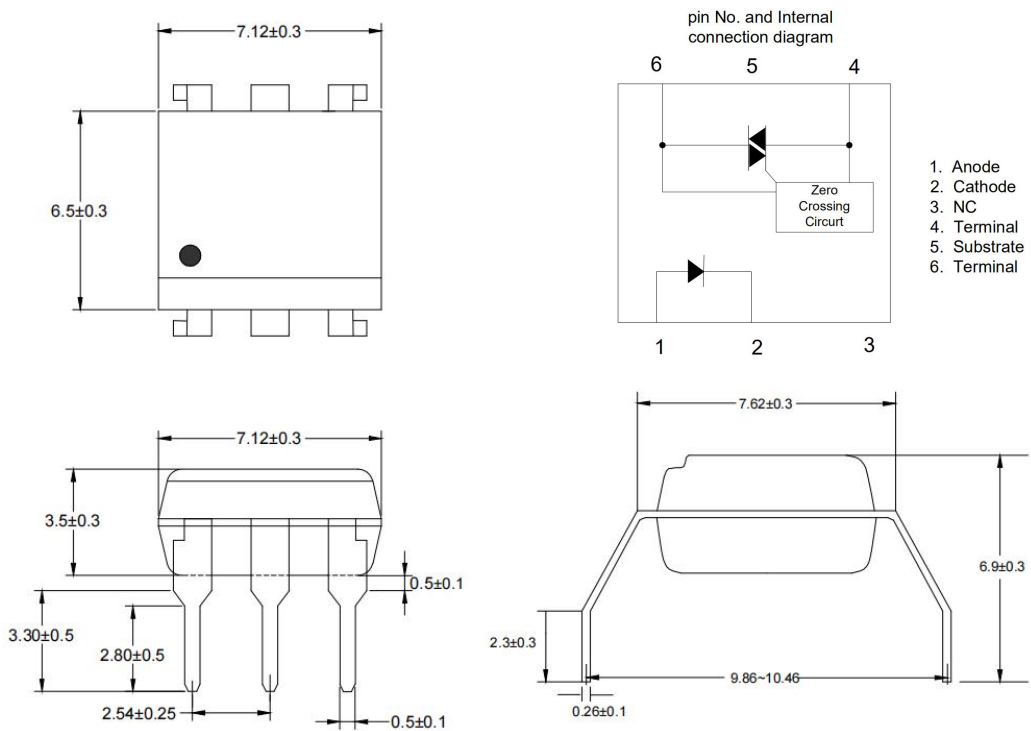
\* VDE Code can be selected.

### 8. Package Dimension

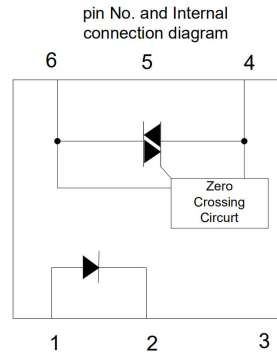
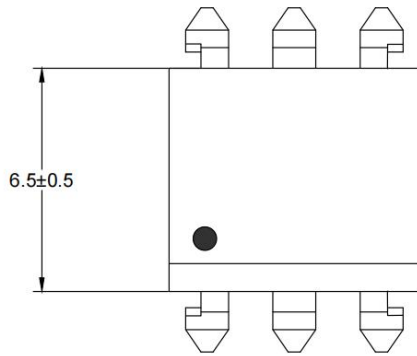
#### (1).MOC30XX



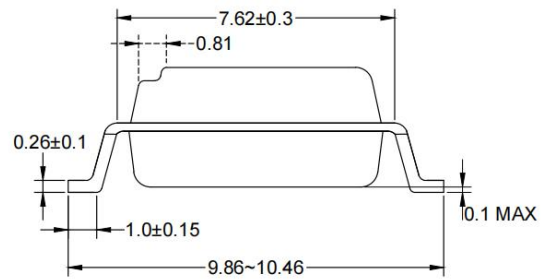
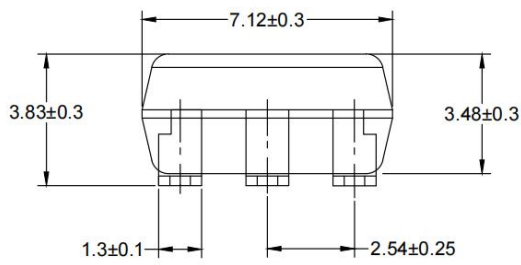
#### (2).MOC30XX M



(3).MOC30XX S

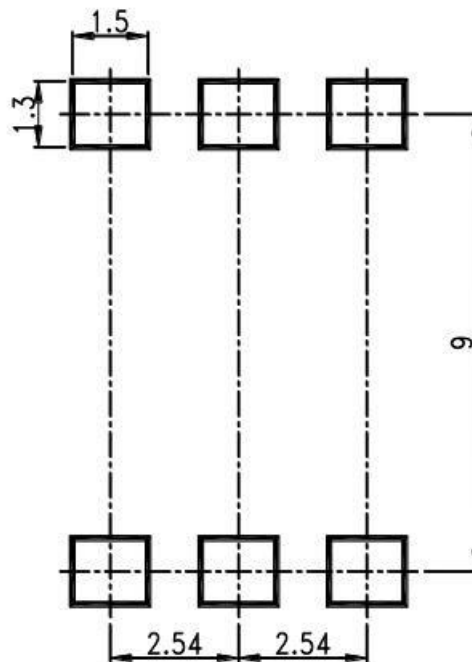


- 1. Anode
- 2. Cathode
- 3. NC
- 4. Terminal
- 5. Substrate
- 6. Terminal



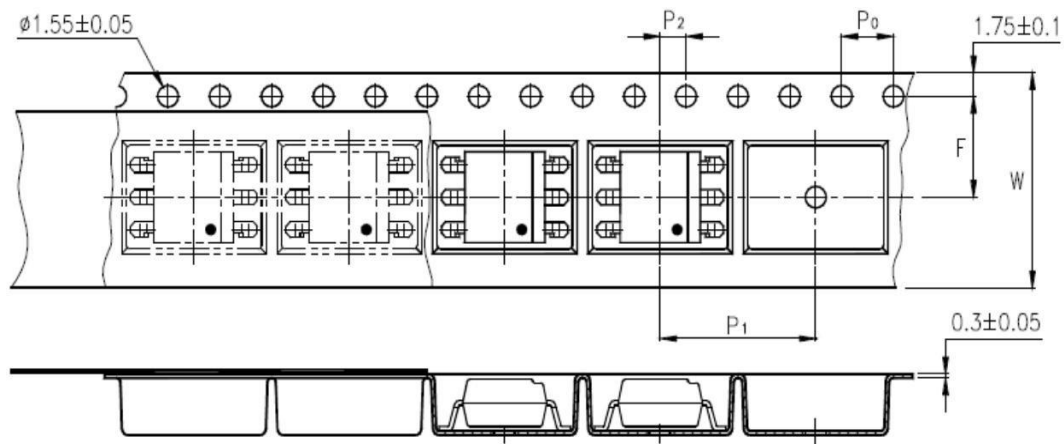
9. RRECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

Unit: mm

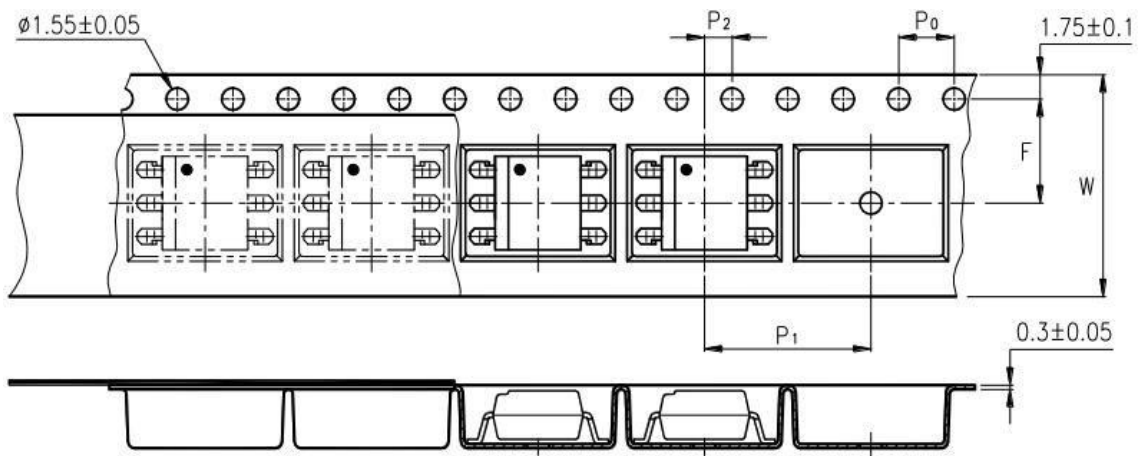


## 10. Taping Dimensions

### (1) TA Type



### (2) TA1 Type



Description	Symbol	Dimension in mm (inch)
Tape wide	W	16±0.3 (0.63)
Pitch of sprocket holes	P <sub>0</sub>	4±0.1 (0.15)
Distance of compartment	F	7.5±0.1 (0.295)
	P <sub>2</sub>	2±0.1 (0.079)
Distance of compartment to compartment	P <sub>1</sub>	12±0.1 (0.472)

Package Type	TA/TA1
Quantities(pcs)	1000



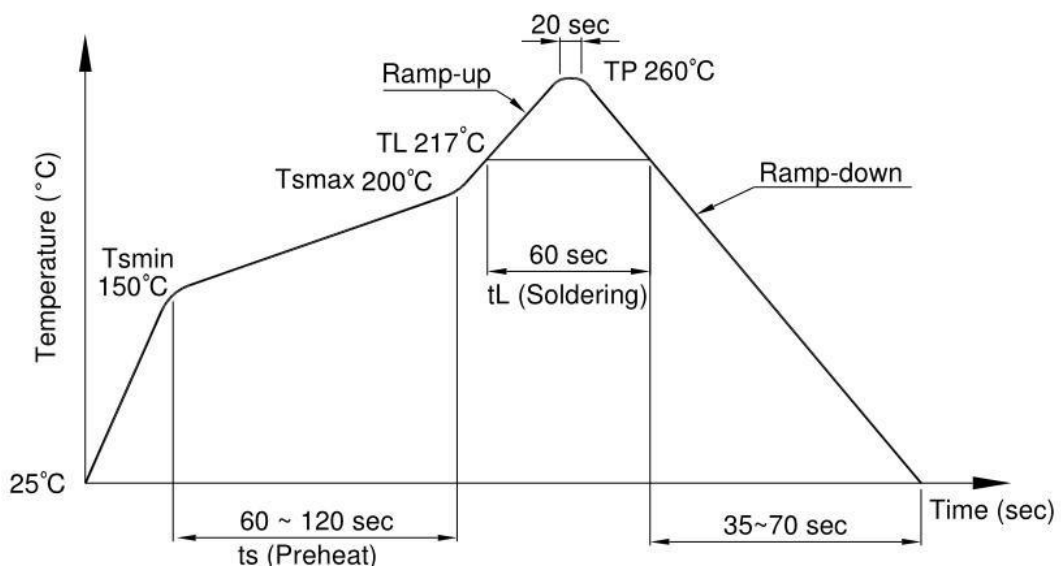


## 12. Temperature Profile Of Soldering

(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.

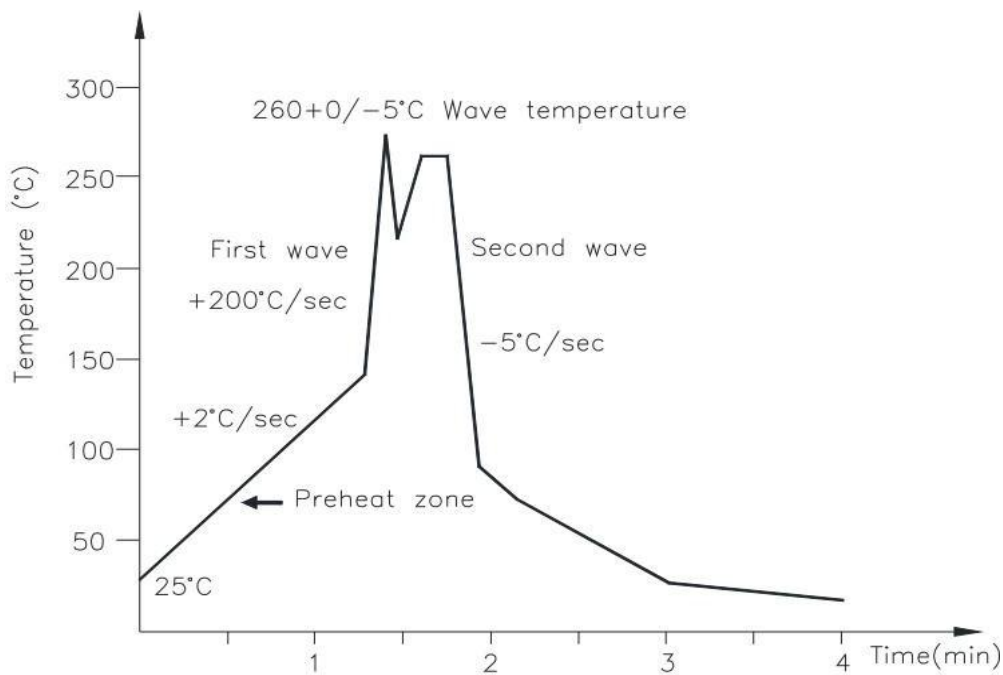
Profile item	Conditions
Preheat - Temperature Min (T Smin ) - Temperature Max (T Smax ) - Time (min to max) (ts)	150°C 200°C 90±30 sec
Soldering zone - Temperature (TL ) - Time (t L )	217°C 60 sec
Peak Temperature	260°C
Peak Temperature time	20 sec
Ramp-up rate	3°C / sec max.
Ramp-down rate from peak temperature	3~6°C / sec
Reflow times	≤3



**(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

### 13. CHARACTERISTICS CURVES (TYPICAL PERFORMANCE)

Fig.1 Forward Current vs. Ambient Temperature

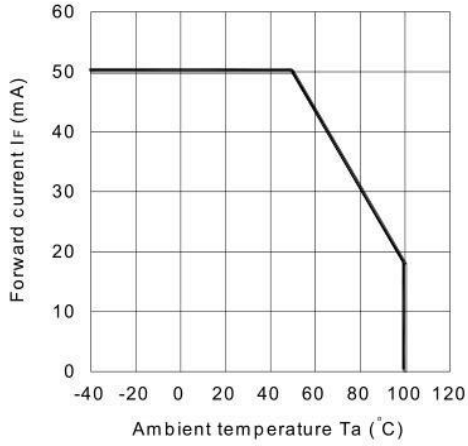


Fig.2 On-state Current vs. Ambient Temperature

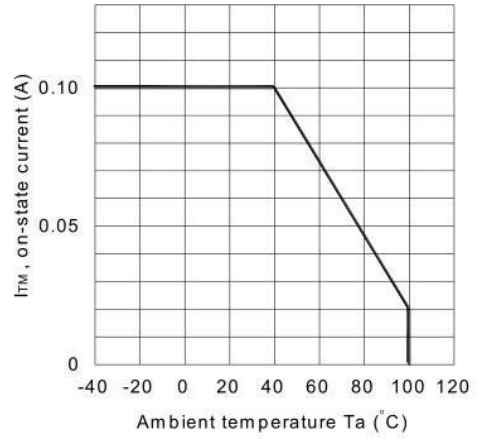


Fig.3 Minimum Trigger Current vs. Ambient Temperature

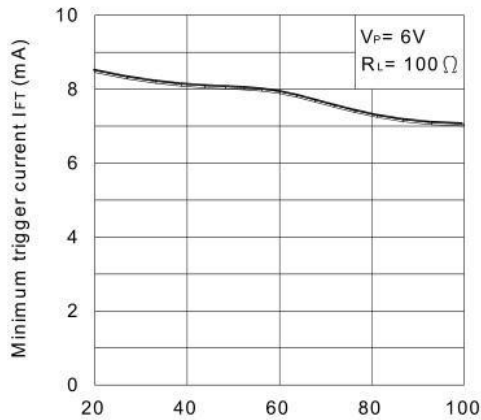


Fig.4 Forward Current vs. Forward Voltage

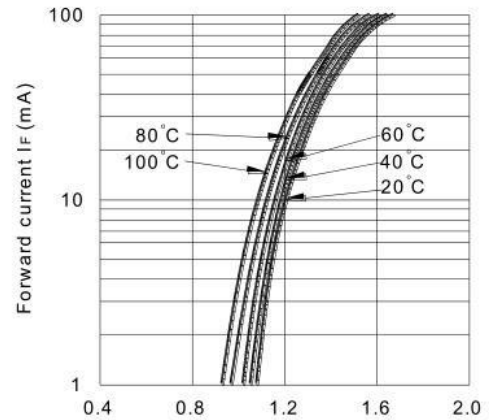


Fig.5 On-state Voltage vs. Ambient Temperature

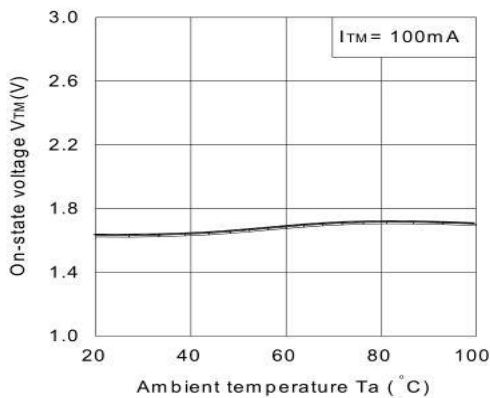


Fig.6 Holding Current vs. Ambient Temperature

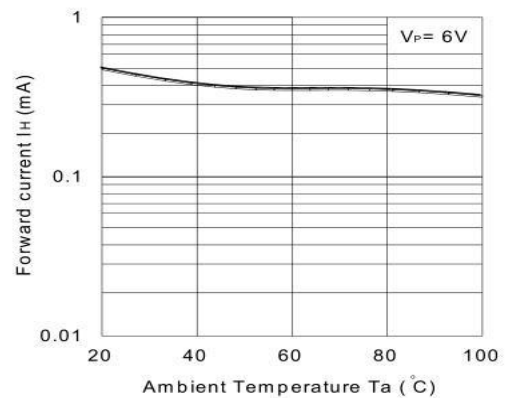


Fig.7 Repetitive Peak Off-state Current vs. Temperature

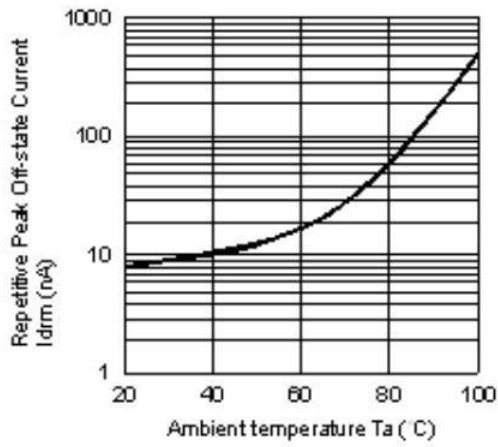
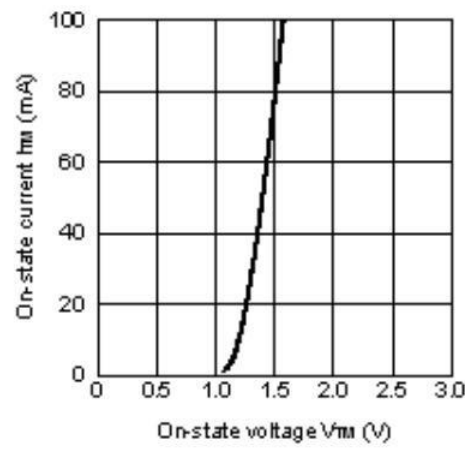


Fig.8 On-state Current vs. On-state Voltage



Basic Driver Circuit

