



ORIENT

Photo coupler

Product Data Sheet

Part Number: OR-MOC304X/306X/308X

Customer: _____

Date: _____

SHENZHEN ORIENT COMPONENTS CO., LTD

Block A 3rd Floor No.4 Building, Tian'an Cyber Park, Huangge Rd, LongGang Dist, Shenzhen, GD

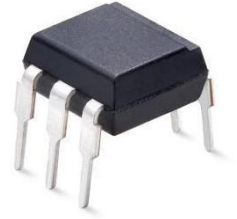
TEL: 0755-29681816

FAX: 0755-29681200

www.orient-opto.com

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 :
OR-MOC304X: Min. 400V;OR-MOC306X: Min. 600V;OR-MOC308X: Min. 800V
- (4) Compliance with EU REACH
- (5) High critical rate of rise of off-state voltage(dV/dt : MIN. 1000V /s)
- (6) Have Dual-in-line package;Wide lead spacing package and Surface mounting package .
- (7) Operating temperature -40 °C to +110 °C
- (8) In compliance with RoHS, REACH standards
- (9) MSL Level 1



2. Description

The OR-MOC304X/OR-MOC306X/OR-MOC308X 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

- 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	Rateing	Unit	
Input	Forward Current	I _F	50	mA	
	Junction Temperature	T _J	125	°C	
	Reverse Voltage	V _R	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 _{TSM}	1	A
	Junction Temperature		T _J	125	°C
	Collector Power Dissipation		P _C	150	mW
Total Power Dissipation		P _{tot}	250	mW	
*Insulation Voltage		V _{iso}	5000	V _{rms}	
Working Temperature		T _{opr}	-40 ~ + 110	°C	
Deposit Temperature		T _{stg}	-55 ~ + 125		
*2 Soldering Temperature		T _{sol}	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 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	$I_F=20\text{mA}$		
	Reverse Current	I_R	---	---	5	μA	$V_R=6\text{V}$		
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	$I_{TM}=100\text{mA Peak}$		
	2.Critical rate of Rise of Off-State Voltage	dv/dt	1000	---	---	V/ μs	$V_{in}=240\text{Vrms}$		
Couple	3.Led Trigger Current, Current Required to Latch Output, Either Direction	OR-MOC3040 OR-MOC3060 OR-MOC3080	I_{FT}	---	---	mA	Main Terminal Voltage = 3V		
		OR-MOC3041 OR-MOC3061 OR-MOC3081						30	15
		OR-MOC3042 OR-MOC3062 OR-MOC3082						10	5
		OR-MOC3043 OR-MOC3063 OR-MOC3083						5	3
		OR-MOC3044 OR-MOC3064 OR-MOC3084						3	
Holding Current, Either Direction		I_H	---	400	---	μA			
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	μA	$I_F = \text{Rated } I_{FT}$, 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-MOC304XV-W-Y-Z
 or **OR-MOC306XV-W-Y-Z**
 or **OR-MOC308XV-W-Y-Z**

Note

X = IFT Rank (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).

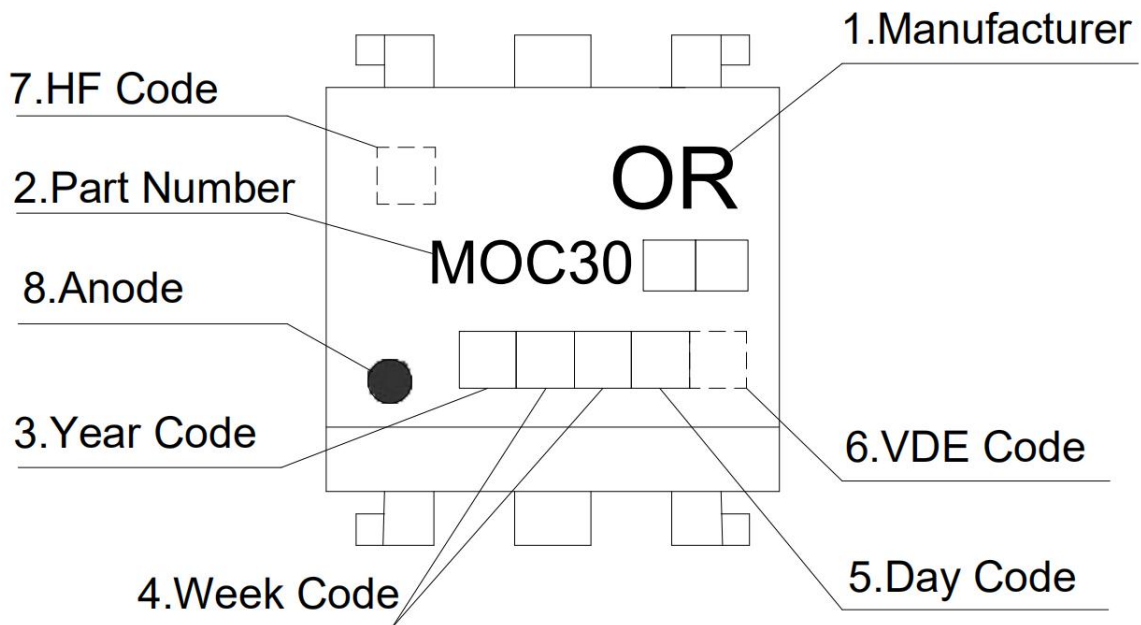
Z = 'G' code for Halogen free (This options is not necessary).

* VDE Code can be selected.

* Halogen Free 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



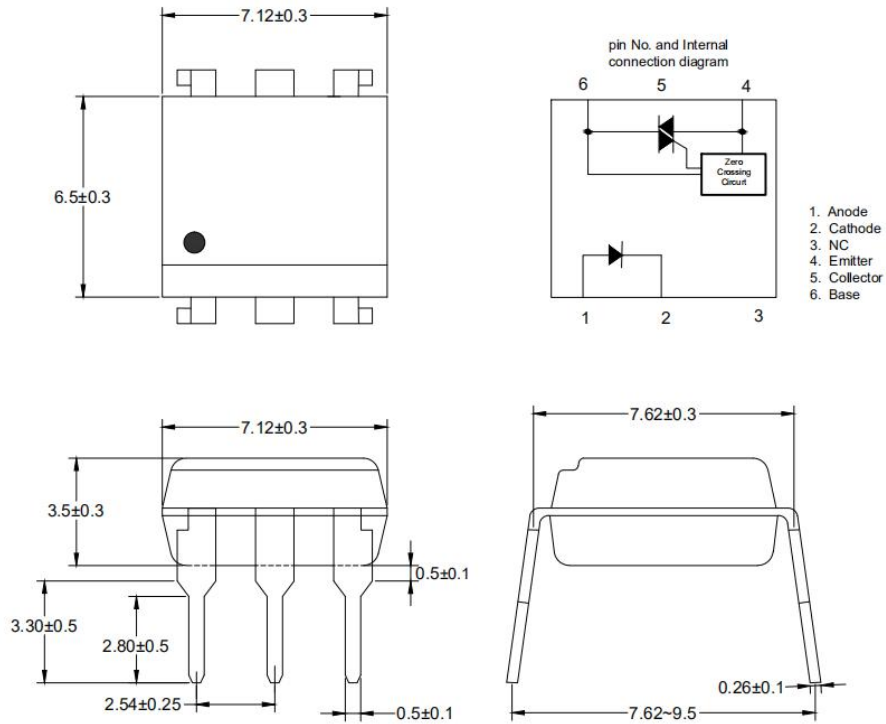
1. Manufacturer : ORIENT.
2. Part Number : MOC30□□.
3. Year Code □ : '0' means '2020' and so on.
4. Week Code □□: 01 means the first week, 02 means the second week and so on.
5. Day Code □ : 'A to F' means 'Monday to Sunday'.
6. VDE Code □.
7. HF Code □: Halogen Free.
8. Anode.

* Halogen Free Mark can be selected.

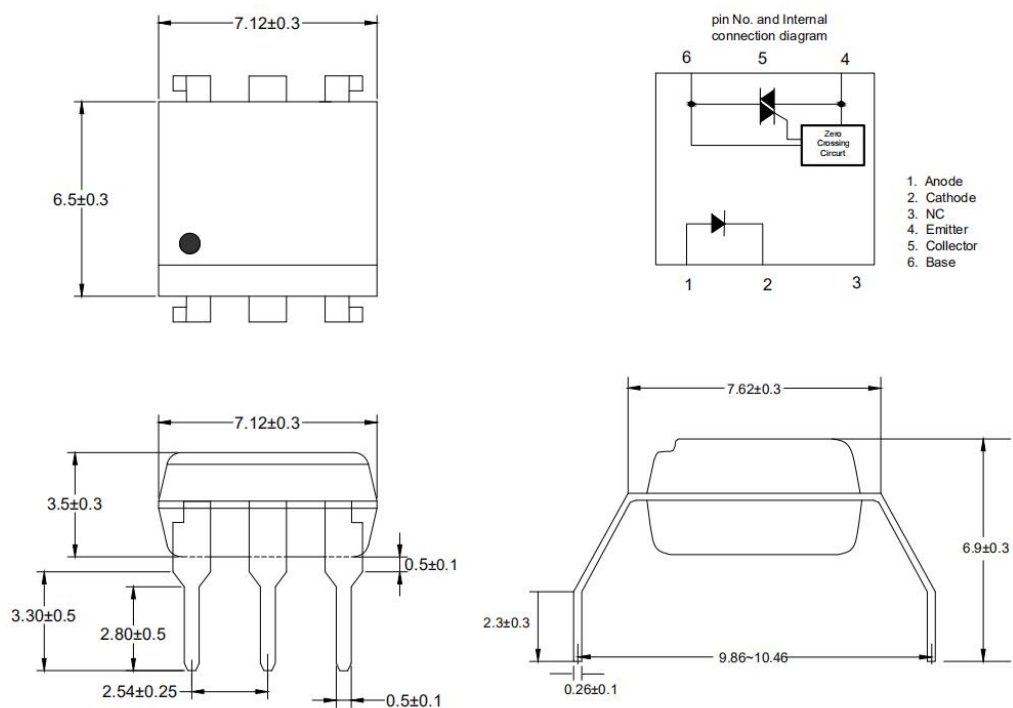
* VDE Code can be selected.

8. Package Dimension

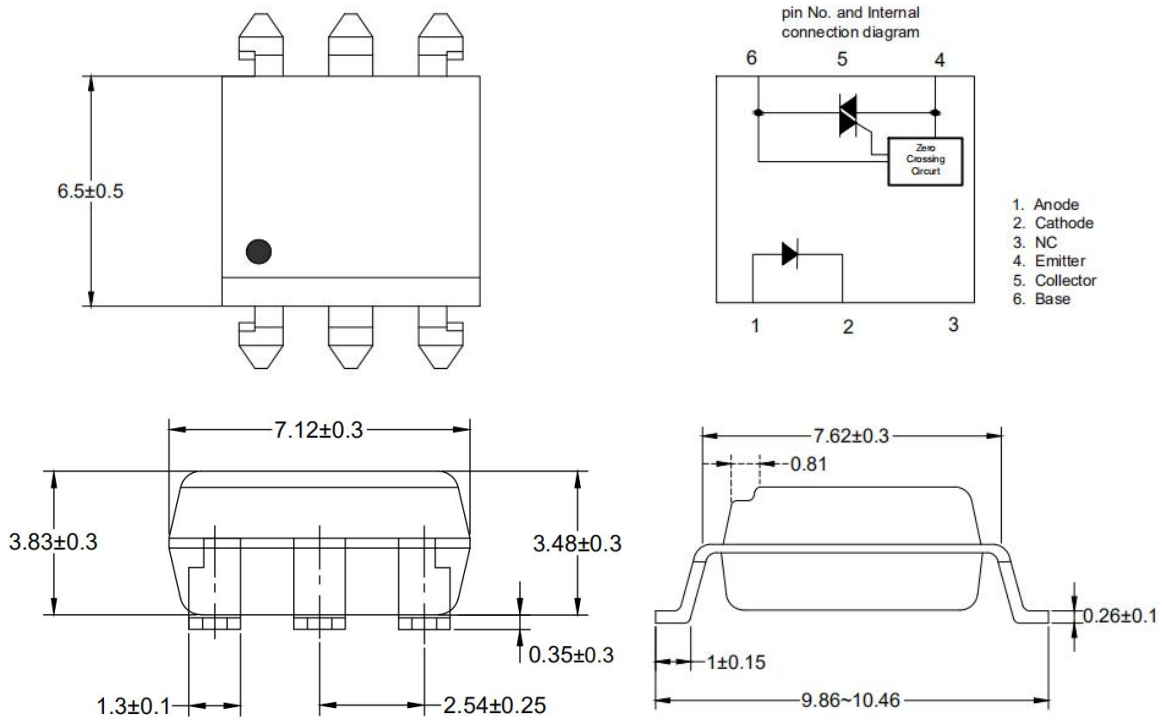
(1).MOC30XX



(2).MOC30XX M

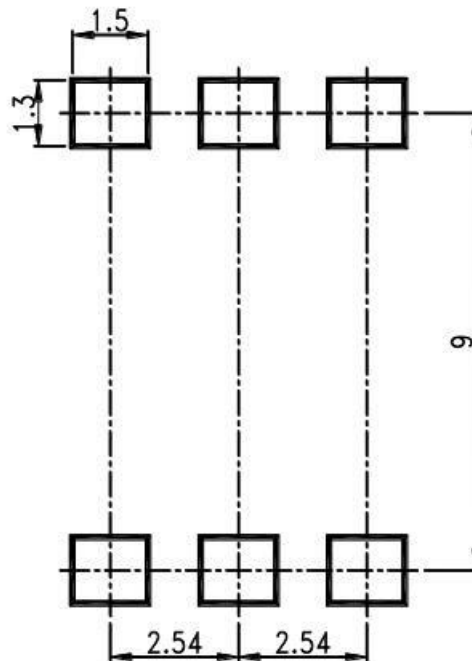


(3).MOC30XX S



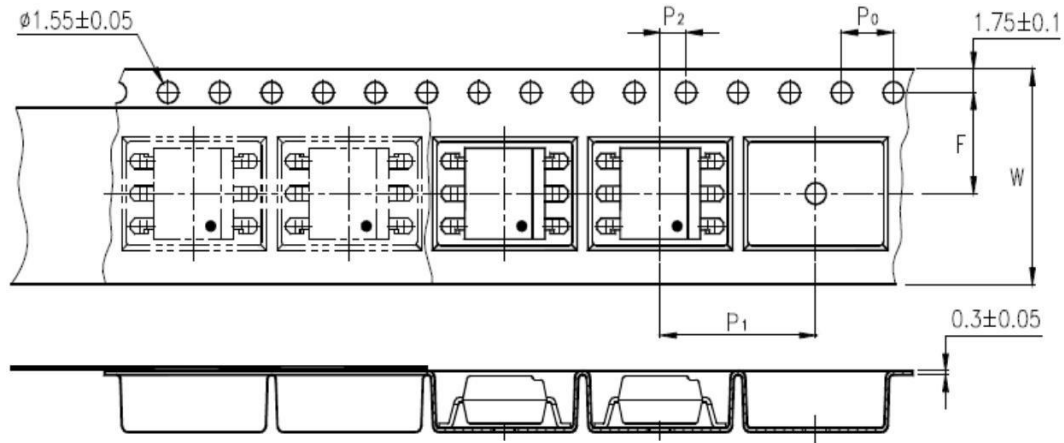
9. RRECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

Unit: mm

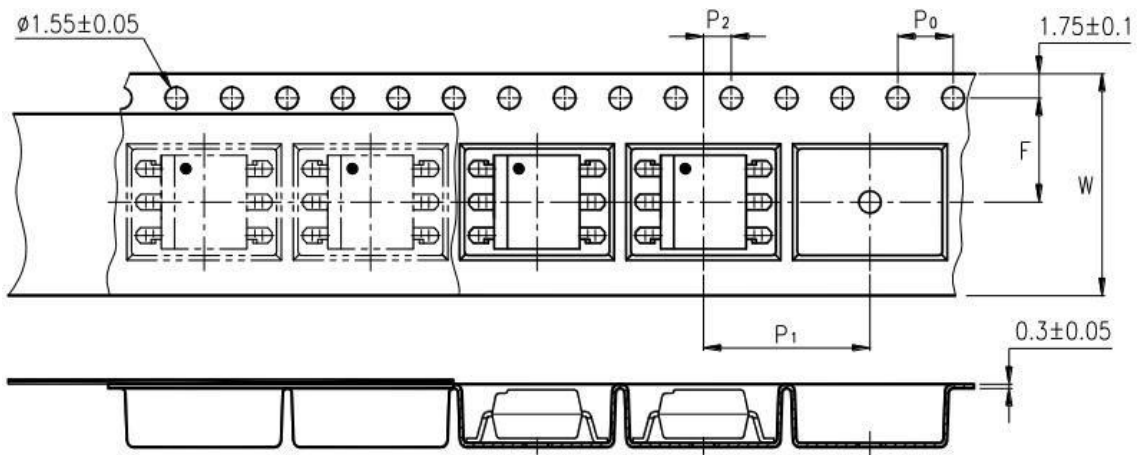


10. Taping Dimensions

(1) .OR-MOC30XXS-TA



(2) OR-MOC30XXS-TA1



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

Package Type	TA/TA1
Quantities(pcs)	1000

11. Package Dimension

(1) package dimension

DIP/M type

Packing Information	
Packing type	Tube(Plug)
Qty per Tube	66
Small box (inner) Dimenaion	525*132*60mm
Max qty per small box	3300
Large box (Outer) Dimenaion	530*290*335mm
Max qty per large box	33000

SOP type

Packing Information	
Packing type	Reel type
Tape Width	16mm
Qty per Reel	1000
Small box (inner) Dimenaion	345*345*60mm
Max qty per small box	2000
Large box (Outer) Dimenaion	620x360x360mm
Max qty per large box	20000

(2)Packing Label Sample



1. MTL NO:Contents with "Order Information" in the specification.
2. LOT NO:The production cycle of the product.
3. BATCH:The CTR RANK of the product.
4. Quantity:Product packaging quantity.
5. Product Data: The data when product be made.

12. Reliability Test

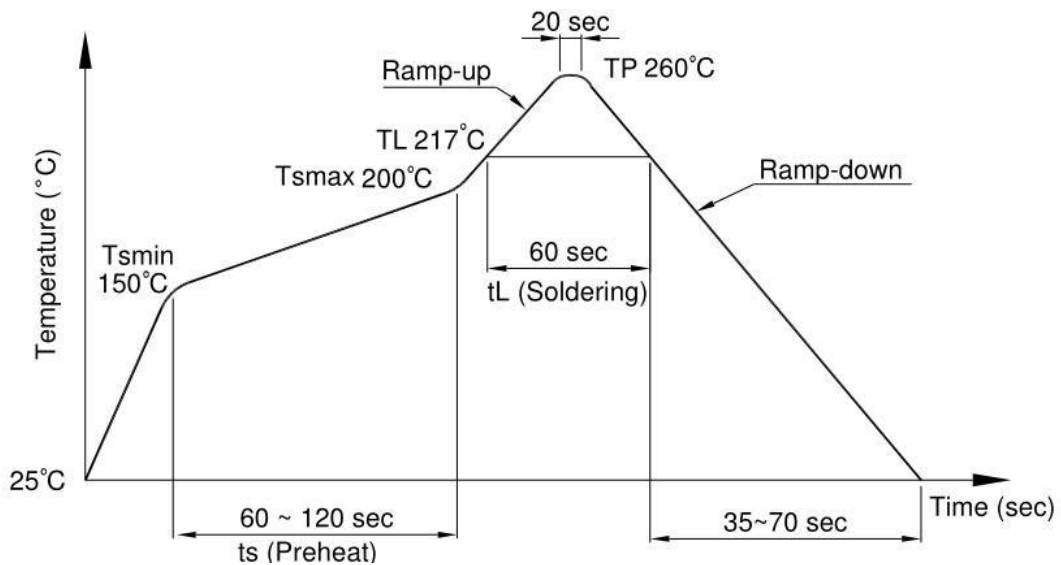
NO.	Item	Condition	Quantity	Cycle	Reference Standards
1	RSH, Resistance to Solder Heat	260±5°C,20s/cycle	22	3 cycles	JESC22A-106
2	SD, Solderability	260±5°C, 10s/cycle	22	1 cycle	JESD22-B102
3	TC, Temperature Cycle	H: 125°C 15min ∫ 5min L: -55°C 15min	77	300cycles	JESC22A-104
4	TS, Thermal Shock	H:100°C 5min ∫ 15s L:-10°C 5min	77	300cysles	JESC22A-106
5	LTSL, Low Temperature Storage	T:-55°C	77	1000h	JESD22-A119
6	HTSL, High Temperature Storage	T:125°C	77	1000h	JESC22A-103
7	THB, High Temperature High Humidity	T:85°C RH: 85%	77	1000h	JESC22A-101
8	HTOL DC Operating Life	T: 110°C IF=10mA VCC=5V	77	1000h	MIL-STD-750 Method 1037
9	ESD-HBM Human Body Model ESD	Ta=25° C, Reference JESD22-A114	6	1 cycle	JESD22-A114

13. 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.

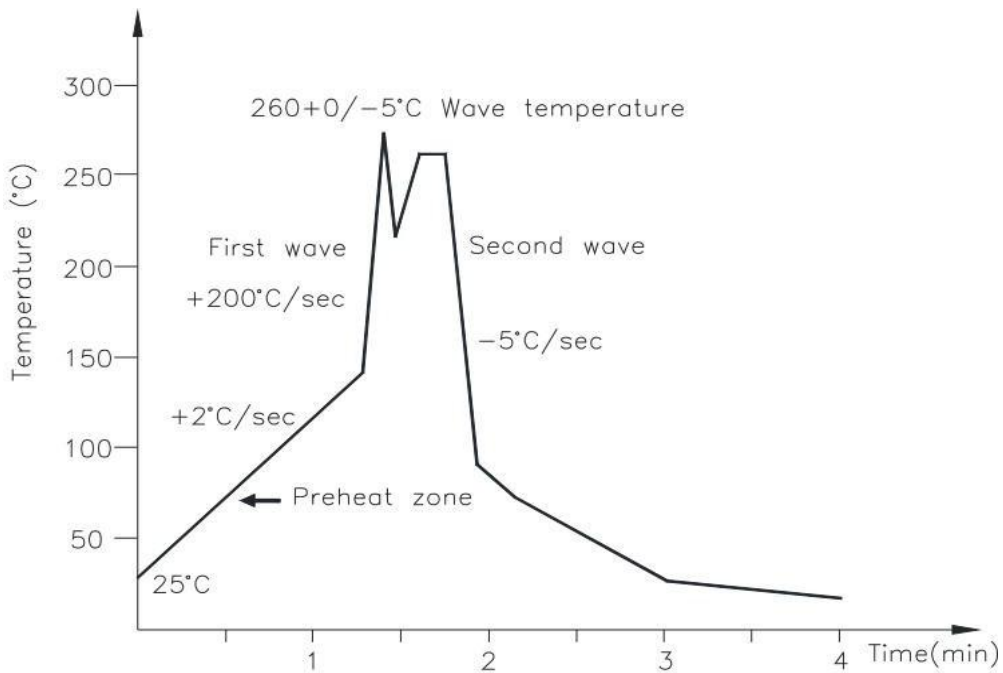
Profile item	Conditions
Preheat - Temperature Min (T Smin) - Temperature Max (T Smax) - Time (min to max) (ts)	150°C 200°C 90±30 sec
Soldering zone - Temperature (TL) - Time (t L)	217°C 60 sec
Peak Temperature	260°C
Peak Temperature time	20 sec
Ramp-up rate	3°C / sec max.
Ramp-down rate from peak temperature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

14. CHARACTERISTICS CURVES (TYPICAL PERFORMANCE)

Fig.1 Forward Current vs. Ambient Temperature

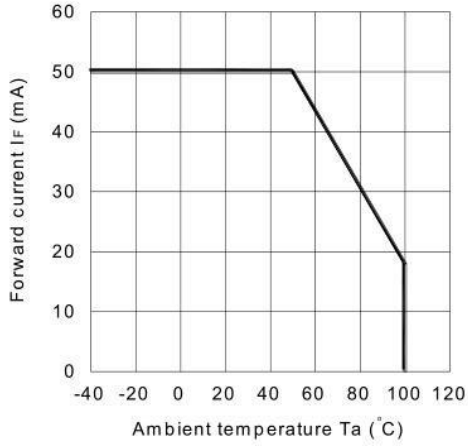


Fig.2 On-state Current vs. Ambient Temperature

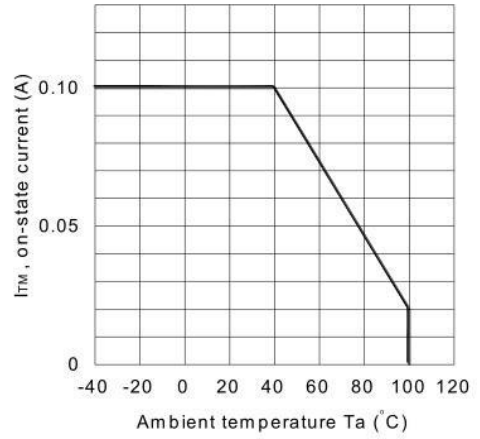


Fig.3 Minimum Trigger Current vs. Ambient Temperature

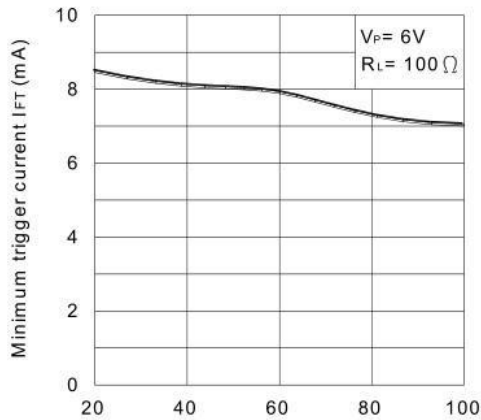


Fig.4 Forward Current vs. Forward Voltage

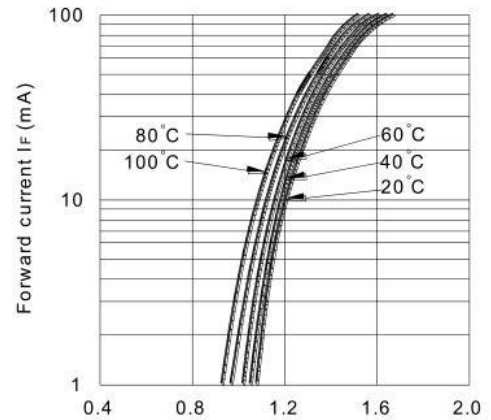


Fig.5 On-state Voltage vs. Ambient Temperature

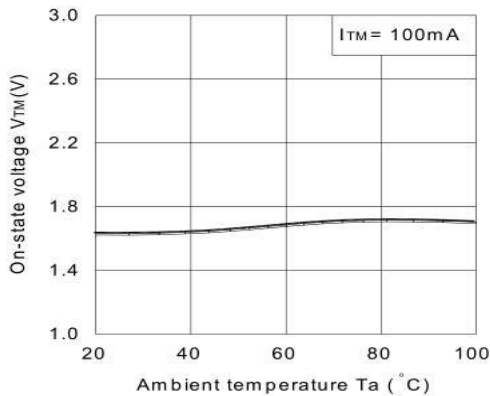


Fig.6 Holding Current vs. Ambient Temperature

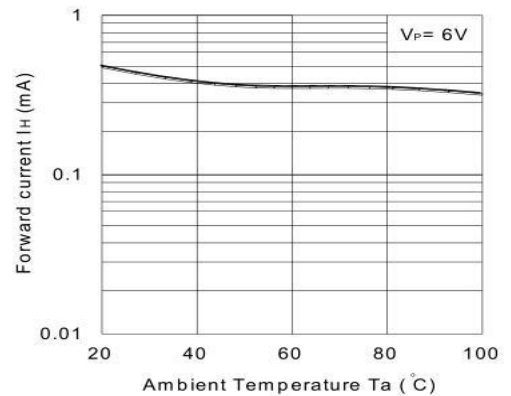


Fig.7 Repetitive Peak Off-state Current vs. Temperature

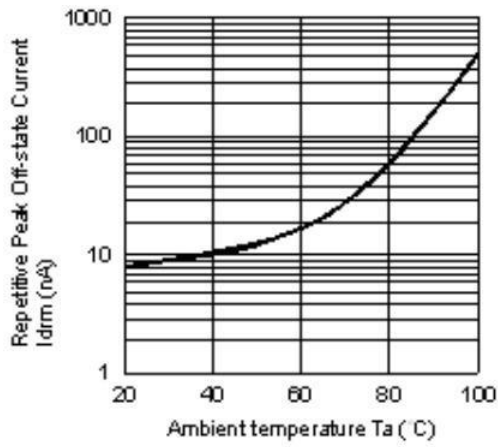
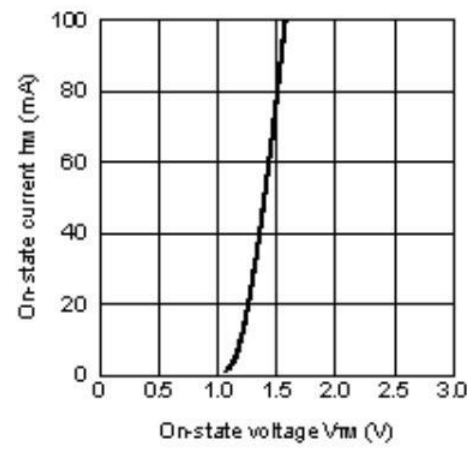


Fig.8 On-state Current vs. On-state Voltage



Basic Driver Circuit

