



ORIENT

Photo coupler

Product Data Sheet

Part Number: OR-M304X(L)/M306X(L)/M308X(L)

Customer: _____

Date: _____

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Preliminary

This datasheet is a preliminary design specification, and the formal specifications are subject to the recognition letter with jointly signed

1. Features

- (1) High isolation voltage between input and output (Viso:3750 V rms)
- (2) 4pin zero-cross optoisolators triac driver output
- (3) High repetitive peak off-state voltage VDRM :
M304X: Max. 400V,M306X: Max. 600V,M308X: Max. 800V
- (4) High critical rate of rise of off-state voltage dv/dt : MIN. 1000 V / μ s
- (5) Tape and reel packaging.
- (6) Operating temperature -40 °C to +110 °C
- (7) Safety approval
UL approved(No.E323844)
VDE approved(No.40029733)
CQC approved (No.CQC19001231256)
- (8) In compliance with RoHS, REACH standards
- (9) MSL Class I



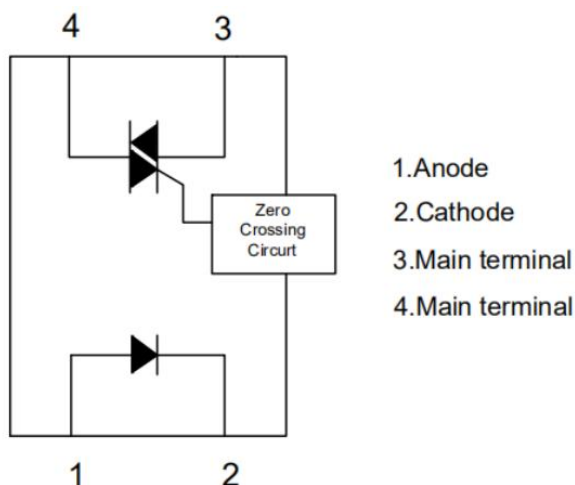
2. Description

The OR-M304X(L)/M306X(L)/M308X(L) 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. Functional Diagram



5. Absolute Maximum Ratings (Ta=25°C)

Parameter			Symbol	Rated Value	Unit
Input	Forward Current		I _F	50	mA
	Junction Temperature		T _J	125	°C
	Reverse Voltage		V _R	6	V
	Power Dissipation		P	100	mW
Output	Off-State Output Terminal Voltage	OR-M304X	V _{DRM}	400	V
		OR-M306X		600	
		OR-M308X		800	
	On state RMS current		I _{T(RMS)}	100	mA(RMS)
	Junction Temperature		T _J	125	°C
	Power Dissipation		P	300	mW
	Total Power Dissipation		P _{tot}	400	mW
	*1 Insulation Voltage		V _{iso}	3750	Vrms
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 are shorted together, and pins 3, 4 are shorted together.

* 2 For 10 seconds

6. Electrical Optical Characteristics at Ta=25°C

Parameter			Symbol	Min	Typ.*	Max	Unit	Condition
Input	Forward Voltage		V_F	---	1.2	1.6	V	$I_F=10\text{mA}$
	Reverse Current		I_R	---	---	5	μA	$V_R=6\text{V}$
Output	*1.Peak Blocking Current, Either Direction	OR-M304X OR-M306X	I_{DRM}	---	10	100	nA	$V_{\text{DRM}} = \text{Rated } V_{\text{DRM}}$
		OR-M308X		---	---	100		
	Inhibit Voltage (MT1-MT2 voltage above which device will not trigger)		V_{INH}	---	---	20	V	$I_F = \text{Rated } I_{\text{FT}}$
	Peak On-State Voltage, Either Direction		V_{TM}	---	1.7	3.0	V	$I_{\text{TM}}=100\text{mA Peak}$
	*2.Critical rate of Rise of Off-State Voltage		dv/dt	1000	---	---	V/ μs	$V_{\text{in}}=240\text{Vrms}$
Transfer Characteristics	*3.Led Trigger Current, Current Required to Latch Output, Either Direction	OR-M3040 OR-M3060 OR-M3080	I_{FT}	---	---	30	mA	Main Terminal Voltage = 3V
		OR-M3041 OR-M3061 OR-M3081		---	---	15		
		OR-M3042 OR-M3062 OR-M3082		---	---	10		
		OR-M3043 OR-M3063 OR-M3083		---	---	5		
		OR-M3044 OR-M3064 OR-M3084		---	---	3		
	Holding Current, Either Direction		I_H	0.15	0.2	----	mA	
ZERO CROSSING	Leakage in Inhibited State		I_{DRM2}	---	---	500	μA	$I_F = \text{Rated } I_{\text{FT}}, \text{ Rated } V_{\text{DRM}}, \text{ Off State}$

*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-M3040 and OR-M3060 and OR-M3080, 15 mA for OR-M3041 and OR-M3061 and OR-M3081, 10 mA for OR-M3042 and OR-M3062 and OR-M3082, 5 mA for OR-M3043 and OR-M3063 and OR-M3083, 3 mA for OR-M3044, OR-M3064 and OR-M3084, and absolute max I_F (50mA).



7. Order Information

Part Number

OR-M304X(L)-W-Y-Z

or OR-M306X(L)-W-Y-Z

or OR-M308X(L)-W-Y-Z

Note

M304X/M306X/M308X= Part Number(X = 0,1,2,3 or 4)

(L)= Dedicated line code.

W = Tape and reel option (TP or TP1).

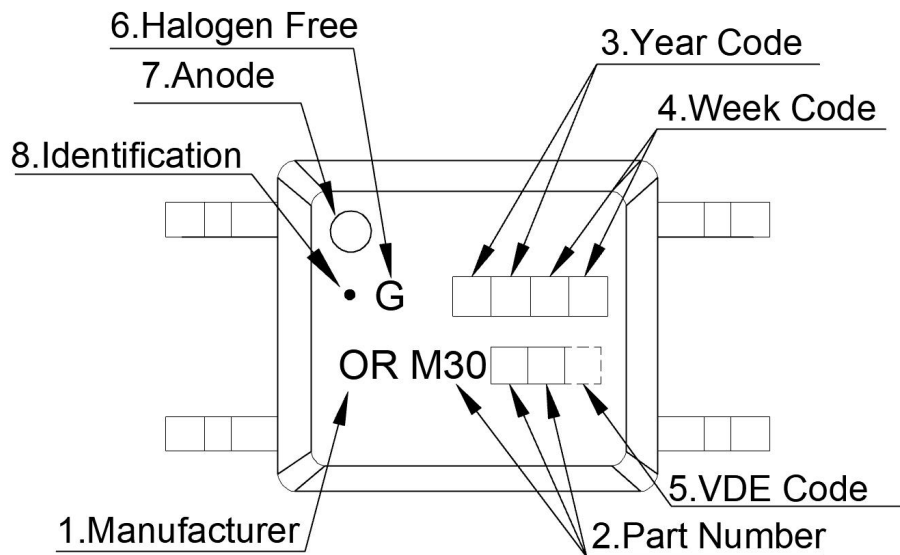
Y = 'V' code for VDE safety (This options is not necessary).

Z = 'G' code for Halogen free.

* VDE Code can be selected.

Option	Description	Packing quantity
TP	Surface mount lead form (low profile) + TP tape & reel option	3000 units per reel
TP1	Surface mount lead form (low profile) + TP1 tape & reel option	3000 units per reel

8. Naming Rule

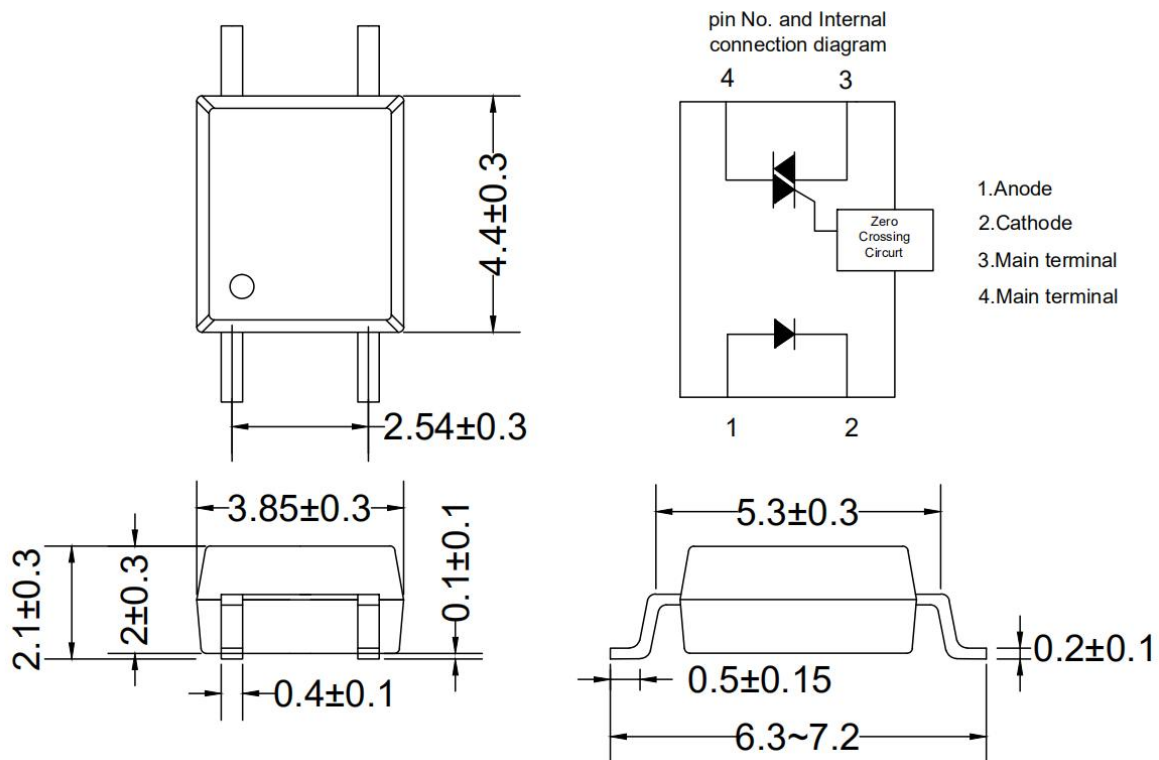


1. Manufacturer : ORIENT.
2. Part Number : M30
3. Year Code : '21' means '2021' and so on.
4. Week Code : 01 means the first week, 02 means the second week and so on.
5. VDE Code . (Optional)
6. HF Code 'G': Halogen Free.
7. Anode.
8. Identification “ • ” : Dedicated line code (L)

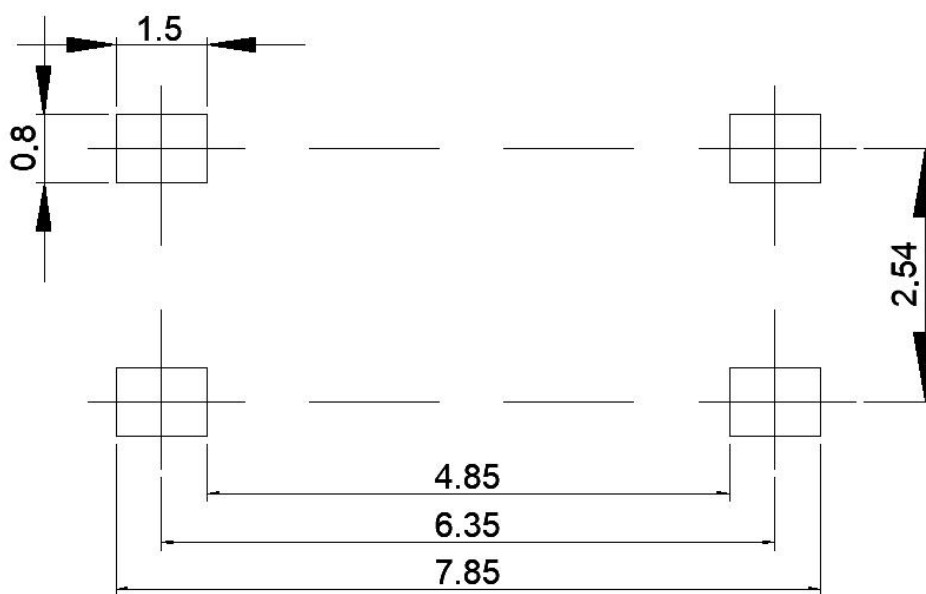
* VDE Code can be selected.

9. Package Dimension

OR-M30XX



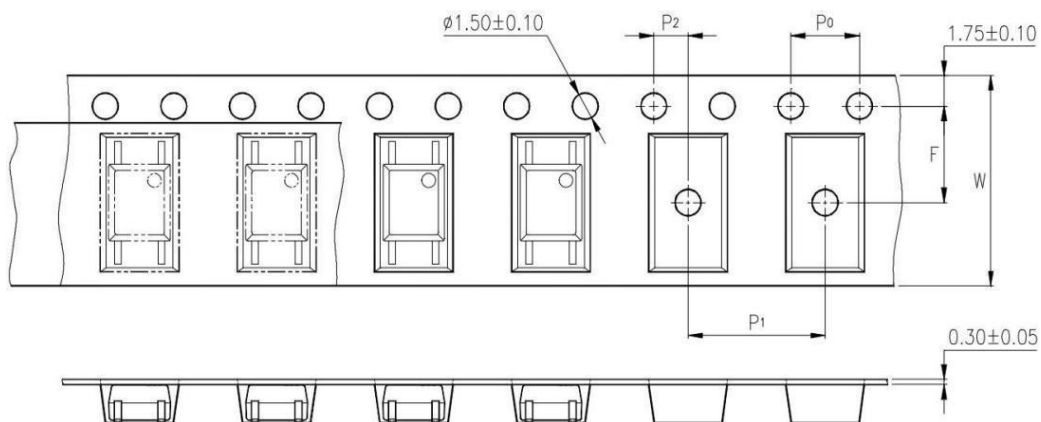
10. Recommended Foot Print Patterns (Mount Pad)



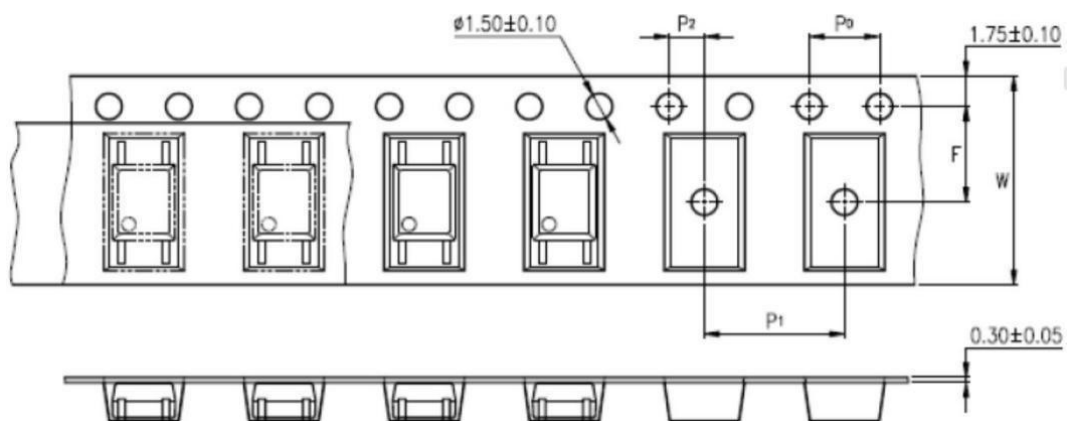
unit: mm

11. Taping Dimensions

(1)TP Type



(2)TP1 Type



Description	Symbol	Dimension in mm (inch)
Tape wide	W	12±0.3 (0.472)
Pitch of sprocket holes	P0	4±0.1 (0.157)
Distance of compartment	F	5.5±0.1 (0.217)
	P2	2±0.1 (0.079)
Distance of compartment to compartment	P1	8±0.1 (0.315)

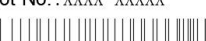
Package Type	TP/TP1
Quantities(pcs)	3000

12. Package Dimension

(1) package dimension

Packing Information	
Packing type	Reel type
Tape Width	12mm
Qty per Reel	3,000pcs
Small box (inner) Dimension	345*345*45mm
Large box (Outer) Dimension	480x360x360mm
Max qty per small box	6,000pcs
Max qty per large box	60,000pcs

(2) Packing Label Sample

 ORIENT ShenZhen Orient Components Co.,LTD		 
Material Code: 120PCXXXXXX 		粘贴位置 设备码
P/N: XXXXXXXXXXXX 		
Lot No. : XXXX-XXXX 		
D/C: XXXXXX 		
Qty: XXXX PCS 	“XXXXXXXXXXXXXXXX” (流水码)	二维码
		MSL: 1 Made in China

Note:

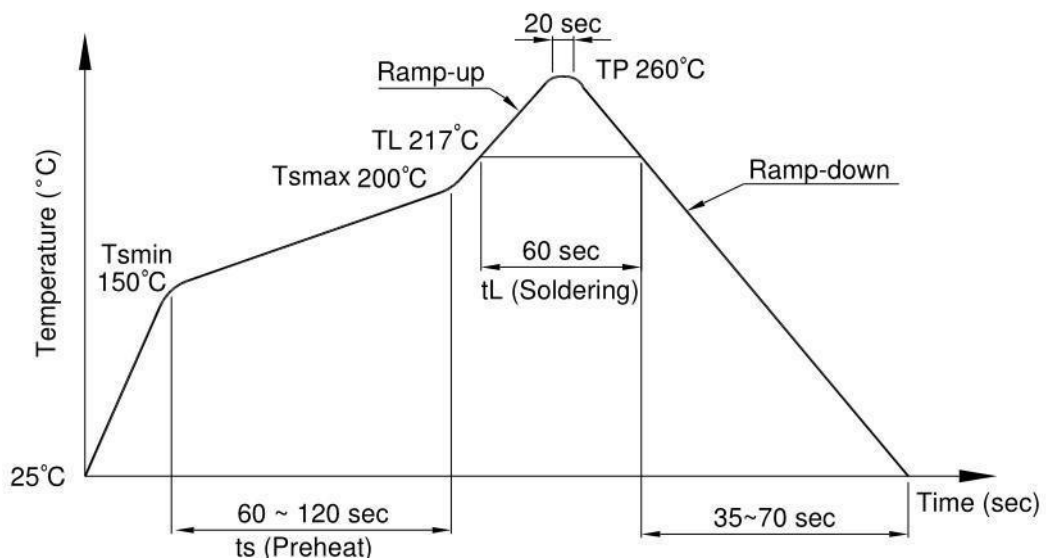
1. Material Code :Product ID.
2. P/N :Contents with "Order Information" in the specification.
3. Lot No. :Product data.
4. D/C :Product weeks.
5. Quantity :Packaging quantity.

13. Temperature Profile Of Soldering

(1).IR Reflow soldering

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

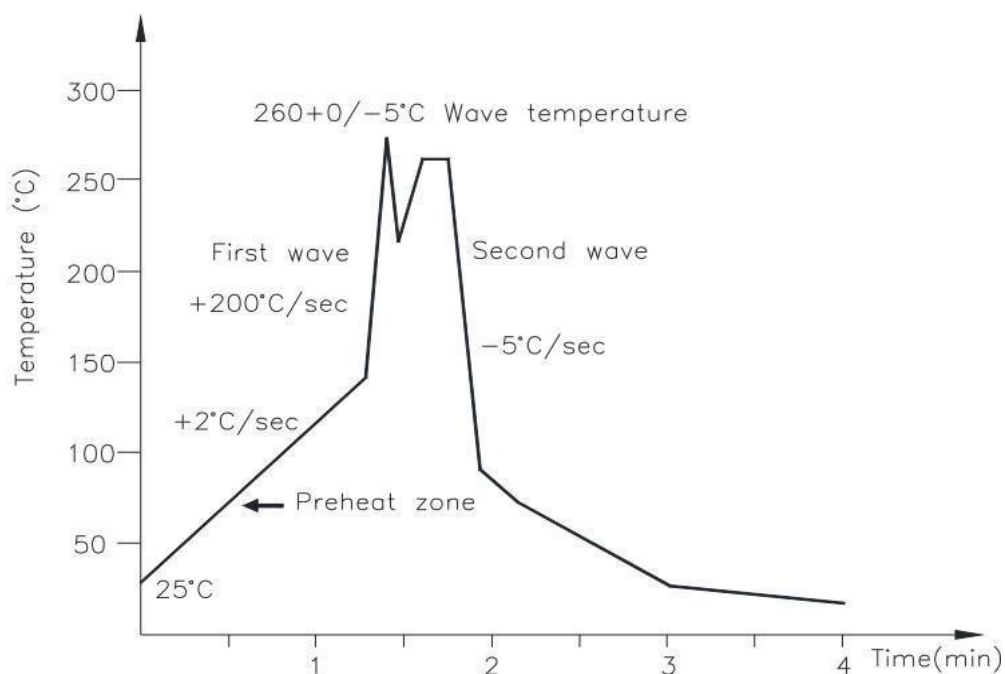
Profile item	Conditions
Preheat - Temperature Min (T Smin) - Temperature Max (T Smax) - Time (min to max) (ts)	150°C 200°C 90±30 sec
Soldering zone - Temperature (TL) - Time (t L)	217°C 60 sec
Peak Temperature	260°C
Peak Temperature time	20 sec
Ramp-up rate	3°C / sec max.
Ramp-down rate from peak temperature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



(2).Wave soldering

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

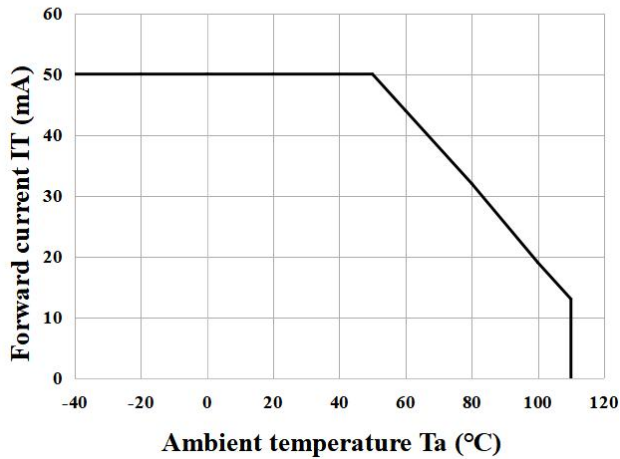


Fig.2 On-state current vs. Ambient temperature

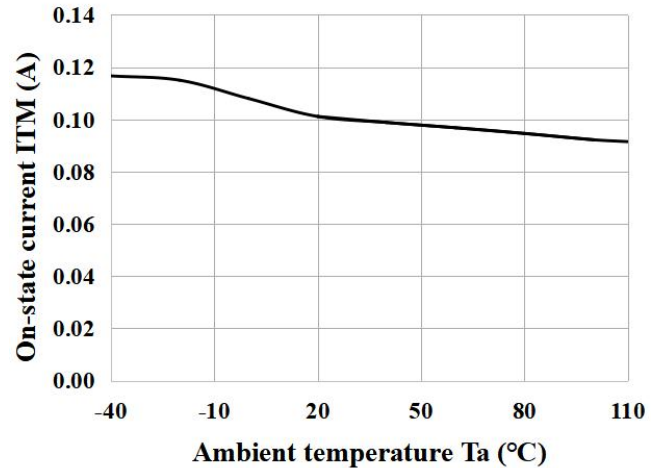


Fig.3 Minimum trigger current vs. Ambient temperature

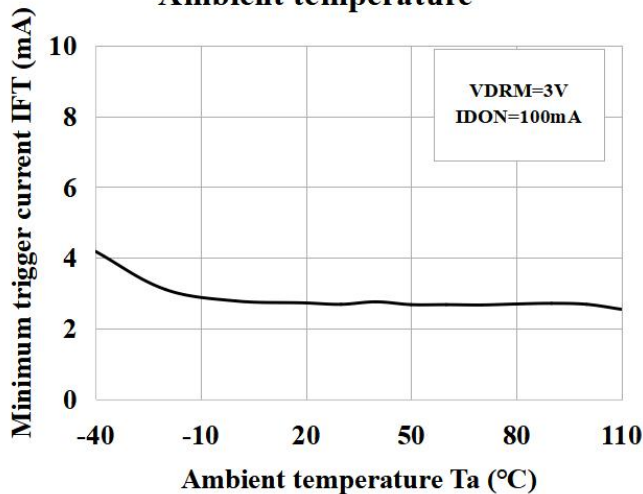


Fig.4 Forward current vs. Forward voltage

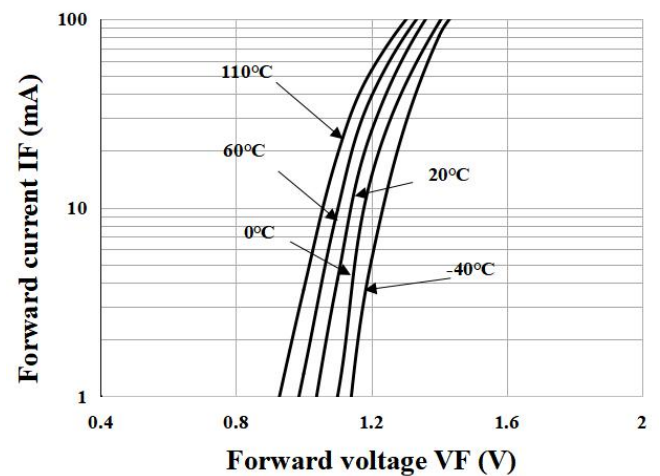


Fig.5 On-state voltage vs. Ambient temperature

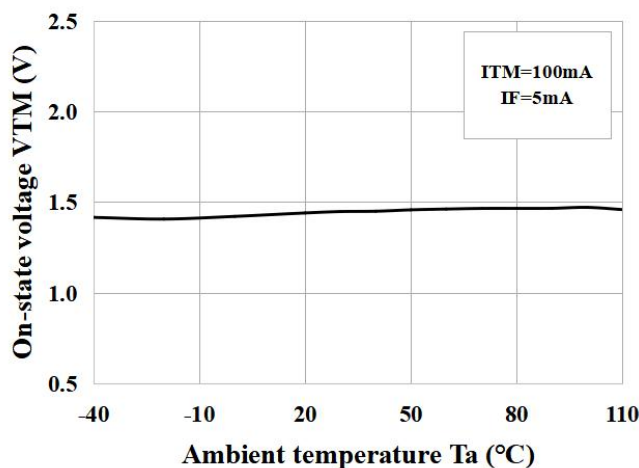


Fig.6 Holding current vs. Ambient temperature

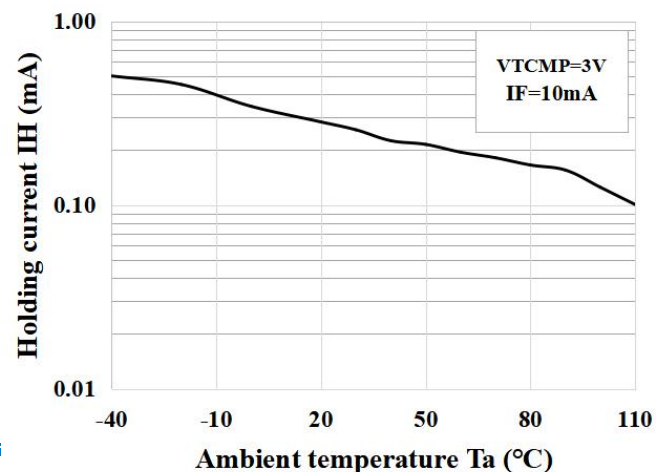


Fig.7 Repetitive peak off-state current vs. Ambient temperature

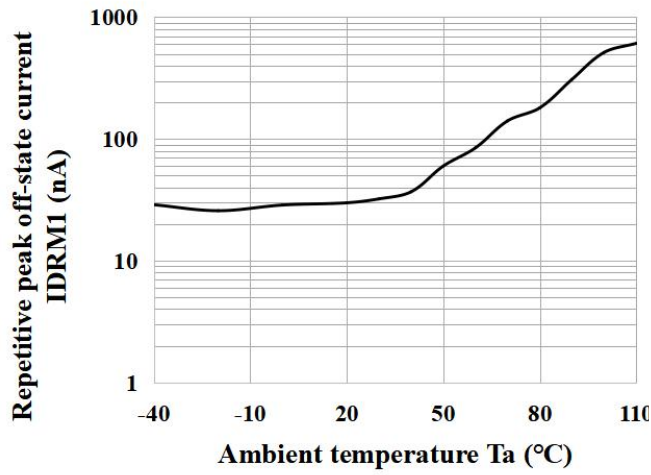
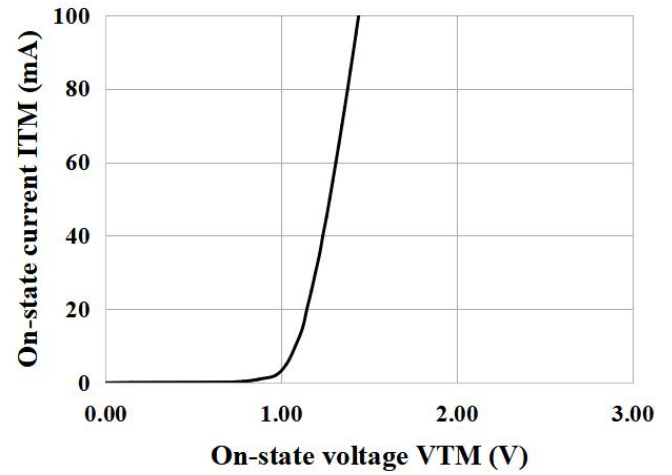
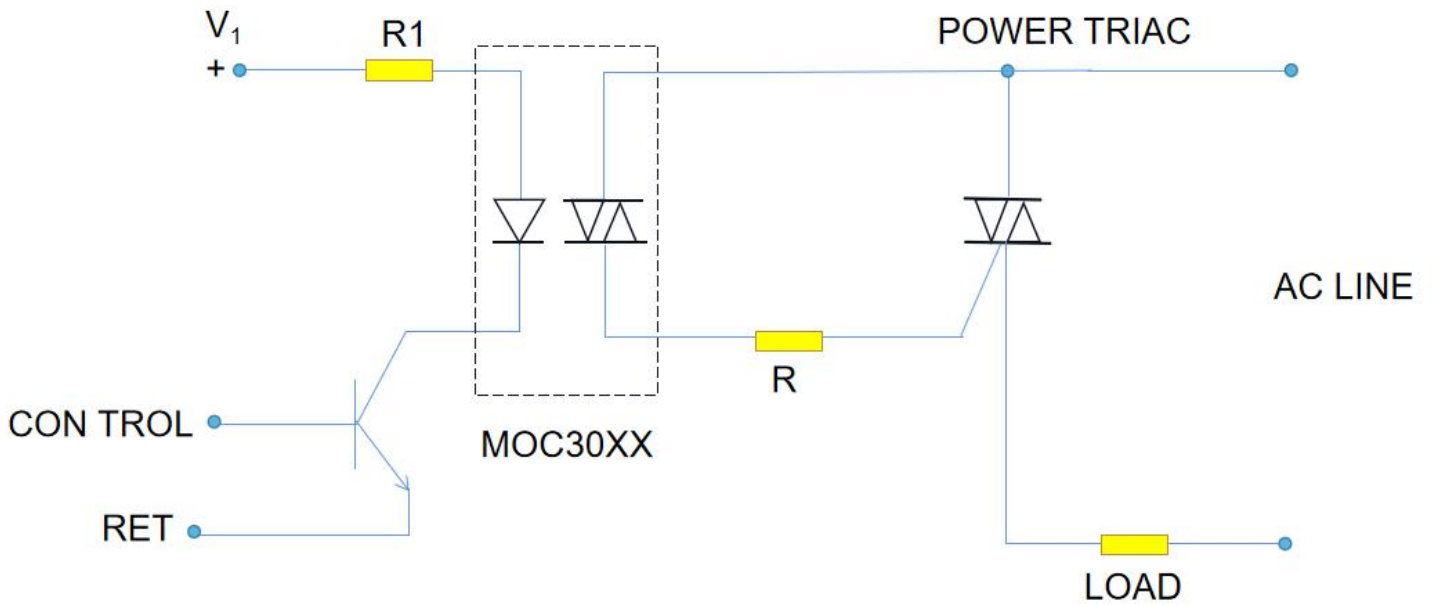


Fig.8 On-state current vs. On-state voltage



Basic driver Circuit





15.NOTES

15.1 Orient is continually improving the quality, reliability, function or design and Orient reserves the right to make changes without further notices.

15.2 The products shown in this publication are designed for the general use in electronic applications such as office automation equipment, communications devices, audio/visual equipment, electrical application and instrumentation.

15.3 For equipment/devices where high reliability or safety is required, such as space applications, nuclear power control equipment, medical equipment, etc, please contact our sales representatives.

15.4 When requiring a device for any “specific” application, please contact our sales in advice.

15.5 If there are any questions about the contents of this publication, please contact us at your convenience.

15.6 The contents described herein are subject to change without prior notice.

15.7 Immerge unit’s body in solder paste is not recommended.