ORIENT

Photo coupler

Product Data Sheet

Part Number: OR-MOC302X(L)/305X(L)/307X(L)

Customer: _____

Date: _____

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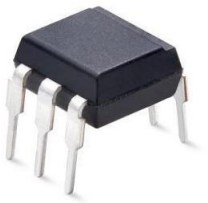
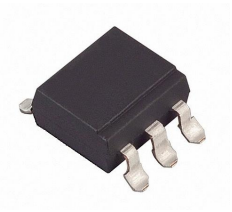
Preliminary

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:5000 V rms)
(2) 6pin non-zero-cross optoisolators triac driver output
(3) High repetitive peak off-state voltage VDRM :
(4) OR-MOC302X: Min. 400V;OR-MOC305X: Min. 600V;OR-MOC307X: Min. 800V
(5) High critical rate of rise of off-state voltage(dV/dt : MIN. 1000V / μs)
(6) Have Dual-in-line package;Wide lead spacing package and Surface mounting package .
(7) Operating temperature -40 ℃ to +110 ℃
(8) Safety approval

UL approved(No.E323844)

VDE approved(No.40029733)

CQC approved (No.CQC19001231480)

(9) In compliance with RoHS, REACH standards
(10) MSL Level 1

2. Description

The OR-MOC302X(L)/305X(L)/307X(L) series of devices each consist of a GaAs infrared emitting diode optically coupled to a monolithic silicon non 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℃)

Parameter			Symbol	Rateing	Unit
Input	Forward Current		I_F	50	mA
	Reverse Voltage		V_R	6	V
	Power Dissipation		P	120	mW
Output	Off-State Output Terminal Voltage	OR-MOC302X	V_{DRM}	400	V
		OR-MOC305X		600	
		OR-MOC307X		800	
	On-State RMS Current		$I_{T(RMS)}$	100	mA
	Peak Repetitive Surge Current (PW=1ms，120 pps)		I_{TSM}	1	A
	Power Dissipation		P	150	mW
Total Power Dissipation			P_{tot}	270	mW
*1 Insulation Voltage			V_{iso}	5000	Vrms
Ambient Operating Temperature Range			T_{opr}	-40 ~ + 110	℃
Storage Temperature			T_{stg}	-55 ~ + 125	
*2 Soldering Temperature			T_{sol}	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, 5&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	μA	V_R=6V
Output	1.Peak Blocking Current, Either Direction	OR-MOC302X OR-MOC305X	I_{DRM}	---	10	100	nA	V_{DRM} = Rated V_{DRM}
		OR-MOC307X		---	---	500		
	Peak On-State Voltage, Either Direction		V_{TM}	---	---	3.0	V	ITM=100mA Peak
	2.Critical rate of Rise of Off-State Voltage		dv/dt	1000	---	---	V/μs	Vin=240Vrms
Couple	3.Led Trigger Current,Current Required to Latch Output, Either Direction	OR-MOC3020 OR-MOC3050 OR-MOC3070	I_{FT}	---	---	30	mA	Main Terminal Voltage = 3V
		OR-MOC3021 OR-MOC3051 OR-MOC3071		---	---	15		
		OR-MOC3022 OR-MOC3052 OR-MOC3072		---	---	10		
		OR-MOC3023 OR-MOC3053 OR-MOC3073		---	---	5		
		OR-MOC3024 OR-MOC3054 OR-MOC3074		---	---	3		
	Holding Current, Either Direction	OR-MOC302X OR-MOC305X OR-MOC307X	I_H	0.2	0.25	----	mA	
Transfer Characteristics	Isolation Resistance		R_{I-O}	$5x10^{10}$	10^{12}	---	Ω	V_{I-O}=500V DC, 40 to 60%RH

*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-MOC3020, OR-MOC3050 and OR-MOC3070,15 mA for OR-MOC3021, OR-MOC3051 and OR-MOC3071,10 mA for OR-MOC3022, OR-MOC3052 and OR-MOC3072,5 mA for OR-MOC3023, OR-MOC3053 and OR-MOC3073,3 mA for OR-MOC3024, OR-MOC3054 and OR-MOC3074, and absolute max I_F (50mA).

6. Order Information

Part Number

OR-MOC302X(L)V-W-Y
OR-MOC305X(L)V-W-Y
or OR-MOC307X(L)V-W-Y

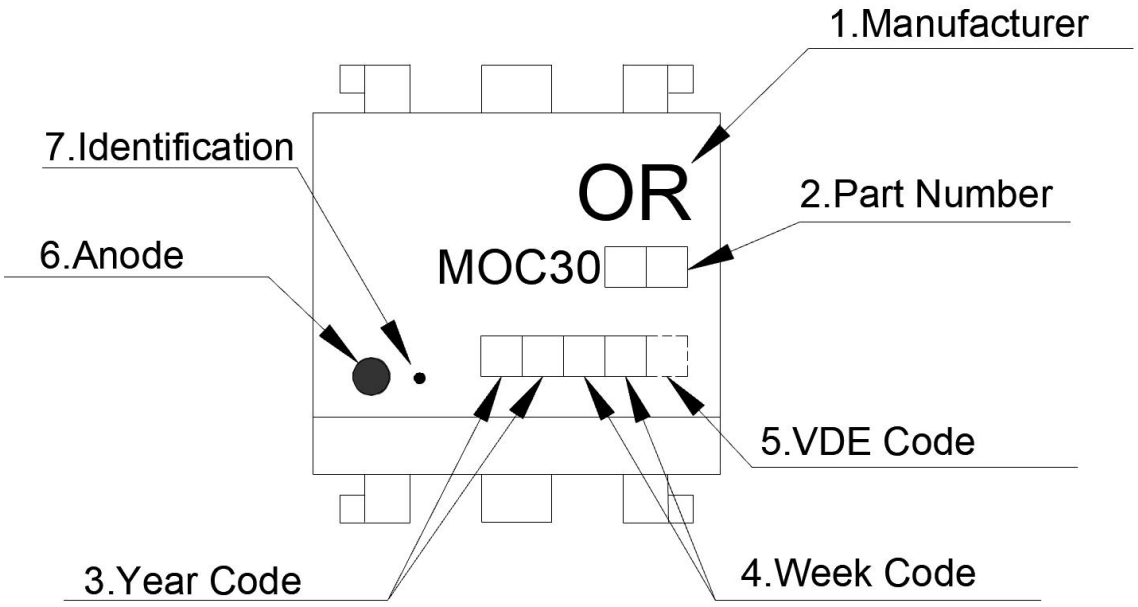
Note

MOC302X/305X/307X= Part number (X = 0,1, 2, 3,or 4).
(L)= Dedicated line code.
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).

* 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

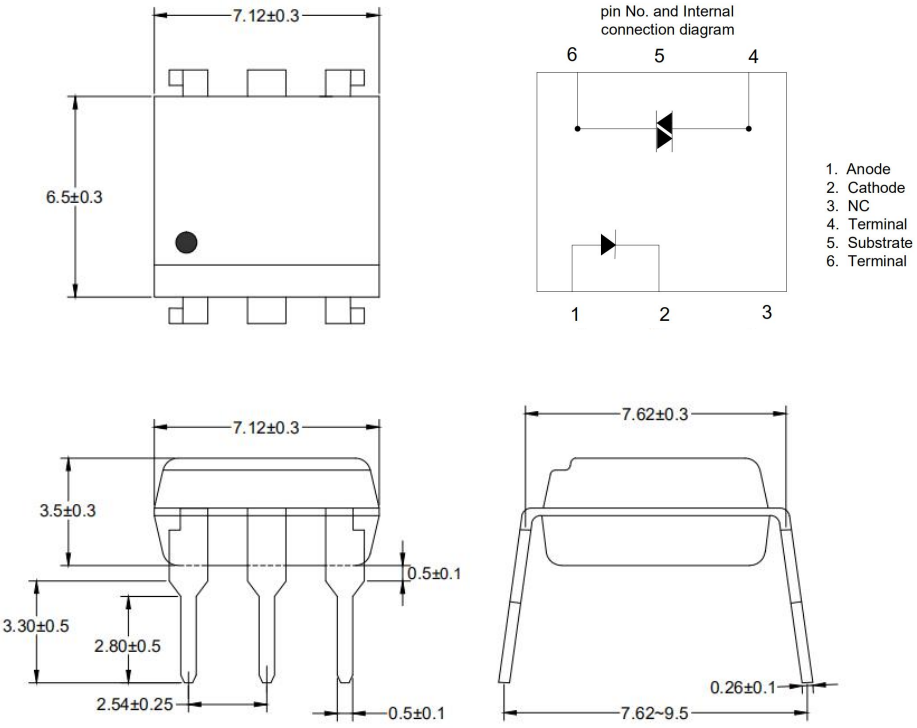


1. Manufacturer : ORIENT.
2. Part Number : MOC30□□.
3. Year Code □□ ： '21' means '2021' and so on.
4. Week Code □□： 01 means the first week, 02 means the second week and so on.
5. VDE Code □. (Optional)
6. Anode.
7. Identification “ • ” : Dedicated line code（L）

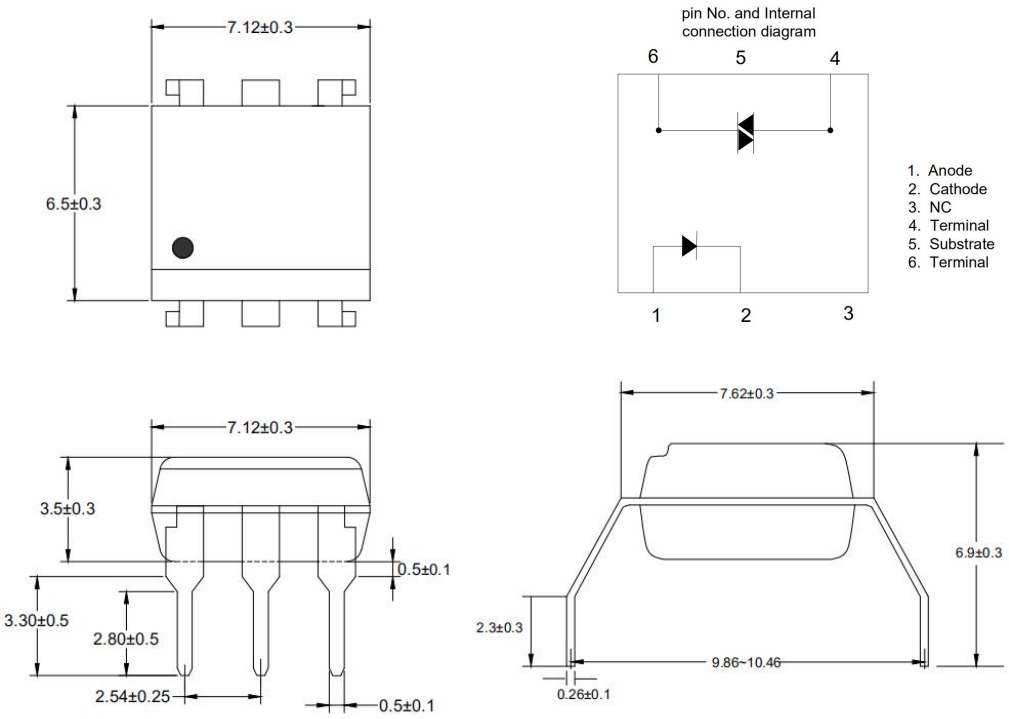
* VDE Code can be selected.

8. Package Dimension

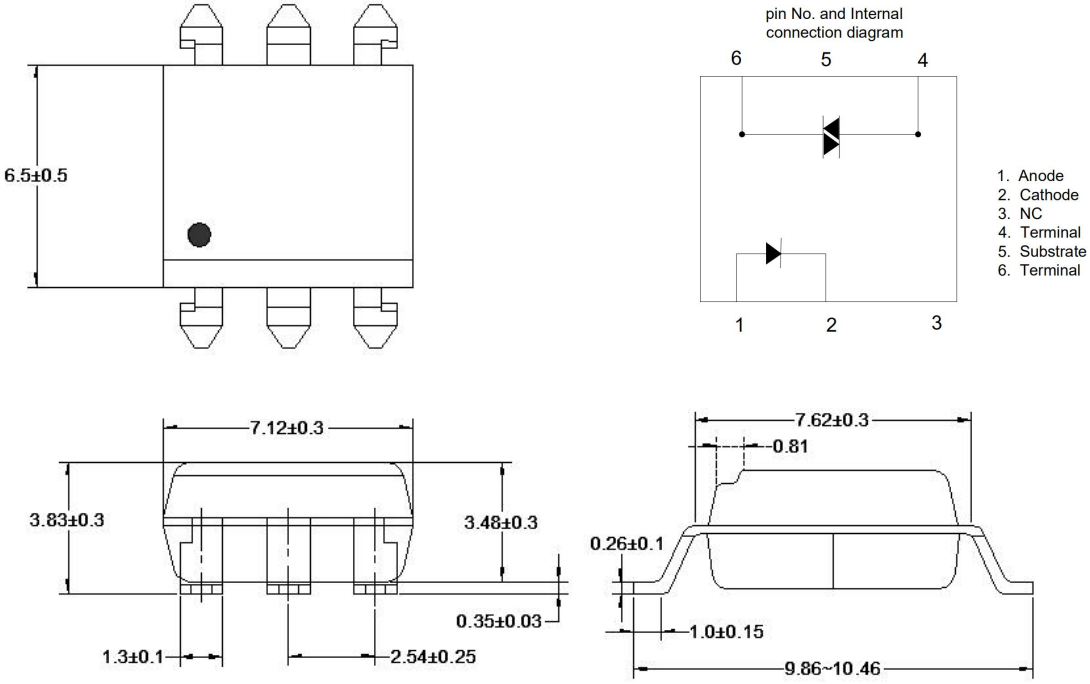
(1).MOC30XX



(2).MOC30XX M

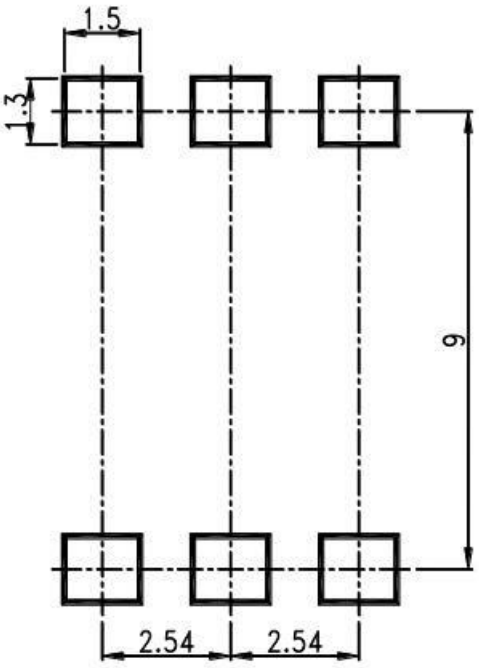


(3).MOC30XX S



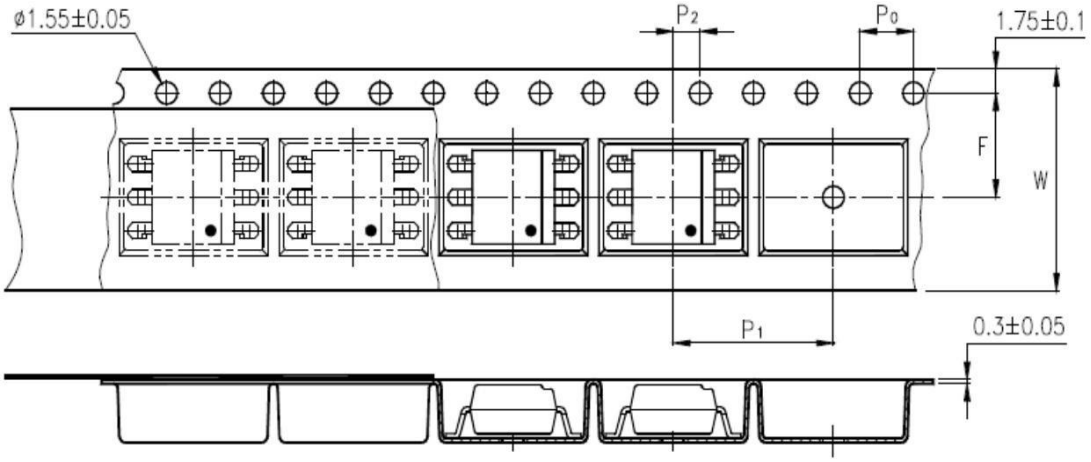
9. RRECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

Unit: mm

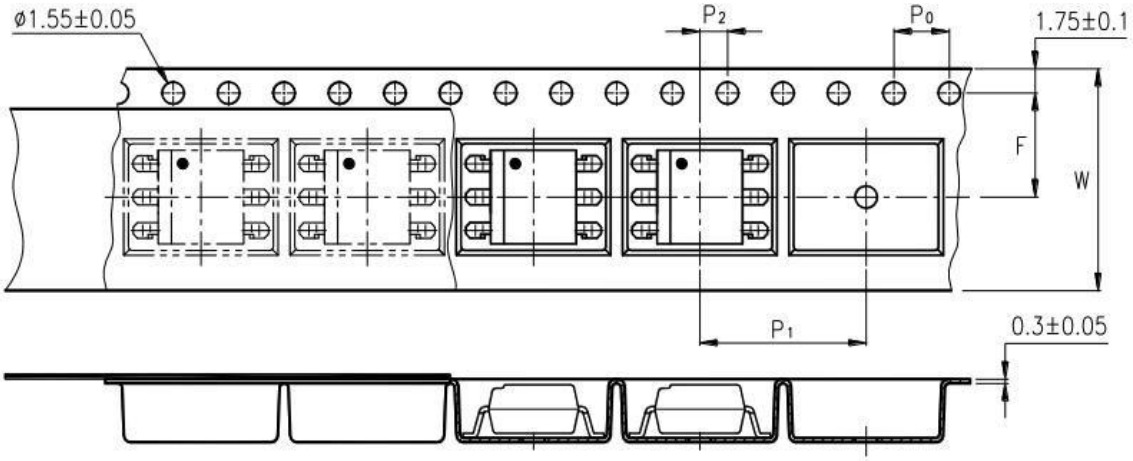


10. Taping Dimensions

(1)TA Type



(2)TA1 Type



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)
	P2	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

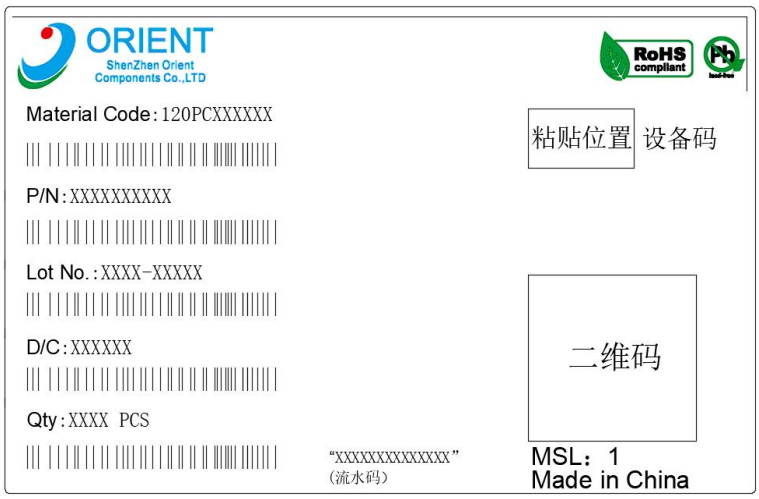
DIP Type

Packing Information	
Packing type	Tube
Qty per Tube	66pcs
Small box (Inner) Dimension	525*128*60mm
Large box (Outer) Dimension	545*290*335mm
The Amount per Inner Box	3,300pcs
The Amount per Outer Box	33,000pcs

SOP Type

Packing Information	
Packing type	Reel type
Tape Width	16mm
Qty per Reel	1,000pcs
Small box (inner) Dimension	345*345*58.5mm
Large box (Outer) Dimension	620x360x360mm
Max qty per small box	2,000pcs
Max qty per large box	20,000pcs

(2)Packing Label Sample



Note:

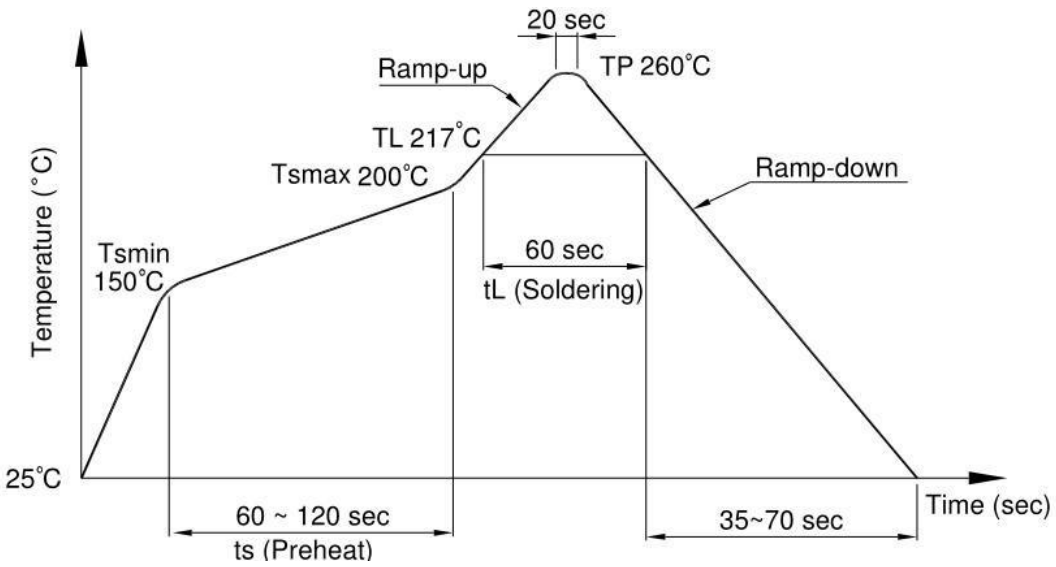
1. Material Code :Product ID.
2. P/N :Contents with "Order Information" in the specification.
3. Lot No. :Product data.
4. D/C :Product weeks.
5. Quantity :Packaging quantity.

12. 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.

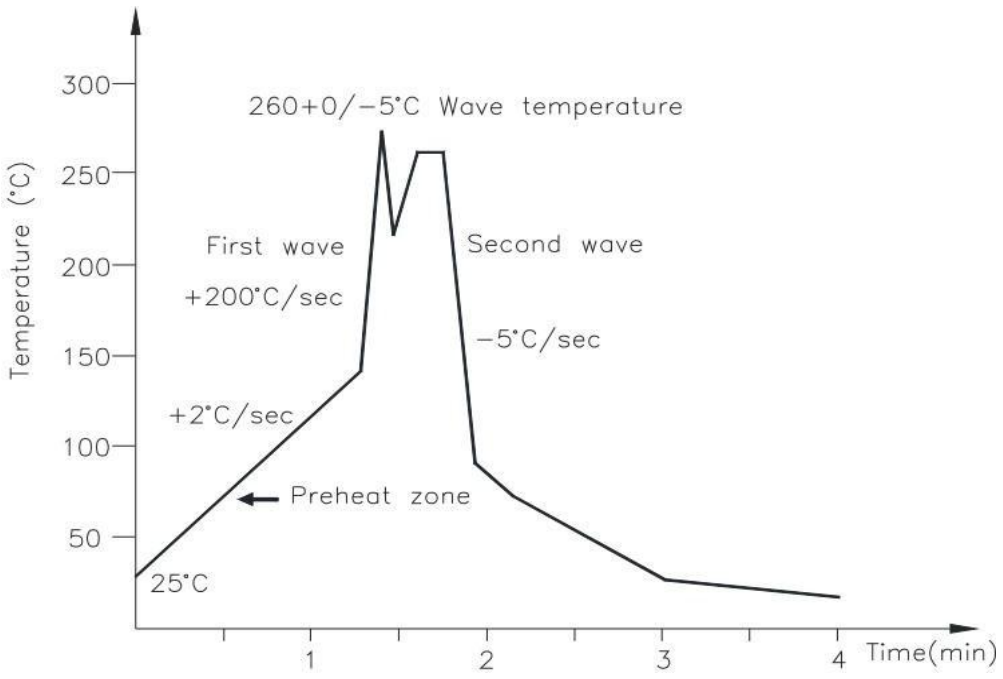
Profile item	Conditions
Preheat - Temperature Min (T Smin) - Temperature Max (T Smax) - Time (min to max) (ts)	 150˚C 200˚C 90±30 sec
Soldering zone - Temperature (TL) - Time (t L)	 217˚C 60 sec
Peak Temperature	260˚C
Peak Temperature time	20 sec
Ramp-up rate	3˚C / sec max.
Ramp-down rate from peak temperature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



(2) .Wave soldering

One time soldering is recommended within the condition of temperature.

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



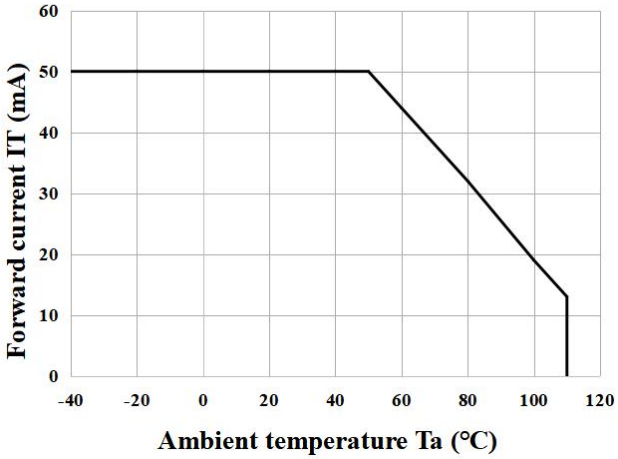
(3).Hand soldering by soldering iron

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

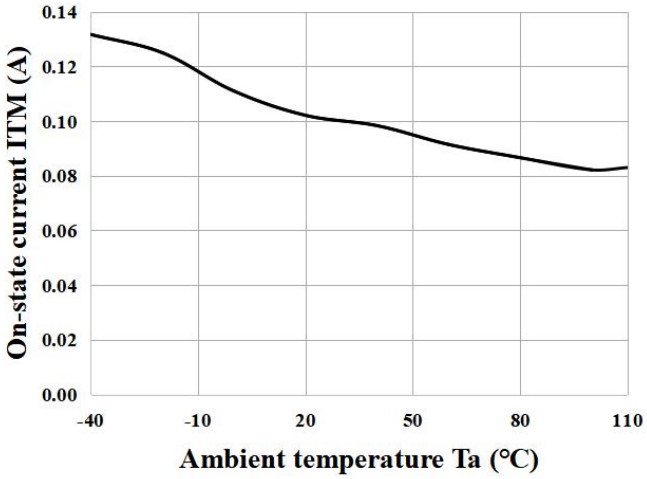
Temperature Time	380+0/-5˚C 3 sec max

13. CHARACTERISTICS CURVES (TYPICAL PERFORMANCE)

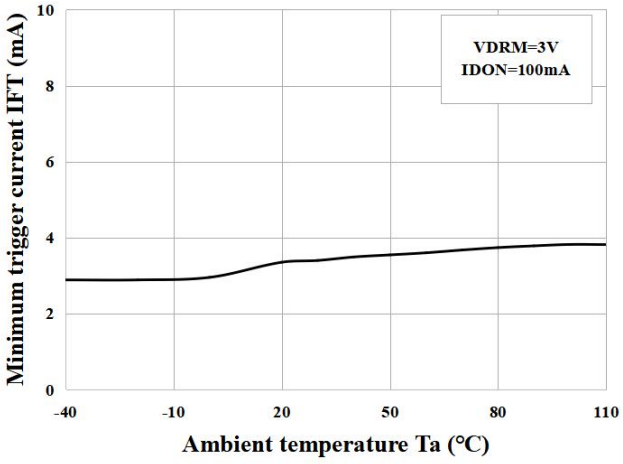
Fig.1 Forward current vs. Ambient temperature



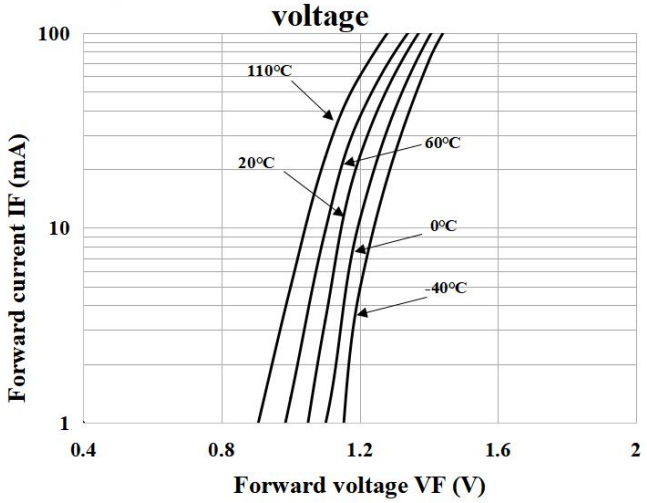
Pig.2 On-state current vs. Ambient temperature



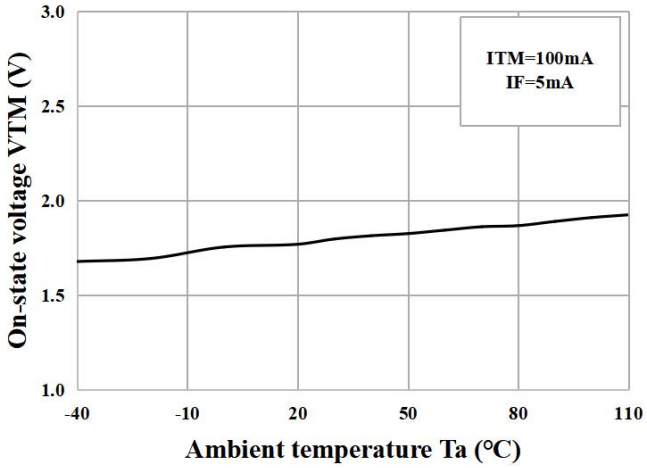
Pig.3 Minimum trigger current vs. Ambient temperature



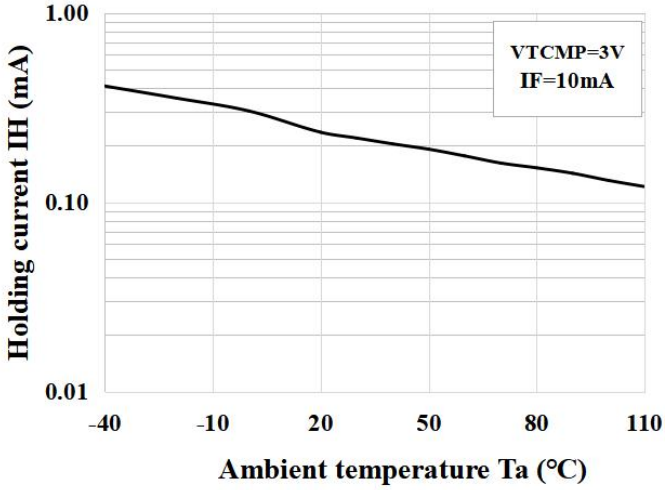
Pig.4 Forward current vs. Forward voltage



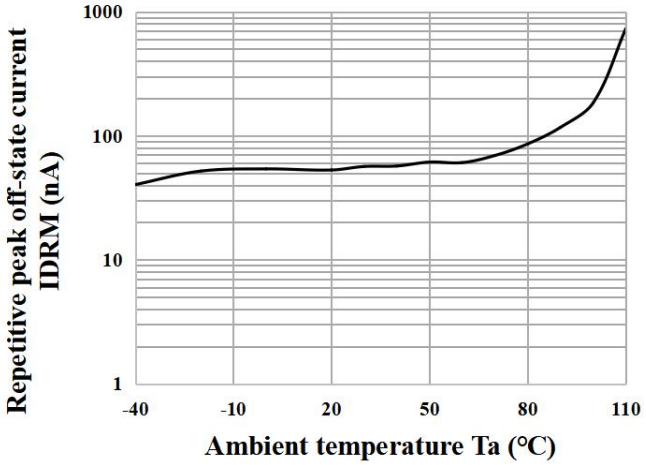
Pig.5 On-state voltage vs. Ambient temperature



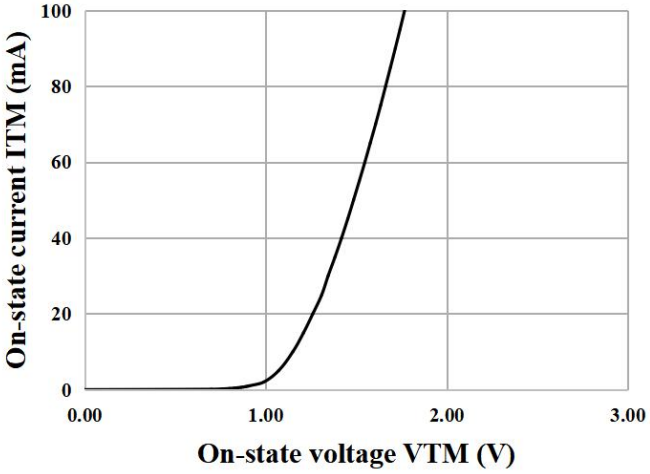
Pig.6 Holding current vs. Ambient temperature



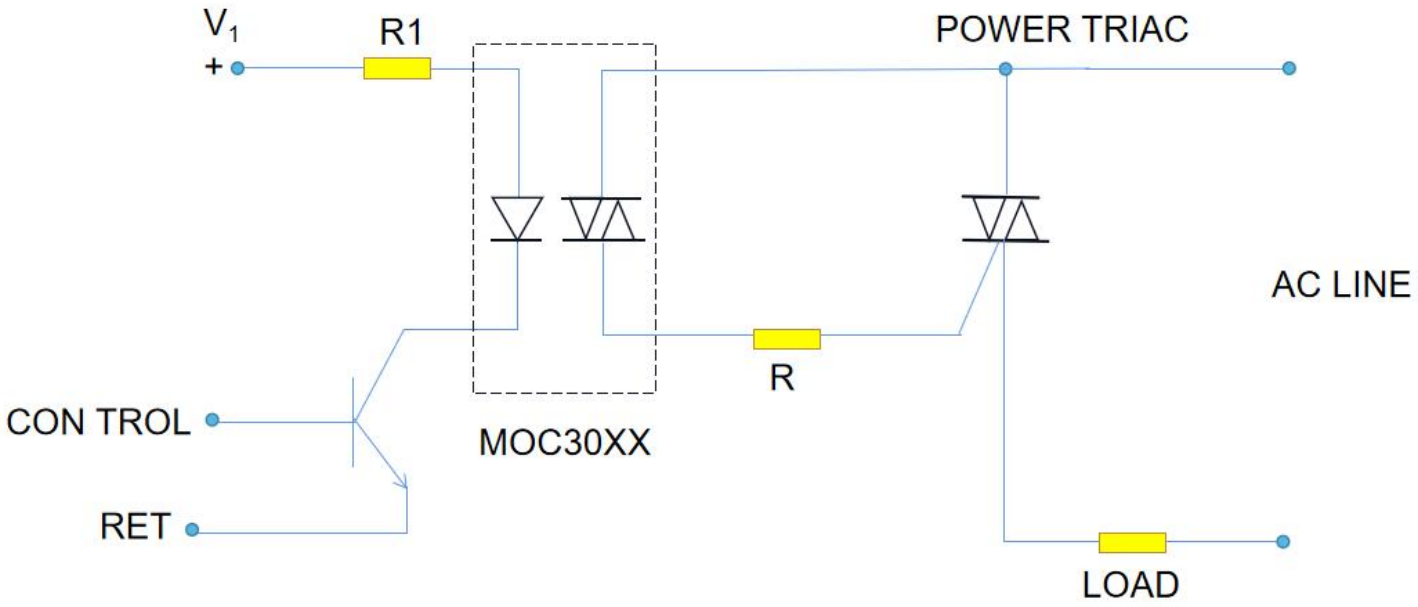
Pig.7 Repetitive peak off-state current vs. Ambient temperature



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



Basic driver Circuit



14. NOTES

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

14.2 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.

14.3 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.

14.4 When requiring a device for any "specific" application, please contact our sales in advice.

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

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

14.7 Immerge unit's body in solder paste is not recommended.