

Features

- High isolation 5000 VRMS
- DC input with random-phase photo triac output
- Operating temperature range - 40 °C to 100 °C
- REACH & RoHS compliance
- MSL class 1
- Regulatory Approvals
 - UL - UL1577
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC - GB4943.1

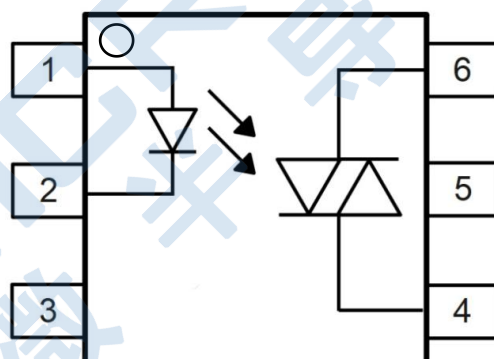
Applications

- Solenoid/valve controls
- Lighting controls
- Motor controls
- Temperature controls
- Static AC power switches
- Solid state relays
- Interfacing microprocessors to 115 to 240VAC peripherals

Description

The MOC302X、MOC305X、MOC307X series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a monolithic silicon random-phase photo triac in a plastic DIP6 package with different lead forming options.

With the robust coplanar double mold structure, MOC302X、MOC305X、MOC307X series provide the most stable isolation feature.



ORDERING INFORMATION

Outline	Part Number	Package	Marking	Packing	Packing Size	Quantity
	MOC302XVPE	DIP6	MOC30XXV /YYWW A	Tube	500mm	65
	MOC305XVPE					
	MOC307XVPE					
	MOC302XVGE	DIP6-M		Tube	500mm	65
	MOC305XVGE					
	MOC307XVGE					
	MOC302XVSE	DIP6-SL		Reel	13 "	1000
	MOC305XVSE					
	MOC307XVSE					

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PIN CONFIGURATION AND FUNCTIONS

		Pin	Name
	1	Anode	
	2	Cathode	
	3	NC	
	4	Terminal	
	5	Substrate	
	6	Terminal	

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit	Note
INPUT				
Forward Current	I_F	60	mA	
Reverse Voltage	V_R	6	V	
Junction Temperature	T_j	125	°C	
Input Power Dissipation	P_I	100	mW	
OUTPUT				
Off-state Output Terminal Voltage	MOC302X	V_{DRM}	400	V
	MOC305X		600	
	MOC307X		800	
Peak Repetitive Surge Current PW=100μs, 120pps	I_{TSM}	1	A	
Junction Temperature	T_j	125	°C	
Output Power Dissipation	P_O	300	mW	
COMMON				
Total Power Dissipation	P_{tot}	400	mW	
Isolation Voltage	V_{iso}	5000	Vrms	1
Operating Temperature	T_{opr}	-40~100	°C	
Storage Temperature	T_{stg}	-55~125	°C	
Soldering Temperature	T_{sol}	260	°C	2

Note 1. AC For 1 Minute, R.H. = 40 ~ 60%

Note 2. For 10 seconds

ELECTRICAL OPTICAL CHARACTERISTICS(T_a=25°C)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Condition	Note
INPUT								
Forward Voltage		V _F	-	1.24	1.4	V	I _F =10mA	
Reverse Current		I _R	-	-	10	μA	V _R =6V	
Input Capacitance		C _{in}	-	8.5	250	pF	V=0, f=1kHz	
OUTPUT								
Peak Off-state Current, Either Direction		I _{DRM}	-	-	100	nA	V _{DRM} =Rated V _{DRM} I _F =0	3
Peak On-state Voltage, Either Direction		V _{TM}	-	1.58	2.5	V	I _{TM} =100mA	
Critical Rate of Rise of Off-state Voltage		d _v /d _t	1000	-	-	V/μs	V _{PEAK} =Rated V _{DRM}	4
TRANSFER CHARACTERISTICS								
LED Trigger Current	MOC3021/3051/3071	I _{FT}	-	-	15	mA	Terminal Voltage = 3V I _{TM} =100mA	
	MOC3022/3052/3072		-	-	10			
	MOC3023/3053/3073		-	-	5			
Holding Current		I _H	-	257	-	μA		
Isolation Resistance		R _{iso}	10 ¹²	10 ¹⁴	-	Ω	DC500V, 40 ~ 60% R.H.	
Floating Capacitance		C _{IO}	-	0.8	-	pF	V=0, f=1MHz	

Note3. Test voltage must be applied within dv/dt rating.

Note4. Refer to Fig.15 & Fig.16

CHARACTERISTIC CURVES

Fig.1 Forward Current vs. Ambient Temperature

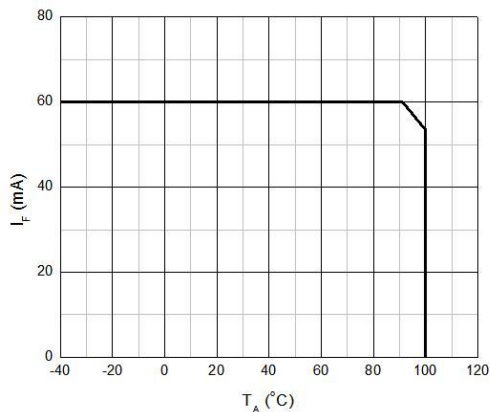


Fig.2 On-state Terminal Current vs. Ambient Temperature

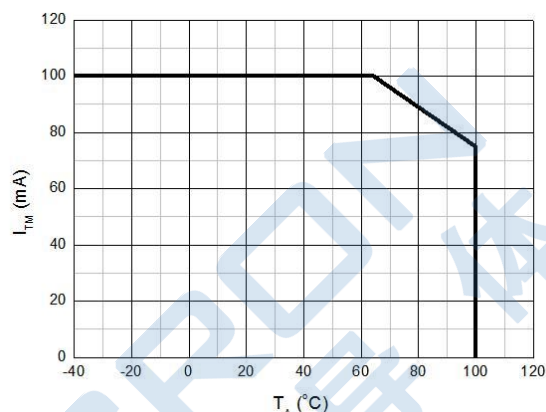


Fig.3 Forward Current vs. Forward Voltage

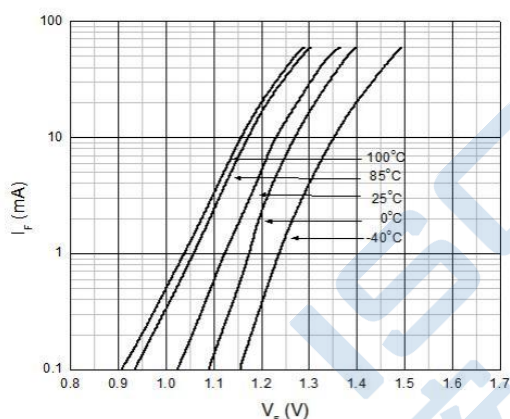


Fig.4 Off-state Terminal Current vs. Ambient Temperature

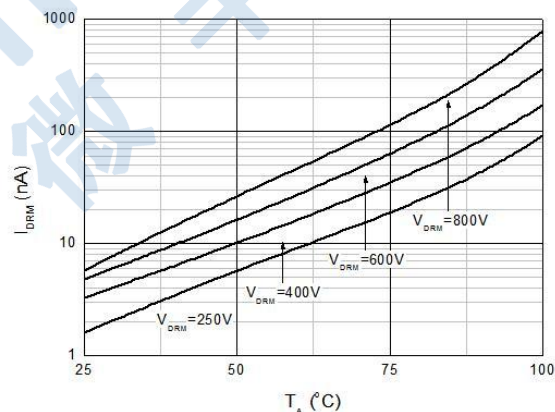


Fig.5 Normalized Off-state Terminal Voltage vs. Ambient Temperature

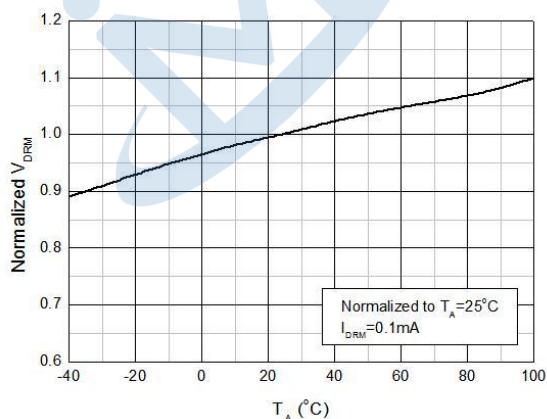


Fig.6 Normalized Trigger Current vs. LED Trigger Pulse Width

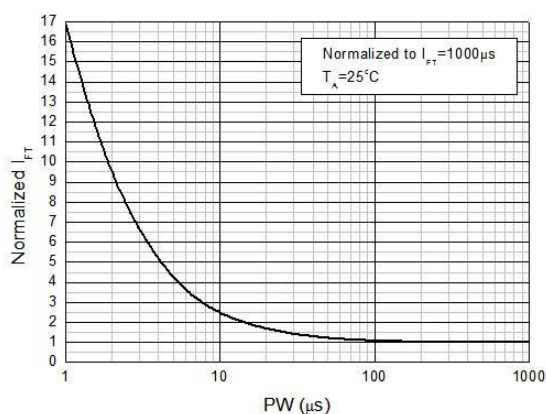


Fig.7 Normalized Trigger Current vs. Ambient Temperature

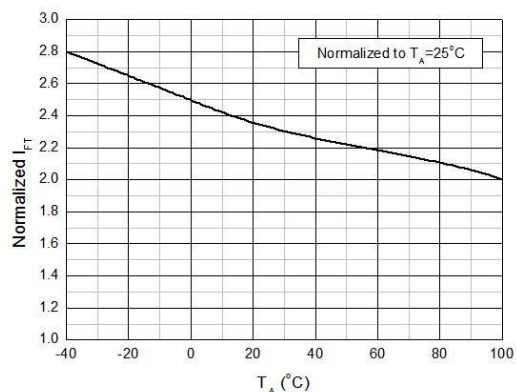


Fig.8 On-state Terminal Voltage vs. Ambient Temperature

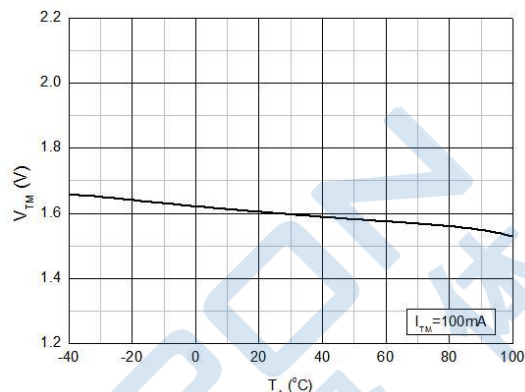


Fig.9 On-state Terminal Voltage vs. On-state Terminal Current

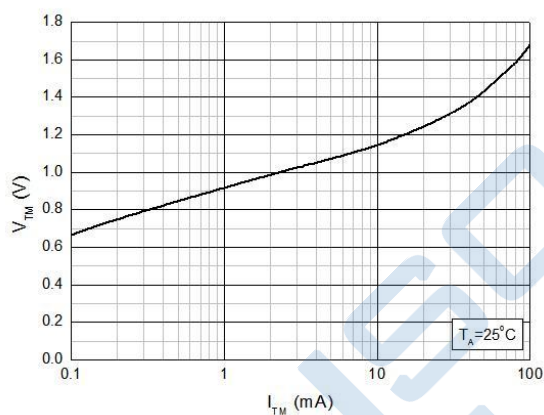


Fig.10 Holding Current vs. Ambient Temperature

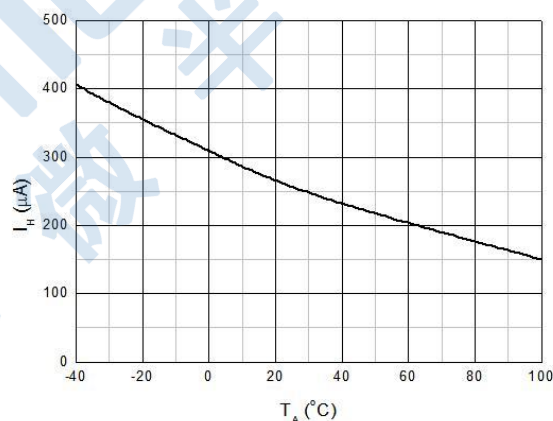


Fig.11 Turn On Time vs. Forward Current

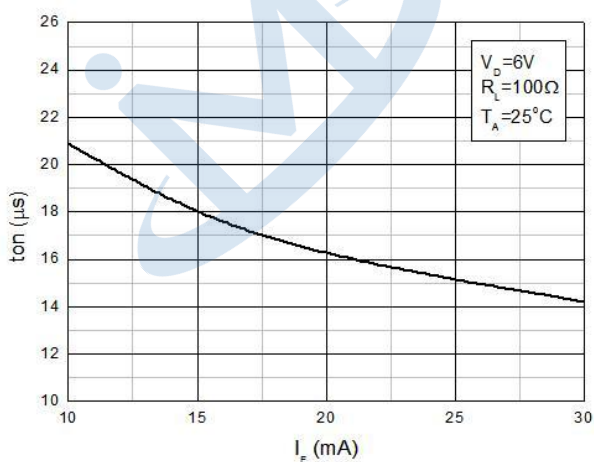
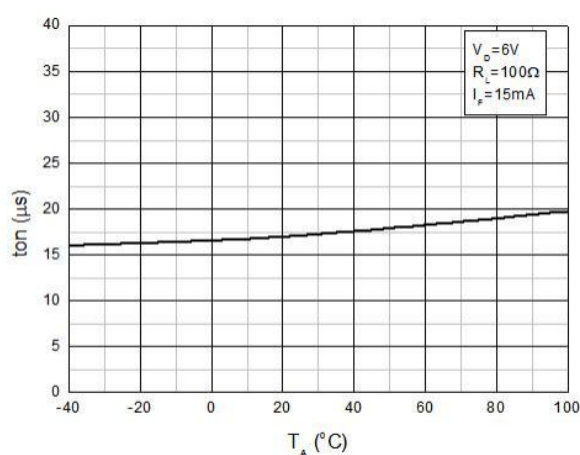


Fig.12 Turn On Time vs. Ambient Temperature



TEST CIRCUITS

Fig.13 Test Circuits of Turn On Time

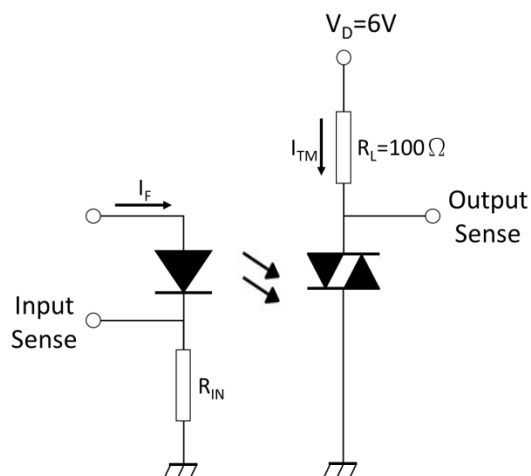


Fig.14 Waveforms of Turn On Time

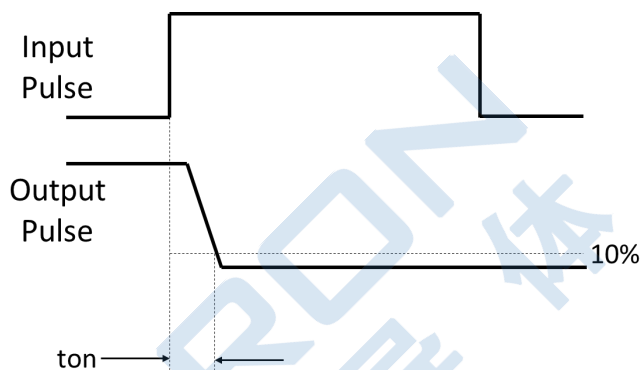


Fig.15 Test Circuits of dV/dt

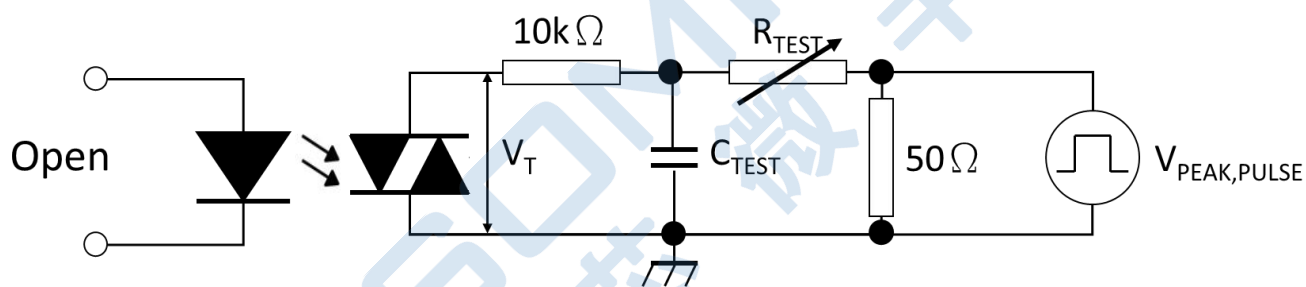
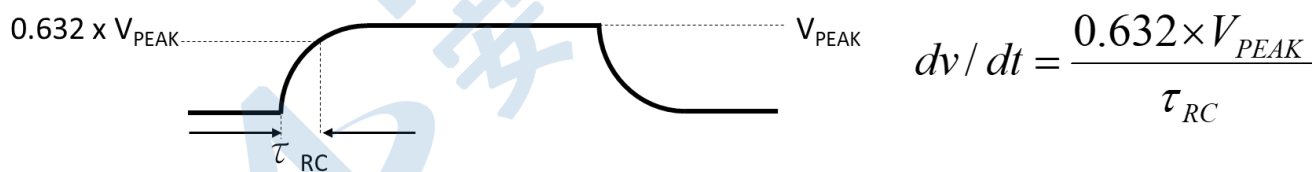
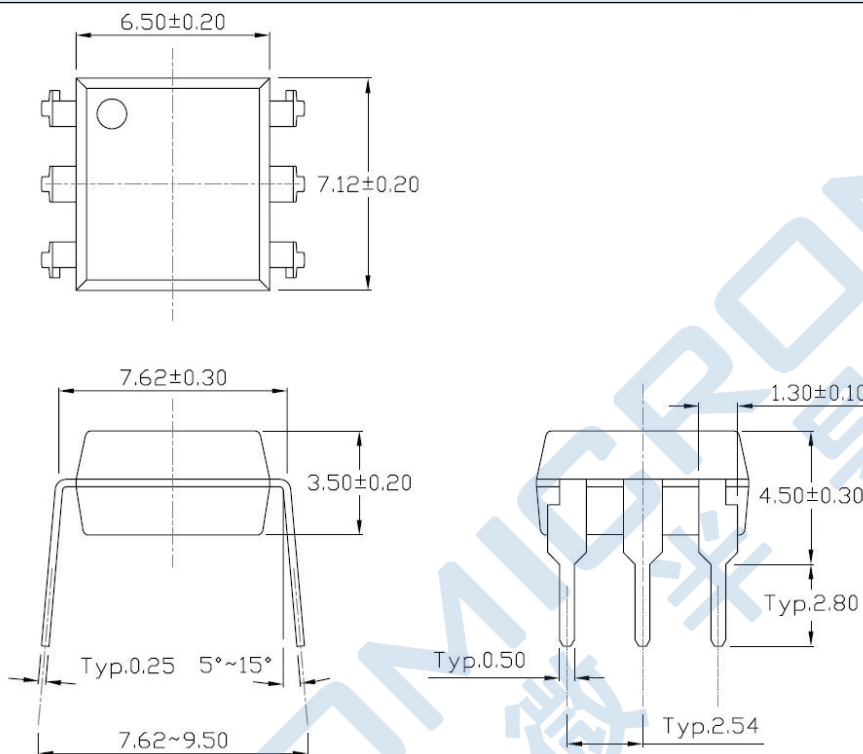


Fig.16 Waveforms of dv/dt

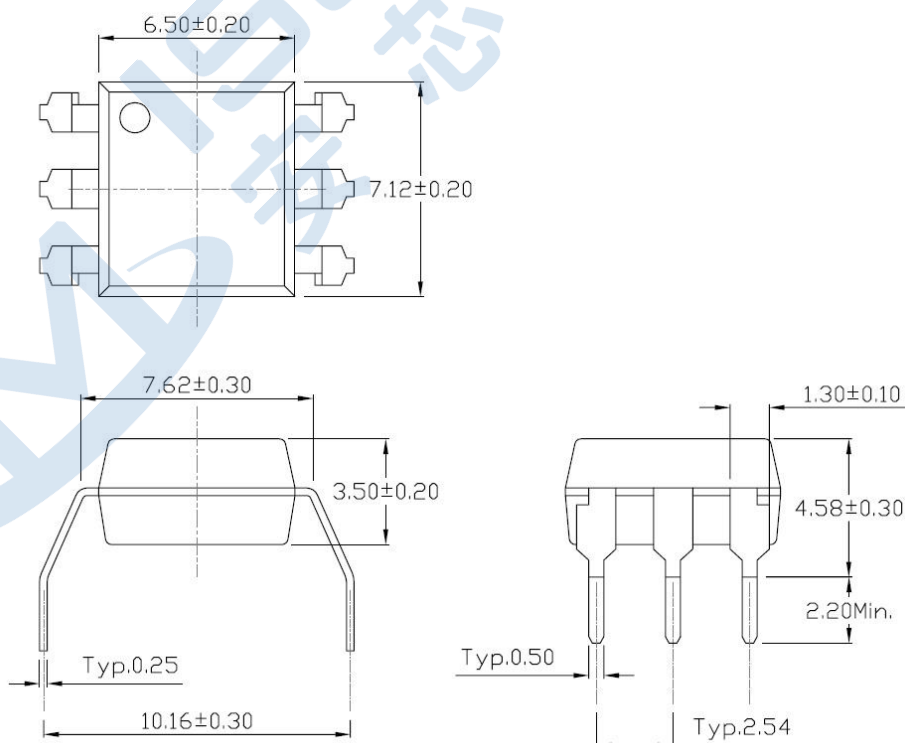


PACKAGE DIMENSIONS

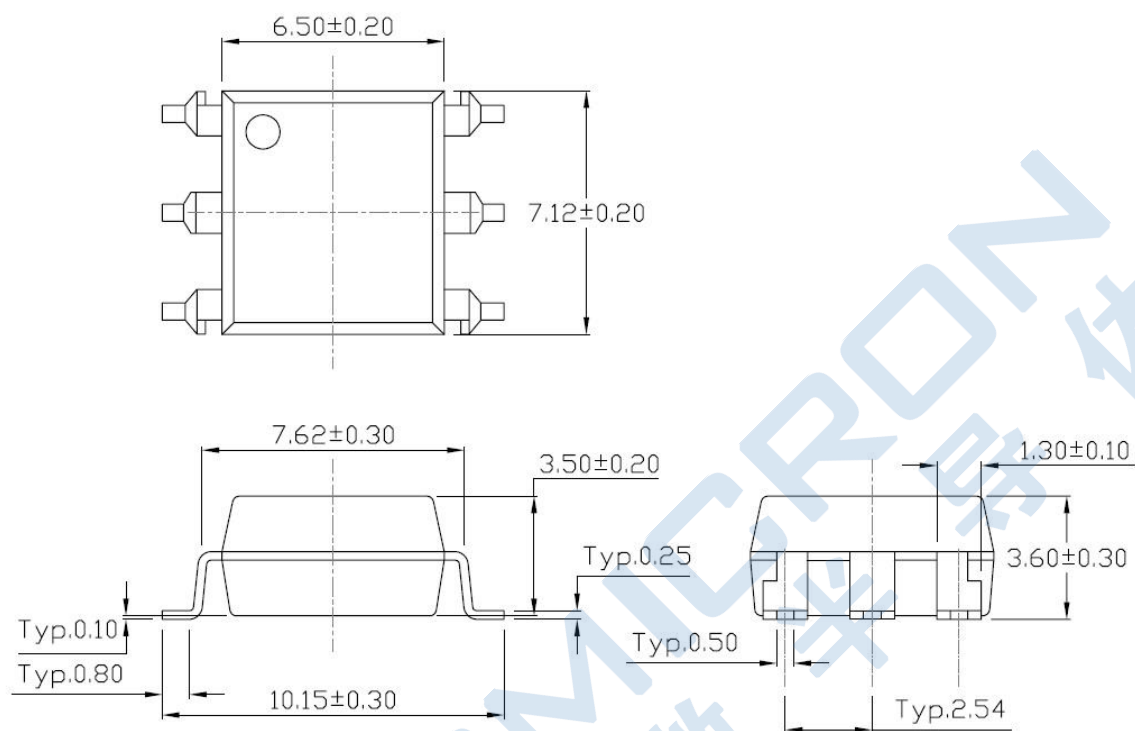
Standard DIP – Through Hole (P Type)



Gullwing (400mil) Lead Forming – Through Hole (M Type)



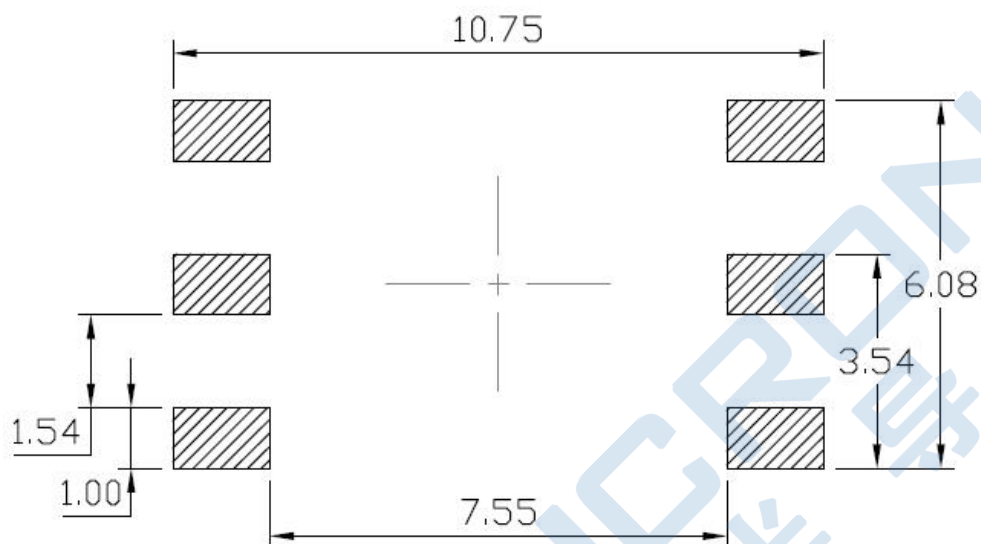
Surface Mount (Low Profile) Lead Forming (S type)



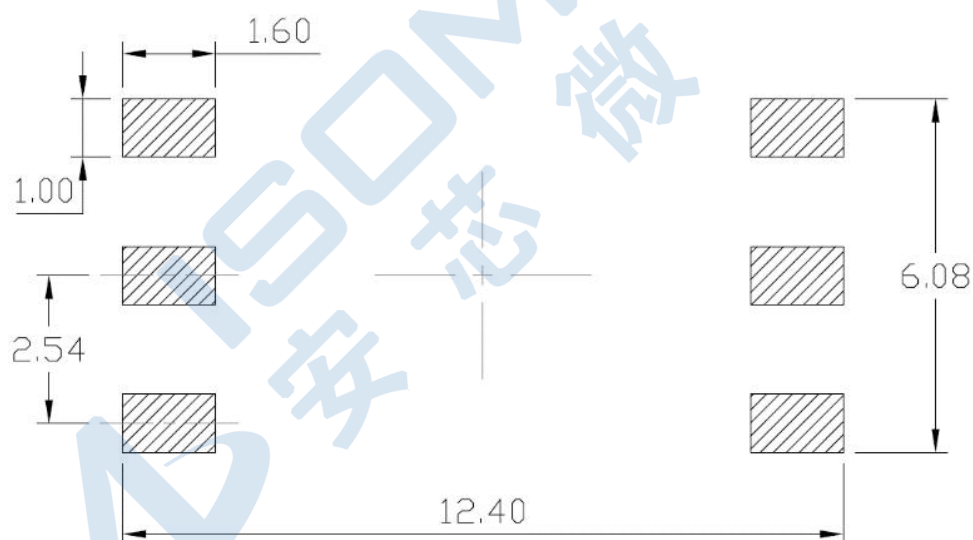
- Dimensions in mm unless otherwise stated

RECOMMENDED SOLDER MASK

Surface Mount (Low Profile) Lead Forming



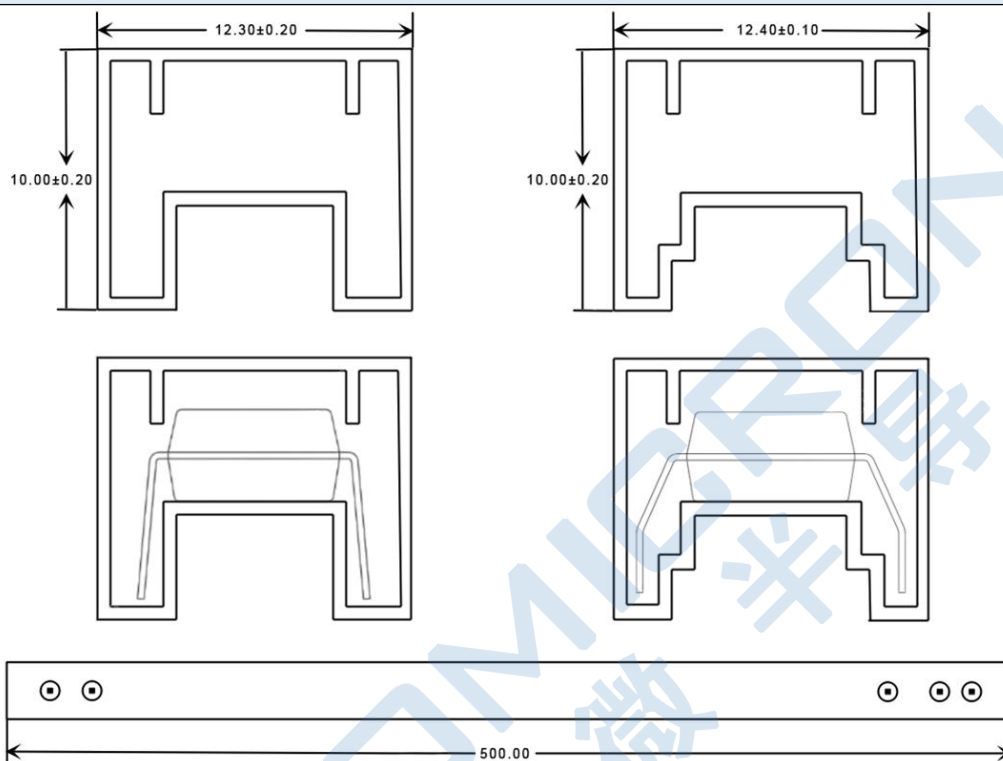
Surface Mount (Gullwing) Lead Forming



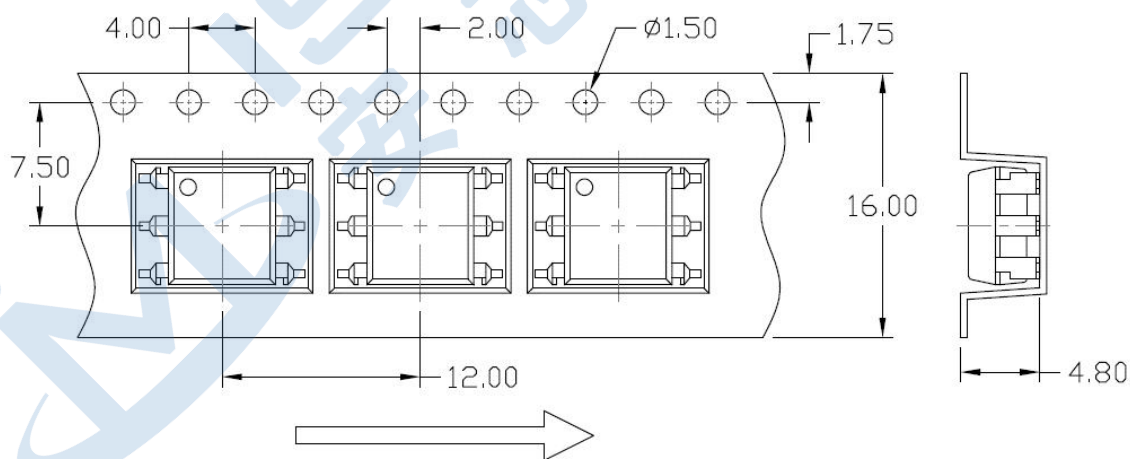
- **Dimensions in mm unless otherwise stated**

CARRIER TAPE SPECIFICATIONS

Option DIP-Standard & DIP-M



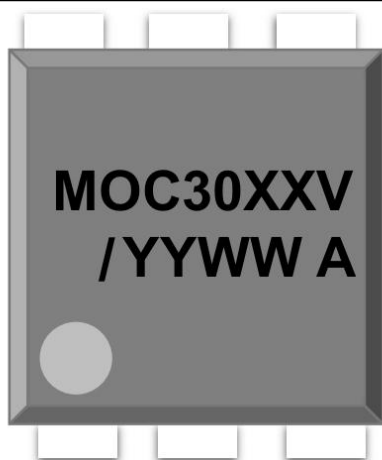
Option SM-SL



- Dimensions in mm unless otherwise stated

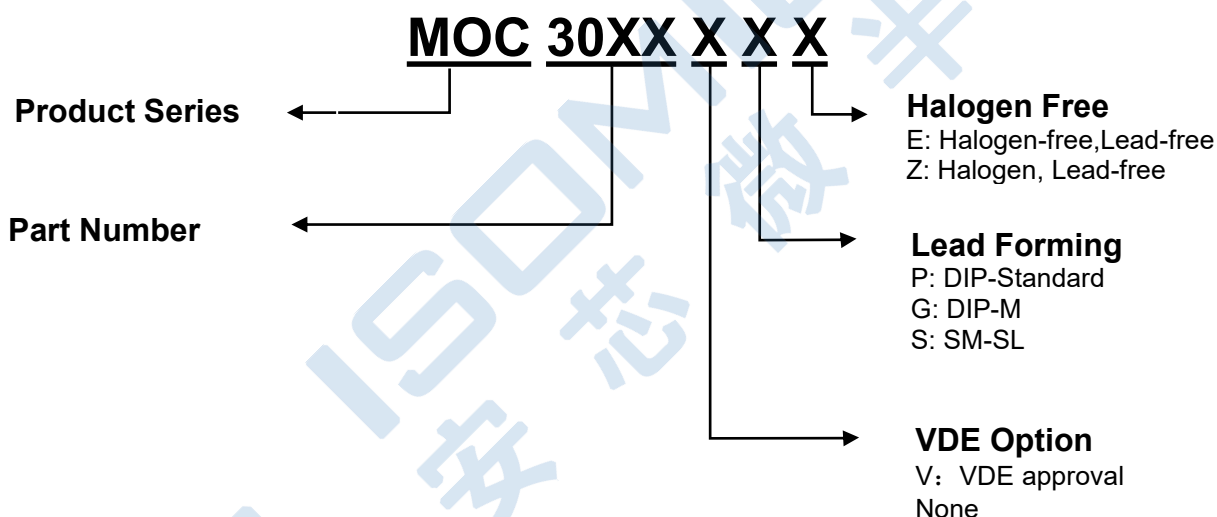
ORDERING AND MARKING INFORMATION

Marking Information



MOC : Product Series
30XX : Part Number
V : VDE Option
/ : ISOMICRON
YY : Fiscal Year
WW : Work Week
A : Manufacturing Code

Order Code

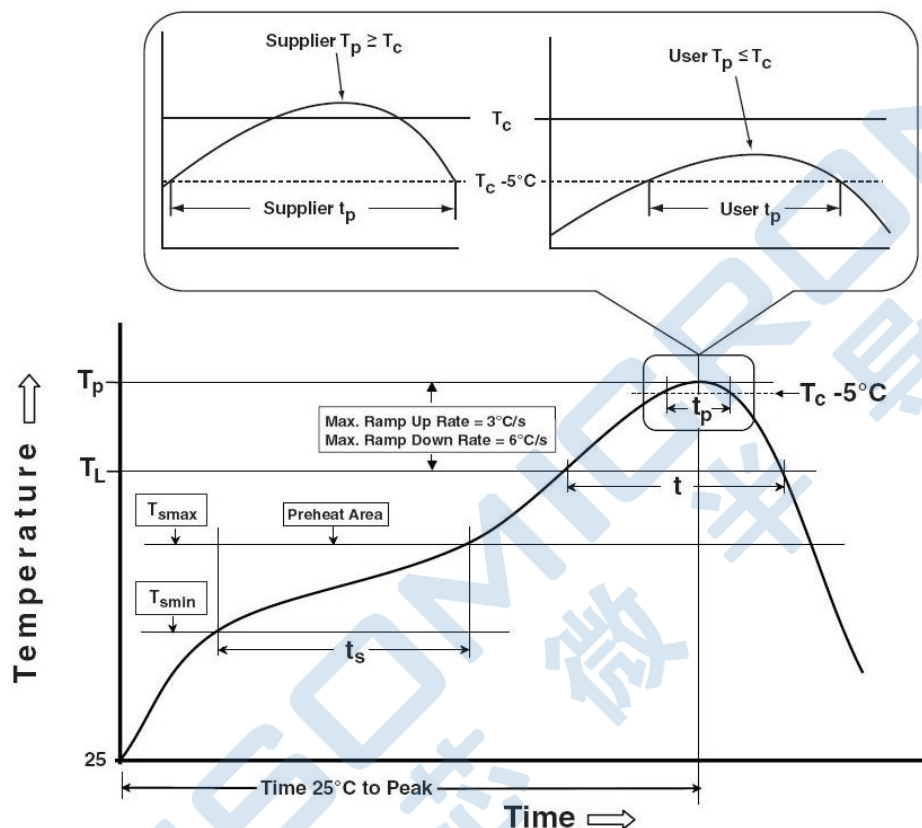


Packing Quantity

Option	Quantity	Quantity – Inner box	Quantity – Outer box
DIP-Standard	65 Units/Tube	20 Tubes/Inner box	6 Inner box/Outer box = 7.8k Units
DIP-M	65 Units/Tube	20 Tubes/Inner box	6 Inner box/Outer box = 7.8k Units
SM-SL	1000 Units/Reel	2 Reels/Inner box	5 Inner box/Outer box = 10k Units

REFLOW INFORMATION

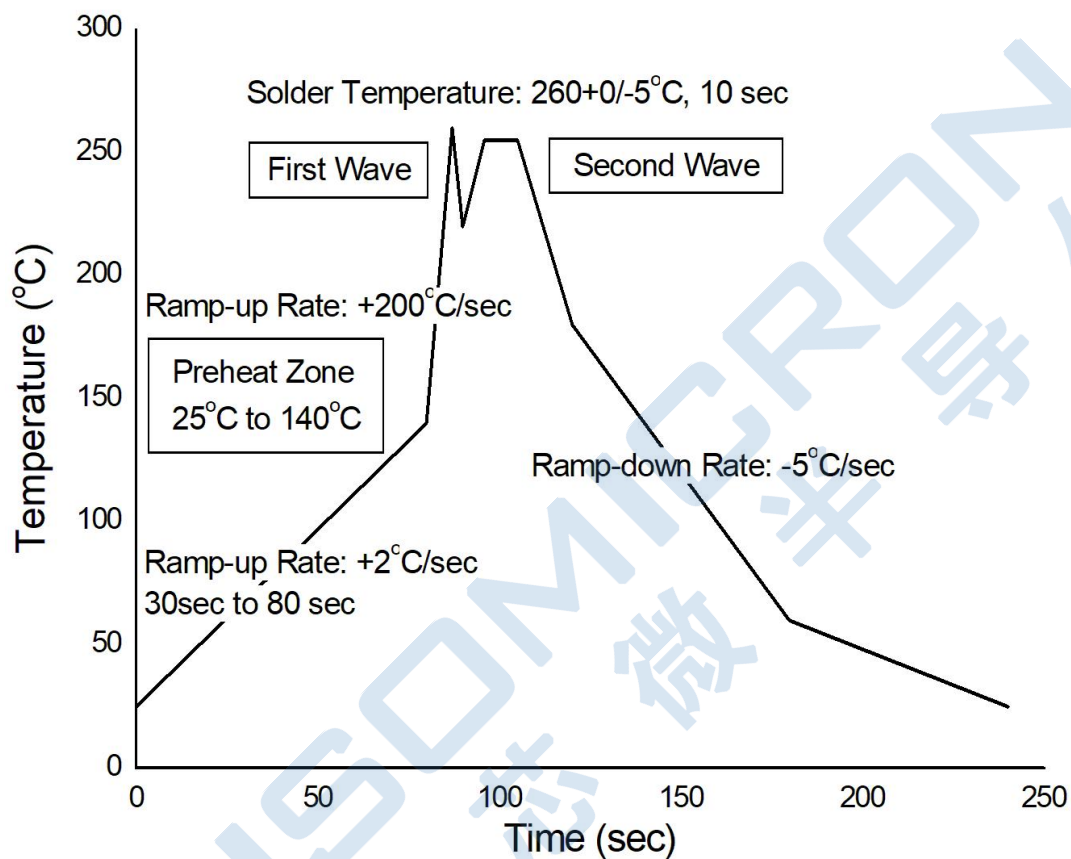
Reflow Profile



Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (T_{smin})	100	150°C
Temperature Max. (T_{smax})	150	200°C
Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds	60-120 seconds
Ramp-up Rate (t_L to t_P)	3°C/second max.	3°C/second max.
Liquidous Temperature (T_L)	183°C	217°C
Time (t_L) Maintained Above (T_L)	60 – 150 seconds	60 – 150 seconds
Peak Body Package Temperature	235°C +0°C / -5°C	260°C +0°C / -5°C
Time (t_P) within 5°C of 260°C	20 seconds	30 seconds
Ramp-down Rate (T_P to T_L)	6°C/second max	6°C/second max
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

TEMPERATURE PROFILE OF SOLDERING

Wave Soldering (JESD22-A111 Compliant)



Hand Soldering By Soldering Iron

Soldering Temperature	380+0/-5°C
Soldering Time	3 sec max.

- One time soldering is recommended for all soldering method.
- Do not solder more than three times for IR reflow soldering.

DISCLAIMER

- ISOMICRON is continually improving the quality, reliability, function and design. ISOMICRON reserves the right to make changes without further notices.
- The characteristic curves shown in this datasheet are representing typical performance which are not guaranteed.
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- This product is not intended to be used for military, aircraft, automotive, medical, life sustaining or lifesaving applications or any other application which can result in human injury or death.
- Please contact ISOMICRON sales agent for special application request.
- Immerge unit's body in solder paste is not recommended.
- Parameters provided in datasheets may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated in each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify ISOMICRON's terms and conditions of purchase, including but not limited to the warranty expressed therein.
- Discoloration might be occurred on the package surface after soldering, reflow or long-time use. It neither impacts the performance nor reliability.