

Features

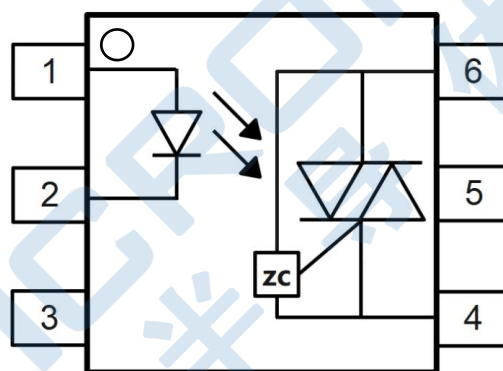
- High isolation 5000 VRMS
- DC input with zero-cross photo triac output
- Operating temperature range - 40 °C to 100 °C
- REACH & RoHS compliance
- MSL class 1
- Regulatory Approvals
 - UL - UL1577
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC – GB4943.1

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 MOC304X, MOC306X and MOC308X 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.



ORDERING INFORMATION

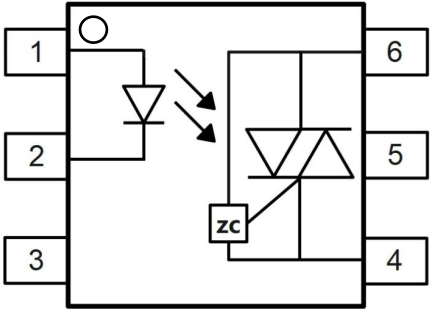
Outline	Part Number	Package	Marking	Packing	Packing Size	Quantity
	MOC304XVPE	DIP6	MOC30XXV /YYWW A	Tube	500mm	65
	MOC306XVPE					
	MOC308XVPE					
	MOC304XVGE	DIP6-M		Tube	500mm	65
	MOC306XVGE					
	MOC308XVGE					
	MOC304XVSE	DIP6-SL		Reel	13 "	1000
	MOC306XVSE					
	MOC308XVSE					

CONTENTS

Pin Configuration And Functions.	3
Absolute Maximum Ratings.	3
Electrical Optical Characteristics.	4
Characteristic Curves.	5
Test Circuits.	8
Package Dimensions.	9
Recommended Solder Mask.	11
Carrier Tape Specifications.	12
Ordering And Marking Information.	13
Reflow Information.	14
Temperature Profile Of Soldering.	15
Disclaimer.	16

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	MOC304X	400	V	
	MOC306X	600		
	MOC308X	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}	-	1.59	2.5	V	I _{TM} =100mA	
Critical Rate of Rise of Off-state Voltage		dv/dt	1000	-	-	V/μs	V _{PEAK} =Rated V _{DRM}	4
TRANSFER CHARACTERISTICS								
LED Trigger Current	MOC3041 MOC3061,MOC3081	I _{FT}	-	-	15	mA	Terminal Voltage = 3V I _{TM} =100mA	
	MOC3042 MOC3062,MOC3082		-	-	10			
	MOC3043 MOC3063,MOC3083		-	-	5			
Holding Current		I _H	-	237	-	μA		
Isolation Resistance		R _{iso}	10 ¹²	10 ¹⁴	-	Ω	DC500V, 40 ~ 60% R.H.	
Floating Capacitance		C _{io}	-	0.4	-	pF	V=0, f=1MHz	
ZERO-CROSSING CHARACTERISTICS								
Inhibit Voltage		V _{INH}	-	-	20	V	I _F =Rated I _{FT}	
Leakage in Inhibited State		I _{DRM2}	-	-	500	μA	I _F =Rated I _{FT} V _{DRM} =Rated V _{DRM}	

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

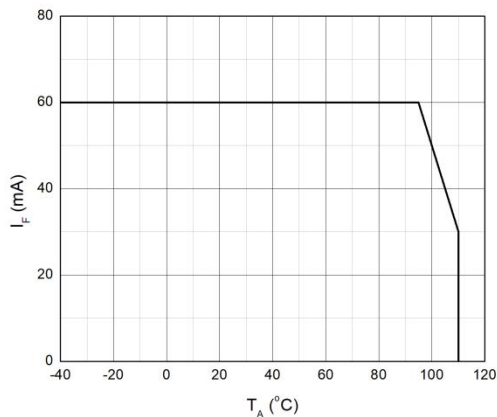


Fig.2 On-state Terminal Current vs. Ambient Temperature

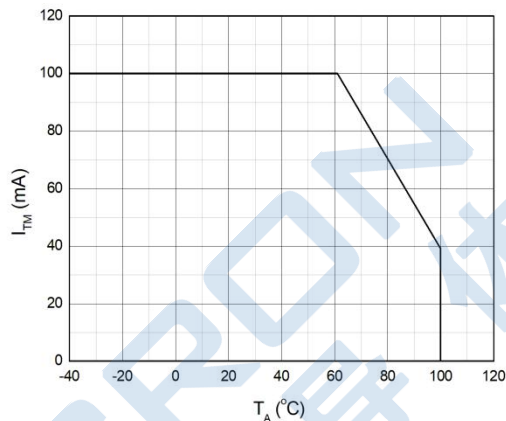


Fig.3 Forward Current vs. Forward Voltage

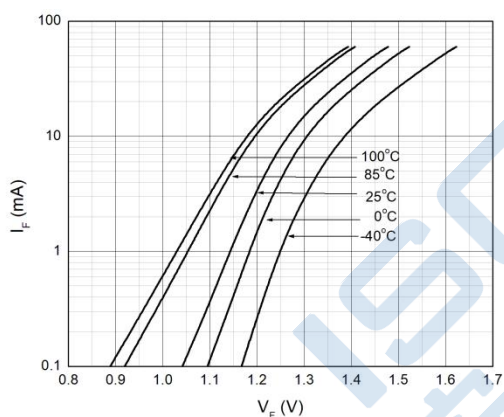


Fig.4 Off-state Terminal Current vs. Ambient Temperature

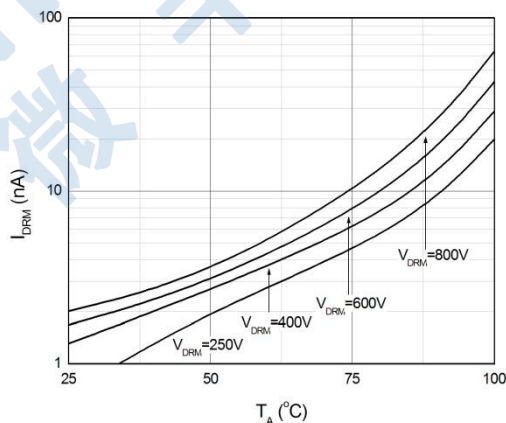


Fig.5 Normalized Off-state Terminal Voltage vs. Ambient Temperature

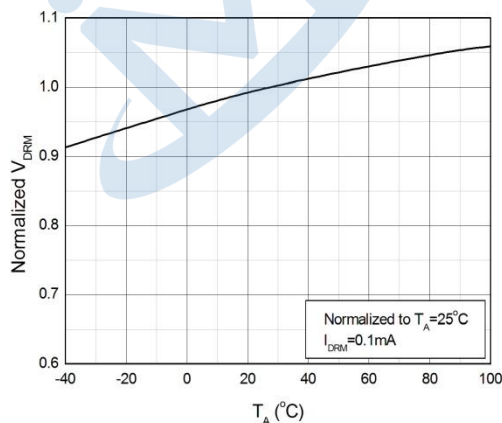


Fig.6 Normalized Trigger Current vs. LED Trigger Pulse Width

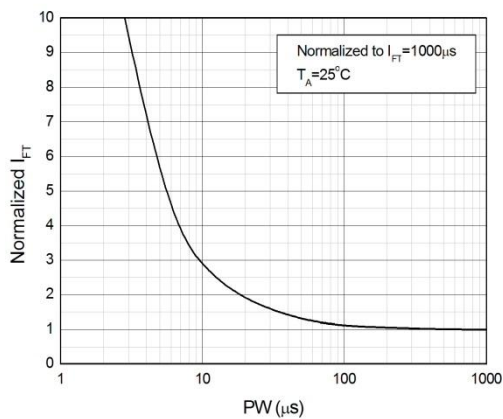
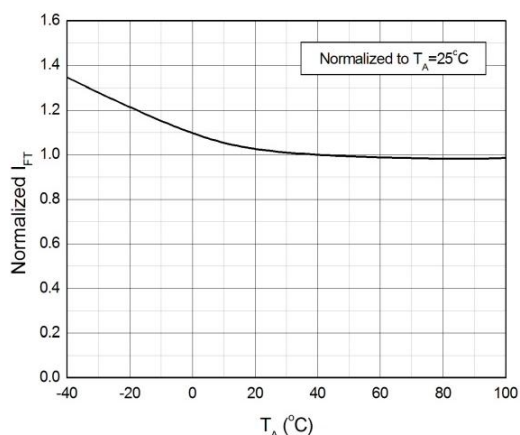
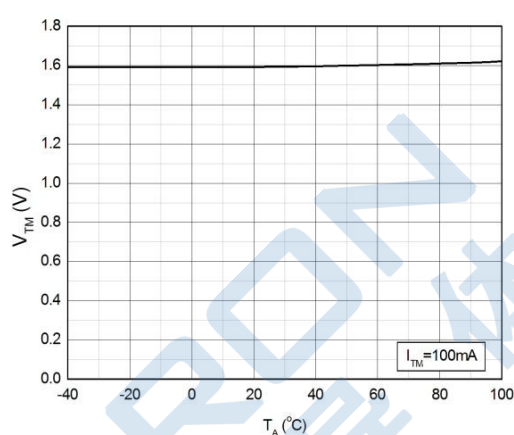
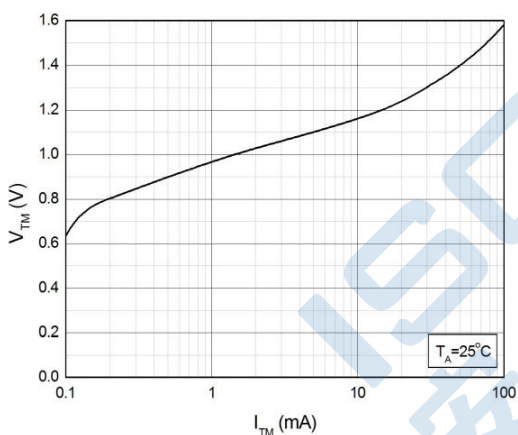
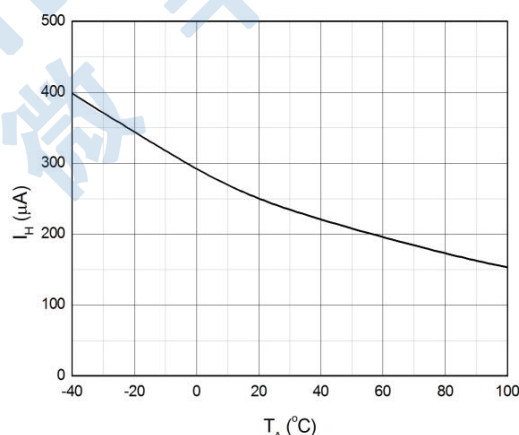
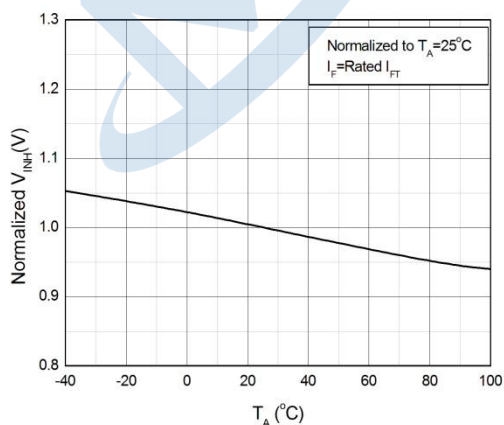
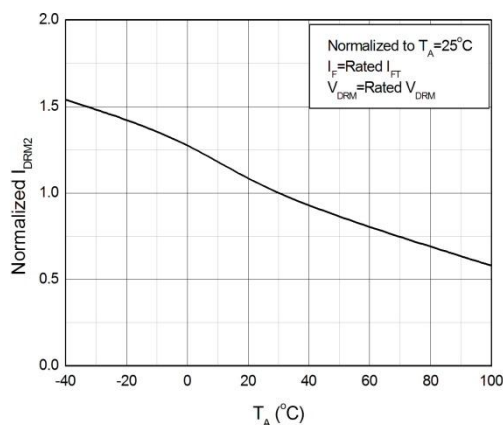
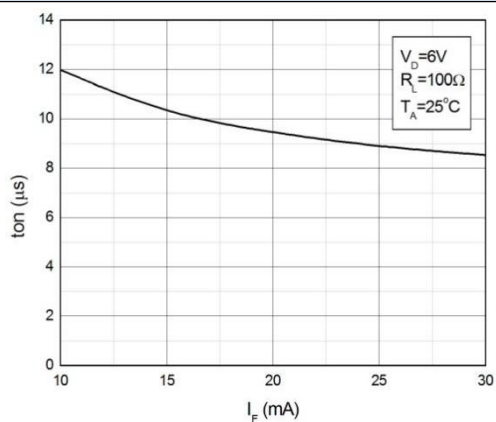
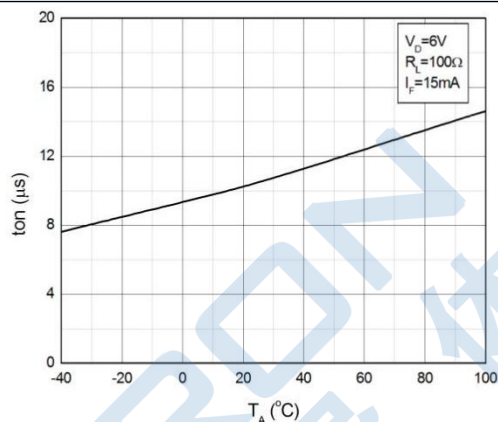


Fig.7 Normalized Trigger Current vs. Ambient Temperature

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 Normalized Inhibit Voltage vs. Ambient Temperature

Fig.12 Normalized Leakage in Inhibit State vs. Ambient Temperature


**Fig.13 Turn On Time
vs. Forward Current**



**Fig.14 Turn On Time
vs. Ambient Temperature**



TEST CIRCUITS

Fig.15 Test Circuits of Turn On Time

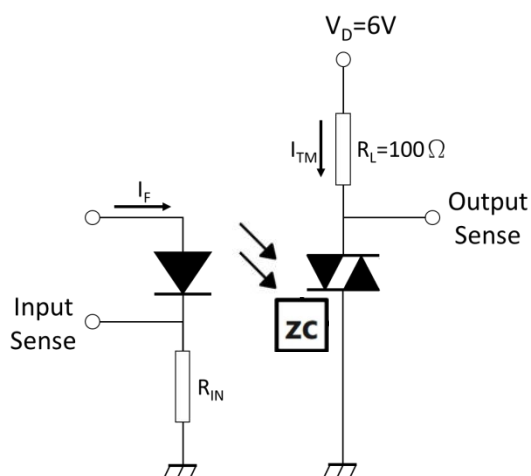


Fig.16 Waveforms of Turn On Time

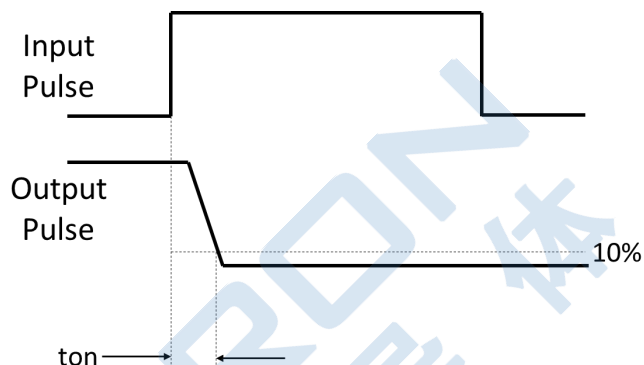


Fig.17 Test Circuits of dV/dt

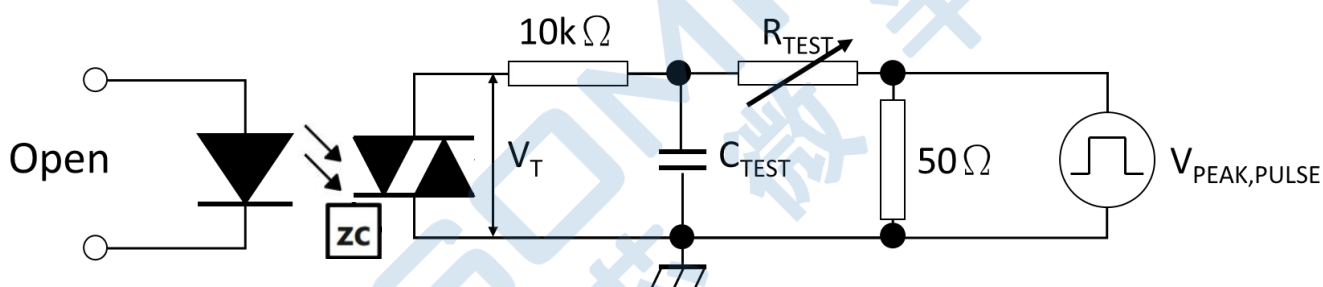
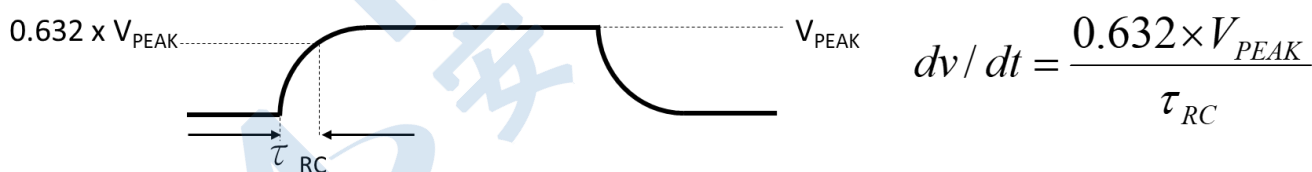
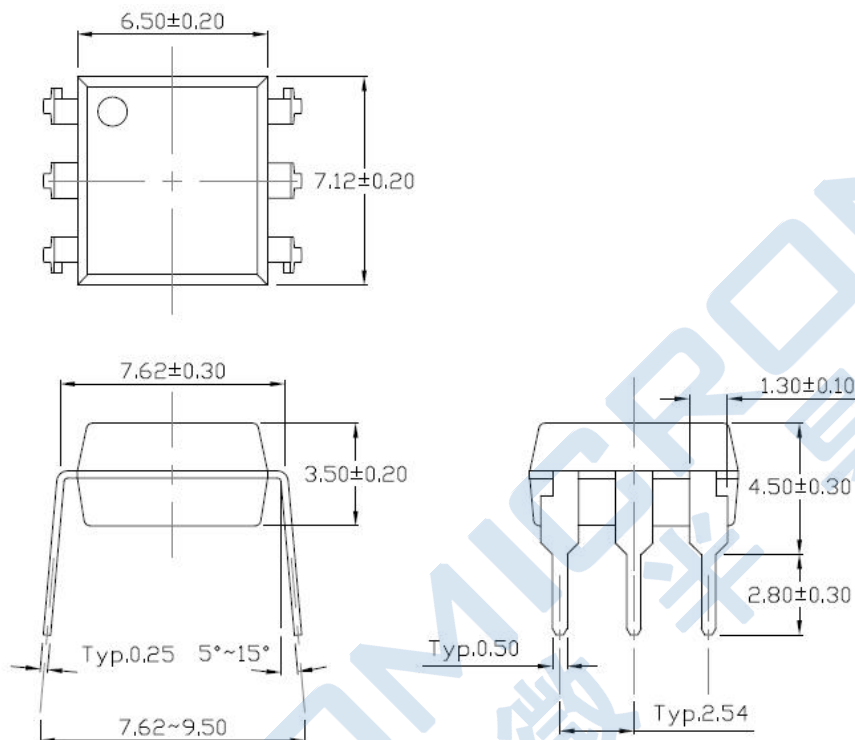


Fig.18 Waveforms of dV/dt

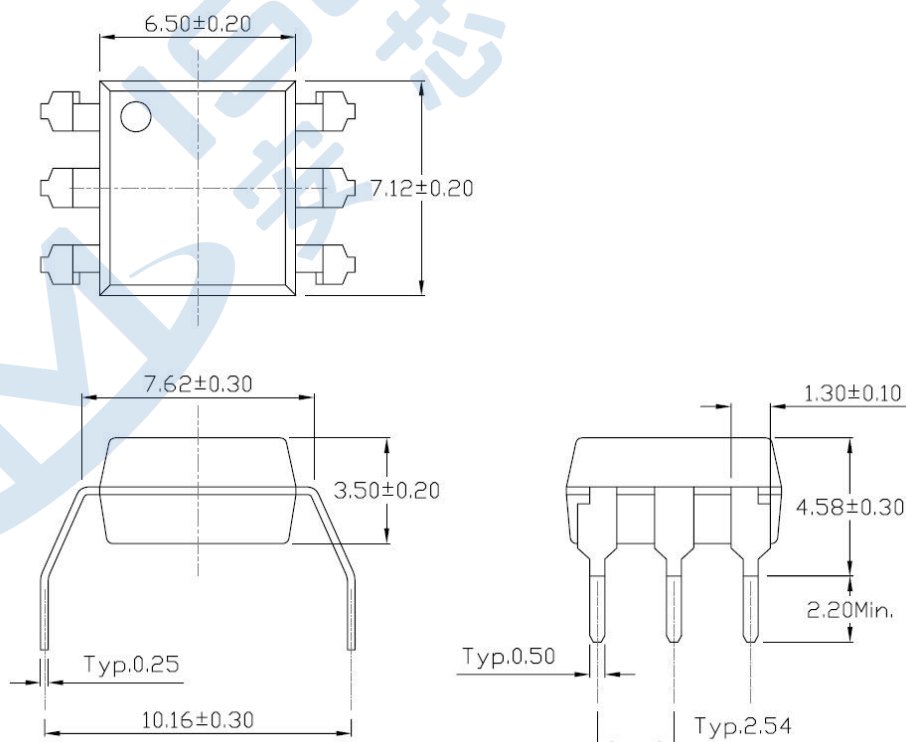


PACKAGE DIMENSIONS

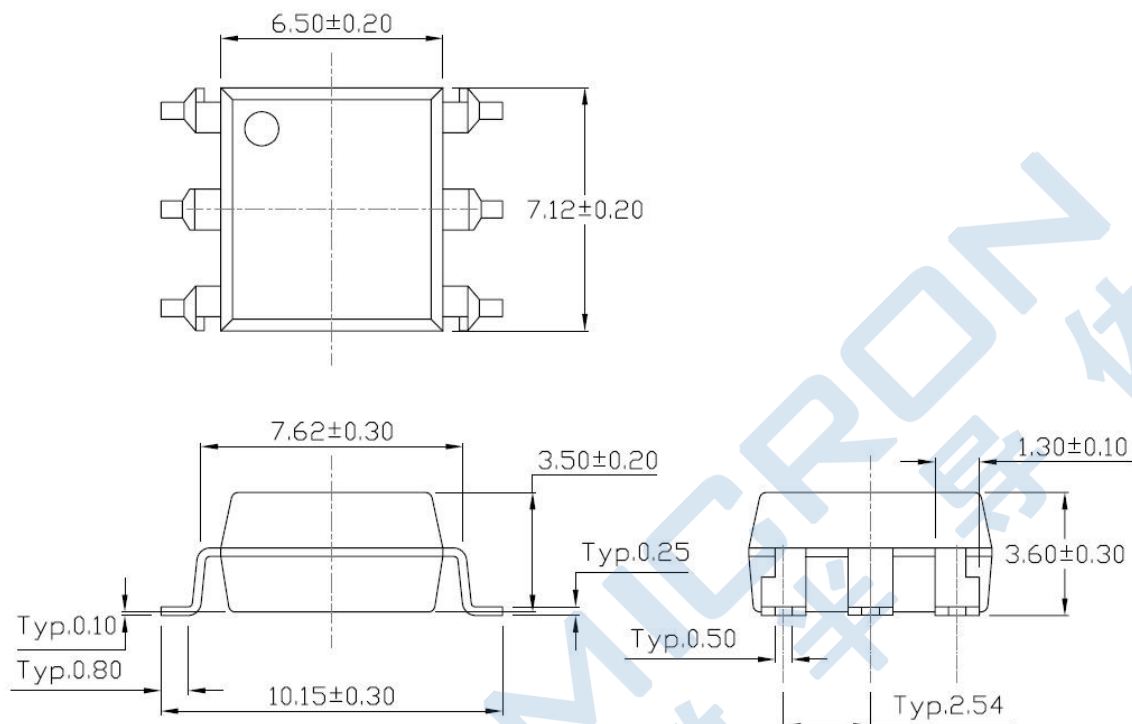
Standard DIP – Through Hole (P Type)



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



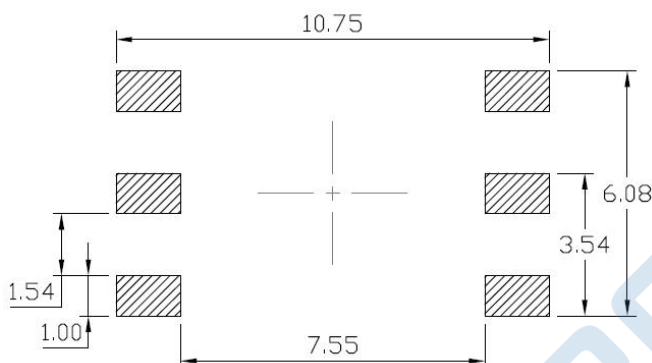
Surface Mount (Low Profile) Lead Forming (SL Type)



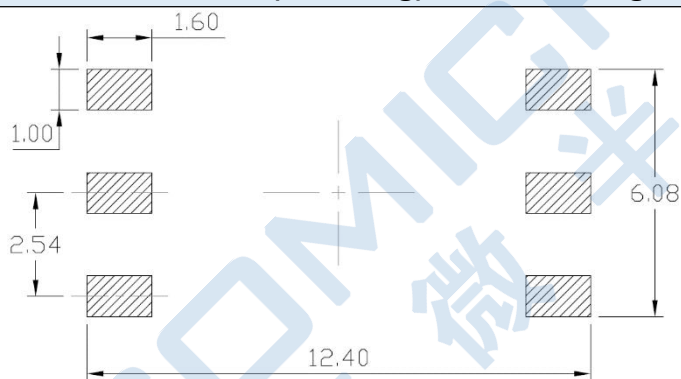
- Dimensions in mm unless otherwise stated

RECOMMENDED SOLDER MASK

Surface Mount (Low Profile) Lead Forming



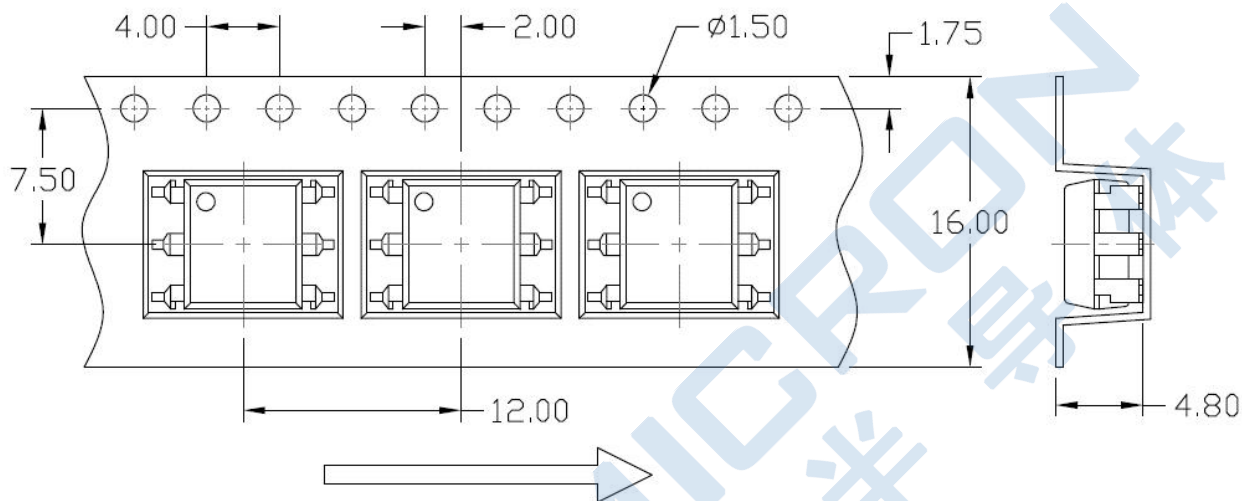
Surface Mount (Gullwing) Lead Forming



- Dimensions in mm unless otherwise stated

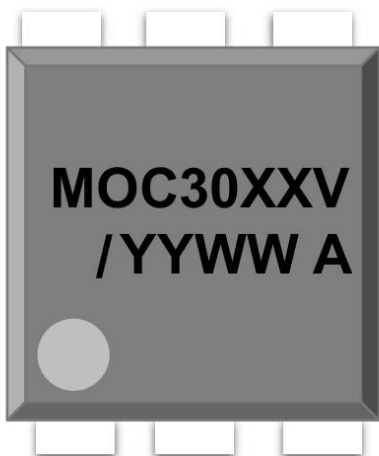
CARRIER TAPE SPECIFICATIONS

Option DIP6-SL



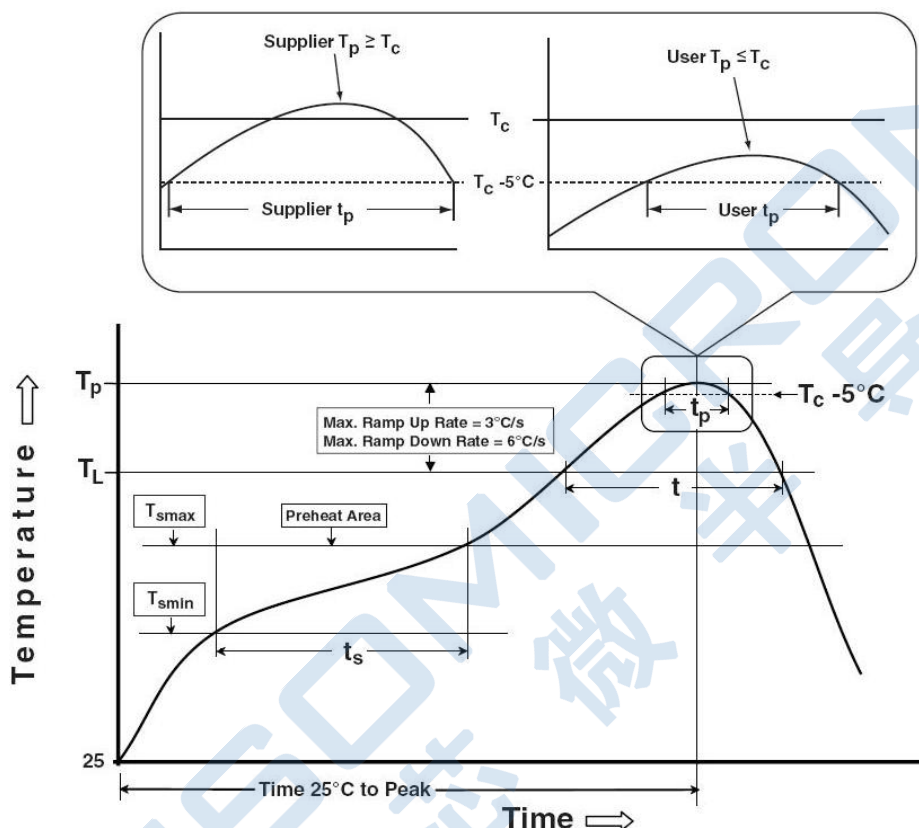
- Dimensions in mm unless otherwise stated

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			
MOC 30XX X X X Product Series Part Number Halogen Free Lead Forming VDE Option E: Halogen-free,Lead-free Z: Halogen, Lead-free P: DIP-Standard G: DIP-M S: SM-SL V: VDE approval None			
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

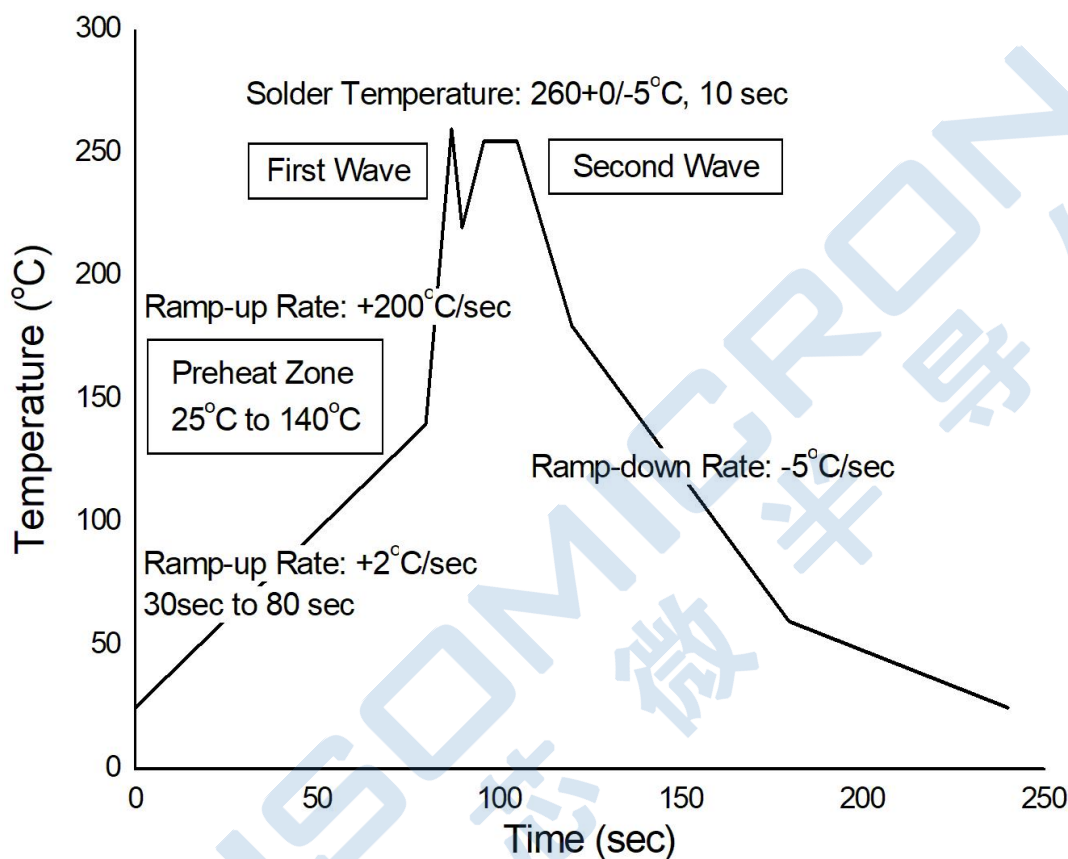
Reflow Profile



Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	100	150°C
Temperature Max. (Tsmax)	150	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds	60-120 seconds
Ramp-up Rate (tL to tP)	3°C/second max.	3°C/second max.
Liquidous Temperature (TL)	183°C	217°C
Time (tL) Maintained Above (TL)	60 – 150 seconds	60 – 150 seconds
Peak Body Package Temperature	235°C +0°C / -5°C	260°C +0°C / -5°C
Time (tP) within 5°C of 260°C	20 seconds	30 seconds
Ramp-down Rate (TP to TL)	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	$380 \pm 5^\circ\text{C}$
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.