Description

The MOC301X, MOC302X and MOC305X 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, MOC301X, MOC302X and MOC305X series provide the most stable isolation feature.

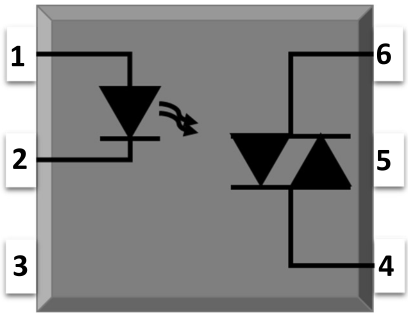
Features

- 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, GB8898
    - cUL- CSA Component Acceptance Service Notice No. 5A

Applications

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

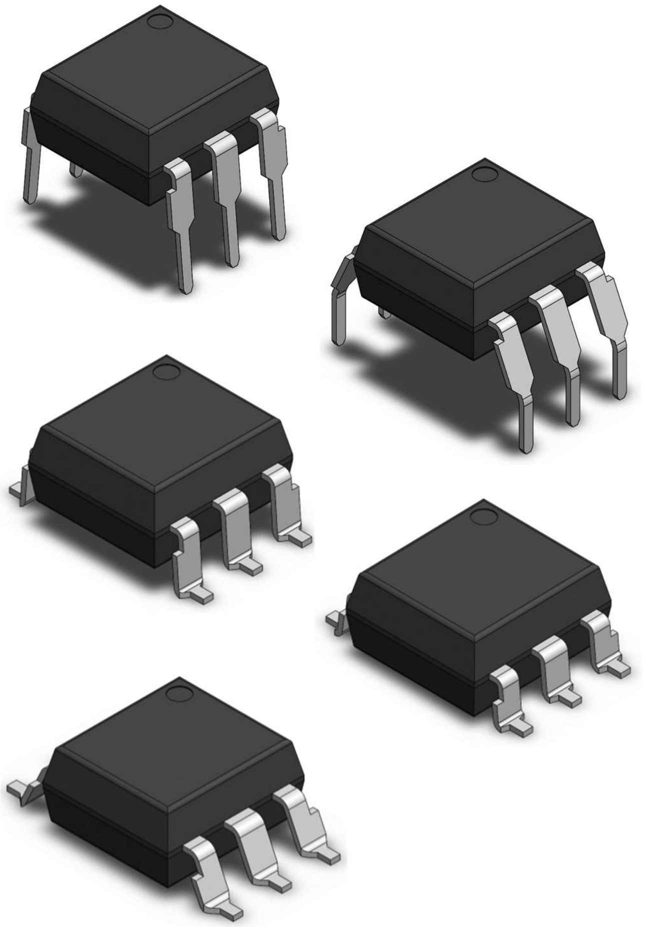
SCHEMATIC



PIN DEFINITION

1. Anode
2. Cathode
3. NC
4. Terminal
5. Substrate
6. Terminal

PACKAGE OUTLINE



ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	VALUE	UNIT	NOTE
INPUT					
Forward Current		I_F	60	mA	
Reverse Voltage		V_R	6	V	
Junction Temperature		Tj	125	°C	
Input Power Dissipation		P_I	100	mW	
OUTPUT					
Off-state Output Terminal Voltage	MOC301X	V_{DRM}	250	V	
	MOC302X		400		
	MOC305X		600		
Peak Repetitive Surge Current PW=100μs, 120pps		I_{TSM}	1	A	
Junction Temperature		Tj	125	°C	
Output Power Dissipation		P_O	300	mW	
COMMON					
Total Power Dissipation		Ptot	400	mW	
Isolation Voltage		Viso	5000	Vrms	1
Operating Temperature		Topr	-40~100	°C	
Storage Temperature		Tstg	-55~125	°C	
Soldering Temperature		Tsol	260	°C	2

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

Note 2. For 10 seconds

ELECTRICAL OPTICAL CHARACTERISTICS at Ta=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		Cin	-	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 Current, Either Direction		V_{TM}	-	1.58	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	MOC3010/3021/3051	I_{FT}	-	-	15	mA	Terminal Voltage = 3V I_{TM}=100mA	
	MOC3011/3022/3052		-	-	10			
	MOC3012/3023/3053		-	-	5			
Holding Current		I_H	-	257	-	μA		
Isolation Resistance		Riso	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

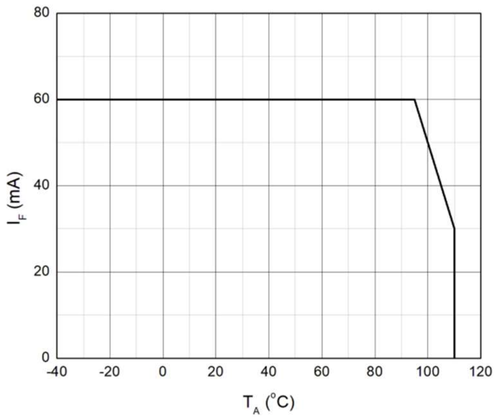


Fig.2 On-state Terminal Current vs. Ambient Temperature

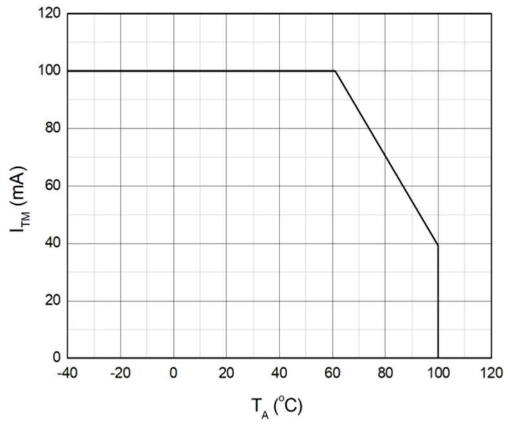


Fig.3 Forward Current vs. Forward Voltage

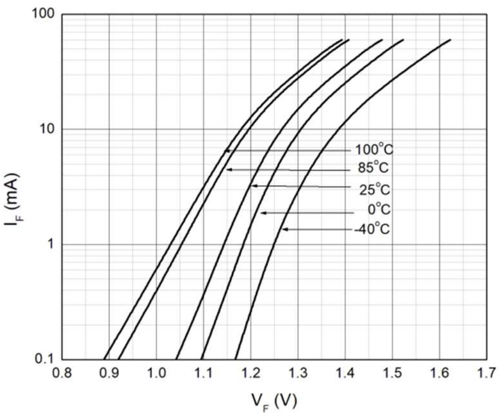


Fig.4 Off-state Terminal Current vs. Ambient Temperature

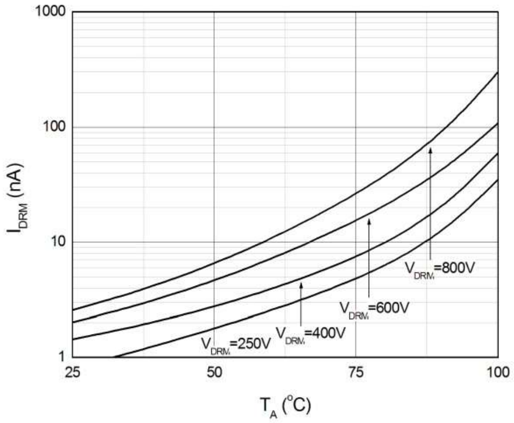


Fig.5 Normalized Off-state Terminal Voltagevs. Ambient Temperature

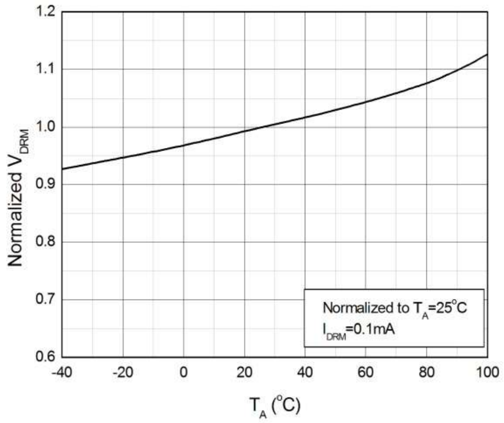
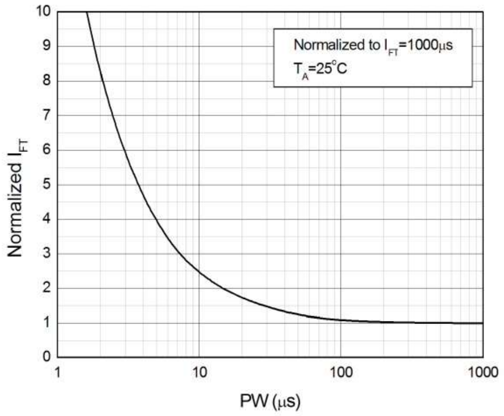


Fig.6 Normalized Trigger Current vs. LED Trigger Pulse Width



CHARACTERISTIC CURVES

Fig.7 Normalized Trigger Current vs. Ambient Temperature

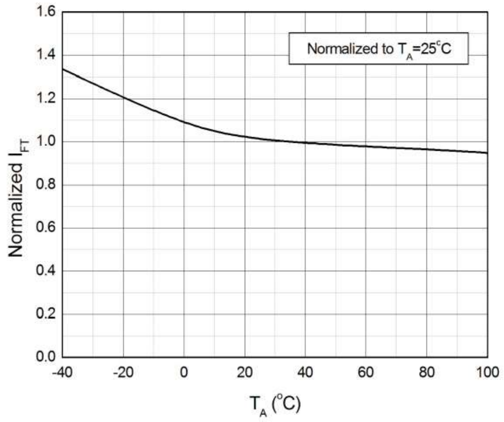


Fig.8 On-state Terminal Voltage vs. Ambient Temperature

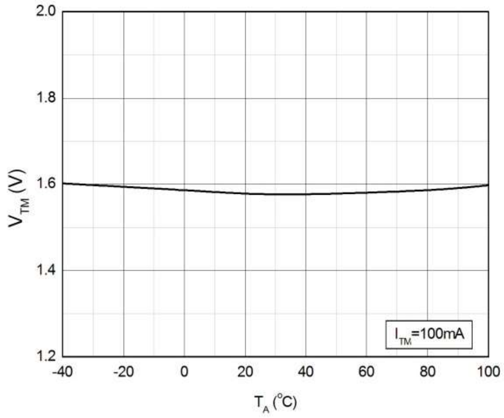


Fig.9 On-state Terminal Voltage vs. On-state Terminal Current

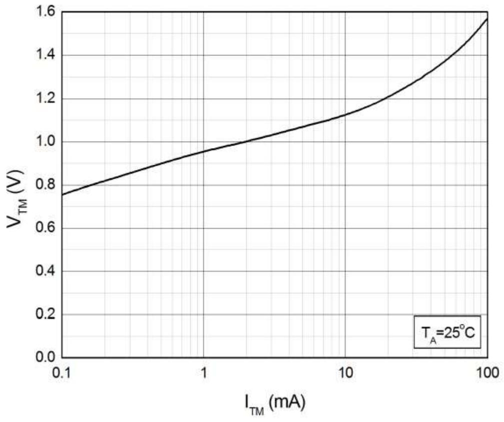


Fig.10 Holding Current vs. Ambient Temperature

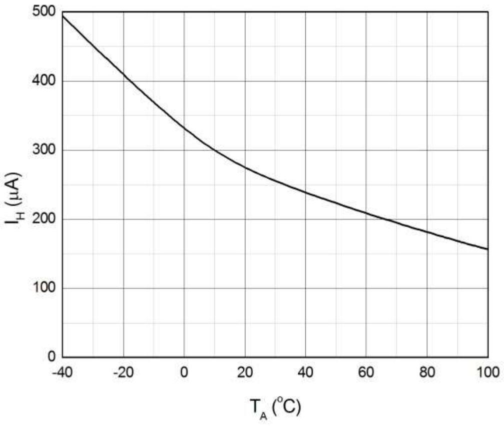


Fig.11 Turn On Time vs. Forward Current

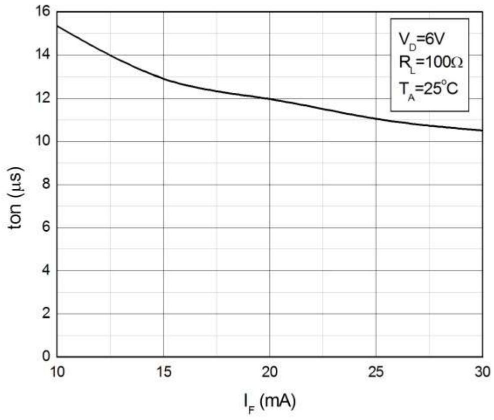
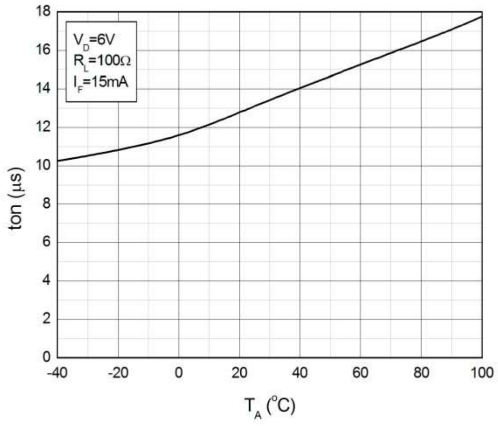


Fig.12 Turn On Time vs. Ambient Temperature



TEST CIRCUITS

Fig.13 Test Circuits of Turn On Time

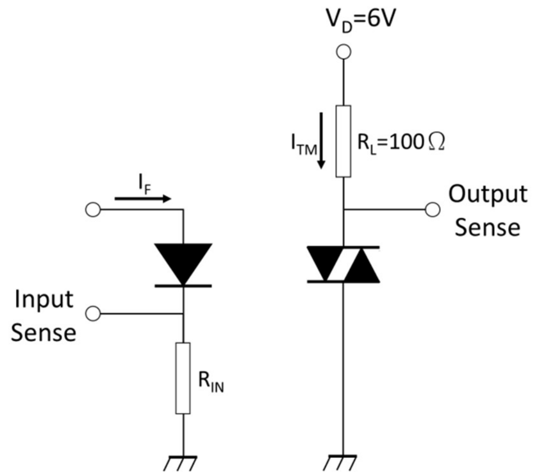


Fig.14 Waveforms of Turn On Time

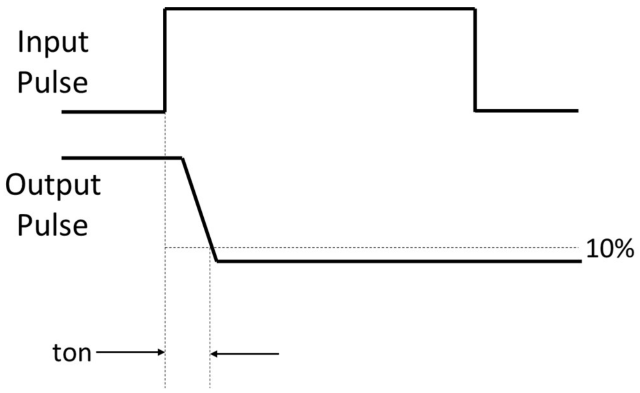


Fig.15 Test Circuits of dV/dt

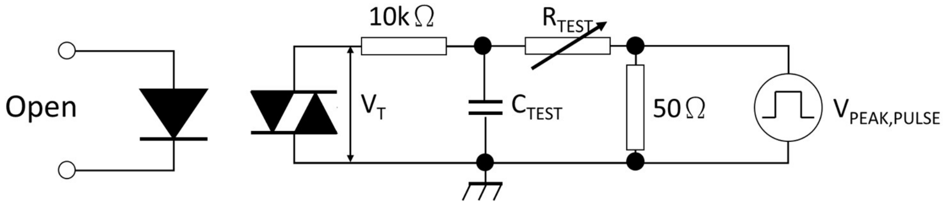
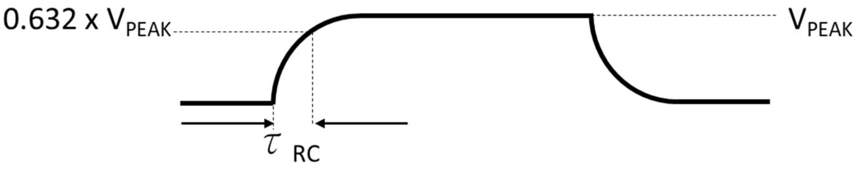


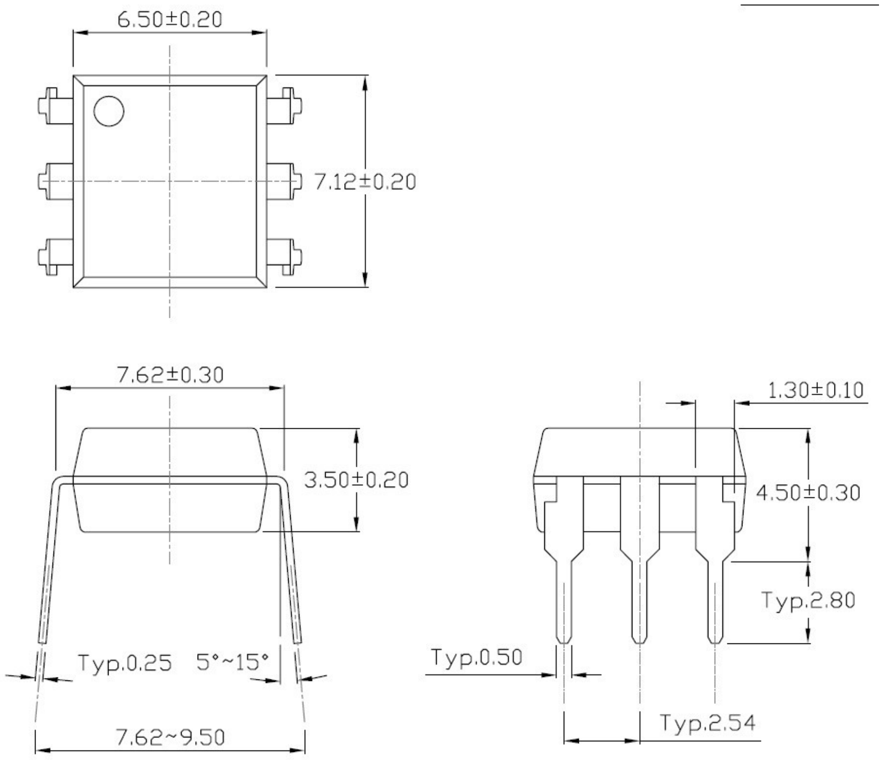
Fig.16 Waveforms of dV/dt



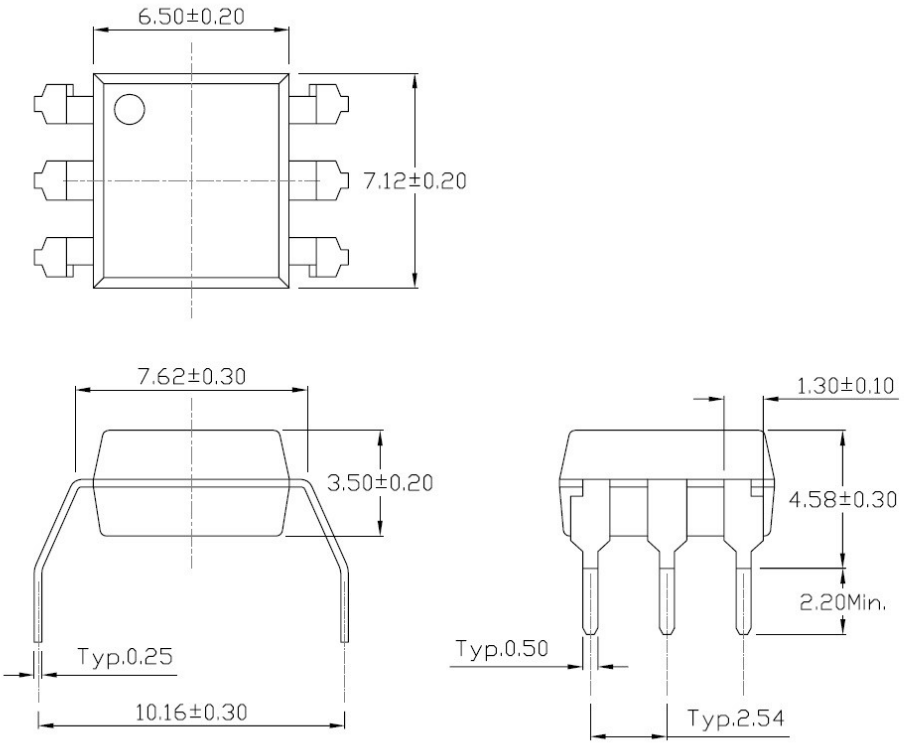
$$dv/dt = \frac{0.632 \times V_{PEAK}}{\tau_{RC}}$$

PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Standard DIP – Through Hole (P Type)

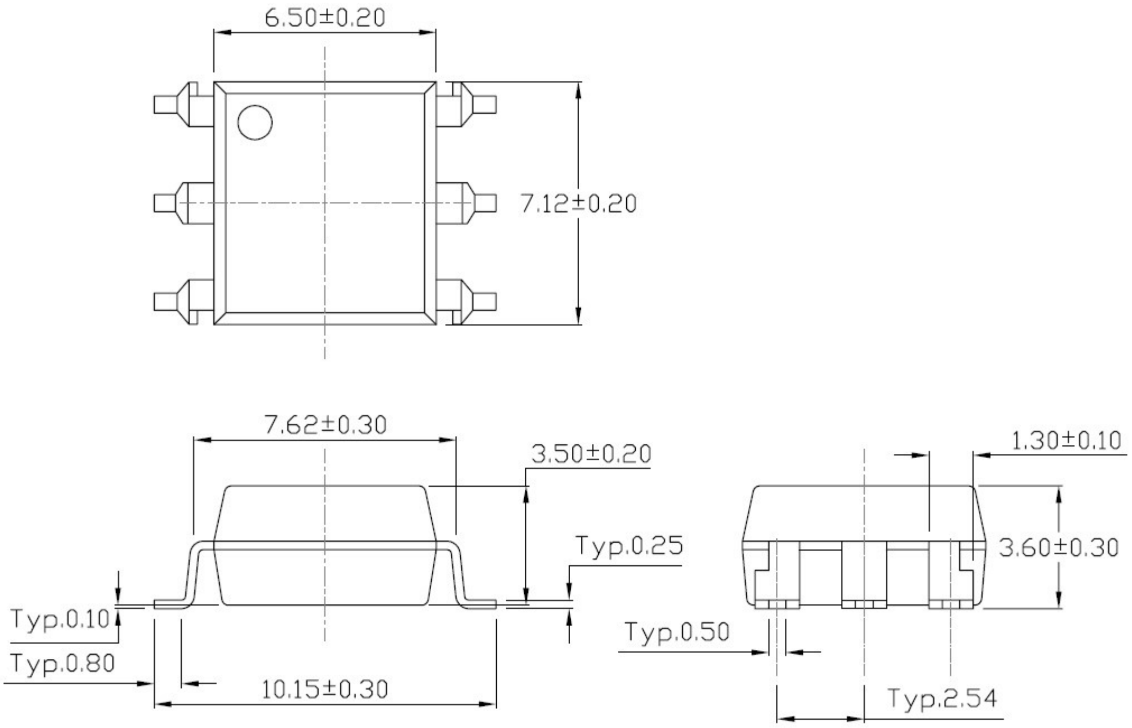


Gullwing (400mil) Lead Forming – Through Hole (G Type)



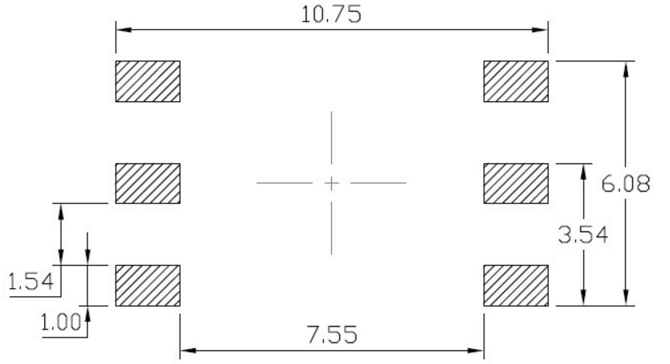
PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

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

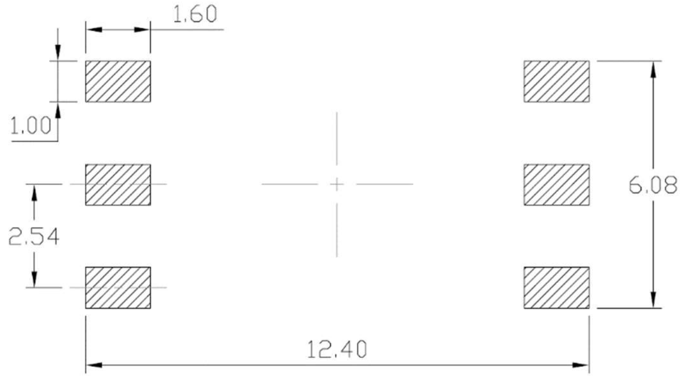


RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)

Surface Mount Lead Forming & Surface Mount (Low Profile) Lead Forming

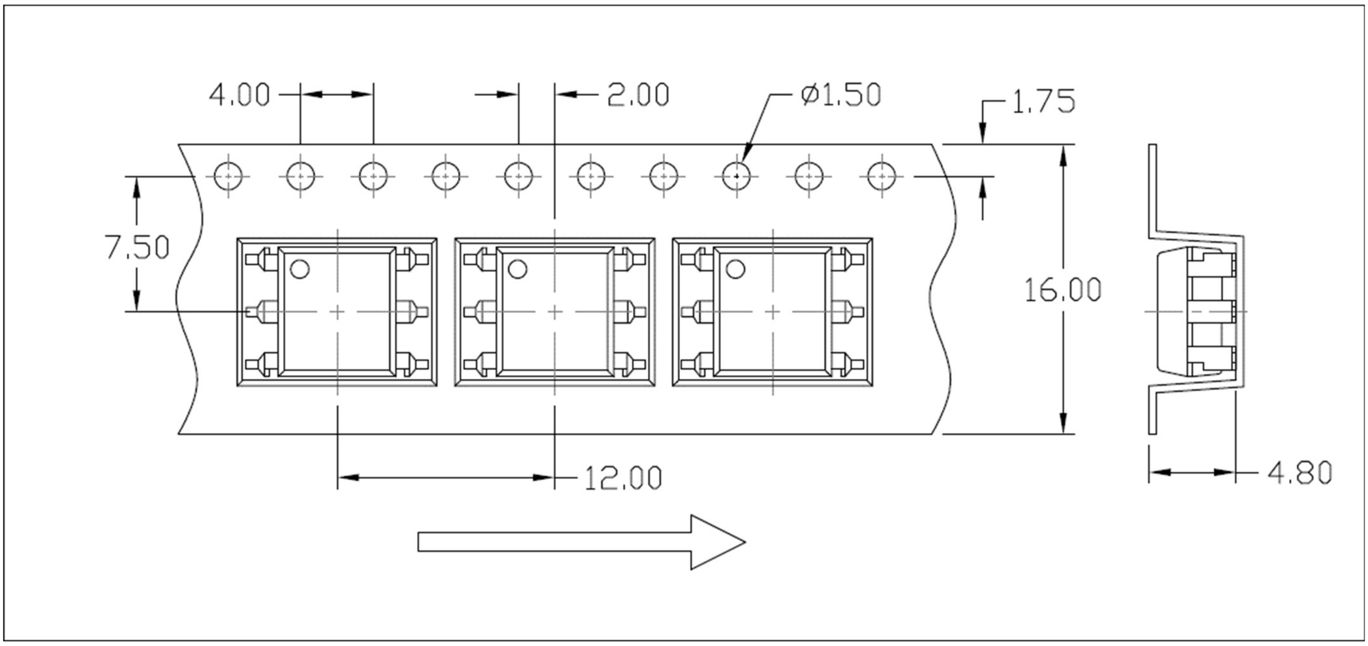


Surface Mount (Gullwing) Lead Forming

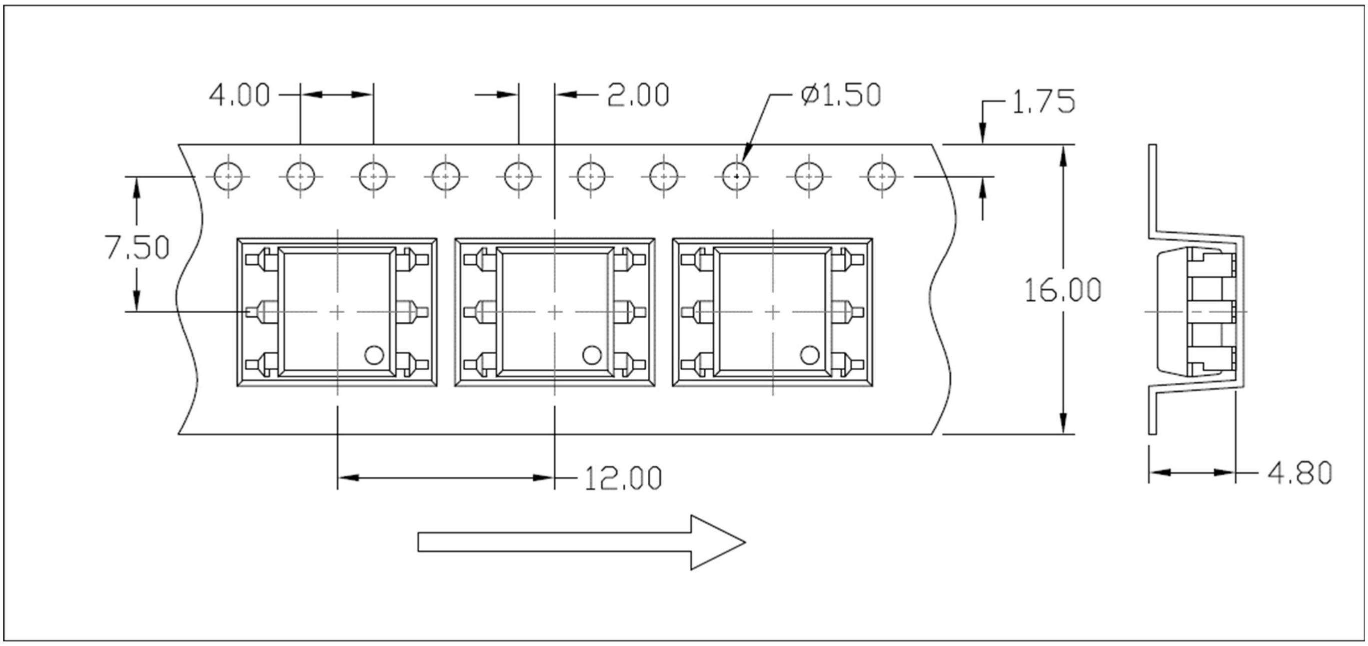


CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option S(T1)

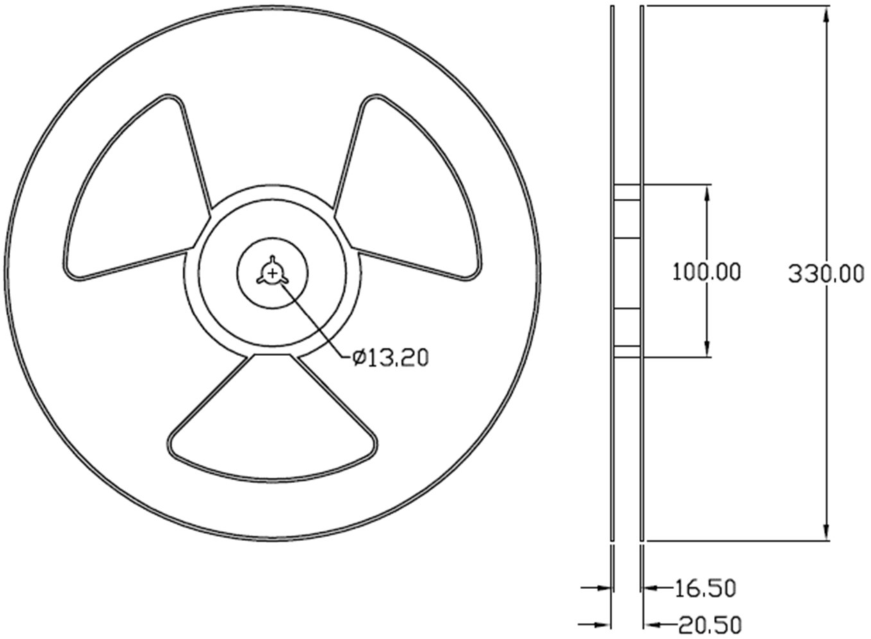


Option S(T2)



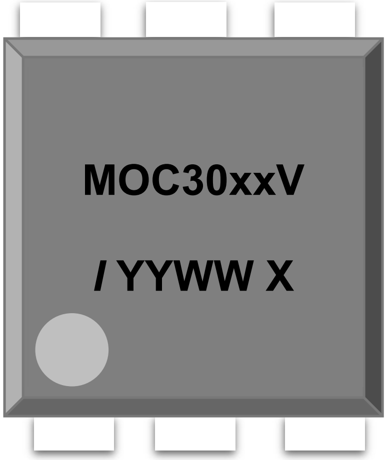
REEL SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option S



ORDERING AND MARKING INFORMATION

MARKING INFORMATION



MOC : TRIAC Coupler
30xx : Part Number
V : VDE Option
/ : ISOCOM MICRON
YY : Manufacture Year
WW : Work Week
X : Manufacturing Code,X=A/B/C/None

ORDERING INFORMATION

MOC30xxV(G/P/S)Z

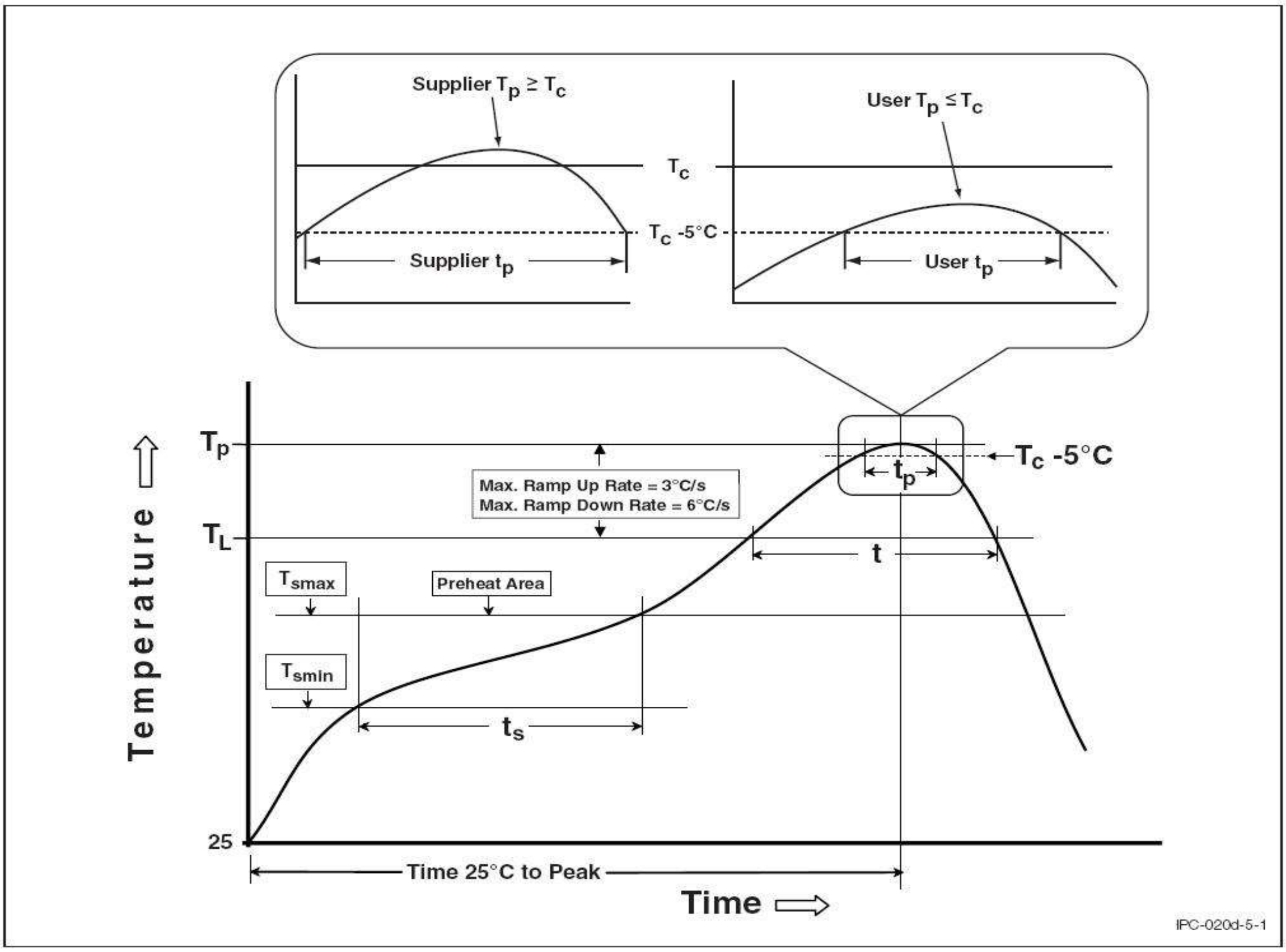
MOC – TRIAC Coupler
30xx – Part Number (11/12/13/21/22/23/51/52/53)
V – VDE Option (V or None)
G/P/S – Lead Form Option G-Gullwing, P-DIP, S-SL
E/Z –E: Halogen-free, Lead-free
Z: Halogen, Lead-free

Packing Quantity

Option	Quantity	Quantity – Inner box	Quantity – Outer box
G	50 Units/Tube	20 Tubes/Inner box	6 Inner box/Outer box = 6k Units
P	50 Units/Tube	20 Tubes/Inner box	6 Inner box/Outer box = 6k Units
S	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.

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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 ISOCOM MICRON 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 ISOCOM MICRON’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.