

## MOC306x



### DESCRIPTION

The MOC306x Series are optically coupled isolators consisting of a Gallium Arsenide infrared emitting diode coupled with a monolithic silicon detector performing the functions of a zero crossing bilateral triac mounted in a standard 6 pin dual-in-line package.

### FEATURES

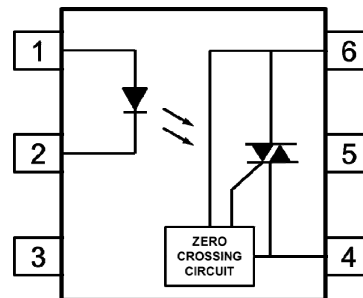
- Zero Voltage Crossing
- Triac Driver Output
- High  $V_{DRM}$  minimum 600V
- High Critical Rate of Rise of Off-State Voltage  $dv/dt$  minimum 600V/ $\mu$ s
- Isolation Voltage 5000V<sub>RMS</sub>
- RoHS Compliant
- UL File No. E91231 Package System "TT"
- VDE File No. 40028086

### APPLICATIONS

- Solenoid / Valve Controls
- Light Controls
- AC Motor Drivers
- Temperature Controls
- AC Motor Starters
- Solid State Relays

### ORDER INFORMATION

- Add Suffix "X" for VDE Approval
- Add G after PN for 10mm lead spacing
- Add SM after PN for Surface Mount
- Add SMT&R after PN for Surface Mount Tape & Reel



- 1 Anode
- 2 Cathode
- 3 NC
- 4 Main Terminal 1
- 5 Substrate, (Do not Connect)
- 6 Main Terminal 2

### ABSOLUTE MAXIMUM RATINGS

$T_A = 25^\circ\text{C}$  unless otherwise specified.

Stresses exceeding the absolute maximum ratings can cause permanent damage to the device.

Exposure to absolute maximum ratings for long periods of time can adversely affect reliability.

#### Input

Forward Current	50mA
Reverse Voltage	6V
Junction Temperature	125°C
Power dissipation	120mW

#### Output

Off State Output Terminal Voltage	600V
On State RMS Current	100mA <sub>RMS</sub>
Peak Repetitive Surge Current (Pulse Width 100 $\mu$ s, 120pps)	1.0A
Junction Temperature	125°C
Power Dissipation	150mW

#### Total Package

Isolation Voltage	5000V <sub>RMS</sub>
Total Power Dissipation	250mW
Operating Temperature	-40 to 100°C
Storage Temperature	-55 to 150°C
Lead Soldering Temperature (10s)	260°C

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## MOC306x

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

#### INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	$V_F$	$I_F = 20\text{mA}$		1.2	1.4	V
Reverse Current	$I_R$	$V_R = 6\text{V}$		0.05	10	$\mu\text{A}$

#### OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Peak Off-state Current Either Direction	$I_{\text{DRM}}$	$V_{\text{DRM}} = 600\text{V}$ $I_F = 0\text{mA}$ Note 1			500	nA
Peak Blocking Voltage Either Direction	$V_{\text{DRM}}$	$I_{\text{DRM}} = 500\text{nA}$	600			V
On-state Voltage Either Direction	$V_{\text{TM}}$	$I_{\text{TM}} = 100\text{mA (peak)}$			3.0	V
Critical Rate of Rise of Off-state Voltage (Static dv/dt)	dv/dt	$I_F = 0\text{mA}$ , $V_{\text{in}} = 240\text{V}_{\text{RMS}}$	1000			V/ $\mu\text{s}$

#### COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Input Trigger Current Either Direction	$I_{\text{FT}}$	$V_{\text{TM}} = 3\text{V}$ Note 2  MOC3060 MOC3061 MOC3062 MOC3063			30 15 10 5	mA
Holding Current Either Direction	$I_{\text{H}}$			400		$\mu\text{A}$



**MOC306x**

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

**ZERO CROSSING CHARACTERISTICS**

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Inhibit Voltage	$V_{INH}$	$I_F = \text{Rated } I_{FT}$ , MT1-MT2 Voltage above which device will not trigger		5	20	V
Leakage Current at Inhibit State	$I_{DRM2}$	$I_F = \text{Rated } I_{FT}$ , $V_{DRM} = 600\text{V}$ , Off-state			500	$\mu\text{A}$

**ISOLATION**

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Isolation Voltage Input-Output	$V_{ISO}$	RH = 40 to 60%, t = 1 min Note 3	5000			$V_{RMS}$

Note 1 : Test Voltage must be applied within dv/dt rating.

Note 2 : Guaranteed to trigger at an  $I_F$  value less than or equal to max  $I_{FT}$ ,  
recommended  $I_F$  lies between Rated  $I_{FT}$  to Absolute Max  $I_F$ .

Note 3 : Measured with input leads shorted together and output leads shorted together.

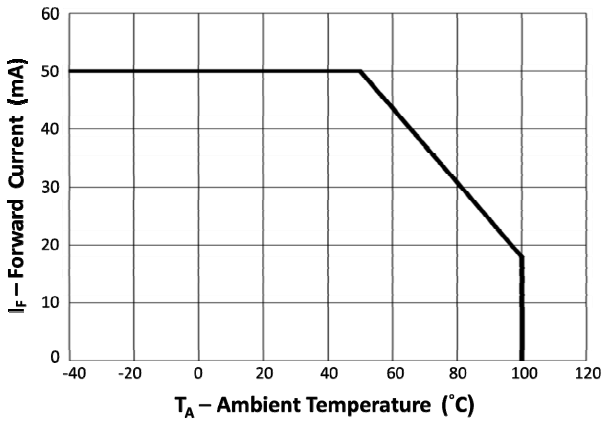


Fig 1 Forward Current vs Ambient Temperature

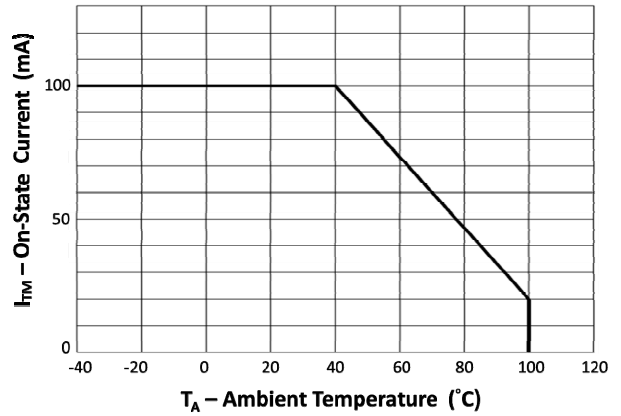


Fig 2 On-State Current vs Ambient Temperature

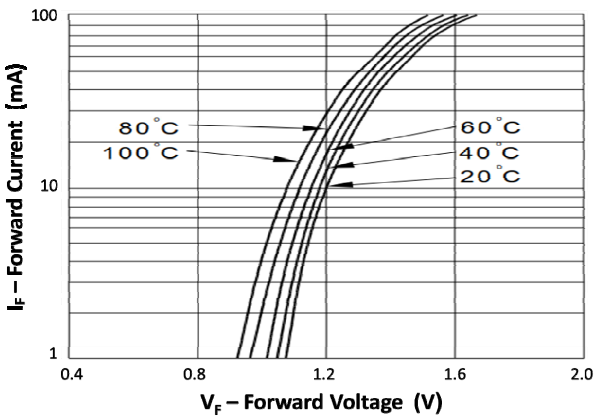


Fig 3 Forward Current vs Forward Voltage

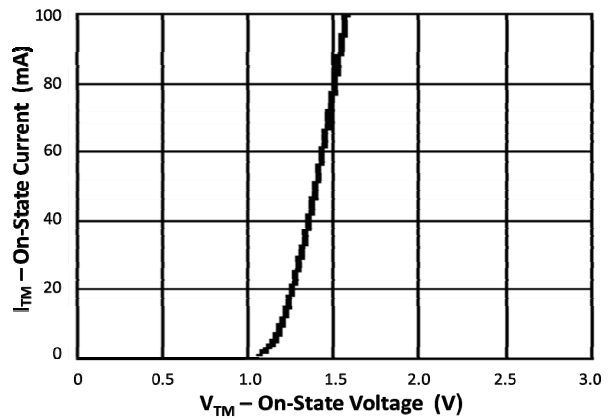


Fig 4 On-state Current vs On-State Voltage

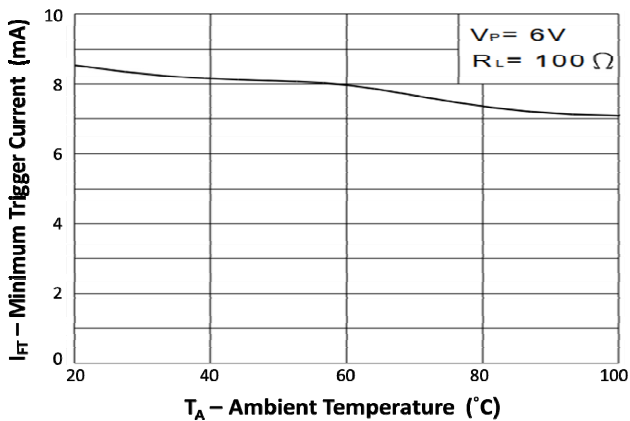


Fig 5 Minimum Trigger Current vs Ambient Temperature

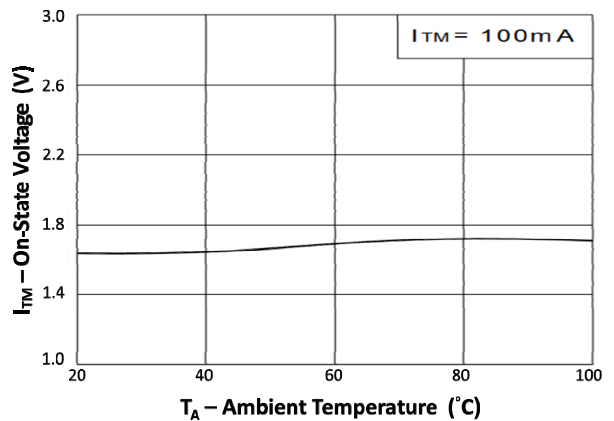


Fig 6 On-State Voltage vs Ambient Temperature

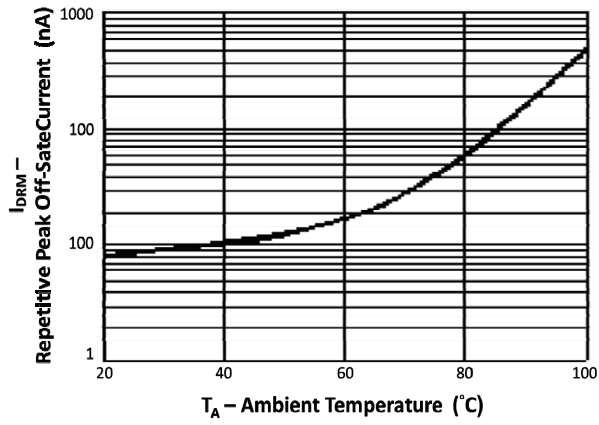


Fig 7 Repetitive Peak Off-State Current vs Ambient Temperature

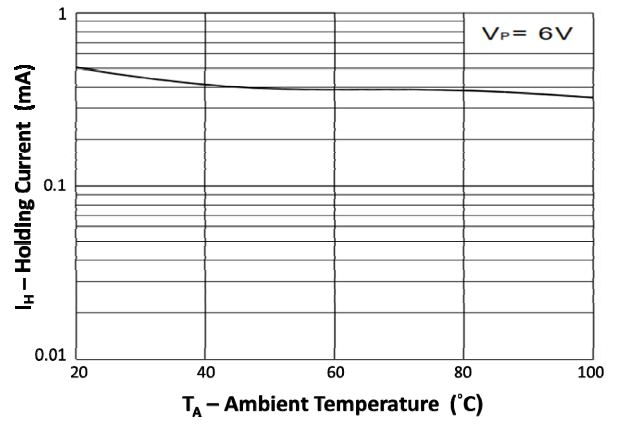


Fig 8 Holding Current vs Ambient Temperature

## MOC306x

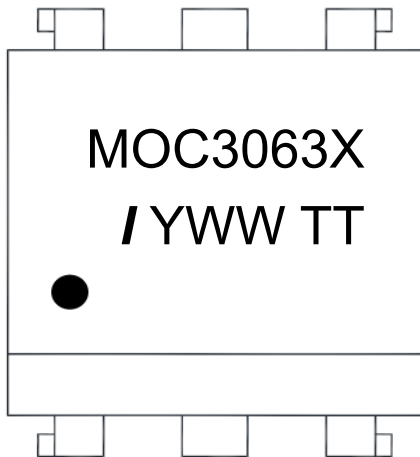
### ORDER INFORMATION

MOC306x (UL Approval)			
After PN	PN	Description	Packing quantity
None	MOC3060, MOC3061, MOC3062, MOC3063	Standard DIP6	65 pcs per tube
G	MOC3060G, MOC3061G, MOC3062G, MOC3063G	10mm Lead Spacing	65 pcs per tube
SM	MOC3060SM, MOC3061SM, MOC3062SM, MOC3063SM	Surface Mount	65 pcs per tube
SMT&R	MOC3060SMT&R, MOC3061SMT&R, MOC3062SMT&R, MOC3063SMT&R	Surface Mount Tape & Reel	1000 pcs per reel

MOC306x (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	MOC3060X, MOC3061X, MOC3062X, MOC3063X	Standard DIP6	65 pcs per tube
G	MOC3060XG, MOC3061XG, MOC3062XG, MOC3063XG	10mm Lead Spacing	65 pcs per tube
SM	MOC3060XSM, MOC3061XSM, MOC3062XSM, MOC3063XSM	Surface Mount	65 pcs per tube
SMT&R	MOC3060XSMT&R, MOC3061XSMT&R, MOC3062XSMT&R, MOC3063XSMT&R	Surface Mount Tape & Reel	1000 pcs per reel

**DEVICE MARKING**

**Example : MOC3063X**



MOC3063X Denotes Device Part Number

/ denotes Isocom

Y denotes 2 digit Year code

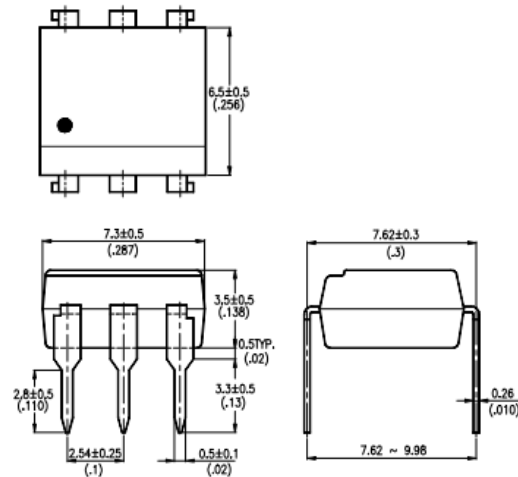
WW denotes 2 digit Week code

TT UL Package System Code

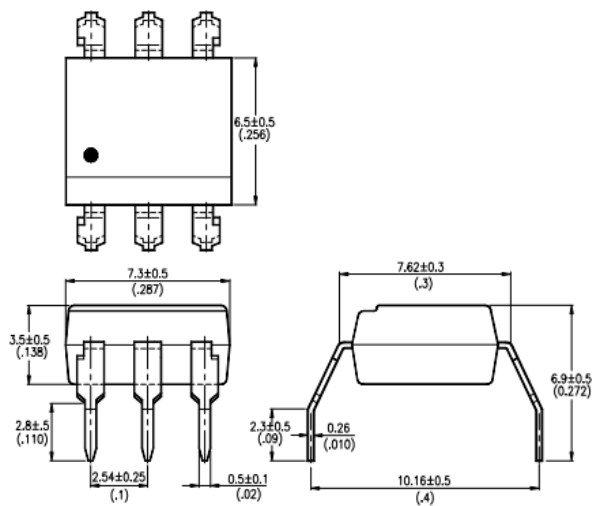
# MOC306x

## PACKAGE DIMENSIONS in mm (inch)

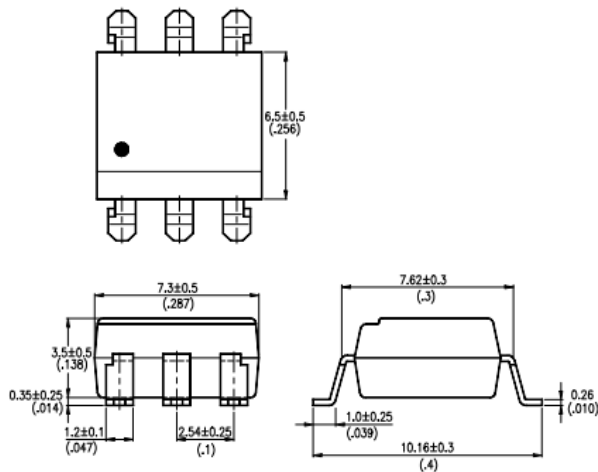
### DIP



### G Form



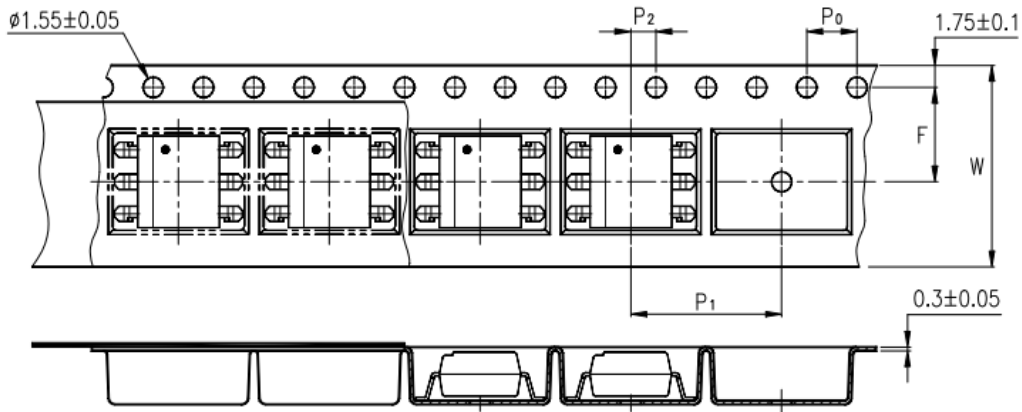
### SMD





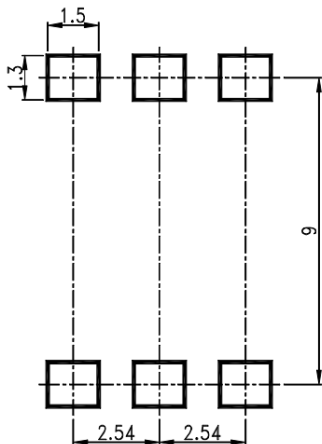
## MOC306x

### TAPE AND REEL PACKAGING

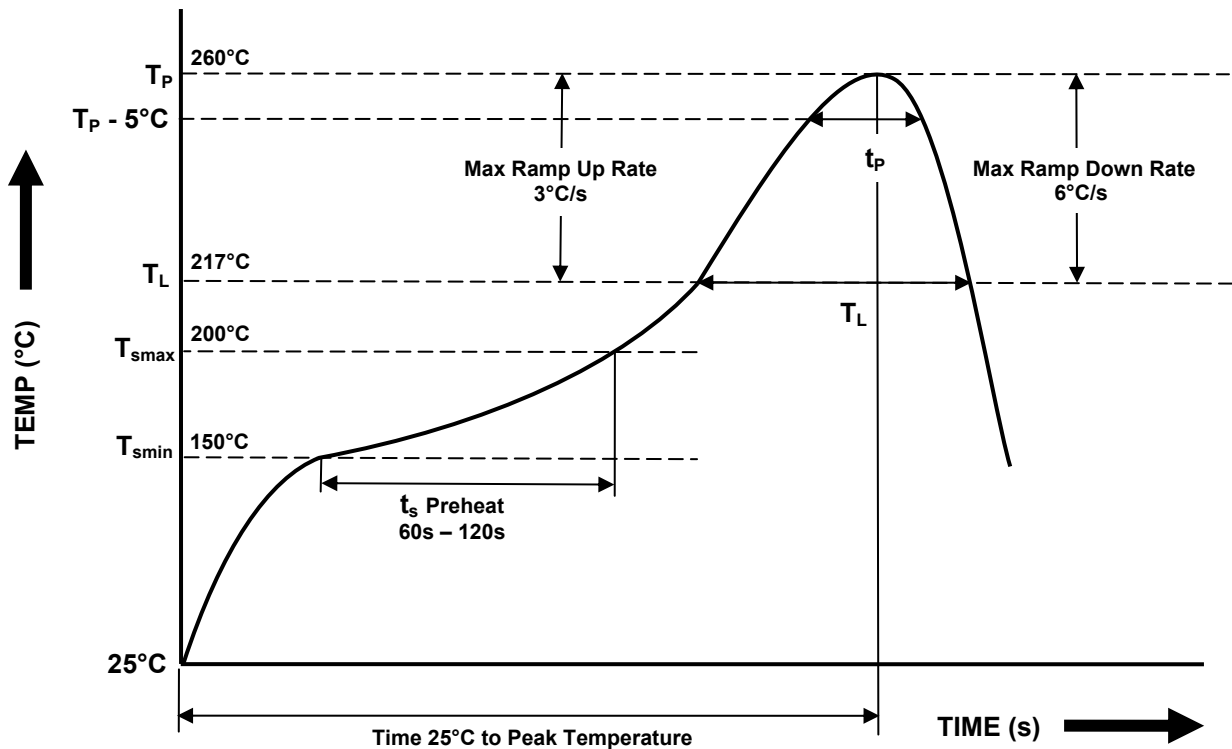


Description	Symbol	Dimension mm (inch)
Tape Width	W	16 ± 0.3 (0.63)
Pitch of Sprocket Holes	P <sub>0</sub>	4 ± 0.1 (0.15)
Distance of Compartment to Sprocket Holes	F	7.5 ± 0.1 (0.295)
	P <sub>2</sub>	2 ± 0.1 (0.079)
Distance of Compartment to Compartment	P <sub>1</sub>	12 ± 0.1 (0.47)

### RECOMMENDED PAD LAYOUT for SMD (mm)



**IR REFLOW SOLDERING TEMPERATURE PROFILE**  
**One Time Reflow Soldering is Recommended.**  
**Do not immerse device body in solder paste.**



Profile Details	Conditions
<b>Preheat</b> - Min Temperature (T <sub>SMIN</sub> ) - Max Temperature (T <sub>SMAX</sub> ) - Time T <sub>SMIN</sub> to T <sub>SMAX</sub> (t <sub>s</sub> )	150°C 200°C 60s - 120s
<b>Soldering Zone</b> - Peak Temperature (T <sub>P</sub> ) - Time at Peak Temperature - Liquidous Temperature (T <sub>L</sub> ) - Time within 5°C of Actual Peak Temperature (T <sub>P</sub> - 5°C) - Time maintained above T <sub>L</sub> (t <sub>L</sub> ) - Ramp Up Rate (T <sub>L</sub> to T <sub>P</sub> ) - Ramp Down Rate (T <sub>P</sub> to T <sub>L</sub> )	260°C 10s max 217°C 30s max 60s - 100s 3°C/s max 6°C/s max
Average Ramp Up Rate (T <sub>smax</sub> to T <sub>P</sub> )	3°C/s max
Time 25°C to Peak Temperature	8 minutes max



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