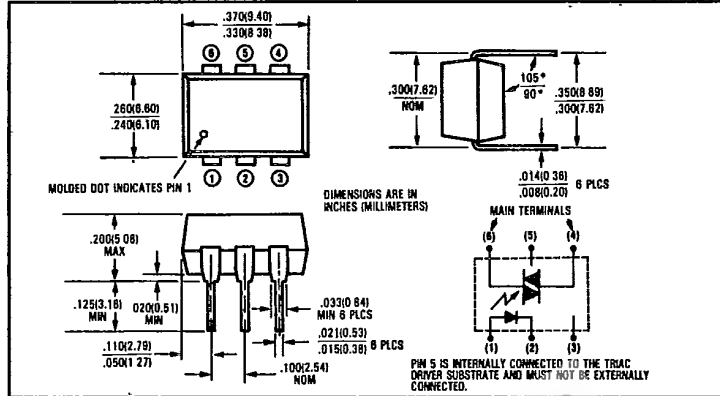
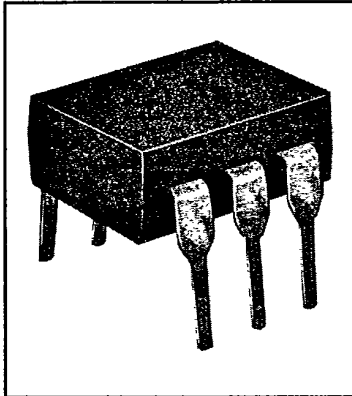


# Optically Coupled Triac Drivers

## Type OPI3009, OPI3010, OPI3011, OPI3012



### Features

- For 120 VAC operation
- 2500 VDC minimum electrical isolation
- Low LED trigger current to latch output
- UL recognized File No. E58730

### Description

The OPI3009, OPI3010, OPI3011, and OPI3012 each consist of a gallium arsenide or gallium aluminum arsenide infrared emitting diode and a monolithic integrated circuit containing a photo-diode and a bidirectional switch, mounted in a standard plastic six pin dual-in-line package. This series is intended to interface electronic controls with power triacs to control resistive and inductive loads as in motors, solenoids, and appliances.

### Absolute Maximum Ratings (T<sub>A</sub> = 25°C unless otherwise noted)

Input-to-Output Isolation Voltage	± 2500 VDC <sup>(1)</sup>
Storage Temperature Range	-40°C to +150°C
Operating Temperature Range	-40°C to +85°C
Lead Soldering Temperature (1/16 inch [1.6 mm] from case for 5 sec. with soldering iron) <sup>(2)</sup>	260°C
Total Device Power Dissipation	.400 mW <sup>(3)</sup>

### Input Diode

Forward DC Current	I <sub>F</sub>	.60 mA
Reverse DC Voltage	V <sub>R</sub>	3.0 V
Power Dissipation	P <sub>D</sub>	100 mW <sup>(4)</sup>

### Output Photosensor

Off-State Terminal Voltage	V <sub>ORM</sub>	250 V
On-State RMS Current	I <sub>T</sub> (RMS)	[Full Cycle] T <sub>A</sub> = 25°C: 100 mA [50-60 Hz] T <sub>A</sub> = 70°C: 50 mA

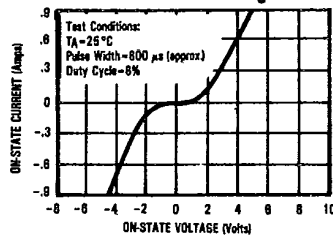
Peak Non-Repetitive Surge Current (PW = 10 ms, duty cycle = 10%)	I <sub>TSM</sub>	1.20 A
Power Dissipation	P <sub>D</sub>	.350 mW <sup>(5)</sup>

### Notes:

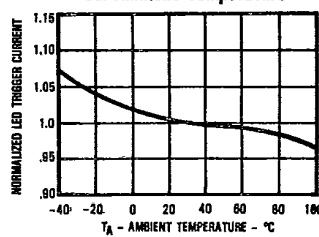
- (1) Measured with input diode leads shorted together and output leads shorted together.
- (2) BMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering.
- (3) Derate 7.27 mW/°C above 25°C.
- (4) Derate 1.82 mW/°C above 25°C.
- (5) Derate 6.38 mW/°C above 25°C.

### Typical Performance Curves

On-State Collector Current vs. On-State Voltage



Normalized LED Trigger Current vs. Ambient Temperature



Types OPI3009, OPI3010, OPI3011, OPI3012

T-41-87

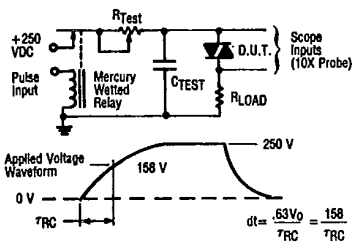
Electrical Characteristics (TA = 25°C unless otherwise noted)

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
<b>Input Diode</b>						
VF	Forward Voltage		1.20	1.50	V	IF = 10.0 mA
			1.40	1.70	V	IF = 30 mA
IR	Reverse Current	.0100	10.0		µA	VR = 3.0 V
<b>Output Photosensor</b>						
IDRM	Peak Blocking Current, Either Direction		10.0	100	nA	VDRM = 250 V. Must be applied within dV/dt rating
VTM	Peak On-State Voltage, Either Direction		1.75	3.0	V	ITM = 100 mA
dV/dt	Critical Rate of Rise of Off-State-Voltage		15.0		V/µs	RL = 2.5 kΩ
dV/dt	Critical Rate of Rise of Commutating Voltage		.140		V/µs	RL = 1.00 kΩ
<b>Coupled</b>						
IFT	LED Trigger Current Required to Latch Output in Either Direction	OPI3009	16.0	30	mA	Main Terminal Voltage = 3.0 V
		OPI3010	10.0	15.0	mA	Main Terminal Voltage = 3.0 V
		OPI3011	7.5	10.0	mA	Main Terminal Voltage = 3.0 V
		OPI3012	3.5	5.0	mA	Main Terminal Voltage = 3.0 V
IH	Holding Current, Either Direction		100		µA	

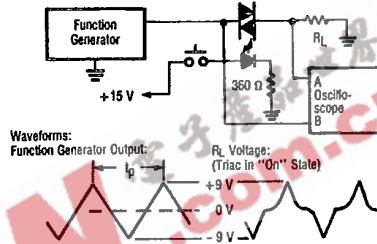


Typical Performance Curves

Static dV/dt Test Circuit



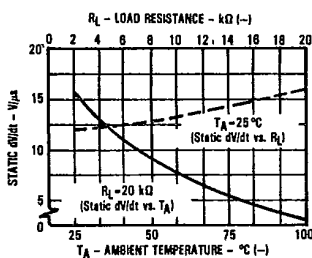
Commutating dV/dt Test Circuit



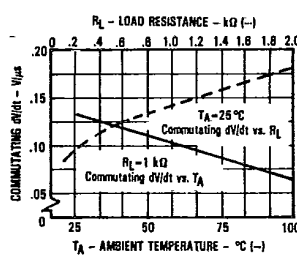
- The relay provides a high speed repeated pulse to the D.U.T.
- 10X probes are used to allow high speeds and voltages.
- The worst case condition for static dV/dt is established by triggering the D.U.T. with a normal input (LED) current, then removing this current. The variable RTEST allows the dV/dt to be increased until the D.U.T. continues to trigger in response to the applied voltage pulse, even after the LED current has been removed. The dV/dt is then decreased until the D.U.T. stops triggering. TRC is measured at this point and recorded.

- 10X probes are used to allow high speeds.
- Frequency is increased until the triac stays "on" after being triggered by pushbutton. Frequency is then decreased until triac turns "off." tp is measured at this point and recorded.
- Commutating dV/dt = 36/tp.

Static dV/dt vs. Ambient Temperature and Load Resistance



Commutating dV/dt vs. Ambient Temperature and Load Resistance



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