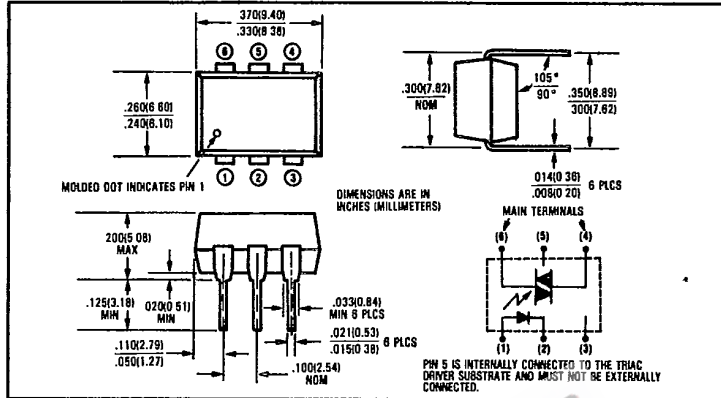
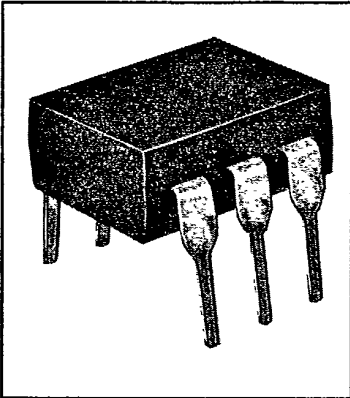




T-41-87

Optically Coupled Triac Drivers

Types OPI3020, OPI3021, OPI3022, OPI3023



Features

- For 220 VAC operation
- 2500 VDC minimum electrical isolation
- Low LED trigger current to latch output
- UL recognized File No. E58730

Description

The OPI3020, OPI3021, OPI3022, and OPI3023 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.

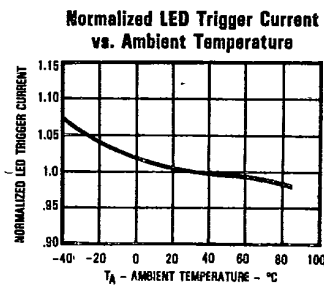
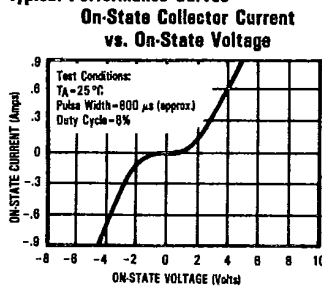
Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

Input-to-Output Isolation Voltage	±2500 VDC ⁽¹⁾
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) ⁽²⁾	260°C
Total Device Power Dissipation	400 mW ⁽³⁾
Input Diode	
Forward DC Current	I _F 60 mA
Reverse DC Voltage	V _R 3.0 V
Power Dissipation	P _D 100 mW ⁽⁴⁾
Output Photosensor	
Off-State Terminal Voltage	V _{DRM} 400 V
On-State RMS Current	I _T (RMS) [Full Cycle] T _A = 25°C 100 mA
	[50-60 Hz] T _A = 70°C 50 mA
Peak Non-Repetitive Surge Current (PW = 10 ms, duty cycle = 10%)	I _{TSM} 1.20 A
Power Dissipation	P _D 350 mW ⁽⁵⁾

Notes:

- (1) Measured with input diode leads shorted together and output leads shorted together.
- (2) RMA 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 0.36 mW/°C above 25°C.

Typical Performance Curves



Types OPI3020, OPI3021, OPI3022, OPI3023

T-41-87

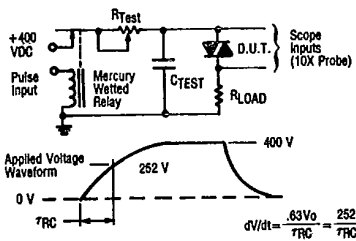
Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Input Diode						
V _F	Forward Voltage		1.20	1.60	V	I _F = 10.0 mA
			1.40	1.70	V	I _F = 30 mA
I _R	Reverse Current		.0100	100	μA	V _R = 3.0 V
Output Photosensor						
I _{DRM}	Peak Blocking Current, Either Direction		10.0	100	nA	V _{DRM} = 400 V. Must be applied within dV/dt rating
V _{TM}	Peak On-State Voltage, Either Direction		1.75	3.0	V	I _{TM} = 100 mA
dV/dt	Critical Rate of Rise of Off-State Voltage		16.0		V/μs	R _L = 1 kΩ
dV/dt	Critical Rate of Rise of Commutating Voltage		.140		V/μs	R _L = 4 kΩ
Coupled						
I _{FT}	LED Trigger Current Required to Latch Output in Either Direction		15.0	30	mA	Main Terminal Voltage = 3.0 V
	OPI3020		10.0	15.0	mA	Main Terminal Voltage = 3.0 V
	OPI3021		7.5	10.0	mA	Main Terminal Voltage = 3.0 V
	OPI3022		3.5	5.0	mA	Main Terminal Voltage = 3.0 V
	OPI3023					Main Terminal Voltage = 3.0 V
I _H	Holding Current, Either Direction		100		μA	

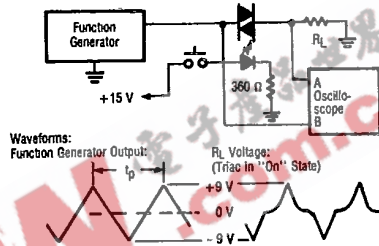


Typical Performance Curves

Static dV/dt Test Circuit



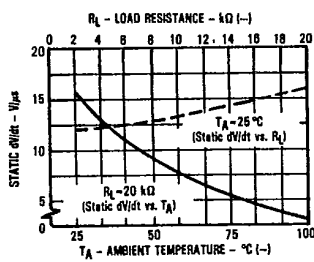
Commutating dV/dt Test Circuit



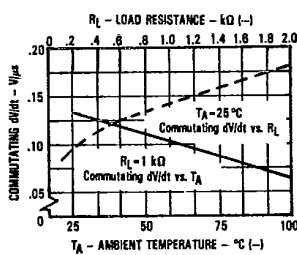
- The relay provides a high speed repeated pulse to the D.U.T.
- 10X probes are used to allow high speeds and voltages.
- The worst case condition for static dV/dt is established by triggering the D.U.T. with a normal input (LED) current, then removing this current. The variable R_{TEST} allows the dV/dt 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. 7RC 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." t_p is measured at this point and recorded.
- Commutating dV/dt = 36/t_p.

Static dV/dt vs. Ambient Temperature and Load Resistance



Commutating dV/dt vs. Ambient Temperature and Load Resistance



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