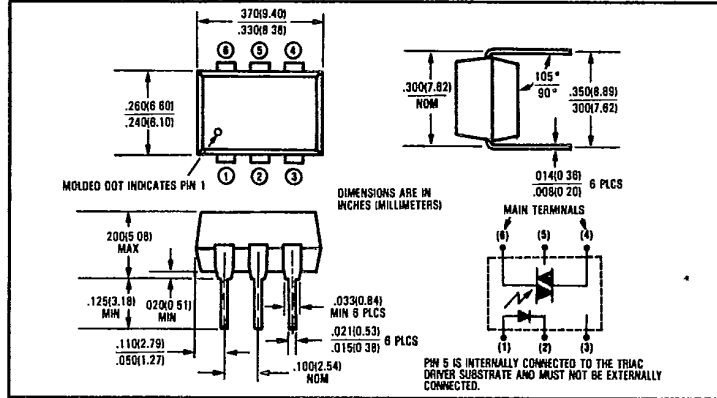
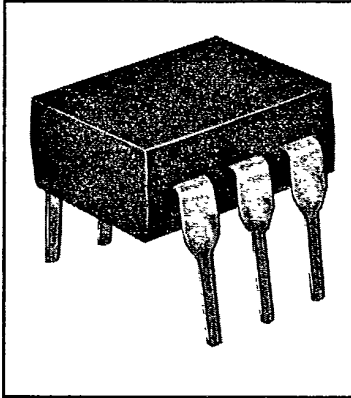




T-41-87

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 (TA=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	IF	60 mA
Reverse DC Voltage	VR	3.0 V
Power Dissipation	PD	100 mW ⁽⁴⁾

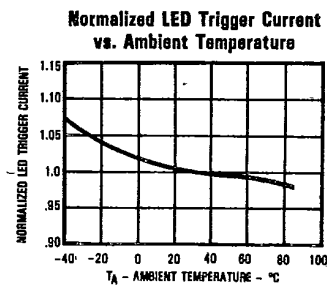
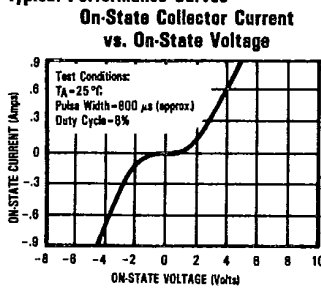
Output Photosensor

Off-State Terminal Voltage	VDRM	400 V
On-State RMS Current	Ir(RMS)	[Full Cycle] TA=25°C: 100 mA [50-60 Hz] TA=70°C: 50 mA
Peak Non-Repetitive Surge Current (PW=10 ms, duty cycle=10%)	ITSM	1.20 A
Power Dissipation	PD	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 6.35 mW/°C above 25°C.

Typical Performance Curves



Types OPI3020, OPI3021, OPI3022, OPI3023

T-41-87

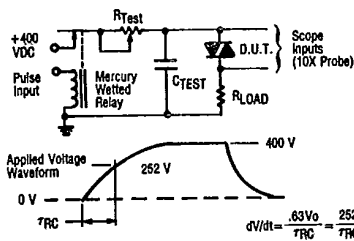
Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Input Diode						
V _F	Forward Voltage		1.20 1.40	1.60 1.70	V	I _F = 10.0 mA 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		15.0		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 10.0 7.5 3.5	30 15.0 10.0 5.0	mA	Main Terminal Voltage = 3.0 V Main Terminal Voltage = 3.0 V Main Terminal Voltage = 3.0 V Main Terminal Voltage = 3.0 V
I _H	Holding Current, Either Direction		100		μA	

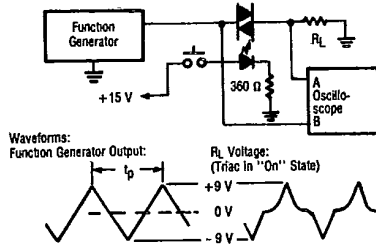


Typical Performance Curves

Static dV/dt Test Circuit



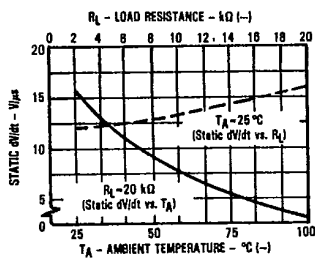
Commutating dV/dt Test Circuit



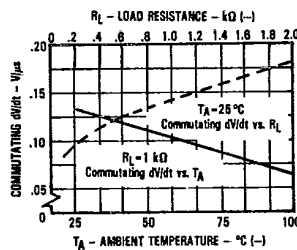
- The relay provides a high speed repeated pulse to the D.U.T.
- 10X probes are used to allow high speeds and voltages.
- The worst case condition for static dV/dt is established by triggering the D.U.T. with a normal input (LED) current, then removing this current. The variable R_{TEST} allows the dV/dt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

Static dV/dt vs. Ambient Temperature and Load Resistance



Commutating dV/dt vs. Ambient Temperature and Load Resistance



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