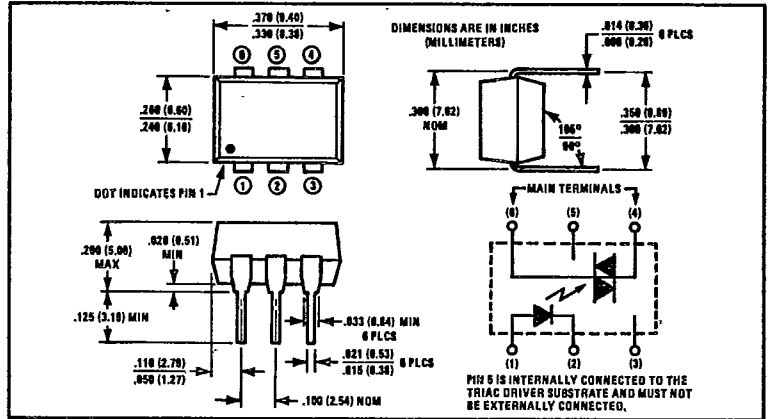
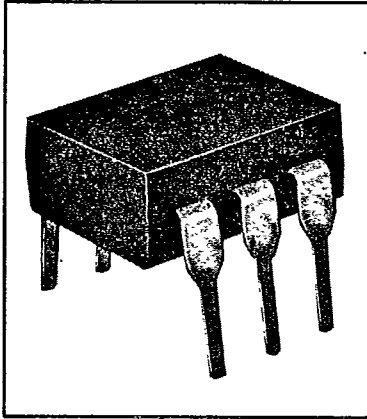


T-41-87

Zero Voltage Crossing Optically Coupled Triac Drivers

Types OPI3040, OPI3041, OPI3042, OPI3043



Features

- For 220 VAC operation
- 2500 VDC minimum electrical isolation
- Zero voltage crossing for reduced EMI and line noise, and improved static dV/dt
- UL recognized File No. E58730

Description

The OPI3040, OPI3041, OPI3042, and OPI3043 each contain a gallium arsenide or gallium aluminum arsenide infrared emitting diode and a monolithic integrated circuit containing a photodiode and a zero voltage bidirectional triac driver, mounted in a standard plastic six pin dual-in-line package. Required LED drive currents are 30 mA, 15 mA, 10 mA, and 5 mA, respectively. This series is intended to be used for low power DC controlling of power triacs which in turn control resistive, inductive, or capacitance loads powered from 220 VAC. Zero voltage crossing ensures that the devices will not turn on until the line voltage reduces to 15 volts, typical.

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

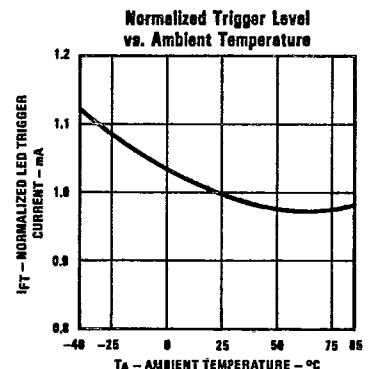
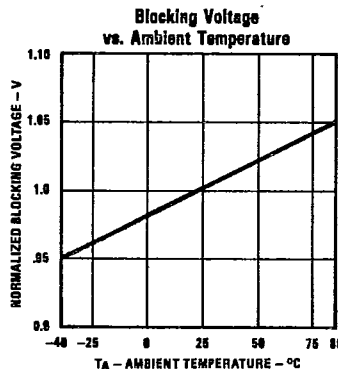
Forward DC Current	IF	60 mA
Reverse DC Voltage	VR	3.0 V
Power Dissipation	PD	100 mW ⁽⁴⁾

Output Photosensor

Off-State Terminal Voltage	VDRM	400 V
On-State RMS Current	IF(RMS)	100 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 6.67 mW/°C above 25°C. (4) Derate 1.67 mW/°C above 25°C. (5) Derate 6.83 mW/°C above 25°C.

Typical Performance Curves



Types OPI3040, OPI3041, OPI3042, OPI3043

T-41-87

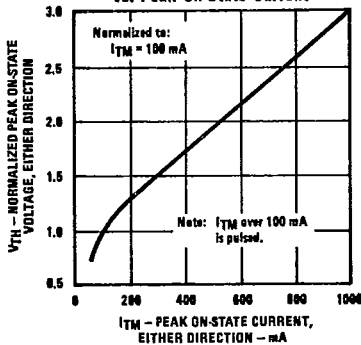
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Electrical Characteristics (T_A = 25°C unless otherwise noted)

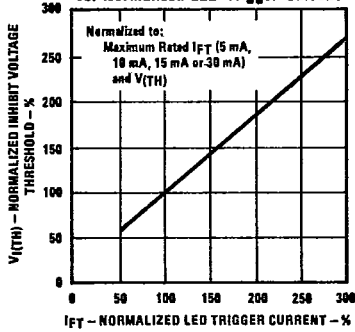
Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Input Diode						
V _F	Forward Voltage		1.20	1.50	V	I _F = 10.0 mA
I _R	Reverse Current			100	μA	V _R = 6.0 V
Output Photosensor						
I _{DRM}	Peak Blocking Current, Either Direction		10.0	100	nA	V _{DRM} = 400 V. Must be applied within dV/dt rating.
V _{TM}	Peak On-State Voltage, Either Direction		1.75	3.0	V	I _{TM} = 100 mA Peak
dV/dt	Critical Rate of Rise of Off-State Voltage		100		V/μs	
Coupled						
I _{FT}	LED Trigger Current Required to Latch Output in Either Direction (Rated I _{FT})	OPI3040 OPI3041 OPI3042 OPI3043	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 R _L = 150 kΩ R _L = 150 kΩ
I _H	Holding Current, Either Direction		200		μA	
V _{ISO}	Isolation Voltage	2500			VDC	See Note (1)
V _{I(TH)}	Zero Voltage Crossing Inhibit Voltage Threshold		15.0	40	V	I _{FT} = Rated I _{FT} . MT1, MT2 voltage above which the device will not trigger.
I _{R(I)}	Leakage Current in Inhibit State	OPI3040 & OPI3041 OPI3042 & OPI3043	100 100	300 200	μA	I _{FT} and MT1, MT2 voltage, as rated. Device in off-state.

Typical Performance Curves

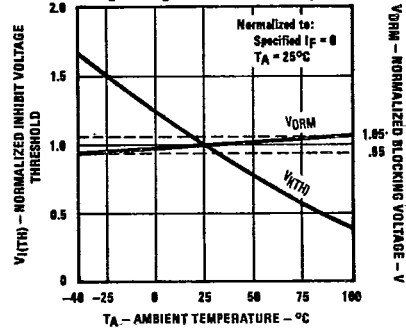
Normalized Peak On-State Voltage vs. Peak On-State Current



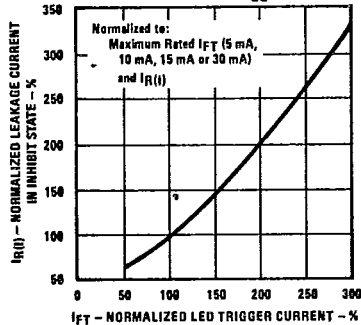
Normalized Inhibit Voltage Threshold vs. Normalized LED Trigger Current



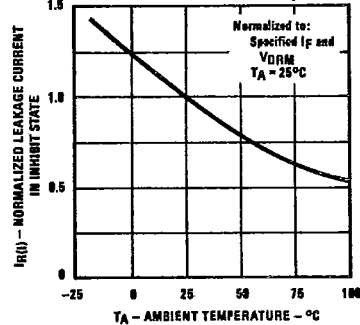
Normalized Inhibit Voltage Threshold and Blocking Voltage vs. Ambient Temperature



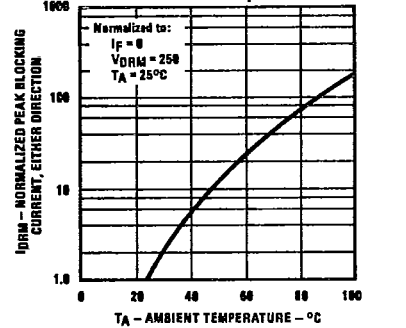
Normalized Leakage Current in Inhibit State vs. Normalized LED Trigger Current



Normalized Leakage Current in Inhibit State vs. Ambient Temperature



Normalized Peak Blocking Current vs. Ambient Temperature



TRW reserves the right to make changes at any time in order to improve design and to supply the best product possible.

Plastic color may vary.

Optoelectronics Division, TRW Electronic Components Group, 1216 W. Crosby Rd., Carrollton, TX 75006 (214) 329-2200, Tlx 6716032 or 216849
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