

Optoelectronics Division  
TRW Electronic Components Group

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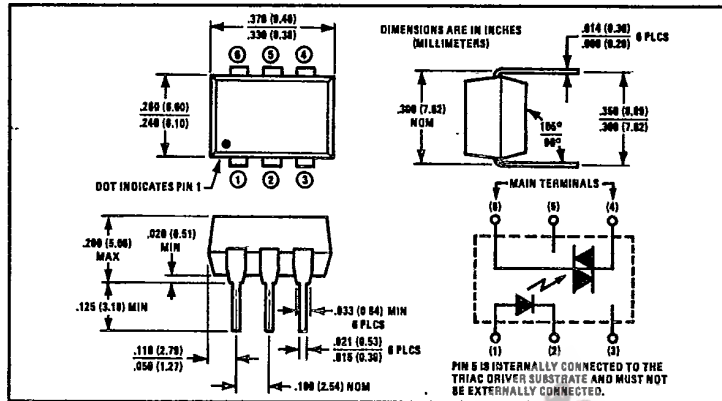
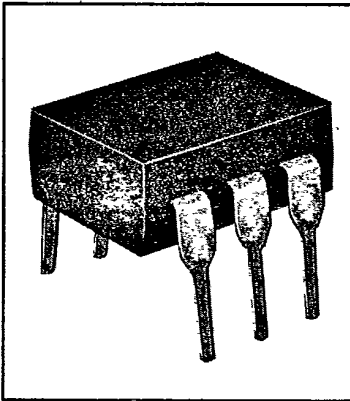
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T-41-87

# Zero Voltage Crossing Optically Coupled Triac Drivers

## Types OPI3030, OPI3031, OPI3032, OPI3033



### Features

- For 120 VAC operation
- 2500 VDC minimum electrical isolation
- Low LED trigger current to latch output
- Zero voltage crossing for reduced EMI and line noise, and improved static dV/dt
- UL recognized File No. E58730

### Description

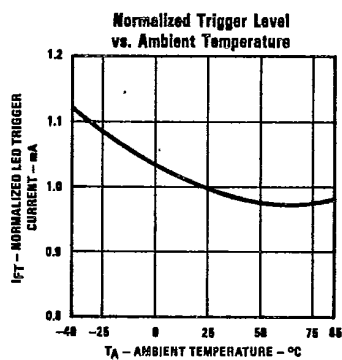
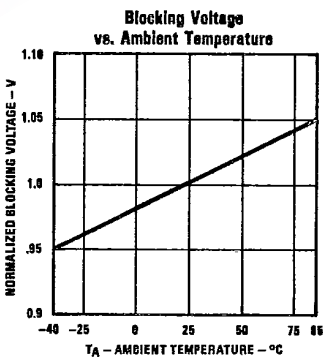
The OPI3030, OPI3031, OPI3032, and OPI3033 each contain a gallium arsenide or gallium aluminum arsenide infrared emitting diode and a monolithic integrated circuit containing a photodiode and a zero voltage bidirectional triac driver, mounted in a standard plastic six pin dual-in-line package. Required 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 120 VAC. Zero voltage crossing ensures that the devices will not turn on until the line voltage reduces to 15 volts, typical.

### 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>
<b>Input Diode</b>	
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>
<b>Output Photosensor</b>	
Off-State Terminal Voltage	V <sub>DRM</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>(4)</sup>

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 8.67 mW/°C above 25°C. (4) Derate 1.67 mW/°C above 25°C. (5) Derate 5.83 mW/°C above 25°C.

### Typical Performance Curves



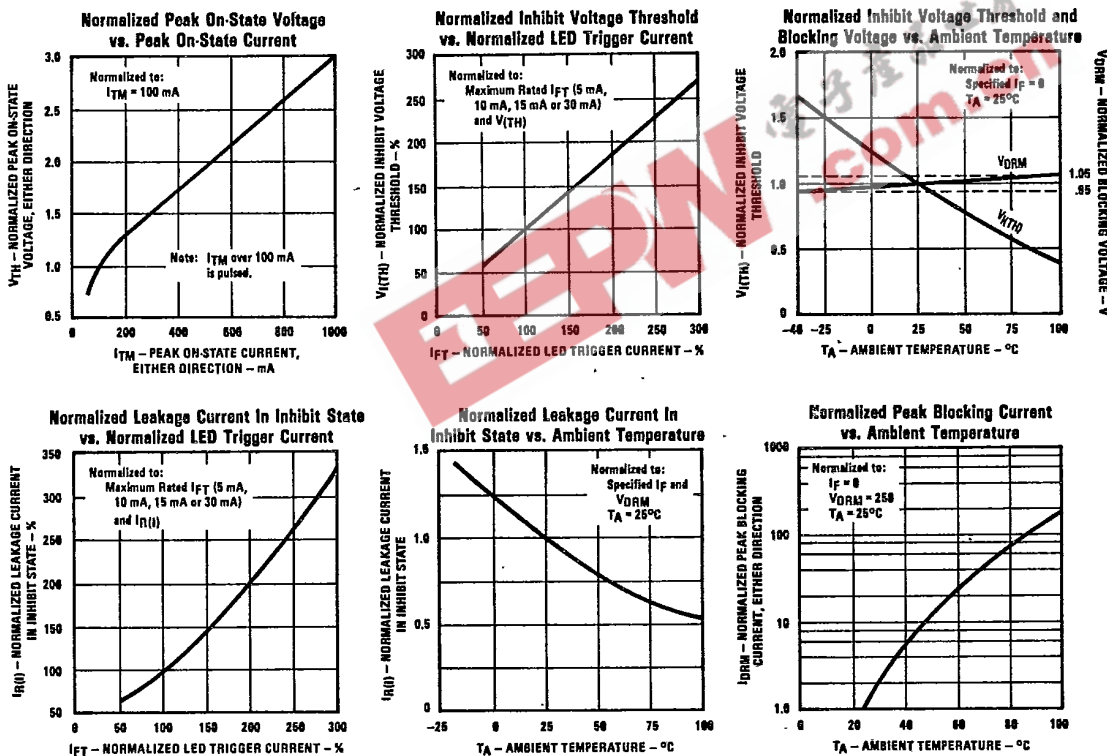
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T-41-87

Electrical Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
<b>Input Diode</b>						
V <sub>F</sub>	Forward Voltage		1.20	1.50	V	I <sub>F</sub> = 10.0 mA
I <sub>R</sub>	Reverse Current			100	μA	V <sub>R</sub> = 8.0 V
<b>Output Photosensor</b>						
I <sub>DRM</sub>	Peak Blocking Current, Either Direction		10.0	100	nA	V <sub>DRM</sub> = 250 V. Must be applied within dV/dt rating.
V <sub>TM</sub>	Peak On-State Voltage, Either Direction		1.76	3.0	V	I <sub>TM</sub> = 100 mA Peak
dV/dt	Critical Rate of Rise of Off-State Voltage		100		V/μs	
<b>Coupled</b>						
I <sub>FT</sub>	LED Trigger Current Required to Latch Output in Either Direction (Rated I <sub>FT</sub> )	OPI3030 OPI3031 OPI3032 OPI3033	15.0 10.0 7.5 3.6	30 15.0 10.0 6.0	mA	Main Terminal Voltage = 3.0 V Main Terminal Voltage = 3.0 V R <sub>L</sub> = 150 kΩ R <sub>L</sub> = 150 kΩ
I <sub>H</sub>	Holding Current, Either Direction		200		μA	
V <sub>ISO</sub>	Isolation Voltage	2500			VDC	See Note (1)
V <sub>I(TH)</sub>	Zero Voltage Crossing Inhibit Voltage Threshold		16.0	25	V	I <sub>FT</sub> = Rated I <sub>FT</sub> . MT1, MT2 voltage above which the device will not trigger.
I <sub>R(I)</sub>	Leakage Current in Inhibit State	OPI3030 & OPI3031 OPI3032 & OPI3033	100 100	300 200	μA	I <sub>FT</sub> and MT1, MT2 voltage as rated. Device in off-state.

Typical Performance Curves



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.  
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