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Optoelectronics Division
TRW Electronic Components Group

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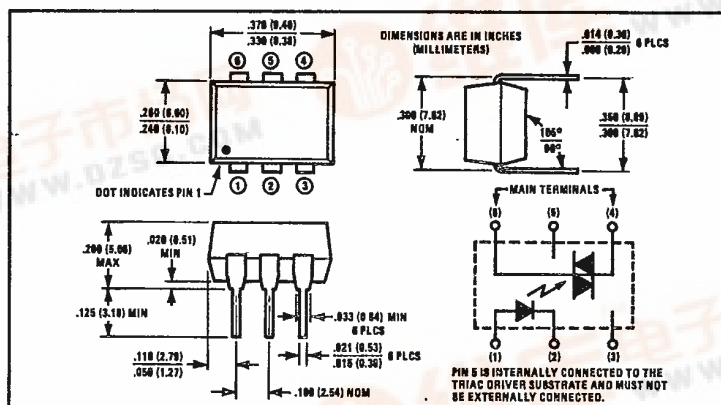
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TRW

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 ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Input-to-Output Isolation Voltage	$\pm 2500 \text{ VDC}^{(1)}$
Storage Temperature Range	-40°C to $+150^\circ\text{C}$
Operating Temperature Range	-40°C to $+85^\circ\text{C}$
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⁾

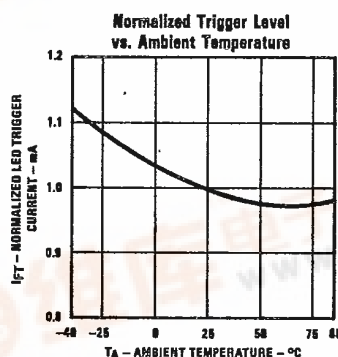
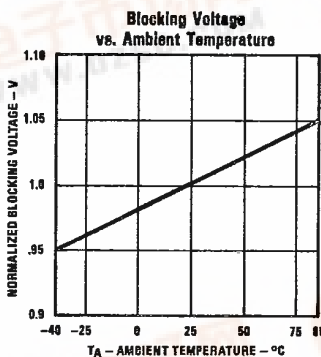
Output Photosensor

Off-State Terminal Voltage	V_{ORM} 250 V
On-State RMS Current	$I_T(\text{RMS})$ Full Cycle, $T_A = 25^\circ\text{C}$ 100 mA
	60-60 Hz, $T_A = 70^\circ\text{C}$ 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 6.67 mW/ $^\circ\text{C}$ above 25°C . (4) Derate 1.67 mW/ $^\circ\text{C}$ above 25°C . (5) Derate 5.83 mW/ $^\circ\text{C}$ above 25°C .

Typical Performance Curves



Optoelectronics Division, TRW Electronic Components Group, 1215 W. Crosby Rd., Carrollton, TX 75006 (214) 323-2200, TLX 6716032 or 215849

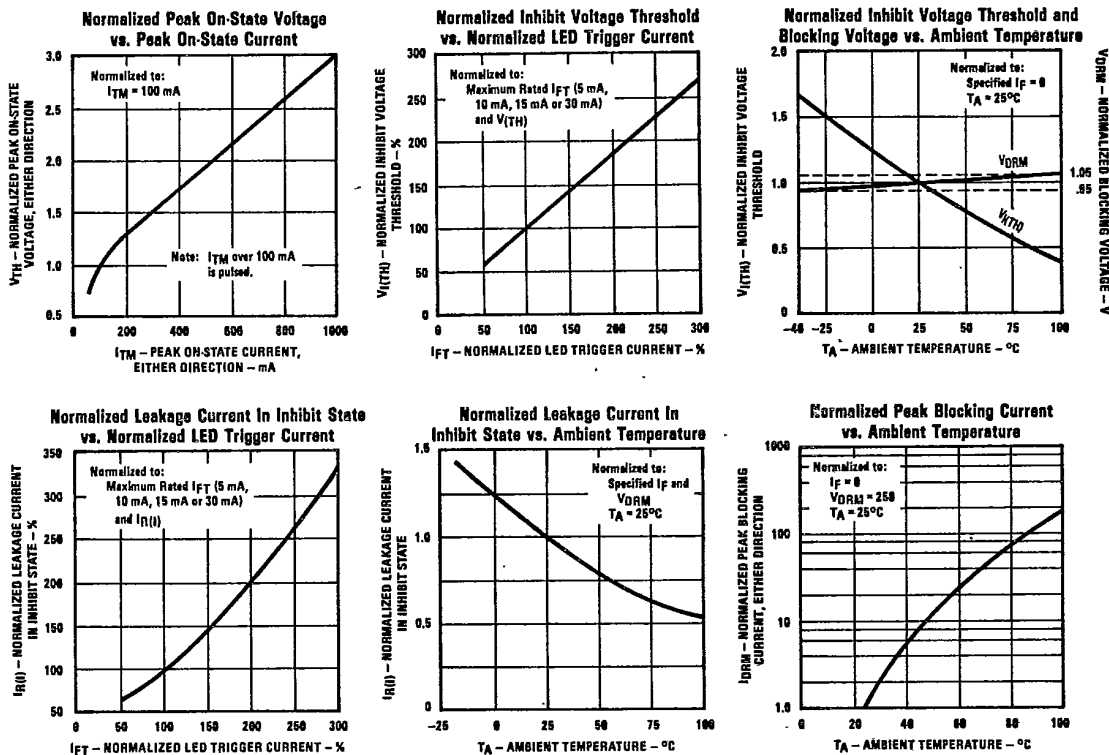
Types OPI3030, OPI3031, OPI3032, OPI3033

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Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Input Diode						
V_F	Forward Voltage		1.20	1.60	V	$I_F = 10.0\text{ mA}$
I_R	Reverse Current			100	μA	$V_R = 8.0\text{ V}$
Output Photosensor						
I_{ORM}	Peak Blocking Current, Either Direction		10.0	100	nA	$V_{ORM} = 250\text{ V}$. Must be applied within dV/dt rating.
V_{TM}	Peak On-State Voltage, Either Direction		1.75	3.0	V	$I_{TM} = 100\text{ mA Peak}$
dV/dt	Critical Rate of Rise of Off-State Voltage		100		$\text{V}/\mu\text{s}$	
Coupled						
I_{FT}	LED Trigger Current Required to Latch Output in Either Direction (Rated I_{FT})	OPI3030 OPI3031 OPI3032 OPI3033	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 $R_L = 150\text{ k}\Omega$ $R_L = 150\text{ k}\Omega$
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	25	V	I_{FT} = Rated I_{FT} . MT1, MT2 voltage above which the device will not trigger.
$I_{R(I)}$	Leakage Current in Inhibit State	OPI3030 & OPI3031 OPI3032 & OPI3033	100 100	300 200	μA	I_{FT} 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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