

Optoelectronics Division
TRW Electronic Components Group

Product Bulletin 5216
January 1985

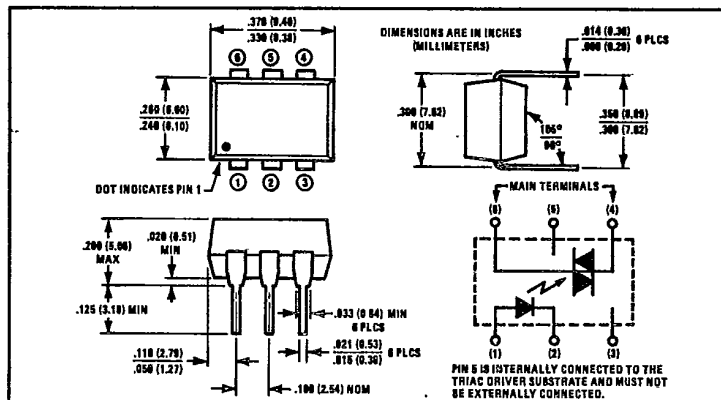
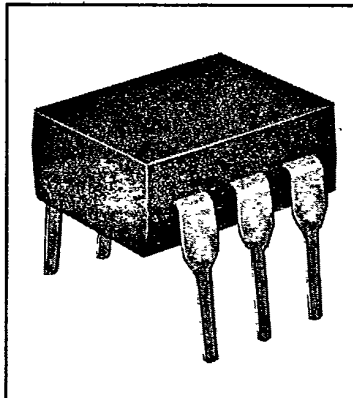
1987 Cost Saver Product!
Call TRW for more information!

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	$.400 \text{ mW}^{(3)}$

Input Diode

Forward DC Current	I_F	60 mA
Reverse DC Voltage	V_R	3.0 V
Power Dissipation	P_D	$100 \text{ mW}^{(4)}$

Output Photosensor

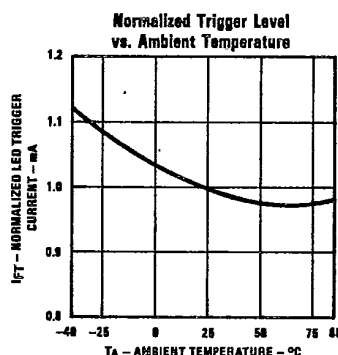
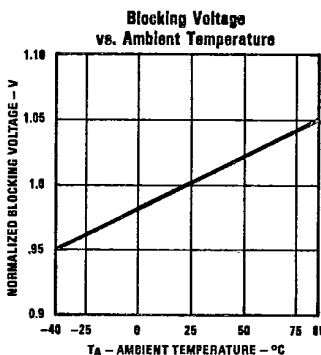
Off-State Terminal Voltage	V_{DRM}	250 V
On-State RMS Current	$I_T(\text{RMS})$	$\begin{cases} \text{Full Cycle, } T_A = 25^\circ\text{C} & 100 \text{ mA} \\ 60-80 \text{ Hz, } T_A = 70^\circ\text{C} & 60 \text{ mA} \end{cases}$

Peak Non-Repetitive Surge Current ($PW = 10 \text{ ms}$, duty cycle = 10%) $I_{TSM} = 1.20 \text{ A}$

Power Dissipation $P_D = 350 \text{ mW}^{(5)}$

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 $8.67 \text{ mW}/^\circ\text{C}$ above 25°C . (4) Derate $1.87 \text{ mW}/^\circ\text{C}$ above 25°C . (5) Derate $5.83 \text{ mW}/^\circ\text{C}$ above 25°C .

Typical Performance Curves



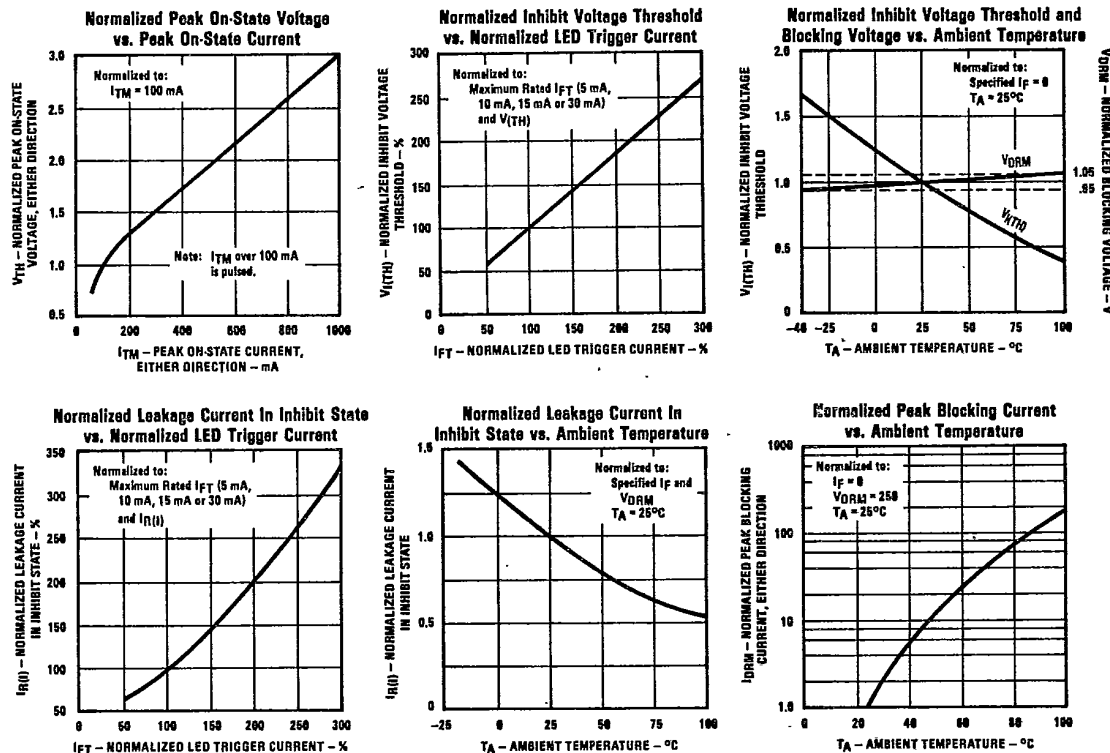
Types OPI3030, OPI3031, OPI3032, OPI3033

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	1.50	V	I _F = 10.0 mA
I _R	Reverse Current			100	μA	V _R = 6.0 V
Output Photosensor						
I _{ORM}	Peak Blocking Current, Either Direction		10.0	100	nA	V _{ORM} = 250 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})	OPI3030	15.0	30	mA	Main Terminal Voltage = 3.0 V
		OPI3031	10.0	15.0	mA	Main Terminal Voltage = 3.0 V
		OPI3032	7.5	10.0	mA	R _L = 150 kΩ
		OPI3033	3.5	5.0	mA	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	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	100	300	μA	I _{FT} and MT1, MT2 voltage as rated. Device in off-state.
		OPI3032 & OPI3033	100	200	μA	

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.
 Optoelectronics Division, TRW Electronic Components Group, 1215 W. Crosby Rd., Carrollton, TX 75006 (214) 323-2200, TLX 6716032 or 215849
 © TRW Inc. 1985, 1983. TRW is the name and mark of TRW Inc. Printed in U.S.A.