

Optoelectronics Division
TRW Electronic Components Group

Product Bulletin 5209
January 1985

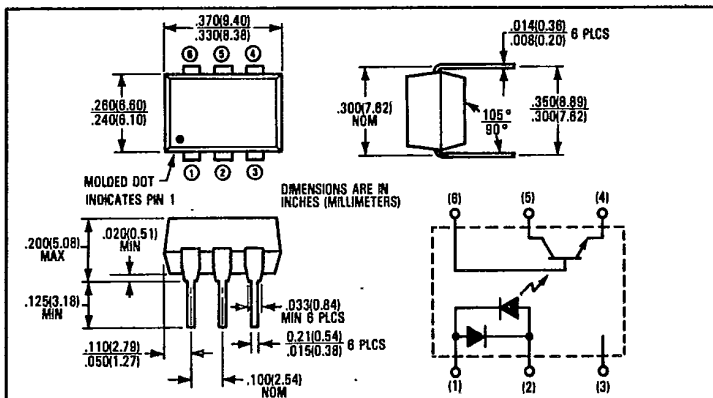
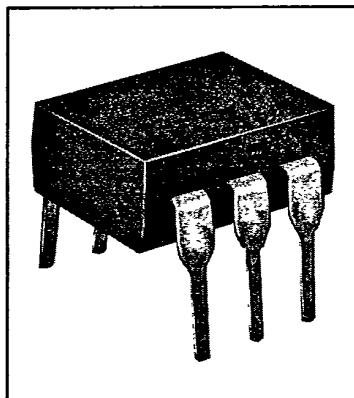
1987 Cost Saver Product!
Call TRW for more information!

TRW

T-41-83...

Optically Coupled Isolators

Types OPI2500, OPI2501



Features

- Two inverse parallel LEDs for AC to logic interfacing
- Low cost six pin dual-in-line package

Description

The OPI2500 and OPI2501 are bi-directional optically coupled isolators consisting of two gallium arsenide infrared emitting diodes connected in inverse parallel and an NPN silicon phototransistor mounted in a standard plastic six pin dual-in-line package. This device is intended for applications where the input to the LEDs is AC.

Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

Input-to-Output Isolation Voltage	±1500 VDC ⁽¹⁾
Storage Temperature Range	-55°C to +150°C
Operating Temperature Range	-55°C to +100°C
Lead Soldering Temperature (1/16 inch [1.6 mm] from case for 3 sec. with soldering iron) ⁽²⁾	260°C

Input Diode

Forward DC Current	±60 mA
Peak Forward Current (1 μs pulse width, 300 pps)	±3.0 A
Power Dissipation	100 mW ⁽³⁾

Output Phototransistor

V _{BRICE0}	30 V
V _{BRICB0}	70 V
V _{BRICE0}	5.0 V
Power Dissipation OPI2500	150 mW ⁽⁴⁾
OPI2501	300 mW ⁽⁵⁾

Notes:

- (1) Measured with input leads shorted together and phototransistor leads shorted together.
- (2) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering or using a solder pot.
- (3) Derate linearly 1.33 mW/°C above 25°C.
- (4) Derate linearly 2.0 mW/°C above 25°C.

Types OPI2500, OPI2501

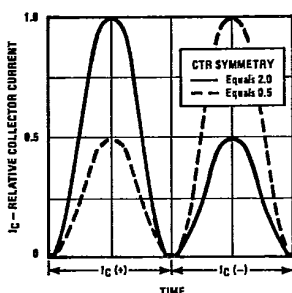
T-41-83 -

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

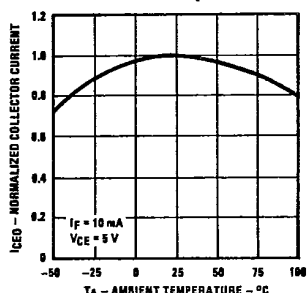
Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Input Diode						
V _F	Forward Voltage			1.50	V	I _F = 10.0 mA
Output Phototransistor						
V _{(BR)CEO}	Collector-to-Emitter Breakdown Voltage	30			V	I _C = 1.00 mA
V _{(BR)ECO}	Emitter-to-Collector Breakdown Voltage	5.0			V	I _E = 10.0 μA
V _{(BR)CBO}	Collector-to-Base Breakdown Voltage	70			V	I _C = 10.0 μA
I _{CEO}	Collector-Emitter Dark Current		5.0	50	nA	V _{CE} = 10.0 V
C _{CE}	Capacitance Collector-to-Emitter		8.0		pF	V _{CE} = 0
h _{FE}	DC Current Gain		250			V _{CE} = 5.0 V, I _C = 100 μA
Coupled						
I _C /I _F	DC Current Transfer Ratio	OPI2500 OPI2501	12.5 20.0	20	%	I _F = ±10.0 mA, V _{CE} = 5.0 V
I _C (+)/I _C (-)	CTR Symmetry (OPI2501 only)		0.5	2.0	(ratio)	I _F = ±10.0 mA, V _{CE} = 10.0 V
V _{CE(SAT)}	Collector-to-Emitter Saturation Voltage			0.50	V	I _F = ±10.0 mA, I _C = 1.00 mA
V _{ISO}	Isolation Voltage	1500			V	See Note 1
R _{IO}	Input-to-Output Resistance	10 ¹¹			Ω	V _{IO} = 500 V. See Note 1
C _{IO}	Input-to-Output Capacitance		2.0		pF	f = 1.00 MHz. See Note 1
t _r	Output Rise Time		2.0		μs	V _{CE} = 10.0 V, I _C = 2.0 mA
t _f	Output Fall Time		2.0		μs	R _L = 100 Ω. See Test Circuit

Typical Performance Curves

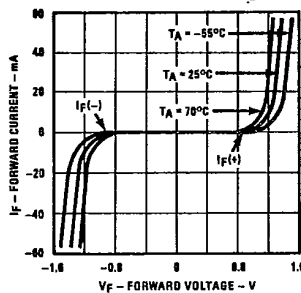
Relative Output Current Wave Form



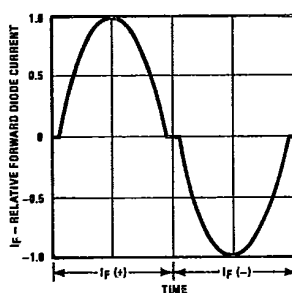
Normalized Collector Current vs Ambient Temperature



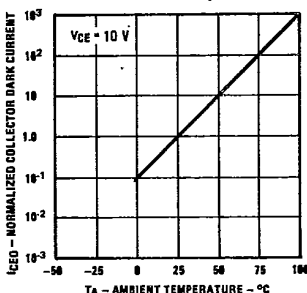
Diode Forward Current vs Diode Forward Voltage



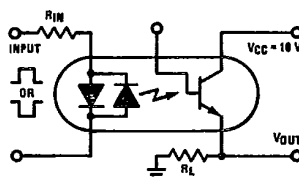
Relative Input Current Wave Form



Normalized Collector Dark Current vs Ambient Temperature



Switching Time Test Circuit



Note: Rise Time (t_r) is time required for collector current to increase from 10% to 90% of its final value. Fall Time (t_f) is time required for the collector current to decrease from 90% to 10% of its initial value.

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. TRW is the name and mark of TRW Inc.

Printed in U.S.A.