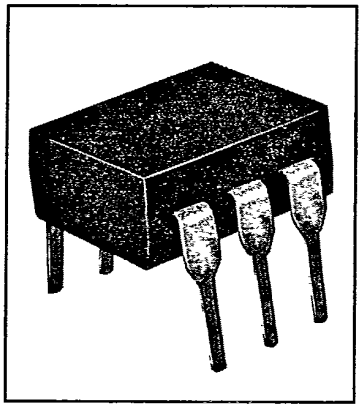
Optoelectronics Division
TRW Electronic Components Group

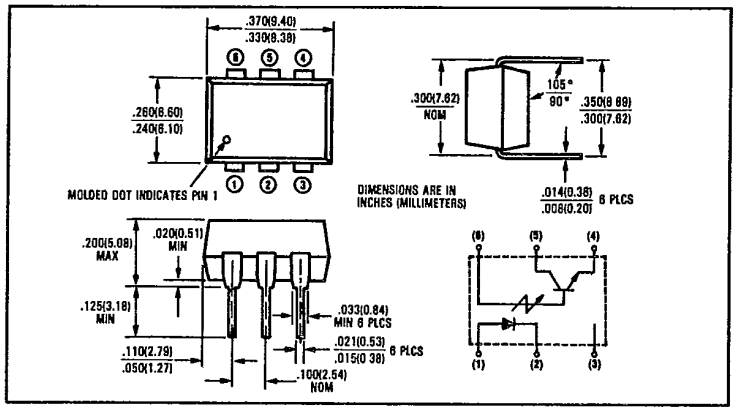
Product Bulletin 5201
January 1985

1987 Cost Saver Product!
Call TRW for more information!

T-41-83

Optically Coupled Isolators
Types OPI2150, OPI2250





Features
- 1500 or 2500 volt isolation
- High current transfer ratio
- Low cost 6 pin dual-in-line package
- UL recognized File No. E58730

Description
The OPI2150 and OPI2250 each consist of a gallium arsenide infrared emitting diode coupled to an NPN silicon phototransistor mounted in a six pin dual-in-line package. The OPI2150 and OPI2250 are identical except for input-to-output isolation voltage.

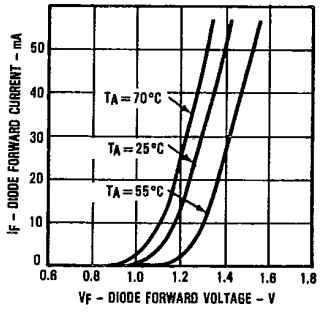
Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Input-to-Output Isolation Voltage OPI2150	±1500 VDC[1]
OPI2250	±2500 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 5 sec. with soldering iron)[2]	260°C
Input Diode	
Forward DC Current	60 mA
Peak Forward Current (1 μs pulse, 300 pps)	3.0 A
Reverse Voltage	3.0 V
Power Dissipation (25°C)	100 mW[3]
Output Transistor	
Power Dissipation	150 mW[4]
$B_{(BR)CEO}$	20 V
$V_{(BR)CBO}$	30 V
$V_{(BR)ECO}$	5.0 V

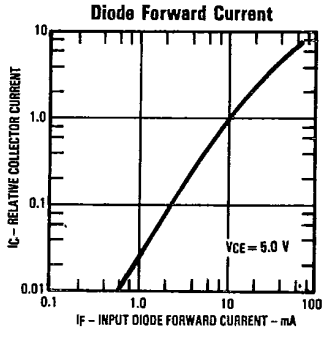
Notes: (1) Measured with input diode leads shorted together and output leads shorted together. (2) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering. (3) Derate linearly 1.33 mW/°C above 25°C. (4) Derate linearly 2.0 mW/°C above 25°C.

Typical Performance Curves

Diode Forward Current vs Diode Forward Voltage



Relative Collector Current vs Diode Forward Current



Types OPI2150, OPI2250

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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			1.50	V	I_F = 10.0 mA
$V_{(BR)R}$	Reverse Breakdown Voltage	2.0			V	I_R = 100 µA
I_R	Reverse Current			100	µA	V_R = 2.0 V
Output Phototransistor						
$V_{(BR)CEO}$	Collector-to-Emitter Breakdown Voltage	20			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-Base Breakdown Voltage	30			V	I_C = 10.0 µA
I_{CEO}	Collector-Emitter Dark Current		10.0	100	nA	V_{CE} = 10.0 V
I_{CBO}	Collector-Base Dark Current			50	nA	V_{CB} = 10.0 V
C_{CE}	Capacitance Collector-to-Emitter		8.0		pF	V_{CE} = 0
h_{FE}	DC Current Gain		150			V_{CE} = 5.0 V, I_C = 100 µA
Coupled						
I_C/I_F	DC Current Transfer Ratio	2.0	5.0		%	I_F = 10.0 mA, V_{CE} = 5.0 V
$V_{CE(SAT)}$	Collector-to-Emitter Saturation Voltage			0.40	V	I_F = 50 mA, I_C = 1.00 mA
V_{ISO}	Isolation Voltage OPI2150 OPI2250	1500 2500			VDC VDC	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_{CC} = 10.0 V I_C = 2.0 mA
t_f	Output Fall Time		2.0		µs	R_L = 100Ω, See Test Circuits

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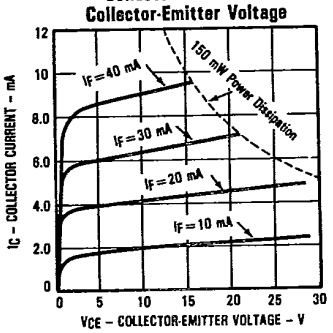
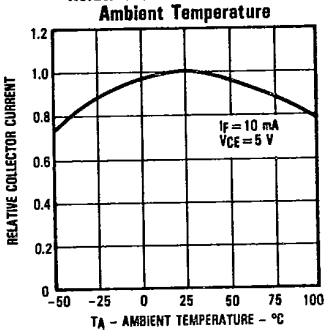
Typical Performance Curves

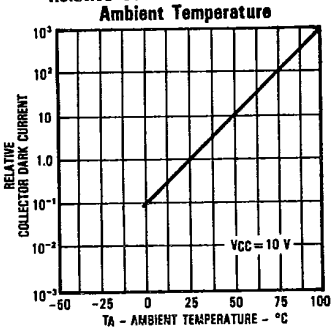
Collector Current vs Collector-Emitter Voltage



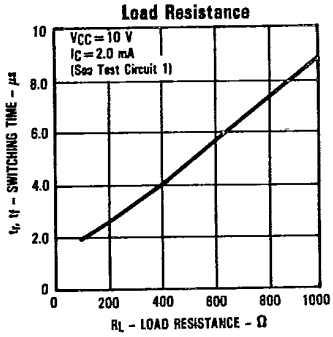
Relative Collector Current vs Ambient Temperature



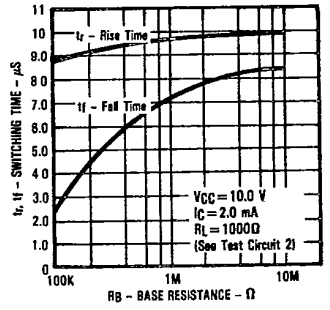
Relative Collector Dark Current vs Ambient Temperature



Rise and Fall Time vs Load Resistance

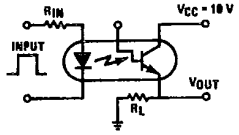


Delay, Rise, and Fall Time vs Base Resistance

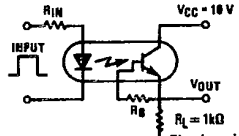


Switching Time Test Circuits

No. 1 – Switching Time vs. Load Resistance



No. 2 – Switching Time vs. Base Resistance



Plastic color may vary.

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