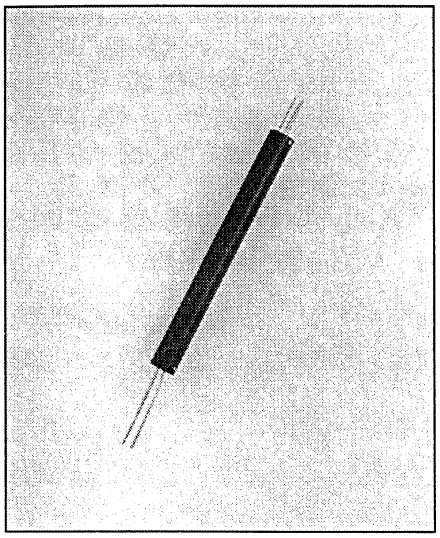
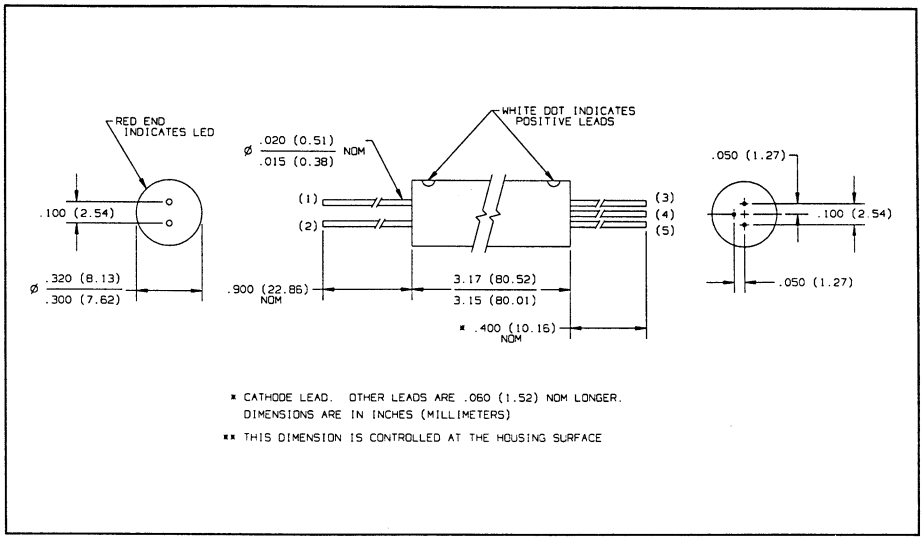
Optically Coupled Isolators
Types OPI150, OPI153





Features

- 50kV electrical isolation
- Phototransistor output (OPI150) or photodarlington output (OPI153)
- Hermetically sealed LED and photosensor
- Base contact lead for conventional transistor biasing
- TX-TXV process available (see Hi-Rel section)

Description

The OPI150 and OPI153 each contain an infrared emitting diode and an NPN silicon phototransistor (OPI150) or photodarlington (OPI153) optically coupled by means of a light pipe and mounted in a high dielectric plastic housing. The LED and sensor are in hermetically sealed packages. These series are designed for applications requiring very high isolation between input and output.

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

Input-to-Output Isolation Voltage	± 50 kVDC(1)
Storage Temperature Range	-40° C to +85° 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]	260° C(2)

Input Diode

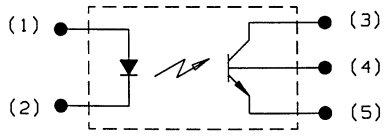
Continuous Forward Current	50 mA
Reverse Voltage	3.0 V
Power Dissipation	200 mW(3)

Output Photosensor

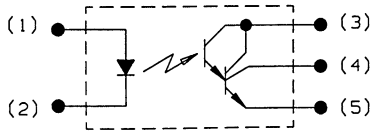
Collector-Emitter Voltage OPI150	30 V
OPI153	15.0 V
Emitter-Collector Voltage OPI150	5.0 V
OPI153	5.0 V
Collector-Base Voltage OPI150	30 V
OPI153	20 V
Power Dissipation OPI150	250 mW(4)
OPI153	250 mW(4)

Notes:
(1) Measured with input and output leads shorted.
(2) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering.
(3) Derate linearly 3.33 mW/° C above 25° C.
(4) Derate linearly 4.17 mW/° C above 25° C.

Schematics



OPI150



OPI153

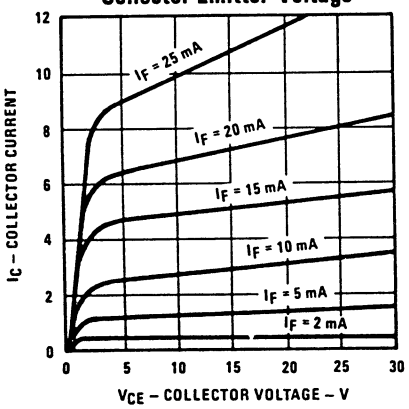
Types OPI150, OPI153

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

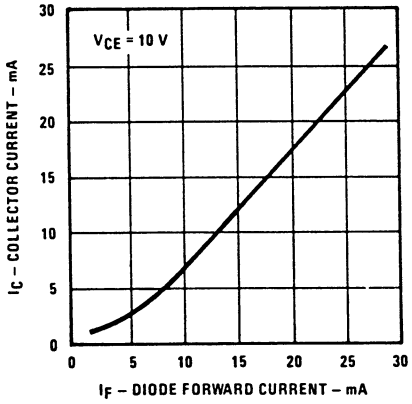
SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode							
V_F	Forward Voltage	OPI150			1.60	V	I_F = 50 mA
		OPI153			1.60	V	I_F = 50 mA
I_R	Reverse Current				100	µA	V_R = 3 V
Output Photosensor							
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	OPI150	30			V	I_C = 1 mA
		OPI153	15			V	I_C = 1 mA
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	OPI150	5			V	I_F = 100 µA
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	OPI150	30			V	I_C = 100 µA
		OPI153	20			V	I_C = 100 µA
I_{CEO}	Collector-Emitter Dark Current	OPI150			100	nA	V_{CE} = 10 V
		OPI153			500	nA	V_{CE} = 10 V
I_{CBO}	Collector-Base Dark Current	OPI150			50	nA	V_{CB} = 10 V
Coupled							
I_C/I_F	DC Current Transfer Ratio	OPI150	10			%	I_F = 10 mA, V_{CE} = 5 V
		OPI153	25			%	I_F = 20 mA, V_{CE} = 5 V
$I_{CB(ON)}$	On-State Potodiode Current	OPI150	10			µA	I_F = 20 mA, V_{CB} = 5 V
$V_{CE(SAT)}$	Saturation Voltage	OPI150			0.50	V	I_F = 16 mA, I_C = 1 mA
		OPI153			1.20	V	I_F = 30 mA, I_C = 2 mA

Typical Performance Curves (OPI150 Only)

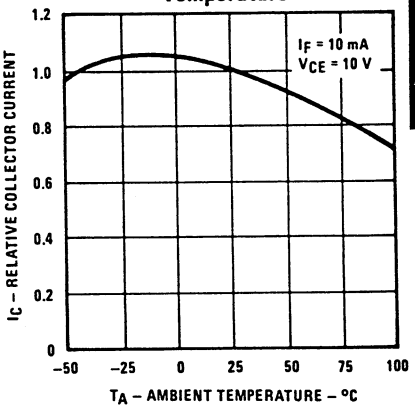
Collector Current vs. Collector-Emitter Voltage



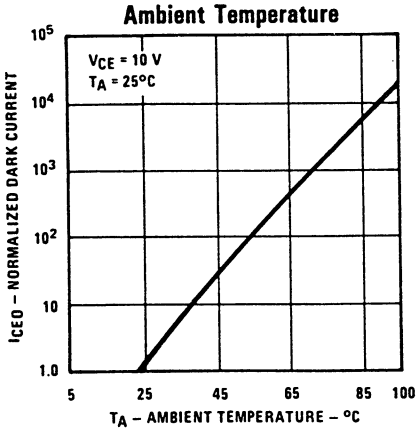
Collector Current vs. Diode Forward Current



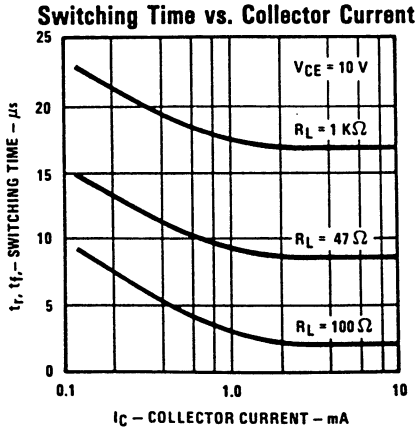
Relative Collector Current vs. Temperature



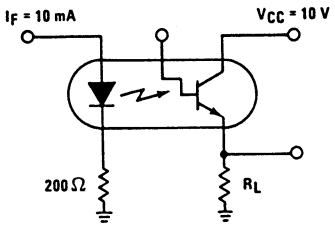
Normalized Dark Current vs. Ambient Temperature



Switching Time vs. Collector Current



Test Circuit



The input waveform is supplied by a generator with the following characteristics: Z_{OUT} = 50Ω, $t_r \leq$ 15 ns. Duty cycle ≈ 1%, pulse width ≈ 100 µs.

Optek Technology, Inc. 1215 W. Crosby Road Carrollton, Texas 75006 (972)323-2200 Fax (972)323-2396