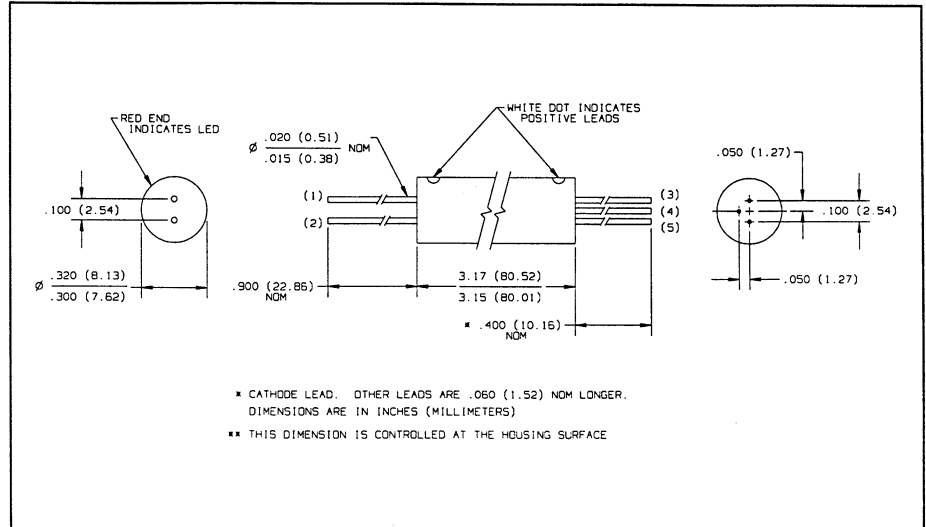
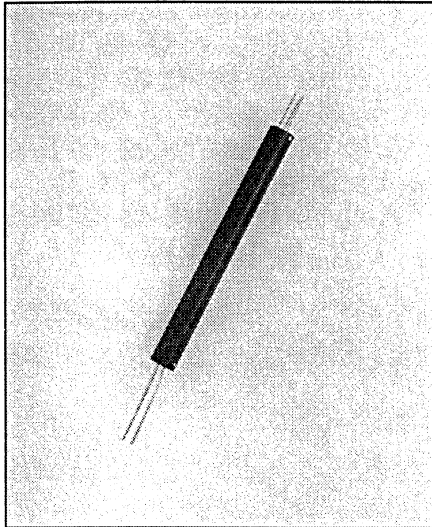


# Optically Coupled Isolators Types OPI150, OPI153



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

Input-to-Output Isolation Voltage	$\pm 50\text{ kVDC}^{(1)}$
Storage Temperature Range	$-40^\circ\text{C}$ to $+85^\circ\text{C}$
Operating Temperature Range	$-40^\circ\text{C}$ to $+85^\circ\text{C}$
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron]	$260^\circ\text{C}^{(2)}$

## Input Diode

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

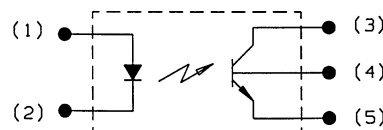
## Output Photosensor

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 <sup>(4)</sup>
OPI153	250 mW <sup>(4)</sup>

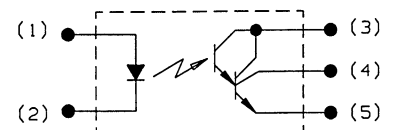
## Notes:

- (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  $3.33\text{ mW}/^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (4) Derate linearly  $4.17\text{ mW}/^\circ\text{C}$  above  $25^\circ\text{C}$ .

## Schematics



OPI150



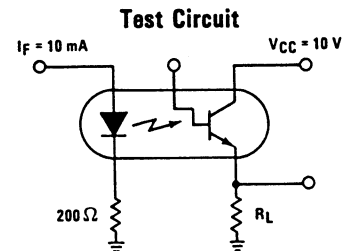
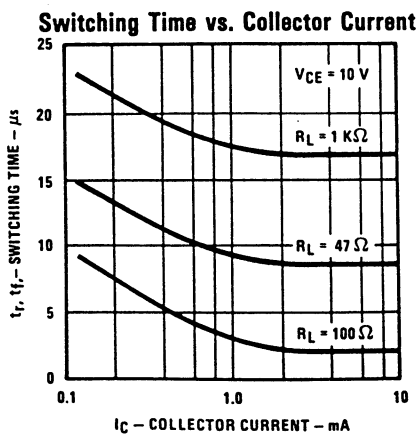
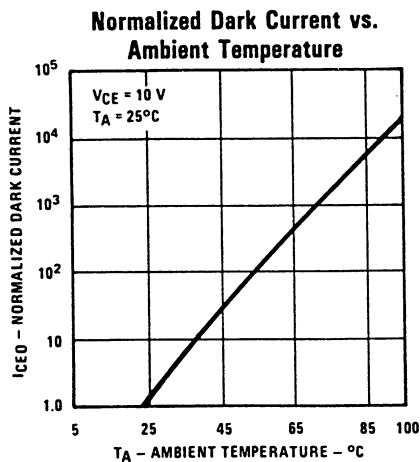
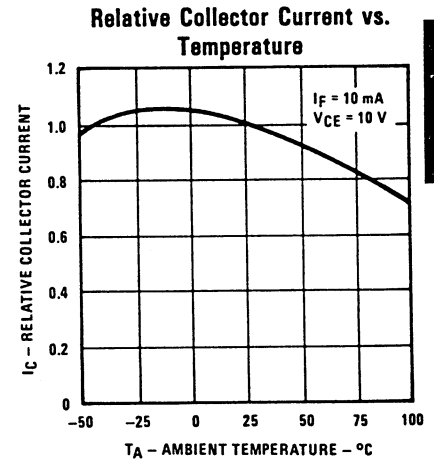
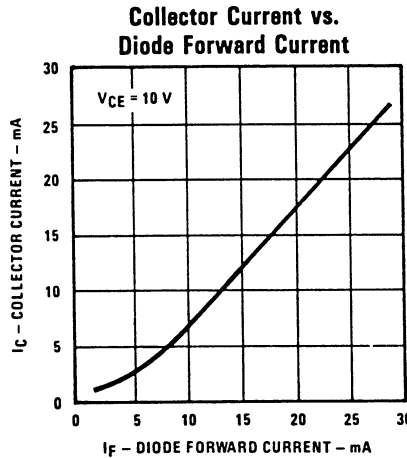
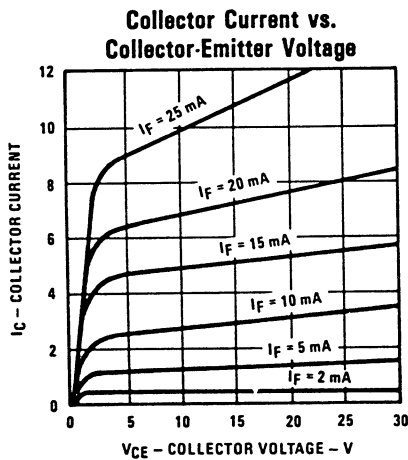
OPI153

# Types OPI150, OPI153

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

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

## Typical Performance Curves (OPI150 Only)



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

Optek reserves the right to make changes at any time in order to improve design and to supply the best product possible.  
 Optek Technology, Inc. 1215 W. Crosby Road Carrollton, Texas 75006 (972)323-2200 Fax (972)323-2396