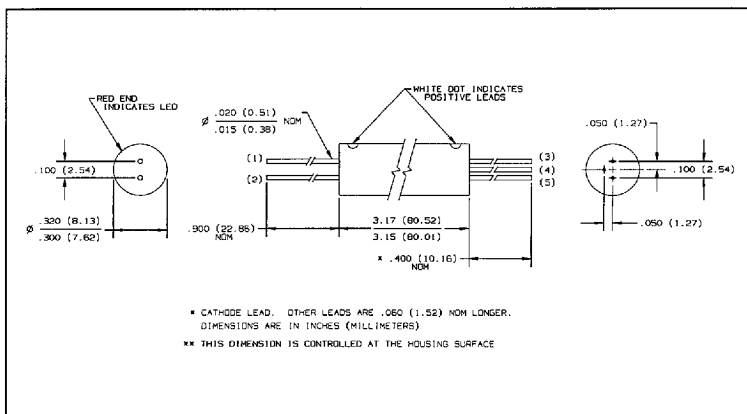
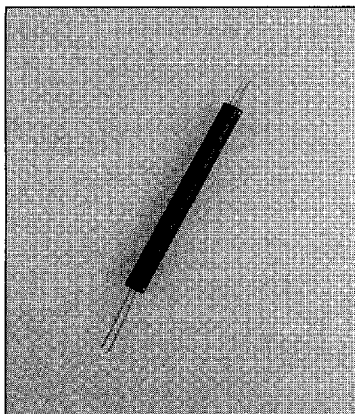


Optically Coupled Isolators

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°C to $+85^\circ\text{C}$
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]	$260^\circ\text{C}^{(2)}$

Input Diode

Continuous Forward Current	50 mA
Reverse Voltage	3.0 V
Power Dissipation	$200\text{ mW}^{(3)}$

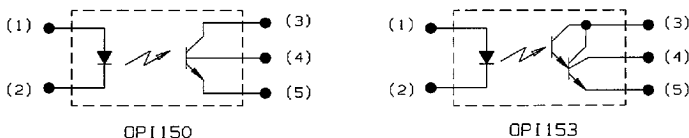
Output Photosensor

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	$250\text{ mW}^{(4)}$
OPI153	$250\text{ mW}^{(4)}$

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

Schematics



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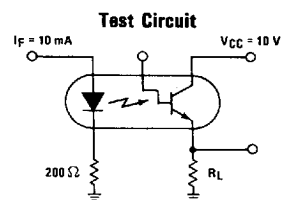
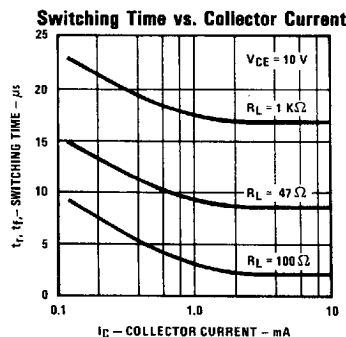
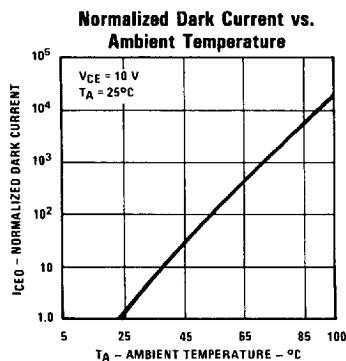
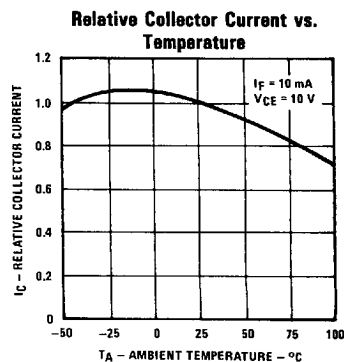
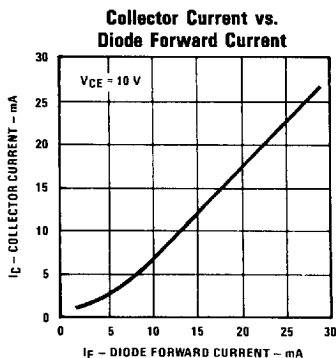
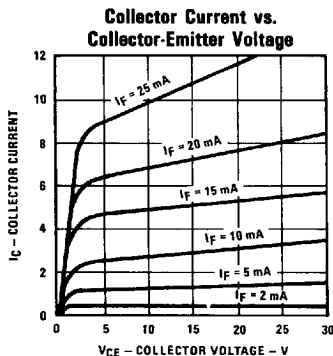
Types OPI150, OPI153

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

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

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 $\approx 100\text{ }\mu\text{s}$.

Optek reserves the right to make changes at any time in order to improve design and to supply the best product possible.

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