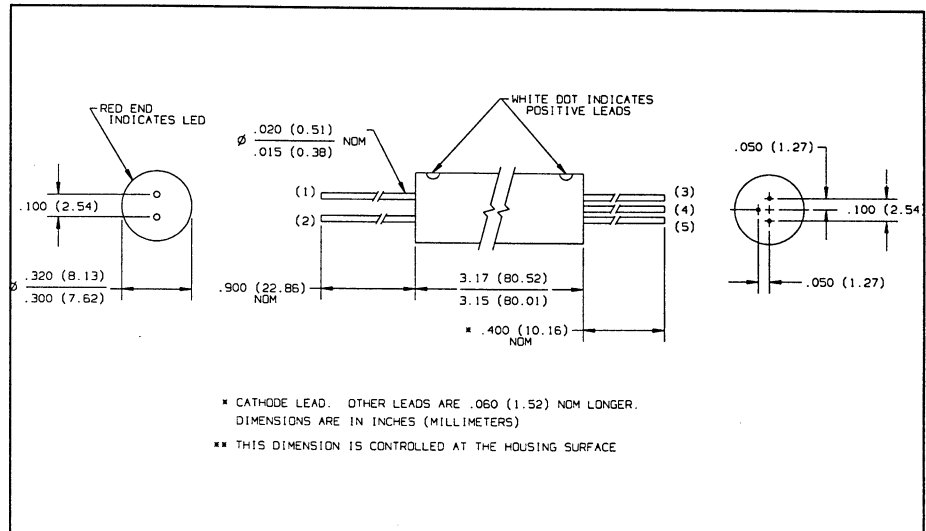
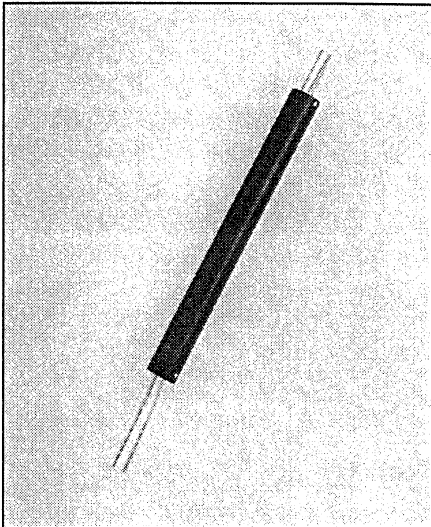


# Optically Coupled Isolators

## Types OPI150TX, OPI150TXV



### Features

- High current transfer ratio
- 50kV electrical isolation
- Base contact lead for conventional transistor biasing
- Components processed to Optek's screening program patterned after MIL-PRF-19500 for TX and TXV devices.

### Description

The OPI150TX and OPI150TXV are optically coupled isolators, consisting of a gallium aluminum arsenide infrared light emitting diode component (OP235TX or OP235TXV) and optically coupled to an NPN silicon phototransistor component (OP804TX or OP804TXV) by means of a light pipe and sealed in a high dielectric plastic housing. This series is designed for applications requiring very high voltage isolation between input and output.

High reliability processing is performed in accordance with MIL-PRF-19500 for both the infrared light emitting diode and the NPN silicon phototransistor at the component level. Typical screening and lot acceptance tests are provided on page 13-4.

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

Input-to-Output Voltage .....	$\pm 50\text{ kVDC}^{(1)}$
Storage Temperature Range .....	$-65^\circ\text{C}$ to $+150^\circ\text{C}$
Operating Temperature Range .....	$-65^\circ\text{C}$ to $+125^\circ\text{C}$
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron] .....	$240^\circ\text{C}$

### Input Diode

Continuous Forward Current .....	100 mA
Reverse Voltage .....	2.0 V
Power Dissipation .....	200 mW <sup>(2)</sup>

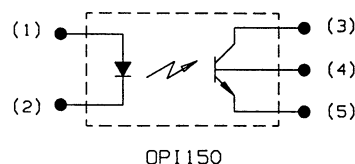
### Output Photosensor

Continuous Collector Current .....	50 mA
Collector-Emitter Voltage .....	50 V
Emitter-Base Voltage .....	7.0 V
Collector-Base Voltage .....	50 V
Power Dissipation .....	250 mW <sup>(3)</sup>

### Notes:

- (1) Measured with input and output leads shored together in air with maximum relative humidity of 50%.
- (2) Derate linearly  $2.00\text{ mW}/^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (3) Derate linearly  $2.50\text{ mW}/^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (4) Methanol or isopropanol are recommended as cleaning agents.

### Schematic



# Types OPI150TX, OPI150TXV

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 <sup>(5)</sup>	1.0	1.4	1.7	V	$I_F = 30\text{ mA}$
		1.2	1.6	1.9	V	$I_F = 30\text{ mA}, T_A = -55^\circ\text{C}$
		0.9	1.15	1.5	V	$I_F = 30\text{ mA}, T_A = 100^\circ\text{C}$
$I_R$	Reverse Current		0.1	10	$\mu\text{A}$	$V_R = 2.0\text{ V}$
<b>Output Photosensor</b>						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	50	80		V	$I_C = 1.0\text{ mA}, I_B = 0, I_F = 0$
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	7.0	110		V	$I_E = 100\ \mu\text{A}, I_C = 0, I_F = 0$
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	50	10.0		V	$I_C = 100\ \mu\text{A}, I_E = 0, I_F = 0$
$I_{CEO}$	Collector-Emitter Dark Current		0.2	100	nA	$V_{CE} = 10.0\text{ V}, I_B = 0, I_F = 0$
			10	100	$\mu\text{A}$	$V_{CE} = 10.0\text{ V}, I_B = 0, I_F = 0, T_A = 100^\circ\text{C}$
$I_{CBO}$	Collector-Base Dark Current		0.1	10	nA	$V_{CB} = 10.0\text{ V}, I_E = 0, I_F = 0$
<b>Coupled</b>						
$I_{C(ON)}$	On-State Collector Current <sup>(5)</sup>	1.0			mA	$V_{CE} = 5\text{ V}, I_B = 0, I_F = 10\text{ mA}$
		0.6			mA	$V_{CE} = 5\text{ V}, I_B = 0, I_F = 10\text{ mA}, T_A = -55^\circ\text{C}$
		0.6			mA	$V_{CE} = 5\text{ V}, I_B = 0, I_F = 10\text{ mA}, T_A = 100^\circ\text{C}$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage		0.20	0.30	V	$I_C = 1.0\text{ mA}, I_B = 0, I_F = 16.0\text{ mA}$
$V_{ISO}$	Isolation Voltage (Input-to-Output)	50.0			kV	See Note 1
$t_r$	Output Rise Time		8.0	15.0	$\mu\text{s}$	$V_{CC} = 10.0\text{ V}, I_C = 2.0\text{ mA}, R_L = 100\ \Omega$
$t_f$	Output Fall time		8.0	15.0	$\mu\text{s}$	$V_{CC} = 10.0\text{ V}, I_C = 2.0\text{ mA}, R_L = 100\ \Omega$

(5) Measurement is taken during last 500  $\mu\text{s}$  of a single 1.0 ms test pulse. Heating due to increased pulse rate or pulse width can cause change in measurement results.

HI-REL OPTO COMPONENTS