

High Reliability Optically Coupled Isolator

OPI150TX, OPI150TXV



Features:

- High current transfer ratio
- 50 kV electrical isolation
- Base contact lead for conventional transistor biasing
- TX and TXV devices processed to MIL-PRF-19500

Description:

Each **OPI150TX** and **OPI150TXV** is an optically coupled isolator that consists of a gallium aluminum arsenide infrared light emitting diode (OP235TX or OP235TXV) which is optically coupled to a NPN silicon phototransistor component (OP804TX or OP804TXV) by means of a light pipe and sealed in a high dielectric plastic housing.

These devices are designed for applications that require high voltage isolation between input and output.

TX and TXV device components are processed to OPTEK's military screening program patterned after MIL-PRF-19500.

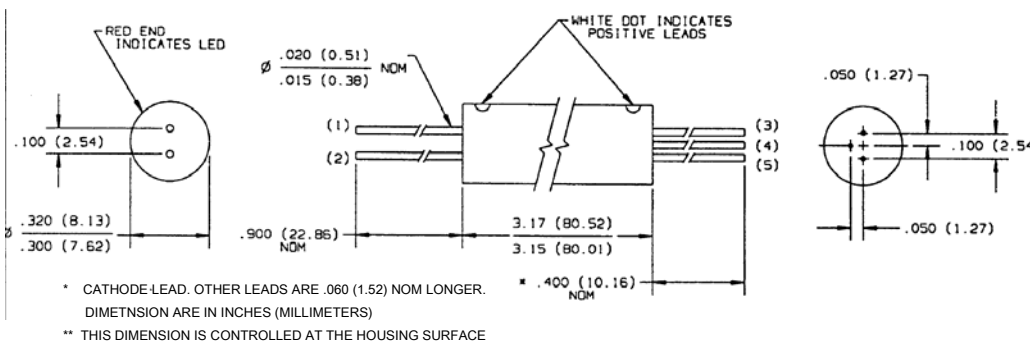
Please refer to Application Bulletins 208 and 210 for additional design information and reliability (degradation) data.

Contact your local representative or OPTEK for more information.

Applications:

- Requiring high voltage isolation between input and output
- Electrical isolation in dirty environments
- Industrial equipment
- Medical equipment
- Office equipment

Part Number	LED Peak Wavelength	Sensor	Isolation Voltage (,000)	CTR Min / Max	I _F (mA) Typ / Max	V _{CE} (Volts) Max	Lead Length / Spacing
OPI150TX	890 nm	Transistor	50	10 / NA	16 / 50	30	0.40" / 3.16"
OPI150TXV							



Pin#	LED	Pin#	Transistor
1	Anode	4	Collector
2	Cathode	3	Emitter

General Note
TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

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

Operating Temperature Range	-65° C to +125° C
Storage Temperature Range	-65° C to +150° C
Input-to-Output Isolation Voltage ⁽¹⁾	±50 kVDC
Lead Soldering Temperature [1/16 inch (1.6 mm) from the case for 5 seconds with soldering iron]	260° C

Input Diode

Continuous Forward Current	100 mA
Reverse Voltage	2 V
Power Dissipation ⁽²⁾	200 mW

Output Photosensor

Continuous Collector Current	50 mA
Collector-Base Voltage	50 V
Collector-Emitter Voltage	50 V
Emitter-Base Voltage	7 V
Power Dissipation ⁽³⁾	250 mW

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
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Input Diode (See OP236TX for additional information - for reference only)

V_F	Forward Voltage ⁽⁵⁾	1.00	1.40	1.70	V	$I_F = 30\text{ mA}$
		1.20	1.60	1.90		$I_F = 30\text{ mA}, T_A = -55^\circ\text{C}$
		0.90	1.15	1.50		$I_F = 30\text{ mA}, T_A = 100^\circ\text{C}$
I_R	Reverse Current	-	0.10	10	μA	$V_R = 2\text{ V}$

Output Phototransistor (See OP805TX for additional information - for reference only)

$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	50	10	-	V	$I_C = 100\ \mu\text{A}, I_E = 0, I_F = 0$
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	50	80	-	V	$I_C = 1\text{ mA}, I_B = 0, I_F = 0$
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	7	11	-	V	$I_E = 100\ \mu\text{A}, I_C = 0, I_F = 0$
I_{CEO}	Collector-Emitter Dark Current	-	0.20	100	na	$V_{CE} = 10\text{ V}, I_B = 0, I_F = 0$
		-	10	100	μA	$V_{CE} = 10\text{ V}, I_B = 0, I_F = 0, T_A = 100^\circ\text{C}$
I_{CBO}	Collector-Base Dark Current	-	0.10	10	nA	$V_{CB} = 10\text{ V}, I_E = 0, I_F = 0$

Notes:

- (1) Measured with input leads shorted together and output leads shorted together in air with a maximum relative humidity of 50%.
- (2) Derate linearly 2.00 mW/° C above 25° C.
- (3) Derate linearly 2.50 mW/° C above 25° C.
- (4) Methanol or isopropanol are recommended as cleaning agents.
- (5) Measurement is taken during the last 500 μs of a single 1.0 ms test pulse. Heating due to increased pulse rate or pulse width can cause change in measurement results.

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Combined						
I _{C(ON)}	On-State Collector Current ⁽¹⁾	1.0	-	-	mA	V _{CE} = 5 V, I _B = 0, I _F = 10 mA
		0.6	-	-		V _{CE} = 5 V, I _B = 0, I _F = 10 mA, T _A = -55° C
		0.6	-	-		V _{CE} = 5 V, I _B = 0, I _F = 10 mA, T _A = 100° C
V _{CE(SAT)}	Collector-Emitter Saturation Voltage	-	0.20	0.30	V	I _C = 1 mA, I _B = 0, I _F = 16 mA
V _{ISO}	Isolation Voltage (Input to Output) ⁽²⁾	50	-	-	kV	See note 2.
t _r	Output Rise Time	-	8	15	μs	V _{CC} = 10 V, I _C = 2 mA, R _L = 100Ω
t _f	Output Fall Time	-	8	15		

Notes:

- (1) Measurement is taken during the last 500 μs of a single 1.0 ms test pulse. Heating due to increased pulse rate or pulse width can cause change in measurement results.
- (2) Measured with input leads shorted together and output leads shorted together in air with a maximum relative humidity of 50%.