

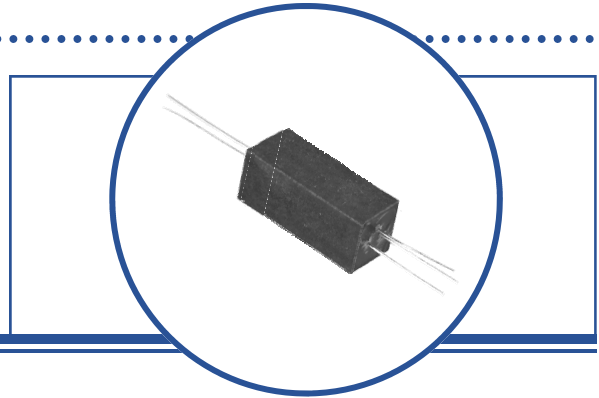
High Reliability Photologic® Optically Coupled Isolator

OPI125 (TX, TXV)



Features:

- High current transfer ratio
- 15 kV electrical isolation
- Direct TTL/LSTTL interface
- High noise immunity
- Data rates to 250 Kbaud
- TX and TXV devices processed to MIL-PRF-19500



Description:

Each **OPI125TX** and **OPI125TXV** is an optically coupled isolator that consists of a gallium aluminum arsenide infrared light emitting diode (OP235 TX or OP235TXV) and a monolithic integrated circuit which incorporates a photodiode, a linear amplifier and a Schmitt trigger on a single die (OPL800TX or OPL800TXV), sealed in a high dielectric plastic housing. The device features TTL/LSTTL compatible logic level output which can drive up to 8 TTL loads directly without additional circuitry. Also featured are medium speed data rates to 250 Kbaud with typical rise and fall times of 70 nanoseconds. These devices are designed for applications that require high voltage isolation between input and output.

TX and TXV devices 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.

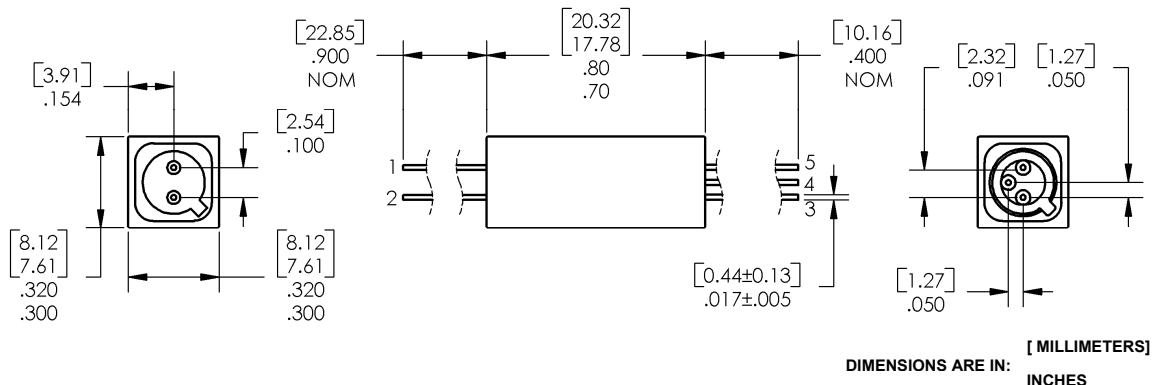
Contact your local representative or OPTEK for more information.

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 Photologic®	Isolation Voltage (,000)	t _{PLH} / t _{PHL} Typ (ns)	I _F (mA) Typ / Max	V _{CE} (Volts) Max	Lead Length / Spacing
OPI125TX	890 nm	Totem Pole	15	5 / 5	7.5 / 25	35.0	0.40" / 0.75"
OPI125TXV	or 935 nm						

Pin #	LED	Pin #	Photologic®
1	Anode	3	Output
2	Cathode	4	Vcc
		5	Ground



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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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⁾	±15 KVDC
Lead Soldering Temperature [1/16 inch (1.6 mm) from the case for 5 seconds with soldering iron]	260° C

Input Diode

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

Output Phototransistor

Continuous Collector Current	50 mA
Collector-Base Voltage	30 V
Collector-Emitter Voltage	30 V
Emitter-Base Voltage	5 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 OP236 for additional information - for reference only)

V_F	Forward Voltage ⁽⁴⁾	1.00	1.40	1.70	V	$I_F = 30\text{ mA}$
		1.20	1.60	1.90		$I_F = 30\text{ mA}, T_A = -55^\circ\text{C}$
		0.30	1.15	1.50		$I_F = 30\text{ mA}, T_A = 100^\circ\text{C}$
I_R	Reverse Current	-	0.1	10	μA	$V_R = 2\text{ V}$

Output Phototransistor (See OPL800TXV for additional information - for reference only)

$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	30	40	-	V	$I_C = 100\ \mu\text{A}, I_E = 0, I_F = 0$
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30	40	-	V	$I_C = 100\ \mu\text{A}, I_B = 0, I_F = 0$
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	5	-	-	V	$I_C = 100\ \mu\text{A}, I_C = 0, I_F = 0$
$I_{C(OFF)}$	Collector-Emitter Dark Current	-	0.2	100	na	$V_{CE} = 10\text{ V}, I_B = 0, I_F = 0$
$I_{CB(OFF)}$	Collector-Base Dark Current	-	10	100	μA	$V_{CE} = 10\text{ V}, I_B = 0, I_F = 0, T_A = 100^\circ\text{C}$
		-	0.1	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%. If suitably encapsulated or oil-immersed, the isolation voltage is increased to at least 25 kV.
- (2) Derate linearly 2.0 mW/° C above 25° C.
- (3) Derate linearly 2.5 mW/° C above 25° C.
- (4) Methanol or isopropanol are recommended as cleaning agents.

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Combined						
$I_{C(ON)}$	On-State Collector Current ⁽¹⁾	2.00	-	-	mA	$V_{CE} = 5\text{ V}, I_B = 0, I_F = 10\text{ mA}$
		1.20	-	-		$V_{CE} = 5\text{ V}, I_B = 0, I_F = 10\text{ mA}, T_A = -55^\circ\text{ C}$
		1.20	-	-		$V_{CE} = 5\text{ V}, I_B = 0, I_F = 10\text{ mA}, T_A = 100^\circ\text{ C}$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	-	0.25	0.30	V	$I_C = 2\text{ mA}, I_B = 0, I_F = 20\text{ mA}$
V_{ISO}	Isolation Voltage (Input to Output) ⁽¹⁾	15	30	-		See note 1.
t_r	Output Rise Time	-	8	15	μs	$V_{CC} = 10\text{ V}, I_C = 2\text{ mA}, R_L = 100\Omega$
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.

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