

# 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



### 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.

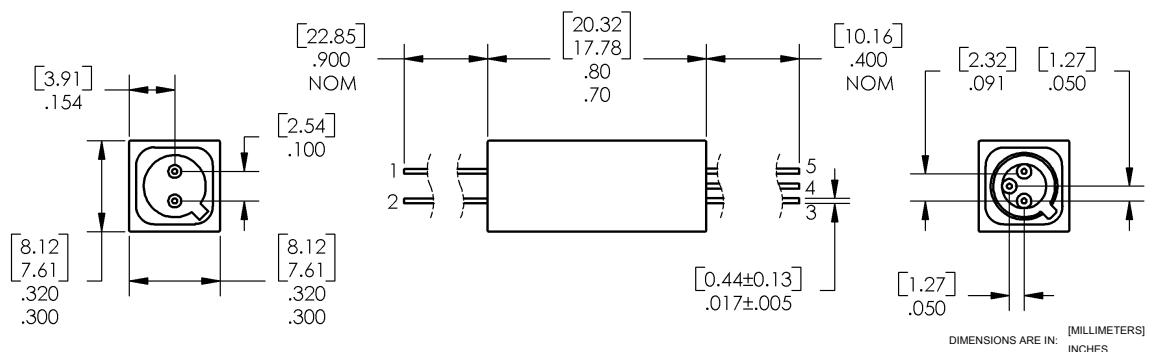
*TX and TXV device components are processed to OPTEK's military screening program patterned after MIL-PRF-19500.*

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

### Applications:

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

Part Number	LED Peak Wavelength	Sensor Photologic®	Isolation Voltage (,000)	t <sub>PLH</sub> / t <sub>PHL</sub> Typ (ns)	I <sub>F</sub> (mA) Typ / Max	V <sub>CE</sub> (Volts) Max	Lead Length / Spacing
OPI125TX	890 nm	Totem Pole	15	5 / 5	7.5 / 25	35.0	0.40" / 0.75"
OPI125TXV							



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

### 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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OPTEK Technology, Inc.  
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200  
www.optekinc.com | www.ttelectronics.com

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## OPI125 (TX, TXV)

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

Operating Temperature Range	-65° C to +150° C
Storage Temperature Range	-55° C to +125° C
Input-to-Output Isolation Voltage <sup>(1)</sup>	± 15 k VDC
Lead Soldering Temperature [1/16 inch (1.6mm) fro case for 5 seconds with soldering iron] <sup>(1)</sup>	260° C
Power Dissipation <sup>(2)</sup>	250 mW

### Input Diode

Forward DC Current	100 mA
Reverse Voltage	2 V
Power Dissipation <sup>(2)</sup>	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 <sup>(2)</sup>	250 mW

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

#### Input Diode

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
$V_F$	Forward Voltage <sup>(4)</sup>	0.90	1.25	1.50	V	$I_F = 10 \text{ mA}$
		1.00	1.45	1.70		$I_F = 10 \text{ mA}, T_A = -55^{\circ}\text{C}$
		0.70	1.10	1.30		$I_F = 10 \text{ mA}, T_A = 100^{\circ}\text{C}$
$I_R$	Reverse Current	-	0.10	10	$\mu\text{A}$	$V_R = 2 \text{ V}$

#### Photologic®

$V_{CC}$	Operating Supply Voltage	4.8		5.2	V	
$I_{CC}$	Supply Current		7.0	15.0	mA	$V_{CC} = 5.2\text{V}, I_F = 0 \text{ or } 7.5 \text{ mA}$

#### 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 2.0 mW/° C above 25° C.  
(3) Derate linearly 2.5 mW/° C above 25° C.  
(4) Measurement is taken during the 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.

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# High Reliability Photologic<sup>®</sup> Optically Coupled Isolator

OPI125 (TX, TXV)



Electrical Characteristics (T <sub>A</sub> = 25°C unless otherwise noted)						
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>Coupled</b>						
I <sub>F</sub> (+)	LED Positive-Going Threshold Current <sup>(1)</sup>	-	-	7.5	mA	V <sub>CC</sub> = 5.0 V
		-	-	7.5	mA	V <sub>CC</sub> = 5.0 V, T <sub>A</sub> = -55°C
		-	-	7.5	mA	V <sub>CC</sub> = 5.0 V, T <sub>A</sub> = 100°C
I <sub>F</sub> (+)/I <sub>F</sub> (-)	Hysteresis Ratio	-	2.0	-	-	-
V <sub>OL</sub>	Low Level Output Voltage	-	-	4.0	V	V <sub>CC</sub> = 4.8 V, I <sub>OL</sub> = 13.0 mA, I <sub>F</sub> = 0
V <sub>OH</sub>	High Level Output Voltage	2.4	-	-	V	V <sub>CC</sub> = 4.8 V, I <sub>OH</sub> = -800 μA, I <sub>F</sub> = 7.5mA
I <sub>OS</sub>	Short Circuit Output Current	-30.0	-	-120	mA	V <sub>CC</sub> = 5.2 V, I <sub>F</sub> = 7.5 mA, Output = GND
V <sub>IOS</sub>	Isolation Voltage (Input-to-Output)	15.0			kV	See Note 1
t <sub>r</sub> , t <sub>f</sub>	Output Rise Time and Fall Time	-	70.0	100	ns	V <sub>CC</sub> = 5.0 V, T <sub>A</sub> = 25°C I <sub>F</sub> = 0 or 10.0 mA I <sub>F</sub> = 10.0 kHz, DC = 50% R <sub>L</sub> = 8 TTL Loads
t <sub>PLH</sub> , t <sub>PHL</sub>	Propagation Delay, Low to High & High to Low	-	5.0	10.0	μs	

**Notes:**

- (1) Measured with input leads shorted together and output leads shorted together in air. 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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