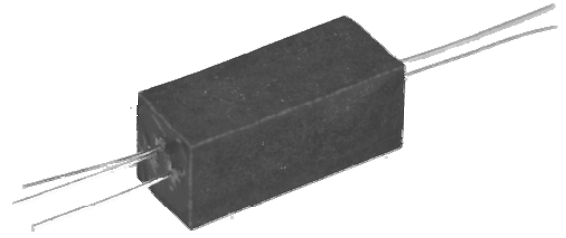


# Photologic® Optically Coupled Isolator

OPI125, OPI126, OPI127, OPI127-032, OPI128

## Features:

- Four output options
- 15 kV input-to-output isolation voltage
- Direct TTL/STTL interface
- High noise immunity
- Data rates to 250 KBit/s
- Hermetically sealed
- TX-TXV process available
- UL File No. E 58730\*



## Description:

Each **OPI125**, **OPI126**, **OPI127**, **OPI127-032** and **OPI128** consists of an optically coupled isolator with a gallium arsenide infrared emitting diode coupled to a monolithic integrated circuit. This circuit incorporates a photodiode, a linear amplifier and a Schmitt trigger on a single silicon chip. For maximum long-term stability, both the diode and the Photologic® sensor are hermetically sealed in separate packages and then mounted in a high dielectric plastic housing.

These devices feature TTL/LSTTL compatible logic level output that can drive up to 8 TTL loads directly without additional circuitry. Also featured are medium-speed data rates to 250 KBit/s, with typical rise and fall times of 70 nanoseconds. \*UL recognition is for 15KV<sub>DC</sub> to 100° C.

TX and TXV processing is available. For more information, contact your local representative or OPTEK.

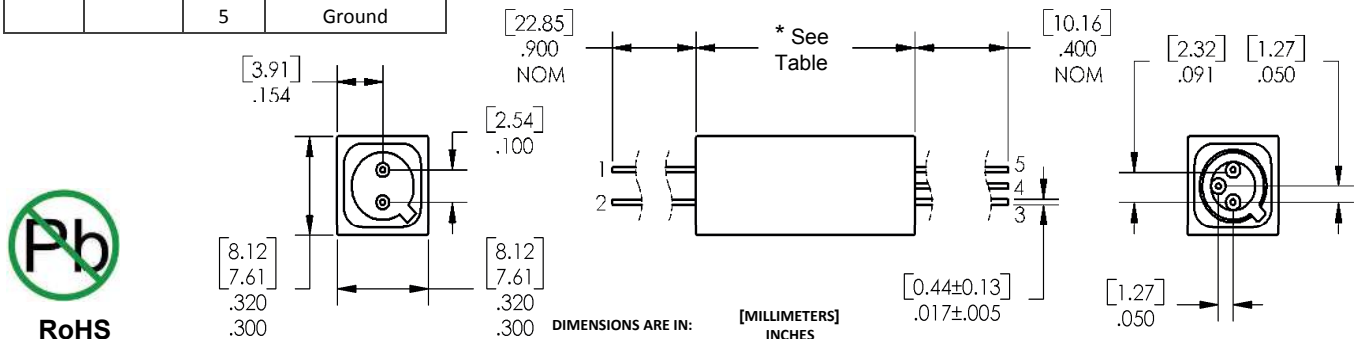
## Applications:

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

### Ordering Information

Part Number	LED Peak Wavelength	Sensor Photologic®	Isolation Voltage (,000)	t <sub>PLH</sub> / t <sub>PHL</sub> Typ (μs)	I <sub>F</sub> (mA) Typ / Max	V <sub>CE</sub> (Volts) Max	Lead Length / Spacing	*Length
OPI125	890 nm or 935 nm	Totem Pole	15	5 / 5	7.5 / 25	35.0	0.40" / 0.75"	0.75" [19mm]
OPI126		Open Collector						
OPI127		Inverted Totem Pole						
OPI127-032		Inverted Totem Pole						
OPI128		Inverted Open Collector						0.75" [19mm]

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



### General Note

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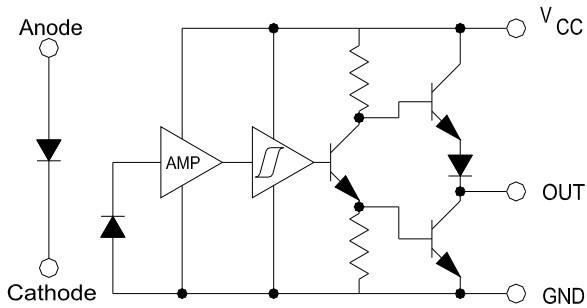


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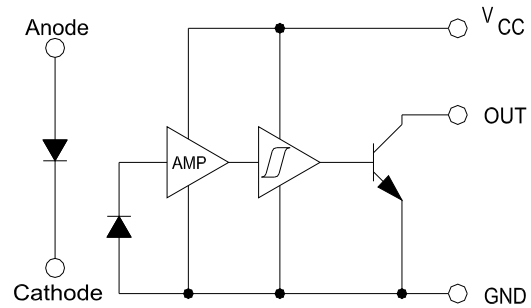
# Photologic® Optically Coupled Isolator

OPI125, OPI126, OPI127, OPI127-032, OPI128

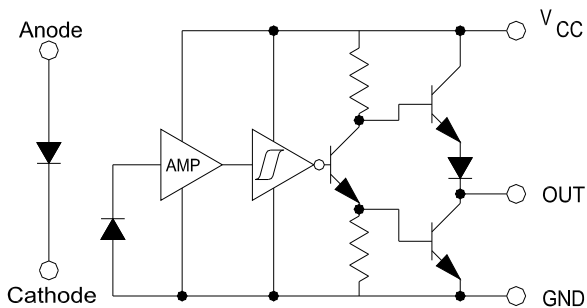
**OPI125 - Totem Pole Output**



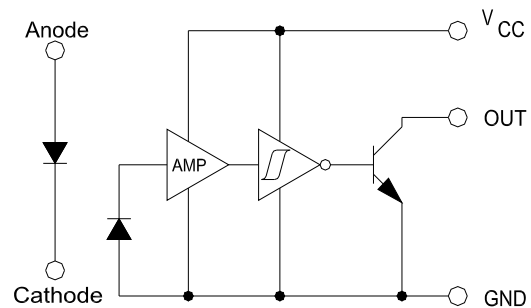
**OPI126 - Open Collector Output**



**OPI127 - Inverted Totem Pole Output**



**OPI128 - Inverted Open Collector Output**



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

Storage Temperature	-55° C to +100° C
Operating Temperature	-55° C to +100° C
Supply Voltage, $V_{CC}$ (not to exceed 3 seconds)	+10 V
Input-to-Output Isolation Voltage <sup>(1)(2)</sup>	$\pm 15$ kVDC
Lead Soldering Temperature (1/16" (1.6 mm) from case for 5 seconds with soldering iron) <sup>(3)</sup>	260° C
<b>Input Diode</b>	
Forward DC Current	25 mA
Reverse DC Voltage	2 V
Power Dissipation <sup>(4)</sup>	200 mW
<b>Output Photosensor</b>	
Output Photologic® Power Dissipation <sup>(5)</sup>	120 mW/° C
Duration of Output Short to VCC or Ground (OPI125, OPI127)	1.00 second
Duration of Output Short to VCC (OPI126, OPI128)	1.00 second
Voltage at Output Lead (OPI126, OPI128)	35 V

### Notes:

- (1) Measured with input and output leads shorted.
- (2) UL recognition is for 3500 Vrms at 60Hz.
- (3) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
- (4) Derate linearly 1.33 mW/° C above 25° C.
- (5) Derate linearly 3.40 mW/° C above 25° C.

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# Photologic® Optically Coupled Isolator

OPI125, OPI126, OPI127, OPI127-032, OPI128

## Electrical Characteristics ( $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$ unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>Diode Input</b> (See OP130 and OP230 for additional information - for reference only)						
$V_F$	Forward Voltage	-	-	1.5	V	$I_F = 10\text{ mA}$ , $T_A = 25^\circ\text{C}$
$I_R$	Reverse Current	-	-	100	$\mu\text{A}$	$V_R = 2\text{ V}$ , $T_A = 25^\circ\text{C}$
$I_F(+)$	LED Positive-Going threshold Current	-	-	7.5	mA	$V_{CC} = 5\text{ V}$ , $T_A = 25^\circ\text{C}$
$I_F(+)/I_F(-)$	Hysteresis Ratio	-	2.0	-	-	-
<b>Photologic® Output</b> (See OP800 and OP801 for additional information - for reference only)						
$V_{CC}$	Operating Supply Voltage	4.5	-	5.5	V	-
$I_{CC}$	Supply Current	-	-	20	mA	$V_{CC} = 5.5\text{ V}$ , $I_F = 0$ or $7.5\text{ mA}$
$V_{OL}$	Low Level Output Voltage OPI125 OPI126 OPI127 OPI128	- - - -	- - - -	0.40 0.40 0.40 0.40	V	$V_{CC} = 4.5\text{ V}$ , $I_{OL} = 13\text{ mA}$ , $I_F = 0\text{ mA}$ $V_{CC} = 4.5\text{ V}$ , $I_{OL} = 13\text{ mA}$ , $I_F = 0\text{ mA}$ $V_{CC} = 4.5\text{ V}$ , $I_{OL} = 13\text{ mA}$ , $I_F = 7.5\text{ mA}$ $V_{CC} = 4.5\text{ V}$ , $I_{OL} = 13\text{ mA}$ , $I_F = 7.5\text{ mA}$
$V_{OH}$	High Level Output Voltage OPI125 OPI127	2.4 2.4	- -	- -	V	$V_{CC} = 4.5\text{ V}$ , $I_{OH} = -800\text{ }\mu\text{A}$ , $I_F = 7.5\text{ mA}$ $V_{CC} = 4.5\text{ V}$ , $I_{OH} = -800\text{ }\mu\text{A}$ , $I_F = 0\text{ mA}$
$I_{OS}$	Short Circuit Output Current OPI125 OPI127	-20 -20	- -	-120 -120	mA	$V_{CC} = 5.5\text{ V}$ , $I_F = 7.5\text{ mA}$ , Output = GND $V_{CC} = 5.5\text{ V}$ , $I_F = 0\text{ mA}$ , Output = GND
$I_{OH}$	High Level Output Current OPI126 OPI128	- -	- -	100 100	$\mu\text{A}$	$V_{CC} = 4.5\text{ V}$ , $V_{OH} = 30\text{ V}$ , $I_F = 7.5\text{ mA}$ $V_{CC} = 4.5\text{ V}$ , $V_{OH} = 30\text{ V}$ , $I_F = 0\text{ mA}$
$t_r, t_f$	Output Rise Time, Output Fall Time OPI125, OPI127	-	100	-	ns	$V_{CC} = 5\text{ V}$ , $T_A = 25^\circ\text{C}$ , $I_F = 0$ or $10\text{ mA}$ , $f = 10\text{ kHz}$ , D.C. = 50%, $R_L = 8\text{ TTL loads}$
	Output Rise Time, Output Fall Time OPI126, OPI128	-	100	-		$V_{CC} = 5\text{ V}$ , $T_A = 25^\circ\text{C}$ , $I_F = 0$ or $10\text{ mA}$ , $f = 10\text{ kHz}$ , D.C. = 50%, $R_L = 360\text{ }\Omega$
$t_{PLH}, t_{PHL}$	Propagation Delay, Low-High, High-Low OPI125, OPI127	-	5	-	$\mu\text{s}$	$V_{CC} = 5\text{ V}$ , $T_A = 25^\circ\text{C}$ , $I_F = 0$ or $10\text{ mA}$ , $f = 10\text{ kHz}$ , D.C. = 50%, $R_L = 8\text{ TTL loads}$
	Propagation Delay, Low-High, High-Low OPI126, OPI128	-	5	-		$V_{CC} = 5\text{ V}$ , $T_A = 25^\circ\text{C}$ , $I_F = 0$ or $10\text{ mA}$ , $f = 10\text{ kHz}$ , D.C. = 50%, $R_L = 360\text{ }\Omega$

### Notes:

- (1) Measured with input and output leads shorted in air with a maximum relative humidity of 50%. If suitably encapsulated or oil-immersed, the isolation voltage is increased to 25 kV minimum.

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