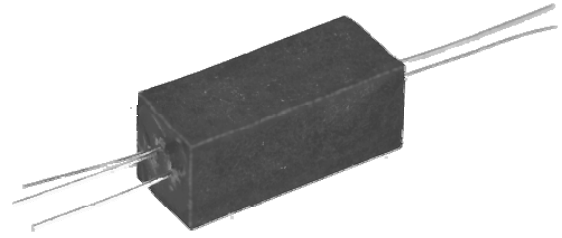


Photologic® Optically Coupled Isolator

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_{DC} to 100° C.

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

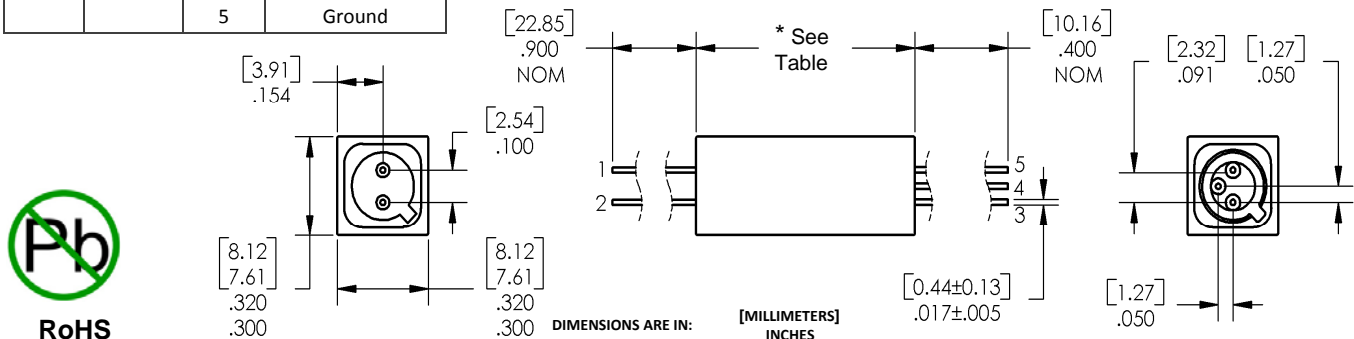
Applications:

- 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 _{PLH} / t _{PHL} Typ (μs) | I _F (mA) Typ / Max | V _{CE} (Volts) Max | Lead Length / Spacing | *Length |
|-------------|---------------------|-------------------------|--------------------------|--|-------------------------------|-----------------------------|-----------------------|--------------|
| OPI125 | 890nm | Totem Pole | 15 | 5 / 5 | 7.5 / 25 | 35.0 | 0.40" / 0.75" | 0.75" [19mm] |
| OPI126 | 935nm | Open Collector | | | | | | 1.26" [32mm] |
| OPI127 | 890nm | Inverted Totem Pole | | | | | | 0.75" [19mm] |
| OPI127-032 | 890nm | Inverted Totem Pole | | | | | | |
| OPI128 | 890nm | Inverted Open Collector | | | | | | |

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



General Note

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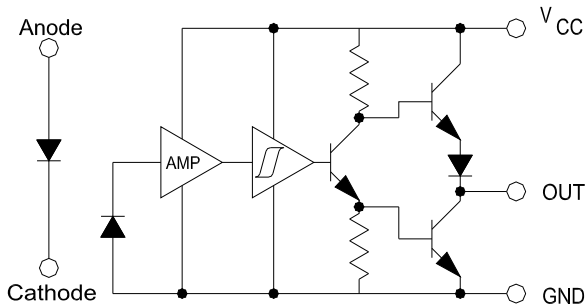


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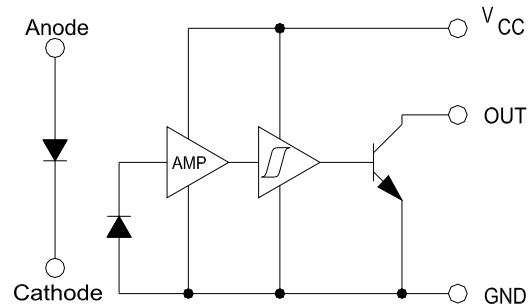
Photologic® Optically Coupled Isolator

OPI125, OPI126, OPI127, OPI127-032, OPI128

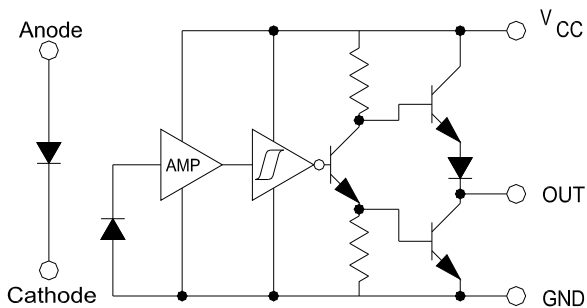
OPI125 - Totem Pole Output



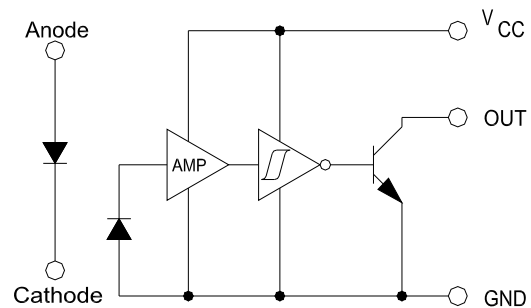
OPI126 - Open Collector Output



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 ⁽¹⁾⁽²⁾ | ± 15 kVDC |
| Lead Soldering Temperature (1/16" (1.6 mm) from case for 5 seconds with soldering iron) ⁽³⁾ | 260° C |
| Input Diode | |
| Forward DC Current | 25 mA |
| Reverse DC Voltage | 2 V |
| Power Dissipation ⁽⁴⁾ | 200 mW |
| Output Photosensor | |
| Output Photologic® Power Dissipation ⁽⁵⁾ | 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 |
|---|--|------------------|------------------|------------------------------|---------------|--|
| Diode Input (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 | μA | $V_R = 2\text{ V}$, $T_A = 25^\circ\text{C}$ |
| $I_F(+)$ | 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 | - | - | - |
| Photologic® Output (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 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 | μA | $V_{CC} = 4.5\text{ V}$, $V_{OH} = 30\text{ V}$, $I_F = 7.5\text{ mA}$ $V_{CC} = 4.5\text{ V}$, $V_{OH} = 30\text{ V}$, $I_F = 0\text{ mA}$ |
| 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 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 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 | - | μs | $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$, $I_F = 0$ or 10 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 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.

General Note

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