

Photologic™ Slotted Optical Switches

Types OPB980, OPB990 Series



Features

- Choice of mounting configuration
- Choice of aperture
- Choice of output configuration
- Choice of opaque or IR transmissive shell material
- Data rates to 250 kBaud
- 24" min 26AWG wire leads

Description

The OPB980 and OPB990 series of Photologic™ Photo Integrated Circuit Switches provide optimum flexibility for the design engineer. Building from a standard housing with a .125" wide slot, the user can specify (1) type and polarity of TTL output, (2) discrete shell material, (3) aperture width, and (4) choice of mounting configuration.

The electrical output can be satisfied as either TTL totem pole or TTL open collector. Either may be supplied with inverter or buffer output polarity. All have added stability of a built-in hysteresis amplifier.

Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

| | |
|--------------------------------------------------------|----------------------|
| Supply Voltage, V _{CC} (Not to exceed 3 sec.) | 10V |
| Storage Temperature Range | -40° C to +80° C |
| Operating Temperature Range | -40° C to +70° C |
| Input Diode Power Dissipation | 100mW ⁽¹⁾ |
| Output Photologic™ Power Dissipation | 200mW ⁽²⁾ |
| Total Device Power Dissipation | 300mW ⁽³⁾ |
| Voltage at Output Lead (Open Collector Output) | 35V |
| Diode Forward D.C. Current | 40mA |
| Diode Reverse D.C. Voltage | 2V |

Notes:

- (1) Derate linearly 2.22mW/° C above 25° C.
- (2) Derate linearly 4.44mW/° C above 25° C.
- (3) Derate linearly 6.66mW/° C above 25° C.
- (4) The OPB980/OPB990 series of switches are terminated with 24 inches of 7 strand 26 AWG, UL 1429 insulated wire on each terminal. Insulation colors and functions are:

| | |
|----------------------|-------------------------|
| RED - IRED Anode | WHITE - V _{CC} |
| BLACK - IRED Cathode | BLUE - Output |
| | GREEN - Ground |

Other wire lengths and/or colors in addition to customer selected connectors are available. Contact your local representative or call the factory.

- (5) Normal application would be with light source blocked, simulated by I_F = 0mA.
- (6) All parameters tested using pulse techniques.

Housing

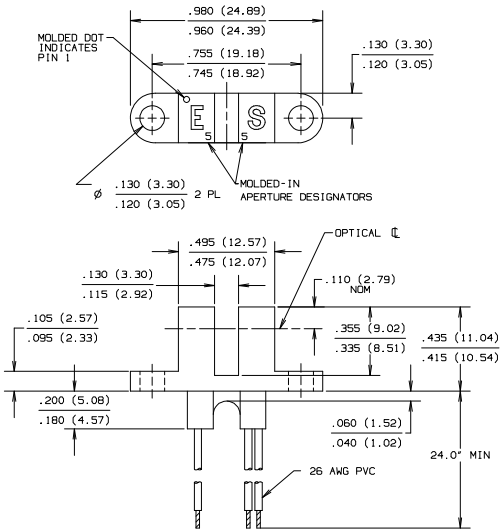
All housings are an opaque grade of injection-molded plastic to minimize the assembly's sensitivity to ambient radiation, both visible and near-infrared. Discrete shells (exposed on the parallel faces inside the device throat) are either IR transmissive plastic for applications where aperture contamination may occur or opaque plastic for maximum protection against ambient light.

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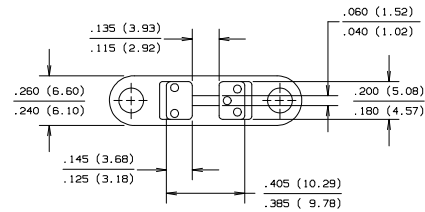
Electrical Characteristics ($T_A = -40^\circ\text{C}$ to $+70^\circ\text{C}$ unless otherwise noted).

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|---------------------------------------------|--------------------------------------------------------------------------------------------|------|-----|------|---------------|--------------------------------------------------------------------------------------------------------|
| Input Diode | | | | | | |
| V_F | Forward Voltage | | | 1.7 | V | $I_F = 20\text{ mA}$, $T_A = 25^\circ\text{C}$ |
| I_R | Reverse Current | | | 100 | μA | $V_R = 2.0\text{ V}$, $T_A = 25^\circ\text{C}$ |
| Output Photologic[®] Sensor | | | | | | |
| V_{CC} | Operating D.C. Supply Voltage | 4.75 | | 5.25 | V | |
| I_{CCL} | Low Level Supply Current: Buffered Totem-Pole Output Buffered Open-Collector Output | | | 15 | mA | $V_{CC} = 5.25\text{ V}$, $I_F = 0\text{ mA}$ ⁽⁵⁾ |
| | Inverted Totem-Pole Output Inverted Open-Collector Output | | | 15 | mA | $V_{CC} = 5.25\text{ V}$, $I_F = 15\text{ mA}$ |
| I_{CCH} | High Level Supply Current: Buffered Totem-Pole Output Buffered Open-Collector Output | | | 15 | mA | $V_{CC} = 5.25\text{ V}$, $I_F = 15\text{ mA}$ |
| | Inverted Totem-Pole Output Inverted Open-Collector Output | | | 15 | mA | $V_{CC} = 5.25\text{ V}$, $I_F = 0\text{ mA}$ ⁽⁵⁾ |
| V_{OL} | Low Level Output Voltage: Buffered Totem-Pole Output Buffered Open-Collector Output | | | 0.4 | V | $V_{CC} = 4.75\text{ V}$, $I_{OL} = 12.8\text{ mA}$ $I_F = 0\text{ mA}$ ⁽⁵⁾ |
| | Inverted Totem-Pole Output Inverted Open-Collector Output | | | 0.4 | V | $V_{CC} = 4.75\text{ V}$, $I_{OL} = 12.8\text{ mA}$ $I_F = 15\text{ mA}$ |
| V_{OH} | High Level Output Voltage: Buffered Totem-Pole Output | 2.4 | | | V | $V_{CC} = 4.75\text{ V}$, $I_{OH} = -800\text{ }\mu\text{A}$ $I_F = 15\text{ mA}$ |
| | Inverted Totem-Pole Output | 2.4 | | | V | $V_{CC} = 4.75\text{ V}$, $I_{OH} = -800\text{ }\mu\text{A}$ $I_F = 0\text{ mA}$ ⁽⁵⁾ |
| I_{OH} | High Level Output Current: Buffered Open-Collector Output | | | 100 | μA | $V_{CC} = 4.75\text{ V}$, $V_{OH} = 30\text{ V}$, $I_F = 15\text{ mA}$, $T_A = 25^\circ\text{C}$ |
| | Inverted Open-Collector Output | | | 100 | μA | $V_{CC} = 4.75\text{ V}$, $V_{OH} = 30\text{ V}$, $I_F = 0\text{ mA}$, $T_A = 25^\circ\text{C}$ |
| $I_{F(+)}$ | LED Positive-Going Threshold Current | | | 15 | mA | $V_{CC} = 5.0\text{ V}$, $T_A = 25^\circ\text{C}$ |
| $I_{F(+)} / I_{F(-)}$ | Hysteresis | | 2.0 | | | $V_{CC} = 5.0\text{ V}$ |
| I_{OS} | Short Circuit Output Current: Buffered Totem-Pole Output "11" Series | -15 | | -60 | mA | $V_{CC} = 5.25\text{ V}$, $I_F = 15\text{ mA}$ Output = GND |
| | Inverted Totem-Pole Output "11" Series | -30 | | -60 | mA | $V_{CC} = 5.25$, $I_F = 0\text{ mA}$ Output = GND |

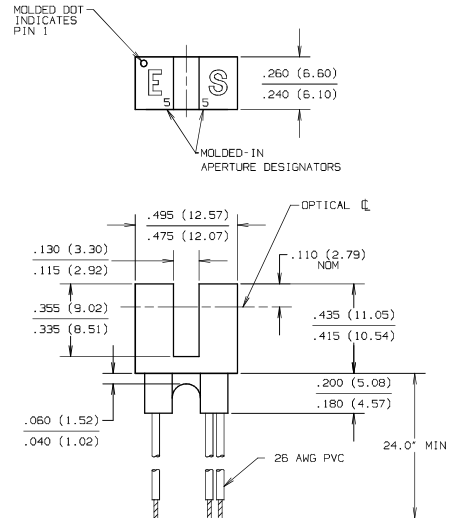
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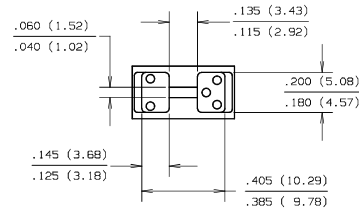
DIMENSIONS ARE IN INCHES (MILLIMETERS)



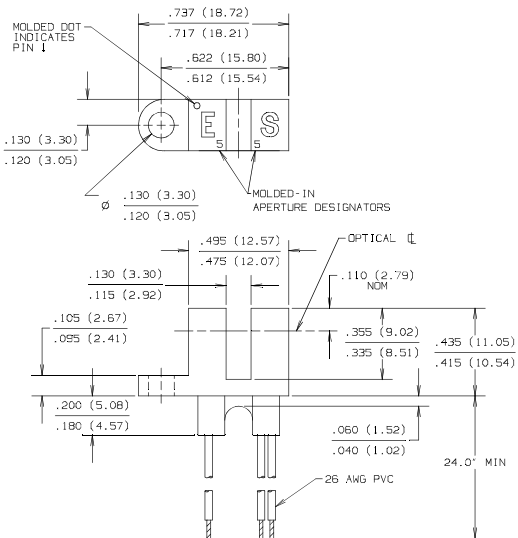
Package N



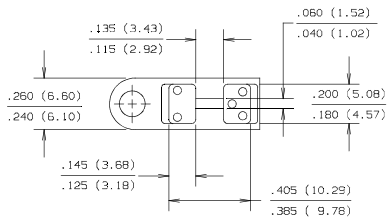
DIMENSIONS ARE IN INCHES (MILLIMETERS)



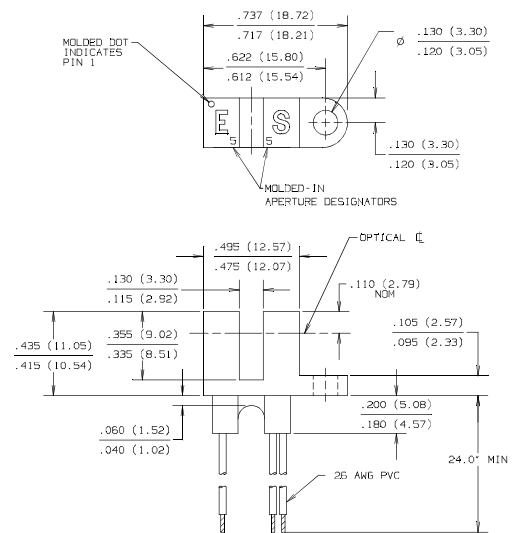
Package L



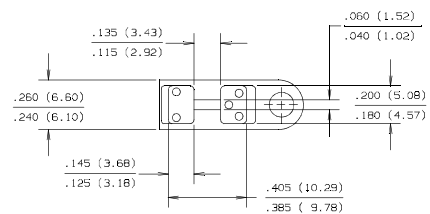
DIMENSIONS ARE IN INCHES (MILLIMETERS)



Package P



DIMENSIONS ARE IN INCHES (MILLIMETERS)



PART NUMBER GUIDE

OPB 9 X X X X X

| | | |
|-----------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------|
| Optek Assembly | | Aperture Width In Front of Sensor 5 = 0.050" 1= 0.010" |
| Photologic™ Photo Integrated Circuit Sensor Family | | Aperture Width In Front of Emitter 5 = 0.050" 1= 0.010" |
| Discrete Shell Material Designation | | Mounting Configurations |
| 8 - Base Mount IR Transmissive Plastic Discrete Shell With Wire Termination | | T - Both Mounting Tabs N - No Mounting Tabs L - Single Mounting Tab Emitter Side |
| 9 - Base Mount Opaque Plastic Discrete Shell With Wire Termination | | P - Single Mounting Tab Photologic™ Side |

Electrical Specification Variations

- 0 - Buffered Totem-Pole Output
- 1 - Buffered Open-Collector Output
- 2 - Inverted Totem-Pole Output
- 3 - Inverted Open-Collector Output