

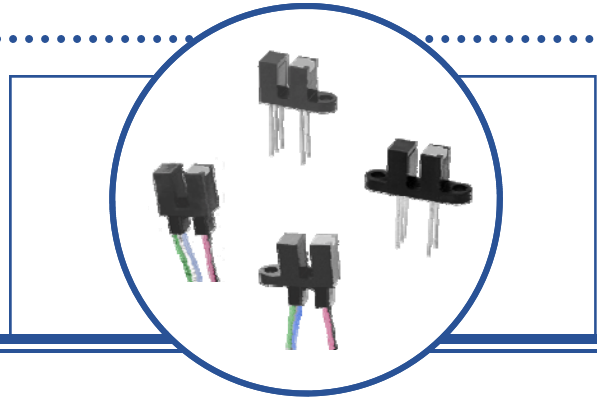
Photologic® Slotted Optical Switch

OPB460, OPB470, OPB480, OPB490 Series



Features:

- Choice of pins or wires mounting configuration
- Choice of aperture
- Choice of output configuration
- Choice of opaque or IR transmissive shell material
- Data rates to 250 kBaud
- Low power consumption



Description:

The **OPB460, OPB470, OPB480** and **OPB490** series of Photologic® photo integrated circuit switches provide optimum flexibility for the design engineer. Building from a standard housing with a 0.125" (3.180 mm) wide slot, a user can specify the type and polarity of TTL output, discrete shell material, aperture width and choice of mounting configurations. **OPB460** through **OPB473** have 0.425" (10.795 mm) PCBoard leads with 0.320" (8.1 mm) spacing. **OPB480** through **OPB493** have 24" (609 mm) 26 AWG wires (UL approved wires).

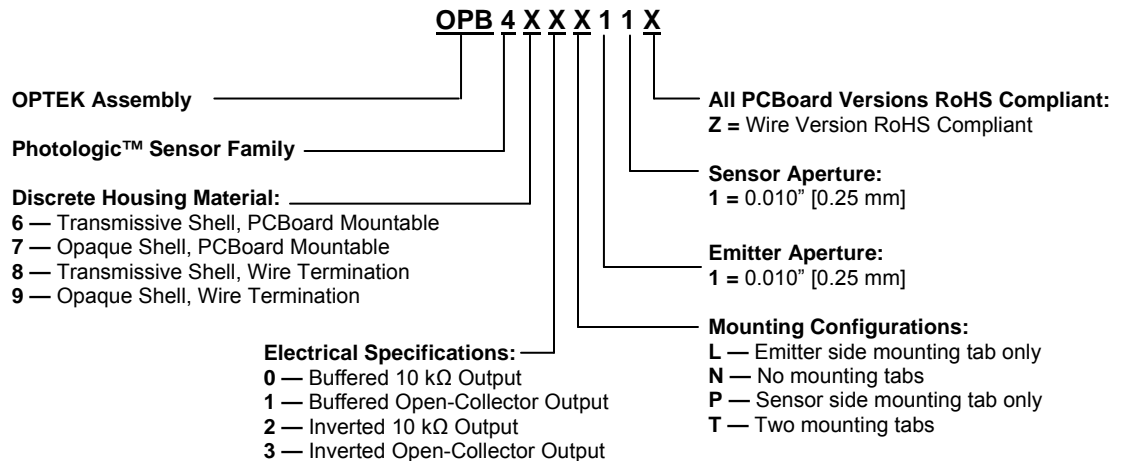
All devices in this series exhibit performance over supply voltages ranging from 4.5 V to 16.0 V, and may be specified as buffered or inverted with 10 kW Pull-up or Open Collector output. Devices are also TTI/LSTTL compatible and can drive up to 10 TTL loads.

Custom electrical, wire and cabling and connectors are available. Contact your local representative or OPTEK for more information.

Applications:

- Mechanical switch replacement
- Speed indication (tachometer)
- Mechanical limit indication
- Edge sensing

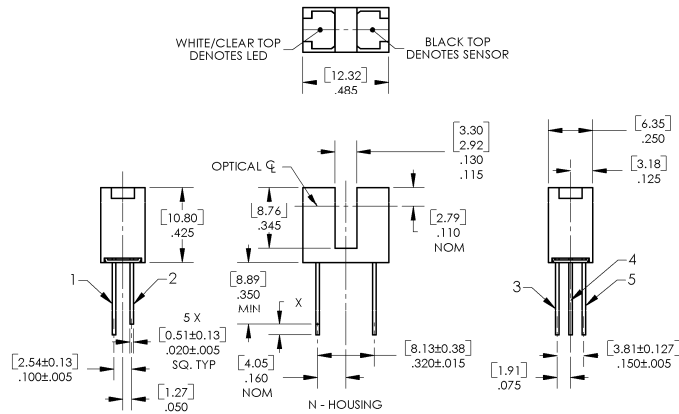
Part Number Guide — OPB460, OPB470, OPB480, OPB490 Series



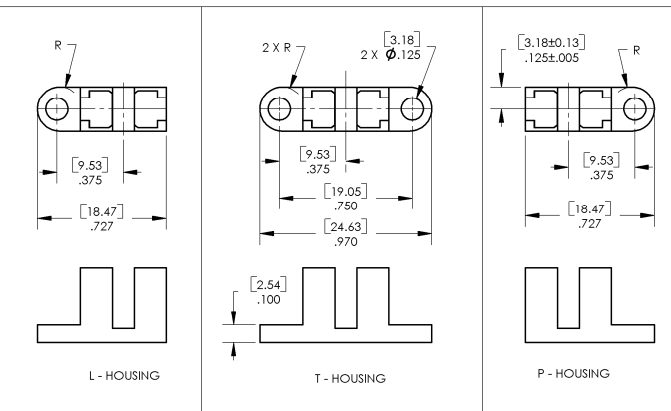
RoHS

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

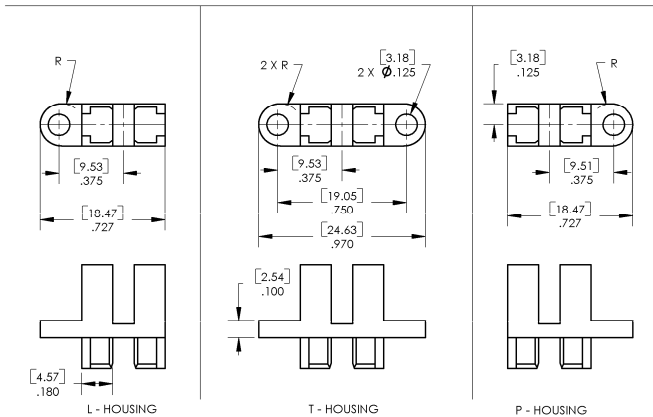
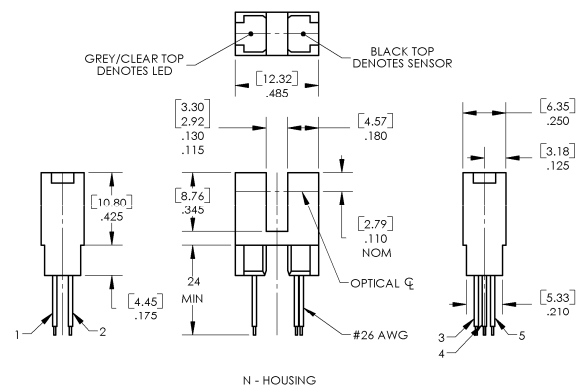
Photologic® Slotted Optical Switch OPB460, OPB470, OPB480, OPB490 Series



| Color-Pin | Description |
|-----------|-------------|
| Red-1 | Anode |
| Black-2 | Cathode |
| White-3 | Vcc |
| Blue-4 | Output |
| Green-5 | Ground |



DIMENSIONS ARE IN: [MILLIMETERS]
[INCHES]



CONTAINS POLYSULFONE
To avoid stress cracking, we suggest using ND Industries' **Vibra-Tite** for thread-locking. **Vibra-Tite** evaporates fast without causing structural failure in OPTEK's molded plastics.
Applies to: OPB460, OPB470, OPB480, OPB490.

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

| | |
|--|------------------|
| Storage & Operating Temperature Range | -40° C to +85° C |
| Lead Soldering Temperature [1/16 inch (1.6mm) from the case for 5 sec. with soldering iron] ⁽¹⁾ | 260°C |

Input Infrared LED

| | |
|--|-------|
| Supply Voltage, V_{CC} (not to exceed 3 seconds) | 18 V |
| Diode Forward DC Current | 40 mA |
| Diode Reverse DC Voltage | 2 V |
| Input Diode Power Dissipation ⁽²⁾ | 75 mW |

Output Photologic®

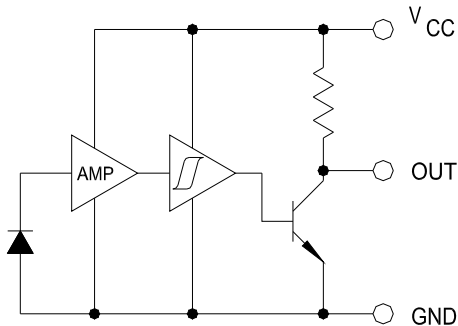
| | |
|---|--------|
| Voltage at Output Lead (Open Collector Output) | 25 V |
| Output Photologic® Power Dissipation ⁽³⁾ | 200 mW |

| | |
|---|--------|
| Total Device Power Dissipation ⁽⁴⁾ | 275 mW |
|---|--------|

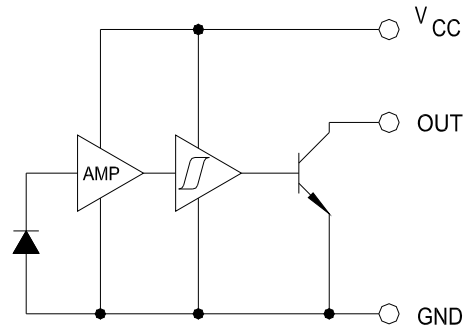
Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
- (2) Derate linearly 1.67 mW/°C above 25° C (OPB460, OPB470) or derate linearly 1.82 mW/°C above 25° C (OPB480, OPB490).
- (3) Derate linearly 1.50 mW/°C above 25° C (OPB460, OPB470) or derate linearly 1.64 mW/°C above 25° C (OPB480, OPB490).
- (4) Derate linearly 3.17 mW/°C above 25° C (OPB460, OPB470) or derate linearly 3.45 mW/°C above 25° C (OPB480, OPB490).
- (5) The OPB460/OPB470 series are terminated with 0.020" square leads designed for printed circuit board mounting.
- (6) The OPB480/OPB490 series of switches are terminated with 24" (609.600 mm) of 7-strand 26 AWG, UL rated insulated wire on each terminal. Insulation colors and functions are: red (anode), black (cathode), white (V_{CC}), blue (output) and green (ground). Other wire lengths and/or colors in addition to customer selected connectors are available. Contact your local representative or call the factory.

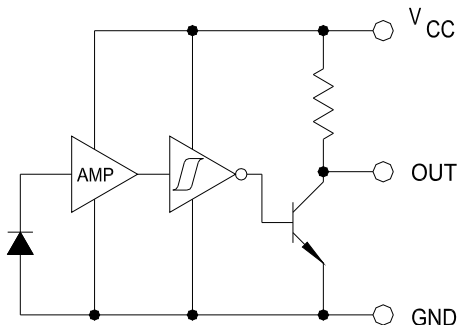
OPB460/470/480/490 Buffered 10K Pull-Up



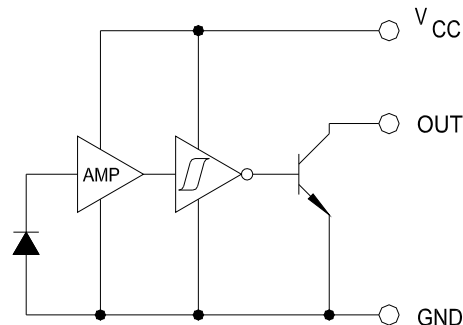
OPB461/471/481/491 Buffered Open-Collector



OPB462/472/482/492 Inverted 10K Pull-Up



OPB463/473/483/493 Inverted Open-Collector



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Electrical Characteristics ($T_A = 25^\circ\text{C}$ 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 | $V_R = 2\text{ V}$, $T_A = 25^\circ\text{C}$ |

Output Photologic® Sensor

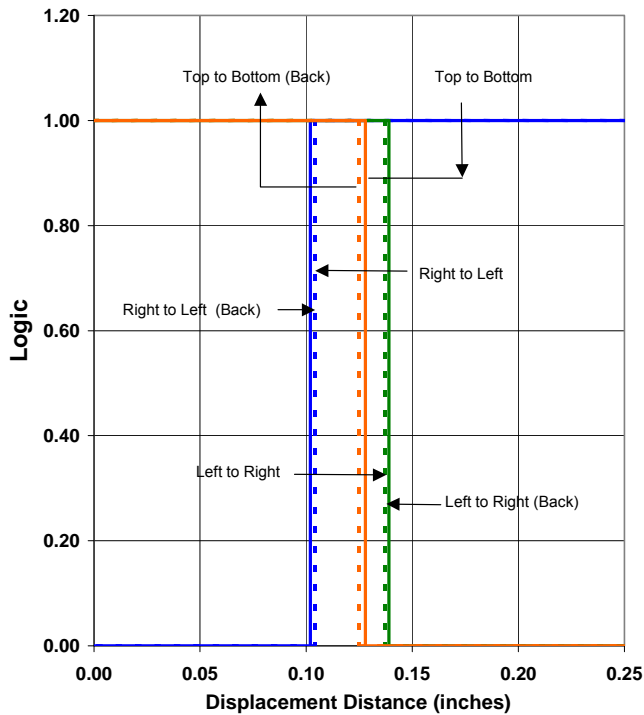
| | | | | | | |
|---------------------|---|------------------|-----|-----|---------------|--|
| V_{CC} | Operating DC Supply Voltage | 4.5 | - | 16 | V | |
| I_{CCL} | Low Level Supply Current: Buffered with 10k pull-up ⁽¹⁾ Buffered Open-Collector Output | - | - | 7.5 | mA | $V_{CC} = 16\text{ V}$, $I_F = 0\text{ mA}$ ⁽¹⁾ |
| | Inverted with 10k pull-up: Inverted Open-Collector Output | - | - | 7.5 | mA | $V_{CC} = 16\text{ V}$, $I_F = 12\text{ mA}$ |
| I_{CCH} | High Level Supply Current: Buffered with 10k pull-up Buffered Open-Collector Output | - | - | 7.5 | mA | $V_{CC} = 16\text{ V}$, $I_F = 12\text{ mA}$ |
| | Inverted with 10k pull-up: Inverted Open-Collector Output | - | - | 7.5 | mA | $V_{CC} = 16\text{ V}$, $I_F = 0\text{ mA}$ ⁽¹⁾ |
| V_{OL} | Low Level Output Voltage: Buffered with 10k pull-up Buffered Open-Collector Output | - | - | 0.4 | V | $V_{CC} = 4.5\text{ V}$, $I_{OL} = 16\text{ mA}$, $I_F = 0\text{ mA}$ |
| | Inverted with 10k pull-up: Inverted Open-Collector Output | - | - | 0.4 | V | $V_{CC} = 4.5\text{ V}$, $I_F = 12\text{ mA}$ ⁽¹⁾ |
| V_{OH} | High Level Output Voltage: Buffered with 10k pull-up | V_{CC} -1.5 | - | - | V | $V_{CC} = 4.5\text{ V to }16\text{ V}$, No Load, $I_F = 12\text{ mA}$ |
| | Inverted with 10k pull-up: Inverted Open-Collector Output ⁽¹⁾ | V_{CC} -1.5 | - | - | V | $V_{CC} = 4.5\text{ V to }16\text{ V}$, No Load, $I_F = 0\text{ mA}$ |
| I_{OH} | High Level Output Current: Buffered Open-Collector Output | - | - | 14 | μA | $V_{CC} = 16\text{ V}$, $I_F = 12\text{ mA}$, $V_{OH} = 25\text{ V}$, $T_A = 25^\circ\text{C}$ |
| | Inverted with 10k pull-up: Inverted Open-Collector Output ⁽¹⁾ | - | - | 14 | μA | $V_{CC} = 16\text{ V}$, $I_F = 0\text{ mA}$, $V_{OH} = 25\text{ V}$, $T_A = 25^\circ\text{C}$ |
| $I_{F(+)}$ | LED Positive-Going Threshold Current | - | - | 10 | mA | $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$ |
| $I_{F(+)} I_{F(-)}$ | Hysteresis | - | 1.4 | - | - | $V_{CC} = 5\text{ V}$ |
| t_r, t_f | Rise Time, Fall Time | - | 50 | - | ns | $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$, $I_F = 0$ or 12 mA |
| t_{PLH}, t_{PHL} | Propagation Delay | - | 3 | - | μs | $R_L = 300\ \Omega$ to 5 V , $C_L = 50\text{ pF}$ |

Notes:

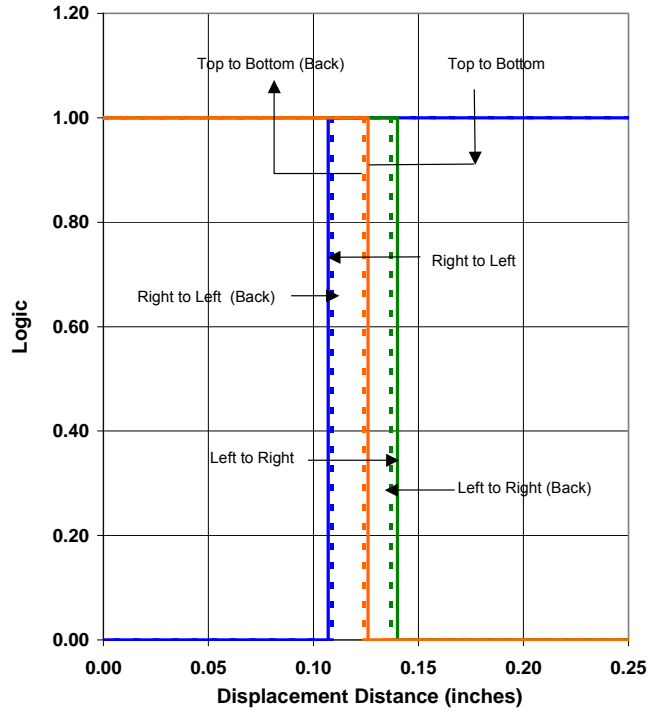
- (1) Normal application would be with light source blocked, simulated by $I_F = 0\text{ mA}$.
- (2) All parameters tested using pulse technique.

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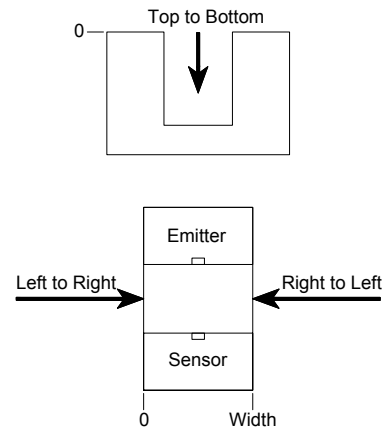
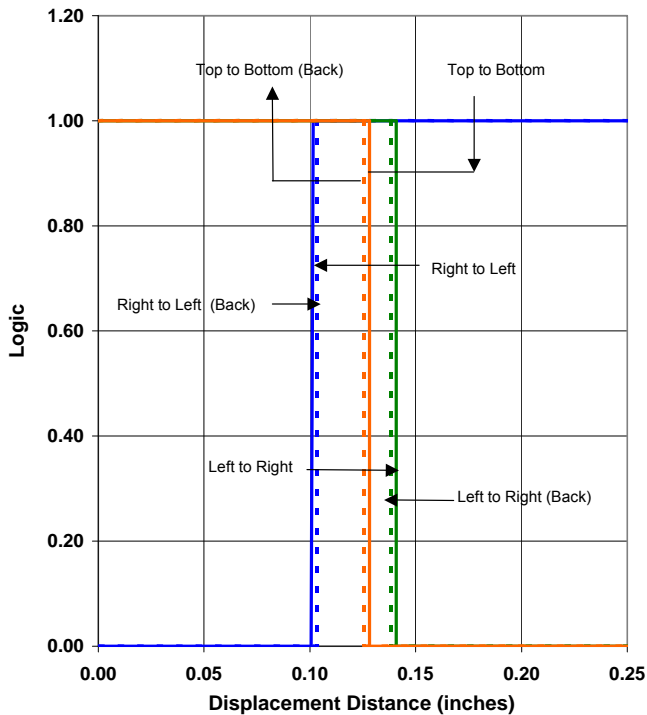
OPB480T55 - Flag Next to Emitter



OPB480T55 - Flag Next to Sensor

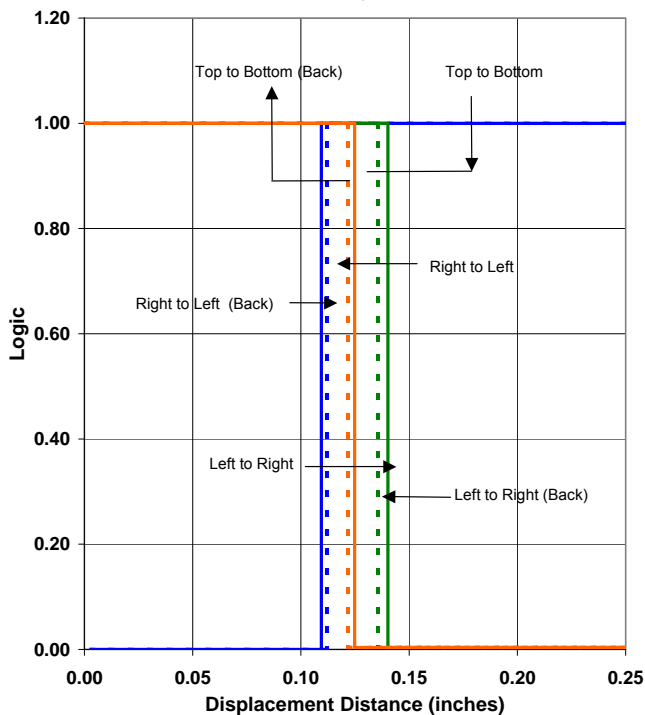


OPB480T55 - Flag in Middle of Slot

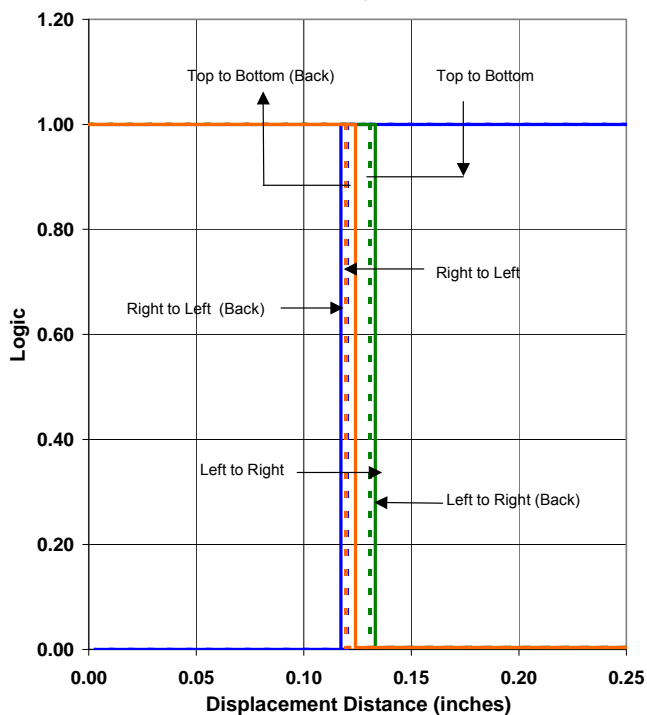


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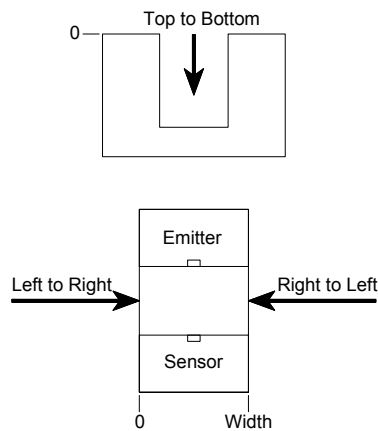
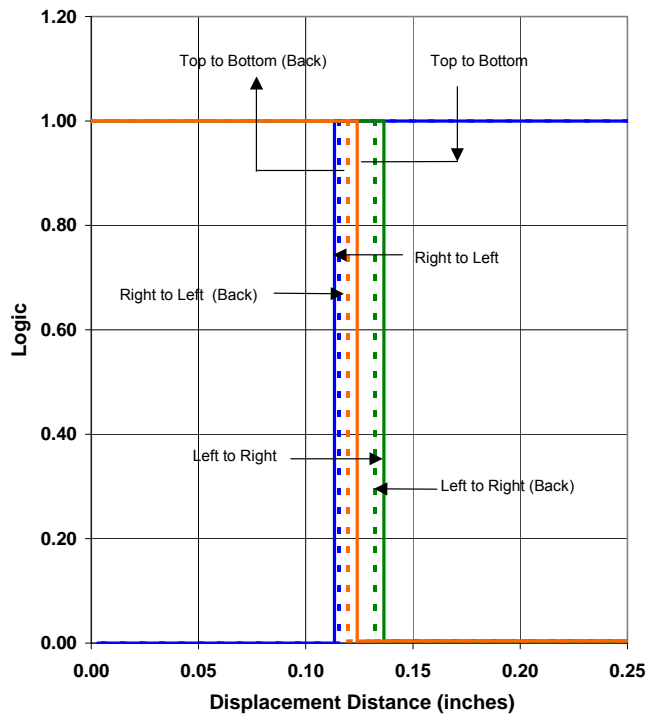
OPB481N51 - Flag Next to Emitter



OPB481N51 - Flag Next to Sensor

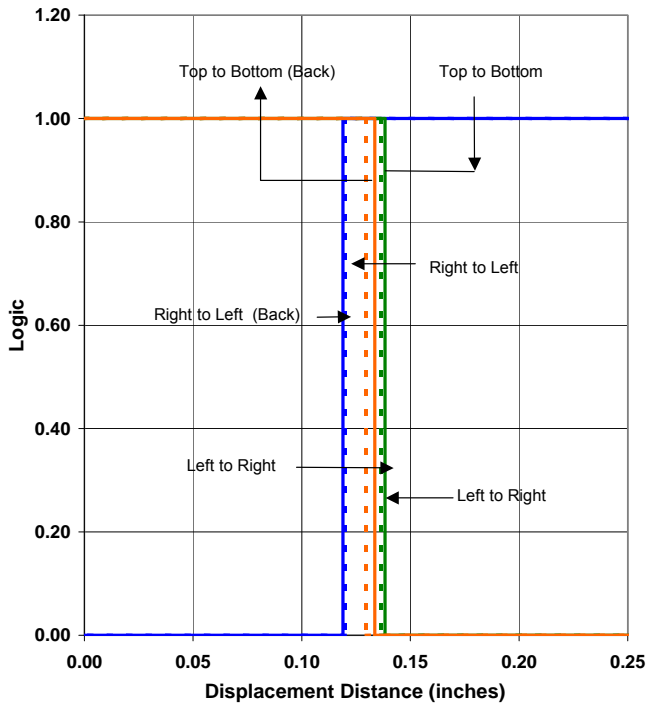


OPB481N51 - Flag in Middle of Slot

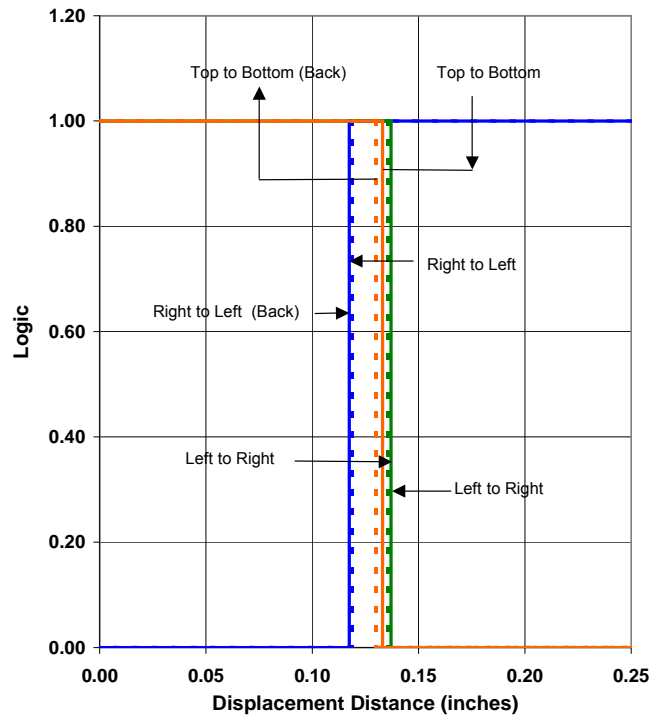


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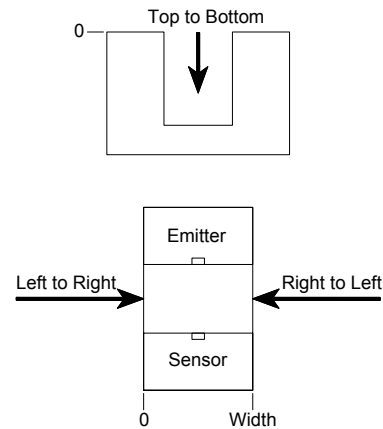
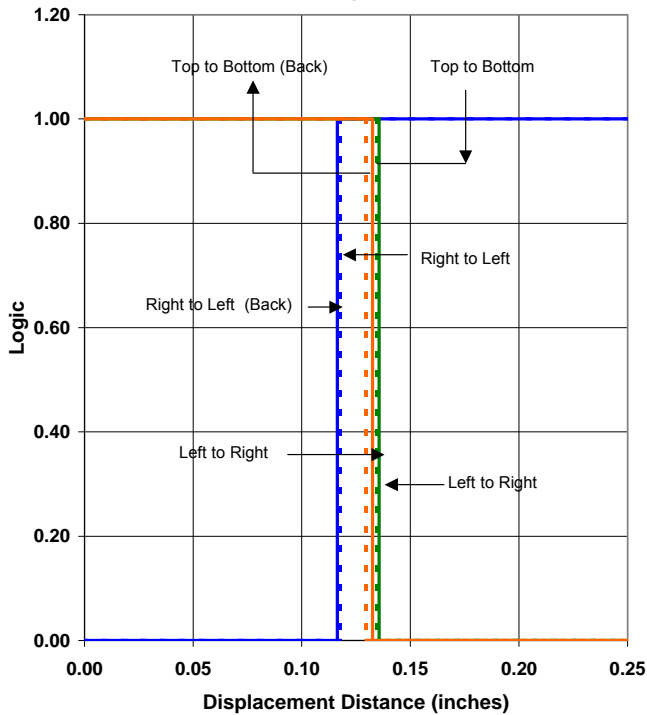
OPB460N11 - Flag Next to Emitter



OPB460N11 - Flag Next to Sensor



OPB460N11 - Flag in Middle of Slot



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