

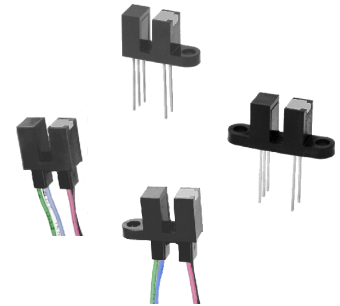
Photologic® Slotted Optical Switch

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).

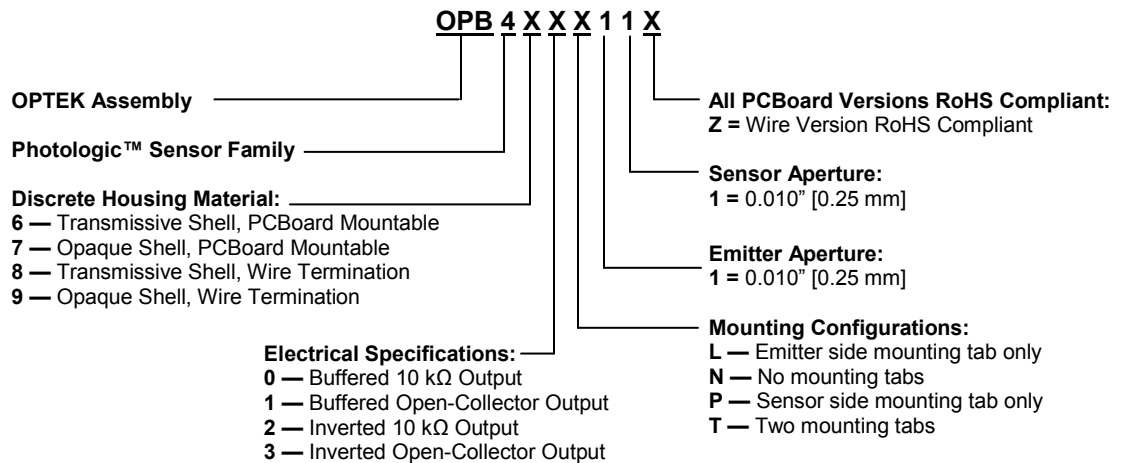
All devices in this series exhibit performance over supply voltages ranging from 4.5 V to 16.0 V, and may be specified as buffered or inverted with 10 kW Pull-up or Open Collector output. Devices are also TTI/LSTTL compatible and can drive up to 10 TTL loads.

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

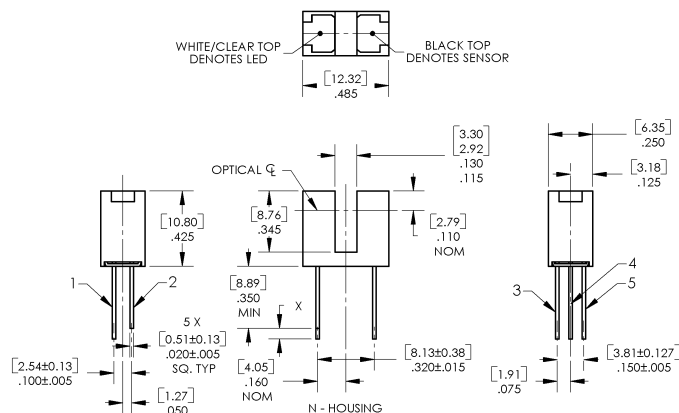


RoHS

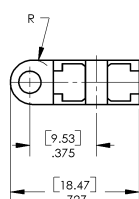
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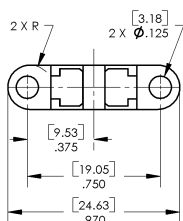
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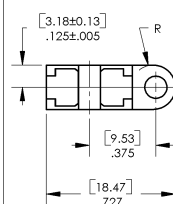
Color-Pin	Description
Red-1	Anode
Black-2	Cathode
White-3	Vcc
Blue-4	Output
Green-5	Ground



I - HOUSING



T - HOUSING



P - HOUSING

MECHANICAL DRAWING OF THE N-HOUSING, showing dimensions in inches and millimeters.

Top View:

- Overall width: 12.32" (312.5)
- Overall height: .485"
- Internal width: 12.32" (312.5)
- Internal height: .485"
- Feature 1 (Left): GREY/CLEAR TOP DENOTES LED
- Feature 2 (Right): BLACK TOP DENOTES SENSOR

Side View (Left):

- Overall height: 10.80" (274.3)
- Internal height: .425"
- Feature 1 (Left): LED
- Feature 2 (Right): Sensor

Front View (Center):

- Overall width: 12.32" (312.5)
- Overall height: 8.76" (222.5)
- Internal width: 12.32" (312.5)
- Internal height: .345"
- Feature 1 (Left): LED
- Feature 2 (Right): Sensor
- Feature 3 (Bottom): OPTICAL C
- Feature 4 (Bottom): #26 AWG

Side View (Right):

- Overall height: 6.35" (162.7)
- Internal height: .250"
- Feature 1 (Left): LED
- Feature 2 (Right): Sensor

Bottom View:

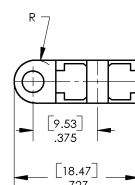
- Overall width: 12.32" (312.5)
- Overall height: 24 MIN
- Internal width: 12.32" (312.5)
- Internal height: .175"
- Feature 1 (Left): LED
- Feature 2 (Right): Sensor
- Feature 3 (Bottom): OPTICAL C
- Feature 4 (Bottom): #26 AWG

Notes:

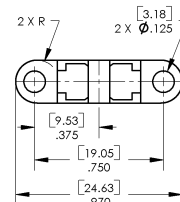
- GREY/CLEAR TOP DENOTES LED
- BLACK TOP DENOTES SENSOR
- OPTICAL C
- #26 AWG

Dimensions:

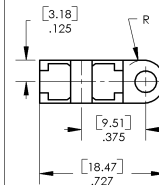
- 12.32" (312.5)
- .485"
- 12.32" (312.5)
- .485"
- 10.80" (274.3)
- .425"
- 8.76" (222.5)
- .345"
- 24 MIN
- .175"
- 6.35" (162.7)
- .250"
- 12.32" (312.5)
- .180"
- 4.57" (117.3)
- 2.79" (70.9)
- .110 NOM
- 5.33" (135.3)
- .210"



L - HOUSING



T - HOUSING



P - HOUSING

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 $+85^\circ\text{C}$
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.

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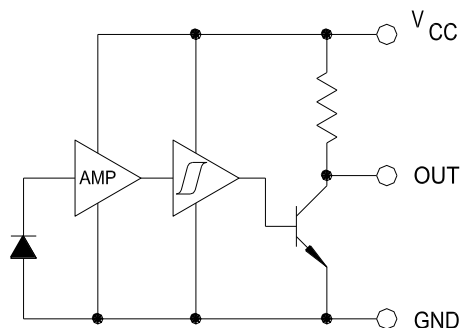
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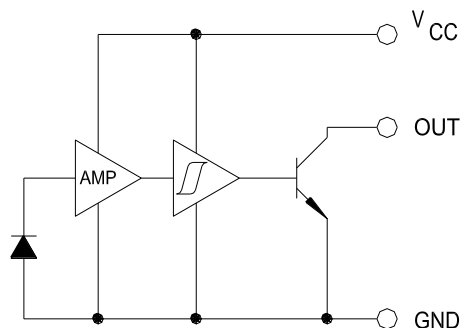
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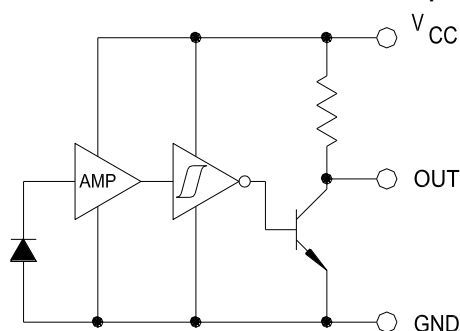
OPB460/470/480/490 Buffered 10K Pull-Up



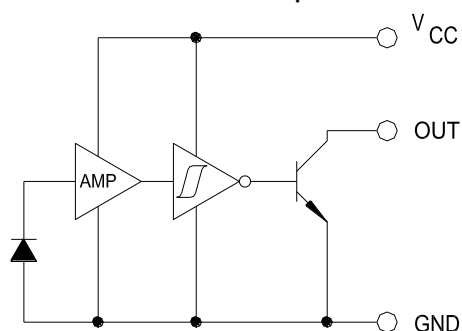
OPB461/471/481/491 Buffered Open-Collector



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 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 V , No Load, $I_F = 0 \text{ mA}$
I_{OH}	High Level Output Voltage: 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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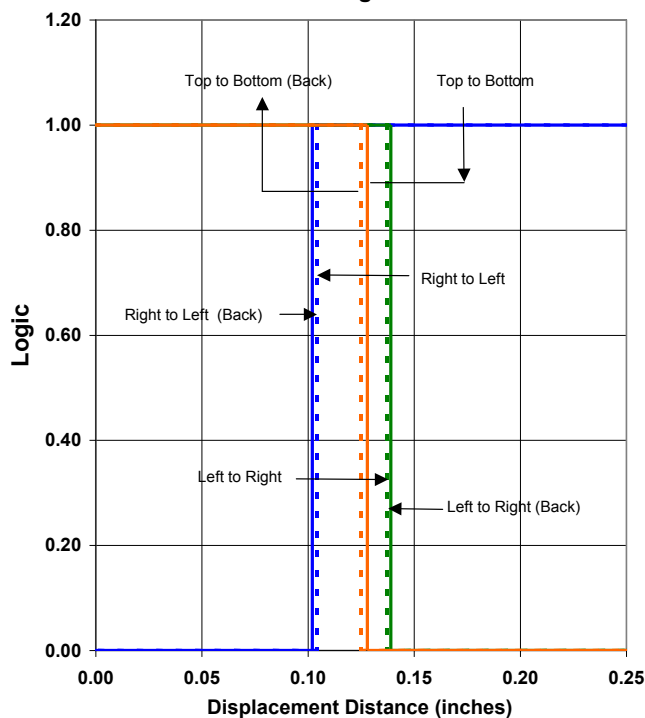
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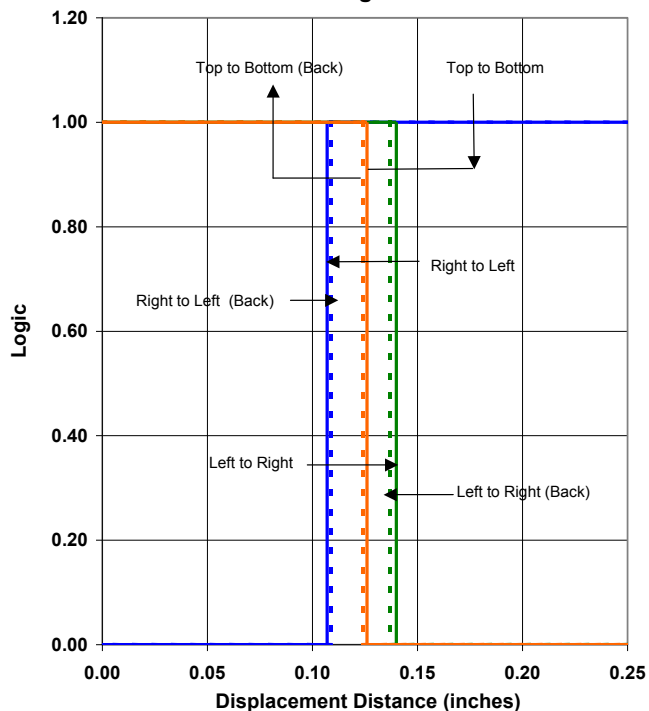
OPB460, OPB470, OPB480, OPB490 Series



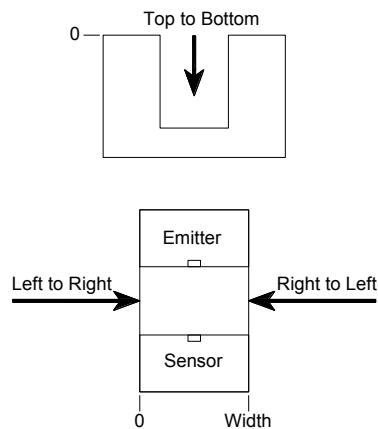
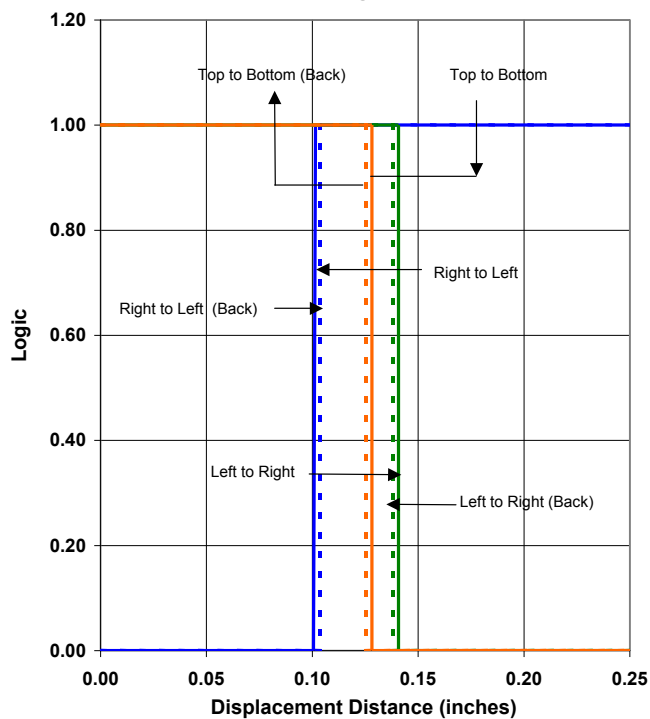
OPB480T55 - Flag Next to Emitter



OPB480T55 - Flag Next to Sensor



OPB480T55 - Flag in Middle of Slot



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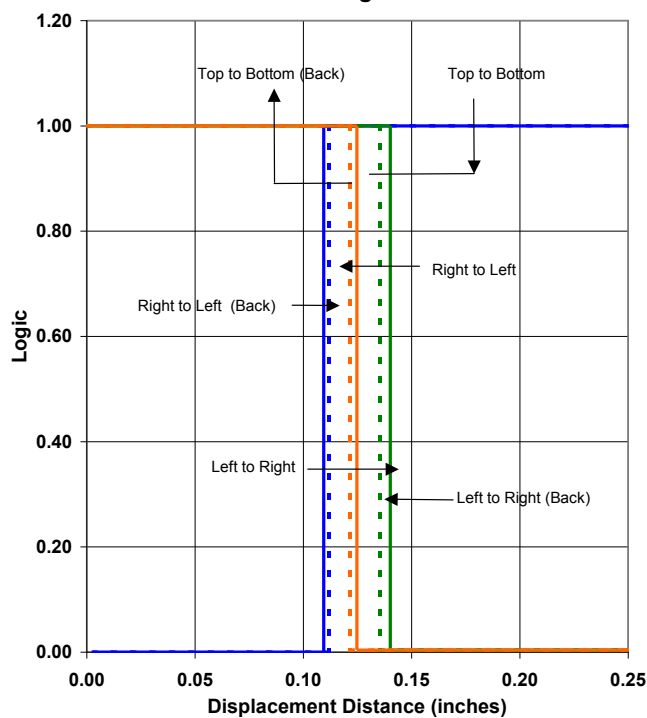
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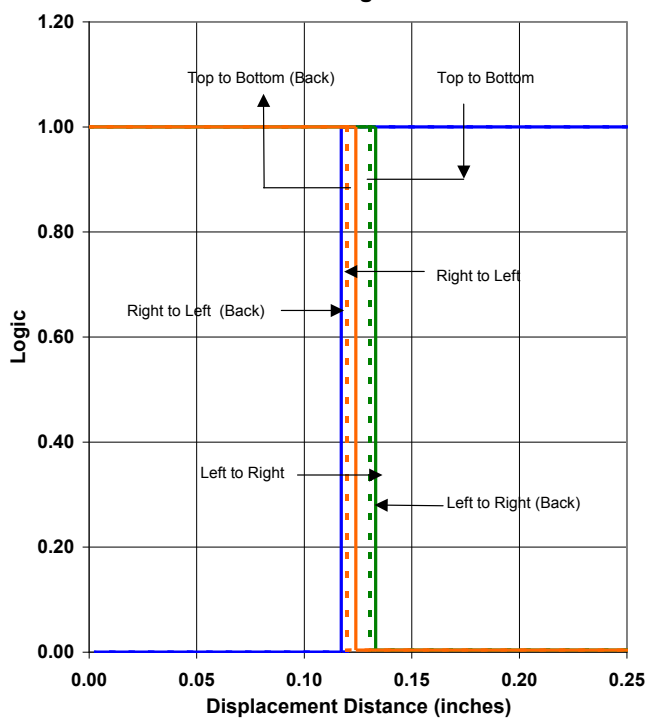
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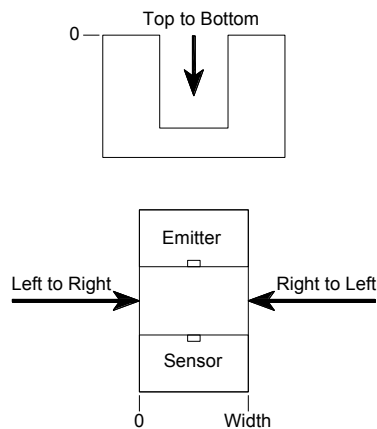
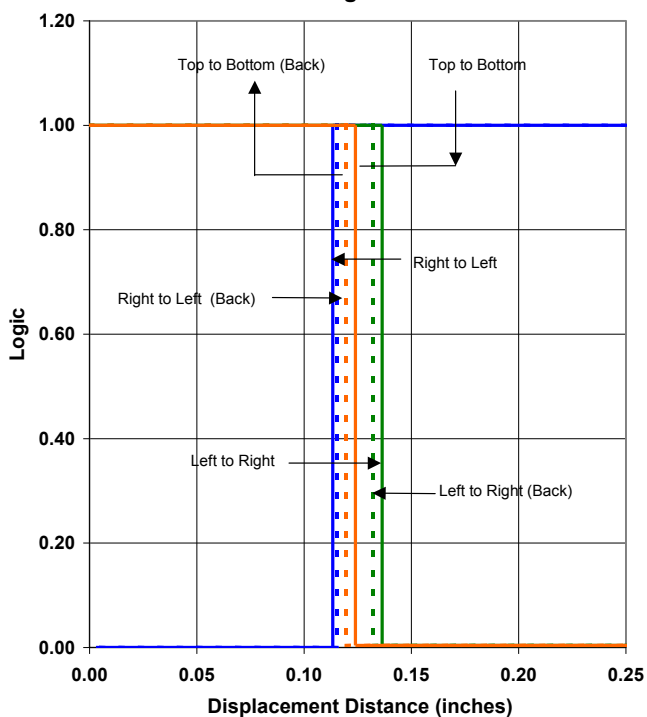
OPB481N51 - Flag Next to Emitter



OPB481N51 - Flag Next to Sensor



OPB481N51 - Flag in Middle of Slot



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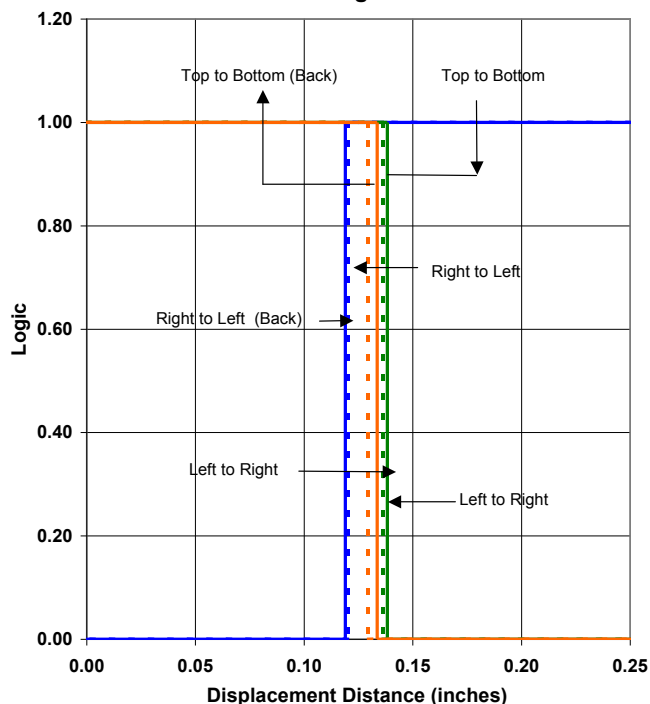
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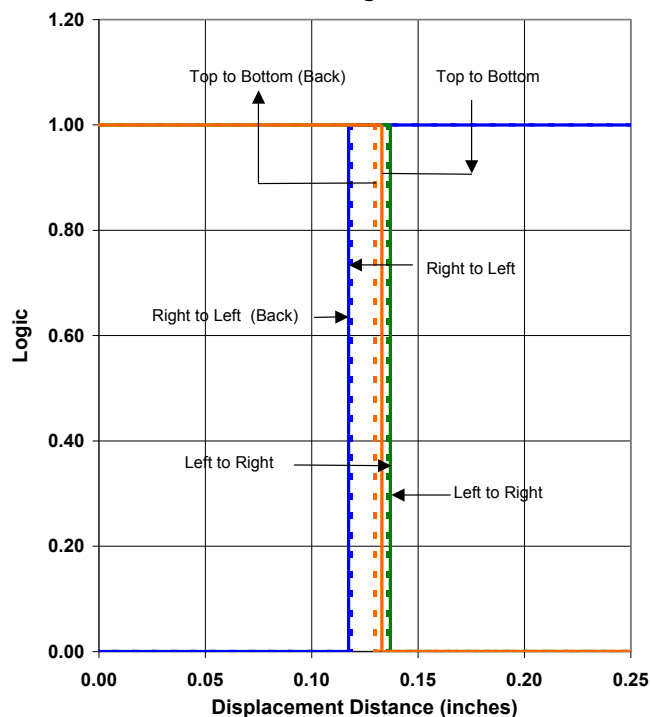
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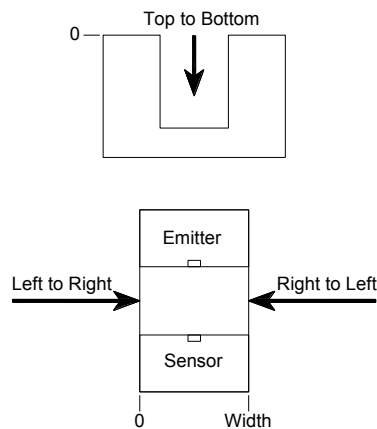
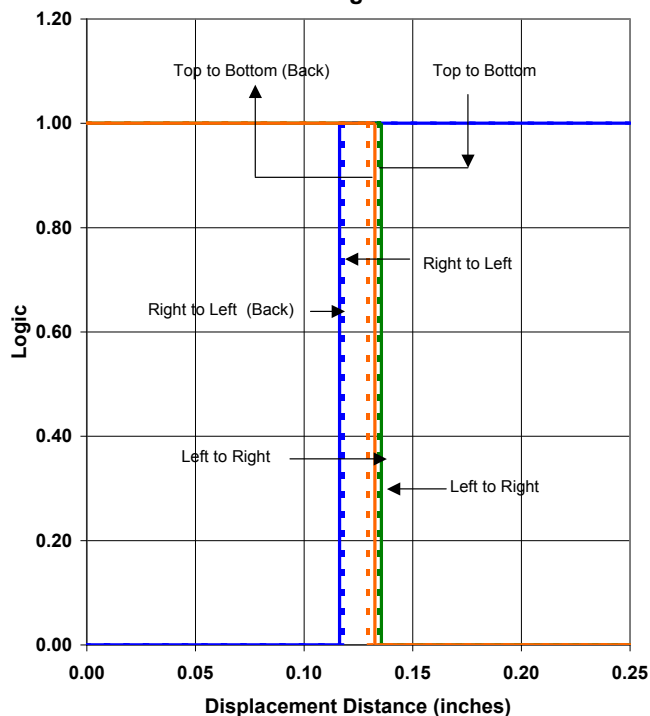
OPB460N11 - Flag Next to Emitter



OPB460N11 - Flag Next to Sensor



OPB460N11 - Flag in Middle of Slot



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