

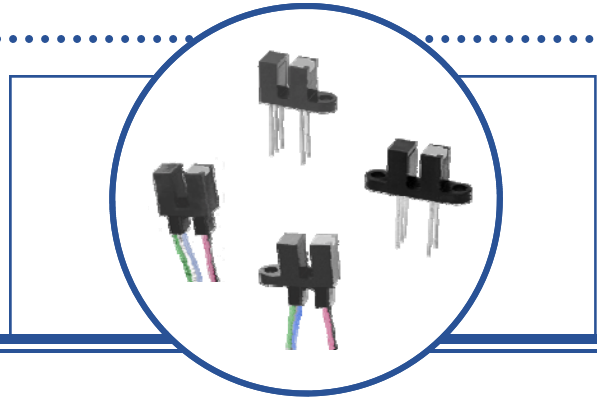
# Photologic® Slotted Optical Switch

## 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).

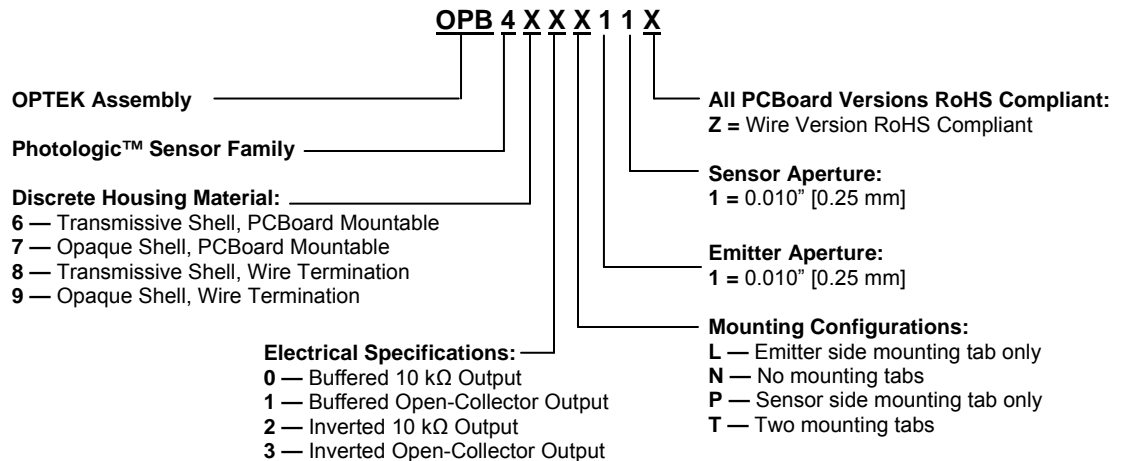
All devices in this series exhibit performance over supply voltages ranging from 4.5 V to 16.0 V, and may be specified as buffered or inverted with 10 kW Pull-up or Open Collector output. Devices are also TTI/LSTTL compatible and can drive up to 10 TTL loads.

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

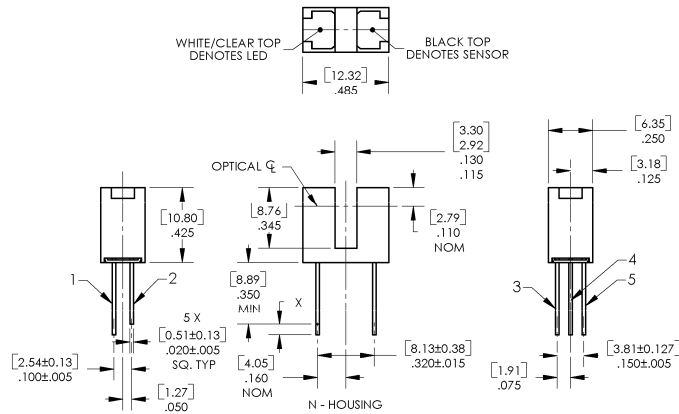


**RoHS**

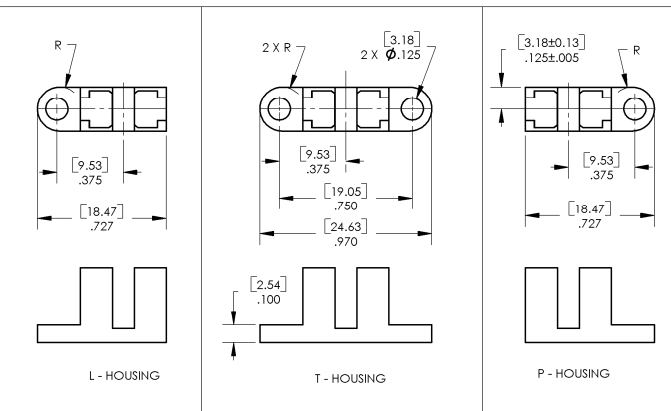
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# Photologic® Slotted Optical Switch

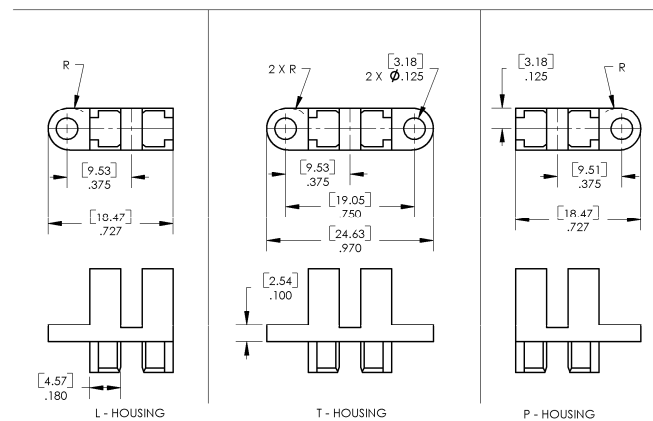
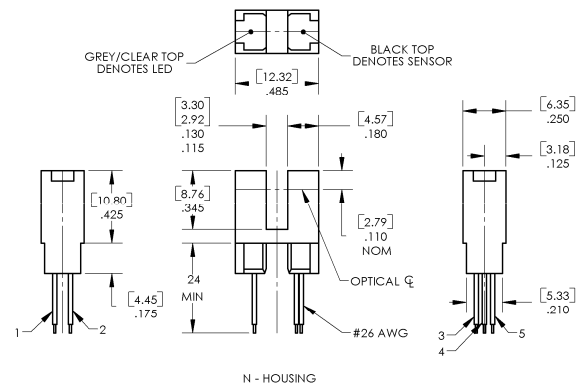
## OPB460, OPB470, OPB480, OPB490 Series



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] <sup>(1)</sup>	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 <sup>(2)</sup>	75 mW

**Output Photologic®**

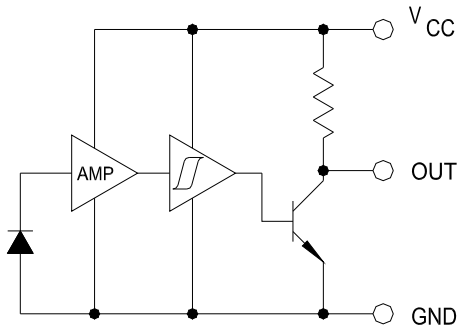
Voltage at Output Lead (Open Collector Output)	25 V
Output Photologic® Power Dissipation <sup>(3)</sup>	200 mW

Total Device Power Dissipation <sup>(4)</sup>	275 mW
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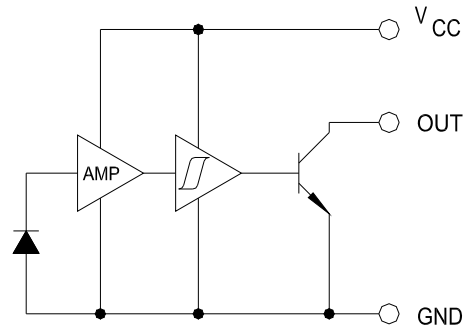
Notes:

- (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.

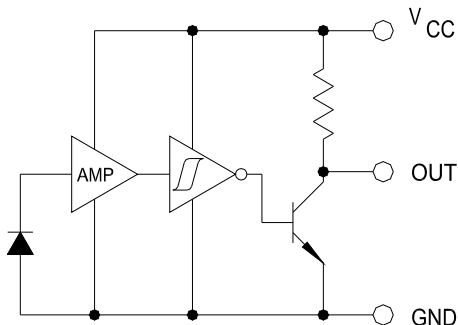
**OPB460/470/480/490 Buffered 10K Pull-Up**



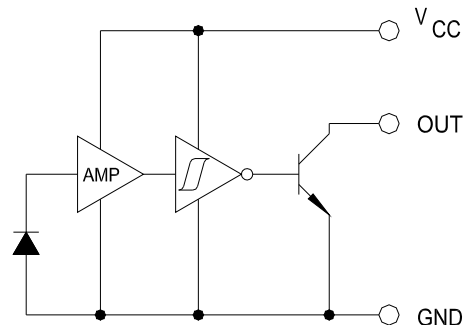
**OPB461/471/481/491 Buffered Open-Collector**



**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
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**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	$\mu\text{A}$	$V_R = 2\text{ V}$ , $T_A = 25^\circ\text{C}$

**Output Photologic® Sensor**

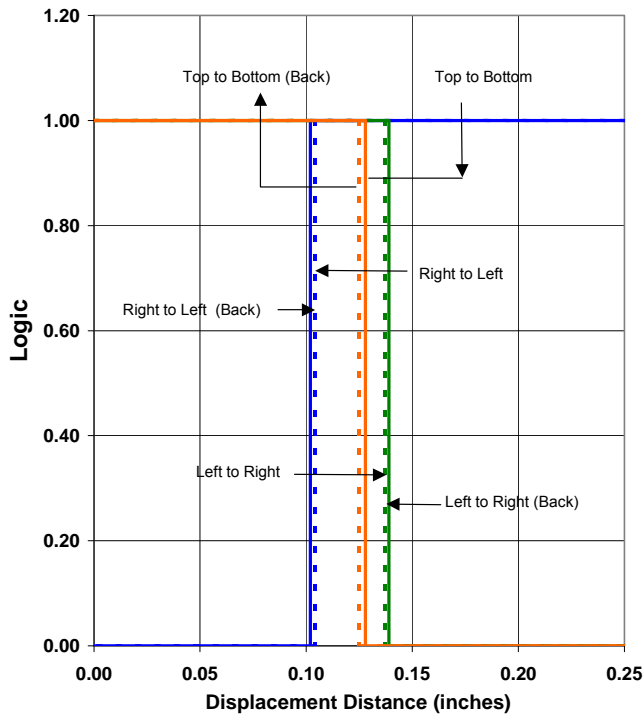
$V_{CC}$	Operating DC Supply Voltage	4.5	-	16	V	
$I_{CCL}$	Low Level Supply Current: Buffered with 10k pull-up <sup>(1)</sup> Buffered Open-Collector Output	-	-	7.5	mA	$V_{CC} = 16\text{ V}$ , $I_F = 0\text{ mA}$ <sup>(1)</sup>
	Inverted with 10k pull-up: Inverted Open-Collector Output	-	-	7.5	mA	$V_{CC} = 16\text{ V}$ , $I_F = 12\text{ mA}$
$I_{CCH}$	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	$V_{CC} = 16\text{ V}$ , $I_F = 0\text{ mA}$ <sup>(1)</sup>
$V_{OL}$	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	$V_{CC} = 4.5\text{ V}$ , $I_F = 12\text{ mA}$ <sup>(1)</sup>
$V_{OH}$	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 <sup>(1)</sup>	$V_{CC}$ -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	$\mu\text{A}$	$V_{CC} = 16\text{ V}$ , $I_F = 12\text{ mA}$ , $V_{OH} = 25\text{ V}$ , $T_A = 25^\circ\text{C}$
	Inverted with 10k pull-up: Inverted Open-Collector Output <sup>(1)</sup>	-	-	14	$\mu\text{A}$	$V_{CC} = 16\text{ V}$ , $I_F = 0\text{ mA}$ , $V_{OH} = 25\text{ V}$ , $T_A = 25^\circ\text{C}$
$I_{F(+)}$	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 $12\text{ mA}$
$t_{PLH}, t_{PHL}$	Propagation Delay	-	3	-	$\mu\text{s}$	$R_L = 300\ \Omega$ to $5\text{ V}$ , $C_L = 50\text{ pF}$

Notes:

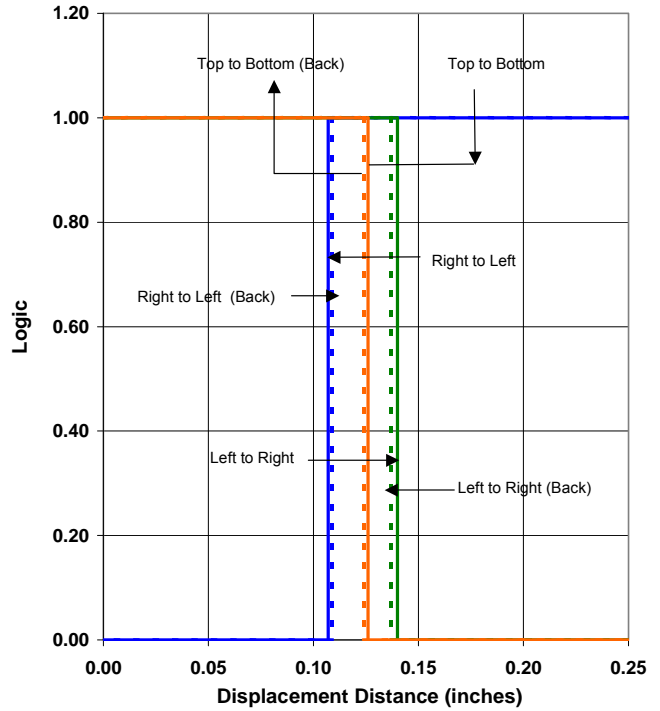
- (1) Normal application would be with light source blocked, simulated by  $I_F = 0\text{ mA}$ .
- (2) All parameters tested using pulse technique.

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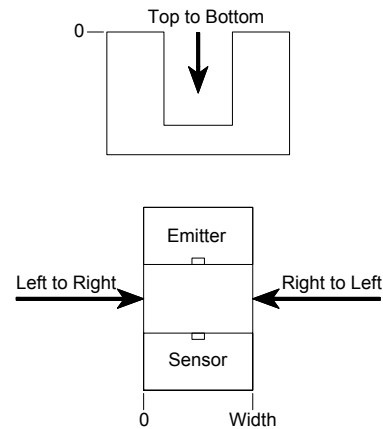
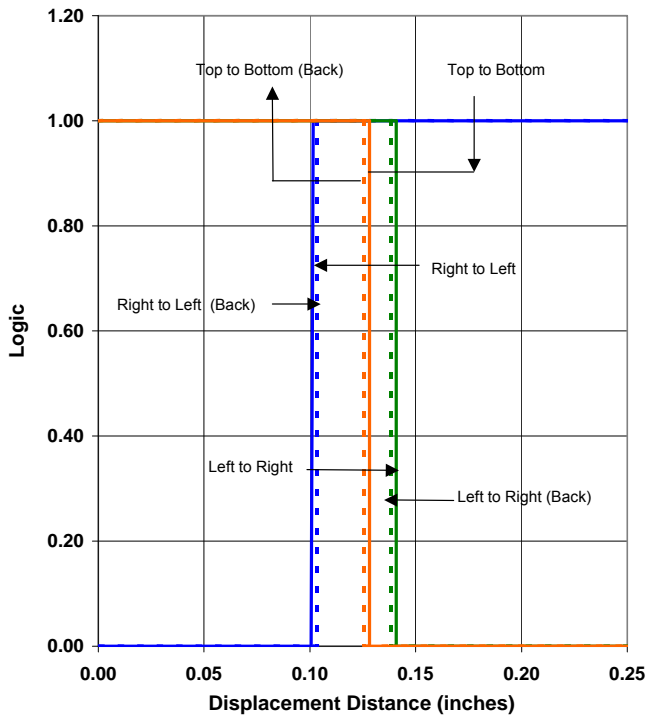
**OPB480T55 - Flag Next to Emitter**



**OPB480T55 - Flag Next to Sensor**

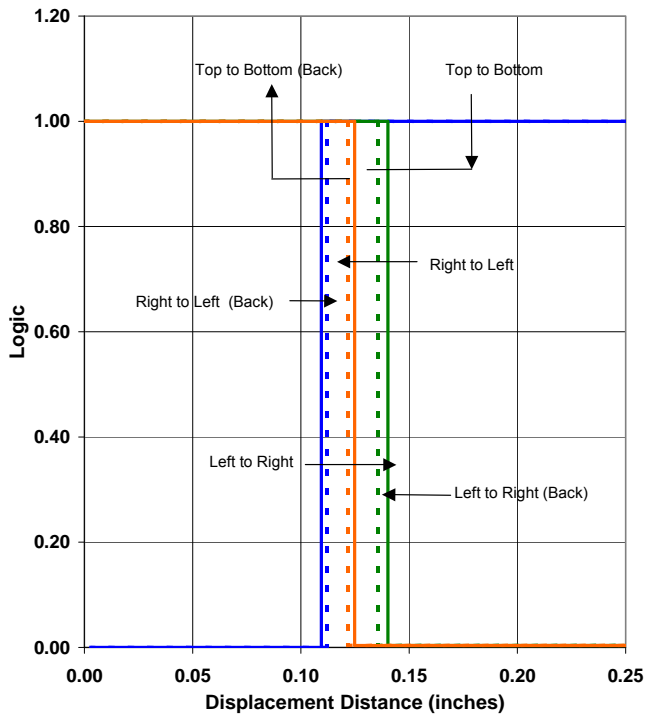


**OPB480T55 - Flag in Middle of Slot**

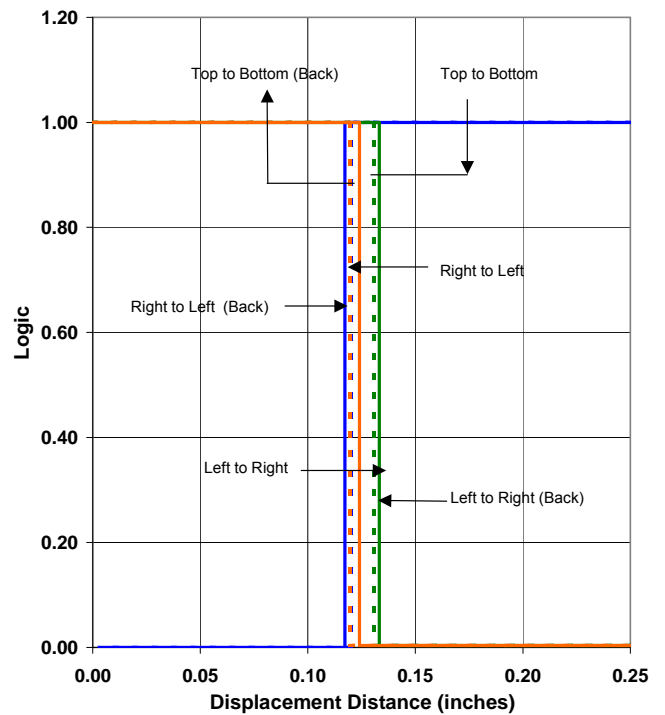


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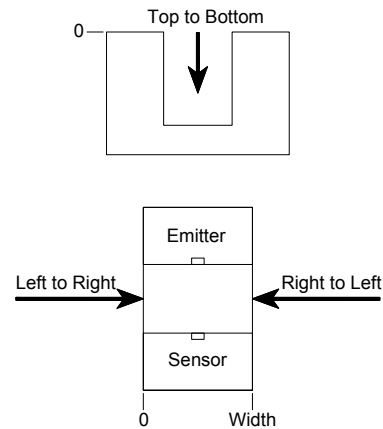
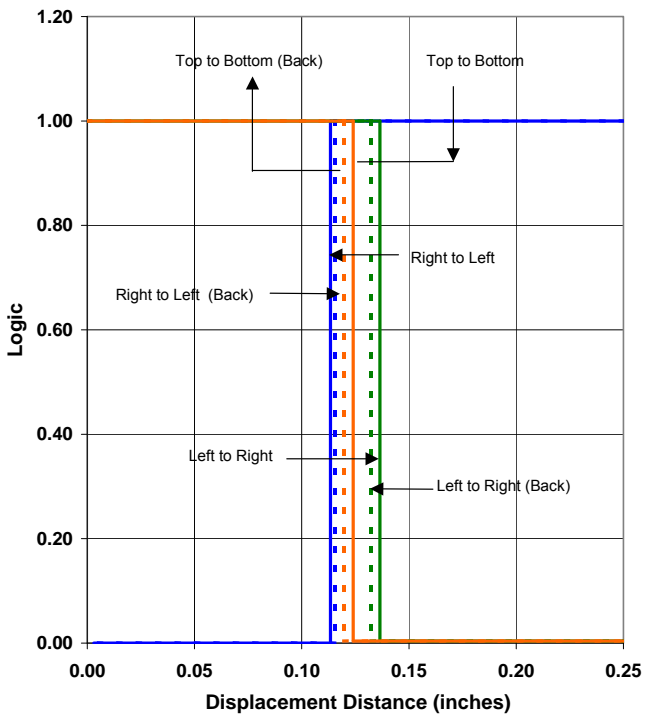
**OPB481N51 - Flag Next to Emitter**



**OPB481N51 - Flag Next to Sensor**

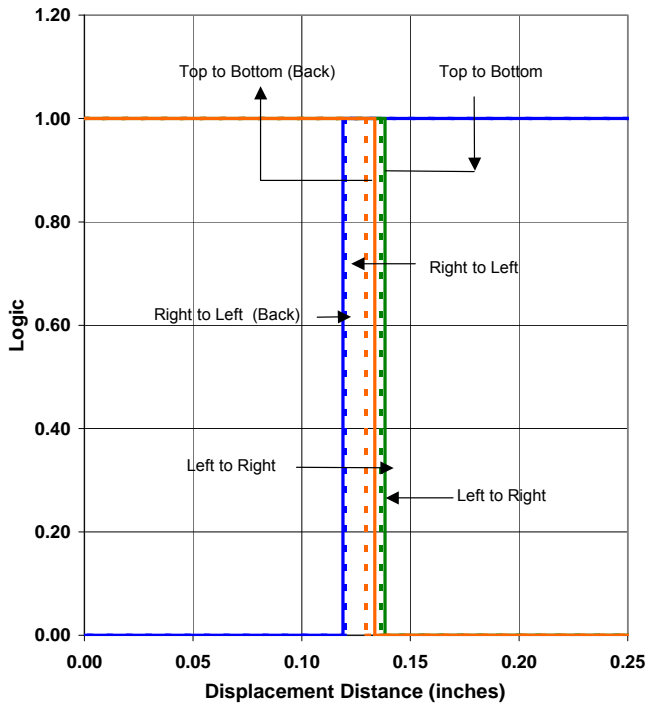


**OPB481N51 - Flag in Middle of Slot**

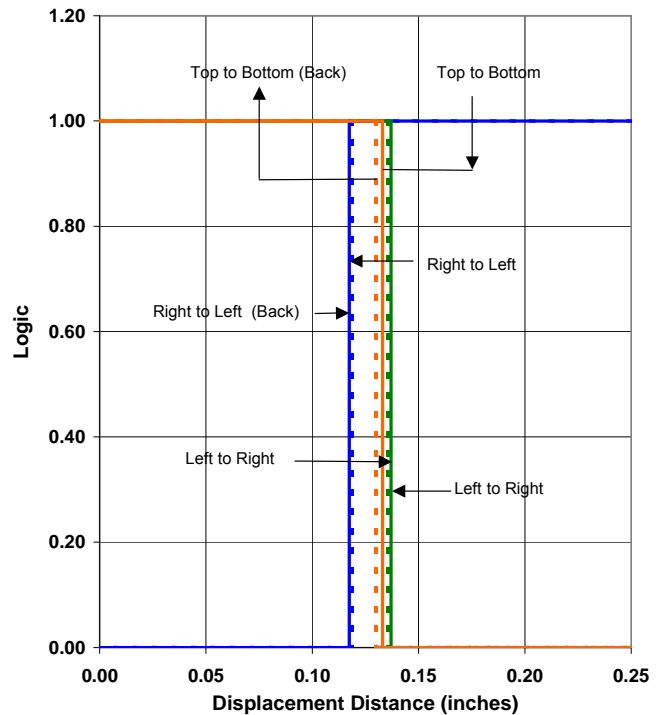


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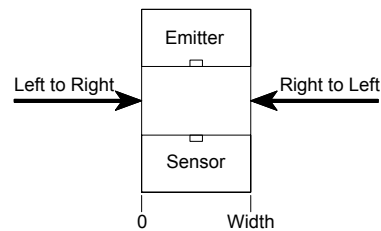
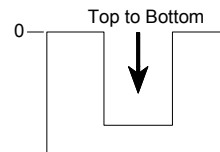
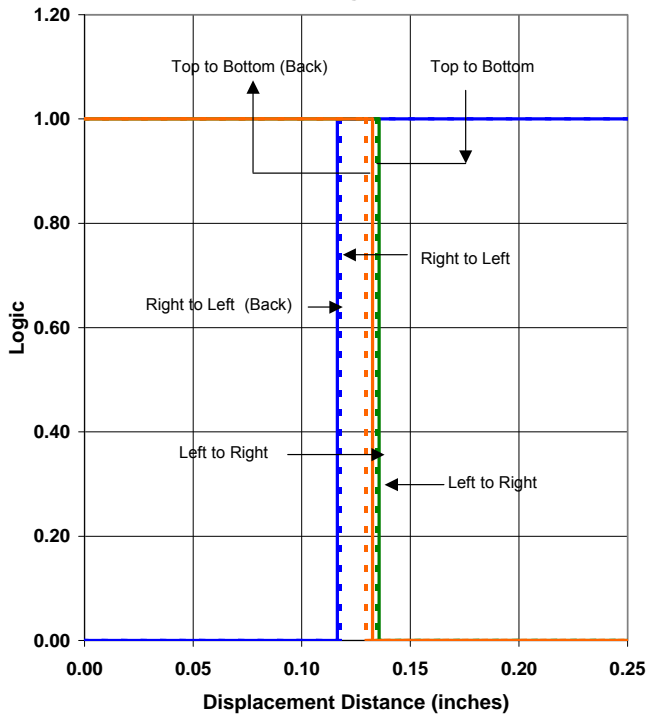
**OPB460N11 - Flag Next to Emitter**



**OPB460N11 - Flag Next to Sensor**



**OPB460N11 - Flag in Middle of Slot**



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