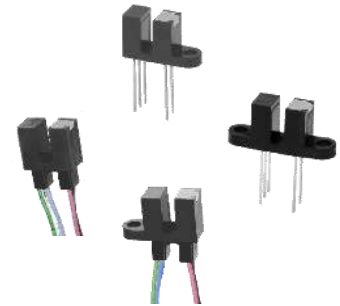


# Photologic® Slotted Optical Switch

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).

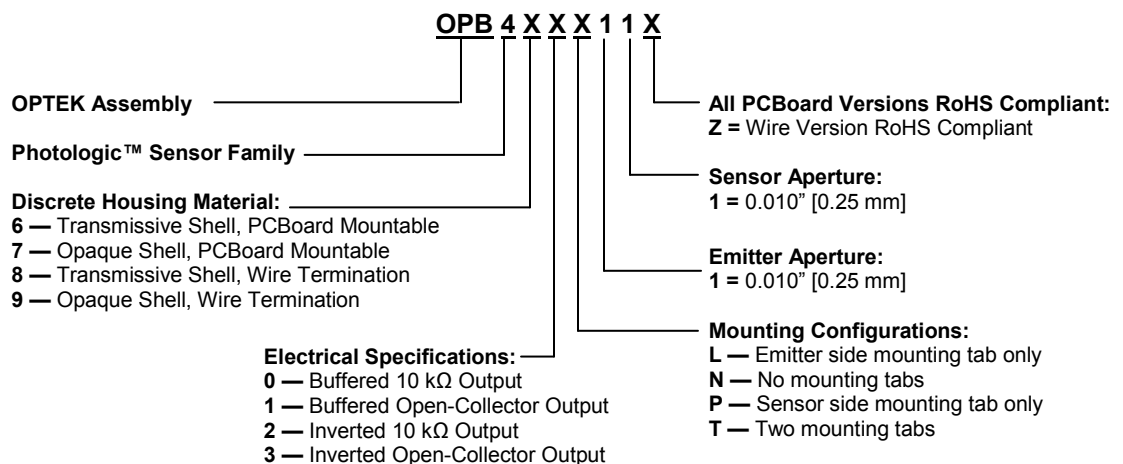
All devices in this series exhibit performance over supply voltages ranging from 4.5 V to 16.0 V, and may be specified as buffered or inverted with 10 kW Pull-up or Open Collector output. Devices are also TTI/LSTTL compatible and can drive up to 10 TTL loads.

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

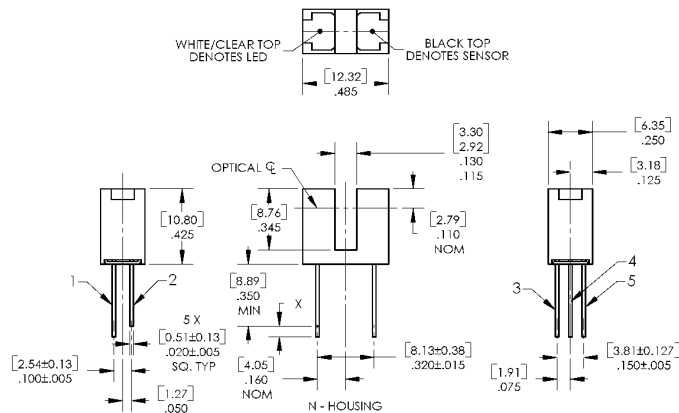


General Note  
TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

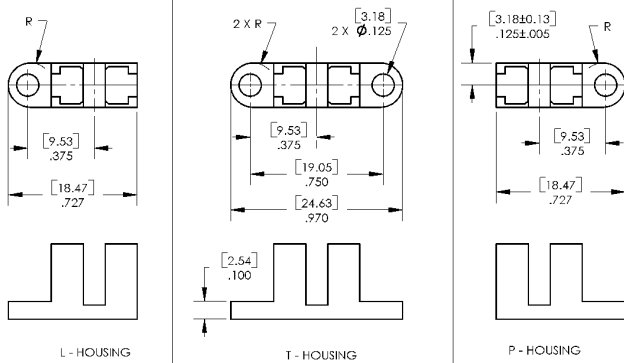
OPTEK Technology, Inc.  
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200  
www.optekinc.com | www.ttelectronics.com

# Photologic® Slotted Optical Switch

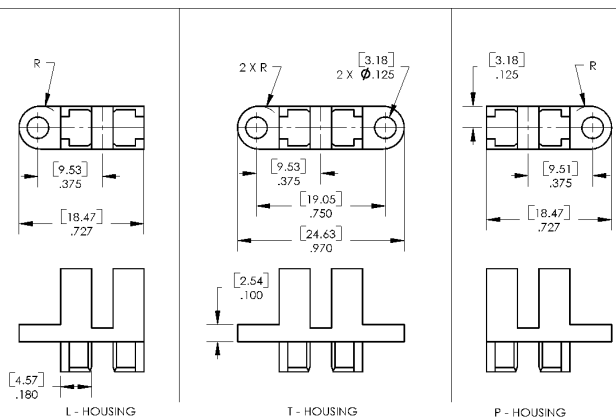
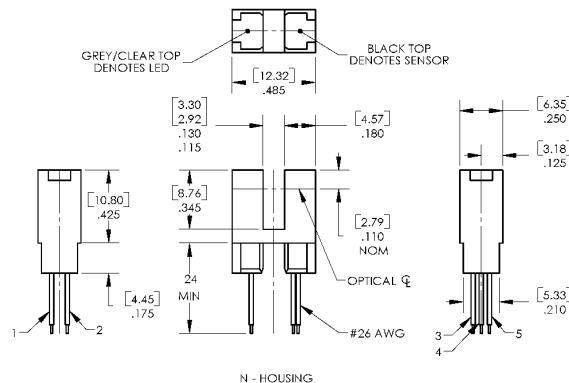
OPB460, OPB470, OPB480, OPB490 Series



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



TOLERANCE DIMENSIONS ARE: ± .25mm [± .010"]



**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.**

General Note  
 TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

OPTEK Technology, Inc.  
 1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200  
[www.optekinc.com](http://www.optekinc.com) | [www.ttelectronics.com](http://www.ttelectronics.com)

# Photologic® Slotted Optical Switch



## OPB460, OPB470, OPB480, OPB490 Series

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
<b>Input Infrared LED</b>	
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
<b>Output Photologic®</b>	
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

Notes:

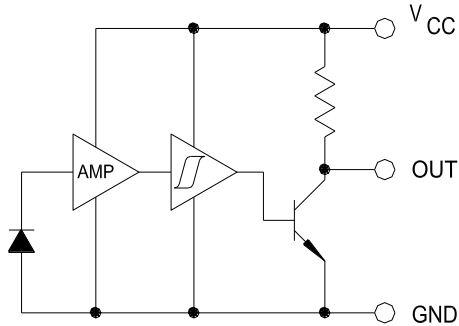
- (1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
- (2) Derate linearly 1.67 mW/°C above 25° C (OPB460, OPB470) or derate linearly 1.82 mW/°C above 25° C (OPB480, OPB490).
- (3) Derate linearly 1.50 mW/°C above 25° C (OPB460, OPB470) or derate linearly 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.

# Photologic® Slotted Optical Switch

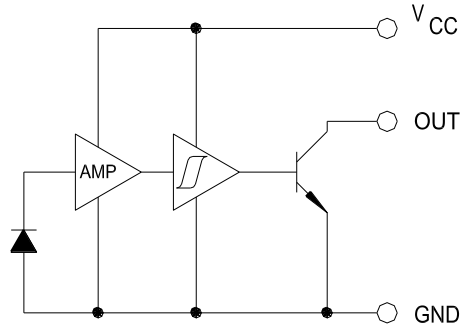


OPB460, OPB470, OPB480, OPB490 Series

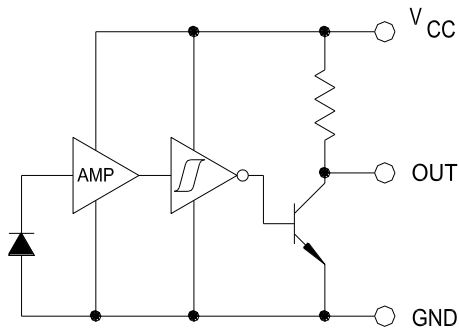
**OPB460/470/480/490 Buffered 10K Pull-Up**



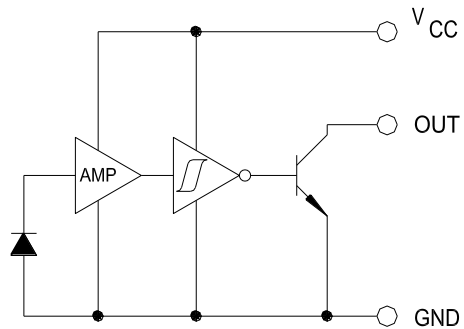
**OPB461/471/481/491 Buffered Open-Collector**



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



**OPB463/473/483/493 Inverted Open-Collector**



General Note  
TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

OPTEK Technology, Inc.  
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200  
www.optekinc.com | www.ttelectronics.com

# Photologic® Slotted Optical Switch

OPB460, OPB470, OPB480, OPB490 Series



Electrical Characteristics (T <sub>A</sub> = 25° C unless otherwise noted)						
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>Input Diode</b>						
V <sub>F</sub>	Forward Voltage	-	-	1.7	V	I <sub>F</sub> = 20 mA, T <sub>A</sub> = 25° C
I <sub>R</sub>	Reverse Current	-	-	100	μA	V <sub>R</sub> = 2 V, T <sub>A</sub> = 25° C
<b>Output Photologic® Sensor</b>						
V <sub>CC</sub>	Operating DC Supply Voltage	4.5	-	16	V	
I <sub>CCL</sub>	Low Level Supply Current: Buffered with 10k pull-up <sup>(1)</sup> Buffered Open-Collector Output	-	-	7.5	mA	V <sub>CC</sub> = 16 V, I <sub>F</sub> = 0 mA <sup>(1)</sup>
	Inverted with 10k pull-up: Inverted Open-Collector Output	-	-	7.5	mA	V <sub>CC</sub> = 16 V, I <sub>F</sub> = 12 mA
I <sub>CCH</sub>	High Level Supply Current: Buffered with 10k pull-up Buffered Open-Collector Output	-	-	7.5	mA	V <sub>CC</sub> = 16 V, I <sub>F</sub> = 12 mA
	Inverted with 10k pull-up: Inverted Open-Collector Output	-	-	7.5	mA	V <sub>CC</sub> = 16 V, I <sub>F</sub> = 0 mA <sup>(1)</sup>
V <sub>OL</sub>	Low Level Output Voltage: Buffered with 10k pull-up Buffered Open-Collector Output	-	-	0.4	V	V <sub>CC</sub> = 4.5 V, I <sub>OL</sub> = 16 mA, I <sub>F</sub> = 0 mA
	Inverted with 10k pull-up: Inverted Open-Collector Output	-	-	0.4	V	V <sub>CC</sub> = 4.5 V, I <sub>F</sub> = 12 mA <sup>(1)</sup>
V <sub>OH</sub>	High Level Output Voltage: Buffered with 10k pull-up	V <sub>CC</sub> -1.5	-	-	V	V <sub>CC</sub> = 4.5 V to 16 V, No Load, I <sub>F</sub> = 12 mA
	Inverted with 10k pull-up: Inverted Open-Collector Output <sup>(1)</sup>	V <sub>CC</sub> -1.5	-	-	V	V <sub>CC</sub> = 4.5 V to 16 V, No Load, I <sub>F</sub> = 0 mA
I <sub>OH</sub>	High Level Output Current: Buffered Open-Collector Output	-	-	14	μA	V <sub>CC</sub> = 16 V, I <sub>F</sub> = 12 mA, V <sub>OH</sub> = 25 V, T <sub>A</sub> = 25° C
	Inverted with 10k pull-up: Inverted Open-Collector Output <sup>(1)</sup>	-	-	14	μA	V <sub>CC</sub> = 16 V, I <sub>F</sub> = 0 mA, V <sub>OH</sub> = 25 V, T <sub>A</sub> = 25° C
I <sub>F(+)</sub>	LED Positive-Going Threshold Current	-	-	10	mA	V <sub>CC</sub> = 5 V, T <sub>A</sub> = 25° C
I <sub>F(+)</sub> /I <sub>F(-)</sub>	Hysteresis	-	1.4	-	-	V <sub>CC</sub> = 5 V
t <sub>r</sub> , t <sub>f</sub>	Rise Time, Fall Time	-	50	-	ns	V <sub>CC</sub> = 5 V, T <sub>A</sub> = 25° C, I <sub>F</sub> = 0 or 12 mA
t <sub>PLH</sub> , t <sub>PHL</sub>	Propagation Delay	-	3	-	μs	R <sub>L</sub> = 300 Ω to 5 V, C <sub>L</sub> = 50 pF

**Notes:**

- (1) Normal application would be with light source blocked, simulated by I<sub>F</sub> = 0 mA.
- (2) All parameters tested using pulse technique.

General Note  
TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

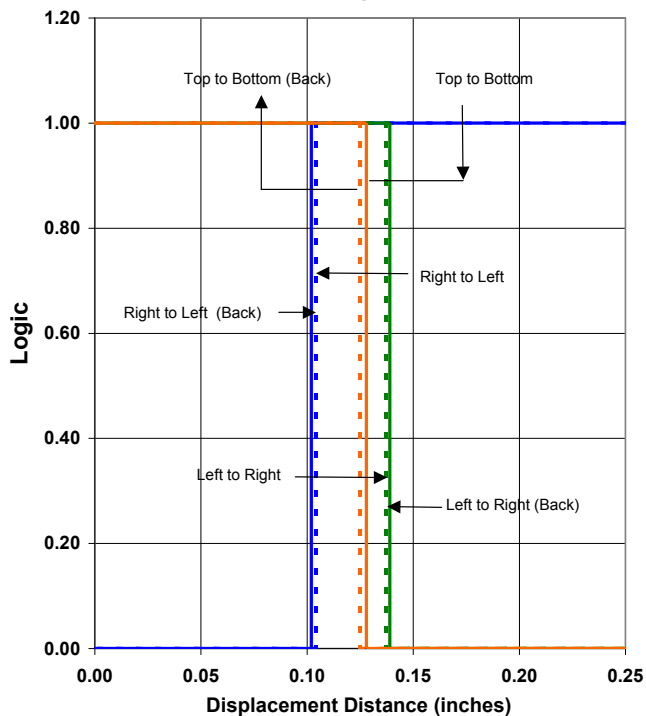
OPTEK Technology, Inc.  
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200  
www.optekinc.com | www.ttelectronics.com

# Photologic® Slotted Optical Switch

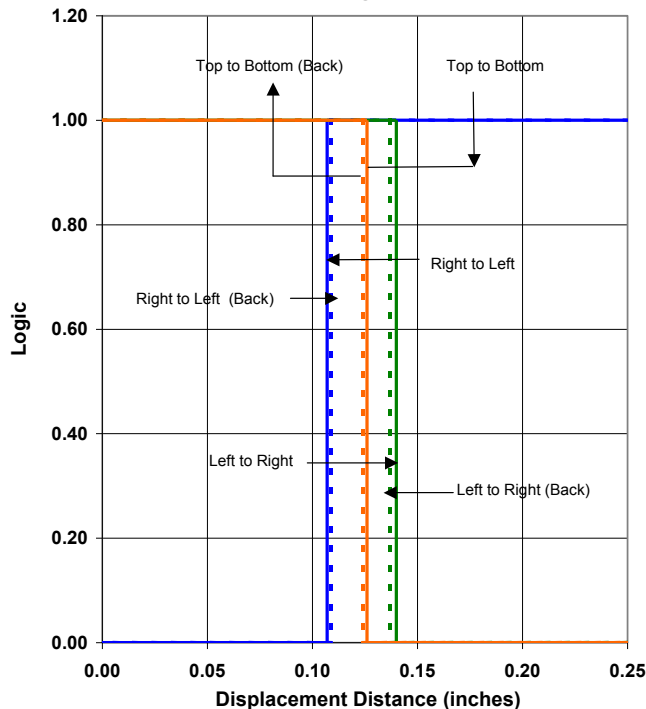


OPB460, OPB470, OPB480, OPB490 Series

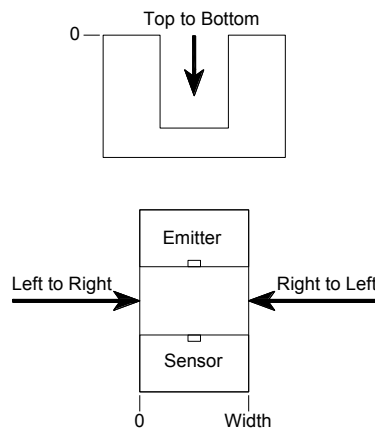
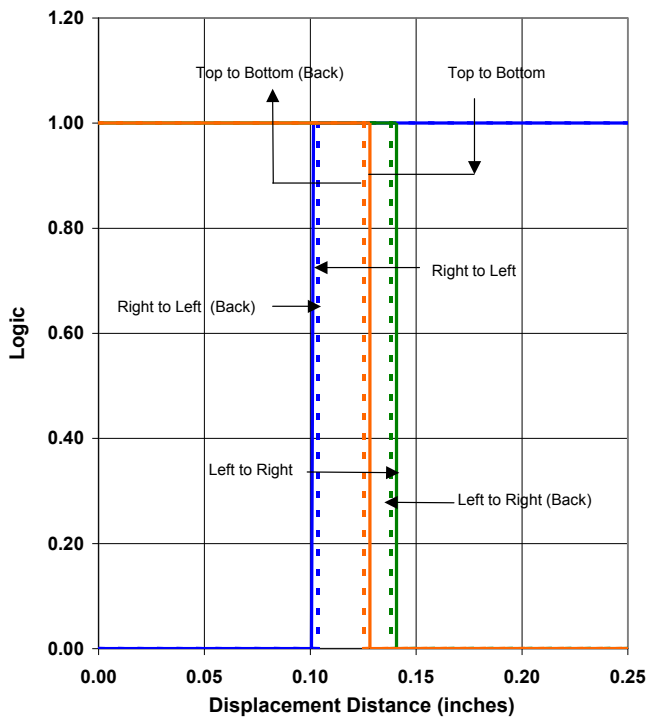
**OPB480T55 - Flag Next to Emitter**



**OPB480T55 - Flag Next to Sensor**



**OPB480T55 - Flag in Middle of Slot**



General Note  
TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

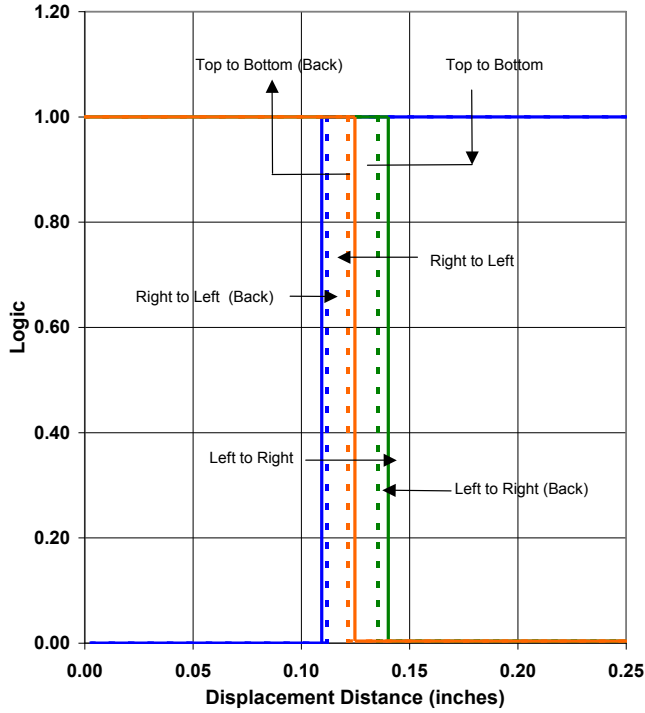
OPTEK Technology, Inc.  
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200  
www.optekinc.com | www.ttelectronics.com

# Photologic® Slotted Optical Switch

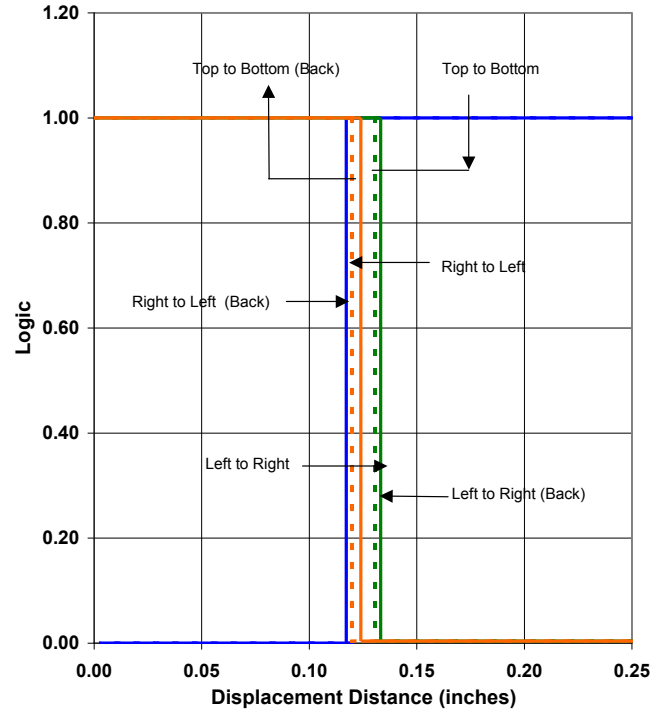


OPB460, OPB470, OPB480, OPB490 Series

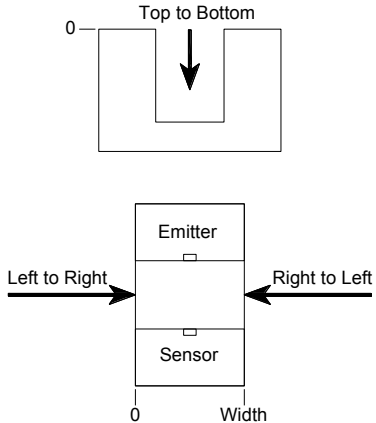
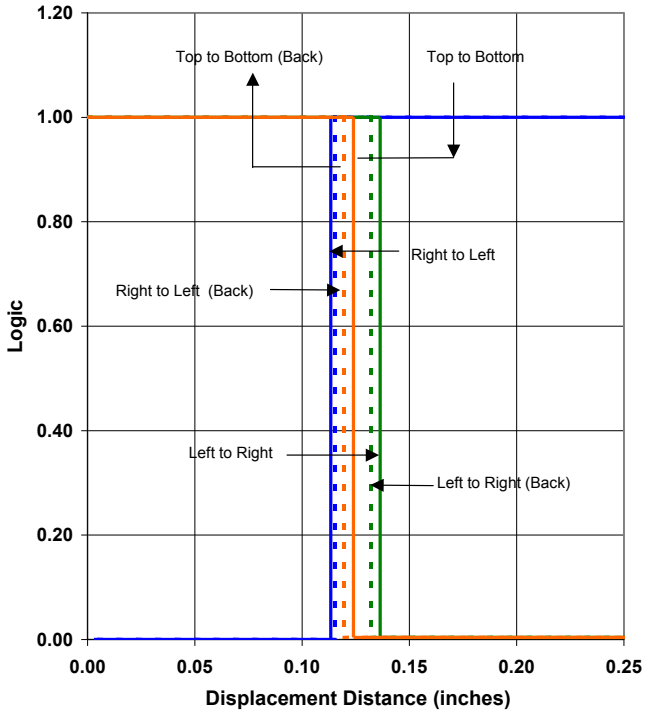
**OPB481N51 - Flag Next to Emitter**



**OPB481N51 - Flag Next to Sensor**



**OPB481N51 - Flag in Middle of Slot**



General Note  
 TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

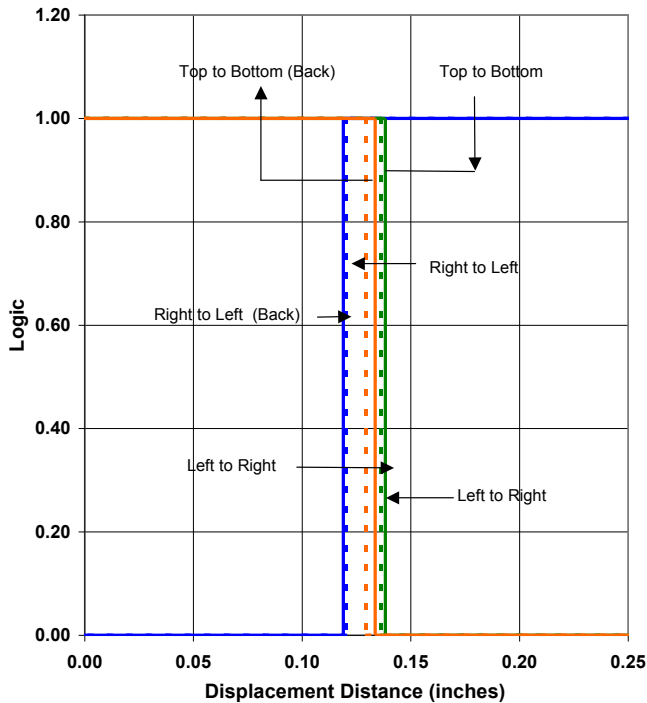
OPTEK Technology, Inc.  
 1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200  
[www.optekinc.com](http://www.optekinc.com) | [www.ttelectronics.com](http://www.ttelectronics.com)

# Photologic® Slotted Optical Switch

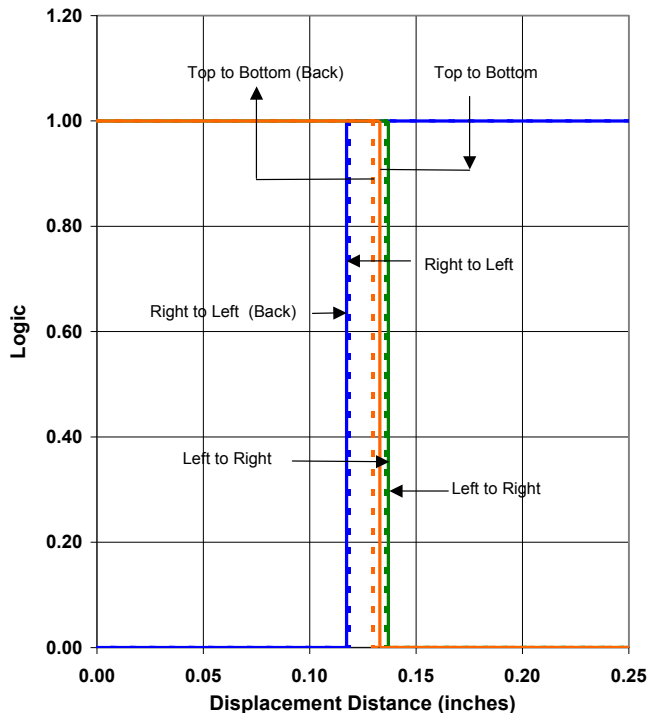


OPB460, OPB470, OPB480, OPB490 Series

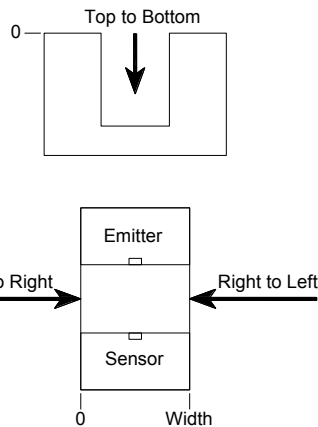
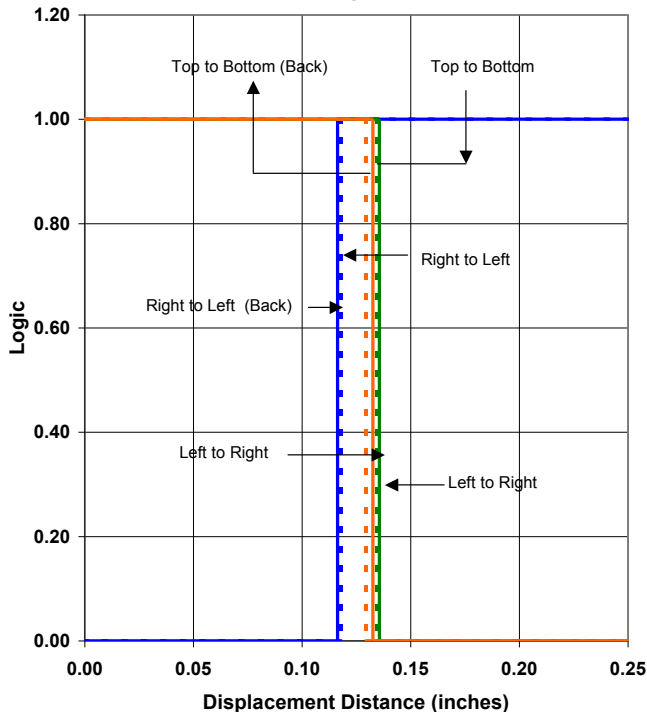
**OPB460N11 - Flag Next to Emitter**



**OPB460N11 - Flag Next to Sensor**



**OPB460N11 - Flag in Middle of Slot**



General Note  
TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

OPTEK Technology, Inc.  
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200  
www.optekinc.com | www.ttelectronics.com